

GlowBit.py

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Chapter 1

Hierarchical Index

1.1 Class Hierarchy

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

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Chapter 2

Class Index

2.1 Class List

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

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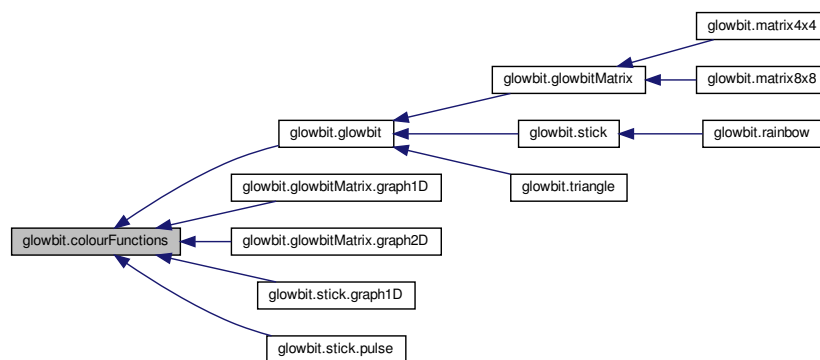
Chapter 3

Class Documentation

3.1 glowbit.colourFunctions Class Reference

Methods for transforming colours to 32-bit packed GlowBit colour values.

Inheritance diagram for glowbit.colourFunctions:



Public Member Functions

- def `wheel` (self, pos)
Converts an integer "colour wheel position" to a packed 32-bit RGB GlowBit colour value.
- def `rgb2GBColour` (self, r, g, b)
Converts the r, g, and b integer arguments to a packed 32-bit RGB GlowBit colour value.

3.1.1 Detailed Description

Methods for transforming colours to 32-bit packed GlowBit colour values.

A packed 32-bit GlowBit colour is an integer with 8-bits per colour channel data encoded in hexadecimal as follows:

0x00RRGGBB

where RR, GG, and BB are hexadecimal values (decimal [0,255]) and the most significant 8 bits are reserved and left as zero.

3.1.2 Member Function Documentation

3.1.2.1 rgb2GBColour()

```
def glowbit.colourFunctions.rgb2GBColour (
    self,
    r,
    g,
    b )
```

Converts the r, g, and b integer arguments to a packed 32-bit RGB GlowBit colour value.

All arguments are required as this is a micropython viper function.

Parameters

<i>r</i>	The red intensity, [0,255]
<i>g</i>	The green intensity, [0,255]
<i>b</i>	The blue intensity, [0,255]

Returns

Packed 32-bit GlowBit colour value

3.1.2.2 wheel()

```
def glowbit.colourFunctions.wheel (
    self,
    pos )
```

Converts an integer "colour wheel position" to a packed 32-bit RGB GlowBit colour value.

The "pos" argument is required as this is a micropython viper function.

Parameters

<i>pos</i>	Colour wheel position [0,255] is mapped to a pure hue in the RGB colourspace. A value of 0 or 255 is mapped to pure red with a smooth red-yellow-green-blue-purple-magenta-red transion for other values.
------------	---

Returns

32-bit integer GlowBit colour value

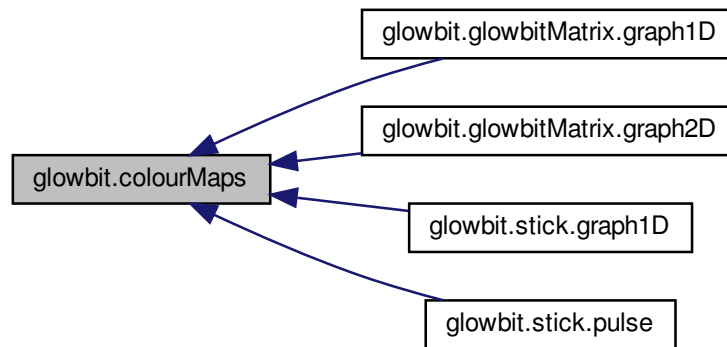
The documentation for this class was generated from the following file:

- glowbit.py

3.2 glowbit.colourMaps Class Reference

Methods which calculate colour gradients.

