

TriEngine2D

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Chapter 1

Main Page

2D 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](#).

TriEngine2D 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

TriEngine2D depends on [log4net](#), which is included in the **libs/log4net** folder.

TriEngine2D 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.

TriEngine2D 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.

TriEngine2D 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.

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Namespace Index

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Class Index

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TriDevs.TriEngine2D.UI.IControl	95
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TriDevs.TriEngine2D.UI.IControlManager	99
Manages various UI controls, automatically updating and drawing them to the screen.	
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A game component that can be added to GameState objects. Drawable game components also implement a draw method to draw themselves to screen.	
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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.	
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Game state manager that keeps track of the active game states and provides methods to control the states.	
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Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.	
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File Index

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Chapter 6

Namespace Documentation

6.1 Package TriDevs

Namespaces

- package [TriEngine2D](#)

6.2 Package TriDevs.TriEngine2D

Namespaces

- package [Audio](#)
- package [Extensions](#)
- package [Graphics](#)
- package [Helpers](#)
- package [Input](#)
- package [Interfaces](#)
- package [Logging](#)
- package [Native](#)
- package [Serializing](#)
- package [Shaders](#)
- package [StateManagement](#)
- 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.TriEngine2D.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.TriEngine2D.Audio.AudioFormat

Different audio formats usable with audio managers.

Enumerator

Ogg The Ogg Vorbis format.

Wav The WAVE format

```

30     {
34         Ogg,
35
39         Wav
40     }
```


6.4 Package TriDevs.TriEngine2D.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.

6.5 Package TriDevs.TriEngine2D.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.

6.6 Package TriDevs.TriEngine2D.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.

6.7 Package TriDevs.TriEngine2D.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.

6.8 Package TriDevs.TriEngine2D.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, MouseWheelEventArgs e)
Event handler delegate for the MouseWheelChanged event.
- delegate void [MouseWheelDownEventHandler](#) (object sender, MouseWheelEventArgs e)
Event handler delegate for the MouseWheelDown event.
- delegate void [MouseWheelUpEventHandler](#) (object sender, MouseWheelEventArgs e)
Event handler delegate for the MouseWheelUp event.

6.8.1 Function Documentation

6.8.1.1 delegate void TriDevs.TriEngine2D.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.

6.8.1.2 `delegate void TriDevs.TriEngine2D.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.

6.8.1.3 `delegate void TriDevs.TriEngine2D.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.

6.8.1.4 `delegate void TriDevs.TriEngine2D.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.

6.8.1.5 `delegate void TriDevs.TriEngine2D.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.

6.8.1.6 `delegate void TriDevs.TriEngine2D.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.

6.8.1.7 `delegate void TriDevs.TriEngine2D.Input.Events.MouseWheelDownEventHandler (object sender, MouseWheelEventArgs e)`

Event handler delegate for the MouseWheelDown event.

Parameters

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

6.8.1.8 `delegate void TriDevs.TriEngine2D.Input.Events.MouseWheelUpEventHandler (object sender, MouseEventArgs e)`

Event handler delegate for the MouseWheelUp event.

Parameters

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

6.9 Package TriDevs.TriEngine2D.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.

6.10 Package TriDevs.TriEngine2D.Logging

Classes

- class [LogManager](#)
Class to manage logging. ILog interfaces should be obtained from this class' methods, as opposed to calling default log4net methods.

6.11 Package TriDevs.TriEngine2D.Native

Classes

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

6.12 Package TriDevs.TriEngine2D.Serializing

Classes

- class [Serializer](#)
Provides serialization methods.

6.13 Package TriDevs.TriEngine2D.Shaders

Classes

- class [Shader](#)
*GLSL shader object loaded and compiled from a *.glsl shader file.*

6.14 Package TriDevs.TriEngine2D.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.

6.15 Package TriDevs.TriEngine2D.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.

6.15.1 Enumeration Type Documentation

6.15.1.1 enum TriDevs.TriEngine2D.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.

```

35     {
36         TTF,
37
38         QFont,
39
40         Unsupported
41     }

```

6.16 Package TriDevs.TriEngine2D.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.

6.17 Package TriDevs.TriEngine2D.UI.Events

Functions

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

6.17.1 Function Documentation

6.17.1.1 delegate void TriDevs.TriEngine2D.UI.Events.ControlClickedEventHandler (object sender, EventArgs e)

Delegate handler for the control clicked event.

Parameters

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

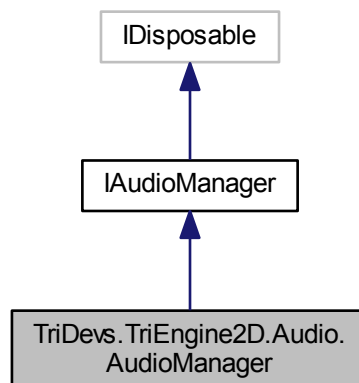
Chapter 7

Class Documentation

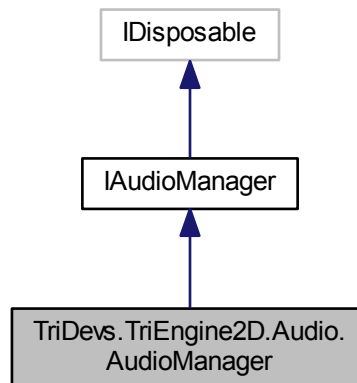
7.1 TriDevs.TriEngine2D.Audio.AudioManager Class Reference

Class to manage engine audio.

Inheritance diagram for TriDevs.TriEngine2D.Audio.AudioManager:



Collaboration diagram for TriDevs.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```

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

```

7.1.3.3 ISound TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```

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

```

7.1.3.4 bool TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```

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

```

7.1.3.5 bool TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```

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

```

7.1.3.6 ISong TriDevs.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.Audio.AudioManager.StopAll ()

Immediately stops all playback of sounds and songs.

Implements [TriDevs.TriEngine2D.Audio.IAudioManager](#).

```

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

```

7.1.3.9 void TriDevs.TriEngine2D.Audio.AudioManager.StopAllSongs ()

Immediately stops playback of all songs.

Implements [TriDevs.TriEngine2D.Audio.IAudioManager](#).

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

7.1.3.10 void TriDevs.TriEngine2D.Audio.AudioManager.StopAllSounds ()

Immediately stops playback of all sounds.

Implements [TriDevs.TriEngine2D.Audio.IAudioManager](#).

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

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

- TriDevs.TriEngine2D/Audio/[AudioManager.cs](#)

7.2 TriDevs.TriEngine2D.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.TriEngine2D.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.

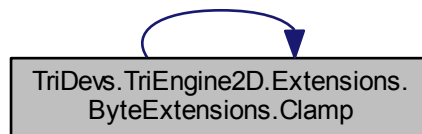
Returns

The clamped value of the byte.

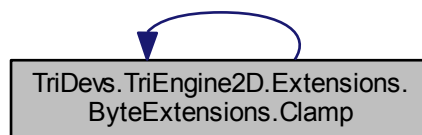
```
39         {
```

```
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:



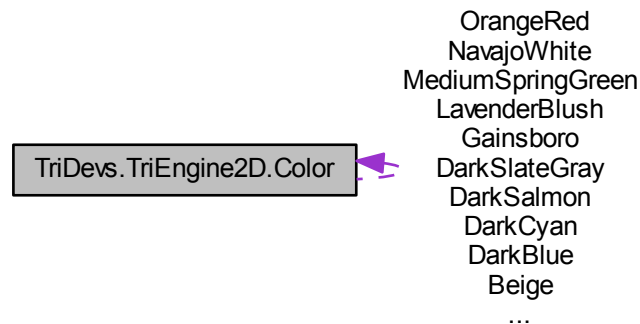
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Extensions/[ByteExtensions.cs](#)

7.3 TriDevs.TriEngine2D.Color Struct Reference

Represents an RGBA color that can be used with [TriEngine2D](#).

Collaboration diagram for TriDevs.TriEngine2D.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)

The color LightYellow.

- 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)

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, 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.TriEngine2D.Color.Color (Color4 color)

Creates a new color from a Color4 color.

Parameters

<i>color</i>	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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.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.TriEngine2D.Color.ToVector3 ()

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

Returns

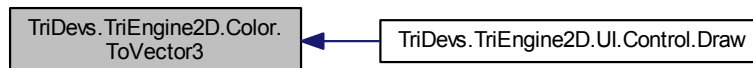
Vector3 representation of this color.

```

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

```

Here is the caller graph for this function:



7.3.3.3 Vector4 TriDevs.TriEngine2D.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.TriEngine2D.Color.A

The color's alpha value.

7.3.4.2 readonly **Color** TriDevs.TriEngine2D.Color.AliceBlue = new **Color**(240, 248, 255) [static]

The color AliceBlue.

7.3.4.3 readonly **Color** TriDevs.TriEngine2D.Color.AntiqueWhite = new **Color**(250, 235, 215) [static]

The color AntiqueWhite.

7.3.4.4 readonly **Color** TriDevs.TriEngine2D.Color.Aqua = new **Color**(0, 255, 255) [static]

The color Aqua.

7.3.4.5 readonly **Color** TriDevs.TriEngine2D.Color.Aquamarine = new **Color**(127, 255, 212) [static]

The color Aquamarine.

7.3.4.6 readonly **Color** TriDevs.TriEngine2D.Color.Azure = new **Color**(240, 255, 255) [static]

The color Azure.

7.3.4.7 readonly float TriDevs.TriEngine2D.Color.B

The blue component of the color.

7.3.4.8 readonly **Color** TriDevs.TriEngine2D.Color.Beige = new **Color**(245, 245, 220) [static]

The color Beige.

7.3.4.9 readonly **Color** TriDevs.TriEngine2D.Color.Bisque = new **Color**(255, 228, 196) [static]

The color Bisque.

7.3.4.10 readonly **Color** TriDevs.TriEngine2D.Color.Black = new **Color**(0, 0, 0) [static]

The color Black.

7.3.4.11 readonly **Color** TriDevs.TriEngine2D.Color.BlanchedAlmond = new **Color**(255, 235, 205) [static]

The color BlanchedAlmond.

7.3.4.12 readonly **Color** TriDevs.TriEngine2D.Color.Blue = new **Color**(0, 0, 255) [static]

The color Blue.

7.3.4.13 readonly **Color** TriDevs.TriEngine2D.Color.BlueViolet = new **Color**(138, 43, 226) [static]

The color BlueViolet.

7.3.4.14 `readonly Color TriDevs.TriEngine2D.Color.Brown = new Color(165, 42, 42) [static]`

The color Brown.

7.3.4.15 `readonly Color TriDevs.TriEngine2D.Color.BurlyWood = new Color(222, 184, 135) [static]`

The color BurlyWood.

7.3.4.16 `readonly Color TriDevs.TriEngine2D.Color.CadetBlue = new Color(95, 158, 160) [static]`

The color CadetBlue.

7.3.4.17 `readonly Color TriDevs.TriEngine2D.Color.Chartreuse = new Color(127, 255, 0) [static]`

The color Chartreuse.

7.3.4.18 `readonly Color TriDevs.TriEngine2D.Color.Chocolate = new Color(210, 105, 30) [static]`

The color Chocolate.

7.3.4.19 `readonly Color TriDevs.TriEngine2D.Color.Coral = new Color(255, 127, 80) [static]`

The color Coral.

7.3.4.20 `readonly Color TriDevs.TriEngine2D.Color.CornflowerBlue = new Color(100, 149, 237) [static]`

The color CornflowerBlue.

7.3.4.21 `readonly Color TriDevs.TriEngine2D.Color.Cornsilk = new Color(255, 248, 220) [static]`

The color Cornsilk.

7.3.4.22 `readonly Color TriDevs.TriEngine2D.Color.Crimson = new Color(220, 20, 60) [static]`

The color Crimson.

7.3.4.23 `readonly Color TriDevs.TriEngine2D.Color.Cyan = new Color(0, 255, 255) [static]`

The color Cyan.

7.3.4.24 `readonly Color TriDevs.TriEngine2D.Color.DarkBlue = new Color(0, 0, 139) [static]`

The color DarkBlue.

7.3.4.25 `readonly Color TriDevs.TriEngine2D.Color.DarkCyan = new Color(0, 139, 139) [static]`

The color DarkCyan.

7.3.4.26 `readonly Color TriDevs.TriEngine2D.Color.DarkGoldenrod = new Color(184, 134, 11) [static]`

The color DarkGoldenrod.

7.3.4.27 `readonly Color TriDevs.TriEngine2D.Color.DarkGray = new Color(169, 169, 169) [static]`

The color DarkGray.

7.3.4.28 `readonly Color TriDevs.TriEngine2D.Color.DarkGreen = new Color(0, 100, 0) [static]`

The color DarkGreen.

7.3.4.29 `readonly Color TriDevs.TriEngine2D.Color.DarkKhaki = new Color(189, 183, 107) [static]`

The color DarkKhaki.

7.3.4.30 `readonly Color TriDevs.TriEngine2D.Color.DarkMagenta = new Color(139, 0, 139) [static]`

The color DarkMagenta.

7.3.4.31 `readonly Color TriDevs.TriEngine2D.Color.DarkOliveGreen = new Color(85, 107, 47) [static]`

The color DarkOliveGreen.

7.3.4.32 `readonly Color TriDevs.TriEngine2D.Color.DarkOrange = new Color(255, 140, 0) [static]`

The color DarkOrange.

7.3.4.33 `readonly Color TriDevs.TriEngine2D.Color.DarkOrchid = new Color(153, 50, 204) [static]`

The color DarkOrchid.

7.3.4.34 `readonly Color TriDevs.TriEngine2D.Color.DarkRed = new Color(139, 0, 0) [static]`

The color DarkRed.

7.3.4.35 `readonly Color TriDevs.TriEngine2D.Color.DarkSalmon = new Color(233, 150, 122) [static]`

The color DarkSalmon.

7.3.4.36 `readonly Color TriDevs.TriEngine2D.Color.DarkSeaGreen = new Color(143, 188, 139) [static]`

The color DarkSeaGreen.

7.3.4.37 `readonly Color TriDevs.TriEngine2D.Color.DarkSlateBlue = new Color(72, 61, 139) [static]`

The color DarkSlateBlue.

7.3.4.38 **readonly Color** `TriDevs.TriEngine2D.Color.DarkSlateGray = new Color(47, 79, 79)` `[static]`

The color DarkSlateGray.

7.3.4.39 **readonly Color** `TriDevs.TriEngine2D.Color.DarkTurquoise = new Color(0, 206, 209)` `[static]`

The color DarkTurquoise.

7.3.4.40 **readonly Color** `TriDevs.TriEngine2D.Color.DarkViolet = new Color(148, 0, 211)` `[static]`

The color DarkViolet.

7.3.4.41 **readonly Color** `TriDevs.TriEngine2D.Color.DeepPink = new Color(255, 20, 147)` `[static]`

The color DeepPink.

7.3.4.42 **readonly Color** `TriDevs.TriEngine2D.Color.DeepSkyBlue = new Color(0, 191, 255)` `[static]`

The color DeepSkyBlue.

7.3.4.43 **readonly Color** `TriDevs.TriEngine2D.Color.DimGray = new Color(105, 105, 105)` `[static]`

The color DimGray.

7.3.4.44 **readonly Color** `TriDevs.TriEngine2D.Color.DodgerBlue = new Color(30, 144, 255)` `[static]`

The color DodgerBlue.

7.3.4.45 **readonly Color** `TriDevs.TriEngine2D.Color.Firebrick = new Color(178, 34, 34)` `[static]`

The color Firebrick.

7.3.4.46 **readonly Color** `TriDevs.TriEngine2D.Color.FloralWhite = new Color(255, 250, 240)` `[static]`

The color FloralWhite.

7.3.4.47 **readonly Color** `TriDevs.TriEngine2D.Color.ForestGreen = new Color(34, 139, 34)` `[static]`

The color ForestGreen.

7.3.4.48 **readonly Color** `TriDevs.TriEngine2D.Color.Fuchsia = new Color(255, 0, 255)` `[static]`

The color Fuchsia.

7.3.4.49 **readonly float** `TriDevs.TriEngine2D.Color.G`

The green component of the color.

7.3.4.50 `readonly Color TriDevs.TriEngine2D.Color.Gainsboro = new Color(220, 220, 220) [static]`

The color Gainsboro.

7.3.4.51 `readonly Color TriDevs.TriEngine2D.Color.GhostWhite = new Color(248, 248, 255) [static]`

The color GhostWhite.

7.3.4.52 `readonly Color TriDevs.TriEngine2D.Color.Gold = new Color(255, 215, 0) [static]`

The color Gold.

7.3.4.53 `readonly Color TriDevs.TriEngine2D.Color.Goldenrod = new Color(218, 165, 32) [static]`

The color Goldenrod.

7.3.4.54 `readonly Color TriDevs.TriEngine2D.Color.Gray = new Color(128, 128, 128) [static]`

The color Gray.

7.3.4.55 `readonly Color TriDevs.TriEngine2D.Color.Green = new Color(0, 128, 0) [static]`

The color Green.

7.3.4.56 `readonly Color TriDevs.TriEngine2D.Color.GreenYellow = new Color(173, 255, 47) [static]`

The color GreenYellow.

7.3.4.57 `readonly Color TriDevs.TriEngine2D.Color.HoneyDew = new Color(240, 255, 240) [static]`

The color HoneyDew.

7.3.4.58 `readonly Color TriDevs.TriEngine2D.Color.HotPink = new Color(255, 105, 180) [static]`

The color HotPink.

7.3.4.59 `readonly Color TriDevs.TriEngine2D.Color.IndianRed = new Color(205, 92, 92) [static]`

The color IndianRed.

7.3.4.60 `readonly Color TriDevs.TriEngine2D.Color.Indigo = new Color(75, 0, 130) [static]`

The color Indigo.

7.3.4.61 `readonly Color TriDevs.TriEngine2D.Color.Ivory = new Color(255, 255, 240) [static]`

The color Ivory.

7.3.4.62 **readonly Color** `TriDevs.TriEngine2D.Color.Khaki = new Color(240, 230, 140)` `[static]`

The color Khaki.

7.3.4.63 **readonly Color** `TriDevs.TriEngine2D.Color.Lavender = new Color(230, 230, 250)` `[static]`

The color Lavender.

7.3.4.64 **readonly Color** `TriDevs.TriEngine2D.Color.LavenderBlush = new Color(255, 240, 245)` `[static]`

The color LavenderBlush.

7.3.4.65 **readonly Color** `TriDevs.TriEngine2D.Color.LawnGreen = new Color(124, 252, 0)` `[static]`

The color LawnGreen.

7.3.4.66 **readonly Color** `TriDevs.TriEngine2D.Color.LemonChiffon = new Color(255, 250, 205)` `[static]`

The color LemonChiffon.

7.3.4.67 **readonly Color** `TriDevs.TriEngine2D.Color.LightBlue = new Color(173, 216, 230)` `[static]`

The color LightBlue.

7.3.4.68 **readonly Color** `TriDevs.TriEngine2D.Color.LightCoral = new Color(240, 128, 128)` `[static]`

The color LightCoral.

7.3.4.69 **readonly Color** `TriDevs.TriEngine2D.Color.LightCyan = new Color(224, 255, 255)` `[static]`

The color LightCyan.

7.3.4.70 **readonly Color** `TriDevs.TriEngine2D.Color.LightGoldenrodYellow = new Color(250, 250, 210)` `[static]`

The color LightGoldenrodYellow.

7.3.4.71 **readonly Color** `TriDevs.TriEngine2D.Color.LightGray = new Color(211, 211, 211)` `[static]`

The color LightGray.

7.3.4.72 **readonly Color** `TriDevs.TriEngine2D.Color.LightGreen = new Color(144, 238, 144)` `[static]`

The color LightGreen.

7.3.4.73 **readonly Color** `TriDevs.TriEngine2D.Color.LightPink = new Color(255, 182, 193)` `[static]`

The color LightPink.

7.3.4.74 **readonly Color** TriDevs.TriEngine2D.Color.LightSalmon = new **Color**(255, 160, 122) [static]

The color LightSalmon.

7.3.4.75 **readonly Color** TriDevs.TriEngine2D.Color.LightSeaGreen = new **Color**(32, 178, 170) [static]

The color LightSeaGreen.

7.3.4.76 **readonly Color** TriDevs.TriEngine2D.Color.LightSkyBlue = new **Color**(135, 206, 250) [static]

The color LightSkyBlue.

7.3.4.77 **readonly Color** TriDevs.TriEngine2D.Color.LightSlateGray = new **Color**(119, 136, 153) [static]

The color LightSlateGray.

7.3.4.78 **readonly Color** TriDevs.TriEngine2D.Color.LightSteelBlue = new **Color**(176, 196, 222) [static]

The color LightSteelBlue.

7.3.4.79 **readonly Color** TriDevs.TriEngine2D.Color.LightYellow = new **Color**(255, 255, 224) [static]

The color LightYellow.

7.3.4.80 **readonly Color** TriDevs.TriEngine2D.Color.Lime = new **Color**(0, 255, 0) [static]

The color Lime.

7.3.4.81 **readonly Color** TriDevs.TriEngine2D.Color.LimeGreen = new **Color**(50, 205, 50) [static]

The color LimeGreen.

7.3.4.82 **readonly Color** TriDevs.TriEngine2D.Color.Linen = new **Color**(250, 240, 230) [static]

The color Linen.

7.3.4.83 **readonly Color** TriDevs.TriEngine2D.Color.Magenta = new **Color**(255, 0, 255) [static]

The color Magenta.

7.3.4.84 **readonly Color** TriDevs.TriEngine2D.Color.Maroon = new **Color**(128, 0, 0) [static]

The color Maroon.

7.3.4.85 **readonly Color** TriDevs.TriEngine2D.Color.MediumAquaMarine = new **Color**(102, 205, 170) [static]

The color MediumAquaMarine.

7.3.4.86 `readonly Color TriDevs.TriEngine2D.Color.MediumBlue = new Color(0, 0, 205)` `[static]`

The color MediumBlue.

7.3.4.87 `readonly Color TriDevs.TriEngine2D.Color.MediumOrchid = new Color(186, 85, 211)` `[static]`

The color MediumOrchid.

7.3.4.88 `readonly Color TriDevs.TriEngine2D.Color.MediumPurple = new Color(147, 112, 219)` `[static]`

The color MediumPurple.

7.3.4.89 `readonly Color TriDevs.TriEngine2D.Color.MediumSeaGreen = new Color(60, 179, 113)` `[static]`

The color MediumSeaGreen.

7.3.4.90 `readonly Color TriDevs.TriEngine2D.Color.MediumSlateBlue = new Color(123, 104, 238)` `[static]`

The color MediumSlateBlue.

7.3.4.91 `readonly Color TriDevs.TriEngine2D.Color.MediumSpringGreen = new Color(0, 250, 154)` `[static]`

The color MediumSpringGreen.

7.3.4.92 `readonly Color TriDevs.TriEngine2D.Color.MediumTurquoise = new Color(72, 209, 204)` `[static]`

The color MediumTurquoise.

7.3.4.93 `readonly Color TriDevs.TriEngine2D.Color.MediumVioletRed = new Color(199, 21, 133)` `[static]`

The color MediumVioletRed.

7.3.4.94 `readonly Color TriDevs.TriEngine2D.Color.MidnightBlue = new Color(25, 25, 112)` `[static]`

The color MidnightBlue.

7.3.4.95 `readonly Color TriDevs.TriEngine2D.Color.MintCream = new Color(245, 255, 250)` `[static]`

The color MintCream.

7.3.4.96 `readonly Color TriDevs.TriEngine2D.Color.MistyRose = new Color(255, 228, 225)` `[static]`

The color MistyRose.

7.3.4.97 `readonly Color TriDevs.TriEngine2D.Color.Moccasin = new Color(255, 228, 181)` `[static]`

The color Moccasin.

7.3.4.98 readonly **Color** TriDevs.TriEngine2D.Color.NavajoWhite = new **Color**(255, 222, 173) [static]

The color NavajoWhite.

7.3.4.99 readonly **Color** TriDevs.TriEngine2D.Color.Navy = new **Color**(0, 0, 128) [static]

The color Navy.

7.3.4.100 readonly **Color** TriDevs.TriEngine2D.Color.OldLace = new **Color**(253, 245, 230) [static]

The color OldLace.

7.3.4.101 readonly **Color** TriDevs.TriEngine2D.Color.Olive = new **Color**(128, 128, 0) [static]

The color Olive.

7.3.4.102 readonly **Color** TriDevs.TriEngine2D.Color.OliveDrab = new **Color**(107, 142, 35) [static]

The color OliveDrab.

7.3.4.103 readonly **Color** TriDevs.TriEngine2D.Color.Orange = new **Color**(255, 165, 0) [static]

The color Orange.

7.3.4.104 readonly **Color** TriDevs.TriEngine2D.Color.OrangeRed = new **Color**(255, 69, 0) [static]

The color OrangeRed.

7.3.4.105 readonly **Color** TriDevs.TriEngine2D.Color.Orchid = new **Color**(218, 112, 214) [static]

The color Orchid.

7.3.4.106 readonly **Color** TriDevs.TriEngine2D.Color.PaleGoldenrod = new **Color**(238, 232, 170) [static]

The color PaleGoldenrod.

7.3.4.107 readonly **Color** TriDevs.TriEngine2D.Color.PaleGreen = new **Color**(152, 251, 152) [static]

The color PaleGreen.

7.3.4.108 readonly **Color** TriDevs.TriEngine2D.Color.PaleTurquoise = new **Color**(175, 238, 238) [static]

The color PaleTurquoise.

7.3.4.109 readonly **Color** TriDevs.TriEngine2D.Color.PaleVioletRed = new **Color**(219, 112, 147) [static]

The color PaleVioletRed.

7.3.4.110 **readonly Color** TriDevs.TriEngine2D.Color.PapayaWhip = new **Color**(225, 239, 213) [static]

The color PapayaWhip.

7.3.4.111 **readonly Color** TriDevs.TriEngine2D.Color.PeachPuff = new **Color**(255, 218, 185) [static]

The color PeachPuff.

7.3.4.112 **readonly Color** TriDevs.TriEngine2D.Color.Peru = new **Color**(205, 133, 63) [static]

The color Peru.

7.3.4.113 **readonly Color** TriDevs.TriEngine2D.Color.Pink = new **Color**(255, 192, 203) [static]

The color Pink.

7.3.4.114 **readonly Color** TriDevs.TriEngine2D.Color.Plum = new **Color**(221, 160, 221) [static]

The color Plum.

7.3.4.115 **readonly Color** TriDevs.TriEngine2D.Color.PowderBlue = new **Color**(176, 224, 230) [static]

The color PowderBlue.

7.3.4.116 **readonly Color** TriDevs.TriEngine2D.Color.Purple = new **Color**(128, 0, 128) [static]

The color Purple.

7.3.4.117 **readonly float** TriDevs.TriEngine2D.Color.R

The red component of the color.

7.3.4.118 **readonly Color** TriDevs.TriEngine2D.Color.Red = new **Color**(255, 0, 0) [static]

The color Red.

7.3.4.119 **readonly Color** TriDevs.TriEngine2D.Color.RosyBrown = new **Color**(188, 143, 143) [static]

The color RosyBrown.

7.3.4.120 **readonly Color** TriDevs.TriEngine2D.Color.RoyalBlue = new **Color**(65, 105, 225) [static]

The color RoyalBlue.

7.3.4.121 **readonly Color** TriDevs.TriEngine2D.Color.SaddleBrown = new **Color**(139, 69, 19) [static]

The color SaddleBrown.

7.3.4.122 readonly **Color** TriDevs.TriEngine2D.Color.Salmon = new **Color**(250, 128, 114) [static]

The color Salmon.

7.3.4.123 readonly **Color** TriDevs.TriEngine2D.Color.SandyBrown = new **Color**(244, 164, 96) [static]

The color SandyBrown.

7.3.4.124 readonly **Color** TriDevs.TriEngine2D.Color.SeaGreen = new **Color**(46, 139, 87) [static]

The color SeaGreen.

7.3.4.125 readonly **Color** TriDevs.TriEngine2D.Color.SeaShell = new **Color**(255, 245, 238) [static]

The color SeaShell.

7.3.4.126 readonly **Color** TriDevs.TriEngine2D.Color.Sienna = new **Color**(160, 82, 45) [static]

The color Sienna.

7.3.4.127 readonly **Color** TriDevs.TriEngine2D.Color.Silver = new **Color**(192, 192, 192) [static]

The color Silver.

7.3.4.128 readonly **Color** TriDevs.TriEngine2D.Color.SkyBlue = new **Color**(135, 206, 235) [static]

The color SkyBlue.

7.3.4.129 readonly **Color** TriDevs.TriEngine2D.Color.SlateBlue = new **Color**(106, 90, 205) [static]

The color SlateBlue.

7.3.4.130 readonly **Color** TriDevs.TriEngine2D.Color.SlateGray = new **Color**(112, 128, 144) [static]

The color SlateGray.

7.3.4.131 readonly **Color** TriDevs.TriEngine2D.Color.Snow = new **Color**(255, 250, 250) [static]

The color Snow.

7.3.4.132 readonly **Color** TriDevs.TriEngine2D.Color.SpringGreen = new **Color**(0, 255, 127) [static]

The color SpringGreen.

7.3.4.133 readonly **Color** TriDevs.TriEngine2D.Color.SteelBlue = new **Color**(70, 130, 180) [static]

The color SteelBlue.

7.3.4.134 readonly **Color** TriDevs.TriEngine2D.Color.Tan = new **Color**(210, 180, 140) [static]

The color Tan.

7.3.4.135 readonly **Color** TriDevs.TriEngine2D.Color.Teal = new **Color**(0, 128, 128) [static]

The color Teal.

7.3.4.136 readonly **Color** TriDevs.TriEngine2D.Color.Thistle = new **Color**(216, 191, 216) [static]

The color Thistle.

7.3.4.137 readonly **Color** TriDevs.TriEngine2D.Color.Tomato = new **Color**(255, 99, 71) [static]

The color Tomato.

7.3.4.138 readonly **Color** TriDevs.TriEngine2D.Color.TransparentBlack = new **Color**(0, 0, 0, 0) [static]

Transparent black color.

7.3.4.139 readonly **Color** TriDevs.TriEngine2D.Color.TransparentWhite = new **Color**(255, 255, 255, 0) [static]

Transparent white color.

7.3.4.140 readonly **Color** TriDevs.TriEngine2D.Color.Turquoise = new **Color**(64, 224, 208) [static]

The color Turquoise.

7.3.4.141 readonly **Color** TriDevs.TriEngine2D.Color.Violet = new **Color**(238, 130, 238) [static]

The color Violet.

7.3.4.142 readonly **Color** TriDevs.TriEngine2D.Color.Wheat = new **Color**(245, 222, 179) [static]

The color Wheat.

7.3.4.143 readonly **Color** TriDevs.TriEngine2D.Color.White = new **Color**(255, 255, 255) [static]

The color White.

7.3.4.144 readonly **Color** TriDevs.TriEngine2D.Color.WhiteSmoke = new **Color**(245, 245, 245) [static]

The color WhiteSmoke.

7.3.4.145 readonly **Color** TriDevs.TriEngine2D.Color.Yellow = new **Color**(255, 255, 0) [static]

The color Yellow.

7.3.4.146 readonly **Color** TriDevs.TriEngine2D.Color.YellowGreen = new **Color**(154, 205, 50) [static]

The color YellowGreen.

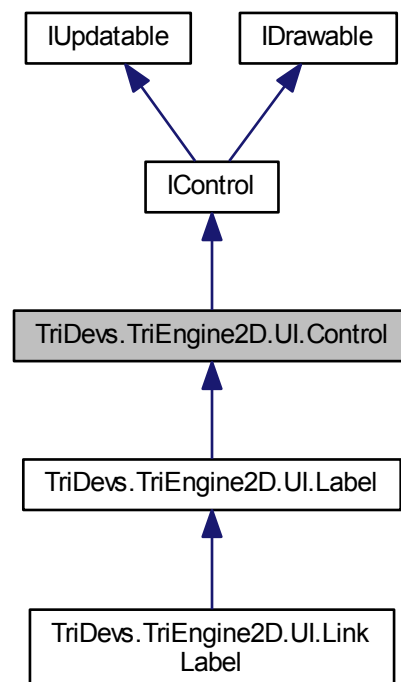
The documentation for this struct was generated from the following file:

- TriDevs.TriEngine2D/[Color.cs](#)

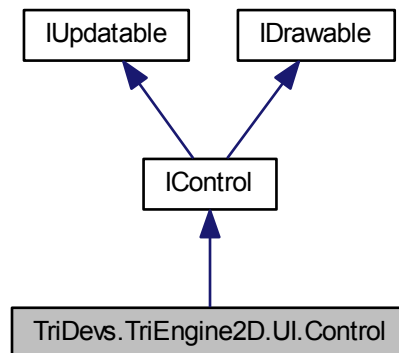
7.4 TriDevs.TriEngine2D.UI.Control Class Reference

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

Inheritance diagram for TriDevs.TriEngine2D.UI.Control:



Collaboration diagram for TriDevs.TriEngine2D.UI.Control:



Public Member Functions

- virtual void [Enable](#) ()
Enables the control.
- 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.

7.4.1 Detailed Description

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

7.4.2 Member Function Documentation

7.4.2.1 virtual void TriDevs.TriEngine2D.UI.Control.Disable () [virtual]

Disables the control.

Implements [TriDevs.TriEngine2D.UI.IControl](#).

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

7.4.2.2 virtual void TriDevs.TriEngine2D.UI.Control.Draw () [virtual]

Draw the object to screen.

Implements [TriDevs.TriEngine2D.Interfaces.IDrawable](#).

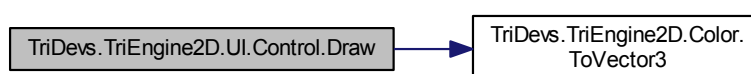
Reimplemented in [TriDevs.TriEngine2D.UI.Label](#).

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

7.4.2.3 virtual void TriDevs.TriEngine2D.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:



7.4.2.4 virtual void TriDevs.TriEngine2D.UI.Control.Enable () [virtual]

Enables the control.

Implements [TriDevs.TriEngine2D.UI.IControl](#).

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

7.4.2.5 virtual void TriDevs.TriEngine2D.UI.Control.Hide () [virtual]

Hides the control.

Implements [TriDevs.TriEngine2D.UI.IControl](#).

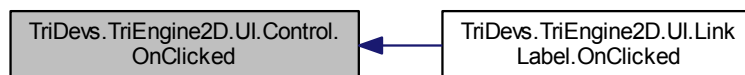
```
96      {
97          Visible = false;
98      }
```

7.4.2.6 virtual void TriDevs.TriEngine2D.UI.Control.OnClicked () [protected],[virtual]

Reimplemented in [TriDevs.TriEngine2D.UI.LinkLabel](#).

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

Here is the caller graph for this function:



7.4.2.7 virtual void TriDevs.TriEngine2D.UI.Control.Show () [virtual]

Shows the control.

Implements [TriDevs.TriEngine2D.UI.IControl](#).

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

7.4.2.8 virtual void TriDevs.TriEngine2D.UI.Control.Update () [virtual]

Updates the object.

Implements [TriDevs.TriEngine2D.Interfaces.IUpdatable](#).

Reimplemented in [TriDevs.TriEngine2D.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.
X + Rectangle.Width))
111             && (mousePos.Y >= Rectangle.Y && mousePos.Y <= (
Rectangle.Y + Rectangle.Height)))
112             OnClicked();
113     }

