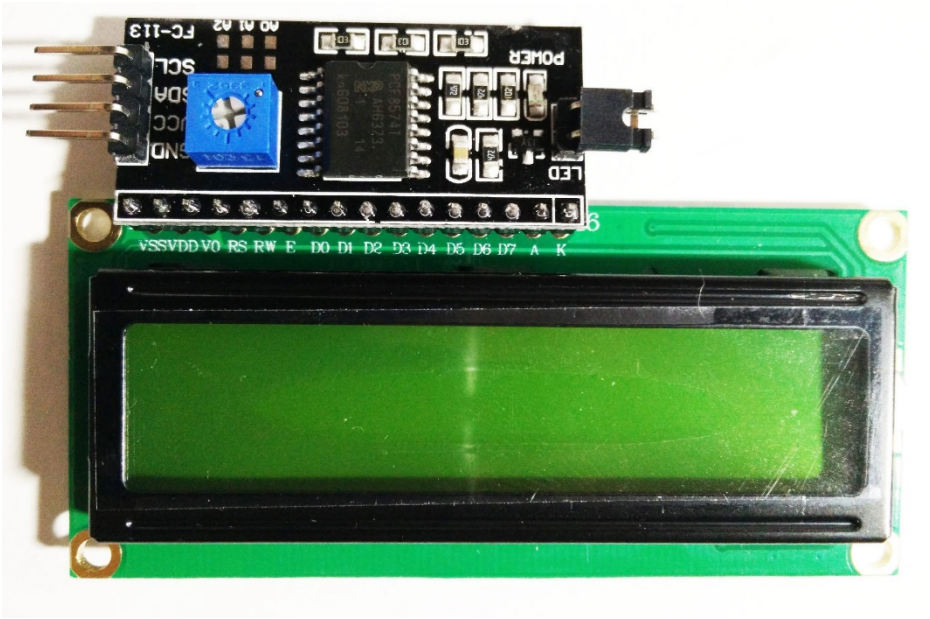
Welcome!

And thank you for purchasing our **AZ-Delivery 16 x 2 LCD I²C Display Bundles**! On the following pages, we would go together with you through the first steps of the installation process until the first illuminated letters. We wish you a lot of fun!



http://flyt.it/DisplayBundle

The **Bundle** consists of a backlit two-line display with space for 16 characters each, and an FC-113 display driver so that the display can be controlled only with four connections via the I²C-interface of an Arduino.

Overview of the most important information

» **16 x 2 LCD**
  » 32-character display (2 lines of 16 characters each)
  » green backlighting
  » directly controllable via 16 pins
  » can be controlled with I^2C via FC-113

» **FC-113 display driver**
  » I^2C connection to the controller
  » Programming via Arduino Code with NewliquidCrystal library

» Power supply via the microcontroller

On the following pages, you will find information about the
» **Structure of the circuit**
And instructions for
» **the first script with I^2C control**.

Overview of all Links

Arduino library "New LiquidCrystal":

» *https://bitbucket.org/fmalpartida/new-liquidcrystal/downloads/*

Application programming interfaces:

» Arduino IDE: *https://www.arduino.cc/en/Main/Software*

» Web-Editor: *https://create.arduino.cc/editor*

» Arduino extension for SublimeText:
https://github.com/Robot-Will/Stino

» Arduino extension "Visual Micro" for Atmel Studio or Microsoft Visual Studio:
http://www.visualmicro.com/page/Arduino-for-Atmel-Studio.aspx

Arduino Tutorials, Examples, References, Community:

» *https://www.arduino.cc/en/Tutorial/HomePage*

» *https://www.arduino.cc/en/Reference/HomePage*

Interesting information from AZ-Delivery

» Arduino compatible boards:
https://az-delivery.de/collections/arduino-kompatible-boards

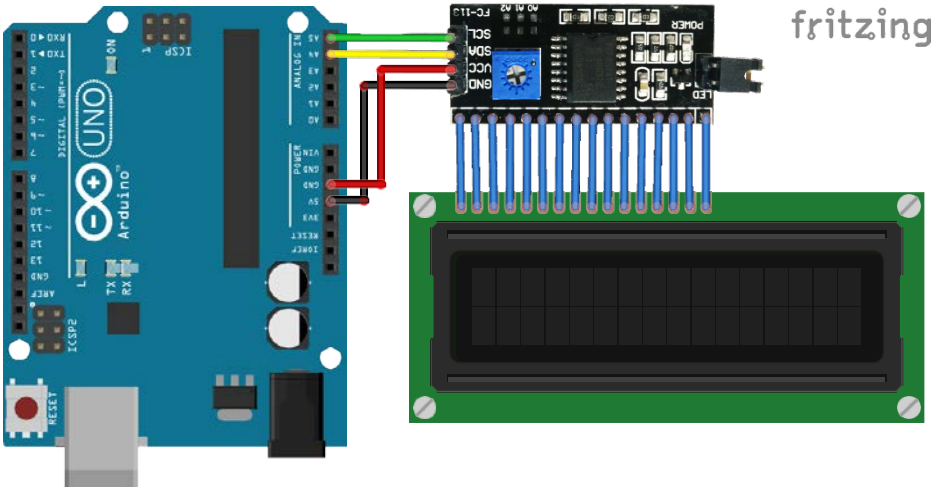
» Arduino accessories:
https://az-delivery.de/collections/arduino-zubehor

