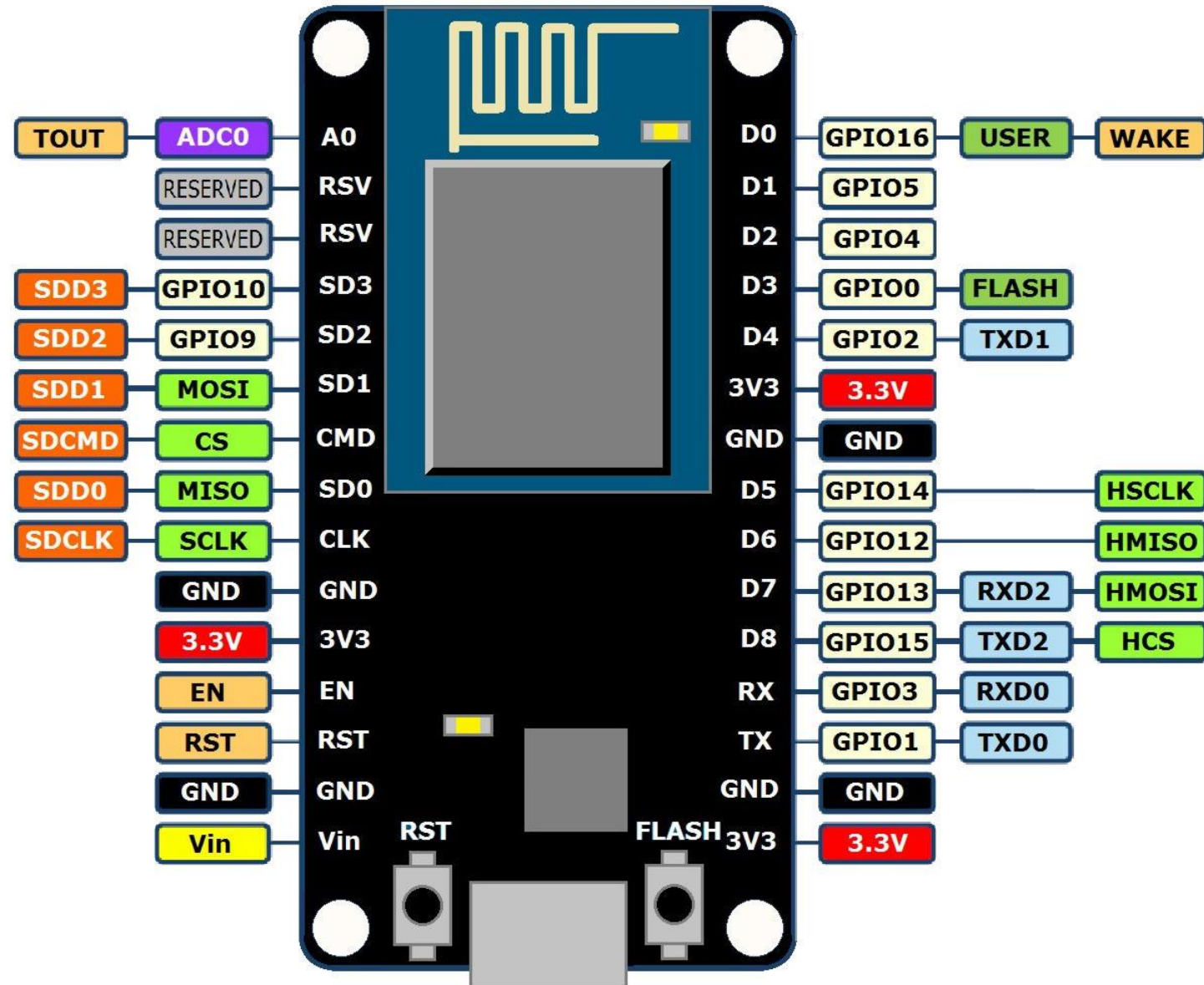


Sensor Suhu dan Kelembaban

Muhammad Iqbal (MIQ)
D3 Teknologi Telekomunikasi
Fakultas Ilmu Terapan
Telkom University

