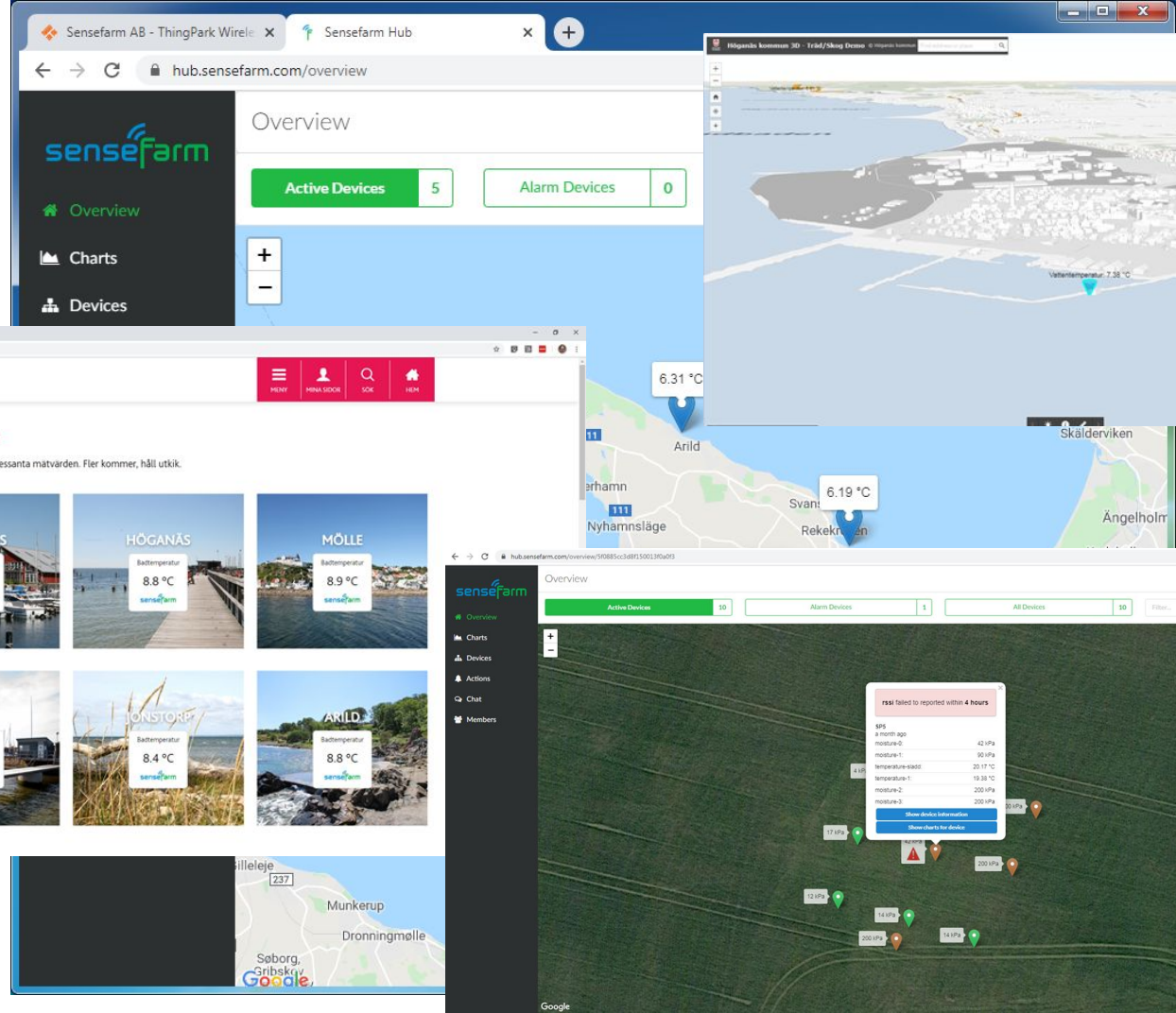


# LoRaWAN server configuration

towards [hub.sensefarm.com](https://hub.sensefarm.com)

© Sensefarm December 2020

# Example usage of the CUBE02 sensor serie with different LoRaWAN servers and operators



# Content

- Locating the encryption keys for Sensefarm products
  - <https://hub.sensefarm.com>
- Actility
  - <https://stadshubb.thingpark.com/portal/web/>
- Talkpool
  - <https://apps.talkpool.com/>
- Netmore
  - <https://portal.blink.services/home>
- Chirpstack
  - <https://www.chirpstack.io/>
- Ygg.io
  - <https://ygg.io>
- The Things Network
  - <https://account.thethingsnetwork.org/>

