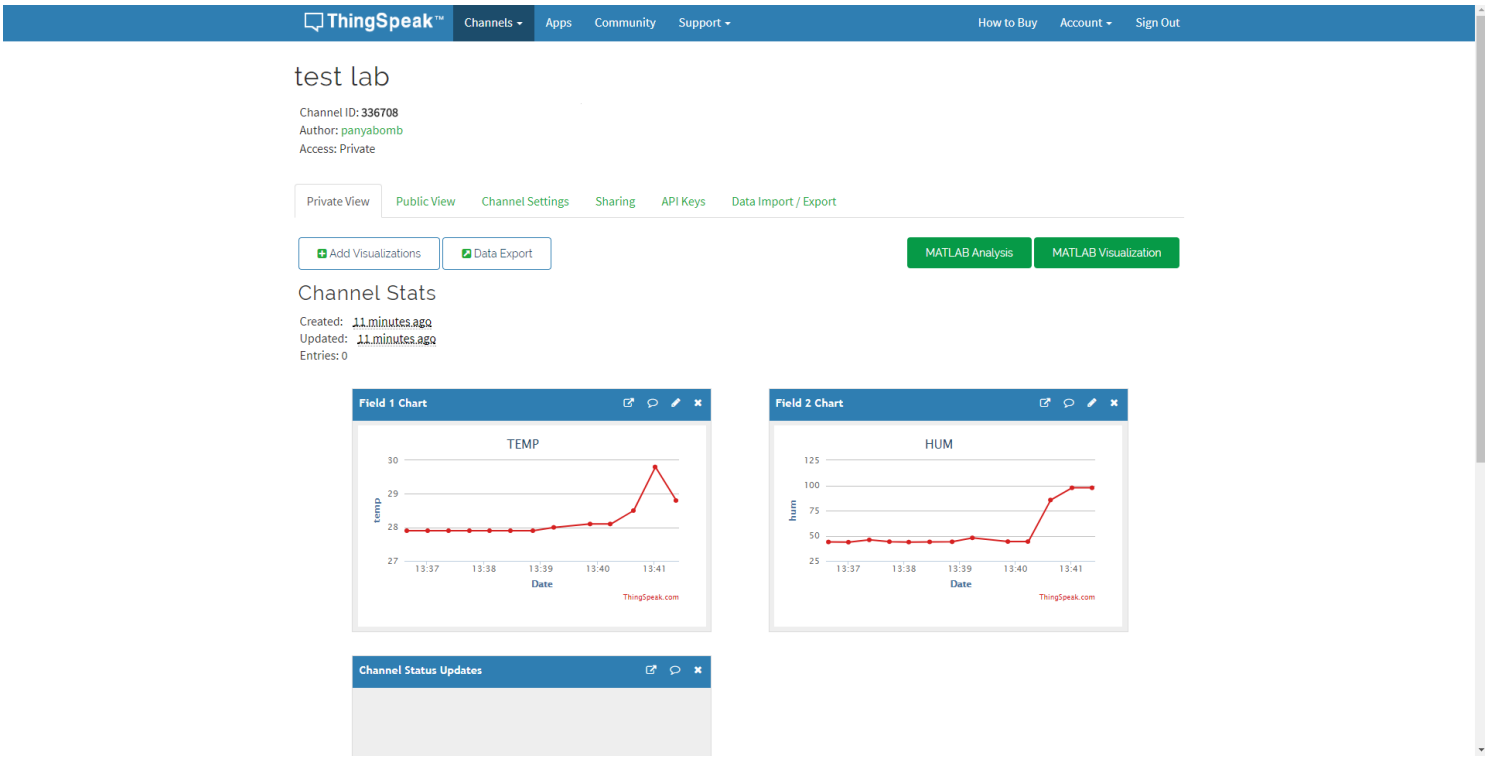
LAB 8 Thingspeak

ภาพการทำงาน



Code

```
#include <LiquidCrystal_I2C.h>

#include "DHT.h"

#include <ESP8266WiFi.h>

#define PUMP_RLY 4    // output drive relay for pump GPIO4 (D2)

#define DHTPIN 2     // what pin we're connected to GPIO2 (D4)

#define DHTTYPE DHT22   // DHT 11
```

```
#define DEBUG
#define DEBUG_PRINTER Serial
#ifdef DEBUG
#define DEBUG_PRINT(...) { DEBUG_PRINTER.print(__VA_ARGS__); }
#define DEBUG_PRINTLN(...) { DEBUG_PRINTER.println(__VA_ARGS__); }
#else
#define DEBUG_PRINT(...) {}
#define DEBUG_PRINTLN(...) {}
#endif
const char* ssid     = "FITM WiFi";
const char* password = "";
DHT *dht;
void connectWifi();
void reconnectWifiIfLinkDown();
void initDht(DHT **dht, uint8_t pin, uint8_t dht_type);
void readDht(DHT *dht, float *temp, float *humid);
void uploadThingsSpeak(float t, float h);
void setup() {
    Serial.begin(115200);
    delay(10);
    pinMode(PUMP_RLY, OUTPUT); // Initialize the PUMP_RLY(4) pin as an output
    digitalWrite(PUMP_RLY, HIGH);// Make sure relay is normal off

    connectWifi();
```

```
    initDht(&dht, DHTPIN, DHTTYPE);}


void loop() {
    static float t_dht;
    static float h_dht;
    readDht(dht, &t_dht, &h_dht);
    if(t_dht > 29) // condition for make relay on
    {
      digitalWrite(PUMP_RLY, HIGH); //If condition true do this!
