

TriEngine

v0.0.15

Generated by Doxygen 1.8.3.1

Mon Jun 10 2013 17:22:57

Contents

1	Main Page	1
2	Namespace Index	3
2.1	Namespace List	3
3	Hierarchical Index	5
3.1	Class Hierarchy	5
4	Class Index	7
4.1	Class List	7
5	File Index	11
5.1	File List	11
6	Namespace Documentation	13
6.1	Package TriDevs	13
6.2	Package TriDevs.TriEngine	13
6.3	Package TriDevs.TriEngine.Audio	14
6.3.1	Enumeration Type Documentation	14
6.3.1.1	AudioFormat	14
6.4	Package TriDevs.TriEngine.EngineTest	15
6.5	Package TriDevs.TriEngine.Extensions	15
6.6	Package TriDevs.TriEngine.Graphics	15
6.7	Package TriDevs.TriEngine.Helpers	15
6.8	Package TriDevs.TriEngine.Input	16
6.9	Package TriDevs.TriEngine.Input.Events	16
6.9.1	Function Documentation	16
6.9.1.1	KeyDownEventHandler	16
6.9.1.2	KeyPressEventHandler	17
6.9.1.3	KeyUpEventHandler	17
6.9.1.4	MouseDownEventHandler	17
6.9.1.5	MouseUpEventHandler	17
6.9.1.6	MouseWheelChangedEventHandler	17

6.9.1.7	MouseWheelDownEventHandler	18
6.9.1.8	MouseWheelUpEventHandler	18
6.10	Package TriDevs.TriEngine.Interfaces	18
6.11	Package TriDevs.TriEngine.Logging	18
6.12	Package TriDevs.TriEngine.Native	18
6.13	Package TriDevs.TriEngine.Serializing	19
6.14	Package TriDevs.TriEngine.Shaders	19
6.15	Package TriDevs.TriEngine.StateManagement	19
6.16	Package TriDevs.TriEngine.Tests	19
6.17	Package TriDevs.TriEngine.Tests.ExtensionTests	19
6.18	Package TriDevs.TriEngine.Tests.HelperTests	20
6.19	Package TriDevs.TriEngine.Tests.StateManagementTests	20
6.20	Package TriDevs.TriEngine.Text	20
6.20.1	Enumeration Type Documentation	20
6.20.1.1	FontType	20
6.21	Package TriDevs.TriEngine.UI	21
6.22	Package TriDevs.TriEngine.UI.Events	21
6.22.1	Function Documentation	21
6.22.1.1	ControlClickedEventHandler	21
7	Class Documentation	23
7.1	TriDevs.TriEngine.Audio.AudioManager Class Reference	23
7.1.1	Detailed Description	24
7.1.2	Constructor & Destructor Documentation	25
7.1.2.1	AudioManager	25
7.1.3	Member Function Documentation	25
7.1.3.1	Dispose	25
7.1.3.2	GetSong	25
7.1.3.3	GetSound	25
7.1.3.4	HasSong	26
7.1.3.5	HasSound	26
7.1.3.6	LoadSong	26
7.1.3.7	LoadSound	27
7.1.3.8	StopAll	27
7.1.3.9	StopAllSongs	28
7.1.3.10	StopAllSounds	28
7.2	TriDevs.TriEngine.Extensions.ByteExtensions Class Reference	28
7.2.1	Detailed Description	28
7.2.2	Member Function Documentation	28
7.2.2.1	Clamp	28

7.3	TriDevs.TriEngine.Color Struct Reference	29
7.3.1	Detailed Description	36
7.3.2	Constructor & Destructor Documentation	36
7.3.2.1	Color	36
7.3.2.2	Color	37
7.3.2.3	Color	37
7.3.2.4	Color	37
7.3.2.5	Color	37
7.3.3	Member Function Documentation	38
7.3.3.1	ToColor4	38
7.3.3.2	ToVector3	38
7.3.3.3	ToVector4	38
7.3.4	Member Data Documentation	38
7.3.4.1	A	38
7.3.4.2	AliceBlue	39
7.3.4.3	AntiqueWhite	39
7.3.4.4	Aqua	39
7.3.4.5	Aquamarine	39
7.3.4.6	Azure	39
7.3.4.7	B	39
7.3.4.8	Beige	39
7.3.4.9	Bisque	39
7.3.4.10	Black	39
7.3.4.11	BlanchedAlmond	39
7.3.4.12	Blue	39
7.3.4.13	BlueViolet	39
7.3.4.14	Brown	40
7.3.4.15	BurlyWood	40
7.3.4.16	CadetBlue	40
7.3.4.17	Chartreuse	40
7.3.4.18	Chocolate	40
7.3.4.19	Coral	40
7.3.4.20	CornflowerBlue	40
7.3.4.21	Cornsilk	40
7.3.4.22	Crimson	40
7.3.4.23	Cyan	40
7.3.4.24	DarkBlue	40
7.3.4.25	DarkCyan	40
7.3.4.26	DarkGoldenrod	41
7.3.4.27	DarkGray	41

7.3.4.28	DarkGreen	41
7.3.4.29	DarkKhaki	41
7.3.4.30	DarkMagenta	41
7.3.4.31	DarkOliveGreen	41
7.3.4.32	DarkOrange	41
7.3.4.33	DarkOrchid	41
7.3.4.34	DarkRed	41
7.3.4.35	DarkSalmon	41
7.3.4.36	DarkSeaGreen	41
7.3.4.37	DarkSlateBlue	41
7.3.4.38	DarkSlateGray	42
7.3.4.39	DarkTurquoise	42
7.3.4.40	DarkViolet	42
7.3.4.41	DeepPink	42
7.3.4.42	DeepSkyBlue	42
7.3.4.43	DimGray	42
7.3.4.44	DodgerBlue	42
7.3.4.45	Firebrick	42
7.3.4.46	FloralWhite	42
7.3.4.47	ForestGreen	42
7.3.4.48	Fuchsia	42
7.3.4.49	G	42
7.3.4.50	Gainsboro	43
7.3.4.51	GhostWhite	43
7.3.4.52	Gold	43
7.3.4.53	Goldenrod	43
7.3.4.54	Gray	43
7.3.4.55	Green	43
7.3.4.56	GreenYellow	43
7.3.4.57	HoneyDew	43
7.3.4.58	HotPink	43
7.3.4.59	IndianRed	43
7.3.4.60	Indigo	43
7.3.4.61	Ivory	43
7.3.4.62	Khaki	44
7.3.4.63	Lavender	44
7.3.4.64	LavenderBlush	44
7.3.4.65	LawnGreen	44
7.3.4.66	LemonChiffon	44
7.3.4.67	LightBlue	44

7.3.4.68	LightCoral	44
7.3.4.69	LightCyan	44
7.3.4.70	LightGoldenrodYellow	44
7.3.4.71	LightGray	44
7.3.4.72	LightGreen	44
7.3.4.73	LightPink	44
7.3.4.74	LightSalmon	45
7.3.4.75	LightSeaGreen	45
7.3.4.76	LightSkyBlue	45
7.3.4.77	LightSlateGray	45
7.3.4.78	LightSteelBlue	45
7.3.4.79	LightYellow	45
7.3.4.80	Lime	45
7.3.4.81	LimeGreen	45
7.3.4.82	Linen	45
7.3.4.83	Magenta	45
7.3.4.84	Maroon	45
7.3.4.85	MediumAquamarine	45
7.3.4.86	MediumBlue	46
7.3.4.87	MediumOrchid	46
7.3.4.88	MediumPurple	46
7.3.4.89	MediumSeaGreen	46
7.3.4.90	MediumSlateBlue	46
7.3.4.91	MediumSpringGreen	46
7.3.4.92	MediumTurquoise	46
7.3.4.93	MediumVioletRed	46
7.3.4.94	MidnightBlue	46
7.3.4.95	MintCream	46
7.3.4.96	MistyRose	46
7.3.4.97	Moccasin	46
7.3.4.98	NavajoWhite	47
7.3.4.99	Navy	47
7.3.4.100	OldLace	47
7.3.4.101	Olive	47
7.3.4.102	OliveDrab	47
7.3.4.103	Orange	47
7.3.4.104	OrangeRed	47
7.3.4.105	Orchid	47
7.3.4.106	PaleGoldenrod	47
7.3.4.107	PaleGreen	47

7.3.4.108 PaleTurquoise	47
7.3.4.109 PaleVioletRed	47
7.3.4.110 PapayaWhip	48
7.3.4.111 PeachPuff	48
7.3.4.112 Peru	48
7.3.4.113 Pink	48
7.3.4.114 Plum	48
7.3.4.115 PowderBlue	48
7.3.4.116 Purple	48
7.3.4.117 R	48
7.3.4.118 Red	48
7.3.4.119 RosyBrown	48
7.3.4.120 RoyalBlue	48
7.3.4.121 SaddleBrown	48
7.3.4.122 Salmon	49
7.3.4.123 SandyBrown	49
7.3.4.124 SeaGreen	49
7.3.4.125 SeaShell	49
7.3.4.126 Sienna	49
7.3.4.127 Silver	49
7.3.4.128 SkyBlue	49
7.3.4.129 SlateBlue	49
7.3.4.130 SlateGray	49
7.3.4.131 Snow	49
7.3.4.132 SpringGreen	49
7.3.4.133 SteelBlue	49
7.3.4.134 Tan	50
7.3.4.135 Teal	50
7.3.4.136 Thistle	50
7.3.4.137 Tomato	50
7.3.4.138 TransparentBlack	50
7.3.4.139 TransparentWhite	50
7.3.4.140 Turquoise	50
7.3.4.141 Violet	50
7.3.4.142 Wheat	50
7.3.4.143 White	50
7.3.4.144 WhiteSmoke	50
7.3.4.145 Yellow	50
7.3.4.146 YellowGreen	51
7.4 TriDevs.TriEngine.Tests.ColorTests Class Reference	51

7.4.1	Member Function Documentation	51
7.4.1.1	ShouldConvertToColor4	51
7.4.1.2	ShouldConvertToVector3	51
7.4.1.3	ShouldConvertToVector4	51
7.4.1.4	ShouldCreateColorWithAlpha	51
7.4.1.5	ShouldMakeByteColorIntoWhite	52
7.4.1.6	ShouldReturnValidArgbValue	52
7.5	TriDevs.TriEngine.UI.Control Class Reference	52
7.5.1	Detailed Description	54
7.5.2	Member Function Documentation	54
7.5.2.1	Disable	54
7.5.2.2	Draw	55
7.5.2.3	Draw	55
7.5.2.4	Enable	55
7.5.2.5	Hide	55
7.5.2.6	OnClicked	56
7.5.2.7	Show	56
7.5.2.8	Update	56
7.5.3	Property Documentation	56
7.5.3.1	Color	56
7.5.3.2	Enabled	56
7.5.3.3	Position	57
7.5.3.4	Rectangle	57
7.5.3.5	Size	57
7.5.3.6	Text	57
7.5.3.7	Visible	57
7.5.4	Event Documentation	57
7.5.4.1	Clicked	57
7.6	TriDevs.TriEngine.UI.ControlManager Class Reference	57
7.6.1	Detailed Description	59
7.6.2	Constructor & Destructor Documentation	59
7.6.2.1	ControlManager	59
7.6.3	Member Function Documentation	59
7.6.3.1	AddControl	59
7.6.3.2	Disable	60
7.6.3.3	Draw	60
7.6.3.4	Enable	60
7.6.3.5	HasControl	60
7.6.3.6	HasControl	61
7.6.3.7	HasControl	61

7.6.3.8	RemoveAllControls	61
7.6.3.9	RemoveAllControls	62
7.6.3.10	RemoveControl	62
7.6.3.11	Update	63
7.6.4	Property Documentation	63
7.6.4.1	Enabled	63
7.7	TriDevs.TriEngine.Extensions.DecimalExtensions Class Reference	63
7.7.1	Detailed Description	63
7.7.2	Member Function Documentation	63
7.7.2.1	Clamp	63
7.8	TriDevs.TriEngine.Extensions.DoubleExtensions Class Reference	64
7.8.1	Detailed Description	64
7.8.2	Member Function Documentation	65
7.8.2.1	Clamp	65
7.9	TriDevs.TriEngine.EngineException Class Reference	65
7.9.1	Detailed Description	66
7.10	TriDevs.TriEngine.Extensions.EnumerationExtensions Class Reference	66
7.10.1	Detailed Description	67
7.10.2	Member Function Documentation	67
7.10.2.1	Has< T >	67
7.10.2.2	Include< T >	67
7.10.2.3	Missing< T >	68
7.10.2.4	Remove< T >	68
7.11	TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests Class Reference	69
7.11.1	Member Function Documentation	69
7.11.1.1	ShouldHaveLongValue	69
7.11.1.2	ShouldHaveValue	69
7.11.1.3	ShouldIncludeLongValue	69
7.11.1.4	ShouldIncludeValue	70
7.11.1.5	ShouldNotHaveLongValue	70
7.11.1.6	ShouldNotHaveValue	70
7.11.1.7	ShouldRemoveLongValue	70
7.11.1.8	ShouldRemoveValue	70
7.11.1.9	ShouldThrowExceptionOnString	70
7.12	TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests Class Reference	70
7.12.1	Member Function Documentation	71
7.12.1.1	ShouldThrowEngineExceptionWhenPassedGeneric	71
7.12.1.2	ShouldThrowUnmodifiedEngineException	71
7.13	TriDevs.TriEngine.Helpers.Exceptions Class Reference	71
7.13.1	Detailed Description	71

7.13.2 Member Function Documentation	71
7.13.2.1 LogException	71
7.14 TriDevs.TriEngine.Extensions.FloatExtensions Class Reference	72
7.14.1 Detailed Description	72
7.14.2 Member Function Documentation	72
7.14.2.1 Clamp	72
7.15 TriDevs.TriEngine.Text.Font Class Reference	73
7.15.1 Detailed Description	74
7.15.2 Constructor & Destructor Documentation	74
7.15.2.1 Font	74
7.15.2.2 QFont	74
7.15.3 Member Function Documentation	75
7.15.3.1 Dispose	75
7.15.3.2 GetDefaultName	75
7.15.3.3 ToString	76
7.15.4 Property Documentation	76
7.15.4.1 Color	76
7.15.4.2 File	76
7.15.4.3 Name	76
7.15.4.4 QFont	76
7.15.4.5 Size	76
7.15.4.6 Type	76
7.16 TriDevs.TriEngine.Text.FontConstructionConfig Class Reference	76
7.16.1 Detailed Description	77
7.16.2 Constructor & Destructor Documentation	77
7.16.2.1 FontConstructionConfig	77
7.16.2.2 QFontConstructionConfig	77
7.16.3 Member Data Documentation	77
7.16.3.1 BuildConfig	77
7.16.3.2 LoadConfig	77
7.17 TriDevs.TriEngine.StateManagement.GameState Class Reference	78
7.17.1 Detailed Description	80
7.17.2 Constructor & Destructor Documentation	80
7.17.2.1 GameState	80
7.17.3 Member Function Documentation	80
7.17.3.1 AddComponent	80
7.17.3.2 Draw	80
7.17.3.3 GetAllComponents	81
7.17.3.4 GetAllComponents	81
7.17.3.5 GetAllComponents	82

7.17.3.6 GetComponent	82
7.17.3.7 GetComponent	82
7.17.3.8 HasComponent	83
7.17.3.9 HasComponent	83
7.17.3.10 HasComponent	83
7.17.3.11 Load	84
7.17.3.12 Pause	84
7.17.3.13 RemoveAllComponents	84
7.17.3.14 RemoveAllComponents	84
7.17.3.15 RemoveAllComponents	85
7.17.3.16 RemoveComponent	85
7.17.3.17 Unload	85
7.17.3.18 Unpause	86
7.17.3.19 Update	86
7.17.4 Member Data Documentation	86
7.17.4.1 Components	86
7.17.5 Property Documentation	86
7.17.5.1 Paused	86
7.18 TriDevs.TriEngine.StateManagement.GameStateManager Class Reference	86
7.18.1 Detailed Description	87
7.18.2 Constructor & Destructor Documentation	88
7.18.2.1 GameStateManager	88
7.18.2.2 GameStateManager	88
7.18.3 Member Function Documentation	88
7.18.3.1 Draw	88
7.18.3.2 Peek	88
7.18.3.3 Pop	88
7.18.3.4 Push	89
7.18.3.5 Switch	89
7.18.3.6 Update	90
7.18.4 Property Documentation	90
7.18.4.1 ActiveState	90
7.18.4.2 StateCount	90
7.19 TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests Class Reference	90
7.19.1 Member Function Documentation	91
7.19.1.1 ShouldAddComponentToGameState	91
7.19.1.2 ShouldHaveComponentMatchingPredicate	91
7.19.1.3 ShouldHaveComponentOfType	91
7.19.1.4 ShouldOnlyHaveExactReferenceToComponent	91
7.19.1.5 ShouldRemoveAllComponentsFromGameState	91

7.19.1.6	ShouldRemoveAllComponentsMatchingPredicateFromGameState	92
7.19.1.7	ShouldRemoveAllComponentsOfTypeFromGameState	92
7.19.1.8	ShouldRemoveComponentFromGameState	92
7.19.1.9	ShouldReturnAllComponent	92
7.19.1.10	ShouldReturnAllComponentsMatchingPredicate	93
7.19.1.11	ShouldReturnAllComponentsOfType	93
7.19.1.12	ShouldReturnComponentMatchingPredicate	93
7.19.1.13	ShouldReturnComponentOfType	93
7.20	TriDevs.TriEngine.GameWindow2D Class Reference	94
7.20.1	Detailed Description	95
7.20.2	Constructor & Destructor Documentation	95
7.20.2.1	GameWindow2D	95
7.20.3	Member Function Documentation	95
7.20.3.1	Initialize	95
7.20.3.2	OnDraw	95
7.20.3.3	OnLoad	95
7.20.3.4	OnRenderFrame	96
7.20.3.5	OnResize	96
7.20.4	Property Documentation	96
7.20.4.1	ClearColor	96
7.21	TriDevs.TriEngine.Native.Helpers Class Reference	96
7.21.1	Detailed Description	96
7.21.2	Member Function Documentation	97
7.21.2.1	GetErrorMessage	97
7.21.2.2	GetLastError	97
7.21.2.3	GetLastErrorInfo	97
7.21.2.4	GetLastErrorMessage	97
7.21.2.5	GetLastWin32Exception	98
7.21.2.6	GetWin32Exception	98
7.22	TriDevs.TriEngine.Audio.IAudioManager Interface Reference	98
7.22.1	Detailed Description	99
7.22.2	Member Function Documentation	99
7.22.2.1	GetSong	99
7.22.2.2	GetSound	100
7.22.2.3	HasSong	100
7.22.2.4	HasSound	101
7.22.2.5	LoadSong	101
7.22.2.6	LoadSound	101
7.22.2.7	StopAll	101
7.22.2.8	StopAllSongs	102

7.22.2.9 StopAllSounds	102
7.23 TriDevs.TriEngine.UI.IControl Interface Reference	102
7.23.1 Detailed Description	104
7.23.2 Member Function Documentation	104
7.23.2.1 Disable	104
7.23.2.2 Enable	104
7.23.2.3 Hide	104
7.23.2.4 Show	104
7.23.3 Property Documentation	105
7.23.3.1 Color	105
7.23.3.2 Enabled	105
7.23.3.3 Position	105
7.23.3.4 Rectangle	105
7.23.3.5 Size	105
7.23.3.6 Text	105
7.23.3.7 Visible	105
7.23.4 Event Documentation	105
7.23.4.1 Clicked	105
7.24 TriDevs.TriEngine.UI.IControlManager Interface Reference	106
7.24.1 Detailed Description	107
7.24.2 Member Function Documentation	108
7.24.2.1 AddControl	108
7.24.2.2 HasControl	108
7.24.2.3 HasControl	108
7.24.2.4 HasControl	108
7.24.2.5 RemoveAllControls	109
7.24.2.6 RemoveAllControls	109
7.24.2.7 RemoveControl	109
7.25 TriDevs.TriEngine.Interfaces.IDrawable Interface Reference	109
7.25.1 Detailed Description	110
7.25.2 Member Function Documentation	110
7.25.2.1 Draw	110
7.26 TriDevs.TriEngine.Interfaces.IDrawableGameComponent Interface Reference	110
7.26.1 Detailed Description	112
7.27 TriDevs.TriEngine.Interfaces.IGameComponent Interface Reference	112
7.27.1 Detailed Description	113
7.27.2 Member Function Documentation	113
7.27.2.1 Disable	113
7.27.2.2 Enable	113
7.27.3 Property Documentation	113

7.27.3.1	Enabled	113
7.28	TriDevs.TriEngine.StateManagement.IGameState Interface Reference	113
7.28.1	Detailed Description	115
7.28.2	Member Function Documentation	115
7.28.2.1	AddComponent	115
7.28.2.2	GetAllComponents	116
7.28.2.3	GetAllComponents	116
7.28.2.4	GetAllComponents	116
7.28.2.5	GetComponent	116
7.28.2.6	GetComponent	117
7.28.2.7	HasComponent	117
7.28.2.8	HasComponent	117
7.28.2.9	HasComponent	117
7.28.2.10	Load	118
7.28.2.11	Pause	118
7.28.2.12	RemoveAllComponents	118
7.28.2.13	RemoveAllComponents	118
7.28.2.14	RemoveAllComponents	119
7.28.2.15	RemoveComponent	119
7.28.2.16	Unload	119
7.28.2.17	Unpause	119
7.28.3	Property Documentation	119
7.28.3.1	Paused	119
7.29	TriDevs.TriEngine.StateManagement.IGameStateManager Interface Reference	120
7.29.1	Detailed Description	121
7.29.2	Member Function Documentation	121
7.29.2.1	Peek	121
7.29.2.2	Pop	121
7.29.2.3	Push	121
7.29.2.4	Switch	121
7.29.3	Property Documentation	122
7.29.3.1	ActiveState	122
7.29.3.2	StateCount	122
7.30	TriDevs.TriEngine.Input.IInputManager Interface Reference	122
7.30.1	Detailed Description	124
7.30.2	Member Function Documentation	124
7.30.2.1	IsKeyDown	124
7.30.2.2	IsKeyUp	124
7.30.2.3	IsMouseDown	124
7.30.2.4	IsMouseUp	124

7.30.2.5	IsWheelChanged	125
7.30.2.6	IsWheelDown	125
7.30.2.7	IsWheelUp	125
7.30.2.8	KeyPressed	125
7.30.2.9	KeyReleased	126
7.30.2.10	MousePressed	126
7.30.2.11	MouseReleased	126
7.30.2.12	Update	127
7.30.2.13	WheelChange	127
7.30.3	Property Documentation	127
7.30.3.1	MousePosition	127
7.30.3.2	MouseWheelValue	127
7.30.3.3	MouseX	127
7.30.3.4	MouseY	127
7.30.3.5	this[Key key]	128
7.30.3.6	this[MouseButton button]	128
7.30.4	Event Documentation	128
7.30.4.1	KeyDown	128
7.30.4.2	KeyPress	128
7.30.4.3	KeyUp	128
7.30.4.4	MouseDown	128
7.30.4.5	MouseUp	128
7.30.4.6	WheelChanged	128
7.30.4.7	WheelDown	129
7.30.4.8	WheelUp	129
7.31	TriDevs.TriEngine.Input.InputManager Class Reference	129
7.31.1	Detailed Description	131
7.31.2	Constructor & Destructor Documentation	131
7.31.2.1	InputManager	131
7.31.2.2	InputManager	131
7.31.3	Member Function Documentation	131
7.31.3.1	IsKeyDown	131
7.31.3.2	IsKeyUp	132
7.31.3.3	IsMouseDown	132
7.31.3.4	IsMouseUp	132
7.31.3.5	IsWheelChanged	133
7.31.3.6	IsWheelDown	133
7.31.3.7	IsWheelUp	133
7.31.3.8	KeyPressed	133
7.31.3.9	KeyReleased	134

7.31.3.10 MousePressed	134
7.31.3.11 MouseReleased	134
7.31.3.12 Update	135
7.31.3.13 WheelChange	135
7.31.4 Property Documentation	135
7.31.4.1 MousePosition	135
7.31.4.2 MouseWheelValue	135
7.31.4.3 MouseX	135
7.31.4.4 MouseY	135
7.31.4.5 this[Key key]	135
7.31.4.6 this[MouseButton button]	135
7.31.5 Event Documentation	135
7.31.5.1 KeyDown	135
7.31.5.2 KeyPress	136
7.31.5.3 KeyUp	136
7.31.5.4 MouseDown	136
7.31.5.5 MouseUp	136
7.31.5.6 WheelChanged	136
7.31.5.7 WheelDown	136
7.31.5.8 WheelUp	136
7.32 TriDevs.TriEngine.Extensions.IntegerExtensions Class Reference	136
7.32.1 Detailed Description	137
7.32.2 Member Function Documentation	137
7.32.2.1 Clamp	137
7.32.2.2 Clamp	138
7.32.2.3 Clamp	138
7.32.2.4 Clamp	138
7.32.2.5 Clamp	139
7.32.2.6 Clamp	139
7.33 TriDevs.TriEngine.Helpers.IO Class Reference	139
7.33.1 Detailed Description	139
7.33.2 Member Function Documentation	140
7.33.2.1 GetAbsolutePath	140
7.34 TriDevs.TriEngine.Audio.ISong Interface Reference	140
7.34.1 Detailed Description	141
7.34.2 Member Function Documentation	141
7.34.2.1 Pause	141
7.34.2.2 Play	142
7.34.2.3 Resume	142
7.34.2.4 Stop	142

7.34.3	Property Documentation	142
7.34.3.1	File	142
7.34.3.2	IsLooped	142
7.34.3.3	Name	142
7.34.3.4	Volume	142
7.35	TriDevs.TriEngine.Audio.ISound Interface Reference	143
7.35.1	Detailed Description	144
7.35.2	Member Function Documentation	144
7.35.2.1	Play	144
7.35.2.2	Stop	144
7.35.3	Property Documentation	144
7.35.3.1	File	144
7.35.3.2	Name	144
7.36	TriDevs.TriEngine.Text.ITextObject Interface Reference	144
7.36.1	Detailed Description	145
7.36.2	Member Function Documentation	145
7.36.2.1	Draw	145
7.36.2.2	Draw	146
7.36.2.3	Draw	146
7.36.3	Property Documentation	146
7.36.3.1	Alignment	146
7.36.3.2	Bounds	146
7.36.3.3	Color	146
7.36.3.4	Font	146
7.36.3.5	Position	146
7.36.3.6	Text	146
7.37	TriDevs.TriEngine.Interfaces.IUpdatable Interface Reference	147
7.37.1	Detailed Description	147
7.37.2	Member Function Documentation	147
7.37.2.1	Update	147
7.38	TriDevs.TriEngine.Input.Events.KeyCharEventArgs Class Reference	147
7.38.1	Detailed Description	148
7.38.2	Member Data Documentation	148
7.38.2.1	KeyChar	148
7.39	TriDevs.TriEngine.Input.Events.KeyEventArgs Class Reference	149
7.39.1	Detailed Description	149
7.39.2	Member Data Documentation	149
7.39.2.1	Key	149
7.40	TriDevs.TriEngine.UI.Label Class Reference	150
7.40.1	Detailed Description	151

7.40.2 Member Function Documentation	152
7.40.2.1 Draw	152
7.40.2.2 SetFont	152
7.40.2.3 Update	152
7.40.2.4 UpdateTextObject	152
7.40.3 Property Documentation	153
7.40.3.1 Alignment	153
7.40.3.2 Position	153
7.40.3.3 Text	153
7.41 TriDevs.TriEngine.UI.LinkLabel Class Reference	153
7.41.1 Detailed Description	155
7.41.2 Member Function Documentation	155
7.41.2.1 OnClicked	155
7.41.3 Property Documentation	156
7.41.3.1 Url	156
7.42 TriDevs.TriEngine.Logging.LogManager Class Reference	156
7.42.1 Detailed Description	157
7.42.2 Member Function Documentation	157
7.42.2.1 ClearOldLogs	157
7.42.2.2 DestroyConsole	157
7.42.2.3 GetLogger	158
7.42.2.4 LoadConfig	158
7.42.2.5 SetupConsole	159
7.43 TriDevs.TriEngine.Helpers.Math Class Reference	159
7.43.1 Detailed Description	160
7.43.2 Member Function Documentation	160
7.43.2.1 Clamp	160
7.43.2.2 Clamp	160
7.43.2.3 Clamp	161
7.43.2.4 Clamp	161
7.43.2.5 Clamp	161
7.43.2.6 Clamp	162
7.43.2.7 Clamp	162
7.43.2.8 Clamp	162
7.43.2.9 Clamp	163
7.43.2.10 Clamp	163
7.44 TriDevs.TriEngine.Tests.HelperTests.MathHelperTests Class Reference	163
7.44.1 Member Function Documentation	164
7.44.1.1 ShouldClampByteToMaximum	164
7.44.1.2 ShouldClampByteToMinimum	164

7.44.1.3	ShouldClampDoubleToMaximum	165
7.44.1.4	ShouldClampDoubleToMinimum	165
7.44.1.5	ShouldClampFloatToMaximum	165
7.44.1.6	ShouldClampFloatToMinimum	165
7.44.1.7	ShouldClampInt16ToMaximum	165
7.44.1.8	ShouldClampInt16ToMinimum	165
7.44.1.9	ShouldClampInt32ToMaximum	165
7.44.1.10	ShouldClampInt32ToMinimum	165
7.44.1.11	ShouldClampInt64ToMaximum	165
7.44.1.12	ShouldClampInt64ToMinimum	166
7.44.1.13	ShouldClampUInt16ToMaximum	166
7.44.1.14	ShouldClampUInt16ToMinimum	166
7.44.1.15	ShouldClampUInt32ToMaximum	166
7.44.1.16	ShouldClampUInt32ToMinimum	166
7.44.1.17	ShouldClampUInt64ToMaximum	166
7.44.1.18	ShouldClampUInt64ToMinimum	166
7.44.1.19	ShouldNotClampByte	166
7.44.1.20	ShouldNotClampDouble	166
7.44.1.21	ShouldNotClampFloat	167
7.44.1.22	ShouldNotClampInt16	167
7.44.1.23	ShouldNotClampInt32	167
7.44.1.24	ShouldNotClampInt64	167
7.44.1.25	ShouldNotClampUInt16	167
7.44.1.26	ShouldNotClampUInt32	167
7.44.1.27	ShouldNotClampUInt64	167
7.44.1.28	ShouldThrowByteClampArgumentException	167
7.44.1.29	ShouldThrowDoubleClampArgumentException	167
7.44.1.30	ShouldThrowFloatClampArgumentException	168
7.44.1.31	ShouldThrowInt16ClampArgumentException	168
7.44.1.32	ShouldThrowInt32ClampArgumentException	168
7.44.1.33	ShouldThrowInt64ClampArgumentException	168
7.44.1.34	ShouldThrowUInt16ClampArgumentException	168
7.44.1.35	ShouldThrowUInt32ClampArgumentException	168
7.44.1.36	ShouldThrowUInt64ClampArgumentException	168
7.45	TriDevs.TriEngine.Audio.Null AudioManager Class Reference	168
7.45.1	Detailed Description	170
7.45.2	Member Function Documentation	170
7.45.2.1	Dispose	170
7.45.2.2	GetSong	170
7.45.2.3	GetSound	170

7.45.2.4	HasSong	171
7.45.2.5	HasSound	171
7.45.2.6	LoadSong	171
7.45.2.7	LoadSound	172
7.45.2.8	StopAll	172
7.45.2.9	StopAllSongs	172
7.45.2.10	StopAllSounds	172
7.46	TriDevs.TriEngine.Input.NullInputManager Class Reference	173
7.46.1	Detailed Description	175
7.46.2	Member Function Documentation	175
7.46.2.1	IsKeyDown	175
7.46.2.2	IsKeyUp	175
7.46.2.3	IsMouseDown	175
7.46.2.4	IsMouseUp	176
7.46.2.5	IsWheelChanged	176
7.46.2.6	IsWheelDown	176
7.46.2.7	IsWheelUp	176
7.46.2.8	KeyPressed	177
7.46.2.9	KeyReleased	177
7.46.2.10	MousePressed	177
7.46.2.11	MouseReleased	178
7.46.2.12	Update	178
7.46.2.13	WheelChange	178
7.46.3	Property Documentation	178
7.46.3.1	MousePosition	178
7.46.3.2	MouseWheelValue	179
7.46.3.3	MouseX	179
7.46.3.4	MouseY	179
7.46.3.5	this[Key key]	179
7.46.3.6	this[MouseButton button]	179
7.46.4	Event Documentation	179
7.46.4.1	KeyDown	179
7.46.4.2	KeyPress	179
7.46.4.3	KeyUp	179
7.46.4.4	MouseDown	179
7.46.4.5	MouseUp	179
7.46.4.6	WheelChanged	179
7.46.4.7	WheelDown	179
7.46.4.8	WheelUp	180
7.47	TriDevs.TriEngine.Audio.NullSong Class Reference	180

7.47.1	Detailed Description	181
7.47.2	Member Function Documentation	181
7.47.2.1	Dispose	181
7.47.2.2	Pause	181
7.47.2.3	Play	181
7.47.2.4	Resume	182
7.47.2.5	Stop	182
7.47.3	Property Documentation	182
7.47.3.1	File	182
7.47.3.2	IsLooped	182
7.47.3.3	Name	182
7.47.3.4	Volume	182
7.48	TriDevs.TriEngine.Audio.NullSound Class Reference	182
7.48.1	Detailed Description	184
7.48.2	Member Function Documentation	184
7.48.2.1	Dispose	184
7.48.2.2	Play	184
7.48.2.3	Stop	184
7.48.3	Property Documentation	184
7.48.3.1	File	184
7.48.3.2	Name	184
7.49	TriDevs.TriEngine.Point< T > Struct Template Reference	184
7.49.1	Detailed Description	185
7.49.2	Constructor & Destructor Documentation	185
7.49.2.1	Point	185
7.49.3	Member Data Documentation	185
7.49.3.1	X	185
7.49.3.2	Y	185
7.50	TriDevs.TriEngine.Graphics.Primitive Class Reference	185
7.50.1	Detailed Description	187
7.50.2	Constructor & Destructor Documentation	187
7.50.2.1	Primitive	187
7.50.2.2	Primitive	187
7.50.3	Member Function Documentation	188
7.50.3.1	Dispose	188
7.50.3.2	Draw	188
7.50.4	Member Data Documentation	188
7.50.4.1	ColorId	188
7.50.4.2	Colors	188
7.50.4.3	Ids	188

7.50.4.4	Indices	188
7.50.4.5	Vertices	188
7.50.5	Property Documentation	188
7.50.5.1	ColorID	188
7.50.5.2	IndicesID	188
7.50.5.3	VerticesID	188
7.51	TriDevs.TriEngine.Program Class Reference	189
7.51.1	Detailed Description	190
7.51.2	Constructor & Destructor Documentation	190
7.51.2.1	Program	190
7.51.3	Member Function Documentation	190
7.51.3.1	Dispose	190
7.51.4	Member Data Documentation	190
7.51.4.1	ID	190
7.52	TriDevs.TriEngine.Graphics.Rectangle Class Reference	190
7.52.1	Detailed Description	191
7.52.2	Constructor & Destructor Documentation	192
7.52.2.1	Rectangle	192
7.53	TriDevs.TriEngine.Rectangle Struct Reference	192
7.53.1	Detailed Description	193
7.53.2	Constructor & Destructor Documentation	194
7.53.2.1	Rectangle	194
7.53.2.2	Rectangle	194
7.53.3	Member Function Documentation	194
7.53.3.1	Equals	194
7.53.3.2	Intersects	194
7.53.4	Member Data Documentation	195
7.53.4.1	Color	195
7.53.4.2	Height	195
7.53.4.3	Width	195
7.53.4.4	X	195
7.53.4.5	Y	195
7.54	TriDevs.TriEngine.Resources Class Reference	195
7.54.1	Detailed Description	196
7.54.2	Member Function Documentation	196
7.54.2.1	AddFont	196
7.54.2.2	AddShader	196
7.54.2.3	GetFont	197
7.54.2.4	GetShader	197
7.54.2.5	LoadFont	197

7.54.2.6	LoadFont	198
7.54.2.7	LoadShader	198
7.54.3	Member Data Documentation	199
7.54.3.1	BasePath	199
7.54.3.2	FontPath	199
7.54.3.3	ShaderPath	199
7.55	TriDevs.TriEngine.Serializing.Serializer Class Reference	199
7.55.1	Detailed Description	199
7.55.2	Member Function Documentation	199
7.55.2.1	Deserialize< T >	199
7.55.2.2	Serialize< T >	200
7.55.2.3	Serialize< T >	200
7.56	TriDevs.TriEngine.Services Class Reference	201
7.56.1	Detailed Description	201
7.56.2	Member Function Documentation	201
7.56.2.1	Provide	201
7.56.2.2	Provide	202
7.56.2.3	Provide	202
7.56.3	Property Documentation	202
7.56.3.1	Audio	202
7.56.3.2	Input	202
7.57	TriDevs.TriEngine.Shaders.Shader Class Reference	202
7.57.1	Detailed Description	204
7.57.2	Constructor & Destructor Documentation	204
7.57.2.1	Shader	204
7.57.3	Member Function Documentation	204
7.57.3.1	Dispose	204
7.57.3.2	GetDefaultName	204
7.57.4	Member Data Documentation	205
7.57.4.1	ID	205
7.57.5	Property Documentation	205
7.57.5.1	File	205
7.57.5.2	Name	205
7.58	TriDevs.TriEngine.Audio.Song Class Reference	205
7.58.1	Detailed Description	206
7.58.2	Member Function Documentation	206
7.58.2.1	Dispose	206
7.58.2.2	Pause	207
7.58.2.3	Play	207
7.58.2.4	Resume	207

7.58.2.5	Stop	207
7.58.3	Property Documentation	207
7.58.3.1	File	207
7.58.3.2	IsLooped	207
7.58.3.3	Name	208
7.58.3.4	Volume	208
7.59	TriDevs.TriEngine.Audio.Sound Class Reference	208
7.59.1	Detailed Description	209
7.59.2	Member Function Documentation	209
7.59.2.1	Dispose	209
7.59.2.2	Play	209
7.59.2.3	Stop	209
7.59.3	Property Documentation	210
7.59.3.1	File	210
7.59.3.2	Name	210
7.60	TriDevs.TriEngine.Extensions.StringExtensions Class Reference	210
7.60.1	Detailed Description	210
7.60.2	Member Function Documentation	210
7.60.2.1	Replace	210
7.60.2.2	Replace	211
7.60.2.3	ReplaceFirst	211
7.61	TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests Class Reference	211
7.61.1	Member Function Documentation	212
7.61.1.1	ShouldReplaceAllWordsCaseInsensitive	212
7.61.1.2	ShouldReplaceAllWordsCaseSensitive	212
7.61.1.3	ShouldReplaceFirstTwoOccurrencesCaseInsensitive	212
7.61.1.4	ShouldReplaceFirstTwoOccurrencesCaseSensitive	212
7.61.1.5	ShouldReplaceFirstWordCaseInsensitive	212
7.61.1.6	ShouldReplaceFirstWordCaseSensitive	212
7.62	TriDevs.TriEngine.Text.TextObject Class Reference	213
7.62.1	Detailed Description	214
7.62.2	Constructor & Destructor Documentation	214
7.62.2.1	TextObject	214
7.62.2.2	TextObject	214
7.62.3	Member Function Documentation	214
7.62.3.1	Draw	214
7.62.3.2	Draw	215
7.62.3.3	Draw	215
7.62.4	Property Documentation	215
7.62.4.1	Alignment	215

7.62.4.2	Bounds	215
7.62.4.3	Color	215
7.62.4.4	Font	215
7.62.4.5	Position	215
7.62.4.6	Text	215
7.63	TriDevs.TriEngine.Helpers.Threading Class Reference	215
7.63.1	Detailed Description	216
7.63.2	Member Function Documentation	216
7.63.2.1	SetCurrentThreadName	216
7.64	TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests Class Reference	216
7.64.1	Member Function Documentation	216
7.64.1.1	ShouldAbortSettingNameOfCurrentThread	216
7.64.1.2	ShouldSetNameOfCurrentThread	217
7.65	TriDevs.TriEngine.Graphics.Triangle Class Reference	217
7.65.1	Detailed Description	218
7.65.2	Constructor & Destructor Documentation	219
7.65.2.1	Triangle	219
7.66	TriDevs.TriEngine.Extensions.Vector3Extensions Class Reference	219
7.66.1	Detailed Description	219
7.66.2	Member Function Documentation	219
7.66.2.1	ToFloatArray	219
7.67	TriDevs.TriEngine.Version Class Reference	220
7.67.1	Detailed Description	220
7.67.2	Member Data Documentation	220
7.67.2.1	Major	220
7.67.2.2	Minor	220
7.67.2.3	Patch	220
7.67.2.4	Suffix	221
7.67.2.5	VersionStringFormat	221
7.67.2.6	VersionStringFormatWithSuffix	221
7.67.3	Property Documentation	221
7.67.3.1	VersionString	221
7.68	TriDevs.TriEngine.Native.WinAPI Class Reference	221
7.68.1	Detailed Description	221
7.68.2	Member Function Documentation	222
7.68.2.1	AllocConsole	222
7.68.2.2	FreeConsole	222
7.68.2.3	GetStdHandle	222
7.68.3	Member Data Documentation	223
7.68.3.1	CODE_PAGE	223

7.68.3.2	STD_OUTPUT_HANDLE	223
7.69	TriDevs.TriEngine.EngineTest.Window2DTest Class Reference	224
7.69.1	Member Function Documentation	225
7.69.1.1	Main	225
7.69.1.2	OnDraw	225
7.69.1.3	OnUnload	225
7.69.1.4	OnUpdateFrame	225
8	File Documentation	229
8.1	README.md File Reference	229
8.2	TriDevs.TriEngine.EngineTest/WindowTest.cs File Reference	229
8.3	TriDevs.TriEngine.Tests/ColorTests.cs File Reference	229
8.4	TriDevs.TriEngine.Tests/ExtensionTests/EnumerationExtensionTests.cs File Reference	229
8.5	TriDevs.TriEngine.Tests/ExtensionTests/StringExtensionTests.cs File Reference	230
8.6	TriDevs.TriEngine.Tests/HelperTests/ExceptionHelperTests.cs File Reference	230
8.7	TriDevs.TriEngine.Tests/HelperTests/MathHelperTests.cs File Reference	230
8.8	TriDevs.TriEngine.Tests/HelperTests/ThreadingHelperTests.cs File Reference	230
8.9	TriDevs.TriEngine.Tests/StateManagementTests/GameStateTests.cs File Reference	230
8.10	TriDevs.TriEngine/Audio/AudioFormat.cs File Reference	231
8.11	TriDevs.TriEngine/Audio/ AudioManager.cs File Reference	231
8.12	TriDevs.TriEngine/Audio/I AudioManager.cs File Reference	231
8.13	TriDevs.TriEngine/Audio/ISong.cs File Reference	231
8.14	TriDevs.TriEngine/Audio/ISound.cs File Reference	232
8.15	TriDevs.TriEngine/Audio/Null AudioManager.cs File Reference	232
8.16	TriDevs.TriEngine/Audio/NullSong.cs File Reference	232
8.17	TriDevs.TriEngine/Audio/NullSound.cs File Reference	232
8.18	TriDevs.TriEngine/Audio/Song.cs File Reference	233
8.19	TriDevs.TriEngine/Audio/Sound.cs File Reference	233
8.20	TriDevs.TriEngine/Color.cs File Reference	233
8.21	TriDevs.TriEngine/EngineException.cs File Reference	233
8.22	TriDevs.TriEngine/Extensions/ByteExtensions.cs File Reference	234
8.23	TriDevs.TriEngine/Extensions/DecimalExtensions.cs File Reference	234
8.24	TriDevs.TriEngine/Extensions/DoubleExtensions.cs File Reference	234
8.25	TriDevs.TriEngine/Extensions/EnumerationExtensions.cs File Reference	234
8.26	TriDevs.TriEngine/Extensions/FloatExtensions.cs File Reference	235
8.27	TriDevs.TriEngine/Extensions/IntegerExtensions.cs File Reference	235
8.28	TriDevs.TriEngine/Extensions/StringExtensions.cs File Reference	235
8.29	TriDevs.TriEngine/Extensions/Vector3Extensions.cs File Reference	235
8.30	TriDevs.TriEngine/GameWindow2D.cs File Reference	236
8.31	TriDevs.TriEngine/Graphics/Primitive.cs File Reference	236

8.32 TriDevs.TriEngine/Graphics/Rectangle.cs File Reference	236
8.33 TriDevs.TriEngine/Rectangle.cs File Reference	236
8.34 TriDevs.TriEngine/Graphics/Triangle.cs File Reference	237
8.35 TriDevs.TriEngine/Helpers/Exceptions.cs File Reference	237
8.36 TriDevs.TriEngine/Helpers/IO.cs File Reference	237
8.37 TriDevs.TriEngine/Helpers/Math.cs File Reference	237
8.38 TriDevs.TriEngine/Helpers/Threading.cs File Reference	238
8.39 TriDevs.TriEngine/Input/Events/Key.cs File Reference	238
8.40 TriDevs.TriEngine/Input/Events/Mouse.cs File Reference	238
8.41 TriDevs.TriEngine/Input/IInputManager.cs File Reference	239
8.42 TriDevs.TriEngine/Input/InputManager.cs File Reference	239
8.43 TriDevs.TriEngine/Input/NullInputManager.cs File Reference	239
8.44 TriDevs.TriEngine/Interfaces>IDrawable.cs File Reference	239
8.45 TriDevs.TriEngine/Interfaces>IDrawableGameComponent.cs File Reference	240
8.46 TriDevs.TriEngine/Interfaces/IGameComponent.cs File Reference	240
8.47 TriDevs.TriEngine/Interfaces/IUpdatable.cs File Reference	240
8.48 TriDevs.TriEngine/Logging/LogManager.cs File Reference	240
8.49 TriDevs.TriEngine/Native/Helpers.cs File Reference	241
8.50 TriDevs.TriEngine/Native/WinAPI.cs File Reference	241
8.51 TriDevs.TriEngine/Point.cs File Reference	241
8.52 TriDevs.TriEngine/Program.cs File Reference	241
8.53 TriDevs.TriEngine/Properties/AssemblyInfo.cs File Reference	242
8.54 TriDevs.TriEngine.EngineTest/Properties/AssemblyInfo.cs File Reference	242
8.55 TriDevs.TriEngine.Tests/Properties/AssemblyInfo.cs File Reference	242
8.56 TriDevs.TriEngine/Resources.cs File Reference	242
8.57 TriDevs.TriEngine/Serializing/Serializer.cs File Reference	242
8.58 TriDevs.TriEngine/Services.cs File Reference	242
8.59 TriDevs.TriEngine/Shaders/Shader.cs File Reference	242
8.60 TriDevs.TriEngine/StateManagement/GameState.cs File Reference	243
8.61 TriDevs.TriEngine/StateManagement/GameStateManager.cs File Reference	243
8.62 TriDevs.TriEngine/StateManagement/IGameState.cs File Reference	243
8.63 TriDevs.TriEngine/StateManagement/IGameStateManager.cs File Reference	243
8.64 TriDevs.TriEngine/Text/Font.cs File Reference	244
8.65 TriDevs.TriEngine/Text/FontConstructionConfig.cs File Reference	244
8.66 TriDevs.TriEngine/Text/FontType.cs File Reference	244
8.67 TriDevs.TriEngine/Text/ITextObject.cs File Reference	244
8.68 TriDevs.TriEngine/Text/TextObject.cs File Reference	245
8.69 TriDevs.TriEngine/UI/Control.cs File Reference	245
8.70 TriDevs.TriEngine/UI/ControlManager.cs File Reference	245
8.71 TriDevs.TriEngine/UI/Events/ControlClicked.cs File Reference	245

8.72 TriDevs.TriEngine/UI/IControl.cs File Reference	246
8.73 TriDevs.TriEngine/UI/IControlManager.cs File Reference	246
8.74 TriDevs.TriEngine/UI/Label.cs File Reference	246
8.75 TriDevs.TriEngine/UI/LinkLabel.cs File Reference	246
8.76 TriDevs.TriEngine/Version.cs File Reference	247

Index	247
--------------	------------

Chapter 1

Main Page

General-purpose engine in C#/OpenGL

Will eventually have scripting API for Lua (and possible additional languages)

IRC

[TriDevs](#) has an IRC channel, feel free to hop in if you have a question about anything: **Server:** irc.kottnet.net **Port:** 6667, 6697 (SSL) **Channel:** [TriDevs](#)

The channel topic contains further info.

License

Copyright © 2013 by [Adam Hellberg](#), [Sijmen Schoon](#) and [Preston Shumway](#).

TriEngine is licensed under the [MIT License](#), more info can be found in the **LICENSE** file.

Contributing

You are free to fork this project and make your own changes, as long as you follow the MIT License.

If you want to make a pull request, please do so to the [main project](#) and not any of the "official" forks.

For your pull request to be accepted, please follow our coding style:

- Indent with 4 spaces, not tabs.
- Curly braces placed on next line.
- All **public** methods, accessors and members must be properly documented.
- Use sensible variable names that describe what they are for.
- Method declarations written as:

“c# public void Hello(string world) “

- If your method accepts many parameters, it can be useful to put parameters on separate lines, as per this style:

“c# public void Hello(string world, bool print) “

- Please write tests for your code (not strictly required, but it's a plus)

By looking through the current source code, you should be able to get a good understanding of the formatting we use.

If you're using Visual Studio, you can change the indent behaviour by going to: **Tools -> Options -> Text Editor -> C# -> Tabs** and make sure "Insert spaces" is checked.

If you write tests for your code, please place these tests in their own project: "< **Namespace>; Tests", create said project if it does not exist (of type Class Library).**

We use NUnit as test framework, feel free to use something else if you want to, but make sure you document what framework you are using and that it is freely available for anyone to obtain.

Dependencies

TriEngine depends on [log4net](#), which is included in the **libs/log4net** folder.

TriEngine depends on [OpenTK](#), this is not included and you will have to build/install it yourself. OpenTK depends on OpenGL drivers being installed, they are usually in your normal video card drivers.

TriEngine depends on [Json.NET](#), this is not included, but is specified in the NuGet package config. If you [properly configure your NuGet settings](#), NuGet will automatically download Json.NET when building any projects that depend on it.

TriEngine depends on [NVorbis](#), which is included in the **libs/NVorbis** folder. [NVorbis is licensed under Ms-PL](#).

If you want to run the tests you will need to have [NUnit](#) installed.

