

MBS Tools Plugin Documentation

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0.1 Introduction

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

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Chapter 4

Audio

4.1 class SoundFileInfoMBS

4.1.1 class SoundFileInfoMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for the file info of a sound file.

Notes: When you open a sound file, the library will fill this and provide you the file format details. When writing a sound file, you need to build valid format.

4.1.2 Properties

4.1.3 Channels as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of channels.

Notes: (Read and Write property)

4.1.4 Format as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The format ID.

Notes: See kFormat constants.
(Read and Write property)

4.1.5 FormatEndianName as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The endian description for the format.

Notes: (Read only property)

4.1.6 FormatName as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The format description for the format.

Notes: (Read only property)

4.1.7 FormatSubName as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The sub format description for the format.

Notes: (Read only property)

4.1.8 Frames as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of frames.

Notes: (Read and Write property)

4.1.9 IsValid as Boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether format is valid.

Notes: Returns true if valid.

(Read only property)

4.1.10 SampleRate as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The sample rate in Hz.

Notes: (Read and Write property)

4.1.11 Sections as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of sections.

Notes: (Read and Write property)

4.1.12 Seekable as Boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether format is seekable.

Notes: (Read and Write property)

4.1.13 Constants

Formats

Constant	Value	Description
kFormatAIFF	&h020000	Apple/SGI AIFF format (big endian).
kFormatAU	&h030000	Sun/NeXT AU format (big endian).
kFormatAVR	&h120000	Audio Visual Research
kFormatCAF	&h180000	Core Audio File format
kFormatEndianMask	&h30000000	Bitmask for the endian format.
kFormatFLAC	&h170000	FLAC lossless file format
kFormatHTK	&h100000	HMM Tool Kit format
kFormatIRCAM	&h0A0000	Berkeley/IRCAM/CARL
kFormatMAT4	&h0C0000	Matlab (tm) V4.2 / GNU Octave 2.0
kFormatMAT5	&h0D0000	Matlab (tm) V5.0 / GNU Octave 2.1
kFormatMPC2K	&h210000	Akai MPC 2000 sampler
kFormatNIST	&h070000	Sphere NIST format.
kFormatOGG	&h200000	Xiph OGG container
kFormatPAF	&h050000	Ensoniq PARIS file format.
kFormatPVF	&h0E0000	Portable Voice Format
kFormatRAW	&h040000	RAW PCM data.
kFormatRF64	&h220000	RF64 WAV file
kFormatSD2	&h160000	Sound Designer 2
kFormatSDS	&h110000	Midi Sample Dump Standard
kFormatSubMask	&h0000FFFF	Bitmask for the sub format.
kFormatSVX	&h060000	Amiga IFF / SVX8 / SV16 format.
kFormatTypeMask	&h0FFF0000	Bitmask for the type format.
kFormatVOC	&h080000	VOC files.
kFormatW64	&h0B0000	Sonic Foundry's 64 bit RIFF/WAV
kFormatWAV	&h010000	Microsoft WAV format (little endian default).
kFormatWAVEX	&h130000	MS WAVE with WAVEFORMATEX
kFormatWVE	&h190000	Psion WVE format
kFormatXI	&h0F0000	Fasttracker 2 Extended Instrument

Sub Formats

Constant	Value	Description
kFormatALAC16	&h0070	Apple Lossless Audio Codec (16 bit).
kFormatALAC20	&h0071	Apple Lossless Audio Codec (20 bit).
kFormatALAC24	&h0072	Apple Lossless Audio Codec (24 bit).
kFormatALAC32	&h0073	Apple Lossless Audio Codec (32 bit).
kFormatALAW	&h0011	A-Law encoded.
kFormatDouble	&h0007	64 bit float data
kFormatDPCM_16	&h0051	16 bit differential PCM (XI only)
kFormatDPCM_8	&h0050	8 bit differential PCM (XI only)
kFormatDWVW_12	&h0040	12 bit Delta Width Variable Word encoding.
kFormatDWVW_16	&h0041	16 bit Delta Width Variable Word encoding.
kFormatDWVW_24	&h0042	24 bit Delta Width Variable Word encoding.
kFormatDWVW_N	&h0043	N bit Delta Width Variable Word encoding.
kFormatFloat	&h0006	32 bit float data
kFormatG721_32	&h0030	32kbs G721 ADPCM encoding.
kFormatG723_24	&h0031	24kbs G723 ADPCM encoding.
kFormatG723_40	&h0032	40kbs G723 ADPCM encoding.
kFormatGSM610	&h0020	GSM 6.10 encoding.
kFormatIMA_ADPCM	&h0012	IMA ADPCM.
kFormatMS_ADPCM	&h0013	Microsoft ADPCM.
kFormatPCM16	&h0002	Signed 16 bit data
kFormatPCM24	&h0003	Signed 24 bit data
kFormatPCM32	&h0004	Signed 32 bit data
kFormatPCMS8	&h0001	Signed 8 bit data
kFormatPCMU8	&h0005	Unsigned 8 bit data (WAV and RAW only)
kFormatULAW	&h0010	U-Law encoded.
kFormatVORBIS	&h0060	Xiph Vorbis encoding.
kFormatVOX_ADPCM	&h0021	OKI / Dialogix ADPCM

Endian Formats

Constant	Value	Description
kFormatEndianBig	&h20000000	Force big endian-ness.
kFormatEndianCPU	&h30000000	Force CPU endian-ness.
kFormatEndianFile	&h00000000	Default file endian-ness.
kFormatEndianLittle	&h10000000	Force little endian-ness.

4.2 class SoundFileMBS

4.2.1 class SoundFileMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A cross platform class to use sndfile library to read/write audio samples.

Notes: As sndfile library is LGPL, you need to include library within your app folder and load it at runtime. This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [Write audio file with samples using AVFoundation](#)
- [MBS Xojo Plugins, version 17.4pr3](#)
- [LibSndfile and TagLib plugins for Xojo](#)

Videos

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

4.2.2 Methods

4.2.3 Close

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Closes file now.

Notes: Same as destructor, but you can call it early.

4.2.4 Constructor

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Private constructor.

4.2.5 Create(file as folderitem, Info as SoundFileInfoMBS) as SoundFileMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new audio file with given format.

Notes: On success returns new sound file object.

4.2.6 ErrorMessage(errorNumber as integer) as string

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries error message for error number.

See also:

- 4.2.38 ErrorMessage as String

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4.2.7 GetString(type as Integer) as string

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries one of the strings.

Notes: See kString* constants.

Returns "" in case of error.

4.2.8 Loaded as Boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether library is loaded.

4.2.9 LoadErrorMessage as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The error message from loading library.

4.2.10 LoadLibrary(file as folderitem) as boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loads sndfile library.

Notes: Returns true on error.

4.2.11 Open(data as MemoryBlock) as SoundFileMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an audio file from in memory data.

Notes: On success returns the sound file object.

See also:

- 4.2.12 `Open(data as String)` as `SoundFileMBS` 56
- 4.2.13 `Open(file as folderitem, readwrite As Boolean = False)` as `SoundFileMBS` 56

4.2.12 `Open(data as String)` as `SoundFileMBS`

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an audio file from in memory data.

Notes: On success returns the sound file object.

See also:

- 4.2.11 `Open(data as MemoryBlock)` as `SoundFileMBS` 55
- 4.2.13 `Open(file as folderitem, readwrite As Boolean = False)` as `SoundFileMBS` 56

4.2.13 `Open(file as folderitem, readwrite As Boolean = False)` as `SoundFileMBS`

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Opens an audio file.

Notes: On success returns the sound file object.

Pass `readwrite = true` to write to the file.

See also:

- 4.2.11 `Open(data as MemoryBlock)` as `SoundFileMBS` 55
- 4.2.12 `Open(data as String)` as `SoundFileMBS` 56

4.2.14 `ReadDouble(p as ptr, items as Int64)` as `Int64`

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads data as double values, converts if necessary.

Notes: Pointer should point to memmoryblock with $8 * \text{Items}$ in size.

Returns number of items read.

4.2.15 `ReadDoubleFrames(p as ptr, items as Int64)` as `Int64`

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads frames as double values, converts if necessary.

Notes: Pointer should point to memmoryblock with 8 * Items * Channels in size.
Returns number of items read.

4.2.16 ReadInt(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads data as Int32 values, converts if necessary.

Notes: Pointer should point to memmoryblock with 4 * Items in size.
Returns number of items read.

4.2.17 ReadIntFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads frames as Int32 values, converts if necessary.

Notes: Pointer should point to memmoryblock with 4 * Items * Channels in size.
Returns number of items read.

4.2.18 ReadRaw(p as ptr, bytes as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Read raw data.

Notes: Pointer should point to memmoryblock with Bytes in size.
Returns number of bytes read.

4.2.19 ReadShort(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads data as Int16 values, converts if necessary.

Notes: Pointer should point to memmoryblock with 2 * Items in size.
Returns number of items read.

4.2.20 ReadShortFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads frames as Int16 values, converts if necessary.

Notes: Pointer should point to memmoryblock with $2 * \text{Items} * \text{Channels}$ in size.
Returns number of items read.

4.2.21 ReadSingle(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads data as single values, converts if necessary.

Notes: Pointer should point to memmoryblock with $4 * \text{Items}$ in size.
Returns number of items read.

4.2.22 ReadSingleFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads frames as single values, converts if necessary.

Notes: Pointer should point to memmoryblock with $4 * \text{Items} * \text{Channels}$ in size.
Returns number of items read.

4.2.23 Seek(frames as Int64, whence as Integer) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Seeks within the audio file.

Notes: See kSeek* constants for whence parameter.

4.2.24 SetString(type as Integer, data as Memoryblock) as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets one of the strings.

Notes: See kString* constants.

Returns zero on success.

See also:

- 4.2.25 SetString(type as Integer, text as string) as Integer

4.2.25 SetString(type as Integer, text as string) as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets one of the strings.

Notes: See kString* constants.

Returns zero on success.

See also:

- 4.2.24 SetString(type as Integer, data as Memoryblock) as Integer

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4.2.26 Version as string

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries version of the library.

4.2.27 WriteDouble(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes data to file in double format.

Notes: Pointer should point to memmemoryblock with 8 * Items in size.

Returns number of items written.

4.2.28 WriteDoubleFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes frames to file in double format.

Notes: Pointer should point to memmemoryblock with 8 * Items * Channels in size.

Returns number of items written.

4.2.29 WriteInt(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes data to file in Int32 format.

Notes: Pointer should point to memmemoryblock with 4 * Items in size.

Returns number of items written.

4.2.30 WriteIntFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes frames to file in Int32 format.

Notes: Pointer should point to memmoryblock with $4 * \text{Items} * \text{Channels}$ in size.
Returns number of items written.

4.2.31 WriteRaw(p as ptr, bytes as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes raw data to file.

Notes: Pointer should point to memmoryblock with Bytes in size.
Returns number of bytes written.

4.2.32 WriteShort(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes data to file in Int16 format.

Notes: Pointer should point to memmoryblock with $2 * \text{Items}$ in size.
Returns number of items written.

4.2.33 WriteShortFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes frames to file in Int16 format.

Notes: Pointer should point to memmoryblock with $2 * \text{Items} * \text{Channels}$ in size.
Returns number of items written.

4.2.34 WriteSingle(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes data to file in single format.

Notes: Pointer should point to memmoryblock with $4 * \text{Items}$ in size.
Returns number of items written.

4.2.35 WriteSingleFrames(p as ptr, items as Int64) as Int64

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes frames to file in single format.

Notes: Pointer should point to memmoryblock with 4 * Items * Channels in size.
Returns number of items written.

4.2.36 WriteSync

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Writes recent changes in file to disk.

4.2.37 Properties

4.2.38 ErrorMessage as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last error message.

Notes: (Read only property)

See also:

- 4.2.6 ErrorMessage(errorNumber as integer) as string

55

4.2.39 ErrorNumber as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The last error number.

Notes: (Read only property)

4.2.40 Handle as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

4.2.41 Info as SoundFileInfoMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries current format.

Notes: (Read only property)

4.2.42 Constants

Seek Mode

Constant	Value	Description
kSeekCurrent	1	Seek relative to current position.
kSeekEnd	2	Seek relative to end.
kSeekSet	0	Seek relative to begin.

Strings

Constant	Value	Description
kStringAlbum	7	Album
kStringArtist	4	Artist
kStringComment	5	Comment
kStringCopyright	2	Copyright
kStringDate	6	Date
kStringGenre	10	Genre
kStringLicense	8	License
kStringSoftware	3	Software
kStringTitle	1	Title
kStringTrackNumber	9	Track Number.

4.3 class TagLibAudioPropertiesMBS

4.3.1 class TagLibAudioPropertiesMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for audio properties.

4.3.2 Properties

4.3.3 Bitrate as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The bit rate for the sound.

Notes: Returns the most appropriate bit rate for the file in kb/s. For constant bitrate formats this is simply the bitrate of the file. For variable bitrate formats this is either the average or nominal bitrate.
(Read and Write property)

4.3.4 Channels as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The number of channels.

Notes: (Read and Write property)

4.3.5 Length as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The length of the file in second.

Notes: (Read and Write property)

4.3.6 SampleRate as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The sample rate in Hz.

Notes: (Read and Write property)

4.4 class TagLibFileRefMBS

4.4.1 class TagLibFileRefMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for file loading in TagLib.

Notes: Uses TagLib, an open source library to read metadata from audio files, e.g. ID3 tags.

Currently it supports both ID3v1 and ID3v2 for MP3 files, Ogg Vorbis comments and ID3 tags and Vorbis comments in FLAC, MPC, Speex, WavPack, TrueAudio, WAV, AIFF, MP4 and ASF files.

Blog Entries

- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.1](#)
- [MBS Xojo Plugins, version 22.1pr4](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 19.4](#)
- [MBS Xojo Plugins, version 19.4pr8](#)
- [TagLib to write ID3v2 Tags in Xojo](#)
- [MBS Xojo Plugins, version 19.3pr4](#)
- [MBS Xojo Plugins, version 19.3pr3](#)
- [MBS Xojo Plugins, version 17.5pr1](#)

4.4.2 Methods

4.4.3 Constructor(file as folderitem)

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor.

Notes: Please point to valid audio file.

May raise error exception.

Uses TagLib, an open source library to read metadata from audio files, e.g. ID3 tags.

Currently it supports both ID3v1 and ID3v2 for MP3 files, Ogg Vorbis comments and ID3 tags and Vorbis comments in FLAC, MPC, Speex, WavPack, TrueAudio, WAV, AIFF, MP4 and ASF files.

4.4.4 CoverArt as Memoryblock

Plugin Version: 22.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns cover art.

Example:

```
// for testing a test file on desktop
dim ff as FolderItem = SpecialFolder.Desktop.Child("test.mp3")

Dim f As New TagLibFileRefMBS(ff)

// show cover art
Dim cover As MemoryBlock = f.CoverArt
If cover <> Nil Then
Dim p As Picture = picture.FromData(cover)

If p <> Nil Then
Dim pw As New PicWindow
pw.Backdrop = p
End If
End If
```

Notes: Should work for MP3, MP4 and FLAC files.

May return JPEG, PNG, GIF or BMP depending on what the file contains.

Result is nil, if there is no art found.

4.4.5 Save as Boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Saves changes to the file.

4.4.6 SetProperty(Dic as Dictionary)

Plugin Version: 19.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets audio tags for audio file.

Example:

```
Dim file As FolderItem = SpecialFolder.Desktop.Child("test.mp3")

Dim tag As New TagLibFileRefMBS(file)
Dim dic As Dictionary = tag.Properties

Break // inspect dictionary

dic.Value("ARTIST") = "John Doe"
dic.Value("ALBUM") = Nil // clear this one
```

```
tag.SetProperties(dic)
```

```
If tag.Save Then
  MsgBox "OK"
Else
  MsgBox "Failed to save"
End If
```

Notes: Please provide dictionary with new tags.

If tags are nil values, we remove them. If they are text values, we update the text.

4.4.7 Properties

4.4.8 audioProperties as TagLibAudioPropertiesMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries audio properties of the audio file.

Notes: (Read only property)

4.4.9 Handle as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

4.4.10 Properties as Dictionary

Plugin Version: 19.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries properties for this file.

Notes: Builds and returns a dictionary with all the properties found by the file handler.

This may include IDv3 tags.

List of ID3v2 tag names:

ALBUM, ALBUMARTIST, ALBUMARTISTSORT, ALBUMSORT, ARTIST, ARTISTSORT, ARTIST-
WEBPAGE, AUDIOSOURCEWEBPAGE, BPM, COMMENT, COMPOSER, CONDUCTOR, CONTENT-
GROUP, COPYRIGHT, COPYRIGHTURL, DATE, DISCNUMBER, ENCODEDBY, ENCODING, EN-

CODINGTIME, FILETYPE, FILEWEBPAGE, GENRE, INITIALKEY, INVOLVEDPEOPLE, ISRC, LABEL, LANGUAGE, LENGTH, LYRICIST, LYRICS, MEDIA, MOOD, MUSICIANCREDITS, ORIGINALALBUM, ORIGINALARTIST, ORIGINALDATE, ORIGINALFILENAME, ORIGINALLYLYRICIST, OWNER, PAYMENTWEBPAGE, PLAYLISTDELAY, PODCAST, PODCASTCATEGORY, PODCASTDESC, PODCASTID, PODCASTURL, PRODUCEDNOTICE, PUBLISHERWEBPAGE, RADIOSTATION, RADIOSTATIONOWNER, RADIOSTATIONWEBPAGE, RELEASEDATE, REMIXER, SUBTITLE, TAGGINGDATE, TITLE, TITLESORT, TRACKNUMBER, URL.

(Read only property)

4.4.11 tags as TagLibTagMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tags in that file.

Notes: (Read only property)

4.5 class TagLibTagMBS

4.5.1 class TagLibTagMBS

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for tags.

Notes: We do have common values in properties like title, comment and track. Other properties can be found in tags dictionary.

Please use TagLibFileRefMBS to load file and query it for the tags.

This is an attempt to abstract away the difference in the meta data formats of various audio codecs and tagging schemes. As such it is generally a subset of what is available in the specific formats but should be suitable for most applications. This is meant to compliment the generic APIs found in TagLibAudioPropertiesMBS and TagLibFileRefMBS.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [MBS Xojo Plugins, version 17.4pr3](#)
- [LibSndfile and TagLib plugins for Xojo](#)

Videos

- [XDC 2020 MBS Plugins Presentation](#)
- [Presentation from Munich conference about MBS Plugins.](#)

4.5.2 Methods

4.5.3 Constructor

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The private constructor.

4.5.4 setTags(Values as Dictionary) as Dictionary

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the tags.

Notes: Returns a new dictionary with values which are not supported.

4.5. CLASS TAGLIBTAGMBS

4.5.5 Properties

4.5.6 Album as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the album.

Notes: (Read and Write property)

4.5.7 Artist as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the artist.

Notes: (Read and Write property)

4.5.8 Comment as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The comment field.

Notes: (Read and Write property)

4.5.9 Genre as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The genre.

Notes: (Read and Write property)

4.5.10 Handle as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

4.5.11 isEmpty as Boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this tag set is empty.

Notes: (Read only property)

4.5.12 Tags as Dictionary

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries list of properties.

Notes: You get a copy as a dictionary with all keys and values.

Values could be strings or array of strings.

(Read only property)

4.5.13 Title as String

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The title.

Notes: (Read and Write property)

4.5.14 Track as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The track number.

Notes: (Read and Write property)

4.5.15 Year as Integer

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The year.

Notes: (Read and Write property)

Chapter 5

Clipper

5.1 class ClipperEngineMBS

5.1.1 class ClipperEngineMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The Clipper class encapsulates boolean operations on polygons (intersection, union, difference and XOR), which is also called polygon clipping.

Notes: Input polygons, both subject and clip sets, are passed to a Clipper object by its AddPath and AddPaths methods, and the clipping operation is performed by calling its Execute method. Multiple boolean operations can be performed on the same input polygon sets by repeat calls to Execute.

Videos

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

5.1.2 Methods

5.1.3 AddPath(path as ClipperPathMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.

Notes: 'Subject' paths may be either open (lines) or closed (polygons) or even a mixture of both, but 'clipping' paths must always be closed. Clipper allows polygons to clip both lines and other polygons, but doesn't allow lines to clip either lines or polygons.

With closed paths, orientation should conform with the filling rule that will be passed via Clipper's Execute

method.

Path Coordinate range:

Path coordinates must be between $\mp 4.6 \times 10^{18}$, otherwise a range error will be thrown when attempting to add the path to the Clipper object. If coordinates can be kept between $\mp 1.0 \times 10^9$, a modest increase in performance (approx. 15-20%) over the larger range can be achieved by avoiding large integer math.

Return Value:

The function will return false if the path is invalid for clipping. A path is invalid for clipping when:

- it has less than 2 vertices
- it has 2 vertices but is not an open path
- the vertices are all co-linear and it is not an open path

Returns true on success.

See also:

- 5.1.4 AddPath(path as ClipperPathMBS, PolyType as Integer, Closed as Boolean) as Boolean 72

5.1.4 AddPath(path as ClipperPathMBS, PolyType as Integer, Closed as Boolean) as Boolean

Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.

See also:

- 5.1.3 AddPath(path as ClipperPathMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean 71

5.1.5 AddPaths(paths as ClipperPathsMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.

Notes: 'Subject' paths may be either open (lines) or closed (polygons) or even a mixture of both, but 'clipping' paths must always be closed. Clipper allows polygons to clip both lines and other polygons, but

doesn't allow lines to clip either lines or polygons.

With closed paths, orientation should conform with the filling rule that will be passed via Clipper's Execute method.

Path Coordinate range:

Path coordinates must be between $\mp 4.6 \times 10^{18}$, otherwise a range error will be thrown when attempting to add the path to the Clipper object. If coordinates can be kept between $\mp 1.0 \times 10^9$, a modest increase in performance (approx. 15-20%) over the larger range can be achieved by avoiding large integer math.

Return Value:

The function will return false if the path is invalid for clipping. A path is invalid for clipping when:

- it has less than 2 vertices
- it has 2 vertices but is not an open path
- the vertices are all co-linear and it is not an open path

Returns true on success.

See also:

- 5.1.6 AddPaths(paths as ClipperPathsMBS, PolyType as Integer, Closed as Boolean) as Boolean 73

5.1.6 AddPaths(paths as ClipperPathsMBS, PolyType as Integer, Closed as Boolean) as Boolean

Plugin Version: 18.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Any number of subject and clip paths can be added to a clipping task, either individually via the AddPath() method, or as groups via the AddPaths() method, or even using both methods.

See also:

- 5.1.5 AddPaths(paths as ClipperPathsMBS, PolyType as ClipperMBS.PolyType, Closed as Boolean) as Boolean 72

5.1.7 Clear

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The Clear method removes any existing subject and clip polygons allowing the Clipper object to be reused for clipping operations on different polygon sets.

5.1.8 Constructor(`initOptions as integer = 0`)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The Clipper constructor creates an instance of the Clipper class.

Notes: One or more `InitOptions` may be passed as a parameter to set the corresponding properties. (These properties can still be set or reset after construction.)

Options:

<code>ReverseSolution</code>	1
<code>StrictlySimple</code>	2
<code>PreserveCollinear</code>	4

5.1.9 Execute(`clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType`) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.10 Execute(`clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType`) as Boolean 75
- 5.1.11 Execute(`clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType`) as Boolean 75
- 5.1.12 Execute(`clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType`) as Boolean 76
- 5.1.13 Execute(`clipType as Integer, byref solution as ClipperPathsMBS, fillType as Integer`) as Boolean 76
- 5.1.14 Execute(`clipType as Integer, byref solution as ClipperPathsMBS, subjFillType as Integer, clipFillType as Integer`) as Boolean 78
- 5.1.15 Execute(`clipType as Integer, byref solution as ClipperPolyTreeMBS, fillType as Integer`) as Boolean 78
- 5.1.16 Execute(`clipType as Integer, byref solution as ClipperPolyTreeMBS, subjFillType as Integer, clipFillType as Integer`) as Boolean 79

5.1.10 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPathsMBS, **subjFillType** as ClipperMBS.PolyFillType, **clipFillType** as ClipperMBS.PolyFillType) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.9 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPathsMBS, **fillType** as ClipperMBS.PolyFillType) as Boolean 74
- 5.1.11 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPolyTreeMBS, **fillType** as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.12 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPolyTreeMBS, **subjFillType** as ClipperMBS.PolyFillType, **clipFillType** as ClipperMBS.PolyFillType) as Boolean 76
- 5.1.13 Execute(**clipType** as Integer, **byref solution** as ClipperPathsMBS, **fillType** as Integer) as Boolean 76
- 5.1.14 Execute(**clipType** as Integer, **byref solution** as ClipperPathsMBS, **subjFillType** as Integer, **clipFillType** as Integer) as Boolean 78
- 5.1.15 Execute(**clipType** as Integer, **byref solution** as ClipperPolyTreeMBS, **fillType** as Integer) as Boolean 78
- 5.1.16 Execute(**clipType** as Integer, **byref solution** as ClipperPolyTreeMBS, **subjFillType** as Integer, **clipFillType** as Integer) as Boolean 79

5.1.11 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPolyTreeMBS, **fillType** as ClipperMBS.PolyFillType) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.9 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPathsMBS, **fillType** as ClipperMBS.PolyFillType) as Boolean 74
- 5.1.10 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPathsMBS, **subjFillType** as ClipperMBS.PolyFillType, **clipFillType** as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.12 Execute(**clipType** as ClipperMBS.ClipType, **byref solution** as ClipperPolyTreeMBS, **subjFillType** as ClipperMBS.PolyFillType, **clipFillType** as ClipperMBS.PolyFillType) as Boolean 76
- 5.1.13 Execute(**clipType** as Integer, **byref solution** as ClipperPathsMBS, **fillType** as Integer) as Boolean 76

- 5.1.14 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 78
- 5.1.15 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `fillType` as Integer) as Boolean 78
- 5.1.16 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 79

5.1.12 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPolyTreeMBS, `subjFillType` as ClipperMBS.PolyFillType, `clipFillType` as ClipperMBS.PolyFillType) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.9 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPathsMBS, `fillType` as ClipperMBS.PolyFillType) as Boolean 74
- 5.1.10 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPathsMBS, `subjFillType` as ClipperMBS.PolyFillType, `clipFillType` as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.11 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPolyTreeMBS, `fillType` as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.13 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `fillType` as Integer) as Boolean 76
- 5.1.14 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 78
- 5.1.15 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `fillType` as Integer) as Boolean 78
- 5.1.16 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 79

5.1.13 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `fillType` as Integer) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

Notes: Once subject and clip paths have been assigned (via `AddPath` and/or `AddPaths`), `Execute` can then perform the clipping operation (intersection, union, difference or XOR) specified by the `clipType` parameter.

The solution parameter can be either a Paths or PolyTree. The Paths is simpler than the PolyTree. Because of this it is quicker to populate and hence clipping performance is a little better (it's roughly 10% faster). However, the PolyTree class provides more information about the returned paths which may be important to users. Firstly, the PolyTree class preserves nested parent-child polygon relationships (ie outer polygons owning/containing holes and holes owning/containing other outer polygons etc). Also, only the PolyTree class can differentiate between open and closed paths since each PolyNode has an IsOpen property. (The Path structure has no member indicating whether it's open or closed.) For this reason, when open paths are passed to a Clipper object, the user must use a PolyTree object as the solution parameter, otherwise an exception will be raised.

When a PolyTree object is used in a clipping operation on open paths, two ancilliary functions have been provided to quickly separate out open and closed paths from the solution - ClipperMBS.OpenPathsFromPolyTree and ClipperMBS.ClosedPathsFromPolyTree. PolyTreeToPaths is also available to convert path data to a Paths structure (irrespective of whether they're open or closed).

There are several things to note about the solution paths returned:

- they aren't in any specific order
- they should never overlap or be self-intersecting (but see notes on rounding)
- holes will be oriented opposite outer polygons
- the solution fill type can be considered either EvenOdd or NonZero since it will comply with either filling rule
- polygons may rarely share a common edge (though this is now very rare as of version 6)

The subjFillType and clipFillType parameters define the polygon fill rule to be applied to the polygons (ie closed paths) in the subject and clip paths respectively. (It's usual though obviously not essential that both sets of polygons use the same fill rule.)

Execute can be called multiple times without reassigning subject and clip polygons (ie when different clipping operations are required on the same polygon sets).

See also:

- 5.1.9 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType) as Boolean 74
- 5.1.10 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPathsMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.11 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, fillType as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.12 Execute(clipType as ClipperMBS.ClipType, byref solution as ClipperPolyTreeMBS, subjFillType as ClipperMBS.PolyFillType, clipFillType as ClipperMBS.PolyFillType) as Boolean 76

- 5.1.14 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 78
- 5.1.15 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `fillType` as Integer) as Boolean 78
- 5.1.16 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 79

5.1.14 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.9 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPathsMBS, `fillType` as ClipperMBS.PolyFillType) as Boolean 74
- 5.1.10 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPathsMBS, `subjFillType` as ClipperMBS.PolyFillType, `clipFillType` as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.11 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPolyTreeMBS, `fillType` as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.12 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPolyTreeMBS, `subjFillType` as ClipperMBS.PolyFillType, `clipFillType` as ClipperMBS.PolyFillType) as Boolean 76
- 5.1.13 Execute(`clipType` as Integer, `byref solution` as ClipperPathsMBS, `fillType` as Integer) as Boolean 76
- 5.1.15 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `fillType` as Integer) as Boolean 78
- 5.1.16 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `subjFillType` as Integer, `clipFillType` as Integer) as Boolean 79

5.1.15 Execute(`clipType` as Integer, `byref solution` as ClipperPolyTreeMBS, `fillType` as Integer) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.9 Execute(`clipType` as ClipperMBS.ClipType, `byref solution` as ClipperPathsMBS, `fillType` as ClipperMBS.PolyFillType) as Boolean 74

- 5.1. *CLASS CLIPPERENGINEMBS* 79
- 5.1.10 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPathsMBS, *subjFillType* as ClipperMBS.PolyFillType, *clipFillType* as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.11 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPolyTreeMBS, *fillType* as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.12 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPolyTreeMBS, *subjFillType* as ClipperMBS.PolyFillType, *clipFillType* as ClipperMBS.PolyFillType) as Boolean 76
- 5.1.13 Execute(*clipType* as Integer, *byref solution* as ClipperPathsMBS, *fillType* as Integer) as Boolean 76
- 5.1.14 Execute(*clipType* as Integer, *byref solution* as ClipperPathsMBS, *subjFillType* as Integer, *clipFillType* as Integer) as Boolean 78
- 5.1.16 Execute(*clipType* as Integer, *byref solution* as ClipperPolyTreeMBS, *subjFillType* as Integer, *clipFillType* as Integer) as Boolean 79

5.1.16 Execute(*clipType* as Integer, *byref solution* as ClipperPolyTreeMBS, *subjFillType* as Integer, *clipFillType* as Integer) as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper engine.

See also:

- 5.1.9 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPathsMBS, *fillType* as ClipperMBS.PolyFillType) as Boolean 74
- 5.1.10 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPathsMBS, *subjFillType* as ClipperMBS.PolyFillType, *clipFillType* as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.11 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPolyTreeMBS, *fillType* as ClipperMBS.PolyFillType) as Boolean 75
- 5.1.12 Execute(*clipType* as ClipperMBS.ClipType, *byref solution* as ClipperPolyTreeMBS, *subjFillType* as ClipperMBS.PolyFillType, *clipFillType* as ClipperMBS.PolyFillType) as Boolean 76
- 5.1.13 Execute(*clipType* as Integer, *byref solution* as ClipperPathsMBS, *fillType* as Integer) as Boolean 76
- 5.1.14 Execute(*clipType* as Integer, *byref solution* as ClipperPathsMBS, *subjFillType* as Integer, *clipFillType* as Integer) as Boolean 78
- 5.1.15 Execute(*clipType* as Integer, *byref solution* as ClipperPolyTreeMBS, *fillType* as Integer) as Boolean 78

5.1.17 GetBounds(byref left as integer, byref top as integer, byref right as integer, byref bottom as integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This method returns the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.

Notes: This call is more efficient than querying all bounds properties.

5.1.18 Properties

5.1.19 BoundsBottom as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Bottom of bounds.

Notes: This method returns the bottom value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.

(Read only property)

5.1.20 BoundsLeft as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Left of bounds.

Notes: This method returns the left value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.

(Read only property)

5.1.21 BoundsRight as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Right of bounds.

Notes: This method returns the right value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.

(Read only property)

5.1.22 BoundsTop as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Top of bounds.

Notes: This method returns the top value of the axis-aligned bounding rectangle of all polygons that have been added to the Clipper object.

(Read only property)

5.1.23 Handle as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

5.1.24 Owner as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent object.

Notes: To avoid Xojo freeing the parent too quick, we keep a reference here.

(Read only property)

5.1.25 PreserveCollinear as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to preserve collinear in input polygons.

Notes: By default, when three or more vertices are collinear in input polygons (subject or clip), the Clipper object removes the 'inner' vertices before clipping. When enabled the PreserveCollinear property prevents this default behavior to allow these inner vertices to appear in the solution.

(Read and Write property)

5.1.26 ReverseSolution as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: When this property is set to true, polygons returned in the solution parameter of the Execute() method will have orientations opposite to their normal orientations.

Notes: (Read and Write property)

5.1.27 StrictlySimple as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to do strictly simple polygon.

Notes: Terminology:

- A simple polygon is one that does not self-intersect.
- A weakly simple polygon is a simple polygon that contains 'touching' vertices, or 'touching' edges.
- A strictly simple polygon is a simple polygon that does not contain 'touching' vertices, or 'touching' edges.

Vertices 'touch' if they share the same coordinates (and are not adjacent). An edge touches another if one of its end vertices touches another edge excluding its adjacent edges, or if they are co-linear and overlapping (including adjacent edges).

Polygons returned by clipping operations (see `Clipper.Execute()`) should always be simple polygons. When the `StrictlySimply` property is enabled, polygons returned will be strictly simple, otherwise they may be weakly simple. It's computationally expensive ensuring polygons are strictly simple and so this property is disabled by default.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

(Read and Write property)

5.1.28 Tag as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.

Notes: You can store here whatever value you like.

(Read and Write property)

5.2 class ClipperExceptionMBS

5.2.1 class ClipperExceptionMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The exception class for clipper.

Notes: Subclass of the RuntimeException class.

5.3 module ClipperMBS

5.3.1 module ClipperMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The central module for Clipper library methods.

Blog Entries

- [Did you try our new Clipper plugin classes?](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 18.0](#)
- [MBS Xojo Plugins, version 18.0pr7](#)

Xojo Developer Magazine

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

5.3.2 Methods

5.3.3 Area(path as ClipperPathMBS) as double

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function returns the area of the supplied polygon.

Notes: It's assumed that the path is closed and does not self-intersect. Depending on orientation, this value may be positive or negative. If Orientation is true, then the area will be positive and conversely, if Orientation is false, then the area will be negative.

5.3.4 CleanPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clean polygon.

Notes: Removes vertices:

that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)

that are within the specified distance of an adjacent vertex

that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices

Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately $\sqrt{2}$ so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit.

(If the edges are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the `InPoly` and `OutPolys` parameters can reference the same `Path` object though in that case the calling code might be clearer if the second definition (accepting a single `Paths` parameter) is used.

See also:

- 5.3.5 `CleanPolygon(Poly as ClipperPathMBS, distance as double = 1.415)` 85

5.3.5 `CleanPolygon(Poly as ClipperPathMBS, distance as double = 1.415)`

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a clean polygon.

Notes: Removes vertices:

that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)

that are within the specified distance of an adjacent vertex

that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices

Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately $\sqrt{2}$ so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit. (If the edges are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the `in_poly` and `out_poly` parameters can reference the same `Path` object though in that case the calling code might be clearer if the second definition (accepting a single `Paths` parameter) is used.

See also:

- 5.3.4 `CleanPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415)` 84

5.3.6 `CleanPolygons(InPoly as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415)`

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates clean polygons.

Notes: Removes vertices:

that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)

that are within the specified distance of an adjacent vertex

that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices

Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately $\sqrt{2}$ so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit. (If the edges are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the InPoly and OutPoly parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

See also:

- 5.3.7 CleanPolygons(Poly as ClipperPathsMBS, distance as double = 1.415) 86

5.3.7 CleanPolygons(Poly as ClipperPathsMBS, distance as double = 1.415)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates clean polygons.

Notes: Removes vertices:

that join co-linear edges, or join edges that are almost co-linear (such that if the vertex was moved no more than the specified distance the edges would be co-linear)

that are within the specified distance of an adjacent vertex

that are within the specified distance of a semi-adjacent vertex together with their out-lying vertices

Vertices are semi-adjacent when they are separated by a single (out-lying) vertex.

The distance parameter's default value is approximately $\sqrt{2}$ so that a vertex will be removed when adjacent or semi-adjacent vertices having their corresponding X and Y coordinates differing by no more than 1 unit. (If the edges are semi-adjacent the out-lying vertex will be removed too.)

This function is overloaded. In the first definition, the InPoly and OutPoly parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

See also:

- 5.3.6 CleanPolygons(InPoly as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, distance as double = 1.415) 85

5.3.8 ClosedPathsFromPolyTree(polytree as ClipperPolyTreeMBS, byref paths as ClipperPathsMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function filters out open paths from the PolyTree structure and returns only closed paths in a Paths structure.

5.3.9 EllipsePoints(Left as Double, Top as Double, Right as Double, Bottom as Double) as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates an ellipse as path of points with given bounding rectangle.

Example:

```
dim p as ClipperPathMBS = ClipperMBS.EllipsePoints(100,100,300,300)
```

5.3.10 MinkowskiDiff(poly1 as ClipperPathMBS, poly2 as ClipperPathMBS, byref solution as ClipperPathsMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates Minkowski Difference.

Notes: Minkowski Difference is performed by subtracting each point in a polygon from the set of points in an open or closed path. A key feature of Minkowski Difference is that when it's applied to two polygons, the resulting polygon will contain the coordinate space origin whenever the two polygons touch or overlap. (This function is often used to determine when polygons collide.)

In the image on the left the blue polygon is the 'minkowski difference' of the two red boxes. The black dot represents the coordinate space origin.

5.3.11 MinkowskiSum(pattern as ClipperPathMBS, path as ClipperPathMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates Minkowski sum.

Notes: Minkowski Addition is performed by adding each point in a polygon 'pattern' to the set of points in an open or closed path. The resulting polygon (or polygons) defines the region that the 'pattern' would pass over in moving from the beginning to the end of the 'path'.

See also:

- 5.3.12 MinkowskiSum(pattern as ClipperPathMBS, paths as ClipperPathsMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean) 88

5.3.12 MinkowskiSum(pattern as ClipperPathMBS, paths as ClipperPathsMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates Minkowski sum.

Notes: Minkowski Addition is performed by adding each point in a polygon 'pattern' to the set of points in an open or closed path. The resulting polygon (or polygons) defines the region that the 'pattern' would pass over in moving from the beginning to the end of the 'path'.

See also:

- 5.3.11 MinkowskiSum(pattern as ClipperPathMBS, path as ClipperPathMBS, byref solution as ClipperPathsMBS, pathIsClosed as boolean) 87

5.3.13 OpenPathsFromPolyTree(polytree as ClipperPolyTreeMBS, byref paths as ClipperPathsMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function filters out closed paths from the PolyTree structure and returns only open paths in a Paths structure.

5.3.14 Orientation(path as ClipperPathMBS) as boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries orientation of path.

Notes: Orientation is only important to closed paths. Given that vertices are declared in a specific order, orientation refers to the direction (clockwise or counter-clockwise) that these vertices progress around a closed path.

Orientation is also dependent on axis direction:

- On Y-axis positive upward displays, Orientation will return true if the polygon's orientation is counter-clockwise.
- On Y-axis positive downward displays, Orientation will return true if the polygon's orientation is clockwise.

Notes:

- Self-intersecting polygons have indeterminate orientations in which case this function won't return a meaningful value.

- The majority of 2D graphic display libraries (eg GDI, GDI+, XLib, Cairo, AGG, Graphics32) and even the SVG file format have their coordinate origins at the top-left corner of their respective viewports with their Y axes increasing downward. However, some display libraries (eg Quartz, OpenGL) have their coordinate origins undefined or in the classic bottom-left position with their Y axes increasing upward.
- For Non-Zero filled polygons, the orientation of holes must be opposite that of outer polygons.
- For closed paths (polygons) in the solution returned by Clipper's Execute method, their orientations will always be true for outer polygons and false for hole polygons (unless the ReverseSolution property has been enabled).

5.3.15 PointInPolygon(path as ClipperPathMBS, pt as ClipperPointMBS) as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns 0 when false, -1 when pt is on poly and +1 when pt is in poly.

Notes: It's assumed that 'poly' is closed and does not self-intersect.

5.3.16 PolyTreeToPaths(polytree as ClipperPolyTreeMBS, byref paths as ClipperPathsMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function converts a PolyTree structure into a Paths structure.

5.3.17 ReversePath(path as ClipperPathMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reverses the vertex order (and hence orientation) in the specified path.

5.3.18 ReversePaths(paths as ClipperPathsMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reverses the vertex order (and hence orientation) in each contained path.

5.3.19 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes self-intersections from the supplied polygon (by performing a boolean union operation using the nominated PolyFillType).

Notes: Polygons with non-contiguous duplicate vertices (ie 'touching') will be split into two polygons.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

See also:

- 5.3.20 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 90

5.3.20 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes self-intersections from the supplied polygon (by performing a boolean union operation using the nominated PolyFillType).

Notes: Polygons with non-contiguous duplicate vertices (ie 'touching') will be split into two polygons.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

See also:

- 5.3.19 SimplifyPolygon(InPoly as ClipperPathMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 90

5.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).

Notes: Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

See also:

- 5.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 91
- 5.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 91
- 5.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer) 92

5.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).

Notes: Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

See also:

- 5.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 90
- 5.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 91
- 5.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer) 92

5.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).

Notes: Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

See also:

- 5.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 90
- 5.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 91
- 5.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer) 92

5.3.24 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes self-intersections from the supplied polygons (by performing a boolean union operation using the nominated PolyFillType).

Notes: Polygons with non-contiguous duplicate vertices (ie 'vertices are touching') will be split into two polygons.

This function is overloaded. In the first definition, the InPolys and OutPolys parameters can reference the same Paths object though in that case the calling code might be clearer if the second definition (accepting a single Paths parameter) is used.

Note: There's currently no guarantee that polygons will be strictly simple since 'simplifying' is still a work in progress.

See also:

- 5.3.21 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 90
- 5.3.22 SimplifyPolygons(InPolys as ClipperPathsMBS, byref OutPolys as ClipperPathsMBS, fillType as Integer) 91
- 5.3.23 SimplifyPolygons(Polys as ClipperPathsMBS, fillType as ClipperMBS.PolyFillType = ClipperMBS.PolyFillType.EvenOdd) 91

5.3.25 TranslatePath(path as ClipperPathMBS, delta as ClipperPointMBS) as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Offsets each point in path by x and y.

Notes: Returns a new path.

See also:

- 5.3.26 TranslatePath(path as ClipperPathMBS, x as Int64, y as Int64) as ClipperPathMBS 93

5.3.26 TranslatePath(path as ClipperPathMBS, x as Int64, y as Int64) as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Offsets each point in path by x and y.

Notes: Returns a new path.

See also:

- 5.3.25 TranslatePath(path as ClipperPathMBS, delta as ClipperPointMBS) as ClipperPathMBS 93

5.3.27 Version as string

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries the version of the Clipper library used.

5.3.28 Constants

Constants

Constant	Value	Description
hiRange	&h3FFFFFFFFFFFFFFF	The higher range.
loRange	&h3FFFFFFF	The lower range.

5.4 class ClipperOffsetMBS

5.4.1 class ClipperOffsetMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The ClipperOffset class encapsulates the process of offsetting (inflating/deflating) both open and closed paths using a number of different join types and end types.

Notes: Preconditions for offsetting:

1. The orientations of closed paths must be consistent such that outer polygons share the same orientation, and any holes have the opposite orientation (ie non-zero filling). Open paths must be oriented with closed outer polygons.
2. Polygons must not self-intersect.

Limitations:

When offsetting, small artefacts may appear where polygons overlap. To avoid these artefacts, offset overlapping polygons separately.

Blog Entries

- [Did you try our new Clipper plugin classes?](#)

5.4.2 Methods

5.4.3 AddPath(path as ClipperPathMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a Path to a ClipperOffset object in preparation for offsetting.

Notes: Any number of paths can be added, and each has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.

See also:

- 5.4.4 AddPath(path as ClipperPathMBS, joinType as Integer, endType as Integer) 94

5.4.4 AddPath(path as ClipperPathMBS, joinType as Integer, endType as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a Path to a ClipperOffset object in preparation for offsetting.

Notes: Any number of paths can be added, and each has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have

at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.

See also:

- 5.4.3 AddPath(path as ClipperPathMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType) 94

5.4.5 AddPaths(paths as ClipperPathsMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds Paths to a ClipperOffset object in preparation for offsetting.

Notes: Any number of paths can be added, and each path has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.

See also:

- 5.4.6 AddPaths(paths as ClipperPathsMBS, joinType as Integer, endType as Integer) 95

5.4.6 AddPaths(paths as ClipperPathsMBS, joinType as Integer, endType as Integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds Paths to a ClipperOffset object in preparation for offsetting.

Notes: Any number of paths can be added, and each path has its own JoinType and EndType. All 'outer' Paths must have the same orientation, and any 'hole' paths must have reverse orientation. Closed paths must have at least 3 vertices. Open paths may have as few as one vertex. Open paths can only be offset with positive deltas.

See also:

- 5.4.5 AddPaths(paths as ClipperPathsMBS, joinType as ClipperMBS.JoinType, endType as ClipperMBS.EndType) 95

5.4.7 Clear

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This method clears all paths from the ClipperOffset object, allowing new paths to be assigned.

5.4.8 Constructor(`miterLimit` as double = 2.0, `roundPrecision` as double = 0.25)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Initializes the clipper offset.

Notes: The `ClipperOffset` constructor takes 2 optional parameters: `MiterLimit` and `ArcTolerance`. These two parameters corresponds to properties of the same name. `MiterLimit` is only relevant when `JoinType` is `jtMiter`, and `ArcTolerance` is only relevant when `JoinType` is `jtRound` or when `EndType` is `etOpenRound`.

5.4.9 Execute(`byref Paths` as `ClipperPathsMBS`, `delta` as double)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper offset engine.

Notes: This method takes two parameters. The first is the structure that receives the result of the offset operation (either a `PolyTree` or a `Paths` structure). The second parameter is the amount to which the supplied paths will be offset. Negative delta values shrink polygons and positive delta expand them.

This method can be called multiple times, offsetting the same paths by different amounts (ie using different deltas).

See also:

- 5.4.10 Execute(`byref PolyTree` as `ClipperPolyTreeMBS`, `delta` as double) 96

5.4.10 Execute(`byref PolyTree` as `ClipperPolyTreeMBS`, `delta` as double)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Executes the clipper offset engine.

Notes: This method takes two parameters. The first is the structure that receives the result of the offset operation (either a `PolyTree` or a `Paths` structure). The second parameter is the amount to which the supplied paths will be offset. Negative delta values shrink polygons and positive delta expand them.

This method can be called multiple times, offsetting the same paths by different amounts (ie using different deltas).

See also:

- 5.4.9 Execute(`byref Paths` as `ClipperPathsMBS`, `delta` as double) 96

5.4.11 Properties

5.4.12 ArcTolerance as Double

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The arc tolerance.

Notes: Firstly, this field/property is only relevant when JoinType = jtRound and/or EndType = etRound.

Since flattened paths can never perfectly represent arcs, this field/property specifies a maximum acceptable imprecision ('tolerance') when arcs are approximated in an offsetting operation. Smaller values will increase 'smoothness' up to a point though at a cost of performance and in creating more vertices to construct the arc.

The default ArcTolerance is 0.25 units. This means that the maximum distance the flattened path will deviate from the 'true' arc will be no more than 0.25 units (before rounding).

Reducing tolerances below 0.25 will not improve smoothness since vertex coordinates will still be rounded to integer values. The only way to achieve sub-integer precision is through coordinate scaling before and after offsetting (see example below).

It's important to make ArcTolerance a sensible fraction of the offset delta (arc radius). Large tolerances relative to the offset delta will produce poor arc approximations but, just as importantly, very small tolerances will substantially slow offsetting performance while providing unnecessary degrees of precision. This is most likely to be an issue when offsetting polygons whose coordinates have been scaled to preserve floating point precision.

Example:

Imagine a set of polygons (defined in floating point coordinates) that is to be offset by 10 units using round joins, and the solution is to retain floating point precision up to at least 6 decimal places.

To preserve this degree of floating point precision, and given that Clipper and ClipperOffset both operate on integer coordinates, the polygon coordinates will be scaled up by 108 (and rounded to integers) prior to offsetting. Both offset delta and ArcTolerance will also need to be scaled by this same factor. If ArcTolerance was left unscaled at the default 0.25 units, every arc in the solution would contain a fraction of 44 THOUSAND vertices while the final arc imprecision would be $0.25 \sqrt{108}$ units (ie once scaling was reversed). However, if 0.1 units was an acceptable imprecision in the final unscaled solution, then ArcTolerance should be set to $0.1 \sqrt{108}$ (0.1 $\sqrt{108}$). Now if scaling is applied equally to both ArcTolerance and to Delta Offset, then in this example the number of vertices (steps) defining each arc would be a fraction of 23.

The formula for the number of steps in a full circular arc is ... $\text{Pi} / \text{acos}(1 - \text{arc_tolerance} / \text{abs}(\text{delta}))$
(Read and Write property)

5.4.13 Handle as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

5.4.14 MiterLimit as Double

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The miter limit.

Notes: This property sets the maximum distance in multiples of delta that vertices can be offset from their original positions before squaring is applied. (Squaring truncates a miter by 'cutting it off' at $1/\sqrt{2}$ delta distance from the original vertex.)

The default value for MiterLimit is 2 (ie twice delta). This is also the smallest MiterLimit that's allowed. If mitering was unrestricted (ie without any squaring), then offsets at very acute angles would generate unacceptably long 'spikes'.

(Read and Write property)

5.4.15 Owner as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent object.

Notes: To avoid Xojo freeing the parent too quick, we keep a reference here.

(Read only property)

5.4.16 Tag as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.

Notes: You can store here whatever value you like.

(Read and Write property)

5.5 class ClipperPathMBS

5.5.1 class ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This class contains a sequence of IntPoint vertices defining a single contour (see also terminology).

Notes: Paths may be open and represent a series of line segments bounded by 2 or more vertices, or they may be closed and represent polygons. Whether or not a path is open depends on context. Closed paths may be 'outer' contours or 'hole' contours. Which they are depends on orientation.

Multiple paths can be grouped into a Paths class: ClipperPathsMBS.

5.5.2 Methods

5.5.3 Append(item as ClipperPointMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Appends a new point to the path.

See also:

- 5.5.4 Append(X as Int64, Y as Int64)

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5.5.4 Append(X as Int64, Y as Int64)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Appends a new path.

Notes: Without creating intermediate Xojo ClipperPointMBS object.

See also:

- 5.5.3 Append(item as ClipperPointMBS)

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5.5.5 Area as double

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This function returns the area of the supplied polygon.

Example:

```
dim points() as ClipperPointMBS
```

```

points.Append new ClipperPointMBS(1,2)
points.Append new ClipperPointMBS(4,2)
points.Append new ClipperPointMBS(4,6)
points.Append new ClipperPointMBS(1,6)

```

```

dim path as new ClipperPathMBS(points)
dim area as Double = path.Area

```

Notes: It's assumed that the path is closed and does not self-intersect. Depending on orientation, this value may be positive or negative. If Orientation is true, then the area will be positive and conversely, if Orientation is false, then the area will be negative.

5.5.6 Clear

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears the path.

5.5.7 Constructor

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty path.

See also:

- 5.5.8 Constructor(otherPath as ClipperPathMBS) 100
- 5.5.9 Constructor(points() as ClipperPointMBS) 100

5.5.8 Constructor(otherPath as ClipperPathMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new path with the copy of old path.

See also:

- 5.5.7 Constructor 100
- 5.5.9 Constructor(points() as ClipperPointMBS) 100

5.5.9 Constructor(points() as ClipperPointMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

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Function: Creates a new path with given points.

See also:

- 5.5.7 Constructor 100
- 5.5.8 Constructor(otherPath as ClipperPathMBS) 100

5.5.10 Equal(otherPath as ClipperPathMBS) as boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if two paths are equal.

Notes: Returns true if both are equal.

5.5.11 Insert(Index as Integer, item as ClipperPointMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inserts a point into the path at given index.

Notes: Index = 0 adds as first path.

5.5.12 Orientation as boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries orientation of path.

Example:

```
dim points() as ClipperPointMBS
```

```
points.Append new ClipperPointMBS(1,2)
points.Append new ClipperPointMBS(4,2)
points.Append new ClipperPointMBS(4,6)
points.Append new ClipperPointMBS(1,6)
```

```
dim path as new ClipperPathMBS(points)
dim Orientation as boolean = path.Orientation
```

Notes: Orientation is only important to closed paths. Given that vertices are declared in a specific order, orientation refers to the direction (clockwise or counter-clockwise) that these vertices progress around a closed path.

Orientation is also dependent on axis direction:

- On Y-axis positive upward displays, Orientation will return true if the polygon's orientation is counter-clockwise.
- On Y-axis positive downward displays, Orientation will return true if the polygon's orientation is clockwise.

Notes:

- Self-intersecting polygons have indeterminate orientations in which case this function won't return a meaningful value.
- The majority of 2D graphic display libraries (eg GDI, GDI+, XLib, Cairo, AGG, Graphics32) and even the SVG file format have their coordinate origins at the top-left corner of their respective viewports with their Y axes increasing downward. However, some display libraries (eg Quartz, OpenGL) have their coordinate origins undefined or in the classic bottom-left position with their Y axes increasing upward.
- For Non-Zero filled polygons, the orientation of holes must be opposite that of outer polygons.
- For closed paths (polygons) in the solution returned by Clipper's Execute method, their orientations will always be true for outer polygons and false for hole polygons (unless the ReverseSolution property has been enabled).

5.5.13 PointInPolygon(pt as ClipperPointMBS) as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns 0 when false, -1 when pt is on poly and +1 when pt is in poly.

Example:

```
dim points() as ClipperPointMBS
```

```
points.Append new ClipperPointMBS(1,2)
```

```
points.Append new ClipperPointMBS(4,2)
```

```
points.Append new ClipperPointMBS(4,6)
```

```
points.Append new ClipperPointMBS(1,6)
```

```
dim path as new ClipperPathMBS(points)
```

```
dim b1 as Integer = path.PointInPolygon(new ClipperPointMBS(2,2)) // -1 on line
```

```
dim b2 as Integer = path.PointInPolygon(new ClipperPointMBS(2,22)) // 0 outside
```

```
dim b3 as Integer = path.PointInPolygon(new ClipperPointMBS(2,3)) // 1 = inside
```

Notes: It's assumed that 'poly' is closed and does not self-intersect.

5.5.14 Remove(index as integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes a point.

5.5.15 ReversePath

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reverses the vertex order (and hence orientation) in the specified path.

5.5.16 TranslatePath(delta as ClipperPointMBS) as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Offsets each point in path by x and y.

Notes: Returns a new path.

See also:

- 5.5.17 TranslatePath(x as Int64, y as Int64) as ClipperPathMBS 103

5.5.17 TranslatePath(x as Int64, y as Int64) as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Offsets each point in path by x and y.

Notes: Returns a new path.

See also:

- 5.5.16 TranslatePath(delta as ClipperPointMBS) as ClipperPathMBS 103

5.5.18 Values as ClipperPointMBS()

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates copy of path as Xojo array or ClipperPointMBS.

5.5.19 ValuesToArray(dest() as ClipperPointMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds ClipperPointMBS objects for the points in the path to the Xojo array.

Notes: Mainly for older Xojo versions where the plugin can't create an array for you.

5.5.20 Properties

5.5.21 Count as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns number of points in path.

Notes: (Read only property)

5.5.22 Empty as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if path is empty.

Notes: (Read only property)

5.5.23 Handle as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

5.5.24 Owner as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent object.

Notes: To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

5.5.25 Tag as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.

Notes: You can store here whatever value you like.

(Read and Write property)

5.5.26 Value(Index as Integer) as ClipperPointMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries or sets a value in the path.

Notes: Raises exception if out of bounds.

(Read and Write computed property)

5.6 class ClipperPathsMBS

5.6.1 class ClipperPathsMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a list of paths.

Notes: This class is fundamental to the Clipper Library. It's a list or array of one or more Path structures. (The Path structure contains an ordered list of vertices that make a single contour.)

Paths may open (a series of line segments), or they may closed (polygons). Whether or not a path is open depends on context. Closed paths may be 'outer' contours or 'hole' contours. Which they are depends on orientation.

5.6.2 Methods

5.6.3 Append(item as ClipperPathMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Appends a new path to the paths.

5.6.4 Clear

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears the path.

5.6.5 Constructor

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty path.

See also:

- 5.6.6 Constructor(otherPaths as ClipperPathsMBS)

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5.6.6 Constructor(otherPaths as ClipperPathsMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new paths list with the copy of old paths list.

See also:

- 5.6.5 Constructor

5.6.7 Equal(otherPaths as ClipperPathsMBS) as boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if two path lists are equal.

Notes: Returns true if both are equal.

5.6.8 Insert(Index as Integer, item as ClipperPathMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inserts a path into the path list at given index.

Notes: Index = 0 adds as first point.

5.6.9 Remove(index as integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes a path.

5.6.10 Reverse

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reverses the vertex order (and hence orientation) in the specified paths.

5.6.11 Values as ClipperPathMBS()

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates copy of path list as Xojo array or ClipperPathMBS.

5.6.12 ValuesToArray(dest() as ClipperPathMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds ClipperPathMBS objects for the paths in the path list to the Xojo array.

Notes: Mainly for older Xojo versions where the plugin can't create an array for you.

5.6.13 Properties

5.6.14 Count as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns number of paths in paths.

Notes: (Read only property)

5.6.15 Empty as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if path list is empty.

Notes: (Read only property)

5.6.16 Handle as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

5.6.17 Owner as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent object.

Notes: To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

5.6.18 Tag as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.

Notes: You can store here whatever value you like.
(Read and Write property)

5.6.19 Value(Index as Integer) as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries or sets a value in the path.

Notes: Raises exception if out of bounds.
(Read and Write computed property)

5.7 class ClipperPointMBS

5.7.1 class ClipperPointMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a point.

Notes: All functions accept nil as a point with values 0/0.

5.7.2 Methods

5.7.3 Constructor(x as Int64 = 0, y as Int64 = 0)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new point with given values.

5.7.4 Equal(other as ClipperPointMBS) as boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compares two points.

Notes: Returns true if both have same value.

All functions accept nil as a point with values 0/0.

5.7.5 Point(x as Int64 = 0, y as Int64 = 0) as ClipperPointMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new point with given values.

5.7.6 Properties

5.7.7 X as Int64

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The x coordinate.

Notes: (Read and Write property)

5.7.8 Y as Int64

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The y coordinate.

Notes: (Read and Write property)

5.8 class ClipperPolyNodeMBS

5.8.1 class ClipperPolyNodeMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a poly node.

Notes: PolyNodes are encapsulated within a PolyTree container, and together provide a data structure representing the parent-child relationships of polygon contours returned by Clipper's Execute method.

A PolyNode object represents a single polygon. Its IsHole property indicates whether it's an outer or a hole. PolyNodes may own any number of PolyNode children (Childs), where children of outer polygons are holes, and children of holes are (nested) outer polygons.

5.8.2 Methods

5.8.3 Constructor

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor for a new object.

5.8.4 Properties

5.8.5 ChildCount as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the number of PolyNode Childs directly owned by the PolyNode object.

Notes: (Read only property)

5.8.6 Childs as ClipperPolyNodesMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The children.

Notes: A read-only list of PolyNode.

Outer PolyNode childs contain hole PolyNodes, and hole PolyNode childs contain nested outer PolyNodes. (Read only property)

5.8.7 Contour as ClipperPathMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a path list which contains any number of vertices.

Notes: (Read and Write property)

5.8.8 Handle as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

5.8.9 IsHole as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true when the PolyNode's polygon (Contour) is a hole.

Notes: Children of outer polygons are always holes, and children of holes are always (nested) outer polygons. The IsHole property of a PolyTree object is undefined but its children are always top-level outer polygons. (Read only property)

5.8.10 IsOpen as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true when the PolyNode's Contour results from a clipping operation on an open contour (path).

Notes: Only top-level PolyNodes can contain open contours. (Read only property)

5.8.11 NextNode as ClipperPolyNodeMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The returned Polynode will be the first child if any, otherwise the next sibling, otherwise the next sibling of the Parent etc.

Notes: A PolyTree can be traversed very easily by calling First() followed by NextNode in a loop until the returned object is a nil reference ... (Read only property)

5.8.12 Owner as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent object.

Notes: To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

5.8.13 ParentNode as ClipperPolyNodeMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the parent PolyNode.

Notes: The PolyTree object (which is also a PolyNode) does not have a parent and will return a null pointer.
(Read only property)

5.8.14 Tag as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.

Notes: You can store here whatever value you like.
(Read and Write property)

5.9 class ClipperPolyNodesMBS

5.9.1 class ClipperPolyNodesMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for the node list.

5.9.2 Methods

5.9.3 Append(item as ClipperPolyNodeMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Appends a new node to the node list.

5.9.4 Clear

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clears the node list.

5.9.5 Constructor

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty node list.

See also:

- 5.9.6 Constructor(otherPolyNodes as ClipperPolyNodesMBS) 115

5.9.6 Constructor(otherPolyNodes as ClipperPolyNodesMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new poly node list with the copy of old poly node list.

See also:

- 5.9.5 Constructor 115

5.9.7 Equal(otherPolyNodes as ClipperPolyNodesMBS) as boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if two node lists are equal.

Notes: Returns true if both are equal.

