



Andhra Pradesh State Skill Development Corporation



INTERNET OF THINGS (IoT)

INTRODUCTION TO THINGSPEAK CLOUD

Thing Speak Cloud:

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud. You can send data to ThingSpeak from your devices, create instant visualizations of live data, and send alerts using web services like Twitter® and Twilio®. With MATLAB® analytics inside ThingSpeak, you can write and execute MATLAB code to perform preprocessing, visualizations, and analyses. ThingSpeak enables engineers and scientists to prototype and build IoT systems without setting up servers or developing web software.

How to create account in ThingSpeak

Sign up ThingSpeak

It's simple just enter your email id and verify your account.

Configuring ThingSpeak

Configuration is just few clicks job

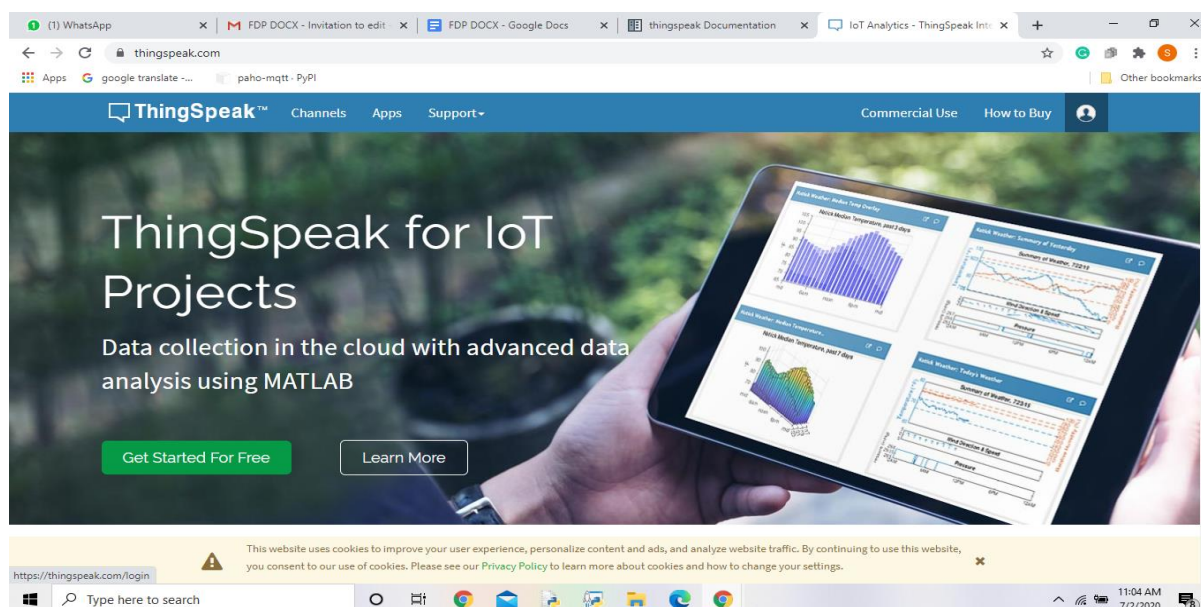


Fig:- Click on sign in option which is on top right corner

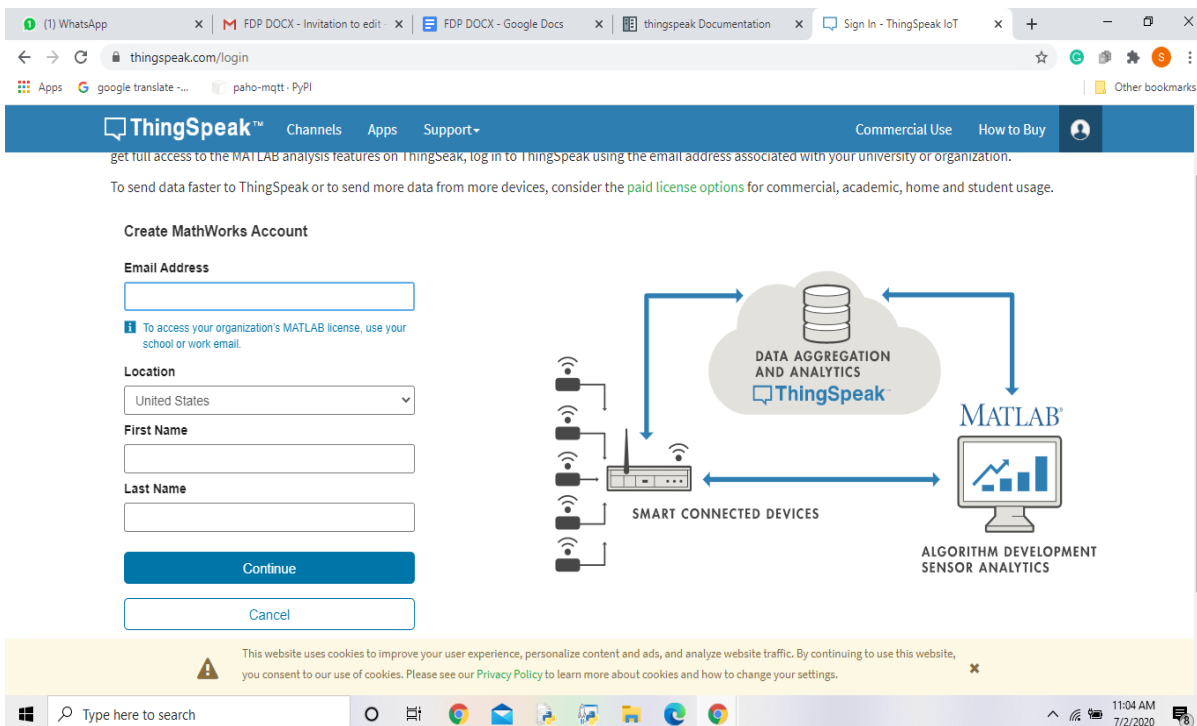


Fig:-Create your account and next continue

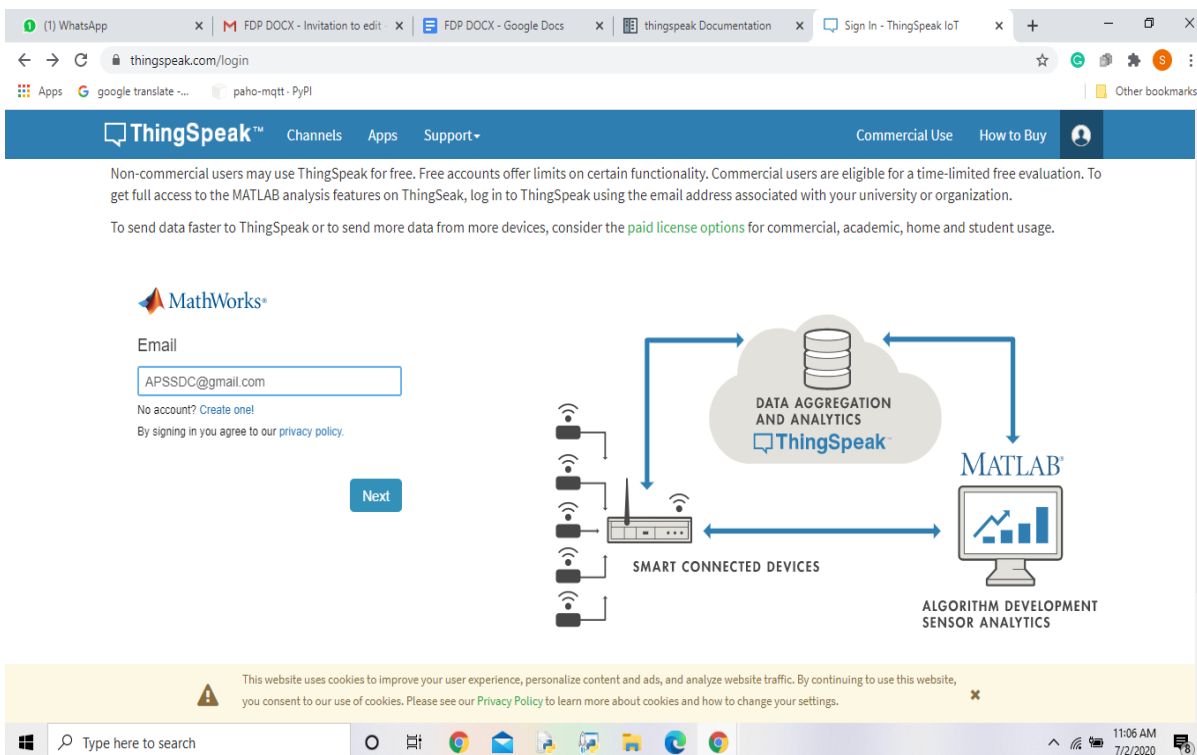
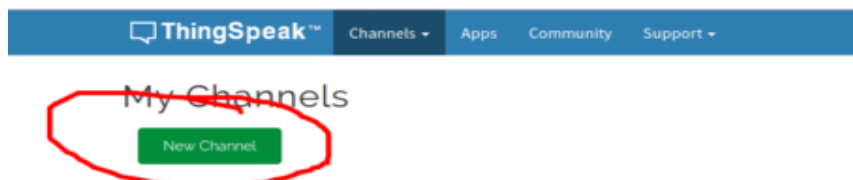


