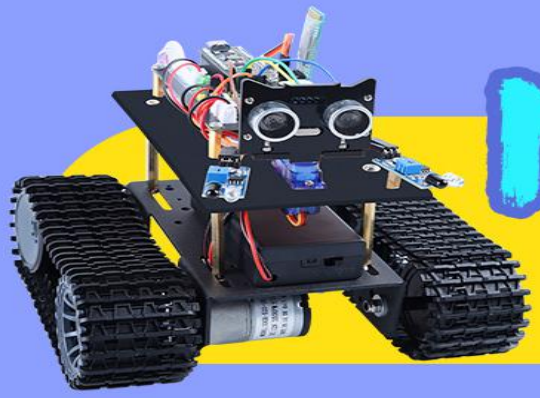

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Lesson 8 Bluetooth Car

Points of This Section

It is very important and so cool to control your car wirelessly in a certain space when we learn the Arduino. So in this lesson, we will teach you how to control a car by Bluetooth.

Learning Objectives:

Learn how to use the Bluetooth module and the Bluetooth APP Learn how to control the light by using Bluetooth
Learn how to control the vehicle via Bluetooth.

Preparations:

A vehicle (equipped with battery) A USB cable
A Bluetooth module A Phone or tablet.

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Ⅰ. Bluetooth module (HC-06)

The Bluetooth is a wireless technology standard for exchanging data between fixed and mobile devices over short distances using short- wave UHF radio waves in the industrial, scientific, and medical radio bands (2.400 to 2.485 GHz), and building personal area networks (PANs). There are also RF protocols such as ZigBee and Wi-Fi.

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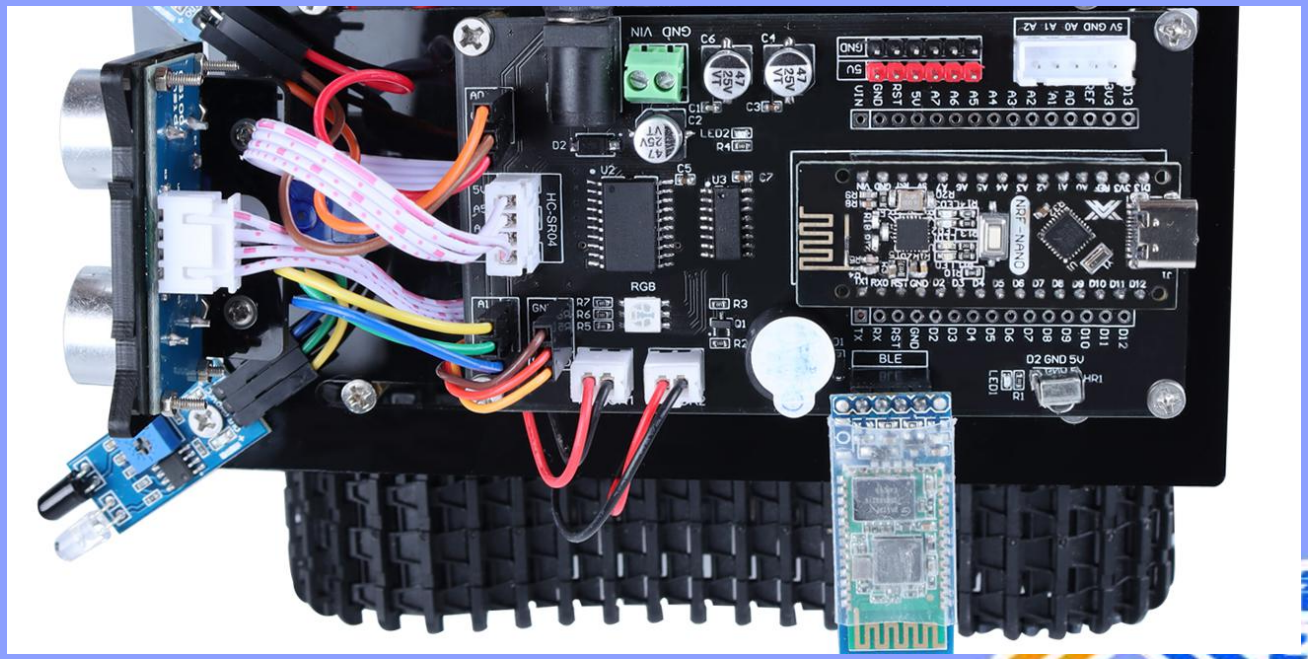
In NANO Bot Car Kit, we use the Bluetooth module model "HC-06", it can send serial data to other devices via Bluetooth.
HC-06 communicates with NANO through the RX/TX pin on the shield.



