

# MBS iOS 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 iOS Plugin

## 0.2 Content

- 1 List of all topics 3
- 2 List of all classes 19
- 3 All items in this plugin 21
- 11 List of Questions in the FAQ 145
- 12 The FAQ 155

# Chapter 1

## List of Topics

• 3 CallKit	21
– 3.1.1 class CXCallDirectoryManagerMBS	21
* 3.1.3 available as Boolean	21
* 3.1.4 Constructor	22
* 3.1.5 getEnabledStatusForExtension(Identifier as String)	22
* 3.1.6 openSettings	22
* 3.1.7 reloadExtension(Identifier as String)	22
* 3.1.8 sharedInstance as CXCallDirectoryManagerMBS	23
* 3.1.10 Handle as Integer	23
* 3.1.12 getEnabledStatusForExtensionCompleted(identifier as string, enabledStatus as Integer, error as NSErrorMBS)	23
* 3.1.13 openSettingsCompleted(error as NSErrorMBS)	23
* 3.1.14 reloadExtensionCompleted(identifier as string, error as NSErrorMBS)	23

• 10 System	141
– 10.1.1 class DCDeviceMBS	141
* 10.1.3 available as boolean	142
* 10.1.4 Constructor	142
* 10.1.5 currentDevice as DCDeviceMBS	142
* 10.1.6 generateToken(CompleteHandler as GenerateTokenCompletedMBS, tag as variant = nil)	142
* 10.1.8 Handle as Integer	143
* 10.1.9 Supported as Boolean	143
* 10.1.12 GenerateTokenCompletedMBS(token as MemoryBlock, Error as NSErrorMBS, Tag as Variant)	144

	5
• 5 Mobile Ads	31
– 5.1.1 class GADAdNetworkResponseInfoMBS	31
* 5.1.3 Constructor	31
* 5.1.5 adNetworkClassName as String	31
* 5.1.6 adSourceID as String	32
* 5.1.7 adSourceInstanceID as String	32
* 5.1.8 adSourceInstanceName as String	32
* 5.1.9 adSourceName as String	32
* 5.1.10 adUnitMapping as Dictionary	32
* 5.1.11 dictionaryRepresentation as Dictionary	33
* 5.1.12 error as NSErrorMBS	33
* 5.1.13 Handle as Integer	33
* 5.1.14 latency as Double	33
– 5.2.1 class GADAdRewardMBS	34
* 5.2.3 Constructor(rewardType as string, rewardAmount as String)	34
* 5.2.5 amount as String	34
* 5.2.6 amountValue as Double	34
* 5.2.7 Handle as Integer	34
* 5.2.8 type as String	35
– 5.3.1 class GADAdSizeMBS	36
* 5.3.3 Banner as GADAdSizeMBS	36
* 5.3.4 Constructor	36
* 5.3.5 Fluid as GADAdSizeMBS	36
* 5.3.6 FullBanner as GADAdSizeMBS	37
* 5.3.7 Invalid as GADAdSizeMBS	37
* 5.3.8 LargeBanner as GADAdSizeMBS	37
* 5.3.9 Leaderboard as GADAdSizeMBS	37
* 5.3.10 MediumRectangle as GADAdSizeMBS	37
* 5.3.11 Skyscraper as GADAdSizeMBS	37
* 5.3.13 Flags as Integer	38
* 5.3.14 Height as Double	38
* 5.3.15 IsFluid as Boolean	38
* 5.3.16 IsValid as Boolean	38
* 5.3.17 StringValue as String	38
* 5.3.18 Width as Double	39
– 5.4.1 class GADAdValueMBS	40
* 5.4.3 Constructor	40
* 5.4.5 amount as String	40
* 5.4.6 amountValue as Double	40
* 5.4.7 currencyCode as String	40

* 5.4.8 Handle as Integer	41
* 5.4.9 precision as Integer	41
– 5.5.1 class GADAppOpenAdMBS	42
* 5.5.3 canPresent(byref error as NSErrorMBS) as Boolean	42
* 5.5.4 Constructor	42
* 5.5.5 Destructor	42
* 5.5.6 loadWithAdUnitID(adUnitID as String, orientation as Integer, request as GADRequestMBS = nil)	43
* 5.5.7 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)	43
* 5.5.8 Present	43
* 5.5.10 Handle as Integer	43
* 5.5.11 responseInfo as GADResponseInfoMBS	44
* 5.5.13 DidDismissFullScreenContent	44
* 5.5.14 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)	44
* 5.5.15 DidRecordClick	44
* 5.5.16 DidRecordImpression	44
* 5.5.17 loadCompleted(error as NSErrorMBS)	45
* 5.5.18 paid(value as GADAdValueMBS)	45
* 5.5.19 WillDismissFullScreenContent	45
* 5.5.20 WillPresentFullScreenContent	45
– 5.6.1 class GADBannerViewMBS	46
* 5.6.3 AddToControl(Control as MobileControl)	46
* 5.6.4 Constructor(AdSize as GADAdSizeMBS)	46
* 5.6.5 Destructor	46
* 5.6.6 loadRequest(request as GADRequestMBS)	46
* 5.6.7 setValidAdSizes(sizes() as GADAdSizeMBS)	47
* 5.6.8 validAdSizes as GADAdSizeMBS()	47
* 5.6.10 adSize as GADAdSizeMBS	47
* 5.6.11 adUnitID as String	47
* 5.6.12 autoloadEnabled as Boolean	48
* 5.6.13 Handle as Integer	48
* 5.6.14 responseInfo as GADResponseInfoMBS	48
* 5.6.16 DidDismissScreen	48
* 5.6.17 DidFailToReceiveAdWithError(error as NSErrorMBS)	48
* 5.6.18 DidReceiveAd	49
* 5.6.19 DidRecordClick	49
* 5.6.20 DidRecordImpression	49
* 5.6.21 paid(value as GADAdValueMBS)	49
* 5.6.22 WillDismissScreen	49
* 5.6.23 WillPresentScreen	49
– 5.7.1 class GADInterstitialAdMBS	50

	7
* 5.7.3 canPresent(byref error as NSErrorMBS) as Boolean	50
* 5.7.4 Constructor	50
* 5.7.5 Destructor	50
* 5.7.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)	51
* 5.7.7 Present	51
* 5.7.9 adUnitID as String	51
* 5.7.10 Handle as Integer	51
* 5.7.11 responseInfo as GADResponseInfoMBS	51
* 5.7.13 DidDismissFullScreenContent	52
* 5.7.14 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)	52
* 5.7.15 DidRecordClick	52
* 5.7.16 DidRecordImpression	52
* 5.7.17 loadCompleted(error as NSErrorMBS)	52
* 5.7.18 paid(value as GADAdValueMBS)	53
* 5.7.19 WillDismissFullScreenContent	53
* 5.7.20 WillPresentFullScreenContent	53
– 5.8.1 class GADMoblieAdsMBS	54
* 5.8.3 Constructor	54
* 5.8.4 Destructor	54
* 5.8.5 disableMediationInitialization	54
* 5.8.6 disableSDKCrashReporting	54
* 5.8.7 registerWebView(WKWebViewPtr as Ptr)	55
* 5.8.8 requestTrackingAuthorization	55
* 5.8.9 sharedInstance as GADMoblieAdsMBS	55
* 5.8.10 start	55
* 5.8.12 applicationMuted as Boolean	56
* 5.8.13 applicationVolume as Single	56
* 5.8.14 Handle as Integer	56
* 5.8.15 requestConfiguration as GADRequestConfigurationMBS	56
* 5.8.16 sdkVersion as String	57
* 5.8.17 trackingAuthorizationStatus as Integer	57
* 5.8.19 requestTrackingAuthorizationCompleted(status as integer)	57
* 5.8.20 startCompleted	57
– 5.9.1 class GADRequestConfigurationMBS	59
* 5.9.3 Constructor	59
* 5.9.4 GADMaxAdContentRatingGeneral as String	59
* 5.9.5 GADMaxAdContentRatingMatureAudience as String	59
* 5.9.6 GADMaxAdContentRatingParentalGuidance as String	59
* 5.9.7 GADMaxAdContentRatingTeen as String	60
* 5.9.8 GADSimulatorID as String	60
* 5.9.9 setSameAppKeyEnabled(enabled as boolean)	60

* 5.9.10	setTestDeviceIdentifiers(testDeviceIdentifiers() as string)	60
* 5.9.11	testDeviceIdentifiers as string()	60
* 5.9.13	Handle as Integer	61
* 5.9.14	maxAdContentRating as String	61
* 5.9.15	publisherPrivacyPersonalizationState as Integer	61
* 5.9.16	tagForChildDirectedTreatment as Variant	61
* 5.9.17	tagForUnderAgeOfConsent as Variant	62
– 5.10.1	class GADRequestMBS	63
* 5.10.3	Constructor	63
* 5.10.4	request as GADRequestMBS	63
* 5.10.6	Handle as Integer	63
* 5.10.7	publisherProvidedID as String	63
* 5.10.8	requestAgent as String	64
– 5.11.1	class GADResponseInfoMBS	65
* 5.11.3	adNetworkInfoArray as GADAdNetworkResponseInfoMBS()	65
* 5.11.4	Constructor	65
* 5.11.5	GADCustomEventAdNetworkClassName as String	65
* 5.11.6	GADErrorUserInfoKeyResponseInfo as String	65
* 5.11.7	GADGoogleAdNetworkClassName as String	66
* 5.11.9	adNetworkClassName as String	66
* 5.11.10	dictionaryRepresentation as Dictionary	66
* 5.11.11	extrasDictionary as Dictionary	66
* 5.11.12	Handle as Integer	66
* 5.11.13	loadedAdNetworkResponseInfo as GADAdNetworkResponseInfoMBS	66
* 5.11.14	responseIdentifier as String	67
– 5.12.1	class GADRewardedAdMBS	68
* 5.12.3	canPresent(byref error as NSErrorMBS) as Boolean	68
* 5.12.4	Constructor	68
* 5.12.5	Destructor	68
* 5.12.6	loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)	68
* 5.12.7	Present	69
* 5.12.9	adReward as GADAdRewardMBS	69
* 5.12.10	adUnitID as String	69
* 5.12.11	Handle as Integer	69
* 5.12.12	responseInfo as GADResponseInfoMBS	69
* 5.12.14	DidDismissFullScreenContent	70
* 5.12.15	DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)	70
* 5.12.16	DidRecordClick	70
* 5.12.17	DidRecordImpression	70
* 5.12.18	loadCompleted(error as NSErrorMBS)	70
* 5.12.19	paid(value as GADAdValueMBS)	71

	9
* 5.12.20 userDidEarnReward	71
* 5.12.21 WillDismissFullScreenContent	71
* 5.12.22 WillPresentFullScreenContent	71
– 5.13.1 class GADRewardedInterstitialAdMBS	72
* 5.13.3 canPresent(byref error as NSErrorMBS) as Boolean	72
* 5.13.4 Constructor	72
* 5.13.5 Destructor	72
* 5.13.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)	73
* 5.13.7 Present	73
* 5.13.9 adReward as GADAdRewardMBS	73
* 5.13.10 adUnitID as String	73
* 5.13.11 Handle as Integer	73
* 5.13.12 responseInfo as GADResponseInfoMBS	74
* 5.13.14 DidDismissFullScreenContent	74
* 5.13.15 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)	74
* 5.13.16 DidRecordClick	74
* 5.13.17 DidRecordImpression	74
* 5.13.18 loadCompleted(error as NSErrorMBS)	74
* 5.13.19 paid(value as GADAdValueMBS)	75
* 5.13.20 userDidEarnReward	75
* 5.13.21 WillDismissFullScreenContent	75
* 5.13.22 WillPresentFullScreenContent	75

• 7 Photos	101
– 7.1.1 class PHPickerConfigurationMBS	101
* 7.1.3 Constructor	101
* 7.1.4 Constructor(PhotoLibrary as Variant)	102
* 7.1.5 copy as PHPickerConfigurationMBS	102
* 7.1.6 preselectedAssetIdentifiers as String()	102
* 7.1.7 setPreselectedAssetIdentifiers(Identifiers() as String)	102
* 7.1.9 DisabledCapabilities as Integer	103
* 7.1.10 Filter as PHPickerFilterMBS	103
* 7.1.11 Handle as Integer	103
* 7.1.12 Mode as Integer	103
* 7.1.13 PreferredAssetRepresentationMode as Integer	103
* 7.1.14 Selection as Integer	104
* 7.1.15 SelectionLimit as Integer	104
– 7.2.1 class PHPickerFilterMBS	106
* 7.2.3 anyFilterMatchingSubfilters(filters() as PHPickerFilterMBS) as PHPickerFilterMBS	106
* 7.2.4 Constructor	106
* 7.2.5 copy as PHPickerFilterMBS	106
* 7.2.6 imagesFilter as PHPickerFilterMBS	106
* 7.2.7 livePhotosFilter as PHPickerFilterMBS	107
* 7.2.8 videosFilter as PHPickerFilterMBS	107
* 7.2.10 Handle as Integer	107
– 7.3.1 class PHPickerResultMBS	108
* 7.3.3 Constructor	108
* 7.3.4 Destructor	108
* 7.3.5 hasItemConformingToTypeIdentifier(typeIdentifier as string) as Boolean	109
* 7.3.6 loadFileRepresentationForTypeIdentifier(typeIdentifier as string, handler as LoadFileRepresentationCompletedMBS)	109
* 7.3.7 TypeIdentifiers as String()	109
* 7.3.9 assetIdentifier as String	109
* 7.3.10 Handle as Integer	109
* 7.3.11 progressCurrent as Integer	110
* 7.3.12 progressTotal as Integer	110
* 7.3.14 LoadFileRepresentationCompletedMBS(File as FolderItem, error as NSErrorMBS, result as PHPickerResultMBS)	110
– 7.4.1 class PHPickerViewControllerMBS	111
* 7.4.3 Constructor(configuration as PHPickerConfigurationMBS)	111
* 7.4.4 Destructor	112
* 7.4.5 Dismiss	112
* 7.4.6 Present	112
* 7.4.8 configuration as PHPickerConfigurationMBS	112

	11
* 7.4.9 Handle as Integer	112
* 7.4.10 popover as Variant	112
* 7.4.11 PopOverHeight as Integer	113
* 7.4.12 PopOverWidth as Integer	113
* 7.4.14 didFinishPicking(Result()) as PHPickerResultMBS)	113

• 8 <b>ProgressView</b>	115
– 8.1.1 class <code>ProgressBackgroundViewMBS</code>	115
* 8.1.3 Constructor	115
* 8.1.5 <code>BlurEffectStyle</code> as Integer	115
* 8.1.6 <code>Color</code> as Variant	116
* 8.1.7 <code>ColorValue</code> as Color	116
* 8.1.8 <code>Handle</code> as Integer	116
* 8.1.9 <code>Style</code> as Integer	116
– 8.2.1 class <code>ProgressBarProgressViewMBS</code>	118
* 8.2.3 Constructor	118
* 8.2.5 <code>Handle</code> as Integer	118
* 8.2.6 <code>LineColor</code> as Variant	118
* 8.2.7 <code>LineColorValue</code> as Color	118
* 8.2.8 <code>Progress</code> as Double	119
* 8.2.9 <code>ProgressColor</code> as Variant	119
* 8.2.10 <code>ProgressColorValue</code> as Color	119
* 8.2.11 <code>ProgressRemainingColor</code> as Variant	119
* 8.2.12 <code>ProgressRemainingColorValue</code> as Color	120
– 8.3.1 class <code>ProgressHUDMBS</code>	121
* 8.3.3 <code>Constructor(Control as MobileControl)</code>	121
* 8.3.4 <code>Constructor(Screen as MobileScreen)</code>	122
* 8.3.5 <code>Constructor(ViewHandle as Integer)</code>	122
* 8.3.6 <code>Destructor</code>	122
* 8.3.7 <code>hide(animated as boolean = true)</code>	122
* 8.3.8 <code>hide(animated as boolean, afterDelay as Double)</code>	123
* 8.3.9 <code>show(animated as boolean = true)</code>	123
* 8.3.11 <code>AnimationType</code> as Integer	123
* 8.3.12 <code>backgroundView</code> as <code>ProgressBackgroundViewMBS</code>	123
* 8.3.13 <code>bezelView</code> as <code>ProgressBackgroundViewMBS</code>	124
* 8.3.14 <code>ButtonTitle</code> as String	124
* 8.3.15 <code>ButtonView</code> as Variant	124
* 8.3.16 <code>ContentColor</code> as Variant	124
* 8.3.17 <code>ContentColorValue</code> as Color	125
* 8.3.18 <code>defaultMotionEffectsEnabled</code> as Boolean	125
* 8.3.19 <code>DetailsLabelText</code> as String	125
* 8.3.20 <code>DetailsLabelView</code> as Variant	125
* 8.3.21 <code>graceTime</code> as Double	126
* 8.3.22 <code>Handle</code> as Integer	126
* 8.3.23 <code>Indicator</code> as Variant	126
* 8.3.24 <code>LabelText</code> as String	126
* 8.3.25 <code>LabelView</code> as Variant	127

	13
* 8.3.26 margin as Double	127
* 8.3.27 MinHeight as Double	127
* 8.3.28 minShowTime as Double	127
* 8.3.29 MinWidth as Double	128
* 8.3.30 Mode as Integer	128
* 8.3.31 offsetX as Double	128
* 8.3.32 offsetY as Double	128
* 8.3.33 Progress as Double	128
* 8.3.34 RemoveFromSuperViewOnHide as Boolean	129
* 8.3.35 Square as Boolean	129
* 8.3.36 userInteractionEnabled as Boolean	129
* 8.3.37 View as Variant	129
* 8.3.39 buttonAction	130
* 8.3.40 hudWasHidden	130
– 8.4.1 class ProgressRoundProgressViewMBS	131
* 8.4.3 Constructor	131
* 8.4.5 Annular as Boolean	131
* 8.4.6 backgroundTintColor as Variant	131
* 8.4.7 backgroundTintColorValue as Color	131
* 8.4.8 Handle as Integer	132
* 8.4.9 Progress as Double	132
* 8.4.10 progressTintColor as Variant	132
* 8.4.11 progressTintColorValue as Color	132

• <b>9 QuickLook</b>	133
– 9.1.1 class QLPreviewControllerMBS	133
* 9.1.3 AddItem(item as FolderItem)	134
* 9.1.4 AddItems(items() as FolderItem)	134
* 9.1.5 canPreviewItem(file as FolderItem) as Boolean	134
* 9.1.6 ClearItems	134
* 9.1.7 Constructor	135
* 9.1.8 Destructor	135
* 9.1.9 Dismiss	135
* 9.1.10 Items as FolderItem()	135
* 9.1.11 Present	135
* 9.1.12 refreshCurrentPreviewItem	135
* 9.1.13 reloadData	136
* 9.1.14 SetItems(items() as FolderItem)	136
* 9.1.16 currentPreviewItem as FolderItem	136
* 9.1.17 currentPreviewItemIndex as Integer	136
* 9.1.18 Handle as Integer	136
* 9.1.20 DidDismiss	137
* 9.1.21 didSaveEditedCopyOfPreviewItem(Item as FolderItem, modifiedContentsFile as FolderItem)	137
* 9.1.22 didUpdateContentsOfPreviewItem(Item as FolderItem)	137
* 9.1.23 editingModeForPreviewItem(Item as FolderItem) as Integer	138
* 9.1.24 shouldOpenURL(URL as String, Item as FolderItem) as Boolean	138
* 9.1.25 WillDismiss	139

