



instructables

Pet Pot



by Mukesh_Sankhla

Introducing Pet Pot - Not Your Ordinary Planter!

Have you ever wanted a plant that communicates with you? Well, that's exactly what Pet Pot is all about! Pet Pot is not just an ordinary planter; it's a smart planter with a unique personality.

Pet Pot uses high-tech sensors to understand what's happening in its environment. It pays attention to things like temperature, humidity, soil moisture, air quality, UV index, and light intensity. And guess what? It expresses its feelings through emojis!

Imagine this: If you forget to water the plant and the soil is dry, Pet Pot might display an angry or sad emoji animation. If the room gets too hot, it'll show a hot emoji. And when the lights go off, it'll put on a sleepy emoji. There are plenty of other emojis to discover, each telling you something different about your plant's well-being.

But that's not all! Pet Pot doesn't just show emojis; it also gives you real-time information about the temperature, humidity, soil moisture, air quality, UV index, and light intensity in its surroundings. It's like having a personal weather station right in your plant pot.

And here's the exciting part: We've gone a step further. We've created a system that stores all this real-time data in a MySQL database on the same device as Pet Pot. We've even set up a NodeRed server to create a user-friendly dashboard. This means you can access and analyze all the data using your everyday devices, like your phone or laptop.

With Pet Pot, you'll not only have a healthy and happy plant but also a fun and interactive addition to your home. It's the future of plant care, and it's here to make your life greener and more exciting. Get ready to experience the magic of Pet Pot!

Supplies:

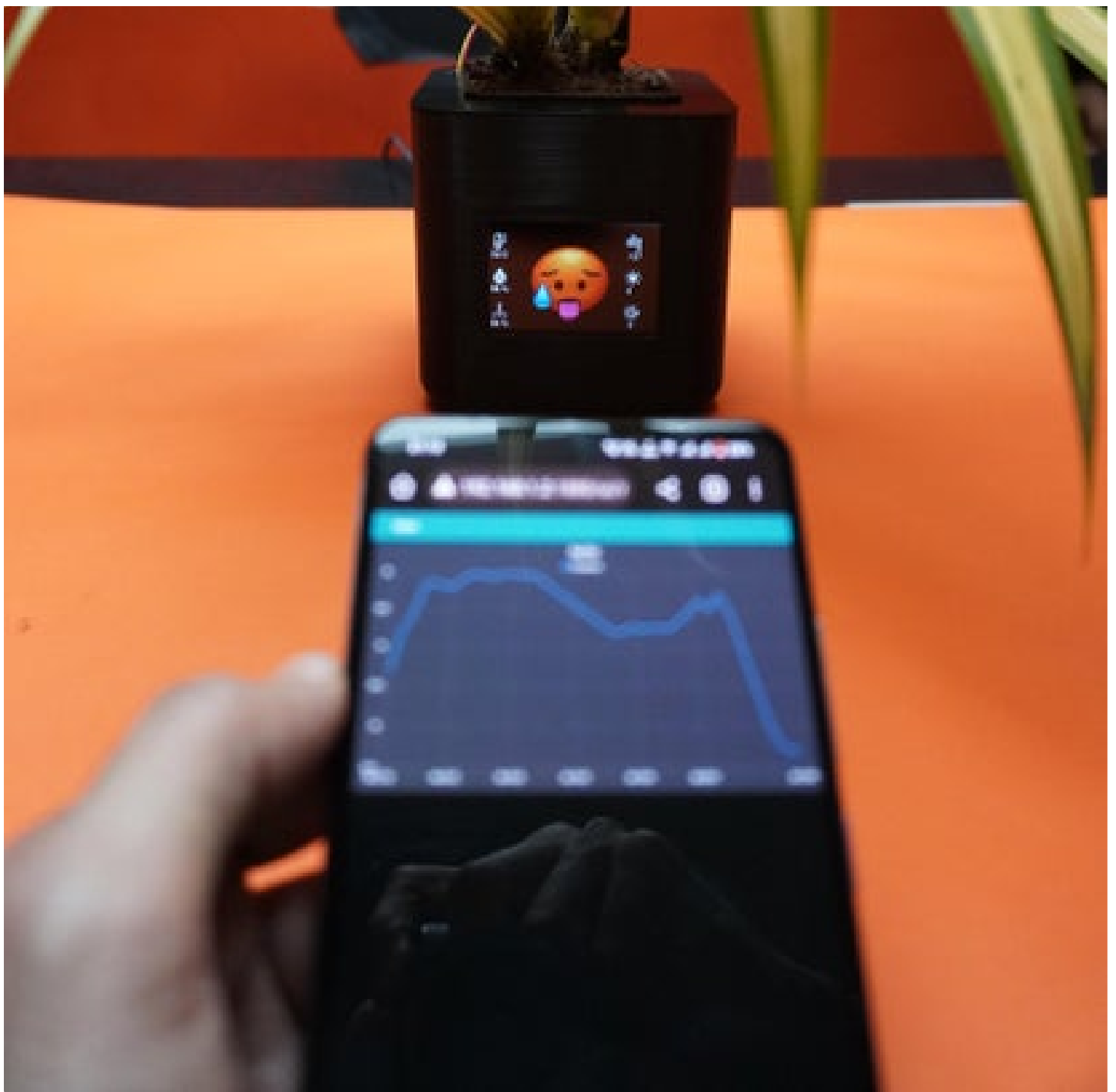
Electronics:

- 1x [DFRobot Unihiker](#)
- 1x [Air Quality Sensor](#)
- 1x [Environment Sensor](#)
- 1x [Soil Moisture Sensor](#)
- 1x [90 Degree Type C Cable](#)
- 1x 80x60 mm See Through Glass Or [Acrylic](#)

Tools I Used:

- [3D Printer](#)
- [Screwdriver Set](#)
- [Small Screwdriver Set](#)
- [Glue Gun](#)



