

Note: I have included all the instructions and the guide below. If you still face any issues, feel free to reach out—I'd be happy to help! 😊

ESP8266 RC Car - Step-by-Step Setup Guide

This guide will help you set up a **WiFi-controlled RC car** using an **ESP8266**, an **L298N motor driver**, and an **Xbox controller**. The ESP8266 receives steering and throttle inputs via WebSockets and controls the motor and servo accordingly.

Hardware Requirements

- **ESP8266** (NodeMCU / Wemos D1 Mini)
- **L298N Motor Driver**
- **DC Motor(s)**
- **Servo Motor** (for steering)
- **Xbox Controller** (or any game controller supported by Pygame)
- **12V Battery or Power Supply**
- **Capacitors (1000 μ F - 2200 μ F) (optional, for power stability)**


Wiring Connections

ESP8266 to L298N

ESP8266 Pin	L298N Pin	Function
D1 (GPIO5)	IN1	Motor Direction 1
D2 (GPIO4)	IN2	Motor Direction 2
D5 (GPIO14)	ENA	Motor Speed (PWM)

ESP8266 to Servo

ESP8266 Pin	Servo Pin	Function
D4 (GPIO2)	Signal	Steering Control
5V	VCC	Power
GND	GND	Ground

 **Important:** Ensure that the **ESP8266** and **L298N** share a common ground (**GND**) for proper operation.

Setting Up Arduino IDE

Install ESP8266 Board Support

1. Open **Arduino IDE**.
2. Go to **File > Preferences**.
3. In "Additional Board Manager URLs," add:
4. http://arduino.esp8266.com/stable/package_esp8266com_index.json
5. Go to **Tools > Board > Boards Manager** and search for **ESP8266**.
6. Install the latest version.

Install Required Libraries

Go to **Sketch > Include Library > Manage Libraries** and install:

- **ESP8266WiFi**
- **WebSocketsServer**
- **Servo**

Arduino IDE Settings

- **Board:** "NodeMCU 1.0 (ESP-12E Module)" (or your ESP8266 variant)
- **Flash Size:** 4MB (Default)
- **Upload Speed:** 115200
- **CPU Frequency:** 80MHz
- **Port:** Select the correct COM port

Upload ESP8266 Code

1. Open **esp8266_code.txt** (rename to **esp8266_code.ino** in Arduino IDE).
 2. Connect your ESP8266 to the computer.
 3. Click **Upload**.
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Setting Up Xbox Controller (Python Script)

Install Python & Pygame

1. Install **Python 3.8+** from python.org.
2. Open **Command Prompt** and install dependencies: (Run the following command in cmd as administrator)

```
pip install pygame websocket-client
```

Run the Xbox Controller Script

1. Open **xbox_control.py** in a text editor.
2. Update the WebSocket IP (default: ws://192.168.4.1:81/).
3. Run the script:
4. `python xbox_control.py`

Connecting & Driving

1. Power up the ESP8266 and L298N.
2. Connect your **PC to the ESP8266 WiFi** (ESP_RC_Car, password: 12345678).
3. Run the Python script to control the car with your Xbox controller!

Troubleshooting

- **No connection?** Check if ESP8266's IP is 192.168.4.1.
- **Car not moving?** Ensure L298N wiring is correct.
- **Laggy control?** Increase WebSocket update rate.

 Enjoy your DIY ESP8266 RC Car!