Chapter 2

Namespace Index

2.1 Namespace List

Here is a list of all namespaces with brief descriptions:

TriDevs	13
TriDevs.TriEngine	13
TriDevs.TriEngine.Audio	14
TriDevs.TriEngine.EngineTest	15
TriDevs.TriEngine.Extensions	15
TriDevs.TriEngine.Graphics	15
TriDevs.TriEngine.Helpers	15
TriDevs.TriEngine.Input	16
TriDevs.TriEngine.Input.Events	16
TriDevs.TriEngine.Interfaces	18
TriDevs.TriEngine.Logging	18
TriDevs.TriEngine.Native	18
TriDevs.TriEngine.Serializing	19
TriDevs.TriEngine.Shaders	19
TriDevs.TriEngine.StateManagement	19
TriDevs.TriEngine.Tests	19
TriDevs.TriEngine.Tests.ExtensionTests	19
TriDevs.TriEngine.Tests.HelperTests	20
TriDevs.TriEngine.Tests.StateManagementTests	20
TriDevs.TriEngine.Text	20
TriDevs.TriEngine.UI	21
TriDevs.TriEngine.UI.Events	21

Chapter 3

Hierarchical Index

3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

TriDevs.TriEngine.Extensions.ByteExtensions	28
TriDevs.TriEngine.Color	29
TriDevs.TriEngine.Tests.ColorTests	51
TriDevs.TriEngine.Extensions.DecimalExtensions	63
TriDevs.TriEngine.Extensions.DoubleExtensions	64
TriDevs.TriEngine.Extensions.EnumerationExtensions	66
TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests	69
EventArgs	
TriDevs.TriEngine.Input.Events.KeyCharEventArgs	147
TriDevs.TriEngine.Input.Events.KeyEventArgs	149
Exception	
TriDevs.TriEngine.EngineException	65
TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests	70
TriDevs.TriEngine.Helpers.Exceptions	71
TriDevs.TriEngine.Extensions.FloatExtensions	72
TriDevs.TriEngine.Text.Font	73
TriDevs.TriEngine.Text.FontConstructionConfig	76
TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests	90
GameWindow	
TriDevs.TriEngine.GameWindow2D	94
TriDevs.TriEngine.EngineTest.Window2DTest	224
TriDevs.TriEngine.Native.Helpers	96
IDisposable	
TriDevs.TriEngine.Audio.IAudioManager	98
TriDevs.TriEngine.Audio.AudioManager	23
TriDevs.TriEngine.Audio.NullAudioManager	168
TriDevs.TriEngine.Audio.ISong	140
TriDevs.TriEngine.Audio.NullSong	180
TriDevs.TriEngine.Audio.Song	205
TriDevs.TriEngine.Audio.ISound	143
TriDevs.TriEngine.Audio.NullSound	182
TriDevs.TriEngine.Audio.Sound	208
TriDevs.TriEngine.Graphics.Primitive	185
TriDevs.TriEngine.Graphics.Rectangle	190
TriDevs.TriEngine.Graphics.Triangle	217
TriDevs.TriEngine.Program	189
TriDevs.TriEngine.Shaders.Shader	202

TriDevs.TriEngine.Interfaces.IDrawable	109
TriDevs.TriEngine.Graphics.Primitive	185
TriDevs.TriEngine.Interfaces.IDrawableGameComponent	110
TriDevs.TriEngine.UI.IControlManager	106
TriDevs.TriEngine.UI.ControlManager	57
TriDevs.TriEngine.StateManagement.IGameState	113
TriDevs.TriEngine.StateManagement.GameState	78
TriDevs.TriEngine.StateManagement.IGameStateManager	120
TriDevs.TriEngine.StateManagement.GameStateManager	86
TriDevs.TriEngine.UI.IControl	102
TriDevs.TriEngine.UI.Control	52
TriDevs.TriEngine.UI.Label	150
TriDevs.TriEngine.UI.LinkLabel	153
IEquatable< Rectangle >	
TriDevs.TriEngine.Rectangle	192
TriDevs.TriEngine.Input.IInputManager	122
TriDevs.TriEngine.Input.InputManager	129
TriDevs.TriEngine.Input.NullInputManager	173
TriDevs.TriEngine.Extensions.IntegerExtensions	136
TriDevs.TriEngine.Helpers.IO	139
TriDevs.TriEngine.Text.ITextObject	144
TriDevs.TriEngine.Text.TextObject	213
TriDevs.TriEngine.Interfaces.IUpdatable	147
TriDevs.TriEngine.Interfaces.IGameComponent	112
TriDevs.TriEngine.Interfaces.IDrawableGameComponent	110
TriDevs.TriEngine.StateManagement.IGameState	113
TriDevs.TriEngine.StateManagement.IGameStateManager	120
TriDevs.TriEngine.UI.IControl	102
TriDevs.TriEngine.Logging.LogManager	156
TriDevs.TriEngine.Helpers.Math	159
TriDevs.TriEngine.Tests.HelperTests.MathHelperTests	163
TriDevs.TriEngine.Point< T >	184
TriDevs.TriEngine.Resources	195
TriDevs.TriEngine.Serializing.Serializer	199
TriDevs.TriEngine.Services	201
TriDevs.TriEngine.Extensions.StringExtensions	210
TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests	211
TriDevs.TriEngine.Helpers.Threading	215
TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests	216
TriDevs.TriEngine.Extensions.Vector3Extensions	219
TriDevs.TriEngine.Version	220
TriDevs.TriEngine.Native.WinAPI	221

Chapter 4

Class Index

4.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

TriDevs.TriEngine.Audio.AudioManager	Class to manage engine audio.	23
TriDevs.TriEngine.Extensions.ByteExtensions	Extensions for System.Byte.	28
TriDevs.TriEngine.Color	Represents an RGBA color that can be used with TriEngine2D.	29
TriDevs.TriEngine.Tests.ColorTests		51
TriDevs.TriEngine.UI.Control	Base control class that all other controls inherits from. Defines basic UI control behaviour.	52
TriDevs.TriEngine.UI.ControlManager	Control manager to manage various UI controls for a game.	57
TriDevs.TriEngine.Extensions.DecimalExtensions	Extensions for System.Decimal.	63
TriDevs.TriEngine.Extensions.DoubleExtensions	Extensions for System.Double.	64
TriDevs.TriEngine.EngineException	Base exception class for all engine-related exceptions. The inner exception will contain more info as to what actually happened.	65
TriDevs.TriEngine.Extensions.EnumerationExtensions	Extensions for System.Enum.	66
TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests		69
TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests		70
TriDevs.TriEngine.Helpers.Exceptions	Provides helper methods for dealing with exceptions.	71
TriDevs.TriEngine.Extensions.FloatExtensions	Extensions for System.Single.	72
TriDevs.TriEngine.Text.Font	Holds a specific font type.	73
TriDevs.TriEngine.Text.FontConstructionConfig	Container class for different QFont configurations for use with the Font constructor.	76
TriDevs.TriEngine.StateManagement.GameState	Base GameState class that all other game states derive from, defines basic GameState behaviour.	78
TriDevs.TriEngine.StateManagement.GameStateManager	Game state manager that keeps track of the active game states and provides methods to control the states.	86
TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests		90

TriDevs.TriEngine.GameWindow2D	Game window class specialized for drawing 2D graphics.	94
TriDevs.TriEngine.Native.Helpers	Helper class with various methods to help native coding and debugging.	96
TriDevs.TriEngine.Audio.IAudioManager	Provides various methods to manipulate audio.	98
TriDevs.TriEngine.UI.IControl	A UI control that can be drawn on screen and interacted with.	102
TriDevs.TriEngine.UI.IControlManager	Manages various UI controls, automatically updating and drawing them to the screen.	106
TriDevs.TriEngine.Interfaces.IDrawable	Implements a simple draw method.	109
TriDevs.TriEngine.Interfaces.IDrawableGameComponent	A game component that can be added to GameState objects. Drawable game components also implement a draw method to draw themselves to screen.	110
TriDevs.TriEngine.Interfaces.IGameComponent	A game component that can be added to IGameState objects.	112
TriDevs.TriEngine.StateManagement.IGameState	A game state that can be used with the game state manager. Represent a specific state of the game, like main menu and options screen.	113
TriDevs.TriEngine.StateManagement.IGameStateManager	Game state manager that keeps track of the active game states and provides methods to control the states.	120
TriDevs.TriEngine.Input.IInputManager	Provides various methods to query input devices like the keyboard.	122
TriDevs.TriEngine.Input.InputManager	Input manager interfacing with input methods provided by a GameWindow.	129
TriDevs.TriEngine.Extensions.IntegerExtensions	Extensions for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.	136
TriDevs.TriEngine.Helpers.IO	Provides various helper functions for doing IO operations.	139
TriDevs.TriEngine.Audio.ISong	A song that will be streamed in the audio player.	140
TriDevs.TriEngine.Audio.ISound	A sound file for use with the audio manager.	143
TriDevs.TriEngine.Text.ITextObject	Implements methods to construct a text object and render it to screen.	144
TriDevs.TriEngine.Interfaces.IUpdatable	Implements a simple update method.	147
TriDevs.TriEngine.Input.Events.KeyCharEventArgs	EventArgs class used for keychar-related events. Contains information about the character related with the event.	147
TriDevs.TriEngine.Input.Events.KeyEventEventArgs	EventArgs class used for key-related events. Contains information about the key related with the event.	149
TriDevs.TriEngine.UI.Label	A simple label to display text on the screen.	150
TriDevs.TriEngine.UI.LinkLabel	A label that, when clicked, will open a URL.	153
TriDevs.TriEngine.Logging.LogManager	Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.	156
TriDevs.TriEngine.Helpers.Math	Various helper methods for working with math.	159
TriDevs.TriEngine.Tests.HelperTests.MathHelperTests	163
TriDevs.TriEngine.Audio.NullAudioManager	Used as a fallback AudioManager object when the service locator fails to find one.	168

TriDevs.TriEngine.Input.NullInputManager	Used as a fallback InputManager object when the service locator fails to find one.	173
TriDevs.TriEngine.Audio.NullSong	Fallback song class used in NullAudioManager .	180
TriDevs.TriEngine.Audio.NullSound	Fallback sound class used in NullAudioManager .	182
TriDevs.TriEngine.Point< T >	A struct representing an X/Y coordinate.	184
TriDevs.TriEngine.Graphics.Primitive	Represents a primitive 2D shape composed of triangles.	185
TriDevs.TriEngine.Program	An OpenGL program.	189
TriDevs.TriEngine.Graphics.Rectangle	A primitive 2D Rectangle shape.	190
TriDevs.TriEngine.Rectangle	A rectangle representing an area in 2D space.	192
TriDevs.TriEngine.Resources	Static class to manage resources.	195
TriDevs.TriEngine.Serializing.Serializer	Provides serialization methods.	199
TriDevs.TriEngine.Services	Provides different game-related service interfaces.	201
TriDevs.TriEngine.Shaders.Shader	GLSL shader object loaded and compiled from a *.glsl shader file.	202
TriDevs.TriEngine.Audio.Song	Song class that can be used with AudioManager .	205
TriDevs.TriEngine.Audio.Sound	Sound class that can be used with the AudioManager .	208
TriDevs.TriEngine.Extensions.StringExtensions	Extensions for System.String	210
TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests		211
TriDevs.TriEngine.Text.TextObject	Implements the ITextObject interface.	213
TriDevs.TriEngine.Helpers.Threading	Provides various helper functions for doing threading operations.	215
TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests		216
TriDevs.TriEngine.Graphics.Triangle	A primitive 2D Triangle shape.	217
TriDevs.TriEngine.Extensions.Vector3Extensions	Extensions for Vector3.	219
TriDevs.TriEngine.Version	Version class specifying the version of this project.	220
TriDevs.TriEngine.Native.WinAPI	Holds various WinAPI stuff.	221
TriDevs.TriEngine.EngineTest.Window2DTest		224

Chapter 5

File Index

5.1 File List

Here is a list of all files with brief descriptions:

TriDevs.TriEngine.EngineTest/ WindowTest.cs	229
TriDevs.TriEngine.EngineTest/Properties/ AssemblyInfo.cs	242
TriDevs.TriEngine.Tests/ ColorTests.cs	229
TriDevs.TriEngine.Tests/ExtensionTests/ EnumerationExtensionTests.cs	229
TriDevs.TriEngine.Tests/ExtensionTests/ StringExtensionTests.cs	230
TriDevs.TriEngine.Tests/HelperTests/ ExceptionHelperTests.cs	230
TriDevs.TriEngine.Tests/HelperTests/ MathHelperTests.cs	230
TriDevs.TriEngine.Tests/HelperTests/ ThreadingHelperTests.cs	230
TriDevs.TriEngine.Tests/Properties/ AssemblyInfo.cs	242
TriDevs.TriEngine.Tests/StateManagerTests/ GameStateTests.cs	230
TriDevs.TriEngine/ Color.cs	233
TriDevs.TriEngine/ EngineException.cs	233
TriDevs.TriEngine/ GameWindow2D.cs	236
TriDevs.TriEngine/ Point.cs	241
TriDevs.TriEngine/ Program.cs	241
TriDevs.TriEngine/ Rectangle.cs	236
TriDevs.TriEngine/ Resources.cs	242
TriDevs.TriEngine/ Services.cs	242
TriDevs.TriEngine/ Version.cs	247
TriDevs.TriEngine/Audio/ AudioFormat.cs	231
TriDevs.TriEngine/Audio/ AudioManager.cs	231
TriDevs.TriEngine/Audio/ I AudioManager.cs	231
TriDevs.TriEngine/Audio/ ISong.cs	231
TriDevs.TriEngine/Audio/ ISound.cs	232
TriDevs.TriEngine/Audio/ Null AudioManager.cs	232
TriDevs.TriEngine/Audio/ NullSong.cs	232
TriDevs.TriEngine/Audio/ NullSound.cs	232
TriDevs.TriEngine/Audio/ Song.cs	233
TriDevs.TriEngine/Audio/ Sound.cs	233
TriDevs.TriEngine/Extensions/ ByteExtensions.cs	234
TriDevs.TriEngine/Extensions/ DecimalExtensions.cs	234
TriDevs.TriEngine/Extensions/ DoubleExtensions.cs	234
TriDevs.TriEngine/Extensions/ EnumerationExtensions.cs	234
TriDevs.TriEngine/Extensions/ FloatExtensions.cs	235
TriDevs.TriEngine/Extensions/ IntegerExtensions.cs	235
TriDevs.TriEngine/Extensions/ StringExtensions.cs	235
TriDevs.TriEngine/Extensions/ Vector3Extensions.cs	235
TriDevs.TriEngine/Graphics/ Primitive.cs	236

TriDevs.TriEngine/Graphics/Rectangle.cs	236
TriDevs.TriEngine/Graphics/Triangle.cs	237
TriDevs.TriEngine/Helpers/Exceptions.cs	237
TriDevs.TriEngine/Helpers/IO.cs	237
TriDevs.TriEngine/Helpers/Math.cs	237
TriDevs.TriEngine/Helpers/Threading.cs	238
TriDevs.TriEngine/Input/IInputManager.cs	239
TriDevs.TriEngine/Input/InputManager.cs	239
TriDevs.TriEngine/Input/NullInputManager.cs	239
TriDevs.TriEngine/Input/Events/Key.cs	238
TriDevs.TriEngine/Input/Events/Mouse.cs	238
TriDevs.TriEngine/Interfaces>IDrawable.cs	239
TriDevs.TriEngine/Interfaces/IDrawableGameComponent.cs	240
TriDevs.TriEngine/Interfaces/IGameComponent.cs	240
TriDevs.TriEngine/Interfaces/IUpdatable.cs	240
TriDevs.TriEngine/Logging/LogManager.cs	240
TriDevs.TriEngine/Native/Helpers.cs	241
TriDevs.TriEngine/Native/WinAPI.cs	241
TriDevs.TriEngine/Properties/AssemblyInfo.cs	242
TriDevs.TriEngine/Serializing/Serializer.cs	242
TriDevs.TriEngine/Shaders/Shader.cs	242
TriDevs.TriEngine/StateManagement/GameState.cs	243
TriDevs.TriEngine/StateManagement/GameStateManager.cs	243
TriDevs.TriEngine/StateManagement/IGameState.cs	243
TriDevs.TriEngine/StateManagement/IGameStateManager.cs	243
TriDevs.TriEngine/Text/Font.cs	244
TriDevs.TriEngine/Text/FontConstructionConfig.cs	244
TriDevs.TriEngine/Text/FontType.cs	244
TriDevs.TriEngine/Text/ITextObject.cs	244
TriDevs.TriEngine/Text/TextObject.cs	245
TriDevs.TriEngine/UI/Control.cs	245
TriDevs.TriEngine/UI/ControlManager.cs	245
TriDevs.TriEngine/UI/IControl.cs	246
TriDevs.TriEngine/UI/IControlManager.cs	246
TriDevs.TriEngine/UI/Label.cs	246
TriDevs.TriEngine/UI/LinkLabel.cs	246
TriDevs.TriEngine/UI/Events/ControlClicked.cs	245

Chapter 6

Namespace Documentation

6.1 Package TriDevs

Namespaces

- package [TriEngine](#)

6.2 Package TriDevs.TriEngine

Namespaces

- package [Audio](#)
- package [EngineTest](#)
- package [Extensions](#)
- package [Graphics](#)
- package [Helpers](#)
- package [Input](#)
- package [Interfaces](#)
- package [Logging](#)
- package [Native](#)
- package [Serializing](#)
- package [Shaders](#)
- package [StateManagement](#)
- package [Tests](#)
- package [Text](#)
- package [UI](#)

Classes

- struct [Color](#)
Represents an RGBA color that can be used with TriEngine2D.
- class [EngineException](#)
Base exception class for all engine-related exceptions. The inner exception will contain more info as to what actually happened.
- class [GameWindow2D](#)
Game window class specialized for drawing 2D graphics.
- struct [Point< T >](#)
A struct representing an X/Y coordinate.

- class [Program](#)
An OpenGL program.
- struct [Rectangle](#)
A rectangle representing an area in 2D space.
- class [Resources](#)
Static class to manage resources.
- class [Services](#)
Provides different game-related service interfaces.
- class [Version](#)
Version class specifying the version of this project.

6.3 Package TriDevs.TriEngine.Audio

Classes

- class [AudioManager](#)
Class to manage engine audio.
- interface [IAudioManager](#)
Provides various methods to manipulate audio.
- interface [ISong](#)
A song that will be streamed in the audio player.
- interface [ISound](#)
A sound file for use with the audio manager.
- class [NullAudioManager](#)
Used as a fallback [AudioManager](#) object when the service locator fails to find one.
- class [NullSong](#)
Fallback song class used in [NullAudioManager](#).
- class [NullSound](#)
Fallback sound class used in [NullAudioManager](#).
- class [Song](#)
Song class that can be used with [AudioManager](#).
- class [Sound](#)
Sound class that can be used with the [AudioManager](#).

Enumerations

- enum [AudioFormat](#) { [Ogg](#), [Wav](#) }
Different audio formats usable with audio managers.

6.3.1 Enumeration Type Documentation

6.3.1.1 enum TriDevs.TriEngine.Audio.AudioFormat

Different audio formats usable with audio managers.

Enumerator

- Ogg** The Ogg Vorbis format.
Wav The WAVE format

```
30      {
34          Ogg,
35          Wav
39      }
```

6.4 Package TriDevs.TriEngine.EngineTest

Classes

- class [Window2DTest](#)

6.5 Package TriDevs.TriEngine.Extensions

Classes

- class [ByteExtensions](#)
Extensions for System.Byte.
- class [DecimalExtensions](#)
Extensions for System.Decimal.
- class [DoubleExtensions](#)
Extensions for System.Double.
- class [EnumerationExtensions](#)
Extensions for System.Enum.
- class [FloatExtensions](#)
Extensions for System.Single.
- class [IntegerExtensions](#)
Extensions for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.
- class [StringExtensions](#)
Extensions for System.String
- class [Vector3Extensions](#)
Extensions for Vector3.

6.6 Package TriDevs.TriEngine.Graphics

Classes

- class [Primitive](#)
Represents a primitive 2D shape composed of triangles.
- class [Rectangle](#)
A primitive 2D [Rectangle](#) shape.
- class [Triangle](#)
A primitive 2D [Triangle](#) shape.

6.7 Package TriDevs.TriEngine.Helpers

Classes

- class [Exceptions](#)
Provides helper methods for dealing with exceptions.
- class [IO](#)
Provides various helper functions for doing [IO](#) operations.
- class [Math](#)
Various helper methods for working with math.
- class [Threading](#)
Provides various helper functions for doing threading operations.

6.8 Package TriDevs.TriEngine.Input

Namespaces

- package [Events](#)

Classes

- interface [IInputManager](#)
Provides various methods to query input devices like the keyboard.
- class [InputManager](#)
Input manager interfacing with input methods provided by a GameWindow.
- class [NullInputManager](#)
Used as a fallback [InputManager](#) object when the service locator fails to find one.

6.9 Package TriDevs.TriEngine.Input.Events

Classes

- class [KeyEventArgs](#)
EventArgs class used for key-related events. Contains information about the key related with the event.
- class [KeyCharEventArgs](#)
EventArgs class used for keychar-related events. Contains information about the character related with the event.

Functions

- delegate void [KeyDownEventHandler](#) (object sender, [KeyEventArgs](#) e)
Event handler delegate for the KeyDown event.
- delegate void [KeyUpEventHandler](#) (object sender, [KeyEventArgs](#) e)
Event handler delegate for the KeyUp event.
- delegate void [KeyPressEventHandler](#) (object sender, [KeyCharEventArgs](#) e)
Event handler delegate for the KeyPress event.
- delegate void [MouseDownEventHandler](#) (object sender, [MouseButtonEventArgs](#) e)
Event handler delegate for the MouseDown event.
- delegate void [MouseUpEventHandler](#) (object sender, [MouseButtonEventArgs](#) e)
Event handler delegate for the MouseUp event.
- delegate void [MouseWheelChangedEventHandler](#) (object sender, [MouseEventArgs](#) e)
Event handler delegate for the MouseWheelChanged event.
- delegate void [MouseWheelDownEventHandler](#) (object sender, [MouseEventArgs](#) e)
Event handler delegate for the MouseWheelDown event.
- delegate void [MouseWheelUpEventHandler](#) (object sender, [MouseEventArgs](#) e)
Event handler delegate for the MouseWheelUp event.

6.9.1 Function Documentation

6.9.1.1 delegate void [TriDevs.TriEngine.Input.Events.KeyDownEventHandler](#) (object sender, [KeyEventArgs](#) e)

Event handler delegate for the KeyDown event.

Parameters

<i>sender</i>	The object that raised the event.
<i>e</i>	KeyEventArgs object with information about the event.

6.9.1.2 delegate void TriDevs.TriEngine.Input.Events.KeyPressEventHandler (object sender, KeyCharEventArgs e)

Event handler delegate for the KeyPress event.

Parameters

<i>sender</i>	The object that raised the event.
<i>e</i>	KeyEventArgs object with information about the event.

6.9.1.3 delegate void TriDevs.TriEngine.Input.Events.KeyUpEventHandler (object sender, KeyEventArgs e)

Event handler delegate for the KeyUp event.

Parameters

<i>sender</i>	The object that raised the event.
<i>e</i>	KeyEventArgs object with information about the event.

6.9.1.4 delegate void TriDevs.TriEngine.Input.Events.MouseDownEventHandler (object sender, MouseButtonEventArgs e)

Event handler delegate for the MouseDown event.

Parameters

<i>sender</i>	The object that raised the event.
<i>e</i>	Mouse button information associated with the event.

6.9.1.5 delegate void TriDevs.TriEngine.Input.Events.MouseUpEventHandler (object sender, MouseButtonEventArgs e)

Event handler delegate for the MouseUp event.

Parameters

<i>sender</i>	The object that raised the event.
<i>e</i>	Mouse button information associated with the event.

6.9.1.6 delegate void TriDevs.TriEngine.Input.Events.MouseWheelChangedEventHandler (object sender, MouseWheelEventArgs e)

Event handler delegate for the MouseWheelChanged event.

Parameters

<i>sender</i>	The object that raised the event.
<i>e</i>	Mouse wheel information associated with the event.

6.9.1.7 delegate void TriDevs.TriEngine.Input.Events.MouseWheelDownEventHandler (object sender, MouseWheelEventArgs e)

Event handler delegate for the MouseWheelDown event.

Parameters

<code>sender</code>	The object that raised the event.
<code>e</code>	Mouse wheel information associated with the event.

6.9.1.8 delegate void TriDevs.TriEngine.Input.Events.MouseWheelUpEventHandler (object sender, MouseWheelEventArgs e)

Event handler delegate for the MouseWheelUp event.

Parameters

<code>sender</code>	The object that raised the event.
<code>e</code>	Mouse wheel information associated with the event.

6.10 Package TriDevs.TriEngine.Interfaces

Classes

- interface [IDrawable](#)

Implements a simple draw method.
- interface [IDrawableGameComponent](#)

A game component that can be added to GameState objects. Drawable game components also implement a draw method to draw themselves to screen.
- interface [IGameComponent](#)

A game component that can be added to IGameState objects.
- interface [IUpdatable](#)

Implements a simple update method.

6.11 Package TriDevs.TriEngine.Logging

Classes

- class [LogManager](#)

Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.

6.12 Package TriDevs.TriEngine.Native

Classes

- class [Helpers](#)

Helper class with various methods to help native coding and debugging.
- class [WinAPI](#)

Holds various WinAPI stuff.

6.13 Package TriDevs.TriEngine.Serializing

Classes

- class [Serializer](#)

Provides serialization methods.

6.14 Package TriDevs.TriEngine.Shaders

Classes

- class [Shader](#)

*GLSL shader object loaded and compiled from a *.glsl shader file.*

6.15 Package TriDevs.TriEngine.StateManagement

Classes

- class [GameState](#)

Base [GameState](#) class that all other game states derive from, defines basic [GameState](#) behaviour.

- class [GameStateManager](#)

Game state manager that keeps track of the active game states and provides methods to control the states.

- interface [IGameState](#)

A game state that can be used with the game state manager. Represent a specific state of the game, like main menu and options screen.

- interface [IGameStateManager](#)

Game state manager that keeps track of the active game states and provides methods to control the states.

6.16 Package TriDevs.TriEngine.Tests

Namespaces

- package [ExtensionTests](#)
- package [HelperTests](#)
- package [StateManagementTests](#)

Classes

- class [ColorTests](#)

6.17 Package TriDevs.TriEngine.Tests.ExtensionTests

Classes

- class [EnumerationExtensionTests](#)
- class [StringExtensionTests](#)

6.18 Package TriDevs.TriEngine.Tests.HelperTests

Classes

- class [ExceptionHelperTests](#)
- class [MathHelperTests](#)
- class [ThreadingHelperTests](#)

6.19 Package TriDevs.TriEngine.Tests.StateManagementTests

Classes

- class [GameStateTests](#)

6.20 Package TriDevs.TriEngine.Text

Classes

- class [Font](#)
Holds a specific font type.
- class [FontConstructionConfig](#)
Container class for different QFont configurations for use with the [Font](#) constructor.
- interface [ITextObject](#)
Implements methods to construct a text object and render it to screen.
- class [TextObject](#)
Implements the [ITextObject](#) interface.

Enumerations

- enum [FontType](#) { [TTF](#), [QFont](#), [Unsupported](#) }
Different font types supported by TriEngine2D.

6.20.1 Enumeration Type Documentation

6.20.1.1 enum TriDevs.TriEngine.Text.FontType

Different font types supported by TriEngine2D.

Enumerator

- TTF** TrueType font file
- QFont** QFont *.qfont files.
- Unsupported** Specifies that the font type is not supported by the library.

```

30      {
34      TTF,
35      QFont,
40      Unsupported
44      }
45

```

6.21 Package TriDevs.TriEngine.UI

Namespaces

- package [Events](#)

Classes

- class [Control](#)
Base control class that all other controls inherits from. Defines basic UI control behaviour.
- class [ControlManager](#)
Control manager to manage various UI controls for a game.
- interface [IControl](#)
A UI control that can be drawn on screen and interacted with.
- interface [IControlManager](#)
Manages various UI controls, automatically updating and drawing them to the screen.
- class [Label](#)
A simple label to display text on the screen.
- class [LinkLabel](#)
A label that, when clicked, will open a URL.

6.22 Package TriDevs.TriEngine.UI.Events

Functions

- delegate void [ControlClickedEventHandler](#) (object sender, EventArgs e)
Delegate handler for the control clicked event.

6.22.1 Function Documentation

6.22.1.1 delegate void TriDevs.TriEngine.UI.Events.ControlClickedEventHandler (object sender, EventArgs e)

Delegate handler for the control clicked event.

Parameters

<code>sender</code>	The object that raised the event.
<code>e</code>	

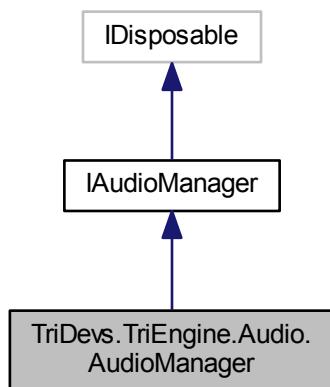
Chapter 7

Class Documentation

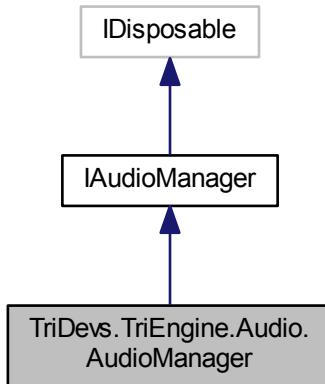
7.1 TriDevs.TriEngine.Audio.AudioManager Class Reference

Class to manage engine audio.

Inheritance diagram for TriDevs.TriEngine.Audio.AudioManager:



Collaboration diagram for TriDevs.TriEngine.Audio.AudioManager:



Public Member Functions

- [AudioManager \(\)](#)
Creates a new instance of `AudioManager`.
- void [Dispose \(\)](#)
- void [StopAll \(\)](#)
Immediately stops all playback of sounds and songs.
- [ISound LoadSound \(string name, string file, `AudioFormat` format=AudioFormat.Wav\)](#)
Loads a sound into the audio manager.
- bool [HasSound \(string name\)](#)
Returns a value indicating whether a sound with the specified name has been loaded into the audio manager.
- [ISound GetSound \(string name\)](#)
Gets the sound with the specified name.
- void [StopAllSounds \(\)](#)
Immediately stops playback of all sounds.
- [ISong LoadSong \(string name, string file, `AudioFormat` format=AudioFormat.Ogg\)](#)
Load a song into the audio manager.
- bool [HasSong \(string name\)](#)
Returns a value indicating whether a song with the specified name has been loaded into the audio manager.
- [ISong GetSong \(string name\)](#)
Gets the song with the specified name.
- void [StopAllSongs \(\)](#)
Immediately stops playback of all songs.

7.1.1 Detailed Description

Class to manage engine audio.

7.1.2 Constructor & Destructor Documentation

7.1.2.1 TriDevs.TriEngine.Audio.AudioManager(AudioManager)

Creates a new instance of [AudioManager](#).

```
47     {
48         _context = new AudioContext();
49         _oggStreamer = new OggStreamer();
50         _sounds = new List<ISound>();
51         _songs = new List<ISong>();
52     }
```

7.1.3 Member Function Documentation

7.1.3.1 void TriDevs.TriEngine.Audio.AudioManager.Dispose()

```
55     {
56         foreach (var sound in _sounds.Where(sound => sound != null))
57             sound.Dispose();
58
59         foreach (var song in _songs.Where(song => song != null))
60             song.Dispose();
61
62         if (_oggStreamer != null)
63         {
64             _oggStreamer.Dispose();
65             _oggStreamer = null;
66         }
67
68         if (_context != null)
69         {
70             _context.Dispose();
71             _context = null;
72         }
73     }
```

7.1.3.2 ISong TriDevs.TriEngine.Audio.AudioManager.GetSong(string name)

Gets the song with the specified name.

Parameters

<i>name</i>	Name of the song to get.
-------------	--------------------------

Returns

An object implementing the [ISong](#) interface, or null if no song matched the requested name.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
132     {
133         return _songs.FirstOrDefault(s => s.Name == name);
134     }
```

7.1.3.3 ISound TriDevs.TriEngine.Audio.AudioManager.GetSound(string name)

Gets the sound with the specified name.

Parameters

<i>name</i>	Name of the sound to get.
-------------	---------------------------

Returns

An object implementing the [ISound](#) interface, or null if no sound matched the requested name.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
102      {
103          return _sounds.FirstOrDefault(s => s.Name == name);
104      }
```

7.1.3.4 bool TriDevs.TriEngine.Audio.AudioManager.HasSong (string name)

Returns a value indicating whether a song with the specified name has been loaded into the audio manager.

Parameters

<i>name</i>	Name to check for.
-------------	--------------------

Returns

True if the song has been loaded, false otherwise.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
127      {
128          return _songs.Any(s => s.Name == name);
129      }
```

7.1.3.5 bool TriDevs.TriEngine.Audio.AudioManager.HasSound (string name)

Returns a value indicating whether a sound with the specified name has been loaded into the audio manager.

Parameters

<i>name</i>	Name to check for.
-------------	--------------------

Returns

True if the sound has been loaded, false otherwise.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
97      {
98          return _sounds.Any(s => s.Name == name);
99      }
```

7.1.3.6 ISong TriDevs.TriEngine.Audio.AudioManager.LoadSong (string name, string file, AudioFormat format = AudioFormat.Ogg)

Load a song into the audio manager.

If a song with the same name has already been loaded, it will be returned instead.

Parameters

<i>name</i>	Name to assign to the new song object.
<i>file</i>	Path to the file that will be used.
<i>format</i>	Format of the file.

Returns

The resulting object implementing the [ISong](#) interface.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```

112      {
113          var existing = _songs.FirstOrDefault(s => s.Name == name);
114          if (existing != null)
115              return existing;
116
117          var loaded = _songs.FirstOrDefault(s => s.File == file) != null;
118          if (loaded)
119              throw new Exception("The song file \"" + file + "\" has already been loaded under a
different name.");
120
121          var song = new Song(name, file, format);
122          _songs.Add(song);
123          return song;
124      }

```

7.1.3.7 [ISound](#) `TriDevs.TriEngine.Audio.AudioManager.LoadSound (string name, string file, AudioFormat format = AudioFormat.Wav)`

Loads a sound into the audio manager.

If a sound with the same name has already been loaded, it will be returned instead.

Parameters

<i>name</i>	Name to assign to the new sound object.
<i>file</i>	Path to the file that will be used.
<i>format</i>	The format of the file to load.

Returns

The resulting object implementing the [ISound](#) interface.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```

82      {
83          var existing = _sounds.FirstOrDefault(s => s.Name == name);
84          if (existing != null)
85              return existing;
86
87          var loaded = _sounds.FirstOrDefault(s => s.File == file) != null;
88          if (loaded)
89              throw new Exception("The sound file \"" + file + "\" has already been loaded under a
different name.");
90
91          var sound = new Sound(name, file, format);
92          _sounds.Add(sound);
93          return sound;
94      }

```

7.1.3.8 [void](#) `TriDevs.TriEngine.Audio.AudioManager.StopAll ()`

Immediately stops all playback of sounds and songs.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```

76      {
77          StopAllSounds();
78          StopAllSongs();
79      }

```

7.1.3.9 void TriDevs.TriEngine.Audio.AudioManager.StopAllSongs ()

Immediately stops playback of all songs.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
137      {
138          _songs.ForEach(s => s.Stop());
139      }
```

7.1.3.10 void TriDevs.TriEngine.Audio.AudioManager.StopAllSounds ()

Immediately stops playback of all sounds.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
107      {
108          _sounds.ForEach(s => s.Stop());
109      }
```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Audio/ AudioManager.cs](#)

7.2 TriDevs.TriEngine.Extensions.ByteExtensions Class Reference

[Extensions](#) for System.Byte.

Static Public Member Functions

- static byte [Clamp](#) (this byte value, byte min, byte max)
Clamps the specified byte between a minimum and maximum value.

7.2.1 Detailed Description

[Extensions](#) for System.Byte.

7.2.2 Member Function Documentation

7.2.2.1 static byte TriDevs.TriEngine.Extensions.ByteExtensions.Clamp (this byte value, byte min, byte max) [static]

Clamps the specified byte between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified byte is below this value, then this will be returned.
<i>max</i>	If the specified byte is above this value, then this will be returned.

Returns

The clamped value of the byte.

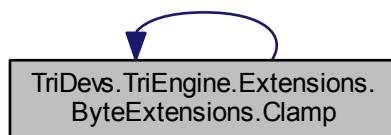
```
39      {
40          return Helpers.Math.Clamp(value, min, max);
```

```
41 }
```

Here is the call graph for this function:



Here is the caller graph for this function:



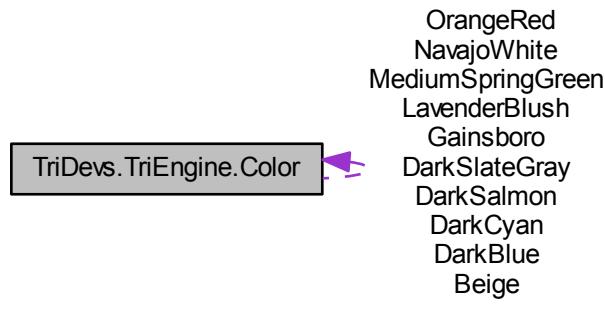
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Extensions/ByteExtensions.cs](#)

7.3 TriDevs.TriEngine.Color Struct Reference

Represents an RGBA color that can be used with TriEngine2D.

Collaboration diagram for TriDevs.TriEngine.Color:



Public Member Functions

- [Color \(Color4 color\)](#)
Creates a new color from a Color4 color.
- [Color \(Color @base, byte a\)](#)
Creates a new color from a base color with new alpha value.
- [Color \(Color @base, float a\)](#)
Creates a new color from a base color with new alpha value.
- [Color \(byte r, byte g, byte b, byte a=255\)](#)
Creates a new color with the specified red, green, blue and alpha values.
- [Color \(float r, float g, float b, float a=1.0f\)](#)
Creates a new color with the specified red, green, blue and alpha values.
- [Vector4 ToVector4 \(\)](#)
Returns a Vector4 representation of this color. This can be used with most OpenTK methods.
- [Vector3 ToVector3 \(\)](#)
Returns a Vector3 representation of this color (ommits alpha value). This can be used with most OpenTK methods.
- [Color4 ToColor4 \(\)](#)
Returns a Color4 representation of this color. This can be used with most OpenTK methods.

Public Attributes

- [readonly float R](#)
The red component of the color.
- [readonly float G](#)
The green component of the color.
- [readonly float B](#)
The blue component of the color.
- [readonly float A](#)
The color's alpha value.

Static Public Attributes

- static readonly `Color AliceBlue = new Color(240, 248, 255)`
The color AliceBlue.
- static readonly `Color AntiqueWhite = new Color(250, 235, 215)`
The color AntiqueWhite.
- static readonly `Color Aqua = new Color(0, 255, 255)`
The color Aqua.
- static readonly `Color Aquamarine = new Color(127, 255, 212)`
The color Aquamarine.
- static readonly `Color Azure = new Color(240, 255, 255)`
The color Azure.
- static readonly `Color Beige = new Color(245, 245, 220)`
The color Beige.
- static readonly `Color Bisque = new Color(255, 228, 196)`
The color Bisque.
- static readonly `Color Black = new Color(0, 0, 0)`
The color Black.
- static readonly `Color BlanchedAlmond = new Color(255, 235, 205)`
The color BlanchedAlmond.
- static readonly `Color Blue = new Color(0, 0, 255)`
The color Blue.
- static readonly `Color BlueViolet = new Color(138, 43, 226)`
The color BlueViolet.
- static readonly `Color Brown = new Color(165, 42, 42)`
The color Brown.
- static readonly `Color BurlyWood = new Color(222, 184, 135)`
The color BurlyWood.
- static readonly `Color CadetBlue = new Color(95, 158, 160)`
The color CadetBlue.
- static readonly `Color Chartreuse = new Color(127, 255, 0)`
The color Chartreuse.
- static readonly `Color Chocolate = new Color(210, 105, 30)`
The color Chocolate.
- static readonly `Color Coral = new Color(255, 127, 80)`
The color Coral.
- static readonly `Color CornflowerBlue = new Color(100, 149, 237)`
The color CornflowerBlue.
- static readonly `Color Cornsilk = new Color(255, 248, 220)`
The color Cornsilk.
- static readonly `Color Crimson = new Color(220, 20, 60)`
The color Crimson.
- static readonly `Color Cyan = new Color(0, 255, 255)`
The color Cyan.
- static readonly `Color DarkBlue = new Color(0, 0, 139)`
The color DarkBlue.
- static readonly `Color DarkCyan = new Color(0, 139, 139)`
The color DarkCyan.
- static readonly `Color DarkGoldenrod = new Color(184, 134, 11)`
The color DarkGoldenrod.
- static readonly `Color DarkGray = new Color(169, 169, 169)`

The color DarkGray.

- static readonly `Color DarkGreen = new Color(0, 100, 0)`

The color DarkGreen.

- static readonly `Color DarkKhaki = new Color(189, 183, 107)`

The color DarkKhaki.

- static readonly `Color DarkMagenta = new Color(139, 0, 139)`

The color DarkMagenta.

- static readonly `Color DarkOliveGreen = new Color(85, 107, 47)`

The color DarkOliveGreen.

- static readonly `Color DarkOrange = new Color(255, 140, 0)`

The color DarkOrange.

- static readonly `Color DarkOrchid = new Color(153, 50, 204)`

The color DarkOrchid.

- static readonly `Color DarkRed = new Color(139, 0, 0)`

The color DarkRed.

- static readonly `Color DarkSalmon = new Color(233, 150, 122)`

The color DarkSalmon.

- static readonly `Color DarkSeaGreen = new Color(143, 188, 139)`

The color DarkSeaGreen.

- static readonly `Color DarkSlateBlue = new Color(72, 61, 139)`

The color DarkSlateBlue.

- static readonly `Color DarkSlateGray = new Color(47, 79, 79)`

The color DarkSlateGray.

- static readonly `Color DarkTurquoise = new Color(0, 206, 209)`

The color DarkTurquoise.

- static readonly `Color DarkViolet = new Color(148, 0, 211)`

The color DarkViolet.

- static readonly `Color DeepPink = new Color(255, 20, 147)`

The color DeepPink.

- static readonly `Color DeepSkyBlue = new Color(0, 191, 255)`

The color DeepSkyBlue.

- static readonly `Color DimGray = new Color(105, 105, 105)`

The color DimGray.

- static readonly `Color DodgerBlue = new Color(30, 144, 255)`

The color DodgerBlue.

- static readonly `Color Firebrick = new Color(178, 34, 34)`

The color Firebrick.

- static readonly `Color FloralWhite = new Color(255, 250, 240)`

The color FloralWhite.

- static readonly `Color ForestGreen = new Color(34, 139, 34)`

The color ForestGreen.

- static readonly `Color Fuchsia = new Color(255, 0, 255)`

The color Fuchsia.

- static readonly `Color Gainsboro = new Color(220, 220, 220)`

The color Gainsboro.

- static readonly `Color GhostWhite = new Color(248, 248, 255)`

The color GhostWhite.

- static readonly `Color Gold = new Color(255, 215, 0)`

The color Gold.

- static readonly `Color Goldenrod = new Color(218, 165, 32)`

The color Goldenrod.

- static readonly `Color Gray` = new `Color(128, 128, 128)`
The color Gray.
- static readonly `Color Green` = new `Color(0, 128, 0)`
The color Green.
- static readonly `Color GreenYellow` = new `Color(173, 255, 47)`
The color GreenYellow.
- static readonly `Color HoneyDew` = new `Color(240, 255, 240)`
The color HoneyDew.
- static readonly `Color HotPink` = new `Color(255, 105, 180)`
The color HotPink.
- static readonly `Color IndianRed` = new `Color(205, 92, 92)`
The color IndianRed.
- static readonly `Color Indigo` = new `Color(75, 0, 130)`
The color Indigo.
- static readonly `Color Ivory` = new `Color(255, 255, 240)`
The color Ivory.
- static readonly `Color Khaki` = new `Color(240, 230, 140)`
The color Khaki.
- static readonly `Color Lavender` = new `Color(230, 230, 250)`
The color Lavender.
- static readonly `Color LavenderBlush` = new `Color(255, 240, 245)`
The color LavenderBlush.
- static readonly `Color LawnGreen` = new `Color(124, 252, 0)`
The color LawnGreen.
- static readonly `Color LemonChiffon` = new `Color(255, 250, 205)`
The color LemonChiffon.
- static readonly `Color LightBlue` = new `Color(173, 216, 230)`
The color LightBlue.
- static readonly `Color LightCoral` = new `Color(240, 128, 128)`
The color LightCoral.
- static readonly `Color LightCyan` = new `Color(224, 255, 255)`
The color LightCyan.
- static readonly `Color LightGoldenrodYellow` = new `Color(250, 250, 210)`
The color LightGoldenrodYellow.
- static readonly `Color LightGray` = new `Color(211, 211, 211)`
The color LightGray.
- static readonly `Color LightGreen` = new `Color(144, 238, 144)`
The color LightGreen.
- static readonly `Color LightPink` = new `Color(255, 182, 193)`
The color LightPink.
- static readonly `Color LightSalmon` = new `Color(255, 160, 122)`
The color LightSalmon.
- static readonly `Color LightSeaGreen` = new `Color(32, 178, 170)`
The color LightSeaGreen.
- static readonly `Color LightSkyBlue` = new `Color(135, 206, 250)`
The color LightSkyBlue.
- static readonly `Color LightSlateGray` = new `Color(119, 136, 153)`
The color LightSlateGray.
- static readonly `Color LightSteelBlue` = new `Color(176, 196, 222)`
The color LightSteelBlue.
- static readonly `Color LightYellow` = new `Color(255, 255, 224)`

- static readonly `Color Lime` = new `Color(0, 255, 0)`
The color Lime.
- static readonly `Color LimeGreen` = new `Color(50, 205, 50)`
The color LimeGreen.
- static readonly `Color Linen` = new `Color(250, 240, 230)`
The color Linen.
- static readonly `Color Magenta` = new `Color(255, 0, 255)`
The color Magenta.
- static readonly `Color Maroon` = new `Color(128, 0, 0)`
The color Maroon.
- static readonly `Color MediumAquamarine` = new `Color(102, 205, 170)`
The color MediumAquamarine.
- static readonly `Color MediumBlue` = new `Color(0, 0, 205)`
The color MediumBlue.
- static readonly `Color MediumOrchid` = new `Color(186, 85, 211)`
The color MediumOrchid.
- static readonly `Color MediumPurple` = new `Color(147, 112, 219)`
The color MediumPurple.
- static readonly `Color MediumSeaGreen` = new `Color(60, 179, 113)`
The color MediumSeaGreen.
- static readonly `Color MediumSlateBlue` = new `Color(123, 104, 238)`
The color MediumSlateBlue.
- static readonly `Color MediumSpringGreen` = new `Color(0, 250, 154)`
The color MediumSpringGreen.
- static readonly `Color MediumTurquoise` = new `Color(72, 209, 204)`
The color MediumTurquoise.
- static readonly `Color MediumVioletRed` = new `Color(199, 21, 133)`
The color MediumVioletRed.
- static readonly `Color MidnightBlue` = new `Color(25, 25, 112)`
The color MidnightBlue.
- static readonly `Color MintCream` = new `Color(245, 255, 250)`
The color MintCream.
- static readonly `Color MistyRose` = new `Color(255, 228, 225)`
The color MistyRose.
- static readonly `Color Moccasin` = new `Color(255, 228, 181)`
The color Moccasin.
- static readonly `Color NavajoWhite` = new `Color(255, 222, 173)`
The color NavajoWhite.
- static readonly `Color Navy` = new `Color(0, 0, 128)`
The color Navy.
- static readonly `Color OldLace` = new `Color(253, 245, 230)`
The color OldLace.
- static readonly `Color Olive` = new `Color(128, 128, 0)`
The color Olive.
- static readonly `Color OliveDrab` = new `Color(107, 142, 35)`
The color OliveDrab.
- static readonly `Color Orange` = new `Color(255, 165, 0)`
The color Orange.
- static readonly `Color OrangeRed` = new `Color(255, 69, 0)`
The color OrangeRed.

- static readonly `Color Orchid` = new `Color`(218, 112, 214)
The color Orchid.
- static readonly `Color PaleGoldenrod` = new `Color`(238, 232, 170)
The color PaleGoldenrod.
- static readonly `Color PaleGreen` = new `Color`(152, 251, 152)
The color PaleGreen.
- static readonly `Color PaleTurquoise` = new `Color`(175, 238, 238)
The color PaleTurquoise.
- static readonly `Color PaleVioletRed` = new `Color`(219, 112, 147)
The color PaleVioletRed.
- static readonly `Color PapayaWhip` = new `Color`(225, 239, 213)
The color PapayaWhip.
- static readonly `Color PeachPuff` = new `Color`(255, 218, 185)
The color PeachPuff.
- static readonly `Color Peru` = new `Color`(205, 133, 63)
The color Peru.
- static readonly `Color Pink` = new `Color`(255, 192, 203)
The color Pink.
- static readonly `Color Plum` = new `Color`(221, 160, 221)
The color Plum.
- static readonly `Color PowderBlue` = new `Color`(176, 224, 230)
The color PowderBlue.
- static readonly `Color Purple` = new `Color`(128, 0, 128)
The color Purple.
- static readonly `Color Red` = new `Color`(255, 0, 0)
The color Red.
- static readonly `Color RosyBrown` = new `Color`(188, 143, 143)
The color RosyBrown.
- static readonly `Color RoyalBlue` = new `Color`(65, 105, 225)
The color RoyalBlue.
- static readonly `Color SaddleBrown` = new `Color`(139, 69, 19)
The color SaddleBrown.
- static readonly `Color Salmon` = new `Color`(250, 128, 114)
The color Salmon.
- static readonly `Color SandyBrown` = new `Color`(244, 164, 96)
The color SandyBrown.
- static readonly `Color SeaGreen` = new `Color`(46, 139, 87)
The color SeaGreen.
- static readonly `Color SeaShell` = new `Color`(255, 245, 238)
The color SeaShell.
- static readonly `Color Sienna` = new `Color`(160, 82, 45)
The color Sienna.
- static readonly `Color Silver` = new `Color`(192, 192, 192)
The color Silver.
- static readonly `Color SkyBlue` = new `Color`(135, 206, 235)
The color SkyBlue.
- static readonly `Color SlateBlue` = new `Color`(106, 90, 205)
The color SlateBlue.
- static readonly `Color SlateGray` = new `Color`(112, 128, 144)
The color SlateGray.
- static readonly `Color Snow` = new `Color`(255, 250, 250)

- static readonly Color **Snow** = new Color(0, 255, 127)

The color Snow.
- static readonly Color **SpringGreen** = new Color(0, 255, 127)

The color SpringGreen.
- static readonly Color **SteelBlue** = new Color(70, 130, 180)

The color SteelBlue.
- static readonly Color **Tan** = new Color(210, 180, 140)

The color Tan.
- static readonly Color **Teal** = new Color(0, 128, 128)

The color Teal.
- static readonly Color **Thistle** = new Color(216, 191, 216)

The color Thistle.
- static readonly Color **Tomato** = new Color(255, 99, 71)

The color Tomato.
- static readonly Color **TransparentBlack** = new Color(0, 0, 0)

Transparent black color.
- static readonly Color **TransparentWhite** = new Color(255, 255, 255, 0)

Transparent white color.
- static readonly Color **Turquoise** = new Color(64, 224, 208)

The color Turquoise.
- static readonly Color **Violet** = new Color(238, 130, 238)

The color Violet.
- static readonly Color **Wheat** = new Color(245, 222, 179)

The color Wheat.
- static readonly Color **White** = new Color(255, 255, 255)

The color White.
- static readonly Color **WhiteSmoke** = new Color(245, 245, 245)

The color WhiteSmoke.
- static readonly Color **Yellow** = new Color(255, 255, 0)

The color Yellow.
- static readonly Color **YellowGreen** = new Color(154, 205, 50)

The color YellowGreen.

7.3.1 Detailed Description

Represents an RGBA color that can be used with TriEngine2D.

7.3.2 Constructor & Destructor Documentation

7.3.2.1 TriDevs.TriEngine.Color.Color (Color4 color)

Creates a new color from a Color4 color.

Parameters

<code>color</code>	The base Color4 to use, RGBA will be copied from this color.
--------------------	--

```

776 : this(color.R, color.G, color.B, color.A)
777     {
778
779 }
```

7.3.2.2 TriDevs.TriEngine.Color.Color (*Color @ base, byte a*)

Creates a new color from a base color with new alpha value.

Parameters

<i>base</i>	The base color to use, RGB will be copied from this color.
<i>a</i>	The new alpha value to assign (0-255).

```
786 : this(@base, a / 255.0f)
787 {
788
789 }
```

7.3.2.3 TriDevs.TriEngine.Color.Color (*Color @ base, float a*)

Creates a new color from a base color with new alpha value.

Parameters

<i>base</i>	The base color to use, RGB will be copied from this color.
<i>a</i>	The new alpha value to assign (0.0-1.0).

```
796 : this(@base.R, @base.G, @base.B, a)
797 {
798
799 }
```

7.3.2.4 TriDevs.TriEngine.Color.Color (*byte r, byte g, byte b, byte a = 255*)

Creates a new color with the specified red, green, blue and alpha values.

Parameters

<i>r</i>	Value of the red component (0-255).
<i>g</i>	Value of the green component (0-255).
<i>b</i>	Value of the blue component (0-255).
<i>a</i>	Alpha value (0-255) where 0 is transparent and 255 is opaque.

```
808 : this(r / 255.0f, g / 255.0f, b / 255.0f, a /
809   255.0f)
810   {
811 }
```

7.3.2.5 TriDevs.TriEngine.Color.Color (*float r, float g, float b, float a = 1.0f*)

Creates a new color with the specified red, green, blue and alpha values.

Parameters

<i>r</i>	Value of the red component (0.0-1.0).
<i>g</i>	Value of the green component (0.0-1.0).
<i>b</i>	Value of the blue component (0.0-1.0).
<i>a</i>	Alpha value (0.0-1.0) where 0.0 is transparent and 1.0 is opaque.

```
821   {
822     R = Helpers.Math.Clamp(r, 0.0f, 1.0f);
823     G = Helpers.Math.Clamp(g, 0.0f, 1.0f);
```

```

824     B = Helpers.Math.Clamp(b, 0.0f, 1.0f);
825     A = Helpers.Math.Clamp(a, 0.0f, 1.0f);
826 }

```

7.3.3 Member Function Documentation

7.3.3.1 Color4 TriDevs.TriEngine.Color.ToColor4()

Returns a Color4 representation of this color. This can be used with most OpenTK methods.

Returns

Color4 representation of this color.

```

857     {
858         return new Color4(R, G, B, A);
859     }

```

7.3.3.2 Vector3 TriDevs.TriEngine.Color.ToVector3()

Returns a Vector3 representation of this color (ommits alpha value). This can be used with most OpenTK methods.

Returns

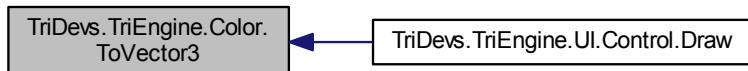
Vector3 representation of this color.

```

846     {
847         return new Vector3(R, G, B);
848     }

```

Here is the caller graph for this function:



7.3.3.3 Vector4 TriDevs.TriEngine.Color.ToVector4()

Returns a Vector4 representation of this color. This can be used with most OpenTK methods.

Returns

Vector4 representation of this color.

```

835     {
836         return new Vector4(R, G, B, A);
837     }

```

7.3.4 Member Data Documentation

7.3.4.1 readonly float TriDevs.TriEngine.Color.A

The color's alpha value.

7.3.4.2 **readonly Color TriDevs.TriEngine.Color.AliceBlue = new Color(240, 248, 255) [static]**

The color AliceBlue.

7.3.4.3 **readonly Color TriDevs.TriEngine.Color.AntiqueWhite = new Color(250, 235, 215) [static]**

The color AntiqueWhite.

7.3.4.4 **readonly Color TriDevs.TriEngine.Color.Aqua = new Color(0, 255, 255) [static]**

The color Aqua.

7.3.4.5 **readonly Color TriDevs.TriEngine.Color.Aquamarine = new Color(127, 255, 212) [static]**

The color Aquamarine.

7.3.4.6 **readonly Color TriDevs.TriEngine.Color.Azure = new Color(240, 255, 255) [static]**

The color Azure.

7.3.4.7 **readonly float TriDevs.TriEngine.Color.B**

The blue component of the color.

7.3.4.8 **readonly Color TriDevs.TriEngine.Color.Beige = new Color(245, 245, 220) [static]**

The color Beige.

7.3.4.9 **readonly Color TriDevs.TriEngine.Color.Bisque = new Color(255, 228, 196) [static]**

The color Bisque.

7.3.4.10 **readonly Color TriDevs.TriEngine.Color.Black = new Color(0, 0, 0) [static]**

The color Black.

7.3.4.11 **readonly Color TriDevs.TriEngine.Color.BlanchedAlmond = new Color(255, 235, 205) [static]**

The color BlanchedAlmond.

7.3.4.12 **readonly Color TriDevs.TriEngine.Color.Blue = new Color(0, 0, 255) [static]**

The color Blue.

7.3.4.13 **readonly Color TriDevs.TriEngine.Color.BlueViolet = new Color(138, 43, 226) [static]**

The color BlueViolet.

7.3.4.14 **readonly Color TriDevs.TriEngine.Color.Brown = new Color(165, 42, 42)** [static]

The color Brown.

7.3.4.15 **readonly Color TriDevs.TriEngine.Color.BurlyWood = new Color(222, 184, 135)** [static]

The color BurlyWood.

7.3.4.16 **readonly Color TriDevs.TriEngine.Color.CadetBlue = new Color(95, 158, 160)** [static]

The color CadetBlue.

7.3.4.17 **readonly Color TriDevs.TriEngine.Color.Chartreuse = new Color(127, 255, 0)** [static]

The color Chartreuse.

7.3.4.18 **readonly Color TriDevs.TriEngine.Color.Chocolate = new Color(210, 105, 30)** [static]

The color Chocolate.

7.3.4.19 **readonly Color TriDevs.TriEngine.Color.Coral = new Color(255, 127, 80)** [static]

The color Coral.

7.3.4.20 **readonly Color TriDevs.TriEngine.Color.CornflowerBlue = new Color(100, 149, 237)** [static]

The color CornflowerBlue.

7.3.4.21 **readonly Color TriDevs.TriEngine.Color.Cornsilk = new Color(255, 248, 220)** [static]

The color Cornsilk.

7.3.4.22 **readonly Color TriDevs.TriEngine.Color.Crimson = new Color(220, 20, 60)** [static]

The color Crimson.

7.3.4.23 **readonly Color TriDevs.TriEngine.Color.Cyan = new Color(0, 255, 255)** [static]

The color Cyan.

7.3.4.24 **readonly Color TriDevs.TriEngine.Color.DarkBlue = new Color(0, 0, 139)** [static]

The color DarkBlue.

7.3.4.25 **readonly Color TriDevs.TriEngine.Color.DarkCyan = new Color(0, 139, 139)** [static]

The color DarkCyan.

7.3.4.26 **readonly Color TriDevs.TriEngine.Color.DarkGoldenrod = new Color(184, 134, 11) [static]**

The color DarkGoldenrod.

7.3.4.27 **readonly Color TriDevs.TriEngine.Color.DarkGray = new Color(169, 169, 169) [static]**

The color DarkGray.

7.3.4.28 **readonly Color TriDevs.TriEngine.Color.DarkGreen = new Color(0, 100, 0) [static]**

The color DarkGreen.

7.3.4.29 **readonly Color TriDevs.TriEngine.Color.DarkKhaki = new Color(189, 183, 107) [static]**

The color DarkKhaki.

7.3.4.30 **readonly Color TriDevs.TriEngine.Color.DarkMagenta = new Color(139, 0, 139) [static]**

The color DarkMagenta.

7.3.4.31 **readonly Color TriDevs.TriEngine.Color.DarkOliveGreen = new Color(85, 107, 47) [static]**

The color DarkOliveGreen.

7.3.4.32 **readonly Color TriDevs.TriEngine.Color.DarkOrange = new Color(255, 140, 0) [static]**

The color DarkOrange.

7.3.4.33 **readonly Color TriDevs.TriEngine.Color.DarkOrchid = new Color(153, 50, 204) [static]**

The color DarkOrchid.

7.3.4.34 **readonly Color TriDevs.TriEngine.Color.DarkRed = new Color(139, 0, 0) [static]**

The color DarkRed.

7.3.4.35 **readonly Color TriDevs.TriEngine.Color.DarkSalmon = new Color(233, 150, 122) [static]**

The color DarkSalmon.

7.3.4.36 **readonly Color TriDevs.TriEngine.Color.DarkSeaGreen = new Color(143, 188, 139) [static]**

The color DarkSeaGreen.

7.3.4.37 **readonly Color TriDevs.TriEngine.Color.DarkSlateBlue = new Color(72, 61, 139) [static]**

The color DarkSlateBlue.

7.3.4.38 **readonly Color TriDevs.TriEngine.Color.DarkSlateGray = new Color(47, 79, 79)** [static]

The color DarkSlateGray.

7.3.4.39 **readonly Color TriDevs.TriEngine.Color.DarkTurquoise = new Color(0, 206, 209)** [static]

The color DarkTurquoise.

7.3.4.40 **readonly Color TriDevs.TriEngine.Color.DarkViolet = new Color(148, 0, 211)** [static]

The color DarkViolet.

7.3.4.41 **readonly Color TriDevs.TriEngine.Color.DeepPink = new Color(255, 20, 147)** [static]

The color DeepPink.

7.3.4.42 **readonly Color TriDevs.TriEngine.Color.DeepSkyBlue = new Color(0, 191, 255)** [static]

The color DeepSkyBlue.

7.3.4.43 **readonly Color TriDevs.TriEngine.Color.DimGray = new Color(105, 105, 105)** [static]

The color DimGray.

7.3.4.44 **readonly Color TriDevs.TriEngine.Color.DodgerBlue = new Color(30, 144, 255)** [static]

The color DodgerBlue.

7.3.4.45 **readonly Color TriDevs.TriEngine.Color.Firebrick = new Color(178, 34, 34)** [static]

The color Firebrick.

7.3.4.46 **readonly Color TriDevs.TriEngine.Color.FloralWhite = new Color(255, 250, 240)** [static]

The color FloralWhite.

7.3.4.47 **readonly Color TriDevs.TriEngine.Color.ForestGreen = new Color(34, 139, 34)** [static]

The color ForestGreen.

7.3.4.48 **readonly Color TriDevs.TriEngine.Color.Fuchsia = new Color(255, 0, 255)** [static]

The color Fuchsia.

7.3.4.49 **readonly float TriDevs.TriEngine.Color.G**

The green component of the color.

7.3.4.50 **readonly Color TriDevs.TriEngine.Color.Gainsboro = new Color(220, 220, 220)** [static]

The color Gainsboro.

7.3.4.51 **readonly Color TriDevs.TriEngine.Color.GhostWhite = new Color(248, 248, 255)** [static]

The color GhostWhite.

7.3.4.52 **readonly Color TriDevs.TriEngine.Color.Gold = new Color(255, 215, 0)** [static]

The color Gold.

7.3.4.53 **readonly Color TriDevs.TriEngine.Color.Goldenrod = new Color(218, 165, 32)** [static]

The color Goldenrod.

7.3.4.54 **readonly Color TriDevs.TriEngine.Color.Gray = new Color(128, 128, 128)** [static]

The color Gray.

7.3.4.55 **readonly Color TriDevs.TriEngine.Color.Green = new Color(0, 128, 0)** [static]

The color Green.

7.3.4.56 **readonly Color TriDevs.TriEngine.Color.GreenYellow = new Color(173, 255, 47)** [static]

The color GreenYellow.

7.3.4.57 **readonly Color TriDevs.TriEngine.Color.HoneyDew = new Color(240, 255, 240)** [static]

The color HoneyDew.

7.3.4.58 **readonly Color TriDevs.TriEngine.Color.HotPink = new Color(255, 105, 180)** [static]

The color HotPink.

7.3.4.59 **readonly Color TriDevs.TriEngine.Color.IndianRed = new Color(205, 92, 92)** [static]

The color IndianRed.

7.3.4.60 **readonly Color TriDevs.TriEngine.Color.Indigo = new Color(75, 0, 130)** [static]

The color Indigo.

7.3.4.61 **readonly Color TriDevs.TriEngine.Color.Ivory = new Color(255, 255, 240)** [static]

The color Ivory.

7.3.4.62 **readonly Color TriDevs.TriEngine.Color.Khaki = new Color(240, 230, 140) [static]**

The color Khaki.

7.3.4.63 **readonly Color TriDevs.TriEngine.Color.Lavender = new Color(230, 230, 250) [static]**

The color Lavender.

7.3.4.64 **readonly Color TriDevs.TriEngine.Color.LavenderBlush = new Color(255, 240, 245) [static]**

The color LavenderBlush.

7.3.4.65 **readonly Color TriDevs.TriEngine.Color.LawnGreen = new Color(124, 252, 0) [static]**

The color LawnGreen.

7.3.4.66 **readonly Color TriDevs.TriEngine.Color.LemonChiffon = new Color(255, 250, 205) [static]**

The color LemonChiffon.

7.3.4.67 **readonly Color TriDevs.TriEngine.Color.LightBlue = new Color(173, 216, 230) [static]**

The color LightBlue.

7.3.4.68 **readonly Color TriDevs.TriEngine.Color.LightCoral = new Color(240, 128, 128) [static]**

The color LightCoral.

7.3.4.69 **readonly Color TriDevs.TriEngine.Color.LightCyan = new Color(224, 255, 255) [static]**

The color LightCyan.

7.3.4.70 **readonly Color TriDevs.TriEngine.Color.LightGoldenrodYellow = new Color(250, 250, 210) [static]**

The color LightGoldenrodYellow.

7.3.4.71 **readonly Color TriDevs.TriEngine.Color.LightGray = new Color(211, 211, 211) [static]**

The color LightGray.

7.3.4.72 **readonly Color TriDevs.TriEngine.Color.LightGreen = new Color(144, 238, 144) [static]**

The color LightGreen.

7.3.4.73 **readonly Color TriDevs.TriEngine.Color.LightPink = new Color(255, 182, 193) [static]**

The color LightPink.

7.3.4.74 **readonly Color TriDevs.TriEngine.Color.LightSalmon = new Color(255, 160, 122) [static]**

The color LightSalmon.

7.3.4.75 **readonly Color TriDevs.TriEngine.Color.LightSeaGreen = new Color(32, 178, 170) [static]**

The color LightSeaGreen.

7.3.4.76 **readonly Color TriDevs.TriEngine.Color.LightSkyBlue = new Color(135, 206, 250) [static]**

The color LightSkyBlue.

7.3.4.77 **readonly Color TriDevs.TriEngine.Color.LightSlateGray = new Color(119, 136, 153) [static]**

The color LightSlateGray.

7.3.4.78 **readonly Color TriDevs.TriEngine.Color.LightSteelBlue = new Color(176, 196, 222) [static]**

The color LightSteelBlue.

7.3.4.79 **readonly Color TriDevs.TriEngine.Color.LightYellow = new Color(255, 255, 224) [static]**

The color LightYellow.

7.3.4.80 **readonly Color TriDevs.TriEngine.Color.Lime = new Color(0, 255, 0) [static]**

The color Lime.

7.3.4.81 **readonly Color TriDevs.TriEngine.Color.LimeGreen = new Color(50, 205, 50) [static]**

The color LimeGreen.

7.3.4.82 **readonly Color TriDevs.TriEngine.Color.Linen = new Color(250, 240, 230) [static]**

The color Linen.

7.3.4.83 **readonly Color TriDevs.TriEngine.Color.Magenta = new Color(255, 0, 255) [static]**

The color Magenta.

7.3.4.84 **readonly Color TriDevs.TriEngine.Color.Maroon = new Color(128, 0, 0) [static]**

The color Maroon.

7.3.4.85 **readonly Color TriDevs.TriEngine.Color.MediumAquamarine = new Color(102, 205, 170) [static]**

The color MediumAquamarine.

7.3.4.86 **readonly Color TriDevs.TriEngine.Color.MediumBlue = new Color(0, 0, 205) [static]**

The color MediumBlue.

7.3.4.87 **readonly Color TriDevs.TriEngine.Color.MediumOrchid = new Color(186, 85, 211) [static]**

The color MediumOrchid.

7.3.4.88 **readonly Color TriDevs.TriEngine.Color.MediumPurple = new Color(147, 112, 219) [static]**

The color MediumPurple.

7.3.4.89 **readonly Color TriDevs.TriEngine.Color.MediumSeaGreen = new Color(60, 179, 113) [static]**

The color MediumSeaGreen.

7.3.4.90 **readonly Color TriDevs.TriEngine.Color.MediumSlateBlue = new Color(123, 104, 238) [static]**

The color MediumSlateBlue.

7.3.4.91 **readonly Color TriDevs.TriEngine.Color.MediumSpringGreen = new Color(0, 250, 154) [static]**

The color MediumSpringGreen.

7.3.4.92 **readonly Color TriDevs.TriEngine.Color.MediumTurquoise = new Color(72, 209, 204) [static]**

The color MediumTurquoise.

7.3.4.93 **readonly Color TriDevs.TriEngine.Color.MediumVioletRed = new Color(199, 21, 133) [static]**

The color MediumVioletRed.

7.3.4.94 **readonly Color TriDevs.TriEngine.Color.MidnightBlue = new Color(25, 25, 112) [static]**

The color MidnightBlue.

7.3.4.95 **readonly Color TriDevs.TriEngine.Color.MintCream = new Color(245, 255, 250) [static]**

The color MintCream.

7.3.4.96 **readonly Color TriDevs.TriEngine.Color.MistyRose = new Color(255, 228, 225) [static]**

The color MistyRose.

7.3.4.97 **readonly Color TriDevs.TriEngine.Color.Moccasin = new Color(255, 228, 181) [static]**

The color Moccasin.

7.3.4.98 **readonly Color TriDevs.TriEngine.Color.NavajoWhite = new Color(255, 222, 173)** [static]

The color NavajoWhite.

7.3.4.99 **readonly Color TriDevs.TriEngine.Color.Navy = new Color(0, 0, 128)** [static]

The color Navy.

7.3.4.100 **readonly Color TriDevs.TriEngine.Color.OldLace = new Color(253, 245, 230)** [static]

The color OldLace.

7.3.4.101 **readonly Color TriDevs.TriEngine.Color.Olive = new Color(128, 128, 0)** [static]

The color Olive.

7.3.4.102 **readonly Color TriDevs.TriEngine.Color.OliveDrab = new Color(107, 142, 35)** [static]

The color OliveDrab.

7.3.4.103 **readonly Color TriDevs.TriEngine.Color.Orange = new Color(255, 165, 0)** [static]

The color Orange.

7.3.4.104 **readonly Color TriDevs.TriEngine.Color.OrangeRed = new Color(255, 69, 0)** [static]

The color OrangeRed.

7.3.4.105 **readonly Color TriDevs.TriEngine.Color.Orchid = new Color(218, 112, 214)** [static]

The color Orchid.

7.3.4.106 **readonly Color TriDevs.TriEngine.Color.PaleGoldenrod = new Color(238, 232, 170)** [static]

The color PaleGoldenrod.

7.3.4.107 **readonly Color TriDevs.TriEngine.Color.PaleGreen = new Color(152, 251, 152)** [static]

The color PaleGreen.

7.3.4.108 **readonly Color TriDevs.TriEngine.Color.PaleTurquoise = new Color(175, 238, 238)** [static]

The color PaleTurquoise.

7.3.4.109 **readonly Color TriDevs.TriEngine.Color.PaleVioletRed = new Color(219, 112, 147)** [static]

The color PaleVioletRed.

7.3.4.110 **readonly Color TriDevs.TriEngine.Color.PapayaWhip = new Color(225, 239, 213)** [static]

The color PapayaWhip.

7.3.4.111 **readonly Color TriDevs.TriEngine.Color.PeachPuff = new Color(255, 218, 185)** [static]

The color PeachPuff.

7.3.4.112 **readonly Color TriDevs.TriEngine.Color.Peru = new Color(205, 133, 63)** [static]

The color Peru.

7.3.4.113 **readonly Color TriDevs.TriEngine.Color.Pink = new Color(255, 192, 203)** [static]

The color Pink.

7.3.4.114 **readonly Color TriDevs.TriEngine.Color.Plum = new Color(221, 160, 221)** [static]

The color Plum.

7.3.4.115 **readonly Color TriDevs.TriEngine.Color.PowderBlue = new Color(176, 224, 230)** [static]

The color PowderBlue.

7.3.4.116 **readonly Color TriDevs.TriEngine.Color.Purple = new Color(128, 0, 128)** [static]

The color Purple.

7.3.4.117 **readonly float TriDevs.TriEngine.Color.R**

The red component of the color.

7.3.4.118 **readonly Color TriDevs.TriEngine.Color.Red = new Color(255, 0, 0)** [static]

The color Red.

7.3.4.119 **readonly Color TriDevs.TriEngine.Color.RosyBrown = new Color(188, 143, 143)** [static]

The color RosyBrown.

7.3.4.120 **readonly Color TriDevs.TriEngine.Color.RoyalBlue = new Color(65, 105, 225)** [static]

The color RoyalBlue.

7.3.4.121 **readonly Color TriDevs.TriEngine.Color.SaddleBrown = new Color(139, 69, 19)** [static]

The color SaddleBrown.

7.3.4.122 readonly Color TriDevs.TriEngine.Color.Salmon = new Color(250, 128, 114) [static]

The color Salmon.

7.3.4.123 readonly Color TriDevs.TriEngine.Color.SandyBrown = new Color(244, 164, 96) [static]

The color SandyBrown.

7.3.4.124 readonly Color TriDevs.TriEngine.Color.SeaGreen = new Color(46, 139, 87) [static]

The color SeaGreen.

7.3.4.125 readonly Color TriDevs.TriEngine.Color.SeaShell = new Color(255, 245, 238) [static]

The color SeaShell.

7.3.4.126 readonly Color TriDevs.TriEngine.Color.Sienna = new Color(160, 82, 45) [static]

The color Sienna.

7.3.4.127 readonly Color TriDevs.TriEngine.Color.Silver = new Color(192, 192, 192) [static]

The color Silver.

7.3.4.128 readonly Color TriDevs.TriEngine.Color.SkyBlue = new Color(135, 206, 235) [static]

The color SkyBlue.

7.3.4.129 readonly Color TriDevs.TriEngine.Color.SlateBlue = new Color(106, 90, 205) [static]

The color SlateBlue.

7.3.4.130 readonly Color TriDevs.TriEngine.Color.SlateGray = new Color(112, 128, 144) [static]

The color SlateGray.

7.3.4.131 readonly Color TriDevs.TriEngine.Color.Snow = new Color(255, 250, 250) [static]

The color Snow.

7.3.4.132 readonly Color TriDevs.TriEngine.Color.SpringGreen = new Color(0, 255, 127) [static]

The color SpringGreen.

7.3.4.133 readonly Color TriDevs.TriEngine.Color.SteelBlue = new Color(70, 130, 180) [static]

The color SteelBlue.

7.3.4.134 **readonly Color TriDevs.TriEngine.Color.Tan = new Color(210, 180, 140)** [static]

The color Tan.

7.3.4.135 **readonly Color TriDevs.TriEngine.Color.Teal = new Color(0, 128, 128)** [static]

The color Teal.

7.3.4.136 **readonly Color TriDevs.TriEngine.Color.Thistle = new Color(216, 191, 216)** [static]

The color Thistle.

7.3.4.137 **readonly Color TriDevs.TriEngine.Color.Tomato = new Color(255, 99, 71)** [static]

The color Tomato.

7.3.4.138 **readonly Color TriDevs.TriEngine.Color.TransparentBlack = new Color(0, 0, 0)** [static]

Transparent black color.

7.3.4.139 **readonly Color TriDevs.TriEngine.Color.TransparentWhite = new Color(255, 255, 255, 0)** [static]

Transparent white color.

7.3.4.140 **readonly Color TriDevs.TriEngine.Color.Turquoise = new Color(64, 224, 208)** [static]

The color Turquoise.

7.3.4.141 **readonly Color TriDevs.TriEngine.Color.Violet = new Color(238, 130, 238)** [static]

The color Violet.

7.3.4.142 **readonly Color TriDevs.TriEngine.Color.Wheat = new Color(245, 222, 179)** [static]

The color Wheat.

7.3.4.143 **readonly Color TriDevs.TriEngine.Color.White = new Color(255, 255, 255)** [static]

The color White.

7.3.4.144 **readonly Color TriDevs.TriEngine.Color.WhiteSmoke = new Color(245, 245, 245)** [static]

The color WhiteSmoke.

7.3.4.145 **readonly Color TriDevs.TriEngine.Color.Yellow = new Color(255, 255, 0)** [static]

The color Yellow.

