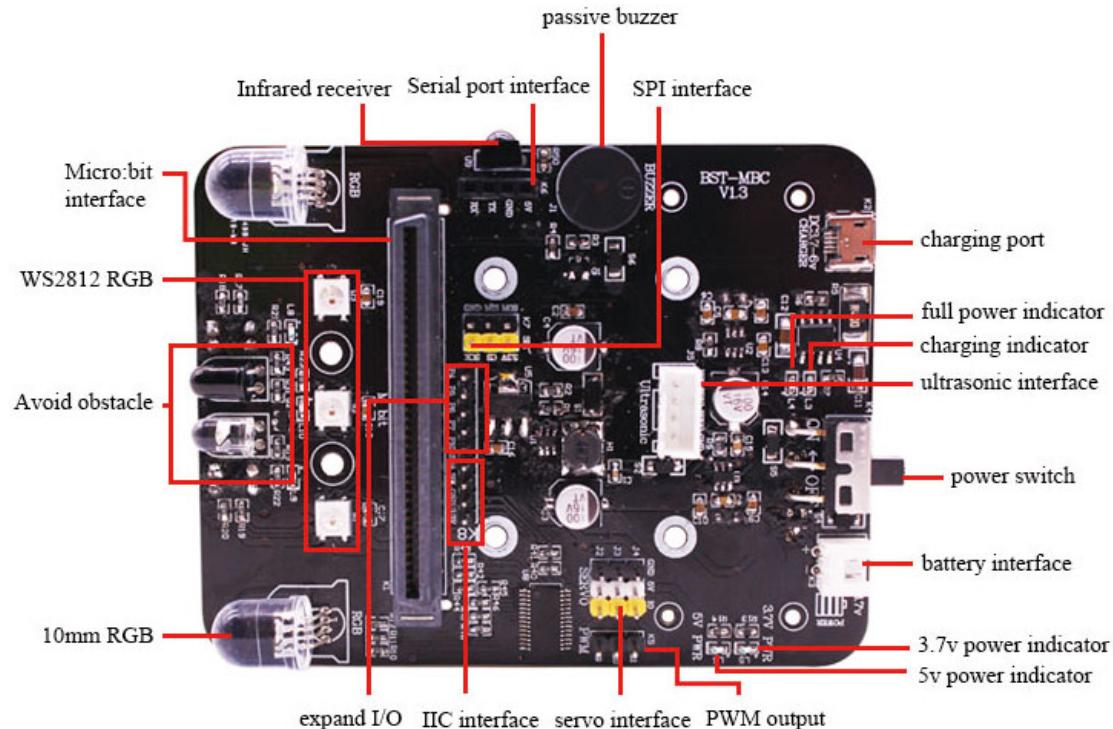


micro-bit breakout manual

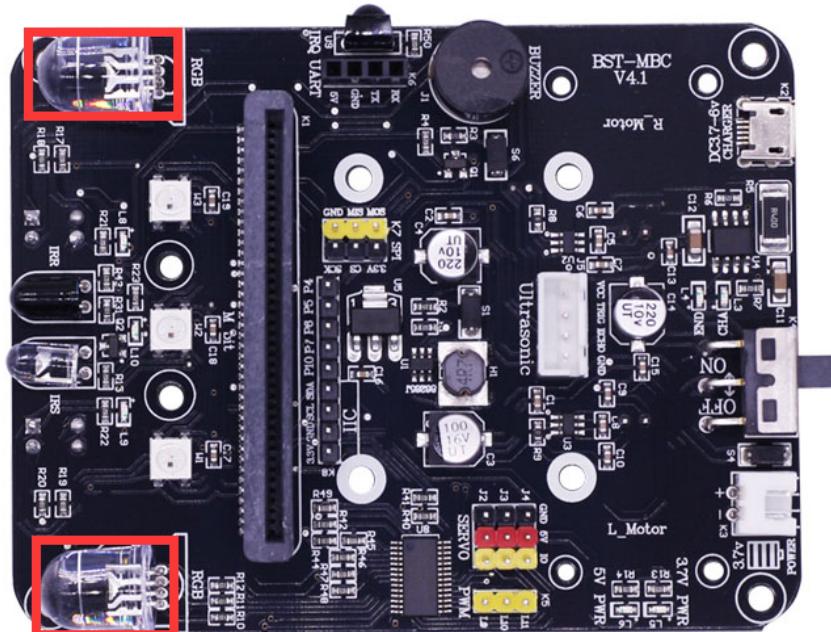
Block package URL: https://github.com/lzty634158/yahboom_mbit_en

Front:

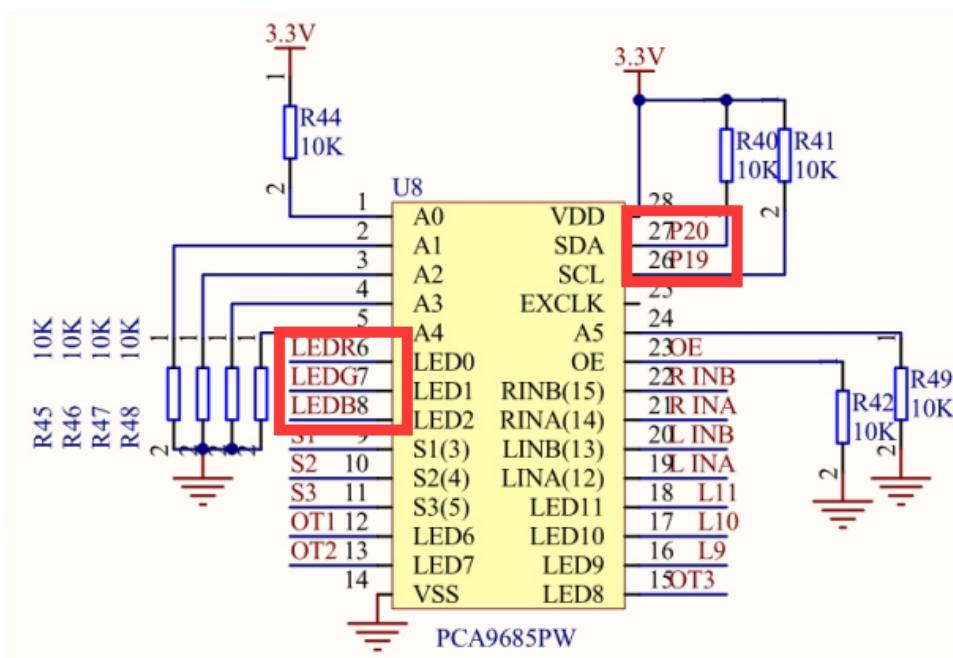
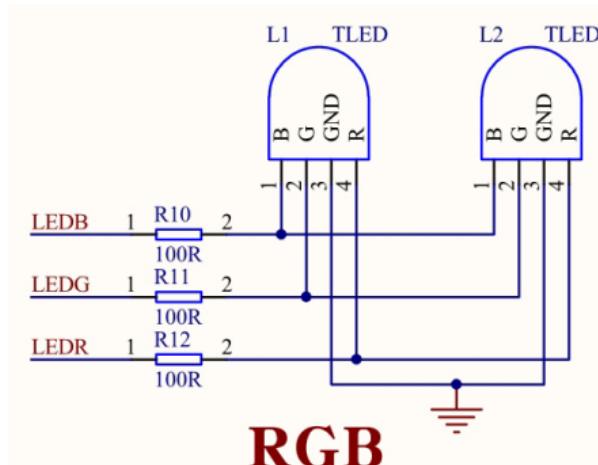


Back: tracking sensor, motor interface and magic sticker

1.RGB search light



1-1 Position



1-2 Schematic diagram

! ! Note:

The two RGB lights are connected in parallel, so the color is controlled at the same time.

