MBS LCMS2 Plugin Documentation

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0.1 Introduction

This is the PDF version of the documentation for the Xojo (Real Studio) Plug-in from Monkeybread Software Germany. Plugin part: MBS LCMS2 Plugin

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LCMS2

5.1 class LCMS2BitmapMBS

5.1.1 class LCMS2BitmapMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a bitmap.
Notes:

You can pass bitmap data as raw memoryblock or fill it using a Real Studio picture.
In our LCMS 1.x plugin, the bitmap was always 16 bit. This plugin also can also use 8 bit or 32 bit.

5.1.2 Methods

5.1.3 Constructor

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates an empty bitmap object.
See also:

5.1.4 Constructor(p as picture, bits as Integer = 8)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.1.3 Constructor 39
- 5.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8) 40
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5.1.5 Constructor(p as picture, left as Integer, top as Integer, width as Integer, height as Integer, bits as Integer = 8)

Plugin Version: 13.2, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.1.3 Constructor 39

5.1.6 Constructor(width as Integer, height as Integer, colorspace as Integer)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.1.7 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.1.8 Constructor(width as Integer, height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.1.9 CopyToPicture(pic as picture, x as Integer = 0, y as Integer = 0) as boolean

Plugin Version: 13.2, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.1.10 Invert

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Inverts the bitmap data.
Notes: Requires correct settings for rowbytes, height and data properties.

5.1.11 Picture(HasAlpha as Boolean = false) as picture

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.1.12 Properties

5.1.13 Bits as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Number of bits.
Notes:

Can be 8, 16 or 32 and is used for conversion to and from Real Studio picture objects.
(Read and Write property)

5.1.14 ColorSpaceType as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The color space type.
Notes:

Only used to let Picture function know what format the data is.
Typically kcmsSigRgbData.
(Read and Write property)

5.1.15 Data as MemoryBlock

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.1.16 Height as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The height of the Bitmap in Pixels.
Notes: (Read and Write property)

5.1.17 RowBytes as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The number of bytes per row.
Notes:

Normally: rowbytes=pixelsize*width+padding
Where padding is some extra bytes.
(Read and Write property)

5.1.18 Width as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The width of the Bitmap in Pixels.
Notes: (Read and Write property)

5.2 class LCMS2CIECAM02MBS

5.2.1 class LCMS2CIECAM02MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.2.2 Methods

5.2.3 Constructor(context as LCMS2ContextMBS, VC as LCMS2ViewingConditionsMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 kCUTSHEET_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.

5.2.4 Forward(value as LCMS2CIEXYZMBS) as LCMS2JChMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Evaluates the CAM02 model in the forward direction: XYZ to JCh
Notes:

value: the input XYZ value.
Returns the output JCh value.

5.2.5 Reverse(value as LCMS2JChMBS) as LCMS2CIEXYZMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Evaluates the CAM02 model in the reverse direction: JCh to XYZ
Notes:

Values: The input JCh value.
Returns the output XYZ value

5.2.6 Properties

5.2.7 Handle as Integer

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal handle to the conversion engine.
Notes: (Read and Write property)

5.3 class LCMS2CIELabMBS

5.3.1 class LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a Lab color.

5.3.2 Methods

5.3.3 BFDdeltaE(Other as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Calculates BFD delta E metric.

5.3.4 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.3.5 CIE94DeltaE(Other as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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).

5.3.6 Clone as LCMS2CIELabMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)
```

5.3.7 CMCdeltaE(Other as LCMS2CIELabMBS, l as Double, c as Double) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.3.8 Constructor(L as Double=0.0, a as Double=0.0, b as Double=0.0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new Lab color with the given values.
See also:

- 5.3.9 Constructor(other as LCMS2CIELabMBS) 49

5.3.9 Constructor(other as LCMS2CIELabMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a copy of the color value.
See also:

- 5.3.8 Constructor(L as Double=0.0, a as Double=0.0, b as Double=0.0) 49

5.3.10 DeltaE(Other as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.3.11 DesaturateLab(amax as Double, amin as Double, bmax as Double, bmin as Double) as Boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Does poor man's gamut mapping.
Notes: See also cmsDesaturateLab in LCMS manual.

5.3.12 XYZ(whitePoint as LCMS2CIEXYZMBS=nil) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts color to XYZ value.
Notes: Setting WhitePoint to NULL forces D50 as white point.

5.3.13 Properties

5.3.14 A as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The a value.
Notes: (Read and Write property)

5.3.15 B as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The b value.
Notes: (Read and Write property)

5.3.16 L as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The L value.
Notes: (Read and Write property)

5.3.17 LCh as LCMS2CIELChMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts color to LCh value.
Notes: (Read only property)

5.4 class LCMS2CIELChMBS

5.4.1 class LCMS2CIELChMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)
```

5.4.2 Methods

5.4.3 Clone as LCMS2CIELChMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the color object.

5.4.4 Constructor(L as Double=0.0, C as Double=0.0, h as Double=0.0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new object with the given values.
See also:

- 5.4.5 Constructor(other as LCMS2CIELChMBS) 52

5.4.5 Constructor(other as LCMS2CIELChMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes object with values from other object.
See also:

- 5.4.4 Constructor(L as Double=0.0, C as Double=0.0, h as Double=0.0) 52

5.4.6 Properties

5.4.7 C as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The C value.
Notes: (Read and Write property)

5.4.8 h as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The h value.
Notes: (Read and Write property)

5.4.9 L as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The L value.
Notes: (Read and Write property)

5.4.10 Lab as LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.5 class LCMS2CIExyYMBS

5.5.1 class LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 Real Studio is case insensitive, we have to name the big Y as YY.

5.5.2 Methods

5.5.3 Clone as LCMS2CIExyYMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the color.

5.5.4 Constructor(other as LCMS2CIExyYMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes the object with values from other object.
See also:

- 5.5.5 Constructor(X as Double=0.0, Y as Double=0.0, YY as Double=0.0) 54

5.5.5 Constructor(X as Double=0.0, Y as Double=0.0, YY as Double=0.0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new xyY object with the given values.
See also:

- 5.5.4 Constructor(other as LCMS2CIExyYMBS) 54

5.5.6 TempFromWhitePoint as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)
```

5.5.7 Properties

5.5.8 x as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The x value.
Notes: (Read and Write property)

5.5.9 XYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.5.10 y as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The y value.
Notes: (Read and Write property)

5.5.11 YY as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The Y value.
Notes:

As Real Studio is case insensitive, we have to name the big Y as YY.
(Read and Write property)

5.6 class LCMS2CIExyYTripleMBS

5.6.1 class LCMS2CIExyYTripleMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a xyY color triple.

5.6.2 Methods

5.6.3 Clone as LCMS2CIExyYTripleMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the xyY triple.

5.6.4 Constructor

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes a xyY triple with zero values.
See also:

- 5.6.5 Constructor(other as LCMS2CIExyYTripleMBS) 57
- 5.6.6 Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS) 57

5.6.5 Constructor(other as LCMS2CIExyYTripleMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes a xyY triple with values from other object.
See also:

- 5.6.4 Constructor 57
- 5.6.6 Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS) 57

5.6.6 Constructor(Red as LCMS2CIExyYMBS, Green as LCMS2CIExyYMBS, Blue as LCMS2CIExyYMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes a xyY triple with given values.
See also:

5.6.7 Properties

5.6.8 Blue as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The blue color. **Notes:** (Read and Write property)

5.6.9 Green as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The green color. **Notes:** (Read and Write property)

5.6.10 Red as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The red color. **Notes:** (Read and Write property)

5.7 class LCMS2CIEXYZMBS

5.7.1 class LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)
```

5.7.2 Methods

5.7.3 Constructor(x as Double=0.0, y as Double=0.0, z as Double=0.0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new object with the given values.

5.7.4 Lab(whitePoint as LCMS2CIEXYZMBS=nil) as LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts the XYZ value to a lab value using the given whitepoint.
Notes: Setting WhitePoint to nil forces D50 as white point.

5.7.5 Properties

5.7.6 x as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The x value.
Notes: (Read and Write property)

5.7.7 xyY as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.7.8 y as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The y value.
Notes: (Read and Write property)

5.7.9 z as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The z value.
Notes: (Read and Write property)

5.8 class LCMS2CIEXYZTripleMBS

5.8.1 class LCMS2CIEXYZTripleMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a XYZ color triple.

5.8.2 Methods

5.8.3 Clone as LCMS2CIEXYZTripleMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the XYZ triple.

5.8.4 Constructor

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes a XYZ triple with zero values.
See also:

- 5.8.5 Constructor(other as LCMS2CIEXYZTripleMBS) 61
- 5.8.6 Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS) 61

5.8.5 Constructor(other as LCMS2CIEXYZTripleMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes a XYZ triple with values from other object.
See also:

- 5.8.4 Constructor 61
- 5.8.6 Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS) 61

5.8.6 Constructor(Red as LCMS2CIEXYZMBS, Green as LCMS2CIEXYZMBS, Blue as LCMS2CIEXYZMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes a XYZ triple with given values.
See also:

5.8.7 Properties

5.8.8 Blue as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The blue color. **Notes:** (Read and Write property)

5.8.9 Green as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The green color. **Notes:** (Read and Write property)

5.8.10 Red as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The red color. **Notes:** (Read and Write property)

5.9 class LCMS2ContextMBS

5.9.1 class LCMS2ContextMBS

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a LCMS2 context.

5.9.2 Methods

5.9.3 Clone as LCMS2ContextMBS

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a copy of the context object.
Notes: You can assign a new tag to the copy.

5.9.4 Constructor(other as LCMS2ContextMBS)

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new context object with a copy of the existing one.
See also:

- 5.9.5 Constructor(tag as Variant = nil) 63

5.9.5 Constructor(tag as Variant = nil)

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new context object with given tag.
See also:

- 5.9.4 Constructor(other as LCMS2ContextMBS) 63

5.9.6 Properties

5.9.7 Handle as Integer

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal handle value.
Notes: (Read and Write property)

5.9.8 Tag as Variant

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The tag value. **Notes:** (Read and Write property)

5.10 class LCMS2CurveSegmentMBS

5.10.1 class LCMS2CurveSegmentMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** A class for a curve segment.
Notes: Segmented curves are formed by several segments.

5.10.2 Methods

5.10.3 Constructor(nGridPoints as Integer = 0)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new object and allocates sample points.
Notes: Pass number of sample points you want to fill.

5.10.4 Properties

5.10.5 nGridPoints as UInt32

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Number of grid points if Type = 0.
Notes: (Read only property)

5.10.6 Type as Integer

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The type of curve segment.
Notes:

Parametric type, Type = 0 means sampled segment.
Negative values are reserved.
(Read and Write property)

5.10.7 x0 as Single

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The x0 value of the domain.
Notes:

Domain; for x0 <x <= x1
(Read and Write property)

5.10.8 x1 as Single

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The x1 value of the domain.
Notes:

Domain; for x0 <x <= x1
(Read and Write property)

5.10.9 Params(index as Integer) as Double

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Parameters if Type != 0.
Notes:

Index from 0 to 9.
(Read and Write computed property)

5.10.10 SampledPoints(index as Integer) as Single

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Array of floats if Type = 0.
Notes:

Index from 0 to nGridPoints-1.
(Read and Write computed property)

5.11 class LCMS2DateMBS

5.11.1 class LCMS2DateMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a date.

5.11.2 Methods

5.11.3 date as date

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The date as a Real Studio date object.

5.11.4 Properties

5.11.5 Day as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The day value.
Notes: (Read only property)

5.11.6 Daylight as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Whether it is daylight saving time.
Notes: (Read only property)

5.11.7 DayOfWeek as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The day of the week.
Notes: (Read only property)

5.11.8 DayOfYear as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The day of the year.

Notes: (Read only property)

5.11.9 Hour as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The hour value.
Notes: (Read only property)

5.11.10 Minute as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The minute value.
Notes: (Read only property)

5.11.11 Month as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The month value.
Notes: (Read only property)

5.11.12 Second as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The second value.
Notes: (Read only property)

5.11.13 Year as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The year value.
Notes: (Read only property)

5.12 class LCMS2DictionaryEntryMBS

5.12.1 class LCMS2DictionaryEntryMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.12.2 Methods

5.12.3 Constructor

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The private constructor.

5.12.4 NextEntry as LCMS2DictionaryEntryMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the next element in linked list.

5.12.5 Properties

5.12.6 DisplayName as LCMS2MLUMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The display name multi language unicode string.

Notes: (Read only property)

5.12.7 DisplayValue as LCMS2MLUMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The display value multi language unicode string.
Notes: (Read only property)

5.12.8 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read only property)

5.12.9 Name as String

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.12.10 Parent as LCMS2DictionaryMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The reference to the parent dictionary.
Notes: (Read only property)

5.12.11 Value as String

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.13 class LCMS2DictionaryMBS

5.13.1 class LCMS2DictionaryMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 NameValue for the dictionary metatag, as described in http://www.color.org/ICCSpecRevision_250210_dictType.pdf

5.13.2 Methods

5.13.3 AddEntry(Name as String, Value as String, DisplayName as LCMS2MLUMBS, DisplayValue as LCMS2MLUMBS) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.13.4 Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Allocates an empty dictionary linked list object.

5.13.5 EntryList as LCMS2DictionaryEntryMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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
```

5.13.6 Properties

5.13.7 context as LCMS2ContextMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.13.8 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.14 class LCMS2GamutBoundaryDescriptionMBS

5.14.1 class LCMS2GamutBoundaryDescriptionMBS

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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
next
```

next

MsgBox str(n1)+" points added and "+str(n2)+" other points found."

Notes: Please check LittleCMS API and tutorial documentation for more details.

5.14.2 Methods

5.14.3 AddPoint(Lab as LCMS2CIELabMBS) as Boolean

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 resurces 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.

5.14.4 CheckPoint(Lab as LCMS2CIELabMBS) as Boolean

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.14.5 Compute(options as UInt32 = 0) as Boolean

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.14.6 Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new object.

5.14.7 Properties

5.14.8 context as LCMS2ContextMBS

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.14.9 Handle as Integer

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read only property)

5.15 class LCMS2ICCDataMBS

5.15.1 class LCMS2ICCDataMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.15.2 Properties

5.15.3 Data as Memoryblock

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The memoryblock with the data.
Notes: (Read only property)

5.15.4 Flags as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The flags.
Notes: (Read and Write property)

5.15.5 Size as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The size of the data.
Notes: (Read and Write property)

5.16 class LCMS2ICCMeasurementConditionsMBS

5.16.1 class LCMS2ICCMeasurementConditionsMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for ICC measurement conditions.

5.16.2 Methods

5.16.3 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new object with given values.

5.16.4 Properties

5.16.5 Backing as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Backing value.
Notes: (Read and Write property)

5.16.6 Flare as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The flare value.
Notes:

Range 0..1.0.
(Read and Write property)

5.16.7 Geometry as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The geometry value.
Notes:

0=unknown, 1=45/0, 0/45 2=0d, d/0.
(Read and Write property)

5.16.8 IlluminantType as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The illuminant type.
Notes: (Read and Write property)

5.16.9 Observer as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The observer value.
Notes:

0 = unknown, 1=CIE 1931, 2=CIE 1964
(Read and Write property)

5.17 class LCMS2ICCViewingConditionsMBS

5.17.1 class LCMS2ICCViewingConditionsMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a ICC viewing conditions tag stored in the profile.

5.17.2 Methods

5.17.3 Constructor(IlluminantXYZ as LCMS2CIEXYZMBS = nil, Backing as LCMS2CIEXYZMBS = nil, IlluminantType as UInt32 = 0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new ICC viewing conditions object.

5.17.4 Properties

5.17.5 IlluminantType as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The illuminant. **Notes:** (Read and Write property)

5.17.6 IlluminantXYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The illuminant. **Notes:** (Read and Write property)

5.17.7 SurroundXYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The surround. **Notes:** (Read and Write property)

5.18 class LCMS2IT8MBS

5.18.1 class LCMS2IT8MBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.2 Methods

5.18.3 Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Allocates an empty CGATS.17 object.

5.18.4 DefineDblFormat(Formatter as string)

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Sets the format string for float numbers.
Notes: It uses the "C" sprintf convention. The default format string is "% .10g".

5.18.5 EnumDataFormat as string()

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns an array with pointers to the column names in current table.
Notes: Return the column names in table.

5.18.6 EnumProperties as string()

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Enumerates all properties in current table.
Notes: Returns array of property name string.

5.18.7 EnumPropertyMulti(Prop as string) as string()

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Enumerates all the identifiers found in a multivalue property in current table.
Notes:

Prop: A string holding property name
Returns an array with property names.

5.18.8 FindDataFormat(Sample as string) as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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, 1 if not found

5.18.9 GetData(Patch as string, Sample as string) as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.10 GetDataAsDouble(Patch as string, Sample as string) as Double

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.11 GetDataRowCol(Row as Integer, Col as Integer) as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.12 GetDataRowColAsDouble(Row as Integer, Col as Integer) as Double

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.13 GetPatchByName(Patch as string) as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Lookups patch index by name.