Monitoring Suhu dan Kelembaban

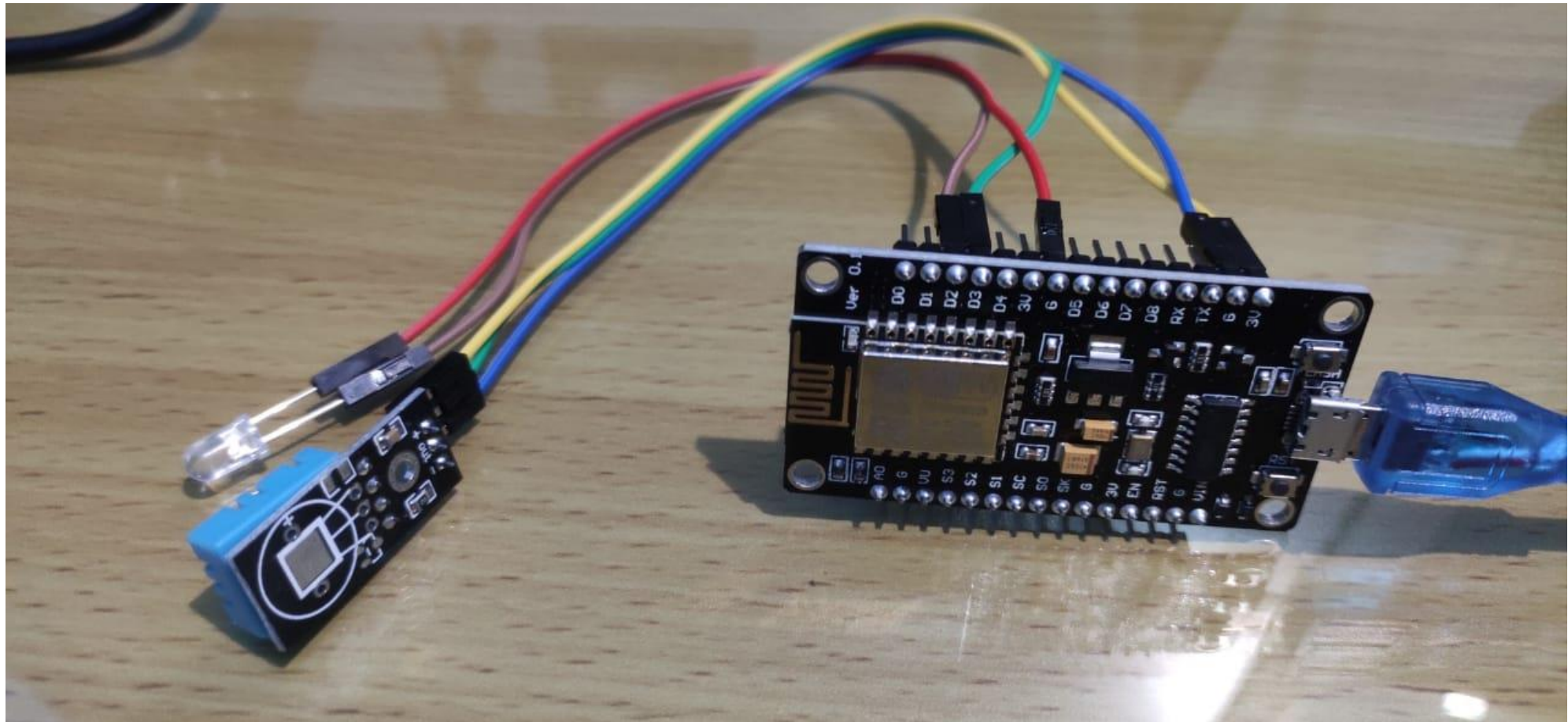
Board NodeMCU



Config Board

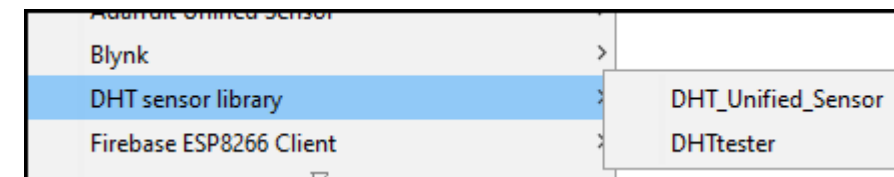
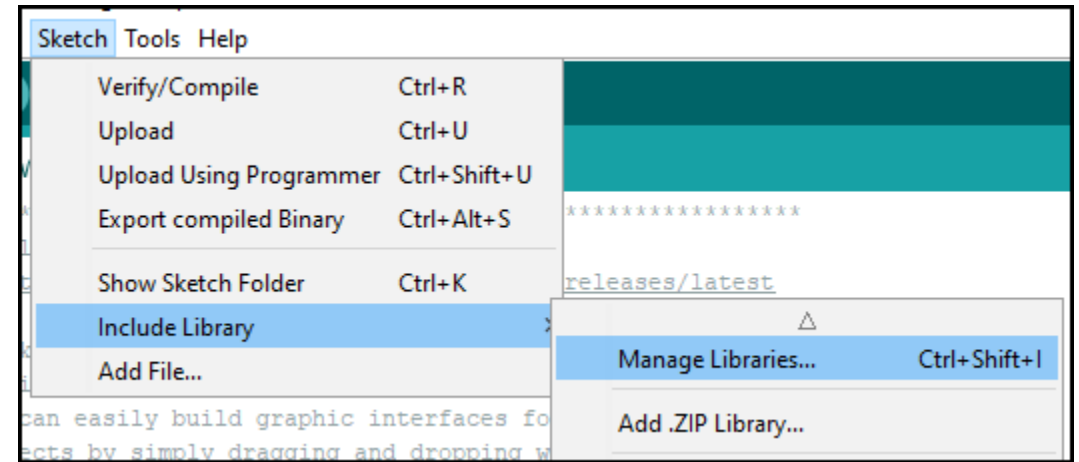
No	DHT	NodeMCU
1	+	3v
2	Out	D3
3	-	G

Config Board



Library DHT

- Menambahkan library DHT
 - DHT sensor library → Install
- File → Examples → DHT



DHT11 Simple

```
#include <DHT.h>

DHT dht(0, DHT11); //Pin, Jenis DHT

void setup(){
  Serial.begin(9600);
  dht.begin();
}

void loop(){
  float kelembaban = dht.readHumidity();
  float suhu = dht.readTemperature();

  Serial.print("kelembaban: ");
  Serial.print(kelembaban);
  Serial.print(" ");
  Serial.print("suhu: ");
  Serial.println(suhu);
}
```


