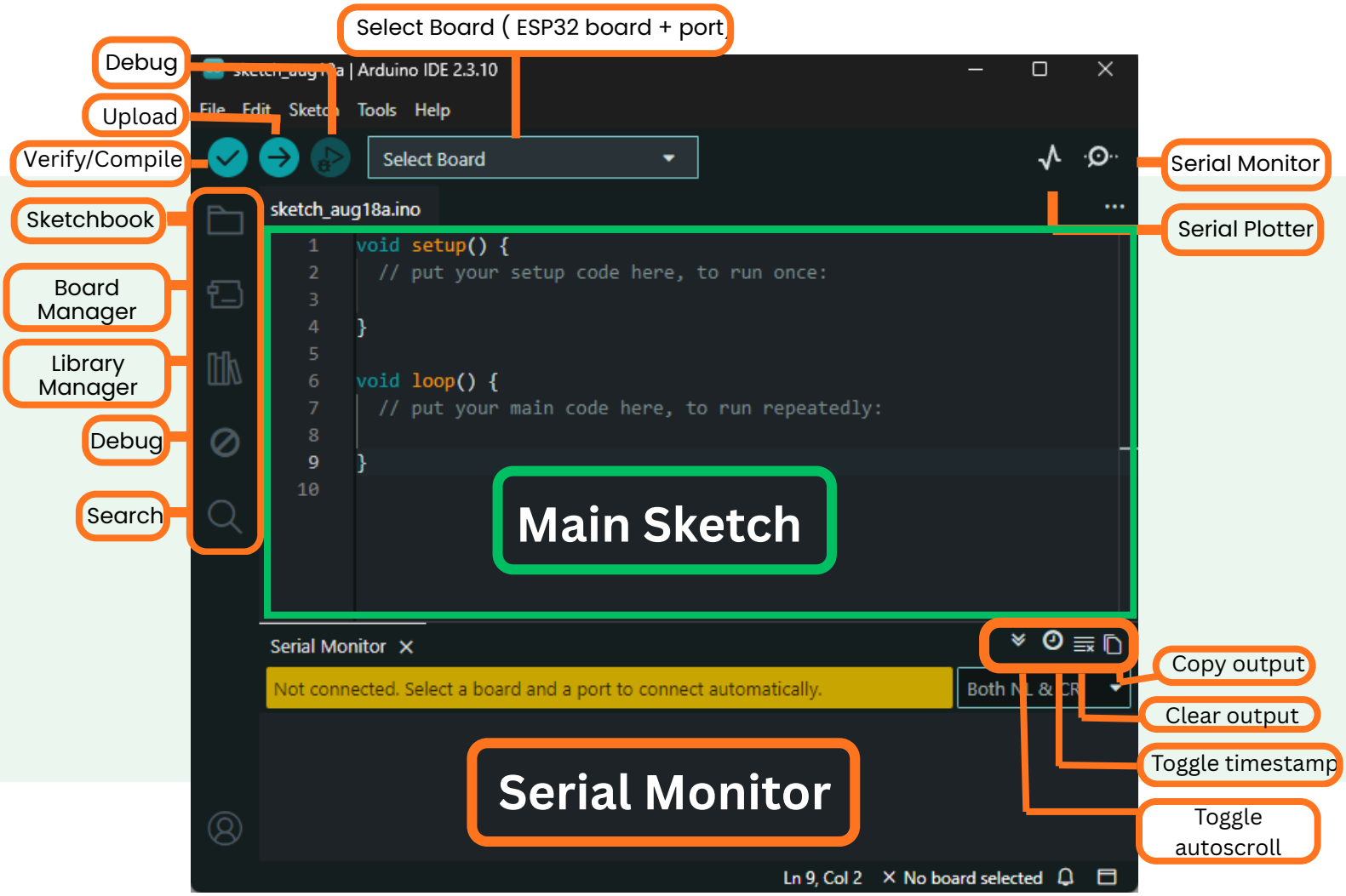
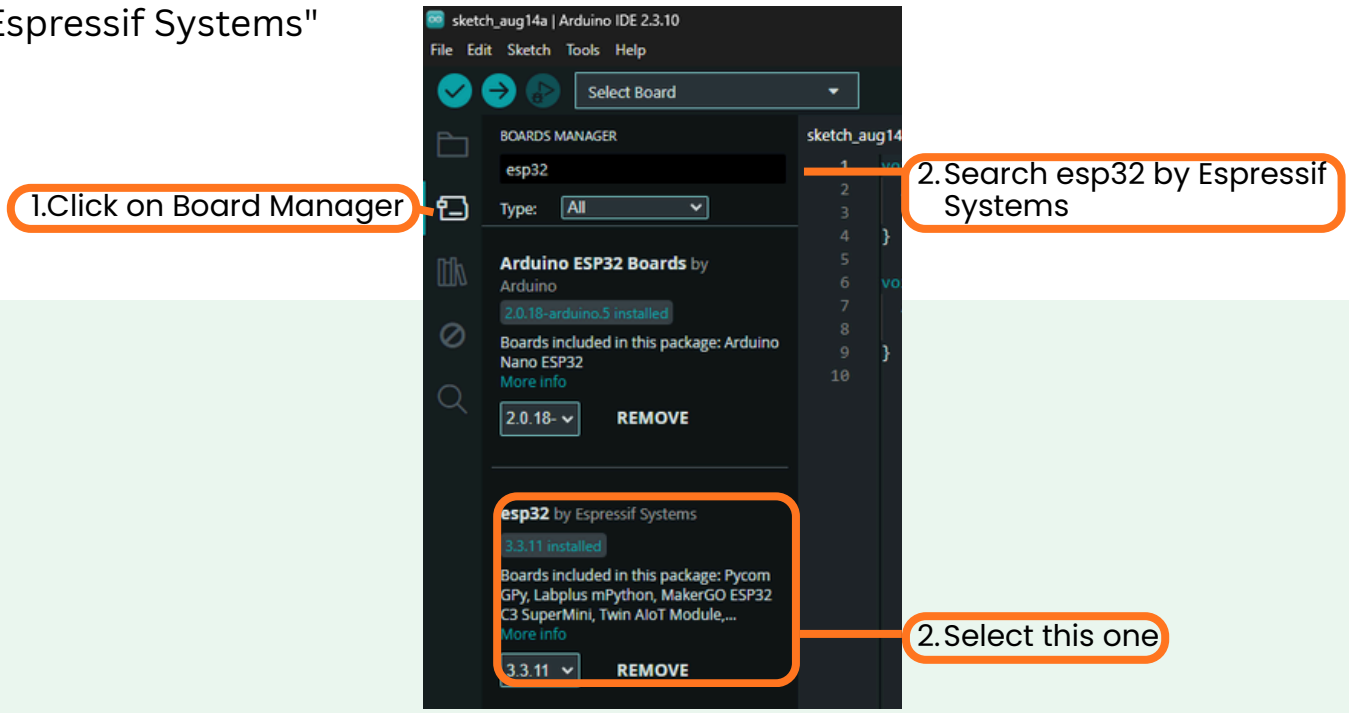
Understanding the Arduino IDE Interface

