

2024-2025 Quality Education Fund Thematic Network - Tertiary Institutes

Progressive Development of STEAM Literacy through STEAM Education and Self-directed Learning

透過STEAM教育自主學習有序發展STEAM素養

自動灌溉系統

匡智翠林晨崗學校

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所需配件

Micro:bit

IoT擴展板

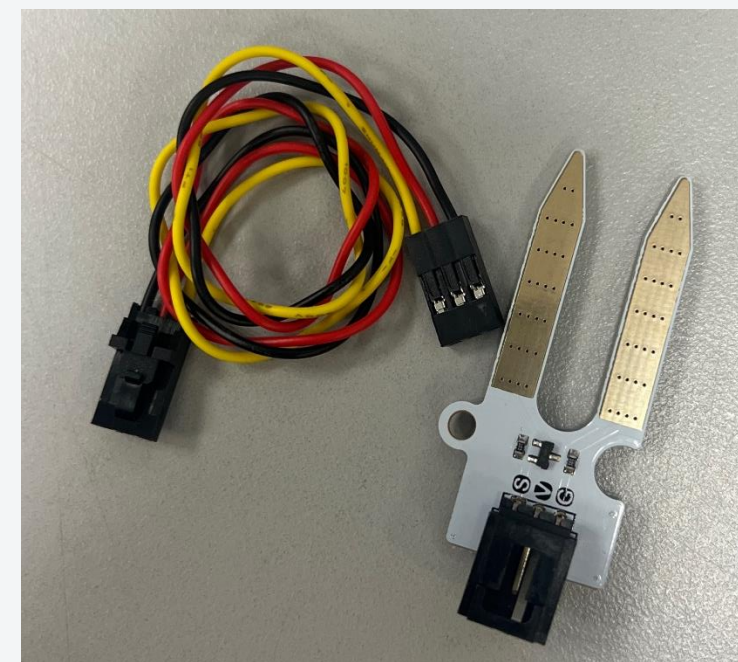
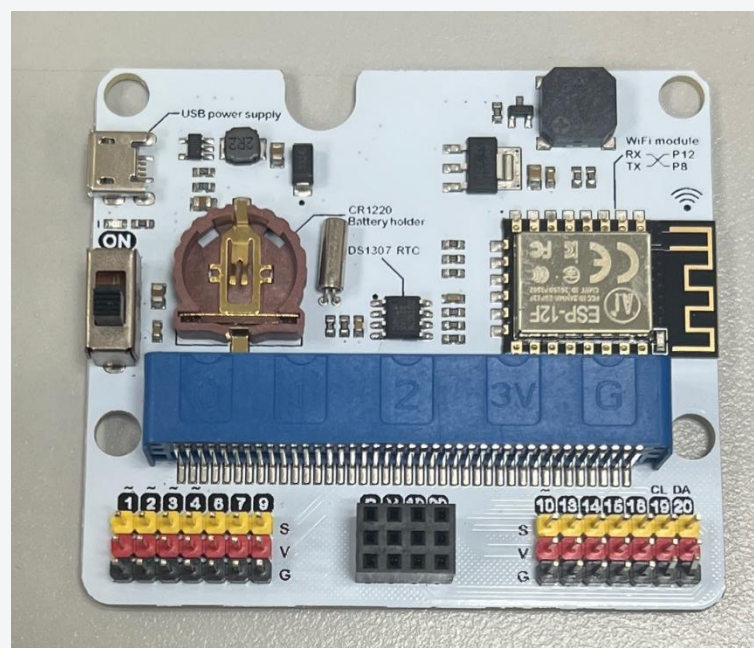
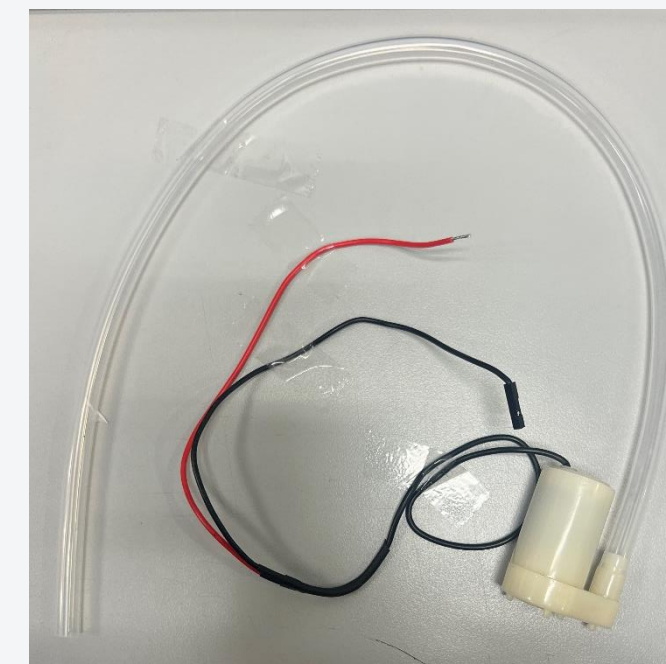
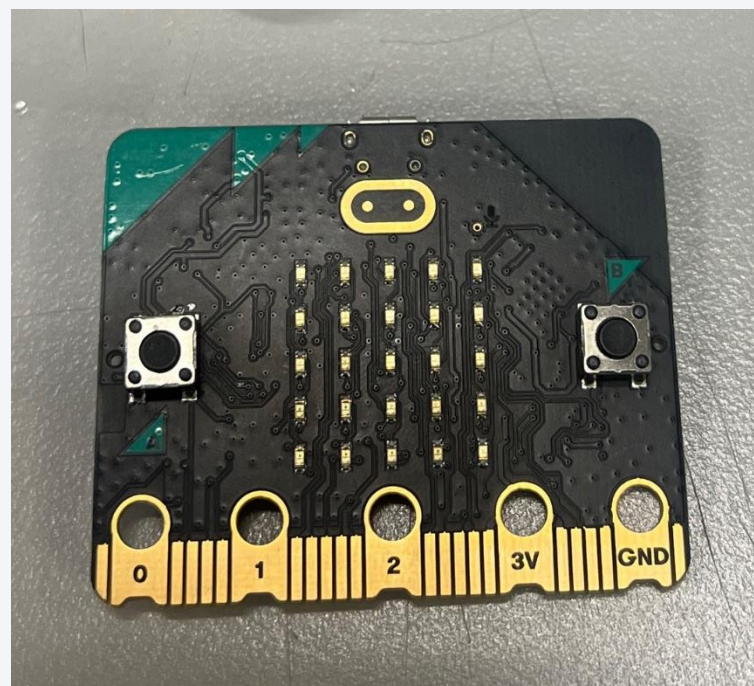
繼電器

