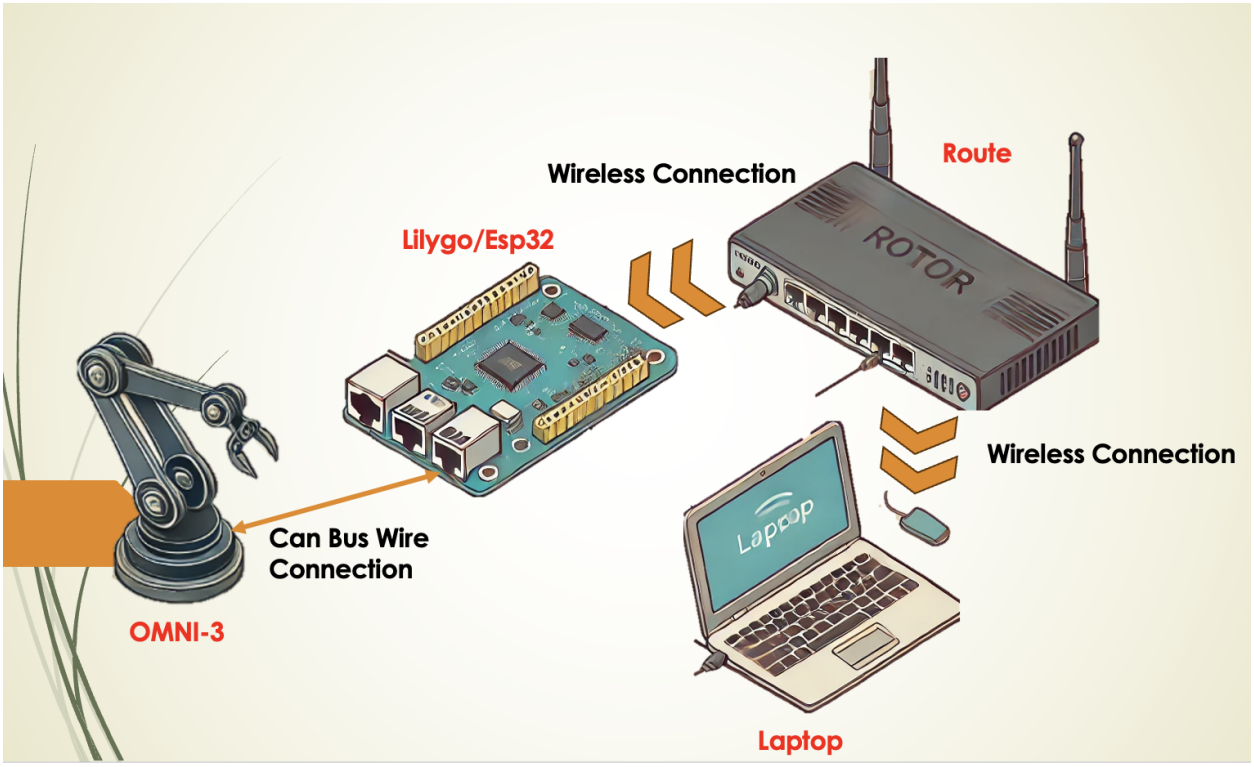
OMNI-3 WebPage Code

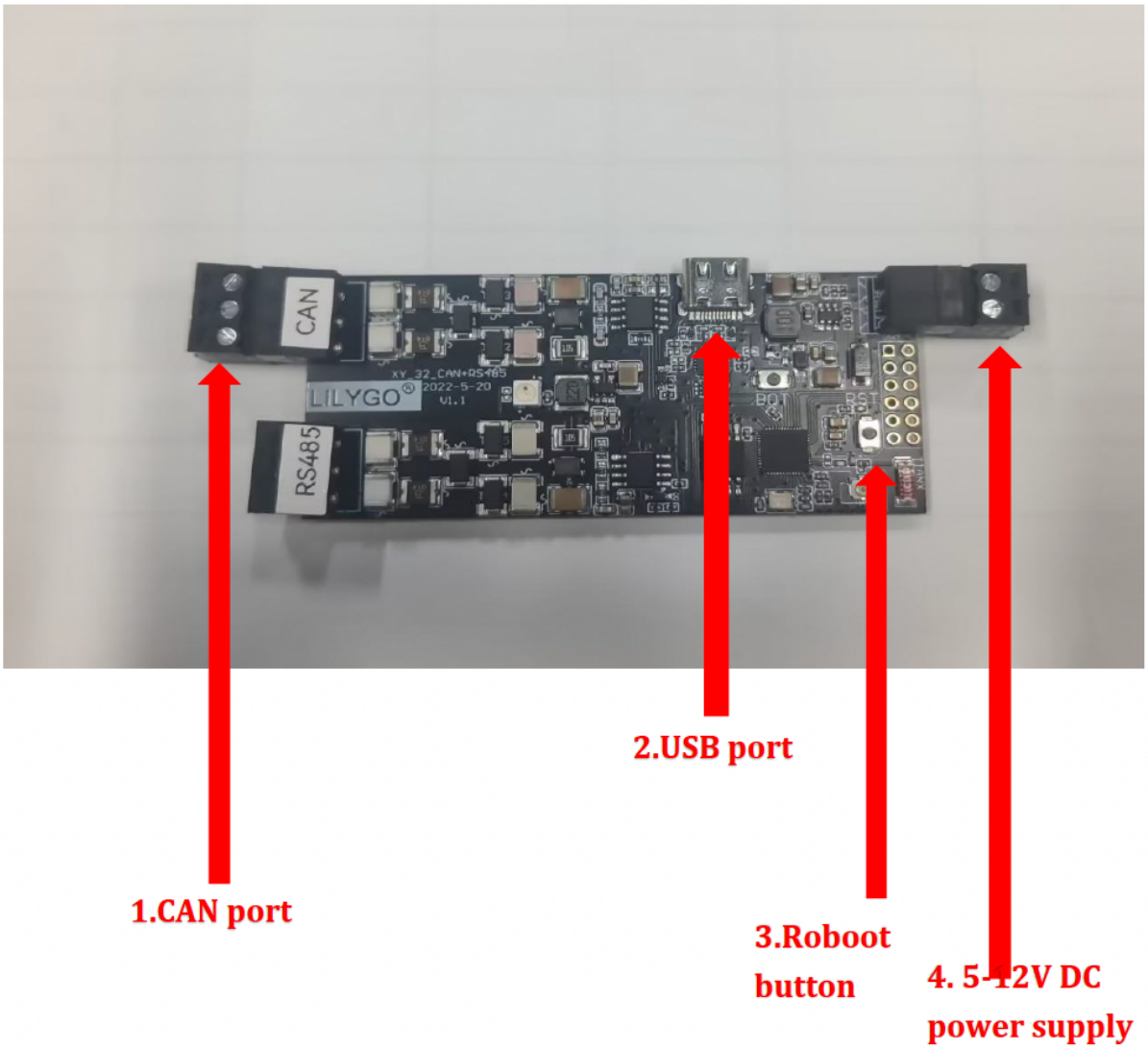
There is 5 steps in control our OMNI-3 Robotic arm through WebPage Code

1: System Overview

To control the robotic arm, we have developed a method that utilizes a LilyGo WiFi module for computer-based control. In simple terms, the robotic arm is connected to the LilyGo module via a wired connection. The LilyGo module then connects to a local area network (LAN), to which the computer is also connected. By accessing the static IP address of the LilyGo module, we can achieve computer-based control of the robotic arm via the LilyGo module. The setup is illustrated in the diagram below.



2: LilyGo Connection



1. CAN Interface
   Connects to the robotic arm for CAN communication. The back of the board is labeled with
   CAN-H (yellow wire) and CAN-L (white wire).
2. USB Interface
   Used for uploading the program to the ESP32 board (Type-C interface). You may keep this