1. Install Arduino IDE -
- Go to https://www.arduino.cc/en/software
- Download the version for your OS (Windows/Mac/Linux)
- Install it and open the app

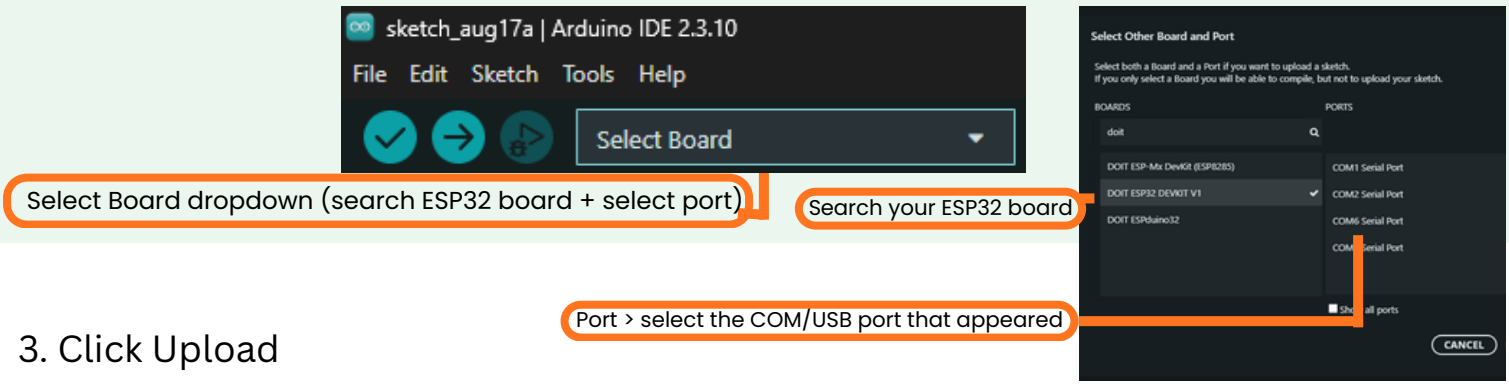


Connecting Your ESP32 Board to Arduino IDE

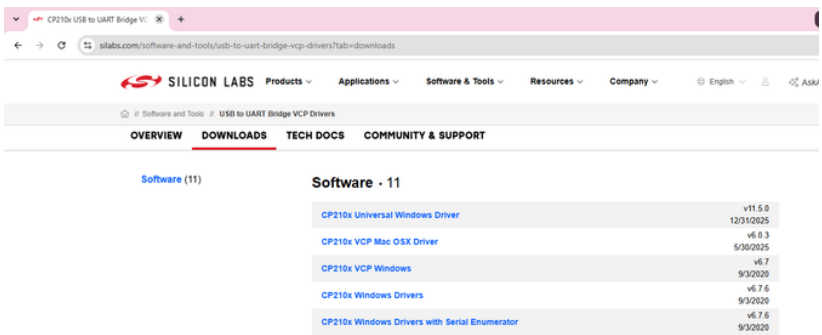
1. Add the ESP32 boards to the board manager. After that install "esp32 by Espressif Systems"



