

Micro:bit handle control

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1. Learning objectives

In this course, we mainly learn how to use MakeCode graphical programming to realize microbit handle control Freestyle.

2. Building blocks

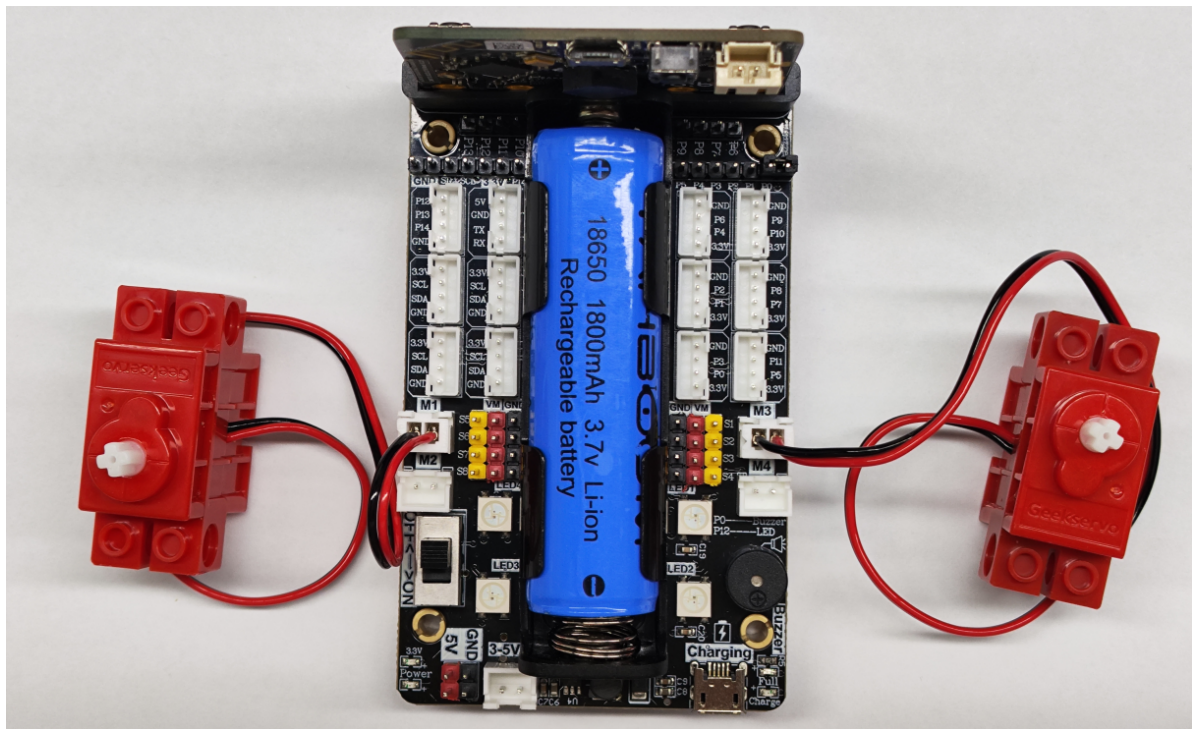
For the building block construction steps, please refer to the installation drawings of **[Assembly Course]**--**[Freestyle]** in the materials or the building block installation album.

3. Motor wiring

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

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

As shown below:



4. Programming

Method 1 Online programming:

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

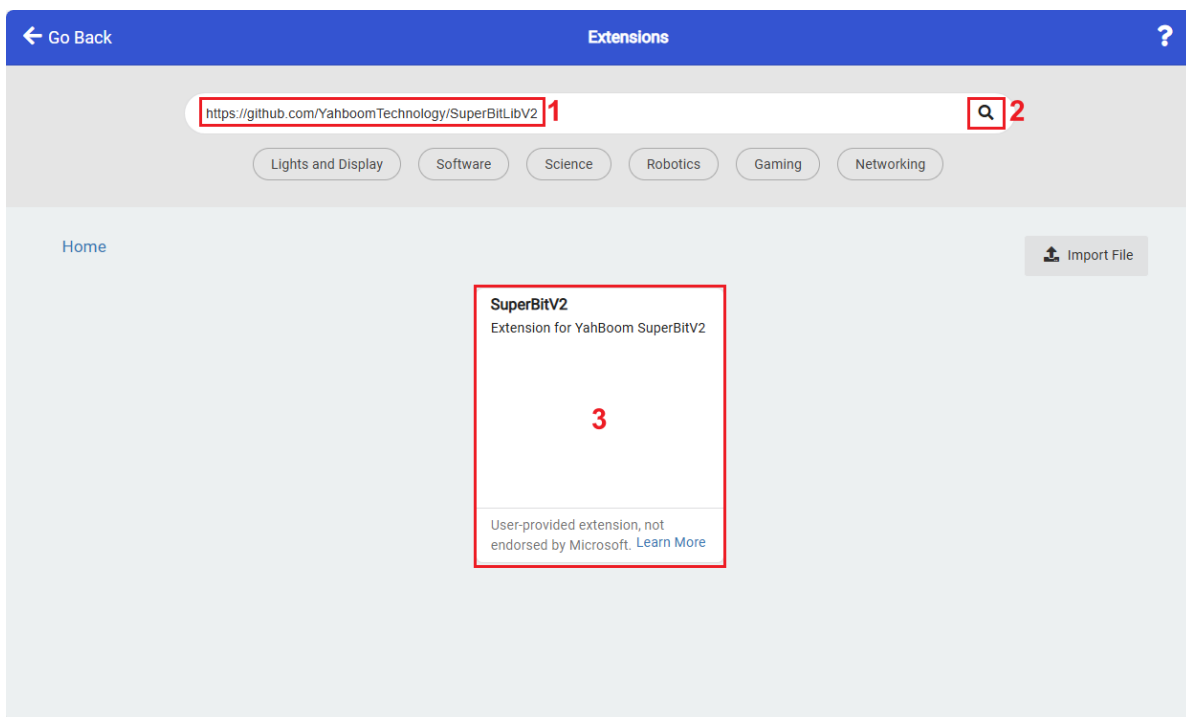
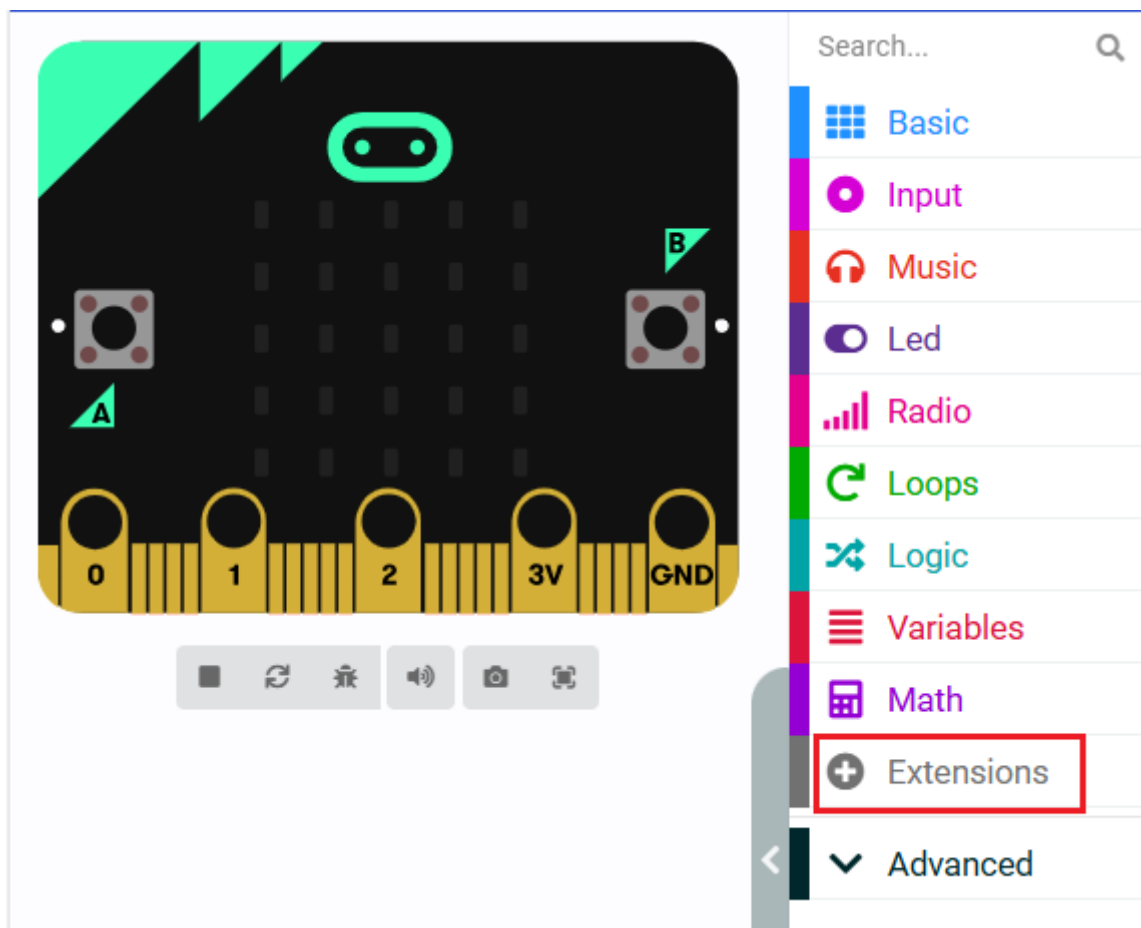
Method 2 Offline programming:

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

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

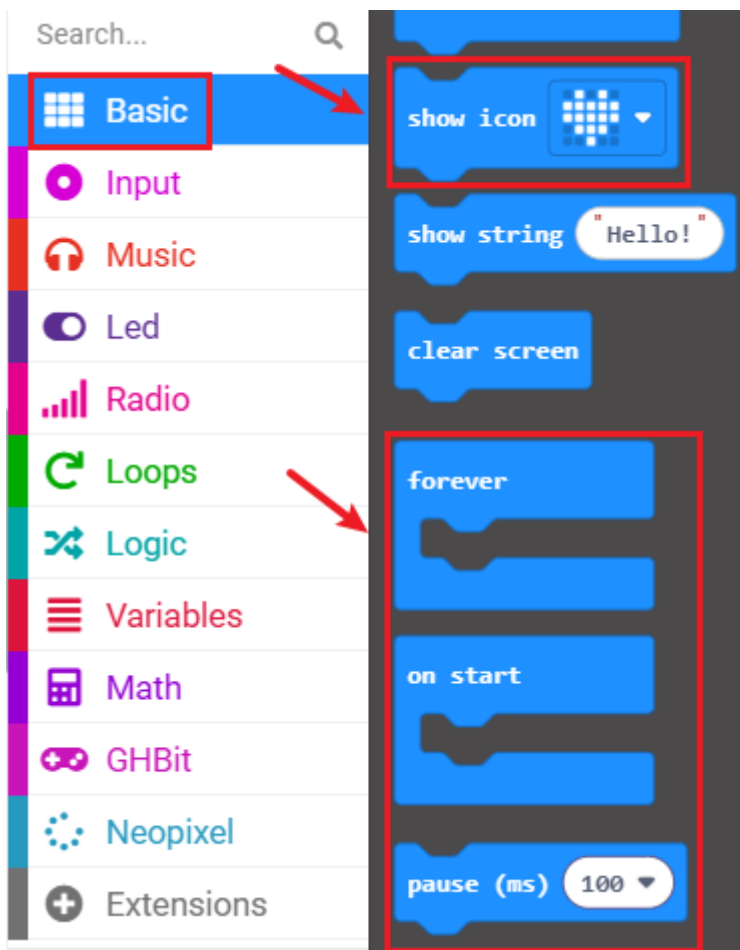
handle expansion package: <https://github.com/YahboomTechnology/GHBitLib>

4.1 Add expansion package

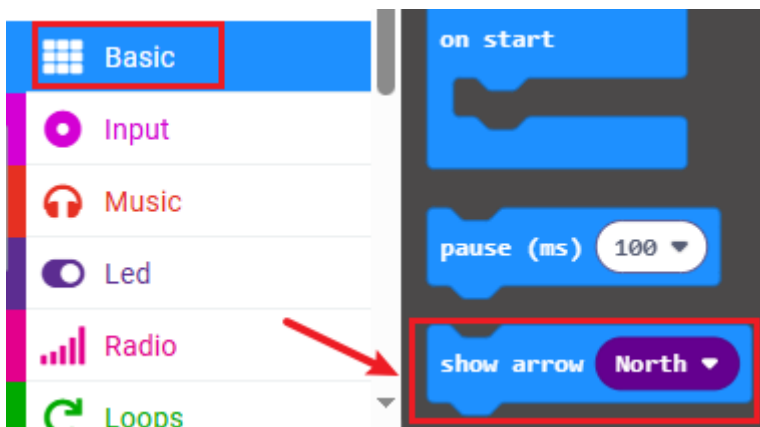
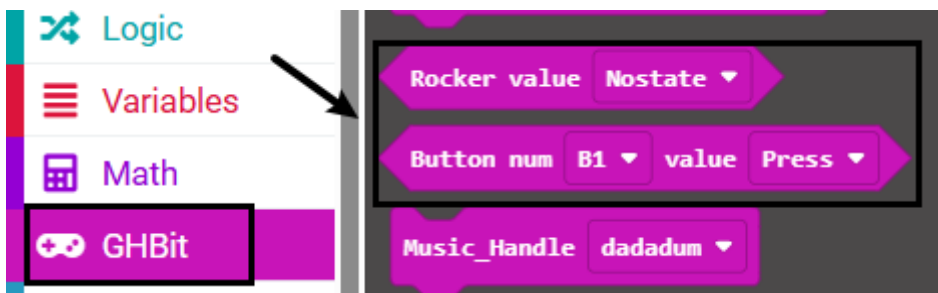
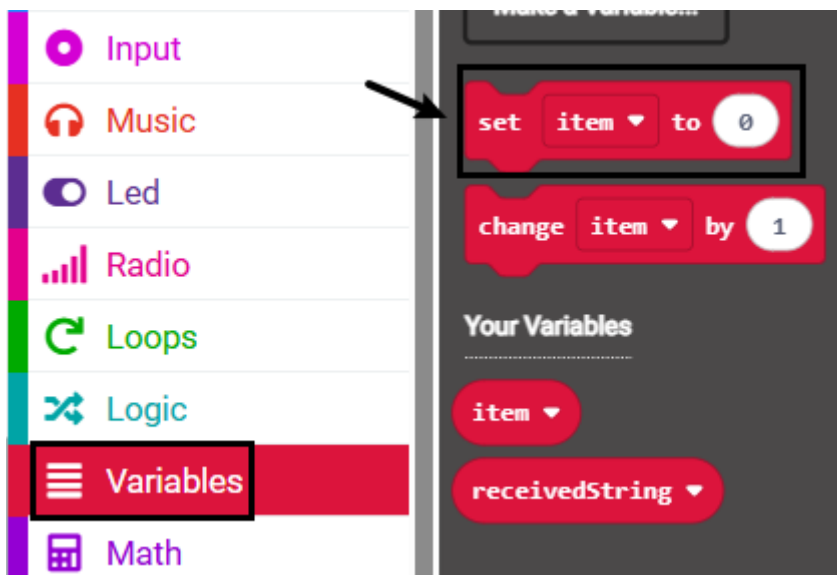


