

# Qbot 3.0 Robot Car Kit

## User Manual



## **Warming tips**

1. If the car is running slower, it means that the battery is already run out, and please charge it as soon as possible. You can play it for 2 hours after charging it for one hour
2. The indicator light will become red when the charging doesn't finish, and when charging complete, the indicator light turns to the green.
3. The ultrasonic sensor must be installed in the right position. Incorrect installation can cause damage to the ultrasonic sensor.
4. When using the infrared remote control, you should make sure that no obstacle will disturb the receiver and transmitter
5. Please don't let any magnetic material close to the electronic component.
6. The product contains some small components; please make sure the young children won't eat it accidentally.
7. Please use the included charger to charge the battery, otherwise, it may cause a fire or other accident.
8. If you do not use the car for a long time, please make sure that the control panel has turned off, and take the battery out of the slot to avoid the unnecessary trouble.
9. About mobile phone control
  - 1) If you are an Android user, please download the QBot.apk file in the folder to your phone. Android version requires 4.3 or later.
  - 2) If you are iPhone user, please search "Qbot" or search "LewanSoul" in the iPhone App Store, and you download the app to your phone
  - 3) Tips: Please use app own Bluetooth module to connect to the Qbot and don't use your phone own Bluetooth module.

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# 1 Introduction

## 1.1 Product introduction

Qbot is an educational robot based on graphical programming and Arduino platform. This robot is perfect for learning STEAM and robotic knowledge and suit for robot lovers and beginners to learn robot and programming. Besides, It has more than ten sensor modules. The whole assembly process of Qbot only takes 2 minutes. The holes in the robot can be compatible with the LEGO building block, and it means that you can create various gameplays. I hope you can enjoy it.

## 1.2 Product Features

1. Quick assembly. The whole assembly process of Qbot only takes 2 minutes.
2. The programmable robot can let you learn how to program while playing the robot. (Mobile APP+ Infrared sensor, Mobile phone APP and infrared remote controller, which can control Qbot to move forward, backward, turn left and turn right)
3. It can be controlled by mobile phone. You can play it whenever you like
4. Graphic programming command blocks can let children have a basic understanding of the programming. We have developed WeMake programming software, which is base on Scratch3.0.
5. Mobile APP controller has many different functions (joystick mode/gravity mode/line drawing mode)
6. Use Scratch to program Arduino.
7. Various learning courses and gameplay: We provide users with Qbot gameplay, and each of them has a very detailed video tutorial.

## 2 Main assembly

### 2.1 Product list

Bottom board	1
Upper board	1
Ultrasonic sensor	1
Lithium battery	1
Infrared remote controller	1
Screwdriver	1
Screw and copper pillar kit	1
USB cable	1

## 2.2 Product parameters

Programming software	WeMake(based on Scrach3.0)Windows Arduino IDE Support
Input	Obstacle avoidance sensor, Line follower, Ultrasonic sensor, Infrared receiver
Output	Buzzer, RGB lights, two motor ports,
Microprocessor	Arduino UNO
Power supply	3.7V DC Lithium battery
Offline mode	Bluetooth module, Arduino App control, iOS App control, Infrared remote control
Diameter	85mm
Net Weight	140g

## 2.3 Components


Name of Component	Picture	Quantity
Upper Board		1
Bottom Board		1
Ultrasonic Sensor		1
Infrared Remote Controller		1
Copper Pillars and Screws		Several
Lithium Battery		1
Connecting Wire		1

# 3 Installation and Operation

## 3.1 Overview



1. Different functions require different program file;
2. The default program in Qbot is a mobile phone app and an infrared remote controller program so that you can use your cell phone and infrared remote controller to control the Qbot directly. It should only have one program file in the Qbot at the same time. If you upload other files (such as Gesture control program file) to Qbot, the mobile phone APP and the infrared remote controller will be removed;
3. If you want to control the Qbot through using the Bluetooth module or infrared remote controller, the programs that we need to download are the same. You can refer to the link or QR code below.
4. Different components of Qbot have different functions. You can create different gameplay
5. When your phone fails to connect to Qbot, please check out whether the Bluetooth program file has already downloaded or not.

Here are the link and QR code.

Types	Learning video
Link	<a href="http://bit.ly/2sg2YYQ">http://bit.ly/2sg2YYQ</a>
QR code	

## 3.2 Mobile phone APP

### 3.2.1 Mobile phone APP Download

Types	Android System
Link	 <a href="http://bit.ly/2RzHErZ">http://bit.ly/2RzHErZ</a>
QR code	

- (1) You can enter the installation package and download it on your mobile phone.
- (2) If you enter the Installation package, you can find the mobile phone App(Android Only)