5.18.14 GetPatchName(nPatch as Integer) as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.15 GetProperty(Prop as string) as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.16 GetPropertyAsDouble(Prop as string) as Double

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.17 GetPropertyMulti(Key as string, SubKey as string) as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Queries property.

5.18.18 GetSheetType as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This function returns the type of the IT8 object.

5.18.19 HeaderIsDictionary(HeaderName as string) as boolean

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.20 HeaderList as string()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.21 HeadersAsDictionary as dictionary

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.22 HeaderSubDictionary(HeaderName as string) as dictionary

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.23 HeaderValue(HeaderName as string) as string

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.24 LoadFromFile(context as LCMS2ContextMBS, file as folderitem) as LCMS2IT8MBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.25 LoadFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2IT8MBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Same as LoadFromFile, but the IT8/CGATS.13 stream is read from a memory block.
Notes: Returns nil on failure.

5.18.26 LoadFromString(context as LCMS2ContextMBS, data as string) as LCMS2IT8MBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Same as LoadFromFile, but the IT8/CGATS.13 stream is read from a string.
Notes: Returns nil on failure.

5.18.27 SaveToFile(file as folderitem) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.18.28 SaveToMemory as Memoryblock

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This function saves a CGATS.17 object to a contiguous memory block.

5.18.29 SaveToString as string

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This function saves a CGATS.17 object to a contiguous memory block.

5.18.30 SetComment(comment as string) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.31 SetData(Patch as string, Sample as string, Val as string) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.32 SetDataAsDouble(Patch as string, Sample as string, Val as Double) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.18.33 SetDataFormat(n as Integer, Sample as String) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.34 SetDataRowCol(Row as Integer, Col as Integer, Val as string) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.35 SetDataRowColAsDouble(Row as Integer, Col as Integer, Val as Double) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.18.36 SetIndexColumn(Sample as string) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Sets the index column.

5.18.37 SetPropertyDouble(Prop as string, Value as Double) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.38 SetPropertyHex(Prop as string, Value as UInt32) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.39 SetPropertyMulti(Key as string, SubKey as string, Value as string) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Adds a new subproperty to the property Key.
Notes:

Value of buffer is interpreted literally.

Key: A string holding property name.
SubKey: A string holding the subproperty name.
Buffer: A string holding the uncooked value of subproperty.

Returns true on success, false on error.

5.18.40 SetPropertyString(Prop as string, Value as String) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.41 SetPropertyUncooked(Prop as string, Value as Memoryblock) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.42 SetSheetType(type as string) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This function sets the type of a CGATS.17 object to the new type.
Notes: Returns true on success, false on error.

5.18.43 SetTable(nTable as UInt32) as UInt32

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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, 1 on error.

5.18.44 SetTableByLabel(Set as string, Field as string, ExpectedType as string) as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Sets table by label.

5.18.45 TableCount as UInt32

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.46 ValidKeywords as string()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.47 ValidSampleIDs as string()

Plugin Version: 13.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.18.48 Properties

5.18.49 context as LCMS2ContextMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.18.50 Handle as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.19 class LCMS2JChMBS

5.19.1 class LCMS2JChMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a JCh value.

5.19.2 Methods

5.19.3 Clone as LCMS2JChMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of this object.

5.19.4 Constructor(J as Double=0.0, C as Double=0.0, h as Double=0.0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new JCh value.
See also:

- 5.19.5 Constructor(other as LCMS2JChMBS) 93

5.19.5 Constructor(other as LCMS2JChMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes new JCh color object with values from existing object.
See also:

- 5.19.4 Constructor(J as Double=0.0, C as Double=0.0, h as Double=0.0) 93

5.19.6 Properties

5.19.7 C as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The C value.
Notes: (Read and Write property)

5.19.8 h as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The h value. **Notes:** (Read and Write property)

5.19.9 J as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The J value. **Notes:** (Read and Write property)

5.20 class LCMS2Mat3MBS

5.20.1 class LCMS2Mat3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** A class for a 3 by 3 matrix.

5.20.2 Methods

5.20.3 Clone as LCMS2Mat3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the matrix.

5.20.4 Constructor

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new matrix.
See also:

- 5.20.5 Constructor(other as LCMS2Mat3MBS) 95
- 5.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS) 95

5.20.5 Constructor(other as LCMS2Mat3MBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a copy of the given matrix.
See also:

- 5.20.4 Constructor 95
- 5.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS) 95

5.20.6 Constructor(v0 as LCMS2Vec3MBS, v1 as LCMS2Vec3MBS, v2 as LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new matrix with the given three vectors.
See also:

- 5.20.4 Constructor 95

5.20.7 Properties

5.20.8 V0 as LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Property for first vector.
Notes: (Read and Write property)

5.20.9 V1 as LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Property for second vector.
Notes: (Read and Write property)

5.20.10 V2 as LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Property for third vector.
Notes: (Read and Write property)

5.20.11 value(index as UInt32) as LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the vector by index.
Notes:

Index from 0 to 2.
(Read and Write computed property)

5.21 module LCMS2MBS

5.21.1 module LCMS2MBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The central LCMS module with all the global methods and constants.

5.21.2 Methods

5.21.3 AdaptationMatrix(ConeMatrix as LCMS2Mat3MBS, FromIll as LCMS2CIEXYZMB ToIll as LCMS2CIEXYZMBS) as LCMS2Mat3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.4 AdaptToIlluminant(SourceWhitePt as LCMS2CIEXYZMBS, Illuminant as LCMS2CIEXYZMBS, Value as LCMS2CIEXYZMBS) as LCMS2CIEXYZMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Chromatic adaptation.
Notes: Adapts a color to a given illuminant. Original color is expected to have a SourceWhitePt white point.

5.21.5 BFDdeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Computes the dE between two Lab values.

5.21.6 BuildRGB2XYZtransferMatrix(WhitePoint as LCMS2CIExyYMBS, Primaries as LCMS2CIExyYTripleMBS) as LCMS2Mat3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 assumming 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.

5.21.7 BYTES_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: bytes per sample

5.21.8 ChannelsOf(ColorSpaceSignature as Integer) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the number of channels in a color space signature.
Example:

```
MsgBox "RGB has "+str(LCMS2MBS.ChannelsOf(LCMS2MBS.kcmsSigRgbData))+" channels"
```

5.21.9 CHANNELS_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.

Notes: Channels (Samples per pixel)

5.21.10 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.21.11 CIE94DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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).

5.21.12 CMCdeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS, l as Double, c as Double) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.13 ColorSpaceICCtoLCMS(ICCColorSpace as Integer) as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts from ICC color space notation to Little CMS color space notation.

5.21.14 ColorSpaceLCMStoICC(LCMSColorSpace as Integer) as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts from Little CMS color space notation to ICC color space notation.

5.21.15 COLORSPACE_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Pixeltype.

5.21.16 CreateBitmapFromPicture(p as picture, bits as Integer = 8) as LCMS2BitmapMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new bitmap based on the pictures.
Notes: Bits can be 8, 16 or 32 bit integers.

5.21.17 D50_xyY as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns D50 white point as xyY color.

5.21.18 D50_XYZ as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns D50 white point as XYZ color.

5.21.19 DeltaE(Lab1 as LCMS2CIELabMBS, Lab2 as LCMS2CIELabMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.20 DOSWAP_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Do swap? ie, BGR, KYMC

5.21.21 EncodedCMMversion as Integer

Plugin Version: 15.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.22 ENDIAN16_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: swap 16 bps endianess?

5.21.23 EXTRA_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Extra samples

5.21.24 FLAVOR_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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).

5.21.25 Float2LabEncoded(c as LCMS2CIELabMBS) as Integer()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Encodes a Lab value.
Notes: Returns array of 3 encoded UInt16 values.

5.21.26 Float2LabEncodedV2(c as LCMS2CIELabMBS) as Integer()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Encodes a Lab value to ICC v2 convention.
Notes: Returns array of 3 encoded UInt16 values.

5.21.27 Float2XYZEncoded(c as LCMS2CIEXYZMBS) as Integer()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Encodes a XYZ value to ICC convention.
Notes: Returns three UInt16 values as Integer array.

5.21.28 FLOAT_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.29 GetAlarmCodes as Integer()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.21.30 GetAlarmCodes(context as LCMS2ContextMBS) as Integer() 103

5.21.30 GetAlarmCodes(context as LCMS2ContextMBS) as Integer()

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.21.29 GetAlarmCodes as Integer() 103

5.21.31 GetSupportedIntentCodes as UInt32()

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Fills an array with idnumbers 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 plugin architecture allows to implement userdefined intents; use this function to get info about such extended functionality.
See also:

- 5.21.32 GetSupportedIntentCodes(context as LCMS2ContextMBS) as UInt32() 104

5.21.32 GetSupportedIntentCodes(context as LCMS2ContextMBS) as UInt32()

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Fills an array with idnumbers 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 plugin architecture allows to implement userdefined intents; use this function to get info about such extended functionality.
See also:

- 5.21.31 GetSupportedIntentCodes as UInt32() 104

5.21.33 GetSupportedIntentDescriptions as string()

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Fills an array with descriptions for all supported intents.
Example:

```
MsgBox Join(LCMS2MBS.GetSupportedIntentDescriptions, EndOfLine)
```

Notes: Little CMS plugin architecture allows to implement userdefined intents; use this function to get info about such extended functionality.

5.21.34 GridPoints(n as Integer) as Integer

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Calculates grid points.
Example:

```
MsgBox str(LCMS2MBS.GridPoints(2))
```

5.21.35 kcmsD50X as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** X value of D50 XYZ normalized to Y=1.0.

5.21.36 kcmsD50Y as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Y value of D50 XYZ normalized to Y=1.0.

5.21.37 kcmsD50Z as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Z value of D50 XYZ normalized to Y=1.0.

5.21.38 kcmsPERCEPTUAL_BLACK_X as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** X of V4 perceptual black.

5.21.39 kcmsPERCEPTUAL_BLACK_Y as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Y of V4 perceptual black.

5.21.40 kcmsPERCEPTUAL_BLACK_Z as Double

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Z of V4 perceptual black.

5.21.41 Lab2LCh(p as LCMS2CIELabMBS) as LCMS2CIELChMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts lab color to LCh value.

5.21.42 Lab2XYZ(p as LCMS2CIELabMBS, whitepoint as LCMS2CIEXYZMBS = nil) as LCMS2CIEXYZMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts color to XYZ value.
Notes: Setting WhitePoint to NULL forces D50 as white point.

5.21.43 LabEncoded2Float(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.44 LabEncoded2FloatV2(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.45 LCh2Lab(p as LCMS2CIELChMBS) as LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Colorimetric space conversion from LCh to Lab.

5.21.46 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a bitmap object with given size and color space.
See also:

- 5.21.47 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS 107
- 5.21.48 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS 108

5.21.47 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a bitmap object with given size and color space.
See also:

- 5.21.46 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS 107
- 5.21.48 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS 108

5.21.48 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer, data as memoryblock) as LCMS2BitmapMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.21.46 NewBitmap(width as Integer,height as Integer, colorspace as Integer) as LCMS2BitmapMBS 107
- 5.21.47 NewBitmap(width as Integer,height as Integer, colorspace as Integer, RowBytes as Integer) as LCMS2BitmapMBS 107

5.21.49 OPTIMIZED_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.50 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.21.51 PLANAR_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Shifts the value so you can bitwise or it with other values to get a pixel format.
Notes: Planar? 0=Chunky, 1=Planar

5.21.52 SetAdaptationState(context as LCMS2ContextMBS, d as Double) as Double

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.21.53 SetAdaptationState(d as Double) as Double 109

5.21.53 SetAdaptationState(d as Double) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.21.54 SetAlarmCodes(context as LCMS2ContextMBS, values() as Integer)

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.21.55 SetAlarmCodes(values() as Integer)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.21.56 SetLogErrorHandler(Context as LCMS2ContextMBS, handler as LCMS2ErrorHandlerMBS)

Plugin Version: 14.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.21.57 SetLogErrorHandler(handler as LCMS2ErrorHandlerMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.21.56 SetLogErrorHandler(Context as LCMS2ContextMBS, handler as LCMS2ErrorHandlerMBS) 110

5.21.58 SWAPFIRST_SH(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.21.59 TagInteger(tag as string) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts tag integer to string.
Example:

```
MsgBox hex(LCMS2MBS.TagInteger("devs"))+" "+LCMS2MBS.TagString(& h64657673)
```

5.21.60 TagString(tag as UInt32) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts tag string to integer.
Example:

```
MsgBox hex(LCMS2MBS.TagInteger("devs"))+" "+LCMS2MBS.TagString(& h64657673)
```

5.21.61 TempFromWhitePoint(TempK as LCMS2CIExyYMBS) as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.62 T_BYTES(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: bytes per sample

5.21.63 T_CHANNELS(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: Channels (Samples per pixel)

5.21.64 T_COLORSPACE(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: Pixeltype

5.21.65 T_DOSWAP(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.

Notes: Do swap? ie, BGR, KYMC

5.21.66 T_ENDIAN16(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: swap 16 bps endianess?

5.21.67 T_EXTRA(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: Extra samples

5.21.68 T_FLAVOR(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: Flavor 0=MinIsBlack(Chocolate) 1=MinIsWhite(Vanilla)

5.21.69 T_FLOAT(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.21.70 T_OPTIMIZED(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: Optimized – previous optimization already returns the final 8-bit value

5.21.71 T_PLANAR(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.

Notes: Planar? 0=Chunky, 1=Planar

5.21.72 T_SWAPFIRST(n as UInt32) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Unpacks a value from a bitwise pixel format.
Notes: Swap first - changes ABGR to BGRA and KCMY to CMYK.

5.21.73 Version as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns version number of LCMS2.
Example:

```
MsgBox LCMS2MBS.Version
```

5.21.74 WhitePointFromTemp(TempK as Double) as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.75 xyY2XYZ(p as LCMS2CIExyYMBS) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Colorimetric space conversion from xyY to XYZ.

5.21.76 XYZ2Lab(p as LCMS2CIEXYZMBS, whitepoint as LCMS2CIEXYZMBS = nil) as LCMS2CIELabMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Converts XYZ color to Lab.
Notes: Setting WhitePoint to nil forces D50 as white point.

5.21.77 XYZ2xyY(p as LCMS2CIEXYZMBS) as LCMS2CIExyYMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Colorimetric space conversion from XYZ to xyY.

5.21.78 XYZEncoded2Float(w0 as UInt16, w1 as UInt16, w2 as UInt16) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.21.79 Constants

5.21.80 kAVG_SURROUND = 1

Plugin Version: 11.3. **Function:** One of the surround constants for viewing conditions.

5.21.81 kcmsEmbeddedProfileFalse = 0

Plugin Version: 11.3. **Function:** One of the header flag constants.

5.21.82 kcmsEmbeddedProfileTrue = 1

Plugin Version: 11.3. **Function:** One of the header flag constants.

5.21.83 kcmsERROR_ALREADY_DEFINED = & h0000000A

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.84 kcmsERROR_BAD_SIGNATURE = & h0000000B

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.85 kcmsERROR_COLORSPACE_CHECK = 9

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.86 kcmsERROR_CORRUPTION_DETECTED = & h0000000C

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.87 kcmsERROR_FILE = 1

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.88 kcmsERROR_INTERNAL = 3

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.89 kcmsERROR_NOT_SUITABLE = & h0000000D

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.90 kcmsERROR_NULL = 4

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.91 kcmsERROR_RANGE = 2

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.92 kcmsERROR_READ = 5

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.93 kcmsERROR_SEEK = 6

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.94 kcmsERROR_UNDEFINED = 0

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.95 kcmsERROR_UNKNOWN_EXTENSION = 8

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.96 kcmsERROR_WRITE = 7

Plugin Version: 11.3. **Function:** One of the error constants.

5.21.97 kcmsFLAGS_8BITS_DEVICELINK = 8

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Create 8 bits devicelinks

5.21.98 kcmsFLAGS_BLACKPOINTCOMPENSATION = & h00002000

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Black point compensation.

5.21.99 kcmsFLAGS_CLUT_POST_LINEARIZATION = 1

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Create postlinearization tables if possible

5.21.100 kcmsFLAGS_CLUT_PRE_LINEARIZATION = & h00000010

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Create prelinearization tables if possible

5.21.101 kcmsFLAGS_COPY_ALPHA = & h04000000

Plugin Version: 16.4. **Function:** One of the flag constants.
Notes: Whether to copy alpha.

5.21.102 kcmsFLAGS_FORCE_CLUT = 2

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Force CLUT optimization

5.21.103 kcmsFLAGS_GAMUTCHECK = & h00001000

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Out of Gamut alarm

5.21.104 kcmsFLAGS_GUESSDEVICECLASS = & h00000020

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Guess device class (for transform2devicelink)

5.21.105 kcmsFLAGS_HIGHRESPRECALC = & h00000400

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Use more memory to give better accurancy

5.21.106 kcmsFLAGS_KEEP_SEQUENCE = & h00000080

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Keep profile sequence for devicelink creation

5.21.107 kcmsFLAGS_LOWRESPRECALC = & h00000800

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Use less memory to minimize resouces

5.21.108 kcmsFLAGS_NOCACHE = & h00000040

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Inhibit 1-pixel cache

5.21.109 kcmsFLAGS_NODEFAULTRESOURCEDEF = & h01000000

Plugin Version: 11.3. **Function:** One of the flag constants.

