

ASSET-TRACKING PLATFORM

Dashboard and Device Management

1. Register and configure your devices

Follow this [guide](#) to register a new device based on its connectivity capability.

GO

2. Look at your devices

Select one or more devices interested in, and then receive events.



3. Analyze the events detected by your devices

Select one or more device and the window time interested in, and then visualize events received by devices.

GO

4. Look at your events

Select one or more devices interested in, and then receive events.



5. Set and detect geofencing events

Select one or more device and draw an area on map in order to enable tracking of geofence events raised by devices.

GO



life.augmented

Quick start guide DSH-ASSETTRACKING

Agenda

1 Overview

2 Dashboard usage

3 NFC device

4 BLE device

5 LoRa device

6 Sigfox device

7 LTE device

8 Wi-Fi device

8 Generic HTTP device

Asset Tracking applications and segmentation

Outdoor real-time monitoring



Containers



Fleet management



Livestock monitoring



Tractor



Mobility sharing



Indoor localization & Warehouse logistics



RTLS



Mobile assets



pallet



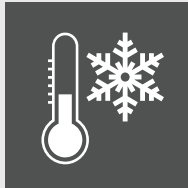
Smart parcels



Employee Safety



Good guarantee



Cold chain



Food tracing



Medical



Disposable



Letters



Packages



Parcels



Asset tracking

ST 360° portfolio offers a 100% flexibility

Outdoor real-time monitoring



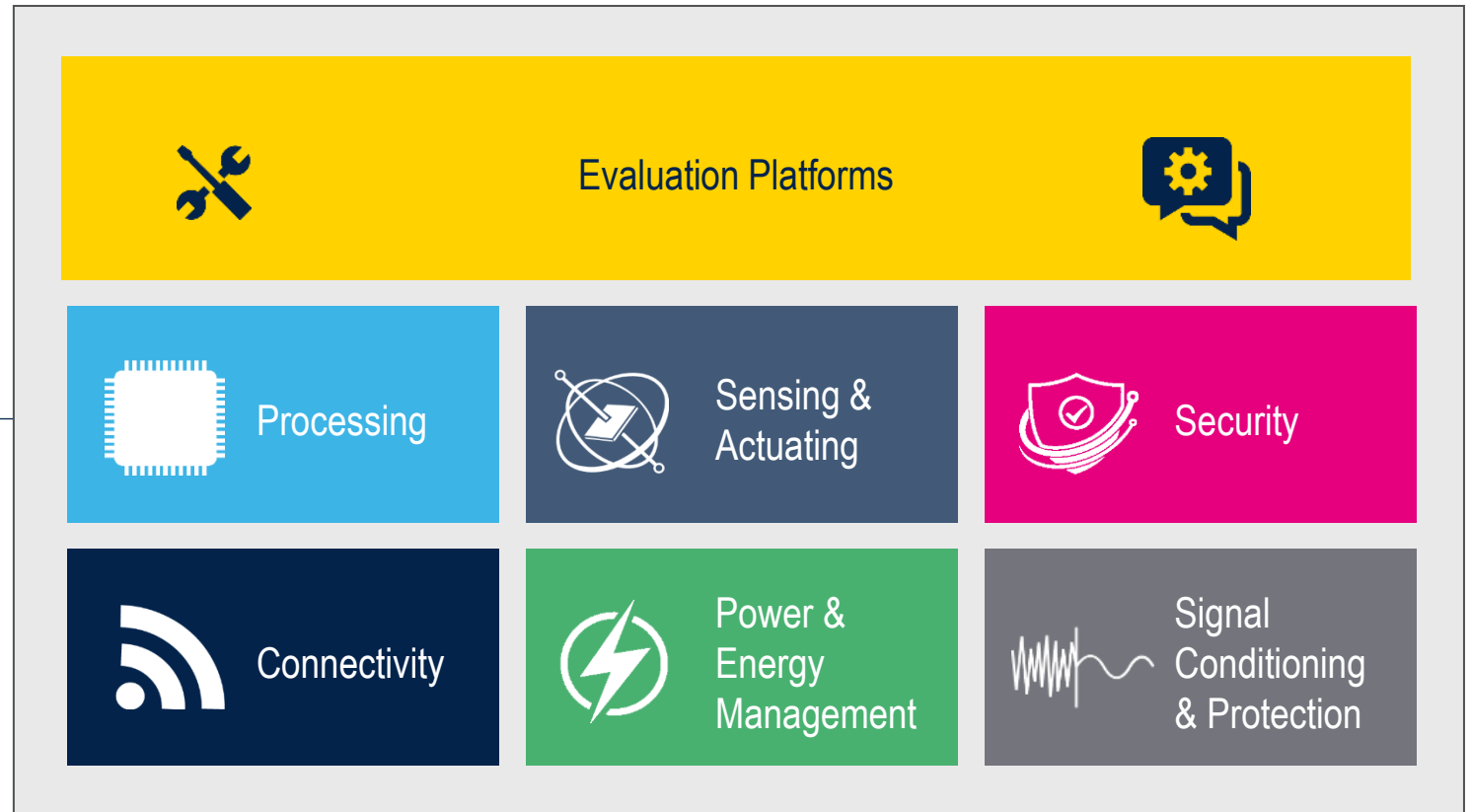
Indoor localization & Warehouse logistics



Good guarantee



Disposable



Multiple applications, one platform, one vendor

Asset tracking reference design per connectivity type



NFC & RFID



NFC Sensor Tag
STEVAl-SMARTAG1
FP-SNS-SMARTAG1
DSH-ASSETTRACKING
ST Asset Tracking



Bluetooth®
Low Energy

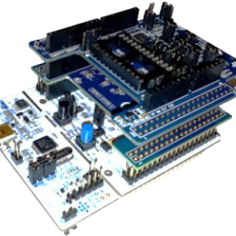


SensorTile.box
STEVAl-MKSBOX1V1
FP-ATR-BLE1
DSH-ASSETTRACKING
ST Asset Tracking



Sub
1GHz

Sub-1 GHz



Sigfox™ Tracker
FP-ATR-SIGOFX1
DSH-ASSETTRACKING



Wi-Fi



STWIn
STEVAl-STWINKT1B
FP-CLD-AWS
DSH-ASSETTRACKING



Sub
1GHz

Sub-1 GHz



LoRa® Tracker
STEVAl-STRKT01
FP-ATR-LORA1
DSH-ASSETTRACKING



Cellular & GNSS



LTE™ Tracker
FP-ATR-LTE1
DSH-ASSETTRACKING



Overview

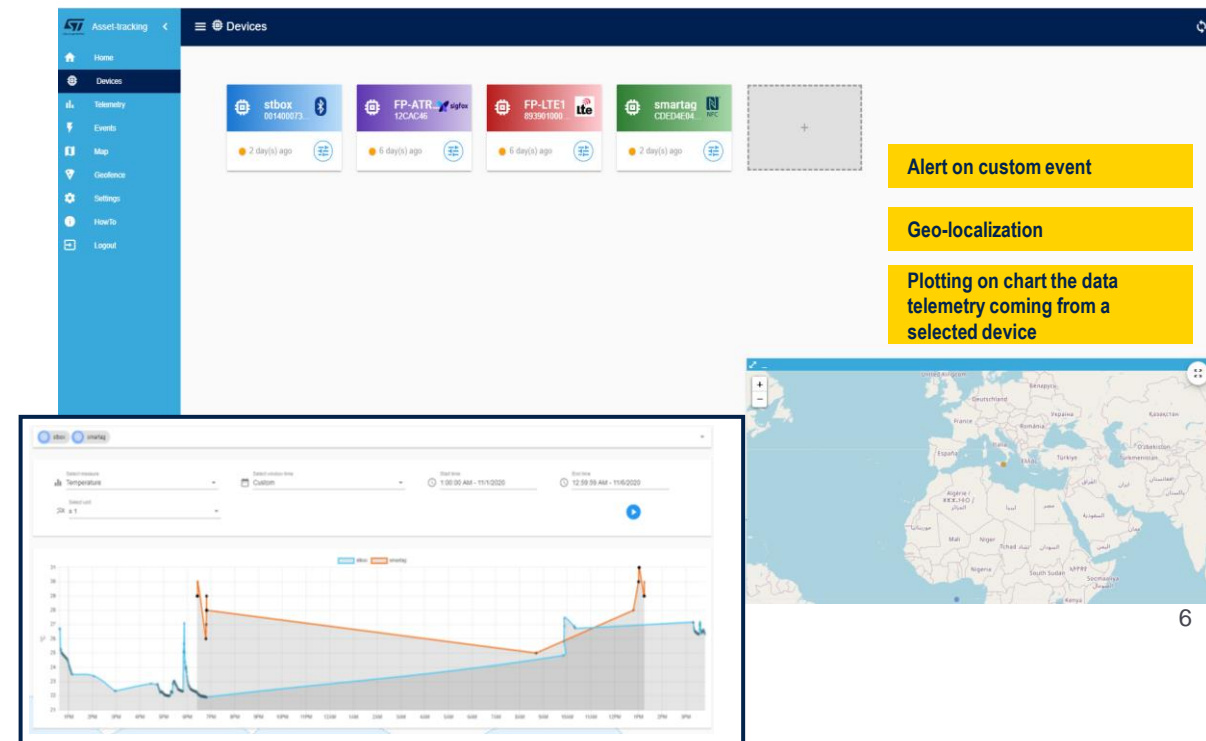
The DSH-ASSETTRACKING dashboard is a cloud application powered by Amazon Web Services (AWS).

It provides a highly functional and intuitive interface tailored for the collection, visualization, and analysis of asset tracking as well as data from motion and environmental sensors such as temperature, humidity, and pressure.

You can use the dashboard to plot and graph real-time or historical position data and sensor values, and to monitor operating conditions such as running temperature and events.

The cloud package receives and processes data directly streamed from the compatible ST devices such as NFC Sensor Tag, STEVAL-STRKT01 IoT LoRa tracker, and Sensortile.box with Bluetooth Low Energy, Sigfox, and LTE nodes.

<https://dsh-assettracking.st.com/>



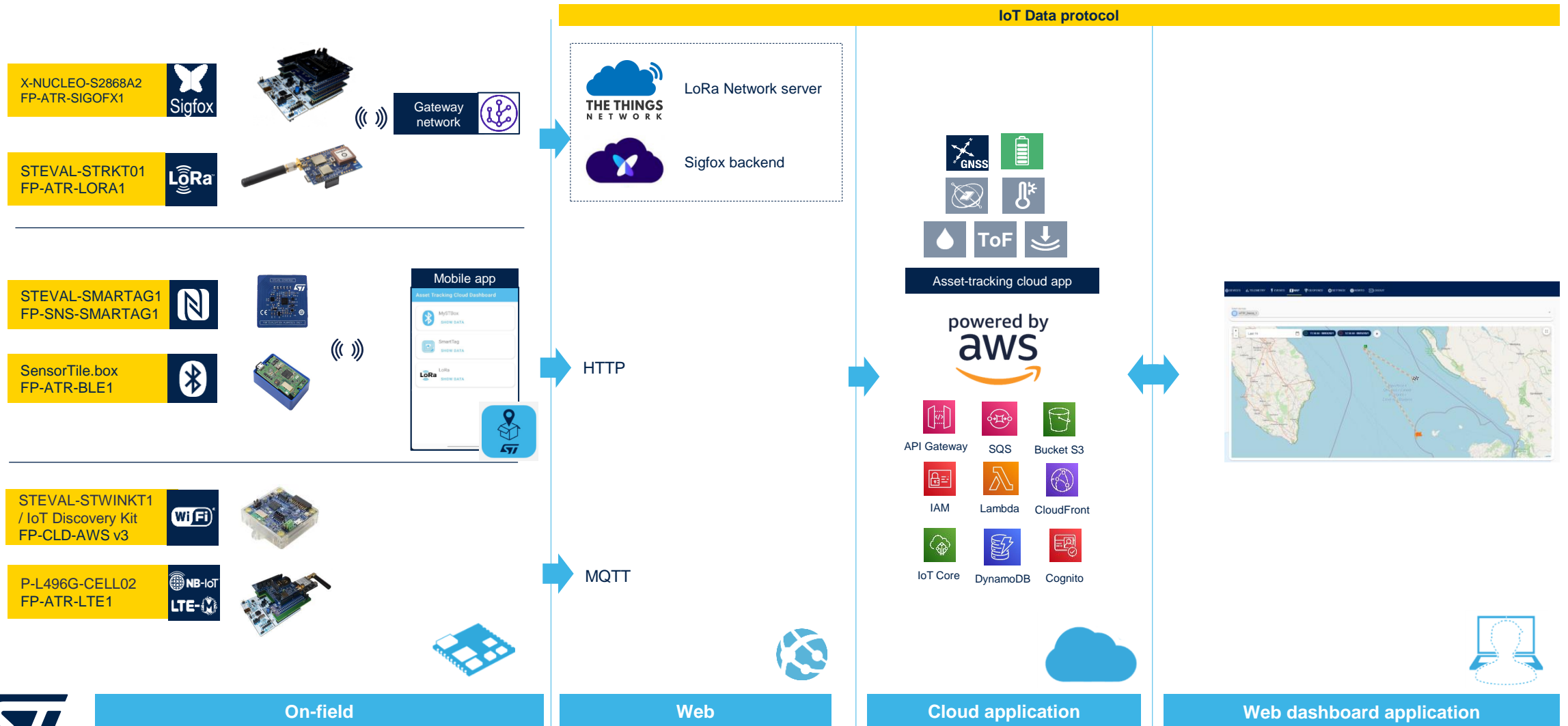
End-to-end Proof of Concepts Asset Tracking



Architecture

End-to-end

Data ingestion flow from sensor to dashboard



Asset tracking dashboard

AWS Services

- IoT, Computing, database



IoT Core



API Gateway



SQS



Lambda



DynamoDB

- Security and user management



IAM



WAF



Shield



Cognito

- Networking and content delivery



Bucket S3



CloudFront



API Gateway

- Management and governance



CloudFormation



CloudWatch

Asset tracking dashboard

How to access it

URL

<https://www.st.com/en/embedded-software/dsh-assettracking.html>

DSH-ASSETTRACKING ACTIVE Save to myST

Cloud Amazon-based web application for asset tracking

[Get Software](#) [Download databrief](#)

Get Software

Part Number	Software Version	Marketing Status	Supplier	Download
DSH-ASSETTRACKING		Active	ST	Go to site

Product overview

Description All features Get Software You might also...