   connection for powering the board via your PC after uploading the code. If you

use a DC power
supply (see "power supply interface" below) to power on the board, this USB cable can be
unplugged after the program is uploaded.

3. Reset Development Board
   Pressing this button will reset the program burned into the development board.
4. Power Supply Interface

   Used to power the development board, requires a voltage supply of 5~12V

3: Lilygo Code

We can find the OMNI-3 control code here: LINK

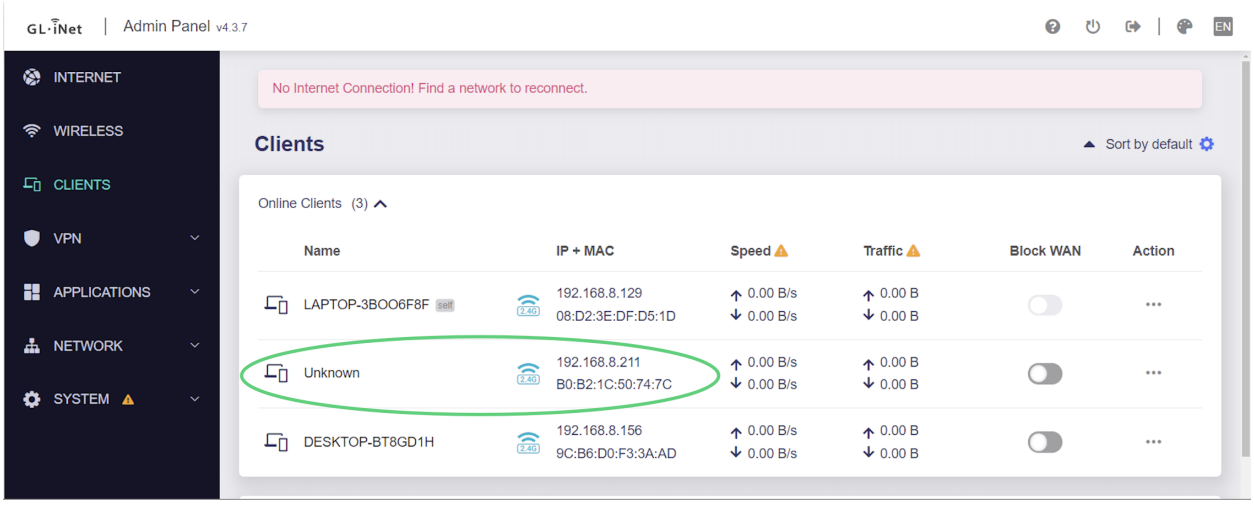
```
#include "rclib.h"
#include <DNSServer.h>
#include <ESPUI.h>
#include <ArduinoJson.h>
#include <WiFi.h>
#include <WebSocketsServer.h>
#include <Arduino.h>

const char *ssid = "GL-SFT1200-004";
const char *password = "goodlife";
const char *hostname = "espressif";
IPAddress local_IP(192, 168, 1, 200); // Static IP address of ESP32
IPAddress gateway(192, 168, 1, 0);    // Gateway
IPAddress subnet(255, 255, 255, 0);   // Subnet mask
```

