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Location: [Home](#) » [OSOYOO Robot Car Kit A series](#) » [V2.1 Robot car kit](#) » Osoyoo V2.1 Robot Car Lesson 7: Imitation Driving with Bluetooth APP

Osoyoo V2.1 Robot Car Lesson 7: Imitation Driving with Bluetooth APP

Post Time: 2020-05-12 18:05:57

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NOTE: ALL OSOYOO PRODUCTS FOR ARDUINO ARE THIRD PARTY BOARD WHICH IS FULLY COMPATIBLE WITH ARDUINO

OSOYOO V2.1 Robot Car for Arduino Lesson 7 : Imitation driving with bluetooth



Authorized Online Retailers

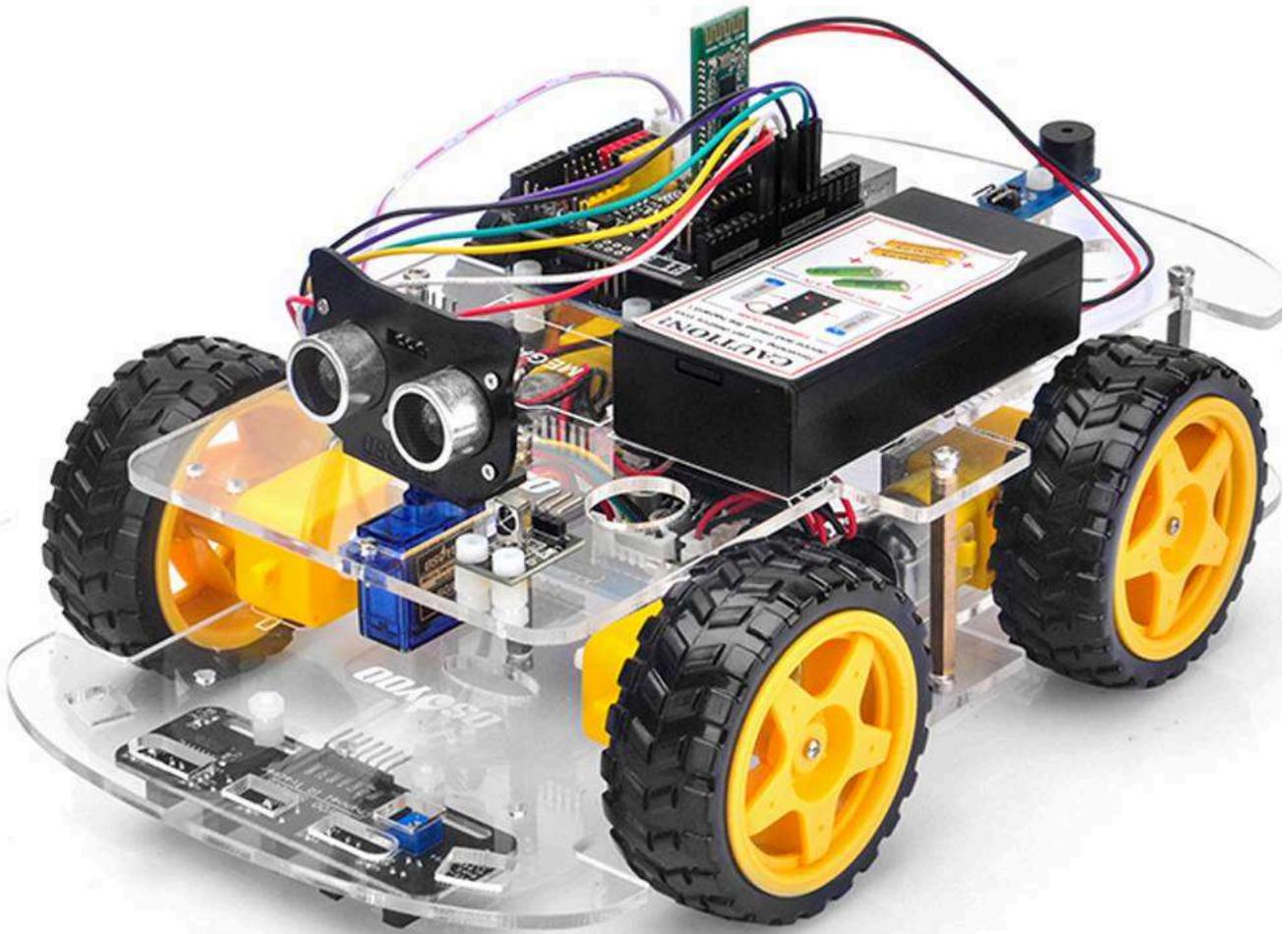
Where to buy the set with 18650 batteries and USB charger

Buy from OSOYOO	Buy from US	Buy from UK	Buy from DE	Buy from IT	Buy from FR	Buy from ES	Etc
OSOYOO Store	BUY NOW						

Buy the V2.1 Robot car without Battery and charger:

Buy from OSOYOO	Buy from US	Buy from UK	Buy from DE	Buy from IT	Buy from FR	Buy from ES	Etc
OSOYOO Store	BUY NOW						

Objective:



In this lesson, we will use Mobile to control our robot car and make an imitation driving. Since it is a mock driving, we will use a virtual steering wheel and gear in our APP to imitate their counterparts in real car.

You must complete **lesson 1 (assembling the car)** before you continue on with this lesson.

