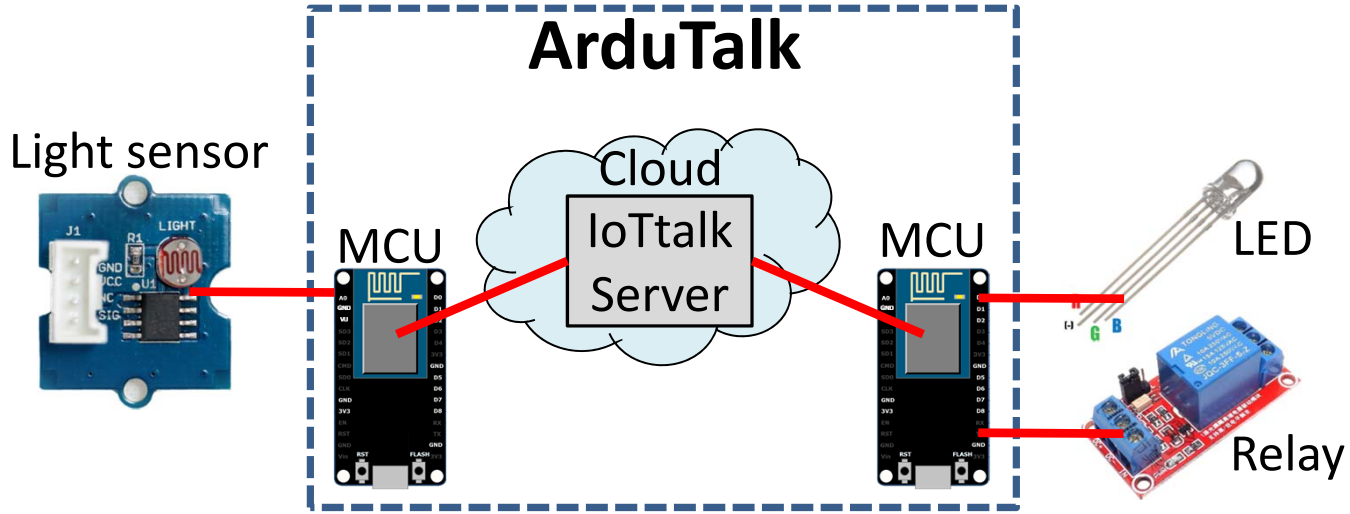
輕鬆使用ArduTalk
開發物聯網應用

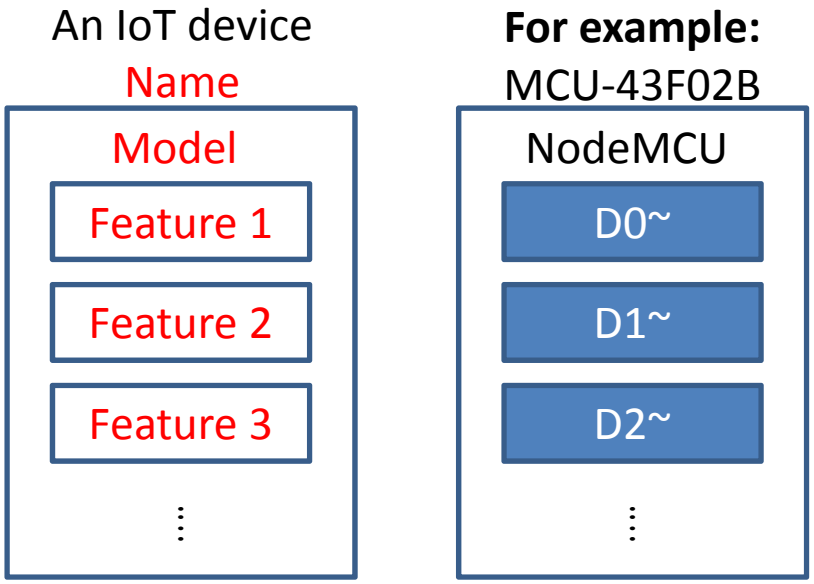
ArduTalk是什麼?

- ArduTalk為基於IoTtalk上提供快速Arduino網路應用開發環境
- 透過ArduTalk可以快速實現單一板子之物聯網應用或是多個板子互聯之應用



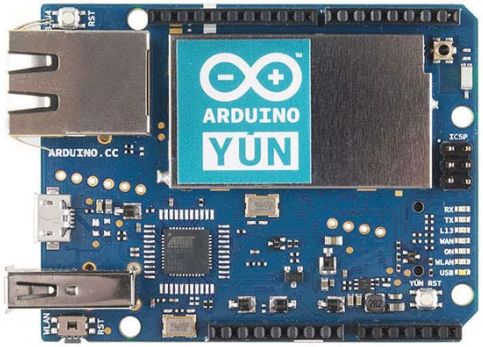
IoTtalk是什麼?

- **IoTtalk 是一物聯網管理平台**
- **IoT 設備管理概念**
  - **Device Feature (DF)**
    - 一個物聯網設備所提供之功能/能力
    - 輸入功能 (Input device feature, **IDF**)
    - 輸出功能(Output device feature, **ODF**)
  - **Device Model (DM)**
    - DM為數個DF之集合
    - 一個 DM為對應著某一個物聯網設備



ArduTalk可使用之微控板

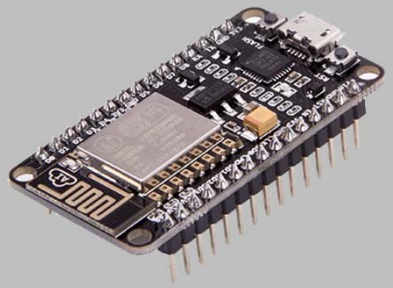
Arduino Yun



LinkIt Smart 7688 Duo

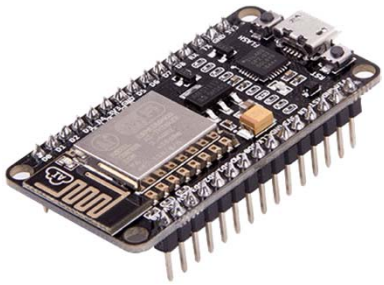
ESP8266

NodeMCU



ArduTalk物聯網應用開發實驗材料

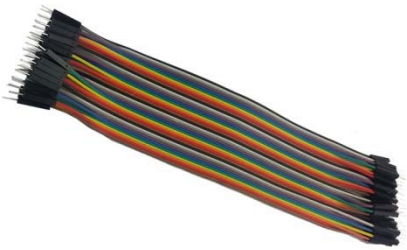
NodeMCU



麵包板 X 2

Micro USB 電源線

杜邦線

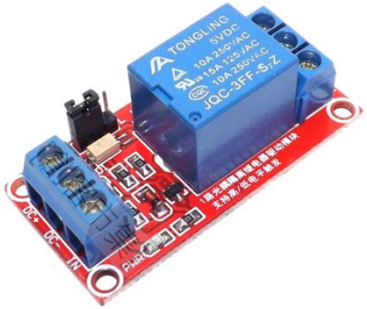


Light sensor

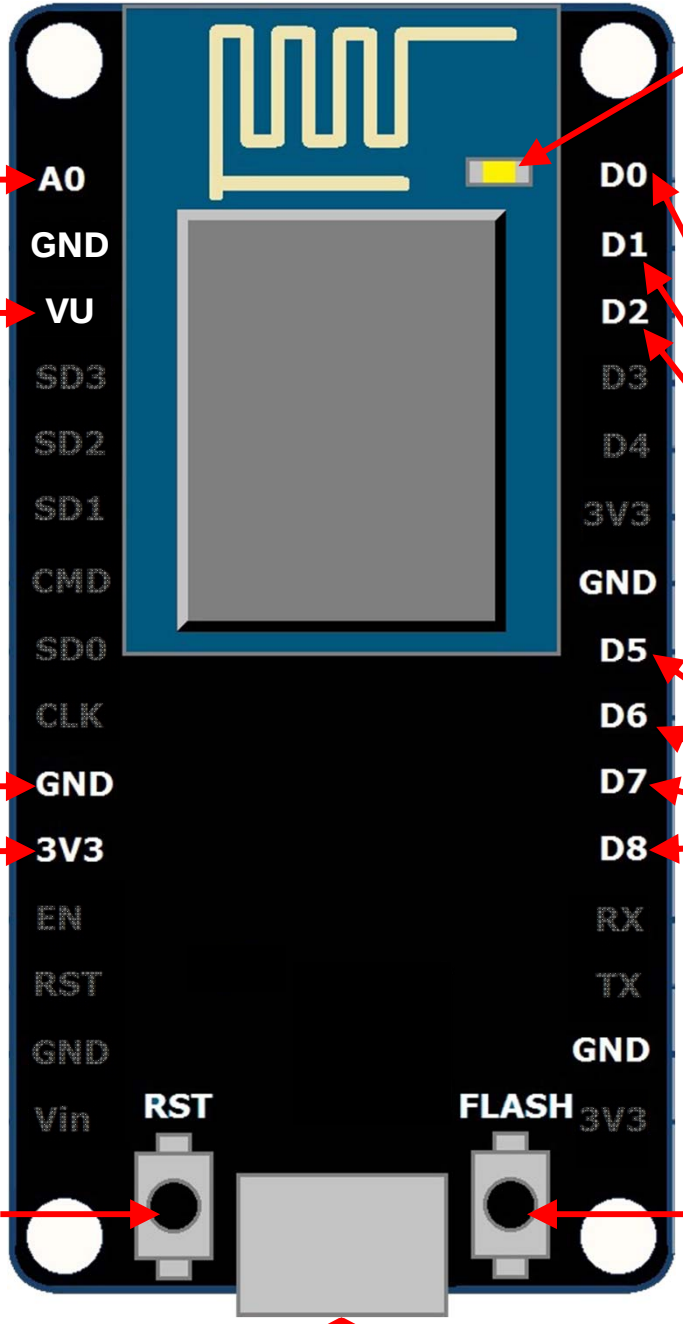
RGB LED

220R電阻

Relay



NodeMCU
(已燒錄ArduTalk)



A0 類比輸入Pin腳

供應5V電源

負極

供應3.3V電源

過電後燈號意義：
沒亮:AP模式(需設定WiFi)
恆亮:無法連上IoTtalk主機
每兩秒閃一下:連上IoTtalk
並可以開始使用

D0, D1, D2
PWM訊號
輸出Pin腳

D5, D6, D7, D8
數位輸出Pin腳

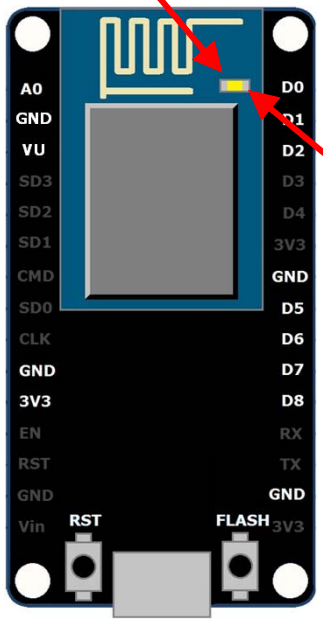
按一下後重新啟動板子

持續按3秒後清除Wi-Fi設定

插入Micro USB供電 (5V)

ArduTalk聯網設定

1.
過電後燈號沒亮:在AP模式(需設定WiFi)



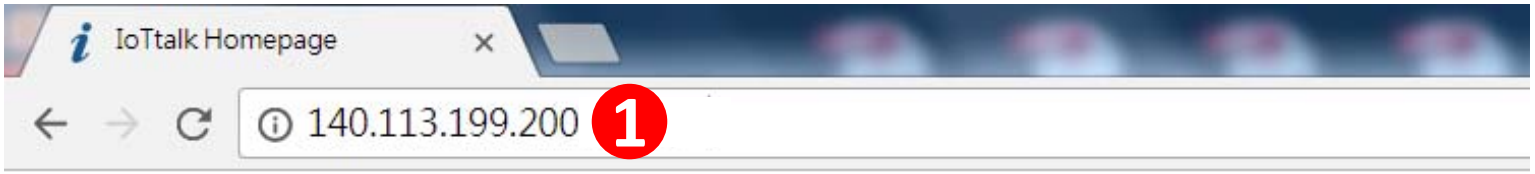
2. 經由自己的手機或電腦掃描WiFi AP, 找尋自己所屬的MCU-xxxxxxxxxxxx六個x是MAC代號

若等一陣子還是沒看到可按一下RST按鈕再找找

3. 用手機或電腦開啟瀏覽器, 網址輸入192.168.0.1

6. 連線成功後燈號每兩秒閃一下表示已連上IoTtalk並可以開始使用

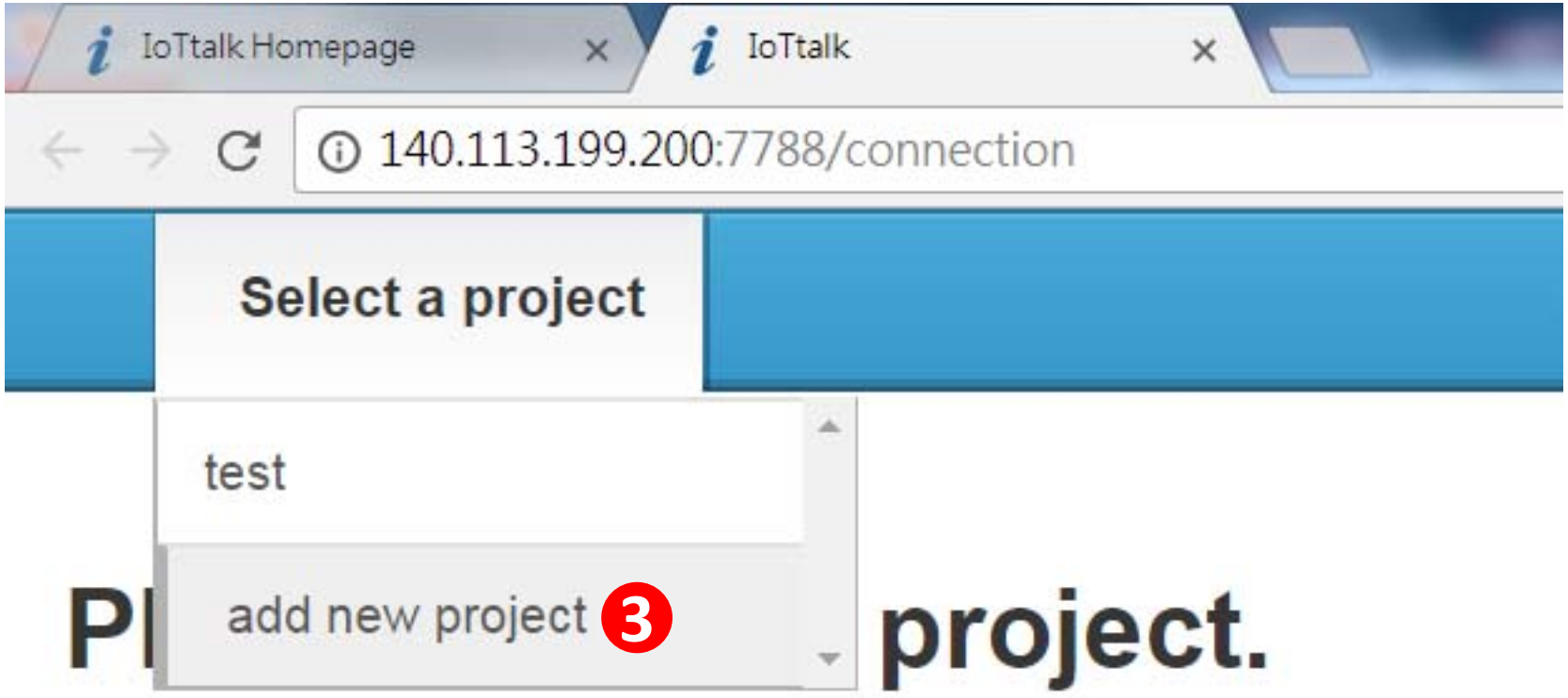
如何在IoTtalk上叫出NodeMCU?



IoTtalk:

- Project 2
- Device Feature Management
- Download Device Feature
- Device Monitor