Inheritance diagram for glowbit.colourMaps:



Public Member Functions

- def `colourMapSolid` (self, index, minIndex, maxIndex)
Trivial colourmap method which always returns the colour in the parent object.
- def `colourMapRainbow` (self, index, minIndex, maxIndex)
Maps the pure hue colour wheel between minIndex and maxIndex.

3.2.1 Detailed Description

Methods which calculate colour gradients.

Custom colour map methods can be written and passed to several GlowBit library methods (eg: [glowbit.stick.graph1D](#)) but must accept the same positional arguments as the methods in this class.

3.2.2 Member Function Documentation

3.2.2.1 colourMapRainbow()

```
def glowbit.colourMaps.colourMapRainbow (
    self,
    index,
    minIndex,
    maxIndex )
```

Maps the pure hue colour wheel between minIndex and maxIndex.

Parameters

<i>index</i>	The value to be mapped
<i>minIndex</i>	The value of index mapped to a colour wheel angle of 0 degrees
<i>maxIndex</i>	The value of index mapped to a colour wheel angle of 360 degrees

Returns

The 32-bit packed GlowBit colour value

3.2.2.2 colourMapSolid()

```
def glowbit.colourMaps.colourMapSolid (
    self,
    index,
    minIndex,
    maxIndex )
```

Trivial colourmap method which always returns the colour in the parent object.

Parameters

<i>index</i>	Dummy argument for compatibility with colourmap method API
<i>minIndex</i>	Dummy argument for compatibility with colourmap method API
<i>maxIndex</i>	Dummy argument for compatibility with colourmap method API

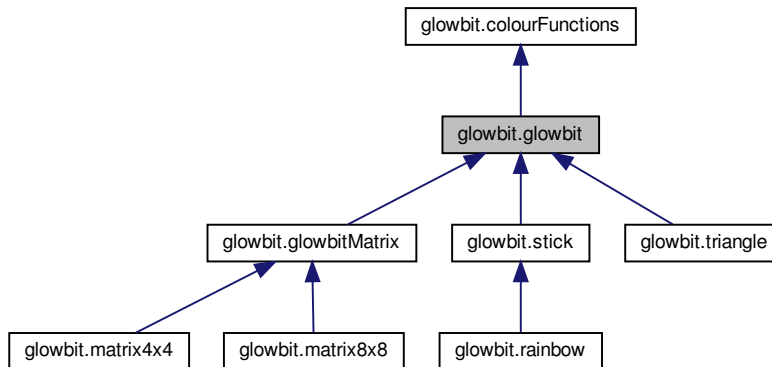
The documentation for this class was generated from the following file:

- glowbit.py

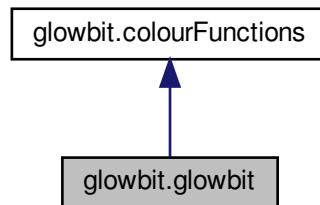
3.3 glowbit.glowbit Class Reference

Low-level methods common to all GlowBit classes.

Inheritance diagram for glowbit.glowbit:



Collaboration diagram for glowbit.glowbit:



Public Member Functions

- def `pixelsShow` (self)
Pushes the internal pixel data buffer to the physical GlowBit LEDs.
- def `pixelSet` (self, i, colour)
Sets the i'th GlowBit LED to a 32-bit GlowBit colour value.
- def `pixelSetNow` (self, i, colour)
Sets the i'th GlowBit LED to a 32-bit GlowBit colour value and updates the physical LEDs.
- def `pixelAdd` (self, i, colour)
Adds a 32-bit GlowBit colour value to the i'th LED in the internal buffer only.
- def `pixelsFill` (self, colour)
Fills all pixels with a solid colour value.
- def `pixelsFillNow` (self, colour)
Fills all pixels with a solid colour value and updates the physical LEDs.
- def `blankDisplay` (self)
Blanks the entire GlowBit display.
- def `getPixel` (self, N)
- def `updateRateLimitFPS` (self, rateLimitFPS)
- def `chaos` (self, iters=100)

