Using NOKIA 5110 display with an ESP8266 NodeMCU

Required material:

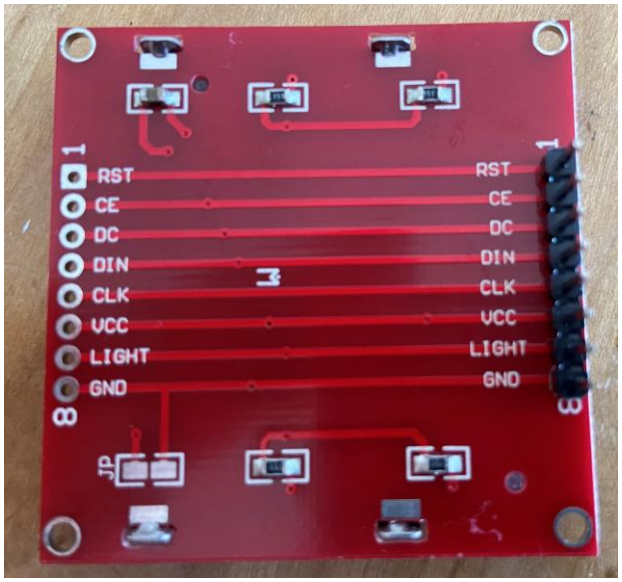
- 1 or 2 x breadboards for the components: see internet
- 8 x jumper wire cables: see internet, sets of board and cables
- 1 x ESP8266 NodeMCU: AZDelivery NodeMCU Amica Modul V2 ESP8266 ESP-12F WiFi WiFi Development Board mit CP2102 kompatibel mit Arduino inklusive E-Book! : Amazon.de: Computer & Zubehör
- 1 x NOKIA 5110 Display: https://www.amazon.de/dp/B07CYZYF3Y/ref=twister_B07ZJ3YMR9?_encoding=UTF8&th=1

Important: there are two versions of the "red" PCB display available. As well you can find a version with blue PCB offered.

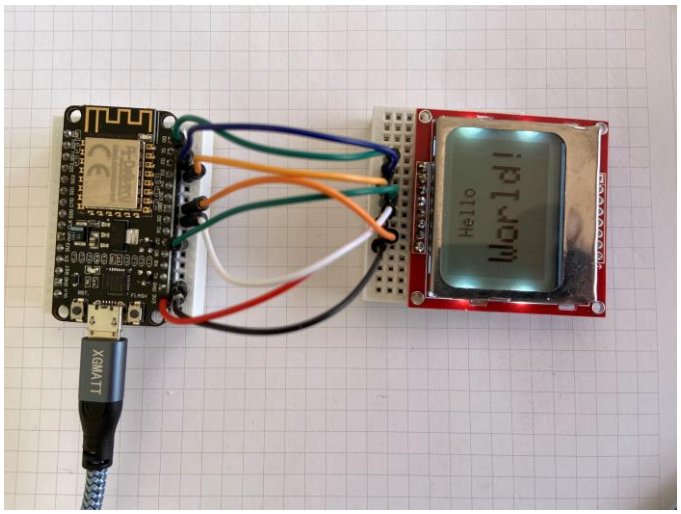
Make sure you are using the version with this printing on the backside. **This type uses GND connection to illuminate the backlight!**

There are **other versions that are using the VCC** for backlight and if potentiometer is used it is possible to dim the brightness. See sparkfun: https://learn.sparkfun.com/tutorials/graphic-lcd-hookup-guide

The displays are monochrome grey color.



