PS3 Bluetooth Controller Tutorial

Perface

Our Company

ACEBOTT STEM Education Tech Co.,Ltd

Founded in China's Silicon Valley in 2013, ACEBOTT is a STEM education solution leader We have a team of 150 individuals, including members from research and development, sales, and logistics. Our goal is to provide high-quality STEM education products and services to our customers. We are working together with STEM education experts and our business partners to produce successful STE products together Our self-own factory also provides CEM services for our clients including logo customization on product packaging and PCB.

Our Tutorial

This is a hands-on course designed for beginners, designed to guide students into the world of programming, electronics and robotics through a PS3 gamepad based approach. In this course, students will learn the control theory and practical application of the PS3 controller, and use the PS3 controller to control the intelligent car of the QD series.

Through this kit, you can:

1. Understand the structure and functions of the PS3 controller.
2. Understand the basic principle of Bluetooth signal transmission and master the application of Bluetooth communication technology
3. Master how the PS3 remote controls the robot movement.
4. Master how the PS3 remote controls characters in Scratch games.
5. Improve your maker skills by following a step-by-step tutorial to complete the Bluetooth Handle Remote Control car project using the ACEBOTT kit.

Overall, the ACEBOTT PS3 Bluetooth Controller Learning Kit is an extension kit

specifically designed for beginners. With this kit, beginners can master the basic working principles and use of the PS3 remote control, and have the ability to apply the knowledge to solve practical problems.

Customer Service

ACEBOTT is a dynamic and fast-growing STEM education technology company that strives to offer excellent products and quality services that meet your expectations. We value your feedback and encourage you to drop us a line at support@acebott.com with any comments or suggestions you may have.

Our experienced engineers are dedicated to promptly addressing any problems or questions you may have about our products. We guarantee a response within 24 hours during business days.

Follow Us

Scan the QR codes to Follow Us for troubleshooting & the latest news.
We have a very large community that is very helpful for troubleshooting and we also have a support team at the ready to answer any questions.

ACEBOTT FB QR Code

YouTube QR Code

Contents

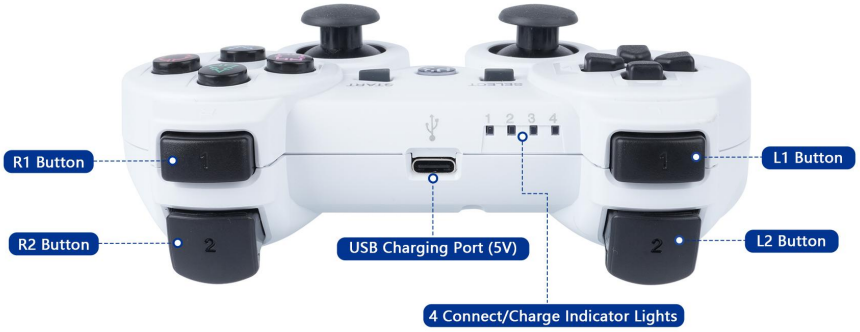
Lesson 1 Introduction of PS3 Bluetooth Controller

Ⅰ.Hardware Introduction

The PS3 Bluetooth controller is a controller that uses the classic Bluetooth mode to connect directly with the ESP32 series chip, and it can be used to remotely control devices with the ESP32 chip as the controller.The handle has multiple control button, can satisfy the control requirements of most of the machinery and equipment.The user needs to enter the Bluetooth pairing code on the back of the handle in the code of the control side of the development board to connect and use it to prevent interference from other handles or signals from the development board.It is easy to use, compared to other older versions of the controller, save the ESP32 Bluetooth MAC address and configuration to the controller this tedious process.

Ⅱ.Specification Parameters

- Battery capacity：400mA
- Charge：5V 0.5A、5V 1A、5V 2A
- Charging time：About 1 hour
- Battery life: About 5 hours
- Vibration feedback: None
- Bluetooth connection distance: About 10m
- Bluetooth standard: Only support traditional classic Bluetooth, not Bluetooth Low Power (Bluetooth LE)
- Supported chip series: ESP32 series
- Size：16*10*6cm

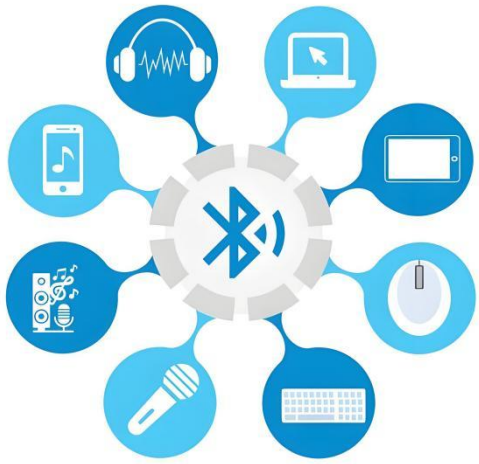


Ⅲ.Principle of Bluetooth Signal Transmission

Bluetooth is a short-range wireless communication technology, designed to provide low power consumption, low cost, short-range wireless communication solutions. Its working principle is based on radio wave communication, and Bluetooth devices use 2.4GHz radio waves to transmit data between devices through the built-in RF module.

The communication process between Bluetooth devices consists of several key steps: device discovery, pairing, connection establishment, and data transfer. Device discovery makes its presence known to surrounding devices by broadcasting a signal, usually at a range of 10 to 100 meters. During pairing, devices exchange a unique key that is used to encrypt communication data and ensure the security of the communication. Once the connection is established, data can be transferred between Bluetooth devices.

The application scenarios of Bluetooth technology are very wide, including wireless headphones, smart watches, car devices, smart homes and so on. With the continuous development and optimization of the technology, Bluetooth will play a more important role in the future of the Internet of Things and smart devices.



Ⅳ.PS3 Controller Charging Instruction

1.Please use the USB port of the computer or the standard 5V0.5A, 5V1A or 5V2A power adapter to charge the handle. It does not support any fast-charging appliances.

2.Before using for the first time, please charge for a while, about 5 minutes, to avoid abnormal situations due to electricity during use.

3.Charging indicator: Lights 1-4 or lights 1 and 4 flashing slowly.

4.Full charge indicator: Lights 1-4 are always on or off, lights 1 and 4 are always on.

Ⅴ.Notes

1.This controller only supports connection with ESP32 chip series, and cannot support Bluetooth connection with other devices, such as laptops, mobile phones, etc., otherwise, the pairing code will be invalid.

2.If the device is connected to the controller and the controller is not operated on, it will go to sleep in about 5 minutes. You need to reconnect the device if you want to use it again.

3.If the controller has problems that can not be solved, you can try to press the reset

button of the controller (using the Dupont wire or other card pin tools), feel the button to press to restore the factory Settings, and then try to pair the connection.

4.This controller is not a common PS game controller in the market, please do not use it for other purposes.

Lesson 2 Basic Control of PS3 Controller

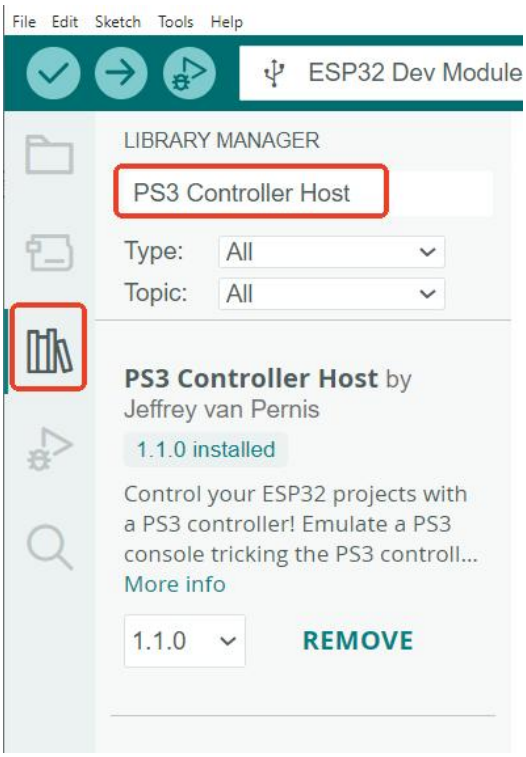
The PS3 Bluetooth controller can control both the QD001 series smart car and the ACECode game character, so please follow me to learn how to implement the basic control.