Parts and Devices

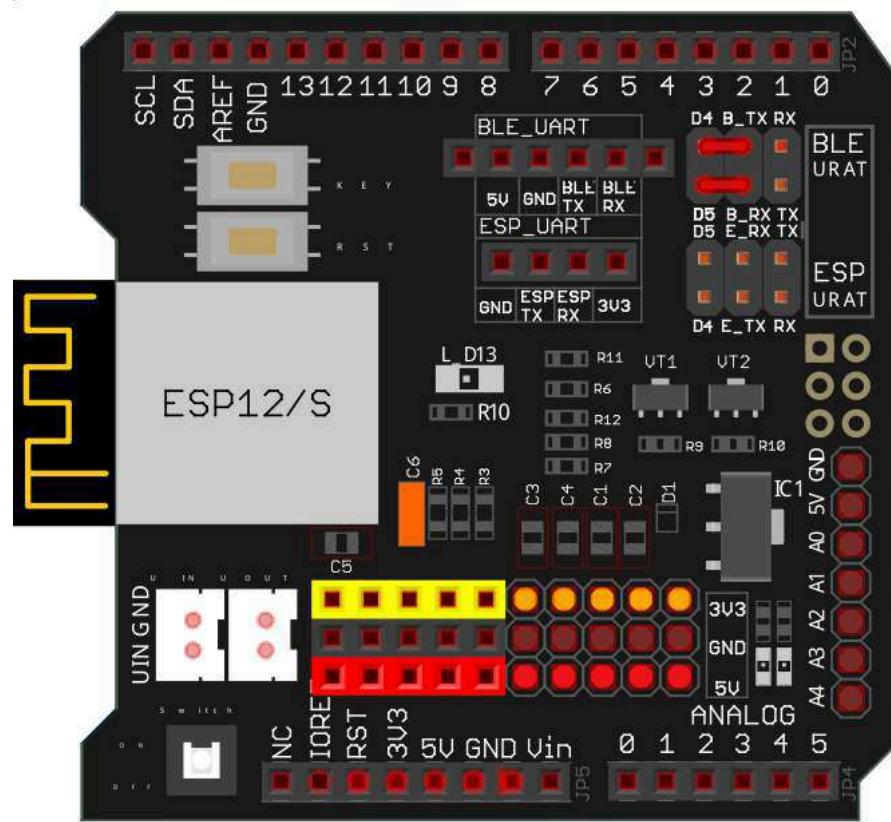
No.	Picture	Device	Qty.	Accessories	Link
1		HC module	1		Click here to

Hardware Installation

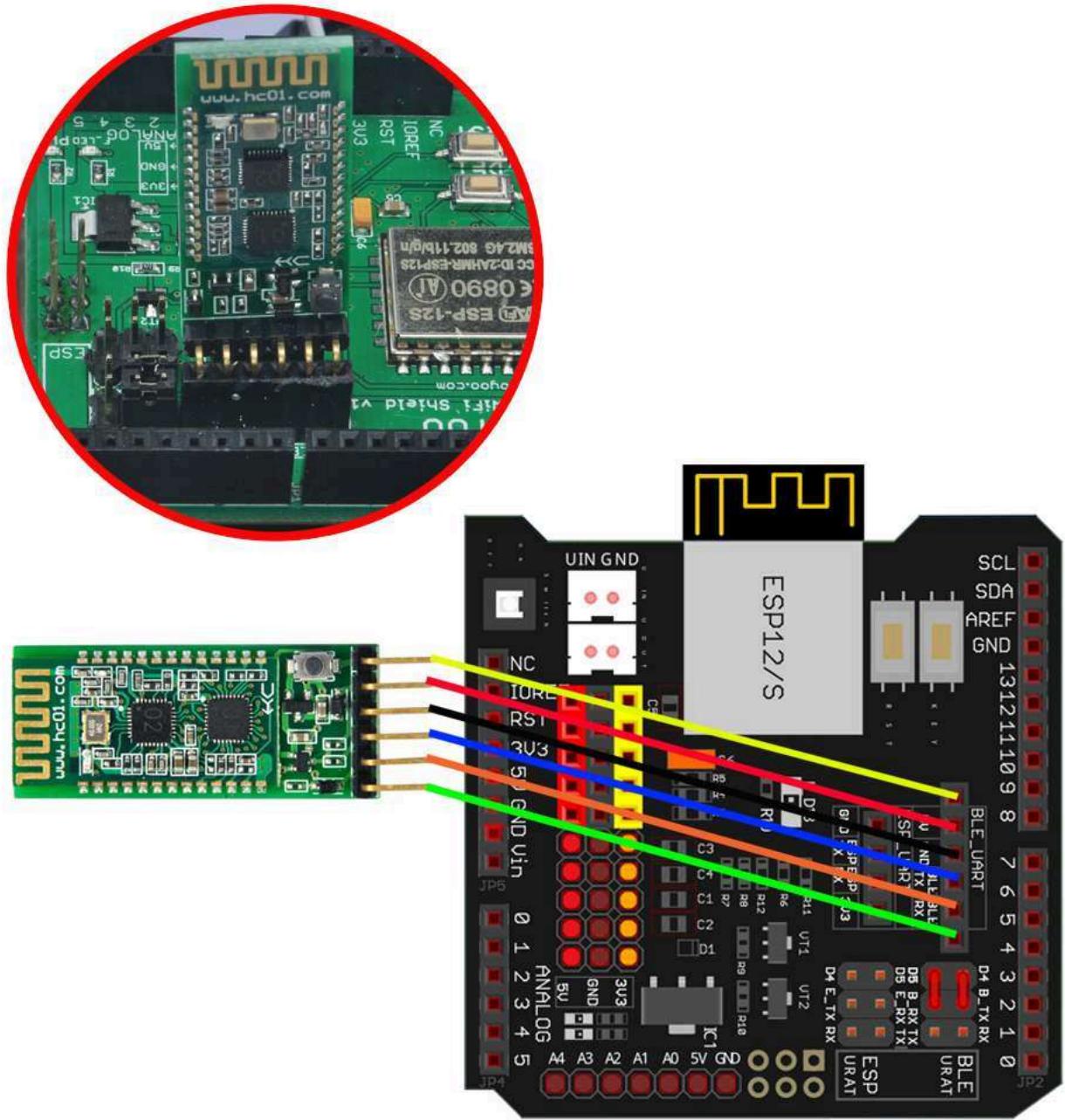
Step 1: Install the smart car basic frame work as per [Smart Car Lesson 1](#). If you have already completed installation in Lesson please remove all wires on Osoyoo basic board

Step 2: Connect Bluetooth TX/RX ports to D4,D5 with jumper caps

Note: Our OSOYOO Uart WiFi shield V1.3 are connected BLE URAT TX/RX ports to D4,D5 with jumper caps by default. If you find Bluetooth TX/RX ports is not connected to D4,D5, you need use a jumper cap or jumper wire to connect B-TX to D4 and B-RX to



Step 4: Insert Bluetooth Module into OSOYOO Uart WiFi shield V1.3 Bluetooth slot as following graph:



Step 3: Connect OSOYOO MODEL X motor driver module and OSOYOO Uart WiFi shield V1.3 as following graph:

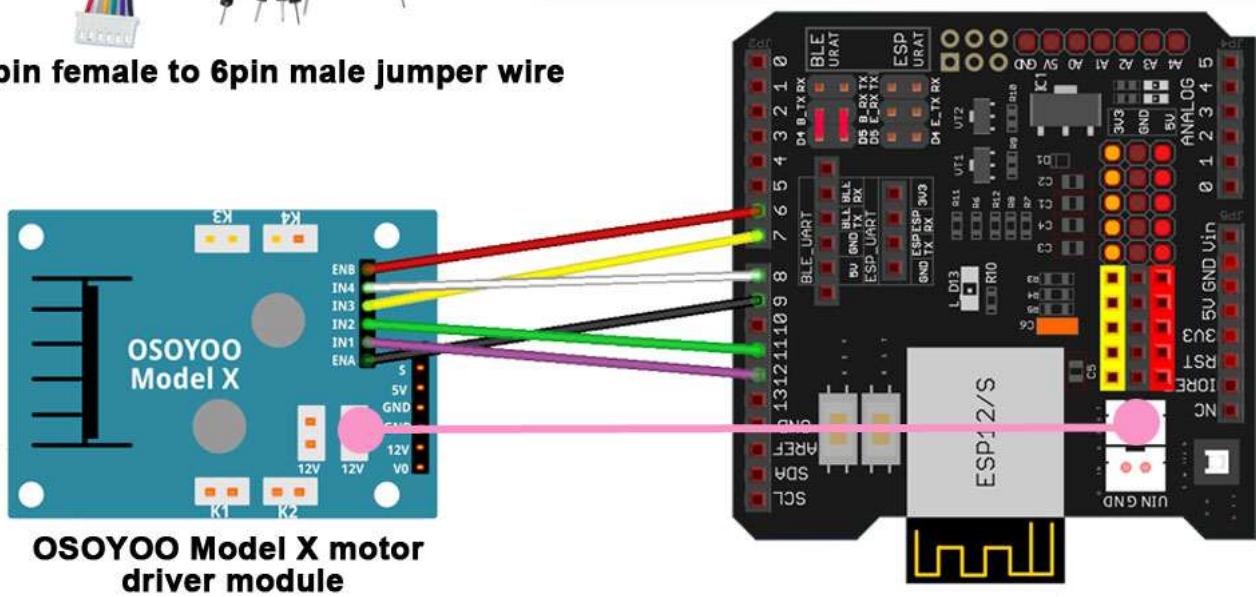
Remember following tips restore your motor control system to lesson 1:

- If your last project is lesson 1,2,3,4, your motor control system is same as Lesson 1, no need do anything.
- If your last project is lesson 5,6, you need change ENA wire from D3 to D9, keep wiring in D6,D7,D8,D11,D12 at same position, remove all other wires in OSOYOO Uart WiFi shield V1.3.

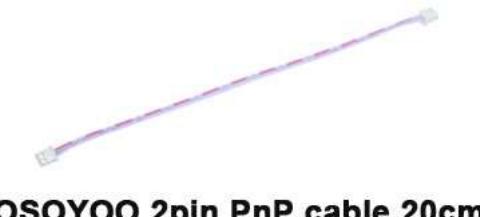
I suggest you run the sketch code in Lesson 1 and make sure motor connection is correct. This is very important for next steps.

**6pin female to 6pin male jumper wire**

OSOYOO MODEL X motor driver module	Color	OSOYOO Uart Wifi shield V1.3
ENA	Black	D9
IN1	Purple	D12
IN2	Green	D11
IN3	Yellow	D7
IN4	White	D8
ENB	Red	D6



OSOYOO MODEL X motor driver module	OSOYOO Uart WiFi shield V1.3
12V	VIN
GND	GND



Software Installation;

Open-source Arduino Software(IDE)		Download IDE here: https://www.arduino.cc/en/Main/Software?setlang=en
7 zip is a free zip utility that un-zips zip files		Download 7zip here for free https://www.7-zip.org/
OSOYOO imitation driving Robot APP		search “OSOYOO imitation driving” in Google Play Google Play or Apple APP store (Note: If you can not find this APP in Google Play, you can directly download the APP from following link: https://osoyoo.com/driver/v1car.apk)

Step 1: Install APP into your mobile phone:

1) Install APP on Android device as following

In Google Play store search APP name “OSOYOO imitation driving”, download the APP as following and install it in your smart phone

If you can not use Google Play to find the APP, please Download the APP from following link
<https://osoyoo.com/driver/v1car.apk>.



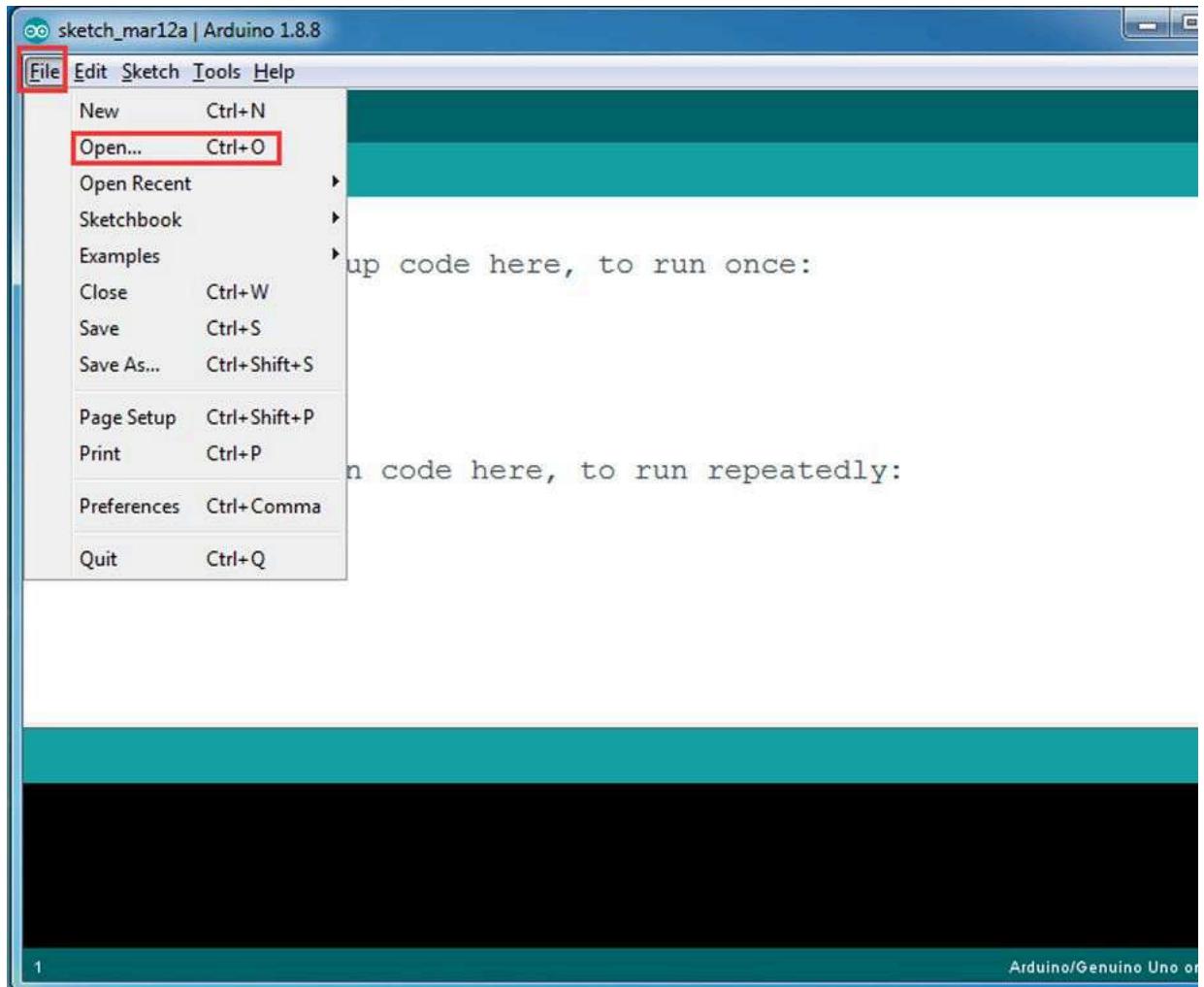
2) Install APP on Apple IOS device as following

