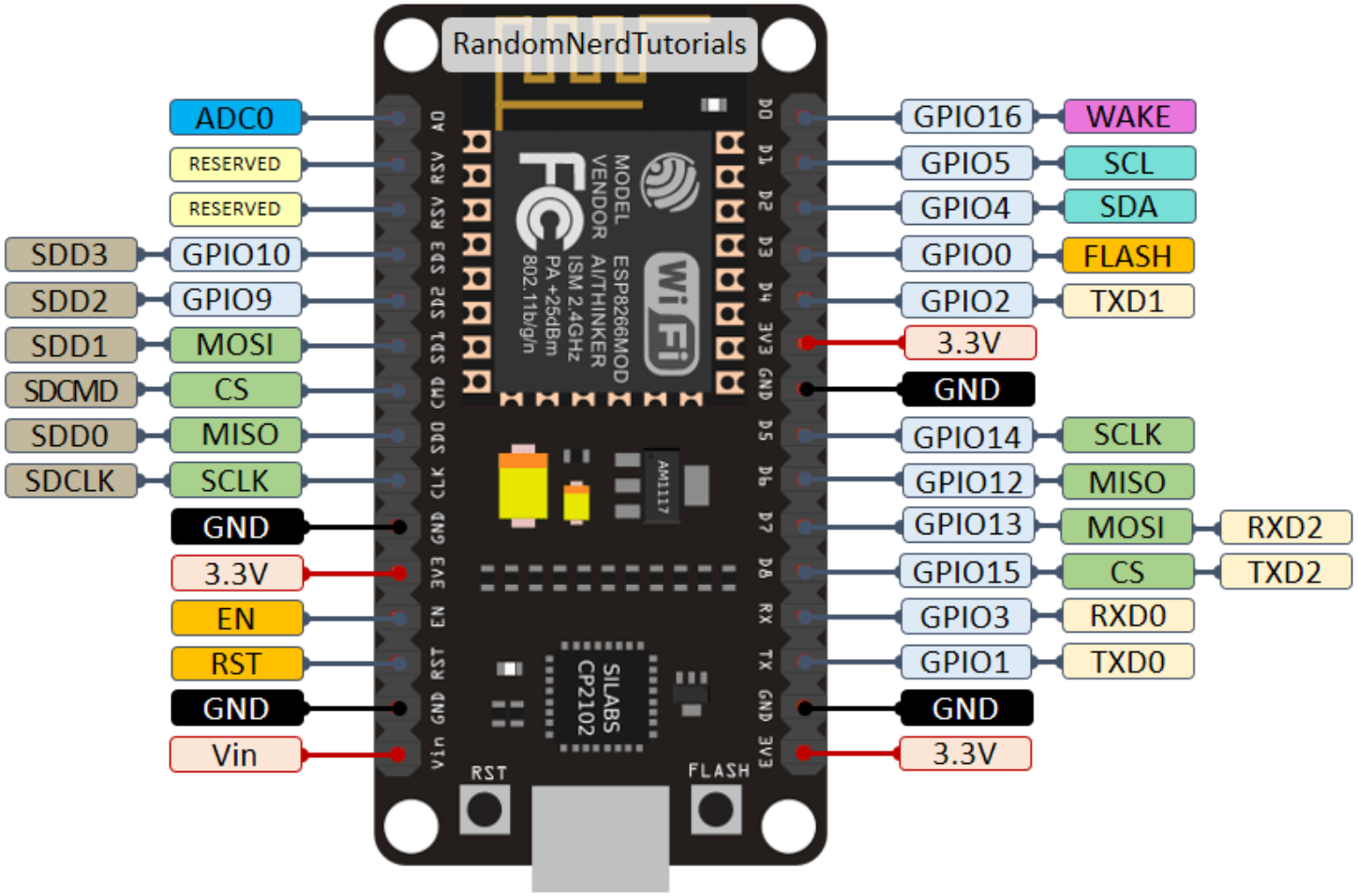
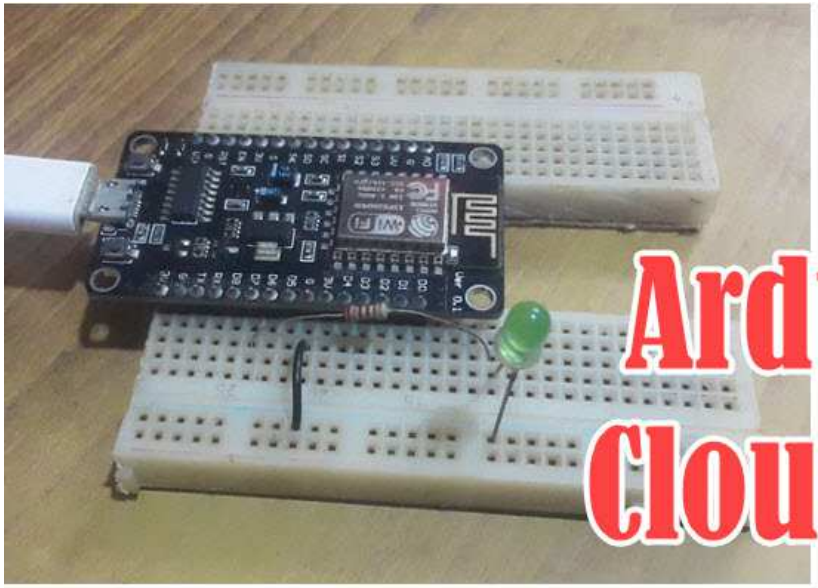
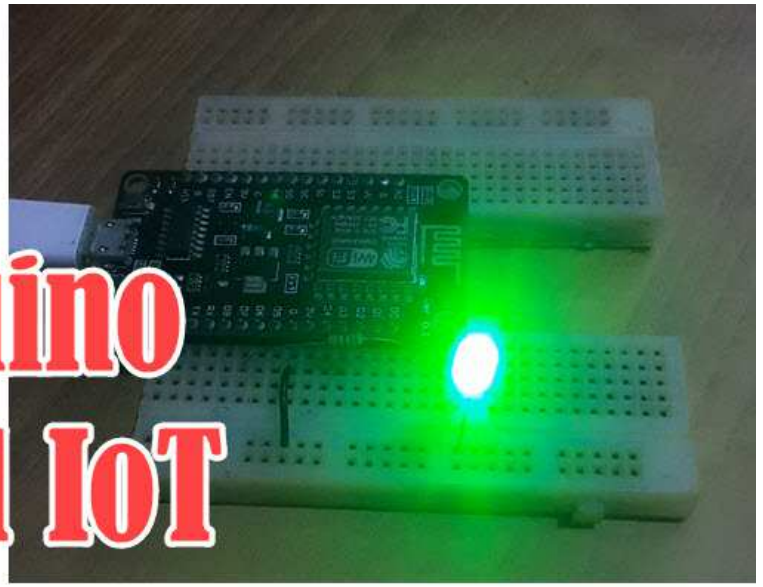
DHT 11 NODEMCU

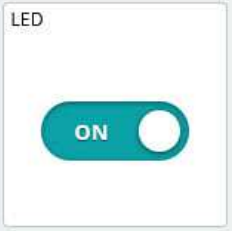

RandomNerdTutorials
ADC0
RESERVED
RESERVED
SDD3
GPIO10
SDD2
GPIO9
SDD1
MOSI
SDCMD
CS
SDD0
MISO
SDCLK
SCLK
GND
3.3V
EN
RST
GND
Vin
GPIO16
WAKE
GPIO5
SCL
GPIO4
SDA
GPIO0
FLASH
GPIO2
TXD1
3.3V
GND
GPIO14
SCLK
GPIO12
MISO
GPIO13
MOSI
RXD2
GPIO15
CS
TXD2
GPIO3
RXD0
GPIO1
TXD0
GND
3.3V
RST
FLASH
ESP8266MOD
AI/THINKER
ISM 2.4GHz
PA +25dBm
802.11b/g/n
SILABS
CP2102
AMS1117

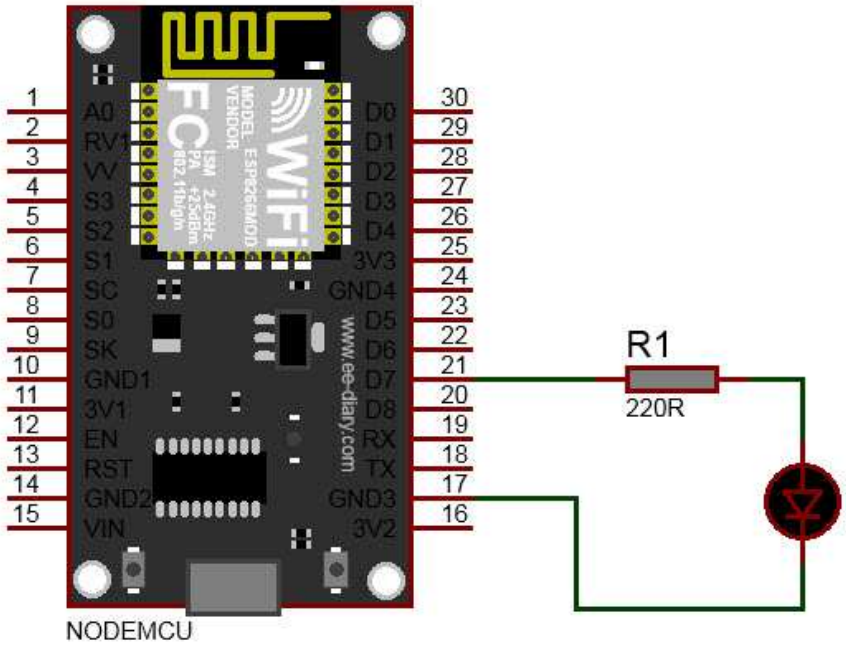
```
#include "DHT.h"
DHT dht;
void setup()
{
  Serial.begin(9600);
  Serial.println();
  Serial.println("Status\tHumidity (%)\tTemperature (C)\t(F)");

  dht.setup(2); // data pin 2
}

void loop()
{
  delay(dht.getMinimumSamplingPeriod());
  float humidity = dht.getHumidity(); // ดึงค่าความชื้น
  float temperature = dht.getTemperature(); // ดึงค่าอุณหภูมิ
  Serial.print(dht.getStatusString());
  Serial.print("\t");
  Serial.print(humidity, 1);
  Serial.print("\t\t");
  Serial.print(temperature, 1);
  Serial.print("\t\t");
  Serial.println(dht.toFahrenheit(temperature), 1);
  delay(1000);
}
```

