userreference

User Reference Manual

Featured

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User Reference Manual

begin

- C++ Prototype

```
uint8_t U8GLIB::begin(void)
```

- C Prototype

```
uint8_t u8g_Begin(u8g_t *u8g)
```

- Description

  Reset display and put it into default state.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

  0, if the init procedure fails.

- Use:

  Outside picture loop.

- Note: Available with v1.11.
- Example:
- See also: U8GLIB

disableCursor

- C++ Prototype

```
void U8GLIB::disableCursor(void)
```

- C Prototype

```
void u8g_DisableCursor(u8g_t *u8g)
```

- Description

  Disable the cursor. The cursor will not be visible.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:
- Use:

Outside picture loop.

- Note:
- Example:
- See also: enableCursor, setCursorColor, setCursorFont, setCursorPos, setCursorStyle

drawBitmap

drawBitmapP

- C++ Prototype

```
void U8GLIB::drawBitmap(u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, u8g_uint_t h, const uint8_t *bitmap)
void U8GLIB::drawBitmapP(u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, u8g_uint_t h, const u8g_pgm_uint8_t *bitmap)
```

- C Prototype

```
void u8g_DrawBitmap(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, u8g_uint_t h, const uint8_t *bitmap)
void u8g_DrawBitmapP(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, u8g_uint_t h, const u8g_pgm_uint8_t *b:
```

- Description

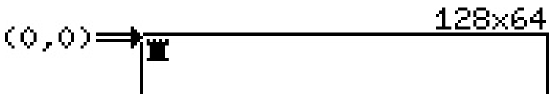
  Draw a bitmap at the specified x/y position (upper left corner of the bitmap). Parts of the bitmap may be outside the display boundaries. The bitmap is specified by the array `bitmap`. A cleared bit means: Do not draw a pixel. A set bit inside the array means: Write pixel with the current color index. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - x: X-position (left position of the bitmap).
  - y: Y-position (upper position of the bitmap).
  - `cnt`: Number of bytes of the bitmap in horizontal direction. The width of the bitmap is `cnt*8`.
  - h: Height of the bitmap.
- Returns:
- Use:

  Inside picture loop.

- Note:
- Example:

```
U8GLIB_PCD8544 u8g(13, 11, 10, 9, 8);                   // SPI communication: SCK = 13, MOSI = 11, CS = 10, A0 = 9,

const uint8_t rook_bitmap[] U8G_PROGMEM = {
  0x00,         // 00000000
  0x55,         // 01010101
  0x7f,          // 01111111
  0x3e,         // 00111110
  0x3e,         // 00111110
  0x3e,         // 00111110
  0x3e,         // 00111110
  0x7f           // 01111111
};

void draw(void) {
  // graphic commands to redraw the complete screen should be placed here
  u8g.drawBitmapP( 0, 0, 1, 8, rook_bitmap);
}

void setup(void) {
}

void loop(void) {
  // picture loop
  u8g.firstPage();
  do {
    draw();
  } while( u8g.nextPage() );

  // rebuild the picture after some delay
  delay(1000);
}
```



- See also: setColorIndex drawXBM

drawBox

- C++ Prototype

```
void U8GLIB::drawBox(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h)
```

- C Prototype

```
void u8g_DrawBox(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h)
```

- Description

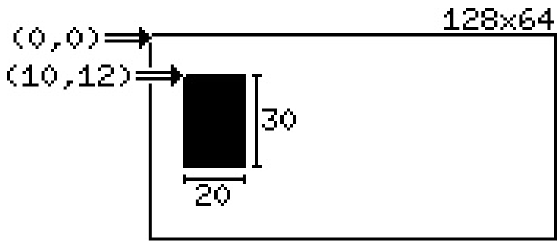
  Draw a box (filled frame), starting at x/y position (upper left edge). The box has width w and height h. Parts of the box can be outside of the display boundaries. This procedure uses the current color index to draw the box. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position of upper left edge.
  - y: Y-position of upper left edge.
  - w: Width of the box.
  - h: Height of the box.
- Returns:
- Use:

  Inside picture loop.

- Note:
- Example:

```
U8GLIB u8g(...)
...
u8g.drawBox(10,12,20,30);
```



- See also: setColorIndex, drawFrame

drawCircle

- C++ Prototype

```
void U8GLIB::drawCircle(u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rad, uint8_t opt = U8G_DRAW_ALL)
```

- C Prototype

```
void u8g_DrawCircle(u8g_t *u8g, u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rad, uint8_t opt)
```

- Description

  Draw a circle with radus rad at position (x0, y0). The diameter of the circle is 2*rad+1 Depending on opt, it is possible to draw only some sections of the circle. Possible values for opt are: U8G_DRAW_UPPER_RIGHT, U8G_DRAW_UPPER_LEFT, U8G_DRAW_LOWER_LEFT, U8G_DRAW_LOWER_RIGHT, U8G_DRAW_ALL. These values can be combined with the | operator.

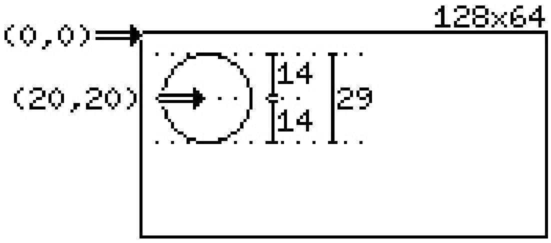
- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x0, y0: Position of the center of the circle.
  - rad: Defines the size of the circle: Radus = rad.
  - opt: Selects some or all sections of the circle.

        - U8G_DRAW_UPPER_RIGHT
        - U8G_DRAW_UPPER_LEFT
        - U8G_DRAW_LOWER_LEFT
        - U8G_DRAW_LOWER_RIGHT
        - U8G_DRAW_ALL
- Returns:
- Use:

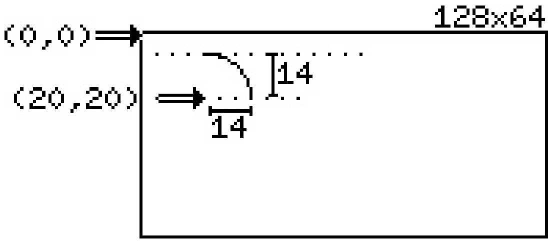
    Inside picture loop.

- Note: Available with v1.02
- Example:

```
u8g.drawCircle(20, 20, 14);
```



```
u8g.drawCircle(20, 20, 14, U8G_DRAW_UPPER_RIGHT);
```



- See also: drawDisc

drawDisc

- C++ Prototype

    ```
    void U8GLIB::drawDisc(u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rad, uint8_t opt = U8G_DRAW_ALL)
    ```

- C Prototype

    ```
    void u8g_DrawDisc(u8g_t *u8g, u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rad, uint8_t opt)
    ```

- Description

    Draw a filled circle with radus rad at position (x0, y0). The diameter of the circle is 2*rad+1 Depending on opt, it is possible to draw only some sections of the disc. Possible values for opt are: U8G_DRAW_UPPER_RIGHT, U8G_DRAW_UPPER_LEFT, U8G_DRAW_LOWER_LEFT, U8G_DRAW_LOWER_RIGHT, U8G_DRAW_ALL. These values can be combined with the | operator.

- Arguments:
    - u8g : Pointer to the u8g structure (C interface only).
    - x0, y0: Position of the center of the filled circle.
    - rad: Defines the size of the disc: Radus = rad.
    - opt: Selects some or all sections of the circle.
        - U8G_DRAW_UPPER_RIGHT
        - U8G_DRAW_UPPER_LEFT
        - U8G_DRAW_LOWER_LEFT
        - U8G_DRAW_LOWER_RIGHT
        - U8G_DRAW_ALL
- Returns:
- Use:

    Inside picture loop.

- Note: Available with v1.02

- Example: See drawCircle
- See also: drawCircle

drawEllipse

- C++ Prototype

```
void U8GLIB::drawEllipse(u8g_t *u8g, u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rx, u8g_uint_t ry, uint8_t opt)
```

- C Prototype

```
void u8g_DrawEllipse(u8g_t *u8g, u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rx, u8g_uint_t ry, uint8_t opt)
```

- Description

  Draw ellipse with radus `rx` and 'ry' at position `(x0, y0)`. `rx*ry` must be lower than 1024 in 8 Bit mode of u8glib. Depending on `opt`, it is possible to draw only some sections of the disc. Possible values for `opt` are: `U8G_DRAW_UPPER_RIGHT`, `U8G_DRAW_UPPER_LEFT`, `U8G_DRAW_LOWER_LEFT`, `U8G_DRAW_LOWER_RIGHT`, `U8G_DRAW_ALL`. These values can be combined with the `|` operator.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `x0`, `y0`: Position of the center of the filled circle.
  - `rx`, `rx`: Defines the size of the ellipse.
  - `opt`: Selects some or all sections of the ellipse.
    - `U8G_DRAW_UPPER_RIGHT`
    - `U8G_DRAW_UPPER_LEFT`
    - `U8G_DRAW_LOWER_LEFT`
    - `U8G_DRAW_LOWER_RIGHT`
    - `U8G_DRAW_ALL`
- Returns:
- Use:

  Inside picture loop.