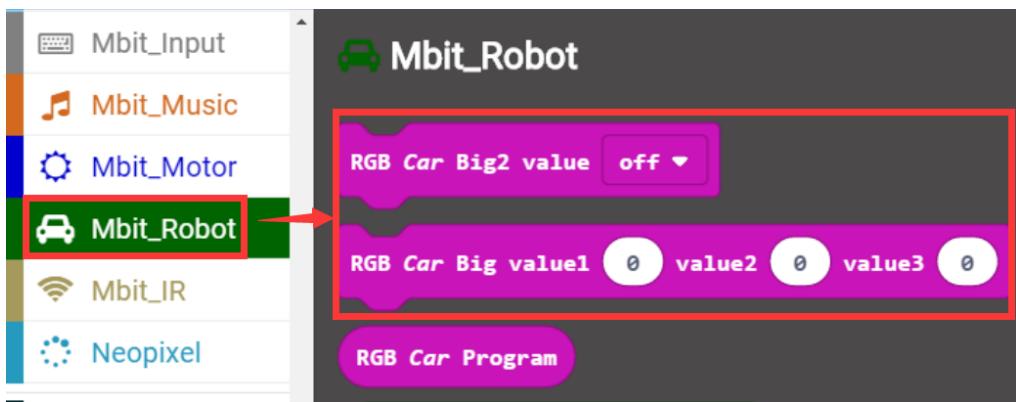
IO port: IIC PCA9685 control

R: Channel 0

G: Channel 1

B: Channel 2

Block:



1-3 Block

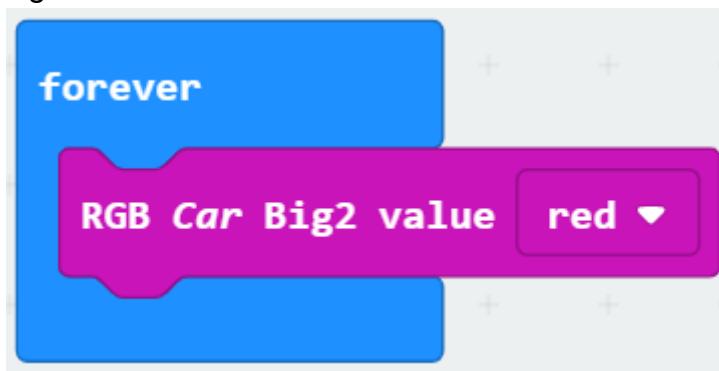
Choose the normal color directly



Choose different RGB color as your thought Range(0-225)



Eg 1:

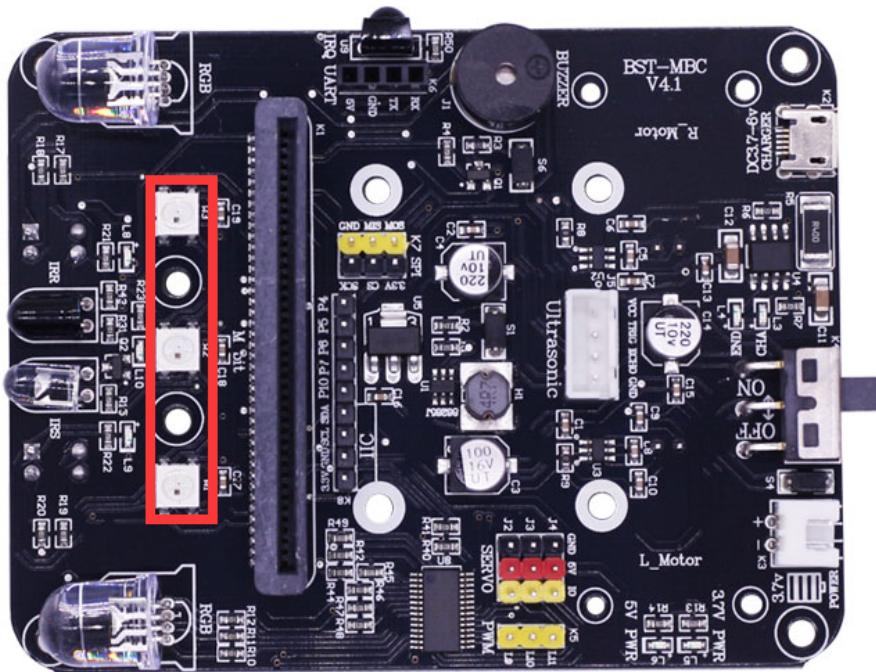


Eg 2:



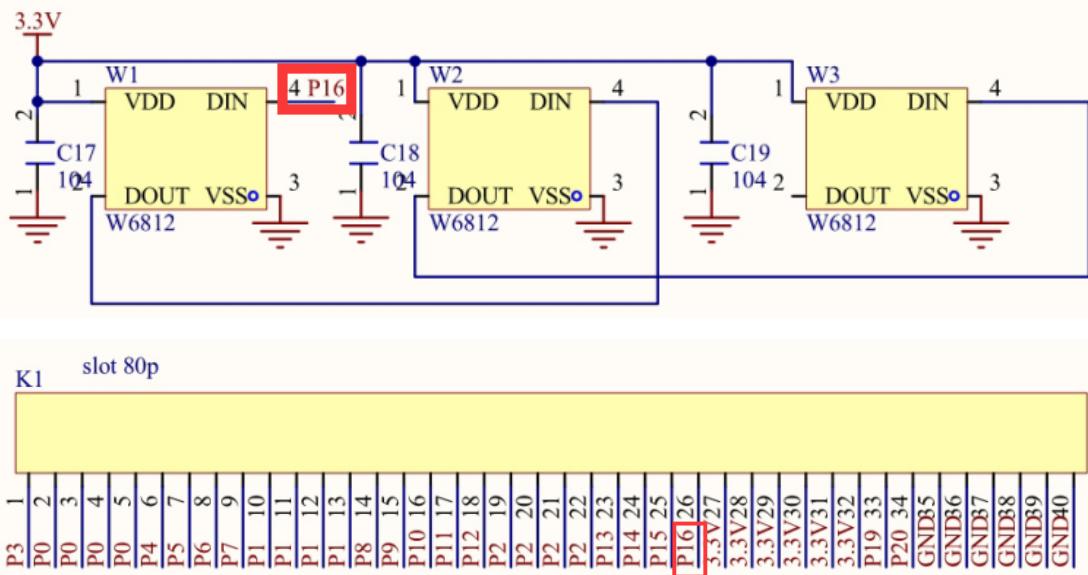
Both of the above programming methods can make the RGB search light become red.

2.RGB flowing light



2-1 Position

RGB



2-2 Schematic diagram

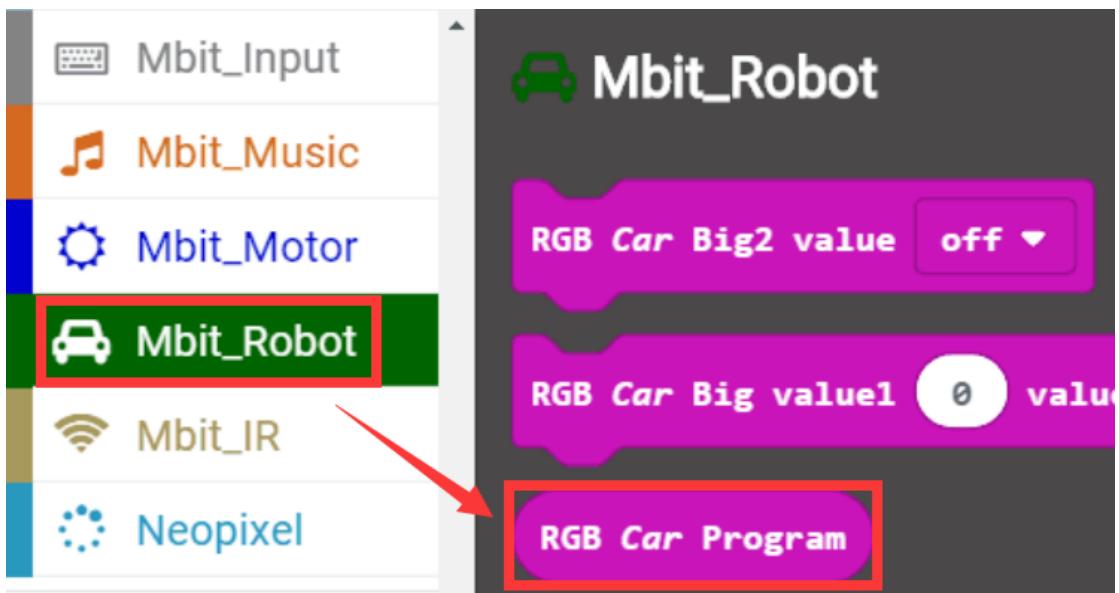
! ! Note:

This RGB light is made of three cascades, controlled the color of the three lights by one IO port.