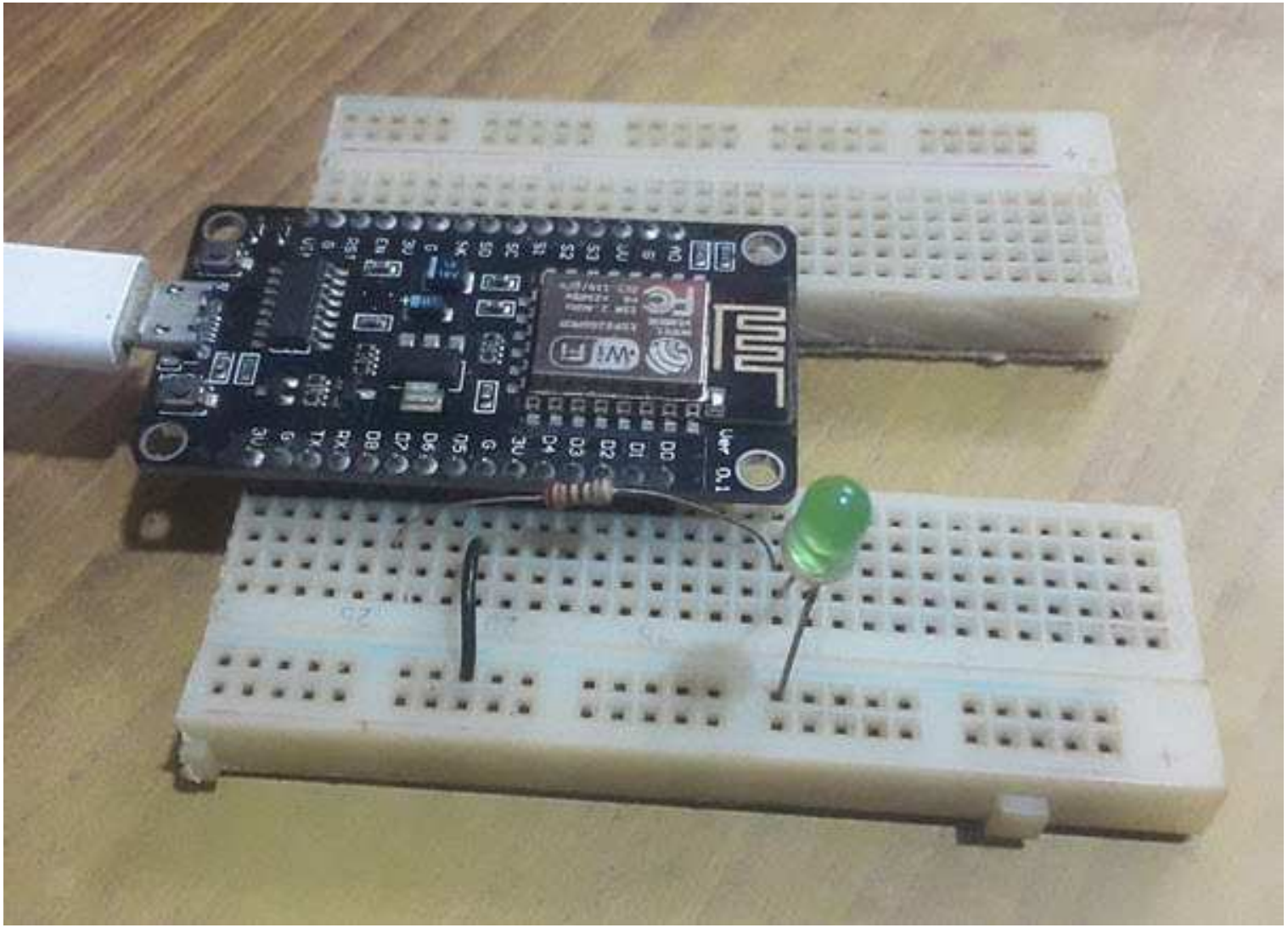




Arduino Cloud IoT platform

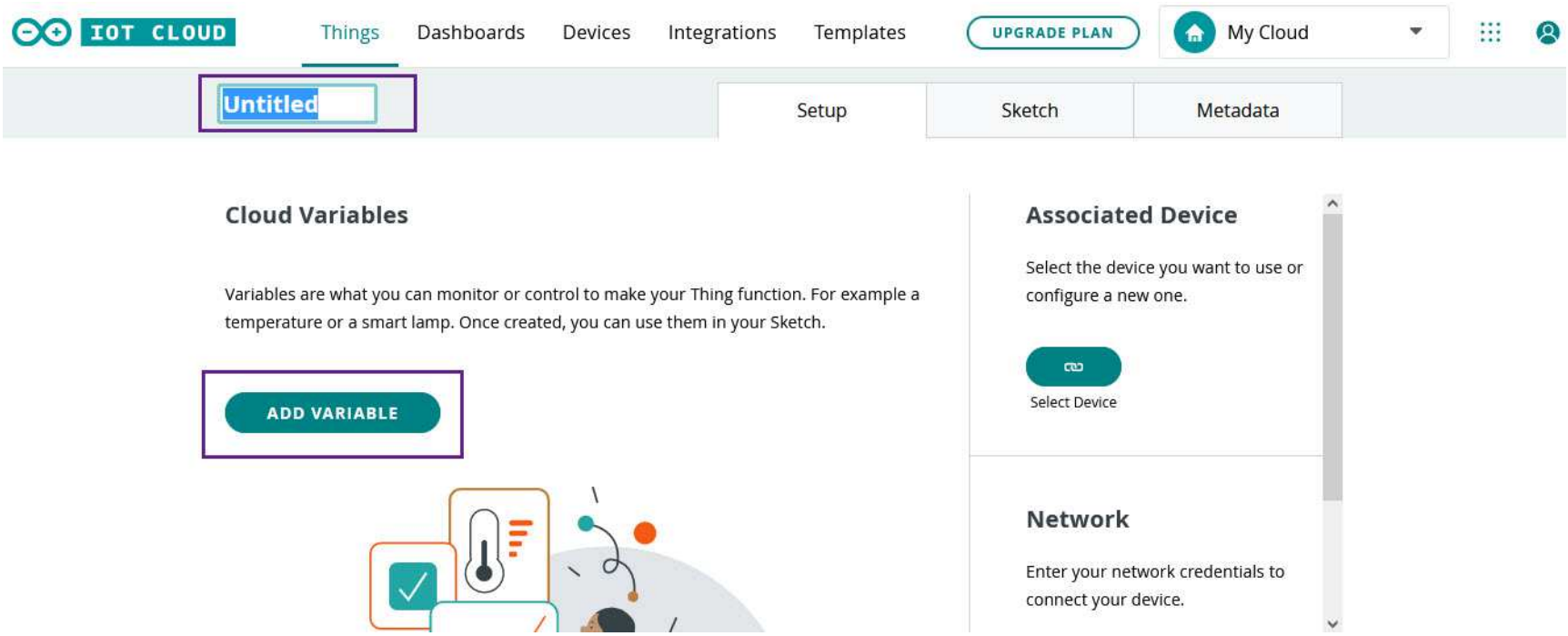


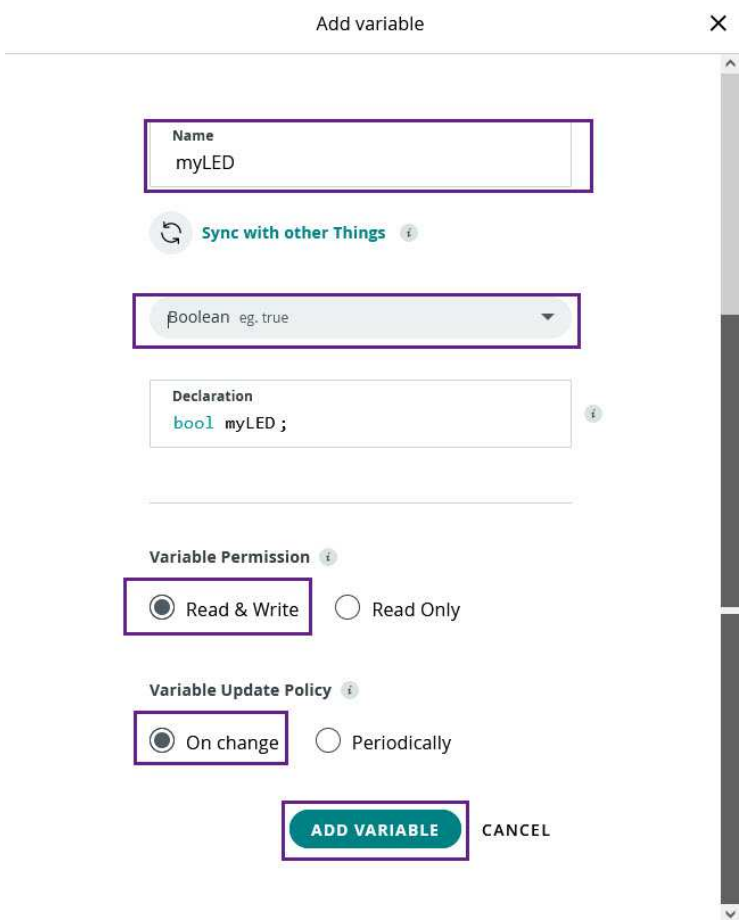

1
A0
2
RV1
3
VV
4
S3
5
S2
6
S1
7
SC
8
S0
9
SK
10
GND1
11
3V1
12
EN
13
RST
14
GND2
15
VIN
30
D0
29
D1
28
D2
27
D3
26
D4
25
3V3
24
GND4
23
D5
22
D6
21
D7
20
D8
19
RX
18
TX
17
GND3
16
3V2
www.ee-diary.com
R1
220R
NODEMCU

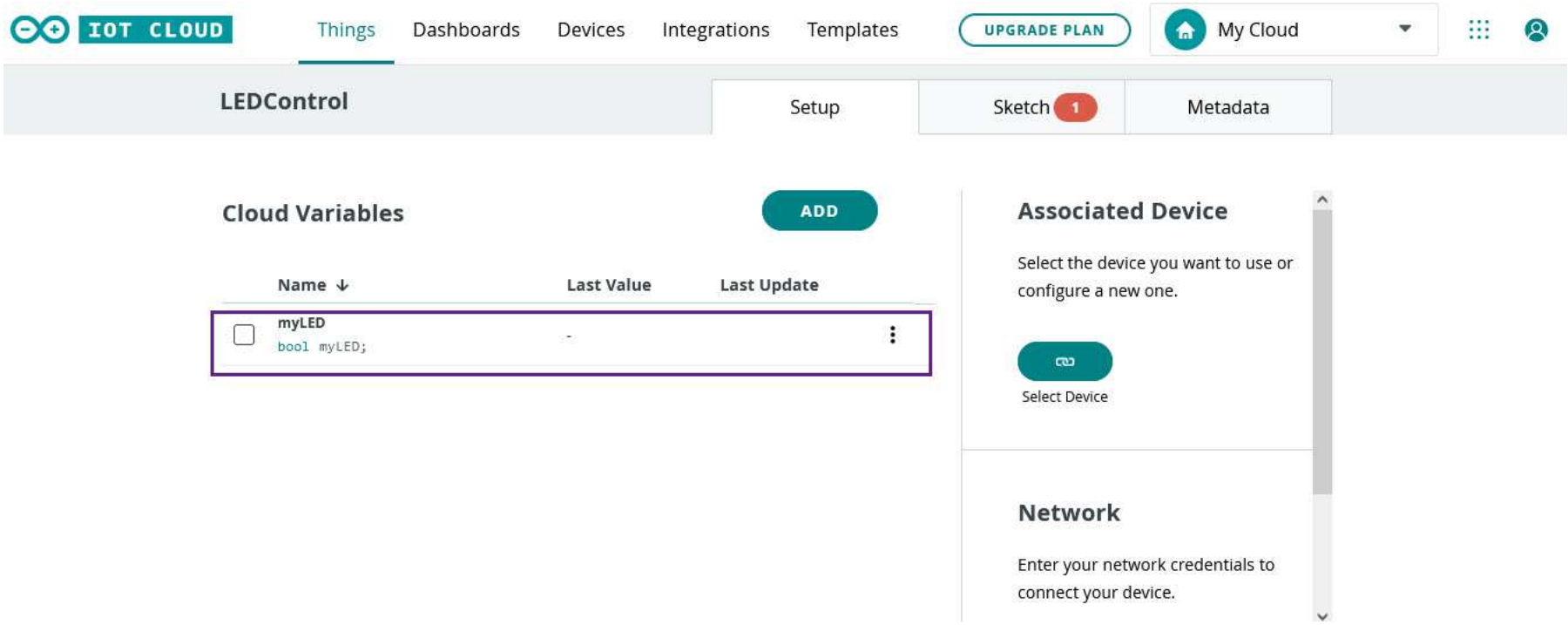


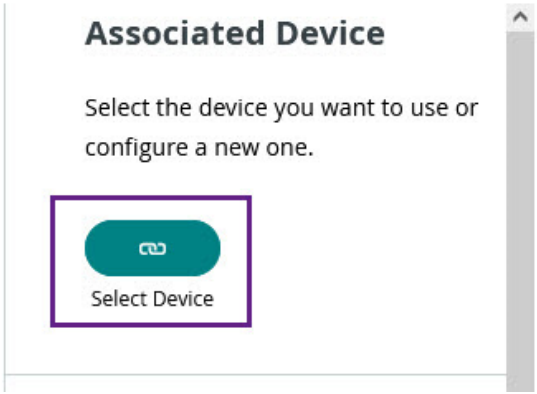

IOT CLOUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
Dashboards
DE3*_ga_NEXN8H46L5*MTY2NjU4ODI1My4yLjEuMTY2NjU4OTI0NC4wLjAuMA..
CREATE

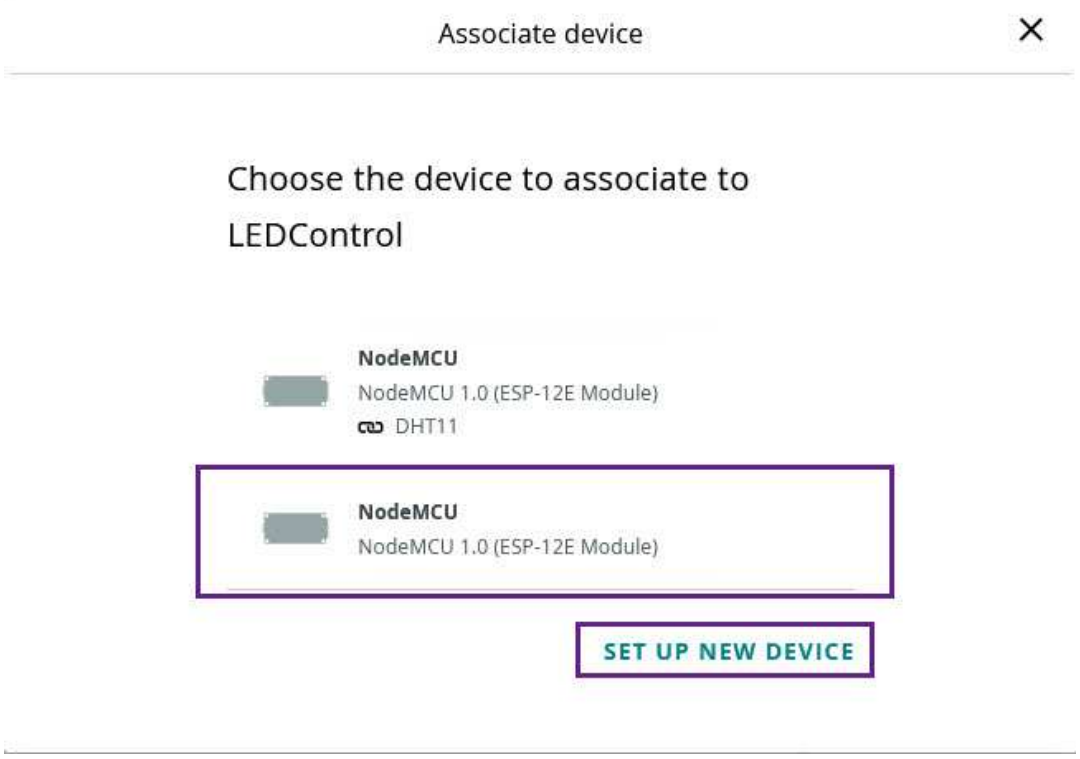

IOT CLOUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
Things
Search and filter Things
CREATE
Name
Device
Variables
Last Modified
DHT11
NodeMCU
NodeMCU 1.0 (ESP-12E Mod...
dhthumid
+1
22 Oct 2022 09:44:55

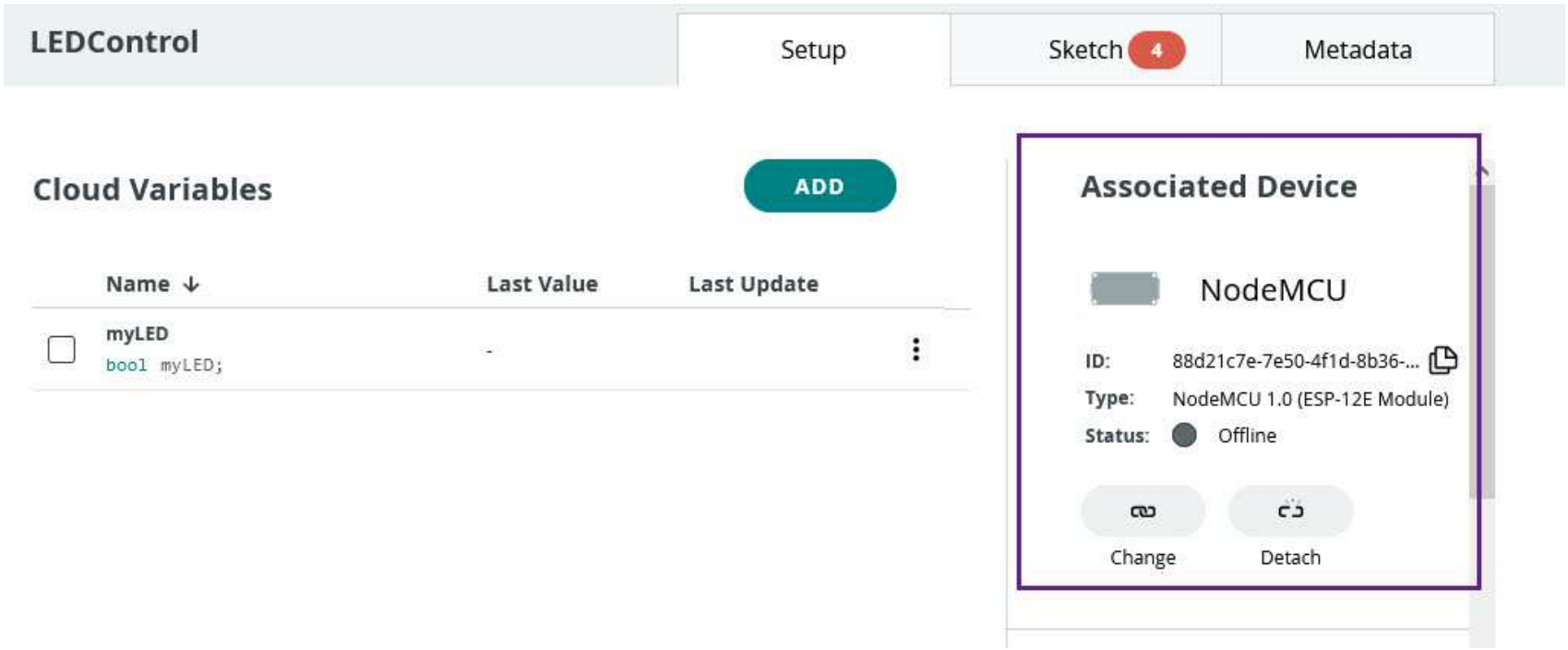

IOT CLOUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
Untitled
Setup
Sketch
Metadata
Cloud Variables
Variables are what you can monitor or control to make your Thing function. For example a temperature or a smart lamp. Once created, you can use them in your Sketch.
ADD VARIABLE
Associated Device
Select the device you want to use or configure a new one.
Select Device
Network
Enter your network credentials to connect your device.

