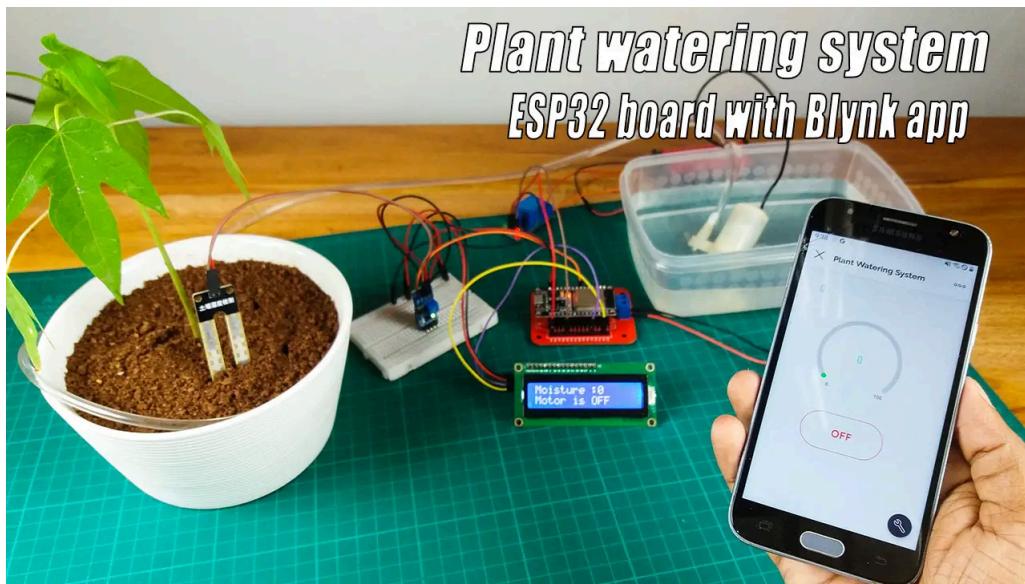


# How to make a plant watering system with ESP32 board and Blynk app



Hello and welcome back. In this project, we will learn how to make a plant watering system with an [ESP32 board](#). For that, I mainly used a [soil moisture sensor](#) to help determine when to water the plants. And you can make this project easily and cheaply. I think it is a good option for your school or university assignments.

