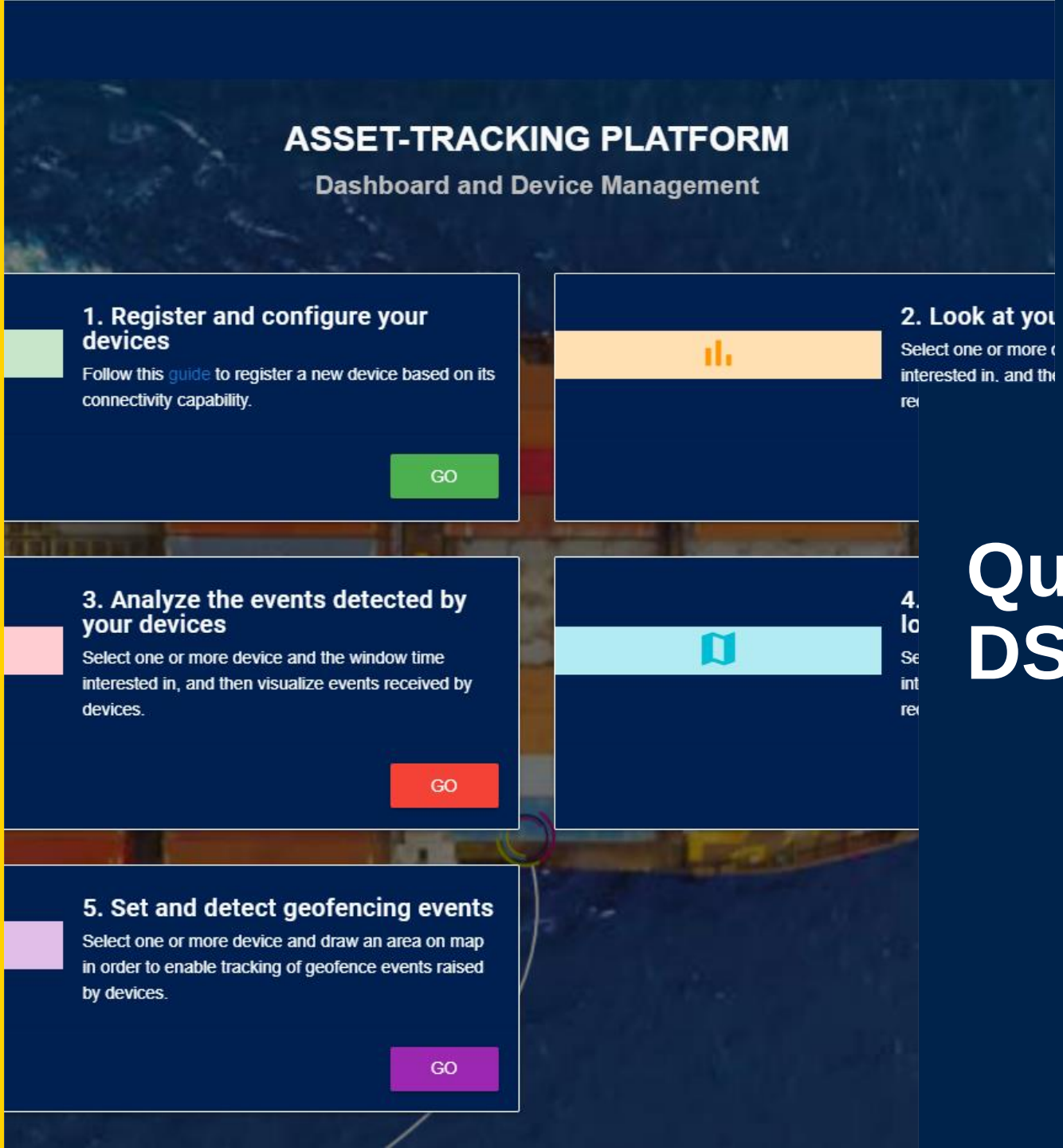

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Quick start guide DSH-ASSETRACKING

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

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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 		

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RTLS = Real Time Localization System

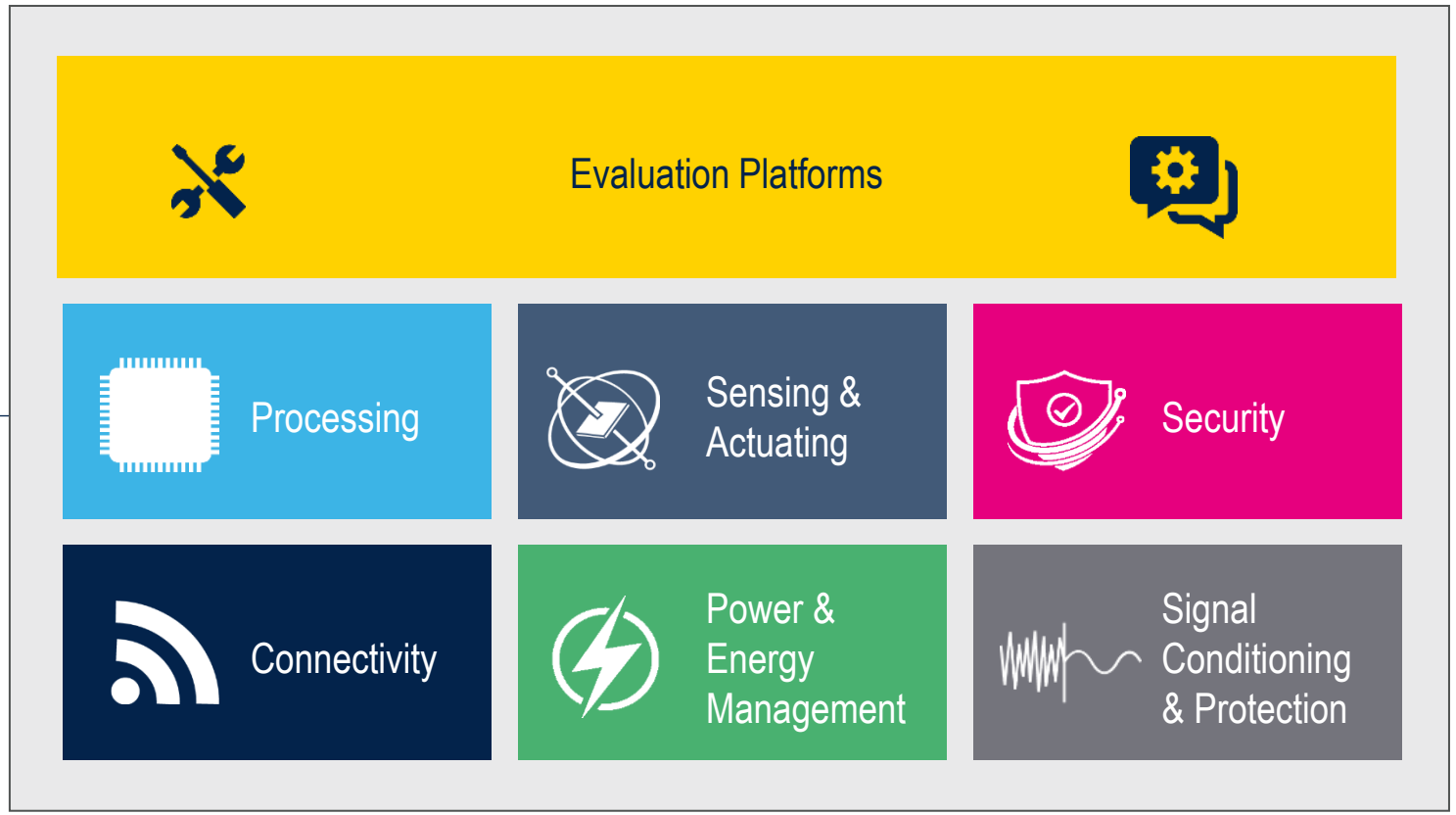
Asset tracking
ST 360° portfolio offers a100% flexibility

Outdoor real-time monitoring

Indoor localization & Warehouse logistics

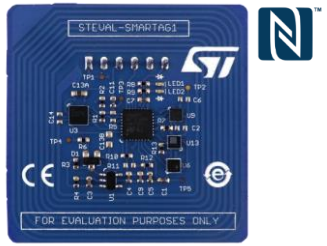
Good guarantee

Disposable



Asset tracking reference design per connectivity type

NFC & RFID



NFC Sensor Tag
STEVAL-SMARTAG1
FP-SNS-SMARTAG1
DSH-ASSETRACKING
ST Asset Tracking

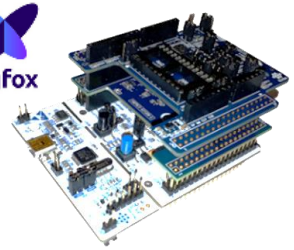
STM32

Bluetooth® Low Energy

SensorTile.box
STEVAL-MKSBOX1V1
FP-ATR-BLE1
DSH-ASSETRACKING
ST Asset Tracking

STM32 BlueNRG iNEMO

Sub-1 GHz



Sigfox™ Tracker
FP-ATR-SIGOFX1
DSH-ASSETRACKING

STM32 Teseo SPIRIT

Wi-Fi

STWIN
STEVAL-STWINKT1B
FP-CLD-AWS
DSH-ASSETRACKING

STM32

Sub-1 GHz

LoRa® Tracker
STEVAL-STRKT01
FP-ATR-LORA1
DSH-ASSETRACKING

STM32 Teseo

Cellular & GNSS

LTE™ Tracker
FP-ATR-LTE1
DSH-ASSETRACKING

STM32 Teseo

Overview

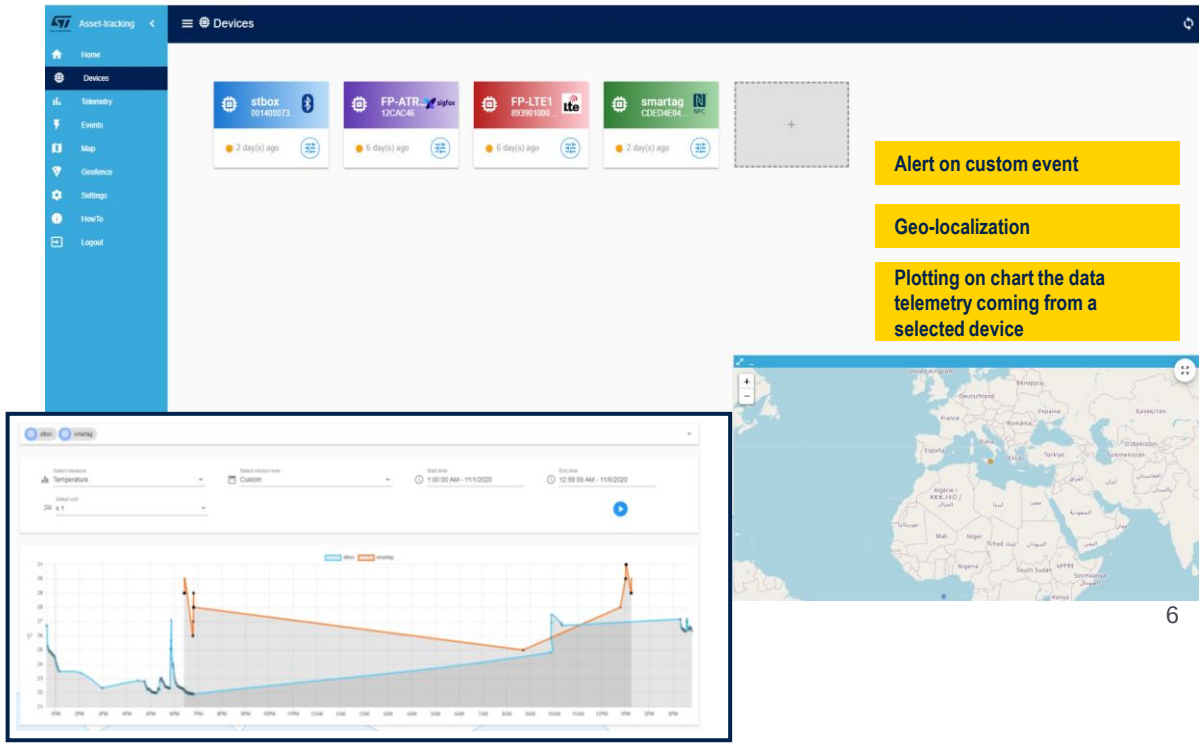
The DSH-ASSETRACKING dashboard is a cloud application powered by Amazon Web Services (AWS).

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 SensortTile.box with Bluetooth Low Energy, Sigfox, and LTE nodes.

https://dsh-assetracking.st.com/



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End-to-end Proof of Concepts
Asset Tracking

STEVAL-SMARTAG1
FP-SNS-SMARTAG1

NFC

ST Asset Trakking

Telecom operator

SensorTile.box
FP-ATR-BLE

Bluetooth®

ST Asset Tracking

Telecom operator

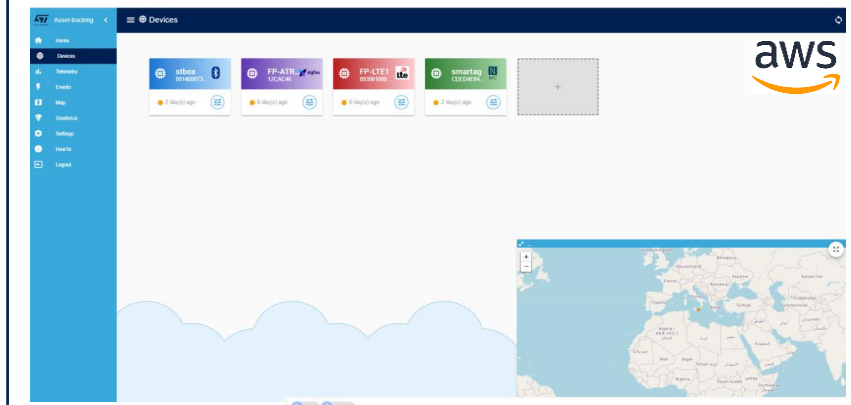
STEVAL-STWINKT1B
FP-CLD-AWS

Wi Fi™

Wi-Fi access

mySTAccount

DSH-ASSETRACKING Cloud Dashboard



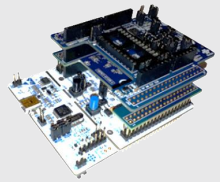
ST Asset Tracking

https://dsh-assetracking.st.com

sigfox

X-NUCLEO-S2868A2
FP-ATR-SIGOFX1

Sigfox backend



LoRa

LoRa Network Server

STEVAL-STRKT01
FP-ATR-LORA1

NFC

ST Asset Tracking

LTE-M

Cellular NB-IoT

Telecom operator

NRND

Architecture
End-to-end

Data ingestion flow from sensor to dashboard

IoT Data protocol

X-NUCLEO-S2868A2
FP-ATR-SIGOFX1

Gateway network

STEVAL-STRKT01
FP-ATR-LORA1

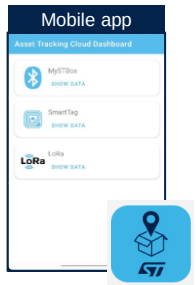
THE THINGS NETWORK — LoRa Network server