2. Select your ESP32 board > Go to Select Board > Search Your Board + Port

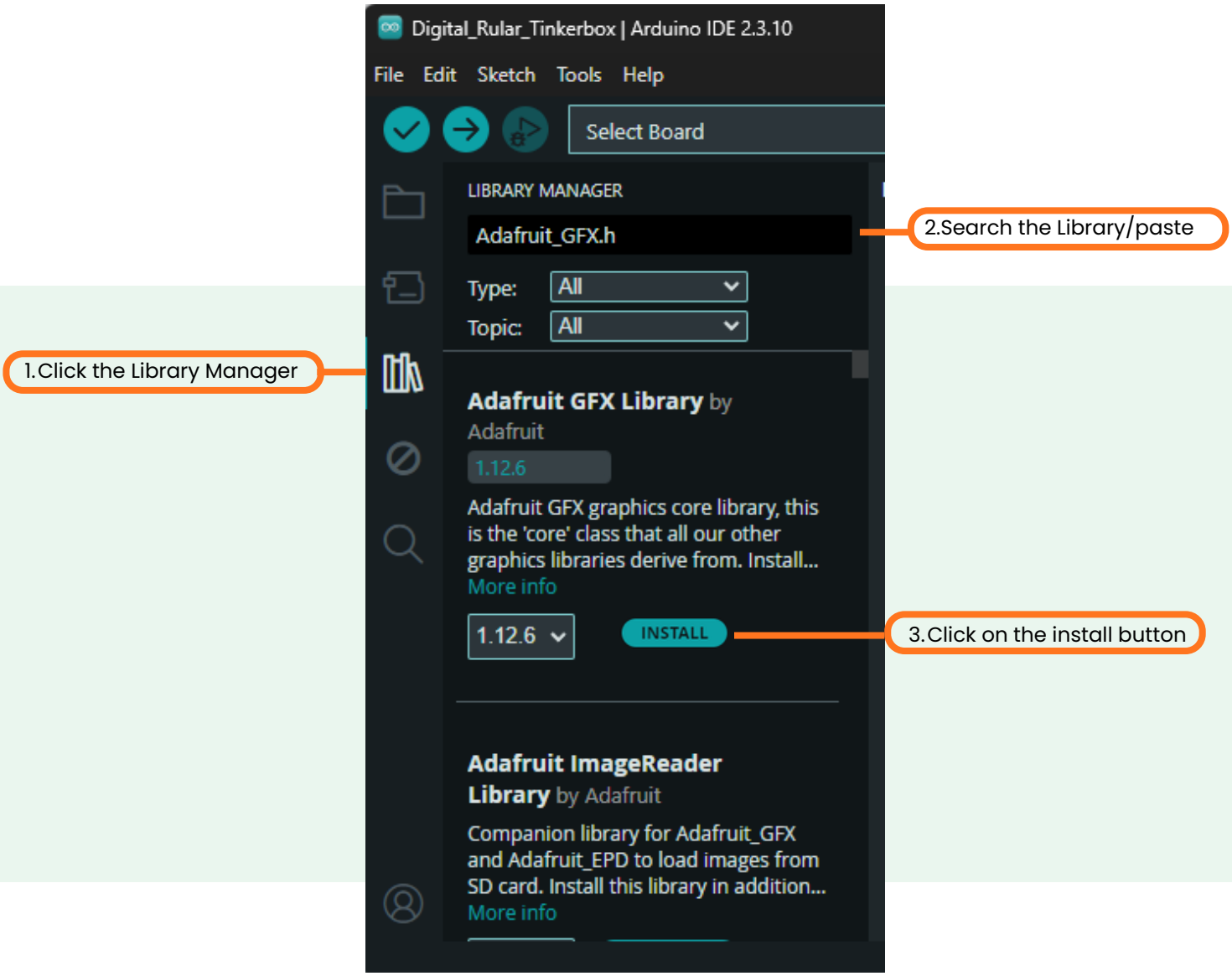


3. Click Upload



If the port is not visible do this :
CP210x or CP2102 -> install Silicon Labs CP210x driver
https://www.silabs.com/software-and-tools/usb-to-uart-bridge-vcp-drivers

Library Installation (Manual Methods)



Note: If prompted for dependencies → Install All

4. Restart Arduino IDE if it doesn't show up right away

Recommended/Essential Libraries

1. Digital Ruler Libraries: LiquidCrystal
2. Clap Controlled Switch Libraries: None required
3. Magnetic Light Libraries: None required
4. GPS Location Finder Libraries: TinyGPS++, SoftwareSerial
5. PIR Motion Detection Lighting System Libraries: None required

6. IR Based Intruder Alert Libraries: None required (IRremote if decoding IR codes)
7. Automatic LDR Based Street Light Libraries: None required
8. Flood Detection & Alert System Libraries: TinyGSM (only if SMS alerts are implemented)
9. Digital Voltmeter Libraries: LiquidCrystal
10. Kitchen Safety Alert Libraries: None required

11. RFID Light/Buzzer Libraries: MFRC522, SPI
12. Rotary Encoder Motor Control Libraries: Encoder
13. Smart Parking Management System Libraries: Servo, LiquidCrystal, NewPing
14. Health Monitoring System Libraries: PulseSensor Playground, DHT sensor library, MAX30100lib (if SpO2/HR module used)
15. Snake Game using Joystick Libraries: Adafruit_GFX, Adafruit_SSD1306