Studi Kasus

- Manfaatkan LED Control jika mencapai suhu tertentu, LED akan menyala

Control LED with DHT11

Config Board

No	DHT	NodeMCU
1	+	3v
2	Out	D3
3	-	G

No	LED	NodeMCU
1	- (kaki pendek)	G
2	+ (kaki Panjang)	D2

DHT11+LED Control

```
#include "DHT.h" //Memasukan Library DHT ke Program

#define DHTPIN 2 //menggunakan pin 2 untuk pemasangan sensornya

#define DHTTYPE DHT11 //memilih tipe DHT11, bisa diubah menjadi DHT22, DHT21

DHT dht(DHTPIN, DHTTYPE); //setting pin yang dipilih dan tipe DHT

int led = 13;

void setup() {
  Serial.begin(9600); //komunikasi Serial dengan komputer

  dht.begin(); //Komunikasi DHT dengan Arduino

  pinMode(led, OUTPUT);
}

void loop() {
  float kelembaban = dht.readHumidity(); //menyimpan nilai Humidity pada variabel kelembaban

  float suhu = dht.readTemperature(); //menyimpan nilai Temperature pada variabel suhu

  Serial.print(" Kelembaban: "); //menampilkan tulisan Kelembaban di Serial Monitor

  Serial.print(kelembaban); //menampilkan nilai kelembaban

  Serial.print(" Suhu: "); //menampilkan tulisan suhu

  Serial.println(suhu); //menampilkan nilai suhu

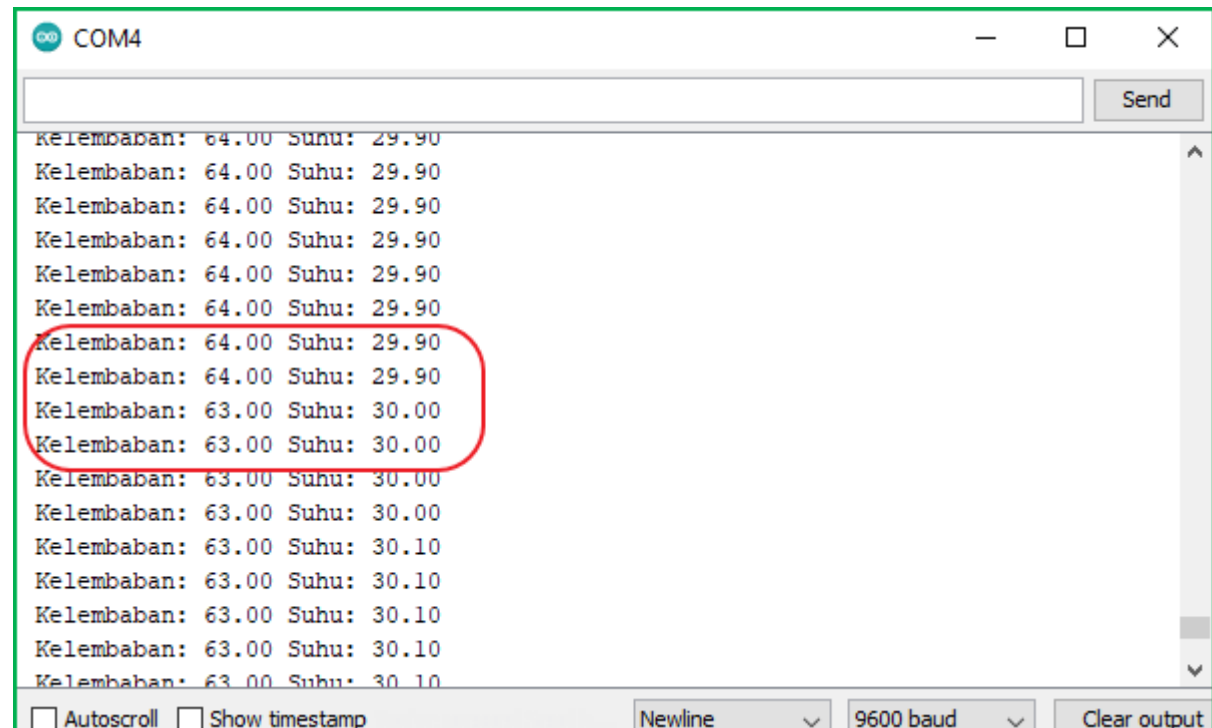
  delay(500); //memberi jeda waktu baca selama 500 mili detik

  if (suhu >= 32) {
    digitalWrite(led, HIGH);
  }
  if (suhu < 32) {
    digitalWrite(led, LOW);
  }
}
```

LED akan menyala jika threshold sudah tercapai
Skenario ini suhu >30 led akan ON, dibawah <30 led akan OFF

Control LED