Sigfox backend

STEVAL-SMARTAG1
FP-SNS-SMARTAG1

SensorTile.box
FP-ATR-BLE1

Mobile app



HTTP

STEVAL-STWINKT1
/ IoT Discovery Kit
FP-CLD-AWS v3

P-L496G-CELL02
FP-ATR-LTE1

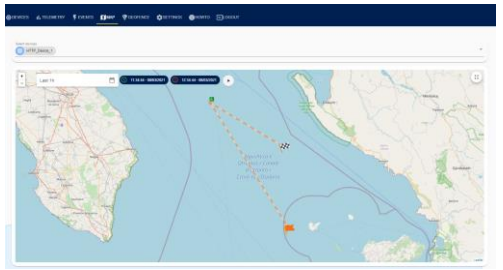
MQTT

GNSS · ToF

Asset-tracking cloud app

powered by aws

API Gateway · SQS · Bucket S3
IAM · Lambda · CloudFront
IoT Core · DynamoDB · Cognito



On-field | Web | Cloud application | Web dashboard application

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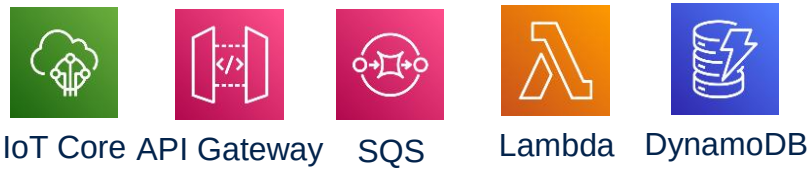
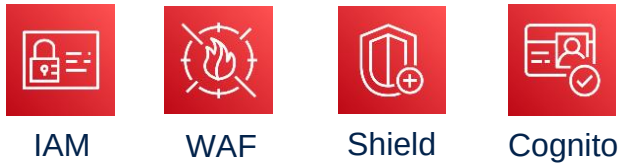
Asset tracking dashboard

AWS Services

- IoT, Computing, database

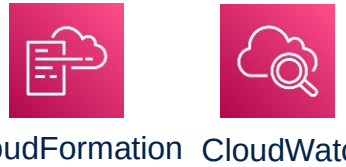


- Security and user management



- Networking and content delivery

- Management and governance



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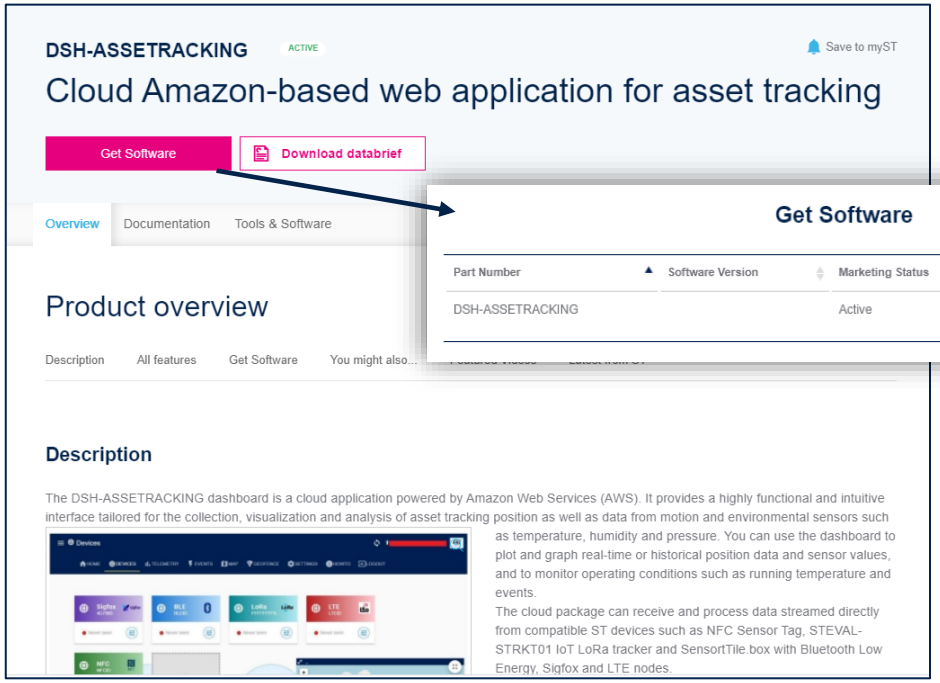
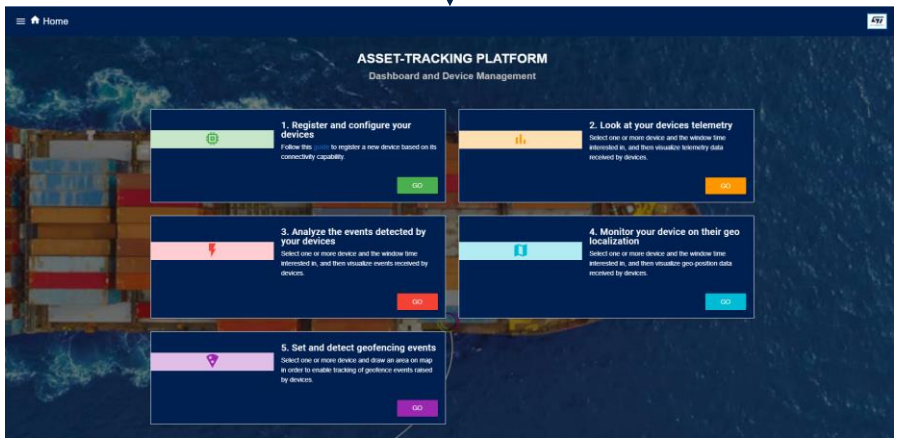
Asset tracking dashboard

How to access it

URL
https://www.st.com/en/embedded-software/dsh-assetracking.html



URL
https://dsh-assetracking.st.com



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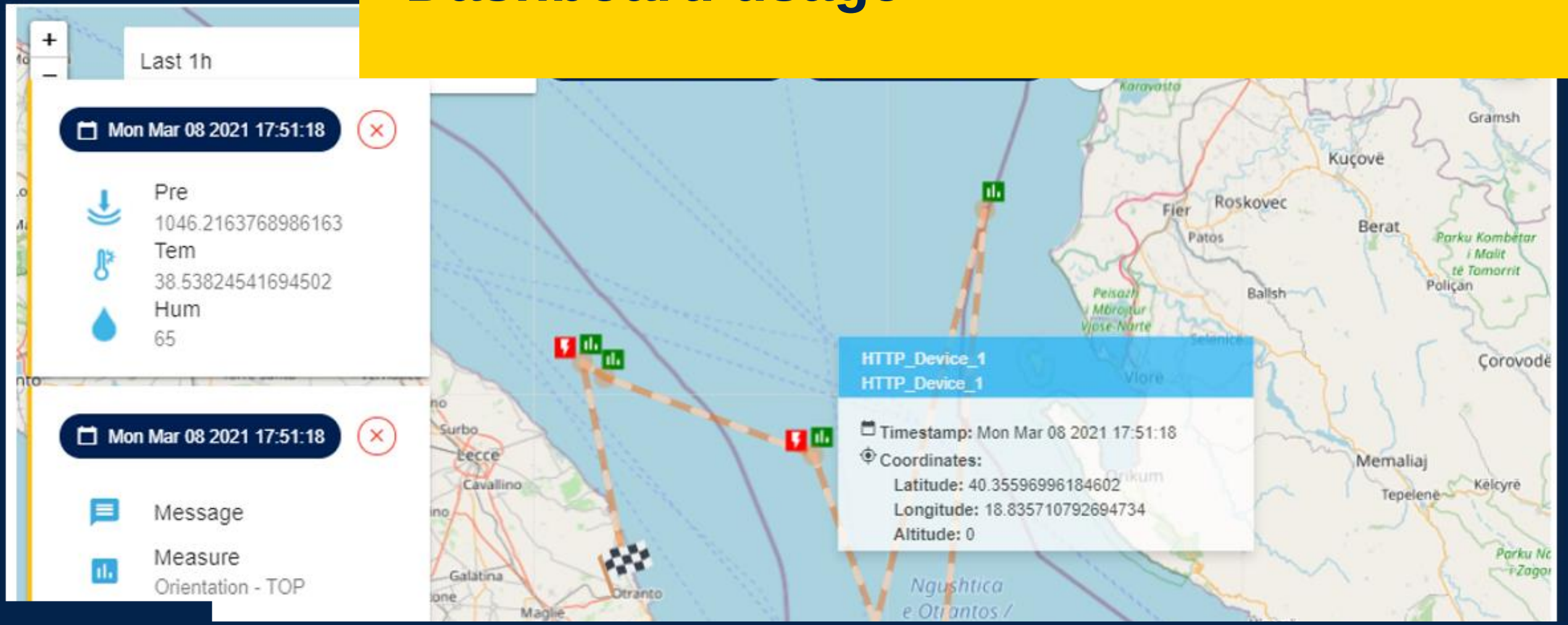
Dashboard usage



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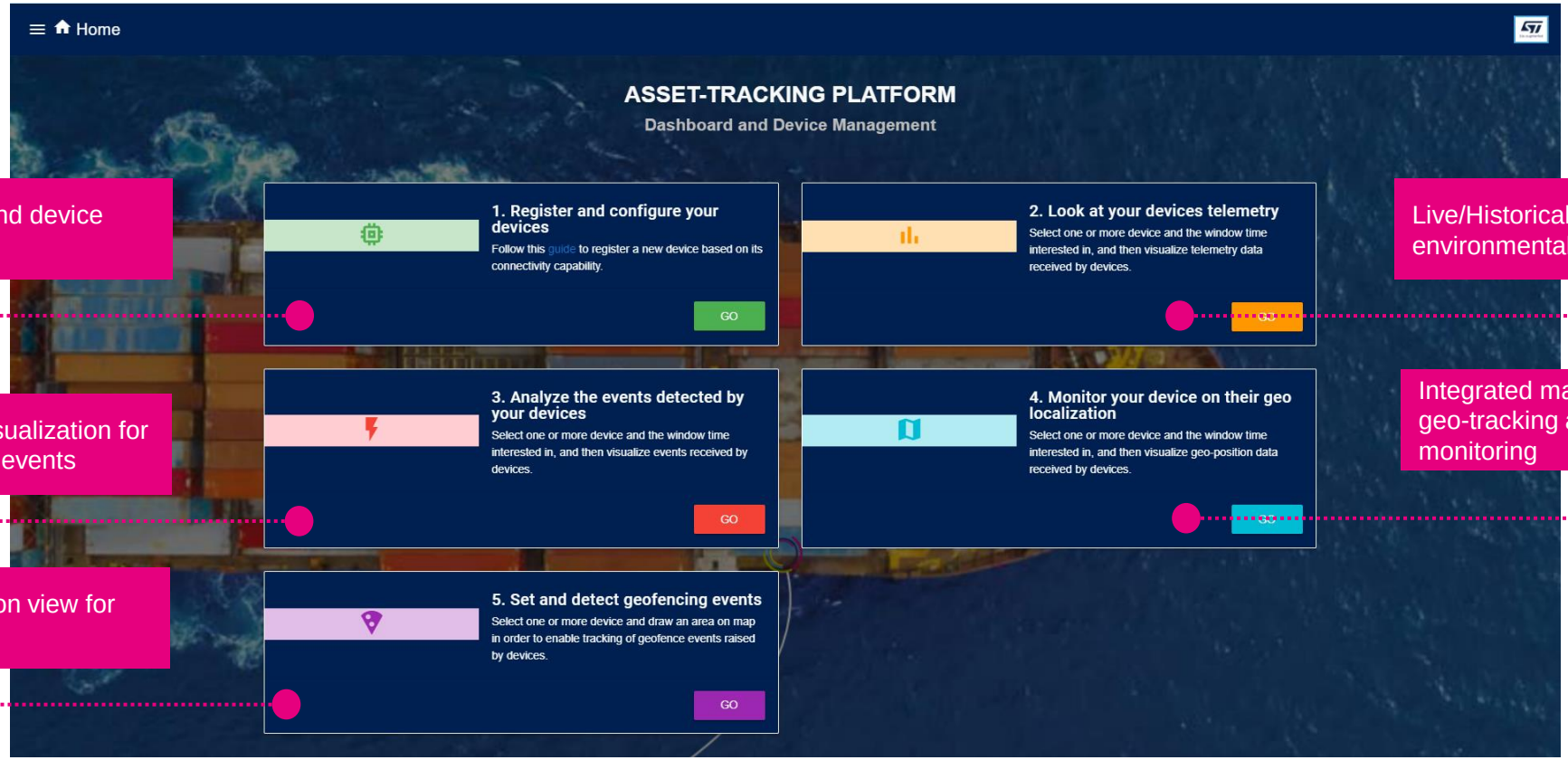
Dashboard usage
Features



Device provisioning and device state monitoring

Live/Historical data visualization for device and geo-fence events

Geo-fence configuration view for devices

Live/Historical data visualization for environmental device telemetry

Integrated map view for device geo-tracking and condition monitoring

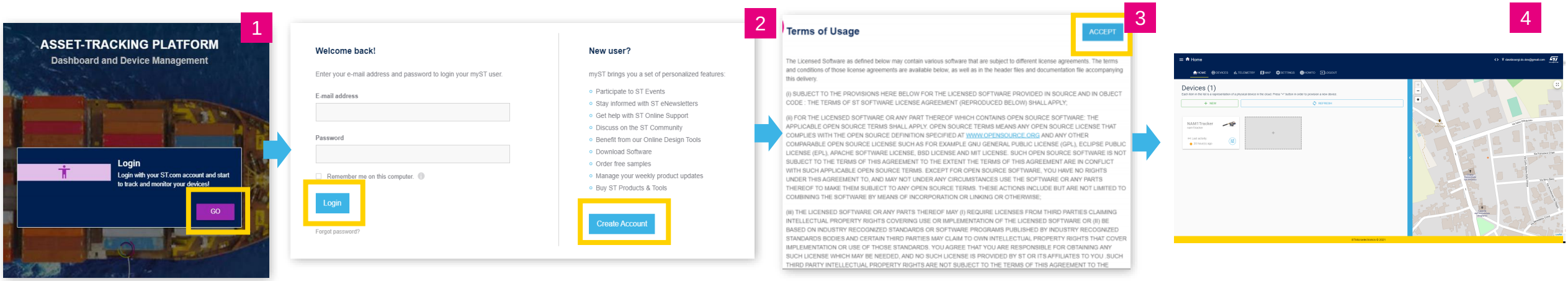
Dashboard usage

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 thegeo-fence
4. Monitor the devices for:
   - The device state
   - Environmental telemetry
   - The device and geo-fencing events
   - The geo-position data

SSO User Login

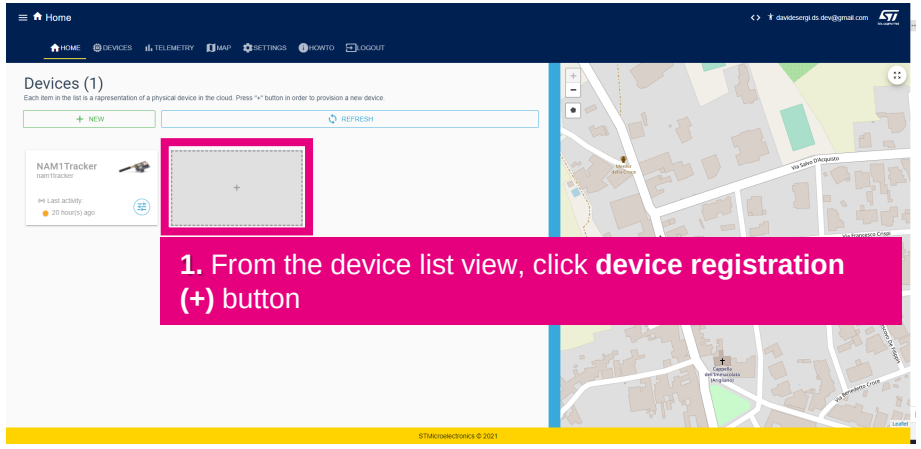
1. Browse ST asset tracking dashboard at https://dsh-assetracking.st.com
2. Create your login or use your my.st.com user account to access the dashboard
3. Accept the dashboard *Terms of Usage*
4. Login again to the dashboard to make the device list view automatically appear