	15
• <b>6 Navigation</b>	95
– 6.1.1 class UIDocumentPickerMBS	95
* 6.1.3 Constructor(Mode as Integer, contentTypesOrURLs() as String, asCopy as Boolean = true)	96
* 6.1.4 Destructor	96
* 6.1.5 Dismiss	97
* 6.1.6 Present	97
* 6.1.8 allowsMultipleSelection as Boolean	97
* 6.1.9 directoryURL as String	97
* 6.1.10 documentPickerMode as Integer	97
* 6.1.11 Handle as Integer	98
* 6.1.12 isBeingPresented as Boolean	98
* 6.1.13 shouldShowFileExtensions as Boolean	98
* 6.1.15 documentPickerDidPickDocuments(URLs() as String)	98
* 6.1.16 documentPickerWasCancelled	99

• 5 Mobile Ads	31
– 5.14.1 class UIViewControllerMBS	76
* 5.14.3 Constructor	76
* 5.14.4 dismissViewController(animated as boolean)	77
* 5.14.5 loadView	77
* 5.14.6 presentViewController(ViewController as UIViewControllerMBS, animated as Boolean)	77
* 5.14.8 className as String	78
* 5.14.9 classPath as String	78
* 5.14.10 currentViewController as UIViewControllerMBS	79
* 5.14.11 isBeingDismissed as Boolean	79
* 5.14.12 isBeingPresented as Boolean	79
* 5.14.13 isViewLoaded as Boolean	79
* 5.14.14 parentViewController as UIViewControllerMBS	79
* 5.14.15 prefersStatusBarHidden as Boolean	80
* 5.14.16 presentedViewController as UIViewControllerMBS	80
* 5.14.17 presentingViewController as UIViewControllerMBS	80
* 5.14.18 Title as String	80
* 5.14.19 View as NSViewMBS	81
– 5.15.1 class UMPConsentFormMBS	82
* 5.15.3 Constructor	82
* 5.15.4 load(handler as ConsentFormLoadCompletedMBS)	82
* 5.15.5 loadAndPresentIfRequiredFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)	82
* 5.15.6 presentFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)	83
* 5.15.7 presentPrivacyOptionsFormFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)	83
* 5.15.8 UMPErrorDomain as String	83
* 5.15.10 Handle as Integer	83
* 5.15.11 VersionString as String	84
* 5.15.14 ConsentFormLoadCompletedMBS(consentForm as UMPConsentFormMBS, Error as NSErrorMBS)	84
* 5.15.15 ConsentFormPresentCompletedMBS(Error as NSErrorMBS)	84
– 5.16.1 class UMPConsentInformationMBS	85
* 5.16.3 Constructor	85
* 5.16.4 Destructor	85
* 5.16.5 requestConsentInfoUpdateWithParameters(parameters as UMPRequestParametersMBS = nil)	85
* 5.16.6 Reset	86
* 5.16.8 canRequestAds as Boolean	86

	17
* 5.16.9 consentStatus as Integer	86
* 5.16.10 formStatus as Integer	86
* 5.16.11 Handle as Integer	86
* 5.16.12 privacyOptionsRequirementStatus as Integer	87
* 5.16.13 sharedInstance as UMPConsentInformationMBS	87
* 5.16.15 ConsentInformationUpdateCompleted(Error as NSErrorMBS)	87
– 5.17.1 class UMPDebugSettingsMBS	89
* 5.17.3 Constructor	89
* 5.17.4 copy as UMPDebugSettingsMBS	90
* 5.17.5 setTestDeviceIdentifiers(testDeviceIdentifiers() as String)	90
* 5.17.6 testDeviceIdentifiers as String()	90
* 5.17.8 geography as Integer	90
* 5.17.9 Handle as Integer	90
– 5.18.1 class UMPRequestParametersMBS	92
* 5.18.3 Constructor	92
* 5.18.4 copy as UMPRequestParametersMBS	92
* 5.18.6 debugSettings as UMPDebugSettingsMBS	92
* 5.18.7 Handle as Integer	92
* 5.18.8 tagForUnderAgeOfConsent as Boolean	93

• 4 Continuity Camera	25
– 4.1.1 class VNDocumentCameraScanMBS	25
* 4.1.3 Constructor	25
* 4.1.4 imageOfPageAtIndex(Index as Integer) as Variant	26
* 4.1.5 pictureOfPageAtIndex(Index as Integer) as Picture	26
* 4.1.7 Handle as Integer	26
* 4.1.8 pageCount as Integer	26
* 4.1.9 title as String	26
– 4.2.1 class VNDocumentCameraViewControllerMBS	27
* 4.2.3 Constructor	27
* 4.2.4 Destructor	27
* 4.2.5 Dismiss	27
* 4.2.6 Present	28
* 4.2.8 Handle as Integer	28
* 4.2.9 isBeingPresented as Boolean	28
* 4.2.10 Supported as Boolean	28
* 4.2.12 didCancel	28
* 4.2.13 didFailWithError(error as NSErrorMBS)	29
* 4.2.14 didFinishWithScan(scan as VNDocumentCameraScanMBS)	29

## Chapter 2

### List of all classes

• CXCallDirectoryManagerMBS	21
• DCDeviceMBS	141
• GADAdNetworkResponseInfoMBS	31
• GADAdRewardMBS	34
• GADAdSizeMBS	36
• GADAdValueMBS	40
• GADAppOpenAdMBS	42
• GADBannerViewMBS	46
• GADInterstitialAdMBS	50
• GADMobilityAdsMBS	54
• GADRequestConfigurationMBS	59
• GADRequestMBS	63
• GADResponseInfoMBS	65
• GADRewardedAdMBS	68
• GADRewardedInterstitialAdMBS	72
• PHPickerConfigurationMBS	101
• PHPickerFilterMBS	106
• PHPickerResultMBS	108
• PHPickerViewControllerMBS	111

• ProgressBackgroundViewMBS	115
• ProgressBarProgressViewMBS	118
• ProgressHUDMBS	121
• ProgressRoundProgressViewMBS	131
• QLPreviewControllerMBS	133
• UIDocumentPickerMBS	95
• UIViewControllerMBS	76
• UMPConsentFormMBS	82
• UMPConsentInformationMBS	85
• UMPDebugSettingsMBS	89
• UMPRequestParametersMBS	92
• VNDocumentCameraScanMBS	25
• VNDocumentCameraViewControllerMBS	27

# Chapter 3

## CallKit

### 3.1 class CXCallDirectoryManagerMBS

#### 3.1.1 class CXCallDirectoryManagerMBS

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** The programmatic interface to an object that manages a Call Directory app extension.

**Notes:** You may need to write your call extension in Xcode.

#### Blog Entries

- [CallKit extension for Xojo iOS application](#)
- [News from the MBS Xojo Plugins Version 22.5](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr1](#)

#### Xojo Developer Magazine

- [21.1, page 34: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes](#)

#### 3.1.2 Methods

#### 3.1.3 available as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Whether the class is available.

**Notes:** Returns true on iOS 10.0 or newer.

### 3.1.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** The constructor.

### 3.1.5 `getEnabledStatusForExtension(Identifier as String)`

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Asynchronously returns the enabled status of the extension with the specified identifier.

**Notes:** identifier: The identifier for the call extension.

Calls `getEnabledStatusForExtensionCompleted` event later.

### 3.1.6 `openSettings`

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Opens the iOS Settings app and shows the Call Blocking & Identification settings.

**Notes:** Before a Call Directory extension can operate on incoming calls, the user must explicitly enable the extension in the iOS Settings app.

Use this method to open the Settings app and show the Call Blocking & Identification settings directly.

Calls `openSettingsCompleted` event later.

### 3.1.7 `reloadExtension(Identifier as String)`

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Asynchronously reloads the extension with the specified identifier.

**Notes:** identifier: The identifier for the call extension.

Calls `reloadExtensionCompleted` event later.

### 3.1.8 sharedInstance as CXCallDirectoryManagerMBS

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** Returns the shared call directory manager instance for the app.

**Notes:** You may prefer to subclass this class to fill events and then keep an instance of your own class around. But at any point you can use this method to get the instance you created or if needed the plugin creates one.

### 3.1.9 Properties

#### 3.1.10 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: All.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 3.1.11 Events

#### 3.1.12 getEnabledStatusForExtensionCompleted(identifier as string, enabled-Status as Integer, error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** An event to be executed when the manager is finished determining the enabled status of the specified extension.

**Notes:** enabledStatus: The enabled status of the extension. For possible values, see status constants.  
error: If an error occurred, an error object indicating how the check failed, otherwise nil.

#### 3.1.13 openSettingsCompleted(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** An event executed when the manager finishes opening the Call Directory panel.

**Notes:** error: If an error occurred, an error object indicating how the operation failed; otherwise, nil.

#### 3.1.14 reloadExtensionCompleted(identifier as string, error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** An event to be executed when the manager is finished reloading the specified extension.

**Notes:** error: If an error occurred, an error object indicating how reloading failed, otherwise nil.

### 3.1.15 Constants

Status

Constant	Value	Description
EnabledStatusDisabled	1	Indicates that the extension is disabled.
EnabledStatusEnabled	2	Indicates that the extension is enabled.
EnabledStatusUnknown	0	Indicates that the enabled status for the extension is unknown.

# Chapter 4

## Continuity Camera

### 4.1 class VNDocumentCameraScanMBS

#### 4.1.1 class VNDocumentCameraScanMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A single document scanned in the document camera.

**Notes:** When the document camera scans a document, it returns the resulting information in this format, through the didFinishWithScan event.

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

#### **Blog Entries**

- [The Top 10 from the MBS Xojo Plugins in 2022](#)
- [News from the MBS Xojo Plugins Version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr4](#)
- [Document Camera Scan functions for Xojo on iOS](#)

#### **Xojo Developer Magazine**

- [21.1, page 32: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes](#)

#### 4.1.2 Methods

#### 4.1.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

#### 4.1.4 `imageOfPageAtIndex(Index as Integer)` as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The image of the page at a specified index.

**Notes:** We return a `NSImageMBS` wrapping the `UIImage`.

#### 4.1.5 `pictureOfPageAtIndex(Index as Integer)` as Picture

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The picture of the page at a specified index.

**Notes:** We build a `Picture` wrapping the `UIImage`.

#### 4.1.6 Properties

##### 4.1.7 `Handle as Integer`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

##### 4.1.8 `pageCount as Integer`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The number of pages in the scanned document.

**Notes:** (Read only property)

##### 4.1.9 `title as String`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The title of the scanned document.

**Notes:** (Read only property)

## 4.2 class VNDocumentCameraViewControllerMBS

### 4.2.1 class VNDocumentCameraViewControllerMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Shows a panel to allow the user to scan a document.

**Notes:** A view controller that shows what the document camera sees.

Present this view controller, as follows, and add it to your view controller hierarchy to scan documents.

#### Blog Entries

- [The Top 10 from the MBS Xojo Plugins in 2022](#)
- [News from the MBS Xojo Plugins Version 22.5](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr4](#)
- [Document Camera Scan functions for Xojo on iOS](#)

#### Xojo Developer Magazine

- [21.1, page 32: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes](#)

### 4.2.2 Methods

### 4.2.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 4.2.4 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 4.2.5 Dismiss

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 4.2.6 Present

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 4.2.7 Properties

#### 4.2.8 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 4.2.9 isBeingPresented as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Whether the controller is presented.

**Notes:** Returns true if the dialog is visible.

(Read only property)

#### 4.2.10 Supported as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Whether you can use this class on the current device.

**Notes:** Returns false for unsupported hardware.

(Read only property)

### 4.2.11 Events

#### 4.2.12 didCancel

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the user cancels.

**Notes:** The plugin dismisses the dialog automatically.

#### 4.2.13 **didFailWithError**(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the user is unable to scan, with the following error.

**Notes:** The plugin dismisses the dialog automatically.

#### 4.2.14 **didFinishWithScan**(scan as VNDocumentCameraScanMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event to be called when something was scanned.

**Notes:** The plugin dismisses the dialog automatically.



# Chapter 5

## Mobile Ads

### 5.1 class GADAdNetworkResponseInfoMBS

#### 5.1.1 class GADAdNetworkResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Response metadata for an individual ad network in an ad response.

**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 22.5pr3](#)

#### 5.1.2 Methods

#### 5.1.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

#### 5.1.4 Properties

#### 5.1.5 adNetworkClassName as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A class name that identifies the ad network.

**Notes:** (Read only property)

### 5.1.6 adSourceID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source ID associated with this ad network response.

**Notes:** Empty if the ad server does not populate this field.

(Read only property)

### 5.1.7 adSourceInstanceID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source instance ID associated with this ad network response. not populate this field.

**Notes:** Empty if the ad server does

(Read only property)

### 5.1.8 adSourceInstanceName as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source instance name associated with this ad network response.

**Notes:** Empty if the ad server does not populate this field.

(Read only property)

### 5.1.9 adSourceName as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad source name associated with this ad network response.

**Notes:** Empty if the ad server does not populate this field.

(Read only property)

### 5.1.10 adUnitMapping as Dictionary

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Network configuration set on the AdMob UI.

**Notes:** (Read only property)

### 5.1.11 dictionaryRepresentation as Dictionary

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** JSON-safe dictionary representation of the ad network response info.

**Notes:** (Read only property)

### 5.1.12 error as NSErrorMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Error associated with the request to the network.

**Notes:** Nil if the network successfully loaded an ad or if the network was not attempted.

(Read only property)

### 5.1.13 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.1.14 latency as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Amount of time the ad network spent loading an ad. 0 if the network was not attempted.

**Notes:** (Read only property)

## 5.2 class GADAdRewardMBS

### 5.2.1 class GADAdRewardMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Ad reward information.

**Blog Entries**

- [MBS Xojo Plugins, version 22.5pr3](#)

### 5.2.2 Methods

### 5.2.3 Constructor(rewardType as string, rewardAmount as String)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns an initialized GADAdReward with the provided reward type and reward amount.

### 5.2.4 Properties

#### 5.2.5 amount as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Amount rewarded to the user as string.

**Notes:** (Read only property)

#### 5.2.6 amountValue as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Amount rewarded to the user as double.

**Notes:** (Read only property)

#### 5.2.7 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.2.8 type as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Type of the reward.

**Notes:** (Read only property)

## 5.3 class GADAdSizeMBS

### 5.3.1 class GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The class for an ad size.

**Notes:** 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 22.5](#)

**Xojo Developer Magazine**

- [21.1, page 33: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes](#)

### 5.3.2 Methods

### 5.3.3 Banner as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** iPhone and iPod Touch ad size.

**Notes:** Typically 320x50.

### 5.3.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 5.3.5 Fluid as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** An ad size that spans the full width of its container, with a height dynamically determined by the ad.

### 5.3.6 FullBanner as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Full Banner size for the iPad (especially in a PopOver or in sheet).

**Notes:** Typically 468x60.

### 5.3.7 Invalid as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Invalid ad size marker.

### 5.3.8 LargeBanner as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Taller version of GADAdSizeBanner.

**Notes:** Typically 320x100.

### 5.3.9 Leaderboard as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Leaderboard size for the iPad.

**Notes:** Typically 728x90.

### 5.3.10 MediumRectangle as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Medium Rectangle size for the iPad (especially in a UISplitView's left pane).

**Notes:** Typically 300x250.

### 5.3.11 Skyscraper as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Skyscraper size for the iPad.

**Notes:** Mediation only. AdMob/Google does not offer this size. Typically 120x600.

### 5.3.12 Properties

#### 5.3.13 Flags as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The flags field.

**Notes:** (Read only property)

#### 5.3.14 Height as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The height value.

**Notes:** (Read only property)

#### 5.3.15 IsFluid as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns true if this is a fluid ad size.

**Notes:** (Read only property)

#### 5.3.16 IsValid as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns true if this is a valid size.

**Notes:** (Read only property)

#### 5.3.17 StringValue as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns a string describing the provided AdSize.

**Notes:** (Read only property)

### 5.3.18 Width as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The width.

**Notes:** (Read only property)

## 5.4 class GADAdValueMBS

### 5.4.1 class GADAdValueMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The monetary value earned from an ad.

**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 22.5pr3](#)

### 5.4.2 Methods

### 5.4.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 5.4.4 Properties

### 5.4.5 amount as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad's value as string.

**Notes:** (Read only property)

### 5.4.6 amountValue as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad's value as double.

**Notes:** (Read only property)

### 5.4.7 countryCode as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The value's currency code.

**Notes:** (Read only property)

### 5.4.8 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.4.9 precision as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The precision of the reported ad value.

**Notes:** (Read only property)

### 5.4.10 Constants

Precisions

Constant	Value	Description
PrecisionEstimated	1	An ad value estimated from aggregated data.
PrecisionPrecise	3	The precise value paid for this ad.
PrecisionPublisherProvided	2	A publisher-provided ad value, such as manual CPMs in a mediation group.
PrecisionUnknown	0	An ad value with unknown precision.

## 5.5 class GADAppOpenAdMBS

### 5.5.1 class GADAppOpenAdMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** An app open ad.

**Notes:** Used to monetize app load screens.

See <https://developers.google.com/admob/ios/app-open> to get started.

#### Blog Entries

- [MBS Xojo Plugins, version 23.6pr5](#)
- [Google Admob for Xojo](#)

### 5.5.2 Methods

#### 5.5.3 canPresent(byref error as NSErrorMBS) as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the interstitial ad can be presented from the provided root view controller.

**Notes:** Sets the error out parameter if the ad can't be presented.

Must be called on the main thread.

### 5.5.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

**Notes:** Please call Load method first to load the ad in background.

Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 5.5.5 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 5.5.6 loadWithAdUnitID(adUnitID as String, orientation as Integer, request as GADRequestMBS = nil)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads an interstitial ad.

**Notes:** Deprecated in favor of the other variant without orientation.

adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.

request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

See also:

- 5.5.7 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil) 43

### 5.5.7 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Loads an interstitial ad.

**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.

request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

See also:

- 5.5.6 loadWithAdUnitID(adUnitID as String, orientation as Integer, request as GADRequestMBS = nil) 43

### 5.5.8 Present

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.

**Notes:** Must be called on the main thread.

### 5.5.9 Properties

#### 5.5.10 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.5.11 responseInfo as GADResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.

**Notes:** Nil until the first ad request succeeds or fails.

(Read only property)

### 5.5.12 Events

#### 5.5.13 DidDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

#### 5.5.14 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

#### 5.5.15 DidRecordClick

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

#### 5.5.16 DidRecordImpression

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

**5.5.17 loadCompleted(error as NSErrorMBS)**

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.