Ⅰ.PS3 Controller Control Smart Car

1.Install the Library

(1)Check the library files

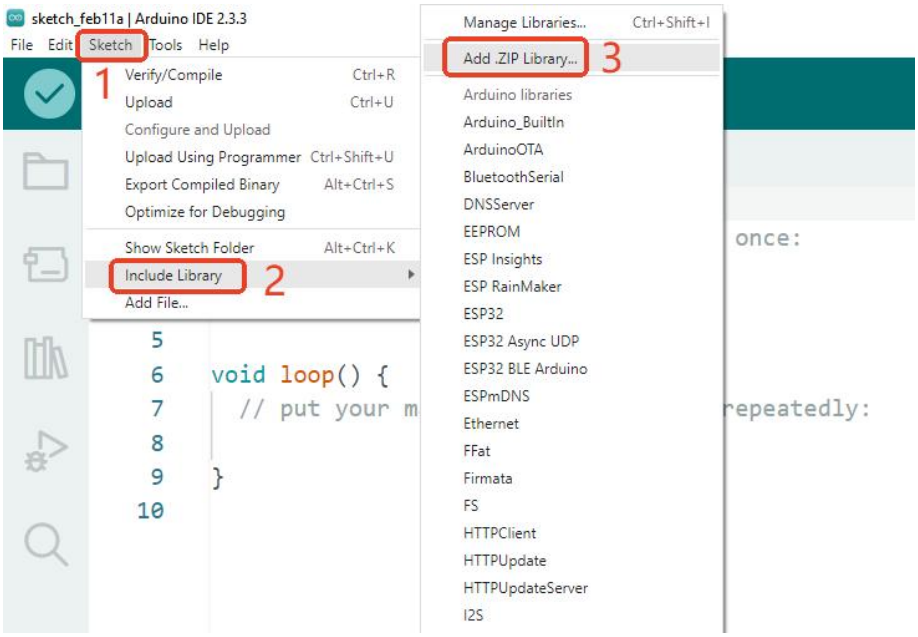
Open the library Manager and search for the PS3 Controller Host to install version 1.1.0 (if a library with version 1.0 installed is displayed below, you will need to remove the library to avoid conflicts with the new version and reinstall the library with version 1.1.0)



(2)Import library file

Open for Arduino IED , click Sketch ->Include Library->Add ZIP Library and select

English \3. PS3_Controller_Host.zip library file.



2.Basic Control Procedures

To realize the function of controlling the car with the PS3 controller, you first need to upload the program of controlling the car with the PS3 controller to the smart car, and then communicate with the controller, and finally use the controller to control the QD001 car to achieve the basic movement of the front and back.

PS3 controller control car logic:

PS3 Controller buttons	Car function
The left joystick X direction	Control car moving left and right
The left joystick Y direction	Control car to move forward and backward

(1)Write the program

Open "Bluetooth_controller_basic_control.ino" in English\2.Program\Lesson 2\Bluetooth_controller_basic_control.

Sample Code:

```
#include <vehicle.h>
#include <Ps3Controller.h>//Import Bluetooth controller's library file

vehicle myCar;
int Speed = 255;//Car speed

void setup() {
  myCar.Init();
  Ps3.begin("20:00:00:00:38:40");//Modified according to the pairing code on the back of your Bluetooth controller
}

void loop() {
  if (Ps3.data.analog.stick.lx > 110 && Ps3.data.analog.stick.ly == 0) {
    myCar.Move(Move_Right, Speed);// Turn right
  }
  else if (Ps3.data.analog.stick.lx < -110 && Ps3.data.analog.stick.ly == 0) {
    myCar.Move(Move_Left, Speed); // Turn left
  }
  else if (Ps3.data.analog.stick.lx == 0 && Ps3.data.analog.stick.ly >= 110) {
    myCar.Move(Backward, Speed); // Move backward
  }
  else if (Ps3.data.analog.stick.lx == 0 && Ps3.data.analog.stick.ly <= -110) {
    myCar.Move(Forward, Speed); // Move forward
  }

  else if ((Ps3.data.analog.stick.ly <= 40 && Ps3.data.analog.stick.ly >= -40) && (Ps3.data.analog.stick.lx <= 40 && Ps3.data.analog.stick.lx >= -40))
  {
    myCar.Move(Stop, 0); // Move Stop
  }
  delay(100);
}
```

PS3 controller code Description:

include <Ps3Controller.h>: Introduce the PS3 controller library into the program.

Ps3.begin("20:00:00:00:38:40"): Open Bluetooth and connect the PS3 controller. You need to fill in the adaptation code on the back of the used PS3 controller, The adaptation code of different PS3 controller is different.

Ps3.data.analog.stick.lx: Get the X-analog value of the left joystick of the PS3 Bluetooth controller, ranging from -128 to 127. The X-analog value is 0 when the joystick is in the middle position. As it moves to the left, the X-analog value gradually decreases, and the minimum value on the far left is -128. As it moves to the right, the X simulation gradually increases, with a maximum value of 127 on the far right.

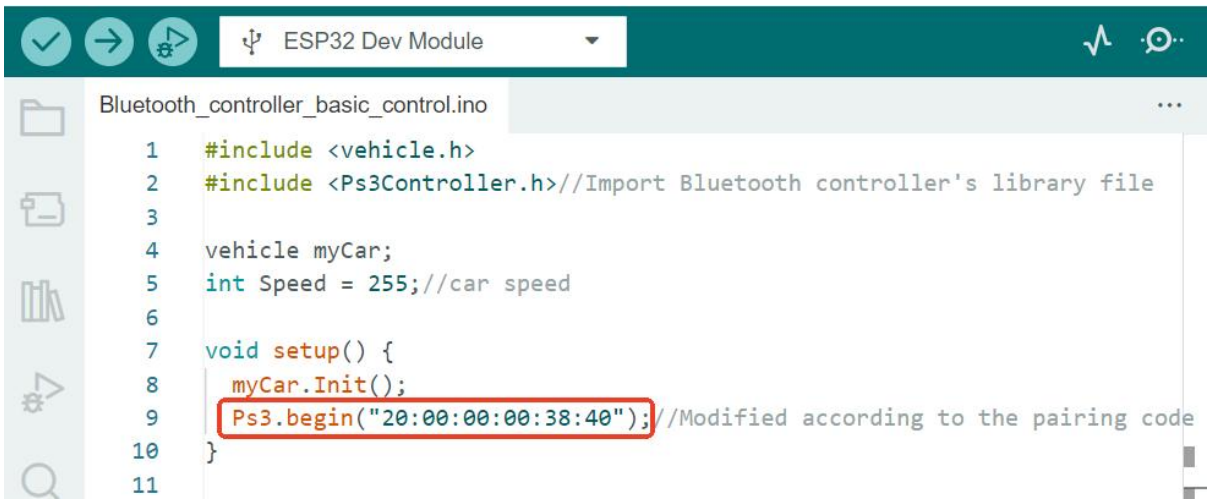
Ps3.data.analog.stick.ly: Get the Y analog value of the left joystick of the PS3 Bluetooth controller, ranging from -128 to 127. When the joystick is in the middle position, the Y analog value is 0. When it moves up, the Y analog value gradually decreases, and the minimum value at the top is -128. As it moves down, the Y simulation gradually increases, with a maximum value of 127 at the bottom.

(2)Fill in the Bluetooth pairing code and upload the program

Enter the Bluetooth pairing code on the back of the PS3 controller into the code to run, for example, the Bluetooth pairing code of your handle is: 20:00:00:00:38:40

In the sample code, find the code Ps3.begin("01:02:03:04:05:06") in the setup function; Change it to Ps3.begin("20:00:00:00:38:40").

