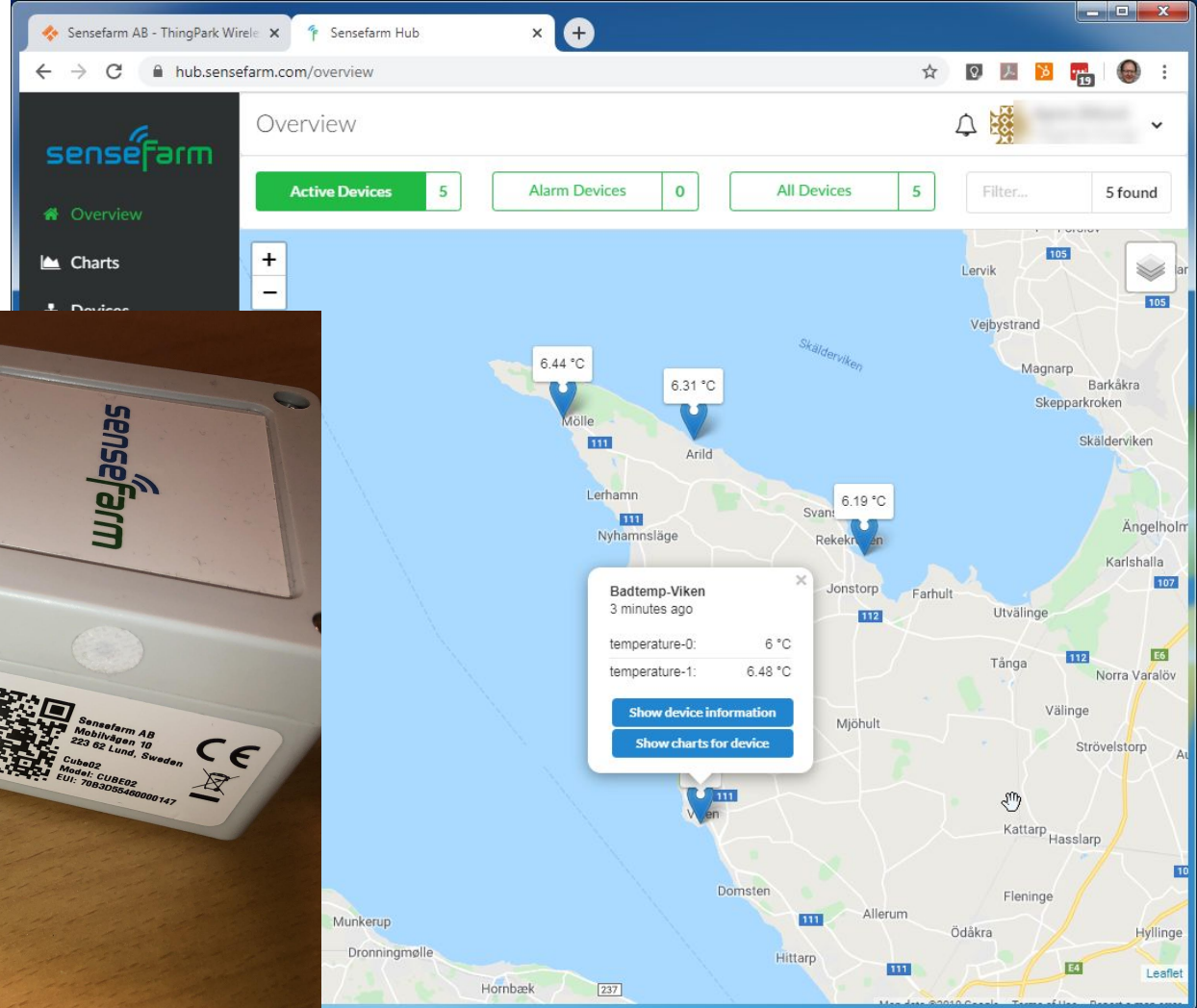


LoRaWAN server configuration examples

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Example usage of the CUBE02 series