**Notes:** Next you can call Present when needed.

**5.5.18 paid(value as GADAdValueMBS)**

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

**5.5.19 WillDismissFullScreenContent**

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

**5.5.20 WillPresentFullScreenContent**

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

**5.5.21 Constants**

Device Orientation Constants

Constant	Value	Description
DeviceOrientationFaceDown	6	The device is held parallel to the ground with the screen facing downwards.
DeviceOrientationFaceUp	5	The device is held parallel to the ground with the screen facing upwards.
DeviceOrientationLandscapeLeft	3	The device is in landscape mode, with the device held upright and the home button on the right side.
DeviceOrientationLandscapeRight	4	The device is in landscape mode, with the device held upright and the home button on the left side.
DeviceOrientationPortrait	1	The device is in portrait mode, with the device held upright and the home button at the bottom.
DeviceOrientationPortraitUpsideDown	2	The device is in portrait mode but upside down, with the device held upright and the home button at the top.
DeviceOrientationUnknown	0	The orientation is currently not known.

## 5.6 class GADBannerViewMBS

### 5.6.1 class GADBannerViewMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A view that displays banner ads.

**Notes:** See <https://developers.google.com/admob/ios/banner> to get started.

**Blog Entries**

- [News from the MBS Xojo Plugins Version 22.5](#)
- [Google Admob for Xojo](#)

**Xojo Developer Magazine**

- [21.1, page 33: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes](#)

### 5.6.2 Methods

### 5.6.3 AddToControl(Control as MobileControl)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Adds the control to the existing mobile control as children.

### 5.6.4 Constructor(AdSize as GADAdSizeMBS)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Initializes and returns a banner view with the specified ad size placed at its superview's origin.

### 5.6.5 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 5.6.6 loadRequest(request as GADRequestMBS)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Requests an ad. The request object supplies targeting information.

### 5.6.7 setValidAdSizes(sizes() as GADAdSizeMBS)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Sets array of GADAdSizeMBS objects, specifying all valid sizes that are appropriate for this slot.

### 5.6.8 validAdSizes as GADAdSizeMBS()

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Optional array of GADAdSizeMBS objects, specifying all valid sizes that are appropriate for this slot.

## 5.6.9 Properties

### 5.6.10 adSize as GADAdSizeMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Required to set this banner view to a proper size.

**Notes:** If not using mediation, then changing the adSize after an ad has been shown will cause a new request (for an ad of the new size) to be sent. If using mediation, then a new request may not be sent.

(Read and Write property)

### 5.6.11 adUnitID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.

**Notes:** Required value created on the Ad Manager website. Create a new ad unit for every unique placement of an ad in your application. Set this to the ID assigned for this placement. Ad units are important for targeting and statistics.

Example Ad Manager ad unit ID: `"/6499/example/banner"`

(Read and Write property)

### 5.6.12 `autoloadEnabled` as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether autoloading of ads in the receiver is enabled.

**Notes:** If enabled, you do not need to call the `loadRequest` method to load ads.

(Read and Write property)

### 5.6.13 `Handle` as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.6.14 `responseInfo` as `GADResponseInfoMBS`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.

**Notes:** Nil until the first ad request succeeds or fails.

(Read only property)

### 5.6.15 `Events`

#### 5.6.16 `DidDismissScreen`

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the full screen view has been dismissed.

**Notes:** You should restart anything paused while handling `WillPresentScreen`.

#### 5.6.17 `DidFailToReceiveAdWithError(error as NSErrorMBS)`

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when an ad request failed.

**Notes:** The failure is normally due to network connectivity or ad availability (for example, no fill).

### 5.6.18 DidReceiveAd

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when an ad request successfully received an ad.

**Notes:** You may want to add the banner view to the view hierarchy if it hasn't been added yet.

### 5.6.19 DidRecordClick

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

### 5.6.20 DidRecordImpression

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when an impression has been recorded for an ad.

### 5.6.21 paid(value as GADAdValueMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 5.6.22 WillDismissScreen

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the full screen view will be dismissed.

### 5.6.23 WillPresentScreen

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a full screen view will be presented in response to the user clicking on an ad.

**Notes:** You may want to pause animations and time sensitive interactions.

## 5.7 class GADInterstitialAdMBS

### 5.7.1 class GADInterstitialAdMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** An interstitial ad.

**Notes:** This is a full-screen advertisement shown at natural transition points in your application such as between game levels or news stories.

See <https://developers.google.com/admob/ios/interstitial> to get started.

#### Blog Entries

- [Add Google Ads to your Xojo app](#)
- [Google Admob for Xojo](#)

### 5.7.2 Methods

#### 5.7.3 canPresent(byref error as NSErrorMBS) as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the interstitial ad can be presented from the provided root view controller.

**Notes:** Sets the error out parameter if the ad can't be presented.

Must be called on the main thread.

### 5.7.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

**Notes:** Please call Load method first to load the ad in background.

Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 5.7.5 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 5.7.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads an interstitial ad.

**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.

request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

### 5.7.7 Present

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.

**Notes:** Must be called on the main thread.

### 5.7.8 Properties

#### 5.7.9 adUnitID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.

**Notes:** (Read only property)

#### 5.7.10 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 5.7.11 responseInfo as GADResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.

**Notes:** Nil until the first ad request succeeds or fails.

(Read only property)

### 5.7.12 Events

#### 5.7.13 DidDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

#### 5.7.14 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

#### 5.7.15 DidRecordClick

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

#### 5.7.16 DidRecordImpression

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

#### 5.7.17 loadCompleted(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.

**Notes:** Next you can call Present when needed.

### 5.7.18 paid(value as GADAdValueMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 5.7.19 WillDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 5.7.20 WillPresentFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

## 5.8 class GADMobilityAdsMBS

### 5.8.1 class GADMobilityAdsMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Google Mobile Ads SDK settings.

**Notes:** You need to load framework first, before using this class.

**Blog Entries**

- [Add Google Ads to your Xojo app](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5](#)

### 5.8.2 Methods

### 5.8.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 5.8.4 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 5.8.5 disableMediationInitialization

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Disables mediation adapter initialization during initialization of the GMA SDK.

**Notes:** Calling this method may negatively impact your ad performance and should only be called if you will not use GMA SDK controlled mediation during this app session. This method must be called before initializing the GMA SDK or loading ads and has no effect once the SDK has been initialized.

### 5.8.6 disableSDKCrashReporting

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Disables automated SDK crash reporting.

**Notes:** If not called, the SDK records the original exception handler if available and registers a new exception handler. The new exception handler only reports SDK related exceptions and calls the recorded original exception handler.

### 5.8.7 registerWebView(WKWebViewPtr as Ptr)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Registers a web view with the Google Mobile Ads SDK to improve in-app ad monetization of ads within this web view.

**Notes:** Please pass handle of HTMLViewer controls or WKWebViewMBS.  
If needed, cast from Integer to Ptr.

### 5.8.8 requestTrackingAuthorization

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The request for user authorization to access app-related data.

**Notes:** The requestTrackingAuthorization: is a one-time request to authorize or deny access to app-related data that can be used for tracking the user or the device. The system remembers the user's choice and doesn't prompt again unless a user uninstalls and then reinstalls the app on the device.

Calls to the API only prompt when the application state is UIApplicationStateActive. The authorization prompt doesn't display if another permission request is pending user confirmation. Concurrent requests aren't preserved by iOS, and calls to the API through an app extension don't prompt. Check the trackingAuthorizationStatus for a status of TrackingManagerAuthorizationStatusNotDetermined to determine if you need to make an additional call.

### 5.8.9 sharedInstance as GADMobilityAdsMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns the shared GADMobilityAds instance.

### 5.8.10 start

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Starts the Google Mobile Ads SDK.

**Notes:** Call this method as early as possible to reduce latency on the session's first ad request. Calls start-

Completed event when the GMA SDK and all mediation networks are fully set up or if set-up times out. The Google Mobile Ads SDK starts on the first ad request if this method is not called.

### 5.8.11 Properties

#### 5.8.12 `applicationMuted` as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicates whether the application's audio is muted.

**Notes:** Affects initial mute state for all ads. Use this method only if your application has its own volume controls (e.g., custom music or sound effect muting). Defaults to false.

(Read and Write property)

#### 5.8.13 `applicationVolume` as Single

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The application's audio volume.

**Notes:** Affects audio volumes of all ads relative to other audio output.

Valid ad volume values range from 0.0 (silent) to 1.0 (current device volume). Use this method only if your application has its own volume controls (e.g., custom music or sound effect volumes). Defaults to 1.0.

(Read and Write property)

#### 5.8.14 `Handle` as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 5.8.15 `requestConfiguration` as `GADRequestConfigurationMBS`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Request configuration that is common to all requests.

**Notes:** (Read only property)

### 5.8.16 sdkVersion as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns the version of the SDK.

**Notes:** (Read only property)

### 5.8.17 trackingAuthorizationStatus as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The authorization status that is current for the calling application.

**Notes:** Use the trackingAuthorizationStatus property to check authorization status.  
(Read only property)

### 5.8.18 Events

#### 5.8.19 requestTrackingAuthorizationCompleted(status as integer)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when requestTrackingAuthorization is done.

#### 5.8.20 startCompleted

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called, when start method finishes.

### 5.8.21 Constants

Tracking Authorization Status

Constant	Value	Description
TrackingManagerAuthorizationStatusAuthorized	3	The value that returns if the user authorizes access to app-related data for tracking the user or the device.
TrackingManagerAuthorizationStatusDenied	2	The value that returns if the user denies authorization to access app-related data for tracking the user or the device.
TrackingManagerAuthorizationStatusNotDetermined	0	The value that returns when the app can't determine the user's authorization status for access to app-related data for tracking the user or the device.
TrackingManagerAuthorizationStatusRestricted	1	The value that returns if authorization to access app-related data for tracking the user or the device has a restricted status.

## 5.9 class GADRequestConfigurationMBS

### 5.9.1 class GADRequestConfigurationMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Request configuration.

**Notes:** The settings in this class will apply to all ad requests.

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 24.0](#)
- [MBS Xojo Plugins, version 23.6pr5](#)

### 5.9.2 Methods

### 5.9.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 5.9.4 GADMaxAdContentRatingGeneral as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable for general audiences, including families.

### 5.9.5 GADMaxAdContentRatingMatureAudience as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable only for mature audiences.

### 5.9.6 GADMaxAdContentRatingParentalGuidance as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable for most audiences with parental guidance.

### 5.9.7 GADMaxAdContentRatingTeen as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Rating for content suitable for teen and older audiences.

### 5.9.8 GADSimulatorID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Add this constant to the testDevices property's array to receive test ads on the simulator.

### 5.9.9 setSameAppKeyEnabled(enabled as boolean)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Controls whether the Google Mobile Ads SDK Same App Key is enabled.

**Notes:** The value set persists across app sessions. The key is enabled by default.

### 5.9.10 setTestDeviceIdentifiers(testDeviceIdentifiers() as string)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Sets the identifiers corresponding to test devices which will always request test ads.

**Notes:** The test device identifier for the current device is logged to the console when the first ad request is made.

### 5.9.11 testDeviceIdentifiers as string()

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Identifiers corresponding to test devices which will always request test ads.

**Notes:** The test device identifier for the current device is logged to the console when the first ad request is made.

### 5.9.12 Properties

#### 5.9.13 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 5.9.14 maxAdContentRating as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The maximum ad content rating. All Google ads will have this content rating or lower.

**Notes:** (Read and Write property)

#### 5.9.15 publisherPrivacyPersonalizationState as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:**

This property lets you specify the personalization treatment that applies to subsequent ad requests.

**Notes:**

(Read and Write property)

#### 5.9.16 tagForChildDirectedTreatment as Variant

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The child directed treatment tag.

**Notes:** This property indicates whether you would like your app to be treated as child-directed for purposes of the Children,Ås Online Privacy Protection Act (COPPA), <https://www.ftc.gov/business-guidance/privacy-security/childrens-privacy>.

If you set this property with true, you are indicating that your app should be treated as child-directed for purposes of the Children,Ås Online Privacy Protection Act (COPPA).

If you set this property with false, you are indicating that your app should not be treated as child-directed for purposes of the Children,Ås Online Privacy Protection Act (COPPA).

If you leave or reset this property as nil, ad requests will include no indication of how you would like your app treated with respect to COPPA.

By setting this property, you certify that this notification is accurate and you are authorized to act on behalf of the owner of the app. You understand that abuse of this setting may result in termination of your Google account.

(Read and Write property)

### 5.9.17 tagForUnderAgeOfConsent as Variant

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The tag for under age consent

**Notes:** This property indicates whether the user is under the age of consent.

[https://developers.google.com/admob/ios/targeting#users\\_under\\_the\\_age\\_of\\_consent](https://developers.google.com/admob/ios/targeting#users_under_the_age_of_consent).

If you set this property with true, a TFUA parameter will be included in all ad requests, and you are indicating that you want ad requests to be handled in a manner suitable for users under the age of consent. This parameter disables personalized advertising, including remarketing, for all ad requests. It also disables requests to third-party ad vendors, such as ad measurement pixels and third-party ad servers.

If you set this property with false, you are indicating that you don't want ad requests to be handled in a manner suitable for users under the age of consent.

If you leave or reset this property as nil, ad requests will include no indication of how you would like your ad requests to be handled in a manner suitable for users under the age of consent.

(Read and Write property)

### 5.9.18 Constants

Privacy treatment personalization states

Constant	Value	Description
PublisherPrivacyPersonalizationStateDefault	0	Indicates that ad requests should receive the default publisher privacy treatment.
PublisherPrivacyPersonalizationStateDisabled	2	Indicates that ad requests should receive non-personalized publisher privacy treatment.
PublisherPrivacyPersonalizationStateEnabled	1	Indicates that ad requests should receive personalized publisher privacy treatment.

## 5.10 class GADRequestMBS

### 5.10.1 class GADRequestMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Specifies optional parameters for ad requests.

**Blog Entries**

- [Add Google Ads to your Xojo app](#)

### 5.10.2 Methods

### 5.10.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 5.10.4 request as GADRequestMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns a default request.

### 5.10.5 Properties

### 5.10.6 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.10.7 publisherProvidedID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Publisher provided user ID.

**Notes:** (Read and Write property)

### 5.10.8 requestAgent as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** String that identifies the ad request's origin.

**Notes:** Third party libraries that reference the Mobile Ads SDK should set this property to denote the platform from which the ad request originated.

For example, a third party ad network called "CoolAds network" that is mediating requests to the Mobile Ads SDK should set this property as "CoolAds".

(Read and Write property)

## 5.11 class GADResponseInfoMBS

### 5.11.1 class GADResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about a response to an ad request.

**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 22.5pr3](#)

### 5.11.2 Methods

### 5.11.3 adNetworkInfoArray as GADAdNetworkResponseInfoMBS()

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Array of metadata for each ad network included in the response.

### 5.11.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 5.11.5 GADCustomEventAdNetworkClassName as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Ad network class name for custom event ads.

### 5.11.6 GADErrorUserInfoKeyResponseInfo as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Key into NSError.userInfo mapping to a GADResponseInfo object.

**Notes:** When ads fail to load, errors returned contain an instance of GADResponseInfoMBS.

### 5.11.7 GADGoogleAdNetworkClassName as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Ad network class name for ads returned from Google's ad network.

### 5.11.8 Properties

#### 5.11.9 adNetworkClassName as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A class name that identifies the ad network that returned the ad. Nil if no ad was returned.

**Notes:** (Read only property)

#### 5.11.10 dictionaryRepresentation as Dictionary

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** JSON-safe dictionary representation of the response info.

**Notes:** (Read only property)

#### 5.11.11 extrasDictionary as Dictionary

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Dictionary of extra parameters that may be returned in an ad response.

**Notes:** (Read only property)

#### 5.11.12 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 5.11.13 loadedAdNetworkResponseInfo as GADAdNetworkResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The GADAdNetworkResponseInfo corresponding to the adapter that was used to load the ad.

**Notes:** Nil if the ad failed to load.

(Read only property)

#### 5.11.14 responseIdentifier as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Unique identifier of the ad response.

**Notes:** (Read only property)

## 5.12 class GADRewardedAdMBS

### 5.12.1 class GADRewardedAdMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A rewarded ad.

**Notes:** Rewarded ads are ads that users have the option of interacting with in exchange for in-app rewards.

**Blog Entries**

- [MBS Xojo Plugins, version 22.5pr3](#)

### 5.12.2 Methods

#### 5.12.3 canPresent(byref error as NSErrorMBS) as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the ad can be presented from the provided root view controller.

**Notes:** Sets the error out parameter if the ad can't be presented.

Must be called on the main thread.

### 5.12.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

**Notes:** Please call Load method first to load the ad in background.

Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

### 5.12.5 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

#### 5.12.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads a reward ad.

**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.  
request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

### 5.12.7 Present

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.

**Notes:** Must be called on the main thread.

### 5.12.8 Properties

#### 5.12.9 adReward as GADAdRewardMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The reward earned by the user for interacting with the ad.

**Notes:** (Read only property)

#### 5.12.10 adUnitID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.

**Notes:** (Read only property)

#### 5.12.11 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 5.12.12 responseInfo as GADResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.

**Notes:** Nil until the first ad request succeeds or fails.

(Read only property)

### 5.12.13 Events

#### 5.12.14 DidDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

#### 5.12.15 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

#### 5.12.16 DidRecordClick

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

#### 5.12.17 DidRecordImpression

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

#### 5.12.18 loadCompleted(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.

**Notes:** Next you can call Present when needed.

### 5.12.19 paid(value as GADAdValueMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 5.12.20 userDidEarnReward

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event to be executed when the user earns a reward.

### 5.12.21 WillDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 5.12.22 WillPresentFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

## 5.13 class GADRewardedInterstitialAdMBS

### 5.13.1 class GADRewardedInterstitialAdMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A rewarded interstitial ad.

**Notes:** Rewarded Interstitial ads are full screen ads that can be presented without user-opt in and allow you to reward the user with in-app items.

**Blog Entries**

- [MBS Xojo Plugins, version 22.5pr3](#)

### 5.13.2 Methods

#### 5.13.3 canPresent(byref error as NSErrorMBS) as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Returns whether the interstitial ad can be presented from the provided root view controller.

**Notes:** Sets the error out parameter if the ad can't be presented.

Must be called on the main thread.

#### 5.13.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

**Notes:** Please call Load method first to load the ad in background.

Then later, when loadCompleted was called, the Handle is not zero and finally you can call Present to show the ad over the current view controller.

#### 5.13.5 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 5.13.6 loadWithAdUnitID(adUnitID as String, request as GADRequestMBS = nil)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Loads a rewarded interstitial ad.

**Notes:** adUnitID: An ad unit ID created in the AdMob or Ad Manager UI.

request: An ad request object. If nil, a default ad request object is used.

Calls loadCompleted event later, when the load operation finishes or times out.

### 5.13.7 Present

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Presents the interstitial ad.

**Notes:** Must be called on the main thread.

### 5.13.8 Properties

#### 5.13.9 adReward as GADAdRewardMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The reward earned by the user for interacting with the ad.

**Notes:** (Read only property)

#### 5.13.10 adUnitID as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The ad unit ID.

**Notes:** (Read only property)

#### 5.13.11 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.13.12 responseInfo as GADResponseInfoMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Information about the ad response that returned the current ad or an error.

**Notes:** Nil until the first ad request succeeds or fails.

(Read only property)

### 5.13.13 Events

#### 5.13.14 DidDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad dismissed full screen content.

#### 5.13.15 DidFailToPresentFullScreenContentWithError(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad failed to present full screen content.