- Note: Available with v1.14
- See also: drawCircle

drawFilledEllipse

- C++ Prototype

```
void U8GLIB::drawFilledEllipse(u8g_t *u8g, u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rx, u8g_uint_t ry, uint8_t opt)
```

- C Prototype

```
void u8g_DrawFilledEllipse(u8g_t *u8g, u8g_uint_t x0, u8g_uint_t y0, u8g_uint_t rx, u8g_uint_t ry, uint8_t opt)
```

- Description

  Draw a filled ellipse with radus `rx` and 'ry' at position `(x0, y0)`. `rx*ry` must be lower than 1024 in 8 Bit mode of u8glib. Depending on `opt`, it is possible to draw only some sections of the disc. Possible values for `opt` are: `U8G_DRAW_UPPER_RIGHT`, `U8G_DRAW_UPPER_LEFT`, `U8G_DRAW_LOWER_LEFT`, `U8G_DRAW_LOWER_RIGHT`, `U8G_DRAW_ALL`. These values can be combined with the `|` operator.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `x0`, `y0`: Position of the center of the filled circle.
  - `rx`, `rx`: Defines the size of the ellipse.
  - `opt`: Selects some or all sections of the ellipse.
    - `U8G_DRAW_UPPER_RIGHT`
    - `U8G_DRAW_UPPER_LEFT`
    - `U8G_DRAW_LOWER_LEFT`
    - `U8G_DRAW_LOWER_RIGHT`
    - `U8G_DRAW_ALL`
- Returns:
- Use:

  Inside picture loop.

- Note: Available with v1.14
- See also: drawCircle

drawFrame

- C++ Prototype

```
void U8GLIB::drawFrame(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h)
```

- C Prototype

```
void u8g_DrawFrame(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h)
```

- Description

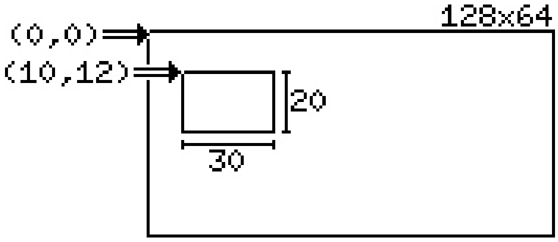
  Draw a frame, starting at x/y position (upper left edge). The frame has width w and height h. Parts of the frame can be outside of the display boundaries. This procedure uses the current color index to draw the lines of the frame. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position of upper left edge.
  - y: Y-position of upper left edge.
  - w: Width of the frame.
  - h: Height of the frame.
- Returns:
- Use:

  Inside picture loop.

- Note:
- Example:

```
U8GLIB u8g(...)
...
u8g.drawFrame(10,12,30,20);
```



- See also: setColorIndex, drawBox

drawHLine

- C++ Prototype

```
void U8GLIB::drawHLine(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w)
```

- C Prototype

```
void u8g_DrawHLine(u8g_t *u8g, uint8_t x, uint8_t y, u8g_uint_t w)
```

- Description

  Draw a horizontal line, starting at x/y position (left edge). The width of the line is w pixels. Parts of the line can be outside of the display boundaries. This procedure uses the current color index to draw the line. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position.
  - y: Y-position.
  - w: Width of the horizontal line.
- Returns:

- Use:

  Inside picture loop.

- Note:
- Example:
- See also: setColorIndex, drawVLine

drawLine

- C++ Prototype

```
void U8GLIB::drawLine(u8g_uint_t x1, u8g_uint_t y1, u8g_uint_t x2, u8g_uint_t y2)
```

- C Prototype

```
void u8g_DrawLine(u8g_t *u8g, u8g_uint_t x1, u8g_uint_t y1, u8g_uint_t x2, u8g_uint_t y2)
```

- Description

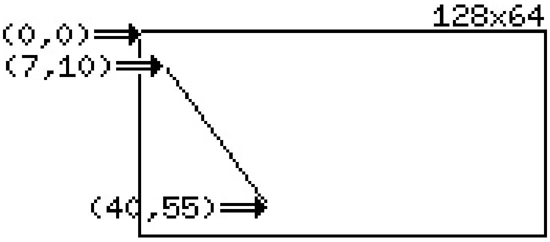
  Draw a line from (x1, y1) to (x2, y2). There are no restrictions on the start end end position. This procedure uses the current color index to draw the line. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x1, y1: Start position.
  - x2, y2: End position.
- Returns:
- Use:

  Inside picture loop.

- Note: Available in v1.03.
- Example:

```
u8g.drawLine(7, 10, 40, 55);
```



- See also: setColorIndex, drawVLine drawHLine

drawPixel

- C++ Prototype

```
void U8GLIB::drawPixel(uint8_t x, uint8_t y)
```

- C Prototype

```
void u8g_DrawPixel(u8g_t *u8g, uint8_t x, uint8_t y)
```

- Description

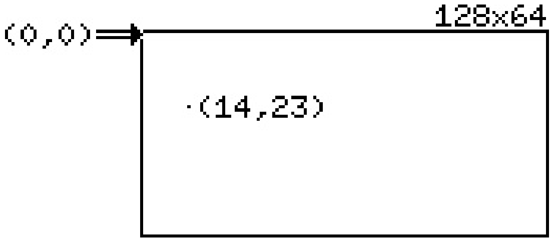
  Draw a pixel at the specified x/y position. Position (0,0) is at the upper left corner of the display. The position may be outside the display boundaries. This procedure uses the current color index to draw the pixel. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position.
  - y: Y-position.
- Returns:
- Use:

Inside picture loop.

- Note:
- Example:

```
U8GLIB u8g(...)
...
u8g.drawPixel(14,23);
```



- See also: setColorIndex

drawRBox

drawRFrame

- C++ Prototype

```
void U8GLIB::drawRBox(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, u8g_uint_t r)
void U8GLIB::drawRFrame(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, u8g_uint_t r)
```

- C Prototype

```
void u8g_DrawRBox(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, u8g_uint_t r)
void u8g_DrawRFrame(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, u8g_uint_t r)
```

- Description

Draw a box/frame with round edges, starting at x/y position (upper left edge). The box/frame has width w and height h. Parts of the box can be outside of the display boundaries. Edges have radius r. It is required that w >= 2*(r+1) and h >= 2*(r+1). This condition is not checked. Behavior is undefined if w or h is smaller than 2*(r+1). This procedure uses the current color index to draw the box. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position of upper left edge.
  - y: Y-position of upper left edge.
  - w: Width of the box.
  - h: Height of the box.
  - r: Radius for the four edges.
- Returns:
- Use:

Inside picture loop.

- Note: Available with v1.09
- Note:
- See also: setColorIndex, drawFrame drawBox

drawStr

drawStr90

drawStr180

drawStr270

drawStrP

drawStr90P

drawStr180P

drawStr270P

- C++ Prototype

```
u8g_uint_t U8GLIB::drawStr(u8g_uint_t x, u8g_uint_t y, const char *s)
u8g_uint_t U8GLIB::drawStr90(u8g_uint_t x, u8g_uint_t y, const char *s)
u8g_uint_t U8GLIB::drawStr180(u8g_uint_t x, u8g_uint_t y, const char *s)
u8g_uint_t U8GLIB::drawStr270(u8g_uint_t x, u8g_uint_t y, const char *s)
u8g_uint_t U8GLIB::drawStrP(u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s)
u8g_uint_t U8GLIB::drawStr90P(u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s)
u8g_uint_t U8GLIB::drawStr180P(u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s)
u8g_uint_t U8GLIB::drawStr270P(u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s)
```

- C Prototype

```
u8g_uint_t u8g_DrawStr(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const char *s);
u8g_uint_t u8g_DrawStr90(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const char *s);
u8g_uint_t u8g_DrawStr180(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const char *s);
u8g_uint_t u8g_DrawStr270(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const char *s);
u8g_uint_t u8g_DrawStrP(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s);
u8g_uint_t u8g_DrawStr90P(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s);
u8g_uint_t u8g_DrawStr180P(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s);
u8g_uint_t u8g_DrawStr270P(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, const u8g_pgm_uint8_t *s);
```

- Description

  Draws a string at the specified x/y position. The x/y position is the lower left corner of the first character of the string. It is required to assign a font with the setFont procedure before the first call to this procedure. This procedure also uses the current color index to draw the characters. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel. The (x,y) arguments are influenced by the reference point calculation mode (`setFontPosBaseline`). 'P' variant: `s` is assumed to point to a string in PROGMEM area. '90', '180', '270' variants: Rotate string output by 90, 180 or 270 degree.

- Arguments:
  - `u8g` : Pointer to the u8g structure (C interface only).
  - x: X-position.
  - y: Y-position.
  - s: A pointer to a C-string (terminated with `\0`).

- Returns:

  The width of the string `s` in pixel.