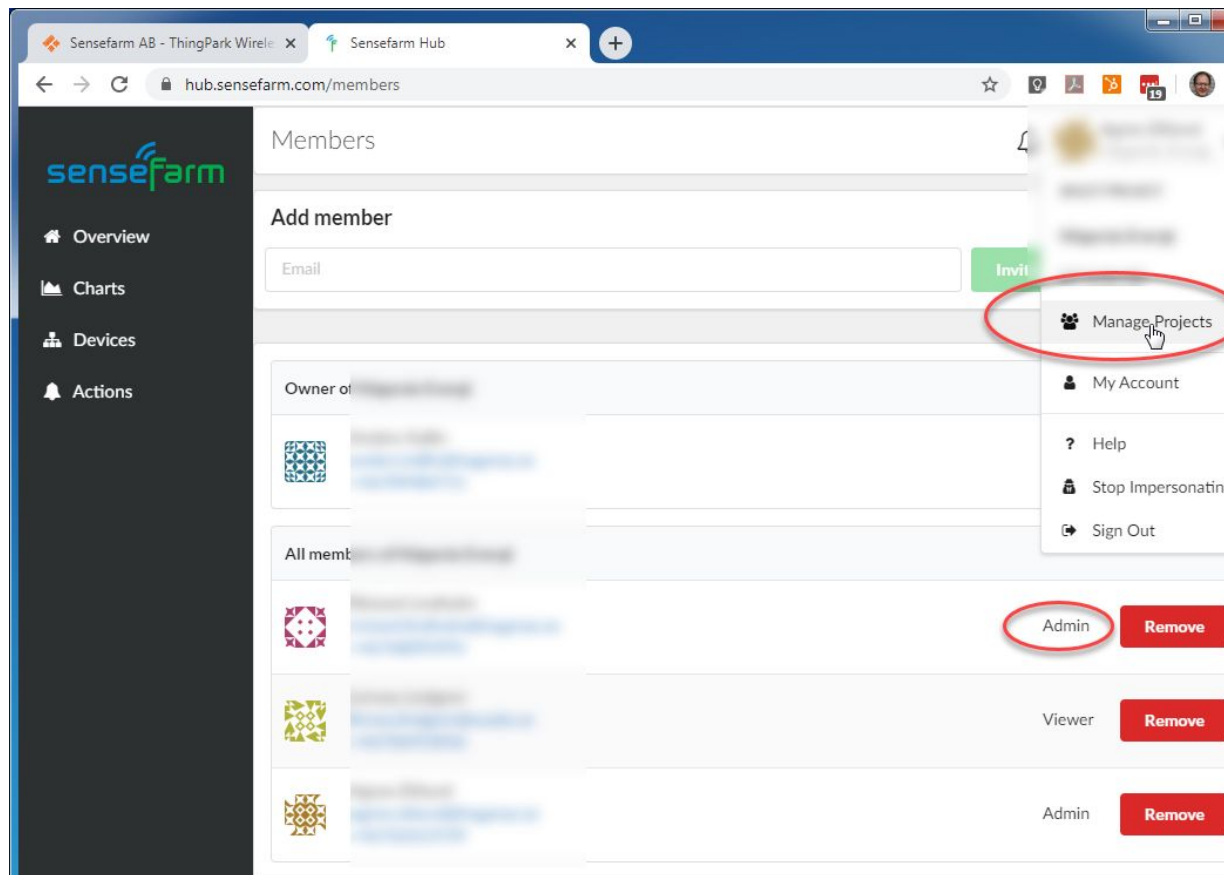
# Locating device encryption keys - 1 of 2

Keys are printed on the lid of the device



They are easier to copy from  
Hub.sensefarm.com

Project roles needed  
for access to keys:  
Owner, Admin



# Locating device encryption keys - 2 of 2

Hub.sensefarm.com

Find device

Press Edit

Settings needed for ABP

devEUI

devAddr

appSkey

nwkSkey

The screenshot shows the Sensefarm web interface. On the left is a dark sidebar with navigation links: Overview, Charts, **Devices** (highlighted with a red circle), Actions, Chat, and Members. The main content area is titled 'Halmstadgården Norr centrum 205'. It contains an 'Admin area' section with a 'Project (Owner)' field. Below this is the 'Device information' section, which lists details for a device named 'Halmstadgården Norr centrum 205'. The device type is 'CUBE02'. A 'Hide Advanced Info' button is highlighted with a red circle. Below this button, the 'Keys' section is expanded, showing the following information: Join Type: ABP, Class: A, devAddr: 01000205, nwkSkey: 42E3F01B1C73D, appSkey: 224C12246. At the bottom of the keys section, there is a link for 'Uplink Payload (Raw Data)'.

