BI-ARD

Indoor Air Quality Measurement Station

HW Documentation

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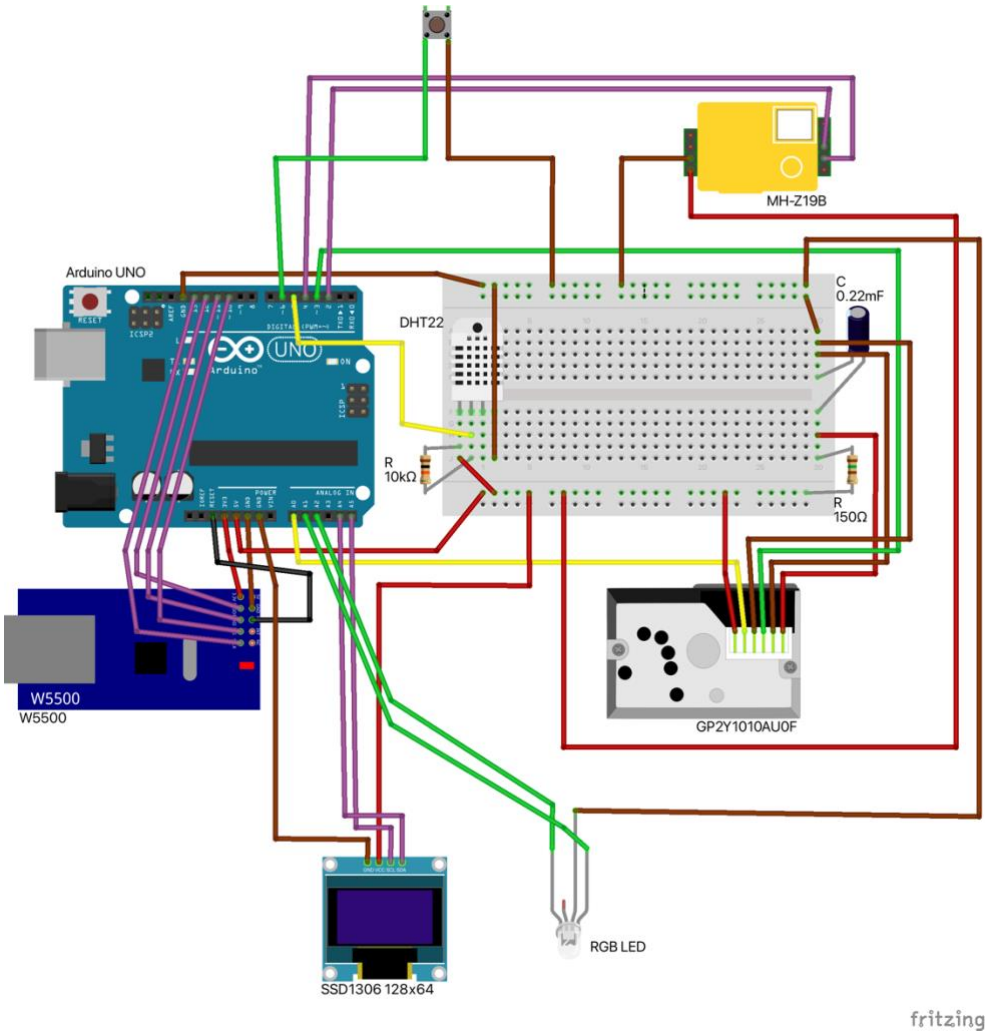
1. Components

