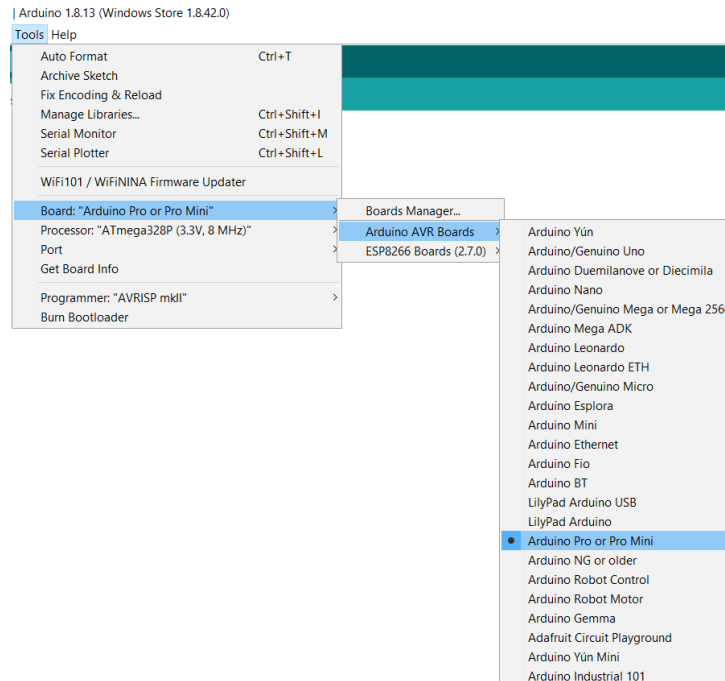


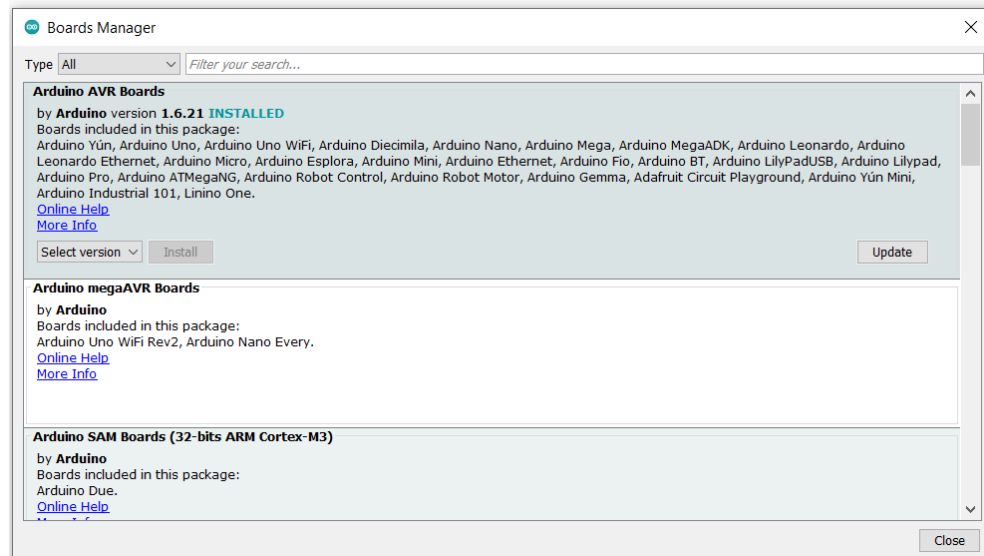
# LoKy Setup

## 1. Arduino IDE:

- Setup board information:



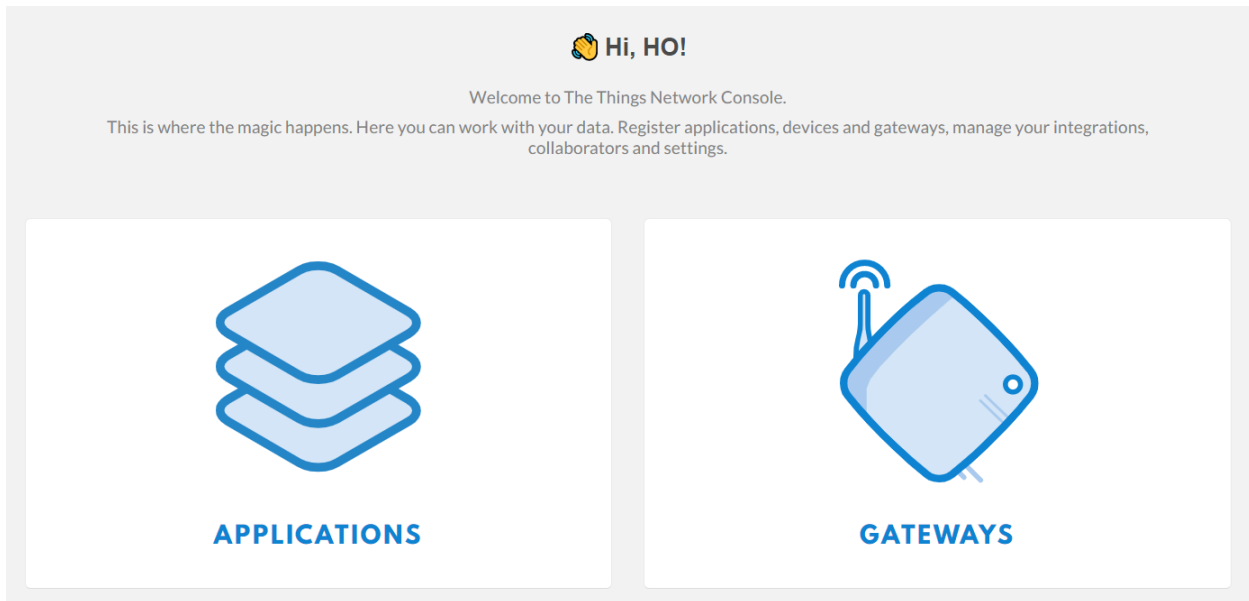
- Install version **1.6.21** on Boards Manager (the higher versions have bugs for LMIC library)



- Select Processor: "ATmega328P (3.3V, 8MHz)" and Port that is connecting to ProMini
- Install Libraries following this instruction: <https://www.arduino.cc/en/guide/libraries>

## 2. The Things Network (TTN)

- Login to TTN console: <https://console.thethingsnetwork.org/> and select Application



- Add a new Application

Applications > Add Application

### ADD APPLICATION

**Application ID**  
The unique identifier of your application on the network

 ✓

**Description**

A human readable description of your new app

 ✓

**Application EUI**

An application EUI will be issued for The Things Network block for convenience, you can add your own in the application settings page.

**Handler registration**

Select the handler you want to register this application to

 ✓

Cancel

Add application

- Register a device

Applications > geelink\_tutorial > Devices


Overview **Devices** Payload Formats Integrations Data Settings

### REGISTER DEVICE [bulk import devices](#)


**Device ID**  
This is the unique identifier for the device in this app. The device ID will be immutable.

geelink\_1

**Device EUI**  
The device EUI is the unique identifier for this device on the network. You can change the EUI later.

 this field will be generated

**App Key**  
The App Key will be used to secure the communication between you device and the network.


 this field will be generated

**App EUI**

70 B3 D5 7E D0 03 26 FA

Cancel **Register**

- After registering a device, adjust the keys into this format

Applications > geelink\_tutorial > Devices >  geelink\_1





Overview **Data** Settings





### DEVICE OVERVIEW






**Application ID** geelink\_tutorial

**Device ID** geelink\_1

**Activation Method** OTAA

**Device EUI**    { 0x7A, 0x0C, 0x11, 0x50, 0x3F, 0xC6, 0x60, 0x00 } 

**Application EUI**    { 0xFA, 0x26, 0x03, 0xD0, 0x7E, 0xD5, 0xB3, 0x70 } 

**App Key**     

**Status** ● never seen

**Frames up** 0 [reset frame counters](#)

**Frames down** 0

### 3. Payload decoder on TTN

Applications > geelink\_tutorial > Payload Formats

Overview Devices **Payload Formats** Integrations Data Settings

#### PAYLOAD FORMATS

**Payload Format**  
The payload format sent by your devices

Custom

decoder converter validator encoder [remove decoder](#)

```

1 function Decoder(bytes, port) {
2   // Decode an uplink message from a buffer
3   // (array) of bytes to an object of fields.
4   var decoded = {};
5
6   // if (port === 1) decoded.Led = bytes[0];
7
8   return decoded;
9 }