5.9.8 Insert(Index as Integer, item as ClipperPolyNodeMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Inserts a poly node into the node list at given index.

Notes: Index = 0 adds as first node.

5.9.9 Remove(index as integer)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes a node.

5.9.10 Values as ClipperPolyNodeMBS()

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates copy of node list as Xojo array or ClipperPolyNodeMBS.

5.9.11 Properties

5.9.12 Count as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns number of nodes.

Notes: (Read only property)

5.9.13 Empty as Boolean

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns true if list is empty.

Notes: (Read only property)

5.9.14 Handle as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

5.9.15 Owner as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent object.

Notes: To avoid Xojo freeing the parent too quick, we keep a reference here.
(Read only property)

5.9.16 Tag as Variant

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag value.

Notes: You can store here whatever value you like.
(Read and Write property)

5.9.17 Value(Index as Integer) as ClipperPolyNodeMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries or sets a value in the node list.

Notes: Raises exception if out of bounds.
(Read and Write computed property)

5.10 class ClipperPolyTreeMBS

5.10.1 class ClipperPolyTreeMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: PolyTree is intended as a read-only data structure that should only be used to receive solutions from clipping and offsetting operations.

Notes: It's an alternative to the Paths data structure which also receives these solutions. PolyTree's two major advantages over the Paths structure are: it properly represents the parent-child relationships of the returned polygons; it differentiates between open and closed paths. However, since PolyTree is a more complex structure than the Paths structure, and since it's more computationally expensive to process (the Execute method being roughly 5-10% slower), it should be used only when parent-child polygon relationships are needed, or when open paths are being 'clipped'.

An empty PolyTree object can be passed as the solution parameter in ClipperEngineMBS.Execute and in ClipperOffsetMBS.Execute. Once the clipping or offsetting operation is completed, the method returns with the PolyTree structure filled with data representing the solution.

A PolyTree object is a container for any number of PolyNode children, with each contained PolyNode representing a single polygon contour (either an outer or hole polygon). PolyTree itself is a specialized PolyNode whose immediate children represent the top-level outer polygons of the solution. (Its own Contour property is always empty.) The contained top-level PolyNodes may contain their own PolyNode children representing hole polygons that may also contain children representing nested outer polygons etc. Children of outers will always be holes, and children of holes will always be outers.

PolyTrees can also contain open paths. Open paths will always be represented by top level PolyNodes. Two functions are provided to quickly separate out open and closed paths from a polytree - OpenPathsFromPolyTree and ClosedPathsFromPolyTree.

Subclass of the ClipperPolyNodeMBS class.

5.10.2 Methods

5.10.3 Clear

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: This method clears any PolyNode children contained by PolyTree the object.

Notes: Clear does not need to be called explicitly. The Clipper.Execute method that accepts a PolyTree parameter will automatically clear the PolyTree object before propagating it with new PolyNodes. Likewise, PolyTree's destructor will also automatically clear any contained PolyNodes.

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5.10.4 Constructor

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new empty polytree.

See also:

- 5.10.5 Constructor(otherPolyNodes as ClipperPolyTreeMBS) 119

5.10.5 Constructor(otherPolyNodes as ClipperPolyTreeMBS)

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a copy of an existing poly tree.

See also:

- 5.10.4 Constructor 119

5.10.6 Properties

5.10.7 First as ClipperPolyNodeMBS

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first node.

Notes: This method returns the first outer polygon contour if any, otherwise a null pointer.

This function is almost equivalent to calling Childs [0] except that when a PolyTree object is empty (has no children), calling Childs [0] would raise an out of range exception.

(Read only property)

5.10.8 Total as Integer

Plugin Version: 18.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns the total number of PolyNodes (polygons) contained within the PolyTree.

Notes: This value is not to be confused with ChildCount which returns the number of immediate children only (Childs) contained by PolyTree.

(Read only property)

Chapter 6

CUPS

6.1 class CUPSDestinationMBS

6.1.1 class CUPSDestinationMBS

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The class for a CUPS destination.

Example:

```
dim lines(-1) as string
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
lines.append c.Name
next
```

```
MsgBox Join(lines,EndOfLine)
```

Blog Entries

- [About plug-in functions returning array](#)

6.1.2 Methods

6.1.3 Options as CUPSOOptionMBS()

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop only.

Function: Options values.

6.1.4 Properties

6.1.5 Instance as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Local instance name or "".

Notes: (Read and Write property)

6.1.6 isDefault as Boolean

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Is this printer the default?

Example:

```
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
if c.isDefault then
MsgBox c.Name
end if
next
```

Notes: (Read and Write property)

6.1.7 Name as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The name of the printer.

Example:

```
dim lines(-1) as string
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
lines.append c.Name
next
```

```
MsgBox Join(lines,EndOfLine)
```

Notes: (Read and Write property)

6.2 class CUPSErrorExceptionMBS

6.2.1 class CUPSErrorExceptionMBS

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The error exception raised by some CUPS functions.

Notes: Subclass of the RuntimeException class.

6.3 class CUPSJobMBS

6.3.1 class CUPSJobMBS

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The class for job details.

Example:

```

dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", true, CUPSMBS.kWhichJobsActive)

if UBound(jobs)<0 then
  MsgBox "no job"
else

  dim j as CUPSJobMBS = jobs(0)
  dim lines(-1) as string

  lines.Append "Title: "+j.Title
  lines.Append "User: "+j.User
  lines.Append "Format: "+j.Format
  lines.Append "Dest: "+j.Dest
  lines.Append "ID: "+str(j.ID)
  lines.Append "Priority: "+str(j.Priority)
  lines.Append "Size: "+str(j.Size)
  lines.Append "State: "+str(j.State)

  if j.CompletedTime<>nil then
    lines.Append "CompletedTime: "+j.CompletedTime.AbbreviatedDate+" "+j.CompletedTime.longtime
  else
    lines.Append "CompletedTime: nil"
  end if

  if j.CreationTime<>nil then
    lines.Append "CreationTime: "+j.CreationTime.AbbreviatedDate+" "+j.CreationTime.longtime
  else
    lines.Append "CreationTime: nil"
  end if

  if j.ProcessingTime<>nil then
    lines.Append "ProcessingTime: "+j.ProcessingTime.AbbreviatedDate+" "+j.ProcessingTime.longtime
  else
    lines.Append "ProcessingTime: nil"
  end if

  MsgBox join(lines,EndOfLine)

end if

```

6.3.2 Properties

6.3.3 CompletedDateTime as DateTime

Plugin Version: 20.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Time the job was completed.

Notes: Value is nil if the value is not set.

(Read and Write property)

6.3.4 CompletedTime as Date

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Time the job was completed.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsComplete)
```

```
if UBound(jobs)<0 then
```

```
  MsgBox "no job"
```

```
else
```

```
  dim j as CUPSJobMBS = jobs(0)
```

```
  MsgBox j.Title+" completed at "+j.CompletedTime.AbbreviatedDate+" "+j.CompletedTime.longtime
```

```
end if
```

Notes: Value is nil if the value is not set.

(Read and Write property)

6.3.5 CreationDateTime as DateTime

Plugin Version: 20.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Time the job was created.

Notes: Value is nil if the value is not set.

(Read and Write property)

6.3.6 CreationTime as Date

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Time the job was created.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsComplete)

if UBound(jobs)<0 then
  MsgBox "no job"
else
  dim j as CUPSJobMBS = jobs(0)

  MsgBox j.Title+" completed at "+j.CreationTime.AbbreviatedDate+" "+j.CreationTime.longtime
end if
```

Notes: Value is nil if the value is not set.
(Read and Write property)

6.3.7 Dest as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Printer or class name.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string

for each j as CUPSJobMBS in jobs
  lines.Append j.Dest
next

MsgBox Join(lines,EndOfLine)
```

Notes: (Read and Write property)

6.3.8 Format as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Document format.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", true, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string
```

```
for each j as CUPSJobMBS in jobs
lines.Append j.Format
next
```

```
MsgBox Join(lines,EndOfLine)
```

Notes: (Read and Write property)

6.3.9 ID as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The job ID.

Example:

```
dim jobs(-1) as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
MsgBox jobs(0).Title+" has ID "+str(jobs(0).ID)
```

Notes: (Read and Write property)

6.3.10 Priority as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Priority (1-100).

Example:

```
dim jobs(-1) as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
MsgBox jobs(0).Title+" has priority "+str(jobs(0).Priority)
```

Notes: (Read and Write property)

6.3.11 ProcessingDateTime as DateTime

Plugin Version: 20.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Time the job was processed.

Notes: Value is nil if the value is not set.

(Read and Write property)

6.3.12 ProcessingTime as Date

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Time the job was processed.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsComplete)

if UBound(jobs)<0 then
  MsgBox "no job"
else
  dim j as CUPSJobMBS = jobs(0)

  MsgBox j.Title+" completed at "+j.ProcessingTime.AbbreviatedDate+" "+j.ProcessingTime.longtime
end if
```

Notes: Value is nil if the value is not set.

(Read and Write property)

6.3.13 Size as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Size in kilobytes.

Example:

```
dim sum as Integer
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)

if UBound(jobs)<0 then
  MsgBox "no job"
else
  for each j as CUPSJobMBS in jobs
    sum=sum+j.Size
  next
```

```
MsgBox "Total size of all print jobs: "+str(sum)+" KB"
end if
```

Notes: (Read and Write property)

6.3.14 State as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Job state.

Example:

```
dim jobs(-1) as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim state as Integer = jobs(0).State // check state of first job
dim s as string = "?"
```

```
Select case state
case CUPSMBS.kJobAborted
s = "Aborted"
case CUPSMBS.kJobCanceled
s = "Canceled"
case CUPSMBS.kJobCompleted
s = "Completed"
case CUPSMBS.kJobHeld
s = "Held"
case CUPSMBS.kJobStopped
s = "Stopped"
case CUPSMBS.kJobPending
s = "Pending"
case CUPSMBS.kJobProcessing
s = "Processing"
end Select
```

```
MsgBox str(State)+"": "+s
```

Notes: (Read and Write property)

6.3.15 Title as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Title/job name.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string
```

```
for each j as CUPSJobMBS in jobs
lines.Append j.Title
next
```

```
MsgBox Join(lines,EndOfLine)
```

Notes: (Read and Write property)

6.3.16 User as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: User the submitted the job.

Example:

```
dim jobs() as CUPSJobMBS = CUPSMBS.GetJobs("", false, CUPSMBS.kWhichJobsAll)
dim lines(-1) as string
```

```
for each j as CUPSJobMBS in jobs
lines.Append j.User
next
```

```
MsgBox Join(lines,EndOfLine)
```

Notes: (Read and Write property)

6.4 module CUPSMBS

6.4.1 module CUPSMBS

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: All.

Function: The module to control the CUPS printing system.

Blog Entries

- [MBS Xojo / Real Studio Plugins, version 17.1pr1](#)
- [MBS Xojo / Real Studio Plugins, version 16.5pr2](#)
- [MBS Real Studio Plugins, version 12.5pr8](#)
- [About plug-in functions returning array](#)

6.4.2 Methods

6.4.3 CancelJob(name as string, job as Int32)

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Cancel a print job on the default server.

Notes: name: Name of printer or class

job: Job ID, kJobIDCurrent for the current job, or kJobIDAll for all jobs

Pass kJobIDAll to cancel all jobs or kJobIDCurrent to cancel the current job on the named destination.

Raises exception on error.

6.4.4 GetDefault as string

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Get the default printer or class for the default server.

Example:

```
MsgBox CUPSMBS.GetDefault
```

6.4.5 GetDestinations as CUPSDestinationMBS()

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Get the list of destinations from the default server.

Example:

```
dim lines(-1) as string
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
lines.append c.Name
next
```

```
MsgBox Join(lines,EndOfLine)
```

Notes: Starting with CUPS 1.2, the returned list of destinations include the printer-info, printer-is-accepting-jobs, printer-is-shared, printer-make-and-model, printer-state, printer-state-change-time, printer-state-reasons, and printer-type attributes as options. CUPS 1.4 adds the marker-change-time, marker-colors, marker-high-levels, marker-levels, marker-low-levels, marker-message, marker-names, marker-types, and printer-commands attributes as well.

6.4.6 GetJobs(name as string, OnlyMyJobs as boolean, whichjobs as Integer) as CUPSJobMBS()

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Get the jobs from the default server.

Notes: name: "" = all destinations, otherwise show jobs for named destination

OnlyMyJobs: false = all users, true = mine

whichjobs: kWhichJobsAll, kWhichJobsActive, or kWhichJobsComplete

A "whichjobs" value of kWhichJobsAll returns all jobs regardless of state, while kWhichJobsActive returns jobs that are pending, processing, or held and kWhichJobsComplete returns jobs that are stopped, canceled, aborted, or completed.

6.4.7 GetPassword(prompt as string) as string

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Get a password from the user.

Notes: Returns "" if the user does not provide a password.

6.4.8 GetPPD(name as string) as string

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Get the PPD file for a printer on the default server.

Example:

```
for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
if c.isDefault then
MsgBox cupsmbs.GetPPD(c.Name)
end if
next
```

Notes: Returns Filename for PPD file.

For classes, cupsGetPPD returns the PPD file for the first printer in the class.

The returned filename is stored in a static buffer and is overwritten with each call to cupsGetPPD or cupsGetPPD2. The caller "owns" the file that is created and must unlink the returned filename.

6.4.9 LastError as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Return the last IPP status code.

6.4.10 LastErrorString as string

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Return the last IPP status-message.

Example:

```
MsgBox CUPSMBS.LastErrorString
```

Notes: Returns status-message text from last request.

6.4.11 PrintData(name as string, Data as String, Title as string) as Integer

Plugin Version: 16.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Print a file to a printer or class on the default server.

Notes: Name: Destination name

Data: Data to print
 Title: Title of job

Returns Job ID or 0 on error

6.4.12 PrintFile(name as string, file as folderitem, title as string) as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Print a file to a printer or class on the default server.

Example:

```
// Print file on default printer...
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ps")

for each c as CUPSDestinationMBS in CUPSMBS.GetDestinations
if c.isDefault then

call CUPSMBS.PrintFile(c.Name, f, f.Name)

end if
next
```

Notes: name: Destination name
 filename: File to print
 title: Title of job

Returns Job ID or 0 on error

See also:

- 6.4.13 PrintFile(name as string, file as folderitem, title as string, options() as CUPSOOptionMBS) as Integer 134

6.4.13 PrintFile(name as string, file as folderitem, title as string, options() as CUPSOOptionMBS) as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Print a file to a printer or class on the default server.

Notes: name: Destination name
 filename: File to print
 title: Title of job

options: Options

Returns Job ID or 0 on error

See also:

- 6.4.12 PrintFile(name as string, file as folderitem, title as string) as Integer 134

6.4.14 PrintFiles(name as string, files() as folderitem, title as string) as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Print files to a printer or class on the default server.

Notes: name: Destination name

filename: Files to print

title: Title of job

Returns Job ID or 0 on error

See also:

- 6.4.15 PrintFiles(name as string, files() as folderitem, title as string, options() as CUPSOOptionMBS) as Integer 135

6.4.15 PrintFiles(name as string, files() as folderitem, title as string, options() as CUPSOOptionMBS) as Integer

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Print files to a printer or class on the default server.

Notes: name: Destination name

files: Files to print

title: Title of job

options: Options

Returns Job ID or 0 on error

See also:

- 6.4.14 PrintFiles(name as string, files() as folderitem, title as string) as Integer 135

6.4.16 Server as string

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Return the hostname/address of the default server.

Example:

MsgBox CUPSMBS.Server

Notes: The returned value can be a fully-qualified hostname, a numeric IPv4 or IPv6 address, or a domain socket pathname.

6.4.17 SetDefaultPrinter(printer as string)

Plugin Version: 12.5, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Sets the default printer.

Notes: Name must be one of CUPSDestinationMBS's name.

6.4.18 SetServer(server as string)

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Set the default server name.

Notes:

server: Server name

The "server" string can be a fully-qualified hostname, a numeric IPv4 or IPv6 address, or a domain socket pathname. Pass "" to restore the default server name.

6.4.19 SetUser(user as string)

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Set the default user name.

Notes: user: User name

Pass "" to restore the default user name.

6.4.20 User as string

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Return the current user's name.

Example:

```
MsgBox CUPSMBS.User
```

6.4.21 Constants

Constants

Constant	Value	Description
kJobAborted	8	One of the constants for the job state. Job was aborted.
kJobCanceled	7	One of the constants for the job state. Job was canceled.
kJobCompleted	9	One of the constants for the job state. Job was completed.
kJobHeld	4	One of the constants for the job state. Job is held.
kJobIDAll	-1	A job constant for all jobs.
kJobIDCurrent	0	A job constant for the current job.
kJobPending	3	One of the constants for the job state. Job is pending
kJobProcessing	5	One of the constants for the job state. Job is processing.
kJobStopped	6	One of the constants for the job state. Job is stopped.
kPrinterAUTHENTICATED	&h400000	One of the printer type/capability bit constants. Printer requires authentication
kPrinterBIND	&h0400	One of the printer type/capability bit constants. Can bind output
kPrinterBW	&h0004	One of the printer type/capability bit constants. Can do B&W printing
kPrinterCLASS	&h0001	One of the printer type/capability bit constants. Printer class
kPrinterCOLLATE	&h0080	One of the printer type/capability bit constants. Can collage copies
kPrinterCOLOR	&h0008	One of the printer type/capability bit constants. Can do color printing
kPrinterCOMMANDS	&h800000	One of the printer type/capability bit constants. Printer supports maintenance commands
kPrinterCOPIES	&h0040	One of the printer type/capability bit constants. Can do copies
kPrinterCOVER	&h0200	One of the printer type/capability bit constants. Can cover output
kPrinterDEFAULT	&h20000	One of the printer type/capability bit constants. Default printer on network
kPrinterDELETE	&h100000	One of the printer type/capability bit constants. Delete printer
kPrinterDISCOVERED	&h1000000	One of the printer type/capability bit constants. Printer was automatically discovered and added.
kPrinterDUPLEX	&h0010	One of the printer type/capability bit constants. Can do duplexing
kPrinterFAX	&h40000	One of the printer type/capability bit constants. Fax queue
kPrinterIMPLICIT	&h10000	One of the printer type/capability bit constants. Implicit class
kPrinterLARGE	&h4000	One of the printer type/capability bit constants. Can do D/E/A1/A0
kPrinterLOCAL	&h0000	One of the printer type/capability bit constants. Local printer or class
kPrinterMEDIUM	&h2000	One of the printer type/capability bit constants. Can do Tabloid/B/C/A3/A2
kPrinterMFP	&h4000000	One of the printer type/capability bit constants. Printer with scanning capabilities
kPrinterNotShared	&h200000	One of the printer type/capability bit constants. Printer is not shared.
kPrinterOPTIONS	&h6fffc	One of the printer type/capability bit constants.
kPrinterPUNCH	&h0100	One of the printer type/capability bit constants.

6.5 class CUPSMissingFunctionExceptionMBS

6.5.1 class CUPSMissingFunctionExceptionMBS

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The exception raised if a CUPS function is not found.

Notes: On Windows this method is raised for each function you call.

Subclass of the RuntimeException class.

6.6 class CUPSOptionMBS

6.6.1 class CUPSOptionMBS

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: The class for the options in CUPS.

Example:

```
dim options() as CUPSOptionMBS
```

```
dim o1 as new CUPSOptionMBS
o1.Name = "media"
o1.Value = "A4"
options.Append o1
```

```
dim o2 as new CUPSOptionMBS
o2.Name = "scaling"
o2.Value = "75"
options.Append o2
```

```
dim o3 as new CUPSOptionMBS
o3.Name = "Collate"
o3.Value = "True"
options.Append o3
```

```
dim o4 as new CUPSOptionMBS
o4.Name = "sides"
o4.Value = "two-sided-long-edge"
options.Append o4
```

6.6.2 Properties

6.6.3 Name as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Name of option.

Notes: (Read and Write property)

6.6.4 Value as String

Plugin Version: 9.7, Platforms: macOS, Linux, Targets: Desktop, Console & Web.

Function: Value of option.

Notes: (Read and Write property)

Chapter 7

JavaScript

7.1 class JavaScriptDateComponentsMBS

7.1.1 class JavaScriptDateComponentsMBS

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

Function: The class for date components in JavaScript.

Example:

```
Dim j As New JavaScriptEngineMBS

// get now
Dim t1 As Double = j.Now

// as components
Dim d1 As JavaScriptDateComponentsMBS = j.TimeToDateComponents(t1)
Dim s1 As String = d1.SQLDateTime
// looks right?

// now convert back
Dim t2 As Double = j.DateComponentsToTime(d1)
Dim d2 As JavaScriptDateComponentsMBS = j.TimeToDateComponents(t2)
Dim s2 As String = d2.SQLDateTime
// still looks right?

Dim t3 As Double = j.DateComponentsToTime(d2)
// should be same time as above, but without fractions

Break
```

Blog Entries

- [News from the MBS Xojo Plugins Version 20.1](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1](#)
- [MBS Xojo Plugins, version 20.1pr1](#)

7.1.2 Properties

7.1.3 DateTimeValue as DateTime

Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The components as Xojo dateTime.

Notes: Convenience function to create date with UTC and values from this object.

(Read only property)

7.1.4 DateValue as Date

Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The components as Xojo date.

Notes: Convenience function to create date with UTC and values from this object.

(Read only property)

7.1.5 Day as Integer

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

Function: The day value.

Notes: Ranges from 1 to 31.

(Read and Write property)

7.1.6 Hour as Integer

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

Function: The hour.

Notes: (Read and Write property)

7.1.7 Millisecond as Integer

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

Function: The milliseconds.

Notes: (Read and Write property)

7.1.8 Minute as Integer

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

Function: The minutes.

Notes: (Read and Write property)

7.1.9 Month as Integer

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

Function: The month value.

Notes: Range is 1 to 12.
(Read and Write property)

7.1.10 Second as Integer

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

Function: The seconds.

Notes: (Read and Write property)

7.1.11 SQLDateTime as String

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

Function: The SQL date and time.

Notes: Convenience property to see value in debugger.
(Read only property)

7.1.12 WeekDay as Integer

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

Function: The week day value.

Notes: Range is 0 to 6. Sunday is 0, Monday is 1, Tuesday is 2, Wednesday is 3, Thursday is 4, Friday is 5 and Saturday is 6.

(Read and Write property)

7.1.13 Year as Integer

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

Function: The year value.

Notes: (Read and Write property)

7.2 class JavaScriptEngineExceptionMBS

7.2.1 class JavaScriptEngineExceptionMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a fatal exception in our JavaScript engine.

Notes: See message property for reason of the exception.

Subclass of the RuntimeException class.

Blog Entries

- [Our JavaScript engine for Xojo](#)

7.3 class JavaScriptEngineMBS

7.3.1 class JavaScriptEngineMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for our embedded JavaScript engine.

Notes: We use Duktape, an embeddable Javascript engine, with a focus on portability and compact footprint.

<https://duktape.org>

Your own JavaScript engine is useful for:

- Running some snippet of JavaScript code without HTMLViewer.
- Using various JavaScript libraries
- Providing a scripting language to your own application.
- An lightweight alternative to XojoScript.
- Working with JSON data
- Enjoy using regular expressions, unicode text functions, number parsing and formatting with no platform dependencies

MBS Plugin added Input(), Yield() and Print() functions for your convenience.

Yield will pass CPU control to other threads, so background tasks continue to run.

MBS Plugin can convert JavaScript values to variant.

Boolean ->Boolean

Number ->Double

String ->String

Buffer ->MemoryBlock

Pointer ->Ptr

Array ->Variant array

Object ->JSON string

null ->nil

We convert variant to JavaScript:

nil ->>null

Int32, Int64, Single, Double, Currency ->Number

Boolean ->Boolean

String, Text, Date ->String

Ptr ->Pointer

all other ->undefined

This class is like XojoScript, but using JavaScript as language.

Warning: error handling is broken in version 21.1 of the MBS Plugin. Please update to 22.2 for a fix.

Blog Entries

- [MBS Xojo Plugin, June 2021 News](#)
- [News from the MBS Xojo Plugins Version 20.1](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1](#)
- [Multithreaded JavaScript usage](#)
- [Our JavaScript engine, a game changer](#)
- [Tips for our JavaScript functions](#)
- [Comparing JavaScriptEngineMBS to XojoScript](#)
- [New in the MBS Xojo Plugins 20.0](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0](#)
- [Our JavaScript engine for Xojo](#)

Videos

- [XDC 2020 MBS Plugins Presentation](#)
- [MBS Xojo Videos - MBS Xojo Plugin, June 2021 News](#)

Xojo Developer Magazine

- 19.5, pages 92 to 93: JavaScript in Xojo, Running JavaScript in your Xojo apps by Stefanie Juchmes
- 19.4, page 9: News
- 18.3, page 47: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes
- 18.3, page 10: News

7.3.2 Methods

7.3.3 AddFunction(Name as String, JavaScript as String, FileName as String = "")

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a global function defined as a text string.

Example:

```
Dim j As New JavaScriptEngineMBS
j.AddFunction "adder", "function (x,y) { return x+y; } "
```

Notes: Optional provide a file name to show in stack traces.

Function source code may contain a function name, but we use only the name parameter to register the function as global one.

7.3.4 CallFunction(Name as String, ParamArray Params as Variant) as Variant

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calls a global function given the name.

Example:

```
Dim j As New JavaScriptEngineMBS

// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "

// call it
Dim r As Variant = j.CallFunction("adder", 2, 3)
Break // check result in debugger
```

Notes: Parameters are passed to the function.

If the function needs more parameter, undefined values are used to fill up.

If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.

See also:

- 7.3.5 CallFunction(Name as String, Params() as Variant) as Variant

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7.3.5 CallFunction(Name as String, Params() as Variant) as Variant

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calls a global function given the name.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "

// call it
Dim Params() As Variant
params.Append 3
params.Append 4
params.Append 5 // one too much ->will be ignored
Dim r As Variant = j.CallFunction("adder", params)
Break // check result in debugger
```

Notes: Parameters are passed to the function.

If the function needs more parameter, undefined values are used to fill up.

If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.

See also:

- 7.3.4 CallFunction(Name as String, ParamArray Params as Variant) as Variant

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7.3.6 CallFunctionMT(Name as String, ParamArray Params as Variant) as Variant

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

Function: Calls a global function given the name.

Notes: Threaded version of CallFunction. If events or delegates are called on main thread, the preemptive thread waits for answer.

Parameters are passed to the function.

If the function needs more parameter, undefined values are used to fill up.

If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 7.3.7 CallFunctionMT(Name as String, Params() as Variant) as Variant

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7.3.7 CallFunctionMT(Name as String, Params() as Variant) as Variant

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

Function: Calls a global function given the name.

Notes: Threaded version of CallFunction. If events or delegates are called on main thread, the preemptive thread waits for answer.

Parameters are passed to the function.

If the function needs more parameter, undefined values are used to fill up.

If the function needs less parameters, additional ones are dropped.

Returns the result of the function converted to a variant.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 7.3.6 CallFunctionMT(Name as String, ParamArray Params as Variant) as Variant 151

7.3.8 DateComponentsToTime(date as JavaScriptDateComponentsMBS) as Double

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

Function: Converts date components to time.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
Dim d As New JavaScriptDateComponentsMBS
```

```
d.Year = 1970
```

```
d.Month = 1
```

```
d.day = 1
```

```
// shows zero as that's the start point in time for unix
MsgBox "Start Time: "+Str(j.DateComponentsToTime(d))
```

Notes: Convert components (year, month, day, etc), interpreted in UTC, into a time value. The weekday argument is ignored in the conversion. If the component values are invalid, an error is thrown.

There are some differences to the ECMAScript Date.UTC() built-in:

- There's no special handling of two-digit years. For example, `Date.UTC(99, 0, 1)` gets interpreted as 1999-01-01. If time is 99, it's interpreted as the year 99.
- The milliseconds component is allowed fractions (sub-millisecond resolution) so that the resulting time value may have fractions.

Like the ECMAScript primitives, the components can exceed their natural range and are normalized. For example, specifying minute as 120 is interpreted as adding 2 hours to the time value. The components are expressed as Integers to allow large and negative values to be used.

7.3.9 Destructor

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The destructor.

7.3.10 Evaluate(JavaScript as String) as Variant

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates a JavaScript expression.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
Dim v As Variant = j.Evaluate("2+3")  
MsgBox v.StringValue
```

Notes: This may include definition of functions and objects and using them. Result is converted to variant and returned.

7.3.11 EvaluateMT(JavaScript as String) as Variant

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

Function: Evaluates a JavaScript expression.

Notes: Threaded version of Evaluate. If events or delegates are called on main thread, the preemptive thread waits for answer.

This may include definition of functions and objects and using them. Result is converted to variant and returned.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

7.3.12 EvaluateToString(JavaScript as String) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Evaluates a JavaScript expression.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
Dim s As String = j.EvaluateToString("2+3")
MsgBox s
```

Notes: This may include definition of functions and objects and using them. Result is converted to string in JavaScript and returned as Xojo string.

7.3.13 InitModules

Plugin Version: 21.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Installs Duktape module loading.

Notes: Only calls JS.InitModules once on a new instance of the JavaScript engine.

Define your own Duktape.modSearch() to provide environment specific module lookups.

After these steps, require() will be registered to the global object and the module system is ready to use.

7.3.14 LoadFunction(Name as String, Data as Memoryblock) as Boolean

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loads a global function from byte code.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
// just add a function
j.AddFunction "adder", "function (x,y) { return x+y; } "
```

```
// get byte code
```

```
Dim m As MemoryBlock = j.SaveFunction("adder")
```

```
// and load back with new name
dim b as Boolean = j.LoadFunction("adder2", m)

// call it
Dim r As Variant = j.CallFunction("adder2", 2, 3)
break // check result in debugger
```

Notes: Load a buffer containing bytecode, recreating the original ECMAScript function (with some limitations). You must ensure that the bytecode has been dumped with a compatible Duktape version and that the bytecode has not been modified since. Loading bytecode from an untrusted source is memory unsafe and may lead to exploitable vulnerabilities.

Returns true in case of success or false on failure.

7.3.15 Now as Double

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

Function: Queries current time as double value.

Notes: This is seconds since 1st January 1970 multiplied by 1000 and may contain fraction with microseconds.

Get current time in POSIX milliseconds, as seen by the ECMAScript environment. The return value matches `Date.now()` with the reservation that sub-millisecond resolution may be available.

7.3.16 RegisterFunction(Name as String, theDelegate as JavaScriptEngineDelegateMBS, ArgCount as Integer = -1, tag as Variant = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Registers a global function with given name to call delegate.

Example:

```
Dim j As New JavaScriptEngineMBS

j.RegisterFunction "MyFunction", AddressOf testFunction, 1, Nil

// call in JavaScript
Dim x As Variant = j.Evaluate("MyFunction(123);")

// call via plugin
```

```
Dim r As Variant = j.CallFunction("MyFunction", "Hello")
```

Break

```
'Public Function testFunction(Name as String, Params() as Variant, tag as Variant) as Variant
' MsgBox params(0).StringValue
' Return "ok"
'End Function
```

Notes: ArgCount can be in range from -1 to 15.

If -1 is passed, we allow variable number of arguments.

Tag is passed to delegate and allows you to pass a context object to the delegate.

7.3.17 SaveFunction(Name as String) as MemoryBlock

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries byte code for global JavaScript function.

Example:

```
Dim j As New JavaScriptEngineMBS

// just add a function
j.AddFunction "add", "function (x,y) { return x+y; } "

// get byte code
Dim m As MemoryBlock = j.SaveFunction("add")

// and load back with new name
dim b as Boolean = j.LoadFunction("add2", m)

// call it
Dim r As Variant = j.CallFunction("add2", 2, 3)
break // check result in debugger
```

Notes: Dump an ECMAScript function at stack top into bytecode, replacing the function with a buffer containing the bytecode data. The bytecode can be loaded back using LoadFunction().

7.3.18 TimeToDateComponents(time as Double) as JavaScriptDateComponentsMBS

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

Function: Converts time to date components.

Example:

```
Dim j As New JavaScriptEngineMBS

// get now
Dim t1 As Double = j.Now

// as components
Dim d1 As JavaScriptDateComponentsMBS = j.TimeToDateComponents(t1)
Dim s1 As String = d1.SQLDateTime
// looks right?

Break
```

Notes: Convert a time value to components (year, month, day, etc) interpreted in UTC. If the time value is invalid, e.g. beyond the valid ECMAScript time range, an error is thrown.

There are some differences to the ECMAScript Date UTC accessors like Date.prototype.getUTCMinutes():

The time value is allowed to have fractions (sub-millisecond resolution) so that the millisecond component may also have fractions.

7.3.19 Properties

7.3.20 Handle as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read and Write property)

7.3.21 MemoryBlocks as Dictionary

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

Function: Queries the dictionary with references memoryblocks.

Notes: Just for debugging to inspect.

Memoryblocks need to stay here to avoid them being destructed too early, which can cause crashes.
(Read only property)

7.3.22 ObjectCount as Integer

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

Function: Queries global object counter.

Notes: A fresh JavaScript engine already has about 400 objects for the built-in functionality.
(Read only property)

7.3.23 StringCount as Integer

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

Function: Queries global string counter.

Notes: A fresh JavaScript engine already has about 1000 strings.
(Read only property)

7.3.24 GlobalMemoryBlock(PropertyName as String) as MemoryBlock

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

Function: Query or assign a global property to reference memoryblock.

Notes: A normal memoryblock passed as parameter to a function or property would be copied.
This method allows you to define a buffer in JavaScript to reference the bytes in a memoryblock, so all changes are visible in Xojo directly.

You can assign nil as value to clear a memoryblock.
(Read and Write computed property)

7.3.25 GlobalProperty(PropertyName as String) as Variant

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get or set a global property.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
j.GlobalProperty("Hello") = "World"  
MsgBox j.GlobalProperty("Hello")
```

Notes: Values are converted to/from variant.

(Read and Write computed property)

7.3.26 GlobalPropertyJSON(PropertyName as String) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get or set a global property as JSON.

Example:

```
Dim j As New JavaScriptEngineMBS
```

```
j.GlobalProperty("Hello") = "World"  
MsgBox j.GlobalPropertyJSON("Hello")
```

```
j.GlobalPropertyJSON("test") = " [ 1,2,3 ] "  
MsgBox j.GlobalPropertyJSON("test")
```

Notes: Same as GlobalProperty, but needs JSON text.
(Read and Write computed property)

7.3.27 Events

7.3.28 Input(values() as Variant) as Variant

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The input event.

Notes: Called in JavaScript with Input() function call.

Takes variable number of arguments, which are provided as variants here.

Return a value, which we pass through to JavaScript as function result.

7.3.29 Print(values() as Variant)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The print event.

Notes: Called in JavaScript with Print() function call.

Takes variable number of arguments, which are provided as variants here.

7.3.30 Delegates

7.3.31 JavaScriptEngineDelegateMBS(Name as String, Params() as Variant, tag as Variant) as Variant

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The delegate definition for RegisterFunction function.

Example:

```
Public Function testFunction(Name as String, Params() as Variant, tag as Variant) as Variant
MsgBox params(0).StringValue
Return "ok"
End Function
```

Notes: We pass name of function, parameters and tag value.
Result is returned to JavaScript.

Chapter 8

LMFit

8.1 class LMFitControlMBS

8.1.1 class LMFitControlMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Collection of input parameters for fit control.

Blog Entries

- [MBS Xojo Plugins, version 19.6pr1](#)

8.1.2 Methods

8.1.3 MsgFileStderr

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set msgfile to stderr.

8.1.4 MsgFileStdout

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set msgfile to stdout.

8.1.5 Properties

8.1.6 epsilon as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Step used to calculate the Jacobian, should be slightly larger than the relative error in the user-supplied functions.

Notes: (Read and Write property)

8.1.7 ftol as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Relative error desired in the sum of squares.

Notes: Termination occurs when both the actual and predicted relative reductions in the sum of squares are at most ftol.

(Read and Write property)

8.1.8 gtol as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Orthogonality desired between fvec and its derivs.

Notes: Termination occurs when the cosine of the angle between fvec and any column of the Jacobian is at most gtol in absolute value.

(Read and Write property)

8.1.9 msgfile as FolderItem

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Progress messages will be written to this file.

Notes: (Read and Write property)

8.1.10 m_maxpri as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: -1, or max number of residuals to print.

Notes: (Read and Write property)

8.1.11 n_maxpri as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: -1, or max number of parameters to print.

Notes: (Read and Write property)

8.1.12 patience as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Used to set the maximum number of function evaluations to $\text{patience} * (\text{number_of_parameters} + 1)$.

Notes: (Read and Write property)

8.1.13 scale_diag as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: If 1, the variables will be rescaled internally.

Notes: Recommended value is 1.

(Read and Write property)

8.1.14 stepbound as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Used in determining the initial step bound.

Notes: This bound is set to the product of stepbound and the Euclidean norm of $\text{diag} * x$ if nonzero, or else to stepbound itself. In most cases stepbound should lie in the interval (0.1,100.0). Generally, the value 100.0 is recommended.

(Read and Write property)

8.1.15 verbosity as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The verbosity flags.

Notes: OR'ed: 1: print some messages; 2: print Jacobian.

(Read and Write property)

8.1.16 xtol as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Relative error between last two approximations.

Notes: Termination occurs when the relative error between two consecutive iterates is at most xtol.

(Read and Write property)

8.2 class LMFitMBS

8.2.1 class LMFitMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: A class to run Levenberg-Marquardt least squares fitting algorithm.

Notes: Based on lmfit library from Joachim Wuttke, Forschungszentrum Juelich GmbH (2004-2013).

Blog Entries

- [MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0](#)
- [MBS Xojo Plugins, version 19.6pr1](#)

Videos

- [XDC 2020 MBS Plugins Presentation](#)

8.2.2 Methods

8.2.3 LMCurve(NPar as Integer, Par as Ptr, mDat as Integer, t as Ptr, y as Ptr, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Runs curve algorithm.

Notes: NPar is the number of variables (INPUT, positive integer).

Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution.

mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill $m \geq n$.

Calls evaluateCurve event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in lmstruct.h

status contains OUTPUT variables that inform about the fit result, as declared and explained in lmstruct.h

See also:

- 8.2.4 LMCurve(NPar as Integer, Par() as double, mDat as Integer, t() as double, y() as double, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 166

8.2.4 LMCurve(NPar as Integer, Par() as double, mDat as Integer, t() as double, y() as double, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Runs curve algorithm.

Notes: NPar is the number of variables (INPUT, positive integer).

Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution.

mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill $m \geq n$.

Calls evaluateCurve event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in lmstruct.h
status contains OUTPUT variables that inform about the fit result, as declared and explained in lmstruct.h
See also:

- 8.2.3 LMCurve(NPar as Integer, Par as Ptr, mDat as Integer, t as Ptr, y as Ptr, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 165

8.2.5 LMMin(NPar as Integer, Par as Ptr, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Runs Levenberg-Marquardt minimization.

Notes: This routine contains the core algorithm of our library.

It minimizes the sum of the squares of m nonlinear functions in n variables by a modified Levenberg-Marquardt algorithm. The function evaluation is done by the user-provided routine 'evaluate'. The Jacobian is then calculated by a forward-difference approximation.

Parameters:

NPar is the number of variables (INPUT, positive integer).

Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution. This should be memoryblock with double values.

mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill $m \geq n$.

Calls evaluateMin event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in `lmstruct.h`
 status contains OUTPUT variables that inform about the fit result, as declared and explained in `lmstruct.h`
 See also:

- 8.2.6 LMMin(NPar as Integer, Par() as double, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 167

8.2.6 LMMin(NPar as Integer, Par() as double, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Runs Levenberg-Marquardt minimization.

Notes: This routine contains the core algorithm of our library.

It minimizes the sum of the squares of m nonlinear functions in n variables by a modified Levenberg-Marquardt algorithm. The function evaluation is done by the user-provided routine 'evaluate'. The Jacobian is then calculated by a forward-difference approximation.

Parameters:

NPar is the number of variables (INPUT, positive integer).

Par is the solution vector (INPUT/OUTPUT, array of length n). On input it must be set to an estimated solution. On output it yields the final estimate of the solution.

mDat is the number of functions to be minimized (INPUT, positive integer). It must fulfill $m \geq n$.

Calls `evaluateMin` event to query values.

control contains INPUT variables that control the fit algorithm, as declared and explained in `lmstruct.h`
 status contains OUTPUT variables that inform about the fit result, as declared and explained in `lmstruct.h`
 See also:

- 8.2.5 LMMin(NPar as Integer, Par as Ptr, mDat as Integer, control as LMFitControlMBS, status as LMFitStatusMBS, tag as variant = nil) 166

8.2.7 Properties

8.2.8 provideArrays as Boolean

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to fill parameter array for `evaluateMin` event.

Notes: If `provideArrays` property is true, we provide values via `parameters` array, which may be slower than

using par pointer.
(Read and Write property)

8.2.9 Events

8.2.10 evaluateCurve(t as double, par as Ptr, nPar as Integer, parameters() as double, tag as variant) as double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: Evaluate is a event that calculates the m functions.

Notes: The parameter par, nPar, parameters and mDat are passed through from the call to LMCurve.

fvec is an array of length m; on OUTPUT, it must contain the m function values for the parameter vector x.

If you return a nonzero value, lmmmin will terminate.
Return zero to continue.

If provideArrays property is true, we provide values via parameters array, which may be slower than using par pointer.

8.2.11 evaluateMin(par as Ptr, nPar as Integer, parameters() as double, mDat as Integer, fvec as Ptr, tag as variant) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: Evaluate is a event that calculates the m functions.

Notes: The parameter par, nPar, parameters and mDat are passed through from the call to LMMin.

fvec is an array of length m; on OUTPUT, it must contain the m function values for the parameter vector x.

If you return a nonzero value, lmmmin will terminate.
Return zero to continue.

If provideArrays property is true, we provide values via parameters array, which may be slower than using par pointer.

8.3 class LMFitStatusMBS

8.3.1 class LMFitStatusMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Collection of output parameters for status info.

Blog Entries

- [MBS Xojo Plugins, version 19.6pr1](#)

8.3.2 Properties

8.3.3 fnorm as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Norm of the residue vector fvec.

Notes: (Read and Write property)

8.3.4 nfev as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Actual number of iterations.

Notes: (Read and Write property)

8.3.5 outcome as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Status indicator.

Notes: Nonnegative values are used as index for the message text.

(Read and Write property)

8.3.6 outcomeInfoMessage as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The info message text.

Notes: The plugin looks up text based on outcome value.

(Read only property)

8.3.7 outcomeShortMessage as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The short message text.

Notes: The plugin looks up text based on outcome value.

(Read only property)

8.3.8 userbreak as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set when function evaluation requests termination.

Notes: (Read and Write property)

Chapter 9

Markdown

9.1 class MarkdownDocumentMBS

9.1.1 class MarkdownDocumentMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class of process markdown text.

Blog Entries

- [MBS Xojo Plugins, version 20.6pr1](#)

9.1.2 Methods

9.1.3 Compile(flags as Integer = 35799040) as boolean

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Compiles the markdown code.

9.1.4 Constructor(data as string, flags as Integer = 35799040)

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new document with the content of the file.

Notes: Text should have EndOfLine.Unix as newline character.

Text must be in UTF-8 encoding to work best.

See also:

- 9.1.5 Constructor(file as folderitem, flags as Integer = 35799040)

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9.1.5 Constructor(file as folderitem, flags as Integer = 35799040)

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a new document with the content of the file.

Notes: Text should have EndOfLine.Unix as newline character.

Text must be in UTF-8 encoding to work best.

See also:

- 9.1.4 Constructor(data as string, flags as Integer = 35799040)

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9.1.6 CSS as string

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates CSS for the html code.

9.1.7 Document as string

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Generates HTML document.

Notes: Creates HTML if needed.

9.1.8 Footnotes as MarkdownFootnoteMBS()

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries list of foot notes.

9.1.9 GenerateCSS(File as folderitem) as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Generates a css file.

Notes: Returns number of bytes written. Or -1 on any error.

9.1.10 GenerateHTML(File as folderitem) as boolean

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Generates a html file.

Notes: Returns true on success and false on failure.

9.1.11 Properties

9.1.12 Author as MarkdownLineMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The author line.

Notes: Can be nil if not used.

(Read only property)

9.1.13 Code as MarkdownParagraphMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Intermediate code generated by compile.

Notes: (Read only property)

9.1.14 Compiled as Boolean

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether document is compiled already.

Notes: (Read only property)

9.1.15 Date as MarkdownLineMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The date line.

Notes: Can be nil if not used.

(Read only property)

9.1.16 ExtraFootnotePrefix as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The extra footnote prefix.

Notes: (Read and Write property)

9.1.17 Handle as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Internal object reference.

Notes: (Read only property)

9.1.18 HasHTML as Boolean

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether html is available.

Notes: Set to true when html is generated.

(Read only property)

9.1.19 Title as MarkdownLineMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The title line.

Notes: Can be nil if not used.

(Read only property)

9.1.20 URLBase as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The URL base.

Notes: (Read and Write property)

9.1.21 Constants

Flags

Constant	Value	Description
kAutoLink	&h4000	make http://foo.com link even without <>s
kCDATA	&h80	generate code for xml ! [CDATA [...]]
kExtraFootnote	&h200000	Enable markdown extra-style footnotes.
kInputMask	&h00030000	
kIsLabel	&h08000000	
kNoAlphaList	&h80000	Forbid alphabetic lists.
kNoDivQuote	&h40000	Forbid >%class% blocks.
kNoDList	&h100000	Forbid definition lists.
kNoExt	&h40	Don't allow pseudo-protocols.
kNoHeader	&h10000	Don't process header blocks.
kNoHTML	8	Don't allow raw html through AT ALL
kNoImage	2	Don't do image processing, block .
kNoLinks	1	Don't do link processing, block <a>tags.
kNoPants	4	don't run smartypants.
kNoRelaxed	&h200	emphasis happens /everywhere/
kNoStrikethrough	&h800	Forbid strikethrough.
kNoSuperscript	&h100	no A ^B
kNoTables	&h400	Disallow tables.
kSafeLink	&h8000	Paranoid check for link protocol.
kStrict	&h10	Disable SUPERScript, RELAXED_EMPHASIS.
kTabStop	&h20000	Expand tabs to 4 spaces.
kTagText	&h20	process text inside an html tag; no * , no <bold>, no html or [] expansion
kTOC	&h1000	Do table-of-contents processing.
kUserFlags	&h0FFFFFFF	

9.2 class MarkdownFootnoteMBS

9.2.1 class MarkdownFootnoteMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a foot note.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

9.2.2 Methods

9.2.3 Constructor

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The private constructor.

9.2.4 Properties

9.2.5 Document as MarkdownDocumentMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The back reference to the markdown document.

Notes: (Read only property)

9.2.6 Flags as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The flags.

Notes: Can be zero or a combination of kFlagExtraBookmark and kFlagReferenced.

(Read only property)

9.2.7 Height as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The dimensions for image link.

Notes: (Read only property)

9.2.8 Link as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: What this footnote points to.

Notes: (Read only property)

9.2.9 RefNumber as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The reference number.

Notes: (Read only property)

9.2.10 Tag as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tag for the reference link.

Notes: (Read only property)

9.2.11 Title as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The title of the footnote.

Notes: (Read only property)

9.2.12 Width as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The dimensions for image link.

Notes: (Read only property)

9.2.13 Constants

Footnote Flags

Constant	Value	Description
kFlagExtraBookmark	1	
kFlagReferenced	2	Set if this footnote is referenced.

9.3 class MarkdownLineMBS

9.3.1 class MarkdownLineMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for a line in the markdown text.

Notes: Each input line is read into a Line, which contains the line, the offset of the first non-space character [this assumes that all tabs will be expanded to spaces!], and a pointer to the next line.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

9.3.2 Methods

9.3.3 Constructor

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The private constructor.

9.3.4 Properties

9.3.5 Count as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The kind of this line.

Notes: See kKind* constants.

(Read only property)

9.3.6 DLE as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The leading indent on the line.

Notes: (Read only property)

9.3.7 Document as MarkdownDocumentMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The back reference to the markdown document.

Notes: (Read only property)

9.3.8 Flags as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Special attributes for this line.

Notes: Can be combination of kFlag* constants.

(Read only property)

9.3.9 Kind as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The line type.

Notes: See kKind* constants.

(Read only property)

9.3.10 NextLine as MarkdownLineMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The next line.

Notes: (Read only property)

9.3.11 Text as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The text of the line.

Notes: (Read only property)

9.3.12 Constants

Flag Values

Constant	Value	Description
kFlagChecked	2	The line was already processed.
kFlagPipeChar	1	line contains a

Kind Values

Constant	Value	Description
kKindCode	1	Code
kKindDash	3	Dash line
kKindEqual	5	Equal line
kKindHR	2	HR line
kKindText	0	Text line
kKindTilde	4	Tilde line

9.4 class MarkdownParagraphMBS

9.4.1 class MarkdownParagraphMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class of a paragraph.

Notes: A paragraph is a collection of Lines, with links to the next paragraph and (if it's a QUOTE, UL, or OL) to the reparsed contents of this paragraph.

This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

9.4.2 Methods

9.4.3 Constructor

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The private constructor.

9.4.4 Properties

9.4.5 Align as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The paragraph alignment.

Notes: Can be kAlignPara, kAlignImplicit or kAlignCenter.

(Read only property)

9.4.6 Document as MarkdownDocumentMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The back reference to the markdown document.

Notes: (Read only property)

9.4.7 Down as MarkdownParagraphMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Recompiled contents of this paragraph.

Notes: (Read only property)

9.4.8 hNumber as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The header level for HDR.

Notes: (Read only property)

9.4.9 Ident as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: ID tag for quote.

Notes: (Read only property)

9.4.10 Lang as String

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: lang attribute for CODE

Notes: (Read only property)

9.4.11 NextParagraph as MarkdownParagraphMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The next paragraph.

Notes: (Read only property)

9.4.12 Text as MarkdownLineMBS

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: All the text in this paragraph.

Notes: (Read only property)

9.4.13 Typ as Integer

Plugin Version: 15.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The type of paragraph.

Notes: See kType* constants.

(Read only property)

9.4.14 Constants

Alignment Values

Constant	Value	Description
kAlignCenter	2	Center
kAlignImplicit	0	Implicit alignment
kAlignPara	1	Paragraph

Typ Codes

Constant	Value	Description
kTypeAL	9	AL
kTypeCode	1	Code
kTypeDL	6	DL
kTypeHDR	11	HDR
kTypeHR	12	HR
kTypeHTML	4	HTML
kTypeListItem	10	ListItem
kTypeMarkup	3	Markup
kTypeOL	8	OL
kTypeQuote	2	Quote
kTypeSource	14	Source
kTypeStyle	5	Style
kTypeTable	13	Table
kTypeUL	7	UL
kTypeWhitespace	0	Whitespace

Chapter 10

RFC

10.1 class RFCClassDescriptionMBS

10.1.1 class RFCClassDescriptionMBS

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

Function: The class for a class description.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.1.2 Methods

10.1.3 Constructor

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

Function: The private constructor.

10.1.4 Destructor

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

Function: The destructor.

10.1.5 Properties

10.1.6 AttributesCount as Integer

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

Function: Queries attribute count for class.

Notes: (Read only property)

10.1.7 Connection as RFCConnectionMBS

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

Function: The connection owning this object.

Notes: (Read only property)

10.1.8 Handle as Integer

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

Function: The internal object reference.

Notes: (Read only property)

10.1.9 ImplementedInterfacesCount as Integer

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

Function: Queries number of implemented interfaces.

Notes: (Read only property)

10.1.10 Name as String

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

Function: The name of the class.

Notes: (Read only property)

10.1.11 Parent as Variant

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

Function: The parent object.

Notes: (Read only property)

10.1.12 ParentClassesCount as Integer

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

Function: Queries number of parent classes.

Notes: (Read only property)

10.2 class RFCConnectionAttributesMBS

10.2.1 class RFCConnectionAttributesMBS

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

Function: The class for information about the partner system on the other side of this RFC connection.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.2.2 Methods

10.2.3 Constructor

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

Function: The private constructor.

10.2.4 Properties

10.2.5 client as String

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

Function: Client ("Mandant")

Notes: (Read only property)

10.2.6 codepage as String

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

Function: Own code page.

Notes: (Read only property)

10.2.7 Connection as RFCConnectionMBS

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

Function: The connection used to get this information.

Notes: (Read only property)

10.2.8 cpicConvId as String

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

Function: CPI-C Conversation ID.

Notes: (Read only property)

10.2.9 dest as String

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

Function: RFC destination.

Notes: (Read only property)

10.2.10 host as String

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

Function: Own host name.

Notes: (Read only property)

10.2.11 isoLanguage as String

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

Function: 2-byte ISO-Language

Notes: (Read only property)

10.2.12 kernelRel as String

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

Function: Partner kernel release.

Notes: (Read only property)

10.2.13 language as String

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

Function: Language.

Notes: (Read only property)

10.2.14 Parent as Variant

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

Function: The parent object for this object.

Notes: (Read only property)

10.2.15 partnerBytesPerChar as String

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

Function: Number of bytes per character in the backend's current codepage.

Notes: Note this is different from the semantics of the PCS parameter.

(Read only property)

10.2.16 partnerCodepage as String

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

Function: Partner code page.

Notes: (Read only property)

10.2.17 partnerHost as String

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

Function: Partner host name.

Notes: (Read only property)

10.2.18 partnerIP as String

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

Function: Partner IP.

Notes: (Read only property)

10.2.19 partnerIPv6 as String

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

Function: Partner IPv6.

Notes: (Read only property)

10.2.20 partnerRel as String

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

Function: Partner system release.

Notes: (Read only property)

10.2.21 partnerSystemCodepage as String

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

Function: Partner system code page.

Notes: (Read only property)

10.2.22 partnerType as String

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

Function: Partner type.

Notes: 2/3/E/R: R/2,R/3,Ext,Reg.Ext

(Read only property)

10.2.23 progName as String

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

Function: Name of the calling APAB program (report, module pool)

Notes: (Read only property)

10.2.24 rel as String

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

Function: My system release.

Notes: (Read only property)

10.2.25 rfcRole as String

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

Function: The RFC role.

Notes: C/S: RFC Client / RFC Server.

(Read only property)

10.2.26 sysId as String

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

Function: R/3 system ID.

Notes: (Read only property)

10.2.27 sysNumber as String

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

Function: R/3 system number.

Notes: (Read only property)

10.2.28 trace as String

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

Function: Trace level (0-3)

Notes: (Read only property)

10.2.29 type as String

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

Function: The type.

Notes: 2/3/E/R: R/2,R/3,Ext,Reg.Ext
(Read only property)

10.2.30 user as String

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

Function: User name.

Notes: (Read only property)

10.3 class RFCConnectionMBS

10.3.1 class RFCConnectionMBS

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

Function: The class for RFC connection to a SAP system.

Example:

// connect code from a sample project:

```
dim loginParams As New Dictionary
if app.LogOnData.SAProuterString.IsEmpty then // LogOn with server (IP-Address)
loginParams.Value("ashost") = app.LogOnData.Anwendungsserver
else // LogOn with Servername and Router-String
loginParams.Value("ashost") = app.LogOnData.SAProuterString+"/H/"+app.LogOnData.Anwendungsserver
end if
loginParams.Value("sysnr") = app.LogOnData.InstanzNr.ToText
loginParams.Value("client") = app.LogOnData.Mandant
loginParams.Value("user") = app.LogOnData.SAPBenutzer
loginParams.Value("passwd") = app.LogOnData.SAPPasswort
loginParams.Value("lang") = app.LogOnData.Sprache

app.ConnectionToSAP = New RFCConnectionMBS(loginParams)
```

Blog Entries

- [MBS Xojo Plugins, version 20.2pr2](#)
- [Connect Xojo to SAP via RFC](#)

10.3.2 Methods

10.3.3 CachedClassDescription(repositoryID as String, Name as String) as RFC-ClassDescriptionMBS

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

Function: Looks for a cached class description.

Notes: This API should be used with care and is only for special scenarios, for example: 1. You know for sure, that a class description has already been cached via ClassDescription(), and don't want to open an extra rfcHandle that will never be used. In this case simply use the SAP System ID as the repositoryID. 2. You have created a hard-coded repository via RfcAddClassDesc(), which contains classes that do not exist in the backend's DDIC.

If repositoryID is "", the "default repository" is used.

repositoryID: System ID of R/3 System, for which this class description has been cached, or "" in case you want to look for it in the default repository.

Name: Name of the class.

10.3.4 CachedFunctionDescription(repositoryID as String, Name as String) as RFCFunctionDescriptionMBS

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

Function: Looks for a cached function description.

Notes: This API should be used with care and is only for special scenarios, for example: 1. You know for sure, that a function description has already been cached via FunctionDescription(), and don't want to open an extra rfcHandle that will never be used. In this case simply use the SAP System ID as the repositoryID. 2. You have created a hard-coded repository via AddFunctionDesc(), which contains function modules that do not exist in the backend's DDIC.

If repositoryID is "", the "default repository" is used.

10.3.5 CachedTypeDescription(repositoryID as String, Name as String) as RFCTypeDescriptionMBS

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

Function: Looks for a cached structure/table description.

Notes: Similar to TypeDescription(), but it only looks into the cache. Again it should almost never be necessary to get a metadata description of a single structure.

repositoryID: System ID of R/3 System, for which this type description has been cached, or "" in case you want to look for it in the default repository.

Name: Name of the DDIC structure/table.

10.3.6 Cancel

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

Function: Cancels the RFC call which is currently being called over the given RFC connection and closes the connection.

Notes: Can be used only on an RFC client connection and needs to be called from a different thread than

the one currently executing the RFC call.

10.3.7 ClassDescription(Name as String) as RFCClassDescriptionMBS

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

Function: Returns the class description that is valid for the system to which connection points to.

Notes: If the class description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the rfcHandle. The result from the DDIC lookup will then be placed into the cache for later use.

The RFC Runtime maintains a cache for every R/3 System ID, as the meta data could be different from R/3 release to R/3 release. This is the main API that should be used.

Name: Name of the class to look up.

10.3.8 ClearRepository(repositoryID as String)

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

Function: Removes all metadata from the repository cache of the specified R/3 System.

Notes: If repositoryID is "", the "default repository" is cleared.

10.3.9 Constructor(LoginParams as Dictionary)

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

Function: Opens an RFC client connection for invoking ABAP function modules in an R/3 backend.

Example:

```
Dim loginParams As New Dictionary
loginParams.Value("ashost") = "hostname"
loginParams.Value("sysnr") = "05"
loginParams.Value("client") = "800"
loginParams.Value("user") = "user"
loginParams.Value("passwd") = "*****"
loginParams.Value("lang") = "EN"
```

```
Dim connection As New RFCConnectionMBS(loginParams)
```

Notes: Opens a client connection to an SAP System. The connectionParams may contain the following name-value pairs:

client, user, passwd, lang, trace and additionally one of

1. Direct application server logon: ashost, sysnr.
2. Logon with load balancing: mshost, msserv, sysid, group.
msserv is needed only, if the service of the message server is not defined as sapms<SYSID>in /etc/services.

When logging on with SNC, user&passwd are to be replaced by

snc_qop, snc_myname, snc_partername and optionally snc_lib.
(If snc_lib is not specified, the underlying SNC layer uses the "global" GSS library defined via environment variable SNC_LIB or SNC_LIB_64.)

When logging on with SSO Ticket, you can use mysapso2 instead of user&passwd. The old SSO format (mysapso) is no longer supported.

Alternatively the connection parameters can be defined in the config file sapnwrfc.ini. In this case you just pass the parameter dest=... and all parameters that are missing in the sapnwrfc.ini entry into RfcOpenConnection().

For a complete list of logon parameters to be used in connectionParams as well as in the sapnwrfc.ini file, see the sample sapnwrfc.ini file in the SDK's demo folder.

If the logon was ok, constructor returns with a new object, otherwise an exception is raised.

10.3.10 CreateFunction(Name as String) as RFCFunctionMBS

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

Function: Creates a data container that can be used to execute function calls in the backend via Invoke.

Notes: The importing parameters can be set using the Value() properties. After the RfcInvoke call returned successfully, the exporting parameters can be read from this data container via the Value() properties.

10.3.11 CreateTransaction(TransactionID as String, QueueName as String) as RFCTransactionMBS

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

Function: Creates a container for executing a (multi-step) transactional call.

Notes: TransactionID: transaction ID used to identify the transaction;

queueName: queue name associated with the transaction. If it is "" or empty, the transaction is for tRfc

10.3.12 Destructor

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

Function: The destructor.

Notes: Closes an RFC connection.

10.3.13 FunctionDescription(Name as String) as RFCFunctionDescriptionMBS

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

Function: Returns the function description that is valid for the system to which connection points to.

Example:

```
Dim fd As RFCFunctionDescriptionMBS = connection.FunctionDescription("BAPI_COMPANY_GETDE-  
TAIL")
```

Notes: If the function description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the connection. The result from the DDIC lookup will then be placed in the cache. The RFC Runtime maintains a cache for every SAP System ID, as the meta data may be different depending on the SAP release. This is the main API that should be used.

10.3.14 isConnected as Boolean

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

Function: Checks if we are connected.

Notes: Same as Ping, but returns boolean and does not raise exception.

10.3.15 Ping

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

Function: Ping the remote communication partner through the passed connection handle.

Notes: Sends a ping to the backend in order to check, whether the connection is still alive. Can be used on

both, client connections as well as server connections.

10.3.16 ResetServerContext

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

Function: Resets the SAP server context ("user context / ABAP session context") associated with the given client connection, but does not close the connection.

10.3.17 TransactionID as String

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

Function: Retrieves a unique 24-digit transaction ID from the backend.

10.3.18 TypeDescription(Name as String) as RFCTypeDescriptionMBS

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

Function: Returns the structure description that is valid for the system to which connection points to.

Notes: If the structure description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the rfcHandle. The result from the DDIC lookup will then be placed into the cache for later use.

The RFC Runtime maintains a cache for every R/3 System ID, as the meta data could be different from R/3 release to R/3 release.

Note

Normally it should not be necessary to lookup separate structure descriptions. They are already looked up as part of the function module, in which they are used.

Name: Name of a DDIC structure or table.