```
7.3.4.146 readonly Color TriDevs.TriEngine.Color.YellowGreen = new Color(154, 205, 50) [static]
```

The color YellowGreen.

The documentation for this struct was generated from the following file:

- [TriDevs.TriEngine/Color.cs](#)

7.4 TriDevs.TriEngine.Tests.ColorTests Class Reference

Public Member Functions

- [void ShouldCreateColorWithAlpha \(\)](#)
- [void ShouldMakeByteColorIntoWhite \(\)](#)
- [void ShouldConvertToVector3 \(\)](#)
- [void ShouldConvertToVector4 \(\)](#)
- [void ShouldConvertToColor4 \(\)](#)
- [void ShouldReturnValidArgbValue \(\)](#)

7.4.1 Member Function Documentation

7.4.1.1 void TriDevs.TriEngine.Tests.ColorTests.ShouldConvertToColor4 ()

```
51      {
52          var color = new Color(0.1f, 0.2f, 0.3f, 0.4f);
53          var color4 = color.ToColor4();
54          Assert.AreEqual(color.R, color4.R, "Red component mismatch!");
55          Assert.AreEqual(color.G, color4.G, "Green component mismatch!");
56          Assert.AreEqual(color.B, color4.B, "Blue component mismatch!");
57          Assert.AreEqual(color.A, color4.A, "Alpha component mismatch!");
58      }
```

7.4.1.2 void TriDevs.TriEngine.Tests.ColorTests.ShouldConvertToVector3 ()

```
30      {
31          var color = new Color(0.1f, 0.2f, 0.3f);
32          var vector = color.ToVector3();
33          Assert.AreEqual(vector.X, color.R);
34          Assert.AreEqual(vector.Y, color.G);
35          Assert.AreEqual(vector.Z, color.B);
36      }
```

7.4.1.3 void TriDevs.TriEngine.Tests.ColorTests.ShouldConvertToVector4 ()

```
40      {
41          var color = new Color(0.1f, 0.2f, 0.3f, 0.4f);
42          var vector = color.ToVector4();
43          Assert.AreEqual(vector.X, color.R);
44          Assert.AreEqual(vector.Y, color.G);
45          Assert.AreEqual(vector.Z, color.B);
46          Assert.AreEqual(vector.W, color.A);
47      }
```

7.4.1.4 void TriDevs.TriEngine.Tests.ColorTests.ShouldCreateColorWithAlpha ()

```
10      {
11          var color = new Color(0.1f, 0.2f, 0.3f, 0.4f);
12          Assert.AreEqual(color.R, 0.1f);
13          Assert.AreEqual(color.G, 0.2f);
14          Assert.AreEqual(color.B, 0.3f);
15          Assert.AreEqual(color.A, 0.4f);
16      }
```

7.4.1.5 void TriDevs.TriEngine.Tests.ColorTests.ShouldMakeByteColorIntoWhite()

```
20      {
21          var color = new Color(255, 255, 255);
22          Assert.AreEqual(color.R, 1.0f);
23          Assert.AreEqual(color.G, 1.0f);
24          Assert.AreEqual(color.B, 1.0f);
25          Assert.AreEqual(color.A, 1.0f);
26      }
```

7.4.1.6 void TriDevs.TriEngine.Tests.ColorTests.ShouldReturnValidArgbValue()

```
62      {
63          var color = new Color(0.1f, 0.2f, 0.3f, 0.4f);
64          var color4 = color.ToColor4();
65          var argb = color4.ToArgb();
66          var expected =
67              (uint) (color4.A * byte.MaxValue) << 24 |
68              (uint) (color4.R * byte.MaxValue) << 16 |
69              (uint) (color4.G * byte.MaxValue) << 8 |
70              (uint) (color4.B * byte.MaxValue);
71          Assert.AreEqual(unchecked((int) expected), argb);
72      }
```

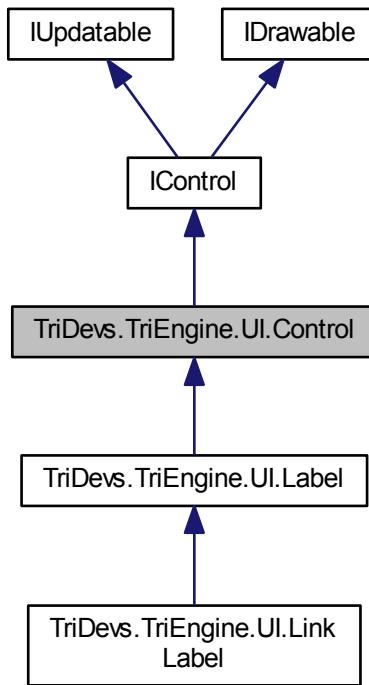
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine.Tests/ColorTests.cs](#)

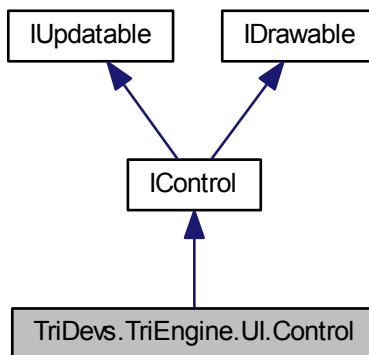
7.5 TriDevs.TriEngine.UI.Control Class Reference

Base control class that all other controls inherits from. Defines basic [UI](#) control behaviour.

Inheritance diagram for TriDevs.TriEngine.UI.Control:



Collaboration diagram for TriDevs.TriEngine.UI.Control:



Public Member Functions

- virtual void [Enable \(\)](#)

- virtual void **Disable** ()
Disables the control.
- virtual void **Show** ()
Shows the control.
- virtual void **Hide** ()
Hides the control.
- virtual void **Update** ()
Updates the object.
- virtual void **Draw** ()
Draw the object to screen.

Protected Member Functions

- virtual void **OnClicked** ()
- virtual void **Draw** (Point< int > position)

Properties

- virtual bool **Enabled** [get, set]
- virtual bool **Visible** [get, set]
- virtual **Color Color** [get, set]
- virtual Point< int > **Position** [get, set]
- virtual Point< int > **Size** [get, set]
- virtual **Rectangle Rectangle** [get, set]
- virtual string **Text** [get, set]

Events

- ControlClickedEventHandler **Clicked**
Raised when this control is clicked on by the user.

7.5.1 Detailed Description

Base control class that all other controls inherits from. Defines basic **UI** control behaviour.

7.5.2 Member Function Documentation

7.5.2.1 virtual void TriDevs.TriEngine.UI.Control.Disable () [virtual]

Disables the control.

Implements [TriDevs.TriEngine.UI.IControl](#).

```
86      {
87          Enabled = false;
88      }
```

7.5.2.2 virtual void TriDevs.TriEngine.UI.Control.Draw() [virtual]

Draw the object to screen.

Implements [TriDevs.TriEngine.Interfaces.IDrawable](#).

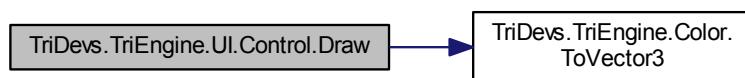
Reimplemented in [TriDevs.TriEngine.UI.Label](#).

```
116     {
117         Draw(Position);
118     }
```

7.5.2.3 virtual void TriDevs.TriEngine.UI.Control.Draw(Point< int > position) [protected], [virtual]

```
121     {
122         // Placeholder drawing,
123         // we should replace this with proper control drawing
124         GL.Disable(EnableCap.Texture2D);
125         var color = Color.ToVector3();
126         GL.Color3(color);
127         GL.Begin(BeginMode.Quads);
128         GL.Vertex2(position.X, position.Y);
129         GL.Vertex2(position.X + Size.X, position.Y);
130         GL.Vertex2(position.X + Size.X, position.Y + Size.Y);
131         GL.Vertex2(position.X, position.Y + Size.Y);
132         GL.End();
133     }
```

Here is the call graph for this function:



7.5.2.4 virtual void TriDevs.TriEngine.UI.Control.Enable() [virtual]

Enables the control.

Implements [TriDevs.TriEngine.UI.IControl](#).

```
81     {
82         Enabled = true;
83     }
```

7.5.2.5 virtual void TriDevs.TriEngine.UI.Control.Hide() [virtual]

Hides the control.

Implements [TriDevs.TriEngine.UI.IControl](#).

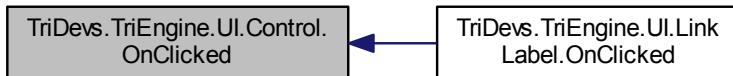
```
96     {
97         Visible = false;
98     }
```

7.5.2.6 virtual void TriDevs.TriEngine.UI.Control.OnClicked() [protected], [virtual]

Reimplemented in [TriDevs.TriEngine.UI.LinkLabel](#).

```
64     {
65         var func = Clicked;
66         if (func != null)
67             func(this, null);
68     }
```

Here is the caller graph for this function:



7.5.2.7 virtual void TriDevs.TriEngine.UI.Control.Show() [virtual]

Shows the control.

Implements [TriDevs.TriEngine.UI.IControl](#).

```
91     {
92         Visible = true;
93     }
```

7.5.2.8 virtual void TriDevs.TriEngine.UI.Control.Update() [virtual]

Updates the object.

Implements [TriDevs.TriEngine.Interfaces.IUpdatable](#).

Reimplemented in [TriDevs.TriEngine.UI.Label](#).

```
101     {
102         // Return immediately if there is no mouse click
103         // We only run the click handlers if the user has is releasing
104         // the mouse button while on a control, to mimic how most UIs
105         // handle click events.
106         if (!Services.Input.MouseReleased(MouseButton.Left))
107             return;
108
109         var mousePos = Services.Input.MousePosition;
110         if ((mousePos.X >= Rectangle.X && mousePos.X <= (Rectangle.
111             X + Rectangle.Width))
112             && (mousePos.Y >= Rectangle.Y && mousePos.Y <= (
113                 Rectangle.Y + Rectangle.Height)))
114             OnClicked();
115     }
```

7.5.3 Property Documentation

7.5.3.1 virtual Color TriDevs.TriEngine.UI.Control.Color [get], [set]

7.5.3.2 virtual bool TriDevs.TriEngine.UI.Control.Enabled [get], [set]

7.5.3.3 virtual Point<int> TriDevs.TriEngine.UI.Control.Position [get], [set]

7.5.3.4 virtual Rectangle TriDevs.TriEngine.UI.Control.Rectangle [get], [set]

7.5.3.5 virtual Point<int> TriDevs.TriEngine.UI.Control.Size [get], [set]

7.5.3.6 virtual string TriDevs.TriEngine.UI.Control.Text [get], [set]

7.5.3.7 virtual bool TriDevs.TriEngine.UI.Control.Visible [get], [set]

7.5.4 Event Documentation

7.5.4.1 ControlClickedEventHandler TriDevs.TriEngine.UI.Control.Clicked

Raised when this control is clicked on by the user.

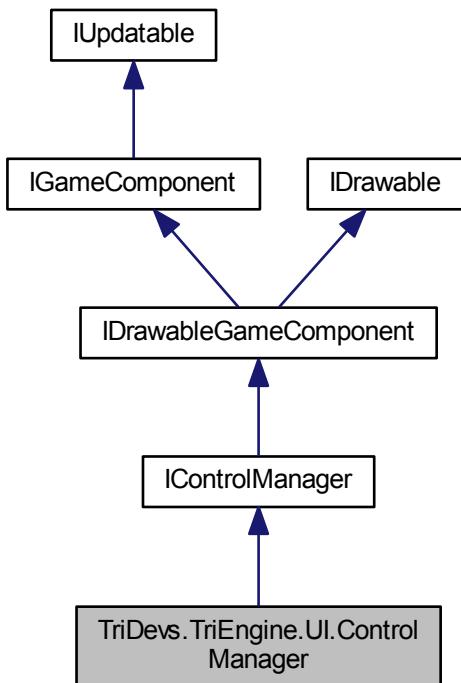
The documentation for this class was generated from the following file:

- TriDevs.TriEngine/UI/[Control.cs](#)

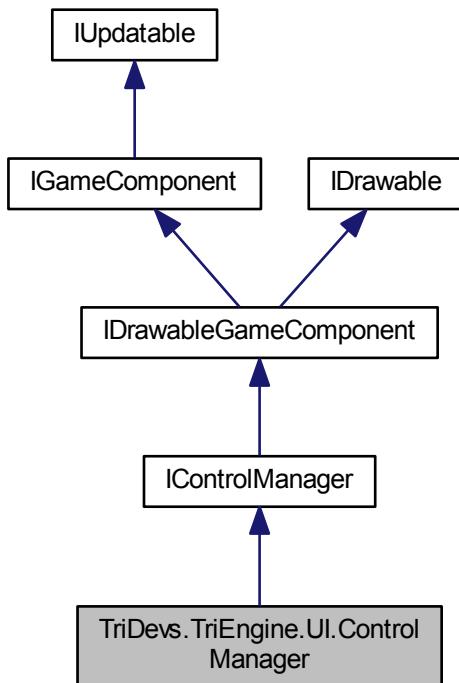
7.6 TriDevs.TriEngine.UI.ControlManager Class Reference

[Control](#) manager to manage various [UI](#) controls for a game.

Inheritance diagram for TriDevs.TriEngine.UI.ControlManager:



Collaboration diagram for TriDevs.TriEngine.UI.ControlManager:



Public Member Functions

- [ControlManager \(\)](#)
Initializes a new instance of this control manager.
- void [Enable \(\)](#)
Enables this game component.
- void [Disable \(\)](#)
Disables this game component.
- void [Update \(\)](#)
Updates the object.
- void [Draw \(\)](#)
Draw the object to screen.
- [IControl AddControl \(IControl control\)](#)
Adds a new control to this control manager.
- void [RemoveControl \(IControl control\)](#)
Removes a control from this control manager.
- void [RemoveAllControls \(Type type\)](#)
Removes all controls of a specific type from this control manager.
- void [RemoveAllControls \(Func< IControl, bool > func\)](#)
Removes all controls matching the supplied predicate function.
- bool [HasControl \(IControl control\)](#)
Returns whether this control manager contains the specified control.

- bool [HasControl](#) (Type type)
Returns whether this control manager contains any control of the specified type.
- bool [HasControl](#) (Func< [IControl](#), bool > func)
Returns whether this control manager contains any control matching the supplied predicate function.

Properties

- bool [Enabled](#) [get, set]

7.6.1 Detailed Description

[Control](#) manager to manage various [UI](#) controls for a game.

7.6.2 Constructor & Destructor Documentation

7.6.2.1 TriDevs.TriEngine.UI.ControlManager.ControlManager()

Initializes a new instance of this control manager.

```
53     {
54         _controls = new List<IControl>();
55     }
```

7.6.3 Member Function Documentation

7.6.3.1 IControl TriDevs.TriEngine.UI.ControlManager.AddControl(IControl control)

Adds a new control to this control manager.

Parameters

<i>control</i>	The control to add.
----------------	---------------------

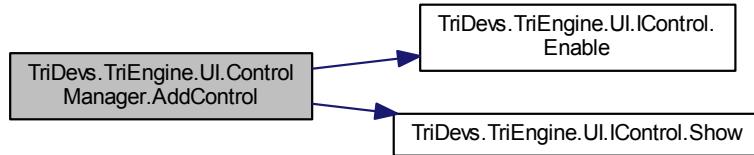
Returns

The control that was added.

Implements [TriDevs.TriEngine.UI.IControlManager](#).

```
78     {
79         if (HasControl(control))
80             throw new InvalidOperationException("Cannot add a control more than once.");
81         control.Enable();
82         _controls.Add(control);
83         control.Show();
84         return control;
85     }
```

Here is the call graph for this function:



7.6.3.2 void TrIDevs.TriEngine.UI.ControlManager.Disable ()

Disables this game component.

Implements [TrIDevs.TriEngine.Interfaces.IGameComponent](#).

```

63     {
64         Enabled = false;
65     }

```

7.6.3.3 void TrIDevs.TriEngine.UI.ControlManager.Draw ()

Draw the object to screen.

Implements [TrIDevs.TriEngine.Interfaces.IDrawable](#).

```

73     {
74         _controls.ForEach(c => c.Draw());
75     }

```

7.6.3.4 void TrIDevs.TriEngine.UI.ControlManager.Enable ()

Enables this game component.

Implements [TrIDevs.TriEngine.Interfaces.IGameComponent](#).

```

58     {
59         Enabled = true;
60     }

```

7.6.3.5 bool TrIDevs.TriEngine.UI.ControlManager.HasControl (IControl control)

Returns whether this control manager contains the specified control.

Parameters

<i>control</i>	The control to check.
----------------	-----------------------

Returns

True if the specified control exists in this control manager, false otherwise.

Implements [TriDevs.TriEngine.UI.IControlManager](#).

```
119     {
120         return HasControl(c => c == control);
121     }
```

7.6.3.6 bool TriDevs.TriEngine.UI.ControlManager.HasControl (Type type)

Returns whether this control manager contains any control of the specified type.

Parameters

<i>type</i>	The type to check.
-------------	--------------------

Returns

True if this control manager contains a control of the specified type, false otherwise.

Implements [TriDevs.TriEngine.UI.IControlManager](#).

```
124     {
125         return HasControl(c => c.GetType() == type);
126     }
```

7.6.3.7 bool TriDevs.TriEngine.UI.ControlManager.HasControl (Func< IControl, bool > func)

Returns whether this control manager contains any control matching the supplied predicate function.

Parameters

<i>func</i>	The predicate function.
-------------	-------------------------

Returns

True if this control manager contains a control matching the specified predicate, false otherwise.

Implements [TriDevs.TriEngine.UI.IControlManager](#).

```
129     {
130         return _controls.Any(func);
131     }
```

7.6.3.8 void TriDevs.TriEngine.UI.ControlManager.RemoveAllControls (Type type)

Removes all controls of a specific type from this control manager.

Parameters

<i>type</i>	The type of control to remove.
-------------	--------------------------------

Implements [TriDevs.TriEngine.UI.IControlManager](#).

```

100      {
101          RemoveAllControls(c => c.GetType() == type);
102      }

```

7.6.3.9 void TriDevs.TriEngine.UI.ControlManager.RemoveAllControls (Func< IControl, bool > func)

Removes all controls matching the supplied predicate function.

Parameters

<i>func</i>	The predicate function to use.
-------------	--------------------------------

Implements [TriDevs.TriEngine.UI.IControlManager](#).

```

105      {
106          var toRemove = _controls.Where(func);
107          var controls = toRemove as IList<IControl> ?? toRemove.ToList();
108          if (controls.Count < 0)
109              return;
110          controls.ToList().ForEach(c =>
111          {
112              c.Hide();
113              c.Disable();
114          });
115          _controls.RemoveAll(c => func(c));
116      }

```

7.6.3.10 void TriDevs.TriEngine.UI.ControlManager.RemoveControl (IControl control)

Removes a control from this control manager.

Parameters

<i>control</i>	The control to remove.
----------------	------------------------

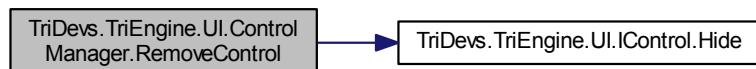
Implements [TriDevs.TriEngine.UI.IControlManager](#).

```

88      {
89          if (!HasControl(control))
90              return;
91          var match = _controls.FirstOrDefault(c => c == control);
92          if (match == null)
93              return;
94          match.Hide();
95          match.Disable();
96          _controls.Remove(match);
97      }

```

Here is the call graph for this function:



7.6.3.11 void TriDevs.TriEngine.UI.ControlManager.Update()

Updates the object.

Implements [TriDevs.TriEngine.Interfaces.IUpdatable](#).

```
68      {
69          _controls.ForEach(c => c.Update());
70      }
```

7.6.4 Property Documentation

7.6.4.1 bool TriDevs.TriEngine.UI.ControlManager.Enabled [get], [set]

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/UI/ControlManager.cs](#)

7.7 TriDevs.TriEngine.Extensions.DecimalExtensions Class Reference

[Extensions](#) for System.Decimal.

Static Public Member Functions

- static decimal [Clamp](#) (this decimal value, decimal min, decimal max)
Clamps the specified decimal between a minimum and maximum value.

7.7.1 Detailed Description

[Extensions](#) for System.Decimal.

7.7.2 Member Function Documentation

7.7.2.1 static decimal TriDevs.TriEngine.Extensions.DecimalExtensions.Clamp (this decimal value, decimal min, decimal max) [static]

Clamps the specified decimal between a minimum and maximum value.

Parameters

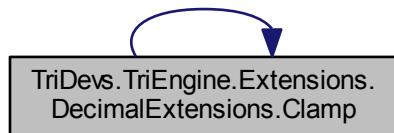
<i>value</i>	Value to clamp.
<i>min</i>	If the specified decimal is below this value, then this will be returned.
<i>max</i>	If the specified decimal is above this value, then this will be returned.

Returns

The clamped value of the decimal.

```
39      {
40          return Helpers.Math.Clamp(value, min, max);
41      }
```

Here is the call graph for this function:



Here is the caller graph for this function:



The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Extensions/DecimalExtensions.cs](#)

7.8 TriDevs.TriEngine.Extensions.DoubleExtensions Class Reference

[Extensions](#) for System.Double.

Static Public Member Functions

- static double [Clamp](#) (this double value, double min, double max)
Clamps the specified double between a minimum and maximum value.

7.8.1 Detailed Description

[Extensions](#) for System.Double.

7.8.2 Member Function Documentation

7.8.2.1 static double TriDevs.TriEngine.Extensions.DoubleExtensions.Clamp (this double *value*, double *min*, double *max*)
[static]

Clamps the specified double between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified double is below this value, then this will be returned.
<i>max</i>	If the specified double is above this value, then this will be returned.

Returns

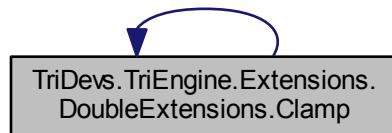
The clamped value of the double.

```
39      {
40          return Helpers.Math.Clamp(value, min, max);
41      }
```

Here is the call graph for this function:



Here is the caller graph for this function:



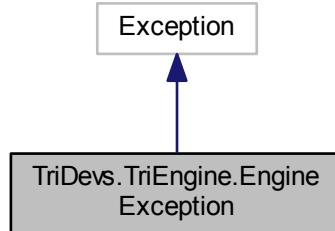
The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Extensions/DoubleExtensions.cs

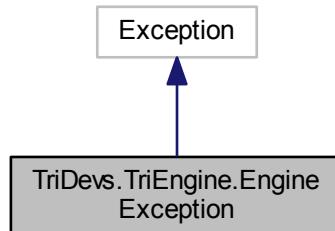
7.9 TriDevs.TriEngine.EngineException Class Reference

Base exception class for all engine-related exceptions. The inner exception will contain more info as to what actually happened.

Inheritance diagram for TriDevs.TriEngine.EngineException:



Collaboration diagram for TriDevs.TriEngine.EngineException:



7.9.1 Detailed Description

Base exception class for all engine-related exceptions. The inner exception will contain more info as to what actually happened.

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/EngineException.cs](#)

7.10 TriDevs.TriEngine.Extensions.EnumerationExtensions Class Reference

[Extensions](#) for System.Enum.

Static Public Member Functions

- static T [Include< T >](#) (this Enum value, T append)
Includes an enumerated type and returns the new value.
- static T [Remove< T >](#) (this Enum value, T remove)

- static bool `Has< T >` (this Enum value, T check)
- Checks if an enumerated type contains a value.*
- static bool `Missing< T >` (this Enum obj, T value)
- Checks if an enumerated type is missing a value.*

7.10.1 Detailed Description

[Extensions](#) for System.Enum.

7.10.2 Member Function Documentation

7.10.2.1 static bool TriDevs.TriEngine.Extensions.EnumerationExtensions.Has< T > (this Enum value, T check) [static]

Checks if an enumerated type contains a value.

Template Parameters

<code>T</code>	The enum type.
----------------	----------------

Parameters

<code>value</code>	The enum to check.
<code>check</code>	Value to check for.

Returns

True if the enum has the value(s), false otherwise.

```

148     {
149         Type type = value.GetType();
150
151         //determine the values
152         var parsed = new _Value(check, type);
153         if (parsed.Signed.HasValue) //if (parsed.Signed is long)
154         {
155             return (Convert.ToInt64(value) & (long)parsed.Signed) == (long)parsed.Signed;
156         }
157         if (parsed.Unsigned.HasValue) //if (parsed.Unsigned is ulong)
158         {
159             return (Convert.ToUInt64(value) & (ulong)parsed.Unsigned) == (ulong)parsed.Unsigned;
160         }
161         return false;
162     }

```

7.10.2.2 static T TriDevs.TriEngine.Extensions.EnumerationExtensions.Include< T > (this Enum value, T append) [static]

Includes an enumerated type and returns the new value.

Template Parameters

<code>T</code>	The enum type.
----------------	----------------

Parameters

<code>value</code>	The enum to append to.
<code>append</code>	Value to append.

Returns

New enum T with the new values.

```

94      {
95          var type = value.GetType();
96
97          //determine the values
98          object result = value;
99          var parsed = new _Value(append, type);
100         if (parsed.Signed.HasValue) //if (parsed.Signed is long)
101         {
102             result = Convert.ToInt64(value) | (long)parsed.Signed;
103         }
104         else if (parsed.Unsigned.HasValue) //else if (parsed.Unsigned is ulong)
105         {
106             result = Convert.ToUInt64(value) | (ulong)parsed.Unsigned;
107         }
108
109         //return the final value
110         return (T)Enum.Parse(type, result.ToString());
111     }

```

7.10.2.3 static bool TriDevs.TriEngine.Extensions.EnumerationExtensions.Missing< T > (this Enum *obj*, T *value*) [static]

Checks if an enumerated type is missing a value.

Template Parameters

<i>T</i>	The enum type.
----------	----------------

Parameters

<i>obj</i>	The enum to check.
<i>value</i>	Value to check for.

Returns

True if the enum is missing the value(s), false otherwise.

```

172     {
173         return !Has(obj, value);
174     }

```

7.10.2.4 static T TriDevs.TriEngine.Extensions.EnumerationExtensions.Remove< T > (this Enum *value*, T *remove*) [static]

Removes an enumerated type and returns the new value.

Template Parameters

<i>T</i>	The enum type.
----------	----------------

Parameters

<i>value</i>	The enum to remove from.
<i>remove</i>	Value to remove.

Returns

New enum T with the value(s) removed.

```

121      {
122          Type type = value.GetType();
123
124          //determine the values
125          object result = value;
126          var parsed = new _Value(remove, type);
127          if (parsed.Signed.HasValue) //if (parsed.Signed is long)
128          {
129              result = Convert.ToInt64(value) & ~(long)parsed.Signed;
130          }
131          else if (parsed.Unsigned.HasValue) //else if (parsed.Unsigned is ulong)
132          {
133              result = Convert.ToUInt64(value) & ~(ulong)parsed.Unsigned;
134          }
135
136          //return the final value
137          return (T)Enum.Parse(type, result.ToString());
138      }

```

The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Extensions/EnumerationExtensions.cs

7.11 TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests Class Reference

Public Member Functions

- void ShouldThrowExceptionOnString ()
- void ShouldHaveValue ()
- void ShouldNotHaveValue ()
- void ShouldIncludeValue ()
- void ShouldRemoveValue ()
- void ShouldHaveLongValue ()
- void ShouldNotHaveLongValue ()
- void ShouldIncludeLongValue ()
- void ShouldRemoveLongValue ()

7.11.1 Member Function Documentation

7.11.1.1 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldHaveLongValue ()

```

63      {
64          Assert.True(LongEnum.Foo.Has(LongEnum.Foo));
65      }

```

7.11.1.2 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldHaveValue ()

```

33      {
34          Assert.True(Enum.Foo.Has(Enum.Foo));
35      }

```

7.11.1.3 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldIncludeLongValue ()

```

75      {
76          var val = LongEnum.Foo;
77          val = val.Include(LongEnum.Bar);
78          Assert.True(val.Has(LongEnum.Foo));
79          Assert.True(val.Has(LongEnum.Bar));
80      }

```

7.11.1.4 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldIncludeValue()

```

45      {
46          var val = Enum.Foo;
47          val = val.Include(Enum.Bar);
48          Assert.True(val.Has(Enum.Foo));
49          Assert.True(val.Has(Enum.Bar));
50      }

```

7.11.1.5 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldNotHaveLongValue()

```

69      {
70          Assert.True(LongEnum.Bar.Missing(LongEnum.Foo));
71      }

```

7.11.1.6 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldNotHaveValue()

```

39      {
40          Assert.True(Enum.Bar.Missing(Enum.Foo));
41      }

```

7.11.1.7 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldRemoveLongValue()

```

84      {
85          var val = LongEnum.Foo.Include(LongEnum.Bar);
86          val = val.Remove(LongEnum.Foo);
87          Assert.True(val.Has(LongEnum.Bar));
88          Assert.True(val.Missing(LongEnum.Foo));
89      }

```

7.11.1.8 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldRemoveValue()

```

54      {
55          var val = Enum.Foo.Include(Enum.Bar);
56          val = val.Remove(Enum.Foo);
57          Assert.True(val.Has(Enum.Bar));
58          Assert.True(val.Missing(Enum.Foo));
59      }

```

7.11.1.9 void TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests.ShouldThrowExceptionOnString()

```

27      {
28          Enum.Foo.Has("string");
29      }

```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine.Tests/ExtensionTests/EnumerationExtensionTests.cs](#)

7.12 TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests Class Reference

Public Member Functions

- void [ShouldThrowEngineExceptionWhenPassedGeneric\(\)](#)
- void [ShouldThrowUnmodifiedEngineException\(\)](#)

7.12.1 Member Function Documentation

7.12.1.1 void TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests.ShouldThrowEngineExceptionWhenPassedGeneric()

```
13     {
14         Exceptions.Throw(new Exception());
15     }
```

7.12.1.2 void TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests.ShouldThrowUnmodifiedEngineException()

```
20     {
21         var ex = new EngineException("Original Exception Message");
22         // The message passed in as parameter shouldn't be used
23         Exceptions.Throw(ex, "New Exception Message");
24     }
```

The documentation for this class was generated from the following file:

- TriDevs.TriEngine.Tests/HelperTests/[ExceptionHelperTests.cs](#)

7.13 TriDevs.TriEngine.Helpers.Exceptions Class Reference

Provides helper methods for dealing with exceptions.

Static Public Member Functions

- static void [LogException](#) (Exception exception)
Outputs exception details to default logger.

7.13.1 Detailed Description

Provides helper methods for dealing with exceptions.

7.13.2 Member Function Documentation

7.13.2.1 static void TriDevs.TriEngine.Helpers.Exceptions.LogException(Exception exception) [static]

Outputs exception details to default logger.

Parameters

<i>exception</i>	The exception to log.
------------------	-----------------------

```
56     {
57         var type = "Generic";
58         if (exception is EngineException)
59             type = "Engine";
60
61         _log.ErrorFormat("{0} exception {1} occurred with message: {2}", type, exception.GetType(),
62                         exception.Message);
63         if (exception.InnerException != null)
64             _log.ErrorFormat("Inner exception {0} with message: {1}", exception.InnerException.GetType(
65                         ),
66                         exception.InnerException.Message);
67         _log.Error("Exception details:", exception);
68         if (exception.InnerException != null)
69             _log.Error("Exception details for inner:", exception.InnerException);
```

The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Helpers/[Exceptions.cs](#)

7.14 TriDevs.TriEngine.Extensions.FloatExtensions Class Reference

[Extensions](#) for System.Single.

Static Public Member Functions

- static float [Clamp](#) (this float value, float min, float max)
Clamps the specified float between a minimum and maximum value.

7.14.1 Detailed Description

[Extensions](#) for System.Single.

7.14.2 Member Function Documentation

7.14.2.1 static float TriDevs.TriEngine.Extensions.FloatExtensions.Clamp (this float value, float min, float max) [static]

Clamps the specified float between a minimum and maximum value.

Parameters

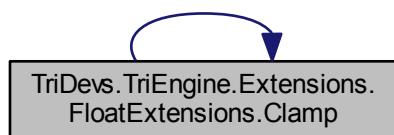
<i>value</i>	Value to clamp.
<i>min</i>	If the specified float is below this value, then this will be returned.
<i>max</i>	If the specified float is above this value, then this will be returned.

Returns

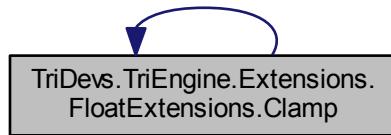
The clamped value of the float.

```
39      {  
40          return Helpers.Math.Clamp(value, min, max);  
41      }
```

Here is the call graph for this function:



Here is the caller graph for this function:



The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Extensions/FloatExtensions.cs](#)

7.15 TriDevs.TriEngine.Text.Font Class Reference

Holds a specific font type.

Public Member Functions

- [`Font`](#) (`string name, string file, int size, bool dropShadow=false, FontType type=FontType.TTF`)
Initializes a new `Font` instance.
- [`Font`](#) (`string name, string file, int size, FontType type, FontConstructionConfig fontConstructionConfig`)
Initializes a new `Font` instance using the specified builder configuration.
- `override string ToString()`
- `void Dispose()`
Disposes of this font instance, releasing all unmanaged resources.

Static Public Member Functions

- `static string GetDefaultName (string file, int size)`
Returns an auto-generated font name based on the file name and font size.

Properties

- `string Name [get]`
Gets the name of this font instance.
- `string File [get]`
Gets the file used to create this font instance.
- `int Size [get]`
Gets the size of this font in points.
- `FontType Type [get]`
Gets the font type.
- `QFont QFont [get]`
Gets the QFont instance associated with this font.
- `Color Color [get, set]`
Gets or sets the color of this font.

7.15.1 Detailed Description

Holds a specific font type.

7.15.2 Constructor & Destructor Documentation

7.15.2.1 `TriDevs.TriEngine.Text.Font.Font (string name, string file, int size, bool dropShadow = false, FontType type = FontType.TTF)`

Initializes a new `Font` instance.

Parameters

<code>name</code>	Name to use for identifying this font, must be unique. Can be set to null to allow the constructor to auto-generate a name for the font.
<code>file</code>	Path to the font file (TTF or qfont).
<code>size</code>	Size (in points) to use for this font.
<code>dropShadow</code>	Whether or not this font should have shadows.
<code>type</code>	The type of font. This will be detected by the file extension, but can be manually specified to control the fallback type used if one was not detected from the file name

```

93         : this(
94             name, file, size, type,
95             new FontConstructionConfig(new QFontBuilderConfiguration(dropShadow),
96                                         new QFontLoaderConfiguration(dropShadow)))
97         {
98     }
99 }
```

7.15.2.2 `TriDevs.TriEngine.Text.Font.Font (string name, string file, int size, FontType type, FontConstructionConfig fontConstructionConfig)`

Initializes a new `Font` instance using the specified builder configuration.

Parameters

<code>name</code>	Name to use for identifying this font, must be unique. Can be set to null to allow the constructor to auto-generate a name for the font.
<code>file</code>	Path to the font file (TTF or qfont).
<code>size</code>	Size (in points) to use for this font.
<code>type</code>	The type of font. This will be detected by the file extension, but can be manually specified to control the fallback type used if one was not detected from the file name
<code>fontConstructionConfig</code>	The <code>FontConstructionConfig</code> containing relevant font build/load configurations.

```

117         {
118             _file = file;
119             _size = size;
120
121             var ext = Path.GetExtension(_file);
122
123             if (string.IsNullOrEmpty(ext))
124                 throw new EngineException("Failed to get file extension of font file!",
125                                         new IOException("System.IO.Path.GetExtension returned null or
empty for specified file."));
126
127             // Disable resharper warning, we are checking for null, resharper doesn't like IsNullOrEmpty
128             // ReSharper disable PossibleNullReferenceException
129             ext = ext.TrimStart('.').ToLower();
130             // ReSharper restore PossibleNullReferenceException
131
132             switch (ext)
133             {
134                 case "ttf":
```

```

135             type = FontType.TTF;
136             break;
137         case "qfont":
138             type = FontType.QFont;
139             break;
140         }
141     _type = type;
142     QFont font;
143     switch (_type)
144     {
145         case FontType.TTF:
146             if (fontConstructionConfig.BuildConfig == null)
147                 throw new EngineException("Builder configuration was null but requested font type
148 requires a builder config!",
149                                         new ArgumentException("BuildConfig was null.", "
150 fontConstructionConfig"));
151             font = new QFont(_file, _size, fontConstructionConfig.BuildConfig);
152             break;
153         case FontType.QFont:
154             if (fontConstructionConfig.LoadConfig == null)
155                 throw new EngineException("Loader configuration was null but requested font type
156 requires a loader config!",
157                                         new ArgumentException("LoadConfig was null.", "
158 fontConstructionConfig"));
159             font = QFont.FromQFontFile(_file, fontConstructionConfig.LoadConfig);
160             break;
161         default:
162             throw new EngineException("Unsupported font type: " + _type,
163                                         new ArgumentException("Font type unsupported.", "type"));
164     }
165     if (font == null)
166         throw new EngineException("Font failed to initialize!",
167                                         new ArgumentException("Font failed to initialize.", "file"));
168     _qfont = font;
169     _name = name ?? GetDefaultName(file, size);
170 }
171 }
```

7.15.3 Member Function Documentation

7.15.3.1 void TriDevs.TriEngine.Text.Font.Dispose()

Disposes of this font instance, releasing all unmanaged resources.

```

195     {
196         QFont.Dispose();
197     }
```

7.15.3.2 static string TriDevs.TriEngine.Text.Font.GetDefaultName(string file, int size) [static]

Returns an auto-generated font name based on the file name and font size.

Parameters

<i>file</i>	The file name.
<i>size</i>	The size (in points) of the font.

Returns

The auto-generated font name.

```

181     {
182         return string.Format(NameFormat, Path.GetFileNameWithoutExtension(file), size);
183     }
```

7.15.3.3 override string TriDevs.TriEngine.Text.Font.ToString ()

```
186      {
187          return Name;
188      }
```

7.15.4 Property Documentation

7.15.4.1 Color TriDevs.TriEngine.Text.Font.Color [get], [set]

Gets or sets the color of this font.

7.15.4.2 string TriDevs.TriEngine.Text.Font.File [get]

Gets the file used to create this font instance.

7.15.4.3 string TriDevs.TriEngine.Text.Font.Name [get]

Gets the name of this font instance.

7.15.4.4 QFont TriDevs.TriEngine.Text.Font.QFont [get]

Gets the QFont instance associated with this font.

7.15.4.5 int TriDevs.TriEngine.Text.Font.Size [get]

Gets the size of this font in points.

7.15.4.6 FontType TriDevs.TriEngine.Text.Font.Type [get]

Gets the font type.

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Text/Font.cs](#)

7.16 TriDevs.TriEngine.Text.FontConstructionConfig Class Reference

Container class for different QFont configurations for use with the [Font](#) constructor.

Public Member Functions

- [FontConstructionConfig \(QFontLoaderConfiguration loadConfig\)](#)

Initialize a new [FontConstructionConfig](#) with a load configuration.

- [FontConstructionConfig \(QFontBuilderConfiguration buildConfig, QFontLoaderConfiguration loadConfig=null\)](#)

Initializes a new [FontConstructionConfig](#) with a builder configuration and optional loader configuration.

Public Attributes

- QFontBuilderConfiguration [BuildConfig](#)
The builder configuration used when constructing fonts from non-qfont files.
- QFontLoaderConfiguration [LoadConfig](#)
The loader configuration used when contructing fonts from a qfont file.

7.16.1 Detailed Description

Container class for different QFont configurations for use with the [Font](#) constructor.

7.16.2 Constructor & Destructor Documentation

7.16.2.1 TriDevs.TriEngine.Text.FontConstructionConfig.FontConstructionConfig ([QFontLoaderConfiguration loadConfig](#))

Initialize a new [FontConstructionConfig](#) with a load configuration.

Parameters

loadConfig	The QFontLoaderConfiguration to use.
----------------------------	--------------------------------------

```
50      : this(null, loadConfig)
51      {
52
53      }
```

7.16.2.2 TriDevs.TriEngine.Text.FontConstructionConfig.FontConstructionConfig ([QFontBuilderConfiguration buildConfig](#), [QFontLoaderConfiguration loadConfig = null](#))

Initializes a new [FontConstructionConfig](#) with a builder configuration and optional loader configuration.

Parameters

buildConfig	The builder configuration to use.
loadConfig	Optional loader configuration to set.

```
62      {
63          BuildConfig = buildConfig;
64          LoadConfig = loadConfig;
65      }
```

7.16.3 Member Data Documentation

7.16.3.1 QFontBuilderConfiguration [TriDevs.TriEngine.Text.FontConstructionConfig.BuildConfig](#)

The builder configuration used when constructing fonts from non-qfont files.

7.16.3.2 QFontLoaderConfiguration [TriDevs.TriEngine.Text.FontConstructionConfig.LoadConfig](#)

The loader configuration used when contructing fonts from a qfont file.

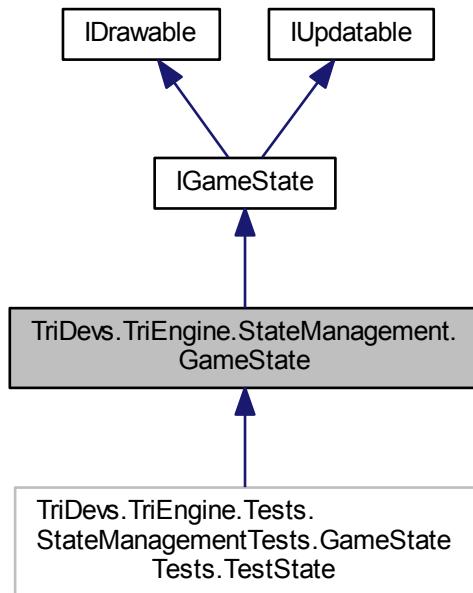
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Text/FontConstructionConfig.cs](#)

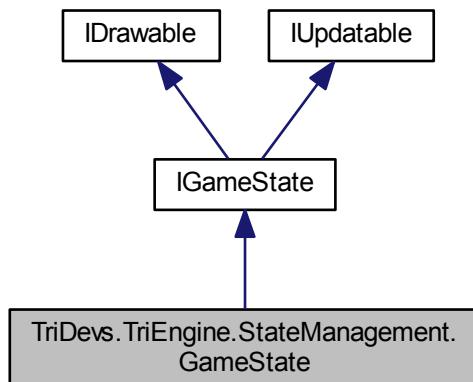
7.17 TriDevs.TriEngine.StateManagement.GameState Class Reference

Base [GameState](#) class that all other game states derive from, defines basic [GameState](#) behaviour.

Inheritance diagram for `TriDevs.TriEngine.StateManagement.GameState`:



Collaboration diagram for `TriDevs.TriEngine.StateManagement.GameState`:



Public Member Functions

- **virtual void Update ()**
Updates the object.
- **virtual void Draw ()**
Draw the object to screen.
- **virtual void Load ()**
Loads resources associated with this game component.
- **virtual void Unload ()**
Unloads resources that were loaded in the [Load](#) method.
- **virtual void Pause ()**
Pauses the game state, preventing update calls from running.
- **virtual void Unpause ()**
Unpauses the game state, enabling update calls again.
- **IListComponent AddComponent (IListComponent component)**
Adds a game component to this game state.
- **void RemoveComponent (IListComponent component)**
Removes the specified component from this game state.
- **void RemoveAllComponents ()**
Removes all components from the game state.
- **void RemoveAllComponents (Type type)**
Removes all components of the specified type from the game state.
- **void RemoveAllComponents (Predicate< IListComponent > predicate)**
Removes all components that match the supplied predicate function.
- **bool HasComponent (IListComponent component)**
Returns whether this game state contains the specified IListComponent.
- **bool HasComponent (Type type)**
Returns whether this game state contains a specific type of component.
- **bool HasComponent (Func< IListComponent, bool > func)**
Returns whether this game state contains a component that matches the supplied predicate.
- **IEnumerable< IListComponent > GetAllComponents ()**
Returns a read-only collection of all components in this game state.
- **IListComponent GetComponent (Type type)**
Returns the specified component type if it exists in this game state.
- **IEnumerable< IListComponent > GetAllComponents (Type type)**
Returns all components of the specified type.
- **IListComponent GetComponent (Func< IListComponent, bool > func)**
Returns the first component that matches the supplied predicate function.
- **IEnumerable< IListComponent > GetAllComponents (Func< IListComponent, bool > func)**
Returns all components that matches the supplied predicate function.

Protected Member Functions

- **GameState ()**

Protected Attributes

- **readonly List< IListComponent > Components**

Properties

- bool `Paused` [get, set]

7.17.1 Detailed Description

Base `GameState` class that all other game states derive from, defines basic `GameState` behaviour.

7.17.2 Constructor & Destructor Documentation

7.17.2.1 `TriDevs.TriEngine.StateManagement.GameState.GameState()` [protected]

```
42     {
43         Components = new List<IGameComponent>();
44     }
```

7.17.3 Member Function Documentation

7.17.3.1 `IGameComponent TriDevs.TriEngine.StateManagement.GameState.AddComponent(IGameComponent component)`

Adds a game component to this game state.

Parameters

<code>component</code>	The component to add.
------------------------	-----------------------

Returns

The component that was added.

Implements `TriDevs.TriEngine.StateManagement.IGameState`.

```
78     {
79         if (HasComponent(component))
80             throw new InvalidOperationException("Cannot add the same component more than once.");
81
82         Components.Add(component);
83         component.Enable();
84         return component; // var comp = someState.AddComponent(new SomeComponent());
85     }
```

Here is the call graph for this function:



7.17.3.2 `virtual void TriDevs.TriEngine.StateManagement.GameState.Draw()` [virtual]

Draw the object to screen.

Implements `TriDevs.TriEngine.Interfaces.IDrawable`.

```

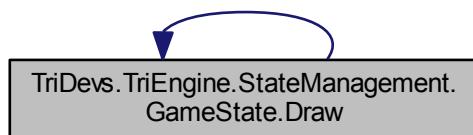
52         {
53             foreach (var component in Components.OfType<
54                 IDrawableGameComponent>())
55             component.Draw();
}

```

Here is the call graph for this function:



Here is the caller graph for this function:



7.17.3.3 `IEnumerable<IGameComponent> TriDevs.TriEngine.StateManagement.GameState.GetAllComponents ()`

Returns a read-only collection of all components in this game state.

Returns

Read-only collection of components.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```

134         {
135             return Components.AsReadOnly();
136         }

```

7.17.3.4 `IEnumerable<IGameComponent> TriDevs.TriEngine.StateManagement.GameState.GetAllComponents (Type type)`

Returns all components of the specified type.

Parameters

<code>type</code>	The type of game component requested.
-------------------	---------------------------------------

Returns

A collection of all components of matching type.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
144      {
145          return Components.FindAll(c => c.GetType() == type);
146      }
```

7.17.3.5 **IEnumerable<IGameComponent>** [TriDevs.TriEngine.StateManagement.GameState.GetAllComponents \(Func<IGameComponent, bool > func \)](#)

Returns all components that matches the supplied predicate function.

Parameters

<i>func</i>	The predicate function.
-------------	-------------------------

Returns

Collection of all matching components, empty collection if no matches were found.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
154      {
155          return Components.Where(func);
156      }
```

7.17.3.6 **IGameComponent** [TriDevs.TriEngine.StateManagement.GameState.GetComponent \(Type type \)](#)

Returns the specified component type if it exists in this game state.

Parameters

<i>type</i>	The component type to get.
-------------	----------------------------

Returns

The component object, or null if it's not added to this game state.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
139      {
140          return Components.FirstOrDefault(c => c.GetType() == type);
141      }
```

7.17.3.7 **IGameComponent** [TriDevs.TriEngine.StateManagement.GameState.GetComponent \(Func<IGameComponent, bool > func \)](#)

Returns the first component that matches the supplied predicate function.

Parameters

<i>func</i>	The predicate function.
-------------	-------------------------

Returns

Component that matches the predicate, null if no matches were found.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
149      {
150          return Components.FirstOrDefault(func);
151      }
```

7.17.3.8 bool [TriState.TriEngine.StateManagement.GameState.HasComponent \(IGameComponent component \)](#)

Returns whether this game state contains the specified IGameComponent.

Parameters

<i>component</i>	The component to check for.
------------------	-----------------------------

Returns

True if the component has been added to this game state, false otherwise.

Implements [TriState.TriEngine.StateManagement.IGameState](#).

```
119      {
120          return Components.Contains(component);
121      }
```

7.17.3.9 bool [TriState.TriEngine.StateManagement.GameState.HasComponent \(Type type \)](#)

Returns whether this game state contains a specific type of component.

Parameters

<i>type</i>	The type to check for.
-------------	------------------------

Returns

True if the type of component has been added to this game state, false otherwise.

Implements [TriState.TriEngine.StateManagement.IGameState](#).

```
124      {
125          return Components.Any(c => c.GetType() == type);
126      }
```

7.17.3.10 bool [TriState.TriEngine.StateManagement.GameState.HasComponent \(Func< IGameComponent, bool > func \)](#)

Returns whether this game state contains a component that matches the supplied predicate.

Parameters

<i>func</i>	Predicate function to use for search.
-------------	---------------------------------------

Returns

True if the game state contains a matching component, false otherwise.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
129      {
130          return Components.Any(func);
131      }
```

7.17.3.11 virtual void TriDevs.TriEngine.StateManagement.GameState.Load() [virtual]

Loads resources associated with this game component.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
58      {
59
60  }
```

7.17.3.12 virtual void TriDevs.TriEngine.StateManagement.GameState.Pause() [virtual]

Pauses the game state, preventing update calls from running.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
68      {
69          Paused = true;
70      }
```

7.17.3.13 void TriDevs.TriEngine.StateManagement.GameState.RemoveAllComponents()

Removes all components from the game state.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
98      {
99          Components.ForEach(c => c.Disable());
100         Components.Clear();
101     }
```

7.17.3.14 void TriDevs.TriEngine.StateManagement.GameState.RemoveAllComponents(Type type)

Removes all components of the specified type from the game state.