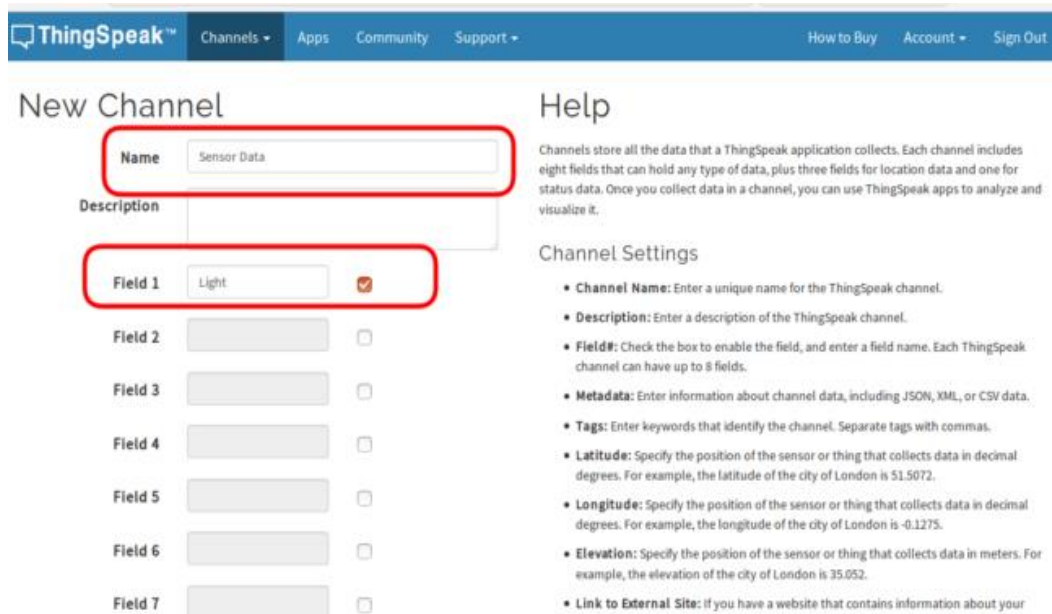
Fig:- Add your mail and click on next

Create New Channel

Click on New Channel



Enter Name and Field. You may have multiple Fields depending on number of sensors and create multiple fields such as Light