Device information	
Name	Halmstadgården Norr centrum 205
Type	CUBE02
ID	[REDACTED]
Connected Gateway	B82 [REDACTED] 88
Source	sensefarm-lora
Latest report	November 18th 2020, 17:04:22
Latest Message Interval	10 minutes
<b>Hide Advanced Info</b>	
<b>Keys</b>	
Join Type	ABP
Class	A
devAddr	01000205
nwkSkey	42E3F01B1C73D
appSkey	224C12246
<a href="#">Uplink Payload (Raw Data)</a>	

*Cube02 sensors are locked down to use ABP and SF12 due to their outdoor field usage.*

*OTAA and ADR requires good bi-directional radio coverage which can not be guaranteed all year around due to plants, sudden rain and quick underground sensor placement.*

# Actility configuration

<https://stadshubb.thingpark.com/portal/web/>

# Adding a device

Manufacturer - Generic  
Model - very important to  
get correct, many similar  
variants:

LoRaWAN 1.0.2 rev B  
Class A  
Rx2\_SF12  
eu868

The screenshot shows the 'New device' form in the Sensefarm AB ThingPark Wireless interface. The form is divided into several sections, with red circles highlighting specific fields:

- Administrative data:**
  - Device name: Test - 70B3D55460000EFB
  - Marker: Change marker
  - Administrative info: (empty text field)
  - Administrative location: 55° 43' 1" N 13° 13' 30" E Change location
  - Motion indicator: Random
- Device identification:**
  - Manufacturer: Generic
  - Model: LoRaWAN 1.0.2 revB - class A - Rx2\_SF12 eu868
  - Device activation: Activation By Personalization (ABP)
  - DevEUI: 70B3D55460000EFB
  - DevAddr: 01000EFB
  - NwkSKey: E32 5E0A5F4
- Network parameters:**
  - Connectivity plan: ORESUNDSKRAFT Connectivity Supplier / ORESUNDSKRAFT Bas (999)
- Application layer handling:**
  - Application server routing profile: sensefarm-cube02
  - AppSKeys: AppSKey D7D! D4E8 Port \*

The left sidebar shows the 'Devices' menu item circled in red. Below it, a table lists existing devices with columns for Name, Type, Identifiers, and Connection status.

Name	Type	Identifiers	Connec
LoRa			
CUBE01-TW-70B3D554600	Testing	70B3D554600	ORESU
LoRaWAN 1.0 revB - class A Rx2_SF12	sensefarm-cube01	2DF3D4D9	
LoRa			
CUBE01-TW-70B3D554600	Testing	70B3D554600	ORESU
LoRaWAN 1.0 revB - class A Rx2_SF12	sensefarm-cube01	2D280C2D	
LoRa			
CUBE01-TW-70B3D554600	Testing	70B3D554600	ORESU
LoRaWAN 1.0 revB - class A Rx2_SF12	sensefarm-cube01	6A0AF032	
LoRa			
CUBE01-TW-70B3D554600	Testing	70B3D554600	ORESU
LoRaWAN 1.0 revB - class A Rx2_SF12	sensefarm-cube01	D9239A74	

v10.18.3-8337ec824 ©2019 Activity



# Security

The device frame counter used by the crypto inside the device is reset to Zero upon reset of CUBE01 and CUBE02 (Should be done when battery is changed)

Thus options such as “Disable frame-counter validation” should be set on all LoRa-WAN servers for easy operation.

Actility has a button called “Reset security context” for this.

The screenshot shows a web browser window with the URL `stadshubb.thingpark.com/deviceManager/`. The page is titled "Sensefarm AB [Subscriber]" and "Anders Hedberg" is logged in. The left sidebar shows a tree view of the device configuration, with "Settings" highlighted under the "CUBE02-70B3D554600000C8" device. The main content area is titled "Node settings" and contains two sections: "Alarm Settings" and "Troubleshooting". The "Alarm Settings" section has a heading "No uplink activity alarm settings." and two rows of settings for "Activate threshold1" and "Activate threshold2". The "Troubleshooting" section has a heading "Security context" and a button labeled "Reset security context". Both the "Settings" item in the sidebar and the "Reset security context" button are circled in red.

