

Micro:bit handle control

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1. Learning objectives
2. Building blocks
3. Motor wiring
4. Programming
 - 4.1 Add expansion package
 - 4.2 Building blocks used
 - 4.3 Add new variables
 - 4.4 Combined blocks
5. Experimental phenomenon

1. Learning objectives

In this course, we mainly learn how to use MakeCode graphical programming to realize the control of the Mobile shooter with the microbit handle.

2. Building blocks

For the building blocks steps, please refer to the installation drawings of **[Assembly Course]-[Mobile shooter]** in the materials or the building blocks installation book.

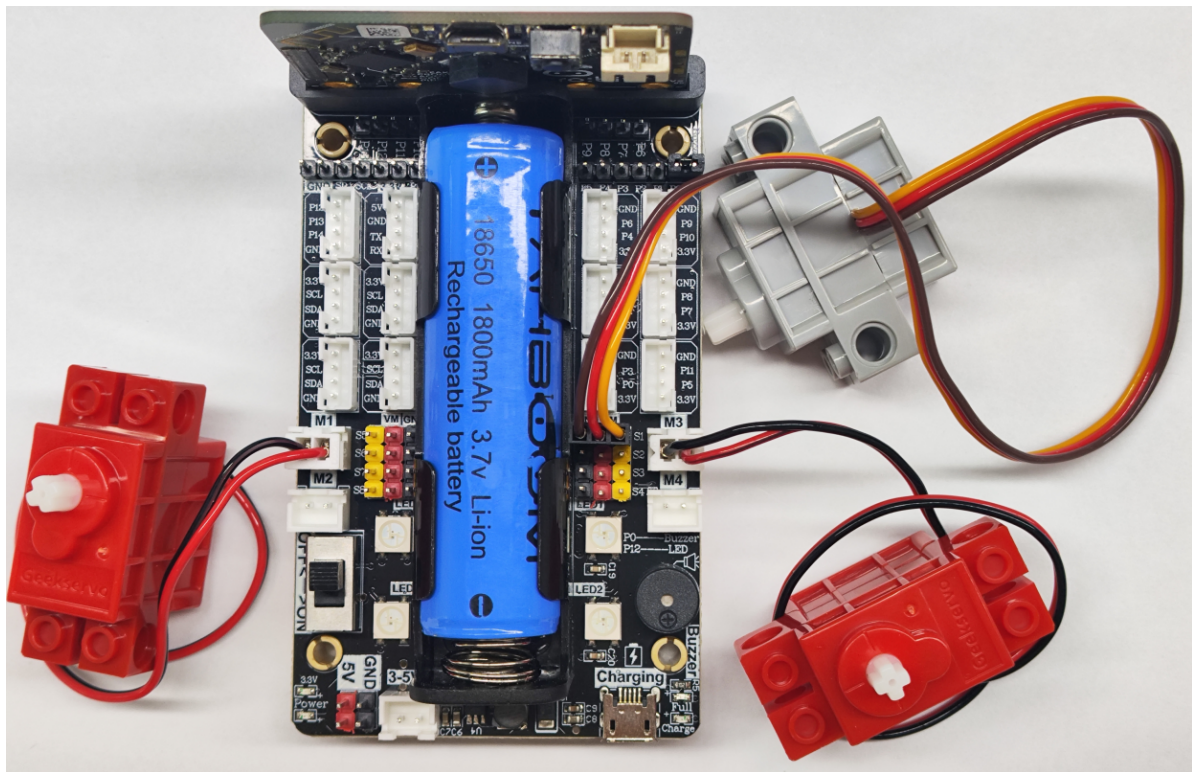
3. Motor wiring

Insert the motor wiring on the left side of the car into the M1 interface of the Super:bit expansion board, and the black wire is close to the battery side;

Insert the motor wiring on the right side of the car into the M3 interface of the Super:bit expansion board, and the black wire is close to the battery side;

