



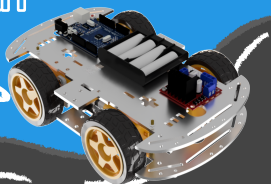
rbt-list/ard4wdcarkit



Robotistan INC
Esmenur SÖNMEZ (Designer) Buura SARIKAYA (Content&Developer)
- Mehmet Suat MORKAN (Editor)- Atakan ÖZTÜRK (Engineer)

3 Germany Drive STE 4 #14230 Wilmington, DE 19804
hello@robotistan.com

4WD ROBOT CAR KIT

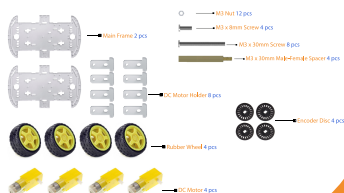


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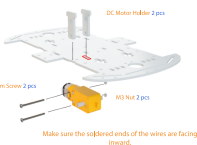
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COMPONENTS OF 4WD KIT



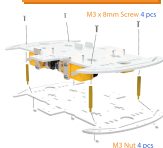
1 Mount the DC motors on to the main unit, placing each one between the motor holders.



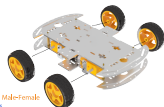
Repeat this step for all four motors.

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

3 Connect the two plates together.



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



5 Now the 4WD Robot Chassis is ready!



AFTER COMPLETING THE 4WD ROBOT CHASSIS

Once you have assembled your 4WD robot chassis, you can build different types of robots using the sensors and modules included in the kit.

In this guide, three fundamental robot projects are introduced.

These projects are designed to help you understand core robotics concepts such as:

Sensor data processing

Motor control

Autonomous and remote-controlled systems

Line Follower Robot (Infrared Sensor)



A line follower robot is an autonomous system that follows a path (usually a black or white line) on the ground.

Module Used:

Infrared (IR) sensor

Detects the contrast between surfaces. Black surfaces absorb light, while white surfaces reflect it. The robot uses this difference to stay on track.

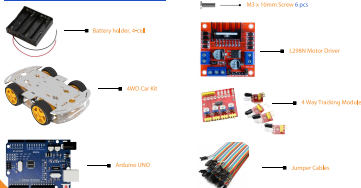
DC motors (4WD chassis)

Provide movement (forward, backward, turning).

Motor driver

Controls the speed and direction of the motors.

COMPONENTS OF 4WD LINE FOLLOWER ROBOT



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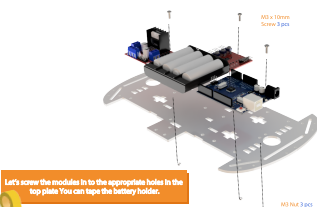
1

M3 x 10mm
Screw 3 pcs



Screw the sensor leads to the end of the base plate.

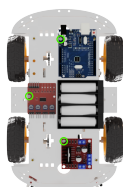
8



Let's screw the modules in to the appropriate holes in the top plate. You can tape the battery holder.

9

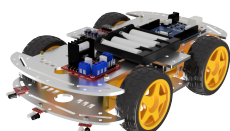
Hint: The screw holes where the modules align are marked as show below.



10

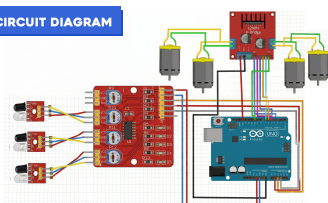
It's finished now

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



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CIRCUIT DIAGRAM



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CODES



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2. OBSTACLE AVOIDING ROBOT (ULTRASONIC SENSOR)



An obstacle avoiding robot is an autonomous system that detects objects in its path and avoids collisions by changing direction. This type of robot continuously measures the distance to nearby object and makes movement decisions based on that data.

Modules Used:

Ultrasonic Sensor (HC-SR04)

Measures distance using ultrasonic sound waves.

It sends signal and calculates how far an object is based on the time it takes for the echo to return. The robot uses this information to detect obstacles in front of it.

DC motors (4WD chassis)

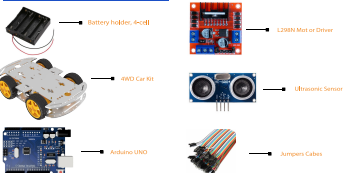
Provide movement (forward, backward, and turning).

Motor driver

Controls the speed and direction of the motors based on distance measurements.

