Automated Irrigation system Applied in Crop Farming (ITC's Green House)

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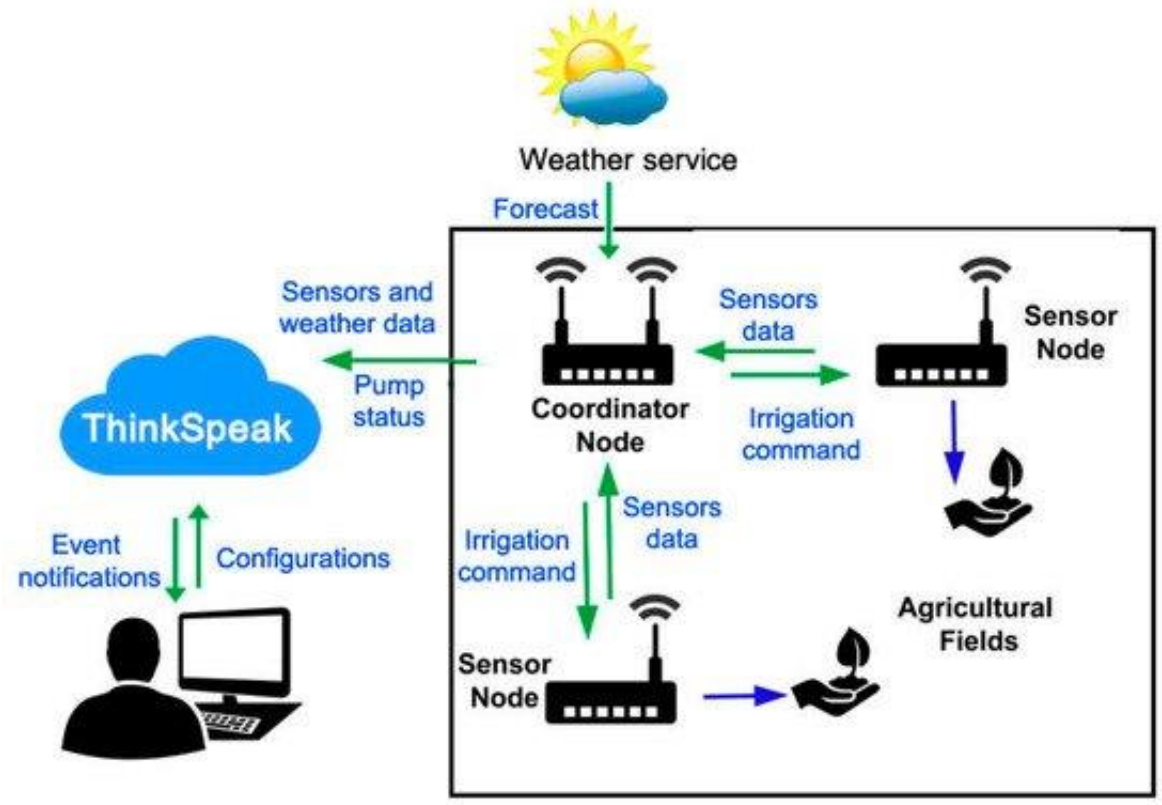
Department : I3 GTR

Project Analysis

❖ The Composition of the system

The system is composed mainly of three parts:

Cloud Platform, Coordinator Node, and Sensor Nodes …



Project Analysis

❖ Planning for first month

Week 1 6 Aug – 13 Aug	Week2 14 Aug – 20 Aug	Week3 21 Aug – 27 Aug	Week4 28 Aug – 3 Sep
Researching Code and test with dht11 Create charnel Thingspeak and testing.	To understand problem of code, Using Wi-Fi with username Combine code with coordinator and testing then send data to Thingspeak.	Collect data from Greenhouse send to Thingspeak And show all the result of Temperature (T1+T2) Or another Sensor on thingspeak.	Need to Complete planning of first month and continue working for second month to use Camera in greenhouse.
Missing: testing some error, problem to understand something in code	Not ready combine code with coordinator yet.		

Project Analysis

❑ Outline

- Results testing ESP8266 with coordinator
- Testing Send Data From Arduino to NodeMCU
- Code for Send Data From Arduino to NodeMCU
- Testing NodeMCU send data to thingspeak.

Project Analysis

❖ Results Testing ESP8266 with Coordinator

Testing collect data from node2 and send to thingspeak by delay 2mn.

