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.

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Catalog

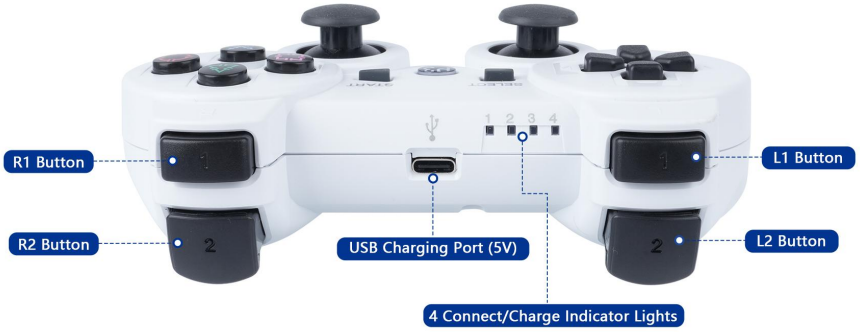
Lesson 1 Introduction of PS3 Bluetooth Controller

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

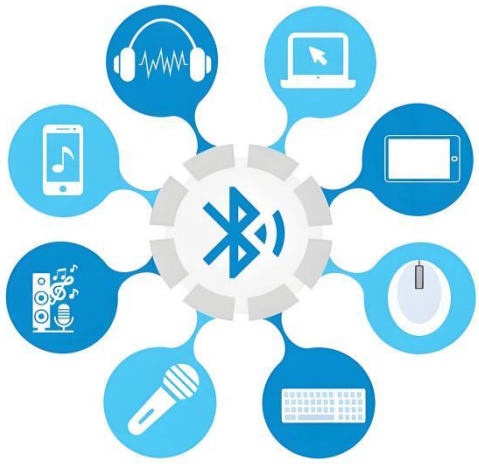


III.Principle of Bluetooth Signal Transmission

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

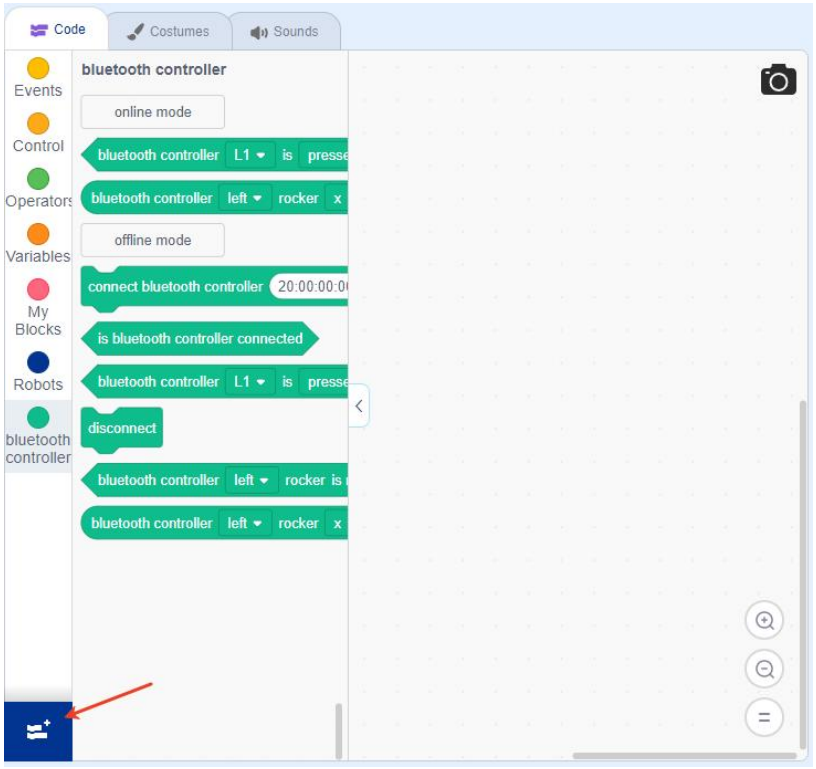
PS3 Bluetooth controller can control both ACECode graphical program in the game character, but also can control the QD001 series of intelligent car, then please follow me to learn how to achieve the basic control of the PS3 handle it.