- Pada saat suhu berubah dari menjadi 30, maka LED akan menyala



```
COM4  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 64.00 Suhu: 29.90  
Kelembaban: 63.00 Suhu: 30.00  
Kelembaban: 63.00 Suhu: 30.00  
Kelembaban: 63.00 Suhu: 30.00  
Kelembaban: 63.00 Suhu: 30.00  
Kelembaban: 63.00 Suhu: 30.10  
Kelembaban: 63.00 Suhu: 30.10  
Kelembaban: 63.00 Suhu: 30.10  
Kelembaban: 63.00 Suhu: 30.10  
Kelembaban: 63.00 Suhu: 30.10  
Kelembaban: 63.00 Suhu: 30.10
```

Autoscroll Show timestamp Newline 9600 baud Clear output

DHT with ThinkSpeak

Config Board

No	DHT	NodeMCU
1	+	3v
2	Out	D3
3	-	G

```

DHT11_ThinkSpeak
#include <DHT.h>
#include <DHT_U.h>

#include <DHT.h> // Including library for dht

#include <ESP8266WiFi.h>

String apiKey = "R4ISOI6FBPH7UWTH"; // Enter your Write API key from ThingSpeak

const char *ssid = "Baymax"; // replace with your wifi ssid and wpa2 key
const char *pass = "12345678";
const char* server = "api.thingspeak.com";

#define DHTPIN 0 //pin where the dht11 is connected

DHT dht(DHTPIN, DHT11);

WiFiClient client;

void setup()
{
    Serial.begin(115200);
    delay(10);
    dht.begin();

    Serial.println("Connecting to ");
    Serial.println(ssid);

    WiFi.begin(ssid, pass);

    while (WiFi.status() != WL_CONNECTED)
    {
        delay(500);
        Serial.print(".");
    }
    Serial.println("");
    Serial.println("WiFi connected");
}

void loop()
{
    float h = dht.readHumidity();
    float t = dht.readTemperature();

    if (isnan(h) || isnan(t))

