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

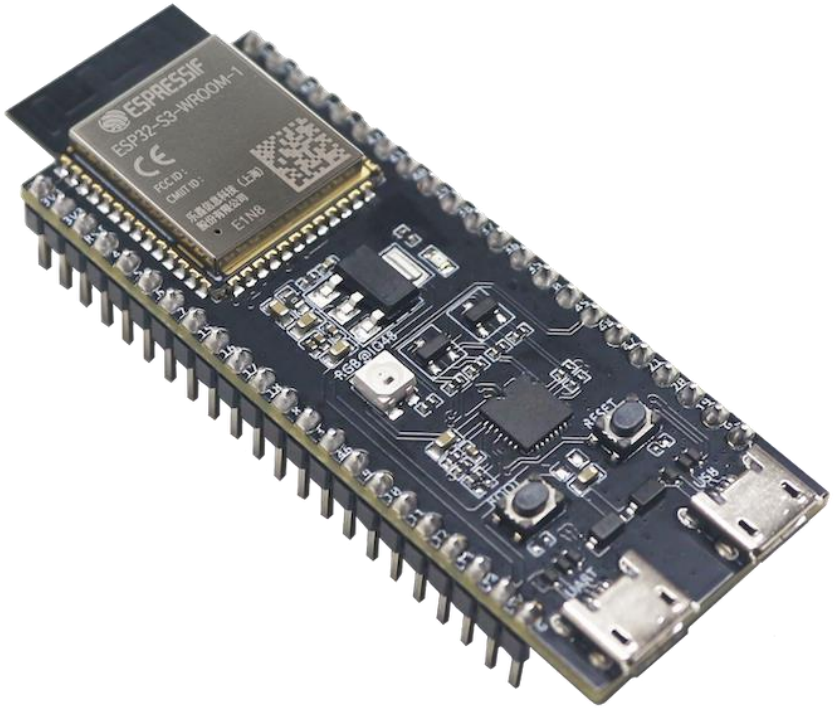
- finishing up
- working on documentation
- working on the final presentation

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

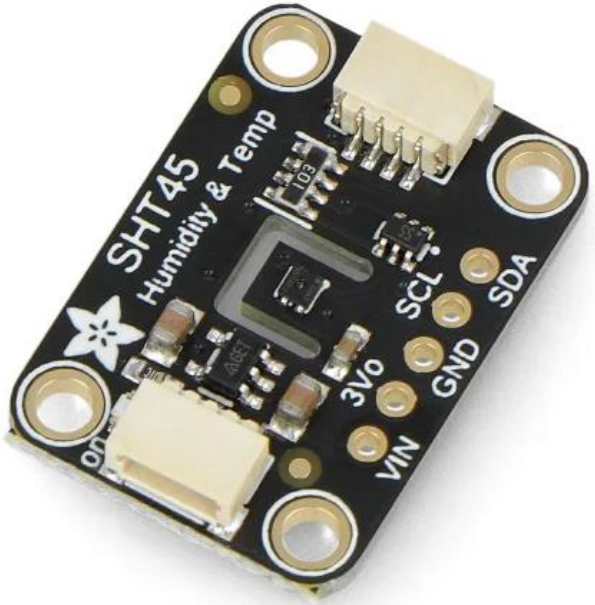
Sensors

- FS400-SHTXX - temperature, humidity

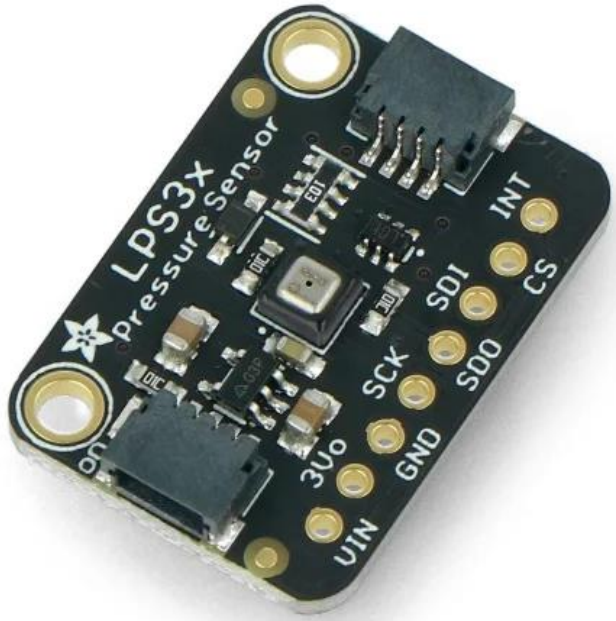
- SHT30 soil sensor - temperature, humidity

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]

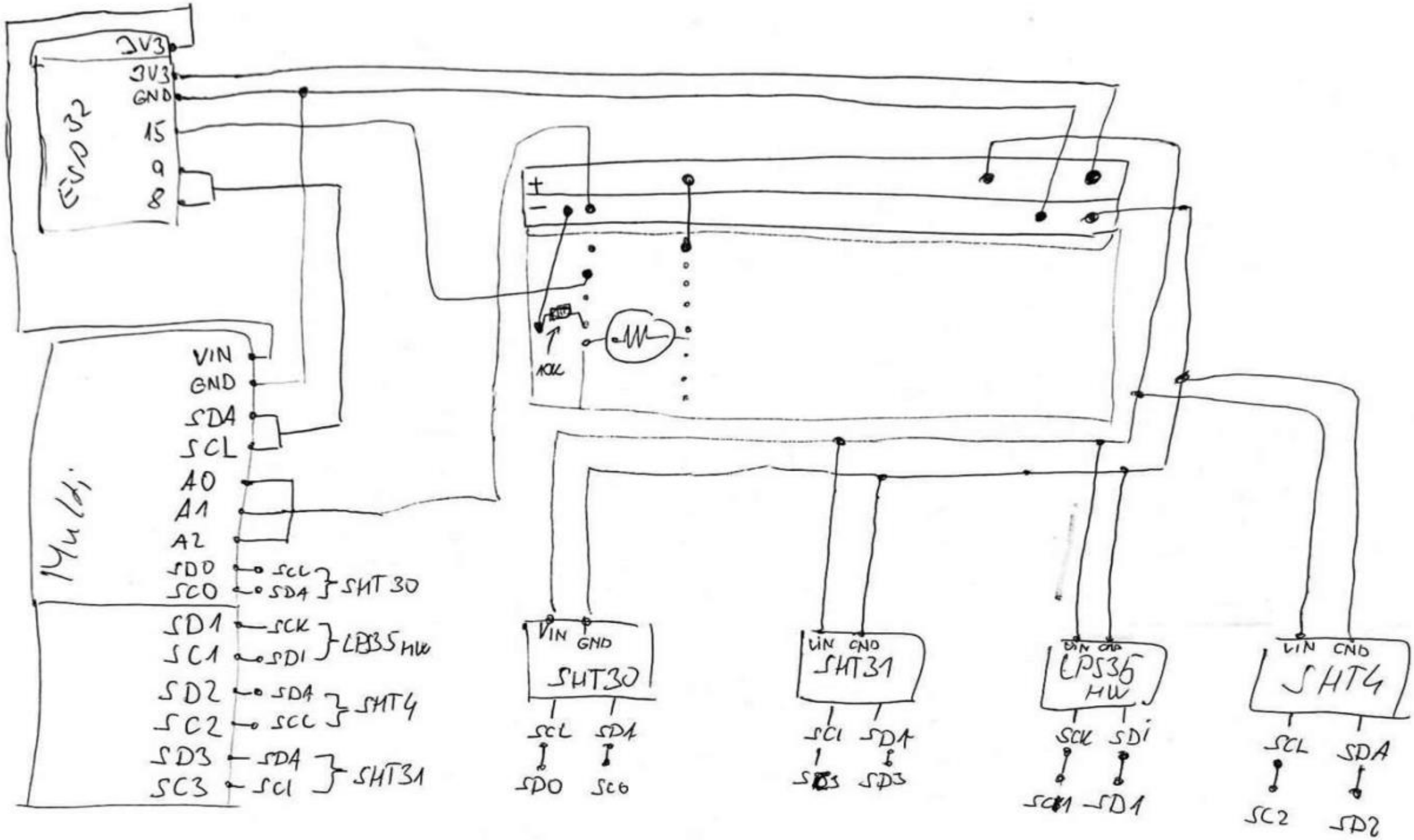
1896

Temp [°C]