土壤濕度計

水泵

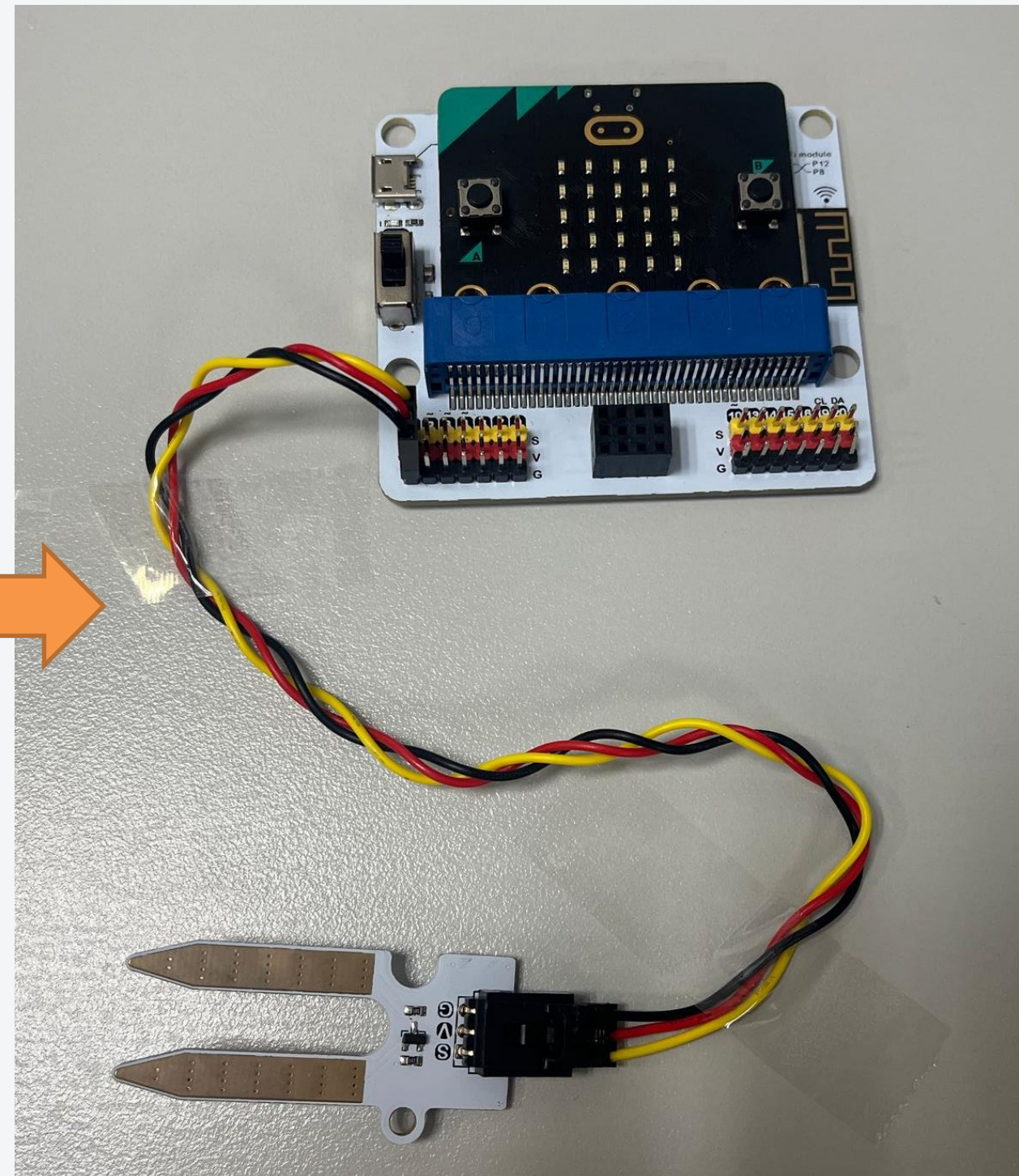
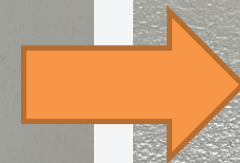
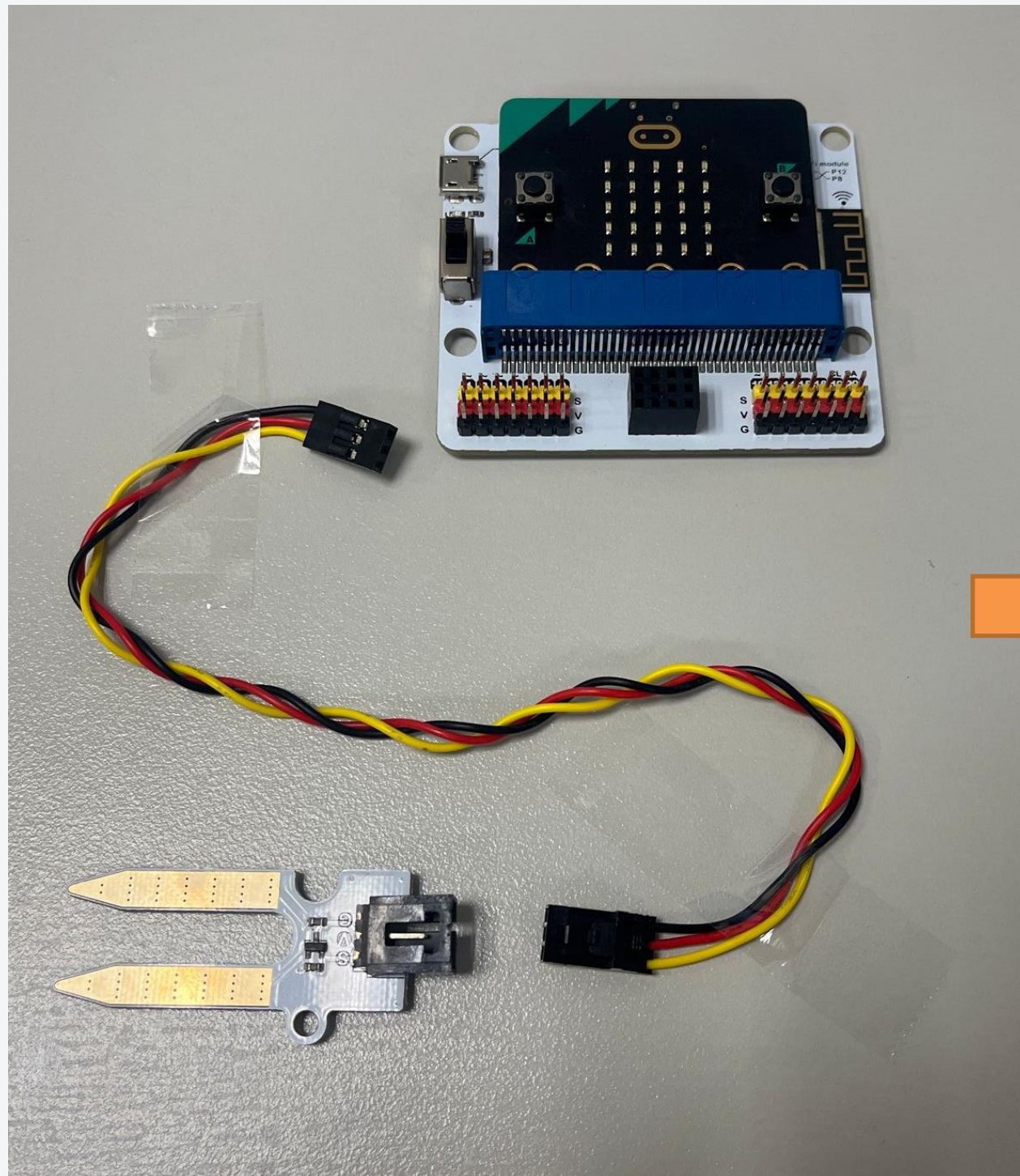
杜邦線

供電裝置



接駁裝置

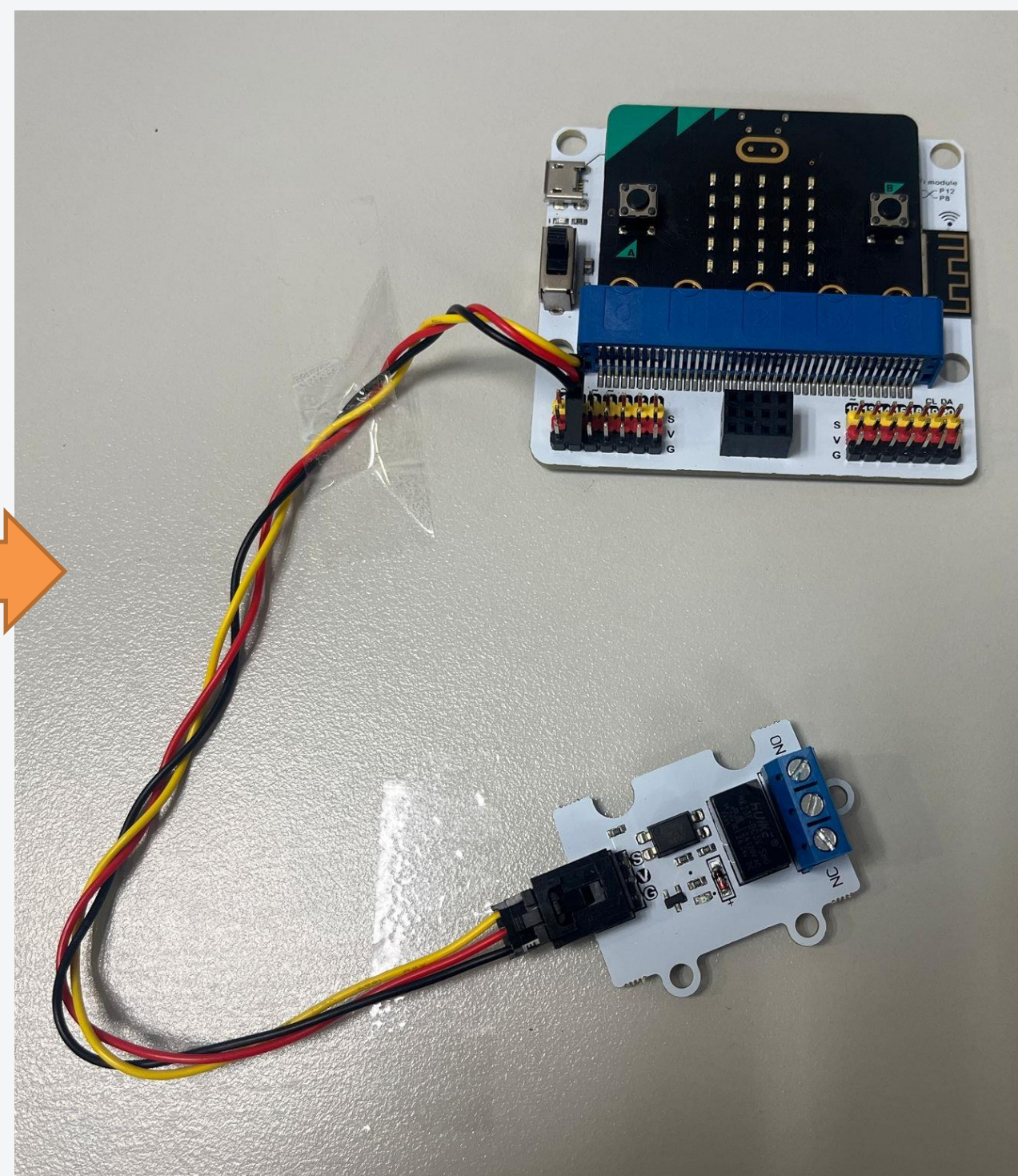
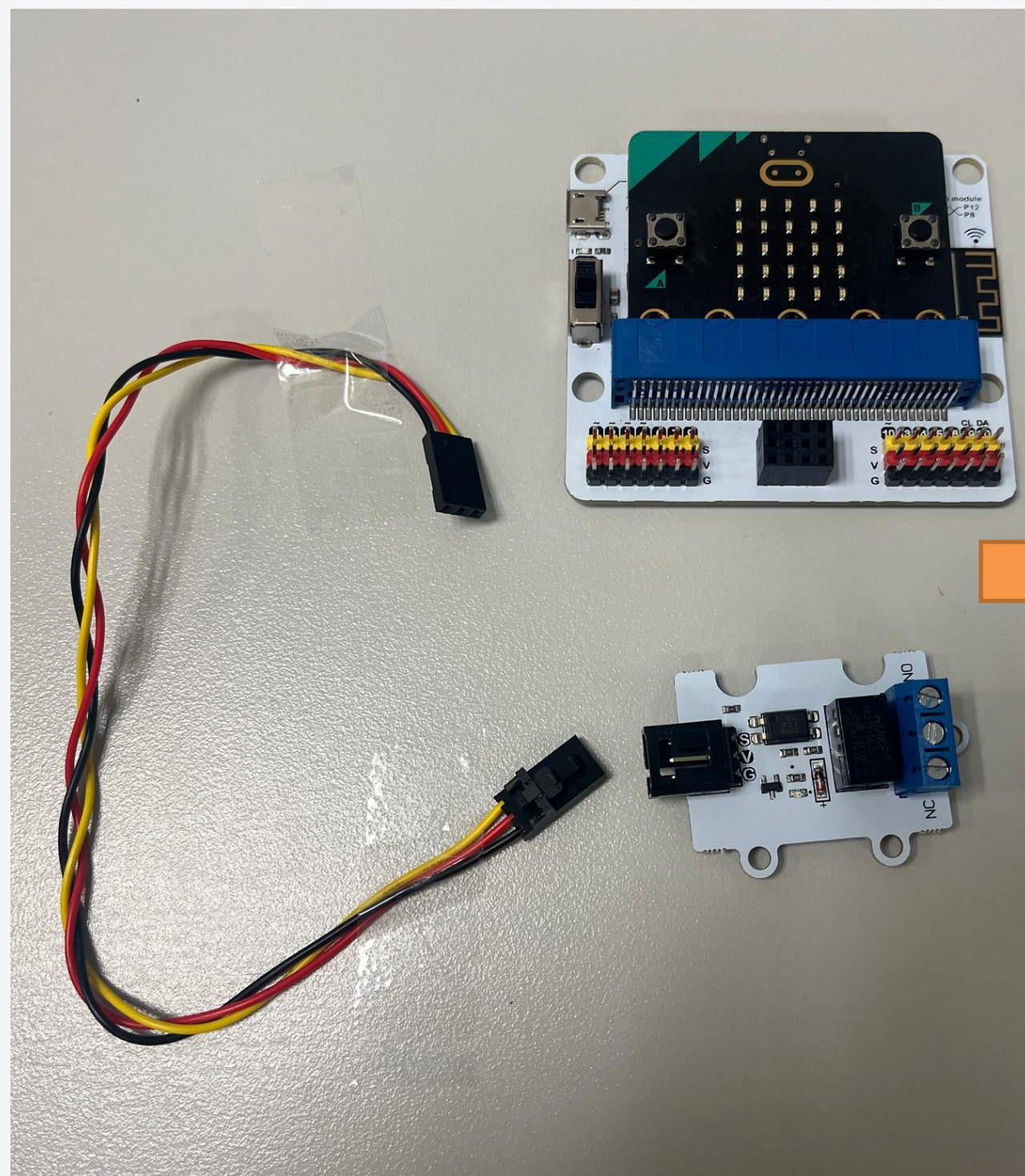
Step 1