Note: The pairing code is different for each controller!



After modifying the pairing code, connect the QD001 smart car and computer with a USB cable, select the correct development board and port, and upload the code to the QD001.

3.Pair Connect

After uploading the program, the smart car should be paired with the PS3 controller.

1. Make sure that the PS3 controller is disconnected from the computer or power

adapter, and do not connect any data cables or charging cables.

2. Keep the car connected to the computer, open the serial port monitor of Arduino IDE, and keep the baud rate at 115200.

3. Long press the power button in the middle of the handle, the 4 indicators of the PS3 controller will flash at the same time, then the PS3 controller will automatically query the connection of the smart car, if it is the first connection may have to press the reset key of the smart car ESP32, or several times, different controller boards may react differently.

4. After successful connection, the first light will be steady on, and it will automatically shut down about 10 seconds after disconnection.

After the pairing is successful, the left joystick of the PS3 controller is swayed up and down to realize the car moving forward and backward, and the left joystick of the PS3 controller is swayed left and right to realize the car moving left and right.

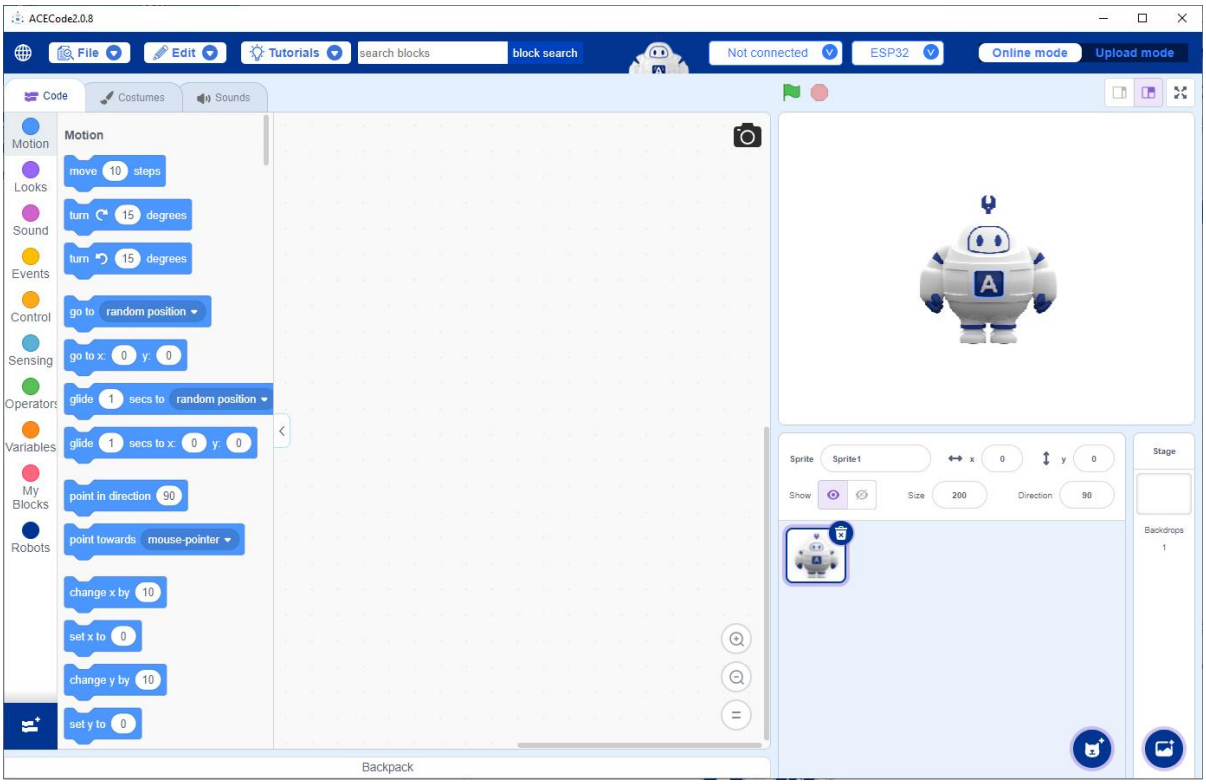
Ⅱ.PS3 Controller Controls the Game Character

In addition to controlling the car movement, the PS3 controller can also control the game characters on ACECode.Let's learn how to do it.

1.Learn About ACECode

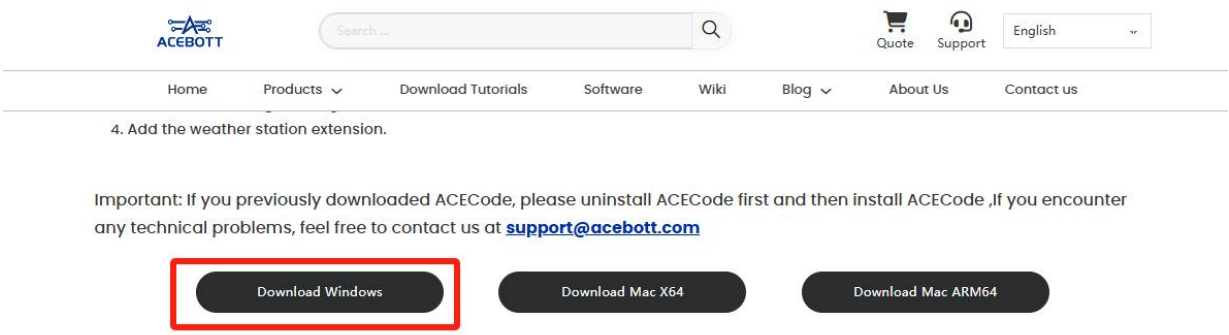
ACECode is a blockly programming tool, users do not need to master complex programming languages, just need to drag and drop blocks to achieve programming. ACECode covers all the functions of Scratch graphical programming, and adds a robot control module on this basis, which allows users to use graphical programming to design their own robot works, reducing the difficulty of robot programming

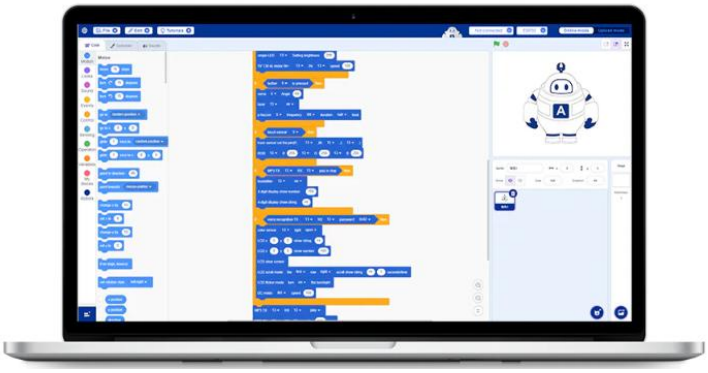
development.



2.Install the ACECode Application

Step 1:Download the ACECode from the website, for Windows. Login ACECode's official website: https://www.acebott.com/pages/software, enter the software Download interface, select ACECode software version of Windows, click on the Download ACECode Download.