5.21.110 kcmsFLAGS_NONEGATIVES = & h00008000

Plugin Version: 15.0. **Function:** One of the flag constants.
Notes: Prevent negative numbers in floating point transforms

5.21.111 kcmsFLAGS_NOOPTIMIZE = & h00000100

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Inhibit optimizations

5.21.112 kcmsFLAGS_NOWHITEONWHITEFIXUP = 4

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Don't fix scum dot

5.21.113 kcmsFLAGS_NULLTRANSFORM = & h00000200

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Don't transform anyway

5.21.114 kcmsFLAGS_SOFTPROOFING = & h00004000

Plugin Version: 11.3. **Function:** One of the flag constants.
Notes: Do softproofing

5.21.115 kcmsFREQUENCE_UNITS_LINES_CM = 0

Plugin Version: 11.3. **Function:** One of the screening flag constants.

5.21.116 kcmsFREQUENCE_UNITS_LINES_INCH = 2

Plugin Version: 11.3. **Function:** One of the screening flag constants.

5.21.117 kcmsGlossy = 0

Plugin Version: 11.3. **Function:** One of the device attribute constants.

5.21.118 kcmsILLUMINANT_TYPE_A = 6

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: A

5.21.119 kcmsILLUMINANT_TYPE_D50 = 1

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: D50

5.21.120 kcmsILLUMINANT_TYPE_D55 = 5

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: D55

5.21.121 kcmsILLUMINANT_TYPE_D65 = 2

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: D65

5.21.122 kcmsILLUMINANT_TYPE_D93 = 3

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: D93

5.21.123 kcmsILLUMINANT_TYPE_E = 7

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: E

5.21.124 kcmsILLUMINANT_TYPE_F2 = 4

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: F2

5.21.125 kcmsILLUMINANT_TYPE_F8 = 8

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: F8

5.21.126 kcmsILLUMINANT_TYPE_UNKNOWN = 0

Plugin Version: 11.3. **Function:** One of the illuminant constants.
Notes: Unknown

5.21.127 kcmsMagicNumber = & h61637370

Plugin Version: 11.3. **Function:** Magic number to identify an ICC profile.

5.21.128 kcmsMatte = 2

Plugin Version: 11.3. **Function:** One of the device attribute constants.

5.21.129 kcmsMAXCHANNELS = & h00000010

Plugin Version: 11.3. **Function:** Maximum number of channels in ICC profiles.

5.21.130 kcmsPRINTER_DEFAULT_SCREENS = 1

Plugin Version: 11.3. **Function:** One of the screening flag constants.

5.21.131 kcmsReflective = 0

Plugin Version: 11.3. **Function:** One of the device attribute constants.

5.21.132 kcmsSig10colorData = & h41434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.133 kcmsSig11colorData = & h42434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.134 kcmsSig12colorData = & h43434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.135 kcmsSig13colorData = & h44434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.136 kcmsSig14colorData = & h45434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.137 kcmsSig15colorData = & h46434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.138 kcmsSig1colorData = & h31434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.139 kcmsSig2colorData = & h32434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.140 kcmsSig3colorData = & h33434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.141 kcmsSig4colorData = & h34434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.142 kcmsSig5colorData = & h35434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.143 kcmsSig6colorData = & h36434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.144 kcmsSig7colorData = & h37434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.145 kcmsSig8colorData = & h38434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.146 kcmsSig9colorData = & h39434C52

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.147 kcmsSigAbstractClass = & h61627374

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Abstract

5.21.148 kcmsSigAMDisplay = & h414D4420

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.149 kcmsSigArgyllArtsTag = & h61727473

Plugin Version: 16.4. **Function:** One of the tag signature constants.

5.21.150 kcmsSigAToB0Tag = & h41324230

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.151 kcmsSigAToB1Tag = & h41324231

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.152 kcmsSigAToB2Tag = & h41324232

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.153 kcmsSigBAcsElemType = & h62414353

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.154 kcmsSigBlueColorantTag = & h6258595A

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.155 kcmsSigBlueMatrixColumnTag = & h6258595A

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.156 kcmsSigBlueTRCTag = & h62545243

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.157 kcmsSigBToA0Tag = & h42324130

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.158 kcmsSigBToA1Tag = & h42324131

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.159 kcmsSigBToA2Tag = & h42324132

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.160 kcmsSigBToD0Tag = & h42324430

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.161 kcmsSigBToD1Tag = & h42324431

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.162 kcmsSigBToD2Tag = & h42324432

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.163 kcmsSigBToD3Tag = & h42324433

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.164 kcmsSigCalibrationDateTimeTag = & h63616C74

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.165 kcmsSigCharTargetTag = & h74617267

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.166 kcmsSigChromaticAdaptationTag = & h63686164

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.167 kcmsSigChromaticityTag = & h6368726D

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.168 kcmsSigChromaticityType = & h6368726D

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.169 kcmsSigClipNegativesElemType = & h636C7020

Plugin Version: 15.0. **Function:** One of the data type signature constants.

5.21.170 kcmsSigCLutElemType = & h636C7574

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.171 kcmsSigCmyData = & h434D5920

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.172 kcmsSigCmykData = & h434D594B

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.173 kcmsSigColorantOrderTag = & h636C726F

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.174 kcmsSigColorantOrderType = & h636C726F

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.175 kcmsSigColorantTableOutTag = & h636C6F74

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.176 kcmsSigColorantTableTag = & h636C7274

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.177 kcmsSigColorantTableType = & h636C7274

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.178 kcmsSigColorimetricIntentImageStateTag = & h63696973

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.179 kcmsSigColorSpaceClass = & h73706163

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Colorspace

5.21.180 kcmsSigCopyrightTag = & h63707274

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.181 kcmsSigCrdInfoTag = & h63726469

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.182 kcmsSigCrdInfoType = & h63726469

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.183 kcmsSigCRTDisplay = & h43525420

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.184 kcmsSigCurveSetElemType = & h63767374

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.185 kcmsSigCurveType = & h63757276

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.186 kcmsSigDataTag = & h64617461

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.187 kcmsSigDataType = & h64617461

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.188 kcmsSigDateTimeTag = & h6474696D

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.189 kcmsSigDateTimeType = & h6474696D

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.190 kcmsSigDeviceMfgDescTag = & h646D6E64

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.191 kcmsSigDeviceModelDescTag = & h646D6464

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.192 kcmsSigDeviceSettingsTag = & h64657673

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.193 kcmsSigDeviceSettingsType = & h64657673

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.194 kcmsSigDictType = & h64696374

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.195 kcmsSigDigitalCamera = & h6463616D

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.196 kcmsSigDigitalCinemaProjector = & h64636A70

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.197 kcmsSigDigitalMotionPictureCamera = & h646D7063

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.198 kcmsSigDisplayClass = & h6D6E7472

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Display

5.21.199 kcmsSigDN = & h444E2020

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: DIN E: DIN 16536-2 densitometer response, with no polarising filter.

5.21.200 kcmsSigDNN = & h444E4E20

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: DIN I: DIN 16536-2 narrow band densitometer response, with no polarising filter.

5.21.201 kcmsSigDNNP = & h444E4E50

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: DIN I: DIN 16536-2 narrow band densitometer response, with polarising filter.

5.21.202 kcmsSigDNP = & h444E2050

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: DIN E: DIN 16536-2 densitometer response, with polarising filter.

5.21.203 kcmsSigDToB0Tag = & h44324230

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.204 kcmsSigDToB1Tag = & h44324231

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.205 kcmsSigDToB2Tag = & h44324232

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.206 kcmsSigDToB3Tag = & h44324233

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.207 kcmsSigDyeSublimationPrinter = & h64737562

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.208 kcmsSigEAcsElemType = & h65414353

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.209 kcmsSigElectrophotographicPrinter = & h6570686F

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.210 kcmsSigElectrostaticPrinter = & h65737461

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.211 kcmsSigFilmScanner = & h6673636E

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.212 kcmsSigFilmWriter = & h6670726E

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.213 kcmsSigFlexography = & h666C6578

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.214 kcmsSigFloatPCS2Lab = & h6C326420

Plugin Version: 12.4. **Function:** One of the data type signature constants.

5.21.215 kcmsSigFloatPCS2XYZ = & h78326420

Plugin Version: 12.4. **Function:** One of the data type signature constants.

5.21.216 kcmsSigFocalPlaneColorimetryEstimates = & h66706365

Plugin Version: 11.3. **Function:** One of the Colorimetric Intent Image State Tag signature constants.

5.21.217 kcmsSigFormulaCurveSeg = & h70617266

Plugin Version: 11.3. **Function:** One of the curve element type signature constants.

5.21.218 kcmsSigGamutTag = & h67616D74

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.219 kcmsSigGravure = & h67726176

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.220 kcmsSigGrayData = & h47524159

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.221 kcmsSigGrayTRCTag = & h6B545243

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.222 kcmsSigGreenColorantTag = & h6758595A

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.223 kcmsSigGreenMatrixColumnTag = & h6758595A

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.224 kcmsSigGreenTRCTag = & h67545243

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.225 kcmsSigHlsData = & h484C5320

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.226 kcmsSigHsvData = & h48535620

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.227 kcmsSigIdentityElemType = & h69646E20

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.228 kcmsSigInkJetPrinter = & h696A6574

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.229 kcmsSigInputClass = & h73636E72

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Input

5.21.230 kcmsSigLab2FloatPCS = & h64326C20

Plugin Version: 12.4. **Function:** One of the data type signature constants.

5.21.231 kcmsSigLab2XYZElemType = & h78326C20

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.232 kcmsSigLabData = & h4C616220

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.233 kcmsSigLabV2toV4 = & h32203420

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.234 kcmsSigLabV4toV2 = & h34203220

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.235 kcmsSigLinkClass = & h6C696E6B

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Link

5.21.236 kcmsSigLuminanceTag = & h6C756D69

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.237 kcmsSigLut16Type = & h6D667432

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.238 kcmsSigLut8Type = & h6D667431

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.239 kcmsSigLutAtoBType = & h6D414220

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.240 kcmsSigLutBtoAType = & h6D424120

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.241 kcmsSigLuvData = & h4C757620

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.242 kcmsSigLuvKData = & h4C75764B

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.243 kcmsSigMacintosh = & h4150504C

Plugin Version: 11.3. **Function:** One of the platform signature constants.
Notes: Mac

5.21.244 kcmsSigMatrixElemType = & h6D617466

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.245 kcmsSigMCH1Data = & h4D434831

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.246 kcmsSigMCH2Data = & h4D434832

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.247 kcmsSigMCH3Data = & h4D434833

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.248 kcmsSigMCH4Data = & h4D434834

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.249 kcmsSigMCH5Data = & h4D434835

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.250 kcmsSigMCH6Data = & h4D434836

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.251 kcmsSigMCH7Data = & h4D434837

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.252 kcmsSigMCH8Data = & h4D434838

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.253 kcmsSigMCH9Data = & h4D434839

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.254 kcmsSigMCHAData = & h4D434841

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.255 kcmsSigMCHBData = & h4D434842

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.256 kcmsSigMCHCData = & h4D434843

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.257 kcmsSigMCHDData = & h4D434844

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.258 kcmsSigMCHEData = & h4D434845

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.259 kcmsSigMCHFData = & h4D434846

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.260 kcmsSigMeasurementTag = & h6D656173

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.261 kcmsSigMeasurementType = & h6D656173

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.262 kcmsSigMediaBlackPointTag = & h626B7074

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.263 kcmsSigMediaWhitePointTag = & h77747074

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.264 kcmsSigMetaTag = & h6D657461

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.265 kcmsSigMicrosoft = & h4D534654

Plugin Version: 11.3. **Function:** One of the platform signature constants.
Notes: Windows

5.21.266 kcmsSigMotionPictureFilmRecorder = & h6D706672

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.267 kcmsSigMotionPictureFilmScanner = & h6D706673

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.268 kcmsSigMultiLocalizedUnicodeType = & h6D6C7563

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.269 kcmsSigMultiProcessElementType = & h6D706574

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.270 kcmsSigNamedColor2Tag = & h6E636C32

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.271 kcmsSigNamedColor2Type = & h6E636C32

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.272 kcmsSigNamedColorClass = & h6E6D636C

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Named Colors

5.21.273 kcmsSigNamedColorElemType = & h6E636C20

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.274 kcmsSigNamedColorTag = & h6E636F6C

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.275 kcmsSigNamedColorType = & h6E636F6C

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.276 kcmsSigNamedData = & h6E6D636C

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.277 kcmsSigOffsetLithography = & h6F666673

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.278 kcmsSigOutputClass = & h70727472

Plugin Version: 11.3. **Function:** One of the profile class signature constants.
Notes: Output

5.21.279 kcmsSigOutputResponseTag = & h72657370

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.280 kcmsSigParametricCurveType = & h70617261

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.281 kcmsSigPerceptualReferenceMediumGamut = & h70726D67

Plugin Version: 11.3. **Function:** One of the reference gammut signature constants.

5.21.282 kcmsSigPerceptualRenderingIntentGamutTag = & h72696730

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.283 kcmsSigPhotoCD = & h4B504344

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.284 kcmsSigPhotographicPaperPrinter = & h7270686F

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.285 kcmsSigPhotoImageSetter = & h696D6773

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.286 kcmsSigPMDisplay = & h504D4420

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.287 kcmsSigPreview0Tag = & h70726530

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.288 kcmsSigPreview1Tag = & h70726531

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.289 kcmsSigPreview2Tag = & h70726532

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.290 kcmsSigProfileDescriptionMLTag = & h6473636D

Plugin Version: 13.2. **Function:** One of the tag signature constants.

5.21.291 kcmsSigProfileDescriptionTag = & h64657363

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.292 kcmsSigProfileSequenceDescTag = & h70736571

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.293 kcmsSigProfileSequenceDescType = & h70736571

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.294 kcmsSigProfileSequenceIdTag = & h70736964

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.295 kcmsSigProfileSequenceIdType = & h70736964

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.296 kcmsSigProjectionTelevision = & h706A7476

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.297 kcmsSigPs2CRD0Tag = & h70736430

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.298 kcmsSigPs2CRD1Tag = & h70736431

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.299 kcmsSigPs2CRD2Tag = & h70736432

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.300 kcmsSigPs2CRD3Tag = & h70736433

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.301 kcmsSigPs2CSATag = & h70733273

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.302 kcmsSigPs2RenderingIntentTag = & h70733269

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.303 kcmsSigRedColorantTag = & h7258595A

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.304 kcmsSigRedMatrixColumnTag = & h7258595A

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.305 kcmsSigRedTRCTag = & h72545243

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.306 kcmsSigReflectionHardcopyOriginalColorimetry = & h72686F63

Plugin Version: 11.3. **Function:** One of the Colorimetric Intent Image State Tag signature constants.

5.21.307 kcmsSigReflectionPrintOutputColorimetry = & h72706F63

Plugin Version: 11.3. **Function:** One of the Colorimetric Intent Image State Tag signature constants.

5.21.308 kcmsSigReflectiveScanner = & h7273636E

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.309 kcmsSigResponseCurveSet16Type = & h72637332

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.310 kcmsSigRgbData = & h52474220

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.311 kcmsSigS15Fixed16ArrayType = & h73663332

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.312 kcmsSigSampledCurveSeg = & h73616D66

Plugin Version: 11.3. **Function:** One of the curve element type signature constants.

5.21.313 kcmsSigSaturationRenderingIntentGamutTag = & h72696732

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.314 kcmsSigSceneAppearanceEstimates = & h73617065

Plugin Version: 11.3. **Function:** One of the Colorimetric Intent Image State Tag signature constants.

5.21.315 kcmsSigSceneColorimetryEstimates = & h73636F65

Plugin Version: 11.3. **Function:** One of the Colorimetric Intent Image State Tag signature constants.

5.21.316 kcmsSigScreeningDescTag = & h73637264

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.317 kcmsSigScreeningTag = & h7363726E

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.318 kcmsSigScreeningType = & h7363726E

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.319 kcmsSigSegmentedCurve = & h63757266

Plugin Version: 11.3. **Function:** One of the curve element type signature constants.

5.21.320 kcmsSigSGI = & h53474920

Plugin Version: 11.3. **Function:** One of the platform signature constants.
Notes: SGI

5.21.321 kcmsSigSignatureType = & h73696720

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.322 kcmsSigSilkscreen = & h73696C6B

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.323 kcmsSigSolaris = & h53554E57

Plugin Version: 11.3. **Function:** One of the platform signature constants.
Notes: Solaris

5.21.324 kcmsSigStatusA = & h53746141

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: Status A: ISO 5-3 densitometer response. This is the accepted standard for reflection densitometers for measuring photographic colour prints.