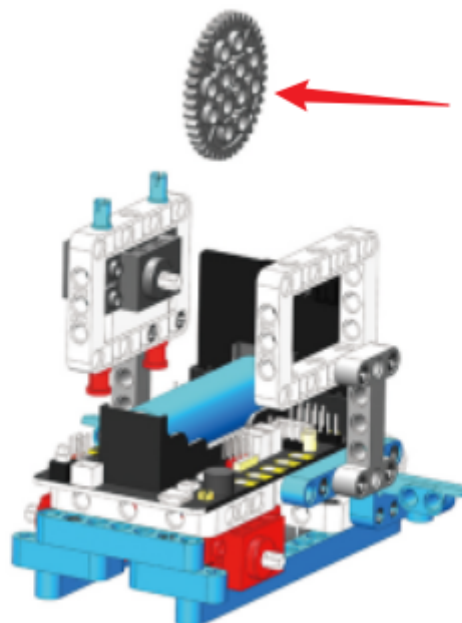
Insert the building blocks servo wiring into the S1 interface of the Super:bit expansion board, and the orange servo wiring is inserted into the yellow pin of S1.

As shown in the figure below:



! Notes:

When taking a course related to building block servos for the first time, we need to remove the large gear installed on the servo and upload the program of this course to micro:bit; then turn on the power switch of the Super:bit expansion board and wait for the building block servo to turn to the initial position; then, we can turn off the power, adjust the angle of the car projection rod to be parallel to the ground, and then install the servo gear. (If you have used the Mobile shooter and servo-related programs before, you can skip this step)



4. Programming

Method 1 Online Programming:

First, connect micro:bit to the computer via a USB data cable, and a U disk will pop up on the computer. Click the URL in the U disk: <https://makecode.microbit.org/> to enter the programming interface. Then, add the Yabo smart software package to program.

Method 2 Offline Programming:

Open the offline programming software MakeCode and enter the programming interface. Click [New] and add the Yahboom smart software package to start programming.

superbit kit expansion package: <https://github.com/YahboomTechnology/SuperBitLibV2>