### 3.2.2 Mobile phone APP to control the Qbot

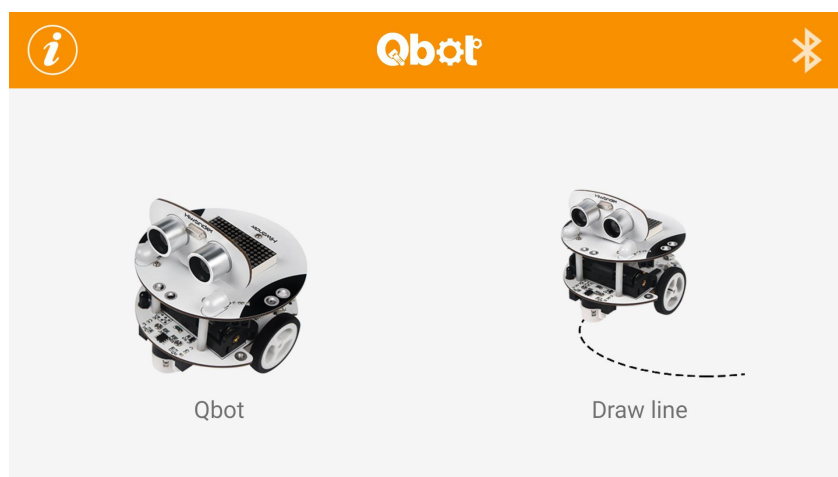
(1) First, turn on Qbot



(2) Then enter Qbot APP that has been download on your mobile phone.

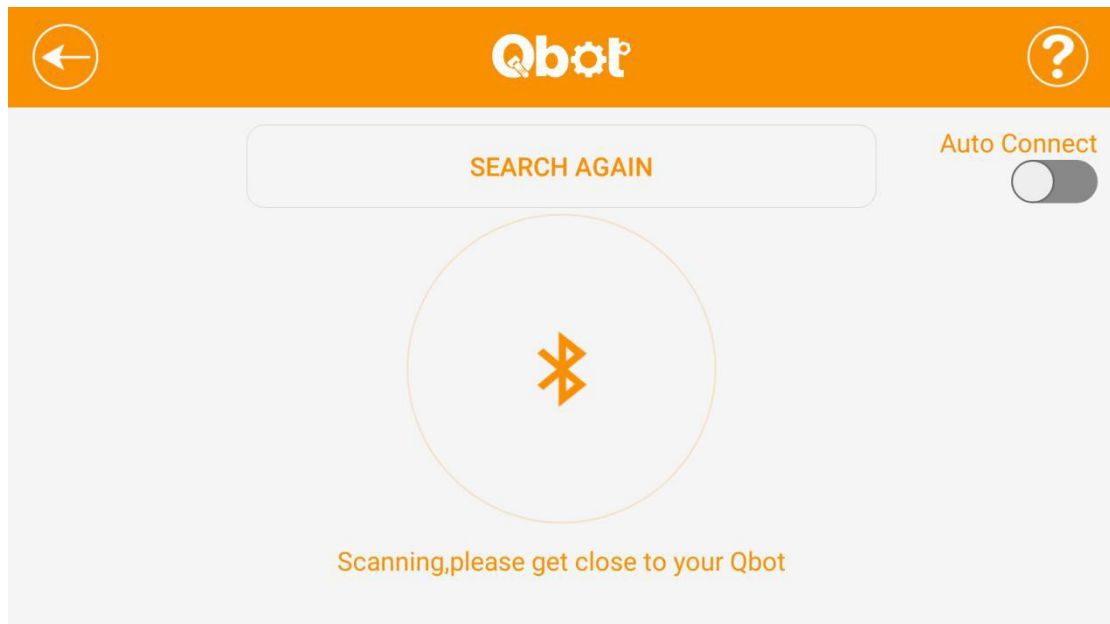


(3) After your phone connects to Qbot, you can start to control your Qbot.