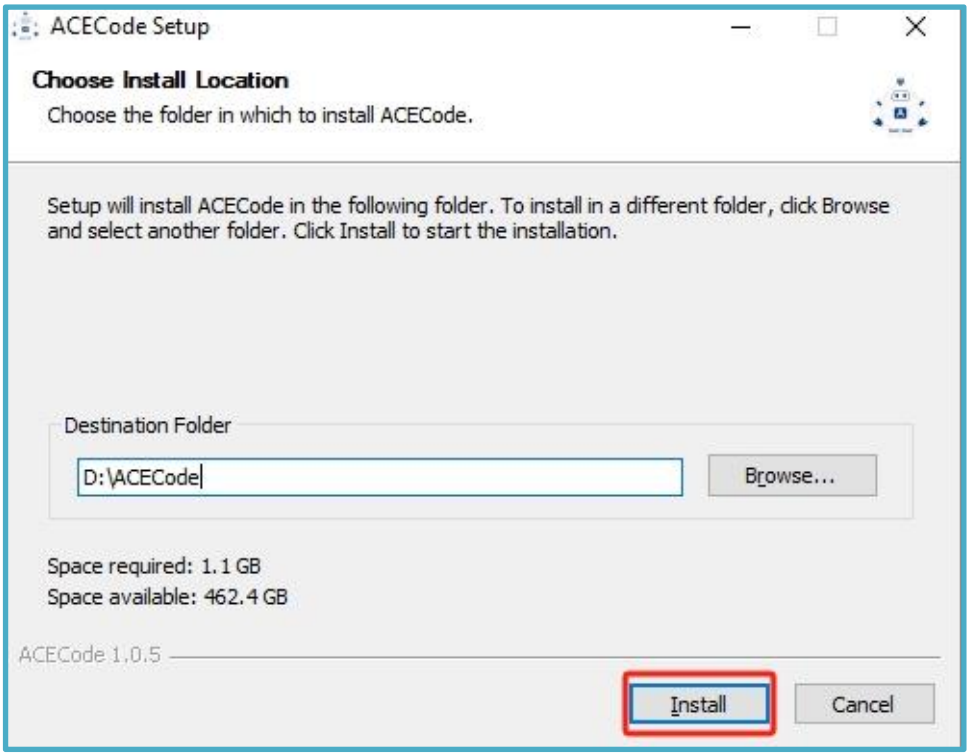


Note: If you downloaded a zip package, unzip it and perform the following installation steps.

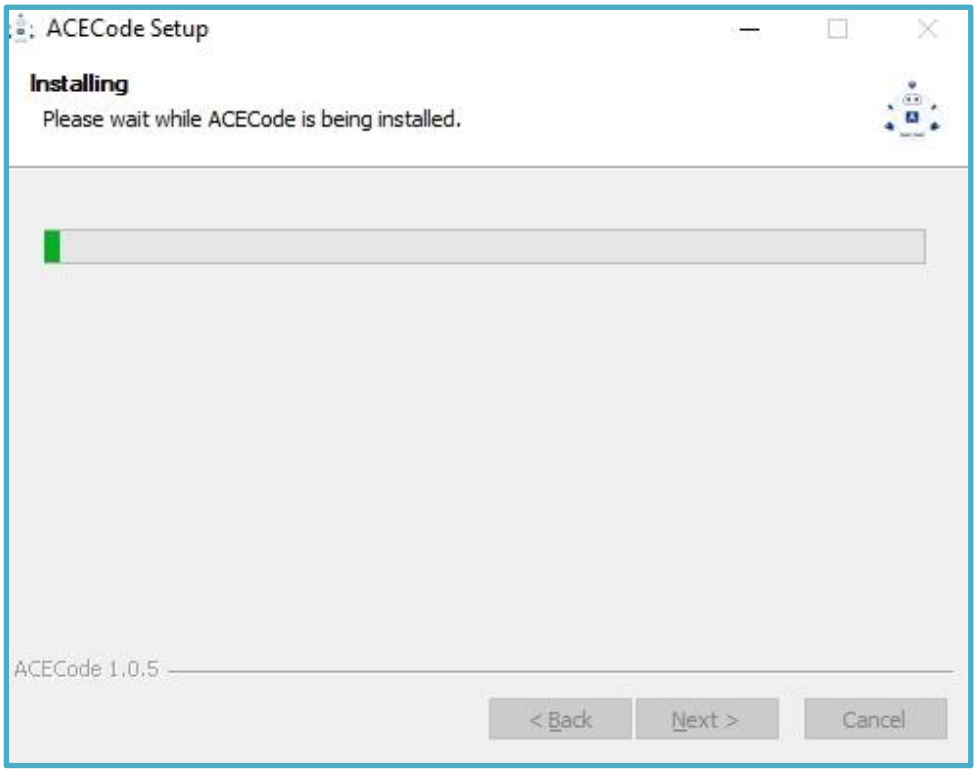
Step 2: Double-click the downloaded installer and follow the instructions to install ACECode.

(1)After the download is complete, the installation package file will appear as shown in the figure. Click to install the software.

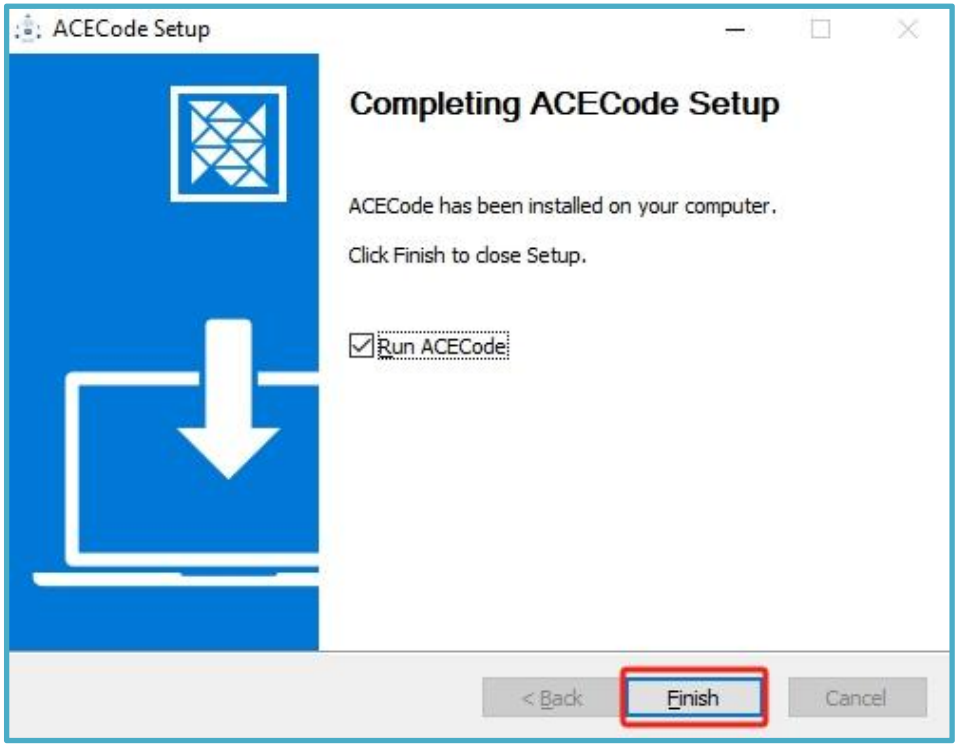
(2)After clicking the software, the following interface will appear. Select "Install". You can choose the default installation path or choose the software installation route yourself.