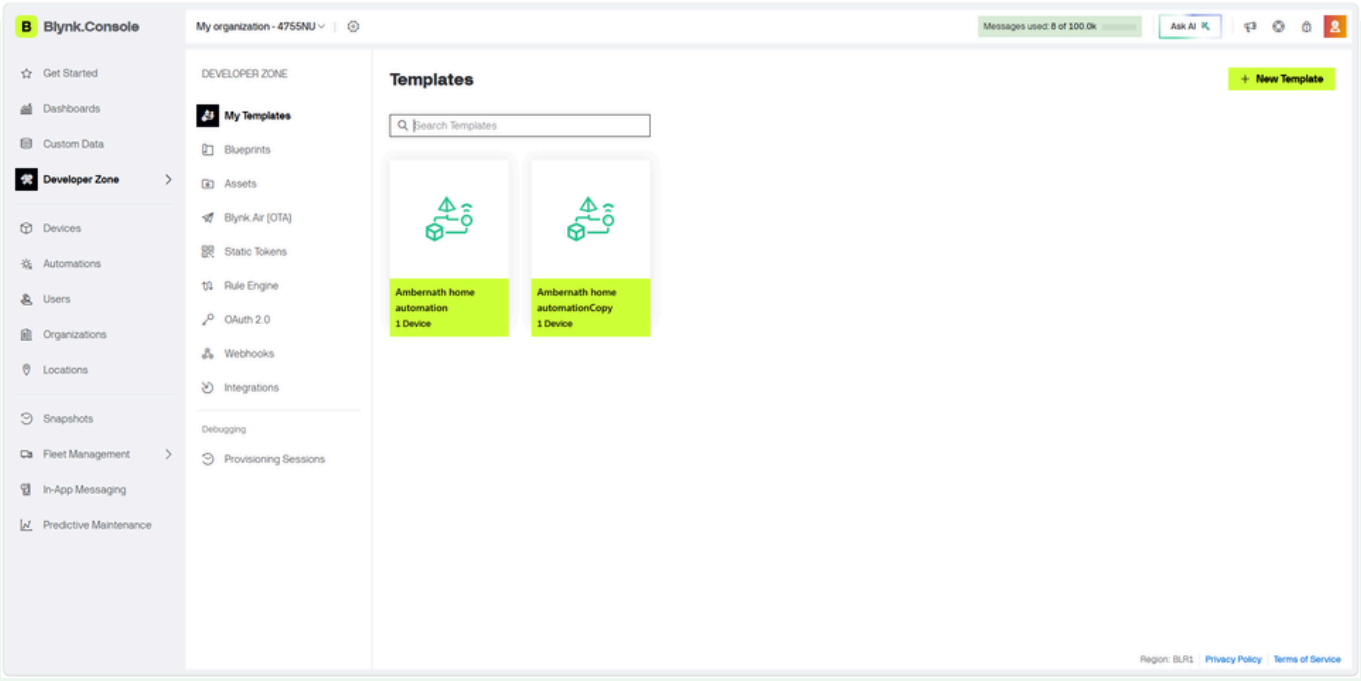
16. Home Automation System Libraries: ESP8266WiFi / WiFi.h, Blynk
17. Drip Irrigation System Libraries: RTClib (only if scheduled irrigation is implemented)
18. Weather Monitoring Station Libraries: DHT sensor library, Adafruit_BMP280, ThingSpeak (if cloud logging)
19. Smart Dustbin Libraries: Servo, NewPing
20. Soil Moisture Monitor Libraries: None required

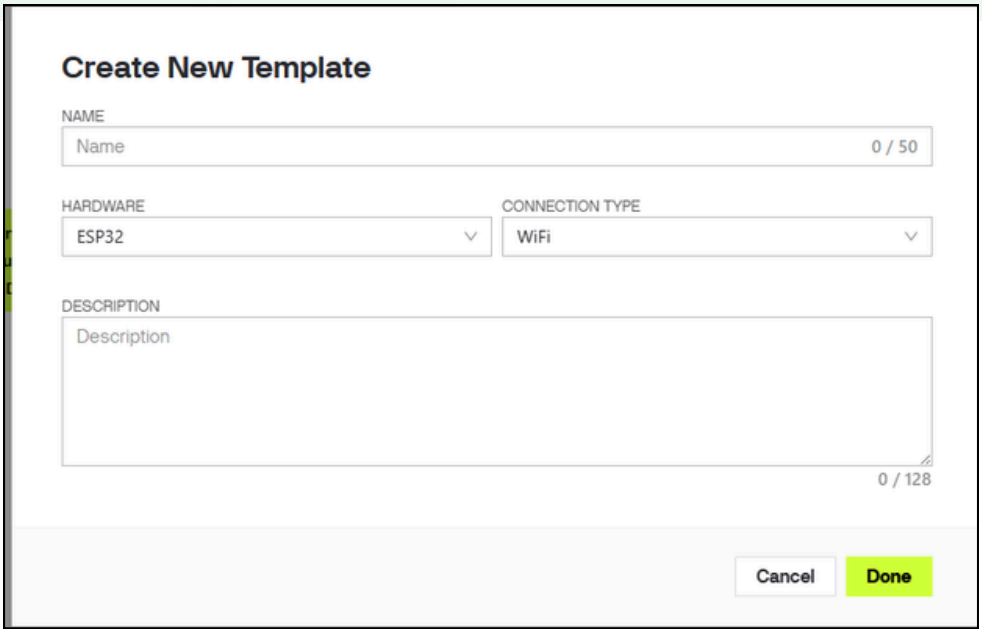
21. Fire Alarm System Libraries: None required
22. Sound Level Meter Libraries: LiquidCrystal (optional, for display output)
23. Digital Door Lock Libraries: Keypad, Servo
24. Digital Thermometer Libraries: DHT sensor library (if DHT sensor used), LiquidCrystal
25. Battery Capacity Tester Libraries: LiquidCrystal