The project …

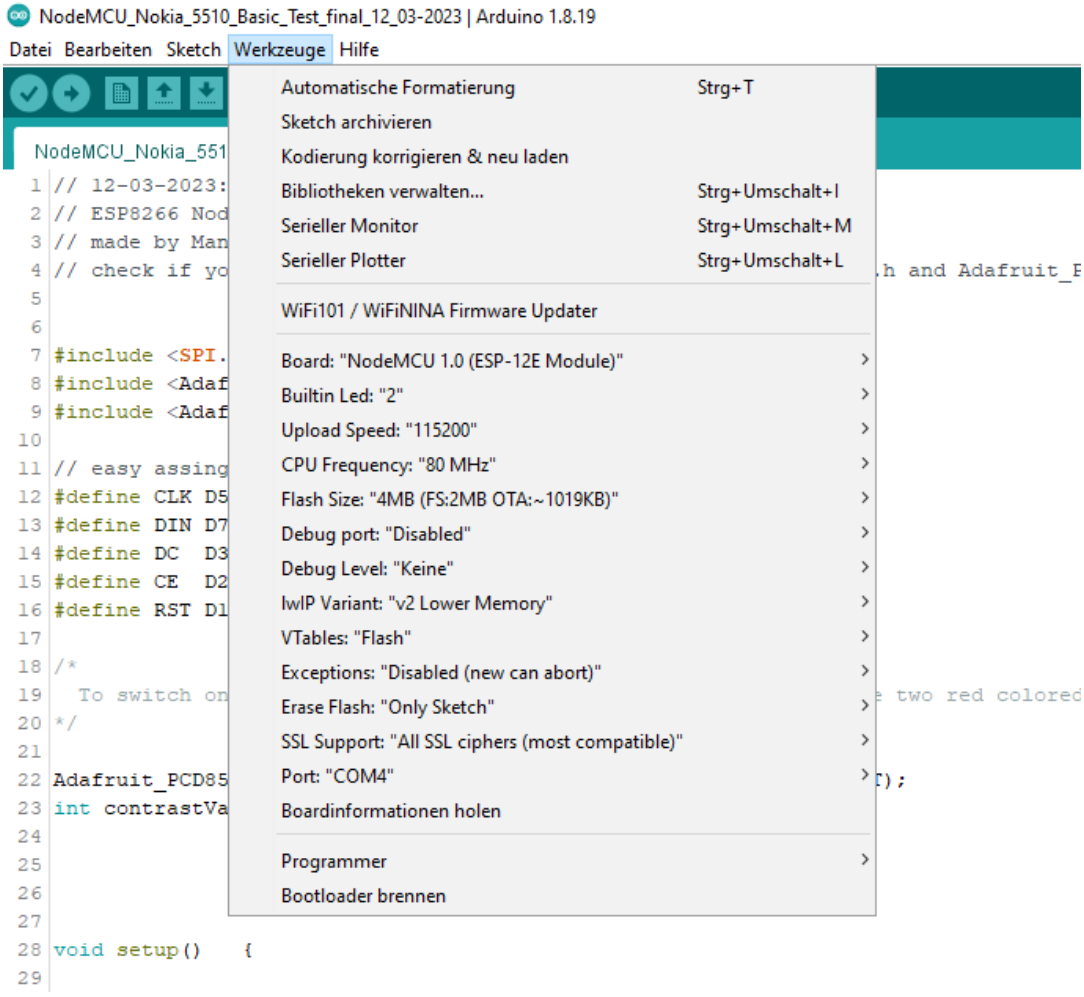


1. Make sure ESP8266 is connected to computer and ready to download sketches:

For absolute beginners:

Make sure you have connected the ESP8266 via USB and have set-up the Arduino IDE programming software already: https://randomnerdtutorials.com/how-to-install-esp8266-board-arduino-ide/