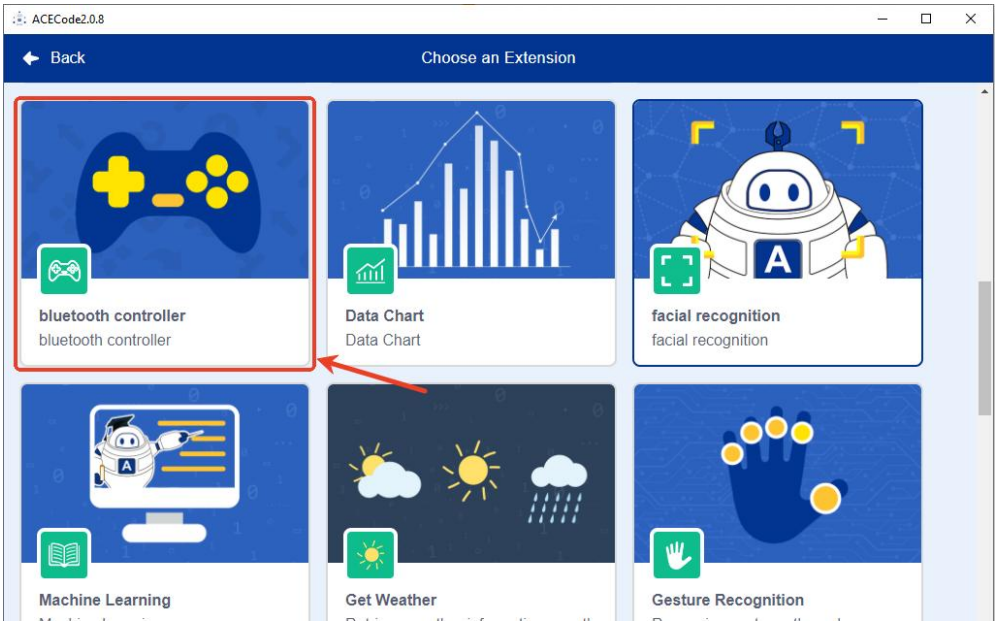
I. PS3 Controller Control the Game Character

How is the PS3 going to control the game characters on the ACECode? Let's learn how to do it together.

1.PS3 Bluetooth Controller Adapted to ACECode

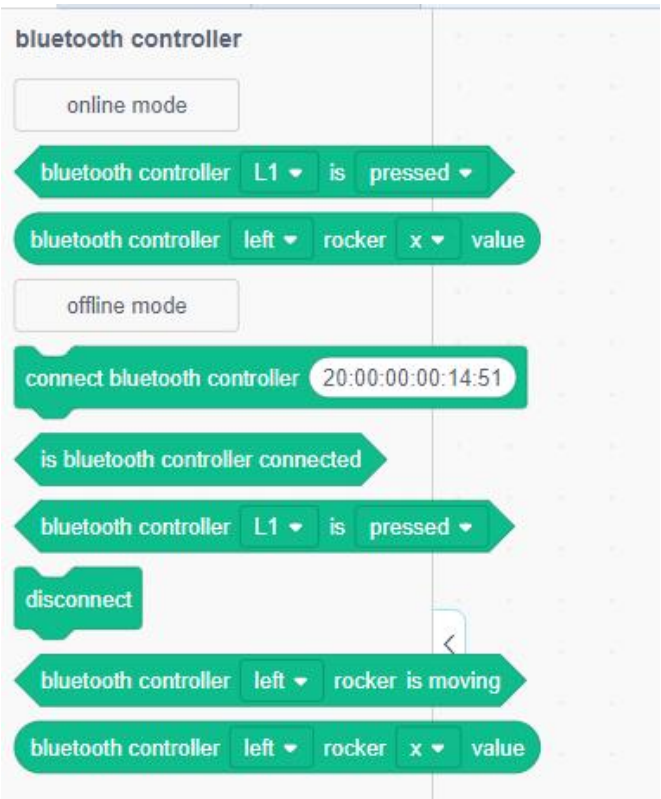
(1) First of all, you need to add the PS3 Bluetooth controller application extension in ACECode, click on the "Add Extension" in the lower left corner of ACECode, and select "Bluetooth controller" in the pop-up page to add.