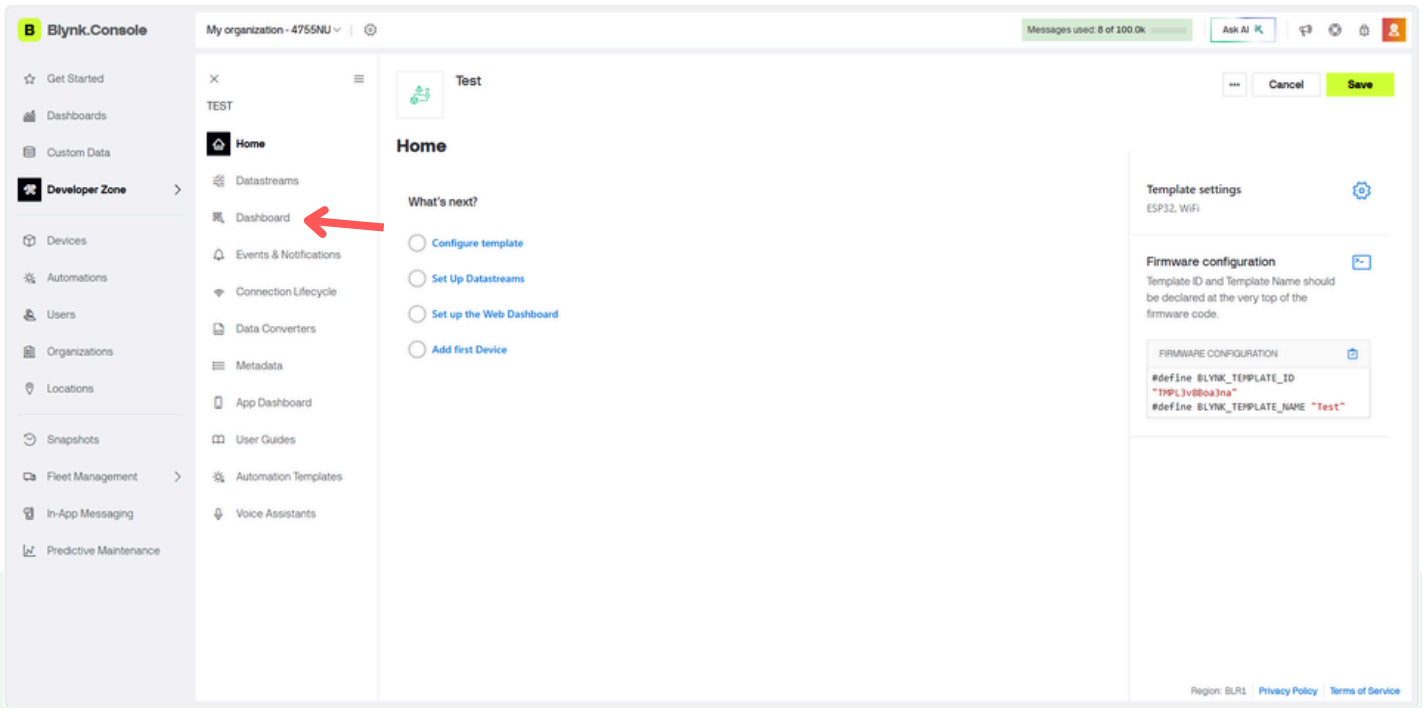
1. Preprogrammed Rover Libraries: None required
2. Moisture Finding Rover Libraries: None required
3. Line Follower Rover Libraries: None required (QTRSensors optional, if using Pololu QTR reflectance array)
4. Obstacle Avoidance Rover Libraries: NewPing, Servo (if sensor mounted on rotating base)
5. Follower Robot Libraries: NewPing (if ultrasonic-based tracking)
6. Gesture Controlled Rover Libraries: Wire.h, MPU6050, RF24 (if NRF24L01) or SoftwareSerial (if HC-05 Bluetooth)

