

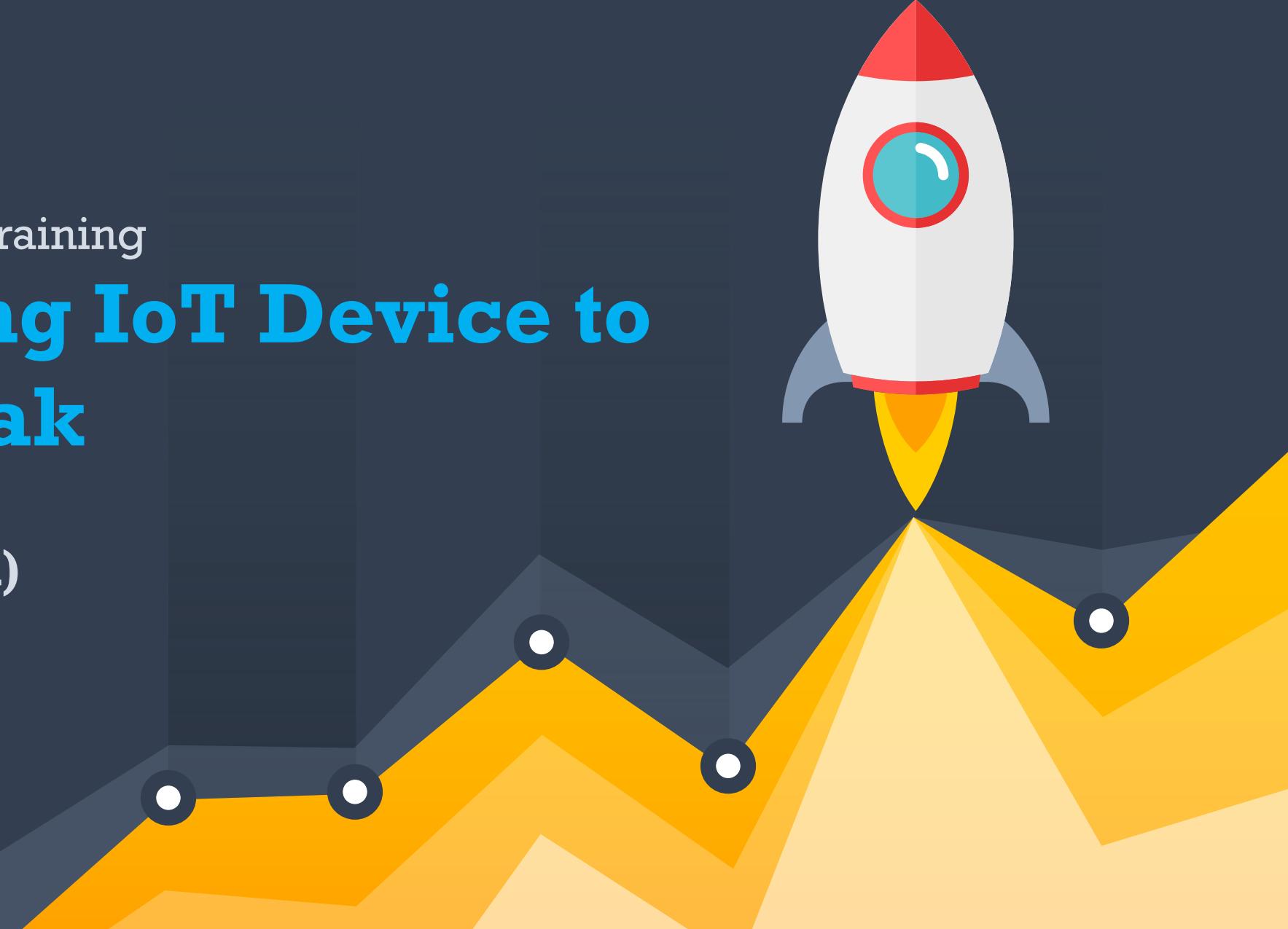


Webinar / Online Training

Connecting IoT Device to ThingSpeak

3 Jun 2020 (Rabu)

11.00 Pagi

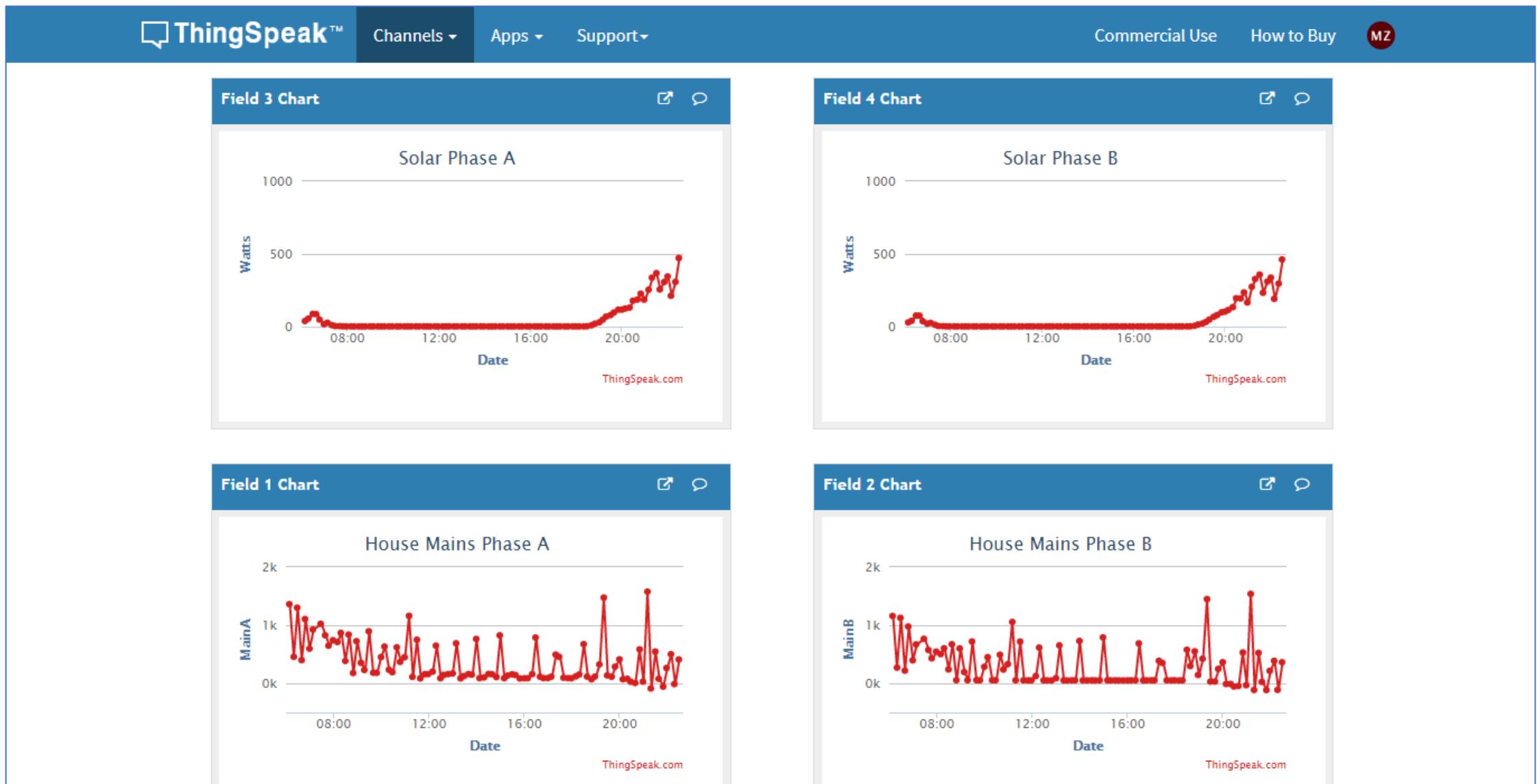


ThingSpeak for IoT Projects

Data collection in the cloud with advanced data analysis using MATLAB

[Channels](#)[Learn More](#)

ThingSpeak Channel



ThingSpeak Apps

ThingSpeak™ Channels ▾ Apps ▾ Support ▾ Commercial Use How to Buy MZ

Actions



ThingTweet
Connect a device to Twitter® and send alerts.



TimeControl
Automatically perform actions at predetermined times with ThingSpeak apps.



React
React when channel data meets certain conditions.



TalkBack
Queue up commands for your device.