In Apple APP store search APP name “OSOYOO imitation driving”, download the APP as following and install it in your smart phone

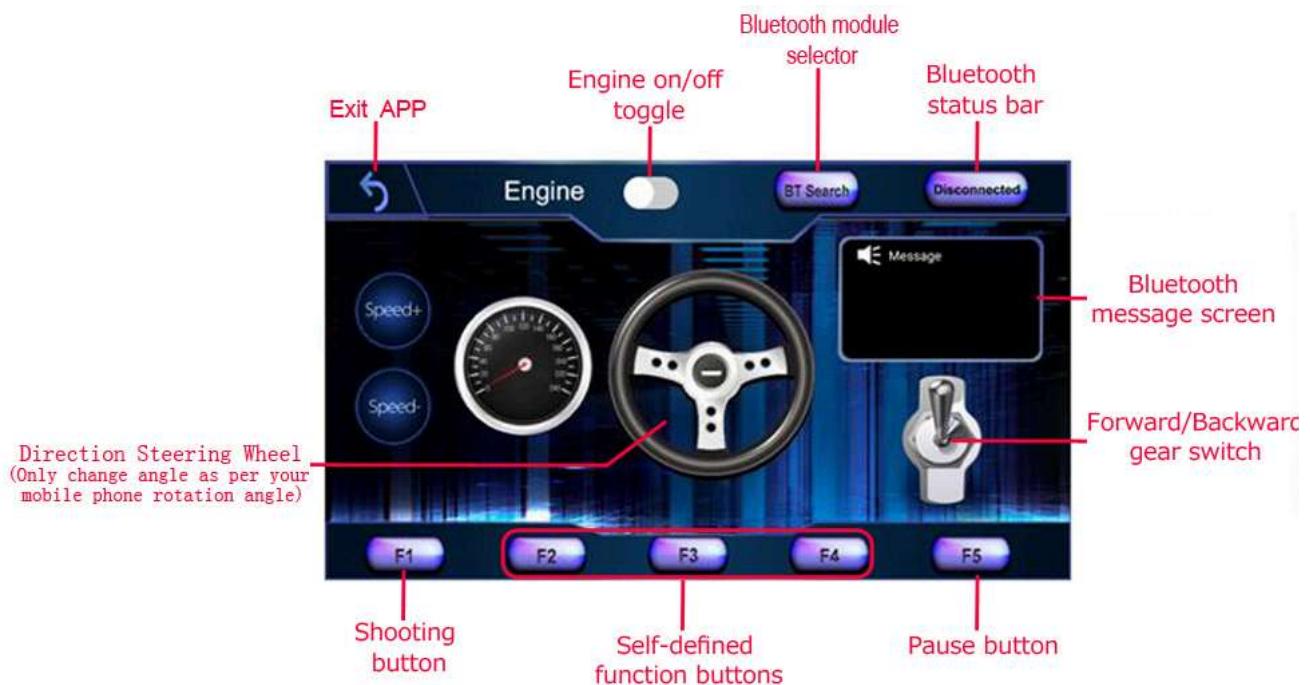


Step 2: Download and install sketch code from [v2smartcar-lesson7](#). Unzip this file, and you will see a folder called v2smartcar-les

Open IDE -> click file -> click Open -> choose code “v2smartcar-lesson7.ino” in v2smartcar-lesson7 folder, load the code into you



EXPLANATION OF APP UI



- **Connect HC-02 bluetooth in Android phone.** There is a **BT Search** button in Android APP: When click button, you will see a Bluetooth device list which has been paired with your APP. Select HC-02 device to connect the car. Once HC-02 is connected, Bluetooth Status will change from Disconnected to Connected. You can control your car when Bluetooth is connected.

- **Connect HC-02 bluetooth in iPhone/iPad**, simply click **Connect** button, a HC-02 device will show up in pop-up list. Click that HC-02 device will connect Bluetooth module to your iPhone. Then the Connect button change name to **Disconnect**.
- **Engine toggle** : When Engine toggle is set to OFF(white), car will stop and all buttons in the APP will be disabled. When Engine toggle is set to ON(red), car will start to move. All other movement control buttons will active.
- **Forward/Backward gear switch**: This gear switch can control the car is moving ahead or reverse like real gear.
- **F1,F2,F3,F4,F5 customized button**. In this lesson, we only use F5 which pause the the car movement. The difference between F5 and Engine OFF button is that Engine OFF button when touched, all other buttons will be disabled. You should toggle Engine button again to enable other button. On the other hand, when F5 is clicked car will stop but all other buttons is still active. Even you do not touch any button just change your cell phone position(like you move the steering wheel), the car will move again.
- **Direction Steering Wheel** : When you rotate your mobile phone angle, the steering wheel will change angle per your mobile phone rotation angle. This will make your car change direction. For example, when steering make clockwise rotation, car will move to left. Remember, the steering and Forward/Backward gear should be together same as you are driving a real car. For example, when you want back your car to a right side park you need set Gear to R position and rotate your steer to count-clockwise direction.
- **Speed+**: Make the robot car speed up
- **Speed-**: Make the robot car slow down

Connect APP to HC-02 Bluetooth Module

• Connect with Android device:

If you use **Android** device and have not paired Bluetooth module with your cell phone, please pair the bluetooth module first before open the APP. In your cell phone Setting->Bluetooth ,find a Bluetooth device called **HC02**, pair with password 1234.After bluetooth HC02 device is paired, open the APP. Click **BT Search** Button to connect / HC02 device.