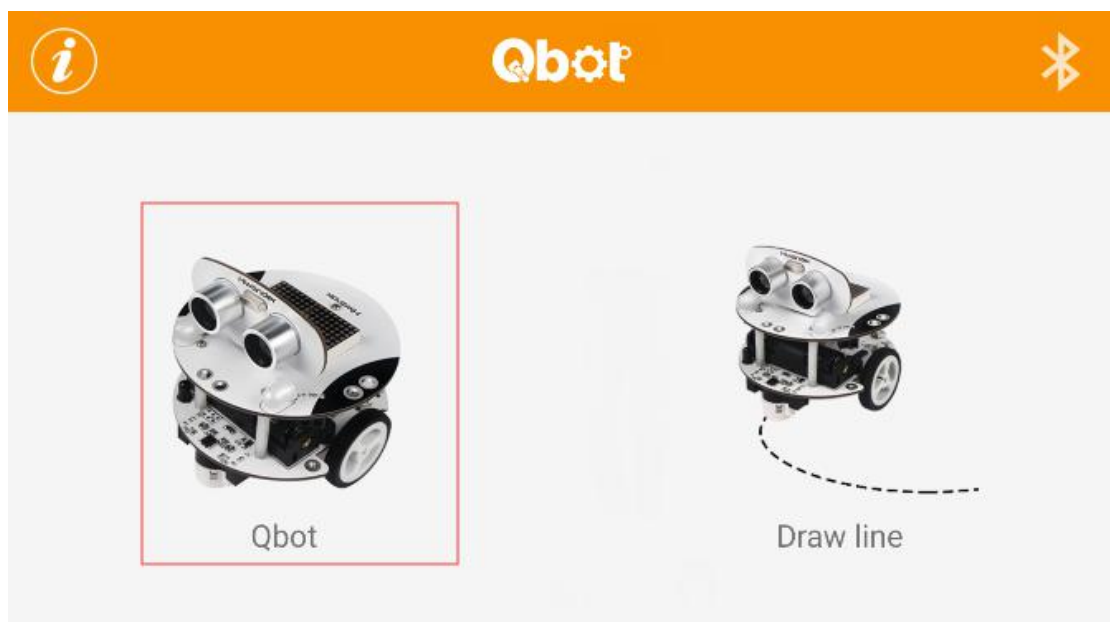


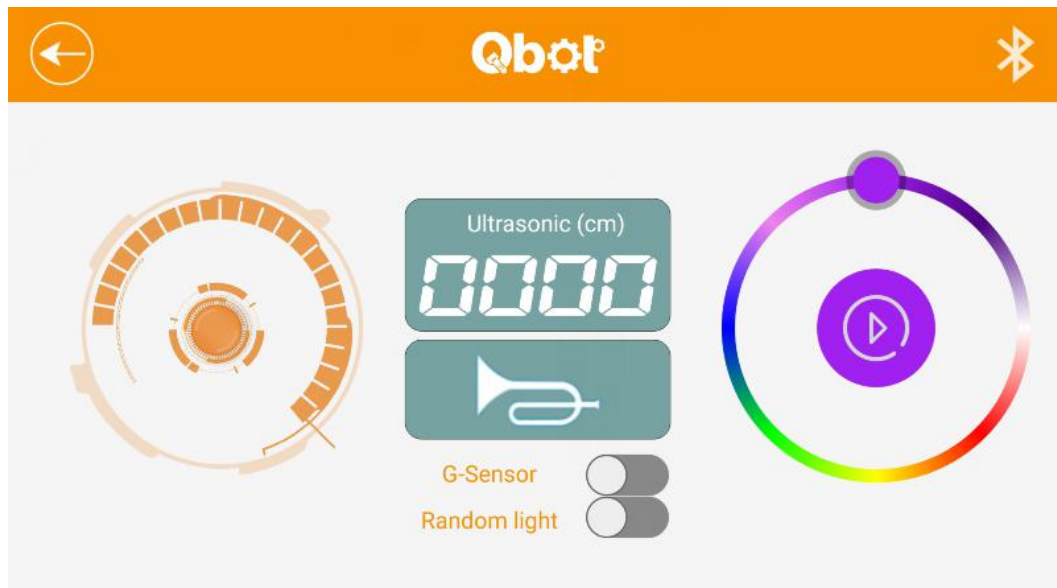
Tips:

1. The app can connect to the Qbot automatically.
2. If you click the list icon on the right, you will see the image as shown below:









If the app fails to connect to Qbot, restart the APP, and reconnect again. (Please remember using the Bluetooth module in the mobile phone app and do not use the one on your phone system).  
If you connect to it successfully, you will see the image as below after clicking the Qbot module:

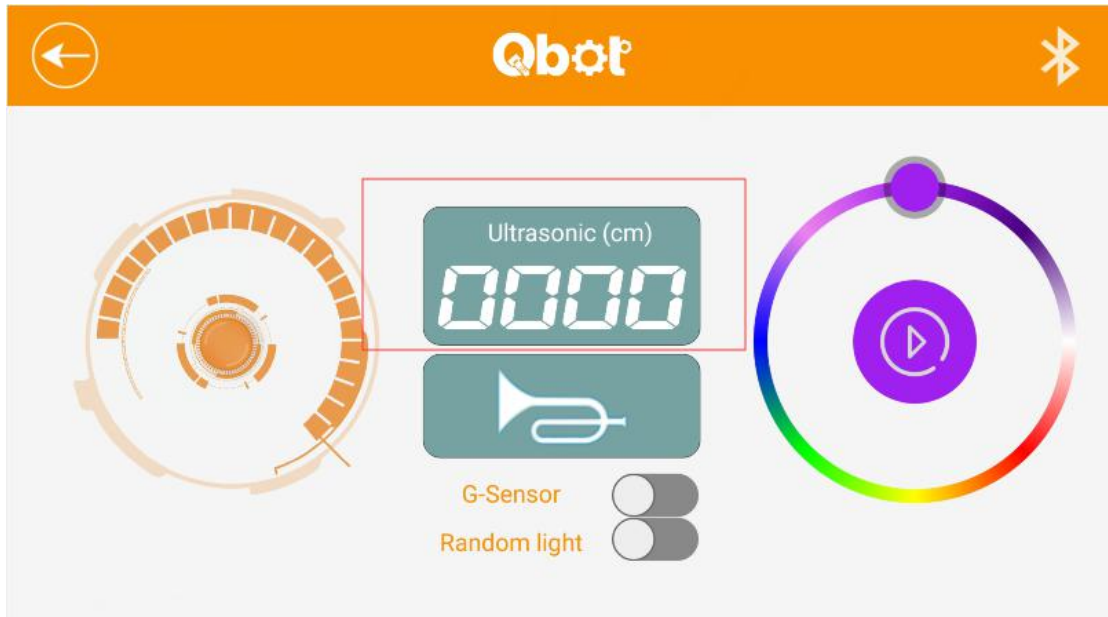




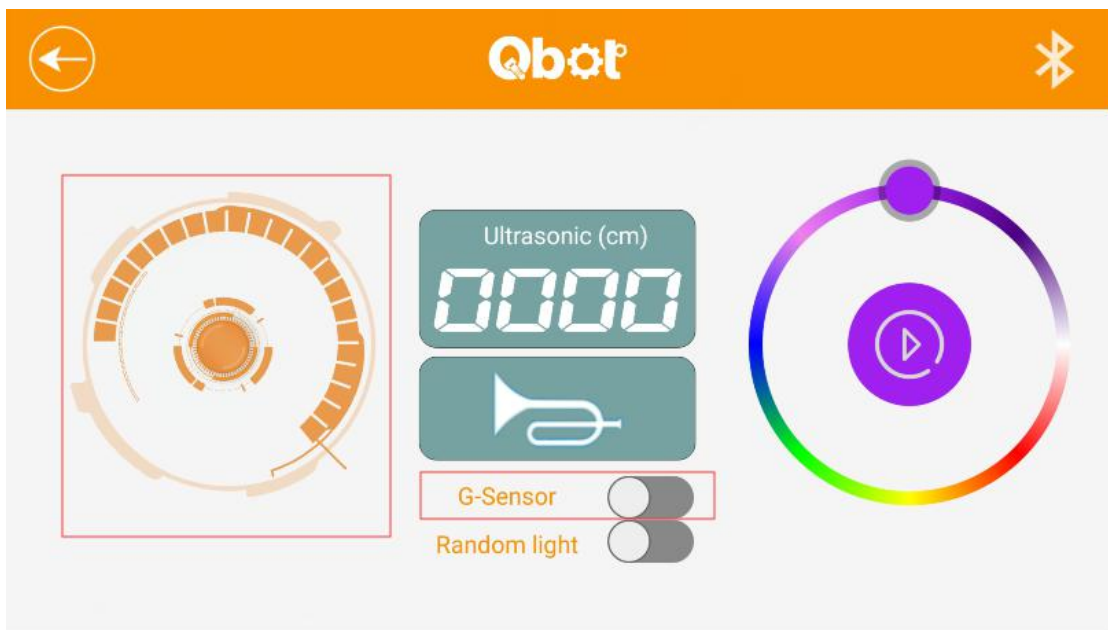
Here is the introduction of each icon:

Icon	Meaning	Icon	Meaning
	Turn on the Bluetooth switch.		Change to gravity mode.
	Display the distance between the ultrasonic sensor and the obstacle		The light color on the upper board will change in each two second
	This mini bubble uses to control the motion of Qbot		Raise the alarm.

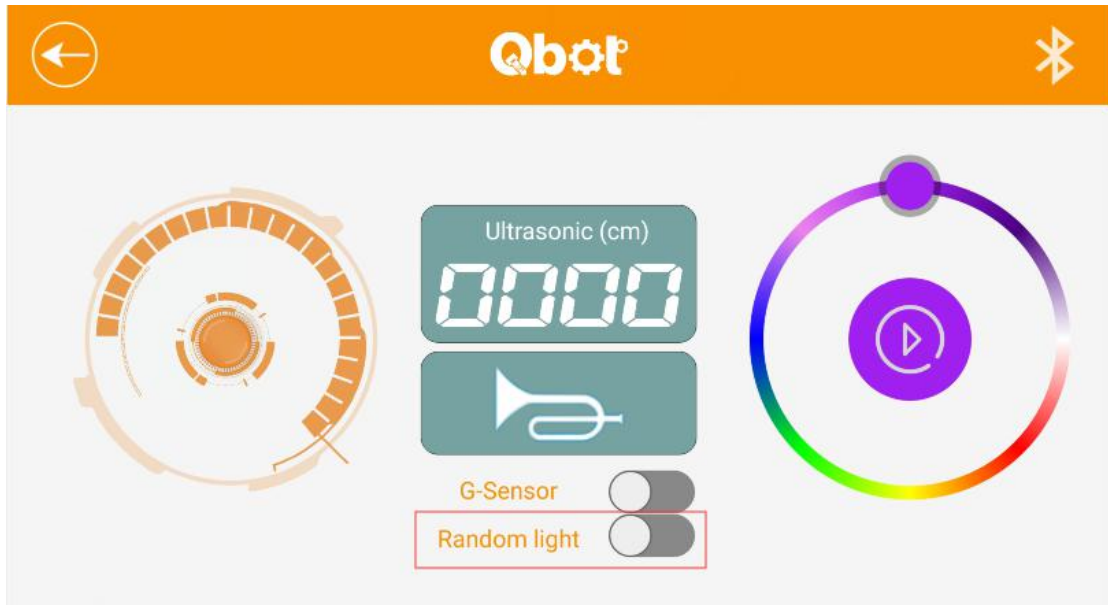
First, you may notice the numbers on the Ultrasonic sensor board. This number represents the distance between the Qbot and the object in front of it. The distance will change when Qbot moves.



