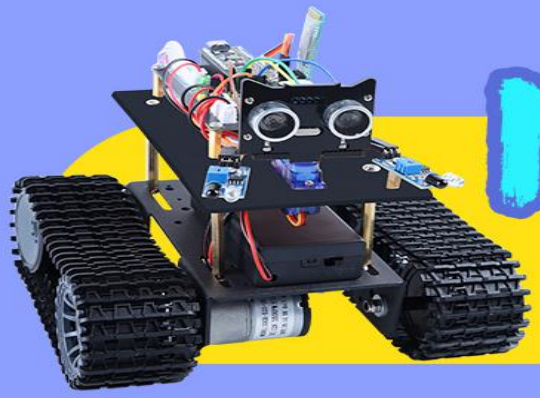

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Lesson 7 Infrared Car

Points of This Section

The joy of learning lies not only in learning how to control your car, but also in learning how to protect your car. So, keep your car far away from collision.

Learning Objectives:

Learn how to assemble the ultrasonic module
Be familiar with using steering
Learn about the principle of obstacle avoidance car
Use the program to make obstacle avoidance car come true

Preparations:

A car (with battery)
A USB cable
A suit of ultrasonic cradle head

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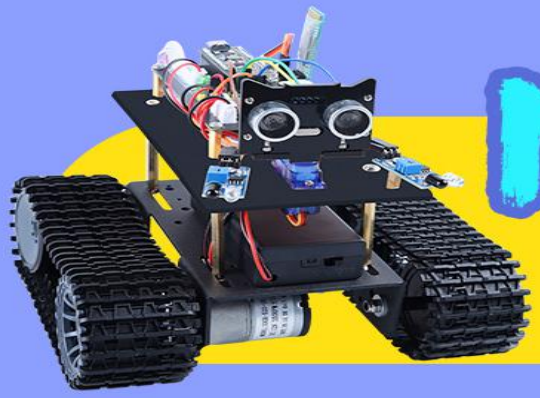

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Lesson6 Infrared Car

The point of this part is that when we learn about Arduino it's really important to control your car wirelessly in a certain space.

So in this lesson, we're going to teach you how to control a car with an infrared remote control.

Objective: Learn how to use infrared remote control to control a vehicle.

Preparation:

a car (equipped with batteries)

a USB cable and an infrared remote control

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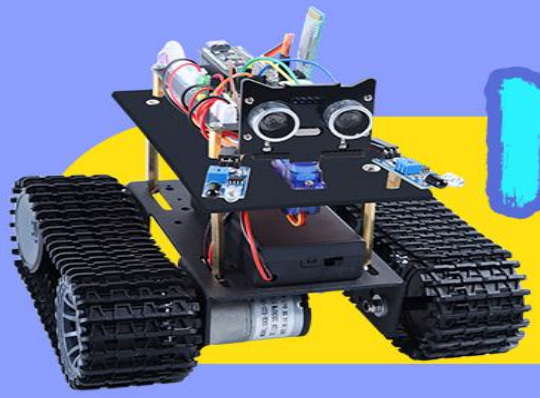

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There are a few difference between these and say a CdS Photocells:
IR detectors are specially filtered for IR light, they are not good at detecting visible light. On the other hand, photocells are good at detecting yellow/green visible light, and are not good at IR light.
IR detectors have a demodulator inside that looks for modulated IR at 38 KHz. Just shining an IR LED won't be detected, it has to be PWM blinking at 38KHz. Photocells do not have any sort of demodulator and can detect any frequency (including DC) within the response speed of the photocell (which is about 1KHz)
IR detectors are digital out - either they detect 38KHz IR signal and output low (0V) or they do not detect any and output high (5V). Photocells act like resistors, the resistance changes depending on how much light they are exposed to.

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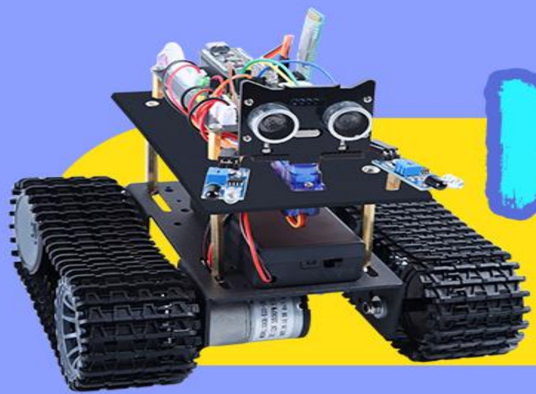

