

Plantmate Automatic Watering Cube PMWC-01 Assembly Instructions:

The document provided is a detailed assembly guide for the Plantmate Automatic Watering Cube, model: PMWC-01.

The guide provides a list of necessary tools, components, and software needed to assemble the device.

The steps include setting up the PCB with the Plantmate Programmer, writing system OS code, initialing the EEPROM data and uploading function code to the PCB. Detailed soldering instructions are also given for various components.

The guide also explains how to assemble the Plantmate G1 into the enclosure and secure it with screws.

PlantMate ®

Model: PMWC-01

www.plantmate.ca

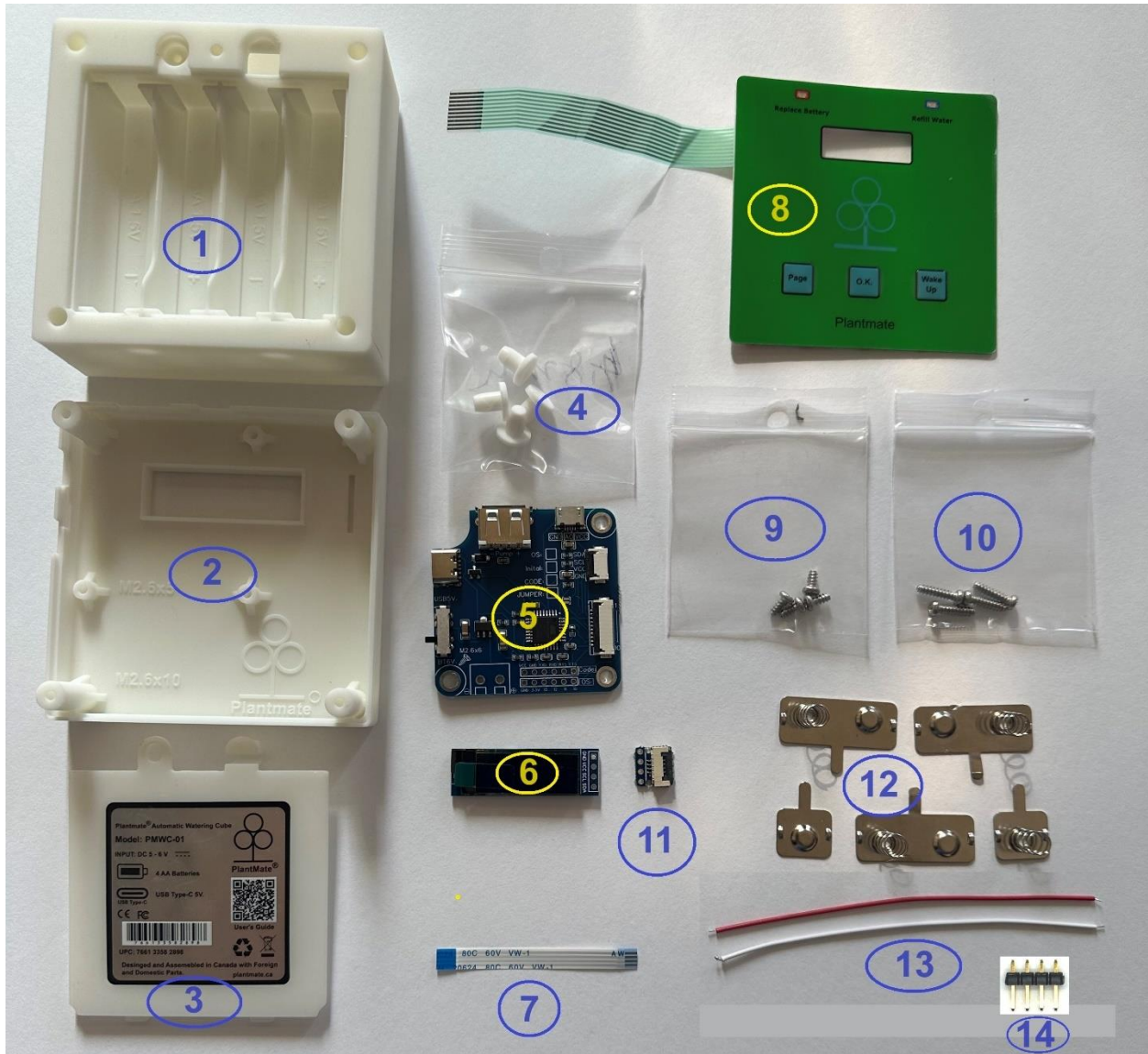
plantmateinfo@gmail.com

Tools Needed:



1. Plantmate programmer
2. Soldering Iron
3. Hot glue gun
4. Needle-nose Plier
5. Wire Cutter
6. Tweezers
7. Phillips Screwdriver

Components:



1. Plantmate G1 Enclosure-back
2. Plantmate G1 Enclosure-front
3. Plantmate g1 Enclosure- battery cover
4. 4 x Silicone Hole Caps (4.8mm x8.5mm)
5. Plantmate G1 main board PCB
6. 0.91" OLED
7. 4Pin 1.0mm Flexible Cable
8. Plantmate G1 Front Pannel
9. 3 x PCB to Enclosure Screws (M2.6x5)
10. 4 x Enclosure Screws (M2.6x8)
11. 4Pin to FFC Adapter and Cable (5cm)

12. AA battery contact springs and plates -1 set
13. 2 x 20mm wires
14. 4Pin Header

Required Software:

- 1. Arduino IDE**
(recommend use Arduino IDE2.0+)
- 2. Inital_EEPROM_Data.ino**
(find it out in Documents/Arduino_11/Plantmate_G1/)
- 3. Plantmate_G1_V5.ino or latest version**
(use the newest version, find it out in Documents/Arduino_II/Plantmate_G1/)

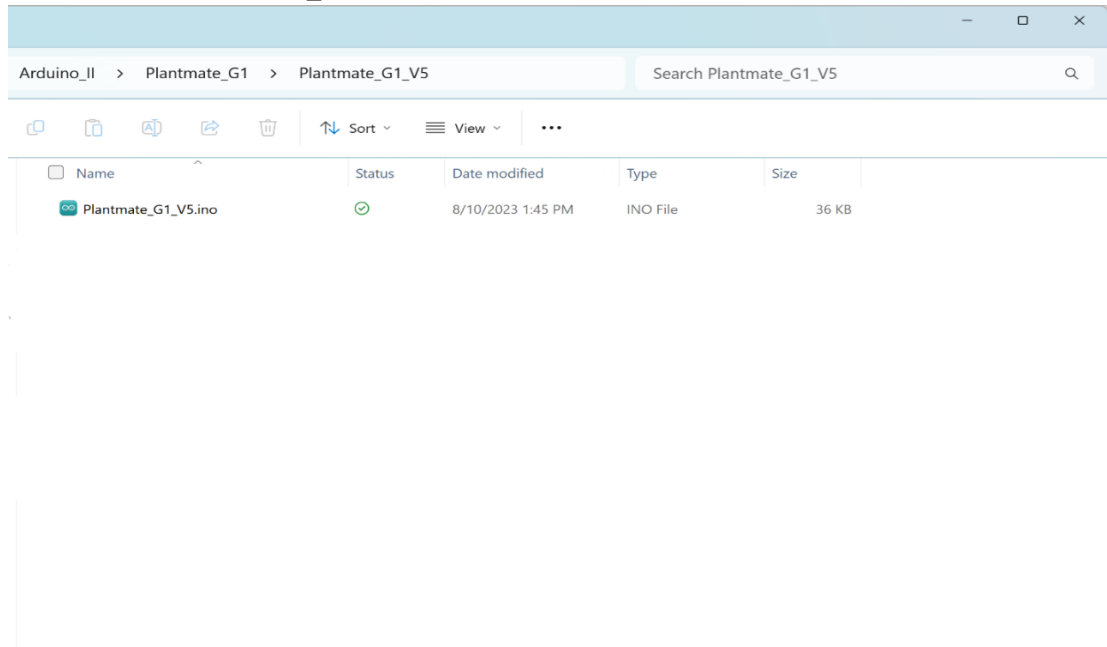
Assembly Steps:

1. Write the operator system (OS) to the Plantmate G1 Main Board PCB

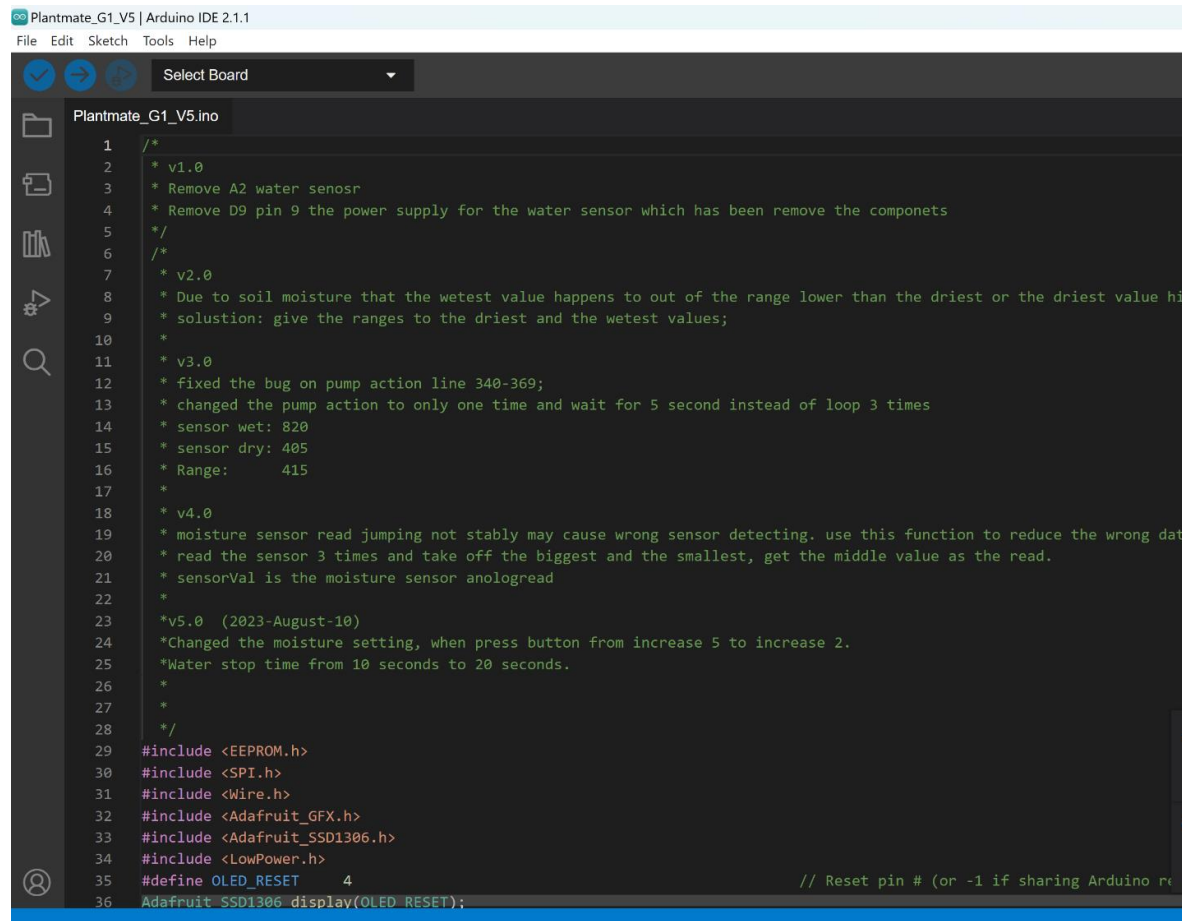
Use the Plantmate Programmer and a computer with the program files to set up the PCB. Place the Plantmate G1 PCB in the programmer as shown in the reference image and connect the USB cable to the computer.



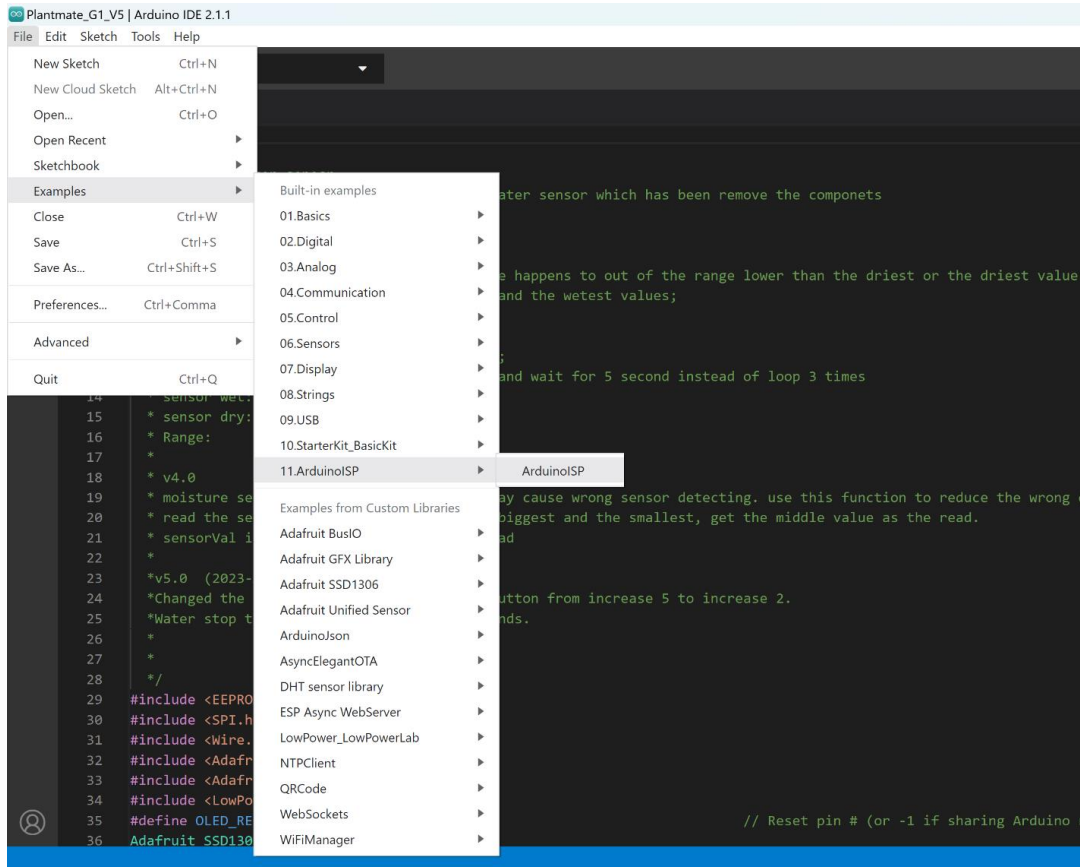
Find the latest Plantmate_G1Vx.ino as shown in the reference screen shot.