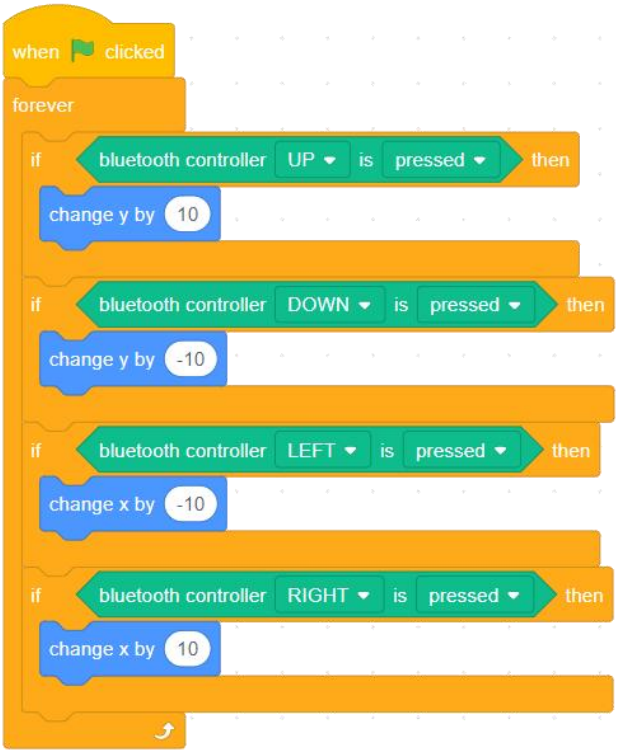


(2) In ACECode, there are two modes of using the Bluetooth controller: online mode and offline mode, in online mode, the Bluetooth controller needs to be connected to the computer with a TypeC cable to control the character in ACECode online; offline mode supports uploading the code to the smart car, and the Bluetooth controller can control the smart car offline.

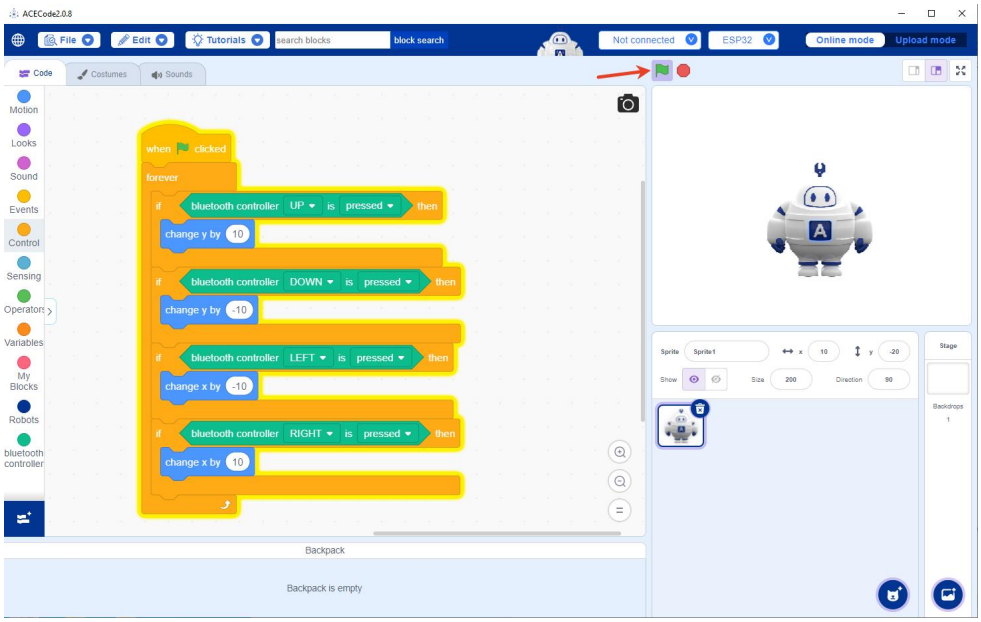
Note:Commands in online mode cannot be mixed with commands in offline mode.



(3) Use the "Up", "Down", "Right" and "Left" buttons of the PS3 controller to control the movement of Lumi on the stage. the reference program is as follows.