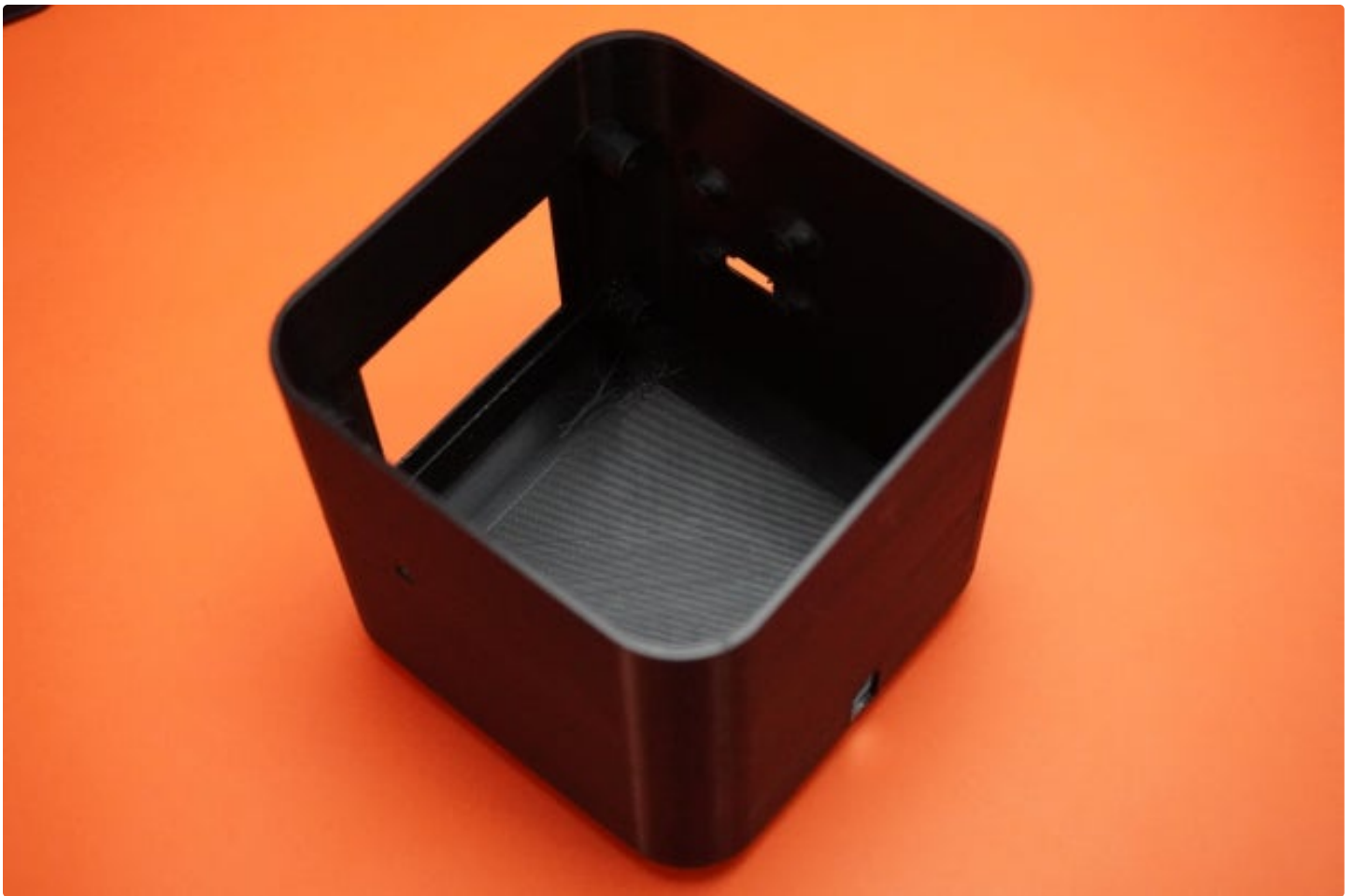




Step 1: CAD Designing & 3D Printing

- First, I used a program called Fusion 360 to create the design for Pet Pot. I made sure to carefully look at all the official data sheets and documents for the electronic components I was going to use. After that, I 3D printed all the parts needed for Pet Pot.
- You can take a look at the design in your web browser or on your mobile app, and if you want to make any changes to it, you can do that using the Fusion 360 software. You can also find the STL files, which are the 3D printing files, right here for easy access : [Pet Pot STL, Codes, and Other Files](#)





<https://www.instructables.comhttps://a360.co/3LdEPIb>

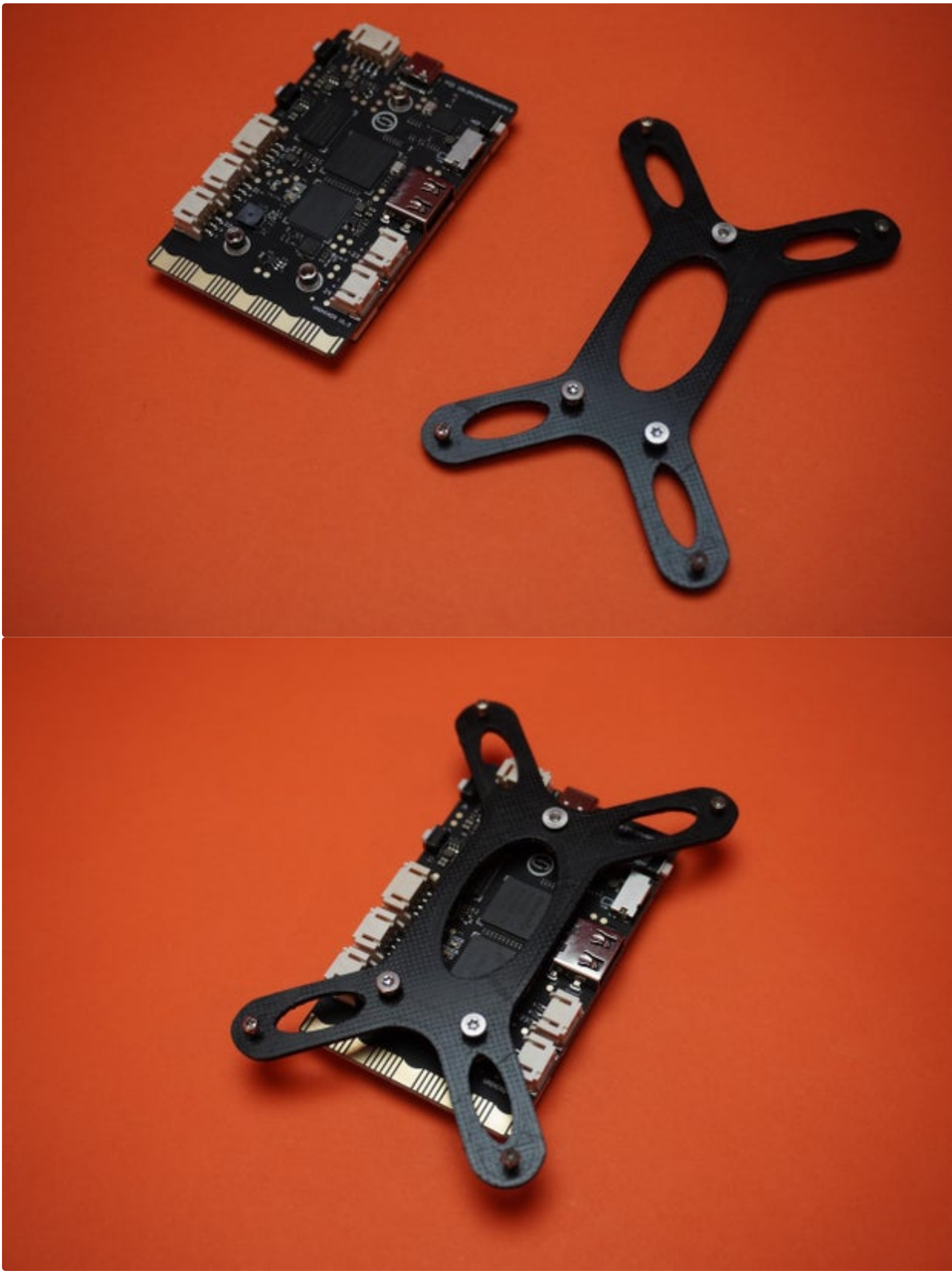


Step 2: Mounting Bracket

Now that we have our 3D printed parts ready , the next step is to join them together.

- Take the 3D printed mounting bracket and align it with the Unihiker board in the desired position.
- Use the three screws to attach the bracket securely to the board. Insert each screw through the bracket's holes and into the corresponding holes on the board.
- Tighten the screws carefully to ensure a firm connection, but be cautious not to overtighten and damage the components.







Step 3: Adding a Transparent Display Cover

In this step, we'll give Pet Pot a sleek look by adding a black see-through glass as a protective visor for the display on the main body. We'll use glue to secure it in place.

- Take the black see-through glass and ensure it's clean and free from any smudges or debris.
- Apply a thin, even layer of adhesive glue to the edges of the display area on the main body of Pet Pot. Be careful not to use too much glue to avoid excess spillage.
- Gently place the black see-through glass over the glued area, ensuring it aligns perfectly with the display.
- Press down lightly on the glass to secure it in place. Make sure it sticks evenly to the main body.
- Allow the glue to dry as per the manufacturer's instructions. This may take some time, so be patient.

Once the glue has completely dried, you'll have a stylish and protective visor for the display on your Pet Pot. It not only adds a sleek appearance but also safeguards the display from dirt and damage.