• Connect with iOS device:

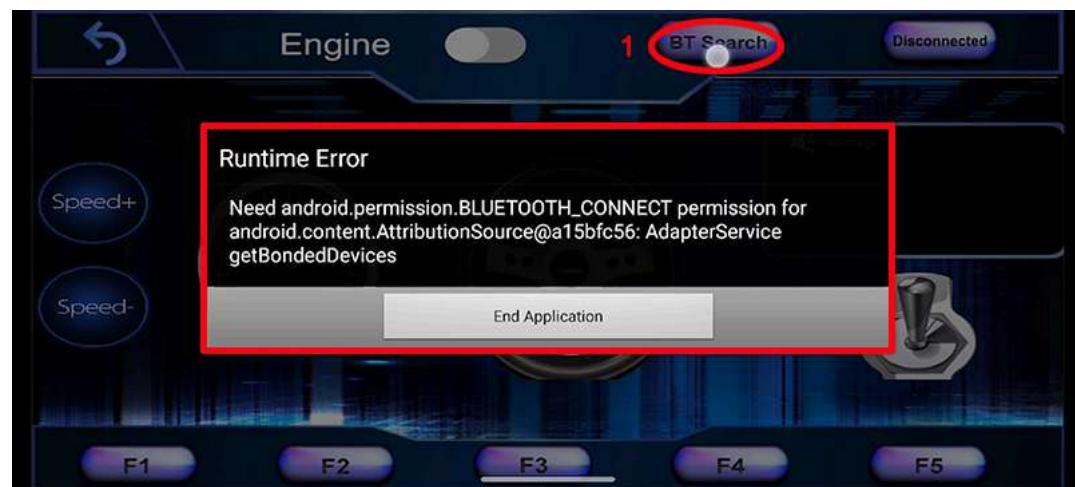
If you use iOS device, simply open the APP, click Connect button, you will see a Bluetooth list, select the HC02 device.

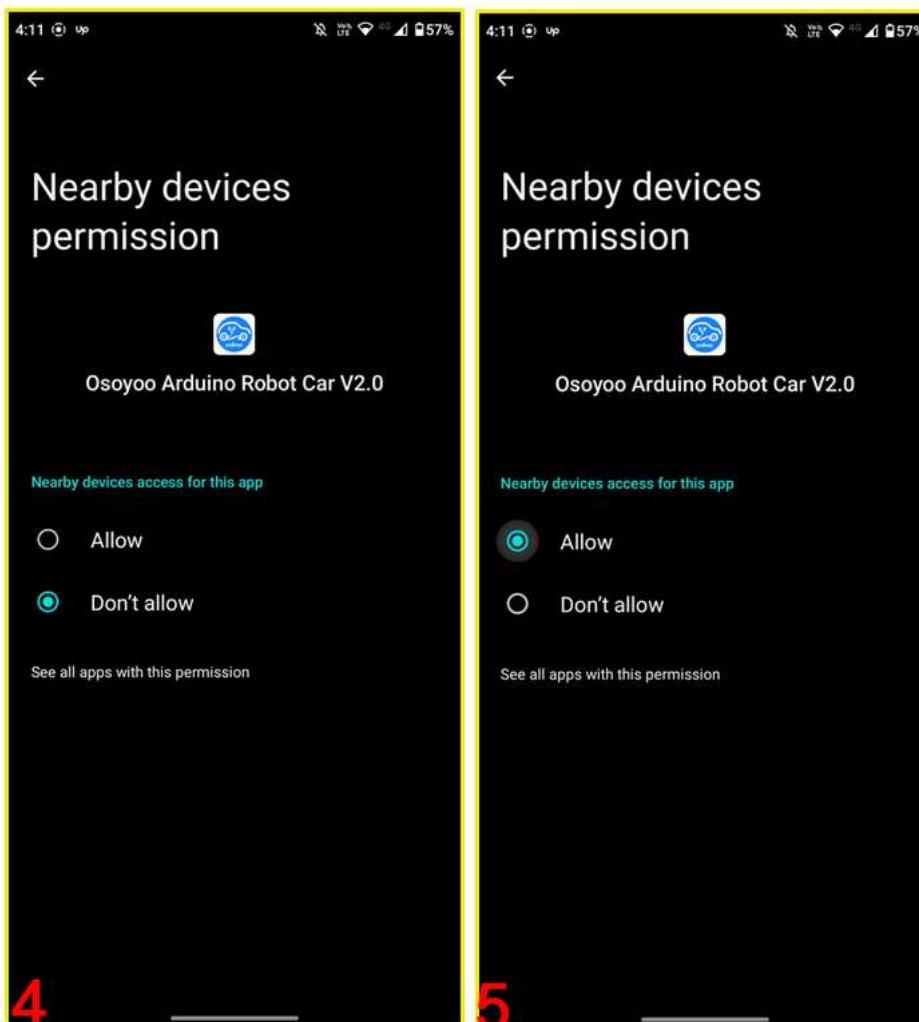
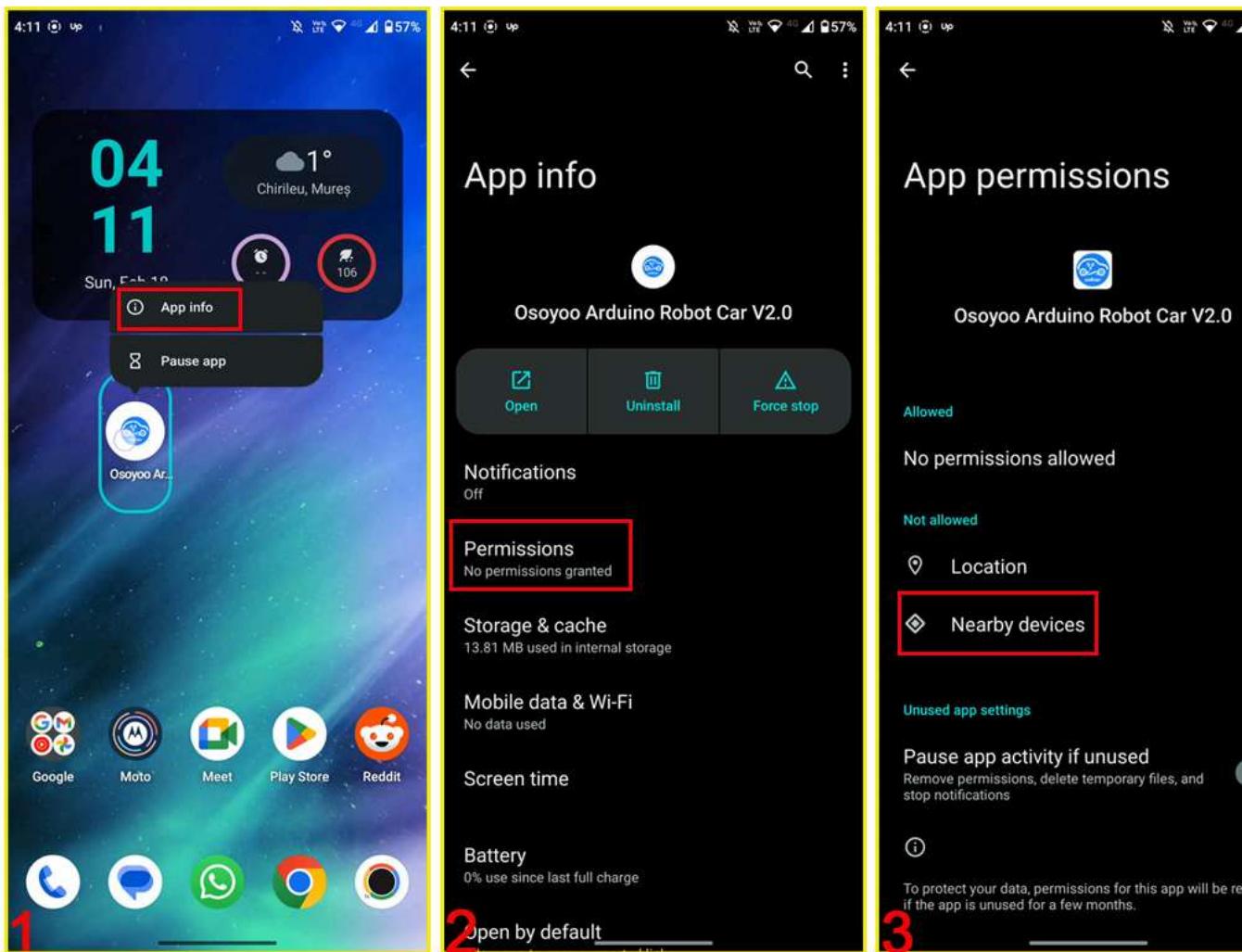
Note: For Android device, when you click BT search button and get the following error pop, Please follow the next steps