	A	B	C	D	E	F	G	H	I
3357	2020-09-25 17:21:43 UTC	3356				30.1	75.1	NAN	NAN
3358	2020-09-25 17:23:43 UTC	3357				30	75.1	NAN	NAN
3359	2020-09-25 17:25:43 UTC	3358				30	75.1	NAN	NAN
3360	2020-09-25 17:27:43 UTC	3359				30	75.1	NAN	NAN
3361	2020-09-25 17:29:43 UTC	3360				30.1	75.2	NAN	NAN
3362	2020-09-25 17:31:43 UTC	3361				30.1	75.2	NAN	NAN
3363	2020-09-25 17:33:44 UTC	3362				30	75.1	NAN	NAN
3364	2020-09-25 17:35:44 UTC	3363				30.1	75.2	NAN	NAN
3365	2020-09-25 17:37:44 UTC	3364				30	75.2	NAN	NAN
3366	2020-09-25 17:39:44 UTC	3365				30	75.2	NAN	NAN
3367	2020-09-25 17:41:44 UTC	3366				30	75.2	NAN	NAN
3368	2020-09-25 17:43:44 UTC	3367				30	75.2	NAN	NAN
3369	2020-09-25 17:45:44 UTC	3368				30	75.2	NAN	NAN
3370	2020-09-25 17:47:45 UTC	3369				30	75.3	NAN	NAN
3371	2020-09-25 17:49:45 UTC	3370				30	75.3	NAN	NAN
3372	2020-09-25 17:51:45 UTC	3371				30	75.3	NAN	NAN
3373	2020-09-25 17:53:45 UTC	3372				30	75.3	NAN	NAN
3374	2020-09-25 17:55:45 UTC	3373				30	75.3	NAN	NAN
3375	2020-09-25 17:57:45 UTC	3374				30	75.3	NAN	NAN
3376	2020-09-25 17:59:45 UTC	3375				30	75.3	NAN	NAN
3377	2020-09-25 18:01:45 UTC	3376				30	75.3	NAN	NAN
3378	2020-09-25 18:03:46 UTC	3377				30	75.3	NAN	NAN
3379	2020-09-25 18:05:46 UTC	3378				30	75.4	NAN	NAN
3380	2020-09-25 18:07:46 UTC	3379				30	75.4	NAN	NAN
3381	2020-09-25 18:09:46 UTC	3380				30	75.4	NAN	NAN
3382	2020-09-25 18:11:46 UTC	3381				30	75.4	NAN	NAN
3383	2020-09-25 18:13:46 UTC	3382				30	75.4	NAN	NAN
3384	2020-09-25 18:15:46 UTC	3383				30	75.4	NAN	NAN
3385	2020-09-25 18:17:47 UTC	3384				30	75.5	NAN	NAN
3386	2020-09-25 18:18:02 UTC	3385				30	75.5	NAN	NAN

feeds (4)

