



Meteo Team

PROCESS CONTROL PROJECT

FINAL PRESENTATION

Project timeline

week 1



- members selection
- work distribution
- initial presentation work

week 2-3



- deciding on sensors and electronic parts
- consulting, connecting to an MCU

Project timeline

week 3-6



- programming the sensors to process the measurements
- testing the output

week 6-9



- working on a 3D model for the meteo device in Fusion360
- finishing the model, consulting

Project timeline

week 9-10



- printing and assembling all parts
- consulting and correcting the printed parts

week 10-12



- integration of VESNA meteo device using API
- setting up the device on an IoT cloud services
- programming the MCU to send measurements to the cloud service

Project timeline

week 12-13

- finishing up
- working on documentation
- working on the final presentation

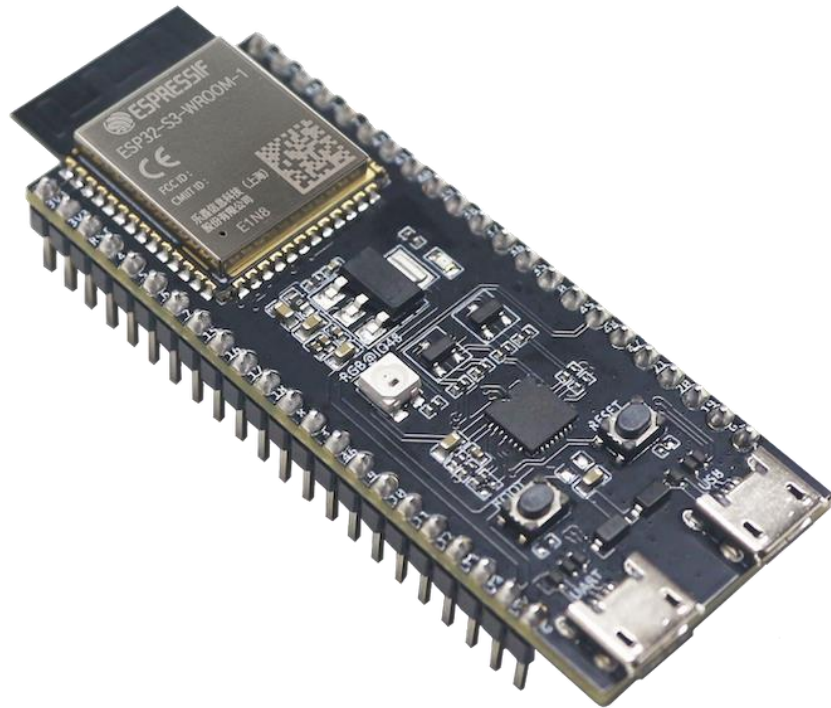


Team Members

- Filip Hlubík: 3D modelling, testing outputs
- Ivana Dukayová: data exchange, cloud service
- Marek Horecký: programming of a microprocessor, testing outputs, team leader
- Richard Bielovič: choosing appropriate sensors, assembling all parts
- Viliam Vrba: 3D modeling, testing outputs

Devices used

- MCU ESP32-S3



- Multiplexer TCA9584A



Sensors

- FS400-SHTXX -
temperature, humidity

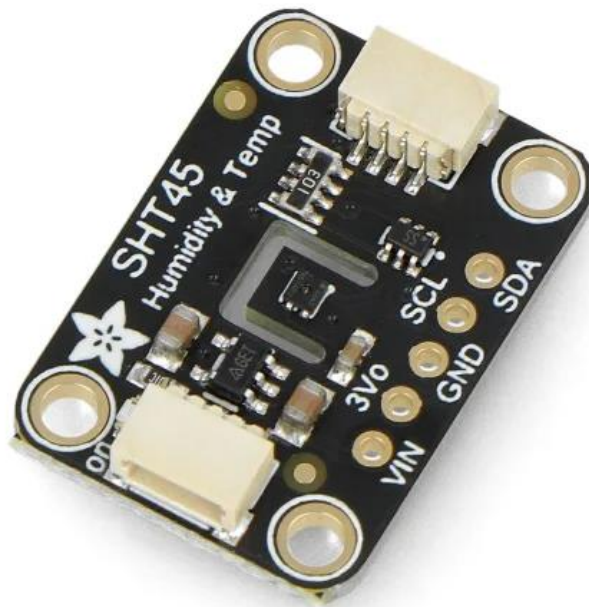


- SHT30 soil sensor -
temperature, humidity

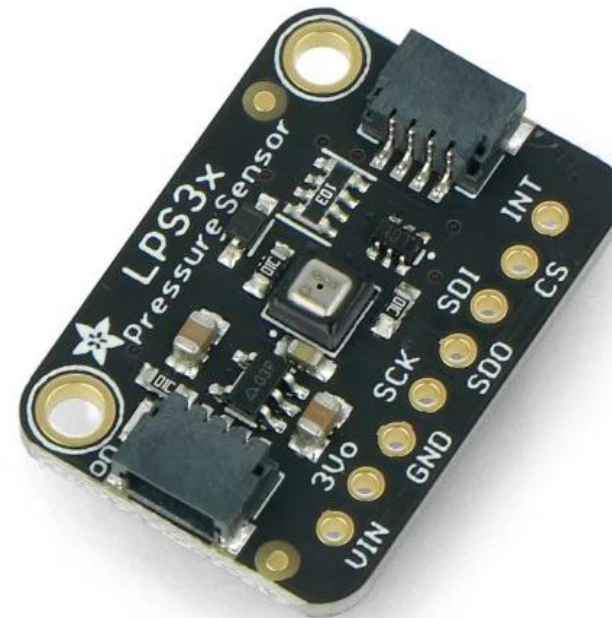


Sensors

- SHT45 - temperature, humidity



- LPS35HW - temperature, pressure



Sensors

- analog photoresistor - light intensity



- DS18B20 sensors - temperature



Software Tools

- Arduino IDE - Programming environment for the ESP32-S3
- Fusion360 - 3D modeling software
- PrusaSlicer - 3D printing slicer software

temperature_sht31 [°C]

27.43

humidity_sht31[%RH]

43.82

temperature_sht30 [°C]

28.24

humidity_sht30 [%RH]

37.02

temperature_sht45 [°C]

26.85

humidity_sht45 [%RH]

40.69

temperature_lps35 [°C]

25.28

pressure_lps35 [hPa]

996.718

photoresistor [kOhm]

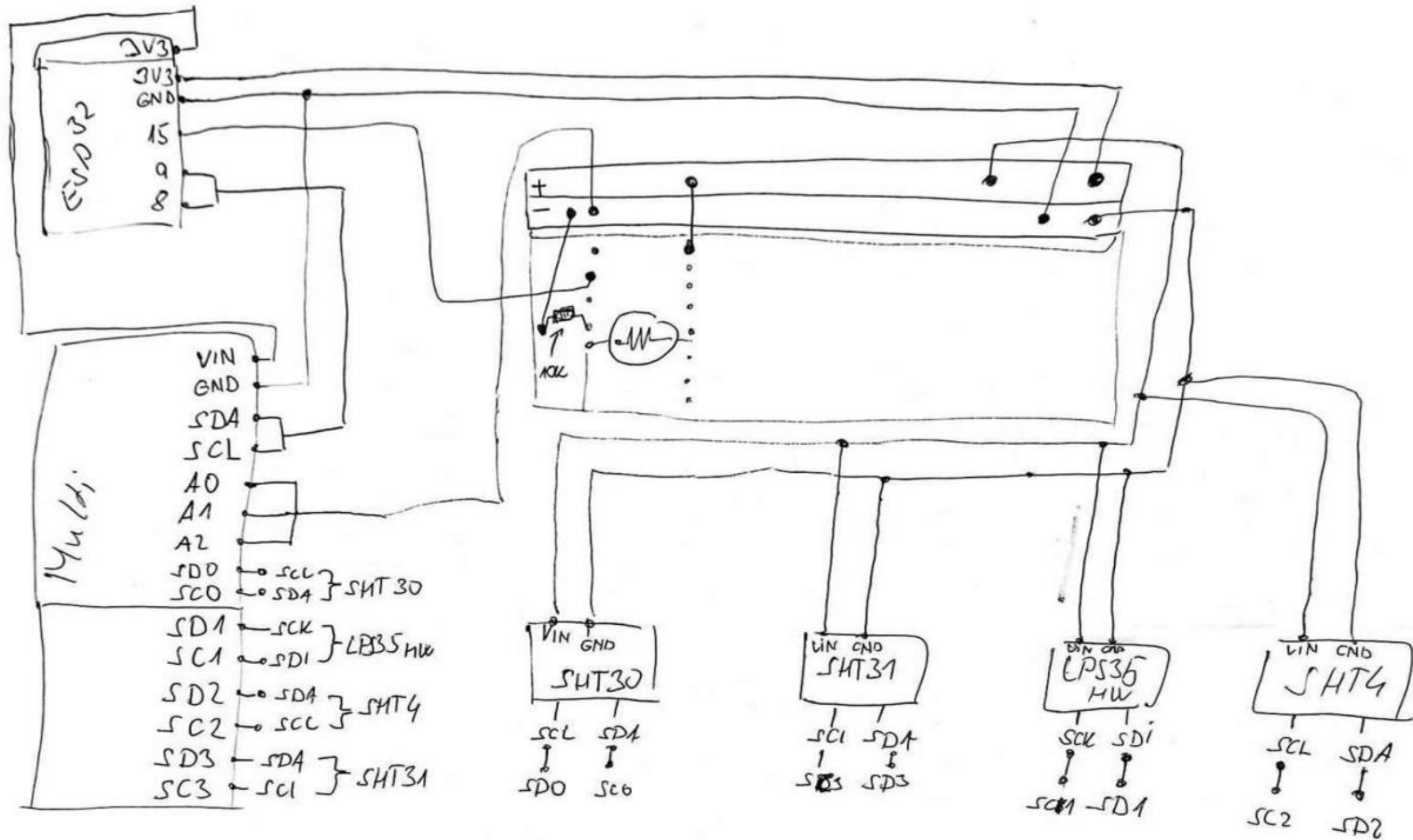
1896

Temp [°C]