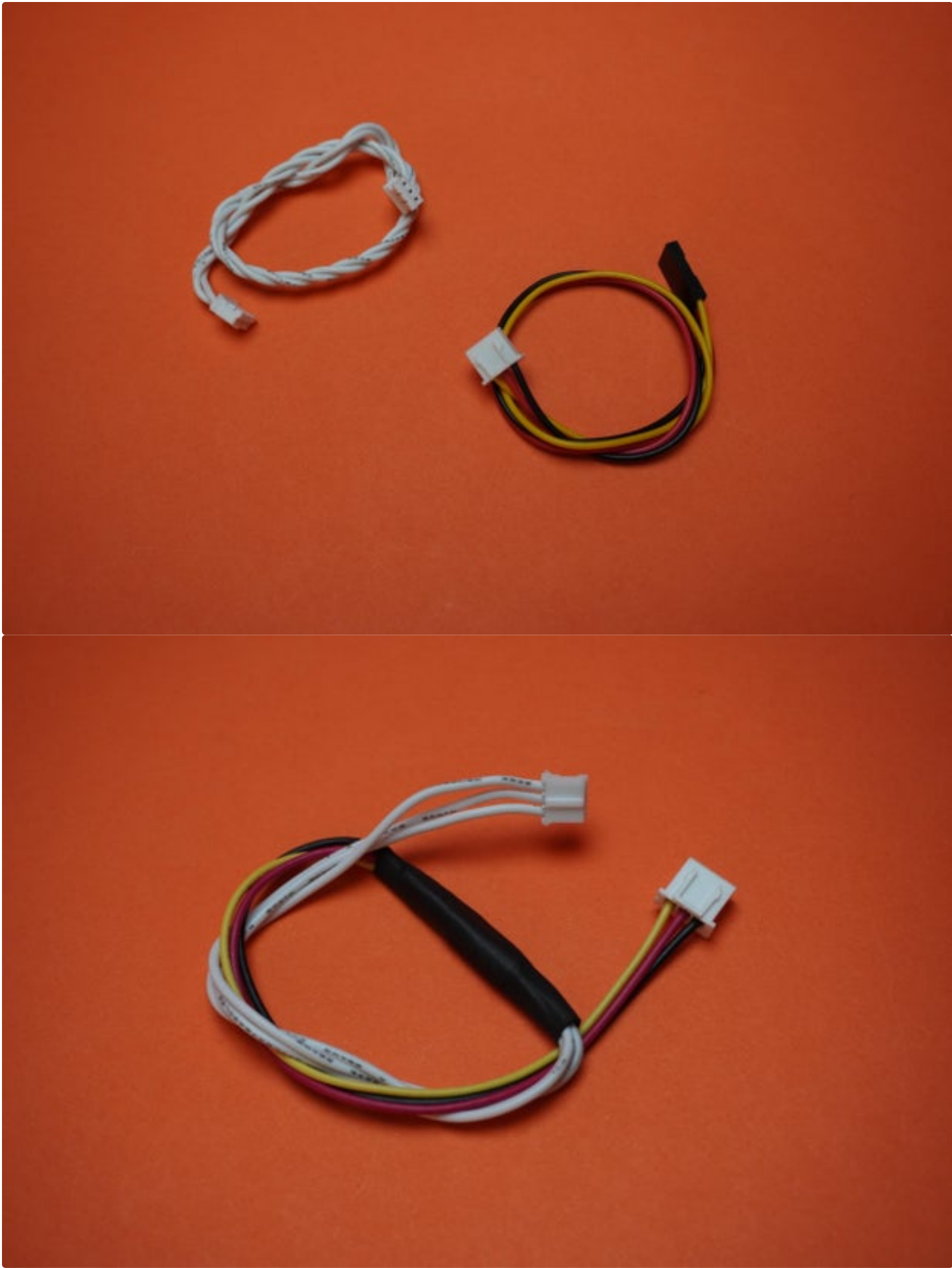


Step 4: Waterproofing the Soil Moisture Sensor

In this step, we'll make sure the soil moisture sensor is protected from water by attaching a 3D printed cover using hot glue.

- Take the 3D printed cover designed for the soil moisture sensor.
- Heat up your hot glue gun and allow it to reach the appropriate temperature for gluing.
- Apply a generous amount of hot glue into the sensor cover bottom body .
- Carefully place the soil moisture sensor into cover body, apply some more glue on the exposed components of the sensor.
- Press the top cover gently but firmly to ensure a secure bond with the bottom body.