```

7.4.3 Property Documentation

7.4.3.1 virtual **Color** TriDevs.TriEngine2D.UI.Control.Color [get], [set]

7.4.3.2 virtual **bool** TriDevs.TriEngine2D.UI.Control.Enabled [get], [set]

7.4.3.3 virtual **Point<int>** TriDevs.TriEngine2D.UI.Control.Position [get], [set]

7.4.3.4 virtual **Rectangle** TriDevs.TriEngine2D.UI.Control.Rectangle [get], [set]

7.4.3.5 virtual **Point<int>** TriDevs.TriEngine2D.UI.Control.Size [get], [set]

7.4.3.6 virtual **string** TriDevs.TriEngine2D.UI.Control.Text [get], [set]

7.4.3.7 virtual **bool** TriDevs.TriEngine2D.UI.Control.Visible [get], [set]

7.4.4 Event Documentation

7.4.4.1 **ControlClickedEventHandler** TriDevs.TriEngine2D.UI.Control.Clicked

Raised when this control is clicked on by the user.

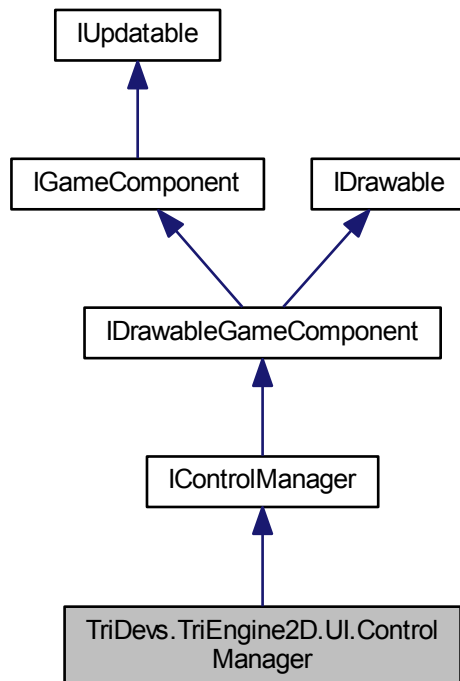
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/UI/[Control.cs](#)

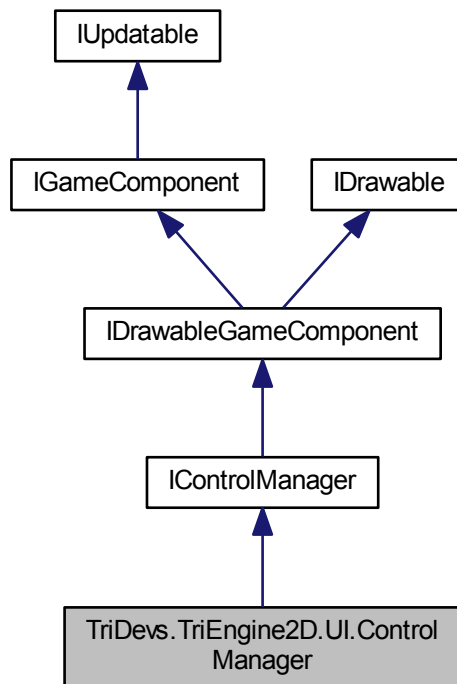
7.5 TriDevs.TriEngine2D.UI.ControlManager Class Reference

Control manager to manage various **UI** controls for a game.

Inheritance diagram for TriDevs.TriEngine2D.UI.ControlManager:



Collaboration diagram for TriDevs.TriEngine2D.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]

7.5.1 Detailed Description

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

7.5.2 Constructor & Destructor Documentation

7.5.2.1 [TriDevs.TriEngine2D.UI.ControlManager.ControlManager](#) ()

Initializes a new instance of this control manager.

```

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

7.5.3 Member Function Documentation

7.5.3.1 [IControl](#) [TriDevs.TriEngine2D.UI.ControlManager.AddControl](#) ([IControl control](#))

Adds a new control to this control manager.

Parameters

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

Returns

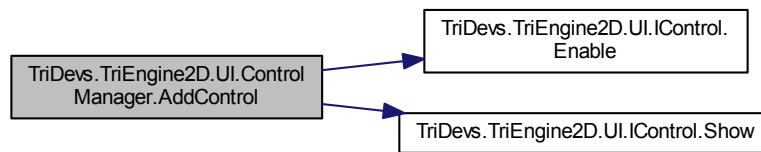
The control that was added.

Implements [TriDevs.TriEngine2D.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:



7.5.3.2 void TriDevs.TriEngine2D.UI.ControlManager.Disable ()

Disables this game component.

Implements [TriDevs.TriEngine2D.Interfaces.IGameComponent](#).

```

63     {
64         Enabled = false;
65     }
  
```

7.5.3.3 void TriDevs.TriEngine2D.UI.ControlManager.Draw ()

Draw the object to screen.

Implements [TriDevs.TriEngine2D.Interfaces.IDrawable](#).

```

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

7.5.3.4 void TriDevs.TriEngine2D.UI.ControlManager.Enable ()

Enables this game component.

Implements [TriDevs.TriEngine2D.Interfaces.IGameComponent](#).

```

58     {
59         Enabled = true;
60     }
  
```

7.5.3.5 bool TriDevs.TriEngine2D.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.TriEngine2D.UI.IControlManager](#).

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

7.5.3.6 bool TriDevs.TriEngine2D.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.TriEngine2D.UI.IControlManager](#).

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

7.5.3.7 bool TriDevs.TriEngine2D.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.TriEngine2D.UI.IControlManager](#).

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

7.5.3.8 void TriDevs.TriEngine2D.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.TriEngine2D.UI.IControlManager](#).

```

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

```

7.5.3.9 void TriDevs.TriEngine2D.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.TriEngine2D.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     }

```

7.5.3.10 void TriDevs.TriEngine2D.UI.ControlManager.RemoveControl (IControl control)

Removes a control from this control manager.

Parameters

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

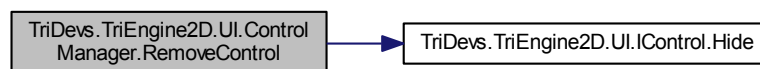
Implements [TriDevs.TriEngine2D.UI.IControlManager](#).

```

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:



7.5.3.11 void TriDevs.TriEngine2D.UI.ControlManager.Update ()

Updates the object.

Implements [TriDevs.TriEngine2D.Interfaces.IUpdatable](#).

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

7.5.4 Property Documentation

7.5.4.1 `bool TriDevs.TriEngine2D.UI.ControlManager.Enabled` `[get]`, `[set]`

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

- [TriDevs.TriEngine2D/UI/ControlManager.cs](#)

7.6 TriDevs.TriEngine2D.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.

7.6.1 Detailed Description

[Extensions](#) for `System.Decimal`.

7.6.2 Member Function Documentation

7.6.2.1 `static decimal TriDevs.TriEngine2D.Extensions.DecimalExtensions.Clamp (this decimal value, decimal min, decimal max)` `[static]`

Clamps the specified decimal between a minimum and maximum value.

Parameters

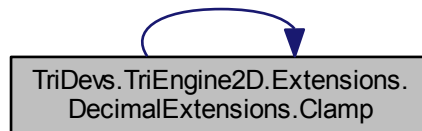
<i>value</i>	Value to clamp.
<i>min</i>	If the specified decimal is below this value, then this will be returned.
<i>max</i>	If the specified decimal is above this value, then this will be returned.

Returns

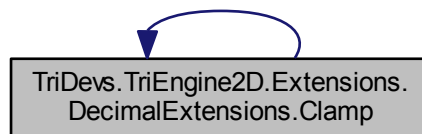
The clamped value of the decimal.

```
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.TriEngine2D/Extensions/DecimalExtensions.cs`

7.7 TriDevs.TriEngine2D.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.

7.7.1 Detailed Description

[Extensions](#) for `System.Double`.

7.7.2 Member Function Documentation

7.7.2.1 static double TriDevs.TriEngine2D.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

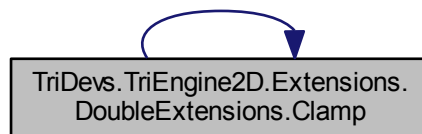
The clamped value of the double.