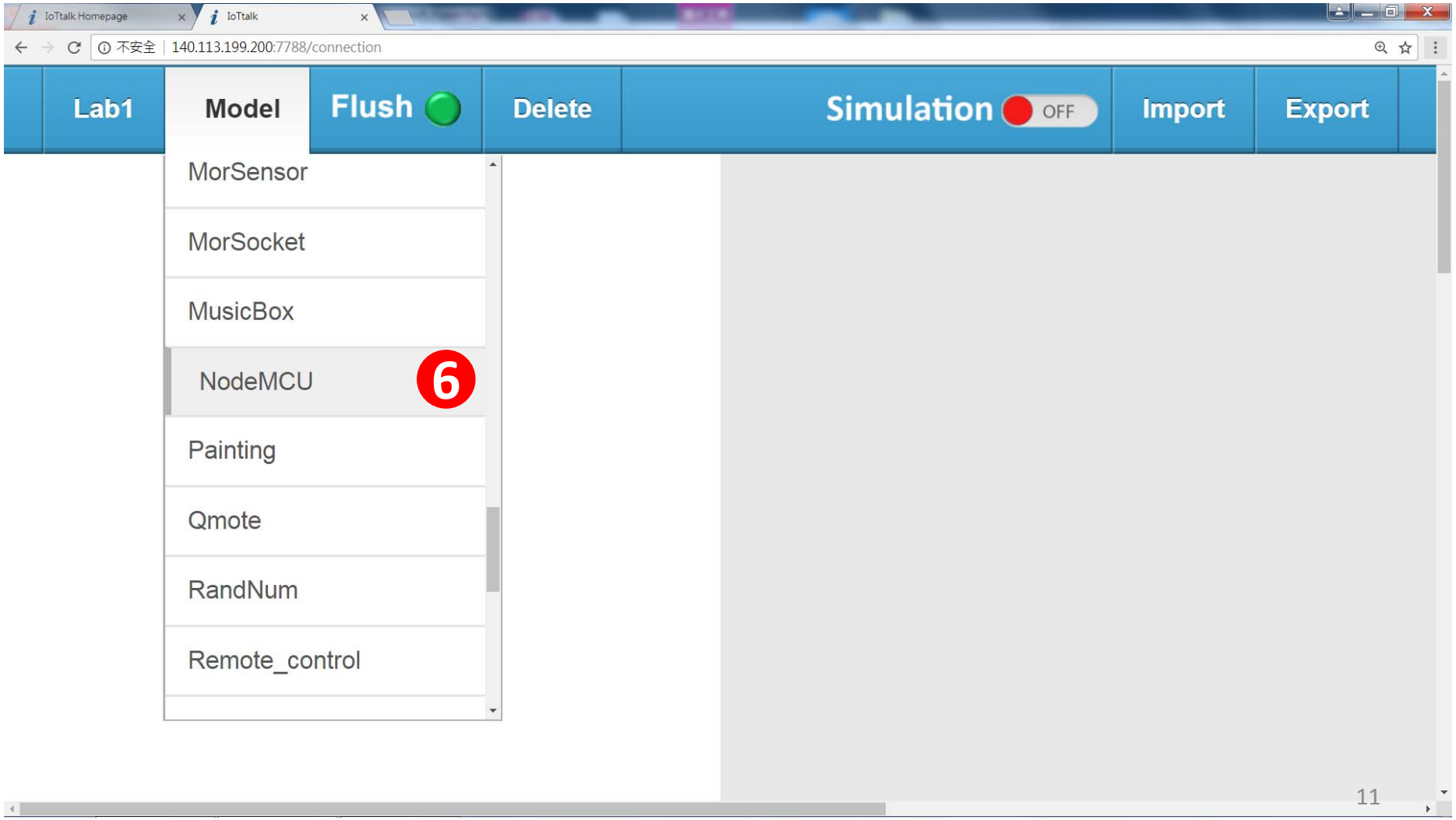
新增屬於自己的專案Project



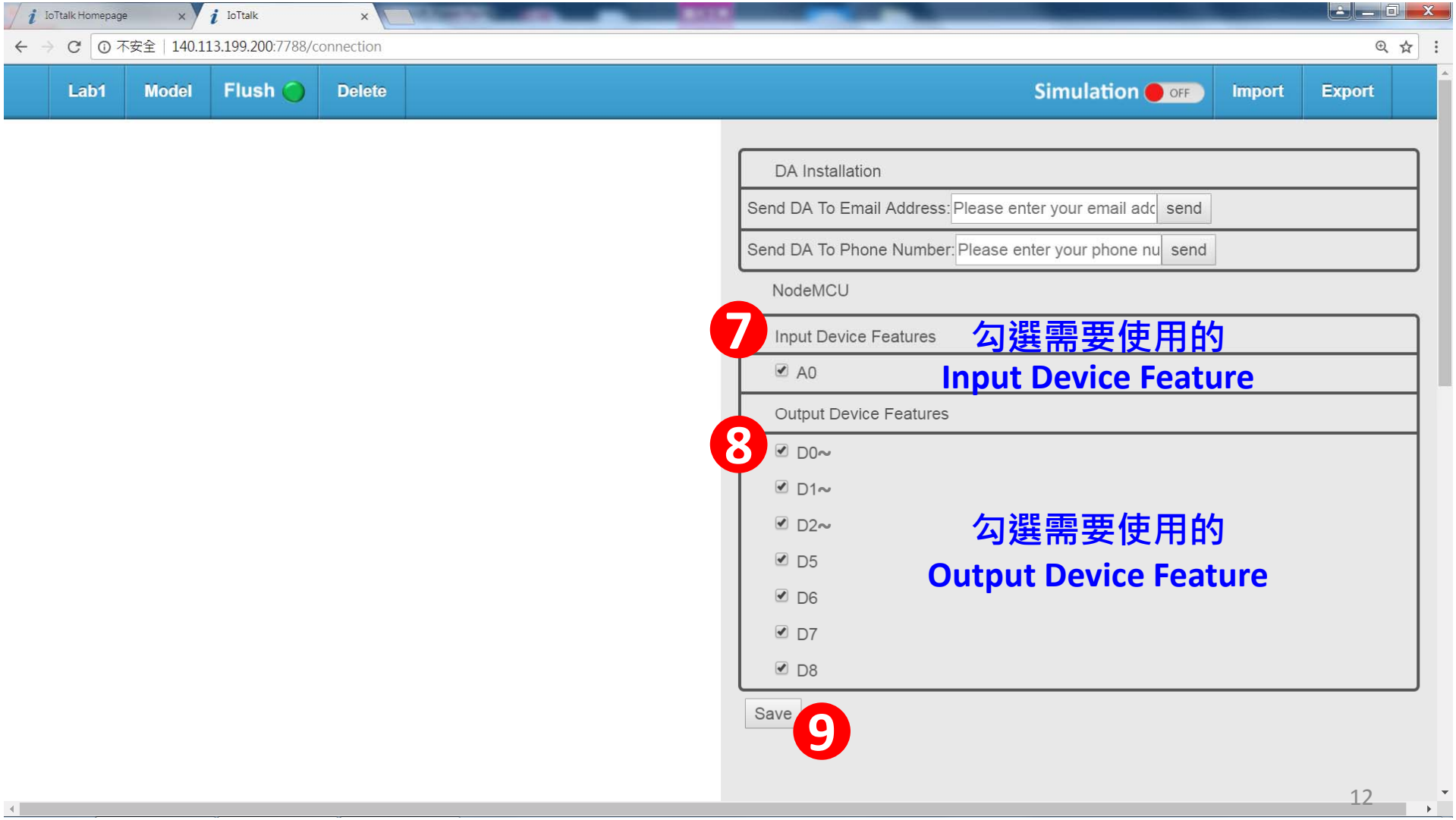
命名專案並指定密碼


IoTtalk Homepage
IoTtalk
不安全 | 140.113.199.200:7788/connection
Add new project
Import
Please add a project.
Enter Project Name
4
Lab1
命名專案名稱
Lab1
Enter Project Password
5
設定專案密碼
Cancel
OK

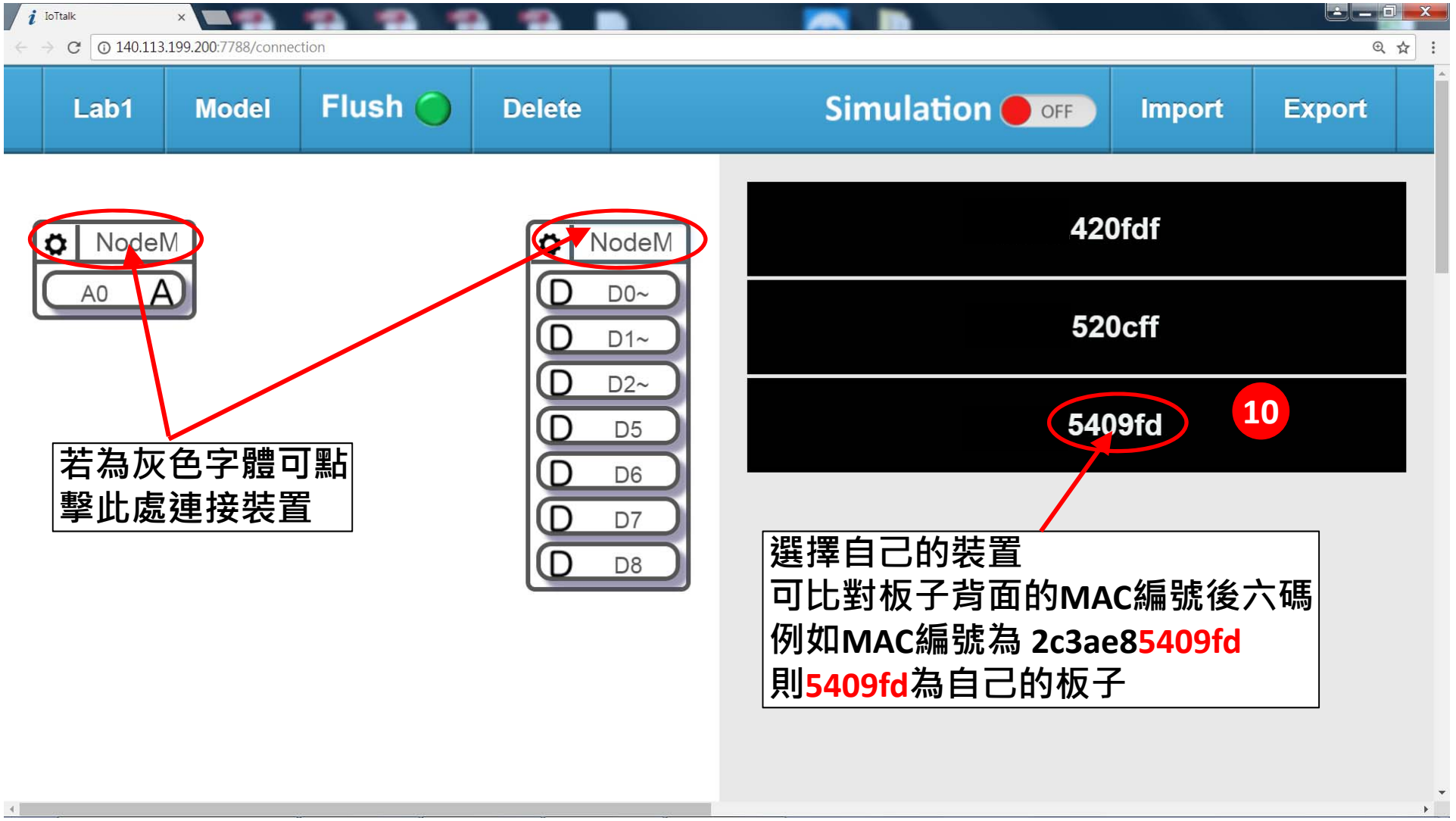
在Model選單中點擊NodeMCU



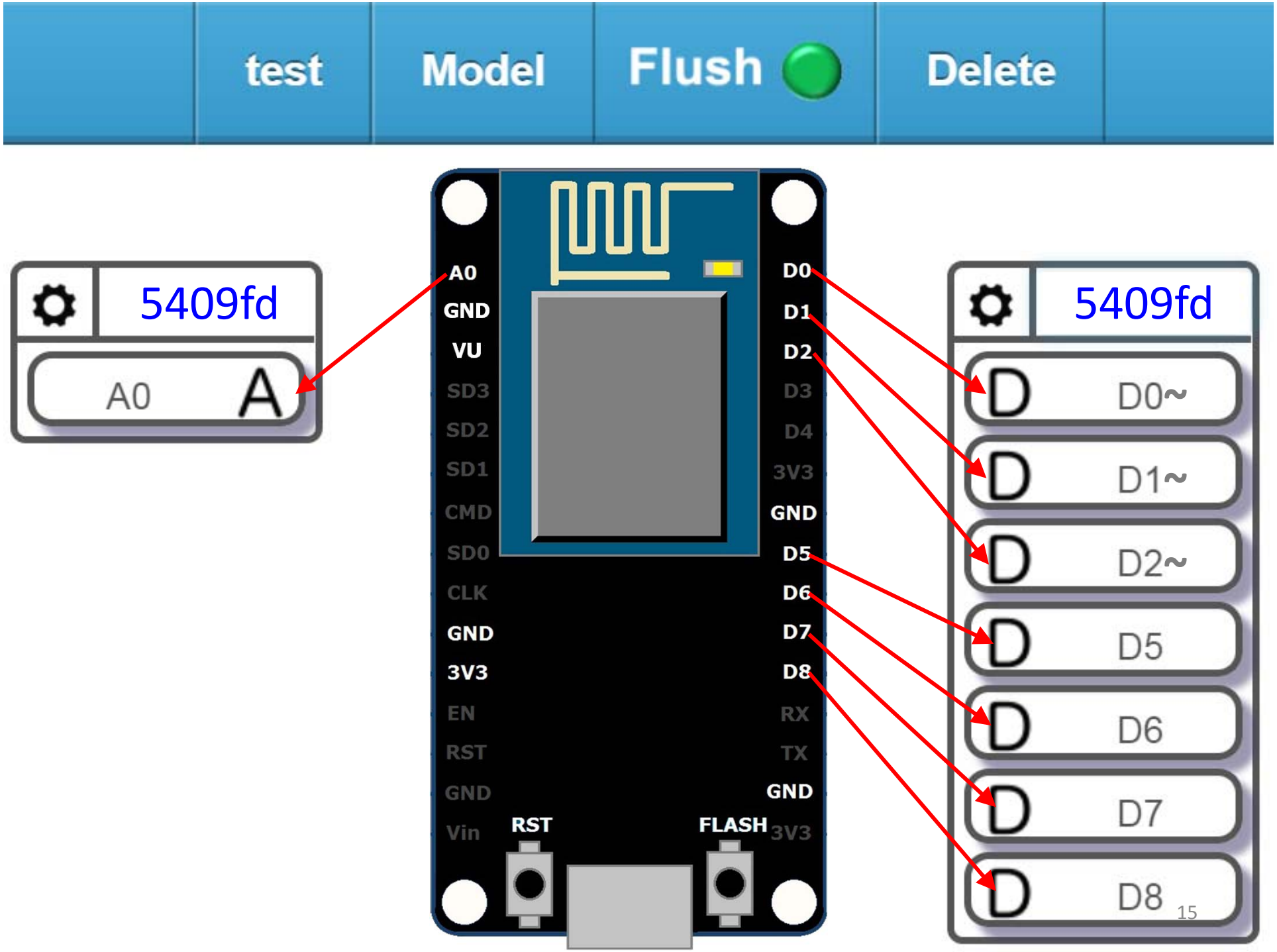
勾選需要的IDF/ODF



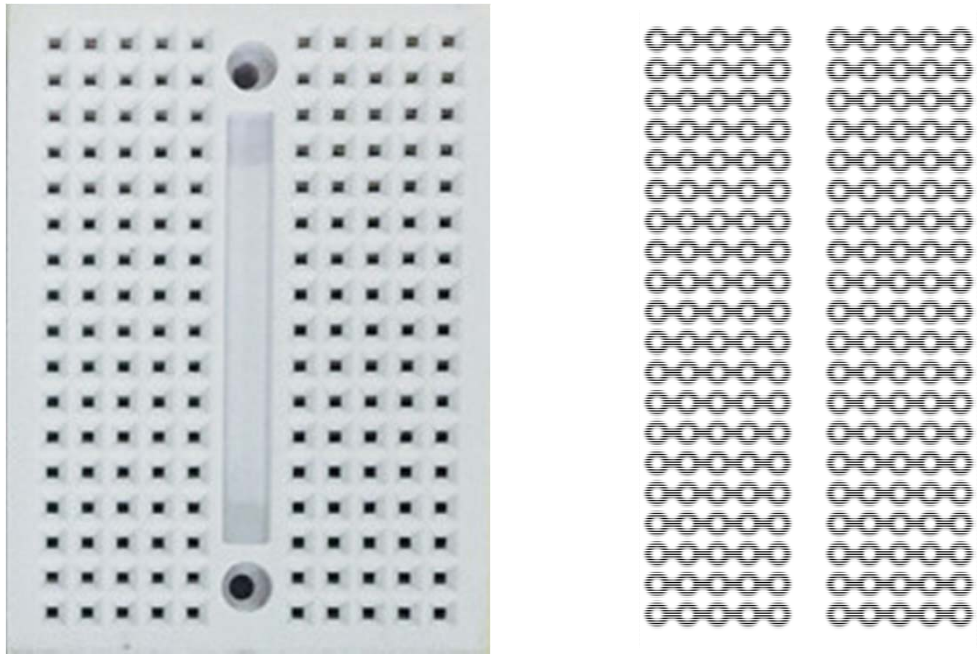
連接正確的板子


IoTtalk
140.113.199.200:7788/connection
Lab1
Model
Flush
Delete
Simulation
OFF
Import
Export
NodeM
A0
A
NodeM
D0~
D1~
D2~
D5
D6
D7
D8
420fdf
520cff
5409fd
10
若為灰色字體可點
擊此處連接裝置
選擇自己的裝置
可比對板子背面的MAC編號後六碼
例如MAC編號為 2c3ae85409fd
則5409fd為自己的板子

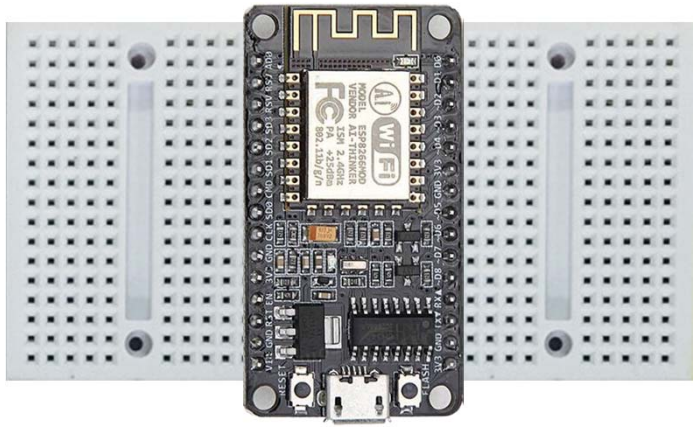
IoTtalk操作畫面


test
Model
Flush
Delete
5409fd
A0
A
A0
GND
VU
SD3
SD2
SD1
CMD
SD0
CLK
GND
3V3
EN
RST
GND
Vin
RST
FLASH
D0
D1
D2
D3
D4
3V3
GND
D5
D6
D7
D8
RX
TX
GND
3V3
5409fd
D
D0~
D
D1~
D
D2~
D
D5
D
D6
D
D7
D
D8