```

```

void loop()
{
    float h = dht.readHumidity();
    float t = dht.readTemperature();

    if (isnan(h) || isnan(t))
    {
        Serial.println("Failed to read from DHT sensor!");
        return;
    }

    if (client.connect(server, 80) // "184.106.153.149" or api.thingspeak.com
    {
        String postStr = apiKey;
        postStr += "&field1=";
        postStr += String(t);
        postStr += "&field2=";
        postStr += String(h);
        postStr += "\r\n\r\n";

        client.print("POST /update HTTP/1.1\n");
        client.print("Host: api.thingspeak.com\n");
        client.print("Connection: close\n");
        client.print("X-THINGSPEAKAPIKEY: "+apiKey+"\n");
        client.print("Content-Type: application/x-www-form-urlencoded\n");
        client.print("Content-Length: ");
        client.print(postStr.length());
        client.print("\n\n");
        client.print(postStr);

        Serial.print("Temperature: ");
        Serial.print(t);
        Serial.print(" degrees Celcius, Humidity: ");
        Serial.print(h);
        Serial.println("% . Send to Thingspeak.");
    }

    client.stop();

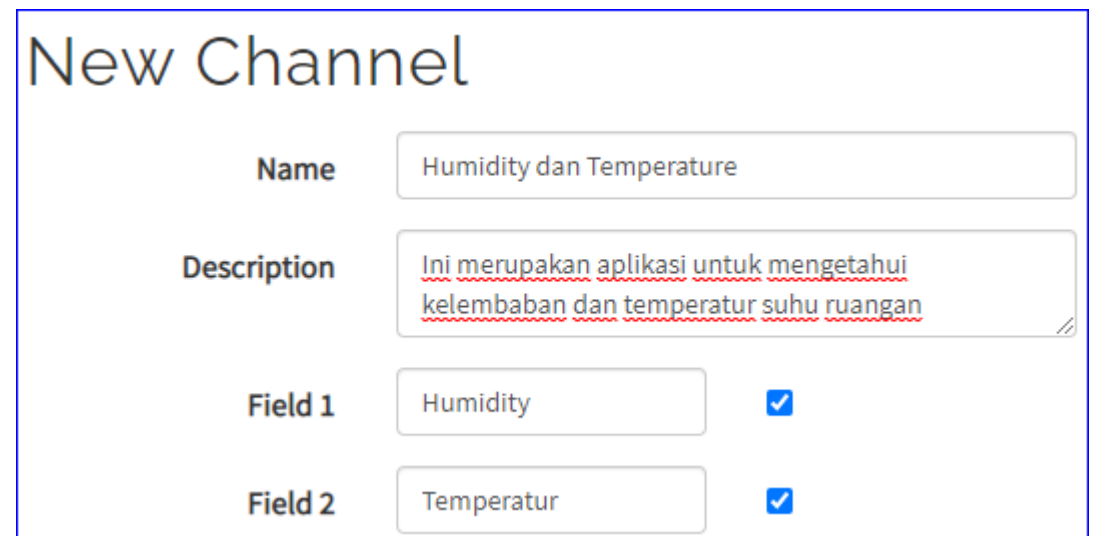
    Serial.println("Waiting...");

    // thingspeak needs minimum 15 sec delay between updates
    delay(1000);
}

```


ThinkSpeak

- Login Akun pada thinkspeak : <https://thingspeak.com/>
- Create a New Channel
- Isikan kolom Name, Description, Field 1 dan Field 2



New Channel


Name	<input type="text" value="Humidity dan Temperature"/>
Description	<input type="text" value="Ini merupakan aplikasi untuk mengetahui kelembaban dan temperatur suhu ruangan"/>
Field 1	<input type="text" value="Humidity"/> <input checked="" type="checkbox"/>
Field 2	<input type="text" value="Temperatur"/> <input checked="" type="checkbox"/>