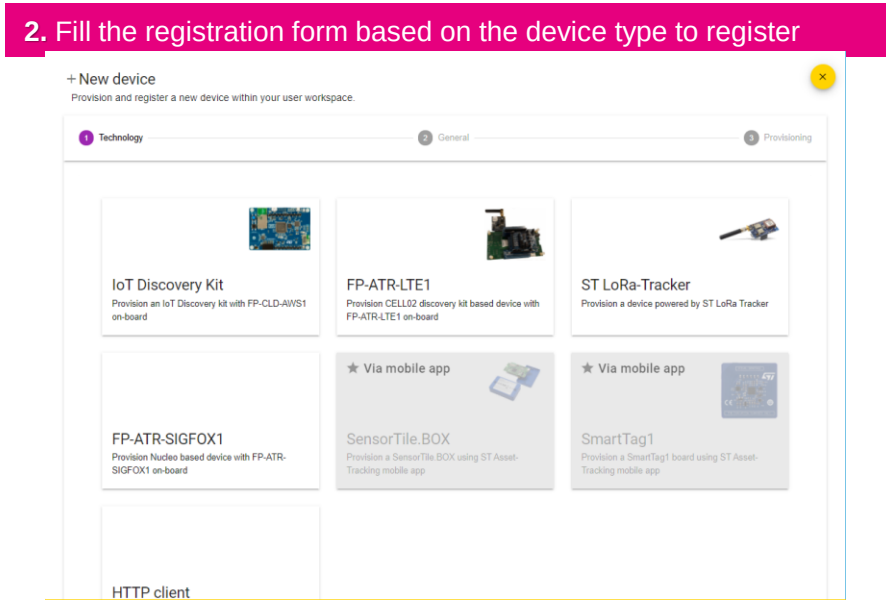


Device provisioning

- 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





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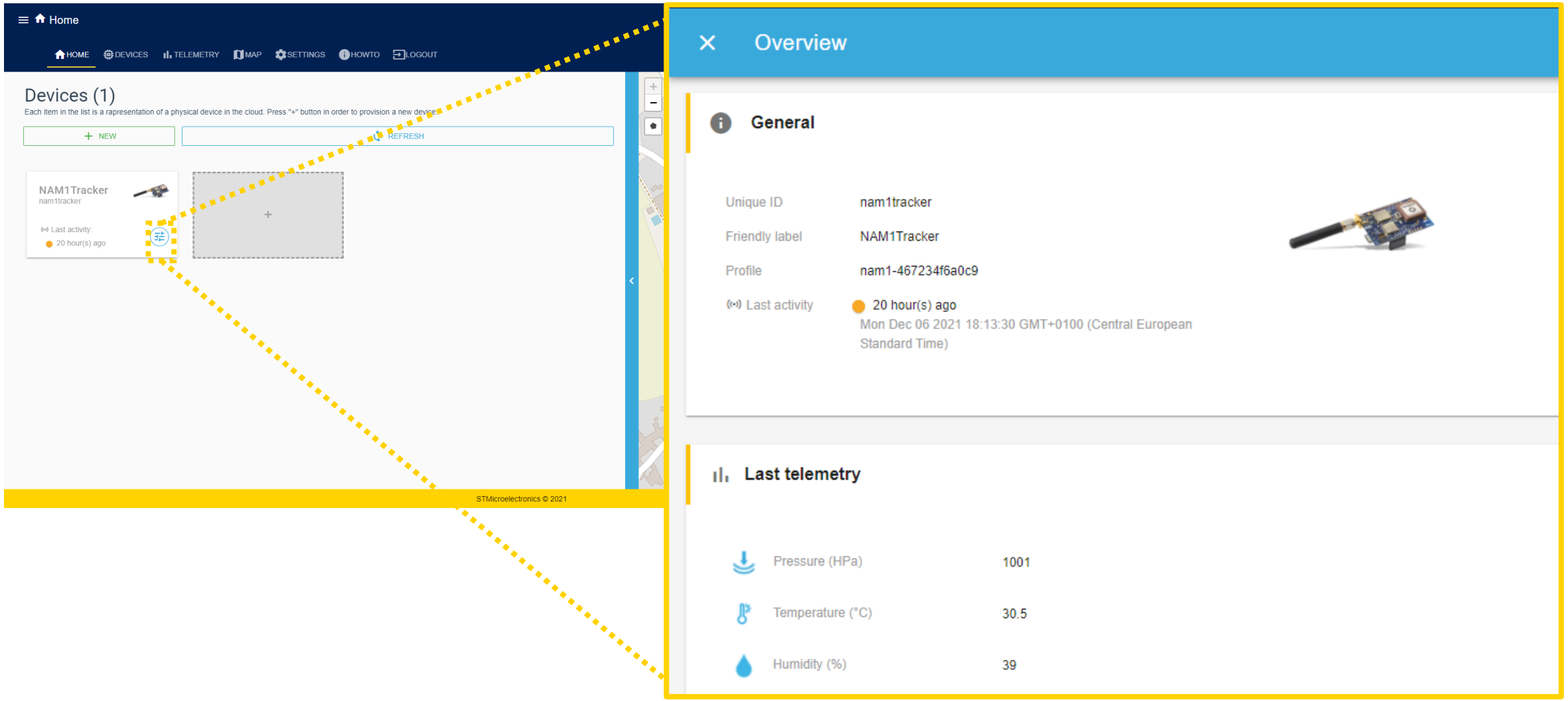
From the device list view, open **device details** view from **devices** view to analyze the last telemetry sent and other information

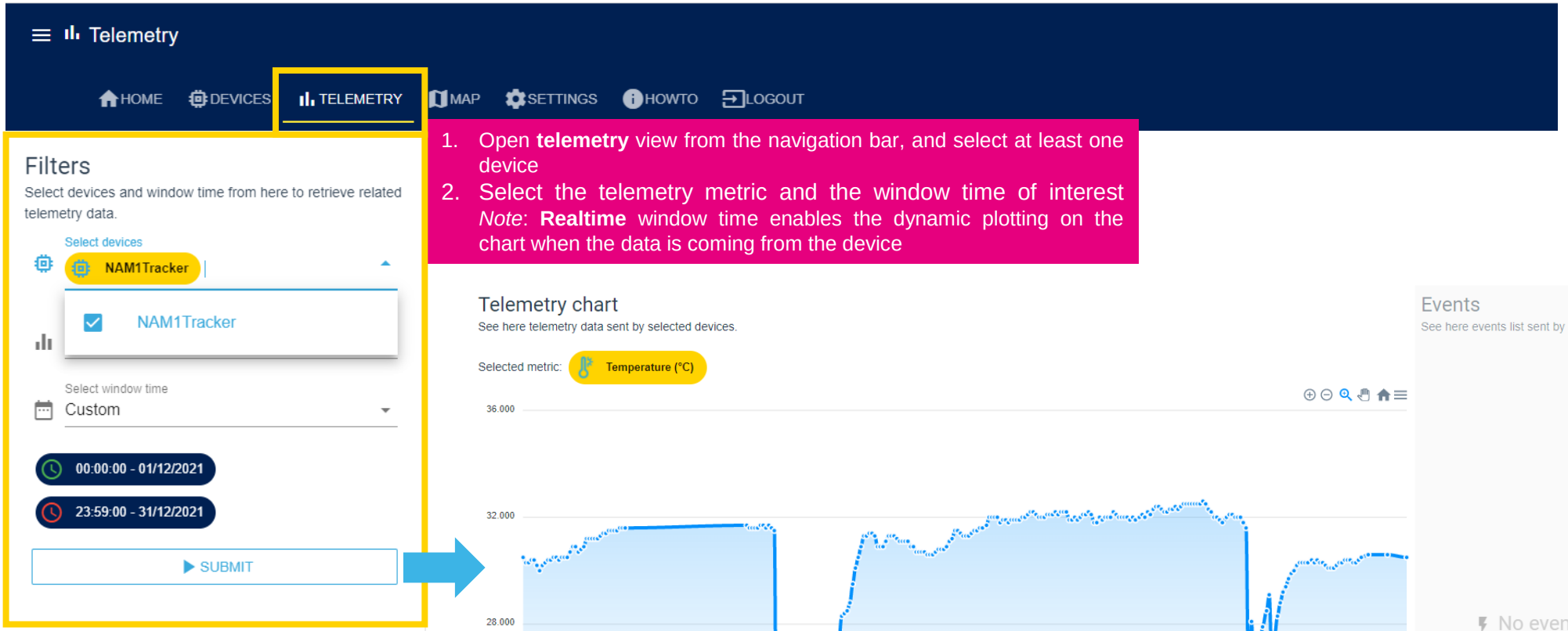
Monitor devices

Device state



Monitor devices

Environmental telemetry

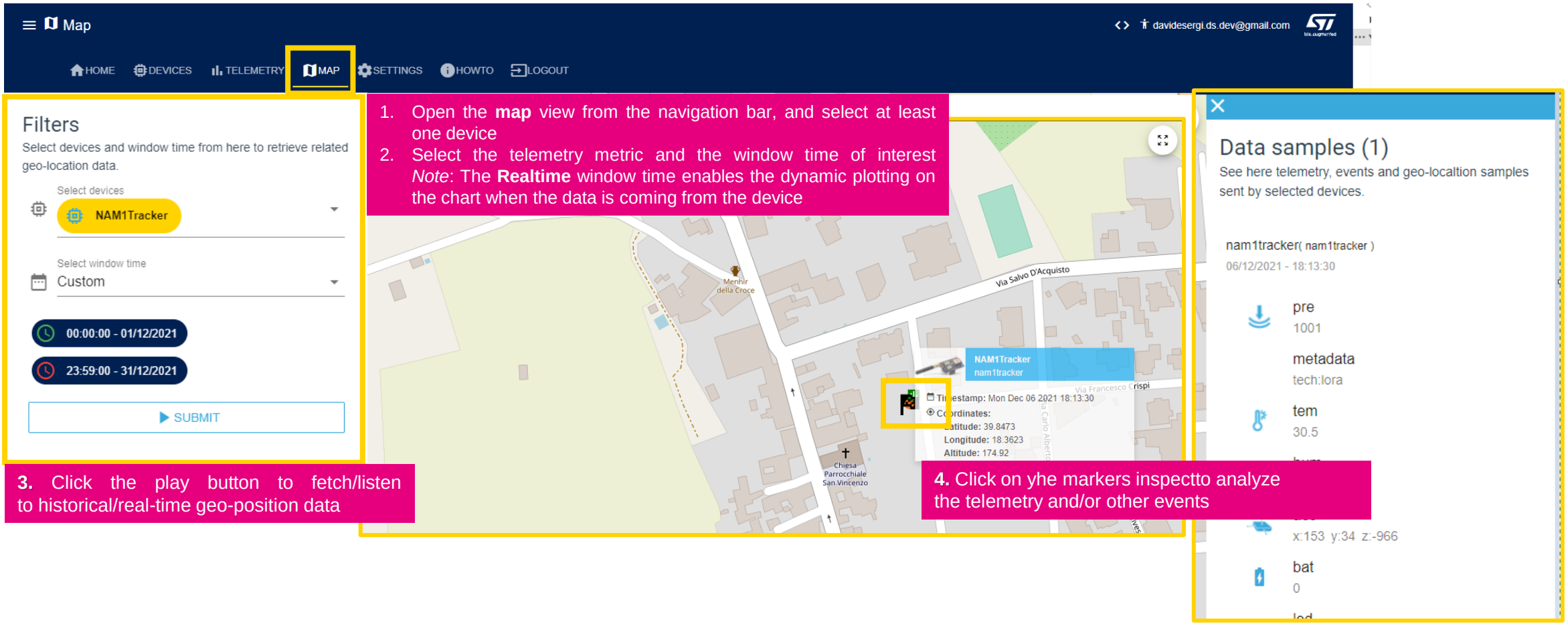


1. Open **telemetry** view from the navigation bar, and select at least one device
2. Select the telemetry metric and the window time of interest
   Note: **Realtime** window time enables the dynamic plotting on the chart when the data is coming from the device

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

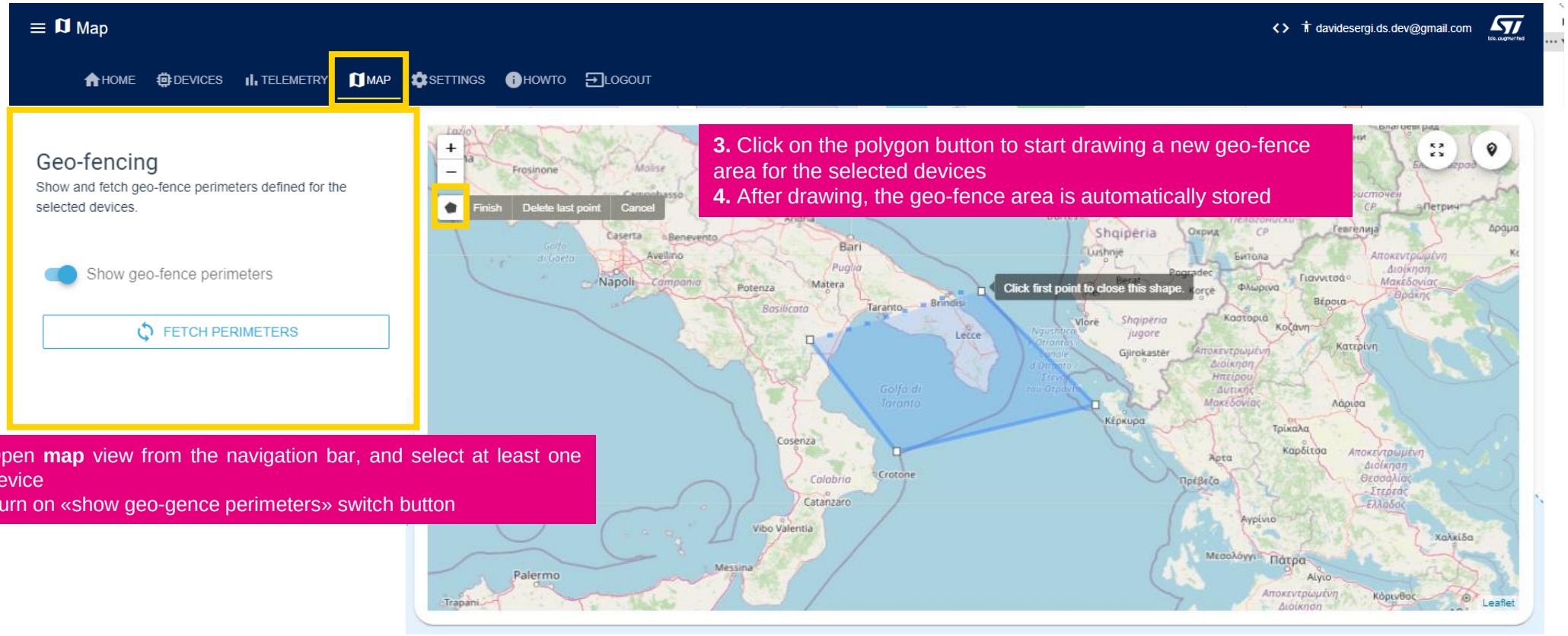
Monitor devices

Geo-position data



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



STEVAL-SMARTAG1

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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

