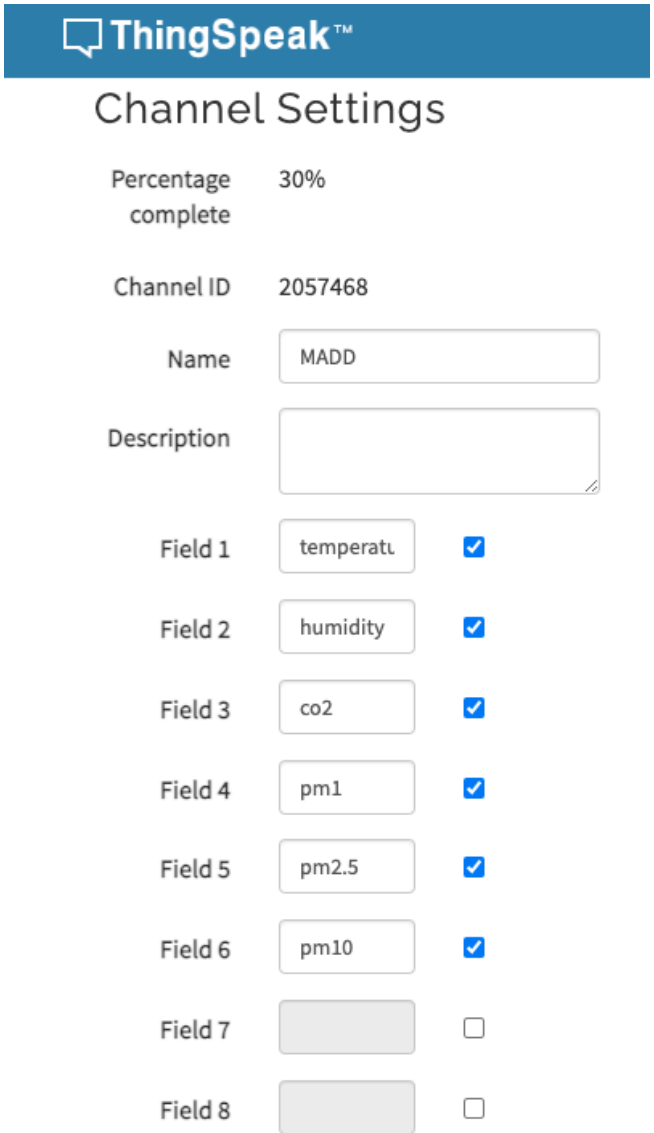
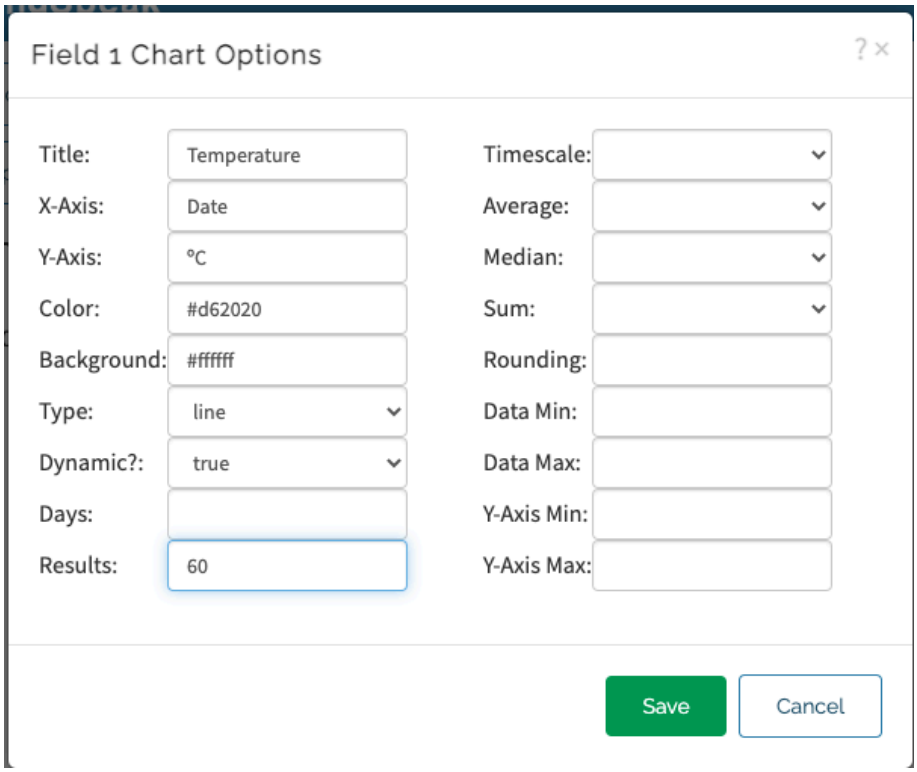
MADD - THINGSPEAK TUTORIAL