In the `main.cpp` file under the `SRC` directory, we can see that `192.168.1.200` is the static IP address of the LilyGo development board within the configured local area network (LAN). This IP address is known as the **static IP address** of the LilyGo board. A static IP is manually assigned to a device and does not change every time it connects to the network, allowing other devices to access it using this fixed IP address.

1. **External Router**: Create a local area network (LAN) with a gateway address of `192.168.1.0` and a subnet mask of `255.255.255.0`.
2. **LilyGo Development Board**: Connect to the router and set its static IP address to `192.168.1.200`.
3. **Laptop**: Connect to the same router and obtain a dynamic IP address (e.g., `192.168.1.x`, where `x` is automatically assigned).
4. **Communication Method**: The laptop can access and communicate with the LilyGo board using the IP address `192.168.1.200` within the LAN.

In this setup, you need to change the ninth and tenth lines to your own router's username and password to enable the LilyGo board to connect to the local network.

You can check if the LilyGo board is successfully connected to the LAN by examining the network information on your computer. If an "unknown" device appears among the online clients, it indicates that the LilyGo board has successfully connected, and you can proceed to the next step. (Note: In our example, the **static IP address** is `192.168.8.211`, but you can set it to your preferred value.)



We can find the OMNI-3 Html control code here: LINK

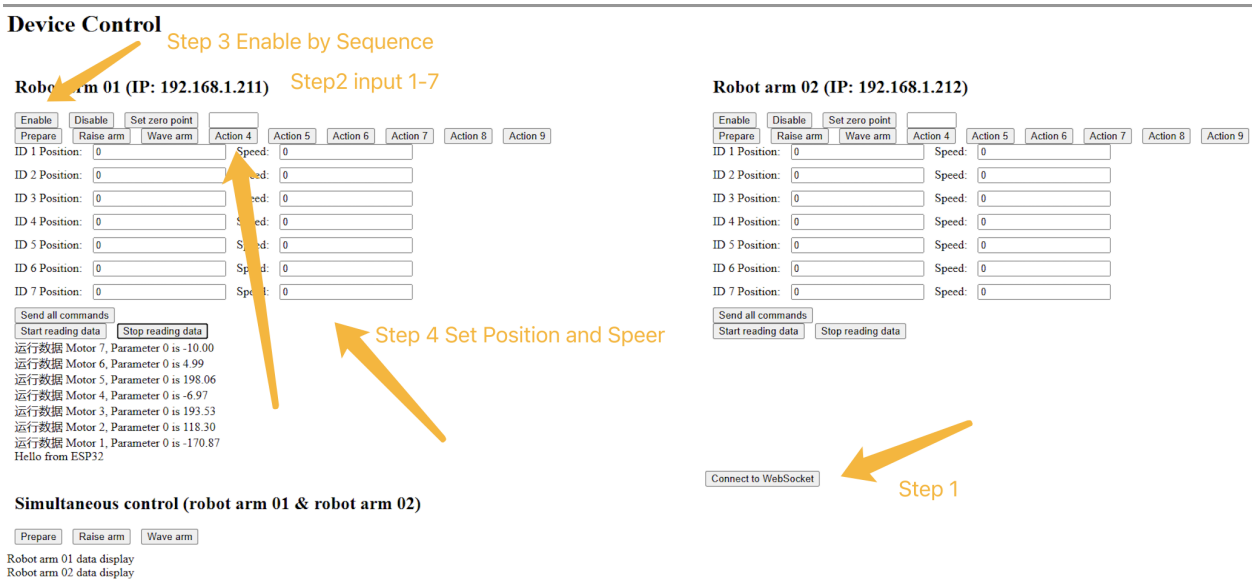
Then, download the Html control code，Modify the IP address in the webpage code (.html file) to control the dual arms separately. The IP needs to be set

differently for each arm and consistent with the burned code. Save the changes after modification.

```
function initializeWebSocket() {
    ws1 = new WebSocket('ws://192.168.1.211:81');  // Create a WebSocket connection to IP address 192.168.1.211:81, connecting to the robot arm 01 (left hand) c
    ws2 = new WebSocket('ws://192.168.1.212:81');  // Create a WebSocket connection to IP address 192.168.1.212:81, connecting to the robot arm 02 (right hand)
```

4. Open the HTML webpage file

To enter the following interface, follow the step in map to control the robotic arm.



5: Finished! You can make your robotic arm move now!