Sensefarm AB - ThingPark Wireless x Sensefarm Hub x +

← → ↻ stadshubb.thingpark.com/deviceManager/

Sensefarm AB [Subscriber] Anders Hedberg

ThingPark Wireless

Devices

- CUBE02-70B3D554600000C8
  - Network
  - Settings
  - Alarms (5)
    - History
  - Multicast groups
  - Connectivity plans
  - AS routing profiles
    - sensefarm-cube01-tw
  - Application servers
    - sensefarm-cube02
    - sensefarm-cube01-tw
    - test
  - Settings

Node settings

Alarm Settings

No uplink activity alarm settings.

☐ Activate threshold1 Trigger: After 2 days of inactivity Action: Raise Alarm Level to Warni

☐ Activate threshold2 Trigger: After 7 days of inactivity Action: Raise Alarm Level to Major

Troubleshooting

Security context

Reset security context

v10.18.3-8337ec824 ©2019



# Set up connection to hub.sensefarm.com - 1 of 2

The screenshot shows the Sensefarm AB device manager interface. The left sidebar contains a tree view with the following items: Devices, Network, Settings, Alarms (5), History, Multicast groups, Connectivity plans, AS routing profiles, **sensefarm-cube01-tw**, **Application servers** (highlighted with a red circle), sensefarm-cube02, sensefarm-cube01-tv, and Settings. The main content area is titled "Application servers" and includes a "Add application servers" button and a "+ Create" button (highlighted with a red circle). Below this is a table of existing application servers:

Name	ID	Status	Type
sensefarm-cube01-tw	TWA_100039957.39645.AS	Active	HTTP Application Server (LoRaWAN)
sensefarm-cube02	TWA_100039957.39642.AS	Active	HTTP Application Server (LoRaWAN)

Below the table is a "New application server" dialog box. It has a "Name:" field and a "Type:" dropdown menu. The dropdown menu is open, showing the following options: HTTP Application Server (LoRaWAN), HTTP Application Server (LoRaWAN), HTTP Application Server (Cellular), and Kafka Cluster. The first two options are highlighted with a red circle.

# Set up connection to hub.sensefarm.com - 2 of 2

Currently implemented  
API's -

<https://activity.sensefarm.com/CUBE02>

<https://activity.sensefarm.com/CUBE01-TW>

Use the correct one for the devices you have.  
CUBE version is printed on device label and  
available on hub.sensefarm.com device page  
under "Factory defaults".

The "Tunnel interface authentication key" is  
Available for customers upon request, but  
turned off by default.

The screenshot shows the 'Application server' configuration page for a device named 'sensefarm-cube02'. The interface includes a sidebar with a tree view of device settings, a main configuration area, and a 'Destinations' dialog box.

**Application server configuration:**

- Name: sensefarm-cube02
- ID: TWA\_100039957.39642.AS
- Content Type: JSON
- Type: HTTP Application Server (LoRaWAN)
- Status: Active