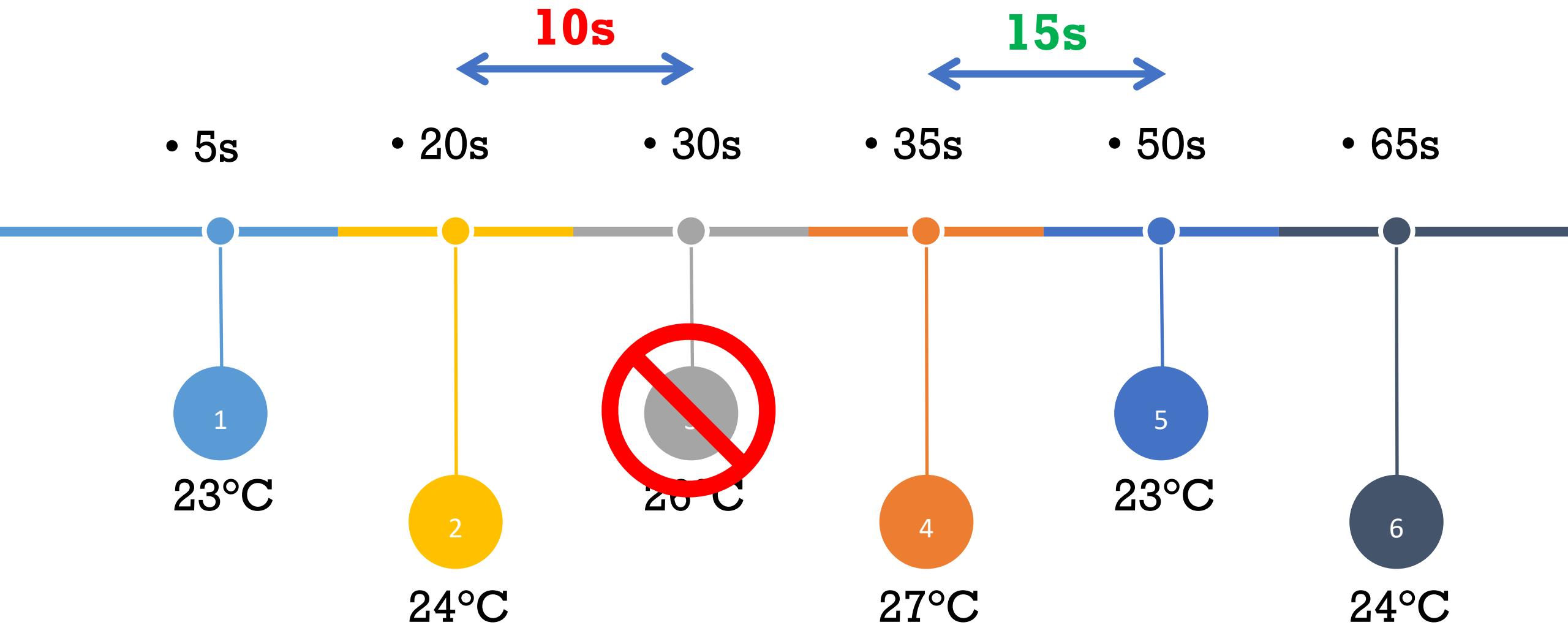


ThingHTTP
Simplify device communication with web services and APIs.

[https://thingspeak.com/prices/thingspeak standard](https://thingspeak.com/prices/thingspeak_standard)

	FREE For time-limited commercial evaluation of the service	STANDARD For all commercial, government and revenue generating activities
Scalable for larger projects	 No. Annual usage is capped.	
Number of messages	3 million/year (~8,200/day) ⁽²⁾	33 million/year per unit (~90,000/day per unit) ⁽²⁾
Message update interval limit	Every 15 seconds	Every second
Number of channels	4	250 per unit
MATLAB Compute Timeout	20 seconds	60 seconds
Number of simultaneous MQTT subscriptions	Limited to 3	50 per unit
Private channel sharing	Limited to 3 shares	Unlimited
Technical Support	Community Support	Standard MathWorks support

Update Interval 15s Limitation



No. of Channel Limitation

The screenshot shows the 'My Channels' section of the ThingSpeak web interface. At the top, there's a navigation bar with links for 'Channels', 'Apps', 'Support', 'Commercial Use', 'How to Buy', and a user icon. Below the navigation is a search bar labeled 'Search by tag'. On the left, a green button says 'New Channel'. The main area displays three channels in a table:

Name	Created	Updated
Arduino IOT Workshop	2016-07-31	2020-02-16 15:50
Weather Monitoring	2017-11-06	2017-11-06 16:15
Haze Monitoring System	2018-02-09	2020-06-03 08:17

A red box highlights the fourth channel slot, which is empty. Inside this box, the text 'My Channel' is displayed in green, and below it, the text 'Limit to 4 Channel' is displayed in red.

Help

Collect data in a ThingSpeak channel from a device, from another channel, or from the web.

Click [New Channel](#) to create a new ThingSpeak channel.

Click on the column headers of the table to sort by the entries in that column or click on a tag to show channels with that tag.

Learn to [create channels](#), explore and transform data.

Learn more about [ThingSpeak Channels](#).

Examples

- Arduino
- Arduino MKR1000
- ESP8266
- Raspberry Pi
- Netduino Plus

Upgrade

Need to send more data faster?

Need to use ThingSpeak for a commercial project?

[Upgrade](#)

Create ThingSpeak Channel

ThingSpeak™ Channels ▾ Apps ▾ Support ▾ Commercial Use How to Buy MZ

My Channels

New Channel 

Search by tag 

Help

Collect data in a ThingSpeak channel from a device, from another channel, or from the web.

Click **New Channel** to create a new ThingSpeak channel.

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Examples

- Arduino
- Arduino MKR1000
- ESP8266
- Raspberry Pi
- Netduino Plus

Upgrade

Need to send more data faster?

Need to use ThingSpeak for a commercial project?

Upgrade

ThingSpeak Channel

The diagram illustrates the process of creating and configuring a ThingSpeak channel for an Arduino IoT workshop.

New Channel: A screenshot of the ThingSpeak "New Channel" configuration page. It shows fields for Name, Description, and eight Fields (Field 1 to Field 8). Under Field 1, "Temperature" is selected, and under Field 2, "Humidity" is selected, both with checked checkboxes. A blue arrow points from the "Name" field to the "Arduino IOT Workshop" channel page.

Arduino IOT Workshop: A screenshot of the ThingSpeak channel details page for "Arduino IOT Workshop". The channel has a Channel ID of 141328, was created by ariffinastute, and is set to Public access. It has 9315 entries. The page includes tabs for Private View, Public View, Channel Settings, Sharing, API Keys, and Data Import / Export, along with buttons for Add Visualizations, Add Widgets, and Export recent data. A blue arrow points from the "Description" field to this page.

Channel Stats: A section on the right of the channel details page showing statistics: Created: 3 years ago, Last entry: about 20 hours ago, and Entries: 9315.

Field 1 Chart: A screenshot of the "Field 1 Chart" for Temperature. The chart shows a single data series named "Temperature" with a red line graph. The Y-axis is labeled "Temperature (C)" with values 30, 35, and 40. The X-axis is labeled "Time" with values 55.5, 56, and 56.5. A blue arrow points from the "Field 1" configuration to this chart.