You can also directly open the "1.Control_Lumi_move.sb3" in the "English \ACECode(Beginner)\2.Program\lesson2", the PS3 controller through the USB cable connected to the computer, click on the small green flag button to run the program, and then press the handle of the up and down left and right buttons, you can control the character up and down the left and right of the basic movement.



(4) Introduction to the Directive

Command 1: Indicates whether the buttons of the joystick are pressed or not, click on the inverted triangle icon to expand and select all the buttons on the joystick.

Command 2: Get the analog value of joystick, click the inverted triangle icon to expand the selection of the left and right joysticks and the analog value of X and Y axes.

II. PS3 Controller Control Smart Car

1. Control the Smart Car

To realize the function of handle control samrt car, firstly, we need to upload the program of PS3 control trolley to the intelligent trolley, then communicate with the handle, and finally use the handle to control the QD001 trolley to realize the forward and backward, left and right base movement.

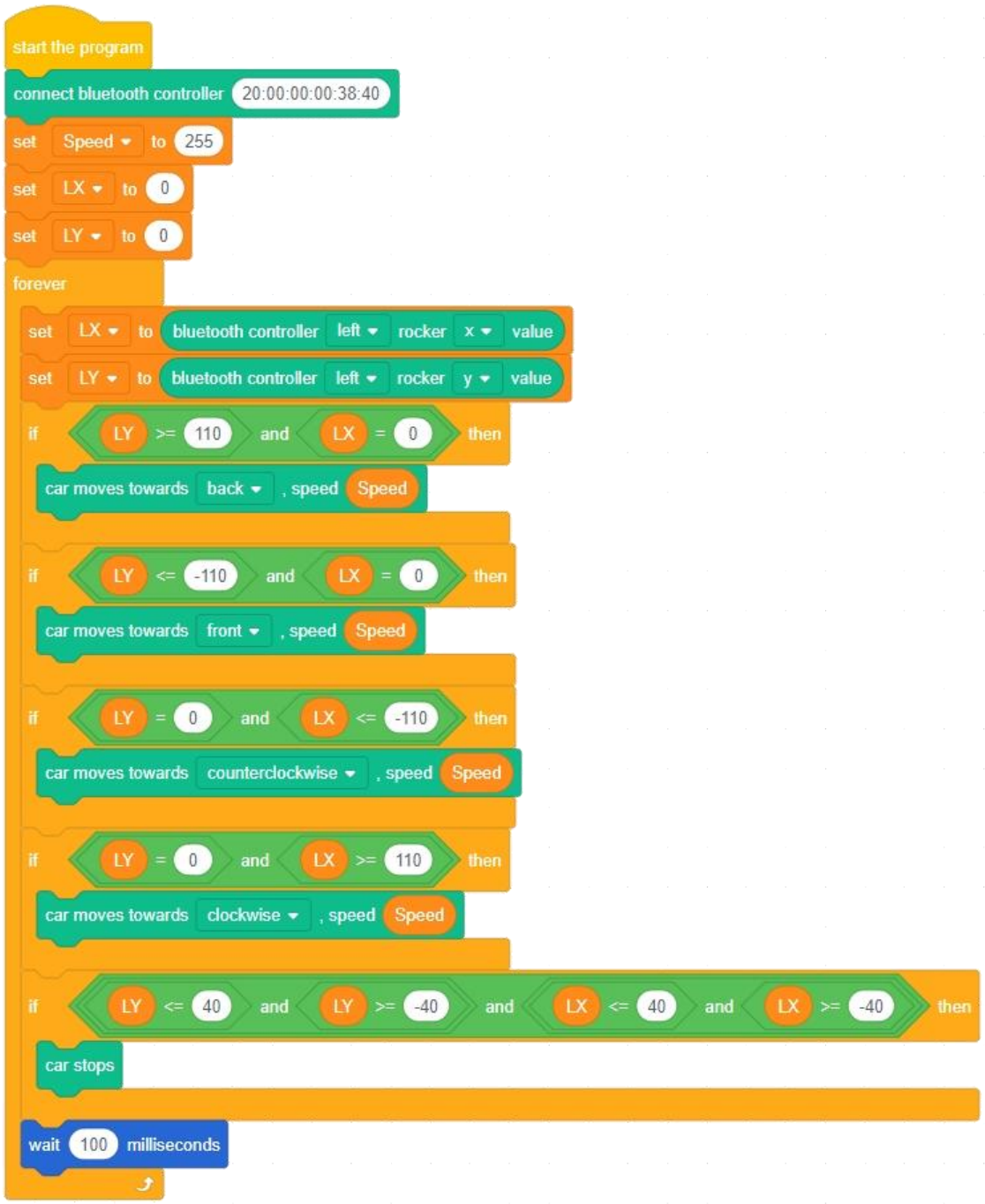
PS3 Controller Control Car Logic:

PS3 Controller button	Car function
Left joystick X direction	Control the trolley to pan left and right
Left joystick Y direction	Control the cart to move back and forth

(1) Write a Program

Open "2.Bluetooth_controller_car_control.sb3" in "English \ACECode(Beginner)\2.Program\lesson2"Documentation.

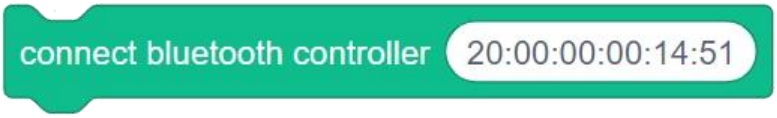
The reference program is as follows:



(2) Introduction to the Directive

Command 1: Turn on the Bluetooth, connect the handle. You need to fill in the adapter code on the back of the handle you are using, the adapter code is different for

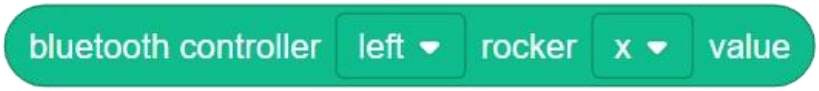
different handles, you need to modify the adapter code according to the actual situation.



Command 2: Get the analog value of the XY axis of the left and right joysticks of the PS3 Bluetooth controller, click the first inverted triangle to select the left and right joysticks, click the second inverted triangle to select the XY axis, the analog value of the XY axis ranges from -128~127.

For the X-axis, the X analog value is 0 when the joystick is in the middle position, and decreases as it moves to the left, with a minimum value of -128 on the leftmost side, and increases as it moves to the right, with a maximum value of 127 on the rightmost side.

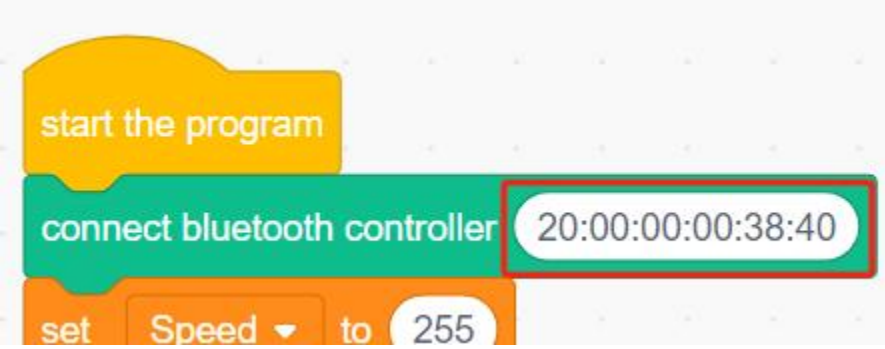
For the Y-axis, the Y analog value is 0 when the joystick is in the middle position, and decreases as it moves upward, with a minimum value of -128 at the top edge, and increases as it moves downward, with a maximum value of 127 at the bottom edge.



(3) Fill in the Bluetooth Pairing Code and Upload the Program

Enter the Bluetooth pairing code on the back of the joystick into the code and run it, for example, your controller's Bluetooth pairing code is:20:00:00:00:38:40

In the sample code, find the command to set the pairing code of the Bluetooth controller and change it to the corresponding pairing code.



Note: Each PS3 controller has a different pairing code!

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

2. Paired Connections

After uploading the program, the smart car has to be paired with the controller.

(1) Make sure the PS3 controller is disconnected from the computer or power adapter, and do not connect any data or charging cables.