Parameters

<i>type</i>	The type of component to remove.
-------------	----------------------------------

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
104      {
105          RemoveAllComponents(c => c.GetType() == type);
106      }
```

7.17.3.15 void TriDevs.TriEngine.StateManagement.GameState.RemoveAllComponents (*Predicate< IGameComponent > predicate*)

Removes all components that match the supplied predicate function.

Parameters

<i>predicate</i>	The predicate function.
------------------	-------------------------

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```

109      {
110          var removed = Components.FindAll(predicate);
111          if (removed.Count < 1)
112              return;
113
114          Components.RemoveAll(predicate);
115          removed.ForEach(c => c.Disable());
116      }

```

7.17.3.16 void TriDevs.TriEngine.StateManagement.GameState.RemoveComponent (*IGameComponent component*)

Removes the specified component from this game state.

Parameters

<i>component</i>

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```

88      {
89          var match = Components.FirstOrDefault(c => c == component);
90          if (match == null)
91              return;
92
93          Components.Remove(match);
94          match.Disable();
95      }

```

Here is the call graph for this function:



7.17.3.17 virtual void TriDevs.TriEngine.StateManagement.GameState.Unload () [virtual]

Unloads resources that were loaded in the [Load](#) method.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```

63      {
64
65      }

```

7.17.3.18 virtual void TriDevs.TriEngine.StateManagement.GameState.Unpause() [virtual]

Unpauses the game state, enabling update calls again.

Implements [TriDevs.TriEngine.StateManagement.IGameState](#).

```
73      {
74          Paused = false;
75      }
```

7.17.3.19 virtual void TriDevs.TriEngine.StateManagement.GameState.Update() [virtual]

Updates the object.

Implements [TriDevs.TriEngine.Interfaces.IUpdatable](#).

```
47      {
48          Components.ForEach(c => c.Update());
49      }
```

7.17.4 Member Data Documentation

7.17.4.1 readonly List<IGameComponent> TriDevs.TriEngine.StateManagement.GameState.Components [protected]

7.17.5 Property Documentation

7.17.5.1 bool TriDevs.TriEngine.StateManagement.GameState.Paused [get], [set]

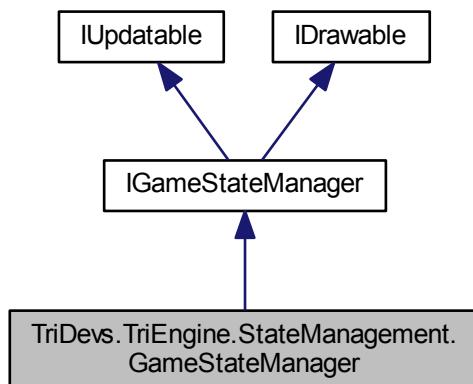
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/StateManager/GameState.cs](#)

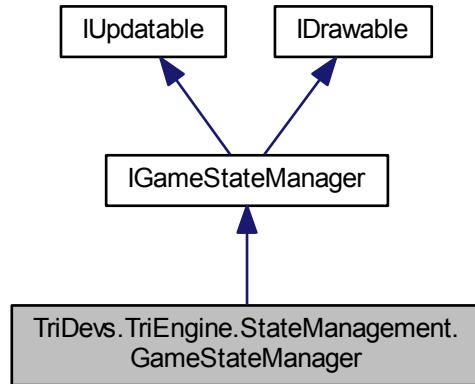
7.18 TriDevs.TriEngine.StateManagement.GameStateManager Class Reference

Game state manager that keeps track of the active game states and provides methods to control the states.

Inheritance diagram for `TriDevs.TriEngine.StateManagement.GameStateManager`:



Collaboration diagram for TriDevs.TriEngine.StateManagement.GameStateManager:



Public Member Functions

- `GameStateManager ()`
Creates a new `GameStateManager` with an empty state stack.
- `GameStateManager (IGameState state)`
Creates a new `GameStateManager` and pushes an initial state onto the stack.
- `void Update ()`
Updates the object.
- `void Draw ()`
Draw the object to screen.
- `IGameState Push (IGameState state)`
Pushes a new game state onto the stack, pausing the current one.
- `IGameState Pop ()`
Pops the currently active state from the stack, unpausing the previous one.
- `IGameState Peek ()`
Returns the game state at the top of the stack, without popping it.
- `IGameState Switch (IGameState state)`
Switches to a new game state, discarding all previous ones in the stack.

Properties

- `int StateCount [get]`
- `IGameState ActiveState [get, set]`

7.18.1 Detailed Description

Game state manager that keeps track of the active game states and provides methods to control the states.

7.18.2 Constructor & Destructor Documentation

7.18.2.1 TriDevs.TriEngine.StateManagement.GameStateManager.GameStateManager()

Creates a new [GameManager](#) with an empty state stack.

```
52     {
53         _states = new Stack<IGameState>();
54     }
```

7.18.2.2 TriDevs.TriEngine.StateManagement.GameStateManager.GameStateManager(IGameState state)

Creates a new [GameManager](#) and pushes an initial state onto the stack.

Parameters

<i>state</i>	The state to initialize with.
--------------	-------------------------------

```
61             : this()
62     {
63         Push(state);
64     }
```

7.18.3 Member Function Documentation

7.18.3.1 void TriDevs.TriEngine.StateManagement.GameStateManager.Draw()

Draw the object to screen.

Implements [TriDevs.TriEngine.Interfaces.IDrawable](#).

```
73     {
74         if (ActiveState != null)
75             ActiveState.Draw();
76     }
```

7.18.3.2 IGameState TriDevs.TriEngine.StateManagement.GameStateManager.Peek()

Returns the game state at the top of the stack, without popping it.

Returns

The state at the top of the stack.

Implements [TriDevs.TriEngine.StateManagement.IGameStateManager](#).

```
102     {
103         return _states.Peek();
104     }
```

7.18.3.3 IGameState TriDevs.TriEngine.StateManagement.GameStateManager.Pop()

Pops the currently active state from the stack, unpausing the previous one.

Returns

The state that was popped.

Implements [TriDevs.TriEngine.StateManagement.IGameStateManager](#).

```

90         {
91             if (_states.Count == 1)
92                 throw new InvalidOperationException("Cannot pop the last remaining game state from stack.");
93
94             var state = _states.Pop();
95             state.Unload();
96             ActiveState = _states.Peek();
97             ActiveState.Unpause();
98             return state;
99         }

```

7.18.3.4 IGameState TriDevs.TriEngine.StateManagement.GameStateManager.Push (IGameState state)

Pushes a new game state onto the stack, pausing the current one.

Parameters

<code>state</code>	The new game state to push onto the stack.
--------------------	--

Returns

The game state that was pushed.

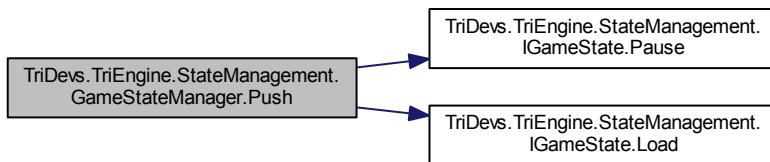
Implements [TriDevs.TriEngine.StateManagement.IGameStateManager](#).

```

79         {
80             if (ActiveState != null)
81                 ActiveState.Pause();
82
83             state.Load();
84             _states.Push(state);
85             ActiveState = state;
86             return state;
87         }

```

Here is the call graph for this function:

**7.18.3.5 IGameState TriDevs.TriEngine.StateManagement.GameStateManager.Switch (IGameState state)**

Switches to a new game state, discarding all previous ones in the stack.

Parameters

<code>state</code>	The new state to switch to.
--------------------	-----------------------------

Returns

The state that was switched to.

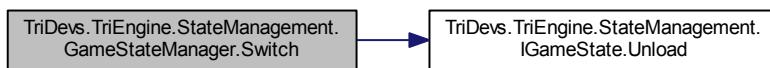
Implements [TriDevs.TriEngine.StateManagement.IGameStateManager](#).

```

107      {
108          while (_states.Count > 0)
109              _states.Pop().Unload();
110
111          _states = new Stack<IGameState>();
112          return Push(state);
113      }

```

Here is the call graph for this function:



7.18.3.6 void TriDevs.TriEngine.StateManagement.GameStateManager.Update()

Updates the object.

Implements [TriDevs.TriEngine.Interfaces.IUpdatable](#).

```

67      {
68          if (ActiveState != null)
69              ActiveState.Update();
70      }

```

7.18.4 Property Documentation

7.18.4.1 IGameState TriDevs.TriEngine.StateManagement.GameStateManager.ActiveState [get], [set]

7.18.4.2 int TriDevs.TriEngine.StateManagement.GameStateManager.StateCount [get]

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/StateManagement/GameStateManager.cs](#)

7.19 TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests Class Reference

Public Member Functions

- void [ShouldAddComponentToGameState\(\)](#)
- void [ShouldRemoveComponentFromGameState\(\)](#)
- void [ShouldRemoveAllComponentsFromGameState\(\)](#)
- void [ShouldRemoveAllComponentsOfTypeFromGameState\(\)](#)

- void ShouldRemoveAllComponentsMatchingPredicateFromGameState ()
- void ShouldOnlyHaveExactReferenceToComponent ()
- void ShouldHaveComponentOfType ()
- void ShouldHaveComponentMatchingPredicate ()
- void ShouldReturnComponentOfType ()
- void ShouldReturnComponentMatchingPredicate ()
- void ShouldReturnAllComponent ()
- void ShouldReturnAllComponentsOfType ()
- void ShouldReturnAllComponentsMatchingPredicate ()

7.19.1 Member Function Documentation

7.19.1.1 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldAddComponentToGameState ()

```
62     {
63         var state = new TestState();
64         Assert.False(state.HasComponent(typeof(FooComponent)));
65         var comp = state.AddComponent(new FooComponent());
66         Assert.True(state.HasComponent(comp));
67     }
```

7.19.1.2 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldHaveComponentMatchingPredicate ()

```
149     {
150         var state = new TestState();
151         var fooComp = new FooComponent();
152         state.AddComponent(fooComp);
153         Assert.True(state.HasComponent(c => ((FooComponent)c).Test == "Foo"));
154         Assert.False(state.HasComponent(c => ((FooComponent)c).Test == "Bar"));
155     }
```

7.19.1.3 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldHaveComponentOfType ()

```
139     {
140         var state = new TestState();
141         var fooComp = new FooComponent();
142         state.AddComponent(fooComp);
143         Assert.True(state.HasComponent(typeof(FooComponent)));
144         Assert.False(state.HasComponent(typeof(BarComponent)));
145     }
```

7.19.1.4 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldOnlyHaveExactReferenceToComponent ()

```
128     {
129         var state = new TestState();
130         var fooComp = new FooComponent();
131         var fooComp2 = new FooComponent();
132         state.AddComponent(fooComp);
133         Assert.True(state.HasComponent(fooComp));
134         Assert.False(state.HasComponent(fooComp2));
135     }
```

7.19.1.5 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldRemoveAllComponentsFromGameState ()

```
82     {
83         var state = new TestState();
84         var fooComp1 = new FooComponent();
85         var fooComp2 = new FooComponent();
86         state.AddComponent(fooComp1);
87         state.AddComponent(fooComp2);
```

```

88         Assert.AreEqual(state.GetAllComponents().Count(), 2);
89         state.RemoveAllComponents();
90         Assert.IsEmpty(state.GetAllComponents());
91     }

```

7.19.1.6 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldRemoveAllComponentsMatching- PredicateFromGameState()

```

108     {
109         var state = new TestState();
110         var fooComp1 = new FooComponent();
111         var fooComp2 = new FooComponent {Test = "NewFoo"};
112         state.AddComponent(fooComp1);
113         state.AddComponent(fooComp2);
114         Assert.AreEqual(state.GetAllComponents().Count(), 2);
115
116         // This is ok in this code, since we only have a FooComponent in the GameState
117         // at the moment. In production code we should probably cast c to FooComponent
118         // and make sure it's not null before checking the Test field.
119         state.RemoveAllComponents(c => ((FooComponent)c).Test == "Foo");
120
121         // The component should only have one element left, as we changed the value of
122         // the Test field on one of the objects.
123         Assert.AreEqual(state.GetAllComponents().Count(), 1);
124     }

```

7.19.1.7 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldRemoveAllComponentsOfTypeFrom- GameState()

```

95     {
96         var state = new TestState();
97         var fooComp1 = new FooComponent();
98         var fooComp2 = new FooComponent();
99         state.AddComponent(fooComp1);
100        state.AddComponent(fooComp2);
101        Assert.AreEqual(state.GetAllComponents().Count(), 2);
102        state.RemoveAllComponents(typeof (FooComponent));
103        Assert.IsEmpty(state.GetAllComponents());
104    }

```

7.19.1.8 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldRemoveComponentFromGameState()

```

71     {
72         var state = new TestState();
73         var fooComp = new FooComponent();
74         state.AddComponent(fooComp);
75         Assert.IsNotEmpty(state.GetAllComponents());
76         state.RemoveComponent(fooComp);
77         Assert.IsEmpty(state.GetAllComponents());
78     }

```

7.19.1.9 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldReturnAllComponent()

```

190     {
191         var state = new TestState();
192         var fooComp = new FooComponent();
193         var customFoo = new FooComponent { Test = "NewFoo" };
194         var barComp = new BarComponent();
195         var customBar = new BarComponent { Test = "NewBar" };
196         state.AddComponent(fooComp);
197         state.AddComponent(customFoo);
198         state.AddComponent(barComp);
199         state.AddComponent(customBar);
200         Assert.AreEqual(state.GetAllComponents().Count(), 4);
201     }

```

7.19.1.10 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldReturnAllComponentsMatchingPredicate()

```

220      {
221          var state = new TestState();
222          var fooComp = new FooComponent();
223          var customFoo = new FooComponent { Test = "NewFoo" };
224          var barComp = new BarComponent();
225          var customBar = new BarComponent { Test = "NewBar" };
226          state.AddComponent(fooComp);
227          state.AddComponent(customFoo);
228          state.AddComponent(barComp);
229          state.AddComponent(customBar);
230
231          // We have to do some null checking, as we have both Foo and Bar components
232          // in the game state.
233
234          Assert.AreEqual(state.GetAllComponents(c =>
235          {
236              var f = c as FooComponent;
237              return f != null && f.Test == "NewFoo";
238          }).Count(), 1);
239
240          Assert.IsEmpty(state.GetAllComponents(c =>
241          {
242              var f = c as FooComponent;
243              return f != null && f.Test == "NewBar";
244          }));
245      }

```

7.19.1.11 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldReturnAllComponentsOfType()

```

205      {
206          var state = new TestState();
207          var fooComp = new FooComponent();
208          var customFoo = new FooComponent { Test = "NewFoo" };
209          var barComp = new BarComponent();
210          var customBar = new BarComponent { Test = "NewBar" };
211          state.AddComponent(fooComp);
212          state.AddComponent(customFoo);
213          state.AddComponent(barComp);
214          state.AddComponent(customBar);
215          Assert.AreEqual(state.GetAllComponents(typeof(FooComponent)).Count(), 2);
216      }

```

7.19.1.12 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldReturnComponentMatchingPredicate()

```

171      {
172          var state = new TestState();
173          var fooComp = new FooComponent();
174          var customFoo = new FooComponent { Test = "NewFoo" };
175          state.AddComponent(fooComp);
176          state.AddComponent(customFoo);
177
178          // We have to do some null checking, as we have both Foo and Bar components
179          // in the game state.
180
181          Assert.AreEqual(state.GetComponent(c =>
182          {
183              var cf = c as FooComponent;
184              return cf != null && cf.Test == "NewFoo";
185          }), customFoo);
186      }

```

7.19.1.13 void TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests.ShouldReturnComponentOfType()

```

159      {
160          var state = new TestState();
161          var fooComp = new FooComponent();
162          var customFoo = new FooComponent { Test = "NewFoo" };
163          state.AddComponent(fooComp);
164          state.AddComponent(customFoo);
165
166          Assert.IsInstanceOf<FooComponent>(state.GetComponent(typeof(FooComponent)));
167      }

```

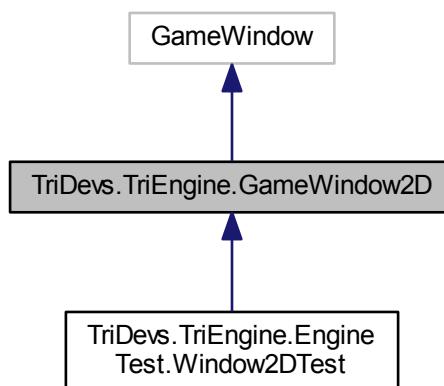
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine.Tests/StateManagerTests/GameStateTests.cs](#)

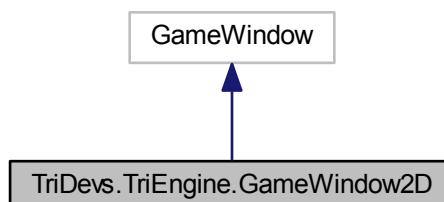
7.20 TriDevs.TriEngine.GameWindow2D Class Reference

Game window class specialized for drawing 2D graphics.

Inheritance diagram for TriDevs.TriEngine.GameWindow2D:



Collaboration diagram for TriDevs.TriEngine.GameWindow2D:



Protected Member Functions

- `GameWindow2D (int width, int height, string title, bool vsync=true)`
- `override void OnResize (EventArgs e)`
- `override void OnLoad (EventArgs e)`
- `sealed override void OnRenderFrame (FrameEventArgs e)`
- `abstract void OnDraw (FrameEventArgs e)`
- `void Initialize ()`

Properties

- **Color ClearColor [get, set]**

7.20.1 Detailed Description

Game window class specialized for drawing 2D graphics.

7.20.2 Constructor & Destructor Documentation

7.20.2.1 **TriDevs.TriEngine.GameWindow2D.GameWindow2D (int width, int height, string title, bool vsync = true) [protected]**

```
49         : base(width, height, GraphicsMode.Default, title)
50     {
51         VSync = vsync ? VSyncMode.On : VSyncMode.Off;
52
53         ClearColor = Color.CornflowerBlue;
54     }
```

7.20.3 Member Function Documentation

7.20.3.1 **void TriDevs.TriEngine.GameWindow2D.Initialize () [protected]**

```
92     {
93         try
94     {
95             GL.Viewport(0, 0, ClientRectangle.Width, ClientRectangle.Height);
96
97             GL.MatrixMode(MatrixMode.Projection);
98
99             GL.LoadIdentity();
100
101            GL.Ortho(0, ClientRectangle.Width - 1, ClientRectangle.Height - 1, 0, -1, 1);
102
103            GL.MatrixMode(MatrixMode.Modelview);
104
105            // Disable the Z-buffer, this is a 2D game window
106            //GL.Disable(EnableCap.DepthTest);
107            //GL.Disable(EnableCap.CullFace);
108            GL.Enable(EnableCap.Blend);
109            GL.BlendEquation(BlendEquationMode.FuncAdd);
110            GL.BlendFunc(BlendingFactorSrc.SrcAlpha, BlendingFactorDest.OneMinusSrcAlpha);
111            //GL.PixelStore(PixelStoreParameter.UnpackAlignment, 1);
112            //GL.RenderMode(RenderingMode.Render);
113
114            GL.ClearColor(ClearColor.ToColor4());
115        }
116        catch (Exception ex)
117        {
118            Helpers.Exceptions.Throw(ex, "Initialization of 2D game window failed during OpenGL setup!");
119        }
120    }
```

7.20.3.2 **abstract void TriDevs.TriEngine.GameWindow2D.OnDraw (FrameEventArgs e) [protected], [pure virtual]**

Implemented in [TriDevs.TriEngine.EngineTest.Window2DTest](#).

7.20.3.3 **override void TriDevs.TriEngine.GameWindow2D.OnLoad (EventArgs e) [protected]**

```
72     {
73         base.OnLoad(e);
74
75         Initialize();
76     }
```

7.20.3.4 sealed override void TriDevs.TriEngine.GameWindow2D.OnRenderFrame (FrameEventArgs e) [protected]

```

79      {
80          base.OnRenderFrame(e);
81
82          GL.Clear(ClearBufferMask.ColorBufferBit);
83
84          OnDraw(e);
85
86          SwapBuffers();
87      }

```

7.20.3.5 override void TriDevs.TriEngine.GameWindow2D.OnResize (EventArgs e) [protected]

```

57      {
58          base.OnResize(e);
59
60          GL.Viewport(0, 0, ClientRectangle.Width, ClientRectangle.Height);
61
62          GL.MatrixMode(MatrixMode.Projection);
63
64          GL.LoadIdentity();
65
66          GL.Ortho(0, ClientRectangle.Width - 1, ClientRectangle.Height - 1, 0, -1, 1);
67
68          GL.MatrixMode(MatrixMode.Modelview);
69      }

```

7.20.4 Property Documentation

7.20.4.1 Color TriDevs.TriEngine.GameWindow2D.ClearColor [get], [set], [protected]

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/GameWindow2D.cs](#)

7.21 TriDevs.TriEngine.Native.Helpers Class Reference

Helper class with various methods to help native coding and debugging.

Static Public Member Functions

- static int [GetLastError \(\)](#)
Gets the last error that was thrown.
- static int [GetLastErrorMessage \(out string message\)](#)
Gets information about the last error that was thrown.
- static string [GetErrorMessage \(int err\)](#)
Gets the error message associated with an error code.
- static string [GetLastErrorMessage \(\)](#)
Gets the error message associated with the last thrown error.
- static Win32Exception [GetWin32Exception \(int err\)](#)
Gets the Win32Exception associated with the specified error code.
- static Win32Exception [GetLastWin32Exception \(\)](#)
Gets the Win32Exception associated with the last thrown error.

7.21.1 Detailed Description

Helper class with various methods to help native coding and debugging.

7.21.2 Member Function Documentation

7.21.2.1 static string TriDevs.TriEngine.Native.Helpers.GetErrorMessage(int err) [static]

Gets the error message associated with an error code.

Parameters

<i>err</i>	The error code to get information about.
------------	--

Returns

The error message.

```
61      {
62          return GetWin32Exception(err).Message;
63      }
```

7.21.2.2 static int TriDevs.TriEngine.Native.Helpers.GetLastError() [static]

Gets the last error that was thrown.

Returns

The error code associated with the thrown error.

```
39      {
40          return Marshal.GetLastWin32Error();
41      }
```

7.21.2.3 static int TriDevs.TriEngine.Native.Helpers.GetLastErrorMessage(out string message) [static]

Gets information about the last error that was thrown.

Parameters

<i>message</i>	Will be set to the error message.
----------------	-----------------------------------

Returns

The error code associated with the thrown error.

```
49      {
50          var err = GetLastError();
51          message = GetWin32Exception(err).Message;
52          return err;
53      }
```

7.21.2.4 static string TriDevs.TriEngine.Native.Helpers.GetLastErrorMessage() [static]

Gets the error message associated with the last thrown error.

Returns

The error message.

```
70      {
71          return GetErrorMessage(GetLastError());
72      }
```

7.21.2.5 static Win32Exception TriDevs.TriEngine.Native.Helpers.GetLastWin32Exception() [static]

Gets the Win32Exception associated with the last thrown error.

Returns

The Win32Exception.

```
89     {
90         return GetWin32Exception(GetLastError());
91     }
```

7.21.2.6 static Win32Exception TriDevs.TriEngine.Native.Helpers.GetWin32Exception(int err) [static]

Gets the Win32Exception associated with the specified error code.

Parameters

<code>err</code>	The error code.
------------------	-----------------

Returns

The Win32Exception for the provided error code.

```
80     {
81         return new Win32Exception(err);
82     }
```

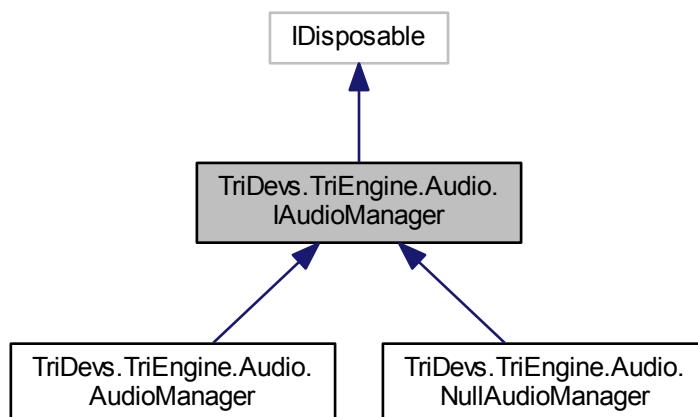
The documentation for this class was generated from the following file:

- `TriDevs.TriEngine/Native/Helpers.cs`

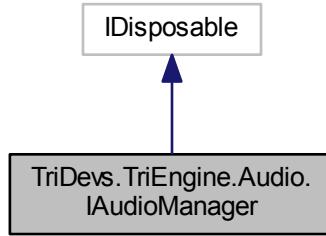
7.22 TriDevs.TriEngine.Audio.IAudioManager Interface Reference

Provides various methods to manipulate audio.

Inheritance diagram for `TriDevs.TriEngine.Audio.IAudioManager`:



Collaboration diagram for TriDevs.TriEngine.Audio.IAudioManager:



Public Member Functions

- void [StopAll \(\)](#)
Immediately stops all playback of sounds and songs.
- [ISound LoadSound \(string name, string file, AudioFormat format=AudioFormat.Wav\)](#)
Loads a sound into the audio manager.
- bool [HasSound \(string name\)](#)
Returns a value indicating whether a sound with the specified name has been loaded into the audio manager.
- [ISound GetSound \(string name\)](#)
Gets the sound with the specified name.
- void [StopAllSongs \(\)](#)
Immediately stops playback of all sounds.
- [ISong LoadSong \(string name, string file, AudioFormat format=AudioFormat.Ogg\)](#)
Load a song into the audio manager.
- bool [HasSong \(string name\)](#)
Returns a value indicating whether a song with the specified name has been loaded into the audio manager.
- [ISong GetSong \(string name\)](#)
Gets the song with the specified name.
- void [StopAllSongs \(\)](#)
Immediately stops playback of all songs.

7.22.1 Detailed Description

Provides various methods to manipulate audio.

7.22.2 Member Function Documentation

7.22.2.1 ISong TriDevs.TriEngine.Audio.IAudioManager.GetSong (string name)

Gets the song with the specified name.

Parameters

<i>name</i>	Name of the song to get.
-------------	--------------------------

Returns

An object implementing the [ISong](#) interface, or null if no song matched the requested name.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

Here is the caller graph for this function:

**7.22.2.2 ISound TriDevs.TriEngine.Audio.IAudioManager.GetSound (string name)**

Gets the sound with the specified name.

Parameters

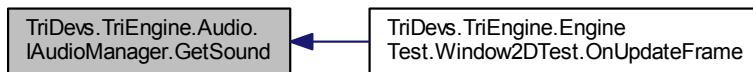
<i>name</i>	Name of the sound to get.
-------------	---------------------------

Returns

An object implementing the [ISound](#) interface, or null if no sound matched the requested name.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

Here is the caller graph for this function:

**7.22.2.3 bool TriDevs.TriEngine.Audio.IAudioManager.HasSong (string name)**

Returns a value indicating whether a song with the specified name has been loaded into the audio manager.

Parameters

<i>name</i>	Name to check for.
-------------	--------------------

Returns

True if the song has been loaded, false otherwise.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

7.22.2.4 bool TriDevs.TriEngine.Audio.IAudioManager.HasSound (string name)

Returns a value indicating whether a sound with the specified name has been loaded into the audio manager.

Parameters

<i>name</i>	Name to check for.
-------------	--------------------

Returns

True if the sound has been loaded, false otherwise.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

7.22.2.5 ISong TriDevs.TriEngine.Audio.IAudioManager.LoadSong (string name, string file, AudioFormat format = AudioFormat.Ogg)

Load a song into the audio manager.

If a song with the same name has already been loaded, it will be returned instead.

Parameters

<i>name</i>	Name to assign to the new song object.
<i>file</i>	Path to the file that will be used.
<i>format</i>	Format of the file.

Returns

The resulting object implementing the [ISong](#) interface.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

7.22.2.6 ISound TriDevs.TriEngine.Audio.IAudioManager.LoadSound (string name, string file, AudioFormat format = AudioFormat.Wav)

Loads a sound into the audio manager.

If a sound with the same name has already been loaded, it will be returned instead.

Parameters

<i>name</i>	Name to assign to the new sound object.
<i>file</i>	Path to the file that will be used.
<i>format</i>	The format of the file to load.

Returns

The resulting object implementing the [ISound](#) interface.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

7.22.2.7 void TriDevs.TriEngine.Audio.IAudioManager.StopAll ()

Immediately stops all playback of sounds and songs.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

7.22.2.8 void TriDevs.TriEngine.Audio.IAudioManager.StopAllSongs()

Immediately stops playback of all songs.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

7.22.2.9 void TriDevs.TriEngine.Audio.IAudioManager.StopAllSounds()

Immediately stops playback of all sounds.

Implemented in [TriDevs.TriEngine.Audio.AudioManager](#), and [TriDevs.TriEngine.Audio.NullAudioManager](#).

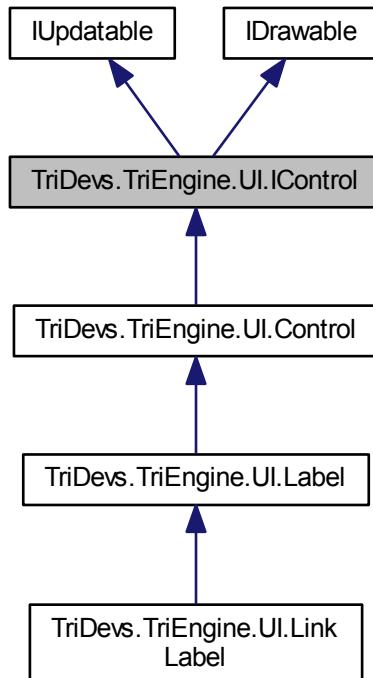
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Audio/IAudioManager.cs](#)

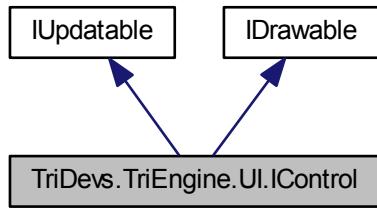
7.23 TriDevs.TriEngine.UI.IContainer Interface Reference

A [UI](#) control that can be drawn on screen and interacted with.

Inheritance diagram for TriDevs.TriEngine.UI.IContainer:



Collaboration diagram for TriDevs.TriEngine.UI.IControl:



Public Member Functions

- void [Enable \(\)](#)
Enables the control.
- void [Disable \(\)](#)
Disables the control.
- void [Show \(\)](#)
Shows the control.
- void [Hide \(\)](#)
Hides the control.

Properties

- bool [Enabled \[get, set\]](#)
Gets or sets a value indicating whether this control can be interacted with.
- bool [Visible \[get, set\]](#)
Gets or sets a value indicating whether this control should be drawn to the screen.
- [Color Color \[get, set\]](#)
The color of this control.
- [Point< int > Position \[get, set\]](#)
The position of this control, in pixel coordinates.
- [Point< int > Size \[get, set\]](#)
Gets or sets the size of this control, in pixels.
- [Rectangle Rectangle \[get, set\]](#)
Gets the rectangular area on the screen that this control is occupying.
- string [Text \[get, set\]](#)
Gets or sets the text associated with this control.

Events

- [ControlClickedEventHandler Clicked](#)
Raised when this control is clicked on by the user.

7.23.1 Detailed Description

A [UI](#) control that can be drawn on screen and interacted with.

7.23.2 Member Function Documentation

7.23.2.1 void TriDevs.TriEngine.UI.IControl.Disable()

Disables the control.

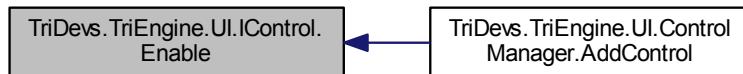
Implemented in [TriDevs.TriEngine.UI.Control](#).

7.23.2.2 void TriDevs.TriEngine.UI.IControl.Enable()

Enables the control.

Implemented in [TriDevs.TriEngine.UI.Control](#).

Here is the caller graph for this function:

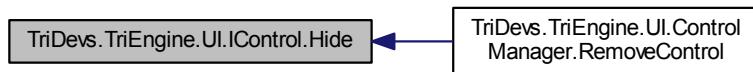


7.23.2.3 void TriDevs.TriEngine.UI.IControl.Hide()

Hides the control.

Implemented in [TriDevs.TriEngine.UI.Control](#).

Here is the caller graph for this function:

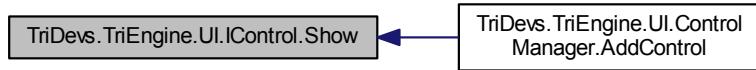


7.23.2.4 void TriDevs.TriEngine.UI.IControl.Show()

Shows the control.

Implemented in [TriDevs.TriEngine.UI.Control](#).

Here is the caller graph for this function:



7.23.3 Property Documentation

7.23.3.1 Color `TriDevs.TriEngine.UI.IControl.Color` [get], [set]

The color of this control.

7.23.3.2 bool `TriDevs.TriEngine.UI.IControl.Enabled` [get], [set]

Gets or sets a value indicating whether this control can be interacted with.

7.23.3.3 Point<int> `TriDevs.TriEngine.UI.IControl.Position` [get], [set]

The position of this control, in pixel coordinates.

7.23.3.4 Rectangle `TriDevs.TriEngine.UI.IControl.Rectangle` [get], [set]

Gets the rectangular area on the screen that this control is occupying.

7.23.3.5 Point<int> `TriDevs.TriEngine.UI.IControl.Size` [get], [set]

Gets or sets the size of this control, in pixels.

7.23.3.6 string `TriDevs.TriEngine.UI.IControl.Text` [get], [set]

Gets or sets the text associated with this control.

7.23.3.7 bool `TriDevs.TriEngine.UI.IControl.Visible` [get], [set]

Gets or sets a value indicating whether this control should be drawn to the screen.

7.23.4 Event Documentation

7.23.4.1 ControlClickedEventHandler `TriDevs.TriEngine.UI.IControl.Clicked`

Raised when this control is clicked on by the user.

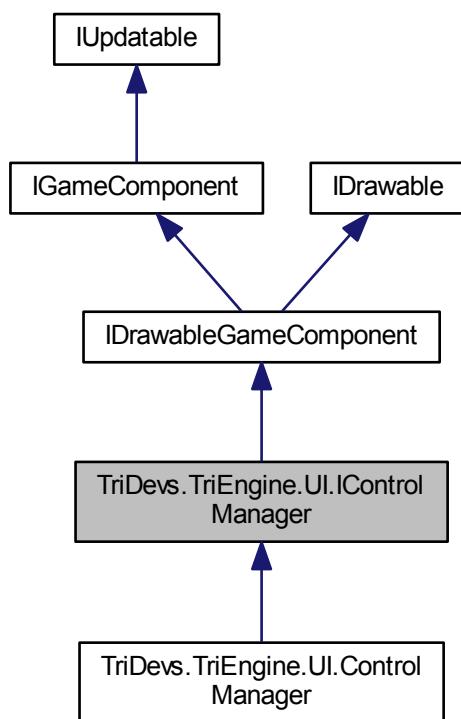
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/UI/IControl.cs](#)

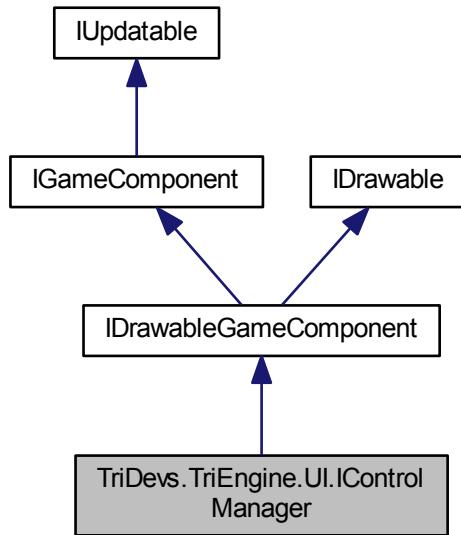
7.24 TriDevs.TriEngine.UI.IControlManager Interface Reference

Manages various [UI](#) controls, automatically updating and drawing them to the screen.

Inheritance diagram for TriDevs.TriEngine.UI.IControlManager:



Collaboration diagram for TriDevs.TriEngine.UI.IControlManager:



Public Member Functions

- [IControl AddControl \(IControl control\)](#)
Adds a new control to this control manager.
- [void RemoveControl \(IControl control\)](#)
Removes a control from this control manager.
- [void RemoveAllControls \(Type type\)](#)
Removes all controls of a specific type from this control manager.
- [void RemoveAllControls \(Func< IControl, bool > func\)](#)
Removes all controls matching the supplied predicate function.
- [bool HasControl \(IControl control\)](#)
Returns whether this control manager contains the specified control.
- [bool HasControl \(Type type\)](#)
Returns whether this control manager contains any control of the specified type.
- [bool HasControl \(Func< IControl, bool > func\)](#)
Returns whether this control manager contains any control matching the supplied predicate function.

Additional Inherited Members

7.24.1 Detailed Description

Manages various UI controls, automatically updating and drawing them to the screen.

7.24.2 Member Function Documentation

7.24.2.1 **IControl** `TriDevs.TriEngine.UI.IControlManager.AddControl (IControl control)`

Adds a new control to this control manager.

Parameters

<code>control</code>	The control to add.
----------------------	---------------------

Returns

The control that was added.

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

7.24.2.2 **bool** `TriDevs.TriEngine.UI.IControlManager.HasControl (IControl control)`

Returns whether this control manager contains the specified control.

Parameters

<code>control</code>	The control to check.
----------------------	-----------------------

Returns

True if the specified control exists in this control manager, false otherwise.

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

7.24.2.3 **bool** `TriDevs.TriEngine.UI.IControlManager.HasControl (Type type)`

Returns whether this control manager contains any control of the specified type.

Parameters

<code>type</code>	The type to check.
-------------------	--------------------

Returns

True if this control manager contains a control of the specified type, false otherwise.

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

7.24.2.4 **bool** `TriDevs.TriEngine.UI.IControlManager.HasControl (Func< IControl, bool > func)`

Returns whether this control manager contains any control matching the supplied predicate function.

Parameters

<code>func</code>	The predicate function.
-------------------	-------------------------

Returns

True if this control manager contains a control matching the specified predicate, false otherwise.

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

7.24.2.5 void TriDevs.TriEngine.UI.IControlManager.RemoveAllControls (Type type)

Removes all controls of a specific type from this control manager.

Parameters

<i>type</i>	The type of control to remove.
-------------	--------------------------------

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

7.24.2.6 void TriDevs.TriEngine.UI.IControlManager.RemoveAllControls (Func< IControl, bool > func)

Removes all controls matching the supplied predicate function.

Parameters

<i>func</i>	The predicate function to use.
-------------	--------------------------------

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

7.24.2.7 void TriDevs.TriEngine.UI.IControlManager.RemoveControl (IControl control)

Removes a control from this control manager.

Parameters

<i>control</i>	The control to remove.
----------------	------------------------

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

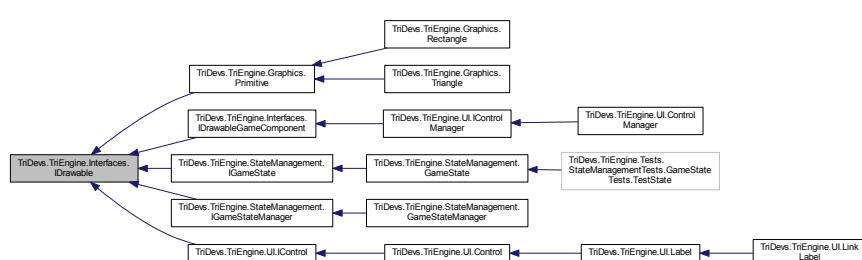
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/UI/IControlManager.cs](#)

7.25 TriDevs.TriEngine.Interfaces.IDrawable Interface Reference

Implements a simple draw method.

Inheritance diagram for TriDevs.TriEngine.Interfaces.IDrawable:



Public Member Functions

- void [Draw \(\)](#)

Draw the object to screen.

7.25.1 Detailed Description

Implements a simple draw method.

7.25.2 Member Function Documentation

7.25.2.1 void TriDevs.TriEngine.Interfaces.IDrawable.Draw ()

Draw the object to screen.

Implemented in [TriDevs.TriEngine.UI.Label](#), [TriDevs.TriEngine.UI.Control](#), [TriDevs.TriEngine.Graphics.Primitive](#), [TriDevs.TriEngine.StateManagement.GameStateManager](#), [TriDevs.TriEngine.UI.ControlManager](#), and [TriDevs.TriEngine.StateManagement.GameState](#).

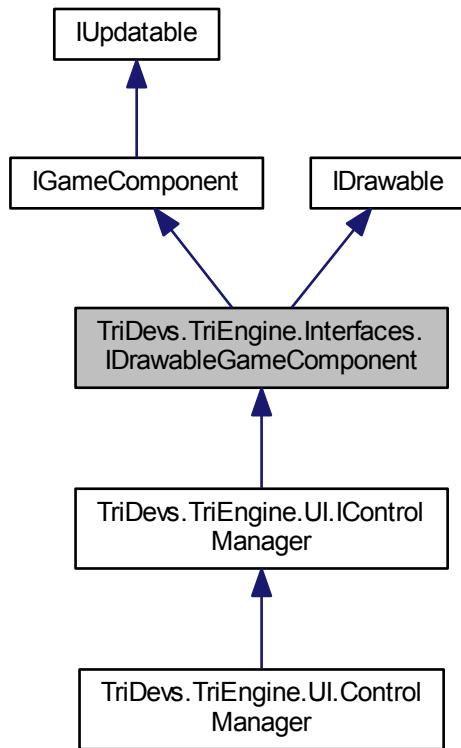
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Interfaces/IDrawable.cs](#)

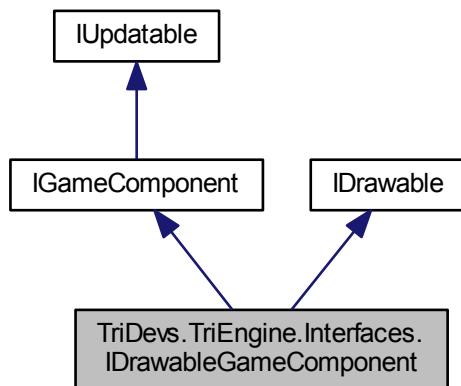
7.26 TriDevs.TriEngine.Interfaces.IDrawableGameComponent Interface Reference

A game component that can be added to GameState objects. Drawable game components also implement a draw method to draw themselves to screen.

Inheritance diagram for TriDevs.TriEngine.Interfaces.IDrawableGameComponent:



Collaboration diagram for TriDevs.TriEngine.Interfaces.IDrawableGameComponent:



Additional Inherited Members

7.26.1 Detailed Description

A game component that can be added to GameState objects. Drawable game components also implement a draw method to draw themselves to screen.

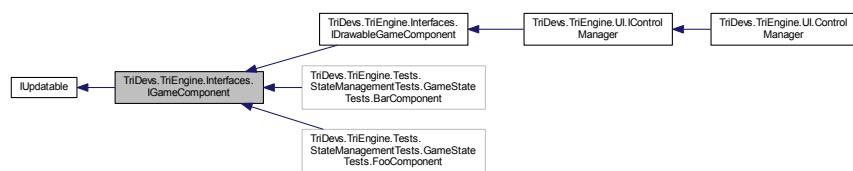
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Interfaces/IDrawableGameComponent.cs](#)

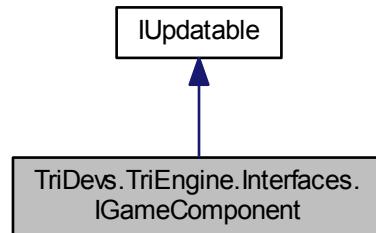
7.27 TriDevs.TriEngine.Interfaces.IGameComponent Interface Reference

A game component that can be added to IGameState objects.

Inheritance diagram for TriDevs.TriEngine.Interfaces.IGameComponent:



Collaboration diagram for TriDevs.TriEngine.Interfaces.IGameComponent:



Public Member Functions

- void `Enable ()`
Enables this game component.
- void `Disable ()`
Disables this game component.

Properties

- bool `Enabled [get, set]`
Gets or sets a value indicating whether this component is enabled or not.

7.27.1 Detailed Description

A game component that can be added to IGameState objects.

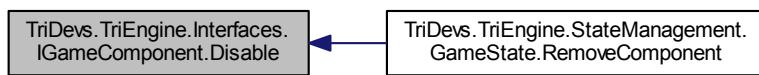
7.27.2 Member Function Documentation

7.27.2.1 void TriDevs.TriEngine.Interfaces.IGameComponent.Disable()

Disables this game component.

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

Here is the caller graph for this function:

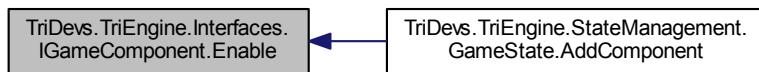


7.27.2.2 void TriDevs.TriEngine.Interfaces.IGameComponent.Enable()

Enables this game component.

Implemented in [TriDevs.TriEngine.UI.ControlManager](#).

Here is the caller graph for this function:



7.27.3 Property Documentation

7.27.3.1 bool TriDevs.TriEngine.Interfaces.IGameComponent.Enabled [get], [set]

Gets or sets a value indicating whether this component is enabled or not.

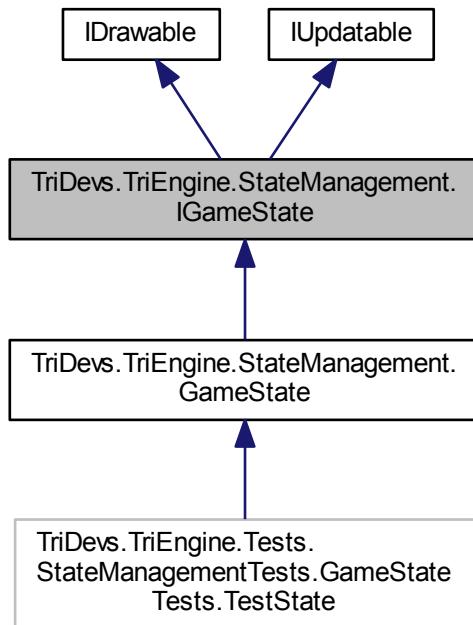
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Interfaces/IGameComponent.cs](#)

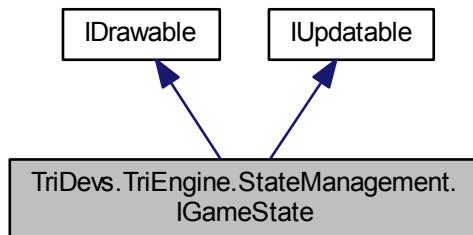
7.28 TriDevs.TriEngine.StateManagement.IGameState Interface Reference

A game state that can be used with the game state manager. Represent a specific state of the game, like main menu and options screen.

Inheritance diagram for TriDevs.TriEngine.StateManagement.IGameState:



Collaboration diagram for TriDevs.TriEngine.StateManagement.IGameState:



Public Member Functions

- void [Load \(\)](#)
Loads resources associated with this game component.
- void [Unload \(\)](#)
Unloads resources that were loaded in the [Load](#) method.
- void [Pause \(\)](#)
Pauses the game state, preventing update calls from running.

- void [Unpause \(\)](#)
Unpauses the game state, enabling update calls again.
- [IGameComponent AddComponent \(IGameComponent component\)](#)
Adds a game component to this game state.
- void [RemoveComponent \(IGameComponent component\)](#)
Removes the specified component from this game state.
- void [RemoveAllComponents \(\)](#)
Removes all components from the game state.
- void [RemoveAllComponents \(Type type\)](#)
Removes all components of the specified type from the game state.
- void [RemoveAllComponents \(Predicate< IGameComponent > predicate\)](#)
Removes all components that match the supplied predicate function.
- bool [HasComponent \(IGameComponent component\)](#)
Returns whether this game state contains the specified IGameComponent.
- bool [HasComponent \(Type type\)](#)
Returns whether this game state contains a specific type of component.
- bool [HasComponent \(Func< IGameComponent, bool > func\)](#)
Returns whether this game state contains a component that matches the supplied predicate.
- [IEnumerable< IGameComponent > GetAllComponents \(\)](#)
Returns a read-only collection of all components in this game state.
- [IGameComponent GetComponent \(Type type\)](#)
Returns the specified component type if it exists in this game state.
- [IEnumerable< IGameComponent > GetAllComponents \(Type type\)](#)
Returns all components of the specified type.
- [IGameComponent GetComponent \(Func< IGameComponent, bool > func\)](#)
Returns the first component that matches the supplied predicate function.
- [IEnumerable< IGameComponent > GetAllComponents \(Func< IGameComponent, bool > func\)](#)
Returns all components that matches the supplied predicate function.

Properties

- bool [Paused \[get, set\]](#)
Gets or sets a value indicating whether this game state is currently paused.

7.28.1 Detailed Description

A game state that can be used with the game state manager. Represent a specific state of the game, like main menu and options screen.

7.28.2 Member Function Documentation

7.28.2.1 IGameComponent TriDevs.TriEngine.StateManagement.IGameState.AddComponent (IGameComponent component)

Adds a game component to this game state.

Parameters

<i>component</i>	The component to add.
------------------	-----------------------

Returns

The component that was added.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.2 IEnumerable<IGameComponent> TriDevs.TriEngine.StateManagement.IGameState.GetAllComponents ()

Returns a read-only collection of all components in this game state.

Returns

Read-only collection of components.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.3 IEnumerable<IGameComponent> TriDevs.TriEngine.StateManagement.IGameState.GetAllComponents (Type type)

Returns all components of the specified type.

Parameters

<i>type</i>	The type of game component requested.
-------------	---------------------------------------

Returns

A collection of all components of matching type.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.4 IEnumerable<IGameComponent> TriDevs.TriEngine.StateManagement.IGameState.GetAllComponents (Func< IGameComponent, bool > func)

Returns all components that matches the supplied predicate function.

Parameters

<i>func</i>	The predicate function.
-------------	-------------------------

Returns

Collection of all matching components, empty collection if no matches were found.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.5 IGameComponent TriDevs.TriEngine.StateManagement.IGameState.GetComponent (Type type)

Returns the specified component type if it exists in this game state.

Parameters

<i>type</i>	The component type to get.
-------------	----------------------------

Returns

The component object, or null if it's not added to this game state.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.6 IGameComponent TriDevs.TriEngine.StateManagement.IGameState.GetComponent (Func< IGameComponent, bool > func)

Returns the first component that matches the supplied predicate function.

Parameters

<i>func</i>	The predicate function.
-------------	-------------------------

Returns

Component that matches the predicate, null if no matches were found.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.7 bool TriDevs.TriEngine.StateManagement.IGameState.HasComponent (IGameComponent component)

Returns whether this game state contains the specified IGameComponent.

Parameters

<i>component</i>	The component to check for.
------------------	-----------------------------

Returns

True if the component has been added to this game state, false otherwise.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.8 bool TriDevs.TriEngine.StateManagement.IGameState.HasComponent (Type type)

Returns whether this game state contains a specific type of component.

Parameters

<i>type</i>	The type to check for.
-------------	------------------------

Returns

True if the type of component has been added to this game state, false otherwise.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.9 bool TriDevs.TriEngine.StateManagement.IGameState.HasComponent (Func< IGameComponent, bool > func)

Returns whether this game state contains a component that matches the supplied predicate.

Parameters

<i>func</i>	Predicate function to use for search.
-------------	---------------------------------------

Returns

True if the game state contains a matching component, false otherwise.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.10 void TriDevs.TriEngine.StateManagement.IGameState.Load ()

Loads resources associated with this game component.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

Here is the caller graph for this function:

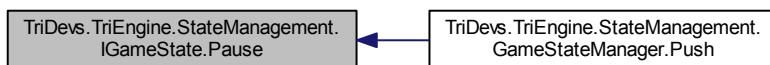


7.28.2.11 void TriDevs.TriEngine.StateManagement.IGameState.Pause ()

Pauses the game state, preventing update calls from running.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

Here is the caller graph for this function:



7.28.2.12 void TriDevs.TriEngine.StateManagement.IGameState.RemoveAllComponents ()

Removes all components from the game state.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.13 void TriDevs.TriEngine.StateManagement.IGameState.RemoveAllComponents (Type type)

Removes all components of the specified type from the game state.

Parameters

<i>type</i>	The type of component to remove.
-------------	----------------------------------

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.14 void TriDevs.TriEngine.StateManagement.IGameState.RemoveAllComponents (*Predicate< IGameComponent > predicate*)

Removes all components that match the supplied predicate function.

Parameters

<i>predicate</i>	The predicate function.
------------------	-------------------------

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.15 void TriDevs.TriEngine.StateManagement.IGameState.RemoveComponent (*IGameComponent component*)

Removes the specified component from this game state.

Parameters

<i>component</i>

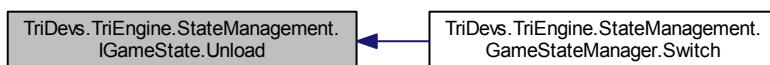
Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.2.16 void TriDevs.TriEngine.StateManagement.IGameState.Unload ()

Unloads resources that were loaded in the [Load](#) method.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

Here is the caller graph for this function:



7.28.2.17 void TriDevs.TriEngine.StateManagement.IGameState.Unpause ()

Unpauses the game state, enabling update calls again.

Implemented in [TriDevs.TriEngine.StateManagement.GameState](#).

7.28.3 Property Documentation

7.28.3.1 bool TriDevs.TriEngine.StateManagement.IGameState.Paused [get], [set]

Gets or sets a value indicating whether this game state is currently paused.

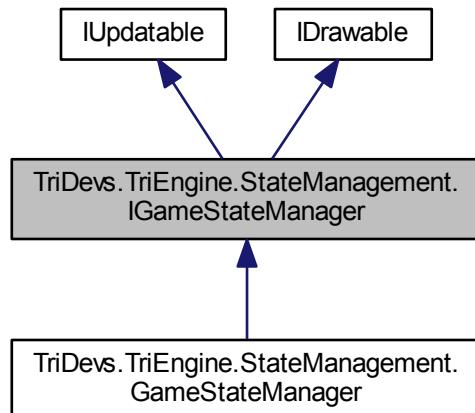
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/StateManagement/IGameState.cs](#)

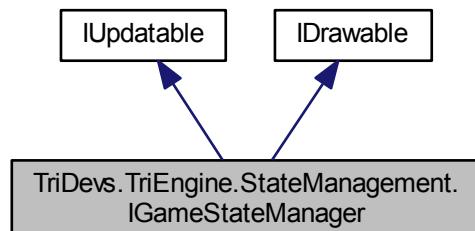
7.29 TriDevs.TriEngine.StateManagement.IGameStateManager Interface Reference

Game state manager that keeps track of the active game states and provides methods to control the states.

Inheritance diagram for TriDevs.TriEngine.StateManagement.IGameStateManager:



Collaboration diagram for TriDevs.TriEngine.StateManagement.IGameStateManager:



Public Member Functions

- [IGameState Push \(IGameState state\)](#)
Pushes a new game state onto the stack, pausing the current one.
- [IGameState Pop \(\)](#)
Pops the currently active state from the stack, unpausing the previous one.
- [IGameState Peek \(\)](#)
Returns the game state at the top of the stack, without popping it.
- [IGameState Switch \(IGameState state\)](#)
Switches to a new game state, discarding all previous ones in the stack.

Properties

- int **StateCount** [get]
Gets the number of game states currently in the stack.
- **IGameState ActiveState** [get]
Gets the currently active game state.

7.29.1 Detailed Description

Game state manager that keeps track of the active game states and provides methods to control the states.

7.29.2 Member Function Documentation

7.29.2.1 IGameState TriDevs.TriEngine.StateManagement.IGameStateManager.Peek ()

Returns the game state at the top of the stack, without popping it.

Returns

The state at the top of the stack.

Implemented in [TriDevs.TriEngine.StateManagement.GameStateManager](#).

7.29.2.2 IGameState TriDevs.TriEngine.StateManagement.IGameStateManager.Pop ()

Pops the currently active state from the stack, unpausing the previous one.

Returns

The state that was popped.

Implemented in [TriDevs.TriEngine.StateManagement.GameStateManager](#).

7.29.2.3 IGameState TriDevs.TriEngine.StateManagement.IGameStateManager.Push (IGameState state)

Pushes a new game state onto the stack, pausing the current one.

Parameters

<code>state</code>	The new game state to push onto the stack.
--------------------	--

Returns

The game state that was pushed.

Implemented in [TriDevs.TriEngine.StateManagement.GameStateManager](#).

7.29.2.4 IGameState TriDevs.TriEngine.StateManagement.IGameStateManager.Switch (IGameState state)

Switches to a new game state, discarding all previous ones in the stack.

Parameters

<code>state</code>	The new state to switch to.
--------------------	-----------------------------

Returns

The state that was switched to.

Implemented in [TriDevs.TriEngine.StateManagement.GameStateManager](#).

7.29.3 Property Documentation

7.29.3.1 [IGameState](#) [TriDevs.TriEngine.StateManagement.IGameStateManager.ActiveState](#) [get]

Gets the currently active game state.

7.29.3.2 [int](#) [TriDevs.TriEngine.StateManagement.IGameStateManager.StateCount](#) [get]

Gets the number of game states currently in the stack.

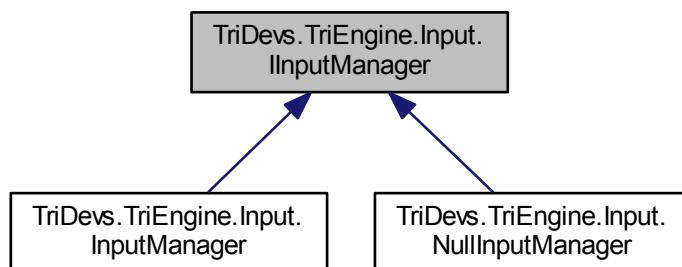
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/StateManager/IGameStateManager.cs](#)

7.30 [TriDevs.TriEngine.Input.IInputManager](#) Interface Reference

Provides various methods to query input devices like the keyboard.

Inheritance diagram for [TriDevs.TriEngine.Input.IInputManager](#):



Public Member Functions

- void [Update \(\)](#)
Updates the input manager, refreshing all current and previous states.
- bool [IsKeyUp \(Key key\)](#)
Returns whether or not the specified key is currently unpressed.
- bool [IsKeyDown \(Key key\)](#)
Returns whether or not the specified key is currently being pressed.
- bool [KeyPressed \(Key key\)](#)
Returns whether or not the specified key has been pressed.
- bool [KeyReleased \(Key key\)](#)

- `bool IsMouseUp (MouseButton button)`
Returns whether or not the specified key has been released.
- `bool IsMouseDown (MouseButton button)`
Returns whether or not the specified mouse button is currently unpressed.
- `bool MousePressed (MouseButton button)`
Returns whether or not the specified mouse button is currently being pressed.
- `bool MouseReleased (MouseButton button)`
Returns whether or not the specified mouse button has been released.
- `bool IsWheelUp ()`
Returns whether the mouse wheel was scrolled up.
- `bool IsWheelDown ()`
Returns whether the mouse wheel was scrolled down.
- `bool IsWheelChanged ()`
Returns whether the mouse wheel scrolled at all.
- `int WheelChange ()`
Returns the mouse wheel's change in value.