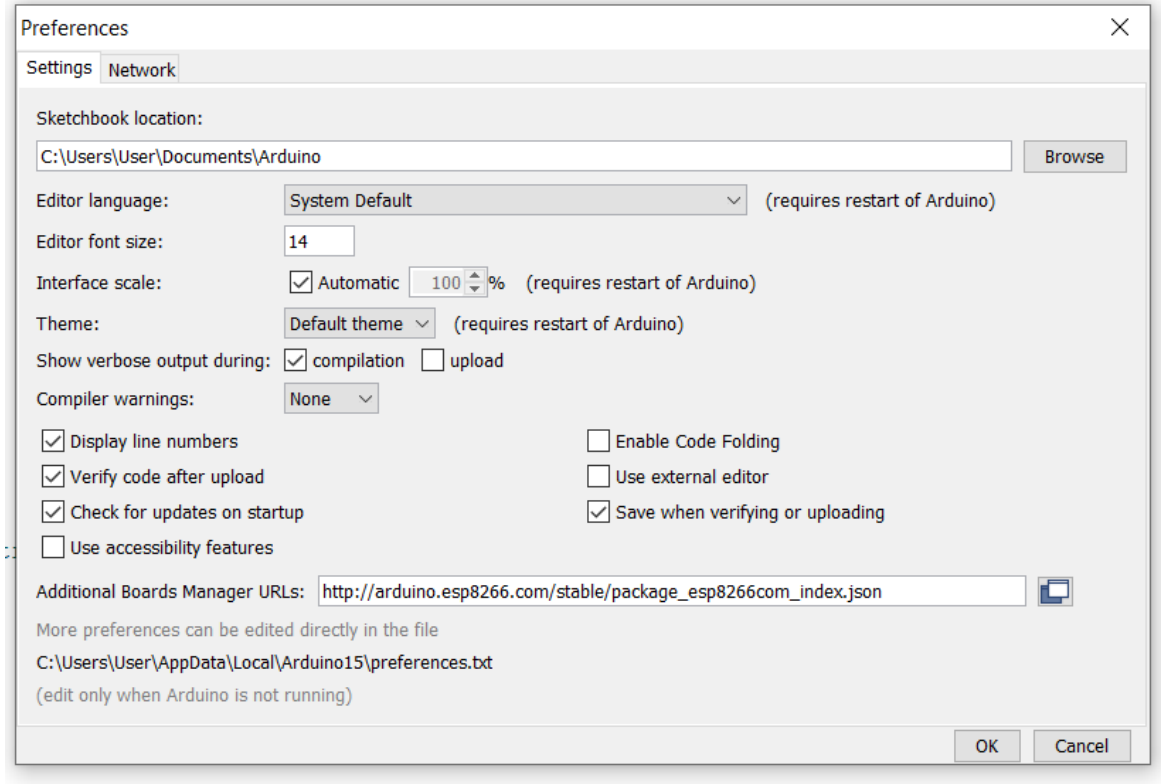
Project Analysis

❖ Testing Send Data From Arduino to NodeMCU

Setting Up ESP8266 for Arduino IDE

Need to install ESP8266 add on in Arduino IDE, for this go to TOOLS > Preferences.

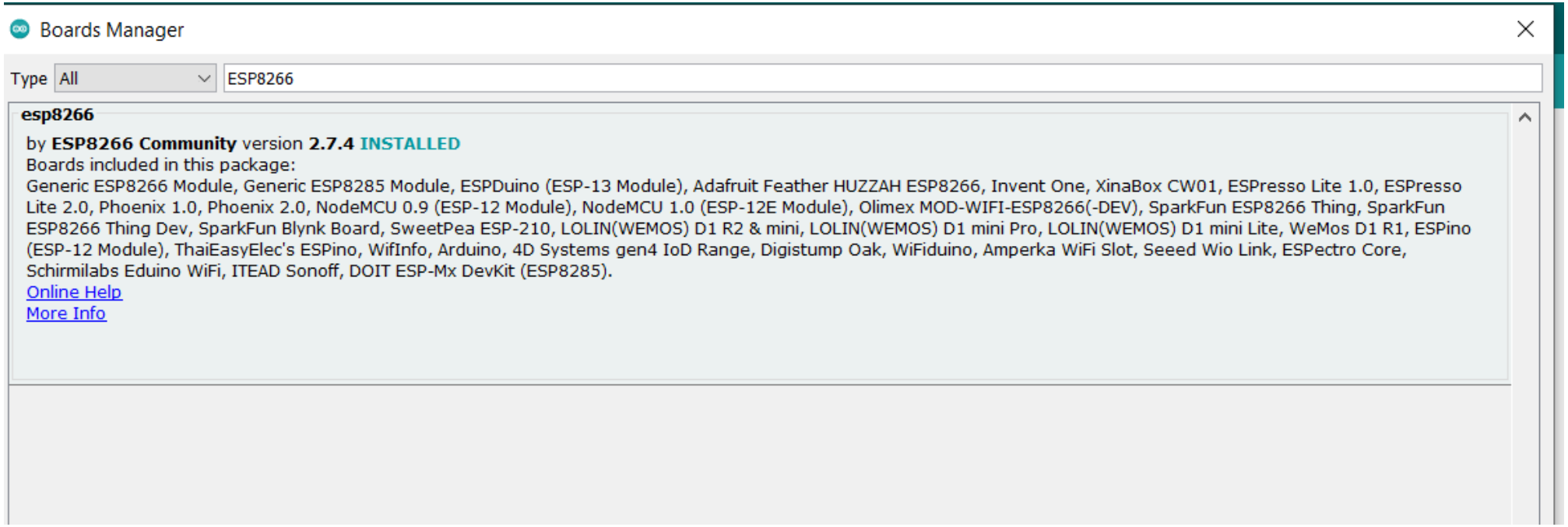
http://arduino.esp8266.com/package_esp8266com_index.json paste this link to "Additional Board Manager URLs"



Project Analysis

Install boards manager

Go to Tools > Board > Boards Manager
Type “ESP8266” in search bar, You will see ESP8266 by ESP8266 community. Click on Install.
I have already installed it. you can see it is showing “INSTALLED”.