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Ⅱ. Getting Started BLE Tool APP

Before beginning, connect the HC-06 Bluetooth module to the expansion board and turn on the power.

STEP1: Install the application

Currently there are only Android apps:

For the Android system, copy the APK file to the Android product device and install it.

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STEP1:Open the "Arduino bluetooth controller" application

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III. Make a Bluetooth Car

When the car turns left or right, it's not necessary to set the speed too fast. On the contrary, we need to control the speed of the car. But how to control?

The answer is PWM.

PWM is the abbreviation of "Pulse Width Modulation", is called pulse modulation in short, is an effective technique to control analog circuit with digital output of microprocessor, car is used to change the speed of motor by altering duty cycle of a square wave. In other words, connect and break circuit between two sides of motor constantly is the switch of holding motor work, and motor will not be off when power is off because of the fast speed.

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So we can control the speed of car if we control specific value of power-on time and power-off time. The speed of car will be maximum when circuit is holding still. The speed of car will be minimum if circuit is holding off. The speed of car will be median in half time. PWM is a technology to get analog quantity through digital method. A square wave is formed by digital control, there are only two states: on and off. (That is high-low of digital pins). Simulate voltage changing from 0 to 5V by controlling specific value of duration on and off time. Occupied time of on (That is high level in academy) is called pulse width, so PWM is also called pulse width modulation. Let’s learn about PWM through five square waves below.

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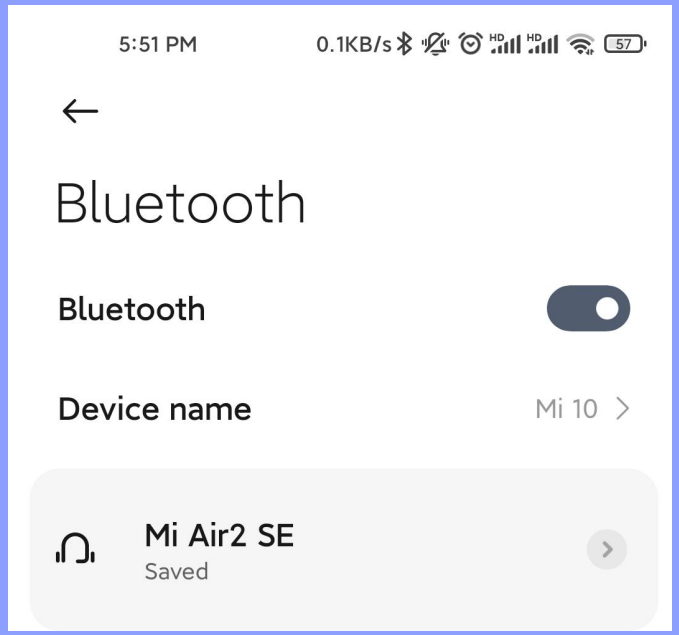
STEP2: Open the APP As below, we use an Android for example to show you how to controlSmart Robot Car via this App: First of all, turn on your cellphone's Bluetooth function.

First of all, turn on your-
cellphone's Bluetooth function.