```

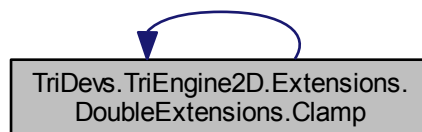
39         {
40             return Helpers.Math.Clamp(value, min, max);
41         }

```

Here is the call graph for this function:



Here is the caller graph for this function:



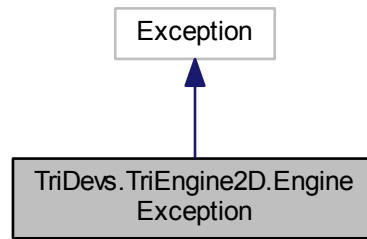
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Extensions/[DoubleExtensions.cs](#)

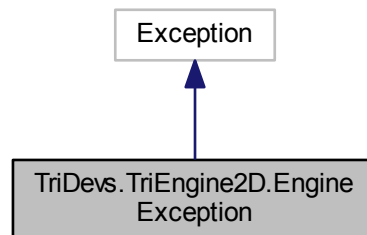
7.8 TriDevs.TriEngine2D.EngineException Class Reference

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

Inheritance diagram for TriDevs.TriEngine2D.EngineException:



Collaboration diagram for TriDevs.TriEngine2D.EngineException:



7.8.1 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.TriEngine2D/[EngineException.cs](#)

7.9 TriDevs.TriEngine2D.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)

Removes an enumerated type and returns the new value.

- 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.

7.9.1 Detailed Description

[Extensions](#) for System.Enum.

7.9.2 Member Function Documentation

7.9.2.1 static bool [TriDevs.TriEngine2D.Extensions.EnumerationExtensions.Has< T >](#) (this Enum value, T check)
[static]

Checks if an enumerated type contains a value.

Template Parameters

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

Parameters

<i>value</i>	The enum to check.
<i>check</i>	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     }

```

7.9.2.2 static T [TriDevs.TriEngine2D.Extensions.EnumerationExtensions.Include< T >](#) (this Enum value, T append)
[static]

Includes an enumerated type and returns the new value.

Template Parameters

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

Parameters

<i>value</i>	The enum to append to.
<i>append</i>	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     }

```

7.9.2.3 static bool TriDevs.TriEngine2D.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     }

```

7.9.2.4 static T TriDevs.TriEngine2D.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.TriEngine2D/Extensions/[EnumerationExtensions.cs](#)

7.10 TriDevs.TriEngine2D.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.

7.10.1 Detailed Description

Provides helper methods for dealing with exceptions.

7.10.2 Member Function Documentation

7.10.2.1 static void TriDevs.TriEngine2D.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(),
exception.Message);
62         if (exception.InnerException != null)
63             _log.ErrorFormat("Inner exception {0} with message: {1}", exception.InnerException.GetType(
),
64                             exception.InnerException.Message);
65         _log.Error("Exception details:", exception);
66         if (exception.InnerException != null)
67             _log.Error("Exception details for inner:", exception.InnerException);
68     }

```

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

- TriDevs.TriEngine2D/Helpers/[Exceptions.cs](#)

7.11 TriDevs.TriEngine2D.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.

7.11.1 Detailed Description

[Extensions](#) for System.Single.

7.11.2 Member Function Documentation

7.11.2.1 static float TriDevs.TriEngine2D.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

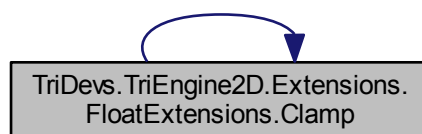
The clamped value of the float.

```

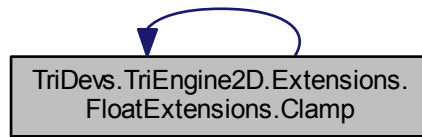
39         {
40             return Helpers.Math.Clamp(value, min, max);
41         }

```

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.TriEngine2D/Extensions/FloatExtensions.cs`

7.12 TriDevs.TriEngine2D.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.

7.12.1 Detailed Description

Holds a specific font type.

7.12.2 Constructor & Destructor Documentation

7.12.2.1 TriDevs.TriEngine2D.Text.Font.Font (string *name*, string *file*, int *size*, bool *dropShadow* = false, **FontType** *type* = **FontType.TTF**)

Initializes a new [Font](#) instance.

Parameters

<i>name</i>	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.
<i>file</i>	Path to the font file (TTF or qfont).
<i>size</i>	Size (in points) to use for this font.
<i>dropShadow</i>	Whether or not this font should have shadows.
<i>type</i>	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     }
```

7.12.2.2 TriDevs.TriEngine2D.Text.Font.Font (string *name*, string *file*, int *size*, **FontType** *type*, **FontConstructionConfig** *fontConstructionConfig*)

Initializes a new [Font](#) instance using the specified builder configuration.

Parameters

<i>name</i>	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.
<i>file</i>	Path to the font file (TTF or qfont).
<i>size</i>	Size (in points) to use for this font.
<i>type</i>	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
<i>font-Construction-Config</i>	The FontConstructionConfig 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
142     _type = type;
143
144     QFont font;
145
146     switch (_type)
147     {
148     case FontType.TTF:
149         if (fontConstructionConfig.BuildConfig == null)
150             throw new EngineException("Builder configuration was null but requested font type
requires a builder config!",
151                                     new ArgumentException("BuildConfig was null.", "
fontConstructionConfig"));
152         font = new QFont(_file, _size, fontConstructionConfig.BuildConfig);
153         break;
154     case FontType.QFont:
155         if (fontConstructionConfig.LoadConfig == null)
156             throw new EngineException("Loader configuration was null but requested font type
requires a loader config!",
157                                     new ArgumentException("LoadConfig was null.", "
fontConstructionConfig"));
158         font = QFont.FromQFontFile(_file, fontConstructionConfig.LoadConfig);
159         break;
160     default:
161         throw new EngineException("Unsupported font type: " + _type,
162                                   new ArgumentException("Font type unsupported.", "type"));
163     }
164
165     if (font == null)
166         throw new EngineException("Font failed to initialize!",
167                                   new ArgumentException("Font failed to initialize.", "file"));
168
169     _qfont = font;
170
171     _name = name ?? GetDefaultName(file, size);
172 }

```

7.12.3 Member Function Documentation

7.12.3.1 void TriDevs.TriEngine2D.Text.Font.Dispose ()

Disposes of this font instance, releasing all unmanaged resources.

```

195     {
196         QFont.Dispose();
197     }

```

7.12.3.2 static string TriDevs.TriEngine2D.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     }

```

7.12.3.3 override string TriDevs.TriEngine2D.Text.Font.ToString ()

```

186         {
187             return Name;
188         }

```

7.12.4 Property Documentation

7.12.4.1 Color TriDevs.TriEngine2D.Text.Font.Color [get], [set]

Gets or sets the color of this font.

7.12.4.2 string TriDevs.TriEngine2D.Text.Font.File [get]

Gets the file used to create this font instance.

7.12.4.3 string TriDevs.TriEngine2D.Text.Font.Name [get]

Gets the name of this font instance.

7.12.4.4 QFont TriDevs.TriEngine2D.Text.Font.QFont [get]

Gets the QFont instance associated with this font.

7.12.4.5 int TriDevs.TriEngine2D.Text.Font.Size [get]

Gets the size of this font in points.

7.12.4.6 FontType TriDevs.TriEngine2D.Text.Font.Type [get]

Gets the font type.

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

- TriDevs.TriEngine2D/Text/[Font.cs](#)

7.13 TriDevs.TriEngine2D.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 constructing fonts from a qfont file.

7.13.1 Detailed Description

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

7.13.2 Constructor & Destructor Documentation

7.13.2.1 TriDevs.TriEngine2D.Text.FontConstructionConfig.FontConstructionConfig (QFontLoaderConfiguration *loadConfig*)

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

Parameters

<i>loadConfig</i>	The QFontLoaderConfiguration to use.
-------------------	--------------------------------------

```

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

7.13.2.2 TriDevs.TriEngine2D.Text.FontConstructionConfig.FontConstructionConfig (QFontBuilderConfiguration *buildConfig*, QFontLoaderConfiguration *loadConfig* = null)

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

Parameters

<i>buildConfig</i>	The builder configuration to use.
<i>loadConfig</i>	Optional loader configuration to set.

```

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

7.13.3 Member Data Documentation

7.13.3.1 QFontBuilderConfiguration TriDevs.TriEngine2D.Text.FontConstructionConfig.BuildConfig

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

7.13.3.2 QFontLoaderConfiguration TriDevs.TriEngine2D.Text.FontConstructionConfig.LoadConfig

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

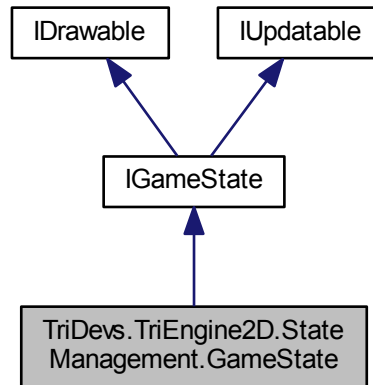
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Text/[FontConstructionConfig.cs](#)

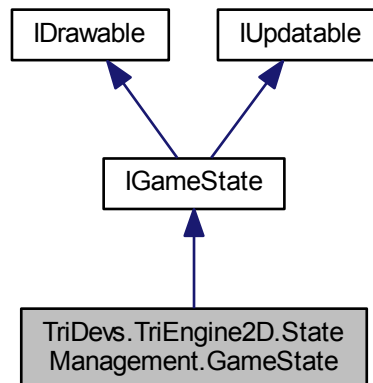
7.14 TriDevs.TriEngine2D.StateManagement.GameState Class Reference

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

Inheritance diagram for TriDevs.TriEngine2D.StateManagement.GameState:



Collaboration diagram for TriDevs.TriEngine2D.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.*
- [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.*

Protected Member Functions

- [GameState](#) ()

Protected Attributes

- readonly List< [IGameComponent](#) > [Components](#)

Properties

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

7.14.1 Detailed Description

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

7.14.2 Constructor & Destructor Documentation

7.14.2.1 TriDevs.TriEngine2D.StateManagement.GameState.GameState () [protected]

```

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

```

7.14.3 Member Function Documentation

7.14.3.1 IGameComponent TriDevs.TriEngine2D.StateManagement.GameState.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.

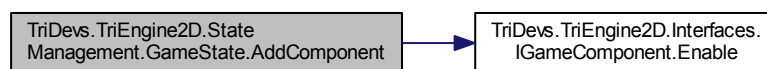
Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

```

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:



7.14.3.2 virtual void TriDevs.TriEngine2D.StateManagement.GameState.Draw () [virtual]

Draw the object to screen.

Implements [TriDevs.TriEngine2D.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:



7.14.3.3 IEnumerable<IGameComponent> TriDevs.TriEngine2D.StateManagement.GameState.GetAllComponents ()

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

Returns

Read-only collection of components.

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

```

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

7.14.3.4 IEnumerable<IGameComponent> TriDevs.TriEngine2D.StateManagement.GameState.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.

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.5 IEnumerable<IGameComponent> TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.6 IGameComponent TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.7 IGameComponent TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.8 bool TriDevs.TriEngine2D.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 [TriDevs.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.9 bool TriDevs.TriEngine2D.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 [TriDevs.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.10 bool TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.11 virtual void TriDevs.TriEngine2D.StateManagement.GameState.Load () [virtual]

Loads resources associated with this game component.

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

```
58     {
59
60 }
```

7.14.3.12 virtual void TriDevs.TriEngine2D.StateManagement.GameState.Pause () [virtual]

Pauses the game state, preventing update calls from running.

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.13 void TriDevs.TriEngine2D.StateManagement.GameState.RemoveAllComponents ()

Removes all components from the game state.

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.14 void TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.IGameState](#).

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

7.14.3.15 void TriDevs.TriEngine2D.StateManagement.GameState.RemoveAllComponents (Predicate< IGameComponent > *predicate*)

Removes all components that match the supplied predicate function.

Parameters

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

Implements [TriDevs.TriEngine2D.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     }

```

7.14.3.16 void TriDevs.TriEngine2D.StateManagement.GameState.RemoveComponent (IGameComponent *component*)

Removes the specified component from this game state.

Parameters

<i>component</i>	
------------------	--

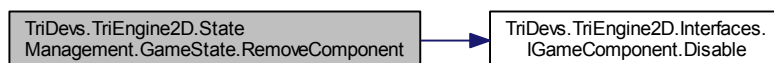
Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

```

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:



7.14.3.17 virtual void TriDevs.TriEngine2D.StateManagement.GameState.Unload () [virtual]

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

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

```

63     {
64
65     }

```

7.14.3.18 `virtual void TriDevs.TriEngine2D.StateManagement.GameState.Unpause () [virtual]`

Unpauses the game state, enabling update calls again.

Implements [TriDevs.TriEngine2D.StateManagement.IGameState](#).

```

73     {
74         Paused = false;
75     }

```

7.14.3.19 `virtual void TriDevs.TriEngine2D.StateManagement.GameState.Update () [virtual]`

Updates the object.

Implements [TriDevs.TriEngine2D.Interfaces.IUpdatable](#).

```

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

```

7.14.4 Member Data Documentation**7.14.4.1** `readonly List<IGameComponent> TriDevs.TriEngine2D.StateManagement.GameState.Components [protected]`**7.14.5 Property Documentation****7.14.5.1** `bool TriDevs.TriEngine2D.StateManagement.GameState.Paused [get], [set]`

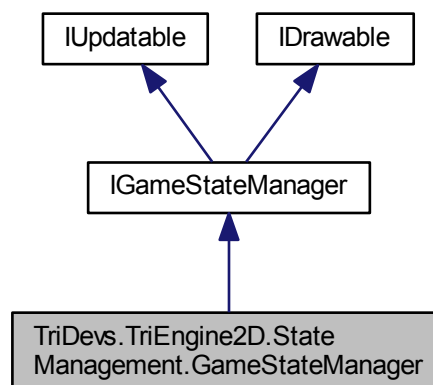
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine2D/StateManagement/GameState.cs](#)

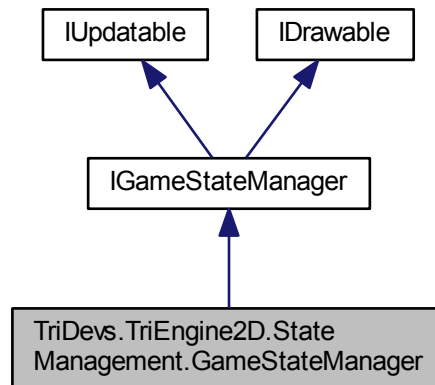
7.15 TriDevs.TriEngine2D.StateManagement.GameStateManager Class Reference

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

Inheritance diagram for `TriDevs.TriEngine2D.StateManagement.GameStateManager`:



Collaboration diagram for TriDevs.TriEngine2D.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]

7.15.1 Detailed Description

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

7.15.2 Constructor & Destructor Documentation

7.15.2.1 TriDevs.TriEngine2D.StateManagement.GameStateManager.GameStateManager ()

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

```

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

```

7.15.2.2 TriDevs.TriEngine2D.StateManagement.GameStateManager.GameStateManager (IGameState state)

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

Parameters

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

```

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

```

7.15.3 Member Function Documentation

7.15.3.1 void TriDevs.TriEngine2D.StateManagement.GameStateManager.Draw ()

Draw the object to screen.

Implements [TriDevs.TriEngine2D.Interfaces.IDrawable](#).

```

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

```

7.15.3.2 IGameState TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.IGameStateManager](#).

```

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

```

7.15.3.3 IGameState TriDevs.TriEngine2D.StateManagement.GameStateManager.Pop ()

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

Returns

The state that was popped.

Implements [TriDevs.TriEngine2D.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 }
```

7.15.3.4 IGameState TriDevs.TriEngine2D.StateManagement.GameStateManager.Push (IGameState state)

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

Parameters

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

Returns

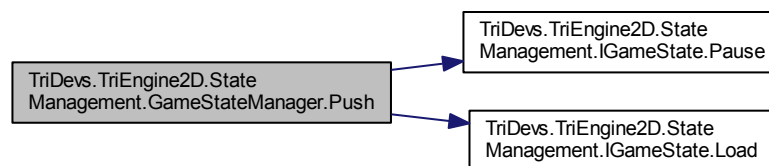
The game state that was pushed.

Implements [TriDevs.TriEngine2D.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:



7.15.3.5 IGameState TriDevs.TriEngine2D.StateManagement.GameStateManager.Switch (IGameState state)

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

Parameters

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

Returns

The state that was switched to.

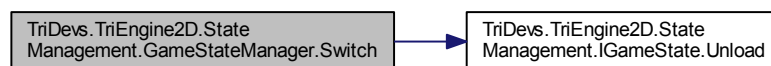
Implements [TriDevs.TriEngine2D.StateManagement.IGameStateManager](#).

```

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:



7.15.3.6 void TriDevs.TriEngine2D.StateManagement.GameStateManager.Update ()

Updates the object.

Implements [TriDevs.TriEngine2D.Interfaces.IUpdatable](#).

```

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

```

7.15.4 Property Documentation

7.15.4.1 IGameState [TriDevs.TriEngine2D.StateManagement.GameStateManager.ActiveState](#) [get], [set]

7.15.4.2 int [TriDevs.TriEngine2D.StateManagement.GameStateManager.StateCount](#) [get]

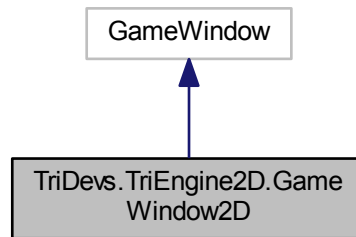
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine2D/StateManagement/GameStateManager.cs](#)

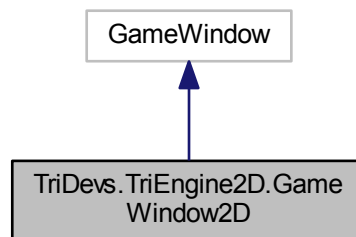
7.16 TriDevs.TriEngine2D.GameWindow2D Class Reference

Game window class specialized for drawing 2D graphics.

Inheritance diagram for TriDevs.TriEngine2D.GameWindow2D:



Collaboration diagram for TriDevs.TriEngine2D.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]

7.16.1 Detailed Description

Game window class specialized for drawing 2D graphics.

7.16.2 Constructor & Destructor Documentation

7.16.2.1 TriDevs.TriEngine2D.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     }

```

7.16.3 Member Function Documentation

7.16.3.1 void TriDevs.TriEngine2D.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     }

```

7.16.3.2 abstract void TriDevs.TriEngine2D.GameWindow2D.OnDraw (FrameEventArgs e) [protected], [pure virtual]

7.16.3.3 override void TriDevs.TriEngine2D.GameWindow2D.OnLoad (EventArgs e) [protected]

```

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

```

7.16.3.4 sealed override void TriDevs.TriEngine2D.GameWindow2D.OnRenderFrame (FrameEventArgs e) [protected]

```

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

```

7.16.3.5 override void TriDevs.TriEngine2D.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     }

```

7.16.4 Property Documentation

7.16.4.1 Color TriDevs.TriEngine2D.GameWindow2D.ClearColor [get], [set], [protected]

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

- TriDevs.TriEngine2D/[GameWindow2D.cs](#)

7.17 TriDevs.TriEngine2D.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 [GetLastErrorInfo](#) (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.

7.17.1 Detailed Description

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

7.17.2 Member Function Documentation

7.17.2.1 static string TriDevs.TriEngine2D.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         }

```

7.17.2.2 static int TriDevs.TriEngine2D.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         }

```

7.17.2.3 static int TriDevs.TriEngine2D.Native.Helpers.GetLastErrorInfo (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         }

```

7.17.2.4 static string TriDevs.TriEngine2D.Native.Helpers.GetLastErrorMessage () [static]

Gets the error message associated with the last thrown error.

Returns

The error message.

```

70         {
71             return GetErrorMessage(GetLastError());
72         }

```

7.17.2.5 static Win32Exception TriDevs.TriEngine2D.Native.Helpers.GetLastWin32Exception () [static]

Gets the Win32Exception associated with the last thrown error.

Returns

The Win32Exception.

```

89         {
90             return GetWin32Exception(GetLastError());
91         }

```

7.17.2.6 static Win32Exception TriDevs.TriEngine2D.Native.Helpers.GetWin32Exception (int *err*) [static]

Gets the Win32Exception associated with the specified error code.

Parameters

<i>err</i>	The error code.
------------	-----------------

Returns

The Win32Exception for the provided error code.

```

80         {
81             return new Win32Exception(err);
82         }

```

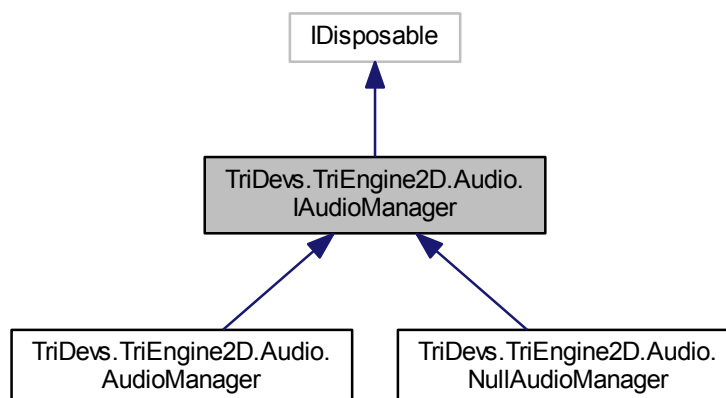
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Native/[Helpers.cs](#)

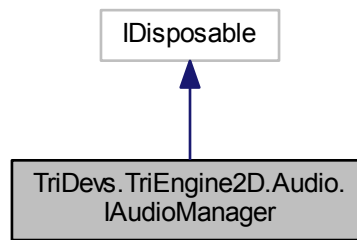
7.18 TriDevs.TriEngine2D.Audio.IAudioManager Interface Reference

Provides various methods to manipulate audio.

Inheritance diagram for TriDevs.TriEngine2D.Audio.IAudioManager:



Collaboration diagram for TriDevs.TriEngine2D.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 [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.

7.18.1 Detailed Description

Provides various methods to manipulate audio.

7.18.2 Member Function Documentation

7.18.2.1 ISong TriDevs.TriEngine2D.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.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.2 ISound TriDevs.TriEngine2D.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.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.3 bool TriDevs.TriEngine2D.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.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.4 bool TriDevs.TriEngine2D.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.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.5 ISong TriDevs.TriEngine2D.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.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.6 `ISound TriDevs.TriEngine2D.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.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.7 `void TriDevs.TriEngine2D.Audio.IAudioManager.StopAll ()`

Immediately stops all playback of sounds and songs.

Implemented in [TriDevs.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.8 `void TriDevs.TriEngine2D.Audio.IAudioManager.StopAllSongs ()`

Immediately stops playback of all songs.