(2) Long press the PS3 controller in the middle of the "P3" button, the PS3 controller's 4 indicator lights will flash at the same time, the PS3 controller will automatically query the connection to the smart car, if it is the first time to connect to the smart car may have to press the smart car ESP32 reset button, or more than one time, different motherboards may not have the same speed of response.

(3) After successful connection, the 4 indicator lights of the PS3 controller will flash at the same time, and it will turn off automatically about 10 seconds after disconnection. After successful pairing, the left stick of the control handle swings up and down to realize the forward and backward movement of the cart, and the left stick of the control handle swings left and right to realize the left and right movement of the cart.

Lesson 3 Integrated Control of PS3 Controller

I. PS3 Controller Control QD001

Open "1.PS3_QD001.sb3" in "English \ACECode(Beginner)\2.Program\lesson3" file, connect the ESP32 controller board and computer with a USB cable, select the correct development board and port, and upload the code to the ESP32 controller board of QD001 smart car.

Description of the PS3 controller's key functions:

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 "2.PS3_QD005.sb3" in "English \ACECode(Beginner)\2.Program\lesson3" file,Connect the ESP32 controller board on the cart and the computer with the USB cable, select the correct development board and port, and upload the code to the ESP32 controller board of the QD005 intelligent cart.

Description of the PS3 controller's key functions:

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 down
R1	Gun up
L2	After pressing, one shot
R2	After pressing, continuous shooting

III. PS3 Controller Control QD001+QD007

Open "3.PS3_QD007.sb3" in "English \ACECode(Beginner)\2.Program\lesson3" 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 QD007 intelligent cart.

Description of the PS3 controller's key functions:

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 "4.PS3_QD008.sb3" in "English \ACECode(Beginner)\2.Program\lesson3" 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 QD008 intelligent cart.

Description of the PS3 controller's key functions:

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

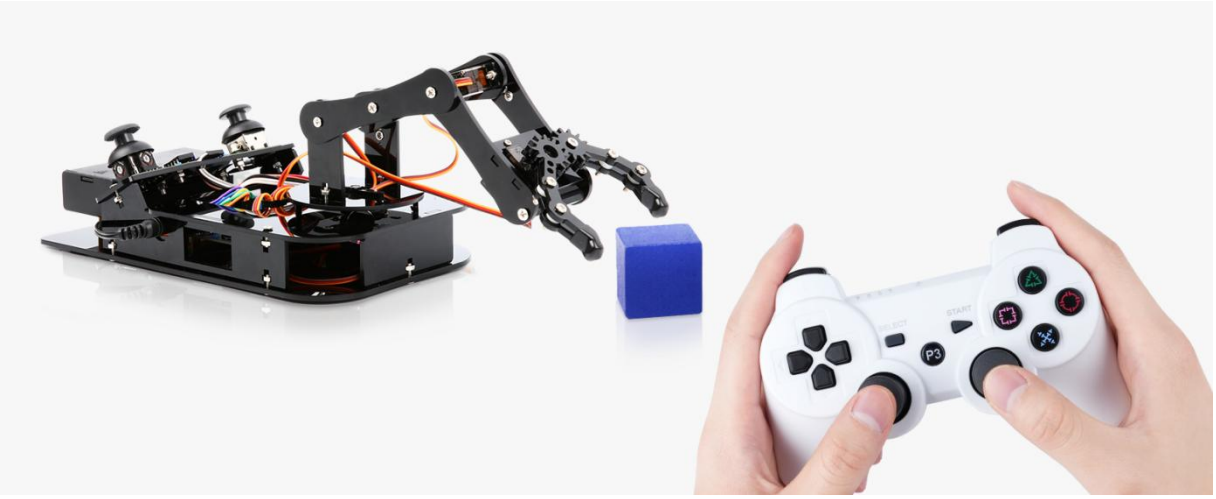
V. PS3 Controller Control QD022

Open "5.PS3_QD022.sb3" in "English \ACECode(Beginner)\2.Program\lesson3" 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 Control the Game

Open "6.game.sb3" in "English \ACECode(Beginner)\2.Program\lesson3". To run the program, connect the PS3 controller to your computer with a USB cable and click Run.

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.