Name Sensor Data

Description

Field 1 Light ☒

Field 2 ☐

Field 3 ☐

Field 4 ☐

Field 5 ☐

Field 6 ☐

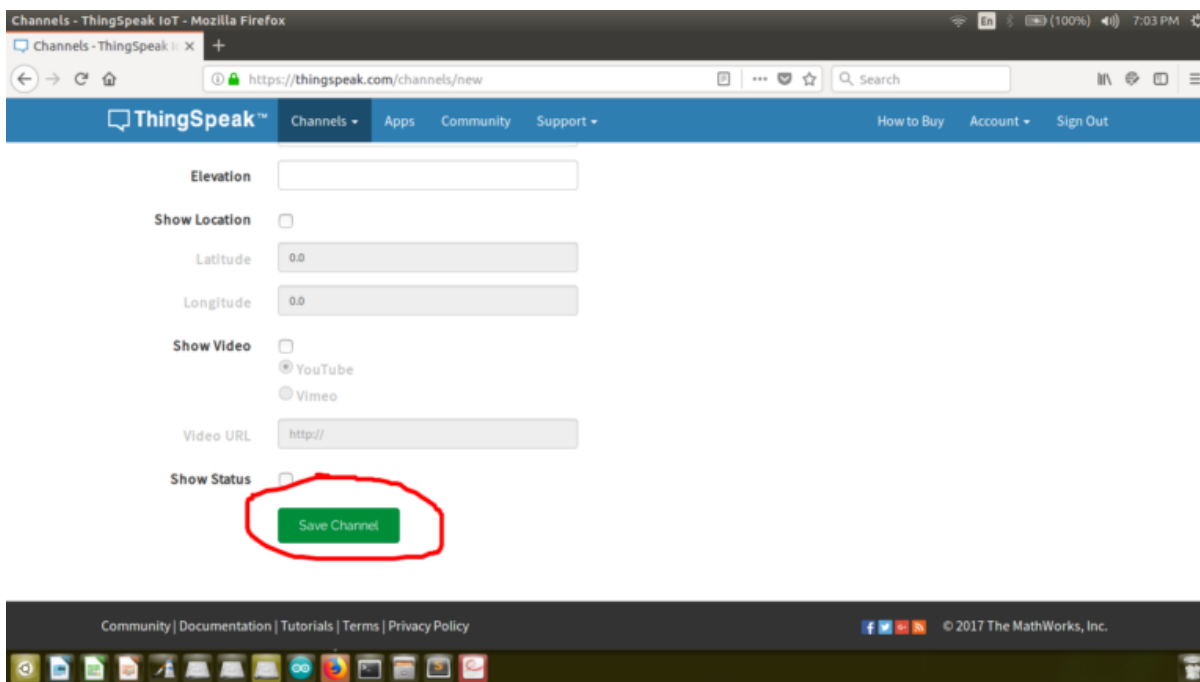
Field 7 ☐

Help

Channels store all the data that a ThingSpeak application collects. Each channel includes eight fields that can hold any type of data, plus three fields for location data and one for status data. Once you collect data in a channel, you can use ThingSpeak apps to analyze and visualize it.

Channel Settings

- **Channel Name:** Enter a unique name for the ThingSpeak channel.
- **Description:** Enter a description of the ThingSpeak channel.
- **Field#:** Check the box to enable the field, and enter a field name. Each ThingSpeak channel can have up to 8 fields.
- **Metadata:** Enter information about channel data, including JSON, XML, or CSV data.
- **Tags:** Enter keywords that identify the channel. Separate tags with commas.
- **Latitude:** Specify the position of the sensor or thing that collects data in decimal degrees. For example, the latitude of the city of London is 51.5072.
- **Longitude:** Specify the position of the sensor or thing that collects data in decimal degrees. For example, the longitude of the city of London is -0.1275.
- **Elevation:** Specify the position of the sensor or thing that collects data in meters. For example, the elevation of the city of London is 35.052.
- **Link to External Site:** If you have a website that contains information about your