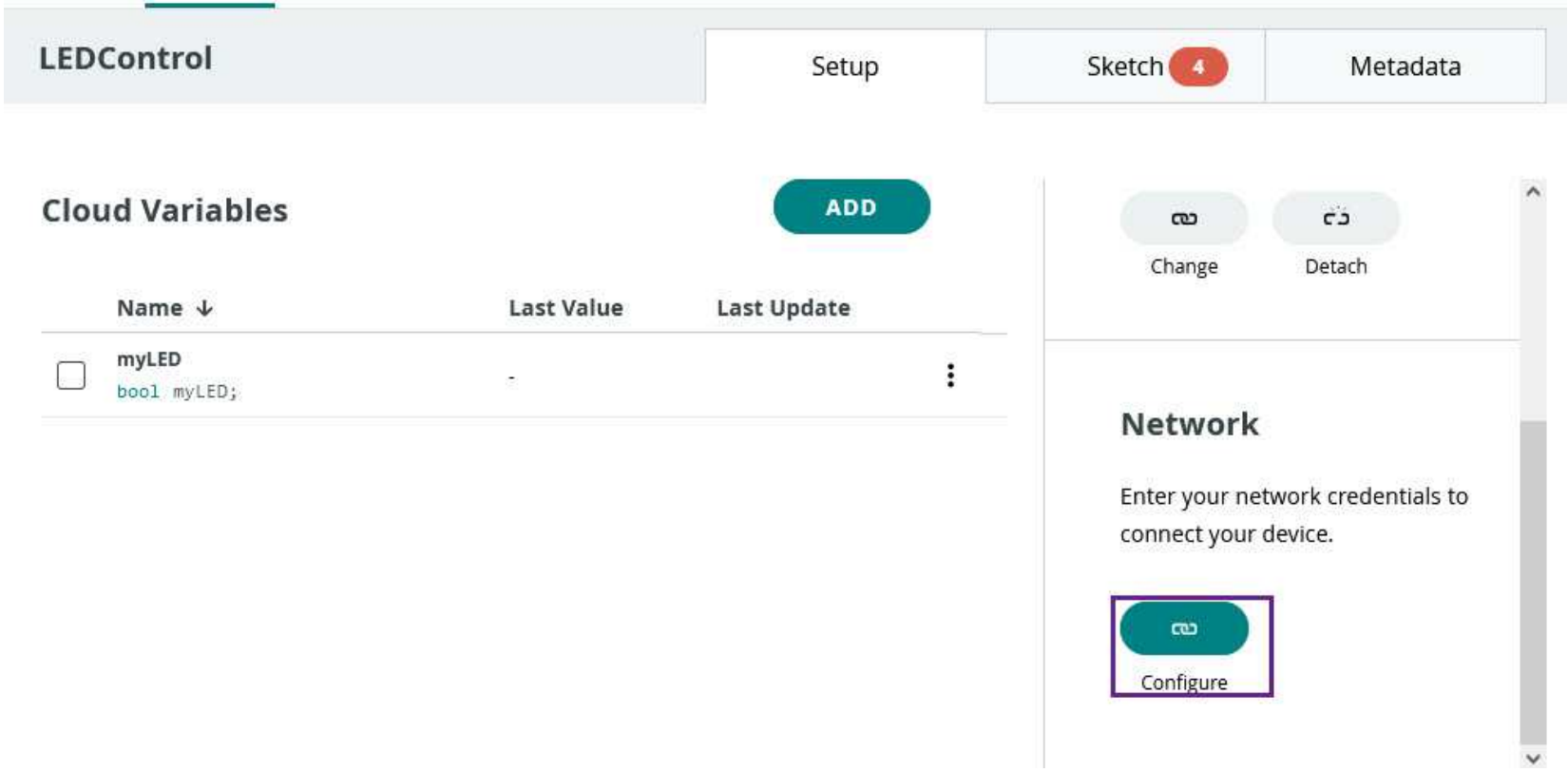

Add variable
Name
myLED
Sync with other Things
Boolean eg. true
Declaration
bool myLED ;
Variable Permission
Read & Write
Read Only
Variable Update Policy
On change
Periodically
ADD VARIABLE
CANCEL

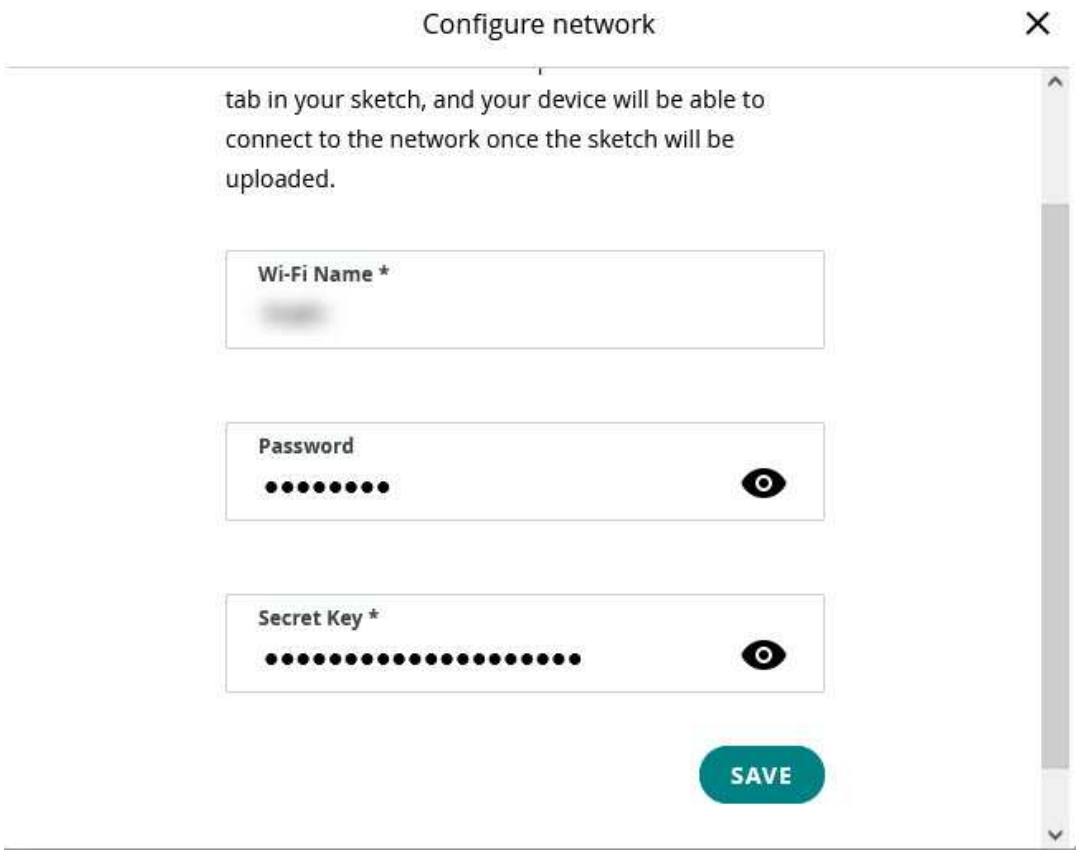

IOT CLOUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
LEDControl
Setup
Sketch 1
Metadata
Cloud Variables
ADD
Name
Last Value
Last Update
myLED
bool myLED;
-
Associated Device
Select the device you want to use or configure a new one.
Select Device
Network
Enter your network credentials to connect your device.

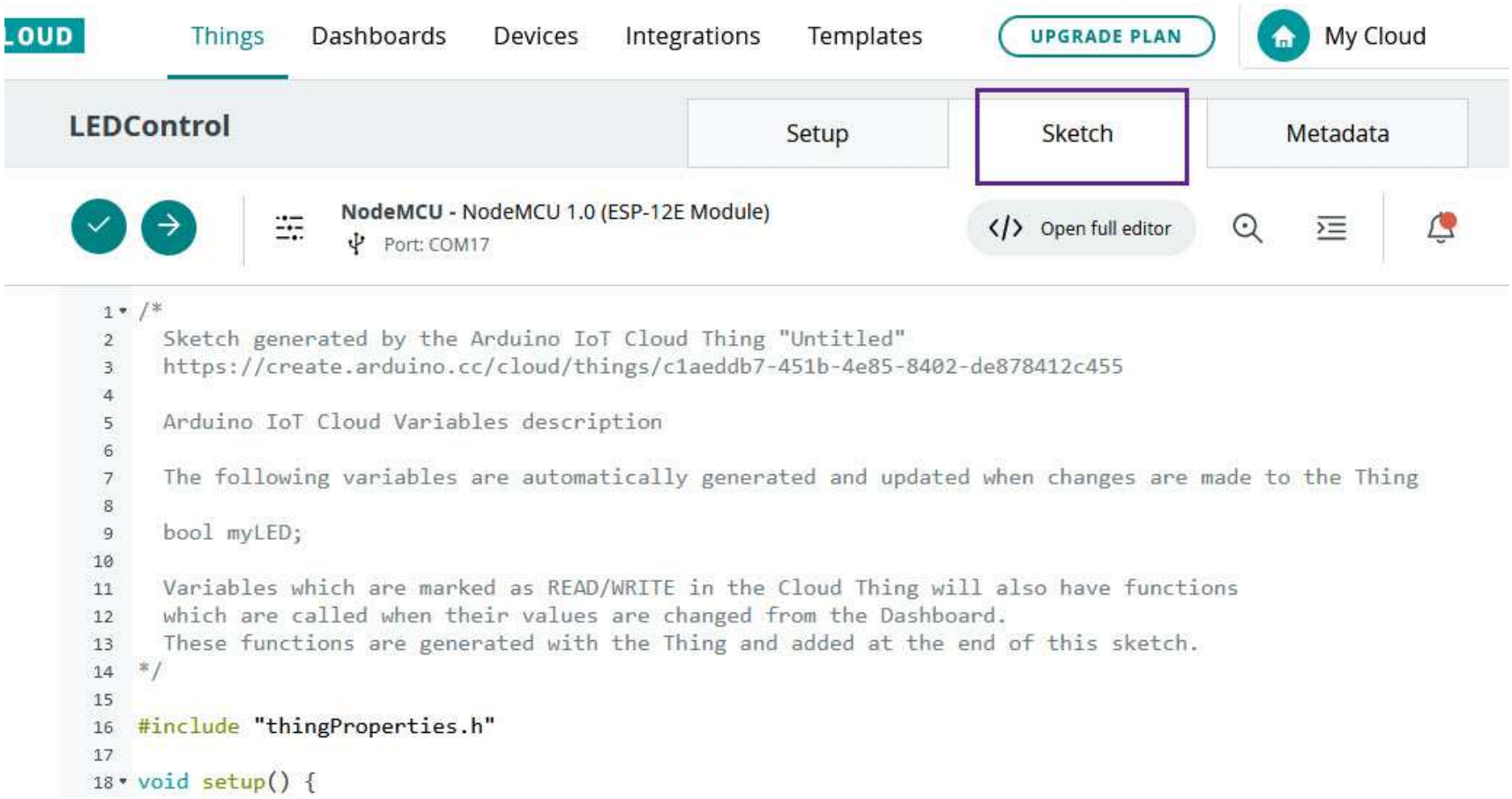

Associated Device
Select the device you want to use or configure a new one.
Select Device


Associate device
Choose the device to associate to
LEDControl
NodeMCU
NodeMCU 1.0 (ESP-12E Module)
DHT11
NodeMCU
NodeMCU 1.0 (ESP-12E Module)
SET UP NEW DEVICE


LEDControl
Setup
Sketch 4
Metadata
Cloud Variables
ADD
Name
Last Value
Last Update
myLED
bool myLED;
-
Associated Device
NodeMCU
ID:
88d21c7e-7e50-4f1d-8b36-...
Type:
NodeMCU 1.0 (ESP-12E Module)
Status:
Offline
Change
Detach

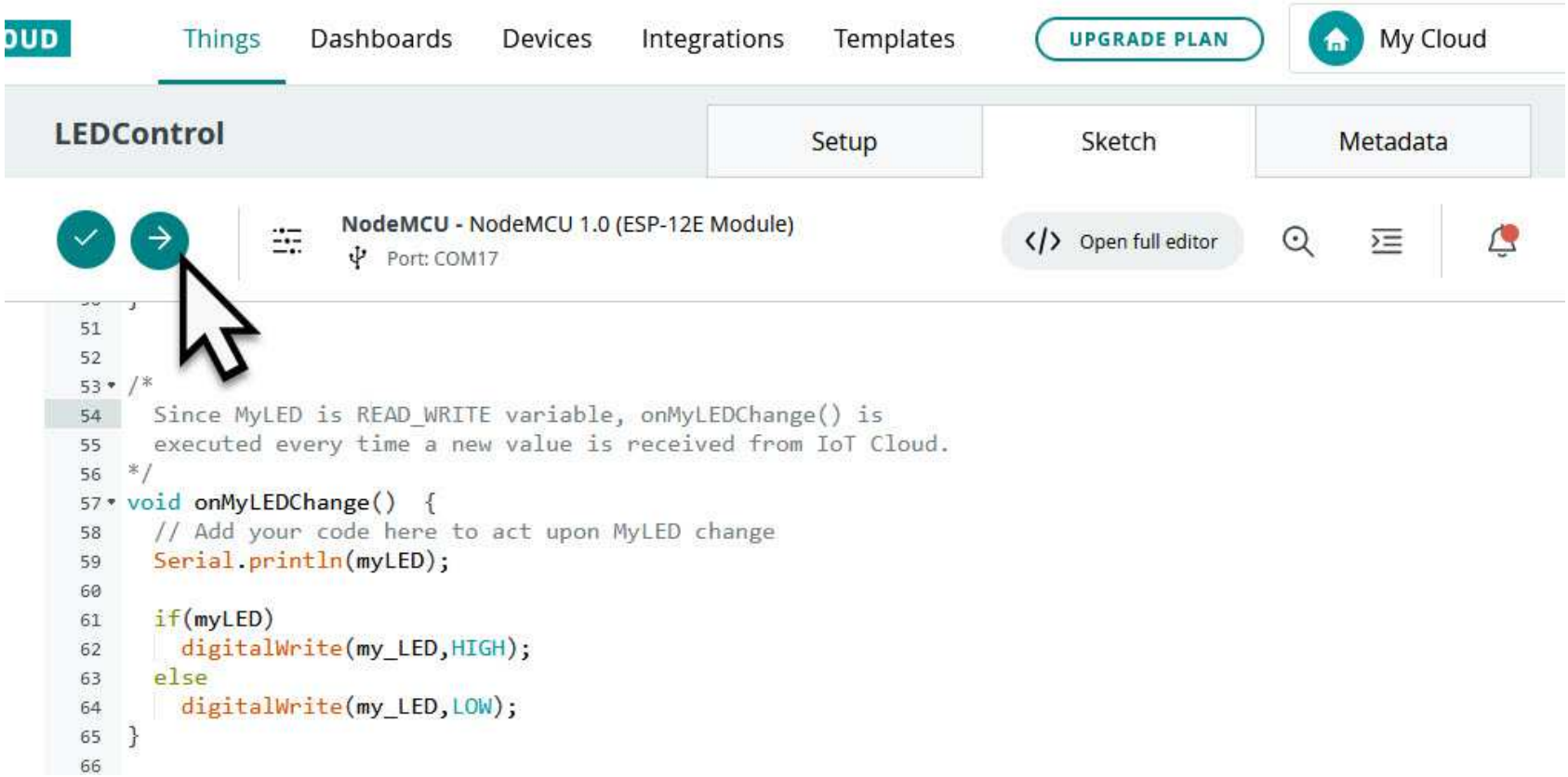

LEDControl
Setup
Sketch 4
Metadata
Cloud Variables
ADD
Name
Last Value
Last Update
myLED
bool myLED;
-
Change
Detach
Network
Enter your network credentials to connect your device.
Configure