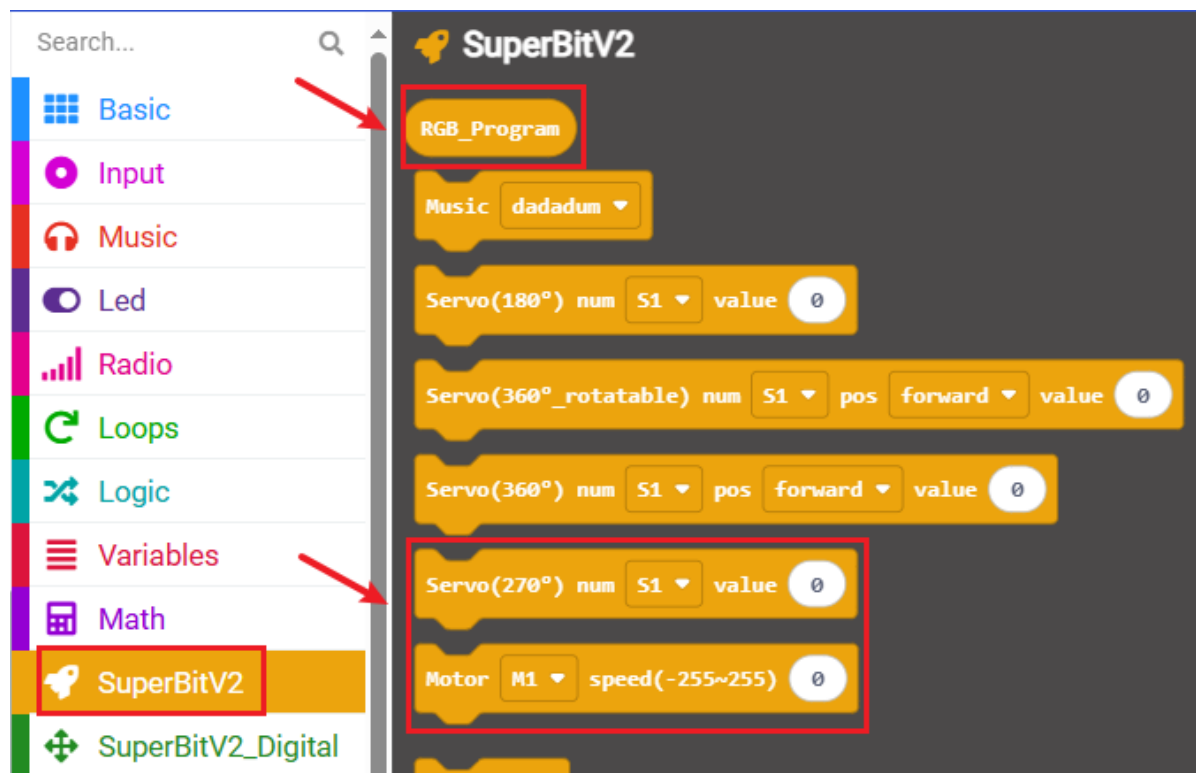
4.2 Blocks used

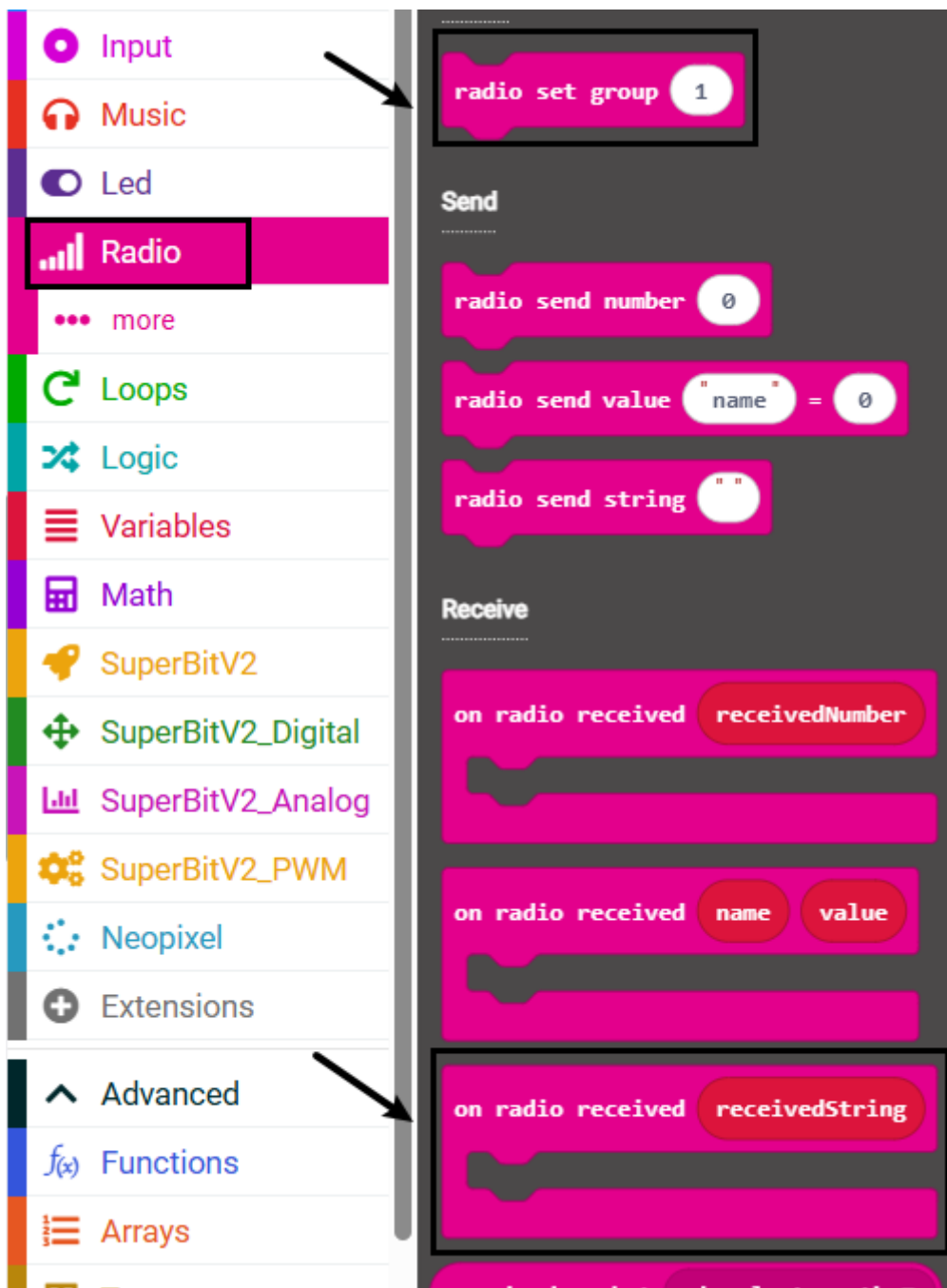
The location of the blocks required for this programming is shown in the figure below.