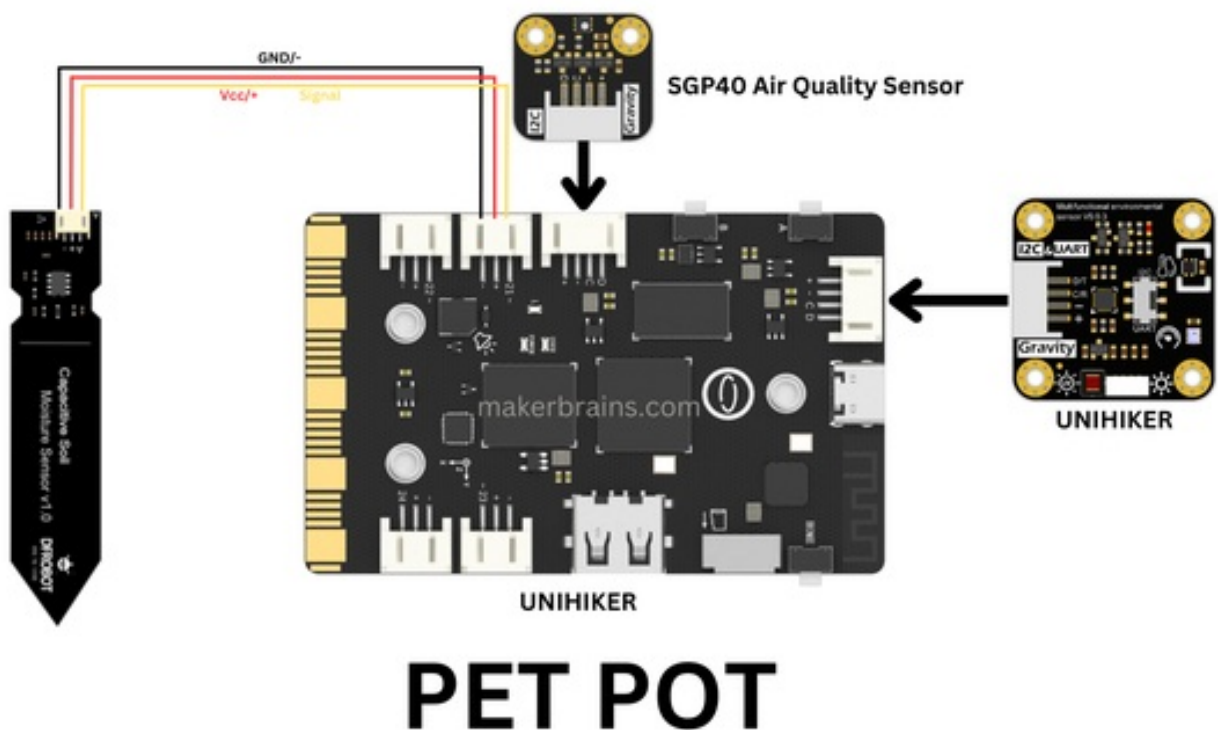


Step 5: Connecting the Sensors to the Board

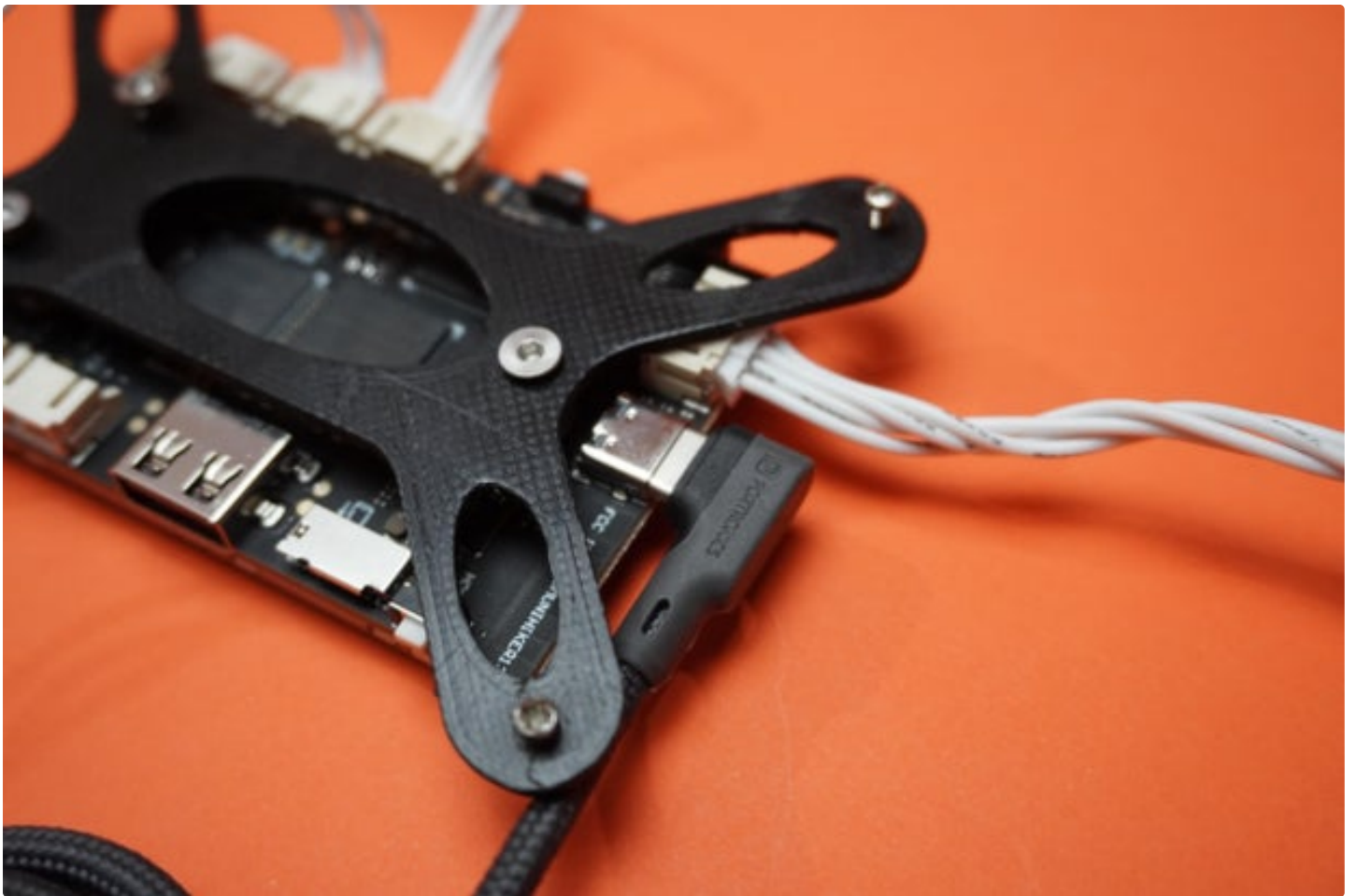
Now, let's connect the sensors to the unihiker board. The air quality and environment sensors can be easily connected using the provided connectors, thanks to the manufacturer's user-friendly design. Follow the diagram for proper connections.

- Air Quality and Environment Sensors (I2C Connection):
- Use the provided connectors for these sensors.
- Follow the diagram to connect them as indicated.
- Soil Moisture Sensor (Custom Connection):
- If you're using the soil moisture sensor provided in the supply, it's straightforward with the provided connectors.
- I made adjustments because I didn't have the particular sensors model, follow the circuit diagram for the modified connections.
- Ensure the connections are secure and properly aligned.
- Additionally, keep in mind that due to design constraints, a 90-degree Type-C cable is being used instead of the standard Type-C cable for power and data transfer.

Make sure to double-check the connections to ensure they are accurate and secure.







