MBS Images Plugin Documentation

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0.1 Introduction

This is the PDF version of the documentation for the Xojo Plug-in from Monkeybread Software Germany.
Plugin part: MBS Images Plugin

0.2 Content

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Chapter 6

Exif

6.1 class ExifTagMBS

6.1.1 class ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a data tag in EXIF.
Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
Blog Entries

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2

- MBS Xojo Plugins, version 20.2pr3

6.1.2 Methods

6.1.3 Constructor

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The private constructor.

6.1.4 Destructor

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The destructor.

6.1.5   Values as Variant()

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries all values for the current tag.
Notes: Number of entries should be equal to components property.

6.1.6   Properties

6.1.7   ByteCount as Integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of bytes used for this tag's data.
Notes: (Read only property)

6.1.8   Components as Integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of components.
Notes: Some values can be arrays, so components is greater than 1.
(Read only property)

6.1.9   DataPointer as Ptr

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The pointer to the data.
Notes: Points into the MemoryBlock stored in data property of ExifTagsMBS object.
(Read only property)

6.1.10   Endian as Integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The endian setting for this value.
Notes: See kEndian* constants.

(Read only property)

6.1.11   Format as Integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data format of this entry.
Notes: See kFormat* constants.
(Read only property)

6.1.12   IsNumeric as Boolean

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this tag is a numeric data type.
Notes: False if format is invalid, string or undefined.
(Read only property)

6.1.13   StringValue as String

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The value as string to display.
Notes: Returns list of values with comma separated if there are multiple numeric values.
String or unknown fields are interpreted as text and trimmed.
(Read only property)

6.1.14   Tag as Integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag ID.
Notes: See EXIF data format documentation for complete list of possible values.
(Read only property)

6.1.15   TagName as String

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the tag.
Notes: We have a list of known tags where we lookup the name for you.
(Read only property)

6.1.16   Value as Variant

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The value of the tag.
Notes: First value for multi value objects (if Components >1).
(Read and Write property)
See also:

6.1.17   Value(ComponentIndex as Integer) as Variant

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The value of the given component.
Notes: ComponentIndex is from 0 to Components-1.
e.g. GPS Coordinate may be stored as 3 values (hour, minute and second)
(Read and Write computed property)
See also:

6.1.18   Constants

Constants

Constant	Value	Description
kTagArtist	&h13B	One of the tag constant.
kTagCopyright	&h8298	One of the tag constant.
kTagDateTime	&h132	One of the tag constant.
kTagDescription	&h10E	One of the tag constant.
kTagExposureTime	&h829A	One of the tag constant.
kTagFlashUsed	&h9209	One of the tag constant.
kTagFNumber	&h829D	One of the tag constant.
kTagGPSAltitude	6	One of the tag constant.
kTagGPSAltitudeRef	5	One of the tag constant.
kTagGPSAreaInformation	&h1C	One of the tag constant.
kTagGPSDateStamp	&h1D	One of the tag constant.
kTagGPSDestBearing	&h18	One of the tag constant.
kTagGPSDestBearingRef	&h17	One of the tag constant.
kTagGPSDestDistance	&h1A	One of the tag constant.
kTagGPSDestDistanceRef	&h19	One of the tag constant.
kTagGPSDestLatitude	&h14	One of the tag constant.
kTagGPSDestLatitudeRef	&h13	One of the tag constant.
kTagGPSDestLongitude	&h16	One of the tag constant.
kTagGPSDestLongitudeRef	&h15	One of the tag constant.
kTagGPSDifferential	&h1E	One of the tag constant.
kTagGPSDOP	11	One of the tag constant.
kTagGPSImgDirection	&h11	One of the tag constant.
kTagGPSImgDirectionRef	&h10	One of the tag constant.
kTagGPSLatitude	2	One of the tag constant.
kTagGPSLatitudeRef	1	One of the tag constant.
kTagGPSLongitude	4	One of the tag constant.
kTagGPSLongitudeRef	3	One of the tag constant.
kTagGPSMapDatum	&h12	One of the tag constant.
kTagGPSMeasureMode	10	One of the tag constant.
kTagGPSProcessingMethod	&h1B	One of the tag constant.
kTagGPSSatellites	8	One of the tag constant.
kTagGPSSpeed	13	One of the tag constant.
kTagGPSSpeedRef	12	One of the tag constant.
kTagGPSStatus	9	One of the tag constant.
kTagGPSTimeStamp	7	One of the tag constant.
kTagGPSTrack	15	One of the tag constant.
kTagGPSTrackRef	14	One of the tag constant.
kTagGPSVersion	0	One of the tag constant.
kTagImageHeight	&h101	One of the tag constant.
kTagImageWidth	&h100	One of the tag constant.
kTagMake	&h10F	One of the tag constant.
kTagModel	&h110	One of the tag constant.
kTagOrientation	&h112	One of the tag constant.
kTagResolutionUnit	&h128	One of the tag constant.
kTagSoftware	&h131	One of the tag constant.
kTagThumbnailLength	&h202	One of the tag constant.
kTagThumbnailOffset	&h201	One of the tag constant.
kTagUserComment	&h9286	One of the tag constant.
kTagXResolution	&h11A	One of the tag constant.
kTagYResolution	&h11B	One of the tag constant.

Endian Mode

Constant	Value	Description
kEndianBig	1	Value is stored in big endian format.
kEndianLittle	2	Value is stored in little endian format.
kEndianUnknown	0	Unknown

Flash Modes

Constant	Value	Description
kFlashAuto	&h18	Auto
kFlashFired	1	Fired
kFlashFlashFunctionPresent	&h20	Flash Function Present
kFlashNo	0	No flash
kFlashOff	&h10	Off
kFlashOn	8	On
kFlashRedEyeReduction	&h40	Red Eye Reduction
kFlashStrobeReturnLightDetected	6	Strobe Return Light Detected

Data Formats

Constant	Value	Description
kFormatByte	1	Byte data. (UInt8)
kFormatDouble	12	Double
kFormatInvalid	0	Invalid
kFormatSByte	6	Signed byte
kFormatSingle	11	Single
kFormatSLong	9	Signed long
kFormatSRational	10	Signed rational value.
kFormatSShort	8	Signed short. (Int16)
kFormatString	2	Text
kFormatULong	4	Unsigned long. (UInt32)
kFormatUndefined	7	Undefined
kFormatURational	5	Unsigned rational value.
kFormatUShort	3	Unsigned short. (UInt16)

Orientation

Constant	Value	Description
kOrientationBottomLeft	4	Bottom Left
kOrientationBottomRight	3	Bottom Right
kOrientationLeftBottom	8	Left Bottom
kOrientationLeftTop	5	Left Top
kOrientationRightBottom	7	Right Bottom
kOrientationRightTop	6	Right Top
kOrientationTopLeft	1	Top Left
kOrientationTopRight	2	Top Right

Units

Constant	Value	Description
kUnitCentimeter	3	Pixel per centimeter
kUnitInch	2	Pixel per Inches
kUnitUndefined	1	Undefined.

6.2   class ExifTagsMBS

6.2.1   class ExifTagsMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The EXIF class.
Notes: This is a home grown class to parse Exif and allow small modifications.
Great to just read values or to update a date field.
This class does not allow to add values or to increase text lengths.
But you can take a template EXIF from one picture, change values and store it with another one.

See also CGImageSourceMBS class for MacOS and iOS for Apple's way to read/write EXIF data.
And see GMImageMBS class to read EXIF via attribute functions in GraphicsMagick.
Blog Entries

- New in the MBS Xojo Plugins Version 20.2

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2

- MBS Xojo Plugins, version 20.2pr3

Xojo Developer Magazine

- 18.4, page 11: News

6.2.2   Methods

6.2.3   Constructor(ExifData as MemoryBlock)

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor taking exif data as memoryblock.
Notes: Please use JPEGImporterMBS, GMImageMBS, NSImageMBS, PNGReaderMBS or other classes to
get EXIF data block.
See also:

- 6.2.4 Constructor(ExifData as String)   76

6.2.4   Constructor(ExifData as String)

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor taking exif data as string.
Notes: Please use JPEGImporterMBS, GMImageMBS, NSImageMBS, PNGReaderMBS or other classes to

get EXIF data block.
See also:

6.2.5 TagByID(Tag as integer) as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries a tag by ID.
Notes: This looks on the Tag property.

6.2.6 TagByIndex(index as integer) as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries a tag by index.

6.2.7 Tags as ExifTagMBS()

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries an array with all tags found.

6.2.8 Properties

6.2.9 Artist as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Artist.
Notes: May be nil if not found.
(Read only property)

6.2.10 Copyright as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Copyright.
Notes: May be nil if not found.

(Read only property)

6.2.11   Count as Integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries number of tags found.
Notes: (Read only property)

6.2.12   Data as MemoryBlock

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data of the Exif record.
Notes: This is a copy of what you passed to the constructor.
It may have been modified if you overwrote a value.
(Read only property)

6.2.13   DateTime as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for DateTime.
Notes: May be nil if not found.
(Read only property)

6.2.14   Description as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Description.
Notes: May be nil if not found.
(Read only property)

6.2.15   ExposureTime as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for ExposureTime.
Notes: May be nil if not found.

(Read only property)

6.2.16   FlashUsed as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for FlashUsed.
Notes: May be nil if not found.
(Read only property)

6.2.17   FNumber as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for FNumber.
Notes: May be nil if not found.
(Read only property)

6.2.18   GPSAltitude as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSAltitude.
Notes: May be nil if not found.
(Read only property)

6.2.19   GPSAltitudeRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSAltitudeRef.
Notes: May be nil if not found.
(Read only property)

6.2.20   GPSAreaInformation as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSAreaInformation.
Notes: May be nil if not found.

(Read only property)

6.2.21   GPSDateStamp as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDateStamp.
Notes: May be nil if not found.
(Read only property)

6.2.22   GPSDestBearing as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestBearing.
Notes: May be nil if not found.
(Read only property)

6.2.23   GPSDestBearingRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestBearingRef.
Notes: May be nil if not found.
(Read only property)

6.2.24   GPSDestDistance as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestDistance.
Notes: May be nil if not found.
(Read only property)

6.2.25   GPSDestDistanceRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestDistanceRef.
Notes: May be nil if not found.

(Read only property)

6.2.26 GPSDestLatitude as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestLatitude.
Notes: May be nil if not found.
(Read only property)

6.2.27 GPSDestLatitudeRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestLatitudeRef.
Notes: May be nil if not found.
(Read only property)

6.2.28 GPSDestLongitude as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestLongitude.
Notes: May be nil if not found.
(Read only property)

6.2.29 GPSDestLongitudeRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDestLongitudeRef.
Notes: May be nil if not found.
(Read only property)

6.2.30 GPSDifferential as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDifferential.
Notes: May be nil if not found.

(Read only property)

6.2.31   GPSDOP as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSDOP.
Notes: May be nil if not found.
(Read only property)

6.2.32   GPSImgDirection as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSImgDirection.
Notes: May be nil if not found.
(Read only property)

6.2.33   GPSImgDirectionRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSImgDirectionRef.
Notes: May be nil if not found.
(Read only property)

6.2.34   GPSLatitude as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSLatitude.
Notes: May be nil if not found.
(Read only property)

6.2.35   GPSLatitudeRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSLatitudeRef.
Notes: May be nil if not found.

(Read only property)

6.2.36 GPSLongitude as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSLongitude.
Notes: May be nil if not found.
(Read only property)

6.2.37 GPSLongitudeRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSLongitudeRef.
Notes: May be nil if not found.
(Read only property)

6.2.38 GPSMapDatum as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSMapDatum.
Notes: May be nil if not found.
(Read only property)

6.2.39 GPSMeasureMode as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSMeasureMode.
Notes: May be nil if not found.
(Read only property)

6.2.40 GPSProcessingMethod as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSProcessingMethod.
Notes: May be nil if not found.

(Read only property)

6.2.41   GPSSatellites as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSSatellites.
Notes: May be nil if not found.
(Read only property)

6.2.42   GPSSpeed as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSSpeed.
Notes: May be nil if not found.
(Read only property)

6.2.43   GPSSpeedRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSSpeedRef.
Notes: May be nil if not found.
(Read only property)

6.2.44   GPSStatus as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSStatus.
Notes: May be nil if not found.
(Read only property)

6.2.45   GPSTimeStamp as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSTimeStamp.
Notes: May be nil if not found.

(Read only property)

6.2.46 GPSTrack as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSTrack.
Notes: May be nil if not found.
(Read only property)

6.2.47 GPSTrackRef as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSTrackRef.
Notes: May be nil if not found.
(Read only property)

6.2.48 GPSVersion as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for GPSVersion.
Notes: May be nil if not found.
(Read only property)

6.2.49 ImageHeight as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for ImageHeight.
Notes: May be nil if not found.
(Read only property)

6.2.50 ImageWidth as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for ImageWidth.
Notes: May be nil if not found.

(Read only property)

6.2.51   Make as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Make.
Notes: May be nil if not found.
(Read only property)

6.2.52   Model as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Model.
Notes: May be nil if not found.
(Read only property)

6.2.53   Orientation as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Orientation.
Notes: May be nil if not found.
(Read only property)

6.2.54   ResolutionUnit as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for ResolutionUnit.
Notes: May be nil if not found.
(Read only property)

6.2.55   Software as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for Software.
Notes: May be nil if not found.

(Read only property)

6.2.56 ThumbnailLength as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for ThumbnailLength.
Notes: May be nil if not found.
(Read only property)

6.2.57 ThumbnailOffset as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for ThumbnailOffset.
Notes: May be nil if not found.
(Read only property)

6.2.58 ThumnnailData as MemoryBlock

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies thumbnail from the EXIF data.
Notes: Returns nil if not thumbnail exists.
(Read only property)

6.2.59 UserComment as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for UserComment.
Notes: May be nil if not found.
(Read only property)

6.2.60 XResolution as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for XResolution.
Notes: May be nil if not found.

(Read only property)

6.2.61   YResolution as ExifTagMBS

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Looks up the tag for YResolution.
Notes: May be nil if not found.
(Read only property)

Chapter 7

Files

7.1 class FolderItem

7.1.1 class FolderItem

Platforms: macOS, Linux, Windows, Targets: All.

Function: One of Xojo's base classes.
Notes: Handles access to files.

7.1.2 Methods

7.1.3 OpenAsGIFMBS as GIFMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a GIF file.
Notes: Returns nil on any error.
QuickTime is not required!
Blog Entries

- Tip of day: Load GIF into WebImageView

7.1.4 OpenAsJPEGMBS as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a JPEG file.
Notes: A short version of OpenAsJPEG with fileposition=0 and allowdamage=false.

See also:

7.1.5   OpenAsJPEGMBS(allowdamaged as Boolean) as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a JPEG file.
Notes: A short version of OpenAsJPEG with fileposition=0.
See also:

7.1.6   OpenAsJPEGMBS(allowdamaged as Boolean,fileposition as Integer) as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a JPEG file.
Example:

```
dim f as folderitem
f=SpecialFolder.Desktop.child("a great jpeg picture.jpg")
window1.backdrop=f.openasjpegMBS
```

Notes: This methods should read all JPEG files you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 120 KB big!

I wrote it mainly because Xojo's built in OpenAsJPEG code crashes badly if your picture is not full downloaded. For example if you have a webbrowser you can now show JPEGs while you download them. Normally you can see a good picture allready with 50% of the data.

Xojo's OpenAsPicture in contrast crashes if the picture is not 100% downloaded or instead of a crash you get a white picture.

See the folder "jpeg load crashtest" in the examples.

The two parameters are both optional. The second is to give a file position to start reading. This way you can load several JPEGs from different file position from one file.
See also:

7.1.7 OpenAsPNGMBS(gamma as single = 0.0, AllowDamaged as Boolean = false) as PNGPictureMBS

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a PNG file.
Example:

dim f as folderitem
f=SpecialFolder.Desktop.child("a great picture.png")
window1.backdrop=f.OpenAsPNGMBS(0).pict

Notes: This methods should read all PNG files you can get.

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 130 KB big!

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
A bad gamma value can give you a black image.

AllowDamaged: Whether to allow damaged PNG files to return a part of the image as picture.

7.1.8 OpenAsTiffMBS(HeaderOnly as boolean=false) as TiffPictureMBS

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a TIFF file.
Example:

```
dim f as FolderItem
dim t as TiffPictureMBS

f=SpecialFolder.Desktop.Child("008.tiff")
t=f.OpenAsTiffMBS(true)

if t<>Nil then
msgbox str(t.width)+" x "+str(t.height)
else
MsgBox "Problem?"
end if
```

Notes: This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 270 KB big!
The plugin supports even more stuff like zlib compressed picture data or JPEGs embedded into TIFFs.

If the function returns nil, you can use a TiffPictureMBS subclass and use the methods there so you get error messages in the error event.

Setting HeaderOnly to true will ignore the actual picture data and load only the header data.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

7.1.9 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single = 0.0) as boolean

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a palette based RGB picture as a PNG file with alpha.
Notes: Pic should have no mask.
Colors must be an array with 256 values defining the palette.
Alphas must be an array with 256 values specifying the alpha value for each palette entry. 255 is opaque and 0 is transparent.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

7.1.10 SaveAs8BitAlphaPNGMBS(pic as picture, colors() as color, alphas() as Integer, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a palette based RGB picture as a PNG file with alpha.
Notes: Pic should have no mask.
Colors must be an array with 256 values defining the palette.
Alphas must be an array with 256 values specifying the alpha value for each palette entry. 255 is opaque and 0 is transparent.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE      = 8
const PNG_FILTER_SUB       = 16
const PNG_FILTER_UP        = 32
const PNG_FILTER_AVG       = 64
const PNG_FILTER_PAETH     = 128
const PNG_FILTER_ALL       = 248
```

Blog Entries

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

See also:

7.1.11   SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single = 0.0) as boolean

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a palette based RGB picture as a PNG file.
Notes: Pic should have no mask.
Colors must be an array with 256 values defining the palette.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

7.1.12   SaveAs8BitPNGMBS(pic as picture, colors() as color, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a palette based RGB picture as a PNG file.
Notes: Pic should have no mask.
Colors must be an array with 256 values defining the palette.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

Blog Entries

- [MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4](#)

Xojo Developer Magazine

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE      = 8
const PNG_FILTER_SUB       = 16
const PNG_FILTER_UP        = 32
const PNG_FILTER_AVG       = 64
const PNG_FILTER_PAETH     = 128
const PNG_FILTER_ALL       = 248
```

-

See also:

-

7.1.13   SaveAsGIFMBS(data as GIFMBS) as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a gif file.
Notes: Returns true on success and false on any error.
QuickTime is not required!
Please check for the lzw patent in your country before using this function as you may need to pay license fees.

7.1.14   SaveAsJPEGMBS(pic as picture, quality as Integer = 80) as boolean

Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a picture into a file using JPEG compression.
Example:

```
dim pic as Picture = LogoMBS(500)
dim f as folderitem
f=SpecialFolder.Desktop.child("a great jpeg picture.jpg")
if f.SaveAsJPEGMBS(pic,75) then
msgbox "Picture saved."
end if
```

Notes: This methods saves 32bit pictures to a file using JPEG Compression. Using the parameter you can specify the quality in range between 25 and 100%

See the "SaveJPEG without QuickTime" example.

As JPEG does not support alpha channel or mask, those are ignored.

The second parameter is optional. There you can give a file position where to start writing. This way you can save several JPEGs to different file position inside one file.

Use the JPEGExporterMBS class for more options.

7.1.15   SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves RGB picture as PNG file.
Notes: If pic has a mask, it is written to the file as alpha channel.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

7.1.16   SaveAsPNGMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves RGB picture as PNG file.
Notes: If pic has a mask, it is written to the file as alpha channel.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS     = 0
const PNG_FILTER_NONE     = 8
const PNG_FILTER_SUB      = 16
const PNG_FILTER_UP       = 32
const PNG_FILTER_AVG      = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL      = 248
```

See also:

- 7.1.15 SaveAsPNGMBS(pic as picture, gamma as single = 0.0) as boolean 96

- 7.1.17 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean 97

- 7.1.18 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean 98

7.1.17 SaveAsPNGMBS(pic as picture, mask as picture, gamma as single = 0.0) as boolean

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves RGB picture as PNG file.
Example:

```
// load
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim p as PNGPictureMBS = f.OpenAsPNGMBS

// save
dim g as FolderItem = SpecialFolder.Desktop.Child("output.png")
if g.SaveAsPNGMBS(p.Pict, p.Mask) then
MsgBox "OK"
else
MsgBox "Failed"
end if
```

Notes: If mask is nil no alpha channel is written to the file.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

7.1.18   SaveAsPNGMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as boolean

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves RGB picture as PNG file.
Notes: If mask is nil no alpha channel is written to the file.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
 const PNG_FILTER_NONE     = 8
 const PNG_FILTER_SUB      = 16
 const PNG_FILTER_UP       = 32
 const PNG_FILTER_AVG      = 64
 const PNG_FILTER_PAETH    = 128
 const PNG_FILTER_ALL      = 248
```

See also:

Chapter 8

GIF

8.1 Globals

8.1.1 GifStringToGifMBS(data as string) as GIFMBS

Plugin Version: 5.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a Gif GIFPictureMBS from memory.
Notes: Returns nil on any error.
Else it should be identical to the folderitem function.

There is a link bug in RB. So if this function always returns nil, you may need a line like "dim g as new GifMBS" to fix it.

8.1.2 GifStringToPictureMBS(data as string) as Picture

Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a Gif picture from memory and returns first picture with mask.
Notes: Returns nil on any error.
Not always a mask is available.

There is a link bug in RB. So if this function always returns nil, you may need a line like "dim g as new GifMBS" to fix it.

8.2   class GifBlockMBS

8.2.1   class GifBlockMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a gif block.
Notes: May have a GIFPictureMBS or an extension, but not both.
Blog Entries

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

8.2.2   Methods

8.2.3   Clone as GifBlockMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.2.4   Properties

8.2.5   Extension as GifExtensionMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The extension data of this gif block.
Notes: (Read and Write property)

8.2.6   Intro as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The intro value of the gif block.
Notes: The type of data.
(Read and Write property)

8.2.7   Picture as GifPictureMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The GIFPictureMBS data of this gif block.
Notes: Not all blocks have a picture, so this property can be nil.
(Read and Write property)

8.3   class GifDataMBS

8.3.1   class GifDataMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for binary data in a gif image.
Blog Entries

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr6

8.3.2   Methods

8.3.3   Clone as GifDataMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.3.4   Properties

8.3.5   DataMemory as Memoryblock

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data as a memoryblock.
Notes: (Read and Write property)

8.3.6   DataString as String

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data as a string.
Notes: (Read and Write property)

8.3.7   Length as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The length in bytes of this data.
Notes: Returns 0 on any error.
(Read only property)

8.4   class GifExtensionMBS

8.4.1   class GifExtensionMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a gif extension.
Blog Entries

- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

8.4.2   Methods

8.4.3   Add(data as GifDataMBS)

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a data object to this extension.

8.4.4   Clone as GifExtensionMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.4.5   Data(index as Integer) as GifDataMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data of this extension.
Notes: Index is 0 based.

8.4.6   Properties

8.4.7   Count as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of data objects attached to this extension.
Notes: Returns 0 on any error.

(Read only property)

8.4.8   FirstData as GifDataMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first data.
Notes: Same as calling Data(0), but this property is visible in the debugger which makes debugging easier.
(Read only property)

8.4.9   Marker as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The marker field of this extension.
Notes: (Read and Write property)

8.5   class GIFMBS

8.5.1   class GIFMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for reading or writing gif files.
Notes: There are patents on the lzw compression used in this class for writing gif files. This patents may be timeout out for some countries, but please check for your target countries.
Blog Entries

- Tip of day: Load GIF into WebImageView

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr6

8.5.2   Methods

8.5.3   Add(block as GifBlockMBS)

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a block to this gif object.

8.5.4   Block(index as Integer) as GifBlockMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The blocks attached to this gif object.
Notes: Index is 0 based.

8.5.5   Clone as GIFMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.5.6   MakeFirstMask as picture

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Searches the first picture in this gif object and returns the matching mask.
Notes: Returns nil on any error.

8.5.7 MakeFirstPicture as picture

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Searches the first picture in this gif object and returns this picture.
Notes: Returns nil on any error.
There is not always a mask available!

8.5.8 MakeFirstPictureWithMask as picture

Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Searches the first picture in this gif object and returns this picture with mask (if exists).
Notes: Returns nil on any error.
There is not always a mask available!

8.5.9 Properties

8.5.10 Count as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of blocks attached to this gif object.
Notes: Not every block has a picture attached, so this is not the picture count.
(Read only property)

8.5.11 FirstBlock as GifBlockMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first block.
Notes: Same as calling Block(0), but this property is visible in the debugger which makes debugging easier.
(Read only property)

8.5.12   Header as String

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The header string for this gif object.
Notes: e.g. "GIF89a"
(Read and Write property)

8.5.13   Screen as GifScreenMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The screen object attached to this gif object.
Notes: (Read and Write property)

8.6 class GifPaletteMBS

8.6.1 class GifPaletteMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a color palette.
Example:

dim p as new GifPaletteMBS

p.Count = 256

p.Value(0)=&cFFEECC

MsgBox hex(p.red(0))+" "+hex(p.Green(0))+" "+hex(p.Blue(0))

Notes: Maximum 256 colors.
Blog Entries

- MBS Real Studio Plugins, version 13.1pr9
- MBS REALbasic Plugins Version 10.4 release notes
- MBS REALbasic Plugins, version 10.4pr6

8.6.2 Methods

8.6.3 Clone as GifPaletteMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.6.4 Properties

8.6.5 Count as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of colors in this palette.
Example:

dim p as new GifPaletteMBS

p.Count = 256

Notes: Value is 2, 4, 16 or 256.
(Read and Write property)

8.6.6   Blue(index as Integer) as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The array of the blue color components in this color palette.
Example:

dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox str(p.blue(0))

Notes: Index from 0 to count-1. (ignores bad indexes)
Value from 0 to 255.
(Read and Write computed property)

8.6.7   Green(index as Integer) as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The array of the green color components in this color palette.
Example:

dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox str(p.green(0))

Notes: Index from 0 to count-1. (ignores bad indexes)
Value from 0 to 255.
(Read and Write computed property)

8.6.8 Red(index as Integer) as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The array of the red color components in this color palette.
Example:

dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox str(p.red(0))

Notes: Index from 0 to count-1. (ignores bad indexes)
Value from 0 to 255.
(Read and Write computed property)

8.6.9 Value(index as Integer) as color

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The colors in this palette.
Example:

dim p as new GifPaletteMBS

p.Count = 1
p.Value(0)=&cFFEECC

MsgBox hex(p.value(0))

Notes: Index from 0 to count-1. (ignores bad indexes)
(Read and Write computed property)

8.7   class GIFPictureMBS

8.7.1   class GIFPictureMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a gif GIFPictureMBS.
Blog Entries

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr6

8.7.2   Methods

8.7.3   Clone as GifPictureMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.7.4   CopyData as memoryblock

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the data of this picture object.
Notes: Returns a new memoryblock with a copy of the data so you can modify it.

8.7.5   MakeMask as picture

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Searches the matching mask for this picture and returns it as picture.
Notes: May return nil.
See also:

- 8.7.6 MakeMask(TransparentColorIndex as Integer) as picture   114

8.7.6   MakeMask(TransparentColorIndex as Integer) as picture

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a mask for this picture based on the current transparent color index.
Notes: Returns nil on low memory.
See also:

8.7.7 MakePicture as picture

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the picture and returns it.
Notes: Returns nil on any error.

8.7.8 PixelData(row as Integer) as memoryblock

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The raw Pixel data for a given row.
Notes: Row is 0 based.
Returns nil on any error.

8.7.9 Properties

8.7.10 Data as Memoryblock

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data of this GIFPictureMBS as a big memoryblock.
Notes: (Read and Write property)

8.7.11 HasPalette as Boolean

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether we have a color map (palette).
Notes: This property was named HasCMap in older plugin versions.
(Read and Write property)

8.7.12   Height as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Height in pixels.
Notes: (Read and Write property)

8.7.13   Interlace as Boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the GIFPictureMBS is interlaced.
Notes: Interlacing makes GIFPictureMBS loading faster in a browser, but requires the newer GIF format 89a.
(Read and Write property)

8.7.14   Left as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x position of the GIFPictureMBS.
Notes: On an animation gif each GIFPictureMBS may have it's own position.
(Read and Write property)

8.7.15   Palette as GifPaletteMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The palette for this GIFPictureMBS.
Notes: (Read and Write property)

8.7.16   PaletteDepth as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The depth of the palette of this GIFPictureMBS.
Notes: Value should be 2, 4, 16 or 256.
(Read and Write property)

8.7.17   Sorted as Boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the color palette is sorted.
Notes: (Read and Write property)

8.7.18   Top as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The y position of this GIFPictureMBS.
Notes: On an animation gif each GIFPictureMBS may have it's own position.
(Read and Write property)

8.7.19   Width as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the GIFPictureMBS in pixels.
Notes: (Read and Write property)

8.8   class GifScreenMBS

8.8.1   class GifScreenMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for the gif screen information.
Blog Entries

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr6

8.8.2   Methods

8.8.3   Clone as GifScreenMBS

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clone of the object.

8.8.4   Properties

8.8.5   Aspect as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The aspect ration of this GIFPictureMBS.
Notes: (Read and Write property)

8.8.6   BackgroundColor as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Index of the background color for this GIFPictureMBS.
Notes: (Read and Write property)

8.8.7   ColorResolution as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The color resolution of the screen area.
Notes: (Read and Write property)

8.8.8   HasPalette as Boolean

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this screen defines a palette.
Notes: (Read and Write property)

8.8.9   Height as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the screen area used.
Notes: (Read and Write property)

8.8.10   Palette as GifPaletteMBS

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The color palette to use for the screen area used.
Notes: (Read and Write property)

8.8.11   PaletteDepth as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The palette depth of the screen area used.
Notes: (Read and Write property)

8.8.12   Sorted as Boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the color palette is sorted.
Notes: (Read and Write property)

8.8.13   Width as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the screen area used.
Notes: (Read and Write property)

Chapter 9

JPEG

9.1 class JPEG2000MBS

9.1.1 class JPEG2000MBS

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for compress/decompress of JPEG 2000 images.
Example:

dim file as FolderItem = GetFolderItem("test.jp2")
dim stream as BinaryStream = BinaryStream.Open(file)
dim data as string = stream.Read(stream.Length)

dim jp2 as new JPEG2000MBS
if jp2.InitDecompress(data) then
MsgBox str(jp2.Width)+" x "+str(jp2.Height)
end if

Notes: Currently only supports RGB, RGBA and Grayscale images.

Please note that Jasper library used here is not very memory efficient and may run out of memory with huge images.
Blog Entries

- MBS Xojo / Real Studio Plugins, version 15.4pr4

9.1.2   Methods

9.1.3   Close

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Performs cleanup.
Notes: Called automatically by destructor for you.
You can call it after you are done to free memory now.

9.1.4   Compress as Boolean

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compresses image.
Notes: Please use first InitCompress, than loop over rows and use SetRow to fill in data.
This method will compress image and set ImageData property.
Returns true on success and false on failure.

9.1.5   Decode(Data as MemoryBlock) as Picture

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Decodes a JPEG 2000 images.
Example:

dim p as Picture = LogoMBS(200)

dim j80 as MemoryBlock = JPEG2000MBS.Encode(p, 80)
dim p80 as Picture = JPEG2000MBS.Decode(j80)

window1.Backdrop = p80

Notes: Returns on success the picture object.
Can raise exception if data is invalid.
See also:

- 9.1.6 Decode(Data as string) as Picture   122

9.1.6   Decode(Data as string) as Picture

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Decodes a JPEG 2000 images.
Notes: Returns on success the picture object.
Can raise exception if data is invalid.
See also:

9.1.7   Encode(pic as picture, Quality as Integer = 80) as MemoryBlock

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Encodes a picture as JPEG 2000 image.
Example:

dim p as Picture = LogoMBS(200)

dim j80 as MemoryBlock = JPEG2000MBS.Encode(p, 80)
dim p80 as Picture = JPEG2000MBS.Decode(j80)

window1.Backdrop = p80

Notes: Returns image data on success or nil on failure.

9.1.8   GetRow(Index as Integer, Row as MemoryBlock = nil) as MemoryBlock

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries image data for a row.
Notes: If you pass in a memoryblock, we use it, else we create a new one.
So you can pass in memoryblock from last call to GetRow.
Returns nil in case of error.

9.1.9   InitCompress(Width as Integer, Height as Integer, BytesPerPixel as Integer, BytesPerRow as Integer = 0) as Boolean

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes the compression for a new image.
Example:

dim p as Picture = LogoMBS(200)
dim pp as new PictureMBS(p)

```
// compress RGB in PictureMBS
dim je as new JPEG2000MBS
if je.InitCompress(pp.Width, pp.Height, 3, pp.RowSize) then
dim h as Integer = pp.Height-1

for i as Integer = 0 to h
dim rowData as MemoryBlock = pp.RowInFormat(i, pp.ImageFormatRGB)
if not je.SetRow(i, rowData) then
Break
exit
end if
next
if je.Compress then
dim ImageData as MemoryBlock = je.ImageData
if ImageData <>nil then
// and decode to show
dim pic as Picture = JPEG2000MBS.Decode(ImageData)
window1.Backdrop = pic
end if
end if
end if
```

Notes: Returns true on success or false on failure.
If BytesPerRow is zero, we calculate it based on BytesPerPixel and Width.
BytesPerPixel can be 1 for gray, 3 for RGB and 4 for RGBA.

9.1.10   InitDecompress(ImageData as MemoryBlock) as Boolean

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes the decompression for given image data.
Example:

```
dim p as Picture = LogoMBS(200)

dim j80 as MemoryBlock = JPEG2000MBS.Encode(p, 80)

// decompress to PictureMBS
dim jd as new JPEG2000MBS

if jd.InitDecompress(j80) then
dim pi as new PictureMBS(jd.Width, jd.Height, PictureMBS.ImageFormatRGB)
dim h as Integer = pi.Height-1

dim r as MemoryBlock
```

```
for i as Integer = 0 to h
// get row. Recycle MemoryBlock, so we don't create new one each row.
r = jd.getRow(i, r)
pi.RowInFormat(i, pi.ImageFormatRGB) = r
next

// get picture
window1.Backdrop = pi.CopyPicture
end if
```

Notes: Returns true on success or false on failure.
BytesPerPixel is set to 1 for gray, 3 for RGB and 4 for RGBA.

9.1.11 SetRow(Index as Integer, Row as MemoryBlock) as Boolean

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets data for a row.
Notes: Returns true on success.

9.1.12 Properties

9.1.13 BytesPerPixel as Integer

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: The number of bytes per pixel.
Notes: One for gray, 3 for RGB and 4 for RGBA.
Set by InitCompress or InitDecompress.
(Read only property)

9.1.14 BytesPerRow as Integer

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: The bytes per row.
Notes: Only used to create memoryblock or check memoryblock size.
Set by InitCompress or InitDecompress.
(Read only property)

9.1.15   Height as Integer

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: The height of the image.
Notes: Set by InitCompress or InitDecompress.
(Read only property)

9.1.16   ImageData as MemoryBlock

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: The image data.
Notes: Set by Compress method on success.
(Read only property)

9.1.17   Options as String

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: Options to pass to Jasper library for compression.
Notes: e.g. "rate=80"
(Read and Write property)

9.1.18   Width as Integer

Plugin Version: 15.4, Platforms: macOS, Linux, Windows, Targets: Desktop only.

Function: The width of the image.
Notes: Set by InitCompress or InitDecompress.
(Read only property)

9.2 class JPEGExporterMBS

9.2.1 class JPEGExporterMBS

Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for JPEG Exporting.
Example:

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if
```

Notes: This class is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

Bases on libjpeg.
Blog Entries

- MBS Xojo Plugins, version 21.1pr7

- MBS Xojo Plugins, version 20.0pr7

- MBS Xojo Plugins, version 19.6pr4

- MBS Xojo Plugins, version 19.5pr7

- libjpeg-turbo for Xojo

- MBS Xojo Plugins, version 19.5pr6

- MBS Xojo Plugins, version 17.3pr5

- ICC color profiling

- Making use of the WebFileUploader

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

9.2.2   Methods

9.2.3   Export

Platforms: macOS, Linux, Windows, Targets: All.

Function: Exports the picture.
Example:

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
```

end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if

Notes: This methods saves 32bit pictures to a file using JPEG Compression. Using the properties of the class you can specify the quality in range between 0 and 100%

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

You may use the function picture.bitmap to make sure that the picture is a bitmap, because this function works only for bitmap pictures.

This method uses the YieldTicks property and may yield time to other threads.

9.2.4 ExportCMYK(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32)

Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Exports a picture from CMYK data in a memoryblock.
Example:

dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// import it
g=getOpenFolderItem("image/jpeg")

ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.ImportCMYK

m=ji.PictureData

// export it
f=SpecialFolder.Desktop.child("test.jpg")
je=new JPEGExporterMBS
je.HorizontalResolution=300
je.VerticalResolution=300
je.ResolutionUnit=1
je.File=f
je.Quality=75
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4

Notes: This methods saves 32bit CMYK pictures to a file using JPEG Compression. Using the properties of the class you can specify the quality in range between 0 and 100%

This method is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

The picture must be in the format that one byte is used for each channel and the channels are ordered in memory in Cyan, Magenta, Yellow and Black.
If rowbytes is 0, the plugin uses width*4 for rowbytes.

This method uses the YieldTicks property and may yield time to other threads.

9.2.5   ExportGray

Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Exports an 8 bit grayscale picture.
Notes: Same as Export, but writes grayscale picture. The picture from picture property is converted to grayscale internally for this.
See also:

9.2.6 ExportGray(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32)

Plugin Version: 17.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Exports an 8 bit grayscale picture.
Notes: Same as Export, but writes grayscale picture using data in memoryblock.
If rowbytes is 0, the plugin uses width for rowbytes.
This method uses the YieldTicks property and may yield time to other threads.
See also:

- 9.2.5 ExportGray 130

9.2.7 ExportRGB(data as memoryblock, width as UInt32, height as UInt32, rowbytes as UInt32)

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Exports a picture from RGB data in a memoryblock.
Example:

```
dim f as FolderItem
dim ji as new JPEGImporterMBS
dim je as new JPEGExporterMBS
dim m as MemoryBlock
dim i,c as Integer

// read jpeg
f=SpecialFolder.Desktop.Child("input.jpg")

ji.Mode=ji.ModeRGB // read RGB to memoryblock
ji.File=f
ji.Import

m=ji.PictureData

// add red
c=m.Size-1
for i=0 to c step 3
m.Byte(i)=255
next

// write jpeg
f=SpecialFolder.Desktop.Child("test.jpg")

je.File=f
je.ExportRGB(m,ji.Width, ji.Height, ji.Width*3)
```

Notes: The memoryblock data must be in the format with bytes in the order RGB.

9.2.8   ExportRGBwithRowDataEvent(width as UInt32, height as UInt32, rowbytes as UInt32)

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Exports a picture from RGB data in memoryblocks from the GetRowData event.
Notes: You need to implement the GetRowData event by subclassing this class.
The memoryblock data must be in the format with bytes in the order RGB.

9.2.9   GetJPEGVersion as String

Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries JPEG library version.
Notes: Currently reporting 9.1 for version 9b.

9.2.10   SetAPI(API as Ptr = nil)

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets API to use.
Example:

// switch API to libjpeg-turbo:
JPEGExporterMBS.SetAPI JPEGTurboMBS.API
JPEGImporterMBS.SetAPI JPEGTurboMBS.API

Notes: Set to nil to use built in jpeglib.
Can be set to JPEGTurboMBS.API to use libjpeg-turbo.

Changing API while you have instances of JPEGExporterMBS or methods in use on other thread using the JPEG Library, may result in a crash.

9.2.11 Properties

9.2.12 API as String

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries name of API used.
Notes: Either libjpeg or libjpeg-turbo.
(Read only property)

9.2.13 data as string

Platforms: macOS, Linux, Windows, Targets: All.

Function: The destination string.
Notes: If file is nil, the compressed data is saved in this property.

The returned string has the encoding set to MacRoman. If you want to concat the string with another you should change the encoding, so both strings have the same encoding. If you don't handle that RB may convert the JPEG data to UTF8 (Unicode) which will destroy it.
(Read and Write property)

9.2.14 DCTMethod as Integer

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Which DCT/IDCT algorithm to use.
Notes: Possible values:

-1	Plugin does not change setting
0	slow but accurate integer algorithm (default)
1	faster, less accurate integer method
2	floating-point: accurate, fast on fast Hardware

Default is Integer slow.
(Read and Write property)

9.2.15   ErrorCode as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The error code from the Export method.
Example:

dim j as new JPEGExporterMBS

// do something

MsgBox str(j.ErrorCode)+" "+j.ErrorMessage

Notes: The last function was successfull if ErrorCode is 0.
If the parameters are not valid, the value is set to -1.
Other values are Mac OS error codes.
(Read and Write property)

9.2.16   ErrorMessage as string

Platforms: macOS, Linux, Windows, Targets: All.

Function: The last error message reported.
Example:

dim j as new JPEGExporterMBS

// do something

MsgBox j.ErrorMessage

Notes: (Read and Write property)

9.2.17   EXIFData as String

Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The EXIF data for this file.
Example:

// Read a picture file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.jpg")
dim ji as new JPEGImporterMBS

```
ji.ReadExifData=true
ji.File=f
ji.Import

// Write a new picture file
dim o as FolderItem = SpecialFolder.Desktop.Child("out.jpg")
dim je as new JPEGExporterMBS

je.File=o
je.EXIFData = ji.ExifData
je.Picture = ji.Picture
je.Export
```

Notes: The export methods use this property.
(Read and Write property)

9.2.18   file as folderitem

Platforms: macOS, Linux, Windows, Targets: All.

Function: The destination file.
Example:

```
dim p as Picture = LogoMBS(500)

'Save the scan
dim je as new JPEGExporterMBS
je.file = SpecialFolder.Desktop.Child("just a test.jpg")
je.quality = 75
je.picture = p
je.VerticalResolution = 72
je.HorizontalResolution = 72
je.ResolutionUnit = 1
je.export
```

Notes: If file is nil and path is "", the destination is the data property.
(Read and Write property)

9.2.19   HorizontalResolution as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The horizontal resolution.
Example:

dim j as new JPEGExporterMBS

// setup 300 dpi
j.VerticalResolution = 300
j.HorizontalResolution = 300
j.ResolutionUnit = 1

Notes: (Read and Write property)

9.2.20   OptimizeCoding as Boolean

Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the plugin should ask the compressor to optimize the huffman coding tables.
Example:

dim j as new JPEGExporterMBS
j.OptimizeCoding = true

Notes: This usually provides a small percentage decrease in file size.
(Read and Write property)

9.2.21   Path as String

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The destination file.
Example:

Dim p As Picture = LogoMBS(500)

'Save the scan
Dim je As New JPEGExporterMBS

// using file
'je.file = SpecialFolder.Desktop.Child("just a test via file.jpg")

```
// using path
Dim f As folderitem = SpecialFolder.Desktop.Child("just a test via path.jpg")
Dim pa As String = f.NativePath
je.path = pa

je.quality = 75
je.picture = p
je.VerticalResolution = 72
je.HorizontalResolution = 72
je.ResolutionUnit = 1
je.export
```

Notes: If file is nil and path is "", the destination is the data property.
(Read and Write property)

9.2.22 Picture as Picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: The picture to use.
Example:

```
dim MyPic as Picture = LogoMBS(500)
dim j as JPEGExporterMBS // your exporter
j.picture=MyPic
```

Notes: Should be a bitmap picture without alpha channel or mask.
(Read and Write property)

9.2.23 ProfileData as String

Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: An ICC profile to write to the file.
Example:

```
dim f as FolderItem
dim j as JPEGImporterMBS
dim p as LCMS2ProfileMBS
dim e as JPEGExporterMBS
```

f=SpecialFolder.Desktop.Child("test2.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all
j.ReadProfileData=true // needed to fill ProfileData property
j.file=f

j.Import

if j.ProfileData="" then
MsgBox "no profile"
Return
end if

p=LCMS2ProfileMBS.CreatesRGBProfile

f=SpecialFolder.Desktop.Child("test3.jpg")
e=new JPEGExporterMBS
e.File=f
e.Picture=j.Picture
e.ProfileData=p.SaveProfileToString
e.Quality=75
e.Export

Notes: the string must contain the binary data of the profile. For example SaveProfileToString of the CMProfileMBS class returns such a string.
If the string is empty, no profile is written.
(Read and Write property)

9.2.24 Progressive as Boolean

Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to make a progressive compressed image.
Example:

dim j as new JPEGExporterMBS
j.Progressive = true

Notes: Default is true.
(Read and Write property)

9.2.25   Quality as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The quality to use.
Example:

dim je as new JPEGExporterMBS
je.quality = 75

Notes: Range from 0 to 100. Default is 75.
(Read and Write property)

9.2.26   ResolutionUnit as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The unit of the resolution properties.
Example:

dim j as new JPEGExporterMBS

// setup 300 dpi
j.VerticalResolution = 300
j.HorizontalResolution = 300
j.ResolutionUnit = 1

Notes: Values:

   0   unknown
   1   dots per inch
   2   dots per cm

(Read and Write property)

9.2.27   VerticalResolution as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The vertical resolution.
Example:

dim j as new JPEGExporterMBS

// setup 300 dpi
j.VerticalResolution = 300
j.HorizontalResolution = 300
j.ResolutionUnit = 1

Notes: (Read and Write property)

9.2.28   WarningMessage as String

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last warning message reported.
Example:

dim j as new JPEGExporterMBS

// do something

MsgBox j.WarningMessage

Notes: (Read and Write property)

9.2.29   XMPData as String

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The XMP data for this file.
Notes: The export methods use this property.
(Read and Write property)

9.2.30   YieldTicks as Integer

Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: How much time is given back to Xojo for other ticks.
Example:

dim j as JPEGExporterMBS // your exporter

j.YieldTicks=6 // only use 1/10th of a second

Notes: If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

9.2.31   Markers(Index as Integer) as string

Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Additional markers.
Example:

dim j as new JPEGExporterMBS

j.Picture = LogoMBS(500)
j.Markers(5) = "Hello World"
j.File = SpecialFolder.Desktop.Child("test.jpg")
j.Export

// now open jpeg file in text editor and you see hello world near beginning

Notes: Index from 0 to 15.
Index zero is used for JFIF header.
Index one is normally used for EXIF or XMP.
Index 13 is often used for Photoshop.

see also
http://www.ozhiker.com/electronics/pjmt/jpeg_info/app_segments.html

You can use this markers to embed a given string in the file. You can encrypt data and store it next to the image as you like.
Of course this will not survive if image is loaded and saved again. But can work as a container to hide data and user sees only image.
(Read and Write computed property)

9.2.32   Events

9.2.33   Error(message as string, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all error messages from the jpeg library.

9.2.34   GetRowData(index as Integer) as memoryblock

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called to query for the next data block.
Notes: The memoryblock data must be in the format with bytes in the order RGB.
Index is from 0 to height-1.
Returning nil will result in an error on the JPEG compression.

9.2.35   Info(message as string, msglevel as Integer, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all information messages from the jpeg library.
Notes: msglevel is one of:

-1:	recoverable corrupt-data warning, may want to abort.
0:	important advisory messages (always display to user).
1:	first level of tracing detail.
2,3,...:	successively more detailed tracing messages.

9.2.36   Warning(message as string, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all warning messages from the jpeg library.

9.2.37   Constants

Resolution Unit

Constant	Value	Description
ResolutionUnitDotsPerCentimeter	2	Dots per centimeter
ResolutionUnitDotsPerInch	1	Dots per inch
ResolutionUnitUnknown	0	Undefined

9.3   class JPEGImporterMarkerMBS

9.3.1   class JPEGImporterMarkerMBS

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a JPEG marker.

9.3.2   Properties

9.3.3   Data as String

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The actual data read as a binary string.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

dim data as string = j.MarkerItem(0).Data

// work with data

Notes: (Read and Write property)

9.3.4   DataLength as Integer

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data length in bytes of the data string.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

MsgBox str(j.MarkerItem(0).DataLength)

// work with data

Notes: (Read and Write property)

9.3.5   Marker as Integer

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The type of this datablock.
Example:

dim j as JPEGImporterMBS
dim f as folderitem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

MsgBox str(j.MarkerItem(0).Marker)

// work with data

Notes: For example &hE0 for the first user defined block.
(Read and Write property)

9.3.6   OriginalLength as Integer

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The original data length in the file.

Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

// do the import

MsgBox str(j.MarkerItem(0).OriginalLength)

// work with data

Notes: Maybe smaller than datalength because of compression.
(Read and Write property)

9.4 class JPEGImporterMBS

9.4.1 class JPEGImporterMBS

Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for JPEG Importing.
Example:

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk
if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if
```

Notes: This class is not depending on any library! It works without QuickTime even on System 7, but as it contains everything needed this method is around 100 KB big!

Bases on libjpeg.
Blog Entries

- News from the MBS Xojo Plugins Version 20.1

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1

- MBS Xojo Plugins, version 20.1pr6

- MBS Xojo Plugins, version 20.1pr5

- Reading JPEG Thumbnails from EXIF

- MBS Xojo Plugins, version 19.5pr7

- libjpeg-turbo for Xojo

- ICC color profiling

- JPEG String to Picture

- MonkeyBread Software Releases the MBS REALbasic plug-ins 8.4

Xojo Developer Magazine

- 18.3, page 10: News

- 17.5, page 40: What's New in the MBS Plugins, With the Plugins growing every year, here are new capabilities you may have missed by Stefanie Juchmes

9.4.2   Methods

9.4.3   BlueTestPicture as picture

Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a 100x100 pixel big picture filles with RGB(0,0,255).
Notes: Just for testing how well the plugin picture code works.

9.4.4   CleanMarkers

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears the marker list.

9.4.5 FinishJPEG

Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Releases all memory buffers needed for the JPEG decompression.
Notes: This must be called if you used InitJPEG!
Else you have a memory leak.

9.4.6 GetJPEGVersion as String

Plugin Version: 17.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries JPEG library version.
Notes: Currently reporting 9.1 for version 9b.

9.4.7 GreenTestPicture as picture

Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a 100x100 pixel big picture filles with RGB(0,255,0).
Notes: Just for testing how well the plugin picture code works.

9.4.8 Import

Platforms: macOS, Linux, Windows, Targets: All.

Function: Imports the picture.
Example:

```
dim f as FolderItem
dim ji as new JPEGImporterMBS
dim je as new JPEGExporterMBS
dim m as MemoryBlock
dim i,c as Integer

// read jpeg
f=SpecialFolder.Desktop.Child("input.jpg")

ji.Mode=ji.ModeRGB // read RGB to memoryblock
ji.File=f
ji.Import

m=ji.PictureData
```

```
// add red
c=m.Size-1
for i=0 to c step 3
m.Byte(i)=255
next

// write jpeg
f=SpecialFolder.Desktop.Child("test.jpg")

je.File=f
je.ExportRGB(m,ji.Width, ji.Height, ji.Width*3)
```

Notes: This methods should read all JPEG files you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

I wrote it mainly because Xojo's built in OpenAsJPEG code crashes badly if your picture is not full downloaded. For example if you have a webbrowser you can now show JPEGs while you download them. Normally you can see a good picture allready with 50% of the data.

Xojo's OpenAsPicture in contrast crashes if the picture is not 100% downloaded or instead of a crash you get a white picture.

This method uses the YieldTicks property and may yield time to other threads.
Depending on the mode this method can read CMYK and RGB. RGB either to memoryblock or to a picture object.
The memoryblock data must be in the format with bytes in the order RGB.

9.4.9   ImportCMYK

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Imports a CMYK picture.
Example:

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// import it
g=getOpenFolderItem("image/jpeg")
ji=new JPEGImporterMBS
```

ji.File=g
ji.AllowDamaged=true
ji.ImportCMYK

m=ji.PictureData

// export it
f=SpecialFolder.Desktop.child("test.jpg")
je=new JPEGExporterMBS
je.HorizontalResolution=300
je.VerticalResolution=300
je.ResolutionUnit=1
je.File=f
je.Quality=75
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4

Notes: This methods should read all JPEG files you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

The read CMYK values are stored in the picturedata property.

This method uses the YieldTicks property and may yield time to other threads.

9.4.10   InitJPEG as boolean

Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes the JPEG decompressor for use with LoopJPEG.
Example:

dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// this code copies a JPG: CMYK or RGB

// import it
g=SpecialFolder.Desktop.Child("PICT1533.JPG")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.CMYK=true // if it is cmyk

if ji.InitJPEG then
do
loop until ji.LoopJPEG<>0
ji.FinishJPEG
end if

// export it
f=SpecialFolder.Desktop.child("PICT1533 copy.JPG")
je=new JPEGExporterMBS
je.File=f
je.Quality=75

if ji.CMYK then
m=ji.PictureData
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
else
je.Picture=ji.Picture
je.Export
end if

Notes: Call FinishJPEG even if this failes.
Returns true if you can loop using LoopJPEG.

9.4.11   LoopJPEG as Integer

Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Decompresses one line of the picture.
Example:

dim j as new JPEGImporterMBS
// fill properties...

if j.initJPEG then
do
loop until j.LoopJPEG<>0
end if
j.FinishJPEG

backdrop=j.Picture // nil if failed

Notes: Return values:

0	Decompression was okay
1	Finished decompression
2	if there was an error.
3	Not initialized
4	Header only was requested

9.4.12 MarkerCount as Integer

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of markers found in the JPEG data stream.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all

// do the import

MsgBox str(j.MarkerCount)

Notes: Only available if ReadMarkers was true on reading the JPEG data.

9.4.13 MarkerItem(index as Integer) as JPEGImporterMarkerMBS

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the marker with the given index.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // needed to fill ExifData property

```
// do the import

dim data as string = j.MarkerItem(0).Data

// work with data
```

Notes: Only available if ReadMarkers was true on reading the JPEG data.

9.4.14   ReadHeader as boolean

Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Read the header of the JPEG data in a file or a memoryblock.
Example:

```
dim f as FolderItem
dim j as JPEGImporterMBS

f=SpecialFolder.Desktop.Child("Jaguar1600.jpg")
j=new JPEGImporterMBS
j.file=f
if j.ReadHeader then
MsgBox str(j.Width)+" x "+str(j.Height)
else
MsgBox "no JPEG"
end if
```

Notes: You can use this function to see if the file is a JPEG image and which dimension it has.
This function calls InitJPEG and FinishJPEG, so we get all the metadata, but no picture.

9.4.15   RedTestPicture as picture

Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a 100x100 pixel big picture filles with RGB(255,0,0).
Notes: Just for testing how well the plugin picture code works.

9.4.16   SetAPI(API as Ptr = nil)

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets API to use.
Example:

// switch API to libjpeg-turbo:
JPEGExporterMBS.SetAPI JPEGTurboMBS.API
JPEGImporterMBS.SetAPI JPEGTurboMBS.API

Notes: Set to nil to use built in jpeglib.
Can be set to JPEGTurboMBS.API to use libjpeg-turbo.

Changing API while you have instances of JPEGImporterMBS or methods in use on other thread using the JPEG Library, may result in a crash.

9.4.17 Properties

9.4.18 AllowDamaged as boolean

Platforms: macOS, Linux, Windows, Targets: All.

Function: whether you want damaged pictures to be returned.
Notes: If AllowDamaged is false, nil will be returned if the picture is damaged.
Default value is false.
(Read and Write property)

9.4.19 API as String

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries name of API used.
Notes: Either libjpeg or libjpeg-turbo.
(Read only property)

9.4.20 BlockSmoothing as Boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to do interblock smoothing.
Notes: Default value is true.

This setting is relevant only when decoding a progressive JPEG image. During the first DC-only scan,

block smoothing provides a very "fuzzy" look instead of the very "blocky" look seen without it; which is better seems a matter of personal taste. But block smoothing is nearly always a win during later stages, especially when decoding a successive-approximation image: smoothing helps to hide the slight blockiness that otherwise shows up on smooth gradients until the lowest coefficient bits are sent.
(Read and Write property)

9.4.21   CMYK as Boolean

Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the decompressor has imported the picture as a CMYK image into a memoryblock.
Example:

```
dim g as FolderItem
dim ji as JPEGImporterMBS

g=getFolderItem("a_auf")
ji=new JPEGImporterMBS
ji.File=g
if ji.InitJPEG then

if ji.CMYK then
MsgBox "CMYK"
else
MsgBox "not"
end if
end if
```

Notes: This property sets the Mode property to ModeCMYK.
(Read and Write property)

9.4.22   ColorComponentCount as Integer

Plugin Version: 3.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of color components.
Notes:

1   Grayscale
3   RGB
4   CMYK

(Read and Write property)

9.4.23 ColorSpace as Integer

Plugin Version: 13.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The color space of the image.
Example:

dim j as new JPEGImporterMBS

j.File = SpecialFolder.Desktop.Child("cmyk.jpg")

if j.InitJPEG then

Select case j.ColorSpace
case j.ColorSpaceCMYK, j.ColorSpaceYCCK
MsgBox "CMYK"
case j.ColorSpaceRGB, j.ColorSpaceYCbCr
MsgBox "RGB"
case j.ColorSpaceGrayScale
MsgBox "Gray"
else
MsgBox "unknown? "+str(j.ColorSpace)
end Select

j.FinishJPEG
end if

Notes: See also the Colorspace constants.
(Read and Write property)

9.4.24 CurrentDepth as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The depth of the picture property.
Notes: In the current implementation always 32bit.
0 if the loading of the picture failed.
(Read and Write property)

9.4.25   data as string

Platforms: macOS, Linux, Windows, Targets: All.

Function: The source string.
Notes: If file is nil, the compressed data is taken from this property.
(Read and Write property)

9.4.26   ErrorMessage as string

Platforms: macOS, Linux, Windows, Targets: All.

Function: The last error message reported.
Notes: (Read and Write property)

9.4.27   ExifData as String

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The exif data stored in the file.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadExifData=true // needed to fill ExifData property

// do the import

dim data as string = j.ExifData

// work with data

Notes: Only used when ReadExifData is set to true before you import the image.
The string contains the binary content of a exif data on disc.
Value is "" if no data was found.
(Read and Write property)

9.4.28 ExifOrientation as Integer

Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries orientation from EXIF data.
Notes: ReadExifData property must be set earlier to have the import process load EXIF data.
Returns -1 in case of error.
Valid values are in range of 1 to 8. See kOrientation* constants.

For new development, please use ExifTagsMBS class instead.
(Read only property)

9.4.29 ExifThumbnail as String

Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Extracts an embedded thumbnail in EXIF data.
Example:

Dim g As New JPEGImporterMBS

g.File = SpecialFolder.Desktop.Child("test.jpg")
g.ReadExifData = True

// not load, but just read header & metadata
If g.ReadHeader Then

// get thumbnail
Dim Thumbnail As String = g.ExifThumbnail

// show it
window1.Backdrop = picture.FromData(Thumbnail)

// if nil, use ScaleFactor and read scaled down version
End If

Notes: ReadExifData property must be set earlier to have the import process load EXIF data.
Returns string containing JPEG compressed image data.

For new development, please use ExifTagsMBS class instead.
(Read only property)

9.4.30   FancyUpsampling as Boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to do fancy upsampling.
Notes: Default value is true.

If true, use direct DCT scaling with DCT size >8 for downsampling of chroma components. If false, use only DCT size <= 8 and simple separate downsampling. Default is true. For better image stability in multiple generation compression cycles it is preferable that this value matches the corresponding FancyUpsampling value in decompression.
(Read and Write property)

9.4.31   file as folderitem

Platforms: macOS, Linux, Windows, Targets: All.

Function: The source file.
Example:

Dim ji As New JPEGImporterMBS

ji.file = SpecialFolder.Desktop.Child("test.jpg")
ji.Import

Backdrop = ji.Picture

Notes: If file is nil and path is "", the source is taken from the data property.
(Read and Write property)

9.4.32   FileOffset as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The offset inside the file.
Notes: (Read and Write property)

9.4.33   Height as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture.
Notes: 0 if the loading of the picture failed.
(Read and Write property)

9.4.34   HorizontalResolution as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The horizontal resolution.
Notes: (Read and Write property)

9.4.35   Mode as Integer

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The operation mode.
Notes: Can be either ModePicture (Default), ModeRGB or ModeCMYK.
(Read and Write property)

9.4.36   OriginalDepth as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The original depth of the picture.
Notes: Value maybe 8 for grayscale pictures and 24 or 32 for colored pictures.
0 if the loading of the picture failed.
(Read and Write property)

9.4.37   Path as String

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The source file.
Example:

Dim ji As New JPEGImporterMBS

// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.jpg")
ji.path = f.NativePath
ji.Import

Backdrop = ji.Picture

Notes: If file is nil and path is "", the source is taken from the data property.
(Read and Write property)

9.4.38   Picture as Picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: The picture as the result.
Notes: Set to nil on any error.
(Read and Write property)

9.4.39   PictureData as MemoryBlock

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The cmyk picture data after importing.
Example:

```
dim g as FolderItem
dim ji as JPEGImporterMBS
dim je as JPEGExporterMBS
dim f as FolderItem
dim m as MemoryBlock

// import it
g=getFolderItem("CMYK Example.jpg")
ji=new JPEGImporterMBS
ji.File=g
ji.AllowDamaged=true
ji.ImportCMYK

m=ji.PictureData
msgBox g.name
// export it
f=SpecialFolder.Desktop.child("CMYK Example2.jpg")
je=new JPEGExporterMBS
je.File=f
je.Quality=75
je.ExportCMYK m, ji.Width, ji.Height, ji.Width*4
```

Notes: Basicly a memoryblock with one byte for each channel.
For ReadByRow methods this property contains memoryblock for a row of the image.
(Read and Write property)

9.4.40 ProfileData as String

Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The ICC profile stored in the file.
Example:

dim f as FolderItem
dim j as JPEGImporterMBS
dim p as LCMS2ProfileMBS

f=SpecialFolder.Desktop.Child("test2.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all
j.ReadProfileData=true // needed to fill ProfileData property
j.file=f

j.Import

if j.ProfileData="" then
MsgBox "no profile"
Return
end if

p=LCMS2ProfileMBS.OpenProfileFromString(j.ProfileData)
MsgBox p.Name

Notes: Only used when ReadProfileData is set to true before you import the image.
The string contains the binary content of a profile file on disc. So you can pass it to the CMOpenProfile-FromDataMBS function or write it to a file using the binarystream class.
Value is "" if no profile was found.
(Read and Write property)

9.4.41 ProgressiveMode as Boolean

Plugin Version: 18.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a progressive jpeg file.

Notes: Loading progressive files needs more memory.
(Read and Write property)

9.4.42   ReadExifData as Boolean

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the plugin should read in the exif data.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadExifData=true // needed to fill ExifData property

// do the import

dim data as string = j.ExifData

// work with data

Notes: If there is exif data, it will be stored in the ExifData property.
Setting this value to true will set ReadMarkers to true, too.
The data is stored in one or more markers, so it is needed to read them before extracting the data.
(Read and Write property)

9.4.43   ReadMarkers as Boolean

Plugin Version: 6.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether importer should read markers.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadMarkers=true // else no metadata is read at all

// do the import

MsgBox str(j.MarkerCount)

Notes: (Read and Write property)

9.4.44 ReadProfileData as Boolean

Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the plugin should read in the icc profile.
Example:

dim j as JPEGImporterMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.jpg")
j=new JPEGImporterMBS

j.ReadProfileData=true // needed to fill ProfileData property

// do the import

dim Profile as string = j.ProfileData

// work with profile data

Notes: If there is a profile, it will be stored in the ProfileData property.
Setting this value to true will set ReadMarkers to true, too.
A profile is stored in one or more markers, so it is needed to read them before extracting the profile.
(Read and Write property)

9.4.45 ReadXMPData as Boolean

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the plugin should read in the xmp data.
Notes: If there is xmp data, it will be stored in the XMPData property.
Setting this value to true will set ReadMarkers to true, too.
The data is stored in one or more markers, so it is needed to read them before extracting the data.
(Read and Write property)

9.4.46   ResolutionUnit as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The unit of the resolution properties.
Notes: Values:

0	unknown
1	dots per inch
2	dots per cm

(Read and Write property)

9.4.47   ScaleFactor as Integer

Plugin Version: 10.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The JPEG Library can scale down the picture on the fly.
Notes: Allowed values: 0, 1, 2, 4, 8
0 and 1 disable scaling.
Default valus is 0 for no scaling.
(Read and Write property)

9.4.48   VerticalResolution as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The vertical resolution.
Notes: (Read and Write property)

9.4.49   WarningMessage as String

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last warning message reported.
Notes: (Read and Write property)

9.4.50 Width as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the picture.
Notes: 0 if the loading of the picture failed.
(Read and Write property)

9.4.51 XMPData as String

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The XMP Data stored in the file.
Notes: Only used when ReadXMPData is set to true before you import the image.
The string contains the binary content of a xmp data on disc.
Value is "" if no data was found.
(Read and Write property)

9.4.52 YieldTicks as Integer

Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: How much time is given back to Xojo for other ticks.
Example:

dim j as JPEGImporterMBS // your importer
j.YieldTicks=6 // only use 1/10th of a second

Notes: If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

9.4.53 Events

9.4.54 Error(message as string, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all error messages from the jpeg library.

9.4.55   HeadersRead as boolean

Plugin Version: 15.2, Platforms: macOS, Linux, Windows, Targets: .

Function: Event called when headers are read.
Notes: This allows you to set Mode, ScaleFactor, FancyUpsampling, BlockSmoothing properties.
Return true to cancel Import/InitJPEG methods early.

9.4.56   Info(message as string, msglevel as Integer, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all information messages from the jpeg library.
Notes: msglevel is one of:

-1:	recoverable corrupt-data warning, may want to abort.
0:	important advisory messages (always display to user).
1:	first level of tracing detail.
2,3,...:	successively more detailed tracing messages.

9.4.57   Warning(message as string, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all warning messages from the jpeg library.

9.4.58   Constants

Color Spaces

Constant	Value	Description
ColorSpaceCMYK	4	C/M/Y/K
ColorSpaceGrayScale	1	Gray
ColorSpaceRGB	2	red/green/blue
ColorSpaceUnknown	0	Not set.
ColorSpaceYCbCr	3	Y/Cb/Cr (also known as YUV)
ColorSpaceYCCK	5	Y/Cb/Cr/K

Orientation Constants

Constant	Value	Description
kOrientationBottomLeft	4	row 0 bottom, col 0 lhs
kOrientationBottomRight	3	row 0 bottom, col 0 rhs
kOrientationLeftBottom	8	row 0 lhs, col 0 bottom
kOrientationLeftTop	5	row 0 lhs, col 0 top
kOrientationRightBottom	7	row 0 rhs, col 0 bottom
kOrientationRightTop	6	row 0 rhs, col 0 top
kOrientationTopLeft	1	row 0 top, col 0 lhs
kOrientationTopRight	2	row 0 top, col 0 rhs

Modes

Constant	Value	Description
ModeAuto	30	Load the image into the picturedata property. Switches on import to RGB, Gray or CMYK depending on color space of JPEG file.
ModeAutoByRow	31	Load the image into the picturedata property. Switches on import to RGB, Gray or CMYK depending on color space of JPEG file.
ModeCMYK	2	Load the image into the picturedata property. The PictureData Memoryblock uses 4 bytes per pixel.
ModeCMYKbyRow	12	Same as ModeCMYK, but PictureData contains only the current row The PictureData Memoryblock uses 4 bytes per pixel.
ModeGray	3	Load the image into the picturedata property. The PictureData Memoryblock uses one byte per pixel.
ModeGraybyRow	13	Same as ModeGray, but PictureData contains only the current row The PictureData Memoryblock uses one byte per pixel.
ModePicture	0	Load the image into the picture property.
ModeRaw	20	Load the image into the picturedata property. The PictureData Memoryblock uses 1 to 4 bytes per pixel. Check the colorspace property to know which color space is used.
ModeRGB	1	Load the image into the picturedata property. The PictureData Memoryblock uses 3 bytes per pixel.
ModeRGBbyRow	11	Same as ModeRGB, but PictureData contains only the current row The PictureData Memoryblock uses 3 bytes per pixel.

9.5 class JPEGMovieMBS

9.5.1 class JPEGMovieMBS

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class to write a movie with JPEGs.
Example:

```
// get a picture
dim p as Picture = LogoMBS(500)

// start movie building
dim m as new JPEGMovieMBS

m.Width = 500
m.Height = 500
m.SecondsPerFrame = 0.5

// add frames where we count up
for i as integer = 1 to 20
dim c as new Picture(500, 500)
dim g as Graphics = c.Graphics
g.ForeColor = &c000000
g.TextSize = 50
g.DrawPicture p, 0, 0
g.DrawString str(i), 20, 50

dim j as string = c.GetData(c.FormatJPEG)
m.AddFrame j

next

// generate movie
dim MovieData as string = m.BuildMovie

// and write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.mov")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write MovieData
```

Notes: This is a self written class to create a QuickTime Movie with one video track using JPEG images. You can use this to quickly write a slideshow video if needed.

Does play in Quicktime player and VLC, but not Windows Media Player.
Blog Entries

- [MBS Xojo Plugins, version 18.4pr3](#)

- [MBS Xojo Plugins 17.2](#)

- [MBS Xojo Plugins, version 17.2pr1](#)

- [JPEGs to Movie](#)

Videos

- [Presentation from London conference about MBS Plugins.](#)

Xojo Developer Magazine

- [15.4, page 9: News](#)

9.5.2 Methods

9.5.3 AddFrame(Image as MemoryBlock)

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a frame.
Notes: Image must be a JPEG compressed image.
See also:

- 9.5.4 AddFrame(Image as String) 171

9.5.4 AddFrame(Image as String)

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a frame.
Notes: Image must be a JPEG compressed image.
See also:

- 9.5.3 AddFrame(Image as MemoryBlock) 171

9.5.5 BuildMovie as String

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Builds the movie.
Notes: Either you get an exception or you get a movie which you can write to a file on disk.

9.5.6   Properties

9.5.7   Duration as Double

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The duration of the video.
Notes: In Seconds.
(Read only property)

9.5.8   FrameCount as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of frames.
Notes: (Read only property)

9.5.9   Height as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the video.
Notes: Must match the JPEGs you use.
(Read and Write property)

9.5.10   SecondsPerFrame as Double

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The seconds to show a frame.
Notes: Default 1 second.
(Read and Write property)

9.5.11   TimeScale as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The time scale to use.
Notes: Defines how fine granular you can define time.
Default is 600 units per second.

(Read and Write property)

9.5.12 Width as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The target width of the video.
Notes: Must match the JPEGs you use.
(Read and Write property)

9.6   class JPEGTransformationMBS

9.6.1   class JPEGTransformationMBS

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class to wrap the jpegtran utility.
Notes: Although rotating and flipping data expressed as DCT coefficients is not hard, there is an asymmetry in the JPEG format specification for images whose dimensions aren't multiples of the iMCU size. The right and bottom image edges are padded out to the next iMCU boundary with junk data; but no padding is possible at the top and left edges. If we were to flip the whole image including the pad data, then pad garbage would become visible at the top and/or left, and real pixels would disappear into the pad margins — perhaps permanently, since encoders & decoders may not bother to preserve DCT blocks that appear to be completely outside the nominal image area. So, we have to exclude any partial iMCUs from the basic transformation.

Transpose is the only transformation that can handle partial iMCUs at the right and bottom edges completely cleanly. Mirror horizontal can flip partial iMCUs at the bottom, but leaves any partial iMCUs at the right edge untouched. Similarly mirror vertical leaves any partial iMCUs at the bottom edge untouched. The other transforms are defined as combinations of these basic transforms and process edge blocks in a way that preserves the equivalence.

The "trim" option causes untransformable partial iMCUs to be dropped; this is not strictly lossless, but it usually gives the best-looking result for odd-size images. Note that when this option is active, the expected mathematical equivalences between the transforms may not hold. (For example, -rot 270 -trim trims only the bottom edge, but -rot 90 -trim followed by -rot 180 -trim trims both edges.)

We also offer a "force to grayscale" option, which simply discards the chrominance channels of a YCbCr image. This is lossless in the sense that the luminance channel is preserved exactly. It's not the same kind of thing as the rotate/flip transformations, but it's convenient to handle it as part of this package, mainly because the transformation routines have to be aware of the option to know how many components to work on.

Bases on libjpeg.
Blog Entries

- MBS REALbasic Plugins, version 11.2pr1

9.6.2   Methods

9.6.3   close

Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The destructor.
Notes: There is no need to call this method except you want to free all resources of this object now without waiting for Xojo to do it for you.

9.6.4 Transform as boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Runs the transformation.
Notes: Outputfile and Inputfile should never be identical, because this will corrupt the file.

Returns only false if the file specifications are invalid.
So after true is returned you still need to check the errorcode property.

9.6.5 Properties

9.6.6 CopyOption as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: What to copy from the meta information.
Notes: Values:

JCOPYOPT_NONE	0	copy no optional markers
JCOPYOPT_COMMENTS	1	copy only comment (COM) markers
JCOPYOPT_ALL	2	copy all optional markers

(Read and Write property)

9.6.7 DebugLevel as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The debug level for the jpeg library.
Notes: (Read and Write property)

9.6.8 ErrorCode as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last error code reported.
Notes: (Read and Write property)

9.6.9   ErrorMessage as String

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last error message reported.
Notes: (Read and Write property)

9.6.10   Grayscale as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to reduce to grayscale (omit color data).
Notes: If true the a color image is converted to grayscale.
(Read and Write property)

9.6.11   InputFile as FolderItem

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The input file.
Notes: Outputfile and Inputfile should never be identical, because this will corrupt the file.
(Read and Write property)

9.6.12   MaxMemoryToUse as Integer

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Maximum memory to use.
Notes: Unit is bytes.
(Read and Write property)

9.6.13   MirrorHorizonal as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to use the left-right mirror transformation.
Notes: Only one transformation can be used.

(Read and Write property)

9.6.14 MirrorVertical as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to use the top-bottom mirror transformation.
Notes: Only one transformation can be used.
(Read and Write property)

9.6.15 OptimizeCoding as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Optimize Huffman table (smaller file, but slow compression)
Notes: (Read and Write property)

9.6.16 OutputFile as FolderItem

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The output file.
Notes: On Mac OS X, this function uses the short file name (31 characters).
So you may consider to save to a temporary file and rename it after the transformation was successfull.

Outputfile and Inputfile should never be identical, because this will corrupt the file.
(Read and Write property)

9.6.17 Progressive as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to create progressive JPEG file.
Notes: (Read and Write property)

9.6.18 Rotate180 as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to use the 180¬∞ clockwise rotation transformation.
Notes: Only one transformation can be used.
(Read and Write property)

9.6.19   Rotate270 as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to use the 270¬∞ clockwise rotation transformation.
Notes: Only one transformation can be used.
(Read and Write property)

9.6.20   Rotate90 as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to use the 90¬∞ clockwise rotation transformation.
Notes: Only one transformation can be used.
(Read and Write property)

9.6.21   Transpose as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to transpose the image across UR-to-LL axis.
Notes: Only one transformation can be used.
(Read and Write property)

9.6.22   Transverse as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to tanspose the image across UL-to-LR axis.
Notes: Only one transformation can be used.
(Read and Write property)

9.6.23   Trim as Boolean

Plugin Version: 3.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: whether to drop non-transformable edge blocks.
Notes: if true, trim partial MCUs as needed.
(Read and Write property)

9.6.24   WarningMessage as String

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last warning message reported.
Notes: (Read and Write property)

9.6.25   Events

9.6.26   Error(message as string, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all error messages from the jpeg library.

9.6.27   Info(message as string, msglevel as Integer, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all information messages from the jpeg library.
Notes: msglevel is one of:

-1:	recoverable corrupt-data warning, may want to abort.
0:	important advisory messages (always display to user).
1:	first level of tracing detail.
2,3,...:	successively more detailed tracing messages.

9.6.28   Warning(message as string, ErrorCode as Integer)

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: .

Function: This events reports all warning messages from the jpeg library.

9.7   module JPEGTurboMBS

9.7.1   module JPEGTurboMBS

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module to use libjpeg-turbo in Xojo.
Example:

```
// switch API to libjpeg-turbo:
JPEGExporterMBS.SetAPI JPEGTurboMBS.API
JPEGImporterMBS.SetAPI JPEGTurboMBS.API
```

Blog Entries

- MBS Xojo Plugins, version 19.5pr7
- libjpeg-turbo for Xojo

9.7.2   Methods

9.7.3   API as Ptr

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns API pointer.
Notes: This returns pointer to internal MBS data structure with function pointers to JPEG library functions.

9.7.4   GetJPEGVersion as String

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries JPEG library version.
Notes: Currently reporting 8.0 for version 8.0.

9.7.5   Constants

Constants

Constant	Value	Description
Version	"2.0.3"	The version string for JPEG Turbo library.