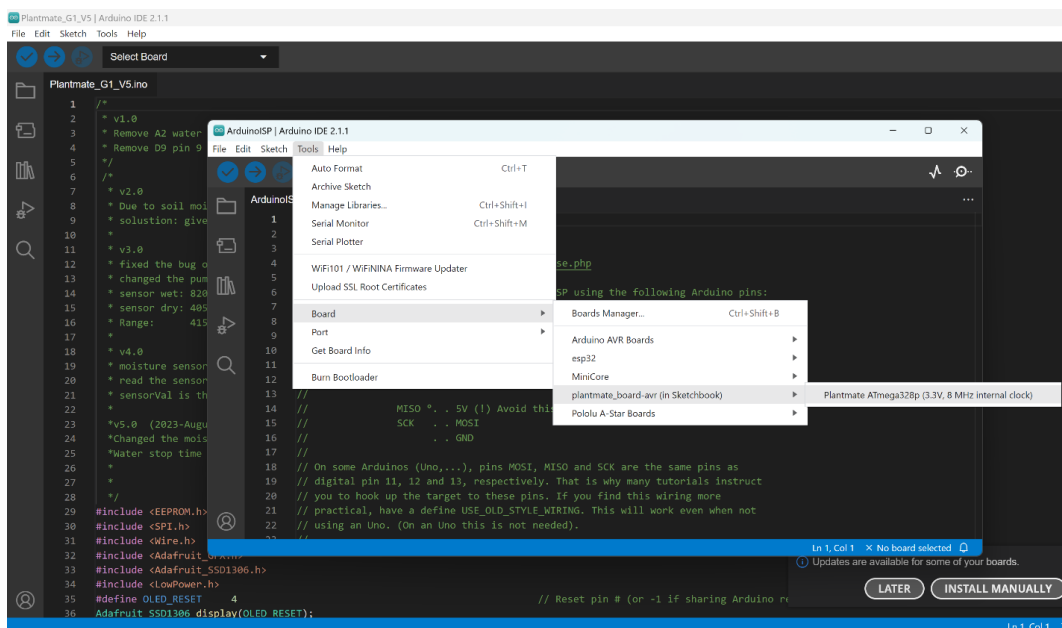
Open it on the Arduino IDE



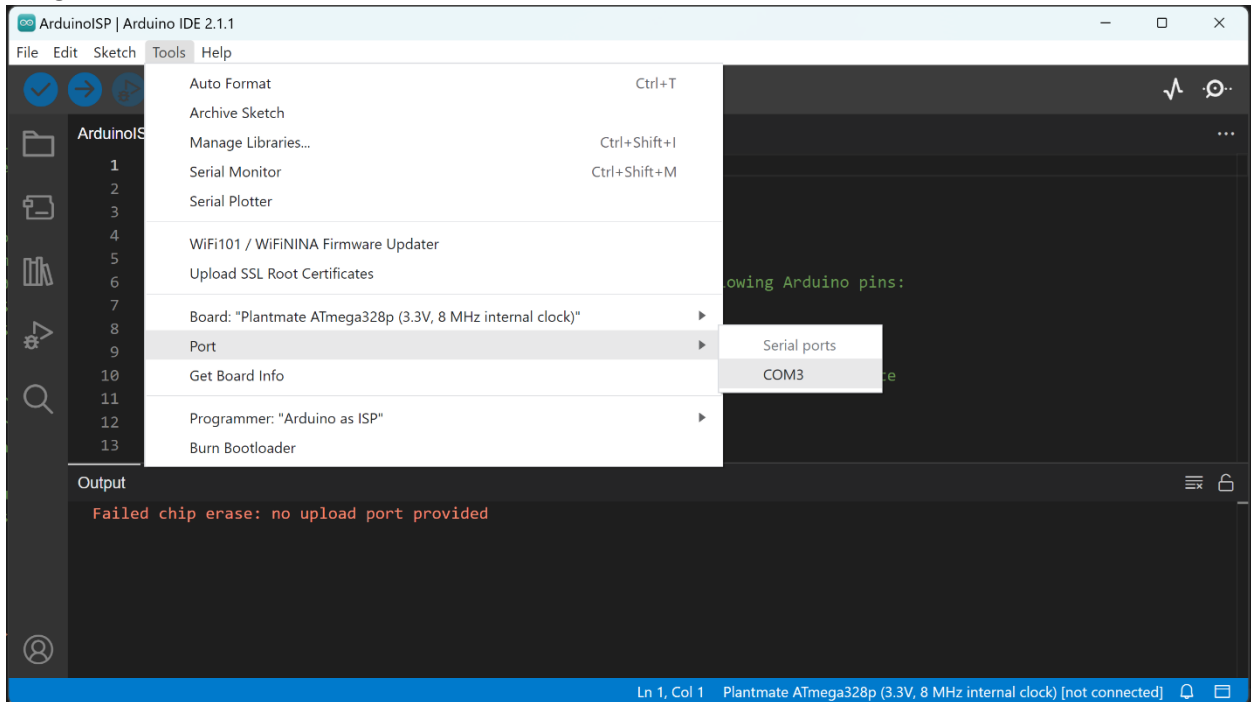
Click on IDE File -> Examples -> ArduinoISP -> ArduinoISP



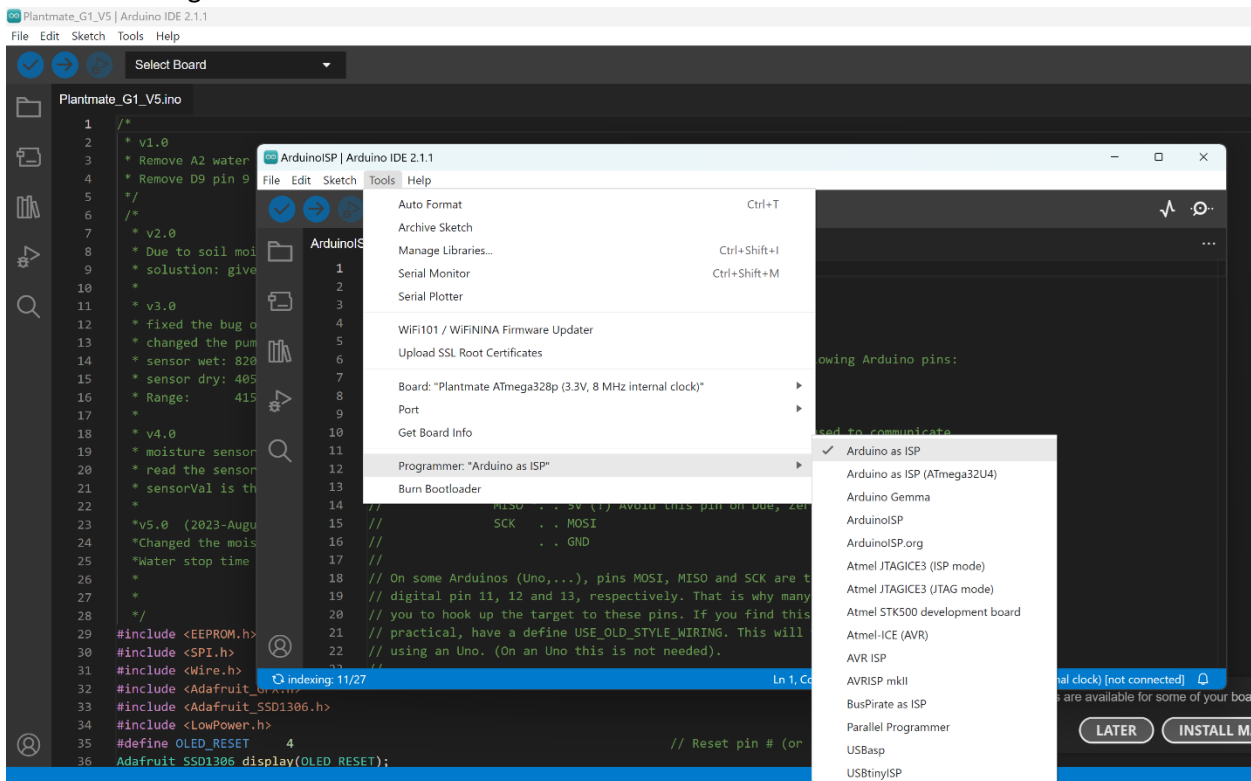
Choose the Board by Click on IDE -> Tools -> Board -> Plantmate_board_avr(in Sketchbook) -> Plantmate ATmega328p(3.3V, 8MHz, internal clock)



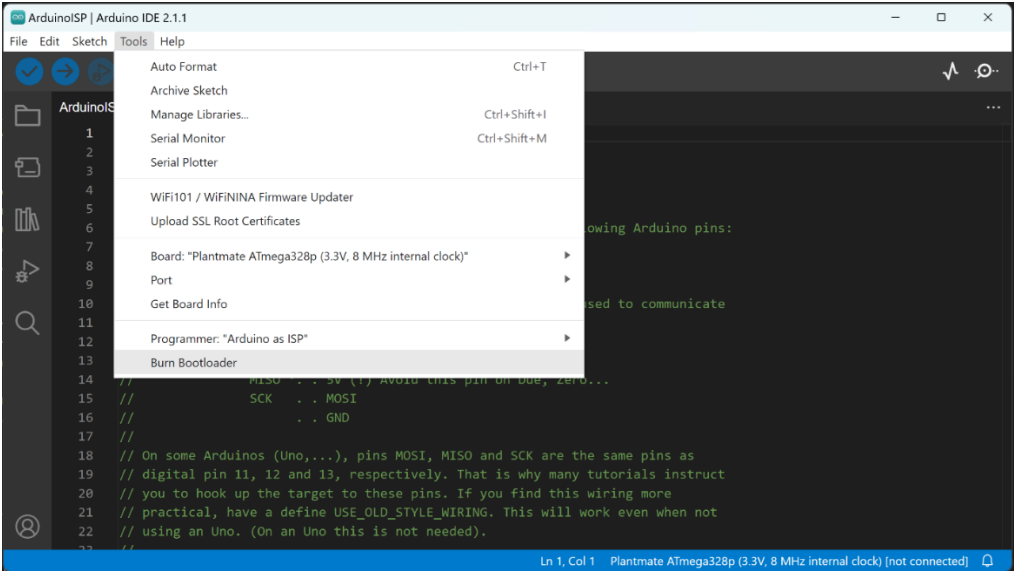
Assignment the USB Port



Choose the Programmer: Arduino as ISP



Make sure the USB cable is connected to the computer and the Plantmate Programmer is clapped to the G1 PCB, click the Burn Bootloader to write the OS to the PCB.