10.3.19 Properties

10.3.20 ConnectionAttributes as RFCConnectionAttributesMBS

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

Function: Returns details about the current client or server connection.

Notes: (Read only property)

10.3.21 Handle as Integer

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

Function: The internal object reference.

Notes: (Read only property)

10.4 class RFCContainerMBS

10.4.1 class RFCContainerMBS

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

Function: The class for a container in a RFC connection.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.4.2 Methods

10.4.3 Constructor

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

Function: The private constructor.

10.4.4 DescribeType as RFCTypeDescriptionMBS

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

Function: Returns the metadata description of the given structure or table.

10.4.5 Destructor

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

Function: The destructor.

10.4.6 StringLength(Index as Integer) as Integer

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

Function: Queries string length for field by index.

See also:

- 10.4.7 StringLength(Name as String) as Integer

10.4.7 StringLength(Name as String) as Integer

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

Function: Queries string length for field by name.

See also:

- 10.4.6 StringLength(Index as Integer) as Integer 201

10.4.8 Value(Index as Integer) as Variant

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

Function: Convenience method to get value as variant.

Notes: When reading, we lookup data type for the property referred by index and return a matching value via variant.

Char, String, Num, Date, Time, BCD, DecF16 and DecF34 are returned as text.

Float is returned as double value.

Long, Second, Minute and Int8 is returned as Int64.

DTDay, DTWeek, DTMonth, TSecond, TMinute, CDeay, Int1, Int2 and Int values are returned as Integer.

Table is returned as RFCTableMBS object.

Structure is returned as RFCStructureMBS object.

Byte data is returned as MemoryBlock.

For Null, ABAPObject, XMLData, BOX types we return nil.

See also:

- 10.4.9 Value(Name as String) as Variant 202

10.4.9 Value(Name as String) as Variant

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

Function: Convenience method to get value as variant.

Notes: When reading, we lookup data type for the property referred by name and return a matching value via variant.

Char, String, Num, Date, Time, BCD, DecF16 and DecF34 are returned as text.

Float is returned as double value.

Long, Second, Minute and Int8 is returned as Int64.

DTDay, DTWeek, DTMonth, TSecond, TMinute, CDeay, Int1, Int2 and Int values are returned as Integer.

Table is returned as RFCTableMBS object.

Structure is returned as RFCStructureMBS object.

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Byte data is returned as MemoryBlock.

For Null, ABAPObject, XMLData, BOX types we return nil.

See also:

- 10.4.8 Value(Index as Integer) as Variant

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10.4.10 Properties

10.4.11 Connection as RFCConnectionMBS

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

Function: The connection this object belongs to.

Notes: (Read only property)

10.4.12 Handle as Integer

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

Function: The internal object reference.

Notes: (Read only property)

10.4.13 Parent as Variant

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

Function: The parent object for this container.

Notes: (Read only property)

10.4.14 Values as Dictionary

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

Function: Convenience property to see all values in debugger.

Notes: (Read only property)

10.4.15 BytesValue(Index as Integer) as Memoryblock

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

Function: Get or set BYTE value with MemoryBlock by index.

Notes: When you get or set, we copy the data.

(Read and Write computed property)

See also:

- 10.4.16 BytesValue(Name as String) as Memoryblock 204

10.4.16 BytesValue(Name as String) as Memoryblock

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

Function: Get or set BYTE value with MemoryBlock by name.

Notes: When you get or set, we copy the data.

(Read and Write computed property)

See also:

- 10.4.15 BytesValue(Index as Integer) as Memoryblock 203

10.4.17 CharsValue(Index as Integer, Size as Integer) as String

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

Function: Get or set chars value by name.

Notes: This is for fixed size char values, so you pass in size.

Please use StringValue() to benefit from plugin querying size for you of existing value.

(Read and Write computed property)

See also:

- 10.4.18 CharsValue(Name as String, Size as Integer) as String 204

10.4.18 CharsValue(Name as String, Size as Integer) as String

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

Function: Get or set chars value by index.

Notes: This is for fixed size char values, so you pass in size.

Please use StringValue() to benefit from plugin querying size for you of existing value.

(Read and Write computed property)

See also:

- 10.4.17 CharsValue(Index as Integer, Size as Integer) as String 204

10.4.19 DateValue(Index as Integer) as String

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

10.4. CLASS RFCCONTAINERMBS 205

Function: Get or set date value by index.

Notes: Format is always 8 character string with format YYYYMMDD.
(Read and Write computed property)

See also:

- 10.4.20 DateValue(Name as String) as String 205

10.4.20 DateValue(Name as String) as String

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

Function: Get or set date value by name.

Notes: Format is always 8 character string with format YYYYMMDD.
(Read and Write computed property)

See also:

- 10.4.19 DateValue(Index as Integer) as String 204

10.4.21 FloatValue(Index as Integer) as Double

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

Function: Get or set float value by index.

Notes: (Read and Write computed property)

See also:

- 10.4.22 FloatValue(Name as String) as Double 205

10.4.22 FloatValue(Name as String) as Double

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

Function: Get or set float value by name.

Notes: (Read and Write computed property)

See also:

- 10.4.21 FloatValue(Index as Integer) as Double 205

10.4.23 Int16Value(Index as Integer) as Int16

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

Function: Get or set UInt16 value by index.

Notes: (Read and Write computed property)

See also:

- 10.4.24 `Int16Value(Name as String) as Int16` 206

10.4.24 `Int16Value(Name as String) as Int16`

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

Function: Get or set `UInt16` value by name.

Notes: (Read and Write computed property)

See also:

- 10.4.23 `Int16Value(Index as Integer) as Int16` 205

10.4.25 `Int32Value(Index as Integer) as Int32`

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

Function: Get or set `UInt32` value by index.

Notes: (Read and Write computed property)

See also:

- 10.4.26 `Int32Value(Name as String) as Int32` 206

10.4.26 `Int32Value(Name as String) as Int32`

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

Function: Get or set `UInt32` value by name.

Notes: (Read and Write computed property)

See also:

- 10.4.25 `Int32Value(Index as Integer) as Int32` 206

10.4.27 `Int64Value(Index as Integer) as Int64`

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

Function: Get or set `Int64` value by index.

Notes: (Read and Write computed property)

See also:

- 10.4.28 `Int64Value(Name as String) as Int64` 207

10.4.28 Int64Value(Name as String) as Int64

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

Function: Get or set Int64 value by name.

Notes: (Read and Write computed property)

See also:

- 10.4.27 Int64Value(Index as Integer) as Int64 206

10.4.29 NumberValue(Index as Integer, Size as Integer) as String

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

Function: Get or set numeric value by index.

Notes: The value of the specified field as num-char array (digits only).

Please pass length. If you don't know, please try StringValue/StringLength.

(Read and Write computed property)

See also:

- 10.4.30 NumberValue(Name as String, Size as Integer) as String 207

10.4.30 NumberValue(Name as String, Size as Integer) as String

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

Function: Get or set numeric value by name.

Notes: The value of the specified field as num-char array (digits only).

Please pass length. If you don't know, please try StringValue/StringLength.

(Read and Write computed property)

See also:

- 10.4.29 NumberValue(Index as Integer, Size as Integer) as String 207

10.4.31 StringValue(Index as Integer) as String

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

Function: Get or set string value by index.

Notes: (Read and Write computed property)

See also:

- 10.4.32 StringValue(Name as String) as String 208

10.4.32 StringValue(Name as String) as String

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

Function: Get or set string value by name.

Example:

```
Dim fd As RFCFunctionDescriptionMBS = connection.FunctionDescription("BAPI_COMPANY_GETDE-
TAIL")
```

```
Dim f As RFCFunctionMBS = fd.CreateFunction
```

```
f.StringValue("COMPANYID") = "000007"
```

```
f.Invoke
```

```
Dim s As RFCStructureMBS = f.StructureValue("RETURN")
```

```
Dim t As String = s.StringValue("MESSAGE")
```

```
MsgBox t
```

Notes: (Read and Write computed property)

See also:

- 10.4.31 StringValue(Index as Integer) as String 207

10.4.33 StructureValue(Index as Integer) as RFCStructureMBS

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

Function: Get or set structure value with RFCStructureMBS object by index.

Notes: (Read and Write computed property)

See also:

- 10.4.34 StructureValue(Name as String) as RFCStructureMBS 208

10.4.34 StructureValue(Name as String) as RFCStructureMBS

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

Function: Get or set structure value with RFCStructureMBS object by name.

Notes: (Read and Write computed property)

See also:

- 10.4.33 StructureValue(Index as Integer) as RFCStructureMBS 208

10.4.35 TableValue(Index as Integer) as RFCTableMBS

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

Function: Get or set table value with RFCTableMBS object by index.

Notes: (Read and Write computed property)

See also:

- 10.4.36 TableValue(Name as String) as RFCTableMBS 209

10.4.36 TableValue(Name as String) as RFCTableMBS

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

Function: Get or set table value with RFCTableMBS object by name.

Notes: (Read and Write computed property)

See also:

- 10.4.35 TableValue(Index as Integer) as RFCTableMBS 209

10.4.37 TimeValue(Index as Integer) as String

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

Function: Get or set time value by index.

Notes: Format is always 6 character string with format HHMMSS.

(Read and Write computed property)

See also:

- 10.4.38 TimeValue(Name as String) as String 209

10.4.38 TimeValue(Name as String) as String

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

Function: Get or set time value by name.

Notes: Format is always 6 character string with format HHMMSS.

(Read and Write computed property)

See also:

- 10.4.37 TimeValue(Index as Integer) as String 209

10.4.39 UInt8Value(Index as Integer) as UInt8

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

Function: Get or set UInt8 value by index.

Notes: (Read and Write computed property)

See also:

- 10.4.40 UInt8Value(Name as String) as UInt8 210

10.4.40 UInt8Value(Name as String) as UInt8

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

Function: Get or set UInt8 value by name.

Notes: (Read and Write computed property)

See also:

- 10.4.39 UInt8Value(Index as Integer) as UInt8 209

10.5 class RFCErrorExceptionMBS

10.5.1 class RFCErrorExceptionMBS

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

Function: The exception class to report any error.

Notes: Subclass of the RuntimeException class.

10.6 class RFCExceptionDescriptionMBS

10.6.1 class RFCExceptionDescriptionMBS

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

Function: The class for an exception description.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.6.2 Methods

10.6.3 Constructor

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

Function: The private constructor.

10.6.4 Properties

10.6.5 Key as String

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

Function: Exception key

Notes: (Read only property)

10.6.6 Message as String

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

Function: Error message (exception text as defined in SE37)

Notes: (Read only property)

10.7 class RFCFieldDescriptionMBS

10.7.1 class RFCFieldDescriptionMBS

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

Function: The class for a field description.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.7.2 Methods

10.7.3 Constructor

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

Function: The private constructor.

10.7.4 Properties

10.7.5 Connection as RFCConnectionMBS

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

Function: The connection for this field.

Notes: (Read only property)

10.7.6 decimals as Integer

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

Function: If the field is of type "packed number" (BCD), this member gives the number of decimals.

Notes: (Read only property)

10.7.7 Name as String

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

Function: Field name.

Notes: (Read only property)

10.7.8 nucLength as Integer

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

Function: Field length in bytes in a 1-byte-per-SAP_CHAR system.

Notes: (Read only property)

10.7.9 nucOffset as Integer

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

Function: Field offset in bytes in a 1-byte-per-SAP_CHAR system.

Notes: (Read only property)

10.7.10 Parent as Variant

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

Function: The parent object.

Notes: (Read only property)

10.7.11 Type as Integer

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

Function: Field data type.

Notes: (Read only property)

10.7.12 TypeDescription as RFCTypeDescriptionMBS

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

Function: Queries the type description for this field.

Notes: (Read only property)

10.7.13 TypeString as String

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

Function: The type as string.

Notes: Convenience property so you can see type in debugger.
(Read only property)

10.7.14 ucLength as Integer

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

Function: Field length in bytes in a 2-byte-per-SAP_CHAR system.

Notes: (Read only property)

10.7.15 ucOffset as Integer

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

Function: Field offset in bytes in a 2-byte-per-SAP_CHAR system.

Notes: (Read only property)

10.8 class RFCFunctionDescriptionMBS

10.8.1 class RFCFunctionDescriptionMBS

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

Function: The class for a function description.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.8.2 Methods

10.8.3 Constructor

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

Function: The private constructor.

10.8.4 CreateFunction as RFCFunctionMBS

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

Function: Creates a data container that can be used to execute function calls in the backend via Invoke.

Notes: The importing parameters can be set using the Value() properties. After the RfcInvoke call returned successfully, the exporting parameters can be read from this data container via the Value() properties.

10.8.5 Destructor

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

Function: The destructor.

10.8.6 ExceptionDescription(Index as Integer) as RFCExceptionDescriptionMBS

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

Function: The exception description by index.

See also:

- 10.8.7 ExceptionDescription(Name as String) as RFCExceptionDescriptionMBS

10.8.7 ExceptionDescription(Name as String) as RFCExceptionDescriptionMBS

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

Function: The exception description by name.

See also:

- 10.8.6 ExceptionDescription(Index as Integer) as RFCExceptionDescriptionMBS 216

10.8.8 ExceptionDescriptions as RFCExceptionDescriptionMBS()

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

Function: Queries all exception descriptions.

10.8.9 ParameterDescription(Index as Integer) as RFCParameterDescriptionMBS

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

Function: Queries parameter description by index.

See also:

- 10.8.10 ParameterDescription(Name as String) as RFCParameterDescriptionMBS 217

10.8.10 ParameterDescription(Name as String) as RFCParameterDescriptionMBS

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

Function: Queries parameter description by name.

See also:

- 10.8.9 ParameterDescription(Index as Integer) as RFCParameterDescriptionMBS 217

10.8.11 ParameterDescriptions as RFCParameterDescriptionMBS()

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

Function: Queries all parameter description as array.

10.8.12 Properties

10.8.13 Connection as RFCConnectionMBS

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

Function: The parent connection.

Notes: (Read only property)

10.8.14 ExceptionCount as Integer

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

Function: Queries number of exceptions.

Notes: (Read only property)

10.8.15 Handle as Integer

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

Function: The internal object reference.

Notes: (Read only property)

10.8.16 Name as String

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

Function: The name of the function.

Notes: (Read only property)

10.8.17 ParameterCount as Integer

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

Function: The number of parameters for this function.

Notes: (Read only property)

10.8.18 Parent as Variant

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

Function: The parent object.

Notes: (Read only property)

10.9 class RFCFunctionMBS

10.9.1 class RFCFunctionMBS

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

Function: The class for a function in a RFC connection.

Notes: Please use values to set parameters and then call invoke.

Subclass of the RFCContainerMBS class.

10.9.2 Methods

10.9.3 Constructor(typeDescription as RFCFunctionDescriptionMBS)

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

Function: Creates a data container that can be used to execute function calls in the backend via Invoke.

Notes: The importing parameters can be set using the Value() properties. After the RfcInvoke call returned successfully, the exporting parameters can be read from this data container via the Value() properties.

10.9.4 DescribeFunction as RFCFunctionDescriptionMBS

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

Function: Returns the function description that is valid for the system to which connection points to.

Notes: If the function description is already in the repository cache for that system ID, it will be returned immediately (from the cache), otherwise it will be looked up in the system's DDIC using the connection. The result from the DDIC lookup will then be placed in the cache. The RFC Runtime maintains a cache for every SAP System ID, as the meta data may be different depending on the SAP release. This is the main API that should be used.

10.9.5 Destructor

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

Function: The destructor.

10.9.6 Invoke

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

Function: Executes a function module in the backend system so far.

Example:

```
Dim fd As RFCFunctionDescriptionMBS = connection.FunctionDescription("BAPI_COMPANY_GETDE-  
TAIL")
```

```
Dim f As RFCFunctionMBS = fd.CreateFunction
```

```
f.StringValue("COMPANYID") = "000007"
```

```
f.Invoke
```

```
Dim s As RFCStructureMBS = f.StructureValue("RETURN")
```

```
Dim t As String = s.StringValue("MESSAGE")
```

```
MsgBox t
```

10.9.7 Properties

10.9.8 ParameterActive(Name as String) as Boolean

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

Function: Whether a parameter is active.

Notes: This is particularly useful for BAPIs which have many large tables, in which you are not interested. Deactivate those and leave only those tables active, in which you are interested. This reduces network traffic and memory consumption in your application considerably.

This functionality can be used for input and output parameters. If the parameter is an input, no data for that parameter will be sent to the backend. If it's an output, the backend will be informed not to return data for that parameter.

(Read and Write computed property)

10.10 module RFCModuleMBS

10.10.1 module RFCModuleMBS

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

Function: The module for globals in RFC API.

Notes: You can use this module and related classes to connect Xojo to SAP applications and databases. We support MacOS, Windows and Linux.

You need to get a SAP login (maybe become SAP developer) and download ,Ä@SAP NetWeaver RFC SDK 7.50.

You need SAP license for user and maybe a developer license yourself.

Please read SAP documentation for various RFC functions to get more details.

MBS Plugin manages memory for you, does reference counting and makes API easier to use for Xojo developers.

Blog Entries

- [Connect Xojo to SAP via RFC](#)

10.10.2 Methods

10.10.3 LoadLibrary(file as folderitem) as boolean

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

Function: Loads the sapnwrfc library.

Example:

```
#If TargetWin32
Const path = "sapnwrfc.dll"
#Else
Dim path As FolderItem = GetFolderItem("libsapnwrfc.dylib")
Dim LibPath As String = path.parent.NativePath

Call RFCModuleMBS.SetCurrentWorkingDirectory(libPath)
#EndIf

If RFCModuleMBS.LoadLibrary(path) Then
MsgBox "Library loaded."
Else
MsgBox "Failed to load library"+EndOfLine+EndOfLine+RFCModuleMBS.LibraryLoadErrorMessage
quit
End If
```

Notes: Pass path to sapnwrfc.dll on Windows or libsapnwrfc.dylib on MacOS or libsapnwrfc.so on Linux. If file is installed in system path, you may just pass file name.

Returns true on success or false on failure.

The LibraryLoadErrorMessage function returns error message on failure.

See also:

- 10.10.4 LoadLibrary(path as string) as boolean 223

10.10.4 LoadLibrary(path as string) as boolean

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

Function: Loads the sapnwrfc library.

Notes: Pass path to sapnwrfc.dll on Windows or libsapnwrfc.dylib on MacOS or libsapnwrfc.so on Linux. If file is installed in system path, you may just pass file name.

Returns true on success or false on failure.

The LibraryLoadErrorMessage function returns error message on failure.

See also:

- 10.10.3 LoadLibrary(file as folderitem) as boolean 222

10.10.5 LocalTransactionID as String

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

Function: Retrieves a unique 24-digit transaction ID.

Notes: The API will attempt to generate a TID locally using the operating system's UUID.

10.10.6 ReloadIniFile

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

Function: Loads the contents of the sapnwrfc.ini file into memory.

Notes: Searches the directory given by IniPath (or the current working directory) for the file sapnwrfc.ini and loads its contents into memory.

10.10.7 SetCurrentWorkingDirectory(path as folderitem) as boolean

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

Function: Sets the current working directory.

Example:

```
Dim path As FolderItem = GetFolderItem("libsapnwrfc.dylib")
Dim LibPath As String = path.parent.NativePath
```

```
Call RFCModuleMBS.SetCurrentWorkingDirectory(libPath)
```

Notes: This is often useful to make sure the DLLs in that folder are found.
See also:

- 10.10.8 SetCurrentWorkingDirectory(path as String) as boolean 224

10.10.8 SetCurrentWorkingDirectory(path as String) as boolean

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

Function: Sets the current working directory.

Notes: This is often useful to make sure the DLLs in that folder are found.

See also:

- 10.10.7 SetCurrentWorkingDirectory(path as folderitem) as boolean 224

10.10.9 Properties

10.10.10 IniPath as String

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

Function: The directory in which to search for the sapnwrfc.ini file.

Notes: By default the sapnwrfc library searches for the sapnwrfc.ini in the current working directory of the process. If you want to keep it in a different directory, use this function to tell the sapnwrfc library about the new path.

Note

After you have changed the directory, the NW RFC lib automatically loads the contents of the new sapnwrfc.ini file from that directory.

Pass the full (absolute) path of the directory, in which the sapnwrfc library should look for the sapnwrfc.ini file. A path relative to the current working directory of the process also works.

(Read and Write property)

10.10.11 LibraryLoadError as Integer

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

Function: The load error code.

Notes: (Read only property)

10.10.12 LibraryLoadErrorMessage as String

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

Function: The load error message.

Notes: (Read only property)

10.10.13 Loaded as Boolean

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

Function: Whether the library is loaded.

Notes: Returns true if the library contains the required functions.

(Read only property)

10.10.14 MajorVersion as Integer

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

Function: Get information about currently loaded sapnwrfc library.

Notes: Major version, e.g. 7500.

(Read only property)

10.10.15 MinorVersion as Integer

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

Function: Get information about currently loaded sapnwrfc library.

Notes: Minor version.

(Read only property)

10.10.16 PatchLevel as Integer

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

Function: Get information about currently loaded sapnwrfe library.

Notes: Patch level of the version.

(Read only property)

10.10.17 TraceDir as String

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

Function: Changes the directory where the NW RFC lib should write trace files.

Notes: This function has the same effect as the sapnwrfe.ini parameter RFC_TRACE_DIR. See the documentation of that parameter in the sample ini file contained in the /demo directory of the NW RFC SDK.

Note

This API call affects only new trace files that will be opened after the call. The directory of already existing trace files is not changed in order to prevent confusion and garbage data...

Pass the new directory. Can be an absolute or relative path name. The directory needs to exist prior to calling this API. The NW RFC lib will not attempt to create non-existing directories.

(Read and Write property)

10.10.18 TraceEncoding as String

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

Function: Changes the character encoding to be used in trace files.

Notes: This function has the same effect as the sapnwrfe.ini parameter RFC_TRACE_ENCODING. See the documentation of that parameter in the sample ini file contained in the /demo directory of the NW RFC SDK.

Note

This API call affects only new trace files that will be opened after the call. The character encoding of already existing trace files is not changed in order to prevent confusion and garbage data...

Pass the new encoding. Possible values are "UTF-16", "UTF-8" and "DEFAULT". On Windows UTF-16 is recommended for faster performance. "DEFAULT" corresponds to the operating system's default character encoding, which is CP1252 or ISO-8859-1 on most Windows systems and UTF-8 on most Linux systems.

(Read and Write property)

10.10.19 TraceType as String

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

Function: Changes the way the NW RFC lib writes trace files.

Notes: This function has the same effect as the sapnwrfc.ini parameter RFC_TRACE_TYPE. See the documentation of that parameter in the sample ini file contained in the /demo directory of the NW RFC SDK.

Note

This API call closes currently open trace files and then changes to "one file per process" or one "file per thread". If the NW RFC lib is already using the given trace type, it does nothing.

Must be either "PROCESS" or "THREAD".

(Read and Write property)

10.10.20 Version as String

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

Function: Get information about currently loaded sapnwrfc library.

Notes: Version as text to show to user.

(Read only property)

10.10.21 Constants

Errors

Constant	Value	Description
kErrorAbapClassException	27	The called function module raised a class based exception
kErrorAbapException	5	The called function module raised an Exception (RAISE or MESSAGE . RAISING)
kErrorAbapMessage	4	The called function module raised an E-, A- or X-Message
kErrorAbapRuntimeFailure	3	SAP system runtime error (SYSTEM_FAILURE): Shortdump on the backend side
kErrorAuthorizationFailure	29	Authorization check error
kErrorBufferTooSmall	23	The given buffer was too small to hold the entire parameter. Data has been truncated.
kErrorCanceled	7	No longer used
kErrorClosed	6	Connection closed by the other side
kErrorCodepageConversionFailure	21	Codepage conversion error
kErrorCommunicationFailure	1	Error in Network & Communication layer
kErrorConversionFailure	22	Error while converting a parameter to the correct data type
kErrorExecuted	16	Inbound tRFC Call already executed (needs to be returned from RFC_ON_CHECK_TRANSACTION in case the TID is already known and successfully processed before.)
kErrorExternalFailure	15	Error in external custom code. (E.g. in the function handlers or tRFC handlers.) Results in SYSTEM_FAILURE
kErrorIllegalState	19	The operation is not supported on that handle at the current point of time (e.g. trying a callback on a server handle, while not in a call)
kErrorInvalidHandle	13	An invalid handle was passed to an API call
kErrorInvalidParameter	20	An invalid parameter was passed to an API call, (e.g. invalid name, type or length)
kErrorInvalidProtocol	11	The received data has an unsupported format
kErrorLogonFailure	2	Unable to logon to SAP system. Invalid password, user locked, etc.
kErrorMemoryInsufficient	9	Memory insufficient
kErrorNotFound	17	Function or structure definition not found (Metadata API)
kErrorNotSupported	18	The operation is not supported on that handle
kErrorOk	0	Everything O.K. Used by every function. (no exception)
kErrorRetry	14	ListenAndDispatch did not receive an RFC request during the timeout period
kErrorSerializationFailure	12	A problem while serializing or deserializing RFM parameters
kErrorStartSapguiFailure	26	Failed to start and attach SAPGUI to the RFC connection.
kErrorTableMoveBof	24	Trying to move the current position before the first row of the table.
kErrorTableMoveEof	25	Trying to move the current position after the last row of the table.
kErrorTimeout	8	Time out
kErrorUnknownError	28	"Something" went wrong, but I don't know what...
kErrorVersionMismatch	10	Version mismatch

10.11 class RFCParameterDescriptionMBS

10.11.1 class RFCParameterDescriptionMBS

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

Function: The class for a parameter description.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.11.2 Methods

10.11.3 Constructor

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

Function: The private constructor

10.11.4 Properties

10.11.5 Connection as RFCConnectionMBS

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

Function: The parent connection.

Notes: (Read only property)

10.11.6 decimals as Integer

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

Function: Gives the number of decimals in case of a packed number (BCD)

Notes: (Read only property)

10.11.7 defaultValue as String

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

Function: Default value as defined in SE37.

Notes: (Read only property)

10.11.8 Direction as Integer

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

Function: Specifies whether the parameter is an input, output or bi-directional parameter.

Notes: (Read only property)

10.11.9 isOptional as Boolean

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

Function: Specifies whether this parameter is defined as optional in SE37.

Notes: True is optional, false non-optional.

(Read only property)

10.11.10 Name as String

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

Function: Parameter name.

Notes: (Read only property)

10.11.11 nucLength as Integer

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

Function: Parameter length in bytes in a 1-byte-per-SAP_CHAR system.

Notes: (Read only property)

10.11.12 parameterText as String

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

Function: Description text of the parameter as defined in SE37.

Notes: (Read only property)

10.11.13 Parent as Variant

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

Function: The parent object.

Notes: (Read only property)

10.11.14 Type as Integer

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

Function: Parameter data type.

Notes: (Read only property)

10.11.15 TypeDescription as RFCTypeDescriptionMBS

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

Function: The structure definition in case this parameter is a structure or table.

Notes: May be nil for other parameter types.

(Read only property)

10.11.16 TypeString as String

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

Function: The type as string.

Notes: Convenience property so you can see type in debugger.

(Read only property)

10.11.17 ucLength as Integer

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

Function: Parameter length in bytes in a 2-byte-per-SAP_CHAR system.

Notes: (Read only property)

10.11.18 Constants

Direction Modes

Constant	Value	Description
kDirectionChanging	3	Import and export parameter. This corresponds to ABAP CHANGING parameter.
kDirectionExport	2	Export parameter. This corresponds to ABAP EXPORTING parameter.
kDirectionImport	1	Import parameter. This corresponds to ABAP IMPORTING parameter.
kDirectionTable	7	Table parameter. This corresponds to ABAP TABLES parameter.

10.12 class RFCStructureMBS

10.12.1 class RFCStructureMBS

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

Function: The class for a structure in a RFC connection.

Notes: Subclass of the RFCContainerMBS class.

10.12.2 Methods

10.12.3 Clone as RFCStructureMBS

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

Function: Creates a copy of the given structure and returns the handle to the new object.

10.12.4 Constructor(typeDescription as RFCTypeDescriptionMBS)

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

Function: Creates an internal structure data object and returns the handle to the structure object.

10.12.5 Destructor

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

Function: The destructor.

10.13 class RFCTableMBS

10.13.1 class RFCTableMBS

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

Function: The class for a table in a RFC connection.

Notes: Subclass of the RFCContainerMBS class.

10.13.2 Methods

10.13.3 AppendNewRow as RFCStructureMBS

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

Function: Creates a new row and appends it at the end of the table.

10.13.4 AppendNewRows(numRows as Integer)

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

Function: Appends a set of new empty rows at the end of the table and moves the table cursor to the first new row.

10.13.5 AppendRow(row as RFCStructureMBS)

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

Function: Appends the given structure at the end of the table.

10.13.6 Clone as RFCTableMBS

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

Function: Creates a copy of the given table and returns the handle to the new table.

10.13.7 Constructor(TypeDescription as RFCTypeDescriptionMBS)

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

Function: Creates a internal table object and returns the handle to the table.

10.13.8 CurrentRow as RFCStructureMBS

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

Function: Gets the structure handle to the current row.

10.13.9 DeleteAllRows

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

Function: Deletes all rows from the table.

10.13.10 DeleteCurrentRow

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

Function: Deletes the current row from the table.

10.13.11 Destructor

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

Function: The destructor.

10.13.12 InsertNewRow as RFCStructureMBS

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

Function: Creates a new row and inserts it at the current position of the table cursor.

10.13.13 InsertRow(row as RFCStructureMBS)

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

Function: Inserts the given structure at the current position of the table cursor.

10.13.14 MoveTo(row as Integer)

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

Function: Moves the cursor from the current position to the position specified by the index.

10.13.15 MoveToFirstRow

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

Function: Moves the current position to the first row of the table.

10.13.16 MoveToLastRow

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

Function: Moves the current position to the last row of the table.

10.13.17 MoveToNextRow

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

Function: Moves the cursor from the current position to the next row.

10.13.18 MoveToPreviousRow

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

Function: Moves the cursor from the current position to the previous row.

10.13.19 ReserveCapacity(numRows as Integer)

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

Function: Reserves memory without changing the size of a table so that new rows can be appended without new memory allocation.

10.13.20 Properties

10.13.21 RowCount as Integer

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

Function: Gets the number of the rows contained in the table.

Notes: (Read only property)

10.13.22 RowType as RFCTypeDescriptionMBS

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

Function: Gets the type descriptor of the table rows.

Notes: (Read only property)

10.14 class RFCTransactionMBS

10.14.1 class RFCTransactionMBS

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

Function: The class for a transaction.

10.14.2 Methods

10.14.3 ConfirmTransaction

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

Function: After SubmitTransaction has finally succeeded, ConfirmTransaction cleans up the transaction handling table in the backend.

Notes: Caution:

After this call the backend is no longer protected against this TID. So another SubmitTransaction would result in a duplicate.

10.14.4 Constructor(connection as RFCConnectionMBS, TransactionID as String, QueueName as String)

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

Function: Creates a container for executing a (multi-step) transactional call.

Notes: TransactionID: transaction ID used to identify the transaction;

queueName: queue name associated with the transaction. If it is "" or empty, the transaction is for tRfc

10.14.5 Destructor

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

Function: The destructor.

10.14.6 InvokeInTransaction(funcHandle as RFCFunctionMBS)

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

Function: Puts a tRfc or qRfc call into the given transaction.

Notes: Can be used multiple times within one transaction handle.

funcHandle: function handle that identifies the Rfc function;

10.14.7 SubmitTransaction

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

Function: Executes all function modules in the backend system, that have accumulated in the transaction so far.

Notes: This step can be repeated until it finally succeeds (RFC_OK). The transaction handling in the backend system protects against duplicates.

10.14.8 Properties

10.14.9 Handle as Integer

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

Function: The internal object reference.

Notes: (Read only property)

10.14.10 TransactionID as String

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

Function: Retrieves a unique 24-digit transaction ID from the SAP backend system.

Notes: (Read only property)

10.15 class RFCTypeDescriptionMBS

10.15.1 class RFCTypeDescriptionMBS

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

Function: The class for a type definition.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

10.15.2 Methods

10.15.3 Constructor

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

Function: The private constructor.

10.15.4 CreateStructure as RFCStructureMBS

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

Function: Creates an internal structure data object and returns the handle to the structure object.

10.15.5 CreateTable as RFCTableMBS

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

Function: Creates a internal table object and returns the handle to the table.

10.15.6 FieldDescription(Index as Integer) as RFCFieldDescriptionMBS

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

Function: Reads the field description of the structure's indexth field.

See also:

- 10.15.7 FieldDescription(Name as String) as RFCFieldDescriptionMBS

10.15.7 FieldDescription(Name as String) as RFCFieldDescriptionMBS

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

Function: Reads the field description of a field given by name.

See also:

- 10.15.6 FieldDescription(Index as Integer) as RFCFieldDescriptionMBS

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10.15.8 FieldDescriptions as RFCFieldDescriptionMBS()

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

Function: Reads all the field descriptions.

10.15.9 Properties

10.15.10 Connection as RFCConnectionMBS

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

Function: The connection owning this object.

Notes: (Read only property)

10.15.11 FieldCount as Integer

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

Function: The number of fields for this type.

Notes: (Read only property)

10.15.12 Handle as Integer

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

Function: The internal object reference.

Notes: (Read only property)

10.15.13 Name as String

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

Function: The name of the type.

Notes: (Read only property)

10.15.14 Parent as Variant

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

Function: The parent object.

Notes: (Read only property)

Chapter 11

SATSolver

11.1 class LGLAbortedExceptionMBS

11.1.1 class LGLAbortedExceptionMBS

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, iOS, Targets: All.

Function: The exception used to report fatal errors in SAT Solver.

Notes: Subclass of the RuntimeException class.

Blog Entries

- [MBS Xojo Plugins, version 21.3pr6](#)

11.2 class LGLMBS

11.2.1 class LGLMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The class for the SAT Solver from lingeling.

Notes: Based on lingeling project here:

<https://github.com/arminbiere/lingeling>

and

<http://fmv.jku.at/lingeling/>

Blog Entries

- [News from the MBS Xojo Plugins Version 21.3](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 21.3](#)
- [MBS Xojo Plugins, version 21.3pr6](#)
- [New in the MBS Xojo Plugins 20.0](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 20.0](#)
- [MBS Xojo Plugins, version 19.6pr2](#)

Videos

- [XDC 2020 MBS Plugins Presentation](#)

Xojo Developer Magazine

- [18.3, page 44: Happy Birthday MonkeyBread Software, What is new in the MBS Xojo Plugins by Stefanie Juchmes](#)

11.2.2 Methods

11.2.3 Add(lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a value.

11.2.4 Assume(lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Assume single units.

11.2.5 CAssume(lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Assume clause (at most one)

11.2.6 Clone as LGLMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Clones the object.

Notes: Both 'Cloning' and 'Forking' can be used to implement 'Push & Pop', but the asymmetric forking is more similar to the classical way of implementing it, needs less resources since for instance eliminated variables do not occupy any memory in the children, but requires lifting back satisfying assignments explicitly (through the whole parent chain). If these full satisfying assignments are really needed actually cloning could be more space efficient too. Assume you want to split the solver into two instances, one with a literal set to false, the other one to true. Then cloning allows you to produce two independent branches, while for forking you need three, since the root / top solver still has to be kept for lifting back a potential assignment.

11.2.7 Constructor

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The constructor.

Notes: Creates new empty object.

11.2.8 DefaultOption(Name as String) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries default value for an option.

11.2.9 Deref(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries value.

Notes: neg=false, pos=true

Returns -1 if lit is bigger than MaxVar.

11.2.10 Failed(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks failed flag for given item.

Notes: neg=false, pos=true
for assumptions.

11.2.11 Fixate

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Add assumptions as units

11.2.12 Fixed(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks fixed flag.

Notes: neg=false, pos=true
Toplevel

11.2.13 FlushCache

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Flush all learned clauses.

11.2.14 FlushTimers

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Flush timers.

11.2.15 Fork as LGLMBS

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Forks the object.

Notes: 'Forking' copies only irredundant clauses and also uses internal variable indices of the parent as

external variable indices. Thus 'parent' and the forked off 'child' do neither exactly work the same way, nor do they use from the API point of view the same set of variables. They are satisfiability equivalent. If the child becomes unsatisfiable the parent can be assumed to be unsatisfiable too and thus 'join' would just add the empty clause to the parent. If the child produces a satisfying assignment, this assignment is turned into an assignment of the parent by 'join'. Parents can be forked multiple times. A child has exactly one parent. Parents and children can be released independently. Between 'Fork' and 'Join' no other operations but further 'Fork' are allowed. The effect of multiple 'Join' with the same parent is unclear at this point. The same memory manager is used for the child and the parent. Options, prefix, output file and the callbacks for 'gettime' and 'Abort' are copied too (if set).

Both 'Cloning' and 'Forking' can be used to implement 'Push & Pop', but the asymmetric forking is more similar to the classical way of implementing it, needs less resources since for instance eliminated variables do not occupy any memory in the children, but requires lifting back satisfying assignments explicitly (through the whole parent chain). If these full satisfying assignments are really needed actually cloning could be more space efficient too. Assume you want to split the solver into two instances, one with a literal set to false, the other one to true. Then cloning allows you to produce two independent branches, while for forking you need three, since the root / top solver still has to be kept for lifting back a potential assignment.

11.2.16 Freeze(lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Freezes the given item.

11.2.17 Frozen(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries frozen state.

11.2.18 GetOptionMinMax(Name as String, byref min as Integer, byref max as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries current value, minimum and maximum values.

11.2.19 HasOption(Name as String) as Boolean

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if the given option is set.

11.2.20 IncVar as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Increases variables by one.

11.2.21 Join(Child as LGLMBS) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Joins back forked child.

11.2.22 LibVersion as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries library version.

Example:

Print "LGL "+LGLMBS.LibVersion

11.2.23 Lookahead as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns a good look ahead literal or zero if all potential literals have been eliminated or have been used as blocking literals in blocked clause elimination.

Notes: Zero is also returned if the formula is already inconsistent. The lookahead literal is made usable again, for instance if it was not frozen during a previous SAT call and thus implicitly became melted. Therefore it can be added in a unit clause.

11.2.24 Melt(lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Melts a literal.

11.2.25 MeltAll

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Melt all literals.

11.2.26 ParseFile(File as FolderItem, force as boolean = false) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file.

Notes: Returns empty text on success or error message from parser.

See also:

- 11.2.27 ParseFile(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 249

11.2.27 ParseFile(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file.

Notes: Returns empty text on success or error message from parser.

See also:

- 11.2.26 ParseFile(File as FolderItem, force as boolean = false) as String 249

11.2.28 ParseFileMT(File as FolderItem, force as boolean = false) as String

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file.

Notes: Returns empty text on success or error message from parser.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 11.2.29 ParseFileMT(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 250

11.2.29 ParseFileMT(File as FolderItem, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file.

Notes: Returns empty text on success or error message from parser.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 11.2.28 ParseFileMT(File as FolderItem, force as boolean = false) as String 249

11.2.30 ParsePath(Path as String, force as boolean = false) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given by path.

Notes: Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

```
.gz    gzip
.xz    xz
.bz2   bzip2
.zip   unzip
.7z    7x
```

See also:

- 11.2.31 ParsePath(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 250

11.2.31 ParsePath(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given by path.

Notes: Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

```
.gz    gzip
.xz    xz
.bz2   bzip2
.zip   unzip
.7z    7x
```

See also:

- 11.2.30 ParsePath(Path as String, force as boolean = false) as String 250

11.2.32 ParsePathMT(Path as String, force as boolean = false) as String

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given by path.

Notes: Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

```
.gz    gzip
.xz    xz
.bz2   bzip2
.zip   unzip
.7z    7x
```

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 11.2.33 ParsePathMT(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 252

11.2.33 ParsePathMT(Path as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given by path.

Notes: Returns empty text on success or error message from parser.

On MacOS and Linux, if file has the following extensions, the file will be decompressed with command line tool and then parsed:

```
.gz    gzip
.xz    xz
.bz2   bzip2
.zip   unzip
.7z    7x
```

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 11.2.32 ParsePathMT(Path as String, force as boolean = false) as String 251

11.2.34 ParseString(Data as String, force as boolean = false) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given it as text.

Notes: Returns empty text on success or error message from parser.

Please pass text with data separated with unix line endings (endofline.unix), so you may need to use ReplaceLineEndings function.

See also:

- 11.2.35 ParseString(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 252

11.2.35 ParseString(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given it as text.

Notes: Returns empty text on success or error message from parser.

Please pass text with data separated with unix line endings (endoffline.unix), so you may need to use ReplaceLineEndings function.

See also:

- 11.2.34 ParseString(Data as String, force as boolean = false) as String 252

11.2.36 ParseStringMT(Data as String, force as boolean = false) as String

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given it as text.

Notes: Returns empty text on success or error message from parser.

Please pass text with data separated with unix line endings (endoffline.unix), so you may need to use ReplaceLineEndings function.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 11.2.37 ParseStringMT(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String 253

11.2.37 ParseStringMT(Data as String, force as boolean, byref LineNo as Integer, byref Max as Integer) as String

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses data file given it as text.

Notes: Returns empty text on success or error message from parser.

Please pass text with data separated with unix line endings (endoffline.unix), so you may need to use ReplaceLineEndings function.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

See also:

- 11.2.36 ParseStringMT(Data as String, force as boolean = false) as String 253

11.2.38 Print(File as FolderItem = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Print system to file or stdout.

Notes: Pass nil to use stdout.

Remaining in DIMACS format

11.2.39 PrintAll(File as FolderItem = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Prints all values.

Notes: Including units & equivalents.

Pass nil to use stdout.

11.2.40 PrintBanner(Name as String, Prefix as String, File as FolderItem = nil)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Prints banner including version of library.

Notes: Pass nil to use stdout.

see `lglbnr` function.

11.2.41 PrintOptions(prefix as string, IgnoreSome as boolean)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Print all options to stdout.

11.2.42 PrintPCS(mixed as boolean)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Prints PCS file.

11.2.43 PrintRangeOptions

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Print range options to stdout.

11.2.44 PrintSizes

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Prints data structure sizes.

11.2.45 PrintStats

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Prints statistics to stdout.

11.2.46 PrintUsage

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Print usage "-h".

11.2.47 ReadOptionFile(File as FolderItem) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reads the option file.

11.2.48 Reconstk(byref Start as Ptr, byref Top as Ptr)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set Start and Top to the 'start' and 'top' of the reconstruction stack, which is used in BCE, BVE and CCE for reconstructing a solution after eliminating variables or clauses.

Notes: These pointers are only valid until the next Sat or Simp call.

11.2.49 ReduceCache

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reset cache size.

11.2.50 Representative(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Return representative from equivalence class if literal is not top-level assigned nor eliminated.

11.2.51 ResetPhase(lit as integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set default phase of a literal.

Notes: Stop forcing phase in decisions.

11.2.52 Reusable(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if item can be reused.

Notes: If a literal was not frozen at the last call to Sat (or Simp) it becomes 'unusable' after the next call even though it might not have been used as blocking literal etc.

11.2.53 Reuse(lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reuses an item.

Notes: If a literal was not frozen at the last call to Sat (or Simp) it becomes 'unusable' after the next call even though it might not have been used as blocking literal etc.

11.2.54 Sat as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the system.

Notes: May output messages to stdout.

11.2.55 SatMT as Integer

Plugin Version: 21.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the system.

Notes: May output messages to stdout.

The work is performed on a preemptive thread, so this function does not block the application and can yield time to other Xojo threads. Must be called in a Xojo thread to enjoy benefits. If called in main thread will block, but keep other background threads running.

11.2.56 SetAPITraceFile(File as FolderItem)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a text file and let the library output to this file.

Notes: Logs API calls to the library.

11.2.57 SetID(tid as Integer, tids as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set individual ids for logging and statistics.

11.2.58 SetImportant(lit as integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Prefer decisions on 'important' variables.

11.2.59 SetOutputFile(File as FolderItem)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates an output file and let the library output to this file.

Notes: Sets output file for report.

11.2.60 SetPhase(lit as integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set default phase of a literal.

Notes: Any decision on this literal will always try this phase. Note, that this function does not have any effect on eliminated variables. Further equivalent variables share the same forced phase and thus if they are set to different default phases, only the last set operation will be kept.

11.2.61 SetPhases

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the phases.

Notes: Assume the solver is in the SATISFIABLE state (after Sat or Simp), then calling SetPhases will copy the current assignment as default phases.

11.2.62 SetTraceFile(File as FolderItem)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Creates a text file and let the library output to this file.

Notes: Set trace output file.

Logs trace calls to the library.

11.2.63 Simp(iterations as integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Calculates the system.

Notes: Iterations must be ≥ 0 .

11.2.64 TraverseAllClauses

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loops over all clauses and calls TraverseAllClauses event for each.

Notes: Internally calls TraverseUnits, TraverseEquivalences and TraverseRemainingClauses.

See also:

11.2. CLASS LGLMBS	259
• 11.2.90 TraverseAllClauses(Lit as Integer)	263

11.2.65 TraverseEquivalences

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loops over equivalences and calls TraverseEquivalences event for each.
See also:

- 11.2.91 TraverseEquivalences(Lit as Integer, Representation as Integer) 263

11.2.66 TraverseRemainingClauses

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loops over remaining clauses and calls TraverseRemainingClauses event for each.
See also:

- 11.2.92 TraverseRemainingClauses(Lit as Integer) 263

11.2.67 TraverseUnits

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Loops over units and calls TraverseUnits event for each.
See also:

- 11.2.93 TraverseUnits(Unit as Integer) 264

11.2.68 Unclone(Child as LGLMBS) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Unclones the object.

11.2.69 Usable(lit as Integer) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks whether an item is usable.

Notes: If a literal was not frozen at the last call to Sat (or Simp) it becomes 'unusable' after the next call even though it might not have been used as blocking literal etc.

11.2.70 Properties

11.2.71 Aborted as Boolean

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The aborted status.

Notes: We set this to true when the processing is aborted due to an error.

See AbortMessage property for the message.

(Read and Write property)

See also:

- 11.2.89 Aborted

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11.2.72 AbortMessage as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The abort reason message.

Notes: (Read only property)

11.2.73 Bytes as Int64

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries current size in bytes.

Notes: (Read only property)

11.2.74 Changed as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Model changed.

Notes: (Read only property)

11.2.75 Confs as Int64

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries number of conflicts.

Notes: (Read only property)

11.2.76 Decs as Int64

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries number of decisions.

Notes: (Read only property)

11.2.77 Handle as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal object reference.

Notes: (Read only property)

11.2.78 Inconsistent as Boolean

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Contains empty clause?

Notes: (Read only property)

11.2.79 MaxMegaBytes as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Maximum memory usage in megabytes.

Notes: (Read only property)

11.2.80 MaxVar as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries maximum index of variables.

Notes: (Read only property)

11.2.81 MegaBytes as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries current size in memory as megabytes.

Notes: (Read only property)

11.2.82 Options as Dictionary

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries all options with values.

Notes: (Read only property)

11.2.83 Prefix as String

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: The prefix for messages.

Notes: (Read and Write property)

11.2.84 ProcessTime as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries CPU usage time used.

Notes: Value is -1 on Windows as we don't have the unix functions there.
(Read only property)

11.2.85 Props as Int64

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries number of propagations.

Notes: (Read only property)

11.2.86 Seconds as Double

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Returns time needed.

Notes: (Read only property)

11.2.87 Option(Name as String) as Integer

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries or sets option value.

Notes: (Read and Write computed property)

11.2.88 Events

11.2.89 Aborted

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called when processing is aborted due to an error.

Notes: Errors are printed to stdout.

See AbortMessage property for the message.

See also:

- 11.2.71 Aborted as Boolean

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11.2.90 TraverseAllClauses(Lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called for TraverseAllClauses method.

See also:

- 11.2.64 TraverseAllClauses

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11.2.91 TraverseEquivalences(Lit as Integer, Representation as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called for TraverseEquivalences method.

See also:

- 11.2.65 TraverseEquivalences

259

11.2.92 TraverseRemainingClauses(Lit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called for TraverseRemainingClauses method.

See also:

- 11.2.66 TraverseRemainingClauses

259

11.2.93 TraverseUnits(Unit as Integer)

Plugin Version: 20.0, Platforms: macOS, Linux, Windows, Targets: .

Function: The event called for TraverseUnits method.

See also:

- 11.2.67 TraverseUnits

259

11.2.94 Constants

SAT Results

Constant	Value	Description
LGL_SATISFIABLE	10	The system is satisfiable.
LGL_UNKNOWN	0	It is not known whether it is satisfiable.
LGL_UNSATISFIABLE	20	The system is not satisfiable.

Chapter 12

SmartCard

12.1 class SmartCardContextMBS

12.1.1 class SmartCardContextMBS

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The class for a SmartCard context.

Example:

```
dim c as new SmartCardContextMBS
dim list() as string = c.Readers
MsgBox Join(list, EndOfLine)
```

Blog Entries

- [MBS Xojo Plugins, version 19.6pr1](#)

12.1.2 Methods

12.1.3 Cancel

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Terminates all outstanding actions within a specific resource manager context.

Notes: The only requests that you can cancel are those that require waiting for external action by the smart card or user. Any such outstanding action requests will terminate with a status indication that the action was canceled. This is especially useful to force outstanding `GetStatusChange` calls to terminate.

Lasterror is set.

12.1.4 Connect(reader as string, ShareMode as UInt32, PreferredProtocols as UInt32) as SmartCardMBS

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Connects to a smartcard.

Example:

```
dim c as new SmartCardContextMBS

dim s as SmartCardMBS
s = c.Connect("MyReader", SmartCardMBS.kShareShared, SmartCardMBS.kProtocolAny)
if s <> nil then
  MsgBox "Connected"
else
  MsgBox "Error: " + str(c.Lasterror)
end if
```

Notes: Establishes a connection (using a specific resource manager context) between the calling application and a smart card contained by a specific reader. If no card exists in the specified reader, an error is returned.

Reader: The name of the reader that contains the target card.

ShareMode: A flag that indicates whether other applications may form connections to the card. Use one of SmartCardMBS.kShare* constants. e.g. kShareExclusive

PreferredProtocols: A bitmask of acceptable protocols for the connection. Possible values may be combined with the OR operation. Use SmartCardMBS.kProtocol* constants. e.g. kProtocolT1

Lasterror and ActiveProtocol are set.

Returns on success a smartcard object, else returns nil.

12.1.5 Constructor

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Initializes a smartcard context.

12.1.6 IsValid as boolean

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Determines whether a smart card context handle is valid.

Notes: Returns true if valid or false if not valid.

12.1.7 ReaderGroups as string()

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Provides the list of reader groups that have previously been introduced to the system.

Notes: The groups may be SCard\$ AllReaders, SCard\$ DefaultReaders, SCard\$ LocalReaders and SCard\$ SystemReaders.

Lasterror is set.

12.1.8 Readers as string()

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Provides the list of readers within a set of named reader groups, eliminating duplicates.

Example:

```
dim c as new SmartCardContextMBS
dim list() as string = c.Readers
MsgBox Join(list, EndOfLine)
```

Notes: Lasterror is set.

See also:

- 12.1.9 Readers(ReaderGroups() as string) as string()

12.1.9 Readers(ReaderGroups() as string) as string()

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Provides the list of readers within a set of named reader groups, eliminating duplicates.

Notes: The caller supplies a list of reader groups, and receives the list of readers within the named groups. Unrecognized group names are ignored. This function only returns readers within the named groups that are currently attached to the system and available for use.

ReaderGroups: The reader groups you like to query.

Lasterror is set.

See also:

- 12.1.8 Readers as string()

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12.1.10 Properties

12.1.11 Available as Boolean

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Whether the smartcard API is available.

Notes: This should be available on Mac and Windows.

Loads on Mac the PCSC.framework.

For Linux you need pcsclite library installed. We try to load libpcsclite.so or /usr/lib/libpcsclite.so.

On Windows we use winscard.dll built into Windows.

(Read only property)

12.1.12 Handle as Integer

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Internal object reference.

Notes: (Read and Write property)

12.1.13 Lasterror as Integer

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The last error code.

Notes: (Read and Write property)

12.1.14 Constants

Error Codes

Constant	Value	Description
kErrorBadSeek	&H80100029	An error occurred in setting the smart card file object pointer.
kErrorCancelled	&H80100002	The action was canceled by an Cancel request.
kErrorCancelledByUser	&H8010006E	The action was canceled by the user.
kErrorCantDispose	&H8010000E	The system could not dispose of the media in the requested manner.
kErrorCardNotAuthenticated	&H8010006F	No PIN was presented to the smart card.
kErrorCardUnsupported	&H8010001C	The smart card does not meet minimal requirements for support.
kErrorCertificateUnavailable	&H8010002D	The requested certificate could not be obtained.
kErrorChvBlocked	&H8010006C	The card cannot be accessed because the maximum number of PIN entry attempts has been reached.
kErrorCommDataLost	&H8010002F	A communications error with the smart card has been detected.
kErrorCommError	&H80100013	An internal communications error has been detected.
kErrorDirNotFound	&H80100023	The specified directory does not exist in the smart card.
kErrorDuplicateReader	&H8010001B	The reader driver did not produce a unique reader name.
kErrorEof	&H8010006D	The end of the smart card file has been reached.
kErrorFileNotFound	&H80100024	The specified file does not exist in the smart card.
kErrorIccCreateorder	&H80100021	The requested order of object creation is not supported.
kErrorIccInstallation	&H80100020	No primary provider can be found for the smart card.
kErrorInsufficientBuffer	&H80100008	The data buffer for returned data is too small for the returned data.
kErrorInternalError	&H80100001	An internal consistency check failed.
kErrorInvalidAtr	&H80100015	An ATR string obtained from the registry is not a valid ATR string.
kErrorInvalidChv	&H8010002A	The supplied PIN is incorrect.
kErrorInvalidHandle	&H80100003	The supplied handle was not valid.
kErrorInvalidParameter	&H80100004	One or more of the supplied parameters could not be properly interpreted.
kErrorInvalidTarget	&H80100005	Registry startup information is missing or not valid.
kErrorInvalidValue	&H80100011	One or more of the supplied parameter values could not be properly interpreted.
kErrorNoAccess	&H80100027	Access is denied to the file.
kErrorNoDir	&H80100025	The supplied path does not represent a smart card directory.
kErrorNoFile	&H80100026	The supplied path does not represent a smart card file.
kErrorNoKeyContainer	&H80100030	The requested key container does not exist on the smart card.
kErrorNoMemory	&H80100006	Not enough memory available to complete this command.
kErrorNoReadersAvailable	&H8010002E	No smart card reader is available.
kErrorNoService	&H8010001D	The smart card resource manager is not running.
kErrorNoSmartcard	&H8010000C	The operation requires a smart card, but no smart card is currently in the device.
kErrorNoSuchCertificate	&H8010002C	The requested certificate does not exist.
kErrorNotReady	&H80100010	The reader or card is not ready to accept commands.
kErrorNotTransacted	&H80100016	An attempt was made to end a nonexistent transaction.
kErrorPciTooSmall	&H80100019	The PCI receive buffer was too small.
kErrorProtoMismatch	&H8010000F	The requested protocols are incompatible with the protocol currently in use with the card.
kErrorReaderUnavailable	&H80100017	The specified reader is not currently available for use.
kErrorReaderUnsupported	&H8010001A	The reader driver does not meet minimal requirements for support.
kErrorRemovedCard	&H80100069	The smart card has been removed, so further communication is not possible.
kErrorResetCard	&H80100068	The smart card was reset.
kErrorSecurityViolation	&H8010006A	Access was denied because of a security violation.
kErrorServerTooBusy	&H80100031	The smart card resource manager is too busy to complete this operation.
kErrorServiceStopped	&H8010001E	The smart card resource manager has shut down.
kErrorSharingViolation	&H8010000B	The smart card cannot be accessed because of other outstanding connections.
kErrorShutdown	&H80100018	The operation has been aborted to allow the server application to exit.
kErrorSuccess	0	No error.
kErrorSystemCancelled	&H80100012	The action was canceled by the system, presumably to log off or shut down.
kErrorTimeout	&H8010000A	The user-specified time-out value has expired.
kErrorUnexpected	&H8010001F	An unexpected card error has occurred.
kErrorUnknownCard	&H8010000D	The specified smart card name is not recognized.
kErrorUnknownError	&H80100014	An internal error has been detected, but the source is unknown.
kErrorUnknownReader	&H80100009	The specified reader name is not recognized.
kErrorUnknownResMng	&H8010002B	An unrecognized error code was returned.
kErrorUnpoweredCard	&H80100067	Power has been removed from the smart card, so that further communication is not possible.

12.2 class SmartCardMBS

12.2.1 class SmartCardMBS

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The class for a smartcard.

Notes: This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [MBS Xojo Plugins, version 20.2pr2](#)
- [MBS Xojo Plugins, version 19.6pr2](#)
- [MBS Xojo Plugins, version 19.6pr1](#)
- [MBS Xojo Plugins, version 19.5pr6](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 18.5](#)
- [MBS Xojo Plugins, version 18.5pr3](#)
- [New functions for smart card reading](#)

12.2.2 Methods

12.2.3 BeginTransaction

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Starts a transaction.

Notes: The function waits for the completion of all other transactions before it begins. After the transaction starts, all other applications are blocked from accessing the smart card while the transaction is in progress.

If a transaction is held on the card for more than five seconds with no operations happening on that card, then the card is reset. Calling any of the Smart Card and Reader Access Functions or Direct Card Access Functions on the card that is transacted results in the timer being reset to continue allowing the transaction to be used.

The BeginTransaction function is a smart card and reader access function. For more information about other access functions, see Smart Card and Reader Access Functions.

Lasterror is set.

12.2.4 CancelTransaction

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Cancels current transaction.

Notes: Lasterror is set.

12.2.5 Constructor

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The private constructor.

12.2.6 Control(ControlCode as Integer, input as ptr, inputLength as UInt32, output as ptr, byref outputLength as UInt32)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Direct control of the reader.

Notes: You can call it any time after a successful call to SmartCard.Connect and before a successful call to SmartCard.Disconnect. The effect on the state of the reader depends on the control code.

ControlCode: Control code for the operation. This value identifies the specific operation to be performed.

Input: Pointer to a buffer that contains the data required to perform the operation. This parameter can be nil if the ControlCode parameter specifies an operation that does not require input data.

inputLength: Size, in bytes, of the buffer pointed to by Input.

output: Pointer to a buffer that receives the operation's output data. This parameter can be nil if the ControlCode parameter specifies an operation that does not produce output data.

outputLength: On input the size, in bytes, of the buffer pointed to by output. On output the receives the size, in bytes, of the data stored into the buffer pointed to by output.

Lasterror is set.

12.2.7 Disconnect(Disposition as Integer = 0)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Terminates a connection previously opened between the calling application and a smart card in the target reader.

Notes: Disposition: Action to take on the card in the connected reader on close.

can be:

kUnpowerCard	Power down the card and reset it (Cold Reset).
kResetCard	Reset the card (Warm Reset).
kLeaveCard	Do not do anything special on reconnect.
kEjectCard	Eject card.

Lasterror is set.

12.2.8 EndTransaction(Disposition as Integer = 0)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Ends transaction.

Notes: Completes a previously declared transaction, allowing other applications to resume interactions with the card.

Disposition: Action to take on the card in the connected reader on close. Can be Eject, Leave, Reset or Unpower. See constants.

Lasterror is set.

12.2.9 GetAttrib(AttrId as UInt32) as Memoryblock

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Retrieves the current reader attributes for the given handle.

Notes: It does not affect the state of the reader, driver, or card.

The plugin first queries for size of attribute and on success queries again to get the data and return it as a memoryblock.

AttrId: The attribute ID. See kAttribute* constants.

Lasterror is set.

12.2.10 ReadFile(FileID as MemoryBlock) as MemoryBlock

Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Read file from smart card with APDU protocol.

Notes: Returns data as MemoryBlock or error message.

The first two bytes are status code.

For Swiss health cards, the relevant IDs are 2F06 and 2F07.

For Belgian EID:

4031	ID RN
4032	SGN RN
4033	ID Address
4034	SGN Address
4035	ID Photo

You find the IDs for files usually in documentation or your card!

For some cards you may first need to move down a hierarchy of folders to get an item via Transmit().

12.2.11 Reconnect(ShareMode as UInt32, PreferredProtocols as UInt32, Initialization as UInt32)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The Reconnect function reestablishes an existing connection between the calling application and a smart card.

Notes: This function moves a card handle from direct access to general access, or acknowledges and clears an error condition that is preventing further access to the card.

Initialization can be one of the following:

kUnpowerCard	Power down the card and reset it (Cold Reset).
kResetCard	Reset the card (Warm Reset).
kLeaveCard	Do not do anything special on reconnect.

ShareMode: A flag that indicates whether other applications may form connections to the card. Use one of SmartCardMBS.kShare* constants. e.g. kShareExclusive

PreferredProtocols: A bitmask of acceptable protocols for the connection. Possible values may be combined with the OR operation. Use SmartCardMBS.kProtocol* constants. e.g. kProtocolT1

Lasterror and ActiveProtocol are set.

12.2.12 SetAttrib(AttrId as UInt32, mem as Memoryblock)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Sets the given reader attribute.

Notes: It does not affect the state of the reader, reader driver, or smart card. Not all attributes are supported by all readers (nor can they be set at all times) as many of the attributes are under direct control of the transport protocol.

AttrId: The attribute ID. See kAttribute* constants.

Mem: The data to store.

Lasterror is set.

12.2.13 SplitValues(Data as MemoryBlock) as Dictionary

Plugin Version: 18.5, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Split values read from smart card.

Notes: Files on smartcard can contain key/value data.

Returns Dictionary with numbers (key) and values as strings.

12.2.14 Status(byref Reader as string, byref State as Integer, byref Protocol as Integer, byref CardID as string)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Provides the current status of a smart card in a reader.

Notes: You can call it any time after a successful call to SCardConnect and before a successful call to SCardDisconnect. It does not affect the state of the reader or reader driver.

Provides reader name, state of card (see kState constants), Protocol (see kProtocol constants) and CardID.

State: Current state of the smart card in the reader. Upon success, it receives one of the following state indicators.

Protocol: Current protocol, if any. The returned value is meaningful only if the returned value of pdwState is kCardStateSpecific.