1. 土壤濕度計駁入擴展板P1
 - a) 將電線簡單插入土壤濕度計
 - b) 將另一邊電線插入擴展板 P1
(黑對黑，紅對紅，黃對黃)

接駁裝置

Step 2

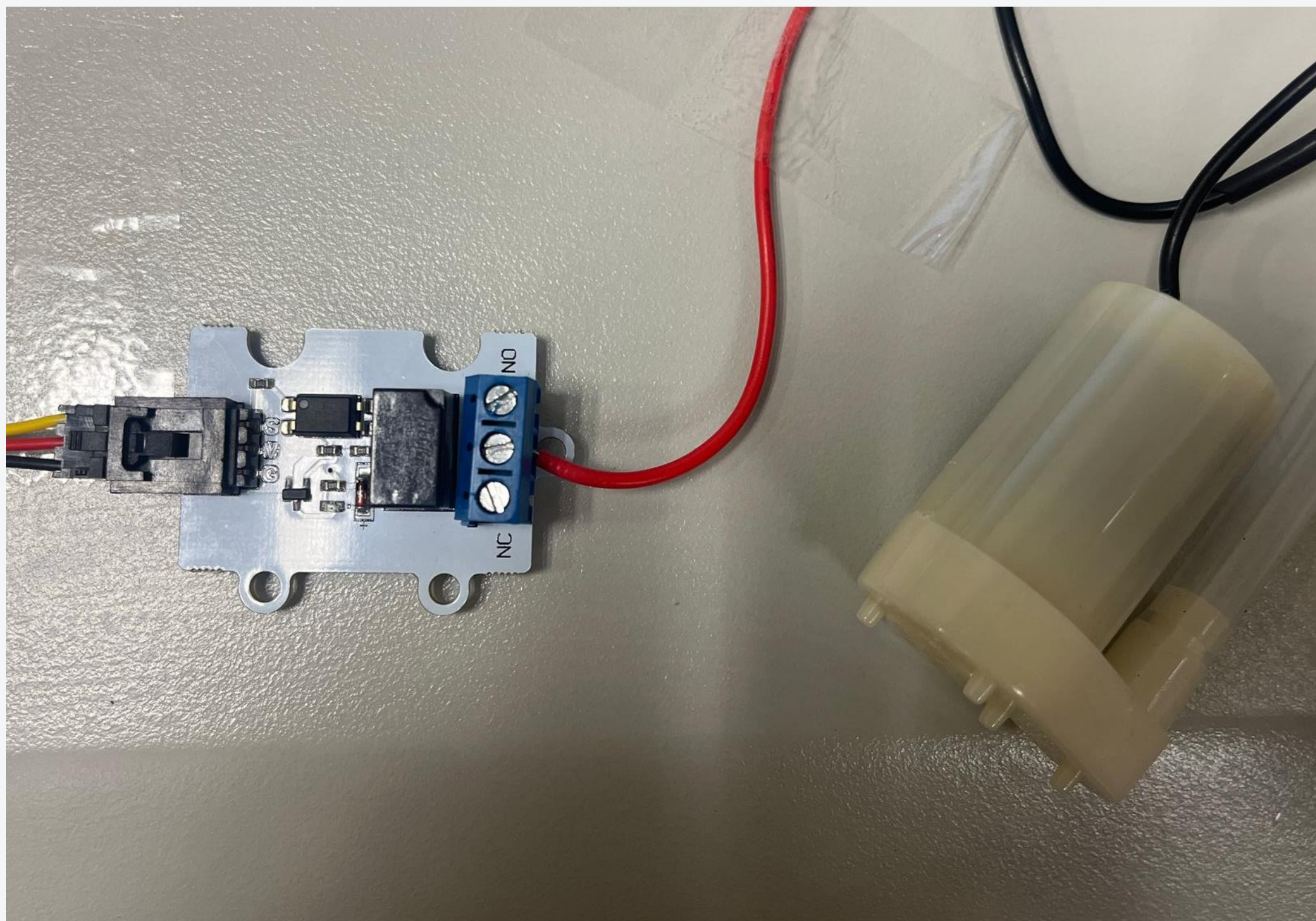


2. 繼電器駁入擴展板 P2

- a) 將電線簡單插入繼電器
- b) 將另一邊電線插入擴展板 P2
(黑對黑，紅對紅，黃對黃)