After finish writing the OS, use permanent marker to mark the OS checkbox.

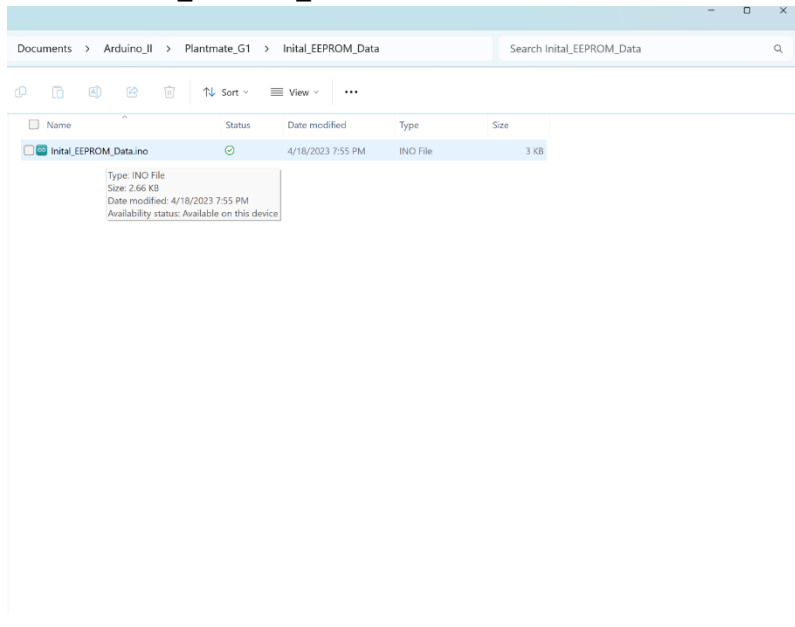


2. Initial the memory and write the function code to the G1 PCB

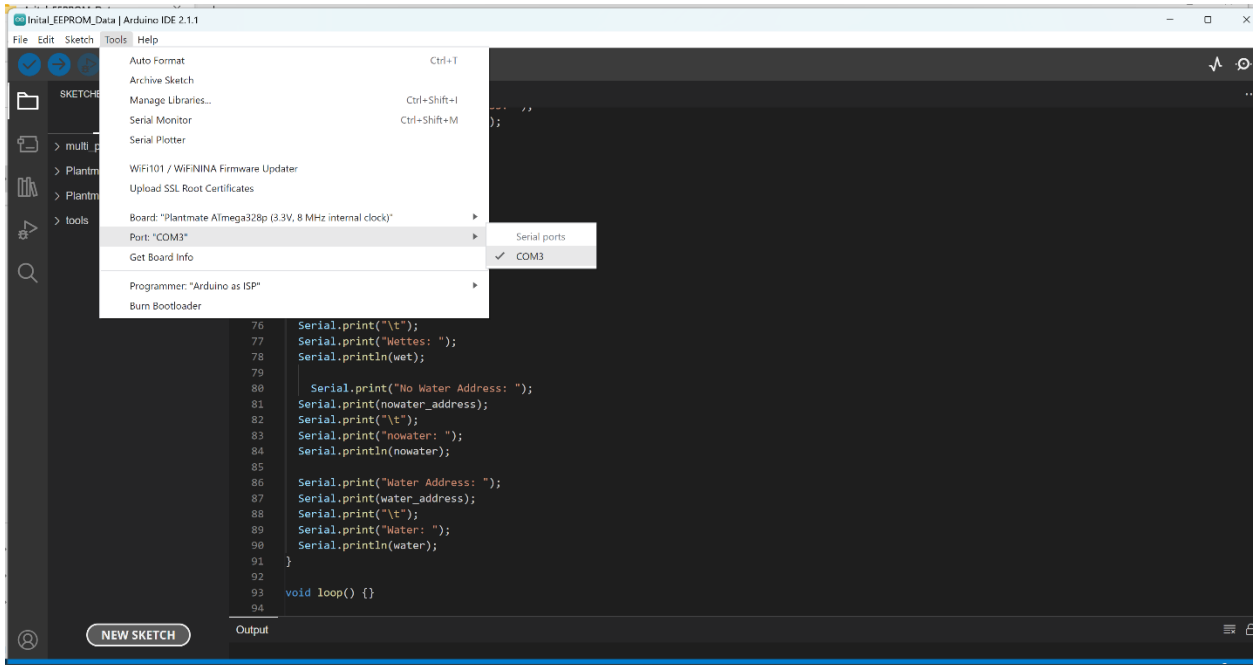
Take out the PCB from the OS position and place it to the Code position.



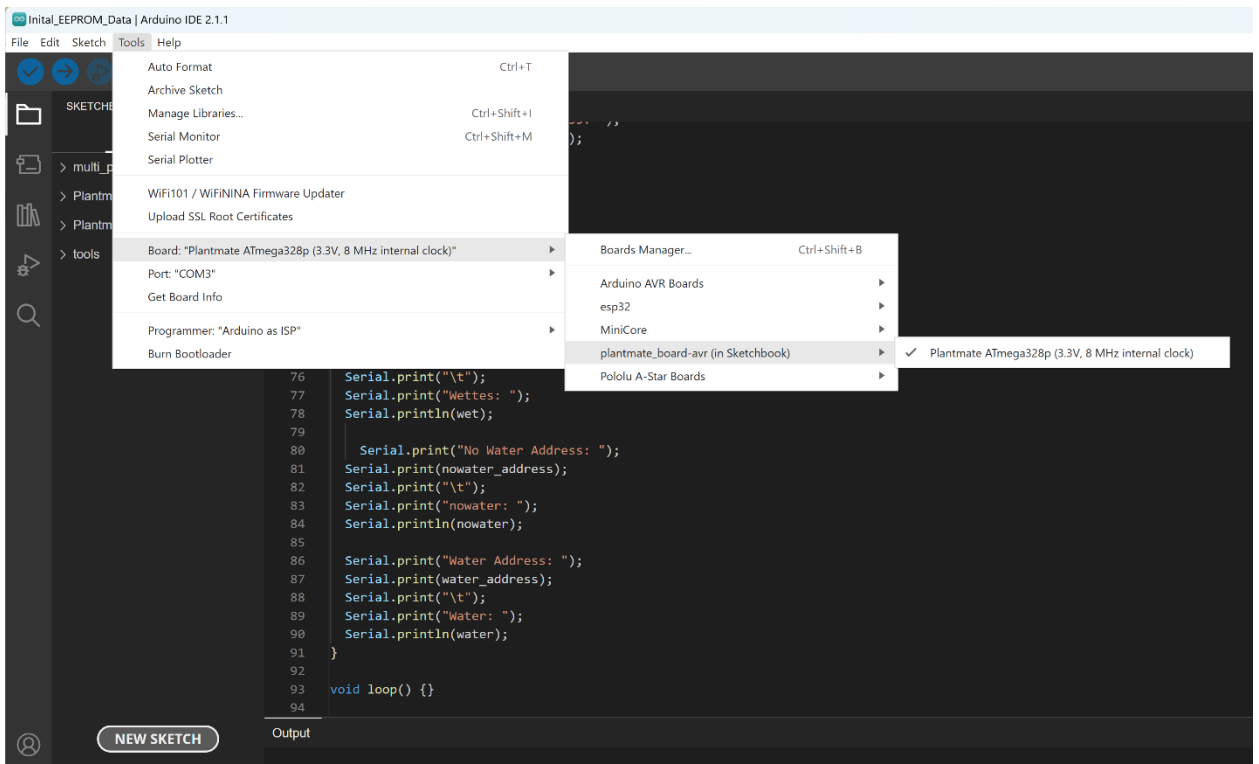
Find the Initial_EEPROM_Data.ino



Open the Initial_EEPROM_Data.ino in Arduino IDE and assignment the USB Port.