Properties

- `int MouseX [get]`
Gets the absolute X position of the pointer, in window pixel coordinates.
- `int MouseY [get]`
Gets the absolute Y position of the pointer, in window pixel coordinates.
- `Point< int > MousePosition [get]`
Gets a Point representing the position of the mouse pointer, in window pixel coordinates.
- `int MouseWheelValue [get]`
Gets the current value of the mouse wheel.
- `bool this[Key key] [get]`
Gets a boolean value indicating whether the specified OpenTK.Input.Key is pressed.
- `bool this[MouseButton button] [get]`
Gets a boolean value indicating whether the specified OpenTK.Input.MouseButton is pressed.

Events

- `KeyDownEventHandler KeyDown`
Raised when a key is pressed down.
- `KeyUpEventHandler KeyUp`
Raised when a key is released.
- `KeyPressEventHandler KeyPress`
Raised when a character is typed.
- `MouseDownEventHandler MouseDown`
Raised when a mouse button is pressed down.
- `MouseUpEventHandler MouseUp`
Raised when a mouse button is released.
- `MouseWheelChangedEventHandler WheelChanged`
Raised when the mouse wheel value changes.
- `MouseWheelDownEventHandler WheelDown`
Raised when the mouse wheel is scrolled downwards.
- `MouseWheelUpEventHandler WheelUp`
Raised when the mouse wheel is scrolled upwards.

7.30.1 Detailed Description

Provides various methods to query input devices like the keyboard.

7.30.2 Member Function Documentation

7.30.2.1 bool TriDevs.TriEngine.Input.IInputManager.IsKeyDown (Key key)

Returns whether or not the specified key is currently being pressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key is currently being pressed, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.2 bool TriDevs.TriEngine.Input.IInputManager.IsKeyUp (Key key)

Returns whether or not the specified key is currently unpressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if the key is currently up (not pressed), false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.3 bool TriDevs.TriEngine.Input.IInputManager.IsMouseDown (MouseButton button)

Returns whether or not the specified mouse button is currently being pressed.

Parameters

<i>button</i>	The button to query for.
---------------	--------------------------

Returns

True if button is currently being pressed, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.4 bool TriDevs.TriEngine.Input.IInputManager.IsMouseUp (MouseButton button)

Returns whether or not the specified mouse button is currently unpressed.

Parameters

<i>button</i>	Button to query for.
---------------	----------------------

Returns

True if the button is currently up (not pressed), false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.5 bool TriDevs.TriEngine.Input.IInputManager.IsWheelChanged ()

Returns whether the mouse wheel scrolled at all.

Returns

True if the mouse wheel scrolled, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.6 bool TriDevs.TriEngine.Input.IInputManager.IsWheelDown ()

Returns whether the mouse wheel was scrolled down.

Returns

True if mouse wheel was scrolled down, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.7 bool TriDevs.TriEngine.Input.IInputManager.IsWheelUp ()

Returns whether the mouse wheel was scrolled up.

Returns

True if mouse wheel was scrolled up, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.8 bool TriDevs.TriEngine.Input.IInputManager.KeyPressed (Key key)

Returns whether or not the specified key has been pressed.

Only returns true if the last state of the key was not pressed.

Parameters

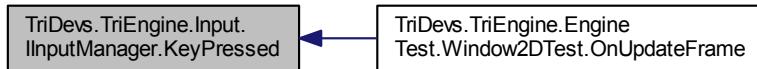
<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key was pressed, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

Here is the caller graph for this function:

**7.30.2.9 bool TriDevs.TriEngine.Input.IInputManager.KeyReleased (Key key)**

Returns whether or not the specified key has been released.

Only returns true if the last state of the key was pressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key was released, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.10 bool TriDevs.TriEngine.Input.IInputManager.MousePressed (MouseButton button)

Returns whether or not the specified mouse button has been pressed.

Only returns true if the last state of the mouse button was not pressed.

Parameters

<i>button</i>	Button to query for.
---------------	----------------------

Returns

True if button was pressed, false otherwise.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.11 bool TriDevs.TriEngine.Input.IInputManager.MouseReleased (MouseButton button)

Returns whether or not the specified mouse button has been released.

Only returns true if the last state of the button was pressed.

Parameters

<i>button</i>	The button to query for.
---------------	--------------------------

Returns

True if the button was released, false otherwise.

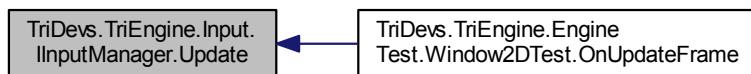
Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.2.12 void TriDevs.TriEngine.Input.IInputManager.Update()

Updates the input manager, refreshing all current and previous states.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

Here is the caller graph for this function:

**7.30.2.13 int TriDevs.TriEngine.Input.IInputManager.WheelChange()**

Returns the mouse wheel's change in value.

Returns

Negative value if wheel scrolled down, positive value if scrolled up, zero if not scrolled.

Implemented in [TriDevs.TriEngine.Input.InputManager](#), and [TriDevs.TriEngine.Input.NullInputManager](#).

7.30.3 Property Documentation**7.30.3.1 Point<int> TriDevs.TriEngine.Input.IInputManager.mousePosition [get]**

Gets a Point representing the position of the mouse pointer, in window pixel coordinates.

7.30.3.2 int TriDevs.TriEngine.Input.IInputManager.mouseWheelValue [get]

Gets the current value of the mouse wheel.

7.30.3.3 int TriDevs.TriEngine.Input.IInputManager.mousePositionX [get]

Gets the absolute X position of the pointer, in window pixel coordinates.

7.30.3.4 int TriDevs.TriEngine.Input.IInputManager.mousePositionY [get]

Gets the absolute Y position of the pointer, in window pixel coordinates.

7.30.3.5 bool TriDevs.TriEngine.Input.IInputManager.this[Key key] [get]

Gets a boolean value indicating whether the specified OpenTK.Input.Key is pressed.

Parameters

<i>key</i>	The key to query.
------------	-------------------

Returns

True if pressed, false otherwise.

7.30.3.6 bool TriDevs.TriEngine.Input.IInputManager.this[MouseButton button] [get]

Gets a boolean value indicating whether the specified OpenTK.Input.MouseButton is pressed.

Parameters

<i>button</i>	The button to query.
---------------	----------------------

Returns

True if pressed, false otherwise.

7.30.4 Event Documentation

7.30.4.1 KeyDownEventHandler TriDevs.TriEngine.Input.IInputManager.KeyDown

Raised when a key is pressed down.

7.30.4.2 KeyPressEventHandler TriDevs.TriEngine.Input.IInputManager.KeyPress

Raised when a character is typed.

7.30.4.3 KeyUpEventHandler TriDevs.TriEngine.Input.IInputManager.KeyUp

Raised when a key is released.

7.30.4.4 MouseDownEventHandler TriDevs.TriEngine.Input.IInputManager.MouseDown

Raised when a mouse button is pressed down.

7.30.4.5 MouseUpEventHandler TriDevs.TriEngine.Input.IInputManager.MouseUp

Raised when a mouse button is released.

7.30.4.6 MouseWheelChangedEventHandler TriDevs.TriEngine.Input.IInputManager.WheelChanged

Raised when the mouse wheel value changes.

7.30.4.7 MouseWheelDownEventHandler TriDevs.TriEngine.Input.IInputManager.WheelDown

Raised when the mouse wheel is scrolled downwards.

7.30.4.8 MouseWheelUpEventHandler TriDevs.TriEngine.Input.IInputManager.WheelUp

Raised when the mouse wheel is scrolled upwards.

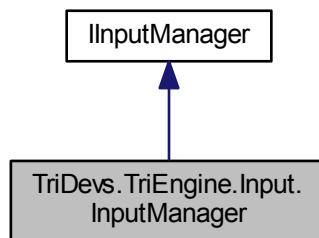
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Input/IInputManager.cs](#)

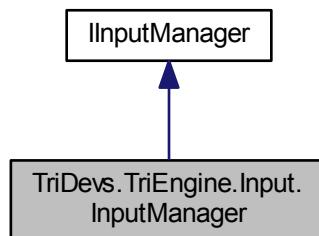
7.31 TriDevs.TriEngine.Input.InputManager Class Reference

[Input](#) manager interfacing with input methods provided by a GameWindow.

Inheritance diagram for TriDevs.TriEngine.Input.InputManager:



Collaboration diagram for TriDevs.TriEngine.Input.InputManager:



Public Member Functions

- [InputManager \(\)](#)

- Creates a new `InputManager` with only basic low-level input support.
- `InputManager (GameWindow window)`
Creates a new `InputManager` associated with the specified `GameWindow`.
- `void Update ()`
Updates the input manager, refreshing all current and previous states.
- `bool IsKeyUp (Key key)`
Returns whether or not the specified key is currently unpressed.
- `bool IsKeyDown (Key key)`
Returns whether or not the specified key is currently being pressed.
- `bool KeyPressed (Key key)`
Returns whether or not the specified key has been pressed.
- `bool KeyReleased (Key key)`
Returns whether or not the specified key has been released.
- `bool IsMouseUp (MouseButton button)`
Returns whether or not the specified mouse button is currently unpressed.
- `bool IsMouseDown (MouseButton button)`
Returns whether or not the specified mouse button is currently being pressed.
- `bool MousePressed (MouseButton button)`
Returns whether or not the specified mouse button has been pressed.
- `bool MouseReleased (MouseButton button)`
Returns whether or not the specified mouse button has been released.
- `bool IsWheelUp ()`
Returns whether the mouse wheel was scrolled up.
- `bool IsWheelDown ()`
Returns whether the mouse wheel was scrolled down.
- `bool IsWheelChanged ()`
Returns whether the mouse wheel scrolled at all.
- `int WheelChange ()`
Returns the mouse wheel's change in value.

Properties

- `int MouseX [get]`
- `int MouseY [get]`
- `Point< int > MousePosition [get]`
- `int MouseWheelValue [get]`
- `bool this[Key key] [get]`
- `bool this[MouseButton button] [get]`

Events

- `KeyDownEventHandler KeyDown`
Raised when a key is pressed down.
- `KeyUpEventHandler KeyUp`
Raised when a key is released.
- `KeyPressEventHandler KeyPress`
Raised when a character is typed.
- `MouseDownEventHandler MouseDown`
Raised when a mouse button is pressed down.
- `MouseUpEventHandler MouseUp`
Raised when a mouse button is released.

- MouseWheelChangedEventHandler [WheelChanged](#)
Raised when the mouse wheel value changes.
- MouseWheelDownEventHandler [WheelDown](#)
Raised when the mouse wheel is scrolled downwards.
- MouseWheelUpEventHandler [WheelUp](#)
Raised when the mouse wheel is scrolled upwards.

7.31.1 Detailed Description

[Input](#) manager interfacing with input methods provided by a GameWindow.

7.31.2 Constructor & Destructor Documentation

7.31.2.1 TriDevs.TriEngine.Input.InputManager()

Creates a new [InputManager](#) with only basic low-level input support.

Creating [InputManager](#) without a driver container will cause the events to be useless and never be raised, only the methods on this class will return any useful info. If you want event support, construct the [InputManager](#) with a GameWindow or other supported driver providers (NYI).

```

109      {
110          // We're assigning an empty mouse device.
111          // This will make position functions return a constant 0.
112          // Instead of being null and causing exceptions.
113          _mouse = new MouseDevice();
114          // We don't have to assign an empty keyboard device,
115          // since we don't have any code that directly relies on it being present.
116      }

```

7.31.2.2 TriDevs.TriEngine.Input.InputManager(GameWindow window)

Creates a new [InputManager](#) associated with the specified GameWindow.

Parameters

<i>window</i>	The GameWindow this InputManager will interface with.
---------------	---

```

123      {
124          _keyboard = window.Keyboard;
125          _mouse = window.Mouse;
126          _keyboard.KeyDown += OnKeyDown;
127          _keyboard.KeyUp += OnKeyUp;
128          window.KeyPress += OnKeyPress;
129          _mouse.ButtonDown += OnMouseDown;
130          _mouse.ButtonUp += OnMouseUp;
131          _mouse.WheelChanged += OnMouseWheelChanged;
132      }

```

7.31.3 Member Function Documentation

7.31.3.1 bool TriDevs.TriEngine.Input.InputManager.IsKeyDown(Key key)

Returns whether or not the specified key is currently being pressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key is currently being pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
201      {
202          return _keyboardState[key];
203      }
```

7.31.3.2 bool TriDevs.TriEngine.Input.InputManager.IsKeyUp (Key key)

Returns whether or not the specified key is currently unpressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if the key is currently up (not pressed), false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
196      {
197          return !_keyboardState[key];
198      }
```

7.31.3.3 bool TriDevs.TriEngine.Input.InputManager.IsMouseDown (MouseButton button)

Returns whether or not the specified mouse button is currently being pressed.

Parameters

<i>button</i>	The button to query for.
---------------	--------------------------

Returns

True if button is currently being pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
221      {
222          return _mouseState[button];
223      }
```

7.31.3.4 bool TriDevs.TriEngine.Input.InputManager.IsMouseUp (MouseButton button)

Returns whether or not the specified mouse button is currently unpressed.

Parameters

<i>button</i>	Button to query for.
---------------	----------------------

Returns

True if the button is currently up (not pressed), false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
216      {
217          return !_mouseState[button];
218      }
```

7.31.3.5 bool TriDevs.TriEngine.Input.InputManager.IsWheelChanged ()

Returns whether the mouse wheel scrolled at all.

Returns

True if the mouse wheel scrolled, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
246      {
247          return _mouseState.Wheel != _lastMouseState.Wheel;
248      }
```

7.31.3.6 bool TriDevs.TriEngine.Input.InputManager.IsWheelDown ()

Returns whether the mouse wheel was scrolled down.

Returns

True if mouse wheel was scrolled down, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
241      {
242          return _mouseState.Wheel < _lastMouseState.Wheel;
243      }
```

7.31.3.7 bool TriDevs.TriEngine.Input.InputManager.IsWheelUp ()

Returns whether the mouse wheel was scrolled up.

Returns

True if mouse wheel was scrolled up, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
236      {
237          return _mouseState.Wheel > _lastMouseState.Wheel;
238      }
```

7.31.3.8 bool TriDevs.TriEngine.Input.InputManager.KeyPressed (Key key)

Returns whether or not the specified key has been pressed.

Only returns true if the last state of the key was not pressed.

Parameters

<code>key</code>	Key to query for.
------------------	-------------------

Returns

True if key was pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
206      {
207          return _keyboardState[key] && !_lastKeyboardState[key];
208      }
```

7.31.3.9 bool TriDevs.TriEngine.Input.InputManager.KeyReleased (Key key)

Returns whether or not the specified key has been released.

Only returns true if the last state of the key was pressed.

Parameters

<code>key</code>	Key to query for.
------------------	-------------------

Returns

True if key was released, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
211      {
212          return !_keyboardState[key] && _lastKeyboardState[key];
213      }
```

7.31.3.10 bool TriDevs.TriEngine.Input.InputManager.MousePressed (MouseButton button)

Returns whether or not the specified mouse button has been pressed.

Only returns true if the last state of the mouse button was not pressed.

Parameters

<code>button</code>	Button to query for.
---------------------	----------------------

Returns

True if button was pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
226      {
227          return _mouseState[button] && !_lastMouseState[button];
228      }
```

7.31.3.11 bool TriDevs.TriEngine.Input.InputManager.MouseReleased (MouseButton button)

Returns whether or not the specified mouse button has been released.

Only returns true if the last state of the button was pressed.

Parameters

<i>button</i>	The button to query for.
---------------	--------------------------

Returns

True if the button was released, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
231      {
232          return !_mouseState[button] && _lastMouseState[button];
233      }
```

7.31.3.12 void TriDevs.TriEngine.Input.InputManager.Update()

Updates the input manager, refreshing all current and previous states.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
187      {
188          _lastKeyboardState = _keyboardState;
189          _keyboardState = Keyboard.GetState();
190
191          _lastMouseState = _mouseState;
192          _mouseState = Mouse.GetState();
193      }
```

7.31.3.13 int TriDevs.TriEngine.Input.InputManager.WheelChange()

Returns the mouse wheel's change in value.

Returns

Negative value if wheel scrolled down, positive value if scrolled up, zero if not scrolled.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
251      {
252          return _mouseState.Wheel - _lastMouseState.Wheel;
253      }
```

7.31.4 Property Documentation**7.31.4.1 Point<int> TriDevs.TriEngine.Input.InputManager.mousePosition [get]****7.31.4.2 int TriDevs.TriEngine.Input.InputManager.mouseWheelValue [get]****7.31.4.3 int TriDevs.TriEngine.Input.InputManager.mousePosition [get]****7.31.4.4 int TriDevs.TriEngine.Input.InputManager.mousePosition [get]****7.31.4.5 bool TriDevs.TriEngine.Input.InputManager.this[Key key] [get]****7.31.4.6 bool TriDevs.TriEngine.Input.InputManager.this[MouseButton button] [get]****7.31.5 Event Documentation****7.31.5.1 KeyDownEventHandler TriDevs.TriEngine.Input.InputManager.KeyDown**

Raised when a key is pressed down.

7.31.5.2 KeyPressEventHandler TriDevs.TriEngine.Input.InputManager.KeyPress

Raised when a character is typed.

7.31.5.3 KeyUpEventHandler TriDevs.TriEngine.Input.InputManager.KeyUp

Raised when a key is released.

7.31.5.4 MouseDownEventHandler TriDevs.TriEngine.Input.InputManager.MouseDown

Raised when a mouse button is pressed down.

7.31.5.5 MouseUpEventHandler TriDevs.TriEngine.Input.InputManager.MouseUp

Raised when a mouse button is released.

7.31.5.6 MouseWheelChangedEventHandler TriDevs.TriEngine.Input.InputManager.WheelChanged

Raised when the mouse wheel value changes.

7.31.5.7 MouseWheelDownEventHandler TriDevs.TriEngine.Input.InputManager.WheelDown

Raised when the mouse wheel is scrolled downwards.

7.31.5.8 MouseWheelUpEventHandler TriDevs.TriEngine.Input.InputManager.WheelUp

Raised when the mouse wheel is scrolled upwards.

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Input/InputManager.cs](#)

7.32 TriDevs.TriEngine.Extensions.IntegerExtensions Class Reference

[Extensions](#) for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.

Static Public Member Functions

- static short [Clamp](#) (this short value, short min, short max)
Clamps the specified short between a minimum and maximum value.
- static ushort [Clamp](#) (this ushort value, ushort min, ushort max)
Clamps the specified unsigned short between a minimum and maximum value.
- static int [Clamp](#) (this int value, int min, int max)
Clamps the specified integer between a minimum and maximum value.
- static uint [Clamp](#) (this uint value, uint min, uint max)
Clamps the specified unsigned integer between a minimum and maximum value.
- static long [Clamp](#) (this long value, long min, long max)
Clamps the specified 64-bit integer between a minimum and maximum value.
- static ulong [Clamp](#) (this ulong value, ulong min, ulong max)
Clamps the specified 64-bit unsigned integer between a minimum and maximum value.

7.32.1 Detailed Description

[Extensions](#) for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.

7.32.2 Member Function Documentation

7.32.2.1 static short TriDevs.TriEngine.Extensions.IntegerExtensions.Clamp (this short value, short min, short max) [static]

Clamps the specified short between a minimum and maximum value.

Parameters

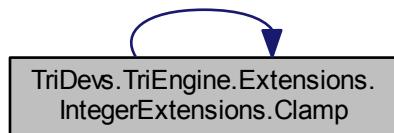
<i>value</i>	Value to clamp.
<i>min</i>	If the specified short is below this value, then this will be returned.
<i>max</i>	If the specified short is above this value, then this will be returned.

Returns

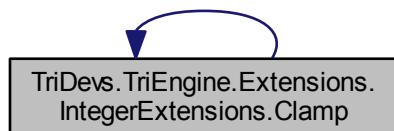
The clamped value of the short.

```
42      {  
43         return Helpers.Math.Clamp(value, min, max);  
44     }
```

Here is the call graph for this function:



Here is the caller graph for this function:



7.32.2.2 static ushort TriDevs.TriEngine.Extensions.IntegerExtensions.Clamp (this ushort *value*, ushort *min*, ushort *max*)
[static]

Clamps the specified unsigned short between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified unsigned short is below this value, then this will be returned.
<i>max</i>	If the specified unsigned short is above this value, then this will be returned.

Returns

The clamped value of the unsigned short.

```
54      {
55          return Helpers.Math.Clamp(value, min, max);
56      }
```

7.32.2.3 static int TriDevs.TriEngine.Extensions.IntegerExtensions.Clamp (this int *value*, int *min*, int *max*) [static]

Clamps the specified integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified integer is below this value, then this will be returned.
<i>max</i>	If the specified integer is above this value, then this will be returned.

Returns

The clamped value of the integer.

```
66      {
67          return Helpers.Math.Clamp(value, min, max);
68      }
```

7.32.2.4 static uint TriDevs.TriEngine.Extensions.IntegerExtensions.Clamp (this uint *value*, uint *min*, uint *max*)
[static]

Clamps the specified unsigned integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified unsigned integer is below this value, then this will be returned.
<i>max</i>	If the specified unsigned integer is above this value, then this will be returned.

Returns

The clamped value of the unsigned integer.

```
78      {
79          return Helpers.Math.Clamp(value, min, max);
80      }
```

7.32.2.5 static long TriDevs.TriEngine.Extensions.IntegerExtensions.Clamp (this long *value*, long *min*, long *max*)
 [static]

Clamps the specified 64-bit integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified 64-bit integer is below this value, then this will be returned.
<i>max</i>	If the specified 64-bit integer is above this value, then this will be returned.

Returns

The clamped value of the 64-bit integer.

```
90      {
91          return Helpers.Math.Clamp(value, min, max);
92      }
```

7.32.2.6 static ulong TriDevs.TriEngine.Extensions.IntegerExtensions.Clamp (this ulong *value*, ulong *min*, ulong *max*)
 [static]

Clamps the specified 64-bit unsigned integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified 64-bit unsigned integer is below this value, then this will be returned.
<i>max</i>	If the specified 64-bit unsigned integer is above this value, then this will be returned.

Returns

The clamped value of the 64-bit unsigned integer.

```
102      {
103          return Helpers.Math.Clamp(value, min, max);
104      }
```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Extensions/IntegerExtensions.cs](#)

7.33 TriDevs.TriEngine.Helpers.IO Class Reference

Provides various helper functions for doing [IO](#) operations.

Static Public Member Functions

- static string [GetAbsolutePath](#) (string path)

Resolves the absolute path from a relative path.

7.33.1 Detailed Description

Provides various helper functions for doing [IO](#) operations.

7.33.2 Member Function Documentation

7.33.2.1 static string TriDevs.TriEngine.Helpers.IO.GetAbsolutePath (string path) [static]

Resolves the absolute path from a relative path.

Parameters

<i>path</i>	The relative path to resolve.
-------------	-------------------------------

Returns

The absolute path to the item.

```
39      {
40          return Path.Combine(Directory.GetCurrentDirectory(), path);
41      }
```

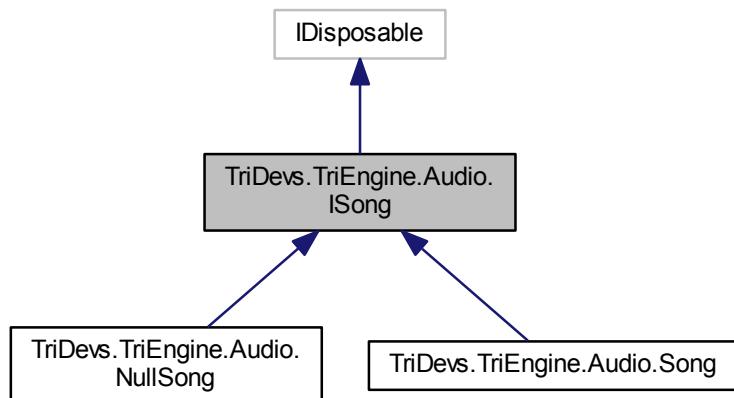
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Helpers/IO.cs](#)

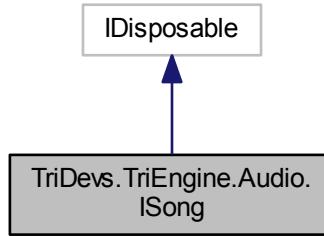
7.34 TriDevs.TriEngine.Audio.ISong Interface Reference

A song that will be streamed in the audio player.

Inheritance diagram for TriDevs.TriEngine.Audio.ISong:



Collaboration diagram for TriDevs.TriEngine.Audio.ISong:



Public Member Functions

- void [Play \(\)](#)
Starts playback of the song.
- void [Stop \(\)](#)
Stops playback of the song.
- void [Pause \(\)](#)
Pauses playback of the song.
- void [Resume \(\)](#)
Resumes playback of a paused song.

Properties

- string [Name \[get\]](#)
Gets the name associated with this song.
- string [File \[get\]](#)
Gets the file this song was loaded from.
- float [Volume \[get, set\]](#)
Gets or sets the song volume.
- bool [IsLooped \[get, set\]](#)
Gets or sets a value indicating that the song should be looped once it reaches the end.

7.34.1 Detailed Description

A song that will be streamed in the audio player.

7.34.2 Member Function Documentation

7.34.2.1 void TriDevs.TriEngine.Audio.ISong.Pause ()

Pauses playback of the song.

Call the [Resume](#) or [Play](#) method to resume playback.

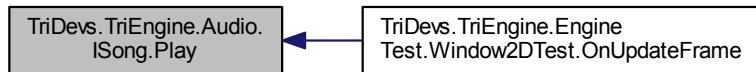
Implemented in [TriDevs.TriEngine.Audio.Song](#), and [TriDevs.TriEngine.Audio.NullSong](#).

7.34.2.2 void TriDevs.TriEngine.Audio.ISong.Play ()

Starts playback of the song.

Implemented in [TriDevs.TriEngine.Audio.Song](#), and [TriDevs.TriEngine.Audio.NullSong](#).

Here is the caller graph for this function:



7.34.2.3 void TriDevs.TriEngine.Audio.ISong.Resume ()

Resumes playback of a paused song.

Implemented in [TriDevs.TriEngine.Audio.Song](#), and [TriDevs.TriEngine.Audio.NullSong](#).

7.34.2.4 void TriDevs.TriEngine.Audio.ISong.Stop ()

Stops playback of the song.

Implemented in [TriDevs.TriEngine.Audio.Song](#), and [TriDevs.TriEngine.Audio.NullSong](#).

7.34.3 Property Documentation

7.34.3.1 string TriDevs.TriEngine.Audio.ISong.File [get]

Gets the file this song was loaded from.

7.34.3.2 bool TriDevs.TriEngine.Audio.ISong.IsLooped [get], [set]

Gets or sets a value indicating that the song should be looped once it reaches the end.

7.34.3.3 string TriDevs.TriEngine.Audio.ISong.Name [get]

Gets the name associated with this song.

7.34.3.4 float TriDevs.TriEngine.Audio.ISong.Volume [get], [set]

Gets or sets the song volume.

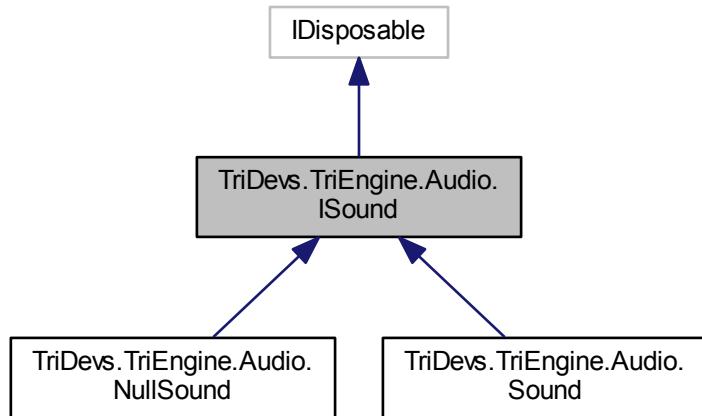
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Audio/ISong.cs](#)

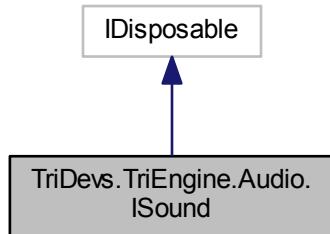
7.35 TriDevs.TriEngine.Audio.ISound Interface Reference

A sound file for use with the audio manager.

Inheritance diagram for TriDevs.TriEngine.Audio.ISound:



Collaboration diagram for TriDevs.TriEngine.Audio.ISound:



Public Member Functions

- void `Play ()`
Plays the sound.
- void `Stop ()`
Stops the sound.

Properties

- string `Name` [get]

Gets the name associated with this sound.

- string [File](#) [get]

Gets the file this sound was created from.

7.35.1 Detailed Description

A sound file for use with the audio manager.

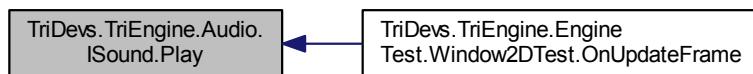
7.35.2 Member Function Documentation

7.35.2.1 void [TriDevs.TriEngine.Audio.ISound.Play](#)()

Plays the sound.

Implemented in [TriDevs.TriEngine.Audio.Sound](#), and [TriDevs.TriEngine.Audio.NullSound](#).

Here is the caller graph for this function:



7.35.2.2 void [TriDevs.TriEngine.Audio.ISound.Stop](#)()

Stops the sound.

Implemented in [TriDevs.TriEngine.Audio.Sound](#), and [TriDevs.TriEngine.Audio.NullSound](#).

7.35.3 Property Documentation

7.35.3.1 string [TriDevs.TriEngine.Audio.ISound.File](#) [get]

Gets the file this sound was created from.

7.35.3.2 string [TriDevs.TriEngine.Audio.ISound.Name](#) [get]

Gets the name associated with this sound.

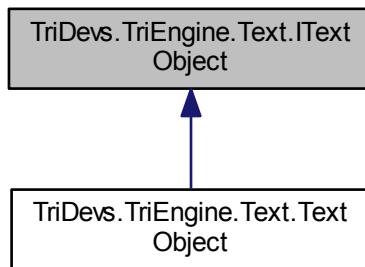
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Audio/ISound.cs](#)

7.36 [TriDevs.TriEngine.Text.ITextObject](#) Interface Reference

Implements methods to construct a text object and render it to screen.

Inheritance diagram for TriDevs.TriEngine.Text.ITextObject:



Public Member Functions

- void [Draw \(\)](#)
Draws this text object to screen with default parameters.
- void [Draw \(Point< int > position\)](#)
Draws this text object to a specific position on the screen specified by the supplied Point struct.
- void [Draw \(int x, int y\)](#)
Draws this text object to screen at the specified X/Y position.

Properties

- [Font Font \[get\]](#)
Gets the [Font](#) font instance associated with this text object.
- string [Text \[get, set\]](#)
Gets or sets the text value of this text object.
- [Color Color \[get, set\]](#)
Gets or sets the color of the text.
- [Point< int > Position \[get, set\]](#)
Gets or sets the screen position of this text, in pixels.
- [Rectangle Bounds \[get\]](#)
Gets the bounds of this text object.
- [QFontAlignment Alignment \[get, set\]](#)
Gets or sets a QFontAlignment value to manage how this text is aligned on screen.

7.36.1 Detailed Description

Implements methods to construct a text object and render it to screen.

7.36.2 Member Function Documentation

7.36.2.1 void TriDevs.TriEngine.Text.ITextObject.Draw ()

Draws this text object to screen with default parameters.

Implemented in [TriDevs.TriEngine.Text.TextObject](#).

7.36.2.2 void TriDevs.TriEngine.Text.ITextObject.Draw (Point< int > position)

Draws this text object to a specific position on the screen specified by the supplied Point struct.

Parameters

<i>position</i>	Point class with X/Y coordinates.
-----------------	-----------------------------------

Implemented in [TriDevs.TriEngine.Text.TextObject](#).

7.36.2.3 void TriDevs.TriEngine.Text.ITextObject.Draw (int x, int y)

Draws this text object to screen at the specified X/Y position.

Parameters

x	
y	

Implemented in [TriDevs.TriEngine.Text.TextObject](#).

7.36.3 Property Documentation

7.36.3.1 QFontAlignment TriDevs.TriEngine.Text.ITextObject.Alignment [get], [set]

Gets or sets a QFontAlignment value to manage how this text is aligned on screen.

7.36.3.2 Rectangle TriDevs.TriEngine.Text.ITextObject.Bounds [get]

Gets the bounds of this text object.

7.36.3.3 Color TriDevs.TriEngine.Text.ITextObject.Color [get], [set]

Gets or sets the color of the text.

7.36.3.4 Font TriDevs.TriEngine.Text.ITextObject.Font [get]

Gets the [Font](#) font instance associated with this text object.

7.36.3.5 Point<int> TriDevs.TriEngine.Text.ITextObject.Position [get], [set]

Gets or sets the screen position of this text, in pixels.

7.36.3.6 string TriDevs.TriEngine.Text.ITextObject.Text [get], [set]

Gets or sets the text value of this text object.

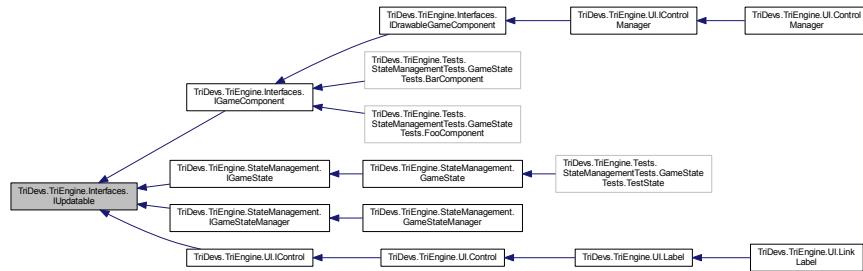
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Text/ITextObject.cs](#)

7.37 TriDevs.TriEngine.Interfaces.IUpdatable Interface Reference

Implements a simple update method.

Inheritance diagram for TriDevs.TriEngine.Interfaces.IUpdatable:



Public Member Functions

- void [Update \(\)](#)

Updates the object.

7.37.1 Detailed Description

Implements a simple update method.

7.37.2 Member Function Documentation

7.37.2.1 void TriDevs.TriEngine.Interfaces.IUpdatable.Update ()

Updates the object.

Implemented in [TriDevs.TriEngine.UI.Label](#), [TriDevs.TriEngine.UI.Control](#), [TriDevs.TriEngine.UI.ControlManager](#), [TriDevs.TriEngine.StateManagement.GameStateManager](#), and [TriDevs.TriEngine.StateManagement.GameState](#).

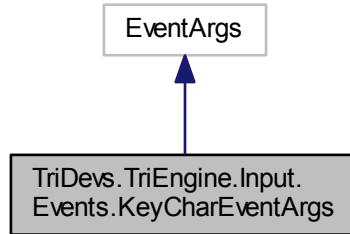
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine/Interfaces/IUpdatable.cs](#)

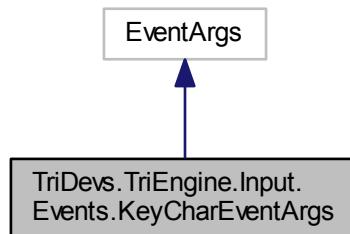
7.38 TriDevs.TriEngine.Input.Events.KeyCharEventArgs Class Reference

EventArgs class used for keychar-related events. Contains information about the character related with the event.

Inheritance diagram for TriDevs.TriEngine.Input.Events.KeyCharEventArgs:



Collaboration diagram for TriDevs.TriEngine.Input.Events.KeyCharEventArgs:



Public Attributes

- readonly char [KeyChar](#)

The char that was involved.

7.38.1 Detailed Description

EventArgs class used for keychar-related events. Contains information about the character related with the event.

7.38.2 Member Data Documentation

7.38.2.1 readonly char [TriDevs.TriEngine.Input.Events.KeyCharEventArgs.KeyChar](#)

The char that was involved.

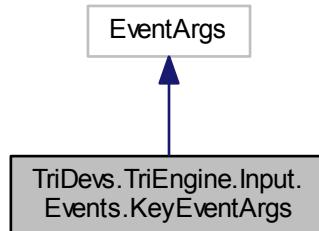
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Input/Events/Key.cs](#)

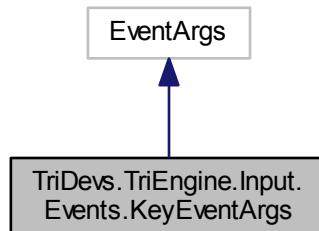
7.39 TriDevs.TriEngine.Input.Events.KeyEventArgs Class Reference

EventArgs class used for key-related events. Contains information about the key related with the event.

Inheritance diagram for TriDevs.TriEngine.Input.Events.KeyEventArgs:



Collaboration diagram for TriDevs.TriEngine.Input.Events.KeyEventArgs:



Public Attributes

- **readonly Key Key**
The Key that was involved.

7.39.1 Detailed Description

EventArgs class used for key-related events. Contains information about the key related with the event.

7.39.2 Member Data Documentation

7.39.2.1 **readonly Key TriDevs.TriEngine.Input.Events.KeyEventArgs.Key**

The **Key** that was involved.

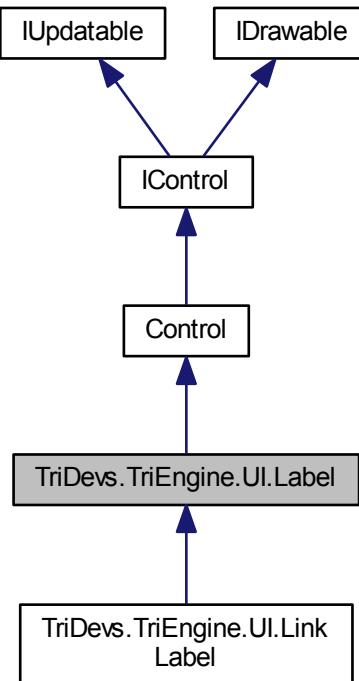
The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Input/Events/[Key.cs](#)

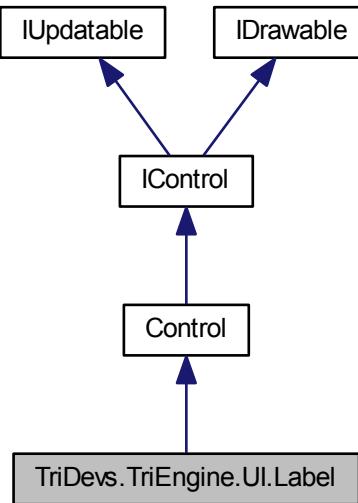
7.40 TriDevs.TriEngine.UI.Label Class Reference

A simple label to display text on the screen.

Inheritance diagram for TriDevs.TriEngine.UI.Label:



Collaboration diagram for TriDevs.TriEngine.UI.Label:



Public Member Functions

- virtual void [SetFont \(Font font\)](#)
Sets the font that this label uses.
- override void [Update \(\)](#)
Updates the object.
- override void [Draw \(\)](#)
Draw the object to screen.

Protected Member Functions

- virtual void [UpdateTextObject \(\)](#)

Properties

- override string [Text \[get, set\]](#)
- override Point< int > [Position \[get, set\]](#)
- virtual QFontAlignment [Alignment \[get, set\]](#)
Gets or sets the QFontAlignment of this label's text.

Additional Inherited Members

7.40.1 Detailed Description

A simple label to display text on the screen.

7.40.2 Member Function Documentation

7.40.2.1 override void TriDevs.TriEngine.UI.Label.Draw() [virtual]

Draw the object to screen.

Reimplemented from [TriDevs.TriEngine.UI.Control](#).

```
135     {
136         base.Draw(_drawPosition);
137
138         if (_textObject == null)
139             return;
140
141         _textObject.Draw();
142     }
```

7.40.2.2 virtual void TriDevs.TriEngine.UI.LabelSetFont(Font font) [virtual]

Sets the font that this label uses.

Parameters

<i>font</i>	The new font instance to use.
-------------	-------------------------------

```
82     {
83         _font = font;
84         UpdateTextObject();
85     }
```

7.40.2.3 override void TriDevs.TriEngine.UI.Label.Update() [virtual]

Updates the object.

Reimplemented from [TriDevs.TriEngine.UI.Control](#).

```
121     {
122         // Override update logic to translate mouse click
123         // positions when label is aligned in a certain way
124
125         if (!Services.Input.MouseReleased(MouseButton.Left))
126             return;
127
128         var mousePos = Services.Input.mousePosition;
129         if ((mousePos.X >= _drawPosition.X && mousePos.X <= (_drawPosition.X +
130             Rectangle.Width)) &&
131             && (mousePos.Y >= _drawPosition.Y && mousePos.Y <= (_drawPosition.Y +
132             Rectangle.Height)))
133             OnClicked();
134     }
```

7.40.2.4 virtual void TriDevs.TriEngine.UI.Label.UpdateTextObject() [protected], [virtual]

```
88     {
89         if (_font == null)
90             return;
91
92         if (_textObject == null)
93         {
94             _textObject = new TextObject(_text, _font, Position,
95                                         Alignment);
96         }
97         else
98         {
99             _textObject.Text = Text;
100            _textObject.Font = _font;
101            _textObject.Position = Position;
102            _textObject.Alignment = Alignment;
103        }
104    }
```

```
102         }
103     Size = new Point<int>(_textObject.Bounds.Width, _textObject.
104     Bounds.Height);
105     switch (Alignment)
106     {
107         case QFontAlignment.Centre:
108             _drawPosition = new Point<int>(Position.X - Size.X / 2,
109             Position.Y);
110             break;
111         case QFontAlignment.Right:
112             _drawPosition = new Point<int>(Position.X - Size.X,
113             Position.Y);
114             break;
115         default:
116             _drawPosition = Position;
117             break;
118     }
```

7.40.3 Property Documentation

7.40.3.1 virtual QFontAlignment TriDevs.TriEngine.UI.Label.Alignment [get], [set]

Gets or sets the QFontAlignment of this label's text.

7.40.3.2 override Point<int> TriDevs.TriEngine.UI.Label.Position [get], [set]

7.40.3.3 override string TriDevs.TriEngine.UI.Label.Text [get], [set]

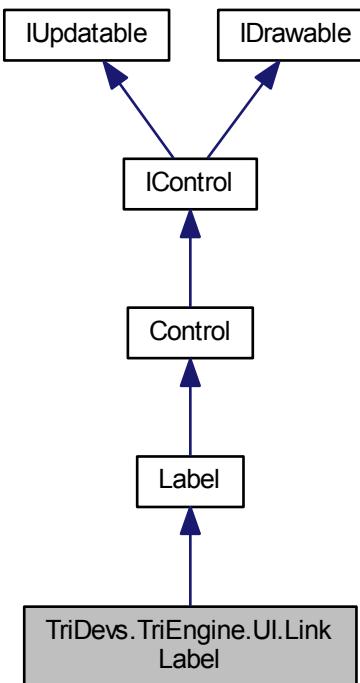
The documentation for this class was generated from the following file:

- TriDevs.TriEngine/UI/Label.cs

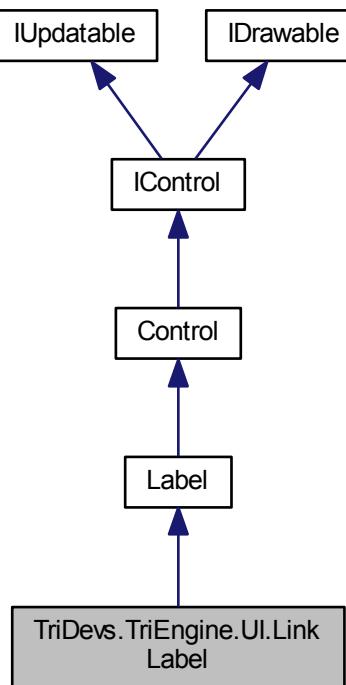
7.41 TriDevs.TriEngine.UI.linkLabel Class Reference

A label that, when clicked, will open a URL.

Inheritance diagram for TriDevs.TriEngine.UI.LinkLabel:



Collaboration diagram for TriDevs.TriEngine.UI.linkLabel:



Protected Member Functions

- `override void OnClicked ()`

Properties

- `virtual string Url [get, set]`
Gets or sets the URL that will open when this label is clicked.

Additional Inherited Members

7.41.1 Detailed Description

A label that, when clicked, will open a URL.

7.41.2 Member Function Documentation

7.41.2.1 `override void TriDevs.TriEngine.UI.linkLabel.OnClicked () [protected], [virtual]`

Reimplemented from [TriDevs.TriEngine.UI.Control](#).

```

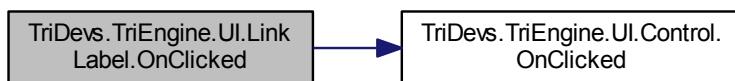
39      {
40          if (!string.IsNullOrEmpty(Url))

```

```

41      {
42          try
43          {
44              System.Diagnostics.Process.Start(Url);
45          }
46          catch (Win32Exception)
47          {
48          }
49      }
50  }
51
52  base.OnClicked();
53 }
54 }
```

Here is the call graph for this function:



7.41.3 Property Documentation

7.41.3.1 virtual string [TriDevs.TriEngine.UI.linkLabel.Url](#) [get], [set]

Gets or sets the URL that will open when this label is clicked.

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/UI/LinkLabel.cs](#)

7.42 [TriDevs.TriEngine.Logging.LogManager](#) Class Reference

Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.

Static Public Member Functions

- static void [LoadConfig](#) (string file=null)
Load a config to use with log4net.
- static ILog [GetLogger](#) (object sender)
Gets an ILog object for the specified object.
- static void [SetupConsole](#) ()
Set up a new console for this process. Will not set up a console if a debugger is attached. This method does nothing if DEBUG is not #defined.
- static void [DestroyConsole](#) ()
Destroys the console associated with the process, if loaded. This method does nothing if DEBUG is not #defined.
- static void [ClearOldLogs](#) (int daysOld=7, string logsDir="logs")
Clear logs that are older than the specified amount of days.

7.42.1 Detailed Description

Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.

7.42.2 Member Function Documentation

7.42.2.1 static void TriDevs.TriEngine.Logging.LogManager.ClearOldLogs (int daysOld = 7, string logsDir = "logs") [static]

Clear logs that are older than the specified amount of days.

Parameters

<i>daysOld</i>	Logs older than this amount of days will be deleted.
<i>logsDir</i>	The directory to clear.

```

136     {
137         var log = GetLogger(typeof(LogManager));
138
139         log.InfoFormat(">> ClearOldLogs({0}, \"{1}\")", daysOld, logsDir);
140
141         if (!Directory.Exists(logsDir))
142         {
143             log.InfoFormat("Directory {0} not found, no logs to clear", logsDir);
144             log.Info("<< ClearOldLogs()");
145             return;
146         }
147
148         var now = DateTime.Now;
149         var max = new TimeSpan(daysOld, 0, 0, 0);
150         var count = 0;
151         foreach (var file in from file in Directory.GetFiles(logsDir)
152                             let modTime = File.GetLastAccessTime(file)
153                             let age = now.Subtract(modTime)
154                             where age > max
155                             select file)
156         {
157             try
158             {
159                 File.Delete(file);
160                 log.InfoFormat("Deleted old log file: {0}", file);
161                 count++;
162             }
163             catch (IOException ex)
164             {
165                 log.WarnFormat("Failed to delete log file: {0} ({1})", file, ex.Message);
166             }
167         }
168
169         log.InfoFormat("Done! Cleared {0} log files.", count);
170         log.Info("<< ClearOldLogs()");
171     }

```

7.42.2.2 static void TriDevs.TriEngine.Logging.LogManager.DestroyConsole () [static]

Destroys the console associated with the process, if loaded. This method does nothing if DEBUG is not #defined.

```

123     {
124 #if DEBUG
125         if (_consoleLoaded)
126             WinAPI.FreeConsole();
127 #endif
128     }

```

Here is the call graph for this function:



7.42.2.3 static ILog TriDevs.TriEngine.Logging.LogManager.GetLogger(object sender) [static]

Gets an ILog object for the specified object.

To get the logger object for a static class, or from static context, call GetLogger(typeof(YourClass)).

Parameters

<code>sender</code>	The object or Type to get an ILog object for.
---------------------	---

Returns

The ILog object.

```

89         {
90             if (!__loaded)
91                 LoadConfig();
92
93             return log4net.LogManager.GetLogger(sender.GetType().ToString() == "System.RuntimeType" ? (Type
94             )sender : sender.GetType());

```

7.42.2.4 static void TriDevs.TriEngine.Logging.LogManager.LoadConfig(string file = null) [static]

Load a config to use with log4net.

LoadConfig will first try to load the specified file, if not null. If it is unable to find the specified file, it will call itself again with file set to null. If no file is specified, it will attempt to load a config file following the pattern: "(Assembly-Name).config" If it is unable to load the config, it will default to BasicConfigurator.

Parameters

<code>file</code>	The config file to load, null if automatic loading is preferred.
-------------------	--

```

57         {
58             if (file == null)
59             {
60                 if (File.Exists(AppDomain.CurrentDomain.FriendlyName + ".config"))
61                     XmlConfigurator.Configure();
62                 else
63                     BasicConfigurator.Configure();
64             }
65             else
66             {
67                 if (File.Exists(file))
68                     XmlConfigurator.Configure(new FileInfo(file));
69                 else
70                 {
71                     LoadConfig();
72                     return;
73                 }
74             }

```

```

75             _loaded = true;
76         }
77     }

```

7.42.2.5 static void TriDevs.TriEngine.Logging.LogManager.SetupConsole() [static]

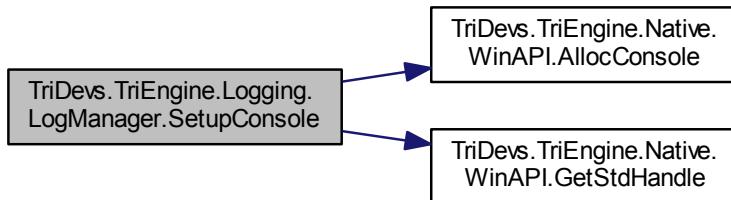
Set up a new console for this process. Will not set up a console if a debugger is attached. This method does nothing if DEBUG is not #defined.

```

102         {
103 #if DEBUG
104         if (System.Diagnostics.Debugger.IsAttached)
105             return;
106
107         WinAPI.AllocConsole();
108         var stdHandle = WinAPI.GetStdHandle(WinAPI.
109             STD_OUTPUT_HANDLE);
110         var safeFileHandle = new SafeFileHandle(stdHandle, true);
111         var fileStream = new FileStream(safeFileHandle, FileAccess.Write);
112         var encoding = Encoding.GetEncoding(WinAPI.CODE_PAGE);
113         var stdOut = new StreamWriter(fileStream, encoding) { AutoFlush = true };
114         Console.SetOut(stdOut);
115         _consoleLoaded = true;
116     }

```

Here is the call graph for this function:



The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Logging/LogManager.cs](#)

7.43 TriDevs.TriEngine.Helpers.Math Class Reference

Various helper methods for working with math.

Static Public Member Functions

- static byte [Clamp](#) (byte value, byte min, byte max)
Clamps the specified byte between a minimum and maximum value.
- static short [Clamp](#) (short value, short min, short max)
Clamps the specified short between a minimum and maximum value.
- static ushort [Clamp](#) (ushort value, ushort min, ushort max)
Clamps the specified unsigned short between a minimum and maximum value.

- static int [Clamp](#) (int value, int min, int max)
Clamps the specified integer between a minimum and maximum value.
- static uint [Clamp](#) (uint value, uint min, uint max)
Clamps the specified unsigned integer between a minimum and maximum value.
- static long [Clamp](#) (long value, long min, long max)
Clamps the specified 64-bit integer between a minimum and maximum value.
- static ulong [Clamp](#) (ulong value, ulong min, ulong max)
Clamps the specified 64-bit unsigned integer between a minimum and maximum value.
- static float [Clamp](#) (float value, float min, float max)
Clamps the specified float between a minimum and maximum value.
- static double [Clamp](#) (double value, double min, double max)
Clamps the specified double between a minimum and maximum value.
- static decimal [Clamp](#) (decimal value, decimal min, decimal max)
Clamps the specified decimal between a minimum and maximum value.

7.43.1 Detailed Description

Various helper methods for working with math.

7.43.2 Member Function Documentation

7.43.2.1 static byte [TriDevs.TriEngine.Helpers.Math.Clamp](#) (byte value, byte min, byte max) [static]

Clamps the specified byte between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified byte is below this value, then this will be returned.
<i>max</i>	If the specified byte is above this value, then this will be returned.

Returns

The clamped value of the byte.

```

41     {
42         if (min > max)
43             throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
44
45         return value < min ? min : (value > max ? max : value);
46     }

```

7.43.2.2 static short [TriDevs.TriEngine.Helpers.Math.Clamp](#) (short value, short min, short max) [static]

Clamps the specified short between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified short is below this value, then this will be returned.
<i>max</i>	If the specified short is above this value, then this will be returned.

Returns

The clamped value of the short.

```

56     {
57         if (min > max)
58             throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
59
60         return value < min ? min : (value > max ? max : value);
61     }

```

7.43.2.3 static ushort TriDevs.TriEngine.Helpers.Math.Clamp (ushort value, ushort min, ushort max) [static]

Clamps the specified unsigned short between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified unsigned short is below this value, then this will be returned.
<i>max</i>	If the specified unsigned short is above this value, then this will be returned.

Returns

The clamped value of the unsigned short.

```

71     {
72         if (min > max)
73             throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
74
75         return value < min ? min : (value > max ? max : value);
76     }

```

7.43.2.4 static int TriDevs.TriEngine.Helpers.Math.Clamp (int value, int min, int max) [static]

Clamps the specified integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified integer is below this value, then this will be returned.
<i>max</i>	If the specified integer is above this value, then this will be returned.

Returns

The clamped value of the integer.

```

86     {
87         if (min > max)
88             throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
89
90         return value < min ? min : (value > max ? max : value);
91     }

```

7.43.2.5 static uint TriDevs.TriEngine.Helpers.Math.Clamp (uint value, uint min, uint max) [static]

Clamps the specified unsigned integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified unsigned integer is below this value, then this will be returned.
<i>max</i>	If the specified unsigned integer is above this value, then this will be returned.

Returns

The clamped value of the unsigned integer.

```

101      {
102          if (min > max)
103              throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
104
105          return value < min ? min : (value > max ? max : value);
106      }

```

7.43.2.6 static long TriDevs.TriEngine.Helpers.Math.Clamp (long value, long min, long max) [static]

Clamps the specified 64-bit integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified 64-bit integer is below this value, then this will be returned.
<i>max</i>	If the specified 64-bit integer is above this value, then this will be returned.

Returns

The clamped value of the 64-bit integer.

```

116      {
117          if (min > max)
118              throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
119
120          return value < min ? min : (value > max ? max : value);
121      }

```

7.43.2.7 static ulong TriDevs.TriEngine.Helpers.Math.Clamp (ulong value, ulong min, ulong max) [static]

Clamps the specified 64-bit unsigned integer between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified 64-bit unsigned integer is below this value, then this will be returned.
<i>max</i>	If the specified 64-bit unsigned integer is above this value, then this will be returned.

Returns

The clamped value of the 64-bit unsigned integer.

```

131      {
132          if (min > max)
133              throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
134
135          return value < min ? min : (value > max ? max : value);
136      }

```

7.43.2.8 static float TriDevs.TriEngine.Helpers.Math.Clamp (float value, float min, float max) [static]

Clamps the specified float between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified float is below this value, then this will be returned.
<i>max</i>	If the specified float is above this value, then this will be returned.

Returns

The clamped value of the float.

```
146      {
147          if (min > max)
148              throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
149
150          return value < min ? min : (value > max ? max : value);
151      }
```

7.43.2.9 static double TriDevs.TriEngine.Helpers.Math.Clamp (double value, double min, double max) [static]

Clamps the specified double between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified double is below this value, then this will be returned.
<i>max</i>	If the specified double is above this value, then this will be returned.

Returns

The clamped value of the double.

```
161      {
162          if (min > max)
163              throw new ArgumentException("Minimum value cannot be greater than maximum value.", "min");
164
165          return value < min ? min : (value > max ? max : value);
166      }
```

7.43.2.10 static decimal TriDevs.TriEngine.Helpers.Math.Clamp (decimal value, decimal min, decimal max) [static]

Clamps the specified decimal between a minimum and maximum value.

Parameters

<i>value</i>	Value to clamp.
<i>min</i>	If the specified decimal is below this value, then this will be returned.
<i>max</i>	If the specified decimal is above this value, then this will be returned.

Returns

The clamped value of the decimal.