29.00

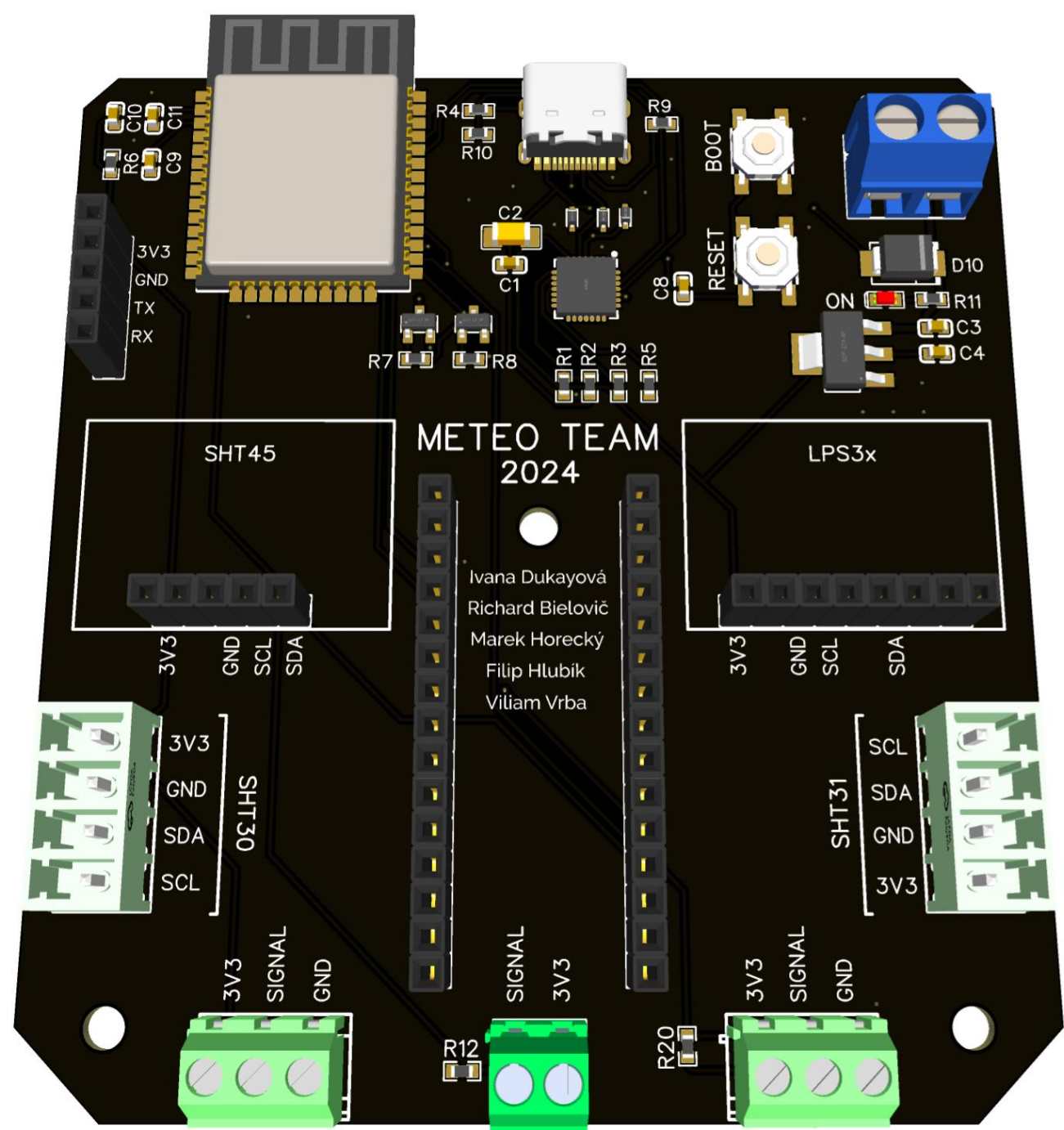
Temp2 [°C]