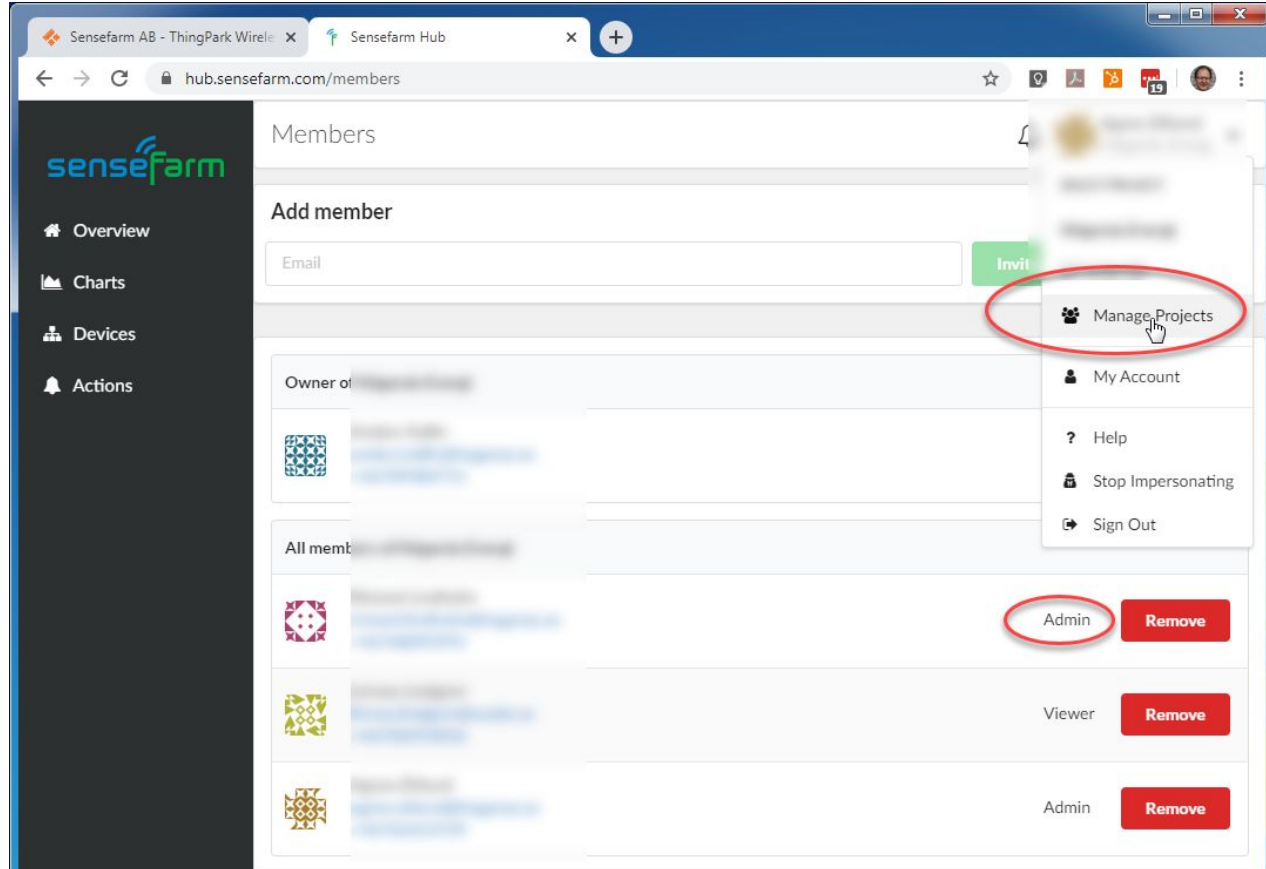
Content

- Finding the encryption keys
 - <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/>

Finding device data, encryption keys - 1 of 2

Hub.sensefarm.com

Project roles needed
for access to keys:
Owner, Admin



Finding device data, 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' 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 is a 'CUBE02' with a specific ID, connected to gateway 'B82...88', source 'sensefarm-lora', and latest report from 'November 18th 2020, 17:04:22'. The latest message interval is '10 minutes'. A 'Hide Advanced Info' button is highlighted with a red circle. Below this button is the 'Keys' section, which contains fields for 'Join Type' (set to 'ABP'), 'Class' (set to 'A'), 'devAddr' (01000205), 'nwkSKey' (42E3F...B1C73D), and 'appSKey' (224C...246). At the bottom of the keys section is a link for 'Uplink Payload (Raw Data)'.

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 with hub.sensefarm.com

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

Set up connection to Sensefarm's application - 1 of 2

The screenshot shows the Sensefarm AB ThingPark Wireless 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** (circled in red), sensefarm-cube02, and sensefarm-cube01-tw. The main content area is titled 'Application servers' and includes a 'Add application servers' button and a '+ Create' button (circled in red). 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)

A 'New application server' modal window is open, showing a 'Name' field and a 'Type' dropdown menu. The 'Type' dropdown is open, and the first two options, 'HTTP Application Server (LoRaWAN)' and 'HTTP Application Server (LoRaWAN)', are circled in red. The 'Create' button is also visible in the modal.