Project Analysis

❖ Code for Send Data From Arduino to NodeMCU

arduino_to_mcu_for_arduino | Arduino 1.8.13 Hourly Build 2020/06/03 04:33

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arduino_to_mcu_for_arduino

```
#include "DHT.h"
#include <SoftwareSerial.h>
#define DHTPIN 2
// Uncomment whatever type you're using!
#define DHTTYPE DHT11 // DHT 11
//#define DHTTYPE DHT22 // DHT 22 (AM2302), AM2321
//#define DHTTYPE DHT21 // DHT 21 (AM2301)
SoftwareSerial espSerial(5, 6);
DHT dht(DHTPIN, DHTTYPE);
String str;
void setup(){
Serial.begin(115200);
espSerial.begin(115200);
dht.begin();
delay(2000);
}
void loop()
{
float h = dht.readHumidity();
// Read temperature as Celsius (the default)
float t = dht.readTemperature();
Serial.print("H: ");
Serial.print(h);
Serial.print("% ");
Serial.print(" T: ");
Serial.print(t);
Serial.println("C");
str =String("coming from arduino: ")+String("H= ")+String(h)+String("T= ")+String(t);
espSerial.println(str);
delay(30000);
}
```

arduino_to_mcu_for_mcu | Arduino 1.8.13 Hourly Build 2020/06/03 04:33

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arduino_to_mcu_for_mcu §

```
void setup() {
// Open serial communications and wait for port to open:
Serial.begin(115200);
while (!Serial) {
; // wait for serial port to connect. Needed for native USB port only
}
}
void loop() { // run over and over
if (Serial.available()) {
Serial.write(Serial.read());
}
}
```

COM7

```
16:49:07.476 -> coming from arduino: H= 57.00T= 32.00
16:49:08.494 -> coming from arduino: H= 57.00T= 32.00
16:49:09.509 -> coming from arduino: H= 57.00T= 32.00
16:49:10.521 -> coming from arduino: H= 57.00T= 32.00
16:49:11.532 -> coming from arduino: H= 57.00T= 32.00
16:49:12.579 -> coming from arduino: H= 57.00T= 32.00
16:49:13.562 -> coming from arduino: H= 57.00T= 32.00
16:49:14.608 -> coming from arduino: H= 57.00T= 32.00
16:49:15.598 -> coming from arduino: H= 57.00T= 32.00
16:49:16.641 -> coming from arduino: H= 57.00T= 32.00
16:49:17.654 -> coming from arduino: H= 57.00T= 32.00
16:49:18.671 -> coming from arduino: H= 57.00T= 32.00
16:49:19.689 -> coming from arduino: H= 57.00T= 32.00
16:49:20.707 -> coming from arduino: H= 57.00T= 32.00
16:49:21.723 -> coming from arduino: H= 57.00T= 32.00
```

Project Analysis

❖ Testing NodeMCU send data to thingspeak.

NodeMCU_ESP8266_DHT11_ThinkSpeak §

```
#include <ESP8266WiFi.h>
#include "DHT.h"
#define DHTTYPE DHT11
#define LEDonBoard 2

String apiKey = "88OOFGWCTW33Q0I6";
const char* ssid = "GTR_LAB";
const char* password = "@gtrlab@";
const char* server = "api.thingspeak.com";
const int DHTPin = 5; //--> The pin used for the DHT11 sensor is Pin D1=Pin 5

DHT dht(DHTPin, DHTTYPE);
WiFiClient client;

void setup() {
  Serial.begin(115200);
  delay(500);
  dht.begin();  //--> Start reading DHT11 sensors
  delay(500);

  WiFi.begin(ssid, password);
  Serial.println("");

  pinMode(LEDonBoard,OUTPUT); //--> On Board LED port Direction output
  digitalWrite(LEDonBoard, HIGH); //--> Turn off Led On Board

  Serial.print("Connecting");
  while (WiFi.status() != WL_CONNECTED) {
    Serial.print(".");

```

NodeMCU_ESP8266_DHT11_ThinkSpeak §

```
    //----------------------------------------Make the On Board Flashing LED on the proce
    digitalWrite(LEDonBoard, LOW);
    delay(250);
    digitalWrite(LEDonBoard, HIGH);
    delay(250);
  }
  digitalWrite(LEDonBoard, HIGH); //--> Turn off the On Board LED when it is connected to
  //----------------------------------------If connection successful show IP address in s
  Serial.println("");
  Serial.print("Successfully connected to : ");
  Serial.println(ssid);
}

void loop() {
  // put your main code here, to run repeatedly:
  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";