27.00

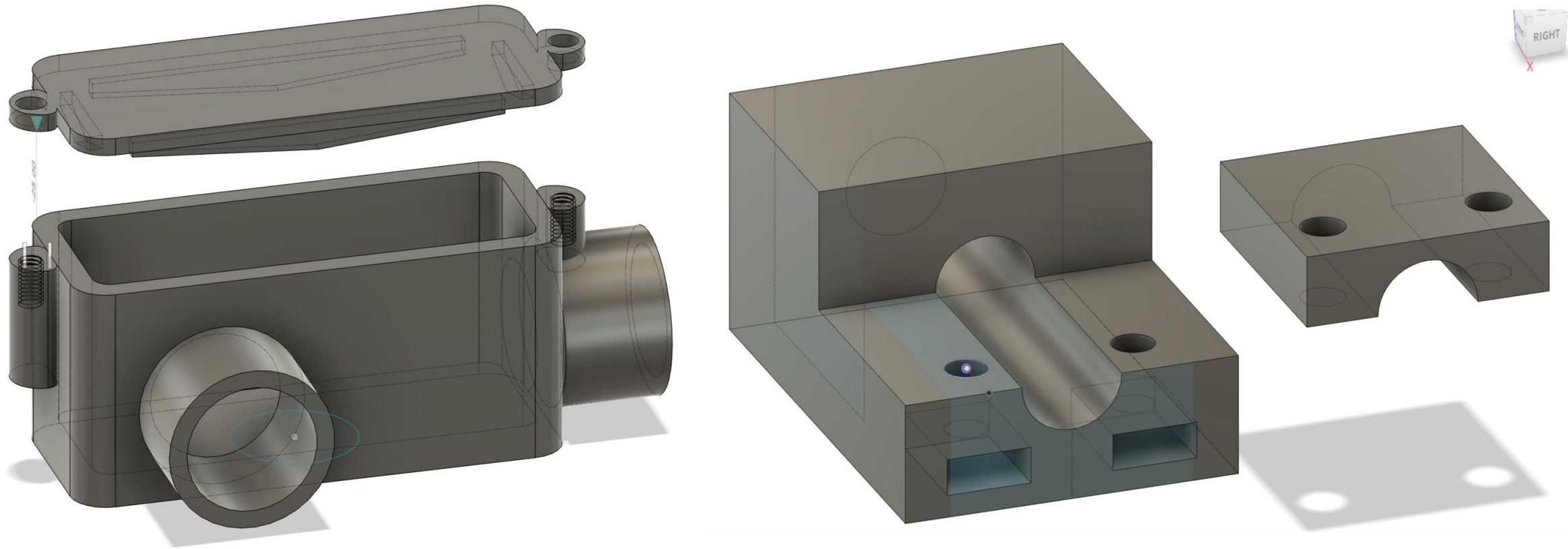


Extras

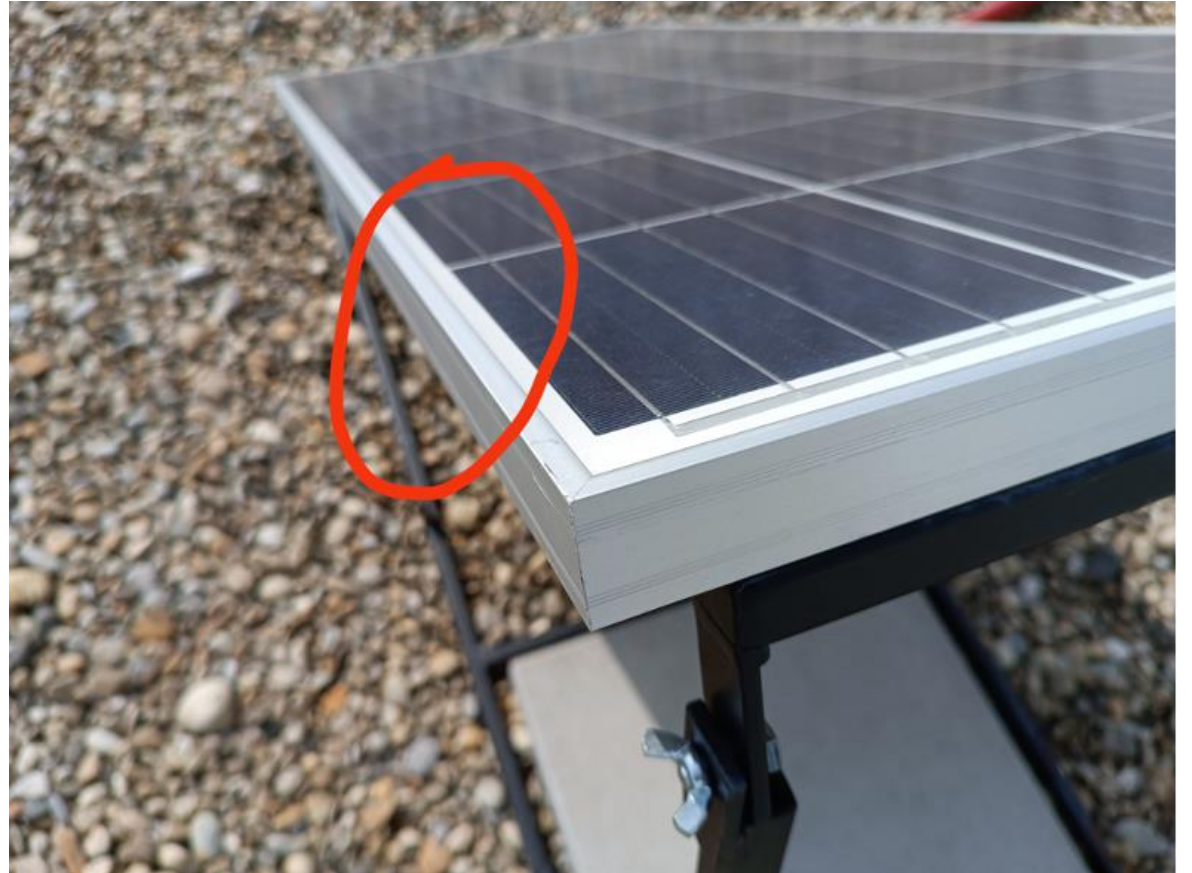
- 2 new sensors
- tiny GPS



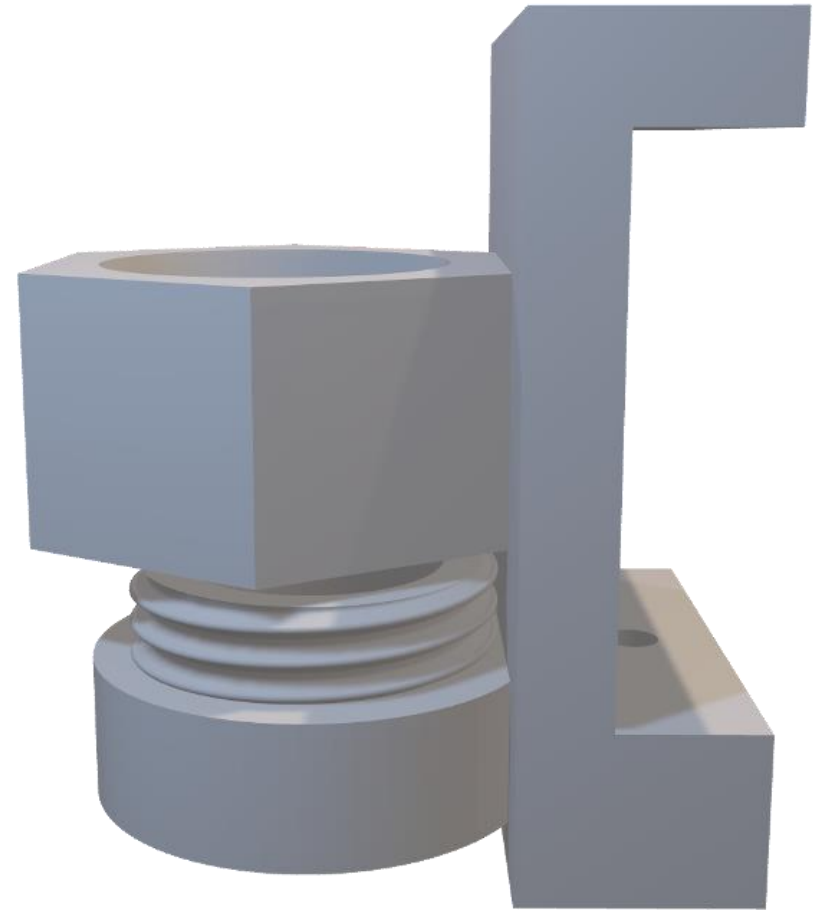
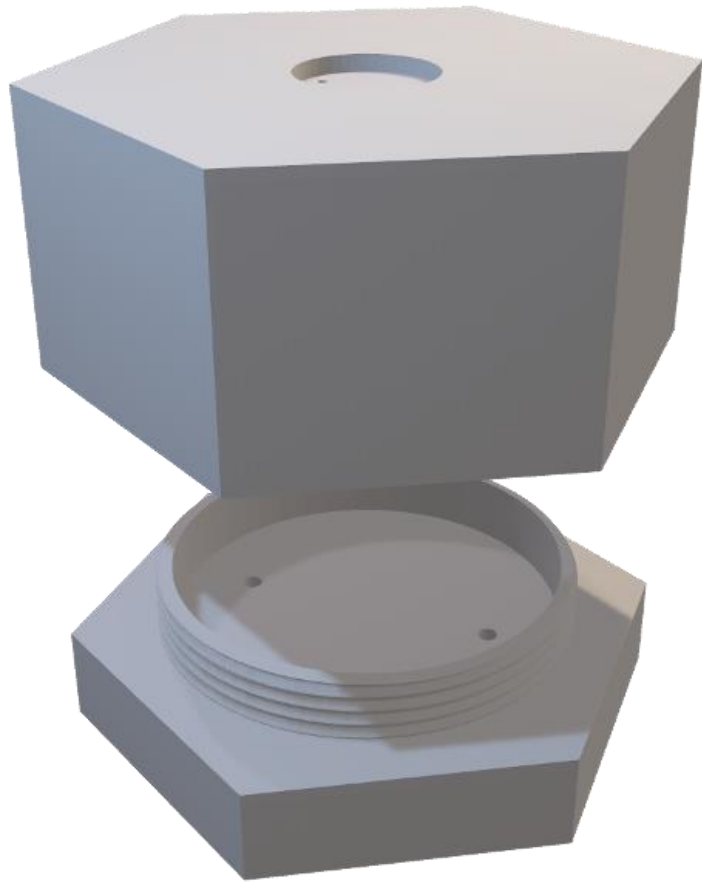
- 3D-models-attempts



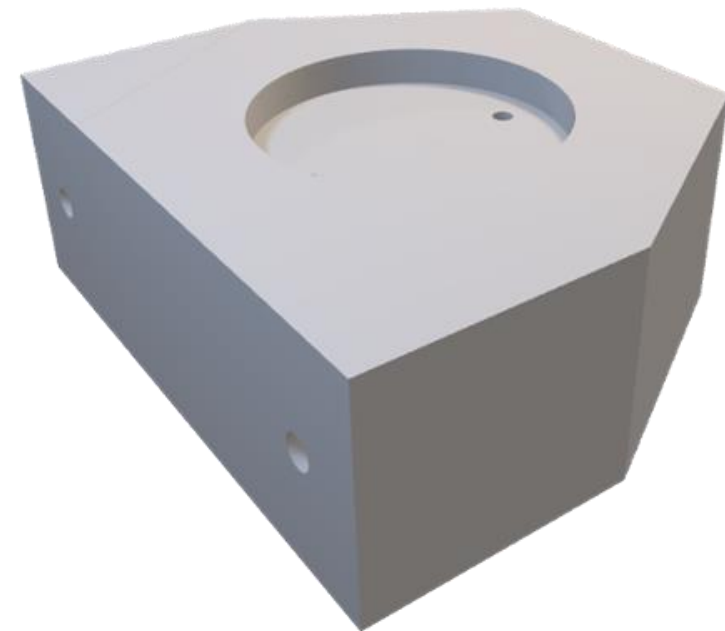
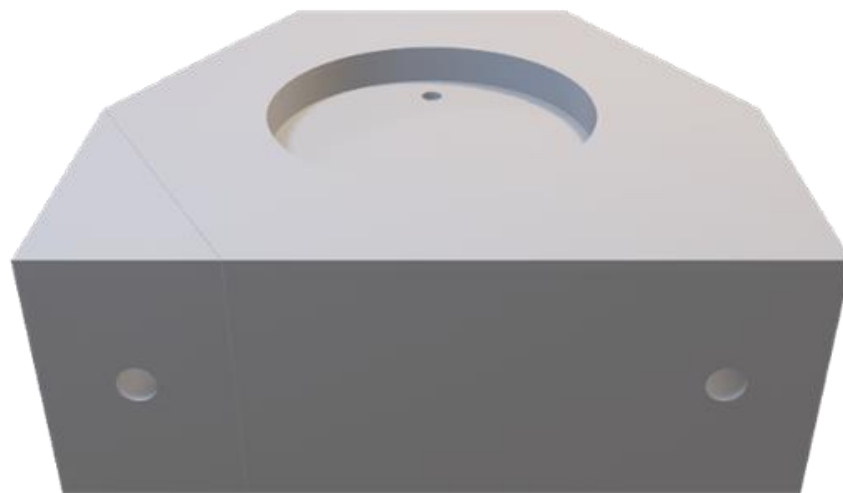
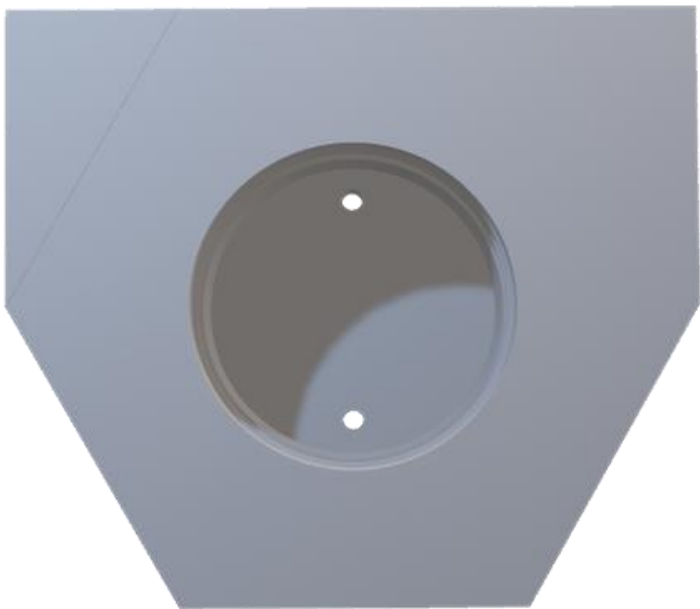
3D-model-photoresistor-task