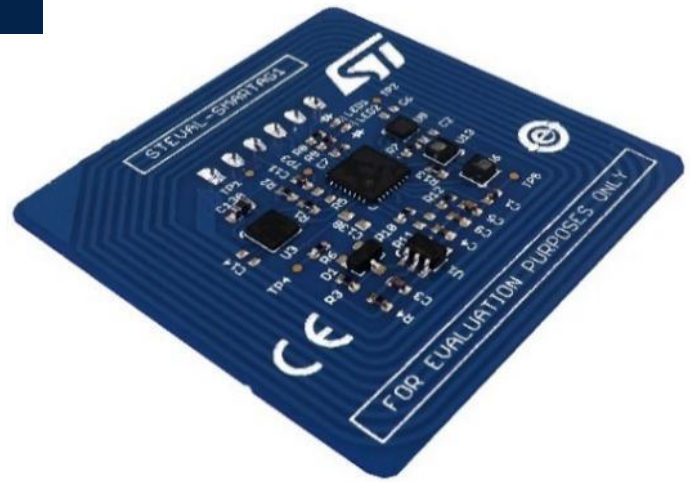
STEVAL-SMARTAG1

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

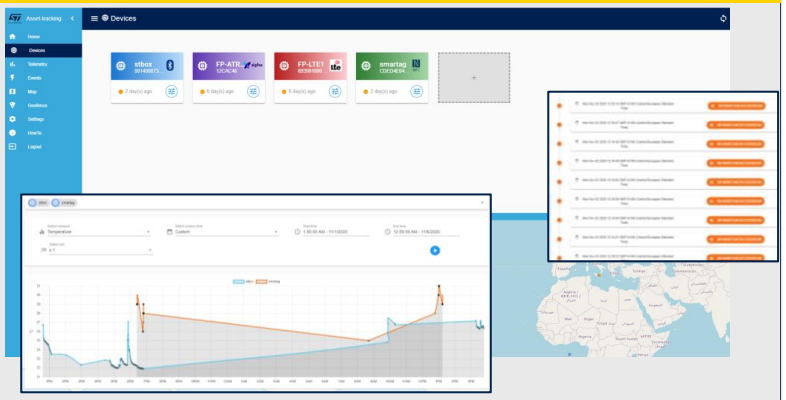
LIS2DW12 – 3x accelerometer

LPS22HH – Pressure sensors

HTS221 – Temperature & humidity

STLQ015 – Voltage regulator

DSH-ASSETRACKING
Asset Tracking Dashboard



Ecosystem

Evaluation board: STEVAL-SMARTAG1

Function Pack: FP-SNS-SMARTAG1

Mobile app: ST Asset Tracking

Cloud dashboard: DSH-ASSETRACKING

Download on the App Store

GET IT ON Google play

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NFC device
Overview

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

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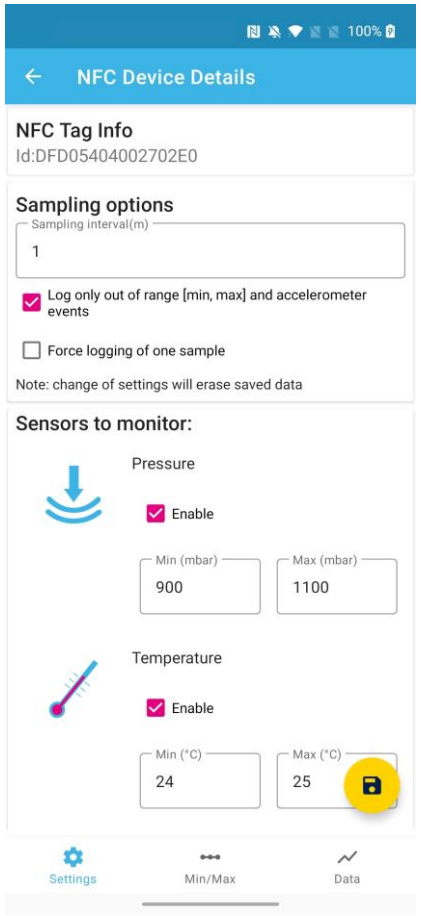
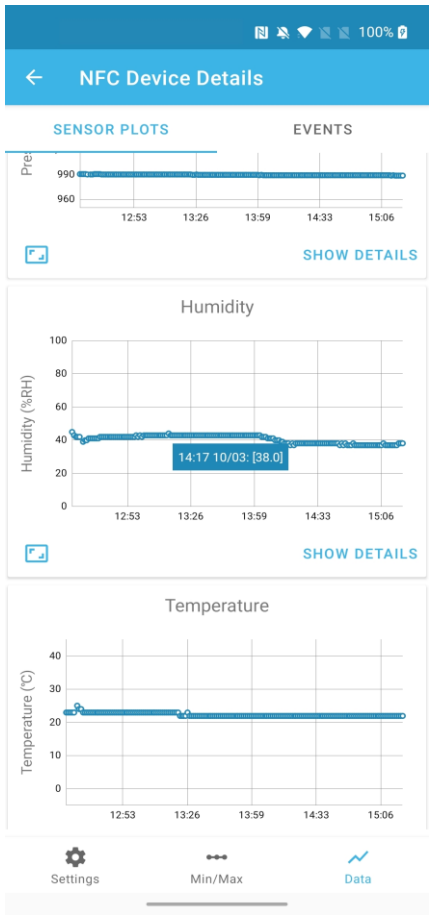
NFC device
Mobile app section

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



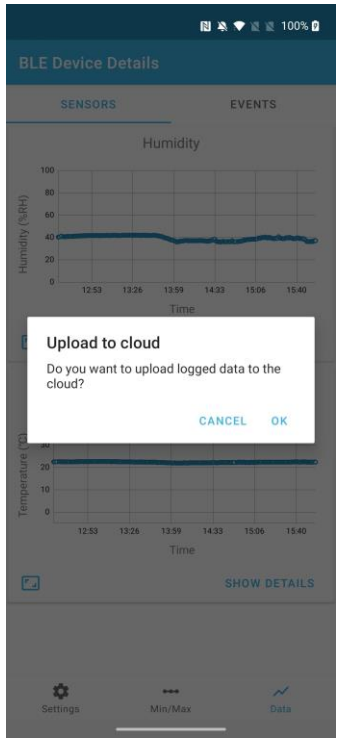
2. Data logging

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

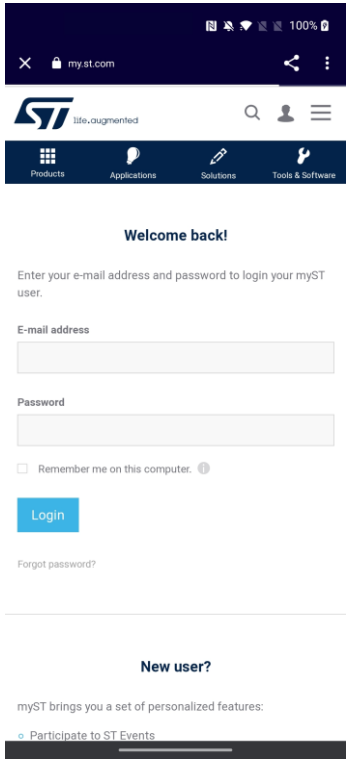


NFC devices
Upload data

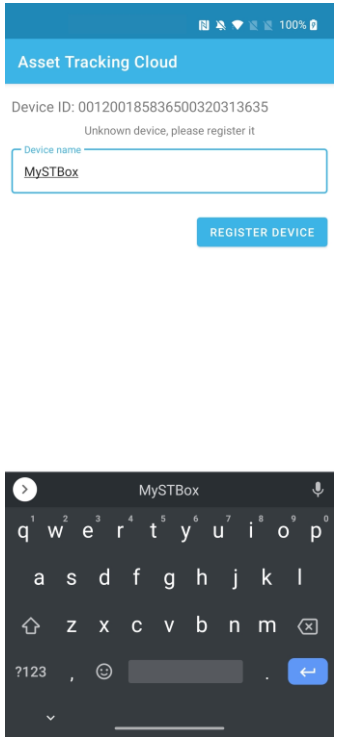
4. Upload telemetry data on cloud



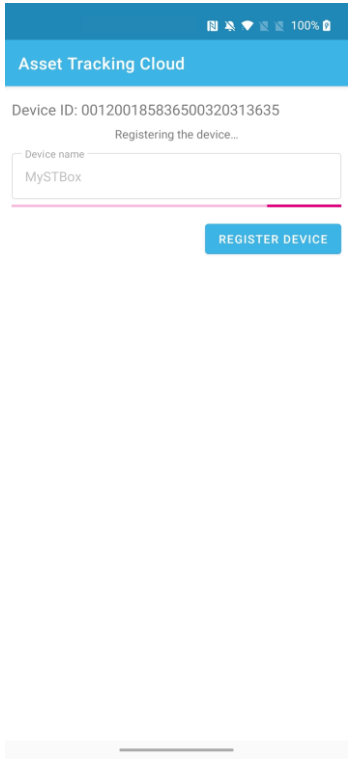
5. Login with your ST user account, if needed



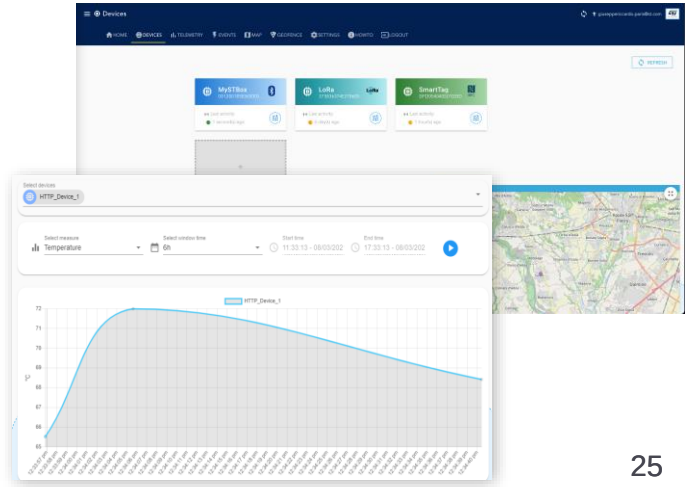
6. Provision the device, if needed



7. Device registration and data uploading



8. Check data on the asset tracking dashboard



SensorTile.Box

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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

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SensorTile.box Bluetooth tracking

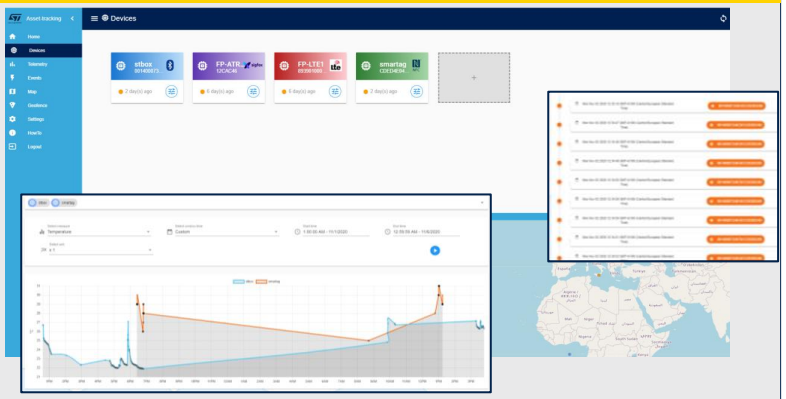
What is it

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 – Inclinometer
LIS2MDL – Magnetometer
MP23ABS1 – Analog Microphone

DSH-ASSETRACKING
Asset Tracking Dashboard



Ecosystem

Evaluation board: STEVAL-MKSBOX1V1
Function Pack: FP-ATR-BLE1
Mobile app: ST Asset Tracking
Cloud dashboard: DSH-ASSETRACKING

Download on the App Store
GET IT ON Google play

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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

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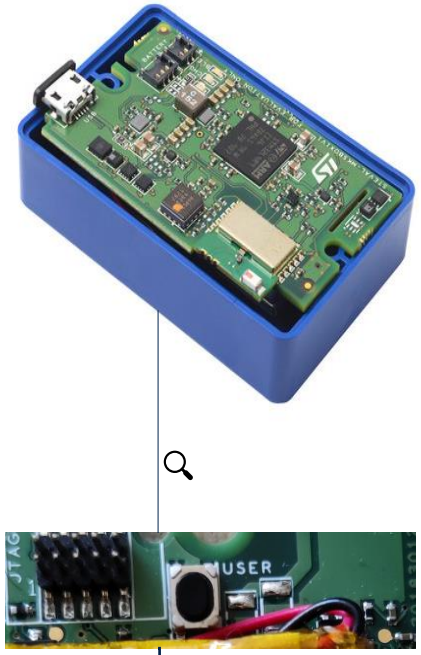
BLE device
Connection



- 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

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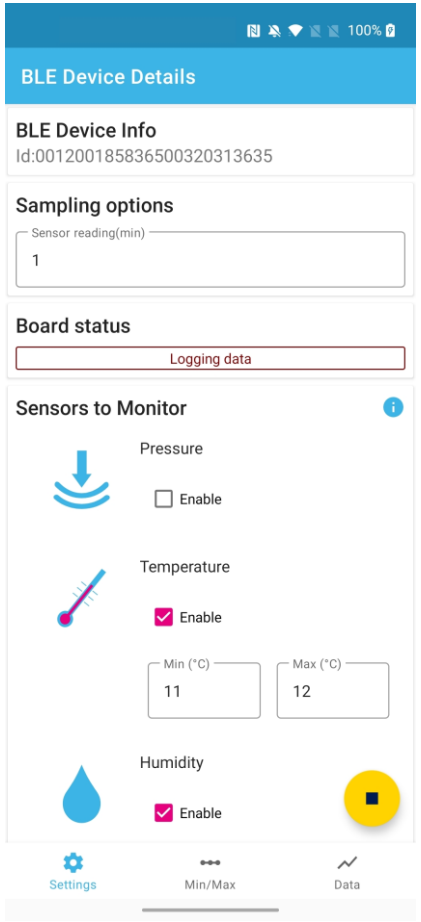
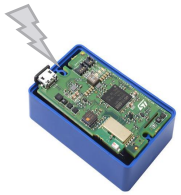
BLE device
Mobile app section

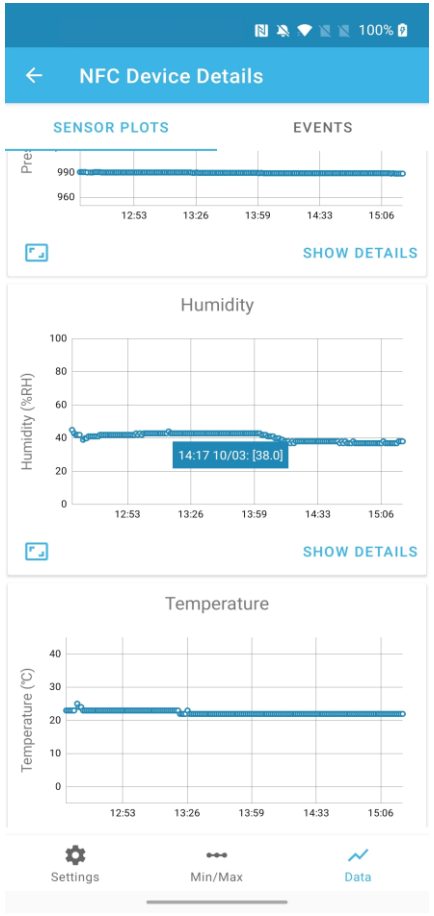
1. Configure device and start data logging via BLE