Public Attributes

- **lastFrame_ms**
- **rateLimit**

Static Public Attributes

- **sideset_init**
- **OUT_LOW**
- **out_shiftdir**
- **SHIFT_LEFT**
- **autopull**
- **True**
- **pull_thresh**

3.3.1 Detailed Description

Low-level methods common to all GlowBit classes.

3.3.2 Member Function Documentation

3.3.2.1 blankDisplay()

```
def glowbit.glowbit.blankDisplay (  
    self )
```

Blanks the entire GlowBit display.

ie: sets the colour value of all GlowBit LEDs to zero in the internal buffer and updates the physical LEDs.

3.3.2.2 pixelAdd()

```
def glowbit.glowbit.pixelAdd (  
    self,  
    i,  
    colour )
```

Adds a 32-bit GlowBit colour value to the i'th LED in the internal buffer only.

Data colour corruption will occur if the sum result of any RGB value exceeds 255. Care must be taken to avoid this manually. eg: if the blue channel's resulting intensity value is 256 it will be set to zero and the red channel incremented by 1. See the [colourFunctions](#) class documentation for the 32-bit GlowBit colour specification.

NB: For efficiency, this method does not do any index bounds checking. If the value of the parameter *i* is larger than the number of LEDs it will cause an `IndexError` exception.

Parameters

<i>i</i>	An LED's index
<i>colour</i>	The 32-bit GlowBit colour value

3.3.2.3 pixelSet()

```
def glowbit.glowbit.pixelSet (  
    self,  
    i,  
    colour )
```

Sets the i'th GlowBit LED to a 32-bit GlowBit colour value.

NB: For efficiency, this method does not do any bounds checking. If the value of the parameter i is larger than the number of LEDs it will cause an IndexError exception.

Parameters

<i>i</i>	An LED's index
<i>colour</i>	The 32-bit GlowBit colour value

3.3.2.4 pixelSetNow()

```
def glowbit.glowbit.pixelSetNow (  
    self,  
    i,  
    colour )
```

Sets the i'th GlowBit LED to a 32-bit GlowBit colour value and updates the physical LEDs.

NB: For efficiency, this method does not do any index bounds checking. If the value of the parameter i is larger than the number of LEDs it will cause an IndexError exception.

Parameters

<i>i</i>	An LED's index
<i>colour</i>	The 32-bit GlowBit colour value

3.3.2.5 pixelsFill()

```
def glowbit.glowbit.pixelsFill (  
    self,  
    colour )
```

Fills all pixels with a solid colour value.

Parameters

<i>colour</i>	The 32-bit GlowBit colour value
---------------	---------------------------------

3.3.2.6 pixelsFillNow()

```
def glowbit.glowbit.pixelsFillNow (
    self,
    colour )
```

Fills all pixels with a solid colour value and updates the physical LEDs.

Parameters

<i>colour</i>	The 32-bit GlowBit colour value
---------------	---------------------------------

3.3.2.7 pixelsShow()

```
def glowbit.glowbit.pixelsShow (
    self )
```

Pushes the internal pixel data buffer to the physical GlowBit LEDs.

This function must be called before the connected GlowBit LEDs will change colour.