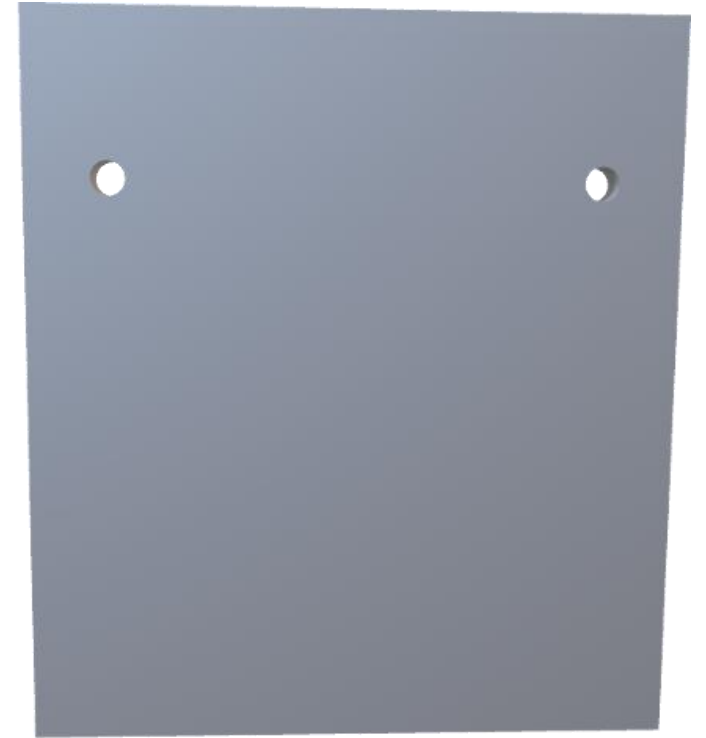
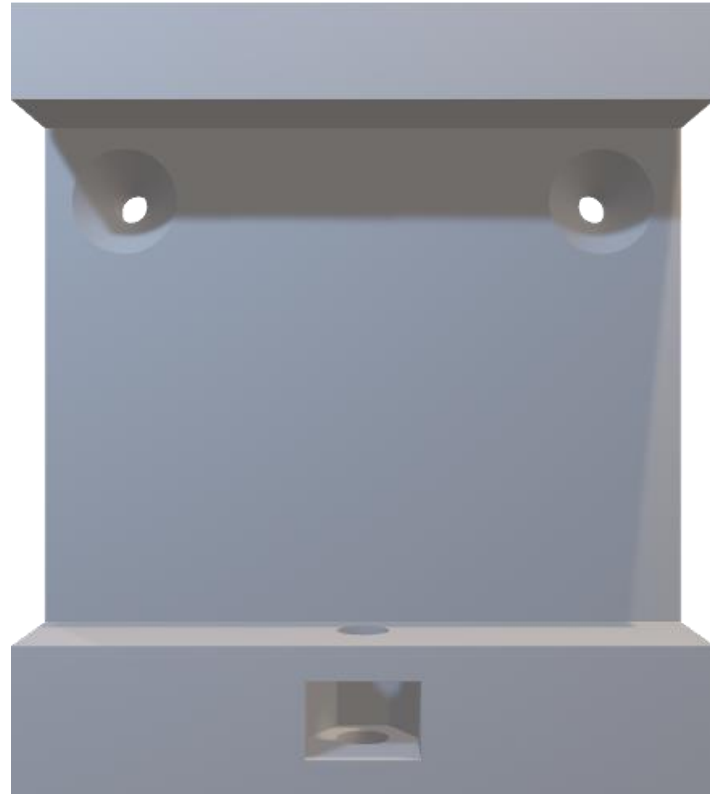
3D-model-photoresistor-prototype



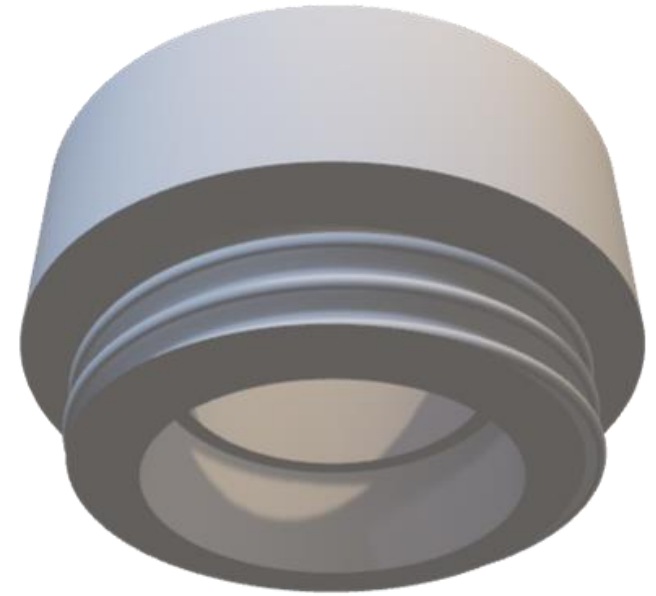
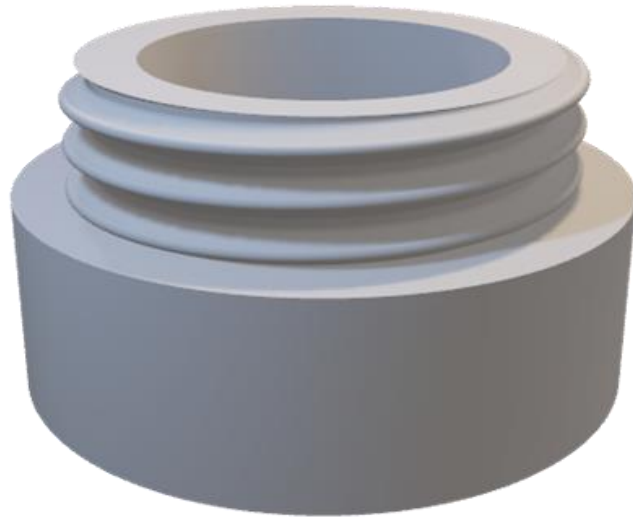
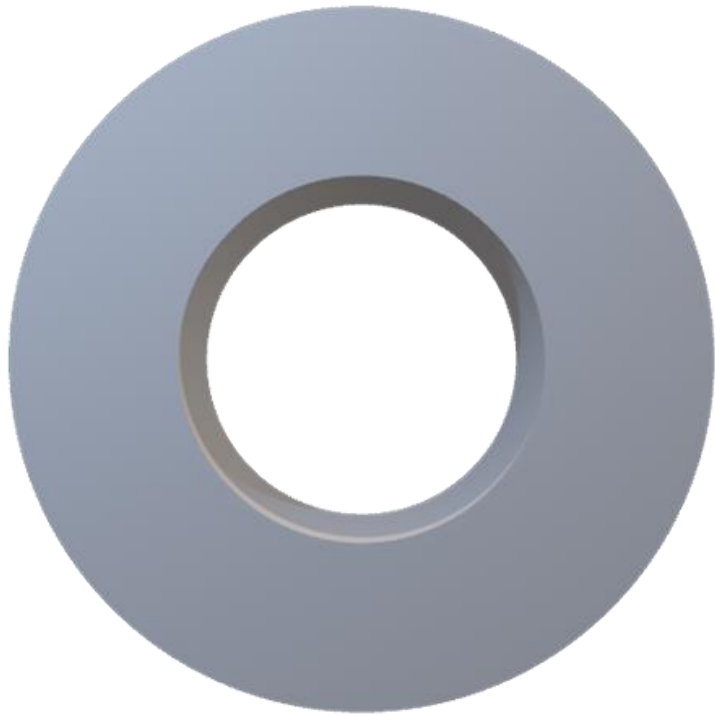
3D-model-photoresistor-body