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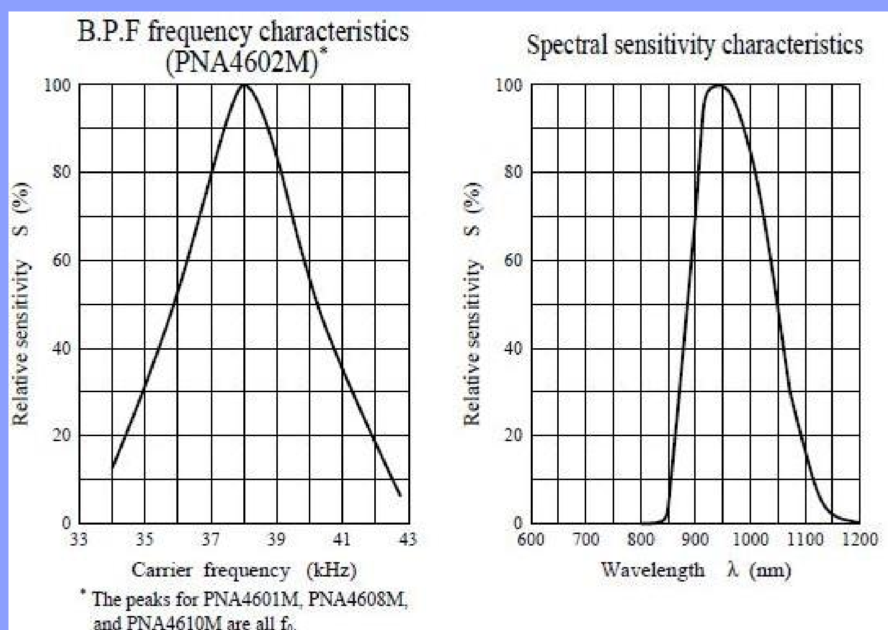
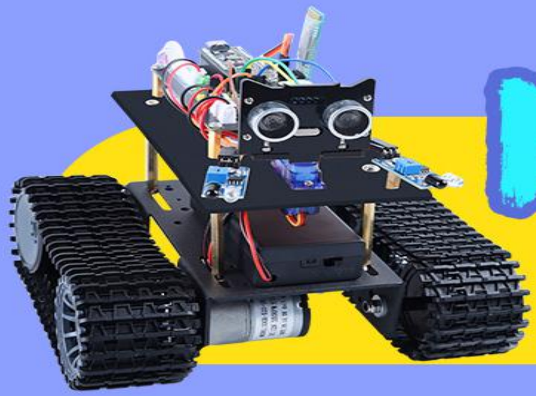
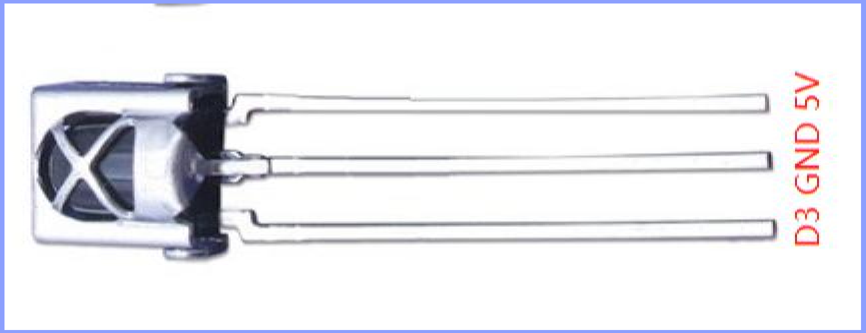
What You Can Measure:

As you can see from these datasheet graphs, the peak frequency detection is at 38 KHz and the peak LED color is 940 nm. You can use from about 35 KHz to 41 KHz but the sensitivity will drop off so that it won't detect as well from afar.





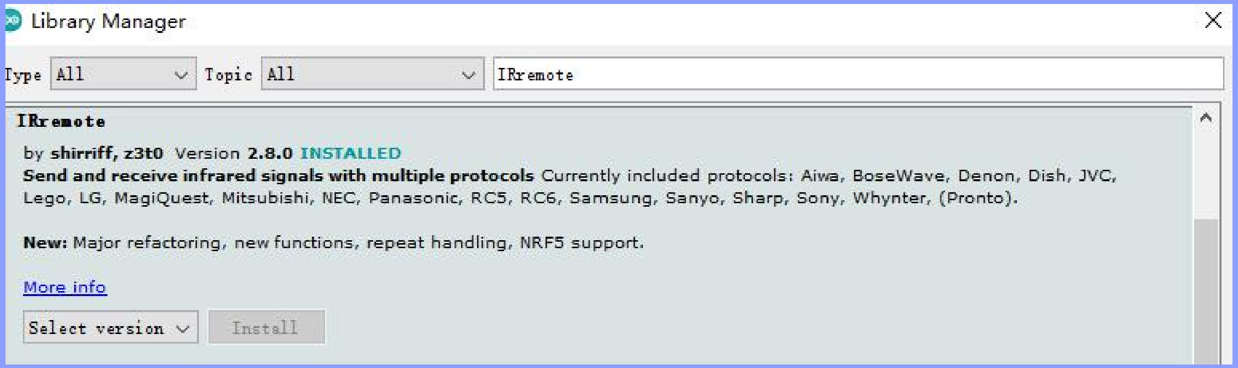
The infrared receiver head has three pins, which have been integrated into the Nano extension board. Connected to the Nano's two pins, the LED light next to the receiver flashes when a signal from the remote control is received.

