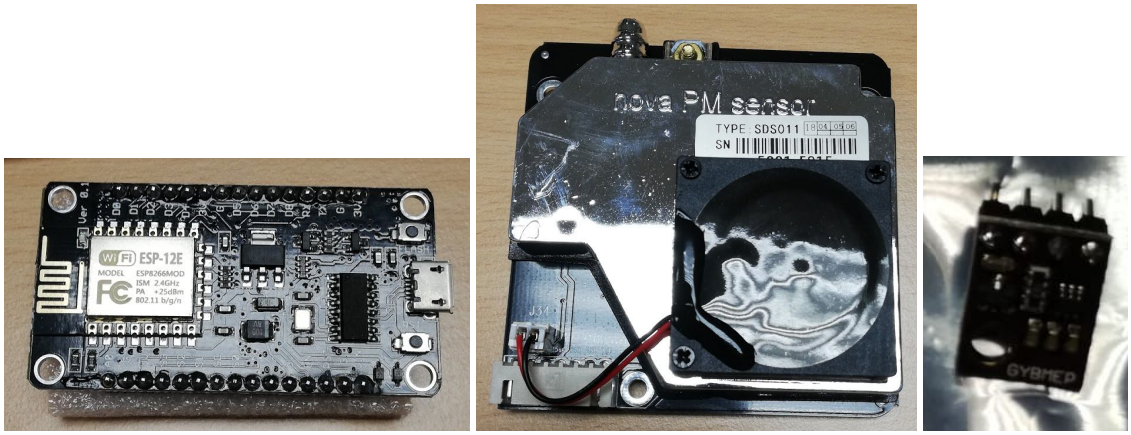
Hardware Architecture

Components for one sensor:

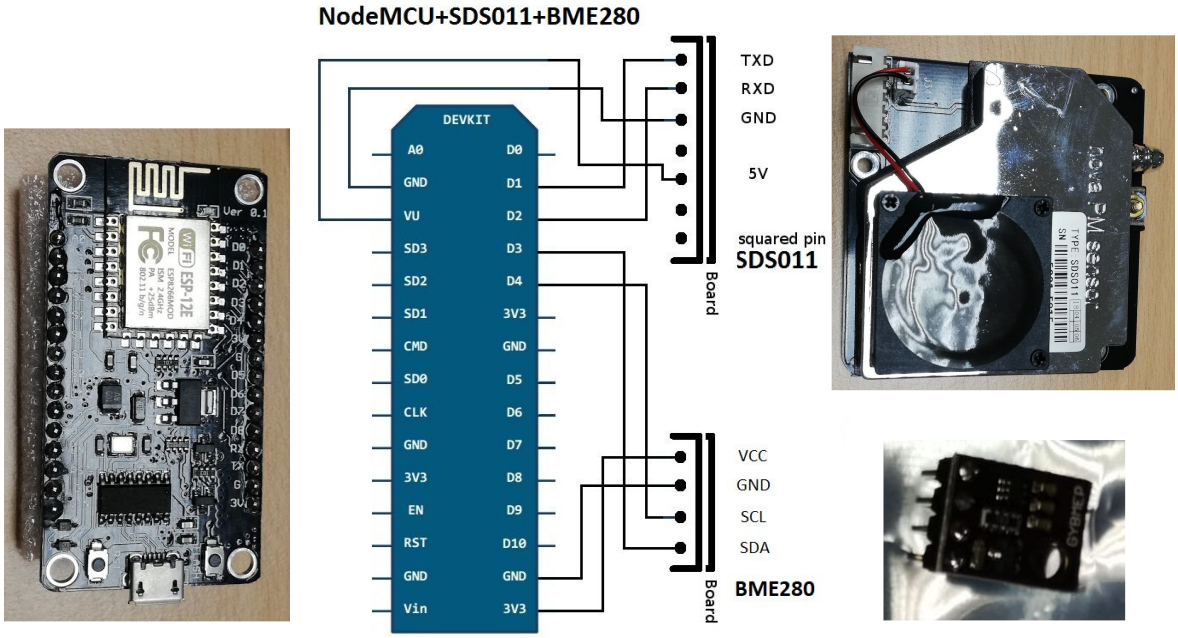
- NodeMCU (ESP8266, CPU/WLAN)
- SDS011 (particulate matter sensor)
- BME280 (temperature, humidity and pressure sensor)
- Dupont cable (female-female, approx. 20cm)
- USB Cable (flat, 2m, Micro-USB)
- USB Power Supply (5V, 1A minimum)
- Net mesh material
- Cable straps
- Flexible tube, diameter 6 mm, length approx. 20cm
- 2 x PVC tubes, Marley Silent HT Arc (DN 75 87°)
- 2 x 3D printed rings to secure the net to the ends of the PVC tubing