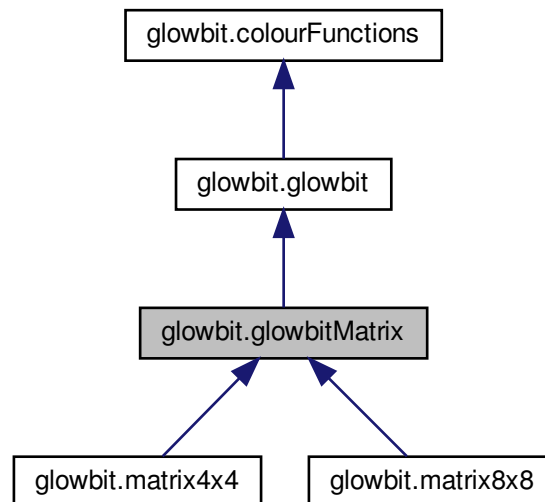
Note that several GlowBit library methods call this method unconditionally (eg: blankDisplay) or optionally (eg: by passing the update = True parameter to stick.graph1D())

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

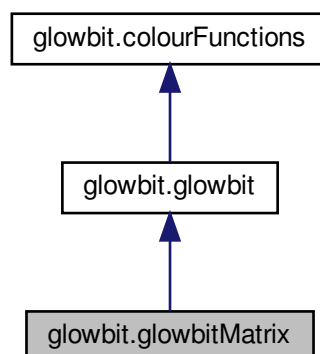
- glowbit.py

3.4 glowbit.glowbitMatrix Class Reference

Inheritance diagram for glowbit.glowbitMatrix:



Collaboration diagram for glowbit.glowbitMatrix:



Classes

- class [graph1D](#)
- class [graph2D](#)
- class [raindrop](#)

Public Member Functions

- def **pixelSetXY** (self, x, y, colour)
- def **pixelSetXYNow** (self, x, y, colour)
- def **pixelSetXYClip** (self, x, y, colour)
- def **pixelAddXY** (self, x, y, colour)
- def **pixelAddXYClip** (self, x, y, colour)
- def **getPixelXY** (self, x, y)
- def **drawLine** (self, x0, y0, x1, y1, colour)
- def **drawTriangle** (self, x0, y0, x1, y1, x2, y2, colour)
- def **drawRectangle** (self, x0, y0, x1, y1, colour)
- def **drawRectangleFill** (self, x0, y0, x1, y1, colour)
- def **drawCircle** (self, x0, y0, r, colour)
- def **updateGraph1D** (self, graph, value)
- def **updateGraph2D** (self, graph)
- def **lineDemo** (self, iters=10)
- def **fireworks** (self, iters=10)
- def **circularRainbow** (self)
- def **rain** (self, iters=1000, density=1)
- def **textDemo** (self, text="Scrolling Text Demo")
- def **bounce** (self, iters=1000)

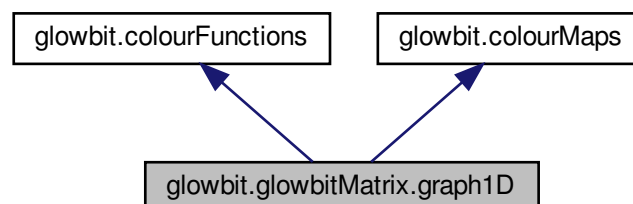
Additional Inherited Members

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

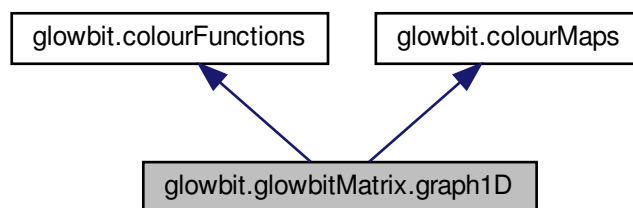
- glowbit.py

3.5 glowbit.glowbitMatrix.graph1D Class Reference

Inheritance diagram for glowbit.glowbitMatrix.graph1D:



Collaboration diagram for glowbit.glowbitMatrix.graph1D:



Public Member Functions

- `def __init__(self, originX=0, originY=7, length=8, direction="Up", minValue=0, maxValue=255, colour=0x<math>\leftarrow`

