Tutorial of
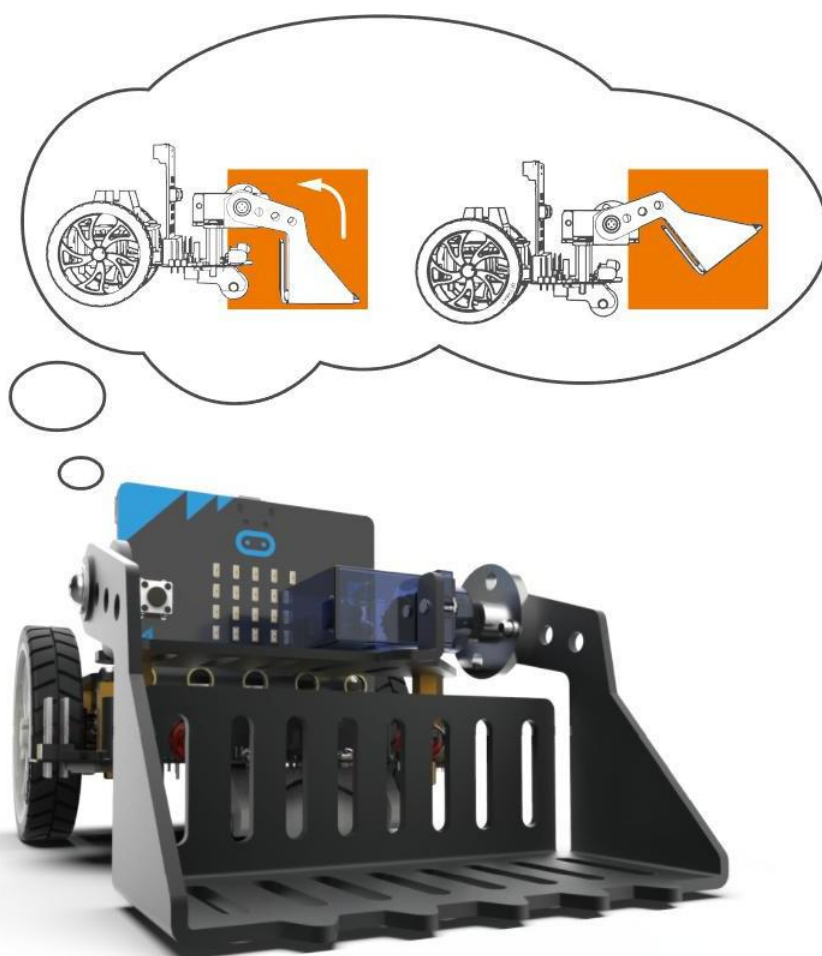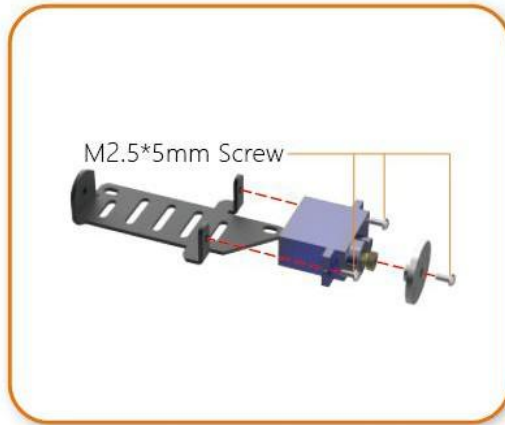
Maqueen Mechanic - Beetle

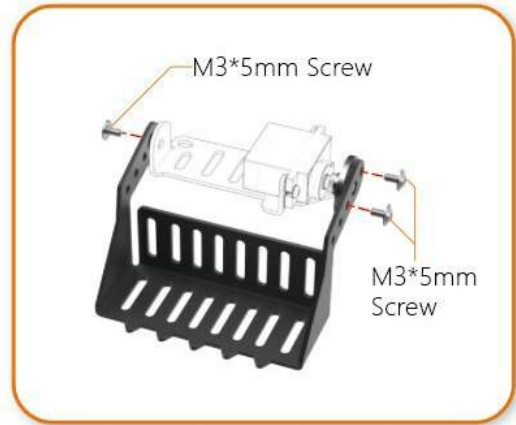## [ROB0156-B]