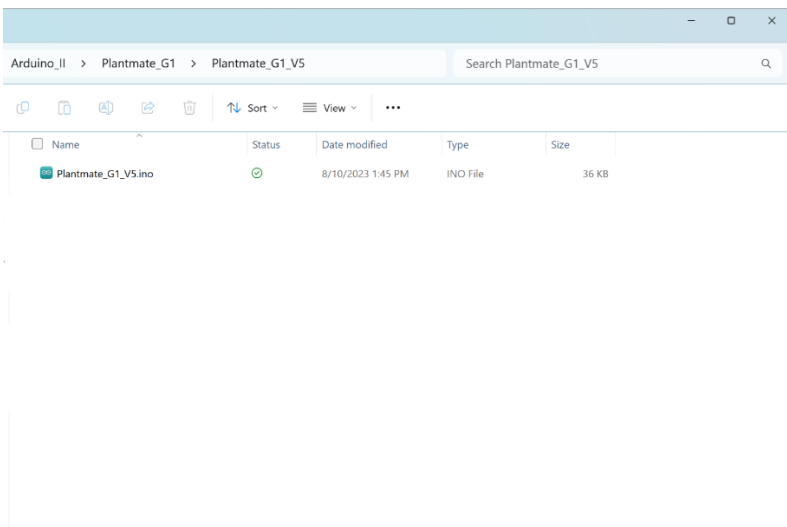
Choose the correct BOARD. Double-Check the USB connection and the settings then upload the initial code to the PCB.



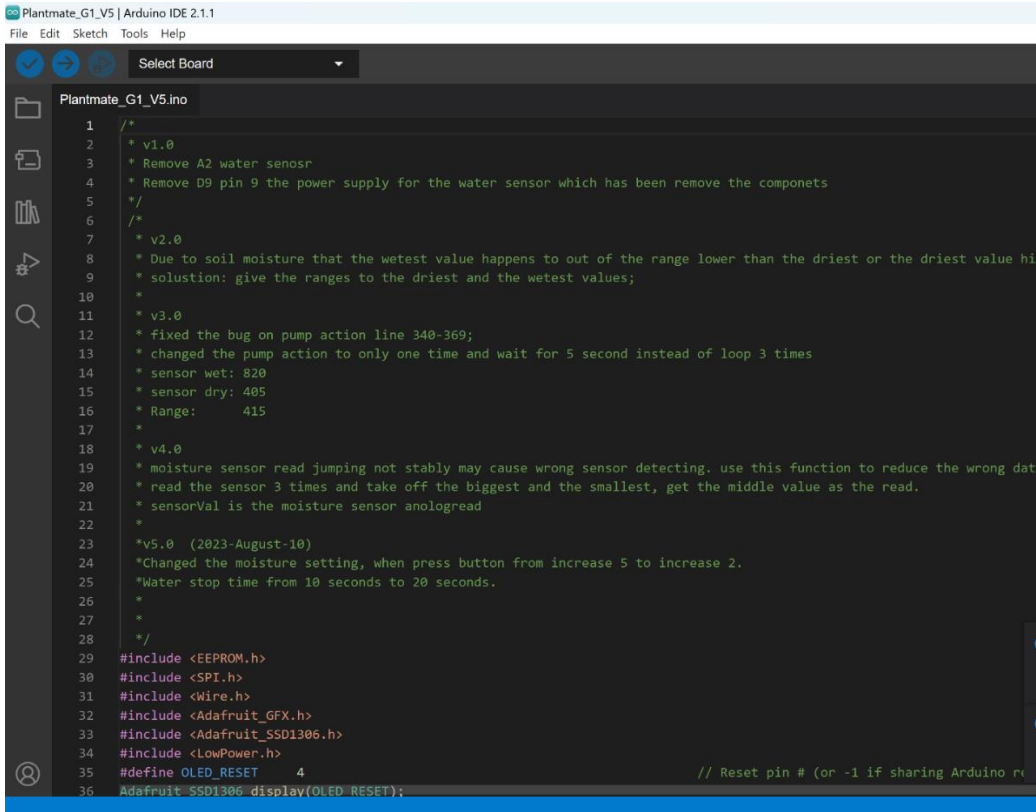
After initial the memory, mark the initial checkbox.



Find the Plantmate_G1_V5.ino



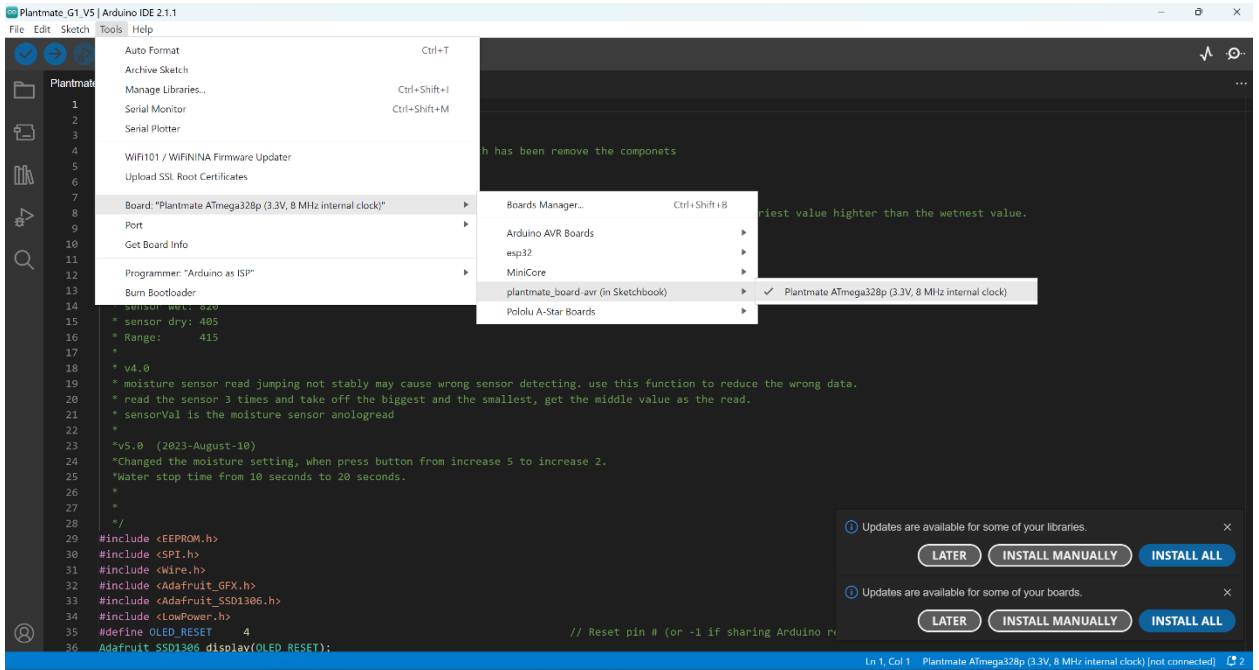
Open the Plantmate_G1_V5.ino in Arduino IDE.



```
Plantmate_G1_V5 | Arduino IDE 2.1.1
File Edit Sketch Tools Help
Select Board

Plantmate_G1_V5.ino
1  /*
2  * v1.0
3  * Remove A2 water sensor
4  * Remove D9 pin 9 the power supply for the water sensor which has been remove the componets
5  */
6  /*
7  * v2.0
8  * Due to soil moisture that the wettest value happens to out of the range lower than the driest or the driest value hi
9  * solution: give the ranges to the driest and the wettest values;
10 *
11 * v3.0
12 * fixed the bug on pump action line 340-369;
13 * changed the pump action to only one time and wait for 5 second instead of loop 3 times
14 * sensor wet: 820
15 * sensor dry: 405
16 * Range: 415
17 *
18 * v4.0
19 * moisture sensor read jumping not stably may cause wrong sensor detecting. use this function to reduce the wrong dat
20 * read the sensor 3 times and take off the biggest and the smallest, get the middle value as the read.
21 * sensorVal is the moisture sensor analogread
22 *
23 *v5.0 (2023-August-10)
24 *Changed the moisture setting, when press button from increase 5 to increase 2.
25 *Water stop time from 10 seconds to 20 seconds.
26 *
27 *
28 */
29 #include <EEPROM.h>
30 #include <SPI.h>
31 #include <Wire.h>
32 #include <Adafruit_GFX.h>
33 #include <Adafruit_SSD1306.h>
34 #include <LowPower.h>
35 #define OLED_RESET 4 // Reset pin # (or -1 if sharing Arduino r
36 Adafruit_SSD1306 display(OLED_RESET);
```

Choose the correct board.