Description

The DSH-ASSETTRACKING dashboard is a cloud application powered by Amazon Web Services (AWS). It provides a highly functional and intuitive interface tailored for the collection, visualization and analysis of asset tracking position as well as data from motion and environmental sensors such as temperature, humidity and pressure. You can use the dashboard to plot and graph real-time or historical position data and sensor values, and to monitor operating conditions such as running temperature and events.

The cloud package can receive and process data streamed directly from compatible ST devices such as NFC Sensor Tag, STEVAL-STRKT01 IoT LoRa tracker and SensorTile.box with Bluetooth Low Energy, Sigfox and LTE nodes.

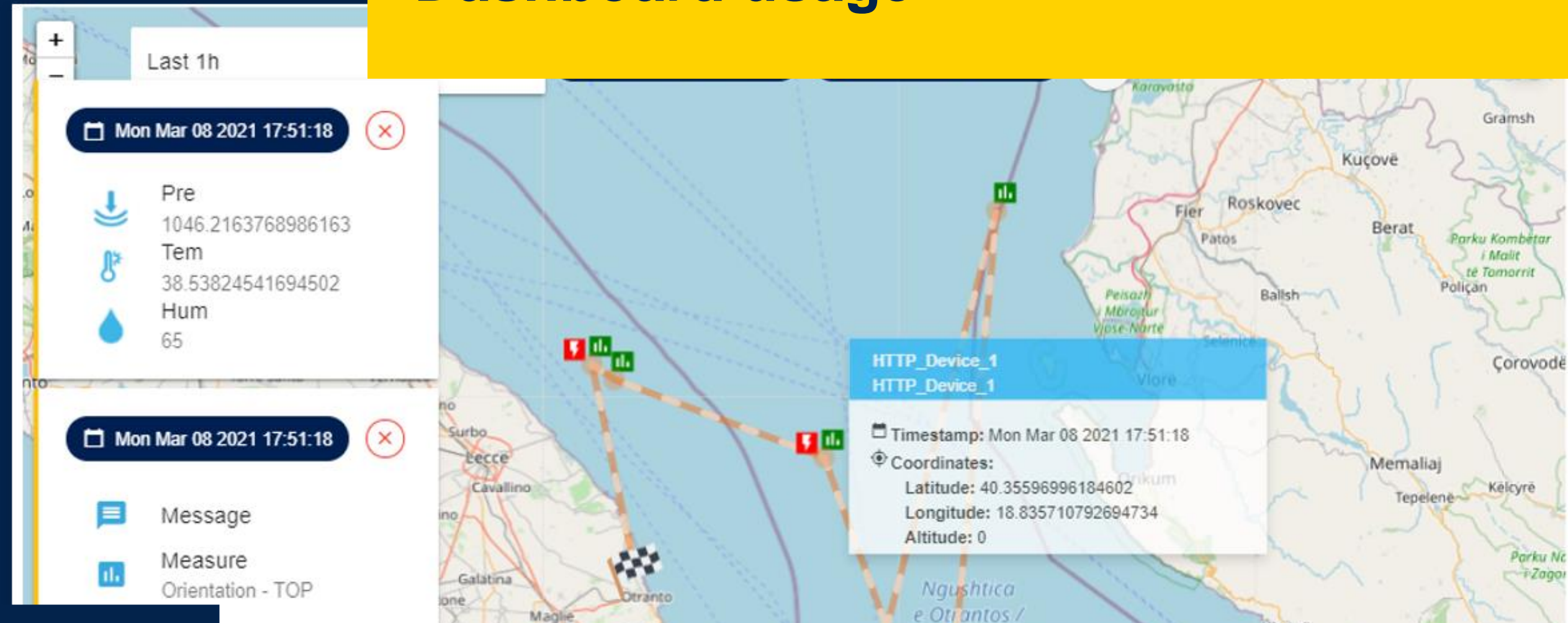
URL

<https://dsh-assettracking.st.com>

ASSET-TRACKING PLATFORM
Dashboard and Device Management

- 1. Register and configure your devices**
Follow this step to register a new device based on its connectivity capability. [GO](#)
- 2. Look at your devices telemetry**
Select one or more device and the window time interval to see, and then visualize telemetry data received by devices. [GO](#)
- 3. Analyze the events detected by your devices**
Select one or more device and the window time interval to see, and then visualize events received by devices. [GO](#)
- 4. Monitor your device on their geo localization**
Select one or more device and the window time interval to see, and then visualize geo position data received by devices. [GO](#)
- 5. Set and detect geofencing events**
Select one or more device and draw an area on map in order to enable tracking of geofencing events raised by devices. [GO](#)

Dashboard usage



Dashboard usage

Features

The screenshot shows the 'ASSET-TRACKING PLATFORM' dashboard with a background image of a cargo ship. The dashboard has a dark blue header with a 'Home' link and an ST logo. The main content area is divided into five numbered steps, each with a colored header bar, an icon, a description, and a 'GO' button. Five pink callout boxes with dashed lines point to specific elements on the dashboard:

- Device provisioning and device state monitoring**: Points to the '1. Register and configure your devices' step, which features a green bar and a microchip icon.
- Live/Historical data visualization for environmental device telemetry**: Points to the '2. Look at your devices telemetry' step, which features an orange bar and a bar chart icon.
- Live/Historical data visualization for device and geo-fence events**: Points to the '3. Analyze the events detected by your devices' step, which features a pink bar and a lightning bolt icon.
- Geo-fence configuration view for devices**: Points to the '5. Set and detect geofencing events' step, which features a purple bar and a geofence icon.
- Integrated map view for device geo-tracking and condition monitoring**: Points to the '4. Monitor your device on their geo localization' step, which features a light blue bar and a map icon.

Dashboard usage

In order to use properly the ST asset tracking dashboard, follow these steps:

1. Log in with your SSO (Single-Sign-On) user login through your my.st.com account
2. Register your device
3. Configure the geo-fence
4. Monitor the devices for:
 - The device state
 - Environmental telemetry
 - The device and geo-fencing events
 - The geo-position data

SSO User Login

1. Browse ST asset tracking dashboard at <https://dsh-assettracking.st.com>
2. Create your login or use your my.st.com user account to access the dashboard
3. Accept the dashboard Terms of Usage
4. Login again to the dashboard to make the device list view automatically appear

1 Screenshot of the ASSET-TRACKING PLATFORM login page. The page title is "ASSET-TRACKING PLATFORM Dashboard and Device Management". Below the title, there is a "Login" section with the text "Login with your ST.com account and start to track and monitor your devices!". A yellow box highlights the "GO" button.

2 Screenshot of the login form. The form has fields for "E-mail address" and "Password". Below the password field, there is a checkbox for "Remember me on this computer." and a "Forgot password?" link. A yellow box highlights the "Login" button. To the right, there is a "New user?" section with a list of features and a "Create Account" button highlighted with a yellow box.

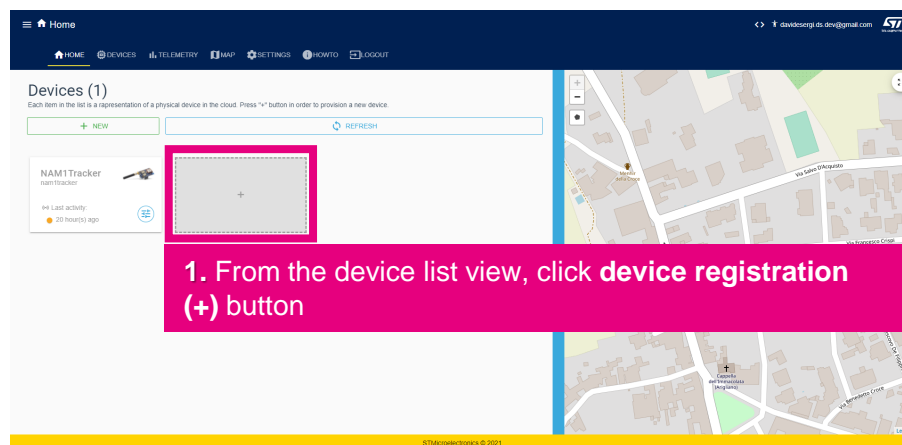
3 Screenshot of the "Terms of Usage" page. The page contains legal text regarding the license. A yellow box highlights the "ACCEPT" button.

4 Screenshot of the dashboard. The dashboard shows a map on the right and a list of devices on the left. A yellow box highlights the "GO" button.

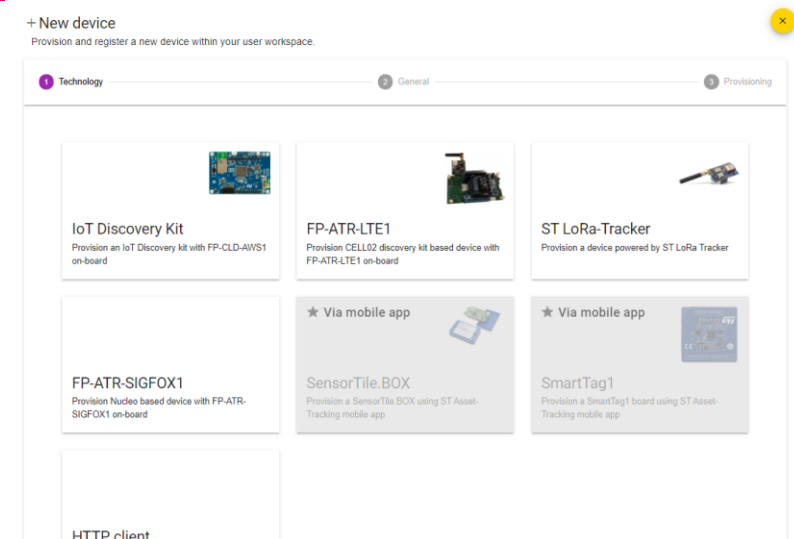
Device provisioning

- ST asset tracking dashboard supports a wide set of device connectivity technologies. For this reason, you have to follow a different provisioning process
- Supported hardware and firmware function packs
 - NFC: ST-EVAL-SMARTAG1 / FP-SNS-SMARTAG1
 - BLE: STEVAL-MKSBOX1V1 / FP-ATR-BLE1
 - LoRa: STEVAL-STRKT01 / FP-ATR-LORA1
 - Sigfox: FP-ATR-SIGFOX1
 - LTE: FP-ATR-LTE1
 - Wi-Fi: IoT Discovery Kit, STWINKT1B / FP-CLD-AWS1 v3

Note: For further information, refer to the other slides about device provisioning included later on



2. Fill the registration form based on the device type to register



From the device list view, open **device details** view from **devices** view to analyze the last telemetry sent and other information

Monitor devices

Device state

The image shows a two-part interface. On the left, the 'Devices (1)' list view displays a single device card for 'NAM1Tracker'. A dashed yellow line indicates a click on the device icon, leading to the 'Overview' page on the right. The 'Overview' page is divided into two sections: 'General' and 'Last telemetry'.

Devices (1)
Each item in the list is a representation of a physical device in the cloud. Press "+" button in order to provision a new device.

NAM1Tracker
nam1tracker

Last activity: 20 hour(s) ago

Overview

General

Unique ID	nam1tracker
Friendly label	NAM1Tracker
Profile	nam1-467234f6a0c9
Last activity	20 hour(s) ago Mon Dec 06 2021 18:13:30 GMT+0100 (Central European Standard Time)

Last telemetry

Pressure (hPa)	1001
Temperature (°C)	30.5
Humidity (%)	39

Monitor devices

Environmental telemetry

The screenshot displays the 'Telemetry' interface. At the top, a navigation bar includes 'HOME', 'DEVICES', 'TELEMETRY' (highlighted), 'MAP', 'SETTINGS', 'HOWTO', and 'LOGOUT'. On the left, the 'Filters' section allows selecting devices (NAM1Tracker is chosen) and window time (Custom, 00:00:00 - 01/12/2021 to 23:59:00 - 31/12/2021). A 'SUBMIT' button is at the bottom of the filters. A large blue arrow points from the 'SUBMIT' button to the 'Telemetry chart'. The chart, titled 'Telemetry chart', shows 'Temperature (°C)' on the y-axis (20,000 to 36,000) over time. The data shows a sharp drop from approximately 31,000 to 20,000, followed by a recovery. On the right, the 'Events' section shows 'No events available'.