Widget

- Add Widgets
 - Pilih Numeric Display

Click on a widget to add it to the Channel

Gauge




Numeric Display

1516.12

DB

Lamp Indicator



Next Cancel

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

+ Add Visualizations + Add Widgets Export recent data

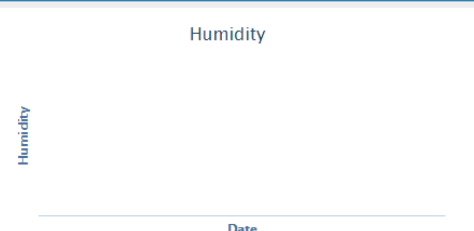
MATLAB Analysis MATLAB Visualization

Channel Stats

Created: about a minute ago
Entries: 0

Field 1 Chart


Humidity



Date ThingSpeak.com

Field 2 Chart

Temp



Date ThingSpeak.com

Temperature Options

Name: Temperature

Field: Field 1

Update Interval: 15 second(s)

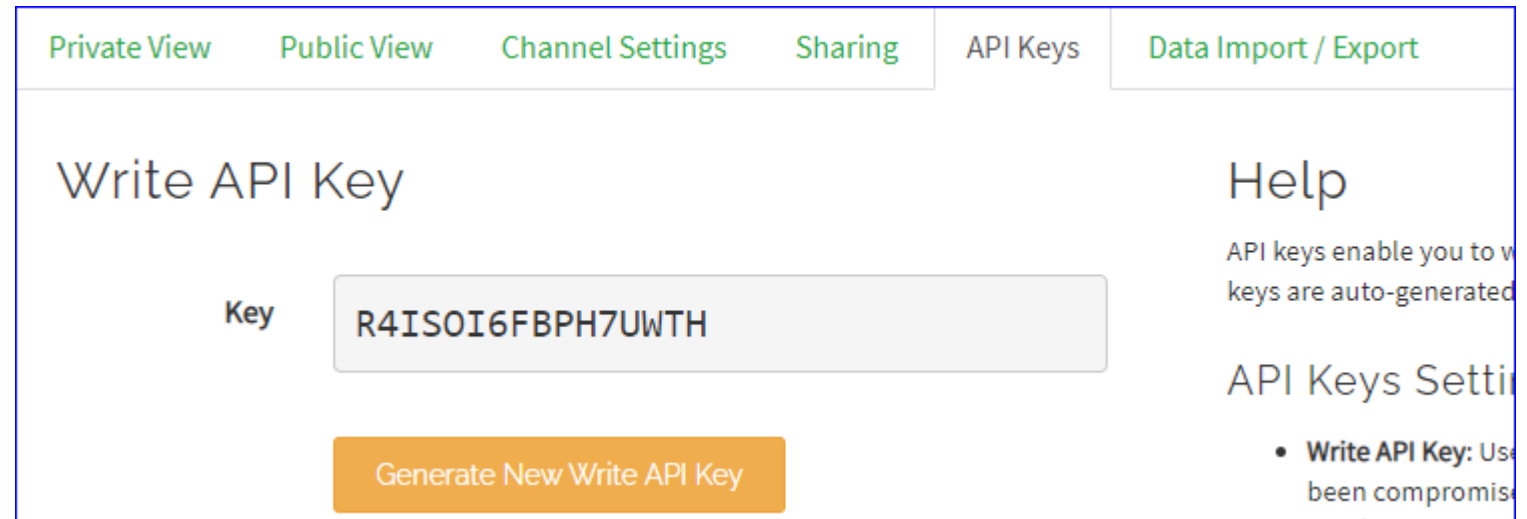
Units: Enter Measurement Units

Data Type: Integer Decimal 1 (# of places)