Implemented in [TriDevs.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

7.18.2.9 `void TriDevs.TriEngine2D.Audio.IAudioManager.StopAllSounds ()`

Immediately stops playback of all sounds.

Implemented in [TriDevs.TriEngine2D.Audio.AudioManager](#), and [TriDevs.TriEngine2D.Audio.NullAudioManager](#).

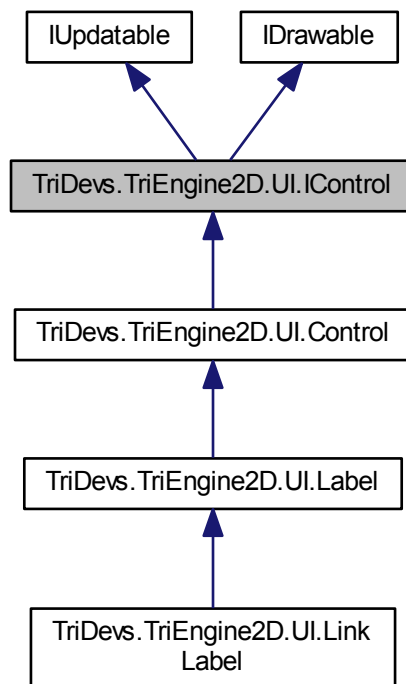
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Audio/IAudioManager.cs](#)

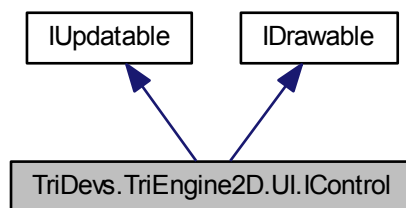
7.19 TriDevs.TriEngine2D.UI.IControl Interface Reference

A [UI](#) control that can be drawn on screen and interacted with.

Inheritance diagram for TriDevs.TriEngine2D.UI.IControl:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.19.1 Detailed Description

A [UI](#) control that can be drawn on screen and interacted with.

7.19.2 Member Function Documentation

7.19.2.1 void TriDevs.TriEngine2D.UI.IControl.Disable ()

Disables the control.

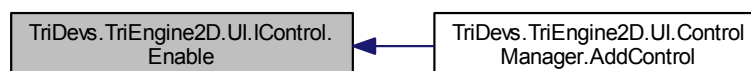
Implemented in [TriDevs.TriEngine2D.UI.Control](#).

7.19.2.2 void TriDevs.TriEngine2D.UI.IControl.Enable ()

Enables the control.

Implemented in [TriDevs.TriEngine2D.UI.Control](#).

Here is the caller graph for this function:

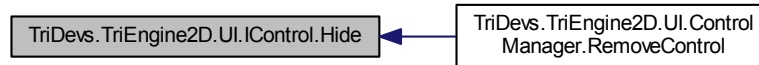


7.19.2.3 void TriDevs.TriEngine2D.UI.IControl.Hide ()

Hides the control.

Implemented in [TriDevs.TriEngine2D.UI.Control](#).

Here is the caller graph for this function:

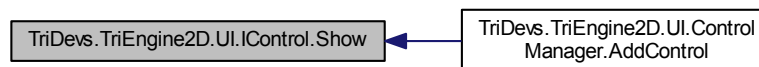


7.19.2.4 void TriDevs.TriEngine2D.UI.IControl.Show ()

Shows the control.

Implemented in [TriDevs.TriEngine2D.UI.Control](#).

Here is the caller graph for this function:



7.19.3 Property Documentation

7.19.3.1 Color TriDevs.TriEngine2D.UI.IControl.Color [get], [set]

The color of this control.

7.19.3.2 bool TriDevs.TriEngine2D.UI.IControl.Enabled [get], [set]

Gets or sets a value indicating whether this control can be interacted with.

7.19.3.3 Point<int> TriDevs.TriEngine2D.UI.IControl.Position [get], [set]

The position of this control, in pixel coordinates.

7.19.3.4 Rectangle TriDevs.TriEngine2D.UI.IControl.Rectangle [get], [set]

Gets the rectangular area on the screen that this control is occupying.

7.19.3.5 `Point<int> TriDevs.TriEngine2D.UI.IControl.Size` `[get]`, `[set]`

Gets or sets the size of this control, in pixels.

7.19.3.6 `string TriDevs.TriEngine2D.UI.IControl.Text` `[get]`, `[set]`

Gets or sets the text associated with this control.

7.19.3.7 `bool TriDevs.TriEngine2D.UI.IControl.Visible` `[get]`, `[set]`

Gets or sets a value indicating whether this control should be drawn to the screen.

7.19.4 Event Documentation

7.19.4.1 `ControlClickedEventHandler TriDevs.TriEngine2D.UI.IControl.Clicked`

Raised when this control is clicked on by the user.

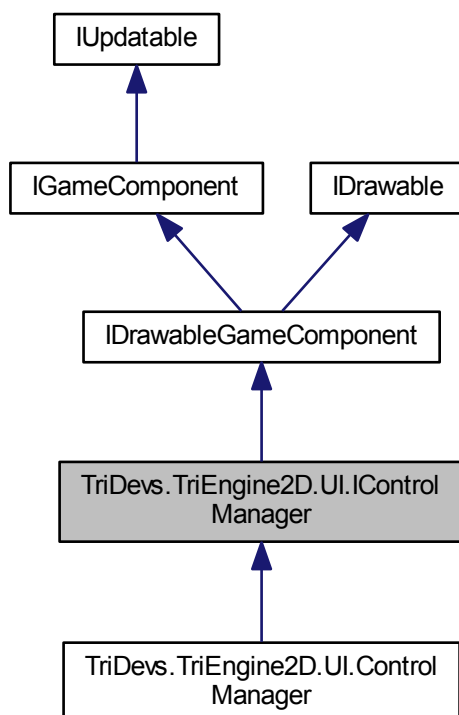
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/UI/IControl.cs](#)

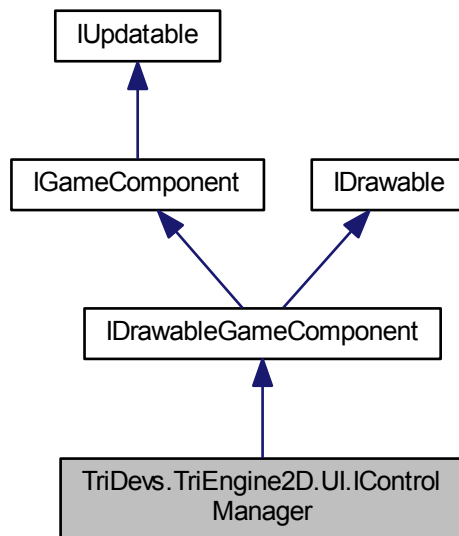
7.20 TriDevs.TriEngine2D.UI.IControlManager Interface Reference

Manages various [UI](#) controls, automatically updating and drawing them to the screen.

Inheritance diagram for TriDevs.TriEngine2D.UI.IControlManager:



Collaboration diagram for TriDevs.TriEngine2D.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

7.20.1 Detailed Description

Manages various [UI](#) controls, automatically updating and drawing them to the screen.

7.20.2 Member Function Documentation

7.20.2.1 `IControl` `TriDevs.TriEngine2D.UI.IControlManager.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.

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

7.20.2.2 `bool` `TriDevs.TriEngine2D.UI.IControlManager.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.

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

7.20.2.3 `bool` `TriDevs.TriEngine2D.UI.IControlManager.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.

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

7.20.2.4 `bool` `TriDevs.TriEngine2D.UI.IControlManager.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.

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

7.20.2.5 void TriDevs.TriEngine2D.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.TriEngine2D.UI.ControlManager](#).

7.20.2.6 void TriDevs.TriEngine2D.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.TriEngine2D.UI.ControlManager](#).

7.20.2.7 void TriDevs.TriEngine2D.UI.IControlManager.RemoveControl (IControl *control*)

Removes a control from this control manager.

Parameters

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

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

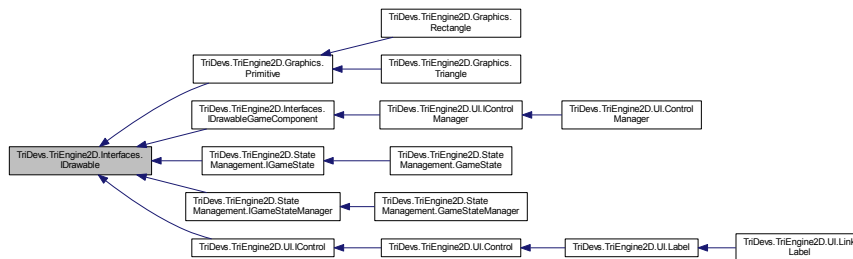
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/UI/IControlManager.cs](#)

7.21 TriDevs.TriEngine2D.Interfaces.IDrawable Interface Reference

Implements a simple draw method.

Inheritance diagram for `TriDevs.TriEngine2D.Interfaces.IDrawable`:



Public Member Functions

- void [Draw](#) ()

Draw the object to screen.

7.21.1 Detailed Description

Implements a simple draw method.

7.21.2 Member Function Documentation

7.21.2.1 void `TriDevs.TriEngine2D.Interfaces.IDrawable.Draw` ()

Draw the object to screen.

Implemented in [TriDevs.TriEngine2D.UI.Label](#), [TriDevs.TriEngine2D.UI.Control](#), [TriDevs.TriEngine2D.Graphics.Primitive](#), [TriDevs.TriEngine2D.StateManagement.GameStateManager](#), [TriDevs.TriEngine2D.UI.ControlManager](#), and [TriDevs.TriEngine2D.StateManagement.GameState](#).

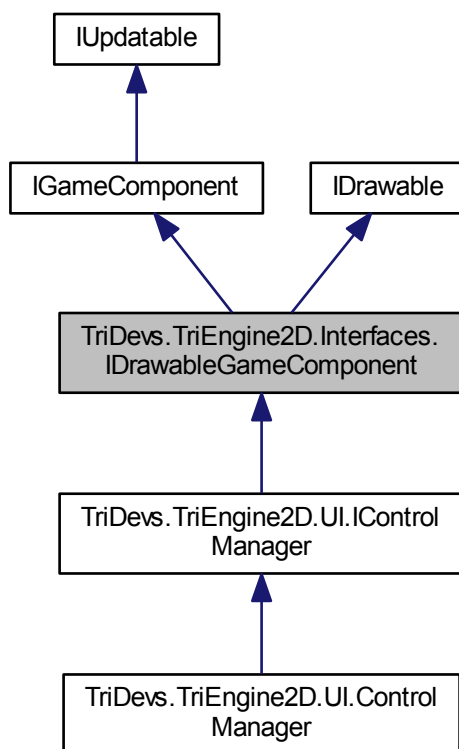
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Interfaces/IDrawable.cs](#)

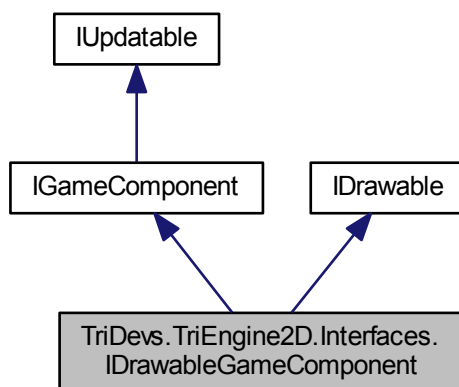
7.22 TriDevs.TriEngine2D.Interfaces.IDrawableGameComponent Interface Reference

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.TriEngine2D.Interfaces.IDrawableGameComponent:



Collaboration diagram for TriDevs.TriEngine2D.Interfaces.IDrawableGameComponent:



Additional Inherited Members

7.22.1 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.

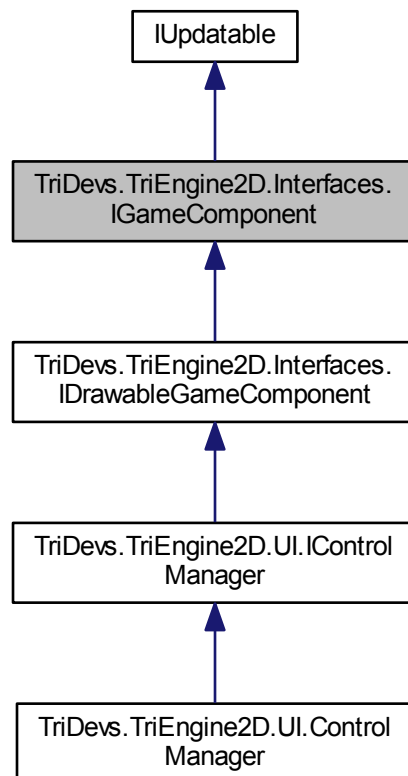
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Interfaces/IDrawableGameComponent.cs](#)

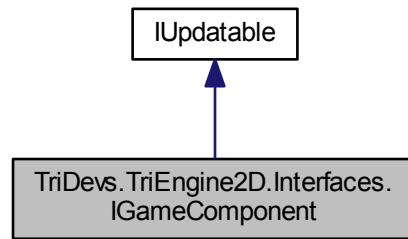
7.23 TriDevs.TriEngine2D.Interfaces.IGameComponent Interface Reference

A game component that can be added to IGameState objects.

Inheritance diagram for TriDevs.TriEngine2D.Interfaces.IGameComponent:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.23.1 Detailed Description

A game component that can be added to IGameState objects.

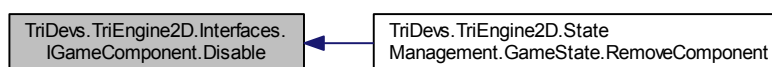
7.23.2 Member Function Documentation

7.23.2.1 void TriDevs.TriEngine2D.Interfaces.IGameComponent.Disable ()

Disables this game component.

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

Here is the caller graph for this function:



7.23.2.2 void TriDevs.TriEngine2D.Interfaces.IGameComponent.Enable ()

Enables this game component.

Implemented in [TriDevs.TriEngine2D.UI.ControlManager](#).

Here is the caller graph for this function:



7.23.3 Property Documentation

7.23.3.1 bool TriDevs.TriEngine2D.Interfaces.IGameComponent.Enabled [get], [set]

Gets or sets a value indicating whether this component is enabled or not.

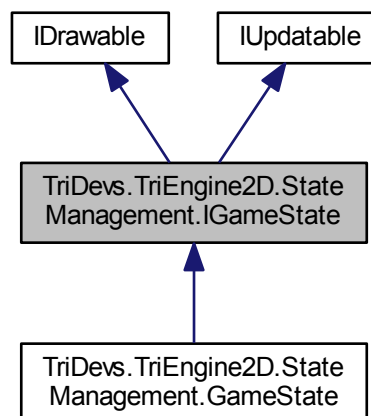
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Interfaces/IGameComponent.cs](#)

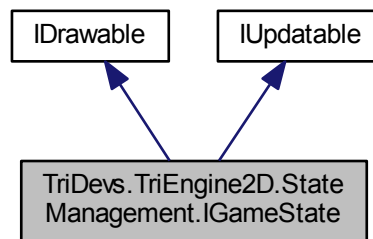
7.24 TriDevs.TriEngine2D.StateManagement.IGameState Interface Reference

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.TriEngine2D.StateManagement.IGameState`:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.24.1 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.

7.24.2 Member Function Documentation

7.24.2.1 **IGameComponent** TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.2 **IEnumerable<IGameComponent>** TriDevs.TriEngine2D.StateManagement.IGameState.GetAllComponents ()

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

Returns

Read-only collection of components.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

7.24.2.3 **IEnumerable<IGameComponent>** TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.4 IEnumerable<IGameComponent> TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.5 IGameComponent TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.6 IGameComponent TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.7 bool TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.8 bool TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.9 bool TriDevs.TriEngine2D.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.

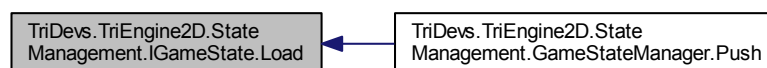
Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

7.24.2.10 void TriDevs.TriEngine2D.StateManagement.IGameState.Load ()

Loads resources associated with this game component.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

Here is the caller graph for this function:

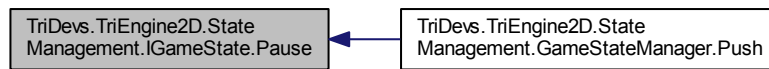


7.24.2.11 void TriDevs.TriEngine2D.StateManagement.IGameState.Pause ()

Pauses the game state, preventing update calls from running.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

Here is the caller graph for this function:



7.24.2.12 void TriDevs.TriEngine2D.StateManagement.IGameState.RemoveAllComponents ()

Removes all components from the game state.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

7.24.2.13 void TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.14 void TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameState](#).

7.24.2.15 void TriDevs.TriEngine2D.StateManagement.IGameState.RemoveComponent (IGameComponent component)

Removes the specified component from this game state.

Parameters

<i>component</i>	
------------------	--

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

7.24.2.16 void TriDevs.TriEngine2D.StateManagement.IGameState.Unload ()

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

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

Here is the caller graph for this function:



7.24.2.17 void `TriDevs.TriEngine2D.StateManagement.IGameState.Unpause ()`

Unpauses the game state, enabling update calls again.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameState](#).

7.24.3 Property Documentation

7.24.3.1 bool `TriDevs.TriEngine2D.StateManagement.IGameState.Paused` `[get]`, `[set]`

Gets or sets a value indicating whether this game state is currently paused.

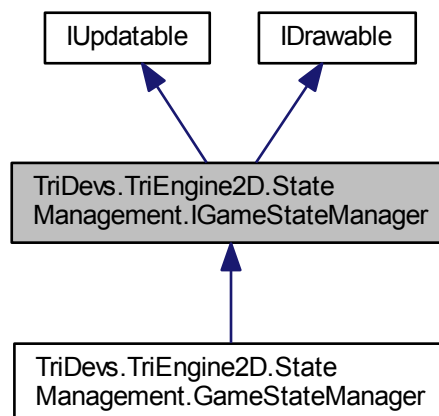
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/StateManagement/IGameState.cs](#)

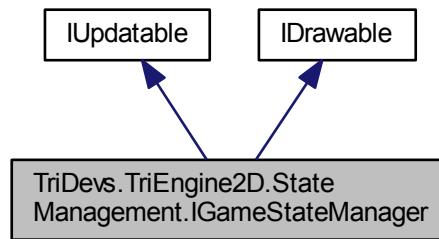
7.25 TriDevs.TriEngine2D.StateManagement.IGameStateManager Interface Reference

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

Inheritance diagram for `TriDevs.TriEngine2D.StateManagement.IGameStateManager`:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.25.1 Detailed Description

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

7.25.2 Member Function Documentation

7.25.2.1 [IGameState](#) `TriDevs.TriEngine2D.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.TriEngine2D.StateManagement.GameStateManager](#).

7.25.2.2 **IGameState** TriDevs.TriEngine2D.StateManagement.IGameStateManager.Pop ()

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

Returns

The state that was popped.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameStateManager](#).

7.25.2.3 **IGameState** TriDevs.TriEngine2D.StateManagement.IGameStateManager.Push (**IGameState** *state*)

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

Parameters

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

Returns

The game state that was pushed.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameStateManager](#).

7.25.2.4 **IGameState** TriDevs.TriEngine2D.StateManagement.IGameStateManager.Switch (**IGameState** *state*)

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

Parameters

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

Returns

The state that was switched to.

Implemented in [TriDevs.TriEngine2D.StateManagement.GameStateManager](#).

7.25.3 Property Documentation

7.25.3.1 **IGameState** TriDevs.TriEngine2D.StateManagement.IGameStateManager.ActiveState [get]

Gets the currently active game state.

7.25.3.2 **int** TriDevs.TriEngine2D.StateManagement.IGameStateManager.StateCount [get]

Gets the number of game states currently in the stack.

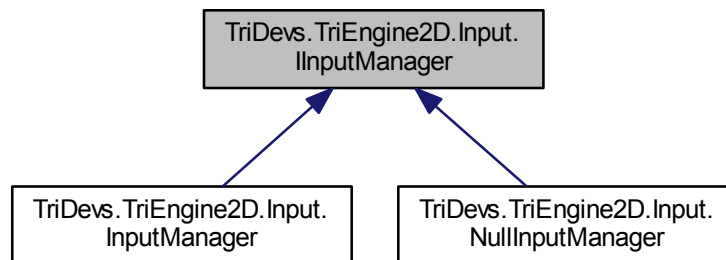
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/StateManagement/IGameStateManager.cs](#)

7.26 TriDevs.TriEngine2D.Input.IInputManager Interface Reference

Provides various methods to query input devices like the keyboard.

Inheritance diagram for TriDevs.TriEngine2D.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)
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]
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.

7.26.1 Detailed Description

Provides various methods to query input devices like the keyboard.

7.26.2 Member Function Documentation

7.26.2.1 `bool TriDevs.TriEngine2D.Input.IInputManager.IsKeyDown (Key key)`

Returns whether or not the specified key is currently being pressed.

Parameters

<code>key</code>	Key to query for.
------------------	-------------------

Returns

True if key is currently being pressed, false otherwise.

Implemented in [TriDevs.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.2 `bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.3 `bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.4 `bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.5 `bool TriDevs.TriEngine2D.Input.IInputManager.IsWheelChanged ()`

Returns whether the mouse wheel scrolled at all.

Returns

True if the mouse wheel scrolled, false otherwise.

Implemented in [TriDevs.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.6 `bool TriDevs.TriEngine2D.Input.IInputManager.IsWheelDown ()`

Returns whether the mouse wheel was scrolled down.

Returns

True if mouse wheel was scrolled down, false otherwise.

Implemented in [TriDevs.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.7 bool TriDevs.TriEngine2D.Input.IInputManager.IsWheelUp ()

Returns whether the mouse wheel was scrolled up.

Returns

True if mouse wheel was scrolled up, false otherwise.

Implemented in [TriDevs.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.8 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.9 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.10 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.11 `bool TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.12 `void TriDevs.TriEngine2D.Input.IInputManager.Update ()`

Updates the input manager, refreshing all current and previous states.

Implemented in [TriDevs.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.2.13 `int TriDevs.TriEngine2D.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.TriEngine2D.Input.InputManager](#), and [TriDevs.TriEngine2D.Input.NullInputManager](#).