www.DFRobot.com

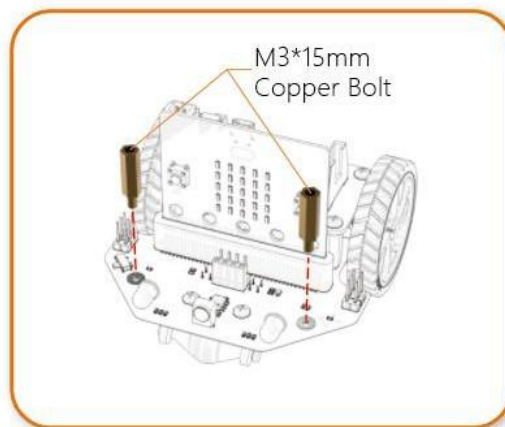# Installation Diagram

M2.5*5mm Screw

● Step1

M3*5mm Screw

M3*5mm Screw

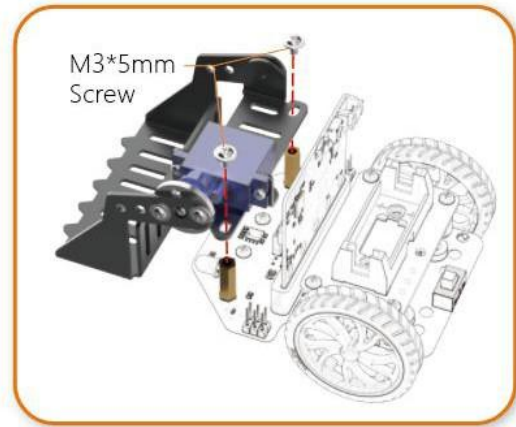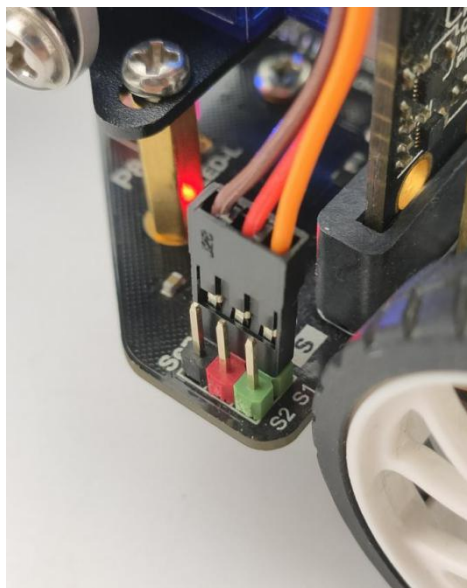● Step2

M3*15mm Copper Bolt

● Step3

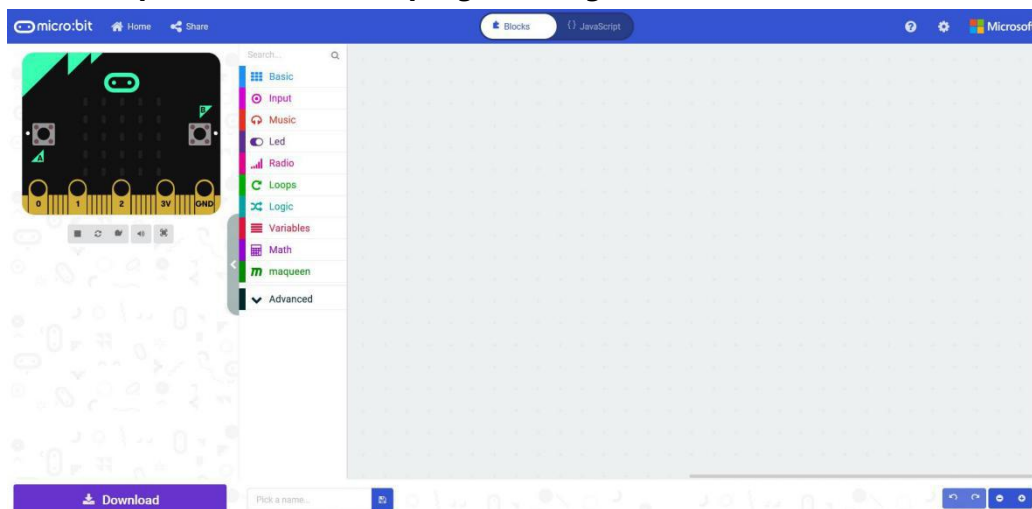M3*5mm Screw

● Step4

Method to Control

1. Wiring

Plug the 3pin servo wire into port S1 or S2 of Maqueen, shown as below:

- Brown wire to Black pin

- Red wire to Red pin

- Orange wire to Green pin

2. Makecode Tutorial

1. Click to open the Makecode programming web :

https://makecode.microbit.org/#editor
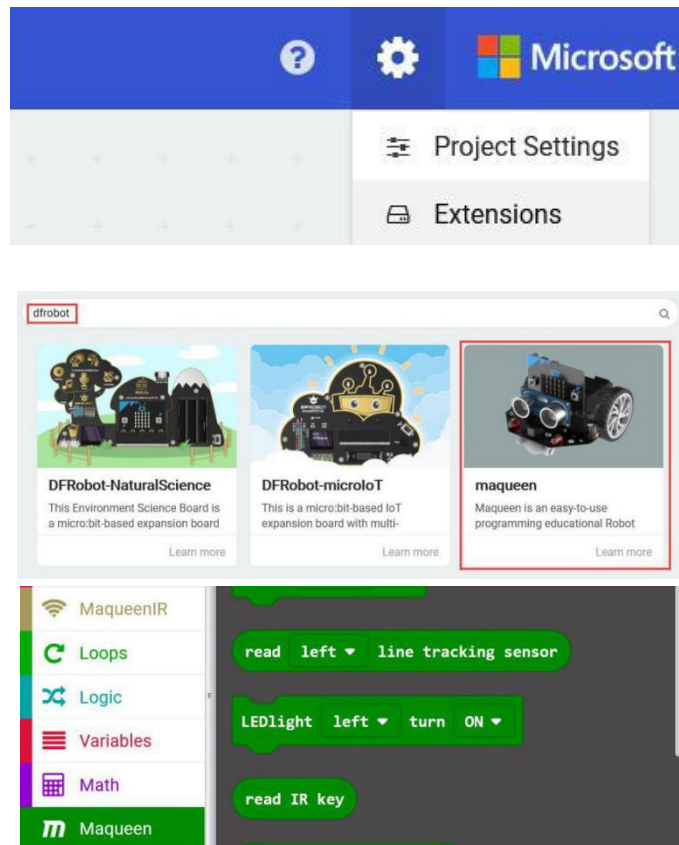
2.   **Import extensions for Maqueen:**

    1) Click **More**

    2) Click **Extensions**

    3) Search **dfrobot**

    4) Click to select **Maqueen**

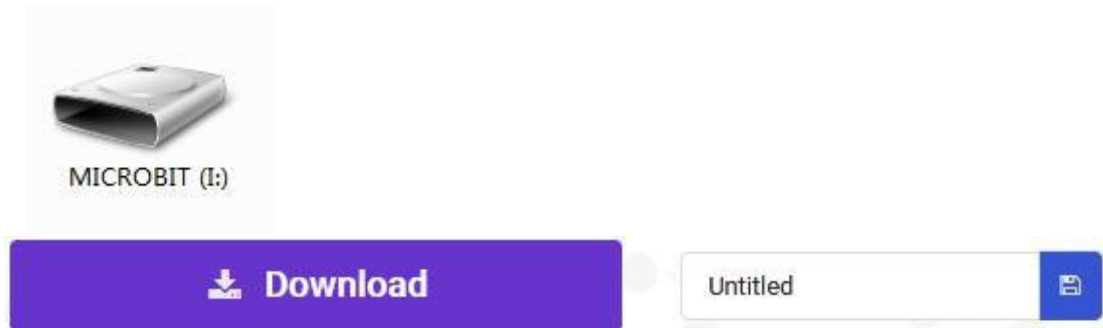As shown in the figure:

3. Examples

1. Make the beetle pincers to grasp and release

    1) The example will use a servo to make the pincers grasp and release. The code is as follows:

2) Connect the micro: bit to the computer via a USB cable. Meanwhile, a new "MICROBIT" disk will show in the computer. Click the "Download" button to download the code to MICROBIT disk. As shown in the figure:

3) Turn Maqueen on when the example code is downloaded, then the beetle pincers will constantly grasp and release.

There are two ways to adjust the starting and ending angles of rotation:

- Adjust the angle value in the code.
- Loosen the two screws on the servo and adjust the servo by hand, then tighten the screws. As shown in the figure:
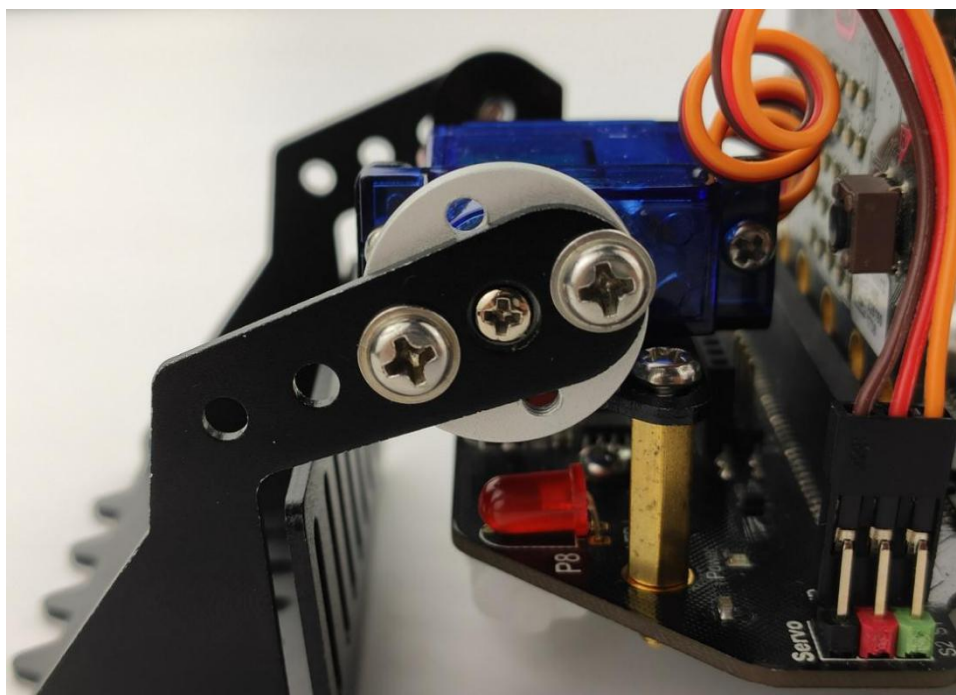
2. IR Remote control of the beetle

This example uses the infrared remote control to make the beetle pincers to grasp and release. Each button of the infrared remote control is corresponding to one key value.

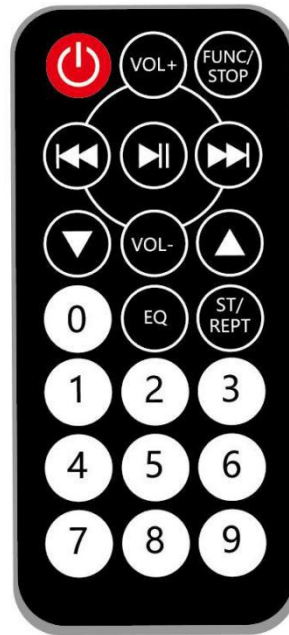| Key	Key Value（Decimal）
Red Key	0
VOL+	1
FUNC/STOP	2
Rwd	4
Pause/Play	5
Fwd	6
Down Triangle	8
VOL-	9
Up Triangle	10
0	12
EQ	13
ST/REPT	14
1	16
2	17
3	18
4	20
5	21
6	22
7	24
8	25
9	26

Key value table of infrared remote control

Now, let's program an example to control the angle of the beetle pincers by the infrared remote control. The code is shown in the figure:

After the code is downloaded to micro: bit, pointing the infrared remote control to the infrared receiver of Maqueen, holding the Up Triangle and the Down Triangle respectively, and the beetle pincers will grasp and release continuously.

3. IR Remote control of the Maqueen Mechanic- Beetle

In the two programs above, we have controlled the movement of the beetle pincers separately. The example below is a comprehensive program.

It uses the infrared remote control to enable the Maqueen move forward and backward and the pincers grasp and release.

Code URL: https://makecode.microbit.org/_D3bFyhgyYT7A

The code is shown as below:

```
on IR received  message ▼
    if        message ▼  = ▼  17    then
        motor  all ▼  move  Forward ▼  at speed  150
    ⊕
    if        message ▼  = ▼  25    then
        motor  all ▼  move  Backward ▼  at speed  150
    ⊕
    if        message ▼  = ▼  20    then
        motor  left ▼  move  Forward ▼  at speed  0
        motor  right ▼  move  Forward ▼  at speed  150
    ⊕
    if        message ▼  = ▼  22    then
        motor  left ▼  move  Forward ▼  at speed  150
        motor  right ▼  move  Forward ▼  at speed  0
    ⊕
    if        message ▼  = ▼  21    then
        motor  all ▼  stop
    ⊕
    if        message ▼  = ▼  8    then
        set  S ▼  to  S ▼  + ▼  3
        servo  S1 ▼  angle  S ▼
    ⊕
    if        message ▼  = ▼  10    then
        set  S ▼  to  S ▼  - ▼  3
        servo  S1 ▼  angle  S ▼
    ⊕
```

```
on start
    set  S ▼  to  120
    servo  S1 ▼  angle  S ▼
```

In this example, Keys 2, 8, 4, 6, 5 are used to control Maqueen to move forward, move backward, turn left, turn right and stop;

Using the Up and Down Triangles to make the beetle pincers release and grasp respectively.