Handle expansion package: <https://github.com/YahboomTechnology/GHBitLib>

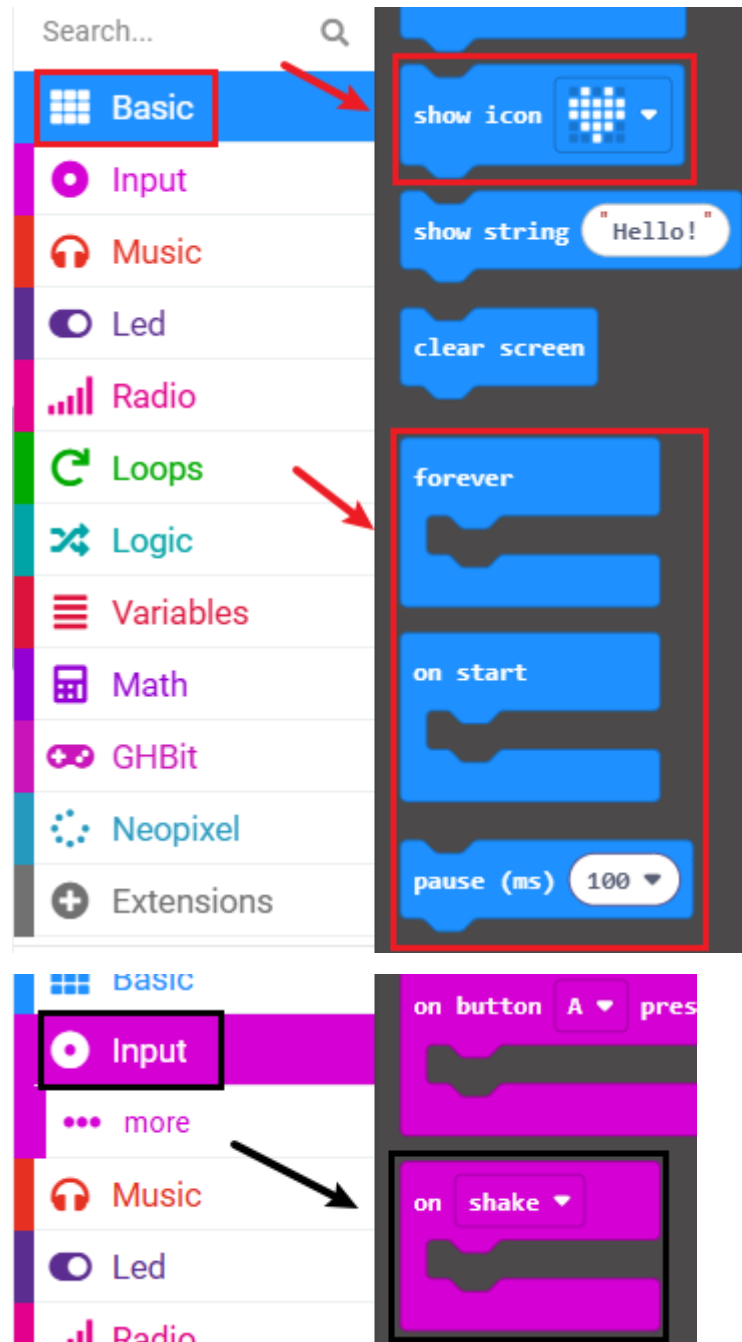
4.1 Add expansion package

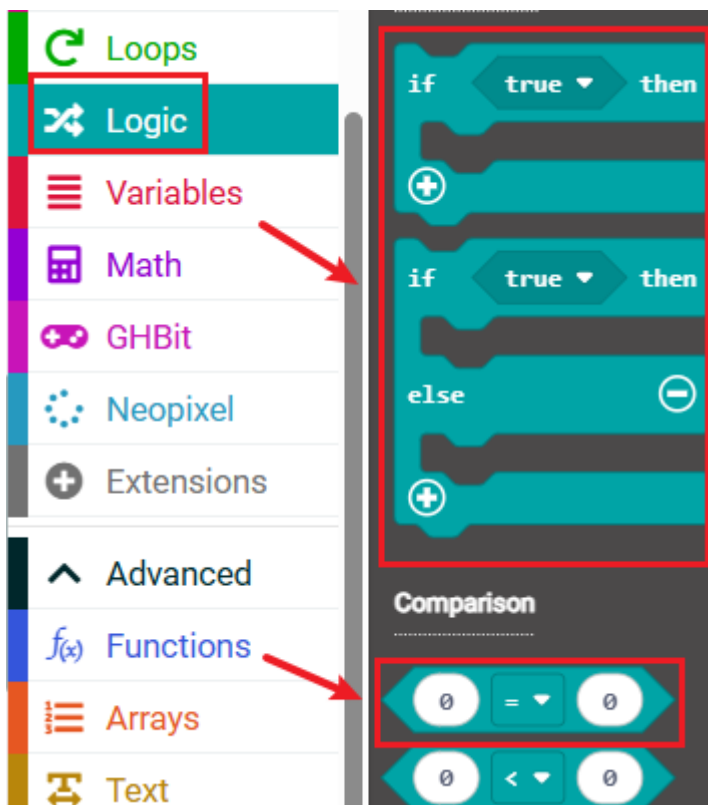
The image shows the MakeCode IDE interface. The top part displays a Scratch-like workspace with a black background and a grid of pins. A red box highlights the 'Extensions' button in the right-hand sidebar. Below the workspace, there are several icons for different functions like 'Run', 'Refresh', 'Save', 'Audio', 'Camera', and 'Screenshot'.