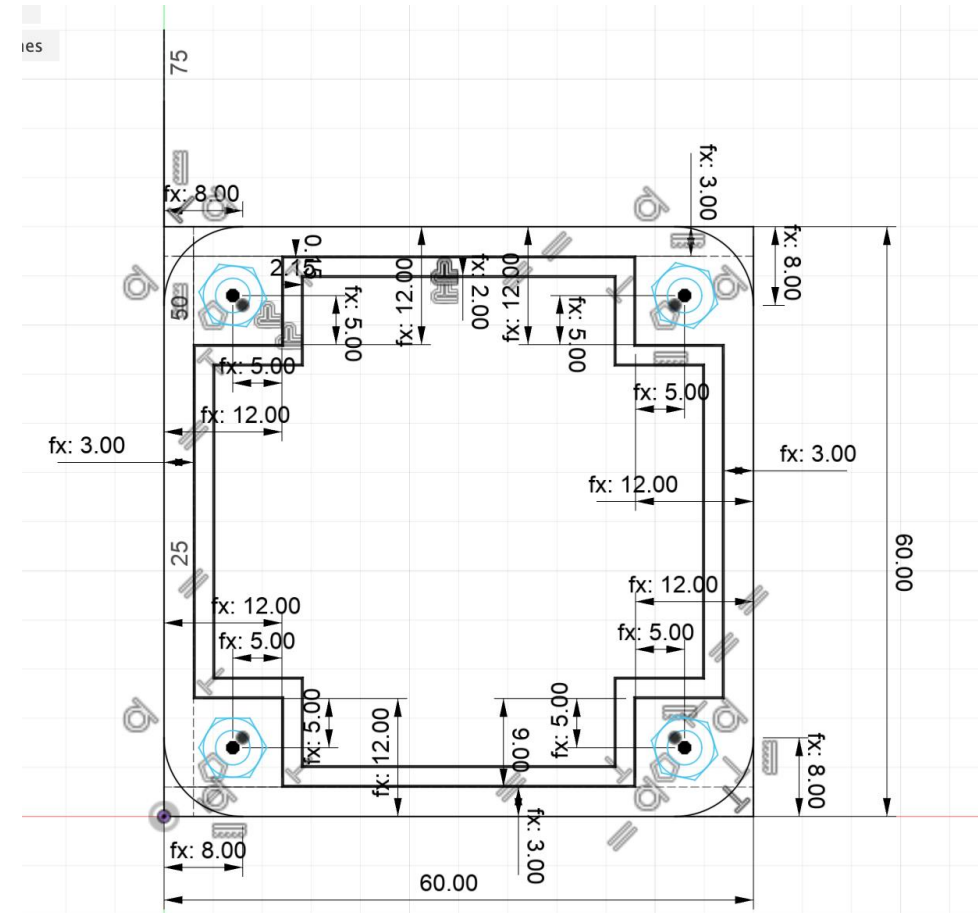
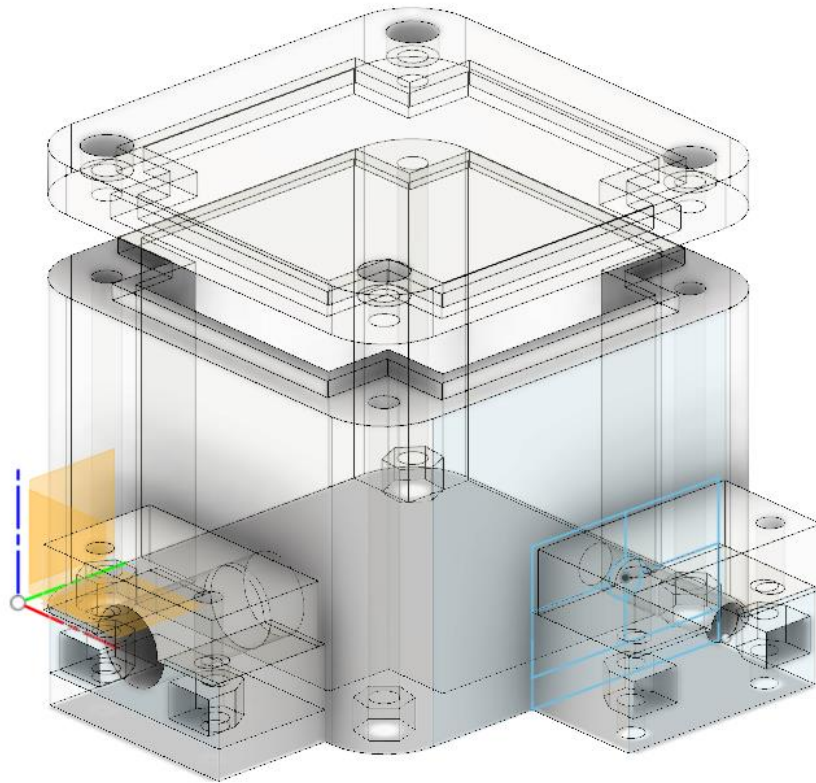
3D-model-photoresistor-holder