1. Go to https://thingspeak.com/
2. Click the person icon - No account? Create one!
3. Register a new account
4. Once registered go to My Channels and create New Channel
5. Name - the name you want for your channel (the name of your project or just MADD)
   Fields: here you will need to set up each field to one of the parameters you are measuring. In general it would be like:
   Field1: temperature
   Field2: humidity
   Field3: co2
   Field4: pm1
   Field5: pm2.5
   Field6: pm10



6. Click “save channel”
7. You can personalize each chart, by changing its title, adding an X/Y-axis name, etc. Feel free to explore on your own.



8. Go to API keys, at the top of the page.
   Here you need to write down two important numbers, to connect your Arduino to Thingspeak.
   First one is your Channel ID, located at the top left. This number corresponds to the channel we created.
   Let’s imagine my Channel ID number is: 123456
   Second one is the write API Key. This number gives access to Arduino to write inside your channel.
   Let’s imagine my Write API key is: ABCDEFG101010
9. Go to https://github.com/mconangla/MADD24/tree/main and download the Thingspeak code or directly here
10. Open the MADD_sensors_Thingspeak code in Arduino
11. In this code you will just need to change two things.
    1. Change the ssid name for your wifi name. It can either be a hotspot from your phone, an open wifi, your home wifi, etc. Take into account it only works with 2.4Ghz networks, so if you share your iPhone’s connection, you should turn on the Maximum Compatibility mode.
    Change these variables in the code:

```
char ssid[] = "YourWifiNameGoesHere";    // your network SSID (name)
char pass[] = "YourWifiPasswordGoesHere";    // your network password
```

2. Change the channel number and Write API key with the numbers you got from ThingSpeak plattform:
Change these variables in the code:

```
unsigned long myChannelNumber = 123456;
const char * myWriteAPIKey = "ABCDEFG101010";
```

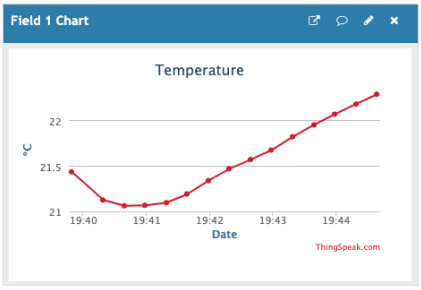
12. Upload your code in your Wemos mini board. Your board has a microcontroller that might need you to install a driver in your computer. The microcontroller is the CH340, in case you want to look information about (it's a pretty common chinese chip).
Windows driver: Windows CH340 Driver
Mac driver: V1.5 CH340 MaxOS Driver Pkg
If you want more info: https://sparks.gogo.co.nz/ch340.html

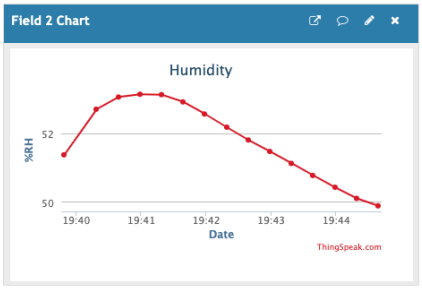
    When uploading the code you might see (sometimes not) two different ports with almost the same name on Arduino. The one without the - on it should work fine. Otherwise, try the other.

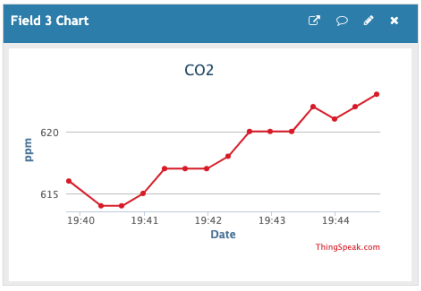
13. If everything went well you should see in serial (115200 baud rate) something like this. It might take some seconds before the board actually connects to your Wifi. Be patient.