#### 5.13.16 DidRecordClick

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when a click has been recorded for the ad.

#### 5.13.17 DidRecordImpression

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when that an impression has been recorded for the ad.

#### 5.13.18 loadCompleted(error as NSErrorMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when Load finished.

**Notes:** Next you can call Present when needed.

### 5.13.19 paid(value as GADAdValueMBS)

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Handles ad events that are estimated to have earned money.

### 5.13.20 userDidEarnReward

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event to be executed when the user earns a reward.

### 5.13.21 WillDismissFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will dismiss full screen content.

### 5.13.22 WillPresentFullScreenContent

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** The event called when the ad will present full screen content.

## 5.14 class UINavigationControllerMBS

### 5.14.1 class UINavigationControllerMBS

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** An object that manages a view hierarchy for your UIKit app.

**Notes:** The UINavigationController class defines the shared behavior that,Äôs common to all view controllers. You rarely create instances of the UINavigationController class directly. Instead, you subclass UINavigationController and add the methods and properties needed to manage the view controller,Äôs view hierarchy.

A view controller,Äôs main responsibilities include the following:

- Updating the contents of the views, usually in response to changes to the underlying data
- Responding to user interactions with views
- Resizing views and managing the layout of the overall interface
- Coordinating with other objects —including other view controllers—in your app

A view controller is tightly bound to the views it manages and takes part in handling events in its view hierarchy. Specifically, view controllers are UIResponder objects and are inserted into the responder chain between the view controller,Äôs root view and that view,Äôs superview, which typically belongs to a different view controller. If none of the view controller,Äôs views handle an event, the view controller has the option of handling the event or passing it along to the superview.

View controllers are rarely used in isolation. Instead, you often use multiple view controllers, each of which owns a portion of your app,Äôs user interface. For example, one view controller might display a table of items while a different view controller displays the selected item from that table. Usually, only the views from one view controller are visible at a time. A view controller may present a different view controller to display a new set of views, or it may act as a container for other view controllers,Äô content and animate views however it wants.

Subclass of the UIResponderMBS class.

#### Blog Entries

- [News from the MBS Xojo Plugins Version 23.3](#)
- [MBS Xojo Plugins, version 23.3pr5](#)

### 5.14.2 Methods

### 5.14.3 Constructor

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The constructor to create a new empty `UIViewController`.

#### 5.14.4 `dismissViewController(animated as boolean)`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the view controller that was presented modally by the view controller.

**Notes:** `animated`: Pass true to animate the transition.

The presenting view controller is responsible for dismissing the view controller it presented. If you call this method on the presented view controller itself, UIKit asks the presenting view controller to handle the dismissal.

If you present several view controllers in succession, thus building a stack of presented view controllers, calling this method on a view controller lower in the stack dismisses its immediate child view controller and all view controllers above that child on the stack. When this happens, only the top-most view is dismissed in an animated fashion; any intermediate view controllers are simply removed from the stack. The top-most view is dismissed using its modal transition style, which may differ from the styles used by other view controllers lower in the stack.

If you want to retain a reference to the view controller's presented view controller, get the value in the `presentedViewController` property before calling this method.

Xojo may not be happy, if you mess up their controllers!

#### 5.14.5 `loadView`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Creates the view that the controller manages.

**Notes:** You should never call this method directly. The view controller calls this method when its view property is requested but is currently nil. This method loads or creates a view and assigns it to the view property.

#### 5.14.6 `presentViewController(ViewController as UIViewControllerMBS, animated as Boolean)`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Presents a view controller modally.

**Notes:** `ViewController`: The view controller to display over the current view controller, its content.

animated: Pass true to animate the presentation; otherwise, pass false.

In a horizontally regular environment, the view controller is presented in the style specified by the `modalPresentationStyle` property. In a horizontally compact environment, the view controller is presented full screen by default. If you associate an adaptive delegate with the presentation controller associated with the object in `viewControllerToPresent`, you can modify the presentation style dynamically.

The object on which you call this method may not always be the one that handles the presentation. Each presentation style has different rules governing its behavior. For example, a full-screen presentation must be made by a view controller that itself covers the entire screen. If the current view controller is unable to fulfill a request, it forwards the request up the view controller hierarchy to its nearest parent, which can then handle or forward the request.

Before displaying the view controller, this method resizes the presented view controller's view based on the presentation style. For most presentation styles, the resulting view is then animated onscreen using the transition style in the `modalTransitionStyle` property of the presented view controller. For custom presentations, the view is animated onscreen using the presented view controller's transition delegate. For current context presentations, the view may be animated onscreen using the current view controller's transition style.

Xojo may not be happy, if you mess up their controllers!

### 5.14.7 Properties

#### 5.14.8 `className` as String

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The name of this `NSViewController` class.

**Notes:** e.g. `XOJViewController`  
(Read only property)

#### 5.14.9 `classPath` as String

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The path of this `NSViewController` class.

**Notes:** Useful for debugging to know what super classes the view controller has.

e.g. `XOJViewController:UIViewController:UIResponder:NSObject`  
(Read only property)

### 5.14.10 currentViewController as UIViewControllerMBS

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Queries the current view controller on the screen.

**Example:**

```
Dim c As UIViewControllerMBS = UIViewControllerMBS.currentViewController
```

Break

**Notes:** (Read only property)

### 5.14.11 isBeingDismissed as Boolean

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view controller is dismissing.

**Notes:** (Read only property)

### 5.14.12 isBeingPresented as Boolean

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view controller is presenting.

**Notes:** (Read only property)

### 5.14.13 isViewLoaded as Boolean

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value indicating whether the view is currently loaded into memory.

**Notes:** (Read only property)

### 5.14.14 parentViewController as UIViewControllerMBS

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The parent view controller of the recipient.

**Notes:** If the recipient is a child of a container view controller, this property holds the view controller it is contained in. If the recipient has no parent, the value in this property is nil.

(Read only property)

#### 5.14.15 `prefersStatusBarHidden` as Boolean

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Specifies whether the view controller prefers the status bar to be hidden or shown.

**Notes:** True if the status bar should be hidden or false if it should be shown.

(Read only property)

#### 5.14.16 `presentedViewController` as `UIViewControllerMBS`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view controller that is presented by this view controller, or one of its ancestors in the view controller hierarchy.

**Notes:** When you present a view controller modally (either explicitly or implicitly) using the `presentViewController` method, the view controller that called the method has this property set to the view controller that it presented. If the current view controller did not present another view controller modally, the value in this property is nil.

(Read only property)

#### 5.14.17 `presentingViewController` as `UIViewControllerMBS`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view controller that presented this view controller.

**Notes:** When you present a view controller modally (either explicitly or implicitly) using the `presentViewController()` method, the view controller that was presented has this property set to the view controller that presented it. If the view controller was not presented modally, but one of its ancestors was, this property contains the view controller that presented the ancestor. If neither the current view controller or any of its ancestors were presented modally, the value in this property is nil.

(Read only property)

#### 5.14.18 `Title` as String

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A localized string that represents the view this controller manages.

**Notes:** Set the title to a human-readable string that describes the view. If the view controller has a valid navigation item or tab-bar item, assigning a value to this property updates the title text of those objects.

(Read and Write property)

### 5.14.19 View as `NSViewMBS`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The view that the controller manages.

**Notes:** This property represents the root view of the view controller's view hierarchy. The default value of this property is nil.

If you access this property when its value is nil, the view controller automatically calls the `loadView` method and returns the resulting view.

Each view controller is the sole owner of its view object. Don't associate the same view object with multiple view controllers. The only exception is that a container view controller implementation may add another view controller's view object to its own view hierarchy. Before adding the subview, the container must first call its `addChildViewController` method to create a parent-child relationship between the two view controller objects.

Because accessing this property can cause the view to be loaded automatically, you can use `viewLoaded` to determine if the view is currently in memory. Unlike this property, `viewLoaded` doesn't force the loading of the view if it's not currently in memory.

(Read and Write property)

## 5.15 class UMPConsentFormMBS

### 5.15.1 class UMPConsentFormMBS

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** A single use consent form object.

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

#### Blog Entries

- [MonkeyBread Software Releases the MBS Xojo Plugins in version 24.0](#)
- [Google Admob Update](#)
- [MBS Xojo Plugins, version 23.6pr5](#)

### 5.15.2 Methods

### 5.15.3 Constructor

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The private constructor.

### 5.15.4 load(handler as ConsentFormLoadCompletedMBS)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Loads a consent form and calls completionHandler on completion.

**Notes:** Must be called on the main queue.

### 5.15.5 loadAndPresentIfRequiredFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Loads a consent form and immediately presents it.

**Notes:** Loads a consent form and immediately presents it from the provided viewController if ConsentInformation.sharedInstance.consentStatus is UMPConsentStatusRequired. Calls handler after the user selects an option and the form is dismissed, or on the next run loop if no form is presented.

Must be called on the main queue.

### 5.15.6 `presentFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)`

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Presents the full screen consent form over viewController.

**Notes:** The form is dismissed and handler is called after the user selects an option.

ConsentInformation.sharedInstance.consentStatus is updated prior to handler being called.

### 5.15.7 `presentPrivacyOptionsFormFromViewController(viewController as UIViewControllerMBS, handler as ConsentFormPresentCompletedMBS)`

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Presents a privacy options form.

**Notes:** Presents a privacy options form from the provided viewController if ConsentInformation.sharedInstance.privacyOptionsRequirementStatus is

PrivacyOptionsRequirementStatusRequired.

Calls handler with nil error after the user selects an option and the form is dismissed, or on the next run loop with a non-nil error if no form is presented. Must be called on the main queue.

This method should only be called in response to a user input to request a privacy options form to be shown. The privacy options form is preloaded by the SDK automatically when a form becomes available. If no form is preloaded, the SDK will invoke the handler on the next run loop, but will asynchronously retry to load one.

### 5.15.8 `UMPErrorDomain as String`

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Error domain for all SDK errors.

### 5.15.9 `Properties`

#### 5.15.10 `Handle as Integer`

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.15.11 VersionString as String

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The SDK version string.

**Notes:** In the form "major.minor.patch".  
(Read only property)

### 5.15.12 Constants

Error codes

Constant	Value	Description
FormErrorCodeAlreadyUsed	6	Form was already used.
FormErrorCodeInternal	5	Internal error.
FormErrorCodeInvalidViewController	9	Form cannot be presented from the provided view controller.
FormErrorCodeTimeout	8	Loading a form timed out.
FormErrorCodeUnavailable	7	Form is unavailable.
RequestErrorCodeInternal	1	Internal error.
RequestErrorCodeInvalidAppID	2	The application's app ID is invalid.
RequestErrorCodeMisconfiguration	4	A misconfiguration exists in the Funding Choices UI.
RequestErrorCodeNetwork	3	Network error communicating with Funding Choices.

### 5.15.13 Delegates

### 5.15.14 ConsentFormLoadCompletedMBS(consentForm as UMPConsentFormMBS, Error as NSErrorMBS)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Provides a nonnull consentForm and a nil error if the load succeeded.

**Notes:** Provides a nil consentForm and a nonnull error if the load failed.

### 5.15.15 ConsentFormPresentCompletedMBS(Error as NSErrorMBS)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Called after presentation of a ConsentForm finishes.

## 5.16 class UMPConsentInformationMBS

### 5.16.1 class UMPConsentInformationMBS

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Consent information.

**Notes:** All methods must be called on the main thread.

**Blog Entries**

- [Google Admob Update](#)
- [MBS Xojo Plugins, version 23.6pr5](#)

### 5.16.2 Methods

### 5.16.3 Constructor

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

**Notes:** Gets you the shared instance.

### 5.16.4 Destructor

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 5.16.5 requestConsentInfoUpdateWithParameters(parameters as UMPRequestParametersMBS = nil)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Requests consent information update.

**Notes:** Must be called in every app session before checking the user's consentStatus or loading a consent form. After calling this method, consentStatus will be updated synchronously to hold the consent state from the previous app session, if one exists.

consentStatus may be updated again immediately before the handler is called.

### 5.16.6 Reset

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Clears all consent state from persistent storage.

### 5.16.7 Properties

#### 5.16.8 canRequestAds as Boolean

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Indicates whether the app has completed the necessary steps for gathering updated user consent.

**Notes:** Returns false until requestConsentInfoUpdateWithParameters is called. Returns true once requestConsentInfoUpdateWithParameters is called and when consentStatus is ConsentStatusNotRequired or ConsentStatusObtained.

(Read only property)

#### 5.16.9 consentStatus as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The user's consent status.

**Notes:** This value defaults to ConsentStatusUnknown until requestConsentInfoUpdateWithParameters is called, and defaults to the previous session's value until your handler from requestConsentInfoUpdateWithParameters is called.

(Read only property)

#### 5.16.10 formStatus as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Consent form status.

**Notes:** This value defaults to FormStatusUnknown and requires a call to requestConsentInfoUpdateWithParameters to update.

(Read only property)

#### 5.16.11 Handle as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.16.12 privacyOptionsRequirementStatus as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Privacy options requirement status.

**Notes:** This value defaults to PrivacyOptionsRequirementStatusUnknown until requestConsentInfoUpdateWithParameters is called, and defaults to the previous session's value until your handler from requestConsentInfoUpdateWithParameters is called.

(Read only property)

### 5.16.13 sharedInstance as UMPConsentInformationMBS

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The shared consent information instance.

**Notes:** (Read only property)

### 5.16.14 Events

#### 5.16.15 ConsentInformationUpdateCompleted(Error as NSErrorMBS)

Plugin Version: 24.0, Platform: iOS, Targets: .

**Function:** Called when the consent info request completes.

**Notes:** Error is nil on success, and non-nil if the update failed.

### 5.16.16 Constants

Consent Status

Constant	Value	Description
ConsentStatusNotRequired	2	Consent not required.
ConsentStatusObtained	3	User consent obtained, personalized vs non-personalized undefined.
ConsentStatusRequired	1	User consent required but not yet obtained.
ConsentStatusUnknown	0	Unknown consent status.

Form Status

Constant	Value	Description
FormStatusAvailable	1	Consent forms are available and can be loaded using <code>loadWithCompletionHandler</code> .
FormStatusUnavailable	2	Consent forms are unavailable. Showing a consent form is not required.
FormStatusUnknown	0	Whether a consent form is available is unknown. An update should be requested using <code>requestConsentInfoUpdateWithParameters()</code> .

#### Privacy options requirement status

Constant	Value	Description
PrivacyOptionsRequirementStatusNotRequired	2	User does not need to modify their privacy options. Either required, or the consent type does not require modification.
PrivacyOptionsRequirementStatusRequired	1	A way must be provided for the user to modify their privacy options.
PrivacyOptionsRequirementStatusUnknown	0	Requirement unknown.

## 5.17 class UMPDebugSettingsMBS

### 5.17.1 class UMPDebugSettingsMBS

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Overrides settings for debugging or testing.

**Example:**

```
// test for Europe Economic Area
Dim debug As New UMPDebugSettingsMBS
debug.geography = debug.DebugGeographyEEA
```

```
Dim param As New UMPRequestParametersMBS
param.debugSettings = debug
param.tagForUnderAgeOfConsent = True
```

UMPConsentInformationMBS.sharedInstance.requestConsentInfoUpdateWithParameters param

#### Blog Entries

- [Google Admob Update](#)
- [MBS Xojo Plugins, version 23.6pr5](#)

### 5.17.2 Methods

### 5.17.3 Constructor

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

**Example:**

```
// test for Europe Economic Area
Dim debug As New UMPDebugSettingsMBS
debug.geography = debug.DebugGeographyEEA
```

```
Dim param As New UMPRequestParametersMBS
param.debugSettings = debug
param.tagForUnderAgeOfConsent = True
```

UMPConsentInformationMBS.sharedInstance.requestConsentInfoUpdateWithParameters param

#### 5.17.4 copy as UMPDebugSettingsMBS

Plugin Version: 24.0, Platform: iOS, Targets: All.

**Function:** Creates a copy of this class.

#### 5.17.5 setTestDeviceIdentifiers(testDeviceIdentifiers() as String)

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Sets the array of device identifier strings.

**Notes:** Debug features are enabled for devices with these identifiers. Debug features are always enabled for simulators.

#### 5.17.6 testDeviceIdentifiers as String()

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Array of device identifier strings.

**Notes:** Debug features are enabled for devices with these identifiers. Debug features are always enabled for simulators.

#### 5.17.7 Properties

#### 5.17.8 geography as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Debug geography.

**Notes:** (Read and Write property)

#### 5.17.9 Handle as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

**5.17.10 Constants**

## Debug Geography

Constant	Value	Description
DebugGeographyDisabled	0	Disable geography debugging.
DebugGeographyEEA	1	Geography appears as in EEA for debug devices.
DebugGeographyNotEEA	2	Geography appears as not in EEA for debug devices.

## 5.18 class UMPRequestParametersMBS

### 5.18.1 class UMPRequestParametersMBS

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Parameters sent on updates to user consent info.

**Blog Entries**

- [Google Admob Update](#)
- [MBS Xojo Plugins, version 23.6pr5](#)

### 5.18.2 Methods

### 5.18.3 Constructor

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 5.18.4 copy as UMPRequestParametersMBS

Plugin Version: 24.0, Platform: iOS, Targets: All.

**Function:** Creates a copy of the object.

### 5.18.5 Properties

### 5.18.6 debugSettings as UMPDebugSettingsMBS

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Debug settings for the request.

**Notes:** (Read and Write property)

### 5.18.7 Handle as Integer

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 5.18.8 tagForUnderAgeOfConsent as Boolean

Plugin Version: 24.0, Platform: iOS, Targets: iOS only.

**Function:** Indicates whether the user is tagged for under age of consent.

**Notes:** (Read and Write property)



# Chapter 6

## Navigation

### 6.1 class UIDocumentPickerMBS

#### 6.1.1 class UIDocumentPickerMBS

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A view controller that provides access to documents or destinations outside your app,Äôs sandbox.

**Notes:** Use a document picker view controller to select a document to open or export, and optionally copy. Don,Äôt copy the document if you can avoid it. The document picker operates in two modes:

Open a document. The user selects a document. The document picker provides access to the document, and the user can edit the document in place. Optionally, you can specify that the document picker makes a copy of the document, leaving the original unchanged.

Export a local document. The user selects a destination. The document picker moves the document, and the user can access it and edit it in place. Optionally, you can specify that the document picker makes a copy of the document, leaving the original unchanged.

#### Working with External Documents

Both the open and export operations grant access to documents outside your app,Äôs sandbox. This access gives users an unprecedented amount of flexibility when working with their documents. However, it also adds a layer of complexity to your file handling. External documents have the following additional requirements: The open and move operations provide security-scoped URLs for all external documents. Call the `startAccessingSecurityScopedResource` method to access or bookmark these documents, and the `stopAccessingSecurityScopedResource` method to release them (see `NSURLMBS` class). If you,Äôre using a `UIDocument` subclass to manage your document, it automatically manages the security-scoped URL for you.

Always use file coordinators (see `NSFileCoordinatorMBS`) to read and write to external documents. Always use a file presenter (see `NSFilePresenterMBS`) when displaying the contents of an external document.