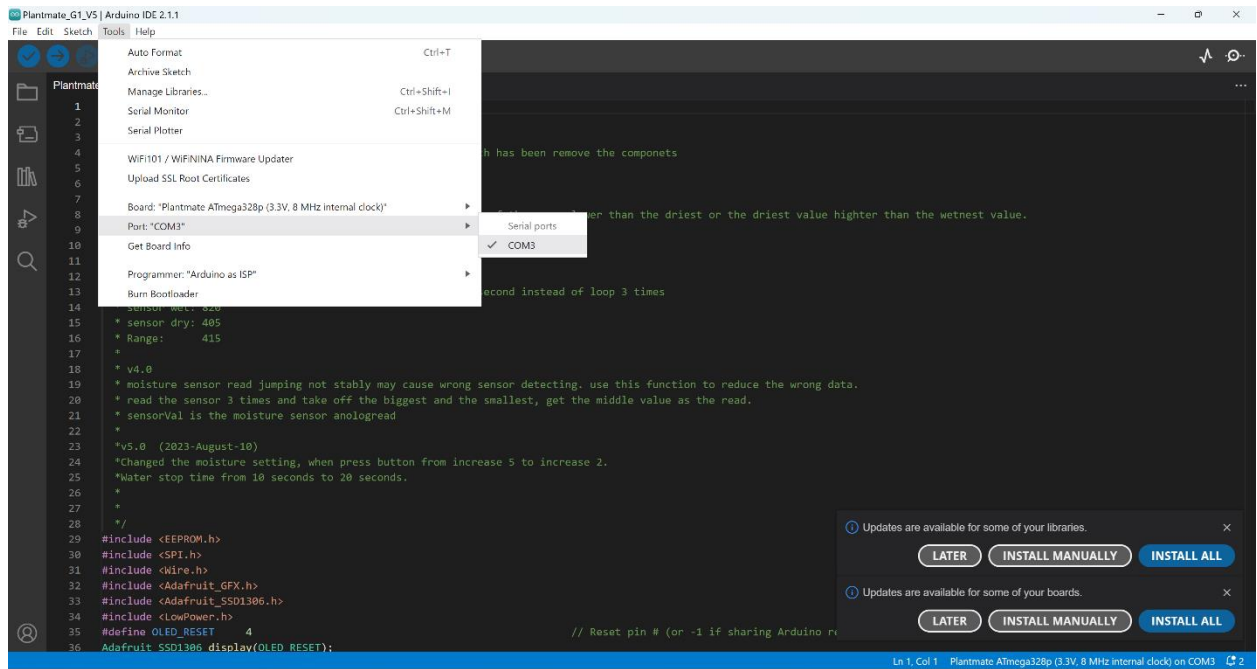


```
Plantmate_G1_V5 | Arduino IDE 2.1.1
File Edit Sketch Tools Help
Auto Format Ctrl+T
Archive Sketch
Manage Libraries... Ctrl+Shift+I
Serial Monitor Ctrl+Shift+M
Serial Plotter
WiFi101 / WIFININA Firmware Updater
Upload SSL Root Certificates
Board: "Plantmate ATmega328p (3.3V, 8 MHz internal clock)"
Port
Get Board Info
Programmer: "Arduino as ISP"
Burn Bootloader
Boards Manager... Ctrl+Shift+B
Arduino AVR Boards
esp32
MiniCore
plantmate_board-avr (in Sketchbook) ✓ Plantmate ATmega328p (3.3V, 8 MHz internal clock)
Pololu A-Star Boards

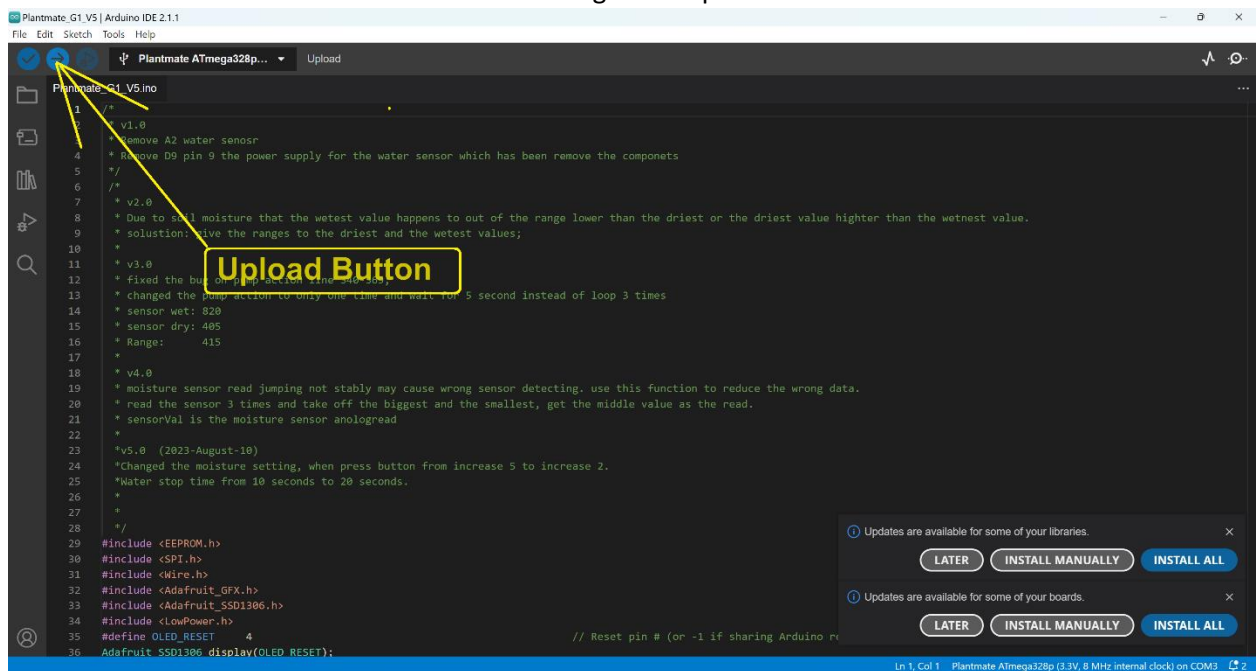
1  /*
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3  * Remove A2 water sensor
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5  */
6  /*
7  * v2.0
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36 Adafruit_SSD1306 display(OLED_RESET);

Ln 1, Col 1 Plantmate ATmega328p (3.3V, 8 MHz internal clock) [not connected]
```


Assignment the USB Port



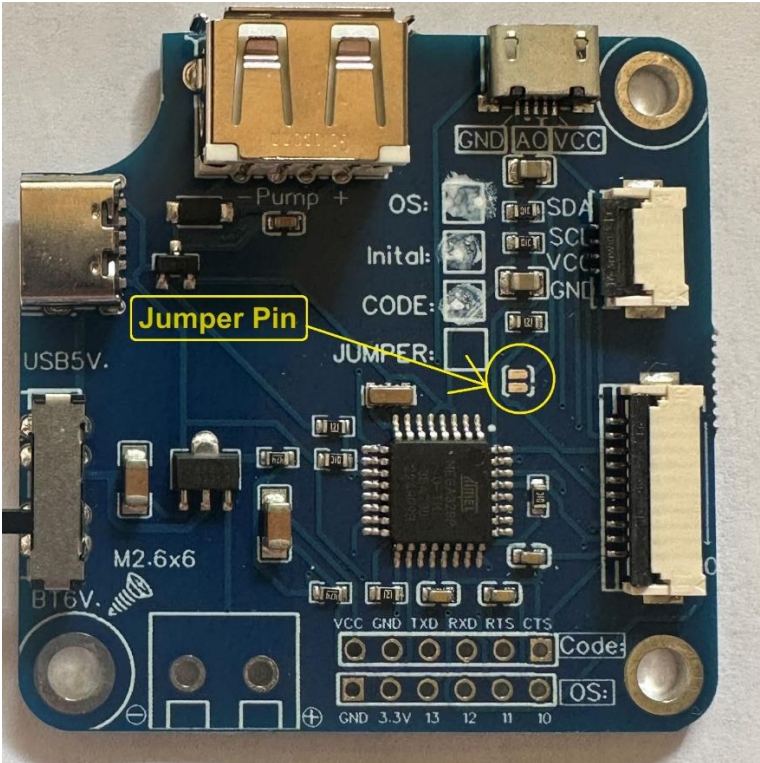
Double-Check the USB connection and the settings then upload the code to the PCB.