2. Data logging

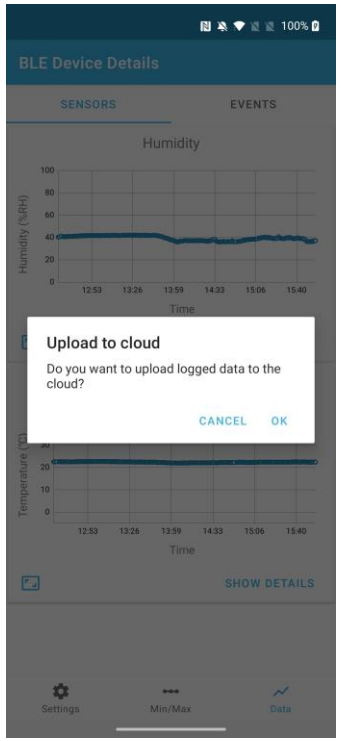


3. Stop logging via BLE and check telemetry data received

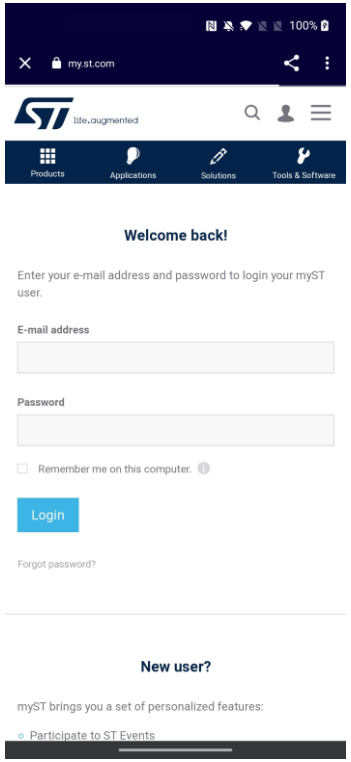


NFC devices
Upload data

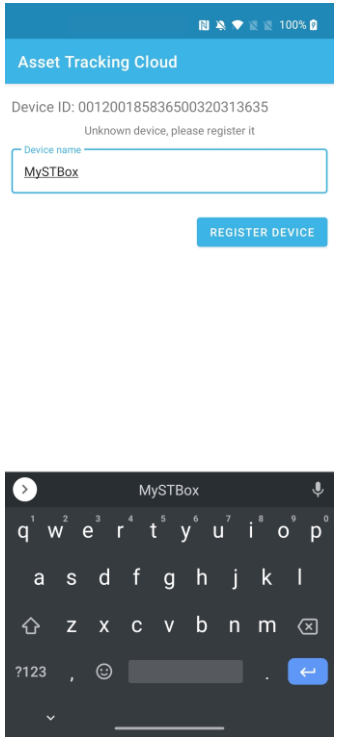
4. Upload the telemetry data on cloud



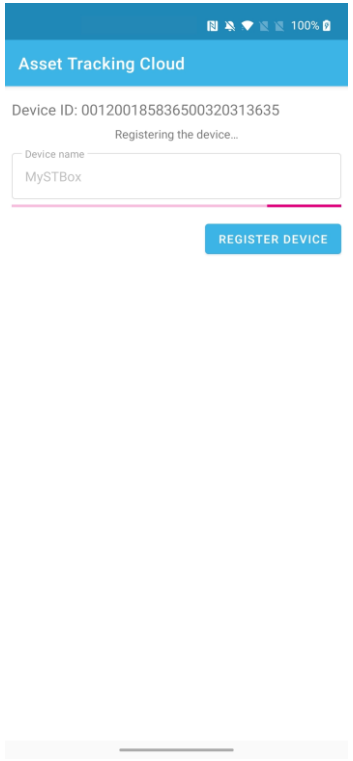
5. Login with your ST user account, if needed



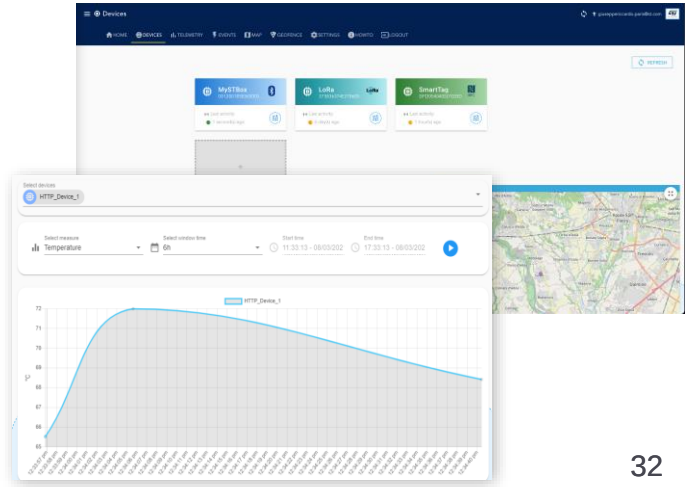
6. Provision the device, if needed



7. Device registration and data uploading



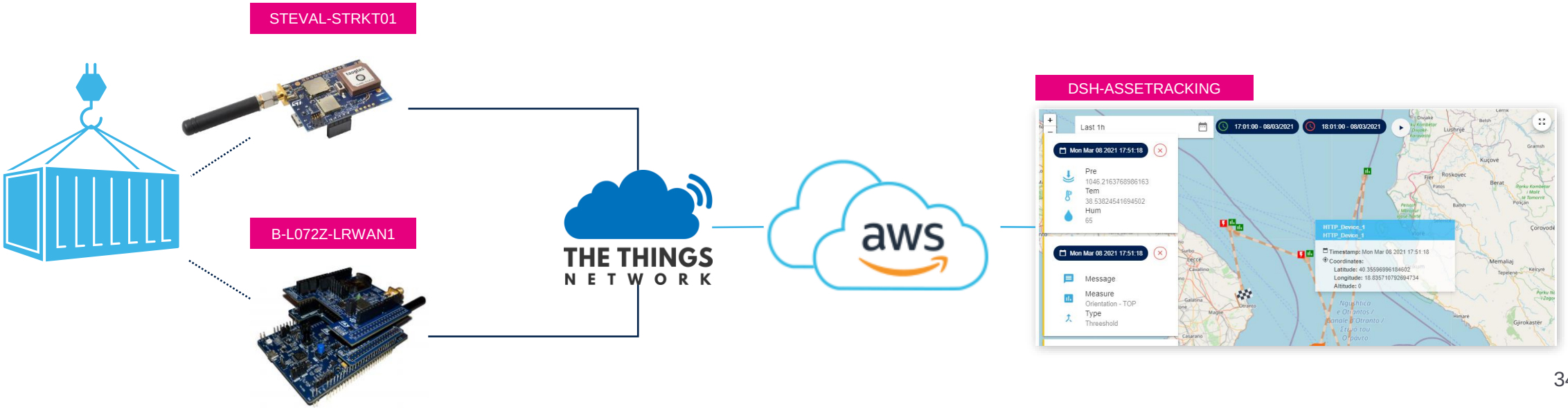
8. Check data on the asset tracking dashboard



STEVAL-STRKT01 (or equivalent)

LoRa device provisioning
Prerequisites

- **Dashboard**
  - Google Chrome or Mozilla Firefox
  - Browse dashboard at: https://dsh-assetracking.com
- **IoT node**
  - *Hardware*:
    - Integrated: STEVAL-STRKT01 — https://www.st.com/en/evaluation-tools/steval-strkt01.html
    - Nucleo-based: B-L072Z-LRWAN1 (+ X-NUCLEO-GNSS1A1, X-NUCLEO-IKS01A2) — https://www.st.com/en/evaluation-tools/b-l072z-lrwan1.html
  - *Software*
    - FP-ATR-LORA1 — https://www.st.com/en/embedded-software/fp-atr-lora1.html



LoRa device provisioning
Steps

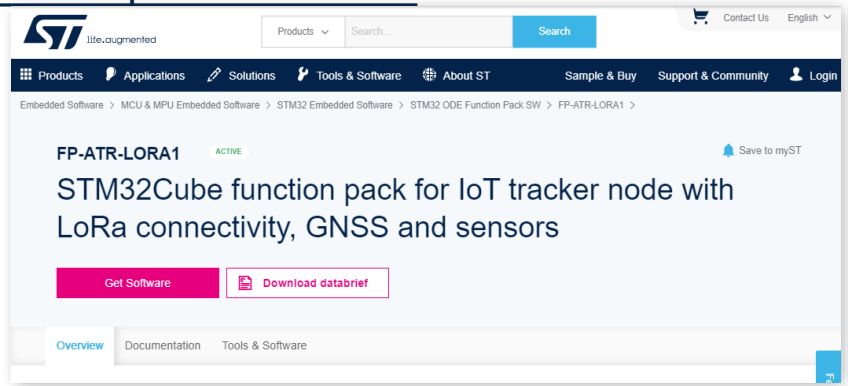
There are two ways of provisioning a LoRa device:

- 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

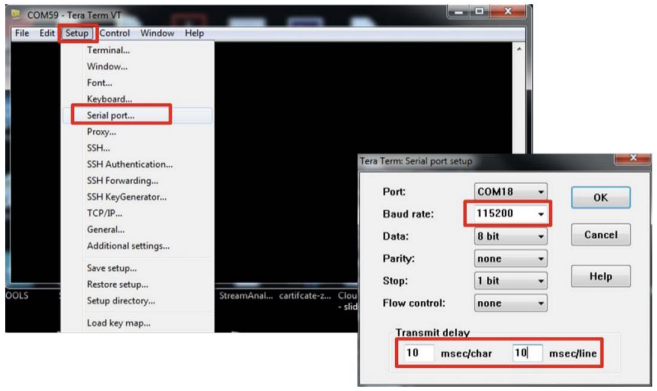
Note: For further information, see https://www.st.com/en/embedded-software/fp-atr-lora1.html#documentation

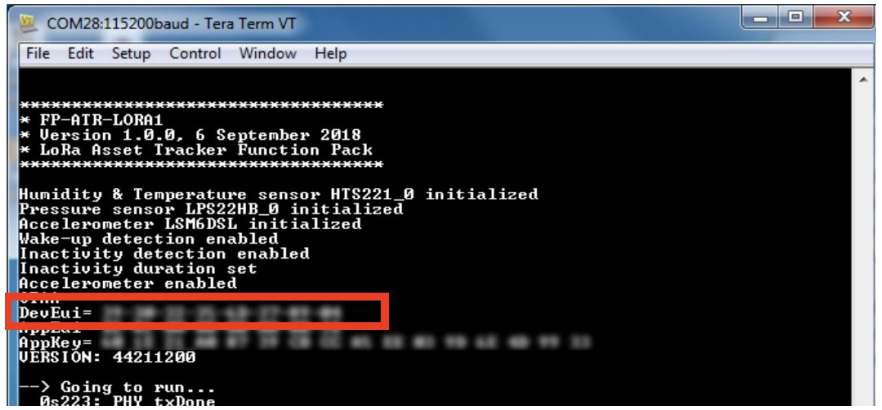
Get the device EUI

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



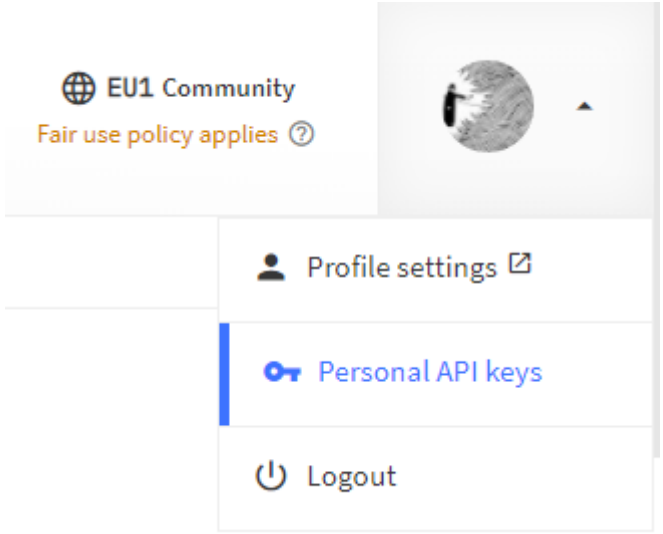
2. Connect the device to a PC via USB cable, and flash the firmware binary
3. Take note of the **device EUI** shown on the serial terminal

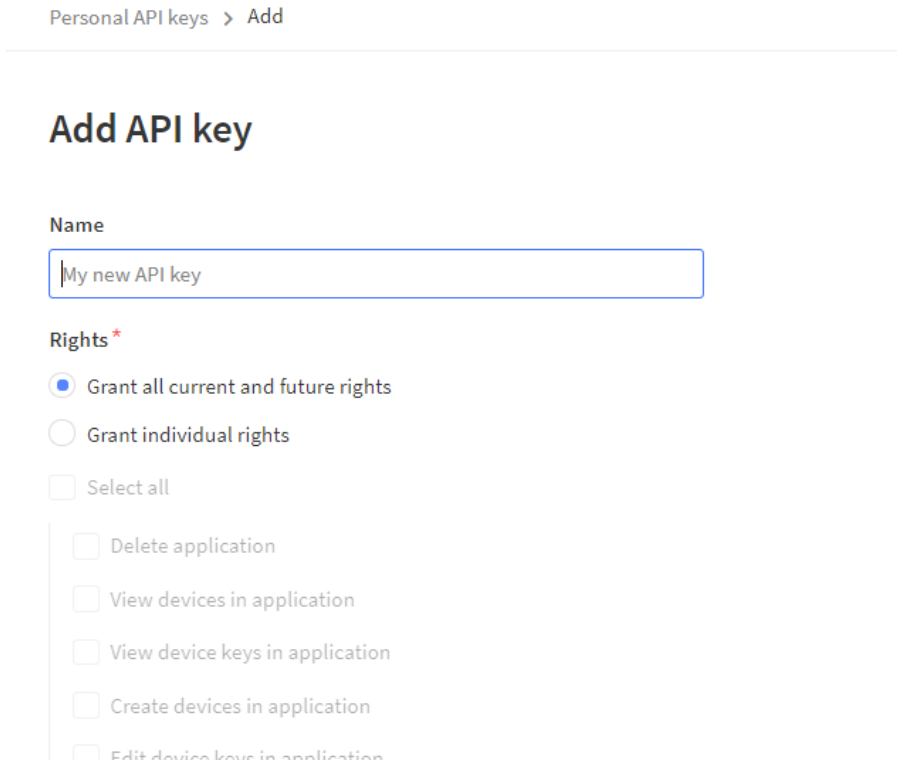




Setup of the TTN

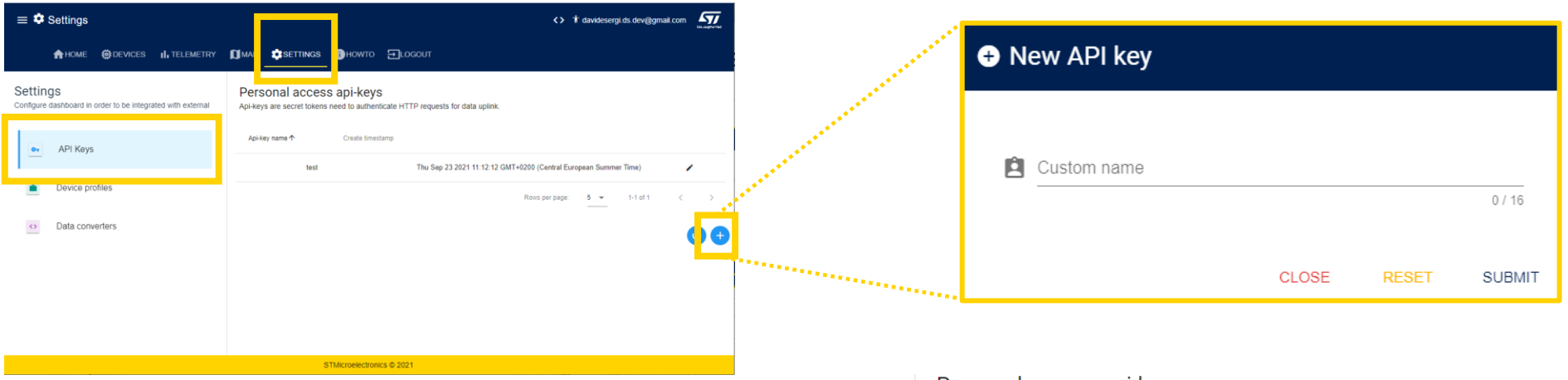
1. Create a console for the TTN user account at https://account.thethingsnetwork.org/users/login
2. Create a new TTN application Personal Api-Key with all the permissions needed



