

- **Radio set group:** Make a program have the group ID you tell it for sending and receiving with radio. A group is like a cable channel (a micro:bit can only send or receive in one group at a time). A group ID is like the cable channel number. If you do not tell your program which group ID to use with this function, it will figure out its own group ID by itself. If you load the very same program onto two different micro:bits, they will be able to talk to each other because they will have the same group ID. In this experiment, we set the group of two micro:bits to 1 so that they can communicate with each other.
- **Radio send number:** This block is to broadcast a number to other micro:bits connected via radio. You need to enter a parameter for this block which is the number you want to send.
- **On radio received receivedNumber:** Run part of a program when the micro:bit receives a number over the radio. "receivedNumber" is a parameter, it's the number that was sent in this packet or 0 if this packet did not contain a number. If the number received by bit1 (receiver_code) is 3, the code inside the if statement of bit1 will be run. If the number received by bit2 (send_code) is 4, the code inside the if statement of bit2 will be run.
- **Download the send_code program to bit2 and receiver_code program to bit1 and see what happens.**

Result

At first, the micro: bit matrix LEDs named bit2 will display a crying face, and then the micro: bit of bit1 will immediately play a melody (comfort bit2), and the crying face of bit2 will become a smiling face.



Does wireless communication require two or more micro:bits? Then if there are no two micro:bits, can the micro: bits be controlled wirelessly? For example, the module is used to wirelessly control the micro: bit.

Experiment 17 – Remotely control your micro:bit

Instruction

When you're too sleepy, you definitely don't want to get up from your bed and turn off the lights. When you are busy with other things, you don't feel like being interrupted by knocking on the door. Well, in this experiment we are ready to help you solve this problem. We will use the remote control to remotely control these things, instead of having to leave for them.

Target

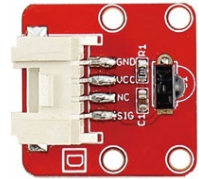
- Learn how IR receiver work and use it to control the LED with infrared remote control and servo connected to micro:bit.
- Learn how to detect the keys pressed by the infrared remote control.

Required Parts

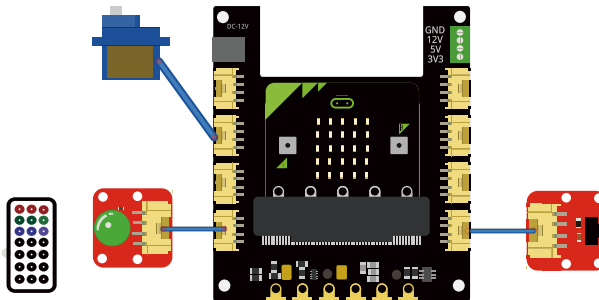
- Micro:bit x1
- Crowtail-Base shield for Micro:bit x1
- Crowtail-IR Receiver x1
- Crowtail-LED(Green) x1
- Crowtail-9G Servo x1
- Crowtail-Cable x2
- Infrared Remote Control x1
- USB cable x1

Hardware learning and connection

The Crowtail- IR Receiver module uses the HS0038B which is miniaturized receivers for infrared remote control systems and it is the standard IR remote control receiver series, supporting all major transmission codes. The IR detector has a demodulator inside that looks for modulated IR at 38 kHz, we can use our infrared remote control to control this module well. The Infrared Receiver can receive signals well within 10 meters. If more than 10 meters, the receiver may not get the signals.



Connect Crowtail-LED, Crowtail-IR Receiver and Crowtail-9G Servo to P0, P16 and P2 ports of Crowtail-Base shield for Micro:bit. **Note: You need to connect 12V power supply for Crowtail-Base shield for Micro:bit.** The hardware connections are as follows:



Programming and note

Before using the IR receiver, we need to add an extension package for this module. Follow the steps below to add an extension package for it.

- **Step1:** Click on the Extensions, then enter the following link <https://github.com/DFRobot/pxt-maqueen> in the search bar.

<https://github.com/DFRobot/pxt-maqueen>





- **Step2:** Add the package to your Makecode and you can see it

- **Receive the value of IR:** Stores the value of the IR received.
- **On button pressed:** This block is to detect whether the key on the infrared remote control is pressed and which key is pressed. In this block, detecting which key was pressed is optional. When the key we selected is pressed, the IR receiver will run the code we need to process when the key is pressed.
- **Download the program to micro:bit to see what happens.**

```

on IR received message
  show number message
  if message = 12 then
    digital write pin P0 to 1
  if message = 24 then
    digital write pin P0 to 0
  if message = 94 then
    servo write pin P2 to 180
    pause (ms) 1000
  if message = 8 then
    servo write pin P2 to 0
    pause (ms) 1000
  
```

Result

When you press the "1" key on the controller, the LED will turn on; when you press the "2" key, the LED will turn off. When you press the "3" key, the shaft of the servo will rotate to 180 degrees(open door); when you press the "4" key, the shaft of the servo will rotate to 0 degrees(close door).



Note: Before using the infrared remote control, please install a coin cell battery for it. The type of the coin cell battery is CR2025.



Can we use remote knowledge to make a remote control car, and if so, what other components and modules do we need?