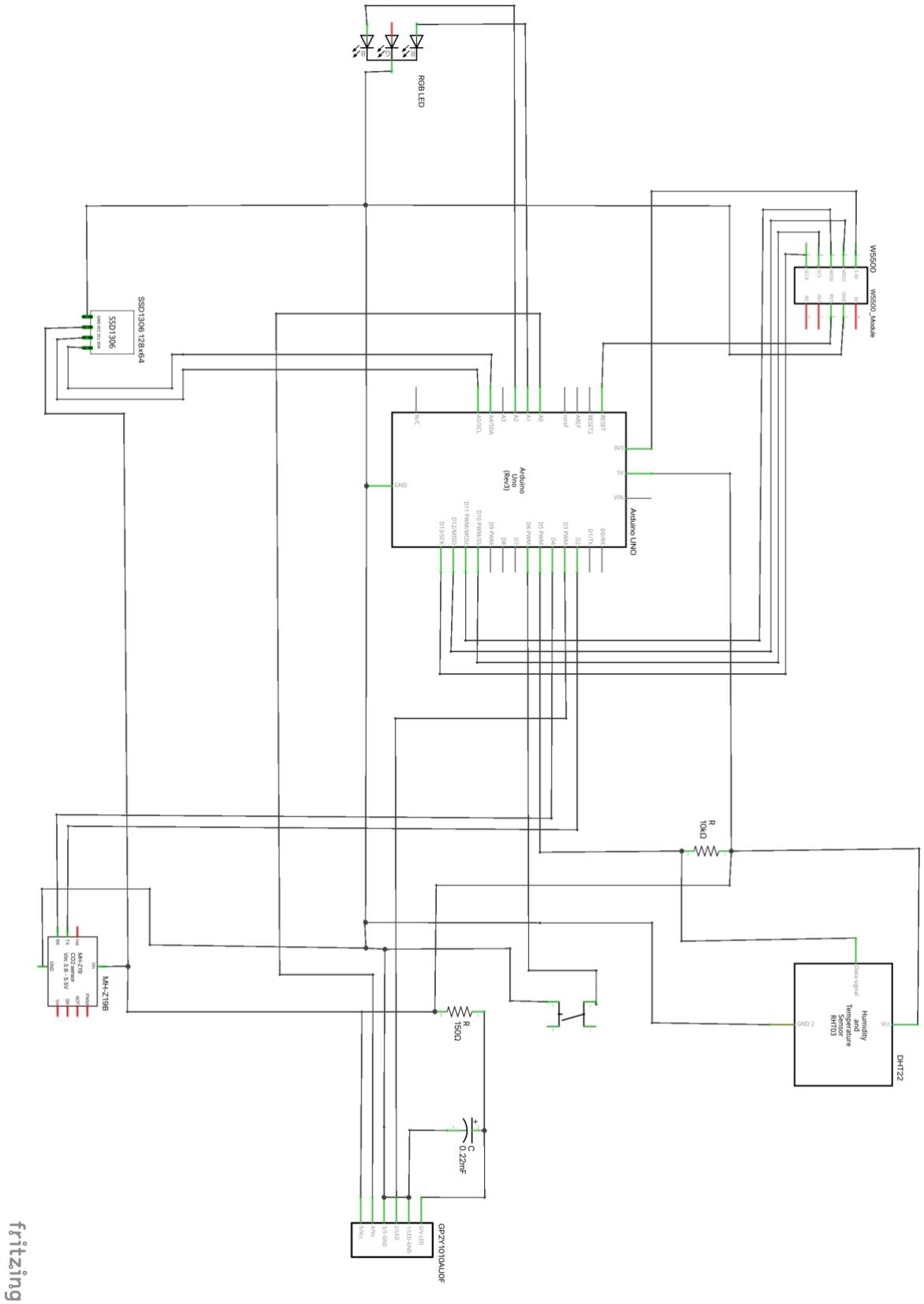
- **Sensors**
  - Dust sensor – GP2Y1010AU0F
  - Tempeature and humidity sensor – DHT22
  - Carbon dioxide sensor – MH-Z19B
- **Peripheries**
  - OLED Display – SSD1306 128x64
  - Ethernet module – W5500
- **Other**
  - Button
  - RGB LED