接駁裝置

Step 3



3.水泵連接繼電器

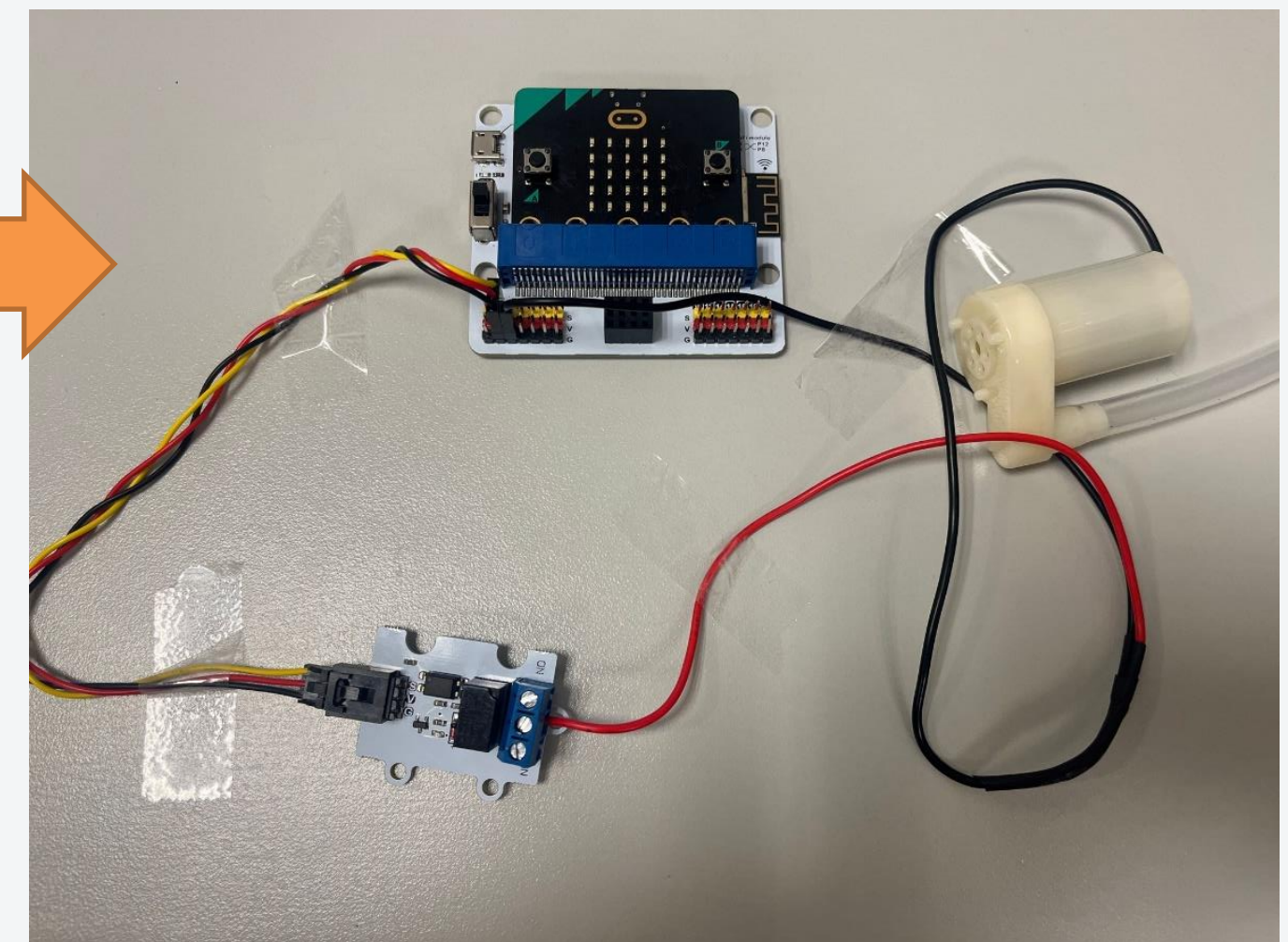
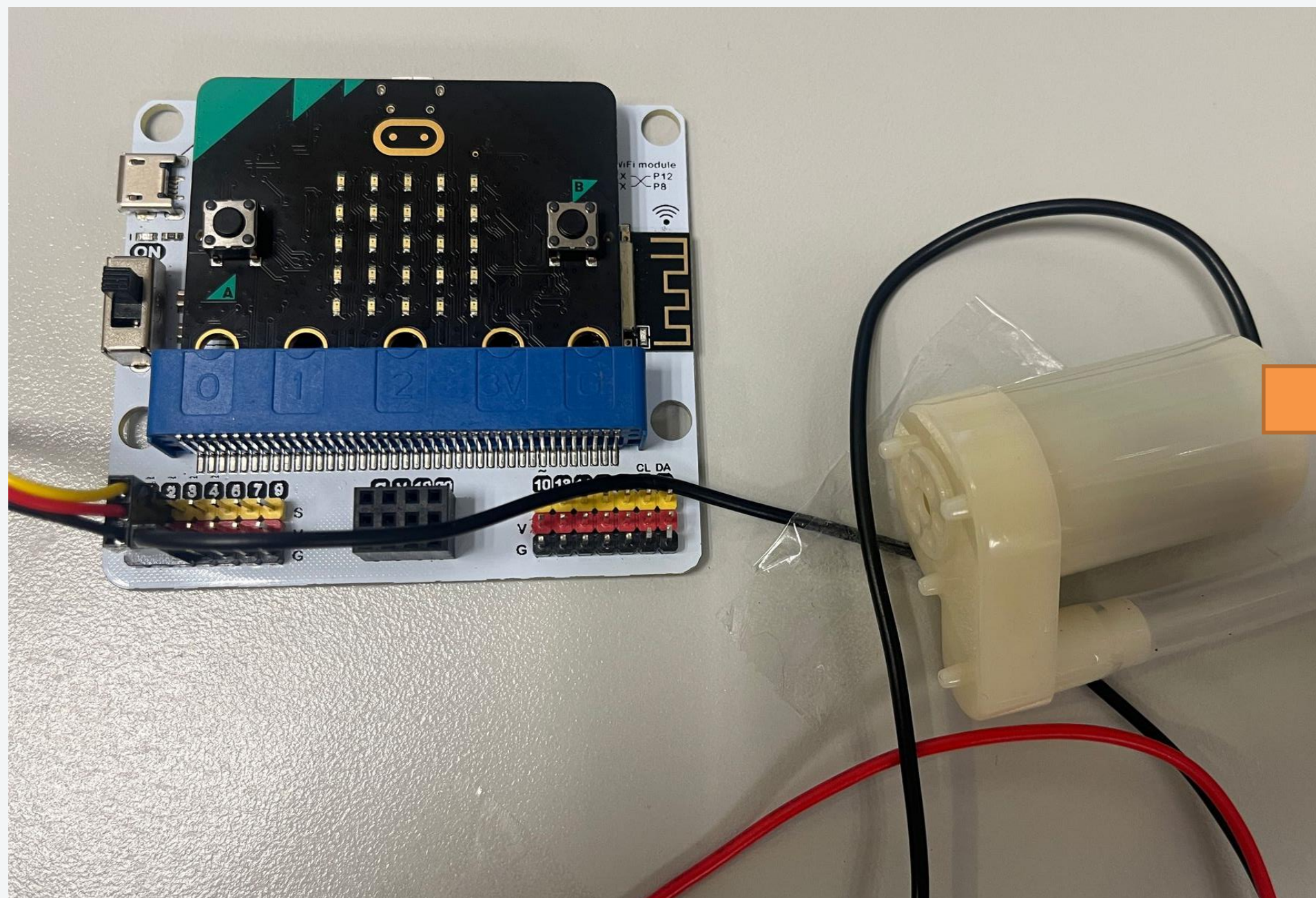
- a) 扭鬆繼電器上的螺絲
- b) 將水泵紅色線駁入繼電器中間Pin位
- c) 扭緊繼電器中間Pin位的螺絲