Field 2 Chart: A screenshot of the "Field 2 Chart" for Humidity. The chart shows a single data series named "Humidity" with a blue line graph. The Y-axis is labeled "Humidity" with values 50, 55, and 60. The X-axis is labeled "Time" with values 55.5, 56, and 56.5. A blue arrow points from the "Field 2" configuration to this chart.

ThingSpeak Channel Settings

ThingSpeak™ [Channels](#) [Apps](#) [Support](#) [Commercial Use](#) [How to Buy](#) MZ

Arduino IOT Workshop

Channel ID: **141328**
Author: [ariffinastute](#)
Access: Public

IOT Workshop Online Humidity & Temperature Sensor Data Logging and Push Notification with ThingSpeak™!

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

Channel Settings

Percentage complete 50%

Channel ID 141328

Name Arduino IOT Workshop

Description IOT Workshop Online Humidity & Temperature Sensor Data Logging and Push Notification with

Field 1 temperature

Field 2 humidity

Field 3

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

- **Percentage complete:** Calculated based on data entered into the various fields of a channel. Enter the name, description, location, URL, video, and tags to complete your channel.
- **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.

ThingSpeak Channel Settings

ThingSpeak™ [Channels](#) [Apps](#) [Support](#) [Commercial Use](#) [How to Buy](#) MZ

Arduino IOT Workshop

Channel ID: **141328**
Author: [ariffinastute](#)
Access: Public

IOT Workshop Online Humidity & Temperature Sensor Data Logging and Push Notification with ThingSpeak™!

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

Channel Sharing Settings

Keep channel view private
 Share channel view with everyone
 Share channel view only with the following users:

Email Address: Add User

Email Address	Shared On	Delete
anonymous@astute.com	2019-12-26	X

Help

ThingSpeak allows you to control who can view the data in your channel. Irrespective of the settings on this tab, reading data from or writing data to the fields of a channel requires the appropriate API key for the channel.

Channel Sharing Settings

- Keep channel view private:** Selecting this option keeps your channel private. Only you will be able to see the channel view.
- Share channel view with everyone:** Selecting this option makes the public view of your channel viewable by anyone browsing the ThingSpeak website.
- Share channel view only with the following users:** Selecting this option shares the private view of your channel only with specific ThingSpeak users.

[Blog](#) | [Documentation](#) | [Tutorials](#) | [Terms](#) | [Privacy Policy](#)

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ThingSpeak Channel Settings

The screenshot shows the ThingSpeak Channel Settings page. At the top, there are navigation links: ThingSpeak™, Channels, Apps, Support, Commercial Use, How to Buy, and a user icon. Below the navigation, there are tabs: Private View, Public View, Channel Settings, Sharing, API Keys (which is highlighted with a red box), and Data Import / Export.

Write API Key (highlighted with a red box):

- Key: GBNYKMRW97WHI3WZ
- Generate New Write API Key

Read API Keys:

- Key: 1D7M20C108E90DW8
- Note: (empty text area)
- Save Note | Delete API Key

Help (callout box):

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 Key (callout box):

- Write API Key: will be embedded on ESP8266
- Read API Key: (text cut off)
- 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 (callout box):

Write a Channel Feed

```
GET https://api.thingspeak.com/update?api_key=GBNYKMRW97WHI3WZ&field1=100
```

Read a Channel Feed

```
GET https://api.thingspeak.com/channels/141328/feeds.json?results=2
```

Read a Channel Field

```
GET https://api.thingspeak.com/channels/141328/fields/1.json
```

ThingSpeak Channel Settings

ThingSpeak™ [Channels](#) [Apps](#) [Support](#) [Commercial Use](#) [How to Buy](#) [MZ](#)

Channel ID: **141328**
Author: [ariffinastute](#)
Access: Public

IOT Workshop Online Humidity & Temperature Sensor Data Logging and Push Notification with ThingSpeak™!

Private View [Public View](#) [Channel Settings](#) [Sharing](#) [API Keys](#) [Data Import / Export](#)

Import
Upload a CSV file to import data into this channel.

File No file chosen

Time Zone

[Upload](#)

Export
Download all of this Channel's feeds in CSV format.

Time Zone

[Download](#)