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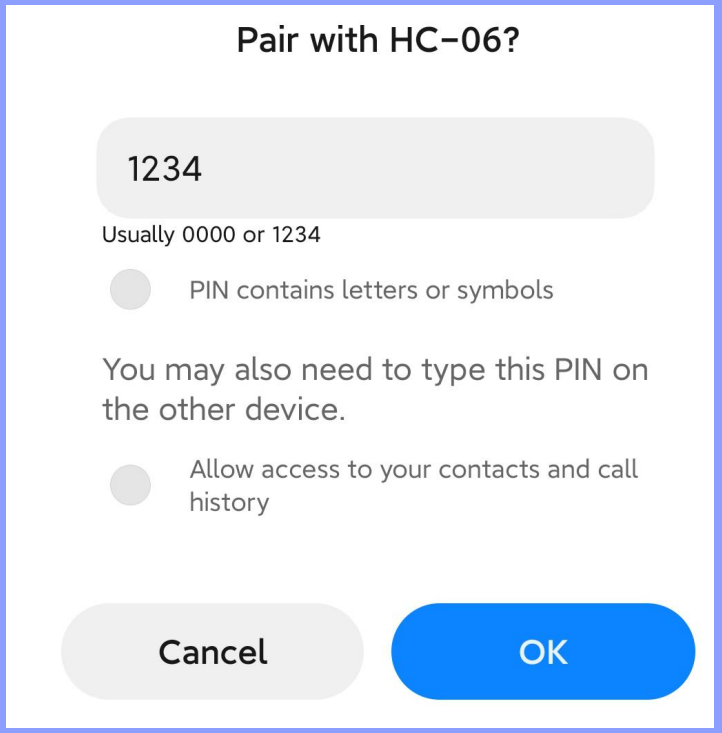
STEP3:turn on bluetooth and search for Bluetooth devices to find HC-06 connection. The default connection pairing password is 1234 or 0000.



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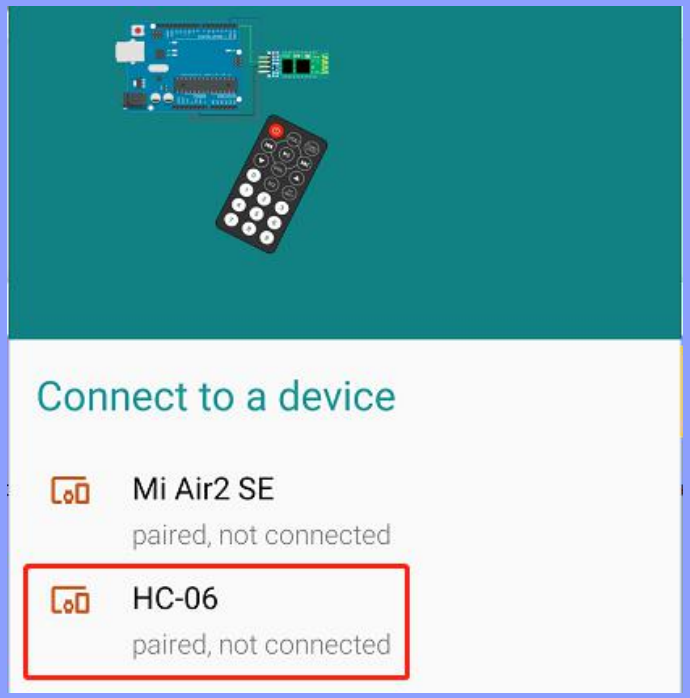
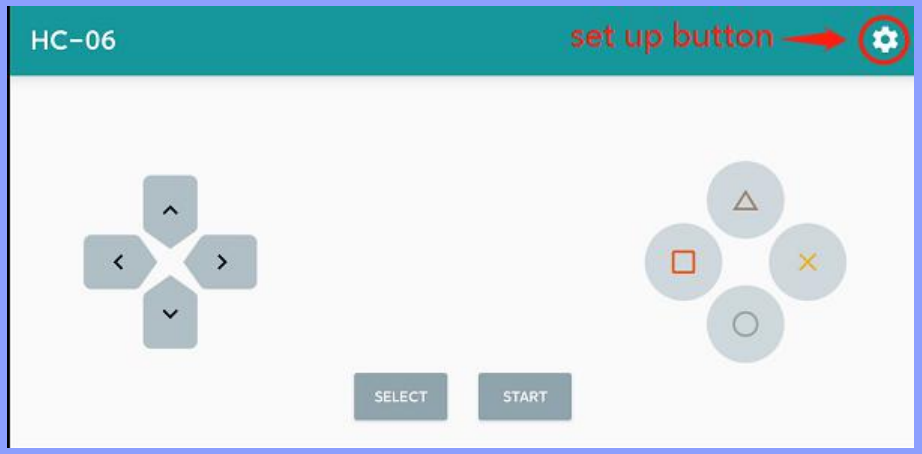
STEP4: Open bluetooth Assistant and find the bluetooth module name HC-06 just configured. After successful connection, a remote control main interface will appear.