Channels - ThingSpeak IoT - Mozilla Firefox

Channels - ThingSpeak IoT X +

https://thingspeak.com/channels/new

ThingSpeak™ Channels Apps Community Support How to Buy Account Sign Out

Elevation

Show Location ☐

Latitude

Longitude

Show Video ☐

YouTube ☐

Vimeo ☐

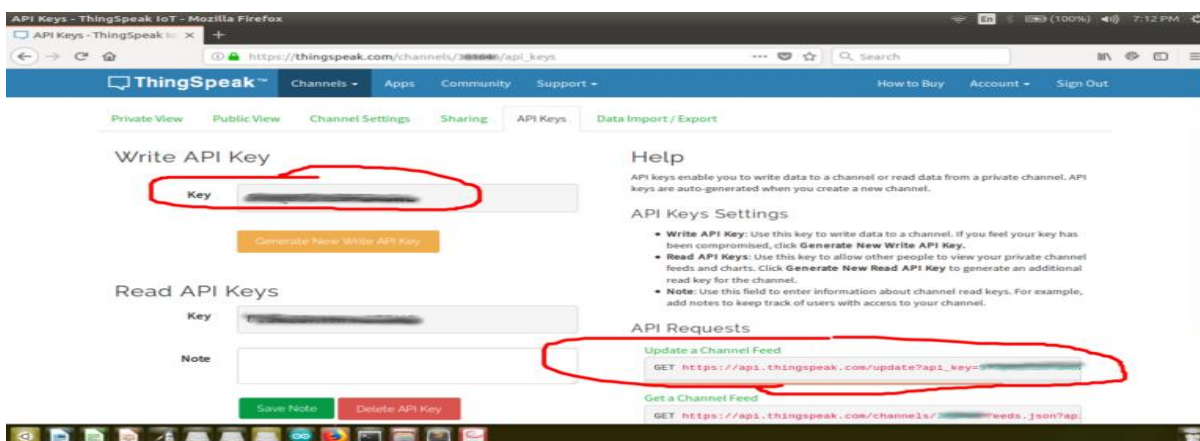
Video URL

Show Status ☐

Save Channel

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API Keys - ThingSpeak IoT - Mozilla Firefox

API Keys - ThingSpeak IoT X +

https://thingspeak.com/channels/123456789/api_keys

ThingSpeak™ Channels Apps Community Support How to Buy Account Sign Out

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

Write API Key

Key

Generate New Write API Key

Read API Keys

Key

Note

Save Note Delete API Key

Help

API keys enable you to write data to a channel or read data from a private channel. API keys are auto-generated when you create a new channel.

API Keys Settings

- Write API Key: Use this key to write data to a channel. If you feel your key has been compromised, click **Generate New Write API Key**.
- Read API Keys: Use this key to allow other people to view your private channel feeds and charts. Click **Generate New Read API Key** to generate an additional read key for the channel.
- Note: Use this field to enter information about channel read keys. For example, add notes to keep track of users with access to your channel.

API Requests

Update a Channel Feed

GET https://api.thingspeak.com/update?api_key=...

Get a Channel Feed

GET https://api.thingspeak.com/channels/.../feeds.json?api_key=...

programming ESP8266 to upload data to ThingSpeak cloud server

Make Changes in program for API KEY, SSID and PASSWORD

Check Data on ThingSpeak Server

Open Your ThingSpeak Account and Click on Private View of Your Channel

Data logging to Thingspeak Cloud

LDR Sensor with Thing Speak Cloud:

In this tutorial, we will be using an LDR to plot its light Intensity level on ThingSpeak using NodeMCU. We will program the NodeMCU to read and store the LDR data into a variable and then upload it to ThingSpeak using its channel name and API key. The NodeMCU should be connected to the internet via Wi-Fi. We will see how to create ThingSpeak Channels and configure it on NodeMCU.

ThingSpeak is an IoT analytics cloud platform service that allows you to aggregate, visualize and analyze live data streams in the cloud. ThingSpeak provides instant visualizations of data posted by ESP8266 to ThingSpeak. ThingSpeak is often used for prototyping and proof of concept IoT systems that require analytics.

We will learn following things

- How to Configure ThingSpeak Cloud server Account ?
- How to program ESP8266 to upload sensor data ?

Lets understand the cloud concept first. Uploading of ESP8266 sensor data is done using the Internet.

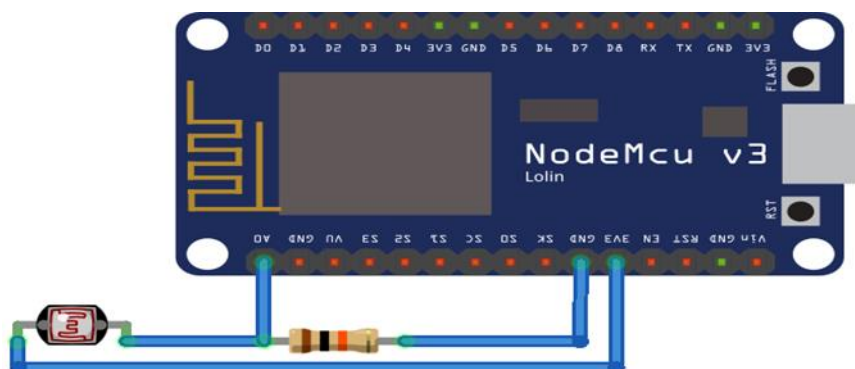
It is a three step process.