Data Import / Export

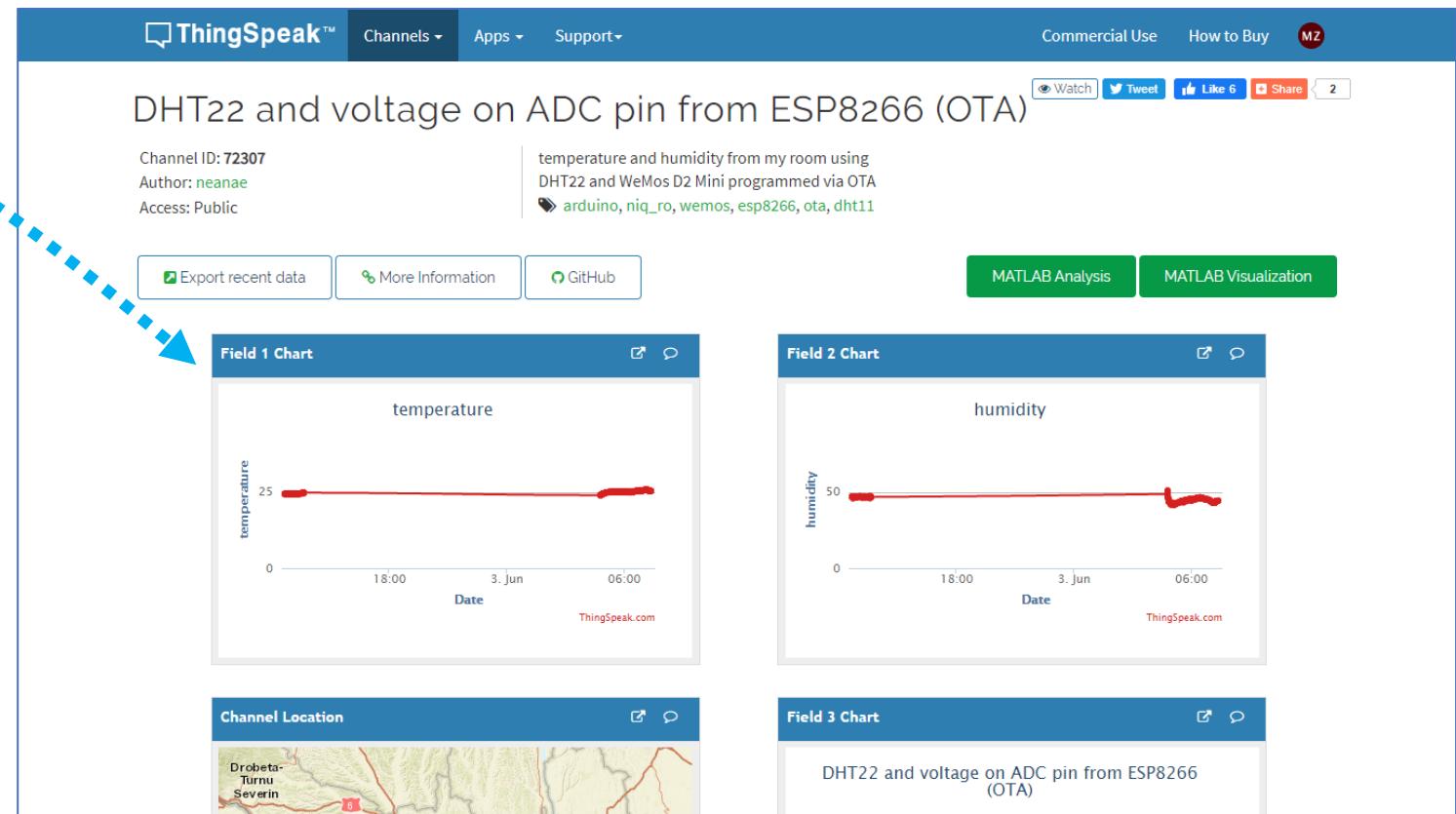
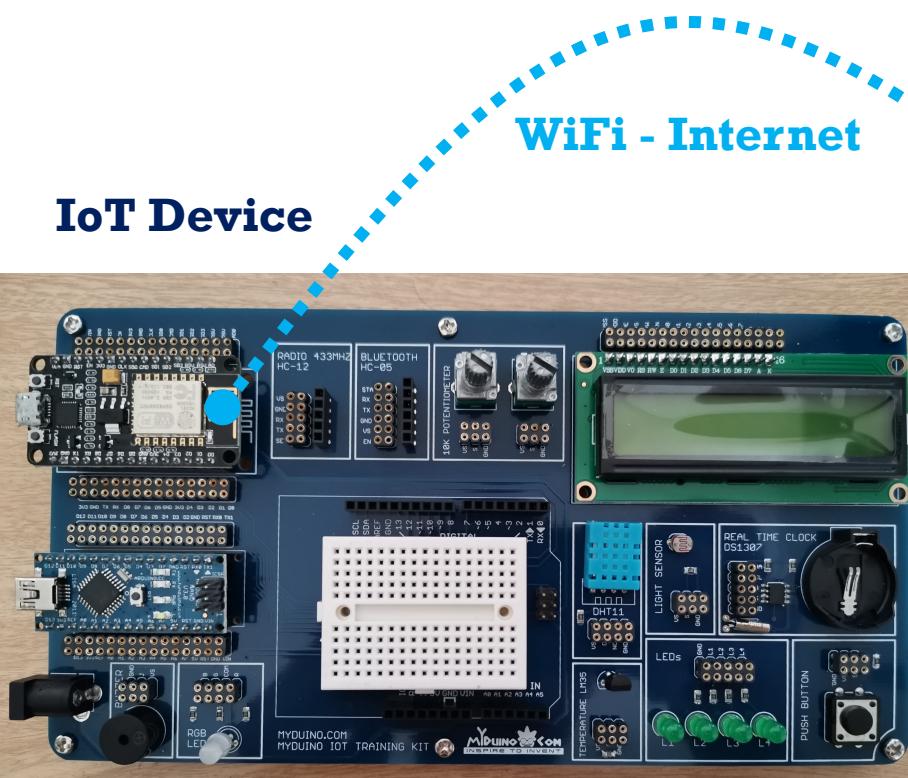
Export