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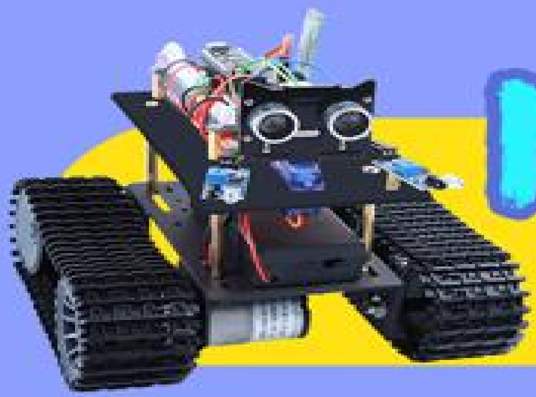

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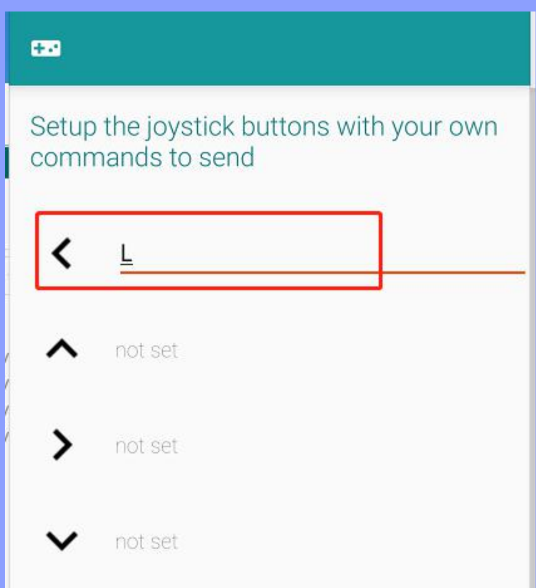
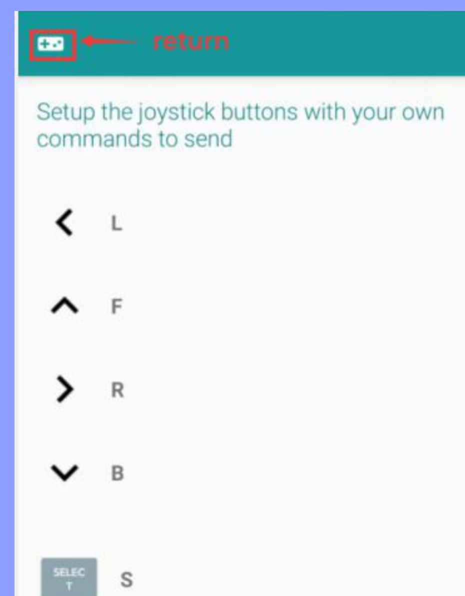
STEP5: Command Settings, such as L for trolley moving to the left.
Select the icon in the upper left corner to return to the control interface.





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Prompt:

When uploading the code to the Nano-NRF board, remove the Bluetooth module from the trolley. After uploading, install the Bluetooth module to the trolley. This is because the pins of the Bluetooth and the download program chip are both connected to the TX and RX pins of the Nano-NRF board, otherwise the program upload will fail.