You can control them at the same time or control them separately and independently.

IO port: P16

Block:



2-3 Block

This block is equivalent to the following block:



Specific use of this block method, please refer to the use of Neopixel library.
Eg 1:

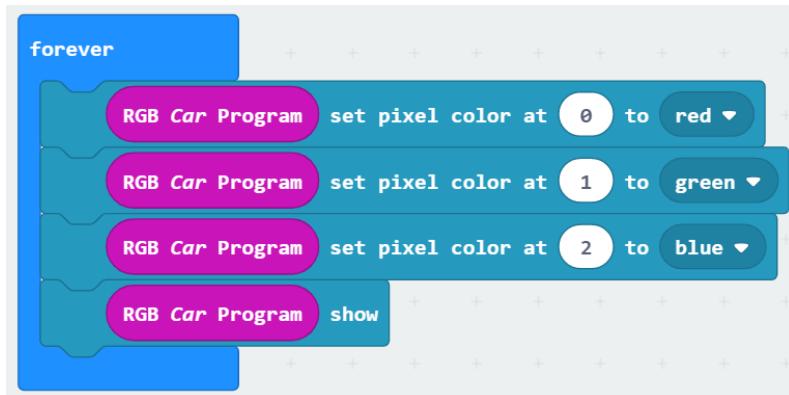


Eg 2:

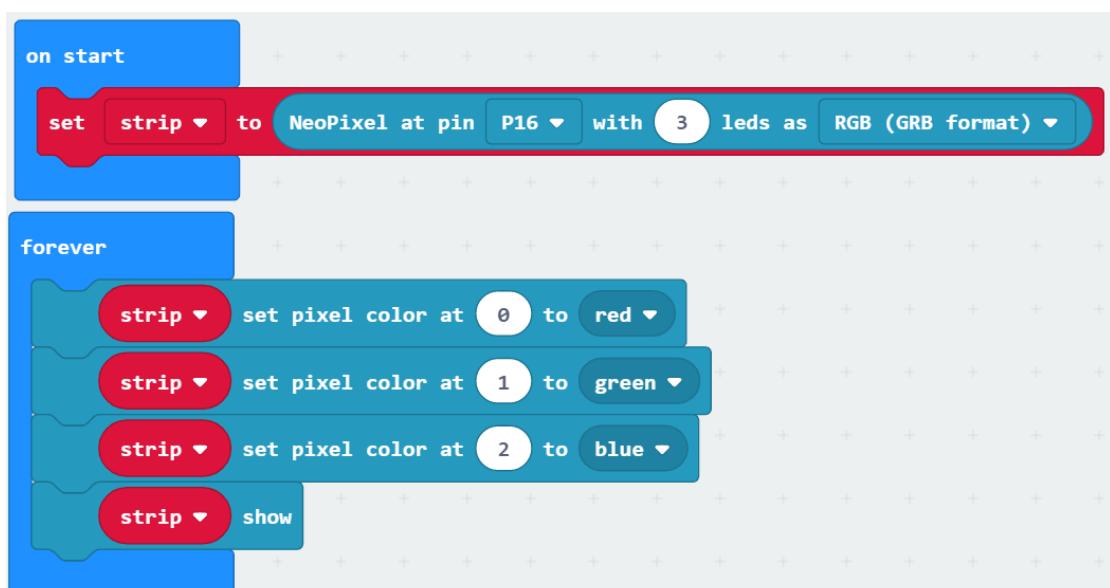


Both of the above programming methods can make the RGB flowing light become red.

Eg 3:



Eg 4:

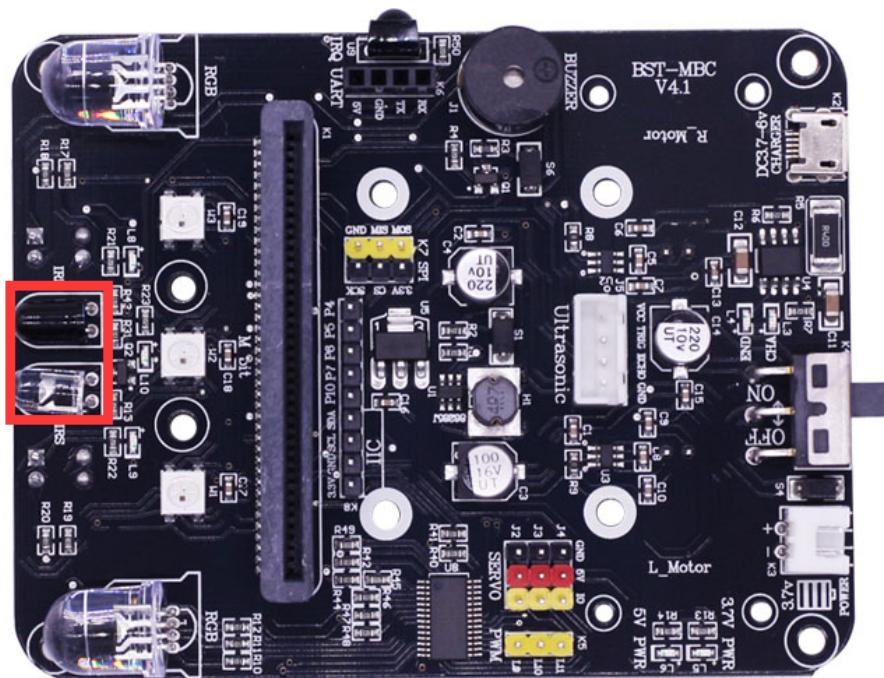


Both of the above programming methods can make the No.1 RGB flowing light

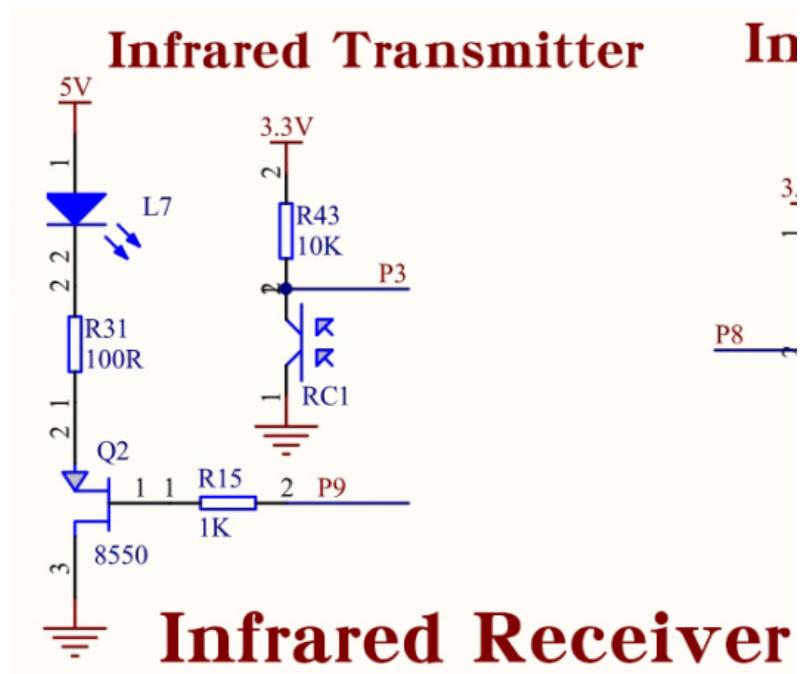
become red, No.2 RGB flowing light become green, No.3 RGB flowing light become blue.



3.Infrared obstacle avoidance or following



3-1 Position



3-2 Schematic diagram

!!Note:

By transmitting infrared radiation, when there is an obstacle in front of detection, the receiving tube receives the signal, and the level from high to low indicates that there is an obstacle detected.

IO port:

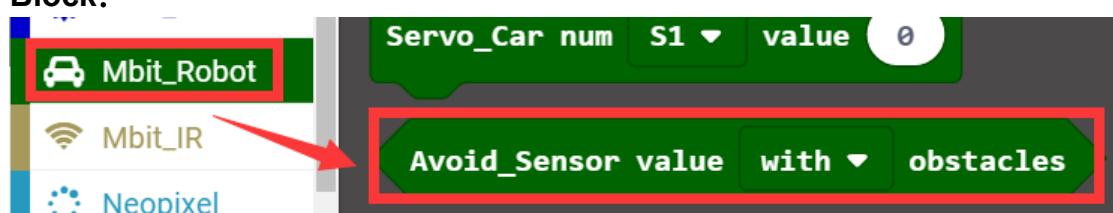
Transmitter IO: P9

Infrared emission at low level; Transmission closed at high level.