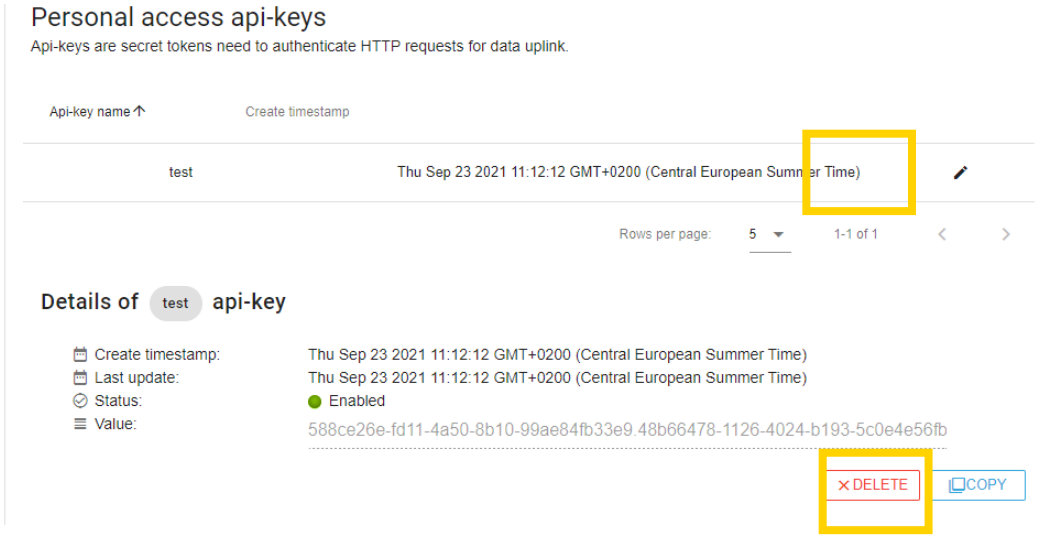


Configure the ST dashboard

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 **<u>api-key value</u>**

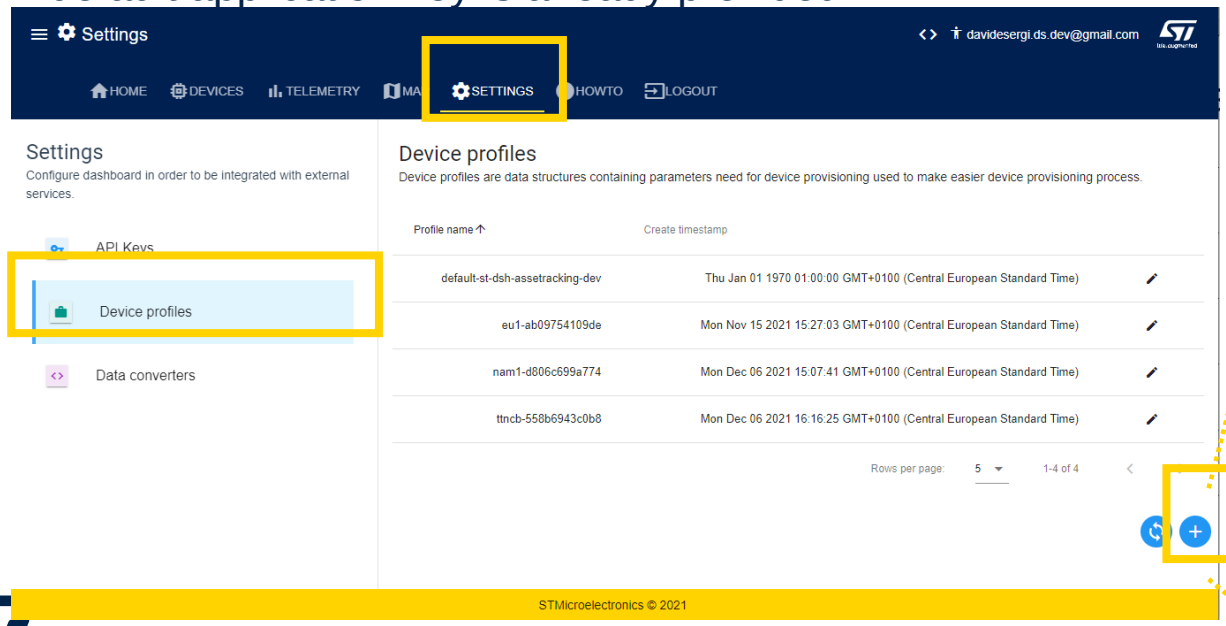


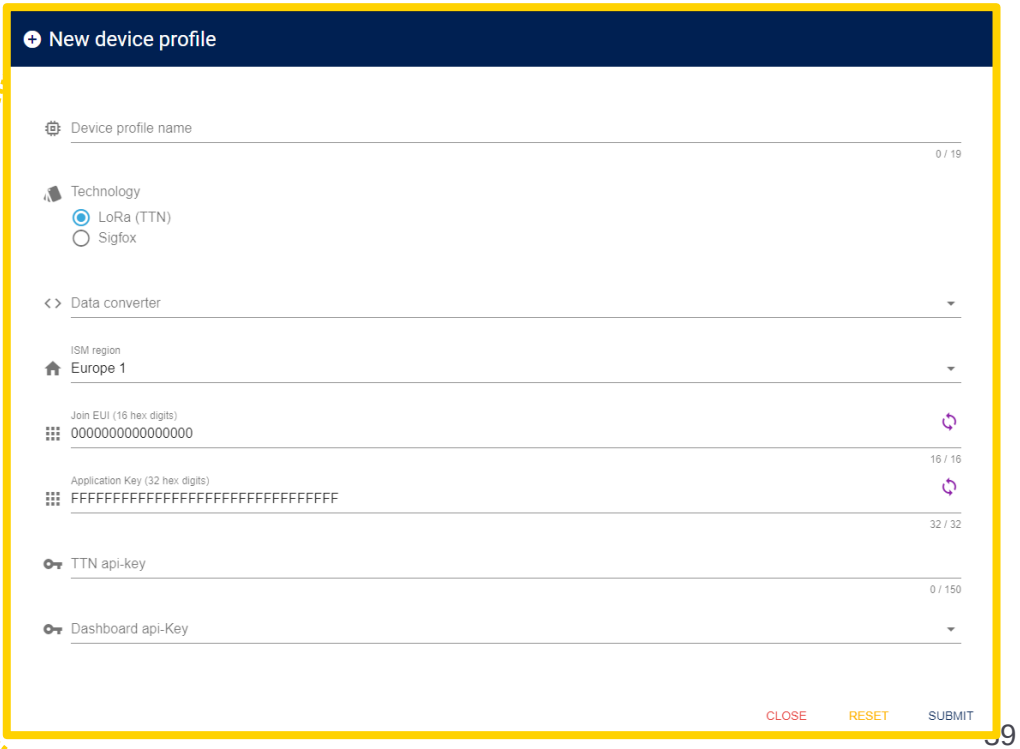
Create a TTN LoRa profile

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.

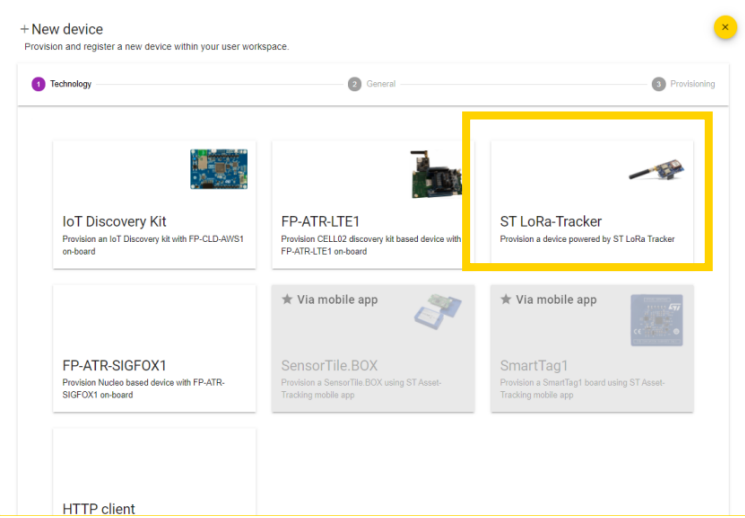


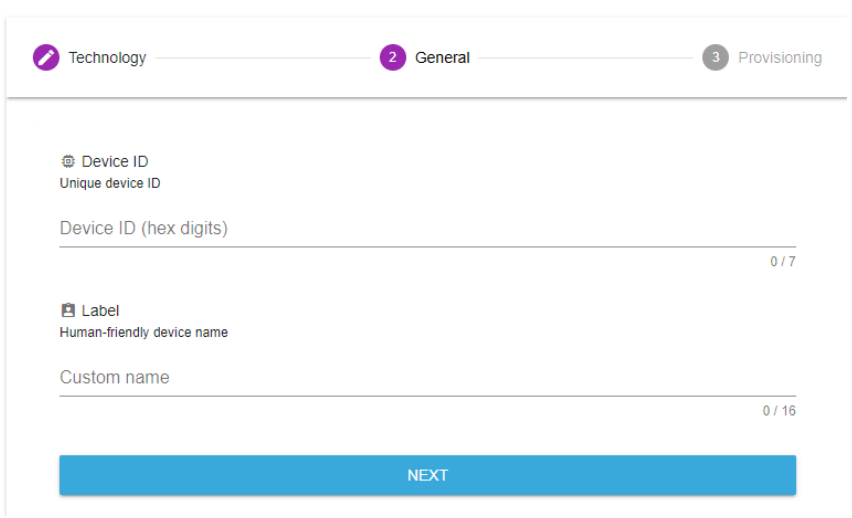


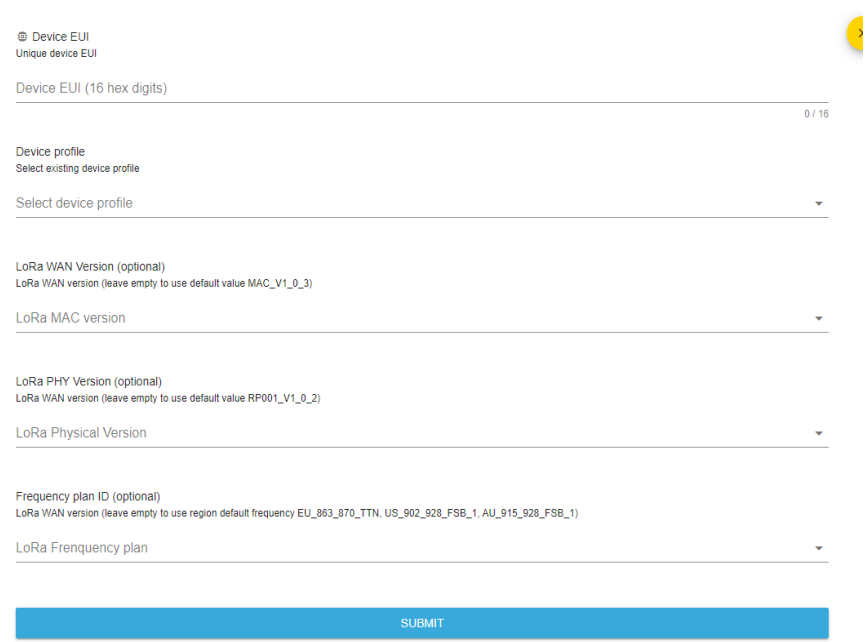
Register the device

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







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Configure the device

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

- Set the device eui (!deviceeui-xxxxxxxxxxxxxxx replacing the x characters with the device eui value)
- Set the join eui (!joineui-xxxxxxxxxxxxxxx , replacing the x characters with the join eui value)
- Set the network key (!ntwkkey-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx, replacing the x characters with the network key value)
- Set the application key (!appkey-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx, 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

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FP-ATR-SIGFOX1

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Sigfox device provisioning
Prerequisites

- **Dashboard**
  - Google Chrome or Mozilla Firefox
  - Browse dashboard at: https://dsh-assetracking.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

SPIRIT

BlueNRG

STM32

Teseo

sigfox

Sigfox Tracker for asset tracking

What is it

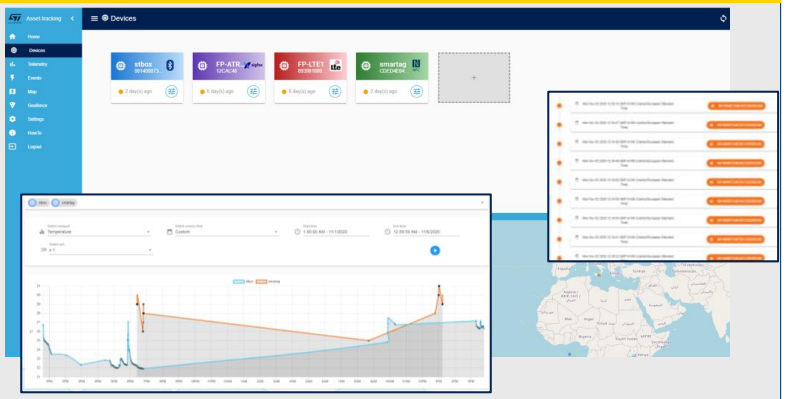
IoT tracker node with Sigfox connectivity and sensors

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

DSH-ASSETRACKING
Asset Tracking Dashboard



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-ASSETRACKING

Download on the App Store
GET IT ON Google play

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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