```
176      {
177          if (min > max)
178              throw new ArgumentException("Minimum value cannot be grater than maximum value.", "min");
179
180          return value < min ? min : (value > max ? max : value);
181      }
```

The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Helpers/Math.cs

7.44 TriDevs.TriEngine.Tests.HelperTests.MathHelperTests Class Reference

Public Member Functions

- void `ShouldNotClampFloat ()`
- void `ShouldNotClampDouble ()`
- void `ShouldNotClampInt16 ()`
- void `ShouldNotClampUInt16 ()`
- void `ShouldNotClampInt32 ()`
- void `ShouldNotClampUInt32 ()`
- void `ShouldNotClampInt64 ()`
- void `ShouldNotClampUInt64 ()`
- void `ShouldNotClampByte ()`
- void `ShouldClampFloatToMinimum ()`
- void `ShouldClampDoubleToMinimum ()`
- void `ShouldClampInt16ToMinimum ()`
- void `ShouldClampUInt16ToMinimum ()`
- void `ShouldClampInt32ToMinimum ()`
- void `ShouldClampUInt32ToMinimum ()`
- void `ShouldClampInt64ToMinimum ()`
- void `ShouldClampUInt64ToMinimum ()`
- void `ShouldClampByteToMinimum ()`
- void `ShouldClampFloatToMaximum ()`
- void `ShouldClampDoubleToMaximum ()`
- void `ShouldClampInt16ToMaximum ()`
- void `ShouldClampUInt16ToMaximum ()`
- void `ShouldClampInt32ToMaximum ()`
- void `ShouldClampUInt32ToMaximum ()`
- void `ShouldClampInt64ToMaximum ()`
- void `ShouldClampUInt64ToMaximum ()`
- void `ShouldClampByteToMaximum ()`
- void `ShouldThrowFloatClampArgumentException ()`
- void `ShouldThrowDoubleClampArgumentException ()`
- void `ShouldThrowInt16ClampArgumentException ()`
- void `ShouldThrowUInt16ClampArgumentException ()`
- void `ShouldThrowInt32ClampArgumentException ()`
- void `ShouldThrowUInt32ClampArgumentException ()`
- void `ShouldThrowInt64ClampArgumentException ()`
- void `ShouldThrowUInt64ClampArgumentException ()`
- void `ShouldThrowByteClampArgumentException ()`

7.44.1 Member Function Documentation

7.44.1.1 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampByteToMaximum ()

```
167      {
168          Assert.AreEqual(Helpers.Math.Clamp((byte) 10, (byte) 0, (byte) 5), 5);
169      }
```

7.44.1.2 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampByteToMinimum ()

```
113      {
114          Assert.AreEqual(Helpers.Math.Clamp((byte) 3, (byte) 5, (byte) 10), 5);
115      }
```

7.44.1.3 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampDoubleToMaximum ()

```
125     {
126         Assert.AreEqual(Helpers.Math.Clamp(1.5, 0.0, 1.0), 1.0);
127     }
```

7.44.1.4 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampDoubleToMinimum ()

```
71     {
72         Assert.AreEqual(Helpers.Math.Clamp(-1.5, 0.0, 1.0), 0.0);
73     }
```

7.44.1.5 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampFloatToMaximum ()

```
119     {
120         Assert.AreEqual(Helpers.Math.Clamp(1.5f, 0.0f, 1.0f), 1.0f);
121     }
```

7.44.1.6 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampFloatToMinimum ()

```
65     {
66         Assert.AreEqual(Helpers.Math.Clamp(-1.5f, 0.0f, 1.0f), 0.0f);
67     }
```

7.44.1.7 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampInt16ToMaximum ()

```
131     {
132         Assert.AreEqual(Helpers.Math.Clamp((short) 10, (short) 0, (short) 5), 5);
133     }
```

7.44.1.8 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampInt16ToMinimum ()

```
77     {
78         Assert.AreEqual(Helpers.Math.Clamp((short) -3, (short) 0, (short) 5), 0);
79     }
```

7.44.1.9 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampInt32ToMaximum ()

```
143     {
144         Assert.AreEqual(Helpers.Math.Clamp(10, 0, 5), 5);
145     }
```

7.44.1.10 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampInt32ToMinimum ()

```
89     {
90         Assert.AreEqual(Helpers.Math.Clamp(-3, 0, 5), 0);
91     }
```

7.44.1.11 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampInt64ToMaximum ()

```
155     {
156         Assert.AreEqual(Helpers.Math.Clamp((long) 10, 0, 5), 5);
157     }
```

7.44.1.12 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampInt64ToMinimum ()

```
101     {
102         Assert.AreEqual(Helpers.Math.Clamp((long) -3, 0, 5), 0);
103     }
```

7.44.1.13 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampUInt16ToMaximum ()

```
137     {
138         Assert.AreEqual(Helpers.Math.Clamp((ushort) 10, (ushort) 0, (ushort) 5), 5);
139     }
```

7.44.1.14 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampUInt16ToMinimum ()

```
83     {
84         Assert.AreEqual(Helpers.Math.Clamp((ushort) 3, (ushort) 5, (ushort) 10), 5);
85     }
```

7.44.1.15 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampUInt32ToMaximum ()

```
149     {
150         Assert.AreEqual(Helpers.Math.Clamp((uint) 10, 0, 5), 5);
151     }
```

7.44.1.16 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampUInt32ToMinimum ()

```
95     {
96         Assert.AreEqual(Helpers.Math.Clamp((uint) 3, 5, 10), 5);
97     }
```

7.44.1.17 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampUInt64ToMaximum ()

```
161     {
162         Assert.AreEqual(Helpers.Math.Clamp((ulong) 10, 0, 5), 5);
163     }
```

7.44.1.18 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldClampUInt64ToMinimum ()

```
107     {
108         Assert.AreEqual(Helpers.Math.Clamp((ulong) 3, 5, 10), 5);
109     }
```

7.44.1.19 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampByte ()

```
59     {
60         Assert.AreEqual(Helpers.Math.Clamp((byte) 3, (byte) 0, (byte) 5), 3);
61     }
```

7.44.1.20 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampDouble ()

```
17     {
18         Assert.AreEqual(Helpers.Math.Clamp(0.5, 0.0, 1.0), 0.5);
19     }
```

7.44.1.21 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampFloat()

```
11     {
12         Assert.AreEqual(Helpers.Math.Clamp(0.5f, 0.0f, 1.0f), 0.5f);
13     }
```

7.44.1.22 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampInt16()

```
23     {
24         Assert.AreEqual(Helpers.Math.Clamp((short) 3, (short) 0, (short) 5), 3);
25     }
```

7.44.1.23 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampInt32()

```
35     {
36         Assert.AreEqual(Helpers.Math.Clamp(3, 0, 5), 3);
37     }
```

7.44.1.24 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampInt64()

```
47     {
48         Assert.AreEqual(Helpers.Math.Clamp((long) 3, 0, 5), 3);
49     }
```

7.44.1.25 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampUInt16()

```
29     {
30         Assert.AreEqual(Helpers.Math.Clamp((ushort) 3, (ushort) 0, (ushort) 5), 3);
31     }
```

7.44.1.26 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampUInt32()

```
41     {
42         Assert.AreEqual(Helpers.Math.Clamp((uint) 3, 0, 5), 3);
43     }
```

7.44.1.27 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldNotClampUInt64()

```
53     {
54         Assert.AreEqual(Helpers.Math.Clamp((ulong) 3, 0, 5), 3);
55     }
```

7.44.1.28 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowByteClampArgumentException()

```
230    {
231        Helpers.Math.Clamp((byte) 5, (byte) 10, (byte) 0);
232    }
```

7.44.1.29 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowDoubleClampArgumentException()

```
181    {
182        Helpers.Math.Clamp(0.5, 1.0, 0.0);
183    }
```

7.44.1.30 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowFloatClampArgumentException ()

```
174     {
175         Helpers.Math.Clamp(0.5f, 1.0f, 0.0f);
176     }
```

7.44.1.31 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowInt16ClampArgumentException ()

```
188     {
189         Helpers.Math.Clamp((short) 5, (short) 10, (short) 0);
190     }
```

7.44.1.32 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowInt32ClampArgumentException ()

```
202     {
203         Helpers.Math.Clamp(5, 10, 0);
204     }
```

7.44.1.33 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowInt64ClampArgumentException ()

```
216     {
217         Helpers.Math.Clamp((long) 5, 10, 0);
218     }
```

7.44.1.34 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowUInt16ClampArgumentException ()

```
195     {
196         Helpers.Math.Clamp((ushort) 5, (ushort) 10, (ushort) 0);
197     }
```

7.44.1.35 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowUInt32ClampArgumentException ()

```
209     {
210         Helpers.Math.Clamp((uint) 5, 10, 0);
211     }
```

7.44.1.36 void TriDevs.TriEngine.Tests.HelperTests.MathHelperTests.ShouldThrowUInt64ClampArgumentException ()

```
223     {
224         Helpers.Math.Clamp((ulong) 5, 10, 0);
225     }
```

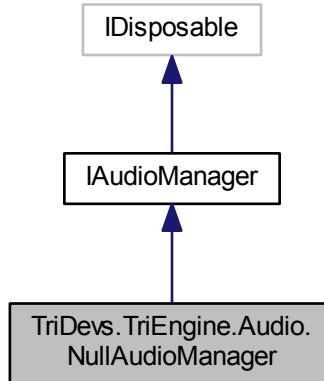
The documentation for this class was generated from the following file:

- TriDevs.TriEngine.Tests/HelperTests/MathHelperTests.cs

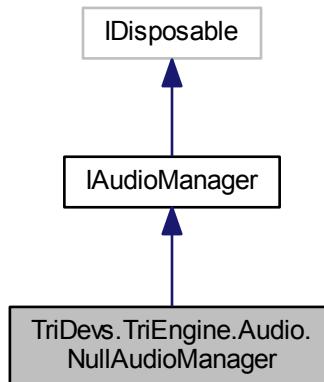
7.45 TriDevs.TriEngine.Audio.NullAudioManager Class Reference

Used as a fallback [AudioManager](#) object when the service locator fails to find one.

Inheritance diagram for TriDevs.TriEngine.Audio.NullAudioManager:



Collaboration diagram for TriDevs.TriEngine.Audio.NullAudioManager:



Public Member Functions

- void [Dispose \(\)](#)
• void [StopAll \(\)](#)
Immediately stops all playback of sounds and songs.
- [ISound LoadSound \(string name, string file, AudioFormat format=AudioFormat.Wav\)](#)
Loads a sound into the audio manager.
- bool [HasSound \(string name\)](#)
Returns a value indicating whether a sound with the specified name has been loaded into the audio manager.
- [ISound GetSound \(string name\)](#)
Gets the sound with the specified name.

- void [StopAllSounds \(\)](#)
Immediately stops playback of all sounds.
- [ISong LoadSong \(string name, string file, AudioFormat format=AudioFormat.Ogg\)](#)
Load a song into the audio manager.
- bool [HasSong \(string name\)](#)
Returns a value indicating whether a song with the specified name has been loaded into the audio manager.
- [ISong GetSong \(string name\)](#)
Gets the song with the specified name.
- void [StopAllSongs \(\)](#)
Immediately stops playback of all songs.

7.45.1 Detailed Description

Used as a fallback [AudioManager](#) object when the service locator fails to find one.

7.45.2 Member Function Documentation

7.45.2.1 void [TriDevs.TriEngine.Audio.NullAudioManager.Dispose \(\)](#)

```
35      {
36
37      }
```

7.45.2.2 [ISong TriDevs.TriEngine.Audio.NullAudioManager.GetSong \(string name \)](#)

Gets the song with the specified name.

Parameters

<i>name</i>	Name of the song to get.
-------------	--------------------------

Returns

An object implementing the [ISong](#) interface, or null if no song matched the requested name.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
75      {
76          return Song;
77      }
```

7.45.2.3 [ISound TriDevs.TriEngine.Audio.NullAudioManager.GetSound \(string name \)](#)

Gets the sound with the specified name.

Parameters

<i>name</i>	Name of the sound to get.
-------------	---------------------------

Returns

An object implementing the [ISound](#) interface, or null if no sound matched the requested name.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```

55      {
56          return Sound;
57      }

```

7.45.2.4 bool TriDevs.TriEngine.Audio.NullAudioManager.HasSong (string name)

Returns a value indicating whether a song with the specified name has been loaded into the audio manager.

Parameters

<i>name</i>	Name to check for.
-------------	--------------------

Returns

True if the song has been loaded, false otherwise.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```

70      {
71          return false;
72      }

```

7.45.2.5 bool TriDevs.TriEngine.Audio.NullAudioManager.HasSound (string name)

Returns a value indicating whether a sound with the specified name has been loaded into the audio manager.

Parameters

<i>name</i>	Name to check for.
-------------	--------------------

Returns

True if the sound has been loaded, false otherwise.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```

50      {
51          return false;
52      }

```

7.45.2.6 ISong TriDevs.TriEngine.Audio.NullAudioManager.LoadSong (string name, string file, AudioFormat format = AudioFormat.Ogg)

Load a song into the audio manager.

If a song with the same name has already been loaded, it will be returned instead.

Parameters

<i>name</i>	Name to assign to the new song object.
<i>file</i>	Path to the file that will be used.
<i>format</i>	Format of the file.

Returns

The resulting object implementing the [ISong](#) interface.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
65      {
66          return Song;
67      }
```

7.45.2.7 ISound [TriDevs.TriEngine.Audio.NullAudioManager.LoadSound](#) (string name, string file, AudioFormat format = AudioFormat.Wav)

Loads a sound into the audio manager.

If a sound with the same name has already been loaded, it will be returned instead.

Parameters

<i>name</i>	Name to assign to the new sound object.
<i>file</i>	Path to the file that will be used.
<i>format</i>	The format of the file to load.

Returns

The resulting object implementing the [ISound](#) interface.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
45      {
46          return Sound;
47      }
```

7.45.2.8 void [TriDevs.TriEngine.Audio.NullAudioManager.StopAll](#) ()

Immediately stops all playback of sounds and songs.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
40      {
41
42      }
```

7.45.2.9 void [TriDevs.TriEngine.Audio.NullAudioManager.StopAllSongs](#) ()

Immediately stops playback of all songs.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
80      {
81
82      }
```

7.45.2.10 void [TriDevs.TriEngine.Audio.NullAudioManager.StopAllSounds](#) ()

Immediately stops playback of all sounds.

Implements [TriDevs.TriEngine.Audio.IAudioManager](#).

```
60      {
61
62  }
```

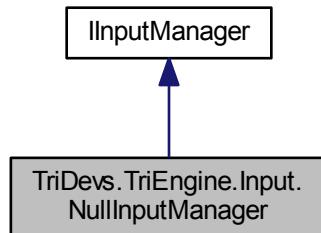
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Audio/NullAudioManager.cs](#)

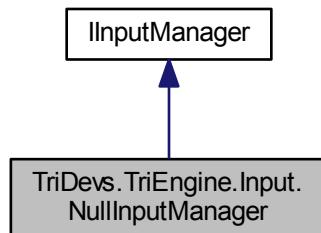
7.46 TriDevs.TriEngine.Input.NullInputManager Class Reference

Used as a fallback [InputManager](#) object when the service locator fails to find one.

Inheritance diagram for `TriDevs.TriEngine.Input.NullInputManager`:



Collaboration diagram for `TriDevs.TriEngine.Input.NullInputManager`:



Public Member Functions

- void [Update \(\)](#)
Updates the input manager, refreshing all current and previous states.
- bool [IsKeyUp \(Key key\)](#)
Returns whether or not the specified key is currently unpressed.
- bool [IsKeyDown \(Key key\)](#)

- **bool KeyPressed (Key key)**
Returns whether or not the specified key is currently being pressed.
- **bool KeyReleased (Key key)**
Returns whether or not the specified key has been pressed.
- **bool IsMouseUp (MouseButton button)**
Returns whether or not the specified mouse button is currently unpressed.
- **bool IsMouseDown (MouseButton button)**
Returns whether or not the specified mouse button is currently being pressed.
- **bool MousePressed (MouseButton button)**
Returns whether or not the specified mouse button has been pressed.
- **bool MouseReleased (MouseButton button)**
Returns whether or not the specified mouse button has been released.
- **bool IsWheelUp ()**
Returns whether the mouse wheel was scrolled up.
- **bool IsWheelDown ()**
Returns whether the mouse wheel was scrolled down.
- **bool IsWheelChanged ()**
Returns whether the mouse wheel scrolled at all.
- **int WheelChange ()**
Returns the mouse wheel's change in value.

Properties

- **int MouseX [get]**
- **int MouseY [get]**
- **Point< int > MousePosition [get]**
- **int MouseWheelValue [get]**
- **bool this[Key key] [get]**
- **bool this[MouseButton button] [get]**

Events

- **KeyDownEventHandler KeyDown**
Raised when a key is pressed down.
- **KeyUpEventHandler KeyUp**
Raised when a key is released.
- **KeyPressEventHandler KeyPress**
Raised when a character is typed.
- **MouseDownEventHandler MouseDown**
Raised when a mouse button is pressed down.
- **MouseUpEventHandler MouseUp**
Raised when a mouse button is released.
- **MouseWheelChangedEventHandler WheelChanged**
Raised when the mouse wheel value changes.
- **MouseWheelDownEventHandler WheelDown**
Raised when the mouse wheel is scrolled downwards.
- **MouseWheelUpEventHandler WheelUp**
Raised when the mouse wheel is scrolled upwards.

7.46.1 Detailed Description

Used as a fallback [InputManager](#) object when the service locator fails to find one.

7.46.2 Member Function Documentation

7.46.2.1 bool TriDevs.TriEngine.Input.NullInputManager.IsKeyDown (Key key)

Returns whether or not the specified key is currently being pressed.

Parameters

key	Key to query for.
-----	-------------------

Returns

True if key is currently being pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
132      {
133          return false;
134      }
```

7.46.2.2 bool TriDevs.TriEngine.Input.NullInputManager.IsKeyUp (Key key)

Returns whether or not the specified key is currently unpressed.

Parameters

key	Key to query for.
-----	-------------------

Returns

True if the key is currently up (not pressed), false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
127      {
128          return true;
129      }
```

7.46.2.3 bool TriDevs.TriEngine.Input.NullInputManager.IsMouseDown (MouseButton button)

Returns whether or not the specified mouse button is currently being pressed.

Parameters

button	The button to query for.
--------	--------------------------

Returns

True if button is currently being pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```

152     {
153         return false;
154     }

```

7.46.2.4 bool TriDevs.TriEngine.Input.NullInputManager.IsMouseUp (MouseButton button)

Returns whether or not the specified mouse button is currently unpressed.

Parameters

<i>button</i>	Button to query for.
---------------	----------------------

Returns

True if the button is currently up (not pressed), false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```

147     {
148         return true;
149     }

```

7.46.2.5 bool TriDevs.TriEngine.Input.NullInputManager.IsWheelChanged ()

Returns whether the mouse wheel scrolled at all.

Returns

True if the mouse wheel scrolled, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```

177     {
178         return false;
179     }

```

7.46.2.6 bool TriDevs.TriEngine.Input.NullInputManager.IsWheelDown ()

Returns whether the mouse wheel was scrolled down.

Returns

True if mouse wheel was scrolled down, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```

172     {
173         return false;
174     }

```

7.46.2.7 bool TriDevs.TriEngine.Input.NullInputManager.IsWheelUp ()

Returns whether the mouse wheel was scrolled up.

Returns

True if mouse wheel was scrolled up, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
167      {
168          return false;
169      }
```

7.46.2.8 bool TriDevs.TriEngine.Input.NullInputManager.KeyPressed (Key key)

Returns whether or not the specified key has been pressed.

Only returns true if the last state of the key was not pressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key was pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
137      {
138          return false;
139      }
```

7.46.2.9 bool TriDevs.TriEngine.Input.NullInputManager.KeyReleased (Key key)

Returns whether or not the specified key has been released.

Only returns true if the last state of the key was pressed.

Parameters

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key was released, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
142      {
143          return false;
144      }
```

7.46.2.10 bool TriDevs.TriEngine.Input.NullInputManager.MousePressed (MouseButton button)

Returns whether or not the specified mouse button has been pressed.

Only returns true if the last state of the mouse button was not pressed.

Parameters

<i>button</i>	Button to query for.
---------------	----------------------

Returns

True if button was pressed, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
157      {
158          return false;
159      }
```

7.46.2.11 bool TriDevs.TriEngine.Input.NullInputManager.MouseReleased (MouseButton button)

Returns whether or not the specified mouse button has been released.

Only returns true if the last state of the button was pressed.

Parameters

<i>button</i>	The button to query for.
---------------	--------------------------

Returns

True if the button was released, false otherwise.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
162      {
163          return false;
164      }
```

7.46.2.12 void TriDevs.TriEngine.Input.NullInputManager.Update ()

Updates the input manager, refreshing all current and previous states.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
122      {
123          // Do nothing
124      }
```

7.46.2.13 int TriDevs.TriEngine.Input.NullInputManager.WheelChange ()

Returns the mouse wheel's change in value.

Returns

Negative value if wheel scrolled down, positive value if scrolled up, zero if not scrolled.

Implements [TriDevs.TriEngine.Input.IInputManager](#).

```
182      {
183          return 0;
184      }
```

7.46.3 Property Documentation**7.46.3.1 Point<int> TriDevs.TriEngine.Input.NullInputManager.mousePosition [get]**

7.46.3.2 int TriDevs.TriEngine.Input.NullInputManager.MouseWheelValue [get]

7.46.3.3 int TriDevs.TriEngine.Input.NullInputManager.MouseX [get]

7.46.3.4 int TriDevs.TriEngine.Input.NullInputManager.MouseY [get]

7.46.3.5 bool TriDevs.TriEngine.Input.NullInputManager.this[Key key] [get]

7.46.3.6 bool TriDevs.TriEngine.Input.NullInputManager.this[MouseButton button] [get]

7.46.4 Event Documentation

7.46.4.1 KeyDownEventHandler TriDevs.TriEngine.Input.NullInputManager.KeyDown

Raised when a key is pressed down.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.2 KeyPressEventHandler TriDevs.TriEngine.Input.NullInputManager.KeyPress

Raised when a character is typed.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.3 KeyUpEventHandler TriDevs.TriEngine.Input.NullInputManager.KeyUp

Raised when a key is released.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.4 MouseDownEventHandler TriDevs.TriEngine.Input.NullInputManager.MouseDown

Raised when a mouse button is pressed down.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.5 MouseUpEventHandler TriDevs.TriEngine.Input.NullInputManager.MouseUp

Raised when a mouse button is released.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.6 MouseWheelChangedEventHandler TriDevs.TriEngine.Input.NullInputManager.WheelChanged

Raised when the mouse wheel value changes.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.7 MouseWheelDownEventHandler TriDevs.TriEngine.Input.NullInputManager.WheelDown

Raised when the mouse wheel is scrolled downwards.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

7.46.4.8 MouseWheelUpEventHandler TriDevs.TriEngine.Input.NullInputManager.WheelUp

Raised when the mouse wheel is scrolled upwards.

This particular event is never raised, it's merely a placeholder in case a proper [InputManager](#) was not supplied.

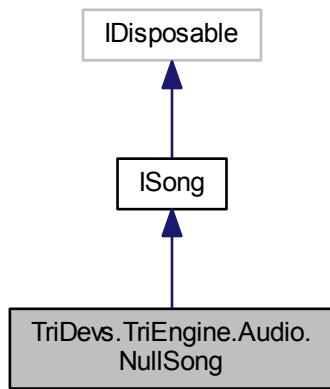
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Input/NullInputManager.cs](#)

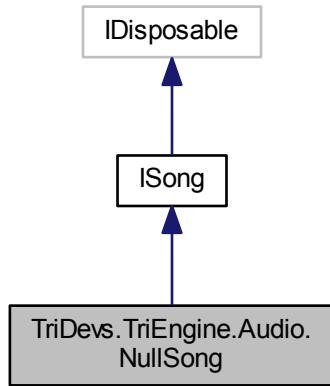
7.47 TriDevs.TriEngine.Audio.NullSong Class Reference

Fallback song class used in [NullAudioManager](#).

Inheritance diagram for TriDevs.TriEngine.Audio.NullSong:



Collaboration diagram for TriDevs.TriEngine.Audio.NullSong:



Public Member Functions

- void [Dispose \(\)](#)
- void [Play \(\)](#)
Starts playback of the song.
- void [Stop \(\)](#)
Stops playback of the song.
- void [Pause \(\)](#)
Pauses playback of the song.
- void [Resume \(\)](#)
Resumes playback of a paused song.

Properties

- string [Name \[get\]](#)
- string [File \[get\]](#)
- float [Volume \[get, set\]](#)
- bool [IsLooped \[get, set\]](#)

7.47.1 Detailed Description

Fallback song class used in [NullAudioManager](#).

7.47.2 Member Function Documentation

7.47.2.1 void TriDevs.TriEngine.Audio.NullSong.Dispose ()

```
37      {  
38  
39      }
```

7.47.2.2 void TriDevs.TriEngine.Audio.NullSong.Pause ()

Pauses playback of the song.

Call the [Resume](#) or [Play](#) method to resume playback.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
52      {  
53  
54      }
```

7.47.2.3 void TriDevs.TriEngine.Audio.NullSong.Play ()

Starts playback of the song.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
42      {  
43  
44      }
```

7.47.2.4 void TriDevs.TriEngine.Audio.NullSong.Resume()

Resumes playback of a paused song.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
57      {  
58  
59      }
```

7.47.2.5 void TriDevs.TriEngine.Audio.NullSong.Stop()

Stops playback of the song.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
47      {  
48  
49      }
```

7.47.3 Property Documentation

7.47.3.1 string TriDevs.TriEngine.Audio.NullSong.File [get]

7.47.3.2 bool TriDevs.TriEngine.Audio.NullSong.IsLooped [get], [set]

7.47.3.3 string TriDevs.TriEngine.Audio.NullSong.Name [get]

7.47.3.4 float TriDevs.TriEngine.Audio.NullSong.Volume [get], [set]

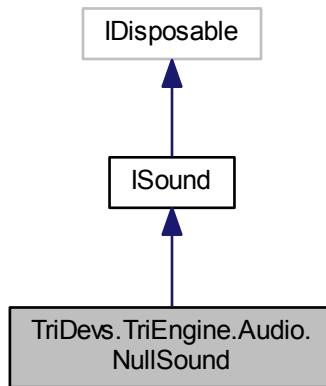
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Audio/NullSong.cs](#)

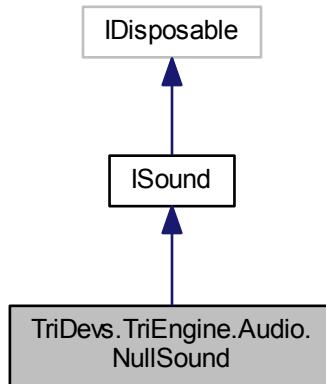
7.48 TriDevs.TriEngine.Audio.NullSound Class Reference

Fallback sound class used in [Null AudioManager](#).

Inheritance diagram for TriDevs.TriEngine.Audio.NullSound:



Collaboration diagram for TriDevs.TriEngine.Audio.NullSound:



Public Member Functions

- void [Play \(\)](#)
Plays the sound.
- void [Stop \(\)](#)
Stops the sound.
- void [Dispose \(\)](#)

Properties

- string [Name](#) [get]

- string [File](#) [get]

7.48.1 Detailed Description

Fallback sound class used in [NullAudioManager](#).

7.48.2 Member Function Documentation

7.48.2.1 void [TriDevs.TriEngine.Audio.NullSound.Dispose](#)()

```
45      {
46
47      }
```

7.48.2.2 void [TriDevs.TriEngine.Audio.NullSound.Play](#)()

Plays the sound.

Implements [TriDevs.TriEngine.Audio.ISound](#).

```
35      {
36
37      }
```

7.48.2.3 void [TriDevs.TriEngine.Audio.NullSound.Stop](#)()

Stops the sound.

Implements [TriDevs.TriEngine.Audio.ISound](#).

```
40      {
41
42      }
```

7.48.3 Property Documentation

7.48.3.1 string [TriDevs.TriEngine.Audio.NullSound.File](#) [get]

7.48.3.2 string [TriDevs.TriEngine.Audio.NullSound.Name](#) [get]

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Audio/NullSound.cs](#)

7.49 [TriDevs.TriEngine.Point< T >](#) Struct Template Reference

A struct representing an X/Y coordinate.

Public Member Functions

- [Point](#) (T x, T y)

Creates a new Point<T> with the specified X and Y values.

Public Attributes

- **T X**
The X value of the coordinate.
- **T Y**
The Y value of the coordinate.

7.49.1 Detailed Description

A struct representing an X/Y coordinate.

Template Parameters

<i>T</i>	The type used for the X and Y members.
----------	--

Type Constraints

T : struct

7.49.2 Constructor & Destructor Documentation

7.49.2.1 TriDevs.TriEngine.Point< T >.Point (T x, T y)

Creates a new Point<T> with the specified X and Y values.

Parameters

x	The X value.
y	The Y value.

```
48
49     {
50         X = x;
51         Y = y;
52     }
```

7.49.3 Member Data Documentation

7.49.3.1 T TriDevs.TriEngine.Point< T >.X

The X value of the coordinate.

7.49.3.2 T TriDevs.TriEngine.Point< T >.Y

The Y value of the coordinate.

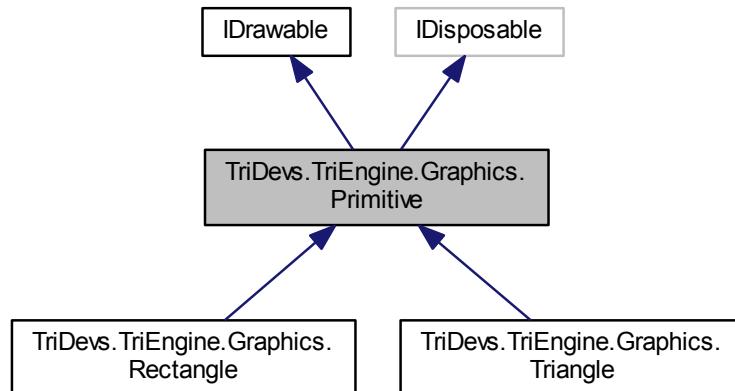
The documentation for this struct was generated from the following file:

- [TriDevs.TriEngine/Point.cs](#)

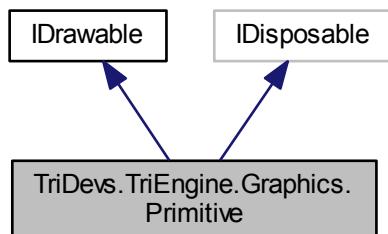
7.50 TriDevs.TriEngine.Graphics.Primitive Class Reference

Represents a primitive 2D shape composed of triangles.

Inheritance diagram for TriDevs.TriEngine.Graphics.Primitive:



Collaboration diagram for TriDevs.TriEngine.Graphics.Primitive:



Public Member Functions

- void [Draw \(\)](#)
Draw the object to screen.
- void [Dispose \(\)](#)

Protected Member Functions

- [Primitive \(ushort\[\] indices, Vector3\[\] vectors, Color\[\] colors=null\)](#)
- [Primitive \(ushort\[\] indices, float\[\] vertices, Color\[\] colors=null\)](#)

Protected Attributes

- uint[] [Ids](#)

- uint [ColorID](#)
- ushort[] [Indices](#)
- float[] [Vertices](#)
- int[] [Colors](#)

Properties

- uint [IndicesID](#) [get]
Indices buffer ID assigned to this primitive by GL.BindBuffer.
- uint [VerticesID](#) [get]
Vertices buffer ID assigned to this primitive by GL.BindBuffer.
- uint [ColorID](#) [get]
Color buffer ID assigned to this primitive by GL.BindBuffer.

7.50.1 Detailed Description

Represents a primitive 2D shape composed of triangles.

7.50.2 Constructor & Destructor Documentation

7.50.2.1 [TriDevs.TriEngine.Graphics.Primitive.Primitive \(ushort\[\] indices, Vector3\[\] vectors, Color\[\] colors = null \) \[protected\]](#)

```
60         : this(indices, vectors.ToFloatArray(), colors)
61     {
62 }
```

7.50.2.2 [TriDevs.TriEngine.Graphics.Primitive.Primitive \(ushort\[\] indices, float\[\] vertices, Color\[\] colors = null \) \[protected\]](#)

```
65     {
66         if (indices.Length % 3 != 0)
67             throw new EngineException(
68                 "Primitives can only be composed of a series of triangles. Expected n*3 points, got " +
69                 vertices.Length + ".",
70                 new ArgumentException("Unexpected number of array items.", "indices"));
71
72         Indices = indices;
73         Vertices = vertices;
74
75         Ids = new uint[2];
76
77         GL.GenBuffers(2, Ids);
78
79         GL.BindBuffer(BufferTarget.ElementArrayBuffer, IndicesID);
80         GL.BufferData(BufferTarget.ElementArrayBuffer, new IntPtr(Indices.Length * sizeof(ushort)),
81             Indices, BufferUsageHint.StaticDraw);
82         GL.BindBuffer(BufferTarget.ElementArrayBuffer, 0);
83
84         GL.BindBuffer(BufferTarget.ArrayBuffer, VerticesID);
85         GL.BufferData(BufferTarget.ArrayBuffer, new IntPtr(Vertices.Length * sizeof(float)),
86             Vertices, BufferUsageHint.StaticDraw);
87         GL.BindBuffer(BufferTarget.ArrayBuffer, 0);
88
89         if (colors != null)
90         {
91             Colors = new int[colors.Length];
92             for (int i = 0; i < colors.Length; i++)
93                 Colors[i] = colors[i].ToColor4().ToArgb();
94
95             GL.GenBuffers(1, out ColorID);
96             GL.BindBuffer(BufferTarget.ArrayBuffer, ColorID);
97             GL.BufferData(BufferTarget.ArrayBuffer, new IntPtr(Colors.Length * sizeof(int)),
98                 Colors, BufferUsageHint.StaticDraw);
99             GL.BindBuffer(BufferTarget.ArrayBuffer, 0);
100        }
101    }
```

7.50.3 Member Function Documentation

7.50.3.1 void TriDevs.TriEngine.Graphics.Primitive.Dispose()

```

123      {
124          GL.DeleteBuffers(2, Ids);
125
126          if (ColorID != 0)
127              GL.DeleteBuffers(1, ref ColorID);
128      }

```

7.50.3.2 void TriDevs.TriEngine.Graphics.Primitive.Draw()

Draw the object to screen.

Implements [TriDevs.TriEngine.Interfaces.IDrawable](#).

```

101     {
102         GL.PushClientAttrib(ClientAttribMask.ClientVertexArrayBit);
103
104         GL.EnableClientState(ArrayCap.VertexArray);
105
106         if (ColorID != 0)
107         {
108             GL.EnableClientState(ArrayCap.ColorArray);
109             GL.BindBuffer(BufferTarget.ArrayBuffer, ColorID);
110             GL.ColorPointer(sizeof(int), ColorPointerType.UnsignedByte, 0, 0);
111         }
112
113         GL.BindBuffer(BufferTarget.ArrayBuffer, VerticesID);
114         GL.VertexPointer(3, VertexPointerType.Float, 0, 0);
115
116         GL.BindBuffer(BufferTarget.ElementArrayBuffer, IndicesID);
117         GL.DrawElements(BeginMode.Triangles, Indices.Length, DrawElementsType.UnsignedShort, 0);
118
119         GL.PopClientAttrib();
120     }

```

7.50.4 Member Data Documentation

7.50.4.1 uint TriDevs.TriEngine.Graphics.Primitive.ColorID [protected]

7.50.4.2 int [] TriDevs.TriEngine.Graphics.Primitive.Colors [protected]

7.50.4.3 uint [] TriDevs.TriEngine.Graphics.Primitive.Ids [protected]

7.50.4.4 ushort [] TriDevs.TriEngine.Graphics.Primitive.Indices [protected]

7.50.4.5 float [] TriDevs.TriEngine.Graphics.Primitive.Vertices [protected]

7.50.5 Property Documentation

7.50.5.1 uint TriDevs.TriEngine.Graphics.Primitive.ColorID [get]

[Color](#) buffer ID assigned to this primitive by GL.BindBuffer.

7.50.5.2 uint TriDevs.TriEngine.Graphics.Primitive.IndicesID [get]

Indices buffer ID assigned to this primitive by GL.BindBuffer.

7.50.5.3 uint TriDevs.TriEngine.Graphics.Primitive.VerticesID [get]

Vertices buffer ID assigned to this primitive by GL.BindBuffer.

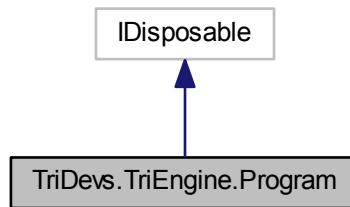
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Graphics/Primitive.cs](#)

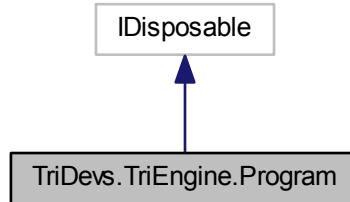
7.51 TriDevs.TriEngine.Program Class Reference

An OpenGL program.

Inheritance diagram for TriDevs.TriEngine.Program:



Collaboration diagram for TriDevs.TriEngine.Program:



Public Member Functions

- [Program \(params Shader\[\] shaders\)](#)
Initializes a new [Program](#) as a shader program.
- [void Dispose \(\)](#)

Public Attributes

- [readonly int ID](#)
The ID of this program.

7.51.1 Detailed Description

An OpenGL program.

7.51.2 Constructor & Destructor Documentation

7.51.2.1 `TriDevs.TriEngine.Program.Program (params Shader[] shaders)`

Initializes a new [Program](#) as a shader program.

Parameters

<code>shaders</code>	The shaders to attach.
----------------------	------------------------

```

45      {
46          ID = GL.CreateProgram();
47
48          foreach (var shader in shaders)
49          {
50              GL.AttachShader(ID, shader.ID);
51          }
52
53          GL.LinkProgram(ID);
54      }

```

7.51.3 Member Function Documentation

7.51.3.1 `void TriDevs.TriEngine.Program.Dispose ()`

```

57      {
58          GL.DeleteProgram(ID);
59      }

```

7.51.4 Member Data Documentation

7.51.4.1 `readonly int TriDevs.TriEngine.Program.ID`

The ID of this program.

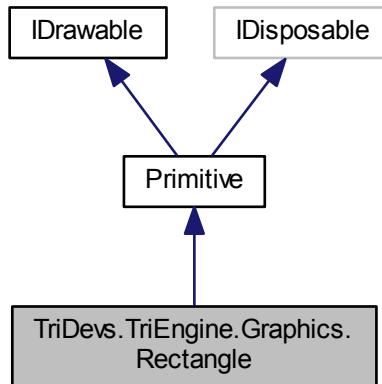
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Program.cs](#)

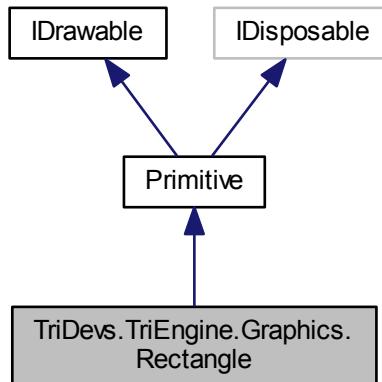
7.52 `TriDevs.TriEngine.Graphics.Rectangle` Class Reference

A primitive 2D [Rectangle](#) shape.

Inheritance diagram for TriDevs.TriEngine.Graphics.Rectangle:



Collaboration diagram for TriDevs.TriEngine.Graphics.Rectangle:



Public Member Functions

- [Rectangle \(TriEngine.Rectangle rect\)](#)
Creates a new 2D [Rectangle](#) with the specified settings.

Additional Inherited Members

7.52.1 Detailed Description

A primitive 2D [Rectangle](#) shape.

7.52.2 Constructor & Destructor Documentation

7.52.2.1 TriDevs.TriEngine.Graphics.Rectangle (`TriEngine.Rectangle rect`)

Creates a new 2D `Rectangle` with the specified settings.

Parameters

<code>rect</code>	The rectangle defining the position and size of this primitive.
-------------------	---

```
38      : base(new ushort[])
39      {
40          // First triangle
41          0, 1, 2,
42
43          // Second triangle
44          0, 2, 3
45      },
```

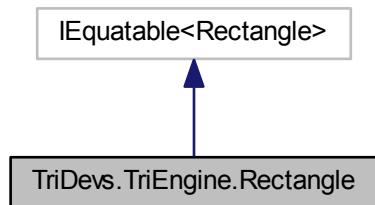
The documentation for this class was generated from the following file:

- `TriDevs.TriEngine/Graphics/Rectangle.cs`

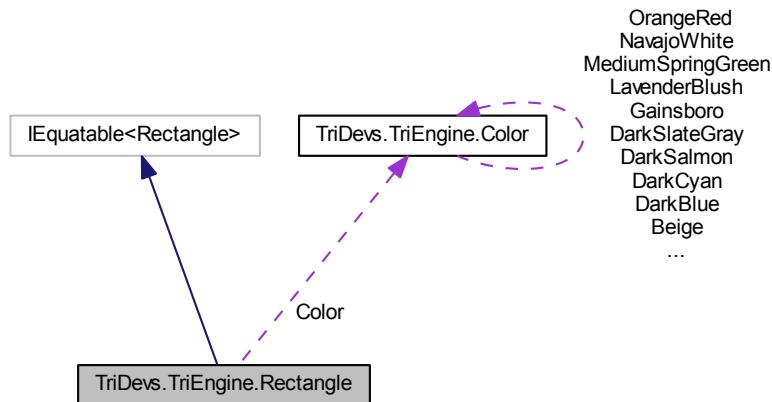
7.53 `TriDevs.TriEngine.Rectangle` Struct Reference

A rectangle representing an area in 2D space.

Inheritance diagram for `TriDevs.TriEngine.Rectangle`:



Collaboration diagram for TriDevs.TriEngine.Rectangle:



Public Member Functions

- **Rectangle** (Point< int > position, Point< int > size, **Color?**color=null)

*Initializes a new **Rectangle** with position and size based on two point objects.*
- **Rectangle** (int x, int y, int width, int height, **Color?**color=null)

Initializes a new rectangle with specified position and size.
- bool **Intersects** (**Rectangle** other)

Returns whether this rectangle is intersecting with another rectangle.
- bool **Equals** (**Rectangle** other)

Public Attributes

- readonly int **X**

The X position of this rectangle, in screen pixels.
- readonly int **Y**

The Y position of this rectangle, in screen pixels.
- readonly int **Width**

The width of this rectangle in pixels.
- readonly int **Height**

The height of this rectangle in pixels.
- readonly **Color** **Color**

Optional color of this rectangle, if it is to be drawn onto the screen.

7.53.1 Detailed Description

A rectangle representing an area in 2D space.

7.53.2 Constructor & Destructor Documentation

7.53.2.1 TriDevs.TriEngine.Rectangle.Rectangle (Point< int > position, Point< int > size, Color? color=null)

Initializes a new [Rectangle](#) with position and size based on two point objects.

Parameters

<i>position</i>	The point to get position from.
<i>size</i>	The point to get width and height from.
<i>color</i>	Color of this rectangle, set to null for default color of black.

```
66      : this(position.X, position.Y, size.X, size.Y, color)
67      {
68
69      }
```

7.53.2.2 TriDevs.TriEngine.Rectangle.Rectangle (int x, int y, int width, int height, Color? color=null)

Initializes a new rectangle with specified position and size.

Parameters

<i>x</i>	X-position of this rectangle, in screen pixels.
<i>y</i>	Y-position of this rectangle, in screen pixels.
<i>width</i>	Width of this rectangle, in pixels.
<i>height</i>	Height of this rectangle, in pixels.
<i>color</i>	Color of this rectangle, set to null for default color of black.

```
80      {
81          X = x;
82          Y = y;
83          Width = width;
84          Height = height;
85          Color = color.HasValue ? color.Value : Color.Black;
86      }
```

7.53.3 Member Function Documentation

7.53.3.1 bool TriDevs.TriEngine.Rectangle.Equals (Rectangle other)

```
114      {
115          return X == other.X && Y == other.Y && Width == other.Width &&
116          Height == other.Height;
}
```

7.53.3.2 bool TriDevs.TriEngine.Rectangle.Intersects (Rectangle other)

Returns whether this rectangle is intersecting with another rectangle.

Parameters

<i>other</i>	Rectangle to check against.
--------------	---

Returns

True if this rectangle is intersecting with the other rectangle, false otherwise.

```
94      {
95          if (Equals(other))
```

```

96             return true;
97
98         if (X >= other.X && (X + Width) <= (other.X + other.Width))
99             return true;
100
101        if (X < other.X && (X + Width) >= other.X)
102            return true;
103
104        if (Y >= other.Y && (Y + Height) <= (other.Y + other.Height))
105            return true;
106
107        if (Y < other.Y && (Y + Height) >= other.Y)
108            return true;
109
110        return false;
111    }

```

7.53.4 Member Data Documentation

7.53.4.1 readonly Color TriDevs.TriEngine.Rectangle.Color

Optional color of this rectangle, if it is to be drawn onto the screen.

7.53.4.2 readonly int TriDevs.TriEngine.Rectangle.Height

The height of this rectangle in pixels.

7.53.4.3 readonly int TriDevs.TriEngine.Rectangle.Width

The width of this rectangle in pixels.

7.53.4.4 readonly int TriDevs.TriEngine.Rectangle.X

The X position of this rectangle, in screen pixels.

7.53.4.5 readonly int TriDevs.TriEngine.Rectangle.Y

The Y position of this rectangle, in screen pixels.

The documentation for this struct was generated from the following file:

- [TriDevs.TriEngine/Rectangle.cs](#)

7.54 TriDevs.TriEngine.Resources Class Reference

Static class to manage resources.

Static Public Member Functions

- static void [AddFont \(Font font\)](#)
Adds a font instance to the resources.
- static void [AddShader \(Shader shader\)](#)
Adds a shader instance to the resources.
- static [Font LoadFont \(string name, string file, int size, bool dropShadow=false, FontType type=FontType.TTF\)](#)
Loads a font file from the default resources path into the resources.

- static [Font LoadFont](#) (string name, string file, int size, [FontType](#) type, [FontConstructionConfig](#) config)
Loads a font file from the default resources path into the resources.
- static [Shader LoadShader](#) (string name, string file, [ShaderType](#) type)
Loads a shader file from the default resources path into the resources.
- static [Font GetFont](#) (string name)
Gets the font object with the specified name from the resources, if it exists.
- static [Shader GetShader](#) (string name)
Gets the shader object with the specified name from the resources, if it exists.

Static Public Attributes

- static string [BasePath](#) = "Resources"
Base path to the resources directory, relative to the current working directory.
- static string [FontPath](#) = "Fonts"
Path to the fonts directory, relative to [BasePath](#).
- static string [ShaderPath](#) = "Shaders"
Path to the shaders directory, relative to [BasePath](#).

7.54.1 Detailed Description

Static class to manage resources.

7.54.2 Member Function Documentation

7.54.2.1 static void TriDevs.TriEngine.Resources.AddFont (Font font) [static]

Adds a font instance to the resources.

Parameters

<i>font</i>	The font object to add.
-------------	-------------------------

Exceptions

<i>EngineException</i>	Thrown if the resources already contain the specified font.
------------------------	---

```

68      {
69          if (Fonts.ContainsKey(font.Name))
70              throw new EngineException("A font with the specified name has already been added to the
resources.");
71
72          Fonts.Add(font.Name, font);
73      }

```

7.54.2.2 static void TriDevs.TriEngine.Resources.AddShader (Shader shader) [static]

Adds a shader instance to the resources.

Parameters

<i>shader</i>	The shader object to add.
---------------	---------------------------

Exceptions

<i>EngineException</i>	Thrown if the resources already contain the specified shader.
------------------------	---

```

81      {
82          if (Shaders.ContainsKey(shader.Name))
83              throw new EngineException("A shader with the specified name has already been added to the
resources.");
84
85          Shaders.Add(shader.Name, shader);
86      }

```

7.54.2.3 static Font TriDevs.TriEngine.Resources.GetFont (string name) [static]

Gets the font object with the specified name from the resources, if it exists.

Parameters

<i>name</i>	Name of the font object to retrieve.
-------------	--------------------------------------

Returns

The font object with the specified name, if it exists, null otherwise.

```

155      {
156          return Fonts.ContainsKey(name) ? Fonts[name] : null;
157      }

```

7.54.2.4 static Shader TriDevs.TriEngine.Resources.GetShader (string name) [static]

Gets the shader object with the specified name from the resources, if it exists.

Parameters

<i>name</i>	Name of the shader object to retrieve.
-------------	--

Returns

The shader object with the specified name, if it exists, null otherwise.

```

166      {
167          return Shaders.ContainsKey(name) ? Shaders[name] : null;
168      }

```

7.54.2.5 static Font TriDevs.TriEngine.Resources.LoadFont (string name, string file, int size, bool dropShadow = false, FontType type = FontType.TTF) [static]

Loads a font file from the default resources path into the resources.

Parameters

<i>name</i>	Name to assign the font, or null to auto-generate one.
<i>file</i>	Font file to load.
<i>size</i>	Size (in points) to use for the font.
<i>dropShadow</i>	Whether or not the font should have shadows.
<i>type</i>	The font filetype.

Returns

The newly loaded font object, or existing font object if one with matching name was found.

```

98     {
99         return LoadFont(name, file, size, type,
100            new FontConstructionConfig(new QFontBuilderConfiguration(
101                dropShadow),
102            new QFontLoaderConfiguration(dropShadow)));
103    }

```

7.54.2.6 static Font TriDevs.TriEngine.Resources.LoadFont (string name, string file, int size, FontType type, FontConstructionConfig config) [static]

Loads a font file from the default resources path into the resources.

Parameters

<i>name</i>	Name to assign the font, or null to auto-generate one.
<i>file</i>	Font file to load.
<i>size</i>	Size (in points) to use for the font.
<i>type</i>	The font filetype.
<i>config</i>	The relevant font construction configs.

Returns

The newly loaded font object, or existing font object if one with matching name was found.

```

114    {
115        var font = GetFont(name);
116
117        if (font != null)
118            return font;
119
120        file = Path.Combine(BasePath, FontPath, file);
121
122        font = new Font(name, file, size, type, config);
123        AddFont(font);
124        return font;
125    }

```

7.54.2.7 static Shader TriDevs.TriEngine.Resources.LoadShader (string name, string file, ShaderType type) [static]

Loads a shader file from the default resources path into the resources.

Parameters

<i>name</i>	Name to assign the shader, or null to auto-generate one.
<i>file</i>	File to load shader code from.
<i>type</i>	The type of shader.

Returns

The newly loaded shader object, or existing shader object if one with matching name was found.

```

135    {
136        var shader = GetShader(name);
137
138        if (shader != null)
139            return shader;
140
141        file = Path.Combine(BasePath, ShaderPath, file);
142
143        shader = new Shader(name, file, type);
144        AddShader(shader);

```

```
145         return shader;
146     }
```

7.54.3 Member Data Documentation

7.54.3.1 string TriDevs.TriEngine.Resources.BasePath = "Resources" [static]

Base path to the resources directory, relative to the current working directory.

7.54.3.2 string TriDevs.TriEngine.Resources.FontPath = "Fonts" [static]

Path to the fonts directory, relative to [BasePath](#).

7.54.3.3 string TriDevs.TriEngine.Resources.ShaderPath = "Shaders" [static]

Path to the shaders directory, relative to [BasePath](#).

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Resources.cs](#)

7.55 TriDevs.TriEngine.Serializing.Serializer Class Reference

Provides serialization methods.

Static Public Member Functions

- static string [Serialize< T >](#) (T data)
Serialize an object to string.
- static void [Serialize< T >](#) (T data, string file, Formatting formatting=Formatting.Indented)
Serializes an object to file.
- static T [Deserialize< T >](#) (string file)
Deserialize a serialized object from file.

7.55.1 Detailed Description

Provides serialization methods.

7.55.2 Member Function Documentation

7.55.2.1 static T TriDevs.TriEngine.Serializing.Serializer.Deserialize< T > (string file) [static]

Deserialize a serialized object from file.

Template Parameters

T	Type of the object being deserialized.
---	--

Parameters

<i>file</i>	File to read from.
-------------	--------------------

Returns

The deserialized object.

```

84      {
85          T data;
86          // Create the StreamReader
87          using (var reader = new StreamReader(file))
88          {
89              // And the json reader
90              using (var jsonReader = new JsonTextReader(reader))
91              {
92                  // Now deserialize the file to the requested object...
93                  data = JsonSerializer.Value.Deserialize<T>(jsonReader);
94                  // ... and close the json reader.
95                  jsonReader.Close();
96              }
97              // Finally, close the file reader
98              reader.Close();
99          }
100         return data;
101     }

```

7.55.2.2 static string TriDevs.TriEngine.Serializing.Serializer.Serialize< T > (T data) [static]

Serialize an object to string.

Template Parameters

<i>T</i>	Type of data.
----------	---------------

Parameters

<i>data</i>	Data to serialize.
-------------	--------------------

Returns

The serialized object in string format.

```

44      {
45          // Create a StringWriter to hold the serialized object
46          var writer = new StringWriter();
47          // Serialize the object into the writer
48          JsonSerializer.Value.Serialize(writer, data);
49          return writer.ToString(); // Return the data as string
50      }

```

7.55.2.3 static void TriDevs.TriEngine.Serializing.Serializer.Serialize< T > (T data, string file, Formatting formatting = Formatting.Indented) [static]

Serializes an object to file.

Template Parameters

<i>T</i>	Type of the data.
----------	-------------------

Parameters

<i>data</i>	Data to serialize.
<i>file</i>	File to serialize to.

formatting	The formatting to use for the JSON output.
------------	--

```

60      {
61          // Create the Streamwriter
62          using (var writer = new StreamWriter(file, false))
63          {
64              // Create the json writer
65              using (var jsonWriter = new JsonTextWriter(writer){Formatting = formatting})
66              {
67                  // Now serialize the object to the file...
68                  JsonSerializer.Value.Serialize(jsonWriter, data);
69                  // ... and close the json writer
70                  jsonWriter.Close();
71              }
72              // Finally, close the file writer
73              writer.Close();
74          }
75      }

```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Serializing/Serializer.cs](#)

7.56 TriDevs.TriEngine.Services Class Reference

Provides different game-related service interfaces.

Static Public Member Functions

- static void [Provide \(IInputManager input\)](#)
Specifies an input manager service to provide.
- static void [Provide \(IAudioManager audio\)](#)
Specifies an audio manager service to provide.
- static void [Provide \(IInputManager input, IAudioManager audio\)](#)
Specifies what services to provide.

Properties

- static [IInputManager Input \[get\]](#)
The input manager service.
- static [IAudioManager Audio \[get\]](#)
The audio manager service.

7.56.1 Detailed Description

Provides different game-related service interfaces.

Actual service providers must be supplied from external code. All Service properties are initialized with Null-type services that provide no real functionality.

7.56.2 Member Function Documentation

7.56.2.1 static void [TriDevs.TriEngine.Services.Provide \(IInputManager input \) \[static\]](#)

Specifies an input manager service to provide.

Parameters

<i>input</i>	An object implementing the <code>IInputManager</code> interface.
--------------	--

```
57      {
58          _input = input;
59      }
```

7.56.2.2 static void TriDevs.TriEngine.Services.Provide (IAudioManager audio) [static]

Specifies an audio manager service to provide.

Parameters

<i>audio</i>	An object implementing the <code>IAudioManager</code> interface.
--------------	--

```
66      {
67          _audio = audio;
68      }
```

7.56.2.3 static void TriDevs.TriEngine.Services.Provide (IInputManager input, IAudioManager audio) [static]

Specifies what services to provide.

Parameters

<i>input</i>	The input service to provide.
<i>audio</i>	The audio service to provide.

```
76      {
77          Provide(input);
78          Provide(audio);
79      }
```

7.56.3 Property Documentation**7.56.3.1 IAudioManager TriDevs.TriEngine.Services.Audio [static], [get]**

The audio manager service.

7.56.3.2 IInputManager TriDevs.TriEngine.Services.Input [static], [get]

The input manager service.

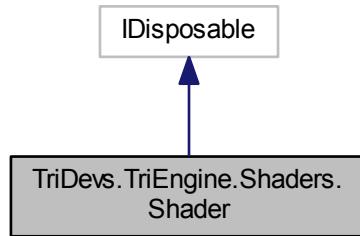
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Services.cs](#)

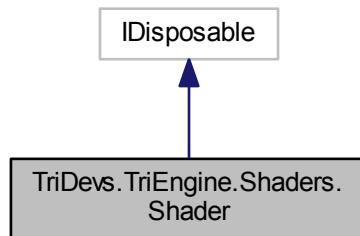
7.57 TriDevs.TriEngine.Shaders.Shader Class Reference

GLSL shader object loaded and compiled from a *.glsl shader file.

Inheritance diagram for TriDevs.TriEngine.Shaders.Shader:



Collaboration diagram for TriDevs.TriEngine.Shaders.Shader:



Public Member Functions

- [Shader](#) (string name, string file, ShaderType type)
Creates a new shader from specified GLSL source file.
- void [Dispose](#) ()

Static Public Member Functions

- static string [GetDefaultName](#) (string file)
Returns an auto-generated shader name based on the file name.

Public Attributes

- readonly int [ID](#)
ID of the shader compiled by OpenGL.

Properties

- string **Name** [get]
The name of this shader object.
- string **File** [get]
The file containing the source for this shader.

7.57.1 Detailed Description

GLSL shader object loaded and compiled from a *.glsl shader file.

7.57.2 Constructor & Destructor Documentation

7.57.2.1 `TriDevs.TriEngine.Shaders.Shader (string name, string file, ShaderType type)`

Creates a new shader from specified GLSL source file.

Parameters

<code>name</code>	The name to give to this shader, or null to let constructor auto-generate a name based on the file name.
<code>file</code>	GLSL source to use.
<code>type</code>	The type of shader to create.

```

63      {
64          _file = file;
65          _name = name ?? GetDefaultName(_file);
66          ID = GL.CreateShader(type);
67          var source = System.IO.File.ReadAllText(_file);
68          GL.ShaderSource(ID, source);
69          GL.CompileShader(ID);
70      }

```

7.57.3 Member Function Documentation

7.57.3.1 `void TriDevs.TriEngine.Shaders.Shader.Dispose ()`

```

83      {
84          GL.DeleteShader(ID);
85      }

```

7.57.3.2 `static string TriDevs.TriEngine.Shaders.Shader.GetDefaultName (string file) [static]`

Returns an auto-generated shader name based on the file name.

Parameters

<code>file</code>	The file name.
-------------------	----------------

Returns

The auto-generated shader name.

```

78      {
79          return Path.GetFileNameWithoutExtension(file);
80      }

```

7.57.4 Member Data Documentation

7.57.4.1 readonly int TriDevs.TriEngine.Shaders.Shader.ID

ID of the shader compiled by OpenGL.

7.57.5 Property Documentation

7.57.5.1 string TriDevs.TriEngine.Shaders.Shader.File [get]

The file containing the source for this shader.

7.57.5.2 string TriDevs.TriEngine.Shaders.Shader.Name [get]

The name of this shader object.

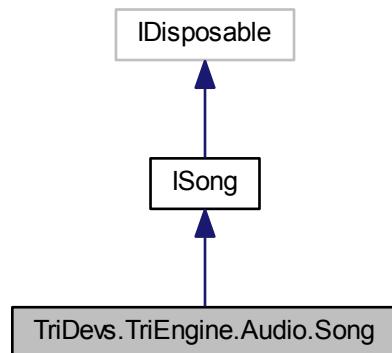
The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Shaders/[Shader.cs](#)

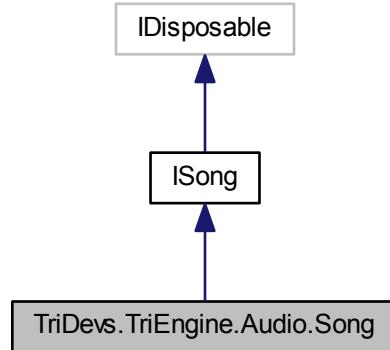
7.58 TriDevs.TriEngine.Audio.Song Class Reference

[Song](#) class that can be used with [AudioManager](#).

Inheritance diagram for TriDevs.TriEngine.Audio.Song:



Collaboration diagram for TriDevs.TriEngine.Audio.Song:



Public Member Functions

- void [Dispose \(\)](#)
- void [Play \(\)](#)
Starts playback of the song.
- void [Stop \(\)](#)
Stops playback of the song.
- void [Pause \(\)](#)
Pauses playback of the song.
- void [Resume \(\)](#)
Resumes playback of a paused song.

Properties

- string [Name \[get\]](#)
- string [File \[get\]](#)
- float [Volume \[get, set\]](#)
- bool [IsLooped \[get, set\]](#)

7.58.1 Detailed Description

[Song](#) class that can be used with [AudioManager](#).

The song class will stream from a specified file, instead of loading it into memory.

7.58.2 Member Function Documentation

7.58.2.1 void [TriDevs.TriEngine.Audio.Song.Dispose \(\)](#)

```

80         {
81             if (_stream == null)
82                 return;
83             Stop();
  
```

```
85         _stream.Dispose();
86         _stream = null;
87     }
```

7.58.2.2 void TriDevs.TriEngine.Audio.Song.Pause()

Pauses playback of the song.

Call the [Resume](#) or [Play](#) method to resume playback.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
108     {
109         _stream.Pause();
110     }
```

7.58.2.3 void TriDevs.TriEngine.Audio.Song.Play()

Starts playback of the song.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
90     {
91         try
92         {
93             _stream.Play();
94         }
95         catch (InvalidOperationException)
96         {
97             Stop();
98             Play();
99         }
100    }
```

7.58.2.4 void TriDevs.TriEngine.Audio.Song.Resume()

Resumes playback of a paused song.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
113     {
114         _stream.Resume();
115     }
```

7.58.2.5 void TriDevs.TriEngine.Audio.Song.Stop()

Stops playback of the song.