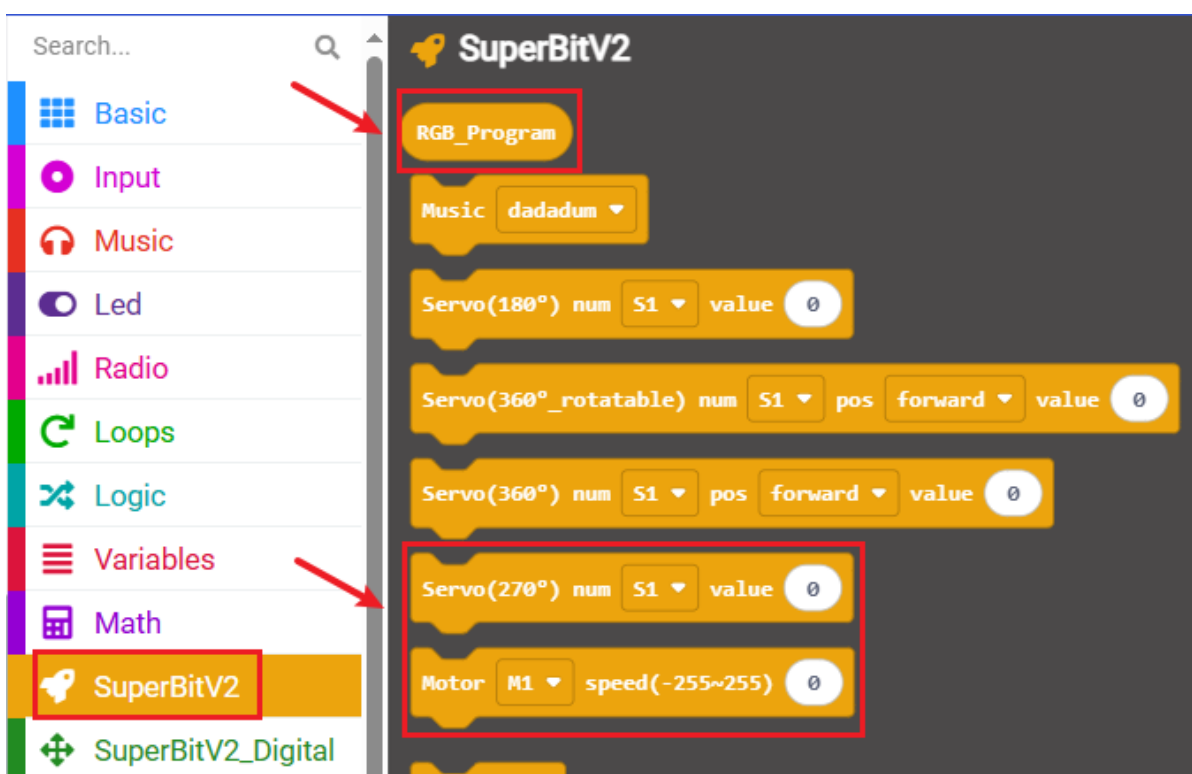
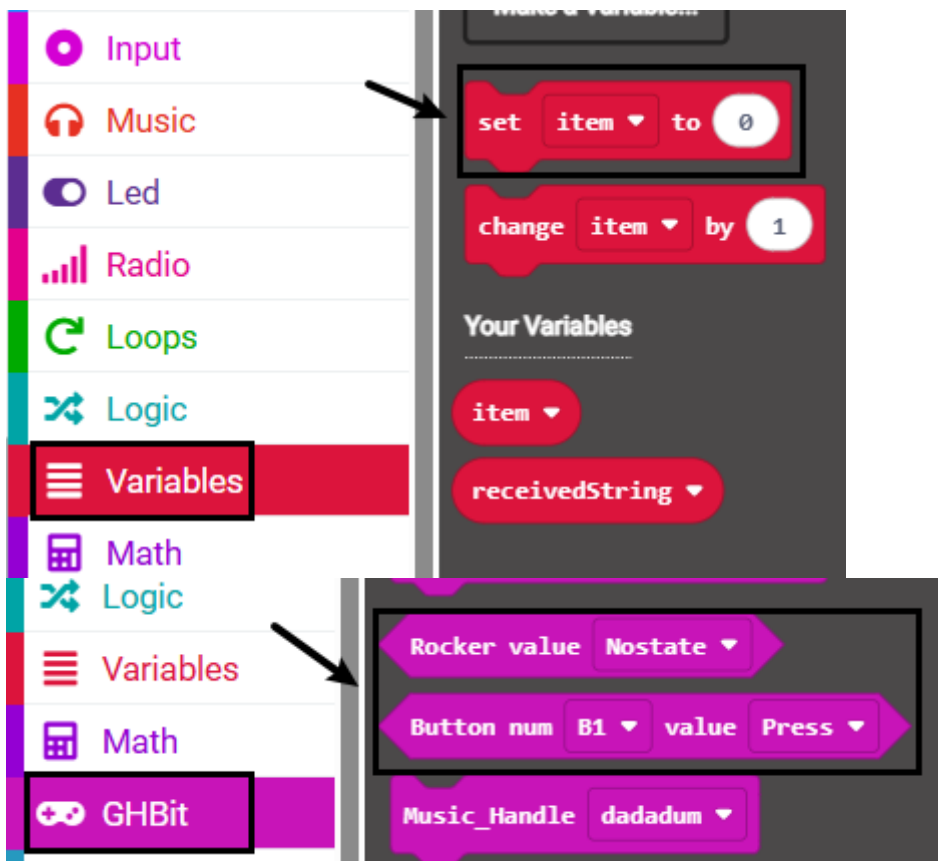
The bottom part of the image shows the 'Extensions' panel. At the top, there is a search bar with the URL <https://github.com/YahboomTechnology/SuperBitLibV2> entered. A red box highlights the search bar and the search icon. Below the search bar, there are several category buttons: 'Lights and Display', 'Software', 'Science', 'Robotics', 'Gaming', and 'Networking'. The 'Software' button is highlighted. In the center, a card for 'SuperBitV2' is displayed, which is an 'Extension for YahBoom SuperBitV2'. A red box highlights this card. At the bottom of the card, it says 'User-provided extension, not endorsed by Microsoft. [Learn More](#)'.