• • •

Also, I used the Blynk cloud for controlling this system. This means we can easily manage and control the watering system using either our computer or smartphone. Additionally, I have used a mini water pump. But you can connect any other water pump. Just ensure that you select a water pump that is compatible with the [relay module](#). (Please refer to the relay module's specifications)

```
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```

It's important to note that this is just a basic structure, and you have the freedom to modify the project according to your preferences. I believe this project will be particularly beneficial for transforming a regular home garden into a smart home garden.

ESP32

- If you want to do this project with the ESP8266 board, please use this [link](#).



OK, let's do this project step by step. The required components are given below.

- [ESP32](#) board x 1 — [Amazon](#) / [Our Store](#)
- 

- [ESP32](#) adapter x 1 — [Amazon](#) / [Our Store](#)
  - Soil moisture sensor x 1 — [Amazon](#) / [Our store](#)
  - LCD screen x 1 — [Amazon](#) / [Our store](#)
- 

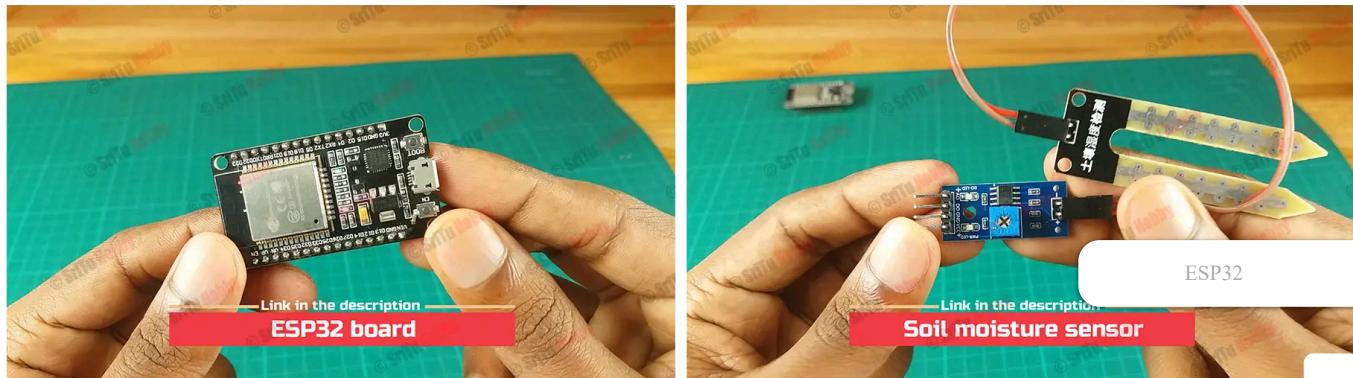
ESP32

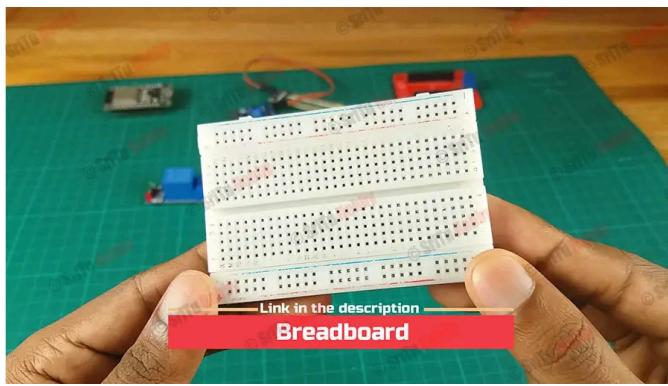
- Jumper wires — [Amazon](#) / [Our store](#)
- Mini Water pump and pipe — [Amazon](#)
- Li-ion battery x 2 — [Amazon](#)
- Battery holder x 1 — [Amazon](#) / [Our store](#)

*Disclosure: These Amazon links are Affiliate links. As an Amazon Associate, I earn from qualifying purchases.*

## Step 1

Firstly, identify these components.





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## Step 2

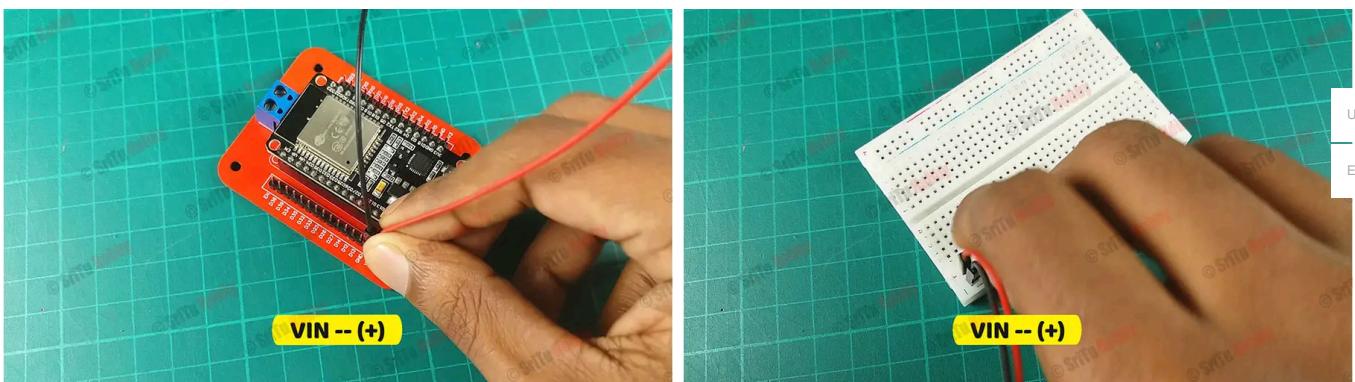
Secondly, install the ESP32 board on the adapter. If you haven't an adapter, you can use two breadboards.

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### Step 3

Thirdly, connect the power lines to the breadboard.

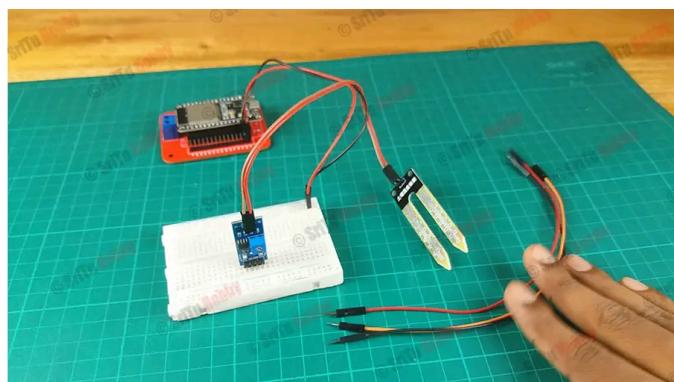
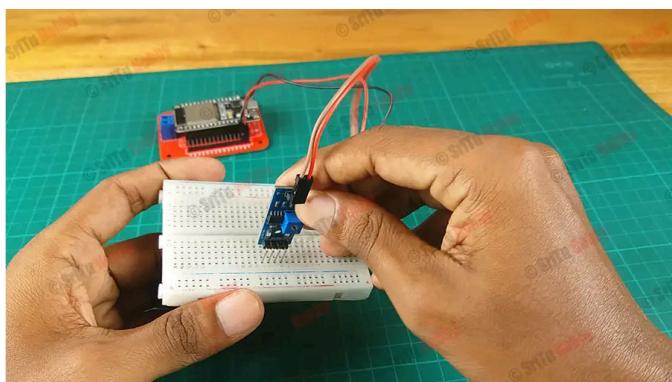
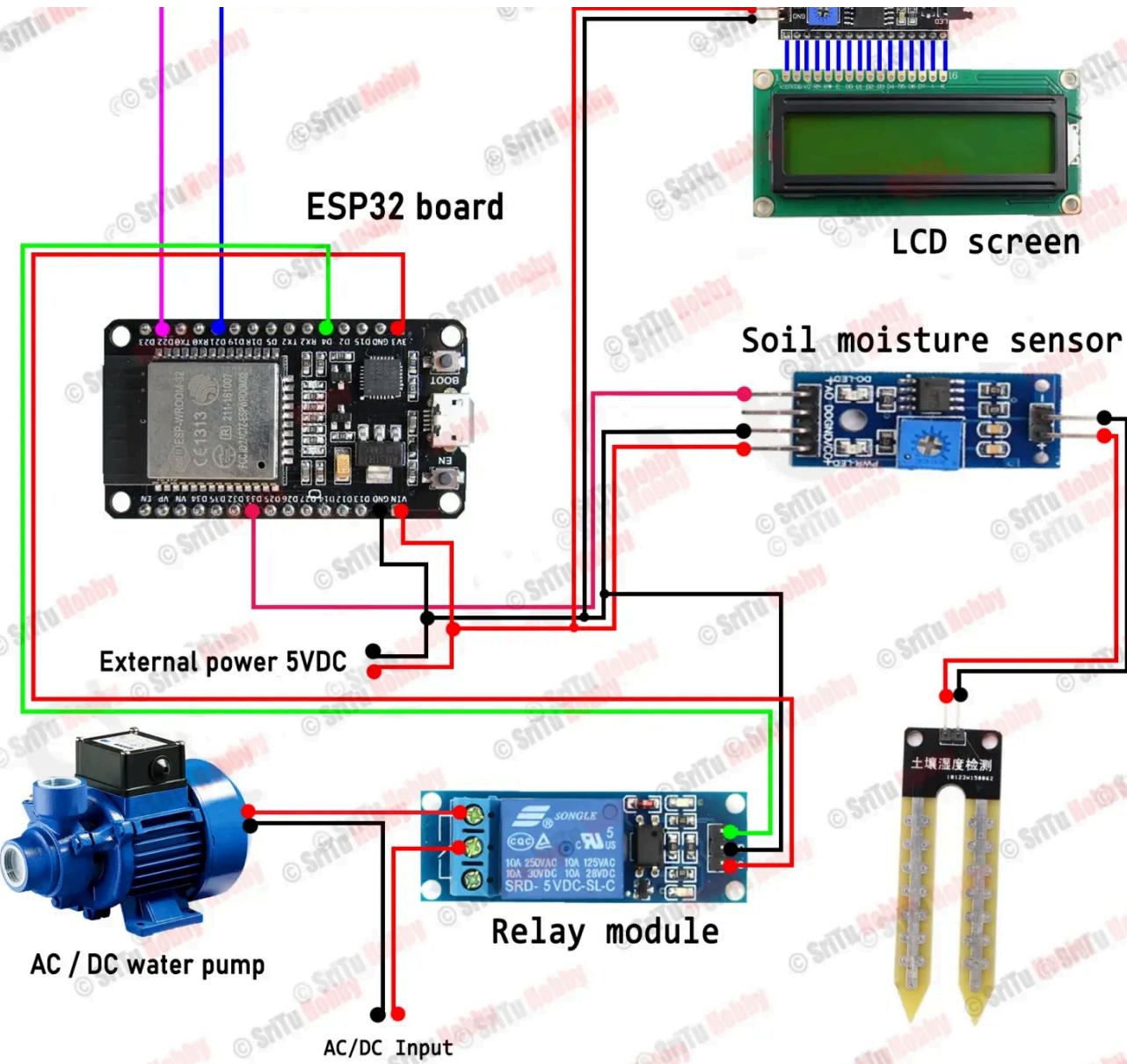


### Step 4

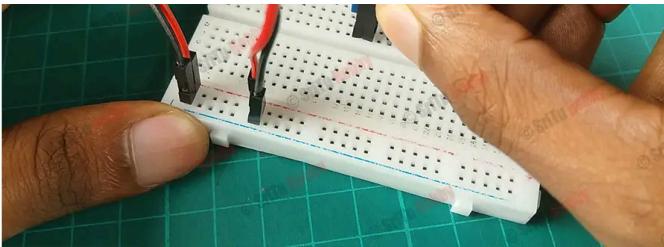
Next, place the soil moisture sensor on the breadboard and connect it to the [ESP32](#) board. For that, use the circuit diagram below.