- Use:

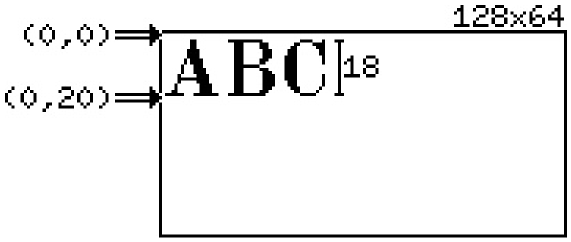
  Inside picture loop.

- Note:

  The C++ Arduino environment also offers the more powerful print procedure.

- Example:

```
U8GLIB u8g(...)
...
u8g.setFont(u8g_font_osb18);
u8g.drawStr(0, 20, "ABC");
```



  - The reference point (0,20) for the origin of the text string usually is one pixel below the lower left edge of the first character.
  - The height of the uppercase letters is shown in the font overview bitmap (in this example 18, see here).
  - In some cases the size of the uppercase letters is also part of the font name.

- See also: setColorIndex, setFont setFontPosBaseline print

drawTriangle

- C++ Prototype

```
void U8GLIB::drawTriangle(uint16_t x0, uint16_t y0, uint16_t x1, uint16_t y1, uint16_t x2, uint16_t y2)
```

- C Prototype

```
void u8g_DrawTriangle(u8g_t *u8g, uint16_t x0, uint16_t y0, uint16_t x1, uint16_t y1, uint16_t x2, uint16_t y2)
```

- Description

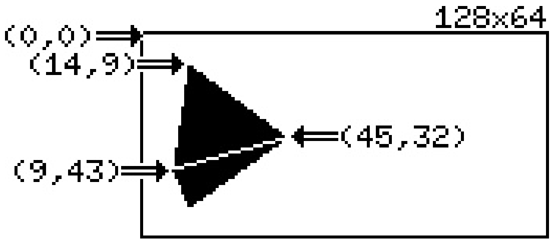
  Draw a triangle (filled polygon). Arguments are 16 bit and the polygon is clipped to the size of the display. Multiple polygons are drawn so that they exactly match without overlap: The left side of a polygon is drawn, the right side is not draw. The upper side is only draw if it is flat. In the example picture below, the pixel at (9,43) is drawn by the polygon procedures, but pixels (14,9) and (45,32) are not drawn.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x0: X-position point 0.
  - y0: Y-position point 0.
  - x1: X-position point 1.
  - y1: Y-position point 1.
  - x2: X-position point 2.
  - y2: Y-position point 2.
- Returns:
- Use:

  Inside picture loop.

- Note: Available with v1.15
- Example:

```
U8GLIB u8g(...)
...
u8g.drawTriangle(14,9, 45,32, 9,42);
u8g.drawTriangle(14,55, 45,33, 9,43);
```



- See also: setColorIndex

drawVLine

- C++ Prototype

```
void U8GLIB::drawVLine(u8g_uint_t x, u8g_uint_t y, u8g_uint_t h)
```

- C Prototype

```
void u8g_DrawVLine(u8g_t *u8g, uint8_t x, uint8_t y, u8g_uint_t h)
```

- Description

  Draw a vertical line, starting at x/y position (upper edge). The height of the line is h pixels. Parts of the line can be outside of the display boundaries. This procedure uses the current color index to draw the line. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position.
  - y: Y-position.
  - h: Height of the horizontal line.
- Returns:

- Use:

  Inside picture loop.

- Note:
- Example:
- See also: setColorIndex, drawHLine

drawXBM

drawXBMP

- C++ Prototype

```
void U8GLIB::drawXBM(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const uint8_t *bitmap)
void U8GLIB::drawXBMP(u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const u8g_pgm_uint8_t *bitmap)
```

- C Prototype

```
void u8g_DrawXBM(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const uint8_t *bitmap)
void u8g_DrawXBMP(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const u8g_pgm_uint8_t *bitmap
```

- Description

  Draw a XBM Bitmap. Position (x,y) is the upper left corner of the bitmap. XBM contains monochrome, 1-bit bitmaps. This procedure only draws pixel values 1. The current color index is used for drawing (see setColorIndex). Pixel with value 0 are not drawn (transparent).

Many tools can save a bitmap as XBM. The result will look like this example:

```
#define u8g_logo_width 38
#define u8g_logo_height 24
static unsigned char u8g_logo_bits[] = {
   0xff, 0xff, 0xff, 0xff, 0x3f, 0xff, 0xff, 0xff, 0xff, 0x3f, 0xe0, 0xe0,
...
   0xff, 0x3f, 0xff, 0xff, 0xff, 0xff, 0x3f, 0xff, 0xff, 0xff, 0xff, 0x3f };
```

This could can be copied directly into your code. Use `drawXBM` to draw this bitmap at (0,0):

```
u8g.drawXBM( 0, 0, u8g_logo_width, u8g_logo_height, u8g_logo_bits);
```

In most cases it is better to place the bitmap into AVR PROGMEM area. Add the `U8G_PROGMEM` after the array definition before the init sequence:

```
static unsigned char u8g_logo_bits[] U8G_PROGMEM = {
```

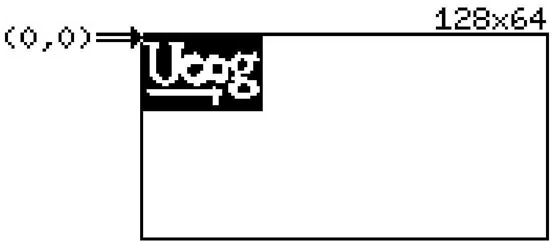
With this modification call the `drawXBMP` variant:

```
u8g.drawXBMP( 0, 0, u8g_logo_width, u8g_logo_height, u8g_logo_bits);
```

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `x`: X-position.
  - `y`: Y-position.
  - `w`: Width of the bitmap.
  - `h`: Height of the bitmap.
  - `bitmap`: Pointer to the start of the bitmap.
- Returns:
- Use:

  Inside picture loop.

- Note:
- Example:



- See also: setColorIndex, drawBitmap

enableCursor

- C++ Prototype

```
void U8GLIB::enableCursor(void)
```

- C Prototype

```
void u8g_EnableCursor(u8g_t *u8g)
```

- Description

  Enable the cursor at the specified position.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:
- Use:

  Outside picture loop.

- Note:
- Example:
- See also: disableCursor, setCursorColor, setCursorFont, setCursorPos, setCursorStyle

firstPage

- C++ Prototype

```
void U8GLIB::firstPage(void)
```

- C Prototype

```
void u8g_FirstPage(u8g_t *u8g)
```

- Description

  A call to this procedure, marks the beginning of the picture loop.

- Arguments:
- Returns:
- Use:

  This procedure call starts the picture loop; it cannot be used inside the picture loop. Picture loops cannot be nested.

- Note:
- Example:
- See also: nextPage

getColorIndex

- C++ Prototype

```
uint8_t U8GLIB::getColorIndex(void)
```

- C Prototype

```
uint8_t u8g_GetColorIndex(u8g_t *u8g)
```

- Description

  The current "color index" is used by all "draw" procedures to set a pixel value on the display. This procedure returns the current value, which has been set as current color index.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

Value, which is used by the "draw" procedures as a pixel value.

- Use:

  Inside and outside picture loop.

- Note:
- Example:
- See also: drawPixel setColorIndex

getFontAscent

- C++ Prototype

```
u8g_int_t U8GLIB::getFontAscent(void)
```

- C Prototype

```
u8g_int_t u8g_GetFontAscentu8g_t *u8g)
```

- Description

  Returns the reference height of the glyphs above the baseline (ascent). This value depends on the current reference height (see setFontRefHeightAll).

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

  The ascent of the current font.

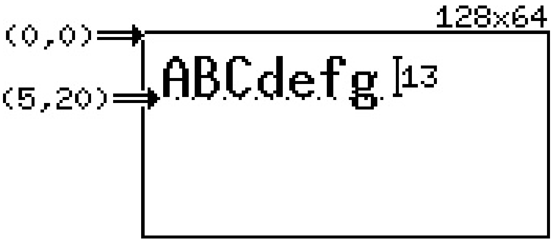
- Use:

  Inside and outside picture loop.

- Note:
- Example:

  For u8g_font_10x20 the ascent is 13.

```
  u8g_SetFont(u8g, u8g_font_10x20);
  u8g_DrawStr(u8g, 5, 20, "ABCdefg");
  a = u8g_GetFontAscent(u8g);
```



The dotted line shows the baseline of the string. The string itself is above the baseline. The reference point for the string (5, 20) is exactly on the baseline. The ascent is the number of pixels of the highest glyph above baseline. To calculate the y position which is above the largest glyph, use baseline_y_pos-u8g_GetFontAscent(u8g)-1.

- See also: setFont getFontDescent setFontRefHeightAll

getFontDescent

- C++ Prototype

```
u8g_int_t U8GLIB::getFontDescent(void)
```

- C Prototype

```
u8g_int_t u8g_GetFontDescent(u8g_t *u8g)
```

- Description

  Returns the reference height of the glyphs below the baseline (descent).