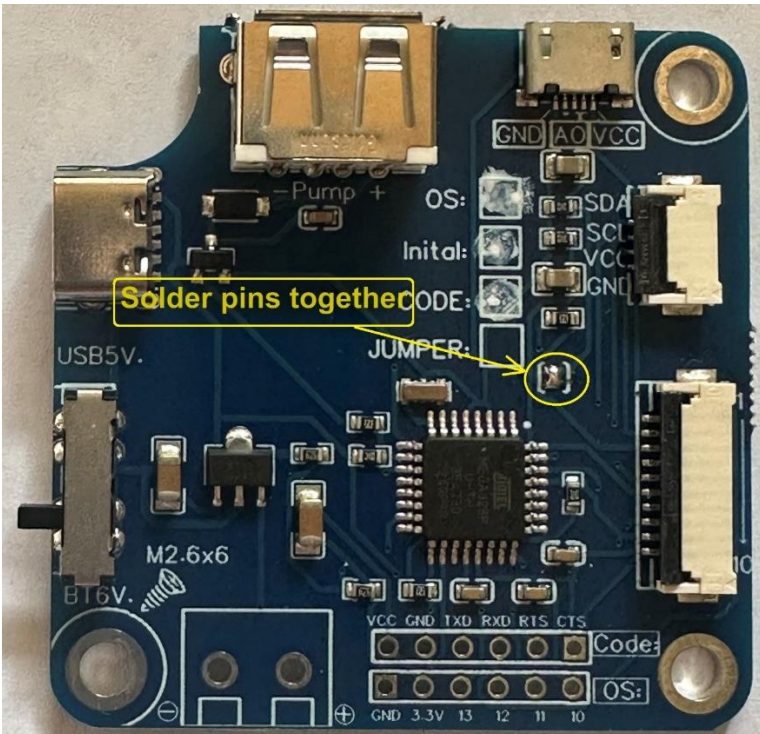
After upload the code, mark the CODE checkbox.



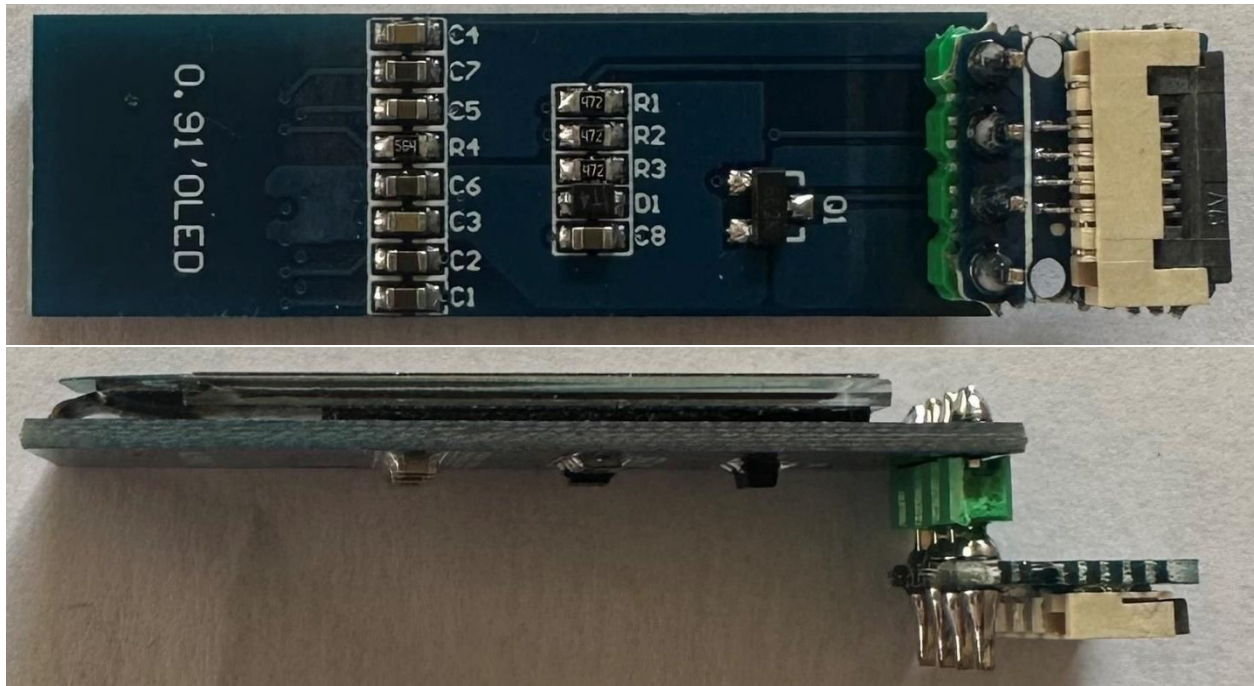
After program the PCB, find the Jumper Pin on the PCB as shown on the below picture.



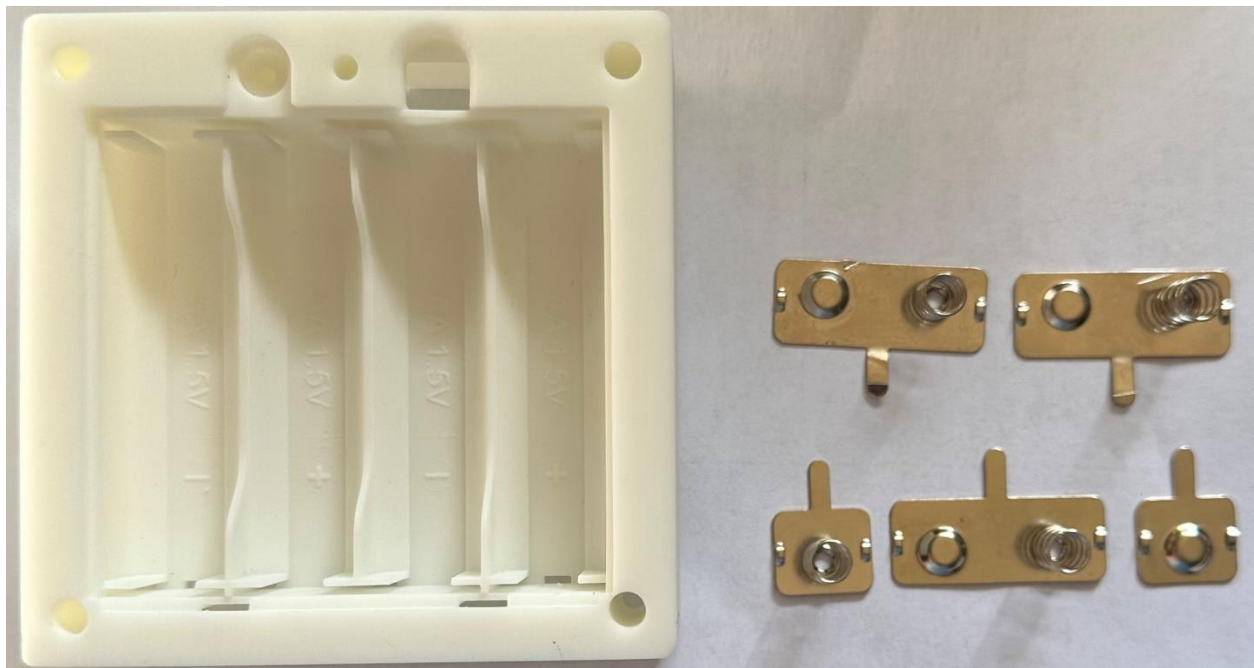
Solder the pin together as the picture.

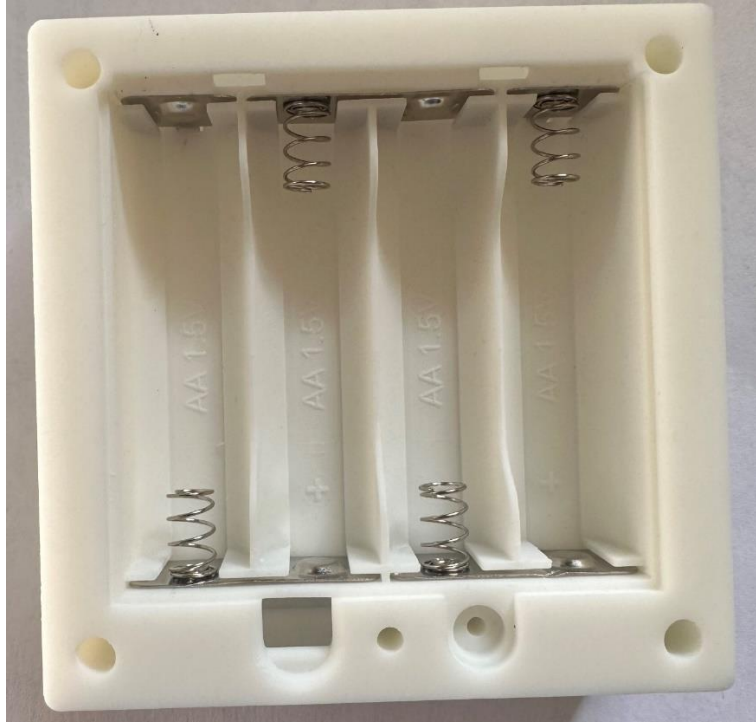


Solder the OLED with 4pin header and the FFC/4Pin adapter together.