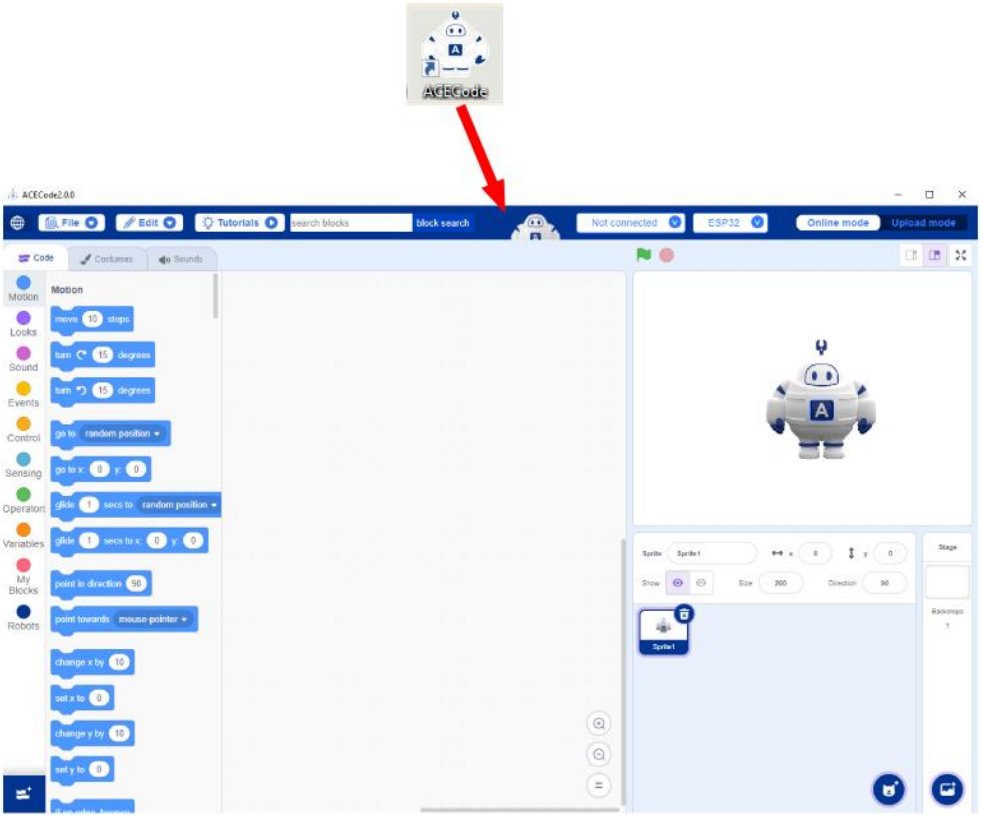
(3)ACECode software is being installed.



(4)The installation is complete.

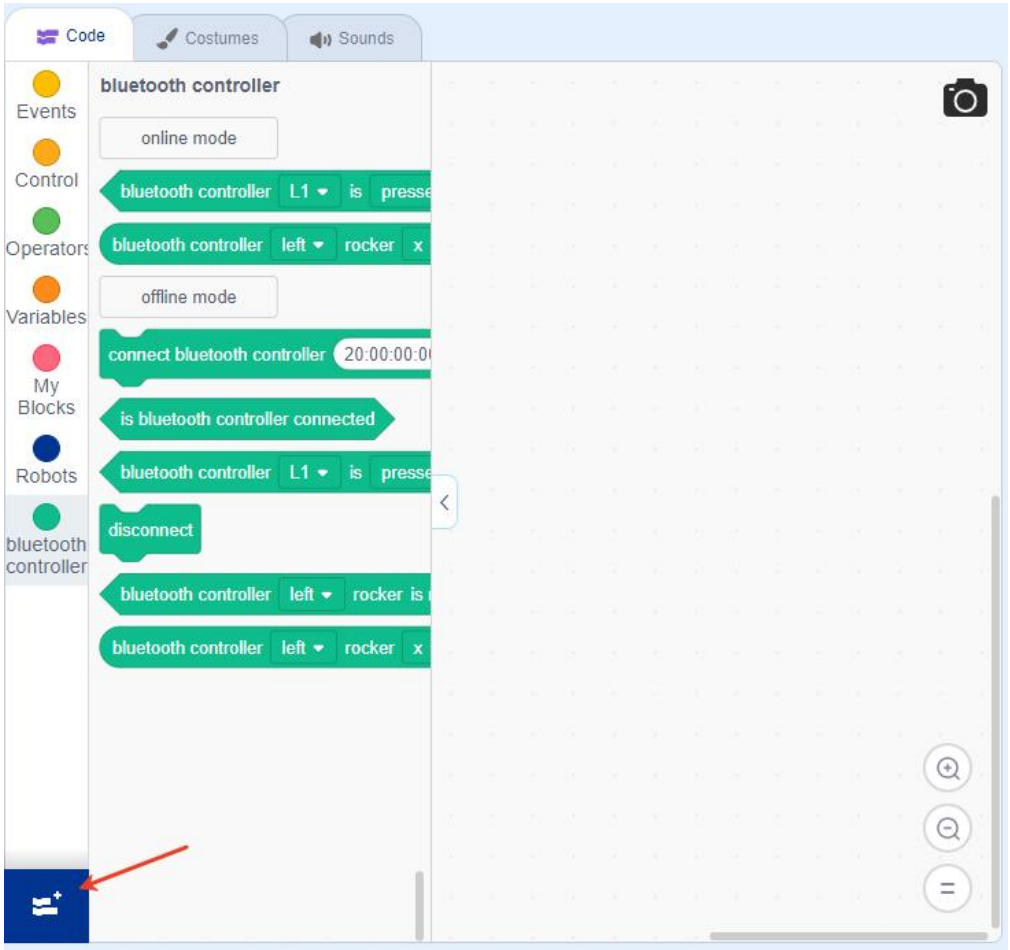


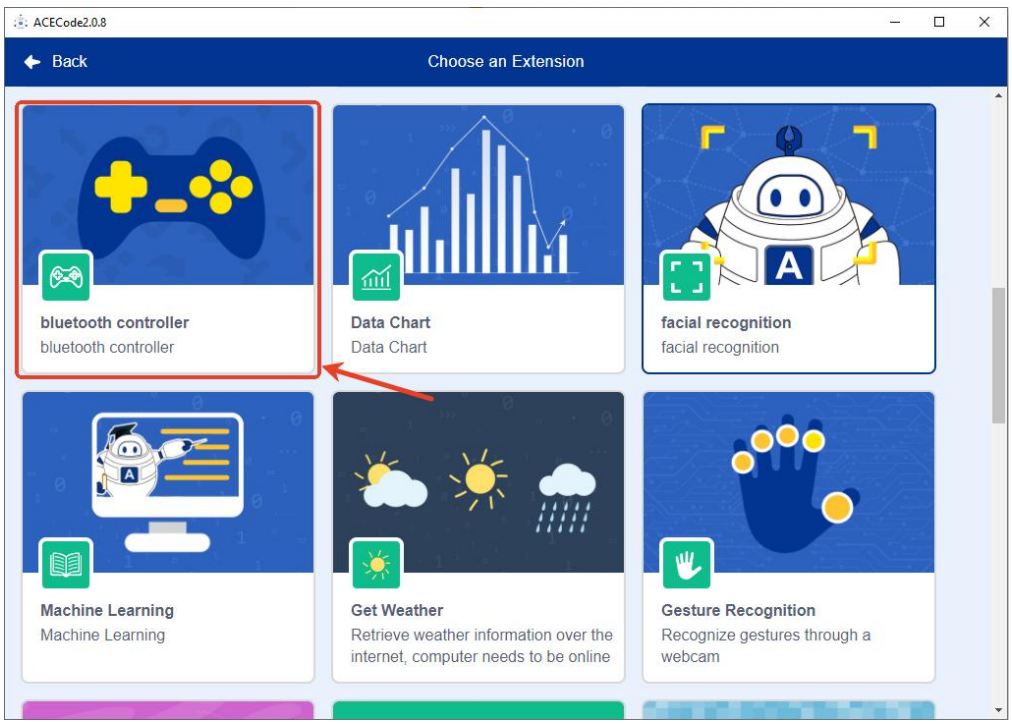
(5)Find the shortcut of ACECode on the desktop and double-click to open ACECode.