3D-model-photoresistor-lid



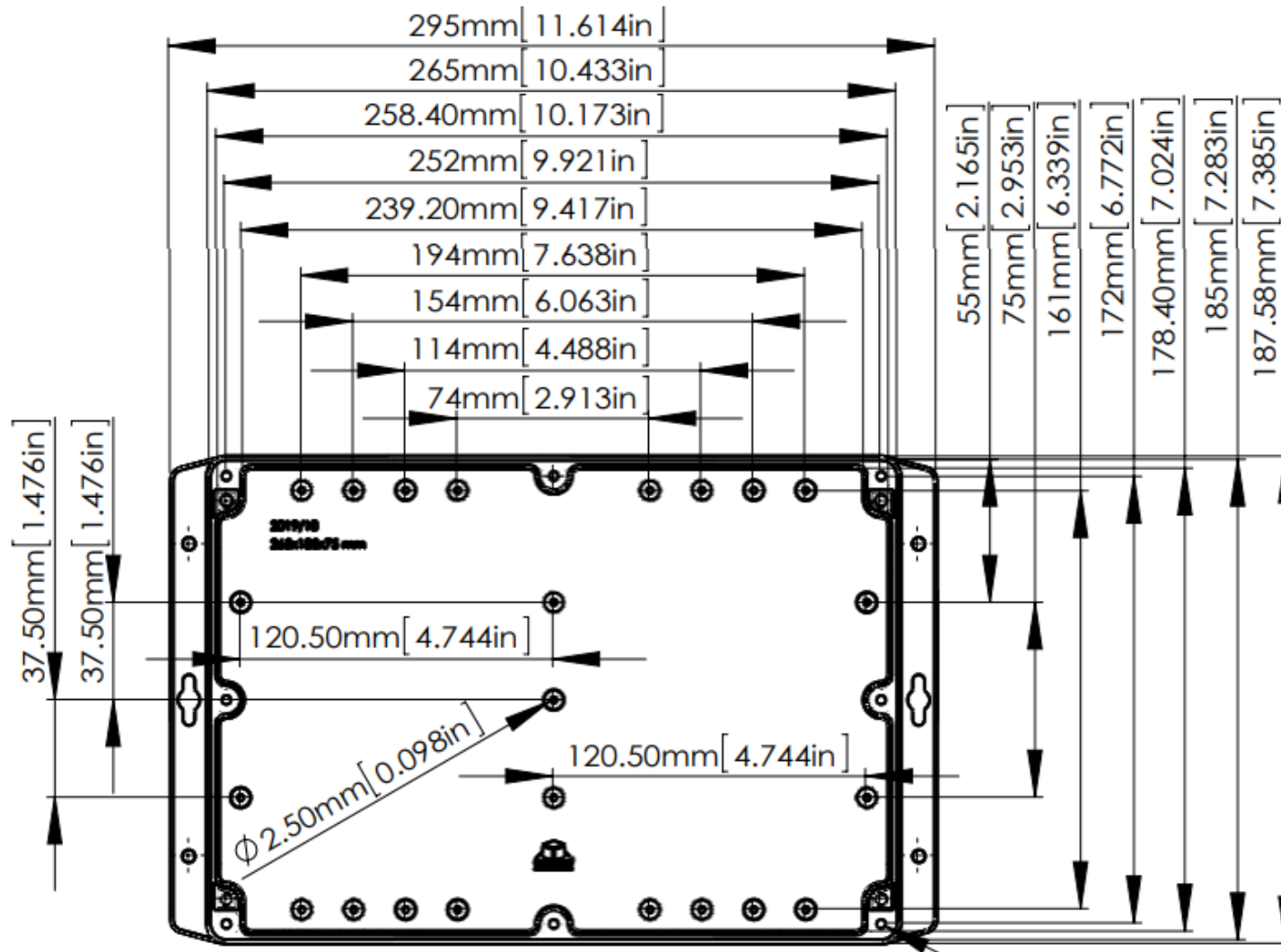
3D-model-waterproof-case



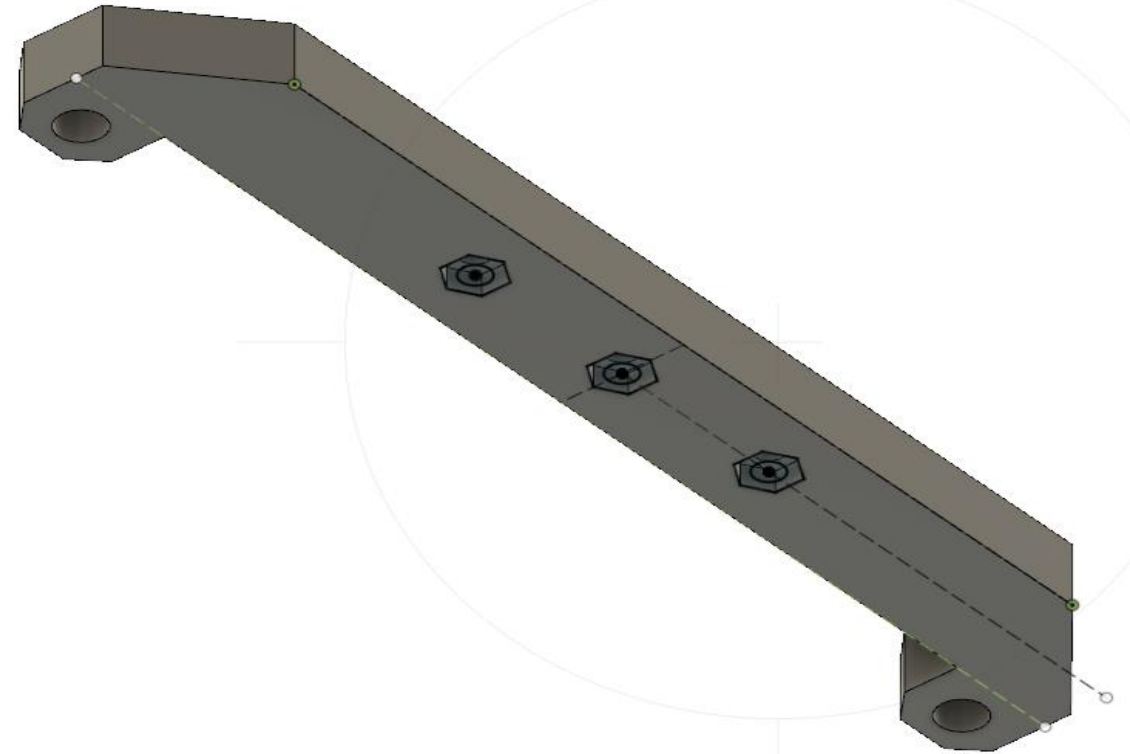
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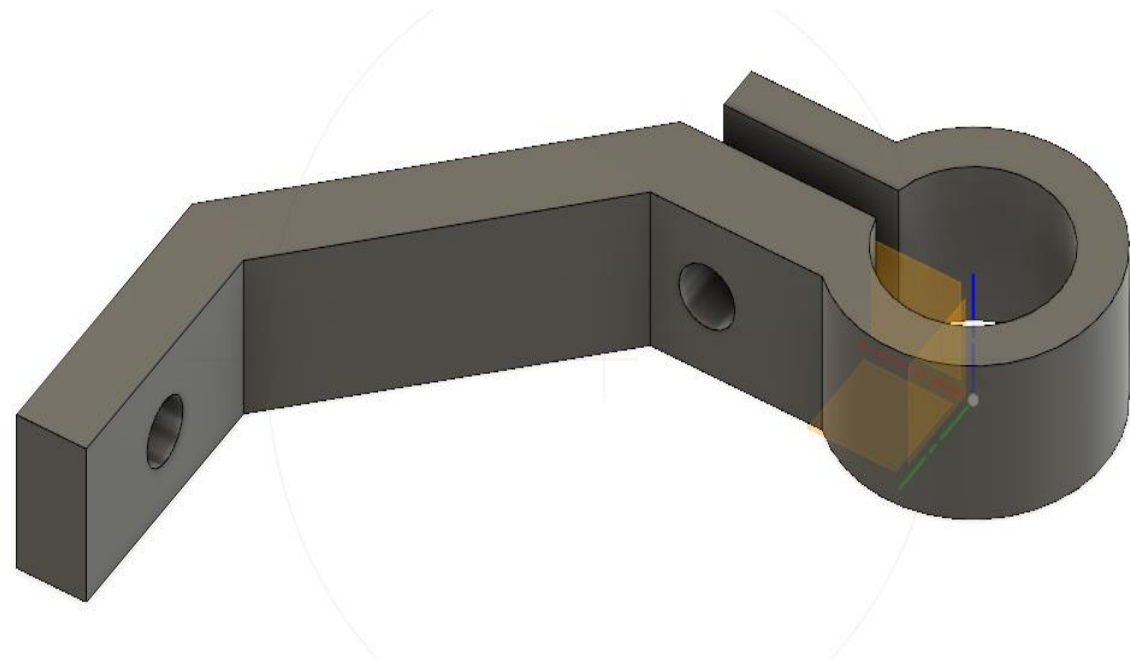
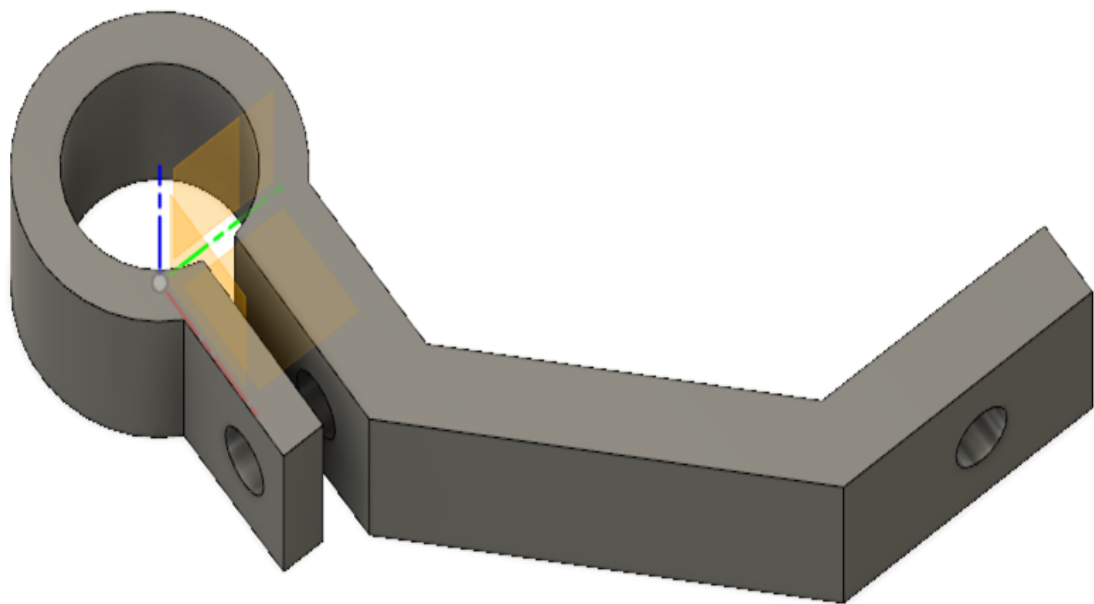
3D-model-waterproof-case



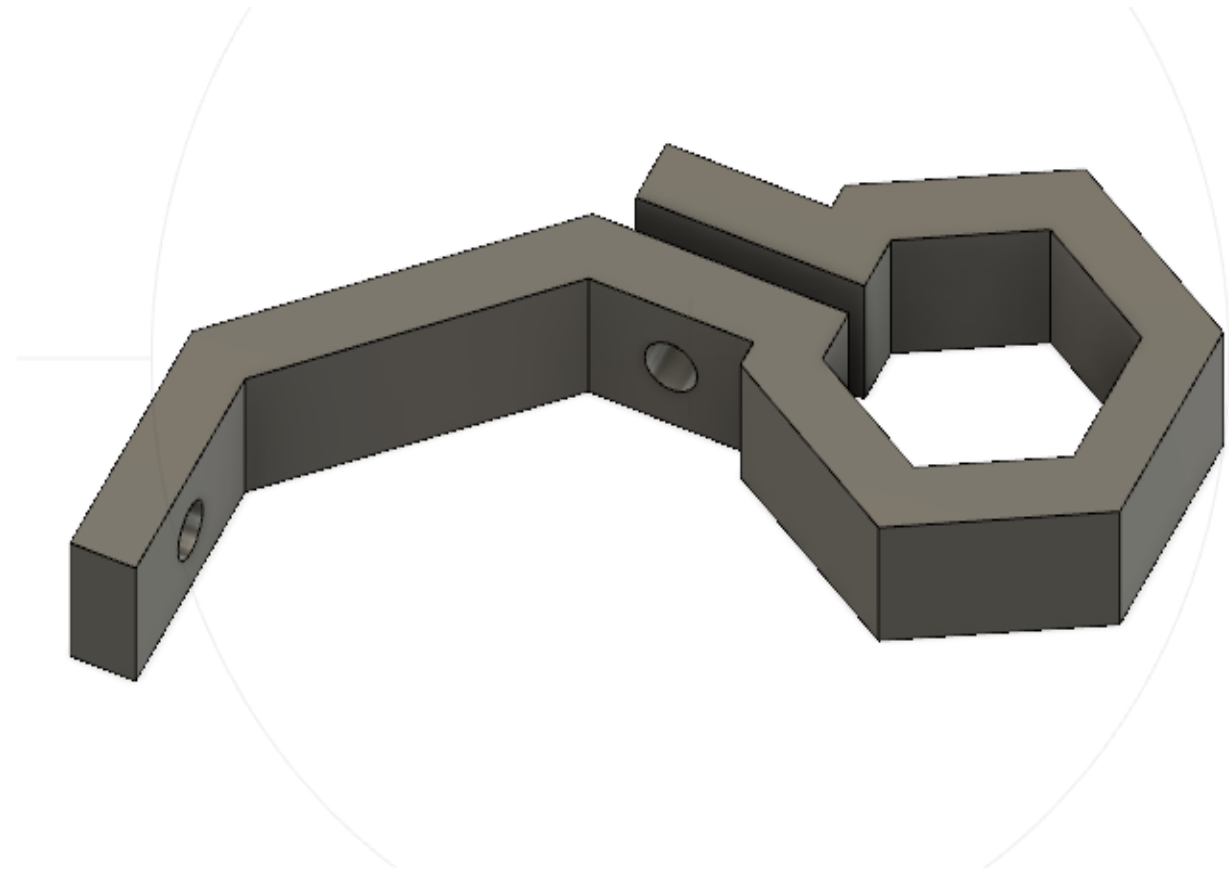
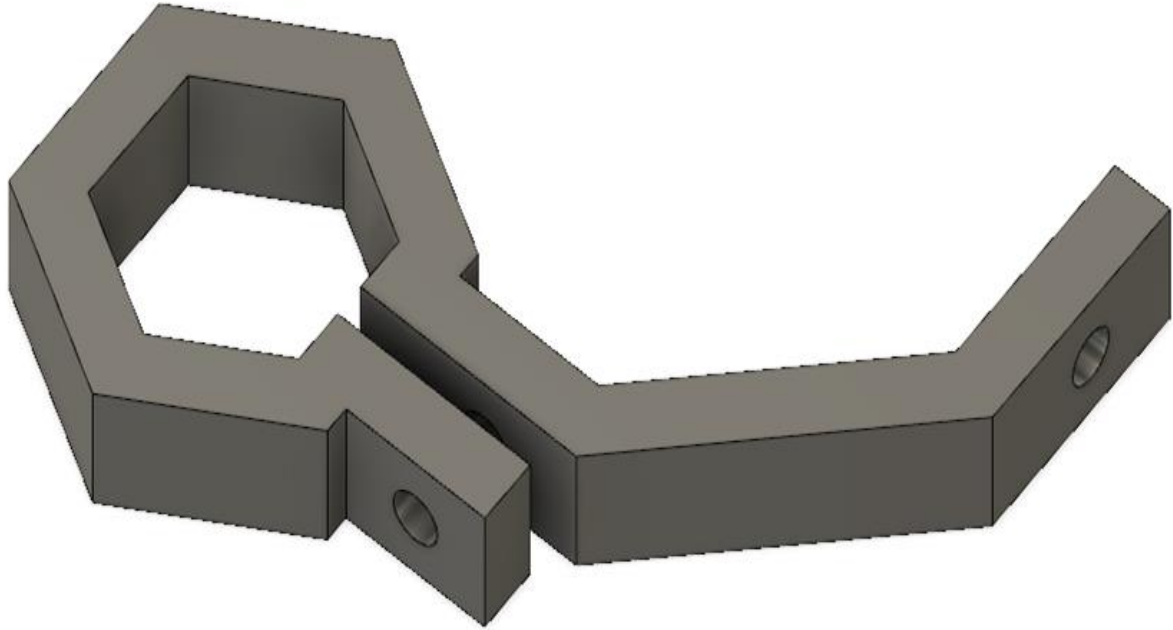
3D-model-pedestal