29.00

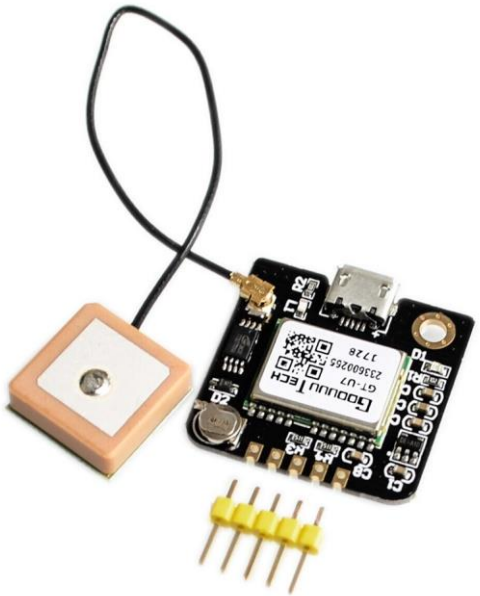
Temp2 [°C]

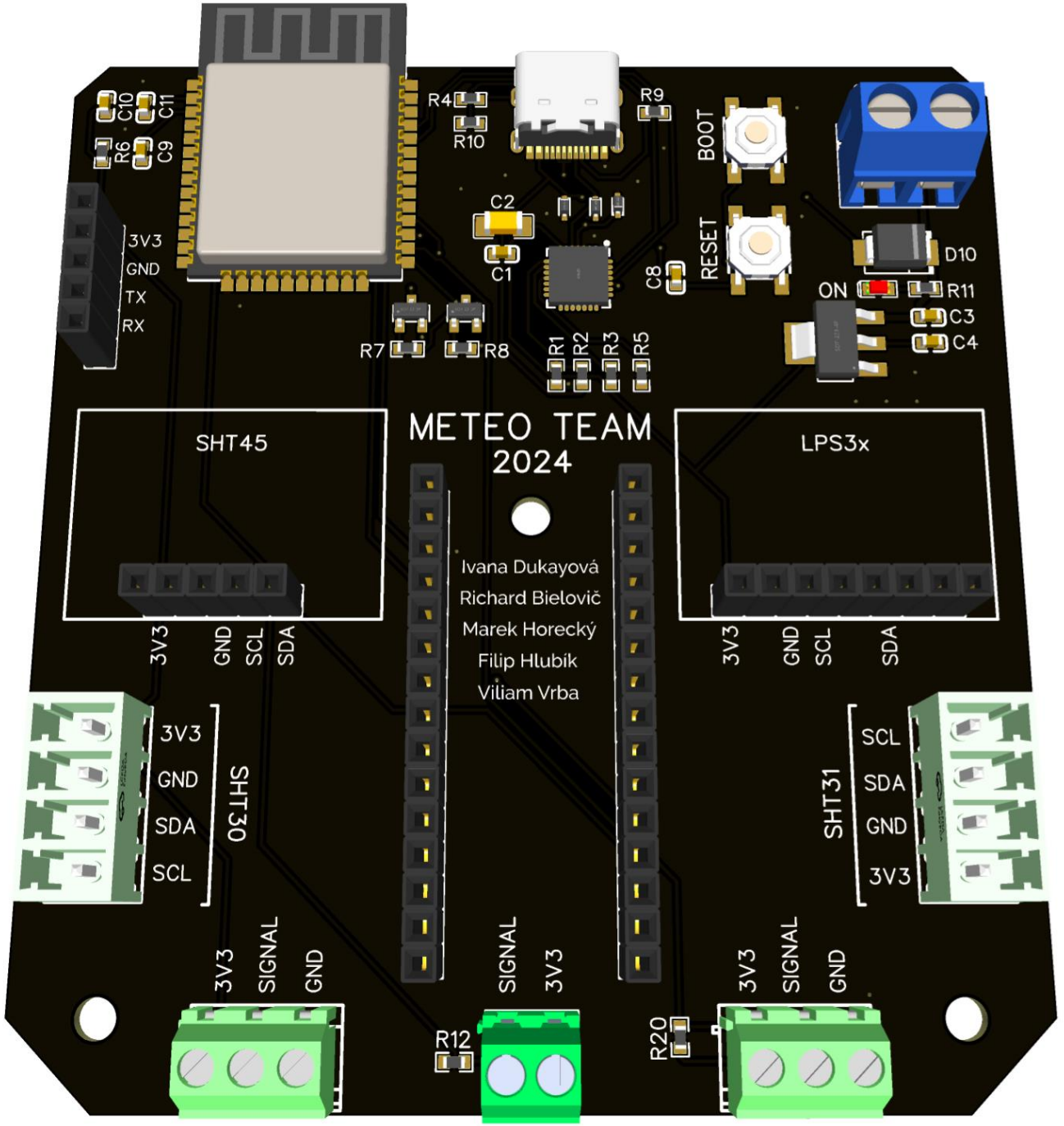
27.00


3V3
3V3
GND
15
9
8
ESP32
VIN
GND
SDA
SCL
A0
A1
A2
SDO
SCO
SCL
SDA
SHT30
SD1
SC1
SCK
SDI
LPS35HW
SD2
SC2
SDA
SCL
SHT4
SD3
SC3
SDA
SCL
SHT31
1kΩ
VIN GND
SHT30
SCL SDA
SDO SCO
VIN GND
SHT31
SCL SDA
SCL SDA
VIN GND
LPS35 HW
SCK SDI
SCK SDI
VIN GND
SHT4
SCL SDA
SC2 SD2

