MGLCD

Arduino and chipKit Monochrome Graphics LCD library

Manual

Rinky-Dink Electronics

Introduction:

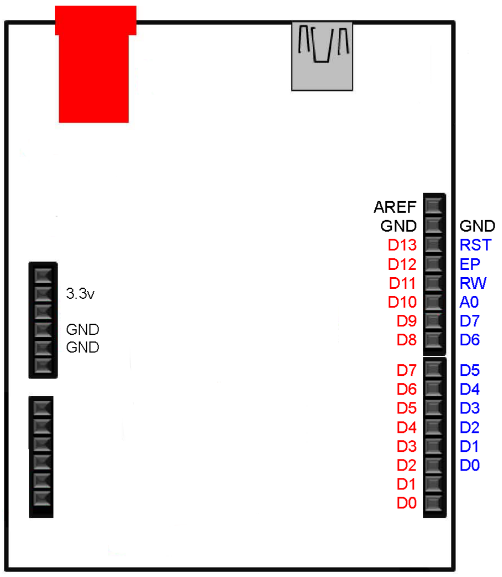
This library has been made to make it easy to use Monochrome Graphics LCDs with Arduino and chipKit development boards.

Basic functionality of this library are based on the demo-code provided by ElecFreaks.

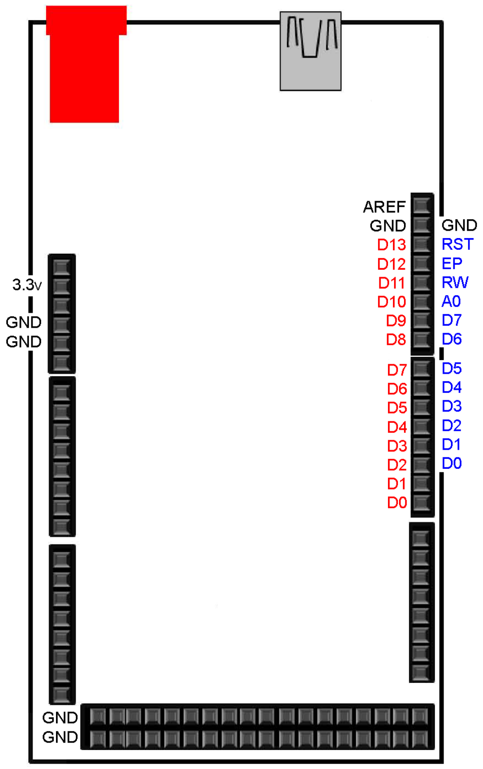
You can always find the latest version of the library at **http://www.RinkyDinkElectronics.com/**

For version information, please refer to **version.txt**.

PINS USED IN THE EXAMPLE SKETCHES:



Arduino 2009/Uno/Leonardo
chipKit Uno32/uC32



Arduino Mega/Due
chipKit Max32

Defined Literals:

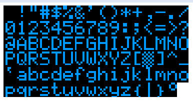
Alignment

For use with print(), printNumI() and printNumF()

LEFT:	0
RIGHT:	9999
CENTER:	9998

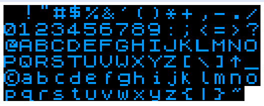
Included Fonts:

SmallFont



Charactersize:	6x8 pixels
Number of characters:	95

WideFont



Charactersize:	8x8 pixels
Number of characters:	95

MediumNumbers

Charactersize:	12x16 pixels
Number of characters:	13

BigNumbers

Charactersize:	14x24 pixels
Number of characters:	13

Functions:

MGLCD(D0, D1, D2, D3, D4, D5, D6, D7, A0, RW, EP, RST);

Class constructor.

Parameters:	`D0-D7:  Pins for Data bus`
	`A0:     Pin for Register Select (Data/Command)`
	`RW:     Pin for Read/Write`
	`EP:     Pin for Data Latching`
	`RST:    Pin for Reset`

Usage:	`MGLCD myGLCD(2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13); // Start an instance of the MGLCD class`

initLCD();

Initialize the LCD.

Parameters:	`None`
Usage:	`myGLCD.initLCD(); // Initialize the display`
Notes:	`This will reset and clear the display.`

rotateDisplay(value);

Select if the output on the display should be rotated 180 degrees.

Parameters:	`value: true  - Rotate output 180 degrees`
	`       false – Do not rotate output`

Usage:	`myGLCD.rotateDisplay(true); // Rotate output to the display`
Notes:	`rotateDisplay() must be called before calling initLCD() to have any effect.`

clrScr();

Clear the screen.

Parameters:	`None`
Usage:	`myGLCD.clrScr(); // Clear the screen`

fillScr();

Fill the screen.

Parameters:	`None`
Usage:	`myGLCD.fillScr(); // Fill the screen`

invert(mode);

Set inversion of the display on or off.

Parameters:	`mode: true  - Invert the display`
	`      false – Normal display`

Usage:	`myGLCD.invert(true); // Set display inversion on`

setPixel(x, y);

Turn on the specified pixel.

Parameters:	`x:  x-coordinate of the pixel`
	`y:  y-coordinate of the pixel`

Usage:	`myGLCD.setPixel(0, 0); // Turn on the upper left pixel`

clrPixel(x, y);

Turn off the specified pixel.

Parameters:	`x:  x-coordinate of the pixel`
	`y:  y-coordinate of the pixel`

Usage:	`myGLCD.clrPixel(0, 0); // Turn off the upper left pixel`

invPixel(x, y);

Invert the state of the specified pixel.

