

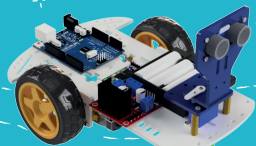


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2WD ROBOT CAR KIT



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(Ultrasonic Sensor&Bluetooth Module)

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2WD BLE Obstacle Avoiding Robot Kit

Assembly & User Manual – Introduction

Are you ready to build the technology of the future with your own hands?

The 2WD BLE Obstacle Avoiding Robot Kit is a comprehensive educational and hobby platform specially designed for technology enthusiasts, students, and makers of all ages who want to step into the world of robotics, electronics, and coding. This project allows you to experience the core dynamics of a modern autonomous system in a fun and practical way, from mechanical assembly to algorithm development.

Key Features of the Kit:

Smart Sensing (Ultrasonic Sensor & Servo):

The **HC-SR04 Ultrasonic Distance Sensor** acts like the robot's eyes, detecting obstacles in its path. Mounted on a Servo Motor, the sensor scans the surroundings to determine the safest path, allowing the robot to avoid obstacles autonomously.

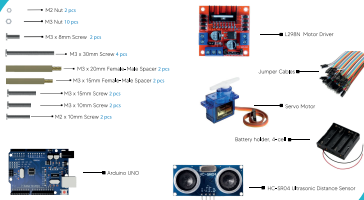
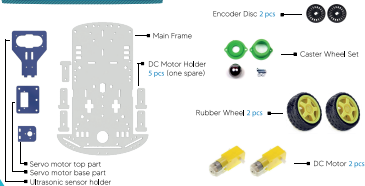
Wireless Freedom (BLE):

Thanks to **Bluetooth Low Energy (BLE)** technology, your robot can do more than just drive autonomously; it can also be remotely controlled wirelessly via smartphones, tablets, or computers.

High Maneuverability (2WD):

Powered by dual DC motors, encoder discs, and a balancing caster wheel, your robot delivers agile, precise, and smooth movement.

COMPONENTS OF 2WD BLE Obstacle Avoiding Robot KIT

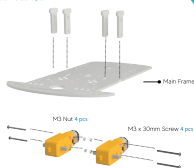


Assembly Guide

DC Motor Holder 2 pcs

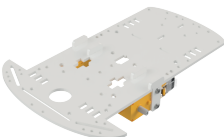
1 Mount the DC motors onto the main unit, placing each one between the motor holders.

Make sure the soldered ends of the wires are facing inward.

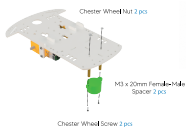


Repeat this step for other motors.

Post-assembly view:



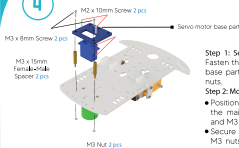
2 Mount the Caster Wheel :



3 Attach the encoder discs to the inward-facing ends of the DC motors.



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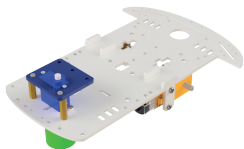


Step 1: Secure the Servo Motor to the Base
Fasten the servo motor to the servo motor base part using M2 10mm screws and M2 nuts.

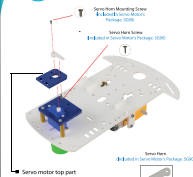
Step 2: Mount the Base Part to the Main Frame
Position the servo motor base part onto the main frame using M3 8mm screws and M3 15mm spacers.

Secure the entire assembly by threading M3 nuts onto the exposed ends of the spacers.

Now the bottom part is complete.
Let's assemble the top part now.



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Important Prerequisite: Servo Motor Calibration

ATTENTION:

Before proceeding with the assembly and screwing processes, you must reset (calibrate) the servo motor using the calibration code provided via the QR code. Ensure the motor is zeroed before inserting any screws.

Servo Horn Assembly Instructions

Step 1: Secure the Servo Horn to the Top Part

Fasten the single-wing servo horn (included in the package) to the "servo motor top part" using the provided servo mounting screw.

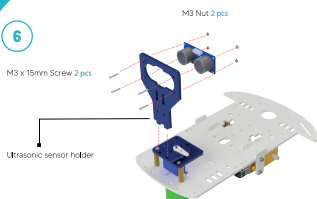
Step 2: Attach the Horn to the Servo Motor

Mount the assembled servo horn onto the gear shaft of the servo motor and screw it firmly into place.