3.PS3 Bluetooth controller with ACECode

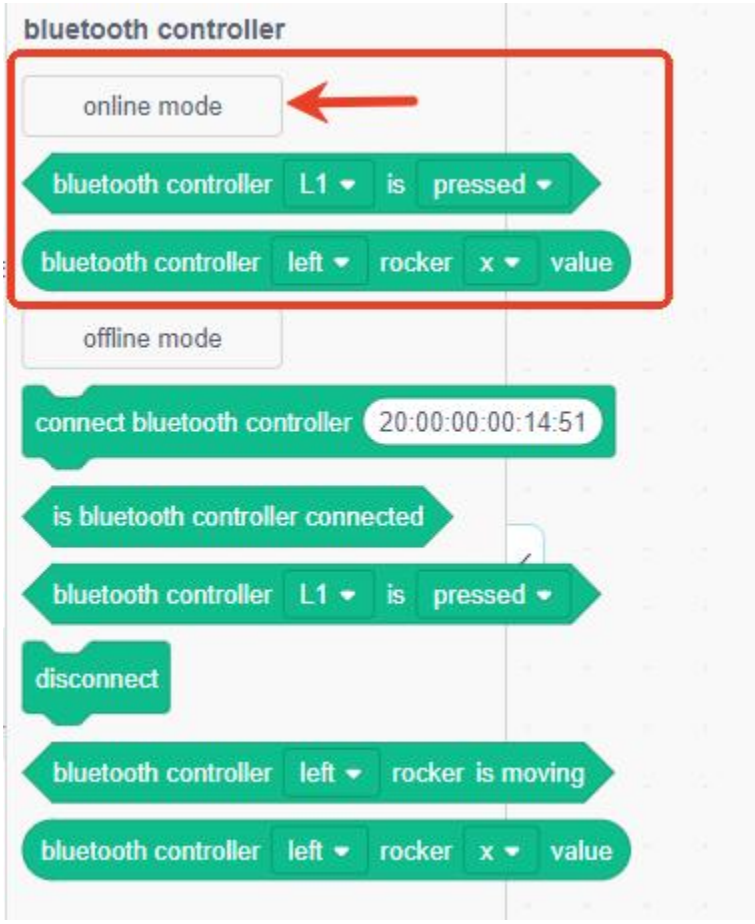
(1)Select the application extension of the PS3 controller





(2)Use instructions in online mode

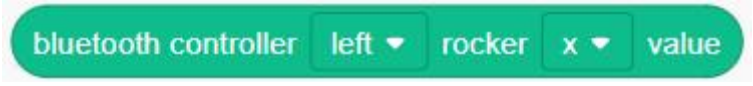
Note: Instructions in online mode cannot be mixed with instructions in offline mode.



(3)Instruction introduction

Indicates whether the keys on the PS3 controller are pressed. Click the knock down triangle icon to expand all the keys on the controller.

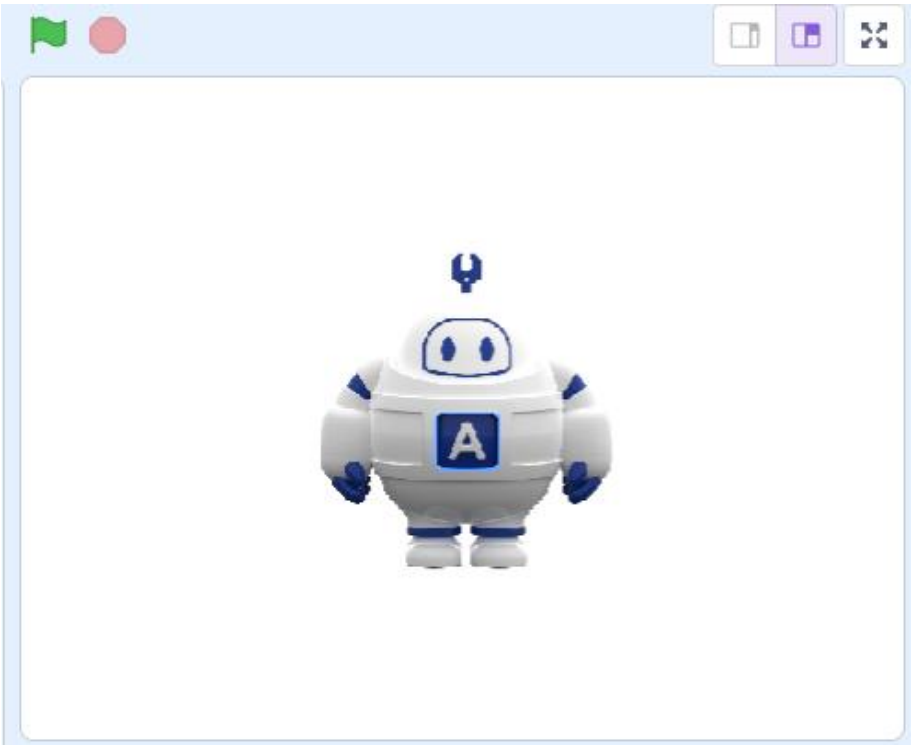
Indicates the analog value of the joystick of the PS3 controller. Click the knocked-down triangle icon to expand and select the analog value of the left and right joystick and the X and Y axes.



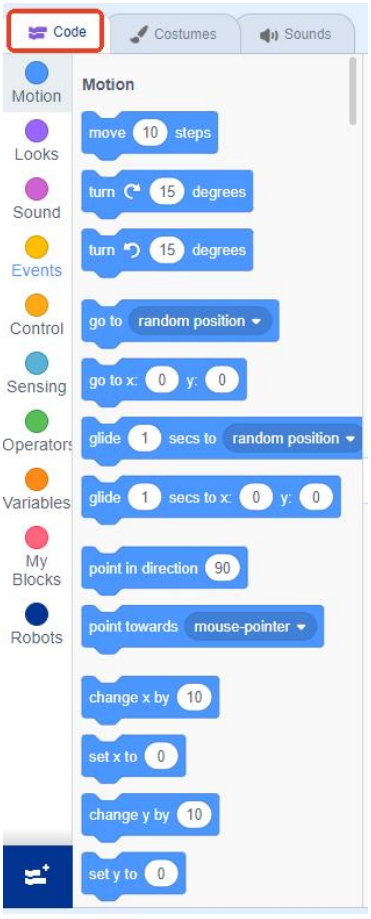
(4)Use PS3 controller to control Lumi movement on stage

Below is the Lumi on the stage, how do we control its movement through

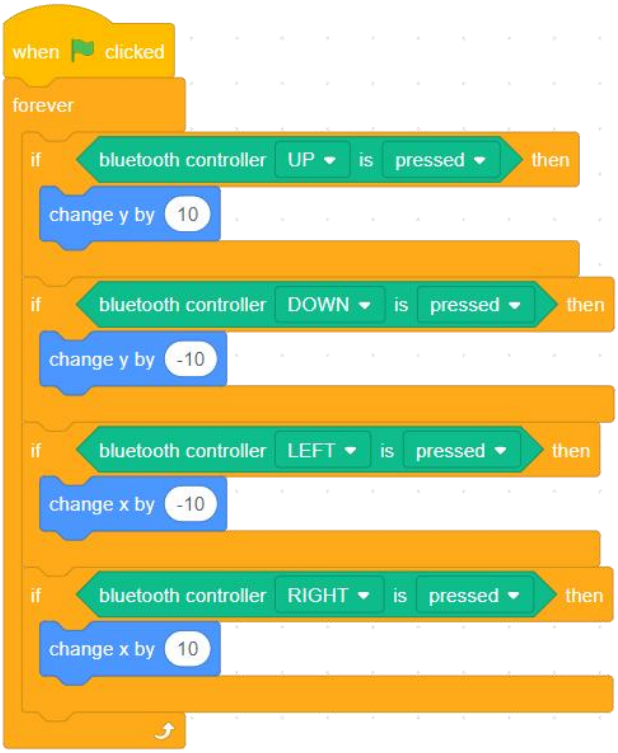
programming? Follow the steps below.