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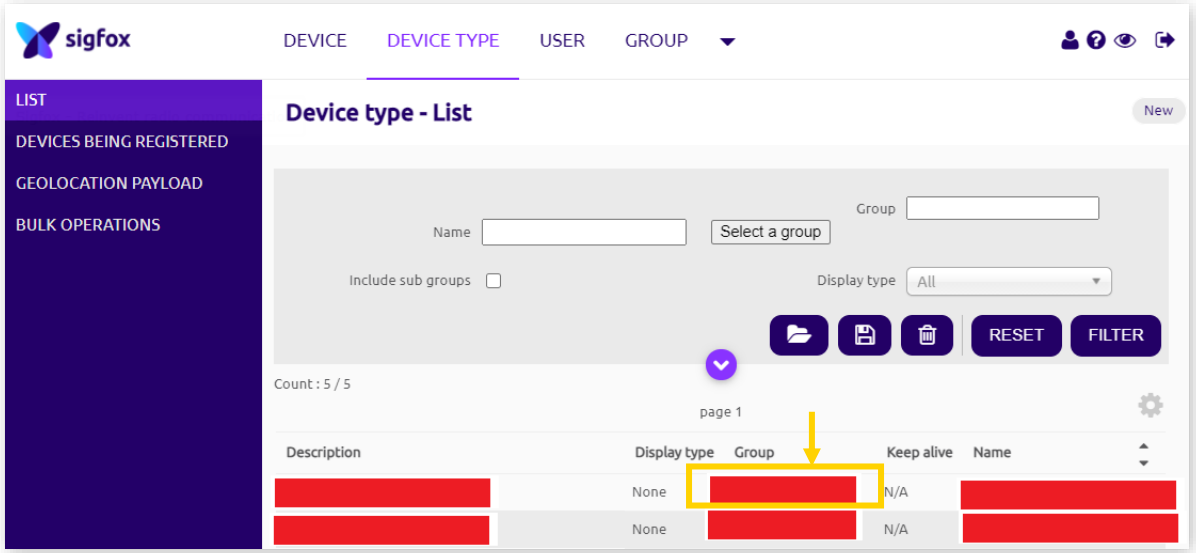
Device activation

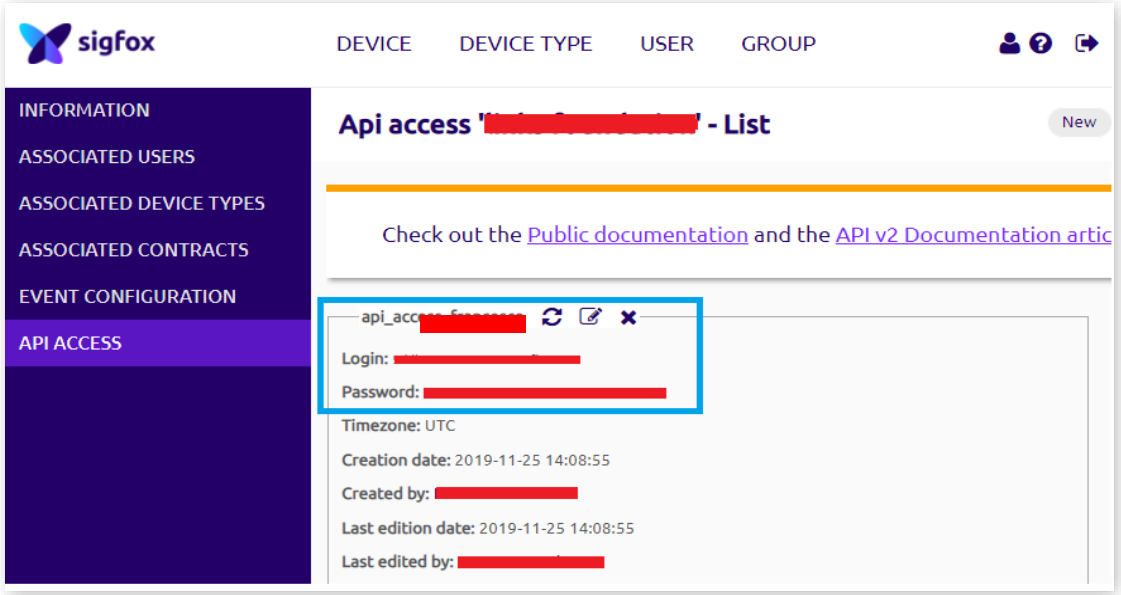
- As a preliminary step, it is necessary to register the Sigfox device.
- There are two steps: ST side registration and Sigfox side registration
- Follow the procedure described in UM2169 "Getting started with the Sigfox S2-LP kit"
- As an alternative, you can watch the following YouTube videos:
  - 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**





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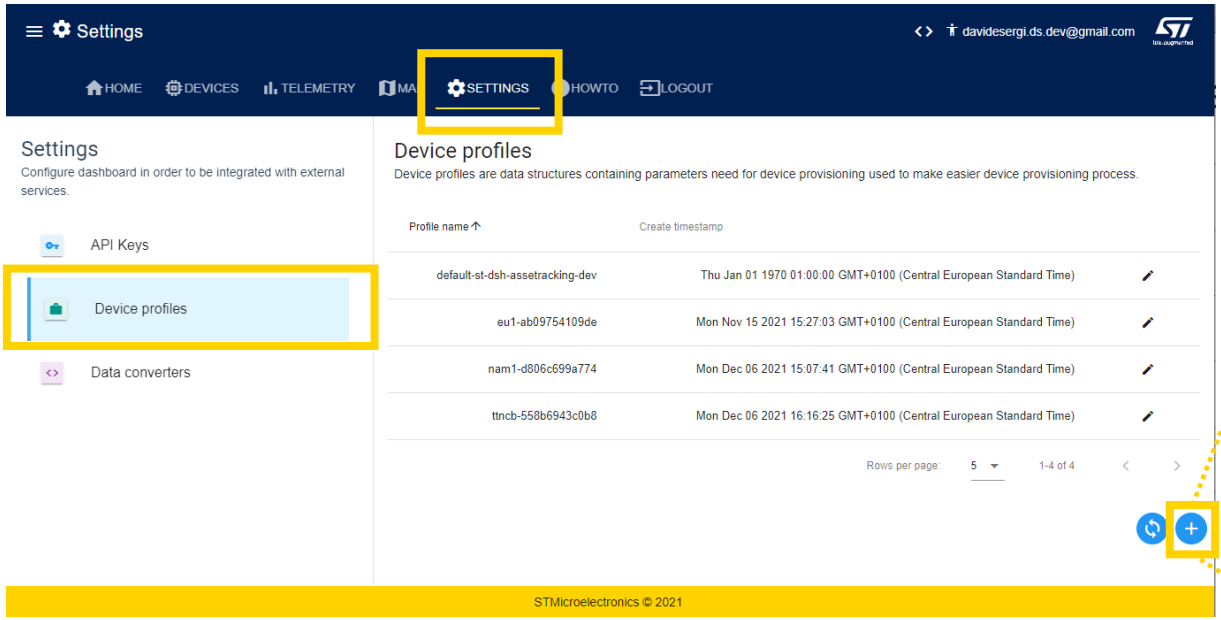
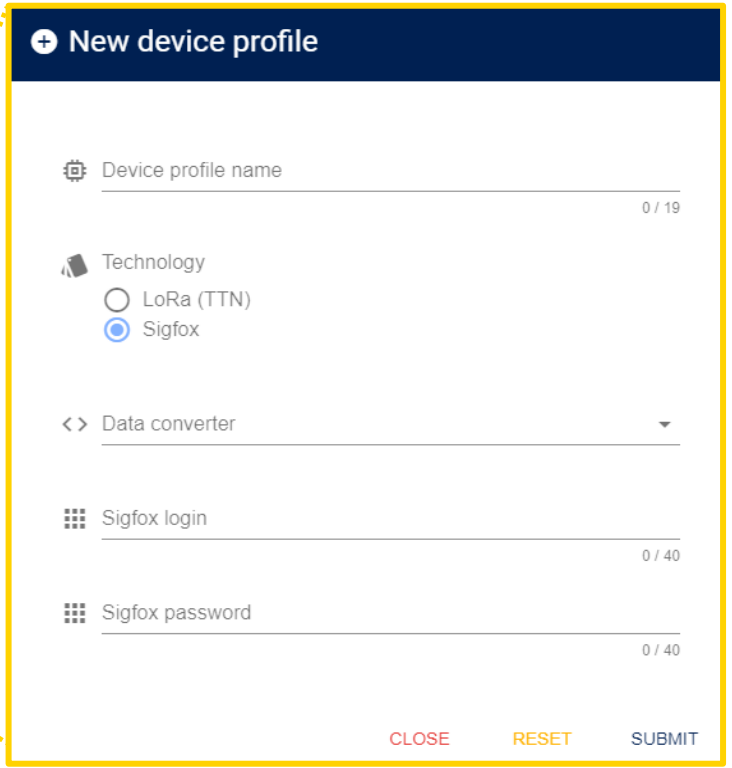
Configure the ST dashboard (1)

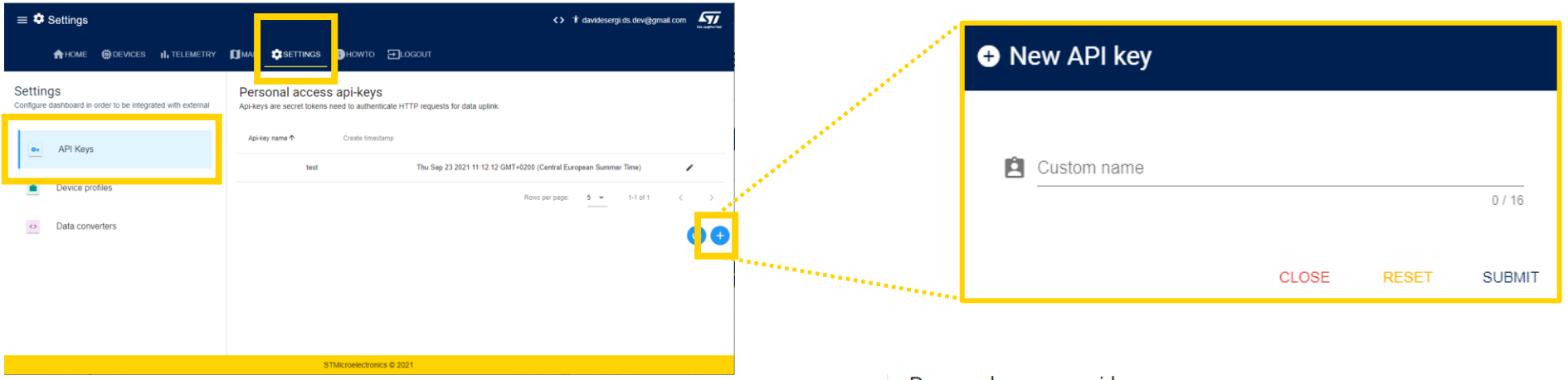
1. On the ST dashboard, select the **settings** view and create a new Sigfox device profile:
   - *Custom name* as a human-friendly label
   - *Sigfox* type
   - *Sigfox data converter*
   - API ACCESS *Login* and *Password* (previously created)



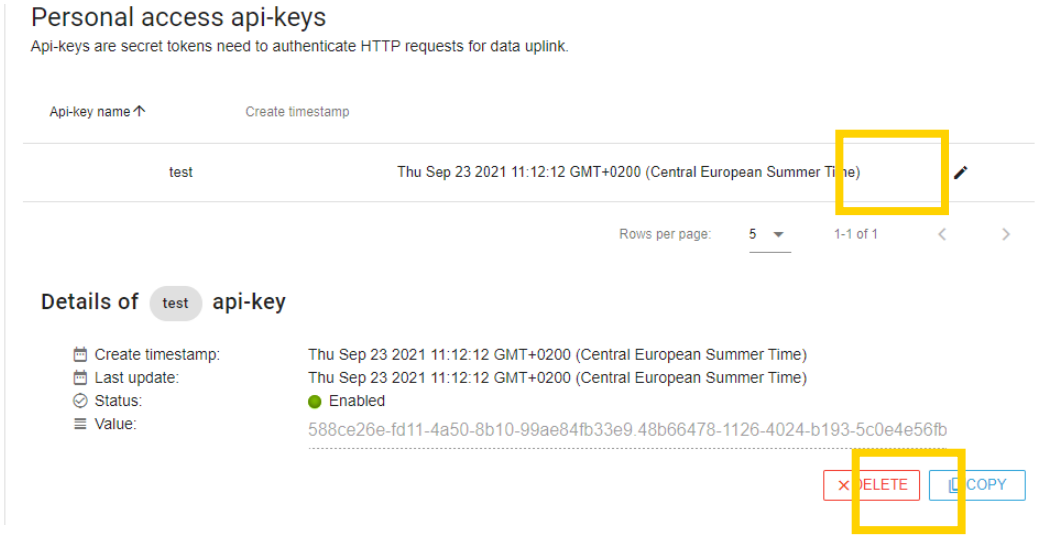


Configure the ST dashboard (2)

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



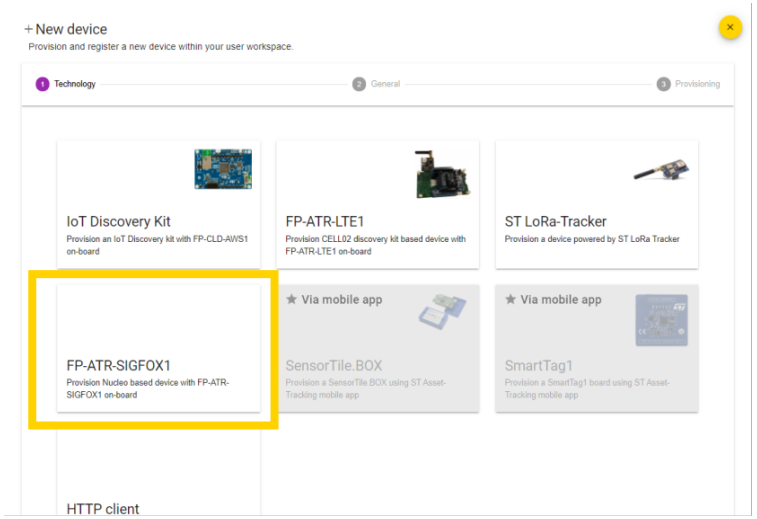
3. Refresh the api-key list and take note of the **<u>api-key value</u>**

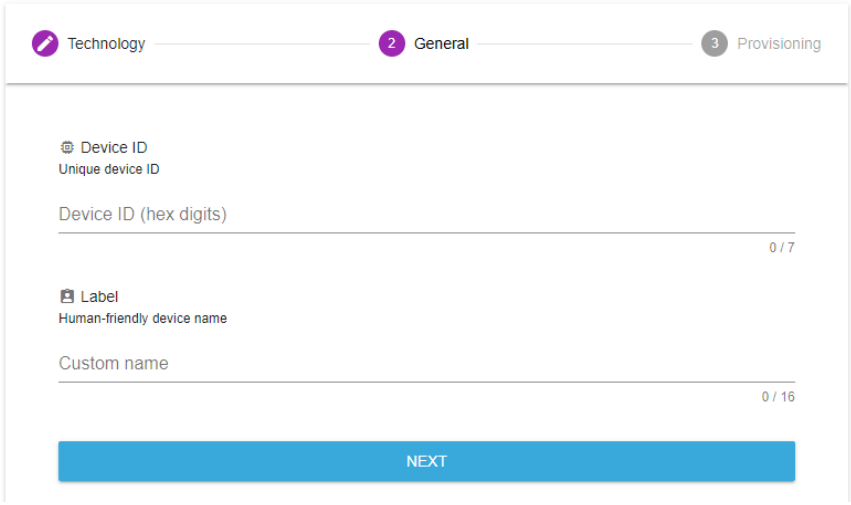


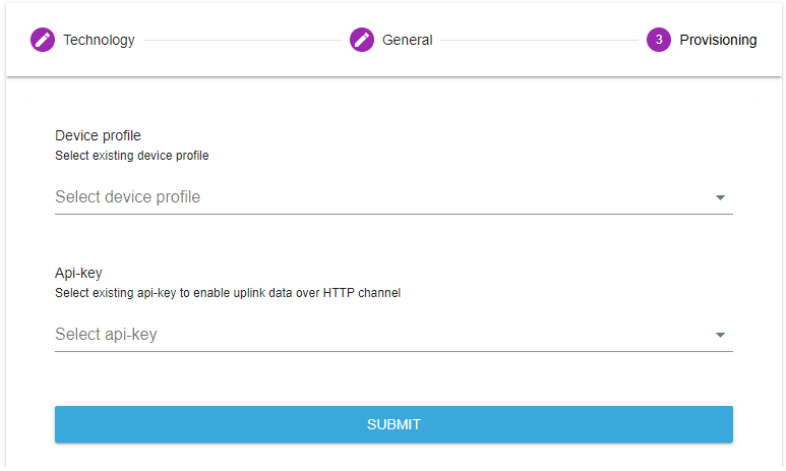
Register the device

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)