1. Open **telemetry** view from the navigation bar, and select at least one device

2. Select the telemetry metric and the window time of interest
*Note: **Realtime** window time enables the dynamic plotting on the chart when the data is coming from the device*

3. Click the play button to fetch/listen to historical/real-time telemetry event data

Monitor devices

Geo-position data

The screenshot displays the NAM1Tracker web application interface. The top navigation bar includes links for HOME, DEVICES, TELEMTRY, MAP, SETTINGS, HOWTO, and LOGOUT. The 'MAP' tab is selected. On the left, the 'Filters' panel allows selecting devices (NAM1Tracker) and window time (Custom). The main map area shows a street view with a marker for 'NAM1Tracker'. A right-hand panel displays 'Data samples (1)' for the selected device, showing telemetry data like 'pre' (1001), 'metadata' (tech:lora), 'tem' (30.5), and 'bat' (0).

Filters
Select devices and window time from here to retrieve related geo-location data.

Select devices
NAM1Tracker

Select window time
Custom

00:00:00 - 01/12/2021
23:59:00 - 31/12/2021

SUBMIT

1. Open the **map** view from the navigation bar, and select at least one device

2. Select the telemetry metric and the window time of interest
*Note: The **Realtime** window time enables the dynamic plotting on the chart when the data is coming from the device*

3. Click the play button to fetch/listen to historical/real-time geo-position data

4. Click on the markers inspect to analyze the telemetry and/or other events

Data samples (1)
See here telemetry, events and geo-location samples sent by selected devices.

nam1tracker(nam1tracker)
06/12/2021 - 18:13:30

pre
1001

metadata
tech:lora

tem
30.5

bat
0

Timestamp: Mon Dec 06 2021 18:13:30
Coordinates:
Latitude: 39.8473
Longitude: 18.3623
Altitude: 174.92

Geo-fencing

- If your devices send geo-position data, you may want to configure geo-fence perimeters (from the geo-fence dashboard view) in order to keep track of geo-fencing events

The screenshot displays the STI Map application interface. The top navigation bar includes a hamburger menu, a 'Map' icon, and the text 'Map'. Below this, a secondary navigation bar contains icons for 'HOME', 'DEVICES', 'TELEMETRY', 'MAP' (highlighted with a yellow box), 'SETTINGS', 'HOWTO', and 'LOGOUT'. The 'MAP' icon is also highlighted with a yellow box.

On the left, a 'Geo-fencing' panel is shown, containing the text 'Show and fetch geo-fence perimeters defined for the selected devices.', a toggle switch labeled 'Show geo-fence perimeters' (which is turned on), and a 'FETCH PERIMETERS' button.

The main map area shows a map of Italy with a blue polygon being drawn. A tooltip 'Click first point to close this shape.' points to the first vertex of the polygon. A pink box with white text contains the following instructions:

1. Open **map** view from the navigation bar, and select at least one device
2. Turn on «show geo-gence perimeters» switch button
3. Click on the polygon button to start drawing a new geo-fence area for the selected devices
4. After drawing, the geo-fence area is automatically stored

STEVAL-SMARTAG1

NFC device

Prerequisites

- **Mobile App:** download ST mobile app
 - ST Asset Tracking [Android] – <https://play.google.com/store/apps/details?id=com.st.assetTracking>
 - ST Asset Tracking [iOS] – <https://apps.apple.com/it/app/st-asset-tracking/id1483734401>

- **SmartTag**

- *Hardware:*

- Integrated: STEVAL-SMARTAG1



STEVAL-SMARTAG1

<https://www.st.com/en/evaluation-tools/steval-smartag1.html>

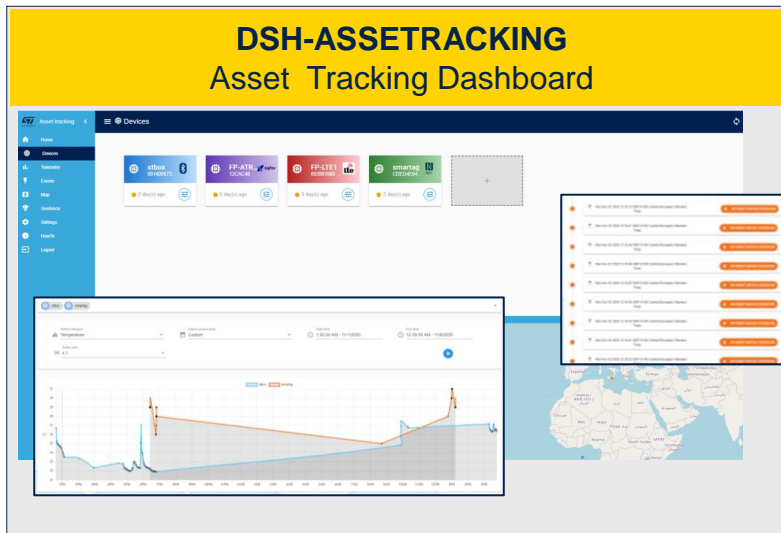
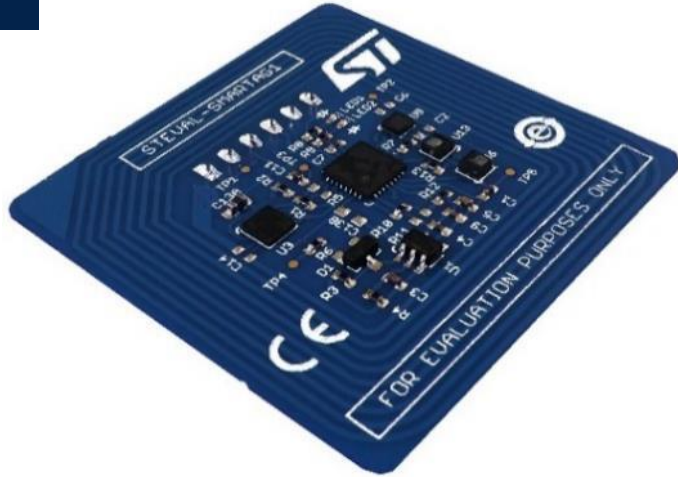
- *Software*

- FP-SNS-SMARTAG1

<https://www.st.com/en/embedded-software/fp-sns-smartag1.html>



NFC sensor TAG for asset tracking



What is it

ST25DV64K NFC Dynamic Tag sensor node (motion, environmental)

Key components

LIS2DW12 – 3x accelerometer

LPS22HH – Pressure sensors

HTS221 – Temperature & humidity

STLQ015 – Voltage regulator

Ecosystem

Evaluation board: STEVAL-SMARTAG1

Function Pack: FP-SNS-SMARTAG1

Mobile app: ST Asset Tracking

Cloud dashboard: DSH-ASSETTRACKING





By clicking on this section of the *ST asset tracking* mobile app, you can:

- Set thresholds
- Start/Stop recording
- See the minimum and maximum recorded telemetry data
- See the telemetry and event data recorded
- Upload data on the cloud

NFC device

Mobile app section

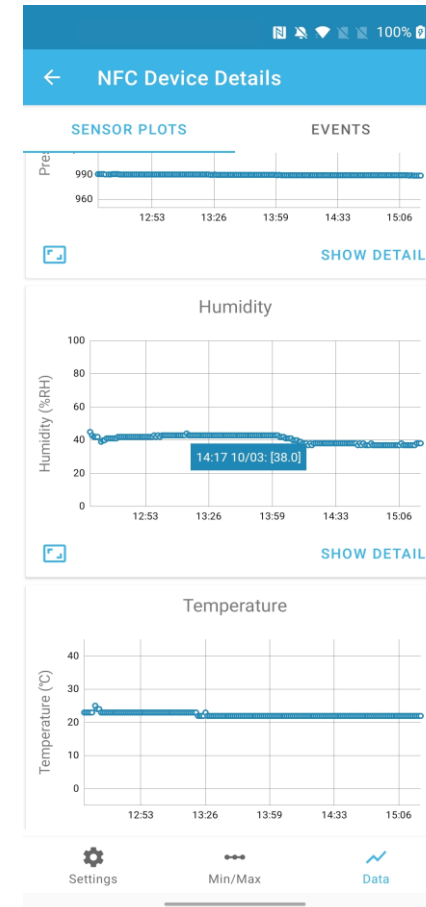
1. Configure the device and start data logging via NFC (bring the device closer)

The screenshot shows the 'NFC Device Details' screen. At the top, there's a status bar with icons for signal, Wi-Fi, and battery at 100%. Below the title bar, the 'NFC Tag Info' section displays 'Id:DFD05404002702E0'. The 'Sampling options' section includes a 'Sampling interval(m)' input set to '1', a checked checkbox for 'Log only out of range [min, max] and accelerometer events', and an unchecked checkbox for 'Force logging of one sample'. A note states: 'Note: change of settings will erase saved data'. The 'Sensors to monitor:' section has two options: 'Pressure' and 'Temperature', both with 'Enable' checkboxes checked. For 'Pressure', the 'Min (mbar)' is 900 and 'Max (mbar)' is 1100. For 'Temperature', the 'Min (°C)' is 24 and 'Max (°C)' is 25, with a yellow save icon next to the max value. At the bottom, there are three tabs: 'Settings' (active), 'Min/Max', and 'Data'.

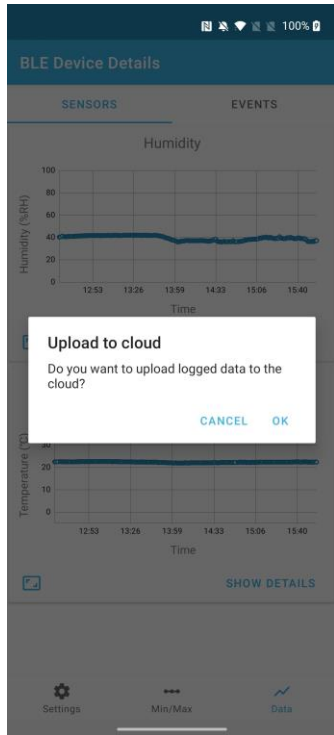
2. Data logging



3. Read data logged via NFC (bring the device closer)



4. Upload telemetry data on cloud



5. Login with your ST user account, if needed

The screenshot shows the myST.com login page. It features the ST logo and navigation links for Products, Applications, Solutions, and Tools & Software. A 'Welcome back!' message is displayed. Below, there's a login form with fields for 'E-mail address' and 'Password', a 'Remember me on this computer' checkbox, and a 'Login' button. A 'Forgot password?' link is also present. At the bottom, a 'New user?' section mentions 'myST brings you a set of personalized features:' and includes a link to 'Participate to ST Events'.

6. Provision the device, if needed

The screenshot shows the 'Asset Tracking Cloud' device registration page. It displays the 'Device ID: 001200185836500320313635' and a message 'Unknown device, please register it'. A text input field for 'Device name' contains 'MySTBox'. A 'REGISTER DEVICE' button is located at the bottom right. Below the registration form, a virtual keyboard is visible, suggesting the user is entering information on a mobile device.

7. Device registration and data uploading

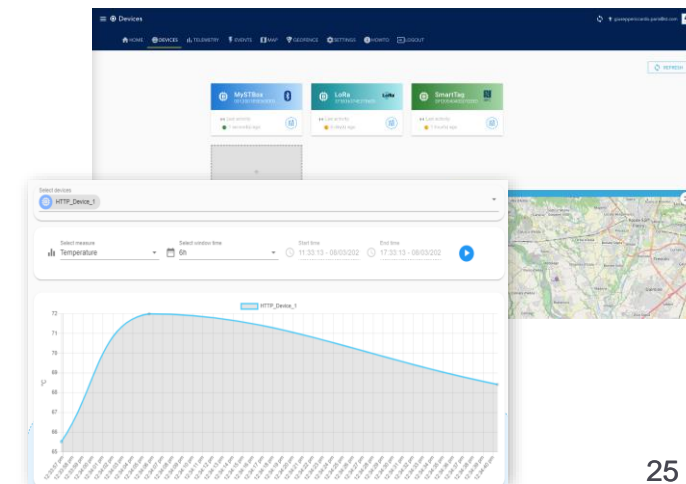
This screenshot is similar to the previous one, showing the 'Asset Tracking Cloud' device registration page. The 'Device ID' is the same. The 'Device name' field now contains 'MySTBox'. The 'REGISTER DEVICE' button remains at the bottom right.