Don't save URLs that the open and move operations provide. You can, however, save a bookmark to these URLs after calling `startAccessingSecurityScopedResource` to ensure you have access. Call the `bookmarkDataWithOptions` method and pass in the `NSURLBookmarkCreationWithSecurityScope` option, creating a bookmark that contains a security-scoped URL.

For more information about working with external documents, see [Providing Access to Directories and Adding a Document Browser to Your App](#).

### Blog Entries

- [News from the MBS Xojo Plugins Version 22.3](#)
- [MBS Xojo Plugins in version 22.3](#)
- [MBS Xojo Plugins, version 22.3pr6](#)
- [MBS Xojo Plugins, version 22.3pr5](#)

## 6.1.2 Methods

### 6.1.3 `Constructor(Mode as Integer, contentTypeOrURLs() as String, asCopy as Boolean = true)`

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Initializes and a document picker/exporter.

**Notes:** For `Mode = ModeImport` or `ModeOpen`, please pass array of content types. That may be mime types (e.g. "image/jpeg"), file extensions with dot prefix (e.g. ".jpg") or UTIs (e.g. "public.archive"). For iOS 13 and older, please pass only UTIs.

For `Mode = ModeExportToService` or `ModeMoveToService` takes in `contentTypeOrURLs` an array of file URLs to export.

`AsCopy` defines whether you like to get a copy on import (copied to temp folder) and copies your file for export. This way you can use temporary folders and later delete them when you are done.

## 6.1.4 Destructor

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 6.1.5 Dismiss

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 6.1.6 Present

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 6.1.7 Properties

#### 6.1.8 allowsMultipleSelection as Boolean

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether the user can select more than one document at a time.

**Notes:** By default, this property is false.

(Read and Write property)

#### 6.1.9 directoryURL as String

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The initial directory that the document picker displays.

**Notes:** Set this property to specify the starting directory for the document picker. This property defaults to "". If you specify a value, the document picker tries to start at the specified directory. Otherwise, it starts with the last directory chosen by the user.

The directoryURL property only returns a value when you explicitly set it. For example, it doesn't calculate the default URL presented to the user when the property isn't set.

For a folderItem, please pass URLPath property.

(Read and Write property)

#### 6.1.10 documentPickerMode as Integer

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The type of file transfer operation that the document picker uses.

**Notes:** (Read only property)

### 6.1.11 Handle as Integer

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 6.1.12 isBeingPresented as Boolean

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** Whether the controller is presented.

**Notes:** Returns true if the dialog is visible.

(Read only property)

### 6.1.13 shouldShowFileExtensions as Boolean

Plugin Version: 22.3, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether the browser always shows file extensions.

**Notes:** The default value is false.

(Read and Write property)

### 6.1.14 Events

#### 6.1.15 documentPickerDidPickDocuments(URLs() as String)

Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** Event called when documents were picked.

**Notes:** The array may have one or more URLs.

The meaning of the provided URLs varies depending on the document picker,Ãs mode:

Import:

The URLs refer to a copy of the selected documents. These documents are temporary files. They remain available only until your application terminates. To keep a permanent copy, move these files to a permanent

location inside your sandbox.

Open:

The URLs refer to the selected documents.

ExportToService:

The URLs refer to new copies of the exported documents at the selected destination.

MoveToService:

The URLs refer to the documents' new locations.

The provided URLs are security-scoped, referring to files outside your app's sandbox. For more about working with external, security-scoped URLs, see Requirements in the Document Picker Programming Guide.

### 6.1.16 documentPickerWasCancelled

Plugin Version: 22.3, Platform: iOS, Targets: .

**Function:** The user canceled the document picker.

### 6.1.17 Constants

Modes

Constant	Value	Description
ModeExportToService	2	The document picker exports a local file to a destination outside the app's sandbox.
ModeImport	0	The document picker imports a file from outside the app's sandbox.
ModeMoveToService	3	The document picker moves a local file outside the app's sandbox and provides access to it as an external file.
ModeOpen	1	The document picker opens an external file outside the app's sandbox.



# Chapter 7

## Photos

### 7.1 class PHPickerConfigurationMBS

#### 7.1.1 class PHPickerConfigurationMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** An object that contains information about how to configure a picker view controller.

#### Blog Entries

- [News from the MBS Xojo Plugins Version 23.4](#)
- [MBS Xojo Plugins, version 23.2pr1](#)
- [The Top 10 from the MBS Xojo Plugins in 2022](#)
- [News from the MBS Xojo Plugins Version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr1](#)

#### 7.1.2 Methods

#### 7.1.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a new configuration object.

**Notes:** This configuration doesn't return asset identifiers. To create configuration object with the system photo library use the other constructor.

See also:

- [7.1.4 Constructor\(PhotoLibrary as Variant\)](#)

102

### 7.1.4 Constructor(PhotoLibrary as Variant)

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a new configuration object for a photo library.

**Notes:** photoLibrary: The library from which to pick photos and videos.

Please pass a PPhotoLibraryMBS class.

See also:

- 7.1.3 Constructor

101

### 7.1.5 copy as PHPickerConfigurationMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the configuration object.

### 7.1.6 preselectedAssetIdentifiers as String()

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** An array of asset identifiers to preselect in the picker.

### 7.1.7 setPreselectedAssetIdentifiers(Identifiers() as String)

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Sets an array of asset identifiers to preselect in the picker.

**Notes:** Preselection works only when initializing a PHPickerConfigurationMBS object with a photo library. Otherwise, the system returns an error.

The number of preselected asset identifiers can exceed your selection limit. The system disables the done action until the selection count is lower than selectionLimit.

Additionally, when you configure a picker with preselected identifiers:

Results include all preselected identifiers when canceling the picker.

Results don't include item providers for preselected assets that remain selected.

When deselecting all assets, the system keeps the done action enabled.

### 7.1.8 Properties

#### 7.1.9 DisabledCapabilities as Integer

Plugin Version: 23.4, Platform: iOS, Targets: Desktop & iOS.

**Function:** Capabilities of the picker that should be disabled.

**Notes:** Default is CapabilitiesNone.

For macOS 14 and iOS 17 or newer.

(Read and Write property)

#### 7.1.10 Filter as PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The filter you apply to restrict the asset types the picker displays.

**Notes:** By default, a configuration object displays all asset types: images, Live Photos, and videos.

(Read and Write property)

#### 7.1.11 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 7.1.12 Mode as Integer

Plugin Version: 23.4, Platform: iOS, Targets: Desktop & iOS.

**Function:** The mode of the picker.

**Notes:** Default is ModeDefault.

For macOS 14 and iOS 17 or newer.

(Read and Write property)

#### 7.1.13 PreferredAssetRepresentationMode as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A mode that determines which representation to use if an asset contains more than one.

**Notes:** An asset can contain many representations under the same uniform type identifier, or you can prefer

a specific format. This mode determines which representation a result uses if many exist.

The system may perform additional transcoding to convert the asset you request to the compatible representation. Use `PHPickerConfigurationMBS.AssetRepresentationModeCurrent` to avoid transcoding, if possible. (Read and Write property)

### 7.1.14 Selection as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The selection behavior for the picker.

**Notes:** (Read and Write property)

### 7.1.15 SelectionLimit as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The maximum number of selections the user can make.

**Notes:** The default value is 1. Setting the value to 0 sets the selection limit to the maximum that the system supports.

(Read and Write property)

### 7.1.16 Constants

Asset Representation Modes

Constant	Value	Description
<code>AssetRepresentationModeAutomatic</code>	0	A mode that indicates that the system chooses the appropriate asset representation.
<code>AssetRepresentationModeCompatible</code>	2	A mode that uses the most compatible asset representation.
<code>AssetRepresentationModeCurrent</code>	1	A mode that uses the current representation to avoid transcoding, if possible.

Capabilities

Constant	Value	Description
CapabilitiesCollectionNavigation	4	The sidebar or the albums tab.
CapabilitiesNone	0	No specified capabilities.
CapabilitiesSearch	1	The search bar.
CapabilitiesSelectionActions	8	The "Cancel" and the "Add" (if possible) button.
CapabilitiesSensitivityAnalysisIntervention	16	Show intervention UI explaining potential risks for kids or teens if an asset is selected. Analysis and intervention will only be performed if "Communications Safety" is enabled in ScreenTime.
CapabilitiesStagingArea	2	The staging area.

## Modes

Constant	Value	Description
ModeCompact	1	Compact picker mode (single row).
ModeDefault	0	Default picker mode.

## Selection Behavior

Constant	Value	Description
SelectionContinuous	2	Selection can be delivered continuously. For macOS 14 and iOS 17 or newer.
SelectionContinuousAndOrdered	3	Selection can be delivered continuously and uses the selection order made by the user. Selected assets are numbered. For macOS 14 and iOS 17 or newer.
SelectionDefault	0	Uses the default selection behavior.
SelectionOrdered	1	Uses the selection order made by the user, numbering the selected assets.

## 7.2 class PHPickerFilterMBS

### 7.2.1 class PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A type that defines the filter to apply to the photo library.

**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 22.5pr1](#)

### 7.2.2 Methods

#### 7.2.3 anyFilterMatchingSubfilters(filters() as PHPickerFilterMBS) as PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a new filter by combining the filters in the array.

**Notes:** filters: The list of filters to combine into a new filter.

### 7.2.4 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 7.2.5 copy as PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Creates a copy of the filter object.

### 7.2.6 imagesFilter as PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A filter that represents images, and includes Live Photos.

### 7.2.7 livePhotosFilter as PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A filter that represents Live Photos.

### 7.2.8 videosFilter as PHPickerFilterMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** A filter that represents video assets.

### 7.2.9 Properties

#### 7.2.10 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

## 7.3 class PHPickerResultMBS

### 7.3.1 class PHPickerResultMBS

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Types that represent a selected asset from the user's photo library.

**Notes:** When you get result objects in a real application and you like to allow more than a few pictures, you may need to manage the jobs to download:

- Have a queue for the result objects to be downloaded.
- Check what types are available on each.
- Download what you need, e.g. HEIC or JPEG representation.
- Have a timer to start downloads and make sure you have only a limited number of parallel downloads like e.g. 4.
- Monitor which downloads failed and keep the NSErrorMBS for logging them.
- Show progress dialog for the download, e.g. with our ProgressHUDMBS class.

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

#### Blog Entries

- [The Top 10 from the MBS Xojo Plugins in 2022](#)
- [News from the MBS Xojo Plugins Version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr1](#)

### 7.3.2 Methods

### 7.3.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The private constructor.

### 7.3.4 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The destructor.

### 7.3.5 `hasItemConformingToTypeIdentifier(typeIdentifier as string)` as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Returns a Boolean value indicating whether an item provider contains a data representation conforming to a specified uniform type identifier (UTI) and to specified open-in-place behavior.

### 7.3.6 `loadFileRepresentationForTypeIdentifier(typeIdentifier as string, handler as LoadFileRepresentationCompletedMBS)`

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Asynchronously loads the requested type to a temporary file.

**Notes:** You can show a progress dialog and use `progressCurrent` and `progressTotal` values. Calls delegate later when download is finished.

### 7.3.7 `TypeIdentifiers as String()`

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** Returns the array of type identifiers for the item provider, listed in the same order in which they were registered.

### 7.3.8 Properties

#### 7.3.9 `assetIdentifier as String`

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The selected asset,Ãs local identifier.

**Notes:** (Read only property)

#### 7.3.10 `Handle as Integer`

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 7.3.11 progressCurrent as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The number of bytes downloaded so far.

**Notes:** This allows you to periodically check how far a download is and show a progress dialog. Only valid after calling loadFileRepresentationForTypeIdentifier method. (Read only property)

### 7.3.12 progressTotal as Integer

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The total size of a download.

**Notes:** This allows you to periodically check how far a download is and show a progress dialog. Only valid after calling loadFileRepresentationForTypeIdentifier method. (Read only property)

### 7.3.13 Delegates

### 7.3.14 LoadFileRepresentationCompletedMBS(File as FolderItem, error as NSErrorMBS, result as PHPickerResultMBS)

Plugin Version: 22.5, Platform: iOS, Targets: Desktop & iOS.

**Function:** The delegate called when loadFileRepresentationForTypeIdentifier is finished.

**Notes:** Called on main thread.

## 7.4 class PHPickerViewControllerMBS

### 7.4.1 class PHPickerViewControllerMBS

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** A view controller that provides the user interface for choosing assets from the photo library.

**Notes:** The PHPickerViewController class is an alternative to UIImagePickerController.

PHPickerViewController improves stability and reliability, and includes several benefits to developers and users, such as the following:

- Deferred image loading and recovery UI
- Reliable handling of large and complex assets, like RAW and panoramic images
- User-selectable assets that aren't available for UIImagePickerController
- Configuration of the picker to display only Live Photos
- Availability of PHLivePhotoMBS objects without library access
- Stricter validations against invalid inputs

You can present a picker object only once; you can't reuse it across sessions.

#### Blog Entries

- [News from the MBS Xojo Plugins Version 23.2](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.2](#)
- [MBS Xojo Plugins, version 23.2pr1](#)
- [The Top 10 from the MBS Xojo Plugins in 2022](#)
- [News from the MBS Xojo Plugins Version 22.5](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr1](#)

### 7.4.2 Methods

### 7.4.3 Constructor(configuration as PHPickerConfigurationMBS)

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Creates a new picker view controller with the configuration you specify.

**Notes:** configuration: The configuration with which to initialize the view controller.

#### 7.4.4 Destructor

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The destructor.

#### 7.4.5 Dismiss

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Dismisses the controller.

#### 7.4.6 Present

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** Presents the controller.

#### 7.4.7 Properties

#### 7.4.8 configuration as PHPickerConfigurationMBS

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The configuration you specify when creating the picker.

**Notes:** (Read only property)

#### 7.4.9 Handle as Integer

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: Desktop & iOS.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 7.4.10 popover as Variant

Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** The NSPopoverMBS object if used.

**Notes:** Allows access to the popover on macOS.

(Read only property)

#### 7.4.11 PopOverHeight as Integer

Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** The desired height for the popover.

**Notes:** We use this size to initialize it. Default is 500.

(Read and Write property)

#### 7.4.12 PopOverWidth as Integer

Plugin Version: 23.2, Platform: macOS, Targets: Desktop only.

**Function:** The desired width for the popover.

**Notes:** We use this size to initialize it. Default is 600.

(Read and Write property)

#### 7.4.13 Events

#### 7.4.14 didFinishPicking(Result() as PHPickerResultMBS)

Plugin Version: 22.5, Platforms: macOS, iOS, Targets: .

**Function:** Notifies the delegate that the user completed a selection or dismissed the picker using the cancel button.

**Notes:** picker: The currently presented picker view controller.

results: The results of the user,Äôs selections.

The system doesn,Äôt automatically dismiss the picker after calling this method, but the plugin does.



# Chapter 8

## ProgressView

### 8.1 class ProgressBackgroundViewMBS

#### 8.1.1 class ProgressBackgroundViewMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The class for a background view.

#### 8.1.2 Methods

#### 8.1.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

#### 8.1.4 Properties

#### 8.1.5 BlurEffectStyle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The blur effect style, when using BackgroundStyleBlur.

**Notes:** Defaults to UIBlurEffectStyleLight.  
(Read and Write property)

### 8.1.6 Color as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The background color or the blur tint color.

**Notes:** Defaults to nil on iOS 13 and later and [ UIColor colorWithWhite:0.8f alpha:0.6f ] on older systems. This uses NSColorMBS to wrap the UIColor.

(Read and Write property)

### 8.1.7 ColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The background color or the blur tint color.

**Example:**

```
// set background color for this HUD
dim p as ProgressHUDMBS // your instance
p.backgroundView.ColorValue = &c00FF00
```

**Notes:** Defaults to nil on iOS 13 and later and [ UIColor colorWithWhite:0.8f alpha:0.6f ] on older systems. This is the color as a Xojo color value.

(Read and Write property)

### 8.1.8 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 8.1.9 Style as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The background style.

**Notes:** Defaults to BackgroundStyleBlur.

(Read and Write property)

### 8.1.10 Constants

#### Styles

Constant	Value	Description
BackgroundStyleBlur	1	UIVisualEffectView or UIToolbar.layer background view.
BackgroundStyleSolidColor	0	Solid color background

## 8.2 class ProgressBarProgressViewMBS

### 8.2.1 class ProgressBarProgressViewMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A flat bar progress view.

### 8.2.2 Methods

### 8.2.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 8.2.4 Properties

### 8.2.5 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 8.2.6 LineColor as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar border line color.

**Notes:** Defaults to white [ UIColor whiteColor ] .

This uses NSColorMBS to wrap the UIColor.

(Read and Write property)

### 8.2.7 LineColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar border line color.

**Notes:** Defaults to white.

This is the color as a Xojo color value.  
(Read and Write property)

### 8.2.8 Progress as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The Progress (0.0 to 1.0).

**Notes:** (Read and Write property)

### 8.2.9 ProgressColor as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar progress color.

**Notes:** Defaults to white [ UIColor whiteColor ] .

This uses NSColorMBS to wrap the UIColor.

(Read and Write property)

### 8.2.10 ProgressColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar progress color.

**Notes:** Defaults to white.

This is the color as a Xojo color value.

(Read and Write property)

### 8.2.11 ProgressRemainingColor as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar background color.

**Notes:** Defaults to clear [ UIColor clearColor ] .

This uses NSColorMBS to wrap the UIColor.

(Read and Write property)

### 8.2.12 ProgressRemainingColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Bar background color.

**Notes:** Defaults to clear [ UIColor clearColor ] .

This is the color as a Xojo color value.

(Read and Write property)

## 8.3 class ProgressHUDMBS

### 8.3.1 class ProgressHUDMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Displays a simple HUD window containing a progress indicator and two optional labels for short messages.

**Notes:** This is a simple drop-in class for displaying a progress HUD view similar to Apple's private `UIProgressHUD` class.

The `MBProgressHUD` window spans over the entire space given to it by the constructor and catches all user input on this region, thereby preventing the user operations on components below the view.

To still allow touches to pass through the HUD, you can set `hud.userInteractionEnabled = false`.

`MBProgressHUD` is a UI class and should therefore only be accessed on the main thread.

#### Blog Entries

- [News from the MBS Xojo Plugins Version 22.5](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 22.5](#)
- [MBS Xojo Plugins, version 22.5pr6](#)
- [MBS Xojo Plugins, version 22.5pr5](#)
- [ProgressDialog functions for iOS](#)
- [MBS Xojo Plugins, version 22.5pr4](#)

#### Xojo Developer Magazine

- [21.1, page 34: News from MBS Xojo Plugins, What's up with MonkeyBread Software by Stefanie Juchmes](#)

### 8.3.2 Methods

### 8.3.3 Constructor(Control as MobileControl)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Creates a HUD on top of the control.

See also:

- [8.3.4 Constructor\(Screen as MobileScreen\)](#) 122
- [8.3.5 Constructor\(ViewHandle as Integer\)](#) 122

### 8.3.4 Constructor(Screen as MobileScreen)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Creates a HUD on top of the screen.

See also:

- 8.3.3 Constructor(Control as MobileControl) 121
- 8.3.5 Constructor(ViewHandle as Integer) 122

### 8.3.5 Constructor(ViewHandle as Integer)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Creates a HUD on top of the given view handle.