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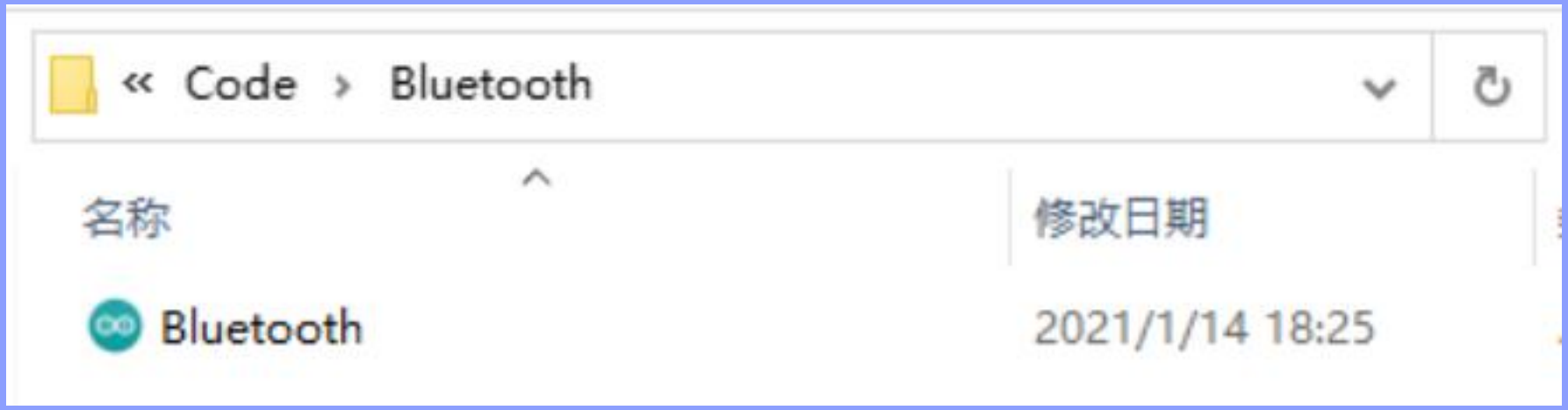
STEP6: the program is uploaded to the Nano-NRF board to achieve Bluetooth control of the car.



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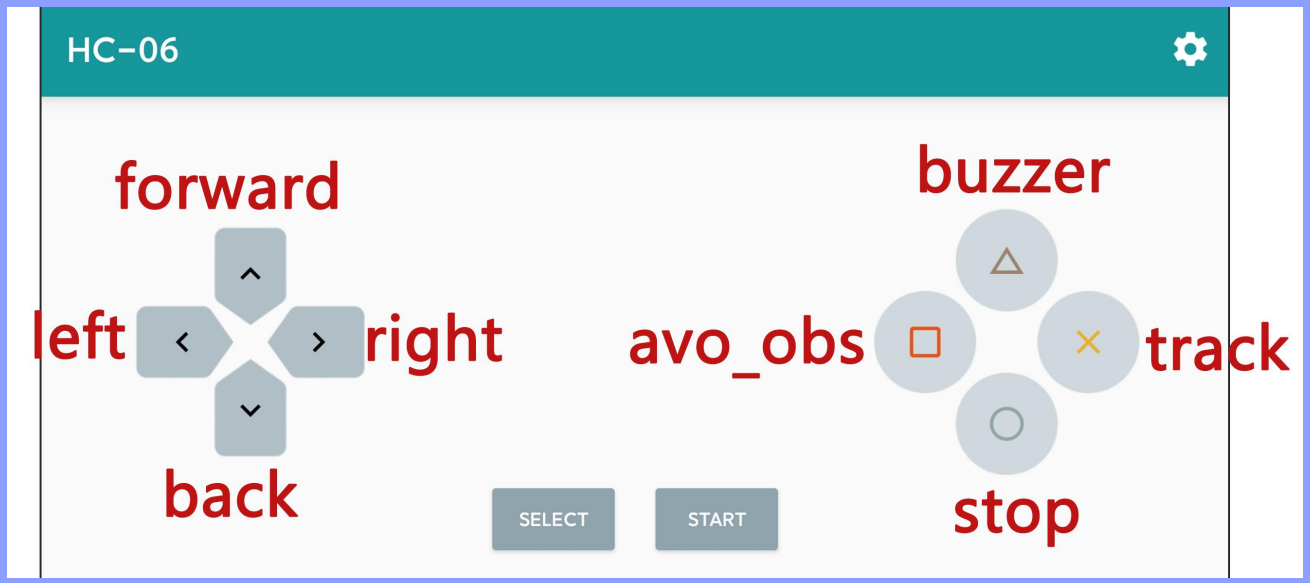
STEP7: When the program is successfully uploaded to the car, the Bluetooth module connects to the phone and everything is ready, then you can send commands to the car, such as pressing the forward button to make the car move forward.



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Thanks for watching!

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