7.26.3 Property Documentation**7.26.3.1** `Point<int> TriDevs.TriEngine2D.Input.IInputManager.MousePosition` `[get]`

Gets a Point representing the position of the mouse pointer, in window pixel coordinates.

7.26.3.2 `int TriDevs.TriEngine2D.Input.IInputManager.MouseWheelValue` `[get]`

Gets the current value of the mouse wheel.

7.26.3.3 `int TriDevs.TriEngine2D.Input.IInputManager.MouseX` `[get]`

Gets the absolute X position of the pointer, in window pixel coordinates.

7.26.3.4 `int TriDevs.TriEngine2D.Input.IInputManager.MouseY` `[get]`

Gets the absolute Y position of the pointer, in window pixel coordinates.

7.26.3.5 `bool TriDevs.TriEngine2D.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.

7.26.3.6 `bool TriDevs.TriEngine2D.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.

7.26.4 **Event Documentation****7.26.4.1** `KeyDownEventHandler TriDevs.TriEngine2D.Input.IInputManager.KeyDown`

Raised when a key is pressed down.

7.26.4.2 `KeyPressEventHandler TriDevs.TriEngine2D.Input.IInputManager.KeyPress`

Raised when a character is typed.

7.26.4.3 `KeyUpEventHandler TriDevs.TriEngine2D.Input.IInputManager.KeyUp`

Raised when a key is released.

7.26.4.4 `MouseDownEventHandler TriDevs.TriEngine2D.Input.IInputManager.MouseDown`

Raised when a mouse button is pressed down.

7.26.4.5 `MouseUpEventHandler TriDevs.TriEngine2D.Input.IInputManager.MouseUp`

Raised when a mouse button is released.

7.26.4.6 `MouseWheelChangedEventHandler TriDevs.TriEngine2D.Input.IInputManager.WheelChanged`

Raised when the mouse wheel value changes.

7.26.4.7 `MouseWheelDownEventHandler TriDevs.TriEngine2D.Input.IInputManager.WheelDown`

Raised when the mouse wheel is scrolled downwards.

7.26.4.8 MouseWheelUpEventHandler TriDevs.TriEngine2D.Input.IInputManager.WheelUp

Raised when the mouse wheel is scrolled upwards.

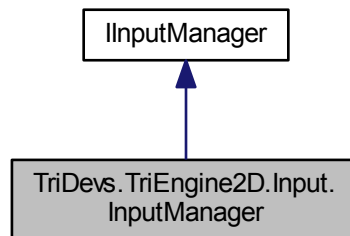
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Input/IInputManager.cs](#)

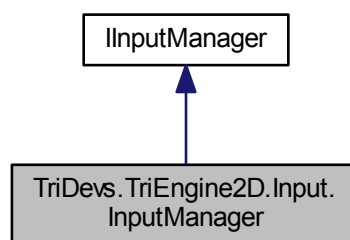
7.27 TriDevs.TriEngine2D.Input.InputManager Class Reference

[Input](#) manager interfacing with input methods provided by a [GameWindow](#).

Inheritance diagram for `TriDevs.TriEngine2D.Input.InputManager`:



Collaboration diagram for `TriDevs.TriEngine2D.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.

7.27.1 Detailed Description

[Input](#) manager interfacing with input methods provided by a [GameWindow](#).

7.27.2 Constructor & Destructor Documentation

7.27.2.1 TriDevs.TriEngine2D.Input.InputManager.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     }
```

7.27.2.2 TriDevs.TriEngine2D.Input.InputManager.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     }
```

7.27.3 Member Function Documentation

7.27.3.1 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

201     {
202         return _keyboardState[key];
203     }
```

7.27.3.2 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

196         {
197             return !_keyboardState[key];
198         }
```

7.27.3.3 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

221         {
222             return _mouseState[button];
223         }
```

7.27.3.4 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

216         {
217             return !_mouseState[button];
218         }
```

7.27.3.5 bool TriDevs.TriEngine2D.Input.InputManager.IsWheelChanged ()

Returns whether the mouse wheel scrolled at all.

Returns

True if the mouse wheel scrolled, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

246     {
247         return _mouseState.Wheel != _lastMouseState.Wheel;
248     }
```

7.27.3.6 bool TriDevs.TriEngine2D.Input.InputManager.IsWheelDown ()

Returns whether the mouse wheel was scrolled down.

Returns

True if mouse wheel was scrolled down, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

241     {
242         return _mouseState.Wheel < _lastMouseState.Wheel;
243     }
```

7.27.3.7 bool TriDevs.TriEngine2D.Input.InputManager.IsWheelUp ()

Returns whether the mouse wheel was scrolled up.

Returns

True if mouse wheel was scrolled up, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

236     {
237         return _mouseState.Wheel > _lastMouseState.Wheel;
238     }
```

7.27.3.8 bool TriDevs.TriEngine2D.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

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key was pressed, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

206     {
207         return _keyboardState[key] && !_lastKeyboardState[key];
208     }
```

7.27.3.9 bool TriDevs.TriEngine2D.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

<i>key</i>	Key to query for.
------------	-------------------

Returns

True if key was released, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

211     {
212         return !_keyboardState[key] && _lastKeyboardState[key];
213     }
```

7.27.3.10 bool TriDevs.TriEngine2D.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

<i>button</i>	Button to query for.
---------------	----------------------

Returns

True if button was pressed, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

226     {
227         return _mouseState[button] && !_lastMouseState[button];
228     }
```

7.27.3.11 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

231     {
232         return !_mouseState[button] && _lastMouseState[button];
233     }
```

7.27.3.12 void TriDevs.TriEngine2D.Input.InputManager.Update ()

Updates the input manager, refreshing all current and previous states.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

187     {
188         _lastKeyboardState = _keyboardState;
189         _keyboardState = Keyboard.GetState();
190
191         _lastMouseState = _mouseState;
192         _mouseState = Mouse.GetState();
193     }

```

7.27.3.13 int TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

251     {
252         return _mouseState.Wheel - _lastMouseState.Wheel;
253     }

```

7.27.4 Property Documentation

7.27.4.1 Point<int> TriDevs.TriEngine2D.Input.InputManager.MousePosition [get]

7.27.4.2 int TriDevs.TriEngine2D.Input.InputManager.MouseWheelValue [get]

7.27.4.3 int TriDevs.TriEngine2D.Input.InputManager.MouseX [get]

7.27.4.4 int TriDevs.TriEngine2D.Input.InputManager.MouseY [get]

7.27.4.5 bool TriDevs.TriEngine2D.Input.InputManager.this[Key key] [get]

7.27.4.6 bool TriDevs.TriEngine2D.Input.InputManager.this[MouseButton button] [get]

7.27.5 Event Documentation

7.27.5.1 KeyDownEventHandler TriDevs.TriEngine2D.Input.InputManager.KeyDown

Raised when a key is pressed down.

7.27.5.2 KeyPressEventHandler TriDevs.TriEngine2D.Input.InputManager.KeyPress

Raised when a character is typed.

7.27.5.3 KeyUpEventHandler TriDevs.TriEngine2D.Input.InputManager.KeyUp

Raised when a key is released.

7.27.5.4 MouseDownEventHandler TriDevs.TriEngine2D.Input.InputManager.MouseDown

Raised when a mouse button is pressed down.

7.27.5.5 MouseUpEventHandler TriDevs.TriEngine2D.Input.InputManager.MouseUp

Raised when a mouse button is released.

7.27.5.6 MouseWheelChangedEventHandler TriDevs.TriEngine2D.Input.InputManager.WheelChanged

Raised when the mouse wheel value changes.

7.27.5.7 MouseWheelDownEventHandler TriDevs.TriEngine2D.Input.InputManager.WheelDown

Raised when the mouse wheel is scrolled downwards.

7.27.5.8 MouseWheelUpEventHandler TriDevs.TriEngine2D.Input.InputManager.WheelUp

Raised when the mouse wheel is scrolled upwards.

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

- TriDevs.TriEngine2D/Input/[InputManager.cs](#)

7.28 TriDevs.TriEngine2D.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.

7.28.1 Detailed Description

[Extensions](#) for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.

7.28.2 Member Function Documentation

7.28.2.1 static short TriDevs.TriEngine2D.Extensions.IntegerExtensions.Clamp (this short *value*, short *min*, short *max*) [static]

Clamps the specified short between a minimum and maximum value.

Parameters

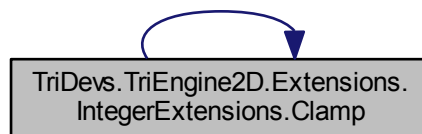
<i>value</i>	Value to clamp.
<i>min</i>	If the specified short is below this value, then this will be returned.
<i>max</i>	If the specified short is above this value, then this will be returned.

Returns

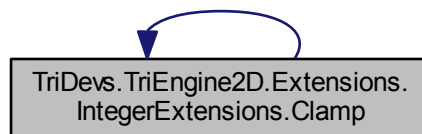
The clamped value of the short.

```
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:



7.28.2.2 static ushort TriDevs.TriEngine2D.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      }
```

7.28.2.3 `static int TriDevs.TriEngine2D.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      }
```

7.28.2.4 `static uint TriDevs.TriEngine2D.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      }
```

7.28.2.5 `static long TriDevs.TriEngine2D.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      }
```

7.28.2.6 static `ulong TriDevs.TriEngine2D.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.TriEngine2D/Extensions/[IntegerExtensions.cs](#)

7.29 TriDevs.TriEngine2D.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.

7.29.1 Detailed Description

Provides various helper functions for doing [IO](#) operations.

7.29.2 Member Function Documentation

7.29.2.1 static string `TriDevs.TriEngine2D.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     }
```

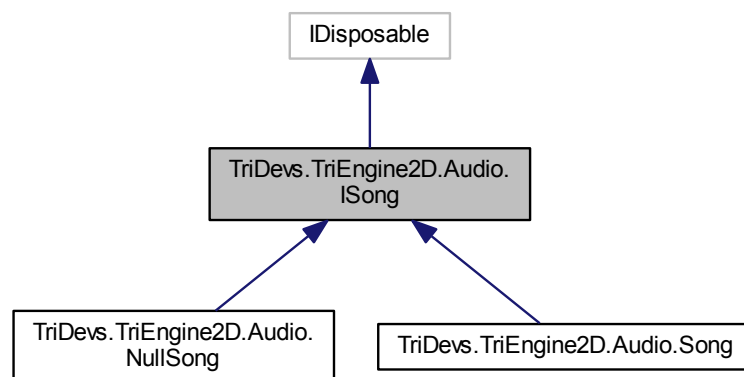
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Helpers/[IO.cs](#)

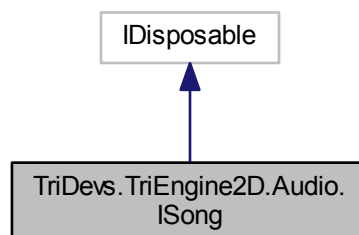
7.30 TriDevs.TriEngine2D.Audio.ISong Interface Reference

A song that will be streamed in the audio player.

Inheritance diagram for TriDevs.TriEngine2D.Audio.ISong:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.30.1 Detailed Description

A song that will be streamed in the audio player.

7.30.2 Member Function Documentation

7.30.2.1 void TriDevs.TriEngine2D.Audio.ISong.Pause ()

Pauses playback of the song.

Call the [Resume](#) or [Play](#) method to resume playback.

Implemented in [TriDevs.TriEngine2D.Audio.Song](#), and [TriDevs.TriEngine2D.Audio.NullSong](#).

7.30.2.2 void TriDevs.TriEngine2D.Audio.ISong.Play ()

Starts playback of the song.

Implemented in [TriDevs.TriEngine2D.Audio.Song](#), and [TriDevs.TriEngine2D.Audio.NullSong](#).

7.30.2.3 void TriDevs.TriEngine2D.Audio.ISong.Resume ()

Resumes playback of a paused song.

Implemented in [TriDevs.TriEngine2D.Audio.Song](#), and [TriDevs.TriEngine2D.Audio.NullSong](#).

7.30.2.4 void TriDevs.TriEngine2D.Audio.ISong.Stop ()

Stops playback of the song.

Implemented in [TriDevs.TriEngine2D.Audio.Song](#), and [TriDevs.TriEngine2D.Audio.NullSong](#).

7.30.3 Property Documentation

7.30.3.1 `string TriDevs.TriEngine2D.Audio.ISong.File` `[get]`

Gets the file this song was loaded from.

7.30.3.2 `bool TriDevs.TriEngine2D.Audio.ISong.IsLooped` `[get]`, `[set]`

Gets or sets a value indicating that the song should be looped once it reaches the end.

7.30.3.3 `string TriDevs.TriEngine2D.Audio.ISong.Name` `[get]`

Gets the name associated with this song.

7.30.3.4 `float TriDevs.TriEngine2D.Audio.ISong.Volume` `[get]`, `[set]`

Gets or sets the song volume.

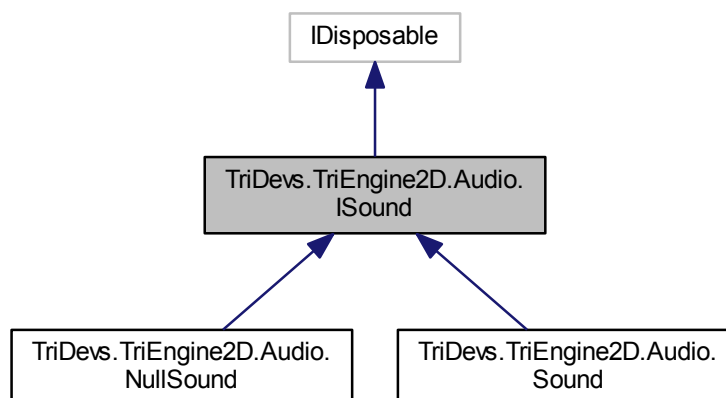
The documentation for this interface was generated from the following file:

- `TriDevs.TriEngine2D/Audio/ISong.cs`

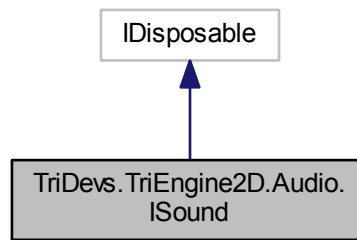
7.31 `TriDevs.TriEngine2D.Audio.ISound` Interface Reference

A sound file for use with the audio manager.

Inheritance diagram for `TriDevs.TriEngine2D.Audio.ISound`:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.31.1 Detailed Description

A sound file for use with the audio manager.

7.31.2 Member Function Documentation

7.31.2.1 void TriDevs.TriEngine2D.Audio.ISound.Play ()

Plays the sound.

Implemented in [TriDevs.TriEngine2D.Audio.Sound](#), and [TriDevs.TriEngine2D.Audio.NullSound](#).

7.31.2.2 void TriDevs.TriEngine2D.Audio.ISound.Stop ()

Stops the sound.

Implemented in [TriDevs.TriEngine2D.Audio.Sound](#), and [TriDevs.TriEngine2D.Audio.NullSound](#).

7.31.3 Property Documentation

7.31.3.1 `string TriDevs.TriEngine2D.Audio.ISound.File` [get]

Gets the file this sound was created from.

7.31.3.2 `string TriDevs.TriEngine2D.Audio.ISound.Name` [get]

Gets the name associated with this sound.

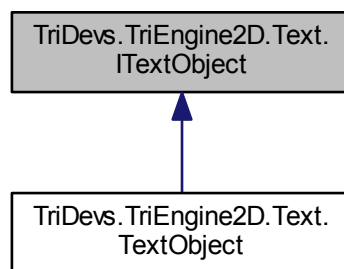
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Audio/ISound.cs](#)

7.32 `TriDevs.TriEngine2D.Text.ITextObject` Interface Reference

Implements methods to construct a text object and render it to screen.

Inheritance diagram for `TriDevs.TriEngine2D.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.

7.32.1 Detailed Description

Implements methods to construct a text object and render it to screen.

7.32.2 Member Function Documentation

7.32.2.1 `void TriDevs.TriEngine2D.Text.ITextObject.Draw ()`

Draws this text object to screen with default parameters.

Implemented in [TriDevs.TriEngine2D.Text.TextObject](#).

7.32.2.2 `void TriDevs.TriEngine2D.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.TriEngine2D.Text.TextObject](#).

7.32.2.3 `void TriDevs.TriEngine2D.Text.ITextObject.Draw (int x, int y)`

Draws this text object to screen at the specified X/Y position.

Parameters

<i>x</i>	
<i>y</i>	

Implemented in [TriDevs.TriEngine2D.Text.TextObject](#).

7.32.3 Property Documentation

7.32.3.1 `QFontAlignment TriDevs.TriEngine2D.Text.ITextObject.Alignment` [get], [set]

Gets or sets a QFontAlignment value to manage how this text is aligned on screen.

7.32.3.2 `Rectangle TriDevs.TriEngine2D.Text.ITextObject.Bounds` [get]

Gets the bounds of this text object.

7.32.3.3 Color `TriDevs.TriEngine2D.Text.ITextObject.Color` [get], [set]

Gets or sets the color of the text.

7.32.3.4 Font `TriDevs.TriEngine2D.Text.ITextObject.Font` [get]

Gets the [Font](#) font instance associated with this text object.

7.32.3.5 Point<int> `TriDevs.TriEngine2D.Text.ITextObject.Position` [get], [set]

Gets or sets the screen position of this text, in pixels.

7.32.3.6 string `TriDevs.TriEngine2D.Text.ITextObject.Text` [get], [set]

Gets or sets the text value of this text object.

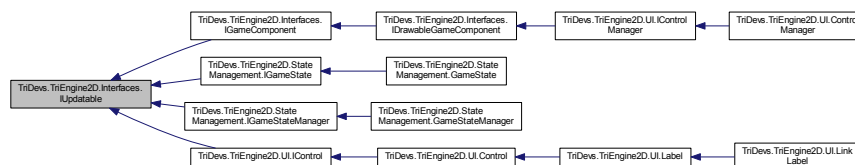
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Text/ITextObject.cs](#)

7.33 TriDevs.TriEngine2D.Interfaces.IUpdatable Interface Reference

Implements a simple update method.

Inheritance diagram for `TriDevs.TriEngine2D.Interfaces.IUpdatable`:



Public Member Functions

- void [Update](#) ()
Updates the object.

7.33.1 Detailed Description

Implements a simple update method.

7.33.2 Member Function Documentation

7.33.2.1 void `TriDevs.TriEngine2D.Interfaces.IUpdatable.Update` ()

Updates the object.

Implemented in [TriDevs.TriEngine2D.UI.Label](#), [TriDevs.TriEngine2D.UI.Control](#), [TriDevs.TriEngine2D.UI.ControlManager](#), [TriDevs.TriEngine2D.StateManagement.GameStateManager](#), and [TriDevs.TriEngine2D.StateManagement.GameState](#).

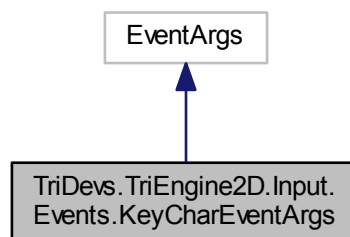
The documentation for this interface was generated from the following file:

- [TriDevs.TriEngine2D/Interfaces/IUpdatable.cs](#)

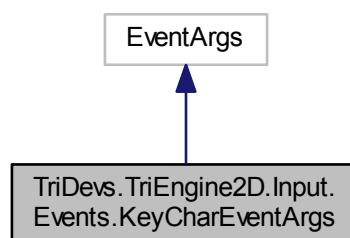
7.34 TriDevs.TriEngine2D.Input.Events.KeyCharEventArgs Class Reference

EventArgs class used for keychar-related events. Contains information about the character related with the event.

Inheritance diagram for TriDevs.TriEngine2D.Input.Events.KeyCharEventArgs:



Collaboration diagram for TriDevs.TriEngine2D.Input.Events.KeyCharEventArgs:



Public Attributes

- readonly char [KeyChar](#)
The char that was involved.

7.34.1 Detailed Description

EventArgs class used for keychar-related events. Contains information about the character related with the event.

7.34.2 Member Data Documentation

7.34.2.1 readonly char TriDevs.TriEngine2D.Input.Events.KeyCharEventArgs.KeyChar

The char that was involved.

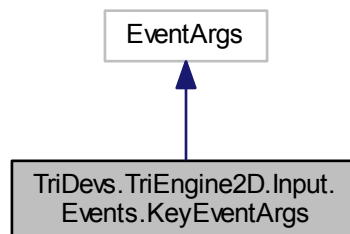
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Input/Events/[Key.cs](#)

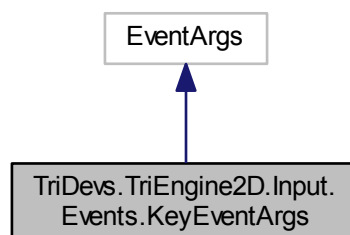
7.35 TriDevs.TriEngine2D.Input.Events.KeyEventArgs Class Reference

EventArgs class used for key-related events. Contains information about the key related with the event.

Inheritance diagram for TriDevs.TriEngine2D.Input.Events.KeyEventArgs:



Collaboration diagram for TriDevs.TriEngine2D.Input.Events.KeyEventArgs:



Public Attributes

- readonly Key [Key](#)

The [Key](#) that was involved.

7.35.1 Detailed Description

EventArgs class used for key-related events. Contains information about the key related with the event.

7.35.2 Member Data Documentation

7.35.2.1 readonly Key TriDevs.TriEngine2D.Input.Events.KeyEventArgs.Key

The [Key](#) that was involved.

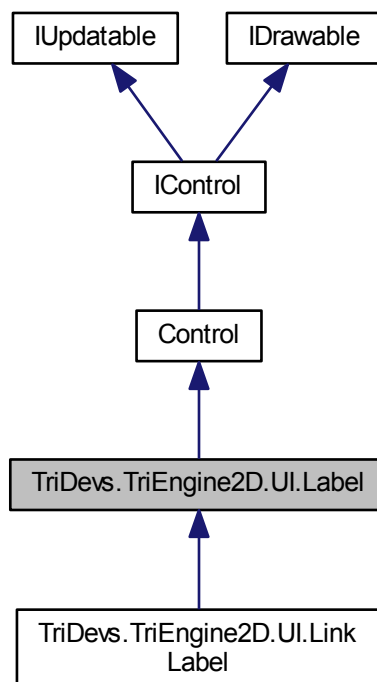
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Input/Events/[Key.cs](#)

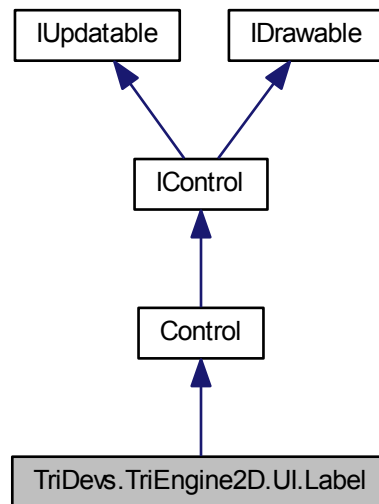
7.36 TriDevs.TriEngine2D.UI.Label Class Reference

A simple label to display text on the screen.

Inheritance diagram for TriDevs.TriEngine2D.UI.Label:



Collaboration diagram for TriDevs.TriEngine2D.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

7.36.1 Detailed Description

A simple label to display text on the screen.

7.36.2 Member Function Documentation

7.36.2.1 override void TriDevs.TriEngine2D.UI.Label.Draw () [virtual]

Draw the object to screen.

Reimplemented from [TriDevs.TriEngine2D.UI.Control](#).