NFC devices

Upload data



8. Check data on the asset tracking dashboard



SensorTile.Box

BLE device

Prerequisites

- **Mobile App:** download ST mobile app

- ST Asset Tracking [Android] – <https://play.google.com/store/apps/details?id=com.st.assetTracking>
- ST Asset Tracking [iOS] – <https://apps.apple.com/it/app/st-asset-tracking/id1483734401>

- **SensorTile.Box**



SensorTile.box

- *Hardware:*

- Integrated: SensorTile.Box

https://www.st.com/content/st_com/en/campaigns/sensortile_box.html

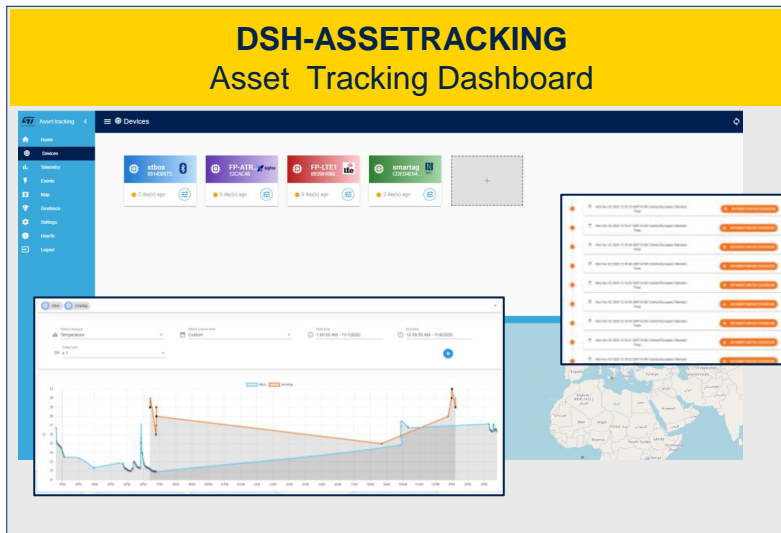
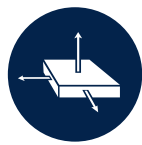
- *Software*

- FP-ATR-BLE1

<https://www.st.com/en/embedded-software/fp-atr-ble1.html>



SensorTile.box Bluetooth tracking



What is it

Bluetooth® Low Energy solution data logger with Environmental and Motion Sensors, and Machine Learning Core

Key components

LSM6DSOX – 6x IMU with ML

LPS22HH – Pressure sensors

HTS221 – Temp. & humidity

STTS751 – Temperature

LIS2DW12 – Accelerometer

LIS3DHH – Inclinator

LIS2MDL – Magnetometer

MP23ABS1 – Analog Microphone

Ecosystem

Evaluation board: STEVAL-MKSBOX1V1

Function Pack: FP-ATR-BLE1

Mobile app: ST Asset Tracking

Cloud dashboard: DSH-ASSETTRACKING



BLE device

Overview



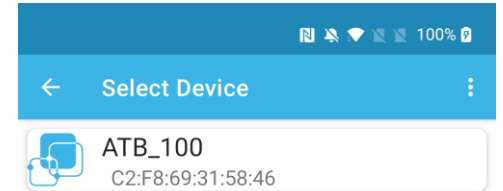
By clicking on this section of the app, you can:

- Set thresholds
- Start/Stop recording
- See the minimum and maximum recorded telemetry data
- See the telemetry and event data recorded
- Upload data on the cloud

BLE device Connection



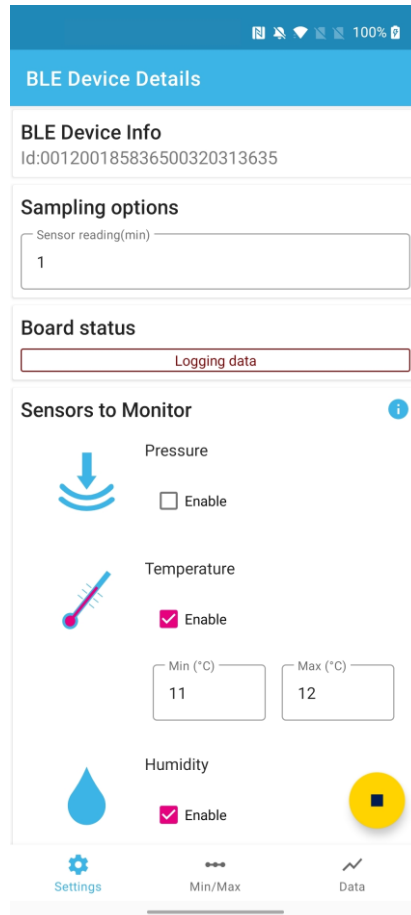
- Clicking on the “USER” button of the SensorTile.Box, it enters the advertising mode.
- In the mobile app, the board you can connect to appears.
- The mobile app filters the devices only by accepting the SensorTile.Box



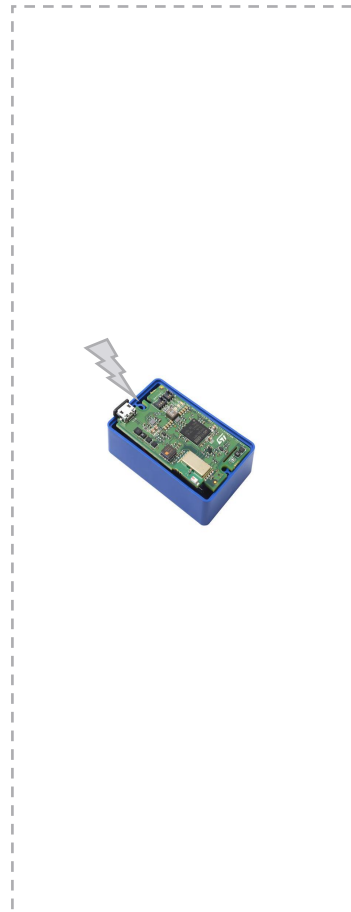
BLE device

Mobile app section

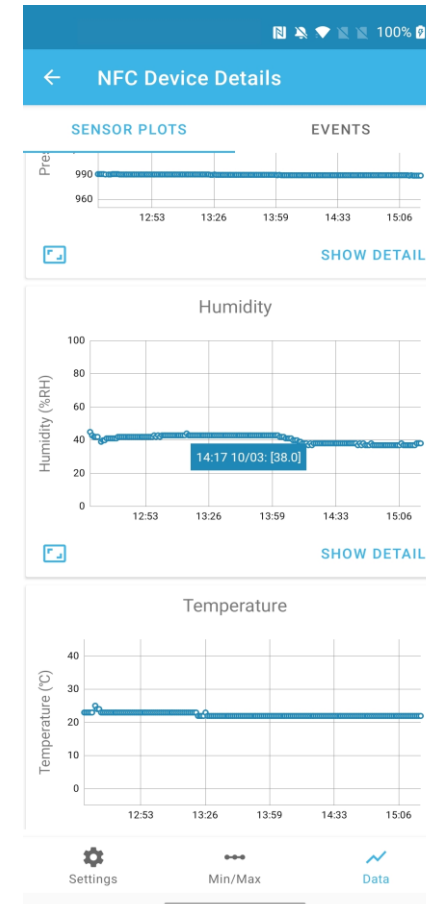
1. Configure device and start data logging via BLE



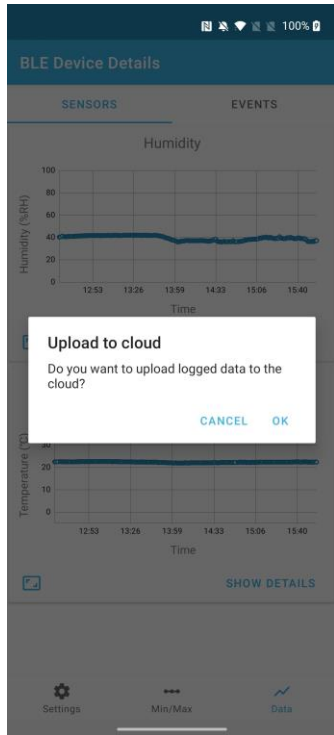
2. Data logging



3. Stop logging via BLE and check telemetry data received



4. Upload the telemetry data on cloud



5. Login with your ST user account, if needed

The screenshot shows the ST life.augmented login page. At the top, there's a header with the ST logo and 'life.augmented'. Below it, there's a navigation bar with icons for 'Products', 'Applications', 'Solutions', and 'Tools & Software'. The main content area has a 'Welcome back!' message and a prompt to 'Enter your e-mail address and password to login your myST user.' There are input fields for 'E-mail address' and 'Password', a checkbox for 'Remember me on this computer.', and a 'Login' button. Below the login section, there's a 'New user?' section with a link to 'Participate to ST Events'.

6. Provision the device, if needed

The screenshot shows the 'Asset Tracking Cloud' device registration page. At the top, there's a header with 'Asset Tracking Cloud'. Below it, there's a message 'Device ID: 001200185836500320313635' and 'Unknown device, please register it'. There's a text input field for 'Device name' with the value 'MySTBox'. Below the input field, there's a 'REGISTER DEVICE' button. At the bottom, there's a keyboard overlay showing the text 'MySTBox'.

7. Device registration and data uploading

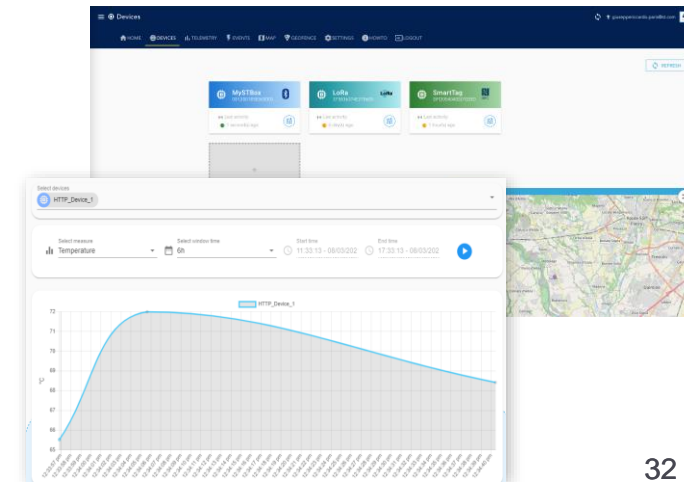
The screenshot shows the 'Asset Tracking Cloud' device registration page. At the top, there's a header with 'Asset Tracking Cloud'. Below it, there's a message 'Device ID: 001200185836500320313635' and 'Registering the device...'. There's a text input field for 'Device name' with the value 'MySTBox'. Below the input field, there's a 'REGISTER DEVICE' button.

NFC devices

Upload data



8. Check data on the asset tracking dashboard



STEVAL-STRKT01 (or equivalent)

LoRa device provisioning

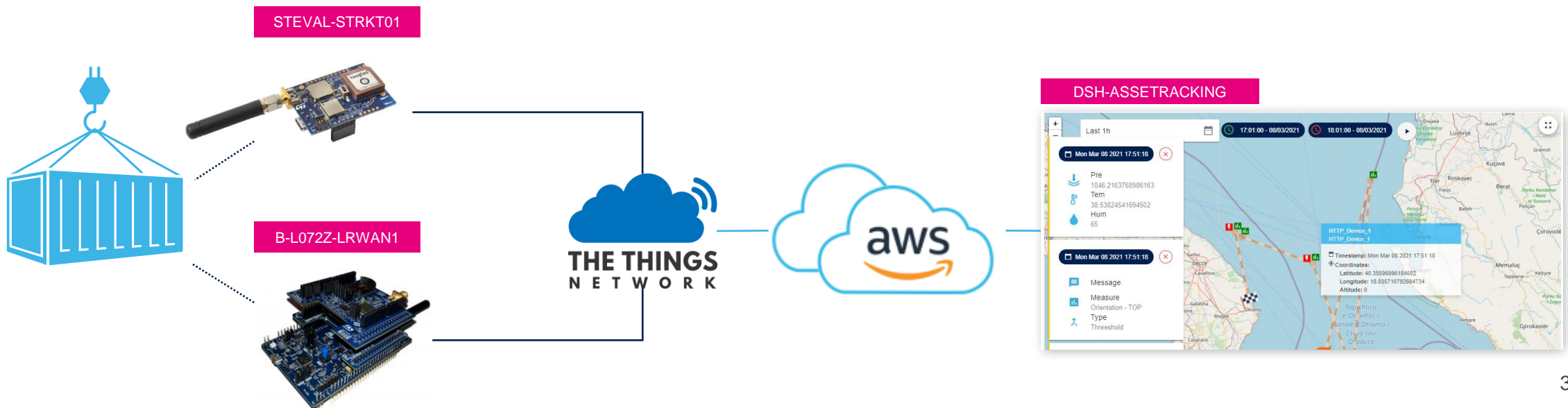
Prerequisites

- **Dashboard**
 - Google Chrome or Mozilla Firefox
 - Browse dashboard at: <https://dsh-assettracking.com>
- **IoT node**
 - *Hardware:*
 - Integrated: STEVAL-STRKT01
 - Nucleo-based: B-L072Z-LRWAN1 (+ X-NUCLEO-GNSS1A1, X-NUCLEO-IKS01A2)
 - *Software*
 - FP-ATR-LORA1

<https://www.st.com/en/evaluation-tools/steval-strkt01.html>

<https://www.st.com/en/evaluation-tools/b-l072z-lrwan1.html>

<https://www.st.com/en/embedded-software/fp-atr-lora1.html>



LoRa device provisioning

Steps

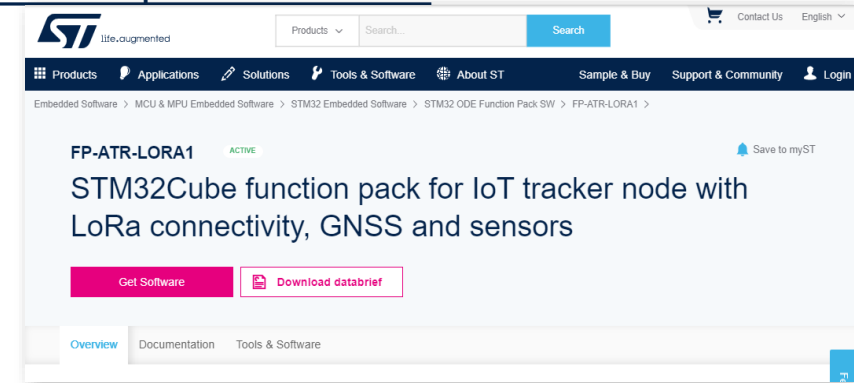
There are two ways of provisioning a LoRa device:

- Plug&Play scenario → Use the default ST TTN account
 1. Get the device EUI
 2. Register the device
 3. Configure the device
- Custom TTN scenario → Use your own TTN account
 1. Get the device EUI
 2. Set the TTN account up
 3. Register the device
 4. Configure the device

