Arduino I2C LCD Backpack Introductory Tutorial

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(http://www.electroschematics.com/wp-content/uploads/2015/12/I2C-LCD-Backpack-Primer.png)

Assume that you are moving towards a complex microcontroller project bundled with blinkers, beepers, and a display panel. To link a standard 16×2 LCD directly with the microcontroller, for instance Arduino, you would need atleast 6 I/O pins to talk to the LCD. However, if you use an LCD module with I2C interface, you only need 2 lines to process the display information. Now a days, it is not necessary to buy an expensive I2C LCD for this task because readymade serial backpack modules for standard LCDs are available at reasonable rates. You can use them with LCD modules that have a HD44780 compatible interface with various screen sizes by attaching to the back of the LCD module. This allows connection to your Arduino (or other microcontroller) using only four channels. Yippee!

(http://www.electroschematics.com/wp-content/uploads/2015/12/I2C-LCD-Backpack-Primer.png)

I2C LCD Backpack

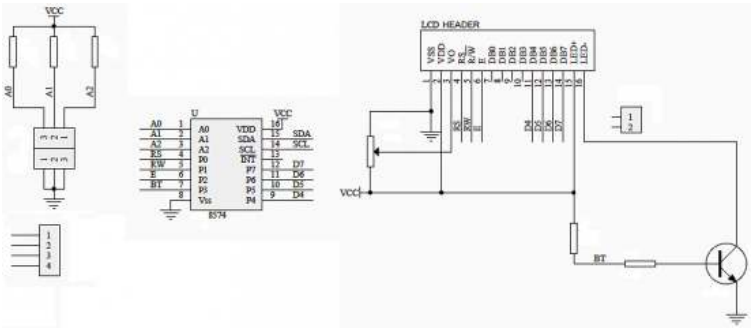
Hitachi's HD44780 based 16×2 character LCD are very cheap and widely available, and is an essential part for any project that displays information. Using the LCD backpack, desired data can be displayed on the LCD through the I2C bus. In principle, such backpacks are built aorund PCF8574 (from NXP) which is a general purpose bidirectional 8 bit I/O port

expander that uses the I2C protocol. The PCF8574 is a silicon CMOS circuit provides general purpose remote I/O expansion (an 8-bit quasi-bidirectional) for most microcontroller families via the two-line bidirectional bus (I2C-bus). Note that most backpack modules are centered around PCF8574T (SO16 package of PCF8574 in DIP16 package) with a default slave address of 0x27. If your backpack holds a PCF8574AT chip, then the default slave address will change to 0x3F. In short, your backpack is based on PCF8574T and the address connections (A0-A1- A2) are not bridged with solder it will have the slave address 0x27.

(http://www.electroschematics.com/wp-content/uploads/2015/12/address-selection-pads-in-the-lcd-backpack.png)

(address selection pads in the lcd backpack)

Reference circuit diagram of an Arduino-compatible LCD backpack is shown below. What follows next is information on how to use one of these inexpensive backpacks to interface with a microcontroller in ways it was exactly intended.

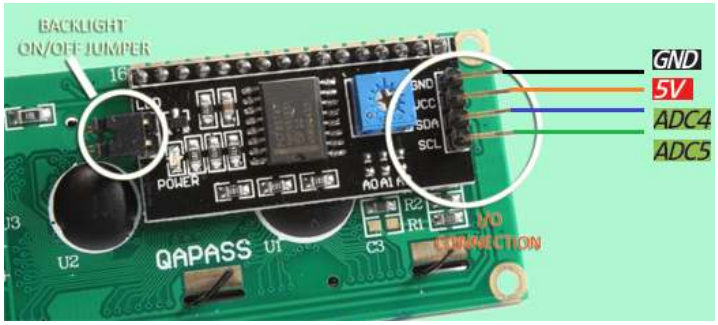


(http://www.electroschematics.com/wp-content/uploads/2015/12/reference-circuit-diagram-of-the-lcd-backpack.png)

(reference circuit diagram of the lcd backpack)

I2C LCD Display

Now let's get started. At first you need to solder the backpack to your LCD module. Ensure that the backpack pins are straight and fit in the LCD module, then solder in the first pin while keeping the backpack in the same plane with the LCD. Once you have finished the soldering work , get four jumper wires and connect the LCD module to your Arduino as per the instruction given below.



(http://www.electroschematics.com/wp-content/uploads/2015/12/lcd-display-to-arduino-wiring.png)

(lcd display to arduino wiring)