CardID: 32-byte buffer that receives the ATR string from the currently inserted card, if available.

Lasterror is set.

See also:

- 12.2.15 Status(byref State as Integer, byref Protocol as Integer, byref CardID as string) 275

12.2.15 Status(byref State as Integer, byref Protocol as Integer, byref CardID as string)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Provides the current status of a smart card in a reader.

Notes: Same as other Status function, but without querying the name.

Lasterror is set.

See also:

- 12.2.14 Status(byref Reader as string, byref State as Integer, byref Protocol as Integer, byref CardID as string) 274

12.2.16 Transmit(ioSendPci as Ptr, SendBuffer as ptr, SendLength as UInt32, ioRecvPci as ptr, RecvBuffer as Ptr, byref RecvLength as UInt32)

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Sends a service request to the smart card and expects to receive data back from the card.

Example:

```
dim card as SmartCardMBS // your card
```

```
dim header as new memoryBlock(8)
```

```
header.Int32Value(0) = 2 // T1
```

```
header.Int32Value(4) = 8 // size of this block
```

```
dim command as new MemoryBlock(5)
```

```
command.Int8Value(0) = 0
```

```
command.Int8Value(1) = &hCA
```

```
command.Int8Value(2) = 1
```

```
command.Int8Value(3) = &h82
```

```
command.Int8Value(4) = 2
```

```
dim buffer as new MemoryBlock(512)
```

```
dim ReceiveHeader as new MemoryBlock(8)
```

```
dim RecvLength as UInt32
```

```
card.Transmit(header, command, command.Size, ReceiveHeader, buffer, RecvLength)
```

MsgBox "Received "+str(RecvLength)+" bytes"

Notes: ioSendPci:

A pointer to the protocol header structure for the instruction. This buffer is in the format of an SCARD_IO_REQUEST structure, followed by the specific protocol control information (PCI).

For the T=0, T=1, and Raw protocols, the PCI structure is constant. The smart card subsystem supplies a global T=0, T=1, or Raw PCI structure, which you can reference by using the symbols SCARD_PCI_T0, SCARD_PCI_T1, and SCARD_PCI_RAW respectively.

SendBuffer:

A pointer to the actual data to be written to the card.

For T=0, the data parameters are placed into the address pointed to by SendBuffer according to the following structure:

Type	name	Description
Byte	Cla	The instruction class
Byte	Ins	The instruction code
Byte	P1	Parameter to the instruction
Byte	P2	Parameter to the instruction
Byte	P3	Size of I/O transfer

The data sent to the card should immediately follow the send buffer. In the special case where no data is sent to the card and no data is expected in return, P3 is not sent.

SendLength:

The length, in bytes, of the SendBuffer parameter.

For T=0, in the special case where no data is sent to the card and no data expected in return, this length must reflect that the P3 member is not being sent; the length should be 4.

ioRecvPci:

Pointer to the protocol header structure for the instruction, followed by a buffer in which to receive any returned protocol control information (PCI) specific to the protocol in use. This parameter can be nil if no PCI is returned.

RecvBuffer:

Pointer to any data returned from the card.

For T=0, the data is immediately followed by the SW1 and SW2 status bytes. If no data is returned from the card, then this buffer will only contain the SW1 and SW2 status bytes.

RecvLength:

Supplies the length, in bytes, of the RecvBuffer parameter and receives the actual number of bytes received from the smart card. This value cannot be SCARD_AUTOALLOCATE because Transmit does not support SCARD_AUTOALLOCATE.

For T=0, the receive buffer must be at least two bytes long to receive the SW1 and SW2 status bytes.

see also

[https://msdn.microsoft.com/en-us/library/windows/desktop/aa379804\(v=vs.85\).aspx](https://msdn.microsoft.com/en-us/library/windows/desktop/aa379804(v=vs.85).aspx)

Lasterror is set.

12.2.17 Properties

12.2.18 ActiveProtocol as Integer

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The active protocol.

Notes: (Read and Write property)

12.2.19 Handle as Integer

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The internal object reference.

Notes: (Read and Write property)

12.2.20 Lasterror as Integer

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: The last error code.

Notes: (Read and Write property)

12.2.21 Constants

Attribute IDs

Constant	Value	Description
kAttributeAtrString	590595	Answer to reset (ATR) string.
kAttributeChannelId	131344	DWORD encoded as &hDDDDCCCC, where DDDD = data channel type, CCCC = channel number. The following encodings are defined for DDDD: &h01 serial I/O; CCCC is a port number. &h02 parallel I/O; CCCC is a port number. &h04 PS/2 keyboard port; CCCC is zero. &h08 SCSI; CCCC is SCSI ID number. &h10 IDE; CCCC is device number. &h20 USB; CCCC is device number. &hFy vendor-defined interface with y in the range zero through 15; C is vendor defined.
kAttributeCharacteristics	393552	Integer indicating which mechanical characteristics are supported. If zero, no special characteristics are supported. Note that multiple bits can be set: &h00000001 Card swallowing mechanism &h00000002 Card ejection mechanism &h00000004 Card capture mechanism All other values are reserved for future use (RFU).
kAttributeCurrentBwt	524809	Current block waiting time.
kAttributeCurrentClk	524802	Current clock rate, in kHz.
kAttributeCurrentCwt	524810	Current character waiting time.
kAttributeCurrentD	524804	Bit rate conversion factor.
kAttributeCurrentEbcEncoding	524811	Current error block control encoding. 0 = longitudinal redundancy check (LRC) 1 = cyclical redundancy check (CRC)
kAttributeCurrentF	524803	Clock conversion factor.
kAttributeCurrentIfsc	524807	Current byte size for information field size card.
kAttributeCurrentIfsd	524808	Current byte size for information field size device.
kAttributeCurrentIoState	590594	Current IO state
kAttributeCurrentN	524805	Current guard time.
kAttributeCurrentProtocolType	524801	Integer encoded as 0x0rrrrpppp where rrr is RFU and should be 0x0000. pppp encodes the current protocol type. Whichever bit has been set indicates the current protocol is currently in use. (For example, if bit zero is set, T=0 protocol is in effect.)
kAttributeCurrentW	524806	Current work waiting time.
kAttributeDefaultClk	196897	Default clock rate, in kHz.
kAttributeDefaultDataRate	196899	Default data rate, in bps.
kAttributeDeviceFriendlyNameA	2147418115	Reader's display name. Windows ANSI encoding.
kAttributeDeviceFriendlyNameW	2147418117	Reader's display name. Unicode encoding.
kAttributeDeviceInUse	2147418114	Reserved for future use.
kAttributeDeviceSystemNameA	2147418116	Reader's system name. Windows ANSI encoding.
kAttributeDeviceSystemNameW	2147418118	Reader's system name. Unicode encoding.
kAttributeDeviceUnit	2147418113	Instance of this vendor's reader attached to the computer. The first instance will be device unit 0, the next will be unit 1 (if it is the same brand of reader) and so on. Two different brands of readers will both have zero for this value.
kAttributeEscAuthrequest	499717	Esc authentication request
kAttributeEscCancel	499715	Esc cancel
kAttributeEscReset	499712	Esc reset
kAttributeExtendedBwt	524812	Extended block wait time.
kAttributeIccInterfaceStatus	590593	Single byte. Zero if smart card electrical contact is not active; nonzero if contact is active.
kAttributeIccPresence	590592	Single byte indicating smart card presence: 0 = not present 1 = card present but not swallowed (applies only if reader supports smart card swallowing) 2 = card present (and swallowed if reader supports smart card swallowing) 4 = card confiscated.

Card States

Constant	Value	Description
kCardStateAbsent	2	There is no card in the reader.
kCardStateNegotiable	32	The card has been reset and is awaiting PTS negotiation.
kCardStatePowered	16	Power is being provided to the card, but the reader driver is unaware of the mode of the card.
kCardStatePresent	4	There is a card in the reader, but it has not been moved into position for use.
kCardStateSpecific	64	The card has been reset and specific communication protocols have been established.
kCardStateSwallowed	8	There is a card in the reader in position for use. The card is not powered.
kCardStateUnknown	1	Unknown state.

Card Initialization Modes

Constant	Value	Description
kEjectCard	3	Eject card.
kLeaveCard	0	Do not do anything special on reconnect.
kResetCard	1	Reset the card (Warm Reset).
kUnpowerCard	2	Power down the card and reset it (Cold Reset).

Protocols

Constant	Value	Description
kProtocolAny	3	Any protocol is welcome
kProtocolRAW	4	Raw protocol
kProtocolT0	1	T=0 is the active protocol.
kProtocolT1	2	T=1 is the active protocol.
kProtocolT15	8	T=15 protocol (not on Windows)
kProtocolUndefined	0	kShareDirect has been specified, so that no protocol negotiation has occurred. It is possible that there is no card in the reader.
kProtocolUnset	0	Unset

Share Modes

Constant	Value	Description
kShareDirect	3	This application is allocating the reader for its private use, and will be controlling it directly. No other applications are allowed access to it.
kShareExclusive	1	This application is not willing to share the card with other applications.
kShareShared	2	This application is willing to share the card with other applications.

Chapter 13

Tidy

13.1 class TidyAttributeMBS

13.1.1 class TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: An attribute of a node.

Blog Entries

- [MBS Xojo Plugins, version 17.4pr3](#)
- [MBS REALbasic Plugins, version 10.5pr4](#)

13.1.2 Properties

13.1.3 Document as TidyDocumentMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The document of this attribute.

Notes: (Read only property)

13.1.4 ID as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The attribute ID.

Notes: (Read only property)

13.1.5 IsABBR as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the ABBR attribute.

Notes: (Read only property)

13.1.6 IsALINK as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the ALINK attribute.

Notes: (Read only property)

13.1.7 IsALT as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the ALT attribute.

Notes: (Read only property)

13.1.8 IsBGCOLOR as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the BGCOLOR attribute.

Notes: (Read only property)

13.1.9 IsCHECKED as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the CHECKED attribute.

Notes: (Read only property)

13.1.10 IsCOLSPAN as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the COLSPAN attribute.

Notes: (Read only property)

13.1.11 IsCONTENT as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the CONTENT attribute.

Notes: (Read only property)

13.1.12 IsDATAFLD as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the DATAFLD attribute.

Notes: (Read only property)

13.1.13 IsEvent as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the Event attribute.

Notes: (Read only property)

13.1.14 IsFOR as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the FOR attribute.

Notes: (Read only property)

13.1.15 IsHEIGHT as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the HEIGHT attribute.

Notes: (Read only property)

13.1.16 IsHREF as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the HREF attribute.

Notes: (Read only property)

13.1.17 IsHTTP_EQUIV as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the HTTP_EQUIV attribute.

Notes: (Read only property)

13.1.18 IsID as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the ID attribute.

Notes: (Read only property)

13.1.19 IsISMAP as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the ISMAP attribute.

Notes: (Read only property)

13.1.20 IsLANG as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the LANG attribute.

Notes: (Read only property)

13.1.21 IsLANGUAGE as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the LANGUAGE attribute.

Notes: (Read only property)

13.1.22 IsLINK as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the LINK attribute.

Notes: (Read only property)

13.1.23 IsLONGDESC as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the LONGDESC attribute.

Notes: (Read only property)

13.1.24 IsNAME as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the NAME attribute.

Notes: (Read only property)

13.1.25 IsOnBLUR as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnBLUR attribute.

Notes: (Read only property)

13.1.26 IsOnClick as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnCLICK attribute.

Notes: (Read only property)

13.1.27 IsOnFOCUS as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnFOCUS attribute.

Notes: (Read only property)

13.1.28 IsOnKEYDOWN as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnKEYDOWN attribute.

Notes: (Read only property)

13.1.29 IsOnKEYPRESS as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnKEYPRESS attribute.

Notes: (Read only property)

13.1.30 IsOnKEYUP as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnKEYUP attribute.

Notes: (Read only property)

13.1.31 IsOnMOUSEDOWN as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnMOUSEDOWN attribute.

Notes: (Read only property)

13.1.32 IsOnMOUSEMOVE as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnMOUSEMOVE attribute.

Notes: (Read only property)

13.1.33 IsOnMOUSEOUT as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnMOUSEOUT attribute.

Notes: (Read only property)

13.1.34 IsOnMOUSEOVER as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnMOUSEOVER attribute.

Notes: (Read only property)

13.1.35 IsOnMOUSEUP as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the OnMOUSEUP attribute.

Notes: (Read only property)

13.1.36 IsProp as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the Prop attribute.

Notes: (Read only property)

13.1.37 IsREL as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the REL attribute.

Notes: (Read only property)

13.1.38 IsROWSPAN as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the ROWSPAN attribute.

Notes: (Read only property)

13.1.39 IsSELECTED as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the SELECTED attribute.

Notes: (Read only property)

13.1.40 IsSRC as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the SRC attribute.

Notes: (Read only property)

13.1.41 IsSTYLE as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the STYLE attribute.

Notes: (Read only property)

13.1.42 IsSUMMARY as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the SUMMARY attribute.

Notes: (Read only property)

13.1.43 IsTARGET as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the TARGET attribute.

Notes: (Read only property)

13.1.44 IsTEXT as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the TEXT attribute.

Notes: (Read only property)

13.1.45 IsTITLE as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the TITLE attribute.

Notes: (Read only property)

13.1.46 IsTYPE as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the TYPE attribute.

Notes: (Read only property)

13.1.47 IsUSEMAP as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the USEMAP attribute.

Notes: (Read only property)

13.1.48 IsVALUE as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the VALUE attribute.

Notes: (Read only property)

13.1.49 IsVLINK as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the VLINK attribute.

Notes: (Read only property)

13.1.50 IsWIDTH as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the WIDTH attribute.

Notes: (Read only property)

13.1.51 IsXMLNS as Boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this attribute is the XMLNS attribute.

Notes: (Read only property)

13.1.52 Name as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of the attribute.

Notes: (Read only property)

13.1.53 NextAttribute as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The next attribute in the attribute list of the node.

Notes: (Read only property)

13.1.54 Value as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The value of the attribute.

Notes: (Read only property)

13.2 module TidyAttrIdMBS

13.2.1 module TidyAttrIdMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.2.2 Constants

Constants

Constant	Value	Description
TidyAttrABBR	1	A constant for use with the Tidy classes.
TidyAttrABOUT	315	A constant for use with the Tidy classes.
TidyAttrACCEPT	2	A constant for use with the Tidy classes.
TidyAttrACCEPT_CHARSET	3	A constant for use with the Tidy classes.
TidyAttrACCESSKEY	4	A constant for use with the Tidy classes.
TidyAttrACTION	5	A constant for use with the Tidy classes.
TidyAttrADD_DATE	6	A constant for use with the Tidy classes.
TidyAttrALIGN	7	A constant for use with the Tidy classes.
TidyAttrALINK	8	A constant for use with the Tidy classes.
TidyAttrALLOWFULLSCREEN	9	A constant for use with the Tidy classes.
TidyAttrALT	10	A constant for use with the Tidy classes.
TidyAttrARCHIVE	11	A constant for use with the Tidy classes.
TidyAttrARIA_ACTIVEDESCENDANT	271	A constant for use with the Tidy classes.
TidyAttrARIA_ATOMIC	272	A constant for use with the Tidy classes.
TidyAttrARIA_AUTOCOMPLETE	273	A constant for use with the Tidy classes.
TidyAttrARIA_BUSY	274	A constant for use with the Tidy classes.
TidyAttrARIA_CHECKED	275	A constant for use with the Tidy classes.
TidyAttrARIA_CONTROLS	276	A constant for use with the Tidy classes.
TidyAttrARIA_DESCRIBEDBY	277	A constant for use with the Tidy classes.
TidyAttrARIA_DISABLED	278	A constant for use with the Tidy classes.
TidyAttrARIA_DROPEFFECT	279	A constant for use with the Tidy classes.
TidyAttrARIA_EXPANDED	280	A constant for use with the Tidy classes.
TidyAttrARIA_FLOWTO	281	A constant for use with the Tidy classes.
TidyAttrARIA_GRABBED	282	A constant for use with the Tidy classes.
TidyAttrARIA_HASPOPOP	283	A constant for use with the Tidy classes.
TidyAttrARIA_HIDDEN	284	A constant for use with the Tidy classes.
TidyAttrARIA_INVALID	285	A constant for use with the Tidy classes.
TidyAttrARIA_LABEL	286	A constant for use with the Tidy classes.
TidyAttrARIA_LABELLEDBY	287	A constant for use with the Tidy classes.
TidyAttrARIA_LEVEL	288	A constant for use with the Tidy classes.
TidyAttrARIA_LIVE	289	A constant for use with the Tidy classes.
TidyAttrARIA_MULTILINE	290	A constant for use with the Tidy classes.
TidyAttrARIA_MULTISELECTABLE	291	A constant for use with the Tidy classes.
TidyAttrARIA_ORIENTATION	292	A constant for use with the Tidy classes.
TidyAttrARIA_OWNS	293	A constant for use with the Tidy classes.
TidyAttrARIA_POSINSET	294	A constant for use with the Tidy classes.
TidyAttrARIA_PRESSED	295	A constant for use with the Tidy classes.
TidyAttrARIA_READONLY	296	A constant for use with the Tidy classes.
TidyAttrARIA_RELEVANT	297	A constant for use with the Tidy classes.
TidyAttrARIA_REQUIRED	298	A constant for use with the Tidy classes.
TidyAttrARIA_SELECTED	299	A constant for use with the Tidy classes.
TidyAttrARIA_SETSIZE	300	A constant for use with the Tidy classes.
TidyAttrARIA_SORT	301	A constant for use with the Tidy classes.
TidyAttrARIA_VALUEMAX	302	A constant for use with the Tidy classes.
TidyAttrARIA_VALUEMIN	303	A constant for use with the Tidy classes.
TidyAttrARIA_VALUENOW	304	A constant for use with the Tidy classes.
TidyAttrARIA_VALUETEXT	305	A constant for use with the Tidy classes.
TidyAttrAS	324	A constant for use with the Tidy classes.
TidyAttrASYNC	171	A constant for use with the Tidy classes.
TidyAttrAUTOCOMPLETE	172	A constant for use with the Tidy classes.
TidyAttrAUTOFOCUS	173	A constant for use with the Tidy classes.
TidyAttrAUTOPLAY	174	A constant for use with the Tidy classes.
TidyAttrAXIS	12	A constant for use with the Tidy classes.
TidyAttrBACKGROUND	13	A constant for use with the Tidy classes.
TidyAttrBASEPROFILE	311	A constant for use with the Tidy classes.
TidyAttrBGCOLOR	14	A constant for use with the Tidy classes.
TidyAttrBGPROPERTIES	15	A constant for use with the Tidy classes.
TidyAttrBORDER	16	A constant for use with the Tidy classes.

13.3 module TidyConfigCategoryMBS

13.3.1 module TidyConfigCategoryMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.3.2 Constants

Constants

Constant	Value	Description
TidyDiagnostics	1	A constant for use with the Tidy classes.
TidyEncoding	3	A constant for use with the Tidy classes.
TidyMarkup	0	A constant for use with the Tidy classes.
TidyMiscellaneous	4	A constant for use with the Tidy classes.
TidyPrettyPrint	2	A constant for use with the Tidy classes.

13.4 module TidyDoctypeModesMBS

13.4.1 module TidyDoctypeModesMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.4.2 Constants

Constants

Constant	Value	Description
TidyDoctypeAuto	2	A constant for use with the Tidy classes.
TidyDoctypeHtml5	0	A constant for use with the Tidy classes.
TidyDoctypeLoose	4	A constant for use with the Tidy classes.
TidyDoctypeOmit	1	A constant for use with the Tidy classes.
TidyDoctypeStrict	3	A constant for use with the Tidy classes.
TidyDoctypeUser	5	A constant for use with the Tidy classes.

13.5 class TidyDocumentMBS

13.5.1 class TidyDocumentMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A document in the tidy library.

Example:

```
dim t as new TidyDocumentMBS
```

```
call t.ParseString("<p>Hello World</p>") // pass here bad html  
call t.CleanAndRepair
```

```
dim s As String=t.SaveString  
MsgBox s // show fixed html
```

Notes: The main class for using the tidy library in Xojo.

Blog Entries

- [MBS Xojo Plugins, version 22.5pr1](#)
- [MBS Xojo Plugins, version 19.4pr2](#)
- [MBS Xojo Plugins, version 17.2pr2](#)

13.5.2 Methods

13.5.3 AccessWarningCount as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of Tidy accessibility warnings encountered.

13.5.4 Body as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The body node in the html tree.

13.5.5 CleanAndRepair as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Execute configured cleanup and repair operations on parsed markup.

Example:

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As String=t.SaveString
MsgBox s // show fixed html
```

13.5.6 ConfigErrorCount as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of Tidy configuration errors encountered.

13.5.7 CopyConfig(otherDocument as TidyDocumentMBS) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copy current configuration settings from one document to another.

13.5.8 DetectedGenericXml as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Input is generic XML (not HTML or XHTML)?

13.5.9 DetectedHtmlVersion as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Detected HTML version: 0, 2, 3 or 4.

13.5.10 DetectedXhtml as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Input is XHTML?

13.5.11 `ErrorBuffer` as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Copies the error text save in the error buffer.

Notes: You need to use `InstallErrorBuffer` before using this function.

13.5.12 `ErrorCount` as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of Tidy errors encountered.

Notes: If >0 , output is suppressed unless `ForceOutput` is set.

13.5.13 `ErrorSummary`

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Write more complete information about errors to current error sink.

13.5.14 `FileExists(filename as string)` as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the file with that name exists.

13.5.15 `GeneralInfo`

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Write more general information about markup to current error sink.

13.5.16 `GetBooleanOption(OptionID as Integer)` as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries the value of a boolean option.

13.5.17 GetIntegerOption(OptionID as Integer) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries the value of an integer option.

13.5.18 GetStringOption(OptionID as Integer) as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries the value of a string option.

13.5.19 Head as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The head node in the html tree.

13.5.20 Html as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The html node in the html tree.

13.5.21 InstallErrorBuffer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Installs an error buffer.

Notes: Use ErrorBuffer to get the text later.

13.5.22 LibraryVersion as string

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

Function: The version number of the library.

13.5.23 LoadConfigFile(filename as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Load an ASCII Tidy configuration file.

13.5.24 LoadConfigFileWithEncoding(Filename as string, CharacterEncoding as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Load a Tidy configuration file with the specified character encoding.

13.5.25 NextOption(Iterator as TidyIteratorMBS) as TidyOptionMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Finds the next option in the list.

13.5.26 NextRelatedOption(Iterator as TidyIteratorMBS) as TidyOptionMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get next related option.

13.5.27 NextUserDeclaredTag(OptionID as Integer, Iterator as TidyIteratorMBS) as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get next declared tag of specified type: TidyInlineTags, TidyBlockTags, TidyEmptyTags or TidyPreTags.

Notes: See TidyOptionIdMBS for constants.

13.5.28 OptionCharacterEncodingName(OptionID as Integer) as String

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get character encoding name.

Notes: Used with TidyCharEncoding, TidyOutCharEncoding, TidyInCharEncoding options.

13.5.29 OptionCurrentPick(OptionID as Integer) as String

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get current pick list value for option by ID.

Notes: Useful for enum types.

13.5.30 OptionForID(OptionID as Integer) as TidyOptionMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Finds option based on given ID.

Notes: Returns nil on failure.

13.5.31 OptionForName(OptionName as string) as TidyOptionMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Finds option by name.

13.5.32 OptionIDForName(OptionName as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Finds Option by name.

Notes: Returns nil on failure.

13.5.33 OptionList as TidyIteratorMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: An iterator running through all the options available.

13.5.34 OptionResetToDefault(OptionID as Integer) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Resets the option to default value.

13.5.35 OptionsDifferentThanDefault as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Any settings different than default?

13.5.36 OptionsDifferentThanSnapshot as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Any settings different than snapshot?

13.5.37 OptionsResetAllToDefault as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reset all options to their default values.

13.5.38 OptionsResetToSnapshot as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Reset config settings to snapshot (after document processing).

13.5.39 OptionsSnapshot as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Take a snapshot of current config settings.

13.5.40 ParseFile(filename as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parse markup in named file.

13.5.41 ParseSource(theInput as TidyInputMBS) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parse markup in given generic input source.

13.5.42 ParseString(data as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parse markup in given string.

Example:

```
dim t as new TidyDocumentMBS
```

```
call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair
```

```
dim s As String=t.SaveString
MsgBox s // show fixed html
```

13.5.43 ParseStringOption(OptionName as string, value as string) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Parses a string to set an option.

Example:

```
dim t as new TidyDocumentMBS
```

```
MsgBox str(t.OptionQuiet)
dim b1 as boolean = t.ParseStringOption("Quiet","true")
MsgBox str(t.OptionQuiet)
```

```
dim b2 as boolean = t.ParseStringOption("Quiet","false")
MsgBox str(t.OptionQuiet)
```

Notes: Useful if you don't know the type of the option.
Returns true on success and false on failure.

13.5.44 RelatedOptionsList(Option as TidyOptionMBS) as TidyIteratorMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Iterate over a list of related options.

13.5.45 ReleaseDate as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get release date (version) for current library.

13.5.46 ReportDoctype as Integer

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

Function: The report document type.

13.5.47 Root as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The root node in the html tree.

13.5.48 RunDiagnostics as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Run configured diagnostics on parsed and repaired markup.

Notes: Must call CleanAndRepair first.

13.5.49 SaveConfig(theOutput as TidyOutputMBS) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Save current settings to given output sink.

Notes: Only non-default values are written.

13.5.50 SaveConfigFile(filename as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Save current settings to named file.

Notes: Only non-default values are written.

13.5.51 SaveFile(filename as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Save to named file.

13.5.52 SaveOutput(theOutput as TidyOutputMBS) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Save to given generic output.

13.5.53 SaveString as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Save to a string.

Example:

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim s As String=t.SaveString
MsgBox s // show fixed html
```

Notes: Returns "" on failure.

The returned string has no encoding set. You need to use DefineEncoding.

13.5.54 SetBooleanOption(OptionID as Integer, value as boolean) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets an option with a given boolean value.

Notes: Returns true on success and false on failure.

13.5.55 SetCharacterEncoding(encodingName as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set the input/output character encoding for parsing markup.

Notes: Values include: ascii, latin1, raw, utf8, iso2022, mac, win1252, utf16le, utf16be, utf16, big5 and shiftjis. Case in-sensitive.

13.5.56 SetErrorFile(filename as string) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Redirects error output to named file.

Notes: Returns true on success.

13.5.57 SetInputCharacterEncoding(encodingName as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set the input character encoding for parsing markup.

Example:

```
dim t as new TidyDocumentMBS
```

```
MsgBox str(t.OptionInCharEncoding)  
call t.SetInputCharacterEncoding "utf8"  
MsgBox str(t.OptionInCharEncoding)
```

Notes: Values include: ascii, latin1, raw, utf8, iso2022, mac, win1252, utf16le, utf16be, utf16, big5 and shiftjis. Case in-sensitive.

13.5.58 SetIntegerOption(OptionID as Integer, value as Integer) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets an option with a given integer value.

Notes: Returns true on success and false on failure.

13.5.59 SetOutputCharacterEncoding(encodingName as string) as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Set the output character encoding for parsing markup.

Notes: Values include: ascii, latin1, raw, utf8, iso2022, mac, win1252, utf16le, utf16be, utf16, big5 and shiftjis. Case in-sensitive.

13.5.60 SetStringOption(OptionID as Integer, value as string) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets an option with a given string value.

Notes: Returns true on success and false on failure.

13.5.61 Status as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get status of current document.

13.5.62 UserDeclaredTagList as TidyIteratorMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Iterate over user declared tags.

13.5.63 WarningCount as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Number of warnings encountered.

13.5.64 Properties

13.5.65 ErrorOutput as TidyOutputMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The output where the error report is written to.

Notes: (Read and Write property)

13.5.66 Handle as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal reference to the tidy document object.

Notes: (Read only property)

13.5.67 OptionAccessibilityCheck as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option accessibility-check.

Notes: This option specifies what level of accessibility checking, if any, that Tidy should perform.

Level 0 (Tidy Classic) is equivalent to Tidy Classic's accessibility checking.

For more information on Tidy's accessibility checking, visit Tidy's Accessibility Page (<http://www.html-tidy.org/accessibility/>).

(Read and Write property)

13.5.68 OptionAccessibilityCheckLevel as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies what level of accessibility checking, if any, that Tidy should do.

Notes: Level 0 is equivalent to Tidy Classic's accessibility checking. For more information on Tidy's accessibility checking, visit the Adaptive Technology Resource Centre at the University of Toronto. :

<http://www.aprompt.ca/Tidy/accessibilitychecks.html>
(Read and Write property)

13.5.69 OptionAddXmlDecl as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option add-xml-decl.

Notes: This option specifies if Tidy should add the XML declaration when outputting XML or XHTML.

Note that if the input already includes an `<?xml ... ?>` declaration then this option will be ignored.

If the encoding for the output is different from `ascii`, one of the `utf*` encodings, or `raw`, then the declaration is always added as required by the XML standard.

(Read and Write property)

13.5.70 OptionAddXmlSpace as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option add-xml-space.

Notes: This option specifies if Tidy should add `xml:space="preserve"` to elements such as `<pre>`, `<style>`, and `<script>` when generating XML.

This is needed if the whitespace in such elements is to be parsed appropriately without having access to the DTD.

(Read and Write property)

13.5.71 OptionAltText as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option alt-text.

Notes: This option specifies the default `alt=` text Tidy uses for `` attributes when the `alt=` attribute is missing.

Use with care, as it is your responsibility to make your documents accessible to people who cannot see the images.

(Read and Write property)

13.5.72 OptionAnchorAsName as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option anchor-as-name.

Notes: This option controls the deletion or addition of the name attribute in elements where it can serve as anchor.

If set to yes a name attribute, if not already existing, is added along an existing id attribute if the DTD allows it.

If set to no any existing name attribute is removed if an id attribute exists or has been added.

(Read and Write property)

13.5.73 OptionAsciiChars as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option ascii-chars.

Notes: Can be used to modify behavior of the clean option when set to yes.

If set to yes when using clean, &mdash;, &rdquo;, and other named character entities are downgraded to their closest ASCII equivalents.

(Read and Write property)

13.5.74 OptionAssumeXmlProcs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option assume-xml-procs.

Notes: This option specifies if Tidy should change the parsing of processing instructions to require ?> as the terminator rather than >.

This option is automatically set if the input is in XML.

(Read and Write property)

13.5.75 OptionBare as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option bare.

Notes: This option specifies if Tidy should strip Microsoft specific HTML from Word 2000 documents, and output spaces rather than non-breaking spaces where they exist in the input.

(Read and Write property)

13.5.76 OptionBlockTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies new block-level tags.

Notes: This option takes a space or comma separated list of tag names. Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. Note you can't change the content model for elements such as <TABLE>, , and <DL>. This option is ignored in XML mode.

(Read and Write property)

13.5.77 OptionBodyOnly as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should print only the contents of the body tag as an HTML fragment.

Notes: If set to "auto", this is performed only if the body tag has been inferred. Useful for incorporating existing whole pages as a portion of another page. This option has no effect if XML output is requested.

Value is 0 for no, 1 for yes and 2 for auto.

(Read and Write property)

13.5.78 OptionBreakBeforeBr as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option break-before-br.

Notes: This option specifies if Tidy should output a line break before each
 element.

(Read and Write property)

13.5.79 OptionCharEncoding as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option char-encoding.

Notes: This option specifies the character encoding Tidy uses for both the input and output.

For ascii Tidy will accept Latin-1 (ISO-8859-1) character values, but will use entities for all characters whose value >127.

For raw, Tidy will output values above 127 without translating them into entities.

For latin1, characters above 255 will be written as entities.

For utf8, Tidy assumes that both input and output are encoded as UTF-8.

You can use iso2022 for files encoded using the ISO-2022 family of encodings e.g. ISO-2022-JP.

For mac and win1252, Tidy will accept vendor specific character values, but will use entities for all characters whose value >127.

For unsupported encodings, use an external utility to convert to and from UTF-8.
(Read and Write property)

13.5.80 OptionClean as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option clean.

Notes: This option specifies if Tidy should perform cleaning of some legacy presentational tags (currently `<i>`, ``, `<center>` when enclosed within appropriate inline tags, and ``). If set to yes then legacy tags will be replaced with CSS `<style>` tags and structural markup as appropriate.
(Read and Write property)

13.5.81 OptionCoerceEndtags as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option coerce-endtags.

Notes: This option specifies if Tidy should coerce a start tag into an end tag in cases where it looks like an end tag was probably intended; for example, given
`foo bar baz`
Tidy will output
`foo bar baz`
(Read and Write property)

13.5.82 OptionCssPrefix as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option css-prefix.

Notes: This option specifies the prefix that Tidy uses for styles rules.
By default, c will be used.
(Read and Write property)

13.5.83 OptionDecorateInferredUI as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option decorate-inferred-ul.

Notes: This option specifies if Tidy should decorate inferred `` elements with some CSS markup to avoid indentation to the right.

(Read and Write property)

13.5.84 OptionDoctype as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option doctype.

Notes: This option specifies the DOCTYPE declaration generated by Tidy.

If set to omit the output won't contain a DOCTYPE declaration. Note this this also implies numeric-entities is set to yes.

If set to html5 the DOCTYPE is set to <!DOCTYPE html>.

If set to auto (the default) Tidy will use an educated guess based upon the contents of the document.

If set to strict, Tidy will set the DOCTYPE to the HTML4 or XHTML1 strict DTD.

If set to loose, the DOCTYPE is set to the HTML4 or XHTML1 loose (transitional) DTD.

Alternatively, you can supply a string for the formal public identifier (FPI).

For example:

```
doctype: "-//ACME//DTD HTML 3.14159//EN"
```

If you specify the FPI for an XHTML document, Tidy will set the system identifier to an empty string. For an HTML document, Tidy adds a system identifier only if one was already present in order to preserve the processing mode of some browsers. Tidy leaves the DOCTYPE for generic XML documents unchanged.

This option does not offer a validation of document conformance.

(Read and Write property)

13.5.85 OptionDoctypeMode as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option doctype-mode.

Notes:

(Read only property)

13.5.86 OptionDropEmptyElements as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option drop-empty-elements.

Notes: This option specifies if Tidy should discard empty elements.

(Read and Write property)

13.5.87 OptionDropEmptyParas as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option drop-empty-paras.

Notes: This option specifies if Tidy should discard empty paragraphs.
(Read and Write property)

13.5.88 OptionDropFontTags as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option drop-font-tags.

Notes: Deprecated; do not use. This option is destructive to `` tags, and it will be removed from future versions of Tidy. Use the clean option instead.

If you do set this option despite the warning it will perform as clean except styles will be inline instead of put into a CSS class. `` tags will be dropped completely and their styles will not be preserved.

If both clean and this option are enabled, `` tags will still be dropped completely, and other styles will be preserved in a CSS class instead of inline.

See clean for more information.

(Read and Write property)

13.5.89 OptionDropPropAttrs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should strip out proprietary attributes, such as MS data binding attributes.

Notes: (Read and Write property)

13.5.90 OptionDropProprietaryAttributes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option drop-proprietary-attributes.

Notes: This option specifies if Tidy should strip out proprietary attributes, such as Microsoft data binding attributes. Additionally attributes that aren't permitted in the output version of HTML will be dropped if used with strict-tags-attributes.

(Read and Write property)

13.5.91 OptionDuplicateAttrs as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** One of the options.

Notes: (Read and Write property)

13.5.92 OptionEmacs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should change the format for reporting errors and warnings to a format that is more easily parsed by GNU Emacs.

Notes: (Read and Write property)

13.5.93 OptionEmacsFile as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** Used internally.

Notes: (Read and Write property)

13.5.94 OptionEmptyTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies new empty inline tags.

Notes: This option takes a space or comma separated list of tag names. Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. Remember to also declare empty tags as either inline or blocklevel. This option is ignored in XML mode.

(Read and Write property)

13.5.95 OptionEncloseBlockText as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option `enclose-block-text`.

Notes: This option specifies if Tidy should insert a `<p>` element to enclose any text it finds in any element that allows mixed content for HTML transitional but not HTML strict.

(Read and Write property)

13.5.96 OptionEncloseBodyText as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should enclose any text it finds in the body element within a <P>element.

Notes: This is useful when you want to take existing HTML and use it with a style sheet.

(Read and Write property)

13.5.97 OptionEncloseText as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option enclose-text.

Notes: This option specifies if Tidy should enclose any text it finds in the body element within a <p> element.

This is useful when you want to take existing HTML and use it with a style sheet.

(Read and Write property)

13.5.98 OptionErrFile as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies the error file Tidy uses for errors and warnings.

Notes: Normally errors and warnings are output to "stderr".

(Read and Write property)

13.5.99 OptionErrorFile as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option error-file.

Notes: This option specifies the error file Tidy uses for errors and warnings. Normally errors and warnings are output to stderr.

(Read and Write property)

13.5.100 OptionEscapeCdata as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option escape-cdata.

Notes: This option specifies if Tidy should convert `<! [CDATA []] >` sections to normal text. (Read and Write property)

13.5.101 OptionEscapeScripts as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option escape-scripts.

Notes: This option causes items that look like closing tags, like `</g` to be escaped to `<\/g`. Set this option to 'no' if you do not want this. (Read and Write property)

13.5.102 OptionFixBackslash as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option fix-backslash.

Notes: This option specifies if Tidy should replace backslash characters `\` in URLs with forward slashes `/`. (Read and Write property)

13.5.103 OptionFixBadComments as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option fix-bad-comments.

Notes: This option specifies if Tidy should replace unexpected hyphens with = characters when it comes across adjacent hyphens.

The default is yes.

This option is provided for users of Cold Fusion which uses the comment syntax: `<!— —>`. (Read and Write property)

13.5.104 OptionFixComments as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should replace unexpected hyphens with "=" characters when it comes across adjacent hyphens.

Notes: The default is yes. This option is provided for users of Cold Fusion which uses the comment syntax: `<!-- -->`

(Read and Write property)

13.5.105 OptionFixUri as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option fix-uri.

Notes: This option specifies if Tidy should check attribute values that carry URIs for illegal characters and if such are found, escape them as HTML4 recommends.

(Read and Write property)

13.5.106 OptionForceOutput as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option force-output.

Notes: This option specifies if Tidy should produce output even if errors are encountered.

Use this option with care; if Tidy reports an error, this means Tidy was not able to (or is not sure how to) fix the error, so the resulting output may not reflect your intention.

(Read and Write property)

13.5.107 OptionGdoc as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option gdoc.

Notes: This option specifies if Tidy should enable specific behavior for cleaning up HTML exported from Google Docs.

(Read and Write property)

13.5.108 OptionGnuEmacs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option gnu-emacs.

Notes: This option specifies if Tidy should change the format for reporting errors and warnings to a format that is more easily parsed by GNU Emacs.

(Read and Write property)

13.5.109 OptionGnuEmacsFile as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option gnu-emacs-file.

Notes: Used internally.

(Read and Write property)

13.5.110 OptionHideComments as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option hide-comments.

Notes: This option specifies if Tidy should print out comments.

(Read and Write property)

13.5.111 OptionHideEndtags as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option hide-endtags.

Notes: This option is an alias for omit-optional-tags.

(Read and Write property)

13.5.112 OptionHtmlOut as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should generate pretty printed output, writing it as HTML.

Notes: (Read and Write property)

13.5.113 OptionInCharEncoding as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies the character encoding Tidy uses for the input.

Notes: See char-encoding for more info.

(Read and Write property)

13.5.114 OptionIndent as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option indent.

Notes: This option specifies if Tidy should indent block-level tags.

If set to auto Tidy will decide whether or not to indent the content of tags such as `<title>`, `<h1>`, `<h6>`, ``, `<td>`, or `<p>`; based on the content including a block-level element.

Setting indent to yes can expose layout bugs in some browsers.

Use the option indent-spaces to control the number of spaces or tabs output per level of indent, and indent-with-tabs to specify whether spaces or tabs are used.

(Read and Write property)

13.5.115 OptionIndentAttributes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option indent-attributes.

Notes: This option specifies if Tidy should begin each attribute on a new line.

(Read and Write property)

13.5.116 OptionIndentCdata as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option indent-cdata.

Notes: This option specifies if Tidy should indent `<![CDATA [] >` sections.

(Read and Write property)

13.5.117 OptionIndentContent as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** One of the options.
Notes: (Read and Write property)

13.5.118 OptionIndentSpaces as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option indent-spaces.

Notes: This option specifies the number of spaces or tabs that Tidy uses to indent content when indent is enabled.

Note that the default value for this option is dependent upon the value of indent-with-tabs (see also).
(Read and Write property)

13.5.119 OptionIndentWithTabs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option indent-with-tabs.

Notes: This option specifies if Tidy should indent with tabs instead of spaces, assuming indent is yes. Set it to yes to indent using tabs instead of the default spaces.

Use the option indent-spaces to control the number of tabs output per level of indent. Note that when indent-with-tabs is enabled the default value of indent-spaces is reset to 1.

Note tab-size controls converting input tabs to spaces. Set it to zero to retain input tabs.
(Read and Write property)

13.5.120 OptionInlineTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies new non-empty inline tags. This option takes a space or comma separated list of tag names.

Notes: Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. This option is ignored in XML mode.

(Read and Write property)

13.5.121 OptionInputEncoding as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option input-encoding.

Notes: This option specifies the character encoding Tidy uses for the input. See char-encoding for more

info.

(Read and Write property)

13.5.122 OptionInputXml as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option input-xml.

Notes: This option specifies if Tidy should use the XML parser rather than the error correcting HTML parser.

(Read and Write property)

13.5.123 OptionJoinClasses as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option join-classes.

Notes: This option specifies if Tidy should combine class names to generate a single, new class name if multiple class assignments are detected on an element.

(Read and Write property)

13.5.124 OptionJoinStyles as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option join-styles.

Notes: This option specifies if Tidy should combine styles to generate a single, new style if multiple style values are detected on an element.

(Read and Write property)

13.5.125 OptionKeepFileTimes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should keep the original modification time of files that Tidy modifies in place.

Notes: The default is no. Setting the option to yes allows you to tidy files without causing these files to be uploaded to a web server when using a tool such as SiteCopy. Note this feature is not supported on some platforms.

(Read and Write property)

13.5.126 OptionKeepTime as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option keep-time.

Notes: This option specifies if Tidy should keep the original modification time of files that Tidy modifies in place.

Setting the option to yes allows you to tidy files without changing the file modification date, which may be useful with certain tools that use the modification date for things such as automatic server deployment.

Note this feature is not supported on some platforms.

(Read and Write property)

13.5.127 OptionLanguage as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option language.

Notes: Currently not used, but this option specifies the language Tidy would use if it were properly localized. For example: en.

(Read and Write property)

13.5.128 OptionLiteralAttribs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should ensure that whitespace characters within attribute values are passed through unchanged.

Notes: (Read and Write property)

13.5.129 OptionLiteralAttributes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option literal-attributes.

Notes: This option specifies how Tidy deals with whitespace characters within attribute values.

If the value is no Tidy normalizes attribute values by replacing any newline or tab with a single space, and further by replacing any contiguous whitespace with a single space.

To force Tidy to preserve the original, literal values of all attributes and ensure that whitespace within attribute values is passed through unchanged, set this option to yes.

(Read and Write property)

13.5.130 OptionLogicalEmphasis as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option logical-emphasis.

Notes: This option specifies if Tidy should replace any occurrence of `<i>` with ``; and any occurrence of `` with ``. Any attributes are preserved unchanged.

This option can be set independently of the clean option.

(Read and Write property)

13.5.131 OptionLowerLiterals as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option lower-literals.

Notes: This option specifies if Tidy should convert the value of an attribute that takes a list of predefined values to lower case.

This is required for XHTML documents.

(Read and Write property)

13.5.132 OptionMakeBare as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should strip Microsoft specific HTML from Word 2000 documents, and output spaces rather than non-breaking spaces where they exist in the input.

Notes: (Read and Write property)

13.5.133 OptionMakeClean as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should strip out surplus presentational tags and attributes replacing them by style rules and structural markup as appropriate.

Notes: It works well on the HTML saved by Microsoft Office products.

(Read and Write property)

13.5.134 OptionMark as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add a meta element to the document head to indicate that the document has been tidied.

Notes: Tidy won't add a meta element if one is already present.

(Read and Write property)

13.5.135 OptionMarkup as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option markup.

Notes: This option specifies if Tidy should generate a pretty printed version of the markup. Note that Tidy won't generate a pretty printed version if it finds significant errors (see force-output).

(Read and Write property)

13.5.136 OptionMergeDivs as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option merge-divs.

Notes: This option can be used to modify the behavior of clean when set to yes.

This option specifies if Tidy should merge nested `<div>`; such as `<div><div>...</div></div>`.

If set to auto the attributes of the inner `<div>`; are moved to the outer one. Nested `<div>`; with id attributes are not merged.

If set to yes the attributes of the inner `<div>`; are discarded with the exception of class and style.

(Read and Write property)

13.5.137 OptionMergeEmphasis as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option merge-emphasis.

Notes: This option specifies if Tidy should merge nested ``; and `<i>`; elements; for example, for the case

`<b class="rtop-2">foo <b class="r2-2">bar baz`;

Tidy will output `<b class="rtop-2">foo bar baz`.

(Read and Write property)

13.5.138 OptionMergeSpans as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option merge-spans.

Notes: This option can be used to modify the behavior of clean when set to yes.

This option specifies if Tidy should merge nested ``, such as `...`.

The algorithm is identical to the one used by merge-divs.

(Read and Write property)

13.5.139 OptionNcr as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option ncr.

Notes: This option specifies if Tidy should allow numeric character references.

(Read and Write property)

13.5.140 OptionNewBlocklevelTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option new-blocklevel-tags.

Notes: This option specifies new block-level tags. This option takes a space or comma separated list of tag names.

Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.

Note you can't change the content model for elements such as `<table>`, ``, `` and `<dl>`.

This option is ignored in XML mode.

(Read and Write property)

13.5.141 OptionNewEmptyTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option new-empty-tags.

Notes: This option specifies new empty inline tags. This option takes a space or comma separated list of tag names.

Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.

Remember to also declare empty tags as either inline or blocklevel.

This option is ignored in XML mode.

(Read and Write property)

13.5.142 OptionNewInlineTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option new-inline-tags.

Notes: This option specifies new non-empty inline tags. This option takes a space or comma separated list of tag names.

Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.

This option is ignored in XML mode.

(Read and Write property)

13.5.143 OptionNewline as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option newline.

Notes: The default is appropriate to the current platform.

Generally CRLF on PC-DOS, Windows and OS/2; CR on Classic Mac OS; and LF everywhere else (Linux, Mac OS X, and Unix).

(Read and Write property)

13.5.144 OptionNewPreTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option new-pre-tags.

Notes: This option specifies new tags that are to be processed in exactly the same way as HTML's <pre> element. This option takes a space or comma separated list of tag names.

Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags.

Note you cannot as yet add new CDATA elements.

This option is ignored in XML mode.

(Read and Write property)

13.5.145 OptionNumEntities as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should output entities other than the built-in HTML entities (&, <, > and ") in the numeric rather than the named entity form.

Notes: Only entities compatible with the DOCTYPE declaration generated are used. Entities that can be represented in the output encoding are translated correspondingly.

(Read and Write property)

13.5.146 OptionNumericEntities as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option numeric-entities.

Notes: This option specifies if Tidy should output entities other than the built-in HTML entities (&amp;, &lt;, &gt;, and &quot;) in the numeric rather than the named entity form.

Only entities compatible with the DOCTYPE declaration generated are used.

Entities that can be represented in the output encoding are translated correspondingly.

(Read and Write property)

13.5.147 OptionOmitOptionalTags as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option omit-optional-tags.

Notes: This option specifies if Tidy should omit optional start tags and end tags when generating output. Setting this option causes all tags for the <html>, <head>, and <body> elements to be omitted from output, as well as such end tags as </p>, , </dt>, </dd>, </option>, </tr>, </td>, and </th>.

This option is ignored for XML output.

(Read and Write property)

13.5.148 OptionOutCharEncoding as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies the character encoding Tidy uses for the output.

Notes: See char-encoding for more info. May only be different from input-encoding for Latin encodings (ascii, latin0, latin1, mac, win1252, ibm858).

(Read and Write property)

13.5.149 OptionOutFile as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies the output file Tidy uses for markup.

Notes: Normally markup is written to "stdout".
(Read and Write property)

13.5.150 OptionOutputBom as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option output-bom.

Notes: This option specifies if Tidy should write a Unicode Byte Order Mark character (BOM; also known as Zero Width No-Break Space; has value of U+FEFF) to the beginning of the output, and only applies to UTF-8 and UTF-16 output encodings.

If set to auto this option causes Tidy to write a BOM to the output only if a BOM was present at the beginning of the input.

A BOM is always written for XML/XHTML output using UTF-16 output encodings.
(Read and Write property)

13.5.151 OptionOutputEncoding as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option output-encoding.

Notes: This option specifies the character encoding Tidy uses for the output.

Note that this may only be different from input-encoding for Latin encodings (ascii, latin0, latin1, mac, win1252, ibm858).

See char-encoding for more information
(Read and Write property)

13.5.152 OptionOutputFile as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option output-file.

Notes: This option specifies the output file Tidy uses for markup. Normally markup is written to stdout.
(Read and Write property)

13.5.153 OptionOutputHtml as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option output-html.

Notes: This option specifies if Tidy should generate pretty printed output, writing it as HTML.
(Read and Write property)

13.5.154 OptionOutputXhtml as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option output-xhtml.

Notes: This option specifies if Tidy should generate pretty printed output, writing it as extensible HTML. This option causes Tidy to set the DOCTYPE and default namespace as appropriate to XHTML, and will use the corrected value in output regardless of other sources.

For XHTML, entities can be written as named or numeric entities according to the setting of numeric-entities. The original case of tags and attributes will be preserved, regardless of other options.
(Read and Write property)

13.5.155 OptionOutputXml as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option output-xml.

Notes: This option specifies if Tidy should pretty print output, writing it as well-formed XML.

Any entities not defined in XML 1.0 will be written as numeric entities to allow them to be parsed by an XML parser.

The original case of tags and attributes will be preserved, regardless of other options.
(Read and Write property)

13.5.156 OptionPreserveEntities as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option preserve-entities.

Notes: This option specifies if Tidy should preserve well-formed entities as found in the input.
(Read and Write property)

13.5.157 OptionPreTags as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies new tags that are to be processed in exactly the same way as HTML's <PRE>element.

Notes: This option takes a space or comma separated list of tag names. Unless you declare new tags, Tidy will refuse to generate a tidied file if the input includes previously unknown tags. Note you can not as yet add new CDATA elements (similar to <SCRIPT>). This option is ignored in XML mode.
(Read and Write property)

13.5.158 OptionPunctuationWrap as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option punctuation-wrap.

Notes: This option specifies if Tidy should line wrap after some Unicode or Chinese punctuation characters.
(Read and Write property)

13.5.159 OptionPunctWrap as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap after some Unicode or Chinese punctuation characters.

Notes: (Read and Write property)

13.5.160 OptionQuiet as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option quiet.

Notes: This option specifies if Tidy should output the summary of the numbers of errors and warnings, or the welcome or informational messages.

(Read and Write property)

13.5.161 OptionQuoteAmpersand as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option quote-ampersand.

Notes: This option specifies if Tidy should output unadorned & characters as &amp;.

(Read and Write property)

13.5.162 OptionQuoteMarks as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option quote-marks.

Notes: This option specifies if Tidy should output " characters as &quot; as is preferred by some editing environments.

The apostrophe character ' is written out as &#39; since many web browsers don't yet support &apos;.

(Read and Write property)

13.5.163 OptionQuoteNbsp as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option quote-nbsp.

Notes: This option specifies if Tidy should output non-breaking space characters as entities, rather than as the Unicode character value 160 (decimal).

(Read and Write property)

13.5.164 OptionRepeatedAttributes as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option repeated-attributes.

Notes: This option specifies if Tidy should keep the first or last attribute, if an attribute is repeated, e.g. has two align attributes.

(Read and Write property)

13.5.165 OptionReplaceColor as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option replace-color.

Notes: This option specifies if Tidy should replace numeric values in color attributes with HTML/XHTML color names where defined, e.g. replace #ffffff with white.

(Read and Write property)

13.5.166 OptionShowBodyOnly as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option show-body-only.

Notes: This option specifies if Tidy should print only the contents of the body tag as an HTML fragment. If set to auto, this is performed only if the body tag has been inferred.

Useful for incorporating existing whole pages as a portion of another page.

This option has no effect if XML output is requested.

(Read and Write property)

13.5.167 OptionShowErrors as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option show-errors.

Notes: This option specifies the number Tidy uses to determine if further errors should be shown. If set to 0, then no errors are shown.

(Read and Write property)

13.5.168 OptionShowInfo as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option show-info.

Notes: This option specifies if Tidy should display info-level messages.

(Read and Write property)

13.5.169 OptionShowMarkup as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should generate a pretty printed version of the markup.

Notes: Note that Tidy won't generate a pretty printed version if it finds significant errors (see force-output).

(Read and Write property)

13.5.170 OptionShowWarnings as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option show-warnings.

Notes: This option specifies if Tidy should suppress warnings. This can be useful when a few errors are hidden in a flurry of warnings.

(Read and Write property)

13.5.171 OptionSkipNested as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option skip-nested.

Notes: This option specifies that Tidy should skip nested tags when parsing script and style data.

(Read and Write property)

13.5.172 OptionSlideStyle as String

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option slide-style.

Notes: This option has no function and is deprecated.

(Read and Write property)

13.5.173 OptionSortAttributes as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option sort-attributes.

Notes: This option specifies that Tidy should sort attributes within an element using the specified sort algorithm. If set to alpha, the algorithm is an ascending alphabetic sort.

(Read and Write property)

13.5.174 OptionSplit as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option split.

Notes: This option has no function and is deprecated.

(Read and Write property)

13.5.175 OptionStrictTagsAttributes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option strict-tags-attributes.

Notes: This options ensures that tags and attributes are applicable for the version of HTML that Tidy outputs. When set to yes (the default) and the output document type is a strict doctype, then Tidy will report errors. If the output document type is a loose or transitional doctype, then Tidy will report warnings. Additionally if drop-proprietary-attributes is enabled, then not applicable attributes will be dropped, too. When set to no, these checks are not performed.

(Read and Write property)

13.5.176 OptionTabSize as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option tab-size.

Notes: This option specifies the number of columns that Tidy uses between successive tab stops. It is used to map tabs to spaces when reading the input.

(Read and Write property)

13.5.177 OptionTidyMark as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option tidy-mark.

Notes: This option specifies if Tidy should add a meta element to the document head to indicate that the document has been tidied.

Tidy won't add a meta element if one is already present.

(Read and Write property)

13.5.178 OptionUppercaseAttributes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option uppercase-attributes.

Notes: This option specifies if Tidy should output attribute names in upper case.

The default is no, which results in lower case attribute names, except for XML input, where the original case is preserved.

(Read and Write property)

13.5.179 OptionUpperCaseAttrs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should output attribute names in upper case.

Notes: The default is no, which results in lower case attribute names, except for XML input, where the original case is preserved.

(Read and Write property)

13.5.180 OptionUppercaseTags as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option uppercase-tags.

Notes: This option specifies if Tidy should output tag names in upper case.

The default is no which results in lower case tag names, except for XML input where the original case is preserved.

(Read and Write property)

13.5.181 OptionVerticalSpace as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option vertical-space.

Notes: This option specifies if Tidy should add some extra empty lines for readability.

The default is no.

If set to auto Tidy will eliminate nearly all newline characters.

(Read and Write property)

13.5.182 OptionVertSpace as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add some empty lines for readability.

Notes: (Read and Write property)

13.5.183 OptionWord2000 as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option word-2000.

Notes: This option specifies if Tidy should go to great pains to strip out all the surplus stuff Microsoft Word 2000 inserts when you save Word documents as "Web pages". It doesn't handle embedded images or VML.

You should consider using Word's "Save As: Web Page, Filtered".

(Read and Write property)

13.5.184 OptionWrap as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap.

Notes: This option specifies the right margin Tidy uses for line wrapping.

Tidy tries to wrap lines so that they do not exceed this length.

Set wrap to 0(zero) if you want to disable line wrapping.

(Read and Write property)

13.5.185 OptionWrapAsp as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap-asp.

Notes: This option specifies if Tidy should line wrap text contained within ASP pseudo elements, which look like: `<% ... %>`.

(Read and Write property)

13.5.186 OptionWrapAttributes as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap-attributes.

Notes: This option specifies if Tidy should line-wrap attribute values, meaning that if the value of an attribute causes a line to exceed the width specified by wrap, Tidy will add one or more line breaks to the value, causing it to be wrapped into multiple lines.

Note that this option can be set independently of wrap-script-literals. By default Tidy replaces any newline or tab with a single space and replaces any sequences of whitespace with a single space.

To force Tidy to preserve the original, literal values of all attributes, and ensure that whitespace characters within attribute values are passed through unchanged, set literal-attributes to yes.

(Read and Write property)

13.5.187 OptionWrapAttVals as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap attribute values, for easier editing.

Notes: This option can be set independently of wrap-script-literals.
(Read and Write property)

13.5.188 OptionWrapJste as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap-jste.

Notes: This option specifies if Tidy should line wrap text contained within JSTE pseudo elements, which look like: `<# ... #>`.
(Read and Write property)

13.5.189 OptionWrapLen as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies the right margin Tidy uses for line wrapping.

Notes: Tidy tries to wrap lines so that they do not exceed this length. Set wrap to zero if you want to disable line wrapping.
(Read and Write property)

13.5.190 OptionWrapPhp as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap-php.

Notes: This option specifies if Tidy should line wrap text contained within PHP pseudo elements, which look like: `<?php ... ?>`.
(Read and Write property)

13.5.191 OptionWrapScriptlets as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap string literals that appear in script attributes.

Notes: Tidy wraps long script string literals by inserting a backslash character before the line break. (Read and Write property)

13.5.192 OptionWrapScriptLiterals as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap-script-literals.

Notes: This option specifies if Tidy should line wrap string literals that appear in script attributes. Tidy wraps long script string literals by inserting a backslash character before the line break. (Read and Write property)

13.5.193 OptionWrapSection as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should line wrap text contained within `<![...] >`section tags.

Notes: (Read and Write property)

13.5.194 OptionWrapSections as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option wrap-sections.

Notes: This option specifies if Tidy should line wrap text contained within `<! [...] >` section tags. (Read and Write property)

13.5.195 OptionWriteBack as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The tidy option write-back.

Notes: This option specifies if Tidy should write back the tidied markup to the same file it read from. You are advised to keep copies of important files before tidying them, as on rare occasions the result may not be what you expect. (Read and Write property)

13.5.196 OptionXhtmlOut as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should generate pretty printed output, writing it as extensible HTML.

Notes: This option causes Tidy to set the DOCTYPE and default namespace as appropriate to XHTML. If a DOCTYPE or namespace is given they will be checked for consistency with the content of the document. In the case of an inconsistency, the corrected values will appear in the output. For XHTML, entities can be written as named or numeric entities according to the setting of the "numeric-entities" option. The original case of tags and attributes will be preserved, regardless of other options.

(Read and Write property)

13.5.197 OptionXmlDecl as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add the XML declaration when outputting XML or XHTML.

Notes: Note that if the input already includes an `<?xml ... ?>` declaration then this option will be ignored. If the encoding for the output is different from "ascii", one of the utf encodings or "raw", the declaration is always added as required by the XML standard.

(Read and Write property)

13.5.198 OptionXmlOut as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should pretty print output, writing it as well-formed XML.

Notes: Any entities not defined in XML 1.0 will be written as numeric entities to allow them to be parsed by a XML parser. The original case of tags and attributes will be preserved, regardless of other options.

(Read and Write property)

13.5.199 OptionXmlPIs as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** One of the options.

Notes: (Read and Write property)

13.5.200 OptionXmlSpace as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** This option specifies if Tidy should add `xml:space="preserve"` to elements such as `<PRE>`, `<STYLE>` and `<SCRIPT>` when generating XML.

Notes: This is needed if the whitespace in such elements is to be parsed appropriately without having access to the DTD.

(Read and Write property)

13.5.201 OptionXmlTags as Boolean

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Deprecated: This item is deprecated and should no longer be used. **Function:** Set this option if the input is xml.

Notes: (Read and Write property)

13.5.202 Events

13.5.203 Filter(level as Integer, line as Integer, column as Integer, message as string) as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

Function: The filter called for every error and warning.

Notes: Callback to filter messages by diagnostic level: info, warning, etc. Just set diagnostic output handler to redirect all diagnostics output.

Return false to proceed with output, true to cancel.

13.5.204 PrettyPrintProgress(line as Integer, column as Integer, destLine as Integer)

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

Function: Reports progress on the print process.

13.6 module TidyDupAttrModesMBS

13.6.1 module TidyDupAttrModesMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.6.2 Constants

Constants

Constant	Value	Description
TidyKeepFirst	0	A constant for use with the Tidy classes.
TidyKeepLast	1	A constant for use with the Tidy classes.

13.7 class TidyInputMBS

13.7.1 class TidyInputMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Delivers raw bytes of input.

13.7.2 Events

13.7.3 EndOfFile as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

Function: Return true if all your data is processed.

Notes: Return false if more data is available for the GetByte call.

13.7.4 GetByte as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

Function: Read one byte and returns it to the tidy library.

13.7.5 UngetByte(value as Integer)

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

Function: Returns a byte to the buffer for later processing.

13.8 class TidyIteratorMBS

13.8.1 class TidyIteratorMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: An iterator for various uses.

13.8.2 Properties

13.8.3 Handle as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal reference to the tidy iterator object.

Notes: (Read only property)

13.9 module TidyLineEndingMBS

13.9.1 module TidyLineEndingMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.9.2 Constants

Constants

Constant	Value	Description
TidyCR	2	A constant for use with the Tidy classes.
TidyCRLF	1	A constant for use with the Tidy classes.
TidyLF	0	A constant for use with the Tidy classes.

13.10 class TidyNodeMBS

13.10.1 class TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A node in the document parse tree.