接駁裝置

Step 4

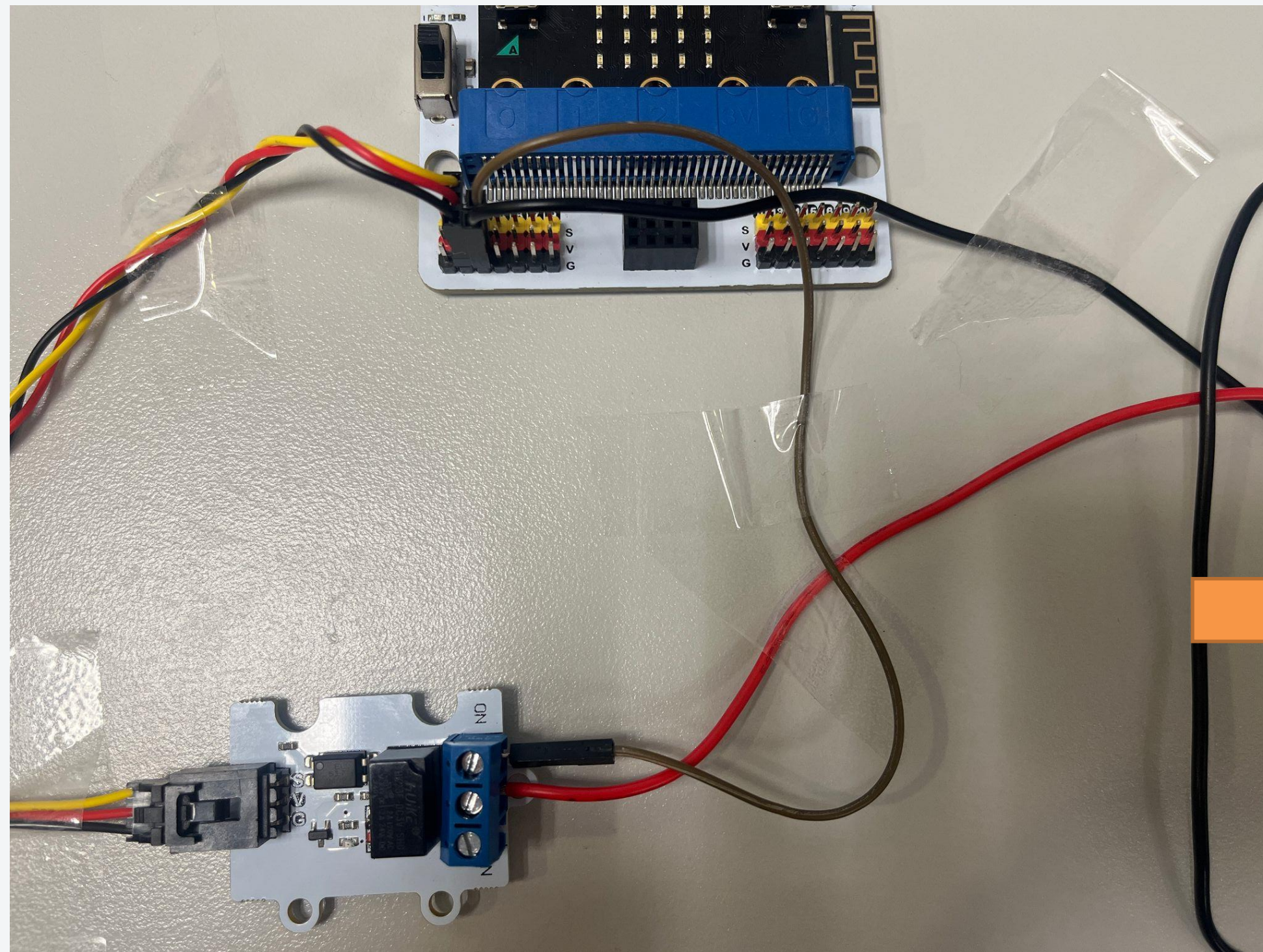
4.水泵連接擴展板

b) 水泵黑色線駁入擴展板 P3 GND位（黑色）



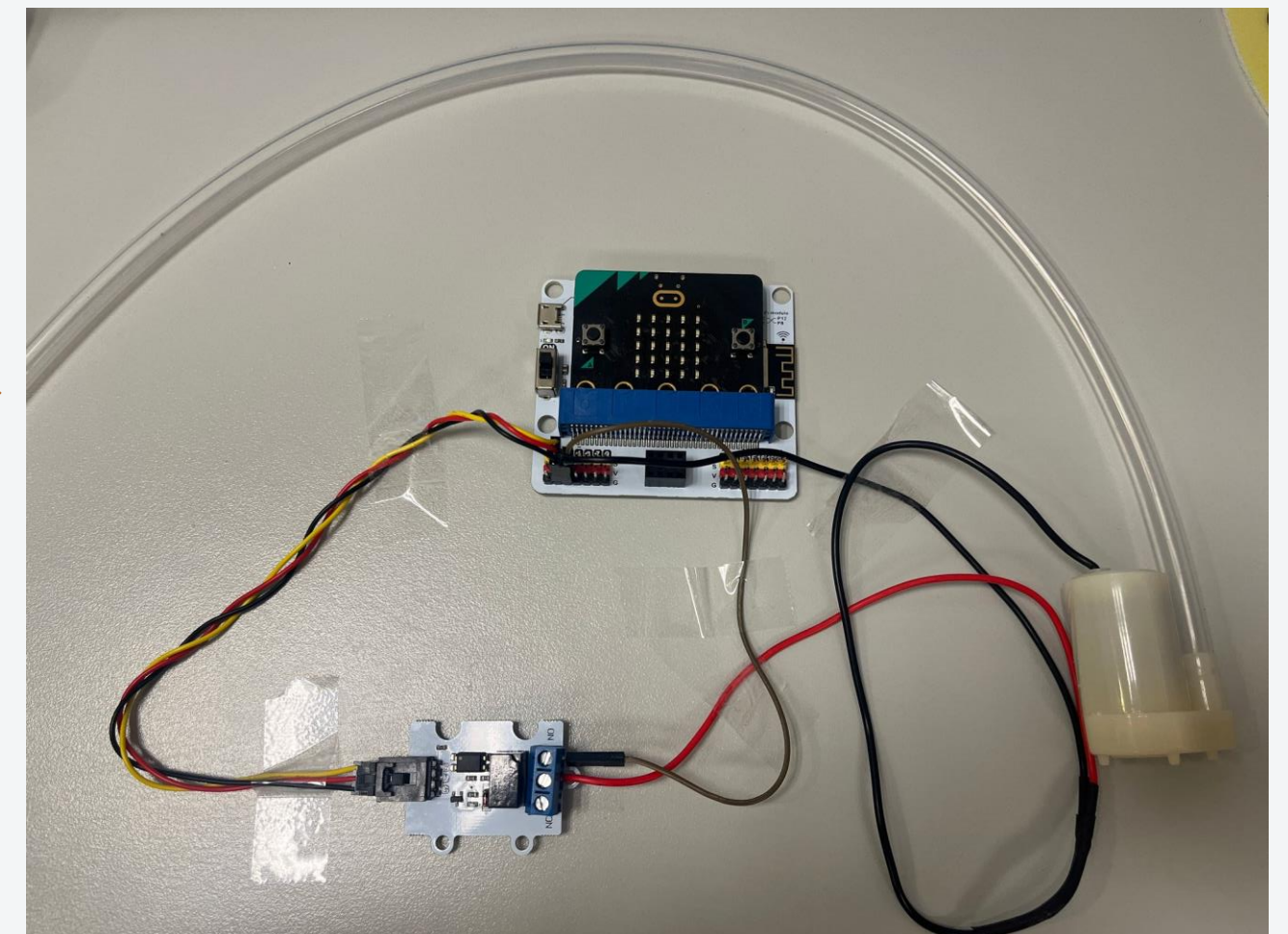
接駁裝置

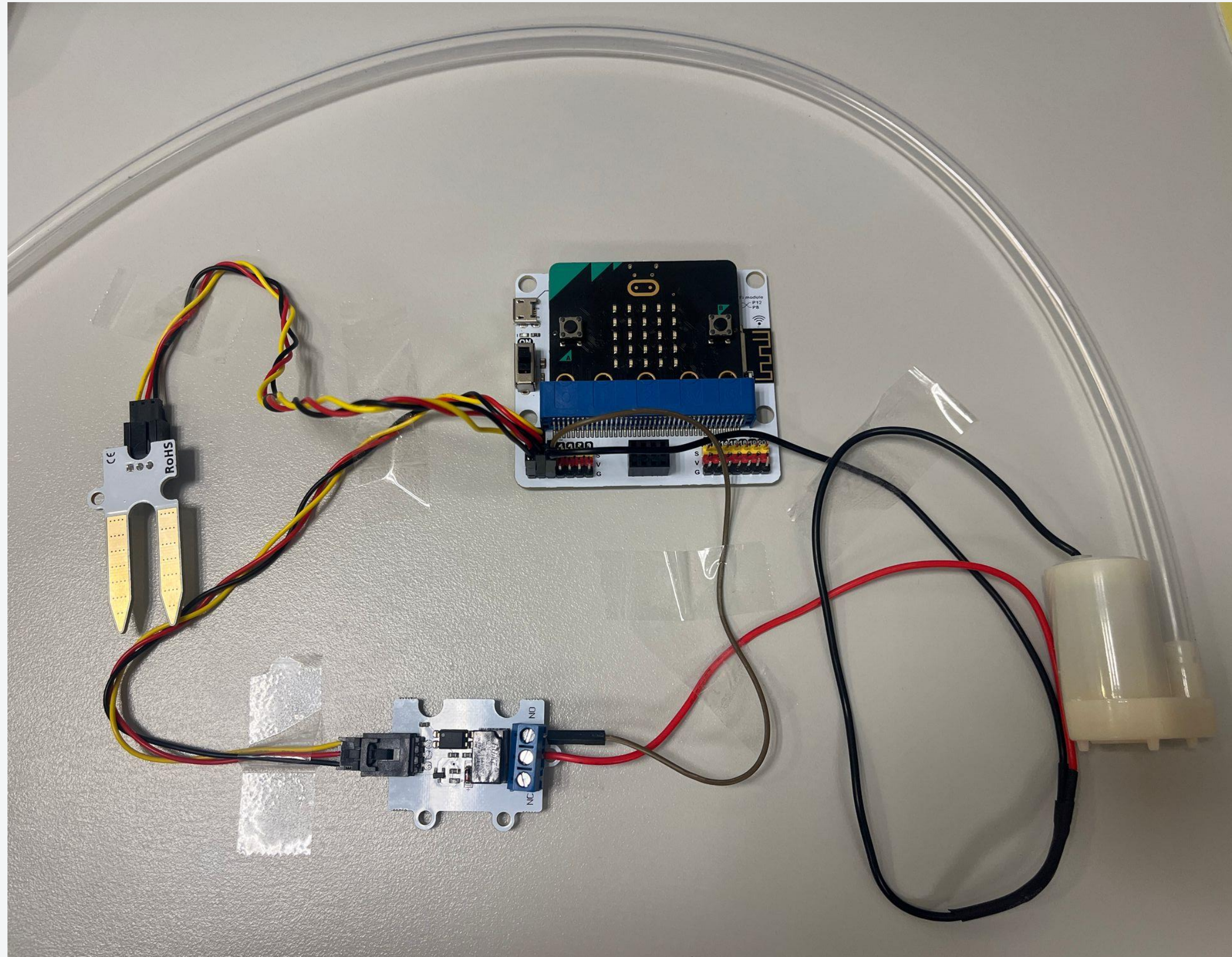
Step 5



5.杜邦線把繼電器與擴展板連接

- a) 另取一條杜邦線，針位駁入繼電器 “NO” 位
- b) 扭緊繼電器 “NO” 位的螺絲
- c) 插位駁入擴展板P3 VCC位（紅色）





基本編程

```
forever
  show number analog read pin P1
  if analog read pin P1 < 700 then
    digital write pin P2 to 1
    pause (ms) 5000
    digital write pin P2 to 0
  else if analog read pin P1 ≥ 700 then
    digital write pin P2 to 0
  +
```