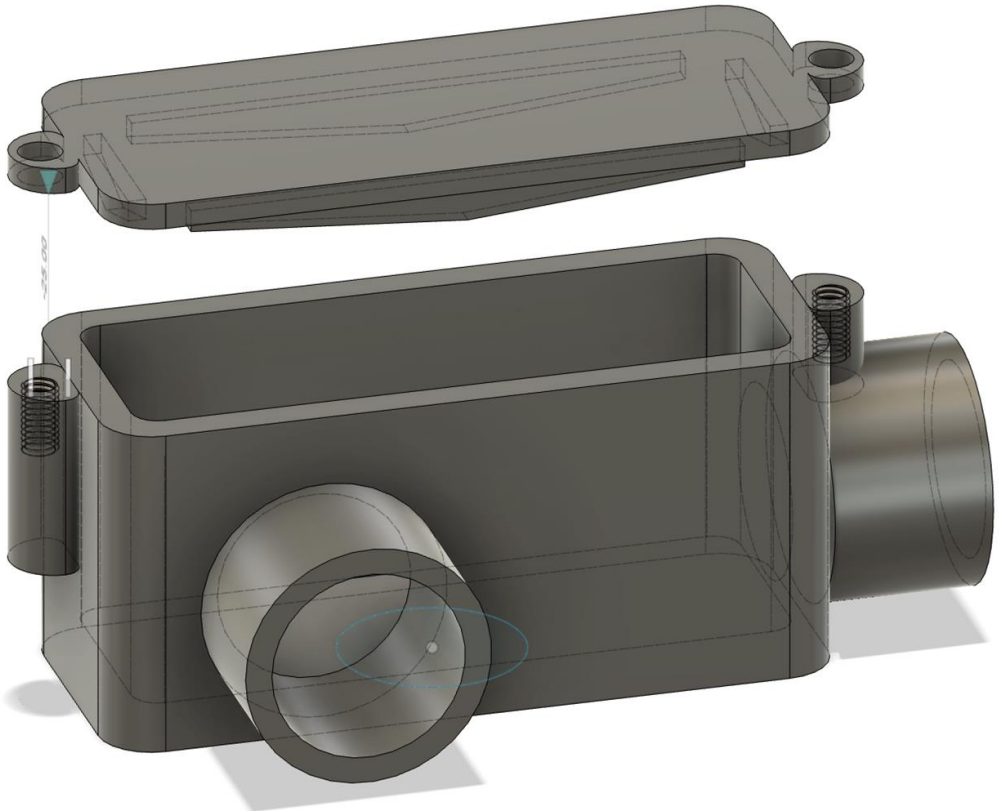
Extras

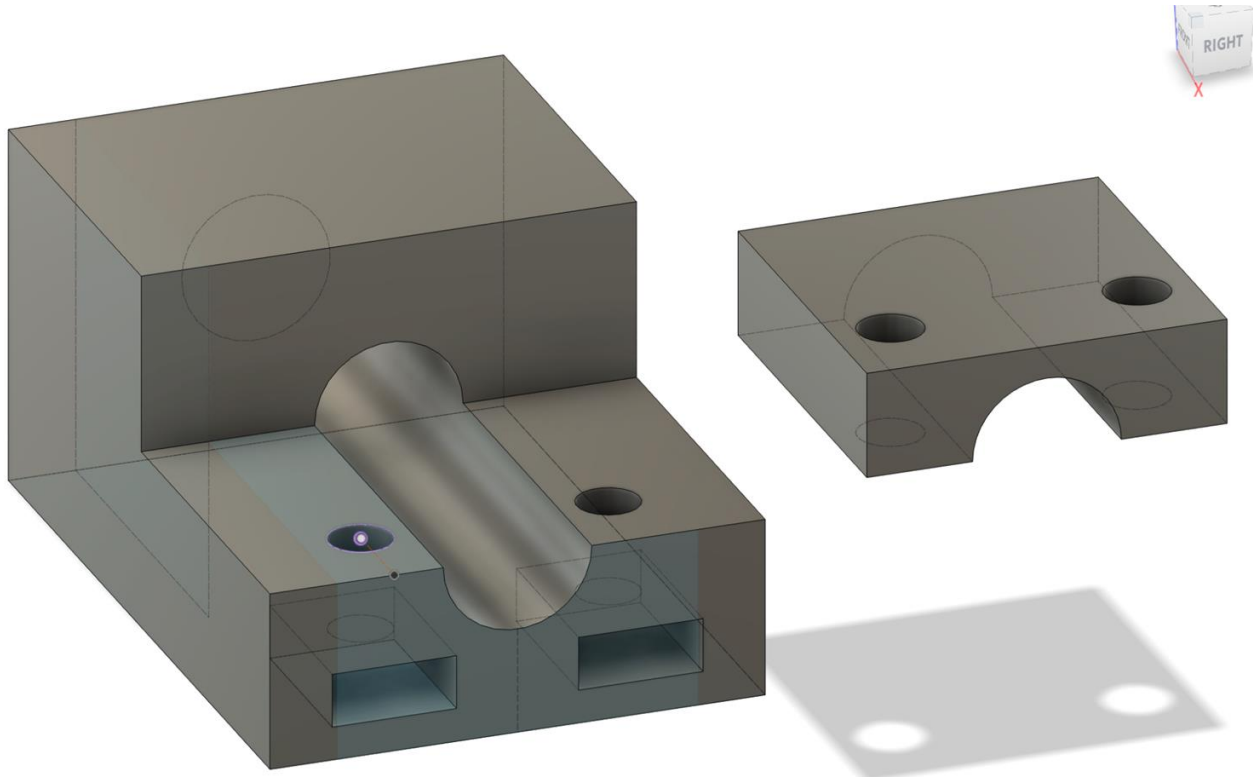
- 2 new sensors
- tiny GPS



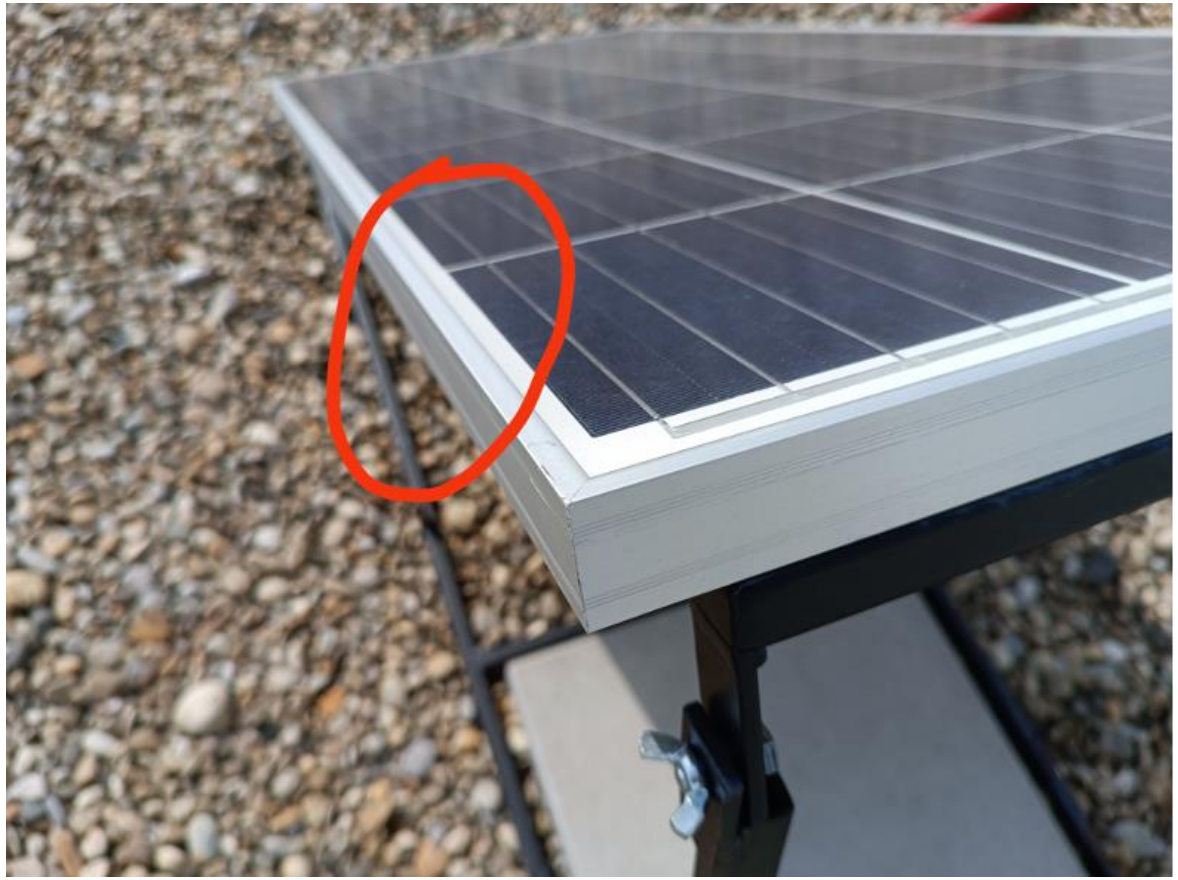


- 3D-models-attempts

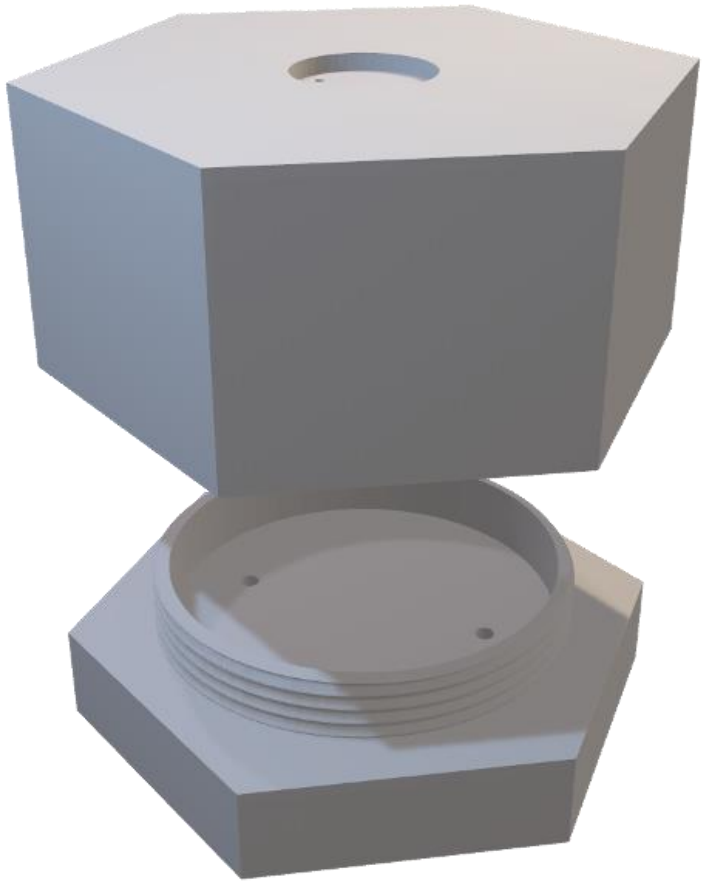


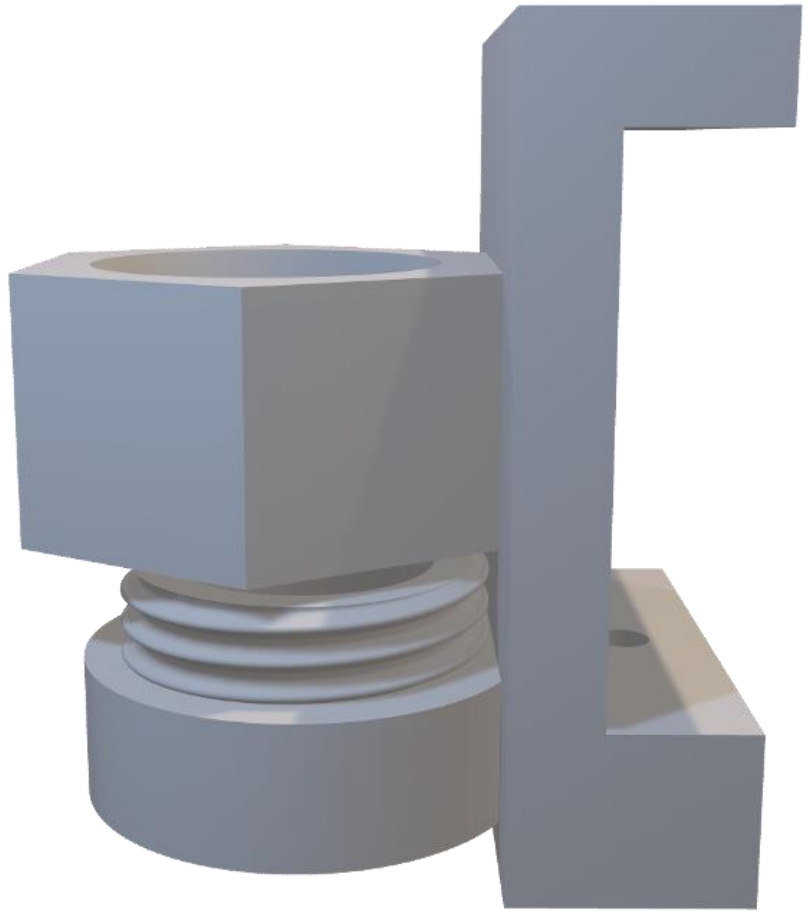