Blog Entries

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13.10.2 Properties

13.10.3 Child as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The child node of this node.

Example:

```
dim t as TidyDocumentMBS // the tidy document
dim n as TidyNodeMBS
dim c as TidyNodeMBS

// iterating over root and its children (for more children you need recursion)
n=t.Root
while n<>nil
  MsgBox n.Text

  c=n.Child
  while c<>nil
    MsgBox c.Text
    c=c.NextNode
  wend

  n=n.NextNode
wend
```

Notes: (Read only property)

13.10.4 Column as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The position of this node.

Notes: (Read only property)

13.10.5 Document as TidyDocumentMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The document of this node.

Notes: (Read only property)

13.10.6 FirstAttribute as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first attribute for this node.

Notes: (Read only property)

13.10.7 GetABBR as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first ABBR attribute for this node.

Notes: (Read only property)

13.10.8 GetALINK as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first ALINK attribute for this node.

Notes: (Read only property)

13.10.9 GetALT as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first ALT attribute for this node.

Notes: (Read only property)

13.10.10 GetBGCOLOR as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first BGCOLOR attribute for this node.

Notes: (Read only property)

13.10.11 GetCHECKED as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first CHECKED attribute for this node.

Notes: (Read only property)

13.10.12 GetCOLSPAN as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first COLSPAN attribute for this node.

Notes: (Read only property)

13.10.13 GetCONTENT as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first CONTENT attribute for this node.

Notes: (Read only property)

13.10.14 GetDATAFLD as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first DATAFLD attribute for this node.

Notes: (Read only property)

13.10.15 GetFOR as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first FOR attribute for this node.

Notes: (Read only property)

13.10.16 GetHEIGHT as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first HEIGHT attribute for this node.

Notes: (Read only property)

13.10.17 GetHREF as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first HREF attribute for this node.

Notes: (Read only property)

13.10.18 GetHTTP_EQUIV as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first HTTP_EQUIV attribute for this node.

Notes: (Read only property)

13.10.19 GetID as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first ID attribute for this node.

Notes: (Read only property)

13.10.20 GetISMAP as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first ISMAP attribute for this node.

Notes: (Read only property)

13.10.21 GetLANG as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first LANG attribute for this node.

Notes: (Read only property)

13.10.22 GetLANGUAGE as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first LANGUAGE attribute for this node.

Notes: (Read only property)

13.10.23 GetLINK as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first LINK attribute for this node.

Notes: (Read only property)

13.10.24 GetLONGDESC as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first LONGDESC attribute for this node.

Notes: (Read only property)

13.10.25 GetNAME as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first NAME attribute for this node.

Notes: (Read only property)

13.10.26 GetOnBLUR as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnBLUR attribute for this node.

Notes: (Read only property)

13.10.27 GetOnClick as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnCLICK attribute for this node.

Notes: (Read only property)

13.10.28 GetOnFocus as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnFOCUS attribute for this node.

Notes: (Read only property)

13.10.29 GetOnKeyDown as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnKEYDOWN attribute for this node.

Notes: (Read only property)

13.10.30 GetOnKeyPress as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnKEYPRESS attribute for this node.

Notes: (Read only property)

13.10.31 GetOnKeyUp as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnKEYUP attribute for this node.

Notes: (Read only property)

13.10.32 GetOnMOUSEDOWN as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnMOUSEDOWN attribute for this node.

Notes: (Read only property)

13.10.33 GetOnMOUSEMOVE as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnMOUSEMOVE attribute for this node.

Notes: (Read only property)

13.10.34 GetOnMOUSEOUT as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnMOUSEOUT attribute for this node.

Notes: (Read only property)

13.10.35 GetOnMOUSEOVER as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnMOUSEOVER attribute for this node.

Notes: (Read only property)

13.10.36 GetOnMOUSEUP as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first OnMOUSEUP attribute for this node.

Notes: (Read only property)

13.10.37 GetREL as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first REL attribute for this node.

Notes: (Read only property)

13.10.38 GetROWSPAN as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first ROWSPAN attribute for this node.

Notes: (Read only property)

13.10.39 GetSELECTED as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first SELECTED attribute for this node.

Notes: (Read only property)

13.10.40 GetSRC as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first SRC attribute for this node.

Notes: (Read only property)

13.10.41 GetSTYLE as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first STYLE attribute for this node.

Notes: (Read only property)

13.10.42 GetSUMMARY as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first SUMMARY attribute for this node.

Notes: (Read only property)

13.10.43 GetTARGET as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first TARGET attribute for this node.

Notes: (Read only property)

13.10.44 GetTEXT as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first TEXT attribute for this node.

Notes: (Read only property)

13.10.45 GetTITLE as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first TITLE attribute for this node.

Notes: (Read only property)

13.10.46 GetTYPE as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first TYPE attribute for this node.

Notes: (Read only property)

13.10.47 GetUSEMAP as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first USEMAP attribute for this node.

Notes: (Read only property)

13.10.48 GetVALUE as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first VALUE attribute for this node.

Notes: (Read only property)

13.10.49 GetVLINK as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first VLINK attribute for this node.

Notes: (Read only property)

13.10.50 GetWIDTH as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first WIDTH attribute for this node.

Notes: (Read only property)

13.10.51 GetXMLNS as TidyAttributeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The first XMLNS attribute for this node.

Notes: (Read only property)

13.10.52 Handle as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal reference to the tidy node object.

Notes: (Read only property)

13.10.53 HasText as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether there is text attached to this node.

Notes: Returns true if yes.

(Read only property)

13.10.54 ID as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The node ID.

Notes: (Read only property)

13.10.55 IsDATAList as Boolean

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

Function: Whether this node is a data list.

Notes: (Read only property)

13.10.56 IsProperty as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether the node is a property.

Notes: (Read only property)

13.10.57 Line as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The position of this node.

Notes: (Read only property)

13.10.58 Name as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The name of this node.

Notes: (Read only property)

13.10.59 NextNode as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The next node in the node list of the parent node.

Notes: (Read only property)

13.10.60 NodeIsA as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a A node.

Notes: (Read only property)

13.10.61 NodeIsADDRESS as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a ADDRESS node.

Notes: (Read only property)

13.10.62 NodeIsAPPLET as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a APPLET node.

Notes: (Read only property)

13.10.63 NodeIsAREA as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a AREA node.

Notes: (Read only property)

13.10.64 NodeIsB as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a B node.

Notes: (Read only property)

13.10.65 NodeIsBASE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BASE node.

Notes: (Read only property)

13.10.66 NodeIsBASEFONT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BASEFONT node.

Notes: (Read only property)

13.10.67 NodeIsBIG as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BIG node.

Notes: (Read only property)

13.10.68 NodeIsBLINK as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BLINK node.

Notes: (Read only property)

13.10.69 NodeIsBLOCKQUOTE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BLOCKQUOTE node.

Notes: (Read only property)

13.10.70 NodeIsBODY as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BODY node.

Notes: (Read only property)

13.10.71 NodeIsBR as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a BR node.

Notes: (Read only property)

13.10.72 NodeIsCAPTION as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a CAPTION node.

Notes: (Read only property)

13.10.73 NodeIsCENTER as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a CENTER node.

Notes: (Read only property)

13.10.74 NodeIsCOL as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a COL node.

Notes: (Read only property)

13.10.75 NodeIsCOLGROUP as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a COLGROUP node.

Notes: (Read only property)

13.10.76 NodeIsDD as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a DD node.

Notes: (Read only property)

13.10.77 NodeIsDIR as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a DIR node.

Notes: (Read only property)

13.10.78 NodeIsDIV as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a DIV node.

Notes: (Read only property)

13.10.79 NodeIsDL as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a DL node.

Notes: (Read only property)

13.10.80 NodeIsDT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a DT node.

Notes: (Read only property)

13.10.81 NodeIsEM as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a EM node.

Notes: (Read only property)

13.10.82 NodeIsEMBED as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a EMBED node.

Notes: (Read only property)

13.10.83 NodeIsFONT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a FONT node.

Notes: (Read only property)

13.10.84 NodeIsFORM as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a FORM node.

Notes: (Read only property)

13.10.85 NodeIsFRAME as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a FRAME node.

Notes: (Read only property)

13.10.86 NodeIsFRAMESET as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a FRAMESET node.

Notes: (Read only property)

13.10.87 NodeIsH1 as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a H1 node.

Notes: (Read only property)

13.10.88 NodeIsH2 as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a H2 node.

Notes: (Read only property)

13.10.89 NodeIsH3 as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a H3 node.

Notes: (Read only property)

13.10.90 NodeIsH4 as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a H4 node.

Notes: (Read only property)

13.10.91 NodeIsH5 as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a H5 node.

Notes: (Read only property)

13.10.92 NodeIsH6 as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a H6 node.

Notes: (Read only property)

13.10.93 NodeIsHEAD as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a HEAD node.

Notes: (Read only property)

13.10.94 NodeIsHeader as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a Header node.

Notes: (Read only property)

13.10.95 NodeIsHR as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a HR node.

Notes: (Read only property)

13.10.96 NodeIsHTML as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a HTML node.

Notes: (Read only property)

13.10.97 NodeIsI as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a I node.

Notes: (Read only property)

13.10.98 NodeIsIFRAME as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a IFRAME node.

Notes: (Read only property)

13.10.99 NodeIsIMG as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a IMG node.

Notes: (Read only property)

13.10.100 NodeIsINPUT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a INPUT node.

Notes: (Read only property)

13.10.101 NodeIsISINDEX as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a ISINDEX node.

Notes: (Read only property)

13.10.102 NodeIsLABEL as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a LABEL node.

Notes: (Read only property)

13.10.103 NodeIsLAYER as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a LAYER node.

Notes: (Read only property)

13.10.104 NodeIsLI as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a LI node.

Notes: (Read only property)

13.10.105 NodeIsLINK as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a LINK node.

Notes: (Read only property)

13.10.106 NodeIsLISTING as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a LISTING node.

Notes: (Read only property)

13.10.107 NodeIsMAP as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a MAP node.

Notes: (Read only property)

13.10.108 NodeIsMARQUEE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a MARQUEE node.

Notes: (Read only property)

13.10.109 NodeIsMENU as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a MENU node.

Notes: (Read only property)

13.10.110 NodeIsMETA as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a META node.

Notes: (Read only property)

13.10.111 NodeIsNOBR as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a NOBR node.

Notes: (Read only property)

13.10.112 NodeIsNOFRAMES as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a NOFRAMES node.

Notes: (Read only property)

13.10.113 NodeIsNOSCRIPT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a NOSCRIPT node.

Notes: (Read only property)

13.10.114 NodeIsOBJECT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a OBJECT node.

Notes: (Read only property)

13.10.115 NodeIsOL as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a OL node.

Notes: (Read only property)

13.10.116 NodeIsOPTGROUP as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a OPTGROUP node.

Notes: (Read only property)

13.10.117 NodeIsOPTION as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a OPTION node.

Notes: (Read only property)

13.10.118 NodeIsP as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a P node.

Notes: (Read only property)

13.10.119 NodeIsPARAM as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a PARAM node.

Notes: (Read only property)

13.10.120 NodeIsPRE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a PRE node.

Notes: (Read only property)

13.10.121 NodeIsQ as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a Q node.

Notes: (Read only property)

13.10.122 NodeIsS as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a S node.

Notes: (Read only property)

13.10.123 NodeIsSCRIPT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a SCRIPT node.

Notes: (Read only property)

13.10.124 NodeIsSELECT as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a SELECT node.

Notes: (Read only property)

13.10.125 NodeIsSMALL as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a SMALL node.

Notes: (Read only property)

13.10.126 NodeIsSPACER as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a SPACER node.

Notes: (Read only property)

13.10.127 NodeIsSPAN as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a SPAN node.

Notes: (Read only property)

13.10.128 NodeIsSTRIKE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a STRIKE node.

Notes: (Read only property)

13.10.129 NodeIsSTRONG as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a STRONG node.

Notes: (Read only property)

13.10.130 NodeIsSTYLE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a STYLE node.

Notes: (Read only property)

13.10.131 NodeIsTABLE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a TABLE node.

Notes: (Read only property)

13.10.132 NodeIsTD as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a TD node.

Notes: (Read only property)

13.10.133 NodeIsText as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a Text node.

Notes: (Read only property)

13.10.134 NodeIsTEXTAREA as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a TEXTAREA node.

Notes: (Read only property)

13.10.135 NodeIsTH as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a TH node.

Notes: (Read only property)

13.10.136 NodeIsTITLE as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a TITLE node.

Notes: (Read only property)

13.10.137 NodeIsTR as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a TR node.

Notes: (Read only property)

13.10.138 NodeIsU as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a U node.

Notes: (Read only property)

13.10.139 NodeIsUL as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a UL node.

Notes: (Read only property)

13.10.140 NodeIsWBR as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a WBR node.

Notes: (Read only property)

13.10.141 NodeIsXMP as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether this is a XMP node.

Notes: (Read only property)

13.10.142 Parent as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The parent node of this node.

Notes: (Read only property)

13.10.143 PrevNode as TidyNodeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The previous node in the node list of the parent node.

Notes: (Read only property)

13.10.144 Text as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The text of this node.

Example:

```
dim t as new TidyDocumentMBS
```

```
call t.ParseString("<p>Hello World</p>") // pass here bad html  
call t.CleanAndRepair
```

```
dim s As TidyNodeMBS=t.Root
```

```
MsgBox s.Text
```

Notes: This text has no encoding defined.

(Read only property)

13.10.145 Type as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The type of this node.

Notes: (Read only property)

13.10.146 Value as string

Plugin Version: 10.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: The decoded value of the node as UTF-8 String.

Example:

```
dim t as new TidyDocumentMBS

call t.ParseString("<p>Hello World</p>") // pass here bad html
call t.CleanAndRepair

dim nodes(-1) as TidyNodeMBS
dim root as TidyNodeMBS = t.Root

// we iterate over all child nodes

nodes.Append root.Child
nodes.Append root.NextNode

while UBound(nodes)>=0
dim n as TidyNodeMBS = nodes.Pop

if n<>Nil then

nodes.Append n.Child // maybe a child?
nodes.Append n.NextNode // maybe a sibling?

if n.HasText then
MsgBox n.Value // Shows "Hello World"
end if
end if
wend
```

Notes: (Read only property)

13.11 module TidyNodeTypeMBS

13.11.1 module TidyNodeTypeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.11.2 Constants

Constants

Constant	Value	Description
TidyNodeAsp	10	A constant for use with the Tidy classes.
TidyNodeCDATA	8	A constant for use with the Tidy classes.
TidyNodeComment	2	A constant for use with the Tidy classes.
TidyNodeDocType	1	A constant for use with the Tidy classes.
TidyNodeEnd	6	A constant for use with the Tidy classes.
TidyNodeJste	11	A constant for use with the Tidy classes.
TidyNodePhp	12	A constant for use with the Tidy classes.
TidyNodeProcIns	3	A constant for use with the Tidy classes.
TidyNodeRoot	0	A constant for use with the Tidy classes.
TidyNodeSection	9	A constant for use with the Tidy classes.
TidyNodeStart	5	A constant for use with the Tidy classes.
TidyNodeStartEnd	7	A constant for use with the Tidy classes.
TidyNodeText	4	A constant for use with the Tidy classes.
TidyNodeXmlDecl	13	A constant for use with the Tidy classes.

13.12 module TidyOptionIdMBS

13.12.1 module TidyOptionIdMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.12.2 Constants

Constants

Constant	Value	Description
TidyAccessibilityCheckLevel	84	A constant for use with the Tidy classes.
TidyAltText	11	A constant for use with the Tidy classes.
TidyAnchorAsName	93	A constant for use with the Tidy classes.
TidyAsciiChars	71	A constant for use with the Tidy classes.
TidyBlockTags	81	A constant for use with the Tidy classes.
TidyBodyOnly	64	A constant for use with the Tidy classes.
TidyBreakBeforeBR	40	A constant for use with the Tidy classes.
TidyBurstSlides	41	A constant for use with the Tidy classes.
TidyCharEncoding	4	A constant for use with the Tidy classes.
TidyCoerceEndTags	21	A constant for use with the Tidy classes.
TidyCSSPrefix	79	A constant for use with the Tidy classes.
TidyDecorateInferredUL	89	A constant for use with the Tidy classes.
TidyDoctype	9	A constant for use with the Tidy classes.
TidyDoctypeMode	8	A constant for use with the Tidy classes.
TidyDropEmptyElems	37	A constant for use with the Tidy classes.
TidyDropEmptyParas	38	A constant for use with the Tidy classes.
TidyDropFontTags	36	A constant for use with the Tidy classes.
TidyDropPropAttrs	35	A constant for use with the Tidy classes.
TidyDuplicateAttrs	10	A constant for use with the Tidy classes.
TidyEmacs	61	A constant for use with the Tidy classes.
TidyEmacsFile	62	A constant for use with the Tidy classes.
TidyEmptyTags	82	A constant for use with the Tidy classes.
TidyEncloseBlockText	57	A constant for use with the Tidy classes.
TidyEncloseBodyText	56	A constant for use with the Tidy classes.
TidyErrFile	13	A constant for use with the Tidy classes.
TidyEscapeCdata	74	A constant for use with the Tidy classes.
TidyEscapeScripts	97	A constant for use with the Tidy classes.
TidyFixBackslash	52	A constant for use with the Tidy classes.
TidyFixComments	39	A constant for use with the Tidy classes.
TidyFixUri	65	A constant for use with the Tidy classes.
TidyForceOutput	69	A constant for use with the Tidy classes.
TidyGDocClean	33	A constant for use with the Tidy classes.
TidyHideComments	67	A constant for use with the Tidy classes.
TidyHideEndTags	23	A constant for use with the Tidy classes.
TidyHtmlOut	27	A constant for use with the Tidy classes.
TidyInCharEncoding	5	A constant for use with the Tidy classes.
TidyIndentAttributes	53	A constant for use with the Tidy classes.
TidyIndentCdata	68	A constant for use with the Tidy classes.
TidyIndentContent	20	A constant for use with the Tidy classes.
TidyIndentSpaces	1	A constant for use with the Tidy classes.
TidyInlineTags	80	A constant for use with the Tidy classes.
TidyJoinClasses	72	A constant for use with the Tidy classes.
TidyJoinStyles	73	A constant for use with the Tidy classes.
TidyKeepFileTimes	58	A constant for use with the Tidy classes.
TidyLanguage	75	A constant for use with the Tidy classes.
TidyLiteralAttribs	63	A constant for use with the Tidy classes.
TidyLogicalEmphasis	34	A constant for use with the Tidy classes.
TidyLowerLiterals	66	A constant for use with the Tidy classes.
TidyMakeBare	31	A constant for use with the Tidy classes.
TidyMakeClean	32	A constant for use with the Tidy classes.
TidyMark	60	A constant for use with the Tidy classes.
TidyMergeDivs	88	A constant for use with the Tidy classes.
TidyMergeEmphasis	87	A constant for use with the Tidy classes.
TidyMergeSpans	92	A constant for use with the Tidy classes.
TidyNCR	76	A constant for use with the Tidy classes.
TidyNewline	7	A constant for use with the Tidy classes.
TidyNumEntities	42	A constant for use with the Tidy classes.
TidyOmitOptionalTags	22	A constant for use with the Tidy classes.

13.13 class TidyOptionMBS

13.13.1 class TidyOptionMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: An option in the tidy preferences.

13.13.2 Methods

13.13.3 Category as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Category of the option.

13.13.4 DefaultBoolean as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The default value for a boolean property.

13.13.5 DefaultInteger as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The default value for an integer property.

13.13.6 DefaultString as String

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The default value for a string property.

13.13.7 Description as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Description of the option.

13.13.8 ID as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get ID of given Option.

13.13.9 IsReadOnly as boolean

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Is Option read-only?

13.13.10 Name as string

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get name of given Option.

13.13.11 Type as Integer

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get datatype of given Option.

13.13.12 Properties

13.13.13 Document as TidyDocumentMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: The document of this option.

Notes: (Read only property)

13.13.14 Handle as Integer

Plugin Version: 10.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: The internal reference to the tidy option object.

Notes: (Read only property)

13.14 module TidyOptionTypeMBS

13.14.1 module TidyOptionTypeMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.14.2 Constants

Constants

Constant	Value	Description
TidyBoolean	2	A constant for use with the Tidy classes.
TidyInteger	1	A constant for use with the Tidy classes.
TidyString	0	A constant for use with the Tidy classes.

13.15 class TidyOutputMBS

13.15.1 class TidyOutputMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Accepts raw bytes of output from the tidy library.

13.15.2 Events

13.15.3 WriteByte(value as Integer)

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: .

Function: Adds one byte to the output buffer.

13.16 module TidyReportLevelKeysMBS

13.16.1 module TidyReportLevelKeysMBS

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

Function: The module for report level keys.

13.16.2 Constants

Constants

Constant	Value	Description
TidyAccessString	603	A constant for use with the Tidy classes.
TidyBadDocumentString	605	A constant for use with the Tidy classes.
TidyConfigString	602	A constant for use with the Tidy classes.
TidyErrorString	604	A constant for use with the Tidy classes.
TidyFatalString	606	A constant for use with the Tidy classes.
TidyInfoString	600	A constant for use with the Tidy classes.
TidyWarningString	601	A constant for use with the Tidy classes.

13.17 module TidyReportLevelMBS

13.17.1 module TidyReportLevelMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.17.2 Constants

Constants

Constant	Value	Description
TidyAccess	3	A constant for use with the Tidy classes.
TidyBadDocument	5	A constant for use with the Tidy classes.
TidyConfig	2	A constant for use with the Tidy classes.
TidyError	4	A constant for use with the Tidy classes.
TidyFatal	6	A constant for use with the Tidy classes.
TidyInfo	0	A constant for use with the Tidy classes.
TidyWarning	1	A constant for use with the Tidy classes.

13.18 module TidyTagIdMBS

13.18.1 module TidyTagIdMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.18.2 Constants

Constants

Constant	Value	Description
TidyTagA	1	A constant for use with the Tidy classes.
TidyTagABBR	2	A constant for use with the Tidy classes.
TidyTagACRONYM	3	A constant for use with the Tidy classes.
TidyTagADDRESS	4	A constant for use with the Tidy classes.
TidyTagALIGN	5	A constant for use with the Tidy classes.
TidyTagAPPLET	6	A constant for use with the Tidy classes.
TidyTagAREA	7	A constant for use with the Tidy classes.
TidyTagARTICLE	123	A constant for use with the Tidy classes.
TidyTagASIDE	124	A constant for use with the Tidy classes.
TidyTagAUDIO	125	A constant for use with the Tidy classes.
TidyTagB	8	A constant for use with the Tidy classes.
TidyTagBASE	9	A constant for use with the Tidy classes.
TidyTagBASEFONT	10	A constant for use with the Tidy classes.
TidyTagBDI	126	A constant for use with the Tidy classes.
TidyTagBDO	11	A constant for use with the Tidy classes.
TidyTagBGSOUND	12	A constant for use with the Tidy classes.
TidyTagBIG	13	A constant for use with the Tidy classes.
TidyTagBLINK	14	A constant for use with the Tidy classes.
TidyTagBLOCKQUOTE	15	A constant for use with the Tidy classes.
TidyTagBODY	16	A constant for use with the Tidy classes.
TidyTagBR	17	A constant for use with the Tidy classes.
TidyTagBUTTON	18	A constant for use with the Tidy classes.
TidyTagCANVAS	127	A constant for use with the Tidy classes.
TidyTagCAPTION	19	A constant for use with the Tidy classes.
TidyTagCENTER	20	A constant for use with the Tidy classes.
TidyTagCITE	21	A constant for use with the Tidy classes.
TidyTagCODE	22	A constant for use with the Tidy classes.
TidyTagCOL	23	A constant for use with the Tidy classes.
TidyTagCOLGROUP	24	A constant for use with the Tidy classes.
TidyTagCOMMAND	128	A constant for use with the Tidy classes.
TidyTagCOMMENT	25	A constant for use with the Tidy classes.
TidyTagDATALIST	129	A constant for use with the Tidy classes.
TidyTagDD	26	A constant for use with the Tidy classes.
TidyTagDEL	27	A constant for use with the Tidy classes.
TidyTagDETAILS	130	A constant for use with the Tidy classes.
TidyTagDFN	28	A constant for use with the Tidy classes.
TidyTagDIALOG	131	A constant for use with the Tidy classes.
TidyTagDIR	29	A constant for use with the Tidy classes.
TidyTagDIV	30	A constant for use with the Tidy classes.
TidyTagDL	31	A constant for use with the Tidy classes.
TidyTagDT	32	A constant for use with the Tidy classes.
TidyTagEM	33	A constant for use with the Tidy classes.
TidyTagEMBED	34	A constant for use with the Tidy classes.
TidyTagFIELDSET	35	A constant for use with the Tidy classes.
TidyTagFIGCAPTION	132	A constant for use with the Tidy classes.
TidyTagFIGURE	133	A constant for use with the Tidy classes.
TidyTagFONT	36	A constant for use with the Tidy classes.
TidyTagFOOTER	134	A constant for use with the Tidy classes.
TidyTagFORM	37	A constant for use with the Tidy classes.
TidyTagFRAME	38	A constant for use with the Tidy classes.
TidyTagFRAMESET	39	A constant for use with the Tidy classes.
TidyTagH1	40	A constant for use with the Tidy classes.
TidyTagH2	41	A constant for use with the Tidy classes.
TidyTagH3	42	A constant for use with the Tidy classes.
TidyTagH4	43	A constant for use with the Tidy classes.
TidyTagH5	44	A constant for use with the Tidy classes.
TidyTagH6	45	A constant for use with the Tidy classes.
TidyTagHEAD	46	A constant for use with the Tidy classes.

13.19 module TidyTriStateMBS

13.19.1 module TidyTriStateMBS

Plugin Version: 5.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: A module with constants for use with the Tidy classes.

13.19.2 Constants

Constants

Constant	Value	Description
TidyAutoState	2	A constant for use with the Tidy classes.
TidyNoState	0	A constant for use with the Tidy classes.
TidyYesState	1	A constant for use with the Tidy classes.

Chapter 14

Timecode

14.1 class LTCDecoderMBS

14.1.1 class LTCDecoderMBS

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

Function: The class for the timecode decoder.

14.1.2 Methods

14.1.3 Constructor(apv as Integer, queueSize as Integer)

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

Function: Create a new LTC decoder.

Notes: apv: audio-frames per video frame. This is just used for initial settings, the speed is tracked dynamically. setting this in the right ballpark is needed to properly decode the first LTC frame in a sequence.
queueSize: length of the internal queue to store decoded frames to SMPTEDecoderWrite.

Raises an out of memory exception if initialization fails.

14.1.4 Destructor

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

Function: The destructor.

14.1.5 FlushQueue

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

Function: Remove all LTC frames from the internal queue.

14.1.6 Read as LTCFrameMBS

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

Function: Decoded LTC frames are placed in a queue.

Notes: This function retrieves a frame from the queue, and stores it a new LTCFrameMBS object.

See also:

- 14.1.7 Read(frame as LTCFrameMBS) as Boolean 388

14.1.7 Read(frame as LTCFrameMBS) as Boolean

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

Function: Decoded LTC frames are placed in a queue.

Notes: This function retrieves a frame from the queue, and stores it the given LTCFrameMBS object.

You should prefer this method and reuse frame objects.

See also:

- 14.1.6 Read as LTCFrameMBS 388

14.1.8 WriteSingle(data as MemoryBlock, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts floating point audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse. Calculated from data.size by dividing by 4.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.9 WriteSingle(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 389
- 14.1.10 WriteSingle(data as String, posinfo as UInt64 = 0) 389

14.1.9 WriteSingle(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts floating point audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.8 WriteSingle(data as MemoryBlock, posinfo as UInt64 = 0) 388
- 14.1.10 WriteSingle(data as String, posinfo as UInt64 = 0) 389

14.1.10 WriteSingle(data as String, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts floating point audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse. Calculated from data.lenb by dividing by 4.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.8 WriteSingle(data as MemoryBlock, posinfo as UInt64 = 0) 388
- 14.1.9 WriteSingle(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 389

14.1.11 WriteSInt16(data as MemoryBlock, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts SInt16 audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse. Calculated from data.size by dividing by 2.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.12 WriteSInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 390
- 14.1.13 WriteSInt16(data as String, posinfo as UInt64 = 0) 390

14.1.12 WriteSInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts SInt16 audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.11 WriteSInt16(data as MemoryBlock, posinfo as UInt64 = 0) 389
- 14.1.13 WriteSInt16(data as String, posinfo as UInt64 = 0) 390

14.1.13 WriteSInt16(data as String, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts SInt16 audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse. Calculated from data.lenb by dividing by 2.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.11 WriteSInt16(data as MemoryBlock, posinfo as UInt64 = 0) 389
- 14.1.12 WriteSInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 390

14.1.14 WriteUInt16(data as MemoryBlock, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts UInt16 audio samples.

Note: internally libltc uses 8 bit only.

14.1. CLASS LTCDECODERMBS 391

Data: Buffer with data

size: number of samples to parse. Calculated from data.size by dividing by 2.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.15 WriteUInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 391
- 14.1.16 WriteUInt16(data as String, posinfo as UInt64 = 0) 391

14.1.15 WriteUInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts UInt16 audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.14 WriteUInt16(data as MemoryBlock, posinfo as UInt64 = 0) 390
- 14.1.16 WriteUInt16(data as String, posinfo as UInt64 = 0) 391

14.1.16 WriteUInt16(data as String, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Wrapper around WriteUInt8 that accepts UInt16 audio samples.

Note: internally libltc uses 8 bit only.

Data: Buffer with data

size: number of samples to parse. Calculated from data.lenb by dividing by 2.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.14 WriteUInt16(data as MemoryBlock, posinfo as UInt64 = 0) 390
- 14.1.15 WriteUInt16(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 391

14.1.17 WriteUInt8(data as MemoryBlock, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Parse raw audio for LTC timestamps. Once a complete LTC frame has been decoded it is pushed into a queue (see Read function).

Data: Buffer with data

Count: number of samples to parse. Taken from data.size.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.18 WriteUInt8(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 392
- 14.1.19 WriteUInt8(data as String, posinfo as UInt64 = 0) 392

14.1.18 WriteUInt8(data as Ptr, Count as Integer, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Parse raw audio for LTC timestamps. Once a complete LTC frame has been decoded it is pushed into a queue (see Read function).

Data: Buffer with data

Count: number of samples to parse.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.17 WriteUInt8(data as MemoryBlock, posinfo as UInt64 = 0) 391
- 14.1.19 WriteUInt8(data as String, posinfo as UInt64 = 0) 392

14.1.19 WriteUInt8(data as String, posinfo as UInt64 = 0)

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

Function: Feed the LTC decoder with new audio samples.

Notes: Parse raw audio for LTC timestamps. Once a complete LTC frame has been decoded it is pushed into a queue (see Read function).

Data: Buffer with data

Count: number of samples to parse. Taken from data.lenb.

posinfo: (optional, recommended) sample-offset in the audio-stream.

See also:

- 14.1.17 WriteUInt8(data as MemoryBlock, posinfo as UInt64 = 0) 391
- 14.1.18 WriteUInt8(data as Ptr, Count as Integer, posinfo as UInt64 = 0) 392

14.1.20 Properties

14.1.21 Handle as Integer

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

Function: The internal object reference.

Notes: (Read and Write property)

14.1.22 QueueLength as Integer

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

Function: Count number of LTC frames currently in the queue.

Notes: Returns number of queued frames.

(Read only property)

14.2 class LTCEncoderMBS

14.2.1 class LTCEncoderMBS

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

Function: The timecode encoder.

14.2.2 Methods

14.2.3 Constructor(SampleRate as Double, FPS as Double, TVStandard as Integer, Flags as Integer)

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

Function: Allocate and initialize LTC audio encoder.

Notes: EncoderReinit internally see, see notes there.

SampleRate: audio sample rate (eg. 48000)

FPS: video-frames per second (e.g. 25.0)

TVStandard: the TV standard to use for Binary Group Flag bit position

flags: binary combination of flags like LTC_NO_PARITY and LTC_BGF_DONT_TOUCH.

14.2.4 CopyBuffer as MemoryBlock

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

Function: Copy the accumulated encoded audio to the given sample-buffer and flush the internal buffer.

Notes: Allocates new MemoryBlock and puts bytes inside.

Returns nil if there is no data.

14.2.5 CopyBufferString as String

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

Function: Copy the accumulated encoded audio to the given sample-buffer and flush the internal buffer.

Notes: Allocates new memory for string and puts bytes inside.

14.2.6 DecrementTimecode as Boolean

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

Function: Move the encoder to the previous timecode frame.

Notes: This is useful for encoding reverse LTC.

14.2.7 Destructor

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

Function: The destructor.

14.2.8 EncodeByte(byte as UInt8, speed as Double) as boolean

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

Function: Generate LTC audio for given byte of the LTC-frame and place it into the internal buffer.

Notes: see also GetBuffer and BufferPtr

LTC has 10 bytes per frame: $0 \leq \text{bytecnt} < 10$ use TimeCode property to set the current frame before Encoding.

The default output signal is @ -3dBFS (38..218 at 8 bit unsigned). see also SetVolume

if speed is < 0 , the bits are encoded in reverse.

slowdown > 10.0 requires custom buffer sizes; see [\ref SetBufferSize](#).

byte: byte of the LTC-frame to encode 0..9

speed: vari-speed, < 1.0 faster, > 1.0 slower ; must be $\neq 0$

Returns true on success, -1 if byte is invalid or buffer overflow (speed > 10.0)

14.2.9 EncodeFrame

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

Function: Encode a full LTC frame at fixed speed.

Notes: This is equivalent to calling EncodeByte 10 times for bytes 0..9 with speed 1.0.

Note: The internal buffer must be empty before calling this function. Otherwise it may overflow. This is usually the case if it is read with `GetBuffer` after calling this function.

The default internal buffersize is exactly one full LTC frame at speed 1.0. See also:

- 14.2.10 `EncodeFrame(Speed as Double)` 396

14.2.10 `EncodeFrame(Speed as Double)`

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

Function: Encode a full LTC frame at fixed speed.

Notes: This is equivalent to calling `EncodeByte` 10 times for bytes 0..9 with given speed. Speed should be around 1.0 for normal speed.

Note: The internal buffer must be empty before calling this function. Otherwise it may overflow. This is usually the case if it is read with `GetBuffer` after calling this function.

The default internal buffersize is exactly one full LTC frame at speed 1.0. See also:

- 14.2.9 `EncodeFrame` 395

14.2.11 `EncoderReinit(SampleRate as Double, FPS as Double, TVStandard as Integer, Flags as Integer) as Boolean`

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

Function: Change the encoder settings without re-allocating any library internal data structure (realtime safe).

Notes: Changing the fps and or sample-rate implies a buffer flush, and biphas state reset.

This call will fail if the internal buffer is too small to hold one full LTC frame. Use `SetBufferSize` to prepare an internal buffer large enough to accommodate all `SampleRate`, `fps` combinations that you would like to re-init to.

The LTC frame payload data is not modified by this call, however, the flag-bits of the LTC-Frame are updated:

If `fps` equals to 29.97 or 30000.0/1001.0, the `LTCFrame`'s `'dfbit'` bit is set to 1 to indicate drop-frame timecode.

Unless the `LTC_BGF_DONT_TOUCH` flag is set the `BGF1` is set or cleared depending on `LTC_TC_CLOCK` and `BGF0,2` according to `LTC_USE_DATE` and the given standard.

ColFrame is cleared and the parity recomputed (unless LTC_NO_PARITY is given).

SampleRate: audio sample rate (eg. 48000)

FPS: video-frames per second (e.g. 25.0)

TVStandard: the TV standard to use for Binary Group Flag bit position

Flags: binary combination of flags.

Returns 0 on success.

14.2.12 FlushBuffer

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

Function: Reset the write-pointer of the encoder-buffer.

14.2.13 GetBuffer(byref size as Integer, flush as boolean) as Ptr

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

Function: Retrieve a pointer to the accumulated encoded audio-data.

Notes: size: if set, the number of valid bytes in the buffer is stored in the buffer.

Flush: call FlushBuffer - reset the buffer write-pointer.

Returns pointer to encoder-buffer.

14.2.14 IncrementTimecode as Boolean

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

Function: Move the encoder to the next timecode frame.

14.2.15 Reset

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

Function: Resets ecoder state.

Notes: Flushes buffer, reset biphase state.

14.2.16 SetBufferSize(SampleRate as Double, FPS as Double) as boolean

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

Function: Configure a custom size for the internal buffer.

Notes: This is needed if you are planning to call EncoderReinit or if you want to keep more than one LTC frame's worth of data in the library's internal buffer.

The buffer-size is $(1 + \text{sample_rate} / \text{fps})$ bytes. resizing the internal buffer will flush all existing data in it - alike [\ref FlushBuffer](#).

SampleRate: audio sample rate (eg. 48000)

FPS: video-frames per second (e.g. 25.0)

Returns 0 on success, -1 if allocation fails (which makes the encoder unusable, call discard the object or realloc the buffer)

14.2.17 SetFilter(RiseTime as Double)

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

Function: Set encoder signal rise-time / signal filtering.

Notes: LTC signal should have a rise time of 40us +/- 10 us. by default the encoder honors this and low-pass filters the output depending on the sample-rate.

If you want a perfect square wave, set 'rise_time' to 0.

Note EncoderReinit resets the filter-time-constant to use the default 40us for the given sample-rate, overriding any value previously set with SetFilter.

RiseTime the signal rise-time in us (10^{-6} sec), set to 0 for perfect square wave, default 40.0

14.2.18 SetVolume(dBFS as double) as boolean

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

Function: Set the volume of the generated LTC signal.

Notes: Typically LTC is sent at 0dBu ; in EBU callibrated systems that corresponds to -18dBFS. - by default libltc creates -3dBFS

since libltc generated 8bit audio-data, the minimum dBFS is about -42dB which corresponds to 1 bit.

0dB corresponds to a signal range of 127
1..255 with 128 at the center.

dBFS: the volume in dB full-scale (≤ 0.0)

Returns true on success, false if the value was out of range

14.2.19 Properties

14.2.20 BufferPtr as Ptr

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

Function: Retrieve a pointer to the accumulated encoded audio-data.

Notes: (Read only property)

14.2.21 BufferSize as Integer

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

Function: Query the length of the internal buffer.

Notes: It is allocated to hold audio-frames for exactly one LTC frame for the given sample-rate and frame-rate. ie. $(1 + \text{sample-rate} / \text{fps})$ bytes

Note this returns the total size of the buffer, not the used/free part. See also BufferPtr.

Returns size of the allocated internal buffer.
(Read only property)

14.2.22 Filter as Double

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

Function: The current filter setting.

Notes: (Read and Write property)

14.2.23 Flags as Integer

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

Function: The flags used to create the encoder.

Notes: (Read only property)

14.2.24 FPS as Double

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

Function: The FPS setting.

Notes: (Read only property)

14.2.25 Frame as LTCFrameMBS

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

Function: Low-level access to the internal LTCFrame data.

Notes: Note: be careful to about dfbit flag in LTCFrameMBS object, the encoder sets this [only] upon initialization.

(Read and Write property)

14.2.26 Handle as Integer

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

Function: The internal object reference.

Notes: (Read and Write property)

14.2.27 SampleRate as Double

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

Function: The current sample rate.

Notes: (Read only property)

14.2.28 Standard as Integer

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

Function: The TV Standard.

Notes: (Read only property)

14.2.29 TimeCode as LTCSMPTETimecodeMBS

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

Function: Get or set the SMPTETimecode for the encoder LTC-frame.

Notes: The next call to EncodeByte or EncodeFrame will encode this time to LTC audio-samples.

Internally this call uses TimeToFrame because the LTCEncoder operates on LTCframes only.

(Read and Write property)

14.2.30 UserBits as UInt32

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

Function: Get or set a 32-bits unsigned integer from the user-data bits.

Notes: It is written LSB first continuously into the eight user fields.

(Read and Write property)

14.3 class LTCFrameExtMBS

14.3.1 class LTCFrameExtMBS

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

Function: Extended LTC frame - includes audio-sample position offsets, volume, etc.

Notes: Note: For TV systems, the sample in the LTC audio data stream where the LTC Frame starts is not necessarily at the same time as the video-frame which is described by the LTC Frame.

offStart denotes the time of the first transition of bit 0 in the LTC frame.

For 525/60 Television systems, the first transition shall occur at the beginning of line 5 of the frame with which it is associated. The tolerance is ∓ 1.5 lines.

For 625/50 systems, the first transition shall occur at the beginning of line 2 ∓ 1.5 lines of the frame with which it is associated.

Only for 1125/60 systems, the first transition occurs exactly at the vertical sync timing reference of the frame. ∓ 1 line.

Subclass of the LTCFrameMBS class.

14.3.2 Properties

14.3.3 OffEnd as Int64

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

Function: OffEnd the sample in the stream corresponding to the end of the LTC frame.

Notes: (Read and Write property)

14.3.4 OffStart as Int64

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

Function: OffStart the approximate sample in the stream corresponding to the start of the LTC frame.

Notes: (Read and Write property)

14.3.5 Reverse as Integer

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

Function: If non-zero, a reverse played LTC frame was detected.

Notes: Since the frame was reversed, it started at offEnd and finishes as offStart (offEnd >offStart). (Note: in reverse playback the (reversed) sync-word of the next/previous frame is detected, this offset is corrected). (Read and Write property)

14.3.6 SampleMax as UInt8

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

Function: The maximum input sample signal for this frame (0..255).

Notes: (Read and Write property)

14.3.7 SampleMin as UInt8

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

Function: The minimum input sample signal for this frame (0..255).

Notes: (Read and Write property)

14.3.8 Volume as Double

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

Function: The volume of the input signal in dbFS.

Notes: (Read and Write property)

14.3.9 biphaseTics(index as Integer) as Single

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

Function: Detailed timing info.

Notes: Phase of the LTC signal; the time between each bit in the LTC-frame in audio-frames. Summing all 80 values in the array will yield audio-frames/LTC-frame = (offEnd - offStart + 1).

Range of index is 0 to 79.

(Read and Write computed property)

14.4 class LTCFrameMBS

14.4.1 class LTCFrameMBS

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

Function: The constructor for a new empty frame.

14.4.2 Methods

14.4.3 Clone as LTCFrameExtMBS

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

Function: Clones the frame.

Notes: Returns always LTCFrameExtMBS object.

Extended fields may not be set if LTCFrameMBS is cloned.

14.4.4 Constructor

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

Function: The constructor to create a new frame.

Notes: Internally calls Reset to set soem default values.

See also:

- 14.4.5 Constructor(InputTimecode as LTC SMPTE Timecode MBS, TVStandard as Integer, Flags as Integer = 0) 404
- 14.4.6 Constructor(other as LTCFrameMBS) 405

14.4.5 Constructor(InputTimecode as LTC SMPTE Timecode MBS, TVStandard as Integer, Flags as Integer = 0)

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

Function: Translate SMPTE Timecode into its binary LTC representation and set the LTC frame's parity bit accordingly.

Notes: InputTimecode: timecode input

TVStandard: the TV standard to use for parity bit assignment

Flags: flags binary combination of flag values - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.

If LTC_USE_DATE is given, user-fields in LTCFrame will be set from the date in SMPTE Timecode,

otherwise the user-bits are not modified. All non-timecode fields remain untouched - except for the parity bit unless LTC_NO_PARITY is given.

See also:

- 14.4.4 Constructor 404
- 14.4.6 Constructor(other as LTCFrameMBS) 405

14.4.6 Constructor(other as LTCFrameMBS)

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

Function: Initializes a frame with copying data from existing frame.

See also:

- 14.4.4 Constructor 404
- 14.4.5 Constructor(InputTimecode as LTCSMPTETimecodeMBS, TVStandard as Integer, Flags as Integer = 0) 404

14.4.7 FrameAlignment(samples_per_frame as Double, TVStandard as Integer) as UInt64

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

Function: LTCFrame sample alignment offset.

Notes: There is a relative offset of the LTC-Frame start and the TV-frame.

The first bit of a LTC frame corresponds to a specific line in the actual video frame. When decoding this offset needs to be subtracted from the LTC-frame's audio-sample-time to match the TV-frame's start position.

For film frames or HDV the offset is zero.

samples_per_frame: audio-samples per timecode-frame (eg. 1920 = 48000/25)

TVStandard: the TV standard

Returns the offset in samples.

14.4.8 FrameDecrement(fps as integer, TVStandard as integer, Flags as integer = 0) as Boolean

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

Function: Decrement the timecode by one Frame (1/framerate seconds) and set the Frame's parity bit accordingly (see SetParity)

Notes: fps: integer framerate (for drop-frame-timecode set frame->dfbit and round-up the fps).

TVStandard: the TV standard to use for parity bit assignment. If set to 1 the 25fps standard is enabled and LTC Frame bit 59 instead of 27 is used for the parity. It only has effect flag bit 4 (LTC_NO_PARITY) is cleared.

Flags: binary combination of flags - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.

If the bit 0 is set (1) interpret user-data as date and decrement date if timecode wraps at 24h.

(Note: leap-years are taken into account, but since the year is two-digit only, the 100,400yr rules are ignored. "00" is assumed to be year 2000 which was a leap year.) bit 3 (8) indicates that the parity bit should not be touched.

Returns true if timecode was wrapped around at 23:59:59:ff, false otherwise.

14.4.9 FrameIncrement(fps as integer, TVStandard as integer, Flags as integer = 0) as Boolean

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

Function: Increment the timecode by one Frame (1/framerate seconds) and set the Frame's parity bit accordingly (see SetParity)

Notes: fps integer framerate (for drop-frame-timecode set frame->dfbit and round-up the fps).

TVStandard: the TV standard to use for parity bit assignment. If set to 1 the 25fps standard is enabled and LTC Frame bit 59 instead of 27 is used for the parity. It only has effect flag bit 4 (LTC_NO_PARITY) is cleared.

flags: binary combination of LTC_BG_FLAGS - here only LTC_USE_DATE and LTC_NO_PARITY are relevant.

If the bit 0 (1) is set (1) interpret user-data as date and increment date if timecode wraps after 24h.

(Note: leap-years are taken into account, but since the year is two-digit only, the 100,400yr rules are ignored. "00" is assumed to be year 2000 which was a leap year.)

Returns true if timecode was wrapped around after 23:59:59:ff, false otherwise

14.4.10 ParseBCGFlags(TVStandard as Integer) as Integer

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

Function: Parse Binary Group Flags into standard independent format.

Notes: bit 0 (1) - BGF 0,

bit 1 (2) - BGF 1,

bit 2 (4) - BGF 2

TVStandard: the TV standard to use – see LTCFrameMBS class for BGF assignment.
Returns LTC Binary Group Flags.

14.4.11 Reset

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

Function: Reset all values of a LTC FRAME to zero, except for the sync-word (0x3FFD) at the end.

Notes: The sync word is set according to architecture (big/little endian).

Also set the Frame's parity bit accordingly (see SetParity)

14.4.12 SetParity(TVStandard as Integer)

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

Function: Set the parity of the LTC frame.

Notes: Bi-Phase Mark Phase Correction bit (bit 27 - or 59) may be set or cleared so that that every 80-bit word contains an even number of zeroes. This means that the phase in every Sync Word will be the same.

This is merely cosmetic; the motivation to keep the polarity of the waveform constant is to make finding the Sync Word visibly (on a scope) easier.

There is usually no need to call this function directly. The encoder utility functions TimeToFrame, FrameIncrement and FrameDecrement include a call to it.

Standard: If 1 (aka LTC_TV_625_50) , the 25fps mode (bit 59 - aka binary_group_flag_bit2) is used, otherwise the 30fps, 24fps mode (bit 27 – biphase_mark_phase_correction) is set or cleared.

14.4.13 Properties

14.4.14 BinaryGroupFlagBit0 as Integer

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

Function: indicate user-data char encoding, see table above - bit 43.

Notes: 1 bit value, so only 0 or 1.

(Read and Write property)

14.4.15 BinaryGroupFlagBit1 as Integer

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

Function: indicate timecode is local time wall-clock, see table above - bit 58.

Notes: 1 bit value, so only 0 or 1.

(Read and Write property)

14.4.16 BinaryGroupFlagBit2 as Integer

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

Function: indicate user-data char encoding (or parity with 25fps), see table above - bit 59.

Notes: 1 bit value, so only 0 or 1.

(Read and Write property)

14.4.17 BiphasMarkPhaseCorrection as Integer

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

Function: The Bi-Phase Mark Phase Correction Bit.

Notes: The Bi-Phase Mark Phase Correction Bit (Bit 27 or 59) may be set or cleared so that that every 80-bit word contains an even number of zeroes. This means that the phase of the pulse train in every Sync Word will be the same.

(Read and Write property)

14.4.18 ColFrame as Integer

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

Function: Colour-frame: timecode intentionally synchronized to a colour TV field sequence

Notes: 1 bit value, so only 0 or 1.

(Read and Write property)

14.4.19 Data as MemoryBlock

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

Function: The raw frame data as memoryblock.

Notes: When setting you can either pass 368 or 364 bytes (LTCFrameExt) or 10 bytes (LTCFrame)

(Read and Write property)

14.4.20 DFBit as Integer

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

Function: indicated drop-frame timecode.

Notes: 1 bit value, so only 0 or 1.
(Read and Write property)

14.4.21 Frames as Integer

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

Function: Get or set frames field.

Notes: Computed by the MBS Plugin for you as a convenience from both frames_tens and frames_unit.
(Read and Write property)

14.4.22 FrameTens as Integer

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

Function: SMPTE framenumbers BCD tens 0..3.

Notes: (Read and Write property)

14.4.23 FrameUnits as Integer

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

Function: SMPTE framenumbers BCD unit 0..9.

Notes: (Read and Write property)

14.4.24 Hours as Integer

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

Function: Get or set hours field.

Notes: Computed by the MBS Plugin for you as a convenience from both hours_tens and hours_unit.
(Read and Write property)

14.4.25 HoursTens as Integer

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

Function: SMPTE hours BCD tens 0..2.

Notes: (Read and Write property)

14.4.26 HoursUnits as Integer

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

Function: SMPTE hours BCD unit 0..9.

Notes: (Read and Write property)

14.4.27 Mins as Integer

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

Function: Get or set minutes field.

Notes: Computed by the MBS Plugin for you as a convenience from both `minutes_tens` and `minutes_unit`.
(Read and Write property)

14.4.28 MinsTens as Integer

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

Function: SMPTE minutes BCD tens 0..6.

Notes: (Read and Write property)

14.4.29 MinsUnits as Integer

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

Function: SMPTE minutes BCD unit 0..9.

Notes: (Read and Write property)

14.4.30 Secs as Integer

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

Function: Get or set seconds field.

Notes: Computed by the MBS Plugin for you as a convenience from both seconds_tens and seconds_unit. (Read and Write property)

14.4.31 SecsTens as Integer

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

Function: SMPTE seconds BCD tens 0..6

Notes: (Read and Write property)

14.4.32 SecsUnits as Integer

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

Function: SMPTE seconds BCD unit 0..9

Notes: (Read and Write property)

14.4.33 SyncWord as Integer

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

Function: The sync word file.

Notes: (Read and Write property)

14.4.34 TimeCode as LTC SMPTE Timecode MBS

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

Function: Convert binary LTCFrame into a SMPTE Timecode.

Notes: (Read only property)

14.4.35 User1 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.

(Read and Write property)

14.4.36 User2 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.

(Read and Write property)

14.4.37 User3 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.

(Read and Write property)

14.4.38 User4 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.

(Read and Write property)

14.4.39 User5 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.

(Read and Write property)

14.4.40 User6 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

14.4.41 User7 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

14.4.42 User8 as Integer

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

Function: User defined bits.

Notes: You can set them as you like, but be aware you only have 4 bits here (value 0 to 15). Usually set as a block of 32-bit using UserBits property in encoder.
(Read and Write property)

14.4.43 UserBits as UInt32

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

Function: Queries all user bits as one 32-bit value.

Notes: (Read only property)

14.5 module LTCMBS

14.5.1 module LTCMBS

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

Function: The central module for global LTC methods.

Notes: This plugin part can load libltc, a library to encode and decode linear timecode.

Linear (or Longitudinal) Timecode (LTC) is an encoding of timecode data as a Manchester-Biphase encoded audio signal.

The audio signal is commonly recorded on a VTR track or other storage media.

libltc facilitates decoding and encoding of LTC from/to timecode, including SMPTE date support.

see

<https://github.com/x42/libltc>

Blog Entries

- [MonkeyBread Software Releases the MBS Xojo Plugins in version 20.1](#)
- [MBS Xojo Plugins, version 20.1pr1](#)

Xojo Developer Magazine

- [18.3, page 10: News](#)

14.5.2 Methods

14.5.3 FrameToTime(OutputTimecode as LTCSMPTETimecodeMBS, InputFrame as LTCFrameMBS, Flags as Integer = 0)

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

Function: Convert binary LTCFrame into a SMPTETimecode.

Notes: Binary combination of flags - here only LTC_USE_DATE is relevant.

if LTC_USE_DATE is set, the user-fields in LTCFrame will be parsed into the date variable of SMPTETimecode. otherwise the date information in the SMPTETimecode is set to zero.

14.5.4 LoadLibrary(file as folderitem) as boolean

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

Function: Loads LTC library from a file.

Notes: Please get a libltc.dll/so/dylib for your platform and tell the plugin where to load it here.

Returns true on success and false on failure.

See `LibraryLoadErrorMessage` and `LibraryLoadError` in case of error.

See also:

- 14.5.5 `LoadLibrary(path as string)` as boolean 415

14.5.5 `LoadLibrary(path as string)` as boolean

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

Function: Loads LTC library from a file path.

Notes: Please get a libltc.dll/so/dylib for your platform and tell the plugin where to load it here.

Returns true on success and false on failure.

See `LibraryLoadErrorMessage` and `LibraryLoadError` in case of error.

See also:

- 14.5.4 `LoadLibrary(file as folderitem)` as boolean 414

14.5.6 `TimeToFrame(OutputFrame as LTCFrameMBS, InputTimecode as LTC-SMPTETimecodeMBS, TVStandard as Integer, Flags as Integer = 0)`

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

Function: Translate SMPTETimecode into its binary LTC representation and set the LTC frame's parity bit accordingly.

Notes: `OutputFrame`: the frame to be set

`InputTimecode`: timecode input

`TVStandard`: the TV standard to use for parity bit assignment

`Flags`: flags binary combination of flag values - here only `LTC_USE_DATE` and `LTC_NO_PARITY` are relevant.

If `LTC_USE_DATE` is given, user-fields in `LTCFrame` will be set from the date in `SMPTETimecode`, otherwise the user-bits are not modified. All non-timecode fields remain untouched - except for the parity bit unless `LTC_NO_PARITY` is given.

14.5.7 Properties

14.5.8 `LibraryLoaded` as Boolean

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

Function: Whether the library is loaded.

Notes: (Read only property)

14.5.9 LibraryLoadError as Integer

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

Function: The load error code.

Notes: (Read only property)

14.5.10 LibraryLoadErrorMessage as String

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

Function: The load error message.

Notes: (Read only property)

14.5.11 Constants

Constants

Constant	Value	Description
LTC_FRAME_BIT_COUNT	80	The bit count for a raw 80 bit LTC frame

Encoder and LTCframe flags

Constant	Value	Description
LTC_BGF_DONT_TOUCH	4	Encoder init or re-init does not touch the BGF bits (initial values after initialization is zero)
LTC_NO_PARITY	8	Parity bit is left untouched when setting or in/decrementing the encoder frame-number
LTC_TC_CLOCK	2	The Timecode is wall-clock aka freerun. This also sets BGF1 (unless LTC_BGF_DONT_TOUCH is given)
LTC_USE_DATE	1	LTCFrame <>SMPTETimecode converter and LTCFrame increment/decrement use date, also set BGF2 to '1' when encoder is initialized or re-initialized (unless LTC_BGF_DONT_TOUCH is given)

TV Standards

Constant	Value	Description
LTC_TV_1125_60	2	30fps
LTC_TV_525_60	0	30fps
LTC_TV_625_50	1	25fps
LTC_TV_FILM_24	3	24fps

14.6 class LTCSMPTETimecodeMBS

14.6.1 class LTCSMPTETimecodeMBS

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

Function: The class for a human readable time representation, decimal values.

14.6.2 Methods

14.6.3 Constructor

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

Function: The constructor to create a new empty timecode.

See also:

- 14.6.4 Constructor(other as LTCSMPTETimecodeMBS) 418

14.6.4 Constructor(other as LTCSMPTETimecodeMBS)

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

Function: Constructors a new time object with copying given values.

See also:

- 14.6.3 Constructor 418

14.6.5 Properties

14.6.6 Data as MemoryBlock

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

Function: Gets or sets data of this smtp timecode with a memoryblock.

Notes: (Read and Write property)

14.6.7 Date as Date

Plugin Version: 20.1, Platforms: macOS, Linux, Windows, Targets: Desktop, Console & Web.

Function: Get or set time stamp via date.

Notes: When setting we take the year mod 100 to fill years field and frame field is set to zero.

When querying we return year + 2000 if year <67 and otherwise year + 1900, so we can have a year range of 1967 to 2066.

(Read and Write property)

14.6.8 DateTime as DateTime

Plugin Version: 20.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Get or set time stamp via date.

Notes: When setting we take the year mod 100 to fill years field and frame field is set to zero.

When querying we return year + 2000 if year <67 and otherwise year + 1900, so we can have a year range of 1967 to 2066.

(Read and Write property)

14.6.9 Days as Integer

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

Function: The days field.

Notes: day of month 1..31

(Read and Write property)

14.6.10 Frame as Integer

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

Function: The frame field.

Notes: sub-second frame 0..(FPS - 1)

(Read and Write property)

14.6.11 Hours as Integer

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

Function: The hours field.

Notes: hour 0..23

(Read and Write property)

14.6.12 Mins as Integer

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

Function: The minutes field.

Notes: minute 0..60

(Read and Write property)

14.6.13 Months as Integer

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

Function: The month field.

Notes: valid months are 1..12

(Read and Write property)

14.6.14 Secs as Integer

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

Function: The seconds field.

Notes: second 0..60

(Read and Write property)

14.6.15 TimeZone as String

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

Function: The time zone field.

Notes: the timezone is maximum 5 characters: "+HHMM" textual representation

(Read and Write property)

14.6.16 Years as Integer

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

Function: The years field.

Notes: LTC-date uses 2-digit year 00.99.

(Read and Write property)

Chapter 15

Wordfile

15.1 class WordFileMBS

15.1.1 class WordFileMBS

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

Function: Word file editing.

Example:

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)

if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then

f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
end if
```

Notes: This is a class for reading word files and replacing text to customize document files. Works for xml and docx files. Does not support old doc file format.

Please report document files where plugin corrupted file or failed to replace text.
This is an abstract class. You can't create an instance, but you can get one from various plugin functions.

Blog Entries

- [News from the MBS Xojo Plugins Version 22.2](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.2](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.0](#)
- [News from the MBS Xojo Plugins Version 21.4](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 21.4](#)
- [MBS Xojo Plugins in version 19.2](#)
- [MonkeyBread Software Releases the MBS Xojo plug-ins in version 17.0](#)
- [MBS Xojo / Real Studio plug-ins in version 16.3](#)
- [MBS Xojo / Real Studio plug-ins version 16.2](#)
- [MBS Xojo / Real Studio plug-ins in version 15.4](#)

Videos

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

Xojo Developer Magazine

- [20.2, page 10: News](#)
- [19.6, page 10: News](#)
- [15.2, page 10: News](#)

15.1.2 Methods

15.1.3 `addMediaFile(name as string, content as string)`

Plugin Version: 19.1, Platforms: macOS, Linux, Windows, Targets: All.

Function: Adds a media file image.

Notes: You can use this function to add a new image.

You need to add the reference in XML yourself to let the image appear somewhere in the document.

15.1.4 Append(other as WordFileMBS, AddPageBreak as boolean = false) as Boolean

Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Appends one word file text to other.

Notes: This function takes document part from other word file and copies it,Äô xml nodes to the current document.

Please only copy from one document to other if they both are made from same template, so internal IDs for styles match.

Returns true on success or false on failure.

Added AddPageBreak parameter in version 19.2. If true, we add a page break between the old and new parts.

15.1.5 AppendTableRow(tag as string) as Integer

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

Function: Duplicates a table row containing a placeholder.

Notes: If you have tables in your template word file and you like to duplicate it, this function can do that and add the new row on the end of the table.

Returns Values

- 0 success
- 1 Tag not found.
- 2 Tag found, but not in a table.
- 3 Missing main document part.

15.1.6 Constructor

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

Function: The private constructor.

15.1.7 Contains(findText as string) as boolean

Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Checks if some text exists in the document.

Notes: This is like HasTag function, but doesn't require markers around the text in the document.

15.1.8 DuplicateTableRow(tag as string) as Integer

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

Function: Duplicates a table row containing a placeholder.

Notes: If you have tables in your template word file and you like to duplicate it, this function can do that and add the new row on just after the row to copy.

Returns Values

- 0 success
- 1 Tag not found.
- 2 Tag found, but not in a table.
- 3 Missing main document part.

15.1.9 FieldNames as String()

Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries field names in the file.

Notes: This looks for form fields in a word file.

15.1.10 GetFieldText(fieldName as string, byref text as String) as boolean

Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries field value.

Notes: The plugin looks for the field with given name and queries it's text.

Returns true if field was found.

15.1.11 HasTag(tag as string) as boolean

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

Function: Checks if a tag exists.

Notes: The place holder in the document must start with `¬´` and end with `¬ª` characters. The place holder you pass here, should not have those quotes.

Returns true on success or false on failure.

If you change font or style of the text within the marker, it will not be recognized. So please keep all text between and including the `¬´` and `¬ª` markers (or whatever is configured) within the same font style.

15.1.12 MediaFiles as String()

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Lists the media files in the word document.

Example:

```
// read a word file:
Dim file As New FolderItem("c:\tmp\test.docx", folderitem.PathModes.Native)
Dim wordStream As BinaryStream = BinaryStream.Open(file)
Dim wordData As String = wordStream.Read(wordStream.Length)
wordStream.close
Dim word As WordFileMBS = WordFileMBS.OpenData(wordData)

// now show list of files in message box
Dim MediaFiles() As String = word.MediaFiles
MessageBox Join(MediaFiles, EndOfLine)
```

Notes: e.g. image1.png

15.1.13 OpenData(Data as MemoryBlock) as WordFileMBS

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

Function: Opens data as document.

Notes: You can pass here XML or Docx file content.

Returns nil in case of an error.

See also:

- 15.1.14 OpenData(Data as String) as WordFileMBS

15.1.14 OpenData(Data as String) as WordFileMBS

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

Function: Opens data as document.

Example:

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)
```

```
if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then
```

```
f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
end if
```

Notes: You can pass here XML or Docx file content.