9.8 Globals

9.8.1 JPEGStringToPictureMBS(buf as string) as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a JPEG file.
Example:

dim s as string
dim h as new HTTPSocket

s=h.Get("http://www.monkeybreadsoftware.de/xojo/images/rbplugin.jpg",90)

Backdrop=JPEGStringToPictureMBS(s)

Notes: Short version of the "JPEGStringToPicture(buf as string,allowdamaged as Boolean) as picture" method. allowdamaged is set to false.
See also:

9.8.2 JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a picture from a JPEG file.
Example:

dim p as Picture = LogoMBS(500)
dim s as string = PictureToJPEGStringMBS(p, 80)

s = leftb(s, lenb(s)-1000) // remove last 1000 bytes

dim q as Picture = JPEGStringToPictureMBS(s, true)

Backdrop = q

Notes: This methods should read all JPEG file data you can get, but I've only tested it for 32 bit color and 8 bit grayscale.

I wrote it mainly because Xojo's built in OpenAsJPEG code crashes badly if your picture is not full downloaded. For example if you have a webbrowser you can now show JPEGs while you download them. Normally

you can see a good picture allready with 50% of the data.

Xojo's OpenAsPicture in contrast crashes if the picture is not 100% downloaded or instead of a crash you get a white picture.

See the "JPEGToString example", "jpeg load crashtest" and "SaveJPEG without QuickTime" examples.
Blog Entries

- MBS Xojo Plugins, version 20.2pr1

- Starting with CURL functions

- Tip of the day: Corrupt pictures

See also:

9.8.3   PictureToJPEGStringMBS(pic as picture, quality as Integer = 80) as string

Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a picture into a string using JPEG compression.
Example:

dim p as Picture = LogoMBS(500)
dim s as string = PictureToJPEGStringMBS(p, 80)
dim q as Picture = JPEGStringToPictureMBS(s)

Backdrop = q

Notes: This methods saves 32bit pictures to a file using JPEG Compression. Using the parameter you can specify the quality in range between 25 and 100%

The picture should be a bitmap picture without alpha channel or mask.
Use the JPEGExporterMBS class for more options.

The returned string has the encoding set to binary (no encoding). If you want to concat the string with another you should change the encoding, so both strings have the same encoding. If you don't handle that RB may convert the JPEG data to UTF8 (Unicode) which will destroy it.

The picture is always encoded with 72 dpi. If you want to set a different dpi value, please use the JPEGExporterMBS class.

Xojo Developer Magazine

- 6.1, page 31: DiscRecording, How to burn a CD from REALbasic on Mac OS X by Christian Schmitz

- 2.4, page 42: Cross platform streams, We write our own binary stream to save our data by Christian Schmitz

- 19.4, page 83: Archives in Xojo, How to Use Zip Archives by Stefanie Juchmes

Chapter 10

Large Picture

10.1 class PictureFactoryMBS

10.1.1 class PictureFactoryMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The factory class for pictures.
Notes: This class gives you a global event where you can provide your own pictures.
Whenever the plugin needs a new PictureMBS object for the result of a function or for temporary storage, you can provide one.

This is mainly for the case where you use virtual memory or you want to reuse pictures.

Used for temporary or result pictures for BoxBlur, DitherFilter, EngraveFilter, GainFilter, GammaFilter, NeonFiltrer, OilFilter, PictureMatrix, Rotate, SolarizeFilter and TransferFilter.
Blog Entries

- MBS Xojo Plugins, version 19.3pr4

10.1.2 Methods

10.1.3 NewPictureMBS(Width as integer, Height as integer, ImageFormat as integer) as PictureMBS

Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new picture.
Notes: This may invoke the event.

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If no factory is registered, we use our default implementation.
If the event or our implementation raises exception, you may need to catch it, e.g. OutOfMemoryException.
See also:

- 10.1.8 NewPictureMBS(Width as Integer, Height as Integer, ImageFormat as Integer) as PictureMBS 186

10.1.4 SetFactory(factory as PictureFactoryMBS)

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the global factory object.
Notes: You can set to nil to delete the existing factory.

10.1.5 Properties

10.1.6 currentFactory as PictureFactoryMBS

Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries current factory.
Notes: Use SetFactory method to change it.
(Read only property)

10.1.7 Events

10.1.8 NewPictureMBS(Width as Integer, Height as Integer, ImageFormat as Integer) as PictureMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The factory event.
Example:

function NewPictureMBS(Width as Integer, Height as Integer, ImageFormat as Integer) as PictureMBS

return new PictureMBS(width, height, ImageFormat)

end function

Notes: This event is called whenever a picture is requested.
Return an picture you created.

The plugin will check the Valid property for this picture and use it only if Valid is true.
See also:

- 10.1.3 NewPictureMBS(Width as integer, Height as integer, ImageFormat as integer) as PictureMBS 185

10.2　class PictureMBS

10.2.1　class PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The MBS picture class for really large pictures.
Example:

dim fSource as FolderItem = SpecialFolder.Desktop.Child("test.png") // some png with alpha
dim oPNGInput as new PNGReaderMBS

If oPNGInput.OpenFile(fSource) Then
If oPNGInput.ApplyOptions(0) Then

dim imgSource as New PictureMBS(oPNGInput.Width, oPNGInput.Height, PictureMBS.ImageFormatRGBA)

' Read row by row the file and puts it in a PictureMBS instance

dim nMax as Integer = oPNGInput.Height - 1
For nInd as Integer = 0 To nMax
imgSource.RowInFormat(nInd, PictureMBS.ImageFormatRGBA, true) = oPNGInput.ReadRow()
Next

' show only alpha/mask channel
Backdrop=imgSource.AlphaChannel.CopyPicture

' show Picture without mask
Backdrop=imgSource.CopyPicture

' show picture with mask
Backdrop=imgSource.CopyPictureWithMask

End If
End If

Notes: Using virtual memory you are only limited to hard disc space for swapping.

The Xojo picture class is limited to 2 GB and to width/height being in platform specific ranges. This class works with pictures up to 100 million pixels width and 2 billion pixels height.
Blog Entries

- Multithreaded plugin functions can increase speed of Xojo application

- Colorspaces in MacOS with Xojo

- MonkeyBread Software Releases the MBS Xojo / Real Studio plug-ins in version 14.0

- CMYK Colors

- MBS Plugins 11.1 Release notes

- A day for bug fixing

- MBS REALbasic plug-ins version 9.5

- MBS REALbasic plug-ins version 9.4

- MBS REALbasic plug-ins version 9.3

- MonkeyBread Software Releases the MBS REALbasic plugins 8.7

Videos

- Presentation from Munich conference about MBS Plugins.

Xojo Developer Magazine

- 8.3, page 22: Dropwords, Part 1, Developing a simple game by Marc Zeedar

- 8.2, page 25: Saving Data, A simple method for saving a data structure by Marc Zeedar

- 8.1, page 25: REALbasic Plugins, Getting started with the Plugin SDK

- 7.6, page 21: Think Big by Thinking Small, Build a platform, not an app by Marc Zeedar

- 7.4, page 8: News

- 7.3, page 9: News

- 16.2, page 9: News

- 12.2, page 10: News

10.2.2 Methods

10.2.3 AlphaChannel as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The alpha channel as a new PictureMBS object.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.AlphaChannel
r.fillrect(100) // fill only alpha channel

Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.4 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies a 5x5 matrix to the picture.
Example:

dim matrix(24) as Integer
dim x,y as Integer
dim value as Integer

for y=0 to 4
for x=0 to 4
matrix(x+y*5)=value // fill matrix
next
next

dim s,d as PictureMBS // make source and dest somewhere

d=s.ApplyMatrix(d, 5, matrix)

Notes: MatrixDimension: Size of the matrix: 1 to 50. This is the width and height of the matrix.
matrix: The matrix array must contain exactly MatrixDimension*MatrixDimension values. (ubound(matrix)=MatrixDimension*MatrixDimension-1)
delta: Optional value. Default is 0.
ScaleFactor: Optional value. Default is 1.0.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For each pixel in the dest image the following operation is done:

- Make sum of all source pixels multiplied with their matrix entry.
- add to the sum the delta value
- multiply the sum by ScaleFactor

See the example project for several example matrices.

A matrix value of 255 or more leaves the dest pixel away from the sum.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 10.2.5 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer) as PictureMBS 191

- 10.2.6 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer, ScaleFactor as Double) as PictureMBS 192

10.2.5 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies a 5x5 matrix to the picture.
Example:

```
dim matrix(24) as Integer
dim x,y as Integer
dim value as Integer

for y=0 to 4
for x=0 to 4
matrix(x+y*5)=value // fill matrix
next
next

dim s,d as PictureMBS // make source and dest somewhere

d=s.ApplyMatrix(d, 5, matrix, 5)
```

Notes: MatrixDimension: Size of the matrix: 1 to 50. This is the width and height of the matrix.
matrix: The matrix array must contain exactly MatrixDimension*MatrixDimension values. (ubound(matrix)=MatrixDimension*MatrixDimension-1)
delta: Optional value. Default is 0.
ScaleFactor: Optional value. Default is 1.0.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For each pixel in the dest image the following operation is done:

- Make sum of all source pixels multiplied with their matrix entry.

- add to the sum the delta value

- multiply the sum by ScaleFactor

See the example project for several example matrices.

A matrix value of 255 or more leaves the dest pixel away from the sum.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.6   ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer, ScaleFactor as Double) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies a 5x5 matrix to the picture.
Example:

```
dim matrix(24) as Integer
dim x,y as Integer
dim value as Integer

for y=0 to 4
for x=0 to 4
matrix(x+y*5)=1 // fill matrix
next
next

dim s,d as PictureMBS // make source and dest somewhere

s = new PictureMBS(LogoMBS(500))
d = new PictureMBS(500, 500, PictureMBS.ImageFormatRGB)

// Blur with 5x5 Matrix
d=s.ApplyMatrix(d, 5, matrix, 1, 1.0/25.0)
```

Backdrop = d.CopyPicture

Notes: MatrixDimension: Size of the matrix: 1 to 50. This is the width and height of the matrix.
matrix: The matrix array must contain exactly MatrixDimension*MatrixDimension values. (ubound(matrix)=MatrixDimension*MatrixDimension-1)
delta: Optional value. Default is 0.
ScaleFactor: Optional value. Default is 1.0.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For each pixel in the dest image the following operation is done:

- Make sum of all source pixels multiplied with their matrix entry.

- add to the sum the delta value

- multiply the sum by ScaleFactor

See the example project for several example matrices.

A matrix value of 255 or more leaves the dest pixel away from the sum.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 10.2.4 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer) as PictureMBS $\qquad$ 190

- 10.2.5 ApplyMatrix(dest as PictureMBS, MatrixDimension as Integer, matrix() as Integer, delta as Integer) as PictureMBS $\qquad$ 191

10.2.7 AutoLevel as boolean

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies auto levels on the picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

call p.AutoLevel
window1.Backdrop = p.CopyPicture

Notes: The histogram is built, white and back points are searched and all pixels adjusted.
Returns true on success and false on any error.

Works only with RGB pictures.
See also:

10.2.8   AutoLevel(x as Integer, y as Integer, w as Integer, h as Integer) as boolean

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies auto levels on the picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
call p.AutoLevel(0,0,50,50)
window1.Backdrop = p.CopyPicture

Notes: The histogram is built, white and back points are searched and all pixels adjusted.
Returns true on success and false on any error.

Works only with RGB pictures.
See also:

10.2.9   BlackChannel as PictureMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The black channel of a CMYK picture as a new PictureMBS object.
Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.10 BlendPicturesWithMaskWithBackground(SourceImage as PictureMBS, DestImage as PictureMBS, Mask as PictureMBS, Result as PictureMBS, BackgroundColour as Color) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Blend picture with mask and background.
Notes: Works for gray and RGB pictures, not for CMYK.
Returns true on success and false on failure.
Blends source and dest image into result image.
If mask is nil, we just copy pictures.
If mask is not nil, we blend using either DestImage (if non nil) or background color.
Alpha channels are not used.
See also:

10.2.11 BlendPicturesWithMaskWithBackground(SourceImage as PictureMBS, DestImage as PictureMBS, Mask as PictureMBS, Result as PictureMBS, BackgroundColour as Color, X As Integer, Y As Integer, Width As Integer, Height As Integer) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Blend picture with mask and background.
Notes: Works for gray and RGB pictures, not for CMYK.
Returns true on success and false on failure.
Blends source and dest image into result image.
If mask is nil, we just copy pictures.
If mask is not nil, we blend using either DestImage (if non nil) or background color.
Alpha channels are not used.
See also:

10.2.12 BlueChannel as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The blue channel as a new PictureMBS object.
Example:

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.BlueChannel
```

r.fillrect(100) // fill only blue channel

Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.13   BoxBlurFilter(dest as PictureMBS, Radius as Double, Iterations as Integer, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The box blur filter.
Example:

Dim boxPic,tempObj As PictureMBS
dim logo as Picture = LogoMBS(500)
dim pictureObj as new PictureMBS(logo)

tempObj = New PictureMBS(pictureObj.Width, pictureObj.Height, pictureObj.ImageFormat)
boxPic = pictureObj.BoxBlurFilter(tempObj, 3.0, 3)

Backdrop=boxpic.CopyPicture

Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Vertical and Horizontal define whether effect is applied horizontal and/or vertical.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.14 BoxBlurFilter(dest as PictureMBS, Radius as Double, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The box blur filter.
Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Vertical and Horizontal define whether effect is applied horizontal and/or vertical.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

- 10.2.13 BoxBlurFilter(dest as PictureMBS, Radius as Double, Iterations as Integer, Vertical as boolean = true, Horizontal as boolean = true) as PictureMBS   196

10.2.15 BoxBlurFractionalFilter(dest as PictureMBS, Radius as Double) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The box blur filter for the radius fraction.
Notes: If you call BoxBlurFilter and BoxBlurFractionalFilter with a radius of 3.5 the BoxBlurFilter does the 3.0 and BoxBlurFractionalFilter does the 0.5.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.

10.2.16 CalculateMemory(width as Integer, height as Integer, theImageFormat as Integer) as Int64

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the memory needed for allocating the image.
Example:

dim n as int64 = PictureMBS.CalculateMemory(1000, 1000, PictureMBS.ImageFormatRGB)

MsgBox str(n)

Notes: Returns number of bytes needed.

10.2.17   CanAllocateImage(width as Integer, height as Integer, theImageFormat as Integer) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Can the image with this size be allocated?
Example:

dim n as Boolean = PictureMBS.CanAllocateImage(1000, 1000, PictureMBS.ImageFormatRGB)
MsgBox str(n)
dim x as Boolean = PictureMBS.CanAllocateImage(100000, 100000, PictureMBS.ImageFormatRGB)
MsgBox str(x)

Notes: Retruns true if possible and false if the size is too big.
To figure out if allocation will work, we simply allocate and release memory and see if that worked.

10.2.18   Channel(index as Integer) as PictureMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the channel with the given index as a new picture object.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.Channel(0)
r.fillrect(100) // fill only red channel

Notes: Returns nil on any error. May raise an out of bounds exception on invalid index. Index is zero based.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.
See also:

- 10.2.146 Channel as String   275

10.2.19 ChannelOffset(index as integer) as integer

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries channel offset within pixel.
Notes: For RGB the red channel has offset 0, the green channel has offset 1 and the blue channel has offset 2.

10.2.20 Channels as String()

Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the channels of an image.
Example:

dim p as new Picture(100,100,32)
dim q as new PictureMBS(p)

dim channels() as string = q.Channels

dim cr as PictureMBS = q.RedChannel
dim cg as PictureMBS = q.GreenChannel
dim cb as PictureMBS = q.BlueChannel
dim c0 as pictureMBS = q.Channel(0)
dim c1 as pictureMBS = q.Channel(1)
dim c2 as pictureMBS = q.Channel(2)

dim crn as string = cg.Channel
dim cgn as string = cg.Channel
dim cbn as string = cg.Channel
dim c0n as string = c0.Channel
dim c1n as string = c1.Channel
dim c2n as string = c2.Channel

Break // check in debugger

10.2.21 ClearCache

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears picture cache.
Notes: If target of this PictureMBS is a Xojo picture, this method clears the Xojo cache for the picture to make sure it recognizes changes.
Does nothing if there is no target picture or there is no cache.

10.2.22   ClearRect

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears all pixels.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.ClearRect
window1.Backdrop = p.CopyPicture

Notes: Writes zeros over all pixels and all channels.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.23   ClearRect(x as Integer, y as Integer, width as Integer, height as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears all pixels in the given area.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.ClearRect(0,0,100,100)
window1.Backdrop = p.CopyPicture

Notes: Writes zeros over all pixels and all channels.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.24   ClipImage as PictureMBS

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new PictureMBS object for the same picture content.
Notes: This may be useful if you need a second PictureMBS object. For example if two threads work on different rows.
See also:

10.2.25 ClipImage(x as Integer, y as Integer, width as Integer, height as Integer) as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new PictureMBS object which draws only into a portion of the existing image.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

// clip it
dim c as PictureMBS = p.ClipImage(100, 100, 300, 300)

// clone it
dim q as PictureMBS = c.Clone

// and see result in debugger
dim pic as Picture = q.CopyPicture

Break

Notes: This may be useful to apply an effect only on a portion of an existing image.
See also:

10.2.26 Clone as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of a picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

// clip it
dim c as PictureMBS = p.ClipImage(100, 100, 300, 300)

// clone it
dim q as PictureMBS = c.Clone

// and see result in debugger

dim pic as Picture = q.CopyPicture

Break

Notes: Does not work for pictures using virtual memory.
(Fails if IsMapping=True)
Copies the whole picture even if you clone just one channel.

Returns nil on low memory.

10.2.27   Close

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Closes the picture by releasing all memory.
Notes: This calls the destructor internally.

10.2.28   CMYKChannels as PictureMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The CMYK channels as a new PictureMBS object.
Notes: Returns nil if the image is not a CMYK picture.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the CMYK pixels directly without modifying an alpha channel
The resulting PictureMBS object is a CMYK picture.

10.2.29   Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Example:

dim DestImage As PictureMBS
dim Image As PictureMBS
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100

dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=new PictureMBS(LogoMBS(500))
Mask=nil
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

// this will only copy the pixels
if DestImage.Combine(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,false) then
window1.Backdrop=DestImage.CopyPicture
end if

Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.31   Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Example:

dim DestImage As PictureMBS
dim Image As PictureMBS

```
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

image=new PictureMBS(LogoMBS(500))
Mask=nil
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

if DestImage.Combine(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,true, &cFF0000, &cFF0000)
then
window1.Backdrop=DestImage.CopyPicture
end if
```

Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color

MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.32 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.33   Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.34   Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Example:

```
dim DestImage As PictureMBS
dim Image As PictureMBS
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

// we create a little mask for a smooth fade
dim m as Picture = New Picture(500,500,32)
```

```
dim g as Graphics = m.Graphics

for y as Integer = 0 to 499
dim n as Integer = y*255/499
g.ForeColor = rgb(n, n, n)
g.DrawLine 0,y,499,y
next

// uncomment to see our mask:
'Backdrop = m
'return

image=new PictureMBS(LogoMBS(500))
Mask=new PictureMBS(m)
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

// this will only copy the pixels
if DestImage.Combine(image,false,Mask,DestX,DestY,SourceX,SourceY,Width,Height,false) then
window1.Backdrop=DestImage.CopyPicture
end if
```

Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position

Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.35 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.36 Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color, MaskColour As color) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

10.2.37   Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Example:

dim DestImage As PictureMBS
dim Image As PictureMBS
dim Mask As PictureMBS
dim DestX as Integer=100
dim DestY as Integer=100
dim SourceX as Integer=0
dim SourceY as Integer=0
dim Width as Integer=500
dim Height as Integer=500

dim UseColours as Boolean = false
dim ForeColour as color = &cFF0000

image=new PictureMBS(LogoMBS(500))
Mask=nil
DestImage=new PictureMBS(700,700,PictureMBS.ImageFormatRGB)

if DestImage.Combine(image,Mask,DestX,DestY,SourceX,SourceY,Width,Height,UseColours,ForeColour) then
window1.Backdrop=DestImage.CopyPicture
end if

Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.

See also:

10.2.38   Combine(Image As PictureMBS, PreMultipliedSource as boolean, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour as Integer, MaskColour as Integer) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from one picture into another picture with some options.
Notes: Returns true on success and false on failure.

This function has 4 behaviors depending on the parameters:

1. If mask is nil and no ForeColour and MaskColour values are passed, the pixels a copied to the destination picture.

2. But if there is a mask, the pixels are copied with applying the mask.

3. If the mask color is not defined, the the pixels are filled with the fore color applying the mask.

4. As the last variation the pixels are copied and the forecolor, the mask color or black is used with the image as the mask. If UseColours parameter is false black is used for this.

Parameters:
Image: the source picture, must not be nil.
PreMultipliedSource: Optional parameter. If true the image must be premultiplied. Default is false.
Mask: the mask picture, can be nil.
DestX: destination position
DestY: destination position
SourceX: source position
SourceY: source position
Width: width of the area to copy
Height: height of the area to copy
UseColours: whether to use the mask colour.
ForeColour: the fore colour, optional, can be integer or color
MaskColour: the mask color, optional, can be integer or color

This function is 5 times in the plugin defined to implement having the last two parameters optional and either integer or color. You can pass a negative number for MaskColour or ForeColour to disable this parameter.

The images you use can be Gray, RGB with or without alpha channels. But most variants here ignore alpha channels. To make sure the alpha channel is not touched, use the PictureMBS.RGBChannels function and pass that new PictureMBS.
See also:

- 10.2.29 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean) as boolean   202

- 10.2.30 Combine(Image As PictureMBS, Mask As PictureMBS, DestX as Integer, DestY as Integer, SourceX as Integer, SourceY as Integer, Width as Integer, Height as Integer, UseColours As Boolean, ForeColour As color) as boolean   205

10.2.39 Combine(Mask As PictureMBS, X as Integer, Y as Integer, Width as Integer, Height as Integer, BackColour As color) as boolean

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines picture with mask and background color.
See also:

10.2.40   CompareImages(other as PictureMBS) as Int64

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compares two pictures.
Example:

dim p as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)

// fill random
p.FillRectRandom

dim q as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)

// copy pixels
call q.CopyPixels(p, 0, 0, 1000, 1000, 0, 0)
q.FillRect(0,0,10,10,0) // fill 100 pixels

// show image
Backdrop = q.CopyPicture

// and compare

Title = str(p.CompareImages(q)) // shows 100

Notes: Returns -1 if both pictures are not from the same structure. (e.g. compare gray with RGB)
Else returns the number of different pixels.

10.2.41   Constructor(Buf as MemoryBlock, width as Integer, height as Integer, ImageFormat as Integer, RowSize as Integer)

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a PictureMBS object based on a memoryblock.
See also:

10.2.42   Constructor(pic as picture, UseAlpha as boolean=false)

Plugin Version: 8.7, Platform: macOS, Targets: All.

Function: Creates a PictureMBS which shares memory with the given picture.
Example:

```
// Create a picture with mask:
dim p as Picture = LogoMBS(200)
dim g as Graphics = p.mask.Graphics

g.ForeColor = &cFFFFFF
g.FillRect 0,0,g.Width,g.Height

g.ForeColor = &c000000
g.Filloval 0,0,g.Width,g.Height

canvas1.Backdrop = p

// create PictureMBS
dim pic as new PictureMBS(p, true)
dim mask as new PictureMBS(p.mask)

// draw mask into alpha channel
call pic.AlphaChannel.CopyPixels(mask,0,0,mask.Width,mask.Height,0,0)
```

// and copy back to Xojo picture
canvas2.Backdrop = pic.CopyPictureWithMask

Notes: All drawings in the Picture and in the PictureMBS object will be visible in both objects.
This function works on Mac OS and Windows with both 24 bit and 32 bit pictures.
On Mac this function can fail if the picture is not a GWorld (Bitmap) picture.

The Valid property is set to true on success.

If you set UseAlpha=True, the 4th channel in a 32 bit picture is available for you as an alpha channel. Xojo does not use the 4th channel in the picture data and 24 bit pictures do not have one. So you can use 32 bit pictures, copy the pictures mask in the alpha channel (using PictureMBS.AlphaChannel. inverting may be needed), perform some operations and later make a copy of the of the image to a picture and extract the alpha channel back into the pictue's mask.

Added support for Console/Web targets in 12.2 plugins. Please be aware that alpha channel of pictures with alpha channel has only a range from 0 to 127 for the values.
See also:

10.2.43 Constructor(width as Integer, height as Integer, ImageFormat as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new PictureMBS object with the given size and Imageformat.
Notes: ImageFormat must be one of the ImageFormat constants.
The Valid property is set to true on success.

The constructor allocated address space for the image.
Physical memory is allocated based on write access to pixels.
See also:

10.2.44   Constructor(width as Integer, height as Integer, ImageFormat as Integer, BlockSize as Int64, FilePath as folderitem)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a PictureMBS object using virtual memory.
Example:

dim mm as int64 = Picturembs.CalculateMemory(7000, 150000, PictureMBS.ImageFormatRGB)
// shows that this size needs 3 GB in memory

// create image
dim blocksize as Integer = 100*1024*1024
dim file as FolderItem = GetTemporaryFolderItem
dim pic as new PictureMBS(7000, 150000, PictureMBS.ImageFormatRGB, blocksize, file)

// draw dots on it
for x as Integer = 0 to pic.Width step 500
for y as Integer = 0 to pic.Height step 500
pic.FillRect(x, y, 100, 100, 175)
next
next

// write to tiff
dim f as FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim t as TiffPictureMBS

if pic <>nil then
t = new TiffPictureMBS

if t.Create(F) then

const PLANARCONFIG_CONTIG = 1
const PHOTOMETRIC_RGB = 2
const FILLORDER_MSB2LSB = 1
const RESUNIT_INCH = 2
const ORIENTATION_TOPLEFT = 1
const COMPRESSION_LZW = 5

t.Height = pic.Height
t.Width = pic.Width

t.RowsPerStrip = 1

```
t.PlanarConfig = PLANARCONFIG_CONTIG
t.Photometric = PHOTOMETRIC_RGB
t.BitsPerSample = 8
t.SamplesPerPixel = 3
t.FillOrder = FILLORDER_MSB2LSB
t.Orientation = ORIENTATION_TOPLEFT
t.ResolutionUnit = RESUNIT_INCH
t.VerticalResolution = 72.0
t.HorizontalResolution = 72.0
t.Compression = COMPRESSION_LZW

for i as Integer = 0 to t.Height - 1
dim m as MemoryBlock = pic.RowInFormat(i, PictureMBS.ImageFormatRGB)
t.Scanline(i) = m

next

t.Close
end if
else

end if

// cleanup
pic = nil
file.delete
```

Notes: The size of this image is limited to available hard disc space.
The system will cache this data in memory to avoid writing it to disc. Using picture sizes bigger than physical memory can result into slow processing.

FilePath points to the location where the file is created.
On Windows the FilePath can be nil in which space in the system swapfile is used.
On Mac/Linux with nil FilePath, we use automatically a temp file path.

BlockSize specifies how many bytes of memory should be used in application memory space. A typical value may be 100 mega bytes.

The Valid property is set to true on success.
File is deleted in destructor and folderitem is than invalid.
See also:

10.2.45   CopyMask as picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the alpha channel into a mask picture.
Notes: Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).
Works for all pictures with alpha channel.
See also:

10.2.46   CopyMask(x as Integer, y as Integer, w as Integer, h as Integer) as picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the given area of the alpha channel into a mask picture.
Notes: Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).
Works for all pictures with alpha channel.
See also:

10.2.47   CopyPicture as picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the RGB channels or the gray channel into a picture.
Example:

```
// get some picture
dim logo as Picture = LogoMBS(500)

// create PictureMBS
dim rgb as new PictureMBS(logo)

// Create a gray picture and copy RGB to gray
dim g as new PictureMBS(500, 500, PictureMBS.ImageFormatG)
```

call g.CopyPixels(rgb)

// Create CMYK and fill cyan channel with grayscale image
dim cmyk as new PictureMBS(500, 500, PictureMBS.ImageFormatCMYK)
call cmyk.MagentaChannel.CopyPixels(g)

// display it
Backdrop = cmyk.CopyPicture

Notes: Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

10.2.48   CopyPicture(x as Integer, y as Integer, w as Integer, h as Integer) as picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the RGB channels or the gray channel in the given area into a picture.
Notes: Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

10.2.49   CopyPictureWithAlpha as picture

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies picture with alpha.
Notes: Returns a picture with HasAlphaChannel = true.
See also:

10.2.50   CopyPictureWithAlpha(x as integer, y as integer, w as integer, h as integer) as picture

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies picture in rectangle with alpha.
Notes: Returns a picture with HasAlphaChannel = true.
See also:

10.2.51   CopyPictureWithMask as picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the picture with mask.
Notes: Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

10.2.52   CopyPictureWithMask(x as Integer, y as Integer, w as Integer, h as Integer) as picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the picture with mask in the given area.
Notes: Be aware that PictureMBS objects can have more pixels than picture objects can store, so this will not always work.
Returns nil on any error (e.g. out of memory).

Works with Gray, RGB and CMYK pictures and supports alpha channel. For CMYK we have some simply conversion to RGB to give you a preview. For a real world application, use Color Conversion like our LCMS plugin.
See also:

10.2.53 CopyPixels(source as PictureMBS) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies all pixels from the source picture to the current picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
// create new picture:
// can be any image format: ImageFormatRGB, ImageFormatG, ImageFormatBGR, etc.
dim d as new PictureMBS(l.Width, l.Height, PictureMBS.ImageFormatRGB)

if d.CopyPixels(p) then
Backdrop = d.CopyPicture
else
MsgBox "Failed."
end if

Notes: This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
- CMYK to CMYK
- CMYK to Gray, copies from black channel
- Gray to CMYK, copies to black channel
If an alpha channel exists in both images, it is copied.
See also:

10.2.54 CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from the source picture to the current picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
dim d as new PictureMBS(700, 700, PictureMBS.ImageFormatRGB)

if d.CopyPixels(p,100,100,500,500) then
Backdrop = d.CopyPicture
else
MsgBox "Failed."
end if

Notes: DestWidth and DestHeight specify how many pixels are copied.
DestX/DestY specify the destination position in the current picture.

This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
- CMYK to Gray, copies from black channel
- Gray to CMYK, copies to black channel
If an alpha channel exists in both images, it is copied.
See also:

10.2.55   CopyPixels(source as PictureMBS, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies pixels from the source picture to the current picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
dim d as new PictureMBS(700, 700, PictureMBS.ImageFormatRGB)

if d.CopyPixels(p,100,100,500,500,0,0) then
Backdrop = d.CopyPicture
else
MsgBox "Failed."
end if

Notes: SourceX/SourceY is the position in the source picture.
DestWidth/DestHeight specify how many pixels are copied.
DestX/DestY specify the destination position in the current picture.

This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
- CMYK to Gray, copies from black channel
- Gray to CMYK, copies to black channel
If an alpha channel exists in both images, it is copied.
See also:

10.2.56 CreatePictureMBS(width as Integer, height as Integer, ImageFormat as Integer) as PictureMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new PictureMBS object.
Notes: Returns nil if no factory can create a valid picture.

First the Factory on the current ImageMBS object (self) is asked to create the picture.
Second the global Factory object is asked.
Third the normal PictureMBS constructor is used.
See also:

10.2.57 CreatePictureMBS(width as Integer, height as Integer, theImageFormat as Integer) as PictureMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new PictureMBS object.
Notes: Returns nil if no factory can create a valid picture.

First the global factory object is asked to create the picture.
Second the normal PictureMBS constructor is used.

See also:

10.2.58   CyanChannel as PictureMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The cyan channel of a CMYK picture as a new PictureMBS object.
Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.59   DiffuseFilter(dest as PictureMBS, level as Integer) as PictureMBS

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies a diffuse filter to the image.
Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Level must be between 0 and min(width,height).

10.2.60   DitherFilter(dest as PictureMBS, matrix as Integer, levels as Integer) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies the dither filter to the picture.
Notes: Use for the matrix parameter one of the Dither* constants.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Levels is a number between 2 and 256 and specifies how many color levels are in the final picture.

Returns nil on any error.

10.2.61 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, Invert-Mask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255
Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.62 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255

Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.63   DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255
Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.64   DrawMaskedPictureApplyMaskRGB(pic as picture, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method applys the pixel values from the Red, Green and Blue channel of the picture with calculating in the mask of the picture.

This is the calculation:
Pixel.Red = (Pixel.Red * (255-Pixel.Mask) + PicturePixel.Red * PicturePixel.Mask) / 255
Pixel.Green = (Pixel.Green * (255-Pixel.Mask) + PicturePixel.Green * PicturePixel.Mask) / 255
Pixel.Blue = (Pixel.Blue * (255-Pixel.Mask) + PicturePixel.Blue * PicturePixel.Mask) / 255

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 10.2.61 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False) 235

- 10.2.62 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 235

- 10.2.63 DrawMaskedPictureApplyMaskRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False) 236

10.2.65 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

- 10.2.66 DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False) 238

10.2.66   DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.67   DrawMaskedPictureRGB(pic as picture, DestX as Integer, DestY as Integer, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green

Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.68 DrawMaskedPictureRGB(pic as picture, InvertMask as boolean=False)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: This method copies the pixel values from the Red, Green and Blue channel of the picture and the pixel value of the picture's mask to the PictureMBS replacing old values.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue
Pixel.Alpha = PicturePixel.Mask

Works only if the PictureMBS has Red, Green, Blue and Alpha channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.69   DrawPictureBlueToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws the blue channel of a picture object into the gray channel of this picture.
Notes: If you want to copy the blue channel of the picture into the blue channel of the PictureMBS, then first get a PictureMBS object for the blue channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.70   DrawPictureBlueToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws the blue channel of a picture object into the gray channel of this picture.
Notes: If you want to copy the blue channel of the picture into the blue channel of the PictureMBS, then first get a PictureMBS object for the blue channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.71   DrawPictureGreenToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws the green channel of a picture object into the gray channel of this picture.
Notes: If you want to copy the green channel of the picture into the green channel of the PictureMBS, then first get a PictureMBS object for the green channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.72 DrawPictureGreenToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws the green channel of a picture object into the gray channel of this picture.
Notes: If you want to copy the green channel of the picture into the green channel of the PictureMBS, then first get a PictureMBS object for the green channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.73 DrawPictureRedToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws the red channel of a picture object into the gray channel of this picture.
Notes: If you want to copy the red channel of the picture into the red channel of the PictureMBS, then first get a PictureMBS object for the red channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.74 DrawPictureRedToGrayChannel(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws the red channel of a picture object into the gray channel of this picture.
Notes: If you want to copy the red channel of the picture into the red channel of the PictureMBS, then first get a PictureMBS object for the red channel and use this method on this object.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.
See also:

10.2.75   DrawPictureRGB(pic as picture)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

10.2.76   DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer)

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

10.2.77 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

10.2.78 DrawPictureRGB(pic as picture, DestX as Integer, DestY as Integer, DestWidth as Integer, DestHeight as Integer, SourceX as Integer, SourceY as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Draws a picture into this PictureMBS object.
Notes: Works only if the PictureMBS has Red, Green and Blue channels.
If you want to copy Pixels from a PictureMBS to a PictureMBS, use CopyPixels.

This is the calculation:
Pixel.Red = PicturePixel.Red
Pixel.Green = PicturePixel.Green
Pixel.Blue = PicturePixel.Blue

This method does ignore a mask in the given picture and does not change set the alpha channel.
See also:

10.2.79   EngraveFilter(dest as PictureMBS, level as Integer) as PictureMBS

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies an engrave filter to the image.
Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Level must be between 0 and min(width,height).

Returns nil on any error.

10.2.80   FillRect(value as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRect(200)
window1.Backdrop = p.CopyPicture

Notes: All channels are filled with the given value.
The range of value is 0 to 255.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.81   FillRect(Value as integer, Alpha as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Notes: All channels are filled with the given value and alpha channel (if exists) with the alpha value.
The range of value is 0 to 255.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.82 FillRect(x as Integer, y as Integer, width as Integer, height as Integer, value as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRect(10, 10, 20, 20, 200)
window1.Backdrop = p.CopyPicture
```

Notes: All channels are filled with the given value.
The range of value is 0 to 255.
Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.83 FillRect(x as integer, y as integer, width as integer, height as integer, Value as integer, Alpha as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Notes: All channels are filled with the given value and alpha channel (if exists) with the alpha value.
The range of value is 0 to 255.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.84   FillRectApply(FillColor as color, alpha as Integer) as boolean

Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color with using alpha.
Example:

dim p as new PictureMBS(300, 300, PictureMBS.ImageFormatRGB)

p.FillRectRGB &cFF0000

call p.FillRectApply 0, 0, 50, 100, &c00FF00, 0
call p.FillRectApply 50, 0, 50, 100, &c00FF00, 255*1/5
call p.FillRectApply 100, 0, 50, 100, &c00FF00, 255*2/5
call p.FillRectApply 150, 0, 50, 100, &c00FF00, 255*3/5
call p.FillRectApply 200, 0, 50, 100, &c00FF00, 255*4/5
call p.FillRectApply 250, 0, 50, 100, &c00FF00, 255*5/5

Backdrop = p.CopyPicture

Notes: Works with gray and RGB pictures.
The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:

10.2.85 FillRectApply(red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean

Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color with using alpha.
Notes: Works with gray and RGB pictures.
The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:

10.2.86 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer) as boolean

Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color with using alpha.
Notes: Works with gray and RGB pictures.
The range of value is 0 to 255.
The alpha channel is ignored of the picture.
This function combines the RGB/Gray channels with the new fill color and the alpha value.
See also:

10.2.87 FillRectApply(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer) as boolean

Plugin Version: 12.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color with using alpha.
Notes: Works with gray and RGB pictures.

The range of value is 0 to 255.

The alpha channel is ignored of the picture.

This function combines the RGB/Gray channels with the new fill color and the alpha value.

See also:

10.2.88   FillRectRandom

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the pixels with random values.
Example:

dim p as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)

p.FillRectRandom

Notes: Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.89   FillRectRandom(x as Integer, y as Integer, width as Integer, height as Integer)

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the pixels with random values.
Example:

dim p as new PictureMBS(1000,1000, PictureMBS.imageFormatRGB)
p.FillRectRandom(0,0,100,100)
Backdrop = p.CopyPicture

Notes: Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.90 FillRectRGB(FillColor as color)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(&cFF0000)
window1.Backdrop = p.CopyPicture

Notes: Works only if the picture has RGB channels.
See also:

10.2.91 FillRectRGB(FillColor as color, alpha as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(&cFF0000, 0)
window1.Backdrop = p.CopyPicture

Notes: Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.

The range of aloha is 0 to 255.
See also:

10.2.92   FillRectRGB(red as Integer, green as Integer, blue as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(255, 0, 0)
window1.Backdrop = p.CopyPicture
```

Notes: Works only if the picture has RGB channels.
The ranges of red, green and blue are 0 to 255.
See also:

10.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(255, 0, 0, 0)
window1.Backdrop = p.CopyPicture

Notes: Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.
The ranges of alpha, red, green and blue are 0 to 255.
See also:

10.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10,10,20,20,&cFF0000)
window1.Backdrop = p.CopyPicture

Notes: Works only if the picture has RGB channels.
See also:

10.2.95   FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10,10,20,20,&cFF0000, 0)
window1.Backdrop = p.CopyPicture

Notes: Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.
The range of aloha is 0 to 255.
See also:

10.2.96   FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10,10,20,20, 255, 0, 0)
window1.Backdrop = p.CopyPicture
```

Notes: Works only if the picture has RGB channels.
The ranges of red, green and blue are 0 to 255.
See also:

10.2.97   FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer, alpha as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills the given area of the picture with the given color.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.FillRectRGB(10, 10, 20, 20, 255, 0, 0, 0)
window1.Backdrop = p.CopyPicture

Notes: Works only if the picture has RGB channels.
Alpha is ignored if the picture does not have an alpha channel.
See also:

- 10.2.90 FillRectRGB(FillColor as color)   249

- 10.2.91 FillRectRGB(FillColor as color, alpha as Integer)   249

- 10.2.92 FillRectRGB(red as Integer, green as Integer, blue as Integer)   250

- 10.2.93 FillRectRGB(red as Integer, green as Integer, blue as Integer, alpha as Integer)   251

- 10.2.94 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color)
  251

- 10.2.95 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, FillColor as color, alpha as Integer)   252

- 10.2.96 FillRectRGB(x as Integer, y as Integer, width as Integer, height as Integer, red as Integer, green as Integer, blue as Integer)   253

10.2.98   GainFilter(dest as PictureMBS, gain as Double, bias as Double) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies the gain filter to the picture.
Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.

10.2.99   GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Changes the gamma value of the picture.
Notes: If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
See also:

10.2.100   GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Changes the gamma value of the picture.
Notes: If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:

10.2.101   GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Changes the gamma value of the picture.
Notes: If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For grayscale pictures the gray color is calculated from red, green and blue value.

Returns nil on any error.
See also:

- 10.2.99 GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS   255

- 10.2.100 GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS
  255

- 10.2.102 GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma
  as Double, alphaGamma as Double) as PictureMBS   256

10.2.102   GammaFilter(dest as PictureMBS, redGamma as Double, greenGamma as Double, blueGamma as Double, alphaGamma as Double) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Changes the gamma value of the picture.
Notes: If dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

For grayscale pictures the gray color is calculated from red, green and blue value.
If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:

- 10.2.99 GammaFilter(dest as PictureMBS, gamma as Double) as PictureMBS   255

- 10.2.100 GammaFilter(dest as PictureMBS, gamma as Double, alphaGamma as Double) as PictureMBS
  255

10.2.103   GrayChannel as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The gray channel as a new PictureMBS object.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.GrayChannel
r.fillrect(100) // fill only gray channel

Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.104   GreenChannel as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The green channel as a new PictureMBS object.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.GreenChannel
r.fillrect(100) // fill only green channel

Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.105   HMirror

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Mirrors the image content horizontally (flip).
Example:

// get some picture
dim l as Picture = LogoMBS(500)
// create new image
dim p as new PictureMBS(l)

// mirror
p.HMirror
// show in window
window1.Backdrop = p.CopyPicture

Notes: Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.106 Invert

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inverts the image data.
Notes: Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.107 Invert(x as Integer, y as Integer, w as Integer, h as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inverts the image data in the given area.
Notes: Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.108 MagentaChannel as PictureMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The magenta channel of a CMYK picture as a new PictureMBS object.
Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.109 MapInRows(FirstRow as Integer, LastRow as Integer) as boolean

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Maps in given row range.
Notes: This function does nothing if given rows are already mapped in.

Fails if range is invalid, image is invalid or mapping is not possible.
Returns true if not a mapped image.

Will resize memory buffer size to be big enough for those rows.

10.2.110   MirroredView as PictureMBS

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new PictureMBS object which draws into the existing on, but has all rows vertically mirrored.
Notes: So if the new picture draws into the first row, the change will be in the last row of the original picture.

10.2.111   Multiply

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Multiplies alpha channel of whole picture.
Notes: Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

10.2.112   Multiply(x as integer, y as integer, width as integer, height as integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Multiplies alpha channel of a rectangle of the picture.
Notes: Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

10.2.113   NeonFilter(dest as PictureMBS) as PictureMBS

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies a neon filter to the image.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.NeonFilter(nil)
window1.Backdrop = p.CopyPicture

Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.114   OilFilter(dest as PictureMBS, levels as Integer, range as Integer) as PictureMBS

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies a oil filter to the image.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.OilFilter(nil,5,5)
window1.Backdrop = p.CopyPicture

Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Levels must be between 0 and 256.
Range must be between 0 and min(width,height).

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.115   RawRow(index as Integer) as memoryblock

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a memoryblock with the data of this row.
Example:

```
// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.RawRow(10)
// modify directly
m.FillBytesMBS(10,100,200)
// show in window
window1.Backdrop = p.CopyPicture
```

Notes: This memoryblock is pointing to the original data, so any modification is applied to the picture.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.

For pictures using virtual memory, this memoryblock can become invalid for the next call to any PictureMBS method!

10.2.116   RawRowPtr(index as Integer) as Ptr

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a Ptr pointing to the data of this row.
Notes: This ptr is pointing to the original data, so any modification is applied to the picture.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.

For pictures using virtual memory, this ptr can become invalid for the next call to any PictureMBS method!

10.2.117   RedChannel as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The red channel as a new PictureMBS object.
Example:

```
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
dim r as PictureMBS = p.RedChannel
```

r.fillrect(100) // fill only red channel

Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.118   RGBChannels as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The RGB channels as a new PictureMBS object.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGBA)
dim r as PictureMBS = p.RGBChannels
r.fillrect(100) // fill only color channels

Notes: Returns nil if the image is not a RGB picture.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the RGB pixels directly without modifying an alpha channel
The resulting PictureMBS object is a RGB picture.

10.2.119   RGBToGray(mode as Integer = 0) as boolean

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Turns picture into grayscale.
Notes: Only for RGB pictures and picture stays RGB, but all channels have same color.
Returns true on success and false on failure.

Modes:

0	$y = 0.33 * R + 0.5 * G + 0.16 * B$	Faster version of 3
1	$y = 0.375 * R + 0.5 * G + 0.125 * B$	Faster version of 3
2	$y = 0.2126 * R + 0.7152 * G + 0.0722 * B$	Photometric/digital ITU-R
3	$y = 0.299 * R + 0.587 * G + 0.114 * B$	Digital CCIR601
4	$y = 0.300 * R + 0.588 * G + 0.112 * B$	Faster version of 3

Mode 2 and 3 uses doubles and mode 0, 4 and 1 use integers so they should be faster.

Still Mode 0 and 1 are just approximation formulas which trade accuracy for perfomance.

e.g. a red pixel (FF0000) will turn to 555555 in Mode 0, 5F5F5F in Mode 1, 363636 in Mode 2 and 4C4C4C in Mode 3 and 4.

10.2.120   Rotate(angle as Double, Red as Integer = 0, Green as Integer = 0, Blue as Integer = 0, Alpha as Integer = 0, Gray as Integer = 0, Cyan as Integer = 0, Magenta as Integer = 0, Yellow as Integer = 0, Black as Integer = 0) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by the given degree.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate(30, 255, 255, 255, 255, 255)
window1.Backdrop = p.CopyPicture

Notes: With Red, Blue, Green, Alpha and Gray specify the color of the fill color.

If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.121   Rotate180

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by 180 degree.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p.Rotate180
window1.Backdrop = p.CopyPicture

Notes: Same as HMirror and VMirror together.

There are two Rotate180 methods. One makes a copy and one not. This one does not make a copy.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.122   Rotate180(dest as PictureMBS=nil) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by 180 degree.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate180
window1.Backdrop = p.CopyPicture
```

Notes: If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture.

Same as HMirror and VMirror together.

There are two Rotate180 methods. One makes a copy and one not. This one does make a copy.

Works with Gray, RGB and CMYK pictures and supports alpha channel.
See also:

10.2.123   Rotate270(dest as PictureMBS=nil) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by 270 degree.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate270
window1.Backdrop = p.CopyPicture
```

Notes: If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.124   Rotate270slow(dest as PictureMBS=nil) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by 270 degree.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate270slow
window1.Backdrop = p.CopyPicture

Notes: If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.125   Rotate90(dest as PictureMBS=nil) as PictureMBS

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by 90 degree.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
p = p.Rotate90
window1.Backdrop = p.CopyPicture

Notes: If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.126   Rotate90slow(dest as PictureMBS=nil) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates the picture by 90 degree.
Example:

dim l as Picture = LogoMBS(500)

dim p as new PictureMBS(l)
p = p.Rotate90slow
window1.Backdrop = p.CopyPicture

Notes: If dest is nil, the PictureFactoryMBS object (local on self or global) is used to create the new picture. Works with Gray, RGB and CMYK pictures and supports alpha channel.

The Rotate90slow function is the older implementation. Please use Rotate90 unless you need the old behavior.

10.2.127 Scale(source as PictureMBS, temp as PictureMBS, mode as Integer, width as Integer, height as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Scales the picture to the given size.
Notes: The final image is stored in the PictureMBS object you call this method on.
On low memory this function can fail or the image may look bad. (e.g. all black)

The size of the temporary picture must have the size of the destination width and the source height. Use ImageFormatScaling when you create the temp image to give it the correct size. Temp picture may not be mapped.

For scaling with the same size as the picture already has, the scaling is still performed.

Returns true on success and false on any error. (e.g. width=0)

Use the constants for the mod:

ScaleTriangle	triangle
ScaleBox	box, nereast neighbor
ScaleLanczos3	lanczos 3
ScaleLanczos8	lanczos 8
ScaleMitchell	mitchell
ScalePoly3	poly 3
ScaleCubic	cubic

This function is optimized for several image formats:
- Gray to Gray.

- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
If an alpha channel exists in both images, it is copied.

10.2.128   ScaleFast(source as PictureMBS, width as Integer, height as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Scales the picture to the new size fast.
Notes: The final image is stored in the PictureMBS object you call this method on.
Returns true on success and false on failure.

This is a low quality alorithm, but it is fast.

This function is optimized for several image formats:
- Gray to Gray.
- RGB to Gray uses R*0.3+G*0.59+B*0.11.
- RGB to RGB.
- Gray to RGB fill red, green and blue with the same gray value.
If an alpha channel exists in both images, it is copied.

10.2.129   ScaleMT(threads as Integer, source as PictureMBS, temp as PictureMBS, mode as Integer, width as Integer, height as Integer) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The multithreaded variant of Scale function.
Notes: Same as Scale, but with additional multithreading.

Threads parameter specifies how many threads you want to use:
A negative value disables threading, zero will use one thread for each CPU core and a positive number specifies the thread count.

If one of the pictures used has IsMapping = true, the plugin calls Scale() function.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

10.2.130 SolarizeFilter(dest as PictureMBS) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies the solarize filter to the picture.
Example:

```
// get some picture
dim l as Picture = LogoMBS(500)
// create new image
dim p as new PictureMBS(l)
// add filter
p = p.SolarizeFilter(nil)
// show in window
window1.Backdrop = p.CopyPicture
```

Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.131 StampFilter(dest as PictureMBS, radius as Double, threshold as Double, softness as Double, Black as Color, White as Color) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies the stamp filter to the picture.
Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.
Works with Gray and RGB pictures and supports alpha channel.

10.2.132   TransferFilter(dest as PictureMBS, gray() as Integer) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Transfers a picture to another picture by looking up each pixel value in the given array.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

dim gray(256) as Integer

for i as Integer = 0 to 255
gray(i)=255-i // invert
next

// inverts the picture
dim d as PictureMBS = p.TransferFilter(nil,gray)

Backdrop = d.CopyPicture

Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The array for gray must have 256 entries starting with index 0.
For RGB pictures the gray array is used for all three channels.

Returns nil on any error.
See also:

- 10.2.133 TransferFilter(dest as PictureMBS, gray() as Integer, alpha() as Integer) as PictureMBS 270

- 10.2.134 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer) as PictureMBS   271

- 10.2.135 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer, alpha() as Integer) as PictureMBS   272

10.2.133   TransferFilter(dest as PictureMBS, gray() as Integer, alpha() as Integer) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Transfers a picture to another picture by looking up each pixel value in the given arrays.
Notes: if dest is nil, the picture factory is used to create a new picture.

On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The arrays for gray and alpha must have 256 entries starting with index 0.
For RGB pictures the gray array is used for all three channels.
If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:

10.2.134 TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Transfers a picture to another picture by looking up each pixel value in the given arrays.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

dim red(256) as Integer
dim green(256) as Integer
dim blue(256) as Integer

for i as Integer = 0 to 255
red(i)=i
green(i)=i
blue(i)=255-i // invert blue
next

dim d as PictureMBS = p.TransferFilter(nil,red,green,blue)

Backdrop = d.CopyPicture
```

Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.

If dest is not nil, it must match the size of the original picture.

The arrays for red, green and blue must have 256 entries starting with index 0.
For grayscale pictures the green array is used for the gray channel.

Returns nil on any error.
See also:

10.2.135   TransferFilter(dest as PictureMBS, red() as Integer, green() as Integer, blue() as Integer, alpha() as Integer) as PictureMBS

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Transfers a picture to another picture by looking up each pixel value in the given arrays.
Notes: if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

The arrays for red, green, blue and alpha must have 256 entries starting with index 0.
For grayscale pictures the green array is used for the gray channel.
If the picture has no alpha channel, the alpha parameter is ignored.

Returns nil on any error.
See also:

10.2.136   Unmultiply

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Un-multiplies alpha channel for whole picture.
Notes: Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmulti-

plied and inverse in the mask.
See also:

10.2.137 Unmultiply(x as integer, y as integer, width as integer, height as integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Un-multiplies alpha channel for given rectangle in picture.
Notes: Pictures with alpha channel must be multiplied, while pictures with mask have the alpha unmultiplied and inverse in the mask.
See also:

10.2.138 UnsharpFilter(origpixels as PictureMBS, Amount as Double, Threshold as Integer) as boolean

Plugin Version: 9.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Runs the unsharp filter.
Notes: You may want to run the BoxBlur filter first before using the unsharp filter.

if dest is nil, the picture factory is used to create a new picture.
On success dest or the new picture is returned.
If dest is not nil, it must match the size of the original picture.

Returns nil on any error.

Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.139 VMirror

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Mirrors the image content vertically.
Example:

```
// get some picture
dim l as Picture = LogoMBS(500)
// create new image
```

dim p as new PictureMBS(l)
// mirror
p.VMirror
// show in window
window1.Backdrop = p.CopyPicture

Notes: Works with Gray, RGB and CMYK pictures and supports alpha channel.

10.2.140   YellowChannel as PictureMBS

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The yellow channel of a CMYK picture as a new PictureMBS object.
Notes: Returns nil if this channel does not exist.
No copy is made of the actual pixel data. Modifying the channel picture will modify the original picture.
Use this function to access the pixels of the channel directly.
The resulting PictureMBS object is a grayscale picture.

10.2.141   Properties

10.2.142   AlphaOffset as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the alpha channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.AlphaOffset)

Notes: (Read and Write property)

10.2.143   BitsPerComponent as Integer

Plugin Version: 14.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of bits per component.
Notes: Value is 8 for most pictures except those with format ImageFormatGray16 which use 16.
(Read only property)

10.2.144   BlackOffset as Integer

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the black channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.BlackOffset)

Notes: (Read only property)

10.2.145   BlueOffset as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the blue channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.BlueOffset)

Notes: (Read and Write property)

10.2.146   Channel as String

Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the channel.
Example:

dim p as new Picture(100,100,32)
dim q as new PictureMBS(p)

dim channels() as string = q.Channels

dim cr as PictureMBS = q.RedChannel
dim cg as PictureMBS = q.GreenChannel
dim cb as PictureMBS = q.BlueChannel
dim c0 as pictureMBS = q.Channel(0)
dim c1 as pictureMBS = q.Channel(1)
dim c2 as pictureMBS = q.Channel(2)

dim crn as string = cg.Channel
dim cgn as string = cg.Channel
dim cbn as string = cg.Channel
dim c0n as string = c0.Channel
dim c1n as string = c1.Channel
dim c2n as string = c2.Channel

Break // check in debugger

Notes: For pictures which represent a channel of a bigger picture.
(Read only property)
See also:

10.2.147   ChannelCount as Integer

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of channels in this picture.
Notes: 1 for gray, 2 for gray+alpha, 3 for RGB, 4 for RGB+alpha or CMYK and 5 for CMYK+alpha.
(Read only property)

10.2.148   CyanOffset as Integer

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the cyan channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.CyanOffset)

Notes: (Read only property)

10.2.149   DebugPicture as Picture

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The picture content to view in the debugger.

Notes: If DebugPictureEnabled is set to true iny our code you can use the DebugPicture property to watch the picture content in the debugger. For speed reasons the size of the debug picture is limited to 512 by 512 pixels. (that could be increased)
(Read only property)

10.2.150 DebugPictureEnabled as Boolean

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether you want to use the DebugPicture property.
Notes: If DebugPictureEnabled is set to true iny our code you can use the DebugPicture property to watch the picture content in the debugger. For speed reasons the size of the debug picture is limited to 512 by 512 pixels. (that could be increased)
(Read and Write property)

10.2.151 Factory as PictureFactoryMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The local factory to be used for pictures created in this picture.
Notes: If one of the functions in this PictureMBS instance needs a new PictureMBS object, this factory is asked first.
(Read and Write property)

10.2.152 FilePath as String

Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The file path to temporary file.
Notes: Only set when we have one, e.g. using mapped memory.
(Read only property)

10.2.153 GrayOffset as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the gray channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatAG)
MsgBox str(p.GrayOffset)

Notes: (Read and Write property)

10.2.154 GreenOffset as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the green channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.GreenOffset)

Notes: (Read and Write property)

10.2.155 HasAlpha as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has an alpha channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.HasAlpha)

Notes: (Read only property)

10.2.156 HasBlack as Boolean

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a blue channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasBlack)

Notes: (Read only property)

10.2.157 HasBlue as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a blue channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasBlue)

Notes: (Read only property)

10.2.158 HasCyan as Boolean

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a blue channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasCyan)

Notes: (Read only property)

10.2.159 HasGray as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a gray channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.HasGray)

Notes: (Read only property)

10.2.160   HasGreen as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a green channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasGreen)

Notes: (Read only property)

10.2.161   HasMagenta as Boolean

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a blue channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasMagenta)

Notes: (Read only property)

10.2.162   HasRed as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasRed)

Notes: (Read only property)

10.2.163   HasYellow as Boolean

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture has a blue channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.HasYellow)

Notes: (Read only property)

10.2.164   Height as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture in pixels.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.Height)

Notes: (Read only property)

10.2.165   ImageFormat as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The image format of this picture object.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.ImageFormat)

Notes: See the ImageFormat* constants.
(Read only property)

10.2.166   ImageFormatString as String

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The format of this picture as a string.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox p.ImageFormatString

Notes: Returns for example "RGB" for ImageFormatRGB.
(Read only property)

10.2.167   IsCMYK as Boolean

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture is a CMYK picture.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.IsCMYK)

Notes: HasCyan, HasMagenta, HasYellow and HasBlack are true if IsRGB is true.
(Read only property)

10.2.168   IsGray as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this picture is a grayscale picture.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatGA)
MsgBox str(p.IsGray)

Notes: HasGray is true if IsGray is true.
(Read only property)

10.2.169 IsMapping as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this picture uses virtual memory.
Notes: If IsMapping is true you should not use the Memory property or the Clone function.
(Read only property)

10.2.170 IsRGB as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the picture is a RGB picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.IsRGB)

Notes: HasRed, HasBlue and HasGreen are true if IsRGB is true.
(Read only property)

10.2.171 MagentaOffset as Integer

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the magenta channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.MagentaOffset)

Notes: (Read only property)

10.2.172   MappingBlockSize as Int64

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The block size for a picture using virtual memory.
Notes: (Read and Write property)

10.2.173   MappingFirstRow as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: First row mapped in memory.
Notes: Only for mapped images.
Value is -1 if no data is mapped in.
(Read only property)

10.2.174   MappingLastRow as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Last row mapped in memory.
Notes: Only for mapped images.
Value is -1 if no data is mapped in.
(Read only property)

10.2.175   MappingRows as Integer

Plugin Version: 17.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of rows for mapping.
Notes: For a mapped image how many rows fit in the mapping buffer.
(Read only property)

10.2.176   Memory as Memoryblock

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a memoryblock without size pointing to the current pixel buffer.
Notes: Use only if IsMapping is false.
If size is -1, it's a memoryblock referencing the pixel data.
If size is >0, you got the original memoryblock used to allocate the memory.

(Read only property)

10.2.177 MemoryTarget as Memoryblock

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: If this picture stores its pixels in a memoryblock, you can access the memory block using this property.
Notes: (Read only property)

10.2.178 Parent as PictureMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent PictureMBS object.
Notes: One PictureMBS can reference the pixels of another PictureMBS. The parent is referenced in this property so it is not released.
(Read only property)

10.2.179 PixelSize as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The size of a pixel in bytes.
Example:

```
dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.PixelSize)
```

Notes: For example:
1 for Gray
2 for Gray with Alpha
3 for RGB
4 for RGB with Alpha
(Read only property)

10.2.180 RedOffset as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the red channel.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.RedOffset)

Notes: (Read and Write property)

10.2.181   RowOffset as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal row offset.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
dim q as PictureMBS = p.ClipImage(10,10,80,80)

MsgBox str(q.width)+" x "+str(q.height)+" with row offset: "+str(q.RowOffset)

Notes: Only used with clipping images.
(Read only property)

10.2.182   RowSize as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The size of one row in bytes.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.RowSize)

Notes: Additional bytes may be needed per row for better alignment of the data.
Also using virtual memory functions requires alignment.
(Read only property)

10.2.183   Target as Picture

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The target picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

window1.Backdrop = p.Target

Notes: if this PictureMBS references the pixels of a Xojo picture, this property keeps a reference to this target picture.
(Read only property)

10.2.184   TotalSize as Int64

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The total size of this picture in bytes.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)

MsgBox str(p.TotalSize)

Notes: The result is Height*RowSize.
(Read only property)

10.2.185   UnclippedHeight as Integer

Plugin Version: 14.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture in pixels.
Notes: Without clipping, the full height of the image.
(Read only property)

10.2.186   Valid as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this instance is a valid picture.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.Valid)

Notes: Valid is false if the constructor failed to create a picture.
(Read only property)

10.2.187   Width as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the picture in pixels.
Example:

dim l as Picture = LogoMBS(500)
dim p as new PictureMBS(l)
MsgBox str(p.Width)

Notes: (Read only property)

10.2.188   YellowOffset as Integer

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal offset for pixels in the yellow channel.
Example:

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatCMYK)
MsgBox str(p.YellowOffset)

Notes: (Read only property)

10.2.189 YieldTicks as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: How much time is given back to Xojo for other ticks.
Example:

dim p as PictureMBS // your picture

p.YieldTicks=6 // only use 1/10th of a second

Notes: If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

10.2.190 DataStringInFormat(ImageFormat as Integer) as string

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data of this picture as a string.
Notes: Strings are limit to 2 GB, but the actual limit is certainly smaller.

You can get and set the image data with this method in the native format.
If you set the data, use a string with at least RowSize bytes.
If you query the data, you will get a copy of the data bytes in a string.
Returns ”” on any error.
May raise OutOfBoundsException for invalid index.

Version 18.1 or later will raise an out of memory exception for 32-bit applications if the memory needed will exceed 2 GB in memory. Allocating that many memory will be impossible.
(Read and Write computed property)

10.2.191 Row(index as Integer) as memoryblock

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A memoryblock with the data of this row.
Example:

// create new image

dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.Row(10)
// modify
m.FillBytesMBS(10,100,200)
// copy back
p.row(10)=m
// show in window
window1.Backdrop = p.CopyPicture

Notes: You can get and set a row with this method in the native format.
If you set the row, use a memoryblock with at least RowSize bytes.
If you query the row, you will get a copy of the row bytes in a new memoryblock.
Returns ”” on any error.
May raise OutOfBoundsException for invalid index.
(Read and Write computed property)

10.2.192   RowInFormat(index as Integer, ImageFormat as Integer) as memoryblock

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A memoryblock with the data of this row in the format you request.
Example:

// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.RowInFormat(10, p.ImageFormatRofRGB)
// modify
m.FillBytesMBS(10,80,200)
// copy back
p.RowInFormat(10, p.ImageFormatRofRGB)=m
// show in window
window1.Backdrop = p.CopyPicture

Notes: You can get and set a row with this method in the given format.
If you set the row, use a memoryblock with at least Width*PixelSize bytes. PixelSize is the format dependend size in bytes for one pixel.
If you query the row, you will get a copy of the row bytes in a new memoryblock.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.
(Read and Write computed property)

See also:

10.2.193 RowInFormat(index as Integer, ImageFormat as Integer, InvertAlpha as boolean) as memoryblock

Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A memoryblock with the data of this row in the format you request.
Example:

```
// create new image
dim p as new PictureMBS(100,100,PictureMBS.ImageFormatRGB)
// copy row
dim m as MemoryBlock = p.RowInFormat(10, p.ImageFormatRGB, true)
// modify
m.FillBytesMBS(10,80,200)
// copy back
p.RowInFormat(10, p.ImageFormatRGB, true)=m
// show in window
window1.Backdrop = p.CopyPicture
```

Notes: You can get and set a row with this method in the given format.
If you set the row, use a memoryblock with at least Width*PixelSize bytes. PixelSize is the format dependend size in bytes for one pixel.
If you query the row, you will get a copy of the row bytes in a new memoryblock.
Returns nil on any error.
May raise OutOfBoundsException for invalid index.
If InvertAlpha is true, the alpha values are inverted by using A=255-A.
(Read and Write computed property)
See also:

10.2.194 RowStringInFormat(index as Integer, ImageFormat as Integer) as string

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The row as a string.
Notes: You can get and set a row with this method in the native format.
If you set the row, use a memoryblock with at least RowSize bytes.
If you query the row, you will get a copy of the row bytes in a string.
Returns nil on any error.

May raise OutOfBoundsException for invalid index.
(Read and Write computed property)

10.2.195   Constants

Constants

Constant	Value	Description
Dither90Halftone6x6Matrix	5	One of the dither modes for the DitherFilter method.
DitherCluster3Matrix	8	One of the dither modes for the DitherFilter method.
DitherCluster4Matrix	9	One of the dither modes for the DitherFilter method.
DitherCluster8Matrix	10	One of the dither modes for the DitherFilter method.
DitherLines4x4Matrix	4	One of the dither modes for the DitherFilter method.
DitherMagic2x2Matrix	1	One of the dither modes for the DitherFilter method.
DitherMagic4x4Matrix	2	One of the dither modes for the DitherFilter method.
DitherOrdered4x4Matrix	3	One of the dither modes for the DitherFilter method.
DitherOrdered6x6Matrix	6	One of the dither modes for the DitherFilter method.
DitherOrdered8x8Matrix	7	One of the dither modes for the DitherFilter method.
ScaleBox	2	One of the scale modes for the Scale function.
ScaleCubic	7	One of the scale modes for the Scale function.
ScaleLanczos3	3	One of the scale modes for the Scale function.
ScaleLanczos8	4	One of the scale modes for the Scale function.
ScaleMitchell	5	One of the scale modes for the Scale function.
ScalePoly3	6	One of the scale modes for the Scale function.
ScaleTriangle	1	One of the scale modes for the Scale function.

Image Formats

Constant	Value	Description
ImageFormat1of3	15	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the first byte with pixelsize=3.
ImageFormat1of4	18	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the first byte with pixelsize=4.
ImageFormat2of3	16	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the second byte with pixelsize=3.
ImageFormat2of4	19	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the second byte with pixelsize=4.
ImageFormat3of3	17	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the third byte with pixelsize=3.
ImageFormat3of4	20	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the third byte with pixelsize=4.
ImageFormat4of4	21	This is the imageformat to use if you target only a gray channel in a RGB picture in memory. Targets the forth byte with pixelsize=4.
ImageFormatABGR	9	
ImageFormatACMYK	25	
ImageFormatAG	13	
ImageFormatAKYMC	30	
ImageFormatAofABGR	18	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatAofARGB	18	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatAofBGRA	21	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatAofRGBA	21	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatARGB	4	
ImageFormatBGR	6	
ImageFormatBGRA	7	
ImageFormatBGRX	8	
ImageFormatBofABGR	19	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatBofARGB	21	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatBofBGR	15	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatBofBGRA	18	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatBofRGB	17	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatBofRGBA	20	This is the imageformat to use if you target only a gray channel in a RGB picture in memory.
ImageFormatBuffer	22	This format is for PixelSize = 1 and no channels.
ImageFormatCMYK	23	
ImageFormatCMYKA	24	
ImageFormatCMYKX	26	
ImageFormatG	11	
ImageFormatG1	11	One gray channel.
ImageFormatG2	42	Two gray channels.
ImageFormatG3	43	Three gray channels.
ImageFormatG4	44	Four gray channels.

Chapter 11

LCMS2

11.1 class LCMS2BitmapMBS

11.1.1 class LCMS2BitmapMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a bitmap.
Notes: You can pass bitmap data as raw memoryblock or fill it using a Xojo picture.
In our LCMS 1.x plugin, the bitmap was always 16 bit. This plugin also can also use 8 bit or 32 bit.
Blog Entries

- ICC color profiling

- MBS Xojo / Real Studio Plugins, version 14.2pr8

- MBS Xojo / Real Studio Plugins, version 13.2pr3

11.1.2 Methods

11.1.3 Constructor

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates an empty bitmap object.
See also:

11.1.4   Constructor(p as picture, bits as Integer = 8)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new bitmap based on the pictures.
Example:

```
// convert picture to bitmap
dim b as new LCMS2BitmapMBS(pic)
// convert to picture
Backdrop = b.Picture
```

Notes: Bits can be 8, 16 or 32 bit integers.
See also:

11.1.5   Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8)

Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new bitmap based on the pictures.
Example:

```
// convert small part of picture to bitmap
dim b as new LCMS2BitmapMBS(pic, 50, 50, 100, 100)
// convert to picture
Backdrop = b.Picture
```

Notes: Picks only the provided area from the source picture.
Bits can be 8, 16 or 32 bit integers.
See also:

11.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a bitmap object with given size and color space.
Notes: Colorspace Type should be one of the color space signatures like kcmsSigRgbData.
Raises exception if colorspace is invalid.
See also:

11.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a bitmap object with given size and color space.
Notes: Colorspace Type should be one of the colorspace signatures like kcmsSigRgbData.
Raises exception if colorspace is invalid.
See also:

11.1.8   Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a bitmap object with given size and color space.
Notes: In this variant, you pass the memoryblock with right size.
Passing memoryblock of wrong size can lead into crashs.
Raises exception if colorspace is invalid.
See also:

11.1.9   CopyToPicture(pic as picture, x as Integer = 0, y as Integer = 0) as boolean

Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies image data into an existing picture.
Example:

```
// convert small part of picture to bitmap
dim b as new LCMS2BitmapMBS(pic)

// create destination picture
dim pic as new Picture(500, 500, 32)

// copy pixels and show
if b.CopyToPicture(pic, 50, 50) then

Backdrop = pic
end if
```

Notes: This may be more efficient for you if you process a lot of image data as you can avoid creating new picture objects with using Picture method in this class.
May not work for all pictures, especially may fail on Linux.
Returns true on success.

11.1.10   Invert

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inverts the bitmap data.
Notes: Requires correct settings for rowbytes, height and data properties.

11.1.11   Picture(HasAlpha as Boolean = false) as picture

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of the picture.
Example:

```
// get some picture
dim logo as Picture = LogoMBS(500)

// let us convert it to a 16 bit memory block
dim l as new LCMS2BitmapMBS(logo, 16)

// check bit depth
Title = str(l.Bits)

// convert back
dim p as Picture = l.Picture

// and display
Backdrop = p
```

Notes: This method works with 8, 16 and 32 bit integer pictures. Make sure bits property is set.

11.1.12   Properties

11.1.13   Bits as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of bits.
Notes: Can be 8, 16 or 32 and is used for conversion to and from Xojo picture objects.
(Read and Write property)

11.1.14   ColorSpaceType as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The color space type.
Notes: Only used to let Picture function know what format the data is.
Typically kcmsSigRgbData.
(Read and Write property)

11.1.15   Data as MemoryBlock

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The memoryblock with the actual image data.
Notes: Data can be stored in 8, 16 or 32 bit Integers or 32bit Floats.
(Read and Write property)

11.1.16   Height as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the Bitmap in Pixels.
Notes: (Read and Write property)

11.1.17   RowBytes as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of bytes per row.
Notes: Normally: rowbytes=pixelsize*width+padding
Where padding is some extra bytes.

(Read and Write property)

11.1.18   Width as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the Bitmap in Pixels.
Notes: (Read and Write property)

11.2   class LCMS2CIECAM02MBS

11.2.1   class LCMS2CIECAM02MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Class to evaluated viewing conditions.
Notes: Viewing conditions. Please note those are CAM model viewing conditions, and not the ICC tag viewing conditions, which I'm naming LCMS2ICCViewingConditionsMBS to make differences evident. Unfortunately, the tag cannot deal with surround La, Yb and D value so is basically useless to store CAM02 viewing conditions.
Blog Entries

- MBS Real Studio Plugins, version 12.0pr5

11.2.2   Methods

11.2.3   Constructor(context as LCMS2ContextMBS, VC as LCMS2Viewing-ConditionsMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a CAM02 object based on given viewing conditions.
Notes: Such object may be used as a color appearance model and evaluated in forward and reverse directions. Viewing conditions is defined by LCMS2ViewingConditionsMBS class. The surround member has to be one of this values: kAVG_SURROUND, kDIM_SURROUND, kDARK_SURROUND or kCUT-SHEET_SURROUND. Degree of chromatic adaptation (d), can be specified in 0...1.0 range, or the model can be instructed to calculate it by using D_CALCULATE constant (-1).

Context: user-defined context cargo.
VC: A structure holding viewing conditions.

11.2.4   Forward(value as LCMS2CIEXYZMBS) as LCMS2JChMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates the CAM02 model in the forward direction: XYZ to JCh
Notes: value: the input XYZ value.
Returns the output JCh value.

11.2.5   Reverse(value as LCMS2JChMBS) as LCMS2CIEXYZMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates the CAM02 model in the reverse direction: JCh to XYZ
Notes: Values: The input JCh value.
Returns the output XYZ value

11.2.6   Properties

11.2.7   Handle as Integer

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal handle to the conversion engine.
Notes: (Read and Write property)

11.3   class LCMS2CIELabMBS

11.3.1   class LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a Lab color.

11.3.2   Methods

11.3.3   BFDdeltaE(Other as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates BFD delta E metric.

11.3.4   CIE2000DeltaE(Other as LCMS2CIELabMBS, Kl as Double = 1.0, Kc as Double = 1.0, Kh as Double = 1.0) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the Delta-E 2000.
Notes: Delta-E 2000 is the first major revision of the dE94 equation. Unlike dE94, which assumes that L* correctly reflects the perceived differences in lightness, dE2000 varies the weighting of L* depending on where in the lightness range the color falls. dE2000 is still under consideration and does not seem to be widely supported in graphics arts applications.

The weightings KL, KC and KH can be modified to reflect the relative importance of lightness, chroma and hue in different industrial applications

11.3.5   CIE94DeltaE(Other as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the CIE 94 delta e value.
Notes: A technical committee of the CIE (TC1-29) published an equation in 1995 called CIE94. The equation is similar to CMC but the weighting functions are largely based on RIT/DuPont tolerance data derived from automotive paint experiments where sample surfaces are smooth.
It also has ratios, labeled kL (lightness) and Kc (chroma) and the commercial factor (cf) but these tend to be preset in software and are not often exposed for the user (as it is the case in Little CMS).

11.3.6 Clone as LCMS2CIELabMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the color object.
Example:

dim l as new LCMS2CIELabMBS(0.1, 0.2, 0.3)
dim k as LCMS2CIELabMBS = l.Clone
MsgBox str(k.L)+" "+str(k.a)+" "+str(k.b)

11.3.7 CMCdeltaE(Other as LCMS2CIELabMBS, l as Double, c as Double) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the CMC delta E.
Notes: In 1984 the CMC (Colour Measurement Committee of the Society of Dyes and Colourists of Great Britain) developed and adopted an equation based on LCH numbers. Intended for the textiles industry, CMC l:c allows the setting of lightness (l) and chroma (c) factors. As the eye is more sensitive to chroma, the default ratio for l:c is 2:1 allowing for 2x the difference in lightness than chroma (numbers). There is also a 'commercial factor' (cf) which allows an overall varying of the size of the tolerance region according to accuracy requirements. A cf=1.0 means that a delta-E CMC value <1.0 is acceptable.
CMC l:c is designed to be used with D65 and the CIE Supplementary Observer. Commonly-used values for l:c are 2:1 for acceptability and 1:1 for the threshold of imperceptibility.

11.3.8 Constructor(L as Double=0.0, a as Double=0.0, b as Double=0.0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new Lab color with the given values.
See also:

- 11.3.9 Constructor(other as LCMS2CIELabMBS) 305

11.3.9 Constructor(other as LCMS2CIELabMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of the color value.
See also:

- 11.3.8 Constructor(L as Double=0.0, a as Double=0.0, b as Double=0.0) 305

11.3.10   DeltaE(Other as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates delta E.
Notes: You don't have to spend too long in the color management world before you come across the term Delta-E. As with many things color, it seems simple to understand at first, yet the closer you look, the more elusive it gets. Delta-E (dE) is a single number that represents the 'distance' between two colors. The idea is that a dE of 1.0 is the smallest color difference the human eye can see. So any dE less than 1.0 is imperceptible and it stands to reason that any dE greater than 1.0 is noticeable. Unfortunately it's not that simple. Some color differences greater than 1 are perfectly acceptable, maybe even unnoticeable. Also, the same dE color difference between two yellows and two blues may not look like the same difference to the eye and there are other places where it can fall down. It's perfectly understandable that we would want to have a system to show errors. After all, we've spent the money on the instruments; shouldn't we get numbers from them? Delta-E numbers can be used for:

- how far off is a print or proof from the original

- how much has a device drifted

- how effective is a particular profile for printing or proofing

- removes subjectivity (as much as possible)

These functions does compute the difference between two Lab colors, using several difference spaces.

The L*a*b* color space was devised in 1976 and, at the same time delta-E 1976 (dE76) came into being. If you can imagine attaching a string to a color point in 3D Lab space, dE76 describes the sphere that is described by all the possible directions you could pull the string. If you hear people speak of just plain 'delta-E' they are probably referring to dE76. It is also known as dE-Lab and dE- ab. One problem with dE76 is that Lab itself is not 'perceptually uniform' as its creators had intended. So different amounts of visual color shift in different color areas of Lab might have the same dE76 number. Conversely, the same amount of color shift might result in different dE76 values. Another issue is that the eye is most sensitive to hue differences, then chroma and finally lightness and dE76 does not take this into account.

11.3.11   DesaturateLab(amax as Double, amin as Double, bmax as Double, bmin as Double) as Boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Does poor man's gamut mapping.
Notes: See also cmsDesaturateLab in LCMS manual.

11.3.12   XYZ(whitePoint as LCMS2CIEXYZMBS=nil) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts color to XYZ value.
Notes: Setting WhitePoint to NULL forces D50 as white point.

11.3.13   Properties

11.3.14   A as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The a value.
Notes: (Read and Write property)

11.3.15   B as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The b value.
Notes: (Read and Write property)

11.3.16   L as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The L value.
Notes: (Read and Write property)

11.3.17   LCh as LCMS2CIELChMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts color to LCh value.
Notes: (Read only property)

11.4   class LCMS2CIELChMBS

11.4.1   class LCMS2CIELChMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The plugin class for CIE LCh values.
Example:

dim c as new LCMS2CIELChMBS(1,2,3)
MsgBox str(c.L)+" "+str(c.C)+" "+str(c.h)

11.4.2   Methods

11.4.3   Clone as LCMS2CIELChMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the color object.

11.4.4   Constructor(L as Double=0.0, C as Double=0.0, h as Double=0.0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new object with the given values.
See also:

11.4.5   Constructor(other as LCMS2CIELChMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes object with values from other object.
See also:

11.4.6   Properties

11.4.7   C as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The C value.
Notes: (Read and Write property)

11.4.8   h as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The h value.
Notes: (Read and Write property)

11.4.9   L as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The L value.
Notes: (Read and Write property)

11.4.10   Lab as LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts the LCh value to a Lab value.
Example:

```
dim c as new LCMS2CIELChMBS(0.1, 0.2, 0.3)
dim lab as LCMS2CIELabMBS = c.Lab
MsgBox str(lab.L)+" "+str(lab.a)+" "+str(lab.b)
```

Notes: (Read only property)

11.5   class LCMS2CIExyYMBS

11.5.1   class LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a CIE xyY value.
Example:

dim c as new LCMS2CIExyYMBS(1,2,3)
MsgBox str(c.x)+" "+str(c.y)+" "+str(c.yy)

Notes: As Xojo is case insensitive, we have to name the big Y as YY.

11.5.2   Methods

11.5.3   Clone as LCMS2CIExyYMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the color.

11.5.4   Constructor(other as LCMS2CIExyYMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes the object with values from other object.
See also:

11.5.5   Constructor(X as Double=0.0, Y as Double=0.0, YY as Double=0.0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new xyY object with the given values.
See also:

11.5.6 TempFromWhitePoint as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the temperature from using this xyY point as the white point.
Example:

dim c as new LCMS2CIExyYMBS(1,2,3)
MsgBox str(c.TempFromWhitePoint)

11.5.7 Properties

11.5.8 x as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x value.
Notes: (Read and Write property)

11.5.9 XYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts the xyY value to XYZ.
Example:

dim c as new LCMS2CIExyYMBS(1,2,3)
dim n as LCMS2CIEXYZMBS = c.XYZ
MsgBox str(n.x)+" "+str(n.y)+" "+str(n.z)
dim x as LCMS2CIExyYMBS = n.xyY
MsgBox str(x.x)+" "+str(x.y)+" "+str(x.yy)

Notes: (Read only property)

11.5.10 y as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The y value.
Notes: (Read and Write property)

11.5.11   YY as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The Y value.
Notes: As Xojo is case insensitive, we have to name the big Y as YY.
(Read and Write property)

11.6 class LCMS2CIExyYTripleMBS

11.6.1 class LCMS2CIExyYTripleMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a xyY color triple.

11.6.2 Methods

11.6.3 Clone as LCMS2CIExyYTripleMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the xyY triple.

11.6.4 Constructor

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes a xyY triple with zero values.
See also:

11.6.5 Constructor(other as LCMS2CIExyYTripleMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes a xyY triple with values from other object.
See also:

11.6.6   Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes a xyY triple with given values.
See also:

11.6.7   Properties

11.6.8   Blue as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The blue color.
Notes: (Read and Write property)

11.6.9   Green as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The green color.
Notes: (Read and Write property)

11.6.10   Red as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The red color.
Notes: (Read and Write property)

11.7 class LCMS2CIEXYZMBS

11.7.1 class LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a CIE XYZ values.
Example:

dim n as new LCMS2CIEXYZMBS(0.1, 0.2, 0.3)
MsgBox str(n.x)+" "+str(n.y)+" "+str(n.z)

11.7.2 Methods

11.7.3 Constructor(x as Double=0.0, y as Double=0.0, z as Double=0.0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new object with the given values.

11.7.4 Lab(whitePoint as LCMS2CIEXYZMBS=nil) as LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts the XYZ value to a lab value using the given whitepoint.
Notes: Setting WhitePoint to nil forces D50 as white point.

11.7.5 Properties

11.7.6 x as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x value.
Notes: (Read and Write property)

11.7.7 xyY as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts the XYZ value to a xyY value.
Example:

dim n as new LCMS2CIEXYZMBS(0.1, 0.2, 0.3)
dim l as LCMS2CIExyYMBS = n.xyY
MsgBox str(l.x)+" "+str(l.y)+" "+str(l.yy)

Notes: (Read only property)

11.7.8   y as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The y value.
Notes: (Read and Write property)

11.7.9   z as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The z value.
Notes: (Read and Write property)

11.8 class LCMS2CIEXYZTripleMBS

11.8.1 class LCMS2CIEXYZTripleMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a XYZ color triple.

11.8.2 Methods

11.8.3 Clone as LCMS2CIEXYZTripleMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the XYZ triple.

11.8.4 Constructor

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes a XYZ triple with zero values.
See also:

11.8.5 Constructor(other as LCMS2CIEXYZTripleMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes a XYZ triple with values from other object.
See also:

11.8.6   Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes a XYZ triple with given values.
See also:

11.8.7   Properties

11.8.8   Blue as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The blue color.
Notes: (Read and Write property)

11.8.9   Green as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The green color.
Notes: (Read and Write property)

11.8.10   Red as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The red color.
Notes: (Read and Write property)

11.9　class LCMS2ContextMBS

11.9.1　class LCMS2ContextMBS

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a LCMS2 context.
Blog Entries

- MBS Xojo / Real Studio Plugins, version 14.1pr1

11.9.2　Methods

11.9.3　Clone as LCMS2ContextMBS

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of the context object.
Notes: You can assign a new tag to the copy.

11.9.4　Constructor(other as LCMS2ContextMBS)

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new context object with a copy of the existing one.
See also:

- 11.9.5 Constructor(tag as Variant = nil) 319

11.9.5　Constructor(tag as Variant = nil)

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new context object with given tag.
See also:

- 11.9.4 Constructor(other as LCMS2ContextMBS) 319

11.9.6　Properties

11.9.7　Handle as Integer

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal handle value.
Notes: (Read and Write property)

11.9.8   Tag as Variant

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.
Notes: (Read and Write property)

11.10   class LCMS2CurveSegmentMBS

11.10.1   class LCMS2CurveSegmentMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a curve segment.
Notes: Segmented curves are formed by several segments.
Blog Entries

- MBS Real Studio Plugins, version 12.0pr4

11.10.2   Methods

11.10.3   Constructor(nGridPoints as Integer = 0)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new object and allocates sample points.
Notes: Pass number of sample points you want to fill.

11.10.4   Properties

11.10.5   nGridPoints as UInt32

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of grid points if Type = 0.
Notes: (Read only property)

11.10.6   Type as Integer

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The type of curve segment.
Notes: Parametric type, Type = 0 means sampled segment.
Negative values are reserved.
(Read and Write property)

11.10.7   x0 as Single

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x0 value of the domain.
Notes: Domain; for x0 <x <= x1
(Read and Write property)

11.10.8   x1 as Single

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x1 value of the domain.
Notes: Domain; for x0 <x <= x1
(Read and Write property)

11.10.9   Params(index as Integer) as Double

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parameters if Type != 0.
Notes: Index from 0 to 9.
(Read and Write computed property)

11.10.10   SampledPoints(index as Integer) as Single

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Array of floats if Type = 0.
Notes: Index from 0 to nGridPoints-1.
(Read and Write computed property)

11.11   class LCMS2DateMBS

11.11.1   class LCMS2DateMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a date.

11.11.2   Properties

11.11.3   Date as Date

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The date as a Xojo date object.
Notes: (Read only property)

11.11.4   DateTime as DateTime

Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The date as a Xojo dateTime object.
Notes: (Read only property)

11.11.5   Day as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The day value.
Notes: (Read only property)

11.11.6   Daylight as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether it is daylight saving time.
Notes: (Read only property)

11.11.7 DayOfWeek as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The day of the week.
Notes: (Read only property)

11.11.8 DayOfYear as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The day of the year.
Notes: (Read only property)

11.11.9 Hour as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The hour value.
Notes: (Read only property)

11.11.10 Minute as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The minute value.
Notes: (Read only property)

11.11.11 Month as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The month value.
Notes: (Read only property)

11.11.12 Second as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The second value.
Notes: (Read only property)

11.11.13 Year as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The year value.
Notes: (Read only property)

11.12   class LCMS2DictionaryEntryMBS

11.12.1   class LCMS2DictionaryEntryMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for an entry of the dictionary.
Example:

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.
Blog Entries

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4

- MBS Real Studio Plugins, version 12.4pr8

- LCMS 2.4

11.12.2   Methods

11.12.3   Constructor

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The private constructor.

11.12.4   NextEntry as LCMS2DictionaryEntryMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the next element in linked list.

11.12.5 Properties

11.12.6 DisplayName as LCMS2MLUMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The display name multi language unicode string.
Notes: (Read only property)

11.12.7 DisplayValue as LCMS2MLUMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The display value multi language unicode string.
Notes: (Read only property)

11.12.8 Handle as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read only property)

11.12.9 Name as String

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name string.
Example:

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

Notes: (Read only property)

11.12.10   Parent as LCMS2DictionaryMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The reference to the parent dictionary.
Notes: (Read only property)

11.12.11   Value as String

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The value string.
Example:

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

Notes: (Read only property)

11.13 class LCMS2DictionaryMBS

11.13.1 class LCMS2DictionaryMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The LCMS 2 class for a dictionary of values.
Example:

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

Notes: This is a simple linked list used to store pairs Name,ÄêValue for the dictionary metatag, as described in http://www.color.org/ICCSpecRevision_25,Äê02,Äê10_dictType.pdf
Blog Entries

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4

- MBS Real Studio Plugins, version 12.4pr8

11.13.2 Methods

11.13.3 AddEntry(Name as String, Value as String, DisplayName as LCMS2MLUMBS, DisplayValue as LCMS2MLUMBS) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds data to a dictionary linked list object.
Notes: No check for duplicity is made. Dictionary and Name parameters a required, rest is optional and nil may be used.

Name, Value: Strings. Value may be empty.
DisplayName, Display Value: Multilocalized Unicode objects. May be nil.
Returns true on success.

11.13.4   Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Allocates an empty dictionary linked list object.

11.13.5   EntryList as LCMS2DictionaryEntryMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns first element in linked list.
Example:

```
// create new dictionary
dim d as new LCMS2DictionaryMBS(nil)
// add a value
call d.AddEntry "Hello", "World", nil, nil
// queries list of entries
dim e as LCMS2DictionaryEntryMBS = d.EntryList
// shows values
MsgBox e.Name+" "+e.Value
```

11.13.6   Properties

11.13.7   context as LCMS2ContextMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The context for this profile.
Notes: Error handling uses it, so you can see which part of your application failed.
(Read and Write property)

11.13.8   Handle as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.14 class LCMS2GamutBoundaryDescriptionMBS

11.14.1 class LCMS2GamutBoundaryDescriptionMBS

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: This class allows you to create gamut boundary, add points, compute and check points.
Example:

```
dim n1,n2 as Integer
dim h as new LCMS2GamutBoundaryDescriptionMBS

// Fill all Lab gamut as valid

for L as Integer = 0 to 100 step 10
for a as Integer = -128 to 128 step 5
for b as Integer = -128 to 128 step 5

dim lab as new LCMS2CIELabMBS(l, a, b)

if h.AddPoint(lab) then
n1 = n1 + 1
else
break
MsgBox "Point not in boundary!"
end if
next
next
next

// Complete boundaries
call h.Compute

// All points should be inside gamut

for L as Integer = 10 to 90 step 25
for a as Integer = -120 to 120 step 25
for b as Integer = -120 to 120 step 25

dim lab as new LCMS2CIELabMBS(l, a, b)

if h.CheckPoint(lab) then
n2 = n2 + 1
else
break
MsgBox "Point not in boundary!"
end if
next
```

MsgBox str(n1)+" points added and "+str(n2)+" other points found."

Notes: Please check LittleCMS API and tutorial documentation for more details.
Blog Entries

- MBS Real Studio Plugins, version 12.1pr6

11.14.2   Methods

11.14.3   AddPoint(Lab as LCMS2CIELabMBS) as Boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a new sample point for computing the gamut boundary descriptor.
Notes: This function can be called as many times as known points. No memory or other resures are wasted
by adding new points. The gamut boundary descriptor cannot be checked until Compute() is called.

Lab: Lab value.
Returns true on success, false on error.

11.14.4   CheckPoint(Lab as LCMS2CIELabMBS) as Boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks whatever a Lab value is inside a given gamut boundary descriptor.
Notes: Lab: Lab value.
Returns: True if point is inside gamut, false otherwise.

11.14.5   Compute(options as UInt32 = 0) as Boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Computes the gamut boundary descriptor using all know points and interpolating any missing
sector(s).
Notes: Call this function after adding all know points with AddPoint() and before using CheckPoint().
Flags: reserved (unused). Set it to 0.
Returns true on success, false on error

11.14.6 Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new object.

11.14.7 Properties

11.14.8 context as LCMS2ContextMBS

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The context for this profile.
Notes: Error handling uses it, so you can see which part of your application failed.
(Read and Write property)

11.14.9 Handle as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read only property)

11.15   class LCMS2ICCDataMBS

11.15.1   class LCMS2ICCDataMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for ICC data.
Notes: This is used for some tags where no dedicated class is available. This way you can modify the data directly in the memoryblock.

11.15.2   Properties

11.15.3   Data as Memoryblock

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The memoryblock with the data.
Notes: (Read only property)

11.15.4   Flags as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The flags.
Notes: (Read and Write property)

11.15.5   Size as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The size of the data.
Notes: (Read and Write property)

11.16   class LCMS2ICCMeasurementConditionsMBS

11.16.1   class LCMS2ICCMeasurementConditionsMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for ICC measurement conditions.

11.16.2   Methods

11.16.3   Constructor(Observer as UInt32 = 0, Backing as LCMS2CIEXYZMBS = nil, Geometry as UInt32 = 0, Flare as Double = 0.0, IlluminantType as UInt32 = 0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new object with given values.

11.16.4   Properties

11.16.5   Backing as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Backing value.
Notes: (Read and Write property)

11.16.6   Flare as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The flare value.
Notes: Range 0..1.0.
(Read and Write property)

11.16.7   Geometry as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The geometry value.
Notes: 0=unknown, 1=45/0, 0/45 2=0d, d/0.
(Read and Write property)

11.16.8   IlluminantType as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The illuminant type.
Notes: (Read and Write property)

11.16.9   Observer as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The observer value.
Notes: 0 = unknown, 1=CIE 1931, 2=CIE 1964
(Read and Write property)

11.17 class LCMS2ICCViewingConditionsMBS

11.17.1 class LCMS2ICCViewingConditionsMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a ICC viewing conditions tag stored in the profile.

11.17.2 Methods

11.17.3 Constructor(IlluminantXYZ as LCMS2CIEXYZMBS = nil, Backing as LCMS2CIEXYZMBS = nil, IlluminantType as UInt32 = 0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new ICC viewing conditions object.

11.17.4 Properties

11.17.5 IlluminantType as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The illuminant.
Notes: (Read and Write property)

11.17.6 IlluminantXYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The illuminant.
Notes: (Read and Write property)

11.17.7 SurroundXYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The surround.
Notes: (Read and Write property)

11.18   class LCMS2IT8MBS

11.18.1   class LCMS2IT8MBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for IT8 handling.
Notes: ANSI CGATS.17 is THE standard text file format for exchanging color measurement data. This standard text format (the ASCII version is by far the most common) is the format accepted by most color measurement and profiling applications.

It consists of a Preamble section containing originator information, keyword definitions, etc and then one or more data sections, each consisting of header and data subsections. The header subsection is where the BEGIN_DATA_FORMAT and END_DATA_FORMAT delimiters define the actual data types / units contained in the following tables. The data subsection contains the BEGIN_DATA and END_DATA delimiters which contain the actual color information in tabular form.

CGATS.17 text files can contain device (RGB, CMYK, etc), colorimetric (Lab, XYZ, etc), densitometric, spectral, naming and other information so it is a fairly comprehensive storage and exchange format.
Blog Entries

- MBS Real Studio Plugins, version 13.1pr8

- MonkeyBread Software Releases the MBS Real Studio plug-ins in version 12.4

- MBS Real Studio Plugins, version 12.4pr8

- LCMS 2.4

11.18.2   Methods

11.18.3   Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Allocates an empty CGATS.17 object.

11.18.4   DefineDblFormat(Formatter as string)

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the format string for float numbers.
Notes: It uses the "C" sprintf convention. The default format string is "%.10g".

11.18.5   EnumDataFormat as string()

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns an array with pointers to the column names in current table.
Notes: Return the column names in table.

11.18.6 EnumProperties as string()

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Enumerates all properties in current table.
Notes: Returns array of property name string.

11.18.7 EnumPropertyMulti(Prop as string) as string()

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Enumerates all the identifiers found in a multi,Äêvalue property in current table.
Notes: Prop: A string holding property name
Returns an array with property names.

11.18.8 FindDataFormat(Sample as string) as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the position (column) of a given data sample name in current table.
Notes: First column is 0 (SAMPLE_ID).
Returns column number if found, ,Äê1 if not found

11.18.9 GetData(Patch as string, Sample as string) as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets a cell [Patch, Sample] as a literal string (uncooked string) in current table.
Notes: Patch: The intended patch name (row)
Sample: The intended sample name (column)

Returns the data for the intended cell on success, ”” on error.

11.18.10 GetDataAsDouble(Patch as string, Sample as string) as Double

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets a cell [Patch, Sample] as a double in current table.
Notes: Patch: The intended patch name (row)
Sample: The intended sample name (column)

Returns the data for the intended cell interpreted as Double on success, 0 on error.

11.18.11   GetDataRowCol(Row as Integer, Col as Integer) as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets a cell [row, col] as a literal string in current table.
Notes: This function is fast since it has not to search columns or rows by name.

row, col: The position of the cell.

Returns the data for the intended cell on success, ”” on error.

11.18.12   GetDataRowColAsDouble(Row as Integer, Col as Integer) as Double

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets a cell [row, col] as a double in current table.
Notes: This function is fast since it has not to search columns or rows by name.
row, col: The position of the cell.

Returns the data for the intended cell interpreted as Double on success, 0 on error.

11.18.13   GetPatchByName(Patch as string) as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Lookups patch index by name.

11.18.14   GetPatchName(nPatch as Integer) as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills buffer with the contents of SAMPLE_ID column for the set given in nPatch.
Notes: That usually corresponds to patch name. Buffer may be NULL to get the internal memory block

used by the CGATS.17 object. If specified, buffer gets a copy of such block. In this case it should have space for at least 1024 characters.

nPatch: set number to retrieve name

Returns the patch name. ”” if error.

11.18.15   GetProperty(Prop as string) as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets a property as a literal string in current table.
Notes: Prop: A string holding property name.

Returns the data for the intended property on success, ”” on error.

11.18.16   GetPropertyAsDouble(Prop as string) as Double

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets a property as a double in current table.
Notes: Prop: A string holding property name.

Returns the data for the intended property interpreted as Double on success, 0 on error.

11.18.17   GetPropertyMulti(Key as string, SubKey as string) as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries property.

11.18.18   GetSheetType as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function returns the type of the IT8 object.

11.18.19 HeaderIsDictionary(HeaderName as string) as boolean

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if a header entry has subkeys, so it has a dictionary with keys and values.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

11.18.20 HeaderList as string()

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns list of header properties.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

11.18.21 HeadersAsDictionary as dictionary

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the header keys and values as dictionary.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.
Returns nil on any error.

11.18.22 HeaderSubDictionary(HeaderName as string) as dictionary

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries the dictionary with subkeys for a given header entry.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.
Returns nil on any error.

11.18.23 HeaderValue(HeaderName as string) as string

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the header value for the given header.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

11.18.24 LoadFromFile(context as LCMS2ContextMBS, file as folderitem) as LCMS2IT8MBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function allocates a CGATS.17 object and fills it with the contents of file.
Notes: Used for reading existing CGATS files.

Context: The context value.
File: The CGATS.17 file name to read/parse

Returns a CGATS.17 object on success, nil on error.

11.18.25 LoadFromMemory(context as LCMS2ContextMBS, data as Memory-block) as LCMS2IT8MBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Same as LoadFromFile, but the IT8/CGATS.13 stream is read from a memory block.
Notes: Returns nil on failure.

11.18.26 LoadFromString(context as LCMS2ContextMBS, data as string) as LCMS2IT8MBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Same as LoadFromFile, but the IT8/CGATS.13 stream is read from a string.
Notes: Returns nil on failure.

11.18.27 SaveToFile(file as folderitem) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function saves a CGATS.17 object to a file.
Notes: File: Destination file. Existing file will be overwritten if possible.

Returns true on success, false on error

11.18.28   SaveToMemory as Memoryblock

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function saves a CGATS.17 object to a contiguous memory block.

11.18.29   SaveToString as string

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function saves a CGATS.17 object to a contiguous memory block.

11.18.30   SetComment(comment as string) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function is intended to provide a way automated IT8 creators can embed comments into the file.
Notes: Comments have no effect, and its only purpose is to document any of the file meaning. On this function the calling order is important; as successive calls to SetComment do embed comments in the same order the function is being called.

Comment: The comment to inserted

Returns true on success, false on error.

11.18.31   SetData(Patch as string, Sample as string, Val as string) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a cell [Patch, Sample] as a literal string (uncooked string) in current table.
Notes: Patch: The intended patch name (row)
Sample: The intended sample name (column)
Val: The value to be set, as a literal

Returns true on success, false on error.

11.18.32 SetDataAsDouble(Patch as string, Sample as string, Val as Double) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a cell [Patch, Sample] as a double in current table.
Notes: Patch: The intended patch name (row)
Sample: The intended sample name (column)
Val: The value to be set, as a cmsFloat64Number

Returns true on success, false on error

11.18.33 SetDataFormat(n as Integer, Sample as String) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets column names in current table.
Notes: First column is 0 (SAMPLE_ID). Special property NUMBER_OF_FIELDS must be set before calling this function.

n: Column to set name
Sample: Name of data

Returns true on success, false on error.

11.18.34 SetDataRowCol(Row as Integer, Col as Integer, Val as string) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a cell [row, col] as a literal string in current table.
Notes: This function is fast since it has not to search columns or rows by name.

row, col: The position of the cell.
Val: The value to be set, as a literal string.

Returns true on success, false on error.

11.18.35 SetDataRowColAsDouble(Row as Integer, Col as Integer, Val as Double) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a cell [Patch, Sample] as a double in current table.
Notes: This function is fast since it has not to search columns or rows by name.

row, col: The position of the cell.
Val: The value to be set, as a cmsFloat64Number

Returns true on success, false on error

11.18.36 SetIndexColumn(Sample as string) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the index column.

11.18.37 SetPropertyDouble(Prop as string, Value as Double) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a property as a double in current table.
Notes: Prop: A string holding property name.
Value: The data for the intended property as Double.

Returns true on success, false on error.

11.18.38 SetPropertyHex(Prop as string, Value as UInt32) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a property as an hexadecimal constant (appends 0x) in current table.
Notes: Prop: A string holding property name.
Value: The value to be set (32 bits max)

Returns true on success, false on error.

11.18.39 SetPropertyMulti(Key as string, SubKey as string, Value as string) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a new sub‚Äêproperty to the property Key.
Notes: Value of buffer is interpreted literally.

Key: A string holding property name.
SubKey: A string holding the sub‚Äêproperty name.
Buffer: A string holding the uncooked value of sub‚Äêproperty.

Returns true on success, false on error.

11.18.40 SetPropertyString(Prop as string, Value as String) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a property as a literal string in current table.
Notes: The string is enclosed in quotes ””.
Returns true on success, false on error.

11.18.41 SetPropertyUncooked(Prop as string, Value as Memoryblock) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets a property with no interpretation in current table.
Notes: No quotes ”” are added. No checking is performed, and it is up to the programmer to make sure the string is valid.
Special prefixes:
0b: Binary
0x : Hexadecimal

Parameters:
cProp: A string holding property name.
Buffer: A string holding the uncooked value to place in the CGATS file.

Returns true on success, false on error.

11.18.42   SetSheetType(type as string) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function sets the type of a CGATS.17 object to the new type.
Notes: Returns true on success, false on error.

11.18.43   SetTable(nTable as UInt32) as UInt32

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function positions the IT8 object in a given table, identified by its position.
Notes: Setting nTable to Table Count + 1 does allocate a new empty table.
Returns the current table number on success, ‚Äê1 on error.

11.18.44   SetTableByLabel(Set as string, Field as string, ExpectedType as string) as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets table by label.

11.18.45   TableCount as UInt32

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function returns the number of tables found in the current CGATS object.
Notes: Returns the number of tables on success, 0 on error.

11.18.46   ValidKeywords as string()

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns list of valid keywords.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

11.18.47   ValidSampleIDs as string()

Plugin Version: 13.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns list of valid sample IDs.
Notes: This is a helper method in our plugin. May stop working if the internals of LCMS2 change in an update.

11.18.48   Properties

11.18.49   context as LCMS2ContextMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The context for this profile.
Notes: Error handling uses it, so you can see which part of your application failed.
(Read and Write property)

11.18.50   Handle as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.19   class LCMS2JChMBS

11.19.1   class LCMS2JChMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a JCh value.

11.19.2   Methods

11.19.3   Clone as LCMS2JChMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of this object.

11.19.4   Constructor(J as Double=0.0, C as Double=0.0, h as Double=0.0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new JCh value.
See also:

11.19.5   Constructor(other as LCMS2JChMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes new JCh color object with values from existing object.
See also:

11.19.6   Properties

11.19.7   C as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The C value.
Notes: (Read and Write property)

11.19.8 h as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The h value.
Notes: (Read and Write property)

11.19.9 J as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The J value.
Notes: (Read and Write property)

11.20   class LCMS2Mat3MBS

11.20.1   class LCMS2Mat3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a 3 by 3 matrix.
Blog Entries

- MBS Real Studio Plugins, version 12.0pr4

11.20.2   Methods

11.20.3   Clone as LCMS2Mat3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the matrix.

11.20.4   Constructor

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new matrix.
See also:

11.20.5   Constructor(other as LCMS2Mat3MBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of the given matrix.
See also:

11.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new matrix with the given three vectors.
See also:

11.20.7 Properties

11.20.8 V0 as LCMS2Vec3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Property for first vector.
Notes: (Read and Write property)

11.20.9 V1 as LCMS2Vec3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Property for second vector.
Notes: (Read and Write property)

11.20.10 V2 as LCMS2Vec3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Property for third vector.
Notes: (Read and Write property)

11.20.11 value(index as UInt32) as LCMS2Vec3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the vector by index.
Notes: Index from 0 to 2.
(Read and Write computed property)

11.21   module LCMS2MBS

11.21.1   module LCMS2MBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The central LCMS module with all the global methods and constants.
Blog Entries

- News from the MBS Xojo Plugins Version 22.0

- MBS Xojo Plugins, version 22.0pr7

- MBS Xojo Plugins, version 20.6pr1

- MBS Xojo Plugins, version 20.3pr2

- MBS Xojo Plugins, version 20.3pr1

- ICC color profiling

11.21.2   Methods

11.21.3   AdaptationMatrix(ConeMatrix as LCMS2Mat3MBS, FromIll as LCMS2CIEXYZMBS, ToIll as LCMS2CIEXYZMBS) as LCMS2Mat3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates adaptation matrix.
Notes: Returns the final chromatic adaptation from illuminant FromIll to Illuminant ToIll.
The cone matrix can be specified in ConeMatrix. If nil, Bradford is assumed.

ConeMatrix: the cone matrix.
FromIll: Source illuminant.
ToIll: Destination illuminant.

Returns matrix on success or nil on failure.

11.21.4   AdaptToIlluminant(SourceWhitePt as LCMS2CIEXYZMBS, Illuminant as LCMS2CIEXYZMBS, Value as LCMS2CIEXYZMBS) as LCMS2CIEXYZMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Chromatic adaptation.
Notes: Adapts a color to a given illuminant. Original color is expected to have a SourceWhitePt white point.

11.21.5   BFDdeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Computes the dE between two Lab values.

11.21.6   BIT15_SH(n as UInt32) as UInt32

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Bit15 flag

11.21.7   BuildRGB2XYZtransferMatrix(WhitePoint as LCMS2CIExyYMBS, Primaries as LCMS2CIExyYTripleMBS) as LCMS2Mat3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Builds RGB to XYZ transfer matrix.
Notes: Build a White point, primary chromas transfer matrix from RGB to CIE XYZ.
This is just an approximation, I am not handling all the non-linear aspects of the RGB to XYZ process, and assuming that the gamma correction has transitive property in the tranformation chain.

The alghoritm:

- First I build the absolute conversion matrix using primaries in XYZ. This matrix is next inverted

- Then I eval the source white point across this matrix obtaining the coeficients of the transformation

- Then, I apply these coeficients to the original matrix

WhitePoint: The white point.
Primaries: The primaries.
Returns matrix on success or nil on failure.

11.21.8   BYTES_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: bytes per sample

11.21.9   ChannelsOf(ColorSpaceSignature as Integer) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of channels in a color space signature.
Example:

MsgBox "RGB has "+str(LCMS2MBS.ChannelsOf(LCMS2MBS.kcmsSigRgbData))+" channels"

11.21.10   CHANNELS_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Channels (Samples per pixel)

11.21.11   CIE2000DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS, Kl as Double = 1.0, Kc as Double = 1.0, Kh as Double = 1.0) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the Delta-E 2000.
Notes: Delta-E 2000 is the first major revision of the dE94 equation. Unlike dE94, which assumes that L* correctly reflects the perceived differences in lightness, dE2000 varies the weighting of L* depending on where in the lightness range the color falls. dE2000 is still under consideration and does not seem to be widely supported in graphics arts applications.

The weightings KL, KC and KH can be modified to reflect the relative importance of lightness, chroma and hue in different industrial applications

11.21.12   CIE94DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the CIE 94 delta e value.
Notes: A technical committee of the CIE (TC1-29) published an equation in 1995 called CIE94. The equation is similar to CMC but the weighting functions are largely based on RIT/DuPont tolerance data derived from automotive paint experiments where sample surfaces are smooth.
It also has ratios, labeled kL (lightness) and Kc (chroma) and the commercial factor (cf) but these tend to be preset in software and are not often exposed for the user (as it is the case in Little CMS).

11.21.13   CMCdeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS, l as Double, c as Double) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the CMC delta E.
Notes: In 1984 the CMC (Colour Measurement Committee of the Society of Dyes and Colourists of Great Britain) developed and adopted an equation based on LCH numbers. Intended for the textiles industry, CMC l:c allows the setting of lightness (l) and chroma (c) factors. As the eye is more sensitive to chroma, the default ratio for l:c is 2:1 allowing for 2x the difference in lightness than chroma (numbers). There is also a 'commercial factor' (cf) which allows an overall varying of the size of the tolerance region according to accuracy requirements. A cf=1.0 means that a delta-E CMC value <1.0 is acceptable.
CMC l:c is designed to be used with D65 and the CIE Supplementary Observer. Commonly-used values for l:c are 2:1 for acceptability and 1:1 for the threshold of imperceptibility.

11.21.14   ColorSpaceICCtoLCMS(ICCColorSpace as Integer) as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts from ICC color space notation to Little CMS color space notation.

11.21.15   ColorSpaceLCMStoICC(LCMSColorSpace as Integer) as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts from Little CMS color space notation to ICC color space notation.

11.21.16   COLORSPACE_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Pixeltype.

11.21.17   CreateBitmapFromPicture(p as picture, bits as Integer = 8) as LCMS2BitmapMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new bitmap based on the pictures.
Notes: Bits can be 8, 16 or 32 bit integers.

11.21.18   D50_xyY as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns D50 white point as xyY color.

11.21.19   D50_XYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns D50 white point as XYZ color.

11.21.20   DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates delta E.
Notes: You don't have to spend too long in the color management world before you come across the term Delta-E. As with many things color, it seems simple to understand at first, yet the closer you look, the more elusive it gets. Delta-E (dE) is a single number that represents the 'distance' between two colors. The idea is that a dE of 1.0 is the smallest color difference the human eye can see. So any dE less than 1.0 is imperceptible and it stands to reason that any dE greater than 1.0 is noticeable. Unfortunately it's not that simple. Some color differences greater than 1 are perfectly acceptable, maybe even unnoticeable. Also, the same dE color difference between two yellows and two blues may not look like the same difference to the eye and there are other places where it can fall down. It's perfectly understandable that we would want to have a system to show errors. After all, we've spent the money on the instruments; shouldn't we get numbers from them? Delta-E numbers can be used for:

- how far off is a print or proof from the original

- how much has a device drifted

- how effective is a particular profile for printing or proofing

- removes subjectivity (as much as possible)

These functions does compute the difference between two Lab colors, using several difference spaces.

The L*a*b* color space was devised in 1976 and, at the same time delta-E 1976 (dE76) came into being. If you can imagine attaching a string to a color point in 3D Lab space, dE76 describes the sphere that is described by all the possible directions you could pull the string. If you hear people speak of just plain 'delta-E' they are probably referring to dE76. It is also known as dE-Lab and dE- ab. One problem with dE76 is that Lab itself is not 'perceptually uniform' as its creators had intended. So different amounts of visual color shift in different color areas of Lab might have the same dE76 number. Conversely, the same amount of color shift might result in different dE76 values. Another issue is that the eye is most sensitive to hue differences, then chroma and finally lightness and dE76 does not take this into account.

11.21.21 DITHER_SH(n as UInt32) as UInt32

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: dither flag

11.21.22 DOSWAP_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Do swap? ie, BGR, KYMC

11.21.23 EnableFastFloatExtensions

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Enables fast float extension for Little CMS 2.10.
Notes: Originally this is GPLv3 licensed, but MBS bought a commercial license for all our plugins, so you don't need to worry about the license.

11.21.24 EncodedCMMversion as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries version of LCMS library.
Example:

dim e as Integer = LCMS2MBS.EncodedCMMversion
MsgBox str(e \1000)+"."+str((e\10) mod 100)+"."+str(e mod 10)

Notes: Returns 2070 for version 2.7.

11.21.25   ENDIAN16_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: swap 16 bps endianess?

11.21.26   EXTRA_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Extra samples

11.21.27   FLAVOR_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla).

11.21.28   Float2LabEncoded(c as LCMS2CIELabMBS) as Integer()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Encodes a Lab value.
Notes: Returns array of 3 encoded UInt16 values.

11.21.29   Float2LabEncodedV2(c as LCMS2CIELabMBS) as Integer()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Encodes a Lab value to ICC v2 convention.
Notes: Returns array of 3 encoded UInt16 values.

11.21.30   Float2XYZEncoded(c as LCMS2CIEXYZMBS) as Integer()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Encodes a XYZ value to ICC convention.
Notes: Returns three UInt16 values as Integer array.

11.21.31   FLOAT_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Floating point – With this flag we can differentiate 16 bits as float and as int.

11.21.32   GetAlarmCodes as Integer()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets the current global codes used to mark out-out-gamut on Proofing transforms.
Notes: Values are meant to be encoded in 16 bits.
Returns array with 16 integer values.
See also:

- 11.21.33 GetAlarmCodes(context as LCMS2ContextMBS) as Integer()   361

11.21.33   GetAlarmCodes(context as LCMS2ContextMBS) as Integer()

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets the current global codes used to mark out-out-gamut on Proofing transforms.
Notes: Values are meant to be encoded in 16 bits.
Returns array with 16 integer values.
See also:

- 11.21.32 GetAlarmCodes as Integer()   361

11.21.34   GetSupportedIntentCodes as UInt32()

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills an array with id‚Äênumbers for all supported intents.
Example:

dim names() as string = LCMS2MBS.GetSupportedIntentDescriptions
dim codes() as UInt32 = LCMS2MBS.GetSupportedIntentCodes

dim u as Integer = UBound(names)
for i as Integer = 0 to u
MsgBox str(codes(i))+": "+names(i)
next

Notes: Little CMS plug‚Äêin architecture allows to implement user‚Äêdefined intents; use this function to get info about such extended functionality.
See also:

11.21.35   GetSupportedIntentCodes(context as LCMS2ContextMBS) as UInt32()

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills an array with id‚Äênumbers for all supported intents.
Example:

dim names() as string = LCMS2MBS.GetSupportedIntentDescriptions
dim codes() as UInt32 = LCMS2MBS.GetSupportedIntentCodes

dim u as Integer = UBound(names)
for i as Integer = 0 to u
MsgBox str(codes(i))+": "+names(i)
next

Notes: Little CMS plug‚Äêin architecture allows to implement user‚Äêdefined intents; use this function to get info about such extended functionality.
See also:

11.21.36   GetSupportedIntentDescriptions as string()

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills an array with descriptions for all supported intents.
Example:

MsgBox Join(LCMS2MBS.GetSupportedIntentDescriptions, EndOfLine)

Notes: Little CMS plug‚Äêin architecture allows to implement user‚Äêdefined intents; use this function to get info about such extended functionality.

11.21.37   GridPoints(n as Integer) as Integer

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates grid points.
Example:

MsgBox str(LCMS2MBS.GridPoints(2))

11.21.38   kcmsD50X as Double

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: X value of D50 XYZ normalized to Y=1.0.

11.21.39   kcmsD50Y as Double

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Y value of D50 XYZ normalized to Y=1.0.

11.21.40   kcmsD50Z as Double

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Z value of D50 XYZ normalized to Y=1.0.

11.21.41   kcmsPERCEPTUAL_BLACK_X as Double

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: X of V4 perceptual black.

11.21.42   kcmsPERCEPTUAL__BLACK__Y as Double

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Y of V4 perceptual black.

11.21.43   kcmsPERCEPTUAL__BLACK__Z as Double

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Z of V4 perceptual black.

11.21.44   Lab2LCh(p as LCMS2CIELabMBS) as LCMS2CIELChMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts lab color to LCh value.

11.21.45   Lab2XYZ(p as LCMS2CIELabMBS, whitepoint as LCMS2CIEXYZMBS = nil) as LCMS2CIEXYZMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts color to XYZ value.
Notes: Setting WhitePoint to NULL forces D50 as white point.

11.21.46   LabEncoded2Float(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Decodes a Lab value, encoded on ICC v4 convention to a lab value.
Notes: w0, w1 and w2: Array of 3 UInt16 holding the encoded values.
Returns lab color.

11.21.47   LabEncoded2FloatV2(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Decodes a Lab value, encoded on ICC v2 convention to a Lab value.
Notes: w0, w1 and w2: 3 UInt16 numbers holding the encoded values.

11.21.48   LCh2Lab(p as LCMS2CIELChMBS) as LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Colorimetric space conversion from LCh to Lab.

11.21.49   NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a bitmap object with given size and color space.
See also:

- 11.21.50 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS   365

- 11.21.51 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS   365

11.21.50   NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a bitmap object with given size and color space.
See also:

- 11.21.49 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS 365

- 11.21.51 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS   365

11.21.51   NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a bitmap object with given size and color space.
Notes: In this variant, you pass the memoryblock with right size.

Passing memoryblock of wrong size can lead into crashs.
See also:

11.21.52   OPTIMIZED_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Optimized – previous optimization already returns the final 8-bit value.

11.21.53   PixelFormat(FloatingPoint as boolean, Optimized as boolean, ColorSpace as UInt32, MinIsWhite as boolean, Planar as boolean, EndianSwap as boolean, DoSwap as boolean, ExtraSamples as UInt32, Channels as UInt32, BytesPerSample as UInt32, SwapFirst as boolean) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Utility function to create a pixel format.
Notes: Format of pixel is defined by one UInt32, using bit fields as follows

A O TTTTT U Y F P X S EEE CCCC BBB

FloatingPoint: With this flag we can differentiate 16 bits as float and as int
Optimized: Previous optimization already returns the final 8-bit value
ColorSpace: Pixeltype
MinIsWhite: Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla)
Planar: Planar? 0=Chunky, 1=Planar
EndianSwap: swap 16 bps endianess?
DoSwap: Do swap? ie, BGR, KYMC
ExtraSamples: Extra samples
Channels: Channels (Samples per pixel)
BytesPerSample: bytes per sample
SwapFirst: Swap first - changes ABGR to BGRA and KCMY to CMYK

11.21.54   PLANAR_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Planar? 0=Chunky, 1=Planar

11.21.55   PREMUL_SH(n as UInt32) as UInt32

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Premultiplied? 0=No, 1=Yes

11.21.56   SetAdaptationState(context as LCMS2ContextMBS, d as Double) as Double

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets adaptation state for absolute colorimetric intent, on all but CreateExtendedTransform.
Notes: Little CMS can handle incomplete adaptation states.

d: Degree on adaptation 0=Not adapted, 1=Complete adaptation, in-between=Partial adaptation. Use negative values to return the global state without changing it.

Returns previous global adaptation state.
See also:

11.21.57   SetAdaptationState(d as Double) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets adaptation state for absolute colorimetric intent, on all but CreateExtendedTransform.
Notes: Little CMS can handle incomplete adaptation states.

d: Degree on adaptation 0=Not adapted, 1=Complete adaptation, in-between=Partial adaptation. Use negative values to return the global state without changing it.

Returns previous global adaptation state.
See also:

11.21.58   SetAlarmCodes(context as LCMS2ContextMBS, values() as Integer)

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the global codes used to mark out-out-gamut on Proofing transforms.
Notes: Values are meant to be encoded in 16 bits.
AlarmCodes: Array of 16 codes. All 16 values must be specified, set to zero for unused channels.
See also:

11.21.59   SetAlarmCodes(values() as Integer)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the global codes used to mark out-out-gamut on Proofing transforms.
Notes: Values are meant to be encoded in 16 bits.
AlarmCodes: Array of 16 codes. All 16 values must be specified, set to zero for unused channels.
See also:

11.21.60   SetLogErrorHandler(Context as LCMS2ContextMBS, handler as LCMS2ErrorHandlerMBS)

Plugin Version: 14.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Allows user to set any specific logger.
Notes: Each time this function is called, the previous logger is replaced. Calling this functin with NULL as parameter, does reset the logger to the default Little CMS logger. The default Little CMS logger does nothing.

LCMS2ErrorHandlerMBS is an Interface. You add it to the interface of your window/thread/class. Than you get a method "Error(context as LCMS2ContextMBS, ErrorCode as UInt32, Text as string)" which is called to log error messages. The context parameter is the object you pass for reference in the various context parameters to LCMS2 functions.
See also:

11.21.61 SetLogErrorHandler(handler as LCMS2ErrorHandlerMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Allows user to set any specific logger.
Notes: Each time this function is called, the previous logger is replaced. Calling this functin with NULL as parameter, does reset the logger to the default Little CMS logger. The default Little CMS logger does nothing.

LCMS2ErrorHandlerMBS is an Interface. You add it to the interface of your window/thread/class. Than you get a method "Error(context as LCMS2ContextMBS, ErrorCode as UInt32, Text as string)" which is called to log error messages. The context parameter is the object you pass for reference in the various context parameters to LCMS2 functions.
See also:

- 11.21.60 SetLogErrorHandler(Context as LCMS2ContextMBS, handler as LCMS2ErrorHandlerMBS) 368

11.21.62 SWAPFIRST_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Swap first - changes ABGR to BGRA and KCMY to CMYK

11.21.63 TagInteger(tag as string) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts tag integer to string.
Example:

MsgBox hex(LCMS2MBS.TagInteger("devs"))+" "+LCMS2MBS.TagString(&h64657673)

11.21.64 TagString(tag as UInt32) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts tag string to integer.
Example:

MsgBox hex(LCMS2MBS.TagInteger("devs"))+" "+LCMS2MBS.TagString(&h64657673)

11.21.65 TempFromWhitePoint(TempK as LCMS2CIExyYMBS) as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Correlates a black body temperature in K from given chromaticity.
Example:

dim c as new LCMS2CIExyYMBS

c.x = 0.32
c.y = 0.32
c.YY = 1.0

MsgBox str(LCMS2MBS.TempFromWhitePoint(c))

Notes: Returns temperature. Or zero on any error.

11.21.66 T_BIT15(n as UInt32) as UInt32

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Bit15 flag

11.21.67 T_BYTES(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: bytes per sample

11.21.68 T_CHANNELS(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Channels (Samples per pixel)

11.21.69   T_COLORSPACE(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Pixeltype

11.21.70   T_DITHER(n as UInt32) as UInt32

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: dither flag

11.21.71   T_DOSWAP(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Do swap? ie, BGR, KYMC

11.21.72   T_ENDIAN16(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: swap 16 bps endianess?

11.21.73   T_EXTRA(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Extra samples

11.21.74   T_FLAVOR(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla)

11.21.75   T_FLOAT(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Floating point – With this flag we can differentiate 16 bits as float and as int

11.21.76   T_OPTIMIZED(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Optimized – previous optimization already returns the final 8-bit value

11.21.77   T_PLANAR(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Planar? 0=Chunky, 1=Planar

11.21.78   T_PREMUL(n as UInt32) as UInt32

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Premultiplied? 0=Yes, 1=No

11.21.79   T_SWAPFIRST(n as UInt32) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unpacks a value from a bitwise pixel format.
Notes: Swap first - changes ABGR to BGRA and KCMY to CMYK.

11.21.80 Version as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns version number of LCMS2.
Example:

MsgBox LCMS2MBS.Version

11.21.81 WhitePointFromTemp(TempK as Double) as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Correlates a black body chromaticity from given temperature in K.
Example:

dim c as LCMS2CIExyYMBS = LCMS2MBS.WhitePointFromTemp(6500)

MsgBox str(c.x)+" "+str(c.y)+" "+str(c.yy)

Notes: Valid range is 4000K-25000K.
TempK: Temperature in oK
Returns white point or nil in case of error.

11.21.82 xyY2XYZ(p as LCMS2CIExyYMBS) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Colorimetric space conversion from xyY to XYZ.

11.21.83 XYZ2Lab(p as LCMS2CIEXYZMBS, whitepoint as LCMS2CIEXYZMBS = nil) as LCMS2CIELabMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Converts XYZ color to Lab.
Notes: Setting WhitePoint to nil forces D50 as white point.

11.21.84   XYZ2xyY(p as LCMS2CIEXYZMBS) as LCMS2CIExyYMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Colorimetric space conversion from XYZ to xyY.

11.21.85   XYZEncoded2Float(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Decodes a XYZ value, encoded on ICC convention to a LCMS2CIEXYZMBS value.
Notes: w0,w1 and w2: Array of 3 UInt16 values holding the encoded valkues.
Returns XYZ color on success or nil on failure.

11.21.86   Constants

Constants

Constant	Value	Description
kcmsMagicNumber	&h61637370	Magic number to identify an ICC profile.
kcmsMAXCHANNELS	16	Maximum number of channels in ICC profiles.
kD_CALCULATE	-1	Special value for D Value of ViewingConditions.
klcmsSignature	&h6C636D73	Little CMS signature.

Surround Constants

Constant	Value	Description
kAVG_SURROUND	1	
kCUTSHEET_SURROUND	4	
kDARK_SURROUND	3	
kDIM_SURROUND	2	

Header Flag Constants

Constant	Value	Description
kcmsEmbeddedProfileFalse	0	
kcmsEmbeddedProfileTrue	1	
kcmsUseAnywhere	0	
kcmsUseWithEmbeddedDataOnly	2	

Error Constants

Constant	Value	Description
kcmsERROR_ALREADY_DEFINED	10	Already defined
kcmsERROR_BAD_SIGNATURE	11	Bad signature
kcmsERROR_COLORSPACE_CHECK	9	Colorspace Check
kcmsERROR_CORRUPTION_DETECTED	12	Corruption detected
kcmsERROR_FILE	1	File error
kcmsERROR_INTERNAL	3	Internal error
kcmsERROR_NOT_SUITABLE	13	Not suitable
kcmsERROR_NULL	4	NULL passed
kcmsERROR_RANGE	2	Range error
kcmsERROR_READ	5	Read error
kcmsERROR_SEEK	6	Seek error
kcmsERROR_UNDEFINED	0	Undefined error
kcmsERROR_UNKNOWN_EXTENSION	8	Unknown extension
kcmsERROR_WRITE	7	Write error

Flag Constants

Constant	Value	Description
kcmsFLAGS_8BITS_DEVICELINK	8	Create 8 bits devicelinks
kcmsFLAGS_BLACKPOINTCOMPENSATION	&h00002000	Black point compensation.
kcmsFLAGS_CLUT_POST_LINEARIZATION	1	Create postlinearization tables if possible
kcmsFLAGS_CLUT_PRE_LINEARIZATION	16	Create prelinearization tables if possible
kcmsFLAGS_COPY_ALPHA	&h04000000	Whether to copy alpha.
kcmsFLAGS_FORCE_CLUT	2	Force CLUT optimization
kcmsFLAGS_GAMUTCHECK	&h00001000	Out of Gamut alarm
kcmsFLAGS_GUESSDEVICECLASS	32	Guess device class (for transform2devicelink)
kcmsFLAGS_HIGHRESPRECALC	&h00000400	Use more memory to give better accurancy
kcmsFLAGS_KEEP_SEQUENCE	&h00000080	Keep profile sequence for devicelink creation
kcmsFLAGS_LOWRESPRECALC	&h00000800	Use less memory to minimize resouces
kcmsFLAGS_NOCACHE	64	Inhibit 1-pixel cache
kcmsFLAGS_NODEFAULTRESOURCEDEF	&h01000000	
kcmsFLAGS_NONEGATIVES	&h00008000	Prevent negative numbers in floating point transforms
kcmsFLAGS_NOOPTIMIZE	&h00000100	Inhibit optimizations
kcmsFLAGS_NOWHITEONWHITEFIXUP	4	Don't fix scum dot
kcmsFLAGS_NULLTRANSFORM	&h00000200	Don't transform anyway
kcmsFLAGS_SOFTPROOFING	&h00004000	Do softproofing

Screening Flag Constants

Constant	Value	Description
kcmsFREQUENCE_UNITS_LINES_CM	0	
kcmsFREQUENCE_UNITS_LINES_INCH	2	
kcmsPRINTER_DEFAULT_SCREENS	1	

Device Attribute Constants

Constant	Value	Description
kcmsGlossy	0	
kcmsMatte	2	
kcmsReflective	0	
kcmsTransparency	1	

Illuminant Constants

Constant	Value	Description
kcmsILLUMINANT_TYPE_A	6	A
kcmsILLUMINANT_TYPE_D50	1	D50
kcmsILLUMINANT_TYPE_D55	5	D55
kcmsILLUMINANT_TYPE_D65	2	D65
kcmsILLUMINANT_TYPE_D93	3	D93
kcmsILLUMINANT_TYPE_E	7	E
kcmsILLUMINANT_TYPE_F2	4	F2
kcmsILLUMINANT_TYPE_F8	8	F8
kcmsILLUMINANT_TYPE_UNKNOWN	0	Unknown

Colorspace Signature Constants

Constant	Value	Description
kcmsSig10colorData	&h41434C52	
kcmsSig11colorData	&h42434C52	
kcmsSig12colorData	&h43434C52	
kcmsSig13colorData	&h44434C52	
kcmsSig14colorData	&h45434C52	
kcmsSig15colorData	&h46434C52	
kcmsSig1colorData	&h31434C52	
kcmsSig2colorData	&h32434C52	
kcmsSig3colorData	&h33434C52	
kcmsSig4colorData	&h34434C52	
kcmsSig5colorData	&h35434C52	
kcmsSig6colorData	&h36434C52	
kcmsSig7colorData	&h37434C52	
kcmsSig8colorData	&h38434C52	
kcmsSig9colorData	&h39434C52	
kcmsSigCmyData	&h434D5920	
kcmsSigCmykData	&h434D594B	
kcmsSigGrayData	&h47524159	
kcmsSigHlsData	&h484C5320	
kcmsSigHsvData	&h48535620	
kcmsSigLabData	&h4C616220	
kcmsSigLabV2toV4	&h32203420	
kcmsSigLabV4toV2	&h34203220	
kcmsSigLuvData	&h4C757620	
kcmsSigLuvKData	&h4C75764B	
kcmsSigMCH1Data	&h4D434831	
kcmsSigMCH2Data	&h4D434832	
kcmsSigMCH3Data	&h4D434833	
kcmsSigMCH4Data	&h4D434834	
kcmsSigMCH5Data	&h4D434835	
kcmsSigMCH6Data	&h4D434836	
kcmsSigMCH7Data	&h4D434837	
kcmsSigMCH8Data	&h4D434838	
kcmsSigMCH9Data	&h4D434839	
kcmsSigMCHAData	&h4D434841	
kcmsSigMCHBData	&h4D434842	
kcmsSigMCHCData	&h4D434843	
kcmsSigMCHDData	&h4D434844	
kcmsSigMCHEData	&h4D434845	
kcmsSigMCHFData	&h4D434846	
kcmsSigNamedData	&h6E6D636C	
kcmsSigRgbData	&h52474220	
kcmsSigXYZData	&h58595A20	
kcmsSigYCbCrData	&h59436272	
kcmsSigYxyData	&h59787920	

Profile Class Signature Constants

Constant	Value	Description
kcmsSigAbstractClass	&h61627374	Abstract
kcmsSigColorSpaceClass	&h73706163	Colorspace
kcmsSigDisplayClass	&h6D6E7472	Display
kcmsSigInputClass	&h73636E72	Input
kcmsSigLinkClass	&h6C696E6B	Link
kcmsSigNamedColorClass	&h6E6D636C	Named Colors
kcmsSigOutputClass	&h70727472	Output

Technology Signature Constants

Constant	Value	Description
kcmsSigAMDisplay	&h414D4420	
kcmsSigCRTDisplay	&h43525420	
kcmsSigDigitalCamera	&h6463616D	
kcmsSigDigitalCinemaProjector	&h64636A70	
kcmsSigDigitalMotionPictureCamera	&h646D7063	
kcmsSigDyeSublimationPrinter	&h64737562	
kcmsSigElectrophotographicPrinter	&h6570686F	
kcmsSigElectrostaticPrinter	&h65737461	
kcmsSigFilmScanner	&h6673636E	
kcmsSigFilmWriter	&h6670726E	
kcmsSigFlexography	&h666C6578	
kcmsSigGravure	&h67726176	
kcmsSigInkJetPrinter	&h696A6574	
kcmsSigMotionPictureFilmRecorder	&h6D706672	
kcmsSigMotionPictureFilmScanner	&h6D706673	
kcmsSigOffsetLithography	&h6F666673	
kcmsSigPhotoCD	&h4B504344	
kcmsSigPhotographicPaperPrinter	&h7270686F	
kcmsSigPhotoImageSetter	&h696D6773	
kcmsSigPMDisplay	&h504D4420	
kcmsSigProjectionTelevision	&h706A7476	
kcmsSigReflectiveScanner	&h7273636E	
kcmsSigSilkscreen	&h73696C6B	
kcmsSigThermalWaxPrinter	&h74776178	
kcmsSigVideoCamera	&h76696463	
kcmsSigVideoMonitor	&h7669646D	

Tag Signature Constants

Constant	Value	Description
kcmsSigArgyllArtsTag	&h61727473	
kcmsSigAToB0Tag	&h41324230	
kcmsSigAToB1Tag	&h41324231	
kcmsSigAToB2Tag	&h41324232	
kcmsSigBlueColorantTag	&h6258595A	
kcmsSigBlueMatrixColumnTag	&h6258595A	
kcmsSigBlueTRCTag	&h62545243	
kcmsSigBToA0Tag	&h42324130	
kcmsSigBToA1Tag	&h42324131	
kcmsSigBToA2Tag	&h42324132	
kcmsSigBToD0Tag	&h42324430	
kcmsSigBToD1Tag	&h42324431	
kcmsSigBToD2Tag	&h42324432	
kcmsSigBToD3Tag	&h42324433	
kcmsSigCalibrationDateTimeTag	&h63616C74	
kcmsSigCharTargetTag	&h74617267	
kcmsSigChromaticAdaptationTag	&h63686164	
kcmsSigChromaticityTag	&h6368726D	
kcmsSigColorantOrderTag	&h636C726F	
kcmsSigColorantTableOutTag	&h636C6F74	
kcmsSigColorantTableTag	&h636C7274	
kcmsSigColorimetricIntentImageStateTag	&h63696973	
kcmsSigCopyrightTag	&h63707274	
kcmsSigCrdInfoTag	&h63726469	
kcmsSigDataTag	&h64617461	
kcmsSigDateTimeTag	&h6474696D	
kcmsSigDeviceMfgDescTag	&h646D6E64	
kcmsSigDeviceModelDescTag	&h646D6464	
kcmsSigDeviceSettingsTag	&h64657673	
kcmsSigDToB0Tag	&h44324230	
kcmsSigDToB1Tag	&h44324231	
kcmsSigDToB2Tag	&h44324232	
kcmsSigDToB3Tag	&h44324233	
kcmsSigGamutTag	&h67616D74	
kcmsSigGrayTRCTag	&h6B545243	
kcmsSigGreenColorantTag	&h6758595A	
kcmsSigGreenMatrixColumnTag	&h6758595A	
kcmsSigGreenTRCTag	&h67545243	
kcmsSigLuminanceTag	&h6C756D69	
kcmsSigMeasurementTag	&h6D656173	
kcmsSigMediaBlackPointTag	&h626B7074	
kcmsSigMediaWhitePointTag	&h77747074	
kcmsSigMetaTag	&h6D657461	
kcmsSigNamedColor2Tag	&h6E636C32	
kcmsSigNamedColorTag	&h6E636F6C	
kcmsSigOutputResponseTag	&h72657370	
kcmsSigPerceptualRenderingIntentGamutTag	&h72696730	
kcmsSigPreview0Tag	&h70726530	
kcmsSigPreview1Tag	&h70726531	
kcmsSigPreview2Tag	&h70726532	
kcmsSigProfileDescriptionMLTag	&h6473636D	
kcmsSigProfileDescriptionTag	&h64657363	
kcmsSigProfileSequenceDescTag	&h70736571	
kcmsSigProfileSequenceIdTag	&h70736964	
kcmsSigPs2CRD0Tag	&h70736430	
kcmsSigPs2CRD1Tag	&h70736431	
kcmsSigPs2CRD2Tag	&h70736432	
kcmsSigPs2CRD3Tag	&h70736433	

Data Type Signature Constants

Constant	Value	Description
kcmsSigBAcsElemType	&h62414353	
kcmsSigChromaticityType	&h6368726D	
kcmsSigClipNegativesElemType	&h636C7020	
kcmsSigCLutElemType	&h636C7574	
kcmsSigColorantOrderType	&h636C726F	
kcmsSigColorantTableType	&h636C7274	
kcmsSigCrdInfoType	&h63726469	
kcmsSigCurveSetElemType	&h63767374	
kcmsSigCurveType	&h63757276	
kcmsSigDataType	&h64617461	
kcmsSigDateTimeType	&h6474696D	
kcmsSigDeviceSettingsType	&h64657673	
kcmsSigDictType	&h64696374	
kcmsSigEAcsElemType	&h65414353	
kcmsSigFloatPCS2Lab	&h6C326420	
kcmsSigFloatPCS2XYZ	&h78326420	
kcmsSigIdentityElemType	&h69646E20	
kcmsSigLab2FloatPCS	&h64326C20	
kcmsSigLab2XYZElemType	&h78326C20	
kcmsSigLut16Type	&h6D667432	
kcmsSigLut8Type	&h6D667431	
kcmsSigLutAtoBType	&h6D414220	
kcmsSigLutBtoAType	&h6D424120	
kcmsSigMatrixElemType	&h6D617466	
kcmsSigMeasurementType	&h6D656173	
kcmsSigMultiLocalizedUnicodeType	&h6D6C7563	
kcmsSigMultiProcessElementType	&h6D706574	
kcmsSigNamedColor2Type	&h6E636C32	
kcmsSigNamedColorElemType	&h6E636C20	
kcmsSigNamedColorType	&h6E636F6C	
kcmsSigParametricCurveType	&h70617261	
kcmsSigProfileSequenceDescType	&h70736571	
kcmsSigProfileSequenceIdType	&h70736964	
kcmsSigResponseCurveSet16Type	&h72637332	
kcmsSigS15Fixed16ArrayType	&h73663332	
kcmsSigScreeningType	&h7363726E	
kcmsSigSignatureType	&h73696720	
kcmsSigTextDescriptionType	&h64657363	
kcmsSigTextType	&h74657874	
kcmsSigU16Fixed16ArrayType	&h75663332	
kcmsSigUcrBgType	&h62666420	
kcmsSigUInt16ArrayType	&h75693136	
kcmsSigUInt32ArrayType	&h75693332	
kcmsSigUInt64ArrayType	&h75693634	
kcmsSigUInt8ArrayType	&h75693038	
kcmsSigVcgtType	&h76636774	
kcmsSigViewingConditionsType	&h76696577	
kcmsSigXYZ2FloatPCS	&h64327820	
kcmsSigXYZ2LabElemType	&h6C327820	
kcmsSigXYZType	&h58595A20	

Response Curve Type Signature Constants

Constant	Value	Description
kcmsSigDN	&h444E2020	DIN E: DIN 16536-2 densitometer response, with no polarising filter.
kcmsSigDNN	&h444E4E20	DIN I: DIN 16536-2 narrow band densitometer response, with no polarising filter.
kcmsSigDNNP	&h444E4E50	DIN I: DIN 16536-2 narrow band densitometer response, with polarising filter.
kcmsSigDNP	&h444E2050	DIN E: DIN 16536-2 densitometer response, with polarising filter.
kcmsSigStatusA	&h53746141	Status A: ISO 5-3 densitometer response. This is the accepted standard for reflection densitometers for measuring photographic colour prints.
kcmsSigStatusE	&h53746145	Status E: ISO 5-3 densitometer response which is the accepted standard in Europe for colour reflection densitometers.
kcmsSigStatusI	&h53746149	Status I: ISO 5-3 densitometer response commonly referred to as narrow band or interference-type response.
kcmsSigStatusM	&h5374614D	Status M: ISO 5-3 densitometer response for measuring colour negatives.
kcmsSigStatusT	&h53746154	Status T: ISO 5-3 wide band colour reflection densitometer response which is the accepted standard in the United States for colour reflection densitometers.

Colorimetric Intent Image State Tag Signature Constants

Constant	Value	Description
kcmsSigFocalPlaneColorimetryEstimates	&h66706365	
kcmsSigReflectionHardcopyOriginalColorimetry	&h72686F63	
kcmsSigReflectionPrintOutputColorimetry	&h72706F63	
kcmsSigSceneAppearanceEstimates	&h73617065	
kcmsSigSceneColorimetryEstimates	&h73636F65	

Curve Element Type Signature Constants

Constant	Value	Description
kcmsSigFormulaCurveSeg	&h70617266	
kcmsSigSampledCurveSeg	&h73616D66	
kcmsSigSegmentedCurve	&h63757266	

Platform Signature Constants

Constant	Value	Description
kcmsSigMacintosh	&h4150504C	Mac
kcmsSigMicrosoft	&h4D534654	Windows
kcmsSigSGI	&h53474920	SGI
kcmsSigSolaris	&h53554E57	Solaris
kcmsSigTaligent	&h54474E54	Taligent
kcmsSigUnices	&h2A6E6978	Unix systems

Reference Gammut Signature Constants

Constant	Value	Description
kcmsSigPerceptualReferenceMediumGamut	&h70726D67	

Spot Shape Constants

Constant	Value	Description
kcmsSPOT_CROSS	7	
kcmsSPOT_DIAMOND	3	
kcmsSPOT_ELLIPSE	4	
kcmsSPOT_LINE	5	
kcmsSPOT_PRINTER_DEFAULT	1	
kcmsSPOT_ROUND	2	
kcmsSPOT_SQUARE	6	
kcmsSPOT_UNKNOWN	0	

Intent Constants

Constant	Value	Description
kINTENT_ABSOLUTE_COLORIMETRIC	3	Absolute Colorimetric ICC Intent.
kINTENT_PERCEPTUAL	0	Perceptual Colorimetric ICC Intent.
kINTENT_PRESERVE_K_ONLY_PERCEPTUAL	10	Special LCMS intent: Perceptual prese
kINTENT_PRESERVE_K_ONLY_RELATIVE_COLORIMETRIC	11	Special LCMS intent: Relative colorime
kINTENT_PRESERVE_K_ONLY_SATURATION	12	Special LCMS intent: Saturation prese
kINTENT_PRESERVE_K_PLANE_PERCEPTUAL	13	Special LCMS intent: Perceptual prese
kINTENT_PRESERVE_K_PLANE_RELATIVE_COLORIMETRIC	14	Special LCMS intent: Relative colorime
kINTENT_PRESERVE_K_PLANE_SATURATION	15	Special LCMS intent: Saturation prese
kINTENT_RELATIVE_COLORIMETRIC	1	Relative Colorimetric ICC Intent.
kINTENT_SATURATION	2	Saturation ICC Intent.

Used Direction Constants

Constant	Value	Description
kLCMS_USED_AS_INPUT	0	
kLCMS_USED_AS_OUTPUT	1	
kLCMS_USED_AS_PROOF	2	

Pixel Type Constants

Constant	Value	Description
kPT_ANY	0	Don't check colorspace
kPT_CMY	5	CMY
kPT_CMYK	6	CMYK
kPT_GRAY	3	Gray
kPT_HLS	13	HLS
kPT_HSV	12	HSV
kPT_Lab	10	Lab
kPT_LabV2	30	Identical to kPT_Lab, but using the V2 old encoding
kPT_MCH1	15	Multichannel with 1 channels.
kPT_MCH10	24	Multichannel with 10 channels.
kPT_MCH11	25	Multichannel with 11 channels.
kPT_MCH12	26	Multichannel with 12 channels.
kPT_MCH13	27	Multichannel with 13 channels.
kPT_MCH14	28	Multichannel with 14 channels.
kPT_MCH15	29	Multichannel with 15 channels.
kPT_MCH2	16	Multichannel with 2 channels.
kPT_MCH3	17	Multichannel with 3 channels.
kPT_MCH4	18	Multichannel with 4 channels.
kPT_MCH5	19	Multichannel with 5 channels.
kPT_MCH6	20	Multichannel with 6 channels.
kPT_MCH7	21	Multichannel with 7 channels.
kPT_MCH8	22	Multichannel with 8 channels.
kPT_MCH9	23	noMultichannel with 9 channels.ne
kPT_RGB	4	RGB
kPT_XYZ	9	XYZ
kPT_YCbCr	7	YCbCr
kPT_YUV	8	Lu'v'
kPT_YUVK	11	Lu'v'K
kPT_Yxy	14	Yxy

Color Space Type Constants

Constant	Value	Description
kTYPE_ABGR_15	&h0404049A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap 15, 8 bytes in total.
kTYPE_ABGR_15_PLANAR	&h0404149A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, planar, swap 15, 8 bytes in total.
kTYPE_ABGR_15_SE	&h04040C9A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap endian, bit 15, 8 bytes in total.
kTYPE_ABGR_16	&h0004049A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap bytes in total.
kTYPE_ABGR_16_PLANAR	&h0004149A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, planar, swap bytes in total.
kTYPE_ABGR_16_PREMUL	&h0084049A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, premultiplied, output, 8 bytes in total.
kTYPE_ABGR_16_SE	&h00040C9A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap endian, 8 bytes in total.
kTYPE_ABGR_8	&h00040499	RGB, 3 channels, 1 bytes, 1 extra samples, integer, chunky, swap bytes in total.
kTYPE_ABGR_8_DITHER	&h08040499	RGB, 3 channels, 1 bytes, 1 extra samples, integer, dither, chunky, 4 bytes in total.
kTYPE_ABGR_8_PLANAR	&h00041499	RGB, 3 channels, 1 bytes, 1 extra samples, integer, planar, swap bytes in total.
kTYPE_ABGR_8_PREMUL	&h00840499	RGB, 3 channels, 1 bytes, 1 extra samples, integer, premultiplied, output, 4 bytes in total.
kTYPE_ABGR_FLT	&h0044049C	RGB, 3 channels, 4 bytes, 1 extra samples, single, chunky, swap bytes in total.
kTYPE_ABGR_FLT_PREMUL	&h00C4049C	RGB, 3 channels, 4 bytes, 1 extra samples, single, premultiplied, output, 16 bytes in total.
kTYPE_ABGR_HALF_FLT	&h0044041A	RGB, 3 channels, 2 bytes, single, chunky, swap output, 6 bytes in
kTYPE_ACMYK_16	&h000640A2	CMYK, 4 channels, 2 bytes, 1 extra samples, integer, chunky, sw bytes in total.
kTYPE_ACMYK_8	&h000640A1	CMYK, 4 channels, 1 bytes, 1 extra samples, integer, chunky, s bytes in total.
kTYPE_AGRAY_16	&h0003048A	GRAY, 1 channels, 2 bytes, 1 extra samples, integer, chunky, sw bytes in total.
kTYPE_AGRAY_16_PLANAR	&h0003508A	GRAY, 1 channels, 2 bytes, 1 extra samples, integer, planar, sv bytes in total.
kTYPE_AGRAY_8	&h00030489	GRAY, 1 channels, 1 bytes, 1 extra samples, integer, chunky, sw bytes in total.
kTYPE_AGRAY_8_PLANAR	&h00035089	GRAY, 1 channels, 1 bytes, 1 extra samples, integer, planar, sv bytes in total.
kTYPE_AGRAY_DBL	&h00430488	GRAY, 1 channels, 8 bytes, 1 extra samples, double, chunky, swa bytes in total.
kTYPE_AGRAY_DBL_PLANAR	&h00435088	GRAY, 1 channels, 8 bytes, 1 extra samples, double, planar, sw bytes in total.
kTYPE_AGRAY_FLT	&h0043048C	GRAY, 1 channels, 4 bytes, 1 extra samples, single, chunky, swa bytes in total.
kTYPE_AGRAY_FLT_PLANAR	&h0043508C	GRAY, 1 channels, 4 bytes, 1 extra samples, single, planar, swap i in total.
kTYPE_AKYMC_16	&h000604A2	CMYK, 4 channels, 2 bytes, 1 extra samples, integer, chunky, swa bytes in total.
kTYPE_AKYMC_8	&h000604A1	CMYK, 4 channels, 1 bytes, 1 extra samples, integer, chunky, swa bytes in total.
kTYPE_ALabV2_8	&h001E4099	LabV2, 3 channels, 1 bytes, 1 extra samples, integer, chunky, sv bytes in total.
kTYPE_ALab_8	&h000A4099	Lab, 3 channels, 1 bytes, 1 extra samples, integer, chunky, swap i in total.
kTYPE_ARGB_15	&h0404409A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap i 8 bytes in total.
kTYPE_ARGB_16	&h0004409A	RGB, 3 channels, 2 bytes, 1 extra samples, integer, chunky, swap i

11.22 class LCMS2MLUMBS

11.22.1 class LCMS2MLUMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a multi localized unicode string.
Notes: MLU funtions are the low-level interface to access the localization features of V4 ICC profiles. Little CMS does offer a high-level interface for easy operation. You may want, however, handle those objects by yourself.

Obtaining localized info from profiles
In versions prior to 4.0, the ICC format defined a required tag 'desc' which stored ASCII, Unicode, and Script Code versions of the profile description for display purposes. However, this structure allowed the profile to be localized for one language only through Unicode or Script Code. Profile vendors had to ship many localized versions to different countries. It also created problems when a document with localized profiles embedded in it was shipped to a system using a different language. With the adoption of V4 spec as basis, Little CMS solves all those issues honoring a new tag type: ‚Äòmluc' and multi localized Unicode. There is a full part of the API to deal with this stuff, but if you don't care about the details and all you want is to display the right string, Little CMS provides a simplified interface for that purpose.
Note that ASCII is strictly 7 bits, so you need to use wide chars if you want to preserve the information in the profile. The localization trick is done by using the lenguage and country codes, which you are supposed to supply. Those are two or three ASCII letters. A list of codes may be found here:

Language Code:
http://lcweb.loc.gov/standards/iso639-2/iso639jac.html

Country Codes:
http://www.iso.ch/iso/en/prods-services/iso3166ma/index.html

In practice, "en" for "english" and "US" for "united states" are implemented in most profiles. It is Ok to set a language and a country even if the profile does not implement such specific language and country. Little CMS will search for a proper match.
If you don't care and want just to take the first string in the profile, you can use:

For the language:
kcmsNoLanguage

For the country:
kcmsNoCountry

This will force to get the very first string, without any searching. A note of warning on that: you will get an string, but the language would be any, and probably that is not what you want. It is better to specify

a default for language, and let LittleCMS to choose any other country (or language!) if what you ask for is not available.
Blog Entries

- MBS Xojo Plugins, version 23.5pr7

11.22.2 Methods

11.22.3 Constructor(context as LCMS2ContextMBS, items as UInt32)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Allocates an empty multilocalized unicode object.
Example:

dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello")
call c.setASCII("de", "DE", "Hallo")

11.22.4 getASCII(LanguageCode as string, CountryCode as string) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets an ASCII (7 bit) entry for the given Language and country.
Example:

dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello")
call c.setASCII("de", "DE", "Hallo")

MsgBox "en: "+c.getASCII("en", "US") + EndOfLine + "de: "+c.getASCII("de", "DE") + EndOfLine + "any: "+c.getASCII("", "")

Notes: Language Code: 3 chars describing the language.
CountryCode: 3 chars describing the country.

Returns the string.

11.22.5   getTranslation(LanguageCode as string, CountryCode as string, byref ObtainedLanguageCode as string, byref ObtainedCountryCode as string) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Obtains the translation rule for given multilocalized unicode object.
Notes: Language Code: 3 chars describing the language.
CountryCode: 3 chars describing the country
ObtainedLanguage: 3 chars to get the language translation.
ObtainedCode: 3 chars to get the country translation.

Returns true on success, false on error

11.22.6   getUnicode(LanguageCode as string, CountryCode as string) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets an unicode (16 bit) entry for the given Language and country.
Notes: Language Code: 3 chars describing the language
CountryCode: 3 chars describing the country

Returns the string value.

11.22.7   setASCII(LanguageCode as string, CountryCode as string, ASCIIString as string) as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills an ASCII (7 bit) entry for the given Language and country.
Example:

dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello")
call c.setASCII("de", "DE", "Hallo")

MsgBox "en: "+c.getASCII("en", "US") + EndOfLine + "de: "+c.getASCII("de", "DE") + EndOfLine + "any: "+c.getASCII("", "")

Notes: Language Code: 3 chars describing the language
CountryCode: 3 chars describing the country

ASCIIString: String to add.

Returns true on success, false on error.

11.22.8 setUnicode(LanguageCode as string, CountryCode as string, Unicode-String as string) as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Fills a UNICODE wide char (16 bit) entry for the given Language and country.
Example:

dim c as new LCMS2MLUMBS(nil, 3)
call c.setUnicode("de", "DE", "K√§tzchen")
dim u as string = c.getUnicode("de", "DE")
MsgBox u

Notes: Language Code: 3 chars describing the language
CountryCode: 3 chars describing the country
WideString: String to add.

Returns true on success, false on error.

11.22.9 translationsCodes(index as Integer, byref LanguageCode as string, byref CountryCode as string) as boolean

Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries language and country code for the given index.
Example:

dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello")
call c.setASCII("de", "DE", "Hallo")

dim u as Integer = c.TranslationsCount-1
for i as Integer = 0 to u
dim LanguageCode as string
dim CountryCode as string

if c.translationsCodes(i, LanguageCode, CountryCode) then

MsgBox LanguageCode+" "+CountryCode
end if
next

Notes: Index is from 0 to TranslationsCount-1.

11.22.10   UnicodeStrings as String()

Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries all available strings.

11.22.11   Properties

11.22.12   Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.22.13   TranslationsCount as Integer

Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries number of stored translations.
Example:

dim c as new LCMS2MLUMBS(nil, 3)

call c.setASCII("en", "US", "Hello")
call c.setASCII("de", "DE", "Hallo")

MsgBox str(c.TranslationsCount)+" translations"

Notes: (Read only property)

11.22.14   Constants

Constants

Constant	Value	Description
kNoCountry	””	One of the possible country constants. Any country.
kNoLanguage	””	One of the possible language constants. Any language.

11.23   class LCMS2NamedColorListMBS

11.23.1   class LCMS2NamedColorListMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Specialized dictionaries for dealing with named color profiles.

11.23.2   Methods

11.23.3   Append(name as string) as Boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a new spot color to the list.
Notes: If the number of elements in the list exceeds the initial storage, the list is realloc'ed to accommodate things.

Name: The spot color name without any prefix or suffix specified in Constructor.
PCS: Optionally, Encoded PCS coordinates as three integers.
Colorant: Optionally, Encoded values for device colorant. (up to 16 entries)

Returns true on success and false on failure.
See also:

- 11.23.4 Append(name as string, PCS() as Integer) as Boolean   392

- 11.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean   393

11.23.4   Append(name as string, PCS() as Integer) as Boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a new spot color to the list.
Notes: If the number of elements in the list exceeds the initial storage, the list is realloc'ed to accommodate things.

Name: The spot color name without any prefix or suffix specified in Constructor.
PCS: Optionally, Encoded PCS coordinates as three integers.
Colorant: Optionally, Encoded values for device colorant. (up to 16 entries)

Returns true on success and false on failure.
See also:

11.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a new spot color to the list.
Notes: If the number of elements in the list exceeds the initial storage, the list is realloc'ed to accommodate things.

Name: The spot color name without any prefix or suffix specified in Constructor.
PCS: Optionally, Encoded PCS coordinates as three integers.
Colorant: Optionally, Encoded values for device colorant. (up to 16 entries)

Returns true on success and false on failure.
See also:

11.23.6 Colorant(nColor as UInt32) as Integer()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns encoded colorants of nth color.
Notes: Array has 16 entries, but not all may be in use.

11.23.7 ColorIndex(name as string) as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Performs a look-up in the dictionary and returns an index on the given color name.
Notes: Returns index on name, or -1 if the spot color is not found.

11.23.8 Constructor(context as LCMS2ContextMBS, n as UInt32, Colorant-Count as UInt32, Prefix as string = "", Suffix as string = "")

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new named color list.
Notes: Allocates an empty named color dictionary.

Context: The user-defined context cargo.
N: Initial number of spot colors in the list
Colorant count: Number of channels of device space (i.e, 3 for RGB, 4 for CMYK, etc,)
Prefix, Suffix: fixed strings for all spot color names, e.g., "coated", "system", ...

On success handle is not zero.

11.23.9   Name(nColor as UInt32) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns name of nth color.

11.23.10   PCS(nColor as UInt32) as Integer()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns encoded PCS of nth color.
Notes: Array has 3 entries.

11.23.11   Prefix(nColor as UInt32) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns prefix of nth color.

11.23.12   Suffix(nColor as UInt32) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns suffix of nth color.

11.23.13 Properties

11.23.14 Count as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of spot colors in a named color list.
Notes: Returns the number of spot colors on success, 0 on error.
(Read only property)

11.23.15 Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.24   class LCMS2PipelineMBS

11.24.1   class LCMS2PipelineMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a pipeline.
Notes: Pipelines are a convenient way to model complex operations on image data. Each pipeline may contain an arbitrary number of stages. Each stage performs a single operation. Pipelines may be optimized to be executed on a certain format (8 bits, for example) and can be saved as LUTs in ICC profiles.
Blog Entries

- MBS Xojo Plugins, version 20.3pr8

- MBS Releases the MBS Real Studio plug-ins in version 12.0

11.24.2   Methods

11.24.3   Append(p as LCMS2PipelineMBS) as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Appends pipeline l2 at the end of pipeline l1.
Notes: Channel count must match.
Returns true on success and false on failure.

11.24.4   CheckAndRetreiveStages(type1 as Integer, byref stage1 as LCMS2StageMBS) as Boolean

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks for some specific stages and returns them via byref parameters.
Notes: This function is quite useful to analyze the structure of a Pipeline and retrieve the Stage elements that conform the Pipeline. It should be called with the Pipeline, the number of expected elements and then a list of expected types followed with a list of double pointers to Stage elements. If the function founds a match with current pipeline, it fills the parameters and returns true if not, returns false without touching anything.
See also:

11.24.5 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS) as Boolean

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks for some specific stages and returns them via byref parameters.
Notes: This function is quite useful to analyze the structure of a Pipeline and retrieve the Stage elements
that conform the Pipeline. It should be called with the Pipeline, the number of expected elements and then
a list of expected types followed with a list of double pointers to Stage elements. If the function founds a
match with current pipeline, it fills the parameters and returns true if not, returns false without touching
anything.
See also:

- 11.24.4 CheckAndRetreiveStages(type1 as Integer, byref stage1 as LCMS2StageMBS) as Boolean 396

- 11.24.6 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, type3 as Integer, byref stage1 as
  LCMS2StageMBS, byref stage2 as LCMS2StageMBS, byref stage3 as LCMS2StageMBS) as Boolean
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11.24.6 CheckAndRetreiveStages(type1 as Integer, type2 as Integer, type3 as Integer, byref stage1 as LCMS2StageMBS, byref stage2 as LCMS2StageMBS, byref stage3 as LCMS2StageMBS) as Boolean

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks for some specific stages and returns them via byref parameters.
Example:

```
// load a profile
Dim file As FolderItem = SpecialFolder.Desktop.child("test.icc")
Dim profile As LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile( file, False )

// get the pipeline
Dim pipeline As LCMS2PipelineMBS = profile.ReadPipeline( LCMS2MBS.kcmsSigBToA1Tag )

// get curves
Dim CurveIn As LCMS2StageMBS
Dim CLUT As LCMS2StageMBS
Dim CurveOut As LCMS2StageMBS

Dim ok As Boolean = pipeline.CheckAndRetreiveStages(_
LCMS2MBS.kcmsSigCurveSetElemType, _
LCMS2MBS.kcmsSigCLutElemType, _
LCMS2MBS.kcmsSigCurveSetElemType, _
CurveIn, CLUT, CurveOut)

Break // check the three entries
```

Notes: This function is quite useful to analyze the structure of a Pipeline and retrieve the Stage elements that conform the Pipeline. It should be called with the Pipeline, the number of expected elements and then a list of expected types followed with a list of double pointers to Stage elements. If the function founds a match with current pipeline, it fills the parameters and returns true if not, returns false without touching anything.
See also:

11.24.7   Constructor(context as LCMS2ContextMBS, InputChannels as UInt32, OutputChannels as UInt32)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Allocates an empty pipeline.
Notes: Final Input and output channels must be specified at creation time.

context: A user-defined context cargo.
InputChannels, OutputChannels: Number of channels on input and output.

11.24.8   Eval16(In as Ptr, Out as Ptr)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates a pipeline usin 16-bit numbers, optionally using the optimized path.
Notes: In: Input values.
Out: Output values.

For in and out you can use memoryblocks with UInt16 values.
We use Ptr for maximum performance. Please make sure the memoryblocks have right size. An UInt16 value has 2 bytes.

11.24.9   EvalFloat(In as Ptr, Out as Ptr)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates a pipeline using floating point numbers.
Notes: In: Input values.

Out: Output values.

For in and out you can use memoryblocks with single values.
We use Ptr for maximum performance. Please make sure the memoryblocks have right size. A single value has 4 bytes.

11.24.10 EvalReverseFloat(Target as Ptr, Result as Ptr, Hint as Ptr)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates a pipeline in the reverse direction, using Newton's method.
Notes: Target: Input values.
Result: Output values.
Hint: Where begin the search.

For target, result and hint you can use memoryblocks with single values.
We use Ptr for maximum performance. Please make sure the memoryblocks have right size. A single value has 4 bytes.

Returns true on success, false on error.

11.24.11 InsertStage(where as Integer, stage as LCMS2StageMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inserts a stage on either the head or the tail of a given pipeline.
Notes: where: enumerated constant, either kAtBegin or kAtEnd.
stage: Pointer to a stage object

11.24.12 SetSaveAs8bitsFlag(save8bit as boolean) as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets an internal flag that marks the pipeline to be saved in 8 bit precision.
Notes: By default all pipelines are saved on 16 bits precision on AtoB/BToA tags and in floating point precision on DToB/BToD tags.

save8bit: State of the flag, true=Save as 8 bits, false=Save as 16 bits

Returns true on success, false on error

11.24.13   Stages as LCMS2StageMBS()

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns an array with all stage objects.

11.24.14   UnlinkStage(where as Integer) as LCMS2StageMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes the stage from the pipeline.
Notes: Returns the removed stage object.
where can be kAtBegin or kAtEnd values.

11.24.15   Properties

11.24.16   context as LCMS2ContextMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The context object.
Notes: (Read and Write property)

11.24.17   FirstStage as LCMS2StageMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get a the first stage in the pipeline, or nil if pipeline is empty.
Notes: Intended for iterators.
(Read only property)

11.24.18   Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.24.19   InputChannels as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of input channels of a given pipeline.
Notes: Number of channels on success, 0 on error.
(Read only property)

11.24.20   LastStage as LCMS2StageMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get a the last stage in the pipeline, or nil if pipeline is empty.
Notes: Intended for iterators.
(Read only property)

11.24.21   OutputChannels as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns number of output channels of a given pipeline.
Notes: Number of channels on success, 0 on error.
(Read only property)

11.24.22   StageCount as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns number of stages of a given pipeline.
Notes: (Read only property)

11.24.23   Constants

Location Constants for UnlinkStage

Constant	Value	Description
kAtBegin	0	At the beginning.
kAtEnd	1	At the end.

11.25 class LCMS2ProfileMBS

11.25.1 class LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a LCMS2 profile.
Blog Entries

- MBS Xojo Plugins, version 23.6pr1

- MBS Xojo Plugins, version 23.5pr6

- MBS Xojo Plugins, version 22.0pr7

- MBS Xojo Plugins, version 21.1pr1

- Colorspaces in MacOS with Xojo

- Tip of day: Load ICC profile on OS X for any image format with CGImageSource

- ICC color profiling

- MBS Xojo / Real Studio Plugins, version 13.4pr3

- MBS Real Studio Plugins, version 12.3pr11

- MBS Real Studio Plugins, version 12.0pr4

11.25.2 Methods

11.25.3 cmsV2Unicode as String

Plugin Version: 24.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns special constant to access unicode string for V2 profiles.
Example:

```
// special v2 unicode string
Dim ProfileVersion As Integer = MyProfile.ProfileVersion

If ProfileVersion = 2 Then
Dim cmsV2Unicode As String = LCMS2ProfileMBS.cmsV2Unicode
Dim s2 As String = MyMLU.getUnicode(cmsV2Unicode, cmsV2Unicode)

If s2<>"" Then
List.AddRow "V2 Unicode Text", s2
End If
End If
```

11.25.4 Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty profile.
Notes: On success the handle property is not zero.
See also:

11.25.5 Constructor(file as folderitem, write as boolean = false)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates profile by reading in an existing profile or creating a new profile at the given location.
Notes: file: file location.
write: Whether to create new profile.

On success the handle property is not zero.
See also:

11.25.6 CreateBCHSWabstractProfile(context as LCMS2ContextMBS, nLUT-Points as UInt32, Bright as double, Contrast as double, Hue as double, Saturation as double, TempSrc as UInt32, TempDest as UInt32) as LCMS2ProfileMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates an abstract devicelink operating in Lab for Bright/Contrast/Hue/Saturation and white point translation.
Notes: White points are specified as temperatures degree of Kelvin.

context: optional context object.
nLUTPoints: Resulting colormap resolution
Bright: Bright increment. May be negative
Contrast: Contrast increment. May be negative.
Hue: Hue displacement in degree.
Saturation: Saturation increment. May be negative
TempSrc: Source white point temperature
TempDest: Destination white point temperature.

Returns an ICC profile object on success, nil on error.

11.25.7   CreateGrayProfile(context as LCMS2ContextMBS, WhitePoint as LCMS2CIExyYM TransferFunction as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function creates a gray profile based on White point and transfer function.
Notes: It populates followingtags; this conform a standard gray display profile:

1   cmsSigProfileDescriptionTag
2   cmsSigMediaWhitePointTag
3   cmsSigGrayTRCTag

Context: Optional context object.
WhitePoint: The white point of the gray device or space.
TransferFunction: tone curve describing the device or space gamma.

Returns an ICC profile object on success, NULL on error.

11.25.8   CreateInkLimitingDeviceLink(context as LCMS2ContextMBS, ColorSpaceSignature as UInt32, Limit as Double) as LCMS2ProfileMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This is a devicelink operating in CMYK for ink-limiting.
Notes: Space: any color space signature. Currently only kcmsSigCmykData is supported.
Limit: Amount of ink limiting in % (0..400%)

Returns new profile or nil on error.

11.25.9   CreateLab2Profile(context as LCMS2ContextMBS = nil, point as LCMS2CIExyYM = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a Lab to Lab identity, marking it as v2 ICC profile.
Notes: Adjustments for accomodating PCS endoing shall be done by Little CMS when using this profile.

Context: The optional context object.
WhitePoint: Lab reference white. nil for D50.

Returns a handle to an ICC profile object on success, nil on error.

11.25.10 CreateLab4Profile(context as LCMS2ContextMBS = nil, point as LCMS2CIExyYM = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a Lab to Lab identity, marking it as v4 ICC profile.
Notes: Context: The optional context object.
WhitePoint: Lab reference white. nil for D50.

Returns a handle to an ICC profile object on success, nil on error.

11.25.11 CreateLinearizationDeviceLink(context as LCMS2ContextMBS, ColorSpaceSignature as UInt32, TransferFunction() as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This is a devicelink operating in the target colorspace with as many transfer functions asÔø°-components.
Notes: Space: The desired color space signature. Like &h52474220 for RGB.
TransferFunction: tone curves describing the device or space linearization.

Please make sure you pass right number of transfer functions matching number of channels of color space.

A handle to an ICC profile object on success, NULL on error.

11.25.12 CreateNULLProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a fake NULL profile.
Notes: This profile return 1 channel as always 0. Is useful only for gamut checking tricks.
Returns an ICC profile object on success, nil on error.

11.25.13   CreateProfilePlaceholder(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates an empty profile object, to be populated by the programmer.
Notes: WARNING: The profile without adding any information is not directly useable.

Context: The context object.
Returns an ICC profile object on success, nil on error.

11.25.14   CreateRGBProfile(context as LCMS2ContextMBS, WhitePoint as LCMS2CIExyY Primaries as LCMS2CIExyYTripleMBS, TransferFunction() as LCMS2ToneCurveM as LCMS2ProfileMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function creates a RGB profile based on White point, primaries and transfer functions.
Notes: It populates following tags; this conform a standard RGB Display Profile, and then I add (As per addendum II) chromaticity tag.

1	cmsSigProfileDescriptionTag
2	cmsSigMediaWhitePointTag
3	cmsSigRedColorantTag
4	cmsSigGreenColorantTag
5	cmsSigBlueColorantTag
6	cmsSigRedTRCTag
7	cmsSigGreenTRCTag
8	cmsSigBlueTRCTag
9	Chromatic adaptation Tag
10	cmsSigChromaticityTag

Context: Optional context object.
WhitePoint: The white point of the RGB device or space.
Primaries: The primaries in xyY of the device or space.
TransferFunction: 3 tone curves describing the device or space gamma. (if you pass just one, the plugin uses it for all three channels)

Returns the new ICC profile object or nil on any error.

11.25.15 CreateSRGBProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Create an ICC virtual profile for sRGB space.
Notes: sRGB is a standard RGB color space created cooperatively by HP and Microsoft in 1996 for use on monitors, printers, and the Internet.

sRGB white point is D65.
xyY 0.3127, 0.3291, 1.0
Ôø°
Primaries are ITU-R BT.709-5 (xYY)

R	0.6400, 0.3300, 1.0
G	0.3000, 0.6000, 1.0
B	0.1500, 0.0600, 1.0

Ôø°
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Predefined virtual profiles sRGB transfer functions are defined by:
Ôø°
If R'sRGB, G'sRGB, B'sRGB <0.04045
R = R'sRGB / 12.92
G = G'sRGB / 12.92
B = B'sRGB / 12.92
elseif R'sRGB, G'sRGB, B'sRGB >= 0.04045
R = ((R'sRGB + 0.055) / 1.055)^2.4
G = ((G'sRGB + 0.055) / 1.055)^2.4
B = ((B'sRGB + 0.055) / 1.055)^2.4
end if

Context: Optional context object.
Returns an ICC profile object on success, nil on error.

11.25.16 CreateXYZProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a XYZ to XYZ identity, marking it as v4 ICC profile.
Notes: WhitePoint used in Absolute colorimetric intent is D50.

Returns the new profile on success or nil on failure.

11.25.17   DetectBlackPoint(Intent as Integer, Flags as Integer) as LCMS2CIEXYZMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Estimate the black point.

11.25.18   DetectDestinationBlackPoint(Intent as Integer, Flags as Integer) as LCMS2CIEXYZMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the black point of a destination profile.
Notes: This algorithm comes from the Adobe paper disclosing its black point compensation method.

11.25.19   DetectRGBProfileGamma(threshold as double) as double

Plugin Version: 22.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Estimate gamma space, always positive.
Notes: Returns -1 on error.
threshold e.g. 0.01.

11.25.20   DetectTAC as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Detects total area coverage.
Notes: When several colors are printed on top of each other, there is a limit to the amount of ink that can be put on paper. This maximum total dot percentage is referred to as either TIC (Total Ink Coverage) or TAC (Total Area Coverage). This function does estimate total area coverage for a given profile in %. Only works on output profiles. On RGB profiles, 400% is returned. TAC is detected by subsampling Lab color space on 6x74x74 points.

Returns estimated area coverage in % on success, 0 on error.

11.25.21 FormatterForBitmap(BitCount as Integer = 8) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Build a suitable formatter for the colorspace of this profile.
Notes: This is a convenience function which prepares you a pixel format for use with LCMS2BitmapMBS class.
Formatters are used to describe how bitmap buffers are organized.

11.25.22 FormatterForColorspace(nBytes as UInt32, IsFloat as boolean = false) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Build a suitable formatter for the colorspace of this profile.
Notes: nBytes is number of bytes per color value. For 3 byte RGB, you pass 1 here.
Formatters are used to describe how bitmap buffers are organized.

e.g.
nBytes = 1 and isfloat = false gives UInt8.
nBytes = 2 and isfloat = false gives UInt16.
nBytes = 4 and isfloat = true gives 32-bit float, which is Single in Xojo.
nBytes = 8 and isfloat = true gives 64-bit float, which is Double in Xojo.

11.25.23 FormatterForPCS(nBytes as UInt32, IsFloat as boolean = false) as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Build a suitable formatter for the colorspace of this profile.
Notes: Formatters are used to describe how bitmap buffers are organized.

11.25.24 GetProfileInfo(Info as Integer, LanguageCode as string, CountryCode as string) as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets several information strings from the profile, dealing with localization.
Notes: Info: A selector of which info to return. (kInfoCopyright, kInfoDescription, kInfoManufacturer or kInfoModel)
Language Code: first name language code from ISO-639/2.

Country Code: first name region code from ISO-3166.

Returns the string. (empty string on error)

11.25.25   IsCLUT(Intent as UInt32, UsedDirection as UInt32) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns whatever a CLUT is present in the profile for the given intent and direction.
Notes: Intent: The intent code.
UsedDirection: UsedAsInput = 0, UsedAsOutput = 1, UsedAsProof = 2.
Returns true CLUT is present for given intent and direction, false otherwise.

11.25.26   IsIntentSupported(Intent as UInt32, UsedDirection as UInt32) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if the requested intent is implemented in the given direction.
Notes: Little CMS has a fallback strategy that allows to specify any rendering intent when creating the transform, but the intent really being used may be another if the requested intent is not implemented.

UsedDirection: UsedAsInput = 0, UsedAsOutput = 1, UsedAsProof = 2.
Returns true if the intent is implemented, false otherwise.

11.25.27   IsTag(TagSignature as Integer) as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if a tag with signature sig is found on the profile.
Notes: Useful to check if a profile contains a given tag.
Returns true if the tag is found or false otherwise.

11.25.28   LinkTag(sig as Integer, dest as Integer) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a directory entry on tag sig that points to same location as tag dest.
Notes: Using this function you can collapse several tag entries to the same block in the profile.

sig: Signature of linking tag.
dest: Signature of linked tag.

Returns ture on success, false on error

11.25.29   MD5computeID as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Computes a MD5 checksum and stores it as Profile ID in the profile header.
Notes: Returns true on success or false on failure.

11.25.30   OpenProfileFromFile(context as LCMS2ContextMBS, file as folderitem, write as boolean = false) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a profile from a file or creates a new profile file there.
Notes: context: Optional context object.
file: The folderitem for the file location.
write: If true, a new profile is created. If false an existing profile is opened.

Returns a new ICC Profile object on success or nil on failure.
See also:

- 11.25.31 OpenProfileFromFile(file as folderitem, write as boolean = false) as LCMS2ProfileMBS 411

11.25.31   OpenProfileFromFile(file as folderitem, write as boolean = false) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a profile from a file or creates a new profile file there.
Example:

Dim path As String = ”/Library/ColorSync/Profiles/Blue Tone.icc”
dim file as new FolderItem(path, FolderItem.PathModes.Native)
Dim p As LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile(file)

MessageBox p.TagCount.ToString+” tags”

Notes: context: Optional context object.

file: The folderitem for the file location.
write: If true, a new profile is created. If false an existing profile is opened.

Returns a new ICC Profile object on success or nil on failure.
See also:

11.25.32   OpenProfileFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an ICC profile which is entirely contained in a memory block.
Notes: Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

11.25.33   OpenProfileFromMemory(data as Memoryblock) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an ICC profile which is entirely contained in a memory block.
Notes: Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

11.25.34 OpenProfileFromString(context as LCMS2ContextMBS, data as string) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an ICC profile which is entirely contained in a string.
Notes: Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

11.25.35 OpenProfileFromString(data as string) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an ICC profile which is entirely contained in a string.
Notes: Context: Optional, the context object.
Data: The profile data.

Useful for accessing embedded profiles. This buffer must hold a full profile image. Memory must be contiguous.
Returns an ICC profile object on success, nil on error.
See also:

11.25.36 PostScriptCRD(context as LCMS2ContextMBS, intent as UInt32, flags as UInt32 = 0) as string

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A wrapper on cmsGetPostScriptColorResource to simplify CRD generation.
Notes: context: Optional a user-defined context cargo.
Intent: The intent code, as described in Intents constants.
Flags: A combination of bit-field kcmsFLAGS* constants.

Returns: The resource as string or an empty string on error.

11.25.37   PostScriptCSA(context as LCMS2ContextMBS, intent as UInt32, flags as UInt32 = 0) as string

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A wrapper on cmsGetPostScriptColorResource to simplify CSA generation.
Notes: context: Optional a user-defined context cargo.
Intent: The intent code, as described in Intents constants.
Flags: A combination of bit-field kcmsFLAGS* constants.

Returns: The resource as string or an empty string on error.

11.25.38   ReadChromaticAdaptation as LCMS2CIEXYZMBS()

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a chromatic adaptation.
Notes: On success returns an array of 3 XYZ values.

11.25.39   ReadChromaticity as LCMS2CIExyYTripleMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads chromaticity tag.
Notes: For kcmsSigChromaticityTag.
Returns nil on error.

11.25.40   ReadCIEXYZ(tag as Integer) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as CIE XYZ value.
Notes: Works with kcmsSigBlueColorantTag, kcmsSigBlueMatrixColumnTag, kcmsSigGreenColorantTag, kcmsSigGreenMatrixColumnTag, kcmsSigLuminanceTag, kcmsSigMediaBlackPointTag, kcmsSigMediaWhitePointTag, kcmsSigRedColorantTag and kcmsSigRedMatrixColumnTag.
Returns nil on any error.

11.25.41   ReadColorantOrder as Memoryblock

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads colorant order.
Notes: For kcmsSigColorantOrderTag.
Returns nil on any error.

11.25.42 ReadDate(tag as Integer) as LCMS2DateMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as date.
Notes: Works with kcmsSigCalibrationDateTimeTag and kcmsSigDateTimeTag.
Returns nil on any error.

11.25.43 ReadDict(tag as Integer) as LCMS2DictionaryMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as Dictionary value.
Notes: Works with kcmsSigMetaTag.
Returns nil on any error.

11.25.44 ReadICCData(tag as Integer) as LCMS2ICCDataMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as ICC Data.
Notes: Works with kcmsSigDataTag, kcmsSigPs2CRD0Tag, kcmsSigPs2CRD1Tag, kcmsSigPs2CRD2Tag, kcmsSigPs2CRD3Tag, kcmsSigPs2CSATag and kcmsSigPs2RenderingIntentTag.
Returns nil on any error.

11.25.45 ReadICCMeasurementConditions as LCMS2ICCMeasurementConditionsMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads IIC measurement conditions.
Notes: for kcmsSigMeasurementTag.
Returns nil on any error.

11.25.46   ReadICCViewingConditions as LCMS2ICCViewingConditionsMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as ICCViewingConditions value.
Notes: Works with kcmsSigViewingConditionsTag.

11.25.47   ReadMLU(tag as Integer) as LCMS2MLUMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as MLU.
Notes: Works with kcmsSigCharTargetTag, kcmsSigCopyrightTag, kcmsSigDeviceMfgDescTag, kcmsSigDeviceModelDescTag, kcmsSigProfileDescriptionTag, kcmsSigScreeningDescTag and kcmsSigViewingCondDescTag.
Returns nil on any error.

11.25.48   ReadNamedColorList(tag as Integer) as LCMS2NamedColorListMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as named color list.
Notes: Works with kcmsSigColorantTableTag, kcmsSigColorantTableOutTag, kcmsSigCrdInfoTag and kcmsSigNamedColor2Tag.
Returns nil on any error.

11.25.49   ReadPipeline(tag as Integer) as LCMS2PipelineMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as pipeline.
Notes: Works with kcmsSigAToB0Tag, kcmsSigAToB1Tag, kcmsSigAToB2Tag, kcmsSigBToA0Tag, kcmsSigBToA1Tag, kcmsSigBToA2Tag, kcmsSigDToB0Tag, kcmsSigDToB1Tag, kcmsSigDToB2Tag, kcmsSigDToB3Tag, kcmsSigBToD0Tag, kcmsSigBToD1Tag, kcmsSigBToD2Tag, kcmsSigBToD3Tag, kcmsSigGamutTag, kcmsSigPreview0Tag, kcmsSigPreview1Tag and kcmsSigPreview2Tag.
Returns nil on any error.

11.25.50   ReadRawTag(sig as Integer) as Memoryblock

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads raw tag.
Notes: Similar to ReadTag*, but different in two important aspects. The important point is, this is raw data. No processing is performed, so you can effectively read wrong or broken profiles with this function. Obviously, then you have to interpret all those bytes!

sig: Signature of tag to be read

Returns memoryblock with data or nil on any error.

Those functions allows to read/write directly to the ICC profile any data, without checking anything. As a rule, mixing Raw with cooked doesn't work, so writting a tag as raw and then reading it as cooked without serializing does result into an error. If that is wha you want, you will need to dump the profile to memory or disk and then reopen it.

Returns nil on any error.

11.25.51   ReadScreening as LCMS2ScreeningMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as screening.
Notes: Works with kcmsSigScreeningTag.
Returns nil on any error.

11.25.52   ReadSequence(tag as Integer) as LCMS2SequenceMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as sequence.
Notes: Only for kcmsSigProfileSequenceDescTag and kcmsSigProfileSequenceIdTag.
Returns nil on any error.

11.25.53   ReadSignature(tag as Integer) as UInt32

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a signature tag.
Notes: Works with kcmsSigColorimetricIntentImageStateTag, kcmsSigPerceptualRenderingIntentGamutTag, kcmsSigSaturationRenderingIntentGamutTag or kcmsSigTechnologyTag.

11.25.54   ReadTag(tag as Integer) as Variant

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a tag.
Notes: This is a convenience function which gives you the tag in whatever class the plugin thing is suitable.
Check with isa what class you get.
Returns nil on any error.

11.25.55   ReadToneCurve(tag as Integer) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads tag as ToneCurve.
Notes: Works with kcmsSigBlueTRCTag, kcmsSigGrayTRCTag, kcmsSigGreenTRCTag and kcmsSigRedTRC-Tag.

11.25.56   ReadUcrBg as LCMS2UcrBgMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads UcrBg tag.

11.25.57   SaveProfileToFile(file as folderitem) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves the contents of a profile to a given file.
Notes: Returns true on success and false on failure.

11.25.58   SaveProfileToMemory as Memoryblock

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves the contents of a profile to a memoryblock.
Notes: Returns memoryblock on success and nil on failure.

11.25.59   SaveProfileToString as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves the contents of a profile to a string.
Notes: Returns string with profile data on success and ”” on failure.

11.25.60   TagLinkedTo(sig as Integer) as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the tag linked to sig, in the case two tags are sharing same resource, or nil if the tag is not linked to any other tag.
Notes: sig: Signature of linking tag.

Returns signature of linked tag, or 0 if no tag is linked.

11.25.61   TagSignature(index as Integer) as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the signature of a tag located in n position being n a 0-based index: i.e., first tag is indexed with n=0.
Notes: index: index to a tag position (0-based)

Returns the tag signature on success, 0 on error.
Changed in v23.5 to raise exception for invalid index.

11.25.62   TagSignatures as Integer()

Plugin Version: 23.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the array of tag signatures.
Example:

```
Dim path As String = ”/Library/ColorSync/Profiles/Blue Tone.icc”
dim file as new FolderItem(path, FolderItem.PathModes.Native)
Dim p As LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile(file)

Dim tags() As Integer = p.TagSignatures
Break // inspect array in debugger
```

Notes: The array contains all tags and you can loop over the array and use ReadTag()

11.25.63   WriteChromaticAdaptation(value as LCMS2Mat3MBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes chromatic adaptation.
Notes: Variant of the function which takes matrix of values.
See also:

11.25.64   WriteChromaticAdaptation(values() as LCMS2CIEXYZMBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes chromatic adaptation.
Notes: Pass array with 3 XYZ colors.
Returns true on success.
See also:

11.25.65   WriteChromaticity(o as LCMS2CIExyYTripleMBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes chromaticity tag.
Notes: For kcmsSigChromaticityTag.
Returns true on success and false on error.

11.25.66   WriteCIEXYZ(tag as Integer, o as LCMS2CIEXYZMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes CIE XYZ tag.
Notes: Works with kcmsSigBlueColorantTag, kcmsSigBlueMatrixColumnTag, kcmsSigGreenColorantTag, kcmsSigGreenMatrixColumnTag, kcmsSigLuminanceTag, kcmsSigMediaBlackPointTag, kcmsSigMediaWhitePointTag, kcmsSigRedColorantTag and kcmsSigRedMatrixColumnTag.

11.25.67   WriteColorantOrder(data as Memoryblock) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes colorant order.
Notes: For kcmsSigColorantOrderTag.

Data should be 16 byte long.
Returns true on success or false on failure.

11.25.68   WriteDate(tag as Integer, o as LCMS2DateMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes date tag.
Notes: Works with kcmsSigCalibrationDateTimeTag and kcmsSigDateTimeTag.

11.25.69   WriteDict(tag as Integer, o as LCMS2DictionaryMBS) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes Dictionary tag.
Notes: Works with kcmsSigMetaTag.

11.25.70   WriteICCData(tag as Integer, o as LCMS2ICCDataMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes ICC Data tag.
Notes: Works with kcmsSigDataTag, kcmsSigPs2CRD0Tag, kcmsSigPs2CRD1Tag, kcmsSigPs2CRD2Tag, kcmsSigPs2CRD3Tag, kcmsSigPs2CSATag and kcmsSigPs2RenderingIntentTag.

11.25.71   WriteICCMeasurementConditions(value as LCMS2ICCMeasurement-ConditionsMBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes IIC measurement conditions.
Notes: for kcmsSigMeasurementTag.
Writes data and returns true on success or false on failure.

11.25.72   WriteICCViewingConditions(o as LCMS2ICCViewingConditionsMBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes ICC Viewing conditions tag.
Notes: Works with kcmsSigViewingConditionsTag.

11.25.73   WriteMLU(tag as Integer, o as LCMS2MLUMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes MLU tag.
Notes: Works with kcmsSigCharTargetTag, kcmsSigCopyrightTag, kcmsSigDeviceMfgDescTag, kcmsSigDeviceModelDescTag, kcmsSigProfileDescriptionTag, kcmsSigScreeningDescTag and kcmsSigViewingCondDescTag.

11.25.74   WriteNamedColorList(tag as Integer, o as LCMS2NamedColorListMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes named color list tag.
Notes: Works with kcmsSigColorantTableTag, kcmsSigColorantTableOutTag, kcmsSigCrdInfoTag and kcmsSigNamedColor2Tag.

11.25.75   WritePipeline(tag as Integer, o as LCMS2PipelineMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes pipeline tag.
Notes: Works with kcmsSigAToB0Tag, kcmsSigAToB1Tag, kcmsSigAToB2Tag, kcmsSigBToA0Tag, kcmsSigBToA1Tag, kcmsSigBToA2Tag, kcmsSigDToB0Tag, kcmsSigDToB1Tag, kcmsSigDToB2Tag, kcmsSigDToB3Tag, kcmsSigBToD0Tag, kcmsSigBToD1Tag, kcmsSigBToD2Tag, kcmsSigBToD3Tag, kcmsSigGamutTag, kcmsSigPreview0Tag, kcmsSigPreview1Tag and kcmsSigPreview2Tag.

11.25.76   WriteRawTag(sig as Integer, data as Memoryblock) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes raw tag.
Notes: The RAW version does the same as WriteTag* but without any interpretation of the data. Please note it is fair easy to deal with "cooked" structures, since there are primitives for allocating, deleting and modifying data. For RAW data you are responsible of everything. If you want to deal with a private tag, you may want to write a plug-in instead of messing up with raw data.

sig: Signature of tag to be written
data: memory block holding the data.

Returns true on success, false on error

Those functions allows to read/write directly to the ICC profile any data, without checking anything. As a rule, mixing Raw with cooked doesn't work, so writting a tag as raw and then reading it as cooked without serializing does result into an error. If that is wha you want, you will need to dump the profile to memory or disk and then reopen it.

11.25.77   WriteScreening(o as LCMS2ScreeningMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes screening tag.
Notes: Works with kcmsSigScreeningTag.

11.25.78   WriteSequence(tag as Integer, o as LCMS2SequenceMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes sequence tag.
Notes: Only for kcmsSigProfileSequenceDescTag and kcmsSigProfileSequenceIdTag.

11.25.79   WriteSignature(tag as Integer, o as UInt32) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes a signature tag with the given values.
Notes: Works with kcmsSigColorimetricIntentImageStateTag, kcmsSigPerceptualRenderingIntentGamutTag, kcmsSigSaturationRenderingIntentGamutTag or kcmsSigTechnologyTag.

11.25.80   WriteToneCurve(tag as Integer, o as LCMS2ToneCurveMBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes tone curve tag.
Example:

// read a profile
dim f as FolderItem = SpecialFolder.Desktop.Child("myprofile.icc")

```
dim p as LCMS2ProfileMBS = LCMS2ProfileMBS.OpenProfileFromFile(f)

// find gray level tone curve
dim t as LCMS2ToneCurveMBS = p.ReadToneCurve(LCMS2MBS.kcmsSigGrayTRCTag)
if t<>nil then

// let's make a new one with half of old values
dim values(1000) as single

for i as Integer = 0 to 1000
values(i) = t.EvalToneCurveFloat(i/1000.0) * 0.5
next

// build new curve with that values
dim n as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildTabulatedToneCurve(nil, values)

// write back
if not p.WriteToneCurve(LCMS2MBS.kcmsSigGrayTRCTag, n) then
MsgBox "failed to write tone curve"
end if
end if

// write profile
f = SpecialFolder.Desktop.Child("test.icc")
call p.SaveProfileToFile(f)
```

Notes: Works with kcmsSigBlueTRCTag, kcmsSigGrayTRCTag, kcmsSigGreenTRCTag and kcmsSigRedTRC-Tag.

11.25.81   WriteUcrBg(o as LCMS2UcrBgMBS) as boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes UcrBg tag.

11.25.82   Properties

11.25.83   ChannelCount as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of channels used for the colorspace of this profile.
Example:

dim p as LCMS2ProfileMBS = LCMS2ProfileMBS.CreateSRGBProfile
MsgBox str(p.ChannelCount)

Notes: (Read only property)

11.25.84   ColorSpaceType as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets/Sets the color space used by the given profile, using the ICC convention.
Notes: (Read and Write property)

11.25.85   context as LCMS2ContextMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The context for this profile.
Notes: Error handling uses it, so you can see which part of your application failed.
(Read only property)

11.25.86   DeviceClass as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets/sets the device class signature from profile header.
Notes: Device Classes:
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kcmsSigInputClass	&h73636E72	scnr
kcmsSigDisplayClass	&h6D6E7472	mntr
kcmsSigOutputClass	&h70727472	prtr
kcmsSigLinkClass	&h6C696E6B	link
kcmsSigAbstractClass	&h61627374	abst
kcmsSigColorSpaceClass	&h73706163	spac
kcmsSigNamedColorClass	&h6e6d636c	nmcl

(Read and Write property)

11.25.87   File as FolderItem

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The file reference.
Notes: Only set for file based profiles, so you can later know what file you used to create the profile object.
(Read and Write property)

11.25.88   Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Internal object reference.
Notes: (Read and Write property)

11.25.89   HeaderAttributes as UInt64

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get/set header attribute flags.
Notes: Flags can be a combination of kcmsReflective,Ôø°kcmsTransparency,Ôø°kcmsGlossy or kcmsMatte.
(Read and Write property)

11.25.90   HeaderCreationDateTime as LCMS2DateMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the date and time when profile was created.
Notes: This is a field stored in profile header.
Returns nil on any error.
(Read only property)

11.25.91   HeaderCreator as UInt32

Plugin Version: 13.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get/set the creator signature as described in the header.
Notes: (Read only property)

11.25.92 HeaderFlags as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get or set header flags of given ICC profile object.
Notes: The profile flags field does contain flags to indicate various hints for the CMM such as distributed processing and caching options. The least-significant 16 bits are reserved for the ICC. Flags in bit positions 0 and 1 shall be used as indicated below.

Position	Field Length (bits)	Field Contents
0	1	Embedded Profile (kcmsEmbeddedProfileFalse if not embedded, kcmsEmbeddedProfileTrue if embedded in file)
1	1	Profile cannot be used independently from the embedded color data (set to kcmsUseWithEmbeddedDataOnly if true, kcmsUseAnywhere if false)

(Read and Write property)

11.25.93 HeaderManufacturer as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get/set the manufacturer signature as described in the header.
Notes: This funcionality is widely superseded by the manufaturer tag. Of use only in elder profiles.
(Read and Write property)

11.25.94 HeaderModel as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get/set the model signature as described in the header.
Notes: This funcionality is widely superseded by
the model tag. Of use only in elder profiles.
(Read and Write property)

11.25.95 HeaderProfileID as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get/set header profile ID.
Notes: Profile ID must be a 16 byte long string.
(Read and Write property)

11.25.96   IsMatrixShaper as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns whatever a matrix-shaper is present in the profile.
Notes: Note that a profile may hold matrix-shaper and CLUT as well.
Returns true if the profile holds a matrix-shaper, false otherwise.
(Read only property)

11.25.97   Name as string

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the profile name.
Notes: This is a convenience function. The plugin builds this name from manufacturer, model and description strings.
(Read only property)

11.25.98   PCS as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets/Sets the profile connection space used by the given profile, using the ICC convention.
Notes: (Read and Write property)

11.25.99   ProfileICCversion as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get/set the profile ICC version in the same format as it is stored in the header.
Notes: (Read and Write property)

11.25.100   ProfileVersion as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets/Sets the ICC version in profile header.
Notes: The version given as to this function as a float n.m is properly encoded.
(Read and Write property)

11.25.101 RenderingIntent as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Gets/Sets the profile header rendering intent.
Notes: From the ICC spec: "The rendering intent field shall specify the rendering intent which should be used (or, in the case of a Devicelink profile, was used) when this profile is (was) combined with another profile. In a sequence of more than two profiles, it applies to the combination of this profile and the next profile in the sequence and not to the entire sequence. Typically, the user or application will set the rendering intent dynamically at runtime or embedding time. Therefore, this flag may not have any meaning until the profile is used in some context, e.g. in a Devicelink or an embedded source profile."
(Read and Write property)

11.25.102 TagCount as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns number of tags of a given profile.
Notes: Returns number of tags on success, -1 on error.
(Read only property)

11.25.103 Constants

Info selector.

Constant	Value	Description
kInfoCopyright	3	The copyright string.
kInfoDescription	0	The description string.
kInfoManufacturer	1	The manufacturer string.
kInfoModel	2	The model string.

11.26   class LCMS2ScreeningChannelMBS

11.26.1   class LCMS2ScreeningChannelMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The screening information for one channel.

11.26.2   Methods

11.26.3   Clone as LCMS2ScreeningChannelMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the screening channel object.

11.26.4   Constructor(Frequency as Double = 0.0, ScreenAngle as Double = 0.0, SpotShape as UInt32 = 0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor.
See also:

11.26.5   Constructor(other as LCMS2ScreeningChannelMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes object with values from other object.
See also:

11.26.6   Properties

11.26.7   Frequency as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The frequency.
Notes: (Read and Write property)

11.26.8   ScreenAngle as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The screen angle.
Notes: (Read and Write property)

11.26.9   SpotShape as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The spot shape.
Notes: See kcmsSpot* constants.
(Read and Write property)

11.27   class LCMS2ScreeningMBS

11.27.1   class LCMS2ScreeningMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for screening parameters.

11.27.2   Properties

11.27.3   Channels as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of channels.
Notes: (Read and Write property)

11.27.4   Flag as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The flags for screening.
Notes: See flags kcmsPRINTER_DEFAULT_SCREENS, kcmsFREQUENCE_UNITS_LINES_CM and kcmsFREQUENCE_UNITS_LINES_INCH.
(Read and Write property)

11.27.5   Channel(index as Integer) as LCMS2ScreeningChannelMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The screening information for each channel.
Notes: Index from 0 to 15.
(Read and Write computed property)

11.28 class LCMS2SequenceDescriptionMBS

11.28.1 class LCMS2SequenceDescriptionMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a sequence description.

11.28.2 Properties

11.28.3 AttributeFlags as UInt64

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The attribute flags.
Notes: (Read and Write property)

11.28.4 Description as LCMS2MLUMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The description.
Notes: (Read only property)

11.28.5 DeviceMfg as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The device Mfg.
Notes: (Read and Write property)

11.28.6 DeviceModel as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The device model.
Notes: (Read and Write property)

11.28.7 Manufacturer as LCMS2MLUMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The manufacturer name.
Notes: (Read only property)

11.28.8 Model as LCMS2MLUMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The model string.
Notes: (Read only property)

11.28.9 ProfileID as Memoryblock

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The profile ID.
Notes: 16 bytes and typically the result of a MD5.
(Read only property)

11.28.10 Technology as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The technology value.
Notes: Use one of the following constants: kcmsSigDigitalCamera, kcmsSigFilmScanner, kcmsSigReflectiveScanner, kcmsSigInkJetPrinter, kcmsSigThermalWaxPrinter, kcmsSigElectrophotographicPrinter, kcmsSigElectrostaticPrinter, kcmsSigDyeSublimationPrinter, kcmsSigPhotographicPaperPrinter, kcmsSigFilmWriter, kcmsSigVideoMonitor, kcmsSigVideoCamera, kcmsSigProjectionTelevision, kcmsSigCRTDisplay, kcmsSigPMDisplay, kcmsSigAMDisplay, kcmsSigPhotoCD, kcmsSigPhotoImageSetter, kcmsSigGravure, kcmsSigOffsetLithography, kcmsSigSilkscreen, kcmsSigFlexography, kcmsSigMotionPictureFilmScanner, kcmsSigMotionPictureFilmRecorder, kcmsSigDigitalMotionPictureCamera or kcmsSigDigitalCinemaProjector.
(Read and Write property)

11.29 class LCMS2SequenceMBS

11.29.1 class LCMS2SequenceMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Profile sequence descriptors.
Notes: Profile sequence can be read/written by using cmsReadTag and cmsWriteTag functions.

11.29.2 Methods

11.29.3 Constructor(context as LCMS2ContextMBS, Count as UInt32)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new sequence with the given number of entries.
Example:

dim d as new LCMS2SequenceMBS(nil, 5)
MsgBox str(d.Count)

Notes: On success the handle property is not zero.

11.29.4 Properties

11.29.5 Count as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of sequence descriptions used in this class.
Notes: (Read only property)

11.29.6 Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.29.7   Description(index as Integer) as LCMS2SequenceDescriptionMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The sequence descriptions.
Notes: Index from 0 to count-1.
(Read and Write computed property)

11.30 class LCMS2StageMBS

11.30.1 class LCMS2StageMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A pipeline stage.
Notes: Stages are single-step operations that can be chained to create pipelines. Actual stage types does include matrices, tone curves, Look-up interpolation and user-defined. There are functions to create new stage types and a plug-in type to allow stages to be saved in multi profile elements tag types. See the plug-in API for further details.
Blog Entries

- MBS Xojo / Real Studio Plugins, version 15.3pr5

- MBS Real Studio Plugins, version 12.1pr1

- MBS Releases the MBS Real Studio plug-ins in version 12.0

- MBS Real Studio Plugins, version 12.0pr5

11.30.2 Methods

11.30.3 CLutFloatValues as Double()

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns CLut floating point values.
Notes: Only if stage is from type kcmsSigCLutElemType and CLutHasFloatValues = true.

11.30.4 CLutParamsSamples as UInt32()

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The sample counts in the CLut parameters.
Notes: Valid on all kinds of tables.

11.30.5 CLutUInt16Values as UInt16()

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns CLut integer values.
Notes: Only if stage is from type kcmsSigCLutElemType and CLutHasFloatValues = false.

11.30.6   CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a 16 bits multidimensional lookup table (CLUT).
Notes: Each dimension has same resolution.

Context: Pointer to a user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

11.30.7   CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a 16 bits multidimensional lookup table (CLUT).
Notes: Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter. The recommended way is to set Table to nil and use StageSampleCLut16bit with a event, because this way the implementation is independent of the selected number of grid points.

Context: Pointer to a user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Memoryblock with a table of UInt16, holding initial values for nodes. If nil the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

- 11.30.6 CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan

11.30.8 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as UInt16) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a 16 bits multidimensional lookup table (CLUT).
Example:

```
// creates CLUT with 17 grid points, 3 input channels RGB and 4 output channels CMYK

dim data() as UInt16

// fill all the data into the table upfront, RGB to CMYK

dim c,m,y,k as Double

for Grid0 as Integer = 0 to 16 // 17 grid, 1st input
dim r as Double = Grid0 / 16
for Grid1 as Integer = 0 to 16 // 17 grid, 2nd input
dim g as Double = Grid0 / 16
for Grid2 as Integer = 0 to 16 // 17 grid, 3rd input
dim b as Double = Grid0 / 16

// some bad conversion

c = r
m = g
y = b
k = 0

// fill array with values
data.Append 65535 * c
data.Append 65535 * m
data.Append 65535 * y
data.Append 65535 * k

next
next
next

dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLut16bit(nil, 17, 3, 4, data)
break
```

Notes: Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter.

Context: Pointer to a user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
values: array of UInt16, holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

11.30.9   CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Similar to CreateStageWithCLut16bit, but it allows different granularity on each CLUT dimension.
Notes: Context: user-defined context cargo.
clutPoints: Memoryblock with array [inputChan] of UInt32 holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

11.30.10 CreateStageWithCLut16bitGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Similar to CreateStageWithCLut16bit, but it allows different granularity on each CLUT dimension.
Notes: Context: user-defined context cargo.
clutPoints: Memoryblock with array [inputChan] of UInt32 holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Memoryblock with table of UInt16, holding initial values for nodes. If nil the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

- 11.30.9 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 440

- 11.30.11 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS 441

11.30.11 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Similar to CreateStageWithCLut16bit, but it allows different granularity on each CLUT dimension.
Example:

// create CLUT with 15 grid points for 1st channel, 16 for 2nd channel and 17 for 3rd channel
dim ChannelGridPoints(2) as UInt32
ChannelGridPoints(0) = 15
ChannelGridPoints(1) = 16
ChannelGridPoints(2) = 17

dim noData() as UInt16 = nil
dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLut16bitGranular(nil, ChannelGridPoints, 3, 4, noData)

break

Notes: Context: user-defined context cargo.
clutPoints: Array [inputChan] of UInt32 holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Table of UInt16, holding initial values for nodes. If nil/empty the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

11.30.12   CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a float multidimensional lookup table (CLUT).
Notes: Each dimension has same resolution.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

11.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a float multidimensional lookup table (CLUT).
Notes: Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter. The recommended way is to set Table to nil and use StageSampleCLutFloat with an event, because this way the implementation is independent of the selected number of grid points.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: Memoryblock with a table of Single (Float32) values, holding initial values for nodes. If nil the CLUT is initialized to zero.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

11.30.14 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a float multidimensional lookup table (CLUT).
Example:

```
// creates CLUT with 17 grid points, 3 input channels and 4 output channels
dim noData() as Double = nil
dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLutFloat(nil, 17, 3, 4, noData)

break
```

Notes: Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
values: Array of double values, holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

11.30.15   CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a float multidimensional lookup table (CLUT).
Example:

```
// creates CLUT with 17 grid points, 3 input channels RGB and 4 output channels CMYK

dim data() as Single

// fill all the data into the table upfront, RGB to CMYK

dim c,m,y,k as Double

for Grid0 as Integer = 0 to 16 // 17 grid, 1st input
dim r as Double = Grid0 / 16
for Grid1 as Integer = 0 to 16 // 17 grid, 2nd input
dim g as Double = Grid0 / 16
for Grid2 as Integer = 0 to 16 // 17 grid, 3rd input
dim b as Double = Grid0 / 16

// some bad conversion
```

```
c = r
m = g
y = b
k = 0

// fill array with values
data.Append c
data.Append m
data.Append y
data.Append k

next
next
next

dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLutFloat(nil, 17, 3, 4, data)

break
```

Notes: Each dimension has same resolution. The CLUT can be initialized by specifying values in Table parameter.

Context: user-defined context cargo.
GridPoints: the number of nodes (same for each component).
inputChan: Number of input channels.
outputChan: Number of output channels.
values: Array of single (Float32) values, holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

11.30.16   CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Similar to CreateStageWithCLutFloat, but it allows different granularity on each CLUT dimension.
Notes: Context: user-defined context cargo.
clutPoints: Memoryblock with Array of UInt32 [inputChan] holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.

Returns a pipeline stage on success, nil on error.
See also:

11.30.17   CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Similar to CreateStageWithCLutFloat, but it allows different granularity on each CLUT dimension.
Notes: Context: user-defined context cargo.
clutPoints: Memoryblock with Array of UInt32 [inputChan] holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: a pointer to a table of Singles (Float32), holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if table memoryblock is not empty/nil, but has wrong size.
See also:

11.30.18 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle() as Single) as LCMS2StageMBS

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Similar to CreateStageWithCLutFloat, but it allows different granularity on each CLUT dimension.
Example:

```
// create CLUT with 15 grid points for 1st channel, 16 for 2nd channel and 17 for 3rd channel
dim ChannelGridPoints(2) as UInt32
ChannelGridPoints(0) = 15
ChannelGridPoints(1) = 16
ChannelGridPoints(2) = 17

dim noData() as Single = nil
dim CLUT as LCMS2StageMBS = LCMS2StageMBS.CreateStageWithCLutFloatGranular(nil, Channel-
GridPoints, 3, 4, noData)
Break
```

Notes: Context: user-defined context cargo.
clutPoints: Array of UInt32 [inputChan] holding the number of nodes for each component.
inputChan: Number of input channels.
outputChan: Number of output channels.
Table: a table of Singles (Float32), holding initial values for nodes.

Returns a pipeline stage on success, nil on error.
Raises exception if values array is not empty/nil, but has wrong size.
See also:

- 11.30.16 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 446

- 11.30.17 CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 446

11.30.19 CreateStageWithIdentity(context as LCMS2ContextMBS, Channels as UInt32) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates an empty (identity) stage that does no operation.
Notes: May be needed in order to save the pipeline as AToB/BToA tags in ICC profiles.

Context: user-defined context cargo.
Channels: Number of channels

Returns a pipeline stage on success, nil on error.

11.30.20   CreateStageWithMatrix(context as LCMS2ContextMBS, Rows as UInt32, Cols as UInt32, Matrix as Memoryblock, Offset as Memoryblock = nil) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains a matrix plus an optional offset.
Notes: Note that Matrix is specified in double precision, whilst CLUT has only float precision. That is because an ICC profile can encode matrices with far more precision that CLUTS.

Context: user-defined context cargo.
Rows, Cols: Dimensions of matrix
Matrix: Memoryblock with a matrix of [Rows, Cols] (double values, 8 byte per value)
Offset: Memoryblock with a vector of [Cols] , nil if no offset is to be applied.

Returns a pipeline stage on success, nil on error.

11.30.21   CreateStageWithToneCurves(context as LCMS2ContextMBS, ChannelCount as Integer) as LCMS2StageMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains n channels tone curves, one per channel.
Notes: Setting Curves to nil forces identity (1:1) curves to be used. The stage keeps and owns a private copy of the tone curve objects.

Context: user-defined context cargo.
Curvess: Optionally, an array of tone curves objects, one per channel.

Returns a pipeline stage on success, nil on error.
See also:

- 11.30.22 CreateStageWithToneCurves(context as LCMS2ContextMBS, Channels() as LCMS2ToneCurveMBS) as LCMS2StageMBS   449

11.30.22 CreateStageWithToneCurves(context as LCMS2ContextMBS, Channels() as LCMS2ToneCurveMBS) as LCMS2StageMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a stage that contains n channels tone curves, one per channel.
Notes: Setting Curves to nil forces identity (1:1) curves to be used. The stage keeps and owns a private copy of the tone curve objects.

Context: user-defined context cargo.
Curvess: Optionally, an array of tone curves objects, one per channel.

Returns a pipeline stage on success, nil on error.
See also:

- 11.30.21 CreateStageWithToneCurves(context as LCMS2ContextMBS, ChannelCount as Integer) as LCMS2StageMBS 448

11.30.23 CubeSize(clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the number of values needed for a CLUT with given dimensions.
Notes: This is a helper function, so you can know how big the table for CreateStageWithCLut16bitGranular or CreateStageWithCLutFloatGranular must be.
See also:

- 11.30.24 CubeSize(GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32 449

11.30.24 CubeSize(GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32

Plugin Version: 15.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the number of values needed for a CLUT with given dimensions.
Notes: This is a helper function, so you can know how big the table for CreateStageWithCLut16bit or CreateStageWithCLutFloat must be.
See also:

- 11.30.23 CubeSize(clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32 449

11.30.25 MatrixOffsets as Double()

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns array with matrix offsets.
Notes: Only if stage is from type kcmsSigMatrixElemType and.

11.30.26 MatrixValues as Double()

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns array with matrix values.
Notes: Only if stage is from type kcmsSigMatrixElemType and.

11.30.27 SampleCLut16bit(sampler as LCMS2StageSamplerMBS, Flags as Integer = 0) as boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Iterate on all nodes of a given CLUT stage, calling a 16-bit sampler on each node.
Notes: Those functions (SampleCLut16bit and SampleCLutFloat) are provided to populate CLUT stages in a way that is independent of the number of nodes. The programmer has to provide an object with event that will be invoked on each CLUT node. LittleCMS does fill the In parameter with the coordinates that addresses the node. It also fills the Out parameter with CLUT contents on the node, so this can be used also to get CLUT contents after reading it from an ICC profile. In this case, a special flag can be specified to make sure the CLUT is being accessed as read-only and not modified (kSamplerInspect).

Works only with CLut stage objects and returns false if the object is not a Clut.

Sampler: The object to receive events.
Flags: Bit-field flags for different options. Only kSamplerInspect is currently supported.

Returns true on success, false on error.

11.30.28 SampleCLutFloat(sampler as LCMS2StageSamplerMBS, Flags as Integer = 0) as boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Iterate on all nodes of a given CLUT stage, calling a float sampler on each node.
Notes: Those functions (SampleCLut16bit and SampleCLutFloat) are provided to populate CLUT stages

in a way that is independent of the number of nodes. The programmer has to provide an object with event that will be invoked on each CLUT node. LittleCMS does fill the In parameter with the coordinates that addresses the node. It also fills the Out parameter with CLUT contents on the node, so this can be used also to get CLUT contents after reading it from an ICC profile. In this case, a special flag can be specified to make sure the CLUT is being accessed as read-only and not modified (kSamplerInspect).

Works only with CLut stage objects and returns false if the object is not a Clut.

Sampler: The object to receive events.
Flags: Bit-field flags for different options. Only kSamplerInspect is currently supported.

Returns true on success, false on error.

11.30.29   ToneCurves as LCMS2ToneCurveMBS()

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns array with tone curves.
Notes: Only if stage is from type kcmsSigCurveSetElemType and.

11.30.30   Properties

11.30.31   CLutEntries as Integer

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of entries in the CLut.
Notes: Only if stage is from type kcmsSigCLutElemType.
(Read only property)

11.30.32   CLutHasFloatValues as Boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this CLut has floating point values.
Notes: Only if stage is from type kcmsSigCLutElemType.
(Read only property)

11.30.33   CLutParamsInputs as Integer

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of input parameters for in the CLut parameters.
Notes: Value is <>1 only in 3D interpolation.
(Read only property)

11.30.34   CLutParamsOutputs as Integer

Plugin Version: 20.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of output parameters for in the CLut parameters.
Notes: Value is <>1 only in 3D interpolation.
(Read only property)

11.30.35   Data as Ptr

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The raw stage data.
Notes: (Read only property)

11.30.36   Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.30.37   InputChannels as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of input channels of a given stage object.
Notes: (Read only property)

11.30.38   NextItem as LCMS2StageMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns next stage in pipeline list, or nil if end of list.
Notes: Intended for iterators.
(Read only property)

11.30.39   OutputChannels as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of output channels of a this stage object.
Notes: (Read only property)

11.30.40   Type as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the type of a given stage object.
Notes: Use this type constants: kcmsSigCurveSetElemType, kcmsSigMatrixElemType, kcmsSigCLutElem-Type, kcmsSigBAcsElemType, kcmsSigEAcsElemType, kcmsSigXYZ2LabElemType, kcmsSigLab2XYZElem-Type, kcmsSigNamedColorElemType, kcmsSigLabV2toV4, kcmsSigLabV4toV2, kcmsSigIdentityElemType.
(Read only property)

11.30.41   Constants

Constants

Constant	Value	Description
kSamplerInspect	&h01000000	One of the flags for Sampling. Use this flag to prevent changes being written to destination when using SampleCLutFloat or SampleCLut16bit.

11.31 class LCMS2StageSamplerMBS

11.31.1 class LCMS2StageSamplerMBS

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for getting sampler callback.
Blog Entries

- MBS Real Studio Plugins, version 12.1pr1

11.31.2 Methods

11.31.3 SliceSpaceFloat(Inputs as UInt32, values() as UInt32) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Slices target space executing a floating point callback of type cmsSAMPLERFLOAT.
Notes: Parameters:
Inputs: Number of components in target space.
clutPoints: Array [nInputs] holding the division slices for each component.
Calls Floating point sample event to execute on each slice.

Returns true on success, false on error.

11.31.4 SliceSpaceInteger(Inputs as UInt32, values() as UInt32) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Slices target space executing a 16 bits callback of type cmsSAMPLER16.
Notes: Parameters:
Inputs: Number of components in target space.
values: Array [nInputs] holding the division slices for each component.

Calls 16 bit Sample event to execute on each slice.

Returns true on success, false on error.

11.31.5 Events

11.31.6 SamplerFloat(InValues as Ptr, OutValues as Ptr, InputChannels as Integer, OutputChannels as Integer) as boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

Function: Sampler event called by SampleCLutFloat.
Notes: In and Out point to 32 bit float values, so please use Single property to access.
InputChannels and OutputChannels are the number of channels.

11.31.7 SamplerInteger(InValues as Ptr, OutValues as Ptr, InputChannels as Integer, OutputChannels as Integer) as boolean

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: .

Function: Sampler event called by SampleCLut16bit.
Notes: In and Out point to 16 bit unsigned integer values, so please use UInt16 property to access.
InputChannels and OutputChannels are the number of channels.

11.32   class LCMS2ToneCurveMBS

11.32.1   class LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a tone curve or gamma.
Blog Entries

- MBS Releases the MBS Real Studio plug-ins in version 12.0

- MBS Real Studio Plugins, version 12.0pr4

11.32.2   Methods

11.32.3   BuildGamma(context as LCMS2ContextMBS, gamma as Double) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Simplified wrapper to BuildParametricToneCurve.
Example:

dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.2)
MsgBox str(t.EstimateGamma)

Notes: Builds a parametric curve of type 1.

Context: user-defined context object.
Gamma: Value of gamma exponent

Returns a newly created tone curve object on success, nil on error.

11.32.4   BuildParametricToneCurve(context as LCMS2ContextMBS, Type as Integer, params() as Double) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Builds a parametric tone curve.
Notes: Parameters:
context: user-defined context object.
Type: Number of parametric tone curve. (see LCMS2 manual)

Params: Array of tone curve parameters.

Returns a newly created tone curve object on success, nil on error.

11.32.5 BuildSegmentedToneCurve(context as LCMS2ContextMBS, Segments() as LCMS2CurveSegmentMBS) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Builds a tone curve from given segment information.
Notes: context: Puser-defined context object
Segments: Array of segments

Returns a newly created tone curve object on success, nil on error.

11.32.6 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as Single) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Builds a tone curve based on a table of floating point values.
Example:

dim values(-1) as Single

for i as Integer = 0 to 9
values.Append 0.5 + i*0.02
next

dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildTabulatedToneCurve(nil, values)

dim items(-1) as string
for i as Integer = 0 to 10
dim v as Single = t.EvalToneCurveFloat(i/10.0)
items.Append str(i/10.0)+" ->"+str(v)
next

MsgBox Join(items,EndOfLine)

Notes: Tone curves built with this function are not restricted to 0...1.0 domain.

context: user-defined context object.
values: Array of samples. Domain of samples is 0...1.0

Returns a newly created tone curve object on success, nil on error.
See also:

- 11.32.7 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as UInt16) as LCMS2ToneCurveMBS 458

11.32.7   BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as UInt16) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Builds a tone curve based on a table of 16-bit values. Tone curves built with this function are restricted to 0...1.0 domain.
Notes: context: user-defined context object.
values: Array of samples. Domain is 0...65535 (UInt32).

Returns a newly created tone curve object on success, nil on error.
See also:

- 11.32.6 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as Single) as LCMS2ToneCurveMBS 457

11.32.8   EstimatedTable as UInt16()

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Tone curves do maintain a shadow low‚Äêresolution tabulated representation of the curve. This function returns an array with this table.

11.32.9   EstimatedTableEntries as UInt32

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Tone curves do maintain a shadow low‚Äêresolution tabulated representation of the curve. This function returns the number of entries such table has.

11.32.10   EstimateGamma(Precision as Double = 0.01) as Double

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Estimates the apparent gamma of the tone curve by using least squares fitting to a pure exponential expression in the f(ùë•) = ùë•.
Example:

dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.2)
MsgBox str(t.EstimateGamma)

Notes: Precision: The maximum standard deviation allowed on the residuals, 0.01 is a fair value, set it to a big number to fit any curve, mo matter how good is the fit.

Returns the estimated gamma at given precision, or -1.0 if the fitting has less precision.

11.32.11   EvalToneCurve16(value as UInt16) as UInt16

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates the given 16-bit number across the given tone curve.
Notes: This function is significantly faster than EvalToneCurveFloat, since it uses a pre-computed 16-bit lookup table.
Value: 16 bit Number to evaluate
Returns operation result

11.32.12   EvalToneCurveFloat(value as Single) as Single

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates the given floating-point number across the given tone curve.
Example:

dim t1 as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 1.0)
dim t2 as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.0)
dim t3 as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 3.0)

dim v1 as Double = t1.EvalToneCurveFloat(0.5)
dim v2 as Double = t2.EvalToneCurveFloat(0.5)
dim v3 as Double = t3.EvalToneCurveFloat(0.5)

MsgBox str(v1)+" "+str(v2)+" "+str(v3)

Notes: Value: floating point number to evaluate
Returns the result.

11.32.13   IsDescending as Boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if f(0) >f(1) , false otherwise.
Notes: Does not take unbounded parts into account.

11.32.14   IsLinear as Boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns an estimation of cube being an identity (1:1) in the [0..1] domain.
Notes: Does not take unbounded parts into account. This is just a coarse approximation, with no mathematical validity.

11.32.15   IsMonotonic as Boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns an estimation of monotonicity of curve in the [0..1] domain.
Example:

dim t as LCMS2ToneCurveMBS = LCMS2ToneCurveMBS.BuildGamma(nil, 2.2)
MsgBox "IsMonotonic: "+str(t.IsMonotonic)

Notes: Does not take unbounded parts into account. This is just a coarse approximation, with no mathematical validity.

11.32.16   IsMultisegment as Boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if the tone curve contains more than one segment, false if it has only one segment.

11.32.17   JoinToneCurve(context as LCMS2ContextMBS, X as LCMS2ToneCurveMBS, Y as LCMS2ToneCurveMBS, nPoints as UInt32) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Composites two tone curves in the form ùëå,àí1(ùëã(ùë°)).

Notes: context: user-defined context object.
X, Y : Tone curve objects.
nPoints: Sample rate for resulting tone curve.

Returns a newly created tone curve object on success, nil on error.

11.32.18 ParametricType as Integer

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the parametric type.

11.32.19 Reverse as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a tone curve that is the inverse f-1 of given tone curve.
Notes: Returns a newly created tone curve object on success, nil on error.
See also:

11.32.20 Reverse(nResultSamples as Integer) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a tone curve that is the inverse f-1 of given tone curve.
Notes: In the case it couldn't be analytically reversed, a tablulated curve of nResultSamples is created.
nResultSamples: Number of samples to use in the case origin tone curve couldn't be analytically reversed
Returns a newly created tone curve object on success, nil on error.
See also:

11.32.21 Smooth(lambda as Double) as Boolean

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Smoothes tone curve according to the lambda parameter.
Notes: Lambda: degree of smoothing.
Returns true on success, false on error.

11.32.22   Properties

11.32.23   Handle as Integer

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.33 class LCMS2TransformMBS

11.33.1 class LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a LCMS 2.x transformation.
Blog Entries

- MonkeyBread Software Releases the MBS Xojo Plugins in version 23.1

- MBS Xojo Plugins, version 23.1pr1

- Multithreaded plugin functions can increase speed of Xojo application

- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0

- MBS Xojo Plugins, version 20.0pr5

- MBS Xojo Plugins, version 19.6pr1

- MBS Xojo Plugins, version 19.5pr8

- MBS Xojo / Real Studio Plugins, version 15.0pr6

- ICC color profiling

- MBS Real Studio Plugins, version 12.4pr1

11.33.2 Methods

11.33.3 ChangeBuffersFormat(InputFormat as UInt32, OutputFormat as UInt32) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function does change the encoding of buffers in a yet-existing transform.
Notes: Not all transforms can be changed, cmsChangeBuffersFormat only works on transforms created originally with at least 16 bits of precision. This function is provided for backwards compatibility and should be avoided whenever possible, as it prevents transform optimization.

InputFormat: A bit-field format specifier as described in Formatters section.
OutputFormat: A bit-field format specifier as described in Formatters section.

Returns true on success and false on failure.

11.33.4   CreateExtendedTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, BPC() as boolean, Intents() as UInt32, AdaptationStates() as Double, GamutProfile as LCMS2ProfileMBS, GamutPCSposition as UInt32, InputFormat as UInt32, OutputFormat as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Extended form of multiprofile color transform creation, exposing all parameters for each profile in the chain.
Notes: All other transform cration functions are wrappers to this call.

Parameters:
context: Pointer to a user-defined context cargo.
Profiles: Array of handles to open profile objects.
BPC: Array of black point compensation states
GamutProfile: A profile holding gamut information for gamut check. Only used if cmsFLAGS_GAMUTCHECK specified. Set to nil for no gamut check.
GamutPCSPosition: Position in the chain of Lab/XYZ PCS to check against gamut profile Only used if cmsFLAGS_GAMUTCHECK specified.
InputFormat: Input format.
OutputFormat: Output format.
Intents: An array holding the intent codes.
Flags: Some flags to control it.

Returns a transform object on success, NULL on error.
See also cmsCreateExtendedTransform in the LCMS2 manual.

11.33.5   CreateMultiprofileTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a multi profile transformation.
Notes: User passes in an array of handles to open profiles. The returned color transform do "smelt" all profiles in a single devicelink. Color spaces must be paired with the exception of Lab/XYZ, which can be interchanged.

context: Optional context object.
Profiles: Array of open profile objects.
InputFormat: A bit-field format specifier as described in Formatters section.
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.

Flags: A combination of bit-field of kcmsFLAGS_* constants.

Returns a transform object on success, nil on error.
See also:

- 11.33.6 CreateMultiprofileTransform(Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 465

11.33.6 CreateMultiprofileTransform(Profiles() as LCMS2ProfileMBS, Input-Format as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a multi profile transformation.
Notes: User passes in an array of handles to open profiles. The returned color transform do "smelt" all profiles in a single devicelink. Color spaces must be paired with the exception of Lab/XYZ, which can be interchanged.

context: Optional context object.
Profiles: Array of open profile objects.
InputFormat: A bit-field format specifier as described in Formatters section.
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.
Flags: A combination of bit-field of kcmsFLAGS_* constants.

Returns a transform object on success, nil on error.
See also:

- 11.33.5 CreateMultiprofileTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 464

11.33.7 CreateProofingTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Same as CreateTransform(), but including soft-proofing.
Notes: A proofing transform does emulate the colors that would appear as the image were rendered on a specific device. That is, for example, with a proofing transform I can see how will look a photo of my

little daughter if rendered on my HP printer. Since most printer profiles does include some sort of gamut-remapping, it is likely colors will not look as the original. Using a proofing transform, it can be done by using the appropriate function. Note that this is an important feature for final users, it is worth of all color-management stuff if the final media is not cheap.

The obtained transform emulates the device described by the "Proofing" profile. Useful to preview final result without rendering to the physical medium. To enable proofing and gamut check you need to include following flags:

cmsFLAGS_GAMUTCHECK: Color out of gamut are flagged to a fixed color defined by the function kcms-SetAlarmCodes
cmsFLAGS_SOFTPROOFING: does emulate the Proofing device.

context: Optional context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code.
ProofingIntent: The intent code.
Flags: A combination of bit-field constants described in Table 42.

Returns transform object on success, nil on error.
See also:

- 11.33.8 CreateProofingTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS   466

11.33.8   CreateProofingTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Same as CreateTransform(), but including soft-proofing.
Notes: A proofing transform does emulate the colors that would appear as the image were rendered on a specific device. That is, for example, with a proofing transform I can see how will look a photo of my little daughter if rendered on my HP printer. Since most printer profiles does include some sort of gamut-remapping, it is likely colors will not look as the original. Using a proofing transform, it can be done by using the appropriate function. Note that this is an important feature for final users, it is worth of all color-management stuff if the final media is not cheap.

The obtained transform emulates the device described by the "Proofing" profile. Useful to preview final result without rendering to the physical medium. To enable proofing and gamut check you need to include following flags:

cmsFLAGS_GAMUTCHECK: Color out of gamut are flagged to a fixed color defined by the function kcms-SetAlarmCodes
cmsFLAGS_SOFTPROOFING: does emulate the Proofing device.

context: Optional context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code.
ProofingIntent: The intent code.
Flags: A combination of bit-field constants described in Table 42.

Returns transform object on success, nil on error.
See also:

- 11.33.7 CreateProofingTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Proofing as LCMS2ProfileMBS, Intent as UInt32, ProofingIntent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 465

11.33.9 CreateTransform(context as LCMS2ContextMBS, InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a color transform for translating bitmaps.
Notes: context: Optional, the context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.
Flags: A combination of bit-field kcmsFLAGS_* constants.

Returns a transform object on success, NULL on error.
See also:

11.33.10   CreateTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a color transform for translating bitmaps.
Notes: context: Optional, the context object.
InputProfile: A profile object capable to work in input direction
InputFormat: A bit-field format specifier as described in Formatters section.
OutputProfile: A profile object capable to work in output direction
OutputFormat: A bit-field format specifier as described in Formatters section.
Intent: The intent code, as described in Intents section.
Flags: A combination of bit-field kcmsFLAGS_* constants.

Returns a transform object on success, NULL on error.
See also:

11.33.11   ToDeviceLink(Version as Double, Flags as UInt32) as LCMS2ProfileMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Generates a device-link profile from a given color transform.
Notes: This profile can then be used by any other function accepting profile handle. Depending on the specified version number, the implementation of the devicelink may vary. Accepted versions are in range 1.0...4.3

Version: The target devicelink version number.
Flags: A combination of bit-field constants kcmsFLAGS_*.

Returns an ICC profile object on success, nil on error.

11.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps according of parameters setup when creating the color transform.
Notes: bitmap: the input and output bitmap.

Returns true on success.
Size of input and output bitmaps must match.
Please make sure RowBytes is either zero for both (block mode) or is correct (row by row mode).
Please make sure input and output color space types of transform match the one in the bitmap.
See also:

- 11.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean 469

- 11.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 469

11.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function translates bitmaps according of parameters setup when creating the color transform.
Notes: inBitmap: the input bitmap.
outBitmap: the output bitmap.

Returns true on success.
Size of input and output bitmaps must match.
Please make sure RowBytes is either zero for both (block mode) or is correct (row by row mode).
Please make sure input and output color space types of transform match the those in the bitmaps.
See also:

- 11.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean 469
- 11.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 469

11.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function translates bitmaps according of parameters setup when creating the color transform.
Notes: InputBuffer: A pointer to the input bitmap.

OutputBuffer: A pointer to the output bitmap.
Size: the number of PIXELS to be transformed.

Returns true on success.
See also:

11.33.15   TransformLineStride(inBitmap as Ptr, outBitmap as Ptr, PixelsPer-Line as UInt32, LineCount as UInt32, BytesPerLineIn as UInt32, BytesPerLineOut as UInt32, BytesPerPlaneIn as UInt32, BytesPer-PlaneOut as UInt32) as boolean

Plugin Version: 16.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps with complex organization.
Notes: Each bitmap may contain several lines, and every may have padding. The distance from one line to the next one is BytesPerLine { In/Out } . In planar formats, each line may hold several planes, each plane may have padding. Padding of lines and planes should be same across all bitmap. I.e. all lines in same bitmap have to be padded in same way. This function may be more efficient that repeated calls to Transform(), especially when customized plug-ins are being used.

Parameters:
InputBuffer: A pointer to the input bitmap
OutputBuffer: A pointer to the output bitmap.
PixelsPerLine: The number of pixels for line, which is same on input and in output.
LineCount: The number of lines, which is same on input and output
BytesPerLine { In,Out } : The distance in bytes from one line to the next one.
BytesPerPlaneIn { In,Out } : The distance in bytes from one plane to the next one inside a line. Only applies in planar formats.

Returns true on success.

11.33.16   TransformLineStrideMT(inBitmap as Ptr, outBitmap as Ptr, PixelsPer-Line as UInt32, LineCount as UInt32, BytesPerLineIn as UInt32, BytesPerLineOut as UInt32, BytesPerPlaneIn as UInt32, BytesPer-PlaneOut as UInt32, ThreadCount as Integer = 1) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps with complex organization.
Notes: Same as TransformLineStride, but with thread support.

ThreadCount: New in MBS Plugin 20.0. If value is zero, we do work on the calling thread. If value is 1, we start a new preemptive thread to do the work and yield on the Xojo thread. If value is >1, we create that many threads and do the split the work to those threads.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

11.33.17 TransformMT(bitmap as LCMS2BitmapMBS, ThreadCount as Integer = 1) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps according of parameters setup when creating the color transform.
Notes: Same as Transform, but with thread support.

ThreadCount: New in MBS Plugin 20.0. If value is zero, we do work on the calling thread. If value is 1, we start a new preemptive thread to do the work and yield on the Xojo thread. If value is >1, we create that many threads and do the split the work to those threads.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

11.33.18 TransformMT(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS ThreadCount as Integer = 1) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps according of parameters setup when creating the color transform.

Notes: Same as Transform, but with thread support.

ThreadCount: New in MBS Plugin 20.0. If value is zero, we do work on the calling thread. If value is 1, we start a new preemptive thread to do the work and yield on the Xojo thread. If value is >1, we create that many threads and do the split the work to those threads.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

11.33.19   TransformMT(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps according of parameters setup when creating the color transform.
Notes: Same as Transform, but with thread support.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.
See also:

11.33.20   TransformRGB(c as color) as color

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Convenience function to convert one RGB color.
Notes: Works for input/output data with Float (4 or 8 byte) or Integer (1, 2 or 4 bytes).

11.33.21 TransformStride(inBitmap as Ptr, outBitmap as Ptr, size as UInt32, Stride as UInt32) as boolean

Plugin Version: 12.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function translates bitmaps according of parameters setup when creating the color transform.
Notes: On planar-organized buffers, the parameter stride specifies the separation between planes, which may be different of the number of pixels to transform. The main application of this function is when several threads are transforming pixels from different zones of same planar buffer. Otherwise it is identical to other Transform functions.

InputBuffer: A pointer to the input bitmap.
OutputBuffer: A pointer to the output bitmap.
Size: the number of PIXELS to be transformed.
Stride: Plane separation on planar formats

Returns true on success.

11.33.22 TransformStrideMT(inBitmap as Ptr, outBitmap as Ptr, size as UInt32, Stride as UInt32) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Translates bitmaps with complex organization.
Notes: Same as TransformLineStride, but with thread support.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.
If you run several threads calling MT methods, you can get all CPU cores busy while main thread shows GUI with progress window.

11.33.23 Properties

11.33.24 AdaptationState as Double

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The adaptation state.
Notes: (Read only property)

11.33.25   context as LCMS2ContextMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The context object.
Notes: (Read and Write property)

11.33.26   EntryColorSpace as Integer

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The entry colorspace.
Notes: (Read only property)

11.33.27   EntryWhitePoint as LCMS2CIEXYZMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The entry white points.
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.28   ExitColorSpace as Integer

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The exit colorspace.
Notes: (Read only property)

11.33.29   ExitWhitePoint as LCMS2CIEXYZMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The exit white points.
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.30   GamutCheck as LCMS2PipelineMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A Pipeline holding the gamut check. It goes from the input space to bilevel.
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.31   Handle as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.
Notes: (Read and Write property)

11.33.32   InputColorant as LCMS2NamedColorListMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Input Colorant table.
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.33   InputFormat as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the input format associated with a given transform.
Notes: (Read only property)

11.33.34   Lut as LCMS2PipelineMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A Pipeline holding the full (optimized) transform.
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.35   NamedColorList as LCMS2NamedColorListMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Retrieve a named color list from a given color transform.
Notes: Returns named color list dictionary on success, nil on error.

Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.36   OriginalFlags as UInt32

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The original flags used to create transform.
Notes: (Read only property)

11.33.37   OutputColorant as LCMS2NamedColorListMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Output Colorant table (for n chans >CMYK)
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.38   OutputFormat as UInt32

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the output format associated with a given transform.
Notes: (Read only property)

11.33.39   RenderingIntent as UInt32

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The intent of this transform. That is usually the last intent in the profilechain, but may differ.
Notes: (Read only property)

11.33.40   Sequence as LCMS2SequenceMBS

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The profiles used to create the transform.
Notes: Only for information, so plugin may return a copy of the data.
(Read only property)

11.33.41 YieldToRB as Boolean

Plugin Version: 23.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the MT methods should yield.
Notes: If true (default), we yield to keep other threads running.
Can be set to false to disable yielding.
(Read and Write property)

11.34   class LCMS2UcrBgMBS

11.34.1   class LCMS2UcrBgMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for the cmsSigUcrBgType tag.
Notes: This is for Undercolorremoval and black generation.
Blog Entries

- MBS Real Studio Plugins, version 12.0pr4

11.34.2   Methods

11.34.3   Constructor(Ucr as LCMS2ToneCurveMBS = nil, Bg as LCMS2ToneCurveMBS = nil, Desc as LCMS2MLUMBS = nil)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new object with given values.

11.34.4   Properties

11.34.5   Bg as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The black generation value.
Notes: (Read and Write property)

11.34.6   Desc as LCMS2MLUMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The description.
Notes: (Read and Write property)

11.34.7   Ucr as LCMS2ToneCurveMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The undercolor removal setting.
Notes: (Read and Write property)

11.35   class LCMS2Vec3MBS

11.35.1   class LCMS2Vec3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a three dimension vector.
Example:

dim v as new LCMS2Vec3MBS(1,2,3)
MsgBox str(v.X)+" "+str(v.y)+" "+str(v.z)

Blog Entries

- MBS Real Studio Plugins, version 12.0pr4

11.35.2   Methods

11.35.3   Clone as LCMS2Vec3MBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of the vector.

11.35.4   Constructor(other as LCMS2Vec3MBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The copy constructor.
Example:

// make a vector
dim v as new LCMS2Vec3MBS(1,2,3)

// create a copy
dim w as new LCMS2Vec3MBS(v)

// show values
MsgBox str(w.X)+" "+str(w.y)+" "+str(w.z)

See also:

11.35.5 Constructor(v1 as Double = 0.0, v2 as Double = 0.0, v3 as Double = 0.0)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor to initialize the object with the given values.
Example:

dim v as new LCMS2Vec3MBS(1,2,3)
MsgBox str(v.X)+" "+str(v.y)+" "+str(v.z)

See also:

- 11.35.4 Constructor(other as LCMS2Vec3MBS)   480

11.35.6 Properties

11.35.7 X as Double

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first value.
Notes: (Read and Write property)

11.35.8 Y as Double

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The second value.
Notes: (Read and Write property)

11.35.9 Z as Double

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The third value.
Notes: (Read and Write property)

11.35.10 value(index as UInt32) as Double

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The values by index.
Notes: Index from 0 to 2.
(Read and Write computed property)

11.36 class LCMS2ViewingConditionsMBS

11.36.1 class LCMS2ViewingConditionsMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Viewing conditions.
Notes: From LCMS documenation: Please note those are CAM model viewing conditions, and not the ICC tag viewing conditions, which I'm naming cmsICCViewingConditions to make differences evident. Unfortunately, the tag cannot deal with surround La, Yb and D value so is basically useless to store CAM02 viewing conditions.

11.36.2 Methods

11.36.3 Clone as LCMS2ViewingConditionsMBS

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a copy of the object.

11.36.4 Constructor(other as LCMS2ViewingConditionsMBS)

Plugin Version: 12.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes object with values from other object.
See also:

11.36.5 Constructor(whitePoint as LCMS2CIEXYZMBS = nil, Yb as Double = 0.0, La as Double = 0.0, surround as Integer = 0, D_value as Double = 0.0)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new viewing conditions object.
See also:

11.36.6   Properties

11.36.7   D_value as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The D value value.
Notes: (Read and Write property)

11.36.8   La as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The La value.
Notes: (Read and Write property)

11.36.9   Surround as Integer

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The surround value.
Notes: Use this constants:
kAVG_SURROUND = 1
kDIM_SURROUND = 2
kDARK_SURROUND = Ôø°3
kCUTSHEET_SURROUND = 4
(Read and Write property)

11.36.10   whitePoint as LCMS2CIEXYZMBS

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The white point.
Notes: (Read and Write property)

11.36.11   Yb as Double

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The Yb value.
Notes: (Read and Write property)

Chapter 12

Pictures Import and Export

12.1 Globals

12.1.1 BitRotateMBS(Degree as Integer, InputData as Ptr, OutputData as Ptr, Width as Integer, Height as Integer, InputRowBytes as Integer = -1, OutputRowBytes as Integer = -1) as boolean

Plugin Version: 18.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Rotates 1bit image in memory.
Example:

Dim InputTIFF As TiffPictureMBS // your input file
Dim OutputTIFF as TiffPictureMBS // your output file

Dim inMB As MemoryBlock = InputTIFF.Scanlines(0, InputTIFF.Height)
Dim outMB As New MemoryBlock(OutputTIFF.BytesPerRow * (OutputTIFF.Height + 8))

Const PlateRotation = 90

Dim b As Boolean = BitRotateMBS(PlateRotation, inMB, outMB, InputTIFF.Width, InputTIFF.Height, InputTIFF.BytesPerRow, OutputTIFF.BytesPerRow)

Break

Notes: Degree can be -360, -270, -180, -90, 0, 90, 180 or 270 to rotate counter clockwise.
InputData points to an 1bit image with given width and height. InputRowBytes if defined tells how many bytes per row are used in the input image. If <= 0, we calculate it. OutputRowBytes defines row bytes for output image, which is different for 90/270 rotation.
Returns true on success or false on failure.
The function is optimized for 180 degree to be quicker if image size is multiply of 8.

For 90 and 270 degree, there is an optimization if width and height are a multiply of 8.
Blog Entries

- MonkeyBread Software Releases the MBS Xojo Plugins in version 18.4

- MBS Xojo Plugins, version 18.4pr5

- MBS Xojo Plugins, version 18.4pr4

Xojo Developer Magazine

- 17.1, page 11: News

- 16.6, page 9: News

12.1.2 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer) as Integer

Plugin Version: 6.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Splits a one bit CMYK file into different files.
Notes: Source file has 1 bit for each channel.
Error code is returned which is 0 for no error.
CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

CallbackTarget can be nil or must be an object with a method with the following declaration: "Progress(RowIndex as Integer, RowCount as Integer)"

Errorcodes:

See also:

- 12.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer, ReadLines as Integer, WriteLines as Integer) as Integer   488

12.1.3 Split1BitFileMBS(f as folderitem, fc as folderitem, fm as folderitem, fy as folderitem, fk as folderitem, width as Integer, height as Integer, CallbackTarget as object, CacheSizeRead as Integer, CacheSizeWrite as Integer, ReadLines as Integer, WriteLines as Integer) as Integer

Plugin Version: 6.3, Platforms: macOS, Linux, Windows, Targets: All.

1   not used
2   Failed to open f
3   Failed to open fc
4   Failed to open fm
5   Failed to open fy
6   Failed to open fk
7   Width<1
8   Height<1
9   Allocating read buffer failed
10   Allocating write buffer failed for c
11   Allocating write buffer failed for m
12   Allocating write buffer failed for y
13   Allocating write buffer failed for k
14   Read failed
15   Write failed for c
16   Write failed for m
17   Write failed for y
18   Write failed for k

Function: Splits a one bit CMYK file into different files.
Notes: Source file has 1 bit for each channel.
Error code is returned which is 0 for no error.
CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

CallbackTarget can be nil or must be an object with a method with the following declaration: "Progress(RowIndex as Integer, RowCount as Integer)"

ReadLines and WriteLines define how many rows to read in one I/O operation.

Errorcodes:

See also:

1	not used
2	Failed to open f
3	Failed to open fc
4	Failed to open fm
5	Failed to open fy
6	Failed to open fk
7	Width<1
8	Height<1
9	Allocating read buffer failed
10	Allocating write buffer failed for c
11	Allocating write buffer failed for m
12	Allocating write buffer failed for y
13	Allocating write buffer failed for k
14	Read failed
15	Write failed for c
16	Write failed for m
17	Write failed for y
18	Write failed for k

12.2   class PNGOptimizerMBS

12.2.1   class PNGOptimizerMBS

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: This class is a wrapper for the OptiPNG command line tool.
Example:

dim p as Picture = LogoMBS(500)

dim fi as FolderItem = SpecialFolder.Desktop.Child("test unoptimized.png")
if not fi.SaveAsPNGMBS(p,0) then
MsgBox "Failed to save PNG file."
Return
end if

dim fo as FolderItem = SpecialFolder.Desktop.Child("test optimized.png")
fo.Delete // delete if existed before

dim o as new PNGOptimizerMBS

o.YieldTicks=10 // give time for other threads

o.InputFile=fi
o.OutputFile=fo

if o.Optimize then
MsgBox "OK: Saved "+str(o.BytesSaved)
fo.Launch
else
MsgBox "failed"
end if

Notes: OptiPNG: Advanced PNG optimization program.
http://optipng.sourceforge.net/

Copyright (C) 2001-2008 Cosmin Truta.
OptiPNG is open-source software, and is distributed under the same licensing and warranty terms as libpng.

PNG optimization is described in detail in the PNG-Tech article "A guide to PNG optimization"
http://www.cs.toronto.edu/
textasciitilde cosmin/pngtech/optipng.html

The idea of running multiple compression trials with different PNG filters and zlib parameters is inspired from the pngcrush program by Glenn Randers-Pehrson.
The idea of performing lossless image reductions is inspired from the pngrewrite program by Jason Summers.
Blog Entries

- MBS Xojo Plugins, version 18.3pr3

- MBS REALbasic Plugins Version 10.4 release notes

- MBS REALbasic Plugins, version 10.4pr3

- MonkeyBread Software Releases the MBS REALbasic plugins 8.7

12.2.2 Methods

12.2.3 Optimize as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The main optimization function.
Notes: Returns true on success and false on failure.

12.2.4   Properties

12.2.5   BytesSaved as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: After the optimization this property shows how many bytes were saved.
Notes: (Read and Write property)

12.2.6   Debug as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Enables debug output.
Notes: (Read and Write property)

12.2.7   Fix as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Enable error recovery.
Notes: (Read and Write property)

12.2.8   Force as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Enforce writing of a new output file.
Notes: If the input image has a digital signature, the library will not optimize the file unless force=true.
(Read and Write property)

12.2.9   full as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to produce a full report on IDAT (might reduce speed).
Notes: (Read and Write property)

12.2.10 InputFile as FolderItem

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The file to process.
Notes: (Read and Write property)

12.2.11 interlace as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The interlace type (0-1).
Notes: Set by default to -1 for undefined.
(Read and Write property)

12.2.12 KeepBackup as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to keep a backup of the modified files.
Notes: If the file exists and KeepBackup=false an error is reported. If you set KeepBackup=True the old file is renamed.
(Read and Write property)

12.2.13 NoBitDepthReduction as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to not do a bit depth reduction.
Notes: Reducing the bit depth of the image data can reduce the file size.
(Read and Write property)

12.2.14 NoColorTypeReduction as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to not do a color type reduction.
Notes: If your PNG file has only 256 colors in use, the optimizer can use a color palette to save space.
(Read and Write property)

12.2.15　NoIDATRecompression as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to not recompress the image data.
Notes: (Read and Write property)

12.2.16　NoPaletteReduction as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to not reduce the palette.
Notes: If not all colors are used, the palette can be reduced in its size.
(Read and Write property)

12.2.17　OptimizationLevel as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The optimization level.
Notes: A value between 0 and 7.
Default is 2.
(Read and Write property)

12.2.18　OutputFile as FolderItem

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: The output file.
Notes: (Read and Write property)

12.2.19　Overwrite as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Overwrite existing files.
Notes: (Read and Write property)

12.2.20 Preserve as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to preserve file attributes if possible.
Notes: (Read and Write property)

12.2.21 Quiet as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Run in quiet mode.
Notes: (Read and Write property)

12.2.22 simulate as Boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the optimization runs only in simulation mode.
Notes: No file is written in simulation mode.
(Read and Write property)

12.2.23 Snip as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Cut one image out of multi-image or animation files.
Notes: (Read and Write property)

12.2.24 StripAll as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Strip metadata objects .
Notes: (Read and Write property)

12.2.25 Verbose as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Run in verbose mode / show copyright and version info.
Notes: (Read and Write property)

12.2.26 YieldTicks as Integer

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: How much time is given back to Xojo for other ticks.
Example:

dim p as new PNGOptimizerMBS
p.YieldTicks=6 // only use 1/10th of a second

Notes: If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

12.2.27 Events

12.2.28 Log(message as string)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

Function: The event to output a message to the log file.
Notes: You may want to show that to your advantaged users.

12.2.29 Panic(message as string)

Plugin Version: 10.4, Platforms: macOS, Linux, Windows, Targets: .

Function: Called if something really bad happend and the app needs to quit.

12.2.30 Progress(index as Integer, count as Integer)

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called for reporting ongoing process in the trials.
Notes: The library will try several PNG settings and report progress so you can update a progress bar.

12.2.31   ProgressBegin

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

Function: This event is called before the library starts to optimize.
Notes: You may want to show a progress dialog here.

12.2.32   ProgressEnd

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: .

Function: This event is called after the library finished.
Notes: You may want to hide your progress dialog here.

Chapter 13

PNG

13.1 Globals

13.1.1 PictureToPNGStringMBS(pic as picture, gamma as single = 0.0) as string

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a picture to a PNG string.
Notes: If the picture has no mask, no alpha channel is written to the file.
Returns "" on any error.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

13.1.2 PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a palette based RGB picture as a PNG file.
Notes: If the picture has no mask, no alpha channel is written to the file.
Colors must be an array with 256 values defining the palette.

Returns true on success and false on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:


```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE      = 8
const PNG_FILTER_SUB       = 16
const PNG_FILTER_UP        = 32
const PNG_FILTER_AVG       = 64
const PNG_FILTER_PAETH     = 128
const PNG_FILTER_ALL       = 248
```


See also:

13.1.3 PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single = 0.0) as string

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a picture to a PNG string.
Notes: Returns ”” on any error.

It uses the mask passed. If nil, no alpha channel is written to the file.
The mask from the picture is ignored.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction

zero: use default value (or value saved in file itself)
negative value: do not correct gamma
See also:

13.1.4   PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves a picture to a PNG string.
Notes: Returns ”” on any error.

It uses the mask passed. If nil, no alpha channel is written to the file.
The mask from the picture is ignored.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

If Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

```
const PNG_NO_FILTERS      = 0
const PNG_FILTER_NONE      = 8
const PNG_FILTER_SUB       = 16
const PNG_FILTER_UP        = 32
const PNG_FILTER_AVG       = 64
const PNG_FILTER_PAETH    = 128
const PNG_FILTER_ALL       = 248
```

Blog Entries

- Inside REAL Studio Web Edition

See also:

13.1.5 PNGStringToPictureMBS(data as string, gamma as single = 0.0, Allow-Damaged as boolean = false) as picture

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads PNG data from a string variable.
Notes: If the picture has an alpah channel the returned picture will have a mask.

Returns picture on success and nil on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

AllowDamaged: Whether to allow damaged PNG files to return a part of the image as picture.
Blog Entries

- MBS Xojo Plugins, version 18.4pr1

13.1.6 PNGStringToPNGPictureMBS(data as string, gamma as single = 0.0, AllowDamaged as boolean = false) as PNGPictureMBS

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads PNG data from a string variable.
Notes: Returns PNGPictureMBS object on success and nil on failure.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

AllowDamaged: Whether to allow damaged PNG files to return a part of the image as picture.

13.2 class PNGpictureMBS

13.2.1 class PNGpictureMBS

Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a PNG picture.
Notes: Based on LibPNG.
Blog Entries

- MBS Real Studio Plugins, version 12.5pr11

- MBS Real Studio Plugins, version 12.5pr8

- MBS Real Studio Plugins, version 11.3pr1

13.2.2 Methods

13.2.3 CombinePictureWithMask as picture

Plugin Version: 4.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a new picture which is created using the picture and it's mask.
Example:

dim t as TiffPictureMBS
' ...
canvas1.backdrop=t.CombinePictureWithMask

13.2.4 PNGLibVersion as string

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The version of the PNG library compiled into the plugin.
Notes: Please ask if you need a newer version.

13.2.5 Properties

13.2.6 height as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture.
Notes: (Read and Write property)

13.2.7   mask as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: The mask of the picture.
Notes: May be nil.
(Read and Write property)

13.2.8   pict as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: The picture data of the picture.
Notes: If this image is all black, you may use a different gamma setting.
(Read and Write property)

13.2.9   width as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the picture.
Notes: (Read and Write property)

13.2.10   Constants

Constants

Constant	Value	Description
kDefaultGamma	0	The default gamma constant.
		Pass this value to get the default gamma.
kDefaultNoGamma	-1	The no gamma constant.
		Pass this value to not do any gamma correction.

13.3 class PNGReaderMBS

13.3.1 class PNGReaderMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for reading PNG files.
Example:

dim Current as PictureMBS // global
dim f as FolderItem

f=GetopenFolderItem(FileTypes.Png)

if f<>Nil then
Current=nil

dim p as new PNGReaderMBS

if p.OpenFile(f) then
if p.ApplyOptions(0) then

Current=new PictureMBS(p.Width,p.Height,PictureMBS.ImageFormatRGB)

dim i,c as Integer

c=p.Height-1
for i=0 to c
Current.RowInFormat(i, PictureMBS.ImageFormatRGBA)=p.ReadRow
next

end if
end if
end if

Notes: Use this class to read PNG files row by row as memoryblock.

Based on LibPNG.
Blog Entries

- MBS Xojo Plugins, version 20.4pr3
- MonkeyBread Software Releases the MBS Xojo Plugins in version 20.2
- MBS Xojo Plugins, version 20.2pr7
- MBS Xojo Plugins, version 20.2pr4

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.5

- MBS Xojo Plugins, version 19.5pr8

- MBS Xojo Plugins in version 19.0

- MBS Plugins 11.1 Release notes

- MBS Plugins 10.3 Release Notes

- MBS REALbasic plug-ins version 9.4

Xojo Developer Magazine

- 18.1, page 10: News

- 17.2, page 11: News

13.3.2   Methods

13.3.3   ApplyOptions(gamma as double = 0.0, ScreenGamma as double = -1.0) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Applies various options.
Notes: The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

Added ScreenGamma parameter in plugin version 15.2. If you set both gamma and Screengamma to a value >0.0, the plugin will use those gamma values. If both are equal, no gamma correction is made.

16-bit images are always reduced to 8-bit images.

Returns true on success and false on failure. Calls ReadHeader method if needed.

13.3.4   CombinePictureWithMask as picture

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines the pict and the mask property to a picture with mask.

13.3.5   Open(file as folderitem, data as string) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens either the data string or the file.
Notes: Returns true on success.

13.3.6   OpenData(data as string) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a PNG file from the data string.
Notes: Returns true on success.

13.3.7   OpenFile(file as folderitem) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a file.
Example:

Dim p As New PNGReaderMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")

If p.OpenFile(f) Then
If p.ApplyOptions Then
If p.ReadPicture Then
window1.Backdrop = p.Pict
End If
end if
End If

Notes: Returns true on success.
See also:

13.3.8   OpenFile(Path as String) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a file.
Example:

```
Dim p As New PNGReaderMBS
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim path As String = f.NativePath

If p.OpenFile(path) Then
If p.ApplyOptions Then
If p.ReadPicture Then
window1.Backdrop = p.Pict
End If
end if
End If
```

Notes: Returns true on success.
See also:

13.3.9   OpenSpecialData(data as string) as boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** Same as OpenData but
with special handling of the png data.
Example:

```
dim f as FolderItem = getfolderitem("mbs.png")
dim b as BinaryStream = f.OpenAsBinaryFile(false) // BinaryStream.Open(f) in newer RB versions
dim s as string = b.Read(B.Length)

dim p as new PNGReaderMBS
if p.OpenSpecialData(s) then
if p.ApplyOptions(0) then
if p.ReadPicture then
Backdrop = p.Pict
Title = "OK"
else
Title = "Failed to read picture."
end if
else
Title = "Failed to apply options."
end if
else
Title = "Failed to open picture."
end if
```

Notes: This function can be used to read PNG files made for the Apple iPhone. The PNG is converted from the Apple format to the normal PNG format and passed to OpenData. In the SourceData property you can get the modified PNG data. Still this modified PNG data has the channels swapped, so you should read the image with the pict property.

On Mac OS X 10.8, the NSImage class also reads iOS optimized PNG files.

Deprecated as it does not read all files and we can't fix this old code. Please use a command line tool to convert instead.

13.3.10   PNGLibVersion as string

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The version of the PNG library compiled into the plugin.

13.3.11   ReadEXIF(byref exif as string) as boolean

Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the EXIF data block.
Notes: Returns true on success or false on failure.

13.3.12   ReadHeader as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads header of PNG.
Notes: This reads header and fill properties Width, Height, ColorType, OriginalColorType, InterlaceType and BitDepth.
Returns true on success and false on failure.

13.3.13   ReadICCProfile(byref name as string, byref compression as Integer, byref profile as string) as boolean

Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the ICC Profile from the PNG file.
Notes: Name is the profile name, compression the method used to compress the profile data and profile a string with the content of the profile as binary data.

Returns true on success.

13.3.14   ReadPicture as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the picture into the pict and mask properties.
Notes: Returns true on success.

13.3.15   ReadRow as memoryblock

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the next row as a memoryblock.
Example:

dim fSource as FolderItem = SpecialFolder.Desktop.Child("test.png") // some png with alpha
dim oPNGInput as new PNGReaderMBS

If oPNGInput.OpenFile(fSource) Then
If oPNGInput.ApplyOptions(0) Then

dim imgSource as New PictureMBS(oPNGInput.Width, oPNGInput.Height, PictureMBS.ImageFormatRGBA)

' Read row by row the file and puts it in a PictureMBS instance

dim nMax as Integer = oPNGInput.Height - 1
For nInd as Integer = 0 To nMax
imgSource.RowInFormat(nInd, PictureMBS.ImageFormatRGBA, true) = oPNGInput.ReadRow()
Next

' show only alpha/mask channel
Backdrop=imgSource.AlphaChannel.CopyPicture

' show Picture without mask
Backdrop=imgSource.CopyPicture

' show picture with mask
Backdrop=imgSource.CopyPictureWithMask

End If
End If

Notes: Returns nil on any error.
Format is RGBA as in the example with 4 bytes per pixel.
See also:

13.3.16 ReadRow(mem as memoryblock) as boolean

Plugin Version: 11.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the next row into the given memoryblock.
Notes: Returns false on any error and true on success.
Format is RGBA as in the example with 4 bytes per pixel.
Make sure the memoryblock is big enough. Else you risk a crash.

See also PNGReaderMBS.RowBytes.

ReadRow with reusing memoryblock is faster than allocating a new one for each row.
See also:

13.3.17 ReadRowAlphaOnly(mem as memoryblock) as boolean

Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the next row into the given memoryblock.
Notes: Returns false on any error and true on success.
Format is alpha channel as in the example with one byte per pixel.
Make sure the memoryblock has size from RowBytes property. Else you risk a crash.
The data in memoryblock is width bytes long, 1/4 of the size of the memoryblock.

See also PNGReaderMBS.RowBytes.

ReadRow with reusing memoryblock is faster than allocating a new one for each row.

13.3.18 ReadRowMaskOnly(mem as memoryblock) as boolean

Plugin Version: 14.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the next row into the given memoryblock.
Notes: Returns false on any error and true on success.

Format is mask (inverse alpha) as in the example with one byte per pixel.
Make sure the memoryblock has size from RowBytes property. Else you risk a crash.
The data in memoryblock is width bytes long, 1/4 of the size of the memoryblock.

See also PNGReaderMBS.RowBytes.
ReadRow with reusing memoryblock is faster than allocating a new one for each row.

13.3.19   ReadsRGBTag(byref file_srgb_intent as Integer) as boolean

Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the sRGB tag.
Notes: Returns true if the value was read into the given variable.

13.3.20   RowBytes as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The length of each row in bytes.

13.3.21   Properties

13.3.22   AllowDamaged as Boolean

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to return picture for files with damaged content.
Notes: e.g. a half downloaded PNG file can still be processed and may give you a preview for the file.
(Read and Write property)

13.3.23   BitDepth as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The bit depth of the PNG file.
Notes: The original value from file headers, not updated by ApplyOptions, even if we convert e.g. 1 bit to
gray for you.
(Read and Write property)

13.3.24 ChunkCacheMax as UInt32

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The maximum cache size for caching chunks.
Notes: The PNG specification sets no limit on the number of ancillary chunks allowed in a PNG datastream. By default, libpng imposes a limit of a total of 1000 sPLT, tEXt, iTXt, zTXt, and unknown chunks to be stored.
You can change the limit on the total number of such hunks that will be stored, with this property, where &h7fffffff means unlimited.
(Read and Write property)

13.3.25 ChunkMallocMax as UInt64

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The maximum allocation size for one chunk.
Example:

dim png as new PNGReaderMBS
png.chunkMallocMax=32 * 1024 * 1024

Notes: Libpng imposes a limit of 8 Megabytes (8,000,000 bytes) on the amount of memory that a compressed chunk other than IDAT can occupy, when decompressed.
You can query or change this limit with with this property.
Any chunks that would cause either of these limits to be exceeded will be ignored.
(Read and Write property)

13.3.26 ColorType as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The color type of the PNG file.
Notes: The value is a combination of this constants:

```
PNG_COLOR_MASK_PALETTE   = 1
PNG_COLOR_MASK_COLOR     = 2
PNG_COLOR_MASK_ALPHA     = 4
```

The PNG library will convert on reading every row into 32bit RGBA, so don't worry about this.

The OriginalColorType property is the color type of the file. ColorType property reports what ApplyOptions changed it to, so you know what ReadRow will put in the MemoryBlock.
(Read and Write property)

13.3.27   CompressionBufferSize as UInt64

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The zlib compression buffer size.
Notes: You can change the zlib compression buffer size to be used while reading compressed data with this property where the default size is 8192 bytes. Note that the buffer size is changed immediately and the buffer is reallocated immediately, instead of setting a flag to be acted upon later.
(Read and Write property)

13.3.28   ExpandGrayToRGB as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether grayscale images are expanded to RGB.
Notes: Set before ApplyOptions if you need this option.
Default is true.

Shall set transformations such that the grayscale image is converted to 24-bit RGB.

see png_set_gray_to_rgb function in libpng documentation.
(Read and Write property)

13.3.29   HasTransparency as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether a transparency block is included for palette images (tRNS).
Notes: Set by ReadHeader or ApplyOptions.
(Read only property)

13.3.30   Height as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture in pixels.

Notes: (Read and Write property)

13.3.31 InterlaceType as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The interlace setting.
Notes: (Read and Write property)

13.3.32 Interlacing as Integer

Plugin Version: 9.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the png file is interlaced.
Notes: Value is 1 if not interlaced and 7 if interlaced.
(Read and Write property)

13.3.33 InvertAlpha as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether alpha values should be inverted.
Notes: Set before ApplyOptions if you need this option.
Default is false.

see png_set_invert_alpha function in libpng documentation.
(Read and Write property)

13.3.34 Mask as Picture

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The mask of the picture.
Notes: (Read and Write property)

13.3.35 OriginalColorType as Integer

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The original color type of the PNG file.
Notes: The value is a combination of this constants:

```
 PNG_COLOR_MASK_PALETTE   = 1
  PNG_COLOR_MASK_COLOR    = 2
  PNG_COLOR_MASK_ALPHA    = 4
```

The PNG library will convert on reading every row into 32bit RGBA, so don't worry about this.

The OriginalColorType property is the color type of the file. ColorType property reports what ApplyOptions changed it to, so you know what ReadRow will put in the MemoryBlock.
(Read and Write property)

13.3.36   Pict as Picture

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The picture read.
Notes: (Read and Write property)

13.3.37   RGBToGray as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to convert RGB to grayscale.
Example:

dim png as PNGReaderMBS

// ask for gray only
png.RGBToGray = True

// avoid extra filler bytes for missing alpha channel
png.UseFiller = false

Notes: Set before ApplyOptions if you need this option.
Default is false.

see png_set_rgb_to_gray function in libpng documentation.
(Read and Write property)

13.3.38 RGBToGrayErrorAction as Integer

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Error handling option for Reduce RGB to grayscale.
Notes: Can be 1 for none, 2 for warn or 3 for error.
Default is 1.
(Read and Write property)

13.3.39 RGBToGrayGreen as Double

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The green coefficient to use for RGB to Gray conversion.
Notes: Default is -1 for default coefficients.
(Read and Write property)

13.3.40 RGBToGrayRed as Double

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The green coefficient to use for RGB to Gray conversion.
Notes: Default is -1 for default coefficients.
(Read and Write property)

13.3.41 SourceData as String

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The source data used in Open functions.
Example:

dim p as PNGReaderMBS // your reader

// write data to file
dim fo as FolderItem = SpecialFolder.Desktop.Child("mbsout.png")
dim bo as BinaryStream = fo.CreateBinaryFile("") // BinaryStream.Create(fo,true) in newer RB Versions

bo.Write p.SourceData

Notes: If you used OpenSpecialData, the data here is the PNG without the Apple modifications, but still with swapped colors.

This property is set by the OpenSpecialData, Open and OpenData functions.
(Read and Write property)

13.3.42   SourceFile as FolderItem

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The folderitem passed to the Open functions.
Notes: This property is set by the Open and OpenFile functions.
(Read and Write property)

13.3.43   SourcePath as String

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The source file path.
Notes: (Read and Write property)

13.3.44   StripAlpha as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to strip alpha.
Notes: Set before ApplyOptions if you need this option.
Default is false.

see png_set_strip_alpha function in libpng documentation.
(Read and Write property)

13.3.45   SwapRB as Boolean

Plugin Version: 10.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to swap red and blue channels.
Example:

dim p as new PNGReaderMBS
p.SwapRB = true

Notes: The PNG files for the iPhone have swapped channels so the iPhone does not need to swap them for display. One of the tricks Apple uses for making the iPhone faster.
This flag is set to true by OpenSpecialData.
(Read and Write property)

13.3.46 UseFiller as Boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether filler byte is used for RGB.
Notes: Set by ApplyOptions if needed.
Defines whether RGB is extended to 4 bytes with an extra filler byte if needed.

see png_set_filler function in libpng documentation.
(Read and Write property)

13.3.47 UserHeightMaximum as UInt32

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height maximum.
Notes: The PNG specification allows the width and height of an image to be as large as 2^{31}-1 (0x7fffffff), or about 2.147 billion rows and columns.
For safety, libpng imposes a default limit of 1 million rows and columns.
Larger images will be rejected immediately with a png_error() call. If you wish to change these limits, you can use this property to set your own limits (libpng may reject some very wide images anyway because of potential buffer overflow conditions).
(Read and Write property)

13.3.48 UserWidthMaximum as UInt32

Plugin Version: 20.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width maximum.
Notes: The PNG specification allows the width and height of an image to be as large as 2^{31}-1 (0x7fffffff), or about 2.147 billion rows and columns.
For safety, libpng imposes a default limit of 1 million rows and columns.
Larger images will be rejected immediately with a png_error() call. If you wish to change these limits, you can use this property to set your own limits (libpng may reject some very wide images anyway because of potential buffer overflow conditions).
(Read and Write property)

13.3.49   Width as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the picture in pixels.
Notes: (Read and Write property)

13.3.50   Events

13.3.51   Error(msg as string)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

Function: The PNG library has an error message for you.
Notes: Processing will stop soon.

13.3.52   Warning(msg as string)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

Function: The PNG library has a warning for you.

13.4 class PNGWriterMBS

13.4.1 class PNGWriterMBS

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class to write a PNG file.
Example:

```
dim Current as PictureMBS // your picture
dim f as FolderItem

f=GetsaveFolderItem(FileTypes.Png,"test.png")

if f<>Nil then
const PNG_COLOR_MASK_PALETTE = 1
const PNG_COLOR_MASK_COLOR = 2
const PNG_COLOR_MASK_ALPHA = 4

dim p as new PNGWriterMBS

p.Width=Current.Width
p.Height=Current.Height
p.Type=PNG_COLOR_MASK_COLOR
p.bpc=3
p.Rowbytes=p.Width*p.bpc

if p.OpenWriteDestination(f) then
if p.SetHeader(false, -1) then
if p.SetGamma(0) then
if p.WriteInfo then
dim i,c as Integer

c=p.Height-1
for i=0 to c
p.WriteRow current.RowInFormat(i, Current.ImageFormatRGB)
next

if p.WriteEnd then
MsgBox "OK"
end if
end if
end if
end if
end if
end if
```

Notes: You can use this class to write PNG files by row.

Based on LibPNG.
Blog Entries

- MBS Xojo Plugins, version 19.5pr6

- MBS Xojo Plugins in version 19.0

- MBS Xojo Plugins, version 19.0pr6

- MBS Xojo / Real Studio Plugins, version 15.0pr11

- MBS Real Studio Plugins, version 11.3pr13

- MBS REALbasic plug-ins version 9.4

Xojo Developer Magazine

- 17.2, page 11: News

13.4.2   Methods

13.4.3   CloseDestination

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Closes the file.

13.4.4   Finish as string

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Finishes the PNG file and returns the PNG file content as string.
Notes: Returns ”” on any error.

13.4.5   OpenWriteDestination(file as folderitem) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens the file to write.
Example:

Dim f As FolderItem = SpecialFolder.Desktop.Child(”test.png”)
Dim p As New PNGWriterMBS

```
Dim pic As Picture = LogoMBS(500)

If p.OpenWriteDestination(f) Then
If p.SetRGBPicture(pic) Then
If p.SetHeader(False, -1) Then
If p.SetGamma(0) Then
If p.WriteInfo Then
If p.WriteRows Then
If p.WriteEnd Then
MsgBox "OK"
End If
End If
End If
End If
End If
End If
End If
```

Notes: If you pass nil for the file, the data is collected in memory and you can get it on the end using the Finish method.
See also:

- 13.4.6 OpenWriteDestination(Path as String) as boolean 523

13.4.6 OpenWriteDestination(Path as String) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens the file to write.
Example:

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.png")
Dim path As String = file.NativePath

Dim p As New PNGWriterMBS
Dim pic As Picture = LogoMBS(500)

If p.OpenWriteDestination(path) Then
If p.SetRGBPicture(pic) Then
If p.SetHeader(False, -1) Then
If p.SetGamma(0) Then
If p.WriteInfo Then
If p.WriteRows Then
If p.WriteEnd Then
MsgBox "OK"
End If
```

End If
End If
End If
End If
End If
End If

Notes: If you pass "" for the file, the data is collected in memory and you can get it on the end using the Finish method.
See also:

13.4.7   PNGLibVersion as string

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The version of the PNG library compiled into the plugin.

13.4.8   SetAlphaData(alphas() as Integer, colors() as color) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the alpha data and the color palette.
Notes: The array can have up to 256 colors.
The color and the alpha arrays must have the same size.
Returns true on success.

13.4.9   SetAlphas as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes the alpha data to the file.
Notes: You must call SetAlphaData before.
Returns true on success.

13.4.10   SetEXIF(EXIFData as string) as boolean

Plugin Version: 19.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes the EXIF data block.
Notes: Returns true on success or false on failure.

13.4.11   SetGamma(gamma as Double = 0.0) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Defines the gamma value and other options for the PNG file.
Notes: Returns on success.

The gamma parameter defines what gamma correction is applied:
positive value: use the value as the gamma correction
zero: use default value (or value saved in file itself)
negative value: do not correct gamma

Default for Mac is 1.8 and for Windows 2.2.
If you use SRGB, the Gamma must be 2.2.

13.4.12   SetGrayPicture(pict as picture, mask as picture = nil) as boolean

Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies a picture into the internal buffers for writing a Grayscale image file.
Notes: This method sets width, height, type and bpc properties.
Returns true on success.

Mask can be nil.

13.4.13   SetHeader(Interlace as boolean = false, Filter as Integer = -1, Compression as Integer = -1) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Defines the header options for the PNG file.
Notes: Interlace is true the Adam7 interlacing is used.
FilterType specifies the filter:

Compression can be between 0 (none) to 9 (max). Default is 6. Value -1 means the plugin will not change from default of PNG library. Normally you have no better compression for setting higher than 6, but only burn more CPU power.

```
const PNG_NO_FILTERS       = 0
const PNG_FILTER_NONE      = 8
const PNG_FILTER_SUB       = 16
const PNG_FILTER_UP        = 32
const PNG_FILTER_AVG       = 64
const PNG_FILTER_PAETH     = 128
const PNG_FILTER_ALL       = 248
```

13.4.14   SetICCProfile(name as string, CompressionType as Integer, Profile as string) as boolean

Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a ICC Profile to the PNG.
Notes: Name is the profile name as an ASCII string.
CompressionType is always 0 (PNG_COMPRESSION_TYPE_BASE).

13.4.15   SetPalette as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the palette data.
Notes: Returns true on success.

13.4.16   SetPaletteData(colors() as color) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the color palette.
Notes: The array can have up to 256 colors.
Returns true on success.

13.4.17   SetPalettePicture(pict as picture) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies a picture into the internal buffers.
Notes: You need to define the color palette before calling this method.

This method sets width, height, type and bpc properties.
Returns true on success.

13.4.18 SetResolution(ResolutionHorizontal as Integer, ResolutionVertical as Integer, Unit as Integer) as boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the resolution of the PNG.
Notes: Unit is ResolutionUnknown, ResolutionMeter or ResolutionDPI.
Internally the PNG saves only in dots per meter, so the plugin converts DPI to DPM for you.

13.4.19 SetRGBPicture(pict as picture, mask as picture = nil) as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies a picture into the internal buffers.
Example:

```
// Write a RGBA PNG file
dim current as Picture = LogoMBS(500)

// create a mask
dim g as Graphics = current.Mask.Graphics
g.ForeColor = &cFFFFFF
g.FillRect 0,0,500,500
g.ForeColor = &c000000
g.FillOval 0,0,500,500

// show in window
window1.Backdrop = current

// and write to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")

dim p as new PNGWriterMBS

if p.OpenWriteDestination(f) then // open file
if p.SetRGBPicture(current, current.mask) then // set picture to write
if p.SetHeader(false, -1) then // setup file header
if p.SetGamma(0) then // and default gamma
if p.WriteInfo then // write file header
if p.WriteRows then // write pixels
if p.WriteEnd then // and write file end
p = nil // cleanup
```

f.Launch
end if
end if
end if
end if
end if
end if
end if

Notes: This method sets width, height, type and bpc properties.
Returns true on success.

Mask can be nil.

13.4.20   SetRows(rows() as memoryblock) as boolean

Plugin Version: 12.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Uses the given memoryblocks for row data.
Notes: The memory is not copied, so keep the array alive!
This method sets height. You need to set width, bpc, type and rowbytes.
Returns true on success.

13.4.21   SetsRGB(intent as Integer) as boolean

Plugin Version: 9.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the sRGB intent.
Notes: Possible values:

```
const PNG_sRGB_INTENT_PERCEPTUAL   = 0
const PNG_sRGB_INTENT_RELATIVE     = 1
const PNG_sRGB_INTENT_SATURATION   = 2
const PNG_sRGB_INTENT_ABSOLUTE     = 3
```

13.4.22   WriteEnd as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Finishes the writing.

Notes: Returns true on success.

Do not call if you use WriteRows.

13.4.23 WriteInfo as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes the PNG file header.
Notes: Returns true on success.

Do not call if you use WriteRows.

13.4.24 WriteRow(row as memoryblock)

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes one row of image data.
Notes: The data must be in the RGBA format with one byte per value.
(4 bytes per Pixel)

Returns true on success.

Do not call if you use WriteRows.

13.4.25 WriteRows as boolean

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes the picture from memory to the file.
Example:

```
// Write a RGB PNG file
dim current as Picture = LogoMBS(500)
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")

dim p as new PNGWriterMBS

if p.OpenWriteDestination(f) then // open file
if p.SetRGBPicture(current) then // set picture to write
if p.SetHeader(false, -1) then // setup file header
```

```
if p.SetGamma(0) then // and default gamma
if p.WriteInfo then // write file header
if p.WriteRows then // write pixels
if p.WriteEnd then // and write file end
p = nil // cleanup
f.Launch
end if
end if
end if
end if
end if
end if
end if
```

Notes: If you call this method, you need to call SetRGBPicture or SetPalettePicture before and you can't call WriteInfo, WriteRow and WriteEnd.

13.4.26   Properties

13.4.27   bpc as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The bytes per pixel.
Notes: Should be 3 for RGB, 1 for palette pictures and 4 for RGB with Alpha.
(Read and Write property)

13.4.28   Height as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture to write.
Notes: (Read and Write property)

13.4.29   Rowbytes as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The bytes per row.
Notes: (Read and Write property)

13.4.30   Type as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The color type.
Notes: The value is a combination of this constants:

```
PNG_COLOR_MASK_PALETTE   = 1
PNG_COLOR_MASK_COLOR     = 2
PNG_COLOR_MASK_ALPHA     = 4
```

(Read and Write property)

13.4.31   Width as Integer

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the picture to write.
Notes: (Read and Write property)

13.4.32   Events

13.4.33   Error(msg as string)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

Function: The PNG library has an error message for you.
Notes: Processing will stop soon.

13.4.34   Warning(msg as string)

Plugin Version: 11.3, Platforms: macOS, Linux, Windows, Targets: .

Function: The PNG library has a warning for you.

13.4.35   Constants

Constants

Constant	Value	Description
ResolutionDPI	2	One of the resolution unit type constants. The unit for points per inch.
ResolutionMeter	1	One of the resolution unit type constants. The unit for points per meter.
ResolutionUnknown	0	One of the resolution unit type constants.

Type Constants

Constant	Value	Description
TypeGray	0	Gray
TypeGrayA	4	Gray with Alpha
TypePalette	1	Palette
TypeRGB	2	RGB
TypeRGBA	6	RGB with Alpha.

Chapter 14

SVG

14.1   class ReSVGMBS

14.1.1   class ReSVGMBS

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: A class to render SVG data to a picture.
Example:

```
// we load this file
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")

Dim p As New ReSVGMBS(file)

// and render them in their normal size:
Dim pic As picture = p.RenderToPicture(p.Width, p.Height)

// show in the window
Window1.Backdrop = pic
```

Notes: This uses the ReSVG library written in Rust.
ReSVG is a fast, small, portable SVG library with the goal to support the whole SVG spec.

see
https://github.com/RazrFalcon/resvg
Blog Entries

- MBS Xojo Plugins, version 23.5pr3

- News from the MBS Xojo Plugins in Version 23.0

- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0](#)

- [MBS Xojo Plugins, version 22.6pr2](#)

Xojo Developer Magazine

- [21.3, page 10: News](#)

- [21.2, page 9: News](#)

14.1.2 Methods

14.1.3 Constructor(data as MemoryBlock)

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Creates SVG from data.
Notes: data: SVG data. Can contain SVG string or gzip compressed data. Must not be nil.

Raises exceptions in case of errors.
See also:

14.1.4 Constructor(data as String)

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Creates SVG from data.
Notes: data: SVG data. Can contain SVG string or gzip compressed data. Must not be empty.

Raises exceptions in case of errors.
See also:

14.1.5 Constructor(file as FolderItem)

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Creates SVG from file.
Example:

```
// we load this file
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")

Dim p As New ReSVGMBS(file)

// and render them in their normal size:
Dim pic As picture = p.RenderToPicture(p.Width, p.Height)

// show in the window
Window1.Backdrop = pic
```

Notes: For the files, .svg and .svgz files are supported.

Raises exceptions in case of errors.
See also:

14.1.6 ImageBox(byref x as double, byref y as double, byref width as double, byref height as double) as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Queries the image bounding box.
Notes: Can be smaller or bigger than a view box.

Returns true on success and sets passed variables.
Return false if an image has no elements.

14.1.7 InitLog

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Initializes the library log.
Notes: Use it if you want to see any warnings.
Must be called only once.
All warnings will be printed to the 'stderr'.

14.1.8 LoadSystemFonts

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Loads system fonts into the internal fonts database.
Notes: This method is very IO intensive.

This method should be executed only once.

The system scanning is not perfect, so some fonts may be omitted. Please send a bug report in this case.
Prints warnings into the log.

Has no effect when the 'text' feature is not enabled.

14.1.9   NodeBox(id as string, byref x as double, byref y as double, byref width as double, byref height as double) as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Returns node's bounding box by ID.
Notes: tree Render tree.

id: Node's ID.

Returns false if a node with such an ID does not exist.
returns false if ID is an empty string.

Returns true on success and sets passed variables.

14.1.10   NodeExists(id as string) as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Returns true if a renderable node with such an ID exists.
Notes: Return false if a node doesn't exist or ID isn't a UTF-8 string.
Return false if a node exists, but not renderable.

14.1.11 Render(width as Integer, Height as Integer, pixmap as Ptr, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil)

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Renders the SVG onto the pixmap.
Notes: FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the pixmap. If nil, we use identity transform.
width: Pixmap width.
height: Pixmap height.
pixmap: Pixmap data. Should have width * height * 4 bytes in size and contain premultiplied RGBA8888 pixels.

14.1.12 RenderNode(ID as string, width as Integer, Height as Integer, pixmap as Ptr, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil)

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Renders the SVG onto the pixmap.
Notes: id: Node's ID. Must not be "".
FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the pixmap. If nil, we use identity transform.
width: Pixmap width.
height: Pixmap height.
pixmap: Pixmap data. Should have width * height * 4 bytes in size and contain premultiplied RGBA8888 pixels.

14.1.13 RenderNodeToPicture(ID as string, width as Integer, Height as Integer, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil) as Picture

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Renders the SVG as picture.
Notes: id: Node's ID. Must not be "".
FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the picture. If nil, we use identity transform.
width: picture width.
height: picture height.

On success, we return the picture with the pixels.
Not supported for macOS 32-bit.

14.1.14   RenderToFile(file as FolderItem, FitToType as Integer = 0, FitToValue as single = 0.0)

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Renders SVG to file.
Notes: Only for macOS 32-bit.

14.1.15   RenderToPicture(width as Integer, Height as Integer, FitToType as Integer = 0, FitToValue as single = 0.0, transform as Ptr = nil) as Picture

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Renders the SVG as picture.
Notes: FitToType: Specifies into which region SVG should be fit.
transform: A root SVG transform. Can be used to position SVG inside the picture. If nil, we use identity transform.
width: picture width.
height: picture height.

On success, we return the picture with the pixels.
Not supported for macOS 32-bit.

14.1.16   ViewBox(byref x as double, byref y as double, byref width as double, byref height as double) as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Queries the image viewbox.
Notes: Returns true on success and sets passed variables.

14.1.17 Properties

14.1.18 Available as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Whether the class is available.
Example:

MessageBox "Available: "+ReSVGMBS.Available.ToString

Notes: Should return true for all targets except iOS.
(Read only property)

14.1.19 DPI as Double

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The target DPI.
Notes: Impact units conversion.
Default: 96
(Read and Write property)

14.1.20 FontFamily as String

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The default font family.
Notes: Will be used when no 'font-family' attribute is set in the SVG.

Default: Times New Roman
(Read and Write property)

14.1.21 FontSize as Double

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The default font size.
Notes: Will be used when no 'font-size' attribute is set in the SVG.
Default: 12
(Read and Write property)

14.1.22   Handle as Integer

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The internal object reference.
Notes: (Read only property)

14.1.23   Height as Double

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Returns an image height.
Example:

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")
Dim p As New ReSVGMBS(file)

MessageBox "width "+p.Width.ToString+" x height "+p.Height.ToString

Notes: The size of a canvas that required to render this SVG.
(Read only property)

14.1.24   ImageRendering as Integer

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The default image rendering method.
Example:

ReSVGMBS.ImageRendering = ReSVGMBS.kImageRenderingOptimizeQuality

Notes: Will be used when an SVG element's 'image-rendering' property is set to 'auto'.
Default: kImageRenderingOptimizeQuality
(Read and Write property)

14.1.25   IsEmpty as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Checks that tree has any nodes.
Notes: Returns true if tree has no nodes.
(Read only property)

14.1.26   KeepNamedGroups as Boolean

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Keep named groups.
Notes: If set to 'true', all non-empty groups with 'id' attribute will not be removed.
Default: false
(Read and Write property)

14.1.27   Languages as String

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: A comma-separated list of languages.
Example:

ReSVGMBS.Languages = "en,en-US"
MessageBox ReSVGMBS.Languages

Notes: Will be used to resolve a 'systemLanguage' conditional attribute.
Example: en,en-US.
Default: en
(Read and Write property)

14.1.28   ShapeRendering as Integer

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The default shape rendering method.
Example:

ReSVGMBS.ShapeRendering = ReSVGMBS.kShapeRenderingGeometricPrecision

Notes: Will be used when an SVG element's 'shape-rendering' property is set to 'auto'.

Default: kShapeRenderingGeometricPrecision
(Read and Write property)

14.1.29   TextRendering as Integer

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The default text rendering method.
Example:

ReSVGMBS.TextRendering = ReSVGMBS.kTextRenderingOptimizeLegibility

Notes: Will be used when an SVG element's 'text-rendering' property is set to 'auto'.
Default: kTextRenderingOptimizeLegibility
(Read and Write property)

14.1.30 Width as Double

Plugin Version: 23.0, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Returns an image width.
Example:

Dim file As FolderItem = SpecialFolder.Desktop.Child("test.svg")
Dim p As New ReSVGMBS(file)

MessageBox "width "+p.Width.ToString+" x height "+p.Height.ToString

Notes: The size of a canvas that required to render this SVG.
(Read only property)

14.1.31 Constants

Errors

Constant	Value	Description
kErrorElementsLimitReached	4	We do not allow SVG with more than 1_000_000 elements for security reasons.
kErrorFileOpenFailed	2	Failed to open the provided file.
kErrorInvalidSize	5	SVG doesn't have a valid size.
		Occurs when width and/or height are <= 0.
		Also occurs if width, height and viewBox are not set.
kErrorMalformedGZip	3	Compressed SVG must use the GZip algorithm.
kErrorNotAnUTF8String	1	Only UTF-8 content are supported.
kErrorOK	0	Everything is ok.
kErrorParsingFailed	6	Failed to parse an SVG data.

Fit Types

Constant	Value	Description
kFitToTypeHeight	2	Fit an image to a specified height.
kFitToTypeOriginal	0	Use an original image size.
kFitToTypeWidth	1	Fit an image to a specified width.
kFitToTypeZoom	3	Zoom an image using scaling factor.

Image Rendering

Constant	Value	Description
kImageRenderingOptimizeQuality	0	Optimize for quality
kImageRenderingOptimizeSpeed	1	Optimize for speed

Shape Renderings

Constant	Value	Description
kShapeRenderingCrispEdges	1	Crisp Edges
kShapeRenderingGeometricPrecision	2	Geometric precision
kShapeRenderingOptimizeSpeed	0	Optimize speed

Text Renderings

Constant	Value	Description
kTextRenderingGeometricPrecision	2	Geometric precision
kTextRenderingOptimizeLegibility	1	Optimize legibility
kTextRenderingOptimizeSpeed	0	Optimize for speed

Chapter 15

TIFF

15.1 Globals

15.1.1 CombineBitCMYKtoRGBMBS(CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, byref output as picture, CacheSizeRead as Integer) as Integer

Plugin Version: 6.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines 1bit raw image files to one 8bit RGB tiff.
Example:

```
dim t(4) as FolderItem
dim dC(4), dM(4), dY(4), dK(4) as Double
dim nC(4), nM(4), nY(4), nK(4) as Integer
dim i as Integer
dim p as Picture

//Cyan
dK(0)=0.0
dC(0)=1.0
dM(0)=0.0
dY(0)=0.0
//Magenta
dK(1)=0.00
dC(1)=0.0
dM(1)=1.0
dY(1)=0.0
//Yellow
```

```
dK(2)=0.00
dC(2)=0.0
dM(2)=0.0
dY(2)=1.0
//Black
dK(3)=1.00
dC(3)=0.0
dM(3)=0.0
dY(3)=0.0
//Pantone, Sonderfarbe, S0
dK(4)=0.00
dC(4)=0.60
dM(4)=0.35
dY(4)=0.15


//Bilder
t(0)=GetFolderItem("test.Cyan.bit")
t(1)=GetFolderItem("test.Magenta.bit")
t(2)=GetFolderItem("test.Yellow.bit")
t(3)=GetFolderItem("test.Black.bit")
t(4)=GetFolderItem("test.S0.bit")


for i=0 to 4
nC(i)=dC(i)*1000.0
nM(i)=dM(i)*1000.0
nY(i)=dY(i)*1000.0
nK(i)=dK(i)*1000.0
next


// Scale 1/n, 1/3, 1/2, 1, 2, 3, n

Title=str(CombineBitCMYKtoRGBMBS(nC,nM,nY,nK, t, 1, 545,567,0,0,545,567,p,0))
Backdrop=p
Width=p.Width
Height=p.Height
```


Notes: All arrays have the same size specifying for each 1bit grayscale source image the colors to be used in the final image.

Result image is written to the output picture which is created. Error code is returned which is 0 for no error. CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

15.1.2 TIFFStringToPictureMBS(data as string) as picture

Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff string and returns the RGB image for this tiff file.
Notes: Returns nil on any error.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.
Blog Entries

- Tip of the day: Corrupt pictures

15.1.3 TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS

Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff string and returns a TiffPictureMBS object.
Notes: if you want to read the picture after this line you need to call ReadBW, ReadRGB or use the Scanline methods.
Returns nil on any error.

15.1.4 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines 1bit tiff image files to one CMYK tiff.
Notes: All arrays have the same size specifying for each 1bit grayscale source image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error. Compression can be set before data is written to current tiff which is for output. The tiff object for output must be perfectly setup before using this function.

15.1.5 CombineBitCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, Files() as FolderItem, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, CacheSizeRead as Integer) as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines 1bit raw image files to one CMYK tiff.
Notes: All arrays have the same size specifying for each 1bit grayscal esource image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error. CacheSize can be set to a value greater than 0. And it may make the process faster or slower depending on what you do.

15.1.6 CombineTiffCMYKtoCMYKMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines Grayscale tiff images to one CMYK tiff.
Example:

```
const PLANARCONFIG_CONTIG=1
const PHOTOMETRIC_RGB=2
const FILLORDER_MSB2LSB=1
const PHOTOMETRIC_SEPARATED=5

dim u,v,ot,t(4) as TiffPictureMBS
dim f as FolderItem
dim pnach as Picture
dim dC(4), dM(4), dY(4), dK(4) as Double
dim nC(4), nM(4), nY(4), nK(4) as Integer
dim i as Integer

//Cyan
dK(0)=0.0
dC(0)=1.0
dM(0)=0.0
dY(0)=0.0
//Magenta
dK(1)=0.00
dC(1)=0.0
dM(1)=1.0
dY(1)=0.0
```

//Yellow
dK(2)=0.00
dC(2)=0.0
dM(2)=0.0
dY(2)=1.0
//Black
dK(3)=1.00
dC(3)=0.0
dM(3)=0.0
dY(3)=0.0
//Pantone, S0
dK(4)=0.00
dC(4)=0.60
dM(4)=0.35
dY(4)=0.15

//Bilder
f=GetFolderItem("test.Cyan.tif")
t(0)=f.OpenAsTiffMBS

f=GetFolderItem("test.Magenta.tif")
t(1)=f.OpenAsTiffMBS

f=GetFolderItem("test.Yellow.tif")
t(2)=f.OpenAsTiffMBS

f=GetFolderItem("test.Black.tif")
t(3)=f.OpenAsTiffMBS

f=GetFolderItem("test.S0.tif")
t(4)=f.OpenAsTiffMBS

for i=0 to 4
nC(i)=dC(i)*1000.0
nM(i)=dM(i)*1000.0
nY(i)=dY(i)*1000.0
nK(i)=dK(i)*1000.0
next

f=GetFolderItem("resultCMYK.tif")
ot=new TiffPictureMBS
if ot.Create(f) then
v=t(0)
u=ot
u.Width=v.Width
u.Height=v.Height
u.RowsPerStrip=v.Height
u.BitsPerSample=8

u.SamplesPerPixel=4
u.ResolutionUnit=v.ResolutionUnit
u.HorizontalPosition=v.HorizontalPosition
u.HorizontalResolution=v.HorizontalResolution
u.VerticalPosition=v.VerticalPosition
u.VerticalResolution=v.VerticalResolution
u.Orientation=v.Orientation
u.PlanarConfig=PLANARCONFIG_CONTIG
u.Photometric=PHOTOMETRIC_SEPARATED
u.FillOrder=FILLORDER_MSB2LSB
Title=str(CombineTiffCMYKtoCMYKMBS(ot, nC,nM,nY,nK,t))
ot.Close
end if

//Neues Bild anzeigen
pnach=f.OpenAsPicture
if pnach<>Nil then
Window1.Width=pNach.Width
Window1.Height=pNach.Height
Window1.Backdrop=pNach
end if

Notes: All arrays have the same size specifying for each 8bit grayscal esource image the colors to be used in the final image.
Result image is written to the current tiffpicture. Error code is returned which is 0 for no error.
You need to set yourself all needed tiffpicture parameters for the output image and you must create it before. The plugin sets width and height for the output tiff.

15.1.7   CombineTiffCMYKtoRGBMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS) as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines Grayscale tiff images to one RGB tiff.
Example:

const PLANARCONFIG_CONTIG=1
const PHOTOMETRIC_RGB=2
const FILLORDER_MSB2LSB=1

dim u,v,ot,t(4) as TiffPictureMBS
dim f as FolderItem
dim pnach as Picture
dim dC(4), dM(4), dY(4), dK(4) as Double

```
dim nC(4), nM(4), nY(4), nK(4) as Integer
dim i as Integer

//Cyan
dK(0)=0.0
dC(0)=1.0
dM(0)=0.0
dY(0)=0.0
//Magenta
dK(1)=0.00
dC(1)=0.0
dM(1)=1.0
dY(1)=0.0
//Yellow
dK(2)=0.00
dC(2)=0.0
dM(2)=0.0
dY(2)=1.0
//Black
dK(3)=1.00
dC(3)=0.0
dM(3)=0.0
dY(3)=0.0
//Pantone, S0
dK(4)=0.00
dC(4)=0.60
dM(4)=0.35
dY(4)=0.15

//Bilder
f=GetFolderItem("test.Cyan.tif")
t(0)=f.OpenAsTiffMBS

f=GetFolderItem("test.Magenta.tif")
t(1)=f.OpenAsTiffMBS

f=GetFolderItem("test.Yellow.tif")
t(2)=f.OpenAsTiffMBS

f=GetFolderItem("test.Black.tif")
t(3)=f.OpenAsTiffMBS

f=GetFolderItem("test.S0.tif")
t(4)=f.OpenAsTiffMBS

for i=0 to 4
nC(i)=dC(i)*1000.0
nM(i)=dM(i)*1000.0
```

```
nY(i)=dY(i)*1000.0
nK(i)=dK(i)*1000.0
next

f=GetFolderItem("resultRGB.tif")
ot=new TiffPictureMBS
if ot.Create(f) then
v=t(0)
u=ot
u.Width=v.Width
u.Height=v.Height
u.RowsPerStrip=v.Height
u.BitsPerSample=8
u.SamplesPerPixel=3
u.ResolutionUnit=v.ResolutionUnit
u.HorizontalPosition=v.HorizontalPosition
u.HorizontalResolution=v.HorizontalResolution
u.VerticalPosition=v.VerticalPosition
u.VerticalResolution=v.VerticalResolution
u.Orientation=v.Orientation
u.PlanarConfig=PLANARCONFIG_CONTIG
u.Photometric=PHOTOMETRIC_RGB
u.FillOrder=FILLORDER_MSB2LSB
Title=str(CombineTiffCMYKtoRGBMBS(ot, nC,nM,nY,nK,t))
ot.Close
end if

//Neues Bild anzeigen
pnach=f.OpenAsPicture
if pnach<>Nil then
Window1.Width=pNach.Width
Window1.Height=pNach.Height
Window1.Backdrop=pNach
end if
```

Notes: All arrays have the same size specifying for each 8bit grayscal esource image the colors to be used in the final image.
Result image is written to the current tiffpicture. Error code is returned which is 0 for no error.
You need to set yourself all needed tiffpicture parameters for the output image and you must create it before.

15.1.8 CombineTiff1BitCMYKtoTiffMBS(dest as TiffPictureMBS, TiffData as TiffPictureMBS, scalex as Double, scaley as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines a one bit gray tiff image to one 1 bit gray tiff.
Notes: Basicly only scales the data.
Result image is written to the current tiffpicture. Error code is returned which is 0 for no error.
You need to set yourself all needed tiffpicture parameters for the output image and you must create it before.
The plugin sets width and height for the output tiff.

15.1.9 CombineTiff8BitCMYKtoTiffMBS(dest as TiffPictureMBS, CyanChannel() as Integer, MagentaChannel() as Integer, YellowChannel() as Integer, BlackChannel() as Integer, TiffData() as TiffPictureMBS, scale as Double, width as Integer, height as Integer, X1 as Integer, Y1 as Integer, X2 as Integer, Y2 as Integer, ditherMode as Integer = 0) as Integer

Plugin Version: 12.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Combines 8bit tiff image files to one CMYK tiff.
Notes: All arrays have the same size specifying for each 8bit grayscale source image the colors to be used in the final image.
Result image is written to the output picture which is created. Error code is returned which is 0 for no error.
Compression can be set before data is written to current tiff which is for output. The tiff object for output must be perfectly setup before using this function.
Blog Entries

- MBS Xojo / Real Studio Plugins, version 14.3pr11

15.2 class TiffPictureMBS

15.2.1 class TiffPictureMBS

Platforms: macOS, Linux, Windows, Targets: All.

Function: A class for a Tiff picture.
Example:

Dim p As Picture = LogoMBS(500)

// save tiff file

```
Dim t As New TiffPictureMBS
Dim file4 As FolderItem = SpecialFolder.Desktop.Child("test4.tif")

t.Pict = p

If t.Create(file4) Then
If t.WriteRGB Then
t.Close
// ok
Else
Break
End If
Else
Break
End If
```

Notes: Bases on libtiff.
Blog Entries

- MBS Xojo Plugins, version 23.2pr1

- MBS Xojo Plugins, version 19.5pr6

- Four ways to save picture as Tiff in Xojo

- MonkeyBread Software Releases the MBS Xojo Plugins in version 19.1

- MBS Xojo Plugins, version 19.1pr2

- MBS Xojo Plugins 18.3

- MBS Xojo Plugins, version 18.3pr1

- Handling errors is important!

- MBS REALbasic plug-in 9.6

- MonkeyBread Software Releases the MBS REALbasic plug-ins 9.2

Xojo Developer Magazine

- 16.5, page 9: News

15.2.2 Methods

15.2.3 AddCustomTag(Tag as Integer, FieldReadCount as Integer, FieldWriteCount as Integer, FieldType as Integer, FieldBit as Integer, OkToChange as Integer, PassCount as Integer, FieldName as string) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a custom tag.
Example:

```
const TIFFTAG_ASCIITAG = 40666
const TIFFTAG_LONGTAG = 40667
const TIFFTAG_SHORTTAG = 40668
const TIFFTAG_RATIONALTAG = 40669
const TIFFTAG_FLOATTAG = 40670
const TIFFTAG_DOUBLETAG = 40671
const TIFFTAG_BYTE = 40672

const TIFFTAG_SOFTWARE=305

const TIFF_BYTE=1
const TIFF_ASCII=2
const TIFF_SHORT=3 // integer 16 bit signed
const TIFF_LONG=4 // integer 32 bit
const TIFF_FLOAT=11
const TIFF_DOUBLE=12

const FIELD_CUSTOM = 65

dim t as new TiffPictureMBS

// open tiff

if not t.AddCustomTag(TIFFTAG_ASCIITAG, -1, -1, TIFF_ASCII, FIELD_CUSTOM, 1, 0, "MyString")
then
MsgBox "AddCustomTag failed1."
end if
```

Notes: See tiff documentation for details.

15.2.4   AddImage as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes existing picture and header information to file and starts a new one.
Example:

```
dim t as TiffPictureMBS
dim f as FolderItem
dim p as Picture

f=SpecialFolder.Desktop.Child("test.tif")
t=new TiffPictureMBS
if t.Create(f) then

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(255,0,0)
p.Graphics.FillOval 0,0,100,100
t.Pict=p
if t.WriteRGB then
if t.AddImage then
p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(0,0,255)
p.Graphics.FillOval 0,0,100,100
t.Pict=p
if t.WriteRGB then
MsgBox "Written multi picture tiff."
end if
end if
end if
end if
```

Notes: Returns true on success and false on any error.

Calls TIFFWriteDirectory internally.

15.2.5   close

Plugin Version: 3.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Closes the Tiff handle.
Notes: In 5.1 and older the destructor.
In 5.2 and later only closes the tiff handle so you can still read the pictures, the output or input buffer.

15.2.6 CombinePictureWithMask as picture

Plugin Version: 6.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a new picture which is created using the picture and it's mask.
Example:

dim t as TiffPictureMBS
' ...
canvas1.backdrop=t.CombinePictureWithMask

15.2.7 Create(file as folderitem) as boolean

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty tiff file.
Example:

dim p as Picture
dim f as FolderItem
dim t as TiffPictureMBS

p=New Picture(100,100,32)

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
t.Pict=p

if t.Create(f) then
if t.WriteRGB then
t.Close
MsgBox "Ok"
f.Launch
end if
end if

Notes: Returns true on success.
See also:

15.2.8   Create(file as folderitem, endian as Integer) as boolean

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty tiff file.
Example:

```
Dim t As New TiffPictureMBS
t.Pict = LogoMBS(500)

// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.tif")

If t.Create(f, 0) Then
If t.WriteRGB Then
t.Close

// open in viewer
f.Launch
End If
End If
```

Notes: Returns true on success.

Endian settings:

0	Default (System)
1	BigEndian (Mac)
2	LittleEndian (Win)

See also:

15.2.9   Create(Path as String, endian as integer = 0) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty tiff file.
Example:

```
Dim t As New TiffPictureMBS
t.Pict = LogoMBS(500)

// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim p as string = f.NativePath

If t.Create(p) Then
If t.WriteRGB Then
t.Close

// open in viewer
f.Launch
End If
End If
```

Notes: Returns true on success.

Endian settings:

0	Default (System)
1	BigEndian (Mac)
2	LittleEndian (Win)

See also:

15.2.10 CreateString(Size as Integer) as boolean

Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new string based tiff writer.
Example:

```
Function PictureToTiffStringMBS(pic as picture) As string
dim t as TiffPictureMBS

t=new TiffPictureMBS
if t.CreateString(&h100000) then
t.Pict=pic
```

if t.WriteRGB then
t.Close
Return t.OutputBuffer
end if
end if
End Function

Notes: Same as the Create() function, but memory based. You can now use functions like Scanline(), WriteSW() or WriteRGB() to put the picture data.

Returns true on success.
The Warning and Error events may show you reasons why it does not work.

The size parameter you pass in is a guess for the initial size of the memory block used. If more data is written, the memory block is resized, but it is quite slow to resize a memoryblock, so make a good guess!

You can and should use this function to write yourself a PictureToTiffString function. The plugin can not well make such a function as there are thousands of possible parameters combination you may want to use. (compared to the JPEG library where you only have the compression level parameter.)
See also:

15.2.11   CreateString(Size as Integer, Mode as string) as boolean

Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new string based tiff writer.
Notes: Same as the other CreateString method, but you can pass a mode string to the library.

mode="wb" for big endian and mode="wl" for little endian.
See also:

15.2.12   Flush as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Flush causes any pending writes for the specified file (including writes for the current directory) to be done.
Notes: In normal operation this call is never needed - the library automatically does any flushing required.

15.2.13 FlushData as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: FlushData flushes any pending image data for the specified file to be written out; directory-related data are not flushed.
Notes: In normal operation this call is never needed √Ö | the library automatically does any flushing required.

15.2.14 GetColorMap(byref red as memoryblock, byref green as memoryblock, byref blue as memoryblock) as boolean

Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries the color map for a paletten image.
Notes: The memoryblock must be 2^bitspersample * 2 bytes big.
Returns true on success and false on failure.

15.2.15 GetColorProfile as string

Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the color profile data stored in the tiff file.
Example:

dim f as FolderItem
dim t as TiffPictureMBS
dim s as string
dim p as LCMS2ProfileMBS

f=SpecialFolder.Desktop.Child("horsehead_steinberg_big.tif")

t=f.OpenAsTiffMBS

s=t.GetColorProfile

p = LCMS2ProfileMBS.OpenProfileFromString(s)

MsgBox p.Name

Notes: Returns "" on any error.

15.2.16   GetData(Tag as Integer) as string

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the string stored for this tag.

15.2.17   GetField(Tag as Integer, mem as memoryblock) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.
The memoryblock you pass in must be big enough to hold whatever data the library stores there.

15.2.18   GetFieldByte(Tag as Integer, byref value as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.19   GetFieldCount(Tag as Integer, byref count as Integer, mem as memoryblock) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Example:

'TIFF Tag ImageID
'
'IFD Image
'Code 32781 (hex 0x800D)
'Name ImageID
'Type ASCII
'Count N
'Default None
'Description
'

'OPI-related.
'

'ImageID is the full pathname of the original, high-resolution image, or any other identifying string that uniquely identifies the original image.
'

'The high-resolution image is not required to be in TIFF format. It can be in any format that an OPI Consumer wishes to support.

DIm tiffImport As TiffPictureMBS
Dim xx as string

tiffImport = New TiffPictureMBS
Call tiffImport.Open(SpecialFolder.Desktop.Child("test.tif"))

// the memoryblock is a storage for the data. In this case a pointer to the CString
dim m as MemoryBlock=NewMemoryBlock(4)
dim count as Integer

if tiffImport.GetFieldCount(32781, count, m) then
MsgBox str(count)
MsgBox m.Ptr(0).CString(0)
end if

tiffImport.close

Notes: This is the special version using memoryblock so you can use it for reading values with a count value.

Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.20 GetFieldDefaultedByte(Tag as Integer, byref value as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

15.2.21 GetFieldDefaultedDouble(Tag as Integer, byref value as Double) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

15.2.22 GetFieldDefaultedInteger(Tag as Integer, byref value as Integer) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

15.2.23 GetFieldDefaultedShort(Tag as Integer, byref value as Integer) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

15.2.24 GetFieldDefaultedSingle(Tag as Integer, byref value as Single) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

15.2.25   GetFieldDefaultedString(Tag as Integer, byref value as String) as boolean

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Example:

```
dim t as TiffPictureMBS
dim f as FolderItem
dim s as string

f=SpecialFolder.Desktop.Child("ChristianSchmitz.tif")
t=f.OpenAsTiffMBS

const TIFFTAG_SOFTWARE=305

if t.GetFieldDefaultedString(TIFFTAG_SOFTWARE, s) then
MsgBox "TIFFTAG_SOFTWARE"+EndOfLine+s
end if
```

Notes: Please look for Tag values in the tiff specification.
Returns true on success. May return a default value.
Please make sure to use the correct setter depending on data type associated with the tag.
The string is returned with ascii encoding. You may need to define a different encoding is this is not correct.

GetFieldDefaulted* is identical to GetField*, except that if a tag is not defined in the current directory and it has a default value, then the default value is returned.

15.2.26   GetFieldDouble(Tag as Integer, byref value as Double) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.

Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.27   GetFieldInteger(Tag as Integer, byref value as Integer) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.28   GetFieldMemory(Tag as Integer, byref ItemCount as Integer) as memoryblock

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: This is the special version using memoryblock so you can use it for reading values with a count value.

Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.29   GetFieldShort(Tag as Integer, byref value as Integer) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.30   GetFieldSingle(Tag as Integer, byref value as Single) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.

Please make sure to use the correct setter depending on data type associated with the tag.

15.2.31 GetFieldString(Tag as Integer, byref value as string) as boolean

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the value associated with the given tag id.
Example:

```
dim t as TiffPictureMBS
dim f as FolderItem
dim s as string

f=SpecialFolder.Desktop.Child("test.tif")
t=f.OpenAsTiffMBS

const TIFFTAG_SOFTWARE=305

if t.GetFieldString(TIFFTAG_SOFTWARE, s) then
MsgBox "TIFFTAG_SOFTWARE"+EndOfLine+s
end if

const TIFFTAG_HOSTCOMPUTER=316

if t.GetFieldString(TIFFTAG_HOSTCOMPUTER, s) then
MsgBox "TIFFTAG_SOFTWARE"+EndOfLine+s
end if

const TIFFTAG_IMAGEDESCRIPTION=270

if t.GetFieldString(TIFFTAG_IMAGEDESCRIPTION, s) then
MsgBox "TIFFTAG_IMAGEDESCRIPTION"+EndOfLine+s
end if

const TIFFTAG_MAKE=271

if t.GetFieldString(TIFFTAG_MAKE, s) then
MsgBox "TIFFTAG_MAKE"+EndOfLine+s
end if

const TIFFTAG_ARTIST=315

if t.GetFieldString(TIFFTAG_ARTIST, s) then
MsgBox "TIFFTAG_ARTIST"+EndOfLine+s
end if
```

Notes: Please look for Tag values in the tiff specification.

Returns true on success. May return a default value.

Please make sure to use the correct setter depending on data type associated with the tag.

The string is returned with ascii encoding. You may need to define a different encoding is this is not correct.

15.2.32 GetXMP as string

Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the xmp metadata package stored in the tiff file.
Example:

dim f as FolderItem
dim t as TiffPictureMBS
dim s as string

f=SpecialFolder.Desktop.Child("test.tif")

t=f.OpenAsTiffMBS

s=t.GetXMP

MsgBox left(s,500)

Notes: Returns "" on any error.

15.2.33 ImageCount as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of images in the TIFF file.
Notes: Returns 0 on any error.

15.2.34 ImageIndex as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The current image index.
Notes: 0 based.

15.2.35 IsLastImage as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the current picture is the last picture.
Notes: Useful if you walk through all pictures using NextImage.

15.2.36 MirrorVertical(output as TiffPictureMBS) as boolean

Plugin Version: 7.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Mirrors the current picture to another tiff object.
Notes: You may be able to pass the current tiff file as the output one if you have it open for read and write.
Returns true on success and false on failure.
Works for any color depth or color mode.

15.2.37 NextImage as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loads the next image in the TIFF file.
Notes: Returns true on success and false on any error.
See also:

15.2.38 NextImage(HeaderOnly as boolean) as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the next image.
Notes: If HeaderOnly is false the current picture is read into the pict&mask properties.
See also:

15.2.39 Open(file as folderitem) as boolean

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff file for readonly access.
Notes: You need to use the ReadRGB method or the Scanline property to get data from this file.
Returns true on success.
See also:

15.2.40   Open(file as folderitem, Mode as string) as boolean

Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff file for read/write access.
Example:

```
dim file as folderitem = SpecialFolder.desktop.child("test.tif")
dim st as new MyTiff

// open for appending
if not st.Open(file,"r+") then
MsgBox "Open Tiff failed!"
else
// change one setting
st.Copyright = "Hello World"

// and save
call st.SaveImage
st.Close
end if
```

Notes: Same as the other Open method, but you can pass a mode string to the library.

The open mode parameter can include the following flags in addition to the "r" (Read), "w" (Write), and "a" (Append) flags. Note however that option flags must follow the read-write-append specification.