Implements [TriDevs.TriEngine.Audio.ISong](#).

```
103     {
104         _stream.Stop();
105     }
```

7.58.3 Property Documentation

7.58.3.1 string TriDevs.TriEngine.Audio.Song.File [get]

7.58.3.2 bool TriDevs.TriEngine.Audio.Song.IsLooped [get], [set]

7.58.3.3 `string TriDevs.TriEngine.Audio.Song.Name` [get]

7.58.3.4 `float TriDevs.TriEngine.Audio.Song.Volume` [get], [set]

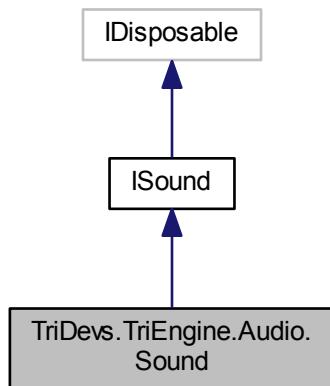
The documentation for this class was generated from the following file:

- `TriDevs.TriEngine/Audio/Song.cs`

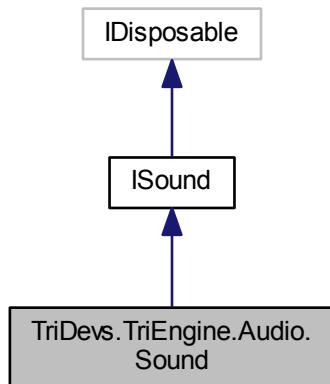
7.59 `TriDevs.TriEngine.Audio.Sound` Class Reference

`Sound` class that can be used with the `AudioManager`.

Inheritance diagram for `TriDevs.TriEngine.Audio.Sound`:



Collaboration diagram for `TriDevs.TriEngine.Audio.Sound`:



Public Member Functions

- void [Play \(\)](#)
Plays the sound.
- void [Stop \(\)](#)
Stops the sound.
- void [Dispose \(\)](#)

Properties

- string [Name \[get\]](#)
- string [File \[get\]](#)

7.59.1 Detailed Description

Sound class that can be used with the [AudioManager](#).

7.59.2 Member Function Documentation

7.59.2.1 void TriDevs.TriEngine.Audio.Sound.Dispose ()

```
187      {
188          Stop \(\);
189          AL.DeleteSources(_sources);
190          AL.DeleteBuffer(_buffer);
191      }
```

7.59.2.2 void TriDevs.TriEngine.Audio.Sound.Play ()

Plays the sound.

Implements [TriDevs.TriEngine.Audio.ISound](#).

```
169      {
170          for (var i = 0; i < SourceCount; i++)
171          {
172              if (GetSourceState(_sources[i]) != ALSourceState.Playing)
173              {
174                  AL.SourcePlay(_sources[i]);
175                  return;
176              }
177          }
178      }
```

7.59.2.3 void TriDevs.TriEngine.Audio.Sound.Stop ()

Stops the sound.

Implements [TriDevs.TriEngine.Audio.ISound](#).

```
181      {
182          for (var i = 0; i < SourceCount; i++)
183          AL.SourceStop(_sources[i]);
184      }
```

7.59.3 Property Documentation

7.59.3.1 string TriDevs.TriEngine.Audio.Sound.File [get]

7.59.3.2 string TriDevs.TriEngine.Audio.Sound.Name [get]

The documentation for this class was generated from the following file:

- TriDevs.TriEngine/Audio/[Sound.cs](#)

7.60 TriDevs.TriEngine.Extensions.StringExtensions Class Reference

[Extensions](#) for System.String

Static Public Member Functions

- static string [ReplaceFirst](#) (this string s, string search, string replace, bool caseInsensitive=false)
Returns a string in which the first occurrence of a specified string is replaced with another string.
- static string [Replace](#) (this string s, string search, string replace, int count, bool caseInsensitive=false)
Returns a string in which the N first occurrences of a specified string are replaced with another string.
- static string [Replace](#) (this string s, string search, string replace, bool caseInsensitive=false)
Returns a string in which all occurrences of a specified string are replaced with another string.

7.60.1 Detailed Description

[Extensions](#) for System.String

7.60.2 Member Function Documentation

7.60.2.1 static string TriDevs.TriEngine.Extensions.StringExtensions.Replace (this string s, string search, string replace, int count, bool caseInsensitive = false) [static]

Returns a string in which the N first occurrences of a specified string are replaced with another string.

Parameters

<i>s</i>	String to modify.
<i>search</i>	String to search for.
<i>replace</i>	String to replace the match(es) with.
<i>count</i>	Number of occurrences to replace.
<i>caseInsensitive</i>	True for case insensitive search, false for case sensitive.

Returns

The supplied string with the N first occurrences of the specified string replaced with the other.

```
56      {
57          var re = caseInsensitive ? new Regex(search, RegexOptions.IgnoreCase) : new Regex(search);
58          return re.Replace(s, replace, count);
59      }
```

```
7.60.2.2 static string TriDevs.TriEngine.Extensions.StringExtensions.Replace ( this string s, string search, string replace, bool caseInsensitive = false ) [static]
```

Returns a string in which all occurrences of a specified string are replaced with another string.

This extension method supports case insensitive searches.

Parameters

<i>s</i>	String to modify.
<i>search</i>	String to search for.
<i>replace</i>	String to replace the match(es) with.
<i>caseInsensitive</i>	True for case insensitive search, false for case sensitive.

Returns

The supplied string with all occurrences of the specified string replaced with the other.

```
73     {
74         var re = caseInsensitive ? new Regex(search, RegexOptions.IgnoreCase) : new Regex(search);
75         return re.Replace(s, replace);
76     }
```

```
7.60.2.3 static string TriDevs.TriEngine.Extensions.StringExtensions.ReplaceFirst ( this string s, string search, string replace, bool caseInsensitive = false ) [static]
```

Returns a string in which the first occurrence of a specified string is replaced with another string.

Parameters

<i>s</i>	String to modify.
<i>search</i>	String to search for.
<i>replace</i>	String to replace the match with.
<i>caseInsensitive</i>	True for case insensitive search, false for case sensitive.

Returns

The supplied string with the first occurrence of the specified string replaced with the other.

```
42     {
43         return Replace(s, search, replace, 1, caseInsensitive);
44     }
```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Extensions/StringExtensions.cs](#)

7.61 TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests Class Reference

Public Member Functions

- void [ShouldReplaceFirstWordCaseSensitive \(\)](#)
- void [ShouldReplaceFirstWordCaseInsensitive \(\)](#)
- void [ShouldReplaceAllWordsCaseSensitive \(\)](#)
- void [ShouldReplaceAllWordsCaseInsensitive \(\)](#)
- void [ShouldReplaceFirstTwoOccurrencesCaseSensitive \(\)](#)
- void [ShouldReplaceFirstTwoOccurrencesCaseInsensitive \(\)](#)

7.61.1 Member Function Documentation

7.61.1.1 void TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests.ShouldReplaceAllWordsCaseInsensitive ()

```
38     {
39         const string expected = "Bar Bar Bar";
40         Assert.AreEqual(FooString.Replace("Foo", "Bar", true), expected);
41         Assert.AreEqual(FooString.Replace("foo", "Bar", true), expected);
42     }
```

7.61.1.2 void TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests.ShouldReplaceAllWordsCaseSensitive ()

```
30     {
31         const string expected = "Bar Bar Bar";
32         Assert.AreEqual(FooString.Replace("Foo", "Bar", false), expected);
33         Assert.AreNotEqual(FooString.Replace("foo", "Bar", false), expected);
34     }
```

7.61.1.3 void TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests.ShouldReplaceFirstTwoOccurrencesCaseInsensitive ()

```
54     {
55         const string expected = "Bar Bar Foo";
56         Assert.AreEqual(FooString.Replace("Foo", "Bar", 2, true), expected);
57         Assert.AreEqual(FooString.Replace("foo", "Bar", 2, true), expected);
58     }
```

7.61.1.4 void TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests.ShouldReplaceFirstTwoOccurrencesCaseSensitive ()

```
46     {
47         const string expected = "Bar Bar Foo";
48         Assert.AreEqual(FooString.Replace("Foo", "Bar", 2), expected);
49         Assert.AreNotEqual(FooString.Replace("foo", "Bar", 2), expected);
50     }
```

7.61.1.5 void TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests.ShouldReplaceFirstWordCaseInsensitive ()

```
22     {
23         const string expected = "Bar Bar Baz";
24         Assert.AreEqual(TestString.ReplaceFirst("Foo", "Bar", true), expected);
25         Assert.AreEqual(TestString.ReplaceFirst("foo", "Bar", true), expected);
26     }
```

7.61.1.6 void TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests.ShouldReplaceFirstWordCaseSensitive ()

```
14     {
15         const string expected = "Bar Bar Baz";
16         Assert.AreEqual(TestString.ReplaceFirst("Foo", "Bar"), expected);
17         Assert.AreNotEqual(TestString.ReplaceFirst("foo", "Bar"), expected);
18     }
```

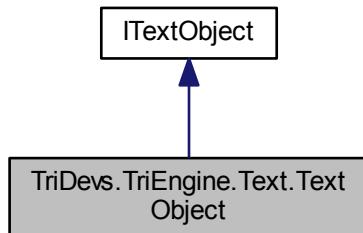
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine.Tests/ExtensionTests/StringExtensionTests.cs](#)

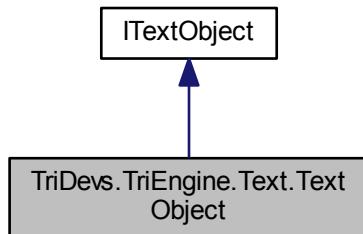
7.62 TriDevs.TriEngine.Text.TextObject Class Reference

Implements the [ITextObject](#) interface.

Inheritance diagram for TriDevs.TriEngine.Text.TextObject:



Collaboration diagram for TriDevs.TriEngine.Text.TextObject:



Public Member Functions

- [TextObject](#) (string text, string fontName, Point< int > position=new Point< int >(), QFontAlignment alignment=QFontAlignment.Centre)
- [TextObject](#) (string text, [Font](#) font, Point< int > position=new Point< int >(), QFontAlignment alignment=QFontAlignment.Centre)

Initializes a new [TextObject](#) instance.

- void [Draw](#) ()

Draws this text object to screen with default parameters.

- void [Draw](#) (Point< int > position)

Draws this text object to a specific position on the screen specified by the supplied Point struct.

- void [Draw](#) (int x, int y)

Draws this text object to screen at the specified X/Y position.

Properties

- `Font Font [get, set]`
- `Color Color [get, set]`
- `string Text [get, set]`
- `Point< int > Position [get, set]`
- `Rectangle Bounds [get]`
- `QFontAlignment Alignment [get, set]`

7.62.1 Detailed Description

Implements the [ITextObject](#) interface.

7.62.2 Constructor & Destructor Documentation

7.62.2.1 `TriDevs.TriEngine.Text.TextObject (string text, string fontName, Point< int > position = new Point<int>(), QFontAlignment alignment = QFontAlignment.Centre)`

```
73         : this(text, Resources.GetFont(fontName), position, alignment)
74     {
75
76 }
```

7.62.2.2 `TriDevs.TriEngine.Text.TextObject (string text, Font font, Point< int > position = new Point<int>(), QFontAlignment alignment = QFontAlignment.Centre)`

Initializes a new [TextObject](#) instance.

Parameters

<code>text</code>	The initial text to set for this text object.
<code>font</code>	The font to use for this text object.
<code>position</code>	The intitial position of this text object.
<code>alignment</code>	The intitial alignment of the text in this text object.

```
87         {
88             if (font == null)
89                 throw new EngineException("Font supplied for TextObject is null!", new
ArgumentNullException("font"));
90
91             Text = text;
92             Font = font;
93             Position = position;
94             Alignment = alignment;
95 }
```

7.62.3 Member Function Documentation

7.62.3.1 `void TriDevs.TriEngine.Text.TextObject.Draw ()`

Draws this text object to screen with default parameters.

Implements [TriDevs.TriEngine.Text.ITextObject](#).

```
104         {
105             Draw(_vectorPos);
106 }
```

7.62.3.2 void TriDevs.TriEngine.Text.TextObject.Draw (Point< int > position)

Draws this text object to a specific position on the screen specified by the supplied Point struct.

Parameters

<i>position</i>	Point class with X/Y coordinates.
-----------------	-----------------------------------

Implements [TriDevs.TriEngine.Text.ITextObject](#).

```
109      {
110          Draw(position.X, position.Y);
111      }
```

7.62.3.3 void TriDevs.TriEngine.Text.TextObject.Draw (int x, int y)

Draws this text object to screen at the specified X/Y position.

Parameters

<i>x</i>	
<i>y</i>	

Implements [TriDevs.TriEngine.Text.ITextObject](#).

```
114      {
115          Draw(new Vector2(x, y));
116      }
```

7.62.4 Property Documentation

7.62.4.1 QFontAlignment TriDevs.TriEngine.Text.TextObject.Alignment [get], [set]

7.62.4.2 Rectangle TriDevs.TriEngine.Text.TextObject.Bounds [get]

7.62.4.3 Color TriDevs.TriEngine.Text.TextObject.Color [get], [set]

7.62.4.4 Font TriDevs.TriEngine.Text.TextObject.Font [get], [set]

7.62.4.5 Point<int> TriDevs.TriEngine.Text.TextObject.Position [get], [set]

7.62.4.6 string TriDevs.TriEngine.Text.TextObject.Text [get], [set]

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Text/TextObject.cs](#)

7.63 TriDevs.TriEngine.Helpers.Threading Class Reference

Provides various helper functions for doing threading operations.

Static Public Member Functions

- static void [SetCurrentThreadName](#) (string name)

Sets the name of the current thread, does nothing if the thread already has a name.

7.63.1 Detailed Description

Provides various helper functions for doing threading operations.

7.63.2 Member Function Documentation

7.63.2.1 static void TriDevs.TriEngine.Helpers.Threading.SetCurrentThreadName (string name) [static]

Sets the name of the current thread, does nothing if the thread already has a name.

Parameters

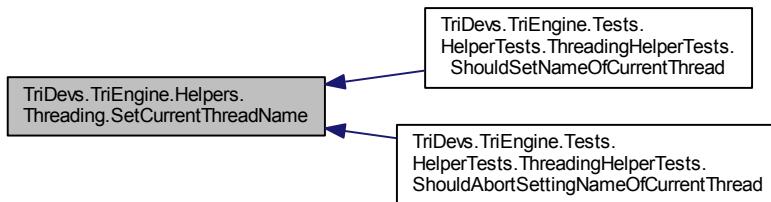
<i>name</i>	The new name for the current thread
-------------	-------------------------------------

```

39      {
40          // We can't set the name on a thread if it's already set, it would throw an exception
41          // So we have to check if the current name is null before trying to set a new one
42          if (string.IsNullOrEmpty(Thread.CurrentThread.Name))
43              Thread.CurrentThread.Name = name;
44      }

```

Here is the caller graph for this function:



The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Helpers/Threading.cs](#)

7.64 TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests Class Reference

Public Member Functions

- [void ShouldSetNameOfCurrentThread \(\)](#)
- [void ShouldAbortSettingNameOfCurrentThread \(\)](#)

7.64.1 Member Function Documentation

7.64.1.1 void TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests.ShouldAbortSettingNameOfCurrentThread ()

```

24      {
25          const string expected = "OldName";
26          string resultName = null;
27          var thread = new Thread(() =>
28          {
29              Threading.SetCurrentThreadName(expected);
30              Threading.SetCurrentThreadName(NewThreadName);

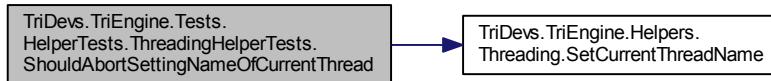
```

```

31             resultName = Thread.CurrentThread.Name;
32         });
33         thread.Start();
34         thread.Join();
35         Assert.AreEqual(resultName, expected);
36     }

```

Here is the call graph for this function:



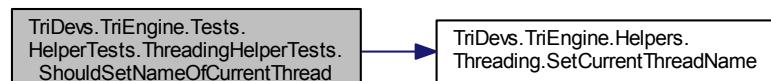
7.64.1.2 void TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests.ShouldSetNameOfCurrentThread()

```

14     {
15         string expected = NewThreadName;
16         if (!string.IsNullOrEmpty(Thread.CurrentThread.Name))
17             expected = Thread.CurrentThread.Name;
18         Threading.SetCurrentThreadName(NewThreadName);
19         Assert.AreEqual(Thread.CurrentThread.Name, expected);
20     }

```

Here is the call graph for this function:



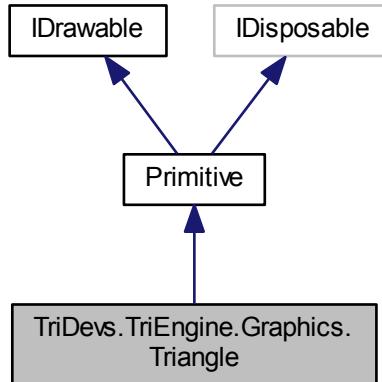
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine.Tests/HelperTests/ThreadingHelperTests.cs](#)

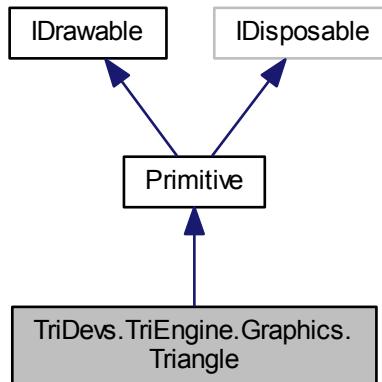
7.65 TriDevs.TriEngine.Graphics.Triangle Class Reference

A primitive 2D [Triangle](#) shape.

Inheritance diagram for TriDevs.TriEngine.Graphics.Triangle:



Collaboration diagram for TriDevs.TriEngine.Graphics.Triangle:



Public Member Functions

- [Triangle](#) (Point< int > top, Point< int > left, Point< int > right)
Creates a new 2D [Triangle](#) with the specified points.

Additional Inherited Members

7.65.1 Detailed Description

A primitive 2D [Triangle](#) shape.

7.65.2 Constructor & Destructor Documentation

7.65.2.1 TriDevs.TriEngine.Graphics.Triangle (Point< int > top, Point< int > left, Point< int > right)

Creates a new 2D [Triangle](#) with the specified points.

Parameters

<i>top</i>	Coordinate of the top edge of this triangle.
<i>left</i>	Coordinate of the lower left edge of this triangle.
<i>right</i>	Coordinate of the lower right edge of this triangle.

```
40     : base(new ushort\[\] {0, 1, 2},
```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Graphics/Triangle.cs](#)

7.66 TriDevs.TriEngine.Extensions.Vector3Extensions Class Reference

[Extensions](#) for Vector3.

Static Public Member Functions

- static float[] [ToFloatArray](#) (this Vector3[] vectors)

Converts an array of Vector3 into a float array (3 floats per vector).

7.66.1 Detailed Description

[Extensions](#) for Vector3.

7.66.2 Member Function Documentation

7.66.2.1 static float [] [TriDevs.TriEngine.Extensions.Vector3Extensions.ToFloatArray](#) (this Vector3[] vectors) [static]

Converts an array of Vector3 into a float array (3 floats per vector).

Parameters

<i>vectors</i>	The vector array to convert.
----------------	------------------------------

Returns

A float array representation of the vectors.

```
40     {
41         var result = new float\[3 \* vectors.Length\];
42
43         for (int i = 0; i < vectors.Length; i++)
44         {
45             int index = i * 3;
46
47             result[index] = vectors[i].X;
48             result[index + 1] = vectors[i].Y;
49             result[index + 2] = vectors[i].Z;
50         }
51
52         return result;
53     }
```

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Extensions/Vector3Extensions.cs](#)

7.67 TriDevs.TriEngine.Version Class Reference

[Version](#) class specifying the version of this project.

Public Attributes

- const int [Major](#) = 0
Major version of the project.
- const int [Minor](#) = 0
Minor version of the project.
- const int [Patch](#) = 15
Patch version of the project.
- const string [Suffix](#) = ""
Optional suffix, empty if no suffix for this version.
- const string [VersionStringFormat](#) = "{0}.{1}.{2}"
The format string used when formatting major, minor and patch version to their string representation.
- const string [VersionStringFormatWithSuffix](#) = [VersionStringFormat](#) + "-{3}"
The format string used when formatting major, minor and patch version to their string representation (with suffix).

Properties

- static string [VersionString](#) [get]
String representation of the current project version.

7.67.1 Detailed Description

[Version](#) class specifying the version of this project.

7.67.2 Member Data Documentation

7.67.2.1 const int TriDevs.TriEngine.Version.Major = 0

Major version of the project.

7.67.2.2 const int TriDevs.TriEngine.Version.Minor = 0

Minor version of the project.

7.67.2.3 const int TriDevs.TriEngine.Version.Patch = 15

Patch version of the project.

7.67.2.4 const string TriDevs.TriEngine.Version.Suffix = ""

Optional suffix, empty if no suffix for this version.

Example values could be "beta" and "alpha".

7.67.2.5 const string TriDevs.TriEngine.Version.VersionStringFormat = "{0}.{1}.{2}"

The format string used when formatting major, minor and patch version to their string representation.

7.67.2.6 const string TriDevs.TriEngine.Version.VersionStringFormatWithSuffix = VersionStringFormat + "-{3}"

The format string used when formatting major, minor and patch version to their string representation (with suffix).

7.67.3 Property Documentation

7.67.3.1 string TriDevs.TriEngine.Version.VersionString [static], [get]

String representation of the current project version.

The documentation for this class was generated from the following file:

- [TriDevs.TriEngine/Version.cs](#)

7.68 TriDevs.TriEngine.Native.WinAPI Class Reference

Holds various [WinAPI](#) stuff.

Public Member Functions

- static IntPtr [GetStdHandle](#) (int nStdHandle)
Retrieves a handle to the specified standard device (standard input, standard output, or standard error).
- static bool [AllocConsole](#) ()
Allocates a new console for the calling process.
- static int [FreeConsole](#) ()
Detaches the calling process from its console.

Public Attributes

- const int [STD_OUTPUT_HANDLE](#) = -11
The standard output device. Initially, this is the active console screen buffer, CONOUT\$.
- const int [CODE_PAGE](#) = 437
The code page to use for the console.

7.68.1 Detailed Description

Holds various [WinAPI](#) stuff.

7.68.2 Member Function Documentation

7.68.2.1 static bool TriDevs.TriEngine.Native.WinAPI.AllocConsole()

Allocates a new console for the calling process.

Returns

If the function succeeds, the return value is nonzero. If the function fails, the return value is zero. To get extended error information, call GetLastError.

Here is the caller graph for this function:



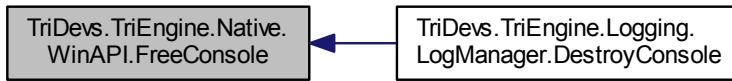
7.68.2.2 static int TriDevs.TriEngine.Native.WinAPI.FreeConsole()

Detaches the calling process from its console.

Returns

If the function succeeds, the return value is nonzero. If the function fails, the return value is zero. To get extended error information, call GetLastError.

Here is the caller graph for this function:



7.68.2.3 static IntPtr TriDevs.TriEngine.Native.WinAPI.GetStdHandle(int nStdHandle)

Retrieves a handle to the specified standard device (standard input, standard output, or standard error).

Parameters

<i>nStdHandle</i>	The standard device.
-------------------	----------------------

Returns

If the function succeeds, the return value is a handle to the specified device, or a redirected handle set by a previous call to SetStdHandle. The handle has GENERIC_READ and GENERIC_WRITE access rights, unless the application has used SetStdHandle to set a standard handle with lesser access. If the function fails, the return value is INVALID_HANDLE_VALUE. To get extended error information, call GetLastError. If an application does not have associated standard handles, such as a service running on an interactive desktop, and has not redirected them, the return value is NULL.

Here is the caller graph for this function:



7.68.3 Member Data Documentation

7.68.3.1 const int TriDevs.TriEngine.Native.WinAPI.CODE_PAGE = 437

The code page to use for the console.

7.68.3.2 const int TriDevs.TriEngine.Native.WinAPI.STD_OUTPUT_HANDLE = -11

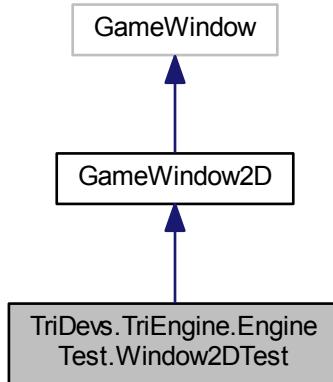
The standard output device. Initially, this is the active console screen buffer, CONOUT\$.

The documentation for this class was generated from the following file:

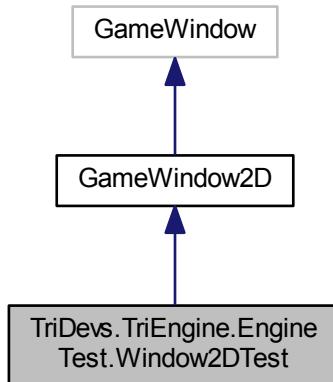
- TriDevs.TriEngine/Native/[WinAPI.cs](#)

7.69 TriDevs.TriEngine.EngineTest.Window2DTest Class Reference

Inheritance diagram for TriDevs.TriEngine.EngineTest.Window2DTest:



Collaboration diagram for TriDevs.TriEngine.EngineTest.Window2DTest:



Static Public Member Functions

- static void [Main](#) (string[] args)

Protected Member Functions

- override void [OnUpdateFrame](#) (FrameEventArgs e)
- override void [OnDraw](#) (FrameEventArgs e)
- override void [OnUnload](#) (EventArgs e)

Additional Inherited Members

7.69.1 Member Function Documentation

7.69.1.1 static void TriDevs.TriEngine.EngineTest.Window2DTest.Main (string[] args) [static]

```

29         {
30             using (var test = new Window2DTest())
31             {
32                 test.Run(30.0);
33             }
34         }

```

7.69.1.2 override void TriDevs.TriEngine.EngineTest.Window2DTest.OnDraw (FrameEventArgs e) [protected], [virtual]

Implements [TriDevs.TriEngine.GameWindow2D](#).

```

183         {
184             _controlManager.Draw();
185             _text.Draw();
186             _triangle.Draw();
187             _rectangle.Draw();
188         }

```

7.69.1.3 override void TriDevs.TriEngine.EngineTest.Window2DTest.OnUnload (EventArgs e) [protected]

```

193         {
194             Console.WriteLine("UNLOAD!");
195             Services.Audio.Dispose();
196             base.OnUnload(e);
197         }

```

7.69.1.4 override void TriDevs.TriEngine.EngineTest.Window2DTest.OnUpdateFrame (FrameEventArgs e) [protected]

```

110         {
111             base.OnUpdateFrame(e);
112             Services.Input.Update();
113             Title = string.Format("TriEngine2D Test X: {0}; Y: {1}; Mem: {2}", Services.Input.MouseX,
114             Services.Input.MouseY, GetMemUsageString());
115
116             if (!Focused)
117                 return;
118
119             if (Services.Input.KeyPressed(Key.Number1))
120             {
121                 _activeSong = "unknown1";
122                 Console.WriteLine("Selected song " + _activeSong);
123             }
124             else if (Services.Input.KeyPressed(Key.Number2))
125             {
126                 _activeSong = "call";
127                 Console.WriteLine("Selected song " + _activeSong);
128             }
129             else if (Services.Input.KeyPressed(Key.Number3))
130             {
131                 _activeSong = "pirates";
132                 Console.WriteLine("Selected song " + _activeSong);
133             }
134
135             var song = Services.Audio.GetSong(_activeSong);
136
137             if (Services.Input.KeyPressed(Key.P))
138             {
139                 Console.WriteLine("Playing " + _activeSong);

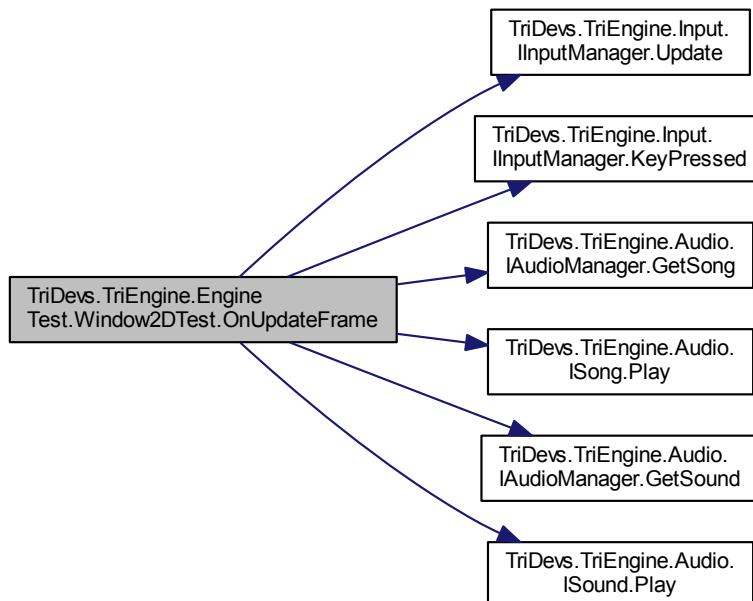
```

```

141         song.Play();
142     }
143     else if (Services.Input.KeyPressed(Key.S))
144     {
145         Console.WriteLine("Stopping " + _activeSong);
146         song.Stop();
147     }
148     else if (Services.Input.KeyPressed(Key.U))
149     {
150         Console.WriteLine("Pausing " + _activeSong);
151         song.Pause();
152     }
153     else if (Services.Input.KeyPressed(Key.R))
154     {
155         Console.WriteLine("Resuming " + _activeSong);
156         song.Resume();
157     }
158     else if (Services.Input.KeyPressed(Key.L))
159     {
160         song.IsLooped = !song.IsLooped;
161         Console.WriteLine(_activeSong + " is {0} looping", song.IsLooped ? "now" : "no longer");
162     }
163     else if (Services.Input.KeyPressed(Key.Minus))
164     {
165         song.Volume -= 0.1f;
166         Console.WriteLine("Volume of " + _activeSong + " set to {0}", song.Volume);
167     }
168     else if (Services.Input.KeyPressed(Key.Plus))
169     {
170         song.Volume += 0.1f;
171         Console.WriteLine("Volume of " + _activeSong + " set to {0}", song.Volume);
172     }
173     if (Services.Input.KeyPressed(Key.Space))
174         Services.Audio.GetSound("test").Play();
175     else if (Services.Input.KeyPressed(Key.B))
176         Services.Audio.GetSound("test2").Play();
177
178     _controlManager.Update();
179 }

```

Here is the call graph for this function:



The documentation for this class was generated from the following file:

- TriDevs.TriEngine.EngineTest/[WindowTest.cs](#)

Chapter 8

File Documentation

8.1 README.md File Reference

8.2 TriDevs.TriEngine.EngineTest/WindowTest.cs File Reference

Classes

- class [TriDevs.TriEngine.EngineTest.Window2DTest](#)

Namespaces

- package [TriDevs.TriEngine.EngineTest](#)

8.3 TriDevs.TriEngine.Tests/ColorTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.ColorTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests](#)

8.4 TriDevs.TriEngine.Tests/ExtensionTests/EnumerationExtensionTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.ExtensionTests.EnumerationExtensionTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests.ExtensionTests](#)

8.5 TriDevs.TriEngine.Tests/ExtensionTests/StringExtensionTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.ExtensionTests.StringExtensionTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests.ExtensionTests](#)

8.6 TriDevs.TriEngine.Tests/HelperTests/ExceptionHelperTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.HelperTests.ExceptionHelperTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests.HelperTests](#)

8.7 TriDevs.TriEngine.Tests/HelperTests/MathHelperTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.HelperTests.MathHelperTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests.HelperTests](#)

8.8 TriDevs.TriEngine.Tests/HelperTests/ThreadingHelperTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.HelperTests.ThreadingHelperTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests.HelperTests](#)

8.9 TriDevs.TriEngine.Tests/StateManagementTests/GameStateTests.cs File Reference

Classes

- class [TriDevs.TriEngine.Tests.StateManagementTests.GameStateTests](#)

Namespaces

- package [TriDevs.TriEngine.Tests.StateManagementTests](#)

8.10 TriDevs.TriEngine/Audio/AudioFormat.cs File Reference

Namespaces

- package [TriDevs.TriEngine.Audio](#)

Enumerations

- enum [TriDevs.TriEngine.Audio.AudioFormat](#) { [TriDevs.TriEngine.Audio.Ogg](#), [TriDevs.TriEngine.Audio.Wav](#) }
Different audio formats usable with audio managers.

8.11 TriDevs.TriEngine/Audio/ AudioManager.cs File Reference

Classes

- class [TriDevs.TriEngine.Audio.AudioManager](#)
Class to manage engine audio.

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.12 TriDevs.TriEngine/Audio/I AudioManager.cs File Reference

Classes

- interface [TriDevs.TriEngine.Audio.I AudioManager](#)
Provides various methods to manipulate audio.

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.13 TriDevs.TriEngine/Audio/ISong.cs File Reference

Classes

- interface [TriDevs.TriEngine.Audio.ISong](#)
A song that will be streamed in the audio player.

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.14 TriDevs.TriEngine/Audio/ISound.cs File Reference

Classes

- interface [TriDevs.TriEngine.Audio.ISound](#)

A sound file for use with the audio manager.

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.15 TriDevs.TriEngine/Audio/NullAudioManager.cs File Reference

Classes

- class [TriDevs.TriEngine.Audio.NullAudioManager](#)

Used as a fallback [AudioManager](#) object when the service locator fails to find one.

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.16 TriDevs.TriEngine/Audio/NullSong.cs File Reference

Classes

- class [TriDevs.TriEngine.Audio.NullSong](#)

Fallback song class used in [NullAudioManager](#).

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.17 TriDevs.TriEngine/Audio/NullSound.cs File Reference

Classes

- class [TriDevs.TriEngine.Audio.NullSound](#)

Fallback sound class used in [NullAudioManager](#).

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.18 TriDevs.TriEngine/Audio/Song.cs File Reference

Classes

- class [TriDevs.TriEngine.Audio.Song](#)
Song class that can be used with [AudioManager](#).

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.19 TriDevs.TriEngine/Audio/Sound.cs File Reference

Classes

- class [TriDevs.TriEngine.Audio.Sound](#)
Sound class that can be used with the [AudioManager](#).

Namespaces

- package [TriDevs.TriEngine.Audio](#)

8.20 TriDevs.TriEngine/Color.cs File Reference

Classes

- struct [TriDevs.TriEngine.Color](#)
Represents an RGBA color that can be used with [TriEngine2D](#).

Namespaces

- package [TriDevs.TriEngine](#)

8.21 TriDevs.TriEngine/EngineException.cs File Reference

Classes

- class [TriDevs.TriEngine.EngineException](#)
Base exception class for all engine-related exceptions. The inner exception will contain more info as to what actually happened.

Namespaces

- package [TriDevs.TriEngine](#)

8.22 TriDevs.TriEngine/Extensions/ByteExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.ByteExtensions](#)
Extensions for System.Byte.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.23 TriDevs.TriEngine/Extensions/DecimalExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.DecimalExtensions](#)
Extensions for System.Decimal.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.24 TriDevs.TriEngine/Extensions/DoubleExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.DoubleExtensions](#)
Extensions for System.Double.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.25 TriDevs.TriEngine/Extensions/EnumerationExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.EnumerationExtensions](#)
Extensions for System.Enum.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.26 TriDevs.TriEngine/Extensions/FloatExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.FloatExtensions](#)
Extensions for System.Single.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.27 TriDevs.TriEngine/Extensions/IntegerExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.IntegerExtensions](#)
Extensions for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.28 TriDevs.TriEngine/Extensions/StringExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.StringExtensions](#)
Extensions for System.String

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.29 TriDevs.TriEngine/Extensions/Vector3Extensions.cs File Reference

Classes

- class [TriDevs.TriEngine.Extensions.Vector3Extensions](#)
Extensions for Vector3.

Namespaces

- package [TriDevs.TriEngine.Extensions](#)

8.30 TriDevs.TriEngine/GameWindow2D.cs File Reference

Classes

- class [TriDevs.TriEngine.GameWindow2D](#)

Game window class specialized for drawing 2D graphics.

Namespaces

- package [TriDevs.TriEngine](#)

8.31 TriDevs.TriEngine/Graphics/Primitive.cs File Reference

Classes

- class [TriDevs.TriEngine.Graphics.Primitive](#)

Represents a primitive 2D shape composed of triangles.

Namespaces

- package [TriDevs.TriEngine.Graphics](#)

8.32 TriDevs.TriEngine/Graphics/Rectangle.cs File Reference

Classes

- class [TriDevs.TriEngine.Graphics.Rectangle](#)

A primitive 2D [Rectangle](#) shape.

Namespaces

- package [TriDevs.TriEngine.Graphics](#)

8.33 TriDevs.TriEngine/Rectangle.cs File Reference

Classes

- struct [TriDevs.TriEngine.Rectangle](#)

A rectangle representing an area in 2D space.

Namespaces

- package [TriDevs.TriEngine](#)

8.34 TriDevs.TriEngine/Graphics/Triangle.cs File Reference

Classes

- class [TriDevs.TriEngine.Graphics.Triangle](#)

A primitive 2D [Triangle](#) shape.

Namespaces

- package [TriDevs.TriEngine.Graphics](#)

8.35 TriDevs.TriEngine/Helpers/Exceptions.cs File Reference

Classes

- class [TriDevs.TriEngine.Helpers.Exceptions](#)

Provides helper methods for dealing with exceptions.

Namespaces

- package [TriDevs.TriEngine.Helpers](#)

8.36 TriDevs.TriEngine/Helpers/IO.cs File Reference

Classes

- class [TriDevs.TriEngine.Helpers.IO](#)

Provides various helper functions for doing [IO](#) operations.

Namespaces

- package [TriDevs.TriEngine.Helpers](#)

8.37 TriDevs.TriEngine/Helpers/Math.cs File Reference

Classes

- class [TriDevs.TriEngine.Helpers.Math](#)

Various helper methods for working with math.

Namespaces

- package [TriDevs.TriEngine.Helpers](#)

8.38 TriDevs.TriEngine/Helpers/Threading.cs File Reference

Classes

- class [TriDevs.TriEngine.Helpers.Threading](#)
Provides various helper functions for doing threading operations.

Namespaces

- package [TriDevs.TriEngine.Helpers](#)

8.39 TriDevs.TriEngine/Input/Events/Key.cs File Reference

Classes

- class [TriDevs.TriEngine.Input.Events.KeyEventEventArgs](#)
EventArgs class used for key-related events. Contains information about the key related with the event.
- class [TriDevs.TriEngine.Input.Events.KeyCharEventArgs](#)
EventArgs class used for keychar-related events. Contains information about the character related with the event.

Namespaces

- package [TriDevs.TriEngine.Input.Events](#)

Functions

- delegate void [TriDevs.TriEngine.Input.Events.KeyDownEventHandler](#) (object sender, KeyEventEventArgs e)
Event handler delegate for the KeyDown event.
- delegate void [TriDevs.TriEngine.Input.Events.KeyUpEventHandler](#) (object sender, KeyEventEventArgs e)
Event handler delegate for the KeyUp event.
- delegate void [TriDevs.TriEngine.Input.Events.KeyPressEventHandler](#) (object sender, KeyCharEventArgs e)
Event handler delegate for the KeyPress event.

8.40 TriDevs.TriEngine/Input/Events/Mouse.cs File Reference

Namespaces

- package [TriDevs.TriEngine.Input.Events](#)

Functions

- delegate void [TriDevs.TriEngine.Input.Events.MouseDownEventHandler](#) (object sender, MouseButtonEventArgs e)
Event handler delegate for the MouseDown event.
- delegate void [TriDevs.TriEngine.Input.Events.MouseUpEventHandler](#) (object sender, MouseButtonEventArgs e)
Event handler delegate for the MouseUp event.
- delegate void [TriDevs.TriEngine.Input.Events.MouseWheelChangedEventHandler](#) (object sender, MouseWheelEventArgs e)

- delegate void [TriDevs.TriEngine.Input.Events.MouseWheelDownEventHandler](#) (object sender, MouseWheelEventArgs e)
 - *Event handler delegate for the MouseWheelDown event.*
- delegate void [TriDevs.TriEngine.Input.Events.MouseWheelUpEventHandler](#) (object sender, MouseWheelEventArgs e)
 - *Event handler delegate for the MouseWheelUp event.*

8.41 TriDevs.TriEngine/Input/IInputManager.cs File Reference

Classes

- interface [TriDevs.TriEngine.Input.IInputManager](#)
 - *Provides various methods to query input devices like the keyboard.*

Namespaces

- package [TriDevs.TriEngine.Input](#)

8.42 TriDevs.TriEngine/Input/InputManager.cs File Reference

Classes

- class [TriDevs.TriEngine.Input.InputManager](#)
 - *Input manager interfacing with input methods provided by a GameWindow.*

Namespaces

- package [TriDevs.TriEngine.Input](#)

8.43 TriDevs.TriEngine/Input/NullInputManager.cs File Reference

Classes

- class [TriDevs.TriEngine.Input.NullInputManager](#)
 - *Used as a fallback [InputManager](#) object when the service locator fails to find one.*

Namespaces

- package [TriDevs.TriEngine.Input](#)

8.44 TriDevs.TriEngine/Interfaces/IDrawable.cs File Reference

Classes

- interface [TriDevs.TriEngine.Interfaces.IDrawable](#)
 - *Implements a simple draw method.*

Namespaces

- package [TriDevs.TriEngine.Interfaces](#)

8.45 TriDevs.TriEngine/Interfaces/IDrawableGameComponent.cs File Reference

Classes

- interface [TriDevs.TriEngine.Interfaces.IDrawableGameComponent](#)

A game component that can be added to GameState objects. Drawable game components also implement a draw method to draw themselves to screen.

Namespaces

- package [TriDevs.TriEngine.Interfaces](#)

8.46 TriDevs.TriEngine/Interfaces/IGameComponent.cs File Reference

Classes

- interface [TriDevs.TriEngine.Interfaces.IGameComponent](#)

A game component that can be added to IGameState objects.

Namespaces

- package [TriDevs.TriEngine.Interfaces](#)

8.47 TriDevs.TriEngine/Interfaces/IUpdatable.cs File Reference

Classes

- interface [TriDevs.TriEngine.Interfaces.IUpdatable](#)

Implements a simple update method.

Namespaces

- package [TriDevs.TriEngine.Interfaces](#)

8.48 TriDevs.TriEngine/Logging/LogManager.cs File Reference

Classes

- class [TriDevs.TriEngine.Logging.LogManager](#)

Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.

Namespaces

- package [TriDevs.TriEngine.Logging](#)

8.49 TriDevs.TriEngine/Native/Helpers.cs File Reference

Classes

- class [TriDevs.TriEngine.Native.Helpers](#)
Helper class with various methods to help native coding and debugging.

Namespaces

- package [TriDevs.TriEngine.Native](#)

8.50 TriDevs.TriEngine/Native/WinAPI.cs File Reference

Classes

- class [TriDevs.TriEngine.Native.WinAPI](#)
Holds various WinAPI stuff.

Namespaces

- package [TriDevs.TriEngine.Native](#)

8.51 TriDevs.TriEngine/Point.cs File Reference

Classes

- struct [TriDevs.TriEngine.Point< T >](#)
A struct representing an X/Y coordinate.

Namespaces

- package [TriDevs.TriEngine](#)

8.52 TriDevs.TriEngine/Program.cs File Reference

Classes

- class [TriDevs.TriEngine.Program](#)
An OpenGL program.

Namespaces

- package [TriDevs.TriEngine](#)

8.53 TriDevs.TriEngine/Properties/AssemblyInfo.cs File Reference

8.54 TriDevs.TriEngine.EngineTest/Properties/AssemblyInfo.cs File Reference

8.55 TriDevs.TriEngine.Tests/Properties/AssemblyInfo.cs File Reference

8.56 TriDevs.TriEngine/Resources.cs File Reference

Classes

- class [TriDevs.TriEngine.Resources](#)

Static class to manage resources.

Namespaces

- package [TriDevs.TriEngine](#)

8.57 TriDevs.TriEngine/Serializing/Serializer.cs File Reference

Classes

- class [TriDevs.TriEngine.Serializing.Serializer](#)

Provides serialization methods.

Namespaces

- package [TriDevs.TriEngine.Serializing](#)

8.58 TriDevs.TriEngine/Services.cs File Reference

Classes

- class [TriDevs.TriEngine.Services](#)

Provides different game-related service interfaces.

Namespaces

- package [TriDevs.TriEngine](#)

8.59 TriDevs.TriEngine/Shaders/Shader.cs File Reference

Classes

- class [TriDevs.TriEngine.Shaders.Shader](#)

*GLSL shader object loaded and compiled from a *.glsl shader file.*

Namespaces

- package [TriDevs.TriEngine.Shaders](#)

8.60 TriDevs.TriEngine/StateManagement/GameState.cs File Reference

Classes

- class [TriDevs.TriEngine.StateManagement.GameState](#)

Base GameState class that all other game states derive from, defines basic GameState behaviour.

Namespaces

- package [TriDevs.TriEngine.StateManagement](#)

8.61 TriDevs.TriEngine/StateManagement/GameStateManager.cs File Reference

Classes

- class [TriDevs.TriEngine.StateManagement.GameStateManager](#)

Game state manager that keeps track of the active game states and provides methods to control the states.

Namespaces

- package [TriDevs.TriEngine.StateManagement](#)

8.62 TriDevs.TriEngine/StateManagement/IGameState.cs File Reference

Classes

- interface [TriDevs.TriEngine.StateManagement.IGameState](#)

A game state that can be used with the game state manager. Represent a specific state of the game, like main menu and options screen.

Namespaces

- package [TriDevs.TriEngine.StateManagement](#)

8.63 TriDevs.TriEngine/StateManagement/IGameStateManager.cs File Reference

Classes

- interface [TriDevs.TriEngine.StateManagement.IGameStateManager](#)

Game state manager that keeps track of the active game states and provides methods to control the states.

Namespaces

- package [TriDevs.TriEngine.StateManagement](#)

8.64 TriDevs.TriEngine/Text/Font.cs File Reference

Classes

- class [TriDevs.TriEngine.Text.Font](#)

Holds a specific font type.

Namespaces

- package [TriDevs.TriEngine.Text](#)

8.65 TriDevs.TriEngine/Text/FontConstructionConfig.cs File Reference

Classes

- class [TriDevs.TriEngine.Text.FontConstructionConfig](#)

Container class for different QFont configurations for use with the [Font](#) constructor.

Namespaces

- package [TriDevs.TriEngine.Text](#)

8.66 TriDevs.TriEngine/Text/FontType.cs File Reference

Namespaces

- package [TriDevs.TriEngine.Text](#)

Enumerations

- enum [TriDevs.TriEngine.Text.FontType](#) { [TriDevs.TriEngine.Text.TTF](#), [TriDevs.TriEngine.Text.QFont](#), [TriDevs.TriEngine.Text.Unsupported](#) }

Different font types supported by TriEngine2D.

8.67 TriDevs.TriEngine/Text/ITextObject.cs File Reference

Classes

- interface [TriDevs.TriEngine.Text.ITextObject](#)

Implements methods to construct a text object and render it to screen.

Namespaces

- package [TriDevs.TriEngine.Text](#)

8.68 TriDevs.TriEngine/Text/TextObject.cs File Reference

Classes

- class [TriDevs.TriEngine.Text.TextObject](#)

Implements the [ITextObject](#) interface.

Namespaces

- package [TriDevs.TriEngine.Text](#)

8.69 TriDevs.TriEngine/UI/Control.cs File Reference

Classes

- class [TriDevs.TriEngine.UI.Control](#)

Base control class that all other controls inherits from. Defines basic [UI](#) control behaviour.

Namespaces

- package [TriDevs.TriEngine.UI](#)

8.70 TriDevs.TriEngine/UI/ControlManager.cs File Reference

Classes

- class [TriDevs.TriEngine.UI.ControlManager](#)

Control manager to manage various [UI](#) controls for a game.

Namespaces

- package [TriDevs.TriEngine.UI](#)

8.71 TriDevs.TriEngine/UI/Events/ControlClicked.cs File Reference

Namespaces

- package [TriDevs.TriEngine.UI.Events](#)

Functions

- delegate void [TriDevs.TriEngine.UI.Events.ControlClickedEventHandler](#) (object sender, EventArgs e)

Delegate handler for the control clicked event.

8.72 TriDevs.TriEngine/UI/IControl.cs File Reference

Classes

- interface [TriDevs.TriEngine.UI.IControl](#)

A UI control that can be drawn on screen and interacted with.

Namespaces

- package [TriDevs.TriEngine.UI](#)

8.73 TriDevs.TriEngine/UI/IControlManager.cs File Reference

Classes

- interface [TriDevs.TriEngine.UI.IControlManager](#)

Manages various UI controls, automatically updating and drawing them to the screen.

Namespaces

- package [TriDevs.TriEngine.UI](#)

8.74 TriDevs.TriEngine/UI/Label.cs File Reference

Classes

- class [TriDevs.TriEngine.UI.Label](#)

A simple label to display text on the screen.

Namespaces

- package [TriDevs.TriEngine.UI](#)

8.75 TriDevs.TriEngine/UI/LinkLabel.cs File Reference

Classes

- class [TriDevs.TriEngine.UI.LinkLabel](#)

A label that, when clicked, will open a URL.

Namespaces

- package [TriDevs.TriEngine.UI](#)

8.76 TriDevs.TriEngine/Version.cs File Reference

Classes

- class [TriDevs.TriEngine.Version](#)
Version class specifying the version of this project.

Namespaces

- package [TriDevs.TriEngine](#)

Index

- A
 - TriDevs::TriEngine::Color, 38
- ActiveState
 - TriDevs::TriEngine::StateManagement::GameManager, 90
 - TriDevs::TriEngine::StateManagement::IGameStateManager, 122
- AddComponent
 - TriDevs::TriEngine::StateManagement::GameState, 80
 - TriDevs::TriEngine::StateManagement::IGameState, 115
- AddControl
 - TriDevs::TriEngine::UI::ControlManager, 59
 - TriDevs::TriEngine::UI::IControlManager, 108
- AddFont
 - TriDevs::TriEngine::Resources, 196
- AddShader
 - TriDevs::TriEngine::Resources, 196
- AliceBlue
 - TriDevs::TriEngine::Color, 38
- Alignment
 - TriDevs::TriEngine::Text::ITextObject, 146
 - TriDevs::TriEngine::Text::TextObject, 215
 - TriDevs::TriEngine::UI::Label, 153
- AllocConsole
 - TriDevs::TriEngine::Native::WinAPI, 222
- AntiqueWhite
 - TriDevs::TriEngine::Color, 39
- Aqua
 - TriDevs::TriEngine::Color, 39
- Aquamarine
 - TriDevs::TriEngine::Color, 39
- Audio
 - TriDevs::TriEngine::Services, 202
- AudioFormat
 - TriDevs::TriEngine::Audio, 14
- AudioManager
 - TriDevs::TriEngine::Audio::AudioManager, 25
- Azure
 - TriDevs::TriEngine::Color, 39
- B
 - TriDevs::TriEngine::Color, 39
- BasePath
 - TriDevs::TriEngine::Resources, 199
- Beige
 - TriDevs::TriEngine::Color, 39
- Bisque
 - TriDevs::TriEngine::Color, 39
- Black
 - TriDevs::TriEngine::Color, 39
- BlanchedAlmond
 - TriDevs::TriEngine::Color, 39
- Blue
 - TriDevs::TriEngine::Color, 39
- BlueViolet
 - TriDevs::TriEngine::Color, 39
- Bounds
 - TriDevs::TriEngine::Text::ITextObject, 146
 - TriDevs::TriEngine::Text::TextObject, 215
- Brown
 - TriDevs::TriEngine::Color, 39
- BuildConfig
 - TriDevs::TriEngine::Text::FontConstructionConfig, 77
- BurlyWood
 - TriDevs::TriEngine::Color, 40
- CODE_PAGE
 - TriDevs::TriEngine::Native::WinAPI, 223
- CadetBlue
 - TriDevs::TriEngine::Color, 40
- Chartreuse
 - TriDevs::TriEngine::Color, 40
- Chocolate
 - TriDevs::TriEngine::Color, 40
- Clamp
 - TriDevs::TriEngine::Extensions::ByteExtensions, 28
 - TriDevs::TriEngine::Extensions::DecimalExtensions, 63
 - TriDevs::TriEngine::Extensions::DoubleExtensions, 65
 - TriDevs::TriEngine::Extensions::FloatExtensions, 72
 - TriDevs::TriEngine::Extensions::IntegerExtensions, 137–139
 - TriDevs::TriEngine::Helpers::Math, 160–163
- ClearColor
 - TriDevs::TriEngine::GameWindow2D, 96
- ClearOldLogs
 - TriDevs::TriEngine::Logging::LogManager, 157
- Clicked
 - TriDevs::TriEngine::UI::Control, 57
 - TriDevs::TriEngine::UI::IControl, 105
- Color
 - TriDevs::TriEngine::Color, 36, 37
 - TriDevs::TriEngine::Rectangle, 195
 - TriDevs::TriEngine::Text::Font, 76

TriDevs::TriEngine::Text::ITextObject, 146
TriDevs::TriEngine::Text::TextObject, 215
TriDevs::TriEngine::UI::Control, 56
TriDevs::TriEngine::UI::IControl, 105
ColorID
 TriDevs::TriEngine::Graphics::Primitive, 188
ColorId
 TriDevs::TriEngine::Graphics::Primitive, 188
Colors
 TriDevs::TriEngine::Graphics::Primitive, 188
Components
 TriDevs::TriEngine::StateManagement::GameState, 86
ControlClickedEventHandler
 TriDevs::TriEngine::UI::Events, 21
ControlManager
 TriDevs::TriEngine::UI::ControlManager, 59
Coral
 TriDevs::TriEngine::Color, 40
CornflowerBlue
 TriDevs::TriEngine::Color, 40
Cornsilk
 TriDevs::TriEngine::Color, 40
Crimson
 TriDevs::TriEngine::Color, 40
Cyan
 TriDevs::TriEngine::Color, 40
DarkBlue
 TriDevs::TriEngine::Color, 40
DarkCyan
 TriDevs::TriEngine::Color, 40
DarkGoldenrod
 TriDevs::TriEngine::Color, 40
DarkGray
 TriDevs::TriEngine::Color, 41
DarkGreen
 TriDevs::TriEngine::Color, 41
DarkKhaki
 TriDevs::TriEngine::Color, 41
DarkMagenta
 TriDevs::TriEngine::Color, 41
DarkOliveGreen
 TriDevs::TriEngine::Color, 41
DarkOrange
 TriDevs::TriEngine::Color, 41
DarkOrchid
 TriDevs::TriEngine::Color, 41
DarkRed
 TriDevs::TriEngine::Color, 41
DarkSalmon
 TriDevs::TriEngine::Color, 41
DarkSeaGreen
 TriDevs::TriEngine::Color, 41
DarkSlateBlue
 TriDevs::TriEngine::Color, 41
DarkSlateGray
 TriDevs::TriEngine::Color, 41
DarkTurquoise
 TriDevs::TriEngine::Color, 42
DarkViolet
 TriDevs::TriEngine::Color, 42
DeepPink
 TriDevs::TriEngine::Color, 42
DeepSkyBlue
 TriDevs::TriEngine::Color, 42
Deserialize< T >
 TriDevs::TriEngine::Serializing::Serializer, 199
DestroyConsole
 TriDevs::TriEngine::Logging::LogManager, 157
DimGray
 TriDevs::TriEngine::Color, 42
Disable
 TriDevs::TriEngine::Interfaces::IGameComponent, 113
 TriDevs::TriEngine::UI::Control, 54
 TriDevs::TriEngine::UI::ControlManager, 60
 TriDevs::TriEngine::UI::IControl, 104
Dispose
 TriDevs::TriEngine::Audio::AudioManager, 25
 TriDevs::TriEngine::Audio::NullAudioManager, 170
 TriDevs::TriEngine::Audio::NullSong, 181
 TriDevs::TriEngine::Audio::NullSound, 184
 TriDevs::TriEngine::Audio::Song, 206
 TriDevs::TriEngine::Audio::Sound, 209
 TriDevs::TriEngine::Graphics::Primitive, 188
 TriDevs::TriEngine::Program, 190
 TriDevs::TriEngine::Shaders::Shader, 204
 TriDevs::TriEngine::Text::Font, 75
DodgerBlue
 TriDevs::TriEngine::Color, 42
Draw
 TriDevs::TriEngine::Graphics::Primitive, 188
 TriDevs::TriEngine::Interfaces::IDrawable, 110
 TriDevs::TriEngine::StateManagement::GameState, 80
 TriDevs::TriEngine::StateManagement::StateManager, 88
 TriDevs::TriEngine::Text::ITextObject, 145, 146
 TriDevs::TriEngine::Text::TextObject, 214, 215
 TriDevs::TriEngine::UI::Control, 54, 55
 TriDevs::TriEngine::UI::ControlManager, 60
 TriDevs::TriEngine::UI::Label, 152
Enable
 TriDevs::TriEngine::Interfaces::IGameComponent, 113
 TriDevs::TriEngine::UI::Control, 55
 TriDevs::TriEngine::UI::ControlManager, 60
 TriDevs::TriEngine::UI::IControl, 104
Enabled
 TriDevs::TriEngine::Interfaces::IGameComponent, 113
 TriDevs::TriEngine::UI::Control, 56
 TriDevs::TriEngine::UI::ControlManager, 63
 TriDevs::TriEngine::UI::IControl, 105
Equals
 TriDevs::TriEngine::Rectangle, 194

File
 TriDevs::TriEngine::Audio::ISong, 142
 TriDevs::TriEngine::Audio::ISound, 144
 TriDevs::TriEngine::Audio::NullSong, 182
 TriDevs::TriEngine::Audio::NullSound, 184
 TriDevs::TriEngine::Audio::Song, 207
 TriDevs::TriEngine::Audio::Sound, 210
 TriDevs::TriEngine::Shaders::Shader, 205
 TriDevs::TriEngine::Text::Font, 76

Firebrick
 TriDevs::TriEngine::Color, 42

FloralWhite
 TriDevs::TriEngine::Color, 42

Font
 TriDevs::TriEngine::Text::Font, 74
 TriDevs::TriEngine::Text::ITextObject, 146
 TriDevs::TriEngine::Text::TextObject, 215

FontConstructionConfig
 TriDevs::TriEngine::Text::FontConstructionConfig, 77

FontPath
 TriDevs::TriEngine::Resources, 199

FontType
 TriDevs::TriEngine::Text, 20

ForestGreen
 TriDevs::TriEngine::Color, 42

FreeConsole
 TriDevs::TriEngine::Native::WinAPI, 222

Fuchsia
 TriDevs::TriEngine::Color, 42

G
 TriDevs::TriEngine::Color, 42

Gainsboro
 TriDevs::TriEngine::Color, 42

GameState
 TriDevs::TriEngine::StateManagement::GameState, 80

GameStateManager
 TriDevs::TriEngine::StateManagement::GameStateManager, 88

GameWindow2D
 TriDevs::TriEngine::GameWindow2D, 95

GetAbsolutePath
 TriDevs::TriEngine::Helpers::IO, 140

GetAllComponents
 TriDevs::TriEngine::StateManagement::GameState, 81, 82
 TriDevs::TriEngine::StateManagement::IGameState, 116

