

## LCD 16x2 I2C



### SPECIFICATIONS

- LED is 16-Character 2-Line, blue Screen and white Character (STN Negative Blue)
- Be I2C-Bus Interface that can connect 8 devices together in the same bus (setup different Address)
- Use IC No.PCF8574A to expand Port for connecting with LCD
- Use Power Supply 5VDC

### COMPONENTS OF LCD 16x2 I2C



1. There are 4 Pins as listed below;

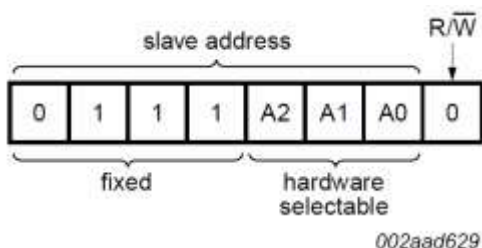
- **PIN GND:** PIN GROUND
- **PIN VCC:** PIN POWER SUPPLY 5VDC
- **PIN SDA:** PIN Signal DATA of I2C-Bus System
- **PIN SCL:** PIN Signal CLOCK of I2C-Bus System

2. Adjustable Resistor adjusts the brightness and contrast LCD Display

3. Jumper chooses Address(A0-A2) of LCD Display. If this Jumper is disconnected, it becomes Logic "1"; but, if it is connected, it becomes Logic "0" instead. Normally, this Jumper is not soldered, the initial Address is 0x3F (A2=1, A1=1, A0=1). If user requires changing the Address, there are 8 available values; 0x38-0x3F as shown in the table below;

PCF8574A address map

Pin connectivity			Address of PCF8574A								Address byte value		7-bit hexadecimal address without R/W
A2	A1	A0	A6	A5	A4	A3	A2	A1	A0	R/W	Write	Read	
V <sub>SS</sub>	V <sub>SS</sub>	V <sub>SS</sub>	0	1	1	1	0	0	0	-	70h	71h	38h
V <sub>SS</sub>	V <sub>SS</sub>	V <sub>DD</sub>	0	1	1	1	0	0	1	-	72h	73h	39h
V <sub>SS</sub>	V <sub>DD</sub>	V <sub>SS</sub>	0	1	1	1	0	1	0	-	74h	75h	3Ah
V <sub>SS</sub>	V <sub>DD</sub>	V <sub>DD</sub>	0	1	1	1	0	1	1	-	76h	77h	3Bh
V <sub>DD</sub>	V <sub>SS</sub>	V <sub>SS</sub>	0	1	1	1	1	0	0	-	78h	79h	3Ch
V <sub>DD</sub>	V <sub>SS</sub>	V <sub>DD</sub>	0	1	1	1	1	0	1	-	7Ah	7Bh	3Dh
V <sub>DD</sub>	V <sub>DD</sub>	V <sub>SS</sub>	0	1	1	1	1	1	0	-	7Ch	7Dh	3Eh
V <sub>DD</sub>	V <sub>DD</sub>	V <sub>DD</sub>	0	1	1	1	1	1	1	-	7Eh	7Fh	3Fh

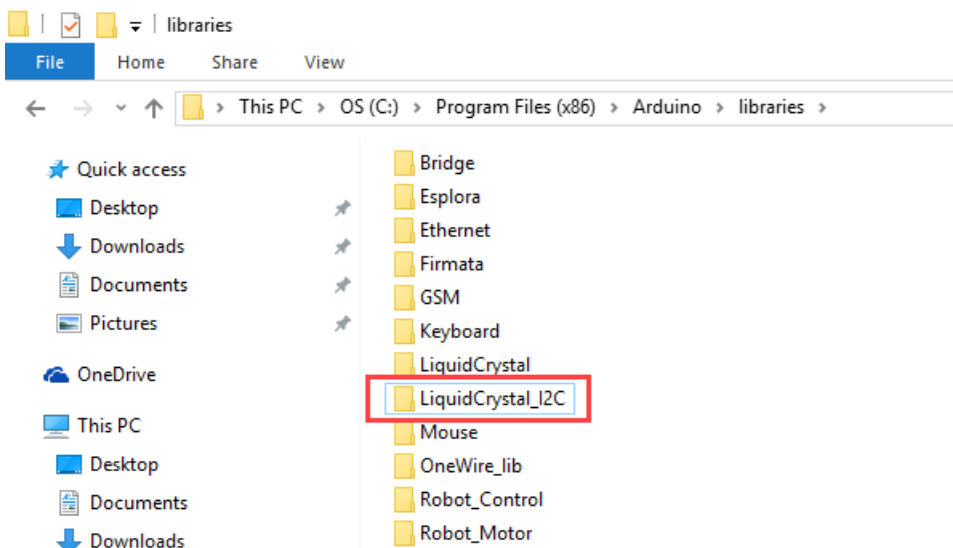
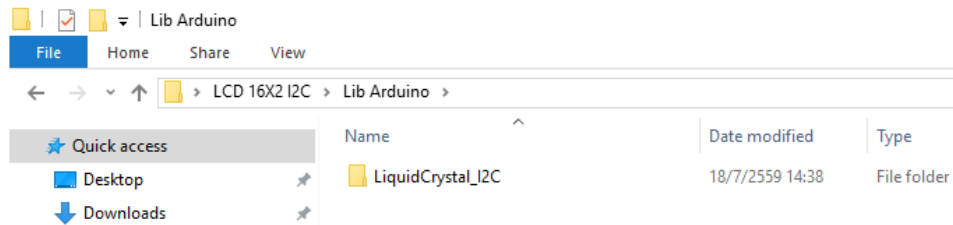


PCF8574A

4. Use IC No. PCF8574A to expand Port
5. LED POWER shows state of supplying Power of LCD Display
6. Jumper disables Power Supply of Backlight at the back of LCD Display. If it is connected, it enables Power Supply of Backlight at the back of LCD Display.