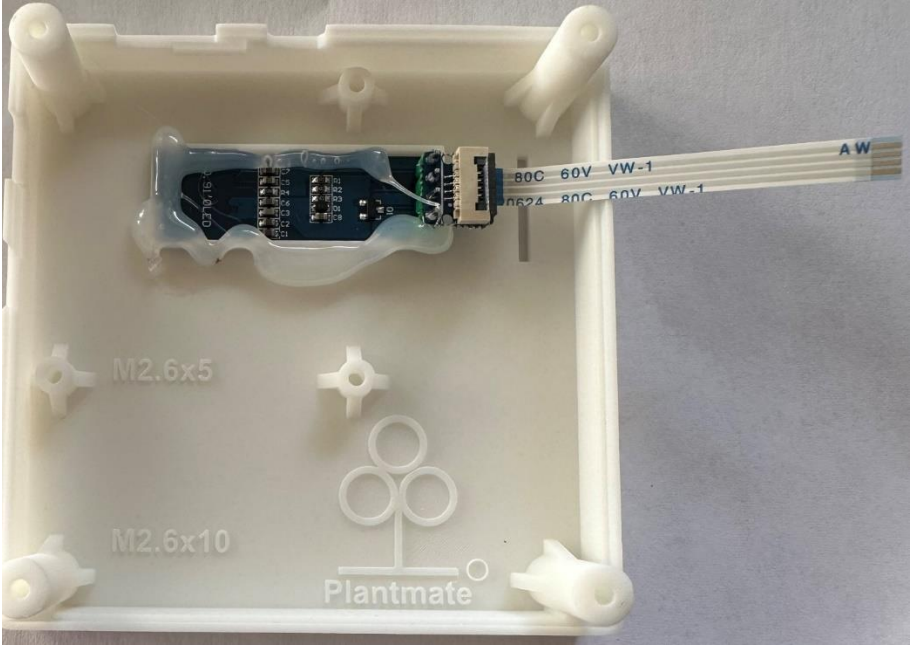


Assembly the AA battery spring and plate set to the enclosure box.

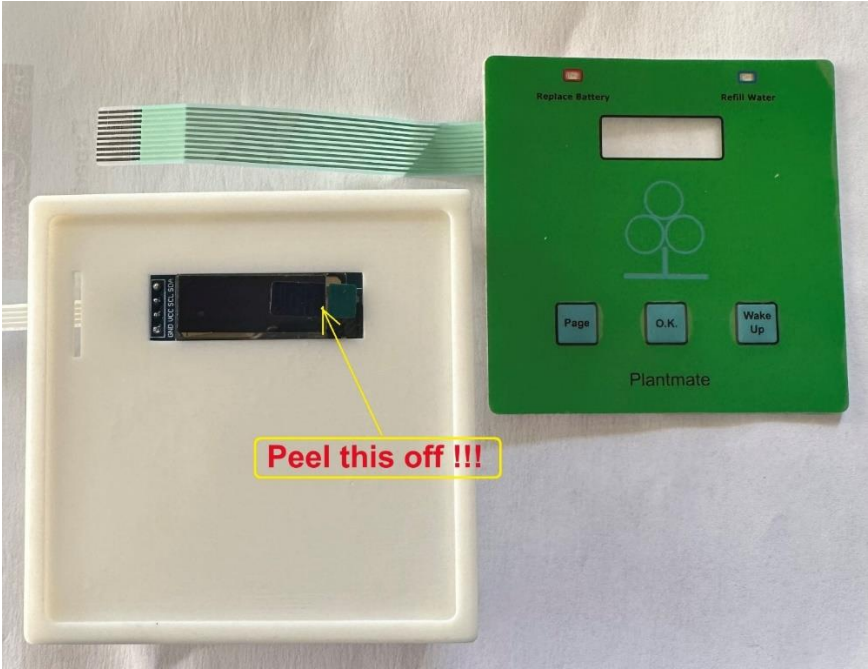




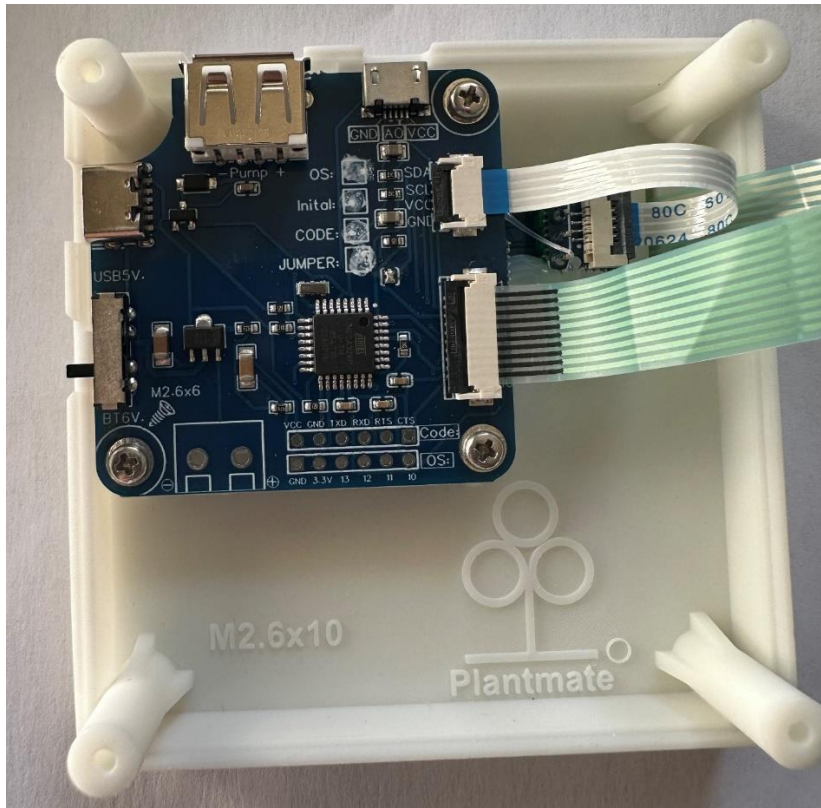
Connect the 4 pin FFC flexible cable to the OLED display then assembly the OLED display to the front enclosure and use the hot glue to glue it.



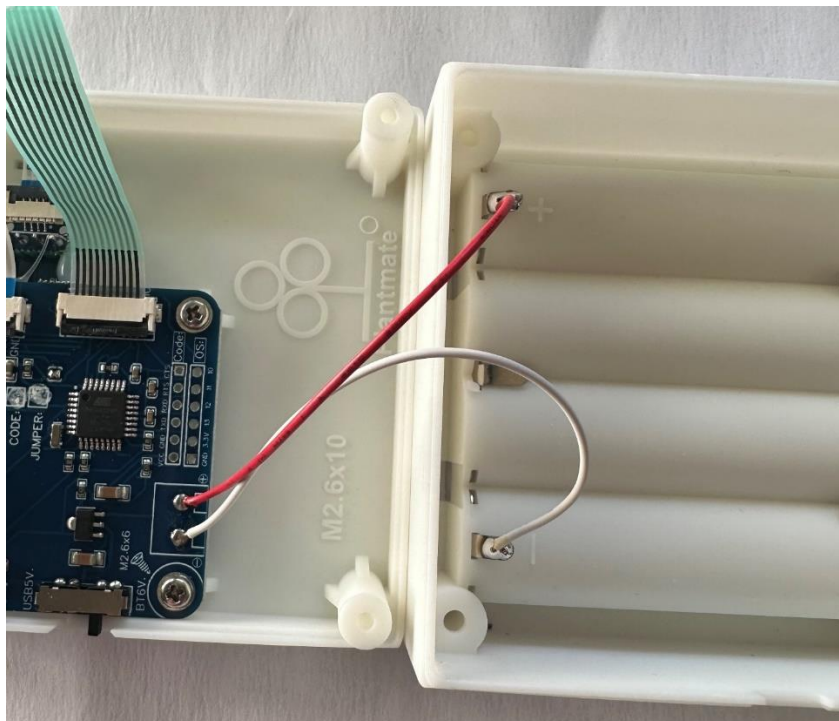
Make sure to peel off the protector plastic on the OLED display before stick the front Pannel on the front enclosure.



Connect the 4 Pin OLED cable and the 8 Pin front panel cable to the PCB and screw the PCB to the front enclosure.



Solder the battery wire.



Screw the front and back enclosures together and cover the screw holes with the caps.



(THE END)