土壤濕度計

根據實際測試數據而定

水泵：0-關, 1-開

開水泵5秒

<https://makecode.microbit.org/S35386-35281-97586-59180>

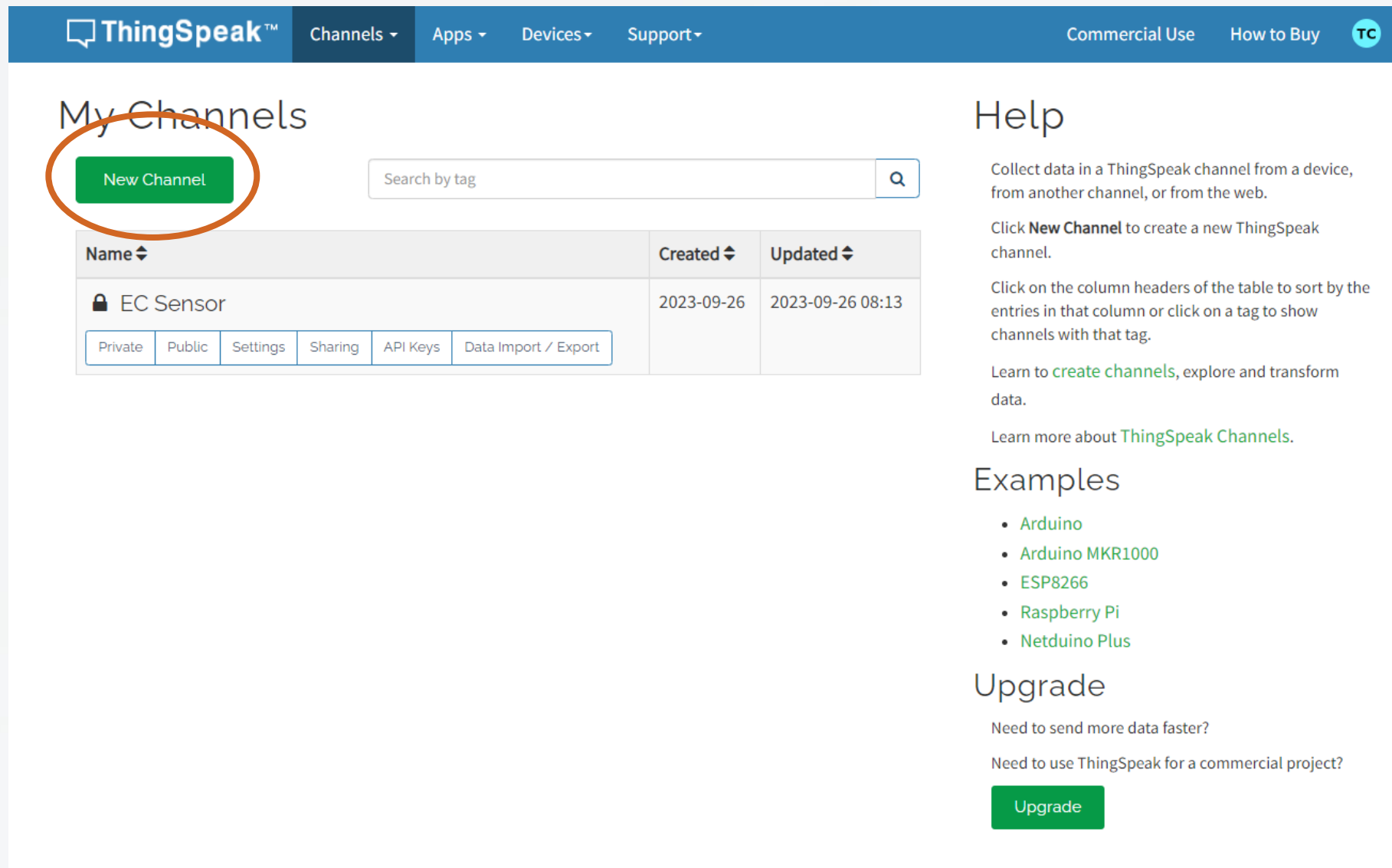
EXTENSIONS :

Hbw to connect with ThingSpeak?



ThingSpeak

Login to ThingSpeak



ThingSpeak™ Channels Apps Devices Support Commercial Use How to Buy TC

My Channels

New Channel Search by tag

Name	Created	Updated
EC Sensor	2023-09-26	2023-09-26 08:13

Private Public Settings Sharing API Keys Data Import / Export

Help

Collect data in a ThingSpeak channel from a device, from another channel, or from the web.

Click **New Channel** to create a new ThingSpeak channel.

Click on the column headers of the table to sort by the entries in that column or click on a tag to show channels with that tag.

Learn to [create channels](#), explore and transform data.

Learn more about [ThingSpeak Channels](#).

Examples

- [Arduino](#)
- [Arduino MKR1000](#)
- [ESP8266](#)
- [Raspberry Pi](#)
- [Netduino Plus](#)

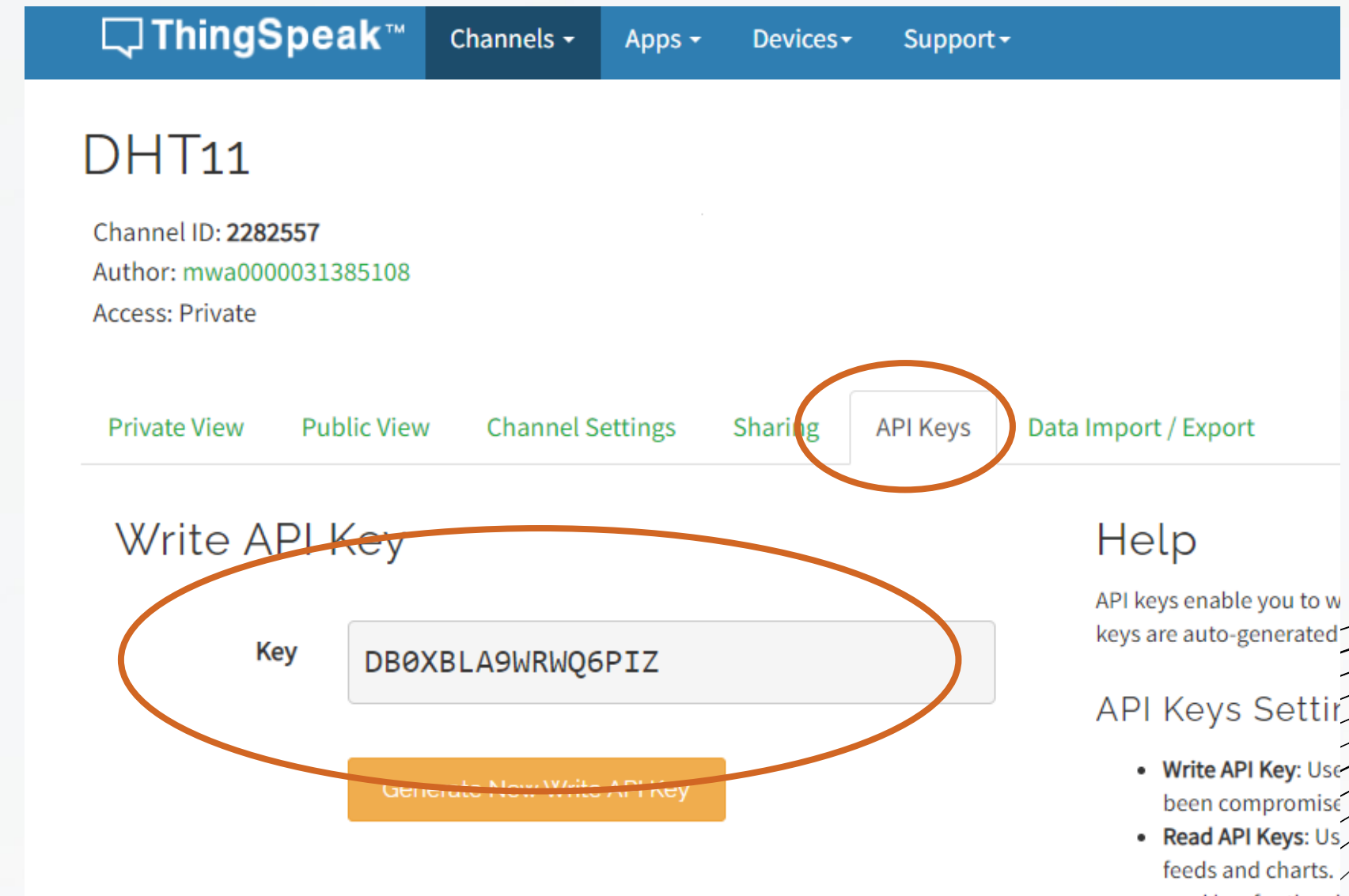
Upgrade

Need to send more data faster?

Need to use ThingSpeak for a commercial project?

Upgrade

1. Add new channel



ThingSpeak™ Channels Apps Devices Support

DHT11

Channel ID: **2282557**
Author: **mwa0000031385108**
Access: Private

Private View Public View Channel Settings Sharing **API Keys** Data Import / Export

Write API Key

Key **DB0XBLA9WRWQ6PIZ**

Generate New Write API Key

Help

API keys enable you to write data to channels. API keys are auto-generated for each channel.