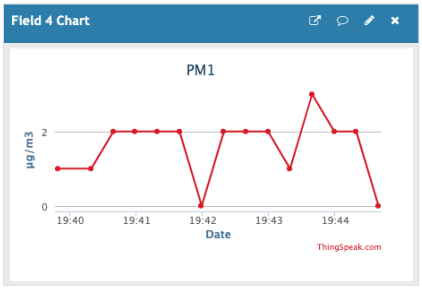
```
19:39:34.648 -> ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯Attempting to connect to SSID: MIWIFI_2G_dyZs
19:39:38.477 -> ..
19:39:48.547 -> Connected.
19:39:48.547 -> Temperature(C):21.5     Humidity(%RH):51        CO2(ppm):611
19:39:49.068 -> PM 1.0(µg/m3): 1        PM 2.5(µg/m3): 2        PM 10(µg/m3): 3
19:39:49.431 -> Channel update successful.
```

14. Every 20 seconds (can't be less for Thingspeak) the board will upload the new measures to Thingspeak, which should look something like this once you start receiving data.









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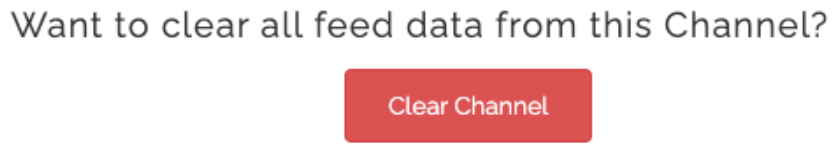
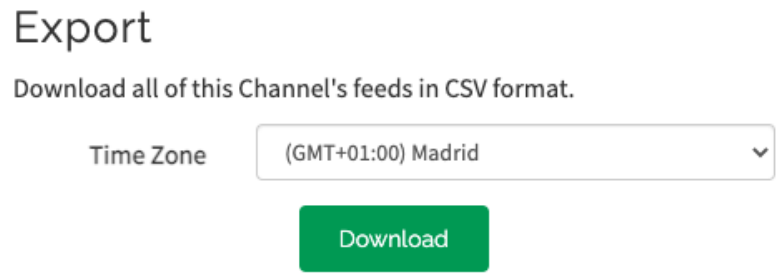
RECOMMENDATIONS:
In ThingSpeak > Channel Settings you will find this option:



It might be useful in case you need to delete the data from your channel without removing all the charts and specifications.

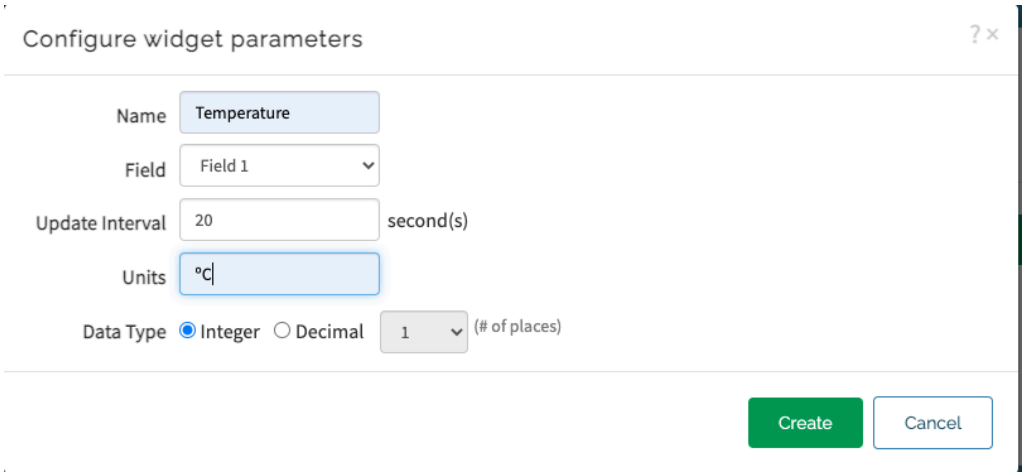
This might be handy if you are measuring different spaces for instance, and want to start from scratch every time you measure a new place.