5.21.325 kcmsSigStatusE = & h53746145

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: Status E: ISO 5-3 densitometer response which is the accepted standard in Europe for colour reflection densitometers.

5.21.326 kcmsSigStatusI = & h53746149

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: Status I: ISO 5-3 densitometer response commonly referred to as narrow band or interference-type response.

5.21.327 kcmsSigStatusM = & h5374614D

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: Status M: ISO 5-3 densitometer response for measuring colour negatives.

5.21.328 kcmsSigStatusT = & h53746154

Plugin Version: 11.3. **Function:** One of the response curve type signature constants.
Notes: Status T: ISO 5-3 wide band colour reflection densitometer response which is the accepted standard in the United States for colour reflection densitometers.

5.21.329 kcmsSigTaligent = & h54474E54

Plugin Version: 11.3. **Function:** One of the platform signature constants.
Notes: Taligent

5.21.330 kcmsSigTechnologyTag = & h74656368

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.331 kcmsSigTextDescriptionType = & h64657363

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.332 kcmsSigTextType = & h74657874

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.333 kcmsSigThermalWaxPrinter = & h74776178

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.334 kcmsSigU16Fixed16ArrayType = & h75663332

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.335 kcmsSigUcrBgTag = & h62666420

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.336 kcmsSigUcrBgType = & h62666420

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.337 kcmsSigUInt16ArrayType = & h75693136

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.338 kcmsSigUInt32ArrayType = & h75693332

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.339 kcmsSigUInt64ArrayType = & h75693634

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.340 kcmsSigUInt8ArrayType = & h75693038

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.341 kcmsSigUnices = & h2A6E6978

Plugin Version: 11.3. **Function:** One of the platform signature constants.
Notes: Unix systems

5.21.342 kcmsSigVcgtTag = & h76636774

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.343 kcmsSigVcgtType = & h76636774

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.344 kcmsSigVideoCamera = & h76696463

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.345 kcmsSigVideoMonitor = & h7669646D

Plugin Version: 11.3. **Function:** One of the technology signature constants.

5.21.346 kcmsSigViewingCondDescTag = & h76756564

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.347 kcmsSigViewingConditionsTag = & h76696577

Plugin Version: 11.3. **Function:** One of the tag signature constants.

5.21.348 kcmsSigViewingConditionsType = & h76696577

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.349 kcmsSigXYZ2FloatPCS = & h64327820

Plugin Version: 12.4. **Function:** One of the data type signature constants.

5.21.350 kcmsSigXYZ2LabElemType = & h6C327820

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.351 kcmsSigXYZData = & h58595A20

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.352 kcmsSigXYZType = & h58595A20

Plugin Version: 11.3. **Function:** One of the data type signature constants.

5.21.353 kcmsSigYCbCrData = & h59436272

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.354 kcmsSigYxyData = & h59787920

Plugin Version: 11.3. **Function:** One of the colorspace signature constants.

5.21.355 kcmsSPOT_CROSS = 7

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.356 kcmsSPOT_DIAMOND = 3

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.357 kcmsSPOT_ELLIPSE = 4

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.358 kcmsSPOT_LINE = 5

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.359 kcmsSPOT_PRINTER_DEFAULT = 1

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.360 kcmsSPOT_ROUND = 2

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.361 kcmsSPOT_SQUARE = 6

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.362 kcmsSPOT_UNKNOWN = 0

Plugin Version: 11.3. **Function:** One of the spot shape constants.

5.21.363 kcmsTransparency = 1

Plugin Version: 11.3. **Function:** One of the device attribute constants.

5.21.364 kcmsUseAnywhere = 0

Plugin Version: 11.3. **Function:** One of the header flag constants.

5.21.365 kcmsUseWithEmbeddedDataOnly = 2

Plugin Version: 11.3. **Function:** One of the header flag constants.

5.21.366 kCUTSHEET_SURROUND = 4

Plugin Version: 11.3. **Function:** One of the surround constants for viewing conditions.

5.21.367 kDARK_SURROUND = 3

Plugin Version: 11.3. **Function:** One of the surround constants for viewing conditions.

5.21.368 kDIM_SURROUND = 2

Plugin Version: 11.3. **Function:** One of the surround constants for viewing conditions.

5.21.369 kD_CALCULATE = -1

Plugin Version: 11.3. **Function:** Special value for D Value of ViewingConditions.

5.21.370 kINTENT_ABSOLUTE_COLORIMETRIC = 3

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Absolute Colorimetric ICC Intent.

5.21.371 kINTENT_PERCEPTUAL = 0

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Perceptual Colorimetric ICC Intent.

5.21.372 kINTENT_PRESERVE_K_ONLY_PERCEPTUAL = & h0000000A

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Special LCMS intent.

5.21.373 kINTENT_PRESERVE_K_ONLY_RELATIVE_COLORIMETRIC = & h0000000B

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Special LCMS intent.

5.21.374 kINTENT_PRESERVE_K_ONLY_SATURATION = & h0000000C

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Special LCMS intent.

5.21.375 kINTENT_PRESERVE_K_PLANE_PERCEPTUAL = & h0000000D

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Special LCMS intent.

5.21.376 kINTENT_PRESERVE_K_PLANE_RELATIVE_COLORIMETRIC = & h0000000E

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Special LCMS intent.

5.21.377 kINTENT_PRESERVE_K_PLANE_SATURATION = & h0000000F

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Special LCMS intent.

5.21.378 kINTENT_RELATIVE_COLORIMETRIC = 1

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Relative Colorimetric ICC Intent.

5.21.379 kINTENT_SATURATION = 2

Plugin Version: 11.3. **Function:** One of the intent constants.
Notes: Saturation ICC Intent.

5.21.380 klcmsSignature = & h6C636D73

Plugin Version: 11.3. **Function:** Little CMS signature.

5.21.381 kLCMS_USED_AS_INPUT = 0

Plugin Version: 11.3. **Function:** One of the used direction constants.

5.21.382 kLCMS_USED_AS_OUTPUT = 1

Plugin Version: 11.3. **Function:** One of the used direction constants.

5.21.383 kLCMS_USED_AS_PROOF = 2

Plugin Version: 11.3. **Function:** One of the used direction constants.

5.21.384 kPT_ANY = 0

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Don't check colorspace

5.21.385 kPT_CMY = 5

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: CMY

5.21.386 kPT_CMYK = 6

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: CMYK

5.21.387 kPT_GRAY = 3

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Gray

5.21.388 kPT_HLS = & h0000000D

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: HLS

5.21.389 kPT_HSV = & h0000000C

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: HSV

5.21.390 kPT_Lab = & h0000000A

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Lab

5.21.391 kPT_LabV2 = & h0000001E

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Identical to kPT_Lab, but using the V2 old encoding

5.21.392 kPT_MCH1 = & h0000000F

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 1 channels.

5.21.393 kPT_MCH10 = & h00000018

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 10 channels.

5.21.394 kPT_MCH11 = & h00000019

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 11 channels.

5.21.395 kPT_MCH12 = & h0000001A

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 12 channels.

5.21.396 kPT_MCH13 = & h0000001B

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 13 channels.

5.21.397 kPT_MCH14 = & h0000001C

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 14 channels.

5.21.398 kPT_MCH15 = & h0000001D

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 15 channels.

5.21.399 kPT_MCH2 = & h00000010

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 2 channels.

5.21.400 kPT_MCH3 = & h00000011

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 3 channels.

5.21.401 kPT_MCH4 = & h00000012

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 4 channels.

5.21.402 kPT_MCH5 = & h00000013

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 5 channels.

5.21.403 kPT_MCH6 = & h00000014

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 6 channels.

5.21.404 kPT_MCH7 = & h00000015

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 7 channels.

5.21.405 kPT_MCH8 = & h00000016

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Multichannel with 8 channels.

5.21.406 kPT_MCH9 = & h00000017

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: noMultichannel with 9 channels.ne

5.21.407 kPT_RGB = 4

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: RGB

5.21.408 kPT_XYZ = 9

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: XYZ

5.21.409 kPT_YCbCr = 7

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: YCbCr

5.21.410 kPT_YUV = 8

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Lu'v'

5.21.411 kPT_YUVK = & h0000000B

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Lu'v'K

5.21.412 kPT_Yxy = & h0000000E

Plugin Version: 11.3. **Function:** One of the pixel type constants.
Notes: Yxy

5.21.413 kTYPE_ABGR_16 = & h0004049A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.414 kTYPE_ABGR_16_PLANAR = & h0004149A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.415 kTYPE_ABGR_16_SE = & h00040C9A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.416 kTYPE_ABGR_8 = & h00040499

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.417 kTYPE_ABGR_8_PLANAR = & h00041499

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.418 kTYPE_ABGR_FLT = & h0044049C

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.419 kTYPE_ABGR_HALF_FLT = & h0044041A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.420 kTYPE_ALabV2_8 = & h001E4099

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.421 kTYPE_ALab_8 = & h000A4099

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.422 kTYPE_ARGB_16 = & h0004409A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.423 kTYPE_ARGB_8 = & h00044099

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.424 kTYPE_ARGB_8_PLANAR = & h00045099

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.425 kTYPE_ARGB_FLT = & h0044409C

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.426 kTYPE_ARGB_HALF_FLT = & h0044409A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.427 kTYPE_BGRA_16 = & h0004449A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.428 kTYPE_BGRA_16_SE = & h00044C9A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.429 kTYPE_BGRA_8 = & h00044499

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.430 kTYPE_BGRA_8_PLANAR = & h00045499

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.431 kTYPE_BGRA_FLT = & h0044449C

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.432 kTYPE_BGRA_HALF_FLT = & h0044449A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.433 kTYPE_BGR_16 = & h0004041A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.434 kTYPE_BGR_16_PLANAR = & h0004141A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.435 kTYPE_BGR_16_SE = & h00040C1A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.436 kTYPE_BGR_8 = & h00040419

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.437 kTYPE_BGR_8_PLANAR = & h00041419

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.438 kTYPE_BGR_DBL = & h00440418

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.439 kTYPE_BGR_FLT = & h0044041C

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.440 kTYPE_BGR_HALF_FLT = & h0044041A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.441 kTYPE_CMYK10_16 = & h00180052

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.442 kTYPE_CMYK10_16_SE = & h00180852

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.443 kTYPE_CMYK10_8 = & h00180051

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.444 kTYPE_CMYK11_16 = & h0019005A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.445 kTYPE_CMYK11_16_SE = & h0019085A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.446 kTYPE_CMYK11_8 = & h00190059

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.447 kTYPE_CMYK12_16 = & h001A0062

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.448 kTYPE_CMYK12_16_SE = & h001A0862

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.449 kTYPE_CMYK12_8 = & h001A0061

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.450 kTYPE_CMYK5_16 = & h0013002A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.451 kTYPE_CMYK5_16_SE = & h0013082A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.452 kTYPE_CMYK5_8 = & h00130029

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.453 kTYPE_CMYK6_16 = & h00140032

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.454 kTYPE_CMYK6_16_PLANAR = & h00141032

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.455 kTYPE_CMYK6_16_SE = & h00140832

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.456 kTYPE_CMYK6_8 = & h00140031

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.457 kTYPE_CMYK6_8_PLANAR = & h00141031

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.458 kTYPE_CMYK7_16 = & h0015003A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.459 kTYPE_CMYK7_16_SE = & h0015083A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.460 kTYPE_CMYK7_8 = & h00150039

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.461 kTYPE_CMYK8_16 = & h00160042

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.462 kTYPE_CMYK8_16_SE = & h00160842

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.463 kTYPE_CMYK8_8 = & h00160041

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.464 kTYPE_CMYK9_16 = & h0017004A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.465 kTYPE_CMYK9_16_SE = & h0017084A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.466 kTYPE_CMYK9_8 = & h00170049

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.467 kTYPE_CMYKA_8 = & h000600A1

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.468 kTYPE_CMYK_16 = & h00060022

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.469 kTYPE_CMYK_16_PLANAR = & h00061022

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.470 kTYPE_CMYK_16_REV = & h00062022

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.471 kTYPE_CMYK_16_SE = & h00060822

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.472 kTYPE_CMYK_8 = & h00060021

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.473 kTYPE_CMYK_8_PLANAR = & h00061021

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.474 kTYPE_CMYK_8_REV = & h00062021

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.475 kTYPE_CMYK_DBL = & h00460020

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point with doubles.

5.21.476 kTYPE_CMYK_FLT = & h00460024

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.477 kTYPE_CMYK_HALF_FLT = & h00460022

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.478 kTYPE_CMY_16 = & h0005001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.479 kTYPE_CMY_16_PLANAR = & h0005101A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.480 kTYPE_CMY_16_SE = & h0005081A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.481 kTYPE_CMY_8 = & h00050019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.482 kTYPE_CMY_8_PLANAR = & h00051019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.483 kTYPE_GRAYA_16 = & h0003008A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.484 kTYPE_GRAYA_16_PLANAR = & h0003108A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.485 kTYPE_GRAYA_16_SE = & h0003088A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.486 kTYPE_GRAYA_8 = & h00030089

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.487 kTYPE_GRAYA_8_PLANAR = & h00031089

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.488 kTYPE_GRAY_16 = & h0003000A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.489 kTYPE_GRAY_16_REV = & h0003200A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.490 kTYPE_GRAY_16_SE = & h0003080A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.491 kTYPE_GRAY_8 = & h00030009

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.492 kTYPE_GRAY_8_REV = & h00032009

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.493 kTYPE_GRAY_DBL = & h00430008

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point with doubles.

5.21.494 kTYPE_GRAY_FLT = & h0043000C

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.495 kTYPE_GRAY_HALF_FLT = & h0043000A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.496 kTYPE_HLS_16 = & h000D001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.497 kTYPE_HLS_16_PLANAR = & h000D101A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.498 kTYPE_HLS_16_SE = & h000D081A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.499 kTYPE_HLS_8 = & h000D0019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.500 kTYPE_HLS_8_PLANAR = & h000D1019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.501 kTYPE_HSV_16 = & h000C001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.502 kTYPE_HSV_16_PLANAR = & h000C101A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.503 kTYPE_HSV_16_SE = & h000C081A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.504 kTYPE_HSV_8 = & h000C0019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.505 kTYPE_HSV_8_PLANAR = & h000C1019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.506 kTYPE_KCMY_16 = & h00064022

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.507 kTYPE_KCMY_16_REV = & h00066022

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.508 kTYPE_KCMY_16_SE = & h00064822

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.509 kTYPE_KCMY_8 = & h00064021

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.510 kTYPE_KCMY_8_REV = & h00066021

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.511 kTYPE_KYMC10_16 = & h00180452

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.512 kTYPE_KYMC10_16_SE = & h00180C52

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.513 kTYPE_KYMC10_8 = & h00180451

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.514 kTYPE_KYMC11_16 = & h0019045A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.515 kTYPE_KYMC11_16_SE = & h00190C5A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.516 kTYPE_KYMC11_8 = & h00190459

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.517 kTYPE_KYMC12_16 = & h001A0462

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.518 kTYPE_KYMC12_16_SE = & h001A0C62

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.519 kTYPE_KYMC12_8 = & h001A0461

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.520 kTYPE_KYMC5_16 = & h0013042A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.521 kTYPE_KYMC5_16_SE = & h00130C2A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.522 kTYPE_KYMC5_8 = & h00130429

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.523 kTYPE_KYMC7_16 = & h0015043A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.524 kTYPE_KYMC7_16_SE = & h00150C3A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.525 kTYPE_KYMC7_8 = & h00150439

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.526 kTYPE_KYMC8_16 = & h00160442

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.527 kTYPE_KYMC8_16_SE = & h00160C42

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.528 kTYPE_KYMC8_8 = & h00160441

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.529 kTYPE_KYMC9_16 = & h0017044A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.530 kTYPE_KYMC9_16_SE = & h00170C4A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.531 kTYPE_KYMC9_8 = & h00170449

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.532 kTYPE_KYMC_16 = & h00060422

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.533 kTYPE_KYMC_16_SE = & h00060C22

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.534 kTYPE_KYMC_8 = & h00060421

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.535 kTYPE_LabA_FLT = & h004A009C

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.536 kTYPE_LabV2_16 = & h001E001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.537 kTYPE_LabV2_8 = & h001E0019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.538 kTYPE_Lab_16 = & h000A001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.539 kTYPE_Lab_8 = & h000A0019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.540 kTYPE_Lab_DBL = & h004A0018

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point with doubles.

5.21.541 kTYPE_Lab_FLT = & h004A001C

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.542 kTYPE_NAMED_COLOR_INDEX = & h0000000A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.543 kTYPE_RGBA_16 = & h0004009A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.544 kTYPE_RGBA_16_PLANAR = & h0004109A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.545 kTYPE_RGBA_16_SE = & h0004089A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.546 kTYPE_RGBA_8 = & h00040099

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.547 kTYPE_RGBA_8_PLANAR = & h00041099

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.548 kTYPE_RGBA_FLT = & h0044009C

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.549 kTYPE_RGBA_HALF_FLT = & h0044009A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.550 kTYPE_RGB_16 = & h0004001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.551 kTYPE_RGB_16_PLANAR = & h0004101A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.552 kTYPE_RGB_16_SE = & h0004081A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.553 kTYPE_RGB_8 = & h00040019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.554 kTYPE_RGB_8_PLANAR = & h00041019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.555 kTYPE_RGB_DBL = & h00440018

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point with doubles.