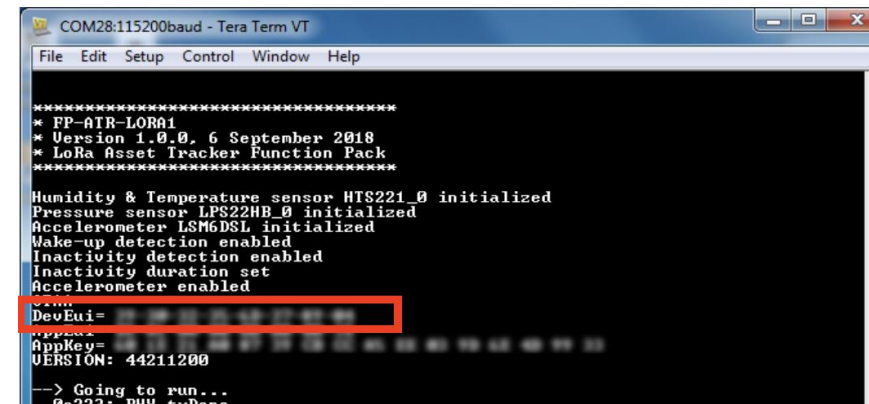
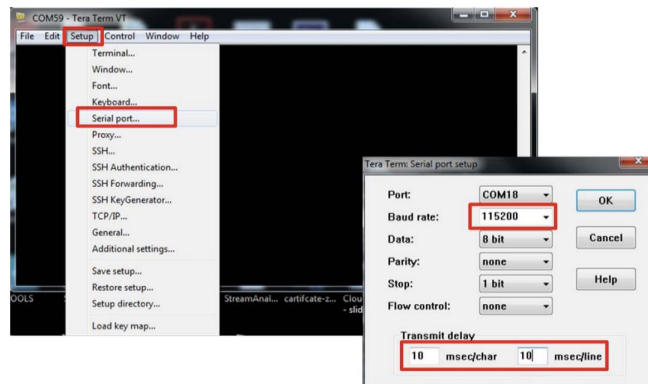
Note: For further information, see <https://www.st.com/en/embedded-software/fp-atr-lora1.html#documentation>

Get the device EUI

1. Download FP-ATR-LORA1 from <https://www.st.com/en/embedded-software/fp-atr-lora1.html>

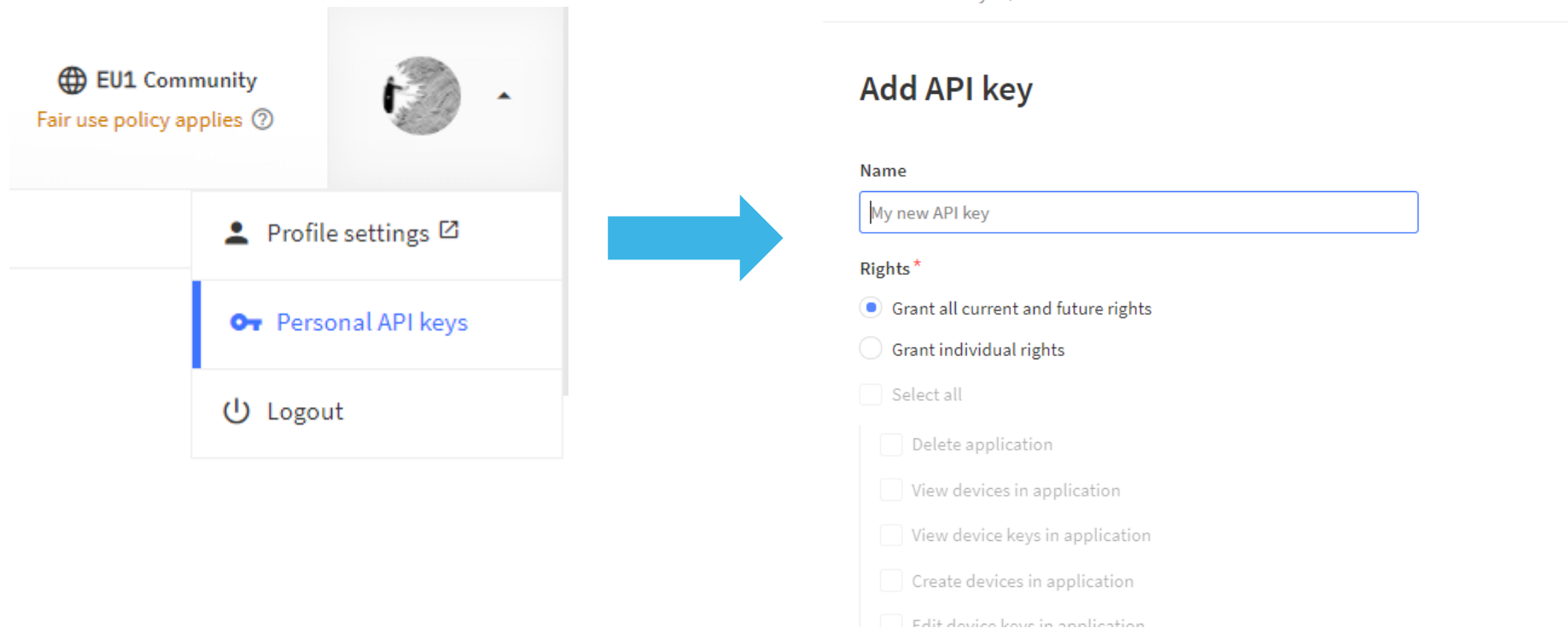


2. Connect the device to a PC via USB cable, and flash the firmware binary
3. Take note of the **device EUI** shown on the serial terminal



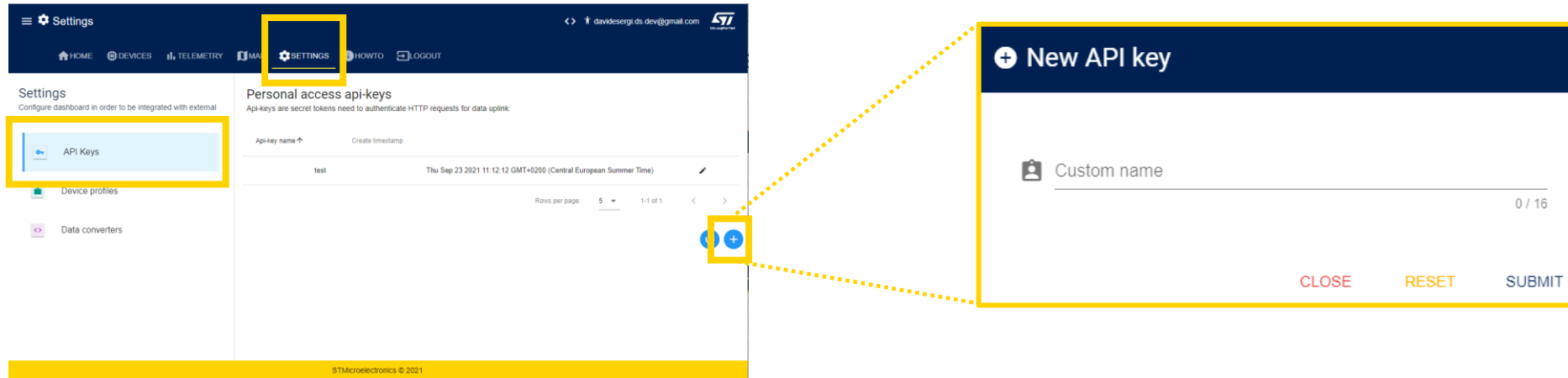
Setup of the TTN

1. Create a console for the TTN user account at <https://account.thethingsnetwork.org/users/login>
2. Create a new TTN application Personal Api-Key with all the permissions needed

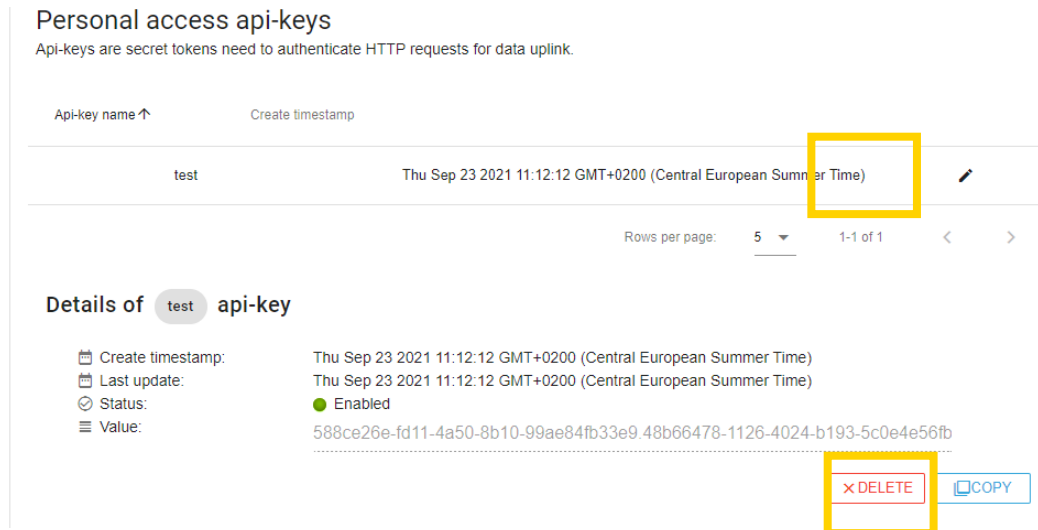


Configure the ST dashboard

2. On the ST dashboard, select the **settings** view and create a new api-key



3. Refresh the api-key list and take note of the api-key value



Create a TTN LoRa profile

On the ST dashboard, select the **settings** view and create a new LoRa device profile with the parameters created in the previous steps:

- Custom name as a human-friendly label
- LoRa TTN type
- LoRa data converter
- TTN ISM region, Application ID, Join/Application EUI, TTN Api-key (got previously) and dashboard Api-Key created previously

Note: A default application key is already provided.

Settings

Configure dashboard in order to be integrated with external services.

API Keys

Device profiles

Data converters

Device profiles

Device profiles are data structures containing parameters need for device provisioning used to make easier device provisioning process.

Profile name ↑	Create timestamp	
default-st-dsh-assettracking-dev	Thu Jan 01 1970 01:00:00 GMT+0100 (Central European Standard Time)	
eu1-ab09754109de	Mon Nov 15 2021 15:27:03 GMT+0100 (Central European Standard Time)	
nam1-d806c599a774	Mon Dec 06 2021 15:07:41 GMT+0100 (Central European Standard Time)	
ttncb-558b6943c0b8	Mon Dec 06 2021 16:16:25 GMT+0100 (Central European Standard Time)	

Rows per page: 5 1-4 of 4

+ New device profile

+ New device profile

Device profile name

Technology

☒ LoRa (TTN)

☐ Sigfox

Data converter

ISM region

Europe 1

Join EUI (16 hex digits)

0000000000000000

Application Key (32 hex digits)

FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

TTN api-key

Dashboard api-Key

CLOSE RESET SUBMIT

Register the device

On the ST dashboard, register your device with the following parameters:

- Custom name as a human-friendly label
- Device EUI (previously created)
- Device profile (previously created or default one)
- And optional parameters if you want to override the default ones

+ New device
Provision and register a new device within your user workspace.

Technology

General

Provisioning

IoT Discovery Kit
Provision an IoT Discovery kit with FP-CLD-AWS1 on-board

FP-ATR-LTE1
Provision a CELL02 discovery kit based device with FP-ATR-LTE1 on-board

ST LoRa-Tracker
Provision a device powered by ST LoRa Tracker

FP-ATR-SIGFOX1
Provision a Nucleo based device with FP-ATR-SIGFOX1 on-board

SensorTile.BOX
Provision a SensorTile.BOX using ST Asset-Tracking mobile app

SmartTag1
Provision a SmartTag1 board using ST Asset-Tracking mobile app

HTTP client

Technology

General

Provisioning

Device ID
Unique device ID

Device ID (hex digits)
0 / 7

Label
Human-friendly device name

Custom name
0 / 16

NEXT

Device EUI
Unique device EUI

Device EUI (16 hex digits)
0 / 16

Device profile
Select existing device profile

Select device profile

LoRa WAN Version (optional)
LoRa WAN version (leave empty to use default value MAC_V1_0_3)

LoRa MAC version

LoRa PHY Version (optional)
LoRa WAN version (leave empty to use default value RP001_V1_0_2)

LoRa Physical Version

Frequency plan ID (optional)
LoRa WAN version (leave empty to use region default frequency EU_863_870_TTN, US_902_928_FSB_1, AU_915_928_FSB_1)

LoRa Frequency plan

SUBMIT

Configure the device

Configure the device via serial terminal by setting the parameters previously created:

- Set the device eui (`!deviceeui-xxxxxxxxxxxxxx` replacing the x characters with the device eui value)
- Set the join eui (`!joineui-xxxxxxxxxxxxxx`, replacing the x characters with the join eui value)
- Set the network key (`!ntwkkey-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx`, replacing the x characters with the network key value)
- Set the application key (`!appkey-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx`, replacing the x characters with the application key value)
- Reset the system (`!sysreset`)

Note:

- Use Join EUI, Application Key and Network Key created from the selected device profile
- For further info, see <https://www.st.com/en/embedded-software/fp-atr-lora1.html#documentation>