Save Cancel

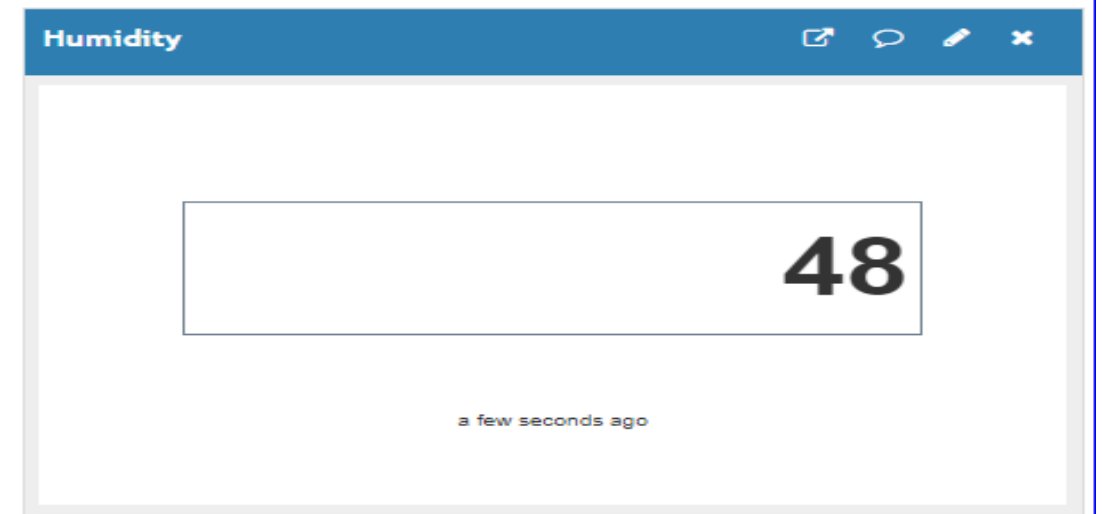
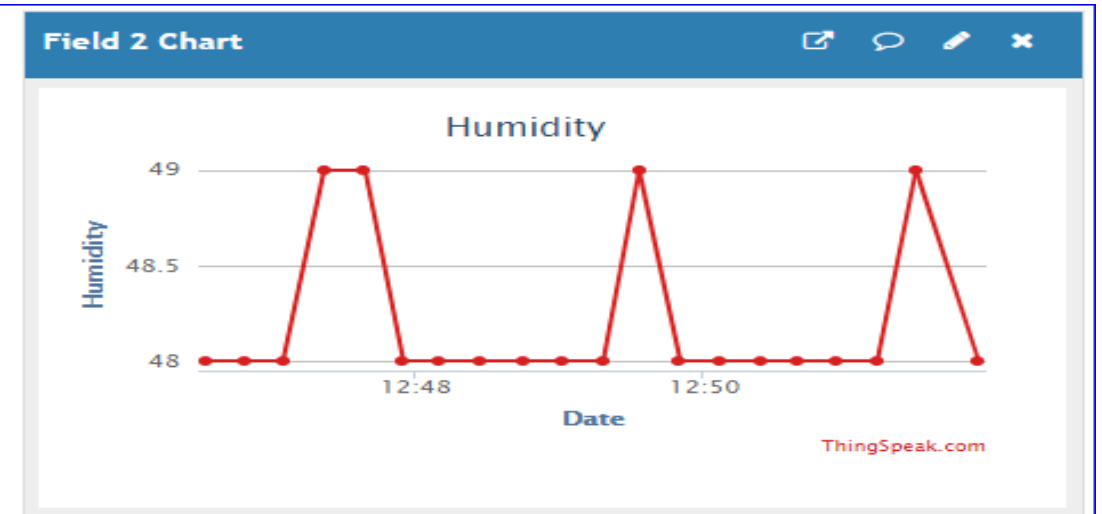
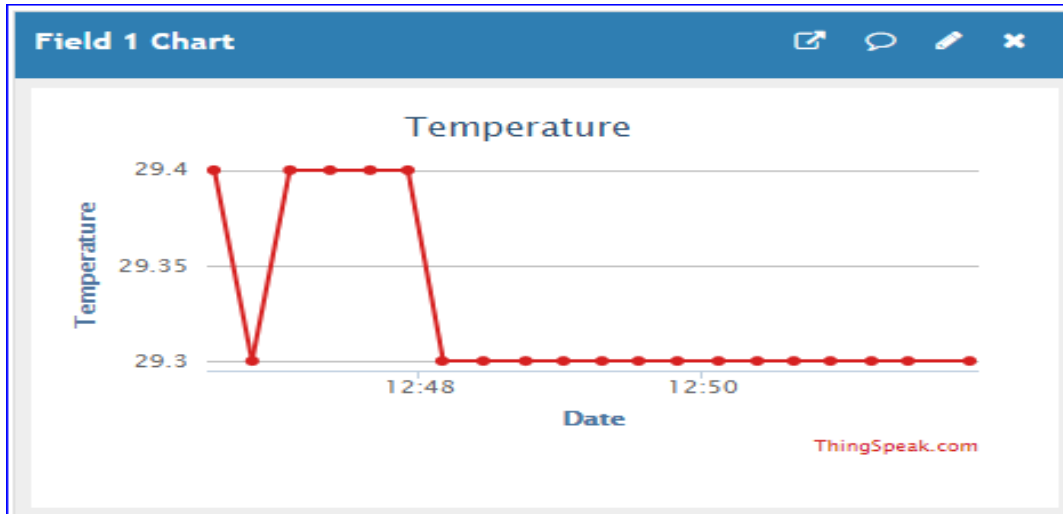
Keys / Token