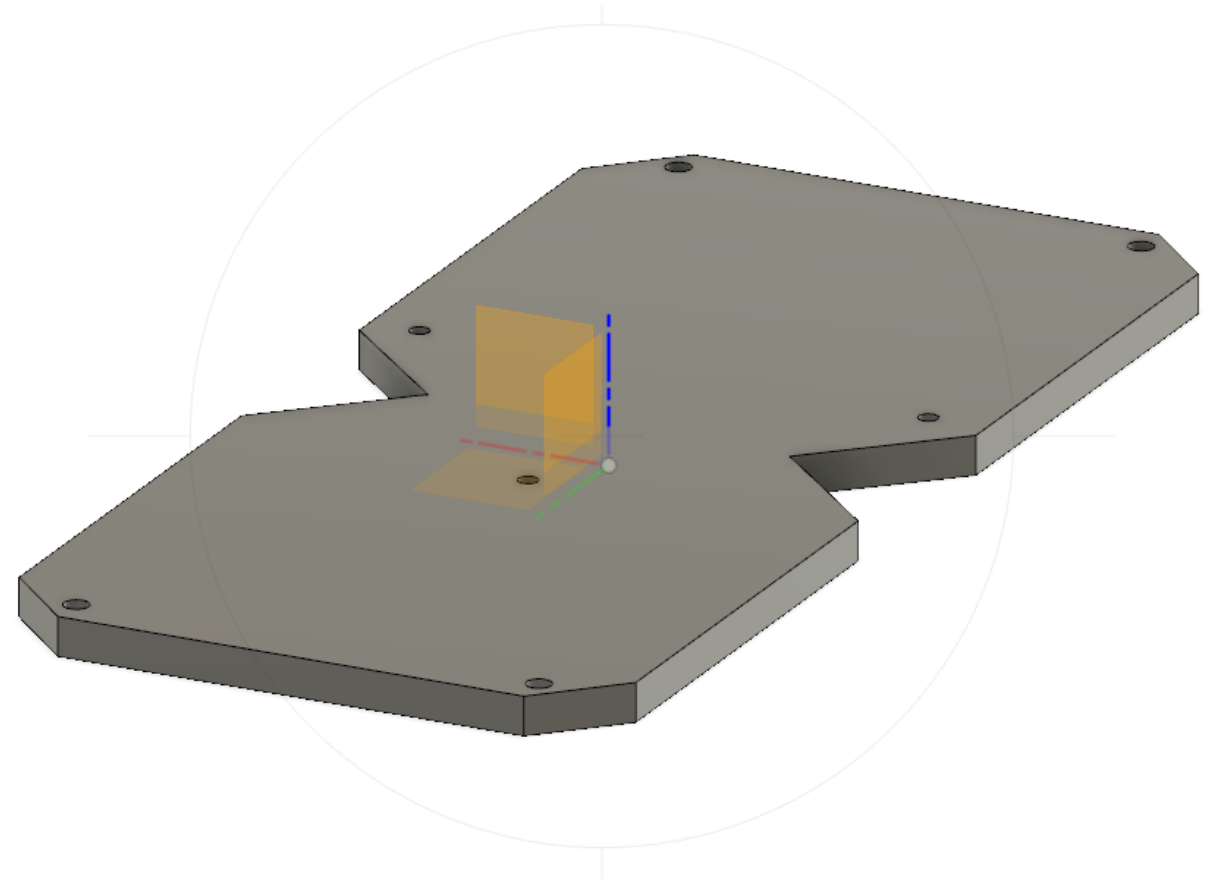
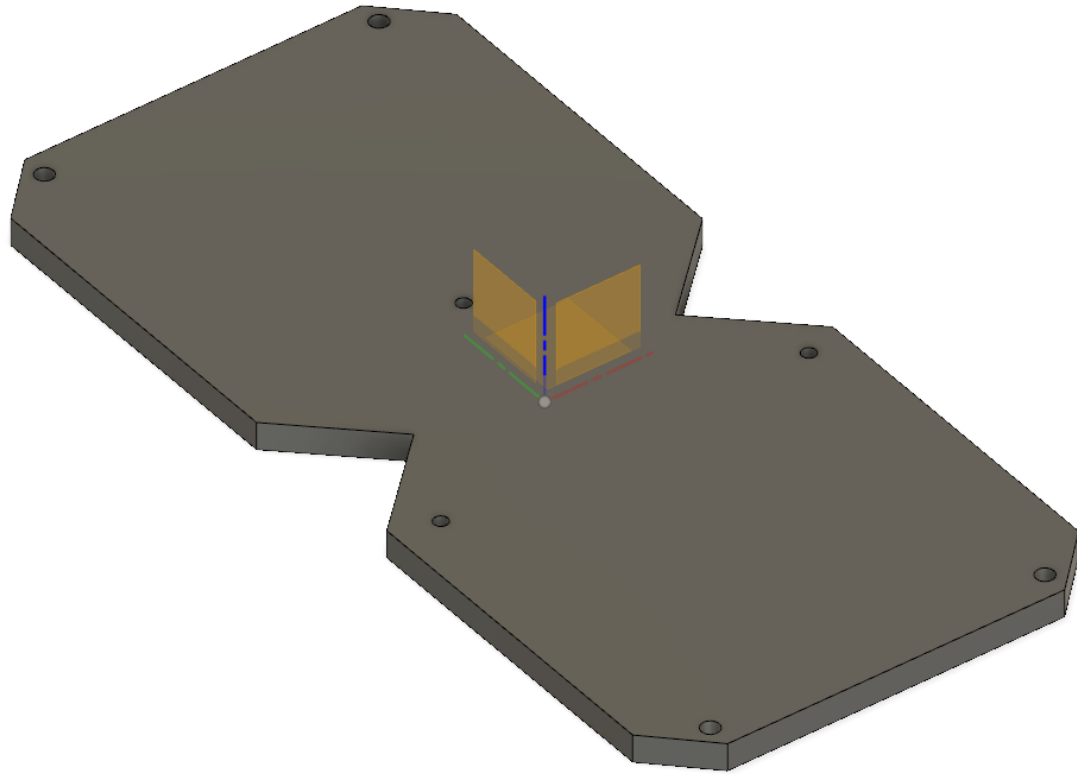
3D-model-holder