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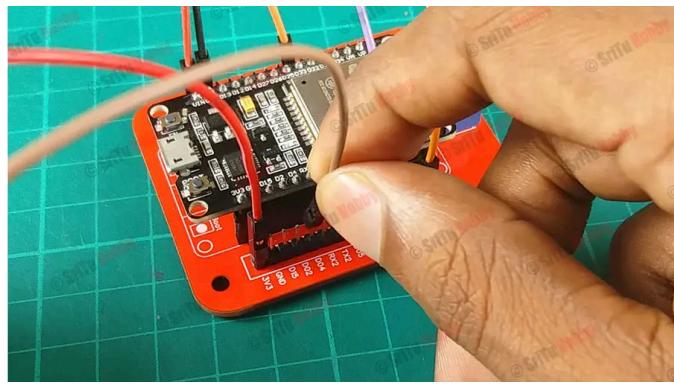
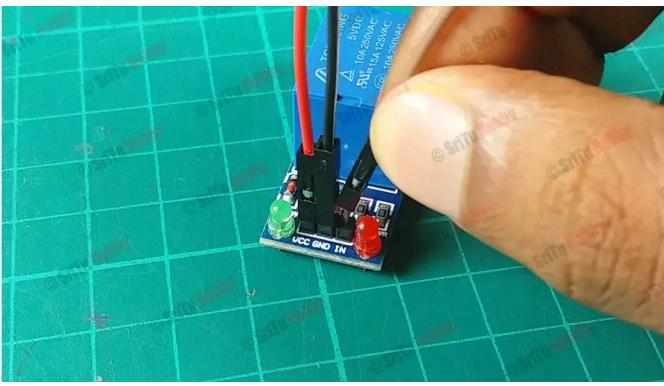
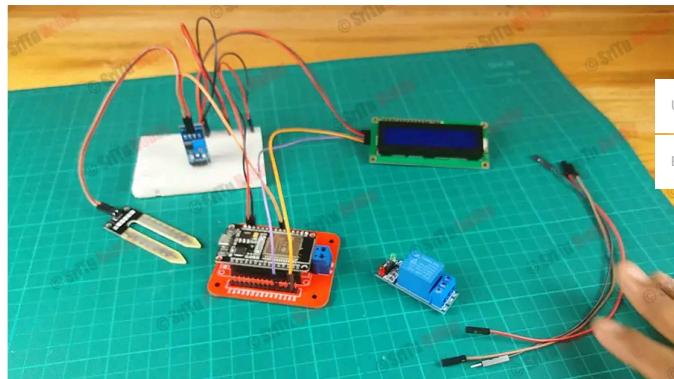
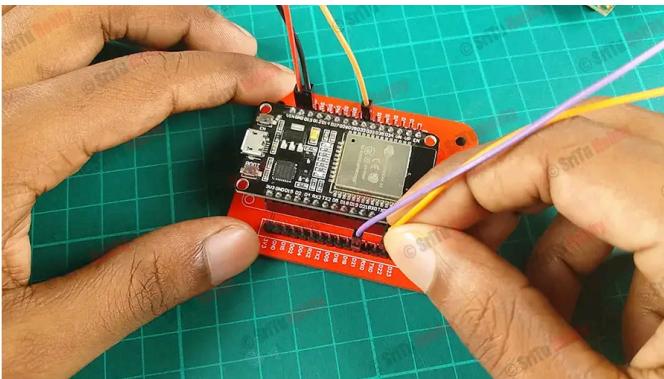
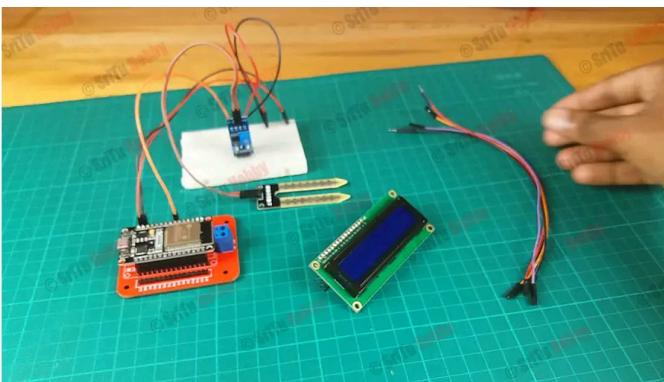


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## Step 5

And then, connect the LCD screen and relay module to the [ESP32](#) board.



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```

## Step 6

Now, let's prepare the Blynk web dashboard. For that, follow the instructions below.

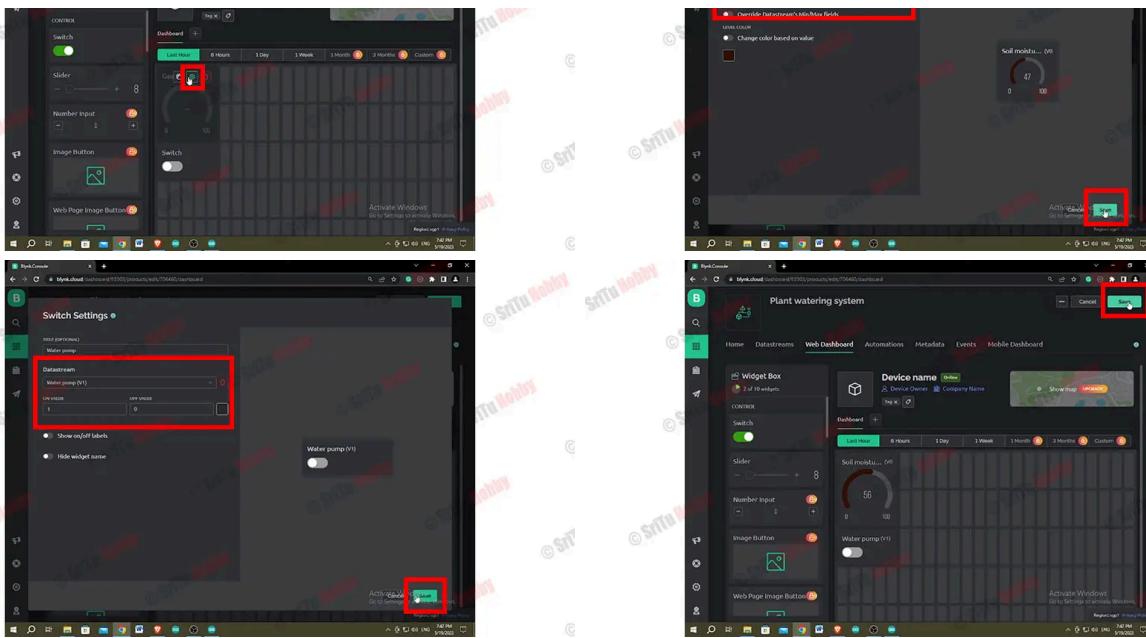
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- First, go to the Blynk website and create a new account using your Email. And then, log in to your account and create a new template. I have created it as a "Plant watering system". You can name it as you like.

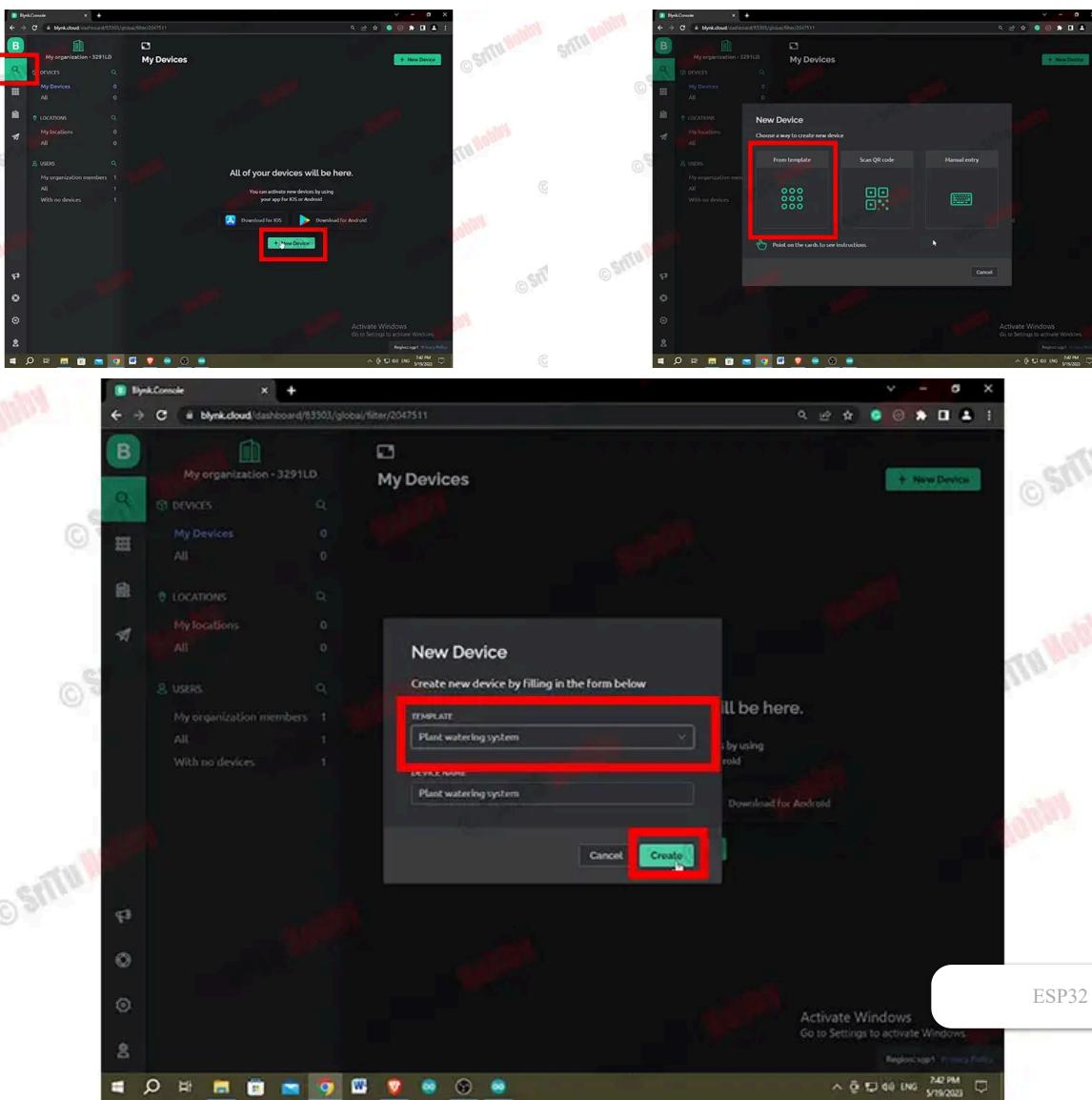


- Next, click the Datasream tab and create two virtual pins. For that, use the instructions below.