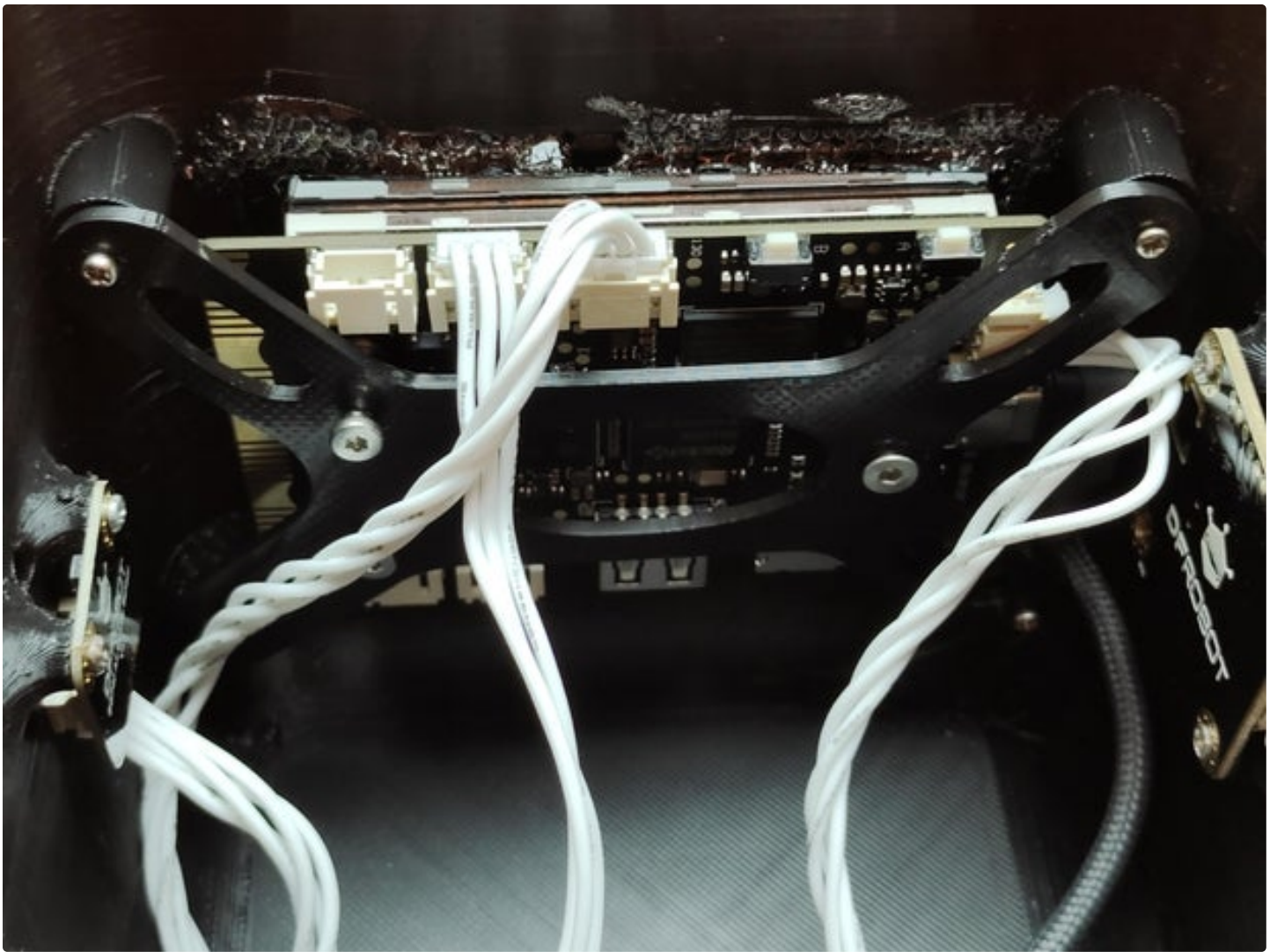


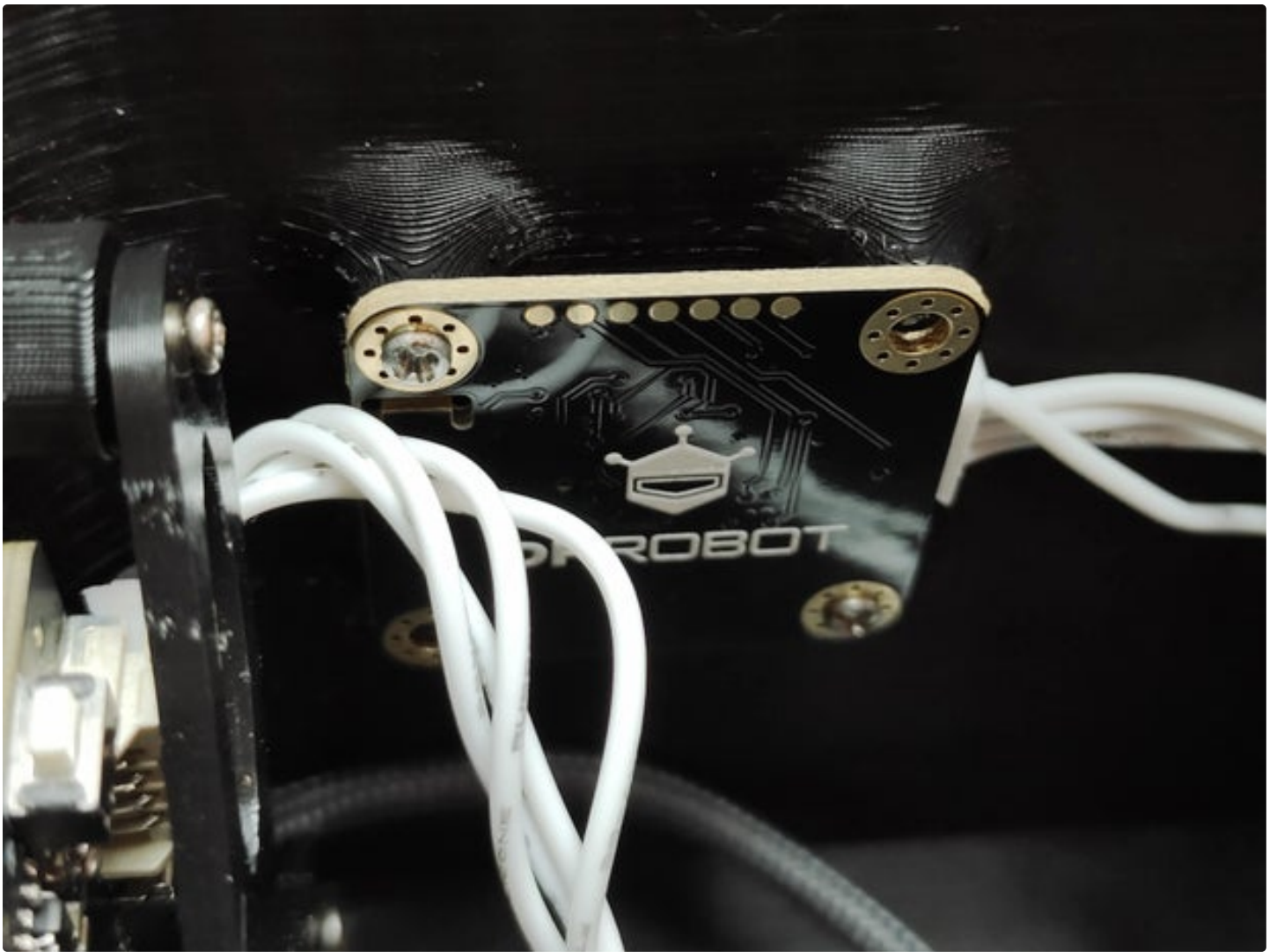
Step 6: Mounting Electronics to the Main Body

In this step, we'll secure all the electronic components to the main body of Pet Pot using screws.

- Place all the electronic components (Unihiker board with the 3D printed mounting bracket, and other sensors or modules) onto the main body in their designated locations.
- Using the appropriate screws, attach each electronic component to the main body. Ensure that you align the mounting holes on the components with those on the main body.
- Tighten the screws carefully, making sure not to over-tighten and damage the components. Use small screwdrivers to reach the inner locations.
- After securing all the components, check to ensure that they are firmly attached and stable. Gently shake the assembly to confirm that nothing is loose.

By completing this step, you'll have successfully mounted all the electronics securely to the main body of Pet Pot. This ensures that the components are in the correct positions and will function properly as part of your smart planter project.









Step 7: Plant Your Green Friend

Now, let's bring your Pet Pot to life by planting a real plant and assembling everything together.

- Select a suitable plant for your Pet Pot and carefully transplant it into the 3D printed pot body. Ensure the plant is potted with soil.
- Gently insert the soil moisture sensor into the soil near the plant's root system. This sensor will help monitor the moisture level to ensure your plant gets just the right amount of water.
- Place the 3D printed pot body, now containing the plant and soil moisture sensor, into the main body of Pet Pot. Make sure it fits snugly and aligns correctly.

Now, with your plant nestled within Pet Pot's now let's make it smart using some codes and logics.









Step 8: Choose Your Pet Pot Program

You have the option to choose between two Python programs for your Pet Pot: "SimplePetPot" and "AdvancePetPot," depending on your level of programming and data needs.

- SimplePetPot (For Beginners):
 - This program is designed for users who are not deeply into programming.
 - It displays emojis on the Pet Pot's display based on sensor readings, making it easy to understand your plant's needs.
 - Additionally, it shows real-time sensor data directly on the display.
- AdvancePetPot (For Advanced Users):
 - This program includes all the features of SimplePetPot.
 - In addition, it provides MySQL data storage capability, allowing you to record and analyze sensor data over time.
 - You can also set up a NodeRed dashboard for a user-friendly interface to visualize and manage your data using your phone or laptop.