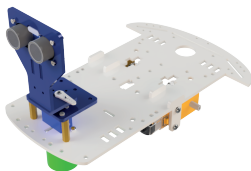
Post-assembly view:



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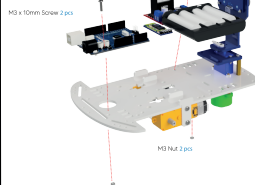


Post-assembly view:



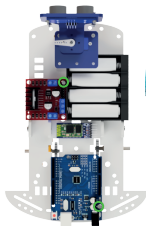
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Let's screw the modules into the appropriate holes in the top plate.



Secure the 10-pin module to the top plate using double-sided tape. You can tape the battery holder.

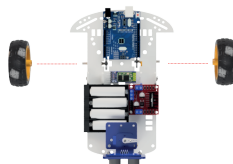
Post-assembly view:



Note: The screw holes where the modules align are marked as shown below.

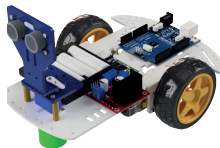
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Attach the wheels to the remaining outer ends of the DC motors.



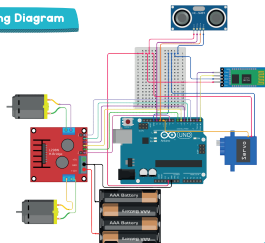
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Now the 2WD BLE Obstacle Avoiding Robot (Ultrasonic Sensor & Bluetooth Module) is ready!



If connecting the cables becomes difficult after this step, you can connect them before assembly.

Wiring Diagram



CODES



This module requires the use of a computer interface via a mobile application to control the robot. The robot is designed to be controlled only with this type of control system.

Users must use a suitable mobile application that offers a computer-based control interface to move the robot.

2WD ROBOT CAR KIT

Power Checks

- Are the batteries fully charged?
- Did you insert the batteries according to the correct +/- polarity?
- Is the battery holder power switch turned ON?
- Is the Arduino UNO power LED on?
- Is the L298N motor driver receiving power correctly?

Chassis & Mechanical Checks

- Are both DC motors firmly mounted to the chassis?
- Are the soldered wire ends facing inward?
- Are the wheels fully pressed onto the motor shafts?
- Is the caster wheel height correctly adjusted with brass standoffs?
- Does the chassis sit flat and level on the ground?
- Did you remove the brown protective film from the acrylic chassis?
- Are any screws tightened too much, preventing free movement?

Motor Connection Checks

- Is the left motor connected to L298N OUT1 & OUT2?
- Is the right motor connected to L298N OUT3 & OUT4?
- Are the motor wires connected to the correct L298N output terminals?
- If the robot moves backward instead of forward, did you reverse the motor wires?
- Are there any loose or disconnected motor wires?
- Are the IN1, IN2, IN3, IN4 pins connected to the correct Arduino digital pins?
- Are the ENA/ENB jumper caps in place (or connected to PWM pins)?

Servo Motor Checks

- Is the SG90 servo connected to a PWM-capable Arduino pin?
- Does the servo scan smoothly from 0° to 180°?
- Is the ultrasonic sensor bracket securely attached to the servo horn?
- Is there any jitter or vibration? (Check power supply)

Obstacle Avoiding Robot (Ultrasonic Sensor)

- Is the HC-SR04 ultrasonic sensor facing forward?
- Are the TRIG and ECHO pins connected to the correct Arduino pins?
- Is there any cable or mechanical part blocking the sensor?
- Is the obstacle at least 2 cm away during testing?
- Did you check the distance threshold value in the code?
- Is the servo motor centered at 90° before attaching the sensor bracket?

Arduino & Code Checks

- Is the correct board selected (Arduino UNO)?
- Is the correct COM port selected?
- Did the code upload complete without errors?
- Do the motor pin numbers in the code match the actual wiring?
- Is GND shared between the Arduino and the L298N motor driver?
- Did you disconnect Bluetooth TX/RX wires before uploading code?
- If using a CH340 clone, is the CH340 USB driver installed?

Tip: Test the motors first, then the sensors, and finally the Bluetooth or autonomous functions. This step-by-step approach makes troubleshooting much easier. If the robot drifts, adjust PWM values for each motor in your code.