See also:

- 8.3.3 Constructor(Control as MobileControl) 121
- 8.3.4 Constructor(Screen as MobileScreen) 122

### 8.3.6 Destructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 8.3.7 hide(animated as boolean = true)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Hides the HUD.

**Notes:** This still calls the hudWasHidden event. This is the counterpart of the show method. Use it to hide the HUD when your task completes.

animated: If set to true the HUD will disappear using the current animationType. If set to false the HUD will not use animations while disappearing.

You may want to set RemoveFromSuperViewOnHide to false in case you like to show it again later.

See also:

- 8.3.8 hide(animated as boolean, afterDelay as Double) 123

### 8.3.8 hide(animated as boolean, afterDelay as Double)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Hides the HUD after a delay.

**Notes:** This still calls the hudWasHidden event. This is the counterpart of the show method. Use it to hide the HUD when your task completes.

animated: If set to true the HUD will disappear using the current animationType. If set to false the HUD will not use animations while disappearing.

delay: Delay in seconds until the HUD is hidden.

See also:

- 8.3.7 hide(animated as boolean = true)

122

### 8.3.9 show(animated as boolean = true)

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Displays the HUD.

**Notes:** You need to make sure that the main thread completes its run loop soon after this method call so that the user interface can be updated. Call this method when your task is already set up to be executed in a new thread (e.g., when using something like a thread or timer).

Animated: If set to true the HUD will appear using the current animationType. If set to false the HUD will not use animations while appearing.

### 8.3.10 Properties

#### 8.3.11 AnimationType as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The animation type that should be used when the HUD is shown and hidden.

**Notes:** (Read and Write property)

#### 8.3.12 backgroundView as ProgressBackgroundViewMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** View covering the entire HUD area, placed behind bezierView.

**Example:**

```
// set background color for this HUD  
dim p as ProgressHUDMBS // your instance  
p.backgroundView.ColorValue = &c00FF00
```

**Notes:** (Read only property)

### 8.3.13 `bezelView` as `ProgressBackgroundViewMBS`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The view containing the labels and indicator (or customView).

**Notes:** (Read only property)

### 8.3.14 `ButtonTitle` as `String`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The title of the button.

**Notes:** (Read and Write property)

### 8.3.15 `ButtonView` as `Variant`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A button that is placed below the labels.

**Notes:** Value is `NSViewMBS` object.

(Read only property)

### 8.3.16 `ContentColor` as `Variant`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A color that gets forwarded to all labels and supported indicators.

**Notes:** Also sets the `tintColor`

for custom views on iOS 7+. Set to nil to manage color individually.

Defaults to semi-translucent black on iOS 7 and later and white on earlier iOS versions.

This uses `NSColorMBS` to wrap the `UIColor`.

(Read and Write property)

### 8.3.17 ContentColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A color that gets forwarded to all labels and supported indicators.

**Example:**

```

dim p as ProgressHUDMBS // your view

// change color to red
p.ContentColorValue = &cFF0000

```

**Notes:** Also sets the tintColor

for custom views on iOS 7+. Set to nil to manage color individually.

Defaults to semi-translucent black on iOS 7 and later and white on earlier iOS versions.

This is the color as a Xojo color value.

(Read and Write property)

### 8.3.18 defaultMotionEffectsEnabled as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** When enabled, the bezel center gets slightly affected by the device accelerometer data.

**Notes:** Defaults to false.

This can cause main thread checker assertions on certain devices. <https://github.com/jdg/MBProgressHUD/issues/552>

(Read and Write property)

### 8.3.19 DetailsLabelText as String

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The text for the details label.

**Notes:** The details text can span multiple lines.

(Read and Write property)

### 8.3.20 DetailsLabelView as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A label that holds an optional details message displayed below the labelText message.

**Notes:** The details text can span multiple lines.  
Value is `UIViewMBS` object.  
(Read only property)

### 8.3.21 `graceTime` as `Double`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:**

Grace period is the time (in seconds) that the invoked method may be run without showing the HUD.

**Notes:**

If the task finishes before the grace time runs out, the HUD will not be shown at all. This may be used to prevent HUD display for very short tasks.  
Defaults to 0 (no grace time).

The `graceTime` needs to be set before the hud is shown.  
(Read and Write property)

### 8.3.22 `Handle` as `Integer`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 8.3.23 `Indicator` as `Variant`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The indicator control in use.

**Notes:** Either `ProgressBarProgressViewMBS` or `ProgressRoundProgressViewMBS` object.  
(Read only property)

### 8.3.24 `LabelText` as `String`

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The label text.

**Notes:** The HUD is automatically resized to fit the entire text.

(Read and Write property)

### 8.3.25 LabelView as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A label that holds an optional short message to be displayed below the activity indicator. #

**Notes:** The HUD is automatically resized to fit the entire text.

Value is NSViewMBS object.

(Read only property)

### 8.3.26 margin as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The amount of space between the HUD edge and the HUD elements (labels, indicators or custom views).

**Notes:** This also represents the minimum bezel distance to the edge of the HUD view.

Defaults to 20.

(Read and Write property)

### 8.3.27 MinHeight as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The minimum size of the HUD bezel.

**Notes:** Defaults to zero (no minimum size).

(Read and Write property)

### 8.3.28 minShowTime as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The minimum time (in seconds) that the HUD is shown.

**Notes:** This avoids the problem of the HUD being shown and than instantly hidden.

Defaults to 0 (no minimum show time).

(Read and Write property)

### 8.3.29 MinWidth as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The minimum size of the HUD bezel.

**Notes:** Defaults to zero (no minimum size).  
(Read and Write property)

### 8.3.30 Mode as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** MBProgressHUD operation mode.

**Notes:** The default is ModeIndeterminate.  
(Read and Write property)

### 8.3.31 offsetX as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The bezel offset relative to the center of the view.

**Notes:** You can use MBProgressMaxOffset and -MBProgressMaxOffset to move the HUD all the way to the screen edge in each direction.

E.g., `CGPointMake(0, MBProgressMaxOffset)` would position the HUD centered on the bottom edge.  
(Read and Write property)

### 8.3.32 offsetY as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The bezel offset relative to the center of the view.

**Notes:** You can use MBProgressMaxOffset and -MBProgressMaxOffset to move the HUD all the way to the screen edge in each direction.

E.g., `CGPointMake(0, MBProgressMaxOffset)` would position the HUD centered on the bottom edge.  
(Read and Write property)

### 8.3.33 Progress as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The progress of the progress indicator, from 0.0 to 1.0.

**Notes:** Defaults to 0.0.

(Read and Write property)

### 8.3.34 RemoveFromSuperViewOnHide as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Removes the HUD from its parent view when hidden.

**Notes:** Defaults to false.

(Read and Write property)

### 8.3.35 Square as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Force the HUD dimensions to be equal if possible.

**Notes:** (Read and Write property)

### 8.3.36 userInteractionEnabled as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A Boolean value that determines whether user events are ignored and removed from the event queue.

**Notes:** When set to false, touch, press, keyboard, and focus events intended for the view are ignored and removed from the event queue. When set to YES, events are delivered to the view normally. The default value of this property is true.

During an animation, user interactions are temporarily disabled for all views involved in the animation, regardless of the value in this property. You can disable this behavior by specifying the `UIViewAnimationOptionAllowUserInteraction` option when configuring the animation.

(Read and Write property)

### 8.3.37 View as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The view as `NSViewMBS` object.

**Notes:** Value is `NSViewMBS` object.

(Read only property)

### 8.3.38 Events

#### 8.3.39 `buttonAction`

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Called when user taps the button.

#### 8.3.40 `hudWasHidden`

Plugin Version: 22.5, Platform: iOS, Targets: .

**Function:** Called after the HUD was fully hidden from the screen.

### 8.3.41 Constants

#### Constants

Constant	Value	Description
<code>MaxOffset</code>	1000000.0	The max offset constant to move to the other border.

#### Animations

Constant	Value	Description
<code>AnimationFade</code>	0	Opacity animation
<code>AnimationZoom</code>	1	Opacity + scale animation (zoom in when appearing zoom out when disappearing)
<code>AnimationZoomIn</code>	3	Opacity + scale animation (zoom in style)
<code>AnimationZoomOut</code>	2	Opacity + scale animation (zoom out style)

#### Modes

Constant	Value	Description
<code>ModeAnnularDeterminate</code>	3	Ring-shaped progress view.
<code>ModeCustomView</code>	4	Shows a custom view.
<code>ModeDeterminate</code>	1	A round, pie-chart like, progress view.
<code>ModeDeterminateHorizontalBar</code>	2	Horizontal progress bar.
<code>ModeIndeterminate</code>	0	A round progress indicator.
<code>ModeText</code>	5	Shows only labels.

## 8.4 class ProgressRoundProgressViewMBS

### 8.4.1 class ProgressRoundProgressViewMBS

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** A progress view for showing definite progress by filling up a circle (pie chart).

### 8.4.2 Methods

### 8.4.3 Constructor

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 8.4.4 Properties

### 8.4.5 Annular as Boolean

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Display mode.

**Notes:** False = round or True = annular. Defaults to round.  
(Read and Write property)

### 8.4.6 backgroundTintColor as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator background (non-progress) color.

**Notes:** Only applicable on iOS versions older than iOS 7.  
Defaults to translucent white (alpha 0.1).  
This uses NSColorMBS to wrap the UIColor.  
(Read and Write property)

### 8.4.7 backgroundTintColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator background (non-progress) color.

**Notes:** Only applicable on iOS versions older than iOS 7.

Defaults to translucent white (alpha 0.1).

This is the color as a Xojo color value.

(Read and Write property)

#### 8.4.8 Handle as Integer

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 8.4.9 Progress as Double

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** The Progress (0.0 to 1.0).

**Notes:** (Read and Write property)

#### 8.4.10 progressTintColor as Variant

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator progress color.

**Notes:** Defaults to white [ UIColor whiteColor ] .

This uses NSColorMBS to wrap the UIColor.

(Read and Write property)

#### 8.4.11 progressTintColorValue as Color

Plugin Version: 22.5, Platform: iOS, Targets: iOS only.

**Function:** Indicator progress color.

**Notes:** Defaults to white.

This is the color as a Xojo color value.

(Read and Write property)

# Chapter 9

## QuickLook

### 9.1 class QLPreviewControllerMBS

#### 9.1.1 class QLPreviewControllerMBS

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** A specialized view controller for previewing an item.

**Notes:** A QLPreviewController can display previews for many common file types, including the following:

- iWork documents
- Microsoft Office documents
- Rich text format, or RTF, documents
- PDF files
- Images
- Text files with a uniform type identifier that conforms to the public.text type. To learn more, see Uniform type identifiers.
- Comma-separated values, or CSV, files
- 3D models in the USDZ format with both standalone and AR views for viewing the model

The list of supported common file types may change between operating system releases. In addition, you can enable previews for your own file types by implementing your own preview extension.

With editing mode, you get the PDF markup editor right into your Xojo application.

See `QLPreviewViewControlMBS` for desktop macOS projects.

See `WinPreviewControlMBS` control for Windows targets.

### Blog Entries

- [News from the MBS Xojo Plugins Version 23.3](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.3](#)
- [MBS Xojo Plugins, version 23.3pr2](#)
- [Adding QuickLook preview for iOS to Xojo](#)

## 9.1.2 Methods

### 9.1.3 `AddItem(item as FolderItem)`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Adds an item to the list of items to show.

**Notes:** Please call `reloadData` if you modify the list of items.

### 9.1.4 `AddItems(items() as FolderItem)`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Add multiple items.

**Notes:** Please call `reloadData` if you modify the list of items.

### 9.1.5 `canPreviewItem(file as FolderItem) as Boolean`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Returns a Boolean value that indicates whether the preview controller can display an item.

**Notes:** If the system can't display an item, but you still attempt to display it, a Quick Look preview controller displays a generic error. Always check whether you can display an item before choosing to do so.

### 9.1.6 `ClearItems`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Remove all items.

### 9.1.7 Constructor

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The constructor.

### 9.1.8 Destructor

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The destructor.

### 9.1.9 Dismiss

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Dismisses the controller.

### 9.1.10 Items as `FolderItem()`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Queries list of items to show.

### 9.1.11 Present

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Presents the controller.

### 9.1.12 `refreshCurrentPreviewItem`

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Asks the Quick Look preview controller to recompute the display of the current preview item.

**Notes:** Quick Look recomputes the display regardless of whether the current preview item changes.

### 9.1.13 reloadData

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Asks the preview controller to reload its data from its data source.

**Notes:** Quick Look recomputes the displayed data only if the current preview item changes.

### 9.1.14 SetItems(items() as FolderItem)

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** Replaces the list of items.

**Notes:** Please call reloadData if you modify the list of items.

### 9.1.15 Properties

#### 9.1.16 currentItem as FolderItem

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The item displaying in the Quick Look preview controller.

**Notes:** If the preview controller isn't displaying an item, this property's value is nil.  
(Read only property)

#### 9.1.17 currentItemIndex as Integer

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The index within the preview item navigation list of the item displaying in the Quick Look preview controller.

**Notes:** You can change which item the preview controller displays, among those in a navigation list, by setting this property's value. If the preview controller isn't displaying an item, this property's value is -1.

(Read and Write property)

#### 9.1.18 Handle as Integer

Plugin Version: 23.3, Platform: iOS, Targets: iOS only.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

### 9.1.19 Events

#### 9.1.20 DidDismiss

Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the preview was closed.

#### 9.1.21 didSaveEditedCopyOfPreviewItem(Item as FolderItem, modifiedContentsFile as FolderItem)

Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the preview item,Äôs edited content was successfully saved to a copy at the given URL.

**Notes:** The platform invokes this callback with an edited copy of the preview item at modifiedContentsFile. It invokes the callback in the following scenarios:

- The editing mode of the previewItem is EditingModeCreateCopy.
- The editing mode of the previewItem is EditingModeUpdateContents and the system can,Äôt overwrite its previewItemURL. In this case, modifiedContentsURL points to a temporary file on disk containing the edited copy.
- The editing mode of the preview item is EditingModeUpdateContents and its content type doesn,Äôt match the content type of the edited version. This mismatch means that the file type of the file at modifiedContentsURL may be different from the file type of the preview item.

The platform may invoke the callback multiple times consecutively with the successive edited versions of the preview item. It typically invokes the callback once for each time the user saves their edits.

#### 9.1.22 didUpdateContentsOfPreviewItem(Item as FolderItem)

Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the content of a preview was updated successfully.

**Notes:** The platform invokes this callback after the preview controller successfully overwrites the file at the previewItem location with an updated file.

The platform may invoke the callback multiple times consecutively with the successive edited versions of the preview item. It typically invokes the callback once for each time the user saves their edits.

### 9.1.23 `editingModeForPreviewItem(Item as FolderItem)` as Integer

Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Returns a value that indicates how the preview controller handles edits to the content of the previewed file.

**Notes:** Return a value that indicates whether the previewed content is editable and how Quick Look saves the edits. If you return `EditingModeUpdateContents` or `EditingModeCreateCopy` to allow edits to a preview, make sure to implement the appropriate callbacks.

The platform invokes this callback when the preview controller loads its data. The system calls it for each preview item that it passes to the data source of the preview controller.

By default, a preview controller doesn't allow edits to a preview. However, you can implement this method to allow the user to edit the previewed document, and specify the behavior for saving changes. The supported set of edits may change over time, but currently includes adding markup to images or PDFs, as well as simple edits to video files.

If you want to update the underlying file in place, return `EditingModeUpdateContents`, and implement both the `didUpdateContentsOfPreviewItem` and `didSaveEditedCopyOfPreviewItem` delegate methods. The Quick Look feature calls `didUpdateContentsOfPreviewItem` first and updates the preview item's content. If it can't update the item directly, it invokes `didSaveEditedCopyOfPreviewItem` and creates a copy of the preview item's content that contains the edits.

If you prefer to always save edits to a copy of the preview item's content, return `EditingModeCreateCopy` and implement `didSaveEditedCopyOfPreviewItem`.

### 9.1.24 `shouldOpenURL(URL as String, Item as FolderItem)` as Boolean

Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Whether the preview controller should open a URL.

**Notes:** The system invokes this method when the user taps a URL link in a preview. If you return `true`, the Quick Look preview controller invokes the `openURL` method on the `UIApplication` object, sending it the value of the `url` parameter. If you return `false`, the system doesn't invoke the `openURL` method and you can do something yourself.

If you don't implement this method, it defaults to returning `true`.

### 9.1.25 WillDismiss

Plugin Version: 23.3, Platform: iOS, Targets: .

**Function:** Tells you that the preview is about to close.

### 9.1.26 Constants

Editing Modes

Constant	Value	Description
EditingModeCreateCopy	2	Represents the mode to create a copy of the file and perform the edits on the copy.
EditingModeDisabled	0	Represents the mode to disable edit mode for the file.
EditingModeUpdateContents	1	Represents the mode to update the file directly without creating a copy.



# Chapter 10

## System

### 10.1 class DCDeviceMBS

#### 10.1.1 class DCDeviceMBS

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** A representation of a device that provides a unique, authenticated token.

**Notes:** Use the shared instance of the DCDevice class to generate a token that identifies a device. Call the generateToken method to get the token, and then send it to your server.

On your server, combine the token with an authentication key that you obtain from Apple, and use the result to request access to two per-device binary digits (bits). After authenticating the device, Apple passes the current values of the bits, along with the date they were last modified, to your server. Your server applies its business logic to this information and communicates the results to your app. For more information about server-side procedures, see [Accessing and Modifying Per-Device Data](#).

To use the DCDevice class, your app must have an app ID that you register on the Apple Developer website.

Apple records the bits for you, and reports the bits back to you, but you,Äre responsible for keeping track of what the bits mean. You,Äre also responsible for determining when to reset the bits for a given device; for example, when a user sells the device to someone else.

#### **Blog Entries**

- [News from the MBS Xojo Plugins in Version 23.0](#)
- [MonkeyBread Software Releases the MBS Xojo Plugins in version 23.0](#)
- [MBS Xojo Plugins, version 22.6pr1](#)

**Xojo Developer Magazine**

- [21.3, page 10: News](#)
- [21.2, page 9: News](#)

## 10.1.2 Methods

### 10.1.3 available as boolean

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** Whether the class is available.

**Example:**

```
MessageBox "available: "+DCDeviceMBS.available.ToString
```

**Notes:** Returns true on macOS 10.15 and newer and iOS 11.0 or newer.

### 10.1.4 Constructor

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** The constructor.

**Notes:** Initializes the object pointing to the current device one internally.

### 10.1.5 currentDevice as DCDeviceMBS

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** A representation of the device for which you want to query the two bits of data.

### 10.1.6 generateToken(CompleteHandler as GenerateTokenCompletedMBS, tag as variant = nil)

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** Generates a token that identifies the current device.

**Notes:** Calls GenerateTokenCompletedMBS event later when done.

Your server uses the generated token in its requests to get or set the persistent bits for the current device. You should treat the token you receive in the completion block as single-use. Although the token remains valid long enough for your server to retry a specific request if necessary, you should not use a token multiple

times. Instead, use this method to generate a new token.

The app you use to generate the token must be associated with your developer account; otherwise, the generation request fails.

### 10.1.7 Properties

#### 10.1.8 Handle as Integer

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** The internal object reference.