1. long-press the APP icon, then click "APP info"

2. click "Permissions"

3.click "Nearby device", then change the option as "Allow" (To learn more about settings, you can visit the video:
https://osoyoo.com/picture/V2.1_Arduino_Robot_Car/Lesson7/APP.mp4)





Drive your Robot Car

Now you have installed your hardware and software for this lesson, let's drive our car!

Step 1)Put your robot car onto the ground and turn on the switch.

Step 2)Go to your mobile phone ->Setting ->Bluetooth setting and search a Bluetooth device called HC-02, pair it with code 1234

Step 3)Open OSOYOO imitation driving Robot APP, Click BT Search button and find the bluetooth you have paired

Step 4)Turn on Engine toggle, click **Speed+** to make the robot speed up as the robot car is very slow at first. When you rotate yo mobile phone angle, your car will change direction.

Enjoy your driving!

On Android device

1. Open OSOYOO imitation driving Robot APP



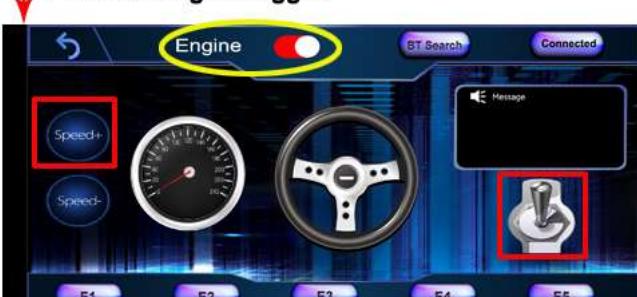
2. Click BT Search and scan Bluetooth device



3. Choose HC-02 device till device is connected



4. Turn on engine toggle



5. Click Speed+ to make the car move, click gear switch to control car move forward or backward rotate mobile phone angle to change car direction,



On IOS device

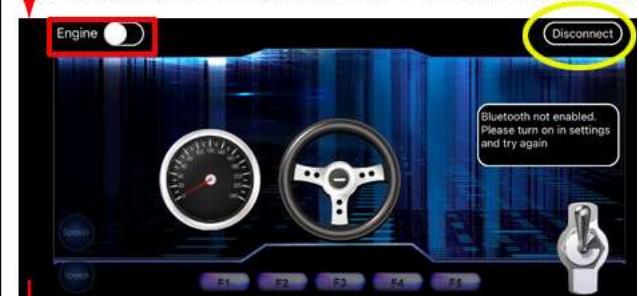
1. Open OSOYOO imitation driving Robot APP



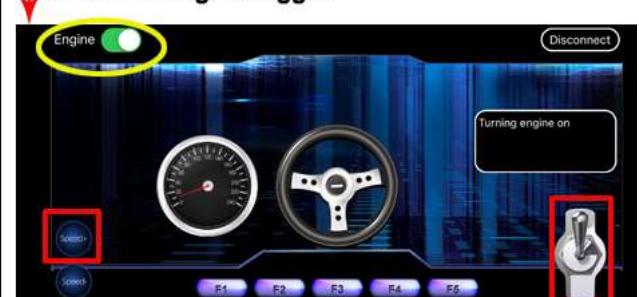
2. Click Connect and scan Bluetooth device