Setting up the BLYNK IOT Dashboard

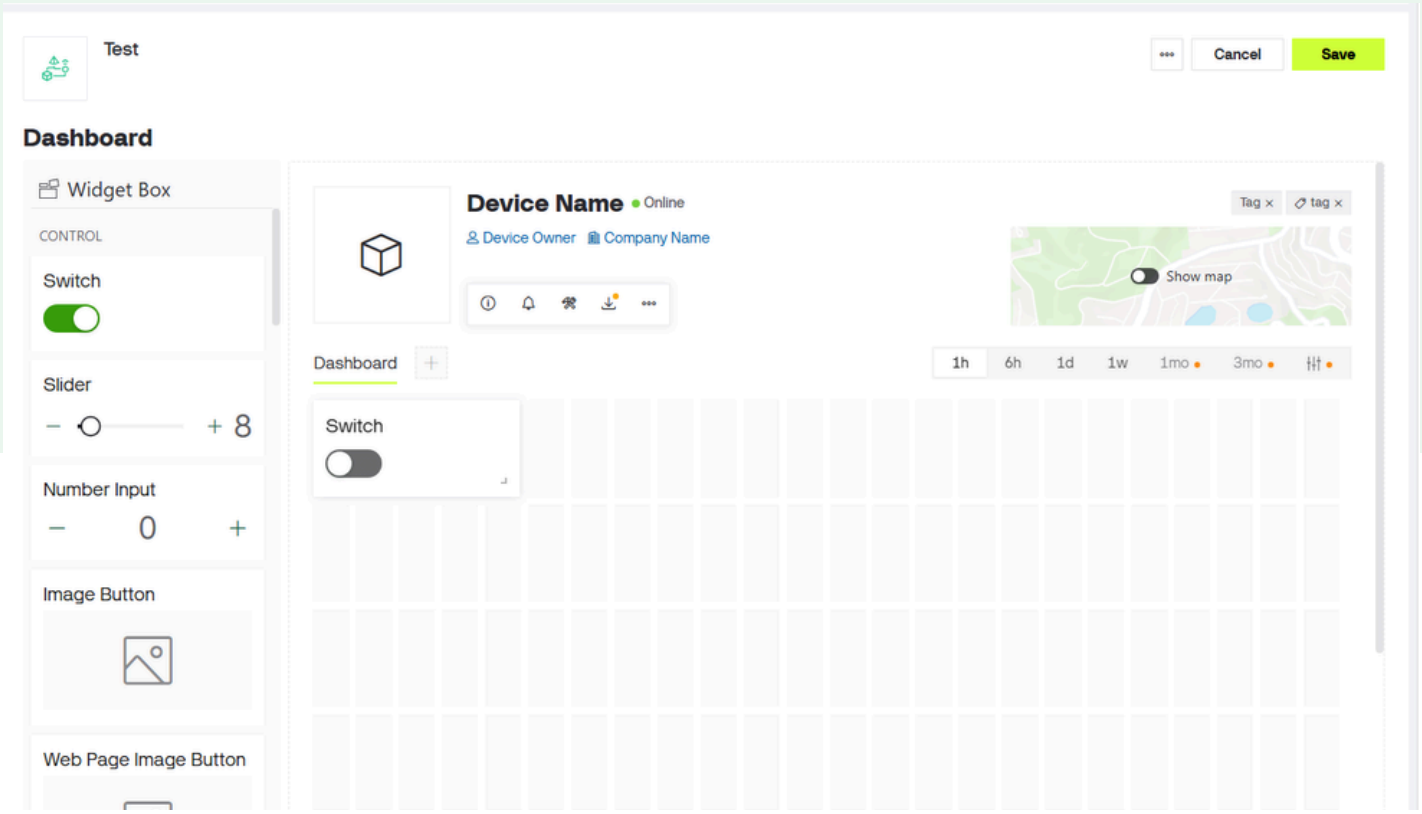
1. Open www.blynk.io and create a user account by clicking signup button. Insert an active Email ID and click signup.
2. A verfication email will be sent to the email id you have entered. Open it and create a password of your choice.
3. Click the new templete button. Insert a Project name of your choice. Check the hardware and connection type. (Description can be empty)



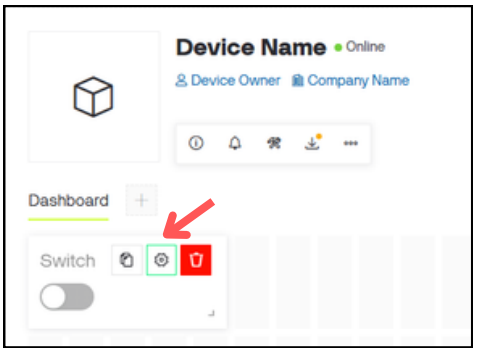




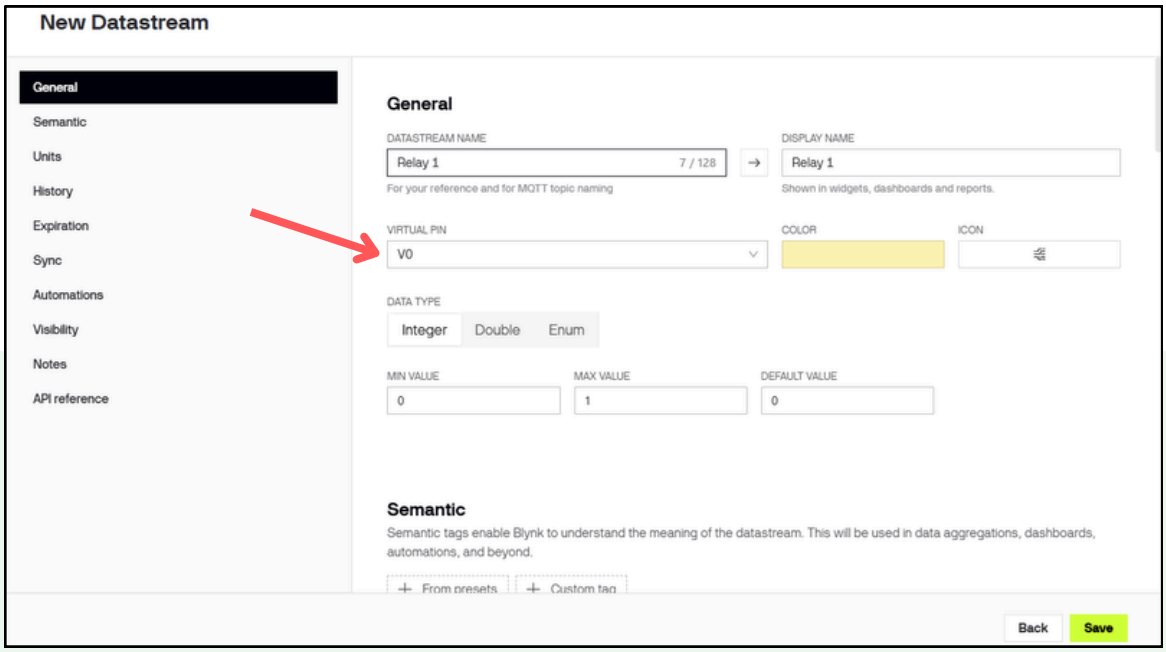
4.Drag the first switch and Drop it in dashboard placement area.