Receiver IO: P3

Obstacle detected at low level; No obstacle was detected at high level.

Block:



3-3 Block

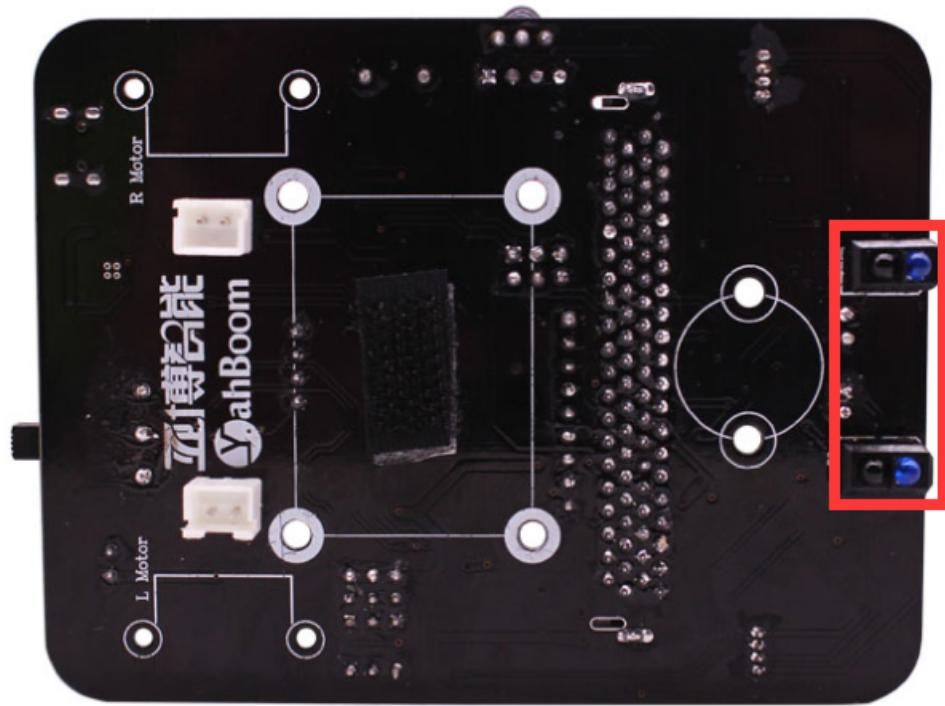
This block returns True or False.

If it satisfies the description of blocks, it returns True; otherwise, it returns False.

Function:

It can be used to avoid obstacles and follow.

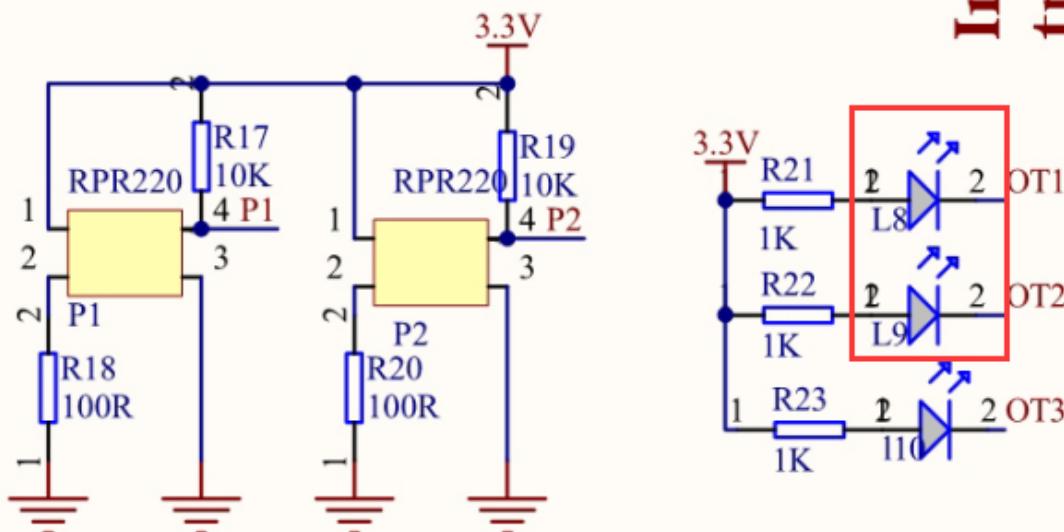
4.Tracking Sensor



4-1 Position

Tracking circuit

Infrared
trans-



4-2 Schematic diagram

Note:

The tracking sensor has the same principle as the obstacle avoidance sensor. Infrared returns to be received on the white line and is absorbed on the black line, detecting a low level. In this way, the difference between the two sides of detection can know which side of the car is offset, and the corresponding

control car moves in the opposite direction to achieve the purpose of line inspection.

IO port:

Right probe IO: P1

When the black line is detected, the L8 light will be on. Otherwise L8 light will be off.

Left probe IO: P2

When the black line is detected, the L9 light will be on. Otherwise L9 light will be off.

Block:



4-3 Block

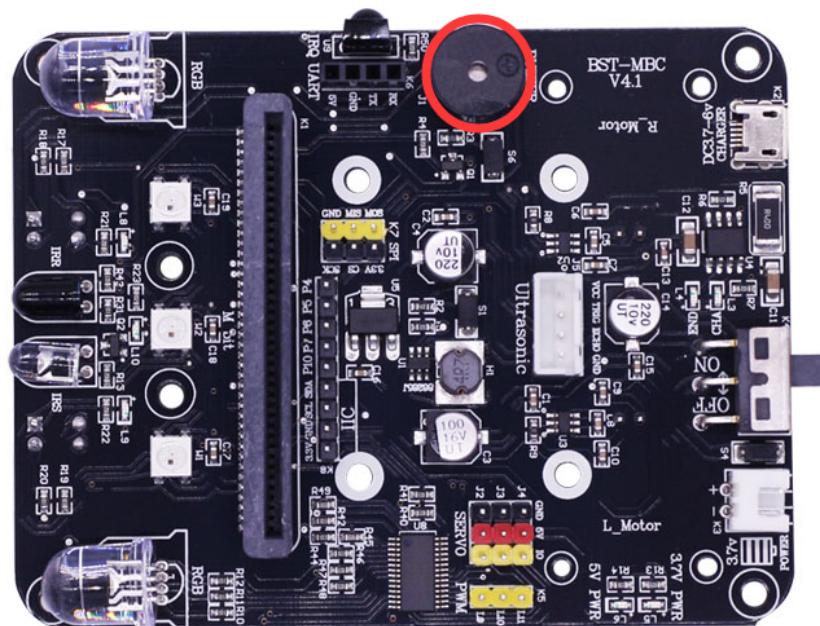
This block returns True or False.

If it satisfies the description of blocks, it returns True; otherwise, it returns False.

Function:

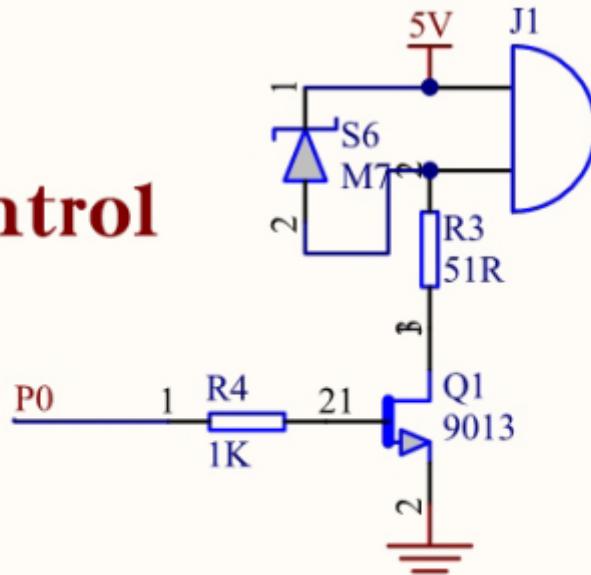
It can be used to track.