**Uplink/downlink security configuration:**

- Status: Active
- AS ID: hub-cube02
- Max timestamp deviation: 60 seconds

**Destinations configuration:**

- Destination: <https://activity.sensefarm.com/CUBE02>

**Uplink/downlink security configuration dialog (bottom left):**

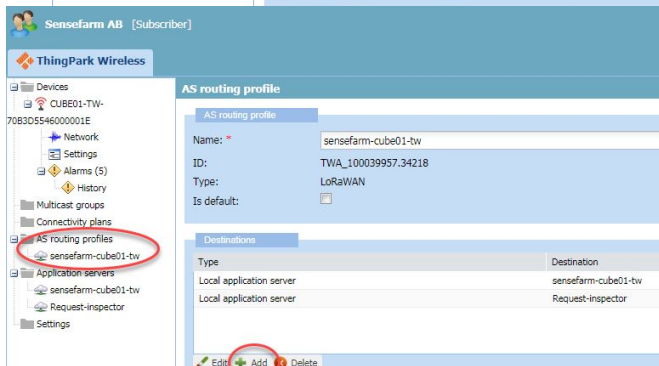
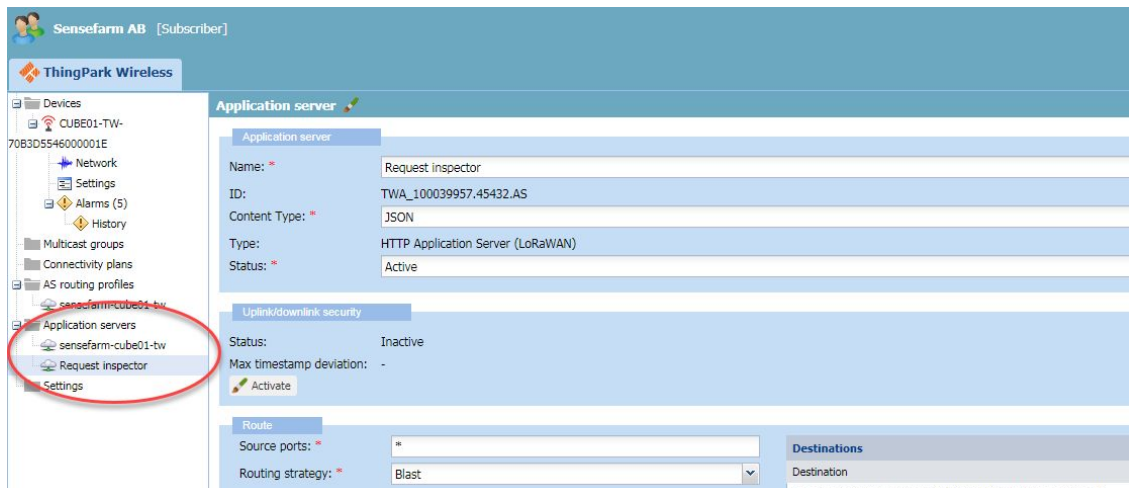
- AS ID: hub-cube02
- Tunnel interface authentication key: BE-C4-99-C6-9E-9C-93-9E-41-3B-66-39-61-63-6C-61
- Max timestamp deviation (seconds): 60

# Feeding sensor data to multiple applications from Actility

Only needed if sensor packets should be sent to more services than hub.sensefarm.com ( requestinspector.com is a nice debugging tool as an example )

Add an extra application server.

Add the application to the routing profile used.



# Talkpool configuration with hub.sensefarm.com

<https://apps.talkpool.com/>

# Talkpool

## apps.talkpool.com

Https URL:

<https://talkpool.sensefarm.com>

Include radio parameters = Yes

The screenshot displays the Talkpool web application interface. The browser's address bar shows the URL `apps.talkpool.com/#/application/70-B3-D5-54-60-00-00-00/customer_servers`. The application's left sidebar contains navigation links for Home, Applications, and Network Activity. The main content area is titled 'SensefarmTest (70-B3-D5-54-60-00-00-00)' and features a 'Customer Servers' tab. Below this, the 'Edit Customer Server' form is visible, containing the following fields and controls:

- Customer Server Name:** A text input field with the value 'SensefarmHub'.
- Include Radio Parameters:** A toggle switch set to 'Yes'.
- Protocol Type:** A dropdown menu with 'HTTP(S)' selected.
- HTTP(S) URL:** A text input field with the value 'https://talkpool.sensefarm.com'.
- Buttons:** 'Update' and 'Cancel' buttons at the bottom right of the form.

Below the form, a 'Customer Servers' table lists existing entries. The table has columns for Name, Include Radio Parameters, Protocol Type, Configuration Data, and Actions.

Name []	Include Radio [] Parameters	Protocol Type []	Configuration Data	Actions
SensefarmHub	Yes	HTTP	URL: https://talkpool.sensefarm.com	[Edit] [Delete]

At the bottom of the table, it indicates 'Showing 1 to 1 out of 1 entries' and provides pagination controls: First, Previous, 1, Next, Last.

# Talkpool - Adding a device.

“:” “-” must be inserted into EUI and Address fields

The screenshot displays the Talkpool web interface. The top navigation bar includes a user profile for Anders Hedberg. The left sidebar shows the 'admin area' with options for 'Owner', 'Device information', and 'Network Activity'. The main content area is titled 'SensefarmTest (70-B3-D5-54-60-00-00-00) / Personalised Devices'. It features a form to 'Add New Personalised Device' with the following fields:

- Device EUI:** 8 pairs of hexadecimal numbers separated by hyphen(-). The value entered is 70-B3-D5-54-60-00-01-C1.
- Network Address:** 4 pairs of hexadecimal numbers separated by colon(:). The value entered is 01:00:01:C1.
- Application Session Key:** Hexadecimal String of size 32. The value entered is C5487683D17389DF731111.
- Network Session Key:** Hexadecimal String of size 32. The value entered is E0FD04CC14779F0D7B5FAD.