See also:

15.2.41   Open(Path as String, Mode as string) as boolean

Plugin Version: 19.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff file for read/write access.
Example:

```
Dim t As New TiffPictureMBS
```

```
// try with path
Dim f As FolderItem = SpecialFolder.Desktop.Child("test.tif")
Dim p As String = f.NativePath

If t.Open(p, "r") Then

If t.ReadRGB Then

window1.Backdrop = t.Pict

End If
End If
```

Notes: Same as the other Open method, but you can pass a mode and path as string to the library.

The open mode parameter can include the following flags in addition to the "r" (Read), "w" (Write), and "a" (Append) flags. Note however that option flags must follow the read-write-append specification.

See also:

- 15.2.39 Open(file as folderitem) as boolean   569

- 15.2.40 Open(file as folderitem, Mode as string) as boolean   570

15.2.42   OpenString(data as string) as boolean

Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff image located in a binary string.
Example:

```
Function TiffStringToPicture(data as string) As picture
dim t as MyTiffPictureMBS

t=new MyTiffPictureMBS

if t.OpenString(data) then
if t.ReadRGB then
return t.Pict
// you could add the mask here.
end if
end if

Return nil // failed
End Function
```

Notes: Same as the Open() function, but memory based. You can now use functions like Scanline(), ReadSW() or ReadRGB() to get the picture data.

Returns true on success.
The Warning and Error events may show you reasons why it does not work.
The string you pass is saved in the data property of the class for later use.

You can and should use this function to write yourself a TiffStringToPicture function.
See also:

15.2.43 OpenString(data as string, Mode as string) as boolean

Plugin Version: 5.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens a tiff image located in a binary string.
Notes: Same as the other OpenString method, but you can pass a mode string to the library.
See also:

15.2.44 RawStripSize(strip as UInt32) as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of bytes in a raw strip (i.e. not decoded).

15.2.45 ReadBW as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the current picture in BW mode.
Example:

dim f as FolderItem
dim p as Picture
dim t as TiffPictureMBS

f=SpecialFolder.Desktop.Child("Multipage fax.tif")
t=f.OpenAsTiffMBS(true)

```
if t.ReadBW then
title=str(t.ImageCount)

p=t.pict
Title=str(p.Depth)
Canvas1.Backdrop=p
end if
```

Notes: Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

- 15.2.46 ReadBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean   573

15.2.46   ReadBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean

Plugin Version: 8.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the current picture in BW mode.
Example:

```
dim f as FolderItem
dim p as Picture
dim t as TiffPictureMBS

f=SpecialFolder.Desktop.Child("Multipage fax.tif")
t=f.OpenAsTiffMBS(true)

if t.ReadBW(0,0,t.width/2,t.height/2) then
title=str(t.ImageCount)

p=t.pict
Title=str(p.Depth)
Canvas1.Backdrop=p
end if
```

Notes: Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

15.2.47   ReadEncodedStrip(strip as UInt32, byref data as Memoryblock) as UInt32

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Read and decode a strip of data from an open TIFF file.
Notes: Read the specified strip of data and place up to size bytes of decompressed information in the (user supplied) data buffer.

The value of strip is a "raw strip number". That is, the caller must take into account whether or not the data are organized in separate planes (PlanarConfiguration=2). To read a full strip of data the data buffer should typically be at least as large as the number returned by StripSize.
The library attempts to hide bit- and byte-ordering differences between the image and the native machine by converting data to the native machine order. Bit reversal is done if the FillOrder tag is opposite to the native machine bit order. 16- and 32-bit samples are automatically byte-swapped if the file was written with a byte order opposite to the native machine byte order,

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedStrip returns -1 if an error was encountered.

15.2.48   ReadEncodedTile(tile as UInt32, byref data as Memoryblock) as Integer

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Read and decode a tile of data from an open TIFF file.
Notes: Read the specified tile of data and place up to size bytes of decompressed information in the (user supplied) data buffer.

The value of tile is a "raw tile number". That is, the caller must take into account whether or not the data are organized in separate planes (PlanarConfiguration=2). ComputeTile automatically does this when

converting an (x,y,z,sample) coordinate quadruple to a tile number. To read a full tile of data the data buffer should be at least as large as the value returned by TileSize.

The library attempts to hide bit- and byte-ordering differences between the image and the native machine by converting data to the native machine order. Bit reversal is done if the FillOrder tag is opposite to the native machine bit order. 16- and 32-bit samples are automatically byte-swapped if the file was written with a byte order opposite to the native machine byte order,

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedTile returns ‚àí1 if an error was encountered.

15.2.49 ReadPreviewBW as boolean

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the current picture in BW mode as a preview.
Notes: This method is faster than ReadBW, because it reads only every 8th line and every 8th pixel in each row. So the picture you get is much smaller, but may be enough for a preview.

Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

- 15.2.50 ReadPreviewBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean 575

15.2.50 ReadPreviewBW(left as Integer, top as Integer, width as Integer, height as Integer) as boolean

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the current picture in BW mode as a preview.
Notes: This method is faster than ReadBW, because it reads only every 8th line and every 8th pixel in each row. So the picture you get is much smaller, but may be enough for a preview.

Returns true on success and false on any error.
Only if the current picture is a 1bit black&white picture, a new picture is created in the pict property and

the data is copied inside.

Data in the TIFF file must be in 1 bit BW mode. Else use ReadRGB which does a lot of converting.

This method uses the YieldTicks property and may yield time to other threads.
See also:

15.2.51   ReadPreviewRGB(ReduceFactor as Integer) as boolean

Plugin Version: 9.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a CMYK or RGB picture and stores it in the pict and name properties.
Notes: This method is faster than ReadRGB, because it reads only every ReduceFactorth line and every ReduceFactorth pixel in each row. So the picture you get is much smaller, but may be enough for a preview.

Returns true on success.
ReadRGB does converting on the picture data if needed so you can read CMYK, RGB, BW and other image data using this function.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

15.2.52   ReadRawStrip(strip as UInt32, byref data as Memoryblock) as UInt32

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Return the undecoded contents of a strip of data from an open TIFF file.
Notes: Read the contents of the specified strip into the (user supplied) data buffer. Note that the value of strip is a "raw strip number". That is, the caller must take into account whether or not the data is organized in separate planes (PlanarConfiguration=2). To read a full strip of data the data buffer should typically be at least as large as the number returned by StripSize.

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedStrip returns -1 if an error was encountered.

15.2.53   ReadRawTile(tile as UInt32, byref data as Memoryblock) as Integer

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Return an undecoded tile of data from an open TIFF file.
Notes:

Read the contents of the specified tile into the (user supplied) data buffer. Note that the value of tile is a "raw tile number". That is, the caller must take into account whether or not the data is organized in separate planes (PlanarConfiguration=2). ComputeTile automatically does this when converting an (x,y,z,sample) coordinate quadruple to a tile number. To read a full tile of data the data buffer should typically be at least as large as the value returned by TileSize.

Returns the actual number of bytes of data that were placed in buf is returned; ReadEncodedTile returns ,àí1 if an error was encountered.

15.2.54 ReadRGB as boolean

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads a CMYK or RGB picture and stores it in the pict and name properties.
Notes: Returns true on success.
ReadRGB does converting on the picture data if needed so you can read CMYK, RGB, BW and other image data using this function.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.
See also:

- 15.2.55 ReadRGB(byref ErrorMessage as string, Dest as MemoryBlock = nil) as memoryblock   577

15.2.55 ReadRGB(byref ErrorMessage as string, Dest as MemoryBlock = nil) as memoryblock

Plugin Version: 9.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the image into a memoryblock as RGB.
Notes: The Scanline() array gives you the raw uncompressed data. But this method decodes the data into a RGBA image.

The Memoryblock has the size of 4*width*height. Each pixel has one byte for red, one byte for green, one byte for blue and one byte for alpha. If no alpha is in the file, all pixels have the same alpha of 255.

If the decompression fails the function returns nil. (e.g. out of memory).
If the decoding fails, you also get an error message.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

If dest is not nil and big enough, the plugin will use it and return it on success. This can avoid additional memory allocations which can cost CPU time (especially to clear the bytes).
See also:

15.2.56   ReadRGBMemoryBegin(byref ErrorMessage as string) as boolean

Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Starts a RGBA reader for the given TIFF picture.
Notes: Like ReadRGB, but with ReadRGBMemoryBegin, ReadRGBMemoryEnd and ReadRGBMemoryStep you can read the RGBA data in portions.

The Memoryblock returned by ReadRGBMemoryStep has the size of 4*width*height. Each pixel has one byte for red, one byte for green, one byte for blue and one byte for alpha. If no alpha is in the file, all pixels have the same alpha of 255.

If the decompression fails the function returns false. (e.g. out of memory).
If the decoding fails, you also get an error message.

This function works with most Tiff formats, but has problems with some like 16 bit CMYK.

15.2.57   ReadRGBMemoryEnd

Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Cleans up the internal data structures created by ReadRGBMemoryBegin.

15.2.58   ReadRGBMemoryStep(x as Integer, y as Integer, width as Integer, height as Integer, Dest as MemoryBlock = nil) as memoryblock

Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the image into a memoryblock as RGBA.
Example:

dim t as new TiffPictureMBS
dim f as FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim e as string

if t.Open(f) then

```
if t.ReadRGBMemoryBegin(e) then

dim w as Integer = t.Width
dim h as Integer = t.Height

dim p as new PictureMBS(w, h, PictureMBS.ImageFormatRGB)

for y as Integer = 0 to h-1 step 100

dim m as MemoryBlock = t.ReadRGBMemoryStep(0, y, w, 100)

for i as Integer = 0 to 99
p.RowInFormat(i+y, PictureMBS.ImageFormatRGBA)=m
next

next

t.ReadRGBMemoryEnd
Backdrop = p.copypicture(0,0,1000,1000) // display a portion
end if

end if
```

Notes: As you see in the example, you can use this method to easily read huge TIFF files into a PictureMBS object.

If the decompression fails the function returns nil. (e.g. out of memory).
Please make sure that the range in x and y, width and height is right.

If dest is not nil and big enough, the plugin will use it and return it on success. This can avoid additional memory allocations which can cost CPU time (especially to clear the bytes).

15.2.59 ReadWithLUT(ColorLookupTable() as color) as boolean

Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the current picture with a Color Lookup Table.
Notes: Returns true on success and false on any error.
Works with 8, 16 amd 32 bits per sample. And with 1 or 3 samples per pixels (Gray or RGB). The lookup table has 256 entries for 8 bit and 65536 entries for 16/32 bit.
This method uses the YieldTicks property and may yield time to other threads.
See also:

15.2.60   ReadWithLUT(ColorLookupTable() as color, left as Integer, top as Integer, width as Integer, height as Integer) as boolean

Plugin Version: 9.8, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the current picture with a Color Lookup Table.
Notes: Returns true on success and false on any error.
Works with 8, 16 amd 32 bits per sample. And with 1 or 3 samples per pixels (Gray or RGB). The lookup table has 256 entries for 8 bit and 65536 entries for 16/32 bit.
This method uses the YieldTicks property and may yield time to other threads.
See also:

15.2.61   RewriteDirectory as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes existing picture and header information to file replacing the old data.
Notes: Returns true on success and false on any error.
As the data is added to the file and just the reference to the old data is deleted, the filesize will grow.

Calls TIFFReWriteDirectory internally. Same as SaveImage.

15.2.62   SaveImage as boolean

Plugin Version: 7.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes existing picture and header information to file replacing the old data.
Notes: Returns true on success and false on any error.
As the data is added to the file and just the reference to the old data is deleted, the filesize will grow.

Calls TIFFReWriteDirectory internally. Same as RewriteDirectory.

15.2.63   Scanline(mem as Ptr, index as Integer, sample as Integer = 0) as boolean

Plugin Version: 11.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads an image scanline in a memoryblock.
Notes: Returns false on any error.
Thee Memoryblock must be big enough. The BytesPerRow functions returns the number of bytes needed.
The first scanline has the index of 0.
This is the fastest way to read scanlines. You provide the memoryblock and you can reuse it for all calls to this method for one tiff.
See also:

15.2.64   ScanlinesScaled(index as integer, count as integer, sample as integer = 0, scaleFactor as Integer = 1) as memoryblock

Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get image scanlines scaled down as one memoryblock.
Notes: Returns nil on any error.

The data for this property is stored in the Tiff file.
The first scanline has the index of 0. Count is the number of scanlines you want to read/write.

If scaleFactor is >1, we scale down and return scaleFactor rows reduced to one row.

This scaling down is to quicker get preview pictures.

15.2.65   SetColorMap(red as memoryblock, green as memoryblock, blue as memoryblock) as boolean

Plugin Version: 9.6, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the color map for a paletten image.
Notes: The memoryblock must be 2^bitspersample * 2 bytes big.
Returns true on success and false on failure.

15.2.66   SetColorProfile(ProfileData as String) as boolean

Plugin Version: 7.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the color profile for this tiff file.
Example:

Dim p As New Picture(100,100,32)

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Dim ImageFile As FolderItem = SpecialFolder.Desktop.Child("test.tif")
Dim ProfileFile As FolderItem = SpecialFolder.Desktop.Child("Generic RGB Profile.icc")

Dim t As New TiffPictureMBS
t.Pict = p

Dim ProfileStream As BinaryStream = BinaryStream.Open(ProfileFile)
Dim ProfileData As String = ProfileStream.Read(ProfileStream.Length)

If t.Create(ImageFile) Then
// set profile before writing
If t.SetColorProfile(ProfileData) Then
// now write picture
If t.WriteRGB Then
t.Close

ImageFile.Launch
Else
Break
End If
Else
Break
End If
Else
Break
End If

Notes: Returns true on success and false on failure.

15.2.67   SetData(Tag as Integer, data as string) as boolean

Plugin Version: 8.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes the string for this tag.

15.2.68   SetFieldByte(Tag as Integer, value as Integer) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tiff data field with the given tag to the given value.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.

Please make sure to use the correct setter depending on data type associated with the tag.

15.2.69 SetFieldDouble(Tag as Integer, value as Double) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tiff data field with the given tag to the given value.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.70 SetFieldInteger(Tag as Integer, value as Integer) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tiff data field with the given tag to the given value.
Example:

```
dim t as TiffPictureMBS
dim f as FolderItem

const TIFFTAG_IMAGELENGTH=257 // integer
const TIFFTAG_IMAGEWIDTH=256 // integer

f=GetTemporaryFolderItem
t=new TiffPictureMBS

if t.Create(f) then

if t.SetFieldInteger(TIFFTAG_IMAGELENGTH,100) then
if t.Height=100 then
MsgBox "ok"
end if
end if

end if
```

Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.71   SetFieldMemory(Tag as Integer, ItemCount as Integer, data as memoryblock) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tiff data field with the given tag to the given value.
Notes: This is the special version of the setter which passes a memoryblock and a count value so you can set an array using this method.

Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.72   SetFieldShort(Tag as Integer, value as Integer) as boolean

Plugin Version: 7.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tiff data field with the given tag to the given value.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.73   SetFieldSingle(Tag as Integer, value as Single) as boolean

Plugin Version: 8.7, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tiff data field with the given tag to the given value.
Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.

15.2.74   SetFieldString(Tag as Integer, value as string) as boolean

Plugin Version: 8.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets one of the fields to the value of the string.
Example:

dim m,p as Picture
dim f as FolderItem
dim t as TiffPictureMBS
dim g as Graphics
dim s as string

```
// make pictures
p=New Picture(100,100,32)
m=New Picture(100,100,32)

p.Graphics.ForeColor=Rgb(0,255,0) // fill green
p.Graphics.Fillrect 0,0,100,100

p.Graphics.ForeColor=Rgb(255,0,0) // fill red
p.Graphics.FillOval 0,0,100,100

m.Graphics.ForeColor=Rgb(0,0,0) // fill black (invisible so green not seen)
m.Graphics.Fillrect 0,0,100,100

m.Graphics.ForeColor=Rgb(255,255,255) // fill white (Visible)
m.Graphics.FillOval 0,0,100,100

// save
f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
t.Pict=p
t.Mask=m

if t.Create(f) then
if t.WriteRGB then

const TIFFTAG_SOFTWARE=305

s="Example Software"
call t.SetFieldString TIFFTAG_SOFTWARE,s

const TIFFTAG_HOSTCOMPUTER=316

s="Example HostComputer"
call t.SetFieldString TIFFTAG_HOSTCOMPUTER,s

const TIFFTAG_IMAGEDESCRIPTION=270

s="Example ImageDescription"
call t.SetFieldString TIFFTAG_IMAGEDESCRIPTION,s

const TIFFTAG_MAKE=271

s="Example Make"
call t.SetFieldString TIFFTAG_MAKE,s

const TIFFTAG_ARTIST=315
```

s="Example Artist"
call t.SetFieldString TIFFTAG_ARTIST,s

t.Close
MsgBox "Ok"
f.Launch
end if
end if

Notes: Please look for Tag values in the tiff specification.
Returns true on success.
Please make sure to use the correct setter depending on data type associated with the tag.
You have to pass in the string with the correct encoding.

15.2.75   SetImageIndex(index as Integer) as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the current image index and reads the new image.
Example:

dim t as TiffPictureMBS // your tiff picture

if t.SetImageIndex(1) then
Canvas1.Backdrop=t.pict
end if

Notes: Reads automatically a RGB picture for you, so the pict property is filled on success.
Returns true on success.
Index is zero based.
See also:

15.2.76   SetImageIndex(index as Integer, HeaderOnly as boolean) as boolean

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the current image index.
Notes: If HeaderOnly is false the current picture is read into the pict&mask properties.

Returns true on success.
See also:

15.2.77   SetXMP(ProfileData as String) as boolean

Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the xmp metadata package for this tiff file.
Notes: Returns true on success and false on failure.

15.2.78   VStripSize(nrows as UInt32) as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of bytes in a strip with nrows rows of data.

15.2.79   VTileSize(nrows as UInt32) as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of bytes in a row-aligned tile with nrows of data.

15.2.80   WriteBW as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Write a black & white image.
Example:

```
dim p as Picture
dim f as FolderItem
dim t as TiffPictureMBS

p=New Picture(100,100,32)
p.Graphics.ForeColor=rgb(0,0,0)
p.Graphics.FillOval 0,0,100,100

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
```

```
if t.Create(f) then
t.Pict=p
if t.WriteBW then
MsgBox "ok"
end if
end if

Backdrop=p
```

Notes: Uses the pictures in the pict property to write a picture.
Currently masks are not supported.

The following settings are made before the image data is written:
PlanarConfig = PLANARCONFIG_CONTIG
Photometric = PHOTOMETRIC_MINISBLACK
BitsPerSample = 1
SamplesPerPixel = 1
FillOrder = FILLORDER_MSB2LSB
VerticalResolution = 72
HorizontalResolution = 72
Orientation = ORIENTATION_TOPLEFT
ResolutionUnit = RESUNIT_INCH
Compression = COMPRESSION_NONE

You may change settings before or later. For example if you set Compression before it should be used for writing image data to the file.
Returns true on success.

This method uses the YieldTicks property and may yield time to other threads.

15.2.81   WriteEncodedStrip(strip as UInt32, data as Memoryblock, size as Integer = 0) as Integer

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compress and write a strip of data to an open TIFF file.
Notes: Compress size bytes of raw data from buf and write the result to the specified strip; replacing any previously written data. Note that the value of strip is a ‚Äò‚Äòraw strip number." That is, the caller must take into account whether or not the data are organized in separate planes (PlanarConfiguration=2).

The library writes encoded data using the native machine byte order. Correctly implemented TIFF readers are expected to do any necessary byte-swapping to correctly process image data with BitsPerSample greater

than 8.

The strip number must be valid according to the current settings of the ImageLength and RowsPerStrip tags. An image may be dynamically grown by increasing the value of ImageLength prior to each call to WriteEncodedStrip.

Returns ,àí1 is returned if an error was encountered. Otherwise, the value of size is returned.
If size is zero, we use the size of memoryblock.

15.2.82   WriteEncodedTile(tile as UInt32, data as Memoryblock, size as Integer = 0) as Integer

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compress and write a tile of data to an open TIFF file.
Notes: Compress size bytes of raw data from buf and append the result to the end of the specified tile. Note that the value of tile is a "raw tile number". That is, the caller must take into account whether or not the data are organized in separate places (PlanarConfiguration=2). ComputeTile automatically does this when converting an (x,y,z,sample) coordinate quadruple to a tile number.

The library writes encoded data using the native machine byte order. Correctly implemented TIFF readers are expected to do any necessary byte-swapping to correctly process image data with BitsPerSample greater than 8.

Returns ,àí1 is returned if an error was encountered. Otherwise, the value of size is returned.

If size is zero, we use the size of memoryblock.

15.2.83   WriteGray as boolean

Plugin Version: 7.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Write a grayscale image with 256 colors.
Example:

dim t as TiffPictureMBS
dim f as FolderItem

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
if t.Create(f) then

t.Pict=LogoMBS(500)
call t.WriteGray
t.Close
end if

Notes: Uses the pictures in the pict property to write a picture.
Currently masks are not supported.

The following settings are made before the image data is written:
PlanarConfig = PLANARCONFIG_CONTIG
Photometric = PHOTOMETRIC_MINISBLACK
BitsPerSample = 8
SamplesPerPixel = 1
FillOrder = FILLORDER_MSB2LSB
VerticalResolution = 72
HorizontalResolution = 72
Orientation = ORIENTATION_TOPLEFT
ResolutionUnit = RESUNIT_INCH
Compression = COMPRESSION_NONE

You may change settings before or later. For example if you set Compression before it should be used for
writing image data to the file.
Returns true on success.

This method uses the YieldTicks property and may yield time to other threads.
Version 13.1 of our plugins writes a 16 bit Gray image if you set BitsPerSample to 16 before calling this
method.

15.2.84 WriteRawStrip(strip as UInt32, data as Memoryblock, size as Integer = 0) as Integer

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Write a strip of raw data to an open TIFF file.
Notes: Append size bytes of raw data to the specified strip.

The strip number must be valid according to the current settings of the ImageLength and RowsPerStrip
tags. An image may be dynamically grown by increasing the value of ImageLength prior to each call to
WriteRawStrip.

Returns -1 is returned if an error occurred. Otherwise, the value of size is returned.

If size is zero, we use the size of memoryblock.

15.2.85 WriteRawTile(tile as UInt32, data as Memoryblock, size as Integer = 0) as Integer

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Write a tile of raw data to an open TIFF file
Notes: Append size bytes of raw data to the specified tile.
Returns ,àí1 is returned if an error occurred. Otherwise, the value of size is returned.
If size is zero, we use the size of memoryblock.

15.2.86 WriteRGB as boolean

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes a RGB image.
Example:

dim m,p as Picture
dim f as FolderItem
dim t as TiffPictureMBS
dim g as Graphics

p=New Picture(100,100,32)
m=New Picture(100,100,32)

p.Graphics.ForeColor=Rgb(0,255,0) // fill green
p.Graphics.Fillrect 0,0,100,100

p.Graphics.ForeColor=Rgb(255,0,0) // fill red
p.Graphics.FillOval 0,0,100,100

m.Graphics.ForeColor=Rgb(0,0,0) // fill black (invisible so green not seen)
m.Graphics.Fillrect 0,0,100,100

m.Graphics.ForeColor=Rgb(255,255,255) // fill white (Visible)
m.Graphics.FillOval 0,0,100,100

f=SpecialFolder.Desktop.Child("test.tif")

t=new TiffPictureMBS
t.Pict=p

t.Mask=m

if t.Create(f) then
if t.WriteRGB then
t.Close
MsgBox "Ok"
f.Launch
end if
end if

Notes: Uses the pictures in the mask and pict properties to write a picture.
If mask is set, the picture is saved with an alpha channel.

The following settings are made before the image data is written:
PlanarConfig = PLANARCONFIG_CONTIG
Photometric = PHOTOMETRIC_RGB
BitsPerSample = 8
SamplesPerPixel = 3
FillOrder = FILLORDER_MSB2LSB
VerticalResolution = 72
HorizontalResolution = 72
Orientation = ORIENTATION_TOPLEFT
ResolutionUnit = RESUNIT_INCH
Compression = COMPRESSION_NONE

You may change settings before or later. For example if you set Compression before it should be used for writing image data to the file.
Returns true on success.

This method uses the YieldTicks property and may yield time to other threads.

15.2.87   Properties

15.2.88   BitsPerSample as Integer

Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The count of bits for each pixel component.
Notes: Should normally by 8 for RGB images.
(Read and Write property)

15.2.89 BytesPerRow as Int64

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of bytes needed for each row in a scan line.
Notes: 0 on any error.
(Read only property)

15.2.90 Compression as Integer

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The compression used.
Notes: some constants:

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.91 Copyright as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The copyright notice of this image.
Example:

```
dim file as folderitem = SpecialFolder.desktop.child("test.tif")
dim st as new MyTiff

// open for appending
if not st.Open(file,"r+") then
MsgBox "Open Tiff failed!"
else
// change one setting
st.Copyright = "Hello World"

// and save
call st.SaveImage
st.Close
end if
```

Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.92   CurrentDirOffset as Integer

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries current directory offset.
Notes: (Read only property)

15.2.93   CurrentRow as Integer

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Return the current row, respectively, that is being read or written.
Notes: These values are updated each time a read or write is done.
(Read only property)

15.2.94   CurrentStrip as Integer

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Return the current strip, respectively, that is being read or written.
Notes: These values are updated each time a read or write is done.
(Read only property)

15.2.95   CurrentTile as Integer

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Return the current tile, respectively, that is being read or written.
Notes: These values are updated each time a read or write is done.
(Read only property)

15.2.96   DateTime as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Date and time of the TIFF file.
Notes: Check some TIFF files for the format used.

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.97   DocumentName as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the document.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.98   ExtraSamples as MemoryBlock

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The settings for the extra samples.
Notes: A memoryblock filled with an array of shorts (16bit integers).

constants:

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.99   FillOrder as Integer

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The fill order of the bits in a byte.
Notes: constants:

(MSB = Most significant bit, LSB = Least significant bit)

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.100   height as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The height of the picture.
Notes: (Read and Write property)

15.2.101   HorizontalPosition as Single

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x Offset of this image in the drawing area.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.102   HorizontalResolution as Single

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The horizontal resolution used.
Notes: Value depends on ResolutionUnit value.

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.103   HostComputer as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Name of the machine where the tiff file was created.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

l   When creating a new file force information be written with Little-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

b   When creating a new file force information be written with Big-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

L   Force image data that is read or written to be treated with bits filled from Least Significant Bit (LSB) to Most Significant Bit (MSB). Note that this is the opposite to the way the library has worked from its inception.

B   Force image data that is read or written to be treated with bits filled from Most Significant Bit (MSB) to Least Significant Bit (LSB); this is the default.

H   Force image data that is read or written to be treated with bits filled in the same order as the native CPU.

M   Enable the use of memory-mapped files for images opened read-only. If the underlying system does not support memory-mapped files or if the specific image being opened cannot be memory-mapped then the library will fallback to using the normal system interface for reading information. By default the library will attempt to use memory-mapped files.

m   Disable the use of memory-mapped files.

C   Enable the use of "strip chopping" when reading images that are comprised of a single strip or tile of uncompressed data. Strip chopping is a mechanism by which the library will automatically convert the single-strip image to multiple strips, each of which has about 8 Kilobytes of data. This facility can be useful in reducing the amount of memory used to read an image because the library normally reads each strip in its entirety. Strip chopping does however alter the apparent contents of the image because when an image is divided into multiple strips it looks as though the underlying file contains multiple separate strips. Finally, note that default handling of strip chopping is a compile-time configuration parameter. The default behaviour, for backwards compatibility, is to enable strip chopping.

c   Disable the use of strip chopping when reading images.

l   When creating a new file force information be written with Little-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

b   When creating a new file force information be written with Big-Endian byte order (but see below). By default the library will create new files using the native CPU byte order.

L   Force image data that is read or written to be treated with bits filled from Least Significant Bit (LSB) to Most Significant Bit (MSB). Note that this is the opposite to the way the library has worked from its inception.

B   Force image data that is read or written to be treated with bits filled from Most Significant Bit (MSB) to Least Significant Bit (LSB); this is the default.

H   Force image data that is read or written to be treated with bits filled in the same order as the native CPU.

M   Enable the use of memory-mapped files for images opened read-only. If the underlying system does not support memory-mapped files or if the specific image being opened cannot be memory-mapped then the library will fallback to using the normal system interface for reading information. By default the library will attempt to use memory-mapped files.

m   Disable the use of memory-mapped files.

C   Enable the use of "strip chopping" when reading images that are comprised of a single strip or tile of uncompressed data. Strip chopping is a mechanism by which the library will automatically convert the single-strip image to multiple strips, each of which has about 8 Kilobytes of data. This facility can be useful in reducing the amount of memory used to read an image because the library normally reads each strip in its entirety. Strip chopping does however alter the apparent contents of the image because when an image is divided into multiple strips it looks as though the underlying file contains multiple separate strips. Finally, note that default handling of strip chopping is a compile-time configuration parameter. The default behaviour, for backwards compatibility, is to enable strip chopping.

c   Disable the use of strip chopping when reading images.

COMPRESSION_NONE	1	dump mode
COMPRESSION_CCITTRLE	2	CCITT modified Huffman RLE
COMPRESSION_CCITTFAX3	3	CCITT Group 3 fax encoding
COMPRESSION_CCITT_T4	3	CCITT T.4 (TIFF 6 name)
COMPRESSION_CCITTFAX4	4	CCITT Group 4 fax encoding
COMPRESSION_CCITT_T6	4	CCITT T.6 (TIFF 6 name)
COMPRESSION_LZW	5	Lempel-Ziv & Welch
COMPRESSION_OJPEG	6	!6.0 JPEG
COMPRESSION_JPEG	7	%JPEG DCT compression
COMPRESSION_NEXT	32766	NeXT 2-bit RLE
COMPRESSION_CCITTRLEW	32771	#1 w/ word alignment
COMPRESSION_PACKBITS	32773	Macintosh RLE
COMPRESSION_THUNDERSCAN	32809	ThunderScan RLE
COMPRESSION_IT8CTPAD	32895	IT8 CT w/padding
COMPRESSION_IT8LW	32896	IT8 Linework RLE
COMPRESSION_IT8MP	32897	IT8 Monochrome picture
COMPRESSION_IT8BL	32898	IT8 Binary line art
COMPRESSION_PIXARFILM	32908	Pixar companded 10bit LZW
COMPRESSION_PIXARLOG	32909	Pixar companded 11bit ZIP
COMPRESSION_DEFLATE	32946	Deflate compression
COMPRESSION_ADOBE_DEFLATE	8	Deflate compression, as recognized by Adobe
COMPRESSION_DCS	32947	Kodak DCS encoding
COMPRESSION_JBIG	34661	ISO JBIG
COMPRESSION_SGILOG	34676	SGI Log Luminance RLE
COMPRESSION_SGILOG24	34677	SGI Log 24-bit packed

EXTRASAMPLE_UNSPECIFIED	0	unspecified data
EXTRASAMPLE_ASSOCALPHA	1	associated alpha data (pre multiplied)
EXTRASAMPLE_UNASSALPHA	2	unassociated alpha data (mask in RB)

FILLORDER_MSB2LSB	1 (default)
FILLORDER_LSB2MSB	2

15.2.104   ImageDescription as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Information about the image.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.105   InputBuffer as String

Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The string passed for OpenString.
Notes: Used for the read requests from the Tiff library.
(Read only property)

15.2.106   IsBigEndian as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether file is big endian.
Notes: (Read only property)

15.2.107   IsByteSwapped as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether bytes are swapped.
Notes: Returns true if the image data was in a different byte-order than the host machine. Zero is returned if the TIFF file and local host byte-orders are the same.
Note that ReadTile(), ReadStrip() and ReadScanline() functions already normally perform byte swapping to local host order if needed.
(Read only property)

15.2.108   IsMSB2LSB as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if the image data is being returned with bit 0 as the most significant bit.
Notes: (Read only property)

15.2.109 IsTiled as Boolean

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a non-zero value if the image data has a tiled organization.
Notes: Zero is returned if the image data is organized in strips.
(Read only property)

15.2.110 IsUpSampled as Boolean

Plugin Version: 18.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether data is upsampled.
Notes: Returns a non-zero value if image data returned through the read interface routines is being up-sampled. This can be useful to applications that want to calculate I/O buffer sizes to reflect this usage (though the usual strip and tile size routines already do this).
(Read only property)

15.2.111 JPEGQuality as Integer

Plugin Version: 13.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The JPEG quality.
Example:

```
dim logo as Picture = LogoMBS(500)
dim pic as new PictureMBS(logo)

// save tiff with jpeg compression
dim f as FolderItem = SpecialFolder.Desktop.Child("test.tif")
dim t as TiffPictureMBS

if pic <>nil then
t = new TiffPictureMBS

if t.Create(F) then

t.Height = pic.Height
t.Width = pic.Width

t.RowsPerStrip = 1
t.PlanarConfig = t.kPlanarConfigContig
t.Photometric = t.kPhotometricRGB
t.BitsPerSample = 8
t.SamplesPerPixel = 3
```

t.FillOrder = t.kFillOrderMSB2LSB
t.Orientation = t.kOrientationTopLeft
t.ResolutionUnit = t.kResUnitInch
t.VerticalResolution = 72.0
t.HorizontalResolution = 72.0
t.Compression = t.kCompressionJPEG
t.RowsPerStrip = 32
t.JPEGQuality = 75

// copy lines
for i as Integer = 0 to t.Height - 1
t.Scanline(i) = pic.RowInFormat(i, PictureMBS.ImageFormatRGB)
next

t.Close
end if
end if

Notes: Default is 75.
(Read and Write property)

15.2.112   Make as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Scanner manufacturer name.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.113   mask as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: The mask of the picture.
Notes: May be nil.
(Read and Write property)

15.2.114   Model as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Scanner model name/number.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.115   NumberOfStrips as UInt32

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of strips in the image.
Notes: (Read only property)

15.2.116   NumberOfTiles as UInt32

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of tiles in the image.
Notes: (Read only property)

15.2.117   Orientation as Integer

Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The orientation of this image.
Example:

```
// creates a tif file with a horizontal flipped image
// red rectangle is on the left in the image data, but with orientation tag it should be displayed on the right side.
// Mac OS X Preview.app shows it correctly.

dim p as Picture
dim t as TiffPictureMBS
dim f as FolderItem

const ORIENTATION_TOPLEFT = 1 //* row 0 top, col 0 lhs */
const ORIENTATION_TOPRIGHT = 2 //* row 0 top, col 0 rhs */
const ORIENTATION_BOTRIGHT = 3 //* row 0 bottom, col 0 rhs */
const ORIENTATION_BOTLEFT = 4 //* row 0 bottom, col 0 lhs */
const ORIENTATION_LEFTTOP = 5 //* row 0 lhs, col 0 top */
const ORIENTATION_RIGHTTOP = 6 //* row 0 rhs, col 0 top */
const ORIENTATION_RIGHTBOT = 7 //* row 0 rhs, col 0 bottom */
const ORIENTATION_LEFTBOT = 8 //* row 0 lhs, col 0 bottom */
```

p=New Picture(150,100,32)

p.Graphics.ForeColor=rgb(255,0,0)
p.Graphics.FillRect 0,0,10,10

t=new TiffPictureMBS
f=SpecialFolder.Desktop.Child("test.tif")

if t.Create(f) then
t.Pict=p

t.Orientation=ORIENTATION_TOPRIGHT
if t.WriteRGB then
end if
t.Orientation=ORIENTATION_TOPRIGHT

t.Close
end if

Notes: Orientation:

The orientation of the image with respect to the rows and columns.
Tag = 274 (112.H)
Type = SHORT
N = 1
1 = The 0th row represents the visual top of the image, and the 0th column represents the visual left-hand side.
2 = The 0th row represents the visual top of the image, and the 0th column represents the visual right-hand side.
3 = The 0th row represents the visual bottom of the image, and the 0th column represents the visual right-hand side.
4 = The 0th row represents the visual bottom of the image, and the 0th column represents the visual left-hand side.
5 = The 0th row represents the visual left-hand side of the image, and the 0th column represents the visual top.
6 = The 0th row represents the visual right-hand side of the image, and the 0th column represents the visual top.
7 = The 0th row represents the visual right-hand side of the image, and the 0th column represents the visual bottom.
8 = The 0th row represents the visual left-hand side of the image, and the 0th column represents the visual bottom.

Default is 1.
Support for orientations other than 1 is not a Baseline TIFF requirement.
(This text was sent in by David Austin)

(Read and Write property)

15.2.118 OutputBuffer as String

Plugin Version: 5.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The current output data from the CreateString function.
Notes: Between CreateString and Close the plugin will record all the output data and you can get a copy using this property.
(Read only property)

15.2.119 PageName as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the current page.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.120 Photometric as Integer

Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: A property of the TIFF image.
Example:

```
// read and write a BW fax tiff with compression

dim d as new OpenDialog()
dim f as FolderItem = GetFolderItem("myfax.tiff")
if f = nil then
return
end if

dim tiff as new TiffPictureMBS()
if not tiff.Open(f) then
MsgBox("Error while opening.")
return
end if

if not tiff.ReadBW() then
MsgBox("Error reading.")
end if
```

```
dim tiff2 as TiffPictureMBS = new TiffPictureMBS()

dim f2 as FolderItem = SpecialFolder.Desktop.Child("Copy.tiff")
if not tiff2.Create(f2) then
MsgBox("Error creating file.")
end if

const COMPRESSION_CCITTFAX3=3
const WhiteIsZero=0
const BlackIsZero=1

tiff2.Pict = tiff.pict
tiff2.Photometric=WhiteIsZero
tiff2.Compression=COMPRESSION_CCITTFAX3
if not tiff2.WriteBW() then
MsgBox("Error writing.") // Error
end if

tiff2.Close()
```

Notes: PhotometricInterpretation:
The color space of the image data.
Tag = 262 (106.H)
Type = SHORT
N = 1

0 = WhiteIsZero. For bilevel and grayscale images: 0 is imaged as white. 2**BitsPerSample-1 is imaged as black. This is the normal value for Compression=2.

1 = BlackIsZero. For bilevel and grayscale images: 0 is imaged as black. 2**BitsPerSample-1 is imaged as white. If this value is specified for Compression=2, the image should display and print reversed.

2 = RGB. In the RGB model, a color is described as a combination of the three primary colors of light (red, green, and blue) in particular concentrations. For each of the three components, 0 represents minimum intensity, and 2**BitsPerSample - 1 represents maximum intensity. Thus an RGB value of (0,0,0) represents black, and (255,255,255) represents white, assuming 8-bit components. For PlanarConfiguration = 1, the components are stored in the indicated order: first Red, then Green, then Blue. For PlanarConfiguration = 2, the StripOffsets for the component planes are stored in the indicated order: first the Red component plane StripOffsets, then the Green plane StripOffsets, then the Blue plane StripOffsets.

3= Palette color. In this model, a color is described with a single component. The value of the component is used as an index into the red, green and blue curves in the ColorMap field to retrieve an RGB triplet that defines the color. When PhotometricInterpretation=3 is used, ColorMap must be present and SamplesPer-

Pixel must be 1.

4 = Transparency Mask. This means that the image is used to define an irregularly shaped region of another image in the same TIFF file. SamplesPerPixel and BitsPerSample must be 1. PackBits compression is recommended. The 1-bits define the interior of the region; the 0-bits define the exterior of the region. A reader application can use the mask to determine which parts of the image to display. Main image pixels that correspond to 1-bits in the transparency mask are imaged to the screen or printer, but main image pixels that correspond to 0-bits in the mask are not displayed or printed. The image mask is typically at a higher resolution than the main image, if the main image is grayscale or color so that the edges can be sharp.

There is no default for PhotometricInterpretation, and it is required. Do not rely on applications defaulting to what you want.
(This text was sent in by David Austin)

For more details see:
http://partners.adobe.com/asn/developer/pdfs/tn/TIFF6.pdf
(Read and Write property)

15.2.121   pict as picture

Platforms: macOS, Linux, Windows, Targets: All.

Function: The picture data of the picture.
Notes: (Read and Write property)

15.2.122   PlanarConfig as Integer

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The storage organization used.
Notes: Value is 1 for a single image plane and 2 for separated planes.

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.123   RasterScanlineSize as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the raster scanline size.
Notes: Returns the size in bytes of a complete decoded and packed raster scanline.

Note that this value may be different from the value returned by ScanlineSize if data is stored as separate planes.
(Read only property)

15.2.124   ResolutionUnit as Integer

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Which unit is used for the Resolution values.
Notes: constants:

RESUNIT_NONE	1	no meaningful units
RESUNIT_INCH	2	english
RESUNIT_CENTIMETER	3	metric

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.125   RowsPerStrip as Integer

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: A property of the TIFF image.
Notes: Should be same as the height for our uses. (with one strip)
(Read and Write property)

15.2.126   SampleFormat as Integer

Plugin Version: 15.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The data sample format.
Notes: Value is 1 for unsigned integer, 2 for signed integer, 3 for IEEE floating point, 4 for untyped data (e.g. JPEG compressed), 5 for complex signed int and 6 for complex IEEE floating point.
(Read and Write property)

15.2.127   SamplesPerPixel as Integer

Plugin Version: 3.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The count of components used for each pixel.
Notes: SamplesPerPixel= 1=Grayscale, 3=RGB, 4=CMYK, ...
Photometric= 0 or 1=Grayscale depending on white point, 2=RGB, 5=CMYK, ...

For other formats see:
http://partners.adobe.com/asn/developer/pdfs/tn/TIFF6.pdf
(Read and Write property)

15.2.128   Software as String

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The software name used to make this image.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.129   StripSize as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the equivalent size for a strip of data as it would be returned in a call to ReadEncodedStrip or as it would be expected in a call to WriteEncodedStrip.
Notes: (Read only property)

15.2.130   TileRowSize as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of bytes of a row of data in a tile.
Notes: (Read only property)

15.2.131   TileSize as UInt64

Plugin Version: 13.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the equivalent size for a tile of data as it would be returned in a call to ReadTile or as it would be expected in a call to WriteTile.
Notes: (Read only property)

15.2.132   Version as Integer

Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The version of the Tiff library used.
Notes: Updated to 3.7.1 in plugin version 5.0.
(Read only property)

15.2.133   VersionString as String

Plugin Version: 5.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The version of the Tiff library used.
Example:

dim z as new TiffPictureMBS

MsgBox z.VersionString

// shows for example:
// LIBTIFF, Version 3.9.4
// Copyright (c) 1988-1996 Sam Leffler
// Copyright (c) 1991-1996 Silicon Graphics, Inc.

Notes: (Read only property)

15.2.134   VerticalPosition as Single

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The y Offset of this image in the drawing area.
Notes: The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.135   VerticalResolution as Single

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: The vertical resolution used.
Notes: Value depends on ResolutionUnit value.

The data for this property is stored in the Tiff file.
(Read and Write property)

15.2.136   width as Integer

Platforms: macOS, Linux, Windows, Targets: All.

Function: The width of the picture.
Notes: (Read and Write property)

15.2.137   YieldTicks as Integer

Plugin Version: 7.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: How much time is given back to Xojo for other ticks.
Example:

dim t as new TiffPictureMBS
t.YieldTicks=6 // only use 1/10th of a second

Notes: If value is greater than zero, the application will yield to another RB thread after the given number of ticks have passed. 60 ticks are one second. Using a small value can slow down processing a lot while a big value keeps your application not responding to mouse clicks.
If you use this property with e.g. 6 as the value, you may also want to use this method in a thread so you can handle mouse events or let Xojo redraw a progressbar.
(Read and Write property)

15.2.138   Scanline(index as Integer, sample as Integer = 0) as memoryblock

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: An image scanline.
Notes: Returns nil on any error.
If you set the value, make sure the Memoryblock is big enough. The BytesPerRow functions returns the number of bytes needed.

The data for this property is stored in the Tiff file.
The first scanline has the index of 0.
(Read and Write computed property)
See also:

15.2.139 Scanlines(index as Integer, count as Integer, sample as Integer = 0, lineStepScanlines as Integer = 1, lineStepReturn as Integer = 1) as memoryblock

Plugin Version: 4.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get or set image scanlines as one memoryblock.
Notes: Returns nil on any error.
If you set the value, make sure the Memoryblock is big enough. The BytesPerRow functions returns the number of bytes needed.

The data for this property is stored in the Tiff file.
The first scanline has the index of 0. Count is the number of scanlines you want to read/write.

If lineStepScanlines is >1, we skip scan lines so we read less data.
If lineStepReturn is >1, we return only every nth row.

If rows can be read with skipping, you should try lineStepScanlines = 2 or more for skipping lines.
If that doesn't work due to tiled data, you can use lineStepReturn = 2 or more.
This skipping is to quicker get preview pictures.
(Read and Write computed property)

15.2.140 Events

15.2.141 Error(libModule as string, message as string)

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: .

Function: An event called whenever an error is to be reported.

15.2.142 Progress(line as Integer, total as Integer)

Plugin Version: 6.2, Platforms: macOS, Linux, Windows, Targets: .

Function: Reports changes in progress.
Notes: Used in CombineBitCMYKtoCMYK, CombineTiffCMYKtoRGB and CombineTiffCMYKtoCMYK methods.

15.2.143 Warning(libModule as string, message as string)

Plugin Version: 4.2, Platforms: macOS, Linux, Windows, Targets: .

Function: An event called whenever a warning is to be reported.

15.2.144 Constants

Compression Constants

Constant	Value	Description
kCompressionAdobeDeflate	8	Deflate compression, as recognized by Adobe
kCompressionCCITTFAX3	3	CCITT Group 3 fax encoding
kCompressionCCITTFAX4	4	CCITT Group 4 fax encoding
kCompressionCCITTRLE	2	CCITT modified Huffman RLE
kCompressionCCITTRLEW	32771	
kCompressionCCITT_T4	3	CCITT T.4 (TIFF 6 name)
kCompressionCCITT_T6	4	CCITT T.6 (TIFF 6 name)
kCompressionDCS	32947	Kodak DCS encoding
kCompressionDeflate	32946	Deflate compression
kCompressionIT8BL	32898	IT8 Binary line art
kCompressionIT8CTPAD	32895	IT8 CT w/padding
kCompressionIT8LW	32896	IT8 Linework RLE
kCompressionIT8MP	32897	IT8 Monochrome picture
kCompressionJBIG	34661	ISO JBIG
kCompressionJP2000	34712	Leadtools JPEG2000
kCompressionJPEG	7	JPEG DCT compression
kCompressionLZMA	34925	LZMA2
kCompressionLZW	5	Lempel-Ziv & Welch
kCompressionNeXT	32766	NeXT 2-bit RLE
kCompressionNone	1	No compression.
kCompressionOJPEG	6	!6.0 JPEG
kCompressionPackBits	32773	Macintosh RLE
kCompressionPixarFilm	32908	Pixar companded 10bit LZW
kCompressionPixarLog	32909	Pixar companded 11bit ZIP
kCompressionSGILOG	34676	SGI Log Luminance RLE
kCompressionSGILOG24	34677	SGI Log 24-bit packed
kCompressionThunderScan	32809	ThunderScan RLE

Fill Order Constants

Constant	Value	Description
kFillOrderLSB2MSB	2	Least significant ->most
kFillOrderMSB2LSB	1	Most significant ->least

Orientation Constants

Constant	Value	Description
kOrientationBottomLeft	4	row 0 bottom, col 0 lhs
kOrientationBottomRight	3	row 0 bottom, col 0 rhs
kOrientationLeftBottom	8	row 0 lhs, col 0 bottom
kOrientationLeftTop	5	row 0 lhs, col 0 top
kOrientationRightBottom	7	row 0 rhs, col 0 bottom
kOrientationRightTop	6	row 0 rhs, col 0 top
kOrientationTopLeft	1	row 0 top, col 0 lhs
kOrientationTopRight	2	row 0 top, col 0 rhs

Photometric Constants

Constant	Value	Description
kPhotometricCIELab	8	!1976 CIE L*a*b*
kPhotometricICCLab	9	ICC L*a*b* [Adobe TIFF Technote 4]
kPhotometricITULab	10	ITU L*a*b*
kPhotometricLogL	32844	CIE Log2(L)
kPhotometricLogLUV	32845	CIE Log2(L) (u',v')
kPhotometricMask	4	$ holdout mask
kPhotometricMinIsBlack	1	Min value is black.
kPhotometricMinIsWhite	0	Min value is white.
kPhotometricPalette	3	color map indexed
kPhotometricRGB	2	RGB color model
kPhotometricSeparated	5	!color separations
kPhotometricYCBCR	6	!CCIR 601

planar config Constants

Constant	Value	Description
kPlanarConfigContig	1	Single image plane.
kPlanarConfigSeparate	2	Separate planes of data.

Predictor Values

Constant	Value	Description
kPredictorFloatingPoint	3	Floating point predictor
kPredictorHorizontal	2	Horizontal differencing
kPredictorNone	1	no prediction scheme used

Resolution Unit Constants

Constant	Value	Description
kResUnitCentimeter	3	Metric
kResUnitInch	2	English
kResUnitNone	1	no meaningful units

Chapter 16

List of Questions in the FAQ

Chapter 17

The FAQ

17.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sure, here's a routine I use (which has an advantage over the previously-posted Date-based solution in that you don't have to rely on the creation of an object – all that happens is some division and string concatenation):
Example:

```
Function SecsToTimeString(timeInSecs as Integer, padHours as boolean, padMinutes as boolean) as string
// Given an amount time (in seconds), generates a string representing that amount
// of time. The padHours and padMinutes parameters determine whether to display
// hours and minutes if their values are zero.

// Examples:
// timeInSecs = 90, padHours = true; returns "00:01:30"
// timeInSecs = 1, padHours = false, padMinutes = true; returns "00:01"
// timeInSecs = 3601, padMinutes = false; returns "01:00:01"

dim hours, minutes, seconds as Integer
dim hoursString, minutesString as string

hours = timeInSecs / 3600
minutes = (timeInSecs mod 3600) / 60
seconds = timeInSecs mod 60

if hours = 0 then
if padHours then
hoursString = "00:"
else
hoursString = ""
end if
```

else
hoursString = Format(hours, "##\:")
end if
if minutes = 0 then
if hours <>0 or padMinutes then
minutesString = "00:"
else
minutesString = ""
end if
else
minutesString = Format(minutes, "00\:")
end if

return hoursString + minutesString + Format(seconds, "00")
End Function

Notes: (from the rb mailinglist)

17.0.2   Do you have plugins for Android?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Since there is no plugin SDK for Android, we have no way to make a plugin for Android.
Notes: We support macOS, Windows, Linux and iOS.

17.0.3   How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use functions from NSColor to get proper highlight color in RGB:
Example:

Function ProperHighlightColor(active as Boolean) As Color
#if TargetCocoa
Dim theColor As NSColorMBS
If active Then
theColor = NSColorMBS.alternateSelectedControlColor
Else
theColor = NSColorMBS.secondarySelectedControlColor
End If

Dim rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibrate-

dRGBColorSpace)
If rgbColor <>Nil Then
Dim red as Integer = rgbColor.redComponent * 255.0
Dim green as Integer = rgbColor.greenComponent * 255.0
Dim blue as Integer = rgbColor.blueComponent * 255.0
Return RGB(red, green, blue)
Else
Return HighlightColor
End If
#else
return HighlightColor
#endif
End Function

Notes: As you see we convert color to Calibrated RGB for best results.
See also:

17.0.4 How to catch delete key?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code in keydown event catches delete or backspace keys.
Example:

Function KeyDown(Key As String) As Boolean
if asc(key) = 8 or asc(key) = 127 then
MsgBox "Delete"
Return true
end if
End Function

See also:

17.0.5 How to convert cmyk to rgb?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

The following is the code to convert cmyk values to an RGB color datatype.
It's just a basic estimate of the color values. If you are looking for completely color accurate solution, this is not it. It should work for most people. :)
Example:

```
Function CMYKToRGB(c as Integer, m as Integer, y as Integer, k as Integer) As color
// converts c,m,y,k values (0-100) to color data type RGB
// place this in a method. Supply C,M,Y,K values-
// it returns color datatype


dim color_RGB as color
dim r, g, b as Integer

r=255-round(2.55*(c+k))
if r<0 then
r=0
end if
g=255-round(2.55*(m+k))
if g<0 then
g=0
end if
b=255-round(2.55*(y+k))
if b<0 then
b=0
end if

color_RGB=RGB(r,g,b)

return color_RGB

End Function
```

Notes:

(from the rb mailinglist)
See also:

17.0.6 How to delete a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code deletes a folder recursively.
Example:

```
Sub deletefolder(f as folderitem)
dim files(-1) as FolderItem

if f=nil then Return

// delete single file
if f.Directory=false then
f.Delete
Return
end if

// get a list of all items in that folder
dim i,c as Integer
c=F.Count
for i=1 to c
files.Append f.TrueItem(i)
next

// delete each item
for each fo as FolderItem in files
if fo=nil then
' ignore
elseif fo.Directory then
deletefolder fo
fo.delete
else ' file
```

fo.Delete
end if
next

f.Delete
End Sub

See also:

17.0.7   How to detect if CPU if 64bit processor?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Via CPUID you can ask CPU:
Example:

dim c as new CPUIDMBS

if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox ”64-bit CPU”
else
MsgBox ”32-bit CPU”
end if

Notes: Should work on all intel compatible CPUs.
See also:

17.0.8 How to query variant type string for a variant?

Plugin Version: 20.5, Platforms: macOS, Linux, Windows.

Answer: The following example function returns type string for variant.
Example:

```
Public Function VariantTypeString(v as Variant) as string
// Xojo's VarType doesn't know Unsigned integers
'Dim type As Integer = VarType(v)

// MBS VarType can detect unsigned integer
Dim type As Integer = GetVariantTypeMBS(v)

Dim IsArray As Boolean = BitwiseAnd(type, Variant.TypeArray) = Variant.TypeArray

// type without array
type = BitwiseAnd(type, Bitwise.OnesComplement(Variant.TypeArray))

// build a dictionary to map types on first call
Static TypeMap As Dictionary
If TypeMap = Nil Then
TypeMap = New Dictionary
TypeMap.Value(Variant.TypeBoolean) = "Boolean"
TypeMap.Value(Variant.TypeCFStringRef) = "CFStringRef"
TypeMap.Value(Variant.TypeColor) = "Color"
TypeMap.Value(Variant.TypeCString) = "CString"
TypeMap.Value(Variant.TypeCurrency) = "Currency"
TypeMap.Value(Variant.TypeDate) = "Date"
TypeMap.Value(Variant.TypeDateTime) = "DateTime"
TypeMap.Value(Variant.TypeDouble) = "Double"
TypeMap.Value(Variant.TypeInt32) = "Int32"
TypeMap.Value(Variant.TypeInt64) = "Int64"
TypeMap.Value(Variant.TypeInteger) = "Integer"
TypeMap.Value(Variant.TypeNil) = "Nil"
TypeMap.Value(Variant.TypeObject) = "Object"
TypeMap.Value(Variant.TypeOSType) = "OSType"
TypeMap.Value(Variant.TypePString) = "PString"
TypeMap.Value(Variant.TypePtr) = "Ptr"
TypeMap.Value(Variant.TypeSingle) = "Single"
TypeMap.Value(Variant.TypeString) = "String"
TypeMap.Value(Variant.TypeStructure) = "Structure"
TypeMap.Value(Variant.TypeText) = "Text"
TypeMap.Value(Variant.TypeWindowPtr) = "WindowPtr"
TypeMap.Value(Variant.TypeWString) = "WString"

// MBS extra types
TypeMap.Value(Variant.TypeInt32+100) = "UInt32"
TypeMap.Value(Variant.TypeInt64+100) = "UInt64"
```

End If

// lookup type

#if DebugBuild then
If Not TypeMap.HasKey(type) Then
Break // missing type
End If
#endif

If IsArray Then
Return "Array of " + TypeMap.Lookup(type,"?")
Else
Return TypeMap.Lookup(type,"?")
End If
End Function

See also:

17.0.9   How to refresh a htmlviewer on Windows?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can ask the browser to reload the website with this code line:
Example:

call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")

See also:

17.0.10 Is there an example for vector graphics in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this example inside the paint event of a window:
Example:

```
dim v as Group2D
dim r as RectShape
dim s as StringShape

const pi=3.14

s=new StringShape
s.Text="Hello World!"
s.TextFont="Geneva"
s.TextSize=24
s.FillColor=rgb(0,0,255)
s.Italic=true
s.y=5
s.x=0

r=new RectShape

r.X=0
r.y=0
r.Height=100
r.Width=180
r.BorderColor=rgb(255,0,0)
r.FillColor=rgb(0,255,0)
r.BorderWidth=5
r.Border=50

v=new Group2d
v.Append r
v.Append s
v.Rotation=pi*-20.0/180.0
v.x=150
v.y=150

g.DrawObject v
```

17.0.11   Picture functions do not preserve resolution values?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the picture functions return pictures with no/default resolution values.
Example:

dim l as Picture = LogoMBS(500)

l.HorizontalResolution = 300
l.VerticalResolution = 300

dim r as Picture = l.Rotate90MBS

MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)

r.HorizontalResolution = l.HorizontalResolution
r.VerticalResolution = l.VerticalResolution

MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)

Notes: So please fix them yourself after calling a function.

Maybe in the future this changes, but currently you can't really set this easily from plugin code.

17.0.12   A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Fill a memoryblock like this:
Example:

Dim MB As Memoryblock
MB = NewMemoryBlock(8)
MB.Short(0) = window1.Top
MB.Short(2) = window1.Left
MB.Short(4) = window1.Height+window1.Top // bottom
MB.Short(6) = window1.Width+window1.Left // right

17.0.13   API client not supported?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you get this exception message on SQLConnectionMBS.Connect, we may have a problem.

Notes: First case is that the given thing is not supported (e.g. MS SQL directly on Mac).

Second case is that the plugin compilation went wrong and the support for the database was not linked into the plugin. Like MySQL missing or MS SQL on Windows missing. In that case please contact us to fix the plugin.

17.0.14   Can I access Access Database with Java classes?

Plugin Version: all, Platform: Windows.

Answer: You can use ucanaccess to access databases created with Microsoft
Example:

dim options(-1) as string

// load all the jar files we have in a folder called java:

dim appFolder as FolderItem = GetFolderItem("")

Dim count as Integer = appFolder.Parent.Child("java").Count
dim libjs() as string
For i as Integer = 1 to count
Dim f As FolderItem = appFolder.Parent.Child("java").item(i)
If f <>Nil and f.Exists Then
libjs.append f.NativePath+";"
End If
Next

// now init virtual machine
dim librery as string = Join(libjs, "")
dim vm as new JavaVMMBS(librery)

if vm.Handle = 0 then
MsgBox "Failed to initialize virtual machine"
else
// now make a new database connection with ucanaccess
dim d as new JavaDatabaseMBS(vm,"net.ucanaccess.jdbc.UcanaccessDriver")
Dim DbFile as FolderItem = appFolder.Parent.Child("Database11.accdb")
dim j as JavaConnectionMBS = d.getConnection("jdbc:ucanaccess://"+DbFile.NativePath)

// select and show values
dim r as JavaResultSetMBS = j.MySelectSQL("Select * From test")
while r.NextRecord
MsgBox r.getString("FirstName") +" "+ r.getString("LastName")
wend

end if

Exception e as JavaExceptionMBS
MsgBox e.message+" errorcode: "+str(e.ErrorNumber)

Notes: see website:
http://ucanaccess.sourceforge.net/site.html

17.0.15 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, we have a graphics class integration for DynaPDF.
Notes: Since MBS Plugin in version 19.2, we can integrate reports with Xojo.

17.0.16 Can I use AppleScripts in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.
Example:

dim a as new AppleScriptMBS

// query my application name
a.Compile "tell application ""System Events"" to return name of current application"

// run
a.Execute

// show result
label1.text = a.Result

// shows something like "My Application.fcgi.debug"

Notes: This can be useful to control the server from remote, if and only if the your sever is running Mac OS X.

17.0.17 Can I use graphics class with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sorry, no. We can't provide a graphics subclass from plugin.
Notes: The is a feature request to allow graphics subclasses:
Feedback case 11391: feedback://showreport?report_id=11391

17.0.18   Can I use sockets on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.
Notes: You can use HTTPSocket, SMTPSocket, POP3Socket, SMTPSecureSocket, SecurePOP3Socket, EasyTCPSocket, EasyUDPSocket, AutoDiscovery, our Bonjour classes or our CURL* classes. But all of them work on the server, not on the client.

This means if you search for a printer with Bonjour, you can find the printers in the local network on your server hosting site. Using SMTPSocket may be a good idea for sending emails from the server like notifications.

17.0.19   Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.
Example:

```
// The data for the pie chart
dim data(-1) as Double=array(55.0, 18.0, 25.0, 22.0, 18.0, 30.0, 35.0)

// The labels for the pie chart, Words are choosen random to check font!
dim labels(-1) as string=array("Germany","Italy","France","Spain","UK","Poland","Russia")

// The colors to use for the sectors
dim colors(-1) as Integer

colors.Append &h66aaee
colors.Append &heebb22
colors.Append &hbbbbbb
colors.Append &h8844ff

if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype/msttcorefonts"
end if

// Create a PieChart object of size 360 x 300 pixels
dim c as new CDPieChartMBS(700, 600)
```

c.setBackground(c.linearGradientColor(0, 0, 0, c.getHeight(), &h0000cc, &h000044))
c.setRoundedFrame(&hffffff, 16)
dim tt as CDTextBoxMBS = c.addTitle("ChartDirector Demonstration", "timesbi.ttf", 18)
tt.setMargin(0, 0, 16, 0)
tt.setFontColor(&hFFFFFF)

// Set the center of the pie at (180, 140) and the radius to 100 pixels
c.setPieSize 350,300,150
// Set the sector colors
c.setColors(c.kDataColor, colors)

// Draw the pie in 3D with a pie thickness of 20 pixels
c.set3D(20)

dim t as CDTextBoxMBS = c.setLabelStyle("arialbd.ttf", 10, &h000000)
t.setBackground(CDPieChartMBS.kSameAsMainColor, CDPieChartMBS.kTransparent, CDPieChartMBS.soft-
Lighting(CDPieChartMBS.kRight, 0))
t.setRoundedCorners(8)

// Use local gradient shading for the sectors, with 5 pixels wide
// semi-transparent white (bbffffff) borders
c.setSectorStyle(CDPieChartMBS.kLocalGradientShading, &hbbffffff, 0)

// Set the pie data and the pie labels
c.setData data,labels
call c.setLabelStyle "arialbd.ttf",18

dim pic as picture = c.makeChartPicture
dim wp as new WebPicture(pic, Picture.FormatJPEG) // JPEG makes it smaller and faster

ImageView1.Picture=wp

Notes: Be aware that our plugin produces pictures for you, which you assign to ImageViews. Tranfserring
those pictures takes time, so you can optimize that with using WebPicture class. There you can decide
between different compressions to improve speed (use JPEG instead of PNG).

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with
"/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

17.0.20   Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our DynaPDF plugin works just fine on the Xojo Web Edition.
Notes: PDF files are created on the server. You may want to offer a preview to the user which uses reduced resolution images to reduce the time to download the PDF.

See our Create PDF example for the Xojo Web Edition.

17.0.21   Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: No.

17.0.22   Can you get an unique machine ID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There is nothing like an unique machine ID.
Notes: 1:
You can use the MAC IDs of the network interfaces.
This can be changed by the user with software tools.
And the list of network interfaces changes if user reorder the interfaces.

2:
You can use the system folder creation date/time.
This may stay equal after cloning machines or after migration to
new PC.

3:
You can use the Mac Serialnumber.
Mac only and it can happen that a Mac does not have a serial
number.

4:
You can use the x86 CPU ID.
This is x86 CPU only and does not avoid running on the same CPU in
different PCs.

17.0.23   ChartDirector: Alignment Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Alignment Specification
Notes: In many ChartDirector objects, you may specify the alignment of the object's content relative to its boundary. For example, for a TextBox object, you may specify the text's alignment relative to the box boundary by using TextBox.setAlignment.

The ChartDirector API defines several constants for the alignment options.

ConstantValueDescription

BottomLeft	1	The leftmost point on the bottom line.
BottomCenter	2	The center point on the bottom line.
BottomRight	3	The rightmost point on the bottom line.
Left	4	The leftmost point on the middle horizontal line.
Center	5	The center point on the middle horizontal line.
Right	6	The rightmost point on the middle horizontal line.
TopLeft	7	The leftmost point on the top line.
TopCenter	8	The center point on the top line.
TopRight	9	The rightmost point on the top line.
Bottom	2	The center point on the bottom line. Same as BottomCenter.
Top	8	The center point on the top line. Same as TopCenter.
TopLeft2	10	An alternative top-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopLeft2 refers to refers to the left of the top side, while TopLeft refers to the top of the left side. The reverse applies for a horizontal axis.
TopRight2	11	An alternative top-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopRight2 refers to refers to the right of the top side, while TopRight refers to the top of the right side. The reverse applies for a horizontal axis.
BottomLeft2	12	An alternative bottom-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomLeft2 refers to refers to the left of the bottom side, while BottomLeft refers to the bottom of the left side. The reverse applies for a horizontal axis.
BottomRight2	13	An alternative bottom-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomRight2 refers to refers to the right of the bottom side, while BottomRight refers to the bottom of the right side. The reverse applies for a horizontal axis.

17.0.24   ChartDirector: Color Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Color Specification
Notes: Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports col-

ors specified in web and HTML compatible ARGB format, in which ARGB refers to the Alpha transparency, Red, Green and Blue components of the color.

In addition to ARGB colors, ChartDirector supports "dynamic" colors. A dynamic color is a color that changes depending on the position of the pixels. The "dynamic" colors that ChartDirector supports include "pattern colors", "metal colors", "gradient colors", "zone colors" and "dash line colors".

ChartDirector supports specifying colors indirectly using "palette colors". When a "palette color" is used, the color is specified as an index to a palette. The actual color is looked up from the palette.ARGB Color ARGB color consists of 4 components - alpha transparency, red, green and blue. The four components are encoded as a 32-bit number, with each component occupying 8 bits. In hexadecimal notation, it is AARRGGBB, where AA, RR, GG and BB are the alpha transparency, red, green and blue components.

Each component ranges from 00 - FF (0 - 255), representing its intensity. For example, pure red color is 00FF0000, pure green color is 0000FF00, and pure blue color is 000000FF. White color is 00FFFFFF, and black color is 00000000.

Most programming language requires you to put special prefix in front of hexadecimal characters. For C++, the prefix is "0x". For example, the syntax for the hexadecimal number 00FFFFFF is 0x00FFFFFF, or simply 0xFFFFFF.
For the alpha transparency component, a zero value means the color is not transparent all at. This is equivalent to traditional RGB colors. A non-zero alpha transparency means the the color is partially transparent. The larger the alpha transparency, the more transparent the color will be. If a partially transparent color is used to draw something, the underlying background can still be seen.

For example, 80FF0000 is a partially transparent red color, while 00FF0000 is a non-transparent red color.

Note that ChartDirector's ARGB color is web and HTML compatible. For example, red is FF0000, the same as in HTML. There are many resources on the web that provide tables in which you can click a color and it will show its HTML color code. These color codes can be used in ChartDirector.

If alpha transparency is FF (255), the color is totally transparent. That means the color is invisible. It does not matter what the RGB components are. So in ChartDirector, only one totally transparent color is used - FF000000. All other colors of the form FFnnnnnn are reserved to represent palette colors and dynamic colors, and should not be interpreted as the normal ARGB colors.

The totally transparent color FF000000 is often used in ChartDirector to disable drawing something. For example, if you want to disable drawing the border of a rectangle, you can set the border color to totally transparent.

For convenience, ChartDirector defines a constant called Transparent, which is equivalent to FF000000.Pattern Color

A pattern color is a dynamic color that changes according to a 2D periodic pattern. When it is used to fill an area, the area will look like being tiled with a wallpaper pattern.

Pattern colors are created using BaseChart.patternColor, BaseChart.patternColor2, DrawArea.patternColor and DrawArea.patternColor2. The patternColor method creates pattern colors using an array of colors as a bitmap. The patternColor2 method creates pattern colors by loading the patterns from image files.

These methods return a 32-bit integer acting as a handle to the pattern color. The handle can be used in any ChartDirector API that expects a color as its input.Metal Color

A metal color is a color of which the brightness varies smoothly across the chart surface as to make the surface looks shiny and metallic. ChartDirector supports using any color as the base color of the metal color. In particular, using yellow and grey as the base colors will result in metal colors that look gold and silver.

Metal colors are most often used as background colors of charts. They are created using CDBaseChartMBS.metalColor, CDBaseChartMBS.goldColor and CDBaseChartMBS.silverColor. The first method allows you to specify an arbitrary base color. The second and third methods use yellow and grey as the base colors, resulting in gold and silver metal colors.

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any ChartDirector API that expects a color as its input.Gradient Color

A gradient color is a color that changes progressively across a direction.

Gradient colors are created using BaseChart.gradientColor, BaseChart.gradientColor2, DrawArea.gradientColor and DrawArea.gradientColor2. The gradientColor method creates a 2-point gradient color that changes from color A to color B. The gradientColor2 method creates a multi-point gradient colors that changes from color A to B to C ....

These methods return a 32-bit integer acting as a handle to the gradient color. The handle can be used in any ChartDirector API that expects a color as its input.

One common use of multi-point gradient colors is to define colors that have metallic look and feel. Please refer to DrawArea.gradientColor2 for details.Dash Line Colors

A dash line color is a color that switches on and off periodically. When used to draw a line, the line will appear as a dash line.

Dash line colors are created using BaseChart.dashLineColor and DrawArea.dashLineColor. They accept a line color and a dash pattern code as arguments, and return a 32-bit integer acting as a handle to the dash line color. The handle can be used in any ChartDirector API that expects a color as its input.Zone Colors

A zone color is for XY charts only. It is a color that automatically changes upon reaching a data threshold value along the x-axis or y-axis. Zone colors are created using Layer.xZoneColor, Layer.yZoneColor, XYChart.xZoneColor or XYChart.yZoneColor.Palette Colors

Palette colors are colors of the format FFFFnnnn, where the least significant 16 bits (nnnn) are the index to the palette. A palette is simply an array of colors. For a palette color, the actual color is obtained by

looking up the palette using the index. For example, the color FFFF0001 is the second color in the palette (first color is index 0).

The colors in the palette can be ARGB colors or "dynamic" colors (pattern, gradient and dash line colors).

The first eight palette colors have special significance. The first three palette colors are the background color, default line color, and default text color of the chart. The 4th to 7th palette colors are reserved for future use. The 8th color is a special dynamic color that is equal to the data color of the "current data set".

The 9th color (index = 8) onwards are used for automatic data colors. For example, in a pie chart, if the sector colors are not specified, ChartDirector will automatically use the 9th color for the first sector, the 10th color for the second sector, and so on. Similarly, for a multi-line chart, if the line colors are not specified, ChartDirector will use the 9th color for the first line, the 10th color for the second line, and so on.

The ChartDirector API defines several constants to facilitate using palette colors.

ConstantValueDescription

Constant	Value	Description
Palette	FFFF0000	The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1).
BackgroundColor	FFFF0000	The background color.
LineColor	FFFF0001	The default line color.
TextColor	FFFF0002	The default text color.
[Reserved]	FFFF0003 - FFFF0006	These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance.
SameAsMainColor	FFFF0007	A dynamic color that is equal to the data color of the current data set. This color is useful for objects that are associated with data sets. For example, in a pie chart, if the sector label background color is SameAsMainColor, its color will be the same as the corresponding sector color.
DataColor	FFFF0008	The starting point for the automatic data color allocation.

When a chart is created, it has a default palette. You may modify the palette using BaseChart.setColor, BaseChart.setColors, or BaseChart.setColors2.

The advantages of using palette colors are that you can change the color schemes of the chart in one place. ChartDirector comes with several built-in palettes represented by the following predefined constants.

ConstantDescription

17.0.25 ChartDirector: Font Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

defaultPalette	An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds).
whiteOnBlackPalette	An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds).
transparentPalette	An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent.

Answer: ChartDirector: Font Specification
Notes: Font Name
In ChartDirector, the font name is simply the file name that contains the font. For example, under the Windows platform, the "Arial" font is "arial.ttf", while the "Arial Bold" font is "arialbd.ttf".

NOTE: Mac OS X Specific Information
In Mac OS X, in addition to ".ttf", ChartDirector also supports Mac OS X font file formats, such as Font Suitcase files and Datafork files (.dfont). These files often contain multiple fonts. For example, the "Gill-Sans.dfont" file contains 6 fonts.

So in addition to the file name, an index is needed to determine the font. The index is specified by appending a " | " character to the font name, followed by the index number. For example, the third font in "GillSans.dfont" is denoted as "GillSans.dfont | 2". (Note: The first font starts at 0.) If no index number is provided, the first font is assumed.

ChartDirector also supports using Mac OS X Font Manager names. For example, one may use "Gill Sans Light Italic" instead of using "GillSans.dfont | 1" as the font name. However, the Mac OS X Font Manager is active only if someone has logged into the Mac GUI console, so this method is only recommended for developing applications that run on the GUI console.

The sample programs that come with ChartDirector are designed to run on all operating systems, so they use generic font file names (eg. "arial.ttf") instead of Mac OS X specific names. To allow them to run on Mac OS X, ChartDirector on Mac OS X has a built-in table to map common font file names to Mac OS X font names:

"arial.ttf", "arialbd.ttf", "ariali.ttf" and "arialbi.ttf" are mapped to "Arial | 0" (Arial), "Arial | 1" (Arial Bold), "Arial | 2" (Arial Italic) and "Arial | 3" (Arial Bold Italic)

"times.ttf", "timesbd.ttf", "timesi.ttf" and "timesbi.ttf" are mapped to "Times New Roman | 0" (Times New Roman), "Times New Roman | 1" (Times New Roman Bold), "Times New Roman | 2" (Times New Roman Italic) and "Times New Roman | 3" (Times New Roman Bold Italic)

"cour.ttf", "courbd.ttf", "couri.ttf" and "courbi.ttf" are mapped to "Courier New | 0" (Courier New), "Courier New | 1" (Courier New Bold), "Courier New | 2" (Courier New Italic) and "Courier New | 3" (Courier New Bold Italic)

Font Location

ChartDirector on Windows does not come with any font files. It relies on the operating system's font files in the " [windows] \Fonts" directory. To see what fonts are installed in your operating system and their file names, use the File Explorer to view that directory.

ChartDirector on Windows will also search for the font files in the "fonts" subdirectory (if it exists) under the directory where the ChartDirector DLL "chartdir.dll" is installed. This is useful for private fonts. Also, for some especially secure web servers, the web anonymous user may not have access to the " [windows] \Fonts" directory. In this case, you may copy the font files to the above subdirectory.

ChartDirector on Mac OS X relies on operating system font files in "/Library/Fonts" and "/System/Library/Fonts".

ChartDirector on Linux, FreeBSD and Solaris assume the fonts files are in the "fonts" subdirectory under the directory where the ChartDirector shared object "libchartdir.so" is installed. ChartDirector on Linux, FreeBSD and Solaris come with a number of font files in the "fonts" subdirectory.

To keep the download size small, ChartDirector on Linux, FreeBSD and Solaris only come with some commonly used fonts. You may download additional fonts from the Internet. In particular, the Microsoft fonts at

http://sourceforge.net/project/showfiles.php?group_id=34153&release_id=105355

is highly recommended. Please refer to

http://www.microsoft.com/typography/faq/faq8.htm

on how you could use the fonts legally in your system.

ChartDirector supports True Type fonts (.ttf), Type 1 fonts (.pfa and .pfb) and Windows bitmap fonts (.fon). On Mac OS X, ChartDirector also supports Font Suitcase and Datafork (.dfont) files. On Linux, FreeBSD and Solaris, ChartDirector also supports Portable Compiled Fonts (.pcf fonts).

If you want ChartDirector to search other directories for the font files, you may list the directories in an environment variable called "FONTPATH".

If you specify an absolute path name for the font file, ChartDirector will use the absolute path name and will not search other directories.Artificial Boldening and Italicizing

Whereas most popular font comes with different styles for "normal", "bold", "italic" and "bold italic", some fonts only come with one style (the normal style). For example, the Monotype Corsiva font that comes with MS Office only has the normal style (mtcorsva.ttf). For these cases, you may append the "Bold" and/or "Italic" words after the font file name (separated with a space) to ask ChartDirector to artificially bolden and/or italicize the font. For example, you may specify the font name as "mtcorsva.ttf Bold".Font List

Instead of specifying a single font file as the font name, you may specify a list of font files as the font name, separated by semi-colons. This is useful when using international characters that are only available in some fonts.

For example, if you would like to use the Arial font ("arial.ttf") for western characters, and the MingLiu font "mingliu.ttc" for Chinese characters (since the Arial font does not have Chinese characters), you may specify the font name as "arial.ttf;mingliu.ttc". In this case, ChartDirector will try the Arial font first. If it cannot find a certain character there, it will try the MingLiu font.Indirect Font Names
ChartDirector supports several special keywords for specifying the font name indirectly. When these keywords are used as font names, ChartDirector will look up the actual font names from a font table. The keywords are as follows:

KeywordsDescription

"normal"	This default normal font, which is the first font in the font table. This is initially mapped to "arial.ttf" (Arial).
"bold"	The default bold font, which is the second font in the font table. This is initially mapped to "arialbd.ttf" (Arial Bold).
"italic"	The default italic font, which is the third font in the font table. This is initially mapped to "ariali.ttf" (Arial Italic).
"boldItalic"	The default bold-italic font, which is the fourth font in the font table. This is initially mapped to "arialbi.ttf" (Arial Bold Italic).
"fontN"	The $(N + 1)$th font in the font table (the first font is "font0").