- **Name — Soil moisture value / PIN — V0 / MIN — 0 / MAX — 100**
- **Name — Water pump / PIN — V1 / MIN — 0 / MAX — 1**

- And then, create a dashboard. I have used one button and one gauge for that. Next, click the gear wheel icons on the widgets and select the Data stream. After, click the save button.



- Now, click the search icon and create a new device. For that, select the template you created earlier.



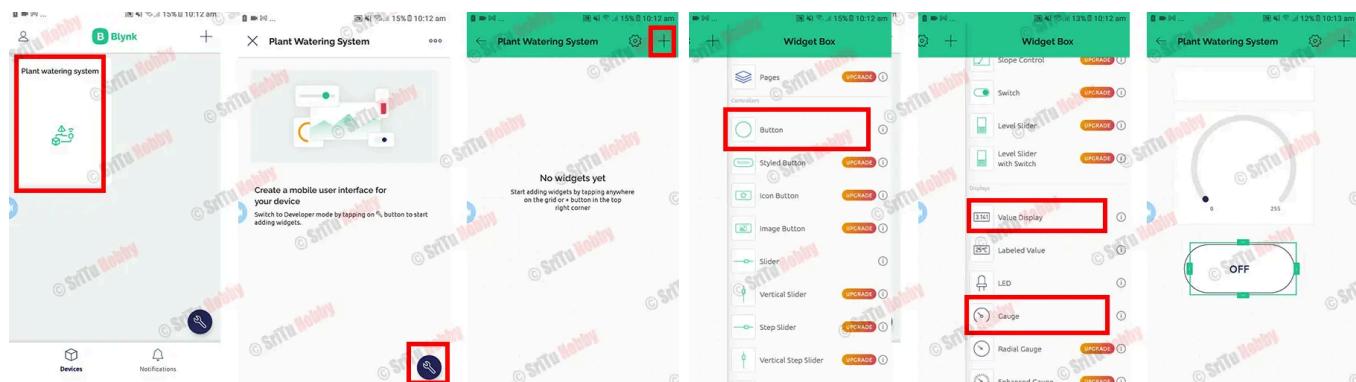
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## Step 7

Now, let's prepare the Blynk mobile dashboard. For that, follow the instructions below.

- First, download and install the Blynk app on your smartphone. Then, log in to your account using your email and password.
- Next, select the template you created on the web dashboard. After, add one button and one gauge to the dashboard. You can customize these widgets as you like.



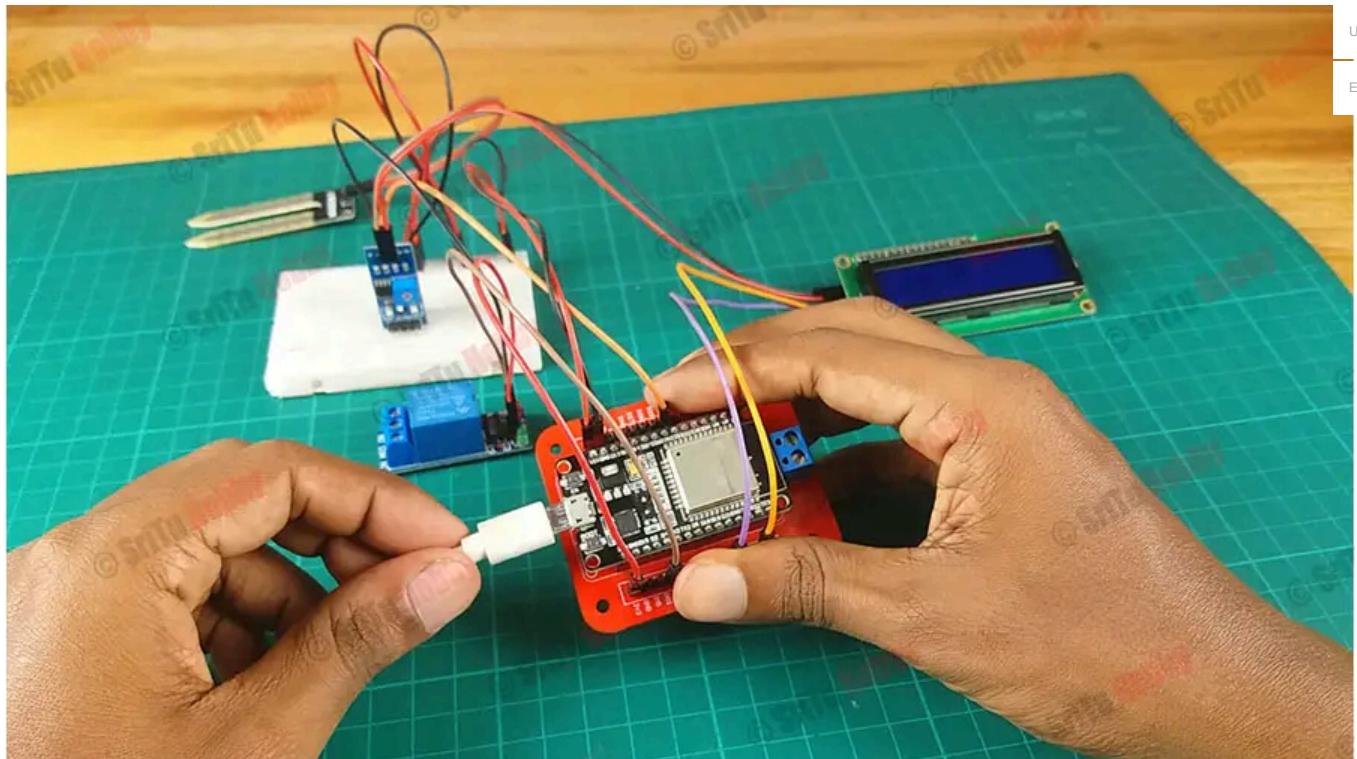
- Finally, click the widgets one by one and select the appropriate data stream as in the web dashboard. color, text size, and other settings as you like.