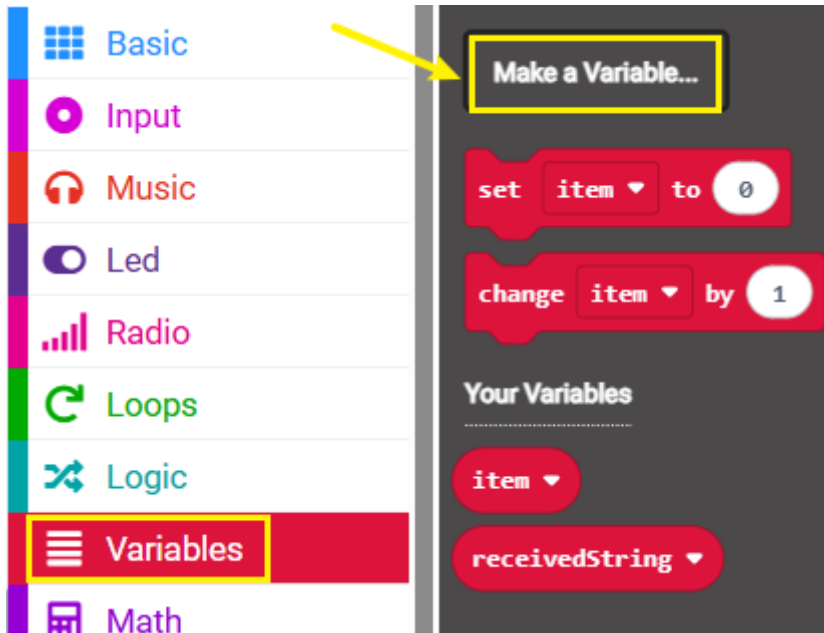






4.3 Add new variables

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

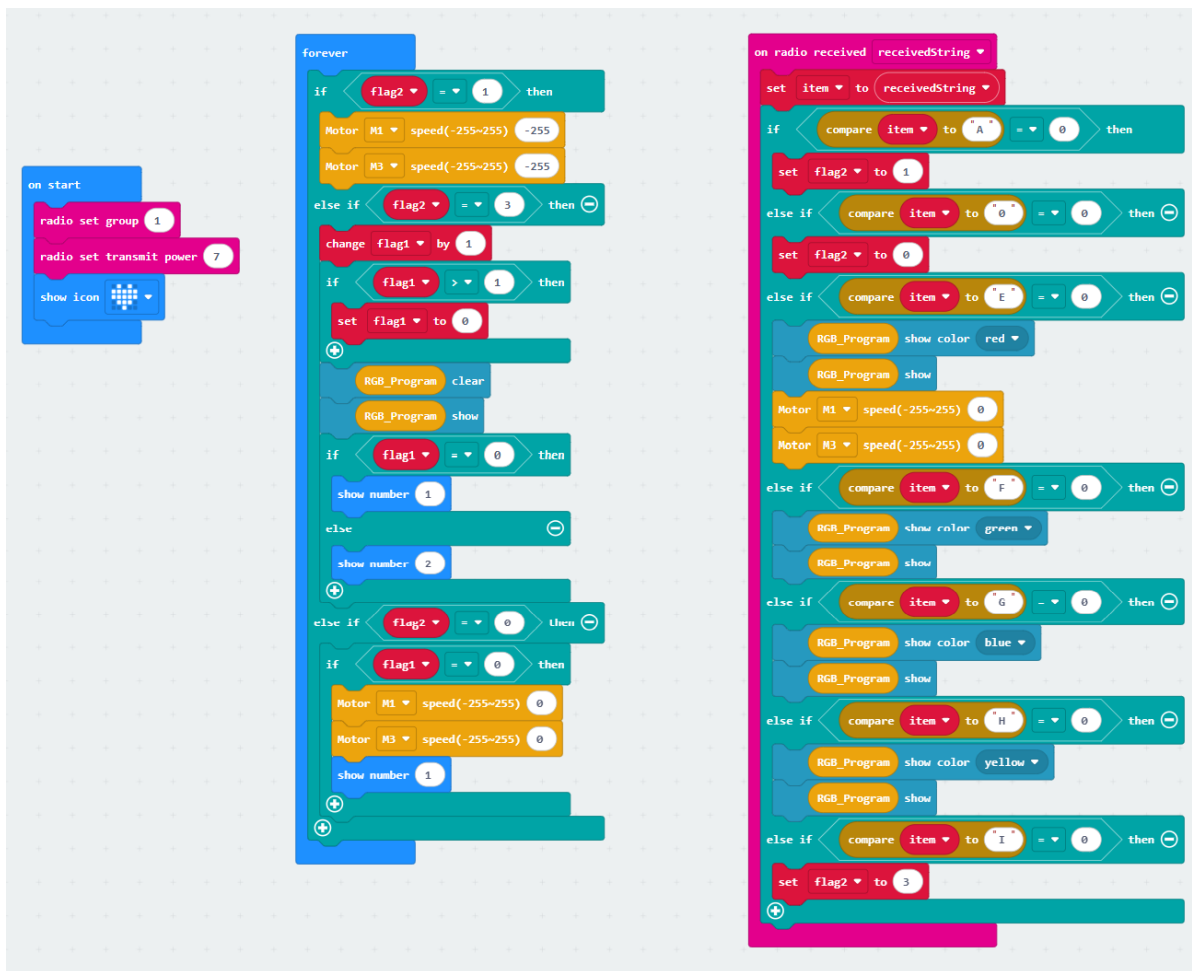


② Enter the variable name to complete the new variable.