```

decoder has no changes

- Change the decoder to the [LoKy\\_decoder](#) and *remember* to **Save** before add integration


### 4. Integrations on TTN

- Add this integration:

Applications > geelink\_tutorial > Integrations

Overview Devices Payload Formats **Integrations** Data Settings

#### ADD INTEGRATION



**Data Storage** (v2.0.1)  
The Things Industries B.V.

Stores data and makes it available through an API. Your data is stored for seven days.

Cancel [Add integration](#)

## 5. Application Server

- Install InfluxDB and Grafana following this instruction:

<https://github.com/ITU-PITLab/public/blob/master/TheThingsNetwork%2Bnode-red%2Binfluxdb%2Bgrafana.md>

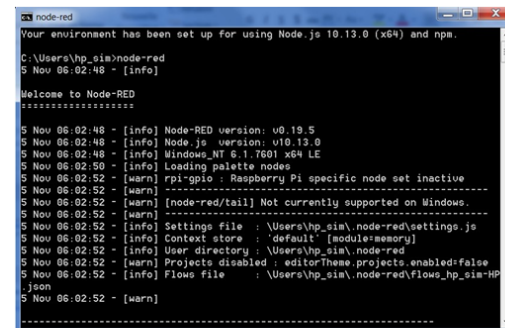
- Install Node-RED

If Git is not installed on your PC: <https://git-scm.com/downloads>. After that, run this command on Gitbash

**`npm install -g --unsafe-perm node-red`**

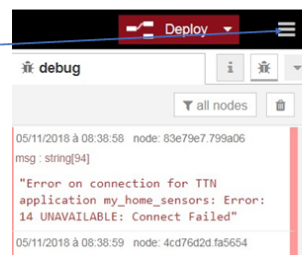
### Connecting to TTN

- Start NODE.js command prompt
- Run: `node-red`
- Open your web browser and go to <http://127.0.0.1:1880>



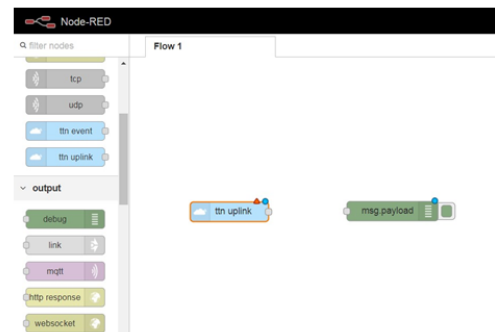
- On the editor, click here and go to palette editor Install:

- `node-red-contrib-ttn`
- `node-red-contrib-influxdb`



### Connecting to TTN

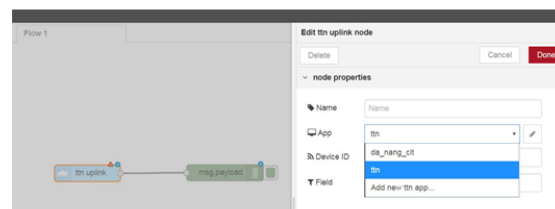
- You have the graphical Node-red editor
- Add ttn uplink and a debug output
- Edit TTN uplink
- Choose « Add new ttn app ... » in App and click on edit



App ID:

Access Key:

Discovery address:

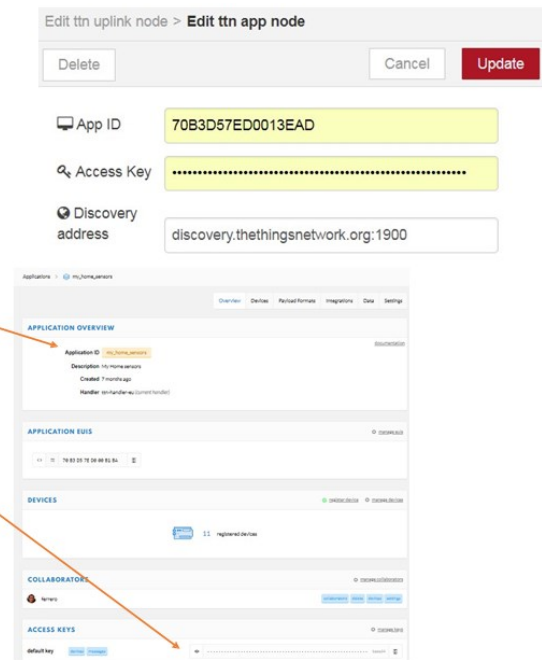


## Connecting to TTN

- You need :
  - App ID :
  - Access Key :
  - Discovery address :

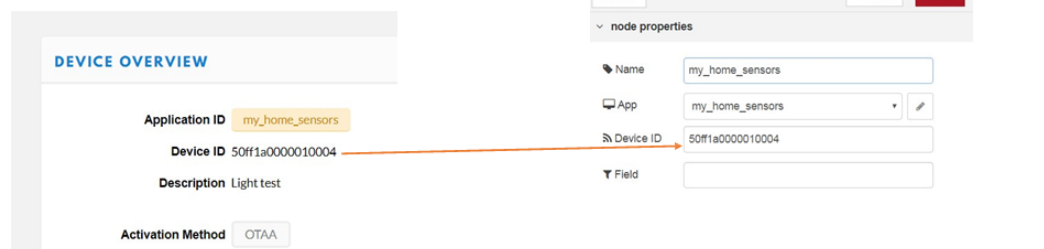
discovery.thethingsnetwork.org:1900

- Go to your application in TTN
- Copy past the Application ID and Access Key



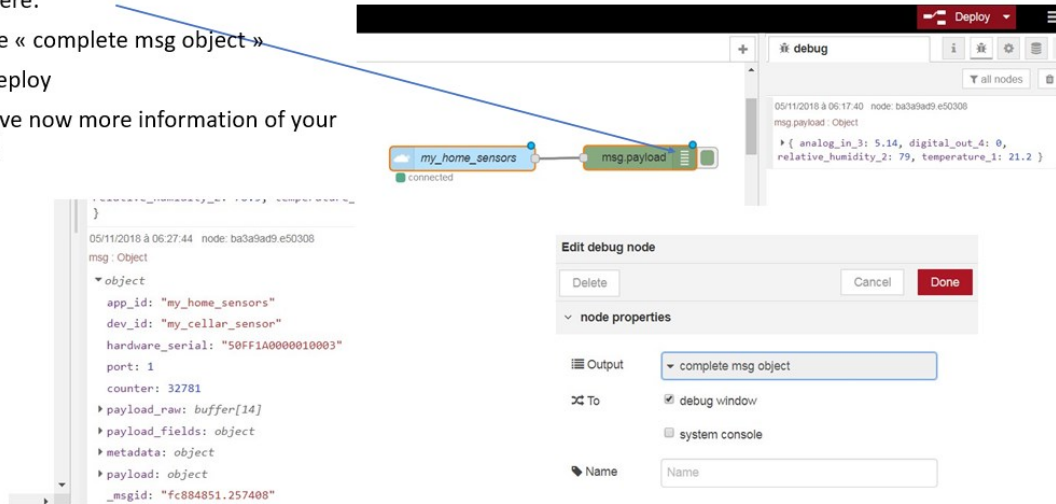
## Connecting to TTN

- Click on Deploy
- Your uplink TTN should be connected
- Click on debug window
- You will receive the packet of the application
- If you want to filter only your device, add your device ID
- Click here:



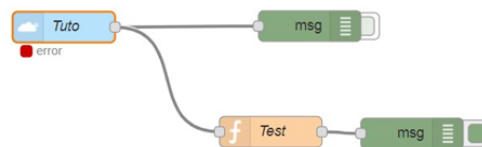
## Connecting to TTN

- Click here:
- Choose « complete msg object »
- And Deploy
- You have now more information of your uplink



## Connecting to TTN

- If you want to extract only 1 data,
- as an example the RSSI (received signal Strength indicator)
- Use a function to extract the wanted data



```

return {
  // Some fields from the metadata freq:
  msg.metadata.frequency,
  cr: msg.metadata.cr,
  dr: msg.metadata.dr,

  // Combine RSSI and SNR of all gateways into two arrays:
  rssi: gateways.map(gw => gw.rssi),
  snr: gateways.map(gw => gw.snr),
};

```

## InfluxDB

- Run « influxd.exe », it will start the database
- Run « influx.exe », it will open a shell
- Write: « CREATE DATABASE mySensor »
- Then write: « SHOW DATABASES »

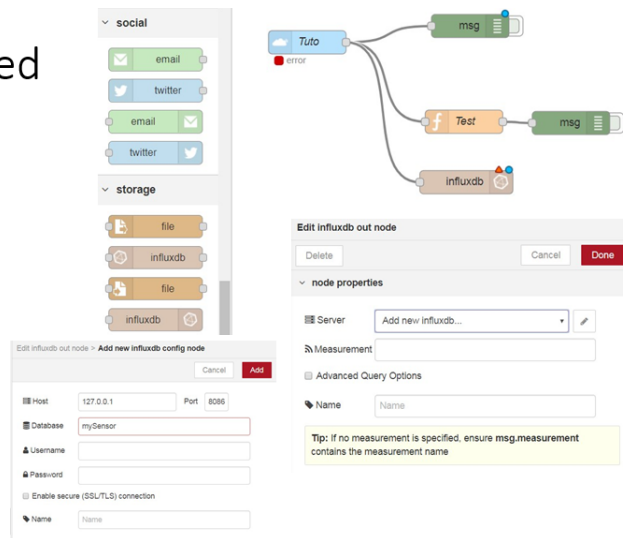
```

> CREATE DATABASE mySensor
> SHOW DATABASES
name: databases
name
----
_internal
tuto
mySensor
>

```

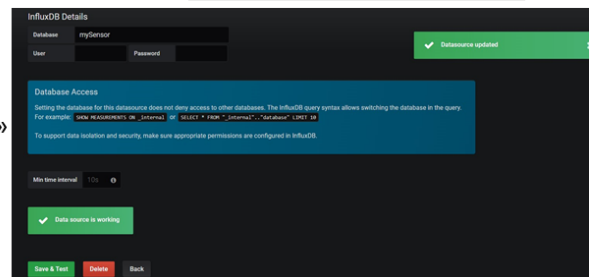
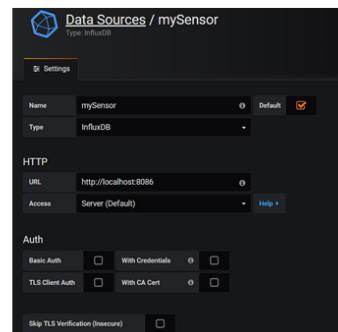
## InfluxDB – Node Red

- How to store data in your database?
- Add an influxdb storage and connect it to your uplink
- Define a server, just add the Database name: mySensor
- Add
- In measurement field, add a name for your device: device1
- Go to InfluxDB shell
- Run : SHOW SERIES ON mySensor



## Grafana

- Go to yours unzip Grafana directory/bin
- Start grafana-server.exe
- Go to : <http://127.0.0.1:3000>
- User name and password is: admin
- Provide a new password
- Click « Add data source »
- Add a name
- Choose InfluxDB type
- Define Database name « mySensor »
- Click on Save and Test



## Grafana

- Create a new dashboard
- Click on Graph
- Panel Title / Edit
- Select your data source and measurement, field temperature, time 1s, fill linear
- Change to the last 5mn
- Put your finger on the sensor
- Look at your curve