FP-ATR-SIGFOX1

Sigfox device provisioning

Prerequisites

- **Dashboard**
 - Google Chrome or Mozilla Firefox
 - Browse dashboard at: <https://dsh-assettracking.com>
- **IoT node**
 - *Hardware:*
 - Nucleo-based: **B-L072Z-LRWAN1** (+ X-NUCLEO-S2868A1, X-NUCLEO-GNSS1A1, X-NUCLEO-IDB05A1 and X-NUCLEO-IKS01A2)
<https://www.st.com/en/evaluation-tools/stm32-nucleo-boards.html>
 - *Software*
 - FP-ATR-SIGFOX1
<https://www.st.com/en/embedded-software/fp-atr-sigfox1.html>

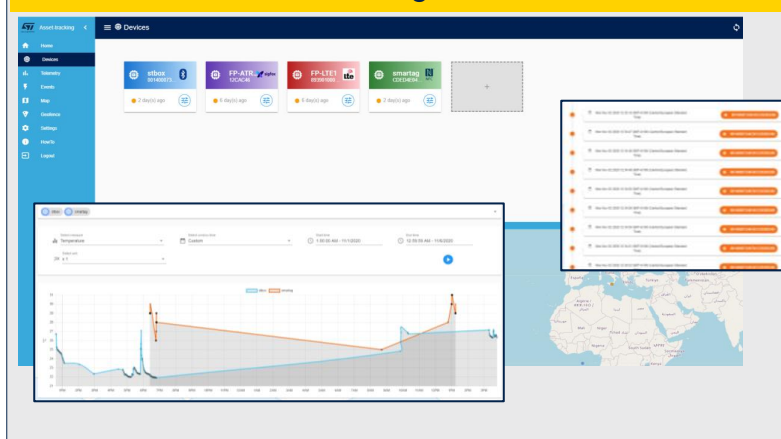


Sub
1GHz



DSH-ASSETTRACKING

Asset Tracking Dashboard



Sigfox Tracker for asset tracking

What is it

IoT tracker node with Sigfox connectivity and sensors

Key components

S2-LP, ULP RF Sigfox
w/ and w/o GNSS

LSM6DSL – Accelerometer + gyroscope

LSM303AGR – Accelerometer + magnetometer

LPS22HB – Pressure sensor

HTS221 – Humidity and temperature sensor

Ecosystem

Development board: NUCLEO-L053R8/NUCLEO-L476RG

Expansion board: X-NUCLEO-S2868A2/915A1 / X-NUCLEO-IKS01A2

X-NUCLEO-IDB005A1 / X-NUCLEO-GNSS1

Function Pack: FP-ATR-SIGFOX1

Mobile app: ST Asset Tracking

Cloud dashboard: DSH-ASSETTRACKING



Sigfox device provisioning

Steps

Follow these steps for Sigfox device provisioning:

1. Activate the device
2. Configure the Sigfox backend
3. Configure the ST dashboard
4. Register the device

Note: For further info, see <https://www.st.com/en/embedded-software/fp-atr-lora1.html#documentation>

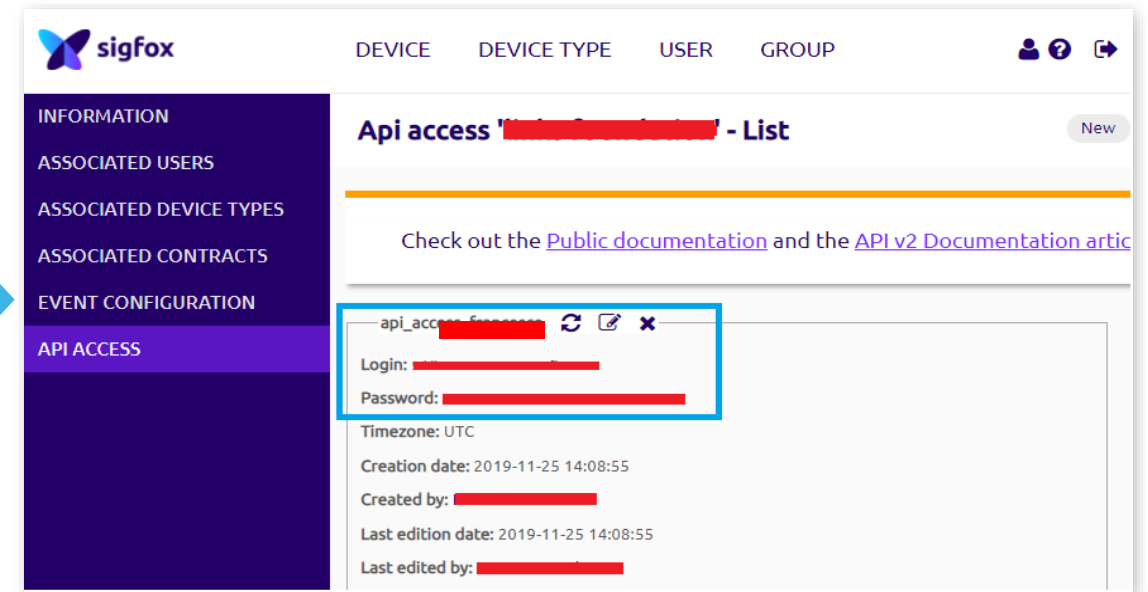
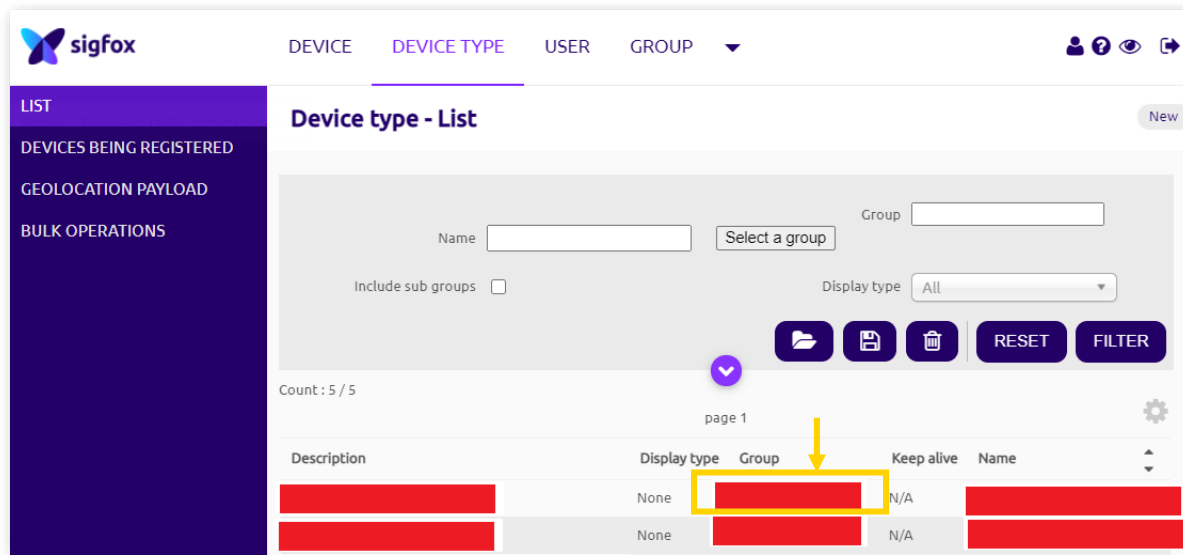
Device activation

- As a preliminary step, it is necessary to register the Sigfox device.
- There are two steps: ST side registration and Sigfox side registration
- Follow the procedure described in UM2169 "Getting started with the Sigfox S2-LP kit"
- As an alternative, you can watch the following YouTube videos:
 - ST Side registration: <https://www.youtube.com/watch?v=JD6UE7ekRxE>
 - Sigfox Side registration: <https://www.youtube.com/watch?v=fTipdrGij7I>
- During the registration procedure, you have to create a free account at <http://backend.sigfox.com>

Note: Sigfox board information (ID, PAC and KEY) can be stored in the device Flash memory using the SIGFOX_FLASHER tool included in the STSW-S2LP-SFX-DK package

Configure the Sigfox backend

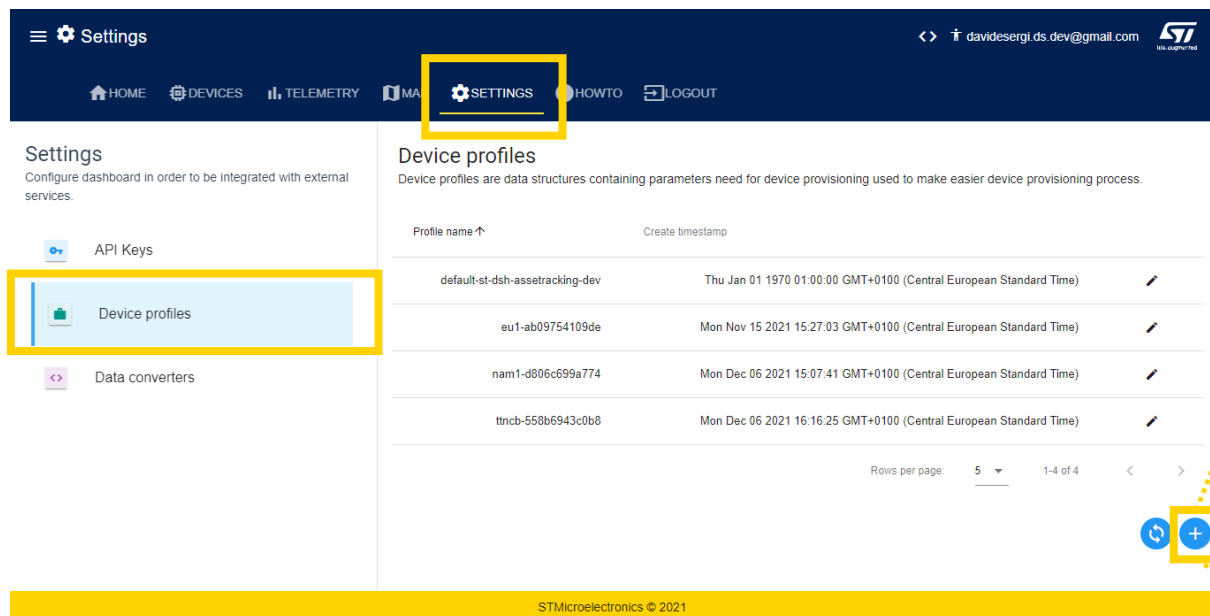
1. On the Sigfox backend, select the **device type** view
2. Click on the group related to the device type linked to the just activated device
3. Create a new API ACCESS (with all the permissions needed) and take note of the Login and Password



Configure the ST dashboard (1)

1. On the ST dashboard, select the **settings** view and create a new Sigfox device profile:

- Custom name as a human-friendly label
- Sigfox type
- Sigfox data converter
- API ACCESS Login and Password (previously created)



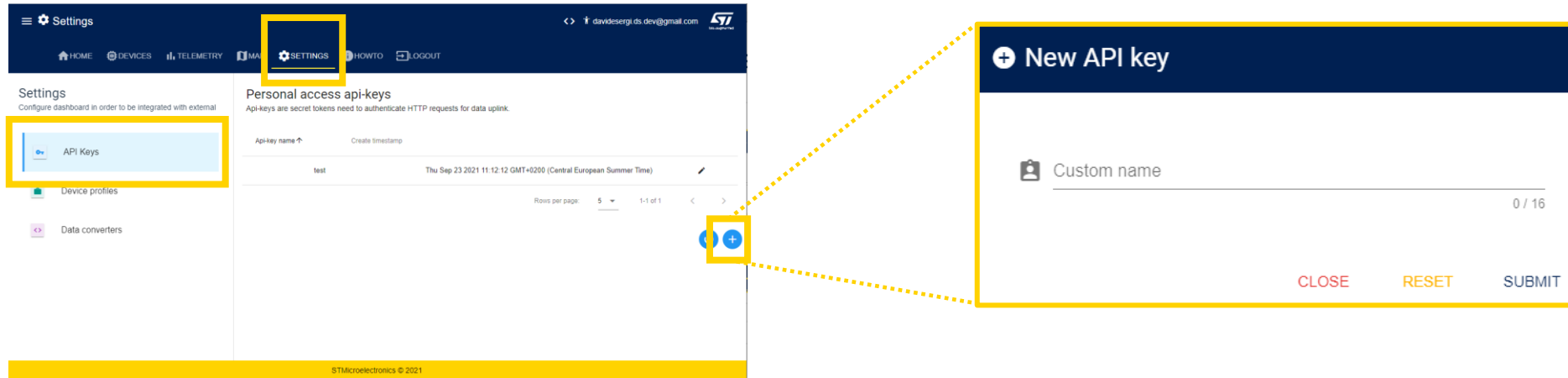
The 'New device profile' form is shown with the following fields:

- Device profile name**: Text input field (0 / 19 characters).
- Technology**: Radio buttons for ☐ LoRa (TTN) and ☒ Sigfox.
- Data converter**: Dropdown menu.
- Sigfox login**: Text input field (0 / 40 characters).
- Sigfox password**: Text input field (0 / 40 characters).