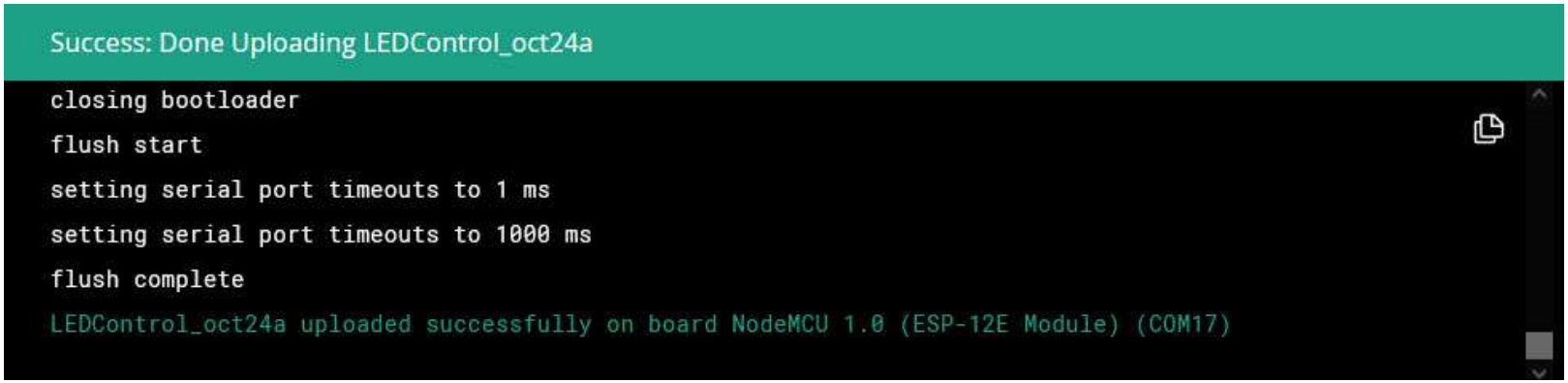

Configure network
tab in your sketch, and your device will be able to connect to the network once the sketch will be uploaded.
Wi-Fi Name *
Password
Secret Key *
SAVE

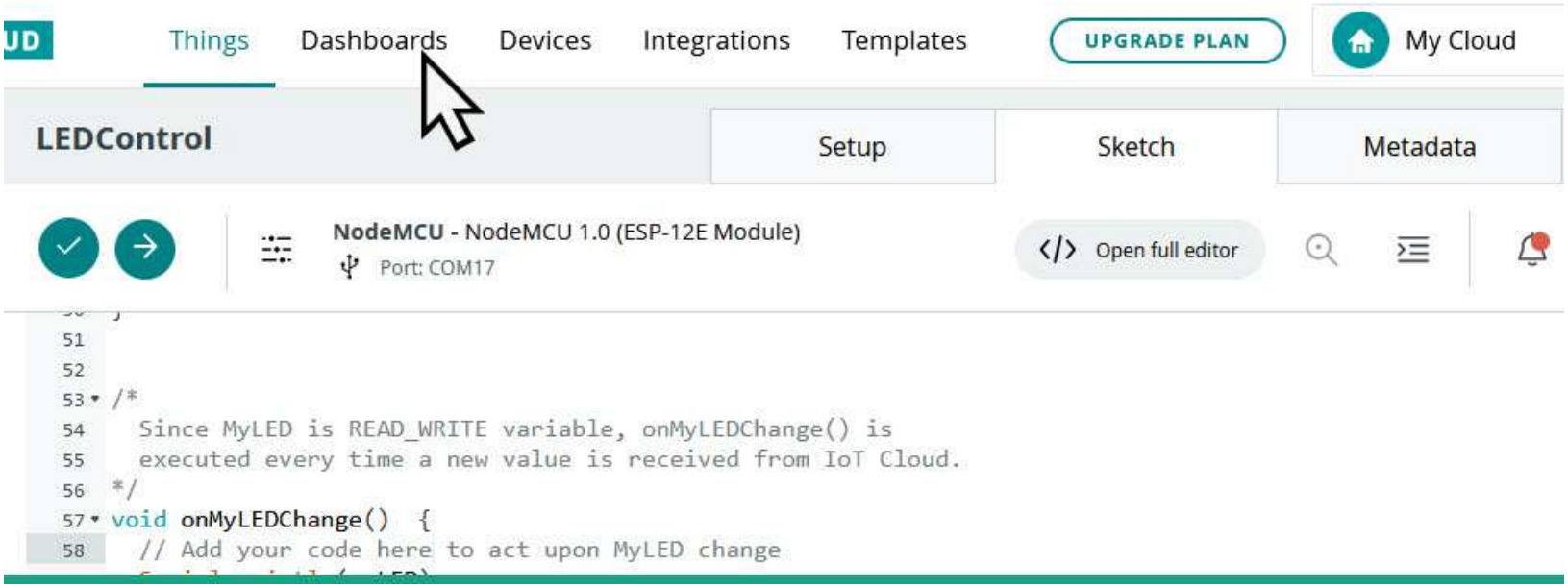

LOUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
LEDControl
Setup
Sketch
Metadata
NodeMCU - NodeMCU 1.0 (ESP-12E Module)
Port: COM17
Open full editor
/*
Sketch generated by the Arduino IoT Cloud Thing "Untitled"
https://create.arduino.cc/cloud/things/c1aeddb7-451b-4e85-8402-de878412c455
Arduino IoT Cloud Variables description
The following variables are automatically generated and updated when changes are made to the Thing
bool myLED;
Variables which are marked as READ/WRITE in the Cloud Thing will also have functions
which are called when their values are changed from the Dashboard.
These functions are generated with the Thing and added at the end of this sketch.
*/
#include "thingProperties.h"
void setup() {

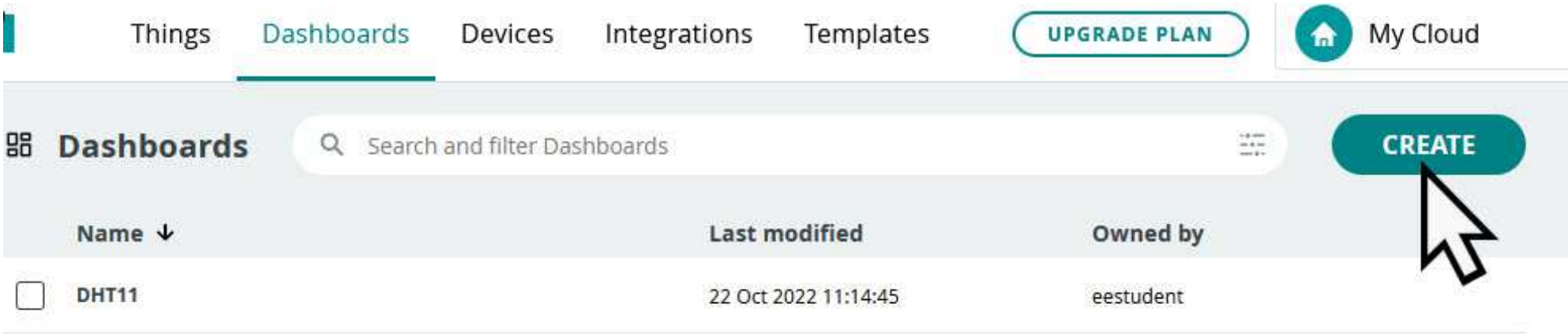
```
#include "thingProperties.h"

const int my_LED = 13;

void setup() {
  // Initialize serial and wait for port to open:
  Serial.begin(9600);
  // This delay gives the chance to wait for a Serial Monitor without blockin
  delay(1500);

  pinMode(my_LED, OUTPUT);

  // Defined in thingProperties.h
  initProperties();
```

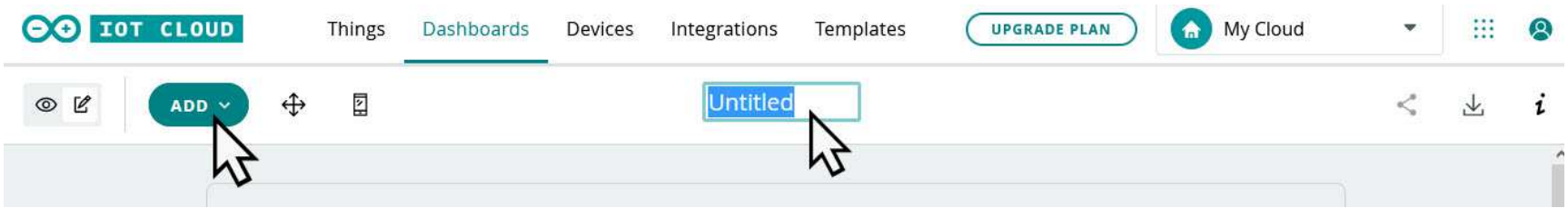
```
/*
  Since MyLED is READ_WRITE variable, onMyLEDChange() is
  executed every time a new value is received from IoT Cloud.
*/
void onMyLEDChange()  {
  // Add your code here to act upon MyLED change
  Serial.println(myLED);

  if(myLED)
    digitalWrite(my_LED,HIGH);
  else
    digitalWrite(my_LED,LOW);
}
```

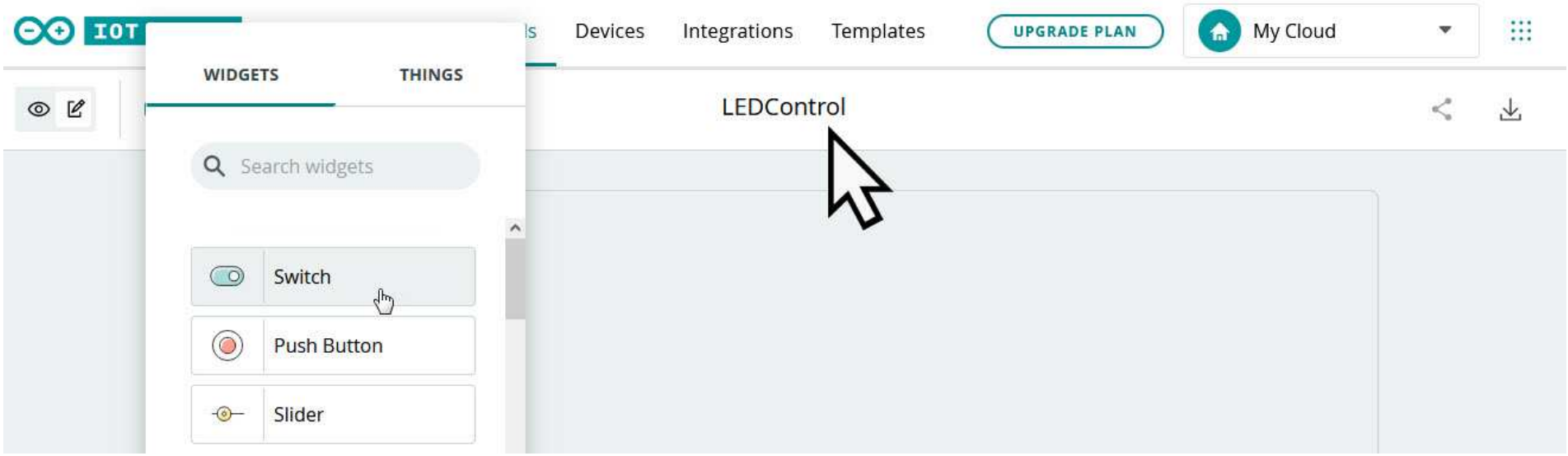

OUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
LEDControl
Setup
Sketch
Metadata
NodeMCU - NodeMCU 1.0 (ESP-12E Module)
Port: COM17
Open full editor
51
52
53 /*
54 Since MyLED is READ_WRITE variable, onMyLEDChange() is
55 executed every time a new value is received from IoT Cloud.
56 */
57 void onMyLEDChange() {
58 // Add your code here to act upon MyLED change
59 Serial.println(myLED);
60
61 if(myLED)
62 digitalWrite(my_LED,HIGH);
63 else
64 digitalWrite(my_LED,LOW);
65 }
66

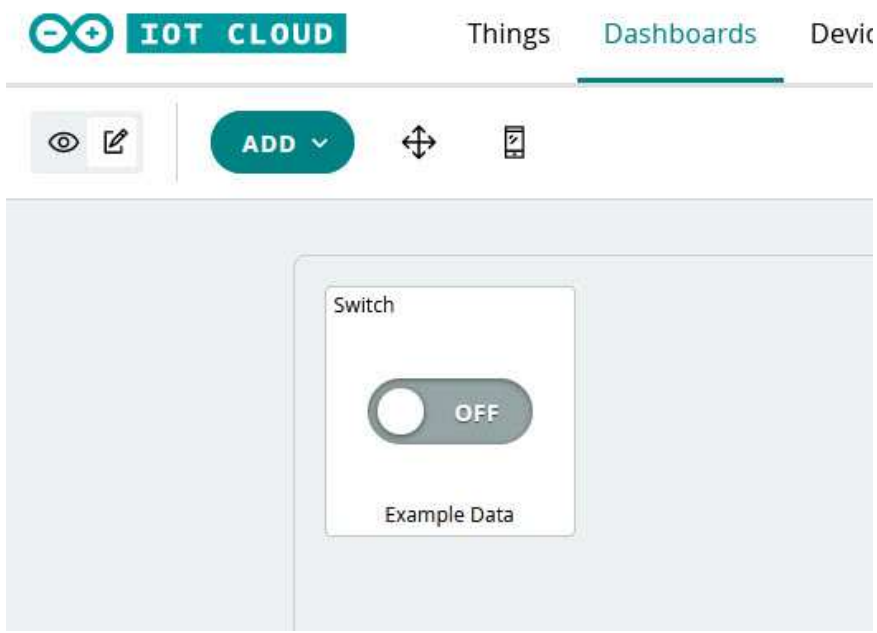

Success: Done Uploading LEDControl_oct24a
closing bootloader
flush start
setting serial port timeouts to 1 ms
setting serial port timeouts to 1000 ms
flush complete
LEDControl_oct24a uploaded successfully on board NodeMCU 1.0 (ESP-12E Module) (COM17)

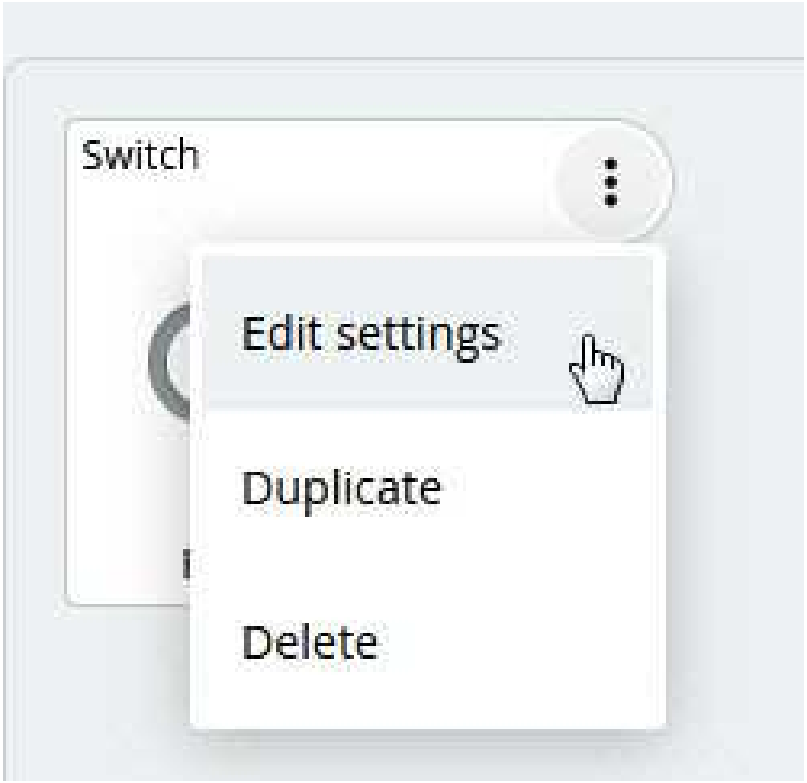

UD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
LEDControl
Setup
Sketch
Metadata
NodeMCU - NodeMCU 1.0 (ESP-12E Module)
Port: COM17
Open full editor
51
52
53 /*
54 Since MyLED is READ_WRITE variable, onMyLEDChange() is
55 executed every time a new value is received from IoT Cloud.
56 */
57 void onMyLEDChange() {
58 // Add your code here to act upon MyLED change