Returns nil in case of an error.

See also:

- 15.1.13 OpenData(Data as MemoryBlock) as WordFileMBS

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15.1.15 OpenXML(XML as String) as WordFileMBS

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

Function: Opens XML file from text string.

Notes: Returns nil in case of error.

15.1.16 Parts as String()

Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries names of the parts of the document.

Example:

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)
```

```
MsgBox w.XML("footer1")
```

Notes: This may tell you how many headers/footers we found in a docx file.
e.g. "footer1", "header1", "document".

15.1.17 RemoveTableRow(tag as string) as Integer

Plugin Version: 17.0, Platforms: macOS, Linux, Windows, Targets: All.

Function: Removes a table row containing a placeholder.

Notes: If you have tables in your template word file and you only fill some rows, you can remove superfluous rows using this function.

Returns Values

- 0 success
- 1 Tag not found.
- 2 Tag found, but not in a table.
- 3 Missing main document part.

15.1.18 ReplaceTag(tag as string, text as string = "", All as boolean = false) as boolean

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

Function: Replaces a placeholder with text.

Example:

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)
```

```
if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then
```

```
f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
```

end if

Notes: The place holder in the document must start with `¬´` and end with `¬ª` characters. The place holder you pass here, should not have those quotes.

Returns true on success or false on failure.

If you need to replace multi line text like addresses, please use several placeholders, at least one per line.

Version 17.0 and newer can handle multi line text better for normal paragraphs with `Chr(13)`. It creates for you new paragraphs for each line in the new text.

If you change font or style of the text within the marker, it will not be recognized. So please keep all text between and including the `¬´` and `¬ª` markers (or whatever is configured) within the same font style.

15.1.19 SetFieldText(fieldName as string, text as String) as boolean

Plugin Version: 17.5, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets field value.

Notes: The plugin looks for the field with given name and sets it's text.

Returns true if field was found.

15.1.20 SetMarkers(openMarker as String, closeMarker as String) as boolean

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Sets the markers to look for before/after a tag.

Notes: Default are `¬´` and `¬ª`.

Should be different and not empty.

Returns true on success or false on failure.

15.1.21 Substitute(findText as string, replaceText as string = "", All as boolean = false) as boolean

Plugin Version: 21.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Replaces some text in the document with new text.

Notes: Like ReplaceTag function, but without markers around the tag.

Handles multi line text better for normal paragraphs with `Chr(13)`. It creates for you new paragraphs for

each line in the new text.

If you change font or style of the text within the find text, it will not be recognized. So please keep all text within the same font style.

15.1.22 Tags as String()

Plugin Version: 22.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries list of tags.

Notes: Depends on the start/end markers set with OpenMarker/CloseMarker properties.

Can be very useful for debugging to query list of tags found in the document.

15.1.23 WriteFile(path as folderItem) as boolean

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

Function: Writes a file to disk.

Example:

```
dim f as FolderItem = GetFolderItem("test.docx")
dim b as BinaryStream = BinaryStream.Open(f)
dim d as string = b.Read(b.Length)
dim w as WordFileMBS = WordFileMBS.OpenData(d)
```

```
if w.ReplaceTag("FirstName", "Peter") then
if w.ReplaceTag("LastName", "Miller") then
```

```
f = GetFolderItem("output.docx")
if w.WriteFile(f) then
MsgBox "OK"
end if
end if
end if
```

Notes: File extension should be correct, either docx or xml depending on what you loaded.

15.1.24 Properties

15.1.25 Caseless as Boolean

Plugin Version: 17.4, Platforms: macOS, Linux, Windows, Targets: All.

Function: Whether to compare tag names case insensitive.

Notes: Set to true for case insensitive comparison of ASCII characters. Default is false.

(Read and Write property)

15.1.26 CloseMarker as String

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The close marker text.

Notes: Default value is "¬".

(Read only property)

15.1.27 OpenMarker as String

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: The open marker text.

Notes: Default value is "¬".

(Read only property)

15.1.28 Text as String

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

Function: Extracts text of word file.

Notes: Plugin inserts a few newline characters for detected line ends.

May not give all text. If you miss something, please send us test files.

(Read only property)

15.1.29 XML as String

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

Function: The XML found in the document.

Notes: (Read and Write property)

See also:

- 15.1.31 XML(part as String) as String

15.1.30 MediaFile(name as string) as String

Plugin Version: 16.3, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries or replaces the content of a media file.

Example:

```
Dim word As WordFileMBS // open word document

// name one
Dim name As String = "image1.jpg"

// or pick from list
'Dim MediaFiles() As String = word.MediaFiles
'Dim name As String = MediaFiles(0) // first one

// load image
Dim ImageFile As FolderItem = SpecialFolder.Desktop.Child("new.jpg")
Dim ImageStream As BinaryStream = BinaryStream.Open(ImageFile)
Dim ImageData As String = ImageStream.Read(ImageStream.Length)

word.MediaFile(name) = ImageData
```

Notes: You can use this to extract images from word file.

Or to replace a placeholder image with the real image.

For replacement please make sure file type and dimensions match.

Raises KeyNotFoundException if media file with given name is not found.

(Read and Write computed property)

15.1.31 XML(part as String) as String

Plugin Version: 16.2, Platforms: macOS, Linux, Windows, Targets: All.

Function: Queries/Sets XML for a part.

Notes: See Parts array for possible parts.

(Read and Write computed property)

See also:

- 15.1.29 XML as String

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Chapter 17

The FAQ

17.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sure, here's a routine I use (which has an advantage over the previously-posted Date-based solution in that you don't have to rely on the creation of an object – all that happens is some division and string concatenation):

Example:

```
Function SecsToTimeString(timeInSecs as Integer, padHours as boolean, padMinutes as boolean) as string
// Given an amount time (in seconds), generates a string representing that amount
// of time. The padHours and padMinutes parameters determine whether to display
// hours and minutes if their values are zero.
```

```
// Examples:
// timeInSecs = 90, padHours = true; returns "00:01:30"
// timeInSecs = 1, padHours = false, padMinutes = true; returns "00:01"
// timeInSecs = 3601, padMinutes = false; returns "01:00:01"
```

```
dim hours, minutes, seconds as Integer
dim hoursString, minutesString as string
```

```
hours = timeInSecs / 3600
minutes = (timeInSecs mod 3600) / 60
seconds = timeInSecs mod 60
```

```
if hours = 0 then
if padHours then
hoursString = "00:"
else
hoursString = ""
end if
```

```

else
hoursString = Format(hours, "##\:")
end if
if minutes = 0 then
if hours <>0 or padMinutes then
minutesString = "00:"
else
minutesString = ""
end if
else
minutesString = Format(minutes, "00\:")
end if

return hoursString + minutesString + Format(seconds, "00")
End Function

```

Notes: (from the rb mailinglist)

17.0.2 Do you have plugins for Android?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Since there is no plugin SDK for Android, we have no way to make a plugin for Android.

Notes: We support macOS, Windows, Linux and iOS.

17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use functions from NSColor to get proper highlight color in RGB:

Example:

```

Function ProperHighlightColor(active as Boolean) As Color
#if TargetCocoa
Dim theColor As NSColorMBS
If active Then
theColor = NSColorMBS.alternateSelectedControlColor
Else
theColor = NSColorMBS.secondarySelectedControlColor
End If

```

```

Dim rgbColor As NSColorMBS = theColor.colorUsingColorSpaceName(NSColorSpaceMBS.NSCalibrate-

```

```

dRGBColorSpace)
If rgbColor <>Nil Then
Dim red as Integer = rgbColor.redComponent * 255.0
Dim green as Integer = rgbColor.greenComponent * 255.0
Dim blue as Integer = rgbColor.blueComponent * 255.0
Return RGB(red, green, blue)
Else
Return HighlightColor
End If
#else
return HighlightColor
#endif
End Function

```

Notes: As you see we convert color to Calibrated RGB for best results.
See also:

- 17.0.4 How to catch delete key? 447
- 17.0.5 How to convert cmyk to rgb? 448
- 17.0.6 How to delete a folder? 449
- 17.0.7 How to detect if CPU is 64bit processor? 450
- 17.0.8 How to query variant type string for a variant? 451
- 17.0.9 How to refresh a htmlviewer on Windows? 452

17.0.4 How to catch delete key?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code in keydown event catches delete or backspace keys.

Example:

```

Function KeyDown(Key As String) As Boolean
if asc(key) = 8 or asc(key) = 127 then
MsgBox "Delete"
Return true
end if
End Function

```

See also:

- 17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 446

- 17.0.5 How to convert cmyk to rgb? 448
- 17.0.6 How to delete a folder? 449
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17.0.5 How to convert cmyk to rgb?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

The following is the code to convert cmyk values to an RGB color datatype.

It's just a basic estimate of the color values. If you are looking for completely color accurate solution, this is not it. It should work for most people. :)

Example:

Function CMYKToRGB(c as Integer, m as Integer, y as Integer, k as Integer) As color

// converts c,m,y,k values (0-100) to color data type RGB

// place this in a method. Supply C,M,Y,K values-

// it returns color datatype

```
dim color_RGB as color
```

```
dim r, g, b as Integer
```

```
r=255-round(2.55*(c+k))
```

```
if r<0 then
```

```
r=0
```

```
end if
```

```
g=255-round(2.55*(m+k))
```

```
if g<0 then
```

```
g=0
```

```
end if
```

```
b=255-round(2.55*(y+k))
```

```
if b<0 then
```

```
b=0
```

```
end if
```

```
color_RGB=RGB(r,g,b)
```

```
return color_RGB
```

```
End Function
```

Notes:

(from the rb mailinglist)
See also:

- 17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 446
- 17.0.4 How to catch delete key? 447
- 17.0.6 How to delete a folder? 449
- 17.0.7 How to detect if CPU is 64bit processor? 450
- 17.0.8 How to query variant type string for a variant? 451
- 17.0.9 How to refresh a htmlviewer on Windows? 452

17.0.6 How to delete a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The following is the code that deletes a folder recursively.

Example:

```
Sub deletefolder(f as folderitem)
dim files(-1) as FolderItem

if f=nil then Return

// delete single file
if f.Directory=false then
f.Delete
Return
end if

// get a list of all items in that folder
dim i,c as Integer
c=F.Count
for i=1 to c
files.Append f.TrueItem(i)
next

// delete each item
for each fo as FolderItem in files
if fo=nil then
' ignore
elseif fo.Directory then
deletefolder fo
fo.delete
else ' file
```

```
fo.Delete
end if
next
```

```
f.Delete
End Sub
```

See also:

- 17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 446
- 17.0.4 How to catch delete key? 447
- 17.0.5 How to convert cmyk to rgb? 448
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- 17.0.8 How to query variant type string for a variant? 451
- 17.0.9 How to refresh a htmlviewer on Windows? 452

17.0.7 How to detect if CPU is 64bit processor?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Via CPUID you can ask CPU:

Example:

```
dim c as new CPUIDMBS

if c.Flags(CPUIDMBS.kFeatureLM) then
MsgBox "64-bit CPU"
else
MsgBox "32-bit CPU"
end if
```

Notes: Should work on all intel compatible CPUs.

See also:

- 17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 446
- 17.0.4 How to catch delete key? 447
- 17.0.5 How to convert cmyk to rgb? 448
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17.0.8 How to query variant type string for a variant?

Plugin Version: 20.5, Platforms: macOS, Linux, Windows.

Answer: The following example function returns type string for variant.

Example:

```
Public Function VariantTypeString(v as Variant) as string
// Xojo's VarType doesn't know Unsigned integers
'Dim type As Integer = VarType(v)

// MBS VarType can detect unsigned integer
Dim type As Integer = GetVariantTypeMBS(v)

Dim IsArray As Boolean = BitwiseAnd(type, Variant.TypeArray) = Variant.TypeArray

// type without array
type = BitwiseAnd(type, Bitwise.OnesComplement(Variant.TypeArray))

// build a dictionary to map types on first call
Static TypeMap As Dictionary
If TypeMap = Nil Then
TypeMap = New Dictionary
TypeMap.Value(Variant.TypeBoolean) = "Boolean"
TypeMap.Value(Variant.TypeCFStringRef) = "CFStringRef"
TypeMap.Value(Variant.TypeColor) = "Color"
TypeMap.Value(Variant.TypeCString) = "CString"
TypeMap.Value(Variant.TypeCurrency) = "Currency"
TypeMap.Value(Variant.TypeDate) = "Date"
TypeMap.Value(Variant.TypeDateTime) = "DateTime"
TypeMap.Value(Variant.TypeDouble) = "Double"
TypeMap.Value(Variant.TypeInt32) = "Int32"
TypeMap.Value(Variant.TypeInt64) = "Int64"
TypeMap.Value(Variant.TypeInteger) = "Integer"
TypeMap.Value(Variant.TypeNil) = "Nil"
TypeMap.Value(Variant.TypeObject) = "Object"
TypeMap.Value(Variant.TypeOSType) = "OSType"
TypeMap.Value(Variant.TypePString) = "PString"
TypeMap.Value(Variant.TypePtr) = "Ptr"
TypeMap.Value(Variant.TypeSingle) = "Single"
TypeMap.Value(Variant.TypeString) = "String"
TypeMap.Value(Variant.TypeStructure) = "Structure"
TypeMap.Value(Variant.TypeText) = "Text"
TypeMap.Value(Variant.TypeWindowPtr) = "WindowPtr"
TypeMap.Value(Variant.TypeWString) = "WString"

// MBS extra types
TypeMap.Value(Variant.TypeInt32+100) = "UInt32"
TypeMap.Value(Variant.TypeInt64+100) = "UInt64"
```

End If

```
// lookup type

#if DebugBuild then
If Not TypeMap.HasKey(type) Then
Break // missing type
End If
#endif

If IsArray Then
Return "Array of " + TypeMap.Lookup(type,"?")
Else
Return TypeMap.Lookup(type,"?")
End If
End Function
```

See also:

- 17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 446
- 17.0.4 How to catch delete key? 447
- 17.0.5 How to convert cmyk to rgb? 448
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- 17.0.9 How to refresh a htmlviewer on Windows? 452

17.0.9 How to refresh a htmlviewer on Windows?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can ask the browser to reload the website with this code line:

Example:

```
call htmlViewer1.IERunJavaScriptMBS("javascript:document.location.reload()")
```

See also:

- 17.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 446
- 17.0.4 How to catch delete key? 447
- 17.0.5 How to convert cmyk to rgb? 448

- 17.0.6 How to delete a folder? 449
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- 17.0.8 How to query variant type string for a variant? 451

17.0.10 Is there an example for vector graphics in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this example inside the paint event of a window:

Example:

```
dim v as Group2D
dim r as RectShape
dim s as StringShape
```

```
const pi=3.14
```

```
s=new StringShape
s.Text="Hello World!"
s.TextFont="Geneva"
s.TextSize=24
s.FillColor=rgb(0,0,255)
s.Italic=true
s.y=5
s.x=0
```

```
r=new RectShape
```

```
r.X=0
r.y=0
r.Height=100
r.Width=180
r.BorderColor=rgb(255,0,0)
r.FillColor=rgb(0,255,0)
r.BorderWidth=5
r.Border=50
```

```
v=new Group2d
v.Append r
v.Append s
v.Rotation=pi*-20.0/180.0
v.x=150
v.y=150
```

```
g.DrawObject v
```

17.0.11 Picture functions do not preserve resolution values?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the picture functions return pictures with no/default resolution values.

Example:

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

```
l.HorizontalResolution = 300
```

```
l.VerticalResolution = 300
```

```
dim r as Picture = l.Rotate90MBS
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

```
r.HorizontalResolution = l.HorizontalResolution
```

```
r.VerticalResolution = l.VerticalResolution
```

```
MsgBox str(r.HorizontalResolution)+" x "+str(r.VerticalResolution)
```

Notes: So please fix them yourself after calling a function.

Maybe in the future this changes, but currently you can't really set this easily from plugin code.

17.0.12 A toolbox call needs a rect - how do I give it one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Fill a memoryblock like this:

Example:

```
Dim MB As Memoryblock
```

```
MB = NewMemoryBlock(8)
```

```
MB.Short(0) = window1.Top
```

```
MB.Short(2) = window1.Left
```

```
MB.Short(4) = window1.Height+window1.Top // bottom
```

```
MB.Short(6) = window1.Width+window1.Left // right
```

17.0.13 API client not supported?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you get this exception message on `SQLConnectionMBS.Connect`, we may have a problem.

Notes: First case is that the given thing is not supported (e.g. MS SQL directly on Mac).

Second case is that the plugin compilation went wrong and the support for the database was not linked into the plugin. Like MySQL missing or MS SQL on Windows missing. In that case please contact us to fix the plugin.

17.0.14 Can I access Access Database with Java classes?

Plugin Version: all, Platform: Windows.

Answer: You can use `ucanaccess` to access databases created with Microsoft

Example:

```

dim options(-1) as string

// load all the jar files we have in a folder called java:

dim appFolder as FolderItem = GetFolderItem("")

Dim count as Integer = appFolder.Parent.Child("java").Count
dim libjs() as string
For i as Integer = 1 to count
Dim f As FolderItem = appFolder.Parent.Child("java").item(i)
If f <> Nil and f.Exists Then
libjs.append f.NativePath+";"
End If
Next

// now init virtual machine
dim library as string = Join(libjs, "")
dim vm as new JavaVMMBS(library)

if vm.Handle = 0 then
MsgBox "Failed to initialize virtual machine"
else
// now make a new database connection with ucanaccess
dim d as new JavaDatabaseMBS(vm,"net.ucanaccess.jdbc.UcanaccessDriver")
Dim DbFile as FolderItem = appFolder.Parent.Child("Database11.accdb")
dim j as JavaConnectionMBS = d.getConnection("jdbc:ucanaccess://" + DbFile.NativePath)

// select and show values
dim r as JavaResultSetMBS = j.MySelectSQL("Select * From test")
while r.NextRecord
MsgBox r.getString("FirstName") + " " + r.getString("LastName")
wend

end if

```

Exception e as JavaExceptionMBS
MsgBox e.message+" **errorcode:** "+str(e.ErrorNumber)

Notes: see website:
<http://ucanaccess.sourceforge.net/site.html>

17.0.15 Can I create PDF from Xojo Report using DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, we have a graphics class integration for DynaPDF.

Notes: Since MBS Plugin in version 19.2, we can integrate reports with Xojo.

17.0.16 Can I use AppleScripts in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Example:

```
dim a as new AppleScriptMBS

// query my application name
a.Compile "tell application ""System Events"" to return name of current application"

// run
a.Execute

// show result
label1.text = a.Result

// shows something like "My Application.fcgi.debug"
```

Notes: This can be useful to control the server from remote, if and only if the your sever is running Mac OS X.

17.0.17 Can I use graphics class with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sorry, no. We can't provide a graphics subclass from plugin.

Notes: This is a feature request to allow graphics subclasses:

Feedback case 11391: [feedback://showreport?report_id=11391](https://feedback.apple.com/feedback/showreport?report_id=11391)

17.0.18 Can I use sockets on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, but they run on the server, not on the client.

Notes: You can use `HTTPSocket`, `SMTPSocket`, `POP3Socket`, `SMTPSecureSocket`, `SecurePOP3Socket`, `EasyTCPSocket`, `EasyUDPSocket`, `AutoDiscovery`, our Bonjour classes or our `CURL*` classes. But all of them work on the server, not on the client.

This means if you search for a printer with Bonjour, you can find the printers in the local network on your server hosting site. Using `SMTPSocket` may be a good idea for sending emails from the server like notifications.

17.0.19 Can I use your ChartDirector plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our ChartDirector plugin works just fine on the Xojo Web Edition.

Example:

```
// The data for the pie chart
dim data(-1) as Double=array(55.0, 18.0, 25.0, 22.0, 18.0, 30.0, 35.0)

// The labels for the pie chart, Words are chosen 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 &hbbsbbb
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. Transferring those pictures takes time, so you can optimize that with using WebPicture class. There you can decide between different compressions to improve speed (use JPEG instead of PNG).

e.g. if you use ubuntu, you can install the ttf-mscorefonts-installer package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

17.0.20 Can I use your DynaPDF plugin on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, our DynaPDF plugin works just fine on the Xojo Web Edition.

Notes: PDF files are created on the server. You may want to offer a preview to the user which uses reduced resolution images to reduce the time to download the PDF.

See our Create PDF example for the Xojo Web Edition.

17.0.21 Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: No.

17.0.22 Can you get an unique machine ID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There is nothing like an unique machine ID.

Notes: 1:

You can use the MAC IDs of the network interfaces.

This can be changed by the user with software tools.

And the list of network interfaces changes if user reorder the interfaces.

2:

You can use the system folder creation date/time.

This may stay equal after cloning machines or after migration to new PC.

3:

You can use the Mac Serialnumber.

Mac only and it can happen that a Mac does not have a serial number.

4:

You can use the x86 CPU ID.

This is x86 CPU only and does not avoid running on the same CPU in different PCs.

17.0.23 ChartDirector: Alignment Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Alignment Specification

Notes: In many ChartDirector objects, you may specify the alignment of the object's content relative to its boundary. For example, for a TextBox object, you may specify the text's alignment relative to the box boundary by using TextBox.setAlignment.

The ChartDirector API defines several constants for the alignment options.

ConstantValueDescription

BottomLeft	1	The leftmost point on the bottom line.
BottomCenter	2	The center point on the bottom line.
BottomRight	3	The rightmost point on the bottom line.
Left	4	The leftmost point on the middle horizontal line.
Center	5	The center point on the middle horizontal line.
Right	6	The rightmost point on the middle horizontal line.
TopLeft	7	The leftmost point on the top line.
TopCenter	8	The center point on the top line.
TopRight	9	The rightmost point on the top line.
Bottom	2	The center point on the bottom line. Same as BottomCenter.
Top	8	The center point on the top line. Same as TopCenter.
TopLeft2	10	An alternative top-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopLeft2 refers to refers to the left of the top side, while TopLeft refers to the top of the left side. The reverse applies for a horizontal axis.
TopRight2	11	An alternative top-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, TopRight2 refers to refers to the right of the top side, while TopRight refers to the top of the right side. The reverse applies for a horizontal axis.
BottomLeft2	12	An alternative bottom-left position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomLeft2 refers to refers to the left of the bottom side, while BottomLeft refers to the bottom of the left side. The reverse applies for a horizontal axis.
BottomRight2	13	An alternative bottom-right position used in Axis.setTitlePos for axis title positioning only. For a vertical axis, BottomRight2 refers to refers to the right of the bottom side, while BottomRight refers to the bottom of the right side. The reverse applies for a horizontal axis.

17.0.24 ChartDirector: Color Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Color Specification

Notes: Many functions in the ChartDirector API accept colors as parameters. ChartDirector supports col-

ors specified in web and HTML compatible ARGB format, in which ARGB refers to the Alpha transparency, Red, Green and Blue components of the color.

In addition to ARGB colors, ChartDirector supports "dynamic" colors. A dynamic color is a color that changes depending on the position of the pixels. The "dynamic" colors that ChartDirector supports include "pattern colors", "metal colors", "gradient colors", "zone colors" and "dash line colors".

ChartDirector supports specifying colors indirectly using "palette colors". When a "palette color" is used, the color is specified as an index to a palette. The actual color is looked up from the palette. ARGB Color ARGB color consists of 4 components - alpha transparency, red, green and blue. The four components are encoded as a 32-bit number, with each component occupying 8 bits. In hexadecimal notation, it is AAR-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 at all. This is equivalent to traditional RGB colors. A non-zero alpha transparency means 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.

A metal color is a color of which the brightness varies smoothly across the chart surface as to make the surface look 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.

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.

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

Palette	FFFF0000	The starting point of the palette. The first palette color is (Palette + 0). The nth palette color is (Palette + n - 1).
BackgroundColor	FFFF0000	The background color.
LineColor	FFFF0001	The default line color.
TextColor	FFFF0002	The default text color.
[Reserved]	FFFF0003 - FFFF0006	These palette positions are reserved. Future versions of ChartDirector may use these palette positions for colors that have special significance.
SameAsMainColor	FFFF0007	A dynamic color that is equal to the data color of the current data set. This color is useful for objects that are associated with data sets. For example, in a pie chart, if the sector label background color is SameAsMainColor, its color will be the same as the corresponding sector color.
DataColor	FFFF0008	The starting point for the automatic data color allocation.

When a chart is created, it has a default palette. You may modify the palette using BaseChart.setColor, BaseChart.setColors, or BaseChart.setColors2.

The advantages of using palette colors are that you can change the color schemes of the chart in one place. ChartDirector comes with several built-in palettes represented by the following predefined constants.

ConstantDescription

17.0.25 ChartDirector: Font Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

defaultPalette	An array of colors representing the default palette. This palette is designed for drawing charts on white backgrounds (or lightly colored backgrounds).
whiteOnBlackPalette	An array of colors useful for drawing charts on black backgrounds (or darkly colored backgrounds).
transparentPalette	An array of colors useful drawing charts on white backgrounds (or lightly colored backgrounds). The data colors in this palette are all semi-transparent.

Answer: ChartDirector: Font Specification

Notes: Font Name

In ChartDirector, the font name is simply the file name that contains the font. For example, under the Windows platform, the "Arial" font is "arial.ttf", while the "Arial Bold" font is "arialbd.ttf".

NOTE: Mac OS X Specific Information

In Mac OS X, in addition to ".ttf", ChartDirector also supports Mac OS X font file formats, such as Font Suitcase files and Datafork files (.dfont). These files often contain multiple fonts. For example, the "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 "FONTSPATH".

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.

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 in your charts in one place.

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.

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.

This is the color to draw the font. (See Color Specification on how colors are represented in ChartDirector.)

This is the angle in degrees by which the font should be rotated anti-clockwise.

By default, text are laid out horizontally, with characters being drawn from left to right.

ChartDirector also supports vertical layout, with characters being drawn from top to bottom. For example, you may use `BaseChart.addText` to add text that are laid out vertically. Vertical layout is common for

oriental languages such as Chinese, Japanese and Korean.

17.0.26 ChartDirector: Mark Up Language

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Mark Up Language

Notes: ChartDirector Mark Up Language (CDML) is a language for including formatting information in text strings by marking up the text with tags.

CDML allows a single text string to be rendered using multiple fonts, with different colors, and even embed images in the text. **Font Styles**

You can change the style of the text by using CDML tags. For example, the line:

```
<*font=timesi.ttf,size=16,color=FF0000>Hello <*font=arial.ttf,size=12,color=8000*>world!
```

will result in the following text rendered:

In general, all tags in CDML are enclosed by <*> and *>. Attributes within the tags determine the styles of the text following the tags within the same block.

If you want to include <*> in text without being interpreted as CDML tags, use «* as the escape sequence.

The following table describes the supported font style attributes in CDML. See **Font Specification** for details on various font attributes.

AttributeDescription

Set the following text to be in superscript style. This attribute does not need to have a value. (You may use "super" as the attribute instead of "super=1".)

Note that unlike HTML tags, no double or single quotes are used in the tags. It is because CDML tags are often embedded as string literals in source code. The double or single quotes, if used, will conflict with the string literal quotes in the source code. Therefore in CDML, no quotes are necessary and they must not be used.

Also, unlike HTML tags, CDML uses the comma character as the delimiter between attributes. It is because certain attributes may contain embed spaces (such as the font file name). So space is not used as the delimiter and the comma character is used instead.

Note the font attribute above starts a new style section, while other attributes just modify the current style

font	Starts a new style section, and sets the font name. You may use this attribute without a value (that is, use "font" instead of "font=arial.ttf") to create a new style section without modifying the font name.
size	The font size.
width	The font width. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
height	The font height. This attribute is used to set the font width and height to different values. If the width and height are the same, use the size attribute.
color	The text color in hex format.
bgColor	The background color of the text in hex format.
underline	The line width of the line used to underline the following characters. Set to 0 to disable underline.
sub	Set the following text to be in subscript style. This attribute does not need to have a value. (You may use "sub" as the attribute instead of "sub=1".)
super	Set the following text to be in superscript style.
xoffset	Draw the following the text by shifting the text horizontally from the original position by the specified offset in pixels.
yoffset	Draw the following the text by shifting the text vertically from the original position by the specified offset in pixels.
advance	Move the cursor forward (to the right) by the number of pixels as specified by the value this attribute.
advanceTo	Move the cursor forward (to the right) to the position as specified by the value this attribute. The position is specified as the number of pixels to the right of the left border of the block. If the cursor has already passed through the specified position, the cursor is not moved.

section. You may use `</font*>` to terminate a style section, which will restore the font styles to the state before the style section.

Blocks and Lines

In CDML, a text string may contain multiple blocks. A block may contain multiple lines of text by separating them with new line characters ("`\n`") or with `<br*>`. The latter is useful for programming languages that cannot represent new line characters easily.

For example, the line:

```
<*size=15*><*block*><*color=FF*>BLOCK<*br*>ONE<*/*>and <*block*><*color=FF00*>BLOCK<*br*>TWO
```

will result in the following text rendered:

The above example contains a line of text. The line contains two blocks with the characters " and " in between. Each block in turn contains two lines. The blocks are defined using `<*block*>` as the start tag and

`<*/*>` as the end tag.

When a block ends, font styles will be restored to the state before entering the block. Embedding Images
CDML supports embedding images in text using the following syntax:

```
<*img=my_image_file.png*>
where my_image_file.png is the path name of the image file.
```

For example, the line:

```
<*size=20*>A <*img=sun.png*>day
will result in the following text rendered:
```

ChartDirector will automatically detect the image file format using the file extension, which must either png, jpg, jpeg, gif, wbmp or wmp (case insensitive).

Please refer to `BaseChart.setSearchPath` or `DrawArea.setSearchPath` on the directory that ChartDirector will search for the file.

The `<*img*>` tag may optionally contain width and height attributes to specify its pixel width and height. In this case, ChartDirector will stretch or compress the image if necessary to the required width and height. Blocks Attributes

CDML supports nesting blocks, that is, a block can contain other sub-blocks. Attributes are supported in the `<*block*>` tag to control the alignment and orientation of the sub-blocks. The `<*img=my_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:

Attribute	Description
-----------	-------------

The value `baseline` means the baseline of sub-blocks should align with the baseline of the block. The `baseline`

width	The width of the block in pixels. By default, the width is automatically determined to be the width necessary for the contents of the block. If the width attribute is specified, it will be used as the width of the block. If the width is insufficient for the contents, the contents will be wrapped into multiple lines.
height	The height of the block in pixels. By default, the height is automatically determined to be the height necessary for the contents of the block. If the height attribute is specified, it will be used as the height of the block.
maxwidth	The maximum width of the block in pixels. If the content is wider than maximum width, it will be wrapped into multiple lines.
truncate	The maximum number of lines of the block. If the content requires more than the maximum number of lines, it will be truncated. In particular, if truncate is 1, the content will be truncated if it exceeds the maximum width (as specified by maxwidth or width) without wrapping. The last few characters at the truncation point will be replaced with "...".
linespacing	The spacing between lines as a ratio to the default line spacing. For example, a line spacing of 2 means the line spacing is two times the default line spacing. The default line spacing is the line spacing as specified in the font used.
bgColor	The background color of the block in hex format.
valign	The vertical alignment of sub-blocks. This is for blocks that contain sub-blocks. Supported values are baseline, top, bottom, middle and absmiddle.

is the underline position of text. This is normal method of aligning text, and is the default in CDML. For images or blocks that are rotated, the baseline is the same as the bottom.

The value top means the top line of sub-blocks should align with the top line of the block.

The value bottom means the bottom line of sub-blocks should align with the bottom line of the block.

The value middle means the middle line of sub-blocks should align with the the middle line of the block. The middle line is the middle position between the top line and the baseline.

The value absmiddle means the absolute middle line of sub-blocks should align with the absolute middle line of the block. The absolute middle line is the middle position between the top line and the bottom line.

halign The horizontal alignment of lines. This is for blocks that contain multiple lines. Supported values are left, center and right.

The value left means the left border of each line should align with the left border of the block. This is the default.

The value center means the horizontal center of each line should align with the horizontal center of the block.

The value right means the right border of each line should align with the right border of the block.

angle Rotate the content of the block by an angle. The angle is specified in degrees in counter-clockwise direction.

17.0.27 ChartDirector: Parameter Substitution and Formatting

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Parameter Substitution and Formatting

Notes: ChartDirector charts often contain a lot of text strings. For example, sector labels in pie charts, axis labels for x and y axes, data labels for the data points, HTML image maps, etc, are all text strings.

ChartDirector uses parameter substitution to allow you to configure precisely the information contained in the text and their format.

Format Strings

In parameter substitution, format strings are used to specify the entities to be include into labels and how to format numbers and dates.

For example, when drawing a pie chart with side label layout, the default sector label format string is:

```
" { label } ( { percent } %)"
```

When the sector label is actually drawn, ChartDirector will replace " { label } " with the sector name, and " { percent } " with the sector percentage. So the above label format will result is a sector label similar to "ABC (34.56%)".

You may change the sector label format by changing the format string. For example, you may change it to:

```
" { label } : US$ { value | 2 } K ( { percent } %)"
```

The sector label will then become something like "ABC: US\$ 123.00 (34.56%)".

In general, in ChartDirector parameter substitution, parameters enclosed by curly brackets will be substituted with their actual values when creating the texts.

For parameters that are numbers or dates/times, ChartDirector supports a special syntax in parameter substitution to allow formatting for these values. Please refer to the Number Formatting and Date/Time Formatting sections below for details.

Parameter Expressions

ChartDirector supports numeric expressions in format strings. They are denoted by enclosing the expression with curly brackets and using "=" as the first character. For example:

```
"USD { value } (Euro { = { value } *0.9 } )"
```

In the above, " { value } " will be substituted with the actual value of the sector. The expression " { = { value } *0.9 } " will be substituted with the actual value of the sector multiplied by 0.9.

ChartDirector parameter expressions support operators "+", "-", "*", "/", "%" (modulo) and "^" (exponentiation). Operators "*", "/", "%", "^" is computed first, followed by "+" and "-". Operators of the same precedence are computed from left to right). Parenthesis "(" and ")" can be used to change the computation order.

Parameters for Pie Charts

The following table describes the parameters available for pie charts.

Parameter	Description
sector	The sector number. The first sector is 0, while the nth sector is (n-1).
dataSet	Same as { sector } . See above.
label	The text label of the sector.
dataSetName	Same as { label } . See above.
value	The data value of the sector.
percent	The percentage value of the sector.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using BaseChart.addExtraField or BaseChart.addExtraField2.

Parameters for All XY Chart Layers

The followings are parameters that are apply to all XY Chart layers in general. Some layer types may have additional parameters (see below).

Note that certain parameters are inapplicable in some context. For example, when specifying the aggregate label of a stacked bar chart, the { dataSetName } parameter is inapplicable. It is because a stacked bar is composed of multiple data sets. It does not belong to any particular data set and hence does not have a data set name.

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for Line Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Trend Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Box-Whisker Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for HLOC and CandleStick Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Additional Parameters for Vector Layers

The followings are parameters that are in additional to the parameters for all XY Chart layers.

Parameters for All Polar Layers

The followings are parameters that are apply to all Polar Chart layers in general. Some layer types may have additional parameters (see below).

{ fieldN } means the extra field is indexed by the data point number. The Pth data point corresponds to the Pth element of the extra field.

Additional Parameters for PolarVector Layers

The followings are parameters that are in additional to the parameters for all Polar Chart layers.

Parameters for Axis

The following table describes the parameters available for pie charts.

Number Formatting

For parameters that are numbers, ChartDirector supports a number of formatting options in parameter substitution.

For example, if you want a numeric field { value } to have a precision of two digits to the right of the decimal point, use ',' (comma) as the thousand separator, and use '.' (dot) as the decimal point, and you may use { value | 2, . } . The number 123456.789 will then be displayed as 123,456.79.

For numbers, the formatting options are specified using the following syntax:

```
{ [ param ] | [ a ] [ b ] [ c ] [ d ] }
```

where:

If this field starts with "E" or "e", followed by a number, it means formatting the value using scientific notation with the specified number of decimal places. If the "E" or "e" is not followed by a number, 3 is assumed.

For example, { value | E4 } will format the value 10.3 to 1.0300E+1, and { value | e4 } will format the same value to 1.0300e+1.

If this field starts with "G" or "g", followed by a number, it means formatting the value using the scientific notation only if the value is large and requires more than the specified number of digits, or the value is less than 0.001. If scientific notation is used, the number following "G" or "g" also specifies the number of significant digits to use. If the "G" or "g" is not followed by a number, 4 is assumed.

For example, consider the format string { value | G4 } . The value 10 will be formatted to 10. The value 100000 will be formatted to 1.000E+5. Similarly, for { value | g4 } , the value 10 will be formatted to 10, while the value 100000 will be formatted to 1.000e+5.

If you skip this argument, ChartDirector will display the exact value using at most 6 decimal places.

You may skip [b] [c] [d] . In this case, the default will be used.

Date/Time Formatting

For parameters that are dates/times, the formatting options can be specified using the following syntax:

```
{ [ param ] | [ datetime_format_string ] }
```

where [datetime_format_string] must start with an english character (A-Z or a-z) that is not "G", "g", "E" or "e", and may contain any characters except ' } ' . (If it starts with "G", "g", "E" or "e", it will be considered as a number format string.)

Certain characters are substituted according to the following table. Characters that are not substituted will be copied to the output.

For example, a parameter substitution format of { value | mm-dd-yyyy } will display a date as something similar to 09-15-2002. A format of { value | dd/mm/yy hh:nn:ss a } will display a date as something similar to 15/09/02 03:04:05 pm.

If you want to include characters in the format string without substitution, you may enclose the characters in single or double quotes.

For example, the format { value | mmm '<*color=dd0000*>'yyyy } will display a date as something like Jan <*color=dd0000*>2005 (the <*color=dd0000*> is a CDML tag to specify red text color). Note that the <*color=dd0000*> tag is copied directly without substitution, even it contains "dd" which normally will be substituted with the day of month.

Escaping URL/HTML/CDML characters

Parameter substitution is often used to create HTML image maps. In HTML, some characters has special meanings and cannot be used reliably. For example, the '>' is used to represent the end of an HTML tag.

Furthermore, if the field happens to be used as an URL, characters such as '?', '&' and '+' also have special meanings.

By default, ChartDirector will escape template fields used in URL and query parameters when generating image maps. It will modify URL special characters to the URL escape format "%XX" (eg. "?" will become "%3F"). After that, it will modify HTML special characters to the HTML escape format "&#nn;" (eg. ">" will become ">"). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - " { escape_url } ", " { noescape_url } ", " { escape_html } ", " { noescape_html } ", " { escape_cdml } " and " { noescape_cdml } ". These fields enable/disable the escape methods used in the template fields that follow them.

17.0.28 ChartDirector: Shape Specification

Plugin Version: 8.2, Platforms: macOS, Linux, Windows.

Answer: ChartDirector: Shape Specification

Notes: Several ChartDirector API accept shape specification as arguments. For example, BarLayer.setBarShape and BarLayer.setBarShape2 can be used to specify shapes of bars in bar charts, while DataSet.setDataSymbol, DataSet.setDataSymbol4, PolarLayer.setDataSymbol and PolarLayer.setDataSymbol4 can be used to specify shapes for data symbols.

Note that in addition to shapes, in many cases ChartDirector also accepts images or custom draw objects for data representation. For example, see DataSet.setDataSymbol2, DataSet.setDataSymbol3, PolarLayer.setDataSymbol2 and PolarLayer.setDataSymbol3.

Built-In Shapes

Built-in shapes are specified as integers. The integers can be explicit constants, or can be generated by a `ChartDirector` method for parameterized shapes. For example, a circle is represented by an explicit constant `CircleShape (=7)`. On the other hand, the number representing a polygon depends on the number of sides the polygon has, so it is generated by using the `PolygonShape` method, passing in the number of sides as argument.

The following table illustrates the various `ChartDirector` shapes:

Custom Shapes

In `ChartDirector`, custom shapes are specified as an array of integers `x0, y0, x1, y1, x2, y2 ...` representing the coordinates of the vertices of the custom polygonal shape.

The polygon should be defined with a bounding square of 1000 x 1000 units, in which the x-axis is from -500 to 500 going from left to right, and the y-axis is from 0 to 1000 going from bottom to top.

`ChartDirector` will automatically scale the polygon so that 1000 units will become to the pixel size as requested by the various `ChartDirector` API.

As an example, the shape of the standard diamond shape in `ChartDirector` is represented as an array with 8 numbers:

```
0, 0, 500, 500, 0, 1000, -500, 500
```

17.0.29 Copy styled text?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to quickly copy styled text from one textarea to another?

Example:

```
#if TargetWin32 then
TextArea1.WinRTFDataMBS = TextArea2.WinRTFDataMBS
#elseif TargetMacOS then
TextArea1.NSTextViewMBS.textStorage.setAttributedString TextArea2.NSTextViewMBS.textStorage
#else
TextArea1.StyledText = TextArea2.StyledText
#endif
```

Notes: The code above uses special plugin functions on Mac and Windows and falls back to framework for Linux.

17.0.30 Do you have code to validate a credit card number?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can check the checksum to tell if a credit card number is not valid.

Example:

```

Dim strNumber As String
Dim nLength as Integer
Dim nValue as Integer
Dim nChecksum as Integer
Dim nIndex as Integer

strNumber = EditField1.Text
nLength = Len(strNumber)
nChecksum = 0

For nIndex = 0 To nLength - 2
nValue = Val(Mid(strNumber, nLength - (nIndex + 1), 1)) * (2 - (nIndex Mod 2))
If nValue <10 Then
nChecksum = nChecksum + nValue
Else
nChecksum = nChecksum + (nValue - 9)
End If
Next

If Val(Mid(strNumber, Len(strNumber), 1)) = (10 - (nChecksum Mod 10)) Mod 10 Then
MsgBox("The credit card number looks valid")
Else
MsgBox("The credit card number is invalid")
End IF

```

Notes: Here's some code that will validate the checksum for a credit card. It works for Visa, MasterCard, American Express and Discover. Not sure about others, but I imagine they use the same basic algorithm. Of course, this doesn't actually mean that the credit card is valid, it's only useful for helping the user catch typos.

The above code doesn't have any error checking and it expects that the credit card number will be entered without spaces, dashes or any other non-numeric characters. Addressing those issues will be an exercise left to the reader. :)

(From Mike Stefanik)

17.0.31 Do you have plugins for X-Rite EyeOne, eXact or i1Pro?

Plugin Version: all.

Answer: Our EyeOne plugin is available on request for licensees of the X-Rite SDKs.

Notes: Please first go to X-Rite and get a SDK license.

Then we can talk about the plugin.

17.0.32 Does SQL Plugin handle stored procedures with multiple result sets?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Yes, the plugin can work with multiple recordsets.

Notes: You need to use SQLCommandMBS class. When you get back results, you use FetchNext to walk over all records in the first result set. Then you simply start again with FetchNext to get the second record set.

Even the RecordSet functions should work, just use them twice to get all records from both record sets.

17.0.33 Does the plugin home home?

Plugin Version: all, Platform: macOS.

Answer: Yes, we like to know who is using the plugin, so the plugin may contact our server.

Example:

none.

Notes: Please note that this does not affect your users as the plugin will only do this in the IDE and the relevant plugin part is never included in your applications.

The plugin if used for some hours, does contact our server to provide statistical data about Xojo version and OS versions. This way we know what versions are used. We can return the version number of the current plugin which may be visible in future versions somehow. And we transmit partial licenses data so we can track use of illegal license keys.

If you do not like to have this, you can block Xojo IDE from contacting our website via your Firewall.

Blocking the transfer will not disable the plugin or change the features.

Or contact us for a plugin version which explicitly does not contain this feature.

17.0.34 folderitem.absolutePath is limited to 255 chars. How can I get longer ones?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Paths on a Mac are not unique, so use them only to display them to the user.

Example:

```
Function AbsolutePath(f as FolderItem) As String
Dim s as string
Dim nf as FolderItem
nf = f
s = ""
while nf<>nil
s = nf.name + "." + s
nf = nf.parent
wend
Return s
End Function
```

17.0.35 Has anyone played round with using CoreImage to do things like add dissolve transitions say when changing from one tab to another within a window?

Platform: macOS.

Answer: This code implements animations for a tabpanel change:

Example:

// in a tabpanel.change event:

```
dim r as CGSTransitionRequestMBS
dim co as new CGSConnectionMBS
dim cw as CGSWindowMBS
dim ct as CGSTransitionMBS
static OldTab as Integer

cw=co.CGSWindow(window1)
If cw = Nil Then
return // 10.3...
End If
r=new CGSTransitionRequestMBS
r.TransitionType=r.CGSFlip
r.HasBackGround=false
r.HasBackColor=false
r.Win=cw
```

```

// watch the value of the clicked tab versus the last tab
if tabpanel1.Value=0 or tabpanel1.Value <OldTab then
r.TransitionOption=r.CGSLeft
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
else
r.TransitionOption=r.CGSRight
ct=co.NewTransition(r)
if ct<>Nil then
Refresh
ct.Invoke(1)
ct.Wait(1)
ct.Release
else
MsgBox "Error creating the transition."
end if
end if
// Keep track of the last tab clicked
OldTab = tabpanel1.Value

```

Notes: See CGS* classes for more details.

17.0.36 How about Plugin support for older OS X?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We support in general Mac OS X 10.5 and newer.

Notes: All the 64-bit plugins on Mac require OS X 10.7.

Intel 32-bit plugins on Mac require OS X 10.5 or newer.

Currently the ChartDirector 6, GraphicsMagick and GameKit plugins requires Mac OS X 10.6. Also for SQL Plugin the built in SQLite library requires 10.6.

17.0.37 How can I detect whether an Intel CPU is a 64bit CPU?

Plugin Version: all.

Answer: Look on the CPU family returned by sysctl:

Example:

Function is64bit() As Boolean

```
#if TargetLittleEndian
```

```
dim m as MemoryBlock = NewMemoryBlock(8)
```

```
dim family as Integer
```

```
dim s as string
```

```
m=SystemControlNameToMIBMBS("hw.cpufamily")
```

```
m=SystemControlMBS(m)
```

```
if m<>nil then
```

```
m.LittleEndian=True
```

```
family=m.Long(0)
```

```
const CPUFAMILY_INTEL_6_14 = &h73d67300 /* "Intel Core Solo" and "Intel Core Duo" (32-bit Pentium-M with SSE3) */
```

```
const CPUFAMILY_INTEL_6_15 = &h426f69ef /* "Intel Core 2 Duo" */
```

```
const CPUFAMILY_INTEL_6_23 = &h78ea4fbc /* Penryn */
```

```
const CPUFAMILY_INTEL_6_26 = &h6b5a4cd2 /* Nehalem */
```

```
Select case family
```

```
case CPUFAMILY_INTEL_6_14
```

```
Return false
```

```
case CPUFAMILY_INTEL_6_15
```

```
Return true
```

```
case CPUFAMILY_INTEL_6_23
```

```
Return true
```

```
case CPUFAMILY_INTEL_6_26
```

```
Return true
```

```
// newer CPUs may be missing here
```

```
end Select
```

```
end if
```

```
#endif
```

```
Return false
```

```
Exception
```

```
Return false
```

```
End Function
```

Notes: This code is written for Mac OS X where you only have a limited number of possible CPUs.

17.0.38 How can I disable the close box of a window on Windows?

Plugin Version: all, Platform: Windows.

Answer: The following code will remove the close item from the system menu of the window.

Example:

```
#if TargetWin32 then
Declare Function GetSystemMenu Lib "user32" (hwnd as Integer, bRevert as Integer) as Integer
Declare Function RemoveMenu Lib "user32" (hMenu as Integer, nPosition as Integer, wFlags as Integer) as Integer
Dim hSysMenu as Integer
hSysMenu = GetSystemMenu(me.WinHWND, 0)
RemoveMenu hSysMenu, &HF060, &H0
#endif
```

Notes: The window may not be updated directly.

17.0.39 How can I get all the environment variables from Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetWin32
declare function GetEnvironmentStrings Lib "kernel32" () as ptr
dim m as memoryBlock
dim n as Integer

m=GetEnvironmentStrings()

n=0
do
msgBox m.cstring(n)
while m.byte(n)<>0
n=n+1
wend
n=n+1
```

```
loop until m.byte(n)=0
#endif
```

Notes: The MBS Plugin has an EnvironmentMBS class for this.

17.0.40 How can i get similar behavior to Roxio Toast or iTunes where clicking a 'burn' button allows the next inserted blank CD-R to bypass the Finder and be accepted by my application?

Plugin Version: all, Platform: macOS.

Answer: You need to get a media reservation.

Example:

```
dim d as DRDeviceMBS // get a device
d.AcquireMediaReservation
```

Notes: Use the plugin function AcquireMediaReservation and later release it using ReleaseMediaReservation.

See plugin examples on how to use it and check Apples DiscRecording framework documentation for more details.

17.0.41 How can I get text from a PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Crossplatform you can use DynaPDF Pro.

Notes: On Mac OS X you can also use PDFKit for the same job.

While DynaPDF Pro gives you each bit of text with rotation, font information and encoding details, PDFKit gives you only the text string for a PDF page.

17.0.42 How can I get text from a Word Document?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: to get the text string from a doc file, use the NSAttributedStringMBS class.

Notes: The NSAttributedStringMBS class is Mac OS X only and we have currently no solution for Windows or Linux.

Use the `NSAttributedStringMBS.initWithDocFormat(data as string)` as boolean method.

17.0.43 How can I get the item string for a given file creator?

Plugin Version: all.

Answer: Try this function:

Example:

```
Sub pullNativeDocs(aCREA As string)
Dim result as Integer
Dim m, k as memoryBlock
Dim f as folderItem
Dim newType as string
Dim anIcon As picture
Dim ofs as Integer
```

```
Declare Function GetFileTypesThatAppCanNativelyOpen Lib "Carbon" (appVRefNumHint as Short, 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.

17.0.44 How can I launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "odoc" with the creator code to the Finder ("MACS"):

Example:

```
Function LaunchByCreator(C As String) As Boolean
Dim A As AppleEvent
A = NewAppleEvent("aevt","odoc","MACS")
A.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf",nil,C)
return A.Send
End Function
```

17.0.45 How can I learn what shared libraries are required by a plugin on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please use the ldd command in the terminal.

Notes: You build an app on any platform, but for Linux.

For the resulting .so files in the libs folder, you can run the ldd command with the library path as parameter. It shows you references lib files and you can make sure you have those installed.

This is a sample run of our graphicsmagick plugin:

```
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$ ldd libMBSGraphicsMagickPlugin17744.so
linux-gate.so.1 =>(0xb76ee000)
libdl.so.2 =>/lib/i386-linux-gnu/libdl.so.2 (0xb6f0e000)
libgtk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgtk-x11-2.0.so.0 (0xb6aa6000)
libpthread.so.0 =>/lib/i386-linux-gnu/libpthread.so.0 (0xb6a8a000)
libstdc++.so.6 =>/usr/lib/i386-linux-gnu/libstdc++.so.6 (0xb69a5000)
libm.so.6 =>/lib/i386-linux-gnu/libm.so.6 (0xb6979000)
libgcc_s.so.1 =>/lib/i386-linux-gnu/libgcc_s.so.1 (0xb695b000)
libc.so.6 =>/lib/i386-linux-gnu/libc.so.6 (0xb67b1000)
```

```

/lib/ld-linux.so.2 (0xb76ef000)
libgdk-x11-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk-x11-2.0.so.0 (0xb6701000)
libpangocairo-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangocairo-1.0.so.0 (0xb66f4000)
libX11.so.6 =>/usr/lib/i386-linux-gnu/libX11.so.6 (0xb65c0000)
libXfixes.so.3 =>/usr/lib/i386-linux-gnu/libXfixes.so.3 (0xb65ba000)
libatk-1.0.so.0 =>/usr/lib/i386-linux-gnu/libatk-1.0.so.0 (0xb659a000)
libcairo.so.2 =>/usr/lib/i386-linux-gnu/libcairo.so.2 (0xb64ce000)
libgdk_pixbuf-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgdk_pixbuf-2.0.so.0 (0xb64ad000)
libgio-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgio-2.0.so.0 (0xb6356000)
libpangoft2-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpangoft2-1.0.so.0 (0xb632a000)
libpango-1.0.so.0 =>/usr/lib/i386-linux-gnu/libpango-1.0.so.0 (0xb62e0000)
libfontconfig.so.1 =>/usr/lib/i386-linux-gnu/libfontconfig.so.1 (0xb62ab000)
libgobject-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgobject-2.0.so.0 (0xb625c000)
libglib-2.0.so.0 =>/lib/i386-linux-gnu/libglib-2.0.so.0 (0xb6163000)
libXext.so.6 =>/usr/lib/i386-linux-gnu/libXext.so.6 (0xb6151000)
libXrender.so.1 =>/usr/lib/i386-linux-gnu/libXrender.so.1 (0xb6147000)
libXinerama.so.1 =>/usr/lib/i386-linux-gnu/libXinerama.so.1 (0xb6142000)
libXi.so.6 =>/usr/lib/i386-linux-gnu/libXi.so.6 (0xb6132000)
libXrandr.so.2 =>/usr/lib/i386-linux-gnu/libXrandr.so.2 (0xb6129000)
libXcursor.so.1 =>/usr/lib/i386-linux-gnu/libXcursor.so.1 (0xb611e000)
libXcomposite.so.1 =>/usr/lib/i386-linux-gnu/libXcomposite.so.1 (0xb611a000)
libXdamage.so.1 =>/usr/lib/i386-linux-gnu/libXdamage.so.1 (0xb6115000)
libfreetype.so.6 =>/usr/lib/i386-linux-gnu/libfreetype.so.6 (0xb607b000)
libxcb.so.1 =>/usr/lib/i386-linux-gnu/libxcb.so.1 (0xb605a000)
libpixman-1.so.0 =>/usr/lib/i386-linux-gnu/libpixman-1.so.0 (0xb5fc2000)
libpng12.so.0 =>/lib/i386-linux-gnu/libpng12.so.0 (0xb5f98000)
libxcb-shm.so.0 =>/usr/lib/i386-linux-gnu/libxcb-shm.so.0 (0xb5f93000)
libxcb-render.so.0 =>/usr/lib/i386-linux-gnu/libxcb-render.so.0 (0xb5f89000)
libz.so.1 =>/lib/i386-linux-gnu/libz.so.1 (0xb5f73000)
libgmodule-2.0.so.0 =>/usr/lib/i386-linux-gnu/libgmodule-2.0.so.0 (0xb5f6e000)
libselinux.so.1 =>/lib/i386-linux-gnu/libselinux.so.1 (0xb5f4f000)
libresolv.so.2 =>/lib/i386-linux-gnu/libresolv.so.2 (0xb5f36000)
libexpat.so.1 =>/lib/i386-linux-gnu/libexpat.so.1 (0xb5f0c000)
libffi.so.6 =>/usr/lib/i386-linux-gnu/libffi.so.6 (0xb5f05000)
libpcre.so.3 =>/lib/i386-linux-gnu/libpcre.so.3 (0xb5ec9000)
librt.so.1 =>/lib/i386-linux-gnu/librt.so.1 (0xb5ec0000)
libXau.so.6 =>/usr/lib/i386-linux-gnu/libXau.so.6 (0xb5ebb000)
libXdmcp.so.6 =>/usr/lib/i386-linux-gnu/libXdmcp.so.6 (0xb5eb4000)
cs@Ubuntu32:
textasciitilde /MeinProgramm/MeinProgramm Libs$

```

As you see all library have been found and their load address is printed behind the na,e. If a library is missing, you usually see the address missing there or being zero.


```

while theRegexMatch <>nil
theStart = theRegexMatch.subExpressionStartB(0) + len(theRegexMatch.subExpressionString(0))

result = result + theRegexMatch.subExpressionString(1)
infoCharset = theRegexMatch.subExpressionString(2)
encodedPart = theRegexMatch.subExpressionString(4)
if theRegexMatch.subExpressionString(3) = "B" then
encodedPart = DecodeBase64(encodedPart)
elseif theRegexMatch.subExpressionString(3) = "Q" then
encodedPart = DecodeQuotedPrintable(encodedPart)
end if
if right(result, 1) = " " then
result = mid(result, 1, len(result)-1)
end if
encodedPart = encodedPart.DefineEncoding(GetInternetTextEncoding(infoCharset))
result = result + encodedPart

theRegex.SearchStartPosition = theStart
theRegexMatch = theRegex.search()
wend

result = result + mid(src, theStart+1)

else
result = src
end if
// theRegexMatch = theRegex.search

msgbox result

```

Notes: May not look nice depending on the controls used.
This is no longer needed when using MimeEmailMBS class which decodes for you.

17.0.48 How do I enable/disable a single tab in a tabpanel?

Plugin Version: all, Platform: macOS.

Answer: Use the TabpanelEnabledMBS method.

Example:

```
TabpanelEnabledMBS(tabpanel1, 1, false)
```

Notes: Use Carbon for MachO and CarbonLib for Mac Carbon and AppearanceLib for Mac OS Classic as

library.

For Cocoa, please use enabled property of NSTabViewItemMBS class.

17.0.49 How do I find the root volume for a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```
Function GetRootVolume(f as FolderItem) as FolderItem
dim root, dum as folderItem
if f <> nil then
root = f // f might be the volume
do
dum = root.parent
if dum <> nil then
root = dum
end if
loop until dum = nil
return root
end if
End Function
```

17.0.50 How do I get the current languages list?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
dim p as new CFPREFERENCESMBS
dim a as CFArrayMBS
dim s as CFStringMBS
dim o as CFOBJECTMBS
dim sa(-1) as string

o=p.CopyAppValue("AppleLanguages", ".GlobalPreferences")

if o<>Nil then
a=CFArrayMBS(o)

dim i,c as Integer
```

```
c=a.Count-1
for i=0 to c
o=a.Item(i)

if o isa CFStringMBS then
s=CFStringMBS(o)
sa.Append s.str
end if
next
end if

MsgBox Join(sa,EndOfLine)
```

Notes: On Mac OS X you can get the list of current languages like this list:

```
de
en
ja
fr
es
it
pt
pt-PT
nl
sv
nb
da
fi
ru
pl
zh-Hans
zh-Hant
ko
```

Which has German (de) on the top for a German user.
This code has been tested on Mac OS X 10.5 only.

17.0.51 How do I get the Mac OS Version?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

dim i as Integer
if system.gestalt("sysv", i) then
//do this in an 'If' in case you don't get any value back at all and system.gestalt returns boolean
if i = &h750 then //If OS is 7.5
//do stuff
elseif i = &h761 then //If OS is 7.6.1
//do stuff
end if
end if

```

Notes: The MBS Plugin has a function SystemInformationMBS.OSVersionString for this.

17.0.52 How do I get the printer name?

Plugin Version: all.

Answer: For Mac OS Classic see the code below and for Mac OS X use the Carbon Print Manager Classes from the MBS Plugin.

Example:

```

dim s as String
dim i as Integer

s=app.ResourceFork.GetResource("STR ",-8192)
if s<>"" then
i=ascb(leftb(s,1))
s=mid(s,2,i)

MsgBox s
end if

```

Notes: A note from Craig Hoyt:

After looking at your example I had a little deja-vu experience. Several years ago I played around with this same code if FutureBasic. I discovered that it did not and still doesn't provide the 'Printer Name', it does return the print driver name. If it returns 'LaserWriter 8' as the print driver you can look into this file and get the 'PAPA' resource #-8192 to get the actual Printer Name. Unfortunately this does not hold true for other printers. My Epson and HP Printers (the Epson has an Ethernet Card and the HP is USB) do not provide this info in their drivers. As far as I can tell it only returns the name by polling the printer itself.

17.0.53 How do I make a metal window if RB does not allow me this?

Plugin Version: all, Platform: macOS.

Answer: The following declare turns any window on Mac OS X 10.2 or newer into a metal one.

Example:

```
declare sub ChangeWindowAttributes lib "Carbon" (win as windowptr, a as Integer, b as Integer)
```

```
ChangeWindowAttributes window1,256,0
```

Notes: May not look nice depending on the controls used.

17.0.54 How do I make a smooth color transition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I'd like to show in a report some bars, which start with color A and end with color B.

The color change should be very smooth.

My problem: If I would start from 255,0,0 and end by 0,0,0, I would have 255 different colors. If the bars are longer than 255 pixels, would this look nice?

Example:

```
// Window.Paint:
Sub Paint(g As Graphics)
dim w,w1,x,p as Integer
dim c1,c2,c as color
dim p1,p2 as Double

c1=rgb(255,0,0) // start color
c2=rgb(0,255,0) // end color

w=g.Width
w1=w-1

for x=0 to w1
p1=x/w1
p2=1.0-p1
```

```

c=rgb(c1.red*p1+c2.red*p2, c1.green*p1+c2.green*p2, c1.blue*p1+c2.blue*p2)

g.ForeColor=c
g.DrawLine x,0,x,g.Height

next
End Sub

```

Notes:

Try the code above in a window paint event handler.

17.0.55 How do I read the applications in the dock app?

Plugin Version: all, Platform: macOS.

Answer: Use CFPREFERENCESMBS class like in this example:

Example:

```

// Reads file names from persistent dock applications and puts them into the list

dim pref as new CFPREFERENCESMBS

dim persistentapps as CFStringMBS = NewCFStringMBS("persistent-apps")
dim ApplicationID as CFStringMBS = NewCFStringMBS("com.apple.dock")
dim tiledata as CFStringMBS = NewCFStringMBS("tile-data")
dim filelabel as CFStringMBS = NewCFStringMBS("file-label")

// get the array of persistent applications from dock preferences
dim o as CObjectMBS = pref.CopyValue(persistentapps, ApplicationID, pref.kCFPreferencesCurrentUser,
pref.kCFPreferencesAnyHost)

if o isa CFArrayMBS then
dim a as CFArrayMBS = CFArrayMBS(o)

// walk over all items in array
dim c as Integer = a.Count-1
for i as Integer = 0 to c

// get dictionary describing item
o = a.Item(i)

if o isa CFDictionaryMBS then
dim d as CFDictionaryMBS = CFDictionaryMBS(o)

```

```

// and pick tile data dictionary
o = d.Value(tiledata)
if o isa CFDictionaryMBS then
d = CFDictionaryMBS(o)

// and pick there the file label
o = d.Value(filelabel)
if o isa CFStringMBS then
// and display it
dim name as string = CFStringMBS(o).str
List.AddRow name
end if
end if
end if

next

else
MsgBox "Failed to read dock preferences."
end if

```

Notes: You can use the `CFPreferencesMBS.SetValue` to change a value and `CFPreferencesMBS.Synchronize` to write the values to disc. You may need to restart the `Dock.app` if you modified things.

17.0.56 How do I truncate a file?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In a `binarystream` you can set the `length` property to truncate.

17.0.57 How do update a Finder's windows after changing some files?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

dim f as folderitem // some file
dim ae as appleevent
ae=newappleevent("fndr","fupd","MACS")
ae.folderitemparam("—")=f
if not ae.send then
//something went wrong

```

end if

Notes: The `folderitem.finderupdate` from the MBS Plugin does something like this.