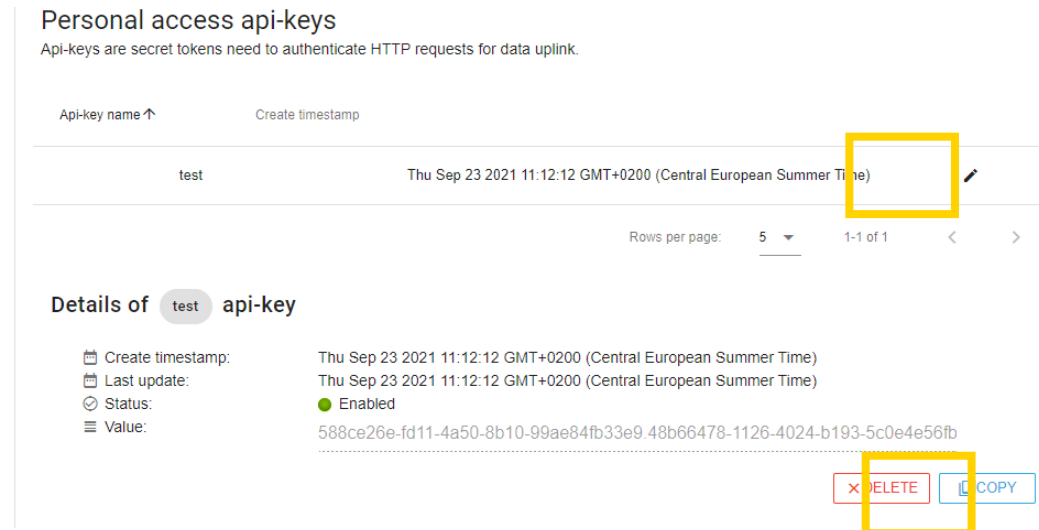
At the bottom right, there are three buttons: **CLOSE**, **RESET**, and **SUBMIT**.

Configure the ST dashboard (2)

2. On the ST dashboard, select the **settings** view and create a new api-key



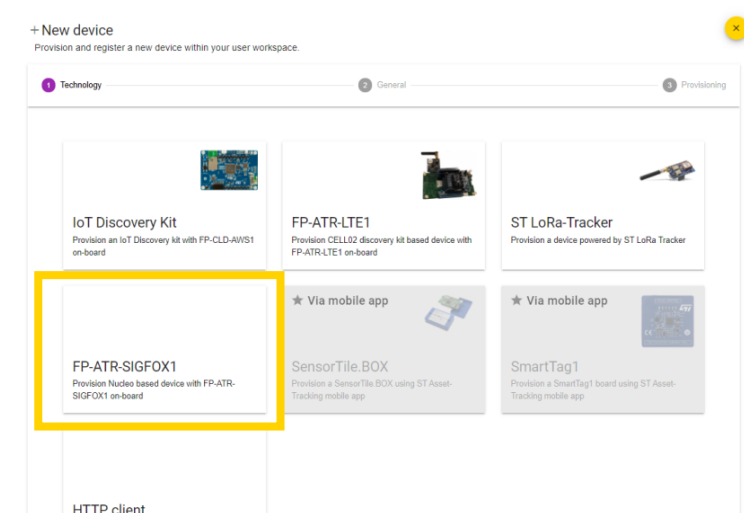
3. Refresh the api-key list and take note of the api-key value



Register the device

On the ST dashboard, register the device with the following parameters:

- Custom name as a human-friendly label
- Device ID and PAC (previously created)
- Device profile (previously created)
- Api-key (previously created)



This screenshot shows the 'General' step of the device registration process. It includes a progress bar at the top with three steps: 1. Technology, 2. General (active), and 3. Provisioning. The form contains the following fields:

- Device ID**: Unique device ID. The input field is labeled 'Device ID (hex digits)' and has a character count of '0 / 7'.
- Label**: Human-friendly device name. The input field is labeled 'Custom name' and has a character count of '0 / 16'.

A blue 'NEXT' button is located at the bottom of the form.

This screenshot shows the 'Provisioning' step of the device registration process. It includes a progress bar at the top with three steps: 1. Technology, 2. General, and 3. Provisioning (active). The form contains the following fields:

- Device profile**: Select existing device profile. A dropdown menu is shown with the text 'Select device profile'.
- Api-key**: Select existing api-key to enable uplink data over HTTP channel. A dropdown menu is shown with the text 'Select api-key'.

A blue 'SUBMIT' button is located at the bottom of the form.

FP-ATR-LTE1

LTE device provisioning

Prerequisites

- **Dashboard**

- Google Chrome or Mozilla Firefox
- Browse dashboard at: <https://dsh-assettracking.com>

- **IoT node**

- *Hardware:*

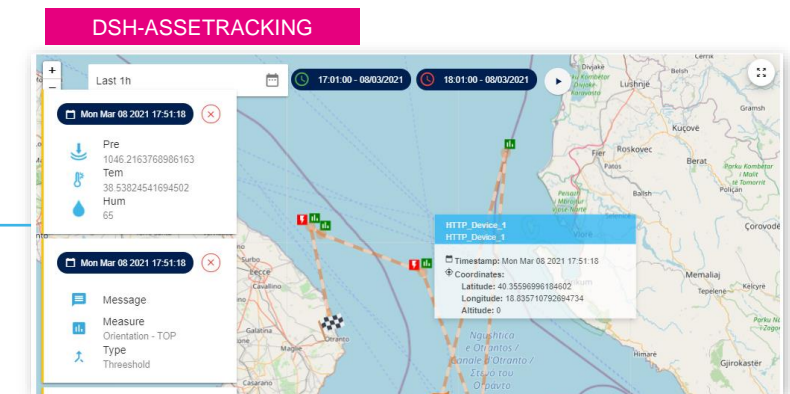
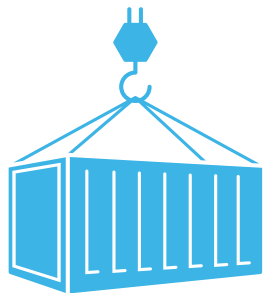
- STM32 Nucleo-based: PL496G-CELL02 (+ X-NUCLEO-IKS01A3, X-NUCLEO-GNSS1A1)

<https://www.st.com/en/evaluation-tools/p-l496g-cell02.html>

- *Software*

- FP-ATR-LTE1

<https://www.st.com/en/embedded-software/fp-atr-lte1.html>



LTE device provisioning

Steps

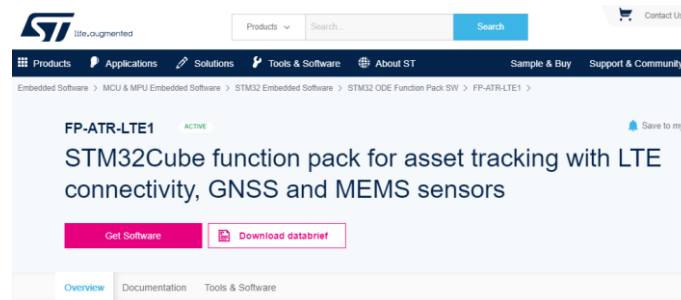
Follow these steps for the LTE device provisioning:

1. Get the device ID
2. Register the device
3. Configure the device

Note: For further info, see <https://www.st.com/en/embedded-software/fp-atr-lte1.html#documentation>

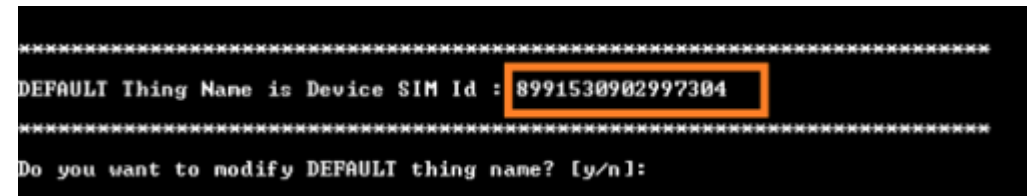
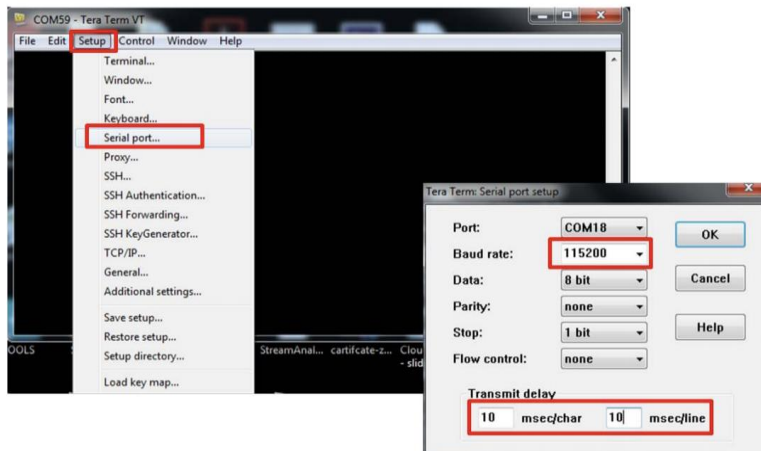
Get the device ID

1. Download FP-ATR-LTE1 from <https://www.st.com/en/embedded-software/fp-atr-lte1.html>



Product overview

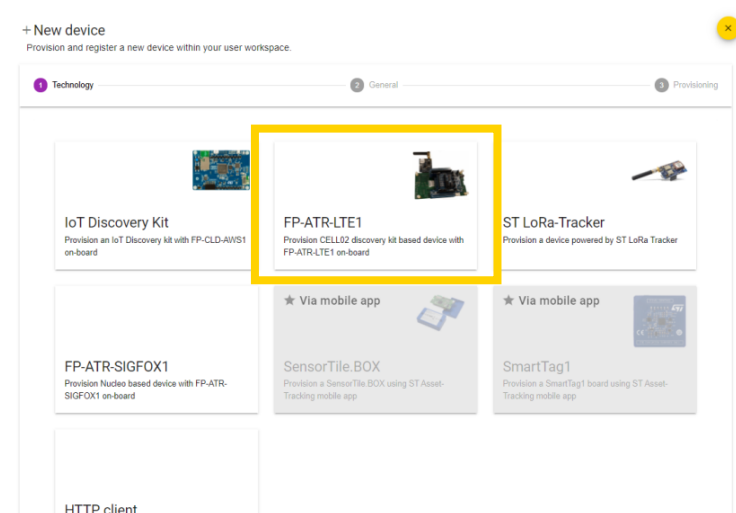
2. Connect the device to a PC via a USB cable, flash the firmware binary and take note of the device ID



Register the device

On the ST dashboard, register the device with the following parameters:

- Custom name as a human-friendly label
- Device ID previously created
- Option Create new device certificate and key checked

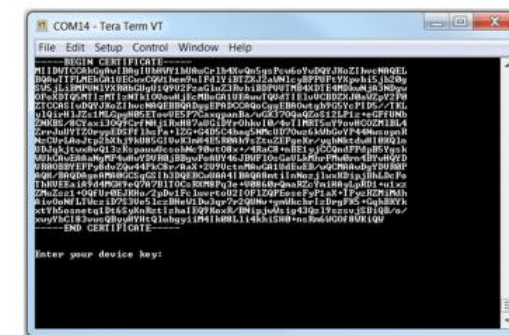
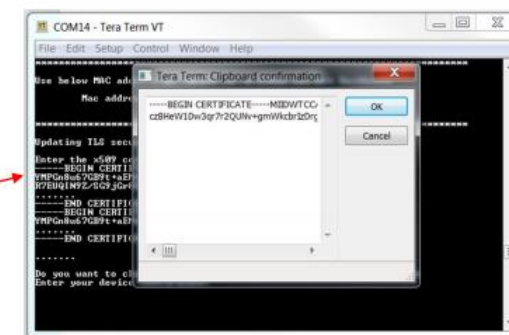
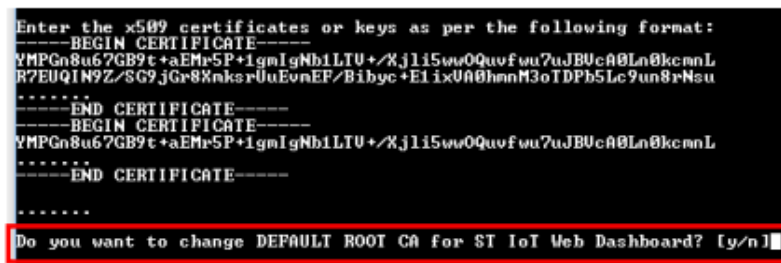
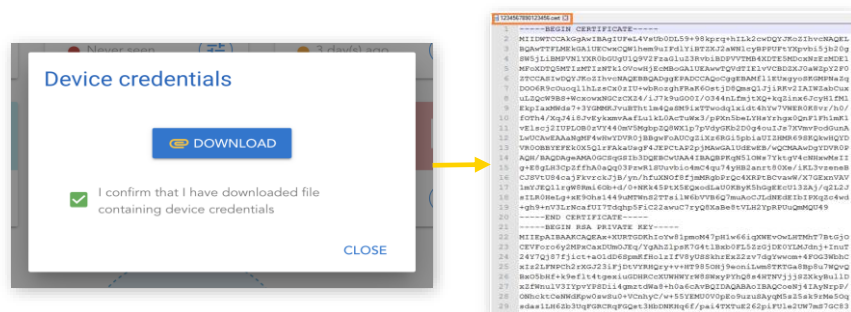


This screenshot shows the 'General' configuration step. It includes fields for 'Device ID' (Unique device ID) and 'Device ID (hex digits)' (0 / 7). There is also a 'Label' field for a 'Human-friendly device name' (Custom name) with a character count of 0 / 16. A blue 'NEXT' button is at the bottom.