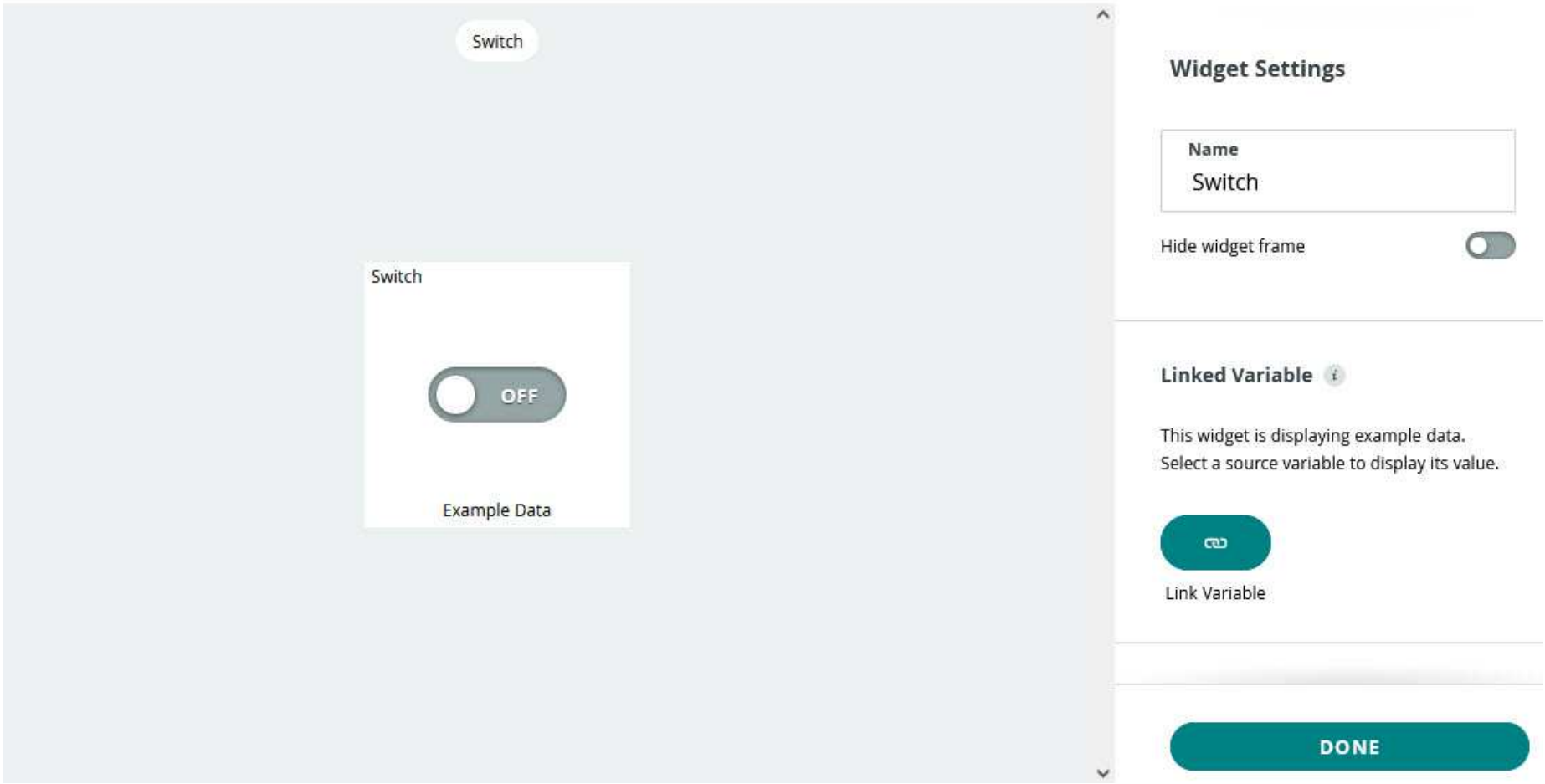

Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
Dashboards
Search and filter Dashboards
CREATE
Name
Last modified
Owned by
DHT11
22 Oct 2022 11:14:45
eestudent

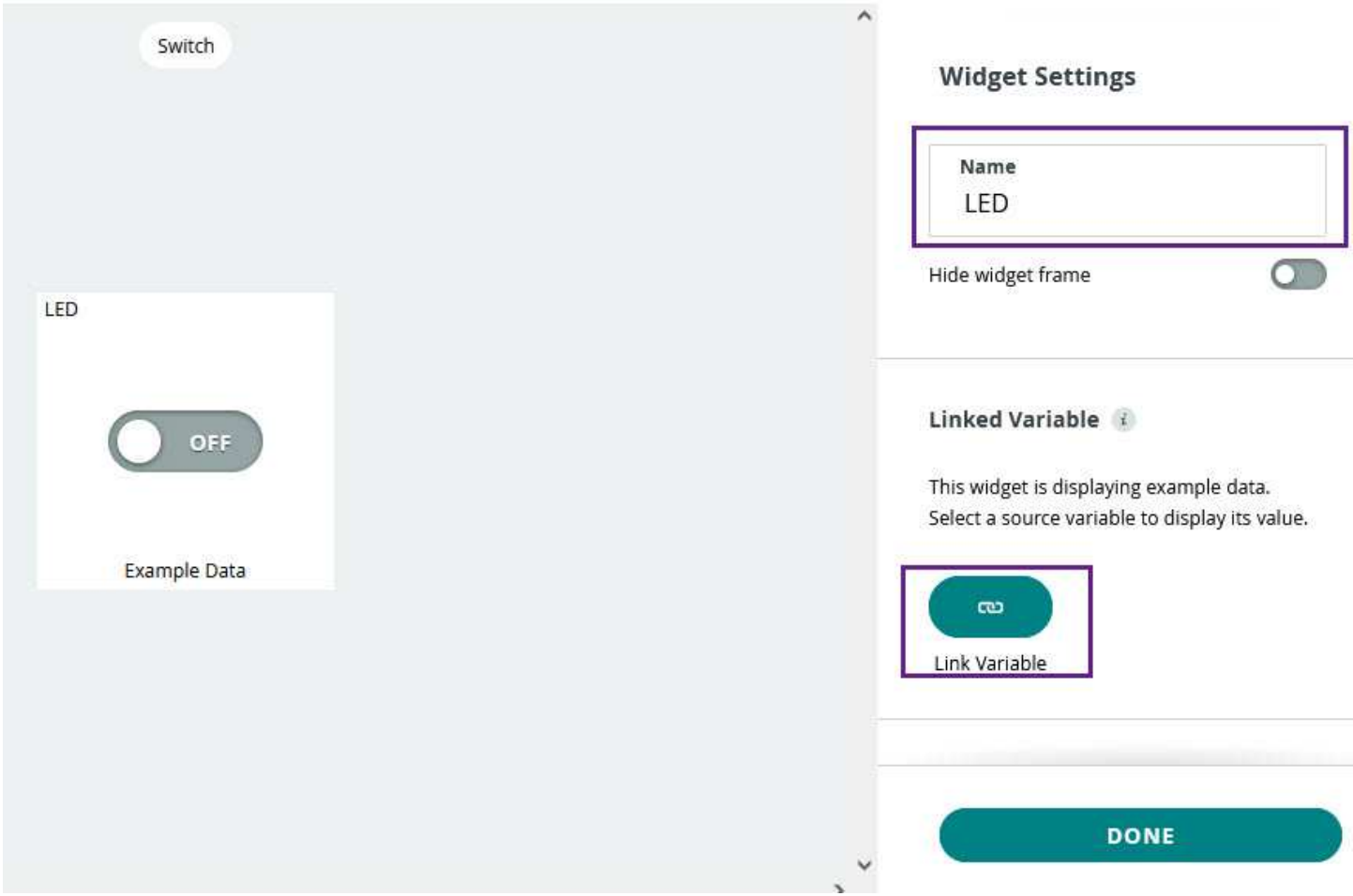

IOT CLOUD
Things
Dashboards
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
ADD
Untitled

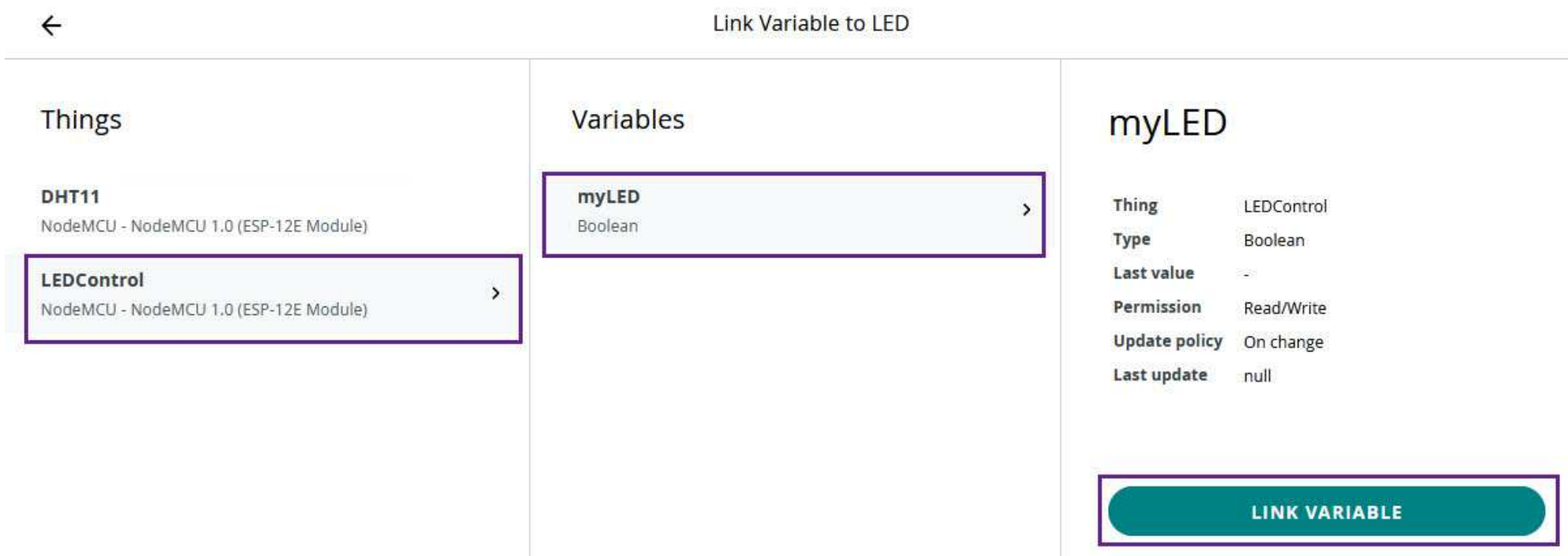

IOT
Devices
Integrations
Templates
UPGRADE PLAN
My Cloud
WIDGETS
THINGS
LEDControl
Search widgets
Switch
Push Button
Slider

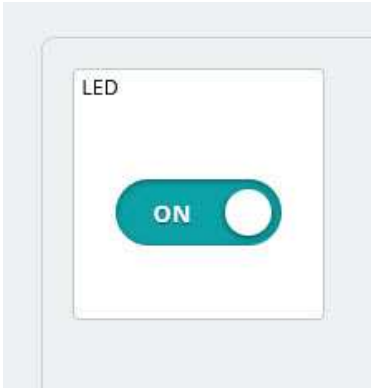

IOT CLOUD
Things
Dashboards
Devic
ADD
Switch
OFF
Example Data


Switch
Edit settings
Duplicate
Delete


Switch
Switch
OFF
Example Data
Widget Settings
Name
Switch
Hide widget frame
Linked Variable
This widget is displaying example data.
Select a source variable to display its value.
Link Variable
DONE


Switch
LED
OFF
Example Data
Widget Settings
Name
LED
Hide widget frame
Linked Variable
This widget is displaying example data.
Select a source variable to display its value.
Link Variable
DONE


Link Variable to LED
Things
DHT11
NodeMCU - NodeMCU 1.0 (ESP-12E Module)
LEDControl
NodeMCU - NodeMCU 1.0 (ESP-12E Module)
Variables
myLED
Boolean
myLED
Thing LEDControl
Type Boolean
Last value -
Permission Read/Write
Update policy On change
Last update null
LINK VARIABLE

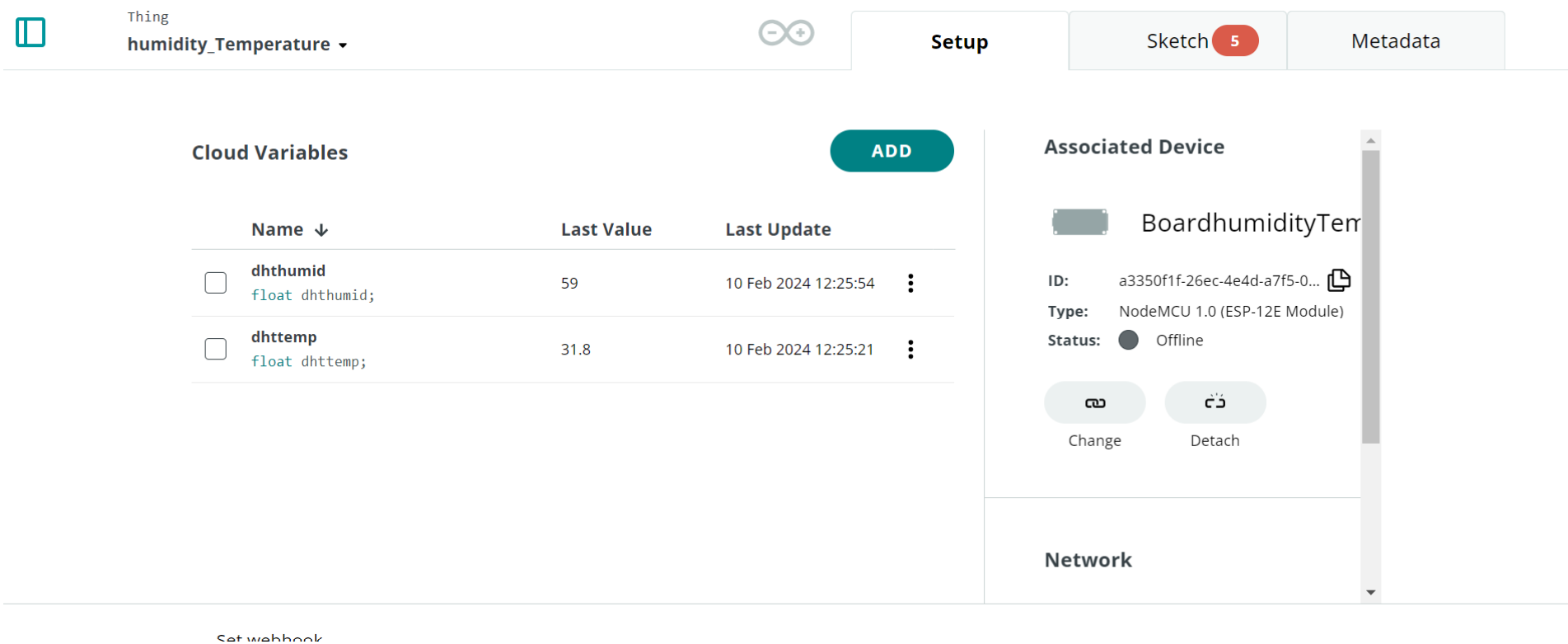

LED
ON

Humidity Temperature NODEMCU

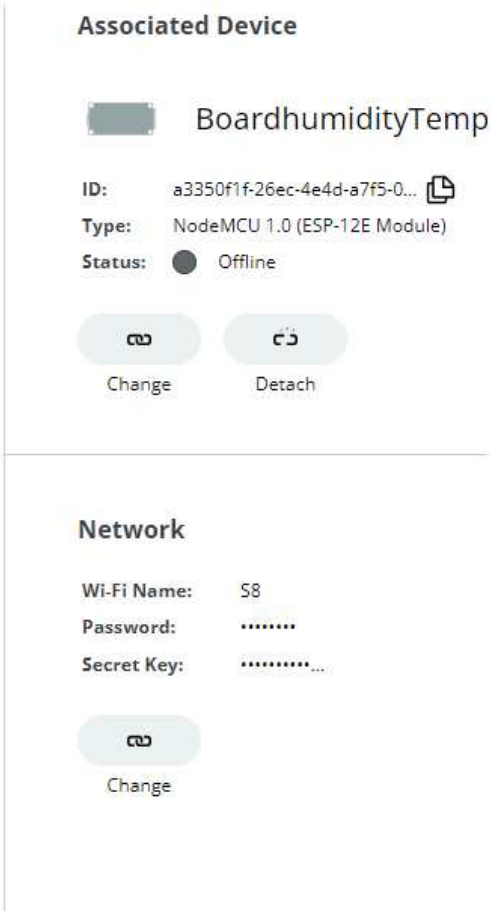
Link Download Agent เพื่อ install ในคอมพิวเตอร์