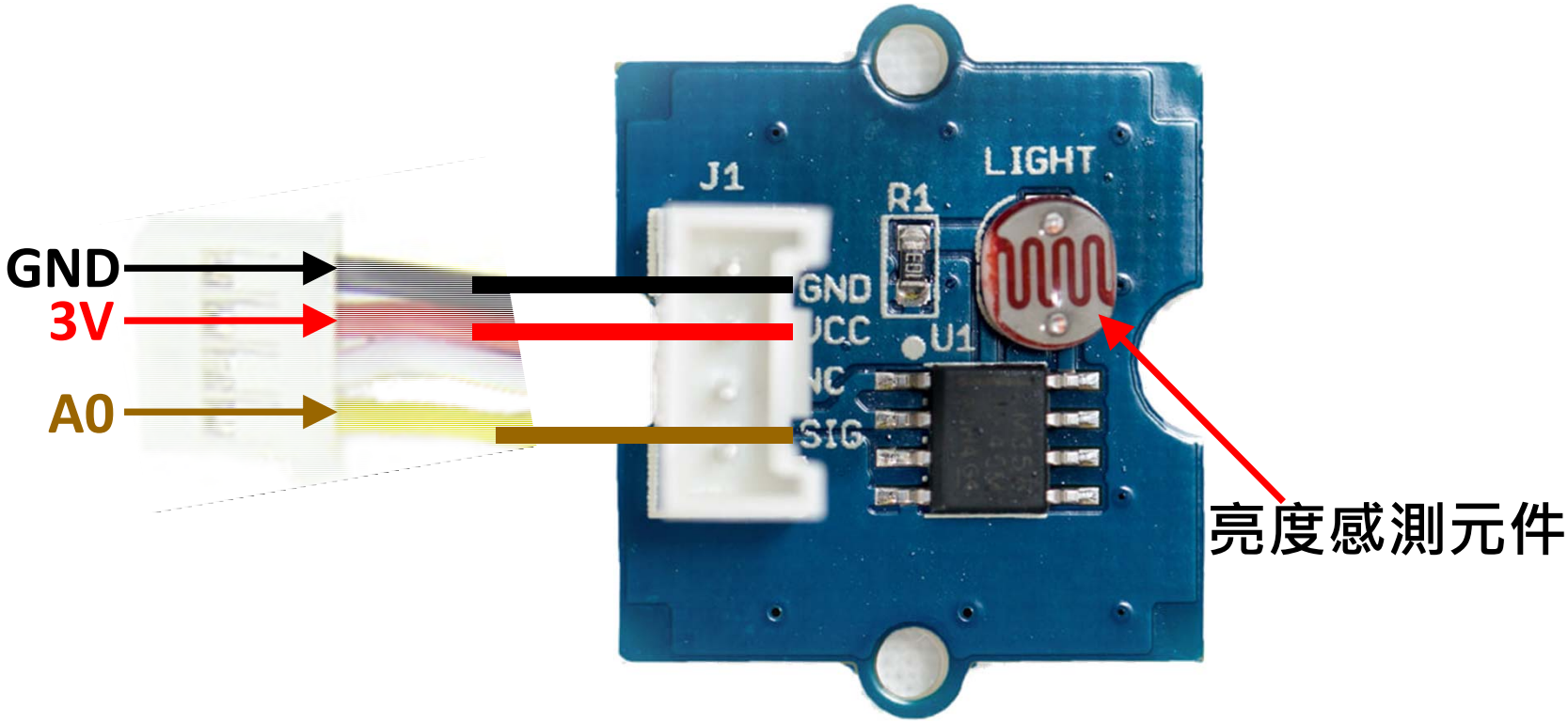
麵包板



將兩塊麵包板與NodeMCU組合方便後續實作



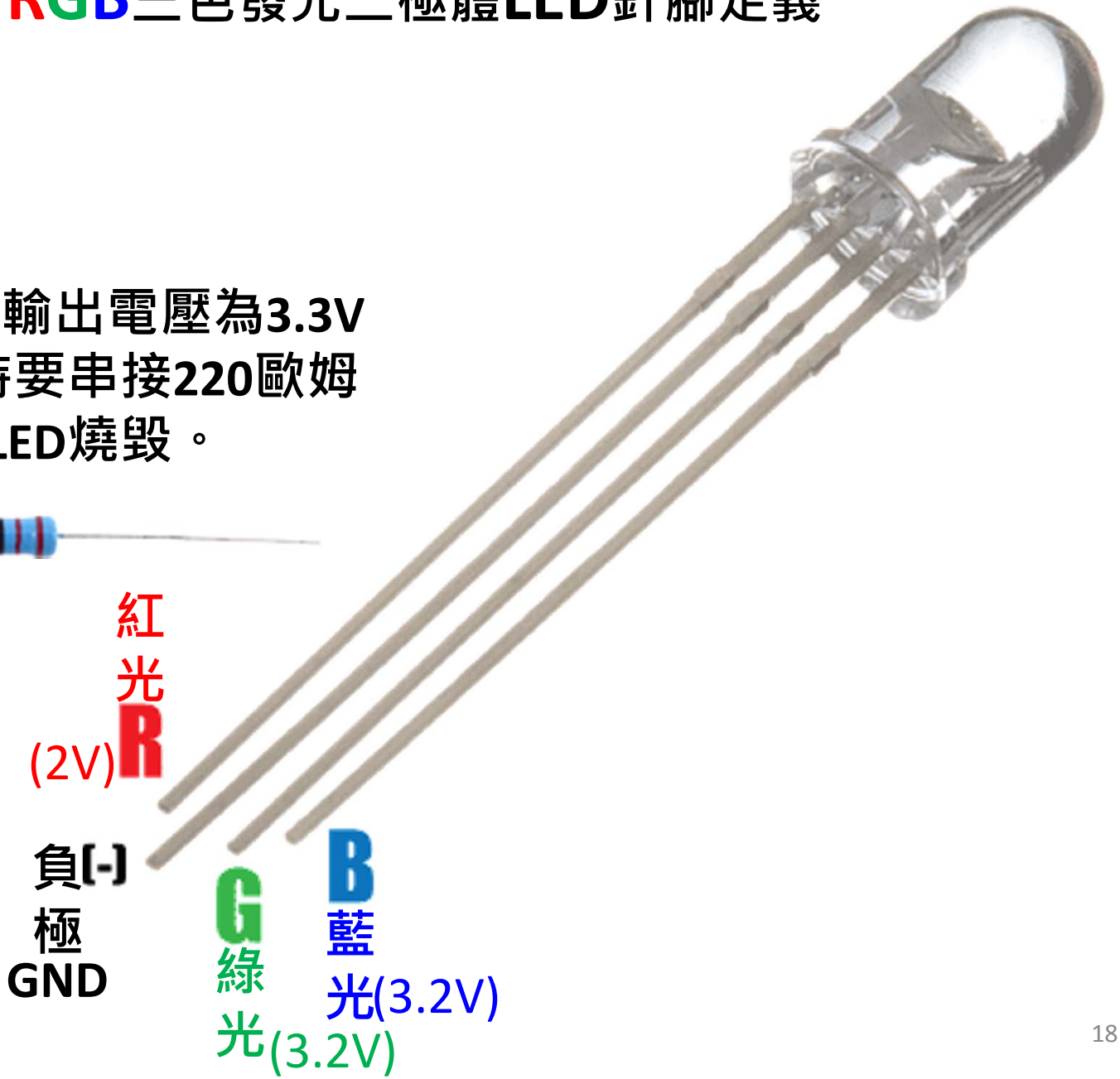
亮度感測器模組 Light sensor



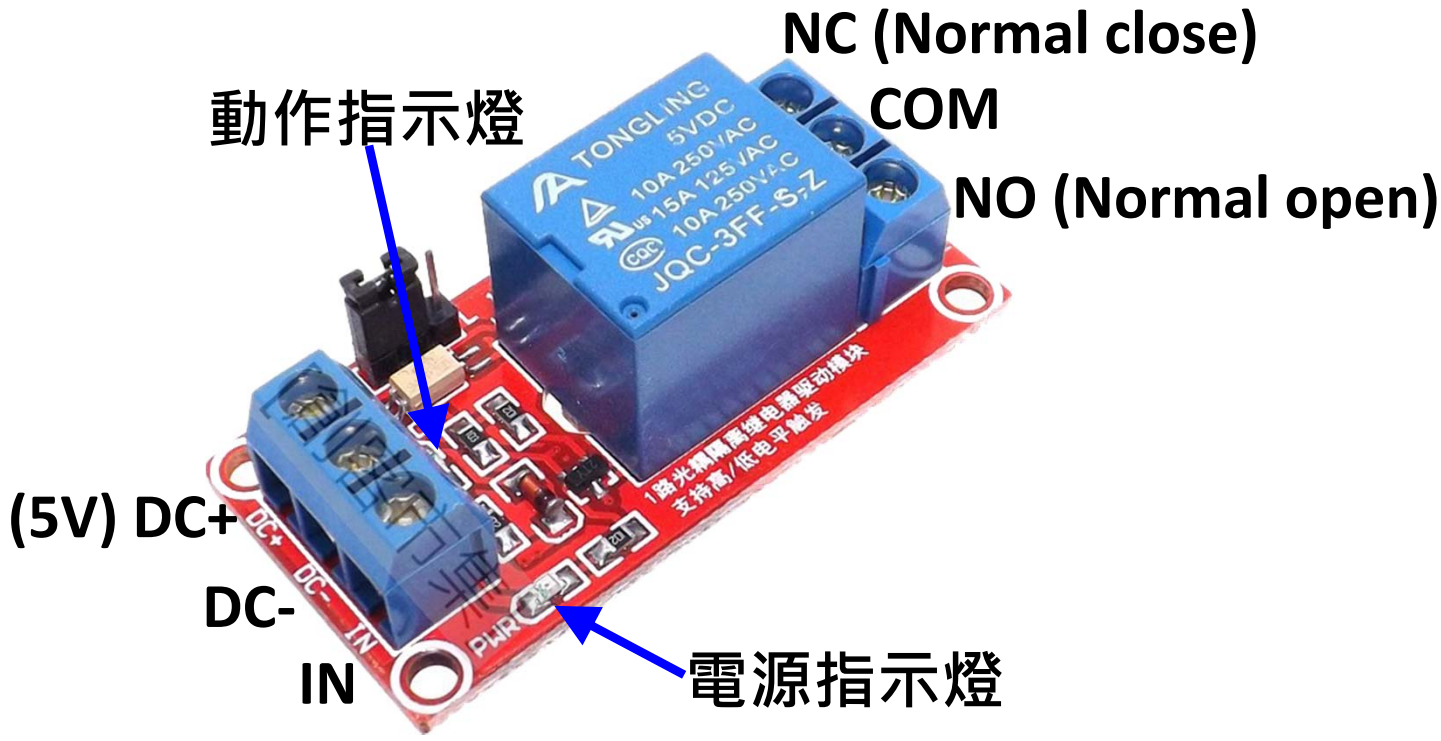
RGB三色發光二極體LED針腳定義

NodeMCU針腳輸出電壓為3.3V
使用紅光LED時要串接220歐姆
之電阻，避免LED燒毀。

220歐姆電阻



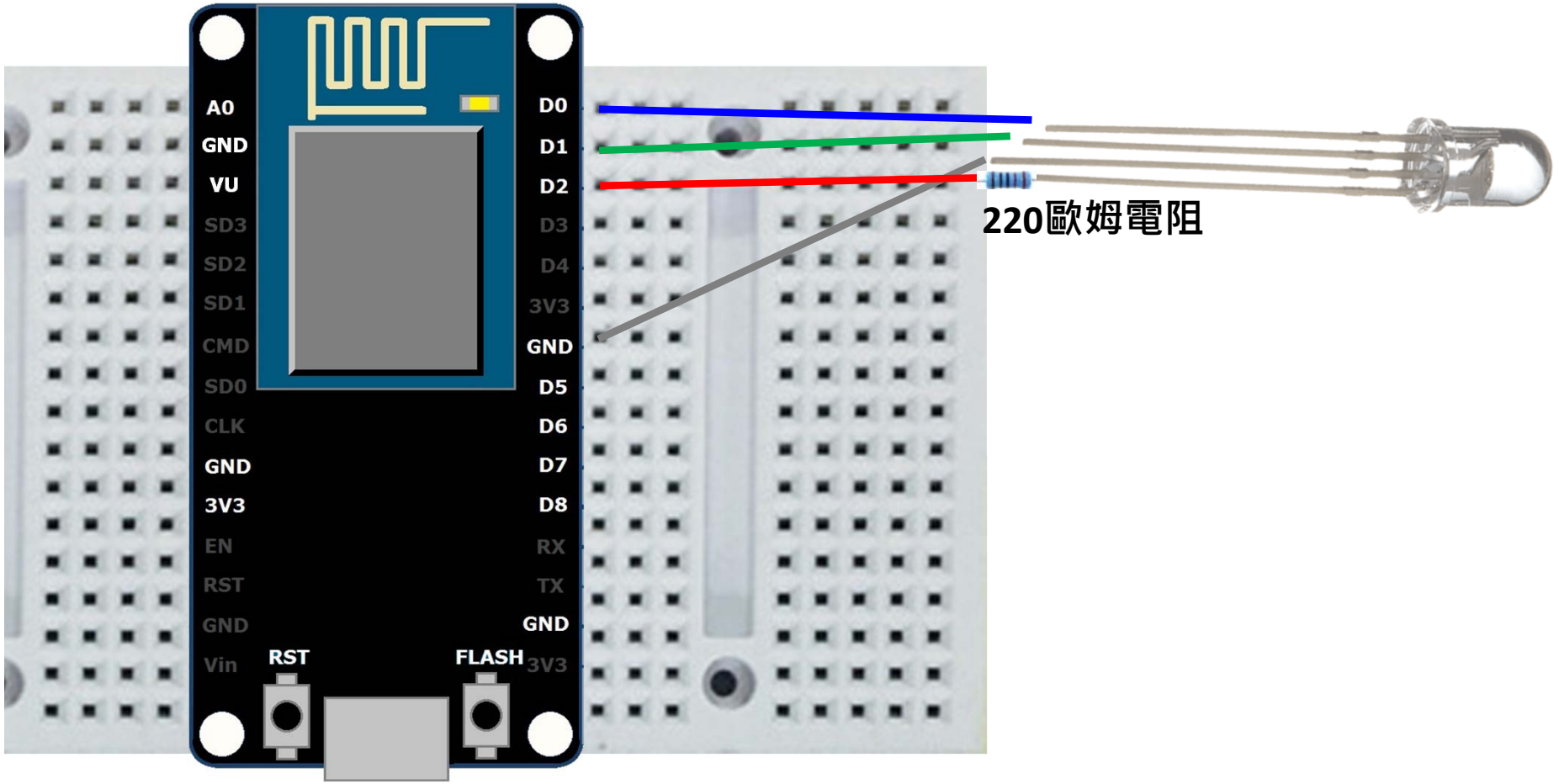
繼電器Relay模組


NC (Normal close)
COM
NO (Normal open)
動作指示燈
(5V) DC+
DC-
IN
電源指示燈
TONGLING
5VDC
10A 250VAC
15A 125VAC
10A 250VAC
JQC-3FF-S-Z
DC+
DC-
IN
PWR

ArduTalk實作範例

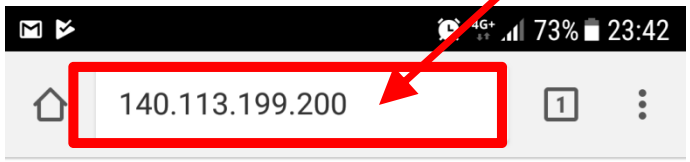
- Lab 1: RGB LED燈控制
  - 以Knob控制
  - 以Smartphone控制
- Lab 2: 亮度感測模組連接 (光感應燈)
- Lab 3: 多板子合作運用
- Lab 4: 虛實整合
- Lab 5: 實作智慧開關
- LAB6: 光感丟球

LAB1 – RGB LED控制



LAB1.1 – 以Knob控制LED

1. 打開手機上的瀏覽器
網址輸入140.113.199.200

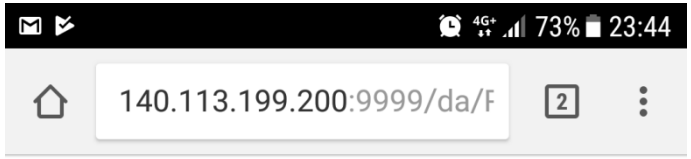


IoTtalk:
- Project
- Device Feature Management
- Download Device Feature
- Device Monitor

Cyber Device List:
- Bulb
- CHT_Dashboard
- GPS
- Graph
- Map
- Message
- RandNum
- Remote_control
- Remote_control(mobile)
- Smartphone
- Voice_Control
- vibration
- MusicBox
- MusicBoxCor