Buttons for 'Add Device' and 'Cancel' are at the bottom of the form. Below the form, a section titled 'Personalised Devices Configured to the Application' shows a table with columns for Device EUI, Network Address, Application Session Key, Network Session Key, and Actions.


At the bottom left, a JSON response is shown with several fields circled in red, corresponding to the form fields:

```
{
  "uniqueId": "333747073636373734004800",
  "devEUI": "70B3D554600001C1",
  "appEUI": "70B3D554600001C1",
  "appKey": "2A749B3488D5997101CE",
  "devAddr": "010001C1",
  "appSKey": "C5487683D17389DF731111",
  "nwksKey": "E0FD04CC14779F0D7B5FAD",
  "generated": "2020-05-13T08:05:30.142Z",
  "abp": true,
  "evp": true
}
```

# Talkpool

Devices must be tagged “CUBE02” for hub.sensefarm.com to accept them.

← → ↻ [apps.talkpool.com/#/device/70-B3-D5-54-60-00-01-83/settings](https://apps.talkpool.com/#/device/70-B3-D5-54-60-00-01-83/settings)



- Home
- Applications
- Network Activity

Home / Devices / 70-B3-D5-54-60-00-01-83 / Settings

CUBE02 (70-B3-D5-54-60-00-01-83)

Info Traffic Downlink Settings

Identification Info Build Info

Device Build Info

Vendor

Alphanumeric String (Max 50 Characters). Allowed Special Characters ( - )

Enter Vendor

Model

Alphanumeric String (Max 50 Characters). Allowed Special Characters ( - @ . : \_ )

CUBE02

Firmware

Alphanumeric String (Max 50 Characters). Allowed Special Characters ( - @ . : \_ )

Enter Firmware

Serial Number

Alphanumeric String (Max 50 Characters). Allowed Special Characters ( - @ . : \_ )

Enter Serial Number

Lora Version

Alphanumeric String (Max 50 Characters). Allowed Special Characters ( - @ . : \_ )