```
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```

## Step 8

Now, connect the [ESP32](#) board to the computer. Then, copy and paste the following program into your [Arduino](#) IDE.



- **Code and circuit diagram — [Download](#)**



X

ESP32

- **I2C LCD library** — [Download](#)
- **Blynk Library** — [Download](#)

```

1 //Include the library files
2 #include <LiquidCrystal_I2C.h>
3 #include <Wire.h>
4 #include <WiFiClient.h>
5 #include <BlynkSimpleEsp32.h>
6
7 #define sensor 33
8 #define relay 4
9
10 //Initialize the LCD display
11 LiquidCrystal_I2C lcd(0x27, 16, 2);
12
13 BlynkTimer timer;
14
15 // Enter your Auth token
16 char auth[] = "*****";
17
18 //Enter your WIFI SSID and password
19 char ssid[] = "*****";
20 char pass[] = "*****";
21
22 void setup() {
23     // Debug console
24     Serial.begin(115200);
25     Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);
26     lcd.init();
27     lcd.backlight();
28     pinMode(relay, OUTPUT);
29     digitalWrite(relay, HIGH);
30
31     lcd.setCursor(1, 0);
32     lcd.print("System Loading");
33     for (int a = 0; a <= 15; a++) {
34         lcd.setCursor(a, 1);
35         lcd.print(".");
36         delay(200);
37     }
38     lcd.clear();
39
40 }
41
42
43 //Get the ultrasonic sensor values
44 void soilMoisture() {
45     int value = analogRead(sensor);
46     value = map(value, 0, 4095, 0, 100);
47     value = (value - 100) * -1;
48     Blynk.virtualWrite(V0, value);
49     Serial.println(value);
50     lcd.setCursor(0, 0);
51     lcd.print("Moisture :");
52     lcd.print(value);
53     lcd.print(" ");
54 }
55
56 //Get the button value
57 BLYNK_WRITE(V1) {
--
```

ESP32

```

63 } else {
64     digitalWrite(relay, HIGH);
65     lcd.setCursor(0, 1);
66     lcd.print("Motor is ON");
67 }
68 }

69 void loop() {
70     soilMoisture();
71     Blynk.run(); //Run the Blynk library
72
73     delay(200);
74 }
75
76 }

```

- Next, copy and paste the Blynk auth token. (For that, check the Blynk website) And then, enter your WIFI name and password.



The image shows two side-by-side screenshots. On the left is the Blynk mobile application interface, displaying a device named 'Plant watering system'. It has a soil moisture sensor reading of 0 and a water pump switch. A context menu is open over the device name, with the 'Copy' option highlighted. On the right is the Arduino IDE code editor, showing the C++ code for the project. Two specific lines of code are highlighted with red boxes: the Blynk auth token ('char auth[] = "150705W4PpEoXQyrrVPlba01C";') and the WiFi SSID and password ('char ssid[] = "\*\*\*\*\*";' and 'char pass[] = "\*\*\*\*\*";').

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```

#include <WiFiClient.h>
#include <BlynkSimpleEsp32.h>

#define sensor 2
#define relay 4

//Initialize the LCD display
LiquidCrystal_I2C lcd(0x27, 16, 2);

BlynkTimer timer;

// Enter your Auth token
char auth[] = "I9LYY0FBAnyx9CX6QvriYPlbaOO1CS3";

//Enter your WIFI SSID and password
char ssid[] = "SriTu Hobby";
char pass[] = "12345678";