5.Hover over switch and a settings icon will pop up. Click the settings icon

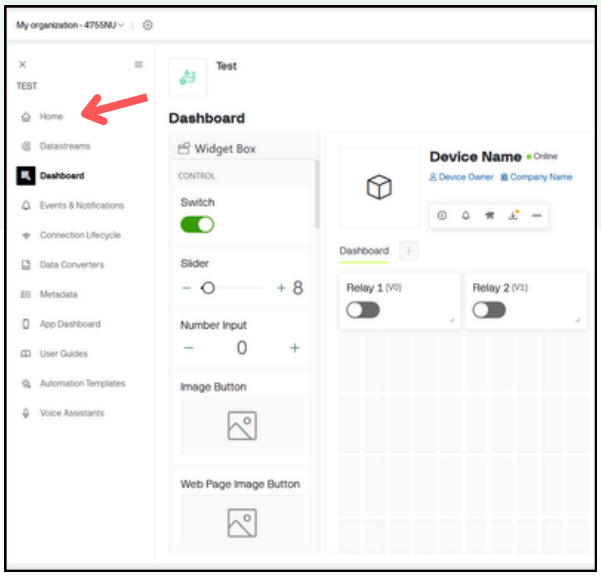


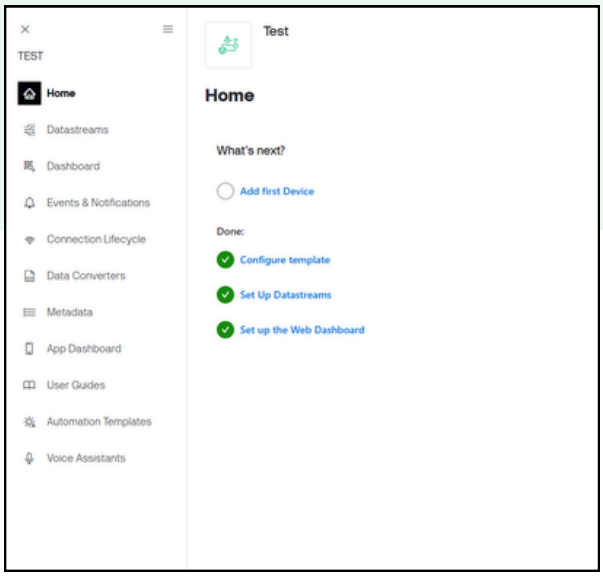
6. In switch settings click create Datastream. In New Datastream menu add a datastream name. Write the Virtual Pin (e.g., V0).



7. Repeat the steps 7-9 to create a 2nd Switch.

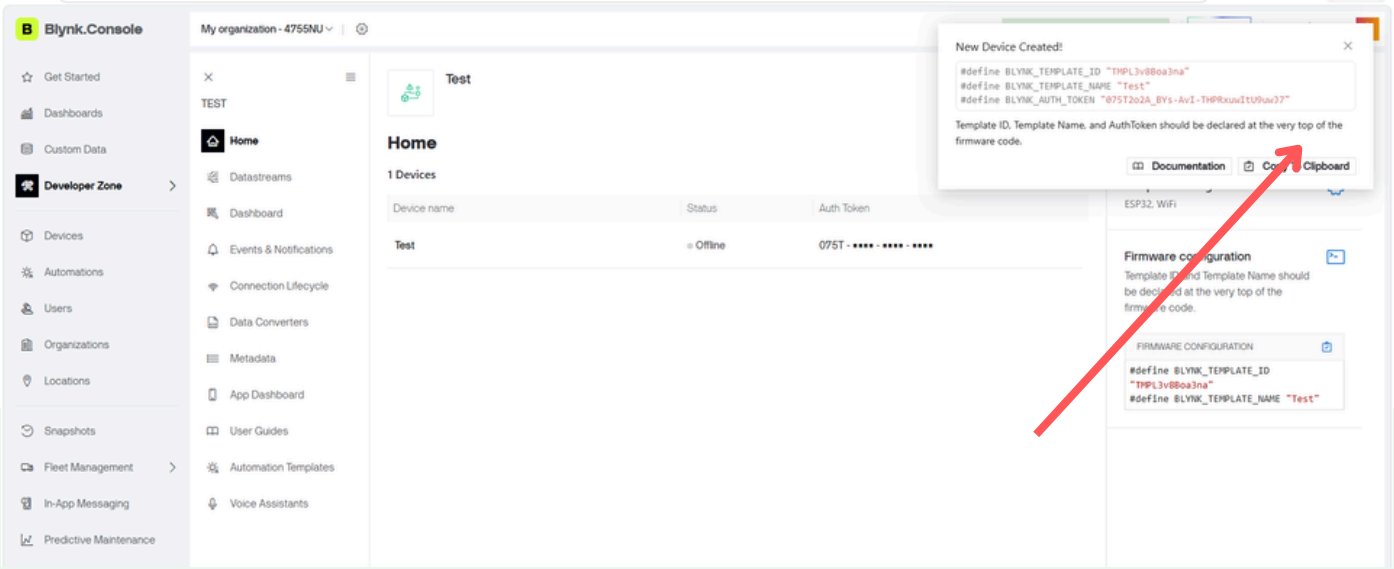
8. Now Come back to Home screen. Then Click Add First Device Checkbox.