```

Project Analysis

NodeMCU_ESP8266_DHT11_ThinkSpeak | Arduino 1.8.13 Hourly Build 2020/06/03 04:33

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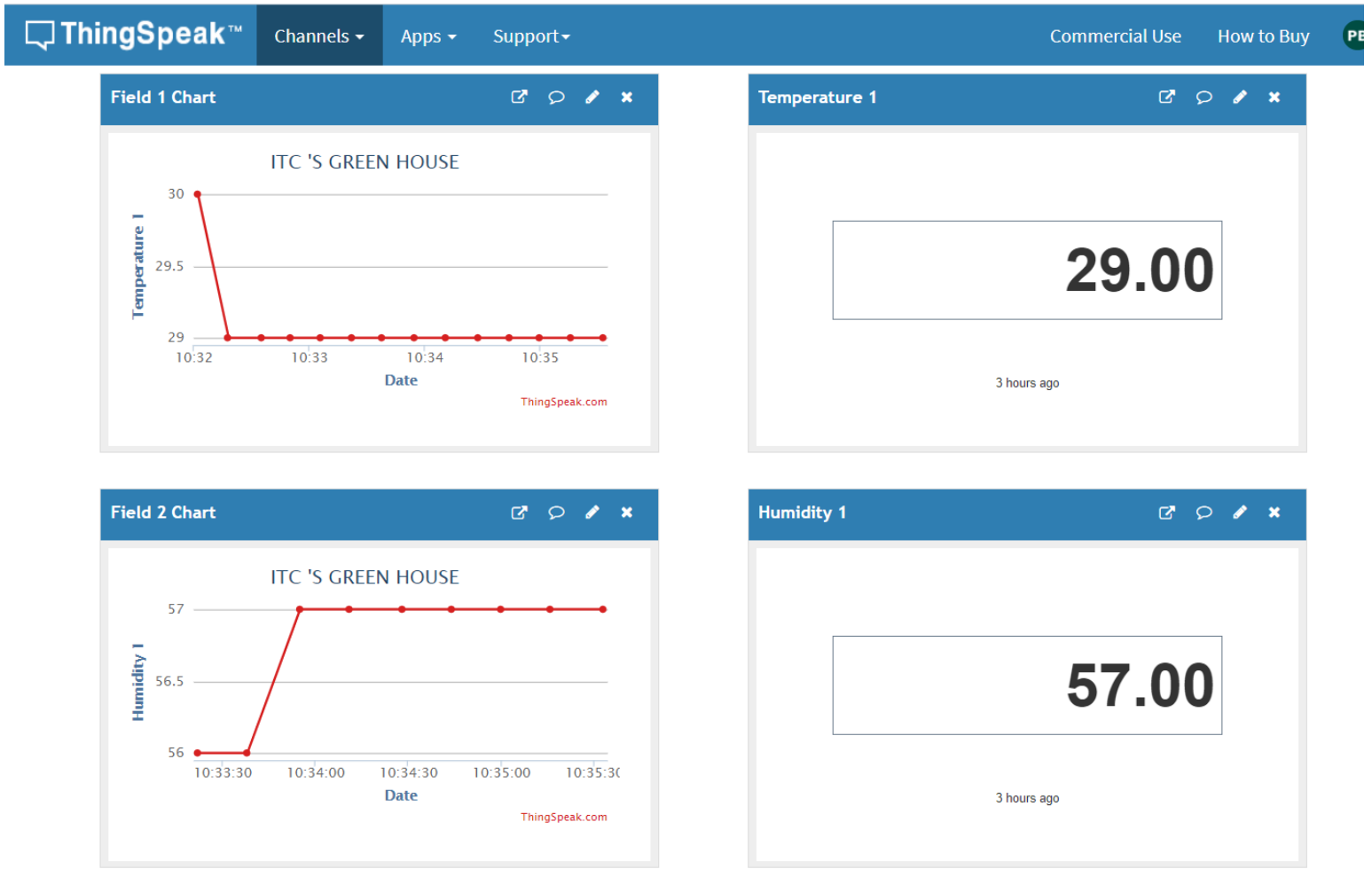
NodeMCU_ESP8266_DHT11_ThinkSpeak §

```
    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
  //----------------------------------------The on board blinks as an indicator that the program is running.
  digitalWrite(LEDonBoard, LOW);
  delay(250);
  digitalWrite(LEDonBoard, HIGH);
  delay(750);
  //----------------------------------------
}
```

Project Analysis

Testing NodeMCU send data Temperature and Humidity to thingspeak



Thank You