Parameters:	`x:  x-coordinate of the pixel`
	`y:  y-coordinate of the pixel`

Usage:	`myGLCD.invPixel(0, 0); // Invert the upper left pixel`

invertText(mode);

Select if text printed with print(), printNumI() and printNumF() should be inverted.

```
Parameters:     mode: true  - Invert the text
                      false – Normal text
Usage:          myGLCD.invertText(true); // Turn on inverted printing
Notes:          SetFont() will turn off inverted printing
```

print(st, x, y);

Print a string at the specified coordinates.
You can use the literals LEFT, CENTER and RIGHT as the x-coordinate to align the string on the screen.

```
Parameters:     st:  the string to print
                x:   x-coordinate of the upper, left corner of the first character
                y:   y-coordinate of the upper, left corner of the first character
Usage:          myGLCD.print(“Hello World”,CENTER,0); // Print “Hello World” centered at the top of the screen
Notes:          The string can be either a char array or a String object
```

printNumI(num, x, y[, length[, filler]]);

Print an integer number at the specified coordinates.
You can use the literals LEFT, CENTER and RIGHT as the x-coordinate to align the string on the screen.

```
Parameters:     num: the value to print (-2,147,483,648 to 2,147,483,647) INTEGERS ONLY
                x:   x-coordinate of the upper, left corner of the first digit/sign
                y:   y-coordinate of the upper, left corner of the first digit/sign
                length: <optional>
                        minimum number of digits/characters (including sign) to display
                filler: <optional>
                        filler character to use to get the minimum length. The character will be inserted in front
                        of the number, but after the sign. Default is ' ' (space).
Usage:          myGLCD.print(num,CENTER,0); // Print the value of “num” centered at the top of the screen
```

printNumF(num, dec, x, y[, divider[, length[, filler]]]);

Print a floating-point number at the specified coordinates.
You can use the literals LEFT, CENTER and RIGHT as the x-coordinate to align the string on the screen.
WARNING: Floating point numbers are not exact, and may yield strange results when compared. Use at your own discretion.

```
Parameters:     num: the value to print (See note)
                dec: digits in the fractional part (1-5) 0 is not supported. Use printNumI() instead.
                x:   x-coordinate of the upper, left corner of the first digit/sign
                y:   y-coordinate of the upper, left corner of the first digit/sign
                divider:  <Optional>
                          Single character to use as decimal point. Default is '.'
                length:   <optional>
                          minimum number of digits/characters (including sign) to display
                filler:   <optional>
                          filler character to use to get the minimum length. The character will be inserted in front
                          of the number, but after the sign. Default is ' ' (space).
Usage:          myGLCD.print(num, 3, CENTER,0); // Print the value of “num” with 3 fractional digits top centered
Notes:          Supported range depends on the number of fractional digits used.
                Approx range is +/- 2*(10^(9-dec))
```

setFont(fontname);

Select font to use with print(), printNumI() and printNumF().

```
Parameters:     fontname: Name of the array containing the font you wish to use
Usage:          myGLCD.setFont(SmallFont); // Select the font called SmallFont
Notes:          You must declare the font-array as an external or include it in your sketch.
```

drawBitmap (x, y, sx, sy, data[, flash]);

Draw a bitmap on the screen.

Parameters:
```
x:     x-coordinate of the upper, left corner of the bitmap
y:     y-coordinate of the upper, left corner of the bitmap
sx:    width of the bitmap in pixels
sy:    height of the bitmap in pixels
data:  array containing the bitmap-data
```
Usage:
```
myGLCD.drawBitmap(0, 0, 32, 32, bitmap); // Draw a 32x32 pixel bitmap in the upper left corner
```
Notes:
You can use the online-tool “*ImageConverter Mono*” to convert pictures into compatible arrays.
The online-tool can be found on my website.
Requires that you *#include <avr/pgmspace.h>* when using an Arduino other than Arduino Due.
While the bitmap data *MUST* be a multiple of 8 pixels high you do not need to display all the rows.
Example: If the bitmap is 24 pixels high and you specify sy=20 only the upper 20 rows will be displayed.

drawLine(x1, y1, x2, y2);

Draw a line between two points.

Parameters:
```
x1: x-coordinate of the start-point
y1: y-coordinate of the start-point
x2: x-coordinate of the end-point
y2: y-coordinate of the end-point
```
Usage:
```
myGLCD.drawLine(0,0,127,63); // Draw a line from the upper left to the lower right corner
```

drawRect(x1, y1, x2, y2);

Draw a rectangle between two points.

Parameters:
```
x1: x-coordinate of the start-corner
y1: y-coordinate of the start-corner
x2: x-coordinate of the end-corner
y2: y-coordinate of the end-corner
```
Usage:
```
myGLCD.drawRect(64,32,127,63); // Draw a rectangle in the lower right corner of the screen
```

drawRoundRect(x1, y1, x2, y2);

Draw a rectangle with slightly rounded corners between two points.
The minimum size is 5 pixels in both directions. If a smaller size is requested the rectangle will not be drawn.

Parameters:
```
x1: x-coordinate of the start-corner
y1: y-coordinate of the start-corner
x2: x-coordinate of the end-corner
y2: y-coordinate of the end-corner
```
Usage:
```
myGLCD.drawRoundRect(0,0,63,31); // Draw a rounded rectangle in the upper left corner of the screen
```

drawCircle(x, y, radius);

Draw a circle with a specified radius.

Parameters:
```
x:      x-coordinate of the center of the circle
y:      y-coordinate of the center of the circle
radius: radius of the circle in pixels
```
Usage:
```
myGLCD.drawCircle(63,31,20); // Draw a circle in the middle of the screen with a radius of 20 pixels
```