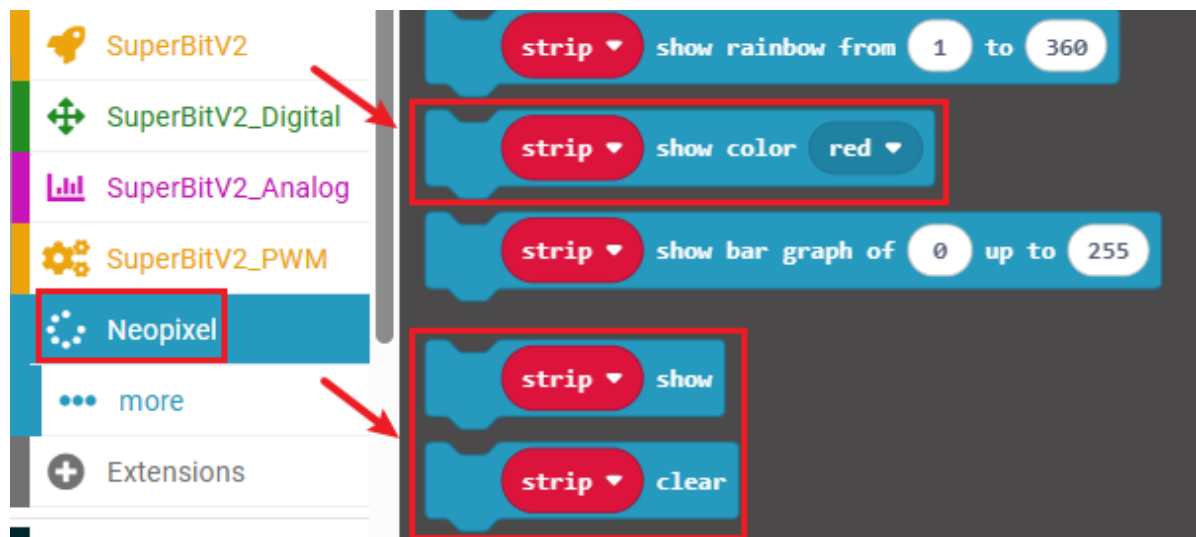
4.2 Building blocks used

The location of the building blocks required for this programming is shown in the figure below.









The image displays the MicroPython IDE interface, showing two panes of code blocks for the radio module. The top pane contains blocks for setting up a radio group and sending data, while the bottom pane contains blocks for setting transmit parameters and receiving data. The left sidebar shows the category menu with 'Radio' and 'more' highlighted in the top pane, and 'Basic' and 'more' highlighted in the bottom pane. Arrows indicate the selection of the 'Radio' category in the top pane and the 'more' option in the bottom pane.

Top Pane:

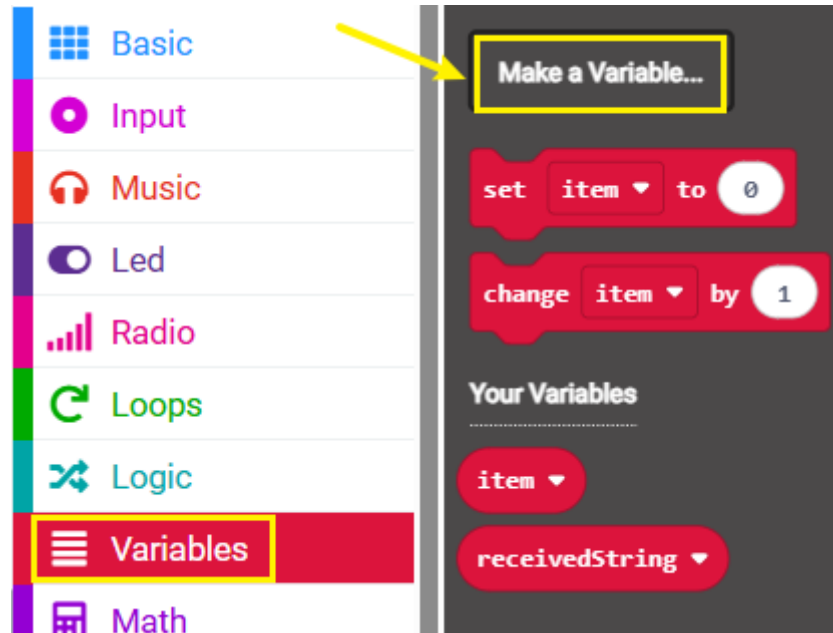
- radio set group** 1
- Send**
 - radio send number 0
 - radio send value "name" = 0
 - radio send string ""
- Receive**
 - on radio received receivedNumber
 - on radio received name value
 - on radio received receivedString