    } else
    {
      digitalWrite(PUMP_RLY, LOW);
    }
    uploadThingsSpeak(t_dht, h_dht);


    // Wait a few seconds between measurements.
    delay(10 * 1000);
    reconnectWifiIfLinkDown();
}


void reconnectWifiIfLinkDown() {
    if (WiFi.status() != WL_CONNECTED) {
        DEBUG_PRINTLN("WIFI DISCONNECTED");
        connectWifi();
    }
```

```
}
void connectWifi() {
    DEBUG_PRINTLN();
    DEBUG_PRINTLN();
    DEBUG_PRINT("Connecting to ");
    DEBUG_PRINTLN(ssid);

    WiFi.begin(ssid, password);
    while (WiFi.status() != WL_CONNECTED) {
        delay(500);
        DEBUG_PRINT(".");
    }
    DEBUG_PRINTLN("");
    DEBUG_PRINTLN("WiFi connected");
    DEBUG_PRINTLN("IP address: ");
    DEBUG_PRINTLN(WiFi.localIP());
}

void initDht(DHT **dht, uint8_t pin, uint8_t dht_type) {
    // Connect pin 1 (on the left) of the sensor to +5V
    // NOTE: If using a board with 3.3V logic like an Arduino Due connect pin 1
    // to 3.3V instead of 5V!
    // Connect pin 2 of the sensor to whatever your DHTPIN is
    // Connect pin 4 (on the right) of the sensor to GROUND
    // Connect a 10K resistor from pin 2 (data) to pin 1 (power) of the sensor
```

```
    // Initialize DHT sensor for normal 16mhz Arduino
    // NOTE: For working with a faster chip, like an Arduino Due or Teensy, you
    // might need to increase the threshold for cycle counts considered a 1 or 0.
    // You can do this by passing a 3rd parameter for this threshold.  It's a bit
    // of fiddling to find the right value, but in general the faster the CPU the
    // higher the value.  The default for a 16mhz AVR is a value of 6.  For an
    // Arduino Due that runs at 84mhz a value of 30 works.
    // Example to initialize DHT sensor for Arduino Due:
    //DHT dht(DHTPIN, DHTTYPE, 30);

    *dht = new DHT(pin, dht_type, 30);
    (*dht)->begin();
    DEBUG_PRINTLN(F("DHTxx test!"))  ;
}

void uploadThingsSpeak(float t, float h) {
    static const char* host = "api.thingspeak.com"; /////////////////
    static const char* apiKey = "96GE1TH5YPRL2GRM"; ///////////////////////

    // Use WiFiClient class to create TCP connections
    WiFiClient client;
    const int httpPort = 80;
    if (!client.connect(host, httpPort)) {
        DEBUG_PRINTLN("connection failed");
```

```
        return;
    }
    // We now create a URI for the request
    String url = "/update/";
    //  url += streamId;
    url += "?key=";
    url += apiKey;
    url += "&field1=";
    url += t;
    url += "&field2=";
    url += h;

    DEBUG_PRINT("Requesting URL: ");
    DEBUG_PRINTLN(url);

    // This will send the request to the server
    client.print(String("GET ") + url + " HTTP/1.1\r\n" +
                 "Host: " + host + "\r\n" +
                 "Connection: close\r\n\r\n");
}
void readDht(DHT *dht, float *temp, float *humid) {

    if (dht == NULL) {
        DEBUG_PRINTLN(F("[dht11] is not initialised. please call initDht() first."));
        return;
```

```
}

// Reading temperature or humidity takes about 250 milliseconds!
// Sensor readings may also be up to 2 seconds 'old' (its a very slow sensor)
float h = dht->readHumidity();

// Read temperature as Celsius
float t = dht->readTemperature();
// Read temperature as Fahrenheit
float f = dht->readTemperature(true);

// Check if any reads failed and exit early (to try again).
if (isnan(h) || isnan(t) || isnan(f)) {
    DEBUG_PRINTLN("Failed to read from DHT sensor!");
    return;
}

// Compute heat index
// Must send in temp in Fahrenheit!
float hi = dht->computeHeatIndex(f, h);

DEBUG_PRINT("Humidity: ");
DEBUG_PRINT(h);
DEBUG_PRINT(" %\t");
DEBUG_PRINT("Temperature: ");
```

```
    DEBUG_PRINT(t);
    DEBUG_PRINT(" *C ");
    DEBUG_PRINT(f);
    DEBUG_PRINT(" *F\t");
    DEBUG_PRINT("Heat index: ");
    DEBUG_PRINT(hi);
    DEBUG_PRINTLN(" *F");


    *temp = t;
    *humid = h;
}
```