**Notes:** (Read and Write property)

#### 10.1.9 Supported as Boolean

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** A Boolean value that indicates whether the device supports the DeviceCheck API.

**Example:**

```
MessageBox "Supported: "+DCDeviceMBS.currentDevice.Supported.ToString
```

**Notes:** For iOS 11.0 or newer and macOS 10.15 or newer.  
(Read only property)

#### 10.1.10 Constants

Errors

Constant	Value	Description
ErrorFeatureUnsupported	1	The feature is not supported on this device.
ErrorInvalidInput	2	Input to the server process was invalid.
ErrorInvalidKey	3	The key used is invalid.
ErrorServerUnavailable	4	The server application to talk to is not available.
ErrorUnknownSystemFailure	0	Unknown error in system.

### 10.1.11 Delegates

### 10.1.12 GenerateTokenCompletedMBS(token as MemoryBlock, Error as NSErrorMBS, Tag as Variant)

Plugin Version: 23.0, Platforms: macOS, iOS, Targets: All.

**Function:** The event called asynchronously from generateToken when work is done.

**Notes:** token: An ephemeral token that identifies the current device.

error: The error that occurred, if any.

Your server uses the generated token in its requests to get or set the persistent bits for the current device. You should treat the token you receive in the completion block as single-use. Although the token remains valid long enough for your server to retry a specific request if necessary, you should not use a token multiple times. Instead, use this method to generate a new token.

The app you use to generate the token must be associated with your developer account; otherwise, the generation request fails.

# Chapter 11

## List of Questions in the FAQ

- 12.0.1 Can anyone help me convert seconds to time in this format hh:mm:ss? 155
- 12.0.2 Do you have plugins for Android? 156
- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 12.0.4 How to catch delete key? 157
- 12.0.5 How to convert cmyk to rgb? 158
- 12.0.6 How to delete a folder? 159
- 12.0.7 How to detect if CPU is 64bit processor? 160
- 12.0.8 How to query variant type string for a variant? 161
- 12.0.9 How to refresh a htmlviewer on Windows? 162
- 12.0.10 Is there an example for vector graphics in Xojo? 163
- 12.0.11 Picture functions do not preserve resolution values? 164
- 12.0.12 A toolbox call needs a rect - how do I give it one? 164
- 12.0.13 API client not supported? 164
- 12.0.14 Can I access Access Database with Java classes? 165
- 12.0.15 Can I create PDF from Xojo Report using DynaPDF? 166
- 12.0.16 Can I use AppleScripts in a web application? 166
- 12.0.17 Can I use graphics class with DynaPDF? 166
- 12.0.18 Can I use sockets on a web application? 167
- 12.0.19 Can I use your ChartDirector plugin on a web application? 167

- 12.0.20 Can I use your DynaPDF plugin on a web application? 168
- 12.0.21 Can I use your plugin controls on a web application? 169
- 12.0.22 Can you get an unique machine ID? 169
- 12.0.23 ChartDirector: Alignment Specification 169
- 12.0.24 ChartDirector: Color Specification 170
- 12.0.25 ChartDirector: Font Specification 173
- 12.0.26 ChartDirector: Mark Up Language 177
- 12.0.27 ChartDirector: Parameter Substitution and Formatting 181
- 12.0.28 ChartDirector: Shape Specification 185
- 12.0.29 Copy styled text? 186
- 12.0.30 Do you have code to validate a credit card number? 187
- 12.0.31 Do you have plugins for X-Rite EyeOne, eXact or i1Pro? 188
- 12.0.32 Does SQL Plugin handle stored procedures with multiple result sets? 188
- 12.0.33 Does the plugin home home? 188
- 12.0.34 folderitem.absolutePath is limited to 255 chars. How can I get longer ones? 189
- 12.0.35 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? 189
- 12.0.36 How about Plugin support for older OS X? 190
- 12.0.37 How can I detect whether an Intel CPU is a 64bit CPU? 191
- 12.0.38 How can I disable the close box of a window on Windows? 192
- 12.0.39 How can I get all the environment variables from Windows? 192
- 12.0.40 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? 193
- 12.0.41 How can I get text from a PDF? 193
- 12.0.42 How can I get text from a Word Document? 193
- 12.0.43 How can I get the item string for a given file creator? 194
- 12.0.44 How can I launch an app using it's creator code? 195
- 12.0.45 How can I learn what shared libraries are required by a plugin on Linux? 195
- 12.0.46 How can I validate an email address? 197
- 12.0.47 How do I decode correctly an email subject? 197

	147
• 12.0.48 How do I enable/disable a single tab in a tabpanel?	198
• 12.0.49 How do I find the root volume for a file?	199
• 12.0.50 How do I get the current languages list?	199
• 12.0.51 How do I get the Mac OS Version?	200
• 12.0.52 How do I get the printer name?	201
• 12.0.53 How do I make a metal window if RB does not allow me this?	202
• 12.0.54 How do I make a smooth color transition?	202
• 12.0.55 How do I read the applications in the dock app?	203
• 12.0.56 How do I truncate a file?	204
• 12.0.57 How do update a Finder's windows after changing some files?	204
• 12.0.58 How to access a USB device directly?	205
• 12.0.59 How to add icon to file on Mac?	205
• 12.0.60 How to ask the Mac for the Name of the Machine?	205
• 12.0.61 How to automatically enable retina in my apps?	206
• 12.0.62 How to avoid leaks with Cocoa functions?	206
• 12.0.63 How to avoid trouble connecting to oracle database with SQL Plugin?	207
• 12.0.64 How to avoid ___NSAutoreleaseNoPool console messages in threads?	207
• 12.0.65 How to bring app to front?	208
• 12.0.66 How to bring my application to front?	208
• 12.0.67 How to catch Control-C on Mac or Linux in a console app?	209
• 12.0.68 How to change name of application menu?	209
• 12.0.69 How to change the name in the menubar of my app on Mac OS X?	210
• 12.0.70 How to check if a folder/directory has subfolders?	210
• 12.0.71 How to check if Macbook runs on battery or AC power?	211
• 12.0.72 How to check if Microsoft Outlook is installed?	212
• 12.0.73 How to check on Mac OS which country or language is currently selected?	212
• 12.0.74 How to code sign my app with plugins?	213
• 12.0.75 How to collapse a window?	213
• 12.0.76 How to compare two pictures?	214

- 12.0.77 How to compile PHP library? 216
- 12.0.78 How to convert a `BrowserType` to a `String` with `WebSession.Browser`? 217
- 12.0.79 How to convert a `EngineType` to a `String` with `WebSession.Engine`? 218
- 12.0.80 How to convert a `PlatformType` to a `String` with `WebSession.Platform`? 218
- 12.0.81 How to convert a text to iso-8859-1 using the `TextEncoder`? 219
- 12.0.82 How to convert `ChartTime` back to Xojo date? 220
- 12.0.83 How to convert line endings in text files? 220
- 12.0.84 How to convert picture to string and back? 221
- 12.0.85 How to copy an array? 222
- 12.0.86 How to copy an dictionary? 222
- 12.0.87 How to copy parts of a movie to another one? 222
- 12.0.88 How to create a birthday like calendar event? 223
- 12.0.89 How to create a GUID? 224
- 12.0.90 How to create a Mac picture clip file? 224
- 12.0.91 How to create a PDF file in Xojo? 225
- 12.0.92 How to create `EmailAttachment` for PDF Data in memory? 225
- 12.0.93 How to create PDF for image files? 226
- 12.0.94 How to CURL Options translate to Plugin Calls? 227
- 12.0.95 How to delete file with ftp and curl plugin? 228
- 12.0.96 How to detect display resolution changed? 228
- 12.0.97 How to detect retina? 229
- 12.0.98 How to disable force quit? 229
- 12.0.99 How to disable the error dialogs from Internet Explorer on javascript errors? 229
- 12.0.100 How to display a PDF file in Xojo? 229
- 12.0.101 How to do a lottery in RB? 230
- 12.0.102 How to do an asycron DNS lookup? 231
- 12.0.103 How to draw a dashed pattern line? 231
- 12.0.104 How to draw a nice antialiased line? 232
- 12.0.105 How to dump java class interface? 233

	149
• 12.0.106 How to duplicate a picture with mask or alpha channel?	234
• 12.0.107 How to enable assistive devices?	235
• 12.0.108 How to encrypt a file with Blowfish?	235
• 12.0.109 How to extract text from HTML?	236
• 12.0.110 How to find empty folders in a folder?	236
• 12.0.111 How to find iTunes on a Mac OS X machine fast?	236
• 12.0.112 How to find network interface for a socket by it's name?	237
• 12.0.113 How to find version of Microsoft Word?	238
• 12.0.114 How to fix CURL error 60/53 on connecting to server?	239
• 12.0.115 How to format double with n digits?	239
• 12.0.116 How to get a time converted to user time zone in a web app?	240
• 12.0.117 How to get an handle to the frontmost window on Windows?	240
• 12.0.118 How to get CFAbsoluteTime from date?	241
• 12.0.119 How to get client IP address on web app?	241
• 12.0.120 How to get fonts to load in charts on Linux?	241
• 12.0.121 How to get fonts to load in DynaPDF on Linux?	242
• 12.0.122 How to get GMT time and back?	243
• 12.0.123 How to get good crash reports?	243
• 12.0.124 How to get list of all threads?	244
• 12.0.125 How to get parameters from webpage URL in Xojo Web Edition?	244
• 12.0.126 How to get the color for disabled textcolor?	244
• 12.0.127 How to get the current free stack space?	245
• 12.0.128 How to get the current timezone?	246
• 12.0.129 How to get the current window title?	247
• 12.0.130 How to get the cursor blink interval time?	248
• 12.0.131 How to get the list of the current selected files in the Finder?	249
• 12.0.132 How to get the Mac OS system version?	250
• 12.0.133 How to get the Mac OS Version using System.Gestalt?	250
• 12.0.134 How to get the screensize excluding the task bar?	251

- 12.0.135 How to get the size of the frontmost window on Windows? 251
- 12.0.136 How to get the source code of a HTMLViewer? 252
- 12.0.137 How to get Xojo apps running Linux? 252
- 12.0.138 How to handle really huge images with GraphicsMagick or ImageMagick? 252
- 12.0.139 How to handle tab key for editable cells in listbox? 253
- 12.0.140 How to hard link MapKit framework? 254
- 12.0.141 How to have a PDF downloaded to the user in a web application? 255
- 12.0.142 How to hide all applications except mine? 255
- 12.0.143 How to hide script errors in HTMLViewer on Windows? 256
- 12.0.144 How to hide the grid/background/border in ChartDirector? 256
- 12.0.145 How to hide the mouse cursor on Mac? 256
- 12.0.146 How to insert image to NSTextView or TextArea? 256
- 12.0.147 How to jump to an anchor in a htmlviewer? 257
- 12.0.148 How to keep a movieplayer unclickable? 257
- 12.0.149 How to keep my web app from using 100% CPU time? 258
- 12.0.150 How to kill a process by name? 258
- 12.0.151 How to know how many CPUs are present? 259
- 12.0.152 How to know the calling function? 259
- 12.0.153 How to launch an app using it's creator code? 260
- 12.0.154 How to launch disc utility? 260
- 12.0.155 How to make a lot of changes to a REAL SQL Database faster? 261
- 12.0.156 How to make a NSImage object for my retina enabled app? 261
- 12.0.157 How to make a window borderless on Windows? 261
- 12.0.158 How to make an alias using AppleEvents? 262
- 12.0.159 How to make AppleScripts much faster? 263
- 12.0.160 How to make double clicks on a canvas? 263
- 12.0.161 How to make my Mac not sleeping? 265
- 12.0.162 How to make my own registration code scheme? 266
- 12.0.163 How to make small controls on Mac OS X? 266

	151
• 12.0.164 How to mark my Mac app as background only?	267
• 12.0.165 How to move a file or folder to trash?	267
• 12.0.166 How to move an application to the front using the creator code?	268
• 12.0.167 How to move file with ftp and curl plugin?	269
• 12.0.168 How to normalize string on Mac?	269
• 12.0.169 How to obscure the mouse cursor on Mac?	270
• 12.0.170 How to open icon file on Mac?	270
• 12.0.171 How to open PDF in acrobat reader?	270
• 12.0.172 How to open printer preferences on Mac?	271
• 12.0.173 How to open special characters panel on Mac?	272
• 12.0.174 How to optimize picture loading in Web Edition?	272
• 12.0.175 How to parse XML?	272
• 12.0.176 How to play audio in a web app?	273
• 12.0.177 How to pretty print xml?	274
• 12.0.178 How to print to PDF?	274
• 12.0.179 How to query Spotlight's Last Open Date for a file?	275
• 12.0.180 How to quit windows?	276
• 12.0.181 How to read a CSV file correctly?	276
• 12.0.182 How to read the command line on windows?	277
• 12.0.183 How to render PDF pages with PDF Kit?	277
• 12.0.184 How to restart a Mac?	278
• 12.0.185 How to resume ftp upload with curl plugin?	278
• 12.0.186 How to rotate a PDF page with CoreGraphics?	279
• 12.0.187 How to rotate image with CoreImage?	280
• 12.0.188 How to run a 32 bit application on a 64 bit Linux?	281
• 12.0.189 How to save HTMLViewer to PDF with landscape orientation?	281
• 12.0.190 How to save RTFD?	281
• 12.0.191 How to save RTFD?	282
• 12.0.192 How to scale a picture proportionally with mask?	282

- 12.0.193 How to scale a picture proportionally? 283
- 12.0.194 How to scale/resize a CIImageMBS? 284
- 12.0.195 How to scale/resize a picture? 285
- 12.0.196 How to search with regex and use unicode codepoints? 285
- 12.0.197 How to see if a file is invisible for Mac OS X? 286
- 12.0.198 How to set cache size for SQLite or REALSQLDatabase? 287
- 12.0.199 How to set the modified dot in the window? 287
- 12.0.200 How to show a PDF file to the user in a Web Application? 287
- 12.0.201 How to show Keyboard Viewer programmatically? 288
- 12.0.202 How to show the mouse cursor on Mac? 289
- 12.0.203 How to shutdown a Mac? 289
- 12.0.204 How to sleep a Mac? 290
- 12.0.205 How to speed up rasterizer for displaying PDFs with DynaPDF? 290
- 12.0.206 How to use PDFLib in my RB application? 290
- 12.0.207 How to use quotes in a string? 291
- 12.0.208 How to use Sybase in Web App? 291
- 12.0.209 How to use the Application Support folder? 291
- 12.0.210 How to use the IOPMCopyScheduledPowerEvents function in Xojo? 292
- 12.0.211 How to validate a GUID? 295
- 12.0.212 How to walk a folder hierarchie non recursively? 295
- 12.0.213 I got this error: PropVal, QDPictMBS.Name (property value), Type mismatch error. Expected CGDataProviderMBS, but got Variant, Name:QDPictMBS 296
- 12.0.214 I registered the MBS Plugins in my application, but later the registration dialog is shown. 296
- 12.0.215 I want to accept Drag & Drop from iTunes 297
- 12.0.216 I'm drawing into a listbox but don't see something. 299
- 12.0.217 I'm searching for a method or so to move a window from position x.y to somewhere else on the screen. 299
- 12.0.218 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? 299
- 12.0.219 Is the fn key on a powerbook keyboard down? 300

	153
• 12.0.220 Is there a case sensitive Dictionary?	300
• 12.0.221 Is there a way to use the MBS plugin to get only the visible item and folder count on a volume?	301
• 12.0.222 Is there an easy way I can launch the Displays preferences panel?	301
• 12.0.223 List of Windows Error codes?	302
• 12.0.224 Midi latency on Windows problem?	302
• 12.0.225 My Xojo Web App does not launch. Why?	302
• 12.0.226 SQLiteDatabase not initialized error?	303
• 12.0.227 Textconverter returns only the first x characters. Why?	303
• 12.0.228 The type translation between CoreFoundation/Foundation and Xojo data types.	304
• 12.0.229 Uploaded my web app with FTP, but it does not run on the server!	306
• 12.0.230 What classes to use for hotkeys?	306
• 12.0.231 What do I need for Linux to get picture functions working?	306
• 12.0.232 What does the NAN code mean?	307
• 12.0.233 What font is used as a 'small font' in typical Mac OS X apps?	307
• 12.0.234 What is last plugin version to run on Mac OS X 10.4?	308
• 12.0.235 What is last plugin version to run on PPC?	308
• 12.0.236 What is last version of the plugins for macOS 32-bit?	309
• 12.0.237 What is the difference between Timer and WebTimer?	309
• 12.0.238 What is the list of Excel functions?	309
• 12.0.239 What is the replacement for PluginMBS?	310
• 12.0.240 What to do on Xojo reporting a conflict?	310
• 12.0.241 What to do with a NSImageCacheException?	311
• 12.0.242 What to do with MySQL Error 2014?	311
• 12.0.243 What to do with SQL Plugin reporting Malformed string as error?	311
• 12.0.244 Where is CGGetActiveDisplayListMBS?	311
• 12.0.245 Where is CGGetDisplaysWithPointMBS?	312
• 12.0.246 Where is CGGetDisplaysWithRectMBS?	312
• 12.0.247 Where is CGGetOnlineDisplayListMBS?	312
• 12.0.248 Where is GetObjectClassNameMBS?	312

- 12.0.249 Where is NetworkAvailableMBS? 312
- 12.0.250 Where is StringHeight function in DynaPDF? 313
- 12.0.251 Where is XLSDocumentMBS class? 313
- 12.0.252 Where to get information about file formats? 313
- 12.0.253 Where to register creator code for my application? 314
- 12.0.254 Which Mac OS X frameworks are 64bit only? 314
- 12.0.255 Which plugins are 64bit only? 315
- 12.0.256 Why application doesn't launch because of a missing ddraw.dll!? 315
- 12.0.257 Why application doesn't launch because of a missing shlwapi.dll!? 315
- 12.0.258 Why do I hear a beep on keydown? 315
- 12.0.259 Why does folderitem.item return nil? 315
- 12.0.260 Why doesn't showurl work? 315
- 12.0.261 Why don't the picture functions not work on Linux? 316
- 12.0.262 Why have I no values in my chart? 316
- 12.0.263 Will application size increase with using plugins? 316
- 12.0.264 XLS: Custom format string guidelines 316
- 12.0.265 Xojo doesn't work with your plugins on Windows 98. 317
- 12.0.266 Xojo or my RB application itself crashes on launch on Mac OS Classic. Why? 318

# Chapter 12

## The FAQ

### 12.0.1 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)

### 12.0.2 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.

### 12.0.3 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:

- 12.0.4 How to catch delete key? 157
- 12.0.5 How to convert cmyk to rgb? 158
- 12.0.6 How to delete a folder? 159
- 12.0.7 How to detect if CPU is 64bit processor? 160
- 12.0.8 How to query variant type string for a variant? 161
- 12.0.9 How to refresh a htmlviewer on Windows? 162

## 12.0.4 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:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156

- 12.0.5 How to convert cmyk to rgb? 158
- 12.0.6 How to delete a folder? 159
- 12.0.7 How to detect if CPU is 64bit processor? 160
- 12.0.8 How to query variant type string for a variant? 161
- 12.0.9 How to refresh a htmlviewer on Windows? 162

## 12.0.5 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:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 12.0.4 How to catch delete key? 157
- 12.0.6 How to delete a folder? 159
- 12.0.7 How to detect if CPU is 64bit processor? 160
- 12.0.8 How to query variant type string for a variant? 161
- 12.0.9 How to refresh a htmlviewer on Windows? 162

**12.0.6 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:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 12.0.4 How to catch delete key? 157
- 12.0.5 How to convert cmyk to rgb? 158
- 12.0.7 How to detect if CPU is 64bit processor? 160
- 12.0.8 How to query variant type string for a variant? 161
- 12.0.9 How to refresh a htmlviewer on Windows? 162

### 12.0.7 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:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 12.0.4 How to catch delete key? 157
- 12.0.5 How to convert cmyk to rgb? 158
- 12.0.6 How to delete a folder? 159
- 12.0.8 How to query variant type string for a variant? 161
- 12.0.9 How to refresh a htmlviewer on Windows? 162

## 12.0.8 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:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 12.0.4 How to catch delete key? 157
- 12.0.5 How to convert cmyk to rgb? 158
- 12.0.6 How to delete a folder? 159
- 12.0.7 How to detect if CPU is 64bit processor? 160
- 12.0.9 How to refresh a htmlviewer on Windows? 162

### 12.0.9 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:

- 12.0.3 How do I get the proper highlight color on Mac OS X for active/inactive selection? 156
- 12.0.4 How to catch delete key? 157
- 12.0.5 How to convert cmyk to rgb? 158

- 12.0.6 How to delete a folder? 163
- 12.0.7 How to detect if CPU is 64bit processor? 159
- 12.0.8 How to query variant type string for a variant? 160

## 12.0.10 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
```

### 12.0.11 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.

### 12.0.12 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
```

### 12.0.13 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.

### 12.0.14 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>

### 12.0.15 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.

### 12.0.16 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.

### 12.0.17 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)

## 12.0.18 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.

## 12.0.19 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.

### 12.0.20 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.

### 12.0.21 Can I use your plugin controls on a web application?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** No.