The font table can be modified using BaseChart.setFontTable or DrawArea.setFontTable.

The advantage of using indirect font names is that you can change the fonts fonts in your charts in one place.Font Index
Most font files contain one font. However, it is possible a font file contains multiple fonts (that is, a font collection). For example, in True Type fonts, font files with extension ".ttc" may represent a font collection.

If a font file contains multiple font, the font index can be used to specify which font to use. By default, the font index is 0, which means the first font in the font file will be used.Font Size
The font size decides how big a font will appear in the image. The font size is expressed in a font unit called points. This is the same unit used in common word processors.

Instead of specifying font size, some ChartDirector API (eg. TextBox.setFontSize) allow you to specify font height and font width separately. You may use different point sizes for font height and font width to create special effects.Font Color
This is the color to draw the font. (See Color Specification on how colors are represented in ChartDirector.)Font Angle
This is the angle in degrees by which the font should be rotated anti-clockwise.Vertical Layout
By default, text are laid out horizontally, with characters being drawn from left to right.

ChartDirector also supports vertical layout, with characters being drawn from top to bottom. For example, you may use BaseChart.addText to add text that are laid out vertically. Vertical layout is common for

oriental languages such as Chinese, Japanese and Korean.

17.0.26 ChartDirector: Mark Up Language

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Mark Up Language
Notes: ChartDirector Mark Up Language (CDML) is a language for including formatting information in text strings by marking up the text with tags.

CDML allows a single text string to be rendered using multiple fonts, with different colors, and even embed images in the text.Font Styles
You can change the style of the text by using CDML tags. For example, the line:

<*font=timesi.ttf,size=16,color=FF0000>Hello <*font=arial.ttf,size=12,color=8000*>world!
will result in the following text rendered:

In general, all tags in CDML are enclosed by <* and *>. Attributes within the tags determine the styles of the text following the tags within the same block.

If you want to include <* in text without being interpreted as CDML tags, use «* as the escape sequence.

The following table describes the supported font style attributes in CDML. See Font Specification for details on various font attributes.

AttributeDescription

Set the following text to be in superscript style. This attribute does not need to have a value. (You may use "super" as the attribute instead of "super=1".)

Note that unlike HTML tags, no double or single quotes are used in the tags. It is because CDML tags are often embedded as string literals in source code. The double or single quotes, if used, will conflict with the string literal quotes in the source code. Therefore in CDML, no quotes are necessary and they must not be used.

Also, unlike HTML tags, CDML uses the comma character as the delimiter between attributes. It is because certain attributes may contain embed spaces (such as the font file name). So space is not used as the delimiter and the comma character is used instead.

Note the font attribute above starts a new style section, while other attributes just modify the current style

font	Starts a new style section, and sets the font name. You may use this attribute without a value (that is, use "font" instead of "font=arial.ttf") to create a new style section without modifying the font name.
size	The font size.
width	The font width. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
height	The font height. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
color	The text color in hex format.
bgColor	The background color of the text in hex format.
underline	The line width of the line used to underline the following characters. Set to 0 to disable underline.
sub	Set the following text to be in subscript style. This attribute does not need to have a value. (You may use "sub" as the attribute instead of "sub=1".)
super	Set the following text to be in superscript style.

xoffset	Draw the following the text by shifting the text horizontally from the original position by the specified offset in pixels.
yoffset	Draw the following the text by shifting the text vertically from the original position by the specified offset in pixels.
advance	Move the cursor forward (to the right) by the number of pixels as specified by the value this attribute.
advanceTo	Move the cursor forward (to the right) to the position as specified by the value this attribute. The position is specified as the number of pixels to the right of the left border of the block. If the cursor has already passed through the specified position, the cursor is not moved.

section. You may use <*/font*>to terminate a style section, which will restore the font styles to the state before the style section.Blocks and Lines

In CDML, a text string may contain multiple blocks. A block may contain multiple lines of text by separating them with new line characters ("\n") or with <*br*>. The latter is useful for programming languages that cannot represent new line characters easily.

For example, the line:

<*size=15*><*block*><*color=FF*>BLOCK<*br*>ONE<*/*>and <*block*><*color=FF00*>BLOCK<*br*>TWO‹ will result in the following text rendered:

The above example contains a line of text. The line contains two blocks with the characters " and " in between. Each block in turn contains two lines. The blocks are defined using <*block*>as the start tag and

<*/*>as the end tag.

When a block ends, font styles will be restored to the state before entering the block.Embedding Images
CDML supports embedding images in text using the following syntax:

<*img=my_image_file.png*>
where my_image_file.png is the path name of the image file.

For example, the line:

<*size=20*>A <*img=sun.png*>day
will result in the following text rendered:

ChartDirector will automatically detect the image file format using the file extension, which must either png,
jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to BaseChart.setSearchPath or DrawArea.setSearchPath on the directory that ChartDirector
will search for the file.

The <*img*>tag may optionally contain width and height attributes to specify its pixel width and height.
In this case, ChartDirector will stretch or compress the image if necessary to the required width and
height.Blocks Attributes
CDML supports nesting blocks, that is, a block can contain other sub-blocks. Attributes are supported
in the <*block*>tag to control the alignment and orientation of the sub-blocks. The <*img=my_im-
age_file.png*>is treated as a block for layout purposes.

For example, the line:

<*block,valign=absmiddle*><*img=molecule.png*><*block*>Hydrazino\nMolecule<*/*><*/*>
will result in the following text rendered:

The the above starts <*block,valign=absmiddle*>which specifies its content should align with each others
in the vertical direction using the absolute middle alignment. The block contains an image, followed by a
space characters, and then another block which has two lines of text.

The following table describes the supported attributes inside <*block*>tag:

AttributeDescription

The value baseline means the baseline of sub-blocks should align with the baseline of the block. The baseline

width	The width of the block in pixels. By default, the width is automatically determined to be the width necessary for the contents of the block. If the width attribute is specified, it will be used as the width of the block. If the width is insufficient for the contents, the contents will be wrapped into multiple lines.
height	The height of the block in pixels. By default, the height is automatically determined to be the height necessary for the contents of the block. If the height attribute is specified, it will be used as the height of the block.
maxwidth	The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines.
truncate	The maximum number of lines of the block. If the content requires more than the maximum number of lines, it will be truncated. In particular, if truncate is 1, the content will be truncated if it exceeds the maximum width (as specified by maxwidth or width) without wrapping. The last few characters at the truncation point will be replaced with "...".
linespacing	The spacing between lines as a ratio to the default line spacing. For example, a line spacing of 2 means the line spacing is two times the default line spacing. The default line spacing is the line spacing as specified in the font used.
bgColor	The background color of the block in hex format.
valign	The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle.

is the underline position of text. This is normal method of aligning text, and is the default in CDML. For images or blocks that are rotated, the baseline is the same as the bottom.

The value top means the top line of sub-blocks should align with the top line of the block.

The value bottom means the bottom line of sub-blocks should align with the bottom line of the block.

The value middle means the middle line of sub-blocks should align with the the middle line of the block. The middle line is the middle position between the top line and the baseline.

The value absmiddle means the absolute middle line of sub-blocks should align with the absolute middle line of the block. The absolute middle line is the middle position between the top line and the bottom line.

halign	The horizontal alignment of lines. This is for blocks that contain multiple lines. Supported values are left, center and right.

The value left means the left border of each line should align with the left border of the block. This is the default.

The value center means the horizontal center of each line should align with the horizontal center of the block.

The value right means the right border of each line should align with the right border of the block.

angle   Rotate the content of the block by an angle. The angle is specified in degrees in counter-clockwise direction.

17.0.27   ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Parameter Substitution and Formatting
Notes: ChartDirector charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, HTML image maps, etc, are all text strings.

ChartDirector uses parameter substitution to allow you to configure precisely the information contained in the text and their format.
Format Strings
In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

" { label } ({ percent } %)"

When the sector label is actually drawn, ChartDirector will replace " { label } " with the sector name, and " { percent } " with the sector percentage. So the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

" { label } : US$ { value | 2 } K ({ percent } %)"

The sector label will then become something like "ABC: US$ 123.00 (34.56%)".

In general, in ChartDirector parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, ChartDirector supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the Number Formatting and Date/Time Formatting sections below for details.

Parameter Expressions

ChartDirector supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

"USD { value } (Euro { = { value } *0.9 })"

In the above, " { value } " will be substituted with the actual value of the sector. The expression " { = { value } *0.9 } " will be substituted with the actual value of the sector multiplied by 0.9.

ChartDirector parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

Parameter	Description
sector	The sector number. The first sector is 0, while the nth sector is (n-1).
dataSet	Same as { sector } . See above.
label	The text label of the sector.
dataSetName	Same as { label } . See above.
value	The data value of the sector.
percent	The percentage value of the sector.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using BaseChart.addExtraField or BaseChart.addExtraField2.

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the { dataSetName } parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for Line Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Trend Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Box-Whisker Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for HLOC and CandleStick Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Vector Layers
The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameters for All Polar Layers
The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for PolarVector Layers
The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameters for Axis
The following table describes the parameters available for pie charts.

Number Formatting
For parameters that are numbers, ChartDirector supports a number of formatting options in parameter substitution.

For example, if you want a numeric field { value } to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use { value | 2,. } . The number 123456.789 will then be displayed as 123,456.79.

For numbers, the formatting options are specified using the following syntax:

{ [param] | [a] [b] [c] [d] }

where:

If this field starts with "E" or "e", followed by a number, it means formatting the value using scientific notation with the specified number of decimal places. If the "E" or "e" is not followed by a number, 3 is assumed.

For example, { value | E4 } will format the value 10.3 to 1.0300E+1, and { value | e4 } will format the same value to 1.0300e+1.

If this field starts with "G" or "g", followed by a number, it means formatting the value using the scientific notation only if the value is large and requires more than the specified number of digits, or the value is less than 0.001. If scientific notation is used, the number following "G" or "g" also specifies the number of significant digits to use. If the "G" or "g" is not followed by a number, 4 is assumed.

For example, consider the format string { value | G4 } . The value 10 will be formatted to 10. The value 100000 will be formatted to 1.000E+5. Similarly, for { value | g4 } , the value 10 will be formatted to 10, while the value 100000 will be formatted to 1.000e+5.

If you skip this argument, ChartDirector will display the exact value using at most 6 decimal places.

You may skip [b] [c] [d] . In this case, the default will be used.

Date/Time Formatting
For parameters that are dates/times, the formatting options can be specified using the following syntax:

{ [param] | [datetime_format_string] }

where [datetime_format_string] must start with an english character (A-Z or a-z) that is not "G", "g", "E" or "e", and may contain any characters except ' } '. (If it starts with "G", "g", "E" or "e", it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

For example, a parameter substitution format of { value | mm-dd-yyyy } will display a date as something similar to 09-15-2002. A format of { value | dd/mm/yy hh:nn:ss a } will display a date as something similar to 15/09/02 03:04:05 pm.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format { value | mmm '<*color=dd0000*>'yyyy } will display a date as something like Jan <*color=dd0000*>2005 (the <*color=dd0000*>is a CDML tag to specify red text color). Note that the <*color=dd0000*>tag is copied directly without substitution, even it contains "dd" which normally will be substituted with the day of month.

Escaping URL/HTML/CDML characters

Parameter substitution is often used to create HTML image maps. In HTML, some characters has special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, ChartDirector will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&amps;#nn;" (eg. ">" will become "&amps;#62;".). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - " { escape_url } ", " { noescape_url } ", " { escape_html } ", " { noescape_html } ", " { escape_cdml } " and { noescape_cdml } ". These fields enable/disable the escape methods used in the template fields that follow them.

17.0.28 ChartDirector: Shape Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Shape Specification
Notes: Several ChartDirector API accept shape specification as arguments. For example, BarLayer.setBarShape and BarLayer.setBarShape2 can be used to specify shapes of bars in bar charts, while DataSet.setDataSymbol, DataSet.setDataSymbol4, PolarLayer.setDataSymbol and PolarLayer.setDataSymbol4 can be used to specify shapes for data symbols.

Note that in addition to shapes, in many cases ChartDirector also accepts images or custom draw objects for data representation. For example, see DataSet.setDataSymbol2, DataSet.setDataSymbol3, PolarLayer.setDataSymbol2 and PolarLayer.setDataSymbol3.

Built-In Shapes

Built-in shapes are specified as integers. The integers can be explicit constants, or can be generated by a ChartDirector method for parameterized shapes. For example, a circle is represented by an explicit constant CircleShape (=7). On the other hand, the number representing a polygon depends on the number of sides the polygon has, so it is generated by using the PolygonShape method, passing in the number of sides as argument.

The following table illustrates the various ChartDirector shapes:

Custom Shapes

In ChartDirector, custom shapes are specified as an array of integers x0, y0, x1, y1, x2, y2 ... representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 1000 x 1000 units, in which the x-axis is from -500 to 500 going from left to right, and the y-axis is from 0 to 1000 going from bottom to top.

ChartDirector will automatically scale the polygon so that 1000 units will become to the pixel size as requested by the various ChartDirector API.

As an example, the shape of the standard diamond shape in ChartDirector is represented as an array with 8 numbers:

0, 0, 500, 500, 0, 1000, -500, 500

17.0.29   Copy styled text?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to quickly copy styled text from one textarea to another?
Example:

```
#if TargetWin32 then
TextArea1.WinRTFDataMBS = TextArea2.WinRTFDataMBS
#elseif TargetMacOS then
TextArea1.NSTextViewMBS.textStorage.setAttributedString TextArea2.NSTextViewMBS.textStorage
#else
TextArea1.StyledText = TextArea2.StyledText
#endif
```

Notes: The code above uses special plugin functions on Mac and Windows and falls back to framework for Linux.

17.0.30 Do you have code to validate a credit card number?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can check the checksum to tell if a credit card number is not valid.
Example:

```
Dim strNumber As String
Dim nLength as Integer
Dim nValue as Integer
Dim nChecksum as Integer
Dim nIndex as Integer

strNumber = EditField1.Text
nLength = Len(strNumber)
nChecksum = 0

For nIndex = 0 To nLength - 2
nValue = Val(Mid(strNumber, nLength - (nIndex + 1), 1)) * (2 - (nIndex Mod 2))
If nValue <10 Then
nChecksum = nChecksum + nValue
Else
nChecksum = nChecksum + (nValue - 9)
End If
Next

If Val(Mid(strNumber, Len(strNumber), 1)) = (10 - (nChecksum Mod 10)) Mod 10 Then
MsgBox("The credit card number looks valid")
Else
MsgBox("The credit card number is invalid")
End IF
```

Notes: Here's some code that will validate the checksum for a credit card. It works for Visa, MasterCard, American Express and Discover. Not sure about others, but I imagine they use the same basic algorithm. Of course, this doesn't actually mean that the credit card is valid, it's only useful for helping the user catch typos.

The above code doesn't have any error checking and it expects that the credit card number will be entered without spaces, dashes or any other non-numeric characters. Addressing those issues will be an exercise left to the reader. :)

(From Mike Stefanik)

17.0.31   Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all.

Answer: Our EyeOne plugin is available on request for licensees of the X-Rite SDKs.
Notes: Please first go to X-Rite and get a SDK license.
Than we can talk about the plugin.

17.0.32   Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the plugin can work with multiple recordsets.
Notes: You need to use SQLCommandMBS class. When you get back results, you use FetchNext to walk
over all records in the first result set. Than you simply start again with FetchNext to get the second record
set.
Even the RecordSet functions should work, just use them twice to get all records from both record sets.

17.0.33   Does the plugin home home?

Plugin Version: all, Platform: macOS.

Answer: Yes, we like to know who is using the plugin, so the plugin may contact our server.
Example:

none.

Notes: Please note that this does not affect your users as the plugin will only do this in the IDE and the
relevant plugin part is never included in your applications.

The plugin if used for some hours, does contact our server to provide statistical data about Xojo version and
OS versions. This way we know what versions are used. We can return the version number of the current
plugin which may be visible in future versions somehow. And we transmit partial licenses data so we can
track use of illegal license keys.

If you do not like to have this, you can block Xojo IDE from contacting our website via your Firewall.
Blocking the transfer will not disable the plugin or change the features.
Or contact us for a plugin version which explicitly does not contain this feature.

17.0.34 folderitem.absolutepath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Paths on a Mac are not unique, so use them only to display them to the user.
Example:

```
Function AbsolutePath(f as FolderItem) As String
Dim s as string
Dim nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + ":" + s
nf = nf.parent
wend
Return s
End Function
```

17.0.35 Has anyone played round with using CoreImage to do things like add dissolve transitions say when changing from one tab to another within a window?

Platform: macOS.

Answer: This code implements animations for a tabpanel change:
Example:

```
// in a tabpanel.change event:

dim r as CGSTransitionRequestMBS
dim co as new CGSConnectionMBS
dim cw as CGSWindowMBS
dim ct as CGSTransitionMBS
static OldTab as Integer

cw=co.CGSWindow(window1)
If cw = Nil Then
return // 10.3...
End If
r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
```

```
// watch the value of the clicked tab versus the last tab
if tabpanel1.Value=0 or tabpanel1.Value <OldTab then
r.TransitionOption=r.CGSLeft
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
else
r.TransitionOption=r.CGSRight
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
end if
// Keep track of the last tab clicked
OldTab = tabpanel1.Value
```

Notes: See CGS* classes for more details.

17.0.36 How about Plugin support for older OS X?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We support in general Mac OS X 10.5 and newer.
Notes: All the 64-bit plugins on Mac require OS X 10.7.
Intel 32-bit plugins on Mac require OS X 10.5 or newer.

Currently the ChartDirector 6, GraphicsMagick and GameKit plugins requires Mac OS X 10.6.
Also for SQL Plugin the built in SQLite library requires 10.6.

17.0.37   How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all.

Answer: Look on the CPU family returned by sysctl:
Example:

Function is64bit() As Boolean

#if TargetLittleEndian

dim m as MemoryBlock = NewMemoryBlock(8)
dim family as Integer
dim s as string

m=SystemControlNameToMIBMBS("hw.cpufamily")
m=SystemControlMBS(m)

if m<>nil then
m.LittleEndian=True
family=m.Long(0)

const CPUFAMILY_INTEL_6_14 = &h73d67300 //* "Intel Core Solo" and "Intel Core Duo" (32-bit Pentium-M with SSE3) */
const CPUFAMILY_INTEL_6_15 = &h426f69ef //* "Intel Core 2 Duo" */
const CPUFAMILY_INTEL_6_23 = &h78ea4fbc //* Penryn */
const CPUFAMILY_INTEL_6_26 = &h6b5a4cd2 //* Nehalem */

Select case family
case CPUFAMILY_INTEL_6_14
Return false
case CPUFAMILY_INTEL_6_15
Return true
case CPUFAMILY_INTEL_6_23
Return true
case CPUFAMILY_INTEL_6_26
Return true
// newer CPUs may be missing here
end Select

end if

#endif

Return false

Exception
Return false
End Function

Notes: This code is written for Mac OS X where you only have a limited number of possible CPUs.

17.0.38   How can I disable the close box of a window on Windows?

Plugin Version: all, Platform: Windows.

Answer: The following code will remove the close item from the system menu of the window.
Example:

```
#if TargetWin32 then
Declare Function GetSystemMenu Lib "user32" (hwnd as Integer, bRevert as Integer) as Integer
Declare Function RemoveMenu Lib "user32" (hMenu as Integer, nPosition as Integer, wFlags as Integer) as
Integer
Dim hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, &HF060, &H0
#endif
```

Notes: The window may not be updated directly.

17.0.39   How can I get all the environment variables from Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:
Example:

```
#if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
dim m as memoryBlock
dim n as Integer

m=GetEnvironmentStrings()

n=0
do
msgBox m.cstring(n)
while m.byte(n)<>0
n=n+1
wend
n=n+1
```

```
loop until m.byte(n)=0
#endif
```

Notes: The MBS Plugin has an EnvironmentMBS class for this.

17.0.40 How can i get similar behavior to Roxio Toast or iTunes where clicking a 'burn' button allows the next inserted blank CD-R to bypass the Finder and be accepted by my application?

Plugin Version: all, Platform: macOS.

Answer: You need to get a media reservation.
Example:

```
dim d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

Notes: Use the plugin function AcquireMediaReservation and later release it using ReleaseMediaReservation.
See plugin examples on how to use it and check Apples DiscRecording framework documentation for more details.

17.0.41 How can I get text from a PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Crossplatform you can use DynaPDF Pro.
Notes: On Mac OS X you can also use PDFKit for the same job.
While DynaPDF Pro gives you each bit of text with rotation, font information and encoding details, PDFKit gives you only the text string for a PDF page.

17.0.42 How can I get text from a Word Document?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: to get the text string from a doc file, use the NSAttributedStringMBS class.
Notes: The NSAttributedStringMBS class is Mac OS X only and we have currently no solution for Windows or Linux.

Use the NSAttributedStringMBS.initWithDocFormat(data as string) as boolean method.

17.0.43   How can I get the item string for a given file creator?

Plugin Version: all.

Answer: Try this function:
Example:

```
Sub pullNativeDocs(aCREA As string)
Dim result as Integer
Dim m, k as memoryBlock
Dim f as folderItem
Dim newType as string
Dim anIcon As picture
Dim ofs as Integer

Declare Function GetFileTypesThatAppCanNativelyOpen Lib "Carbon" (appVRefNumHint as Short, appSig-
nature as OSType, nativeTypes as Ptr) as Short Inline68K("701CABFC")
Declare Function GetDocumentKindString Lib "Carbon" (docVRefNum as Short, docType as OSType, doc-
Creator as OSType, kindString as ptr) as Short Inline68K("7016ABFC")

listBox1.deleteAllRows

m = newMemoryBlock(1024)
result = GetFileTypesThatAppCanNativelyOpen(Volume(0).MacVRefNum, aCREA, m)
if result <>0 then
listBox1.addRow "<Not found.>"
return
end if

do
if m.byte(ofs*4) = 0 then
exit
else
newType = m.OSTypeMBS(ofs*4)
listBox1.addRow newType
k = newMemoryBlock(64)
result = GetDocumentKindString(Volume(0).MacVRefNum, newType, aCREA, k)
if result = 0 then
listBox1.cell(ofs,1) = k.pString(0)
ofs = ofs + 1
else
listBox1.cell(ofs,1) = "(unknown)"
end if

end if
```

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loop

End Sub

Notes: Change "Translation" to "CarbonLib" for Mac OS X.

17.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):
Example:

Function LaunchByCreator(C As String) As Boolean
Dim A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("—-") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function

17.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please use the ldd command in the terminal.
Notes: You build an app on any platform, but for Linux.
For the resulting .so files in the libs folder, you can run the ldd command with the library path as parameter.
It shows you references lib files and you can make sure you have those installed.

This is a sample run of our graphicsmagick plugin:

cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$ ldd libMBSGraphicsMagickPlugin17744.so
linux-gate.so.1 =>(0xb76ee000)
libdl.so.2 =>/lib/i386-linux-gnu/libdl.so.2 (0xb6f0e000)
libgtk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgtk-x11-2.0.so.0 (0xb6aa6000)
libpthread.so.0 =>/lib/i386-linux-gnu/libpthread.so.0 (0xb6a8a000)
libstdc++.so.6 =>/usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
libm.so.6 =>/lib/i386-linux-gnu/libm.so.6 (0xb6979000)
libgcc_s.so.1 =>/lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
libc.so.6 =>/lib/i386-linux-gnu/libc.so.6 (0xb67b1000)

/lib/ld-linux.so.2 (0xb76ef000)
libgdk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
libpangocairo-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
libX11.so.6 =>/usr/lib/i386-linux-gnu/libX11.so.6 (0xb65c0000)
libXfixes.so.3 =>/usr/lib/i386-linux-gnu/libXfixes.so.3 (0xb65ba000)
libatk-1.0.so.0 =>/usr/lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 =>/usr/lib/i386-linux-gnu/libcairo.so.2 (0xb64ce000)
libgdk_pixbuf-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb64ad000)
libgio-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgio-2.0.so.0 (0xb6356000)
libpangoft2-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
libpango-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
libfontconfig.so.1 =>/usr/lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
libgobject-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb625c000)
libglib-2.0.so.0 =>/lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
libXext.so.6 =>/usr/lib/i386-linux-gnu/libXext.so.6 (0xb6151000)
libXrender.so.1 =>/usr/lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
libXinerama.so.1 =>/usr/lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
libXi.so.6 =>/usr/lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
libXrandr.so.2 =>/usr/lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
libXcursor.so.1 =>/usr/lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
libXcomposite.so.1 =>/usr/lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
libXdamage.so.1 =>/usr/lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
libfreetype.so.6 =>/usr/lib/i386-linux-gnu/libfreetype.so.6 (0xb607b000)
libxcb.so.1 =>/usr/lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
libpixman-1.so.0 =>/usr/lib/i386-linux-gnu/libpixman-1.so.0 (0xb5fc2000)
libpng12.so.0 =>/lib/i386-linux-gnu/libpng12.so.0 (0xb5f98000)
libxcb-shm.so.0 =>/usr/lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f93000)
libxcb-render.so.0 =>/usr/lib/i386-linux-gnu/libxcb-render.so.0 (0xb5f89000)
libz.so.1 =>/lib/i386-linux-gnu/libz.so.1 (0xb5f73000)
libgmodule-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgmodule-2.0.so.0 (0xb5f6e000)
libselinux.so.1 =>/lib/i386-linux-gnu/libselinux.so.1 (0xb5f4f000)
libresolv.so.2 =>/lib/i386-linux-gnu/libresolv.so.2 (0xb5f36000)
libexpat.so.1 =>/lib/i386-linux-gnu/libexpat.so.1 (0xb5f0c000)
libffi.so.6 =>/usr/lib/i386-linux-gnu/libffi.so.6 (0xb5f05000)
libpcre.so.3 =>/lib/i386-linux-gnu/libpcre.so.3 (0xb5ec9000)
librt.so.1 =>/lib/i386-linux-gnu/librt.so.1 (0xb5ec0000)
libXau.so.6 =>/usr/lib/i386-linux-gnu/libXau.so.6 (0xb5ebb000)
libXdmcp.so.6 =>/usr/lib/i386-linux-gnu/libXdmcp.so.6 (0xb5eb4000)
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$

As you see all library have been found and their load address is printed behind the na,e.
If a library is missing, you usually see the address missing there or being zero.

17.0.46   How can I validate an email address?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:
Example:

```
Dim re As RegEx
re = New RegEx
Dim rm As RegExMatch

re.SearchPattern = " [ a-z0-9!#$ %&'*+/=?^_' { | }
textasciitilde - ] +(?:\. [ a-z0-9!#$ %&'*+/=?^_' { | }
textasciitilde - ] +)*@(?: [ a-z0-9 ] (?: [ a-z0-9- ] * [ a-z0-9 ] )?\.)+ [ a-z0-9 ] (?: [ a-z0-9- ] * [ a-z0-9 ] )?"
rm = re.Search(editField1.Text)

if rm = Nil Then
StaticText2.text = editField1.Text + " not valid email"
Else
StaticText2.Text = editField1.Text + " is valid"
End if
```

Notes: Adapted from:
http://www.regular-expressions.info/email.html

17.0.47   How do I decode correctly an email subject?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following code can be used to decode an email subject including several encodings including Base 64.
Example:

```
dim src as string // input

dim theRegex as Regex
dim theRegexMatch as RegexMatch
dim result, infoCharset, encodedPart as string
dim theStart as Integer

if instr(src, "=?") >0 then
theRegex = new Regex
theRegex.Options.Greedy = false
theRegex.searchPattern = "(.*)=\?(.+)\?(Q | B)\?(.+)\?="
theRegexMatch = theRegex.search(src)
```

```
while theRegexMatch <>nil
theStart = theRegexMatch.subExpressionStartB(0) + len(theRegexMatch.subExpressionString(0))

result = result + theRegexMatch.subExpressionString(1)
infoCharset = theRegexMatch.subExpressionString(2)
encodedPart = theRegexMatch.subExpressionString(4)
if theRegexMatch.subExpressionString(3) = "B" then
encodedPart = DecodeBase64(encodedPart)
elseif theRegexMatch.subExpressionString(3) = "Q" then
encodedPart = DecodeQuotedPrintable(encodedPart)
end if
if right(result, 1) = " " then
result = mid(result, 1, len(result)-1)
end if
encodedPart = encodedPart.DefineEncoding(GetInternetTextEncoding(infoCharset))
result = result + encodedPart

theRegex.SearchStartPosition = theStart
theRegexMatch = theRegex.search()
wend

result = result + mid(src, theStart+1)

else
result = src
end if
// theRegexMatch = theRegex.search

msgbox result
```

Notes: May not look nice depending on the controls used.
This is no longer needed when using MimeEmailMBS class which decodes for you.

17.0.48   How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Platform: macOS.

Answer: Use the TabpanelEnabledMBS method.
Example:

```
TabpanelEnabledMBS(tabpanel1, 1, false)
```

Notes: Use Carbon for MachO and CarbonLib for Mac Carbon and AppearanceLib for Mac OS Classic as

library.

For Cocoa, please use enabled property of NSTabViewItemMBS class.

17.0.49   How do I find the root volume for a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:
Example:

```
Function GetRootVolume(f as FolderItem) as FolderItem
dim root, dum as folderItem
if f <>nil then
root = f // f might be the volume
do
dum = root.parent
if dum <>nil then
root = dum
end if
loop until dum = nil
return root
end if
End Function
```

17.0.50   How do I get the current languages list?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

```
dim p as new CFPreferencesMBS
dim a as CFArrayMBS
dim s as CFStringMBS
dim o as CFObjectMBS
dim sa(-1) as string

o=p.CopyAppValue("AppleLanguages",".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

dim i,c as Integer
```

```
c=a.Count-1
for i=0 to c
o=a.Item(i)

if o isa CFStringMBS then
s=CFStringMBS(o)
sa.Append s.str
end if
next
end if

MsgBox Join(sa,EndOfLine)
```

Notes: On Mac OS X you can get the list of current languages like this list:

```
de
en
ja
fr
es
it
pt
pt-PT
nl
sv
nb
da
fi
ru
pl
zh-Hans
zh-Hant
ko
```

Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

17.0.51   How do I get the Mac OS Version?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

```
dim i as Integer
if system.gestalt("sysv", i) then
//do this in an 'If' in case you don't get any value back at all and system.gestalt returns boolean
if i = &h750 then //If OS is 7.5
//do stuff
elseif i = &h761 then //If OS is 7.6.1
//do stuff
end if
end if
```

Notes: The MBS Plugin has a function SystemInformationMBS.OSVersionString for this.

17.0.52 How do I get the printer name?

Plugin Version: all.

Answer: For Mac OS Classic see the code below and for Mac OS X use the Carbon Print Manager Classes from the MBS Plugin.
Example:

```
dim s as String
dim i as Integer

s=app.ResourceFork.GetResource("STR ",-8192)
if s<>"" then
i=ascb(leftb(s,1))
s=mid(s,2,i)

MsgBox s
end if
```

Notes: A note from Craig Hoyt:

After looking at your example I had a little deja-vu experience. Several
years ago I played around with this same code if FutureBasic. I discovered
that it did not and still doesn't provide the 'Printer Name', it does
return the print driver name. If it returns 'LaserWriter 8' as the print
driver you can look into this file and get the 'PAPA' resource #-8192 to
get the actual Printer Name. Unfortunately this does not hold true for
other printers. My Epson and HP Printers (the Epson has an Ethernet Card
and the HP is USB) do not provide this info in their drivers. As far as I
can tell it only returns the name by polling the printer itself.

17.0.53   How do I make a metal window if RB does not allow me this?

Plugin Version: all, Platform: macOS.

Answer: The following declare turns any window on Mac OS X 10.2 or newer into a metal one.
Example:

declare sub ChangeWindowAttributes lib ”Carbon” (win as windowptr, a as Integer, b as Integer)

ChangeWindowAttributes window1,256,0

Notes: May not look nice depending on the controls used.

17.0.54   How do I make a smooth color transition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I'd like to show in a report some bars, which start with color A
and end with color B.

The color change should be very smooth.

My problem: If I would start from 255,0,0 and end by 0,0,0, I would have
255 different colors. If the bars are longer than 255 pixels, would
this look nice?
Example:

```
// Window.Paint:
Sub Paint(g As Graphics)
dim w,w1,x,p as Integer
dim c1,c2,c as color
dim p1,p2 as Double

c1=rgb(255,0,0) // start color
c2=rgb(0,255,0) // end color

w=g.Width
w1=w-1

for x=0 to w1
p1=x/w1
p2=1.0-p1
```

c=rgb(c1.red*p1+c2.red*p2, c1.green*p1+c2.green*p2, c1.blue*p1+c2.blue*p2)

g.ForeColor=c
g.DrawLine x,0,x,g.Height

next
End Sub

Notes:

Try the code above in a window paint event handler.

17.0.55   How do I read the applications in the dock app?

Plugin Version: all, Platform: macOS.

Answer: Use CFPreferencesMBS class like in this example:
Example:

```
// Reads file names from persistent dock applications and puts them into the list

dim pref as new CFPreferencesMBS

dim persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
dim ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
dim tiledata as CFStringMBS = NewCFStringMBS("tile-data")
dim filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
dim o as CFObjectMBS = pref.CopyValue(persistentapps, ApplicationID, pref.kCFPreferencesCurrentUser,
pref.kCFPreferencesAnyHost)

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

// walk over all items in array
dim c as Integer = a.Count-1
for i as Integer = 0 to c

// get dictionary describing item
o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)
```

```
// and pick tile data dictionary
o = d.Value(tiledata)
if o isa CFDictionaryMBS then
d = CFDictionaryMBS(o)

// and pick there the file label
o = d.Value(filelabel)
if o isa CFStringMBS then
// and display it
dim name as string = CFStringMBS(o).str
List.AddRow name
end if
end if
end if

next

else
MsgBox "Failed to read dock preferences."
end if
```

Notes: You can use the CFPreferencesMBS.SetValue to change a value and CFPreferencesMBS.Synchronize to write the values to disc. You may need to restart the Dock.app if you modified things.

17.0.56   How do I truncate a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In a binarystream you can set the length property to truncate.

17.0.57   How do update a Finder's windows after changing some files?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

```
dim f as folderitem // some file
dim ae as appleevent
ae=newappleevent("fndr","fupd","MACS")
ae.folderitemparam("—-")=f
if not ae.send then
//something went wrong
```

end if

Notes: The folderitem.finderupdate from the MBS Plugin does something like this.

17.0.58   How to access a USB device directly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: First, it depends on the device.
Notes: Some devices can be talked directly from user mode code, but some require a kernel driver.

For some devices you can use plugins to access them like:

- Audio and Video sources using the QTGrabberClassMBS

- Mass storage devices using the folderitem class.

- Serial devices using the System.SerialPort function.

- HID USB devices can be used with MacHIDMBS, WinHIDMBS or LinuxHIDInterface class.

- Any USB device may be used with MacUSBMBS or WinUSBMBS classes.

In general it is always the best to take the most high level access to have others do the work for the details.

17.0.59   How to add icon to file on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use FolderItem.AddCustomIcon or NSWorkspaceMBS.setIcon functions.
Notes: Please close any open stream for the file you want to add an icon.

17.0.60   How to ask the Mac for the Name of the Machine?

Plugin Version: all, Platform: macOS.

Answer: Using Apple Events you can use this code:
Example:

Function Computername() As string

```
dim theEvent as AppleEvent
dim err as boolean

theEvent = newAppleEvent("mchn","getd","MACS")

err = theEvent.send

return theevent.ReplyString

End Function
```

Notes: Code above is for Mac OS 9!
Also the MBS Plugin has a function for this which may be faster and work also on Macs without Filesharing (which handles this event).

17.0.61   How to automatically enable retina in my apps?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:
Example:

```
Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSHighResolutionCapable""
YES")
```

Notes: This will set the NSHighResolutionCapable flag to YES.

17.0.62   How to avoid leaks with Cocoa functions?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:
Example:

```
// in a Timer Action event:
Sub Action()
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS
```

End Sub

Notes: With Xojo 2009r4 the code above should not be needed as Xojo runtime does automatically handle the NSAutoreleasePools for you. For older Xojo versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use Xojo 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a objc_msgSend call.

17.0.63   How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Platform: macOS.

Answer: For oracle the most important thing is to point the plugin to the libraries from oracle.
Notes: In environment variables, the paths like ORACLE_HOME must be defined.
On Mac OS X you also need to define DYLD_LIBRARY_PATH to point to the dylib files from oracle.

For that you need to modify /etc/launchd.conf for Mac OS X 10.8 and newer.
In older versions those variables in .MacOSX/environment.plist file in user's home.

Another way for the case you bundle things inside your app is to use the LSEnvironment key in info.plist. In info.plist it looks like this:

<key>LSEnvironment</key>
<dict>
<key>test</key>
<string>Hello World</string>
</dict>

17.0.64   How to avoid ___NSAutoreleaseNoPool console messages in threads?

Plugin Version: all, Platform: macOS.

Answer: You need to use your own NSAutoreleasePool on a thread like this:
Example:

sub MyThread.run
dim pool as new NSAutoreleasePoolMBS
// do work here

pool=nil

end sub

Notes: For more details read here:
http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutorelease-Pool_Class/Reference/Reference.html

17.0.65   How to bring app to front?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use this code:
Example:

```
// First way:
app.FrontMostMBS = true

// second way:
dim p as new ProcessMBS
p.GetCurrentProcess
p.FrontProcess = true

// third way:
NSApplicationMBS.sharedApplication.activateIgnoringOtherApps(true)

// for Windows:
RemoteControlMBS.WinBringWindowToTop
```


Notes: This will bring a Mac app to the front layer.

17.0.66   How to bring my application to front?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:
Example:

```
Dim A As AppleEvent
A = NewAppleEvent("misc","actv","")
If Not A.Send then
Beep
end if
```

Notes: (Code is Mac only)

17.0.67   How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use SignalHandlerMBS class for this.
Example:

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

dim ende as boolean = false
do
if SignalHandlerMBS.IsFlagSet(2) then
Print "Flag 2 set. Existing..."
ende = true
end if

DoEvents 1
loop until ende
```

Notes: The signal is catched, a flag is set and you can ask later in your normal application flow for the result.

17.0.68   How to change name of application menu?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use this code to change the application menu name on Mac OS X:
Example:

```
dim mb as new MenubarMBS
dim m as MenuMBS = mb.item(1) // 1 is in my tests the app menu
if m<>Nil then
m.MenuTitle = "Hello World"
end if
```

Notes: This code is for Carbon only.

17.0.69   How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer:

You mean it screws up if the file name of the bundle itself is different
than the name of the executable file in the MacOS folder within the
bundle? If so, you should find something like this within your
Info.plist file (or the 'plst' resource that the RB IDE builds for you):

<key>CFBundleExecutable</key>
<string>Executable file name here</string>

Just make sure that file name matches.

However, if your question involves how you can change the name of the app
that appears in the menu and the dock, that's different. You can make
this name different from the file name by changing the CFBundleName key:

<key>CFBundleName</key>
<string>Name for menu here</string>

Note that if you use my free AppBundler program, this second part is
taken care of for you – just fill in a custom name in the right field.
You can find AppBundler (from Thomas Reed) at
http://www.bitjuggler.com/products/appbundler/ .

17.0.70   How to check if a folder/directory has subfolders?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this to check all items in a folder:
Example:

```
Function HasSubFolder(folder as FolderItem) As Boolean
dim c as Integer = folder.Count

for i as Integer = 1 to c
dim item as FolderItem = folder.TrueItem(i)

if item<>Nil and item.Directory then
Return true
end if
```

next

End Function

Notes: We use trueitem() here to avoid resolving alias/link files.
Also we check for nil as we may not have permission to see all items.
And if one is a directory, we return without checking the rest.

17.0.71   How to check if Macbook runs on battery or AC power?

Plugin Version: all, Platform: macOS.

Answer: Please use our IOPowerSourcesMBS class like this:
Example:

Function PowerSourceState() as Integer
dim p as new IOPowerSourcesMBS

// check all power sources
dim u as Integer = p.Count-1
for i as Integer = 0 to u
dim d as CFDictionaryMBS = p.Item(i)
if d<>nil then
// check if they have a power source state key:
dim o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
if o isa CFStringMBS then
dim s as string = CFStringMBS(o).str

'MsgBox s

if s = "AC Power" then
Return 1
elseif s = "Battery Power" then
Return 2
end if
end if
end if
next
Return 0 // unknown
End Function

Notes: If you want to check the CFDictionaryMBS content, simply use a line like "dim x as dictionary = d.dictionary" and check the contents in the debugger.

17.0.72   How to check if Microsoft Outlook is installed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you need Outlook for Scripting, you should simply check registry for the required Outlook.Application class:
Example:

```
Function OutlookInstalled() As Boolean
#if TargetWin32 then

try
dim r as new RegistryItem("HKEY_CLASSES_ROOT\Outlook.Application\CLSID", false)

Return true

catch r as RegistryAccessErrorException
// not installed
Return false

end try

#else

// Windows only, so false on other platforms
Return false

#endif

End Function
```

17.0.73   How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Platform: macOS.

Answer: The code below returns a country value.
Example:

```
dim result as Integer

IF TargetMacOS THEN
```

CONST smScriptLang = 28
CONST smSystemScript = -1

DECLARE FUNCTION GetScriptManagerVariable LIB "Carbon" (selector as Integer) as Integer
DECLARE FUNCTION GetScriptVariable LIB "Carbon" (script as Integer, selector as Integer) as Integer

result=GetScriptVariable(smSystemScript, smScriptLang)

END IF

Notes: Returns values like:

For more values, check "Script.h" in the frameworks.

17.0.74 How to code sign my app with plugins?

Plugin Version: all, Platform: macOS.

Answer: When you try to code sign the application with plugin dylibs on Mac OS X, you may see error message that there is actually a signature included.
Notes: Please use the -f command line parameter with codesign utility to overwrite our MBS signature.
We sign our plugins for MacOS, iOS and Windows to make sure they have not been modified.

In terminal, you do like this:

cd <Path to folder of app>

xattr -cr <Appname>.app
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.dylib
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.framework
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app

Please use the name of your certificate (See keychain), the name of your app and the path to the app folder.
If you have helper apps you need to sign them first.
You can use a build step to automatically sign your app on build.

17.0.75 How to collapse a window?

Plugin Version: all, Platform: macOS.

Answer: Use this function (Mac only):
Example:

Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
dim state, err as Integer
dim wh as MemoryBlock

Declare Function CollapseWindow Lib ”Carbon” (window as Integer,collapse as Integer) as Integer

IF CollapseStatus THEN
state = 1
ELSE
state = 0
END IF

err = CollapseWindow(w.MacWindowPtr, state)

End Sub

Notes: Also the MBS Plugin has a window.collapsedmbs property you can set.
For Windows the MBS Plugin has a window.isiconicmbs property.

17.0.76   How to compare two pictures?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:
Example:

Function ComparePictures(p as picture,q as picture) as Integer
dim r,u as RGBSurface
dim x,y,n,m,h,w as Integer
dim w1,w2,h1,h2,d1,d2 as Integer
dim c1,c2 as color

h1=p.Height
h2=q.Height
w1=p.Width
w2=q.Width
d1=p.Depth
d2=q.Depth

if d1<>d2 then
Return 1
elseif w1<>w2 then

```
return 2
elseif h1<>h2 then
Return 3
else
r=p.RGBSurface
u=q.RGBSurface

if r=nil or u=nil then
Return -1
else
h=h1-1
w=w1-1
m=min(w,h)

for n=0 to m
c1=r.Pixel(n,n)
c2=u.Pixel(n,n)
if c1<>c2 then
Return 4
end if
next

for y=0 to h
for x=0 to w
c1=r.Pixel(x,y)
c2=u.Pixel(x,y)
if c1<>c2 then
Return 5
end if
next
next

// 0 for equal
// -1 for error (no RGBsurface)
// 1 for different depth
// 2 for different width
// 3 for different height
// 4 for different pixels (fast test)
// 5 for different pixels (slow test)
end if
end if

Exception
Return -1
End Function
```

Notes: Remember that this only works on bitmap pictures, so the picture.BitmapMBS function may be useful.

17.0.77   How to compile PHP library?

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.
Notes: This instructions were written based on PHP 5.2.6 on Mac OS X:

- Best take a new Mac with current Xcode version installed.

- Download the source code archive. e.g. "php-5.2.6.tar.bz2"

- Expand that archive on your harddisc.

- Open terminal window

- change directory to the php directory. e.g. "cd /php-5.2.6"

- execute this two lines to define the supported CPU types and the minimum Mac OS X version:

- export CFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"

- export CXXFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"

- the command "./configure help" does show the configure options.

- use configure with a line like this:

- ./configure –enable-embed –with-curl -enable-ftp –enable-zip –enable-sockets –enable-static –enable-soap –with-zlib –with-bz2 –enable-exif –enable-bcmath –enable-calendar

- start the compilation with "make all"

- other option is to use "make install" which first does the same as "make all" and than does some installation scripts.

- you may get an error about a duplicate symbole __yytext. Search the file "zend_ini_scanner.c", search a line with "char *yytext;" and change it to "extern char *yytext;".

- On the end you get a lot of error messages, but you have a working library (named libphp5.so) file in the invisible ".libs" folder inside your php source folder.

Possible problems and solutions:

- If the path to your files has spaces, you can get into trouble. e.g. "/RB Plugins/PHP" is bad as files will be searched sometimes in "/RB".

- If you have in /usr/local/lib libraries which conflict with the default libraries, you can get into trouble.

- If you installed some open source tools which compiled their own libraries, you can get into conflicts.

- if you have to reconfigure or after a problem, you may need to use "make clean" before you start "make all" again.

Feel free to install additional libraries and add more packages to the configure line.

17.0.78 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:
Example:

Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
case WebSession.BrowserType.Android
Return "Andriod"
case WebSession.BrowserType.Blackberry
Return "Blackberry"
case WebSession.BrowserType.Chrome
Return "Chrome"
case WebSession.BrowserType.ChromeOS
Return "ChromeOS"
case WebSession.BrowserType.Firefox
Return "Firefox"
case WebSession.BrowserType.InternetExplorer
Return "InternetExplorer"
case WebSession.BrowserType.Opera
Return "Opera"
case WebSession.BrowserType.Safari
Return "Safari"
case WebSession.BrowserType.SafariMobile
Return "SafariMobile"
case WebSession.BrowserType.Unknown
Return "Unknown"
else
Return "Unkown: "+str(integer(s))
end Select

End Function

17.0.79   How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:
Example:

```
Function GetRenderingEngineName(s as WebSession.EngineType) As string
Select case s
case WebSession.EngineType.Gecko
Return "Gecko"
case WebSession.EngineType.Presto
Return "Presto"
case WebSession.EngineType.Trident
Return "Trident"
case WebSession.EngineType.Unknown
Return "Unknown"
case WebSession.EngineType.WebKit
Return "WebKit"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

17.0.80   How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:
Example:

```
Function GetPlatformName(s as WebSession.PlatformType) As string
Select case s
case WebSession.PlatformType.Blackberry
Return "Blackberry"
case WebSession.PlatformType.iPad
Return "iPad"
case WebSession.PlatformType.iPhone
Return "iPhone"
case WebSession.PlatformType.iPodTouch
Return "iPodTouch"
case WebSession.PlatformType.Linux
Return "Linux"
case WebSession.PlatformType.Macintosh
Return "Macintosh"
```

```
case WebSession.PlatformType.PS3
Return "PS3"
case WebSession.PlatformType.Unknown
Return "Unknown"
case WebSession.PlatformType.WebOS
Return "WebOS"
case WebSession.PlatformType.Wii
Return "Wii"
case WebSession.PlatformType.Windows
Return "Windows"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

17.0.81   How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you althrough it's not perfect.
You need to set lc to the current color you use.
Example:

```
dim outstring as string
dim theMac, thePC as textencoding
dim Mac2PC as textconverter

theMac = getTextEncoding(0) // MacRoman
thePC = getTextEncoding(&h0201) // ISOLatin1

Mac2PC = getTextConverter(theMac, thePC)
// if you wanted to do the opposite just create a converter
// PC2Mac = getTextConverter(thePC, theMac)

outstring = Mac2PC.convert("Bj√rn, this text should be converted")
Mac2PC.clear
```

Notes:

You have to call Mac2PC.clear after every conversion to reset the encoding engine.
See also newer TextConverterMBS class.

17.0.82 How to convert ChartTime back to Xojo date?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have this example code:
Example:

```
Function ChartTimeToDate(ChartTime as Double) As date
static diff as Double = 0.0

if diff = 0.0 then
dim d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
dim da as new date(2015, 1, 1)
dim ts as Double = da.TotalSeconds

diff = ts - d2
end if

dim d as new date
d.TotalSeconds = diff + ChartTime

Return d
End Function
```

Notes: As you see we calculate the difference in base date from Date and ChartTime and later use difference to convert.

17.0.83 How to convert line endings in text files?

Plugin Version: all, Platform: macOS.

Answer: You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.
Example:

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
dim it as TextInputStream = TextInputStream.Open(inputfile)
dim ot as TextOutputStream = TextOutputStream.Create(outputfile)

ot.Delimiter = EndOfLine.Windows // new line ending
while not it.EOF
ot.WriteLine it.ReadLine
wend
```

Notes: TextInputStream will read any input line endings and with delimiter property in TextOutputStream you can easily define your new delimiter.

17.0.84   How to convert picture to string and back?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use this plugin functions:
Notes: JPEG:

JPEGStringToPictureMBS(buf as string) as picture
JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean) as picture
PictureToJPEGStringMBS(pic as picture,quality as Integer) as string

PNG:

PictureToPNGStringMBS(pic as picture, gamma as single) as string
PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single) as string
PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string
PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer) as string
PNGStringToPictureMBS(data as string, gamma as single) as picture
PNGStringToPNGPictureMBS(data as string, gamma as single) as PNGpictureMBS

Tiff:

TIFFStringToPictureMBS(data as string) as picture
TIFFStringToTiffPictureMBS(data as string) as TiffPictureMBS

BMP:

BMPStringtoPictureMBS(data as string) as picture
Picture.BMPDataMBS(ResolutionValueDPI as Integer=72) as string

GIF:

GifStringToGifMBS(data as string) as GIFMBS
GifStringToPictureMBS(data as string) as Picture

17.0.85   How to copy an array?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy an array:
Example:

```
Function CopyArray(a() as Double) as Double()
dim r() as Double
for each v as Double in a
r.Append v
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of an array of objects, you need to change code to also make a copy of those objects.

17.0.86   How to copy an dictionary?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy a dictionary:
Example:

```
Function CopyDictionary(d as Dictionary) As Dictionary
dim r as new Dictionary
for each key as Variant in d.keys
r.Value(key) = d.Value(key)
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of an dictionary of objects, you need to change code to also make a copy of those objects.

17.0.87   How to copy parts of a movie to another one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.

Example:

dim f as FolderItem
dim md as EditableMovie
dim ms as EditableMovie

f=SpecialFolder.Desktop.Child("Our First Snowman.mov")
ms=f.OpenEditableMovie

ms.SelectionStartMBS=5
ms.SelectionLengthMBS=10

f=SpecialFolder.Desktop.Child("dummy.mov")
md=f.CreateMovie

msgbox str(md.AddMovieSelectionMBS(ms))

Notes: If result is not 0, the method fails.

17.0.88   How to create a birthday like calendar event?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

```
// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

dim calendars() as CalCalendarMBS = s.calendars
```

```
// set properties
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(0) // add to first calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if
```

Notes: This adds an event to iCal for the given date with alarm to remember you and repeats it every year.

17.0.89   How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the UUIDMBS class for this.

17.0.90   How to create a Mac picture clip file?

Plugin Version: all, Platform: Windows.

Answer: You can use code like this one.
Example:

```
dim f As FolderItem
dim p As Picture

f=SpecialFolder.Desktop.Child("Test.pictClipping")
if f=nil then Return

p=new Picture(300,200,32) 'Make a sample picture
p.Graphics.ForeColor=RGB(0,255,255)
p.Graphics.FillOval 0,0,99,99
```

```
p.Graphics.ForeColor=RGB(255,0,0)
p.Graphics.DrawOval 0,0,99,99

dim r As ResourceFork 'ResourceFork is needed for a clip file

// Please define a file type Any
r=f.CreateResourceFork("Any")

// get PICT data using plugin function
dim pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")

dim m as new MemoryBlock(8)

m.LittleEndian = false
m.Int16Value(0) = 0
m.Int16Value(2) = 0
m.Int16Value(4) = p.Width
m.Int16Value(6) = p.Height

r.AddResource(m,"RECT",256,"")

'Values taken from a sample file and irrelevant to the problem
dim data as string = DecodeBase64("AQAAAAAAAAAAAAAAACAFRDRVIAAAABAAAAAAAAAABUQ0lQAAAAA
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

17.0.91 How to create a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check our DynaPDF plugin and the examples.
Notes: An alternative can be to use the CoreGraphics and Cocoa functions on Mac OS X.
For Windows, we can only suggest our DynaPDF plugin.

17.0.92 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Platform: macOS.

Answer: You can use code like the one below:
Example:

Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
dim a as new EmailAttachment

a.data = EncodeBase64(PDFData, 76)
a.ContentEncoding = "base64"
a.MIMEType = "application/pdf"
a.MacType = "PDF "
a.MacCreator = "prvw"
a.Name = filename

Return a
End Function

Notes: Compared to sample code from Xojo documentation, we set the mime type correct for PDF.
The MacType/MacCreator codes are deprecated, but you can still include them for older Mac email clients.
"prvw" is the creator code for Apple's preview app.

17.0.93 How to create PDF for image files?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use DynaPDF like this:
Example:

Function CreatePrintPDF(jpgFiles() as folderitem, pdfFile as FolderItem, PageWidth as Integer, PageHeight
as Integer) As Boolean
// have files?
If pdfFile = Nil Then Return False
If jpgFiles = Nil Then Return False

If jpgFiles.Ubound <0 Then Return False

// new DynaPDF
Dim pdf As New MyDynapdfMBS

// page width/height in MilliMeter
Dim pdfWidth as Integer = PageWidth * 72 / 25.4
Dim pdfHeight as Integer = PageHeight * 72 / 25.4

// put your license here
Call pdf.SetLicenseKey "Starter"

// create pdf
Call pdf.CreateNewPDF pdfFile

```
// set a couple of options
Call pdf.SetPageCoords(MyDynaPDFMBS.kpcTopDown)
Call pdf.SetResolution(300)
Call pdf.SetUseTransparency(False)
Call pdf.SetSaveNewImageFormat(False)
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
Call pdf.SetJPEGQuality(100)

// set page size
Call pdf.SetBBox(MyDynaPDFMBS.kpbMediaBox, 0, 0, pdfWidth, pdfHeight)
Call pdf.SetPageWidth(pdfWidth)
Call pdf.SetPageHeight(pdfHeight)

// append pages with one image per page
For i as Integer = 0 To jpgFiles.Ubound
Call pdf.Append
Call pdf.InsertImageEx(0, 0, pdfWidth, pdfHeight, jpgFiles(i), 1)
Call pdf.EndPage
Next

// close
Call pdf.CloseFile

Return True
End Function
```

Notes: This is to join image files in paper size to a new PDF.
e.g. scans in A4 into an A4 PDF.

17.0.94 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a few tips on how to translate command line CURL calls to plugin calls.
Notes: curl -vX PUT http://localhost:5984/appserials/78569238475/DocumentRegister.docx?rev=3-25634563456
–data-binary @DocumentRegister.docx -H "Content-Type: application/msword"

- The option -v means verbose. You can use OptionVerbose and listen for messages in the DebugMessage event.

- The option -X PUT means we want to do a HTTP PUT Request. So set OptionPut to true. Also you will want to set OptionUpload to true as you upload data.

- We have the URL which you put into OptionURL property.

- The –data-binary option tells CURL to pass the given data. With the @ before the data, it is intrepreted as a file name, so the data is read from the given file. You'll need to open this file and pass data with the Read event as needed. (See CURLS ftp file upload example project)

- The last option -H specifies an additional header for the upload. Pas this additional header with the SetOptionHTTPHeader method.

curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfcd4328001c59 -d ' { "type":"Product","description":"Application Serial","acronym":"AppSerial","dateAdded":"2011-03-21 14:57:36" } '

- Option -X PUT like above.

- Pass the URL again in OptionURL

- This time data is passed in command line for CURL. You'd put this data in the quotes into a string and make it available in the Read event. (See CURLS ftp upload example project)

17.0.95   How to delete file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.
Example:

```
dim d as CURLMBS // your curl object

// delete file
dim ws() As String
ws.Append "DELE Temp.txt"

d.SetOptionPostQuote(ws)
```

Notes: Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.
The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. To delete use DELE and the file path.

17.0.96   How to detect display resolution changed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X simply listen for display changed notifications.
Notes: Use the "Distribution Notification Center.rbp" example project as a base and use it to listen to notifications with the name "O3DeviceChanged".

17.0.97   How to detect retina?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use Window.BackingScaleFactorMBS to query the factor.
Example:

msgbox str(window1.BackingScaleFactorMBS)

17.0.98   How to disable force quit?

Plugin Version: all, Platform: macOS.

Answer:

Please visit this website and get the control panel for Mac OS 9 there:
http://www3.sk.sympatico.ca/tinyjohn/DFQ.html

For Mac OS X use the MBS Plugin with the SetSystemUIModeMBS method.
Notes:

Please use presentationOptions in NSApplicationMBS for Cocoa applications.

17.0.99   How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Platform: Windows.

Answer: You can use this code in the htmlviewer open event:
Example:

```
if targetwin32 then
htmlviewer1._ole.Content.value("Silent") = True
end if
```

Notes: This disables the error dialogs from Internet Explorer.

17.0.100   How to display a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X you can use CoreGraphics or PDFKit to display a PDF.
Notes: An alternative can be to load the PDF into a htmlviewer so the PDF plugin can display it.
On Windows you may need to use the Acrobat ActiveX control from Adobe or launch Acrobat Reader.

17.0.101   How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:
Example:

```
Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next

' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub
```

```
Sub Open()
// Test it

dim za(0) as Integer ' the array of the numbers

lotto 49,6,za ' 6 of 49 in Germany


' and display them
staticText1.text=str(za(0))+chr(13)+str(za(1))+chr(13)+str(za(2))+chr(13)+str(za(3))+chr(13)+str(za(4))+chr(13)+str(za
End Sub
```

17.0.102   How to do an asycron DNS lookup?

Plugin Version: all, Platform: Windows.

Answer: use CFHostMBS class (Mac OS X only).
Notes: Xojo internal functions and plugin DNS functions are sycronized.
You can use DNSLookupThreadMBS class for doing them asyncron.

17.0.103   How to draw a dushed pattern line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:
Example:

```
// call like this: DrawDushedPatternLine g,0,0,width,height,10

Sub DrawDushedPatternLine(g as graphics,x1 as Integer,y1 as Integer,x2 as Integer,y2 as Integer, partlen
as Integer)
dim x,y,ox,oy as Double
dim dx,dy as Double
dim w,h,d as Double
dim b as Boolean

w=x2-x1
h=y2-y1

d=sqrt(w*w+h*h)

dx=w/d*partlen
dy=h/d*partlen
```

```
b=true
x=x1
while (x<x2) and (y<y2)
ox=x
oy=y

x=x+dx
y=y+dy

if b then
g.DrawLine ox,oy,x,y
end if

b=not b
wend


End Sub
```

Notes: It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

17.0.104   How to draw a nice antialiased line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you althrough it's not perfect.
You need to set lc to the current color you use.
Example:

```
Sub drawLine(xs as Integer, ys as Integer, xe as Integer, ye as Integer, face as RGBSurface, lineColor as
color)
dim intX, intY, count, n, xDiff, yDiff as Integer
dim v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
dim c as color

const st=1.0

xDiff=xe-xs
yDiff=ye-ys
count=max(abs(xDiff), abs(yDiff))
xStep=xDiff/count
yStep=yDiff/count
```

xx=xs
yy=ys
for n=1 to count
intX=xx
intY=yy
floatX=xx-intX
floatY=yy-intY

v=(1-floatX)*(1-floatY)*st
v1=1-v
c=face.pixel(intX, intY)
face.pixel(intX, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*(1-floatY)*st
v1=1-v
c=face.pixel(intX+1, intY)
face.pixel(intX+1, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=(1-floatX)*floatY*st
v1=1-v
c=face.pixel(intX, intY+1)
face.pixel(intX, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*floatY*st
v1=1-v
c=face.pixel(intX+1, intY+1)
face.pixel(intX+1, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)

xx=xx+xStep
yy=yy+yStep
next

End Sub

Notes:

PS: st should be 1 and face should be a RGBSurface or a Graphics object.

17.0.105　How to dump java class interface?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.
Notes: For example show ResultSet class: javap -s java.sql.ResultSet

17.0.106   How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this function:
Example:

```
Function Duplicate(extends p as Picture) As Picture
#if RBVersion >= 2011.04 then
if p.HasAlphaChannel then

// create nw picture and copy content:
dim q as new Picture(p.Width, p.Height)
q.Graphics.DrawPicture p,0,0

Return q

end if
#endif

// create new picture
dim q as new Picture(p.Width, p.Height, 32)

// get mask
dim oldMask as Picture = p.mask(false)
if oldMask = nil then
// no mask, so simple copy
q.Graphics.DrawPicture p,0,0
Return q
end if

// remove mask
p.mask = nil

// copy picture and mask
q.Graphics.DrawPicture p, 0, 0
q.mask.Graphics.DrawPicture oldMask,0,0

// restore mask
p.mask = oldmask

Return q
End Function
```

Notes: Simply copy it to a module and call it like this: q = p.duplicate.
The code above works with old Xojo versions because of the #if even if your RS version does not support
alpha channel pictures. This way it's future proof.

17.0.107   How to enable assistive devices?

Plugin Version: all, Platform: macOS.

Answer: You can use AppleScript code like below:
Notes: tell application "System Events"
activate

set UI elements enabled to true

return UI elements enabled
end tell

You can run this with AppleScriptMBS class.

17.0.108   How to encrypt a file with Blowfish?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:
Example:

```
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")

// read input
dim bi as BinaryStream = BinaryStream.Open(fi)
dim si as string = bi.Read(bi.Length)
bi.Close

// encrypt
dim so as string = BlowfishMBS.Encrypt("MyKey",si)

// write output
dim bo as BinaryStream = BinaryStream.Create(fo)
bo.Write so
bo.Close
```

Notes: Of course you can decrypt same way, just use Decrypt function and of course swap files.

17.0.109   How to extract text from HTML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:
Example:

```
dim html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)

MsgBox text // shows: Gr√º√üe
```

Notes: You can use it together with RemoveHTMLTagsMBS to remove html tags. What you get will be the text without tags.
DecodingFromHTMLMBS turns HTML escapes back to unicode characters. Like ä to √§.

17.0.110   How to find empty folders in a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this code:
Example:

```
dim folder as folderitem // your folder

dim c as Integer = folder.count
for i as Integer = 1 to c
dim item as folderitem = folder.trueitem(i)
if item = nil then
// ignore
elseif item.directory then
// folder
if item.count = 0 then
// found empty folder
end if
end if
next
```

17.0.111   How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Platform: macOS.

Answer: You can try Launch Services.
Example:

dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.NativePath

17.0.112 How to find network interface for a socket by it's name?

Plugin Version: all, Platform: macOS.

Answer: You can use our plugin to build a lookup table.
Example:

```
Function FindNetworkInterface(name as string) As NetworkInterface
name = name.trim

if name.len = 0 then Return nil

// search by IP/MAC
dim u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if n.IPAddress = name or n.MACAddress = name then
Return n
end if
next

// use MBS Plugin to build a mapping
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
dim map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
dim IPv4s() as string = n.IPv4s
dim IPv6s() as string = n.IPv6s

for each IPv4 as string in IPv4s
map.Value(IPv4) = n.Name
next
for each IPv6 as string in IPv6s
map.Value(IPv6) = n.Name
next
if n.MAC<>"" then
map.Value(n.MAC) = n.Name
```

```
end if
next

// now search interfaces by name, IPv4 or IPv6
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if map.Lookup(n.IPAddress, "") = name then
Return n
end if

if map.Lookup(n.MACAddress, "") = name then
Return n
end if
next

End Function
```

Notes: The code above uses a lookup table build using NetworkInterfaceMBS class to find the network interface by name.

17.0.113   How to find version of Microsoft Word?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:
Example:

```
// find Word
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("","com.microsoft.Word","")

// open bundle
dim c as new NSBundleMBS(f)

// read info
dim d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion","")
```

Notes: Older versions of Word can be found with creator code "MSWD".

17.0.114 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Platform: macOS.

Answer: You probably connect with SSL and you have no valid certificate.
Example:

```
dim d as new CURLSMBS

// Disable SSL verification
d.OptionSSLVerifyHost = 0 // don't verify server
d.OptionSSLVerifyPeer = 0 // don't proofs certificate is authentic

// With SSL Verification:
dim cacert as FolderItem = Getfolderitem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2 // verify server
d.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
```

Notes: You can either use the code above to disable the SSL verification and have no security.
Or you use the cacert file and enable the verification. Than you only get a connection if the server has a valid certificate.

see also:
http://curl.haxx.se/ca/

17.0.115 How to format double with n digits?

Plugin Version: all, Platform: macOS.

Answer: You can use the FormatMBS function for this.
Example:

```
dim d as Double = 123.4567890
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

d = 0.000000123456
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
```

listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

Notes: see FormatMBS for details.
In general %f is normal style, %e is scientific and %g is whichever gives best result for given space.

17.0.116   How to get a time converted to user time zone in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.GMTOffset property.
Example:

```
Sub Open()
// current date on server
dim d as new date
dim s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

dim t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

17.0.117   How to get an handle to the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: This function returns a handle for the frontmost window:
Example:

```
Function GetForegroundWindowHandle() as Integer
#if targetwin32 then
declare function GetForegroundWindow Lib "user32.dll" as Integer
Return GetForegroundWindow()
#endif
End Function
```

17.0.118 How to get CFAbsoluteTime from date?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use code like this:
Example:

```
dim d as new date
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim g as new CFGregorianDateMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

dim at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
dim x as Double = at.Value

MsgBox str(x)
```

Notes: As you see we need a timezone and put the date values in a gregorian date record. Now we can query absolute time for the given timezone.

17.0.119 How to get client IP address on web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.RemoteAddress property.
Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

17.0.120 How to get fonts to load in charts on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the SetFontSearchPath method in the CDBaseChartMBS class to specify where your fonts are.
Example:

if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if

// also you can later switch default fonts:

dim Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf","/usr/share/fonts/truetype/piboto/Pi
#EndIf

Notes: On macOS, iOS and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

17.0.121   How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the AddFontSearchPath method in the DynaPDFMBS class to specify where your fonts are.
Example:

dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if

Notes: On Mac OS X and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with "/usr/share/fonts/truetype/msttcorefonts" as the path. No backslash on the end of a path, please.

17.0.122   How to get GMT time and back?

Plugin Version: all, Platform: macOS.

Answer: You can use the date class and the GMTOffset property.
Example:

```
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds,"0.0")+" "+str(e.TotalSeconds, "0.0")

dim GMTTimeStamp as Double = e.TotalSeconds

// restore
dim f as new date

// add GMT offset here
f.TotalSeconds = GMTTimeStamp + f.GMTOffset*3600
// because here it's removed
f.GMTOffset = f.GMTOffset

MsgBox d.ShortTime+" ("+str(d.GMTOffset)+") "+str(d.TotalSeconds,"0.0")+EndOfLine+_
e.ShortTime+" ("+str(e.GMTOffset)+") "+str(e.TotalSeconds,"0.0")+EndOfLine+_
f.ShortTime+" ("+str(f.GMTOffset)+") "+str(f.TotalSeconds,"0.0")
```

Notes: It's sometimes a bit tricky with the date class as setting one property often changes the others.

17.0.123   How to get good crash reports?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check this website from the webkit website:
Notes: http://webkit.org/quality/crashlogs.html

17.0.124   How to get list of all threads?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the runtime module like in this function:
Example:

```
Function Threads() As Thread()
#pragma DisableBackgroundTasks
dim t() as Thread

Dim o as Runtime.ObjectIterator=Runtime.IterateObjects
While o.MoveNext
if o.Current isa Thread then
t.Append thread(o.current)
end if
Wend

Return t
End Function
```

Notes: This returns an array of all thread objects currently in memory.
The pragma is important here as it avoids thread switches which may cause a thread to be created or deleted.

17.0.125   How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the Webpage.ParametersReceived event.
Example:

```
Sub ParametersReceived(Variables As Dictionary)
for each key as Variant in Variables.keys
MsgBox key+" ->"+Variables.Value(key)
next
End Sub
```

Notes: The text encodings of this strings is not defined in Xojo 2010r5. Please use DefineEncoding.

17.0.126   How to get the color for disabled textcolor?

Plugin Version: all, Platform: macOS.

Answer: Ask the appearance manager:
Example:

Function GetThemeTextColor(inColor as Integer, inDepth as Integer, inColorDev as Boolean) As Color
declare function GetThemeTextColor lib "Carbon" (inColor as Integer, inDepth as Integer, inColorDev as Boolean, outColor as Ptr) as Integer

dim i as Integer
dim col as MemoryBlock

col = newMemoryBlock(6)

i = GetThemeTextColor(inColor, inDepth, inColorDev, col)

return RGB(col.UShort(0)\256, col.UShort(2)\256, col.UShort(4)\256)
End Function

Notes: The color for this is:

const kThemeTextColorDialogInactive = 2.

c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

17.0.127   How to get the current free stack space?

Plugin Version: all, Platform: macOS.

Answer: You can something like the code below:
Example:

Sub ShowStackSize()
dim threadid as Integer
dim size as Integer

declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
declare function ThreadCurrentStackSpace lib "Carbon" (threadid as Integer, byref size as Integer) as short

if GetCurrentThread(threadid)=0 then
if 0=ThreadCurrentStackSpace(threadid,size) then
MsgBox str(size)
end if
end if

End Sub

Notes: For Mac OS 9, use "ThreadLib" instead of "CarbonLib". You can use #if if you like for that.

17.0.128   How to get the current timezone?

Plugin Version: all, Platforms: macOS, Windows.

Answer:

You can use the TimeZoneMBS class or the CFTimeZoneMBS class.
Or code like below:
Example:

```
Function GMTOffsetInMinutes() as Integer
// Returns the offset of the current time to GMT in minutes.
// supports Mac OS and Windows, but not Linux yet (let me know if
// you have code for that, please)
//
// Note that the offset is not always an even multiple of 60, but
// there are also half hour offsets, even one 5:45h offset

// This version by Thomas Tempelmann (rb@tempel.org) on 25 Nov 2005
// with a fix that should also make it work with future Intel Mac targets.
//
// Using code from various authors found on the RB NUG mailing list

dim result, bias, dayLightbias as Integer
dim info as memoryBlock
dim offset as Integer

#if targetMacOS then

Declare Sub ReadLocation lib "Carbon" (location As ptr)

info = NewMemoryBlock(12)
ReadLocation info
if false then
// bad, because it does not work on Intel Macs:
'offset = info.short(9) * 256 + info.byte(11)
else
offset = BitwiseAnd (info.long(8), &hFFFFFF)
end

offset = info.short(9) * 256 + info.byte(11)
```

```
offset = offset \60
return offset

#endif

#if targetWin32 then

Declare Function GetTimeZoneInformation Lib "Kernel32" ( tzInfoPointer as Ptr ) as Integer
// returns one of
// TIME_ZONE_ID_UNKNOWN 0
// – Note: e.g. New Delhi (GMT+5:30) and Newfoundland (-3:30) return this value 0
// TIME_ZONE_ID_STANDARD 1
// TIME_ZONE_ID_DAYLIGHT 2

info = new MemoryBlock(172)
result = GetTimeZoneInformation(info)

bias = info.Long(0)
// note: the original code I found in the NUG archives used Long(84) and switched to Long(0)
// only for result=1 and result=2, but my tests found that Long(0) is also the right value for result=0

if result = 2 then
daylightBias = info.long(168)
end if
offset = - (bias + dayLightbias)
return offset

#endif

End Function
```

17.0.129 How to get the current window title?

Plugin Version: all, Platform: macOS.

Answer: The code below returns the current window title for the frontmost window on Mac OS X if Accessibilty services are
Example:

```
Function CurrentWindowTitle() As string
// your application needs permissions for accessibility to make this work!

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS
```

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
Return cs.str
end if
end if
end if
end if
End Function

17.0.130   How to get the cursor blink interval time?

Plugin Version: all, Platform: macOS.

Answer: On Mac OS you can use GetCaretTime from the toolbox.
Example:

declare function GetCaretTime lib "Carbon" () as Integer

MsgBox str(GetCaretTime())+" ticks"

Notes: 60 ticks make one second.

17.0.131 How to get the list of the current selected files in the Finder?

Plugin Version: all, Platform: macOS.

Answer:

Use the AppleScript like this one:

tell application "finder"
return selection
end tell

Which translates into this AppleEvent:

Process("Finder").SendAE "core,getd,'—-':obj { form:prop, want:type(prop), seld:type(sele), from:'null'() } "

and as Xojo code it looks like this:
Example:

```
dim ae as appleevent
dim o1 as appleeventObjectSpecifier
dim f as folderItem
dim aList as appleeventdescList
dim i as Integer
dim dateiname as string

// setup the AppleEvent
o1=getpropertyObjectDescriptor( nil, "sele")
ae= newappleEvent("core", "getd", "MACS")
ae.objectSpecifierParam("—-")=o1

// send it
if ae.send then
// got the list
alist=ae.replyDescList

// now show the list of filename into an editfield:

for i=1 to alist.count
f=alist.folderItemItem(i)

dateiname=f.name
// editfield1 with property "mulitline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
```

end if

17.0.132   How to get the Mac OS system version?

Plugin Version: all, Platform: macOS.

Answer: The following code queries the value and displays the version number:
Example:

```
dim first as Integer
dim second as Integer
dim third as Integer
dim l as Integer

if System.Gestalt("sysv",l) then

Third=Bitwiseand(l,15)
second=Bitwiseand(l\16,15)
first=Bitwiseand(l\256,15)+10*Bitwiseand(l\256\16,15)
end if

if First>=10 then
msgbox "Mac OS X "+str(First)+"."+str(Second)+"."+str(third)
else
msgbox "Mac OS "+str(First)+"."+str(Second)+"."+str(third)
end if
```

17.0.133   How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

```
Dim s As String
Dim b As Boolean
Dim i, resp as Integer

// Systemversion
b = System.Gestalt("sysv", resp)
If b then
s = Hex(resp)
```

```
For i =Len(s)-1 DownTo 1
s=Left(s,i)+"."+Mid(s,i+1)
Next
MsgBox "Systemversion: Mac OS " + s
end if
```

Notes: The MBS Plugin has a SystemInformationMBS.OSVersionString function for this.

17.0.134 How to get the screensize excluding the task bar?

Plugin Version: all, Platform: Windows.

Answer: Try this code:
Notes: Use the Screen class with the available* properties.

17.0.135 How to get the size of the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:
Notes: Make yourself a class for the WindowRect with four properties:

```
Bottom as Integer
Left as Integer
Right as Integer
Top as Integer
```

Add the following method to your class:

```
Sub GetWindowRect(windowhandle as Integer)
dim err as Integer
dim mem as memoryBlock
#if targetwin32 then
Declare Function GetWindowRect Lib "user32.dll" (hwnd as Integer, ipRect As Ptr) as Integer

mem = newmemoryBlock(16)
err = GetWindowRect(windowhandle, mem)
Left = mem.long(0)
Top = mem.Long(4)
Right = mem.Long(8)
Bottom = mem.Long(12)
```

#endif
End Sub

Good to use for the MDI Master Window!

17.0.136   How to get the source code of a HTMLViewer?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

// for Windows:

msgbox HTMLViewer1.IEHTMLTextMBS

// for MacOS with WebKit 2.x:

msgbox HTMLViewer1.WKWebViewMBS.HTMLText

17.0.137   How to get Xojo apps running Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You need to install some requuire packages.
Notes: You need CUPS as well as GTK packages. On 64 bit systems also the ia32-libs package.

Please note that you need a x86 compatible Linux. So no PPC, Power, ARM or other CPUs.

17.0.138   How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sometimes it may be better to use an extra application to process images.
Notes: A typical 32 bit app made with Xojo can use around 1.8 GB on Windows and 3 GB on Mac OS X. Some images may be huge, so that processing them causes several copies of the image to be in memory. With a 500 MB image in memory, doing a scale or rotation may require a temp image. So with source, temp and dest images with each 500 MB plus your normal app memory usage, you may hit the limit of Windows with 1.8 GB.

In that case it may be worth running a tool like gm in the shell class. gm is the command line version of GraphicsMagick. There you can run the 64 bit version which is not limited in memory like your own application. Also you can monitor progress and keep your app responsive.

17.0.139 How to handle tab key for editable cells in listbox?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this function:
Example:

```
Function HandleTabInList(list as listbox, row as Integer, column as Integer, key as String) As Boolean
// Handle tab character in Listbox.CellKeyDown event

Select case asc(key)
case 9
if Keyboard.AsyncShiftKey then
// back

// look for column left
for i as Integer = column-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row before
row = row - 1
if row >= 0 then
for i as Integer = list.ColumnCount-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
else
// forward

// look for column right
for i as Integer = column+1 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
```

```
// not found, so look in row below
row = row + 1
if row <list.ListCount then
for i as Integer = 0 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
end if
end Select
End Function
```

Notes: You call it from CellKeyDown event like this:

```
EventHandler Function CellKeyDown(row as Integer, column as Integer, key as String) As Boolean
if HandleTabInList(me, row, column, key) then Return true
End EventHandler
```

As you see in the code, we handle tab and shift + tab for moving back and forward. Also we wrap to previous/next row if needed. Feel free to extend this to wrap from last to first row or create a new row for editing.

17.0.140   How to hard link MapKit framework?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Our MapKit classes weak link the framework. If you need hard linking it for the App Store, you can add this method to a class:
Example:

```
Sub ReferenceMapKit()
// just put this in window or app class

#if TargetMachO and Target64Bit then
Declare sub testing Lib "MapKit" Selector "test" (id as ptr)
testing(nil)
#endif

End Sub
```

Notes: No need to call the method.
Just having it in a window or app, will cause the compiler to hard link the framework.

17.0.141 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.
Example:

```
dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer
CurrentFile.ForceDownload = true

// start the download
showurl(CurrentFile.url)
```

Notes: See our Create PDF example for the Xojo Web Edition.

17.0.142 How to hide all applications except mine?

Platform: macOS.

Answer: The code below will on Mac OS hide all applications except your one:
Example:

```
dim p as new ProcessMBS

p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

17.0.143   How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Platform: Windows.

Answer: Set Internet Explorer to silent mode with code like this:
Example:

htmlviewer1._ole.Content.value("Silent") = True

Notes: Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

17.0.144   How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you want to hide something in a chart, simply assign the kTransparent constant as color.