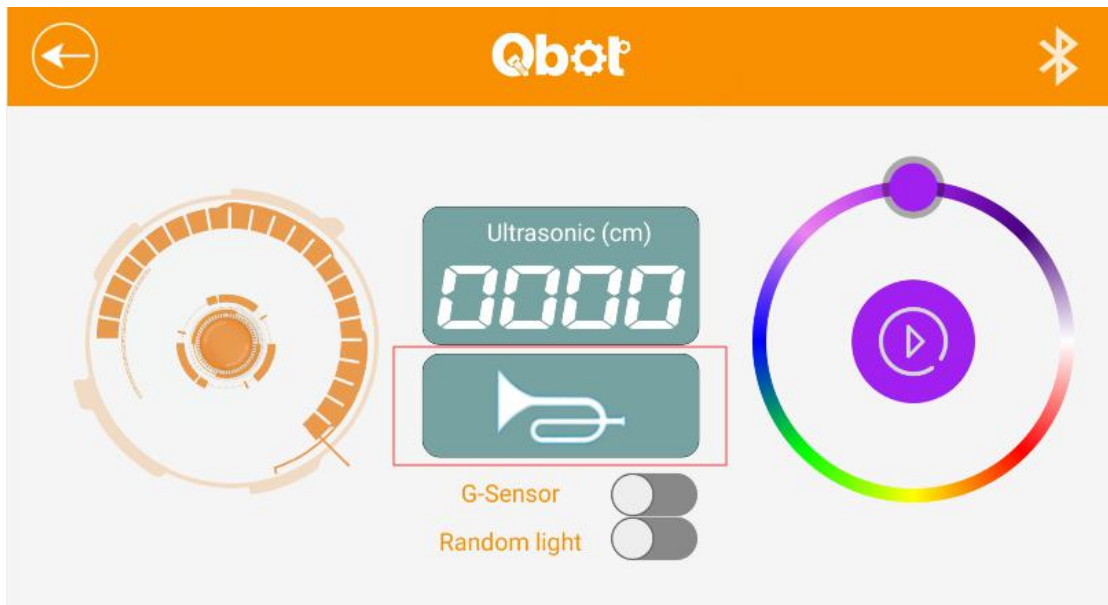
Then, you can click the Gravity control icon, and you can control the motion of Qbot by shaking your mobile phone. We offer two modes to control the motion of Qbot, and the other is stick mode, which means you can operate the Qbot through the virtual button on your phone.



After that, if you click the random light, The light color on the upper board will change in each two second



If you click on the horn icon, the Qbot will raise the alarm.



If you click the “draw line” icon, you will see the image as shown below:

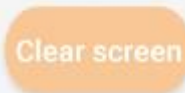




You can draw any lines you want on the app. After clicking “Play” icon, Qbot will follow the track and move, and you can clear the line you draw by clicking “Clear screen” icon as shown in the picture, if you draw a graph in the gray part, the Qbot will go around the shapes that you draw.





Here is the function of the icon:

	Clear the line you draw on the screen.
	Let Qbot follow the line you have drawn.
	When you press this button, you can stop the Qbot at any time.

### 3.3 Infrared remote controller

Qbot package contains an infrared remote controller, and you can use it to control the motion Qbot.



**The hardware principle of infrared remote controller:** Infrared light is a light that our human eye can not see. We regard the infrared remote

controller as a flashlight that can emit infrared light and the infrared receiver module as an eye that can see the infrared light.



When we press button 2 on the remote controller. Qbot will move forward, and if we press button 8, it will move backward, and press 4 and 6 can let Qbot turn left and right respectively

### **3.4 WeMake Software**

#### **3.4.1 What' s WeMake Software**

WeMake is our company self-developed graphical programming program editor, which is based on Scratch 3.0. We can use this software to program. WeMake's simple structure makes it possible for everyone to build intelligent robots without having to learn esoteric programming knowledge.

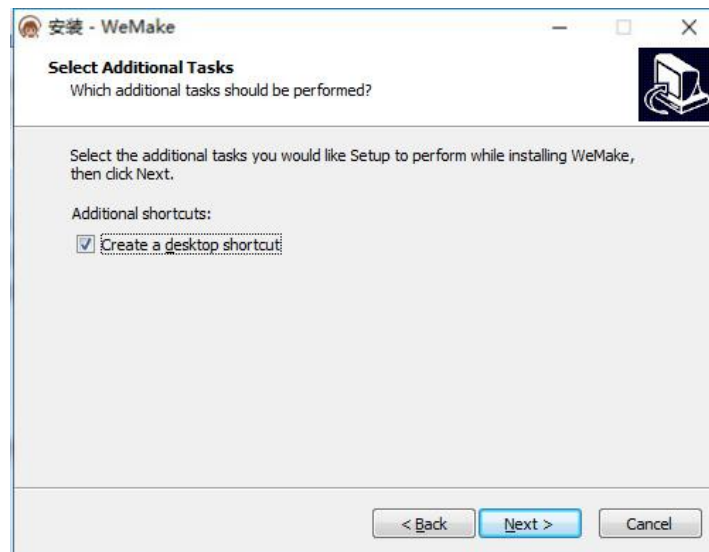
#### **3.4.2 How to install WeMake on your computer**