Set up connection to Sensefarm's application - 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 is divided into several sections:

- Application server:** Contains fields for Name (sensefarm-cube02), ID (TWA_100039957.39642.AS), Content Type (JSON), Type (HTTP Application Server (LoRaWAN)), and Status (Active). The ID, Content Type, and Status fields are circled in red.
- Uplink/downlink security:** Shows Status (Active), AS ID (hub-cube02), and Max timestamp deviation (60 seconds).
- Route:** Shows Source ports (*) and Routing strategy (Sequential).
- Destinations:** A table with one entry: Destination (https://activity.sensefarm.com/CUBE02). This entry is circled in red.

On the left sidebar, under 'Application servers', 'sensefarm-cube02' is highlighted with a red circle. An arrow points from this circle to the 'Uplink/downlink security configuration' dialog box.

The 'Uplink/downlink security configuration' dialog box shows the following fields:

- 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

Buttons for 'Save' and 'Close' are visible at the top right.

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.

The image displays two screenshots of the Sensefarm AB [Subscriber] interface, illustrating the configuration of an application server and its integration into a routing profile.

Top Screenshot: Application server configuration

- Left sidebar:** Shows the navigation menu with 'Application servers' highlighted. Below it, 'sensefarm-cube01-tw' and 'Request inspector' are listed.
- Main panel:** Displays the configuration for the 'Request Inspector' application server.
 - Application server:**
 - Name: Request Inspector
 - ID: TWA_100039957.45432.AS
 - Content Type: JSON
 - Type: HTTP Application Server (LoRaWAN)
 - Status: Active
 - Uplink/downlink security:**
 - Status: Inactive
 - Max timestamp deviation: -
 - Activate button
 - Route:**
 - Source ports: *
 - Routing strategy: Blast
 - Destinations:**
 - Destination: <https://requestinspector.com/p/01e62007pkde0ttmgea5a1jmf>
 - Buttons: Edit, Add, Delete, Up, Down

Bottom Screenshot: AS routing profile configuration

- Left sidebar:** Shows the navigation menu with 'AS routing profiles' highlighted. Below it, 'sensefarm-cube01-tw' is listed.
- Main panel:** Displays the configuration for the 'sensefarm-cube01-tw' AS routing profile.
 - AS routing profile:**
 - Name: sensefarm-cube01-tw
 - ID: TWA_100039957.34218
 - Type: LoRaWAN
 - Is default: ☐
 - Destinations:**

Type	Destination
Local application server	sensefarm-cube01-tw
Local application server	Request-inspector

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 displays the 'Sensefarm AB - ThingPark Wireless' web interface. The left sidebar shows a tree view with 'Devices' highlighted. The main area shows a 'New device' form with the following fields and values:

- Administrative data:**
 - Device name: Test - 70B3D55460000EFB
 - Marker:
 - Administrative info: (empty)
 - Administrative location: 55° 43' 1" N 13° 13' 30" E
 - 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 D7D5 04E8

The 'Create' button in the top right of the form is also highlighted with a red circle.

At the bottom right of the interface, the version 'v10.18.3-8337ec824' and copyright '©2019 Activity' are visible.

Security

The device frame counter used by the crypto inside the device is reset to Zero upon reset of CUBE01 and CUBE02 (usually 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 Hed" 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 Hed

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

Save

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

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 currently showing 'HTTP(S)'.
- 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' section displays a table of existing servers. The table has columns for Name, Include Radio Parameters, Protocol Type, Configuration Data, and Actions. One entry is shown:

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 image shows a screenshot of the Talkpool web interface. The top navigation bar includes a user profile for Anders Hedberg. The main content area is titled 'SensefarmTest (70-B3-D5-54-60-00-00-00) / Personalised Devices'. The 'Add New Personalised Device' form is displayed, with fields for Device EUI, Network Address, Application Session Key, and Network Session Key. The Device EUI field contains '70-B3-D5-54-60-00-01-C1' and the Network Address field contains '01:00:01:C1', both of which are circled in red. Below the form, a table shows 'Personalised Devices Configured to the Application' with columns for Device EUI, Network Address, Application Session Key, Network Session Key, and Actions.

admin area

Owner

Device information

Name	70B3D554600001C1
Type	CUBE02
Source	sensefarm
D	70B3D554600001C1
Latest report	May 13th 2020, 10:33
Latest Message Interval	No Info