5.21.556 kTYPE_RGB_FLT = & h0044001C

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.557 kTYPE_RGB_HALF_FLT = & h0044001A

Plugin Version: 12.4. **Function:** One of the color space type constants.

5.21.558 kTYPE_XYZ_16 = & h0009001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.559 kTYPE_XYZ_DBL = & h00490018

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point with doubles.

5.21.560 kTYPE_XYZ_FLT = & h0049001C

Plugin Version: 11.3. **Function:** One of the color space type constants.
Notes: Floating point.

5.21.561 kTYPE_YCbCr_16 = & h0007001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.562 kTYPE_YCbCr_16_PLANAR = & h0007101A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.563 kTYPE_YCbCr_16_SE = & h0007081A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.564 kTYPE_YCbCr_8 = & h00070019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.565 kTYPE_YCbCr_8_PLANAR = & h00071019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.566 kTYPE_YUVK_16 = & h00062022

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.567 kTYPE_YUVK_8 = & h00062021

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.568 kTYPE_YUV_16 = & h0008001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.569 kTYPE_YUV_16_PLANAR = & h0008101A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.570 kTYPE_YUV_16_SE = & h0008081A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.571 kTYPE_YUV_8 = & h00080019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.572 kTYPE_YUV_8_PLANAR = & h00081019

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.21.573 kTYPE_Yxy_16 = & h000E001A

Plugin Version: 11.3. **Function:** One of the color space type constants.

5.22 class LCMS2MLUMBS

5.22.1 class LCMS2MLUMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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: mluc' 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.