This screenshot shows the 'Provisioning' step. It features the AWS IoT logo and a section for 'Device credentials' with the instruction 'Select how device credentials have to provided to establish cloud connection'. Two radio buttons are present: 'New private-key and certificates pair generated on cloud' (which is selected) and 'Use existing certificate'. A blue 'SUBMIT' button is at the bottom.

Configure the device

1. After the registration, download the **device credentials** from the popup and open the file with a text editor
2. In the serial terminal, enter 'n' to confirm the first default value of the Root CA
3. Copy and paste the private key string on the device via serial terminal
4. Copy and paste the private key string on the device via serial terminal



FP-CLD-AWS1

Wi-Fi device provisioning

Prerequisites

- **Dashboard**
 - Google Chrome or Mozilla Firefox
 - Browse the dashboard at: <https://dsh-assettracking.com>
- **IoT node**
 - *Hardware:*
 - B-L4S5I-IOT01A
 - STEVAL-STWINKIT1(B)
 - *Software*
 - FP-CLD-AWS1 v3

<https://www.st.com/en/evaluation-tools/b-l4s5i-iot01a.html>

<http://www.st.com/stwin>

<https://www.st.com/en/embedded-software/fp-cld-aws1.html>



Wi-Fi device provisioning

Steps

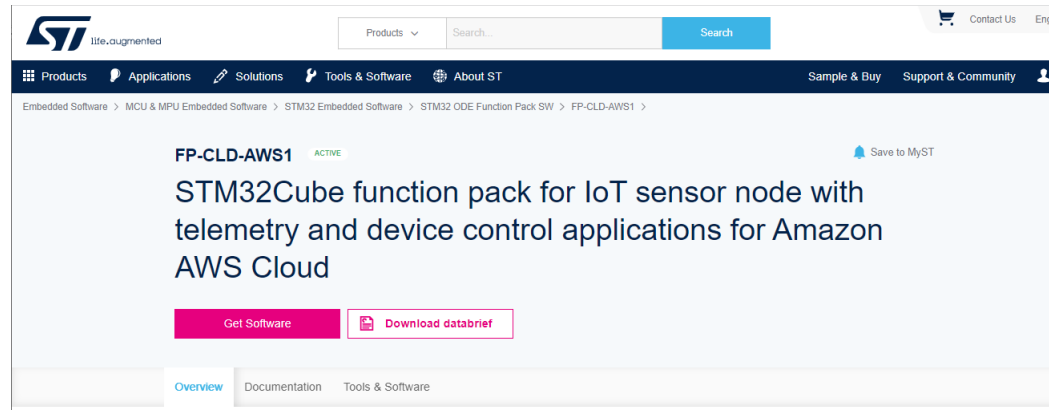
Follow these steps for the Wi-Fi device provisioning:

1. Flash the device
2. Get the device certificate
3. Register the device

Note: For further info, see <https://www.st.com/en/embedded-software/fp-cld-aws1.html#documentation>

Flash the device

1. Download FP-CLD-AWS1 from <https://www.st.com/en/embedded-software/fp-cld-aws1.html>

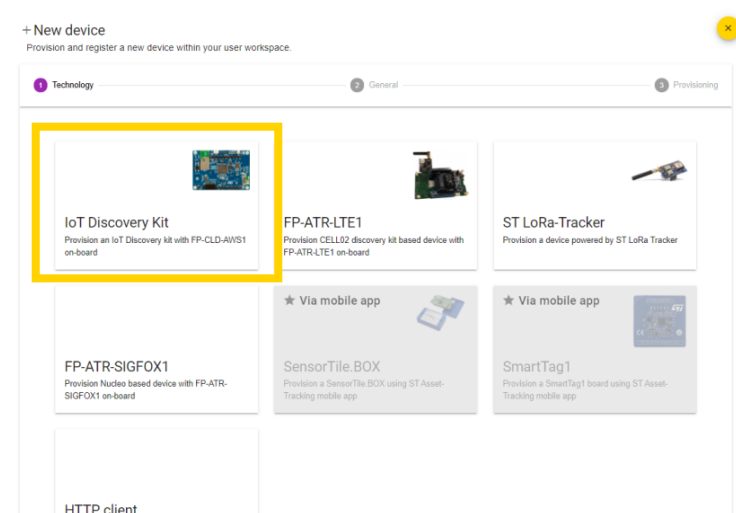


2. Follow the guide at <https://www.st.com/en/embedded-software/fp-cld-aws1.html#documentation> to flash the device according to the board used (B-L4S5I-IOT01A, STEVAL-STWINKIT1(B))

Register the device

On the ST dashboard, register the device with the following parameters:

- Custom name as a human-friendly label
- Device ID (previously created)
- Option Create new device certificate and key checked

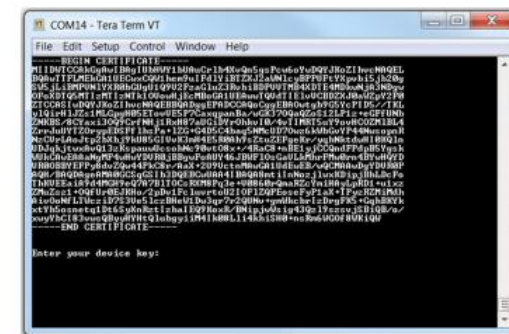
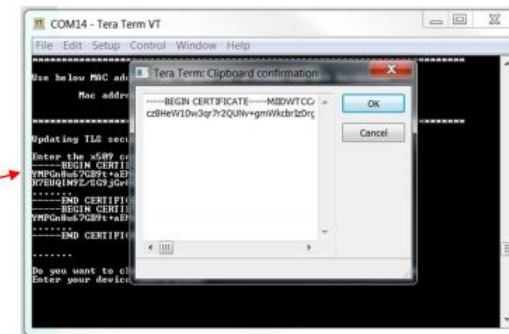
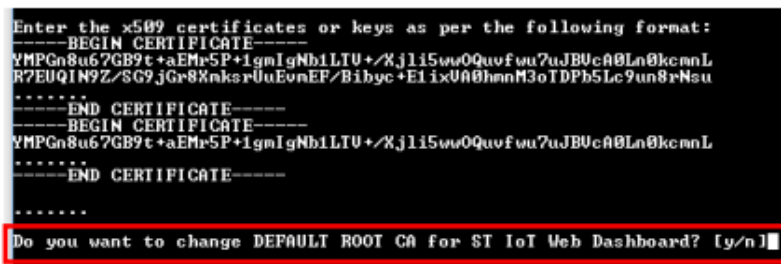
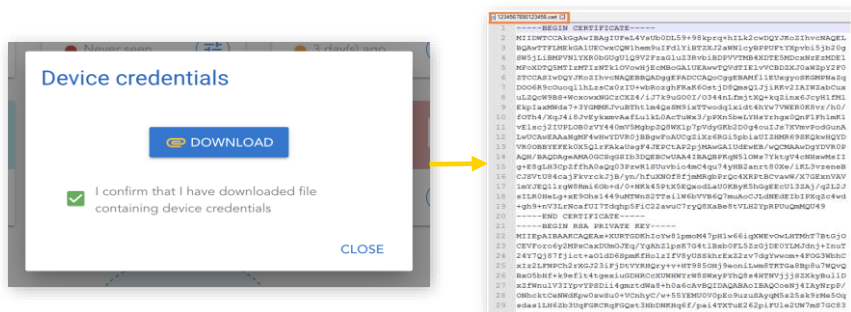


This screenshot shows the 'General' configuration step in the ST dashboard. The progress bar at the top indicates three steps: 'Technology' (selected), 'General', and 'Provisioning'. The 'Device ID' section has a label 'Unique device ID' and a text input field for 'Device ID (hex digits)' with a character count of '0 / 7'. The 'Label' section has a label 'Human-friendly device name' and a text input field for 'Custom name' with a character count of '0 / 16'. A blue 'NEXT' button is at the bottom.

This screenshot shows the 'Provisioning' step in the ST dashboard. The progress bar at the top indicates three steps: 'Technology', 'General', and 'Provisioning' (selected). The 'Device credentials' section features the AWS IoT logo and a heading 'Select how device credentials have to provided to establish cloud connection'. There are two radio button options: 'New private-key and certificates pair generated on cloud' (which is selected) and 'Use existing certificate'. A blue 'SUBMIT' button is at the bottom.

Configure the device

1. After the registration, download the **device credentials** from the popup and open the file with a text editor
2. In the serial terminal, enter 'n' to confirm the first default value of the Root CA
3. Copy and paste the private key string on the device via a serial terminal
4. Copy and paste the private key string on the device via a serial terminal

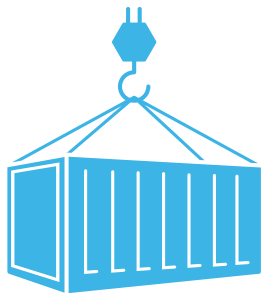


Generic HTTP device

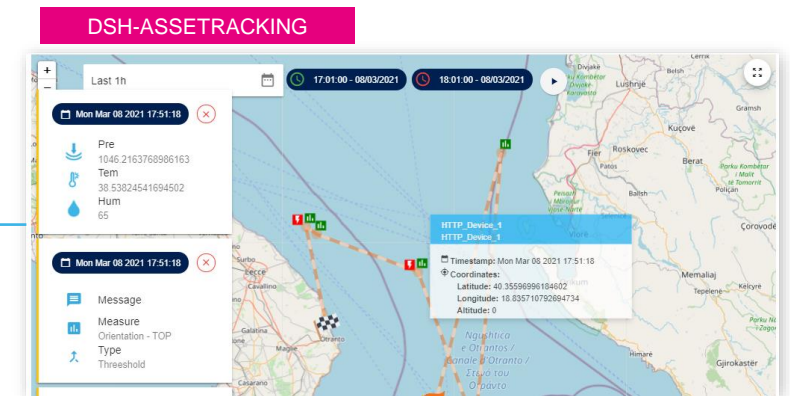
HTTP device provisioning

Prerequisites

- **Dashboard**
 - Google Chrome or Mozilla Firefox
 - Browse the dashboard at: <https://dsh-assettracking.com>
- **IoT node**
 - *Software*
 - HTTP client application (e.g. Postman)
 - IoT Protocol



HTTP
Client device



Wi-Fi device provisioning

Steps

Follow these steps for the Wi-Fi device provisioning:

1. Register the device
2. Create the api-key
3. Send the data

Register the device

On the ST dashboard, register the device with the following parameters:

- Custom name as a human-friendly label
- Device ID

+ New device
Provision and register a new device within your user workspace.

Technology | General | Provisioning

IoT Discovery Kit
Provision an IoT Discovery kit with FP-CLD-AWS1 on-board

FP-ATR-LTE1
Provision CELL02 discovery kit based device with FP-ATR-LTE1 on-board

ST LoRa-Tracker
Provision a device powered by ST LoRa Tracker

FP-ATR-SIGFOX1
Provision Nucleo based device with FP-ATR-SIGFOX1 on-board

SensorTile.BOX
Provision a SensorTile.BOX using ST Asset-Tracking mobile app

SmartTag1
Provision a SmartTag1 board using ST Asset-Tracking mobile app

HTTP client

Device ID
Unique device ID

Device ID (hex digits) 0 / 7

Label
Human-friendly device name

Custom name 0 / 16

NEXT

Configure the ST dashboard

2. On the ST dashboard, select the **settings** view and create a new api-key

The screenshot shows the ST dashboard's 'Settings' page. The top navigation bar has a 'SETTINGS' tab highlighted with a yellow box. The left sidebar has an 'API Keys' link highlighted with a yellow box. The main content area shows 'Personal access api-keys' with a table containing one row: 'test' with a timestamp 'Thu Sep 23 2021 11:12:12 GMT+0200 (Central European Summer Time)'. A yellow box highlights the '+ New API key' button at the bottom right of the table. A dotted line connects this button to a 'New API key' modal form. The modal form has a 'Custom name' input field and 'CLOSE', 'RESET', and 'SUBMIT' buttons.

3. Refresh the api-key list and take note of the api-key value

The screenshot shows the 'Personal access api-keys' table and details. The table has a header with 'Api-key name' and 'Create timestamp'. It contains one row: 'test' with a timestamp 'Thu Sep 23 2021 11:12:12 GMT+0200 (Central European Summer Time)'. A yellow box highlights the timestamp. Below the table, the 'Details of test api-key' section shows the 'Value' field with a long alphanumeric string: '588ce26e-fd11-4a50-8b10-99ae84fb33e9.48b66478-1126-4024-b193-5c0e4e56fb'. A yellow box highlights the 'DELETE' button at the bottom right.

Send the data

Send the HTTP request with the telemetry data:

- URL: <https://gizravz67f.execute-api.eu-central-1.amazonaws.com/v1/telemetry>
- HTTP Headers
 - Authorization: **<api-key value previously created>**
 - Content-type: **application/json**
- Body following *IoT Protocol* specs →

```
{
  "device_id": "<device id>",
  "values": [
    {
      "ts": "<epoch milliseconds>",
      "t": "tem | hum | pre",
      "v": 25.52
    }, {
      "ts": "<epoch milliseconds>",
      "t": "acc | gyr | mag",
      "v": {
        "x": 0.1,
        "y": 0.1,
        "z": 0.1
      }
    }, {
      "ts": "<epoch milliseconds>",
      "t": "evt",
      "v": {
        "et": "<event type>",
        "m": "<measure name>",
        "l": "<label>"
      }
    }
  ]
}
```

IoT Protocol
- Up stream message -

Thank you

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