3D-model-photoresistor-task

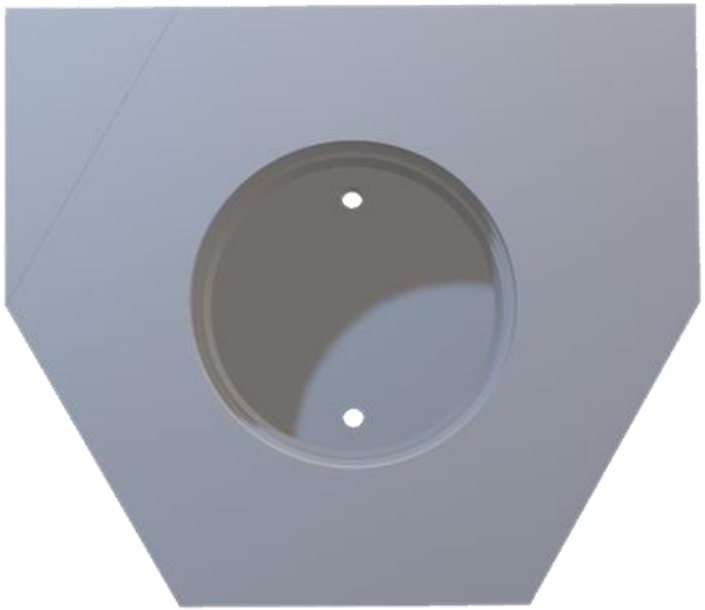


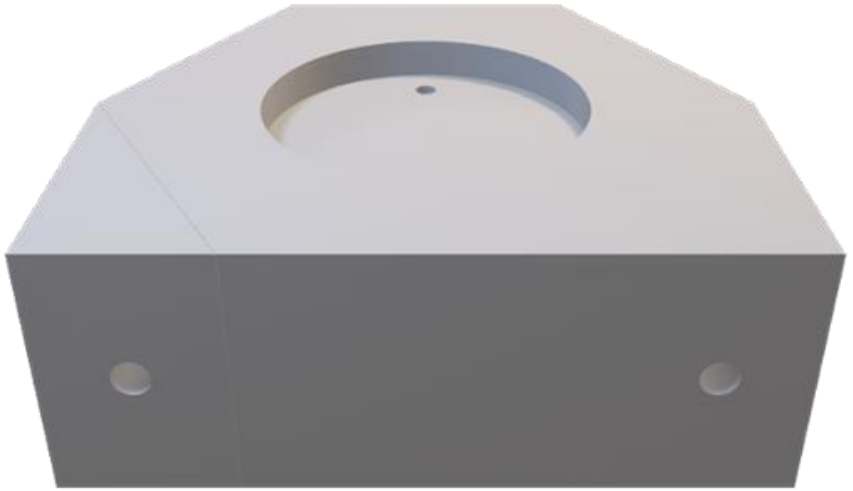
3D-model-photoresistor-prototype

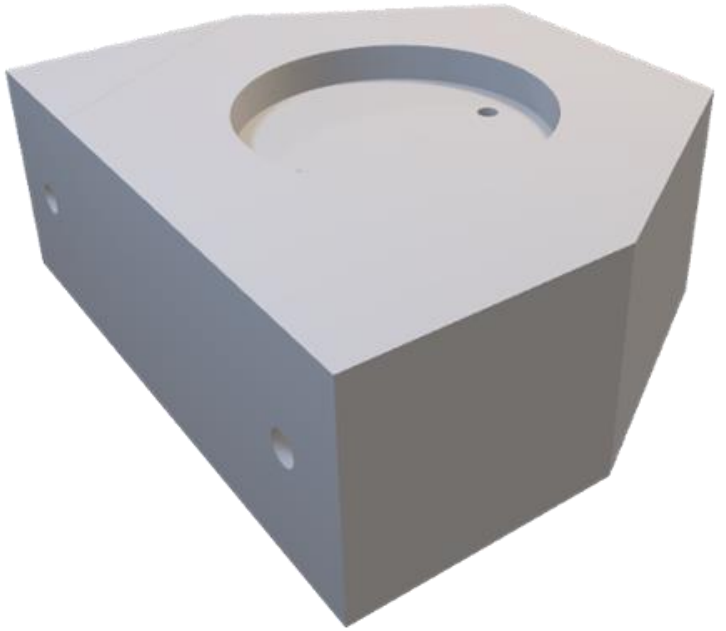




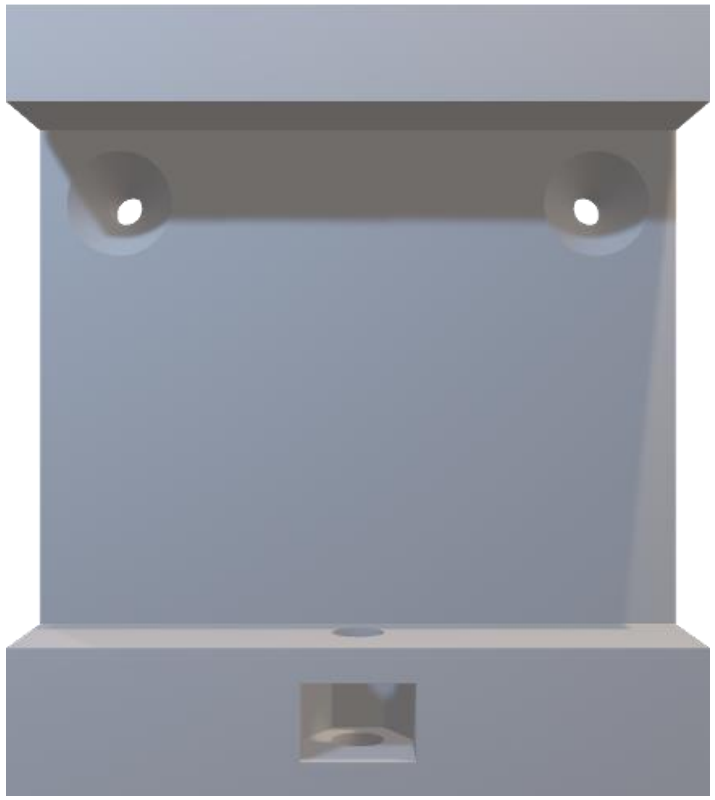
3D-model-photoresistor-body