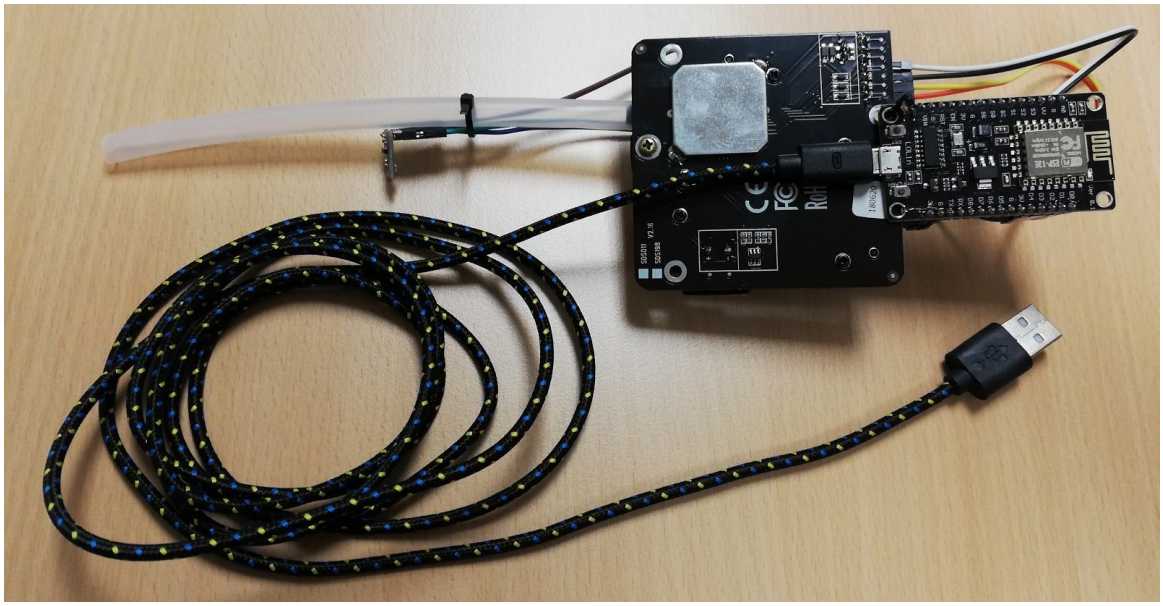
Left: NodeMCU (ESP8266 microcontroller), Center: SDS011 (PM Sensor), Right: BME280 (temperature, humidity and pressure sensor)

Construction:

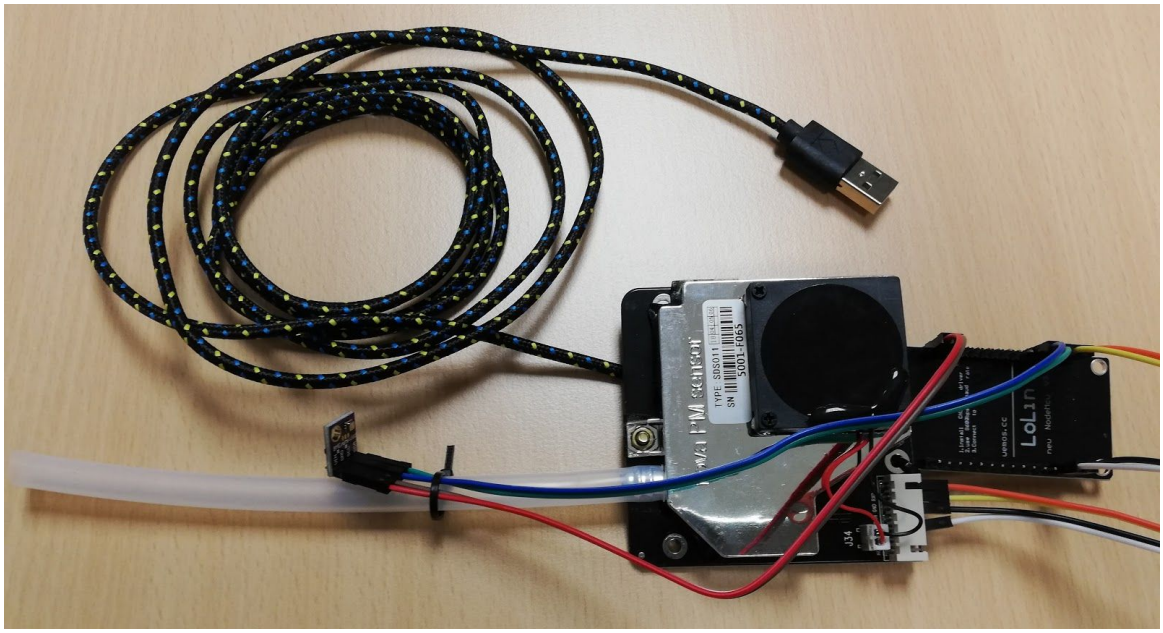
We followed the fine dust sensor construction manual provided at:
https://luftdaten.info/en/construction-manual/
However, since we use a BME280 sensor instead of a DHT22 sensor, the connection schematic is the following:



Connection schematic for the fine dust sensor

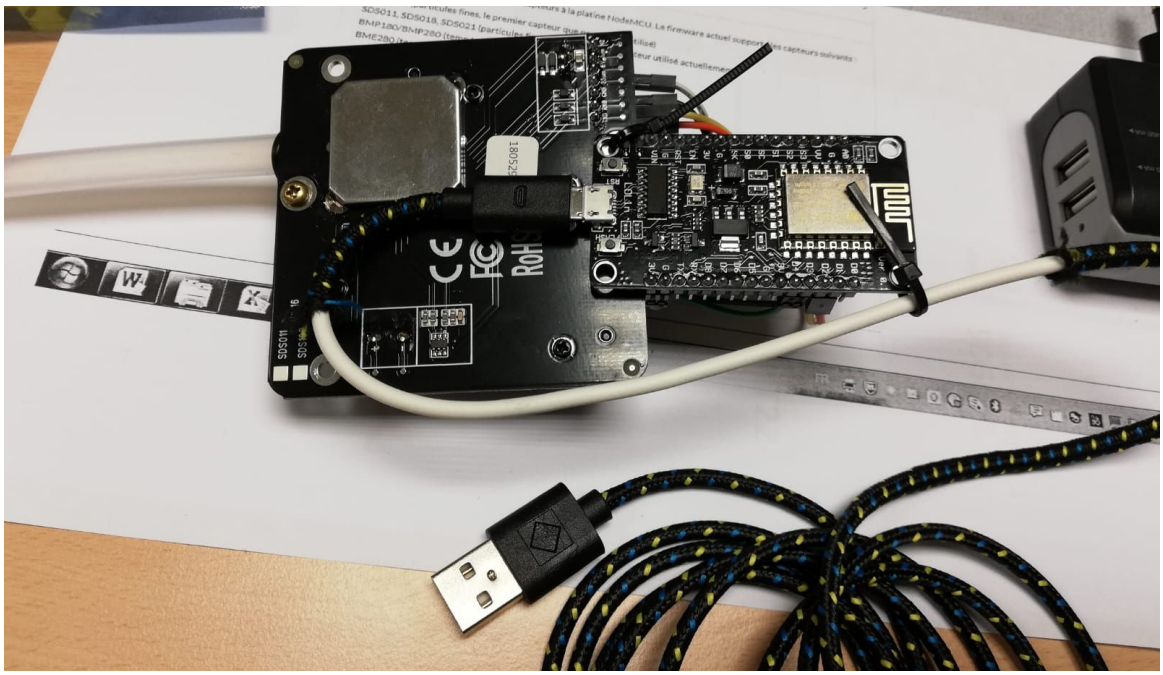


Top view of the assembled sensor



Bottom view of the assembled sensor

Since we are using braided USB cables, we have to remove parts of the sleeving at the end of the cable and glue them to avoid absorbed rainwater from entering and damaging the sensor:



Sleeve removed from the end of the USB cable