- https://create.arduino.cc/getting-started/plugin/welcome

สร้าง Thing โดยประกอบด้วย temp และ humidity ดังภาพ



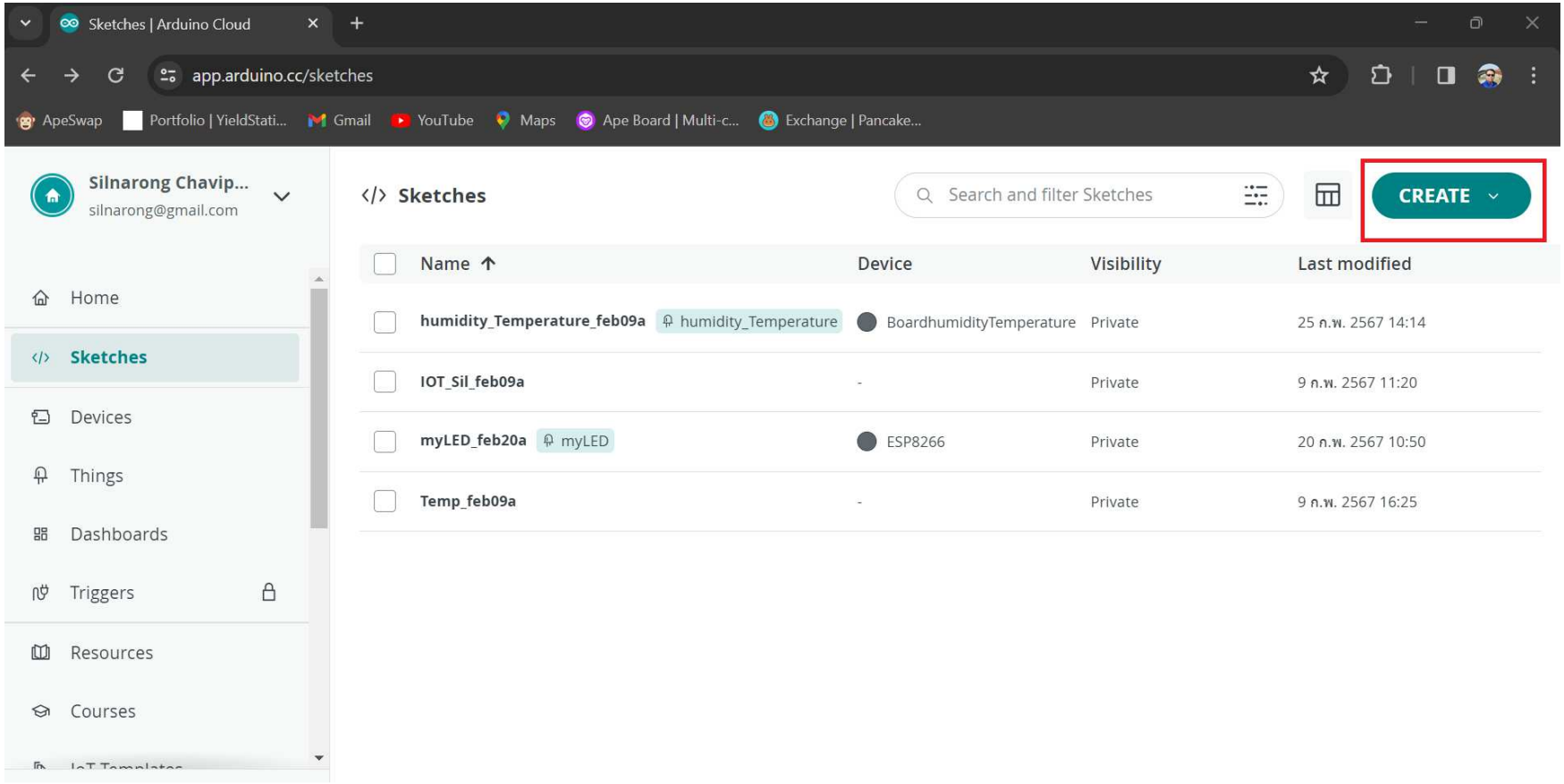
กำหนดค่า Associated Device และ Network ตาม LAB เดิม



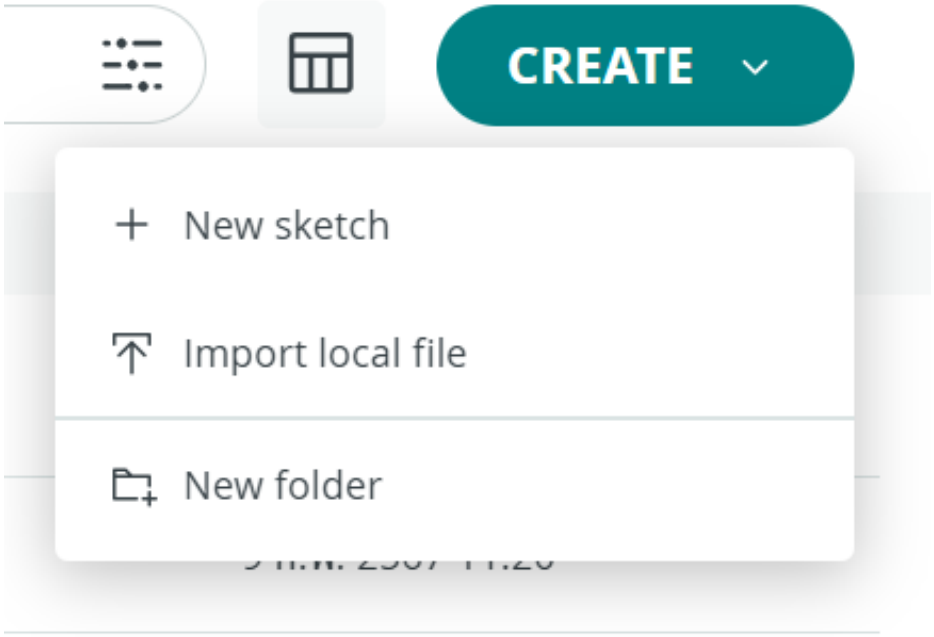
การ Add Library DHT เข้าใน Sketches

- ไปที่เมนู Sketches ที่ใช้ในการเขียน Code ให้ Create Sketches โดย Add Library DHT เข้ามาดังนี้

กด Create ด้านขวาบน



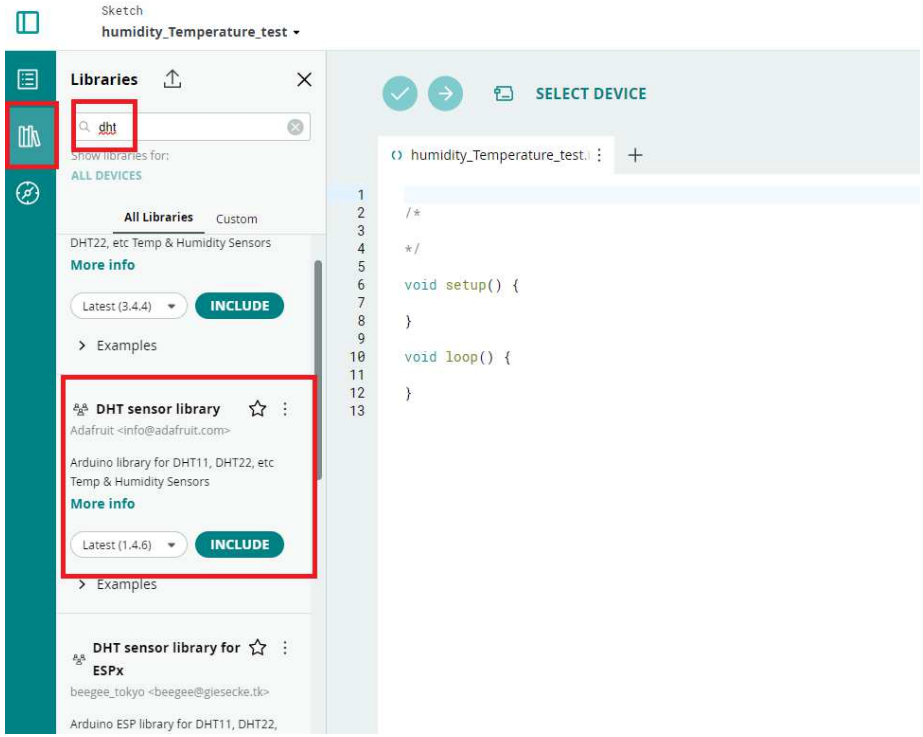
เลือก New Sketch



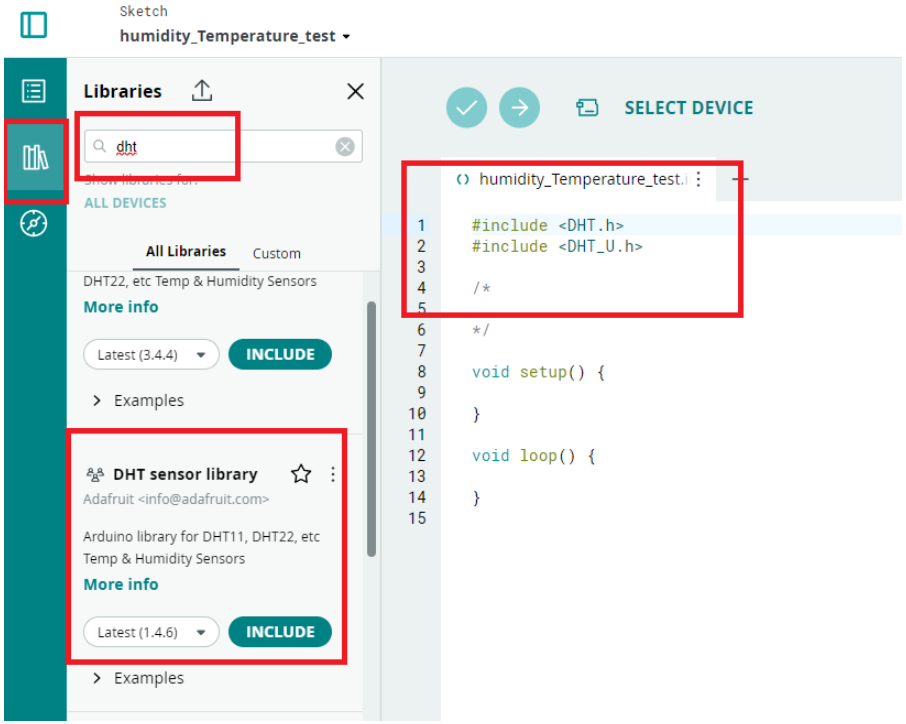
- ตั้งชื่อ Sketch ตามความเหมาะสมในที่นี่กำหนดชื่อ humidity_Temperature_test

กด Icon Libraly ค้นหา Library ชื่อว่า dht ดังภาพ

- ทำการ **Libraly** ให้ **Version** ตรงกับภาพด้านล่าง



เมื่อคลิก Include จะปรากฏ Libraly ตามบรรทัดที่ 1 และ 2

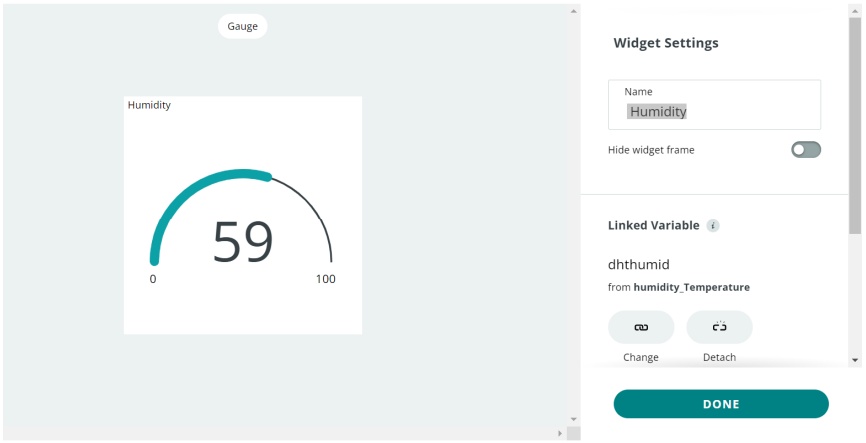


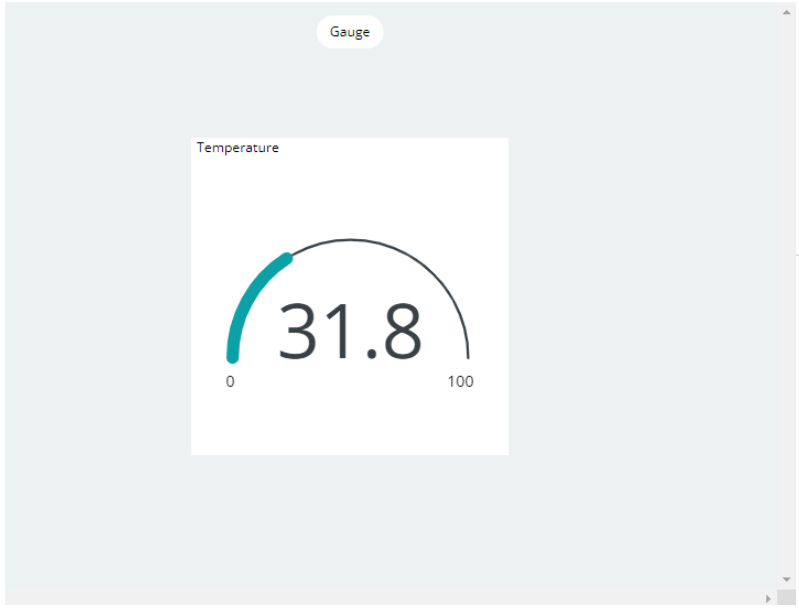
เขียน Code ใน Slide ต่อไป

```
// DHT sensor library - Version: Latest
#include <DHT.h>
#include <DHT_U.h>

#include "thingProperties.h"

DHT dht(13,DHT11);

void setup() {
  // Initialize serial and wait for port to open:
  Serial.begin(9600);
  // This delay gives the chance to wait for a Serial Monitor without blocking if none is found
  delay(1500);

  dht.begin();

  // Defined in thingProperties.h
  initProperties();

  // Connect to Arduino IoT Cloud
  ArduinoCloud.begin(ArduinoIoTPreferredConnection);

  /*
     The following function allows you to obtain more information
     related to the state of network and IoT Cloud connection and errors
     the higher number the more granular information you'll get.
     The default is 0 (only errors).
     Maximum is 4
 */
  setDebugMessageLevel(2);
  ArduinoCloud.printDebugInfo();
}

void loop() {
  ArduinoCloud.update();
  // Your code here
  delay(2000);

  dhttemp = dht.readTemperature();
  dhthumid = dht.readHumidity();

}
```