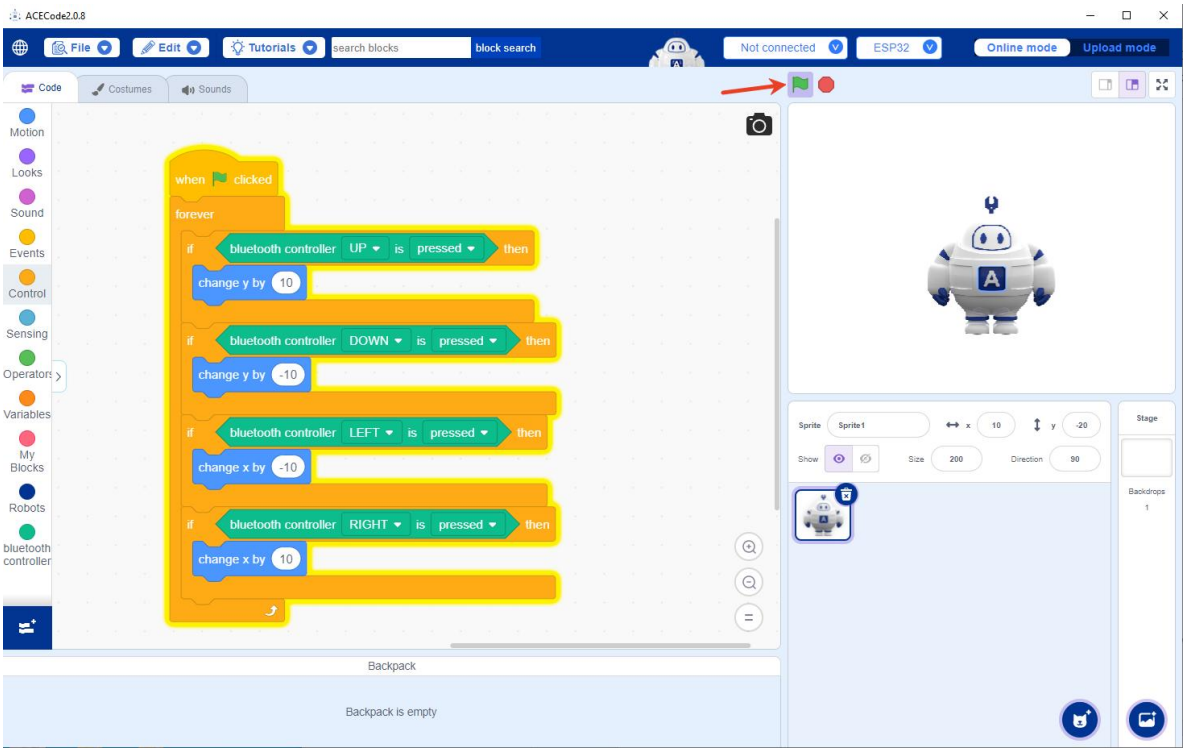
Click Lumi with the mouse, and then select the corresponding code instruction in the Code of the software page.



Sample Code:



Or directly open "Control_Lumi_move.sb3" in English \ 2.Program \Lesson 2, connect the PS3 controller to the computer through the USB cable, click the small green flag button to run the program, and then press the up and down left and right buttons of the controller, you can control the basic movement of the role up and down, left and right.

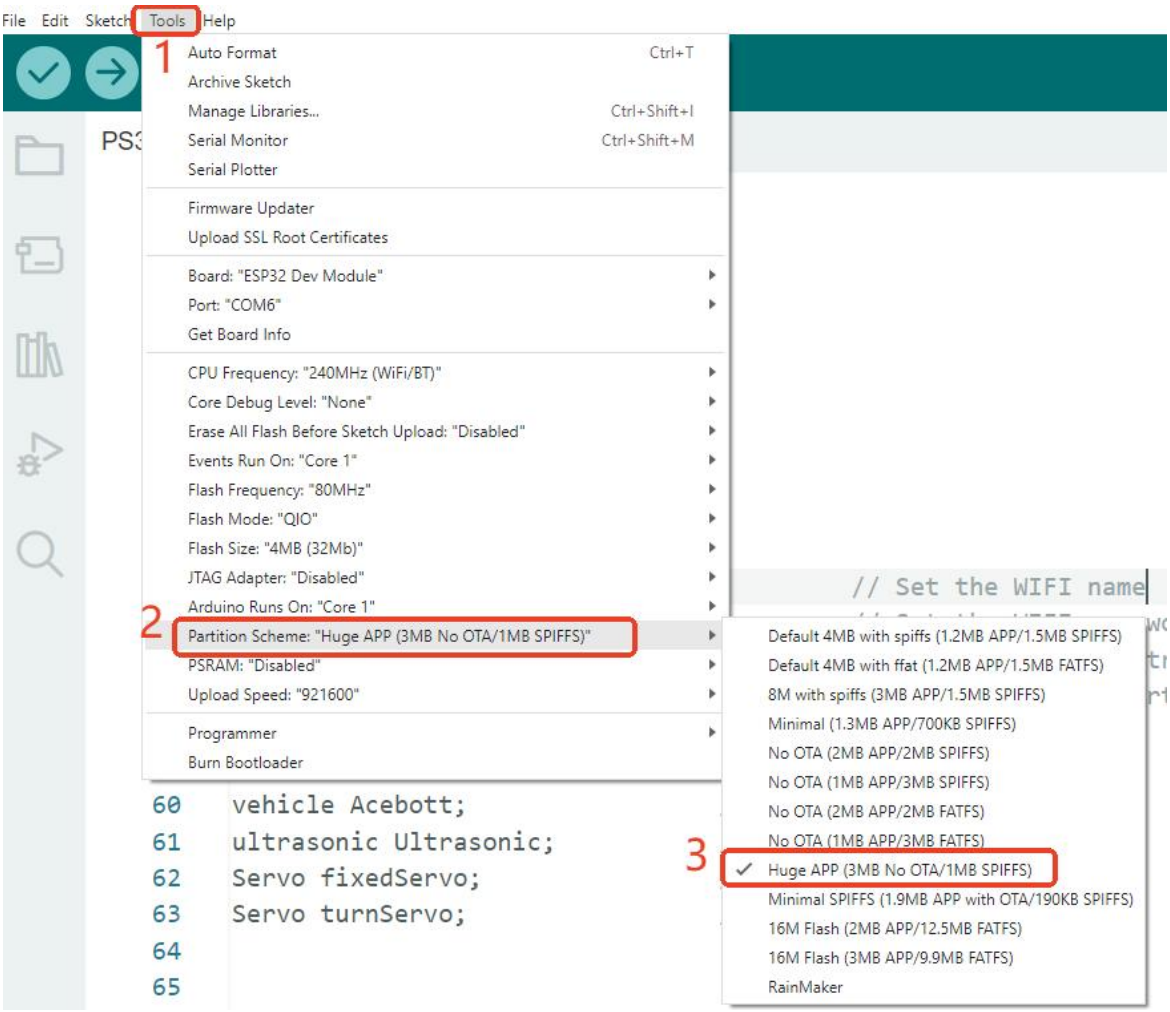


Lesson 3 Integrated Control of PS3 Controller

Ⅰ.PS3 Controller Control QD001

Open "PS3_QD001.ino" in English \ 2.Program \Lesson 3, Connect the ESP32 controller board to the computer with a USB cable, select the correct development board and port, and upload the code to the ESP32 controller board of the QD001 smart car.

Note: In the program of QD smart car series controlled by PS3 controller, the following compilation mode needs to be modified to Huge APP mode, otherwise it will cause an error to upload the program.



PS3 controller button function description:

Control key	Function
Left joystick	Control car forward and backward movement and left and right rotation
Right joystick	Control the car left and right movement and oblique motion
Up button	Play music
Down button	Control LED lights on and off
Y button	Control car to avoid obstacles
X button	Control car tracking 1
B button	Control car tracking 2
A button	Control car follow

Note: PS3 bluetooth controller control program still maintain the functionality of the APP.

Ⅱ.PS3 Controller Control QD001+QD005

Open "PS3_QD005.ino" in English \ 2.Program \Lesson 3, Connect the ESP32 controller board to the computer with a USB cable, select the correct development board and port, and upload the code to the ESP32 controller board of the QD005 smart car.

Note: In the program of QD smart car series controlled by PS3 controller, the compilation mode needs to be changed to Huge APP mode, otherwise the program will upload an error. For details, please refer to the picture of PS3 controller control QD001.