Public Attributes

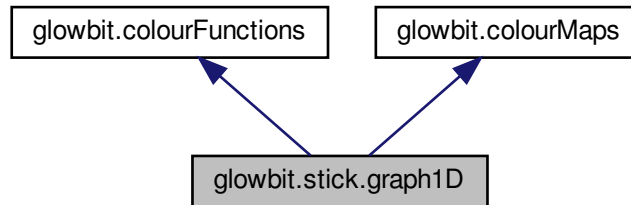
- `minValue`
- `maxValue`
- `originX`
- `originY`
- `length`
- `orientation`
- `inc`
- `m`
- `update`
- `colour`
- `colourMap`

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

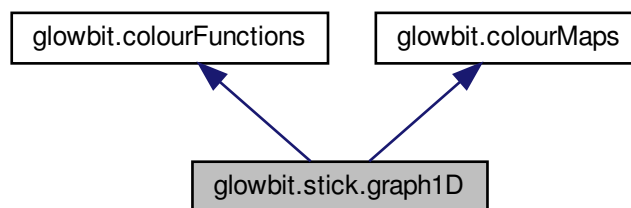
- `glowbit.py`

3.6 glowbit.stick.graph1D Class Reference

Inheritance diagram for glowbit.stick.graph1D:



Collaboration diagram for glowbit.stick.graph1D:



Public Member Functions

- `def __init__(self, minValue=0, maxValue=255, minIndex=0, maxIndex=7, colour=0xFFFFFF, colourMap="↔ Solid", update=False)`

Public Attributes

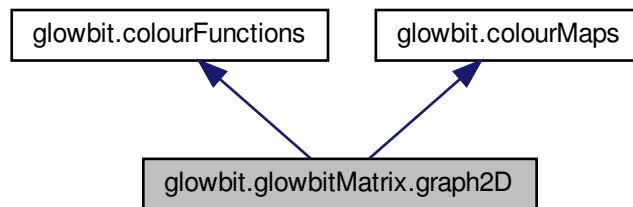
- `minValue`
- `maxValue`
- `minIndex`
- `maxIndex`
- `m`
- `offset`
- `update`
- `colour`
- `colourMap`

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

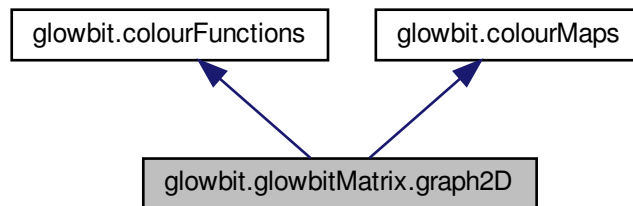
- `glowbit.py`

3.7 glowbit.glowbitMatrix.graph2D Class Reference

Inheritance diagram for glowbit.glowbitMatrix.graph2D:



Collaboration diagram for glowbit.glowbitMatrix.graph2D:



Public Member Functions

- `def __init__(self, minValue=0, maxValue=255, originX=0, originY=7, width=8, height=8, colour=0xFFFFFF, bgColour=0x000000, colourMap="Solid", update=False, filled=False, bars=False)`
- `def addData(self, value)`

Public Attributes

- `minValue`
- `maxValue`
- `originX`
- `originY`
- `width`
- `height`
- `colour`
- `bgColour`
- `update`

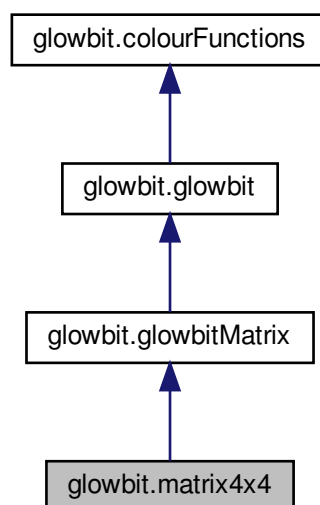
- **m**
- **offset**
- **bars**
- **data**
- **colourMap**