การตั้งค่า Dash Board

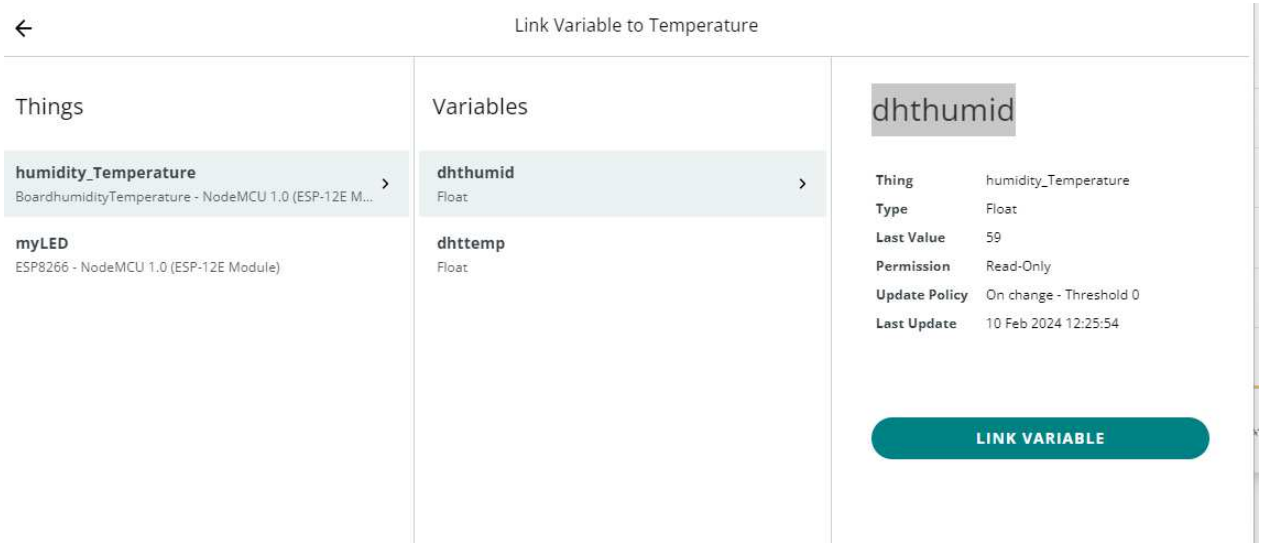
- สร้าง **Dash Board** โดยเลือกเป็นแบบ **Gauge** ทั้ง **Humidity** และ **Temp**





การ Link Variable ของ dhttempe และ dhthumid

- ให้ทำการ **Link Variable** ในแต่ละตัวตรงกับ **Guage** ที่สร้าง
- ให้ **Link** ทั้งสองค่าให้ถูกต้องตามลำดับ

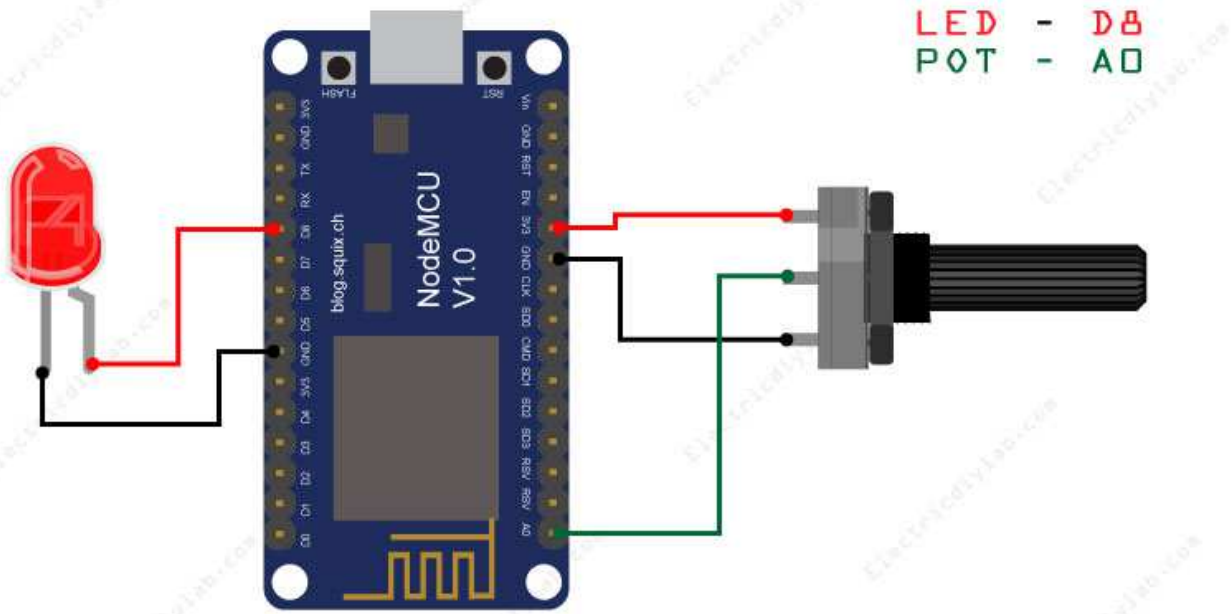


ทดสอบการเชื่อมต่อ

- 1.ติดตั้ง Agent เพื่อเชื่อมต่อบอร์ดกับ Arduino IOT
- 2.เปิด hostspot Wifi
- 3.ดูผลการทดลองผ่าน Dashboard และบนมือถือ

ปิดเปิดไฟและอ่านค่าความต้านทานแบบปรับค่าได

- ต่อวงรจรตามรูป

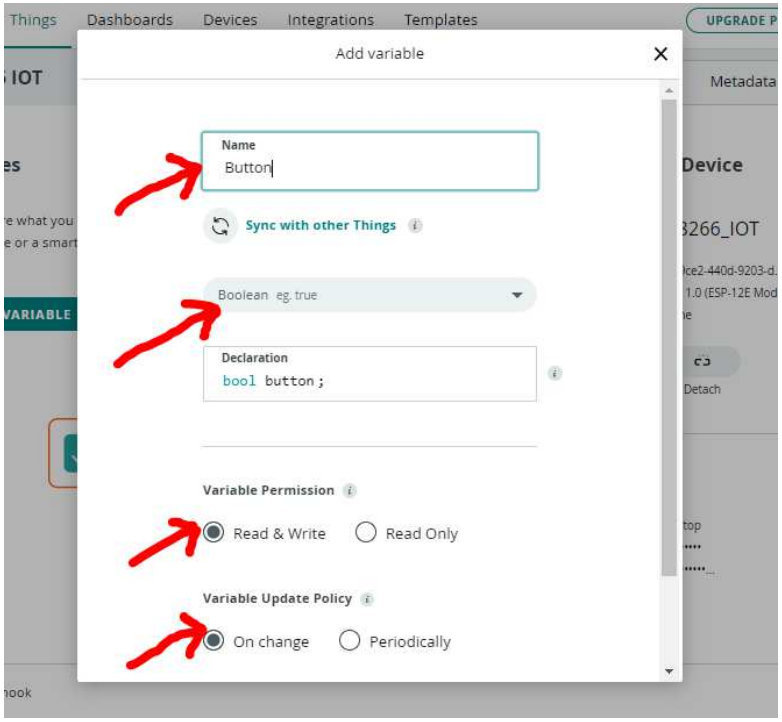


ให้นักศึกษากำหนดค่า

- บอร์ดที่ใช้เชื่อมต่อ
- ค่า Think และการเชื่อมต่อ WiFi

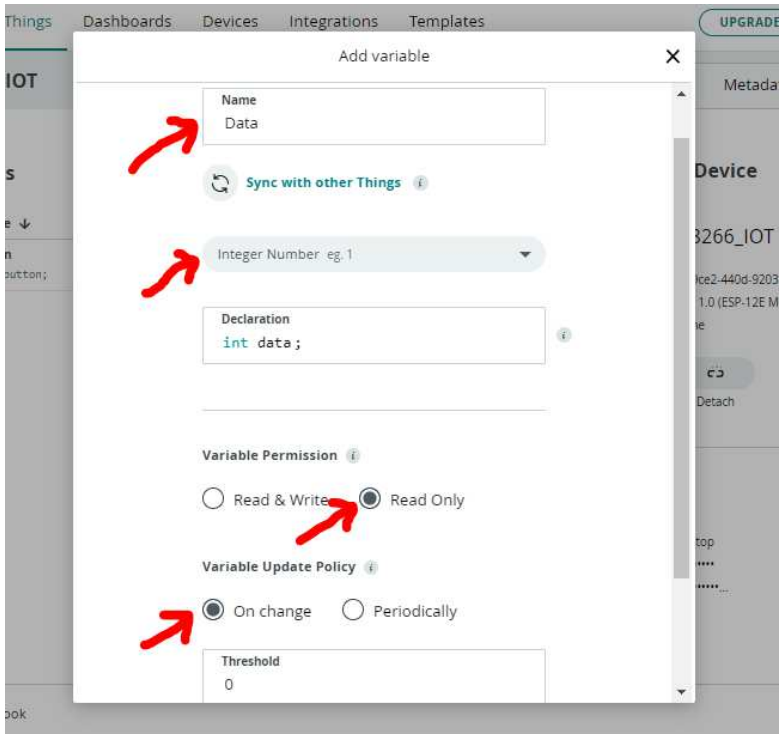
กำหนดค่าตัวแปร

- การกำหนดค่าตัวแปรจะมี 2 ตัวแปร จากรูปวงจรคือมีตัวแปรหลอดไฟ LED และ ตัวต้าทานแบบปรับค่าได้
- ตัวแปรแรกของเราคือ Button ซึ่งจำเป็นสำหรับการเปิด/ปิด Led ที่เชื่อมต่อกับ Esp8266

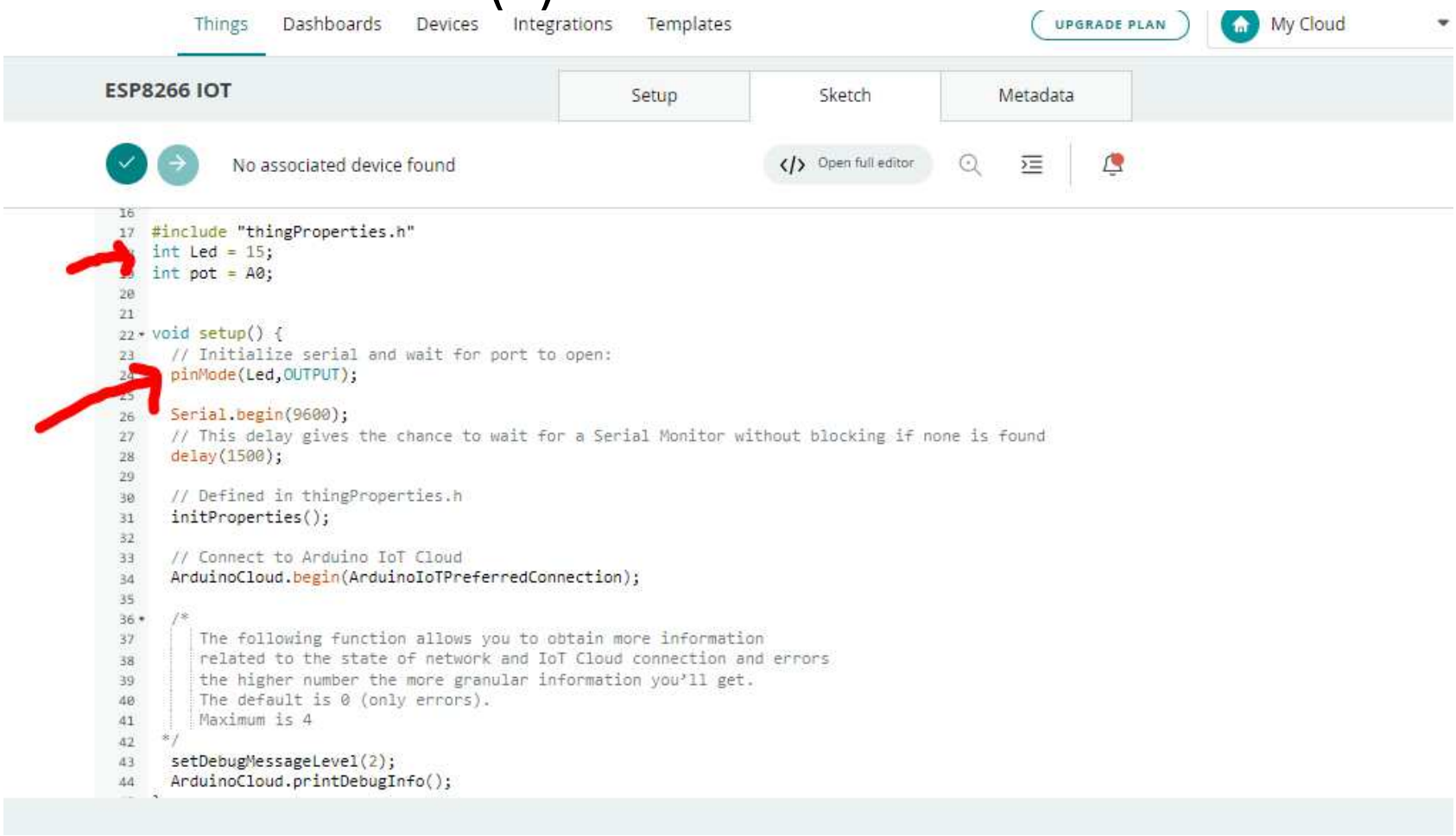


กำหนดค่าตัวแปร

- ตัวแปรที่สองของเรากำหนดชื่อ Data คือให้ตัวต้านทานแบบปรับค่าได้แสดงข้อมูลบนแดชบอร์ดบน Arduino IOT