Install Wemake

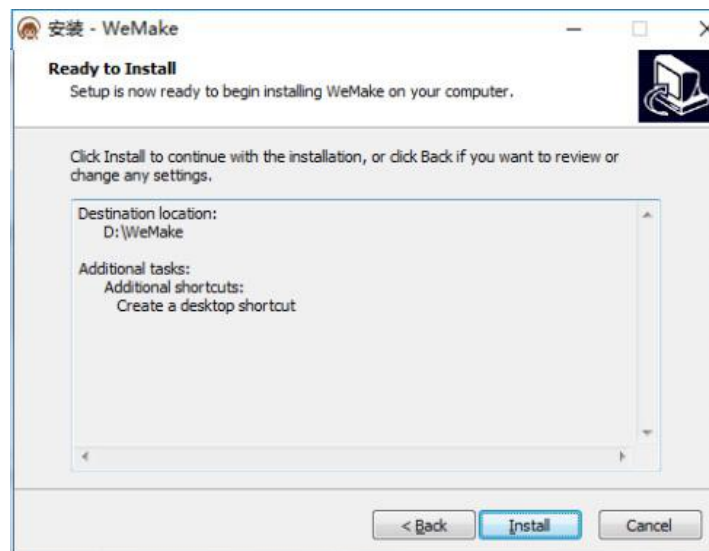
Enter the installation file and select the installation path.



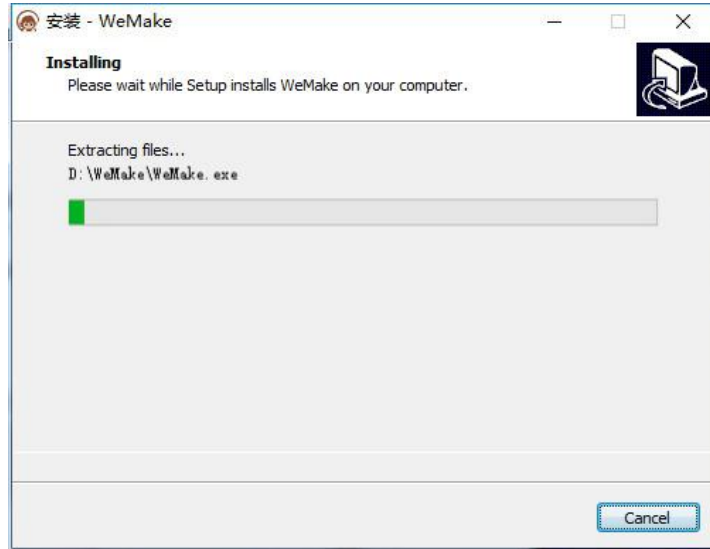
Click the “Next” button



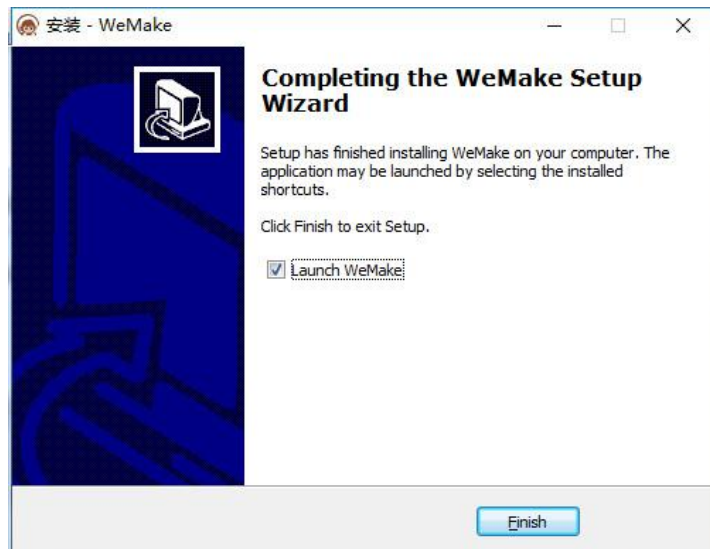
Then click the “Install” button.



Wait for a while



Finally, select “Launch Website” and click “Finish” button



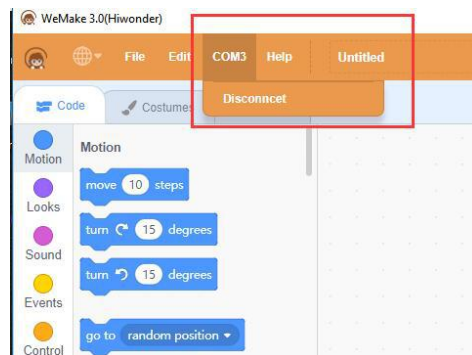
How to let Wemake connect to the Qbot:

We only can use Wemake to program Qbot, when Qbot has been connected to Wemake.