5. Buzzer



5-1 Position

control



Passive buzzer

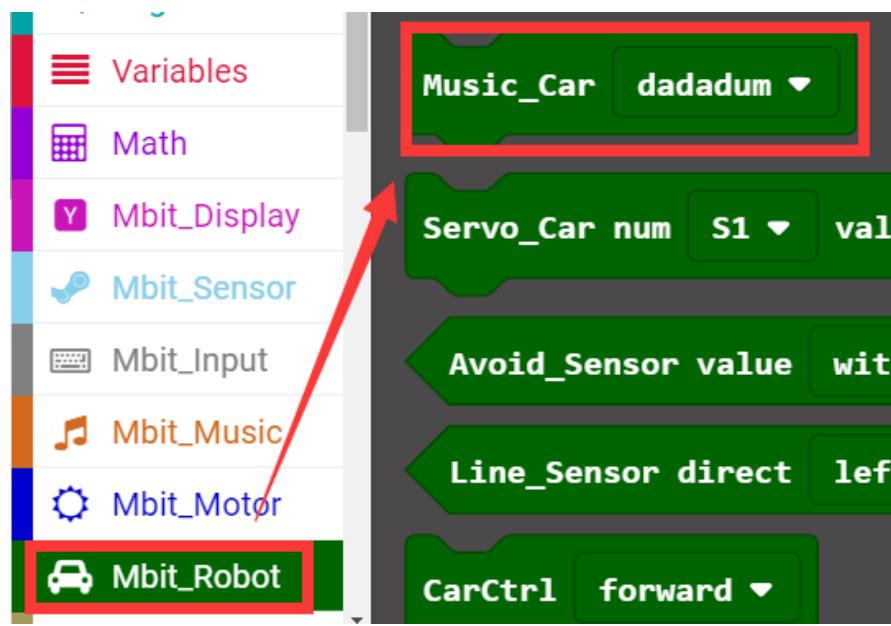
5-2 Schematic diagram

!!Note:

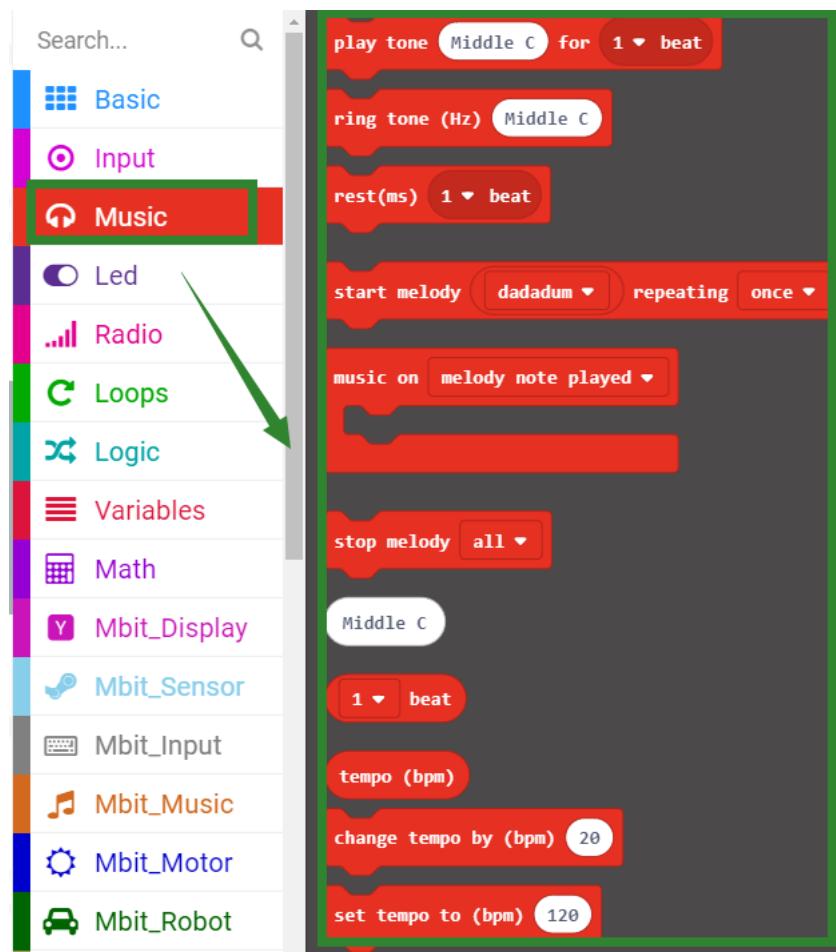
The buzzer is a passive buzzer. It could plays music and sing.

IO port: P0

Block:



5-3 Block-1

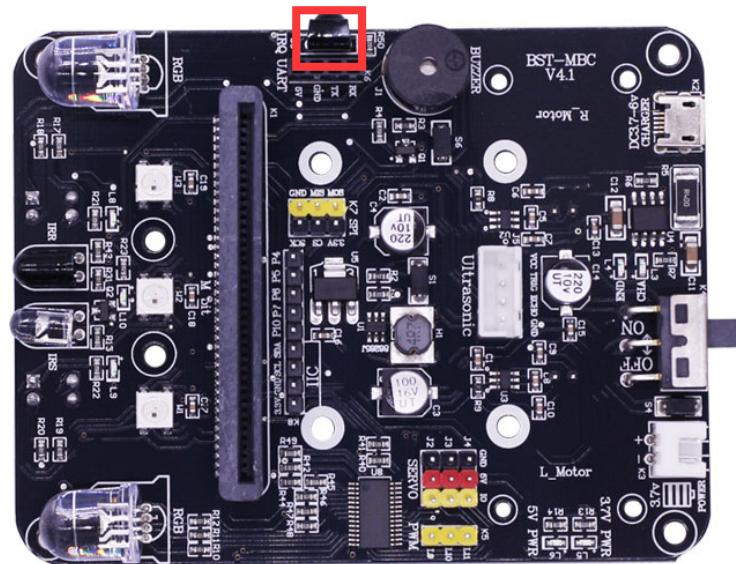


5-4 Block-2

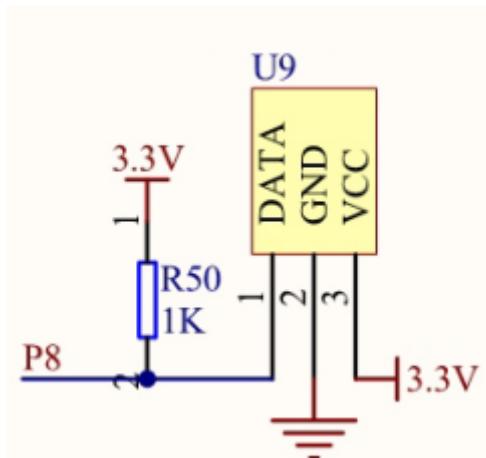
Note:

“Block-1” and “Block-2” from official all could be used, because our hardware is consistent with the official IO port.

6. Infrared remote control



6-1 Position



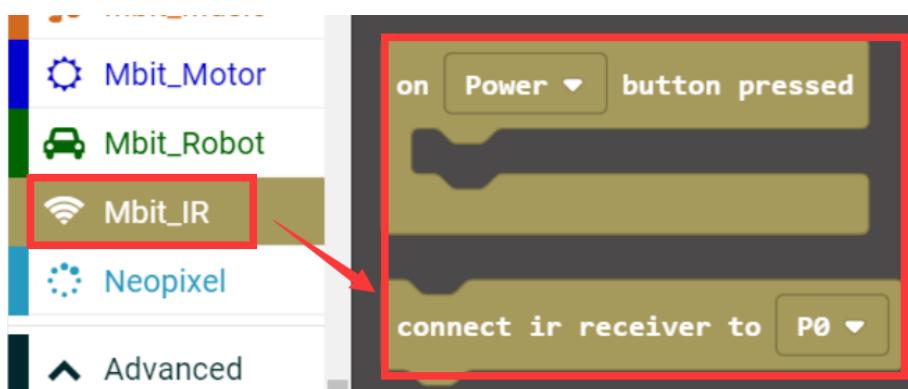
6-2 Schematic diagram

!!Note:

This function is achieved by our remote control.