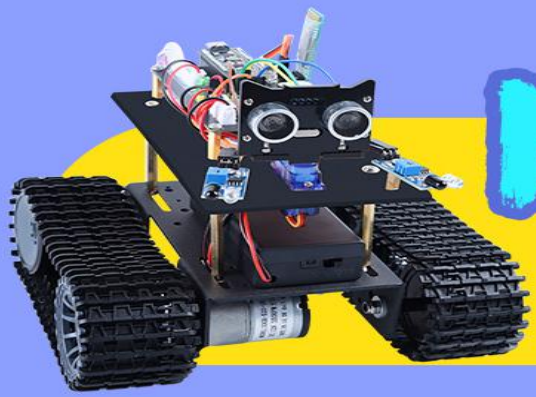


Infrared remote control library installation

steps: In the IDE, click "Project" - "Load Libraries" - "Manage Libraries" and look for "IrRemote" to install.

The image below is installed. If yours is not installed, click Install.





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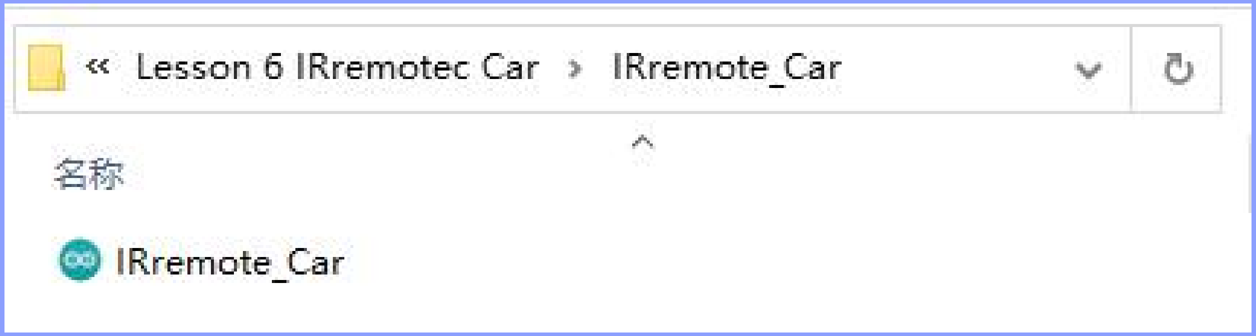
Finally, the program is uploaded to the Nano-NRF board to realize the infrared control of the car. Press the button of the remote control to switch the car mode, such as: obstacle avoidance mode, follow mode, car direction (forward, left, right turn, back) and other modes.



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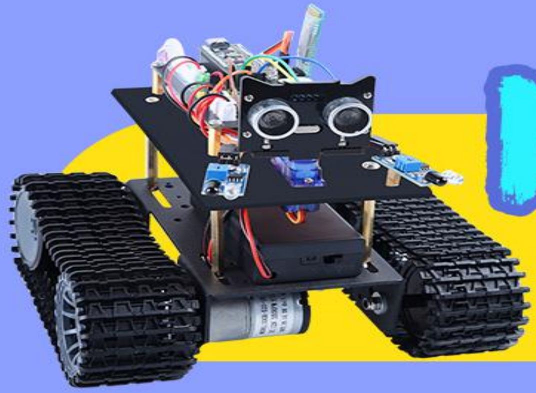