How can we connect Qbot to Wemake? First, we need to connect Qbot to the computer with the USB cable, enter Wemake software, and select the corresponding option in Menu>connect>



After clicking the corresponding serial port, the serial port connection is successful.

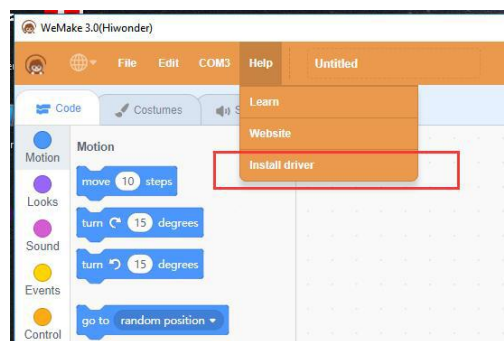


Different computers may have different USB ports, and you can open the device manager, expand "Ports (COM & LPT)".

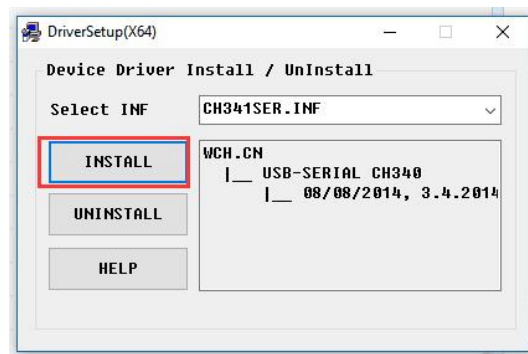


If you cannot find the corresponding USB port in the device manager, you need to install the driver again.

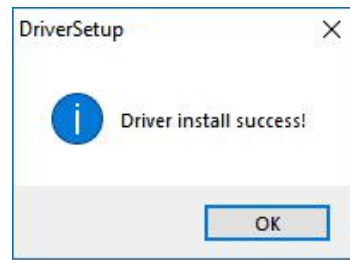
Open Wemake software, Menu>Connect>Install Driver