17.0.58 How to access a USB device directly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: First, it depends on the device.

Notes: Some devices can be talked directly from user mode code, but some require a kernel driver.

For some devices you can use plugins to access them like:

- Audio and Video sources using the `QTGrabberClassMBS`
- Mass storage devices using the `folderitem` class.
- Serial devices using the `System.SerialPort` function.
- HID USB devices can be used with `MacHIDMBS`, `WinHIDMBS` or `LinuxHIDInterface` class.
- Any USB device may be used with `MacUSBMBS` or `WinUSBMBS` classes.

In general it is always the best to take the most high level access to have others do the work for the details.

17.0.59 How to add icon to file on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use `FolderItem.AddCustomIcon` or `NSWorkspaceMBS.setIcon` functions.

Notes: Please close any open stream for the file you want to add an icon.

17.0.60 How to ask the Mac for the Name of the Machine?

Plugin Version: all, Platform: macOS.

Answer: Using Apple Events you can use this code:

Example:

Function `Computername()` *As string*

```

dim theEvent as AppleEvent
dim err as boolean

theEvent = newAppleEvent("mchn","getd","MACS")

err = theEvent.send

return theevent.ReplyString

End Function

```

Notes: Code above is for Mac OS 9!

Also the MBS Plugin has a function for this which may be faster and work also on Macs without Filesharing (which handles this event).

17.0.61 How to automatically enable retina in my apps?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSHighResolutionCapable""
YES")

```

Notes: This will set the NSHighResolutionCapable flag to YES.

17.0.62 How to avoid leaks with Cocoa functions?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```

// in a Timer Action event:
Sub Action()
static LastPool as NSAutoreleasePoolMBS = nil
static CurrentPool as NSAutoreleasePoolMBS = nil

```

```

LastPool = CurrentPool
CurrentPool = new NSAutoreleasePoolMBS

```

End Sub

Notes: With Xojo 2009r4 the code above should not be needed as Xojo runtime does automatically handle the `NSAutoreleasePools` for you. For older Xojo versions you need to use code with a timer with the action event above to avoid memory leaks.

Please do not use Xojo 2009r4 and newer with plugins before version 9.5. You can get crashes there which typically show a line with a `objc_msgSend` call.

17.0.63 How to avoid trouble connecting to oracle database with SQL Plugin?

Plugin Version: all, Platform: macOS.

Answer: For oracle the most important thing is to point the plugin to the libraries from oracle.

Notes: In environment variables, the paths like `ORACLE_HOME` must be defined.

On Mac OS X you also need to define `DYLD_LIBRARY_PATH` to point to the dylib files from oracle.

For that you need to modify `/etc/launchd.conf` for Mac OS X 10.8 and newer.

In older versions those variables in `.MacOSX/environment.plist` file in user's home.

Another way for the case you bundle things inside your app is to use the `LSEnvironment` key in `info.plist`. In `info.plist` it looks like this:

```
<key>LSEnvironment</key>
<dict>
<key>test</key>
<string>Hello World</string>
</dict>
```

17.0.64 How to avoid `___NSAutoreleaseNoPool` console messages in threads?

Plugin Version: all, Platform: macOS.

Answer: You need to use your own `NSAutoreleasePool` on a thread like this:

Example:

```
sub MyThread.run
dim pool as new NSAutoreleasePoolMBS
// do work here

pool=nil
```

end sub

Notes: For more details read here:

http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutoreleasePool_Class/Reference/Reference.html

17.0.65 How to bring app to front?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use this code:

Example:

```
// First way:
```

```
app.FrontMostMBS = true
```

```
// second way:
```

```
dim p as new ProcessMBS
```

```
p.GetCurrentProcess
```

```
p.FrontProcess = true
```

```
// third way:
```

```
NSApplicationMBS.sharedApplication.activateIgnoringOtherApps(true)
```

```
// for Windows:
```

```
RemoteControlMBS.WinBringWindowToTop
```

Notes: This will bring a Mac app to the front layer.

17.0.66 How to bring my application to front?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code txt) to the frontmost application:

Example:

```
Dim A As AppleEvent
```

```
A = NewAppleEvent("misc", "actv", "")
```

```
If Not A.Send then
```

```
Beep
```

```
end if
```

Notes: (Code is Mac only)

17.0.67 How to catch Control-C on Mac or Linux in a console app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use SignalHandlerMBS class for this.

Example:

```
// watch for Control-C on Mac
call SignalHandlerMBS.SetFlagHandler(2)

dim ende as boolean = false
do
if SignalHandlerMBS.IsFlagSet(2) then
Print "Flag 2 set. Existing..."
ende = true
end if

DoEvents 1
loop until ende
```

Notes: The signal is caught, a flag is set and you can ask later in your normal application flow for the result.

17.0.68 How to change name of application menu?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use this code to change the application menu name on Mac OS X:

Example:

```
dim mb as new MenubarMBS
dim m as MenuMBS = mb.item(1) // 1 is in my tests the app menu
if m<>Nil then
m.MenuTitle = "Hello World"
end if
```

Notes: This code is for Carbon only.

17.0.69 How to change the name in the menubar of my app on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer:

You mean it screws up if the file name of the bundle itself is different than the name of the executable file in the MacOS folder within the bundle? If so, you should find something like this within your Info.plist file (or the 'plst' resource that the RB IDE builds for you):

```
<key>CFBundleExecutable</key>
<string>Executable file name here</string>
```

Just make sure that file name matches.

However, if your question involves how you can change the name of the app that appears in the menu and the dock, that's different. You can make this name different from the file name by changing the CFBundleName key:

```
<key>CFBundleName</key>
<string>Name for menu here</string>
```

Note that if you use my free AppBundler program, this second part is taken care of for you – just fill in a custom name in the right field. You can find AppBundler (from Thomas Reed) at <http://www.bitjuggler.com/products/appbundler/>.

17.0.70 How to check if a folder/directory has subfolders?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this to check all items in a folder:

Example:

```
Function HasSubFolder(folder as FolderItem) As Boolean
dim c as Integer = folder.Count
```

```
for i as Integer = 1 to c
dim item as FolderItem = folder.TrueItem(i)
```

```
if item<>Nil and item.Directory then
Return true
end if
```

next

End Function

Notes: We use trueitem() here to avoid resolving alias/link files. Also we check for nil as we may not have permission to see all items. And if one is a directory, we return without checking the rest.

17.0.71 How to check if Macbook runs on battery or AC power?

Plugin Version: all, Platform: macOS.

Answer: Please use our IOPowerSourcesMBS class like this:

Example:

```
Function PowerSourceState() as Integer
dim p as new IOPowerSourcesMBS

// check all power sources
dim u as Integer = p.Count-1
for i as Integer = 0 to u
dim d as CFDictionaryMBS = p.Item(i)
if d<>nil then
// check if they have a power source state key:
dim o as CFObjectMBS = d.Value(NewCFStringMBS("Power Source State"))
if o isa CFStringMBS then
dim s as string = CFStringMBS(o).str

'MsgBox s

if s = "AC Power" then
Return 1
elseif s = "Battery Power" then
Return 2
end if
end if
end if
next
Return 0 // unknown
End Function
```

Notes: If you want to check the CFDictionaryMBS content, simply use a line like "dim x as dictionary = d.dictionary" and check the contents in the debugger.

17.0.72 How to check if Microsoft Outlook is installed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you need Outlook for Scripting, you should simply check registry for the required Outlook.Application class:

Example:

```
Function OutlookInstalled() As Boolean
    #if TargetWin32 then

    try
    dim r as new RegistryItem("HKEY_CLASSES_ROOT\Outlook.Application\CLSID", false)

    Return true

    catch r as RegistryAccessErrorException
    // not installed
    Return false

    end try

    #else

    // Windows only, so false on other platforms
    Return false

    #endif

End Function
```

17.0.73 How to check on Mac OS which country or language is currently selected?

Plugin Version: all, Platform: macOS.

Answer: The code below returns a country value.

Example:

```
dim result as Integer

IF TargetMacOS THEN
```

```

CONST smScriptLang = 28
CONST smSystemScript = -1

DECLARE FUNCTION GetScriptManagerVariable LIB "Carbon" ( selector as Integer) as Integer
DECLARE FUNCTION GetScriptVariable LIB "Carbon" ( script as Integer, selector as Integer) as Integer

result=GetScriptVariable(smSystemScript, smScriptLang)

END IF

```

Notes: Returns values like:

For more values, check "Script.h" in the frameworks.

17.0.74 How to code sign my app with plugins?

Plugin Version: all, Platform: macOS.

Answer: When you try to code sign the application with plugin dylibs on Mac OS X, you may see error message that there is actually a signature included.

Notes: Please use the -f command line parameter with codesign utility to overwrite our MBS signature. We sign our plugins for MacOS, iOS and Windows to make sure they have not been modified.

In terminal, you do like this:

```

cd <Path to folder of app>

xattr -cr <Appname>.app
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.dylib
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app/Contents/Frameworks/*.framework
codesign -f -s "Developer ID Application: <Your Name>" <Appname>.app

```

Please use the name of your certificate (See keychain), the name of your app and the path to the app folder. If you have helper apps you need to sign them first.

You can use a build step to automatically sign your app on build.

17.0.75 How to collapse a window?

Plugin Version: all, Platform: macOS.

Answer: Use this function (Mac only):

Example:

```
Sub CollapseRBwindow(w as window, CollapseStatus as boolean)
dim state, err as Integer
dim wh as MemoryBlock
```

```
Declare Function CollapseWindow Lib "Carbon" (window as Integer, collapse as Integer) as Integer
```

```
IF CollapseStatus THEN
state = 1
ELSE
state = 0
END IF
```

```
err = CollapseWindow(w.MacWindowPtr, state)
```

```
End Sub
```

Notes: Also the MBS Plugin has a window.collapsedmbs property you can set. For Windows the MBS Plugin has a window.isiconicmbs property.

17.0.76 How to compare two pictures?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can try this code:

Example:

```
Function ComparePictures(p as picture,q as picture) as Integer
dim r,u as RGBSurface
dim x,y,n,m,h,w as Integer
dim w1,w2,h1,h2,d1,d2 as Integer
dim c1,c2 as color
```

```
h1=p.Height
h2=q.Height
w1=p.Width
w2=q.Width
d1=p.Depth
d2=q.Depth
```

```
if d1<>d2 then
Return 1
elseif w1<>w2 then
```

```

return 2
elseif h1<>h2 then
Return 3
else
r=p.RGBSurface
u=q.RGBSurface

if r=nil or u=nil then
Return -1
else
h=h1-1
w=w1-1
m=min(w,h)

for n=0 to m
c1=r.Pixel(n,n)
c2=u.Pixel(n,n)
if c1<>c2 then
Return 4
end if
next

for y=0 to h
for x=0 to w
c1=r.Pixel(x,y)
c2=u.Pixel(x,y)
if c1<>c2 then
Return 5
end if
next
next

// 0 for equal
// -1 for error (no RGBsurface)
// 1 for different depth
// 2 for different width
// 3 for different height
// 4 for different pixels (fast test)
// 5 for different pixels (slow test)
end if
end if

Exception
Return -1
End Function

```

Notes: Remember that this only works on bitmap pictures, so the `picture.BitmapMBS` function may be useful.

17.0.77 How to compile PHP library?

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: This instructions were written based on PHP 5.2.6 on Mac OS X:

- Best take a new Mac with current Xcode version installed.
- Download the source code archive. e.g. "php-5.2.6.tar.bz2"
- Expand that archive on your harddisc.
- Open terminal window
- change directory to the php directory. e.g. "cd /php-5.2.6"
- execute this two lines to define the supported CPU types and the minimum Mac OS X version:
- export CFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- export CXXFLAGS="-arch ppc -arch i386 -mmacosx-version-min=10.3"
- the command "./configure help" does show the configure options.
- use configure with a line like this:
- ./configure --enable-embed --with-curl --enable-ftp --enable-zip --enable-sockets --enable-static --enable-soap --with-zlib --with-bz2 --enable-exif --enable-bcmath --enable-calendar
- start the compilation with "make all"
- other option is to use "make install" which first does the same as "make all" and than does some installation scripts.
- you may get an error about a duplicate symbole __yytext. Search the file "zend_ini_scanner.c", search a line with "char *yytext;" and change it to "extern char *yytext;"
- On the end you get a lot of error messages, but you have a working library (named libphp5.so) file in the invisible ".libs" folder inside your php source folder.

Possible problems and solutions:

- If the path to your files has spaces, you can get into trouble. e.g. "/RB Plugins/PHP" is bad as files will be searched sometimes in "/RB".

- If you have in /usr/local/lib libraries which conflict with the default libraries, you can get into trouble.
- If you installed some open source tools which compiled their own libraries, you can get into conflicts.
- if you have to reconfigure or after a problem, you may need to use "make clean" before you start "make all" again.

Feel free to install additional libraries and add more packages to the configure line.

17.0.78 How to convert a BrowserType to a String with WebSession.Browser?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetBrowserName(s as WebSession.BrowserType) As string
Select case s
case WebSession.BrowserType.Android
Return "Andriod"
case WebSession.BrowserType.Blackberry
Return "Blackberry"
case WebSession.BrowserType.Chrome
Return "Chrome"
case WebSession.BrowserType.ChromeOS
Return "ChromeOS"
case WebSession.BrowserType.Firefox
Return "Firefox"
case WebSession.BrowserType.InternetExplorer
Return "InternetExplorer"
case WebSession.BrowserType.Opera
Return "Opera"
case WebSession.BrowserType.Safari
Return "Safari"
case WebSession.BrowserType.SafariMobile
Return "SafariMobile"
case WebSession.BrowserType.Unknown
Return "Unknown"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

17.0.79 How to convert a EngineType to a String with WebSession.Engine?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetRenderingEngineName(s as WebSession.EngineType) As string
Select case s
case WebSession.EngineType.Gecko
Return "Gecko"
case WebSession.EngineType.Presto
Return "Presto"
case WebSession.EngineType.Trident
Return "Trident"
case WebSession.EngineType.Unknown
Return "Unknown"
case WebSession.EngineType.WebKit
Return "WebKit"
else
Return "Unkown: "+str(integer(s))
end Select

End Function
```

17.0.80 How to convert a PlatformType to a String with WebSession.Platform?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this:

Example:

```
Function GetPlatformName(s as WebSession.PlatformType) As string
Select case s
case WebSession.PlatformType.Blackberry
Return "Blackberry"
case WebSession.PlatformType.iPad
Return "iPad"
case WebSession.PlatformType.iPhone
Return "iPhone"
case WebSession.PlatformType.iPodTouch
Return "iPodTouch"
case WebSession.PlatformType.Linux
Return "Linux"
case WebSession.PlatformType.Macintosh
Return "Macintosh"
```

```

case WebSession.PlatformType.PS3
Return "PS3"
case WebSession.PlatformType.Unknown
Return "Unknown"
case WebSession.PlatformType.WebOS
Return "WebOS"
case WebSession.PlatformType.Wii
Return "Wii"
case WebSession.PlatformType.Windows
Return "Windows"
else
Return "Unkown: "+str(integer(s))
end Select

```

End Function

17.0.81 How to convert a text to iso-8859-1 using the TextEncoder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

dim outstring as string
dim theMac, thePC as textencoding
dim Mac2PC as textconverter

theMac = getTextEncoding(0) // MacRoman
thePC = getTextEncoding(&h0201) // ISOLatin1

Mac2PC = getTextConverter(theMac, thePC)
// if you wanted to do the opposite just create a converter
// PC2Mac = getTextConverter(thePC, theMac)

outstring = Mac2PC.convert("Bj√rn, this text should be converted")
Mac2PC.clear

```

Notes:

You have to call Mac2PC.clear after every conversion to reset the encoding engine.
See also newer TextConverterMBS class.

17.0.82 How to convert ChartTime back to Xojo date?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have this example code:

Example:

```
Function ChartTimeToDate(ChartTime as Double) As date
static diff as Double = 0.0

if diff = 0.0 then
dim d2 as Double = CDBaseChartMBS.chartTime(2015, 1, 1)
dim da as new date(2015, 1, 1)
dim ts as Double = da.TotalSeconds

diff = ts - d2
end if

dim d as new date
d.TotalSeconds = diff + ChartTime

Return d
End Function
```

Notes: As you see we calculate the difference in base date from Date and ChartTime and later use difference to convert.

17.0.83 How to convert line endings in text files?

Plugin Version: all, Platform: macOS.

Answer: You can simply read file with TextInputStream and write with new line endings using TextOutputStream class.

Example:

```
dim inputfile as FolderItem = SpecialFolder.Desktop.Child("test.txt")
dim outputfile as FolderItem = SpecialFolder.Desktop.Child("output.txt")
dim it as TextInputStream = TextInputStream.Open(inputfile)
dim ot as TextOutputStream = TextOutputStream.Create(outputfile)

ot.Delimiter = EndOfLine.Windows // new line ending
while not it.EOF
ot.WriteLine it.ReadLine
wend
```

Notes: `TextInputStream` will read any input line endings and with `delimiter` property in `TextOutputStream` you can easily define your new delimiter.

17.0.84 How to convert picture to string and back?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use this plugin functions:

Notes: JPEG:

`JPEGStringToPictureMBS(buf as string)` as picture
`JPEGStringToPictureMBS(buf as string,allowdamaged as Boolean)` as picture
`PictureToJPEGStringMBS(pic as picture,quality as Integer)` as string

PNG:

`PictureToPNGStringMBS(pic as picture, gamma as single)` as string
`PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single)` as string
`PictureToPNGStringMBS(pic as picture, gamma as single, Interlace as Boolean, FilterType as Integer)` as string
`PictureToPNGStringMBS(pic as picture, mask as picture, gamma as single, Interlace as Boolean, FilterType as Integer)` as string
`PNGStringToPictureMBS(data as string, gamma as single)` as picture
`PNGStringToPNGPictureMBS(data as string, gamma as single)` as PNGpictureMBS

Tiff:

`TIFFStringToPictureMBS(data as string)` as picture
`TIFFStringToTiffPictureMBS(data as string)` as TiffPictureMBS

BMP:

`BMPStringtoPictureMBS(data as string)` as picture
`Picture.BMPDataMBS(ResolutionValueDPI as Integer=72)` as string

GIF:

`GifStringToGifMBS(data as string)` as GIFMBS
`GifStringToPictureMBS(data as string)` as Picture

17.0.85 How to copy an array?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy an array:

Example:

```
Function CopyArray(a() as Double) as Double()
dim r() as Double
for each v as Double in a
r.Append v
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of an array of objects, you need to change code to also make a copy of those objects.

17.0.86 How to copy an dictionary?

Plugin Version: all, Platform: macOS.

Answer: You can use a function like this to copy a dictionary:

Example:

```
Function CopyDictionary(d as Dictionary) As Dictionary
dim r as new Dictionary
for each key as Variant in d.keys
r.Value(key) = d.Value(key)
next
Return r
End Function
```

Notes: If needed make several copies of this method with different data types, not just double.
For a deep copy of an dictionary of objects, you need to change code to also make a copy of those objects.

17.0.87 How to copy parts of a movie to another one?

Plugin Version: all, Platforms: macOS, Windows.

Answer: The code below copies ten seconds of the snowman movie to the dummy movie starting at the 5th second.

Example:

```

dim f as FolderItem
dim md as EditableMovie
dim ms as EditableMovie

f=SpecialFolder.Desktop.Child("Our First Snowman.mov")
ms=f.OpenEditableMovie

ms.SelectionStartMBS=5
ms.SelectionLengthMBS=10

f=SpecialFolder.Desktop.Child("dummy.mov")
md=f.CreateMovie

msgbox str(md.AddMovieSelectionMBS(ms))

```

Notes: If result is not 0, the method fails.

17.0.88 How to create a birthday like calendar event?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

// start a connection to the calendar database
dim s as new CalCalendarStoreMBS

// needed for the error details
dim e as NSErrorMBS

dim r as CalRecurrenceRuleMBS = CalRecurrenceRuleMBS.initYearlyRecurrence(1, nil) // repeat every
year without end

dim a as new CalAlarmMBS // add alarm
a.action = a.CalAlarmActionDisplay
a.relativeTrigger = -3600*24 // 24 Hours before

// create a new calendar
dim c as new CalEventMBS

dim d as new date(2011, 04, 20) // the date

dim calendars() as CalCalendarMBS = s.calendars

```

```

// set properties
c.Title="Test Birthday"
c.startDate=d
c.recurrenceRule = r
c.calendar=calendars(0) // add to first calendar
c.addAlarm(a)
c.endDate = d
c.isAllDay = true

// save event
call s.saveEvent(c,s.CalSpanAllEvents, e)
if e<>nil then
MsgBox e.localizedDescription
else
MsgBox "New event was created."
end if

```

Notes: This adds an event to iCal for the given date with alarm to remember you and repeats it every year.

17.0.89 How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the UUIDMBS class for this.

17.0.90 How to create a Mac picture clip file?

Plugin Version: all, Platform: Windows.

Answer: You can use code like this one.

Example:

```

dim f As FolderItem
dim p As Picture

f=SpecialFolder.Desktop.Child("Test.pictClipping")
if f=nil then Return

p=new Picture(300,200,32) 'Make a sample picture
p.Graphics.ForeColor=RGB(0,255,255)
p.Graphics.FillOval 0,0,99,99

```

```
p.Graphics.ForeColor=RGB(255,0,0)
p.Graphics.DrawOval 0,0,99,99
```

```
dim r As ResourceFork 'ResourceFork is needed for a clip file
```

```
// Please define a file type Any
r=f.CreateResourceFork("Any")
```

```
// get PICT data using plugin function
dim pictdata as string = p.PicHandleDataMBS
r.AddResource(pictdata,"PICT",256,"Picture")
```

```
dim m as new MemoryBlock(8)
```

```
m.LittleEndian = false
m.Int16Value(0) = 0
m.Int16Value(2) = 0
m.Int16Value(4) = p.Width
m.Int16Value(6) = p.Height
```

```
r.AddResource(m,"RECT",256,"")
```

```
'Values taken from a sample file and irrelevant to the problem
```

```
dim data as string = DecodeBase64("AQAAAAAAAAAAAAAAAAACAFRDRVIAAABAAAAAAAAAAABUQ0IQAAAAA")
r.AddResource(data,"drag",128,"") 'ditto
r.Close
```

Notes: In general Apple has deprecated this, but a few application still support clippings.

17.0.91 How to create a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Check our DynaPDF plugin and the examples.

Notes: An alternative can be to use the CoreGraphics and Cocoa functions on Mac OS X. For Windows, we can only suggest our DynaPDF plugin.

17.0.92 How to create EmailAttachment for PDF Data in memory?

Plugin Version: all, Platform: macOS.

Answer: You can use code like the one below:

Example:

Function EmailAttachmentFromPDFData(PDFData as string, filename as string) As EmailAttachment
 dim a as new EmailAttachment

```
a.data = EncodeBase64(PDFData, 76)
a.ContentEncoding = "base64"
a.MIMEType = "application/pdf"
a.MacType = "PDF "
a.MacCreator = "prvw"
a.Name = filename
```

Return a

End Function

Notes: Compared to sample code from Xojo documentation, we set the mime type correct for PDF. The MacType/MacCreator codes are deprecated, but you can still include them for older Mac email clients. "prvw" is the creator code for Apple's preview app.

17.0.93 How to create PDF for image files?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use DynaPDF like this:

Example:

```
Function CreatePrintPDF(jpgFiles() as folderitem, pdfFile as FolderItem, PageWidth as Integer, PageHeight as Integer) As Boolean
  // have files?
  If pdfFile = Nil Then Return False
  If jpgFiles = Nil Then Return False

  If jpgFiles.Ubound < 0 Then Return False

  // new DynaPDF
  Dim pdf As New MyDynapdfMBS

  // page width/height in MilliMeter
  Dim pdfWidth as Integer = PageWidth * 72 / 25.4
  Dim pdfHeight as Integer = PageHeight * 72 / 25.4

  // put your license here
  Call pdf.SetLicenseKey "Starter"

  // create pdf
  Call pdf.CreateNewPDF pdfFile
```

```

// set a couple of options
Call pdf.SetPageCoords(MyDynaPDFMBS.kpcTopDown)
Call pdf.SetResolution(300)
Call pdf.SetUseTransparency(False)
Call pdf.SetSaveNewImageFormat(False)
Call pdf.SetGStateFlags(MyDynaPDFMBS.kgfUseImageColorSpace, False)
Call pdf.SetJPEGQuality(100)

// set page size
Call pdf.SetBBox(MyDynaPDFMBS.kpbMediaBox, 0, 0, pdfWidth, pdfHeight)
Call pdf.SetPageWidth(pdfWidth)
Call pdf.SetPageHeight(pdfHeight)

// append pages with one image per page
For i as Integer = 0 To jpgFiles.Ubound
Call pdf.Append
Call pdf.InsertImageEx(0, 0, pdfWidth, pdfHeight, jpgFiles(i), 1)
Call pdf.EndPage
Next

// close
Call pdf.CloseFile

Return True
End Function

```

Notes: This is to join image files in paper size to a new PDF.
e.g. scans in A4 into an A4 PDF.

17.0.94 How to CURL Options translate to Plugin Calls?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a few tips on how to translate command line CURL calls to plugin calls.

Notes: `curl -vX PUT http://localhost:5984/appserials/78569238475/DocumentRegister.docx?rev=3-25634563456 -data-binary @DocumentRegister.docx -H "Content-Type: application/msword"`

- The option `-v` means verbose. You can use `OptionVerbose` and listen for messages in the `DebugMessage` event.
- The option `-X PUT` means we want to do a HTTP PUT Request. So set `OptionPut` to true. Also you will want to set `OptionUpload` to true as you upload data.
- We have the URL which you put into `OptionURL` property.

- The `-data-binary` option tells CURL to pass the given data. With the `@` before the data, it is interpreted 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. Pass this additional header with the `SetOptionHTTPHeader` method.

```
curl -X PUT http://127.0.0.1:5984/appserials/f2f4e540bf8bb60f61cfd4328001c59 -d '{ "type": "Product", "description": "Application Serial", "acronym": "AppSerial", "dateAdded": "2011-03-21 14:57:36" } '
```

- Option `-X PUT` like above.
- Pass the URL again in `OptionURL`
- This time data is passed in command line for CURL. You'd put this data in the quotes into a string and make it available in the Read event. (See CURLS ftp upload example project)

17.0.95 How to delete file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
dim d as CURLMBS // your curl object
```

```
// delete file
```

```
dim ws() As String
```

```
ws.Append "DELE Temp.txt"
```

```
d.SetOptionPostQuote(ws)
```

Notes: Use `SetOptionPostQuote`, `SetOptionPreQuote` or `SetOptionQuote`.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. To delete use `DELE` and the file path.

17.0.96 How to detect display resolution changed?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X simply listen for display changed notifications.

Notes: Use the "Distribution Notification Center.rbp" example project as a base and use it to listen to notifications with the name "O3DeviceChanged".

17.0.97 How to detect retina?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use Window.BackingScaleFactorMBS to query the factor.

Example:

```
msgbox str(window1.BackingScaleFactorMBS)
```

17.0.98 How to disable force quit?

Plugin Version: all, Platform: macOS.

Answer:

Please visit this website and get the control panel for Mac OS 9 there:

<http://www3.sk.sympatico.ca/tinyjohn/DFQ.html>

For Mac OS X use the MBS Plugin with the SetSystemUIModeMBS method.

Notes:

Please use presentationOptions in NSApplicationMBS for Cocoa applications.

17.0.99 How to disable the error dialogs from Internet Explorer on javascript errors?

Plugin Version: all, Platform: Windows.

Answer: You can use this code in the htmlviewer open event:

Example:

```
if targetwin32 then
htmlviewer1._ole.Content.value("Silent") = True
end if
```

Notes: This disables the error dialogs from Internet Explorer.

17.0.100 How to display a PDF file in Xojo?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac OS X you can use CoreGraphics or PDFKit to display a PDF.

Notes: An alternative can be to load the PDF into a htmlviewer so the PDF plugin can display it.

On Windows you may need to use the Acrobat ActiveX control from Adobe or launch Acrobat Reader.

17.0.101 How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this function:

Example:

```

Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next

' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub

```



```

b=true
x=x1
while (x<x2) and (y<y2)
  ox=x
  oy=y

  x=x+dx
  y=y+dy

  if b then
    g.DrawLine ox,oy,x,y
  end if

  b=not b
wend

```

End Sub

Notes: It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

17.0.104 How to draw a nice antialiased line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

This code can help you although it's not perfect.
You need to set lc to the current color you use.

Example:

```

Sub drawLine(xs as Integer, ys as Integer, xe as Integer, ye as Integer, face as RGBSurface, lineColor as
color)
  dim intX, intY, count, n, xDiff, yDiff as Integer
  dim v, v1, floatX, floatY, xx, yy, xStep, yStep as Double
  dim c as color

  const st=1.0

  xDiff=xe-xs
  yDiff=ye-ys
  count=max(abs(xDiff), abs(yDiff))
  xStep=xDiff/count
  yStep=yDiff/count

```

```

xx=xs
yy=ys
for n=1 to count
intX=xx
intY=yy
floatX=xx-intX
floatY=yy-intY

v=(1-floatX)*(1-floatY)*st
v1=1-v
c=face.pixel(intX, intY)
face.pixel(intX, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*(1-floatY)*st
v1=1-v
c=face.pixel(intX+1, intY)
face.pixel(intX+1, intY)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=(1-floatX)*floatY*st
v1=1-v
c=face.pixel(intX, intY+1)
face.pixel(intX, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)
v=floatX*floatY*st
v1=1-v
c=face.pixel(intX+1, intY+1)
face.pixel(intX+1, intY+1)=rgb(v*lineColor.red+v1*c.red, v*lineColor.green+v1*c.green, v*lineColor.blue+v1*c.blue)

xx=xx+xStep
yy=yy+yStep
next

End Sub

```

Notes:

PS: st should be 1 and face should be a RGBSurface or a Graphics object.

17.0.105 How to dump java class interface?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In terminal you can use "javap -s <classname>" to display the class with the method names and parameters.

Notes: For example show ResultSet class: javap -s java.sql.ResultSet

17.0.106 How to duplicate a picture with mask or alpha channel?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this function:

Example:

```
Function Duplicate(extends p as Picture) As Picture
#if RBVersion >= 2011.04 then
if p.HasAlphaChannel then

// create nw picture and copy content:
dim q as new Picture(p.Width, p.Height)
q.Graphics.DrawPicture p,0,0

Return q

end if
#endif

// create new picture
dim q as new Picture(p.Width, p.Height, 32)

// get mask
dim oldMask as Picture = p.mask(false)
if oldMask = nil then
// no mask, so simple copy
q.Graphics.DrawPicture p,0,0
Return q
end if

// remove mask
p.mask = nil

// copy picture and mask
q.Graphics.DrawPicture p, 0, 0
q.mask.Graphics.DrawPicture oldMask,0,0

// restore mask
p.mask = oldmask

Return q
End Function
```

Notes: Simply copy it to a module and call it like this: `q = p.duplicate`.

The code above works with old Xojo versions because of the `#if` even if your RS version does not support alpha channel pictures. This way it's future proof.

17.0.107 How to enable assistive devices?

Plugin Version: all, Platform: macOS.

Answer: You can use AppleScript code like below:

Notes: tell application "System Events"
activate

```
set UI elements enabled to true
```

```
return UI elements enabled
end tell
```

You can run this with AppleScriptMBS class.

17.0.108 How to encrypt a file with Blowfish?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
dim fi as FolderItem = SpecialFolder.Desktop.Child("test.xojo_binary_project")
dim fo as FolderItem = SpecialFolder.Desktop.Child("test.encrypted")
```

```
// read input
```

```
dim bi as BinaryStream = BinaryStream.Open(fi)
```

```
dim si as string = bi.Read(bi.Length)
```

```
bi.Close
```

```
// encrypt
```

```
dim so as string = BlowfishMBS.Encrypt("MyKey",si)
```

```
// write output
```

```
dim bo as BinaryStream = BinaryStream.Create(fo)
```

```
bo.Write so
```

```
bo.Close
```

Notes: Of course you can decrypt same way, just use Decrypt function and of course swap files.

17.0.109 How to extract text from HTML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use both RemoveHTMLTagsMBS and DecodingFromHTMLMBS like this:

Example:

```
dim html as string = "<p><B>Gr&uuml;&szlig;e</B></P>"
dim htmltext as string = RemoveHTMLTagsMBS(html)
dim text as string = DecodingFromHTMLMBS(htmltext)
```

MsgBox text // shows: Gr√üë

Notes: You can use it together with RemoveHTMLTagsMBS to remove html tags. What you get will be the text without tags.

DecodingFromHTMLMBS turns HTML escapes back to unicode characters. Like ä to √.

17.0.110 How to find empty folders in a folder?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Try this code:

Example:

```
dim folder as folderitem // your folder

dim c as Integer = folder.count
for i as Integer = 1 to c
dim item as folderitem = folder.trueitem(i)
if item = nil then
// ignore
elseif item.directory then
// folder
if item.count = 0 then
// found empty folder
end if
end if
next
```

17.0.111 How to find iTunes on a Mac OS X machine fast?

Plugin Version: all, Platform: macOS.

Answer: You can try Launch Services.

Example:

```
dim f as FolderItem

f=LaunchServicesFindApplicationForInfoMBS("hook","com.apple.iTunes","iTunes.app")

MsgBox f.NativePath
```

17.0.112 How to find network interface for a socket by it's name?

Plugin Version: all, Platform: macOS.

Answer: You can use our plugin to build a lookup table.

Example:

```
Function FindNetworkInterface(name as string) As NetworkInterface
name = name.trim

if name.len = 0 then Return nil

// search by IP/MAC
dim u as Integer = System.NetworkInterfaceCount-1
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if n.IPAddress = name or n.MACAddress = name then
Return n
end if
next

// use MBS Plugin to build a mapping
dim interfaces() as NetworkInterfaceMBS = NetworkInterfaceMBS.AllInterfaces
dim map as new Dictionary

for each n as NetworkInterfaceMBS in interfaces
dim IPv4s() as string = n.IPv4s
dim IPv6s() as string = n.IPv6s

for each IPv4 as string in IPv4s
map.Value(IPv4) = n.Name
next
for each IPv6 as string in IPv6s
map.Value(IPv6) = n.Name
next
if n.MAC<>>" then
map.Value(n.MAC) = n.Name
```

```

end if
next

// now search interfaces by name, IPv4 or IPv6
for i as Integer = 0 to u
dim n as NetworkInterface = System.GetNetworkInterface(i)
if map.Lookup(n.IPAddress, "") = name then
Return n
end if

if map.Lookup(n.MACAddress, "") = name then
Return n
end if
next

End Function

```

Notes: The code above uses a lookup table build using NetworkInterfaceMBS class to find the network interface by name.

17.0.113 How to find version of Microsoft Word?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```

// find Word
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.microsoft.Word", "")

// open bundle
dim c as new NSBundleMBS(f)

// read info
dim d as Dictionary = c.infoDictionary

// show version
MsgBox d.Lookup("CFBundleVersion", "")

```

Notes: Older versions of Word can be found with creator code "MSWD".

17.0.114 How to fix CURL error 60/53 on connecting to server?

Plugin Version: all, Platform: macOS.

Answer: You probably connect with SSL and you have no valid certificate.

Example:

```
dim d as new CURLSMBS

// Disable SSL verification
d.OptionSSLVerifyHost = 0 // don't verify server
d.OptionSSLVerifyPeer = 0 // don't proofs certificate is authentic

// With SSL Verification:
dim cacert as FolderItem = Getfolderitem("cacert.pem")
d.OptionCAInfo = cacert.NativePath
d.OptionSSLVerifyHost = 2 // verify server
d.OptionSSLVerifyPeer = 1 // proofs certificate is authentic
```

Notes: You can either use the code above to disable the SSL verification and have no security. Or you use the cacert file and enable the verification. Than you only get a connection if the server has a valid certificate.

see also:

<http://curl.haxx.se/ca/>

17.0.115 How to format double with n digits?

Plugin Version: all, Platform: macOS.

Answer: You can use the FormatMBS function for this.

Example:

```
dim d as Double = 123.4567890
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)

d = 0.000000123456
listbox1.AddRow FormatMBS("%f", d)
listbox1.AddRow FormatMBS("%e", d)
```

```
listbox1.AddRow FormatMBS("%g", d)

listbox1.AddRow FormatMBS("%5.5f", d)
listbox1.AddRow FormatMBS("%5.5e", d)
listbox1.AddRow FormatMBS("%5.5g", d)
```

Notes: see FormatMBS for details.

In general %f is normal style, %e is scientific and %g is whichever gives best result for given space.

17.0.116 How to get a time converted to user time zone in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.GMTOffset property.

Example:

```
Sub Open()
// current date on server
dim d as new date
dim s as string = d.LongTime

// adjust to client GMT offset
d.GMTOffset = d.GMTOffset + Session.GMTOffset

dim t as string = D.LongTime

MsgBox s+EndOfLine+t
End Sub
```

17.0.117 How to get an handle to the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: This function returns a handle for the frontmost window:

Example:

```
Function GetForegroundWindowHandle() as Integer
#if targetwin32 then
declare function GetForegroundWindow Lib "user32.dll" as Integer
Return GetForegroundWindow()
#endif
End Function
```

17.0.118 How to get CFAbsoluteTime from date?

Plugin Version: all, Platforms: macOS, Windows.

Answer: Use code like this:

Example:

```
dim d as new date
dim t as CFTimeZoneMBS = SystemCFTimeZoneMBS
dim g as new CFGregorianCalendarMBS
g.Day = d.Day
g.Month = d.Month
g.Year = d.Year
g.Minute = d.Minute
g.Hour = d.Hour
g.Second = d.Second

dim at as CFAbsoluteTimeMBS = g.AbsoluteTime(t)
dim x as Double = at.Value
```

```
MsgBox str(x)
```

Notes: As you see we need a timezone and put the date values in a gregorian date record. Now we can query absolute time for the given timezone.

17.0.119 How to get client IP address on web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the WebSession.RemoteAddress property.

Example:

```
Sub Open()
Title = Session.RemoteAddress
End Sub
```

17.0.120 How to get fonts to load in charts on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `SetFontSearchPath` method in the `CDBaseChartMBS` class to specify where your fonts are.

Example:

```

if TargetLinux then
CDBaseChartMBS.SetFontSearchPath "/usr/share/fonts/truetype;/usr/share/fonts/truetype/msttcorefonts"
else
// on Mac and Windows we use system fonts.
end if

// also you can later switch default fonts:

dim Chart as CDBaseChartMBS // your chart

#If TargetARM And TargetLinux Then
// use specific fonts on Linux on Raspberry Pi
Call Chart.setDefaultFonts("/usr/share/fonts/truetype/piboto/PibotoLt-Regular.ttf", "/usr/share/fonts/truetype/piboto/Pi
#EndIf

```

Notes: On macOS, iOS and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the `ttf-mscorefonts-installer` package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

17.0.121 How to get fonts to load in DynaPDF on Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use the `AddFontSearchPath` method in the `DynaPDFMBS` class to specify where your fonts are.

Example:

```

dim d as new DynaPDFMBS
if TargetLinux then
call d.AddFontSearchPath "/usr/share/fonts/truetype", true
else
// on Mac and Windows we use system fonts.
end if

```

Notes: On Mac OS X and Windows, the fonts are loaded from the system's font folder.

e.g. if you use ubuntu, you can install the `ttf-mscorefonts-installer` package and call this method with `"/usr/share/fonts/truetype/msttcorefonts"` as the path. No backslash on the end of a path, please.

17.0.122 How to get GMT time and back?

Plugin Version: all, Platform: macOS.

Answer: You can use the date class and the GMTOffset property.

Example:

```
// now
dim d as new date

// now in GMT
dim e as new date
e.GMTOffset = 0

// show
MsgBox str(d.TotalSeconds,"0.0")+ " " +str(e.TotalSeconds, "0.0")

dim GMTTimeStamp as Double = e.TotalSeconds

// restore
dim f as new date

// add GMT offset here
f.TotalSeconds = GMTTimeStamp + f.GMTOffset*3600
// because here it's removed
f.GMTOffset = f.GMTOffset

MsgBox d.ShortTime+" (" +str(d.GMTOffset)+") " +str(d.TotalSeconds,"0.0")+EndOfLine+_
e.ShortTime+" (" +str(e.GMTOffset)+") " +str(e.TotalSeconds,"0.0")+EndOfLine+_
f.ShortTime+" (" +str(f.GMTOffset)+") " +str(f.TotalSeconds,"0.0")
```

Notes: It's sometimes a bit tricky with the date class as setting one property often changes the others.

17.0.123 How to get good crash reports?

Plugin Versions: all, Platforms: macOS, Linux, Windows.

Answer: Check this website from the webkit website:

Notes: <http://webkit.org/quality/crashlogs.html>

17.0.124 How to get list of all threads?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the runtime module like in this function:

Example:

```
Function Threads() As Thread()
#pragma DisableBackgroundTasks
dim t() as Thread

Dim o as Runtime.ObjectIterator=Runtime.IterateObjects
While o.MoveNext
if o.Current isa Thread then
t.Append thread(o.current)
end if
Wend

Return t
End Function
```

Notes: This returns an array of all thread objects currently in memory.

The pragma is important here as it avoids thread switches which may cause a thread to be created or deleted.

17.0.125 How to get parameters from webpage URL in Xojo Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the Webpage.ParametersReceived event.

Example:

```
Sub ParametersReceived(Variables As Dictionary)
for each key as Variant in Variables.keys
MsgBox key+" ->" +Variables.Value(key)
next
End Sub
```

Notes: The text encodings of this strings is not defined in Xojo 2010r5. Please use DefineEncoding.

17.0.126 How to get the color for disabled textcolor?

Plugin Version: all, Platform: macOS.

Answer: Ask the appearance manager:

Example:

```
Function GetThemeTextColor(inColor as Integer, inDepth as Integer, inColorDev as Boolean) As Color
declare function GetThemeTextColor lib "Carbon" (inColor as Integer, inDepth as Integer, inColorDev as
Boolean, outColor as Ptr) as Integer
```

```
dim i as Integer
```

```
dim col as MemoryBlock
```

```
col = newMemoryBlock(6)
```

```
i = GetThemeTextColor(inColor, inDepth, inColorDev, col)
```

```
return RGB(col.UShort(0)\256, col.UShort(2)\256, col.UShort(4)\256)
```

```
End Function
```

Notes: The color for this is:

```
const kThemeTextColorDialogInactive = 2.
```

```
c = GetThemeTextColor(kThemeTextColorDialogInactive, Screen(0).Depth, true)
```

For Mac OS X you should use "CarbonLib" instead of "AppearanceLib" ...

17.0.127 How to get the current free stack space?

Plugin Version: all, Platform: macOS.

Answer: You can something like the code below:

Example:

```
Sub ShowStackSize()
```

```
dim threadid as Integer
```

```
dim size as Integer
```

```
declare function GetCurrentThread lib "Carbon" (byref threadid as Integer) as short
```

```
declare function ThreadCurrentStackSize lib "Carbon" (threadid as Integer, byref size as Integer) as short
```

```
if GetCurrentThread(threadid)=0 then
```

```
if 0=ThreadCurrentStackSize(threadid,size) then
```

```
MsgBox str(size)
```

```
end if
```

```
end if
```

End Sub

Notes: For Mac OS 9, use "ThreadLib" instead of "CarbonLib". You can use #if if you like for that.

17.0.128 How to get the current timezone?

Plugin Version: all, Platforms: macOS, Windows.

Answer:

You can use the TimeZoneMBS class or the CFTimeZoneMBS class.
Or code like below:

Example:

```
Function GMTOffsetInMinutes() as Integer
// Returns the offset of the current time to GMT in minutes.
// supports Mac OS and Windows, but not Linux yet (let me know if
// you have code for that, please)
//
// Note that the offset is not always an even multiple of 60, but
// there are also half hour offsets, even one 5:45h offset

// This version by Thomas Tempelmann (rb@tempel.org) on 25 Nov 2005
// with a fix that should also make it work with future Intel Mac targets.
//
// Using code from various authors found on the RB NUG mailing list

dim result, bias, dayLightbias as Integer
dim info as memoryBlock
dim offset as Integer

#if targetMacOS then

Declare Sub ReadLocation lib "Carbon" (location As ptr)

info = NewMemoryBlock(12)
ReadLocation info
if false then
// bad, because it does not work on Intel Macs:
'offset = info.short(9) * 256 + info.byte(11)
else
offset = BitwiseAnd (info.long(8), &hFFFFFF)
end

offset = info.short(9) * 256 + info.byte(11)
```

```

offset = offset \60
return offset

#endif

#if targetWin32 then

Declare Function GetTimeZoneInformation Lib "Kernel32" ( tzInfoPointer as Ptr ) as Integer
// returns one of
// TIME_ZONE_ID_UNKNOWN 0
// - Note: e.g. New Delhi (GMT+5:30) and Newfoundland (-3:30) return this value 0
// TIME_ZONE_ID_STANDARD 1
// TIME_ZONE_ID_DAYLIGHT 2

info = new MemoryBlock(172)
result = GetTimeZoneInformation(info)

bias = info.Long(0)
// note: the original code I found in the NUG archives used Long(84) and switched to Long(0)
// only for result=1 and result=2, but my tests found that Long(0) is also the right value for result=0

if result = 2 then
daylightBias = info.long(168)
end if
offset = - (bias + dayLightbias)
return offset

#endif

End Function

```

17.0.129 How to get the current window title?

Plugin Version: all, Platform: macOS.

Answer: The code below returns the current window title for the frontmost window on Mac OS X if Accessibility services are

Example:

```

Function CurrentWindowTitle() As string
// your application needs permissions for accessibility to make this work!

dim SystemWideElement,FocusedApplicationElement,FocusedWindowElement as AXUIElementMBS
dim FocusedApplication,FocusedWindow,Title as AXValueMBS
dim s as String
dim cs as CFStringMBS

```

```

SystemWideElement=AccessibilityMBS.SystemWideAXUIElement
if SystemWideElement<>nil then
FocusedApplication=SystemWideElement.AttributeValue(AccessibilityMBS.kAXFocusedApplicationAttribute)
if FocusedApplication.Type=AccessibilityMBS.kAXUIElementMBSTypeID then
FocusedApplicationElement=new AXUIElementMBS
FocusedApplicationElement.Handle=FocusedApplication.Handle
FocusedApplicationElement.RetainObject

FocusedWindow=FocusedApplicationElement.AttributeValue(AccessibilityMBS.kAXFocusedWindowAttribute)

if FocusedWindow<>nil and AccessibilityMBS.kAXUIElementMBSTypeID=FocusedWindow.Type then

FocusedWindowElement=new AXUIElementMBS
FocusedWindowElement.Handle=FocusedWindow.Handle
FocusedWindowElement.RetainObject

Title=FocusedWindowElement.AttributeValue(AccessibilityMBS.kAXTitleAttribute)
if Title<>nil and Title.Type=kCFStringMBSTypeID then
cs=new CFStringMBS
cs.handle=Title.Handle
cs.RetainObject
Return cs.str
end if
end if
end if
end if
End Function

```

17.0.130 How to get the cursor blink interval time?

Plugin Version: all, Platform: macOS.

Answer: On Mac OS you can use GetCaretTime from the toolbox.

Example:

```
declare function GetCaretTime lib "Carbon" () as Integer
```

```
MsgBox str(GetCaretTime()+ " ticks")
```

Notes: 60 ticks make one second.

17.0.131 How to get the list of the current selected files in the Finder?

Plugin Version: all, Platform: macOS.

Answer:

Use the AppleScript like this one:

```
tell application "finder"
return selection
end tell
```

Which translates into this AppleEvent:

```
Process("Finder").SendAE "core,getd,'—':obj { form:prop, want:type(prop), seld:type(sele), from:'null'() }
"
```

and as Xojo code it looks like this:

Example:

```
dim ae as appleEvent
dim o1 as appleEventObjectSpecifier
dim f as folderItem
dim alist as appleEventDescList
dim i as Integer
dim dateiname as string

// setup the AppleEvent
o1=getpropertyObjectDescriptor( nil, "sele")
ae= newappleEvent("core", "getd", "MACS")
ae.objectSpecifierParam("—")=o1

// send it
if ae.send then
// got the list
alist=ae.replyDescList

// now show the list of filename into an editfield:

for i=1 to alist.count
f=alist.folderItem(i)

dateiname=f.name
// editfield1 with property "multiline=true"!
editfield1.text=editfield1.text + dateiname + chr(13)
next
```

end if

17.0.132 How to get the Mac OS system version?

Plugin Version: all, Platform: macOS.

Answer: The following code queries the value and displays the version number:

Example:

```

dim first as Integer
dim second as Integer
dim third as Integer
dim l as Integer

if System.Gestalt("sysv",l) then

Third=Bitwiseand(l,15)
second=Bitwiseand(l\16,15)
first=Bitwiseand(l\256,15)+10*Bitwiseand(l\256\16,15)
end if

if First>=10 then
msgbox "Mac OS X "+str(First)+" "+str(Second)+" "+str(third)
else
msgbox "Mac OS "+str(First)+" "+str(Second)+" "+str(third)
end if

```

17.0.133 How to get the Mac OS Version using System.Gestalt?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```

Dim s As String
Dim b As Boolean
Dim i, resp as Integer

// Systemversion
b = System.Gestalt("sysv", resp)
If b then
s = Hex(resp)

```

```

For i =Len(s)-1 DownTo 1
s=Left(s,i)+””+Mid(s,i+1)
Next
MsgBox ”Systemversion: Mac OS ” + s
end if

```

Notes: The MBS Plugin has a SystemInformationMBS.OSVersionString function for this.

17.0.134 How to get the screensize excluding the task bar?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Use the Screen class with the available* properties.

17.0.135 How to get the size of the frontmost window on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Notes: Make yourself a class for the WindowRect with four properties:

```

Bottom as Integer
Left as Integer
Right as Integer
Top as Integer

```

Add the following method to your class:

```

Sub GetWindowRect(windowhandle as Integer)
dim err as Integer
dim mem as memoryBlock
#if targetwin32 then
Declare Function GetWindowRect Lib ”user32.dll” (hwnd as Integer, ipRect As Ptr) as Integer

mem = newmemoryBlock(16)
err = GetWindowRect(windowhandle, mem)
Left = mem.long(0)
Top = mem.Long(4)
Right = mem.Long(8)
Bottom = mem.Long(12)

```

```
#endif  
End Sub
```

Good to use for the MDI Master Window!

17.0.136 How to get the source code of a HTMLViewer?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
// for Windows:
```

```
msgbox HTMLViewer1.IEHTMLTextMBS
```

```
// for MacOS with WebKit 2.x:
```

```
msgbox HTMLViewer1.WKWebViewMBS.HTMLText
```

17.0.137 How to get Xojo apps running Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You need to install some require packages.

Notes: You need CUPS as well as GTK packages. On 64 bit systems also the ia32-libs package.

Please note that you need a x86 compatible Linux. So no PPC, Power, ARM or other CPUs.

17.0.138 How to handle really huge images with GraphicsMagick or ImageMagick?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Sometimes it may be better to use an extra application to process images.

Notes: A typical 32 bit app made with Xojo can use around 1.8 GB on Windows and 3 GB on Mac OS X. Some images may be huge, so that processing them causes several copies of the image to be in memory. With a 500 MB image in memory, doing a scale or rotation may require a temp image. So with source, temp and dest images with each 500 MB plus your normal app memory usage, you may hit the limit of Windows with 1.8 GB.

In that case it may be worth running a tool like gm in the shell class. gm is the command line version of GraphicsMagick. There you can run the 64 bit version which is not limited in memory like your own application. Also you can monitor progress and keep your app responsive.

17.0.139 How to handle tab key for editable cells in listbox?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this function:

Example:

```
Function HandleTabInList(list as listbox, row as Integer, column as Integer, key as String) As Boolean
// Handle tab character in Listbox.CellKeyDown event
```

```
Select case asc(key)
case 9
if Keyboard.AsyncShiftKey then
// back

// look for column left
for i as Integer = column-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next

// not found, so look in row before
row = row - 1
if row >= 0 then
for i as Integer = list.ColumnCount-1 downto 0
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
else
// forward

// look for column right
for i as Integer = column+1 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
```

```

// not found, so look in row below
row = row + 1
if row <list.ListCount then
for i as Integer = 0 to list.ColumnCount-1
if list.ColumnType(i) >= list.TypeEditable then
list.EditCell(row, i)
Return true
end if
next
end if
end if
end Select
End Function

```

Notes: You call it from CellKeyDown event like this:

```

EventHandler Function CellKeyDown(row as Integer, column as Integer, key as String) As Boolean
if HandleTabInList(me, row, column, key) then Return true
End EventHandler

```

As you see in the code, we handle tab and shift + tab for moving back and forward. Also we wrap to previous/next row if needed. Feel free to extend this to wrap from last to first row or create a new row for editing.

17.0.140 How to hard link MapKit framework?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Our MapKit classes weak link the framework. If you need hard linking it for the App Store, you can add this method to a class:

Example:

```

Sub ReferenceMapKit()
// just put this in window or app class

#if TargetMachO and Target64Bit then
Declare sub testing Lib "MapKit" Selector "test" (id as ptr)
testing(nil)
#endif

End Sub

```

Notes: No need to call the method.

Just having it in a window or app, will cause the compiler to hard link the framework.

17.0.141 How to have a PDF downloaded to the user in a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the PDF file with the PDF plugin from the browser.

Example:

```
dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer
CurrentFile.ForceDownload = true

// start the download
showurl(CurrentFile.url)
```

Notes: See our Create PDF example for the Xojo Web Edition.

17.0.142 How to hide all applications except mine?

Platform: macOS.

Answer: The code below will on Mac OS hide all applications except your one:

Example:

```
dim p as new ProcessMBS

p.GetFirstProcess
do
if not p.FrontProcess then
p.Visible=false
end if
loop until not p.GetNextProcess
```

17.0.143 How to hide script errors in HTMLViewer on Windows?

Plugin Version: all, Platform: Windows.

Answer: Set Internet Explorer to silent mode with code like this:

Example:

```
htmlviewer1._ole.Content.value("Silent") = True
```

Notes: Simply put this code in the open event of your htmlviewer control (using me instead of htmlviewer1).

17.0.144 How to hide the grid/background/border in ChartDirector?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: If you want to hide something in a chart, simply assign the kTransparent constant as color.

17.0.145 How to hide the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub HideCursor Lib "Carbon" () Inline68K("A852")
```

```
HideCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

17.0.146 How to insert image to NSTextView or TextArea?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to insert file:

Example:

```
// insert a file to textview
```

```
Public Sub InsertFile(textview as NSTextViewMBS, f as FolderItem)
```

```
// read to file
```

```

dim b as BinaryStream = BinaryStream.Open(f)
dim s as string = b.Read(b.Length)

// build wrapper
dim fileWrapper as NSFileWrapperMBS = NSFileWrapperMBS.initRegularFileWithContents(s)
fileWrapper.preferredFilename = f.name

// make attachment
dim fileAttachment as new NSTextAttachmentMBS(fileWrapper)
dim attributedString as NSAttributedStringMBS = NSAttributedStringMBS.attributedStringWithAttachment(fileAttachment)

// add to a NSTextViewMBS
textview.insertText attributedString

End Sub

```

Notes: For TextArea you can query the underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

17.0.147 How to jump to an anchor in a htmlviewer?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You can use javascript to change the current window's location.

Example:

```

// load website
htmlviewer1.LoadURL "http://www.monkeybreadsoftware.net/addressbook-abpersonmbs.shtml"

// later jump to anchor named "16":

if TargetWin32 then
call HTMLViewer1.IERunJavaScriptMBS "window.location = ""#16""
end if

```

17.0.148 How to keep a movieplayer unclickable?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: To keep the user away from clicking on a playing Movie you can just drop a Canvas in front of the Movieplayer and take the clicks there.

Example:

```
Function Canvas1.MouseDown(X as Integer, Y as Integer) as boolean
return true // take it and do nothing
End Function
```

17.0.149 How to keep my web app from using 100% CPU time?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Linux and MacOS you can use renice command in the terminal. On Windows use the task manager to reduce priority.

Notes: If you launch your app with nohup on Linux or Mac OS X like this from the terminal or a script:

```
nohup /webapps/MyApp/MyApp &
```

you can simply have a second line saying this:

```
renice 20 $ !
```

which tells the system to lower priority to lowest value for the latest background process.

17.0.150 How to kill a process by name?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can kill a process (or application) by name if you loop over all the processes and kill the one you need.

Example:

```
dim p as new ProcessMBS
p.GetfirstProcess ' get first
do
if p.name = "TextEdit" then
call p.KillProcess
Return
end if
loop until not p.GetNextProcess
```

Notes: You may want to check the result of killProcess function. Not every user is allowed to kill every application.

17.0.151 How to know how many CPUs are present?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```
Function GetCPUCount() as Integer
Declare Function MPProcessors Lib "Carbon" () as Integer
```

```
Return MPProcessors()
End Function
```

Notes: Your app will than need that library to launch on Classic. To avoid this the MBS plugin checks if this library is available and return 1 if it's not available.

17.0.152 How to know the calling function?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: On Mac you can use a helper function like this this code:

Example:

```
Public Function CallingFunction() as string
// Query name of calling function of a function
```

```
#Pragma BreakOnExceptions false
```

```
try
```

```
// raise a dummy exception
dim r as new NilObjectException
raise r
```

```
catch x as NilObjectException
```

```
// get stack
dim stack() as string = x.Stack
```

```
// pick function name and return
dim name as string = stack(2)
Return name
```

```
end try
End Function
```

Notes: You need to include function names in your application.

17.0.153 How to launch an app using it's creator code?

Plugin Version: all, Platform: macOS.

Answer: Send an AppleEvent "oapp" with the creator code to the Finder ("MACS"):

Example:

```
Dim a as AppleEvent
dim creator as string

creator = "MSIE" ' here the Internet Explorer

a = NewAppleEvent("aevt", "odoc", "MACS")
a.Timeout = -1

a.ObjectSpecifierParam("—") = GetUniqueIDObjectDescriptor("appf", nil, creator)

if not a.send then
msgBox "An error has occured"
else

end if
```

17.0.154 How to launch disc utility?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this code:

Example:

```
dim f as FolderItem = LaunchServicesFindApplicationForInfoMBS("", "com.apple.DiskUtility", "")

if f<>Nil then
f.Launch
end if
```

Notes: This works even if people renamed the disc utility or moved it to another folder.

17.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You may try to embed your changes to the database between two transaction calls.

Example:

```
dim db as Database // some database

db.SQLiteExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLiteExecute "END TRANSACTION"
```

Notes: This can increase speed by some factors.

17.0.156 How to make a NSImage object for my retina enabled app?

Plugin Version: all, Platform: macOS.

Answer: You can use code like this:

Example:

```
Function NewRetinaImage(pic as Picture, mask as Picture = nil) As NSImageMBS
// first make a NSImageMBS from it
dim n as new NSImageMBS(pic, mask)

// now set to half the size, so we have 2x pixels for the image
n.size = new NSSizeMBS(n.width/2, n.height/2)

// and return
Return n
End Function
```

Notes: The thing to do is to have 2x the pixels, but assign a size to the image which gives it the right size in points.

You can pass the NSImageMBS from here to NSMenuItemMBS. For Retina displays, the full resolution is used. For others it will be reduced.

17.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

Answer: Try this declares:

Example:

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).
```

```
Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &H8080000
```

```
Dim styleFlags as Integer
```

```
#If TargetWin32 Then
```

```
Declare Function SetWindowLong Lib "user32" Alias "SetWindowLongA" (hwnd as Integer, nIndex as Integer, dwNewLong as Integer) as Integer
```

```
Declare Function SetWindowPos Lib "user32" (hwnd as Integer, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer
```

```
styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )
```

```
#EndIf
```

17.0.158 How to make an alias using AppleEvents?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
Sub MakeAlias(folder as folderitem, target as folderitem, aliasname as string)
```

```
dim ev as AppleEvent
```

```
dim myResult as boolean
```

```
dim properties as AppleEventRecord
```

```
ev = NewAppleEvent("core", "crel", "MACS")
```

```
ev.MacTypeParam("kocl") = "alis"
```

```
ev.FolderItemParam("to ") = target
```

```
ev.FolderItemParam("insh") = folder
```

```
properties=new AppleEventRecord
```

```

properties.StringParam("pnam")=aliasname

ev.RecordParam("prdt")=properties

myResult = ev.send
// true on success, false on error
End Sub

```

Notes: Call it like this:

```
MakeAlias SpecialFolder.Desktop, SpecialFolder.Desktop.Child("Gif Copy.rb"), "test.rb alias"
```

Seems to not work on Mac OS X 10.6

17.0.159 How to make AppleScripts much faster?

Plugin Version: all, Platform: macOS.

Answer: use "ignoring application responses" like in this example:

```

Notes: on run { fn,fpx,fpy }
ignoring application responses
tell app "Finder" to set the position of folder fn to fpx,fpy
end ignoring
end run

```

17.0.160 How to make double clicks on a canvas?

Plugin Version: all, Platform: macOS.

Answer:

Update: Newer Xojo versions support DoubleClick event, so you don't need this code.