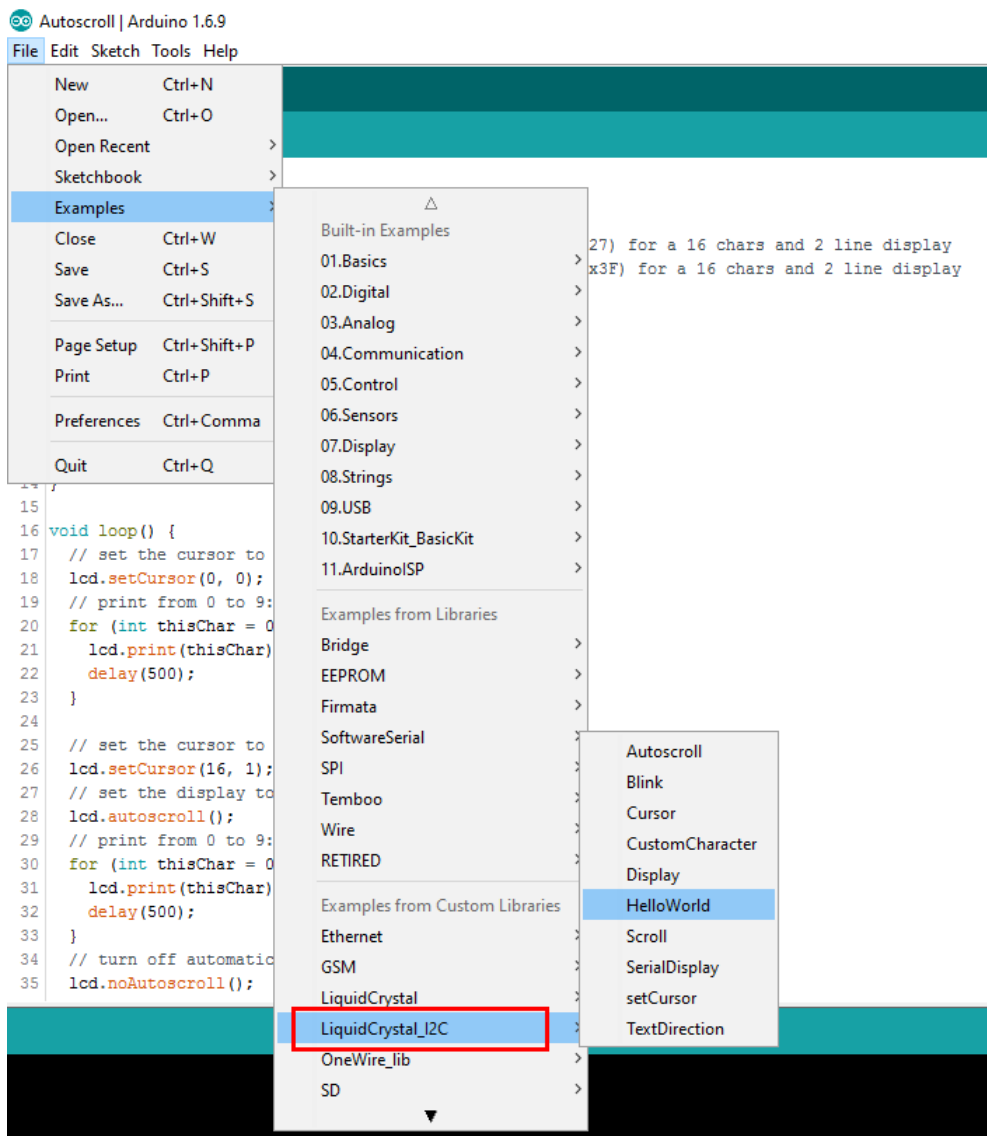
## Example of using LCD 16x2 I2C

1. This example uses Arduino. First of all, it has to install Library of LCD 16x2 I2C; copy Folder **LiquidCrystal\_I2C** in CD and then paste in the Folder **libraries** of Program Arduino. In this case, the example shows how to install the Library at the location **C:\Program Files (x86)\Arduino\libraries** as shown in the picture below;



2. Connect Pin GND, VCC, SDA, SCL of LCD with Board Arduino; and then connect to computer.
3. Open Program Arduino; choose board and Port that is actually connected

4. Click Menu **File---Examples**, user will see the example **LiquidCrystal\_I2C** is added in the folder as shown in the picture. Next, choose the example **HelloWorld** to test the operation.



5. Upload Program into Board Arduino. When uploaded successfully, user will see the message shown on the LCD Display.

**NOTE:** If connected many LCD 16x2 I2C at the same time, it might not communicate because Pin SCL and Pin SDA of LCD Display of every LCD Display is connected with 4.7K Resistor Pull-Up (R8,R9); in this case, it should remove Resistor R8 and R9 and there is only one board left that is connected with Resistor.