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

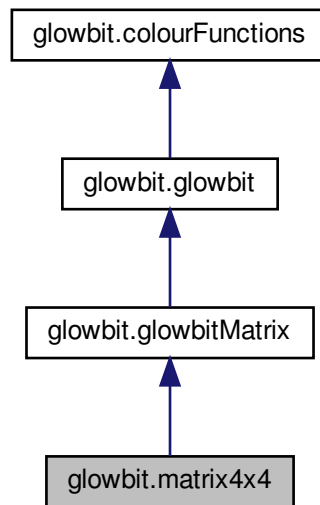
- glowbit.py

3.8 glowbit.matrix4x4 Class Reference

Inheritance diagram for glowbit.matrix4x4:



Collaboration diagram for glowbit.matrix4x4:



Public Member Functions

- `def __init__` (self, tiles=1, pin=18, brightness=20, mapFunction=None, rateLimitFPS=30, sm=0)
- `def remap4x4` (self, x, y)

Public Attributes

- `sm`
- `pixelsShow`
- `ticks_ms`
- `tiles`
- `numLEDs`
- `numLEDsX`
- `numLEDsY`
- `strip`
- `ar`
- `dimmer_ar`
- `lastFrame_ms`
- `scrollingText`
- `brightness`
- `remap`
- `rateLimit`

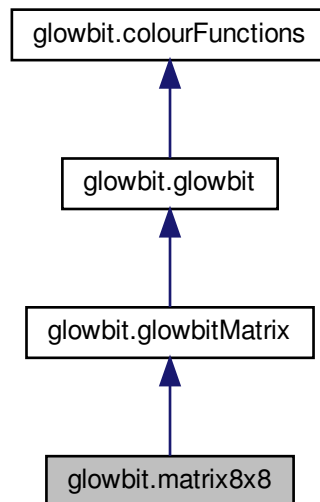
Additional Inherited Members

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

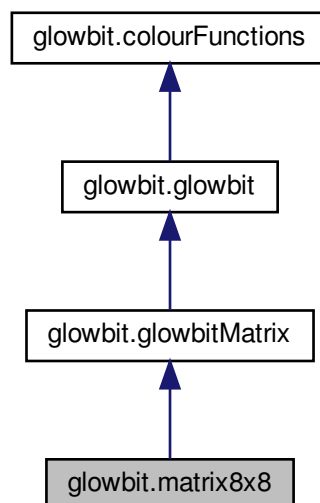
- `glowbit.py`

3.9 glowbit.matrix8x8 Class Reference

Inheritance diagram for glowbit.matrix8x8:



Collaboration diagram for glowbit.matrix8x8:



Classes

- class [textScroll](#)

Public Member Functions

- `def __init__ (self, tileRows=1, tileCols=1, pin=18, brightness=20, mapFunction=None, rateLimitFPS=-1, rateLimitCharactersPerSecond=-1, sm=0)`
- `def printTextWrap (self, string, x=0, y=0, colour=0xFFFFFF)`
- `def addTextScroll (self, string, y=0, x=0, colour=0xFFFFFF, bgColour=0x000000, update=False, blocking=False)`
- `def updateTextScroll (self)`
- `def remap8x8 (self, x, y)`
- `def drawChar (self, char, Px, Py, colour)`
- `def updateRateLimitCharactersPerSecond (self, rateLimitCharactersPerSecond)`
Changes the 8x8 matrix display's update rate in units of "characters of scrolling text per second".

Public Attributes

- `tileRows`
- `tileCols`
- `numLEDs`
- `numLEDsX`
- `numLEDsY`
- `sm`
- `pixelsShow`
- `ticks_ms`
- `strip`
- `ar`
- `dimmer_ar`
- `brightness`
- `scrollingText`
- `lastFrame_ms`
- `rateLimit`
- `scrollingTextList`
- `remap`
- `updateText`
- `update`

Additional Inherited Members

3.9.1 Member Function Documentation

3.9.1.1 updateRateLimitCharactersPerSecond()

```
def glowbit.matrix8x8.updateRateLimitCharactersPerSecond (
    self,
    rateLimitCharactersPerSecond )
```

Changes the 8x8 matrix display's update rate in units of "characters of scrolling text per second".