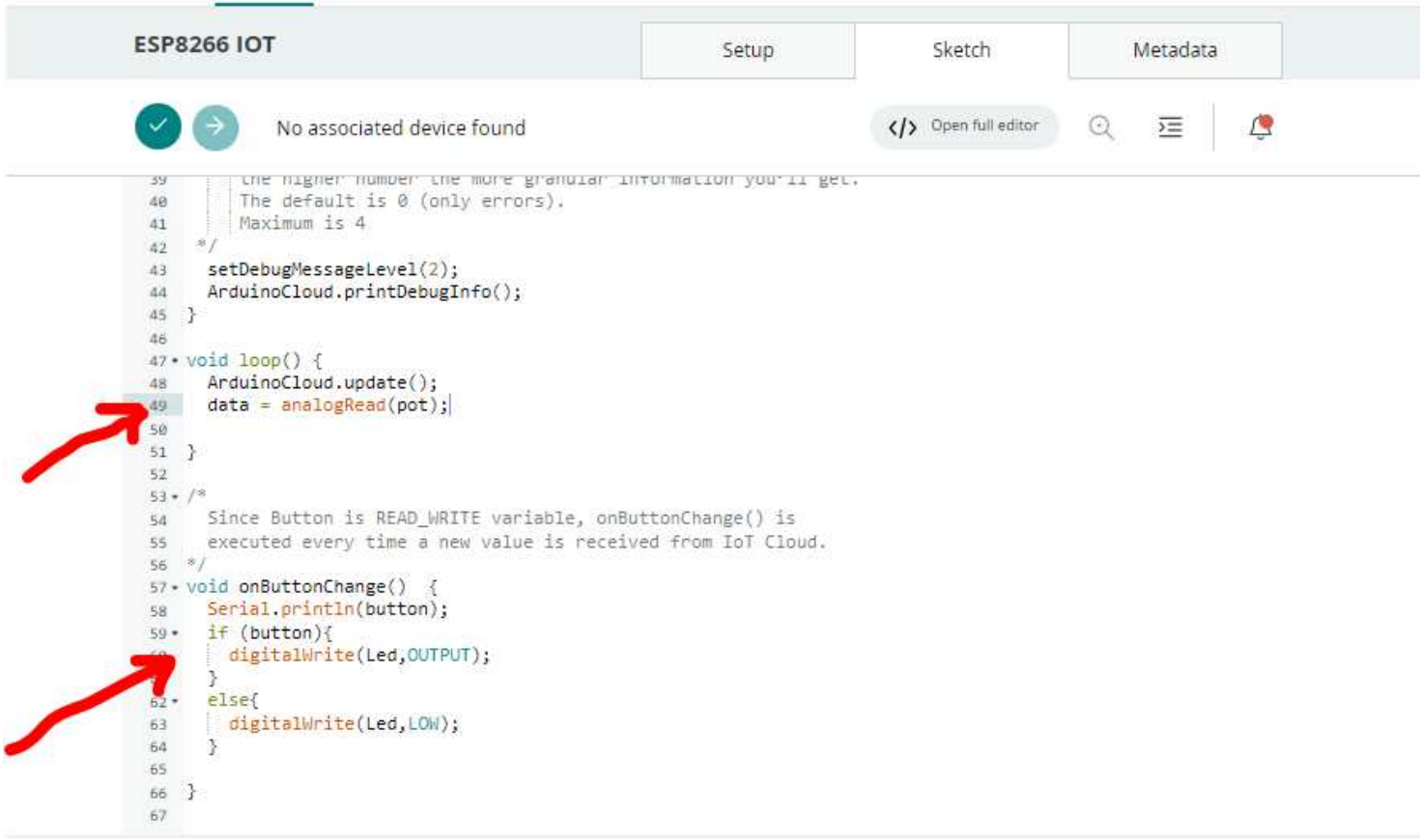


เขียน Code ดังนี้(1)

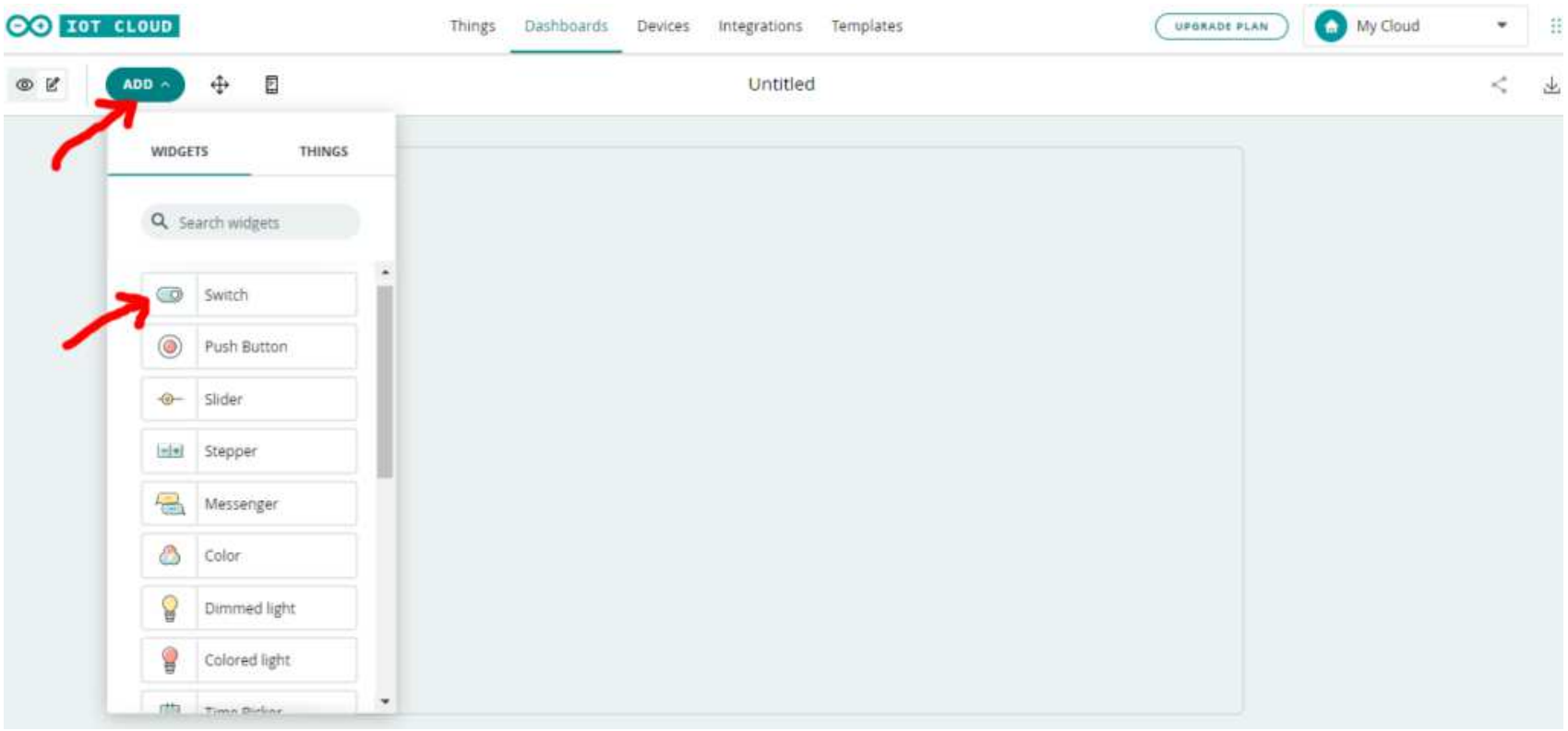



```
#include "thingProperties.h"
int Led = 15;
int pot = A0;


void setup() {
  // Initialize serial and wait for port to open:
  pinMode(Led,OUTPUT);

  Serial.begin(9600);
  // This delay gives the chance to wait for a Serial Monitor without blocking if none is found
  delay(1500);

  // Defined in thingProperties.h
  initProperties();

  // Connect to Arduino IoT Cloud
  ArduinoCloud.begin(ArduinoIoTPreferredConnection);

  /*
     The following function allows you to obtain more information
     related to the state of network and IoT Cloud connection and errors
     the higher number the more granular information you'll get.
     The default is 0 (only errors).
     Maximum is 4
 */
  setDebugMessageLevel(2);
  ArduinoCloud.printDebugInfo();
```

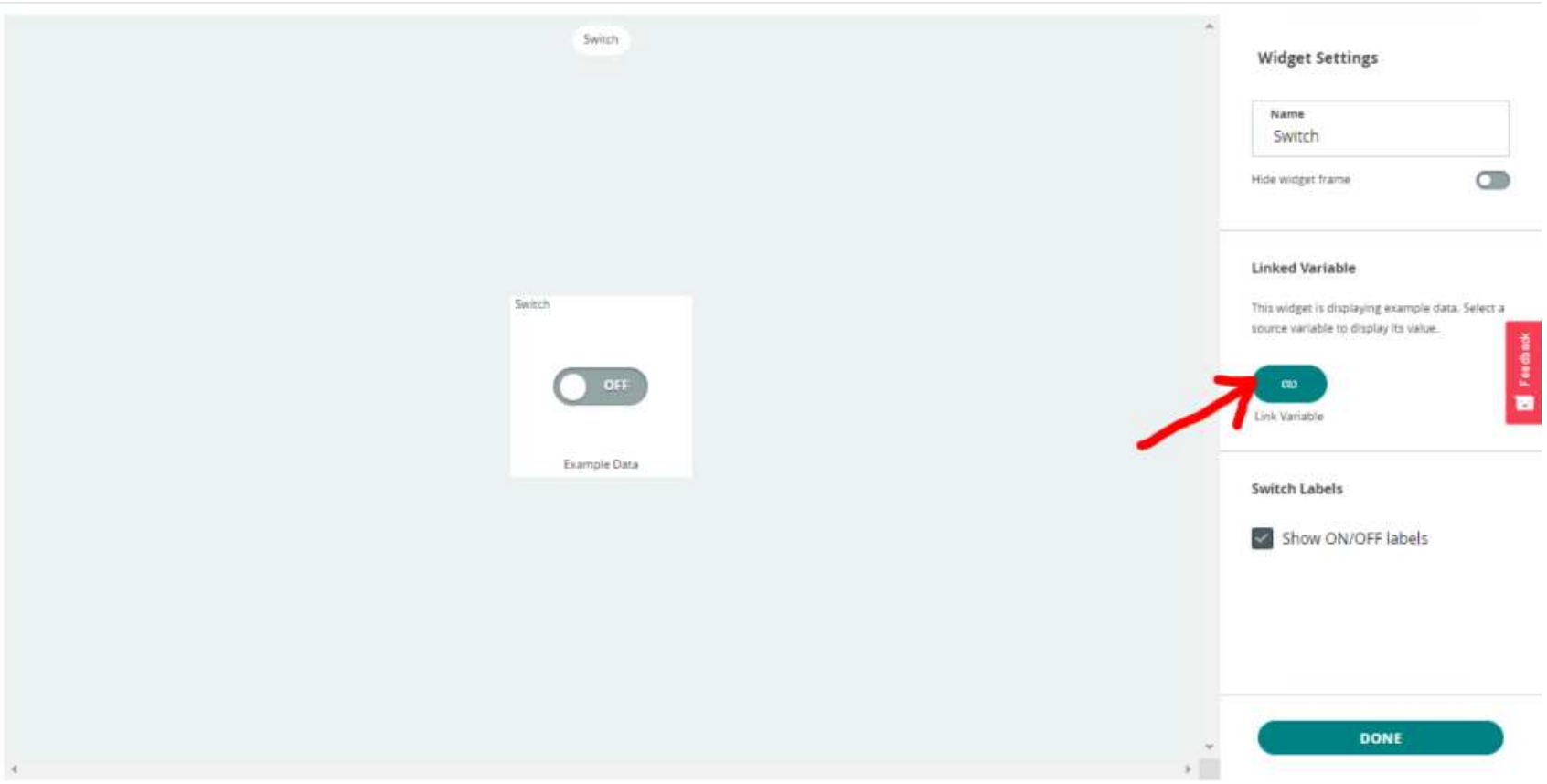
เขียน Code ดังนี้(2)



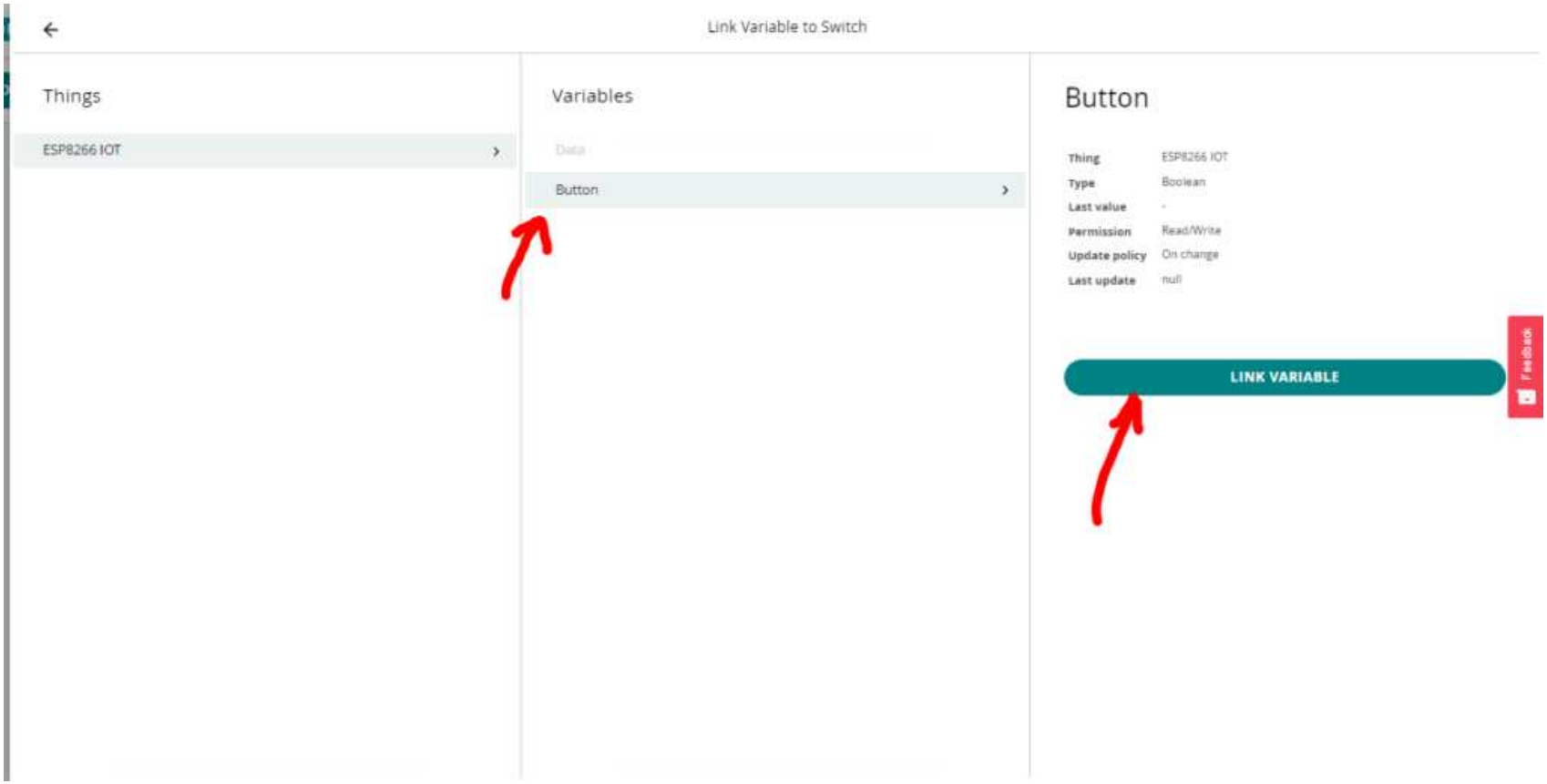
การสร้าง Dashboard - 1



การสร้าง Dashboard - 2



การสร้าง Dashboard - 3



การสร้าง Dashboard - 4

- ทำการเชื่อมต่อ Dashboard ให้ถูกต้องในแต่ละตัวแปร
- และสร้าง Dashboard ที่แสดงผลในส่วนของค่าตัวต้าทานแบบปรับค่าได้

ทดสอบการเชื่อมต่อ

- ดูผลบนหน้าจอคอมพิวเตอร์และบนมือถือของตัวเอง

การสร้าง Dashboard