- Arguments:

  - u8g : Pointer to the u8g structure (C interface only).

- Returns:

  The descent of the current font.

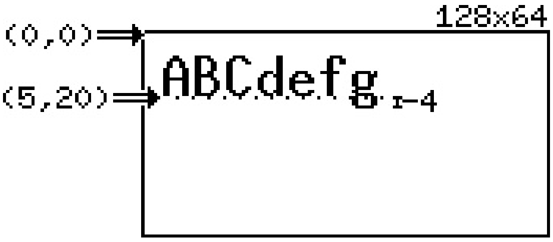
- Use:

  Inside and outside picture loop.

- Note:
- Example:

  For u8g_font_10x20 the descent is -4.

```
u8g_SetFont(u8g, u8g_font_10x20);
u8g_DrawStr(u8g, 5, 20, "ABCdefg");
d = u8g_GetFontDescent(u8g);
```



The dotted line shows the baseline of the string. The string itself is above the baseline. The reference point for the string (5, 20) is exactly on the baseline. The ascent is the number of pixels of the highest glyph above baseline. To calculate the y position which is below the glyph with the highest descent, use baseline_y_pos-u8g_GetFontDescent(u8g).

- See also: setFont getFontAscent

getFontLineSpacing

- C++ Prototype

```
u8g_int_t U8GLIB::getFontLineSpacing(void)
```

- C Prototype

```
u8g_int_t u8g_getFontLineSpacing(u8g_t *u8g)
```

- Description

  Returns the vertical distance of two lines of text, written with the current font. This value is derived from the ascent and descent value and multiplied with the current LineSpacingFactor. The returned value is influenced by the current font, the "Reference Height" and the LineSpacingFactor.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

  The distance of two lines (pixel).

- Use:

  Inside and outside picture loop.

- Note:
- See also: setFont getFontAscent getFontDescent setFontRefHeightAll setLineSpacingFactor

getHeight

- C++ Prototype

```
u8g_uint_t U8GLIB::getHeight(void)
```

- C Prototype

```
u8g_uint_t u8g_GetHeight(u8g_t *u8g)
```

- Description

  Returns the height of the display.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

  The height of the display.

- Use:

  Inside and outside picture loop.

- Note:
- Example:
- See also: getWidth

getMode

- C++ Prototype

```
uint8_t U8GLIB::getMode(void)
```

- C Prototype

```
uint8_t u8g_GetMode(u8g_t *u8g)
```

- Description

  Returns information about the display (display mode). The result of this procedure can be used to extract the number of bits per pixel:

  ```
  U8G_MODE_GET_BITS_PER_PIXEL(mode)
  ```

  Predefined modes are:

  - U8G_MODE_BW: black/white monochrome mode with 1 bit per pixel
  - U8G_MODE_GRAY2BIT: Graylevel mode with 2 bit per pixel
- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

  The current display mode.

- Use:

  Inside and outside picture loop.

- Note:
- Example:
- See also:

getWidth

- C++ Prototype

```
u8g_uint_t U8GLIB::getWidth(void)
```

- C Prototype

```
u8g_uint_t u8g_GetWidth(u8g_t *u8g)
```

- Description

  Returns the width of the display.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns:

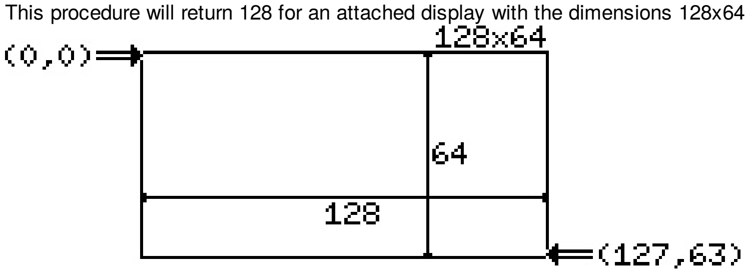
  The width of the display.

- Use:

Inside and outside picture loop.

- Note:
- Example:

This procedure will return 128 for an attached display with the dimensions 128x64.



- See also: getHeight

getStrWidth

- C++ Prototype

```
u8g_uint_t U8GLIB::getStrWidth(const char *s)
u8g_uint_t U8GLIB::getStrWidthP(const u8g_pgm_uint8_t *s)
```

- C Prototype

```
u8g_uint_t u8g_GetStrWidth(u8g_t *u8g, const char *s)
u8g_uint_t u8g_GetStrWidthP(u8g_t *u8g, const u8g_pgm_uint8_t *s)
```

- Description

Returns the width of the string "s", based on the current font.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - s : Pointer to a string.
- Returns:

The width of the string.

- Use:

Inside the picture loop.

- Note:
- Example: See Tutorial Font and String Handling
- See also: setFont

InitSPI, InitHWSPI, Init8Bit InitComFn

- C Prototype

```
uint8_t u8g_InitSPI(u8g_t *u8g, u8g_dev_t *dev, uint8_t sck, uint8_t mosi, uint8_t cs, uint8_t a0, uint8_t reset);
uint8_t u8g_InitHWSPI(u8g_t *u8g, u8g_dev_t *dev, uint8_t cs, uint8_t a0, uint8_t reset);
uint8_t u8g_Init8Bit(u8g_t *u8g, u8g_dev_t *dev, uint8_t d0, uint8_t d1, uint8_t d2, uint8_t d3, uint8_t d4, uint8_
  uint8_t en, uint8_t cs1, uint8_t cs2, uint8_t di, uint8_t rw, uint8_t reset);
uint8_t u8g_InitComFn(u8g_t *u8g, u8g_dev_t *dev, u8g_com_fnptr com_fn);
```

- Description

For the C-Interface only: Create a new interface to a graphics display. This procedure must be called before calling any other C-procedure. The dev argument describes the type of the display. See here for a complete list of available devices. u8g_InitComFn will be the default init precedure for the ARM plattfrom. It requires a specific low level procedure for the ARM controller. An examples for this procedure is here for the LPC1114 (end of u8g_arm.c). A more detailed description of the communication procedure can be found here: INSTALL

- Arguments:
  - dev: A pointer to a device structure.
  - Arduino pins: Required pins to connect the display depending on the communication interface.
  - reset: The reset pin is optional and can be U8G_PIN_NONE
  - com_fn: A procedure that handles low level access to the display.
- Returns:

- Use:

  Outside picture loop.

- Note: `u8g_InitComFn` is avialble with `v1.14`.
- Example:
- See also: List of supported devices, U8GLIB C++ Constructor

nextPage

- C++ Prototype

```
uint8_t U8GLIB::nextPage(void)
```

- C Prototype

```
uint8_t u8g_NextPage(u8g_t *u8g)
```

- Description

  A call to this procedure, marks the end of the body of the picture loop.

- Arguments:
- Returns:

  0, if the picture loop has been finished, 1 if another redraw of the picture is required.

- Use:

  This procedure call marks the body of the picture loop, it can not be used inside the picture loop (Picture loops can not be nested).

- Note:

  This procedure will not reset or modify any internal values (like the draw color or the current font). The font settings and draw properties at the end of the body of the picture loop are still the same when the body of the picture loop is started again. Usually it is a good idea to set such properties at the beginning of the body of the picture loop.

- Example:
- See also: firstPage Picture Loop

print

- C++ Prototype

```
U8GLIB::print(...)
```

- C Prototype
- Description

  A call to the print procedure of the `Print` base class. See the documentation on the Arduino web page: http://arduino.cc/en/Serial/Print. `print()` behaves similar to `drawStr`. All font settings also apply to this procedure. All strings and values passed to the `print` procedure are written to the "print position". The "print position" can be set via setPrintPos.

- Arguments: See http://arduino.cc/en/Serial/Print
- Returns: See http://arduino.cc/en/Serial/Print
- Use:

  Inside the picture loop.

- Note:
- Example:
- See also: setPrintPos drawStr

setColorIndex

- C++ Prototype

```
void U8GLIB::setColorIndex(uint8_t color_index)
```

- C Prototype

```
void u8g_SetColorIndex(u8g_t *u8g, uint8_t color_index)
```

- Description

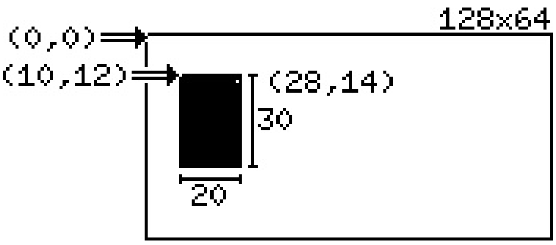
  The current "color index" is used by all "draw" procedures to set a pixel value on the display. For a monochrome display, the color index 0 will usually clear a pixel and the color index 1 will set a pixel. For a display which supports gray levels, this procedure sets the gray level for drawing.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `color_index`: Value, which is used by the "draw" procedures as a pixel value.
- Returns:
- Use:

  Inside and outside picture loop. It is a good practice to use this procedure at the beginning of the body of the picture loop.