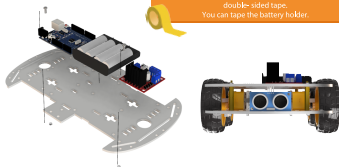
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COMPONENTS OF 4WD OBSTACLE AVOIDING ROBOT



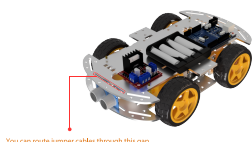
15

Secure the ultrasonic sensor to the base plate using double-sided tape. You can tape the battery holder.



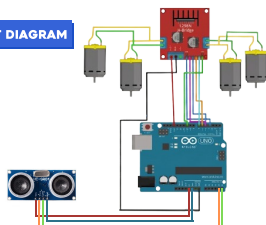
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It's finished now.
 If connecting the cables becomes difficult after this step, you can connect them before assembly.



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CIRCUIT DIAGRAM



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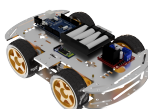
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3. BLUETOOTH CONTROLLED ROBOT

A Bluetooth controlled robot is a remotely operated system that can be controlled using a mobile device. Instead of making decisions on its own, the robot moves according to commands sent by the user via a Bluetooth connection.

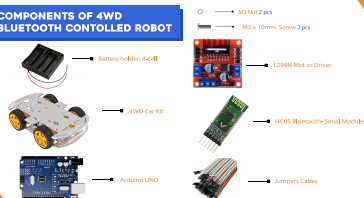


Modules used:

- Bluetooth Module: Enables wireless communication between the robot and a mobile device. It receives commands such as forwards, backward, left, and right from a mobile application.
- DC motors (4WD chassis): Provide movement (forward, backward, and turning).
- Motor driver: Controls the speed and direction of the motors based on the commands received via Bluetooth.

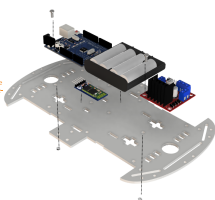
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COMPONENTS OF 4WD BLUETOOTH CONTROLLED ROBOT



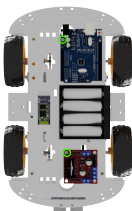
21

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



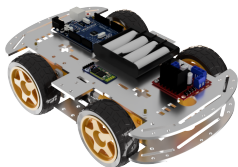
22

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

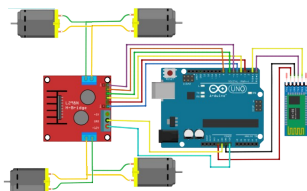


It's finished now

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



CIRCUIT DIAGRAM



CODES



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This kit requires the use of a Gamepad interface as a mobile application to control the robot. The robot is designed to be controlled only with this type of control method.

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

CHECKLIST / TROUBLESHOOTING 4WD 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 all DC motors firmly mounted to the chassis?
- Are the soldered wire ends facing inward?
- Are the wheels fully pressed onto the motor shafts?
- Are any screws tightened too much, preventing free movement?
- Does the chassis sit flat on the ground?

Line Following Robot (IR Sensor)

- Is the 4-way IR tracking module parallel to the ground?
- Is the distance between the sensor and the ground approximately 5-15 mm?
- Is there sufficient contrast between the black line and the white surface?

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?

Motor Connection Checks

- Are the left-side motors connected to the same motor output group?
- Are the right-side motors connected to the same motor output group?
- Are the motor wires connected to the correct L298N output terminals?
- If the robot moves backward instead of forward, did you reverse the motor pair wires?
- Are there any loose or disconnected motor wires?
- Are the VCC, GND, and OUT pins connected correctly?
- Do the sensor indicator LEDs respond when placed over the line?

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?

Bluetooth Controlled Robot

- Is the HC-05 blinking?
- Has the Bluetooth device selected?
- Is the correct bluetooth device selected?
- Are the TX and RX connections wired correctly?
- Is the mobile application running in Gamepad control mode?

Quick Test Procedure

- Arduino LED is ON
- L298N LED is ON
- Left wheels rotate
- Right wheels rotate
- All four wheels rotate in the same direction when the Forward command is given
- IR sensor LEDs respond to the line
- Ultrasonic sensor responds to distance changes
- Bluetooth connection can be established successfully

Final Check

- All screws are tight but do not restrict movement.
- All cables are connected according to the circuit diagram.
- Sensors are facing the correct direction.
- The Arduino code has been uploaded successfully.
- The robot has been tested on a flat surface.
- The first test was performed at low speed.

Tip: Test the motors first, then the sensors, and finally the Bluetooth or autonomous functions. This step-by-step approach makes troubleshooting much easier.

NOTES