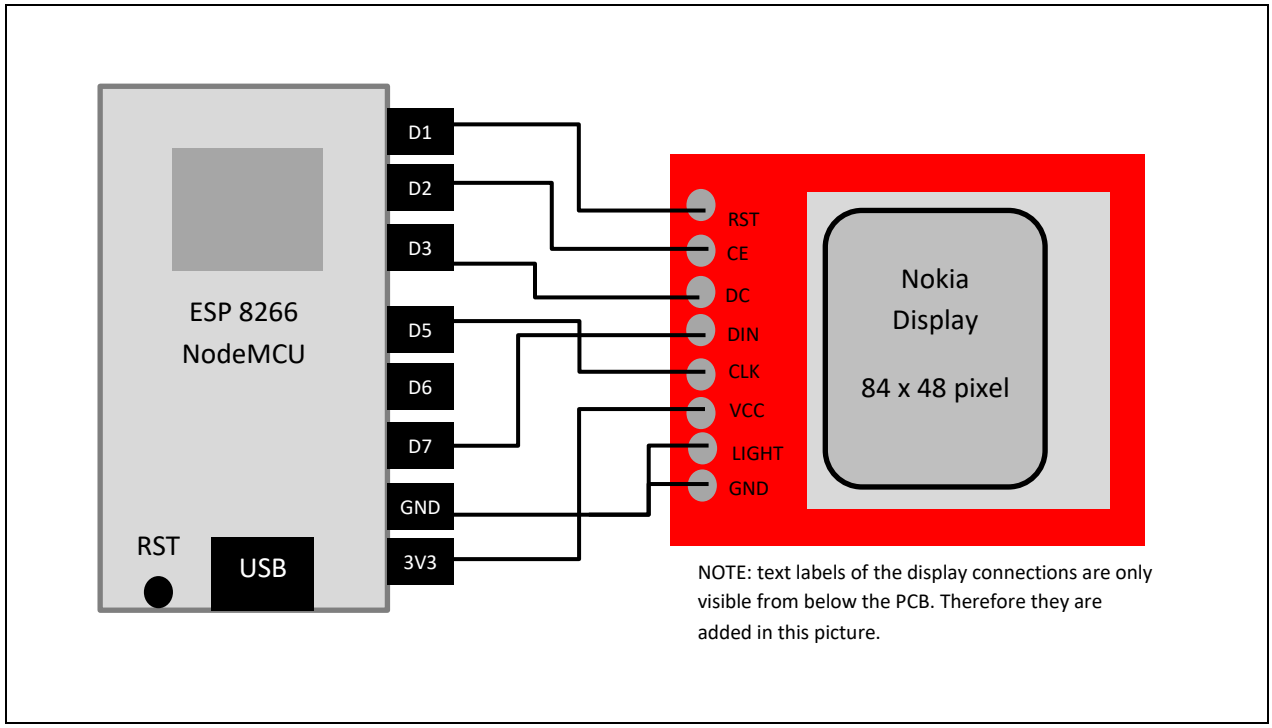
Use the menu “tool” to see or change the settings for ESP8266 NodeMCU.



2. ESP8266 wiring to the LCD display:

Ensure the proper wiring between the ESP8266 NodeMCU and the LCD Display, which was originally designed for a mobile phone of NOKIA 5110.
(History of the phone: https://en.wikipedia.org/wiki/Nokia_5110).

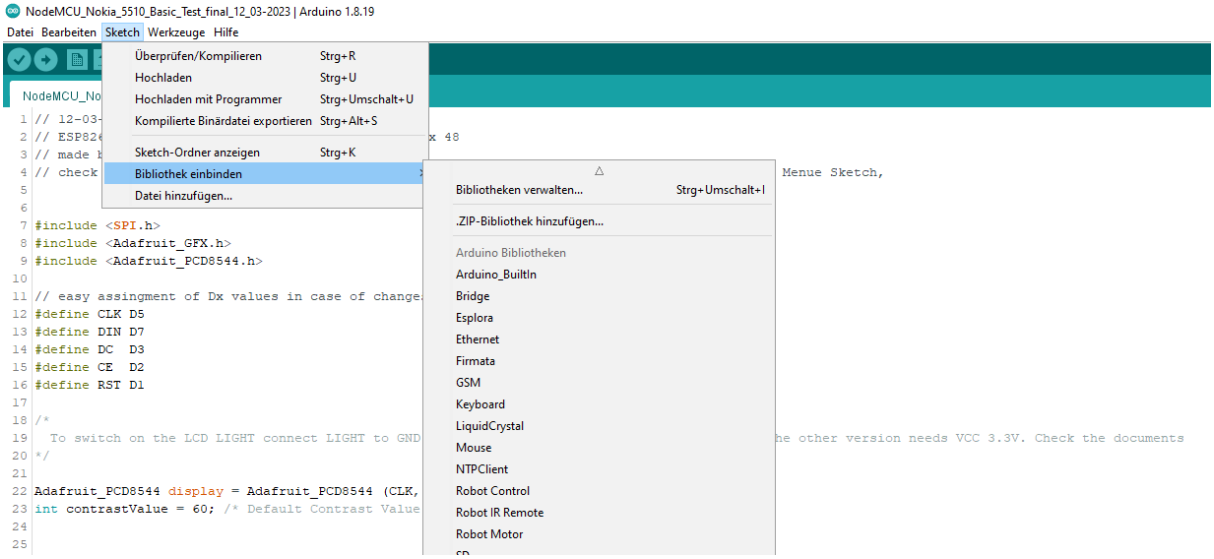
Wiring schematic (top view of components shown):