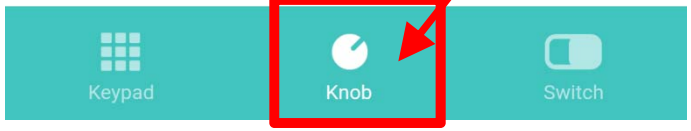
VPython List:
- 3DMotion1
- 3DMotion2

2. 叫出一個 Remote_control備用

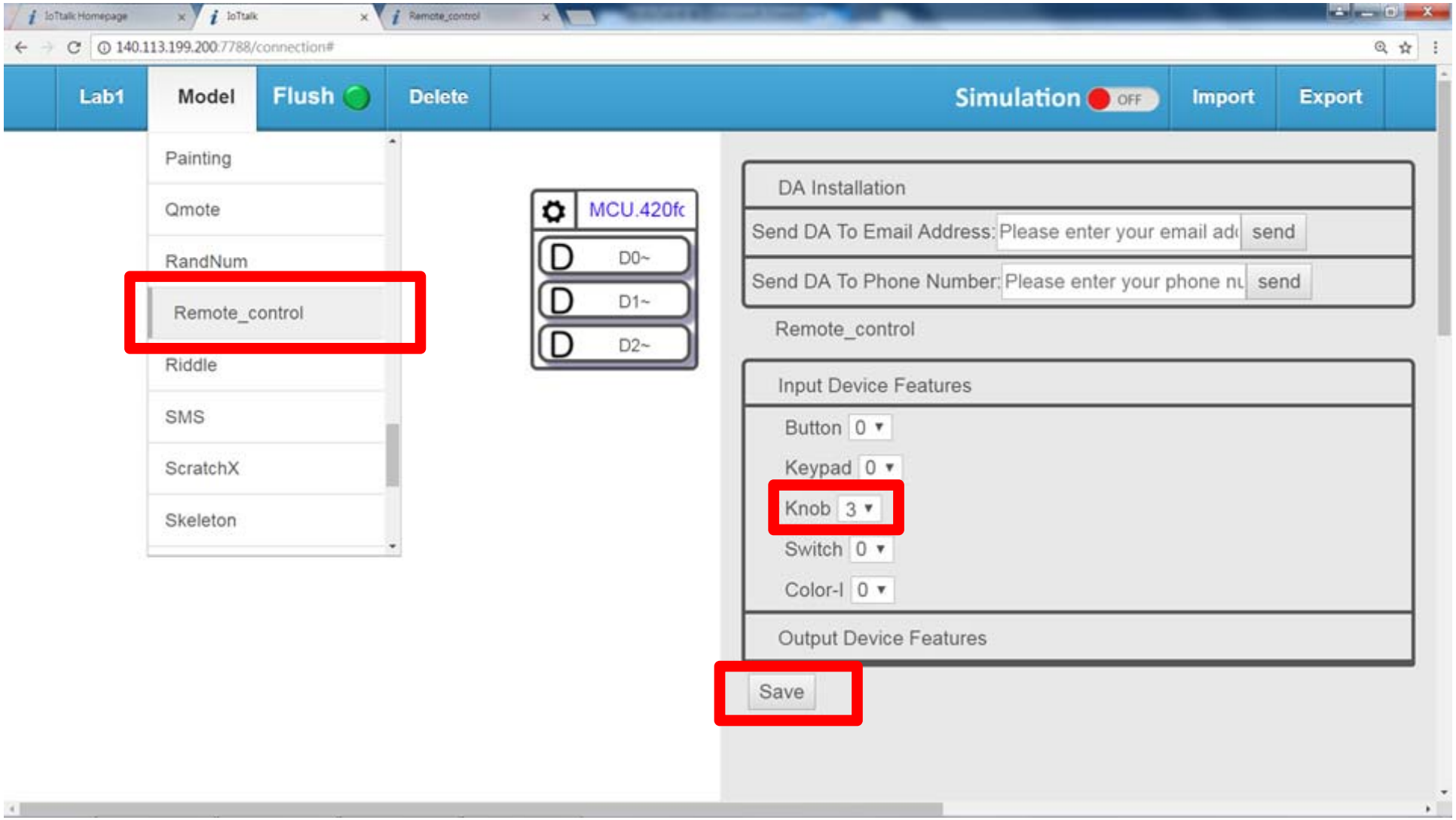


4. 記住這設備名稱

3. 選取類型

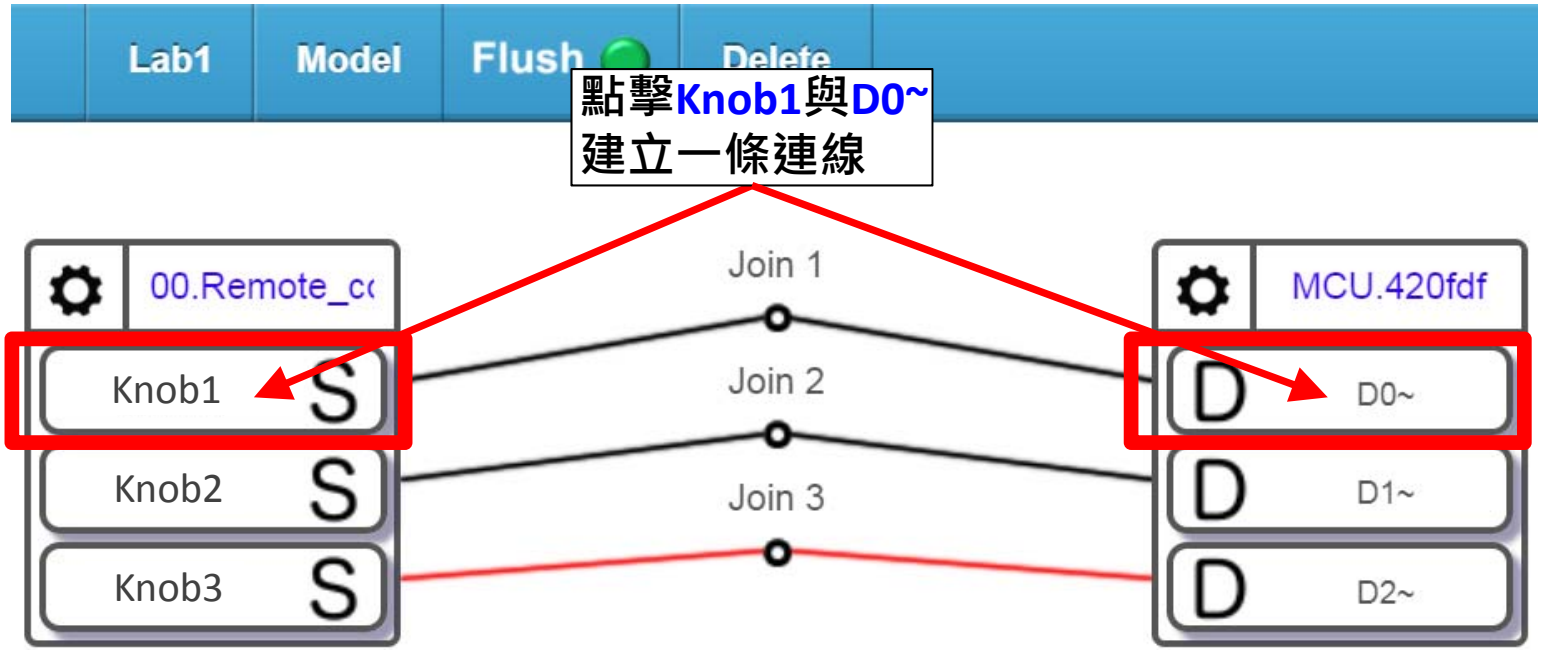


在IoTtalk介面操點選Remote_control，選3個Knob

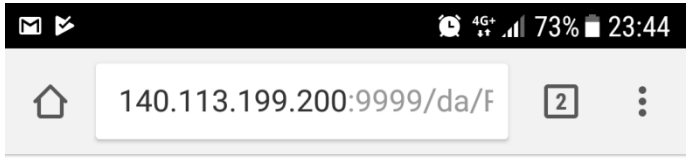


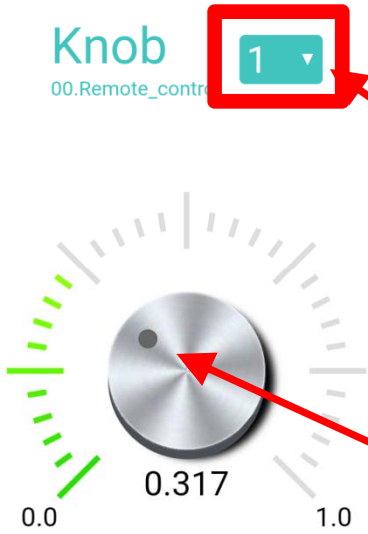
將叫出來的Model連接上Remote_control

LAB1.1 – 以Knob控制LED



LAB1.1 – 以Knob控制LED

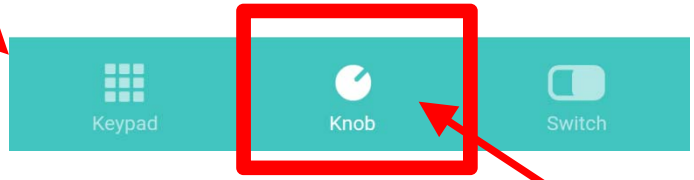




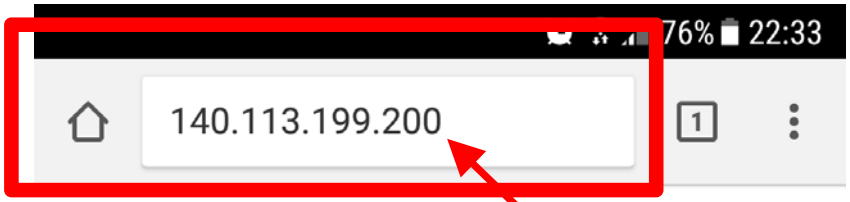
切換Knob1~Knob3
試著調整三個Knob1~Knob3
控制RGB三個LED, 可以調出
很多種顏色喔!

轉轉旋鈕看看
會發生甚麼事?

也可以試試看用Keypad、Switch
會發生甚麼事?
(要先去IoTtalk頁面建立
Keypad、Switch與D1~之間的連線)



選取類型



使用手機Chrome瀏覽器
輸入此網址

IoTtalk:

- Project
- Device Featur
- Download Device Feature
- Device Monitor

Cyber Device List:

- Bulb
- CHT_Dashboard
- GPS
- Graph
- Map
- Message
- RandNum
- Remote_control
- Remote_control(mobile)
- Smartphone
- Voice_Control
- vibration
- MusicBox
- MusicBoxController

VPython List:

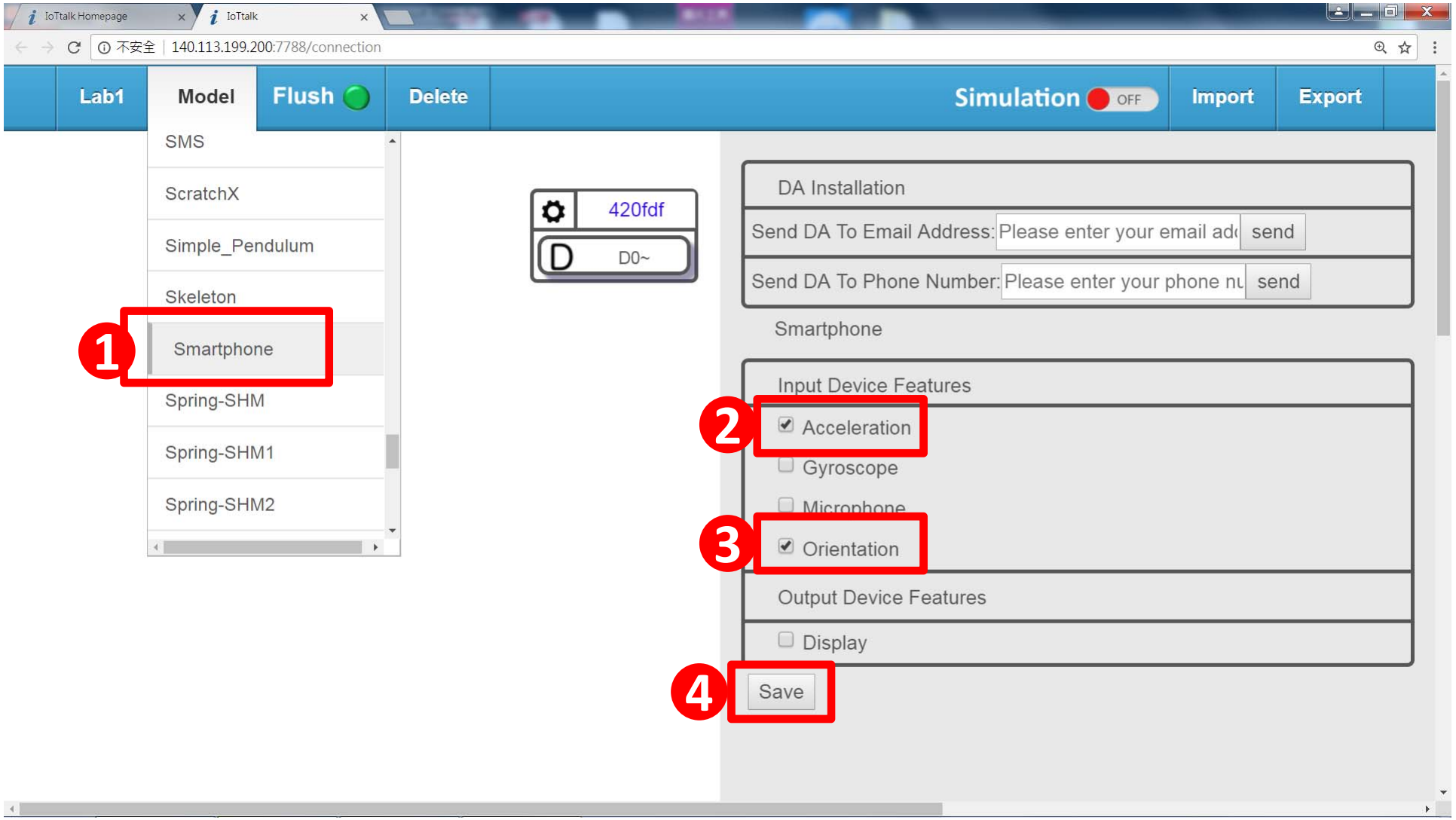
- 3DMotion1
- 3DMotion2

點擊Smartphone

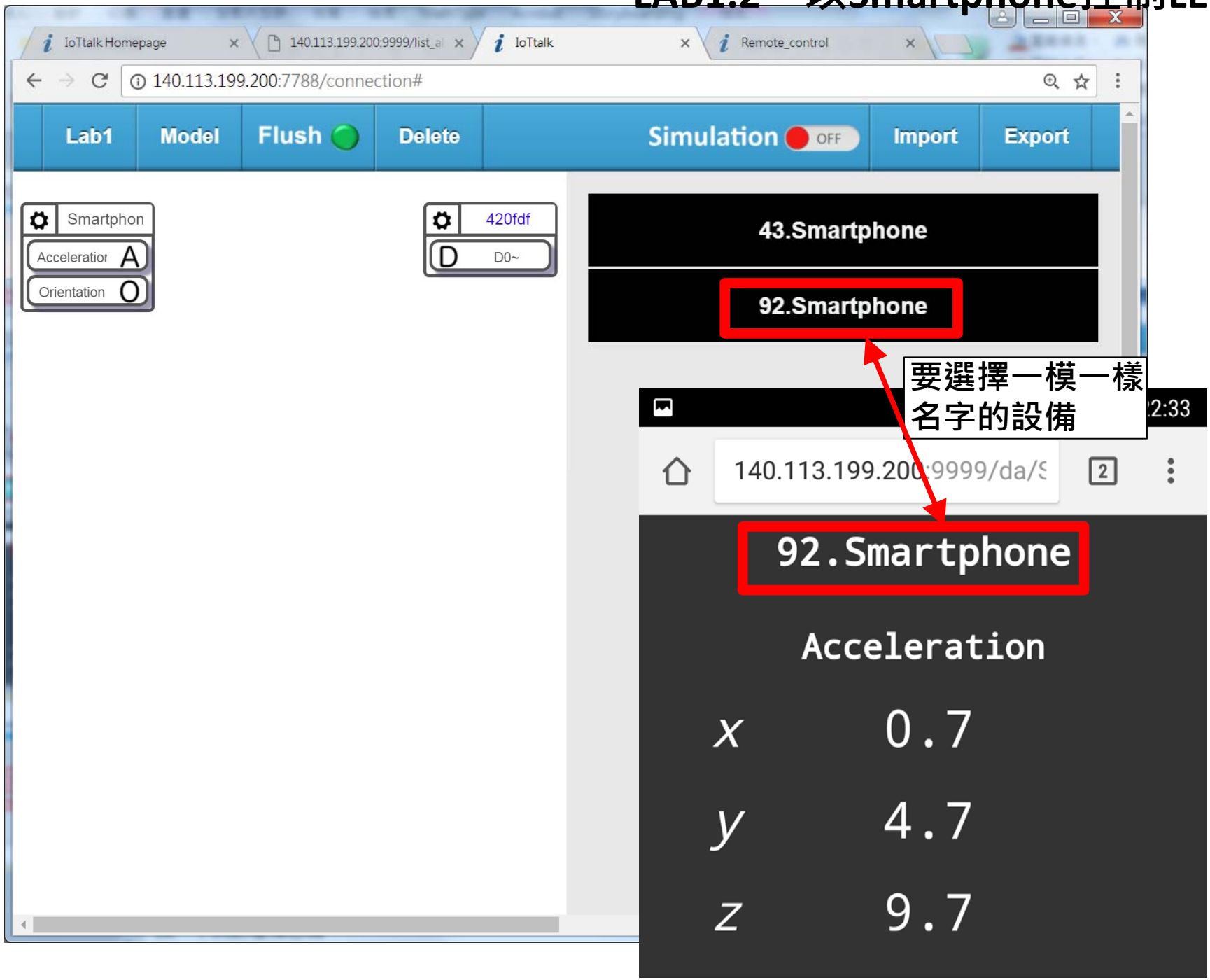
LAB1.2 – 以Smartphone控制LED

記住這名稱

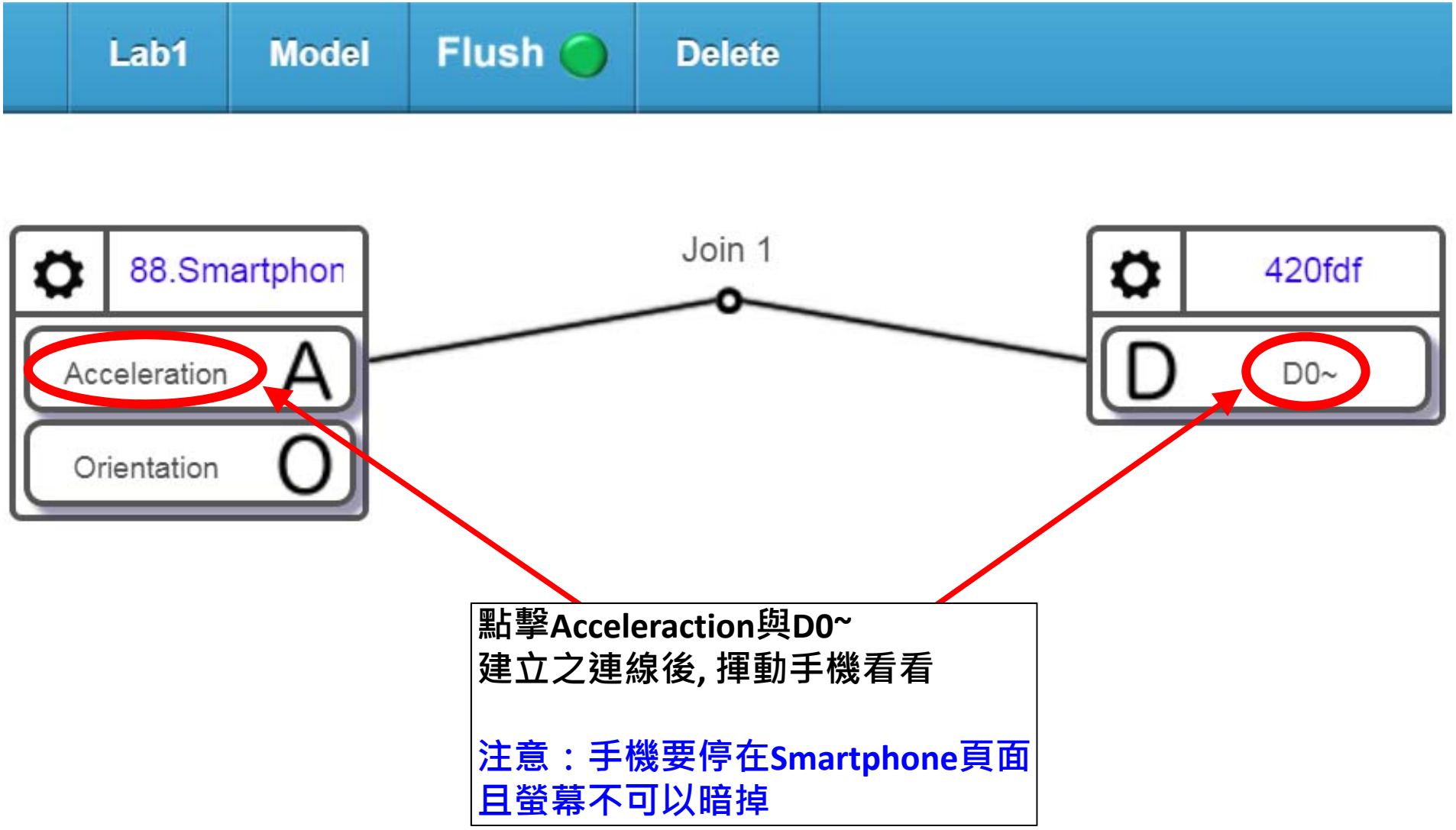
LAB1.2 – 以Smartphone控制LED



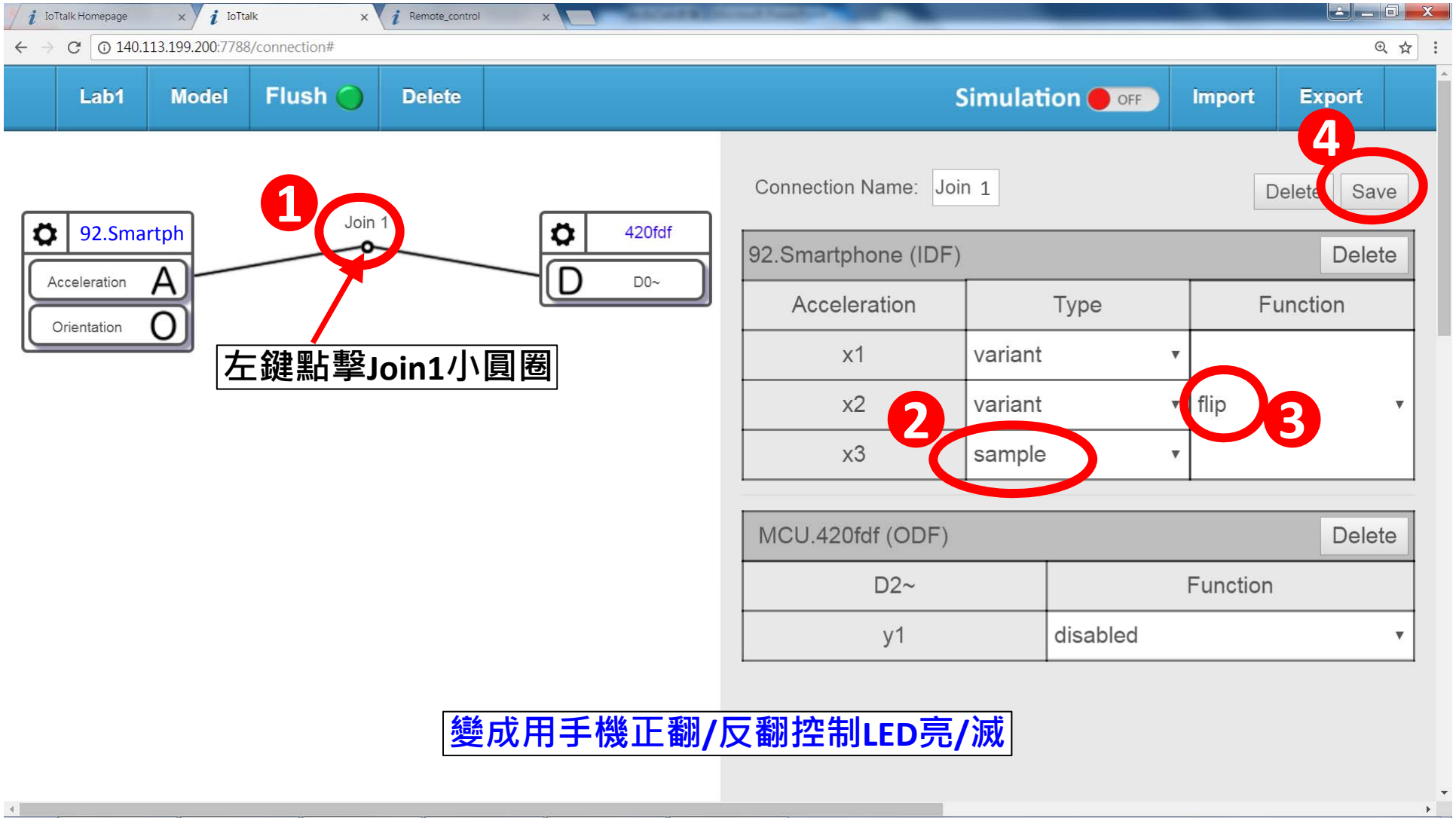
LAB1.2 – 以Smartphone控制LED



LAB1.2 – 以Smartphone控制LED

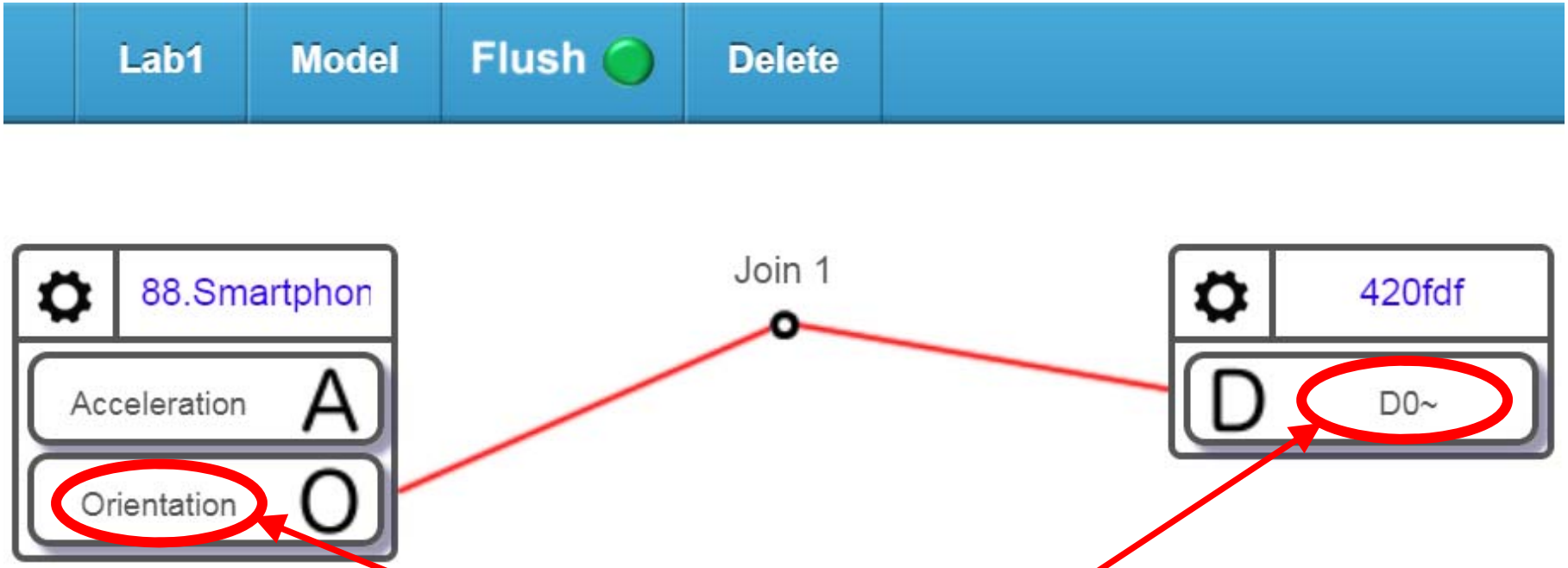


LAB1.2 – 以Smartphone控制LED



LAB1.2 – 以Smartphone控制LED

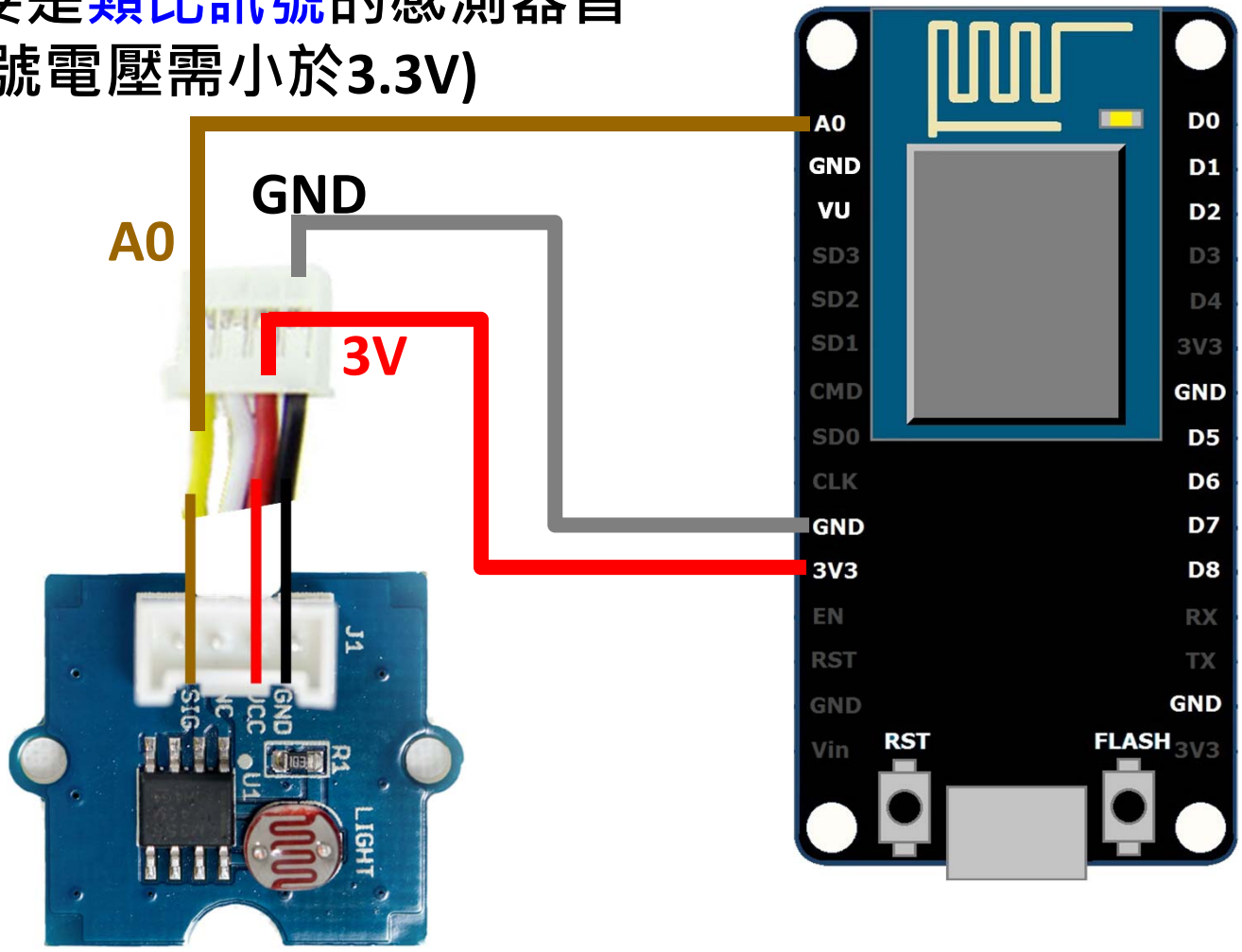
LAB1.2 – 以Smartphone控制LED



也可以試試看用Orientation控制LED
把手機變成Knob一樣，旋轉手機即
可控制LED亮度
注意：舊的連線Acceleration/D0~要刪掉
不然舊連線運作會干擾LED反應

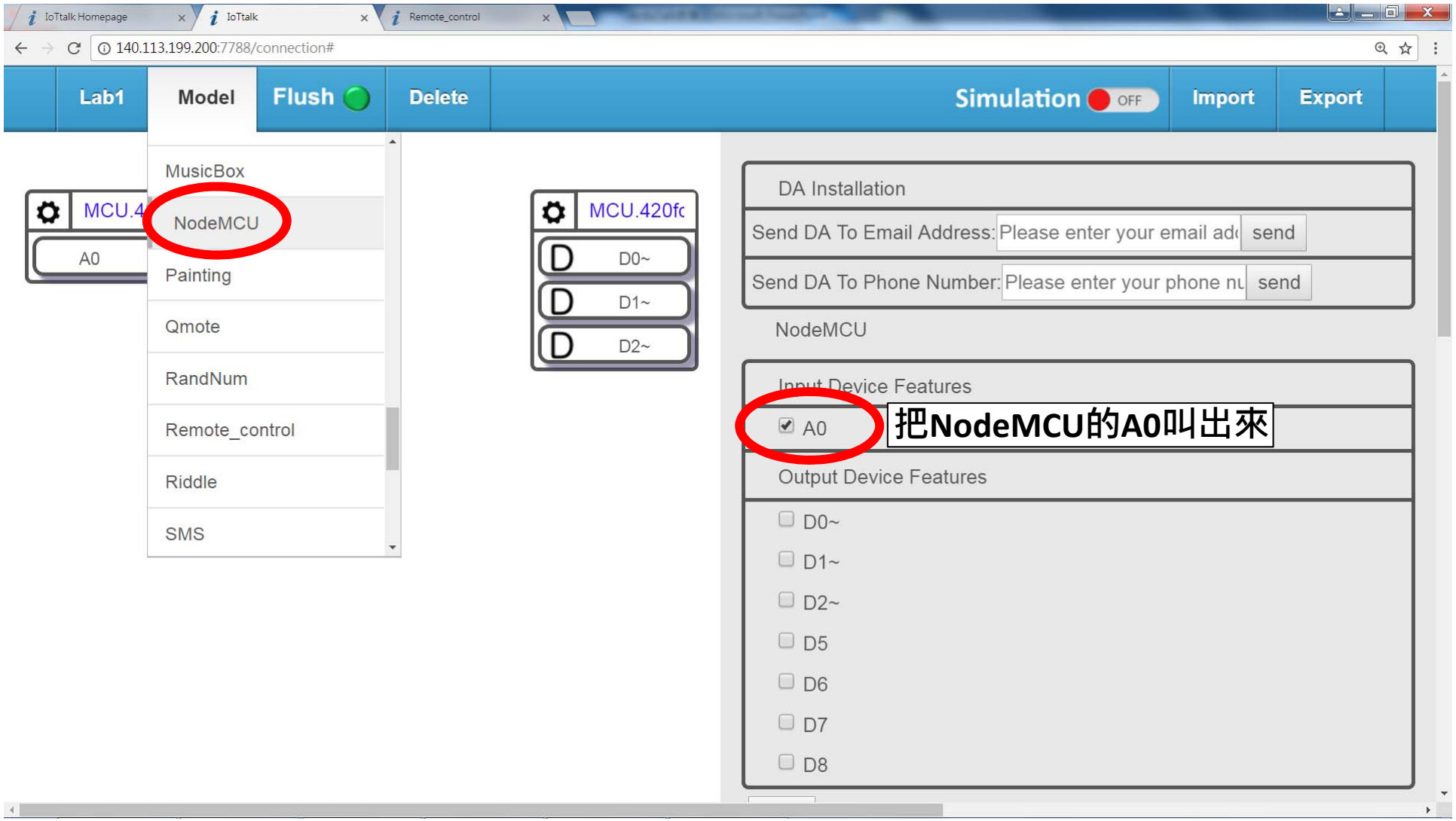
LAB2 – 連接感測器當輸入信號

本次實作使用亮度感測器當試驗，
但其實只要是類比訊號的感測器皆
可使用(訊號電壓需小於3.3V)