2. Wiring

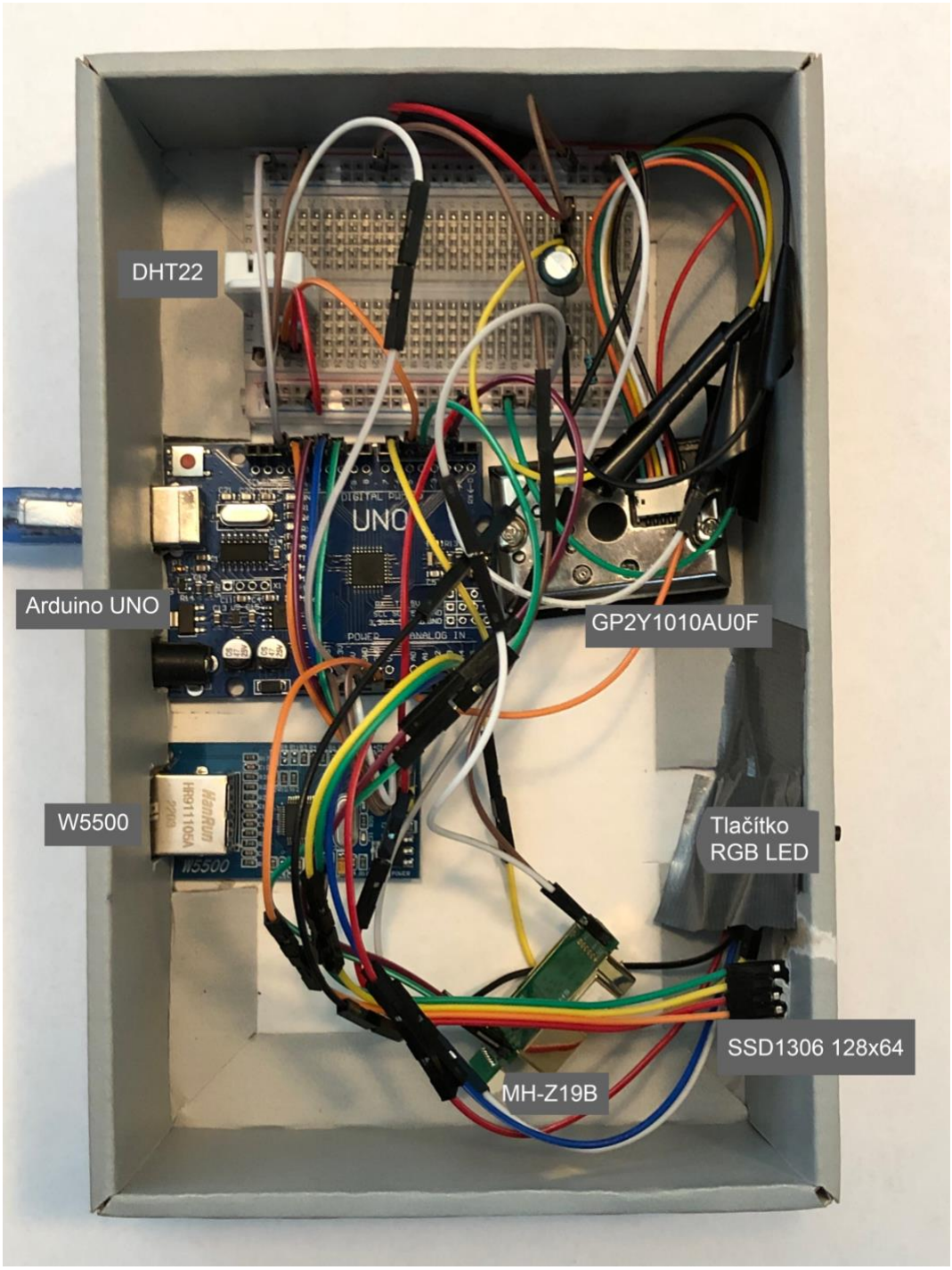
- Illustration



- Schematic


RGB LED
W5500
W5500_Module
SSD1306 128x64
SSD1306
Arduino UNO
Arduino Uno (Rev3)
R 10kΩ
R 150Ω
C 0.22mF
MH-Z19B
Humidity and Temperature Sensor RHT03
DHT22
GP2Y1010AU0F
fritzing

- Real


DHT22
Arduino UNO
GP2Y1010AU0F
W5500
Tlačítko
RGB LED
SSD1306 128x64
MH-Z19B

3. Settings

3.1. Pins

If the pins on the Arduino were wired differently, this must be taken into account by changing the pin in the code.

All pins are defined in the header of *AirQuality.ino* file where they can be changed.

```
/****************************************
 * Pins
 ****************************************/
#define tempeatureDigitalPIN    5
#define pollutionAnalogPIN      A0
#define pollutionDigitalPIN     3
#define co2RxPIN                4
#define co2TxPIN                2
#define buttonPIN               6
#define redLedPIN               A1
#define blueLedPIN              A2
```

3.2. Measurement frequency

The period of regular sensor data measurement is defined in the header of the *AirQuality.ino* file, where this time can be changed. The unit is milliseconds. The minimum value is 2000 ms, but more is recommended.

```
/****************************************
 * Constants
 ****************************************/
#define measureRate             7000
```

3.3. Internet connection

For the correct functioning of the web server that displays the results it is necessary to set up the Ethernet module correctly. To connect, you must know the MAC address of the module and have a static IP address assigned. These values must be set in the header of the *AirQuality.ino* file.

```
/****************************************
 * Ethernet settings
 ****************************************/
byte mac [] = {
    0xDE, 0xAD, 0xBE, 0xEF, 0xFE, 0xED
}; //< MAC address of ethernet module

IPAddress ip(192, 168, 0, 102); //< Assigned static IP address
```