Download

A	B	C	D	E	F	G	H	I
656	2016-08-13 21:19:04 +08	655	51	47				
657	2016-08-13 21:19:21 +08	656	64	91				
658	2016-08-13 21:19:39 +08	657	99	21				
659	2016-08-13 21:19:57 +08	658	51	45				
660	2016-08-13 21:20:14 +08	659	23	46				
661	2016-08-13 21:20:32 +08	660	79	5				
662	2016-08-13 21:20:50 +08	661	50	18				
663	2016-08-13 21:21:08 +08	662	55	38				
664	2016-08-13 21:21:25 +08	663	80	3				
665	2016-08-13 21:21:43 +08	664	79	68				
666	2016-08-13 21:22:01 +08	665	54	35				
667	2016-08-13 21:22:19 +08	666	70	6				

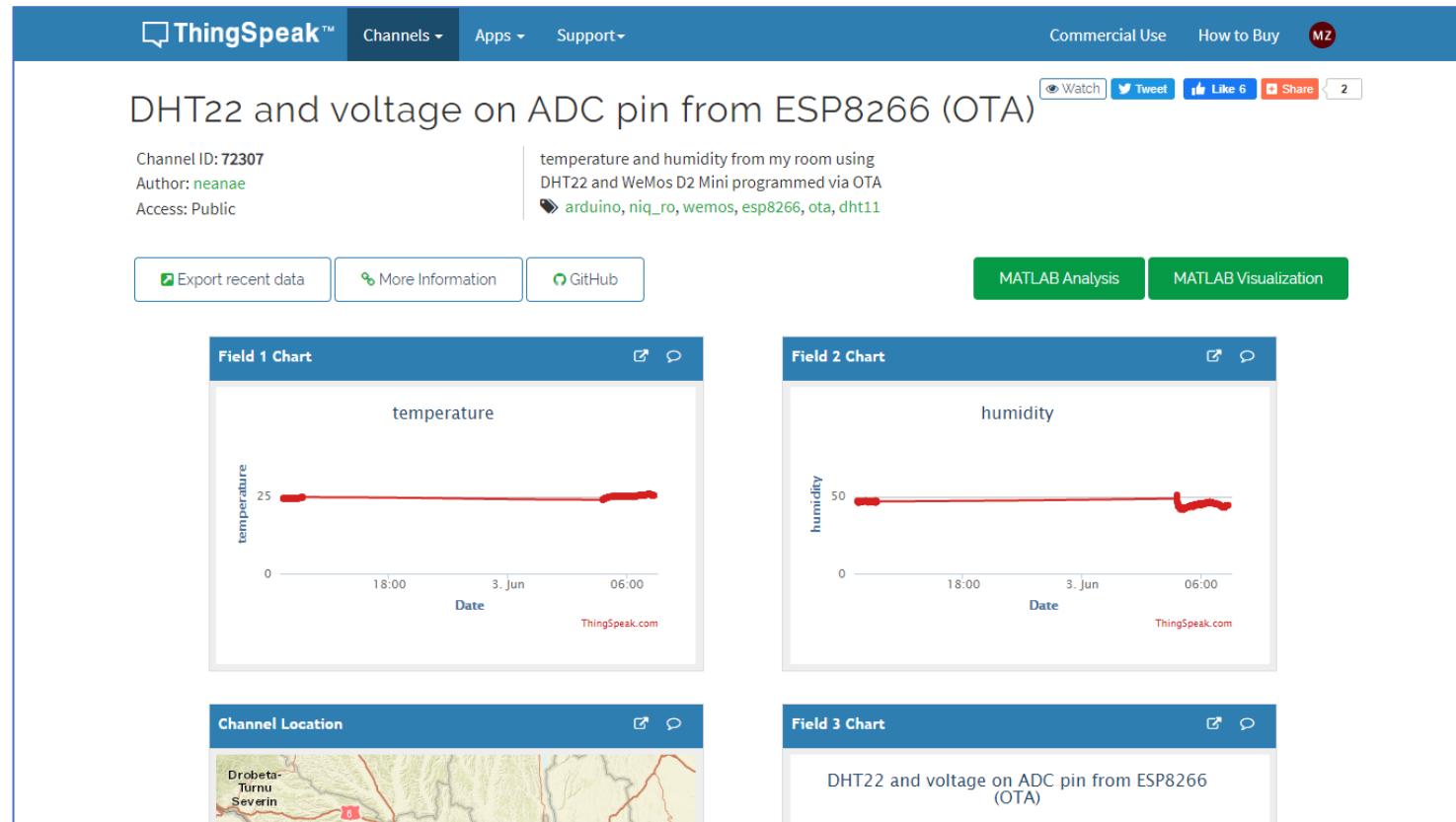
Let's Get Hands-on

IoT Platform, ThingSpeak



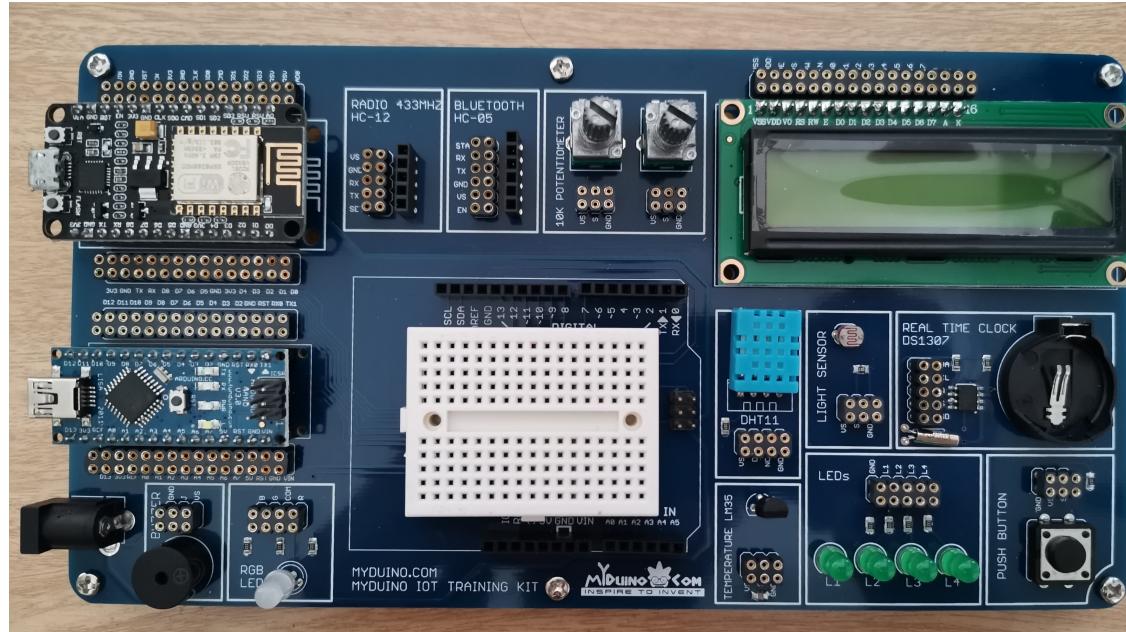
- NodeMCU (Microcontroller + WiFi, ESP8266)
- DHT11 Sensor (Input, Temperature & Humidity)

IoT Platform, ThingSpeak



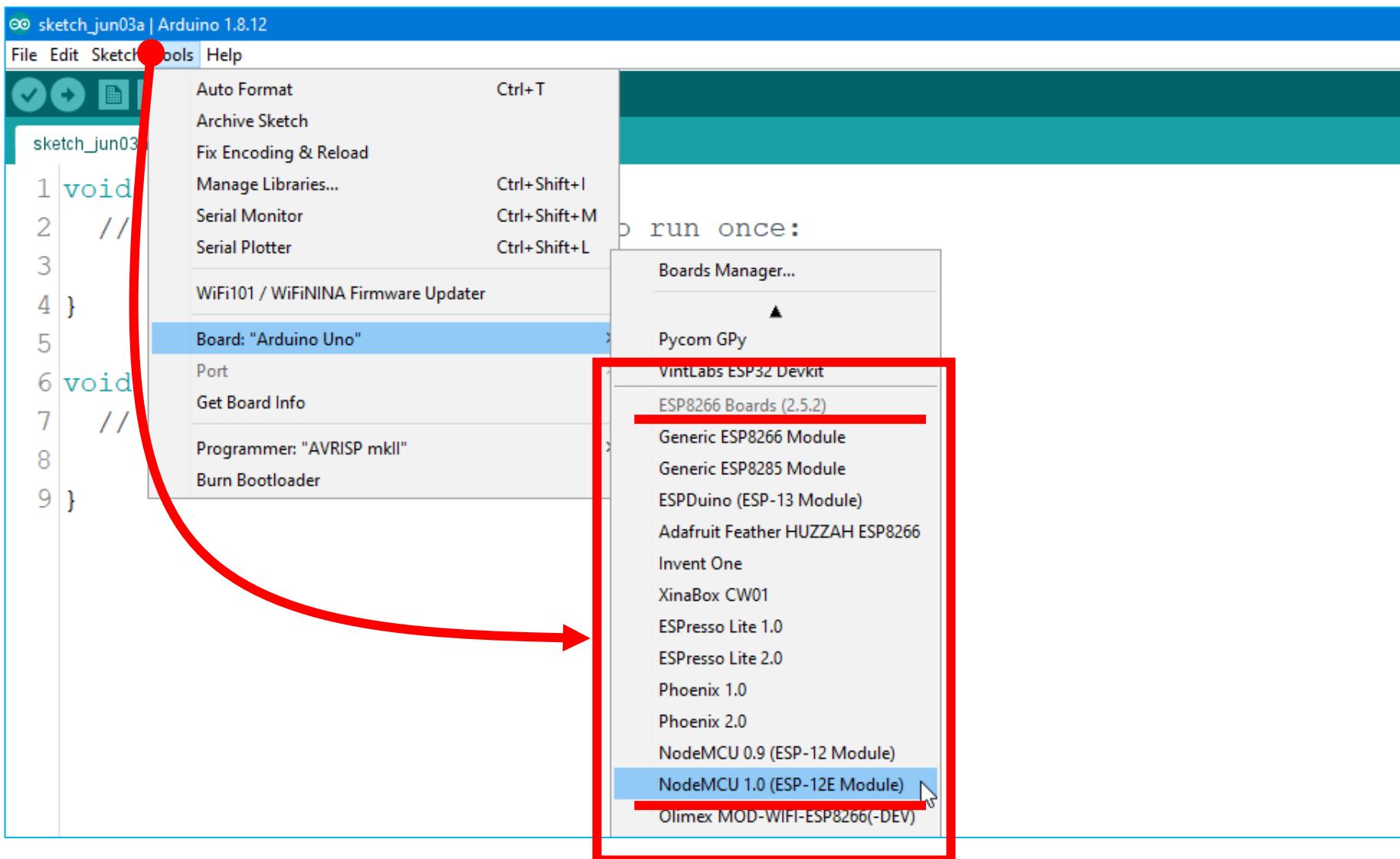
- Create a Channel
- Setup Channel according to project preferences
- Look for Channel's API Key and its API
- Use given Channel's API to embed in Arduino programming for ESP8266