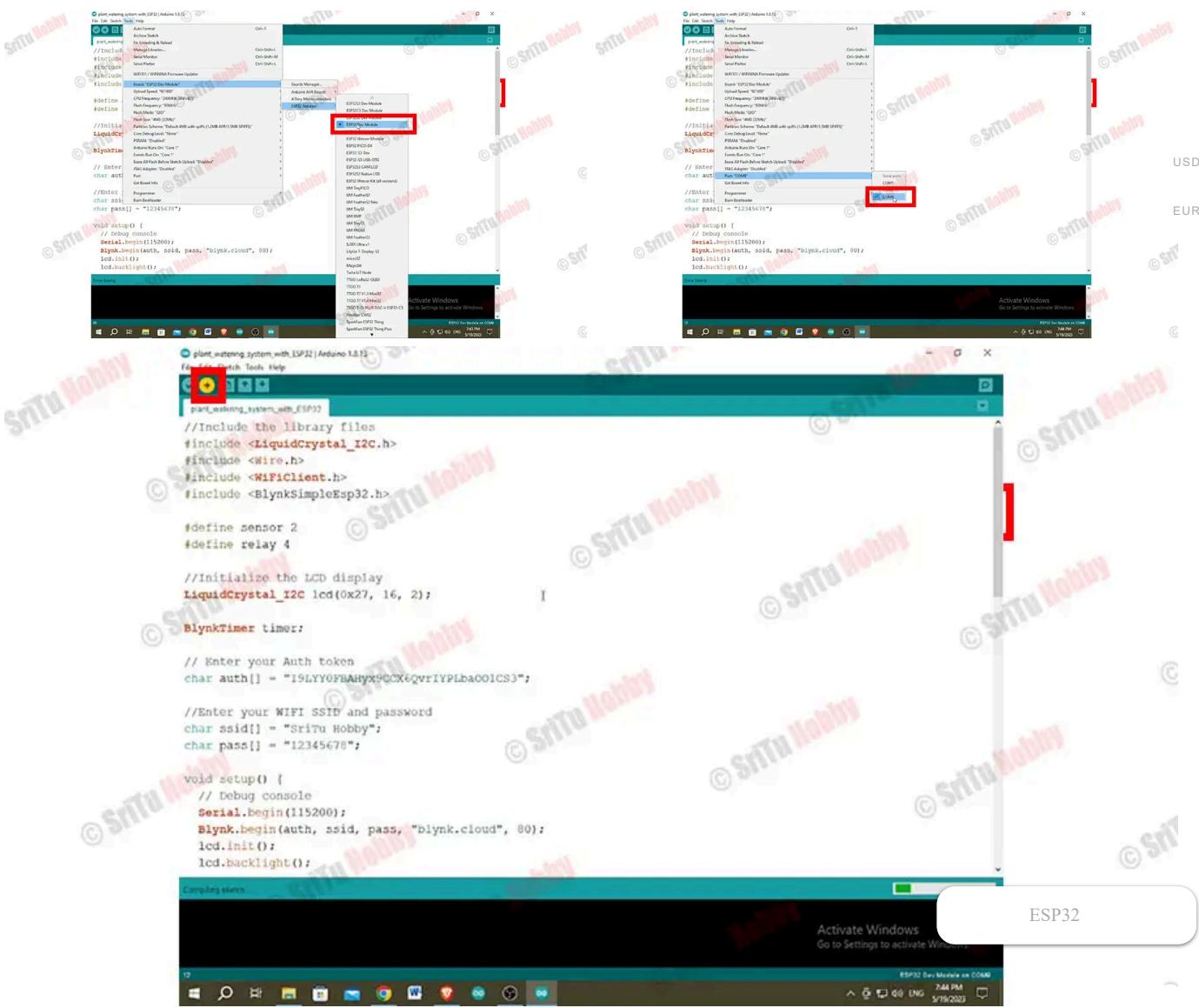
void setup() {
  // Debug console
  Serial.begin(115200);
  Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);
  lcd.init();
  lcd.backlight();
}