Bottom Pane:

- more**
 - radio set transmit power 7
 - radio set transmit serial number true
 - radio set frequency band 0
 - radio raise event
 - from source MICROBIT_ID_BUTTON_A

4.3 Add new variables

① Find the [Variable] option in the building block bar ---- [Set variable]

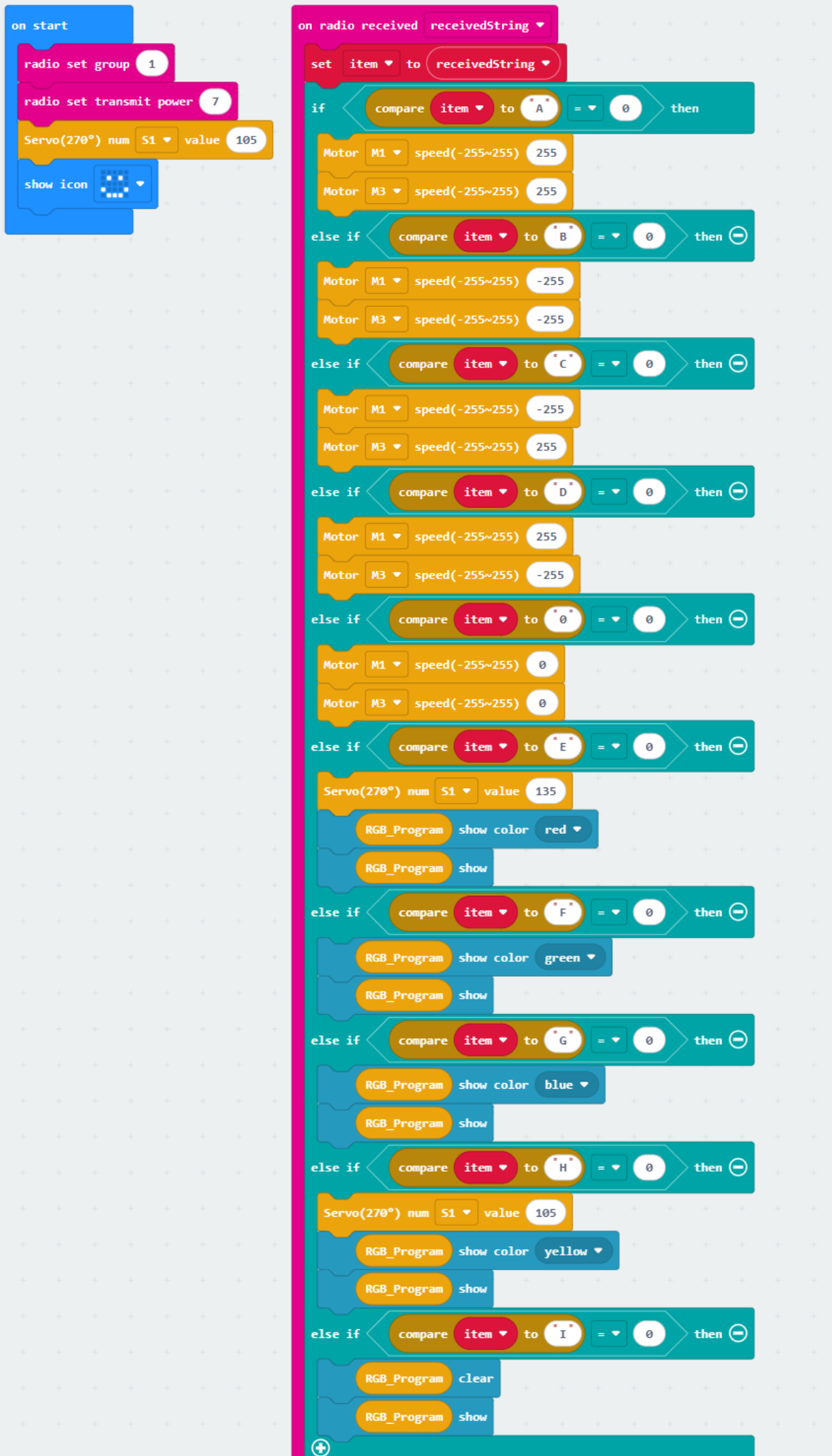