» AZ-Delivery G+Community:
https://plus.google.com/communities/115110265322509467732

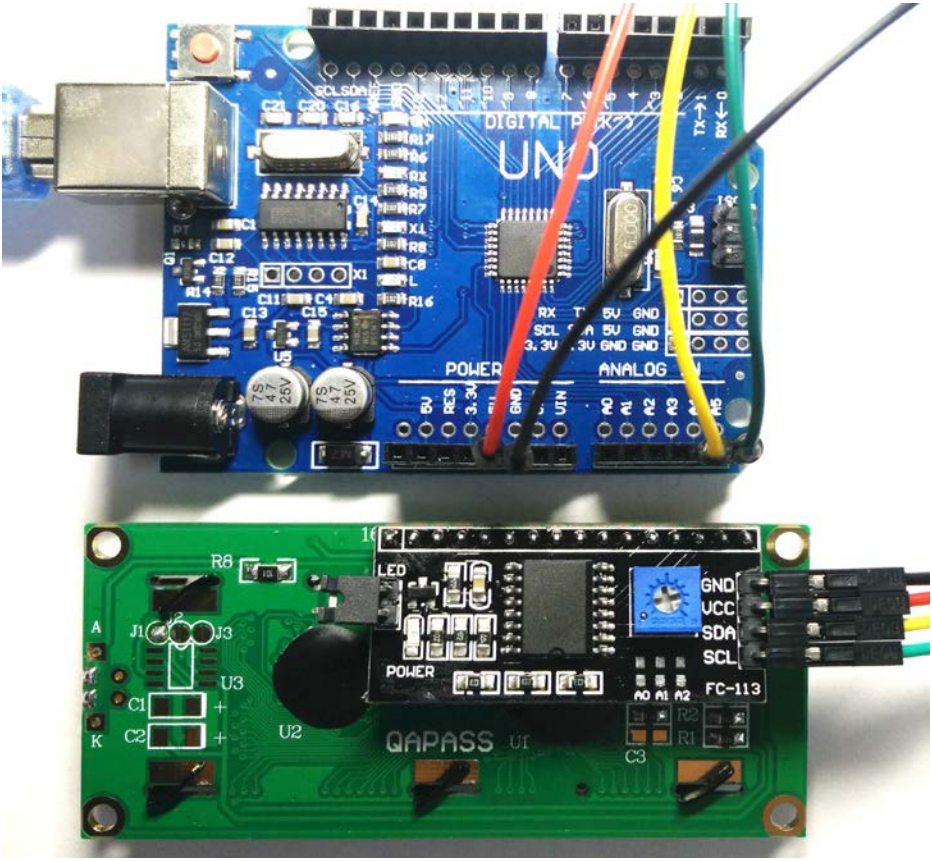
» AZ-Delivery on Facebook:
https://www.facebook.com/AZDeliveryShop/

Structure of the circuit

For the connection of all three components, a total of only four cables between the controller were enough, as in the **AZ-Delivery UNO R3**, and the **FC-113 display driver**. The latter has already a pin header, which must be soldered in the direction of the **16x2 LC display** so that the four-angled contact pins touch the edge of the display. You can solder it from the front or, as shown on the right in the picture, from the back of the display module.



Ideally, you would have an extension cable, with a socket and a plug, for a connector. Otherwise, the ends on the **FC-113** side can be easily soldered.



FC-113	UNO R3
GND	GND
VCC	5V
SDA	A4
SCL	A5

Installation of the library for the FC-113

The **16x2 LC-Display** is a very popular module, which is why in the Arduino IDE there is already an integrated official library called "**LiquidCrystal**". Unfortunately, it only works when the display is directly connected to the UNO.
One development team had programmed with the library "**New LiquidCrystal**" a very extensive extension, which not only enables image display via I^2C-Module but has also the ability to achieve this task considerably fast. You can download the current zip file "**NewliquidCrystal_x.x.x. zip**" here:

» *https://bitbucket.org/fmalpartida/new-liquidcrystal/downloads/*

Unpack the "**NewliquidCrystal**" folder, which is located in the **libraries** directory of your sketchbook folder. Then close any open instances of your Arduino IDE and start the program anew. Now you should be able to find your included examples, which should be located in the library under *other*.