API Keys Settings

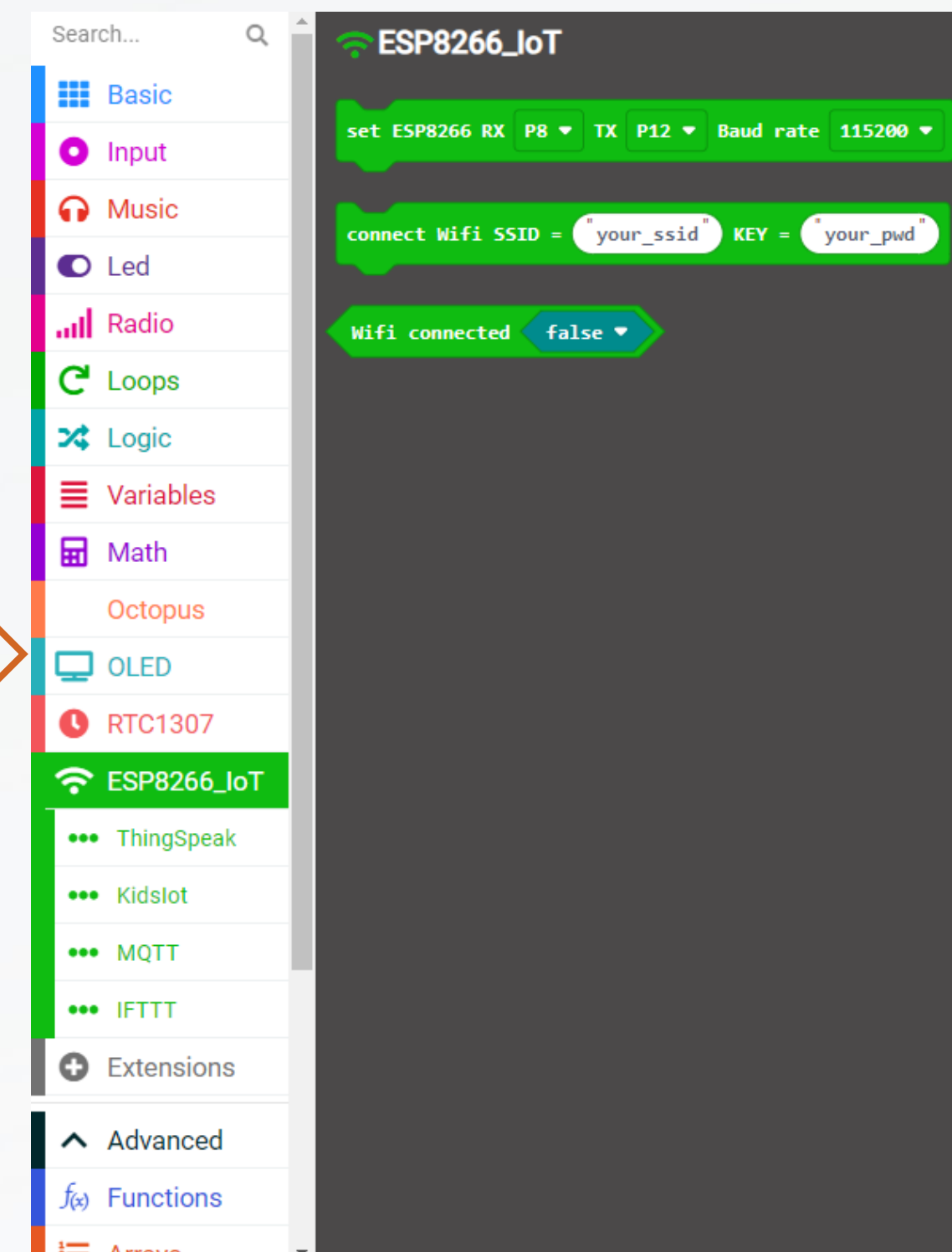
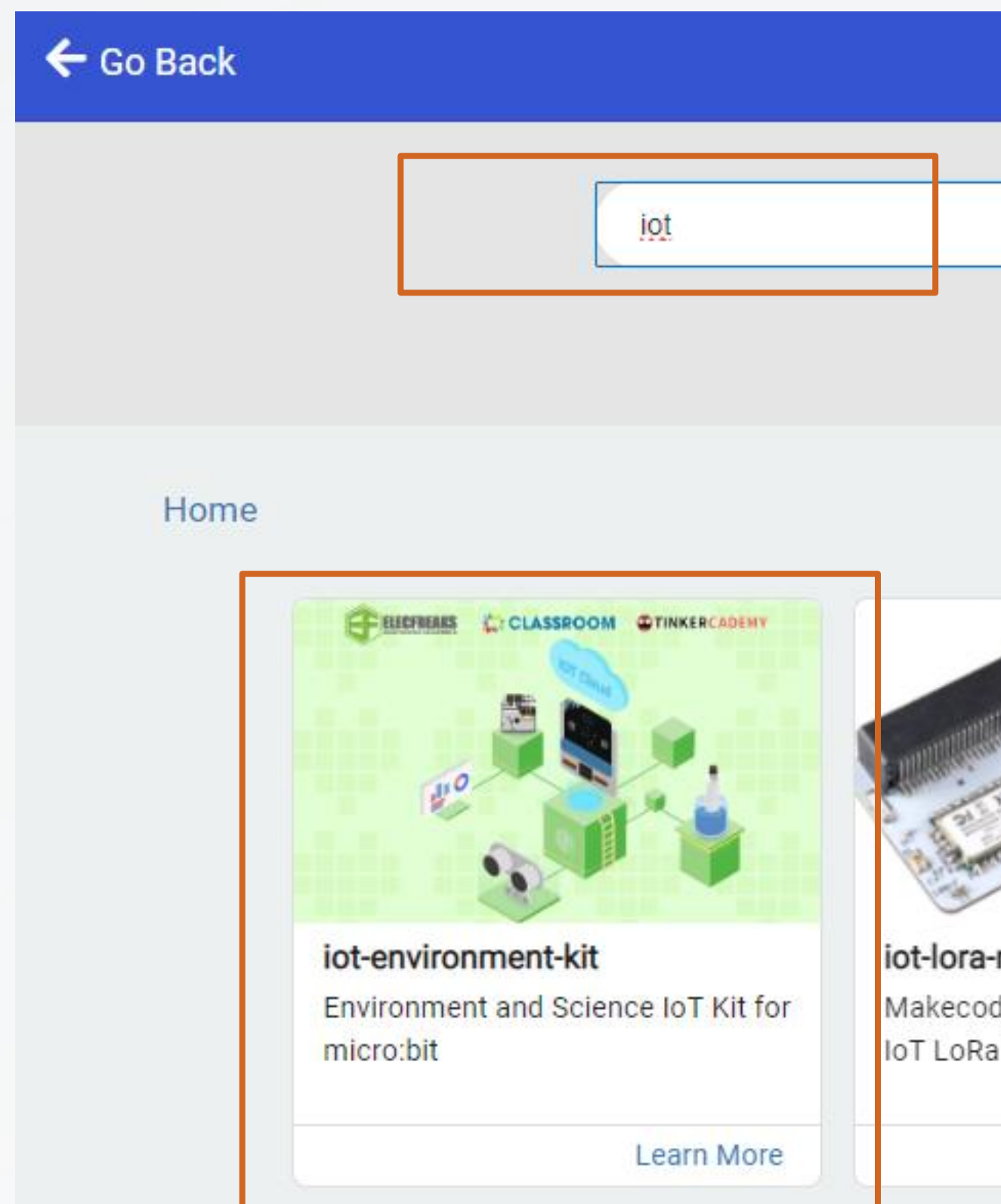
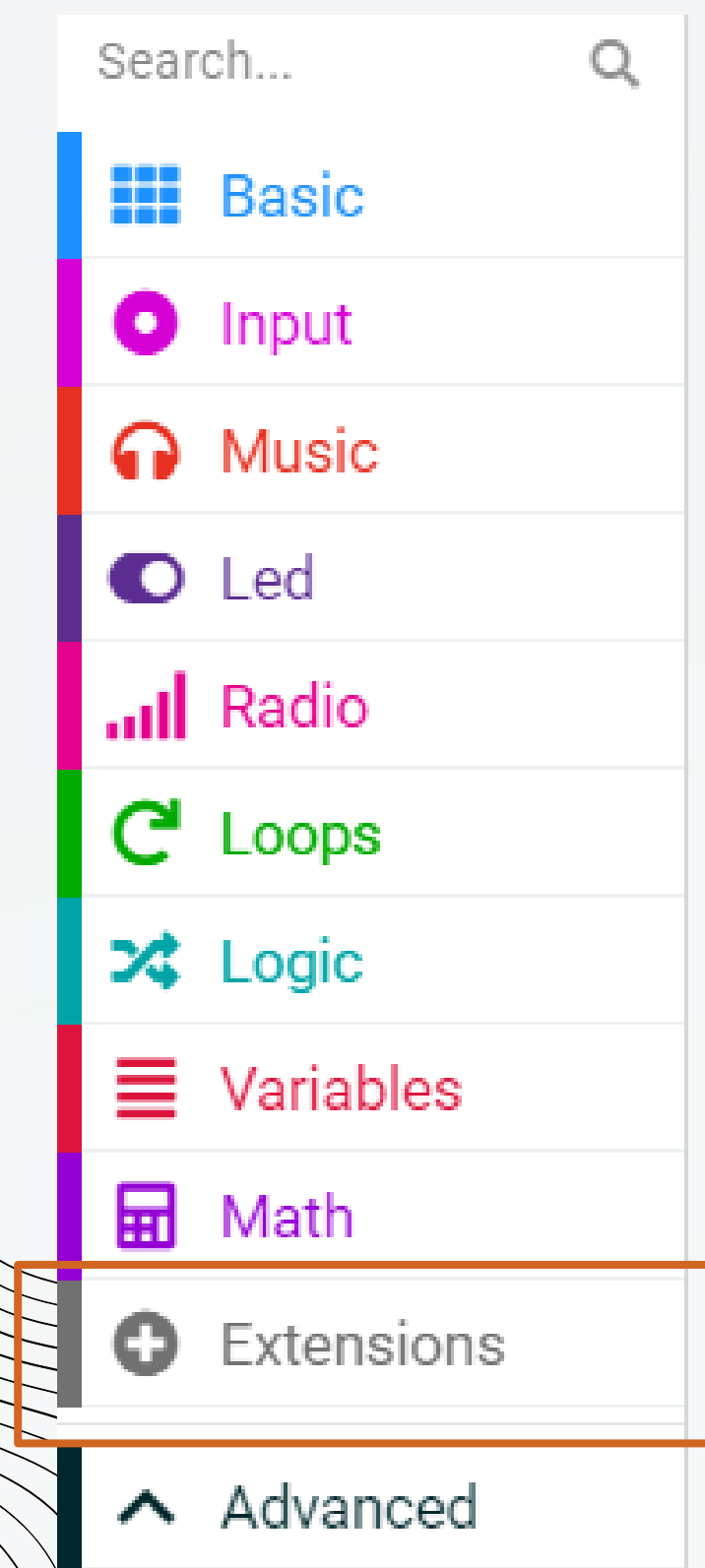
- **Write API Key:** Used to write data to the channel. If the key has been compromised, you should generate a new key.
- **Read API Key:** Used to read data from the channel. If the key has been compromised, you should generate a new key.