GetComponent
 TriDevs::TriEngine::StateManagement::GameState, 82
 TriDevs::TriEngine::StateManagement::IGameState, 116, 117

GetDefaultName
 TriDevs::TriEngine::Shaders::Shader, 204
 TriDevs::TriEngine::Text::Font, 75

GetErrorMessage

GetFont
 TriDevs::TriEngine::Resources, 197

GetLastError
 TriDevs::TriEngine::Native::Helpers, 97

GetLastErrorInfo
 TriDevs::TriEngine::Native::Helpers, 97

GetLastErrorMessage
 TriDevs::TriEngine::Native::Helpers, 97

GetLastWin32Exception
 TriDevs::TriEngine::Native::Helpers, 97

GetLogger
 TriDevs::TriEngine::Logging::LogManager, 158

GetShader
 TriDevs::TriEngine::Resources, 197

GetSong
 TriDevs::TriEngine::Audio::AudioManager, 25
 TriDevs::TriEngine::Audio::IAudioManager, 99
 TriDevs::TriEngine::Audio::Null AudioManager, 170

GetSound
 TriDevs::TriEngine::Audio::AudioManager, 25
 TriDevs::TriEngine::Audio::IAudioManager, 100
 TriDevs::TriEngine::Audio::Null AudioManager, 170

GetStdHandle
 TriDevs::TriEngine::Native::WinAPI, 222

GetWin32Exception
 TriDevs::TriEngine::Native::Helpers, 98

GhostWhite
 TriDevs::TriEngine::Color, 43

Gold
 TriDevs::TriEngine::Color, 43

Goldenrod
 TriDevs::TriEngine::Color, 43

Gray
 TriDevs::TriEngine::Color, 43

Green
 TriDevs::TriEngine::Color, 43

GreenYellow
 TriDevs::TriEngine::Color, 43

Has< T >
 TriDevs::TriEngine::Extensions::Enumeration-Extensions, 67

HasComponent
 TriDevs::TriEngine::StateManagement::GameState, 83
 TriDevs::TriEngine::StateManagement::IGameState, 117

HasControl
 TriDevs::TriEngine::UI::ControlManager, 60, 61
 TriDevs::TriEngine::UI::IControlManager, 108

HasSong
 TriDevs::TriEngine::Audio::AudioManager, 26
 TriDevs::TriEngine::Audio::IAudioManager, 100
 TriDevs::TriEngine::Audio::Null AudioManager, 171

HasSound
 TriDevs::TriEngine::Audio::AudioManager, 26
 TriDevs::TriEngine::Audio::IAudioManager, 100
 TriDevs::TriEngine::Audio::Null AudioManager, 171

Height
 TriDevs::TriEngine::Rectangle, 195

Hide
 TriDevs::TriEngine::UI::Control, 55
 TriDevs::TriEngine::UI::IControl, 104

HoneyDew
 TriDevs::TriEngine::Color, 43

HotPink
 TriDevs::TriEngine::Color, 43

ID
 TriDevs::TriEngine::Program, 190
 TriDevs::TriEngine::Shaders::Shader, 205

Ids
 TriDevs::TriEngine::Graphics::Primitive, 188

Include< T >
 TriDevs::TriEngine::Extensions::Enumeration-Extensions, 67

IndianRed
 TriDevs::TriEngine::Color, 43

Indices
 TriDevs::TriEngine::Graphics::Primitive, 188

IndicesID
 TriDevs::TriEngine::Graphics::Primitive, 188

Indigo
 TriDevs::TriEngine::Color, 43

Initialize
 TriDevs::TriEngine::GameWindow2D, 95

Input
 TriDevs::TriEngine::Services, 202

InputManager
 TriDevs::TriEngine::Input::InputManager, 131

Intersects
 TriDevs::TriEngine::Rectangle, 194

IsKeyDown
 TriDevs::TriEngine::Input::IInputManager, 124
 TriDevs::TriEngine::Input::InputManager, 131
 TriDevs::TriEngine::Input::NullInputManager, 175

IsKeyUp
 TriDevs::TriEngine::Input::IInputManager, 124
 TriDevs::TriEngine::Input::InputManager, 132
 TriDevs::TriEngine::Input::NullInputManager, 175

IsLooped
 TriDevs::TriEngine::Audio::ISong, 142
 TriDevs::TriEngine::Audio::NullSong, 182
 TriDevs::TriEngine::Audio::Song, 207

IsMouseDown
 TriDevs::TriEngine::Input::IInputManager, 124
 TriDevs::TriEngine::Input::InputManager, 132
 TriDevs::TriEngine::Input::NullInputManager, 175

IsMouseUp
 TriDevs::TriEngine::Input::IInputManager, 124
 TriDevs::TriEngine::Input::InputManager, 132
 TriDevs::TriEngine::Input::NullInputManager, 176

IsWheelChanged
 TriDevs::TriEngine::Input::IInputManager, 125
 TriDevs::TriEngine::Input::InputManager, 133
 TriDevs::TriEngine::Input::NullInputManager, 176

IsWheelDown
 TriDevs::TriEngine::Input::IInputManager, 125
 TriDevs::TriEngine::Input::InputManager, 133
 TriDevs::TriEngine::Input::NullInputManager, 176

IsWheelUp
 TriDevs::TriEngine::Input::IInputManager, 125
 TriDevs::TriEngine::Input::InputManager, 133
 TriDevs::TriEngine::Input::NullInputManager, 176

Ivory
 TriDevs::TriEngine::Color, 43

Key
 TriDevs::TriEngine::Input::Events::KeyEventArgs, 149

KeyChar
 TriDevs::TriEngine::Input::Events::KeyCharEventArgs, 148

KeyDown
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 179

KeyDownEventHandler
 TriDevs::TriEngine::Input::Events, 16

KeyPress
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 179

KeyPressEventHandler
 TriDevs::TriEngine::Input::Events, 17

KeyPressed
 TriDevs::TriEngine::Input::IInputManager, 125
 TriDevs::TriEngine::Input::InputManager, 133
 TriDevs::TriEngine::Input::NullInputManager, 177

KeyReleased
 TriDevs::TriEngine::Input::IInputManager, 126
 TriDevs::TriEngine::Input::InputManager, 134
 TriDevs::TriEngine::Input::NullInputManager, 177

KeyUp
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 136
 TriDevs::TriEngine::Input::NullInputManager, 179

KeyUpEventHandler
 TriDevs::TriEngine::Input::Events, 17

Khaki
 TriDevs::TriEngine::Color, 43

Lavender
 TriDevs::TriEngine::Color, 44

LavenderBlush
 TriDevs::TriEngine::Color, 44

LawnGreen
 TriDevs::TriEngine::Color, 44

LemonChiffon
 TriDevs::TriEngine::Color, 44

LightBlue
 TriDevs::TriEngine::Color, 44

LightCoral
 TriDevs::TriEngine::Color, 44

LightCyan
 TriDevs::TriEngine::Color, 44

LightGoldenrodYellow
 TriDevs::TriEngine::Color, 44
 LightGray
 TriDevs::TriEngine::Color, 44
 LightGreen
 TriDevs::TriEngine::Color, 44
 LightPink
 TriDevs::TriEngine::Color, 44
 LightSalmon
 TriDevs::TriEngine::Color, 44
 LightSeaGreen
 TriDevs::TriEngine::Color, 45
 LightSkyBlue
 TriDevs::TriEngine::Color, 45
 LightSlateGray
 TriDevs::TriEngine::Color, 45
 LightSteelBlue
 TriDevs::TriEngine::Color, 45
 LightYellow
 TriDevs::TriEngine::Color, 45
 Lime
 TriDevs::TriEngine::Color, 45
 LimeGreen
 TriDevs::TriEngine::Color, 45
 Linen
 TriDevs::TriEngine::Color, 45
 Load
 TriDevs::TriEngine::StateManagement::GameState, 84
 TriDevs::TriEngine::StateManagement::IGameState, 118
 LoadConfig
 TriDevs::TriEngine::Logging::LogManager, 158
 TriDevs::TriEngine::Text::FontConstructionConfig, 77
 LoadFont
 TriDevs::TriEngine::Resources, 197, 198
 LoadShader
 TriDevs::TriEngine::Resources, 198
 LoadSong
 TriDevs::TriEngine::Audio::AudioManager, 26
 TriDevs::TriEngine::Audio::IAudioManager, 101
 TriDevs::TriEngine::Audio::NullAudioManager, 171
 LoadSound
 TriDevs::TriEngine::Audio::AudioManager, 27
 TriDevs::TriEngine::Audio::IAudioManager, 101
 TriDevs::TriEngine::Audio::NullAudioManager, 172
 LogException
 TriDevs::TriEngine::Helpers::Exceptions, 71
 Magenta
 TriDevs::TriEngine::Color, 45
 Main
 TriDevs::TriEngine::EngineTest::Window2DTest, 225
 Major
 TriDevs::TriEngine::Version, 220
 Maroon
 TriDevs::TriEngine::Color, 45
 MediumAquamarine
 TriDevs::TriEngine::Color, 45
 MediumBlue
 TriDevs::TriEngine::Color, 45
 MediumOrchid
 TriDevs::TriEngine::Color, 46
 MediumPurple
 TriDevs::TriEngine::Color, 46
 MediumSeaGreen
 TriDevs::TriEngine::Color, 46
 MediumSlateBlue
 TriDevs::TriEngine::Color, 46
 MediumSpringGreen
 TriDevs::TriEngine::Color, 46
 MediumTurquoise
 TriDevs::TriEngine::Color, 46
 MediumVioletRed
 TriDevs::TriEngine::Color, 46
 MidnightBlue
 TriDevs::TriEngine::Color, 46
 Minor
 TriDevs::TriEngine::Version, 220
 MintCream
 TriDevs::TriEngine::Color, 46
 Missing < T >
 TriDevs::TriEngine::Extensions::Enumeration-Extensions, 68
 MistyRose
 TriDevs::TriEngine::Color, 46
 Moccasin
 TriDevs::TriEngine::Color, 46
 MouseDown
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 136
 TriDevs::TriEngine::Input::NullInputManager, 179
 MouseDownEventHandler
 TriDevs::TriEngine::Input::Events, 17
 MousePosition
 TriDevs::TriEngine::Input::IInputManager, 127
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 178
 MousePressed
 TriDevs::TriEngine::Input::IInputManager, 126
 TriDevs::TriEngine::Input::InputManager, 134
 TriDevs::TriEngine::Input::NullInputManager, 177
 MouseReleased
 TriDevs::TriEngine::Input::IInputManager, 126
 TriDevs::TriEngine::Input::InputManager, 134
 TriDevs::TriEngine::Input::NullInputManager, 178
 MouseUp
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 136
 TriDevs::TriEngine::Input::NullInputManager, 179
 MouseUpEventHandler
 TriDevs::TriEngine::Input::Events, 17
 MouseWheelChangedEventHandler
 TriDevs::TriEngine::Input::Events, 17
 MouseWheelDownEventHandler

TriDevs::TriEngine::Input::Events, 17
MouseWheelUpEventHandler
 TriDevs::TriEngine::Input::Events, 18
MouseWheelValue
 TriDevs::TriEngine::Input::IInputManager, 127
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 178
MouseX
 TriDevs::TriEngine::Input::IInputManager, 127
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 179
MouseY
 TriDevs::TriEngine::Input::IInputManager, 127
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 179
Name
 TriDevs::TriEngine::Audio::ISong, 142
 TriDevs::TriEngine::Audio::ISound, 144
 TriDevs::TriEngine::Audio::NullSong, 182
 TriDevs::TriEngine::Audio::NullSound, 184
 TriDevs::TriEngine::Audio::Song, 207
 TriDevs::TriEngine::Audio::Sound, 210
 TriDevs::TriEngine::Shaders::Shader, 205
 TriDevs::TriEngine::Text::Font, 76
NavajoWhite
 TriDevs::TriEngine::Color, 46
Navy
 TriDevs::TriEngine::Color, 47
Ogg
 TriDevs::TriEngine::Audio, 14
OldLace
 TriDevs::TriEngine::Color, 47
Olive
 TriDevs::TriEngine::Color, 47
OliveDrab
 TriDevs::TriEngine::Color, 47
OnClicked
 TriDevs::TriEngine::UI::Control, 55
 TriDevs::TriEngine::UI::LinkLabel, 155
OnDraw
 TriDevs::TriEngine::EngineTest::Window2DTest,
 225
 TriDevs::TriEngine::GameWindow2D, 95
OnLoad
 TriDevs::TriEngine::GameWindow2D, 95
OnRenderFrame
 TriDevs::TriEngine::GameWindow2D, 95
OnResize
 TriDevs::TriEngine::GameWindow2D, 96
OnUnload
 TriDevs::TriEngine::EngineTest::Window2DTest,
 225
OnUpdateFrame
 TriDevs::TriEngine::EngineTest::Window2DTest,
 225
Orange
 TriDevs::TriEngine::Color, 47
OrangeRed
 TriDevs::TriEngine::Color, 47
Orchid
 TriDevs::TriEngine::Color, 47
PaleGoldenrod
 TriDevs::TriEngine::Color, 47
PaleGreen
 TriDevs::TriEngine::Color, 47
PaleTurquoise
 TriDevs::TriEngine::Color, 47
PaleVioletRed
 TriDevs::TriEngine::Color, 47
PapayaWhip
 TriDevs::TriEngine::Color, 47
Patch
 TriDevs::TriEngine::Version, 220
Pause
 TriDevs::TriEngine::Audio::ISong, 141
 TriDevs::TriEngine::Audio::NullSong, 181
 TriDevs::TriEngine::Audio::Song, 207
 TriDevs::TriEngine::StateManagement::GameState,
 84
 TriDevs::TriEngine::StateManagement::IGame-
 State, 118
Paused
 TriDevs::TriEngine::StateManagement::GameState,
 86
 TriDevs::TriEngine::StateManagement::IGame-
 State, 119
PeachPuff
 TriDevs::TriEngine::Color, 48
Peek
 TriDevs::TriEngine::StateManagement::Game-
 StateManager, 88
 TriDevs::TriEngine::StateManagement::IGame-
 StateManager, 121
Peru
 TriDevs::TriEngine::Color, 48
Pink
 TriDevs::TriEngine::Color, 48
Play
 TriDevs::TriEngine::Audio::ISong, 141
 TriDevs::TriEngine::Audio::ISound, 144
 TriDevs::TriEngine::Audio::NullSong, 181
 TriDevs::TriEngine::Audio::NullSound, 184
 TriDevs::TriEngine::Audio::Song, 207
 TriDevs::TriEngine::Audio::Sound, 209
Plum
 TriDevs::TriEngine::Color, 48
Point
 TriDevs::TriEngine::Point< T >, 185
Pop
 TriDevs::TriEngine::StateManagement::Game-
 StateManager, 88
 TriDevs::TriEngine::StateManagement::IGame-
 StateManager, 121
Position
 TriDevs::TriEngine::Text::ITextObject, 146

TriDevs::TriEngine::Text::TextObject, 215
 TriDevs::TriEngine::UI::Control, 56
 TriDevs::TriEngine::UI::IControl, 105
 TriDevs::TriEngine::UI::Label, 153
PowderBlue
 TriDevs::TriEngine::Color, 48
Primitive
 TriDevs::TriEngine::Graphics::Primitive, 187
Program
 TriDevs::TriEngine::Program, 190
Provide
 TriDevs::TriEngine::Services, 201, 202
Purple
 TriDevs::TriEngine::Color, 48
Push
 TriDevs::TriEngine::StateManagement::Game-
 StateManager, 89
 TriDevs::TriEngine::StateManagement::IGame-
 StateManager, 121

QFont
 TriDevs::TriEngine::Text, 20
QFont
 TriDevs::TriEngine::Text::Font, 76

R
 TriDevs::TriEngine::Color, 48
README.md, 229
Rectangle
 TriDevs::TriEngine::Graphics::Rectangle, 192
 TriDevs::TriEngine::Rectangle, 194
 TriDevs::TriEngine::UI::Control, 57
 TriDevs::TriEngine::UI::IControl, 105
Red
 TriDevs::TriEngine::Color, 48
Remove< T >
 TriDevs::TriEngine::Extensions::Enumeration-
 Extensions, 68
RemoveAllComponents
 TriDevs::TriEngine::StateManagement::Game-
 State, 84
 TriDevs::TriEngine::StateManagement::IGame-
 State, 118
RemoveAllControls
 TriDevs::TriEngine::ControlManager, 61, 62
 TriDevs::TriEngine::UI::IControlManager, 109
RemoveComponent
 TriDevs::TriEngine::StateManagement::Game-
 State, 85
 TriDevs::TriEngine::StateManagement::IGame-
 State, 119
RemoveControl
 TriDevs::TriEngine::ControlManager, 62
 TriDevs::TriEngine::UI::IControlManager, 109
Replace
 TriDevs::TriEngine::Extensions::StringExtensions,
 210
ReplaceFirst
 TriDevs::TriEngine::Extensions::StringExtensions,
 211
Resume
 TriDevs::TriEngine::Audio::ISong, 142
 TriDevs::TriEngine::Audio::NullSong, 181
 TriDevs::TriEngine::Audio::Song, 207
RosyBrown
 TriDevs::TriEngine::Color, 48
RoyalBlue
 TriDevs::TriEngine::Color, 48

SaddleBrown
 TriDevs::TriEngine::Color, 48
Salmon
 TriDevs::TriEngine::Color, 48
SandyBrown
 TriDevs::TriEngine::Color, 49
SeaGreen
 TriDevs::TriEngine::Color, 49
SeaShell
 TriDevs::TriEngine::Color, 49
Serialize< T >
 TriDevs::TriEngine::Serializing::Serializer, 200
SetCurrentThreadName
 TriDevs::TriEngine::Helpers::Threading, 216
SetFont
 TriDevs::TriEngine::UI::Label, 152
SetupConsole
 TriDevs::TriEngine::Logging::LogManager, 159
Shader
 TriDevs::TriEngine::Shaders::Shader, 204
ShaderPath
 TriDevs::TriEngine::Resources, 199
ShouldAbortSettingNameOfCurrentThread
 TriDevs::TriEngine::Tests::HelperTests::Threading-
 HelperTests, 216
ShouldAddComponentToGameState
 TriDevs::TriEngine::Tests::StateManagementTests-
 ::GameStateTests, 91
Should.ClampByteToMaximum
 TriDevs::TriEngine::Tests::HelperTests::Math-
 HelperTests, 164
Should.ClampByteToMinimum
 TriDevs::TriEngine::Tests::HelperTests::Math-
 HelperTests, 164
Should.ClampDoubleToMaximum
 TriDevs::TriEngine::Tests::HelperTests::Math-
 HelperTests, 164
Should.ClampDoubleToMinimum
 TriDevs::TriEngine::Tests::HelperTests::Math-
 HelperTests, 165
Should.ClampFloatToMaximum
 TriDevs::TriEngine::Tests::HelperTests::Math-
 HelperTests, 165
Should.ClampFloatToMinimum
 TriDevs::TriEngine::Tests::HelperTests::Math-
 HelperTests, 165
Should.ClampInt16ToMaximum

TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 165
ShouldClampInt16ToMinimum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 165
ShouldClampInt32ToMaximum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 165
ShouldClampInt32ToMinimum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 165
ShouldClampInt64ToMaximum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 165
ShouldClampInt64ToMinimum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 165
ShouldClampUInt16ToMaximum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldClampUInt16ToMinimum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldClampUInt32ToMaximum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldClampUInt32ToMinimum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldClampUInt64ToMaximum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldClampUInt64ToMinimum
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldConvertToColor4
TriDevs::TriEngine::Tests::ColorTests, 51
ShouldConvertToVector3
TriDevs::TriEngine::Tests::ColorTests, 51
ShouldConvertToVector4
TriDevs::TriEngine::Tests::ColorTests, 51
ShouldCreateColorWithAlpha
TriDevs::TriEngine::Tests::ColorTests, 51
ShouldHaveComponentMatchingPredicate
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 91
ShouldHaveComponentOfType
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 91
ShouldHaveLongValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 69
ShouldHaveValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 69
ShouldIncludeLongValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 69
ShouldIncludeValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 69
ShouldMakeByteColorIntoWhite
TriDevs::TriEngine::Tests::ColorTests, 51
ShouldNotClampByte
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldNotClampDouble
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldNotClampFloat
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 166
ShouldNotClampInt16
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 167
ShouldNotClampInt32
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 167
ShouldNotClampInt64
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 167
ShouldNotClampUInt16
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 167
ShouldNotClampUInt32
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 167
ShouldNotClampUInt64
TriDevs::TriEngine::Tests::HelperTests::Math-
HelperTests, 167
ShouldNotHaveLongValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 70
ShouldNotHaveValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 70
ShouldOnlyHaveExactReferenceToComponent
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 91
ShouldRemoveAllComponentsFromGameState
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 91
ShouldRemoveAllComponentsMatchingPredicateFrom-
GameState
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 92
ShouldRemoveAllComponentsOfTypeFromGameState
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 92
ShouldRemoveComponentFromGameState
TriDevs::TriEngine::Tests::StateManagementTests-
::GameStateTests, 92
ShouldRemoveLongValue
TriDevs::TriEngine::Tests::ExtensionTests::Enumeration-
ExtensionTests, 70
ShouldRemoveValue

TriDevs::TriEngine::Tests::ExtensionTests::EnumerationExtensionTests, 70
 ShouldReplaceAllWordsCaseInsensitive
 TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests, 212
 ShouldReplaceAllWordsCaseSensitive
 TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests, 212
 ShouldReplaceFirstTwoOccurrencesCaseInsensitive
 TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests, 212
 ShouldReplaceFirstTwoOccurrencesCaseSensitive
 TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests, 212
 ShouldReplaceFirstWordCaseInsensitive
 TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests, 212
 ShouldReplaceFirstWordCaseSensitive
 TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests, 212
 ShouldReturnAllComponent
 TriDevs::TriEngine::Tests::StateManagementTests::GameStateTests, 92
 ShouldReturnAllComponentsMatchingPredicate
 TriDevs::TriEngine::Tests::StateManagementTests::GameStateTests, 92
 ShouldReturnAllComponentsOfType
 TriDevs::TriEngine::Tests::StateManagementTests::GameStateTests, 93
 ShouldReturnComponentMatchingPredicate
 TriDevs::TriEngine::Tests::StateManagementTests::GameStateTests, 93
 ShouldReturnComponentOfType
 TriDevs::TriEngine::Tests::StateManagementTests::GameStateTests, 93
 ShouldReturnValidArgbValue
 TriDevs::TriEngine::Tests::ColorTests, 52
 ShouldSetNameOfCurrentThread
 TriDevs::TriEngine::Tests::HelperTests::ThreadingHelperTests, 217
 ShouldThrowByteClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 167
 ShouldThrowDoubleClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 167
 ShouldThrowEngineExceptionWhenPassedGeneric
 TriDevs::TriEngine::Tests::HelperTests::ExceptionHelperTests, 71
 ShouldThrowExceptionOnString
 TriDevs::TriEngine::Tests::ExtensionTests::EnumerationExtensionTests, 70
 ShouldThrowFloatClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 167
 ShouldThrowInt16ClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 168
 ShouldThrowInt32ClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 168
 ShouldThrowInt64ClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 168
 ShouldThrowUInt16ClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 168
 ShouldThrowUInt32ClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 168
 ShouldThrowUInt64ClampArgumentException
 TriDevs::TriEngine::Tests::HelperTests::MathHelperTests, 168
 ShouldThrowUnmodifiedEngineException
 TriDevs::TriEngine::Tests::HelperTests::ExceptionHelperTests, 71
 Show
 TriDevs::TriEngine::UI::Control, 56
 TriDevs::TriEngine::UI::IControl, 104
 Sienna
 TriDevs::TriEngine::Color, 49
 Silver
 TriDevs::TriEngine::Color, 49
 Size
 TriDevs::TriEngine::Text::Font, 76
 TriDevs::TriEngine::UI::Control, 57
 TriDevs::TriEngine::UI::IControl, 105
 SkyBlue
 TriDevs::TriEngine::Color, 49
 SlateBlue
 TriDevs::TriEngine::Color, 49
 SlateGray
 TriDevs::TriEngine::Color, 49
 Snow
 TriDevs::TriEngine::Color, 49
 SpringGreen
 TriDevs::TriEngine::Color, 49
 StateCount
 TriDevs::TriEngine::StateManagement::GameStateManager, 90
 TriDevs::TriEngine::StateManagement::IGameStateManager, 122
 SteelBlue
 TriDevs::TriEngine::Color, 49
 Stop
 TriDevs::TriEngine::Audio::ISong, 142
 TriDevs::TriEngine::Audio::ISound, 144
 TriDevs::TriEngine::Audio::NullSong, 182
 TriDevs::TriEngine::Audio::NullSound, 184
 TriDevs::TriEngine::Audio::Song, 207
 TriDevs::TriEngine::Audio::Sound, 209
 StopAll
 TriDevs::TriEngine::Audio:: AudioManager, 27
 TriDevs::TriEngine::Audio::IAudioManager, 101
 TriDevs::TriEngine::Audio::NullAudioManager, 172
 StopAllSongs

TriDevs::TriEngine::Audio::AudioManager, 27
TriDevs::TriEngine::Audio::IAudioManager, 101
TriDevs::TriEngine::Audio::NullAudioManager, 172
StopAllSounds
 TriDevs::TriEngine::Audio::AudioManager, 28
 TriDevs::TriEngine::Audio::IAudioManager, 102
 TriDevs::TriEngine::Audio::NullAudioManager, 172
Suffix
 TriDevs::TriEngine::Version, 220
Switch
 TriDevs::TriEngine::StateManagement::StateManager, 89
 TriDevs::TriEngine::StateManagement::IGameStateManager, 121
TTF
 TriDevs::TriEngine::Text, 20
Tan
 TriDevs::TriEngine::Color, 49
Teal
 TriDevs::TriEngine::Color, 50
Text
 TriDevs::TriEngine::Text::ITextObject, 146
 TriDevs::TriEngine::Text::TextObject, 215
 TriDevs::TriEngine::UI::Control, 57
 TriDevs::TriEngine::UI::IControl, 105
 TriDevs::TriEngine::UI::Label, 153
TextObject
 TriDevs::TriEngine::Text::TextObject, 214
Thistle
 TriDevs::TriEngine::Color, 50
ToColor4
 TriDevs::TriEngine::Color, 38
ToFloatArray
 TriDevs::TriEngine::Extensions::Vector3Extensions, 219
ToString
 TriDevs::TriEngine::Text::Font, 75
ToVector3
 TriDevs::TriEngine::Color, 38
ToVector4
 TriDevs::TriEngine::Color, 38
Tomato
 TriDevs::TriEngine::Color, 50
TransparentBlack
 TriDevs::TriEngine::Color, 50
TransparentWhite
 TriDevs::TriEngine::Color, 50
TriDevs::TriEngine::Audio
 Ogg, 14
 Wav, 14
TriDevs::TriEngine::Text
 QFont, 20
 TTF, 20
 Unsupported, 20
TriDevs, 13
TriDevs.TriEngine, 13
TriDevs.TriEngine.Audio, 14
TriDevs.TriEngine.Audio.AudioManager, 23
TriDevs.TriEngine.Audio.IAudioManager, 98
TriDevs.TriEngine.Audio.ISong, 140
TriDevs.TriEngine.Audio.ISound, 143
TriDevs.TriEngine.Audio.NullAudioManager, 168
TriDevs.TriEngine.Audio.NullSong, 180
TriDevs.TriEngine.Audio.NullSound, 182
TriDevs.TriEngine.Audio.Song, 205
TriDevs.TriEngine.Audio.Sound, 208
TriDevs.TriEngine.Color, 29
TriDevs.TriEngine.EngineException, 65
TriDevs.TriEngine.EngineTest, 15
TriDevs.TriEngine.EngineTest.Window2DTest, 224
TriDevs.TriEngine.EngineTest/Properties/AssemblyInfo.cs, 242
TriDevs.TriEngine.EngineTest/WindowTest.cs, 229
TriDevs.TriEngine.Extensions, 15
TriDevs.TriEngine.Extensions.ByteExtensions, 28
TriDevs.TriEngine.Extensions.DecimalExtensions, 63
TriDevs.TriEngine.Extensions.DoubleExtensions, 64
TriDevs.TriEngine.Extensions.EnumerationExtensions, 66
TriDevs.TriEngine.Extensions.FloatExtensions, 72
TriDevs.TriEngine.Extensions.IntegerExtensions, 136
TriDevs.TriEngine.Extensions.StringExtensions, 210
TriDevs.TriEngine.Extensions.Vector3Extensions, 219
TriDevs.TriEngine.GameWindow2D, 94
TriDevs.TriEngine.Graphics, 15
TriDevs.TriEngine.Graphics.Primitive, 185
TriDevs.TriEngine.Graphics.Rectangle, 190
TriDevs.TriEngine.Graphics.Triangle, 217
TriDevs.TriEngine.Helpers, 15
TriDevs.TriEngine.Helpers.Exceptions, 71
TriDevs.TriEngine.Helpers.IO, 139
TriDevs.TriEngine.Helpers.Math, 159
TriDevs.TriEngine.Helpers.Threading, 215
TriDevs.TriEngine.Input, 16
TriDevs.TriEngine.Input.Events, 16
TriDevs.TriEngine.Input.Events.KeyCharEventArgs, 147
TriDevs.TriEngine.Input.Events.KeyEventArgs, 149
TriDevs.TriEngine.Input.IInputManager, 122
TriDevs.TriEngine.Input.InputManager, 129
TriDevs.TriEngine.Input.NullInputManager, 173
TriDevs.TriEngine.Interfaces, 18
TriDevs.TriEngine.Interfaces.IDrawable, 109
TriDevs.TriEngine.Interfaces.IDrawableGameComponent, 110
TriDevs.TriEngine.Interfaces.IGameComponent, 112
TriDevs.TriEngine.Interfaces.IUpdatable, 147
TriDevs.TriEngine.Logging, 18
TriDevs.TriEngine.Logging.LogManager, 156
TriDevs.TriEngine.Native, 18
TriDevs.TriEngine.Native.Helpers, 96
TriDevs.TriEngine.Native.WinAPI, 221
TriDevs.TriEngine.Point< T >, 184
TriDevs.TriEngine.Program, 189
TriDevs.TriEngine.Rectangle, 192
TriDevs.TriEngine.Resources, 195
TriDevs.TriEngine.Serializing, 19

TriDevs.TriEngine.Serializing.Serializer, 199
 TriDevs.TriEngine.Services, 201
 TriDevs.TriEngine.Shaders, 19
 TriDevs.TriEngine.Shaders.Shader, 202
 TriDevs.TriEngine.StateManagement, 19
 TriDevs.TriEngine.StateManagement.GameState, 78
 TriDevs.TriEngine.StateManagement.GameState-
 Manager, 86
 TriDevs.TriEngine.StateManagement.IGameState, 113
 TriDevs.TriEngine.StateManagement.IGameState-
 Manager, 120
 TriDevs.TriEngine.Tests, 19
 TriDevs.TriEngine.Tests.ColorTests, 51
 TriDevs.TriEngine.Tests.ExtensionTests, 19
 TriDevs.TriEngine.Tests.ExtensionTests.Enumeration-
 ExtensionTests, 69
 TriDevs.TriEngine.Tests.ExtensionTests.StringExtension-
 Tests, 211
 TriDevs.TriEngine.Tests.HelperTests, 20
 TriDevs.TriEngine.Tests.HelperTests.ExceptionHelper-
 Tests, 70
 TriDevs.TriEngine.Tests.HelperTests.MathHelperTests,
 163
 TriDevs.TriEngine.Tests.HelperTests.ThreadingHelper-
 Tests, 216
 TriDevs.TriEngine.Tests.StateManagementTests, 20
 TriDevs.TriEngine.Tests.StateManagementTests.Game-
 StateTests, 90
 TriDevs.TriEngine.Tests/ColorTests.cs, 229
 TriDevs.TriEngine.Tests/ExtensionTests/Enumeration-
 ExtensionTests.cs, 229
 TriDevs.TriEngine.Tests/ExtensionTests/StringExtension-
 Tests.cs, 230
 TriDevs.TriEngine.Tests/HelperTests/ExceptionHelper-
 Tests.cs, 230
 TriDevs.TriEngine.Tests/HelperTests/MathHelperTests.-
 cs, 230
 TriDevs.TriEngine.Tests/HelperTests/ThreadingHelper-
 Tests.cs, 230
 TriDevs.TriEngine.Tests/Properties/AssemblyInfo.cs,
 242
 TriDevs.TriEngine.Tests/StateManagementTests/Game-
 StateTests.cs, 230
 TriDevs.TriEngine.Text, 20
 TriDevs.TriEngine.Text.Font, 73
 TriDevs.TriEngine.Text.FontConstructionConfig, 76
 TriDevs.TriEngine.Text.ITextObject, 144
 TriDevs.TriEngine.Text.TextObject, 213
 TriDevs.TriEngine.UI, 21
 TriDevs.TriEngine.UI.Control, 52
 TriDevs.TriEngine.UI.ControlManager, 57
 TriDevs.TriEngine.UI.Events, 21
 TriDevs.TriEngine.UI.IControl, 102
 TriDevs.TriEngine.UI.IControlManager, 106
 TriDevs.TriEngine.UI.Label, 150
 TriDevs.TriEngine.UI.LinkLabel, 153
 TriDevs.TriEngine.Version, 220
 TriDevs.TriEngine.Audio/AudioFormat.cs, 231
 TriDevs.TriEngine.Audio/ AudioManager.cs, 231
 TriDevs.TriEngine.Audio/I AudioManager.cs, 231
 TriDevs.TriEngine.Audio/ISong.cs, 231
 TriDevs.TriEngine.Audio/ISound.cs, 232
 TriDevs.TriEngine.Audio/Null AudioManager.cs, 232
 TriDevs.TriEngine.Audio/NullSong.cs, 232
 TriDevs.TriEngine.Audio/NullSound.cs, 232
 TriDevs.TriEngine.Audio/Song.cs, 233
 TriDevs.TriEngine.Audio/Sound.cs, 233
 TriDevs.TriEngine.Color.cs, 233
 TriDevs.TriEngine/EngineException.cs, 233
 TriDevs.TriEngine/Extensions/ByteExtensions.cs, 234
 TriDevs.TriEngine/Extensions/DecimalExtensions.cs,
 234
 TriDevs.TriEngine/Extensions/DoubleExtensions.cs, 234
 TriDevs.TriEngine/Extensions/EnumerationExtensions.-
 cs, 234
 TriDevs.TriEngine/Extensions/FloatingPointExtensions.cs, 235
 TriDevs.TriEngine/Extensions/IntegerExtensions.cs, 235
 TriDevs.TriEngine/Extensions/StringExtensions.cs, 235
 TriDevs.TriEngine/Extensions/Vector3Extensions.cs,
 235
 TriDevs.TriEngine/GameWindow2D.cs, 236
 TriDevs.TriEngine/Graphics/Primitive.cs, 236
 TriDevs.TriEngine/Graphics/Rectangle.cs, 236
 TriDevs.TriEngine/Graphics/Triangle.cs, 237
 TriDevs.TriEngine/Helpers/Exceptions.cs, 237
 TriDevs.TriEngine/Helpers/IO.cs, 237
 TriDevs.TriEngine/Helpers/Math.cs, 237
 TriDevs.TriEngine/Helpers/Threading.cs, 238
 TriDevs.TriEngine/Input/Events/Key.cs, 238
 TriDevs.TriEngine/Input/Events/Mouse.cs, 238
 TriDevs.TriEngine/Input/IInputManager.cs, 239
 TriDevs.TriEngine/Input/InputManager.cs, 239
 TriDevs.TriEngine/Input/NullInputManager.cs, 239
 TriDevs.TriEngine/Interfaces/IDrawable.cs, 239
 TriDevs.TriEngine/Interfaces/IDrawableGameComponent.-
 cs, 240
 TriDevs.TriEngine/Interfaces/IGameComponent.cs, 240
 TriDevs.TriEngine/Interfaces/IUpdatable.cs, 240
 TriDevs.TriEngine/Logging/LogManager.cs, 240
 TriDevs.TriEngine/Native/Helpers.cs, 241
 TriDevs.TriEngine/Native/WinAPI.cs, 241
 TriDevs.TriEngine/Point.cs, 241
 TriDevs.TriEngine/Program.cs, 241
 TriDevs.TriEngine/Properties/AssemblyInfo.cs, 242
 TriDevs.TriEngine/Rectangle.cs, 236
 TriDevs.TriEngine/Resources.cs, 242
 TriDevs.TriEngine/Serializing/Serializer.cs, 242
 TriDevs.TriEngine/Services.cs, 242
 TriDevs.TriEngine/Shaders/Shader.cs, 242
 TriDevs.TriEngine/StateManagement/GameState.cs,
 243
 TriDevs.TriEngine/StateManagement/GameState-
 Manager.cs, 243
 TriDevs.TriEngine/StateManagement/IGameState.cs,
 243

TriDevs.TriEngine/StateManagement/IGameStateManager.cs, 243
TriDevs.TriEngine/Text/Font.cs, 244
TriDevs.TriEngine/Text/FontConstructionConfig.cs, 244
TriDevs.TriEngine/Text/FontType.cs, 244
TriDevs.TriEngine/Text/ITextObject.cs, 244
TriDevs.TriEngine/Text/TextObject.cs, 245
TriDevs.TriEngine/UI/Control.cs, 245
TriDevs.TriEngine/UI/ControlManager.cs, 245
TriDevs.TriEngine/UI/Events/ControlClicked.cs, 245
TriDevs.TriEngine/UI/IControl.cs, 246
TriDevs.TriEngine/UI/IControlManager.cs, 246
TriDevs.TriEngine/UI/Label.cs, 246
TriDevs.TriEngine/UI/LinkLabel.cs, 246
TriDevs.TriEngine/Version.cs, 247
TriDevs::TriEngine::Audio
 AudioFormat, 14
TriDevs::TriEngine::Audio::AudioManager
 AudioManager, 25
 Dispose, 25
 GetSong, 25
 GetSound, 25
 HasSong, 26
 HasSound, 26
 LoadSong, 26
 LoadSound, 27
 StopAll, 27
 StopAllSongs, 27
 StopAllSounds, 28
TriDevs::TriEngine::Audio::IAudioManager
 GetSong, 99
 GetSound, 100
 HasSong, 100
 HasSound, 100
 LoadSong, 101
 LoadSound, 101
 StopAll, 101
 StopAllSongs, 101
 StopAllSounds, 102
TriDevs::TriEngine::Audio::ISong
 File, 142
 IsLooped, 142
 Name, 142
 Pause, 141
 Play, 141
 Resume, 142
 Stop, 142
 Volume, 142
TriDevs::TriEngine::Audio::ISound
 File, 144
 Name, 144
 Play, 144
 Stop, 144
TriDevs::TriEngine::Audio::NullAudioManager
 Dispose, 170
 GetSong, 170
 GetSound, 170
 HasSong, 171
 HasSound, 171
 LoadSong, 171
 LoadSound, 172
 StopAll, 172
 StopAllSongs, 172
 StopAllSounds, 172
 TriDevs::TriEngine::Audio::NullSong
 Dispose, 181
 File, 182
 IsLooped, 182
 Name, 182
 Pause, 181
 Play, 181
 Resume, 181
 Stop, 182
 Volume, 182
 TriDevs::TriEngine::Audio::NullSound
 Dispose, 184
 File, 184
 Name, 184
 Play, 184
 Stop, 184
 TriDevs::TriEngine::Audio::Song
 Dispose, 206
 File, 207
 IsLooped, 207
 Name, 207
 Pause, 207
 Play, 207
 Resume, 207
 Stop, 207
 Volume, 208
 TriDevs::TriEngine::Audio::Sound
 Dispose, 209
 File, 210
 Name, 210
 Play, 209
 Stop, 209
 TriDevs::TriEngine::Color
 A, 38
 AliceBlue, 38
 AntiqueWhite, 39
 Aqua, 39
 Aquamarine, 39
 Azure, 39
 B, 39
 Beige, 39
 Bisque, 39
 Black, 39
 BlanchedAlmond, 39
 Blue, 39
 BlueViolet, 39
 Brown, 39
 BurlyWood, 40
 CadetBlue, 40
 Chartreuse, 40
 Chocolate, 40
 Color, 36, 37

Coral, 40
 CornflowerBlue, 40
 Cornsilk, 40
 Crimson, 40
 Cyan, 40
 DarkBlue, 40
 DarkCyan, 40
 DarkGoldenrod, 40
 DarkGray, 41
 DarkGreen, 41
 DarkKhaki, 41
 DarkMagenta, 41
 DarkOliveGreen, 41
 DarkOrange, 41
 DarkOrchid, 41
 DarkRed, 41
 DarkSalmon, 41
 DarkSeaGreen, 41
 DarkSlateBlue, 41
 DarkSlateGray, 41
 DarkTurquoise, 42
 DarkViolet, 42
 DeepPink, 42
 DeepSkyBlue, 42
 DimGray, 42
 DodgerBlue, 42
 Firebrick, 42
 FloralWhite, 42
 ForestGreen, 42
 Fuchsia, 42
 G, 42
 Gainsboro, 42
 GhostWhite, 43
 Gold, 43
 Goldenrod, 43
 Gray, 43
 Green, 43
 GreenYellow, 43
 HoneyDew, 43
 HotPink, 43
 IndianRed, 43
 Indigo, 43
 Ivory, 43
 Khaki, 43
 Lavender, 44
 LavenderBlush, 44
 LawnGreen, 44
 LemonChiffon, 44
 LightBlue, 44
 LightCoral, 44
 LightCyan, 44
 LightGoldenrodYellow, 44
 LightGray, 44
 LightGreen, 44
 LightPink, 44
 LightSalmon, 44
 LightSeaGreen, 45
 LightSkyBlue, 45
 LightSlateGray, 45
 LightSteelBlue, 45
 LightYellow, 45
 Lime, 45
 LimeGreen, 45
 Linen, 45
 Magenta, 45
 Maroon, 45
 MediumAquaMarine, 45
 MediumBlue, 45
 MediumOrchid, 46
 MediumPurple, 46
 MediumSeaGreen, 46
 MediumSlateBlue, 46
 MediumSpringGreen, 46
 MediumTurquoise, 46
 MediumVioletRed, 46
 MidnightBlue, 46
 MintCream, 46
 MistyRose, 46
 Moccasin, 46
 NavajoWhite, 46
 Navy, 47
 OldLace, 47
 Olive, 47
 OliveDrab, 47
 Orange, 47
 OrangeRed, 47
 Orchid, 47
 PaleGoldenrod, 47
 PaleGreen, 47
 PaleTurquoise, 47
 PaleVioletRed, 47
 PapayaWhip, 47
 PeachPuff, 48
 Peru, 48
 Pink, 48
 Plum, 48
 PowderBlue, 48
 Purple, 48
 R, 48
 Red, 48
 RosyBrown, 48
 RoyalBlue, 48
 SaddleBrown, 48
 Salmon, 48
 SandyBrown, 49
 SeaGreen, 49
 SeaShell, 49
 Sienna, 49
 Silver, 49
 SkyBlue, 49
 SlateBlue, 49
 SlateGray, 49
 Snow, 49
 SpringGreen, 49
 SteelBlue, 49
 Tan, 49

Teal, 50
Thistle, 50
ToColor4, 38
ToVector3, 38
ToVector4, 38
Tomato, 50
TransparentBlack, 50
TransparentWhite, 50
Turquoise, 50
Violet, 50
Wheat, 50
White, 50
WhiteSmoke, 50
Yellow, 50
YellowGreen, 50

TriDevs::TriEngine::EngineTest::Window2DTest
Main, 225
OnDraw, 225
OnUnload, 225
OnUpdateFrame, 225

TriDevs::TriEngine::Extensions::ByteExtensions
Clamp, 28

TriDevs::TriEngine::Extensions::DecimalExtensions
Clamp, 63

TriDevs::TriEngine::Extensions::DoubleExtensions
Clamp, 65

TriDevs::TriEngine::Extensions::EnumerationExtensions
Has< T >, 67
Include< T >, 67
Missing< T >, 68
Remove< T >, 68

TriDevs::TriEngine::Extensions::FloatExtensions
Clamp, 72

TriDevs::TriEngine::Extensions::IntegerExtensions
Clamp, 137–139

TriDevs::TriEngine::Extensions::StringExtensions
Replace, 210
ReplaceFirst, 211

TriDevs::TriEngine::Extensions::Vector3Extensions
ToFloatArray, 219

TriDevs::TriEngine::GameWindow2D
ClearColor, 96
GameWindow2D, 95
Initialize, 95
OnDraw, 95
OnLoad, 95
OnRenderFrame, 95
OnResize, 96

TriDevs::TriEngine::Graphics::Primitive
ColorID, 188
ColorId, 188
Colors, 188
Dispose, 188
Draw, 188
Ids, 188
Indices, 188
IndicesID, 188
Primitive, 187

Vertices, 188
VerticesID, 188
TriDevs::TriEngine::Graphics::Rectangle
Rectangle, 192

TriDevs::TriEngine::Graphics::Triangle
Triangle, 219

TriDevs::TriEngine::Helpers::Exceptions
LogException, 71

TriDevs::TriEngine::Helpers::IO
GetAbsolutePath, 140

TriDevs::TriEngine::Helpers::Math
Clamp, 160–163

TriDevs::TriEngine::Helpers::Threading
SetCurrentThreadName, 216

TriDevs::TriEngine::Input::Events
KeyDownEventHandler, 16
KeyPressEventHandler, 17
KeyUpEventHandler, 17
MouseDownEventHandler, 17
MouseUpEventHandler, 17
MouseWheelChangedEventHandler, 17
MouseWheelDownEventHandler, 17
MouseWheelUpEventHandler, 18

TriDevs::TriEngine::Input::Events::KeyCharEventArgs
KeyChar, 148

TriDevs::TriEngine::Input::Events::KeyEventArgs
Key, 149

TriDevs::TriEngine::Input::IInputManager
IsKeyDown, 124
IsKeyUp, 124
IsMouseDown, 124
IsMouseUp, 124
IsWheelChanged, 125
IsWheelDown, 125
IsWheelUp, 125
KeyDown, 128
KeyPress, 128
KeyPressed, 125
KeyReleased, 126
KeyUp, 128
MouseDown, 128
MousePosition, 127
MousePressed, 126
MouseReleased, 126
MouseUp, 128
MouseWheelValue, 127
MouseX, 127
MouseY, 127
Update, 127

WheelChange, 127
WheelChanged, 128
WheelDown, 128
WheelUp, 129

TriDevs::TriEngine::Input::InputManager
InputManager, 131
IsKeyDown, 131
IsKeyUp, 132
IsMouseDown, 132

IsMouseUp, 132
 IsWheelChanged, 133
 IsWheelDown, 133
 IsWheelUp, 133
 KeyDown, 135
 KeyPress, 135
 KeyPressed, 133
 KeyReleased, 134
 KeyUp, 136
 MouseDown, 136
 MousePosition, 135
 MousePressed, 134
 MouseReleased, 134
 MouseUp, 136
 MouseWheelValue, 135
 MouseX, 135
 MouseY, 135
 Update, 135
 WheelChange, 135
 WheelChanged, 136
 WheelDown, 136
 WheelUp, 136

TriDevs::TriEngine::Input::NullInputManager
 IsKeyDown, 175
 IsKeyUp, 175
 IsMouseDown, 175
 IsMouseUp, 176
 IsWheelChanged, 176
 IsWheelDown, 176
 IsWheelUp, 176
 KeyDown, 179
 KeyPress, 179
 KeyPressed, 177
 KeyReleased, 177
 KeyUp, 179
 MouseDown, 179
 MousePosition, 178
 MousePressed, 177
 MouseReleased, 178
 MouseUp, 179
 MouseWheelValue, 178
 MouseX, 179
 MouseY, 179
 Update, 178
 WheelChange, 178
 WheelChanged, 179
 WheelDown, 179
 WheelUp, 179

TriDevs::TriEngine::Interfaces::IDrawable
 Draw, 110

TriDevs::TriEngine::Interfaces::IGameComponent
 Disable, 113
 Enable, 113
 Enabled, 113

TriDevs::TriEngine::Interfaces::IUpdatable
 Update, 147

TriDevs::TriEngine::Logging::LogManager
 ClearOldLogs, 157

DestroyConsole, 157
 GetLogger, 158
 LoadConfig, 158
 SetupConsole, 159

TriDevs::TriEngine::Native::Helpers
 GetErrorMessage, 97
 GetLastError, 97
 GetLastErrorInfo, 97
 GetLastErrorMessage, 97
 GetLastWin32Exception, 97
 GetWin32Exception, 98

TriDevs::TriEngine::Native::WinAPI
 AllocConsole, 222
 CODE_PAGE, 223
 FreeConsole, 222
 GetStdHandle, 222

TriDevs::TriEngine::Point< T >
 Point, 185
 X, 185
 Y, 185

TriDevs::TriEngine::Program
 Dispose, 190
 ID, 190
 Program, 190

TriDevs::TriEngine::Rectangle
 Color, 195
 Equals, 194
 Height, 195
 Intersects, 194
 Rectangle, 194
 Width, 195
 X, 195
 Y, 195

TriDevs::TriEngine::Resources
 AddFont, 196
 AddShader, 196
 BasePath, 199
 FontPath, 199
 GetFont, 197
 GetShader, 197
 LoadFont, 197, 198
 LoadShader, 198
 ShaderPath, 199

TriDevs::TriEngine::Serializing::Serializer
 Deserialize< T >, 199
 Serialize< T >, 200

TriDevs::TriEngine::Services
 Audio, 202
 Input, 202
 Provide, 201, 202

TriDevs::TriEngine::Shaders::Shader
 Dispose, 204
 File, 205
 GetDefaultName, 204
 ID, 205
 Name, 205
 Shader, 204

TriDevs::TriEngine::StateManagement::GameState

AddComponent, 80
Components, 86
Draw, 80
GameState, 80
GetAllComponents, 81, 82
GetComponent, 82
HasComponent, 83
Load, 84
Pause, 84
Paused, 86
RemoveAllComponents, 84
RemoveComponent, 85
Unload, 85
Unpause, 85
Update, 86

TriDevs::TriEngine::StateManagement::GameStateManager
ActiveState, 90
Draw, 88
GameManager, 88
Peek, 88
Pop, 88
Push, 89
StateCount, 90
Switch, 89
Update, 90

TriDevs::TriEngine::StateManagement::IGameState
AddComponent, 115
GetAllComponents, 116
GetComponent, 116, 117
HasComponent, 117
Load, 118
Pause, 118
Paused, 119
RemoveAllComponents, 118
RemoveComponent, 119
Unload, 119
Unpause, 119

TriDevs::TriEngine::StateManagement::IGameStateManager
ActiveState, 122
Peek, 121
Pop, 121
Push, 121
StateCount, 122
Switch, 121

TriDevs::TriEngine::Tests::ColorTests
ShouldConvertToColor4, 51
ShouldConvertToVector3, 51
ShouldConvertToVector4, 51
ShouldCreateColorWithAlpha, 51
ShouldMakeByteColorIntoWhite, 51
ShouldReturnValidArgbValue, 52

TriDevs::TriEngine::Tests::ExtensionTests::EnumerationExtensionTests
ShouldHaveLongValue, 69
ShouldHaveValue, 69
ShouldIncludeLongValue, 69

ShouldIncludeValue, 69
ShouldNotHaveLongValue, 70
ShouldNotHaveValue, 70
ShouldRemoveLongValue, 70
ShouldRemoveValue, 70
ShouldThrowExceptionOnString, 70

TriDevs::TriEngine::Tests::ExtensionTests::StringExtensionTests
ShouldReplaceAllWordsCaseInsensitive, 212
ShouldReplaceAllWordsCaseSensitive, 212
ShouldReplaceFirstWordCaseInsensitive, 212
ShouldReplaceFirstWordCaseSensitive, 212

TriDevs::TriEngine::Tests::HelperTests::ExceptionHelperTests
ShouldThrowUnmodifiedEngineException, 71

TriDevs::TriEngine::Tests::HelperTests::MathHelperTests
ShouldClampByteToMaximum, 164
ShouldClampByteToMinimum, 164
ShouldClampDoubleToMaximum, 164
ShouldClampDoubleToMinimum, 165
ShouldClampFloatToMaximum, 165
ShouldClampFloatToMinimum, 165
ShouldClampInt16ToMaximum, 165
ShouldClampInt16ToMinimum, 165
ShouldClampInt32ToMaximum, 165
ShouldClampInt32ToMinimum, 165
ShouldClampInt64ToMaximum, 165
ShouldClampInt64ToMinimum, 165
ShouldClampUInt16ToMaximum, 166
ShouldClampUInt16ToMinimum, 166
ShouldClampUInt32ToMaximum, 166
ShouldClampUInt32ToMinimum, 166
ShouldClampUInt64ToMaximum, 166
ShouldClampUInt64ToMinimum, 166
ShouldNotClampByte, 166
ShouldNotClampDouble, 166
ShouldNotClampFloat, 166
ShouldNotClampInt16, 167
ShouldNotClampInt32, 167
ShouldNotClampInt64, 167
ShouldNotClampUInt16, 167
ShouldNotClampUInt32, 167
ShouldNotClampUInt64, 167
ShouldThrowByteClampArgumentException, 167
ShouldThrowDoubleClampArgumentException, 167

ShouldThrowFloatClampArgumentException, 167
ShouldThrowInt16ClampArgumentException, 168
ShouldThrowInt32ClampArgumentException, 168
ShouldThrowInt64ClampArgumentException, 168

TriDevs::TriEngine::Tests::HelperTests::ThreadingHelperTests
ShouldSetNameOfCurrentThread, 217

TriDevs::TriEngine::Tests::StateManagementTests::GameStateTests
ShouldHaveComponentMatchingPredicate, 91
ShouldHaveComponentOfType, 91

ShouldReturnAllComponent, 92
 ShouldReturnComponentMatchingPredicate, 93
 ShouldReturnComponentOfType, 93

TriDevs::TriEngine::Text
 FontType, 20

TriDevs::TriEngine::Text::Font
 Color, 76
 Dispose, 75
 File, 76
 Font, 74
 GetDefaultName, 75
 Name, 76
 QFont, 76
 Size, 76
 ToString, 75
 Type, 76

TriDevs::TriEngine::Text::FontConstructionConfig
 BuildConfig, 77
 FontConstructionConfig, 77
 LoadConfig, 77

TriDevs::TriEngine::Text::ITextObject
 Alignment, 146
 Bounds, 146
 Color, 146
 Draw, 145, 146
 Font, 146
 Position, 146
 Text, 146

TriDevs::TriEngine::Text::TextObject
 Alignment, 215
 Bounds, 215
 Color, 215
 Draw, 214, 215
 Font, 215
 Position, 215
 Text, 215
 TextObject, 214

TriDevs::TriEngine::UI::Control
 Clicked, 57
 Color, 56
 Disable, 54
 Draw, 54, 55
 Enable, 55
 Enabled, 56
 Hide, 55
 OnClicked, 55
 Position, 56
 Rectangle, 57
 Show, 56
 Size, 57
 Text, 57
 Update, 56
 Visible, 57

TriDevs::TriEngine::UI::ControlManager
 AddControl, 59
 ControlManager, 59
 Disable, 60
 Draw, 60

Enable, 60
 Enabled, 63
 HasControl, 60, 61
 RemoveAllControls, 61, 62
 RemoveControl, 62
 Update, 62

TriDevs::TriEngine::UI::Events
 ControlClickedEventHandler, 21

TriDevs::TriEngine::UI::IControl
 Clicked, 105
 Color, 105
 Disable, 104
 Enable, 104
 Enabled, 105
 Hide, 104
 Position, 105
 Rectangle, 105
 Show, 104
 Size, 105
 Text, 105
 Visible, 105

TriDevs::TriEngine::UI::IControlManager
 AddControl, 108
 HasControl, 108
 RemoveAllControls, 109
 RemoveControl, 109

TriDevs::TriEngine::UI::Label
 Alignment, 153
 Draw, 152
 Position, 153
 SetFont, 152
 Text, 153
 Update, 152
 UpdateTextObject, 152

TriDevs::TriEngine::UI::LinkLabel
 OnClicked, 155
 Url, 156

TriDevs::TriEngine::Version
 Major, 220
 Minor, 220
 Patch, 220
 Suffix, 220
 VersionString, 221
 VersionStringFormat, 221
 VersionStringFormatWithSuffix, 221

Triangle
 TriDevs::TriEngine::Graphics::Triangle, 219

Turquoise
 TriDevs::TriEngine::Color, 50

Type
 TriDevs::TriEngine::Text::Font, 76

Unload
 TriDevs::TriEngine::StateManagement::GameState, 85
 TriDevs::TriEngine::StateManagement::IGameState, 119

Unpause

TriDevs::TriEngine::StateManagement::GameState, 85
TriDevs::TriEngine::StateManagement::IGameState, 119
Unsupported
 TriDevs::TriEngine::Text, 20
Update
 TriDevs::TriEngine::Input::IInputManager, 127
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 178
 TriDevs::TriEngine::Interfaces::IUpdatable, 147
 TriDevs::TriEngine::StateManagement::GameState, 86
 TriDevs::TriEngine::StateManagement::GameManager, 90
 TriDevs::TriEngine::UI::Control, 56
 TriDevs::TriEngine::UI::ControlManager, 62
 TriDevs::TriEngine::UI::Label, 152
UpdateTextObject
 TriDevs::TriEngine::UI::Label, 152
Url
 TriDevs::TriEngine::UI::LinkLabel, 156

VersionString
 TriDevs::TriEngine::Version, 221
VersionStringFormat
 TriDevs::TriEngine::Version, 221
VersionStringFormatWithSuffix
 TriDevs::TriEngine::Version, 221
Vertices
 TriDevs::TriEngine::Graphics::Primitive, 188
VerticesID
 TriDevs::TriEngine::Graphics::Primitive, 188
Violet
 TriDevs::TriEngine::Color, 50
Visible
 TriDevs::TriEngine::UI::Control, 57
 TriDevs::TriEngine::UI::IControl, 105
Volume
 TriDevs::TriEngine::Audio::ISong, 142
 TriDevs::TriEngine::Audio::NullSong, 182
 TriDevs::TriEngine::Audio::Song, 208

Wav
 TriDevs::TriEngine::Audio, 14
Wheat
 TriDevs::TriEngine::Color, 50
WheelChange
 TriDevs::TriEngine::Input::IInputManager, 127
 TriDevs::TriEngine::Input::InputManager, 135
 TriDevs::TriEngine::Input::NullInputManager, 178
WheelChanged
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 136
 TriDevs::TriEngine::Input::NullInputManager, 179
WheelDown
 TriDevs::TriEngine::Input::IInputManager, 128
 TriDevs::TriEngine::Input::InputManager, 136
 TriDevs::TriEngine::Input::NullInputManager, 179