Open the driver installation interface

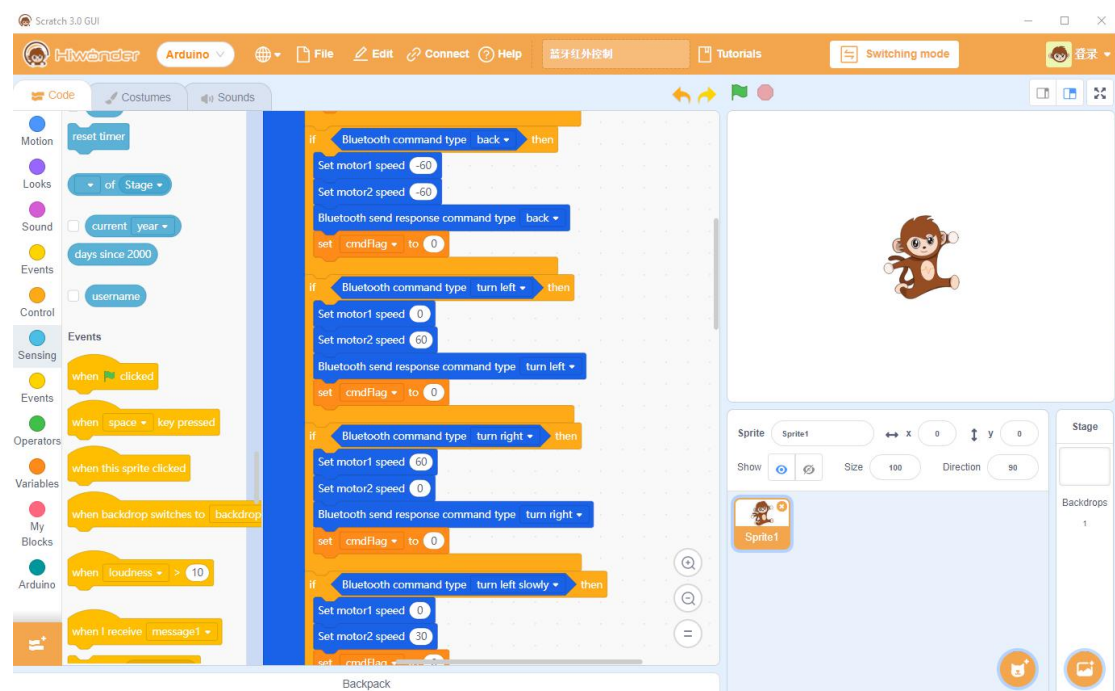


Then click install



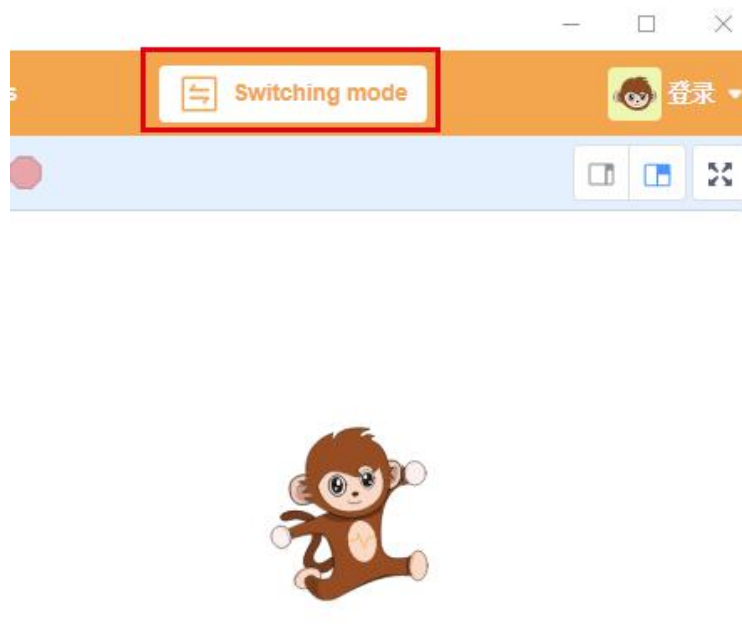
Wait for installation. The dialog box will automatically close after the installation complete.

Editing and uploading program:



You should drag the module and build the corresponding logic to edit the program. The detail will demonstrate and explain in the learning course.

After the program is written, click the "Switching mode".



Click the upload icon after your Qbot is connected to Wemake, and wait for program upload:

A screenshot of an Arduino IDE code editor. The code is written in C++ and controls two motors based on key presses. The code is as follows:

```
93 motor2.reverseRun(40);
94 cmdFlag=1;
95 }else{
96   if(boardIr.keyPressedLong(74)){
97     motor1.reverseRun(-40);
98     motor2.reverseRun(-40);
99     cmdFlag=1;
100  }else{
101    if(boardIr.keyPressedLong(16)){
102      motor1.reverseRun(-40);
103      motor2.reverseRun(40);
104      cmdFlag=1;
105    }else{
106      if(boardIr.keyPressedLong(90)){
107        motor1.reverseRun(40);
108        motor2.reverseRun(-40);
109        cmdFlag=1;
110      }else{
111        if((cmdFlag==1)){
112          motor1.reverseRun(0);
113          motor2.reverseRun(0);
114        }
115      }
116    }
117  }
118 }
119 }
```

The upload icon (a green square with a white upward-pointing arrow) is highlighted with a red rectangular box in the top right corner of the editor window.

Arduino IDE

You can also use ArduinoIDE to edit the code yourself for uploading.

## 4FAQ

Q1: I had bought Qbot for my children, and how do my children learn to use it?

A: The products of our company are suitable for people of all ages. Children under the third grade are advised to use it with parents. In the process of operation, children not only can improve problem-solving skill but also develop the interest of programming.

Q2: Why can't Qbot move in a straight line when it goes forward or backward, and how can I deal with it?

A: Because of the difference of Qbot components, the speed of the two wheels can't be the same even if the same power supply for two wheels. So the user should modify the speed of wheel by Wemake. The slower wheel program should set high-speed value.

Q3: I have turned on the Qbot power switch, but phone app still can't connect to Qbot. How can i deal with it? Moreover, why do I need to input PIN in the process of using the Bluetooth to connect the Qbot?

A: First, you should use the mobile phone app Bluetooth module, and don't use your own Bluetooth. If the battery is almost run out, the Bluetooth signal will weaken and cause unsuccessful connection, so please check whether the battery has enough power or not. Some phone app using permissions may influence the regular use of the app, so you need to allow the app to have using permission of some phone function.

Q4: Why can't my mobile APP control Qbot?

A: First, make sure that whether you have downloaded (mobile + infrared control) .sb2 file to the Qbot. (The user can find the associated path through his document) Next, check whether your phone has turned on Bluetooth and Qbot power switch.

Case 1: The APP prompt that “read the firmware version timeout.”

Find Qbot(mobile phone + infrared control).sb2 file, and drag it into the WeMake interface, and then download it to Qbot.After all process complete, restart Qbot.

Case 2: Don't have enough power supply

When Qbot doesn't have enough power supply, it will make a sound like "DiDiDi." When you hear that, the battery should be taken out and put into a special charger to charge at least two hours.

Q5: Why does the .sb2 file fail to read?

A: If your Makecode display "Fail to upload," This prompt means that you do not select the control panel type. You should choose Qbot in the control panel, or reconnect the USB port first.

Q6. Why can't LED light turn on?

A: First, please check whether the Qbot power switch has turned on, and second check whether Qbot has enough power supply.



## 5 The Historical version of the user manual

Version	Modification date	Instructions	Modifier
V2.1	2019.11.5	Adding information: (1) Solve the problem of drawing line function on the mobile phone (2) WeMake (Scratch 3.0) (3) Change Mini USB port to micro USB	Peter