3D-model-hexagon-holder

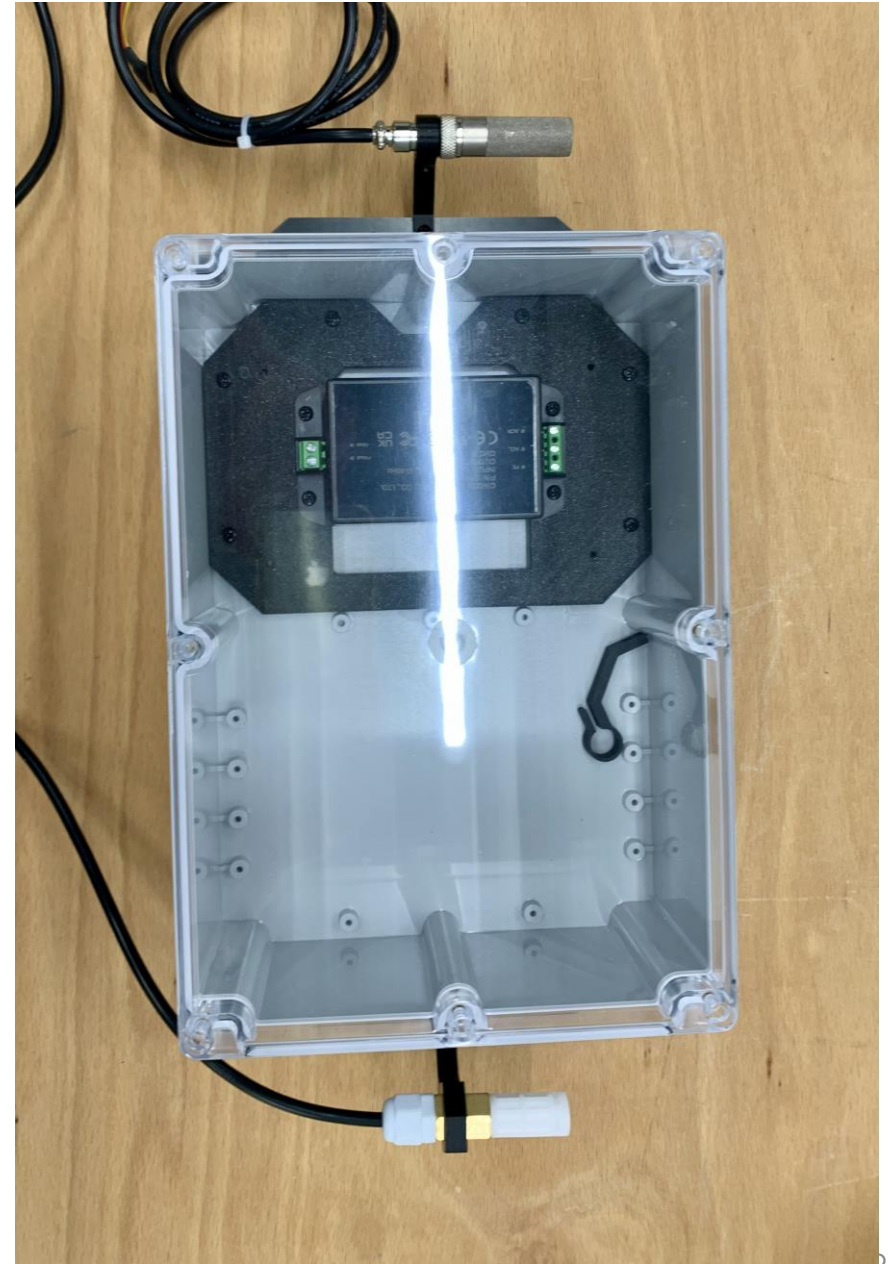


3D-model-plate

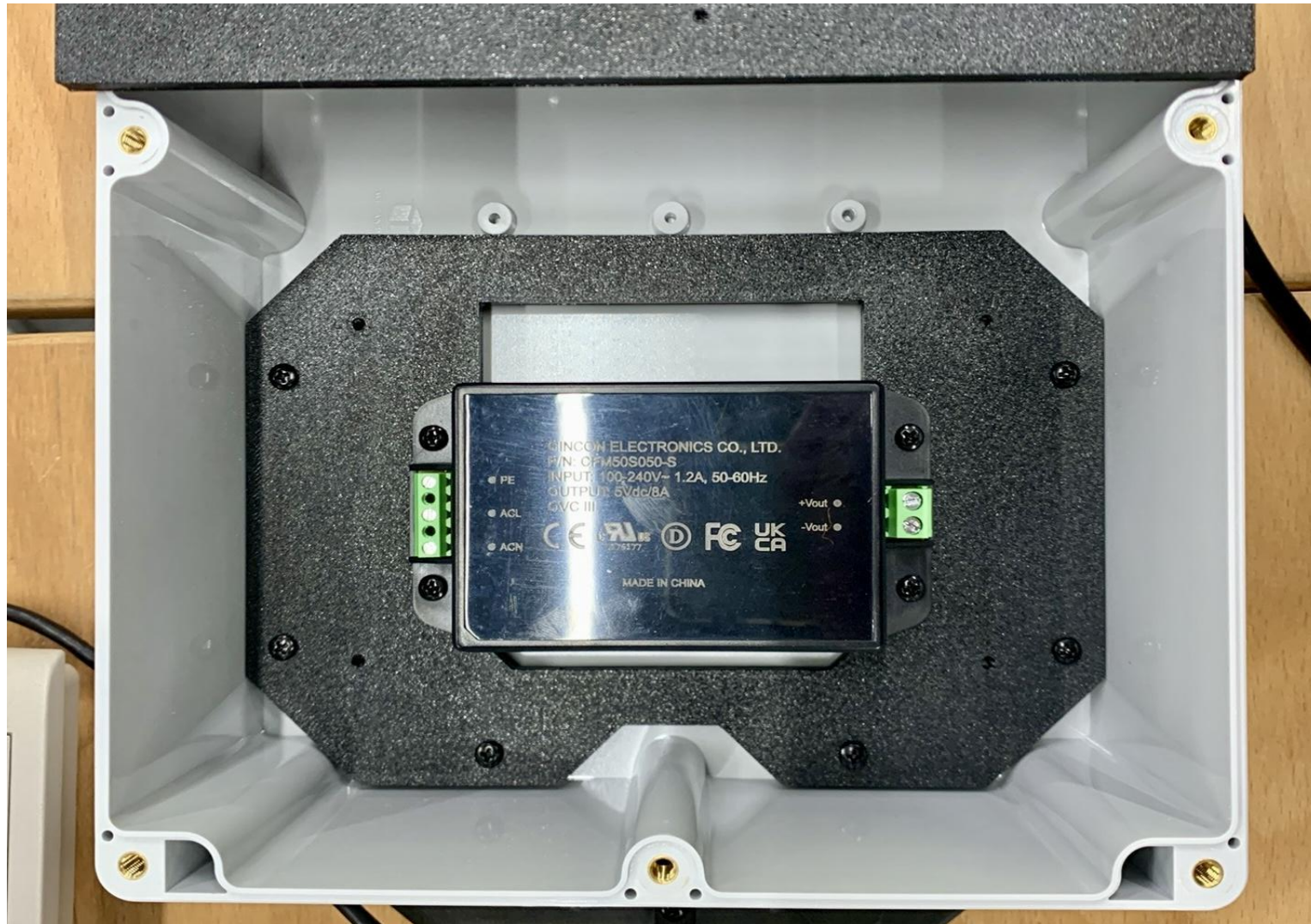


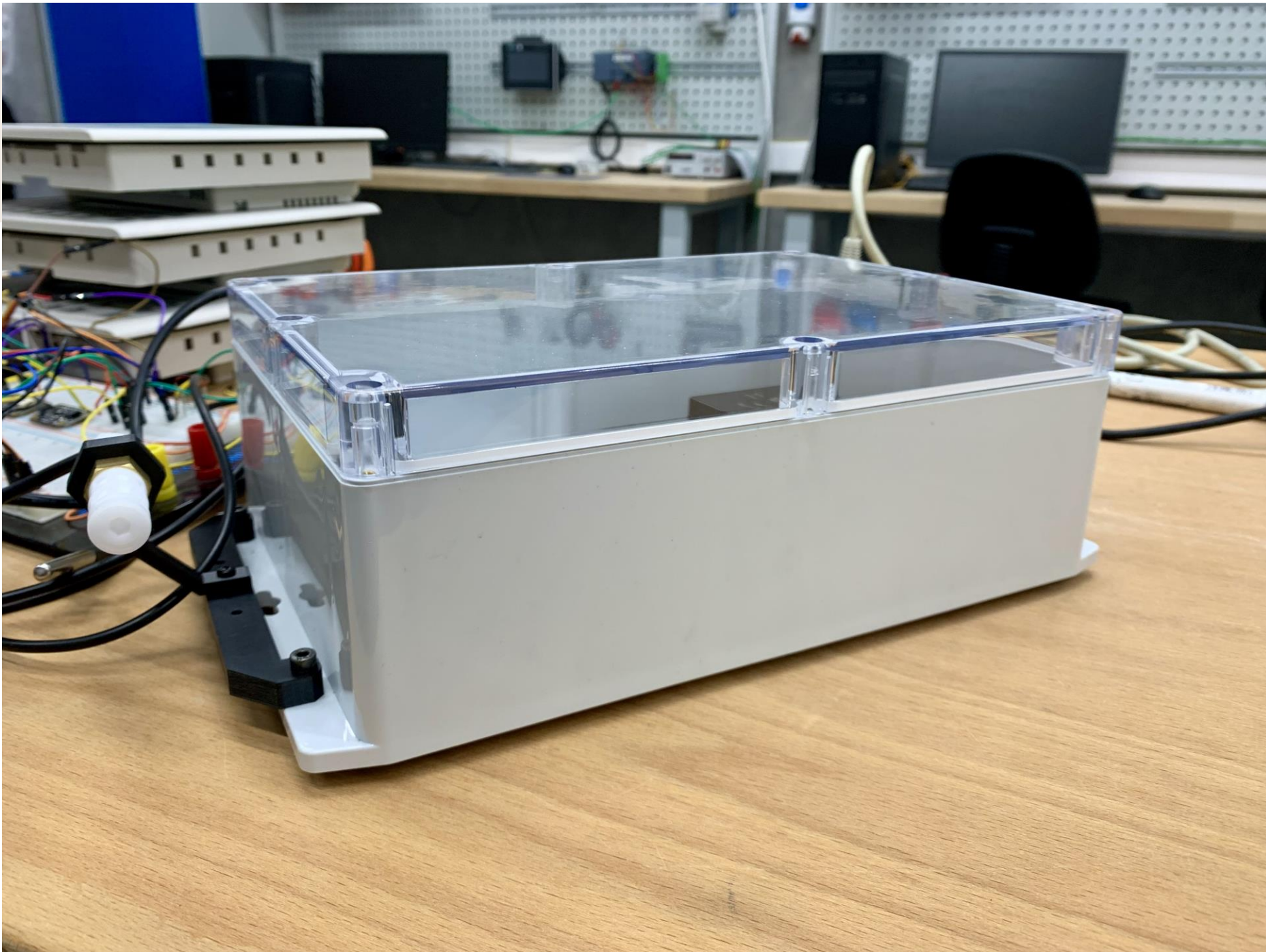
3D-results





3D-results





Future improvements

- implement the tiny GPS device and share the location with other parties
- place the meteo station on the roof and test in real-world conditions
- visualize the data