3. ESP8266 libraries and sketch to test the display:

Find the demo sketch for testing provided below. Note, that the relevant lines are used only in set-up and therefore only processed one time on IDE Serial monitor and the display. If not yet done, you need to install first the libraries needed to use the display: SPI.h, Adafruit_GFX.h and Adafruit_PCS8544.h

Installing & manage libraries: Use the IDE software with the menu **to install or manage the libraries**. The link below will help you further if needed. Use key words like GFX or SPI or PCS8544 to find them and use the once described.



https://docs.arduino.cc/software/ide-v1/tutorials/installing-libraries

Note: if nothing will happen, it may be the display is a damaged one (community feedback). So make sure you wired correctly, installed the libraries and downloaded the sketch provided below. The LIGHT of the backlight should be working by connecting to GND. That does not ensure a proper devise function as it only enables the LEDs.

4. Demo sketch to test the display:

Copy the sketch and copy into your Arduino IDE. This will run only one time during set-up sequence. Press reset button to restart again.

```
// 12-03-2023: running test Version
// ESP8266 NodeMCU with Nokia_5510 Display LCD 48 x 48
// made by Manfred Koch, Germany
// check if you have "included" the libraries SPI.h, Adafruit_GFX.h and Adafruit_PCS8544.h


#include <SPI.h>
#include <Adafruit_GFX.h>
#include <Adafruit_PCD8544.h>

// easy assignment of pins Dx values in case of changes
#define CLK D5
#define DIN D7
#define DC  D3
#define CE  D2
#define RST D1

/*
  To switch on the LCD LIGHT connect LIGHT to GND. Note: There are two red coloured Displays.
The other version needs VCC 3.3V. Check the documents
*/

Adafruit_PCD8544 display = Adafruit_PCD8544 (CLK, DIN, DC, CE, RST);
int contrastValue = 60; /* Default Contrast Value */


void setup()   {

  // Note: this sequence is only executed one time. Press reset button on ESP8266 to restart.
  Serial.begin(115200); // set baud rate and check if same is used in the software setting
  Serial.println ();
  delay(2000);
  Serial.println ("Hello World!");
  Serial.println ("one time on NodeMCU ESP8266 serial Monitor and displayed to Nokia 5510");
  Serial.println ();

  display.begin ();
  display.setContrast (60);
  display.clearDisplay ();
  display.setRotation (2);

  display.setTextSize (1);
  display.setTextColor (BLACK);
  display.setCursor (24, 5);
  display.println ("Hello");
  display.setTextSize (2);
  display.setCursor (10, 20);
  display.println ("World!");
  display.display ();

} // end of set-up



void loop() {

  // write here your program otherwise nothing happens further

} // end of loop
```

Further ideas:

- **Switch backlight on/off:** Connecting the pin of the backlight not to ground pin, but to a ESP8266 pin and toggle on/off by setting it to high / low status. I have added on sketch as *.ino file. Please change the wiring then accordingly.