② Enter the variable name to complete the new variable.

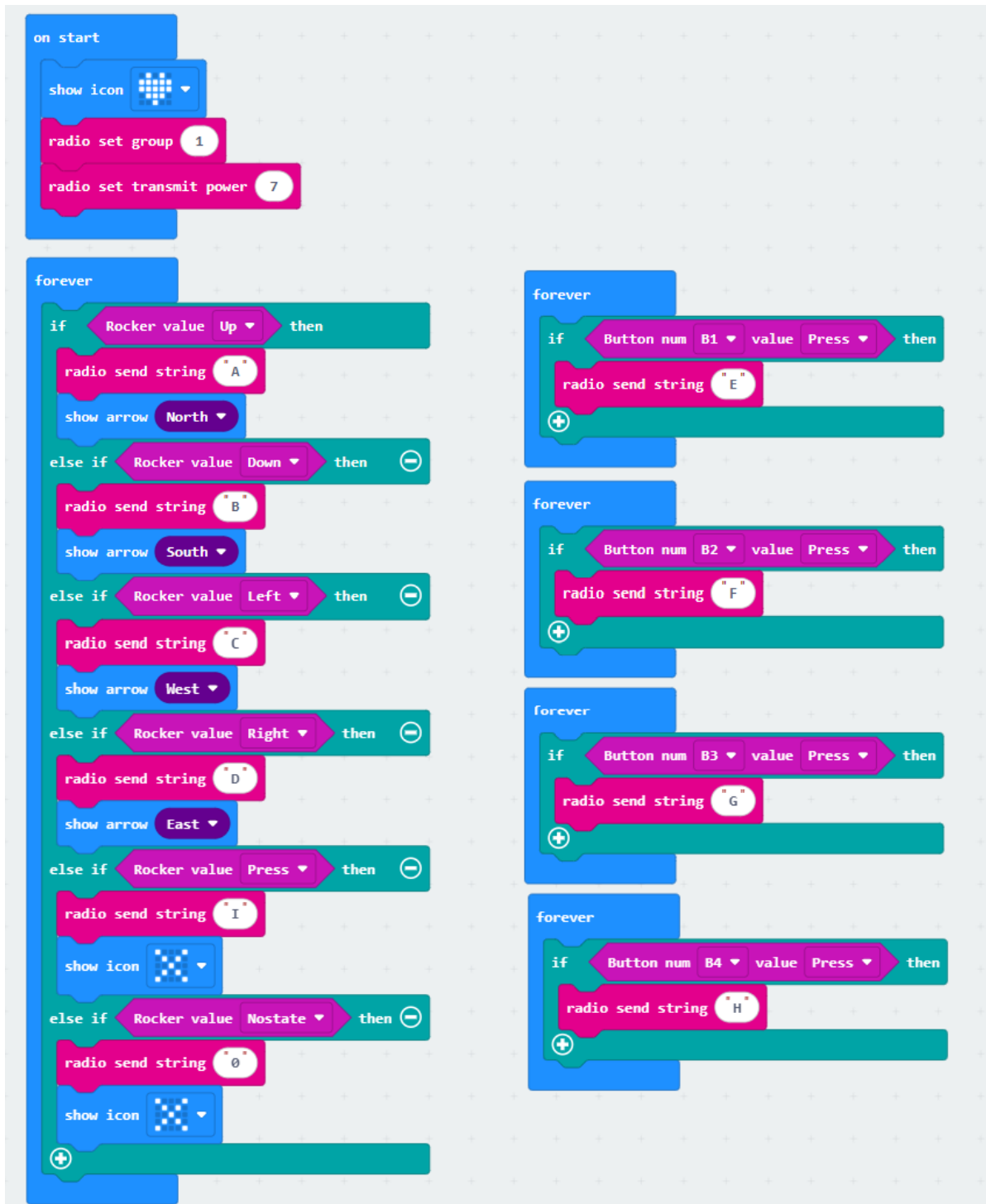
The image shows a dialog box titled 'New variable name:'. It has a text input field with the placeholder text 'value'. At the bottom right, there is a green button labeled 'Ok' with a checkmark icon. The dialog box has a close button (an 'X' in a circle) in the top right corner.