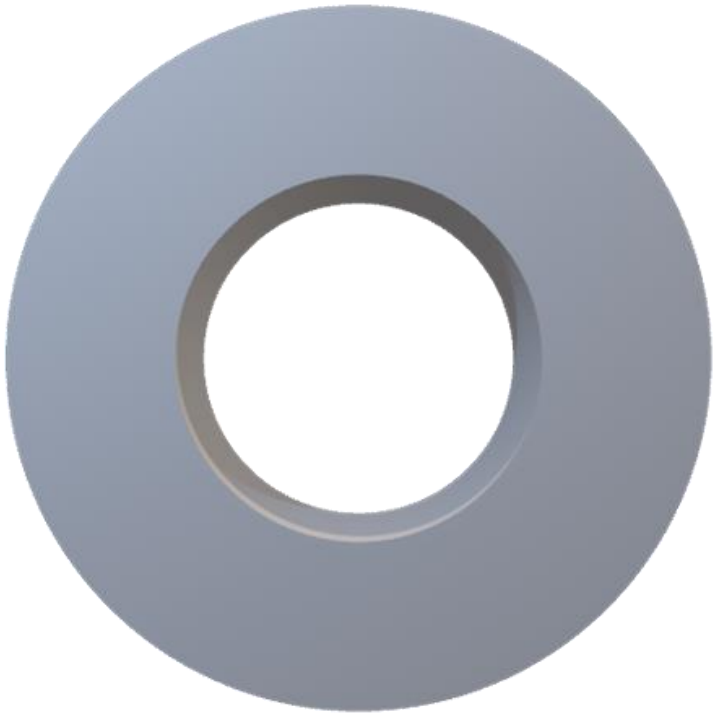


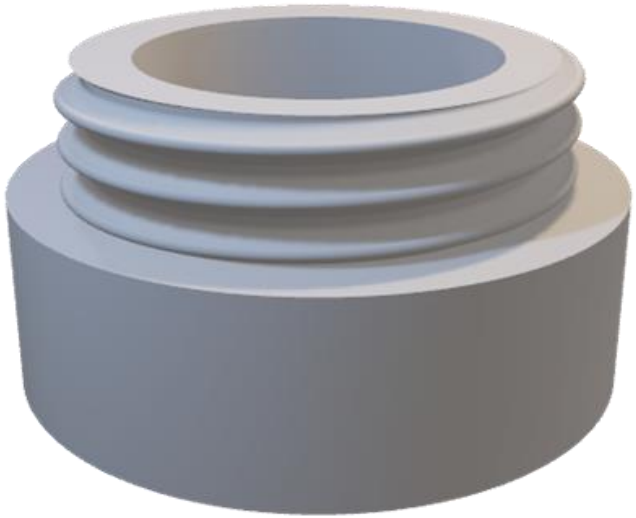


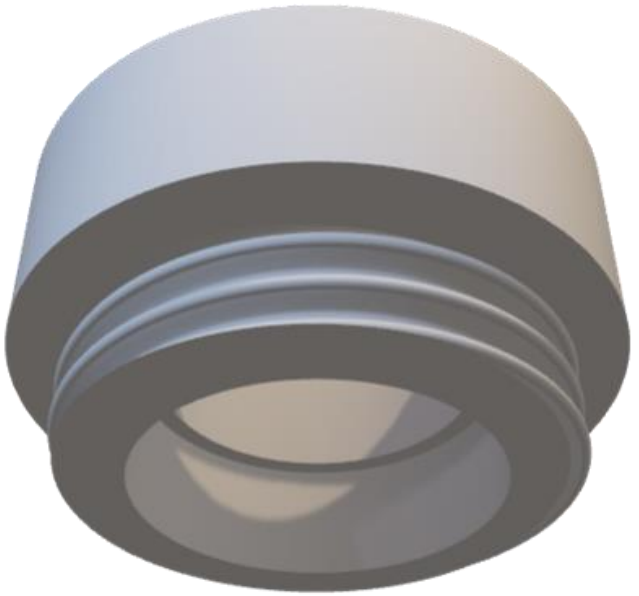
3D-model-photoresistor-holder



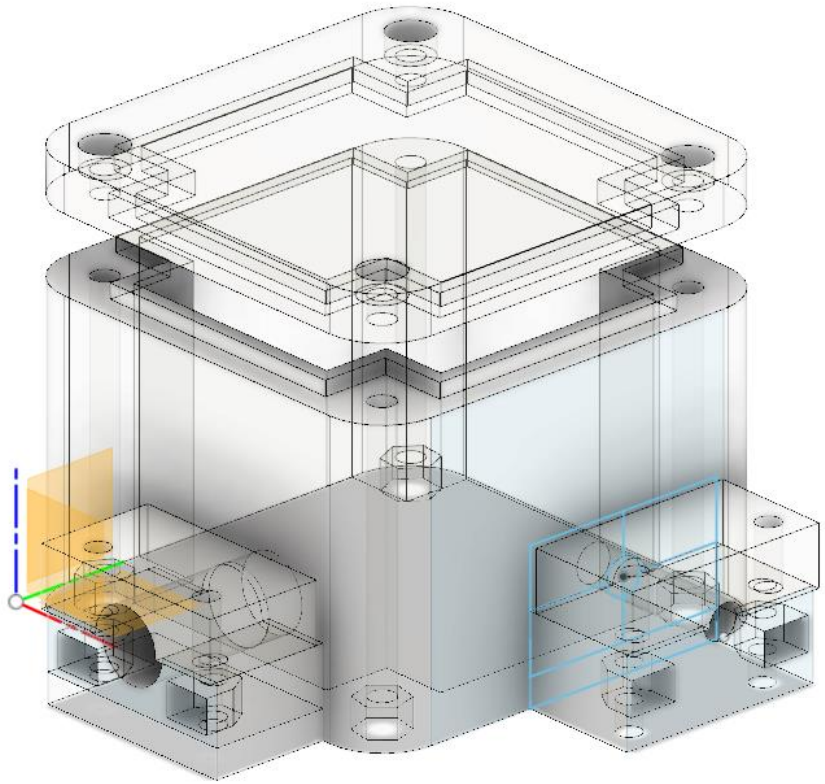
3D-model-photoresistor-lid