3. Choose HC-02 device till APP shows Disconnect

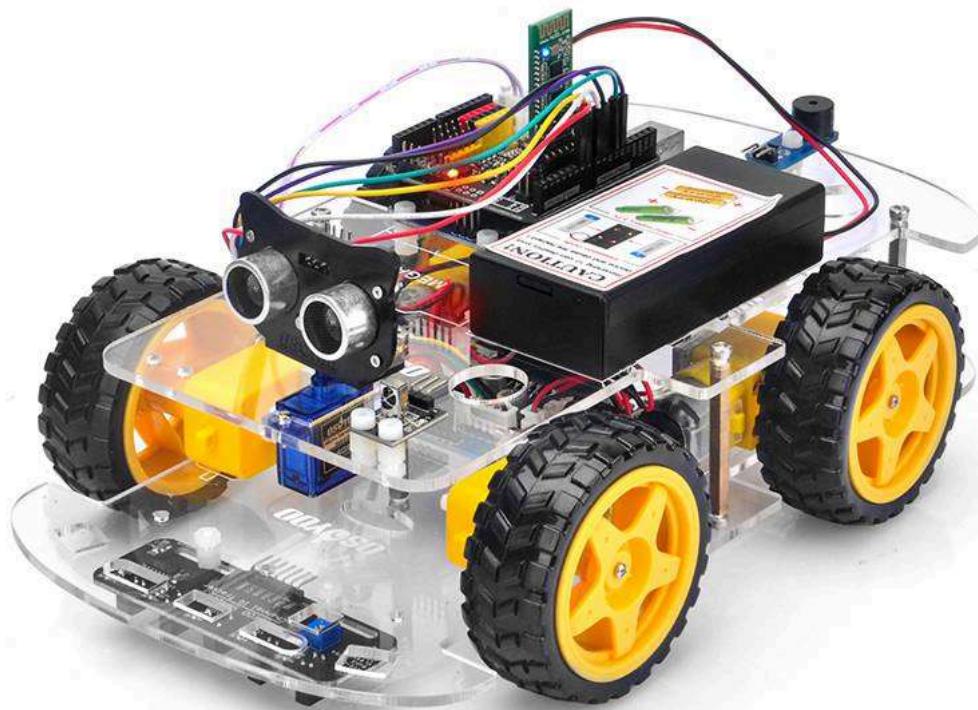


4. Turn on engine toggle



5. Click Speed+ to make the car move, click gear switch to control car move forward or backward rotate mobile phone angle to change car direction,



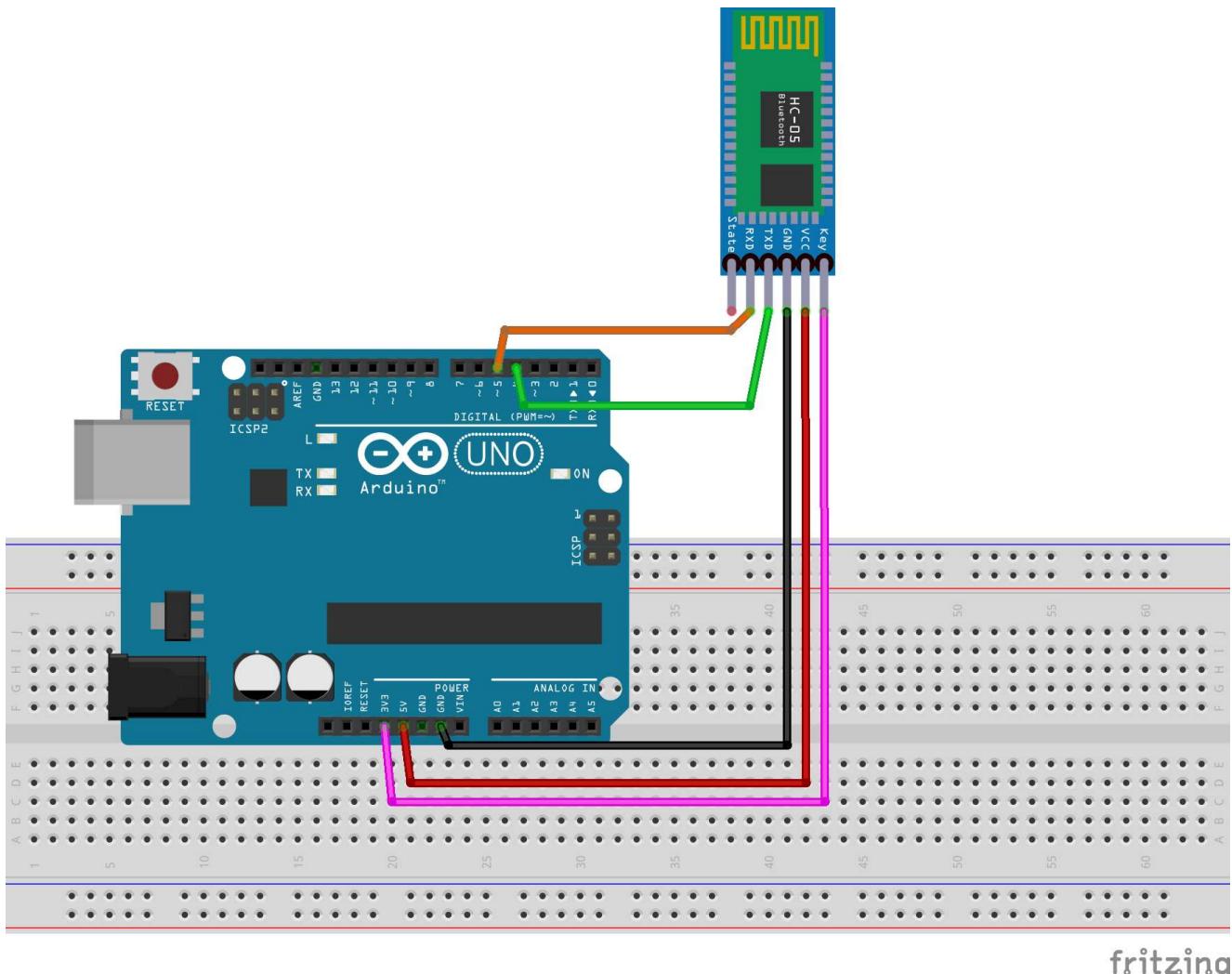


Trouble Shooting:

We have a group of students, all our robot cars are using same bluetooth name "HC-02" which might conflict with each other in the same room. How to change the HC-02 name to other bluetooth name?