Here's my tip from the tips list on how to add a double-click event to the Canvas control. The technique could easily be used for a window or any Rectcontrol:

Because of its built-in drawing methods, the Canvas control is often used to create custom interface controls. But while the Canvas control has event handlers for most mouse events, it doesn't have an event handler for DoubleClick events. Fortunately, you can add a double-click event handler to a Canvas control easily. Basically, you're going to create a new class based on Canvas and add a double-click event to that. You can then use the new class anytime you need a Canvas with a double-click event.

To create a new Canvas class with a DoubleClick event handler, do this:

1. Add a new class to your project.
2. Set the Super property of the new class to "Canvas".
3. Change the name of this new class to "DoubleClickCanvas".

A double-click occurs when two clicks occur within the users double-click time (set in the Mouse control panel on both Macintosh and Windows) and within five pixels of each other. So, you'll need a few properties to store when and where the last click occurred.

4. Add a new property with the following declaration and mark it as private: lastClickTicks as Integer
5. Add a new property with the following declaration and mark it as private: lastClickX as Integer
6. Add a new property with the following declaration and mark it as private: lastClickY as Integer

Since the Canvas control doesn't have a DoubleClick event, you will need to add one.

7. Add a new event to your class by choosing New Event from the Edit menu and enter "DoubleClick" as the event name.

Double-clicks occur on MouseUp. In order for the mouseUp event to fire, you must return True in the MouseDown event.

8. In the MouseDown event, add the following code:
Return True

In the MouseUp event, you will need to determine what the users double-click time is. This value is represented on both the Mac and Windows in ticks. A tick is 1/60th of a second. Since there isn't a built-in function for this, you'll need to make a toolbox call. The mouseUp event code below makes the appropriate toolbox call for both Macintosh and Windows. It then compares the time of the users last click to the time of the current click and compares the location of the users last click to the location of the current click.

9. Add the following code to the MouseUp event:

```
dim doubleClickTime, currentClickTicks as Integer

#if targetMacOS then
Declare Function GetDbtTime Lib "Carbon" () as Integer
doubleClickTime = GetDbtTime()
#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 occurred close enough together in space
if abs(X - lastClickX) <= 5 and abs(Y - LastClickY) <= 5 then
DoubleClick //a double click has occurred so call the event
end if
end if
lastClickTicks = currentClickTicks
lastClickX = X
lastClickY = Y

```

10. Now to test out your new DoubleClickCanvas, drag the class from the Project window to a window in your project to create an instance of it.

11. Double-click on the canvas you just added to your window to open the Code Editor. Notice that the canvas has a DoubleClick event handler. In this event handler, add the following code:
BEEP

17.0.161 How to make my Mac not sleeping?

Plugin Version: all, Platform: macOS.

Answer: Just inform the Mac OS about some system activity with code like this:

Example:

```

Sub UpdateSystemActivity()

#if TargetCarbon
declare function myUpdateSystemActivity lib "Carbon" alias "UpdateSystemActivity" (activity as Integer)
as short

const OverallAct = 0 // Delays idle sleep by small amount */
const UsrActivity = 1 // Delays idle sleep and dimming by timeout time */
const NetActivity = 2 // Delays idle sleep and power cycling by small amount */
const HDAActivity = 3 // Delays hard drive spindown and idle sleep by small amount */
const IdleActivity = 4 // Delays idle sleep by timeout time */

dim e as Integer

e=myUpdateSystemActivity(UsrActivity)

```

```
// you may react on an error if e is not 0 after the call.
```

```
#endif
End Sub
```

Notes: You may use another constant if you prefer some different behavior. Call it maybe every second.

17.0.162 How to make my own registration code scheme?

Plugin Version: all, Platform: Windows.

Answer: There are excellent articles about how to make a registration code scheme, but you can also simply use our RegistrationEngineMBS class.

Notes: If you need a license text, why not use the one from Xojo as a starting point?

17.0.163 How to make small controls on Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: You can try this code on Mac OS X:

Example:

```

'/*
' * Use the control's default drawing variant. This does not apply to
' * Scroll Bars, for which Normal is Large.
' */
const kControlSizeNormal = 0

'/*
' * Use the control's small drawing variant. Currently supported by
' * the Check Box, Combo Box, Radio Button, Scroll Bar, Slider and Tab
' * controls.
' */
const kControlSizeSmall = 1

'/*
' * Use the control's small drawing variant. Currently supported by
' * the Indeterminate Progress Bar, Progress Bar and Round Button
' * controls.
' */
const kControlSizeLarge = 2

```

```

'/*
' * Control drawing variant determined by the control's bounds. This
' * ControlSize is only available with Scroll Bars to support their
' * legacy behavior of drawing differently within different bounds.
' */
const kControlSizeAuto = &hFFFF

const kControlSizeTag = "size"

declare function SetControlData lib "Carbon" (controlhandle as Integer, part as short, tagname as OS-
Type, size as Integer, data as ptr) as short

dim m as MemoryBlock

m=NewMemoryBlock(2)
m.UShort(0)=kControlSizeSmall

Title=str(SetControlData(CheckBox1.Handle, 0, kControlSizeTag, 2, m))

```

17.0.164 How to mark my Mac app as background only?

Plugin Version: all, Platform: macOS.

Answer: You can run a build script on each build with this code:

Example:

```

Dim App As String = CurrentBuildLocation + "/" + CurrentBuildAppName + ".app"
Call DoShellCommand("/usr/bin/defaults write " + App + "/Contents/Info ""NSUIElement"" YES")

```

Notes: This will set the NSUIElement flag to YES.

17.0.165 How to move a file or folder to trash?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```

Function MoveToTrash(f as FolderItem) As Boolean
#If TargetMacOS then
dim r as FolderItem
dim e as Integer = MacFileOperationMBS.MoveObjectToTrashSync(f, r, MacFileOperationMBS.kFSFile-
OperationDefaultOptions)

```

```

if e = 0 then
Return true // Ok
end if

#elseif TargetWin32 then
dim w as new WindowsFileCopyMBS

dim flags as Integer = w.FileOperationAllowUndo + w.FileOperationNoErrorUI + w.FileOperationSilent
+ w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if

flags = w.FileOperationNoErrorUI + w.FileOperationSilent + w.FileOperationNoConfirmation
if w.FileOperationDelete(f, flags) then
Return true // OK
end if
#else
// Target not supported
break
Return false
#endif
End Function

```

Notes: If you want to move a file to trash, you could use `f.movefileto f.trashfolder`, but that will overwrite existing files in the trash. You can use our `MacFileOperationMBS` class to move a file on Mac to the trash. And it uses the same code as the Finder, so files are renamed when the same name is already in use in the trash:

On Windows we use `WindowsFileCopyMBS` class.
Requires Mac OS X 10.5.

17.0.166 How to move an application to the front using the creator code?

Plugin Version: all, Platform: macOS.

Answer: This makes SimpleText (Code ttxt) to the frontmost application:

Example:

```

dim a as appleevent

a=newappleEvent("misc","actv","ttxt")

```

```
if a.send then
end if
```

Notes: (Code is Mac only)

17.0.167 How to move file with ftp and curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can set post/pre quotes to have ftp commands executed before or after the download/upload.

Example:

```
dim d as CURLMBS // your curl object

// rename/move file
dim ws() As String
ws.Append "RNFR Temp.txt"
ws.append "RNTO MyFile.txt"

d.SetOptionPostQuote(ws)
```

Notes: Use SetOptionPostQuote, SetOptionPreQuote or SetOptionQuote.

The ftp commands you pass here are native ftp commands and not the commands you use with ftp applications. So rename is two commands. First RNFR to tell where to rename from and second RNTD with the new file name. To delete use DELE and the file path.

17.0.168 How to normalize string on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like below:

Example:

```
Function Normalize(t as string) As string
const kCFStringNormalizationFormD = 0 // Canonical Decomposition
const kCFStringNormalizationFormKD = 1 // Compatibility Decomposition
const kCFStringNormalizationFormC = 2 // Canonical Decomposition followed by Canonical Composition
const kCFStringNormalizationFormKC = 3 // Compatibility Decomposition followed by Canonical Composition

dim s as CFStringMBS = NewCFStringMBS(t)
dim m as CFMutableStringMBS = s.Normalize(kCFStringNormalizationFormD)
```

```
Return m.str  
End Function
```

Notes: This uses Apple's CFString functions to normalize unicode variants.

17.0.169 How to obscure the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ObscureCursor Lib "Carbon" ()
```

```
ObscureCursor
```

Notes: The MBS Plugin has this function, but it's not supported for Windows.

17.0.170 How to open icon file on Mac?

Plugin Version: all, Platform: macOS.

Answer: Use the NSImageMBS class like this:

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.ico")
```

```
dim n as new NSImageMBS(f)
```

```
window1.Backdrop = n.CopyPictureWithMask
```

17.0.171 How to open PDF in acrobat reader?

Plugin Version: all, Platform: macOS.

Answer: Try this code:

Example:

```
dim pdf as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
```

```

// open PDF in Acrobat Reader on Mac:

// find app
dim bundleID as string = "com.adobe.Reader"
dim app as FolderItem = LaunchServicesFindApplicationForInfoMBS("", bundleID, "")

if app<>nil then

// launch app with parameters

dim docs() as FolderItem
docs.Append pdf

dim param as new LaunchServicesLaunchParameterMBS
param.Defaults = true
param.Application = app

dim x as FolderItem = LaunchServicesOpenXMBS(docs, param)

// on failure, simply launch it
if x = nil then
pdf.Launch(true)
end if

else
pdf.Launch(true)
end if

```

Notes: On Windows, simply use pdf.launch or WindowsShellExecuteMBS.

17.0.172 How to open printer preferences on Mac?

Plugin Version: all, Platform: macOS.

Answer: You can use our OpenMacOSXPreferencesPaneMBS function like this:

Example:

```

dim e as Integer = OpenMacOSXPreferencesPaneMBS("PrintAndFax")
if 0 = e then
MsgBox "OK"
elseif e = -43 then
MsgBox "File not found."
else
MsgBox "Error: "+str(e)
end if

```

17.0.173 How to open special characters panel on Mac?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have functions for that in Cocoa and Carbon.

Example:

```
dim a as new NSApplicationMBS
a.orderFrontCharacterPalette
```

Notes: For Cocoa, you can use `orderFrontCharacterPalette` method in `NSApplicationMBS` class.

Or simply for Carbon and Cocoa the `ShowCharacterPaletteMBS` method.

17.0.174 How to optimize picture loading in Web Edition?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the `WebPicture` class.

Notes: Take your picture and create a `WebPicture` object. Store this `WebPicture` in a property of the `WebPage`, `Session` or `app` (as global as possible). On the first time you use this picture on an user session, the browser will load it. Second time you use it, the browser will most likely pick it from the cache.

Having pictures in `App` or some module reuses the same picture for all sessions which reduces memory footprint.

This does not work well with pictures you change very often or use only for one webpage on one user.

If you like to see an example, check our `Map` example.

17.0.175 How to parse XML?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use code like this:

Example:

```
dim s as string = "<test><test /></test>"
```

```
try
```

```

dim x as new XmlDocument(s)
MsgBox "OK"
catch xe as XmlException
MsgBox "invalid XML"
end try

```

Notes: If you got an exception, you have a parse error.

17.0.176 How to play audio in a web app?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the HTML5 audio tag and control it with javascript.

Notes: This is just another example app I made today. It plays a christmas song. The audio file is provided by the application to the server, so no external web server is needed and this application can run stand alone. To compile and run you need Xojo 2010r5.

In the open event we search the audio files and open them as binarystreams. We create the two webfile objects. Those webfiles are part of the app class, so we have them globally. There we set the data with the content of our streams. We also define file names and mime types. They are needed so browser know what we have here:

```

audioFileM4V = new WebFile
audioFileM4V.Data = bM.Read(BM.Length)
audioFileM4V.Filename = "music.m4a"
audioFileM4V.MIMEType = "audio/m4a"

```

```

audioFileOGG = new WebFile
audioFileOGG.Data = bO.Read(BO.Length)
audioFileOGG.Filename = "music.ogg"
audioFileOGG.MIMEType = "audio/ogg"

```

Next in the open event of the webpage we have a PageSource control. The location is set to be before content. In the open event we define the html code for this. First we pick the URLs for the audio files. Than we build the html to use the audio tag. As you see, we give it an ID for later use and have it preload automatically. If you add an autoplay tag, you can have the audio play right away. Inside the audio tag we have two sources so we provide audio for both Firefox (OGG) and Safari (MPEG4). Finally we have a text to display if HTML5 audio tag is not supported.

You can set the source in the EditSource event:

```
dim urlO as string = app.audioFileOGG.URL
dim urlM as string = app.audioFileM4V.URL
me.Source = "<audio id=""mymusic"" preload=""auto""><source src="""+urlO+""" type=""audio/ogg""
/><source src="""+urlM+""" type=""audio/mpeg"" />Your browser does not support the audio ele-
ment.</audio>"
```

Next in the Play button we execute code to play the audio. This is a short javascript code which searches in the html document for the element with the ID "mymusic" which is the ID of our audio tag above. Once we got the object, we call it's play method to start playback.

```
me.ExecuteJavaScript("document.getElementById('mymusic').play();")
```

same for pause:

```
me.ExecuteJavaScript("document.getElementById('mymusic').pause();")
```

and finally for changing volume:

```
me.ExecuteJavaScript("document.getElementById('mymusic').volume="+str(me.Value/100.0)+"");")
```

17.0.177 How to pretty print xml?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use the XML Transform method with the right XLS.

Notes: Learn more here:

<http://docs.xojo.com/index.php/XMLDocument.Transform>

17.0.178 How to print to PDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code below shows how to redirect printing to a PDF file on Mac OS X.

Example:

```
// get Xojo printer setup
dim p as new PrinterSetup

// now put it into NSPrintInfo to manipulate
dim n as new NSPrintInfoMBS
n.SetupString = p.SetupString
```

```

// change destination to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
n.SetSaveDestination(f)

// move back
p.SetupString = n.SetupString

// and print as usual
dim g as Graphics = OpenPrinter(p)
g.DrawString "Hello World", 20, 20

```

Notes: And you can use normal graphics class for that.

17.0.179 How to query Spotlight's Last Open Date for a file?

Plugin Version: all, Platform: macOS.

Answer: You can use a MDItemMBS objec to query this value:

Example:

```

Function LastOpenedDate(Extends F As FolderItem, DefaultOtherDates As Boolean = True) As Date
#If TargetMacOS Then
Dim xMDItem as New MDItemMBS(F)
Dim xDate as Variant

If xMDItem <>Nil Then
xDate = xMDItem.GetAttribute(xMDItem.kMDItemLastUsedDate).DateValue
If xDate IsA Date Then Return xDate
Else
If xDate <>Nil Then Break
End If
#EndIf

If DefaultOtherDates Then
If F.ModificationDate <>Nil Then Return F.ModificationDate
If F.CreationDate <>Nil Then Return F.CreationDate
End If
End Function

```

Notes: Thanks for Josh Hoggan for this example code.

17.0.180 How to quit windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
dim i1,i2,r as Integer
declare function ExitWindowsEx lib "user32" (uFlags as Integer, dwReserved as Integer) as Integer
i1 = 2
i2 = 0
r = ExitWindowsEx(i1,i2)
if r<>0 then
' Error()
end if

#endif
```

Notes: uFlags parameters:

```
'4 = EWX_Force
'0 = EWX_Logoff
'2 = EWX_Reboot
'1 = EWX_shutdown, should shut down computer
```

Also check the ExitWindowsMBS method.

17.0.181 How to read a CSV file correctly?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With all the rules for quotes and delimiters, you can simply use the SplitCommaSeparatedValuesMBS method in our plugins like this:

Example:

```
dim f as FolderItem = SpecialFolder.Desktop.Child("test.csv")
dim t as TextInputStream = f.OpenAsTextFile

while not t.EOF
dim s as string = t.ReadLine(encodings.ASCII)

dim items() as string = SplitCommaSeparatedValuesMBS(s, ";", """")
```

```
List.AddRow ""
dim u as Integer = UBound(items)
for i as Integer = 0 to u
List.Cell(List.LastIndex,i) = items(i)
next

wend
```

Notes: Please make sure you choose the right text encoding.

17.0.182 How to read the command line on windows?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
#if targetwin32 then
dim line as string
Dim mem as MemoryBlock

Declare Function GetCommandLineA Lib "kernel32" () As Ptr

mem=GetCommandLineA()
s=mem.cstring(0)

#endif
```

Notes: Newer Xojo versions have a system.commandline property.

17.0.183 How to render PDF pages with PDF Kit?

Plugin Version: all, Platform: Windows.

Answer: Try this code:

Example:

```
// choose a file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")

// open it as PDF Document
dim sourceFile as New PDFDocumentMBS(f)
```

```

if sourceFile.handle <>0 then // it is a PDF file

// get upper bound of pages
dim c as Integer = sourceFile.pageCount-1

// from first to last page
for n as Integer = 0 to c

// pick that page
dim page as PDFPageMBS = sourceFile.pageAtIndex(n)

// render to image
dim p as NSImageMBS = page.Render

// and convert to RB picture and display
Backdrop = p.CopyPictureWithMask

next

end if

```

Notes: PDFKit works only on Mac OS X.

17.0.184 How to restart a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```

dim ae as appleevent
ae=newappleEvent("FNDR","rest","MACS")
if not ae.send then
msgBox "The computer couldn't be restarted."
end if

```

17.0.185 How to resume ftp upload with curl plugin?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: CURL supports that and you simply need to set the right options.

Notes: First of course OptionUpload must be true. Second OptionFTPAppend must be true so the OptionResumeFrom is used. Store there (or in OptionResumeFromLarge) your start value. Don't forget to implement the read event and return data there as requested.

17.0.186 How to rotate a PDF page with CoreGraphics?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: This code opens a PDF and draws the first page into a new PDF with 90° rotation.

Example:

```
// Rotate a PDF page

// our files
dim sourcefile as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
dim destfile as FolderItem = SpecialFolder.Desktop.Child("rotated.pdf")

// open PDF
dim pdf as CGPDFDocumentMBS = sourcefile.OpenAsCGPDFDocumentMBS

// query media size of first page
dim r as CGRectMBS = pdf.MediaBox(1)

// create new PDF
dim c as CGContextMBS = destfile.NewCGPDFDocumentMBS(r,"title","Author","Creator")

// create rotated rectangle
dim nr as new CGRectMBS(0,0,r.Height,r.Width)

// create new page
c.BeginPage nr
c.SaveGState

const pi = 3.14159265

// rotate by 90°
c.RotateCTM pi*1.5

// fix origin
c.TranslateCTM -r.width,0

// draw PDF
c.DrawCGPDFDocument pdf,r,1

// cleanup
c.RestoreGState
c.EndPage
```

```
c = nil

// show in PDF viewer
destfile.Launch
```

Notes: This code is Mac only as it needs CoreGraphics.

17.0.187 How to rotate image with CoreImage?

Plugin Version: all, Platform: macOS.

Answer: Use the code like the one below:

Example:

```
// Rotate image with CoreImage

// load image
dim f as FolderItem = SpecialFolder.Desktop.Child("test.png")
dim image as new CIImageMBS(f)

// rotate 45 degree
dim n as new NSAffineTransformMBS
n.rotateByDegrees(45)

dim TransformFilter as new CIFilterAffineTransformMBS
TransformFilter.inputImage = image
TransformFilter.inputTransform = n

// get result
dim resultImage as CIImageMBS = TransformFilter.outputImage

// for saving to file
dim outputImage as NSImageMBS = resultImage.RenderNSImage(false)

f = SpecialFolder.Desktop.Child("output.png")
dim b as BinaryStream = BinaryStream.Create(f, true)
b.Write outputImage.PNGRepresentation

// as Xojo picture object for display
dim pic as Picture = outputImage.CopyPictureWithMask

Backdrop = pic
```

17.0.188 How to run a 32 bit application on a 64 bit Linux?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Install 32 bit compatibility libraries.

Notes: The package is called ia32-libs for ubuntu (and others).

Some applications need to be run on a 32 bit system as they need some hardware related libraries. Like libUSB or libHID for USB devices.

17.0.189 How to save HTMLViewer to PDF with landscape orientation?

Plugin Version: all, Platform: macOS.

Answer: You can use NSPrintInfoMBS to change the options for PrintToPDFFile function.

Example:

```
// make it landscape
dim n as NSPrintInfoMBS = NSPrintInfoMBS.sharedPrintInfo
n.orientation = n.NSLandscapeOrientation

// save html to file
dim f as FolderItem = SpecialFolder.Desktop.Child("test.pdf")
call HTMLViewer1.PrintToPDFFileMBS(f,10,30,10,30)
```

Notes: You may want to reset options later.
This code is only for Mac OS X.

17.0.190 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: With NSTextViewMBS you can use this code to save to RTFD:

Example:

```
// save text as RTFD including image attachments
dim f as FolderItem = GetSaveFolderItem(FileTypes1.ApplicationRtfd, "test.rtf")

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 underlying NSTextViewMBS object via TextArea.NSTextViewMBS method.

17.0.191 How to save RTFD?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: How to load PDF to htmlviewer on desktop?

Example:

```

Public Sub LoadPDFData(viewer as HTMLViewer, PDFData as string)
Dim base64string As String = EncodeBase64(PDFData)

// remove line endings to make it a big line
base64string = ReplaceLineEndings(base64string, "")

// build data URL
// https://en.wikipedia.org/wiki/Data_URI_scheme
Dim dataURL As String = "data:application/pdf;base64," + base64string

// show in webviewer
HTMLViewer1.LoadURL(dataURL)

// may not work everywhere due to URL length limit
// for Web projects, use WebFile instead!
End Sub

```

Notes: This avoids a temporary file, which may also work.
For Web Apps, please use WebFile.

17.0.192 How to scale a picture proportionally with mask?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportionalScaledWithMask(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// check if we have a mask and clear it
dim m as picture = pic.mask(False)
pic.mask = nil

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

if m <>nil then
// restore mask and scale it
pic.mask = m
NewPic.mask.Graphics.DrawPicture m, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height
end if

// return result
Return NewPic
End Function

```

Notes: This version handles mask. As you see we actually have to remove mask in order to copy the picture part correctly.

17.0.193 How to scale a picture proportionally?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: For a proportional scaling, we calculate the new picture size relative to the target maximum size.

Example:

```

Function ProportionalScaled(extends pic as Picture, Width as Integer, Height as Integer) As Picture
// Calculate scale factor

dim faktor as Double = min( Height / Pic.Height, Width / Pic.Width)

```

```

// Calculate new size
dim w as Integer = Pic.Width * faktor
dim h as Integer = Pic.Height * faktor

// create new picture
dim NewPic as new Picture(w,h,32)

// draw picture in the new size
NewPic.Graphics.DrawPicture Pic, 0, 0, w, h, 0, 0, Pic.Width, Pic.Height

// return result
Return NewPic
End Function

```

Notes: This does not handle mask, but you can scale the mask the same way and assign it to the new picture.
(see other FAQ entry with mask)

17.0.194 How to scale/resize a CIIImageMBS?

Plugin Version: all, Platform: Windows.

Answer: Use the CIFilterLanczosScaleTransform filter to scale down a picture to a specific size.

Example:

```

Dim pic As Picture = LogoMBS(500)
Dim image As CIIImageMBS = CIIImageMBS.imageWithPicture(pic)

Dim filter As New CIFilterLanczosScaleTransformMBS

Const targetWidth = 600.0
Const targetHeight = 400.0

Dim scale As Double = targetHeight / image.Extent.Height
Dim aspect As Double = targetWidth / (image.Extent.Width * scale)

filter.inputImage = image
filter.inputScale = scale
filter.inputAspectRatio = aspect

Dim result As Picture = filter.outputImage.RenderPicture

Backdrop = result

```

Notes: This is same code as our scaleTo convenience method.

17.0.195 How to scale/resize a picture?

Plugin Version: all, Platform: Windows.

Answer: There are several ways to scale or resize a picture. The easiest way may be the ScaleMBS function in the Picture class.

Example:

```
dim Original,Scaled as Picture
```

```
Original=LogoMBS(500)
Scaled=Original.ScaleMBS(100,100,true)
```

Notes: The plugin ways:

- GraphicsMagick can scale/resize.
- CoreImage scale filter may result in the fastest and best images on Mac OS X 10.4.
- NSImageMBS can scale, but is Mac OS X only.
- CGImageMBS can scale, but is Mac OS X only.
- CIImageMBS can scale, but is Mac OS X only.
- QuickTime Graphics exporter and importer can be connected to scale. (this was used more often a few years ago)
- ImageMagick can scale very nice and crossplatform. But the ImageMagick libraries are big.
- The picture.ScaleMBS function is self written and results in equal output on Mac, Windows and Linux without any additional libraries installed.
- Picture.ScalingMBS does crossplatform scaling with several modes.

with pure Xojo:

- make a new picture and draw the old one with new size inside.

17.0.196 How to search with regex and use unicode codepoints?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can specify unicode characters in search string with backslash x and digits.

Example:

```
dim r as RegExMbs
dim s as string
dim c as Integer
```

```

s="123 √√√° ABC 456"

r=new RegExMBS
if r.Compile("√.") then
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

r=new RegExMBS
if r.Compile("\xF6.") then // finds √ using Unicode codepoint
c=r.Execute(s,0)
MsgBox str(c)+" "+str(r.Offset(0))+" "+str(r.Offset(1))
// shows: 1 4 10
// 1 for ubound of the offset array
// 4 for 4 bytes before the matched pattern
// 10 for the 10 bytes before the end of the matched pattern
end if

```

17.0.197 How to see if a file is invisible for Mac OS X?

Plugin Version: all, Platform: macOS.

Answer: Try this function:

Example:

```

Function Invisible(F As FolderItem) As Boolean
Dim TIS As TextInputStream
Dim S,All As String
Dim I as Integer
dim g as folderitem

If Left(F.Name,1)="." or not f.visible Then
Return True
End If

g=F.Parent.Child(".hidden")
If g.Exists Then
TIS=g.OpenAsTextFile
if tis<>Nil then
All=TIS.ReadAll
For I=1 to CountFields(All,Chr(11))
S=NthField(All, Chr(11), I)

```

```

If S=F.name Then
Return True
End If
Next
end if
End if
End Function

```

17.0.198 How to set cache size for SQLite or REALSQLDatabase?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You use the pragma cache_size command on the database.

Example:

```

// set cache size to 20000 pages which is about 20 MB for default page size
dim db as REALSQLDatabase
db.SQLExecute "PRAGMA cache_size = 20000"

```

Notes: Default cache size is 2000 pages which is not much.

You get best performance if whole database fits in memory.

At least you should try to have a cache big enough so you can do queries in memory.

You only need to call this pragma command once after you opened the database.

17.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

Answer: Try this declares:

Example:

```

window1.ModifiedMBS=true

```

17.0.200 How to show a PDF file to the user in a Web Application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use a WebHTMLViewer control and load the

Example:

```

dim CurrentFile as WebFile // a property of the WebPage

// define the PDF file
CurrentFile = new WebFile
CurrentFile.Filename = "test.pdf"
CurrentFile.MIMEType = "application/pdf"
CurrentFile.Data = "some pdf data" // MyDynaPDF.GetBuffer

// load into html viewer
HTMLViewer1.URL = CurrentFile.URL

```

Notes: See our Create PDF example for the Xojo Web Edition.

17.0.201 How to show Keyboard Viewer programmatically?

Platform: macOS.

Answer: Use Xojo or AppleScript to launch the KeyboardViewerServer.app.

Example:

```

dim a as new AppleScriptMBS
dim text as string
dim lines(-1) as string

lines.append "set theApplication to ""KeyboardViewerServer""
lines.append "set thePath to ""/System/Library/Components/KeyboardViewer.component/Contents/Shared-
Support/KeyboardViewerServer.app""
lines.append ""
lines.append "set POSIXPath to ((POSIX file thePath) as string)"
lines.append "tell application ""System Events"" to set isRunning to 0 <(count (application processes whose
name is theApplication))"
lines.append "if isRunning then tell application POSIXPath to quit"
lines.append "delay 0.15"
lines.append ""
lines.append "ignoring application responses"
lines.append " tell application POSIXPath to run"
lines.append "end ignoring"

text=join(lines,EndOfLine.macintosh)

a.Compile text
a.Execute

```

Notes: AppleScript code:

```
set theApplication to "KeyboardViewerServer"
set thePath to "/System/Library/Components/KeyboardViewer.component/Contents/SharedSupport/KeyboardViewerServer.app"
```

```
set POSIXPath to ((POSIX file thePath) as string)
tell application "System Events" to set isRunning to 0 <(count (application processes whose name is theApplication))
if isRunning then tell application POSIXPath to quit
delay 0.15
```

```
ignoring application responses
tell application POSIXPath to run
end ignoring
```

17.0.202 How to show the mouse cursor on Mac?

Plugin Version: all, Platform: macOS.

Answer: Try this declare:

Example:

```
Declare Sub ShowCursor Lib "Carbon" ()
```

```
ShowCursor
```

Notes: The MBS Plugin has this function and supports it on Windows, too.

17.0.203 How to shutdown a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR", "shut", "MACS")
if not ae.send then
msgBox "The computer couldn't be shutdown."
end if
```

Notes: Or toolbox call (Attention: This method will stop the computer immediatly: No document asked to be saved, all applications quitting without knowing).

```
Declare Sub ShutDwnPower Lib "Carbon" ()
ShutDwnPower
```

17.0.204 How to sleep a Mac?

Plugin Version: all, Platform: macOS.

Answer: Ask the Finder via Apple Events:

Example:

```
dim ae as appleevent
ae=newappleEvent("FNDR","slep","MACS")
if not ae.send then
msgBox "The computer doesn't want to sleep."
end if
```

17.0.205 How to speed up rasterizer for displaying PDFs with DynaPDF?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Here a few speed tips:

Notes:

- Use the DynaPDFRasterizerMBS function instead of our render functions.
- Reuse DynaPDFRasterizerMBS as long as the target picture size doesn't change.
- Import only the PDF pages you want to display.
- Let DynaPDF do zooming, rotating or other effects instead of you change it.

17.0.206 How to use PDFLib in my RB application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The PDFlib plugin was discontinued in favor of our DynaPDF plugin.

Notes: If you need help to move, please contact us.

17.0.207 How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Just double them.

Example:

```
msgbox "This String contains ""quotes"""
```

17.0.208 How to use Sybase in Web App?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use our MBS Xojo SQL Plugin to connect to a Sybase Database in your web application.

Notes: If you see db.Connect giving the error message "cs_ctx_alloc ->CS_MEM_ERROR", than some things are not setup right for Sybase.

The Apache process may not have all the SYBASE environment variables being set when the CGI was launched.

Adding these lines to /etc/httpd/conf/httpd.conf stopped the faux memory errors for us:

```
SetEnv LD_LIBRARY_PATH /opt/sybase/OCS-15_0/lib:/opt/sybase/OCS-15_0/lib3p64:/opt/sybase/OCS-15_0/lib3p:
SetEnv SYBROOT /opt/sybase
SetEnv SYBASE_OCS /opt/sybase
SetEnv SYBASE /opt/sybase
```

17.0.209 How to use the Application Support folder?

Plugin Version: all, Platform: macOS.

Answer:

I was saving a registration code for an app to the Preference folder. People on the list have suggested that it would be better in the ApplicationSupportFolder. How do I save the file called CWWPrefs into that folder using MBS?

I have checked for examples and the docs but can't see how to apply it

```
//f = SpecialFolder.Preferences.child("CWWPrefs")
f = ApplicationSupportFolderMBS(-32768)
```

Example:

```

dim folder,file as FolderItem

folder = createApplicationSupportFolderMBS(-32763)

if folder=nil then
// Some very old Mac OS Versions may not support it
// or the plugin may fail for any reason
folder=SpecialFolder.Preferences
end if

file=folder.Child("CWWPrefs")

MsgBox file.NativePath

```

Notes:

You may not be able to write there with a normal user account!

17.0.210 How to use the IOPMCopyScheduledPowerEvents function in Xojo?

Plugin Version: all, Platform: macOS.

Answer: You can use the following code which does this using the SoftDeclareMBS class.

Example:

```

Sub Open()
dim c as CFDateMBS
dim t as CFAbsoluteTimeMBS

// get current date
c=NewCFDateMBS

// in absolute time (seconds since x)
t=c.AbsoluteTime

// add 600 seconds (= 10 Minutes)
t.Value=t.Value+600

// Make a Date from it
c=t.Date

// Schedule the event
// 0 on success
// E00002C1 for missing root rights

```

```

Title=hex(schedulePowerEvent(c, "wake"))

// Just for information, display the scheduled stuff
CFShowMBS CopyScheduledPowerEvents
End Sub

Function CopyScheduledPowerEvents() As carrayMBS
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 CFDictionaryes
'* returned by IOPMCopyScheduledPowerEvents().
'*/
'/*!
'@define kIOPMAutoWake
'@abstract Value for scheduled wake from sleep.
'*/
'#define kIOPMAutoWake "wake"
,
'/*!
'@define kIOPMAutoPowerOn
'@abstract Value for scheduled power on from off state.

```

```

*/
#define kIOPMAutoPowerOn "poweron"
,
/*!
#define kIOPMAutoWakeOrPowerOn
@abstract Value for scheduled wake from sleep, or power on. The system will either wake OR
power on, whichever is necessary.
*/
,
#define kIOPMAutoWakeOrPowerOn "wakepoweron"
/*!
#define kIOPMAutoSleep
@abstract Value for scheduled sleep.
*/
,
#define kIOPMAutoSleep "sleep"
/*!
#define kIOPMAutoShutdown
@abstract Value for scheduled shutdown.
*/
,
#define kIOPMAutoShutdown "shutdown"

s=new SoftDeclareMBS

if s.LoadLibrary("IOKit.framework") then
if s.LoadFunction("IOPMSchedulePowerEvent") then

m=NewMemoryBlock(12)
m.Long(0)=time_to_wake.handle
m.Long(4)=0 // nil
m.Long(8)=type.Handle

if s.CallFunction(3,m) then
Return s.Result
end if
end if
end if

End Function

```

Notes: Requires Mac OS X and to execute root rights.

17.0.211 How to validate a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use this function below which uses a regular expression to verify that the string is a valid UUID/GUID:

Example:

Function IsGUID(guid as string) As Boolean

dim r as new RegEx

```
r.SearchPattern = "^(\{ 0,1 } ( [ 0-9a-fA-F ] ) { 8 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 4 } -( [ 0-9a-fA-F ] ) { 12 } \} { 0,1 } )$ "
```

Return r.Search(guid)<>nil

End Function

Notes: Simply parsing the GUID with CFUUIDMBS does not give the same result as CFUUIDMBS will also take a string like "DDDD".

17.0.212 How to walk a folder hierarchie non recursively?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Use code like this one:

Example:

Sub Walk(folder as FolderItem)

dim folders() as FolderItem

folders.Append folder

while UBound(folders)>=0

dim currentFolder as FolderItem = folders.pop

dim c as Integer = currentFolder.Count

for i as Integer = 1 to c

dim item as FolderItem = currentFolder.TrueItem(i)

if item = Nil then

// no permission

elseif item.Visible then // only visible

if item.Directory then

folders.Append item

```
else
// work with file here
end if

end if

next

wend
End Sub
```

Notes: As you see we go with a long loop which runs until we don't have more folders to process. We ignore items we can't access due to permission limits. And we only work visible items. If you like, check `folderitem.isBundleMBS` on item to handle packages and applications better on Mac OS X.

17.0.213 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS

Plugin Version: all, Platform: macOS.

Answer: The plugins MacOSX and MacOSXCF belong together. If you use one part, please also install the other part.

Notes: We splitted the plugin because the Xojo IDE on Windows crashed on compilation.

17.0.214 I registered the MBS Plugins in my application, but later the registration dialog is shown.

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: There are two main reasons.

Notes: 1. you may use the plugin before registering them. This is often the case if you register in a window open event and use the plugin in a control open event.

On the console on Mac OS X or Windows, you may see a message like this "MBS Plugins were used by the application before the RegisterMBSPlugin function was called. Please fix this in your code!".

2. you may have mixed different plugin versions which are not compatible.

In this case you can see a message "Internal plugin registration error." on the console on Mac OS X. Newer plugins may show a message dialog reporting this. Older version simply think they are not registered.

If the installer just merges old and new applications, users may have libraries of older and newer plugin versions in the libs folder. If your application loads the wrong version, the registration fails.

If you use remote debugging, make sure you clear the temporary files there, too. Otherwise you may have old DLLs on your hard disc which may disturb your application.

You can run into issues if you use your registration code on different places of your app. Please register only once in app.open (or app Constructor). If you have several codes, simply call them one after the other.

Also check that you only call RegisterMBSPlugin with valid serial number. If you later call RegisterMBSPlugin with Demo like in example code above, you remove the license.

Next check if you can clear the Xojo caches and that helps. This includes the Xojo Scratch folder and the Plugins & Project caches. Simply locate those folders and delete them. For Windows look in hidden AppData folder in your user folder. For Mac, please check textasciitilde /Library/Caches and your temp folders.

Finally make sure you use the right serial number. Not an older one or a misspelled one.

17.0.215 I want to accept Drag & Drop from iTunes

Plugin Version: all, Platform: macOS.

Answer: You need to accept AcceptMacDataDrop "itun" and Handle the DropObject.

Example:

```
Sub Open()
window1.AcceptMacDataDrop "itun"
End Sub
```

```
Sub DropObject(obj As DragItem)
dim s as string
dim f as folderItem
dim d as CFDictionaryMBS
dim o as CFObjectMBS
dim key as CFStringMBS
dim dl as CFDictionaryListMBS
dim i,c as Integer
dim u as CFURLMBS
dim file as FolderItem
```

```
if obj.MacDataAvailable("itun") then
s = obj.MacData("itun")
```

```
// Parse XML
o=NewCFObjectMBSFromXML(NewCFBinaryDataMBSStr(s))

// Make dictionary
if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

// get Tracks Dictionary
key=NewCFStringMBS("Tracks")
o=d.Value(key)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)
dl=d.List

// Walk over all entries in the Tracks dictionary
c=dl.Count-1
for i=0 to c
o=dl.Value(i)

if o isa CFDictionaryMBS then
d=CFDictionaryMBS(o)

key=NewCFStringMBS("Location")
o=d.Value(key)
if o isa CFStringMBS then
u=NewCFURLMBS CFStringMBS(o),nil

file=u.file
if file<>nil then
MsgBox file.NativePath
end if
end if
end if
next
end if
end if
end if
End Sub
```

Notes: The code above inside a window on Xojo 5.5 with MBS Plugin 5.3 will do it nice and show the paths.

17.0.216 I'm drawing into a listbox but don't see something.

Plugin Version: all.

Answer: If you draw this in a listbox cellbackground, you need to draw on the correct position

Example:

```
Function CellBackgroundPaint(g As Graphics, row as Integer, column as Integer) As Boolean
dim f as FolderItem
f=SpecialFolder.Desktop
f.DrawWideIconMBS(g,listbox1.left,listbox1.top+row*20,16)
Return true
End Function
```

Notes: Try this in a listbox. The Graphics object there has a clipping and an offset which the plugin doesn't know about.

17.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen.

Platform: macOS.

Answer:

The code I produced in RB isn't smooth enough. Is there a call in MBS, if not, can it be done? The speed of it has to be like the show of a DrawerWindow.

Try the declare below for Carbon. With WindowLib it will work on Mac OS 8.5 and newer.

Notes:

See Window.Transition functions.

17.0.218 If I use one of your plug-ins under windows, would this then impose the use of dll after compilation or my would my compiled soft still be a stand-alone single file software?

Platforms: macOS, Linux, Windows.

Answer: Stand alone.

Notes: Xojo compiles all used plugins into the application binary.

Some plugin parts need external dlls but you will find that in the documentation. (e.g. pdfib for some classes)

17.0.219 Is the fn key on a powerbook keyboard down?

Plugin Version: all, Platform: macOS.

Answer: I am unable to figure out how or if it is possible to detect if the fn key is down on a powerbook keyboard. Is it possible?

Example:

' Window.Open Event of a blank project:

```
dim i as Integer

for i=0 to 127
if keyboard.asynckeydown(i) then
title=str(i) // found
return
end if
next
title="" // not found
```

Notes: This test application shows the keycode (decimal) 63 for the fn key.

17.0.220 Is there a case sensitive Dictionary?

Plugin Version: all.

Answer: The MBS Plugin has several classes which can work as a replacement.

Notes: First you could use VariantToVariantHashMapMBS or VariantToVariantOrderedMapMBS.

If you know that all keys are Strings or Integers only, you can use the specialized classes which are a little bit faster due to avoiding variants:

```
IntegerToIntegerHashMapMBS class
IntegerToIntegerOrderedMapMBS class
IntegerToStringHashMapMBS class
IntegerToStringOrderedMapMBS class
IntegerToVariantHashMapMBS class
IntegerToVariantOrderedMapMBS class
StringToStringHashMapMBS class
StringToStringOrderedMapMBS class
StringToVariantHashMapMBS class
StringToVariantOrderedMapMBS class
```

17.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can use the DirectorySizeMBS class for this as in the example below:

Example:

```
dim d as DirectorySizeMBS

d=new DirectorySizeMBS

// volume(1) as my boot volume is very full
if d.update(volume(1),true,0) then
MsgBox str(d.VisibleItemCount)+" visible items, "+str(d.HiddenItemCount)+" invisible items."
end if
```

Notes: Complete Question: Is there a way to use the MBS plugin to get only the visible item and folder count on a volume? The FileCount and FolderCount properties of VolumeInformationMBS seem to provide the total # of items including invisible items such as .DS_Store and more importantly .Trashes which is causing me a great amount of difficulty during a recursive scan of a volume. I've got a progress bar which uses the total of the filecount and foldercount properties as the maximum value, but my routine needs to filter out all invisible items, as it is creating a catalog of a volume for archiving purposes. Any thoughts how I could get accurate number.

17.0.222 Is there an easy way I can launch the Displays preferences panel?

Plugin Version: all, Platform: macOS.

Answer: Use the code below:

Example:

```
dim error as Integer

error=OpenMacOSXPreferencesPaneMBS("Displays")
if error<>0 then
MsgBox "Failed to launch QuickTime System Preferences panel."
end if
```

17.0.223 List of Windows Error codes?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We have a list of windows error codes on our website.

Notes: <http://www.monkeybreadsoftware.de/xojo/winerror.shtml>

17.0.224 Midi latency on Windows problem?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: The issue is system related, not a problem with RB or the plugin.

Notes: Two things will adversely affect the timing:

(1) latency of the software synthesizer output driver. The default Windows wavetable synthesizer has considerable latency. I don't know how many milliseconds, but it is noticeable.

(2) latency of the digital audio output driver. Different systems have different drivers for different audio hardware. My Dell laptop has a minimum 15ms latency in the audio driver.

These two things put together were causing a very sluggish MIDI response. I was able to verify these as the culprits by routing MIDI directly out of RB into a sample player, which only introduces the latency of (2) and does not include latency of (1).

I don't know how widely known are these facts, if not then you may want to add this information to the documentation, since Windows programmers using the MIDI plugin may not know those problems, and might mistakenly blame your plugin, as I did :) Sorry about that!

(From Aaron Andrew Hunt)

17.0.225 My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

Answer: Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:

Notes: Just a list of checks to do for linux apache installations:

- You have 64bit linux? Then you need 32 bit compatibility libraries.
- The folder of your app is writable? Set permissions to 777.
- The cgi script is executable? Set permissions to 755.

- The app file itself is executable? Set permissions to 755.
- You uploaded cgi file as text, so it has unix line endings? (this often gives error "Premature end of script headers" in apache log)
- You uploaded config.cfg file and made it writable? Set permissions to 666.
- Your apache allows execution of cgi scripts? You enabled cgi for apache and uncommented addhandler command for CGI on a new apache installation?
- You uploaded the app file and libraries as binary files? Upload as text breaks them.
- You did upload the libs folder?
- You don't have code in app.open, session.open and other events which crashes app right at launch?
- You don't have a print command in your app.open event? (see feedback case 23817)
- You allowed htaccess file to overwrite permissions?

17.0.226 SQLiteDatabase not initialized error?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Before you can use SQLiteDatabaseMBS, it must be initialized.

Example:

```
dim d as new SQLiteDatabaseMBS
```

Notes: This happens normally when you use "new SQLiteDatabaseMBS".

But if you just have a SQLConnectionMBS and get a recordset there, the initialization may not have happened, yet.

So please simply add a line "dim d as new SQLiteDatabaseMBS" to your app.open code after registration, so the plugin part can initialize and late provide recordsets.

17.0.227 Textconverter returns only the first x characters. Why?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Some older Xojo versions limit the Textconverter to around 1024 characters in input and output. This should be fixed with RB5.

Notes:

Xojo seems not to support Textconverters at all on Windows.

17.0.228 The type translation between CoreFoundation/Foundation and Xojo data types.

Plugin Version: all, Platform: macOS.

Answer: The plugin does conversion between Cocoa/Carbon data types and native Xojo data types. The following list help you knowing what the current plugins support:

Notes: Cocoa NSObject to Variant:

```

nil ->nil
NSDictionary ->Dictionary
NSData ->MemoryBlock
NSString ->String
NSAttributedString ->NSAttributedStringMBS
NSDate ->Date
NSNumber ->double/integer/Int64/UInt64/UInt32/Boolean
NSURL ->String
NSValue with NSRect ->NSRectMBS
NSValue with NSPoint ->NSPointMBS
NSValue with NSSize ->NSSizeMBS
NSValue with NSRange ->NSRangeMBS
NSValue with QTTime ->QTTimeMBS
NSValue with QTTimeRange ->QTTimeRangeMBS
NSArray ->Array of Variant
QuartzFilter ->QuartzFilterMBS

```

- ->*MBS

Variant to Cocoa NSObject:

```

nil ->nil
Dictionary ->NSDictionary
Boolean ->NSNumber
Integer ->NSNumber
Color ->NSColor
Int64 ->NSNumber
Single ->NSNumber
Double ->NSNumber
Date ->NSDate
MemoryBlock ->NSData
String ->NSString
NSImageMBS ->NSImage
NSAttributedStringMBS ->NSAttributedString
NSColorMBS ->NSColor
NSRectMBS ->NSValue with NSRect
NSSizeMBS ->NSValue with NSSize

```

NSPointMBS ->NSValue with NSPoint
 NSRangeMBS ->NSValue with NSRange
 NSBurnMBS ->NSBurn
 NSViewMBS ->NSView
 NSFontMBS ->NSFont
 NSParagraphStyleMBS ->NSParagraphStyle
 NSAttributedStringMBS ->NSAttributedString
 WebPolicyDelegateMBS ->WebPolicyDelegate
 WebUIDelegateMBS ->WebUIDelegate
 WebFrameLoadDelegateMBS ->WebFrameLoadDelegate
 WebResourceLoadDelegateMBS ->WebResourceLoadDelegate
 NSIndexSetMBS ->NSIndexSet
 QTTimeMBS ->QTTime
 QTTimeRangeMBS ->QTTimeRange
 Array of Variant ->NSArray
 Array of String ->NSArray
 CFStringMBS ->NSString
 CFNumberMBS ->NSNumber
 CFDataMBS ->NSData
 CFURLMBS ->NSURL
 CFArrayMBS ->NSArray
 CFDictionaryMBS ->NSDictionary
 CFBinaryDataMBS ->NSData

Carbon CTypeRef 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 CTypeRef:

Dictionary ->CFDictionaryRef
 Boolean ->CFBooleanRef
 Color ->CFNumberRef
 Integer ->CFNumberRef

Int64 ->CFNumberRef
Single ->CFNumberRef
Double ->CFNumberRef
String ->CFStringRef
Color ->CGColorRef
Date ->CFDateRef
nil ->nil
Memoryblock ->CFDataRef
FolderItem ->CFURLRef
Dictionary ->CFDictionaryRef
Array of Variant/String/Date/Double/Single/Int64/Integer ->CFArray
CGRectMBS ->CGRect as CFDataRef
CGSizeMBS ->CGSize as CFDataRef
CGPointMBS ->CGPoint as CFDataRef
CGColorMBS ->CGColor
CGColorSpaceMBS ->CGColorSpace
CGImageMBS ->CGImage
CGDataConsumerMBS ->CGDataConsumer
CGDataProviderMBS ->CGDataProvider
CF*MBS ->CF*

Strings without encodings should be put into dictionaries as memoryblocks.

17.0.229 Uploaded my web app with FTP, but it does not run on the server!

Plugin Version: all, Platform: Windows.

Answer: If you see errors like a simple "Segmentation Fault" on Linux or some other wired errors, you may want to check your FTP upload mode. It must be binary for web apps. ASCII mode corrupts the application.

17.0.230 What classes to use for hotkeys?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use CarbonHotKeyMBS class on Mac and WindowsKeyFilterMBS on Windows.

Notes: CarbonHotKeyMBS will also work fine in Cocoa apps.

17.0.231 What do I need for Linux to get picture functions working?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: In order to get our plugins working on Linux systems without GUI, the plugin loads graphics

libraries dynamically.

Notes: To get it working, the plugin tries to load gtk with this paths:

- libgtk-x11-2.0.so”
- libgtk-x11-2.0.so.0”
- /usr/lib/libgtk-x11-2.0.so”
- /usr/lib32/libgtk-x11-2.0.so”
- /usr/lib/libgtk-x11-2.0.so.0”
- /usr/lib32/libgtk-x11-2.0.so.0”

gdk is loaded with this paths:

- libgdk-x11-2.0.so”
- libgdk-x11-2.0.so.0”
- /usr/lib/libgdk-x11-2.0.so”
- /usr/lib32/libgdk-x11-2.0.so”
- /usr/lib/libgdk-x11-2.0.so.0”
- /usr/lib32/libgdk-x11-2.0.so.0”

For the paths without explicit path, the system will search in /lib, /usr/lib and all directories in the LD_LIBRARY_PATH environment variable.

17.0.232 What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

17.0.233 What font is used as a 'small font' in typical Mac OS X apps?

Plugin Version: all, Platform: macOS.

Answer:

Xojo 4.5 has a constant "SmallSystem" to use for a font name.

For older versions try this code:

Example:

```

Sub GetThemeFont(fontType as Integer, ByRef fontName as String, ByRef fontSize as Integer, ByRef
fontName as Integer)
dim err as Integer
dim theFont, theFontSize, theFontStyle as MemoryBlock

const smSystemScript = -1

Declare Function GetThemeFont Lib "Carbon" (inFontID as Integer, inScript as Integer, outFontName
as Ptr, outFontSize as Ptr, outStyle as Ptr) as Integer

theFont = NewMemoryBlock(256) //Str255
theFontSize = NewMemoryBlock(2) //SInt16
theFontStyle = NewMemoryBlock(1) //Style

err = GetThemeFont(fontType, smSystemScript, theFont, theFontSize, theFontStyle)

if err = 0 then
fontName = theFont.PString(0)
fontSize = theFontSize.UShort(0)
fontStyle = theFontStyle.Byte(0)
else
fontName = ""
fontSize = 0
fontStyle = 0
end if
End Sub

```

17.0.234 What is last plugin version to run on Mac OS X 10.4?

Plugin Version: all, Platform: Windows.

Answer: Last Version with 10.4 support is version 15.4.

Notes: With version 15.4 you can build applications for OS X 10.4 and newer.

For Version 16.0 we disabled 10.4 and moved minimum to 10.5. We may be able to enable it again to build a version of 16.x, but may need to charge for this by hour.

17.0.235 What is last plugin version to run on PPC?

Plugin Version: all, Platform: Windows.

Answer: Last Version with PPC is 15.4.

Notes: With version 15.4 you can build PPC applications for OS X 10.4 and newer.

For Version 16.0 we disabled PPC. We may be able to enable it again to build a PPC version of 16.x, but may need to charge for this by hour.

17.0.236 What is last version of the plugins for macOS 32-bit?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use version 23.0 or older.

Notes: We stopped including 32-bit code for macOS in version 23.1. Please use older versions if you use an old Xojo.

Xojo 2017r3 and newer load our 64-bit plugins.

17.0.237 What is the difference between Timer and WebTimer?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Timer is server side and WebTimer client side.

Notes: Timer is the normal timer class in Xojo. It runs on the server. On the client side the WebTimer runs on the client. It triggers a request to the server to perform the action. So a WebTimer is good to keep the connection running and the website updated regularly. A timer on the server is good to make regular jobs like starting a database backup every 24 hours.

17.0.238 What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Below a list of function names known by LibXL.

Notes: LibXL parses the functions and writes tokens to the excel file. So even if Excel can do more functions, we can only accept the ones known by LibXL.

ABS, ABSREF, ACOS, ACOSH, ACTIVE.CELL, ADD.BAR, ADD.COMMAND, ADD.MENU, ADD.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, REFTTEXT, 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.

17.0.239 What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

Answer: Use the SoftDeclareMBS class to load libraries dynamically.

17.0.240 What to do on Xojo reporting a conflict?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

I get an error like "This item conflicts with another item of the same name" when using one of the plugin functions.

Xojo just wants to tell you that you dropped something in the plugins folder what is not a plugin.

Notes:

Some users dropped the examples, the documentation or other files into the plugins folder. Don't do it.

17.0.241 What to do with a NSImageCacheException?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You need to add exception handlers for NSExcptionMBS in order to catch this exception.

Notes: You may also add code to write the stack of the exception into a log file for later locating the error source.

A NSImage has several image representations in memory. So basicly you pass in the base image and for whatever size an image is needed, the NSImage class will create a cache image representation of the requested size so on the next query it can use that cache for the same requested size.

17.0.242 What to do with MySQL Error 2014?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: You can get this error on MySQL if you have a recordset open while you create another one.

17.0.243 What to do with SQL Plugin reporting Malformed string as error?

Plugin Version: all, Platform: macOS.

Answer: Please make sure the table and/or database fields have a text encoding set.

Notes: For Firebird our plugin tries to use UTF-8 encoding if possible and to correctly convert between various tables, the tables and their fields need to have a text encoding defined.

e.g. if the text field in the table is windows-1252 and the other ISO 8859-5, then the Firebird database can convert them to UTF-8 and deliver texts to the plugin.

If encoding is set to none, it may get confused for non-ascii text.

17.0.244 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetActiveDisplayList.

17.0.245 Where is CGGetDisplaysWithPointMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithPoint.

17.0.246 Where is CGGetDisplaysWithRectMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetDisplaysWithRect.

17.0.247 Where is CGGetOnlineDisplayListMBS?

Plugin Version: all, Platform: Windows.

Answer: This is now CGDisplayMBS.GetOnlineDisplayList.

17.0.248 Where is GetObjectClassNameMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Please use this replacement method:

Example:

```
Function GetObjectClassNameMBS(o as Object) As string
dim t as Introspection.TypeInfo = Introspection.GetType(o)
Return t.FullName
End Function
```

Notes: GetObjectClassNameMBS was removed from the plugins.

17.0.249 Where is NetworkAvailableMBS?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: We removed NetworkAvailableMBS some versions ago. It was not working right and basically it's not useful. If you want to check whether you have a network, than do a DNS resolve:

Example:

```

// two independent domain names
const domain1 = "www.google.com"
const domain2 = "www.macsw.de"

// resolve IPs
dim ip1 as string = DNSNameToAddressMBS(Domain1)
dim ip2 as string = DNSNameToAddressMBS(Domain2)

// if we got IPs and not the same IPs (error/login pages)
if len(ip1)=0 or len(ip2)=0 or ip1=ip2 then
MsgBox "no connection"
else
MsgBox "have connection"
end if

```

Notes: This way you can detect whether you got something from DNS. And you can make sure that a DNS redirection to a login page won't catch you.

17.0.250 Where is StringHeight function in DynaPDF?

Plugin Version: all, Platform: Windows.

Answer: Use the function GetFTextHeight or GetFTextHeightEx.

Notes: Be aware that GetFTextHeight works with format commands and you may want to escape your text if you don't use them.

17.0.251 Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

Answer: This class has been removed in favor of XLBookMBS class.

Notes: This classes have been removed XLSCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

17.0.252 Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

Please visit this web page:

<http://www.wotsit.org>

17.0.253 Where to register creator code for my application?

Plugin Version: all, Platform: macOS.

Answer:

Register at Apple:

<http://developer.apple.com/dev/cftype/information.html>

17.0.254 Which Mac OS X frameworks are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some frameworks from Mac OS X do not support 32 bit applications, so we can't provide plugins for Xojo until 64bit target is available.

Notes: For Mac OS X 10.8:

- Accounts
- EventKit
- GLKit
- Social

and in 10.9:

- Accounts
- AVKit
- EventKit
- GameController
- GLKit
- MapKit
- MediaLibrary
- Social
- SpriteKit

In general Apple makes all new frameworks being 64 bit only.

17.0.255 Which plugins are 64bit only?

Plugin Version: all, Platform: macOS.

Answer: Some of our plugins work only in 64 bit modes as operation systems do not provide 32 bit code.

Notes: This effects currently: EventKit, Accounts, Social frameworks from Apple and our matching plugins.

17.0.256 Why application doesn't launch because of a missing ddraw.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install DirectX from Microsoft on your Windows.

17.0.257 Why application doesn't launch because of a missing shlwapi.dll!?

Plugin Version: all, Platform: Windows.

Answer: Some RB versions require that you install the Internet Explorer from Microsoft on your Windows.

Notes: This bug is for several older Windows 95 editions.

17.0.258 Why do I hear a beep on keydown?

Plugin Version: all, Platform: Windows.

Answer: When the user presses a key, RB goes through all keydown event handlers till on returns true.

Notes: If no keydown event handler returns true for the key, a beep is performed.

17.0.259 Why does folderitem.item return nil?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer: Because Xojo fails to make a folderitem for you. Reason may be an alias file which can't be resolved or simply that you don't have enough access rights to read the folder content.

Notes: A more rarely reason is that the directory changed and the file with the given index or name does no longer exist.

17.0.260 Why doesn't showurl work?

Plugin Version: all, Platforms: macOS, Linux, Windows.

Answer:

There are three main reasons:

1. showurl is not supported by Xojo in 68k applications.
2. there is now application defined for the protocol (e.g. http) in the Internet Control panel.
3. You don't have Internet Config installed.

You can use the InternetConfigMBS class to check for this stuff.

17.0.261 Why don't the picture functions not work on Linux?

Plugin Version: all, Platform: macOS.

Answer: Please make sure libcairo is installed.

Notes: For accessing pictures on Linux, the MBS Plugin relays on the cairo library.

Please install the package if you don't have it already.

Our plugin looks for library called libcairo.so or libcairo.so.2.

17.0.262 Why have I no values in my chart?

Plugin Version: all, Platforms: macOS, Windows.

Answer: You have no data points visible, there may be several reasons:

Notes: For example one of the data values may be infinite or invalid.

Or the scaling may be out of range, so you simply see nothing.

17.0.263 Will application size increase with using plugins?

Plugin Version: all, Platform: Windows.

Answer: All plugins used by your application will be included in the application.

Notes: If you use no plugins, your application will not change size.

And if you use one class from the plugins, your application size will increase by a few kilobytes.

The documentation of the plugins include a list of all plugin parts and their sizes for the different platforms.

17.0.264 XLS: Custom format string guidelines

Plugin Version: all, Platform: macOS.

Answer: You have to download the source code and compile a static version of the library.

Notes: Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. Four sections example:

```
#,###.00_); [ Red ] (#,###.00);0.00;"sales "@
```

The following table describes the different symbols that are available for use in custom number formats.

Specify colors

To set the text color for a section of the format, type the name of one of the following eight colors in square brackets in the section. The color code must be the first item in the section.

Instead of using the name of the color, the color index can be used, like this [Color3] for Red. Valid numeric indexes for color range from 1 to 56, which reference by index to the legacy color palette.

Specify conditions

To set number formats that will be applied only if a number meets a specified condition, enclose the condition in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; >Greater than; <Less than; >= Greater than or equal to, <= Less than or equal to, and <>Not equal to. For example, the following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.

```
[ Red ] [ <=100 ] ; [ Blue ] [ >100 ]
```

If the cell value does not meet any of the criteria, then pound signs ("##") are displayed across the width of the cell.

Dates and times

Examples

17.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

Answer: Please upgrade your Windows version.

17.0.266 Xojo or my RB application itself crashes on launch on Mac OS Classic.
Why?

Plugin Version: all.

Answer:

You may check if the application has enough memory to be loaded.

RB should have on Mac OS Classic more than 20 MB of RAM.

I preferred to use 50 MB and for an application a 10 MB partition is a good way to start.

Parameter	Description
x	The x value of the data point. For an enumerated x-axis (see <code>Axis.setLabels</code> 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 <code>Layer.addExtraField</code> , <code>Layer.addExtraField2</code> , <code>BaseChart.addExtraField</code> or <code>BaseChart.addExtraField2</code> .

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 <code>LineStyle.setSymbolScale</code> .
zy	The symbol scale in the y dimension. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .
z	The symbol scale without distinguishing the dimension to use. Applicable for layers with symbol scales set by <code>LineStyle.setSymbolScale</code> .

Parameter	Description
slope	The slope of the trend line.
intercept	The y-intercept of the trend line.
corr	The correlation coefficient in linear regression analysis.
stderr	The standard error in linear regression analysis.

Parameter	Description
top	The value of the top edge of the box-whisker symbol.
bottom	The value of the bottom edge of the box-whisker symbol.
max	The value of the maximum mark of the box-whisker symbol.
min	The value of the minimum mark of the box-whisker symbol.
med	The value of the median mark of the box-whisker symbol.

Parameter	Description
high	The high value.
low	The low value.
open	The open value.
close	The close value.

Parameter	Description
dir	The direction of the vector.
len	The length of the vector.

Parameter	Description
radius	The radial value of the data point.
value	Same as { radius } . See above.
angle	The angular value of the data point.
x	Same as { angle } . See above.
label	The angular label of the data point.
xLabel	Same as { label } . See above.
name	The name of the layer to which the data point belongs.
dataSetName	Same as { name } . See above.
i	The data point number. The first data point is 0. The nth data point is (n-1).
dataItem	Same as { i } . See above.
z	The symbol scale. Applicable for layers with symbol scales set by Polar-Layer.setSymbolScale.
fieldN	The (N + 1)th extra field. For example, { field0 } means the first extra field. An extra field is an array of custom elements added using Layer.addExtraField, Layer.addExtraField2, BaseChart.addExtraField or BaseChart.addExtraField2.
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 add 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,,