### 12.0.22 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.

### 12.0.23 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.

## 12.0.24 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

### 12.0.25 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](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.

## 12.0.26 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.

### 12.0.27 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 `"&#62;"`). Similarly, it will escape other attributes in the image map using HTML escape format (but not URL escape format).

In addition to escaping HTML and URL special characters, ChartDirector will also remove CDML fields in creating image maps. It is because CDML is only interpreted in ChartDirector, should not be useful outside of ChartDirector (such as in browser tool tips).

In some cases, you may not want ChartDirector to escape the special characters. For example, if the parameters have already been escaped before passing to ChartDirector, you may want to disable ChartDirector from escaping them again.

ChartDirector supports the following special fields to control the escape methods - `" { escape_url } "`, `" { noescape_url } "`, `" { escape_html } "`, `" { noescape_html } "`, `" { escape_cdml } "` and `" { noescape_cdml } "`. These fields enable/disable the escape methods used in the template fields that follow them.

## 12.0.28 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
```

### 12.0.29 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.

### 12.0.30 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)

### 12.0.31 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.

### 12.0.32 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.

### 12.0.33 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.

### 12.0.34 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
```

### 12.0.35 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.

### 12.0.36 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.

### 12.0.37 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.

### 12.0.38 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.

### 12.0.39 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.

#### 12.0.40 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.

#### 12.0.41 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.

#### 12.0.42 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.

### 12.0.43 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.

## 12.0.44 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
```

## 12.0.45 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 name. 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.

### 12.0.48 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.

### 12.0.49 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
```

### 12.0.50 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.

### 12.0.51 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.

### 12.0.52 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.

**12.0.53 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.

**12.0.54 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.

**12.0.55 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.

### 12.0.56 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.

### 12.0.57 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.

### 12.0.58 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.

### 12.0.59 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.

### 12.0.60 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).

### 12.0.61 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.

### 12.0.62 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.

### 12.0.63 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>
```

### 12.0.64 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](http://developer.apple.com/mac/library/documentation/Cocoa/Reference/Foundation/Classes/NSAutoreleasePool_Class/Reference/Reference.html)

### 12.0.65 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.

### 12.0.66 How to bring my application to front?

Plugin Version: all, Platform: macOS.

**Answer:** This makes SimpleText (Code txtxt) 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)

### 12.0.67 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.

### 12.0.68 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.

**12.0.69 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/>.

**12.0.70 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.

### 12.0.71 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.

### 12.0.72 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
```

### 12.0.73 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.

### 12.0.74 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.

### 12.0.75 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.

### 12.0.76 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.

### 12.0.77 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.

## 12.0.78 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
```

### 12.0.79 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
```

### 12.0.80 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

```

### 12.0.81 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.

### 12.0.82 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.

### 12.0.83 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.

## 12.0.84 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

### 12.0.85 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.

### 12.0.86 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.

### 12.0.87 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.

**12.0.88 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.

### 12.0.89 How to create a GUID?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Use the UUIDMBS class for this.

### 12.0.90 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.

### 12.0.91 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.

### 12.0.92 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.

### 12.0.93 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.

## 12.0.94 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)

### 12.0.95 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.

### 12.0.96 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".

### 12.0.97 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)
```

### 12.0.98 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.

### 12.0.99 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.

### 12.0.100 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.

### 12.0.101 How to do a lottery in RB?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Try this function:

**Example:**

```
Sub Lotto(max as Integer,count as Integer,z() as Integer)
// Lotto count numbers of max put into the array z beginning at index 0
dim n(0) as Integer ' all the numbers
dim m as Integer ' the highest field in the current array
dim i,a,b,d as Integer ' working variables

'fill the array with the numbers
m=max-1
redim n(m)

for i=0 to m
n(i)=i+1
next

' unsort them by exchanging random ones
m=max*10
for i=1 to m
a=rnd*max
b=rnd*max

d=n(a)
n(a)=n(b)
n(b)=d
next

' get the first count to the dest array
m=count-1
redim z(m)
for i=0 to m
z(i)=n(i)
next

'sort the result
z.sort
End Sub
```

```

Sub Open()
// Test it

dim za(0) as Integer ' the array of the numbers

lotto 49,6,za ' 6 of 49 in Germany

' and display them
staticText1.text=str(za(0))+chr(13)+str(za(1))+chr(13)+str(za(2))+chr(13)+str(za(3))+chr(13)+str(za(4))+chr(13)+str(za(5))+chr(13)+str(za(6))+chr(13)+str(za(7))+chr(13)+str(za(8))+chr(13)+str(za(9))+chr(13)+str(za(10))+chr(13)+str(za(11))+chr(13)+str(za(12))+chr(13)+str(za(13))+chr(13)+str(za(14))+chr(13)+str(za(15))+chr(13)+str(za(16))+chr(13)+str(za(17))+chr(13)+str(za(18))+chr(13)+str(za(19))+chr(13)+str(za(20))+chr(13)+str(za(21))+chr(13)+str(za(22))+chr(13)+str(za(23))+chr(13)+str(za(24))+chr(13)+str(za(25))+chr(13)+str(za(26))+chr(13)+str(za(27))+chr(13)+str(za(28))+chr(13)+str(za(29))+chr(13)+str(za(30))+chr(13)+str(za(31))+chr(13)+str(za(32))+chr(13)+str(za(33))+chr(13)+str(za(34))+chr(13)+str(za(35))+chr(13)+str(za(36))+chr(13)+str(za(37))+chr(13)+str(za(38))+chr(13)+str(za(39))+chr(13)+str(za(40))+chr(13)+str(za(41))+chr(13)+str(za(42))+chr(13)+str(za(43))+chr(13)+str(za(44))+chr(13)+str(za(45))+chr(13)+str(za(46))+chr(13)+str(za(47))+chr(13)+str(za(48))+chr(13)+str(za(49))+chr(13)+str(za(50))+chr(13)+str(za(51))+chr(13)+str(za(52))+chr(13)+str(za(53))+chr(13)+str(za(54))+chr(13)+str(za(55))+chr(13)+str(za(56))+chr(13)+str(za(57))+chr(13)+str(za(58))+chr(13)+str(za(59))+chr(13)+str(za(60))+chr(13)+str(za(61))+chr(13)+str(za(62))+chr(13)+str(za(63))+chr(13)+str(za(64))+chr(13)+str(za(65))+chr(13)+str(za(66))+chr(13)+str(za(67))+chr(13)+str(za(68))+chr(13)+str(za(69))+chr(13)+str(za(70))+chr(13)+str(za(71))+chr(13)+str(za(72))+chr(13)+str(za(73))+chr(13)+str(za(74))+chr(13)+str(za(75))+chr(13)+str(za(76))+chr(13)+str(za(77))+chr(13)+str(za(78))+chr(13)+str(za(79))+chr(13)+str(za(80))+chr(13)+str(za(81))+chr(13)+str(za(82))+chr(13)+str(za(83))+chr(13)+str(za(84))+chr(13)+str(za(85))+chr(13)+str(za(86))+chr(13)+str(za(87))+chr(13)+str(za(88))+chr(13)+str(za(89))+chr(13)+str(za(90))+chr(13)+str(za(91))+chr(13)+str(za(92))+chr(13)+str(za(93))+chr(13)+str(za(94))+chr(13)+str(za(95))+chr(13)+str(za(96))+chr(13)+str(za(97))+chr(13)+str(za(98))+chr(13)+str(za(99))
End Sub

```

### 12.0.102 How to do an asycron DNS lookup?

Plugin Version: all, Platform: Windows.

**Answer:** use CFHostMBS class (Mac OS X only).

**Notes:** Xojo internal functions and plugin DNS functions are sycronized.

You can use DNSLookupThreadMBS class for doing them asycron.

### 12.0.103 How to draw a dushed pattern line?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You can try this code:

**Example:**

```
// call like this: DrawDushedPatternLine g,0,0,width,height,10
```

```

Sub DrawDushedPatternLine(g as graphics,x1 as Integer,y1 as Integer,x2 as Integer,y2 as Integer, partlen
as Integer)
dim x,y,ox,oy as Double
dim dx,dy as Double
dim w,h,d as Double
dim b as Boolean

w=x2-x1
h=y2-y1

d=sqrt(w*w+h*h)

dx=w/d*partlen
dy=h/d*partlen

```

```

b=true
x=x1
while (x<x2) and (y<y2)
  ox=x
  oy=y

  x=x+dx
  y=y+dy

  if b then
    g.DrawLine ox,oy,x,y
  end if

  b=not b
wend

```

End Sub

**Notes:** It would be possible to add this to the plugin, but I think it's better if you do it in plain Xojo code, so it even works on Windows.

### 12.0.104 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.

**12.0.105 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

**12.0.106 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.

### 12.0.107 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.

### 12.0.108 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.

**12.0.109 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 &auml; to √§.

**12.0.110 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
```

**12.0.111 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
```

## 12.0.112 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.

### 12.0.113 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".

### 12.0.114 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/>

### 12.0.115 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.

### 12.0.116 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
```

### 12.0.117 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
```

### 12.0.118 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.

### 12.0.119 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
```

### 12.0.120 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.

### 12.0.121 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.

### 12.0.122 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.

### 12.0.123 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>

**12.0.124 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.

**12.0.125 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.

**12.0.126 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" ...

## 12.0.127 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.

### 12.0.128 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

```

### 12.0.129 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

```

### 12.0.130 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.

### 12.0.131 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

### 12.0.132 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

```

### 12.0.133 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.

### 12.0.134 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.

### 12.0.135 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!

### 12.0.136 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
```

### 12.0.137 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.

### 12.0.138 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.

### 12.0.139 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.

### 12.0.140 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.

### 12.0.141 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.

### 12.0.142 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
```

### 12.0.143 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).

### 12.0.144 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.

### 12.0.145 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.

### 12.0.146 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.

### 12.0.147 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

```

### 12.0.148 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
```

### 12.0.149 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.

### 12.0.150 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.

### 12.0.151 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.

### 12.0.152 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.

### 12.0.153 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
```

### 12.0.154 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.

### 12.0.155 How to make a lot of changes to a REAL SQL Database faster?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** You may try to embed your changes to the database between two transaction calls.

**Example:**

```
dim db as Database // some database

db.SQLExecute "BEGIN TRANSACTION"
// Do some Stuff
db.SQLExecute "END TRANSACTION"
```

**Notes:** This can increase speed by some factors.

### 12.0.156 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.

### 12.0.157 How to make a window borderless on Windows?

Plugin Version: all, Platform: Windows.

**Answer:** Try this declares:

**Example:**

```
// Sets window to borderless popup type, and sets its initial dimensions.
// Call this method, then Win32SetBorderlessPos, and then RB's Show
// method. Use RB Frame type 7 (Global Floating Window).

Const SWP_NOMOVE = &H2
Const SWP_FRAMECHANGED = &H20
Const HWND_TOPMOST = -1
Const GWL_STYLE = -16
Const WS_POPUPWINDOW = &H80880000

Dim styleFlags as Integer

#If TargetWin32 Then

Declare Function SetWindowLong Lib "user32" Alias "SetWindowLongA" (hwnd as Integer, nIndex as Integer, dwNewLong as Integer) as Integer
Declare Function SetWindowPos Lib "user32" (hwnd as Integer, hWndInstertAfter as Integer, x as Integer, y as Integer, cx as Integer, cy as Integer, flags as Integer) as Integer

styleFlags = SetWindowLong( w.WinHWND, GWL_STYLE, WS_POPUPWINDOW )
styleFlags = BitwiseOr( SWP_FRAMECHANGED, SWP_NOMOVE )
styleFlags = SetWindowPos( w.WinHWND, HWND_TOPMOST, 0, 0, wd, ht, styleFlags )

#EndIf
```

### 12.0.158 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

### 12.0.159 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

```

### 12.0.160 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

## 12.0.161 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.

### 12.0.162 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?

### 12.0.163 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))

```

### 12.0.164 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.

### 12.0.165 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.

### 12.0.166 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)

### 12.0.167 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 "RNT0 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 RNT0 with the new file name. To delete use DELE and the file path.

### 12.0.168 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.

### 12.0.169 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.

### 12.0.170 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
```

### 12.0.171 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.

### 12.0.172 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

```

### 12.0.173 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.

### 12.0.174 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.

### 12.0.175 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.

## 12.0.176 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)+"");")
```

### 12.0.177 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>

### 12.0.178 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.

### 12.0.179 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.

**12.0.180 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.

**12.0.181 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.

### 12.0.182 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.

### 12.0.183 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.

### 12.0.184 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

```

### 12.0.185 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.

## 12.0.186 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.

### 12.0.187 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
```

### 12.0.188 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.

### 12.0.189 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.

### 12.0.190 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.

### 12.0.191 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.

### 12.0.192 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.

### 12.0.193 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)

### 12.0.194 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.

### 12.0.195 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.

### 12.0.196 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

```

### 12.0.197 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

```

### 12.0.198 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.

### 12.0.199 How to set the modified dot in the window?

Plugin Version: all, Platform: macOS.

**Answer:** Try this declares:

**Example:**

```

window1.ModifiedMBS=true

```

### 12.0.200 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.

### 12.0.201 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
```

### 12.0.202 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.

### 12.0.203 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
```

### 12.0.204 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
```

### 12.0.205 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.

### 12.0.206 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.

### 12.0.207 How to use quotes in a string?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Just double them.

**Example:**

```
msgbox "This String contains ""quotes"""
```

### 12.0.208 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
```

### 12.0.209 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!

**12.0.210 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.

### 12.0.211 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".

### 12.0.212 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.

#### 12.0.213 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.

#### 12.0.214 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.

## 12.0.215 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.

### 12.0.216 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.

### 12.0.217 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.

### 12.0.218 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)

**12.0.219** 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.

**12.0.220** 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
```

### 12.0.221 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.

### 12.0.222 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
```

### 12.0.223 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>

### 12.0.224 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)

### 12.0.225 My Xojo Web App does not launch. Why?

Plugin Version: all, Platform: macOS.

**Answer:** Here is a list of checks to do for linux apache installations with Xojo or Xojo Web applications:

**Notes:** Just a list of checks to do for linux apache installations:

- You have 64bit linux? Than you need 32 bit compatibility libraries.
- The folder of your app is writable? Set permissions to 777.
- The cgi script is executable? Set permissions to 755.

- The app file itself is executable? Set permissions to 755.
- You uploaded cgi file as text, so it has unix line endings? (this often gives error "Premature end of script headers" in apache log)
- You uploaded config.cfg file and made it writable? Set permissions to 666.
- Your apache allows execution of cgi scripts? You enabled cgi for apache and uncommented addhandler command for CGI on a new apache installation?
- You uploaded the app file and libraries as binary files? Upload as text breaks them.
- You did upload the libs folder?
- You don't have code in app.open, session.open and other events which crashes app right at launch?
- You don't have a print command in your app.open event? (see feedback case 23817)
- You allowed htaccess file to overwrite permissions?

### 12.0.226 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.

### 12.0.227 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.

### 12.0.228 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 QTime ->QTimeMBS  
 NSValue with QTimeRange ->QTimeRangeMBS  
 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.

### 12.0.229 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.

### 12.0.230 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.

### 12.0.231 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.

### 12.0.232 What does the NAN code mean?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

### 12.0.233 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

```

### 12.0.234 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.

### 12.0.235 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.

### 12.0.236 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.

### 12.0.237 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.

### 12.0.238 What is the list of Excel functions?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:** Below is 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.

### 12.0.239 What is the replacement for PluginMBS?

Plugin Version: all, Platform: macOS.

**Answer:** Use the SoftDeclareMBS class to load libraries dynamically.

### 12.0.240 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.

### 12.0.241 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.

### 12.0.242 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.

### 12.0.243 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.

### 12.0.244 Where is CGGetActiveDisplayListMBS?

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetActiveDisplayList.

**12.0.245 Where is CGGetDisplaysWithPointMBS?**

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetDisplaysWithPoint.

**12.0.246 Where is CGGetDisplaysWithRectMBS?**

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetDisplaysWithRect.

**12.0.247 Where is CGGetOnlineDisplayListMBS?**

Plugin Version: all, Platform: Windows.

**Answer:** This is now CGDisplayMBS.GetOnlineDisplayList.

**12.0.248 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.

**12.0.249 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.macs.w.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.

### 12.0.250 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.

### 12.0.251 Where is XLSDocumentMBS class?

Plugin Version: all, Platform: macOS.

**Answer:** This class has been removed in favor of XLBookMBS class.

**Notes:** These classes have been removed: XLCellMBS, XLSDocumentMBS, XLSFormatRecordMBS, XLSMergedCellsMBS, XLSRowMBS and XLSSheetMBS.

### 12.0.252 Where to get information about file formats?

Plugin Version: all, Platforms: macOS, Linux, Windows.

**Answer:**

Please visit this web page:

<http://www.wotsit.org>

### 12.0.253 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>

### 12.0.254 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.

### 12.0.255 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.

### 12.0.256 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.

### 12.0.257 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.

### 12.0.258 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.

### 12.0.259 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.

### 12.0.260 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.

**12.0.261 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.

**12.0.262 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.

**12.0.263 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.

**12.0.264 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

### 12.0.265 Xojo doesn't work with your plugins on Windows 98.

Plugin Version: all, Platform: Windows.

**Answer:** Please upgrade your Windows version.

**12.0.266** 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,,