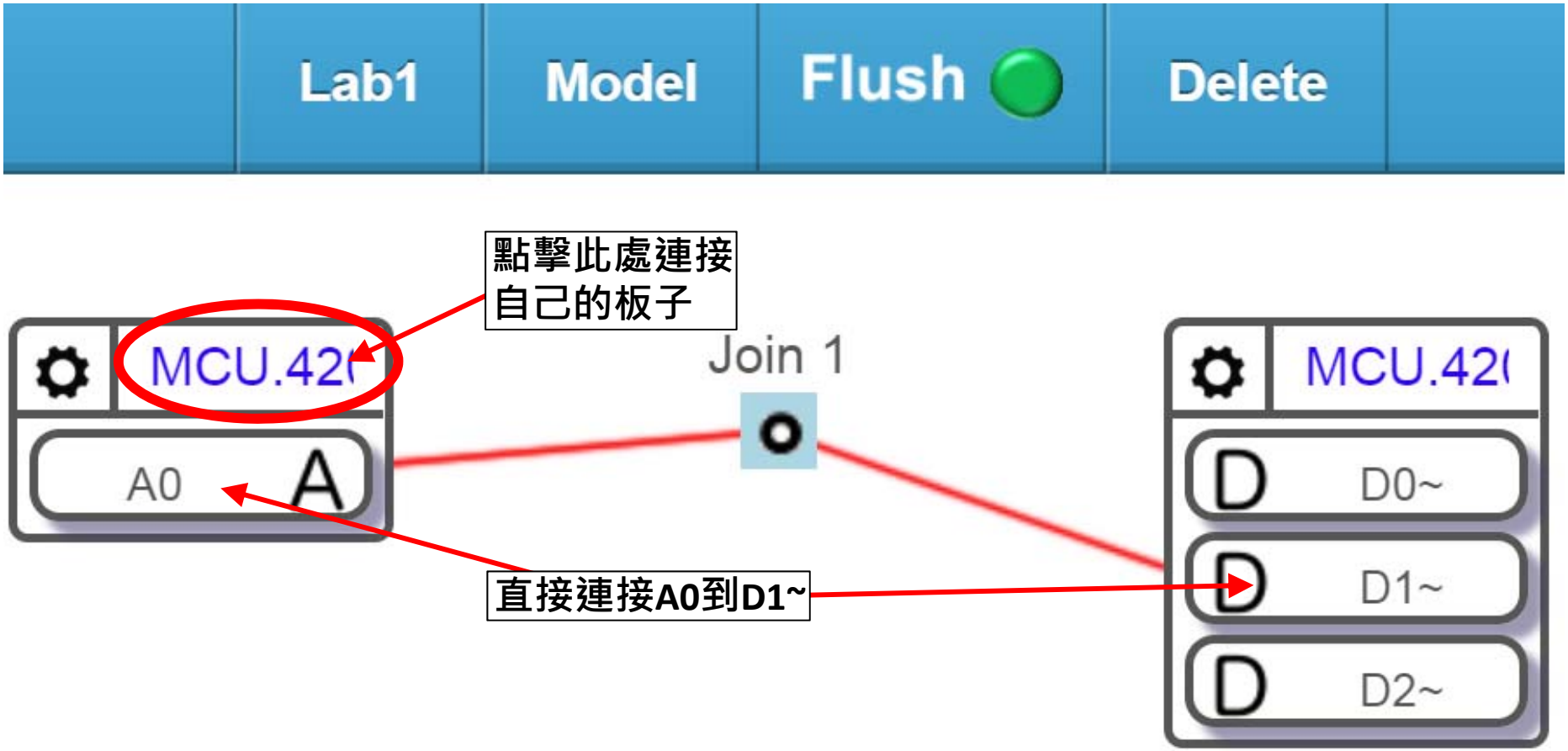


亮度感測器模組

LAB2 – 亮度感測模組連接

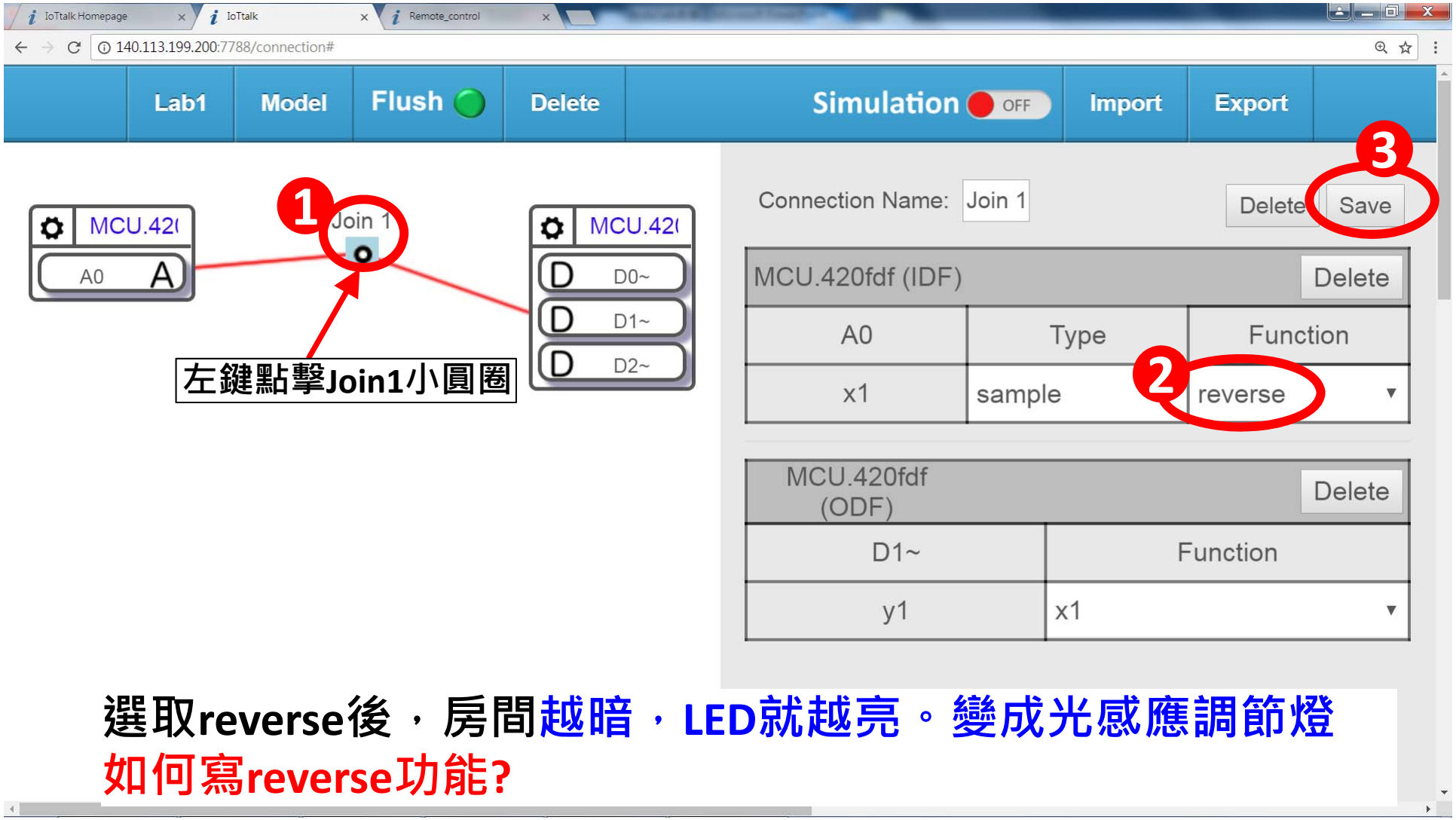


LAB2 – 亮度感測模組連接



錯誤示範：房間亮LED就亮，房間暗LED就暗

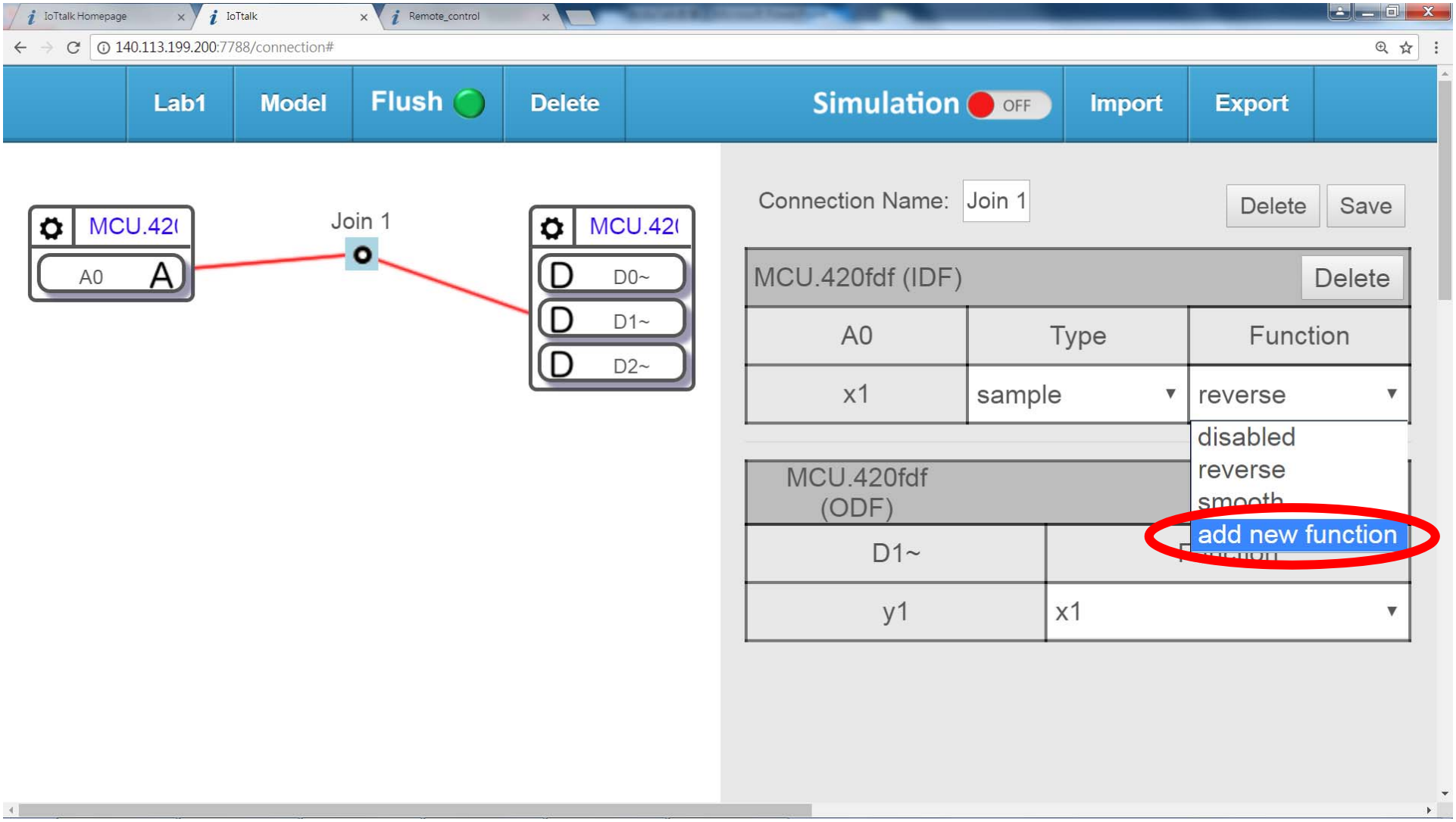
LAB2 – 亮度感測模組連接



選取reverse後，房間越暗，LED就越亮。變成光感應調節燈

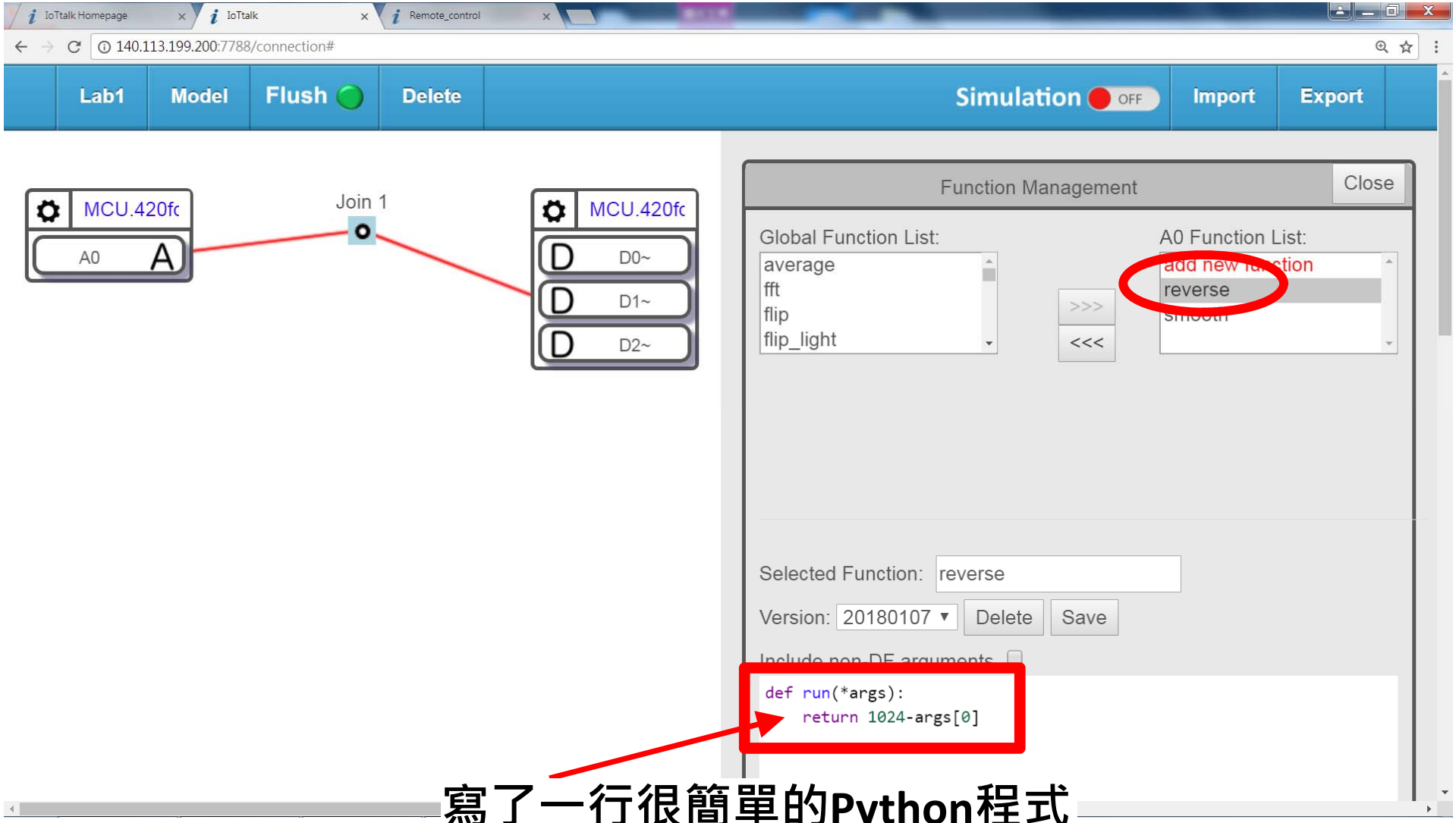
如何寫reverse功能?

LAB2 – 亮度感測模組連接



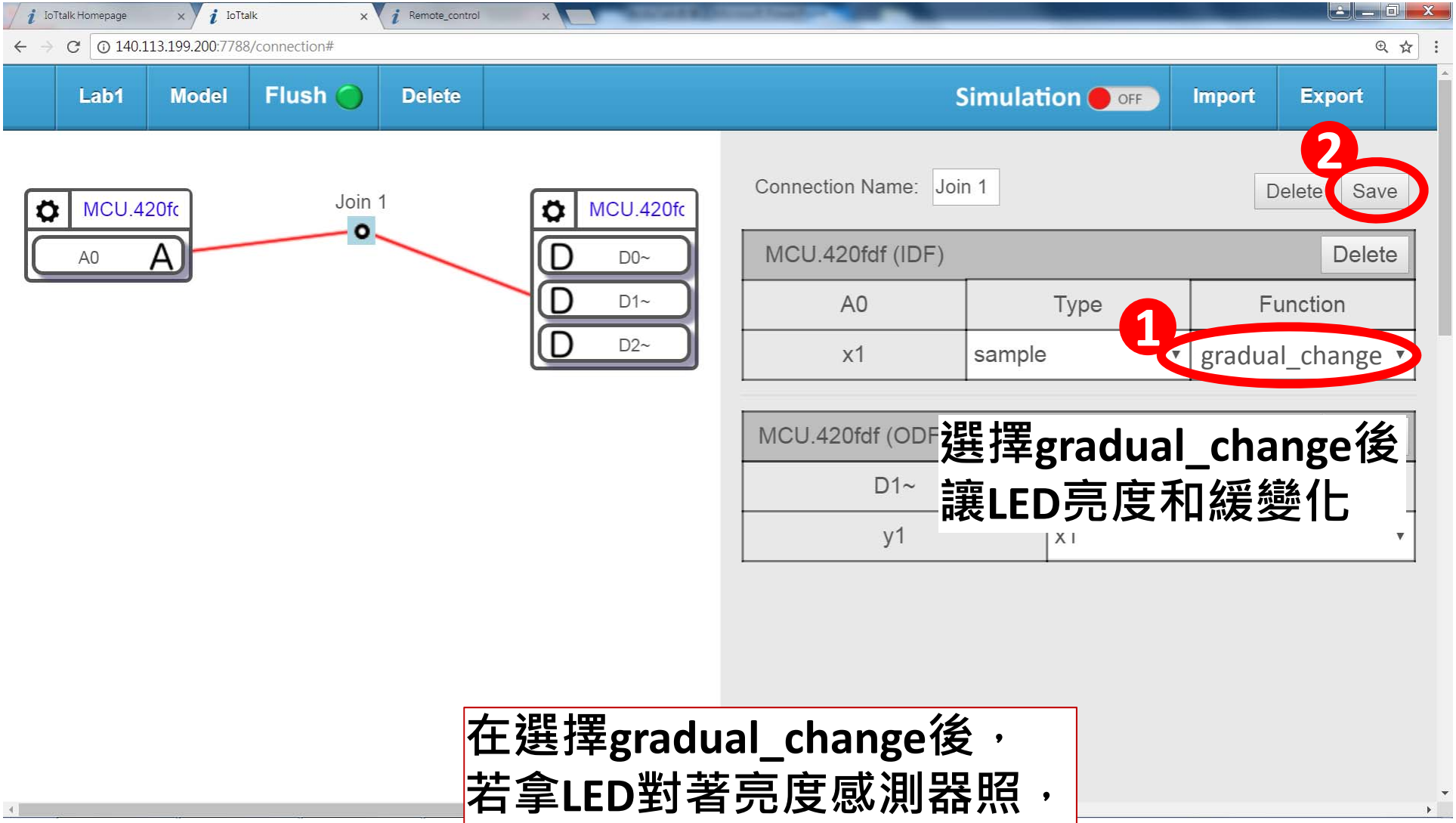
LAB2 – 亮度感測模組連接

IoTtalk允許使用者利用Python語言撰寫自己DF 功能



寫了一行很簡單的Python程式

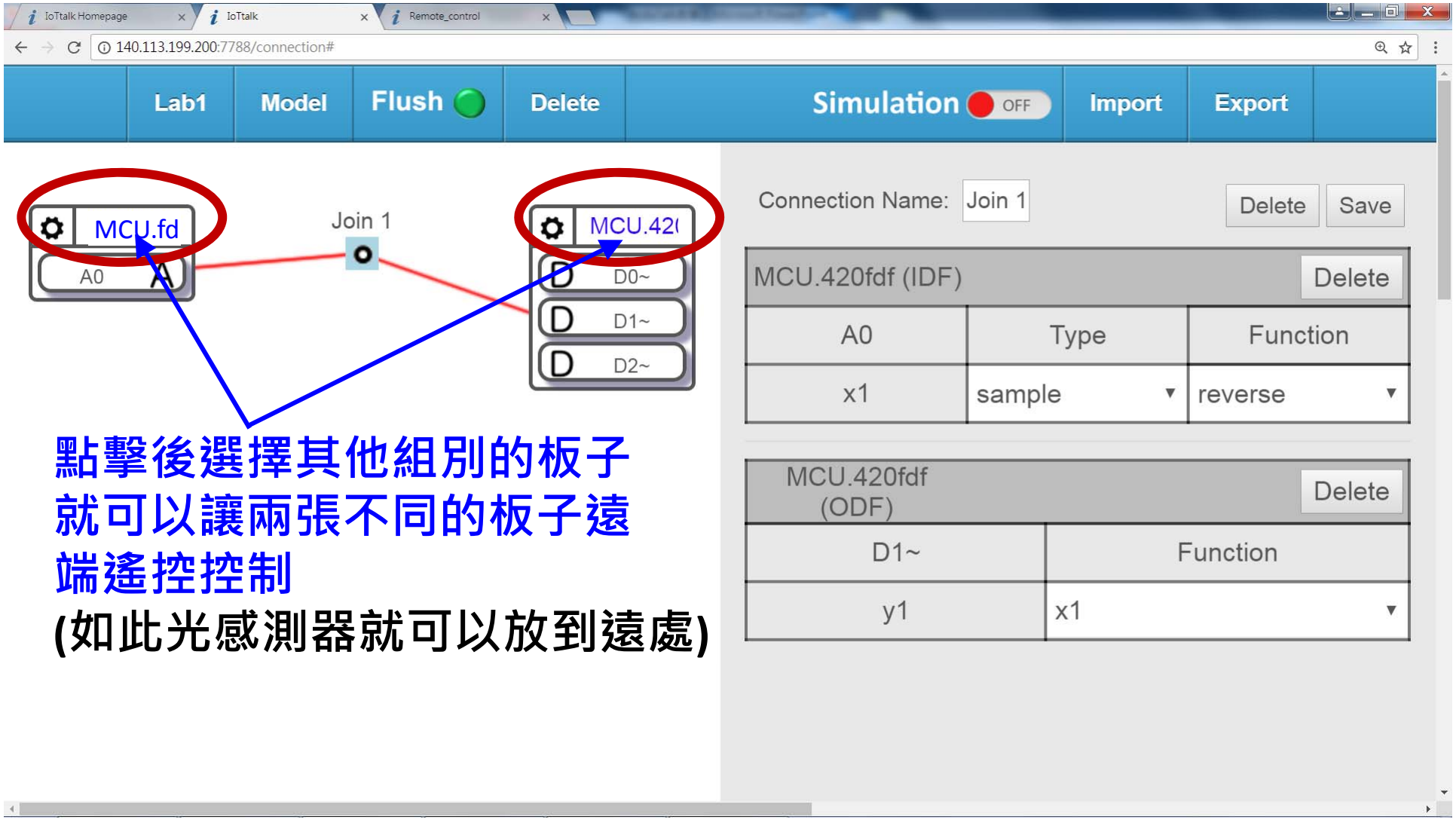
LAB2 – 亮度感測模組連接



在選擇gradual_change後，
若拿LED對著亮度感測器照，
會發生什麼事情呢?