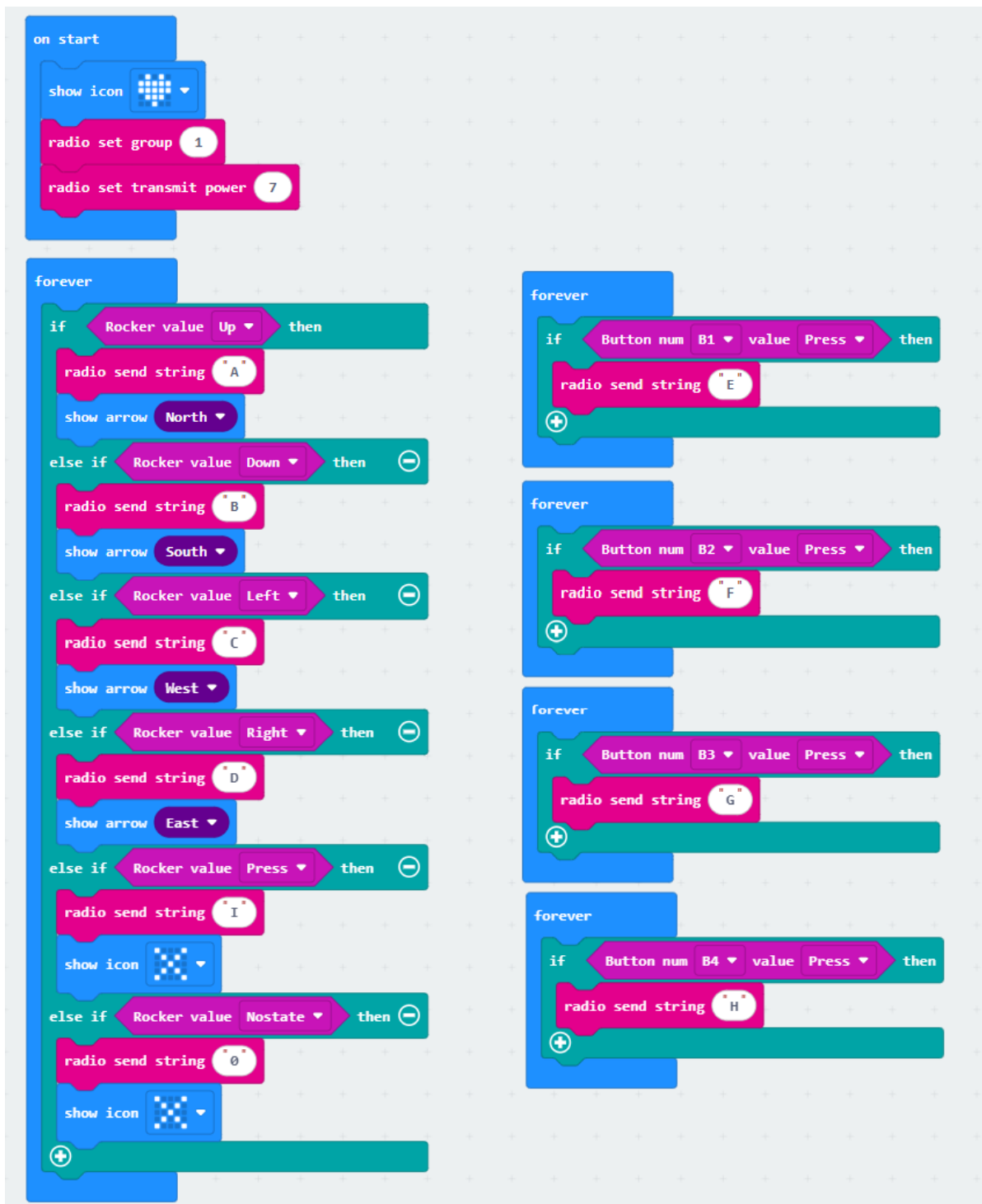
A screenshot of a dialog box titled 'New variable name:'. It has a close button (an 'X' in a circle) in the top right corner. Below the title is a text input field containing the word 'value'. At the bottom right of the dialog is a green button with the text 'Ok' and a checkmark icon, which is highlighted with a red box.