- API Keys digunakan pada script di Arduino IDE, pada line “String api-Key”



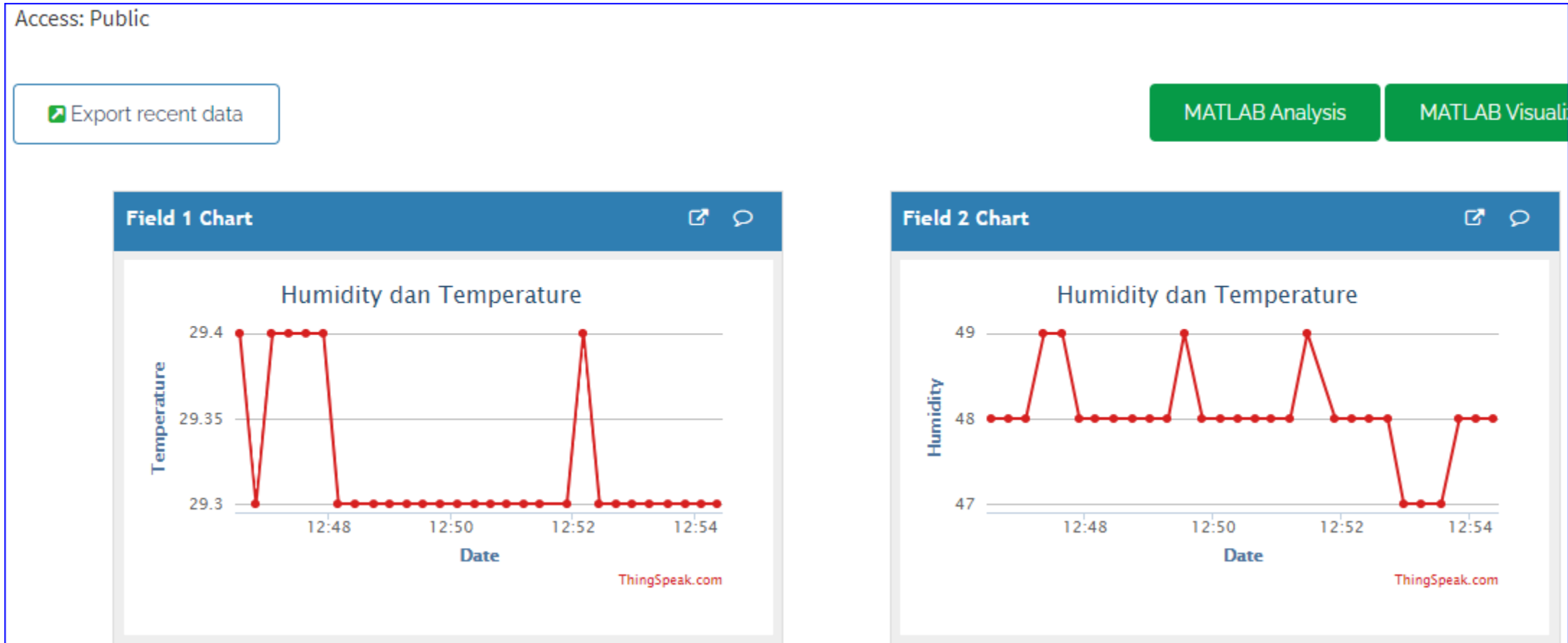
The screenshot shows a web interface for managing API keys. At the top, there are navigation tabs: Private View, Public View, Channel Settings, Sharing, API Keys (selected), and Data Import / Export. The main content area is titled 'Write API Key' and features a text input field labeled 'Key' containing the alphanumeric string 'R4ISOI6FBPH7UWTH'. Below the input field is an orange button labeled 'Generate New Write API Key'. To the right of the main content, there is a 'Help' section with text explaining that API keys enable users to work with data and that keys are auto-generated. Below the help text is a section titled 'API Keys Settings' with a bullet point that reads 'Write API Key: Use' followed by text that is partially cut off.

Output ThinkSpeak



Sharing Public View

- <https://thingspeak.com/channels/1386339>



Terima Kasih