

## **LCD5110\_Basic - Arduino library support for Nokia 5110 compatible LCDs**

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Basic functionality of this library are based on the demo-code provided by ITEad studio. You can find the latest version of the library at <http://www.henningkarlsen.com/electronics>

This library has been made to make it easy to use the basic functions of the Nokia 5110 LCD module on an Arduino.

If you make any modifications or improvements to the code, I would appreciate that you share the code with me so that I might include it in the next release. I can be contacted through <http://www.henningkarlsen.com/electronics/contact.php>

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## Defined Literals:

Alignment
For use with print(), printNumI() and printNumF()
LEFT: 0
RIGHT: 9999
CENTER: 9998

## Included Fonts:

SmallFont
 A 6x8 pixel font character set showing digits 0-9, uppercase and lowercase letters, and various symbols.
Character size: 6x8 pixels
Number of characters: 95

MediumNumbers
 A 12x16 pixel font character set showing digits 0-9, a decimal point, and a minus sign.
Character size: 12x16 pixels
Number of characters: 13

BigNumbers
 A 14x24 pixel font character set showing digits 0-9, a decimal point, and a minus sign.
Character size: 14x24 pixels
Number of characters: 13

## Functions:

### LCD5110(SCK, MOSI, DC, RST, CS);

Class constructor.

Parameters:     SCK:     Arduino pin for Clock signal  
                  MOSI:    Arduino pin for Data transfer  
                  DC:     Arduino pin for Register Select (Data/Command)  
                  RST:     Arduino pin for Reset  
                  CS:     Arduino pin for Chip Select  
Usage:           LCD5110 myGLCD(8, 9, 10, 11, 12); // Start an instance of the LCD5110 class

### InitLCD();

Initialize the LCD.

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

### clrScr();

Clear the screen.

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

### clrRow(row[, start\_x[, end\_x]]);

Clear a part of, or a whole row.

Parameters:     row: 8 pixel high row to clear (0-5)  
                  start\_x: <optional>  
                          x-coordinate to start the clearing on (default = 0)  
                  end\_x:   <optional>  
                          x-coordinate to end the clearing on (default = 83)  
Usage:           myGLCD.clrRow(5, 42); // Clear the right half of the lower row

### 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

### 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 y-coordinate will be adjusted to be aligned with an 8 pixel high display row.  
                  In effect only 0, 8, 16, 24, 32 and 40 can be used as y-coordinates.

### printNumI(num, x, y);

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  
Usage:           myGLCD.print(num,CENTER,0); // Print the value of "num" centered at the top of the screen  
Notes:           The y-coordinate will be adjusted to be aligned with an 8 pixel high display row.  
                  In effect only 0, 8, 16, 24, 32 and 40 can be used as y-coordinates.

#### **printNumF(num, dec, x, y);**

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 (0-239)  
                  y:    y-coordinate of the upper, left corner of the first digit/sign (0-319)

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<sup>9-dec</sup>)  
                  The y-coordinate will be adjusted to be aligned with an 8 pixel high display row.  
                  In effect only 0, 8, 16, 24, 32 and 40 can be used as y-coordinates.

#### **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  
                  flash: <optional>  
                          true    - data-array is in flash memory (Default)  
                          false   - data-array is in RAM

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 5110](#)" to convert pictures into compatible arrays.  
                  The online-tool can be found on my website.  
                  Requires that you #include <avr/pgmspace.h>