LAB3 – 多板子合作運用

在LAB2中，光感應調節燈，我們改使用兩張板子，一張為光感測器，另一張連接LED燈



點擊後選擇其他組別的板子就可以讓兩張不同的板子遠端遙控控制

(如此光感測器就可以放到遠處)

LAB4 – 虛實整合

140.113.199.200

使用手機Chrome瀏覽器
輸入此網址

IoTtalk:

- Project
- Device Featur
- Download Device Feature
- Device Monitor

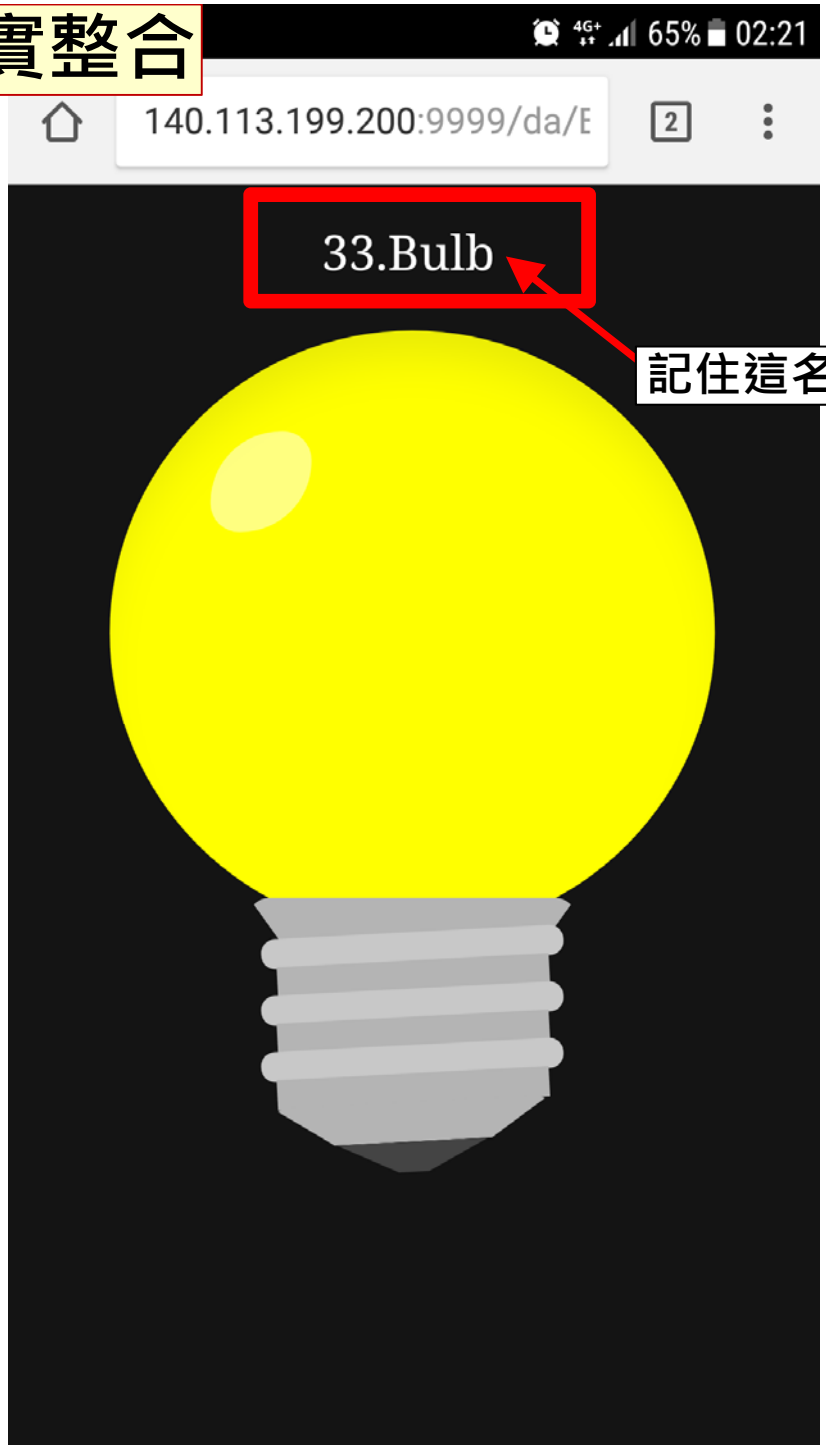
Cyber Device List:

- Bulb
- CHT Dashboard
- GPS
- Graph
- Map
- Message
- RandNum
- Remote_control
- Remote_control(mobile)
- Smartphone
- Voice_Control
- vibration
- MusicBox
- MusicBoxController

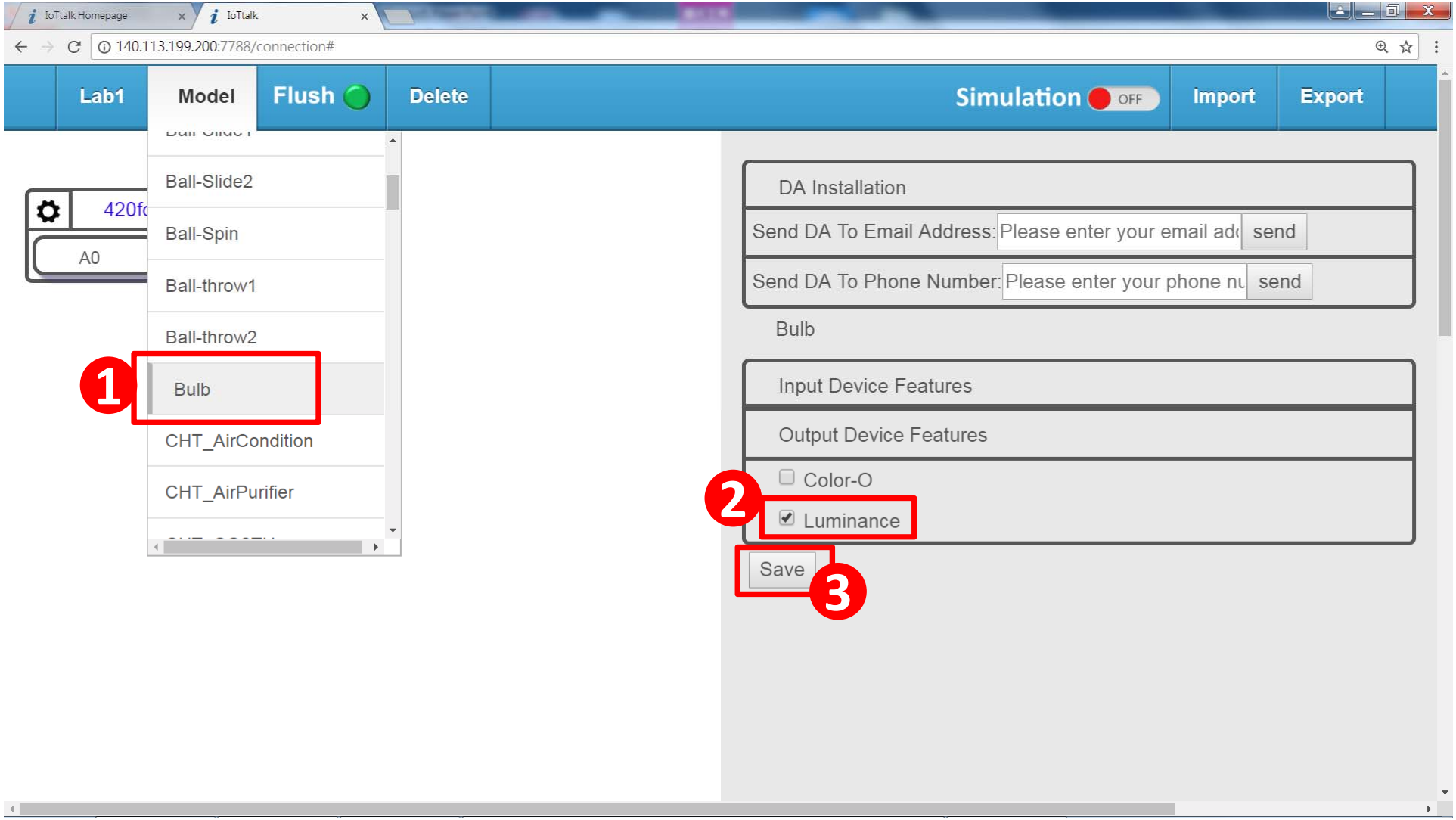
VPython List:

- 3DMotion1
- 3DMotion2

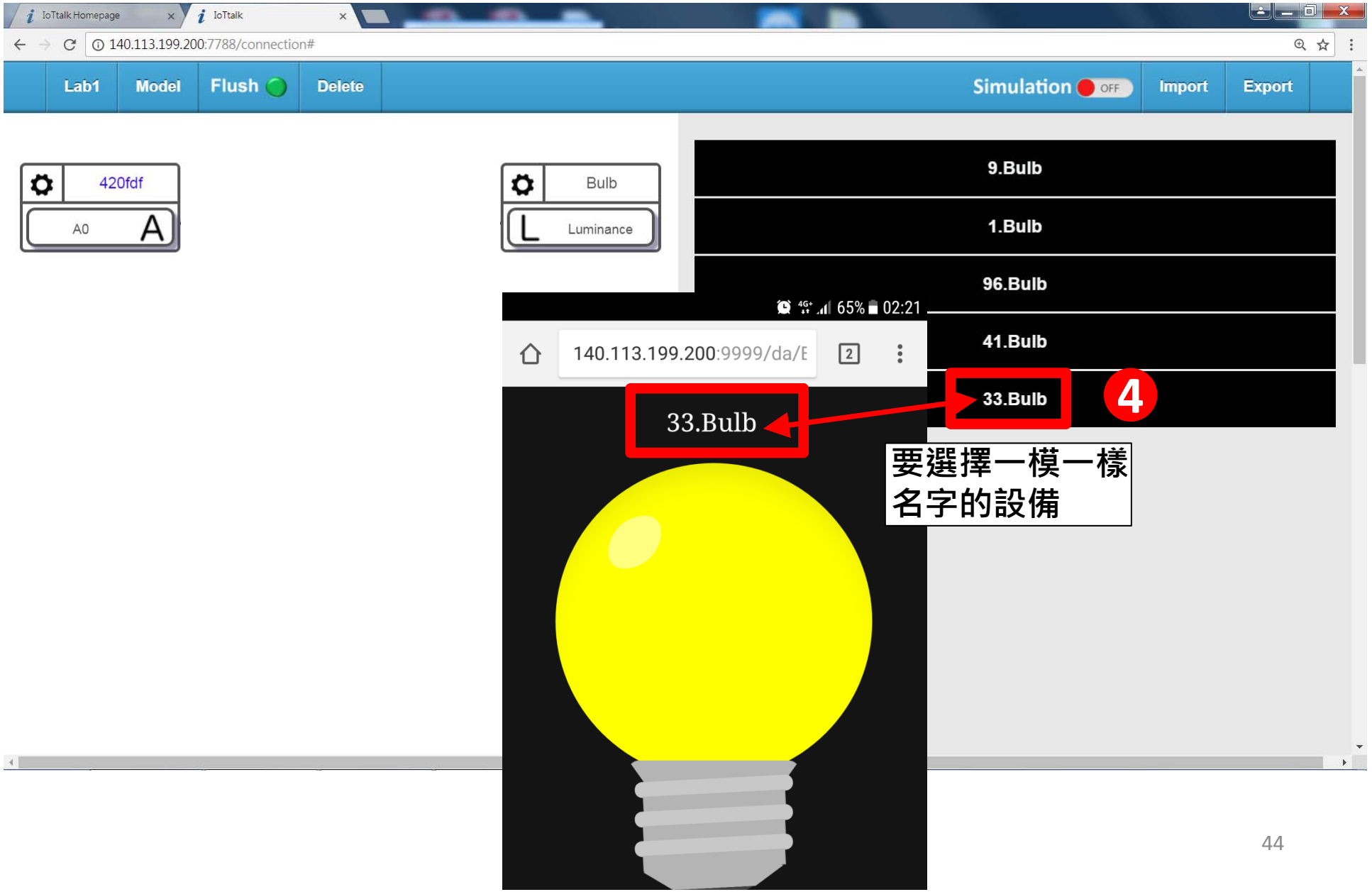
點擊叫出Bulb備用



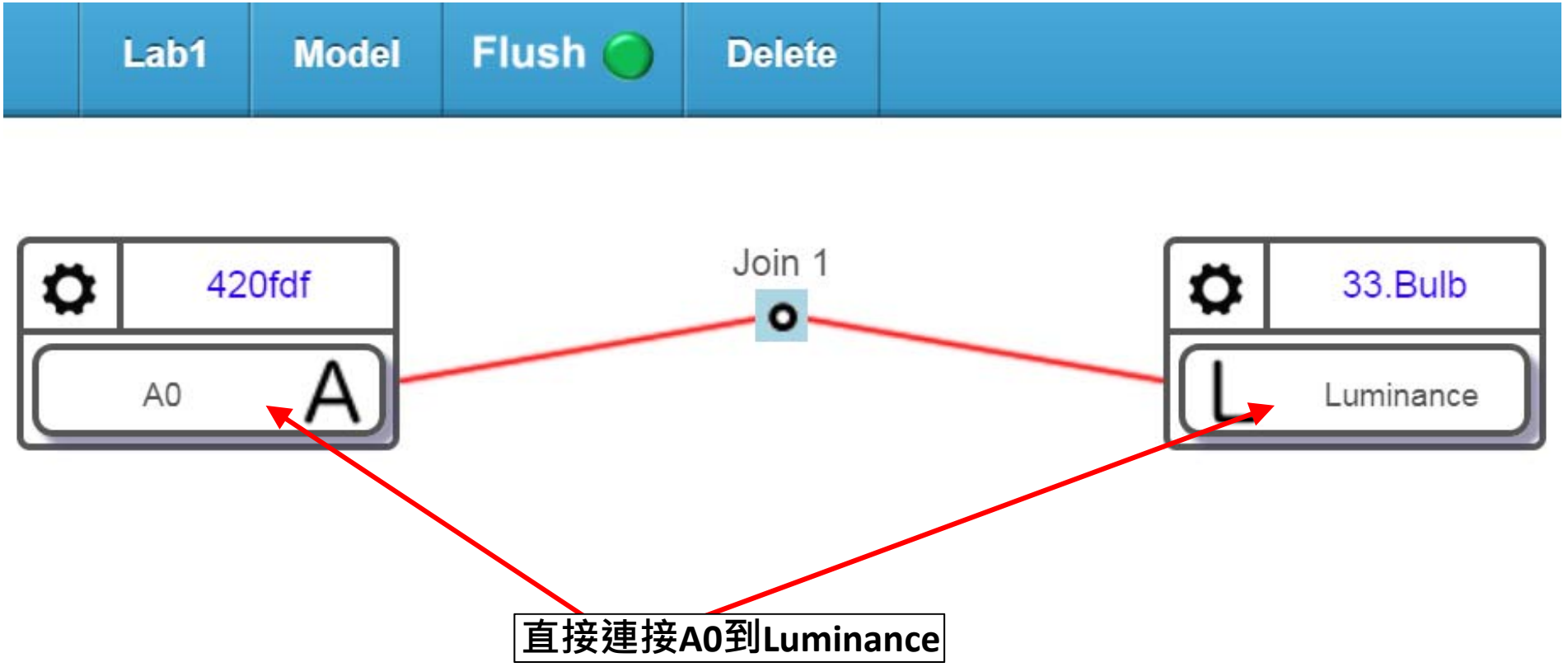
在IoTtalk介面操點選Bulb，並勾選Luminance



選擇正確的裝置並掛載上Model



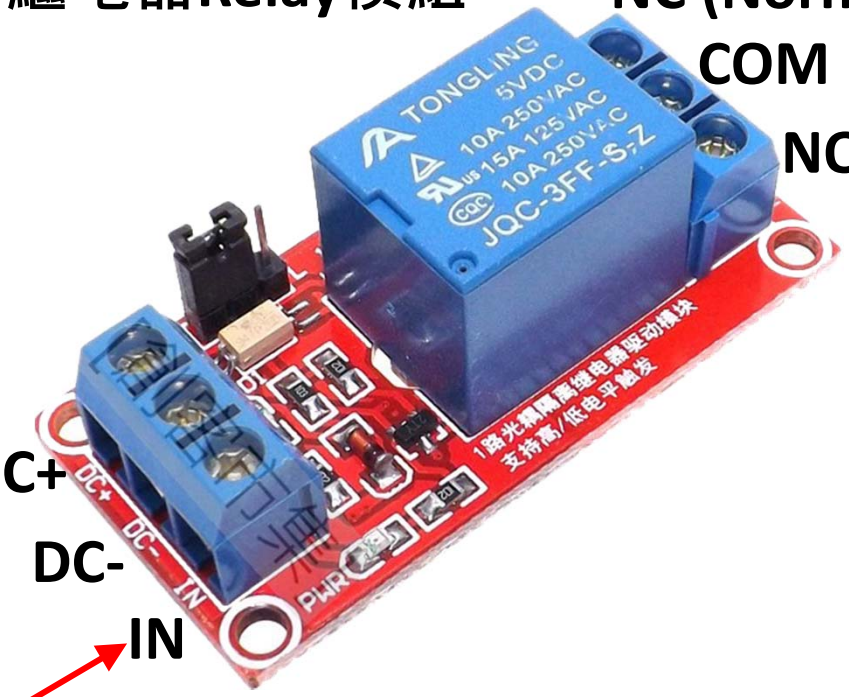
連接A0到Luminance



觀察虛擬燈泡的明暗變化是否符合真實LED的模式
可搭配使用reverse、gradual_change兩個功能 (參見page 39)

LAB5 – 智慧開關

繼電器Relay模組



NC (Normal close)

COM

NO (Normal open)