5.22.2 Methods

5.22.3 Constructor(context as LCMS2ContextMBS, items as UInt32)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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" )
```

5.22.4 getASCII(LanguageCode as string, CountryCode as string) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.22.5 getTranslation(LanguageCode as string, CountryCode as string, byref ObtainedLanguageCode as string, byref ObtainedCountryCode as string) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.22.6 getUnicode(LanguageCode as string, CountryCode as string) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.22.7 setASCII(LanguageCode as string, CountryCode as string, ASCIIString as string) as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.22.8 setUnicode(LanguageCode as string, CountryCode as string, UnicodeString as string) as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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", "Ktzchen" )
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.

5.22.9 translationsCodes(index as Integer, byref LanguageCode as string, byref CountryCode as string) as boolean

Plugin Version: 13.2, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.22.10 Properties

5.22.11 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.22.12 TranslationsCount as Integer

Plugin Version: 13.2, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.22.13 Constants

5.22.14 kNoCountry = ""

Plugin Version: 11.3. **Function:** One of the possible country constants.
Notes: Any country.

5.22.15 kNoLanguage = ""

Plugin Version: 11.3. **Function:** One of the possible language constants.
Notes: Any language.

5.23 class LCMS2NamedColorListMBS

5.23.1 class LCMS2NamedColorListMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Specialized dictionaries for dealing with named color profiles.

5.23.2 Methods

5.23.3 Append(name as string) as Boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.23.4 Append(name as string, PCS() as Integer) as Boolean 186
- 5.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean 187

5.23.4 Append(name as string, PCS() as Integer) as Boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.23.5 Append(name as string, PCS() as Integer, Colorant() as Integer) as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.23.6 Colorant(nColor as UInt32) as Integer()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns encoded colorants of nth color.
Notes: Array has 16 entries, but not all may be in use.

5.23.7 ColorIndex(name as string) as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.23.8 Constructor(context as LCMS2ContextMBS, n as UInt32, ColorantCount as UInt32, Prefix as string = "", Suffix as string = "")

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.23.9 Name(nColor as UInt32) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns name of nth color.

5.23.10 PCS(nColor as UInt32) as Integer()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns encoded PCS of nth color.
Notes: Array has 3 entries.

5.23.11 Prefix(nColor as UInt32) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns prefix of nth color.

5.23.12 Suffix(nColor as UInt32) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns suffix of nth color.

5.23.13 Properties

5.23.14 Count as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.23.15 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.24 class LCMS2PipelineMBS

5.24.1 class LCMS2PipelineMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.24.2 Methods

5.24.3 Append(p as LCMS2PipelineMBS) as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Appends pipeline l2 at the end of pipeline l1.
Notes:

Channel count must match.
Returns true on success and false on failure.

5.24.4 Constructor(context as LCMS2ContextMBS, InputChannels as UInt32, OutputChannels as UInt32)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.24.5 Eval16(In as Ptr, Out as Ptr)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.24.6 EvalFloat(In as Ptr, Out as Ptr)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.24.7 EvalReverseFloat(Target as Ptr, Result as Ptr, Hint as Ptr)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.24.8 InsertStage(where as Integer, stage as LCMS2StageMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.24.9 SetSaveAs8bitsFlag(save8bit as boolean) as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.24.10 Stages as LCMS2StageMBS()

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns an array with all stage objects.

5.24.11 UnlinkStage(where as Integer) as LCMS2StageMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Removes the stage from the pipeline.
Notes:

Returns the removed stage object.
where can be kAtBegin or kAtEnd values.

5.24.12 Properties

5.24.13 context as LCMS2ContextMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The context object.
Notes: (Read and Write property)

5.24.14 FirstStage as LCMS2StageMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Get a the first stage in the pipeline, or nil if pipeline is empty.
Notes:

Intended for iterators.
(Read only property)

5.24.15 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.24.16 InputChannels as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the number of input channels of a given pipeline.
Notes:

Number of channels on success, 0 on error.
(Read only property)

5.24.17 LastStage as LCMS2StageMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Get a the last stage in the pipeline, or nil if pipeline is empty.
Notes:

Intended for iterators.
(Read only property)

5.24.18 OutputChannels as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns number of output channels of a given pipeline.
Notes:

Number of channels on success, 0 on error.
(Read only property)

5.24.19 StageCount as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns number of stages of a given pipeline.
Notes: (Read only property)

5.24.20 Constants

5.24.21 kAtBegin = 0

Plugin Version: 11.3. **Function:** One of the constants for UnlinkStage.
Notes: At the beginning.

5.24.22 kAtEnd = 1

Plugin Version: 11.3. **Function:** One of the constants for UnlinkStage.
Notes: At the end.

5.25 class LCMS2ProfileMBS

5.25.1 class LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a LCMS2 profile.

5.25.2 Methods

5.25.3 Constructor(context as LCMS2ContextMBS = nil)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new empty profile.
Notes: On success the handle property is not zero.
See also:

- 5.25.4 Constructor(file as folderitem, write as boolean = false) 195

5.25.4 Constructor(file as folderitem, write as boolean = false)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.3 Constructor(context as LCMS2ContextMBS = nil) 195

5.25.5 CreateBCHSWabstractProfile(context as LCMS2ContextMBS, nLUTPoints as Integer, Bright as Double, Contrast as Double, Hue as Double, Saturation as Double, TempSrc as Integer, TempDest as Integer) as LCMS2ProfileMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.6 CreateGrayProfile(context as LCMS2ContextMBS, WhitePoint as LCMS2CIExyYM TransferFunction as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.7 CreateInkLimitingDeviceLink(context as LCMS2ContextMBS, ColorSpaceSignature as UInt32, Limit as Double) as LCMS2ProfileMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.8 CreateLab2Profile(context as LCMS2ContextMBS = nil, point as LCMS2CIExyYMB = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.9 CreateLab4Profile(context as LCMS2ContextMBS = nil, point as LCMS2CIExyYMB = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.10 CreateLinearizationDeviceLink(context as LCMS2ContextMBS, ColorSpaceSignature as UInt32, TransferFunction() as LCMS2ToneCurveMBS) as LCMS2ProfileMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This is a devicelink operating in the target colorspace with as many transfer functions ascomponents.
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.

5.25.11 CreateNULLProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.12 CreateProfilePlaceholder(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.13 CreateRGBProfile(context as LCMS2ContextMBS, WhitePoint as LCMS2CIExyYM Primaries as LCMS2CIExyYTripleMBS, TransferFunction() as LCMS2ToneCurveM as LCMS2ProfileMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

Context: Optional context object.
WhitePoint: The white point of the RGB device or space.
Primaries: The primaries in xyY of the device or space.

1	cmsSigProfileDescriptionTag
2	cmsSigMediaWhitePointTag
3	cmsSigRedColorantTag
4	cmsSigGreenColorantTag
5	cmsSigBlueColorantTag
6	cmsSigRedTRCTag
7	cmsSigGreenTRCTag
8	cmsSigBlueTRCTag
9	Chromatic adaptation Tag
10	cmsSigChromaticityTag

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.

5.25.14 CreateSRGBProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

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

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Predefined virtual profiles sRGB transfer functions are defined by:

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.

5.25.15 CreateXYZProfile(context as LCMS2ContextMBS = nil) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.16 DetectBlackPoint(Intent as Integer, Flags as Integer) as LCMS2CIEXYZMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Estimate the black point.

5.25.17 DetectDestinationBlackPoint(Intent as Integer, Flags as Integer) as LCMS2CIEXYZMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Calculates the black point of a destination profile.
Notes: This algorithm comes from the Adobe paper disclosing its black point compensation method.

5.25.18 DetectTAC as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.19 FormatterForBitmap(BitCount as Integer = 8) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.20 FormatterForColorspace(nBytes as UInt32, IsFloat as boolean = false) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Build a suitable formatter for the colorspace of this profile.
Notes: Formatters are used to describe how bitmap buffers are organized.

5.25.21 FormatterForPCS(nBytes as UInt32, IsFloat as boolean = false) as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Build a suitable formatter for the colorspace of this profile.
Notes: Formatters are used to describe how bitmap buffers are organized.

5.25.22 GetProfileInfo(Info as Integer, LanguageCode as string, CountryCode as string) as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.23 IsCLUT(Intent as UInt32, UsedDirection as UInt32) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.24 IsIntentSupported(Intent as UInt32, UsedDirection as UInt32) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.25 IsTag(TagSignature as Integer) as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.26 LinkTag(sig as Integer, dest as Integer) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.25.27 MD5computeID as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Computes a MD5 checksum and stores it as Profile ID in the profile header.
Notes: Returns true on success or false on failure.

5.25.28 OpenProfileFromFile(context as LCMS2ContextMBS, file as folderitem, write as boolean = false) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.29 OpenProfileFromFile(file as folderitem, write as boolean = false) as LCMS2ProfileMBS 204

5.25.29 OpenProfileFromFile(file as folderitem, write as boolean = false) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.28 OpenProfileFromFile(context as LCMS2ContextMBS, file as folderitem, write as boolean = false) as LCMS2ProfileMBS 203

5.25.30 OpenProfileFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.31 OpenProfileFromMemory(data as Memoryblock) as LCMS2ProfileMBS 204

5.25.31 OpenProfileFromMemory(data as Memoryblock) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.30 OpenProfileFromMemory(context as LCMS2ContextMBS, data as Memoryblock) as LCMS2ProfileMBS 204

5.25.32 OpenProfileFromString(context as LCMS2ContextMBS, data as string) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.33 OpenProfileFromString(data as string) as LCMS2ProfileMBS 205

5.25.33 OpenProfileFromString(data as string) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.25.32 OpenProfileFromString(context as LCMS2ContextMBS, data as string) as LCMS2ProfileMBS 205

5.25.34 PostScriptCRD(context as LCMS2ContextMBS, intent as UInt32, flags as UInt32 = 0) as string

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.35 PostScriptCSA(context as LCMS2ContextMBS, intent as UInt32, flags as UInt32 = 0) as string

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.36 ReadChromaticAdaptation as LCMS2CIEXYZMBS()

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads a chromatic adaptation.
Notes: On success returns an array of 3 XYZ values.

5.25.37 ReadChromaticity as LCMS2CIExyYTripleMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads chromaticity tag.
Notes:

For kcmsSigChromaticityTag.
Returns nil on error.

5.25.38 ReadCIEXYZ(tag as Integer) as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.39 ReadColorantOrder as Memoryblock

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads colorant order.
Notes:

For kcmsSigColorantOrderTag.
Returns nil on any error.

5.25.40 ReadDate(tag as Integer) as LCMS2DateMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as date.
Notes:

Works with kcmsSigCalibrationDateTimeTag and kcmsSigDateTimeTag.
Returns nil on any error.

5.25.41 ReadDict(tag as Integer) as LCMS2DictionaryMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as Dictionary value.
Notes:

Works with kcmsSigMetaTag.
Returns nil on any error.

5.25.42 ReadICCData(tag as Integer) as LCMS2ICCDataMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as ICC Data.

Notes:

Works with kcmsSigDataTag, kcmsSigPs2CRD0Tag, kcmsSigPs2CRD1Tag, kcmsSigPs2CRD2Tag, kcmsSigPs2CRD3Tag, kcmsSigPs2CSATag and kcmsSigPs2RenderingIntentTag.
Returns nil on any error.

5.25.43 ReadICCMeasurementConditions as LCMS2ICCMeasurementConditionsMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads IIC measurement conditions.
Notes:

for kcmsSigMeasurementTag.
Returns nil on any error.

5.25.44 ReadICCViewingConditions as LCMS2ICCViewingConditionsMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as ICCViewingConditions value.
Notes: Works with kcmsSigViewingConditionsTag.

5.25.45 ReadMLU(tag as Integer) as LCMS2MLUMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as MLU.
Notes:

Works with kcmsSigCharTargetTag, kcmsSigCopyrightTag, kcmsSigDeviceMfgDescTag, kcmsSigDeviceModelDescTag, kcmsSigProfileDescriptionTag, kcmsSigScreeningDescTag and kcmsSigViewingCondDescTag.
Returns nil on any error.

5.25.46 ReadNamedColorList(tag as Integer) as LCMS2NamedColorListMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as named color list.
Notes:

Works with kcmsSigColorantTableTag, kcmsSigColorantTableOutTag, kcmsSigCrdInfoTag and kcmsSigNamedColor2Tag.
Returns nil on any error.

5.25.47 ReadPipeline(tag as Integer) as LCMS2PipelineMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.48 ReadRawTag(sig as Integer) as Memoryblock

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.49 ReadScreening as LCMS2ScreeningMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as screening.
Notes:

Works with kcmsSigScreeningTag.
Returns nil on any error.

5.25.50 ReadSequence(tag as Integer) as LCMS2SequenceMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as sequence.
Notes:

Only for kcmsSigProfileSequenceDescTag and kcmsSigProfileSequenceIdTag.
Returns nil on any error.

5.25.51 ReadSignature(tag as Integer) as UInt32

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads a signature tag.
Notes: Works with kcmsSigColorimetricIntentImageStateTag, kcmsSigPerceptualRenderingIntentGamutTag, kcmsSigSaturationRenderingIntentGamutTag or kcmsSigTechnologyTag.

5.25.52 ReadTag(tag as Integer) as Variant

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.53 ReadToneCurve(tag as Integer) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads tag as ToneCurve.
Notes: Works with kcmsSigBlueTRCTag, kcmsSigGrayTRCTag, kcmsSigGreenTRCTag and kcmsSigRedTRCTag.

5.25.54 ReadUcrBg as LCMS2UcrBgMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Reads UcrBg tag.

5.25.55 SaveProfileToFile(file as folderitem) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Saves the contents of a profile to a given file.
Notes: Returns true on success and false on failure.

5.25.56 SaveProfileToMemory as Memoryblock

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Saves the contents of a profile to a memoryblock.
Notes: Returns memoryblock on success and nil on failure.

5.25.57 SaveProfileToString as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Saves the contents of a profile to a string.
Notes: Returns string with profile data on success and "" on failure.

5.25.58 TagLinkedTo(sig as Integer) as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.59 TagSignature(index as Integer) as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.60 WriteChromaticAdaptation(value as LCMS2Mat3MBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes chromatic adaptation.
Notes: Variant of the function which takes matrix of values.
See also:

- 5.25.61 WriteChromaticAdaptation(values() as LCMS2CIEXYZMBS) as boolean 212

5.25.61 WriteChromaticAdaptation(values() as LCMS2CIEXYZMBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes chromatic adaptation.
Notes:

Pass array with 3 XYZ colors.
Returns true on success.
See also:

- 5.25.60 WriteChromaticAdaptation(value as LCMS2Mat3MBS) as boolean 212

5.25.62 WriteChromaticity(o as LCMS2CIExyYTripleMBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes chromaticity tag.
Notes:

For kcmsSigChromaticityTag.
Returns true on success and false on error.

5.25.63 WriteCIEXYZ(tag as Integer, o as LCMS2CIEXYZMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes CIE XYZ tag.
Notes: Works with kcmsSigBlueColorantTag, kcmsSigBlueMatrixColumnTag, kcmsSigGreenColorantTag, kcmsSigGreenMatrixColumnTag, kcmsSigLuminanceTag, kcmsSigMediaBlackPointTag, kcmsSigMediaWhitePointTag, kcmsSigRedColorantTag and kcmsSigRedMatrixColumnTag.

5.25.64 WriteColorantOrder(data as Memoryblock) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes colorant order.
Notes:

For kcmsSigColorantOrderTag.
Data should be 16 byte long.
Returns true on success or false on failure.

5.25.65 WriteDate(tag as Integer, o as LCMS2DateMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes date tag.
Notes: Works with kcmsSigCalibrationDateTimeTag and kcmsSigDateTimeTag.

5.25.66 WriteDict(tag as Integer, o as LCMS2DictionaryMBS) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes Dictionary tag.
Notes: Works with kcmsSigMetaTag.

5.25.67 WriteICCData(tag as Integer, o as LCMS2ICCDataMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes ICC Data tag.
Notes: Works with kcmsSigDataTag, kcmsSigPs2CRD0Tag, kcmsSigPs2CRD1Tag, kcmsSigPs2CRD2Tag, kcmsSigPs2CRD3Tag, kcmsSigPs2CSATag and kcmsSigPs2RenderingIntentTag.

5.25.68 WriteICCMeasurementConditions(value as LCMS2ICCMeasurement-ConditionsMBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes IIC measurement conditions.
Notes:

for kcmsSigMeasurementTag.
Writes data and returns true on success or false on failure.

5.25.69 WriteICCViewingConditions(o as LCMS2ICCViewingConditionsMBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes ICC Viewing conditions tag.

Notes: Works with kcmsSigViewingConditionsTag.

5.25.70 WriteMLU(tag as Integer, o as LCMS2MLUMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes MLU tag.
Notes: Works with kcmsSigCharTargetTag, kcmsSigCopyrightTag, kcmsSigDeviceMfgDescTag, kcmsSigDeviceModelDescTag, kcmsSigProfileDescriptionTag, kcmsSigScreeningDescTag and kcmsSigViewingCondDescTag.

5.25.71 WriteNamedColorList(tag as Integer, o as LCMS2NamedColorListMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes named color list tag.
Notes: Works with kcmsSigColorantTableTag, kcmsSigColorantTableOutTag, kcmsSigCrdInfoTag and kcmsSigNamedColor2Tag.

5.25.72 WritePipeline(tag as Integer, o as LCMS2PipelineMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.73 WriteRawTag(sig as Integer, data as Memoryblock) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.74 WriteScreening(o as LCMS2ScreeningMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes screening tag.
Notes: Works with kcmsSigScreeningTag.

5.25.75 WriteSequence(tag as Integer, o as LCMS2SequenceMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes sequence tag.
Notes: Only for kcmsSigProfileSequenceDescTag and kcmsSigProfileSequenceIdTag.

5.25.76 WriteSignature(tag as Integer, o as UInt32) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes a signature tag with the given values.
Notes: Works with kcmsSigColorimetricIntentImageStateTag, kcmsSigPerceptualRenderingIntentGamutTag, kcmsSigSaturationRenderingIntentGamutTag or kcmsSigTechnologyTag.

5.25.77 WriteToneCurve(tag as Integer, o as LCMS2ToneCurveMBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.25.78 WriteUcrBg(o as LCMS2UcrBgMBS) as boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Writes UcrBg tag.

5.25.79 Properties

5.25.80 ChannelCount as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.81 ColorSpaceType as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Gets/Sets the color space used by the given profile, using the ICC convention.
Notes: (Read and Write property)

5.25.82 context as LCMS2ContextMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The context for this profile.
Notes:

Error handling uses it, so you can see which part of your application failed.
(Read only property)

5.25.83 DeviceClass as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Gets/sets the device class signature from profile header.
Notes:

Device Classes:

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)

5.25.84 File as Folderitem

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.85 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Internal object reference.
Notes: (Read and Write property)

5.25.86 HeaderAttributes as UInt64

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Get/set header attribute flags.
Notes:

Flags can be a combination of kcmsReflective,kcmsTransparency,kcmsGlossy or kcmsMatte.
(Read and Write property)

5.25.87 HeaderCreationDateTime as LCMS2DateMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.88 HeaderCreator as UInt32

Plugin Version: 13.2, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Get/set the creator signature as described in the header.
Notes: (Read only property)

5.25.89 HeaderFlags as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.90 HeaderManufacturer as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.91 HeaderModel as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.92 HeaderProfileID as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Get/set header profile ID.
Notes:

Profile ID must be a 16 byte long string.
(Read and Write property)

5.25.93 IsMatrixShaper as Boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.94 Name as string

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.95 PCS as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Gets/Sets the profile connection space used by the given profile, using the ICC convention.
Notes: (Read and Write property)

5.25.96 ProfileICCversion as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Get/set the profile ICC version in the same format as it is stored in the header.
Notes: (Read and Write property)

5.25.97 ProfileVersion as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.98 RenderingIntent as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.25.99 TagCount as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns number of tags of a given profile.
Notes:

Returns number of tags on success, -1 on error.
(Read only property)

5.25.100 Constants

5.25.101 kInfoCopyright = 3

Plugin Version: 11.3. **Function:** One of the info selectors for GetProfileInfo.
Notes: The copyright string.

5.25.102 kInfoDescription = 0

Plugin Version: 11.3. **Function:** One of the info selectors for GetProfileInfo.
Notes: The description string.

5.25.103 kInfoManufacturer = 1

Plugin Version: 11.3. **Function:** One of the info selectors for GetProfileInfo.
Notes: The manufacturer string.

5.25.104 kInfoModel = 2

Plugin Version: 11.3. **Function:** One of the info selectors for GetProfileInfo.
Notes: The model string.

5.26 class LCMS2ScreeningChannelMBS

5.26.1 class LCMS2ScreeningChannelMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The screening information for one channel.

5.26.2 Methods

5.26.3 Clone as LCMS2ScreeningChannelMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the screening channel object.

5.26.4 Constructor(Frequency as Double = 0.0, ScreenAngle as Double = 0.0, SpotShape as UInt32 = 0)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The constructor.
See also:

- 5.26.5 Constructor(other as LCMS2ScreeningChannelMBS) 223

5.26.5 Constructor(other as LCMS2ScreeningChannelMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes object with values from other object.
See also:

- 5.26.4 Constructor(Frequency as Double = 0.0, ScreenAngle as Double = 0.0, SpotShape as UInt32 = 0) 223

5.26.6 Properties

5.26.7 Frequency as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The frequency. **Notes:** (Read and Write property)

5.26.8 ScreenAngle as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The screen angle. **Notes:** (Read and Write property)

5.26.9 SpotShape as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The spot shape. **Notes:**

See kcmsSpot* constants.
(Read and Write property)

5.27 class LCMS2ScreeningMBS

5.27.1 class LCMS2ScreeningMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for screening parameters.

5.27.2 Properties

5.27.3 Channels as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The number of channels.
Notes: (Read and Write property)

5.27.4 Flag as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The flags for screening.
Notes:

See flags kcmsPRINTER_DEFAULT_SCREENS, kcmsFREQUENCE_UNITS_LINES_CM and kcmsFREQUENCE_UNITS_LI
(Read and Write property)

5.27.5 Channel(index as Integer) as LCMS2ScreeningChannelMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The screening information for each channel.
Notes:

Index from 0 to 15.
(Read and Write computed property)

5.28 class LCMS2SequenceDescriptionMBS

5.28.1 class LCMS2SequenceDescriptionMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a sequence description.

5.28.2 Properties

5.28.3 AttributeFlags as UInt64

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The attribute flags.
Notes: (Read and Write property)

5.28.4 Description as LCMS2MLUMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The description.
Notes: (Read only property)

5.28.5 DeviceMfg as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The device Mfg.
Notes: (Read and Write property)

5.28.6 DeviceModel as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The device model.
Notes: (Read and Write property)

5.28.7 Manufacturer as LCMS2MLUMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The manufacturer name.
Notes: (Read only property)

5.28.8 Model as LCMS2MLUMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The model string.
Notes: (Read only property)

5.28.9 ProfileID as Memoryblock

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The profile ID.
Notes:

16 bytes and typically the result of a MD5.
(Read only property)

5.28.10 Technology as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.29 class LCMS2SequenceMBS

5.29.1 class LCMS2SequenceMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Profile sequence descriptors.
Notes: Profile sequence can be read/written by using cmsReadTag and cmsWriteTag functions.

5.29.2 Methods

5.29.3 Constructor(context as LCMS2ContextMBS, Count as UInt32)

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.29.4 Properties

5.29.5 Count as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The number of sequence descriptions used in this class.
Notes: (Read only property)

5.29.6 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.29.7 Description(index as Integer) as LCMS2SequenceDescriptionMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The sequence descriptions.
Notes:

Index from 0 to count-1.
(Read and Write computed property)

5.30 class LCMS2StageMBS

5.30.1 class LCMS2StageMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.30.2 Methods

5.30.3 CLutFloatValues as Double()

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns CLut floating point values.
Notes: Only if stage is from type kcmsSigCLutElemType and CLutHasFloatValues = true.

5.30.4 CLutUInt16Values as UInt16()

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns CLut integer values.
Notes: Only if stage is from type kcmsSigCLutElemType and CLutHasFloatValues = false.

5.30.5 CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.30.6 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.30.7 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as UInt16) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.5 CreateStageWithCLut16bit(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 230
- 5.30.6 CreateStageWithCLut16bit(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS 231

5.30.8 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.9 CreateStageWithCLut16bitGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS 233
- 5.30.10 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS 234

5.30.9 CreateStageWithCLut16bitGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16 as Memoryblock) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.8 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 233
- 5.30.10 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS 234

5.30.10 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableUInt16() as UInt16) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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, Channel-
GridPoints, 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:

- 5.30.8 CreateStageWithCLut16bitGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32,

5.30.11 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.30.12 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.11 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 235
- 5.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS 236
- 5.30.14 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS 237

5.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.30.14 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as single) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.11 CreateStageWithCLutFloat(Context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 235
- 5.30.12 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 235
- 5.30.13 CreateStageWithCLutFloat(context as LCMS2ContextMBS, GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32, values() as Double) as LCMS2StageMBS 236

5.30.15 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.30.16 CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

5.30.17 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle() as Single) as LCMS2StageMBS

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.15 CreateStageWithCLutFloatGranular(Context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32) as LCMS2StageMBS 238
- 5.30.16 CreateStageWithCLutFloatGranular(context as LCMS2ContextMBS, clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32, TableSingle as Memoryblock) as LCMS2StageMBS 239

5.30.18 CreateStageWithIdentity(context as LCMS2ContextMBS, Channels as UInt32) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.30.19 CreateStageWithMatrix(context as LCMS2ContextMBS, Rows as UInt32, Cols as UInt32, Matrix as Memoryblock, Offset as Memoryblock = nil) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.30.20 CreateStageWithToneCurves(context as LCMS2ContextMBS, ChannelCount as Integer) as LCMS2StageMBS

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.21 CreateStageWithToneCurves(context as LCMS2ContextMBS, Channels() as LCMS2ToneCurveMBS) as LCMS2StageMBS 241

5.30.21 CreateStageWithToneCurves(context as LCMS2ContextMBS, Channels() as LCMS2ToneCurveMBS) as LCMS2StageMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.20 CreateStageWithToneCurves(context as LCMS2ContextMBS, ChannelCount as Integer) as LCMS2StageMBS 241

5.30.22 CubeSize(clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.23 CubeSize(GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32 242

5.30.23 CubeSize(GridPoints as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32

Plugin Version: 15.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.30.22 CubeSize(clutPoints() as UInt32, inputChan as UInt32, outputChan as UInt32 = 1) as UInt32 242

5.30.24 MatrixOffsets as Double()

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns array with matrix offsets.
Notes: Only if stage is from type kcmsSigMatrixElemType and.

5.30.25 MatrixValues as Double()

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns array with matrix values.

Notes: Only if stage is from type kcmsSigMatrixElemType and.

5.30.26 SampleCLut16bit(sampler as LCMS2StageSamplerMBS, Flags as Integer = 0) as boolean

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.30.27 SampleCLutFloat(sampler as LCMS2StageSamplerMBS, Flags as Integer = 0) as boolean

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.30.28 ToneCurves as LCMS2ToneCurveMBS()

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns array with tone curves.
Notes: Only if stage is from type kcmsSigCurveSetElemType and.

5.30.29 Properties

5.30.30 CLutEntries as Integer

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The number of entries in the CLut.
Notes:

Only if stage is from type kcmsSigCLutElemType.
(Read only property)

5.30.31 CLutHasFloatValues as Boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Whether this CLut has floating point values.
Notes:

Only if stage is from type kcmsSigCLutElemType.
(Read only property)

5.30.32 Data as Ptr

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The raw stage data.
Notes: (Read only property)

5.30.33 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.30.34 InputChannels as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the number of input channels of a given stage object.
Notes: (Read only property)

5.30.35 NextItem as LCMS2StageMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns next stage in pipeline list, or nil if end of list.
Notes:

Intended for iterators.
(Read only property)

5.30.36 OutputChannels as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the number of output channels of a this stage object.
Notes: (Read only property)

5.30.37 Type as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the type of a given stage object.
Notes:

Use this type constants: kcmsSigCurveSetElemType, kcmsSigMatrixElemType, kcmsSigCLutElemType, kcmsSigBAcsElemType, kcmsSigEAcsElemType, kcmsSigXYZ2LabElemType, kcmsSigLab2XYZElemType, kcmsSigNamedColorElemType, kcmsSigLabV2toV4, kcmsSigLabV4toV2, kcmsSigIdentityElemType.
(Read only property)

5.30.38 Constants

5.30.39 kSamplerInspect = & h01000000

Plugin Version: 12.1. **Function:** One of the flags for Sampling.
Notes: Use this flag to prevent changes being written to destination when using SampleCLutFloat or SampleCLut16bit.

5.31 class LCMS2StageSamplerMBS

5.31.1 class LCMS2StageSamplerMBS

Plugin Version: 12.1, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** A class for getting sampler callback.

5.31.2 Methods

5.31.3 SliceSpaceFloat(Inputs as UInt32, values() as UInt32) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.31.4 SliceSpaceInteger(Inputs as UInt32, values() as UInt32) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.31.5 Events

5.31.6 SamplerFloat(InValues as Ptr, OutValues as Ptr, InputChannels as Integer, OutputChannels as Integer) as boolean

Plugin Version: 12.1, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.31.7 SamplerInteger(InValues as Ptr, OutValues as Ptr, InputChannels as Integer, OutputChannels as Integer) as boolean

Plugin Version: 12.1, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32 class LCMS2ToneCurveMBS

5.32.1 class LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a tone curve or gamma.

5.32.2 Methods

5.32.3 BuildGamma(context as LCMS2ContextMBS, gamma as Double) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32.4 BuildParametricToneCurve(context as LCMS2ContextMBS, Type as Integer, params() as Double) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32.5 BuildSegmentedToneCurve(context as LCMS2ContextMBS, Segments() as LCMS2CurveSegmentMBS) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32.6 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as Single) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.32.7 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as UInt16) as LCMS2ToneCurveMBS 251

5.32.7 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as UInt16) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.32.6 BuildTabulatedToneCurve(context as LCMS2ContextMBS, values() as Single) as LCMS2ToneCurveMBS 250

5.32.8 EstimatedTable as UInt16()

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Tone curves do maintain a shadow lowresolution tabulated representation of the curve. This function returns an array with this table.

5.32.9 EstimatedTableEntries as UInt32

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Tone curves do maintain a shadow lowresolution tabulated representation of the curve. This function returns the number of entries such table has.

5.32.10 EstimateGamma(Precision as Double = 0.01) as Double

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Estimates the apparent gamma of the tone curve by using least squares fitting to a pure exponential expression in the f()

= .
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.

5.32.11 EvalToneCurve16(value as UInt16) as UInt16

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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

5.32.12 EvalToneCurveFloat(value as Single) as Single

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32.13 IsDescending as Boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns true if f(0) >f(1) , false otherwise.
Notes: Does not take unbounded parts into account.

5.32.14 IsLinear as Boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32.15 IsMonotonic as Boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.32.16 IsMultisegment as Boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns true if the tone curve contains more than one segment, false if it has only one segment.

5.32.17 JoinToneCurve(context as LCMS2ContextMBS, X as LCMS2ToneCurveMBS, Y as LCMS2ToneCurveMBS, nPoints as UInt32) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Composites two tone curves in the form 1(()).
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.

5.32.18 ParametricType as Integer

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the parametric type.

5.32.19 Reverse as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.32.20 Reverse(nResultSamples as Integer) as LCMS2ToneCurveMBS 254

5.32.20 Reverse(nResultSamples as Integer) as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.32.19 Reverse as LCMS2ToneCurveMBS 254

5.32.21 Smooth(lambda as Double) as Boolean

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Smoothes tone curve according to the lambda parameter.
Notes:

Lambda: degree of smoothing.
Returns true on success, false on error.

5.32.22 Properties

5.32.23 Handle as Integer

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.33 class LCMS2TransformMBS

5.33.1 class LCMS2TransformMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for a LCMS 2.x transformation.

5.33.2 Methods

5.33.3 ChangeBuffersFormat(InputFormat as UInt32, OutputFormat as UInt32) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.33.4 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.33.5 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.33.6 CreateMultiprofileTransform(Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 257

5.33.6 CreateMultiprofileTransform(Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.33.5 CreateMultiprofileTransform(context as LCMS2ContextMBS, Profiles() as LCMS2ProfileMBS, InputFormat as UInt32, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 257

5.33.7 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 kcmsSetAlarmCodes
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:

5.33.8 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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 kcmsSetAlarmCodes
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:

- 5.33.7 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 258

5.33.9 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.33.10 CreateTransform(InputProfile as LCMS2ProfileMBS, InputFormat as UInt32, OutputProfile as LCMS2ProfileMBS, OutputFormat as UInt32, Intent as UInt32, Flags as UInt32 = 0) as LCMS2TransformMBS 260

5.33.10 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.33.9 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 260

5.33.11 ToDeviceLink(Version as Double, Flags as UInt32) as LCMS2ProfileMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This 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:

- 5.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean 262

5.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

• 5.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean 261

• 5.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean 262

5.33.14 Transform(InputBuffer as Ptr, OutputBuffer as Ptr, Size as UInt32) as boolean

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

• 5.33.12 Transform(bitmap as LCMS2BitmapMBS) as boolean 261

• 5.33.13 Transform(inBitmap as LCMS2BitmapMBS, outBitmap as LCMS2BitmapMBS) as boolean 262

5.33.15 TransformLineStride(inBitmap as Ptr, outBitmap as Ptr, PixelsPerLine as UInt32, LineCount as UInt32, BytesPerLineIn as UInt32, BytesPerLineOut as UInt32, BytesPerPlaneIn as UInt32, BytesPerPlaneOut as UInt32) as boolean

Plugin Version: 16.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** This 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.

5.33.16 TransformRGB(c as color) as color

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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).

5.33.17 TransformStride(inBitmap as Ptr, outBitmap as Ptr, size as UInt32, Stride as UInt32) as boolean

Plugin Version: 12.4, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.33.18 Properties

5.33.19 AdaptationState as Double

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The adaptation state.
Notes: (Read only property)

5.33.20 context as LCMS2ContextMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The context object.
Notes: (Read and Write property)

5.33.21 EntryColorSpace as Integer

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The entry colorspace.
Notes: (Read only property)

5.33.22 EntryWhitePoint as LCMS2CIEXYZMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The entry white points.
Notes:

Only for information, so plugin may return a copy of the data.
(Read only property)

5.33.23 ExitColorSpace as Integer

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The exit colorspace.
Notes: (Read only property)

5.33.24 ExitWhitePoint as LCMS2CIEXYZMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The exit white points.
Notes:

Only for information, so plugin may return a copy of the data.
(Read only property)

5.33.25 GamutCheck as LCMS2PipelineMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.33.26 Handle as Integer

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The internal object reference.
Notes: (Read and Write property)

5.33.27 InputColorant as LCMS2NamedColorListMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Input Colorant table.
Notes:

Only for information, so plugin may return a copy of the data.
(Read only property)

5.33.28 InputFormat as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the input format associated with a given transform.
Notes: (Read only property)

5.33.29 Lut as LCMS2PipelineMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** A Pipeline holding the full (optimized) transform.
Notes:

Only for information, so plugin may return a copy of the data.
(Read only property)

5.33.30 NamedColorList as LCMS2NamedColorListMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)

5.33.31 OriginalFlags as UInt32

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The original flags used to create transform.
Notes: (Read only property)

5.33.32 OutputColorant as LCMS2NamedColorListMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Output Colorant table (for n chans >CMYK)
Notes:

Only for information, so plugin may return a copy of the data.
(Read only property)

5.33.33 OutputFormat as UInt32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns the output format associated with a given transform.
Notes: (Read only property)

5.33.34 RenderingIntent as UInt32

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The intent of this transform. That is usually the last intent in the profilechain, but may differ.
Notes: (Read only property)

5.33.35 Sequence as LCMS2SequenceMBS

Plugin Version: 15.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The profiles used to create the transform.
Notes:

Only for information, so plugin may return a copy of the data.
(Read only property)

5.34 class LCMS2UcrBgMBS

5.34.1 class LCMS2UcrBgMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The class for the cmsSigUcrBgType tag.
Notes: This is for Undercolorremoval and black generation.

5.34.2 Methods

5.34.3 Constructor(Ucr as LCMS2ToneCurveMBS = nil, Bg as LCMS2ToneCurveMBS = nil, Desc as LCMS2MLUMBS = nil)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new object with given values.

5.34.4 Properties

5.34.5 Bg as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The black generation value.
Notes: (Read and Write property)

5.34.6 Desc as LCMS2MLUMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The description.
Notes: (Read and Write property)

5.34.7 Ucr as LCMS2ToneCurveMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The undercolor removal setting.
Notes: (Read and Write property)

5.35 class LCMS2Vec3MBS

5.35.1 class LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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)
```