- Note:
- Example:

```
U8GLIB u8g(...)
...
u8g.setColorIndex(1);
u8g.drawBox(10, 12, 20, 30);
u8g.setColorIndex(0);
u8g.drawPixel(28, 14);          // clear pixel at (28, 14)
```



- See also: drawPixel getColorIndex setDefaultBackgroundColor

setContrast

- C++ Prototype

```
uint8_t U8GLIB::setContrast(uint8_t contast)
```

- C Prototype

```
uint8_t u8g_SetContrast(u8g_t *u8g, uint8_t contast)
```

- Description

  Assigns a new contrast value (0..255) to the display. Not all displays or driver support the setting of the contrast value (see devices table).

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `contrast`: New contrast value (0..255).
- Returns:

  The value 1, if the contrast value has been assigned.

- Use:

  Inside and outside picture loop. It is a good practice to use this procedure not inside the picture loop.

- Note: Available with v1.02
- Example:
- See also: Device Table

setCursorColor

- C++ Prototype

```
void U8GLIB::setCursorColor(uint8_t fg, uint8_t bg)
```

- C Prototype

```
void u8g_SetCursorColor(u8g_t *u8g, uint8_t fg, uint8_t bg)
```

- Description

  Assign the foreground and background color index for the cursor.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - fg: Foreground color index.
  - bg: Background color index.
- Returns:
- Use:

  Outside picture loop.

- Note:
- Example:
- See also: enableCursor

setCursorFont

- C++ Prototype

```
void U8GLIB::setCursorFont(const u8g_pgm_uint8_t *font)
```

- C Prototype

```
void u8g_SetCursorFont(u8g_t *u8g, const u8g_pgm_uint8_t *font)
```

- Description

  Set the cursor font (see note below). The cursor shape can be selected from this font.

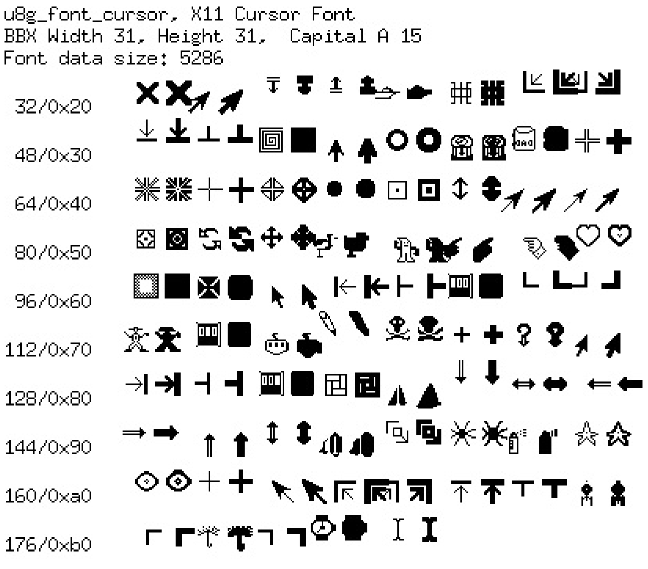
- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - font: A pointer to the font data with cursor shapes.
- Returns:
- Use:

  Outside picture loop.

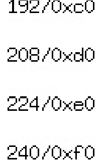
- Note:

  The following cursor fonts are available:

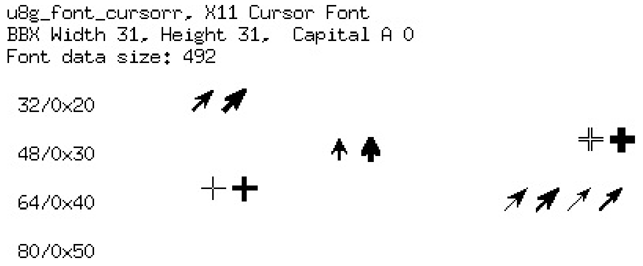
u8g_font_cursor



u8g_font_cursor, X11 Cursor Font
BBX Width 31, Height 31, Capital A 15
Font data size: 5286



u8g_font_cursorr, reduced number of cursor shapes, uses less memory.


u8g_font_cursorr, X11 Cursor Font
BBX Width 31, Height 31, Capital A 0
Font data size: 492
32/0x20
48/0x30
64/0x40
80/0x50

- Example:
- See also: setCursorStyle, enableCursor

setCursorPos

- C++ Prototype

```
void U8GLIB::setCursorPos(uint8_t x, uint8_t y)
```

- C Prototype

```
void u8g_SetCursorPos(u8g_t *u8g, uint8_t x, uint8_t y)
```

- Description

  Draw the enabled cursor at the specified x/y position.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - x: X-position.
  - y: Y-position.
- Returns:
- Use:

  Outside picture loop.

- Note:
- Example:
- See also: enableCursor

setCursorStyle

- C++ Prototype

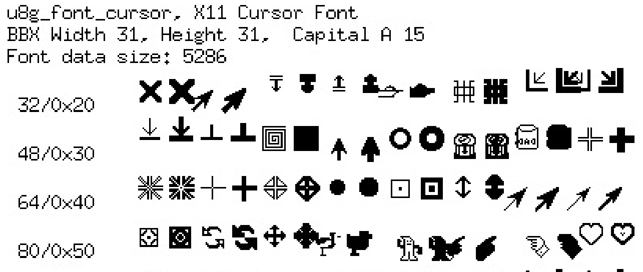
```
void U8GLIB::setCursorStyle(uint8_t encoding)
```

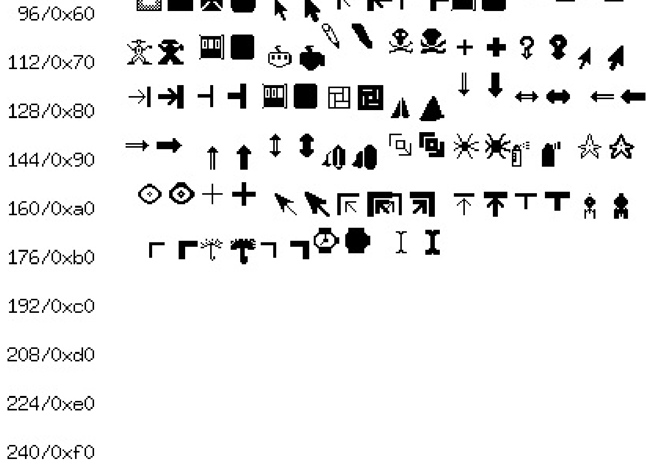
- C Prototype

```
void u8g_SetCursorStyle(u8g_t *u8g, uint8_t encoding)
```

- Description

  Set the cursor shape. The cursor shape is defined by two bitmaps of a cursor font. The encoding 32 will select the bitmaps 32 and 33 of a cursor font. In the font u8g_font_cursor, this would select the x cursor in the upper left edge:


u8g_font_cursor, X11 Cursor Font
BBX Width 31, Height 31, Capital A 15
Font data size: 5286
32/0x20
48/0x30
64/0x40
80/0x50



- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `encoding`: A character position within the cursor font.
- Returns:
- Use:

  Outside picture loop.

- Note:
- Example:
- See also: setCursorFont, enableCursor

setDefaultBackgroundColor

setDefaultForegroundColor

setDefaultMidColor

- C++ Prototype

```
void U8GLIB::setDefaultBackgroundColor(void)
void U8GLIB::setDefaultForegroundColor(void)
void U8GLIB::setDefaultMidColor(void)
```

- C Prototype

```
void u8g_SetDefaultBackgroundColor(u8g_t *u8g)
void u8g_SetDefaultForegroundColor(u8g_t *u8g)
void u8g_SetDefaultMidColor(u8g_t *u8g)
```

- Description

  Assign one of the default colors as current color index. On a monochrom display, `setDefaultBackgroundColor` will assign 0 to the current color index and `setDefaultForegroundColor` will assign 1 to the current color index. For all display types, it is ensured, that `setDefaultBackgroundColor` and `setDefaultForegroundColor` will assign different values.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
- Returns:
- Use:

  Inside and outside picture loop.

- Note:
- Example:
- See also: setColorIndex

setFont

- C++ Prototype

```
void U8GLIB::setFont(const u8g_fntpgm_uint8_t *font)
```

- C Prototype

```
void u8g_SetFont(u8g_t *u8g, const u8g_pgm_uint8_t *font)
```

- Description

  Set the current font and reset the font reference position to "Baseline" (setFontPosBaseline). This font will be used for any further font and draw procedures. U8glib has a lot of built-in fonts which can be used as argument. See here for an overview.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `font`: A pointer to the font data.
- Returns:
- Use:

  Inside and outside picture loop. It is a good practice to use this procedure at the beginning of the body of the picture loop.

- Note:

  The fonts are loaded into memory as needed. The more fonts you use, the larger your program will be.