4.4 Combined blocks

The microbit summary program on **Mobile shooter** is shown in the figure below



Handle rocker control program is as follows



Handle gravity control program is as follows



You can also directly open the **microbit-Handle-control-mobile-shooter.hex**, **microbit-Handle-rocker-control.hex**, **microbit-Handle-gravity-control.hex** files provided in this experiment and drag them into the browser that opens the URL, and the program diagram of this project source code will be automatically opened

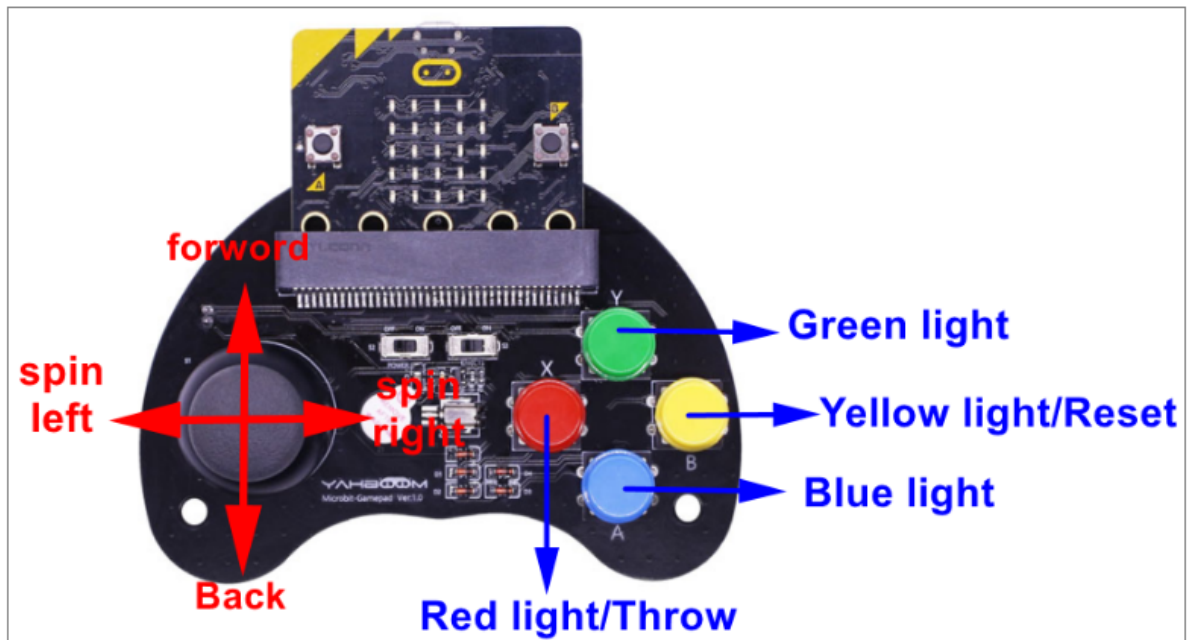
5. Experimental phenomenon

We need to download the Mobile shooter program to the micro:bit motherboard of the Mobile shooter, turn on the power switch of the Mobile shooter, and we can see a smiley face pattern displayed on the micro:bit dot matrix;

Download the handle remote control program to the micro:bit motherboard of the handle, turn on the power switch of the handle, and we can see that the micro:bit dot matrix will initialize to display a heart pattern, and then display an "X" pattern, indicating that the handle is in the default state and no data is sent.

The two will automatically pair, and then we can start remotely controlling the Mobile shooter.

The handle functions are as follows.



!Note: When the handle is controlled by the joystick, press the joystick to turn off the RGB light. This function does not exist when the handle is controlled by gravity.