For example, a value of 2 would scroll 2 characters per second; leaving each character at least partly visible for 0.5 seconds.

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

- `glowbit.py`

3.10 glowbit.micropython Class Reference

Public Member Functions

- def **viper** (func)

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

- glowbit.py

3.11 glowbit.rp2.PIO Class Reference

Static Public Attributes

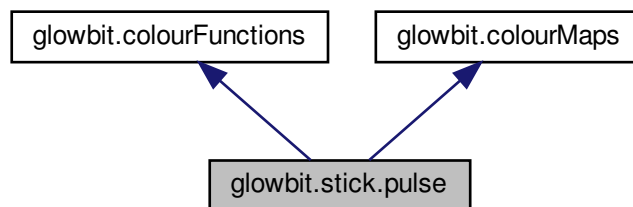
- **OUT_LOW** = None
- **SHIFT_LEFT** = None

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

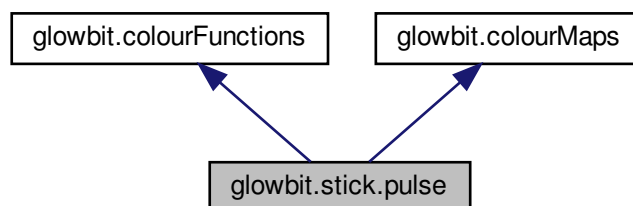
- glowbit.py

3.12 glowbit.stick.pulse Class Reference

Inheritance diagram for glowbit.stick.pulse:



Collaboration diagram for glowbit.stick.pulse:



Public Member Functions

- def **__init__** (self, speed=100, colour=0xFFFFFF, index=0, colourMap=None)
- def **update** (self)

Public Attributes

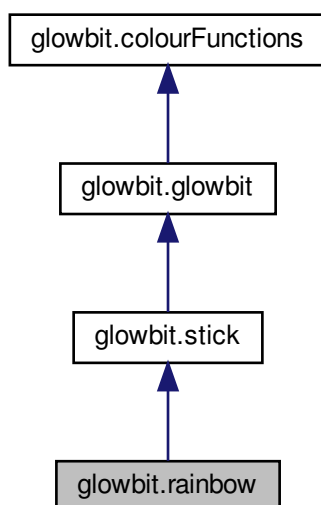
- **speed**
- **index**
- **position**
- **colour**
- **colourMap**

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

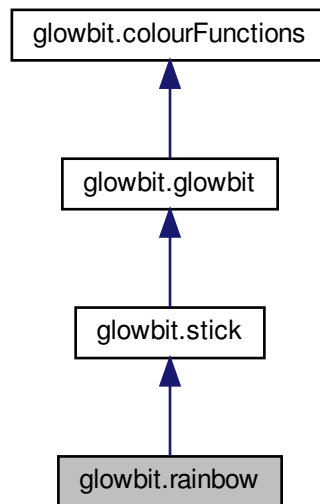
- glowbit.py

3.13 glowbit.rainbow Class Reference

Inheritance diagram for glowbit.rainbow:



Collaboration diagram for glowbit.rainbow:



Public Member Functions

- def **__init__** (self, numLEDs=13, pin=18, brightness=40, rateLimitFPS=60, sm=0)
- def **pixelSetAngle** (self, angle, colour)
- def **drawRainbow** (self, offset=0)
- def **rainbowLoop** (self)

Additional Inherited Members

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

- glowbit.py

3.14 glowbit.glowbitMatrix.raindrop Class Reference

Public Member Functions

- def **__init__** (self, x, speed)
- def **update** (self)
- def **getY** (self)

Public Attributes

- **x**
- **speed**
- **y**

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

- glowbit.py

3.15 glowbit.rp2 Class Reference

Classes

- class [PIO](#)