Choose the program that best suits your needs and level of expertise. With either option, you'll be able to interact with and care for your Pet Pot in a way that fits your preferences.

```

1 import pygame
2 import GPIO
3 import random
4 import datetime
5 import sys
6 from DFRobot_EEnvironmental_Sensor import *
7 from DFRobot_SGP40 import DFRobot_SGP40
8 from gpiozero import Board, Pin
9
10 Board().begin()
11
12 SENS040 = DFRobot_EEnvironmental_Sensor_I2C(bus=0x01, addr=0x22) # Initialize Environmental Sensor
13 sgp40 = DFRobot_SGP40(relative_humidity=50, temperature_c=25) # Initialize Air Quality Sensor
14 MoistureSensor = Pin(Pin.P21, Pin.ANALOG) # Initialize Soil Moisture Sensor
15
16 # Atmospheric pressure unit select
17 HPA = 0x01
18 KPA = 0x02
19
20 # Temperature unit select
21 TEMP_C = 0x01
22 TEMP_F = 0x04
23
24 SENS040.begin()
25 sgp40.begin(10)
26
27 # Initialize Pygame
28 pygame.init()
29
30 # Set the display dimensions
31 screen_width = 240
32 screen_height = 320
33 screen = pygame.display.set_mode((screen_width, screen_height))
34
35 # Load the emoji animations
36 emoji_animations = {
37     'angry1': cv2.VideoCapture("Animations/Angry1.mov"),
38     'angry2': cv2.VideoCapture("Animations/Angry2.mov"),
39     'angry3': cv2.VideoCapture("Animations/Angry3.mov"),
40     'angry4': cv2.VideoCapture("Animations/Angry4.mov"),
41     'happy1': cv2.VideoCapture("Animations/Happy1.mov"),
42     'happy2': cv2.VideoCapture("Animations/Happy2.mov"),
43     'happy3': cv2.VideoCapture("Animations/Happy3.mov"),
44     'happy4': cv2.VideoCapture("Animations/Happy4.mov"),
45     'sad1': cv2.VideoCapture("Animations/Sad1.mov"),
46     'sad2': cv2.VideoCapture("Animations/Sad2.mov"),
47     'sad3': cv2.VideoCapture("Animations/Sad3.mov"),
48     'sad4': cv2.VideoCapture("Animations/Sad4.mov"),
49 }
50
51 import mysql.connector
52
53 db_config = {
54     "host": "localhost", # or your MySQL server's IP address
55     "port": 3306, # the default MySQL port
56     "user": "root",
57     "password": "root",