5.35.2 Methods

5.35.3 Clone as LCMS2Vec3MBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a copy of the vector.

5.35.4 Constructor(other as LCMS2Vec3MBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.35.5 Constructor(v1 as Double = 0.0, v2 as Double = 0.0, v3 as Double = 0.0) 270

5.35.5 Constructor(v1 as Double = 0.0, v2 as Double = 0.0, v3 as Double = 0.0)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 5.35.4 Constructor(other as LCMS2Vec3MBS) 269

5.35.6 Properties

5.35.7 X as Double

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The first value.
Notes: (Read and Write property)

5.35.8 Y as Double

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The second value.
Notes: (Read and Write property)

5.35.9 Z as Double

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The third value.
Notes: (Read and Write property)

5.35.10 value(index as UInt32) as Double

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The values by index.
Notes:

Index from 0 to 2.
(Read and Write computed property)

5.36 class LCMS2ViewingConditionsMBS

5.36.1 class LCMS2ViewingConditionsMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **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.

5.36.2 Methods

5.36.3 Clone as LCMS2ViewingConditionsMBS

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Returns a copy of the object.

5.36.4 Constructor(other as LCMS2ViewingConditionsMBS)

Plugin Version: 12.0, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Initializes object with values from other object.
See also:

- 5.36.5 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) 272

5.36.5 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, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** Creates a new viewing conditions object.
See also:

- 5.36.4 Constructor(other as LCMS2ViewingConditionsMBS) 272

5.36.6 Properties

5.36.7 D_value as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The D value value.
Notes: (Read and Write property)

5.36.8 La as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The La value.
Notes: (Read and Write property)

5.36.9 Surround as Int32

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The surround value.
Notes:

Use this constants:
kAVG_SURROUND = 1
kDIM_SURROUND = 2
kDARK_SURROUND = 3
kCUTSHEET_SURROUND = 4
(Read and Write property)

5.36.10 whitePoint as LCMS2CIEXYZMBS

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The white point.
Notes: (Read and Write property)

5.36.11 Yb as Double

Plugin Version: 11.3, Console & Web: Yes, Mac: Yes, Win: Yes, Linux: Yes. **Function:** The Yb value.
Notes: (Read and Write property)

Chapter 6

List of Questions in the FAQ

Chapter 7

The FAQ

7.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

7.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.NSCalibratedRGBColorSpace)
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:

7.0.3 How to catch delete key?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:

7.0.4 How to convert cmyk to rgb?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:

7.0.5 How to delete a folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
else ' file
fo.Delete
end if
next

f.Delete
End Sub
```

See also:

- 7.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 286
- 7.0.3 How to catch delete key? 287
- 7.0.4 How to convert cmyk to rgb? 287
- 7.0.6 How to detect if CPU if 64bit processor? 290
- 7.0.7 How to refresh a htmlviewer on Windows? 290

7.0.6 How to detect if CPU if 64bit processor?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:

- 7.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 286
- 7.0.3 How to catch delete key? 287
- 7.0.4 How to convert cmyk to rgb? 287
- 7.0.5 How to delete a folder? 289
- 7.0.7 How to refresh a htmlviewer on Windows? 290

7.0.7 How to refresh a htmlviewer on Windows?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can ask the browser to reload the website with this code line:
Example:

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:

- 7.0.2 How do I get the proper highlight color on Mac OS X for active/inactive selection? 286
- 7.0.3 How to catch delete key? 287
- 7.0.4 How to convert cmyk to rgb? 287
- 7.0.5 How to delete a folder? 289
- 7.0.6 How to detect if CPU if 64bit processor? 290

7.0.8 Is there an example for vector graphics in REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.9 Picture functions do not preserve resolution values?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.10 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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
```

7.0.11 API client not supported?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.12 Can I access Access Database with Java classes?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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

7.0.13 Can I create PDF from Real Studio Report using DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.14 Can I use AppleScripts in a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.15 Can I use graphics class with DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.16 Can I use OGG with REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** There is a QuickTime plugin for OGG which works with REALbasic.
Notes: That should be a solution for playback and recording on Mac and Windows.

7.0.17 Can I use sockets on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, but they run on the server, not on the client.
Notes:

You can use HTTPSocket, SMTPSocket, POP3Socket, SMTPSecureSocket, SecurePOP3Socket, EasyTCP-Socket, 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.

7.0.18 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, our ChartDirector plugin works just fine on the Real Studio 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.

7.0.19 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Yes, our DynaPDF plugin works just fine on the Real Studio 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 Real Studio Web Edition.
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

7.0.20 Can I use your plugin controls on a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** No.

7.0.21 Can you get an unique machine ID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.22 ChartDirector: Alignment Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.23 ChartDirector: Color Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** ChartDirector: Color Specification
Notes:

Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports colors 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 AAR-

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.

RGGBB, 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

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.

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.

ConstantDescription

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.

7.0.24 ChartDirector: Font Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 "GillSans.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.

7.0.25 ChartDirector: Mark Up Language

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

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.

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".)

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.

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 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_image_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

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.

The value baseline means the baseline of sub-blocks should align with the baseline of the block. The baseline

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.

7.0.26 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

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

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.

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.

7.0.27 ChartDirector: Shape Specification

Plugin Version: 8.2, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.28 Copy styled text?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.29 Do you have code to validate a credit card number?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

7.0.30 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all, Console & Web: No. **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.

7.0.31 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.32 Does the plugin home home?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.33 folderitem.absolutepath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.34 Future of editablemovie class?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** In short, it will go away, so switch to plugin functions soon.
Notes:

The editableMovie class has been deprecated.
Deprecated means that Real Software will remove it someday, but as of today (and probably a few more years) the class will be available and running. Just not forever. The reason is that Apple deprecated the old QuickTime APIs and they are not available for 64 bit.
For 64 bit, you can move to our QTKit plugin.
We expect the old QuickTime classes in Real Studio and our plugins will continue to work in 32 bit applications. Even if editableMovie class is removed next year from Real Studio, our plugin still provides movie class extensions to do similar functions.

7.0.35 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?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.36 How about Plugin support for older OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all, Console & Web: No. **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.

7.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.40 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, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.41 How can I get text from a PDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.42 How can I get text from a Word Document?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.43 How can I get the item string for a given file creator?

Plugin Version: all, Console & Web: No. **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, appSignature as OSType, nativeTypes as Ptr) as Short Inline68K("701CABFC")
Declare Function GetDocumentKindString Lib "Carbon" (docVRefNum as Short, docType as OSType, docCreator 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
loop

End Sub
```

Notes: Change "Translation" to "CarbonLib" for Mac OS X.

7.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.46 How can I validate an email address?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.47 How do I check if the QuickTime component for the JPEG exporting is available?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** If you want to know if the PictureToString functions will work, you may try this function:
Example:

```
Function IsQTJPEGExporerAvailable() As boolean
dim q as QTComponentInformationMBS

// search for QuickTime JPEG exporter codec
q=new QTComponentInformationMBS

while q.NextComponent
if q.Type="imco" and q.SubType="jpeg" then
Return true
end if
wend

Return false // not found
End Function
```

Notes:

It should work like this for other types like:

”tiff” ->TIFF
”PNTG” ->Mac Paint
”gif ” ->GIF
”WRLE” ->Windows BMP
”tga ” ->Targa
”png ” ->PNG
etc.

7.0.48 How do I check if the QuickTime component for the JPEG importing is available?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** If you want to know if the StringToPicture functions will work, you may try this function:
Example:

```
Function IsQTJPEGImporterAvailable() As boolean
dim q as QTComponentInformationMBS

// search for QuickTime JPEG importer codec
q=new QTComponentInformationMBS

while q.NextComponent
if q.Type=”imdc” and q.SubType=”jpeg” then
Return true
end if
wend

Return false // not found
End Function
```

Notes:

It should work like this for other types like:
”tiff” ->TIFF
”PNTG” ->Mac Paint
”gif ” ->GIF
”WRLE” ->Windows BMP
”tga ” ->Targa
”png ” ->PNG
etc.

7.0.49 How do I check if the QuickTime component for the Sequence grabber is available?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** If you want to know if the QTGrabberClass will work, you can use this code:
Example:

```
Function IsQTGrabberAvailable() As boolean
dim q as QTComponentInformationMBS

q=new QTComponentInformationMBS

while q.NextComponent
if q.Type="barg" then
Return true
end if
wend

Return false // not found
End Function
```

Notes: Don't forget that you need to check for each other component you use like the compression functions.

7.0.50 How do I decode correctly an email subject?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.51 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.52 How do I find the root volume for a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.53 How do I get the current languages list?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.54 How do I get the Mac OS Version?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.55 How do I get the printer name?

Plugin Version: all, Console & Web: No. **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.

7.0.56 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.57 How do I make a smooth color transition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.58 How do I read the applications in the dock app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.59 How do I truncate a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** In a binarystream you can set the length property to truncate.

7.0.60 How do update a Finder's windows after changing some files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.61 How to access a USB device directly?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.62 How to add icon to file on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.63 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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).

7.0.64 How to automatically enable retina in my apps?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.65 How to avoid leaks with Cocoa functions?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 REALbasic 2009r4 the code above should not be needed as REALbasic runtime does automatically handle the NSAutoreleasePools for you. For older REALbasic versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use REALbasic 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a objc_msgSend call.

7.0.66 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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>

7.0.67 How to avoid __NSAutoreleaseNoPool console messages in threads?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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/NSAutoreleasePool_Class/Reference/Reference.html

7.0.68 How to bring app to front?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.69 How to bring my application to front?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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)

7.0.70 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.71 How to change name of application menu?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

7.0.72 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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/ .

7.0.73 How to check if a folder/directory has subfolders?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.74 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.75 How to check if Microsoft Outlook is installed?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.76 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.77 How to code sign my app with plugins?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Mac and Windows to make sure they have not been modified.

In terminal, you do like this:

cd <Path to folder of 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.

7.0.78 How to collapse a window?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.79 How to compare two pictures?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.80 How to compile PHP library?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.81 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.82 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.83 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.84 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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("Bjrn, this text should be converted")
Mac2PC.clear
```

Notes: You have to call Mac2PC.clear after every conversion to reset the encoding engine.

7.0.85 How to convert ChartTime back to Xojo date?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.86 How to convert line endings in text files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.87 How to convert picture to string and back?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.88 How to copy an array?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.89 How to copy an dictionary?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.90 How to copy parts of a movie to another one?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

7.0.91 How to create a birthday like calendar event?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.92 How to create a GUID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the UUIDMBS class for this.

7.0.93 How to create a Mac picture clip file?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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("AQAAAAAAAAAAAAAAAAACAFRDRVIAAAABAAAAAAAAAABUQ0lQAAAAA
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

7.0.94 How to create a PDF file in REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.95 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.96 How to create PDF for image files?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.97 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

7.0.98 How to delete file with ftp and curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.99 How to detect display resolution changed?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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".

7.0.100 How to detect retina?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use Window.BackingScaleFactorMBS to query the factor.
Example:

```
msgbox str(window1.BackingScaleFactorMBS)
```

7.0.101 How to disable force quit?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.102 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.103 How to display a PDF file in REALbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.104 How to do a lottery in RB?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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(z
End Sub
```

7.0.105 How to do an asycron DNS lookup?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** use CFHostMBS class (Mac OS X only).
Notes:

REALbasic internal functions and plugin DNS functions are sycronized.

You can use DNSLookupThreadMBS class for doing them asyncron.

7.0.106 How to draw a dushed pattern line?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Realbasic code, so it even works on Windows.

7.0.107 How to draw a nice antialiased line?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.108 How to draw with CGContextMBS using my own handle?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can try this code:
Example:

```
Soft Declare Function QDBeginCGContext Lib "Carbon" (port as Integer, ByRef contextHandle as Integer)
as Integer
dim contextRef as Integer
call QDBeginCGContext(g.handle(graphics.HandleTypeCGrafPtr), contextRef)
dim c as new CGContextMBS(contextRef)

c.BeginPath
c.SetLineWidth(3)
c.SetRGBFillColor(1,0,0,0.5)
c.FillRect(CGMakeRectMBS(0,0,100,100))
c.DrawPath(c.kCGPathFillStroke)
c.Flush // and so on

Soft Declare Function QDEndCGContext Lib "Carbon" (port as Integer, ByRef contextHandle as Inte-
ger) as Integer
dim h as Integer = c.Handle
call QDEndCGContext(g.handle(graphics.HandleTypeCGrafPtr), h)
c.Handle=0
```

Notes: Basicly you can provide your own handle to CGContextMBS. But if you do not set it back to 0 the CGContextMBS destructor will release the handle which can result into a crash. (if the reference count is wrong)

7.0.109 How to dump java class interface?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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

7.0.110 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Real Studio versions because of the # if even if your RS version does not support alpha channel pictures. This way it's future proof.

7.0.111 How to enable assistive devices?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.112 How to encrypt a file with Blowfish?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.113 How to extract text from HTML?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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: Gre
```

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 & auml; to .