- Example:
- See also: drawStr setFontPosBaseline

setFontLineSpacingFactor

- C++ Prototype

```
void U8GLIB::setFontLineSpacingFactor(uint8_t factor)
```

- C Prototype

```
void u8g_SetFontLineSpacingFactor(u8g_t *u8g,uint8_t factor)
```

- Description

  Assign the factor for the `LineSpacing` calclation.

Line stretch	0.5	0.8	1.0	1.2	1.5	2.0
factor	32	51	64	77	96	128

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `factor`: See above.
- Returns:
- Use:

  Inside and outside picture loop.

- Note:
- See also: getFontLineSpacing

setFontPosBaseline

setFontPosBottom

setFontPosCenter

setFontPosTop

- C++ Prototype

```
void U8GLIB::setFontPosBaseline(void)
void U8GLIB::setFontPosBottom(void)
void U8GLIB::setFontPosCenter(void)
void U8GLIB::setFontPosTop(void)
```

- C Prototype

```
void u8g_SetFontPosBaseline(u8g_t *u8g);
void u8g_SetFontPosBottom(u8g_t *u8g);
void u8g_SetFontPosCenter(u8g_t *u8g);
void u8g_SetFontPosTop(u8g_t *u8g);
```

- Description

  Set the reference position for the character and string draw procedure. In the following command

  ```
  u8g_DrawStr(u8g, 5, 20, "ABCdefg");
  ```

  the string is placed at (5,20), where (5,20) defines the left start of the baseline if `setFontPosBaseline` has been called (which also is the default).

  - `setFontPosBottom`: Reference position is `getFontDescent()` below baseline.
  - `setFontPosTop`: Reference position is `getFontAscent()+1` above baseline (one pixel above the highest refrence character).
  - `setFontPosCenter`: Reference position centered with respect to `getFontAscent()` and `getFontDescent()`.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).

- Returns:

- Use:

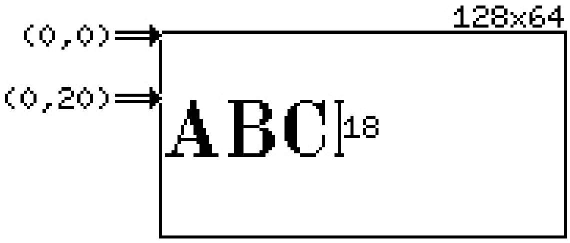
  Inside and outside picture loop.

- Note:

- Example:

  `setFontPosTop` will move the reference point (0,20) for the origin of the text string to the upper left corner of the string.

  ```
  U8GLIB u8g(...)
  ...
  u8g.setFont(u8g_font_osb18);
  u8g.setFontPosTop();
  u8g.drawStr(0, 20, "ABC");
  ```

- See also: drawStr getFontAscent getFontDescent

setFontRefHeightAll

setFontRefHeightExtendedText

setFontRefHeightText

- C++ Prototype

  ```
  void U8GLIB::setFontRefHeightAll(void)
  void U8GLIB::setFontRefExtendedHeightText(void)
  void U8GLIB::setFontRefHeightText(void)
  ```

- C Prototype

  ```
  void u8g_SetFontRefHeightAll(u8g_t *u8g)
  void u8g_SetFontRefHeightExtendedText(u8g_t *u8g)
  void u8g_SetFontRefHeightText(u8g_t *u8g)
  ```

- Description

  A call to one of these procedure will define the calculation method for the ascent and descent of the current font. This method will be used for the current and all other fonts, which will be set with `setFont()`. Changing this calculation method has an effect on `getFontAscent()` and `getFontDescent()`. It has also an effect on the text position methods other than `setFontPosBaseline()`

  - `setFontRefHeightAll`: Ascent will be the highest ascent of all glyphs of the current font. Descent will be the highest descent of all glyphs of the current font.
  - `setFontRefHeightExtendedText`: Ascent will be the largest ascent of "A", "1" or "(" of the current font. Descent will be the descent of "g" or "(" of the current font (this is the default after startup).
  - `setFontRefHeightText`: Ascent will be the ascent of "A" or "1" of the current font. Descent will be the descent "g" of the current font.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).

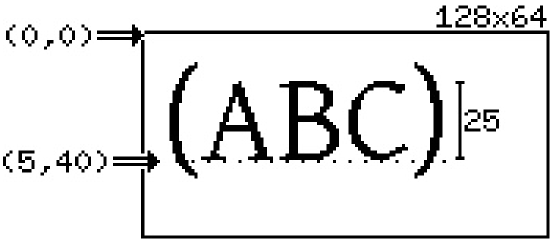
- Returns:

- Use:

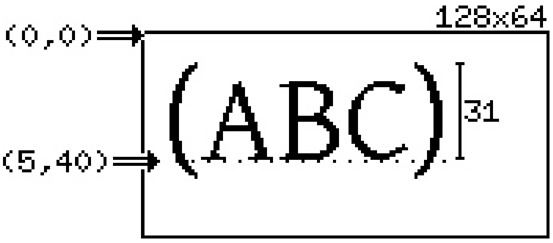
  Inside and outside picture loop.

- Note:
- Example:

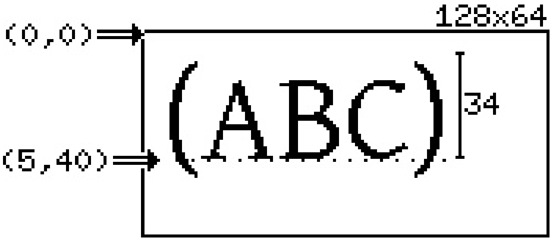
  `setFontRefHeightText`: Ascent value of `u8g_font_gdr25` is 25.



`setFontRefHeightExtendedText`: Ascent value of `u8g_font_gdr25` is 31.



`setFontRefHeightAll`: Ascent value of `u8g_font_gdr25` is 35.



- See also: setFontPosBaseline getFontAscent

setHardwareBackup

- C++ Prototype

```
void U8GLIB::setHardwareBackup(u8g_state_cb backup_cb)
```

- C Prototype

```
void u8g_SetHardwareBackup(u8g_t *u8g, u8g_state_cb backup_cb);
```

- Description

  The display can be connected to I/O pins which are also shared with other external devices. Examples are SPI, TWI or UART interfaces. Example: SD card and SPI display share Clock and Data pins (but have different chip select lines). The SD Card software uses the SPI hardware of the microcontroller to access the SD card, but U8glib should use a software SPI mode. In such a case, the hardware state of the microcontroller SPI subsystem must be modified before access to SD card and display. This modification is activated by this procedure. Usage is: (1) Init u8glib, (2) call this procedure and (3) init other libraries. Available backup procedures:

  - `u8g_backup_avr_spi`: Backup SPI hardware state of an AVR microcontroller.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
  - `backup_cb`: Hardware state backup procedure (specific to controller and hardware subsystem).
- Returns:
- Use:

Outside picture loop.

- Note: Available in v1.05.
- Example:

U8glib uses software SPI and SD library hardware SPI:

```
U8GLIB_DOGM128 u8g(7, 5, 1, 2);                    // SPI Com: SCK = 7, MOSI = 5, CS = 1, A0 = 2
...
void setup()  {
  ...
  // SPI backup: Avoid conflict between SW-SPI (u8glib) and HW-SPI (SD)
  u8g.setHardwareBackup(u8g_backup_avr_spi);
  ...
  // Setup Arduino SD library
  pinMode(SS, OUTPUT);
  if (SD.begin(23)) {
    mas_Init(mas_device_sd, NULL);
  }
  ...
}
```

- See also:

setPrintPos

- C++ Prototype

```
void U8GLIB::setPrintPos(u8g_uint_t x, u8g_uint_t y)
```

- C Prototype
- Description

Assignes the (x,y) position for the next call of the print procedure.

- Arguments:
  - x: X-position.
  - y: Y-position.
- Returns:
- Use:

Inside picture loop.

- Example:
- See also: print

setRGB

- C++ Prototype

```
void U8GLIB::setRGB(uint8_t r, uint8_t g, uint8_t b)
```

- C Prototype

```
 void u8g_SetRGB(u8g_t *u8g, uint8_t r, uint8_t g, uint8_t b)
```

- Description

Assignes RGB color for one of the color devices.

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
  - r: Red part of the color, range: 0..255.
  - g: Green part of the color, range: 0..255.
  - b: Blue part of the color, range: 0..255.
- Returns:
- Note: Available with v1.13
- Use:

Inside picture loop.