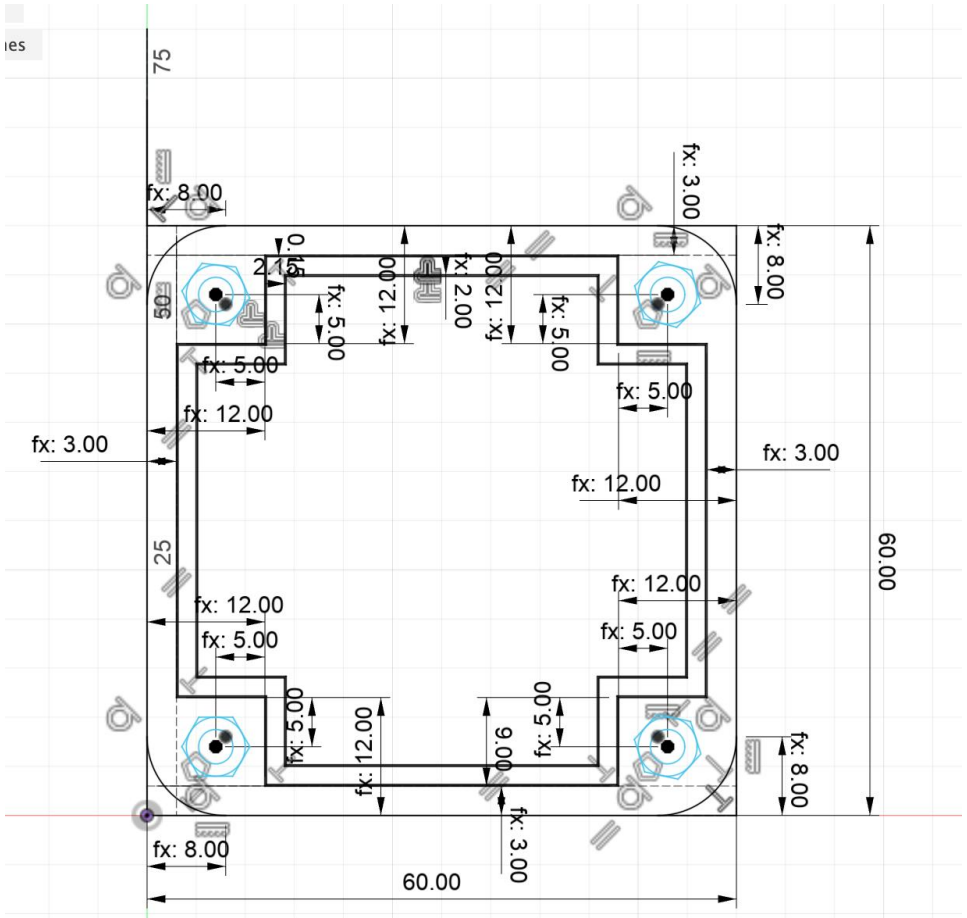






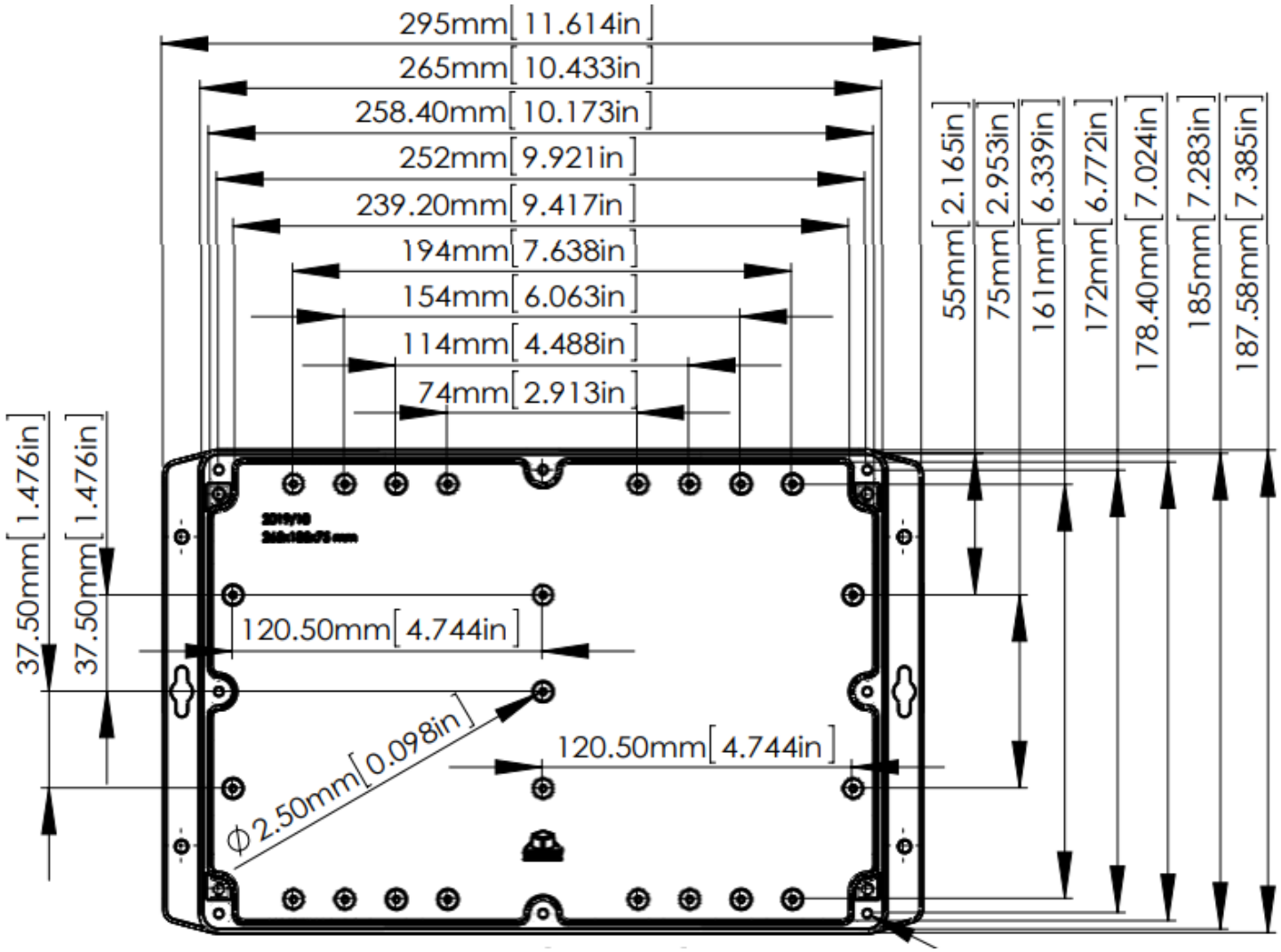
3D-model-waterproof-case



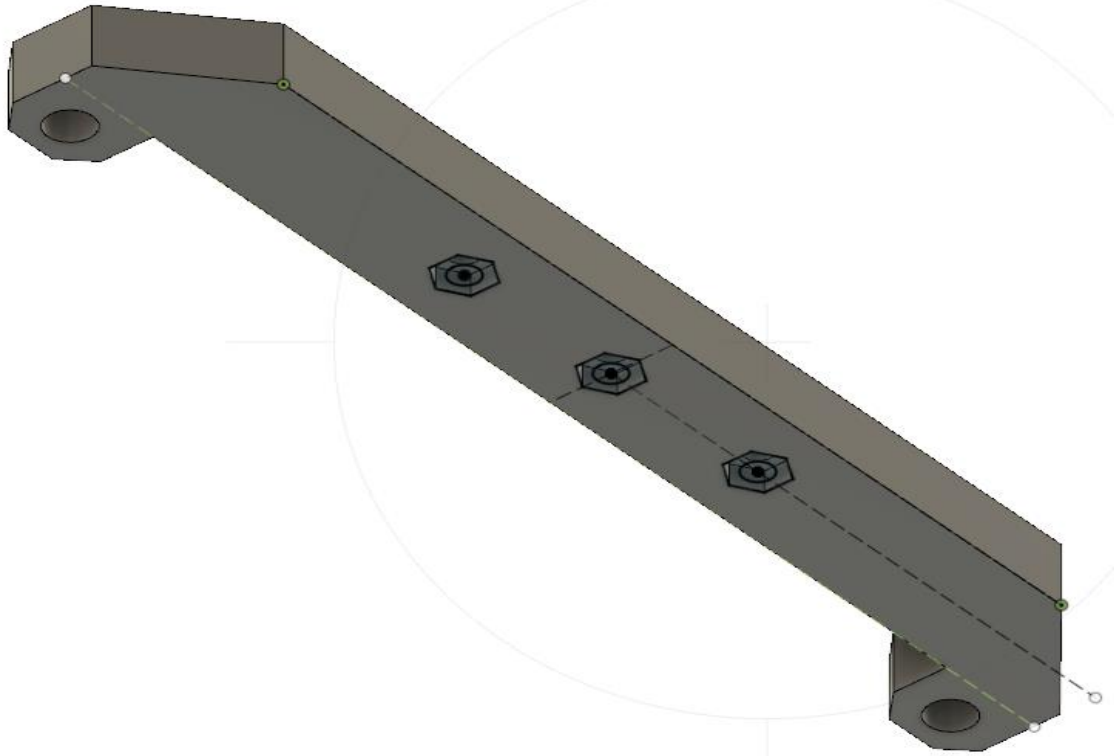


3D-model-waterproof-case

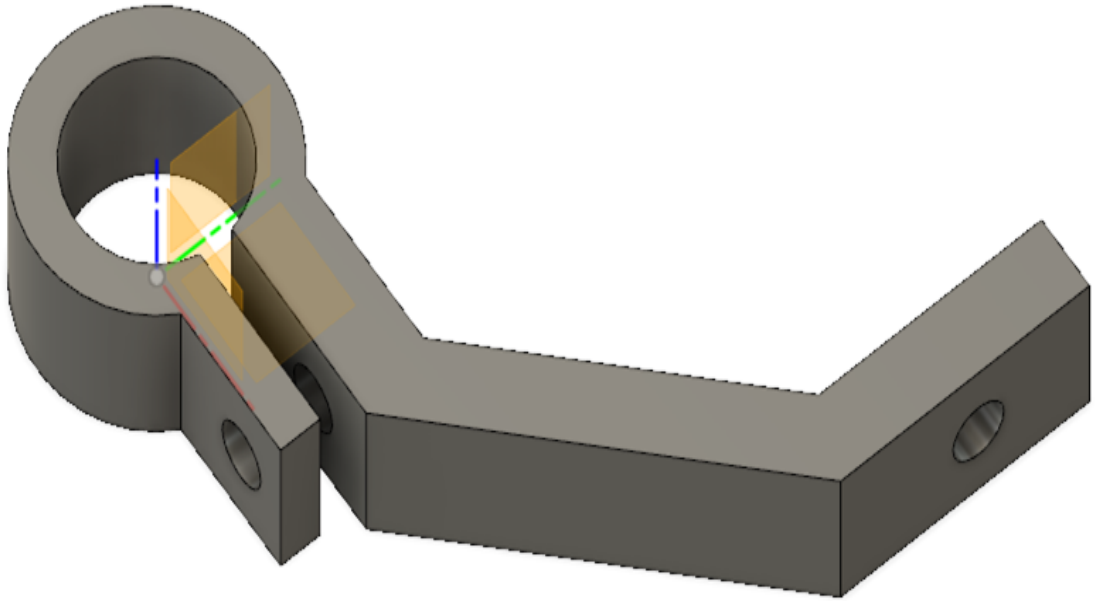
3D-model-waterproof-case

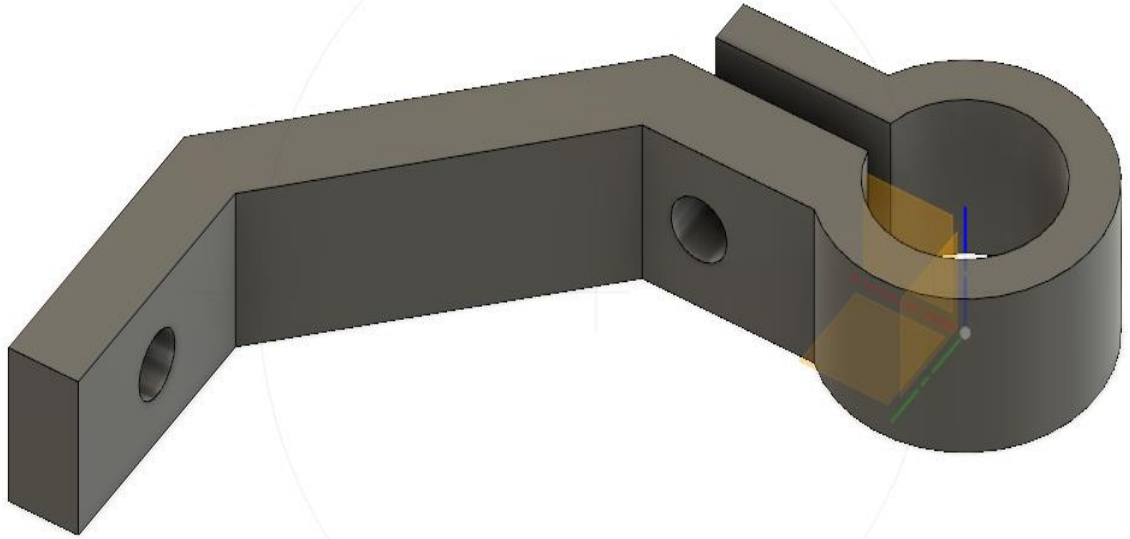