58     "database": "unihiker"
59 }
60
61 # Initialize a MySQL connection
62 try:
63     conn = mysql.connector.connect(**db_config)
64     cursor = conn.cursor()
65 except mysql.connector.Error as err:
66     print(f"Error: {err}")
67     conn.close()
68     exit(1)
69
70 Board().begin()
71
72 SENS040 = DFRobot_EEnvironmental_Sensor_I2C(bus=0x01, addr=0x22) # Initialize Environmental Sensor
73 sgp40 = DFRobot_SGP40(relative_humidity=50, temperature_c=25) # Initialize Air Quality Sensor
74 MoistureSensor = Pin(Pin.P21, Pin.ANALOG) # Initialize Soil Moisture Sensor
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76 # Atmospheric pressure unit select
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83
84 SENS040.begin()
85 sgp40.begin(10)
86
87 # Initialize Pygame
88 pygame.init()
89
90 # Set the display dimensions

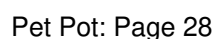
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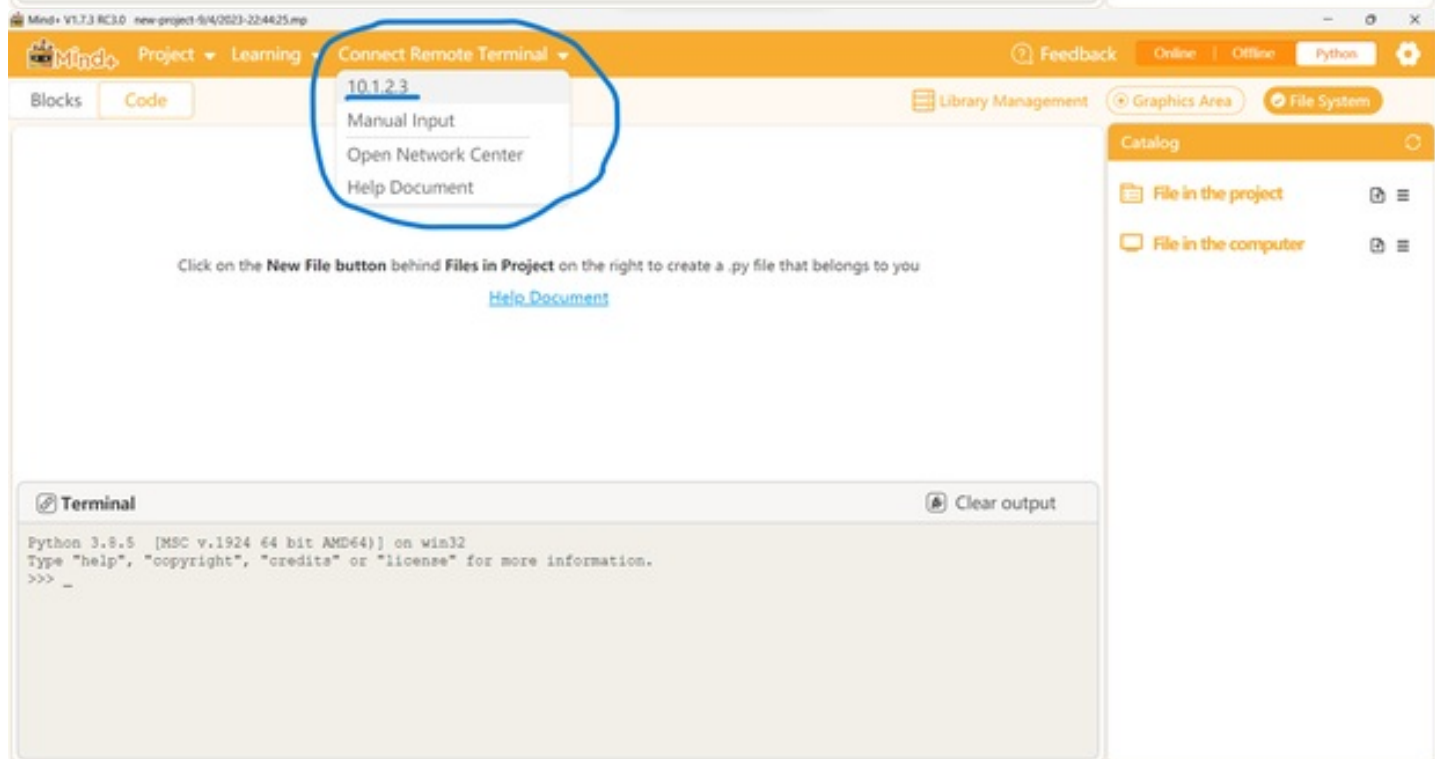
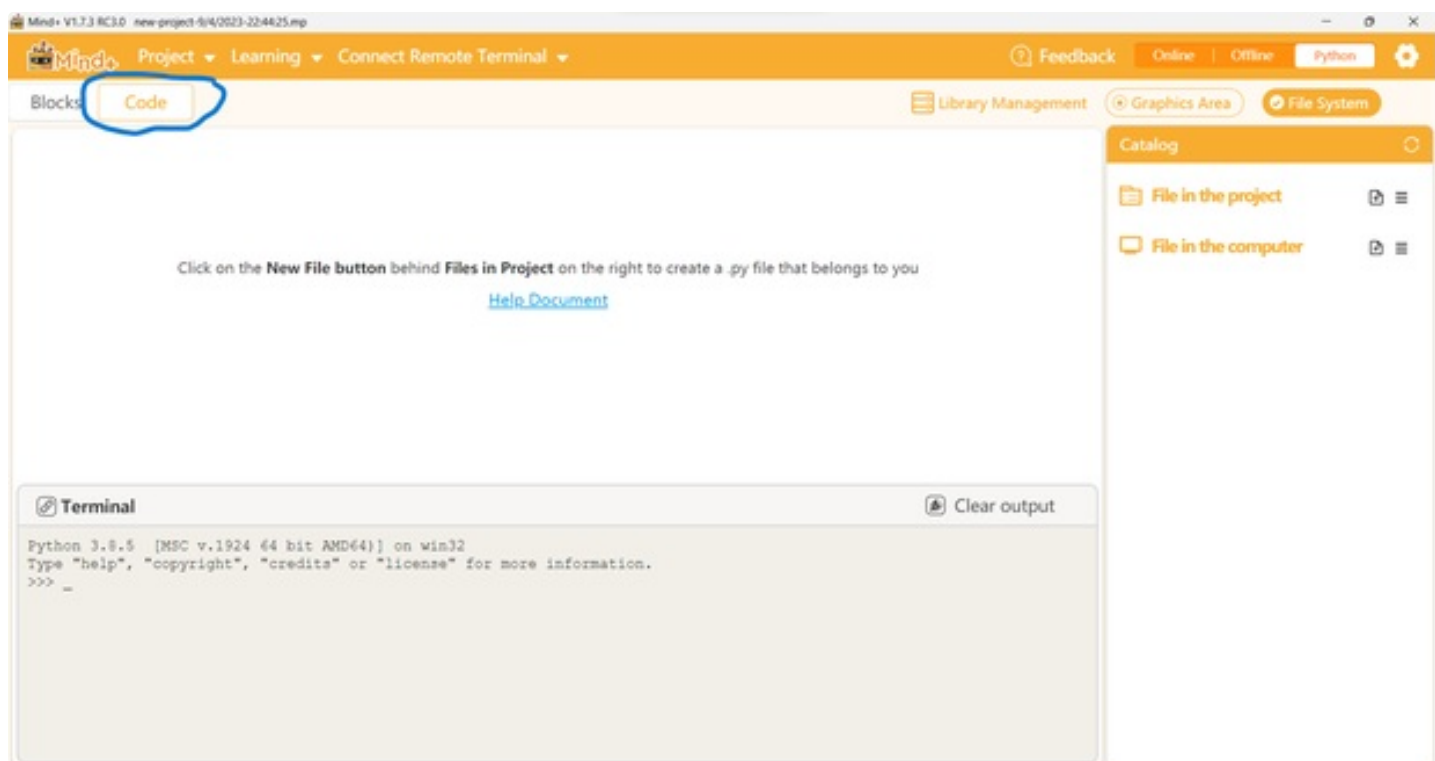
Step 9: SimplePetPot

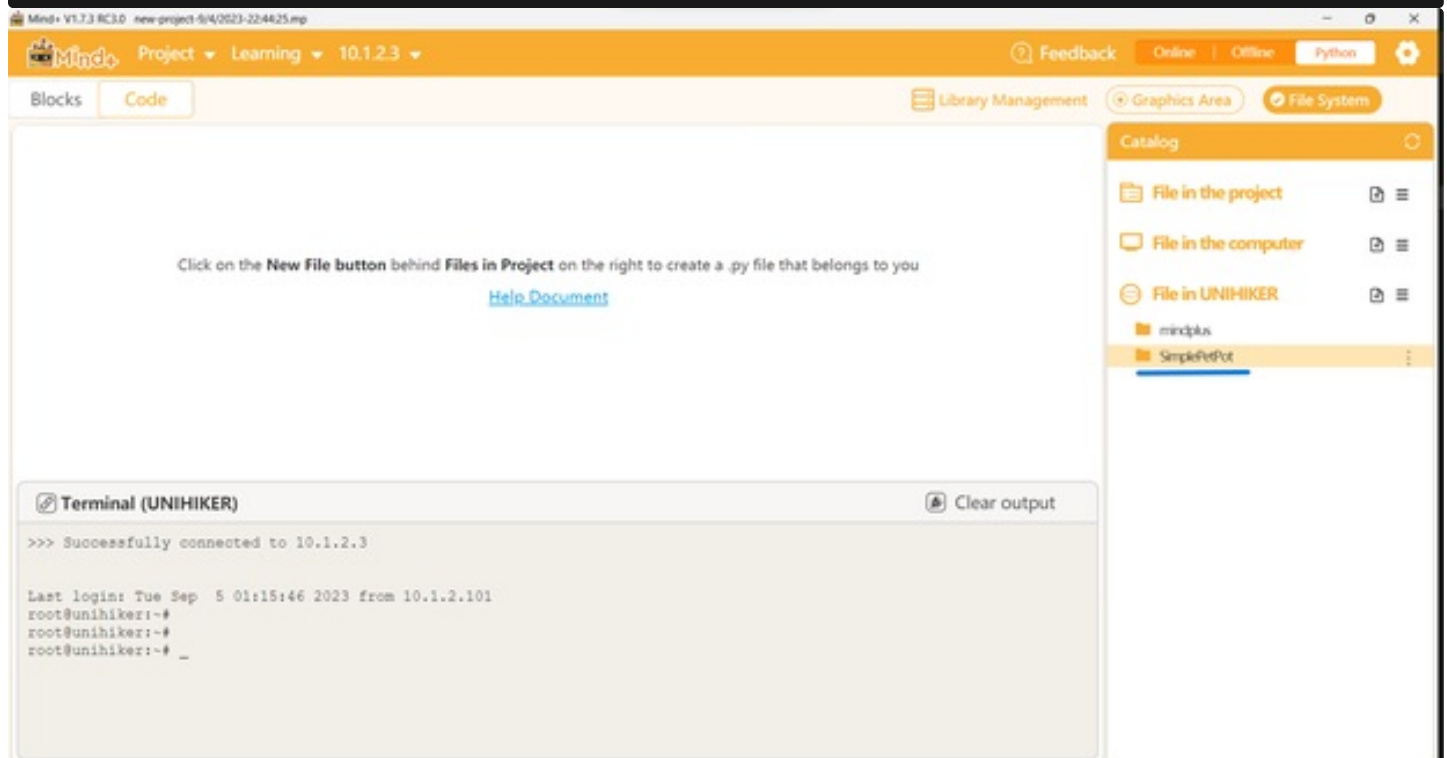
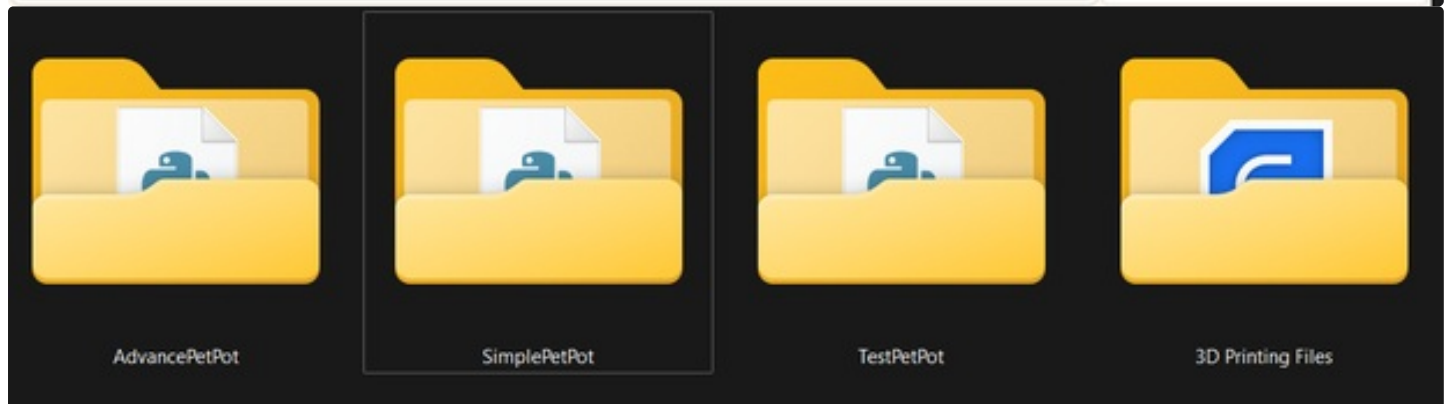
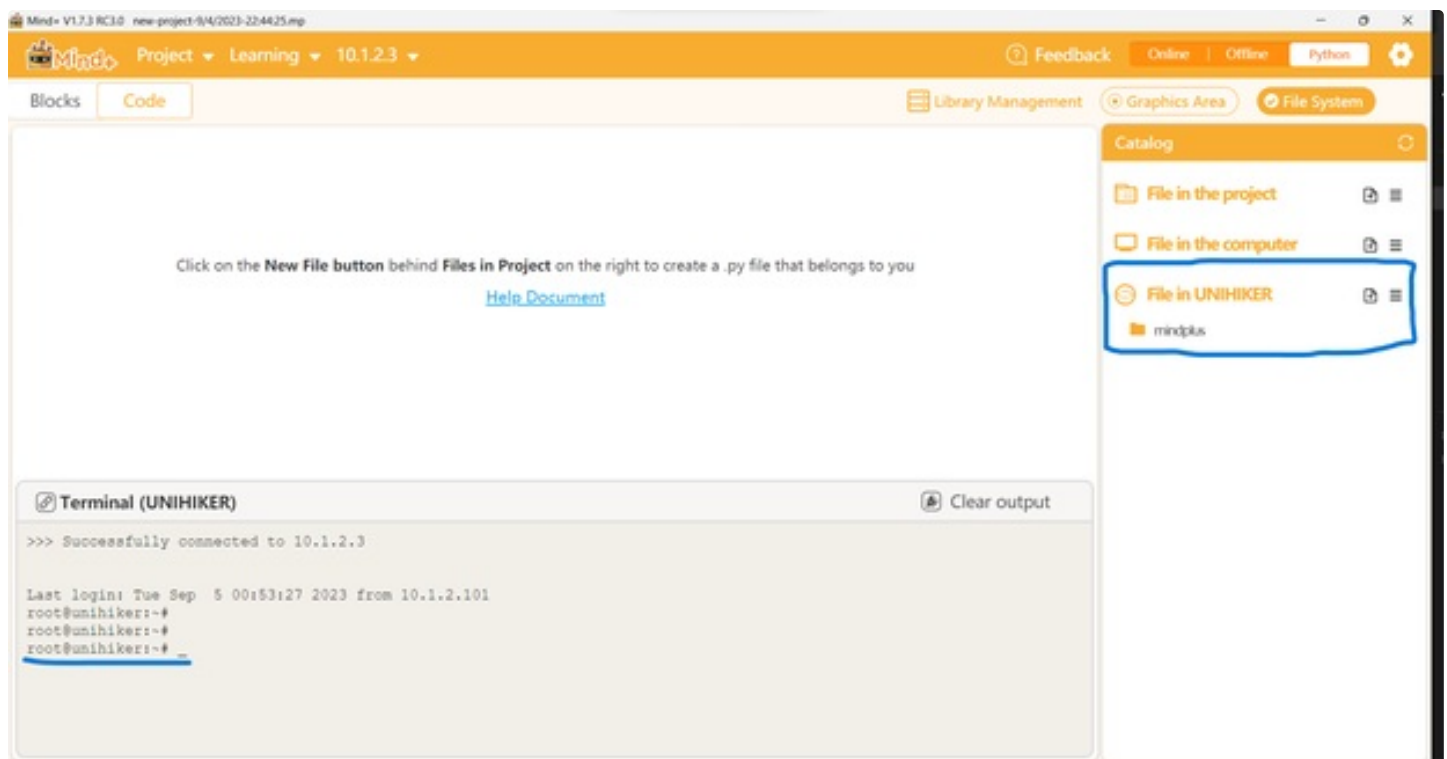
To begin coding SimplePetPot with the Mind+ software, please follow these detailed steps:

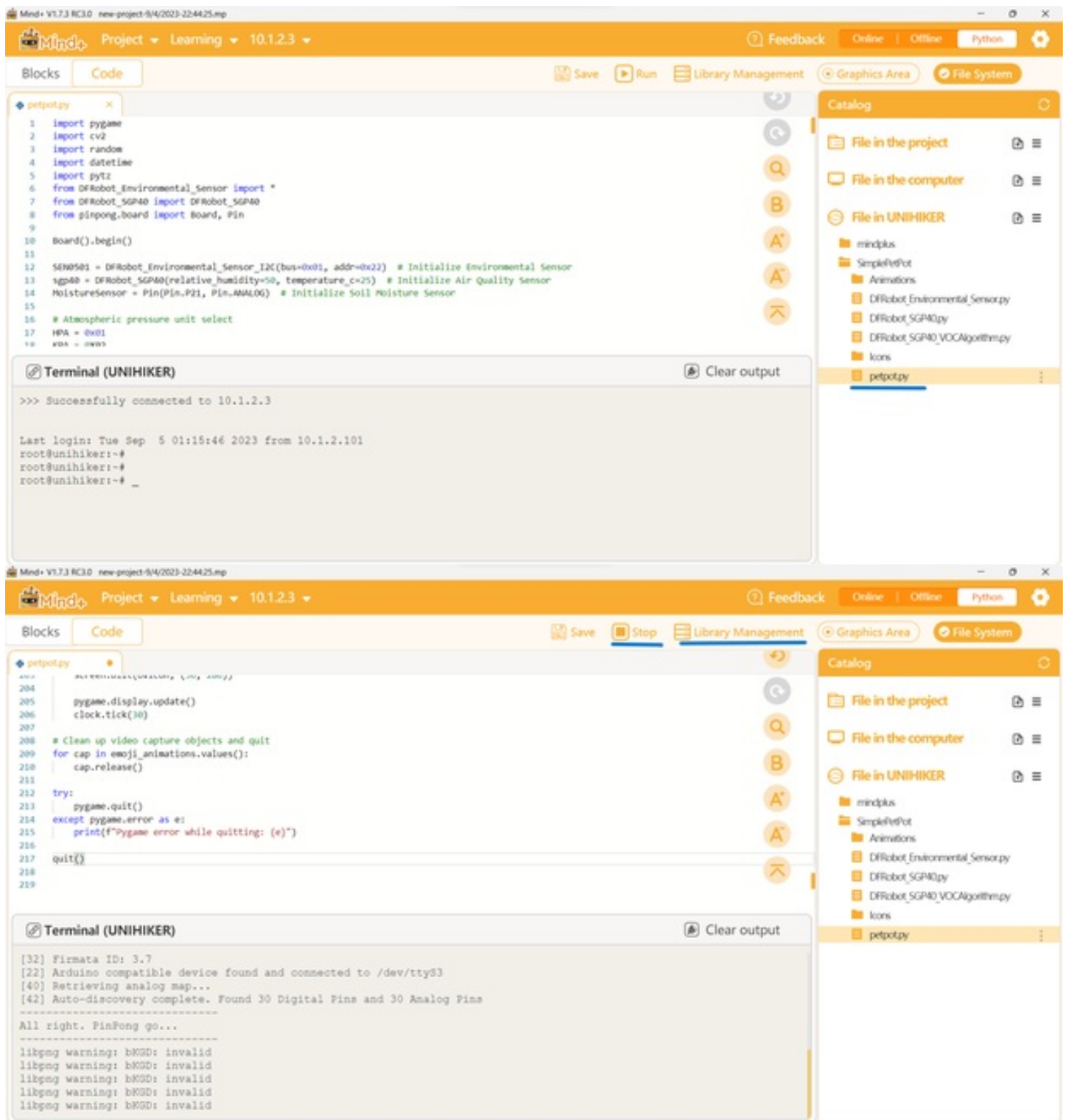
- Visit the Mind+ download page at <https://mindplus.cc/download-en.html>.
- Download the Mind+ software for your computer's operating system (Windows, macOS, Linux) and follow the installation instructions.
- After installation, launch the Mind+ software on your computer.
- Ensure you have selected the appropriate development board or microcontroller in the Mind+ software that matches the hardware you are using for your Pet Pot project.
- Go to the "Extensions" menu in Mind+.
- Select "Unihiker" from the available extensions.
- Ensure your Unihiker board is connected to your computer using the 90-degree Type-C cable.
- In Mind+, click on the "Code" menu.
- Look for an option to connect to the Unihiker, typically displayed as "@10.1.2.3". This option should appear if your Unihiker is properly connected.