- Example:
- See also: setColorIndex

setRot90

setRot180

setRot270

- C++ Prototype

```
void U8GLIB::setRot90()
void U8GLIB::setRot180()
void U8GLIB::setRot270()
```

- C Prototype

```
void u8g_SetRot90(u8g_t *u8g)
void u8g_SetRot180(u8g_t *u8g)
void u8g_SetRot270(u8g_t *u8g)
```

- Description

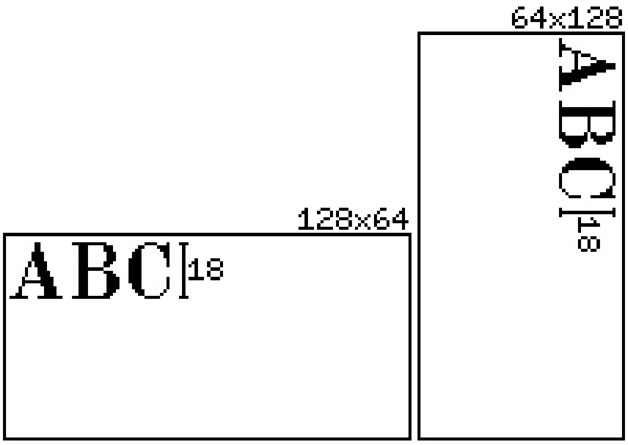
  Clockwise rotates the display screen by 90, 180 or 270 degree. For most display devices, landscape view is the default mode. Rotation by 90 or 270 degree will put the display into portrait mode.

- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
- Returns:
- Use:

  Outside picture loop. Arduino environment: It is a good practice to use this procedure in the `setup()` procedure.

- Example:

  Left: Default landscape mode. Right: Portrait mode with `setRot90`.



- See also: undoRotation

setScale2x2

- C++ Prototype

```
void U8GLIB::setScale2x2()
```

- C Prototype

```
void u8g_SetScale2x2(u8g_t *u8g)
```

- Description

  This command halfs x and y dimension of the display. After calling this command, graphics commands output blocks of size 2x2 pixel until a call to `u8g:undoScale()`. `getHeight()` and `getWidth()` only return half of the original display values. All graphic commands between "u8g::setScale2x2()" and "u8g:undoScale()" are scaled up (line draw, pixel set, font, bitmaps, ...).

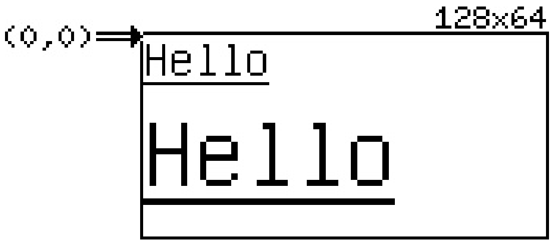
- Arguments:
  - `u8g` : Pointer to the `u8g` structure (C interface only).
- Returns:

- Note: Available with v1.09
- Use:

  Outside or inside picture loop. If used inside the picture loop, also call `u8g:undoScale()` inside the picture loop.

- Example:

```
void draw(void) {
  u8g.setFont(u8g_font_unifont);
  u8g.setFontPosTop();
  u8g.drawStr(0, 1, "Hello");
  u8g.drawHLine(0, 1+14, 40);
  u8g.setScale2x2();                    // Scale up all draw procedures
  u8g.drawStr(0, 12, "Hello");          // actual display position is (0,24)
  u8g.drawHLine(0, 12+14, 40);          // All other procedures are also affected
  u8g.undoScale();                      // IMPORTANT: Switch back to normal mode
}
```



- See also: undoScale

sleepOn

sleepOff

- C++ Prototype

```
void U8GLIB::sleepOn(void)
void U8GLIB::sleepOff(void)
```

- C Prototype

```
void u8g_SleepOn(u8g_t *u8g)
void u8g_SleepOff(u8g_t *u8g)
```

- Description

  Enable/disable sleep mode for the display (if possible).

- Arguments:
  - u8g : Pointer to the u8g structure (C interface only).
- Returns: -
- Use:

  Outside picture loop.

- Note:

  Available with v1.11. Supported for ST7565 and SSD13xx controller.

- Example:

`undoRotation`

- C++ Prototype

```
void U8GLIB::undoRotation()
```

- C Prototype

```
void u8g_UndoRotation(u8g_t *u8g)
```

- Description

  Remove an applied rotation done by the "setRotXY" commands. After calling this command, the display will have its default orientation. Nothing happens if the display has default orientation.

- Arguments:

    - u8g : Pointer to the u8g structure (C interface only).
- Returns:
- Use:

  Outside picture loop.

- Example:
- See also: setRot90

undoScale

- C++ Prototype

```
void U8GLIB::undoScale()
```

- C Prototype

```
void u8g_UndoScale(u8g_t *u8g)
```

- Description

  Remove an applied scaling. If the scaling has been applied within the body of the picture loop, then this command should be called within the body of the picture loop.

- Arguments:
    - u8g : Pointer to the u8g structure (C interface only).
- Returns:
- Note: Available with v1.09
- Example:
- See also: setScale2x2

U8GLIB

- C++ Prototype

```
void U8GLIB::U8GLIB(u8g_dev_t *dev)
void U8GLIB::U8GLIB(u8g_dev_t *dev, uint8_t sck, uint8_t mosi, uint8_t cs, uint8_t a0, uint8_t reset)
void U8GLIB::U8GLIB(u8g_dev_t *dev, uint8_t d0, uint8_t d1, uint8_t d2, uint8_t d3, uint8_t d4, uint8_t d5, uint8_t
        uint8_t en, uint8_t cs1, uint8_t cs2, uint8_t di, uint8_t rw, uint8_t reset)
```

- Description

  Create a new interface to a graphics display. The dev argument describes the type of the display. See here for a complete list of available devices. Usually this constructor is not called directly. Instead there are drived classes for each available device. See also the last column of the device list for a complete list of available constructor calls.

- Arguments:
    - dev: A pointer to a device structure.
    - Arduino pins: Required pins to connect the display depending on the communication interface.
    - reset: The reset pin is optional and can be U8G_PIN_NONE
- Returns:
- Use:

  Outside picture loop.

- Note:
- Example:
- See also: List of supported devices

Comment by cooljian...@gmail.com, Dec 31, 2012

HI , a problem---arduino 12864,when in parallel there are "noises",when in spi ,it's okay,could you tell me why,thanks?

Comment by project member olikr...@gmail.com, Dec 31, 2012

Hmmm... maybe wires are too long.

Oliver

Comment by sjag...@gmail.com, Jan 16, 2013

Hi Oliver, Can you tell me if can u8g_dev_ssd1306_128x64 works with ssd1309 controller? It seems that the control commands of the same. Thank you very much.

Comment by project member olikr...@gmail.com, Jan 16, 2013

Unfortunately i do not have access to an ssd1309 controller and so far nobody gave me feedback on this controller, so i think the best thing would be to test the u8g_dev_ssd1306_128x64 sub system with your display. Any feedback on this controller is wellcome.

Oliver

Comment by DanielHB...@gmail.com, Jan 31, 2013

I am trying to take an analog readout from a sensor and output it in line with a string on an lcd. (temp sensor reading -> "Temperature: XX.XX") I can display the string portion but i am not able to display the updating sensor readings. Is there any way to do this?

Comment by project member olikr...@gmail.com, Jan 31, 2013

For Arduino: Use the print Interface (as defined on the arduino home page) For AVR: Create a string with sprintf first

Comment by heikki.m...@gmail.com, Feb 25, 2013

Heya Oliver,

Is it possible to get the color of the drawn pixel?

I've a monochrome display and I'd like to join two histograms. Another histogram is made of bars and another is made of dots. I'd like to convert the color of the dots in to the no-color mode in the cases where those two diagrams are overlapping.

-Heikki

Comment by project member olikr...@gmail.com, Feb 25, 2013

Something like "getPixel(x,y)" is not available at the moment.

Comment by bad...@gmail.com, Feb 19, 2014

Hey Oliver,

is it possible to invert some colors while drawing eg a XBMP?

Thank you! Oliver

Comment by project member olikr...@gmail.com, Feb 19, 2014

Not sure if I understand the question correctly, but the inversion of colors is not possible.

Comment by bad...@gmail.com, Feb 23, 2014

Yeah, I tried to change black and white in the bitmaps.

I've tried it like this:

u8g.h {{{void u8g_DrawXBM(u8g_t **u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const uint8_t** bitmap); void u8g_DrawXBMP(u8g_t **u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const u8g_pgm_uint8_t** bitmap); void u8g_DrawInvertedXBM(u8g_t **u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const uint8_t** bitmap); void u8g_DrawInvertedXBMP(u8g_t **u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t w, u8g_uint_t h, const u8g_pgm_uint8_t** bitmap);}}}

With:

in u8g_DrawInvertedHXBMP of u8g_bitmap.c `u8g_Draw8Pixel(u8g, x, y, 2, ~u8g_pgm_read(bitmap));`

But i only get 'u8g_DrawInvertedXBM' was not declared in this scope :(

Comment by project member olikr...@gmail.com, Feb 23, 2014 in principle this should work....

```
void u8g_DrawInvHBitmapP(u8g_t u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, const u8g_pgm_uint8_t bitmap) {
    while( cnt > 0 ) {
        u8g_Draw8Pixel?(u8g, x, y, 0, ~u8g_pgm_read(bitmap));
        bitmap++;
        cnt--;
        x+=8;
    }
}

void u8g_DrawInvBitmapP(u8g_t u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, u8g_uint_t h, const u8g_pgm_uint8_t bitmap)
    if ( u8g_IsBBXIntersection(u8g, x, y, cnt*8, h) == 0 )
        return;

    while( h > 0 ) {
        u8g_DrawInvHBitmapP(u8g, x, y, cnt, bitmap);
        bitmap += cnt;
        y++;
        h--;
    }
}
```

Comment by bad...@gmail.com, Feb 23, 2014

Yes, its the same principle, just another draw-function. But the problem is still the same. I modified the u8g.h and the *bitmap.c, which compiles perfectly. As soon as I try to call this new function in my project, AtmelStudio? complains, that >'u8g_DrawInvBitmapP' was not declared in this scope<.*

I rebuild the entire solution and both projects separately severeal times, without success. Any idea?