Public Member Functions

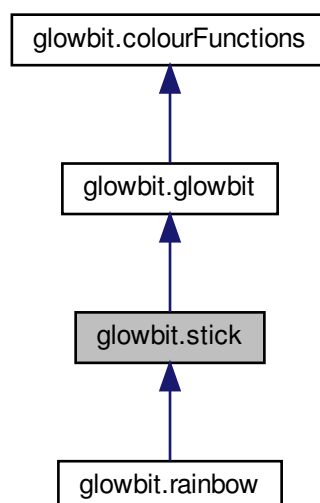
- def **asm_pio** (sideset_init, out_shiftdir, autopull, pull_thresh)

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

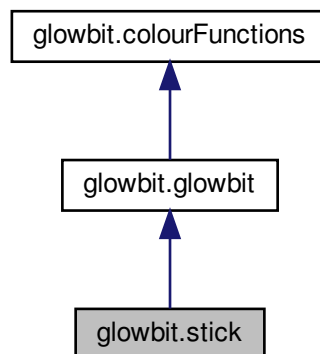
- glowbit.py

3.16 glowbit.stick Class Reference

Inheritance diagram for glowbit.stick:



Collaboration diagram for glowbit.stick:



Classes

- class [graph1D](#)
- class [pulse](#)

Public Member Functions

- def **__init__** (self, numLEDs=8, pin=18, brightness=20, rateLimitFPS=30, sm=0)
- def **addPulse** (self, speed=100, colour=[0xFFFFFF], index=0, colourMap=None)
- def **updatePulses** (self)
- def **updateGraph1D** (self, graph, value)
- def **fillSlice** (self, i=0, j=-1, colour=0xFFFFFF)
- def **pulseDemo** (self, iters=480)
- def **graphDemo** (self, iters=3)
- def **sliceDemo** (self)

Public Attributes

- **sm**
- **pixelsShow**
- **ticks_ms**
- **numLEDs**
- **strip**
- **lastFrame_ms**
- **ar**
- **dimmer_ar**
- **rateLimit**
- **brightness**
- **pulses**

Additional Inherited Members

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

- glowbit.py

3.17 glowbit.matrix8x8.textScroll Class Reference

Public Member Functions

- `def __init__(self, string, y=0, x=0, colour=0xFFFFFF, bgColour=0)`

Public Attributes

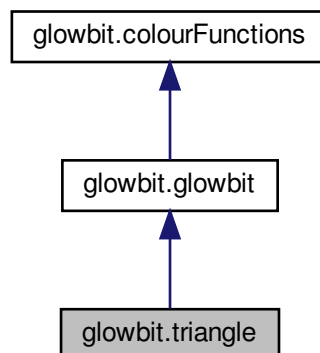
- `x`
- `y`
- `colour`
- `bgColour`
- `string`

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

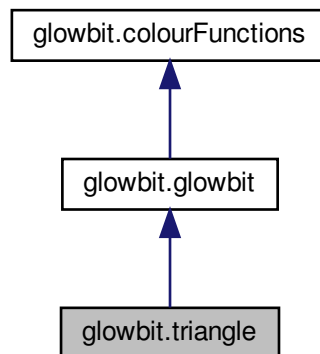
- glowbit.py

3.18 glowbit.triangle Class Reference

Inheritance diagram for glowbit.triangle:



Collaboration diagram for glowbit.triangle:



Public Member Functions

- `def __init__ (self, numTris=1, pin=18, brightness=20, rateLimitFPS=-1, sm=0, LEDsPerTri=6)`
- `def fillTri (self, tri, colour)`

Public Attributes

- `sm`
- `pixelsShow`
- `ticks_ms`
- `LEDsPerTri`
- `numLEDs`
- `numTris`
- `strip`
- `ar`
- `dimmer_ar`
- `rateLimit`
- `brightness`
- `lastFrame_ms`

Additional Inherited Members

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

- `glowbit.py`

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 - glowbit::colourMaps, [7](#)
- colourMapSolid
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