```

135     {
136         base.Draw(_drawPosition);
137
138         if (_textObject == null)
139             return;
140
141         _textObject.Draw();
142     }
```

7.36.2.2 virtual void TriDevs.TriEngine2D.UI.Label.SetFont (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     }
```

7.36.2.3 override void TriDevs.TriEngine2D.UI.Label.Update () [virtual]

Updates the object.

Reimplemented from [TriDevs.TriEngine2D.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 +
Rectangle.Width))
130             && (mousePos.Y >= _drawPosition.Y && mousePos.Y <= (_drawPosition.Y +
Rectangle.Height)))
131             OnClicked();
132     }
```

7.36.2.4 virtual void TriDevs.TriEngine2D.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,
Alignment);
95         }
96         else
97         {
98             _textObject.Text = Text;
99             _textObject.Font = _font;
100             _textObject.Position = Position;
101             _textObject.Alignment = Alignment;
```

```

102         }
103
104         Size = new Point<int>(_textObject.Bounds.Width, _textObject.
Bounds.Height);
105
106         switch (Alignment)
107         {
108             case QFontAlignment.Centre:
109                 _drawPosition = new Point<int>(Position.X - Size.X / 2,
Position.Y);
110                 break;
111             case QFontAlignment.Right:
112                 _drawPosition = new Point<int>(Position.X - Size.X,
Position.Y);
113                 break;
114             default:
115                 _drawPosition = Position;
116                 break;
117         }
118     }

```

7.36.3 Property Documentation

7.36.3.1 virtual QFontAlignment TriDevs.TriEngine2D.UI.Label.Alignment [get], [set]

Gets or sets the QFontAlignment of this label's text.

7.36.3.2 override Point<int> TriDevs.TriEngine2D.UI.Label.Position [get], [set]

7.36.3.3 override string TriDevs.TriEngine2D.UI.Label.Text [get], [set]

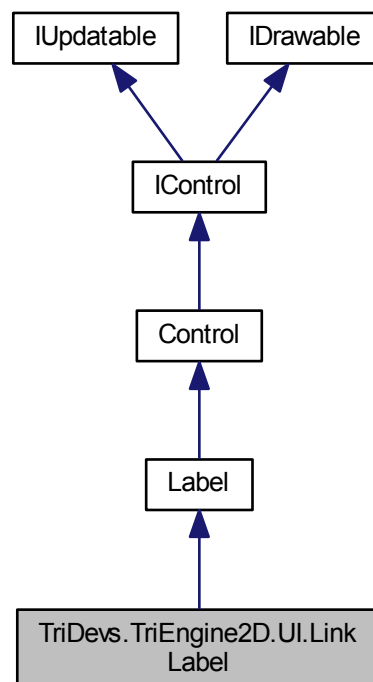
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/UI/[Label.cs](#)

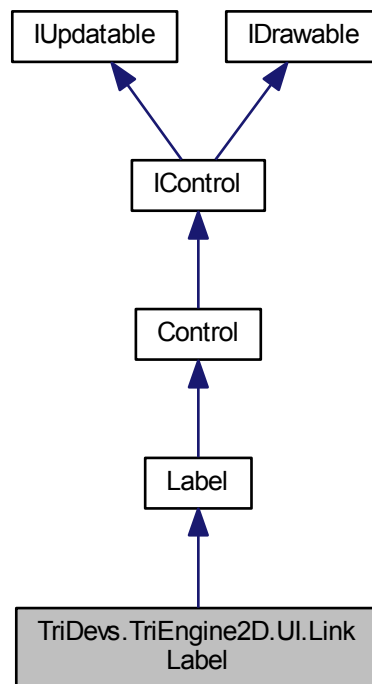
7.37 TriDevs.TriEngine2D.UI.LinkLabel Class Reference

A label that, when clicked, will open a URL.

Inheritance diagram for TriDevs.TriEngine2D.UI.LinkLabel:



Collaboration diagram for TriDevs.TriEngine2D.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

7.37.1 Detailed Description

A label that, when clicked, will open a URL.

7.37.2 Member Function Documentation

7.37.2.1 override void `TriDevs.TriEngine2D.UI.LinkLabel.OnClicked` () [protected], [virtual]

Reimplemented from `TriDevs.TriEngine2D.UI.Control`.

```

39         {
40             if (!string.IsNullOrEmpty(Url))

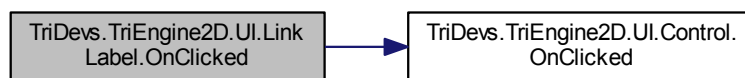
```

```

41         {
42             try
43             {
44                 System.Diagnostics.Process.Start (Url);
45             }
46             catch (Win32Exception)
47             {
48             }
49         }
50     }
51 }
52
53     base.OnClicked();
54 }

```

Here is the call graph for this function:



7.37.3 Property Documentation

7.37.3.1 virtual string TriDevs.TriEngine2D.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.TriEngine2D/UI/[LinkLabel.cs](#)

7.38 TriDevs.TriEngine2D.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.

7.38.1 Detailed Description

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

7.38.2 Member Function Documentation

7.38.2.1 static void TriDevs.TriEngine2D.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     }

```

7.38.2.2 static void TriDevs.TriEngine2D.Logging.LogManager.DestroyConsole () [static]

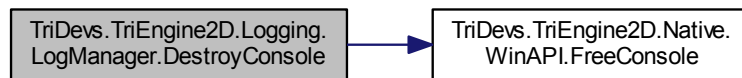
Destroys the console associated with the process, if loaded. This method does nothing if DEBUG is not #defined.

```

123     {
124     #if DEBUG
125         if (_consoleLoaded)
126             WinAPI.FreeConsole();
127     #endif
128     }

```


Here is the call graph for this function:



7.38.2.3 static ILog TriDevs.TriEngine2D.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

<i>sender</i>	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());
95     }
  
```

7.38.2.4 static void TriDevs.TriEngine2D.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

<i>file</i>	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     }
  
```

```

76         _loaded = true;
77     }

```

7.38.2.5 static void TriDevs.TriEngine2D.Logging.LogManager.SetupConsole () [static]

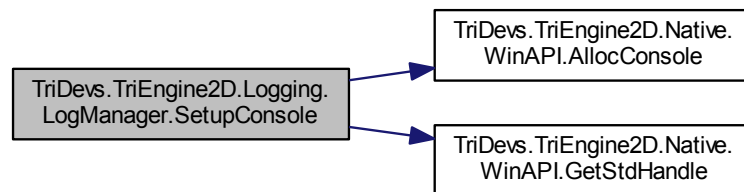
Set up a new console for this process. Will not set up a console if a debugger is attached. This method does nothing if DEBUG is not #defined.

```

102     {
103     #if DEBUG
104         if (System.Diagnostics.Debugger.IsAttached)
105             return;
106
107         WinAPI.AllocConsole();
108         var stdHandle = WinAPI.GetStdHandle(WinAPI.
STD_OUTPUT_HANDLE);
109         var safeFileHandle = new SafeFileHandle(stdHandle, true);
110         var fileStream = new FileStream(safeFileHandle, FileAccess.Write);
111         var encoding = Encoding.GetEncoding(WinAPI.CODE_PAGE);
112         var stdOut = new StreamWriter(fileStream, encoding) { AutoFlush = true };
113         Console.SetOut(stdOut);
114         _consoleLoaded = true;
115     #endif
116     }

```

Here is the call graph for this function:



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

- [TriDevs.TriEngine2D/Logging/LogManager.cs](#)

7.39 TriDevs.TriEngine2D.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.

7.39.1 Detailed Description

Various helper methods for working with math.

7.39.2 Member Function Documentation

7.39.2.1 static byte TriDevs.TriEngine2D.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         }

```

7.39.2.2 static short TriDevs.TriEngine2D.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         }

```

7.39.2.3 static ushort TriDevs.TriEngine2D.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         }

```

7.39.2.4 static int TriDevs.TriEngine2D.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         }

```

7.39.2.5 static uint TriDevs.TriEngine2D.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     }

```

7.39.2.6 static long TriDevs.TriEngine2D.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     }

```

7.39.2.7 static ulong TriDevs.TriEngine2D.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     }

```

7.39.2.8 static float TriDevs.TriEngine2D.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     }

```

7.39.2.9 static double TriDevs.TriEngine2D.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     }

```

7.39.2.10 static decimal TriDevs.TriEngine2D.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     }

```

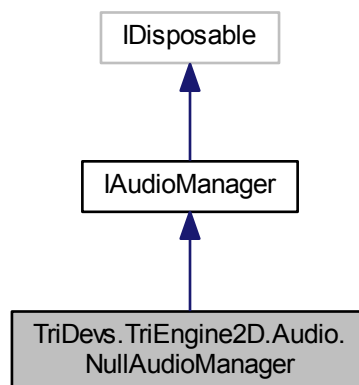
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Helpers/[Math.cs](#)

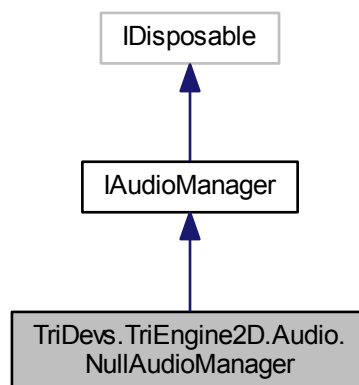
7.40 TriDevs.TriEngine2D.Audio.NullAudioManager Class Reference

Used as a fallback [AudioManager](#) object when the service locator fails to find one.

Inheritance diagram for TriDevs.TriEngine2D.Audio.NullAudioManager:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.40.1 Detailed Description

Used as a fallback [AudioManager](#) object when the service locator fails to find one.

7.40.2 Member Function Documentation

7.40.2.1 void TriDevs.TriEngine2D.Audio.NullAudioManager.Dispose ()

```

35         {
36
37     }
```

7.40.2.2 ISong TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```

75         {
76             return Song;
77     }
```

7.40.2.3 ISound TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).


```
55     {  
56         return Sound;  
57     }
```

7.40.2.4 bool TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```
70     {  
71         return false;  
72     }
```

7.40.2.5 bool TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```
50     {  
51         return false;  
52     }
```

7.40.2.6 ISong TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```
65         {
66             return Song;
67         }
```

7.40.2.7 **ISound** [TriDevs.TriEngine2D.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.TriEngine2D.Audio.IAudioManager](#).

```
45         {
46             return Sound;
47         }
```

7.40.2.8 **void** [TriDevs.TriEngine2D.Audio.NullAudioManager.StopAll](#) ()

Immediately stops all playback of sounds and songs.

Implements [TriDevs.TriEngine2D.Audio.IAudioManager](#).

```
40         {
41
42         }
```

7.40.2.9 **void** [TriDevs.TriEngine2D.Audio.NullAudioManager.StopAllSongs](#) ()

Immediately stops playback of all songs.

Implements [TriDevs.TriEngine2D.Audio.IAudioManager](#).

```
80         {
81
82         }
```

7.40.2.10 **void** [TriDevs.TriEngine2D.Audio.NullAudioManager.StopAllSounds](#) ()

Immediately stops playback of all sounds.

Implements [TriDevs.TriEngine2D.Audio.IAudioManager](#).

```
60     {  
61  
62     }
```

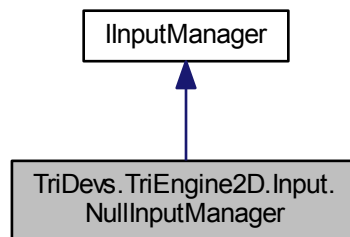
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Audio/[NullAudioManager.cs](#)

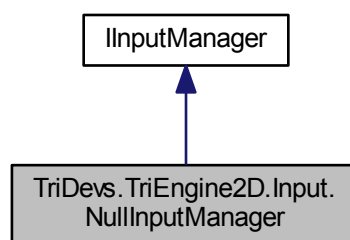
7.41 TriDevs.TriEngine2D.Input.NullInputManager Class Reference

Used as a fallback [InputManager](#) object when the service locator fails to find one.

Inheritance diagram for TriDevs.TriEngine2D.Input.NullInputManager:



Collaboration diagram for TriDevs.TriEngine2D.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)

- 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.

7.41.1 Detailed Description

Used as a fallback [InputManager](#) object when the service locator fails to find one.

7.41.2 Member Function Documentation

7.41.2.1 `bool TriDevs.TriEngine2D.Input.NullInputManager.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.TriEngine2D.Input.IInputManager](#).

```
132     {  
133         return false;  
134     }
```

7.41.2.2 `bool TriDevs.TriEngine2D.Input.NullInputManager.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.TriEngine2D.Input.IInputManager](#).

```
127     {  
128         return true;  
129     }
```

7.41.2.3 `bool TriDevs.TriEngine2D.Input.NullInputManager.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.TriEngine2D.Input.IInputManager](#).

```

152     {
153         return false;
154     }

```

7.41.2.4 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```

147     {
148         return true;
149     }

```

7.41.2.5 bool TriDevs.TriEngine2D.Input.NullInputManager.IsWheelChanged ()

Returns whether the mouse wheel scrolled at all.

Returns

True if the mouse wheel scrolled, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

177     {
178         return false;
179     }

```

7.41.2.6 bool TriDevs.TriEngine2D.Input.NullInputManager.IsWheelDown ()

Returns whether the mouse wheel was scrolled down.

Returns

True if mouse wheel was scrolled down, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```

172     {
173         return false;
174     }

```

7.41.2.7 bool TriDevs.TriEngine2D.Input.NullInputManager.IsWheelUp ()

Returns whether the mouse wheel was scrolled up.

Returns

True if mouse wheel was scrolled up, false otherwise.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```
167     {  
168         return false;  
169     }
```

7.41.2.8 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```
137     {  
138         return false;  
139     }
```

7.41.2.9 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```
142     {  
143         return false;  
144     }
```

7.41.2.10 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```
157     {
158         return false;
159     }
```

7.41.2.11 bool TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```
162     {
163         return false;
164     }
```

7.41.2.12 void TriDevs.TriEngine2D.Input.NullInputManager.Update ()

Updates the input manager, refreshing all current and previous states.

Implements [TriDevs.TriEngine2D.Input.IInputManager](#).

```
122     {
123         // Do nothing
124     }
```

7.41.2.13 int TriDevs.TriEngine2D.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.TriEngine2D.Input.IInputManager](#).

```
182     {
183         return 0;
184     }
```

7.41.3 Property Documentation**7.41.3.1 Point<int> TriDevs.TriEngine2D.Input.NullInputManager.MousePosition [get]**

7.41.3.2 `int TriDevs.TriEngine2D.Input.NullInputManager.MouseWheelValue` `[get]`

7.41.3.3 `int TriDevs.TriEngine2D.Input.NullInputManager.MouseX` `[get]`

7.41.3.4 `int TriDevs.TriEngine2D.Input.NullInputManager.MouseY` `[get]`

7.41.3.5 `bool TriDevs.TriEngine2D.Input.NullInputManager.this[Key key]` `[get]`

7.41.3.6 `bool TriDevs.TriEngine2D.Input.NullInputManager.this[MouseButton button]` `[get]`

7.41.4 Event Documentation

7.41.4.1 `KeyDownEventHandler TriDevs.TriEngine2D.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.

7.41.4.2 `KeyPressEventHandler TriDevs.TriEngine2D.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.

7.41.4.3 `KeyUpEventHandler TriDevs.TriEngine2D.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.

7.41.4.4 `MouseDownEventHandler TriDevs.TriEngine2D.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.

7.41.4.5 `MouseUpEventHandler TriDevs.TriEngine2D.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.

7.41.4.6 `MouseWheelChangedEventHandler TriDevs.TriEngine2D.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.

7.41.4.7 `MouseWheelDownEventHandler TriDevs.TriEngine2D.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.

7.41.4.8 MouseWheelUpEventHandler TriDevs.TriEngine2D.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.

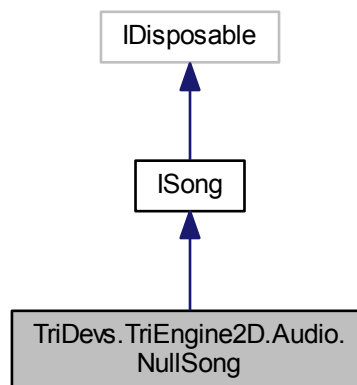
The documentation for this class was generated from the following file:

- [TriDevs.TriEngine2D/Input/NullInputManager.cs](#)

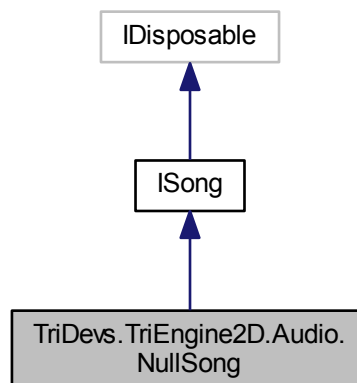
7.42 TriDevs.TriEngine2D.Audio.NullSong Class Reference

Fallback song class used in [NullAudioManager](#).

Inheritance diagram for TriDevs.TriEngine2D.Audio.NullSong:



Collaboration diagram for TriDevs.TriEngine2D.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]

7.42.1 Detailed Description

Fallback song class used in [NullAudioManager](#).

7.42.2 Member Function Documentation

7.42.2.1 void TriDevs.TriEngine2D.Audio.NullSong.Dispose ()

```
37         {  
38  
39         }
```

7.42.2.2 void TriDevs.TriEngine2D.Audio.NullSong.Pause ()

Pauses playback of the song.

Call the [Resume](#) or [Play](#) method to resume playback.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```
52         {  
53  
54         }
```

7.42.2.3 void TriDevs.TriEngine2D.Audio.NullSong.Play ()

Starts playback of the song.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```
42         {  
43  
44         }
```

7.42.2.4 void TriDevs.TriEngine2D.Audio.NullSong.Resume ()

Resumes playback of a paused song.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```
57         {  
58  
59     }
```

7.42.2.5 void TriDevs.TriEngine2D.Audio.NullSong.Stop ()

Stops playback of the song.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```
47         {  
48  
49     }
```

7.42.3 Property Documentation

7.42.3.1 string TriDevs.TriEngine2D.Audio.NullSong.File [get]

7.42.3.2 bool TriDevs.TriEngine2D.Audio.NullSong.IsLooped [get], [set]

7.42.3.3 string TriDevs.TriEngine2D.Audio.NullSong.Name [get]

7.42.3.4 float TriDevs.TriEngine2D.Audio.NullSong.Volume [get], [set]

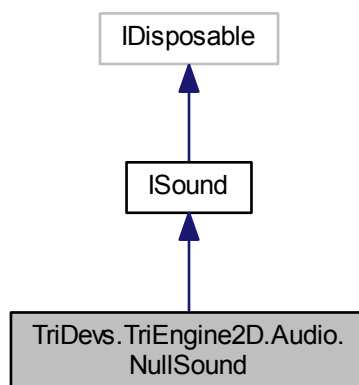
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Audio/[NullSong.cs](#)

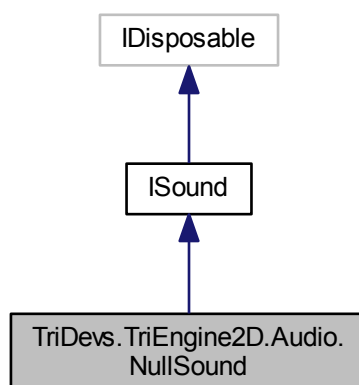
7.43 TriDevs.TriEngine2D.Audio.NullSound Class Reference

Fallback sound class used in [NullAudioManager](#).

Inheritance diagram for TriDevs.TriEngine2D.Audio.NullSound:



Collaboration diagram for TriDevs.TriEngine2D.Audio.NullSound:



Public Member Functions

- void [Play](#) ()
Plays the sound.
- void [Stop](#) ()
Stops the sound.
- void [Dispose](#) ()

Properties

- string [Name](#) [get]

- string [File](#) [get]

7.43.1 Detailed Description

Fallback sound class used in [NullAudioManager](#).

7.43.2 Member Function Documentation

7.43.2.1 void TriDevs.TriEngine2D.Audio.NullSound.Dispose ()

```
45         {
46
47     }
```

7.43.2.2 void TriDevs.TriEngine2D.Audio.NullSound.Play ()

Plays the sound.

Implements [TriDevs.TriEngine2D.Audio.ISound](#).

```
35         {
36
37     }
```

7.43.2.3 void TriDevs.TriEngine2D.Audio.NullSound.Stop ()

Stops the sound.

Implements [TriDevs.TriEngine2D.Audio.ISound](#).

```
40         {
41
42     }
```

7.43.3 Property Documentation

7.43.3.1 string TriDevs.TriEngine2D.Audio.NullSound.File [get]

7.43.3.2 string TriDevs.TriEngine2D.Audio.NullSound.Name [get]

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

- TriDevs.TriEngine2D/Audio/[NullSound.cs](#)

7.44 TriDevs.TriEngine2D.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.

7.44.1 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

7.44.2 Constructor & Destructor Documentation

7.44.2.1 TriDevs.TriEngine2D.Point< T >.Point (T x, T y)

Creates a new Point<T> with the specified X and Y values.

Parameters

<i>x</i>	The X value.
<i>y</i>	The Y value.