1) Wire Connection

- HC-02 TX → Arduino D4 (SoftwareSerial RX)
- HC-02 RX ← Arduino D5 (SoftwareSerial TX)
- HC-02 VCC → 5V
- HC-02 GND → GND
- HC-02 KEY / EN / STATE (depending on your module) → HIGH (3.3V or 5V)



fritzing

2)Download Arduino AT command sketch from following link:

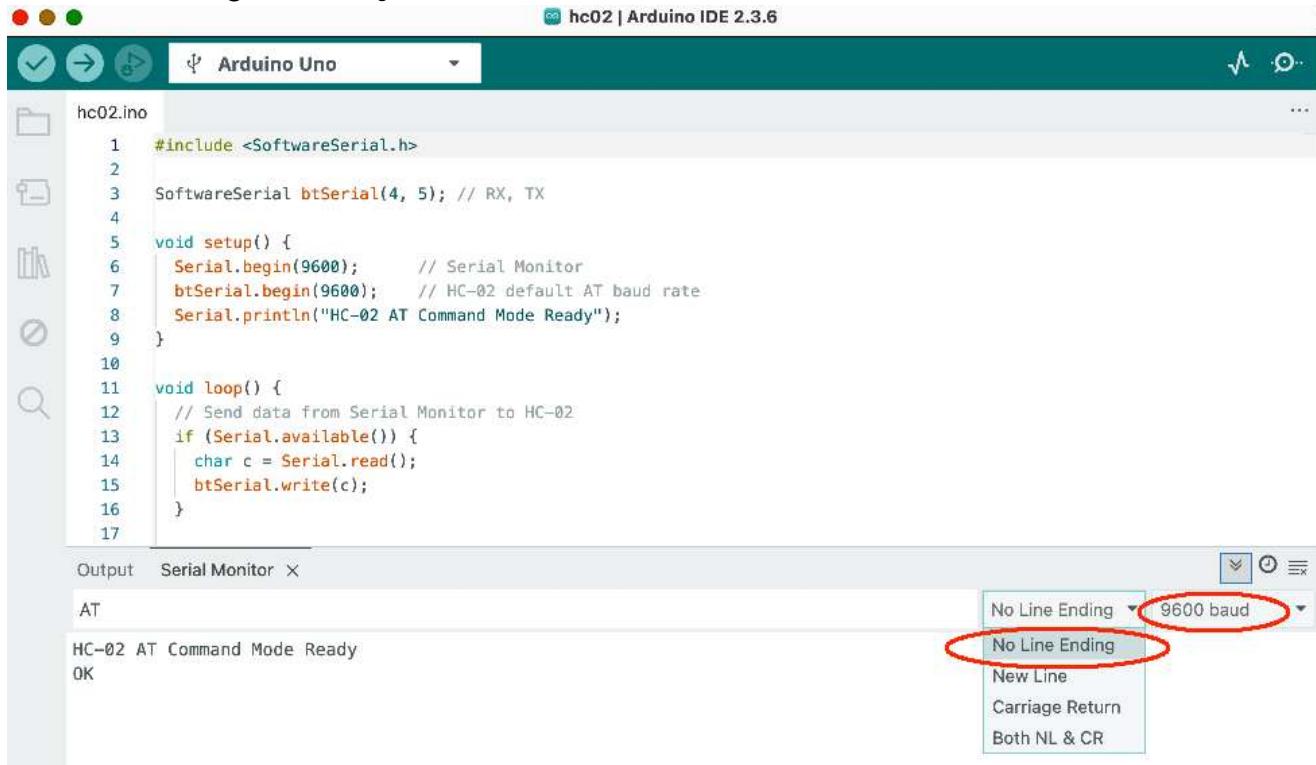
<https://osoyoo.com/driver/2wd/hc02.zip>

unzip above file , you will see a folder “hc02”, enter that folder and double click hc02.ino file to open it in Arduino IDE

3)Test AT command in Serial Monitor

After you upload the hc02.ino code to Arduino, open your Arduino IDE Serial monitor, set baud rate to 9600, set line

to **No Line Ending** as following:



The screenshot shows the Arduino IDE interface. The top bar displays "hc02 | Arduino IDE 2.3.6". The left sidebar shows project files like "hc02.ino". The main editor window contains the following code:

```

1 #include <SoftwareSerial.h>
2
3 SoftwareSerial btSerial(4, 5); // RX, TX
4
5 void setup() {
6     Serial.begin(9600);      // Serial Monitor
7     btSerial.begin(9600);    // HC-02 default AT baud rate
8     Serial.println("HC-02 AT Command Mode Ready");
9 }
10
11 void loop() {
12     // Send data from Serial Monitor to HC-02
13     if (Serial.available()) {
14         char c = Serial.read();
15         btSerial.write(c);
16     }
17 }

```

The "Serial Monitor" tab is selected at the bottom, showing the output:

HC-02 AT Command Mode Ready
OK

A dropdown menu for "No Line Ending" is open, with "No Line Ending" highlighted. Other options include "9600 baud", "New Line", "Carriage Return", and "Both NL & CR". The "9600 baud" option is also circled in red.

To test the AT command, you can type AT in output field and press enter, now you should see OK in Serial monitor (see above picture). If you can't see OK, please double check Step 1 to 3.

4)Now you can use AT command to change your HC-02 bluetooth module.

The format is AT+NAMEnewname

For example, if you want to change your HC-02 module name to osoyoo2025, then type following AT command in Serial monitor :

AT+NAMEosoyoo2025

after you press enter button, your Serial monitor will response:

OKsetname

This means your bluetooth module's new name has been changed to osoyoo2025

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DownLoad Url :

osoyoo.com

5 Comments



samGamgy says:
September 9, 2022 at 8:39 am

Hello! Me and my son have just hooked up our OSOYOO as the directions provide. We ran the lesson 1 code to check the motors are working properly. We can connect the iOS app to the HC-02 but we cannot get the engine to start. We checked everything over and cannot find our error. Any ideas?

[Log in to Reply](#)



elaine says:
September 9, 2022 at 4:17 pm

Please click speed+ several times to make the robot car move quickly.
please provide the screenshot when you operate the APP.

[Log in to Reply.](#)

James Robb says:
December 21, 2022 at 9:55 pm

Hi Elaine,
I have a small problem with Lesson 7. I have completed all connections and downloaded the App to my android phone. The BT-search finds HC-02 and App connects. I can start engine, run the back with toggle control and pause the car with button F. However the steering wheel does not work. Have you any suggestions?
Regards, James Robb.

[Log in to Reply.](#)

elaine says:
December 23, 2022 at 12:21 pm

hi, James,

The way you rotate your cell phone may be wrong. You need to rotate the cell phone vertically not horizontally. Please see our video.

If it doesn't work yet, please tell me which version Android IOS of your phone.
Elaine

[Log in to Reply.](#)

James Robb says:
December 23, 2022 at 9:54 pm

Hi Elaine,
I have already tried all movements of the phone. I have a Blackview A50 mobile phone (no sim card) only used as controller. It has Android 11 o/s.

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