void loop() {
  timer.run();
}

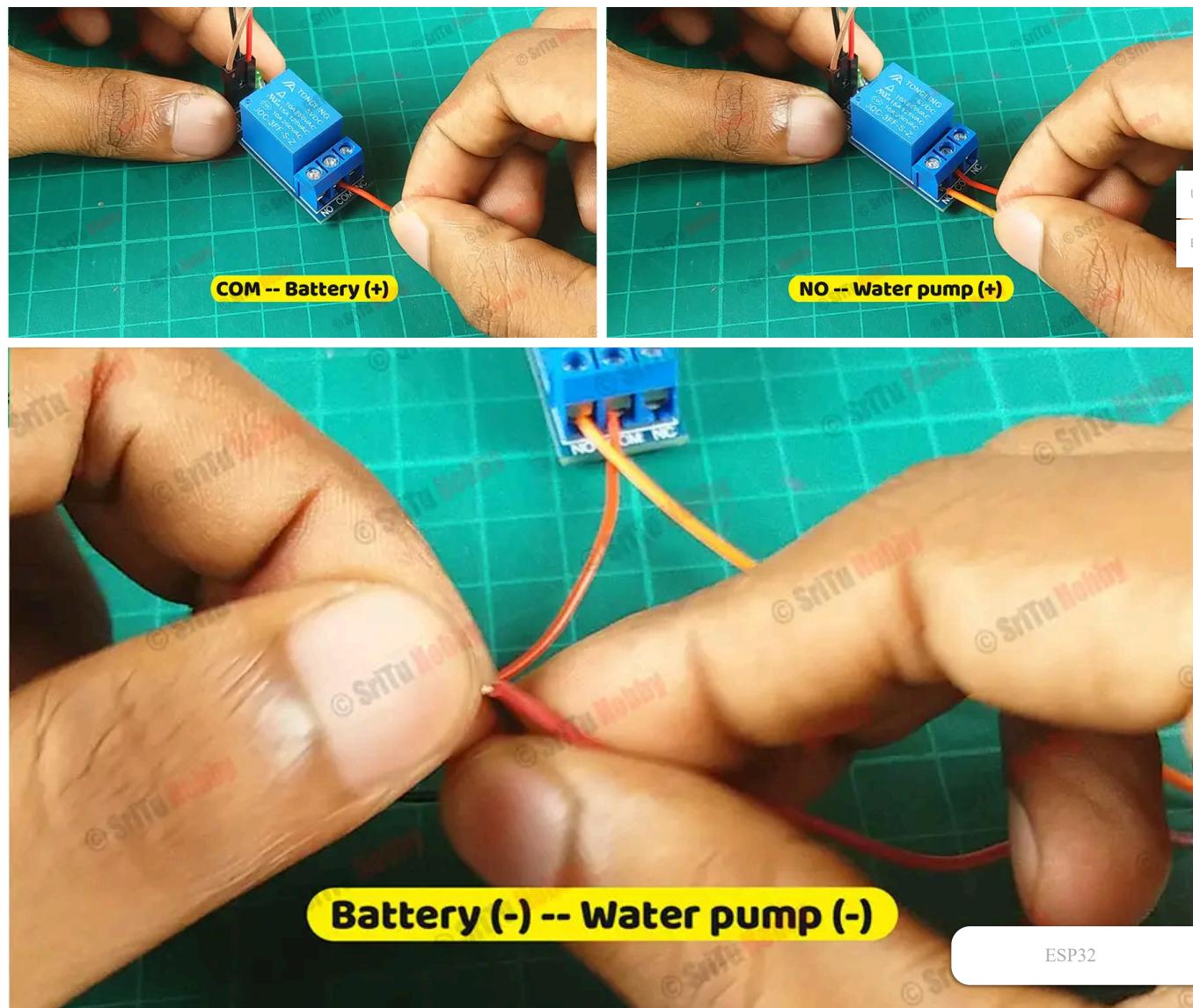
```

The code is displayed in a text editor window. A red box highlights the section where WiFi credentials are defined: `char ssid[] = "SriTu Hobby";` and `char pass[] = "12345678";`.

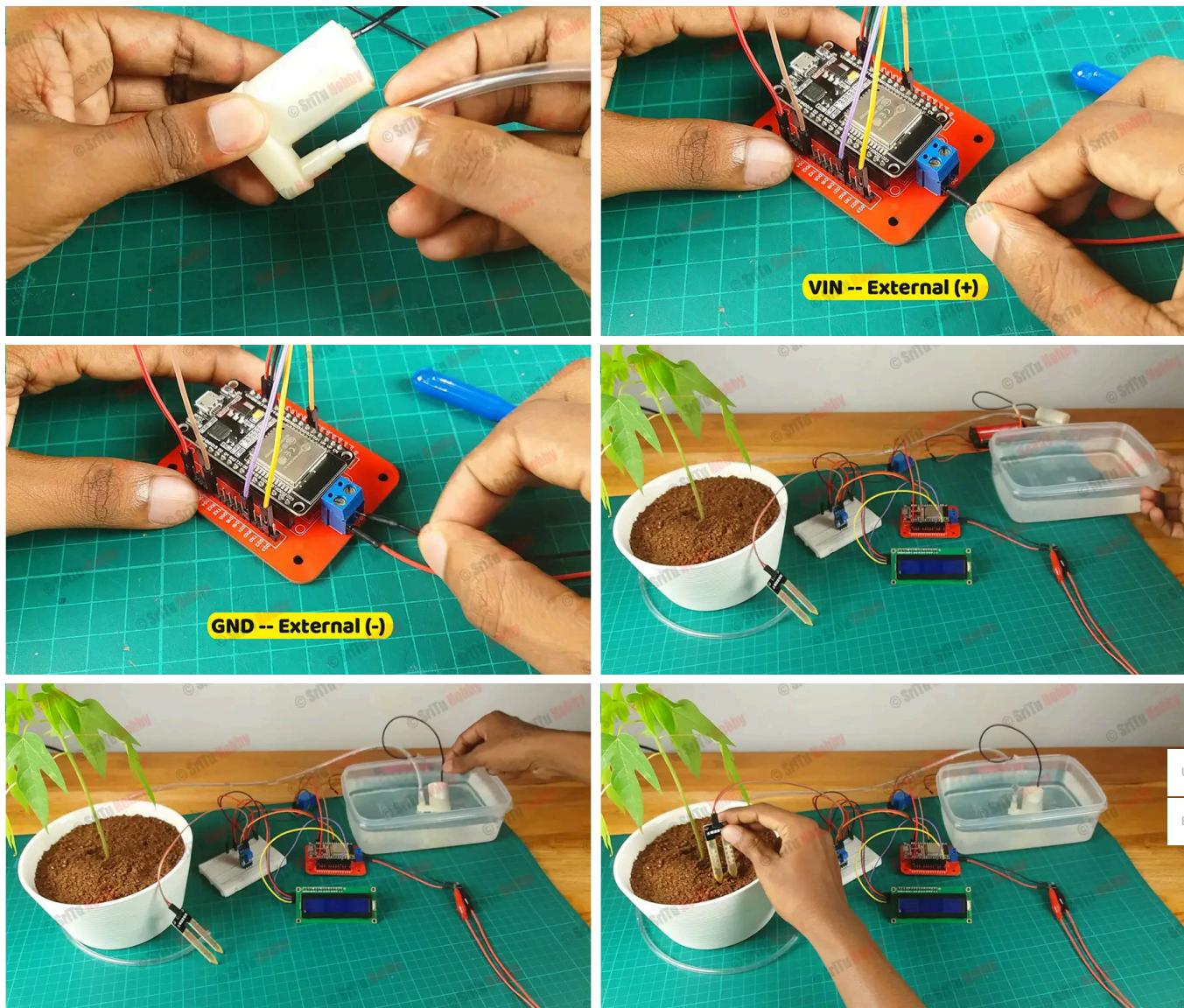
- After, select the board and port. Finally, click the upload button.



Next, connect the water pump to the relay module. I have used the small water pump for that. You can change it to your liking, but you must remember to use the appropriate relay module. Also, I used the two Li-ion batteries to power up this motor.



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Now, you can test this project. The full video guide is below. We hope to see you in the next project or tutorial.

## Troubleshoot

- Check all connections.



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### How to make a plant watering system with ESP32 board and Blynk app



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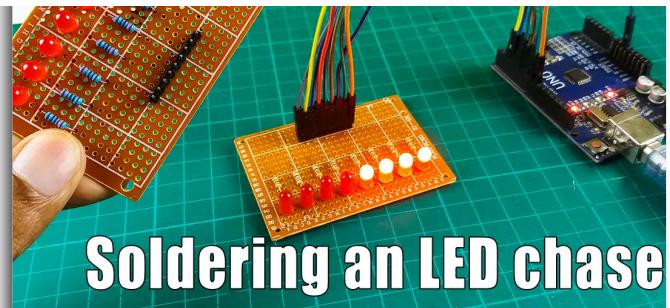
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**Suyash Amudan** says:

October 5, 2023 at 1:25 am

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Where is

- 1)LiquidCrystal\_I2C.h
- 2)Wire.h
- 3)WifiClient.h
- 4)BlynkSimpleESP32.h??

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**SriTu Hobby** says:

October 5, 2023 at 11:09 am

These are library files. Download these files and include to the [Arduino](#) IDE.

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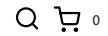
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**Do we need ultrasonic sensor in this project (HC-SR04)?**[Reply](#)

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