- Connect to your WiFi hot spot having internet access.
- Read Sensor data
- Upload data to ThingSpeak

Hardware Required:

- NodeMCU
- LDR Module
- 10K Ohm Resistor
- Jumper Wires
- Breadboard (Optional)

Circuit Diagram:



Once the hardware is set up, We can go ahead and create our ThingSpeak Channel and copy Write API keys

FactoryForward

Channel ID: **177486**

Author: **sarathkumar341**

Access: Private

How Intense the Light

Private View

Public View

Channel Settings

Sharing

API Keys

Data Import / Export

Write API Key

Key

TSANADA10PNU5378

Generate New Write API Key

Help

API keys enable you to
keys are auto-generated

API Keys Set

- **Write API Key:** Used to write data to the channel.
- **Read API Key:** Used to read data from the channel.

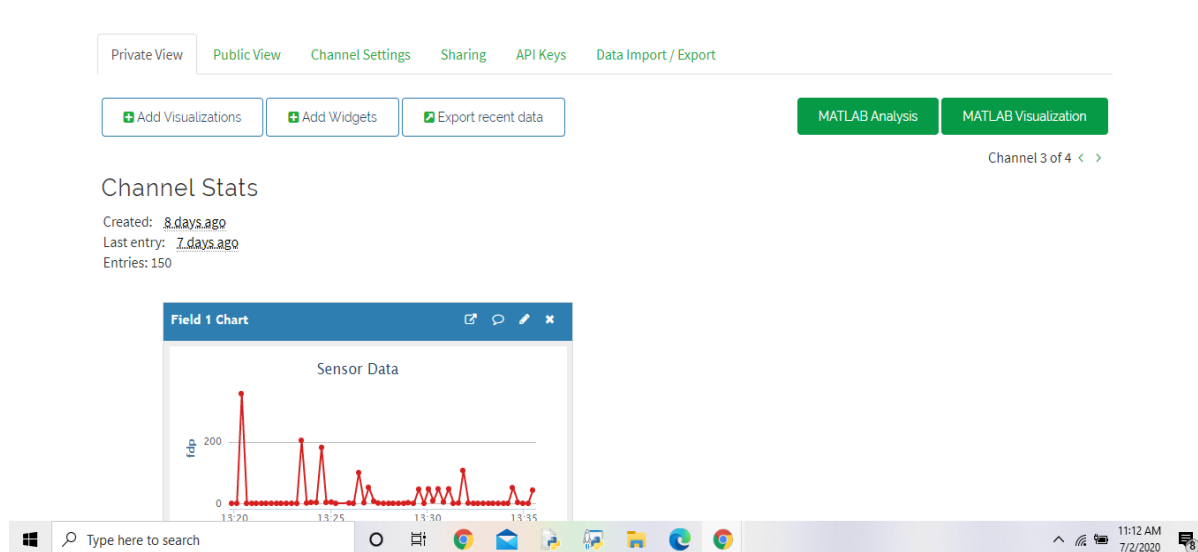
Now we are ready to write the code

```
#include<ESP8266WiFi.h>
#include<ESP8266HTTPClient.h>
WiFiClient bal;
HTTPClient ht;
String st="http://api.thingspeak.com/update?";
String s;
int ldr=A0;
void setup()
{
  pinMode(A0,INPUT);
  Serial.begin(9600);
  //WiFi.begin("u'r wifi user name","password");
  WiFi.begin("xxxxxxx","xxxxxxx");
  while(!(WiFi.status()==WL_CONNECTED))//a==b;(!(a==b));a!=b
  {
    delay(20);
  }
  Serial.println("Wifi connected");
}
void loop()
{
  if(bal.connect("api.thingspeak.com",80))
  {
    s=st;
  }
}
```



```
s+="key=";
s+="xxxxxxxxxx";//u'r thingspeak Write api
s+="&field1=";
s+=analogRead(A0);
Serial.println(analogRead(A0));
ht.begin(s);
ht.GET();
ht.end();
}
}
```

Upload the code to nodemcu board



Check Data on ThingSpeak Server

Open Your ThingSpeak Account and Click on Private View of Your Channel

You did it well....That's it....You can Create multiple Fields and Upload multiple sensor data. and also you can create multiple channels for multiple Data Nodes.