In the Data Import/Export tab you will be able to export all the gathered data into an Excel file, so that later on you can analyze it or just save it in case you need to review something.



I'd recommend you do this as well, everytime you measure one specific place and before you go and measure the next one.

PERSONALIZATION:
You can add other visualizations to your dashboard, such as numeric values, gauges, and custom made charts. I find it quite useful to register the latest value with a numeric display by:
Add widgets > numeric display
You should set the Field with the value that matches the parameter you want to visualize:



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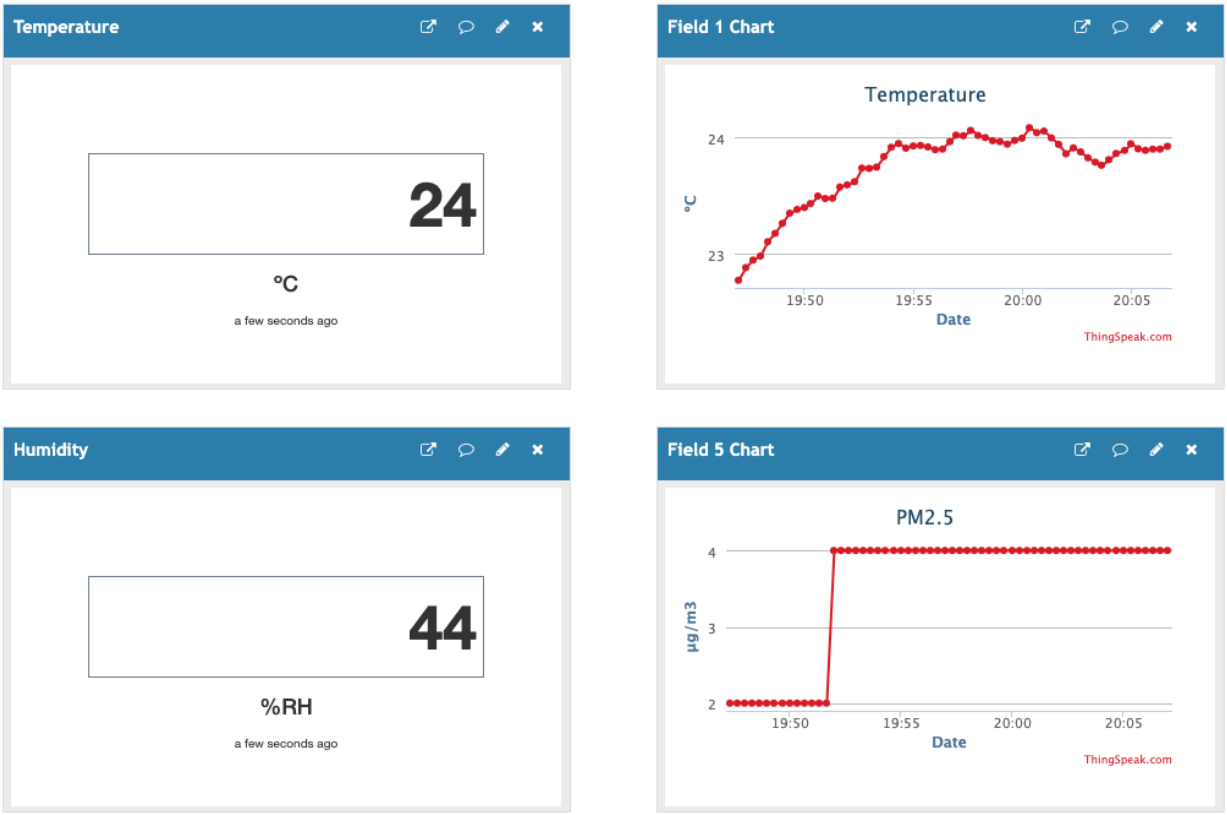
Here you have an example of a setup:



Just do your own the way you feel that is more useful for you!
Feel free to look over the internet for more possible visualizations, capabilities of ThingSpeak, etc.

USE:
You can set up your device to be “autonomous” by setting everything up first, uploading the code and then connecting the battery and turning it on.
Otherwise you can always track the values through the serial in your computer directly, in case you just need to grab some values from different places and don’t need to track them for a long time.

That's it. Let me know guys if you have any doubts.
You can always write me on Teams or directly at mconangla@elisava.net

Happy data!
Marc