3D-model-pedestal

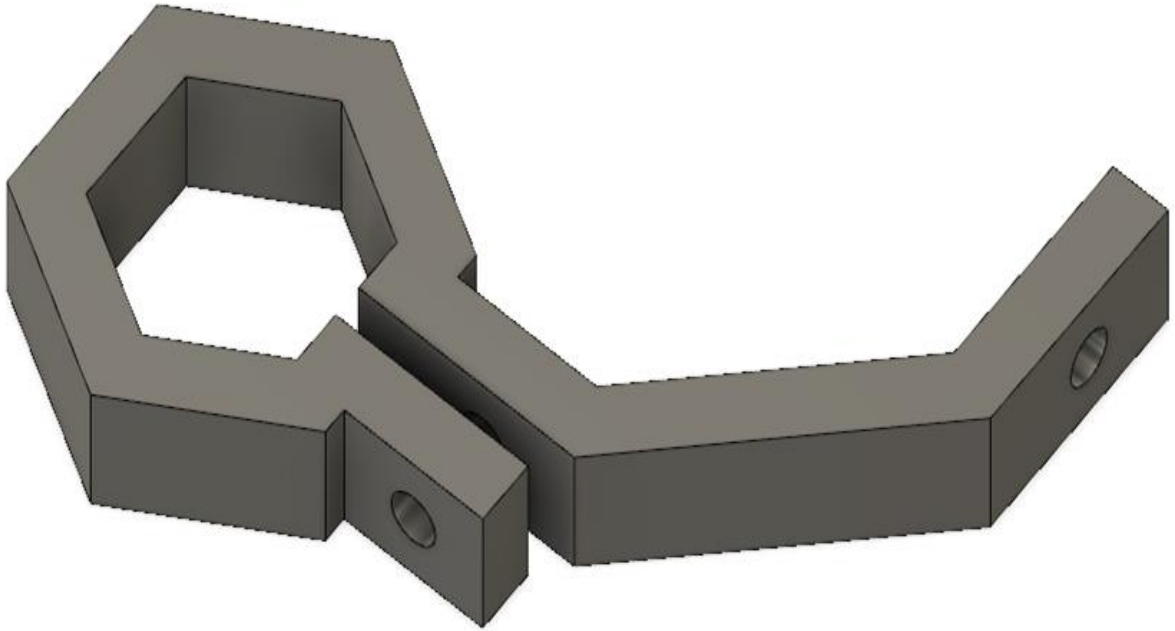


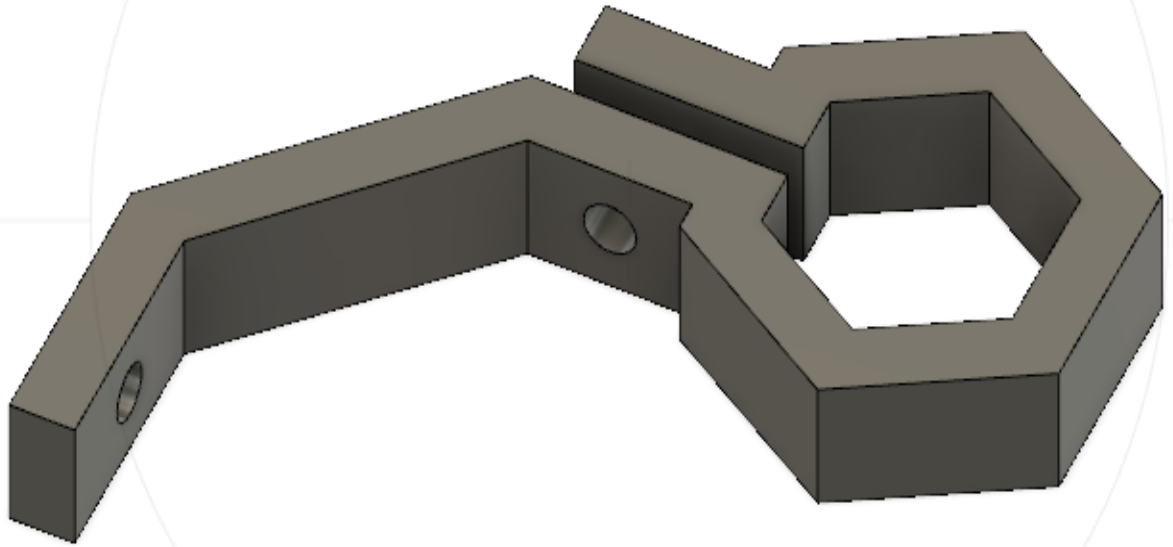
3D-model-holder



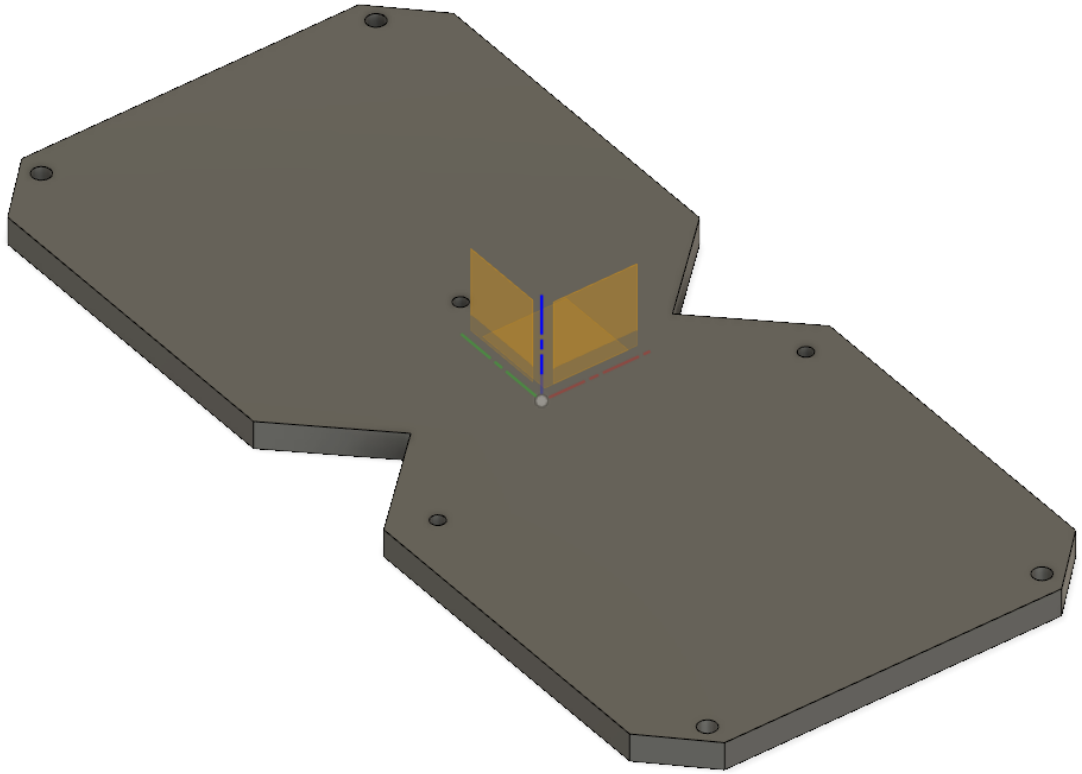


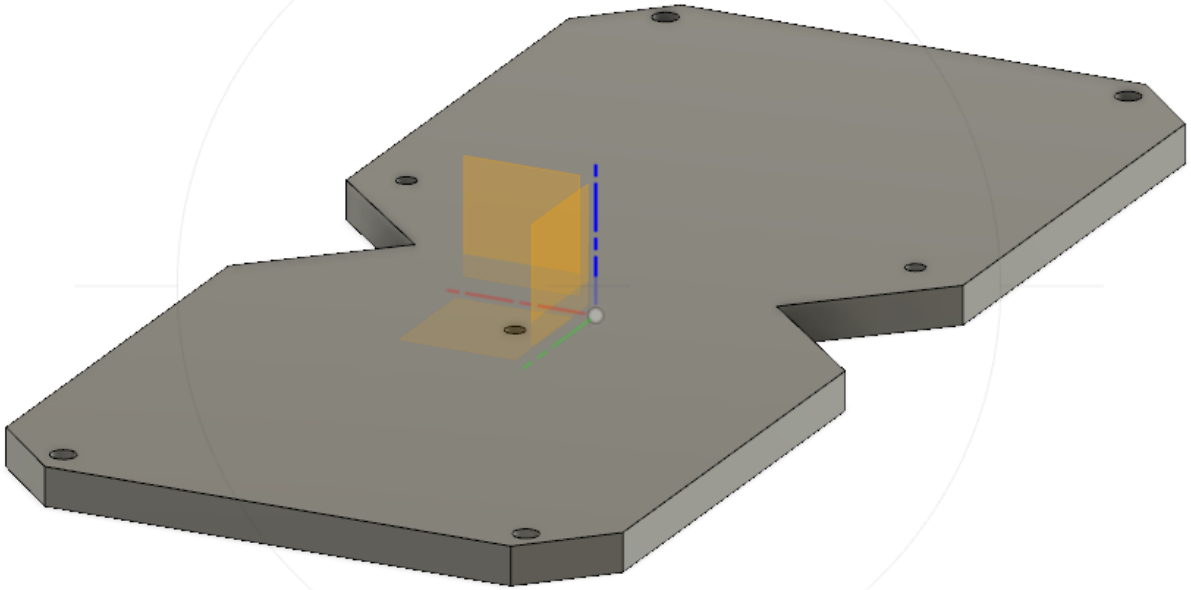
3D-model-hexagon-holder