```

48     {
49         X = x;
50         Y = y;
51     }
```

7.44.3 Member Data Documentation

7.44.3.1 T TriDevs.TriEngine2D.Point< T >.X

The X value of the coordinate.

7.44.3.2 T TriDevs.TriEngine2D.Point< T >.Y

The Y value of the coordinate.

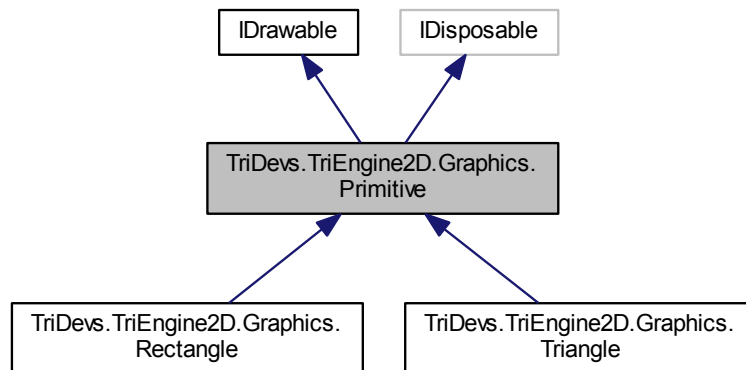
The documentation for this struct was generated from the following file:

- TriDevs.TriEngine2D/[Point.cs](#)

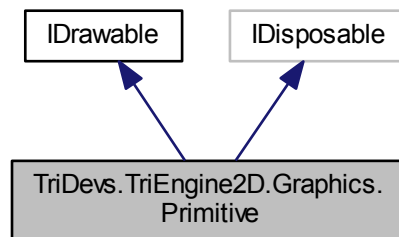
7.45 TriDevs.TriEngine2D.Graphics.Primitive Class Reference

Represents a primitive 2D shape composed of triangles.

Inheritance diagram for TriDevs.TriEngine2D.Graphics.Primitive:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.45.1 Detailed Description

Represents a primitive 2D shape composed of triangles.

7.45.2 Constructor & Destructor Documentation

7.45.2.1 TriDevs.TriEngine2D.Graphics.Primitive.Primitive (ushort[] indices, Vector3[] vectors, Color[] colors = null) [protected]

```
60         : this(indices, vectors.ToFloatArray(), colors)
61         {
62         }
```

7.45.2.2 TriDevs.TriEngine2D.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     }
```

7.45.3 Member Function Documentation

7.45.3.1 void TriDevs.TriEngine2D.Graphics.Primitive.Dispose ()

```

123     {
124         GL.DeleteBuffers(2, Ids);
125
126         if (ColorID != 0)
127             GL.DeleteBuffers(1, ref ColorId);
128     }

```

7.45.3.2 void TriDevs.TriEngine2D.Graphics.Primitive.Draw ()

Draw the object to screen.

Implements [TriDevs.TriEngine2D.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     }

```

7.45.4 Member Data Documentation

7.45.4.1 uint TriDevs.TriEngine2D.Graphics.Primitive.ColorId [protected]

7.45.4.2 int [] TriDevs.TriEngine2D.Graphics.Primitive.Colors [protected]

7.45.4.3 uint [] TriDevs.TriEngine2D.Graphics.Primitive.Ids [protected]

7.45.4.4 ushort [] TriDevs.TriEngine2D.Graphics.Primitive.Indices [protected]

7.45.4.5 float [] TriDevs.TriEngine2D.Graphics.Primitive.Vertices [protected]

7.45.5 Property Documentation

7.45.5.1 uint TriDevs.TriEngine2D.Graphics.Primitive.ColorID [get]

[Color](#) buffer ID assigned to this primitive by GL.BindBuffer.

7.45.5.2 uint TriDevs.TriEngine2D.Graphics.Primitive.IndicesID [get]

Indices buffer ID assigned to this primitive by GL.BindBuffer.

7.45.5.3 uint TriDevs.TriEngine2D.Graphics.Primitive.VerticesID [get]

Vertices buffer ID assigned to this primitive by GL.BindBuffer.

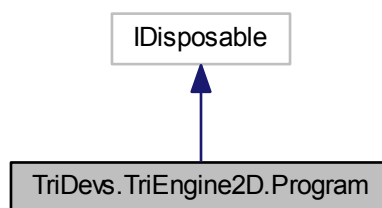
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Graphics/[Primitive.cs](#)

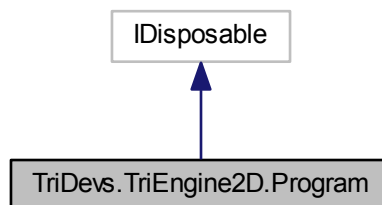
7.46 TriDevs.TriEngine2D.Program Class Reference

An OpenGL program.

Inheritance diagram for TriDevs.TriEngine2D.Program:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.46.1 Detailed Description

An OpenGL program.

7.46.2 Constructor & Destructor Documentation

7.46.2.1 TriDevs.TriEngine2D.Program.Program (params Shader[] *shaders*)

Initializes a new [Program](#) as a shader program.

Parameters

<i>shaders</i>	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     }
```

7.46.3 Member Function Documentation

7.46.3.1 void TriDevs.TriEngine2D.Program.Dispose ()

```

57     {
58         GL.DeleteProgram(ID);
59     }
```

7.46.4 Member Data Documentation

7.46.4.1 readonly int TriDevs.TriEngine2D.Program.ID

The ID of this program.

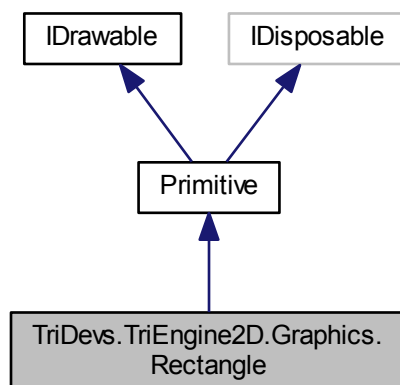
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/[Program.cs](#)

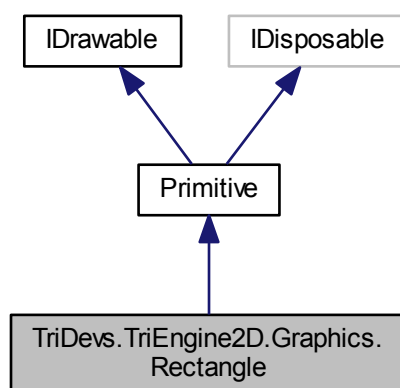
7.47 TriDevs.TriEngine2D.Graphics.Rectangle Class Reference

A primitive 2D [Rectangle](#) shape.

Inheritance diagram for TriDevs.TriEngine2D.Graphics.Rectangle:



Collaboration diagram for TriDevs.TriEngine2D.Graphics.Rectangle:



Public Member Functions

- [Rectangle](#) ([TriEngine2D.Rectangle](#) rect)
Creates a new 2D [Rectangle](#) with the specified settings.

Additional Inherited Members

7.47.1 Detailed Description

A primitive 2D [Rectangle](#) shape.

7.47.2 Constructor & Destructor Documentation

7.47.2.1 TriDevs.TriEngine2D.Graphics.Rectangle.Rectangle (TriEngine2D.Rectangle *rect*)

Creates a new 2D [Rectangle](#) with the specified settings.

Parameters

<i>rect</i>	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         },

```

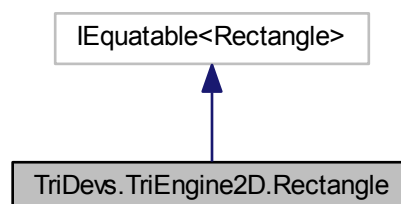
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Graphics/[Rectangle.cs](#)

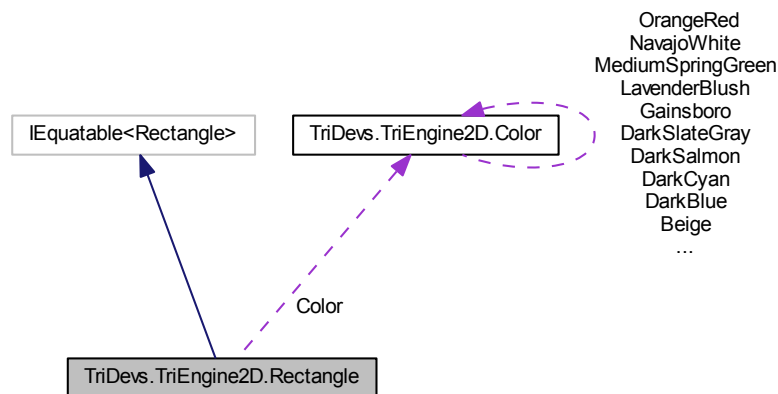
7.48 TriDevs.TriEngine2D.Rectangle Struct Reference

A rectangle representing an area in 2D space.

Inheritance diagram for TriDevs.TriEngine2D.Rectangle:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.48.1 Detailed Description

A rectangle representing an area in 2D space.

7.48.2 Constructor & Destructor Documentation

7.48.2.1 TriDevs.TriEngine2D.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     }
```

7.48.2.2 TriDevs.TriEngine2D.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     }
```

7.48.3 Member Function Documentation

7.48.3.1 bool TriDevs.TriEngine2D.Rectangle.Equals (Rectangle other)

```

114     {
115         return X == other.X && Y == other.Y && Width == other.Width &&
116         Height == other.Height;
117     }
```

7.48.3.2 bool TriDevs.TriEngine2D.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     }
```



```

106
107         if (Y < other.Y && (Y + Height) >= other.Y)
108             return true;
109
110         return false;
111     }

```

7.48.4 Member Data Documentation

7.48.4.1 readonly Color TriDevs.TriEngine2D.Rectangle.Color

Optional color of this rectangle, if it is to be drawn onto the screen.

7.48.4.2 readonly int TriDevs.TriEngine2D.Rectangle.Height

The height of this rectangle in pixels.

7.48.4.3 readonly int TriDevs.TriEngine2D.Rectangle.Width

The width of this rectangle in pixels.

7.48.4.4 readonly int TriDevs.TriEngine2D.Rectangle.X

The X position of this rectangle, in screen pixels.

7.48.4.5 readonly int TriDevs.TriEngine2D.Rectangle.Y

The Y position of this rectangle, in screen pixels.

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

- TriDevs.TriEngine2D/[Rectangle.cs](#)

7.49 TriDevs.TriEngine2D.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](#).

7.49.1 Detailed Description

Static class to manage resources.

7.49.2 Member Function Documentation

7.49.2.1 static void [TriDevs.TriEngine2D.Resources.AddFont](#) ([Font](#) *font*) [static]

Adds a font instance to the resources.

Parameters

<i>font</i>	The font object to add.
-------------	-------------------------

Exceptions

EngineException	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     }

```

7.49.2.2 static void [TriDevs.TriEngine2D.Resources.AddShader](#) ([Shader](#) *shader*) [static]

Adds a shader instance to the resources.

Parameters

<i>shader</i>	The shader object to add.
---------------	---------------------------

Exceptions

EngineException	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     }

```

7.49.2.3 static Font TriDevs.TriEngine2D.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     }
```

7.49.2.4 static Shader TriDevs.TriEngine2D.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     }
```

7.49.2.5 static Font TriDevs.TriEngine2D.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(
dropShadow),
101             new QFontLoaderConfiguration(dropShadow)));
102     }
```

7.49.2.6 static Font TriDevs.TriEngine2D.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         }

```

7.49.2.7 static Shader TriDevs.TriEngine2D.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         }

```

7.49.3 Member Data Documentation

7.49.3.1 string TriDevs.TriEngine2D.Resources.BasePath = "Resources" [static]

Base path to the resources directory, relative to the current working directory.

7.49.3.2 `string TriDevs.TriEngine2D.Resources.FontPath = "Fonts" [static]`

Path to the fonts directory, relative to [BasePath](#).

7.49.3.3 `string TriDevs.TriEngine2D.Resources.ShaderPath = "Shaders" [static]`

Path to the shaders directory, relative to [BasePath](#).

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

- [TriDevs.TriEngine2D/Resources.cs](#)

7.50 TriDevs.TriEngine2D.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.

7.50.1 Detailed Description

Provides serialization methods.

7.50.2 Member Function Documentation

7.50.2.1 `static T TriDevs.TriEngine2D.Serializing.Serializer.Deserialize< T > (string file) [static]`

Deserialize a serialized object from file.

Template Parameters

<i>T</i>	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 }

```

7.50.2.2 static string TriDevs.TriEngine2D.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     }

```

7.50.2.3 static void TriDevs.TriEngine2D.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.
<i>formatting</i>	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.TriEngine2D/Serializing/[Serializer.cs](#)

7.51 TriDevs.TriEngine2D.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.

7.51.1 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.

7.51.2 Member Function Documentation

7.51.2.1 static void TriDevs.TriEngine2D.Services.Provide ([IInputManager](#) *input*) [static]

Specifies an input manager service to provide.

Parameters

<i>input</i>	An object implementing the IInputManager interface.
--------------	---

```
57     {
58         _input = input;
59     }
```

7.51.2.2 static void TriDevs.TriEngine2D.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      }

```

7.51.2.3 `static void TriDevs.TriEngine2D.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      }

```

7.51.3 Property Documentation

7.51.3.1 `IAudioManager TriDevs.TriEngine2D.Services.Audio [static], [get]`

The audio manager service.

7.51.3.2 `IInputManager TriDevs.TriEngine2D.Services.Input [static], [get]`

The input manager service.

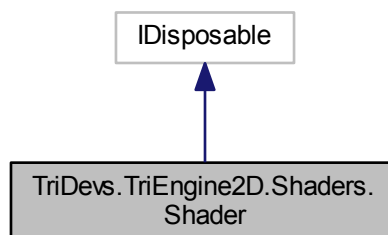
The documentation for this class was generated from the following file:

- `TriDevs.TriEngine2D/Services.cs`

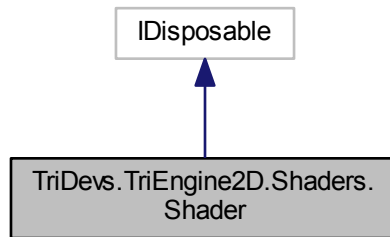
7.52 TriDevs.TriEngine2D.Shaders.Shader Class Reference

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

Inheritance diagram for `TriDevs.TriEngine2D.Shaders.Shader`:



Collaboration diagram for TriDevs.TriEngine2D.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.

7.52.1 Detailed Description

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

7.52.2 Constructor & Destructor Documentation

7.52.2.1 TriDevs.TriEngine2D.Shaders.Shader.Shader (string name, string file, ShaderType type)

Creates a new shader from specified GLSL source file.

Parameters

<i>name</i>	The name to give to this shader, or null to let constructor auto-generate a name based on the file name.
<i>file</i>	GLSL source to use.
<i>type</i>	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     }

```

7.52.3 Member Function Documentation

7.52.3.1 void TriDevs.TriEngine2D.Shaders.Shader.Dispose ()

```

83     {
84         GL.DeleteShader(ID);
85     }

```

7.52.3.2 static string TriDevs.TriEngine2D.Shaders.Shader.GetDefaultName (string file) [static]

Returns an auto-generated shader name based on the file name.

Parameters

<i>file</i>	The file name.
-------------	----------------

Returns

The auto-generated shader name.

```

78     {
79         return Path.GetFileNameWithoutExtension(file);
80     }

```

7.52.4 Member Data Documentation

7.52.4.1 readonly int TriDevs.TriEngine2D.Shaders.Shader.ID

ID of the shader compiled by OpenGL.

7.52.5 Property Documentation

7.52.5.1 string TriDevs.TriEngine2D.Shaders.Shader.File [get]

The file containing the source for this shader.

7.52.5.2 string TriDevs.TriEngine2D.Shaders.Shader.Name [get]

The name of this shader object.

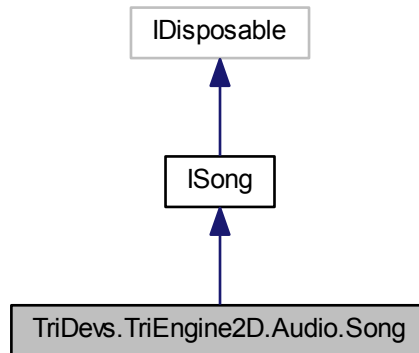
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Shaders/[Shader.cs](#)

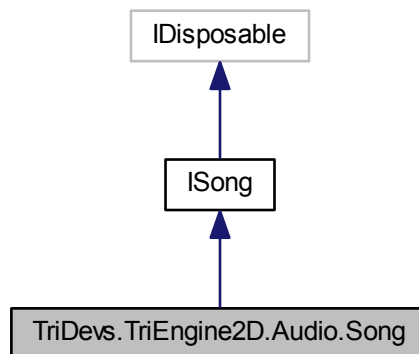
7.53 TriDevs.TriEngine2D.Audio.Song Class Reference

[Song](#) class that can be used with [AudioManager](#).

Inheritance diagram for TriDevs.TriEngine2D.Audio.Song:



Collaboration diagram for TriDevs.TriEngine2D.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]

7.53.1 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.

7.53.2 Member Function Documentation

7.53.2.1 void TriDevs.TriEngine2D.Audio.Song.Dispose ()

```

80         {
81             if (_stream == null)
82                 return;
83
84             Stop();
85             _stream.Dispose();
86             _stream = null;
87         }
```

7.53.2.2 void TriDevs.TriEngine2D.Audio.Song.Pause ()

Pauses playback of the song.

Call the [Resume](#) or [Play](#) method to resume playback.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```

108         {
109             _stream.Pause();
110         }
```

7.53.2.3 void TriDevs.TriEngine2D.Audio.Song.Play ()

Starts playback of the song.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```

90         {
91             try
92             {
93                 _stream.Play();
94             }
95             catch (InvalidDataException)
96             {
97                 Stop();
98                 Play();
99             }
100         }
```

7.53.2.4 void TriDevs.TriEngine2D.Audio.Song.Resume ()

Resumes playback of a paused song.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```
113         {  
114             _stream.Resume();  
115         }
```

7.53.2.5 void TriDevs.TriEngine2D.Audio.Song.Stop ()

Stops playback of the song.

Implements [TriDevs.TriEngine2D.Audio.ISong](#).

```
103         {  
104             _stream.Stop();  
105         }
```

7.53.3 Property Documentation

7.53.3.1 string TriDevs.TriEngine2D.Audio.Song.File [get]

7.53.3.2 bool TriDevs.TriEngine2D.Audio.Song.IsLooped [get], [set]

7.53.3.3 string TriDevs.TriEngine2D.Audio.Song.Name [get]

7.53.3.4 float TriDevs.TriEngine2D.Audio.Song.Volume [get], [set]

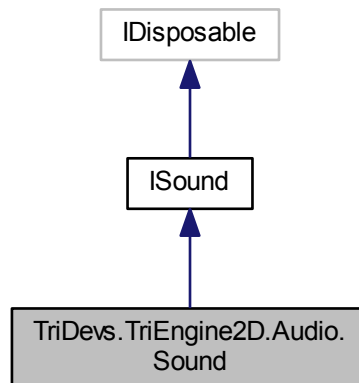
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Audio/[Song.cs](#)

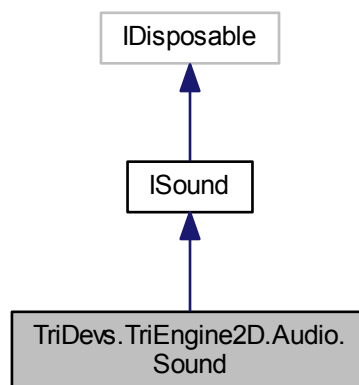
7.54 TriDevs.TriEngine2D.Audio.Sound Class Reference

[Sound](#) class that can be used with the [AudioManager](#).

Inheritance diagram for TriDevs.TriEngine2D.Audio.Sound:



Collaboration diagram for TriDevs.TriEngine2D.Audio.Sound:



Public Member Functions

- void [Play](#) ()
Plays the sound.
- void [Stop](#) ()
Stops the sound.
- void [Dispose](#) ()

Properties

- string [Name](#) [get]

- string [File](#) [get]

7.54.1 Detailed Description

[Sound](#) class that can be used with the [AudioManager](#).

7.54.2 Member Function Documentation

7.54.2.1 void TriDevs.TriEngine2D.Audio.Sound.Dispose ()

```
187     {
188         Stop();
189         AL.DeleteSources(_sources);
190         AL.DeleteBuffer(_buffer);
191     }
```

7.54.2.2 void TriDevs.TriEngine2D.Audio.Sound.Play ()

Plays the sound.

Implements [TriDevs.TriEngine2D.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     }
```

7.54.2.3 void TriDevs.TriEngine2D.Audio.Sound.Stop ()

Stops the sound.