Enter Lora Version



# Netmore configuration with hub.sensefarm.com

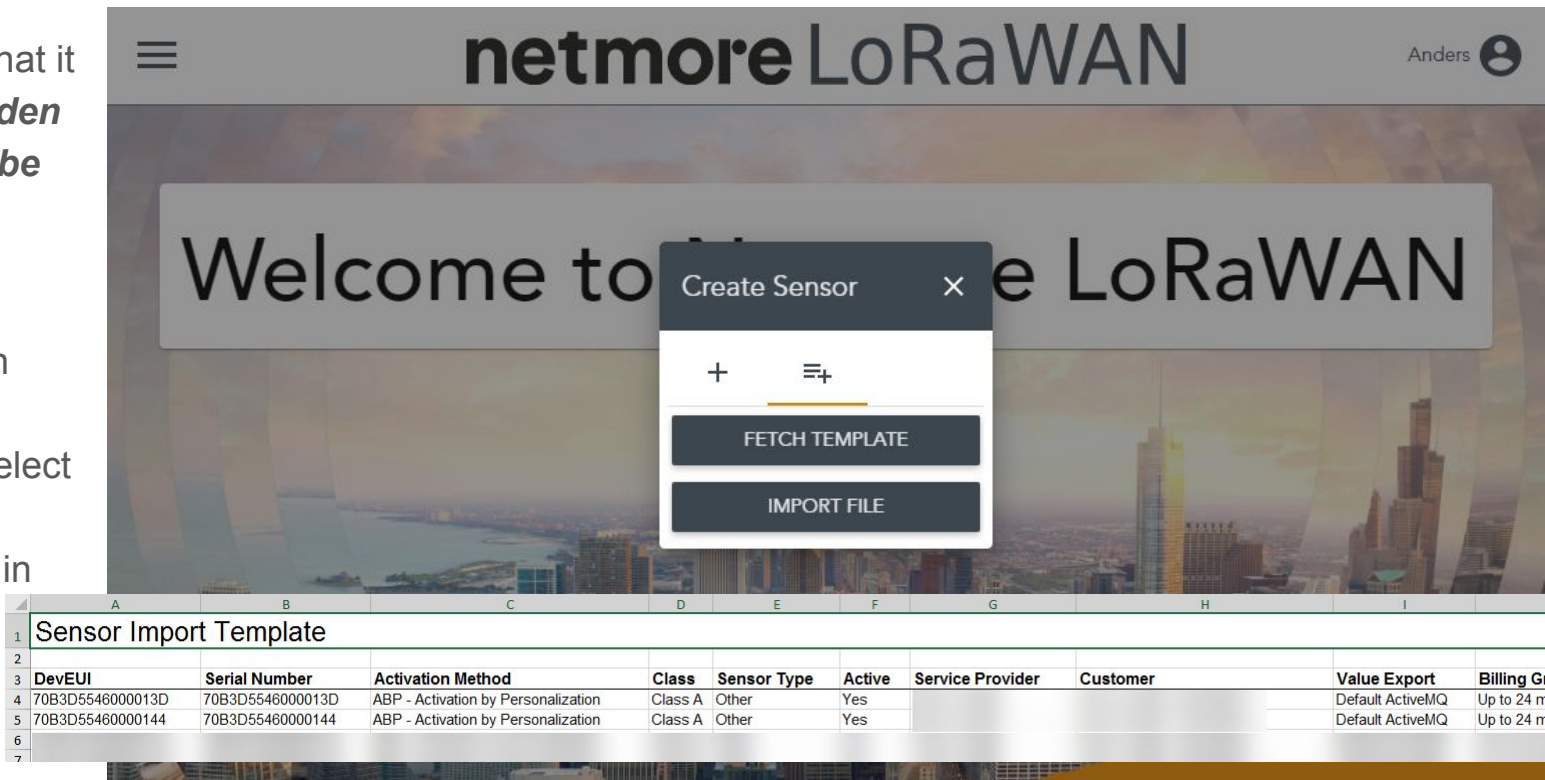
<https://portal.blink.services/home>

We really recommend the batch creation

Do one sensor manually, check that it works. ***Some hidden values can only be set by Netmore support!***

Then do the batch creation:

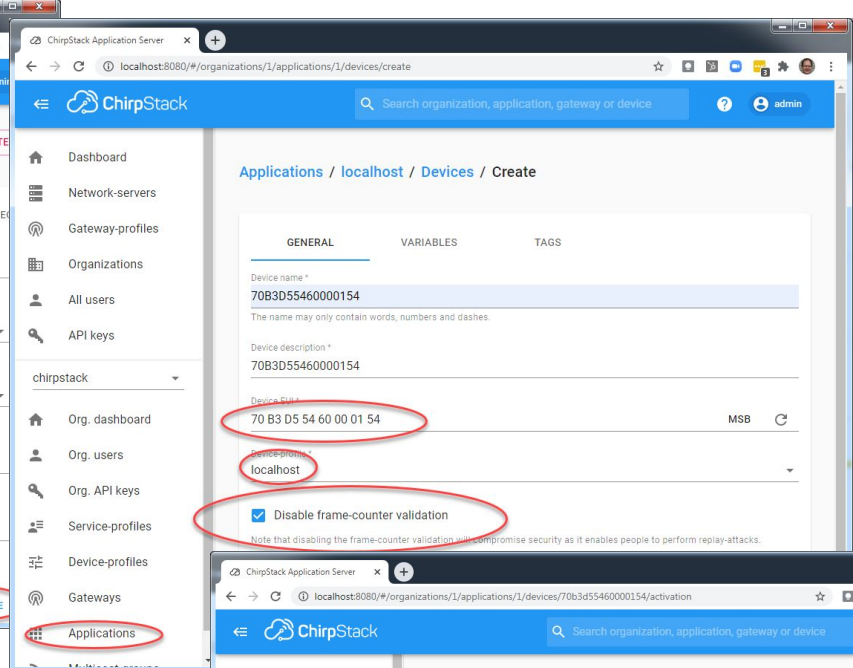
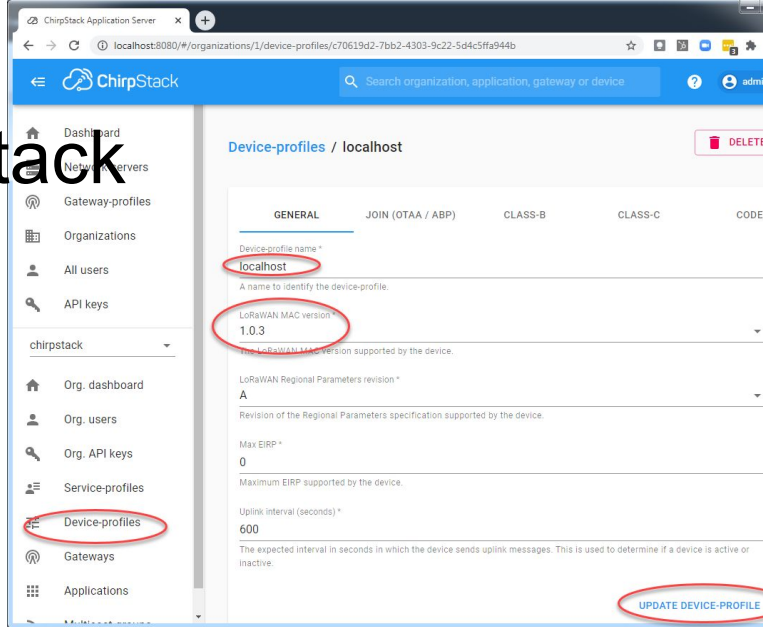
Create Sensor, Select batch, Fetch the template, Open it in excel, Fill it with values, re-import