(5V) DC+

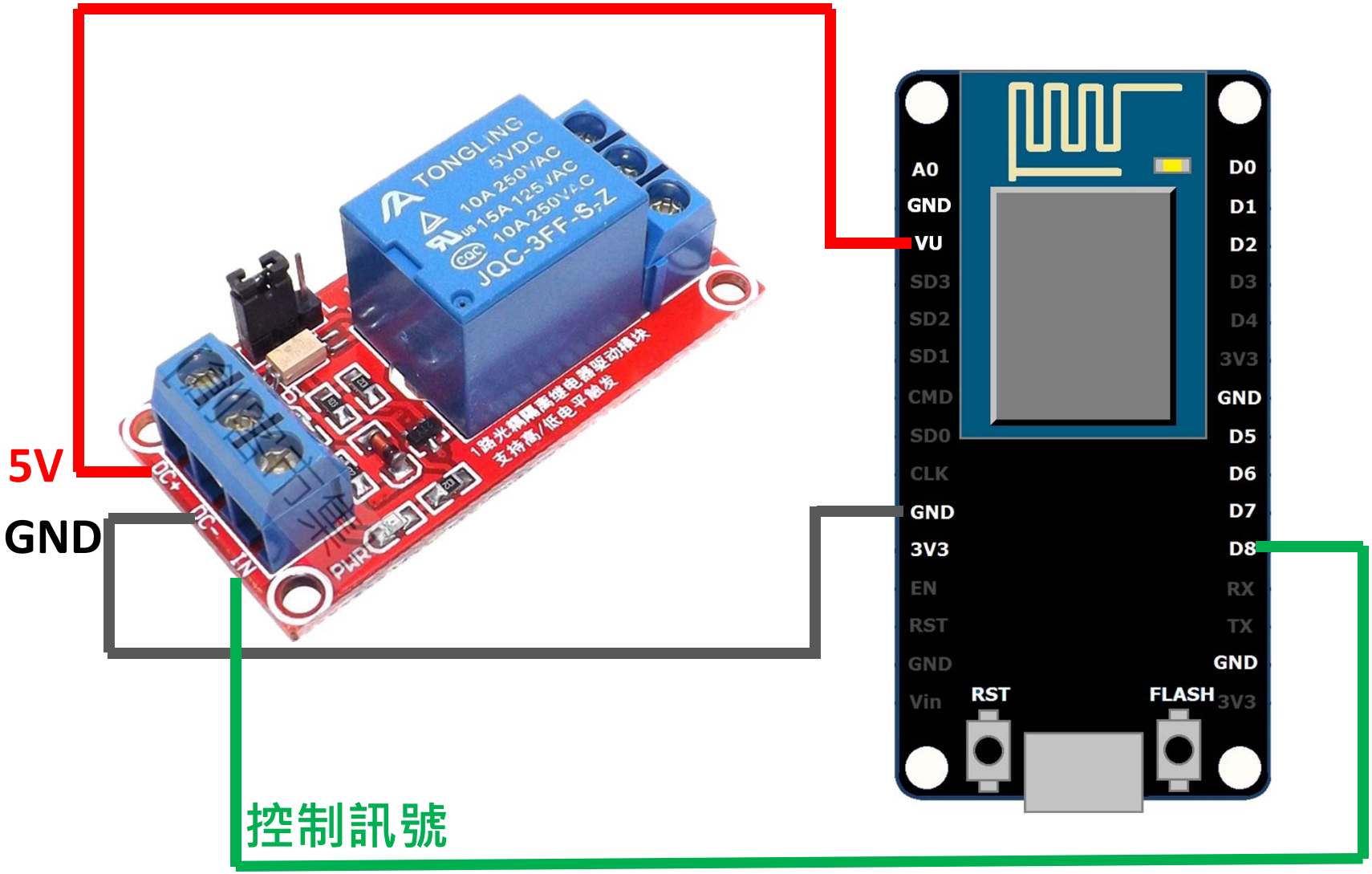
DC-

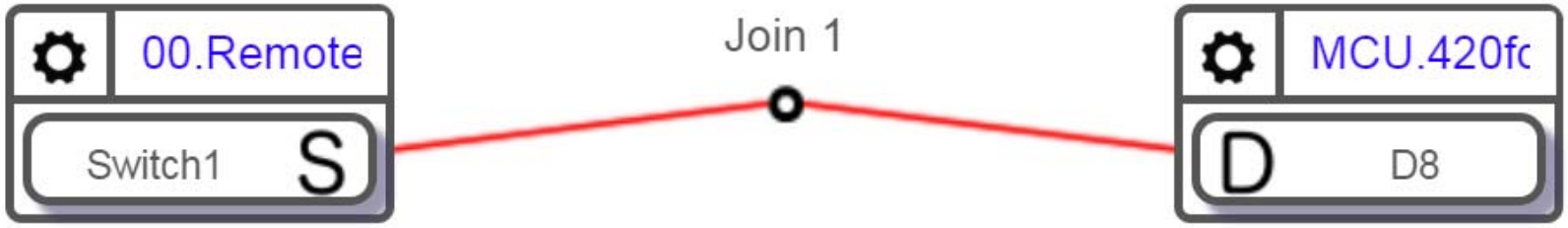
IN

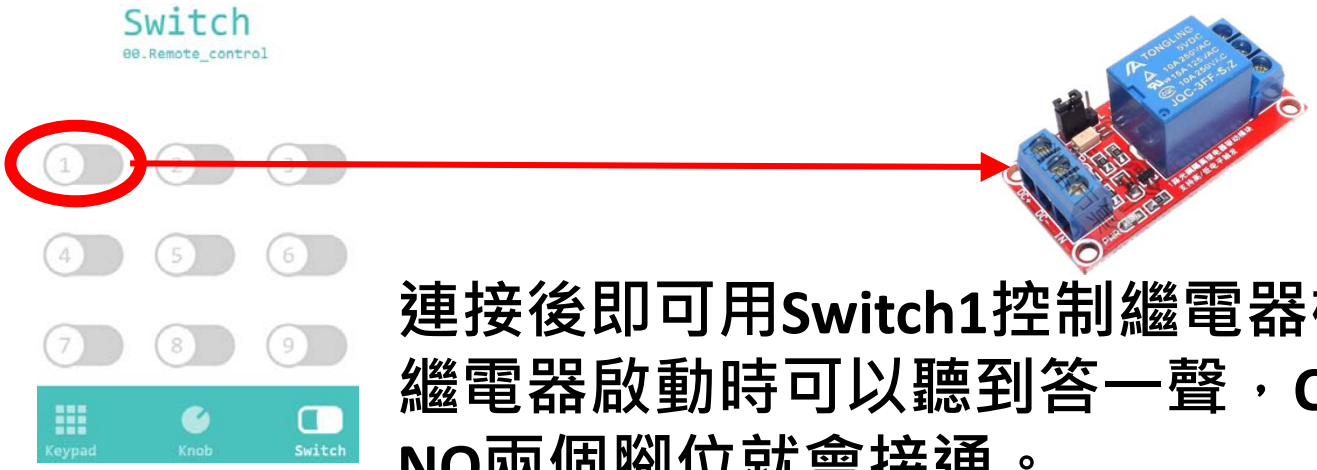
只可以連接D5, D6, D7, D8數位輸出腳位

(連接D0, D1, D2 PWM腳位會沒反應)

LAB5 – 智慧開關


5V
GND
TONGLING
5VDC
10A 250VAC
15A 125VAC
10A 250VAC
JQC-3FF-S-Z
DC+
DC-
IN
PWR
A0
GND
VU
SD3
SD2
SD1
CMD
SD0
CLK
GND
3V3
EN
RST
GND
Vin
D0
D1
D2
D3
D4
3V3
GND
D5
D6
D7
D8
RX
TX
GND
3V3
RST
FLASH
控制訊號



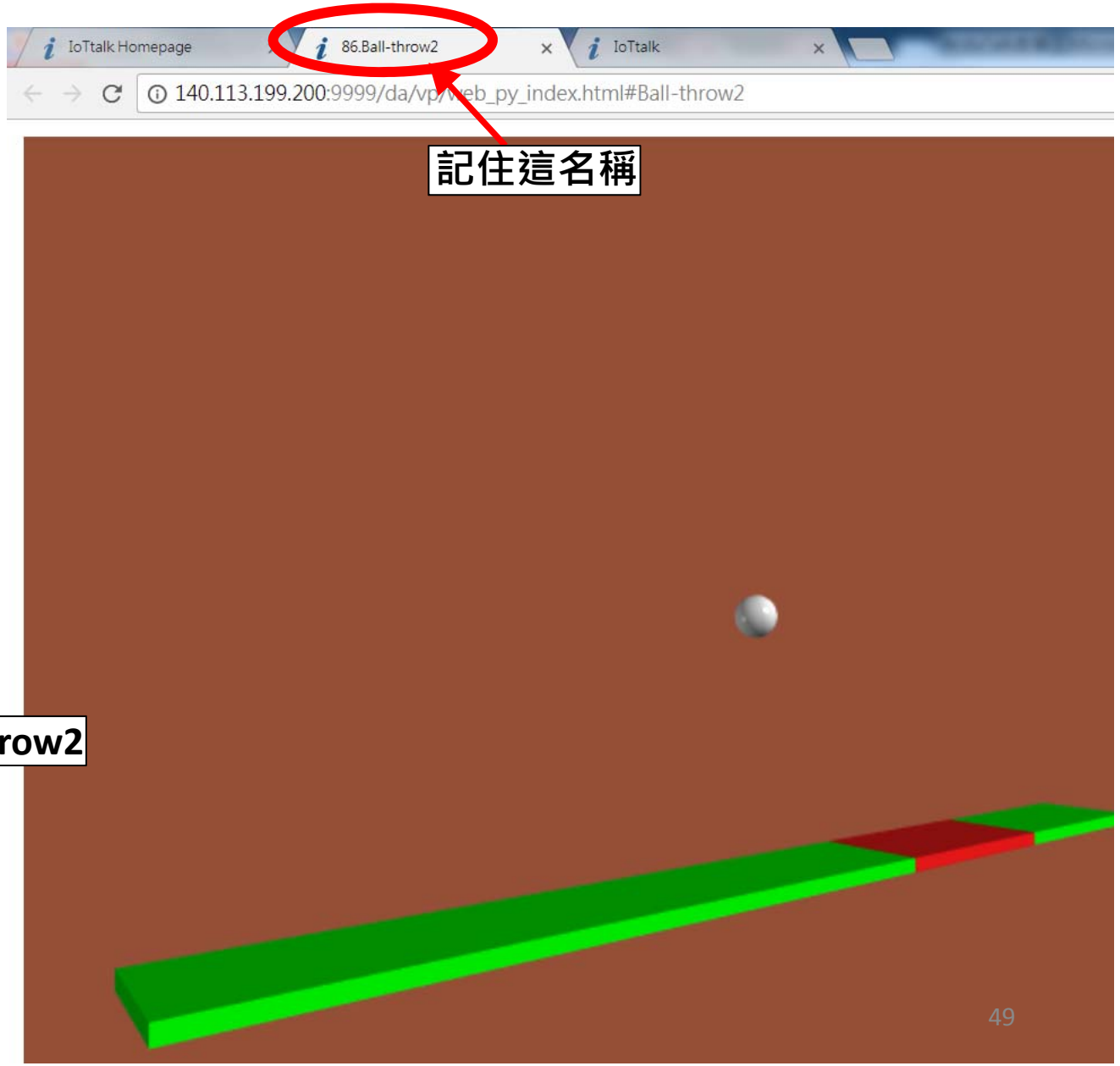


連接後即可用Switch1控制繼電器模組，繼電器啟動時可以聽到答一聲，COM跟NO兩個腳位就會接通。

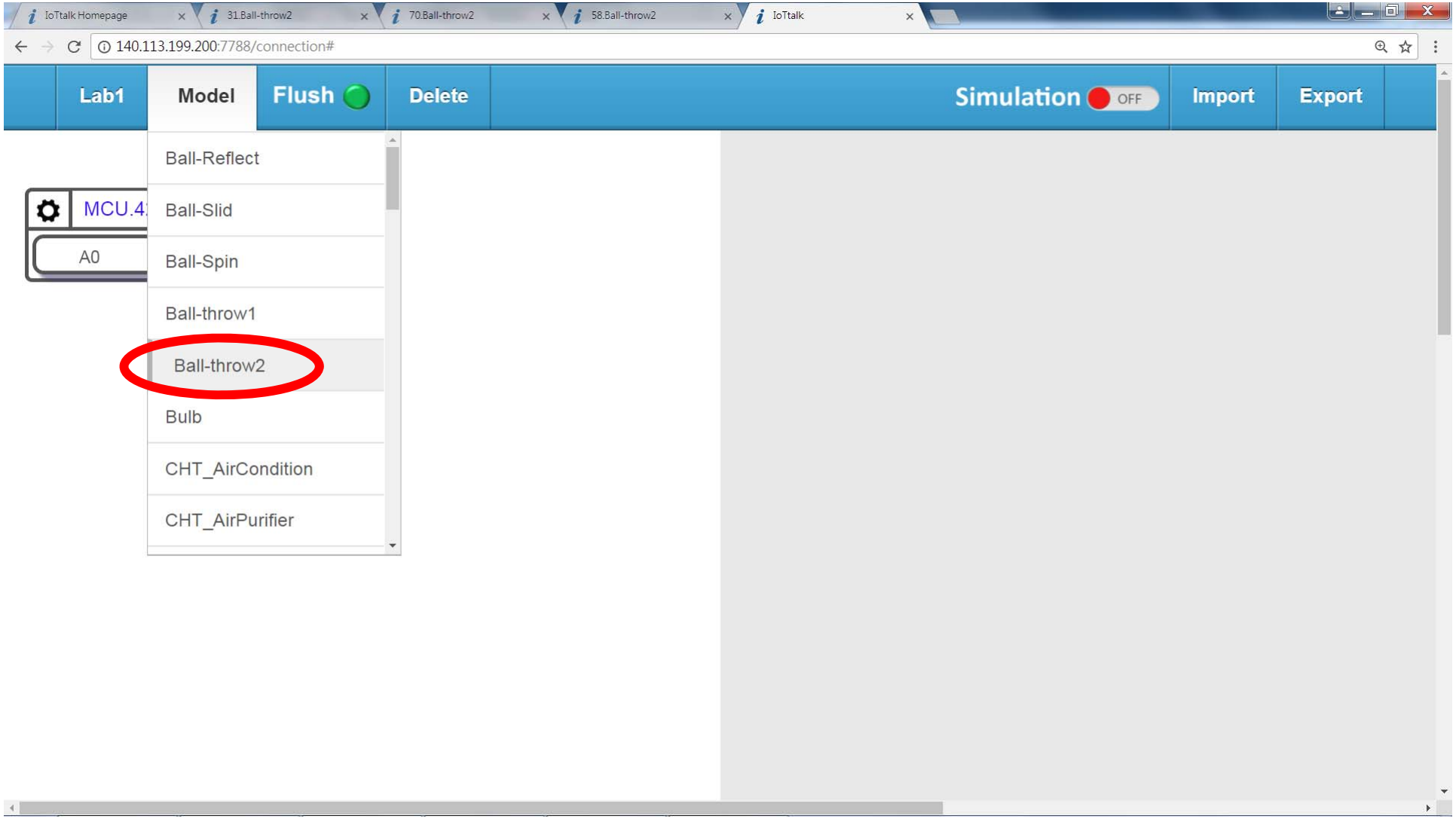
可嘗試以光感測器模組取代Switch1，變成光感開關。
或是以Acceleration取代Switch1，就變成體感開關。

LAB6 – 光感丟球

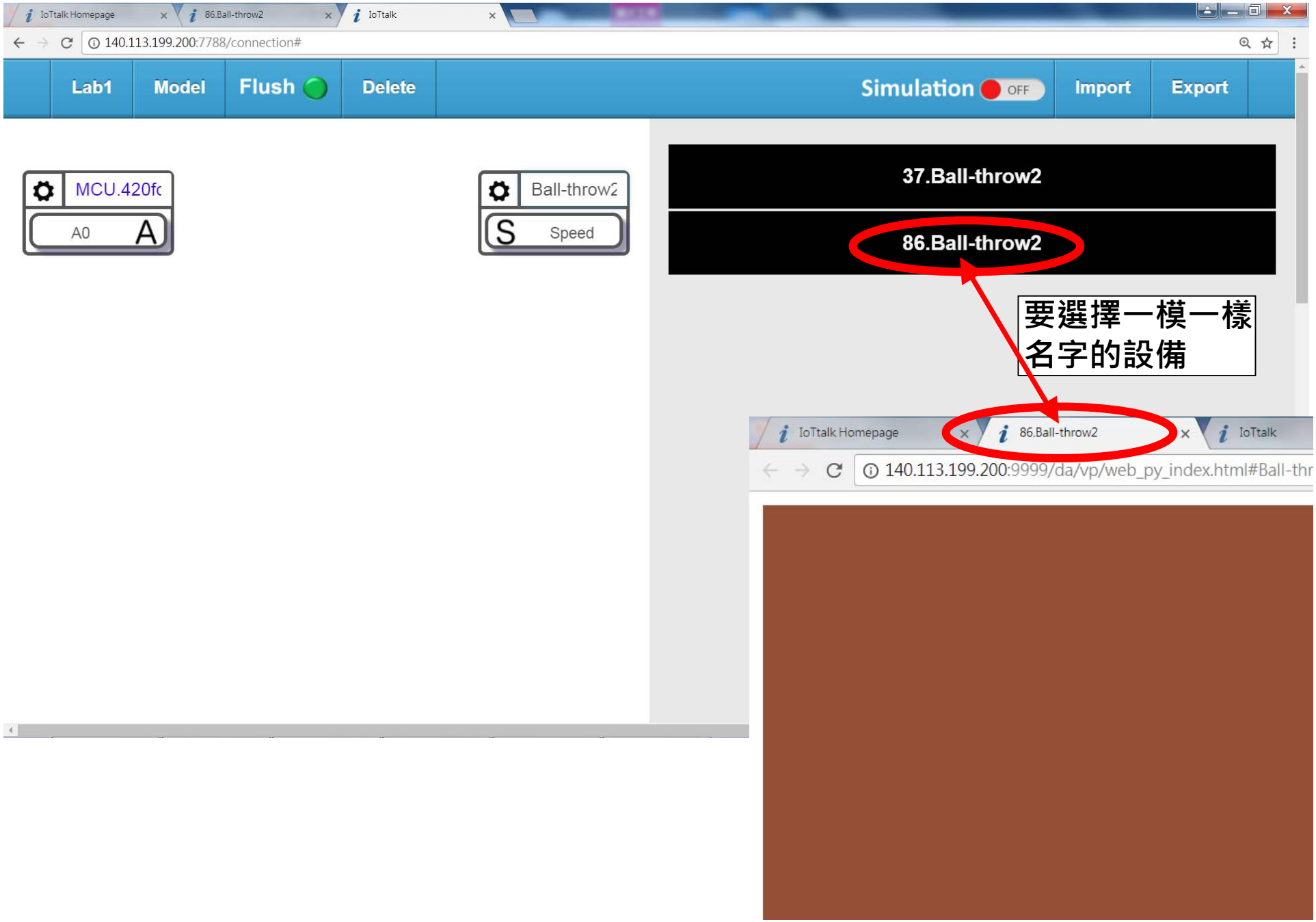

IoTtalk Homepage
IoTtalk
140.113.199.200:9999/#
Voice_Control
vibration
MusicBox
MusicBoxController
VPython List:
3DMotion1
3DMotion2
AirResistance1
AirResistance2
Ball-Slid
Ball-Slide1
Ball-Slide2
Ball-Spin
Ball-throw2
Collision2
Collision3
Collision4
ConicalPendulum1
ConicalPendulum2
ElasticCollision1
Free-FallandProjectileMotion2
點擊Ball-throw2

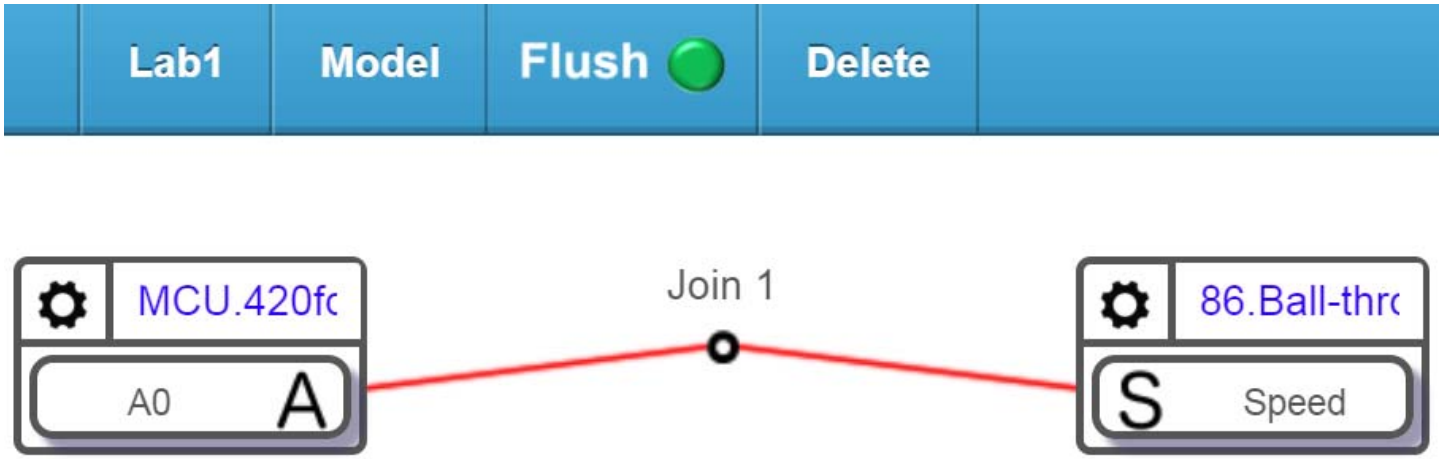

IoTtalk Homepage
86.Ball-throw2
IoTtalk
140.113.199.200:9999/da/vp/web_py_index.html#Ball-throw2
記住這名稱

HW1 – 光感丟球


IoTtalk Homepage
31.Ball-throw2
70.Ball-throw2
58.Ball-throw2
IoTtalk
140.113.199.200:7788/connection#
Lab1
Model
Flush
Delete
Simulation
OFF
Import
Export
MCU.4
A0
Ball-Reflect
Ball-Slid
Ball-Spin
Ball-throw1
Ball-throw2
Bulb
CHT_AirCondition
CHT_AirPurifier

HW1 – 光感丟球


IoTtalk Homepage
86.Ball-throw2
IoTtalk
140.113.199.200:7788/connection#
Lab1
Model
Flush
Delete
Simulation
OFF
Import
Export
MCU.420fc
A0
A
Ball-throw2
S
Speed
37.Ball-throw2
86.Ball-throw2
要選擇一模一樣
名字的設備
IoTtalk Homepage
86.Ball-throw2
IoTtalk
140.113.199.200:9999/da/vp/web_py_index.html#Ball-thr



建立A0到Speed連線後，可以用手遮住光感應器來控制丟球力道

如果試著把A0更換為Smartphone的Acceleration，甩動手機時會怎樣呢?

多多嘗試各種可能的連接組合

試著組合不同的IDF/ODF
來實現不同的創意應用

聯絡資訊: 林勻蔚 (jyneda@gmail.com)