4.4 Combined blocks

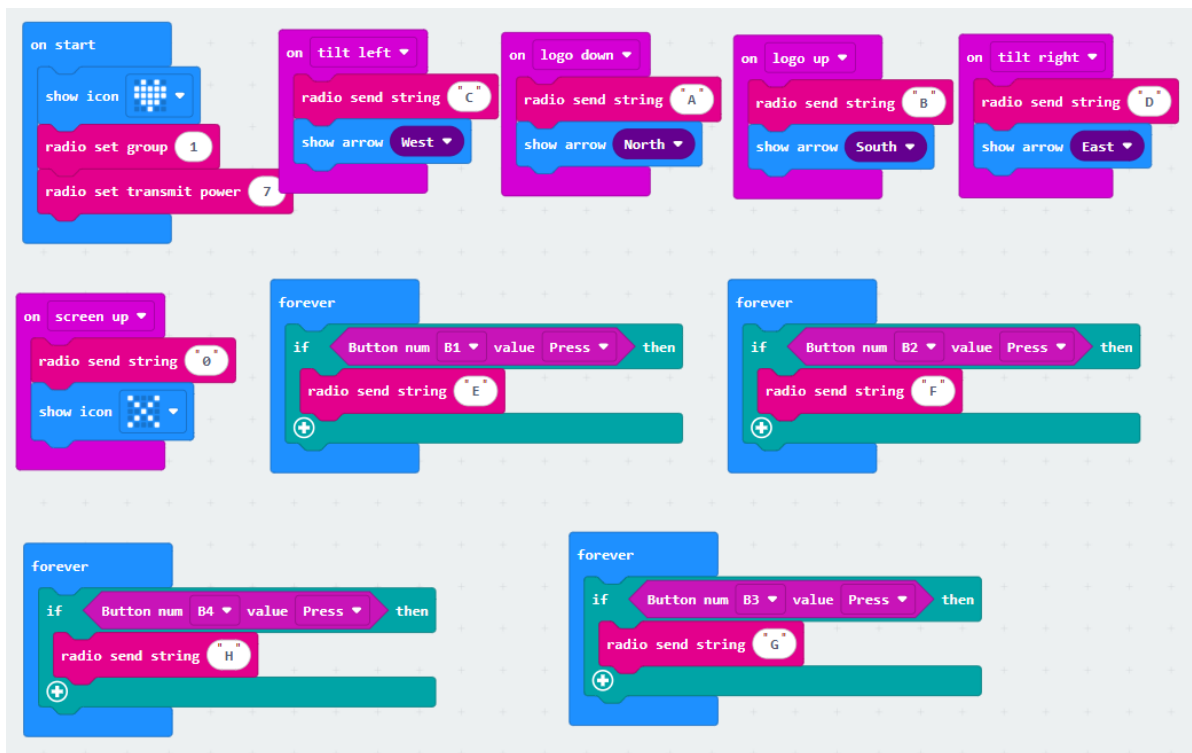
The microbit summary program on **Freestyle** is shown in the figure below



Handle rocker control program is as follows



Handle gravity control program is as follows



You can also directly open the **microbit-handle-control-Freestyle.hex**、**microbit-Handle-rocker-control.hex**、**microbit-Handle-gravity-control.hex** Drag the file into the browser that opens the URL, and the program diagram of the source code of this project will be automatically opened

5. Experimental phenomenon

We need to download the Freestyle program to the micro:bit motherboard of Freestyle, turn on the power switch of Freestyle, and we can see that a heart pattern will be initialized 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 a heart pattern will be initialized on the micro:bit dot matrix, and then an "X" pattern will be displayed, indicating that the handle is in the default state and no data is sent.

The two will automatically complete the pairing, and then we can start remote control of Freestyle.

The handle functions are as follows. .



Handle rocker control:

After the joystick and Freestyle are paired successfully, we can see the number 1 displayed on the micro:bit dot matrix of Freestyle, indicating that it is in mode 1.

In mode 1:

- Push the joystick forward to control the movement of Freestyle, and it stops when you release your hand;
- Press the red button to light up the red RGB light;
- Press the green button to light up the green RGB light;
- Press the yellow button to light up the yellow RGB light;
- Press the blue button to light up the blue RGB light.

We can press the joystick to switch to mode 2. At this time, we can see the number 2 displayed on the micro:bit dot matrix of Freestyle, indicating that it is in mode 2.

In mode 2:

- Push the joystick forward to control the Freestyle movement, and it will keep rotating when you release your hand;
- Press the red button to light up the red RGB light and stop the Freestyle in motion;
- Press the green button to light up the green RGB light;
- Press the yellow button to light up the yellow RGB light;
- Press the blue button to light up the blue RGB light.

Each time you press the joystick, it will switch back and forth between mode 1 and mode 2, and the RGB light will go out.

Handle gravity control:

After the handle and Freestyle are successfully paired, we can see the number 1 displayed on the micro:bit dot matrix of Freestyle.

- Tilt the handle forward to control the Freestyle movement, and stop the movement when placed horizontally;
- Press the red button to light up the red RGB light;
- Press the green button to light up the green RGB light;
- Press the yellow button to light up the yellow RGB light;
- Press the blue button to light up the blue RGB light.

(Note: There is only one mode for handle gravity control, and mode 2 cannot be switched)