Comment by project member olikr...@gmail.com, Feb 23, 2014

Did you add the name of the procedure to u8g.h?

```
void u8g_DrawInvBitmapP(u8g_t u8g, u8g_uint_t x, u8g_uint_t y, u8g_uint_t cnt, u8g_uint_t h, const u8g_pgm_uint8_t *bitmap)
```

BTW: I think "" **was removed in my comment before.**

Comment by bad...@gmail.com, Feb 23, 2014

Yes, of course :)

Comment by project member olikr...@gmail.com, Feb 28, 2014

dcan55, it is difficult to answer your question, if everything is distributed accross different wiki pages. Additionally i need a lot more information (Environment, existing code, HW setup) to give a proper answer. Questions on M2tklib for Arduino are better discussed here: http://forum.arduino.cc/index.php?topic=114029.0

Comment by rastaman...@mail.ru, Mar 7, 2014

Using AVR Studio 4.Mikrokontroller Atmega328 + DS1307 + st7920.

> I can display the string portion but i am not able to display the clock. Is there any way to do this?

If possible example.

Comment by project member olikr...@gmail.com, Mar 7, 2014

What do you mean by "display the clock"? You mean, display the current time? Probably you can construct the string with sprintf. Not sure if sprintf is present, but code should look like this: sprintf(str, "%02d:%02d", h, m); where str is the string, h hour and m minutes.

Comment by rastaman...@mail.ru, Mar 8, 2014

Thank you very much!

Comment by dca...@gmail.com, Mar 14, 2014

I am having a really strange problem with the u8g code .. I have replicated the menu's to a two menu system and was going to add another sub menu to the second main menu when the compiled upload stopped working??? I still have plenty of RAM and the code is just copied repeated routines from the example with some motor control lines in it but when I added the last function sub routine the code just quit. Is the best place for this discussion here????

David Canfield

Comment by project member olikr...@gmail.com, Mar 14, 2014

I think the best would be to start a discussion in the Arduino Forum, if you are using an Arduino Board. If you do so, you should give some background information: What board? What display? What do you mean by "stopped working"

Comment by m.bish...@gmail.com, Mar 18, 2014

Is there a mail list I can join? I am going to try and port this to Microchip XC32 compiler (PIC32MX part). Looking for a porting guide or the file list that needs to be touched.

Comment by andrzej....@gmail.com, Mar 28, 2014

Another excellent open source pearl, thanx a lot for it. I am first time to graphic LCDs and with this lib and bread-board I could run first graphics within an hour. A little digging and couple hours later I made UC1601 driver working in USART as SPI master mode with AVR atmega. Kudos!

cheers, jedreg.

Comment by project member olikr...@gmail.com, Mar 28, 2014

@bishop2: I once made the source compile under the XC8, but link optimization is not supported on the freeware versions of the Microchip compilers. @andrzej: Thanks.

Comment by sm.m...@gmail.com, Apr 16, 2014

Hi, I made a program for FollowFocus? Then I did choose to show some of the features on display ST7920_128X64 The program works my likeness servo tester The display shows how many degrees the testimony turned servo But when I print program to display ST7920_128X64 attached to this program FollowFocus?, I began to long delays and noise servo . I tried a lot. and realized that the problem is not caused by the graphics , since practically no difference . it is caused by the function u8g.nextPage () after it atmega328 very long update for the servo outputs

Comment by ettill...@gmail.com, Jun 14, 2014

Greetings,

Is there a way to put a frame or a bitmap on screen and not have it clear ... What I am trying to do is ... make sort of an overlay or back ground that is always there and I just change out the data in it, hope fully to have a faster refresh rate. The overlay would consist of a couple of frames in the shape of a battery and some text labels for values. The actual numbers would be the only thing refreshed each write cycle. I am using a ATMEGA328 stand alone and a ST7920 via SPI hardware. And I2C INA219 for voltage and current sensing. Any help would be appreciated. Thanks

Comment by project member olikr...@gmail.com, Jun 16, 2014

Hi

You need to redraw the frame/bitmap every time you draw something. See here: https://code.google.com/p/u8glib/wiki/tpictureloop

Comment by tony...@gmail.com, Aug 7, 2014

Hi,

Thank you for providing this library. Is there a way to reduce the overall size of the library? I am using a display that is compatible with U8GLIB_SSD1306_128X64 u8g(U8G_I2C_OPT_NONE); // I2C / TWI

My sketch fit on an Uno when using an LCD but now with the OLED I am about 5200 bytes too big. Any assistance to reduce the size is greatly appreciated.

Comment by project member olikr...@gmail.com, Aug 7, 2014

Did you use font names with and "r" postfix? Maybe this helps. Also note that for all fonts,the font overview bitmap includes the actual font size in bytes.

Comment by tony...@gmail.com, Aug 7, 2014

Thanks for the quick reply. I am using the follow to define the font:

u8g.setFont(u8g_font_unifont);

The output to the OLED is very basic text. Should I be using something different to reduce the size of the sketch? I was thinking it was the size of the library that is using up memory. Can it be scaled down or is there another solution?

Comment by project member olikr...@gmail.com, Aug 8, 2014

For all fonts, the actual font data size is given, see here for the unifont font: https://code.google.com/p/u8glib/wiki/fontgroupunifont

So, using u8g.setFont(u8g_font_unifontr); will reduce by 4K if you do not require the none-english umlaut glyphs. You may also look for some other font, which uses less than what is used by "u8g_font_unifontr"

Beyond this, the Arduino environment already takes care, that unused functions are removed. So there is no further optimization, except to restrict yourself to as little graphics primitives as possible.

Comment by tony...@gmail.com, Aug 8, 2014

Thanks! that worked as you described above. Appreciate the help

Comment by tony...@gmail.com, Aug 8, 2014

do you have any suggestions for a font that uses less memory than "u8g_font_unifontr" Also, is there any difference using u8g.drawStr vs ug8.print commands for text ? Thanks !

Comment by project member olikr...@gmail.com, Aug 8, 2014

You probably need to go through the fonts by yourself. Smaller fonts require lesser space ;-)

u8g.print will include all the other Arduino standard function for print, so i guess drawStr will use lesser memory.

Comment by mark.hae...@gmail.com, Oct 22, 2014

Hi Oli.

My project will have a menu system that tries to use icons/symbols for each menu entry (and maybe for each menu option as well), hence I will require a lot of flash memory for all the (nearly full-screen, i.e. 128x64x1bit) images. Right now I am at 20 of 30KiB flash, and haven't even really started adding the menu items.

So, as an alternative to drawXBMP?, I thought about having a draw function that uses a very simple compression algorithm, like RLE, which would drastically reduce footprint of (most) embedded pictures, while allowing a very simple and efficient decoder. At least for simple (non-dithered) 1bit graphics, the memory requirement will be much(!) smaller. Have you also already considered implementing something like this in u8glib, or do you think this would be a bigger problem? I think that (efficiently) managing pages could be an issue, as you don't know where to jump in your bitmap if you only need a part of it. This could maybe be done by only compressing the image per line (RLE of same color cannot span multiple lines), so that you can quickly jump line-wise to the part you need. Or a header jump-table that points to the start of each line.

Or would you simply suggest to do all decompression from flash (RLE) to RAM (bitmap) in the user application and then use drawXBM() on the decompressed image in RAM? However, I fear that my AVR (Arduino w/ m328p) won't have enough free memory on stack during runtime (1KiB framebuffer required for full-screen image), do I doubt this won't work for me.

Im general, what do you think about the idea of (simple) compressed image support?

Thanks in advance, Mark

Comment by project member olikr...@gmail.com, Oct 22, 2014

There is a low level function, which allows you to draw 8 pixel at once: `u8g_Draw8Pixel(u8g_t *u8g, u8g_uint_t x, u8g_uint_t y, uint8_t dir, uint8_t pixel);` Your RLE decode could use this function.

Comment by alidetud...@gmail.com, Yesterday (27 hours ago)

Why Drawstr and DrawBitmap? cannot be used at the same time, alone can display, put a block does not show

u8g_SetFont?(&u8g,u8g_font_fur14);

u8g_DrawStr?(&u8g,5, 41, shijian); u8g_DrawBitmap?(&u8g,45, 25, 3, 24,tu2);

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