# Chirpstack

<https://www.chirpstack.io/>

# Chirpstack



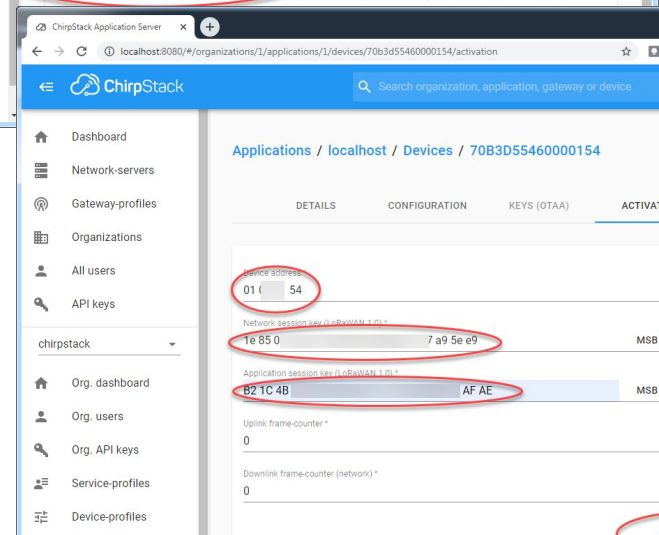
Create a device profile

1.0.3 protocol ( or less )

Application

**Mark “Disable frame-counter-validation” !**

Activation-tab will show for ABP keys entering



# Yggio

<https://ygg.io>

# Yggio

Select IoT-nodes

Press “New IoT-node” at the top of the screen and follow the wizard. Device model name is “sensefarm-cube02-sm”

Select the new node from the list.

*Obs! There is a translated xxx(simple-lora-node)  
Do not select that node as we need the raw data!*

Select Channels

Select HTTP

Enter URL:

<https://yggio.sensefarm.com:443/>

The screenshot shows the YGGIO web interface. At the top, the 'New IoT-node' button is circled in red. On the left sidebar, the 'IoT-nodes' menu item is circled in red. The main content area is titled 'Viewing lora-node'. It displays details for a node named 'Strips-6119709-JBV'. The 'Category' is 'Uncategorized' and the 'Description' is 'no description'. Below this, there are tabs for 'Access rights', 'Specifications', 'Channels', 'Translators', 'Value', 'Routingkeys', and 'LoRa Control'. The 'Channels' tab is circled in red and contains a form with the following fields: 'Name' (yggio.sensefarm.com), 'Protocol' (HTTP selected, with MQTT also visible), and 'URL' (https://yggio.sensefarm.com:443/). The 'URL' field is also circled in red. At the bottom of the form are 'Edit' and 'Delete' buttons. On the right side, a 'Status' panel shows 'Last reported', 'No report interval set', and 'Status: Connected to LoRa App S signal'.

# The Things Network

## CUBE series of devices

The Cube-02 DevAddr can not be configured from the web-interface.

The TTN command line tool is needed, please check out "ttnctl devices set" on this page

<https://www.thethingsnetwork.org/docs/network/cli/api.html>

The TTN CLI tool can be downloaded from <https://www.thethingsnetwork.org/docs/network/cli/quick-start.html>

## Hub.sensefarm.com

For connecting to hub.sensefarm.com, please contact [info@sensefarm.com](mailto:info@sensefarm.com)