2. Find API Key

Add extensions to Makecode

1. Click "Extensions"

2. Search "iot" and choose "datalogger"



iot編程

Step 2

Step 1

Scratch code for Step 1:

- on start** (circled in yellow)
- set ESP8266 RX** P8 ▼ **TX** P12 ▼ **Baud rate** 115200 ▼
- connect Wifi SSID =** "IoT" (circled in red) **KEY =** "eduhk+IoT+2018" (circled in red)
- if** Wifi connected **true** ▼ **then**
- show icon** (grid icon)
- 確保Wi-Fi連接成功** (Ensure Wi-Fi connection successful)

Scratch code for Step 2:

- forever** (circled in yellow)
- show number** **analog read pin** P1 ▼ (circled in yellow)
- connect thingspeak**
- set data to send ThingSpeak**
- Write API key =** "EXRPABTCUMBR1Q8T" (circled in red)
- Field 1 =** **analog read pin** P1 ▼ (circled in yellow)
- +**
- Upload data to ThingSpeak**

Thingspeak:
Write API Key

P1-P4可以
記錄Data

土壤濕度計

iot編程

Step 3

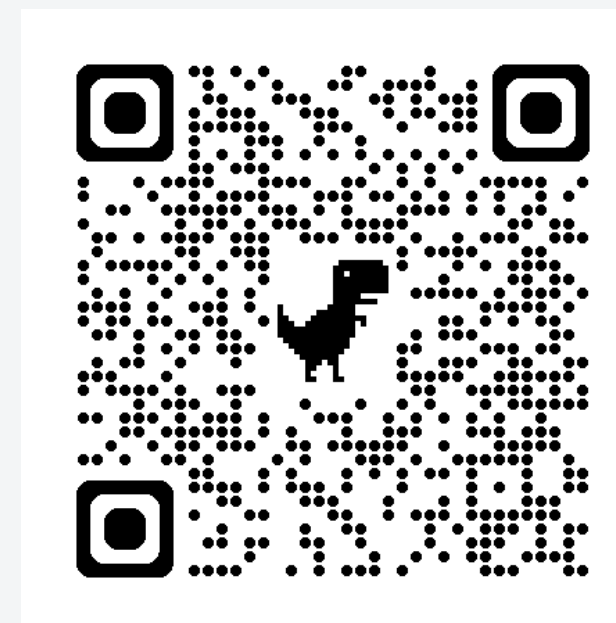
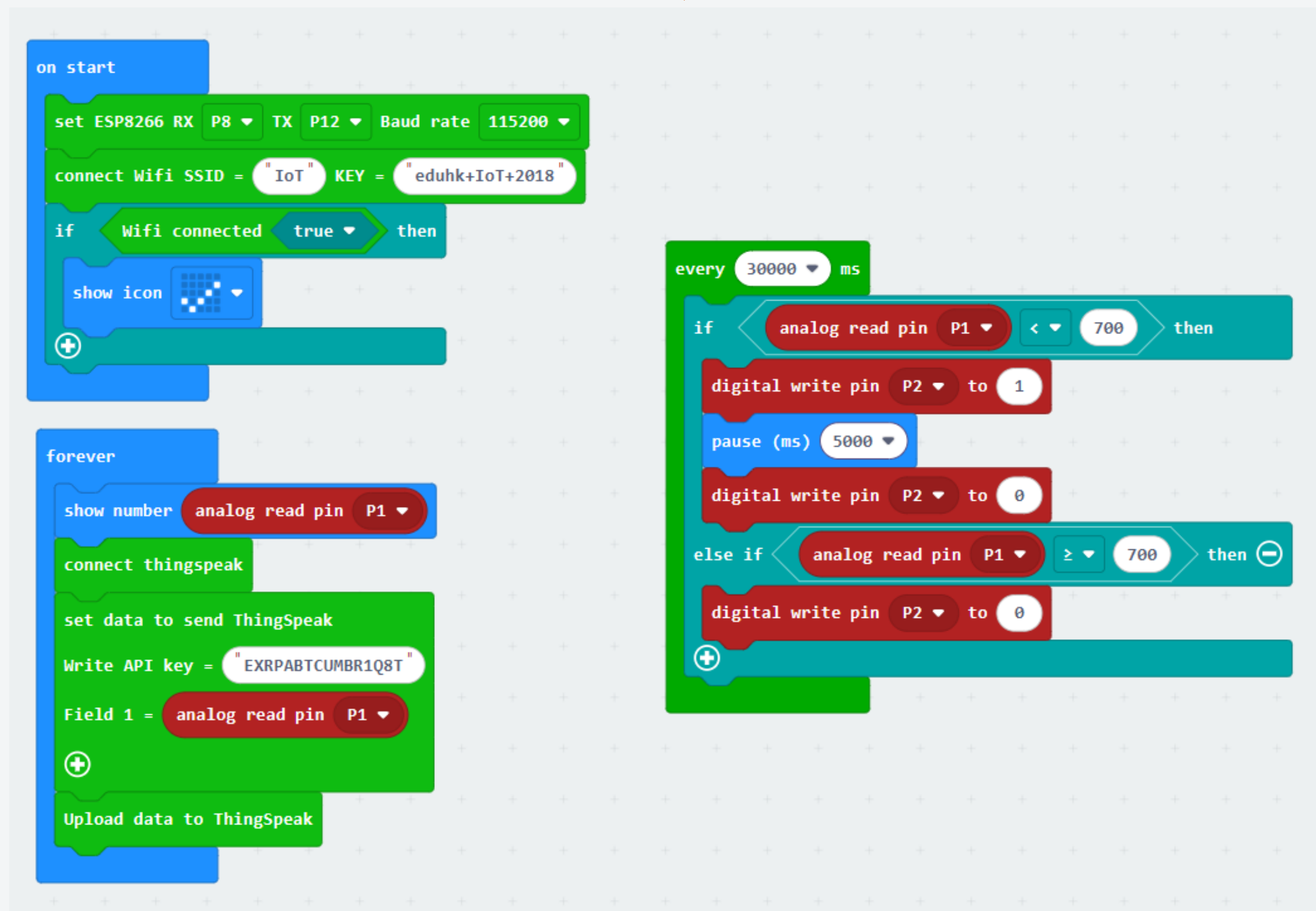


```
every 30000 ms
  if (analog read pin P1 < 700) then
    digital write pin P2 to 1
    pause (ms) 5000
    digital write pin P2 to 0
  else if (analog read pin P1 >= 700) then
    digital write pin P2 to 0
  loop
```

根據實際測試數據而定

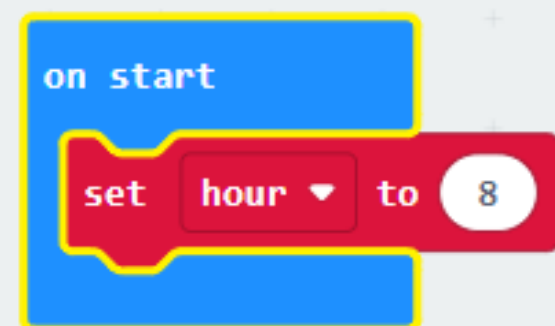
水泵：0-關, 1-開

iot 編程



<https://makecode.microbit.org/S06157-49144-03922-94573>

時間編程



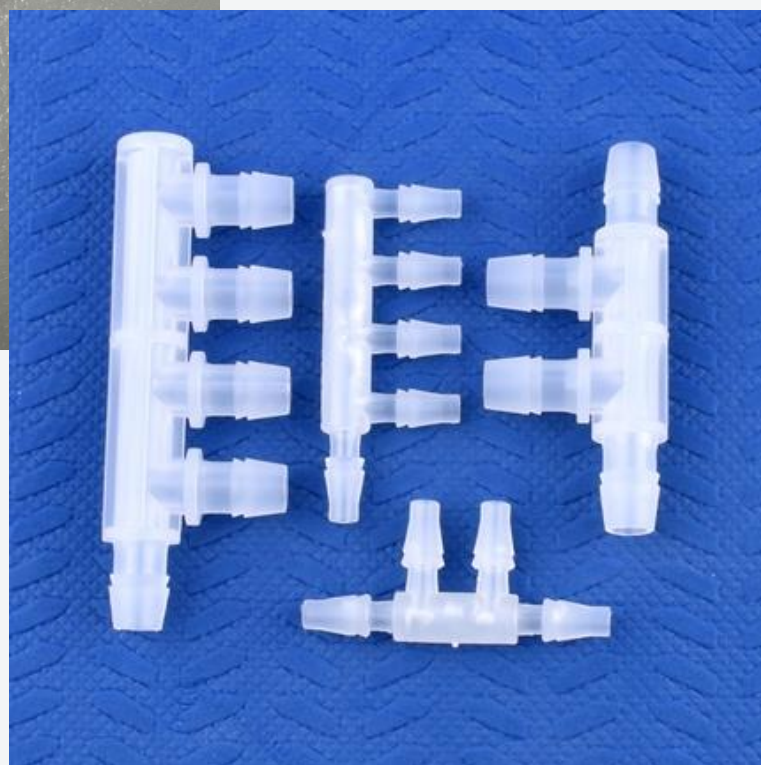
根據植物的特性設定灌溉時間接
(e.g. 每8小時開一次水泵)



通過控制水泵開啟時間來控制灌溉水量

灌溉間隔時間

水泵



水泵



Thanks for your attention