Implements [TriDevs.TriEngine2D.Audio.ISound](#).

```
181     {
182         for (var i = 0; i < SourceCount; i++)
183             AL.SourceStop(_sources[i]);
184     }
```

7.54.3 Property Documentation

7.54.3.1 string TriDevs.TriEngine2D.Audio.Sound.File [get]

7.54.3.2 string TriDevs.TriEngine2D.Audio.Sound.Name [get]

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

- TriDevs.TriEngine2D/Audio/[Sound.cs](#)

7.55 TriDevs.TriEngine2D.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.

7.55.1 Detailed Description

[Extensions](#) for System.String

7.55.2 Member Function Documentation

7.55.2.1 static string TriDevs.TriEngine2D.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      }
```

7.55.2.2 static string TriDevs.TriEngine2D.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     }

```

7.55.2.3 `static string TriDevs.TriEngine2D.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

<code>s</code>	String to modify.
<code>search</code>	String to search for.
<code>replace</code>	String to replace the match with.
<code>caseInsensitive</code>	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     }

```

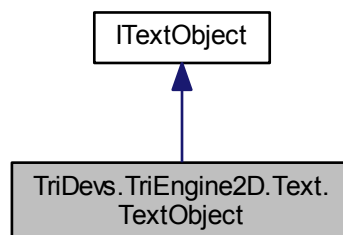
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Extensions/[StringExtensions.cs](#)

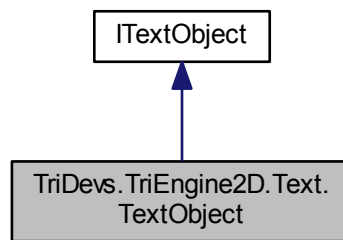
7.56 TriDevs.TriEngine2D.Text.TextObject Class Reference

Implements the [ITextObject](#) interface.

Inheritance diagram for TriDevs.TriEngine2D.Text.TextObject:



Collaboration diagram for TriDevs.TriEngine2D.Text.TextObject:



Public Member Functions

- [TextObject](#) (string text, string fontName, 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]

7.56.1 Detailed Description

Implements the [ITextObject](#) interface.

7.56.2 Constructor & Destructor Documentation

7.56.2.1 TriDevs.TriEngine2D.Text.TextObject.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     }
```

7.56.2.2 `TriDevs.TriEngine2D.Text.TextObject.TextObject (string text, Font font, Point< int > position = new Point<int>(), QFontAlignment alignment = QFontAlignment.Centre)`

Initializes a new [TextObject](#) instance.

Parameters

<i>text</i>	The initial text to set for this text object.
<i>font</i>	The font to use for this text object.
<i>position</i>	The initial position of this text object.
<i>alignment</i>	The initial 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     }

```

7.56.3 Member Function Documentation

7.56.3.1 `void TriDevs.TriEngine2D.Text.TextObject.Draw ()`

Draws this text object to screen with default parameters.

Implements [TriDevs.TriEngine2D.Text.ITextObject](#).

```

104     {
105         Draw(_vectorPos);
106     }

```

7.56.3.2 `void TriDevs.TriEngine2D.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.TriEngine2D.Text.ITextObject](#).

```

109     {
110         Draw(position.X, position.Y);
111     }

```

7.56.3.3 `void TriDevs.TriEngine2D.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.TriEngine2D.Text.ITextObject](#).

```

114         {
115             Draw(new Vector2(x, y));
116         }

```

7.56.4 Property Documentation

7.56.4.1 **QFontAlignment** TriDevs.TriEngine2D.Text.TextObject.Alignment [get], [set]

7.56.4.2 **Rectangle** TriDevs.TriEngine2D.Text.TextObject.Bounds [get]

7.56.4.3 **Color** TriDevs.TriEngine2D.Text.TextObject.Color [get], [set]

7.56.4.4 **Font** TriDevs.TriEngine2D.Text.TextObject.Font [get], [set]

7.56.4.5 **Point<int>** TriDevs.TriEngine2D.Text.TextObject.Position [get], [set]

7.56.4.6 **string** TriDevs.TriEngine2D.Text.TextObject.Text [get], [set]

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

- TriDevs.TriEngine2D/Text/[TextObject.cs](#)

7.57 TriDevs.TriEngine2D.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.

7.57.1 Detailed Description

Provides various helper functions for doing threading operations.

7.57.2 Member Function Documentation

7.57.2.1 **static void** TriDevs.TriEngine2D.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         }

```

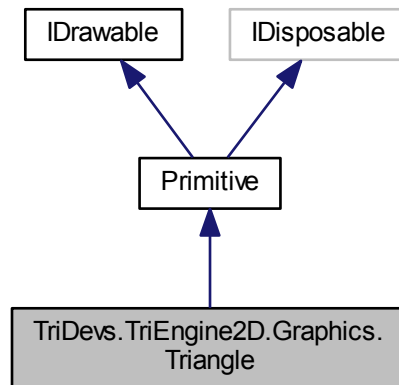
The documentation for this class was generated from the following file:

- TriDevs.TriEngine2D/Helpers/[Threading.cs](#)

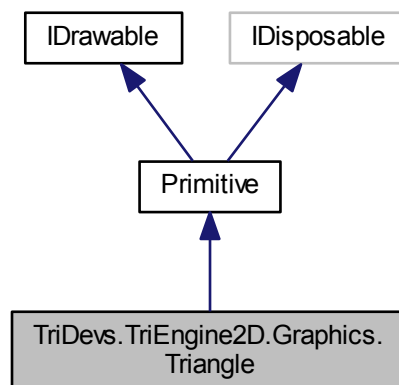
7.58 TriDevs.TriEngine2D.Graphics.Triangle Class Reference

A primitive 2D [Triangle](#) shape.

Inheritance diagram for TriDevs.TriEngine2D.Graphics.Triangle:



Collaboration diagram for TriDevs.TriEngine2D.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

7.58.1 Detailed Description

A primitive 2D [Triangle](#) shape.

7.58.2 Constructor & Destructor Documentation

7.58.2.1 TriDevs.TriEngine2D.Graphics.Triangle.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.TriEngine2D/Graphics/[Triangle.cs](#)

7.59 TriDevs.TriEngine2D.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).

7.59.1 Detailed Description

[Extensions](#) for Vector3.

7.59.2 Member Function Documentation

7.59.2.1 static float [] TriDevs.TriEngine2D.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.TriEngine2D/Extensions/[Vector3Extensions.cs](#)

7.60 TriDevs.TriEngine2D.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](#) = 14
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.

7.60.1 Detailed Description

[Version](#) class specifying the version of this project.

7.60.2 Member Data Documentation

7.60.2.1 const int TriDevs.TriEngine2D.Version.Major = 0

Major version of the project.

7.60.2.2 const int TriDevs.TriEngine2D.Version.Minor = 0

Minor version of the project.

7.60.2.3 `const int TriDevs.TriEngine2D.Version.Patch = 14`

Patch version of the project.

7.60.2.4 `const string TriDevs.TriEngine2D.Version.Suffix = ""`

Optional suffix, empty if no suffix for this version.

Example values could be "beta" and "alpha".

7.60.2.5 `const string TriDevs.TriEngine2D.Version.VersionStringFormat = "{0}.{1}.{2}"`

The format string used when formatting major, minor and patch version to their string representation.

7.60.2.6 `const string TriDevs.TriEngine2D.Version.VersionStringFormatWithSuffix = VersionStringFormat + "-{3}"`

The format string used when formatting major, minor and patch version to their string representation (with suffix).

7.60.3 Property Documentation

7.60.3.1 `string TriDevs.TriEngine2D.Version.VersionString` `[static], [get]`

String representation of the current project version.

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

- [TriDevs.TriEngine2D/Version.cs](#)

7.61 TriDevs.TriEngine2D.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.

7.61.1 Detailed Description

Holds various [WinAPI](#) stuff.

7.61.2 Member Function Documentation

7.61.2.1 static bool TriDevs.TriEngine2D.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:



7.61.2.2 static int TriDevs.TriEngine2D.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:



7.61.2.3 static IntPtr TriDevs.TriEngine2D.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:



7.61.3 Member Data Documentation

7.61.3.1 `const int TriDevs.TriEngine2D.Native.WinAPI.CODE_PAGE = 437`

The code page to use for the console.

7.61.3.2 `const int TriDevs.TriEngine2D.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.TriEngine2D/Native/WinAPI.cs`

Chapter 8

File Documentation

8.1 README.md File Reference

8.2 TriDevs.TriEngine2D/Audio/AudioFormat.cs File Reference

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

Enumerations

- enum [TriDevs.TriEngine2D.Audio.AudioFormat](#) { [TriDevs.TriEngine2D.Audio.Ogg](#), [TriDevs.TriEngine2D.Audio.Wav](#) }

Different audio formats usable with audio managers.

8.3 TriDevs.TriEngine2D/Audio/AudioManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Audio.AudioManager](#)

Class to manage engine audio.

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.4 TriDevs.TriEngine2D/Audio/IAudioManager.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Audio.IAudioManager](#)

Provides various methods to manipulate audio.

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.5 TriDevs.TriEngine2D/Audio/ISong.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Audio.ISong](#)
A song that will be streamed in the audio player.

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.6 TriDevs.TriEngine2D/Audio/ISound.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Audio.ISound](#)
A sound file for use with the audio manager.

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.7 TriDevs.TriEngine2D/Audio/NullAudioManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Audio.NullAudioManager](#)
Used as a fallback [AudioManager](#) object when the service locator fails to find one.

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.8 TriDevs.TriEngine2D/Audio/NullSong.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Audio.NullSong](#)
Fallback song class used in [NullAudioManager](#).

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.9 TriDevs.TriEngine2D/Audio/NullSound.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Audio.NullSound](#)
Fallback sound class used in [NullAudioManager](#).

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.10 TriDevs.TriEngine2D/Audio/Song.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Audio.Song](#)
[Song](#) class that can be used with [AudioManager](#).

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.11 TriDevs.TriEngine2D/Audio/Sound.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Audio.Sound](#)
[Sound](#) class that can be used with the [AudioManager](#).

Namespaces

- package [TriDevs.TriEngine2D.Audio](#)

8.12 TriDevs.TriEngine2D/Color.cs File Reference

Classes

- struct [TriDevs.TriEngine2D.Color](#)
Represents an RGBA color that can be used with [TriEngine2D](#).

Namespaces

- package [TriDevs.TriEngine2D](#)

8.13 TriDevs.TriEngine2D/EngineException.cs File Reference

Classes

- class [TriDevs.TriEngine2D.EngineException](#)

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

Namespaces

- package [TriDevs.TriEngine2D](#)

8.14 TriDevs.TriEngine2D/Extensions/ByteExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.ByteExtensions](#)

[Extensions](#) for System.Byte.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.15 TriDevs.TriEngine2D/Extensions/DecimalExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.DecimalExtensions](#)

[Extensions](#) for System.Decimal.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.16 TriDevs.TriEngine2D/Extensions/DoubleExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.DoubleExtensions](#)

[Extensions](#) for System.Double.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.17 TriDevs.TriEngine2D/Extensions/EnumerationExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.EnumerationExtensions](#)
Extensions for System.Enum.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.18 TriDevs.TriEngine2D/Extensions/FloatExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.FloatExtensions](#)
Extensions for System.Single.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.19 TriDevs.TriEngine2D/Extensions/IntegerExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.IntegerExtensions](#)
Extensions for System.Int16, System.UInt16, System.Int32, System.UInt32, System.Int64 and System.UInt64.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.20 TriDevs.TriEngine2D/Extensions/StringExtensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.StringExtensions](#)
Extensions for System.String

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.21 TriDevs.TriEngine2D/Extensions/Vector3Extensions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Extensions.Vector3Extensions](#)
Extensions for Vector3.

Namespaces

- package [TriDevs.TriEngine2D.Extensions](#)

8.22 TriDevs.TriEngine2D/GameWindow2D.cs File Reference

Classes

- class [TriDevs.TriEngine2D.GameWindow2D](#)
Game window class specialized for drawing 2D graphics.

Namespaces

- package [TriDevs.TriEngine2D](#)

8.23 TriDevs.TriEngine2D/Graphics/Primitive.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Graphics.Primitive](#)
Represents a primitive 2D shape composed of triangles.

Namespaces

- package [TriDevs.TriEngine2D.Graphics](#)

8.24 TriDevs.TriEngine2D/Graphics/Rectangle.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Graphics.Rectangle](#)
A primitive 2D [Rectangle](#) shape.

Namespaces

- package [TriDevs.TriEngine2D.Graphics](#)

8.25 TriDevs.TriEngine2D/Rectangle.cs File Reference

Classes

- struct [TriDevs.TriEngine2D.Rectangle](#)
A rectangle representing an area in 2D space.

Namespaces

- package [TriDevs.TriEngine2D](#)

8.26 TriDevs.TriEngine2D/Graphics/Triangle.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Graphics.Triangle](#)
A primitive 2D [Triangle](#) shape.

Namespaces

- package [TriDevs.TriEngine2D.Graphics](#)

8.27 TriDevs.TriEngine2D/Helpers/Exceptions.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Helpers.Exceptions](#)
Provides helper methods for dealing with exceptions.

Namespaces

- package [TriDevs.TriEngine2D.Helpers](#)

8.28 TriDevs.TriEngine2D/Helpers/IO.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Helpers.IO](#)
Provides various helper functions for doing [IO](#) operations.

Namespaces

- package [TriDevs.TriEngine2D.Helpers](#)

8.29 TriDevs.TriEngine2D/Helpers/Math.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Helpers.Math](#)
Various helper methods for working with math.

Namespaces

- package [TriDevs.TriEngine2D.Helpers](#)

8.30 TriDevs.TriEngine2D/Helpers/Threading.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Helpers.Threading](#)
Provides various helper functions for doing threading operations.

Namespaces

- package [TriDevs.TriEngine2D.Helpers](#)

8.31 TriDevs.TriEngine2D/Input/Events/Key.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Input.Events.KeyEventArgs](#)
EventArgs class used for key-related events. Contains information about the key related with the event.
- class [TriDevs.TriEngine2D.Input.Events.KeyCharEventArgs](#)
EventArgs class used for keychar-related events. Contains information about the character related with the event.

Namespaces

- package [TriDevs.TriEngine2D.Input.Events](#)

Functions

- delegate void [TriDevs.TriEngine2D.Input.Events.KeyDownEventHandler](#) (object sender, KeyEventArgs e)
Event handler delegate for the KeyDown event.
- delegate void [TriDevs.TriEngine2D.Input.Events.KeyUpEventHandler](#) (object sender, KeyEventArgs e)
Event handler delegate for the KeyUp event.
- delegate void [TriDevs.TriEngine2D.Input.Events.KeyPressEventHandler](#) (object sender, KeyCharEventArgs e)
Event handler delegate for the KeyPress event.

8.32 TriDevs.TriEngine2D/Input/Events/Mouse.cs File Reference

Namespaces

- package [TriDevs.TriEngine2D.Input.Events](#)

Functions

- delegate void [TriDevs.TriEngine2D.Input.Events.MouseDownEventHandler](#) (object sender, MouseButtonEventArgs e)
Event handler delegate for the MouseDown event.
- delegate void [TriDevs.TriEngine2D.Input.Events.MouseUpEventHandler](#) (object sender, MouseButtonEventArgs e)
Event handler delegate for the MouseUp event.
- delegate void [TriDevs.TriEngine2D.Input.Events.MouseWheelChangedEventHandler](#) (object sender, MouseWheelEventArgs e)
Event handler delegate for the MouseWheelChanged event.
- delegate void [TriDevs.TriEngine2D.Input.Events.MouseWheelDownEventHandler](#) (object sender, MouseWheelEventArgs e)
Event handler delegate for the MouseWheelDown event.
- delegate void [TriDevs.TriEngine2D.Input.Events.MouseWheelUpEventHandler](#) (object sender, MouseWheelEventArgs e)
Event handler delegate for the MouseWheelUp event.

8.33 TriDevs.TriEngine2D/Input/IInputManager.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Input.IInputManager](#)
Provides various methods to query input devices like the keyboard.

Namespaces

- package [TriDevs.TriEngine2D.Input](#)

8.34 TriDevs.TriEngine2D/Input/InputManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Input.InputManager](#)
Input manager interfacing with input methods provided by a GameWindow.

Namespaces

- package [TriDevs.TriEngine2D.Input](#)

8.35 TriDevs.TriEngine2D/Input/NullInputManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Input.NullInputManager](#)
Used as a fallback [InputManager](#) object when the service locator fails to find one.

Namespaces

- package [TriDevs.TriEngine2D.Input](#)

8.36 TriDevs.TriEngine2D/Interfaces/IDrawable.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Interfaces.IDrawable](#)
Implements a simple draw method.

Namespaces

- package [TriDevs.TriEngine2D.Interfaces](#)

8.37 TriDevs.TriEngine2D/Interfaces/IDrawableGameComponent.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.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.TriEngine2D.Interfaces](#)

8.38 TriDevs.TriEngine2D/Interfaces/IGameComponent.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Interfaces.IGameComponent](#)
A game component that can be added to IGameState objects.

Namespaces

- package [TriDevs.TriEngine2D.Interfaces](#)

8.39 TriDevs.TriEngine2D/Interfaces/IUpdatable.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Interfaces.IUpdatable](#)

Implements a simple update method.

Namespaces

- package [TriDevs.TriEngine2D.Interfaces](#)

8.40 TriDevs.TriEngine2D/Logging/LogManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.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.TriEngine2D.Logging](#)

8.41 TriDevs.TriEngine2D/Native/Helpers.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Native.Helpers](#)

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

Namespaces

- package [TriDevs.TriEngine2D.Native](#)

8.42 TriDevs.TriEngine2D/Native/WinAPI.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Native.WinAPI](#)

Holds various [WinAPI](#) stuff.

Namespaces

- package [TriDevs.TriEngine2D.Native](#)

8.43 TriDevs.TriEngine2D/Point.cs File Reference

Classes

- struct [TriDevs.TriEngine2D.Point< T >](#)
A struct representing an X/Y coordinate.

Namespaces

- package [TriDevs.TriEngine2D](#)

8.44 TriDevs.TriEngine2D/Program.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Program](#)
An OpenGL program.

Namespaces

- package [TriDevs.TriEngine2D](#)

8.45 TriDevs.TriEngine2D/Properties/AssemblyInfo.cs File Reference

8.46 TriDevs.TriEngine2D/Resources.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Resources](#)
Static class to manage resources.

Namespaces

- package [TriDevs.TriEngine2D](#)

8.47 TriDevs.TriEngine2D/Serializing/Serializer.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Serializing.Serializer](#)
Provides serialization methods.

Namespaces

- package [TriDevs.TriEngine2D.Serializing](#)

8.48 TriDevs.TriEngine2D/Services.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Services](#)
Provides different game-related service interfaces.

Namespaces

- package [TriDevs.TriEngine2D](#)

8.49 TriDevs.TriEngine2D/Shaders/Shader.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Shaders.Shader](#)
*GLSL shader object loaded and compiled from a *.glsl shader file.*

Namespaces

- package [TriDevs.TriEngine2D.Shaders](#)

8.50 TriDevs.TriEngine2D/StateManagement/GameState.cs File Reference

Classes

- class [TriDevs.TriEngine2D.StateManagement.GameState](#)
Base [GameState](#) class that all other game states derive from, defines basic [GameState](#) behaviour.

Namespaces

- package [TriDevs.TriEngine2D.StateManagement](#)

8.51 TriDevs.TriEngine2D/StateManagement/GameStateManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.StateManagement.GameStateManager](#)
Game state manager that keeps track of the active game states and provides methods to control the states.

Namespaces

- package [TriDevs.TriEngine2D.StateManagement](#)

8.52 TriDevs.TriEngine2D/StateManagement/IGameState.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.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.TriEngine2D.StateManagement](#)

8.53 TriDevs.TriEngine2D/StateManagement/IGameStateManager.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.StateManagement.IGameStateManager](#)

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

Namespaces

- package [TriDevs.TriEngine2D.StateManagement](#)

8.54 TriDevs.TriEngine2D/Text/Font.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Text.Font](#)

Holds a specific font type.

Namespaces

- package [TriDevs.TriEngine2D.Text](#)

8.55 TriDevs.TriEngine2D/Text/FontConstructionConfig.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Text.FontConstructionConfig](#)

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

Namespaces

- package [TriDevs.TriEngine2D.Text](#)

8.56 TriDevs.TriEngine2D/Text/FontType.cs File Reference

Namespaces

- package [TriDevs.TriEngine2D.Text](#)

Enumerations

- enum [TriDevs.TriEngine2D.Text.FontType](#) { [TriDevs.TriEngine2D.Text.TTF](#), [TriDevs.TriEngine2D.Text.QFont](#), [TriDevs.TriEngine2D.Text.Unsupported](#) }

Different font types supported by TriEngine2D.

8.57 TriDevs.TriEngine2D/Text/ITextObject.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.Text.ITextObject](#)

Implements methods to construct a text object and render it to screen.

Namespaces

- package [TriDevs.TriEngine2D.Text](#)

8.58 TriDevs.TriEngine2D/Text/TextObject.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Text.TextObject](#)

Implements the [ITextObject](#) interface.

Namespaces

- package [TriDevs.TriEngine2D.Text](#)

8.59 TriDevs.TriEngine2D/UI/Control.cs File Reference

Classes

- class [TriDevs.TriEngine2D.UI.Control](#)

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

Namespaces

- package [TriDevs.TriEngine2D.UI](#)

8.60 TriDevs.TriEngine2D/UI/ControlManager.cs File Reference

Classes

- class [TriDevs.TriEngine2D.UI.ControlManager](#)
Control manager to manage various UI controls for a game.

Namespaces

- package [TriDevs.TriEngine2D.UI](#)

8.61 TriDevs.TriEngine2D/UI/Events/ControlClicked.cs File Reference

Namespaces

- package [TriDevs.TriEngine2D.UI.Events](#)

Functions

- delegate void [TriDevs.TriEngine2D.UI.Events.ControlClickedEventHandler](#) (object sender, EventArgs e)
Delegate handler for the control clicked event.

8.62 TriDevs.TriEngine2D/UI/IControl.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.UI.IControl](#)
A UI control that can be drawn on screen and interacted with.

Namespaces

- package [TriDevs.TriEngine2D.UI](#)

8.63 TriDevs.TriEngine2D/UI/IControlManager.cs File Reference

Classes

- interface [TriDevs.TriEngine2D.UI.IControlManager](#)
Manages various UI controls, automatically updating and drawing them to the screen.

Namespaces

- package [TriDevs.TriEngine2D.UI](#)

8.64 TriDevs.TriEngine2D/UI/Label.cs File Reference

Classes

- class [TriDevs.TriEngine2D.UI.Label](#)
A simple label to display text on the screen.

Namespaces

- package [TriDevs.TriEngine2D.UI](#)

8.65 TriDevs.TriEngine2D/UI/LinkLabel.cs File Reference

Classes

- class [TriDevs.TriEngine2D.UI.LinkLabel](#)
A label that, when clicked, will open a URL.

Namespaces

- package [TriDevs.TriEngine2D.UI](#)

8.66 TriDevs.TriEngine2D/Version.cs File Reference

Classes

- class [TriDevs.TriEngine2D.Version](#)
[Version](#) class specifying the version of this project.

Namespaces

- package [TriDevs.TriEngine2D](#)

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