

Day 5: Project Day - Wi-Fi Controlled Car

This is the day everything comes together! We will use all the skills we've learned—from controlling the brain to using sensors and actuators—to build a complete project: a car that you can drive using your phone!

Today's Goal:

1. Combine our knowledge of controllers, actuators, and drivers.
2. Learn how to create a Wi-Fi network to send commands wirelessly.
3. Build and program a fully functional Wi-Fi controlled robot car.

1. Recap: The Story So Far 📖

- **Day 1:** We learned the basics: **Sensors, Controllers, and Actuators**.
- **Day 2:** We programmed our **Controller** to control a simple actuator (LED).
- **Day 3:** We added **Sensors** to see the world and made our system react.
- **Day 4:** We learned to control **Actuators** like servo motors with precision.

Today, we're building a robot that uses powerful motors as actuators and Wi-Fi for communication.

2. New Hardware for Our Car

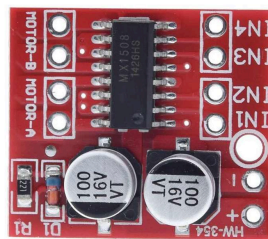
Geared DC Motors

The small yellow motors we will use are **Geared DC Motors**. The gearbox on the front reduces the motor's speed but increases its **torque** (turning power). This is important for a robot car, giving it the strength to move.

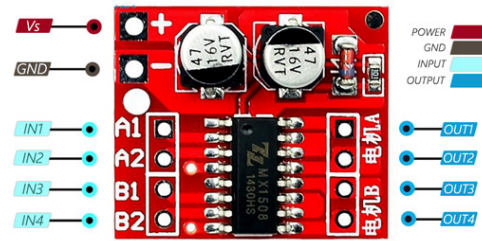
MX1508 Motor Driver

Remember from Day 4 how motors need more power than the NodeMCU can provide? For our car's motors, we will use a dedicated **MX1508 Motor Driver**.

- **What is it?** It's a small circuit board designed to control two DC motors.
- **Why use it?** It's a bridge. We send



small, safe signals from our NodeMCU to the driver, and the driver uses a separate power source (like a battery pack) to run the motors. It allows us to easily control the motor's **direction** (forward/backward) and **speed**.



3. Hands-on Project: Building the Wi-Fi Car

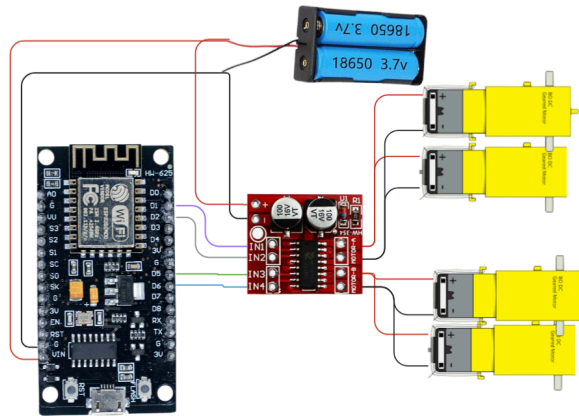
Let's assemble our car and get it ready for the final code.

Things You'll Need:

- Car Chassis, Wheels, and Geared DC Motors
- NodeMCU
- 1 x MX1508 Motor Driver
- Jumper Wires
- A separate power source for the motors (e.g., a 2x Lithium battery pack). **Do not power the motors from the NodeMCU.**

Connection Diagram:

- **Power for the Driver:**
 - Connect your battery pack's + (positive) to the **VCC** pin on the MX1508.
 - Connect your battery pack's - (negative/ground) to the **GND** pin on the MX1508. Also, connect this GND to a **GND** pin on the NodeMCU (this is a crucial step to make them work together).
- **Motors to Driver:**
 - Connect the Left Motor to the **MOTOR A** terminals on the driver.
 - Connect the Right Motor to the **MOTOR B** terminals on the driver.
- **NodeMCU to Driver (Control Signals):**
 - NodeMCU **D1** -> MX1508 **IN1** (Left Motor)
 - NodeMCU **D2** -> MX1508 **IN2** (Left Motor)
 - NodeMCU **D5** -> MX1508 **IN3** (Right Motor)
 - NodeMCU **D6** -> MX1508 **IN4** (Right Motor)



4. Step 1: Test Your Motors!

Before adding the complex Wi-Fi code, it's very important to test if our motors are wired correctly. This simple code will make the car move forward for 2 seconds, then backward for 2 seconds.

Motor Test Code

[Click to see all code](#)

After uploading: If both wheels move forward and then backward, your wiring is correct! If one wheel moves in the wrong direction, just swap the two wires for that motor on the motor driver.

5. Step 2: The Final Code for Wireless Control!

Once the motors are tested, it's time for the final code. This will turn our NodeMCU into a Wi-Fi hotspot.

Copy and paste this entire code into your Arduino IDE.

[Click to see all code](#)

How to Use It:

1. **Upload the Code:** Make sure all your connections are correct and upload this code to your NodeMCU.

2. **Connect Your Phone:** On your smartphone, go to Wi-Fi settings. You will see a new network named "**wifi-car**". Connect to it using the password "**12345678**".
3. **Use the Controller App:** Open the "**connect_robo**" app on your phone.
4. **Configure the App:**
 - Set the **IP Address** to 192.168.4.1 (the NodeMCU's address).
 - Set the **Port** to 4210.
5. **Drive!** You can now control your robot car using the joystick on your phone!

Congratulations! You have built a complete, Wi-Fi controlled robot. You have successfully combined all the concepts from the past five days into one amazing project.