

# LCD5110\_Basic

Arduino and chipKit library for Nokia 5110 compatible LCDs

## Manual



## **PREFACE:**

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

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>

You can always find the latest version of the library at <http://electronics.henningkarlsen.com/>

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://electronics.henningkarlsen.com/contact.php>.

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


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

InitLCD([contrast]);	
Initialize the LCD.	
Parameters:	contrast: <b>&lt;optional&gt;</b> Specify a value to use for contrast (0-127) Default is 70
Usage:	myGLCD.initLCD(); // Initialize the display
Notes:	This will reset and clear the display.

setContrast(contrast);	
Set the contrast of the LCD.	
Parameters:	contrast: Specify a value to use for contrast (0-127)
Usage:	myGLCD.setContrast(70); // Sets the contrast to the default value of 70

enableSleep();	
Put the display in Sleep Mode.	
Parameters:	None
Usage:	myGLCD.enableSleep(); // Put the display into Sleep Mode
Notes:	Entering Sleep Mode will not turn off the backlight as this is a hardware function.

disableSleep();	
Re-enable the display after it has been put in Sleep Mode.	
Parameters:	None
Usage:	myGLCD.disableSleep(); // Wake the display after putting it into Sleep Mode
Notes:	The display will automatically be cleared when Sleep Mode is disabled. Exiting Sleep Mode will not turn on the backlight as this is a hardware function.

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: <b>&lt;optional&gt;</b> x-coordinate to start the clearing on (default = 0) end_x: <b>&lt;optional&gt;</b> 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.  
                  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  
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[, 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))  
                  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.

#### **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

#### **drawBitmap (x, y, data, sx, sy);**

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  
                  data: array containing the bitmap-data  
                  sx: width of the bitmap in pixels  
                  sy: height of the bitmap in pixels  
Usage:           myGLCD.drawBitmap(0, 0, bitmap, 32, 32); // 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.