Factory Defaults

```
{  "uniqueId": "333747073636373734004800",  "devEUI": "70B3D554600001C1",  "appEUI": "70B3D554600001C1",  "appKey": "2A749B3488D5997101CE",  "devAddr": "010001C1",  "appSKey": "C5487683D17389DF731111",  "nwksKey": "E0FD04CC4779F0D7B5FAD",  "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



- 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!***

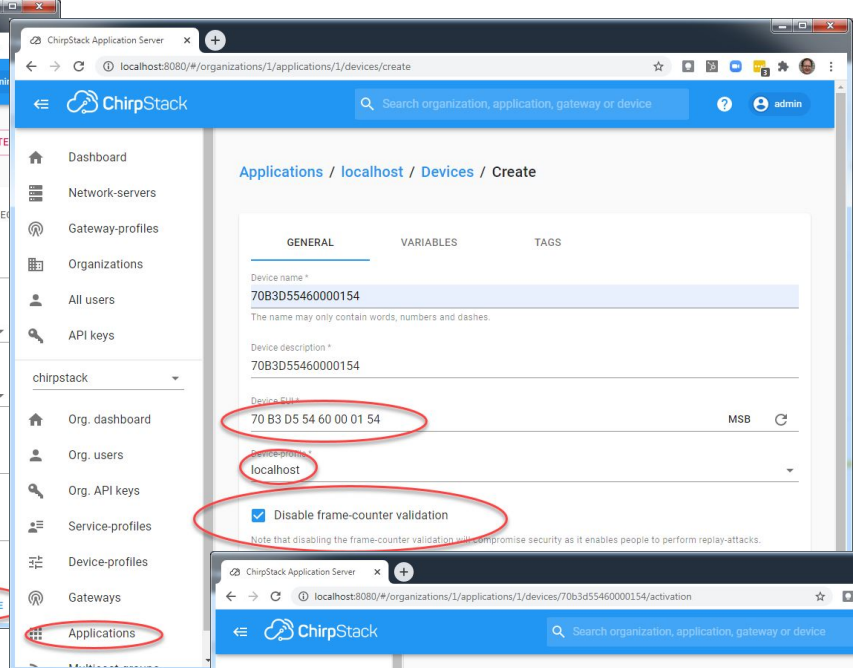
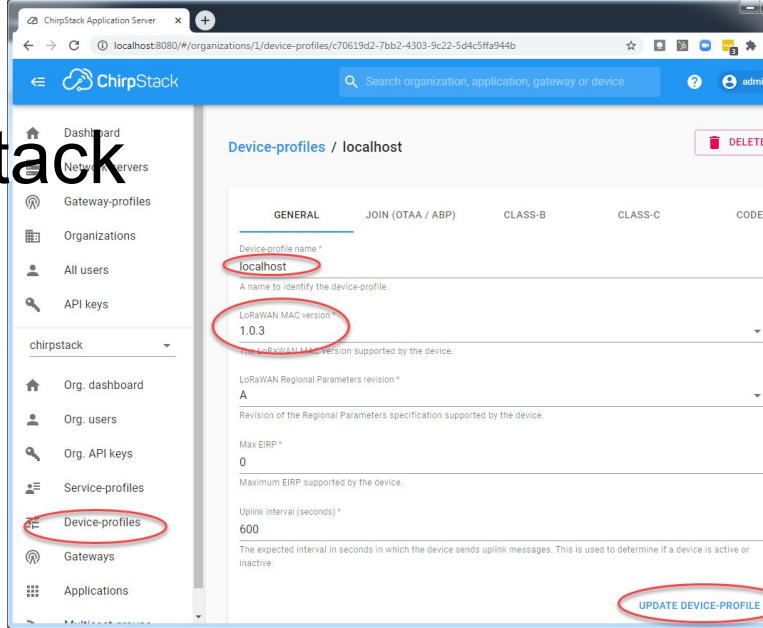
Then do the batch creation:

Create Sensor, Select batch, Fetch the template, Open it in excel, Fill it with va

The screenshot shows the netmore LoRaWAN web interface. A 'Create Sensor' modal is open, displaying two options: a single sensor icon (+) and a batch sensor icon (≡+). Below these icons are two buttons: 'FETCH TEMPLATE' and 'IMPORT FILE'. In the background, a large 'Welcome to netmore LoRaWAN' banner is visible. At the bottom of the image, an Excel spreadsheet titled 'Sensor Import Template' is shown, containing columns for sensor details and activation methods.

DevEUI	Serial Number	Activation Method	Class	Sensor Type	Active	Service Provider	Customer	Value Export	Billing G
70B3D5546000013D	70B3D5546000013D	ABP - Activation by Personalization	Class A	Other	Yes			Default ActiveMQ	Up to 24 m
70B3D55460000144	70B3D55460000144	ABP - Activation by Personalization	Class A	Other	Yes			Default ActiveMQ	Up to 24 m

Chirpstack



Create a device profile

1.0.3 protocol (or less)

Application

Mark “Disable frame-counter-validation” !

Activation-tab will show for ABP keys.