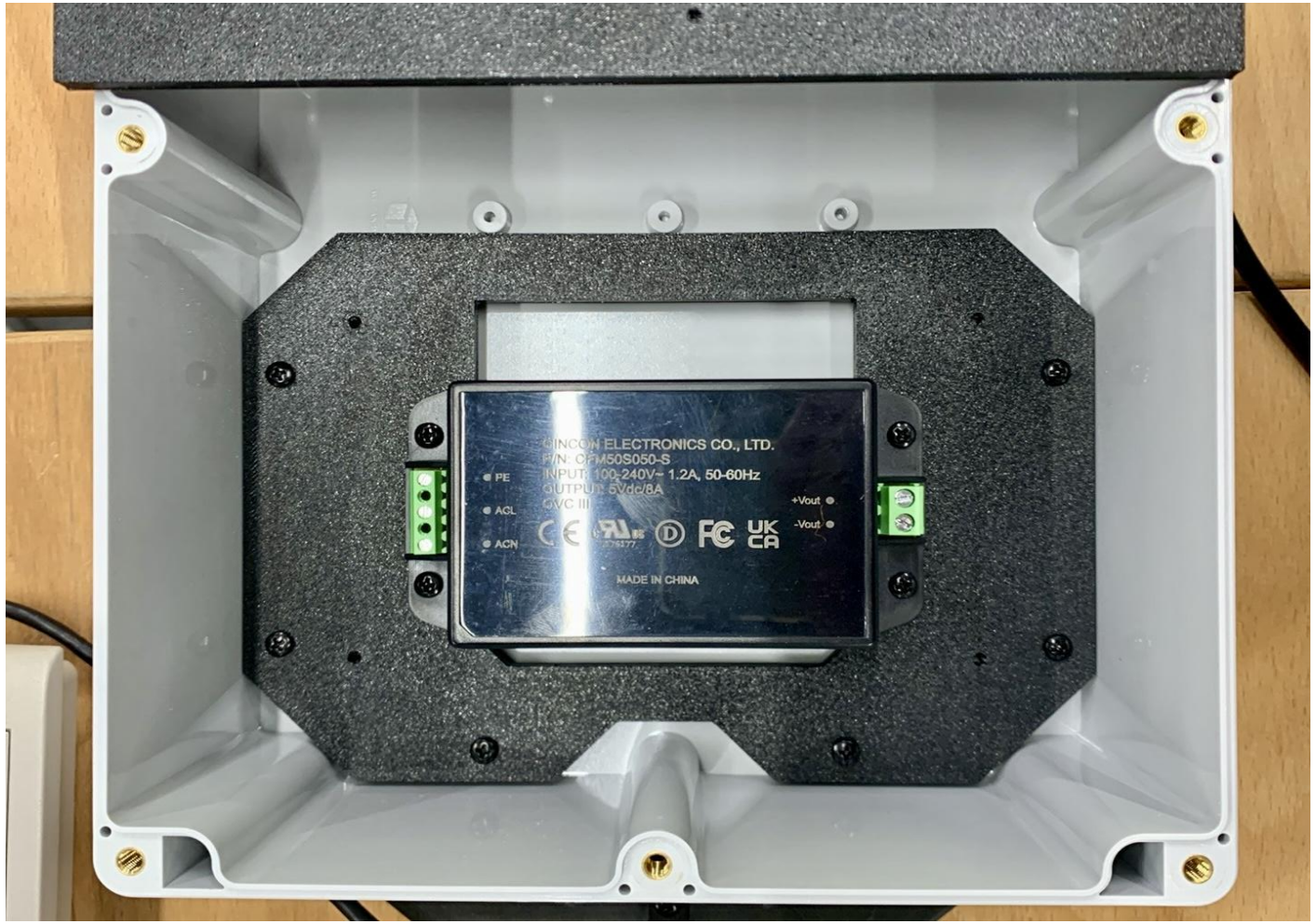
3D-model-plate





3D-results

3D-results


MINCON ELECTRONICS CO., LTD.
P/N: OPM50S050-S
INPUT: 100-240V~ 1.2A, 50-60Hz
OUTPUT: 5Vdc/8A
SVC III
PE
ACL
ACN
+Vout
-Vout
MADE IN CHINA

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