melabs Serial LCD Quick Instructions

The melabs Serial LCD (SLCD) can display serial data from either asynchronous RS232-style or synchronous I^{2}C input. A range of baud rates from 2400 to 57,600 is available and the serial data is buffered so that no delay is necessary when transmitting data to the SLCD.

The SLCD is available with a 16-character by 2-line or a 20-character by 4-line liquid crystal display. Other display formats may be available by request. The display includes an LED backlight with variable brightness. The melabs Serial LCD board is also available separately to attach to other displays that utilize a Hitachi HD44780 or equivalent controller IC.

These quick instructions provide the information you need to get started using the melabs Serial LCD. Complete instructions can be found at http://melabs.com/slcd.

Power Supply

The SLCD is powered by 5 volts to either of the 2 serial input connectors, J1 or J2. The connectors are labeled '+5' for the 5 volt connection and 'G' for the ground connection.

RS232-style USART Serial Connection

Asynchronous RS232-style serial data is applied to the pin labeled 'RX' on connector J1. The data format is a start bit followed by 8 data bits and a stop bit (8N1). There is no parity. The default baud rate is 9600. Other baud rates may be selected by shorting jumpers JP1 and/or JP2. The table below shows the baud rate selections.

Baud	JP1	JP2
2400	SHORTED	SHORTED
9600 (default)	OPEN	OPEN
19,200	OPEN	SHORTED
57,600	SHORTED	OPEN

Jumper JP3 selects whether the serial signal is true or inverted. The default (open) state is inverted. This allows for direct connection to a PC without the need for an RS232 driver IC. The true state can be selected by shorting JP3.

I2C Serial Connection

I^{2}C synchronous serial data is applied to connector J2. 'SC' is the serial clock connection and 'SD' is the serial data connection. The SLCD board includes a 4.7k pullup resistor on each of these lines. The default I^{2}C address is hexadecimal 50. Jumpers JP1 and JP2 can be used to select alternate addresses as shown in the table below.

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I2C Address	JP1	JP2
Hex 50 (default)	OPEN	OPEN
Hex 52	SHORTED	OPEN
Hex 54	OPEN	SHORTED
Hex 56	SHORTED	SHORTED

Contrast Control

POT1 on the SLCD is used to set the contrast for the LCD. Adjust it for the best character visibility, darkest characters on the lightest background. A test screen can be displayed to provide visible characters for adjusting the potentiometer.

Test Screen

Connecting both 'SC' and 'SD' on connector J2 to ground on power up will display a test screen for a short time. Depending on the size of the display, this screen shows the SLCD firmware version number, baud rate and mode, I2C address, backlight level, and the number of characters and lines the controller is set for. The LED backlight will also be lit to approximately half brightness. The display will clear and enter regular operation after 10 seconds.

Backlight Brightness

The brightness of the LED backlight may be set from off to full on in 256 steps using a serial command. First an escape character is sent (hexadecimal **1b** or decimal **27**) followed by an asterisk (hexadecimal **2a** or decimal **42**) and then a single character of hexadecimal **0** to **ff** (decimal **0** to **255)** where **0** is off and **ff** (**255**) is full on.

      Serout 0, N9600, ($1b, $2a, $80)   ' Set LCD backlight to about half brightness

Other Commands

Other commands are also available to clear the display and set the cursor position. For example, to clear the display, send the hexadecimal value **fe** (or decimal **254**), followed by the value **1**. Some other commands are shown in the table below. A complete list of commands can be found at http://melabs.com/slcd.

Command	Operation
Hex fe, 1	Clear display and move cursor to beginning of first line
Hex fe, 80	Move cursor to beginning of first line
Hex fe, c0	Move cursor to beginning of second line
Hex fe, 94	Move cursor to beginning of third line
Hex fe, d4	Move cursor to beginning of fourth line

      Serout 0, N9600, ($fe, $1)   ' Clear screen and move cursor to start of first line

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