IO port: P8

Block:



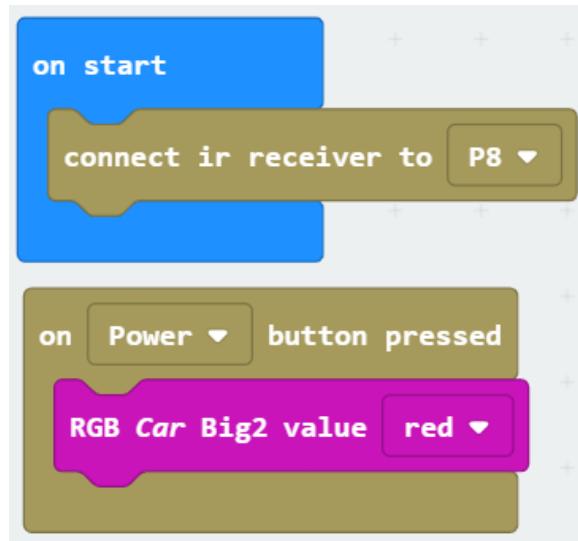
6-3 Block

!!Note:

When using infrared remote control, you need to configure the infrared receiver IO port, can be executed at boot time.

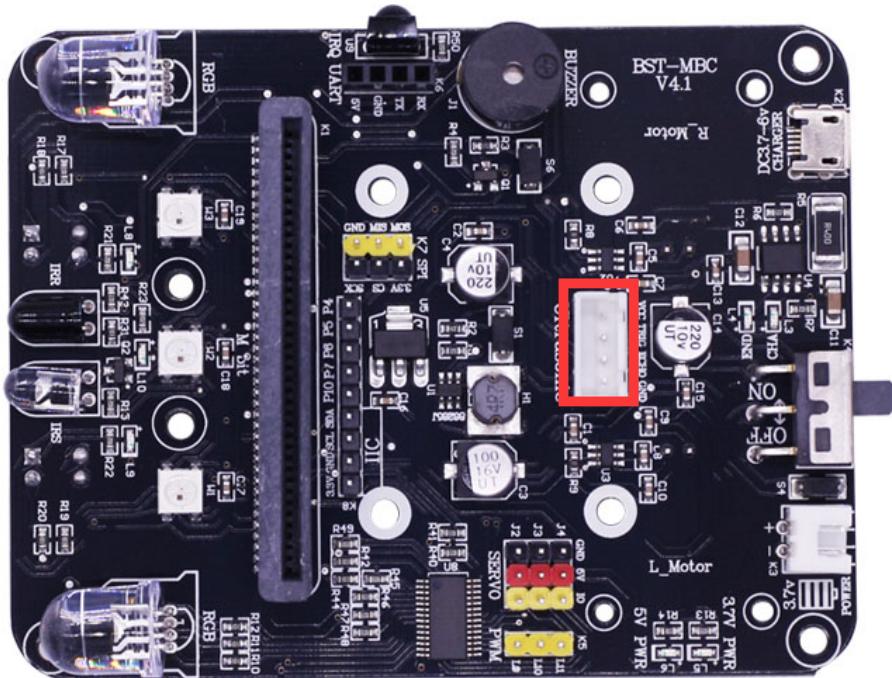
Then you can call the infrared remote event function, you can select all buttons corresponding to the event, execute in each event any function you want to perform.

As shown in the figure below, configure the infrared receiver to be connected to the P8 port. When the remote control's Power button is pressed, the car searchlight will turn on red.

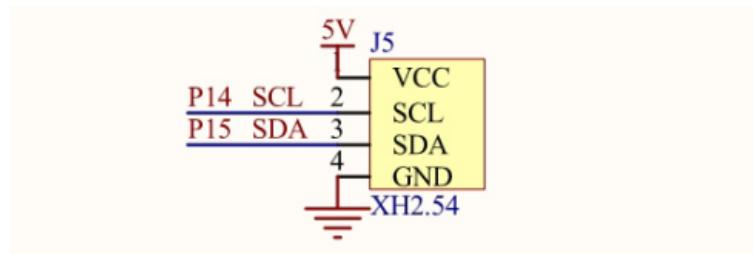


6-4 Example

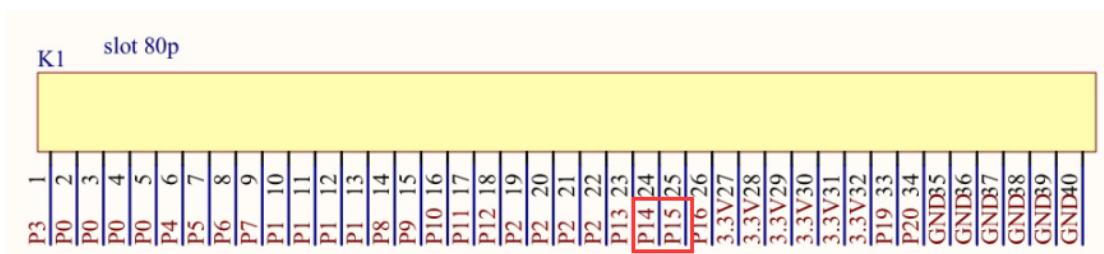
7. Ultrasonic



7-1 Position



Ultrasonic module



!!!Note:

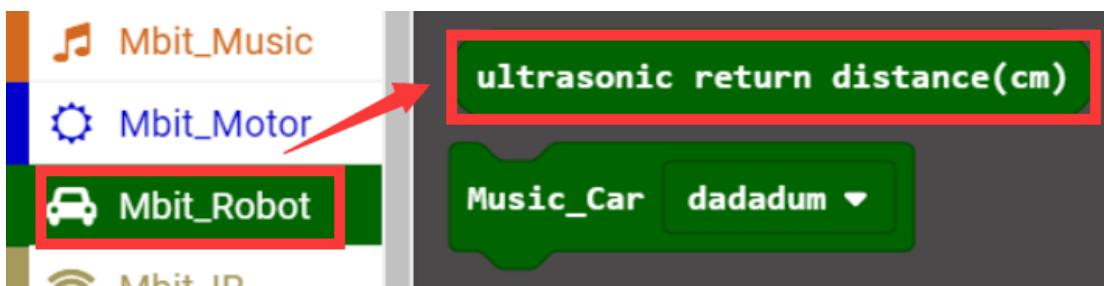
Ultrasonic module is an external module that can measure the distance in front of it to achieve obstacle avoidance and other functions.

IO port:

Transmitter Trig (SCL) : P14

Receiver Echo (SDA) : P15

Block:



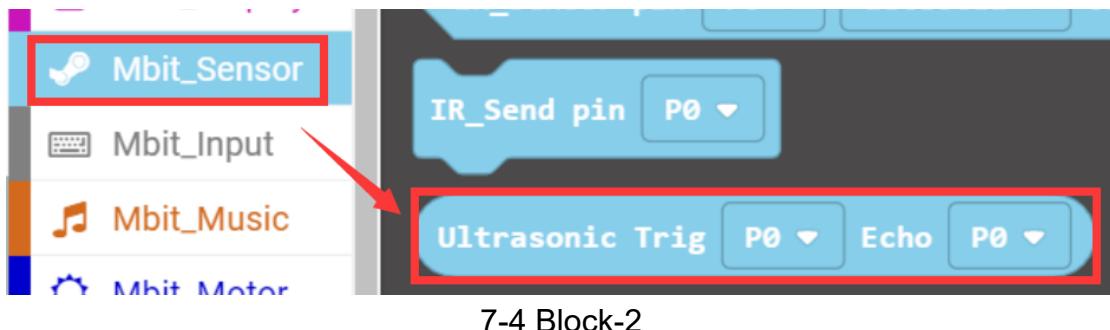
7-3 Block-1

! ! Note:

This is a packaged block. The IO port has been written in the library.

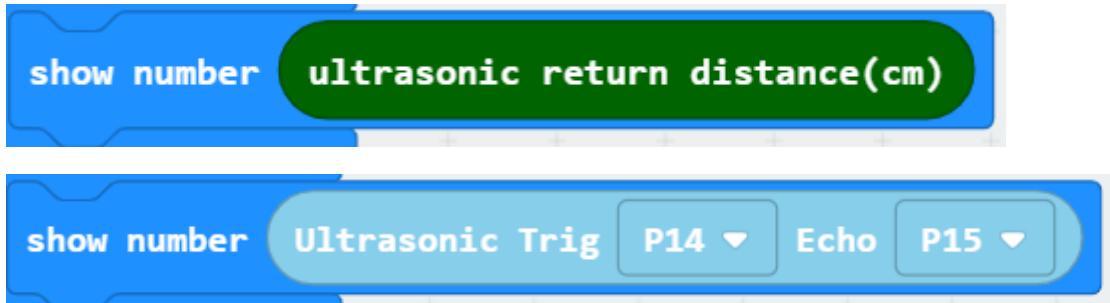
The ultrasonic measurement distance (cm) is returned.