PS3 controller button function description:

Control key	Function
Left joystick	Control car forward and backward movement and left and right rotation
Right joystick	Control the car left and right movement and oblique motion
Up button	Play music
Down button	Control LED lights on and off
Y button	Control car to avoid obstacles
X button	Control car tracking 1
B button	Control car tracking 2
A button	Control car follow
SEL	Speed control (1st to 5th gear switch)
L1	Gun up
R1	Gun down
L2	After pressing, one shot

R2	After pressing, continuous shooting

Ⅲ.PS3 Controller Control QD001+QD007

Open "PS3_QD007.ino" in English \ 2.Program \Lesson 3, Connect the ESP32 controller board to the computer with a USB cable, select the correct development board and port, and upload the code to the ESP32 controller board of the QD007 smart car.

Note: In the program of QD smart car series controlled by PS3 controller, the compilation mode needs to be changed to Huge APP mode, otherwise the program will upload an error. For details, please refer to the picture of PS3 controller control QD001.

PS3 controller button function description:

Control key	Function

Left joystick	Control car forward and backward movement and left and right rotation
Right joystick	Control the car left and right movement and oblique motion
Y button	Control car to avoid obstacles
X button	Control car tracking 1
B button	Control car tracking 2
A button	Control car follow
Left key	Robot arm claws open
Right key	Robot arm claws closed
Left joystick X	Control chassis servo
Left joystick Y	Control shoulder servo
Right joystick X	Control wrist servo
Right joystick Y	Control elbow servo
L1	Switch the car motion mode
R1	Switch the robot arm mode
START	Robot arm Angle reset

Ⅳ.PS3 Controller Control QD001+QD008

Open "PS3_QD008.ino" in English \ 2.Program \Lesson 3, Connect the ESP32 controller board to the computer with a USB cable, select the correct development board and port, and upload the code to the ESP32 controller board of the QD008 smart car.

Note: In the program of QD smart car series controlled by PS3 controller, the compilation mode needs to be changed to Huge APP mode, otherwise the program will upload an error. For details, please refer to the picture of PS3 controller control QD001.

PS3 controller button function description:

Control key	Function
Left joystick	Control car forward and backward movement and left and right rotation
Right joystick	Control the car left and right movement and oblique motion
Up button	Play music
Down button	Control LED lights on and off
Y button	Control car to avoid obstacles
X button	Control car tracking 1
B button	Control car tracking 2
A button	Control car follow
L1	Solar panel up
R1	Solar panel down

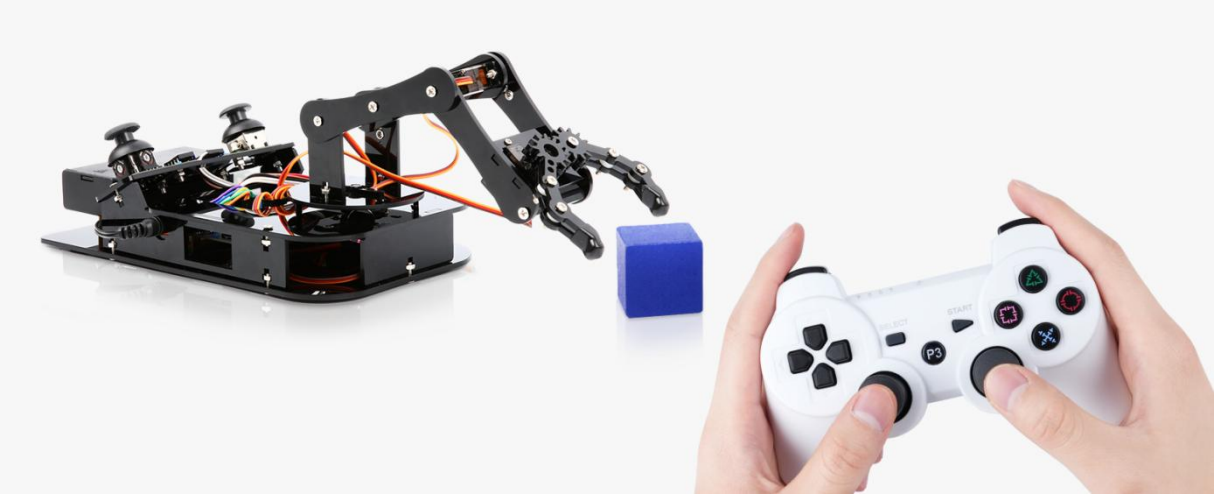
Ⅴ. PS3 Controller Control QD022

Open "PS3_QD022.ino" in English \ 2.Program \Lesson 3 file, use the USB cable to connect the ESP32 controller board of the cart and the computer, choose the correct development board and port, and upload the code to the ESP32 controller board of the QD022.

Description of the PS3 controller's key functions:

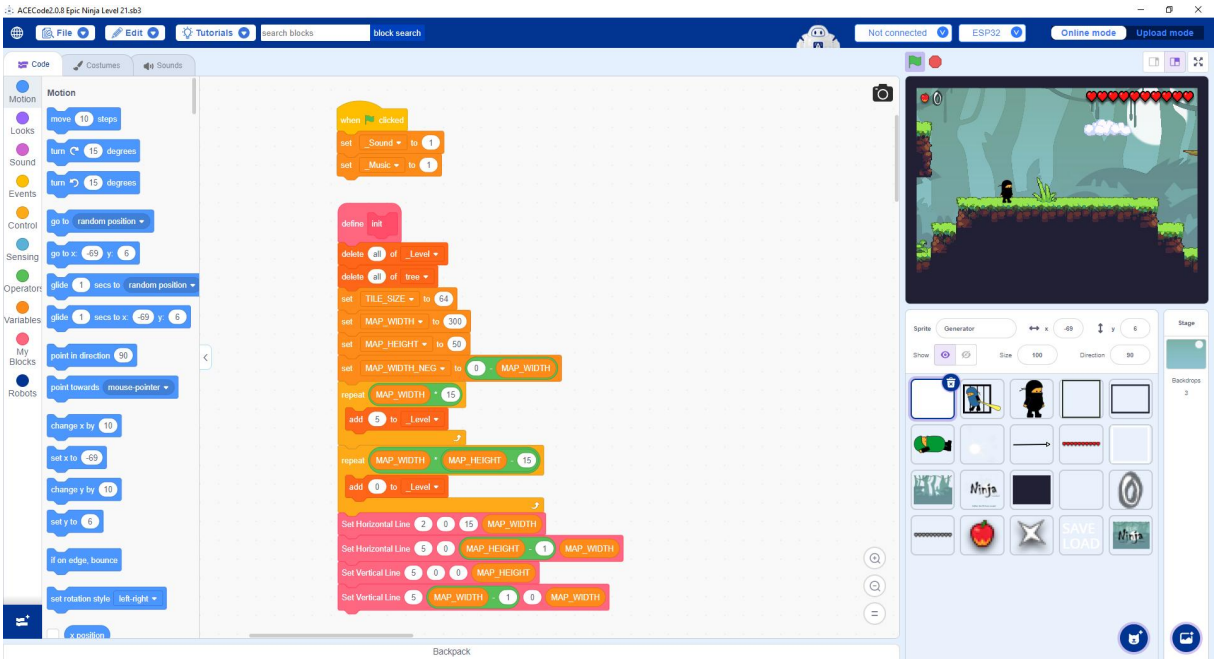
Control key	Function
Left joystick	Control the movement of the robotic arm's base and shoulder. The joystick's forward/backward motion controls the shoulder, while left/right motion controls the base rotation.
Right joystick	Control the movement of the robotic arm's elbow and gripper. The joystick's forward/backward motion adjusts the elbow, while left/right motion opens/closes the gripper.

L1	Record action and delete, short press 0.5S to record action, up to 20 actions can be recorded. Long press 4-5S to delete all recorded actions.
R1	Execute recorded actions.



Ⅵ.PS3 controller controls the game

Open "game.sb3" in English \ 2.Program \Lesson 3, connect the PS3 controller to the computer with a USB cable, then click Run program.



Control mode:

Use the left joystick to control the game character's forward, backward and jump, and

use the X button to control the character's attack action.