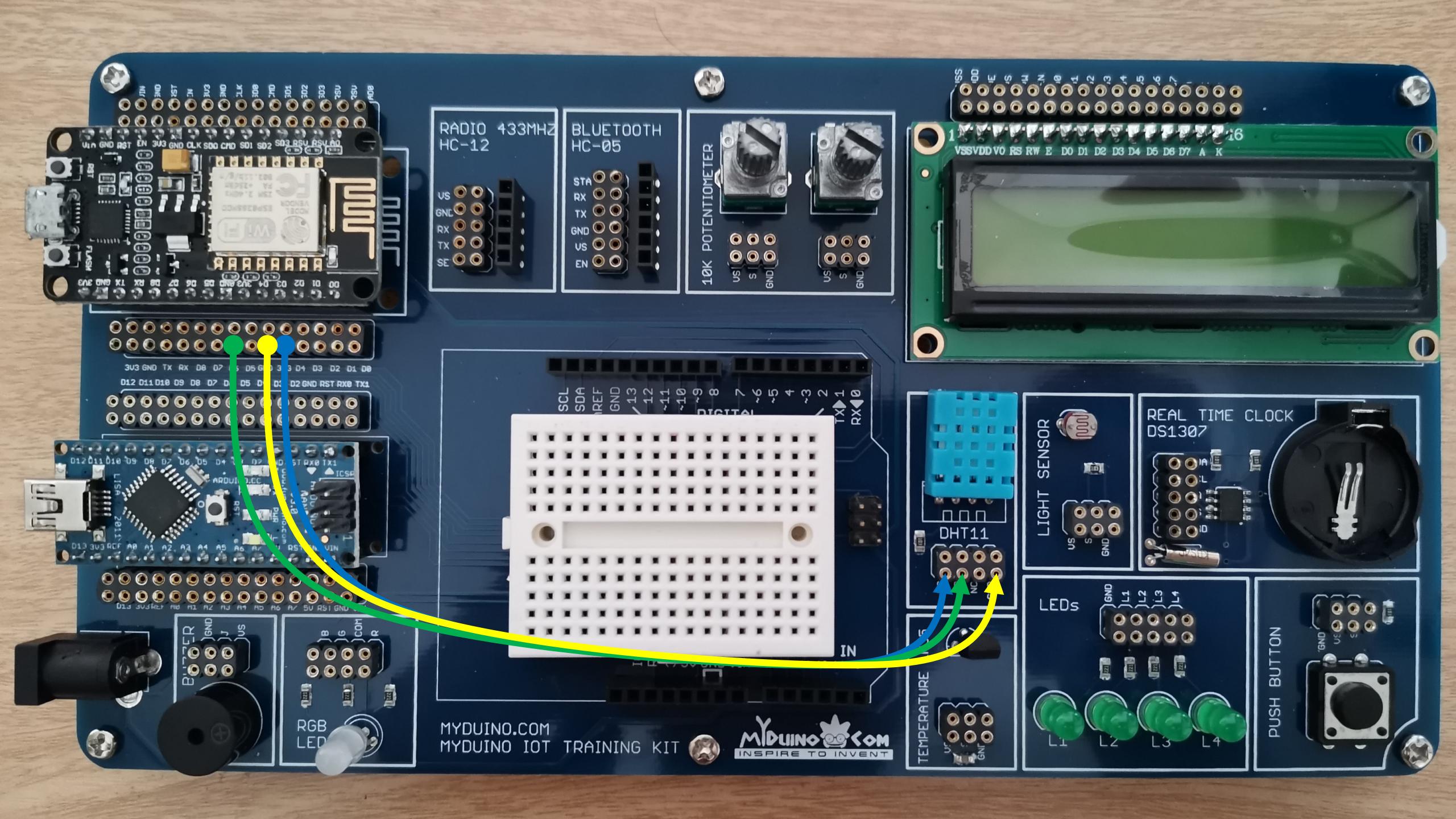
IoT Platform, ThingSpeak



- Make sure Arduino IDE compatible to program ESP8266
- Interfacing DHT11 to NodeMCU (Wiring)
- Arduino IDE to create ESP8266 sketch for:
 1. Connecting to nearest able to use WiFi router
 2. Acquisition of temperature & humidity data from DHT11
 3. Send data to ThingSpeak by using its Channel's API

- Make sure Arduino IDE compatible to program ESP8266







NodeMCU_WiFi

```
1 #include <ESP8266WiFi.h>
2
3 #define WIFI_SSID "myinvententerprise"
4 #define WIFI_PASS "04222682"
5
6 void setup() {
7     Serial.begin(9600);
8
9     WiFi.begin(WIFI_SSID, WIFI_PASS);
10
11    while(WiFi.status() != WL_CONNECTED) {
12        Serial.print(".");
13        delay(250);
14    }
15
16    Serial.println();
17    Serial.println("NodeMCU WiFi Connected!");
18    Serial.print("IP Address:");
```