- Once connected to the Unihiker, open the directory where your SimplePetPot code is stored. It should be in a folder you've downloaded, likely named "SimplePetPot."
- Drag and drop the entire "SimplePetPot" folder from the downloaded zip file into the appropriate location within the Mind+ software.
- In Mind+, locate and open the "PetPot.py" code file from the "SimplePetPot" folder.
- Run the code within the Mind+ environment.
- If you encounter any errors or missing libraries while running the code, you can download and install the required libraries from the Mind+ Library Management.

Following these steps will allow you to code and run SimplePetPot using the Mind+ software, creating a user-friendly interface for your Pet Pot project.









Step 10: AdvancePetPot

- Follow the same above instructions for setting the Mind+ software.
- Drag and drop the AdvancePetPot folder into unihikers directory.
- Follow this tutorial for [Setting Up The SSH For Unihiker](#).

Installing Node-Red:

- Use the below command to install Node-Red

```
bash <(curl -sL https://raw.githubusercontent.com/node-red/linux-installers/master/deb/update-nodejs-and-nodered)
```

- Use the below command to start Node-Red

```
node-red-start
```

- Once Node-Red is installed, you can start it by opening a web browser and entering the following URL:

```
http://{your_pi_ip-address}:1880
```

Step 11: Conclusion

Pet Pot is not just a planter; it's a living, breathing ecosystem. It's a testament to human ingenuity and the desire to nurture the natural world in our digital age.

If you found this project enjoyable and inspiring, please consider giving it a like and sharing your thoughts in the comments. Your feedback is a great source of motivation for me. If you've undertaken this project yourself, don't hesitate to share your own version in the "I made it" section below. Thank you, and I look forward to sharing more exciting projects with you in the future! 😊📧