17.0.145   How to hide the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:
Example:

Declare Sub HideCursor Lib "Carbon" () Inline68K("A852")

HideCursor

Notes: The MBS Plugin has this function and supports it on Windows, too.

17.0.146   How to insert image to NSTextView or TextArea?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to insert file:
Example:

// insert a file to textview

Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
// read to file

```
dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttach-
ment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub
```

Notes: For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

17.0.147   How to jump to an anchor in a htmlviewer?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You can use javascript to change the current window's location.
Example:

```
// load website
htmlviewer1.LoadURL "http://www.monkeybreadsoftware.net/addressbook-abpersonmbs.shtml"

// later jump to anchor named "16":

if TargetWin32 then
call HTMLViewer1.IERunJavaScriptMBS "window.location = ""#16"""
end if
```

17.0.148   How to keep a movieplayer unclickable?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: To keep the user away from clicking on a playing Movie you can just drop a Canvas in front of the Movieplayer and take the clicks there.
Example:

Function Canvas1.MouseDown(X as Integer, Y as Integer) as boolean
return true // take it and do nothing
End Function

17.0.149   How to keep my web app from using 100% CPU time?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Linux and MacOS you can use renice command in the terminal. On Windows use the task manager to reduce priority.
Notes: If you launch your app with nohup on Linux or Mac OS X like this from the terminal or a script:

nohup /webapps/MyApp/MyApp &

you can simply have a second line saying this:

renice 20 $!

which tells the system to lower priority to lowest value for the latest background process.

17.0.150   How to kill a process by name?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can kill a process (or application) by name if you loop over all the processes and kill the one you need.
Example:

```
dim p as new ProcessMBS
p.GetfirstProcess ' get first
do
if p.name = "TextEdit" then
call p.KillProcess
Return
end if
loop until not p.GetNextProcess
```

Notes: You may want to check the result of killProcess function. Not every user is allowed to kill every application.

17.0.151   How to know how many CPUs are present?

Plugin Version: all, Platform: macOS.

Answer: Try this function:
Example:

```
Function GetCPUCount() as Integer
Declare Function MPProcessors Lib "Carbon" () as Integer

Return MPProcessors()
End Function
```

Notes: Your app will than need that library to launch on Classic. To avoid this the MBS plugin checks if this library is available and return 1 if it's not available.

17.0.152   How to know the calling function?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use a helper function like this this code:
Example:

```
Public Function CallingFunction() as string
// Query name of calling function of a function

#Pragma BreakOnExceptions false

try

// raise a dummy exception
dim r as new NilObjectException
raise r

catch x as NilObjectException

// get stack
dim stack() as string = x.Stack

// pick function name and return
dim name as string = stack(2)
Return name

end try
End Function
```

Notes: You need to include function names in your application.

17.0.153   How to launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):
Example:

```
Dim a as AppleEvent
dim creator as string

creator = "MSIE" ' here the Internet Explorer

a = NewAppleEvent("aevt", "odoc", "MACS")
a.Timeout = -1

a.ObjectSpecifierParam("—-") = GetUniqueIDObjectDescriptor("appf", nil, creator)

if not a.send then
msgBox "An error has occured"
else

end if
```

17.0.154   How to launch disc utility?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this code:
Example:

```
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("","com.apple.DiskUtility","")

if f<>Nil then
f.Launch
end if
```

Notes: This works even if people renamed the disc utility or moved it to another folder.

17.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You may try to embed your changes to the database between two transaction calls.
Example:

```
dim db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

Notes: This can increase speed by some factors.

17.0.156 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Platform: macOS.

Answer: You can use code like this:
Example:

```
Function NewRetinaImage(pic as Picture, mask as Picture = nil) As NSImageMBS
// first make a NSImageMBS from it
dim n as new NSImageMBS(pic, mask)

// now set to half the size, so we have 2x pixels for the image
n.size = new NSSizeMBS(n.width/2, n.height/2)

// and return
Return n
End Function
```

Notes: The thing to do is to have 2x the pixels, but assign a size to the image which gives it the right size in points.
You can pass the NSImageMBS from here to NSMenuItemMBS. For Retina displays, the full resolution is used. For others it will be reduced.

17.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this declares:
Example:

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).

Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &H80880000

Dim styleFlags as Integer

#If TargetWin32 Then

Declare Function SetWindowLong Lib "user32" Alias "SetWindowLongA" (hwnd as Integer, nIndex as Integer, dwNewLong as Integer) as Integer
Declare Function SetWindowPos Lib "user32" (hwnd as Integer, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer

styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )

#EndIf
```

17.0.158   How to make an alias using AppleEvents?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
dim ev as AppleEvent
dim myResult as boolean
dim properties as AppleEventRecord

ev = NewAppleEvent("core","crel","MACS")
ev.MacTypeParam("kocl") = "alis"
ev.FolderItemParam("to ") = target
ev.FolderItemParam("insh") = folder

properties=new AppleEventRecord
```

properties.StringParam("pnam")=aliasname

ev.RecordParam("prdt")=properties

myResult = ev.send
// true on success, false on error
End Sub

Notes: Call it like this:
MakeAlias SpecialFolder.Desktop, SpecialFolder.Desktop.Child("Gif Copy.rb"), "test.rb alias"

Seems to not work on Mac OS X 10.6

17.0.159   How to make AppleScripts much faster?

Plugin Version: all, Platform: macOS.

Answer: use "ignoring application responses" like in this example:
Notes: on run { fn,fpx,fpy }
ignoring application responses
tell app "Finder" to set the position of folder fn to fpx,fpy
end ignoring
end run

17.0.160   How to make double clicks on a canvas?

Plugin Version: all, Platform: macOS.

Answer:

Update: Newer Xojo versions support DoubleClick event, so you don't need this code.

Here's my tip from the tips list on how to add a double-click event to the Canvas control. The technique could easily be used for a window or any Rectcontrol:

Because of its built-in drawing methods, the Canvas control is often used to create custom interface controls. But while the Canvas control has event handlers for most mouse events, it doesn't have an event handler for DoubleClick events. Fortunately, you can add a double-click event handler to a Canvas control easily. Basically, you're going to create a new class based on Canvas and add a double-click event to that. You can then use the new class anytime you need a Canvas with a double-click event.

To create a new Canvas class with a DoubleClick event handler, do this:

1. Add a new class to your project.
2. Set the Super property of the new class to "Canvas".
3. Change the name of this new class to "DoubleClickCanvas".

A double-click occurs when two clicks occur within the users double-click time (set in the Mouse control panel on both Macintosh and Windows) and within five pixels of each other. So, you'll need a few properties to store when and where the last click occurred.

4. Add a new property with the following declaration and mark it as private: lastClickTicks as Integer
5. Add a new property with the following declaration and mark it as private: lastClickX as Integer
6. Add a new property with the following declaration and mark it as private: lastClickY as Integer

Since the Canvas control doesn't have a DoubleClick event, you will need to add one.

7. Add a new event to your class by choosing New Event from the Edit menu and enter "DoubleClick" as the event name.

Double-clicks occur on MouseUp. In order for the mouseUp event to fire, you must return True in the MouseDown event.

8. In the MouseDown event, add the following code:
Return True

In the MouseUp event, you will need to determine what the users double-click time is. This value is represented on both the Mac and Windows in ticks. A tick is 1/60th of a second. Since there isn't a built-in function for this, you'll need to make a toolbox call. The mouseUp event code below makes the appropriate toolbox call for both Macintosh and Windows. It then compares the time of the users last click to the time of the current click and compares the location of the users last click to the location of the current click.

9. Add the following code to the MouseUp event:

dim doubleClickTime, currentClickTicks as Integer

#if targetMacOS then
Declare Function GetDblTime Lib "Carbon" () as Integer
doubleClickTime = GetDblTime()
#endif

#if targetWin32 then
Declare Function GetDoubleClickTime Lib "User32.DLL" () as Integer

doubleClickTime = GetDoubleClickTime()/60 // convert to ticks from milliseconds
#endif

currentClickTicks = ticks
//if the two clicks happened close enough together in time
if (currentClickTicks - lastClickTicks) <= doubleClickTime then
//if the two clicks occured close enough together in space
if abs(X - lastClickX) <= 5 and abs(Y - LastClickY) <= 5 then
DoubleClick //a double click has occured so call the event
end if
end if
lastClickTicks = currentClickTicks
lastClickX = X
lastClickY = Y

10. Now to test out your new DoubleClickCanvas, drag the class from the Project window to a window in your project to create an instance of it.

11. Double-click on the canvas you just added to your window to open the Code Editor. Notice that the canvas has a DoubleClick event handler. In this event handler, add the following code:
BEEP

17.0.161   How to make my Mac not sleeping?

Plugin Version: all, Platform: macOS.

Answer: Just inform the Mac OS about some system activity with code like this:
Example:

Sub UpdateSystemActivity()

#if TargetCarbon
declare function myUpdateSystemActivity lib "Carbon" alias "UpdateSystemActivity" (activity as Integer)
as short

const OverallAct = 0 // Delays idle sleep by small amount */
const UsrActivity = 1 // Delays idle sleep and dimming by timeout time */
const NetActivity = 2 // Delays idle sleep and power cycling by small amount */
const HDActivity = 3 // Delays hard drive spindown and idle sleep by small amount */
const IdleActivity = 4 // Delays idle sleep by timeout time */

dim e as Integer

e=myUpdateSystemActivity(UsrActivity)

// you may react on an error if e is not 0 after the call.

#endif
End Sub

Notes: You may use another constant if you prefer some different behavior.
Call it maybe every second.

17.0.162   How to make my own registration code scheme?

Plugin Version: all, Platform: Windows.

Answer: There are excellent articles about how to make a registratin code scheme, but you can also simply use our RegistrationEngineMBS class.
Notes: If you need a license text, why not use the one from Xojo as a starting point?

17.0.163   How to make small controls on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:
Example:

```
'/*
'* Use the control's default drawing variant. This does not apply to
'* Scroll Bars, for which Normal is Large.
'*/
const kControlSizeNormal = 0

'/*
'* Use the control's small drawing variant. Currently supported by
'* the Check Box, Combo Box, Radio Button, Scroll Bar, Slider and Tab
'* controls.
'*/
const kControlSizeSmall = 1

'/*
'* Use the control's small drawing variant. Currently supported by
'* the Indeterminate Progress Bar, Progress Bar and Round Button
'* controls.
'*/
const kControlSizeLarge = 2
```

```
'/*
'* Control drawing variant determined by the control's bounds. This
'* ControlSize is only available with Scroll Bars to support their
'* legacy behavior of drawing differently within different bounds.
'*/
const kControlSizeAuto = &hFFFF

const kControlSizeTag = "size"

declare function SetControlData lib "Carbon" (controlhandle as Integer, part as short, tagname as OS-
Type, size as Integer, data as ptr) as short

dim m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))
```

17.0.164   How to mark my Mac app as background only?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:
Example:

```
Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSUIElement"" YES")
```

Notes: This will set the NSUIElement flag to YES.

17.0.165   How to move a file or folder to trash?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:
Example:

```
Function MoveToTrash(f as FolderItem) As Boolean
#if TargetMacOS then
dim r as FolderItem
dim e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFile-
OperationDefaultOptions)
```

```
if e = 0 then
Return true // Ok
end if

#elseif TargetWin32 then
dim w as new WindowsFileCopyMBS

dim flags as Integer = w.FileOperationAllowUndo + w.FileOperationNoErrorUI + w.FileOperationSilent
+ w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if

flags = w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if
#else
// Target not supported
break
Return false
#endif
End Function
```

Notes: If you want to move a file to trash, you could use f.movefileto f.trashfolder, but that will overwrite existing files in the trash. You can use our MacFileOperationMBS class to move a file on Mac to the trash. And it uses the same code as the Finder, so files are renamed when the same name is already in use in the trash:

On Windows we use WindowsFileCopyMBS class.
Requires Mac OS X 10.5.

17.0.166   How to move an application to the front using the creator code?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:
Example:

```
dim a as appleevent

a=newappleEvent("misc","actv","ttxt")
```

```
if a.send then
end if
```

Notes: (Code is Mac only)

17.0.167 How to move file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.
Example:

```
dim d as CURLMBS // your curl object

// rename/move file
dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNTO MyFile.txt"

d.SetOptionPostQuote(ws)
```

Notes: Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.
The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. So rename is two commands. First RNFR to tell where to rename from and second RNTO with the new file name. To delete use DELE and the file path.

17.0.168 How to normalize string on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:
Example:

```
Function Normalize(t as string) As string
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS = NewCFStringMBS(t)
dim m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)
```

Return m.str
End Function

Notes: This uses Apple's CFString functions to normalize unicode variants.

17.0.169   How to obscure the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:
Example:

Declare Sub ObscureCursor Lib "Carbon" ()

ObscureCursor

Notes: The MBS Plugin has this function, but it's not supported for Windows.

17.0.170   How to open icon file on Mac?

Plugin Version: all, Platform: macOS.

Answer: Use the NSImageMBS class like this:
Example:

dim f as FolderItem = SpecialFolder.Desktop.Child("test.ico")
dim n as new NSImageMBS(f)

window1.Backdrop = n.CopyPictureWithMask

17.0.171   How to open PDF in acrobat reader?

Plugin Version: all, Platform: macOS.

Answer: Try this code:
Example:

dim pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

```
// open PDF in Acrobat Reader on Mac:

// find app
dim bundleID as string = "com.adobe.Reader"
dim app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")

if app<>nil then

// launch app with parameters

dim docs() as FolderItem
docs.Append pdf

dim param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

dim x as FolderItem = LaunchServicesOpenXMBS(docs, param)

// on failure, simply launch it
if x = nil then
pdf.Launch(true)
end if

else
pdf.Launch(true)
end if
```

Notes: On Windows, simply use pdf.launch or WindowsShellExecuteMBS.

17.0.172   How to open printer preferences on Mac?

Plugin Version: all, Platform: macOS.

Answer: You can use our OpenMacOSXPreferencesPaneMBS function like this:
Example:

```
dim e as Integer = OpenMacOSXPreferencesPaneMBS("PrintAndFax")
if 0 = e then
MsgBox "OK"
elseif e = -43 then
MsgBox "File not found."
else
MsgBox "Error: "+str(e)
end if
```

17.0.173   How to open special characters panel on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have functions for that in Cocoa and Carbon.
Example:

dim a as new NSApplicationMBS
a.orderFrontCharacterPalette

Notes: For Cocoa, you can use orderFrontCharacterPalette method in NSApplicationMBS class.

Or simply for Carbon and Cocoa the ShowCharacterPaletteMBS method.

17.0.174   How to optimize picture loading in Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebPicture class.
Notes: Take your picture and create a WebPicture object. Store this WebPicture in a property of the WebPage, Session or app (as global as possible). On the first time you use this picture on an user session, the browser will load it. Second time you use it, the browser will most likely pick it from the cache.
Having pictures in App or some module reuses the same picture for all sessions which reduces memory footprint.
This does not work well with pictures you change very often or use only for one webpage on one user.

If you like to see an example, check our Map example.

17.0.175   How to parse XML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:
Example:

dim s as string = ”<test><test /></test>”

try

```
dim x as new XmlDocument(s)
MsgBox "OK"
catch xe as XmlException
MsgBox "invalid XML"
end try
```

Notes: If you got an exception, you have a parse error.

17.0.176   How to play audio in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the HTML5 audio tag and control it with javscript.
Notes: This is just another example app I made today. It plays a christmas song. The audio file is provided by the application to the server, so no external web server is needed and this application can run stand alone. To compile and run you need Xojo 2010r5.

In the open event we search the audio files and open them as binarystreams. We create the two webfile objects. Those webfiles are part of the app class, so we have them globally. There we set the data with the content of our streams. We also define file names and mime types. They are needed so browser know what we have here:

```
audioFileM4V = new WebFile
audioFileM4V.Data = bM.Read(BM.Length)
audioFileM4V.Filename = "music.m4a"
audioFileM4V.MIMEType = "audio/m4a"


audioFileOGG = new WebFile
audioFileOGG.Data = bO.Read(BO.Length)
audioFileOGG.Filename = "music.ogg"
audioFileOGG.MIMEType = "audio/ogg"
```

Next in the open event of the webpage we have a PageSource control. The location is set to be before content. In the open event we define the html code for this. First we pick the URLs for the audio files. Than we build the html to use the audio tag. As you see, we give it an ID for later use and have it preload automatically. If you add an autoplay tag, you can have the audio play right away. Inside the audio tag we have two sources so we provide audio for both Firefox (OGG) and Safari (MPEG4). Finally we have a text to display if HTML5 audio tag is not supported.

You can set the source in the EditSource event:

dim urlo as string = app.audioFileOGG.URL
dim urlm as string = app.audioFileM4V.URL
me.Source = ”<audio id=””mymusic”” preload=””auto””><source src=”””+urlo+””” type=””audio/ogg””
/><source src=”””+urlm+””” type=””audio/mpeg”” />Your browser does not support the audio element.</audio>”

Next in the Play button we execute code to play the audio. This is a short javascript code which searches in the html document for the element with the ID ”mymusic” which is the ID of our audio tag above. Once we got the object, we call it's play method to start playback.

me.ExecuteJavaScript(”document.getElementById('mymusic').play();”)

same for pause:

me.ExecuteJavaScript(”document.getElementById('mymusic').pause();”)

and finally for changing volume:

me.ExecuteJavaScript(”document.getElementById('mymusic').volume=”+str(me.Value/100.0)+”;”)

17.0.177   How to pretty print xml?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the XML Transform method with the right XLS.
Notes: Learn more here:
http://docs.xojo.com/index.php/XMLDocument.Transform

17.0.178   How to print to PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code below shows how to redirect printing to a PDF file on Mac OS X.
Example:

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString
```

```
// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20
```

Notes: And you can use normal graphics class for that.

17.0.179 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Platform: macOS.

Answer: You can use a MDItemMBS objec to query this value:
Example:

```
Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
#If TargetMacOS Then
Dim xMDItem as New MDItemMBS(F)
Dim xDate as Variant

If xMDItem <>Nil Then
xDate = xMDItem.GetAttribute(xMDItem.kMDItemLastUsedDate).DateValue
If xDate IsA Date Then Return xDate
Else
If xDate <>Nil Then Break
End If
#EndIf

If DefaultOtherDates Then
If F.ModificationDate <>Nil Then Return F.ModificationDate
If F.CreationDate <>Nil Then Return F.CreationDate
End If
End Function
```

Notes: Thanks for Josh Hoggan for this example code.

17.0.180   How to quit windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:
Example:

```
#if targetwin32 then
dim i1,i2,r as Integer
declare function ExitWindowsEx lib "user32" (uFlags as Integer, dwReserved as Integer) as Integer
i1 = 2
i2 = 0
r = ExitWindowsEx(i1,i2)
if r<>0 then
' Error()
end if

#endif
```

Notes: uFlags parameters:

```
'4 = EWX_Force
'0 = EWX_Logoff
'2 = EWX_Reboot
'1 = EWX_shutdown, should shut down computer
```

Also check the ExitWindowsMBS method.

17.0.181   How to read a CSV file correctly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:
Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = f.OpenAsTextFile

while not t.EOF
dim s as string = t.ReadLine(encodings.ASCII)

dim items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")
```

```
List.AddRow ""
dim u as Integer = UBound(items)
for i as Integer = 0 to u
List.Cell(List.LastIndex,i) = items(i)
next

wend
```

Notes: Please make sure you choose the right text encoding.

17.0.182   How to read the command line on windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:
Example:

```
#if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

#endif
```

Notes: Newer Xojo versions have a system.commandline property.

17.0.183   How to render PDF pages with PDF Kit?

Plugin Version: all, Platform: Windows.

Answer: Try this code:
Example:

```
// choose a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
dim sourceFile as New PDFDocumentMBS(f)
```

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
dim c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
dim page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
dim p as NSImageMBS = page.Render

// and convert to RB picture and display
Backdrop = p.CopyPictureWithMask

next

end if

Notes: PDFKit works only on Mac OS X.

17.0.184   How to restart a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:
Example:

dim ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if

17.0.185   How to resume ftp upload with curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: CURL supports that and you simply need to set the right options.

Notes: First of course OptionUpload must be true. Second OptionFTPAppend must be true so the OptionResumeFrom is used. Store there (or in OptionResumeFromLarge) your start value.
Don't forget to implement the read event and return data there as requested.

17.0.186 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code opens a PDF and draws the first page into a new PDF with 90¬∞ rotation.
Example:

```
// Rotate a PDF page

// our files
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90¬∞
c.RotateCTM pi*1.5

// fix origin
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage
```

c = nil

// show in PDF viewer
destfile.Launch

Notes: This code is Mac only as it needs CoreGraphics.

17.0.187   How to rotate image with CoreImage?

Plugin Version: all, Platform: macOS.

Answer: Use the code like the one below:
Example:

// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation

// as Xojo picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic

17.0.188   How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Install 32 bit compatibility libraries.
Notes: The package is called ia32-libs for ubuntu (and others).
Some applications need to be run on a 32 bit system as they need some hardware related libraries. Like libUSB or libHID for USB devices.

17.0.189   How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Platform: macOS.

Answer: You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.
Example:

```
// make it landscape
dim n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
n.orientation = n.NSLandscapeOrientation

// save html to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call HTMLViewer1.PrintToPDFFileMBS(f,10,30,10,30)
```

Notes: You may want to reset options later.
This code is only for Mac OS X.

17.0.190   How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to save to RTFD:
Example:

```
// save text as RTFD including image attachments
dim f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtfd, "test.rtfd")

if f = nil then Return

dim a as NSAttributedStringMBS = textView.textStorage
dim w as NSFileWrapperMBS = a.RTFDFileWrapperFromRange(0, a.length, DocumentAttributes)

dim e as NSErrorMBS
if w.writeToFile(f, e) then
```

```
else
MsgBox e.LocalizedDescription
end if
```

Notes: For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

17.0.191   How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to load PDF to htmlviewer on desktop?
Example:

```
Public Sub LoadPDFData(viewer as HTMLViewer, PDFData as string)
Dim base64string As String = EncodeBase64(PDFData)

// remove line endings to make it a big line
base64string = ReplaceLineEndings(base64string, "")

// build data URL
// https://en.wikipedia.org/wiki/Data_URI_scheme
Dim dataURL As String = "data:application/pdf;base64," + base64string

// show in webviewer
HTMLViewer1.LoadURL(dataURL)

// may not work everywhere due to URL length limit
// for Web projects, use WebFile instead!
End Sub
```

Notes: This avoids a temporary file, which may also work.
For Web Apps, please use WebFile.

17.0.192   How to scale a picture proportionally with mask?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.
Example:

Function ProportinalScaledWithMask(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min(Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
dim m as picture = pic.mask(False)
pic.mask = nil

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

if m <>nil then
// restore mask and scale it
pic.mask = m
NewPic.mask.Graphics.DrawPicture m, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height
end if

// return result
Return NewPic
End Function

Notes: This version handles mask. As you see we actually have to remove mask in order to copy the picture part correctly.

17.0.193   How to scale a picture proportionally?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.
Example:

Function ProportionalScaled(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min(Height / Pic.Height, Width / Pic.Width)

```
// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

// return result
Return NewPic
End Function
```

Notes: This does not handle mask, but you can scale the mask the same way and assign it to the new picture.
(see other FAQ entry with mask)

17.0.194   How to scale/resize a CIImageMBS?

Plugin Version: all, Platform: Windows.

Answer: Use the CIFilterLanczosScaleTransform filter to scale down a picture to a specific size.
Example:

```
Dim pic As Picture = LogoMBS(500)
Dim image As CIImageMBS = CIImageMBS.imageWithPicture(pic)

Dim filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Dim scale As Double = targetHeight / image.Extent.Height
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim result As Picture = filter.outputImage.RenderPicture

Backdrop = result
```

Notes: This is same code as our scaleTo convenience method.

17.0.195   How to scale/resize a picture?

Plugin Version: all, Platform: Windows.

Answer: There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.
Example:

dim Original,Scaled as Picture

Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)

Notes: The plugin ways:
- GraphicsMagick can scale/resize.
- CoreImage scale filter may result in the fastest and best images on Mac OS X 10.4.
- NSImageMBS can scale, but is Mac OS X only.
- CGImageMBS can scale, but is Mac OS X only.
- CIImageMBS can scale, but is Mac OS X only.
- QuickTime Graphics exporter and importer can be connected to scale. (this was used more often a few years ago)
- ImageMagick can scale very nice and crossplatform. But the ImageMagick libraries are big.
- The picture.ScaleMBS function is self written and results in equal output on Mac, Windows and Linux without any additional libraries installed.
- Picture.ScalingMBS does crossplatform scaling with several modes.

with pure Xojo:
- make a new picture and draw the old one with new size inside.

17.0.196   How to search with regex and use unicode codepoints?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can specify unicode characters in search string with backslash x and digits.
Example:

dim r as RegExMbs
dim s as string
dim c as Integer

s="123 √§√√º ABC 456"

r=new RegExMBS
if r.Compile(".√.") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

r=new RegExMBS
if r.Compile(".\xF6.") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

17.0.197   How to see if a file is invisible for Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: Try this function:
Example:

Function Invisible(F As FolderItem) As Boolean
Dim TIS As TextInputStream
Dim S,All As String
Dim I as Integer
dim g as folderitem

If Left(F.Name,1)="." or not f.visible Then
Return True
End If

g=F.Parent.Child(".hidden")
If g.Exists Then
TIS=g.OpenAsTextFile
if tis<>Nil then
All=TIS.ReadAll
For I=1 to CountFields(All,Chr(11))
S=NthField(All, Chr(11), I)

```
If S=F.name Then
Return True
End If
Next
end if
End if
End Function
```

17.0.198 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You use the pragma cache_size command on the database.
Example:

```
// set cache size to 20000 pages which is about 20 MB for default page size
dim db as REALSQLDatabase
db.SQLExecute "PRAGMA cache_size = 20000"
```

Notes: Default cache size is 2000 pages which is not much.
You get best performance if whole database fits in memory.
At least you should try to have a cache big enough so you can do queries in memory.
You only need to call this pragma command once after you opened the database.

17.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

Answer: Try this declares:
Example:

```
window1.ModifiedMBS=true
```

17.0.200 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the
Example:

dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer

// load into html viewer
HTMLViewer1.URL = CurrentFile.URL

Notes: See our Create PDF example for the Xojo Web Edition.

17.0.201 How to show Keyboard Viewer programmatically?

Platform: macOS.

Answer: Use Xojo or AppleScript to launch the KeyboardViewerServer.app.
Example:

dim a as new AppleScriptMBS
dim text as string
dim lines(-1) as string

lines.append "set theApplication to ""KeyboardViewerServer"""
lines.append "set thePath to ""/System/Library/Components/KeyboardViewer.component/Contents/Shared-Support/KeyboardViewerServer.app"""
lines.append ""
lines.append "set POSIXPath to ((POSIX file thePath) as string)"
lines.append "tell application ""System Events"" to set isRunning to 0 <(count (application processes whose name is theApplication))"
lines.append "if isRunning then tell application POSIXPath to quit"
lines.append "delay 0.15"
lines.append ""
lines.append "ignoring application responses"
lines.append " tell application POSIXPath to run"
lines.append "end ignoring"

text=join(lines,EndOfLine.macintosh)

a.Compile text
a.Execute

Notes: AppleScript code:

set theApplication to "KeyboardViewerServer"
set thePath to "/System/Library/Components/KeyboardViewer.component/Contents/SharedSupport/KeyboardViewerServer.app"

set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theApplication))
if isRunning then tell application POSIXPath to quit
delay 0.15

ignoring application responses
tell application POSIXPath to run
end ignoring

17.0.202 How to show the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:
Example:

Declare Sub ShowCursor Lib "Carbon" ()

ShowCursor

Notes: The MBS Plugin has this function and supports it on Windows, too.

17.0.203 How to shutdown a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:
Example:

dim ae as appleevent
ae=newappleEvent("FNDR","shut","MACS")
if not ae.send then
msgBox "The computer couldn't be shutdown."
end if

Notes: Or toolbox call (Attention: This method will stop the computer immediataly: No document asked to be saved, all applications quitting without knowing).

Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower

17.0.204   How to sleep a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:
Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

17.0.205   How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Here a few speed tips:
Notes:

- Use the DynaPDFRasterizerMBS function instead of our render functions.

- Reuse DynaPDFRasterizerMBS as long as the target picture size doesn't change.

- Import only the PDF pages you want to display.

- Let DynaPDF do zooming, rotating or other effects instead of you change it.

17.0.206   How to use PDFLib in my RB application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The PDFlib plugin was discontinued in favor of our DynaPDF plugin.
Notes: If you need help to move, please contact us.

17.0.207   How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Just double them.
Example:

msgbox "This String contains ""quotes"""

17.0.208   How to use Sybase in Web App?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use our MBS Xojo SQL Plugin to connect to a Sybase Database in your web application.
Notes: If you see db.Connect giving the error message "cs_ctx_alloc ->CS_MEM_ERROR", than some things are not setup right for Sybase.
The Apache process may not have all the SYBASE environment variables being set when the CGI was launched.

Adding these lines to /etc/httpd/conf/httpd.conf stopped the faux memory errors for us:

SetEnv LD_LIBRARY_PATH /opt/sybase/OCS-15_0/lib:/opt/sybase/OCS-15_0/lib3p64:/opt/sybase/OCS-15_0/lib3p:
SetEnv SYBROOT /opt/sybase
SetEnv SYBASE_OCS /opt/sybase
SetEnv SYBASE /opt/sybase

17.0.209   How to use the Application Support folder?

Plugin Version: all, Platform: macOS.

Answer:

I was saving a registration code for an app to the Preferencefolder.
People on the list have suggested that it would be better in
the ApplicationSupportFolder. How do I save the file called CWWPrefs
into that folder using MBS?

I have checked for examples and the docs but can't see how to apply it

//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)

Example:

dim folder,file as FolderItem

folder = createApplicationSupportFolderMBS(-32763)

if folder=nil then
// Some very old Mac OS Versions may not support it
// or the plugin may fail for any reason
folder=SpecialFolder.Preferences
end if

file=folder.Child("CWWPrefs")

MsgBox file.NativePath

Notes:

You may not be able to write there with a normal user account!

17.0.210   How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Platform: macOS.

Answer: You can use the following code which does this using the SoftDeclareMBS class.
Example:

Sub Open()
dim c as CFDateMBS
dim t as CFAbsoluteTimeMBS

// get current date
c=NewCFDateMBS

// in absolute time (seconds since x)
t=c.AbsoluteTime

// add 600 seconds (= 10 Minutes)
t.Value=t.Value+600

// Make a Date from it
c=t.Date

// Schedule the event
// 0 on success
// E00002C1 for missing root rights

Title=hex(schedulePowerEvent(c, "wake"))

// Just for information, display the scheduled stuff
CFShowMBS CopyScheduledPowerEvents
End Sub

Function CopyScheduledPowerEvents() As cfarrayMBS
dim s as SoftDeclareMBS
dim m as MemoryBlock

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMCopyScheduledPowerEvents") then
if s.CallFunction(0,nil) then
Return NewCFArrayMBSHandle(s.Result,true)
else
MsgBox "Failed to Call IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOPMCopyScheduledPowerEvents."
end if
else
MsgBox "Failed to load IOKit."
end if

Return nil
End Function

Function SchedulePowerEvent(time_to_wake as CFDateMBS, Type as CFStringMBS) as Integer
dim s as SoftDeclareMBS
dim m as MemoryBlock

'/*
'* Types of power event
'* These are potential arguments to IOPMSchedulePowerEvent().
'* These are all potential values of the kIOPMPowerEventTypeKey in the CFDictionaries
'* returned by IOPMCopyScheduledPowerEvents().
'*/
'/*!
'@define kIOPMAutoWake
'@abstract Value for scheduled wake from sleep.
'*/
'#define kIOPMAutoWake "wake"
'
'/*!
'@define kIOPMAutoPowerOn
'@abstract Value for scheduled power on from off state.

'*/
'#define kIOPMAutoPowerOn "poweron"
'

'/*!
'@define kIOPMAutoWakeOrPowerOn
'@abstract Value for scheduled wake from sleep, or power on. The system will either wake OR
'power on, whichever is necessary.
'*/
'

'#define kIOPMAutoWakeOrPowerOn "wakepoweron"
'/*!
'@define kIOPMAutoSleep
'@abstract Value for scheduled sleep.
'*/
'

'#define kIOPMAutoSleep "sleep"
'/*!
'@define kIOPMAutoShutdown
'@abstract Value for scheduled shutdown.
'*/
'

'#define kIOPMAutoShutdown "shutdown"

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMSchedulePowerEvent") then

m=NewMemoryBlock(12)
m.Long(0)=time_to_wake.handle
m.Long(4)=0 // nil
m.Long(8)=type.Handle

if s.CallFunction(3,m) then
Return s.Result
end if
end if
end if

End Function

Notes: Requires Mac OS X and to execute root rights.

17.0.211   How to validate a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this function below which uses a regular expression to verify that the string is a valid UUID/GUID:
Example:

Function IsGUID(guid as string) As Boolean
dim r as new RegEx

r.SearchPattern = "^(\{ { 0,1 } ([0-9a-fA-F]) { 8 } -([0-9a-fA-F]) { 4 } -([0-9a-fA-F]) { 4 } -([0-9a-fA-F]) { 4 } -([0-9a-fA-F]) { 12 } \} { 0,1 })$ "

Return r.Search(guid)<>nil
End Function

Notes: Simply parsing the GUID with CFUUIDMBS does not give the same result as CFUUIDMBS will also take a string like "DDDD".

17.0.212   How to walk a folder hierarchie non recursively?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this one:
Example:

Sub Walk(folder as FolderItem)
dim folders() as FolderItem

folders.Append folder

while UBound(folders)>=0

dim currentFolder as FolderItem = folders.pop

dim c as Integer = currentFolder.Count
for i as Integer = 1 to c
dim item as FolderItem = currentFolder.TrueItem(i)

if item = Nil then
// no permission
elseif item.Visible then // only visible

if item.Directory then
folders.Append item

```
else
// work with file here
end if

end if

next

wend
End Sub
```

Notes: As you see we go with a long loop which runs until we don't have more folders to process.
We ignore items we can't access due to permission limits.
And we only work visible items.
If you like, check folderitem.isBundleMBS on item to handle packages and applications better on Mac OS X.

17.0.213   I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error.   Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Platform: macOS.

Answer: The plugins MacOSX and MacOSXCF belong together. If you use one part, please also install the other part.
Notes: We splitted the plugin because the Xojo IDE on Windows crashed on compilation.

17.0.214   I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There are two main reasons.
Notes: 1. you may use the plugin before registering them. This is often the case if you register in a window open event and use the plugin in a control open event.
On the console on Mac OS X or Windows, you may see a message like this "MBS Plugins were used by the application before the RegisterMBSPlugin function was called. Please fix this in your code!".

2. you may have mixed different plugin versions which are not compatible.
In this case you can see a message "Internal plugin registration error." on the console on Mac OS X. Newer plugins may show a message dialog reporting this. Older version simply think they are not registered.

If the installer just merges old and new applications, users may have libraries of older and newer plugin versions in the libs folder. If your application loads the wrong version, the registration fails.

If you use remote debugging, make sure you clear the tempory files there, too. Otherwise you may have old DLLs on your hard disc which may disturb your application.

You can run into issues if you use your registration code on different places of your app. Please register only once in app.open (or app Constructor). If you have several codes, simply call them one after the other.

Also check that you only call RegisterMBSPlugin with valid serial number. If you later call RegisterMBSPlugin with Demo like in example code above, you remove the license.

Next check if you can clear the Xojo caches and that helps. This includes the Xojo Scratch folder and the Plugins & Project caches. Simply locate those folders and delete them. For Windows look in hidden AppData folder in your user folder. For Mac, please check
textasciitilde /Library/Caches and your temp folders.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

17.0.215 I want to accept Drag & Drop from iTunes

Plugin Version: all, Platform: macOS.

Answer: You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.
Example:

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub

Sub DropObject(obj As DragItem)
dim s as string
dim f as folderItem
dim d as CFDictionaryMBS
dim o as CFObjectMBS
dim key as CFStringMBS
dim dl as CFDictionaryListMBS
dim i,c as Integer
dim u as CFURLMBS
dim file as FolderItem

if obj.MacDataAvailable("itun") then
s = obj.MacData("itun")
```

```
// Parse XML
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

// Make dictionary
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

// get Tracks Dictionary
key=NewCFStringMBS("Tracks")
o=d.Value(key)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
dl=d.List

// Walk over all entries in the Tracks dictionary
c=dl.Count-1
for i=0 to c
o=dl.Value(i)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

key=NewCFStringMBS("Location")
o=d.Value(key)
if o isa CFStringMBS then
u=NewCFURLMBSCFStringMBS(CFStringMBS(o),nil)

file=u.file
if file<>nil then
MsgBox file.NativePath
end if
end if
end if
next
end if
end if
end if
End Sub
```

Notes: The code above inside a window on Xojo 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

17.0.216 I'm drawing into a listbox but don't see something.

Plugin Version: all.

Answer: If you draw this in a listbox cellbackground, you need to draw on the correct position
Example:

Function CellBackgroundPaint(g As Graphics, row as Integer, column as Integer) As Boolean
dim f as FolderItem
f=SpecialFolder.Desktop
f.DrawWideIconMBS(g,listbox1.left,listbox1.top+row*20,16)
Return true
End Function

Notes: Try this in a listbox. The Graphics object there has a cliping and an offset which the plugin doesn't know about.

17.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Platform: macOS.

Answer:

The code I produced in RB isn't smooth enough. Is there a call in MBS, if not, can it be done? The speed of it has to be like the show of a DrawerWindow.

Try the declare below for Carbon. With WindowLib it will work on Mac OS 8.5 and newer.
Notes:

See Window.Transition functions.

17.0.218 If I use one of your plug-ins under windows, would this then impose the use of dll after compilation or my would my compiled soft still be a stand-alone single file software?

Platforms: macOS, Linux, Windows.

Answer: Stand alone.
Notes: Xojo compiles all used plugins into the application binary.
Some plugin parts need external dlls but you will find that in the documentation. (e.g. pdflib for some classes)

17.0.219   Is the fn key on a powerbook keyboard down?

Plugin Version: all, Platform: macOS.

Answer: I am unable to figure out how or if it is possible to detect if the fn key is down on a powerbook keyboard. Is it possible?
Example:

' Window.Open Event of a blank project:

dim i as Integer

for i=0 to 127
if keyboard.asynckeydown(i) then
title=str(i) // found
return
end if
next
title="" // not found

Notes: This test application shows the keycode (decimal) 63 for the fn key.

17.0.220   Is there a case sensitive Dictionary?

Plugin Version: all.

Answer: The MBS Plugin has several classes which can work as a replacement.
Notes: First you could use VariantToVariantHashMapMBS or VariantToVariantOrderedMapMBS.
If you know that all keys are Strings or Integers only, you can use the specialized classes which are a little bit faster due to avoiding variants:

IntegerToIntegerHashMapMBS class
IntegerToIntegerOrderedMapMBS class
IntegerToStringHashMapMBS class
IntegerToStringOrderedMapMBS class
IntegerToVariantHashMapMBS class
IntegerToVariantOrderedMapMBS class
StringToStringHashMapMBS class
StringToStringOrderedMapMBS class
StringToVariantHashMapMBS class
StringToVariantOrderedMapMBS class

17.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the DirectorySizeMBS class for this as in the example below:
Example:

```
dim d as DirectorySizeMBS

d=new DirectorySizeMBS

// volume(1) as my boot volume is very full
if d.update(volume(1),true,0) then
MsgBox str(d.VisibleItemCount)+" visible items, "+str(d.HiddenItemCount)+" invisible items."
end if
```

Notes: Complete Question: Is there a way to use the MBS plugin to get only the visible item and folder count on a volume? The FileCount and FolderCount properties of VolumeInformationMBS seem to provide the total # of items including invisible items such as .DS_Store and more importantly .Trashes which is causing me a great amount of difficulty during a recursive scan of a volume. I've got a progress bar which uses the total of the filecount and foldercount properties as the maximum value, but my routine needs to filter out all invisible items, as it is creating a catalog of a volume for archiving purposes. Any thoughts how I could get accurate number.

17.0.222 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Platform: macOS.

Answer: Use the code below:
Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

17.0.223   List of Windows Error codes?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have a list of windows error codes on our website.
Notes: http://www.monkeybreadsoftware.de/xojo/winerror.shtml

17.0.224   Midi latency on Windows problem?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The issue is system related, not a problem with RB or the plugin.
Notes: Two things will adversely affect the timing:

(1) latency of the software synthesizer output driver. The default Windows wavetable synthesizer has considerable latency. I don't know how many milliseconds, but it is noticeable.

(2) latency of the digital audio output driver. Different systems have different drivers for different audio hardware. My Dell laptop has a minimum 15ms latency in the audio driver.

These two things put together were causing a very sluggish MIDI response. I was able to verify these as the culprits by routing MIDI directly out of RB into a sample player, which only introduces the latency of (2) and does not include latency of (1).

I don't know how widely known are these facts, if not then you may want to add this information to the documentation, since Windows programmers using the MIDI plugin may not know those problems, and might mistakenly blame your plugin, as I did :) Sorry about that!

(From Aaron Andrew Hunt)

17.0.225   My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

Answer: Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:
Notes: Just a list of checks to do for linux apache installations:

- You have 64bit linux? Than you need 32 bit compatibility libraries.
- The folder of your app is writable? Set permissions to 777.
- The cgi script is executable? Set permissions to 755.

- The app file itself is executable? Set permissions to 755.

- You uploaded cgi file as text, so it has unix line endings? (this often gives error "Premature end of script headers" in apache log)

- You uploaded config.cfg file and made it writable? Set permissions to 666.

- Your apache allows execution of cgi scripts? You enabled cgi for apache and uncommented addhandler command for CGI on a new apache installation?

- You uploaded the app file and libraries as binary files? Upload as text breaks them.

- You did upload the libs folder?

- You don't have code in app.open, session.open and other events which crashes app right at launch?

- You don"t have a print command in your app.open event? (see feedback case 23817)

- You allowed htaccess file to overwrite permissions?

17.0.226   SQLDatabase not initialized error?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Before you can use SQLDatabaseMBS, it must be initialized.
Example:

dim d as new SQLDatabaseMBS

Notes: This happens normally when you use "new SQLDatabaseMBS".
But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happend, yet.
So please simply add a line "dim d as new SQLDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

17.0.227   Textconverter returns only the first x characters. Why?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Some older Xojo versions limit the Textconverter to around 1024 characters in input and output.
This should be fixed with RB5.
Notes:

Xojo seems not to support Textconverters at all on Windows.

17.0.228   The type translation between CoreFoundation/Foundation and Xojo data types.

Plugin Version: all, Platform: macOS.

Answer: The plugin does conversion between Cocoa/Carbon data types and native Xojo data types. The following list help you knowing what the current plugins support:
Notes: Cocoa NSObject to Variant:

nil ->nil
NSDictionary ->Dictionary
NSData ->MemoryBlock
NSString ->String
NSAttributedString ->NSAttributedStringMBS
NSDate ->Date
NSNumber ->double/integer/Int64/UInt64/UInt32/Boolean
NSURL ->String
NSValue with NSRect ->NSRectMBS
NSValue with NSPoint ->NSPointMBS
NSValue with NSSize ->NSSizeMBS
NSValue with NSRange ->NSRangeMBS
NSValue with QTTime ->QTTimeMBS
NSValue with QTTimeRange ->QTTimeRangeMBS
NSArray ->Array of Variant
QuartzFilter ->QuartzFilterMBS

- ->*MBS

Variant to Cocoa NSObject:

nil ->nil
Dictionary ->NSDictionary
Boolean ->NSNumber
Integer ->NSNumber
Color ->NSColor
Int64 ->NSNumber
Single ->NSNumber
Double ->NSNumber
Date ->NSDate
MemoryBlock ->NSData
String ->NSString
NSImageMBS ->NSImage
NSAttributedStringMBS ->NSAttributedString
NSColorMBS ->NSColor
NSRectMBS ->NSValue with NSRect
NSSizeMBS ->NSValue with NSSize

NSPointMBS ->NSValue with NSPoint
NSRangeMBS ->NSValue with NSRange
NSBurnMBS ->NSBurn
NSViewMBS ->NSView
NSFontMBS ->NSFont
NSParagraphStyleMBS ->NSParagraphStyle
NSAttributedStringMBS ->NSAttributedString
WebPolicyDelegateMBS ->WebPolicyDelegate
WebUIDelegateMBS ->WebUIDelegate
WebFrameLoadDelegateMBS ->WebFrameLoadDelegate
WebResourceLoadDelegateMBS ->WebResourceLoadDelegate
NSIndexSetMBS ->NSIndexSet
QTTimeMBS ->QTTime
QTTimeRangeMBS ->QTTimeRange
Array of Variant ->NSArray
Array of String ->NSArray
CFStringMBS ->NSString
CFNumberMBS ->NSNumber
CFDataMBS ->NSData
CFURLMBS ->NSURL
CFArrayMBS ->NSArray
CFDictionaryMBS ->NSDictionary
CFBinaryDataMBS ->NSDate

Carbon CFTypeRef to Variant:

CFDictionaryRef ->Dictionary
CFStringRef ->String
CFDataRef ->String
CFURL ->String
CFNumber ->Integer/Double/Int64
CFArray ->Array
CFDate ->date
nil ->nil
CGColorSpace ->CGColorSpaceMBS
CGColor ->CGColorMBS
CGImage ->CGImageMBS
CF* ->CF*MBS

Variant to Carbon CFTypeRef:

Dictionary ->CFDictionaryRef
Boolean ->CFBooleanRef
Color ->CFNumberRef
Integer ->CFNumberRef

Int64 ->CFNumberRef
Single ->CFNumberRef
Double ->CFNumberRef
String ->CFStringRef
Color ->CGColorRef
Date ->CFDateRef
nil ->nil
Memoryblock ->CFDataRef
FolderItem ->CFURLRef
Dictionary ->CFDictionaryRef
Array of Variant/String/Date/Double/Single/Int64/Integer ->CFArray
CGRectMBS ->CGRect as CFDataRef
CGSizeMBS ->CGSize as CFDataRef
CGPointMBS ->CGPoint as CFDataRef
CGColorMBS ->CGColor
CGColorSpaceMBS ->CGColorSpace
CGImageMBS ->CGImage
CGDataConsumerMBS ->CGDataConsumer
CGDataProviderMBS ->CGDataProvider
CF*MBS ->CF*

Strings without encodings should be put into dictionaries as memoryblocks.

17.0.229   Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Platform: Windows.

Answer: If you see errors like a simple "Segmentation Fault" on Linux or some other wired errors, you may want to check your FTP upload mode. It must be binary for web apps. ASCII mode corrupts the application.

17.0.230   What classes to use for hotkeys?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.
Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

17.0.231   What do I need for Linux to get picture functions working?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In order to get our plugins working on Linux systems without GUI, the plugin loads graphics

libraries dynamically.
Notes: To get it working, the plugin tries to load gtk with this paths:

- libgtk-x11-2.0.so"
- libgtk-x11-2.0.so.0"
- /usr/lib/libgtk-x11-2.0.so"
- /usr/lib32/libgtk-x11-2.0.so"
- /usr/lib/libgtk-x11-2.0.so.0"
- /usr/lib32/libgtk-x11-2.0.so.0"

gdk is loaded with this paths:

- libgdk-x11-2.0.so"
- libgdk-x11-2.0.so.0"
- /usr/lib/libgdk-x11-2.0.so"
- /usr/lib32/libgdk-x11-2.0.so"
- /usr/lib/libgdk-x11-2.0.so.0"
- /usr/lib32/libgdk-x11-2.0.so.0"

For the paths without explicit path, the system will search in /lib, /usr/lib and all directories in the LD_LIBRARY_PATH environment variable.

17.0.232   What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

17.0.233   What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Platform: macOS.

Answer:

Xojo 4.5 has a constant "SmallSystem" to use for a font name.
For older versions try this code:
Example:

```
Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef
fontStyle as Integer)
dim err as Integer
dim theFont, theFontSize, theFontStyle as MemoryBlock

const smSystemScript = -1

Declare Function GetThemeFont Lib "Carbon" (inFontID as Integer, inScript as Integer, outFontName
as Ptr, outFontSize as Ptr, outStyle as Ptr) as Integer

theFont = NewMemoryBlock(256) //Str255
theFontSize = NewMemoryBlock(2) //SInt16
theFontStyle = NewMemoryBlock(1) //Style

err = GetThemeFont(fontType, smSystemScript, theFont, theFontSize, theFontStyle)

if err = 0 then
fontName = theFont.PString(0)
fontSize = theFontSize.UShort(0)
fontStyle = theFontStyle.Byte(0)
else
fontName = ""
fontSize = 0
fontStyle = 0
end if
End Sub
```

17.0.234   What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Platform: Windows.

Answer: Last Version with 10.4 support is version 15.4.
Notes: With version 15.4 you can build applications for OS X 10.4 and newer.
For Version 16.0 we disabled 10.4 and moved minimum to 10.5. We may be able to enable it again to build
a version of 16.x, but may need to charge for this by hour.

17.0.235   What is last plugin version to run on PPC?

Plugin Version: all, Platform: Windows.

Answer: Last Version with PPC is 15.4.
Notes: With version 15.4 you can build PPC applications for OS X 10.4 and newer.
For Version 16.0 we disabled PPC. We may be able to enable it again to build a PPC version of 16.x, but
may need to charge for this by hour.

17.0.236   What is last version of the plugins for macOS 32-bit?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use version 23.0 or older.
Notes: We stopped including 32-bit code for macOS in version 23.1.
Please us older versions if you use an old Xojo.

Xojo 2017r3 and newer load our 64-bit plugins.

17.0.237   What is the difference between Timer and WebTimer?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Time is server side and WebTimer client side.
Notes: Timer is the normal timer class in Xojo. It runs on the server. On the side the WebTimer runs on the client. It triggers a request to the server to perform the action. So a WebTimer is good to keep the connection running and the website updated regularly. A timer on the server is good to make regular jobs like starting a database backup every 24 hours.

17.0.238   What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a list of function names known by LibXL.
Notes: LibXL parses the functions and writes tokens to the excel file. So even if Excel can do more functions, we can only accept the ones known by LibXL.

ABS, ABSREF, ACOS, ACOSH, ACTIVE.CELL, ADD.BAR, ADD.COMMAND, ADD.MENU, ADD.TOOL-BAR, ADDRESS, AND, APP.TITLE, AREAS, ARGUMENT, ASC, ASIN, ASINH, ATAN, ATAN2, ATANH, AVEDEV, AVERAGE, AVERAGEA, BAHTTEXT, BETADIST, BETAINV, BINOMDIST, BREAK, CALL, CALLER, CANCEL.KEY, CEILING, CELL, CHAR, CHECK.COMMAND, CHIDIST, CHIINV, CHITEST, CHOOSE, CLEAN, CODE, COLUMN, COLUMNS, COMBIN, CONCATENATE, CONFIDENCE, COR-REL, COS, COSH, COUNT, COUNTA, COUNTBLANK, COUNTIF, COVAR, CREATE.OBJECT, CRIT-BINOM, CUSTOM.REPEAT, CUSTOM.UNDO, DATE, DATEDIF, DATESTRING, DATEVALUE, DAV-ERAGE, DAY, DAYS360, DB, DBCS, DCOUNT, DCOUNTA, DDB, DEGREES, DELETE.BAR, DELETE.COM-MAND, DELETE.MENU, DELETE.TOOLBAR, DEREF, DEVSQ, DGET, DIALOG.BOX, DIRECTORY, DMAX, DMIN, DOCUMENTS, DOLLAR, DPRODUCT, DSTDEV, DSTDEVP, DSUM, DVAR, DVARP, ECHO, ELSE, ELSE.IF, ENABLE.COMMAND, ENABLE.TOOL, END.IF, ERROR, ERROR.TYPE, EVAL-UATE, EVEN, EXACT, EXEC, EXECUTE, EXP, EXPONDIST, FACT, FALSE, FCLOSE, FDIST, FILES, FIND, FINDB, FINV, FISHER, FISHERINV, FIXED, FLOOR, FOPEN, FOR, FOR.CELL, FORECAST,

FORMULA.CONVERT, FPOS, FREAD, FREADLN, FREQUENCY, FSIZE, FTEST, FV, FWRITE, FWRITELN, GAMMADIST, GAMMAINV, GAMMALN, GEOMEAN, GET.BAR, GET.CELL, GET.CHART.ITEM, GET.DEF, GET.DOCUMENT, GET.FORMULA, GET.LINK.INFO, GET.MOVIE, GET.NAME, GET.NOTE, GET.OBJECT, GET.PIVOT.FIELD, GET.PIVOT.ITEM, GET.PIVOT.TABLE, GET.TOOL, GET.TOOL-BAR, GET.WINDOW, GET.WORKBOOK, GET.WORKSPACE, GETPIVOTDATA, GOTO, GROUP, GROWTH, HALT, HARMEAN, HELP, HLOOKUP, HOUR, HYPERLINK, HYPGEOMDIST, IF, IN-DEX, INDIRECT, INFO, INITIATE, INPUT, INT, INTERCEPT, IPMT, IRR, ISBLANK, ISERR, ISER-ROR, ISLOGICAL, ISNA, ISNONTEXT, ISNUMBER, ISPMT, ISREF, ISTEXT, ISTHAIDIGIT, KURT, LARGE, LAST.ERROR, LEFT, LEFTB, LEN, LENB, LINEST, LINKS, LN, LOG, LOG10, LOGEST, LOGINV, LOGNORMDIST, LOOKUP, LOWER, MATCH, MAX, MAXA, MDETERM, MEDIAN, MID, MIDB, MIN, MINA, MINUTE, MINVERSE, MIRR, MMULT, MOD, MODE, MONTH, MOVIE.COM-MAND, N, NA, NAMES, NEGBINOMDIST, NEXT, NORMDIST, NORMINV, NORMSDIST, NORM-SINV, NOT, NOTE, NOW, NPER, NPV, NUMBERSTRING, ODD, OFFSET, OPEN.DIALOG, OP-TIONS.LISTS.GET, OR, PAUSE, PEARSON, PERCENTILE, PERCENTRANK, PERMUT, PHONETIC, PI, PIVOT.ADD.DATA, PMT, POISSON, POKE, POWER, PPMT, PRESS.TOOL, PROB, PRODUCT, PROPER, PV, QUARTILE, RADIANS, RAND, RANK, RATE, REFTEXT, REGISTER, REGISTER.ID, RELREF, RENAME.COMMAND, REPLACE, REPLACEB, REPT, REQUEST, RESET.TOOLBAR, RESTART, RESULT, RESUME, RETURN, RIGHT, RIGHTB, ROMAN, ROUND, ROUNDBAHTDOWN, ROUND-BAHTUP, ROUNDDOWN, ROUNDUP, ROW, ROWS, RSQ, RTD, SAVE.DIALOG, SAVE.TOOLBAR, SCENARIO.GET, SEARCH, SEARCHB, SECOND, SELECTION, SERIES, SET.NAME, SET.VALUE, SHOW.BAR, SIGN, SIN, SINH, SKEW, SLN, SLOPE, SMALL, SPELLING.CHECK, SQRT, STANDARD-IZE, STDEV, STDEVA, STDEVP, STDEVPA, STEP, STEYX, SUBSTITUTE, SUBTOTAL, SUM, SUMIF, SUMPRODUCT, SUMSQ, SUMX2MY2, SUMX2PY2, SUMXMY2, SYD, T, TAN, TANH, TDIST, TER-MINATE, TEXT, TEXT.BOX, TEXTREF, THAIDAYOFWEEK, THAIDIGIT, THAIMONTHOFYEAR, THAINUMSOUND, THAINUMSTRING, THAISTRINGLENGTH, THAIYEAR, TIME, TIMEVALUE, TINV, TODAY, TRANSPOSE, TREND, TRIM, TRIMMEAN, TRUE, TRUNC, TTEST, TYPE, UNREG-ISTER, UPPER, USDOLLAR, USERDEFINED, VALUE, VAR, VARA, VARP, VARPA, VDB, VIEW.GET, VLOOKUP, VOLATILE, WEEKDAY, WEIBULL, WHILE, WINDOW.TITLE, WINDOWS, YEAR and ZTEST.

17.0.239   What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

Answer: Use the SoftDeclareMBS class to load libraries dynamically.

17.0.240   What to do on Xojo reporting a conflict?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

Xojo just wants to tell you that you dropped something in the plugins folder what is not a plugin.
Notes:

Some users dropped the examples, the documentation or other files into the plugins folder. Don't do it.

17.0.241 What to do with a NSImageCacheException?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You need to add exception handlers for NSExceptionMBS in order to catch this exception.
Notes: You may also add code to write the stack of the exception into a log file for later locating the error source.

A NSImage has several image representations in memory. So basicly you pass in the base image and for whatever size an image is needed, the NSImage class will create a cache image representation of the requested size so on the next query it can use that cache for the same requested size.

17.0.242 What to do with MySQL Error 2014?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can get this error on MySQL if you have a recordset open while you create another one.

17.0.243 What to do with SQL Plugin reporting Malformed string as error?

Plugin Version: all, Platform: macOS.

Answer: Please make sure the table and/or database fields have a text encoding set.
Notes: For Firebird our plugin tries to use UTF-8 encoding if possible and to correctly convert between various tables, the tables and their fields need to have a text encoding defined.
e.g. if the text field in the table is windows-1252 and the other ISO 8859-5, then the Firebird database can convert them to UTF-8 and deliver texts to the plugin.
If encoding is set to none, it may get confused for non-ascii text.

17.0.244 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetActiveDisplayList.

17.0.245   Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithPoint.

17.0.246   Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithRect.

17.0.247   Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetOnlineDisplayList.

17.0.248   Where is GetObjectClassNameMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use this replacement method:
Example:

```
Function GetObjectClassNameMBS(o as Object) As string
dim t as Introspection.TypeInfo = Introspection.GetType(o)
Return t.FullName
End Function
```

Notes: GetObjectClassNameMBS was removed from the plugins.

17.0.249   Where is NetworkAvailableMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We removed NetworkAvailableMBS some versions ago. It was not working right and basicly it's not useful. If you want to check whether you have a network, than do a DNS resolve:
Example:

```
// two independend domain names
const domain1 = "www.google.com"
const domain2 = "www.macsw.de"

// resolve IPs
dim ip1 as string = DNSNameToAddressMBS(Domain1)
dim ip2 as string = DNSNameToAddressMBS(Domain2)

// if we got IPs and not the same IPs (error/login pages)
if len(ip1)=0 or len(ip2)=0 or ip1=ip2 then
MsgBox "no connection"
else
MsgBox "have connection"
end if
```

Notes: This way you can detect whether you got something from DNS. And you can make sure that a DNS redirection to a login page won't catch you.

17.0.250   Where is StringHeight function in DynaPDF?

Plugin Version: all, Platform: Windows.

Answer: Use the function GetFTextHeight or GetFTextHeightEx.
Notes: Be aware that GetFTextHeight works with format commands and you may want to escape your text if you don't use them.

17.0.251   Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

Answer: This class has been removed in favor of XLBookMBS class.
Notes: This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMerged-CellsMBS, XLSRowMBS and XLSSheetMBS.

17.0.252   Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Please visit this web page:
http://www.wotsit.org

17.0.253   Where to register creator code for my application?

Plugin Version: all, Platform: macOS.

Answer:

Register at Apple:
http://developer.apple.com/dev/cftype/information.html

17.0.254   Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some frameworks from Mac OS X do not support 32 bit applications, so we can't provide plugins for Xojo until 64bit target is available.
Notes: For Mac OS X 10.8:

- Accounts
- EventKit
- GLKit
- Social

and in 10.9:

- Accounts
- AVKit
- EventKit
- GameController
- GLKit
- MapKit
- MediaLibrary
- Social
- SpriteKit

In general Apple makes all new frameworks being 64 bit only.

17.0.255   Which plugins are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some of our plugins work only in 64 bit modes as operation systems do not provide 32 bit code.
Notes: This effects currently: EventKit, Accounts, Social frameworks from Apple and our matching plugins.

17.0.256   Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install DirectX from Microsoft on your Windows.

17.0.257   Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install the Internet Explorer from Microsoft on your Windows.
Notes: This bug is for several older Windows 95 editions.

17.0.258   Why do I hear a beep on keydown?

Plugin Version: all, Platform: Windows.

Answer: When the user presses a key, RB goes through all keydown event handlers till on returns true.
Notes: If no keydown event handler returns true for the key, a beep is performed.

17.0.259   Why does folderitem.item return nil?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Because Xojo fails to make a folderitem for you. Reason may be an alias file which can't be resolved or simply that you don't have enough access rights to read the folder content.
Notes: A more rarely reason is that the directory changed and the file with the given index or name does no longer exist.

17.0.260   Why doesn't showurl work?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

There are three main reasons:

1. showurl is not supported by Xojo in 68k applications.
2. there is now application defined for the protocol (e.g. http) in the Internet Control panel.
3. You don't have Internet Config installed.

You can use the InternetConfigMBS class to check for this stuff.

17.0.261   Why don't the picture functions not work on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please make sure libcairo is installed.
Notes: For accessing pictures on Linux, the MBS Plugin relays on the cairo library.
Please install the package if you don't have it already.
Our plugin looks for library called libcairo.so or libcairo.so.2.

17.0.262   Why have I no values in my chart?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You have no data points visible, there may be several reasons:
Notes: For example one of the data values may be infinite or invalid.
Or the scaling may be out of range, so you simply see nothing.

17.0.263   Will application size increase with using plugins?

Plugin Version: all, Platform: Windows.

Answer: All plugins used by your application will be included in the application.
Notes: If you use no plugins, your application will not change size.
And if you use one class from the plugins, your application size will increase by a few kilobytes.
The documentation of the plugins include a list of all plugin parts and their sizes for the different platforms.

17.0.264   XLS: Custom format string guidelines

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. Four sections example:

#,###.00_); [Red] (#,###.00);0.00;"sales "@

The following table describes the different symbols that are available for use in custom number formats.

Specify colors

To set the text color for a section of the format, type the name of one of the following eight colors in square brackets in the section. The color code must be the first item in the section.

Instead of using the name of the color, the color index can be used, like this [Color3] for Red. Valid numeric indexes for color range from 1 to 56, which reference by index to the legacy color palette.

Specify conditions

To set number formats that will be applied only if a number meets a specified condition, enclose the condition in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; >Greater than; <Less than; >= Greater than or equal to, <= Less than or equal to, and <>Not equal to. For example, the following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.

[Red] [<=100] ; [Blue] [>100]

If the cell value does not meet any of the criteria, then pound signs ("#") are displayed across the width of the cell.

Dates and times

Examples

17.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

Answer: Please upgrade your Windows version.

17.0.266   Xojo or my RB application itself crashes on launch on Mac OS Classic. Why?

Plugin Version: all.

Answer:

You may check if the application has enough memory to be loaded.
RB should have on Mac OS Classic more than 20 MB of RAM.
I prefered to use 50 MB and for an application a 10 MB partition is a good way to start.

Parameter	Description
x	The x value of the data point. For an enumerated x-axis (see Axis.setLabels on what is an enumerated axis), the first data point is 0, and the nth data point is (n-1).
xLabel	The bottom x-axis label of the data point.
x2Label	The top x-axis label of the data point.
value	The value of the data point.
accValue	The sum of values of all data points that are in the same x position and same data group as the current data point, and with data set number less than or equal to the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
totalValue	The sum of values of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
percent	The percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
accPercent	The accumulated percentage of the data point based on the total value of all data points that are in the same x position and same data group as the current data point. This is useful for stacked charts, such as stacked bar chart and stacked area chart.
gpercent	The percentage of the data point based on the total value of all data points in a layer.
dataSet	The data set number to which the data point belongs. The first data set is 0. The nth data set is (n-1).
dataSetName	The name of the data set to which the data point belongs.
dataItem	The data point number within the data set. The first data point is 0. The nth data point is (n-1).
dataGroup	The data group number to which the data point belongs. The first data group is 0. The nth data group is (n-1).
dataGroupName	The name of the data group to which the data point belongs.
layerId	The layer number to which the data point belongs. The first layer is 0. The nth layer is (n-1).
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2.

diFieldN	Same as fieldN. See above.
dsFieldN	Similar to fieldN, except that dsFieldN means the extra field is indexed by data set number. The Pth data set corresponds to the Pth element of the extra field.
dsdiFieldN	Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth data set corresponds to the Pth element of the $(N + Q)$th extra field.

Parameter	Description
zx	The symbol scale in the x dimension. Applicable for layers with symbol scales set by LineLayer.setSymbolScale.
zy	The symbol scale in the y dimension. Applicable for layers with symbol scales set by LineLayer.setSymbolScale.
z	The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by LineLayer.setSymbolScale.

Parameter	Description
slope	The slope of the trend line.
intercept	The y-intercept of the trend line.
corr	The correlation coefficient in linear regression analysis.
stderr	The standard error in linear regression analysis.

Parameter	Description
top	The value of the top edge of the box-whisker symbol.
bottom	The value of the bottom edge of the box-whisker symbol.
max	The value of the maximum mark of the box-whisker symbol.
min	The value of the minimum mark of the box-whisker symbol.
med	The value of the median mark of the box-whisker symbol.

Parameter	Description
high	The high value.
low	The low value.
open	The open value.
close	The close value.

Parameter	Description
dir	The direction of the vector.
len	The length of the vector.

Parameter	Description
radius	The radial value of the data point.
value	Same as { radius } . See above.
angle	The angular value of the data point.
x	Same as { angle } . See above.
label	The angular label of the data point.
xLabel	Same as { label } . See above.
name	The name of the layer to which the data point belongs.
dataSetName	Same as { name } . See above.
i	The data point number. The first data point is 0. The nth data point is (n-1).
dataItem	Same as { i } . See above.
z	The symbol scale. Applicable for layers with symbol scales set by Polar-Layer.setSymbolScale.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2.

Parameter	Description
diFieldN	Same as fieldN. See above.
dsFieldN	Similar to fieldN, except that dsFieldN means the extra field is indexed by layer index. The Pth layer corresponds to the Pth element of the extra field.
dsdiFieldN	Similar to fieldN, except that dsdiFieldN means the extra fields are indexed by both the data set number and data point number. The Pth data item of the Qth layer corresponds to the Pth element of the (N + Q)th extra field.

Parameter	Description
dir	The direction of the vector.
len	The length of the vector.

Parameter	Description
value	The axis value at the tick position.
label	The axis label at the tick position.

Parameter	Description
[param]	The name of the parameter
[a]	If this field a number, it specifies the number of decimal places (digits to the right of the decimal point).

[b]

textasciitilde ' for no thousand separator. The default is '
textasciitilde ', which can be modified using BaseChart.setNumberFormat.
[c]

[d]
textasciitilde ' for no negative sign character. The default is '-', which can be modified using BaseChart.setNumberFormat.

The thousand separator. Should be a non-alphanumeric character (not 0-9,
A-Z, a-z). Use '

The decimal point character. The default is '.', which can be modified using
BaseChart.setNumberFormat.
The negative sign character. Use '

Parameter	Description
yyyy	The year in 4 digits (e.g. 2002)
yyy	The year showing only the least significant 3 digits (e.g. 002 for the year 2002)
yy	The year showing only the least significant 2 digits (e.g. 02 for the year 2002)
y	The year showing only the least significant 1 digits (e.g. 2 for the year 2002)
mmm	The month formatted as its name. The default is to use the first 3 characters of the english month name (Jan, Feb, Mar ...). The names can be configured using BaseChart.setMonthNames.
mm	The month formatted as 2 digits from 01 - 12, adding leading zero if necessary.
m	The month formatted using the minimum number of digits from 1 - 12.
MMM	The first 3 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
MM	The first 2 characters of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
M	The first character of the month name converted to upper case. The names can be configured using BaseChart.setMonthNames.
dd	The day of month formatted as 2 digits from 01 - 31, adding leading zero if necessary.
d	The day of month formatted using the minimum number of digits from 1 - 31.
w	The name of the day of week. The default is to use the first 3 characters of the english day of week name (Sun, Mon, Tue ...). The names can be configured using BaseChart.setWeekDayNames.
hh	The hour of day formatted as 2 digits, adding leading zero if necessary. The 2 digits will be 00 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
h	The hour of day formatted using the minimum number of digits. The digits will be 0 - 23 if the 'a' option (see below) is not specified, otherwise it will be 01 - 12.
nn	The minute formatted as 2 digits from 00 - 59, adding leading zero if necessary.
n	The minute formatted using the minimum number of digits from 00 - 59.
ss	The second formatted as 2 digits from 00 - 59, adding leading zero if necessary.
s	The second formatted using the minimum number of digits from 00 - 59.
a	Display either 'am' or 'pm', depending on whether the time is in the morning or afternoon. The text 'am' and 'pm' can be modified using BaseChart.setAMPM.

Shape Id	Value	Description
SquareShape	1	Square shape. See (1, 1) above.
DiamondShape	2	Diamond shape. See (2, 1) above.
TriangleShape	3	Triangle shape pointing upwards. See (3, 1) above.
RightTriangleShape	4	Triangle shape pointing rightwards. See (4, 1) above.
LeftTriangleShape	5	Triangle shape pointing leftwards. See (5, 1) above.
InvertedTriangleShape	6	Triangle shape pointing downwards. See (1, 2) above.
CircleShape	7	Circle shape. See (2, 2) above.
StarShape	[Method]	Star shapes of various points. See (2, 3), (2, 4), (2, 5), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5) above for stars with 3 to 10 points.
PolygonShape	[Method]	Polygon shapes symmetrical about a vertical axis with a vertex at the top center position. See (4, 1), (4, 3), (4, 5), (5, 1) for polygons of 5 to 8 sides.
Polygon2Shape	[Method]	Polygon shapes symmetrical about a vertical axis but without any vertex at the top center position. See (4, 2), (4, 4) for polygons of 5 and 6 sides.
CrossShape	[Method]	'+' shapes. See (5, 2), (5, 3), (5, 4), (5, 5), (6, 1), (6, 2), (6. 3) for '+' shape with arm width of 0.1 - 0.7.
Cross2Shape	[Method]	'X' shapes. See (6, 4), (6, 5), (7, 1), (7, 2), (7, 3), (7, 4), (7, 5) for 'X' shapes with arm width of 0.1 - 0.7.

langEnglish	0	Roman script
langFrench	1	Roman script
langGerman	2	Roman script
langItalian	3	Roman script
langDutch	4	Roman script
langSwedish	5	Roman script
langSpanish	6	Roman script
langDanish	7	Roman script
langPortuguese	8	Roman script
langNorwegian	9	Roman script
langHebrew	10	Hebrew script
langJapanese	11	Japanese script
langArabic	12	Arabic script
langFinnish	13	Roman script
langGreek	14	Greek script using smRoman script code
langIcelandic	15	modified smRoman/Icelandic script
langMaltese	16	Roman script
langTurkish	17	modified smRoman/Turkish script
langCroatian	18	modified smRoman/Croatian script
langTradChinese	19	Chinese (Mandarin) in traditional characters
langUrdu	20	Arabic script
langHindi	21	Devanagari script
langThai	22	Thai script
langKorean	23	Korean script

Nan	Meaning
1	Invalid square root (negative number, usually)
2	Invalid addition (indeterminate such as infinity + (-infinity))
4	Invalid division (indeterminate such as 0/0)
8	Invalid multiplication (indeterminate such as 0*infinity)
9	Invalid modulo such as (a mod 0)
17	Try to convert invalid string to a number like val("x7")
33	Invalid argument in a trig function
34	Invalid argument in an inverse trig function
36	Invalid argument in a log function
37	Invalid argument in Pow function
38	Invalid argument in toolbox financial function
40	Invalid argument in hyperbolic function
42	Invalid argument in a gamma function

Symbol	Description and result
0	Digit placeholder. For example, if the value 8.9 is to be displayed as 8.90, use the format #.00
#	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall not display extra zeros when the number typed has fewer digits on either side of the decimal than there are # symbols in the format. For example, if the custom format is #.##, and 8.9 is in the cell, the number 8.9 is displayed.
?	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall put a space for insignificant zeros on either side of the decimal point so that decimal points are aligned in the column. For example, the custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in a column.
. (period)	Decimal point.
%	Percentage. If the cell contains a number between 0 and 1, and the custom format 0% is used, the application shall multiply the number by 100 and adds the percentage symbol in the cell.
, (comma)	Thousands separator. The application shall separate thousands by commas if the format contains a comma that is enclosed by number signs (#) or by zeros. A comma that follows a placeholder scales the number by one thousand. For example, if the format is #.0,, and the cell value is 12,200,000 then the number 12.2 is displayed.
E- E+ e- e+	Scientific format. The application shall display a number to the right of the "E" symbol that corresponds to the number of places that the decimal point was moved. For example, if the format is 0.00E+00, and the value 12,200,000 is in the cell, the number 1.22E+07 is displayed. If the number format is #0.0E+0, then the number 12.2E+6 is displayed.
$ -+/():space	Displays the symbol. If it is desired to display a character that differs from one of these symbols, precede the character with a backslash (\). Alternatively, enclose the character in quotation marks. For example, if the number format is (000), and the value 12 is in the cell, the number (012) is displayed.
\	Display the next character in the format. The application shall not display the backslash. For example, if the number format is 0\!, and the value 3 is in the cell, the value 3! is displayed.
*	Repeat the next character in the format enough times to fill the column to its current width. There shall not be more than one asterisk in one section of the format. If more than one asterisk appears in one section of the format, all but the last asterisk shall be ignored. For example, if the number format is 0*x, and the value 3 is in the cell, the value 3xxxxxx is displayed. The number of x characters that are displayed in the cell varies based on the width of the column.
_ (underline)	Skip the width of the next character. This is useful for lining up negative and positive values in different cells of the same column. For example, the number format _(0.0_);(0.0) aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses.
"text"	Display whatever text is inside the quotation marks. For example, the format 0.00 "dollars" displays 1.23 dollars when the value 1.23 is in the cell.
@	Text placeholder. If text is typed in the cell, the text from the cell is placed in the format where the at symbol (@) appears. For example, if the number format is "Bob "@" Smith" (including quotation marks), and the value "John" is in the cell, the value Bob John Smith is displayed.

[Black]   [Green]   [White]   [Blue]   [Magenta]   [Yellow]   [Cyan]   [Red]

To display	As	Use this code
Months	1-12	m
Months	01-12	mm
Months	Jan-Dec	mmm
Months	January-December	mmmm
Months	J-D	mmmmm
Days	1-31	d
Days	01-31	dd
Days	Sun-Sat	ddd
Days	Sunday-Saturday	dddd
Years	00-99	yy
Years	1900-9999	yyyy
Hours	0-23	h
Hours	00-23	hh
Minutes	0-59	m
Minutes	00-59	mm
Seconds	0-59	s
Seconds	00-59	ss
Time	4 AM	h AM/PM
Time	4:36 PM	h:mm AM/PM
Time	4:36:03 P	h:mm:ss A/P
Time	4:36:03.75	h:mm:ss.00
Elapsed time	1:02	[h] :mm
Elapsed time	62:16	[mm] :ss
Elapsed time	3735.80	[ss] .00

To display	As	Use this code
1234.59	1234.6	####.#
8.9	8.900	#.000
.631	0.6	0.#
12	12.0	#.0#
1234.568	1234.57	#.0#
44.398	44.398	???.???
102.65	102.65	???.???
2.8	2.8	???.???
5.25	5 1/4	# ??/??
5.3	5 3/10	# ??/??
12000	12,000	#,###
12000	12	#,
12400000	12.4	0.0,,