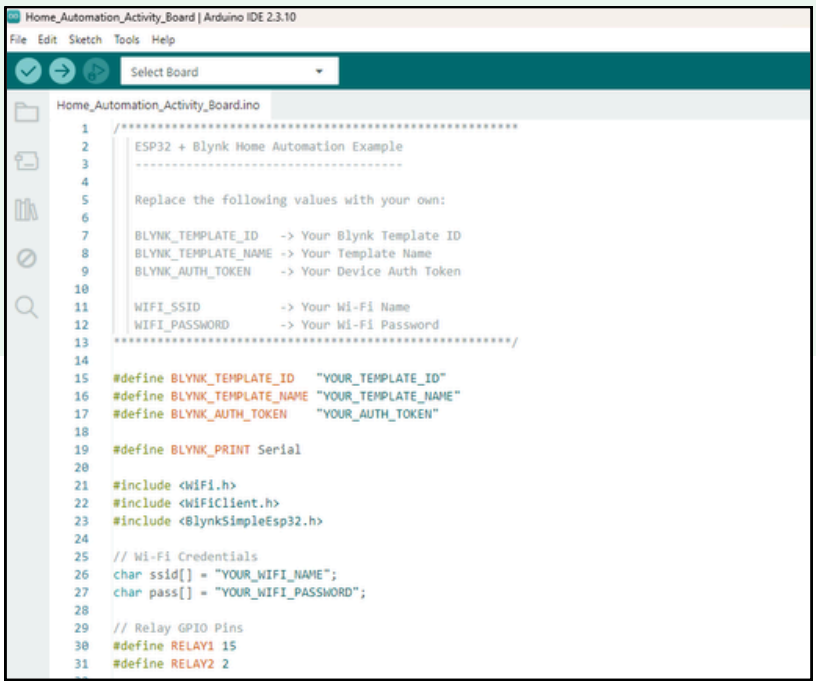


9. Now Come back to Home screen. Then Click Add First Device Checkbox.

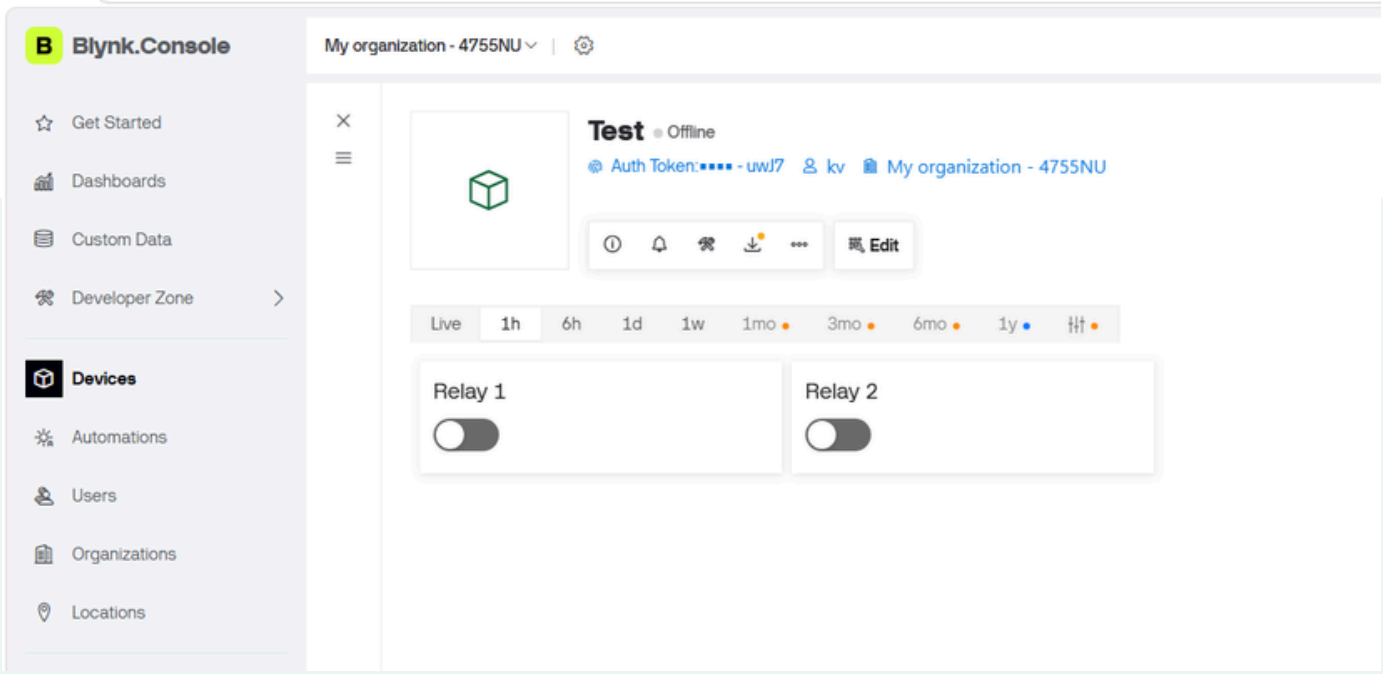
10. Name your device and click create. It will be created and you will get a pop-up with all the required details for code. Click copy to clipboard button. Click the save button on Right top corner.



11. Open Arduino IDE and write/paste your code in it. Replace the Blynk Details, Wifi SSID & Password. Verify Relay GPIO Pin assignment before uploading the code.



12. After code upload. Open the blynk devices menu. and Open your device. Check the status dot and label. When it turns green and label changes to Online. You can start Using your switches on blynk dashboard.



13. If the blynk details, Wifi details & Relay Pin assignment is correct you can easily control your relay remotely over the internet. **Distance doesn't matter**. Verify details and connections if doesn't work.