The distance can also be measured using the following position blocks, which is equivalent to the packaged block.



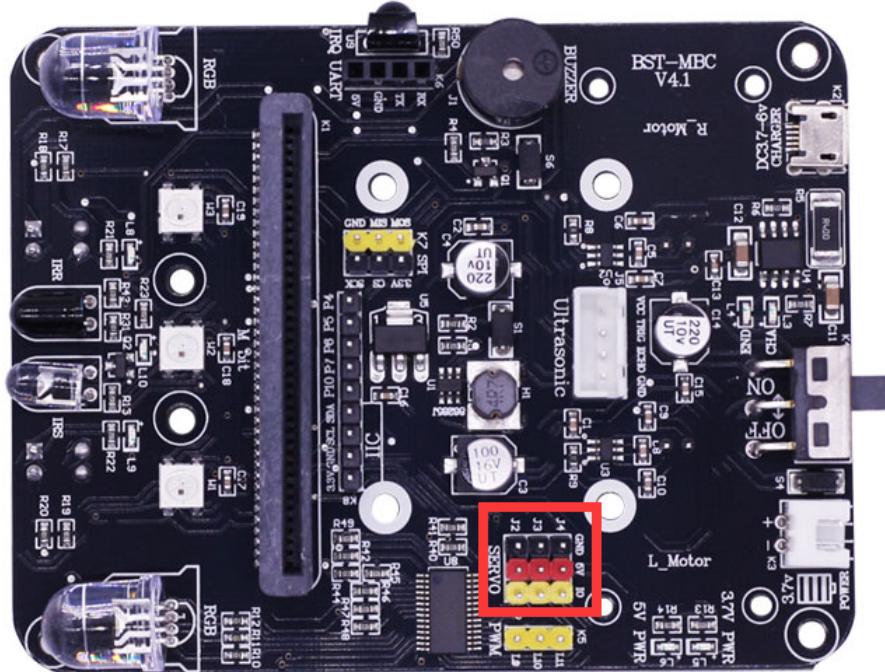
7-4 Block-2

The effect of the two blocks is the same as shown in the figure below.



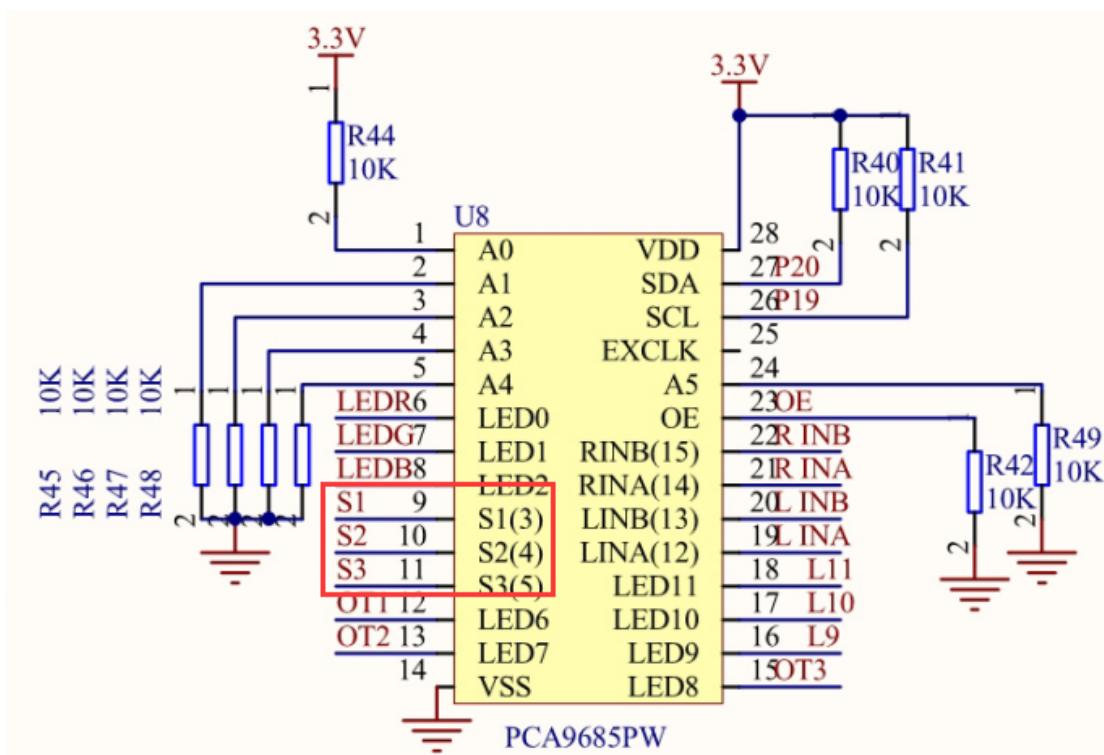
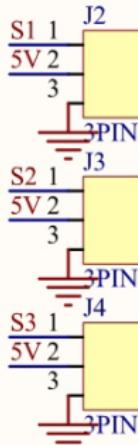
7-5 Example

8. Servo Function



8-1 Position

Servo interface



!!!Note:

The expansion board supports 3-channel servo and 3 - channel independent PWM output.

IO port:

The PWM wave is output by IIC controlling the channel of PCA9685 chip.

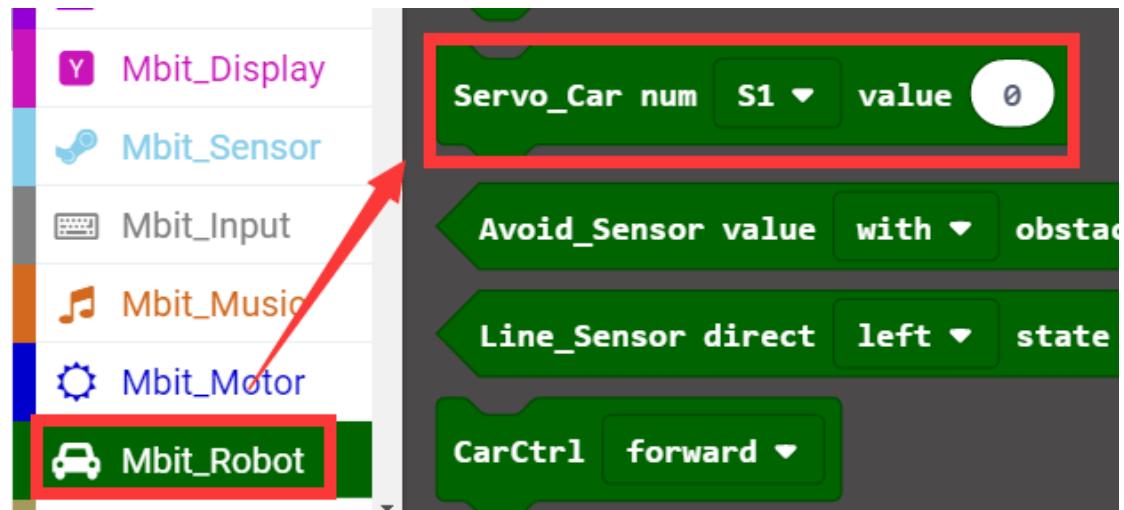
S1 Servo Channel (J2) : Channel 3

S2 Servo Channel (J3) : Channel 4

S3 Servo Channel (J4) : Channel 5

PWM1 (L9) : Channel 9
 PWM2 (L10) : Channel 10
 PWM3 (L11) : Channel 11

Block:

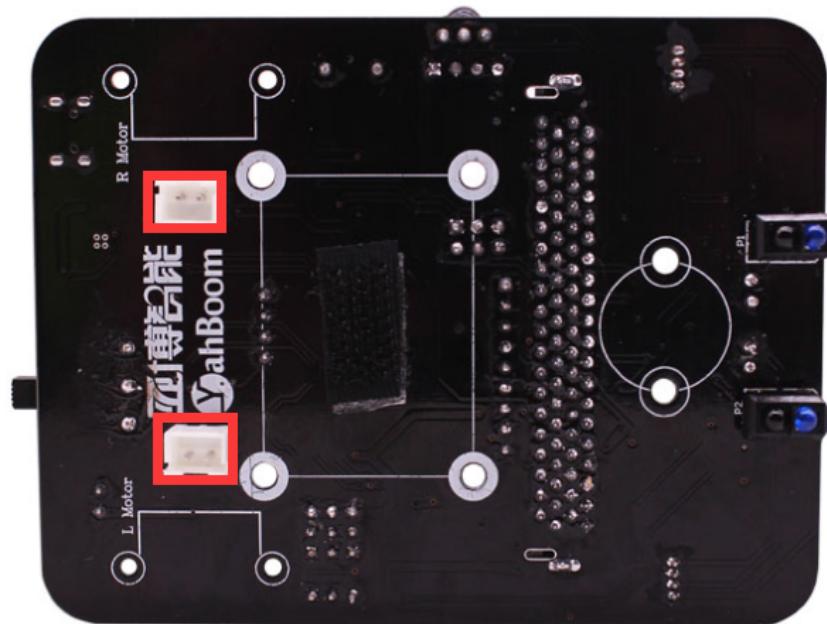


8-3 Block

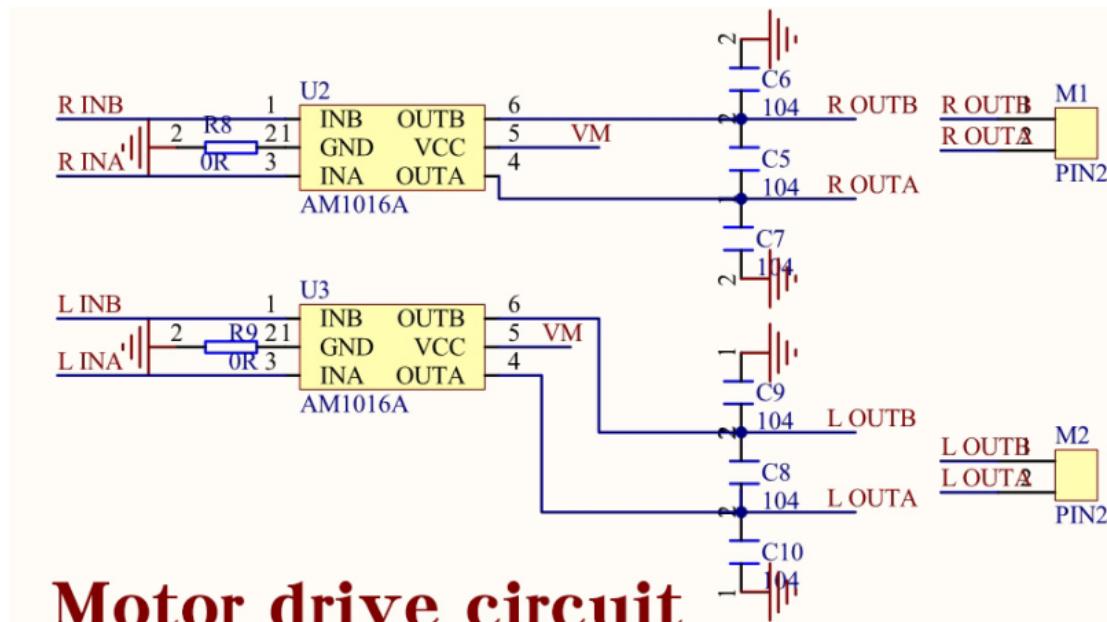
!!!Note:

Three Numbers can be selected, corresponding to the extension screen printing J2, J3, J4, Angle range can be set 0-180 degrees.

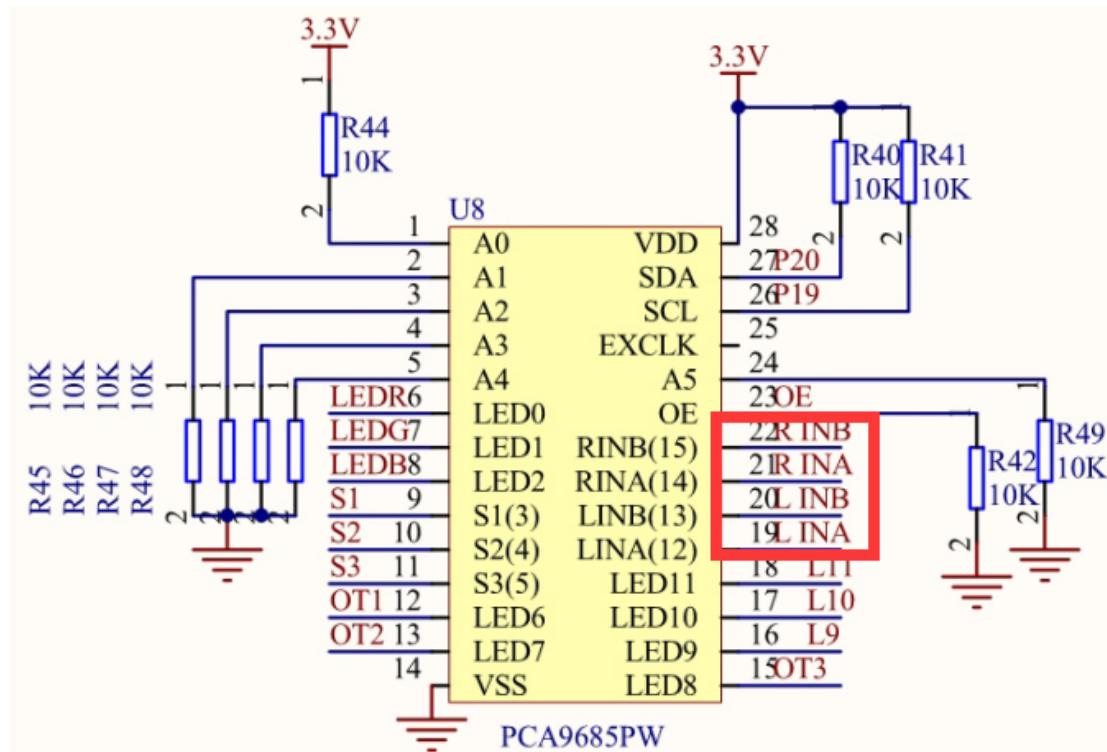
9. Motor Function



9-1 Position



Motor drive circuit



9-2 Schematic diagram

!!! Note:

IIC drives PCA9685 channel output PWM for speed control.

IO port:

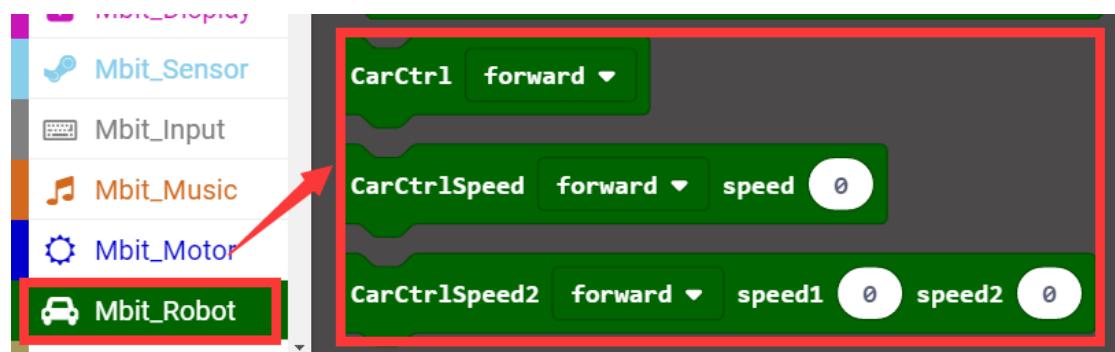
Left motor A: Channel 12

Left motor B: Channel 13

Right motor A: Channel 14

Right motor B: Channel 15

Block:



9-3 Block

The first is to control the motor direction, the default speed is the maximum;
The second is to set the speed of two motors at the same time and control the direction.

The third is not only to control the direction, but also set the speed of two motors separately.