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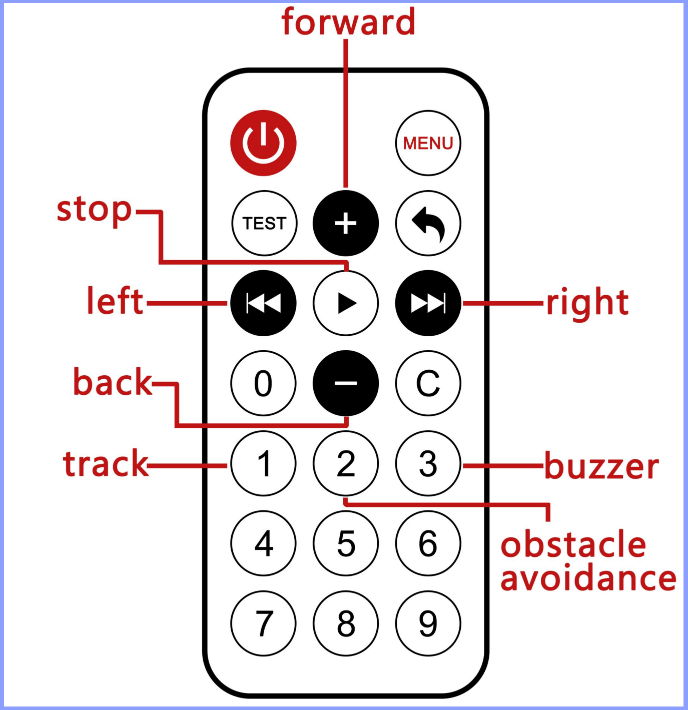
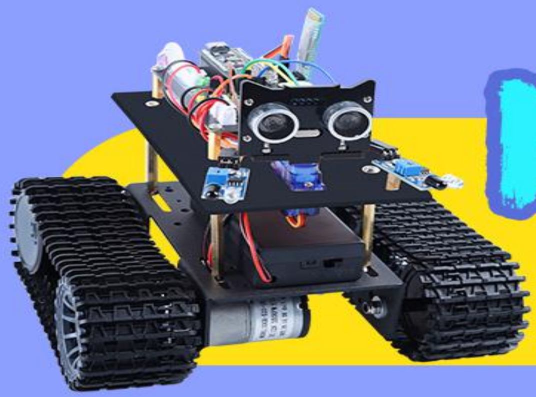
The picture on the right is the physical picture of the infrared remote control. The value of each key is different, and the key function can be customized.
For example, "+" is set as the car forward button.





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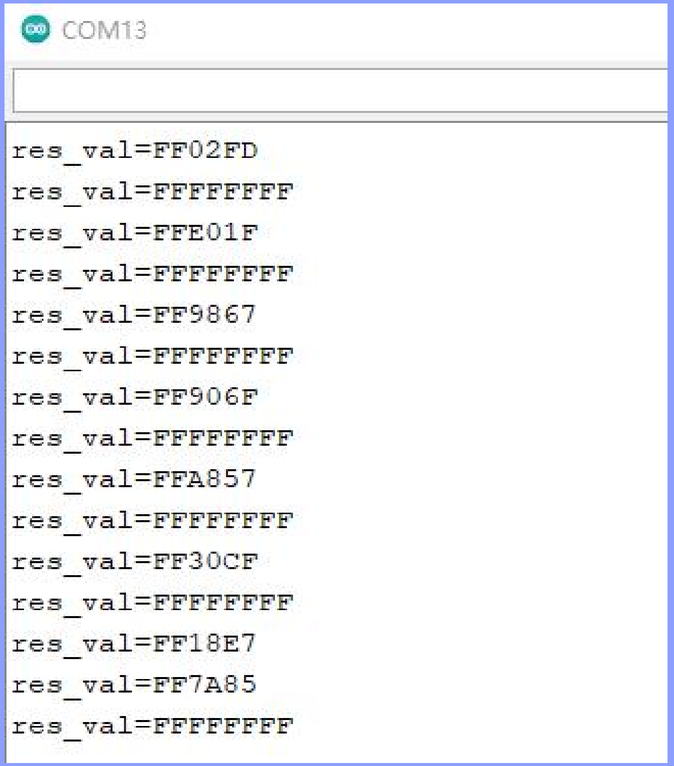
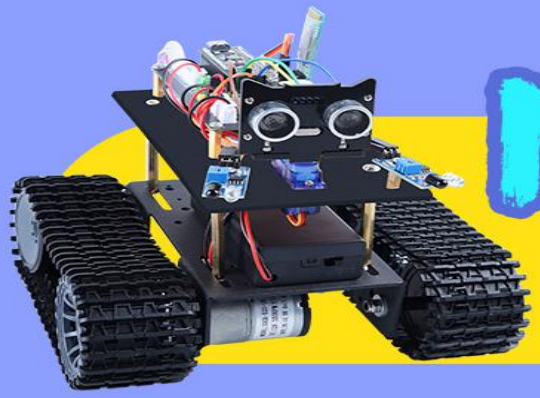
When the infrared remote control is pressed, the key codes of different keys can be seen in the serial port monitor. Then we select two key code values for conditional control, and the remote control car can be realized.



COM13

```
res_val=FF02FD
res_val=FFFFFFFF
res_val=FFE01F
res_val=FFFFFFFF
res_val=FF9867
res_val=FFFFFFFF
res_val=FF906F
res_val=FFFFFFFF
res_val=FFA857
res_val=FFFFFFFF
res_val=FF30CF
res_val=FFFFFFFF
res_val=FF18E7
res_val=FF7A85
res_val=FFFFFFFF
```



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Thanks for watching!

智熠 ZHIYI