The First Script

What is better for a text display module than a "**Hello World**" sketch?
In order to point out the commands, which are necessary for the display, we would not, in this case, use an example from the library, but rather write our own sketch:

```
#include <Wire.h>
#include <LCD.h>
#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C  lcd(0x27,2,1,0,4,5,6,7,3,POSITIVE);

void setup()
{
    lcd.begin(16, 2);
    lcd.clear();

    lcd.setCursor(0,0);
    lcd.print(">AZ-Delivery.de<");
    lcd.setCursor(0,1);
    lcd.print(">16x2 & FC-113!<");
}

void loop()
{
    lcd.setBacklight(HIGH);
    delay(1000);
    lcd.setBacklight(LOW);
    delay(1000);
}
```

The IDE-internal "**Wire.h**"-library for the I²C-communication, the "**LCD.h**" for the display commands and the "**LiquidCrystal_I2C.h**" for the switching between the display driver and display must be integrated, in order to create a connection.

The most important line follows line 5:

» "**0x27**" indicates the I²C address of the FC-113-driver.

» "**2,1,0,4,5,6,7**" designate the pins of the FC-113 to control the display.

» "**3**" defines the connection for the backlighting.

» "**POSITIVE**" activated the backlighting.

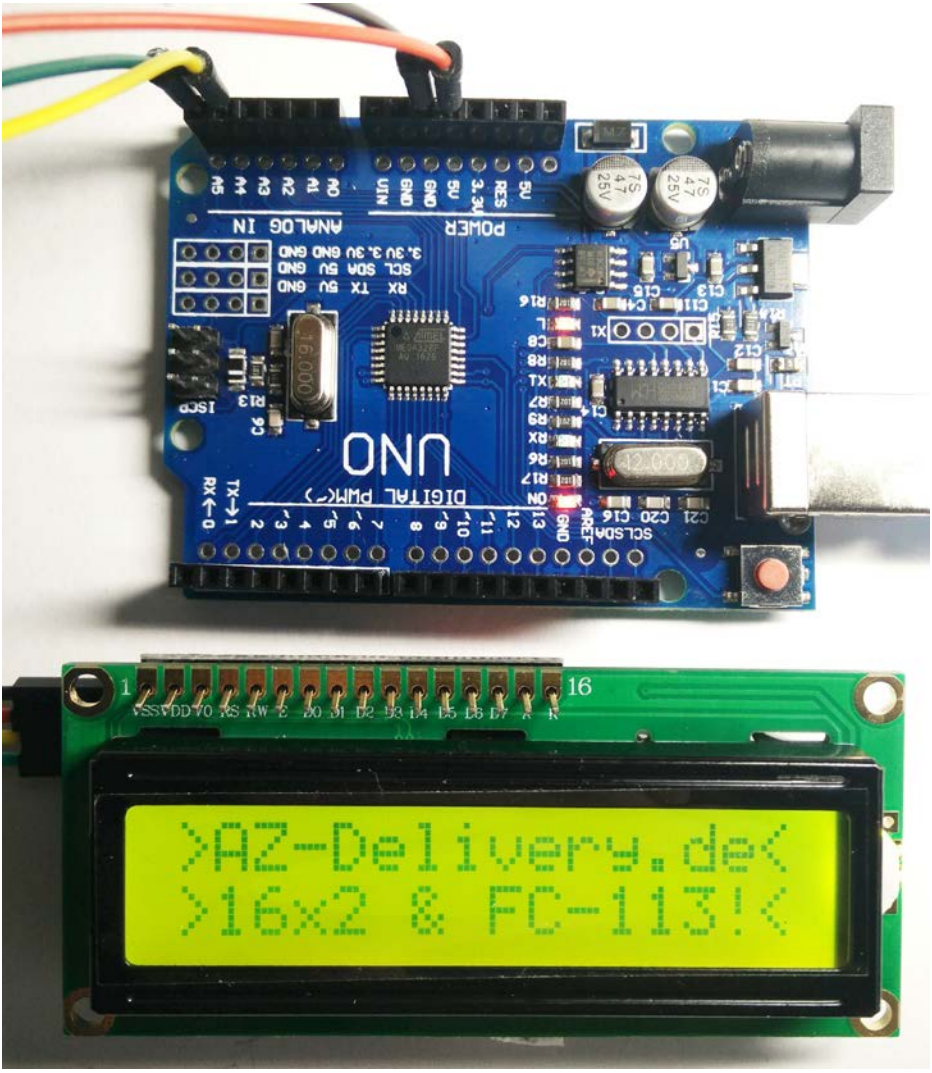
» The commands "**begin**" and "**clear**" activate and empty the display, respectively.

» With "**setCurser**" you can always define your starting point (column, line) for your subsequent input.

» "**print**" is the command that allows you to deliver ordinary strings to the display. However, please keep in mind that while the library can confidently handle all Latin letters, numbers and most commonly used special characters, it can get "creative" with unusual symbols or characters.

» With "**setBacklight**" you can always activate or deactivate the backlighting, while the sketch is running.

Congratulations! You have projected your first lines on a **16x2 LC-display**! For the next step, have a look at the "**HelloWorld_i2c**" sketch from the "**NewliquidCrystal**" examples. However, in order for something on the display to happen, you must always change the initialization of the "**LiquidCrystal_I2C**" class, according to line 5 from the example on the left.



And for more hardware our online store is always at your disposal:

https://az-delivery.de

Enjoy!

Imprint

https://az-delivery.de/pages/about-us