7.0.114 How to find empty folders in a folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.115 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** You can try Launch Services.
Example:

```
dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.AbsolutePath
```

7.0.116 How to find network interface for a socket by it's name?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.117 How to find version of Microsoft Word?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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".

7.0.118 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.UnixpathMBS
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/

7.0.119 How to format double with n digits?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.120 How to get a time converted to user time zone in a web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.121 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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
```

7.0.122 How to get CFAbsoluteTime from date?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

7.0.123 How to get client IP address on web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the WebSession.RemoteAddress property.
Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

7.0.124 How to get fonts to load in charts on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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"
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.

7.0.125 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.126 How to get GMT time and back?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.127 How to get good crash reports?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Check this website from the webkit website:
Notes: http://webkit.org/quality/crashlogs.html

7.0.128 How to get list of all threads?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.129 How to get parameters from webpage URL in Real Studio Web Edition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Real Studio 2010r5. Please use DefineEncoding.

7.0.130 How to get Real Studio apps running Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.131 How to get the color for disabled textcolor?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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" ...

7.0.132 How to get the current free stack space?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.133 How to get the current timezone?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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
```

7.0.134 How to get the current window title?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
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
```

7.0.135 How to get the cursor blink interval time?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.136 How to get the list of the current selected files in the Finder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Realbasic 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
```

7.0.137 How to get the Mac OS system version?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.138 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.139 How to get the screensize excluding the task bar?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Try this code:
Notes: Use the Screen class with the available* properties.

7.0.140 How to get the size of the frontmost window on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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!

7.0.141 How to get the source code of a HTMLViewer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this code:
Example:

```
// for Windows:

msgbox HTMLViewer1.IEHTMLTextMBS

// for Mac OS X:

msgbox HTMLViewer1.mainFrameMBS.dataSource.data
```

7.0.142 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Sometimes it may be better to use an extra application to process images.
Notes:

A typical 32 bit app made with Xojo (Real Studio) 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.

7.0.143 How to handle tab key for editable cells in listbox?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.144 How to hard link MapKit framework?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.145 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Real Studio Web Edition.

7.0.146 How to hide all applications except mine?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.147 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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).

7.0.148 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** If you want to hide something in a chart, simply assign the kTransparent constant as color.

7.0.149 How to hide the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.150 How to insert image to NSTextView or TextArea?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub
```

Notes: For TextArea you can query the underlaying NSTextViewMBS object via TextArea.NSTextViewMBS method.

7.0.151 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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"""
elseif TargetMacOS then
call HTMLViewer1.EvaluateJavaScriptMBS "window.location = ""# 16"""
else
// not supported
end if
```

7.0.152 How to keep a movieplayer unclickable?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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
```

7.0.153 How to keep my web app from using 100% CPU time?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** On Linux and Mac OS X 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.

7.0.154 How to kill a process by name?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.155 How to know how many CPUs are present?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.156 How to know if a movie is finished?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** This code can help you althrough it's not perfect:
Example:

```
Declare Function IsMovieDone Lib "QuickTime" (theMovie as Integer) as Integer

if IsMovieDone(moviePlayer1.movie.handle) <>0 then
//movie is finished
end if
```

Notes: But be carefull! It crashes sometimes for an unknown reason!?

7.0.157 How to know if QuickTime is installed on any target and can play MPEG 4 movies?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Try this code:
Example:

```
dim q as QTComponentInformationMBS

q=new QTComponentInformationMBS

// "eat " = Movie importers
while q.NextComponentOfType("eat ")
if q.SubType="MP4 " then
MsgBox "found: "+q.Name+ " codec"
end if
wend
```

Notes: If you find a MP4 movie importing codec you can be sure that a MP4 movie can be opened.

7.0.158 How to know if QuickTime is installed on any target?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Try this function:
Example:

```
Dim theEffect as QTEffect

theEffect=GetQTCrossFadeEffect

if theEffect = nil then
msgBox "QuickTime is not installed."
else
msgBox "Quicktime is installed."
end if
```

Notes: The problem with this code is that it checks only if the QuickTime part of the cross fade effect is available. Use the QTComponentInformationMBS to check for the features you really need.

7.0.159 How to know the calling function?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.160 How to launch an app using it's creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.161 How to launch disc utility?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.162 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.163 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.164 How to make a window borderless on Windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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
```

7.0.165 How to make an alias using AppleEvents?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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

7.0.166 How to make an application smaller?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

If you use an older copy of REALbasic, you should try to compile for 68k only instead of PPC. It's a little bit slower, but code is much smaller.

On any Mac OS target you can save your images as JPEG and drop the into your application. REALbasic will include them as JPEGs into the Mac applications (convert to BMP for Windows). This will make the resources of your application smaller, but requires that the user has QuickTime 2.5 or newer installed.

7.0.167 How to make AppleScripts much faster?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.168 How to make double clicks on a canvas?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.169 How to make my Mac not sleeping?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.170 How to make my own registration code scheme?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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 Real Studio as a starting point?

7.0.171 How to make small controls on Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 OSType, 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))
```

7.0.172 How to mark my Mac app as background only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.173 How to move a file or folder to trash?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.kFSFileOperationDefaultOptions)

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.

7.0.174 How to move an application to the front using the creator code?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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)

7.0.175 How to move file with ftp and curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.176 How to normalize string on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.177 How to obscure the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.178 How to open icon file on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.179 How to open PDF in acrobat reader?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.180 How to open printer preferences on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.181 How to open special characters panel on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.182 How to optimize picture loading in Web Edition?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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:
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

7.0.183 How to parse XML?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.184 How to play audio in a web app?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can use the HTML5 audio tag and control it with javscript.
Notes:

See our web apps here:
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

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 Real Studio 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)+";")

7.0.185 How to pretty print xml?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Use the XML Transform method with the right XLS.
Notes:

Learn more here:
http://docs.xojo.com/index.php/XMLDocument.Transform

7.0.186 How to print to PDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.187 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.188 How to quit windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.189 How to read a CSV file correctly?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.190 How to read the command line on windows?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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 Realbasic versions have a system.commandline property.

7.0.191 How to render PDF pages with PDF Kit?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.192 How to restart a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.193 How to resume ftp upload with curl plugin?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.194 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.195 How to rotate image with CoreImage?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Real Studio picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

7.0.196 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.197 How to save a quicktime movie as a reference movie?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** Example code is below:
Example:

```
// save as reference movie
dim f as FolderItem
dim m as movie

f=SpecialFolder.Desktop.Child("test.mov")
m=f.OpenAsMovie

f=SpecialFolder.Desktop.Child("new movie.mov")

msgbox str(m.SaveMBS(f,false,false))
```

7.0.198 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.199 How to save RTFD?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.200 How to scale a picture proportionally with mask?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Pic-
ture
// 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.

7.0.201 How to scale a picture proportionally?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

7.0.202 How to scale/resize a picture?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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:
- The GWorld class which uses QuickTime. Includes nice Bicubic scaling with QuickTime 6.
- QTGraphicsImporterMBS and QTGraphicsExporterMBS 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 REALbasic:
- make a new picture and draw the old one with new size inside.

7.0.203 How to search with regex and use unicode codepoints?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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  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
```

7.0.204 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.205 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.206 How to set the modified dot in the window?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this declares:
Example:

```
window1.ModifiedMBS=true
```

7.0.207 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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 Real Studio Web Edition.
http://www.monkeybreadsoftware.de/realbasic/webapps.shtml

7.0.208 How to show Keyboard Viewer programmatically?

Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use Realbasic 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
```

7.0.209 How to show the mouse cursor on Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Try this declare:
Example:

```
Declare Sub ShowCursor Lib "Carbon" ()

ShowCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

7.0.210 How to shutdown a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.211 How to sleep a Mac?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.212 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.213 How to use PDFLib in my RB application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** The PDFlib plugin was discontinued in favor of our DynaPDF plugin.
Notes: If you need help to move, please contact us.

7.0.214 How to use quotes in a string?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Just double them.
Example:

```
msgbox "This String contains ""quotes""."
```

7.0.215 How to use Sybase in Web App?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use our MBS Real Studio 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

7.0.216 How to use the Application Support folder?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.UnixpathMBS
```

Notes: You may not be able to write there with a normal user account!

7.0.217 How to use the IOPMCopyScheduledPowerEvents function in Realbasic?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.218 How to validate a GUID?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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".

7.0.219 How to walk a folder hierarchie non recursively?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.220 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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 Real Studio IDE on Windows crashed on compilation.

7.0.221 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

7.0.222 I want to accept Drag & Drop from iTunes

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.UnixpathMBS
end if
end if
end if
next
end if
end if
```

```
end if
End Sub
```

Notes: The code above inside a window on Realbasic 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

7.0.223 I'm drawing into a listbox but don't see something.

Plugin Version: all, Console & Web: No. **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.

7.0.224 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.225 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?

Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Stand alone.
Notes:

REALbasic 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)

7.0.226 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.227 Is there a case sensitive Dictionary?

Plugin Version: all, Console & Web: No. **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

7.0.228 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.229 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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
```

7.0.230 Is there an easy way I can launch the Quicktime preferences panel?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the code below:
Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("QuickTime")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

7.0.231 List of Windows Error codes?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** We have a list of windows error codes on our website.
Notes: http://www.monkeybreadsoftware.de/xojo/winerror.shtml

7.0.232 Midi latency on Windows problem?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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)

7.0.233 My Xojo Web App does not launch. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Here is a list of checks to do for linux apache installations with Xojo or Real Studio 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?

7.0.234 Pictures are not shown in my application. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:**

On Mac OS Classic, please check the memory partition size which may be too low.
Else (most times on Windows) you are simple missing the part of QuickTime to load images.

7.0.235 Realbasic doesn't work with your plugins on Windows 98.

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Upgrade your Windows version or complain to Realsoftware.

7.0.236 REALbasic or my RB application itself crashes on launch on Mac OS Classic. Why?

Plugin Version: all, Console & Web: No. **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.

7.0.237 SQLDatabase not initialized error?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.238 Textconverter returns only the first x characters. Why?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

Some older REALbasic versions limit the Textconverter to around 1024 characters in input and output. This should be fixed with RB5.
Notes: REALbasic seems not to support Textconverters at all on Windows.

7.0.239 The type translation between CoreFoundation/Foundation and Realbasic data types.

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** The plugin does conversion between Cocoa/Carbon data types and native REALbasic 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.

7.0.240 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.241 What classes to use for hotkeys?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.
Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

7.0.242 What do I need for Linux to get picture functions working?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.243 What does the NAN code mean?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

7.0.244 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:**

REALbasic 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
```

7.0.245 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.246 What is last plugin version to run on PPC?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.247 What is the difference between Timer and WebTimer?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Time is server side and WebTimer client side.
Notes: Timer is the normal timer class in Real Studio. 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.

7.0.248 What is the list of Excel functions?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.TOOLBAR, 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, CORREL, COS, COSH, COUNT, COUNTA, COUNTBLANK, COUNTIF, COVAR, CREATE.OBJECT, CRITBINOM, CUSTOM.REPEAT, CUSTOM.UNDO, DATE, DATEDIF, DATESTRING, DATEVALUE, DAVERAGE, DAY, DAYS360, DB, DBCS, DCOUNT, DCOUNTA, DDB, DEGREES, DELETE.BAR, DELETE.COMMAND, 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, EVALUATE, 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.TOOLBAR, GET.WINDOW, GET.WORKBOOK, GET.WORKSPACE, GETPIVOTDATA, GOTO, GROUP, GROWTH, HALT, HARMEAN, HELP, HLOOKUP, HOUR, HYPERLINK, HYPGEOMDIST, IF, INDEX, INDIRECT, INFO, INITIATE, INPUT, INT, INTERCEPT, IPMT, IRR, ISBLANK, ISERR, ISERROR, 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.COMMAND, N, NA, NAMES, NEGBINOMDIST, NEXT, NORMDIST, NORMINV, NORMSDIST, NORMSINV, NOT, NOTE, NOW, NPER, NPV, NUMBERSTRING, ODD, OFFSET, OPEN.DIALOG, OPTIONS.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, ROUNDBAHTUP, 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, STANDARDIZE, STDEV, STDEVA, STDEVP, STDEVPA, STEP, STEYX, SUBSTITUTE, SUBTOTAL, SUM, SUMIF, SUMPRODUCT, SUMSQ, SUMX2MY2, SUMX2PY2, SUMXMY2, SYD, T, TAN, TANH, TDIST, TERMINATE, TEXT, TEXT.BOX, TEXTREF, THAIDAYOFWEEK, THAIDIGIT, THAIMONTHOFYEAR, THAINUMSOUND, THAINUMSTRING, THAISTRINGLENGTH, THAIYEAR, TIME, TIMEVALUE, TINV, TODAY, TRANSPOSE, TREND, TRIM, TRIMMEAN, TRUE, TRUNC, TTEST, TYPE, UNREGISTER, UPPER, USDOLLAR, USERDEFINED, VALUE, VAR, VARA, VARP, VARPA, VDB, VIEW.GET, VLOOKUP, VOLATILE, WEEKDAY, WEIBULL, WHILE, WINDOW.TITLE, WINDOWS, YEAR and ZTEST.

7.0.249 What is the replacement for PluginMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** Use the SoftDeclareMBS class to load libraries dynamically.

7.0.250 What to do on Realbasic reporting a conflict?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

REALbasic 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.

7.0.251 What to do with a NSImageCacheException?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

7.0.252 What to do with MySQL Error 2014?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** You can get this error on MySQL if you have a recordset open while you create another one.

7.0.253 What ways do I have to ping?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **Answer:** You have different ways
Notes:

1. Use the shell class and the ping utility.

2. Use the MBS Network Plugin and there the SuperSocket part:

a) On Windows the ICMPPingMBS works to ping.
b) On Mac OS X it uses OpenTransport and needs root rights. You need to use sudo to run this application. This does not work on Intel Macs, because the plugin is not endian safe.

3. The DarwinPingMBS.Ping method:

Compiled for Mac OS X Macho target it works as a syncronized ping method.
The Windows version had a bug and was fixed in plugin version 8.2pr4. So it works now.

4. The DarwinPingMBS.SimplePing method:

Works on Mac OS X Macho target.

But this method can be called from a thread to make it working in background.

7.0.254 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetActiveDisplayList.

7.0.255 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetDisplaysWithPoint.

7.0.256 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetDisplaysWithRect.

7.0.257 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** This is now CGDisplayMBS.GetOnlineDisplayList.

7.0.258 Where is GetObjectClassNameMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.259 Where is NetworkAvailableMBS?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **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.

7.0.260 Where is StringHeight function in DynaPDF?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.261 Where is XLSDocumentMBS class?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:** This class has been removed in favor of XLBookMBS class.
Notes: This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

7.0.262 Where to get information about file formats?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

Please visit this web page:
http://www.wotsit.org

7.0.263 Where to register creator code for my application?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **Answer:**

Register at Apple:
http://developer.apple.com/dev/cftype/information.html

7.0.264 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.265 Which plugins are 64bit only?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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.

7.0.266 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **Answer:** Some RB versions require that you install DirectX from Microsoft on your Windows.

7.0.267 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.268 Why do I hear a beep on keydown?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.269 Why does folderitem.item return nil?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:** Because Realbasic 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.

7.0.270 Why doesn't showurl work?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: Yes. **Answer:**

There are three main reasons:

1. showurl is not supported by REALbasic 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.

7.0.271 Why have I no values in my chart?

Plugin Version: all, Console & Web: No, Mac: Yes, Win: Yes, Linux: No. **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.

7.0.272 Will application size increase with using plugins?

Plugin Version: all, Console & Web: No, Mac: No, Win: Yes, Linux: No. **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.

7.0.273 XLS: Custom format string guidelines

Plugin Version: all, Console & Web: No, Mac: Yes, Win: No, Linux: No. **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

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 PolarLayer.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.

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] The thousand separator. Should be a non-alphanumeric character (not 0-9, A-Z, a-z). Use ' textasciitilde ' for no thousand separator. The default is ' textasciitilde ', which can be modified using BaseChart.setNumberFormat.

[c] The decimal point character. The default is '.', which can be modified using BaseChart.setNumberFormat.

[d] The negative sign character. Use ' textasciitilde ' for no negative sign character. The default is '-', which can be modified using BaseChart.setNumberFormat.

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,,