FP-ATR-LTE1

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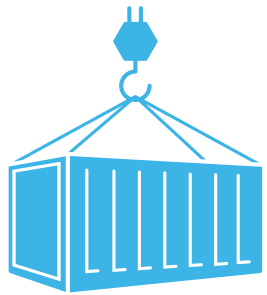
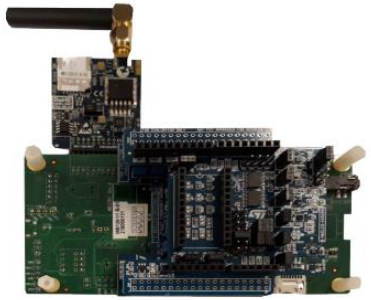
LTE device provisioning
Prerequisites

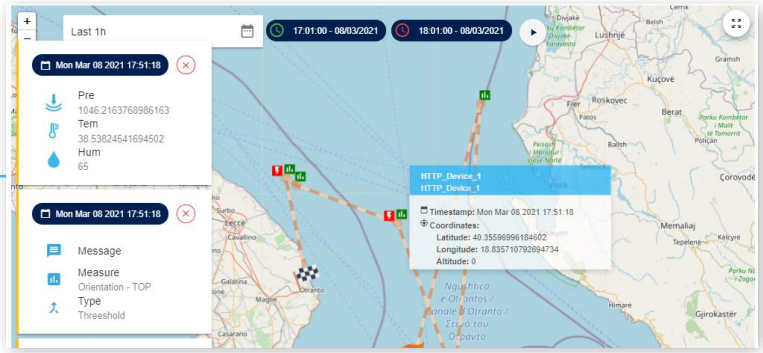
- **Dashboard**
  - Google Chrome or Mozilla Firefox
  - Browse dashboard at: https://dsh-assetracking.com
- **IoT node**
  - *Hardware*:
    - STM32 Nucleo-based: PL496G-CELL02 (+ X-NUCLEO-IKS01A3, X-NUCLEO-GNSS1A1) https://www.st.com/en/evaluation-tools/p-l496g-cell02.html
  - *Software*
    - FP-ATR-LTE1 https://www.st.com/en/embedded-software/fp-atr-lte1.html



PL496G-CELL02



DSH-ASSETRACKING



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LTE device provisioning
Steps

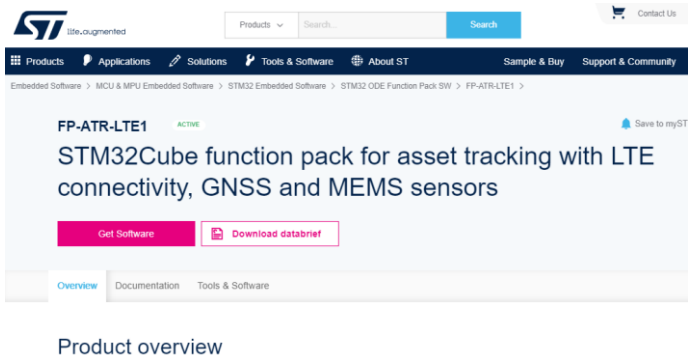
Follow these steps for the LTE device provisioning:

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

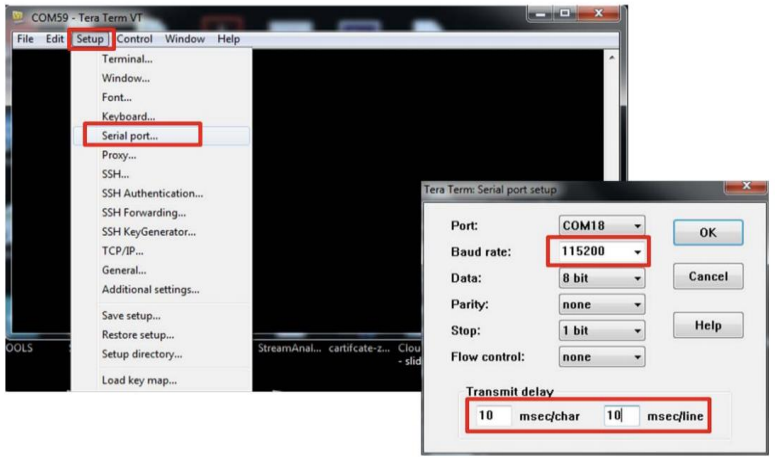
Note: For further info, see https://www.st.com/en/embedded-software/fp-atr-lte1.html#documentation

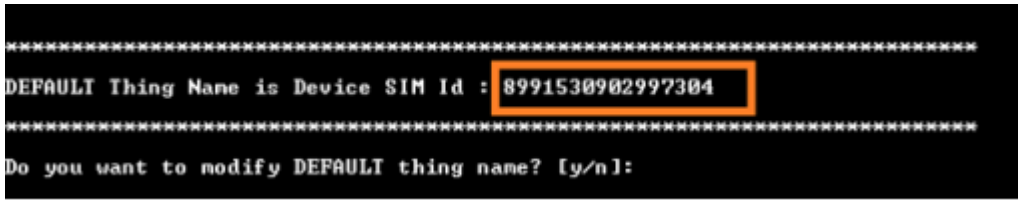
Get the device ID

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



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

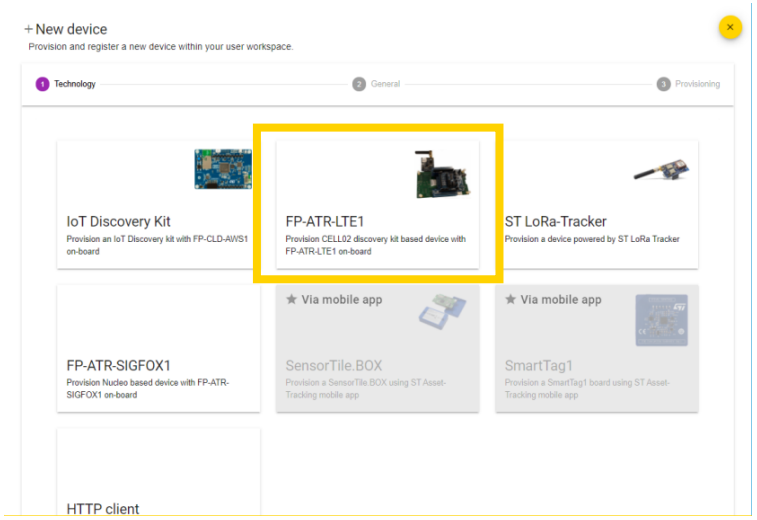


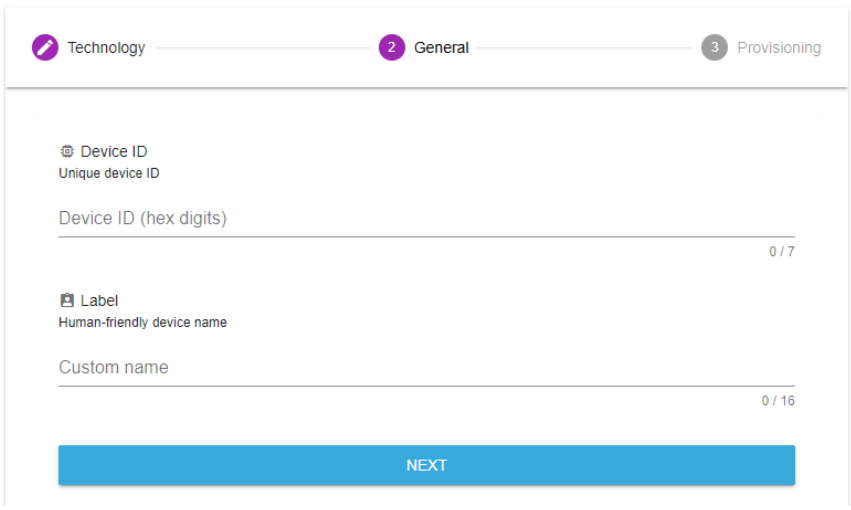


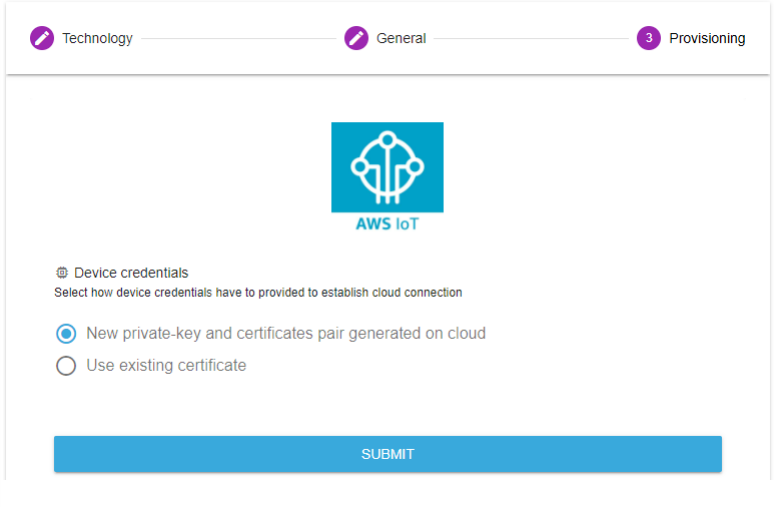
Register the device

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

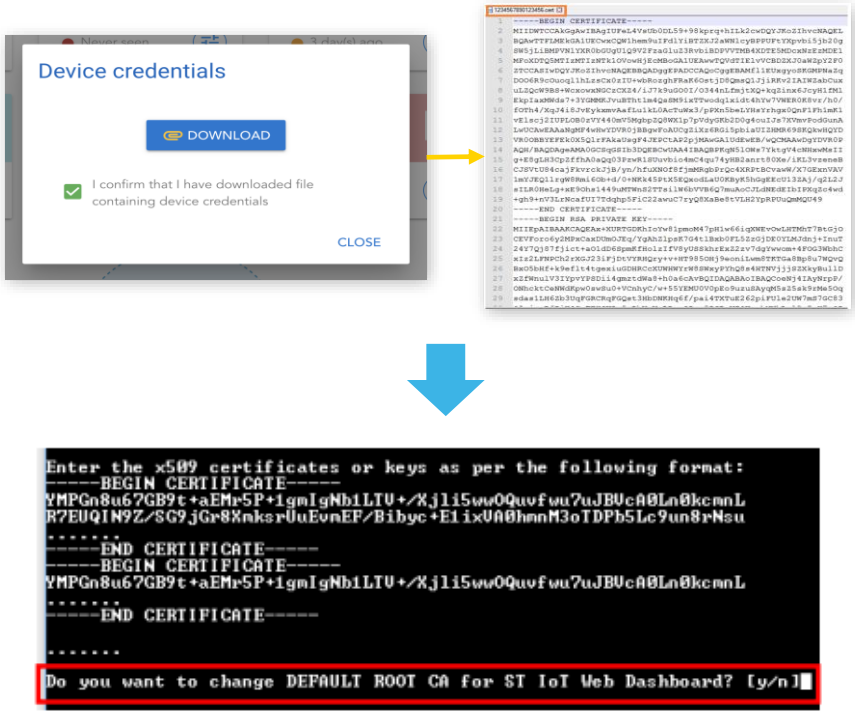


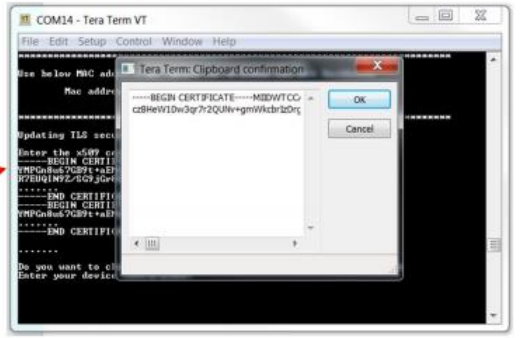


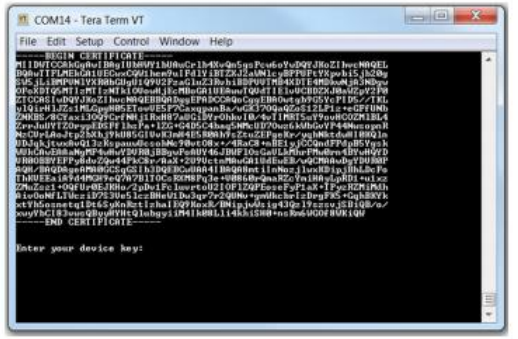


Configure the device

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

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Wi-Fi device provisioning
Prerequisites

- **Dashboard**
  - Google Chrome or Mozilla Firefox
  - Browse the dashboard at: https://dsh-assetracking.com
- **IoT node**
  - *Hardware*:
    - B-L4S5I-IOT01A — https://www.st.com/en/evaluation-tools/b-l4s5i-iot01a.html
    - STEVAL-STWINKIT1(B) — http://www.st.com/stwin
  - *Software*
    - FP-CLD-AWS1 v3 — https://www.st.com/en/embedded-software/fp-cld-aws1.html

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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

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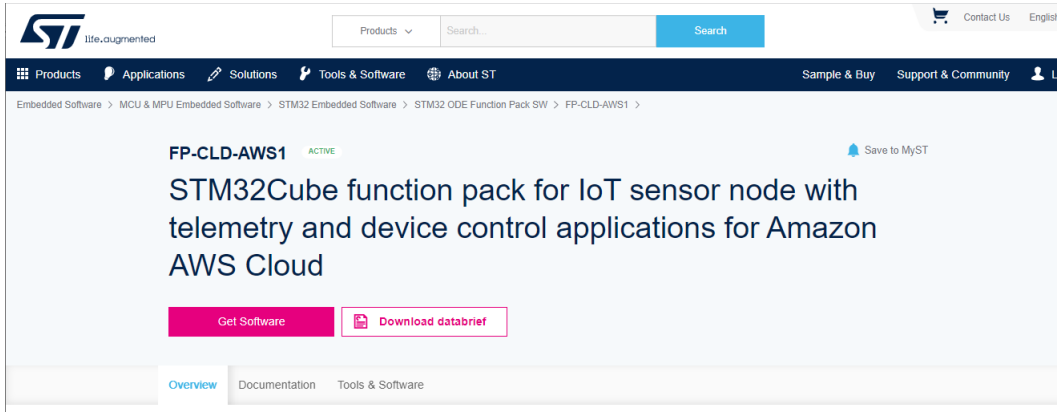
Flash the device

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

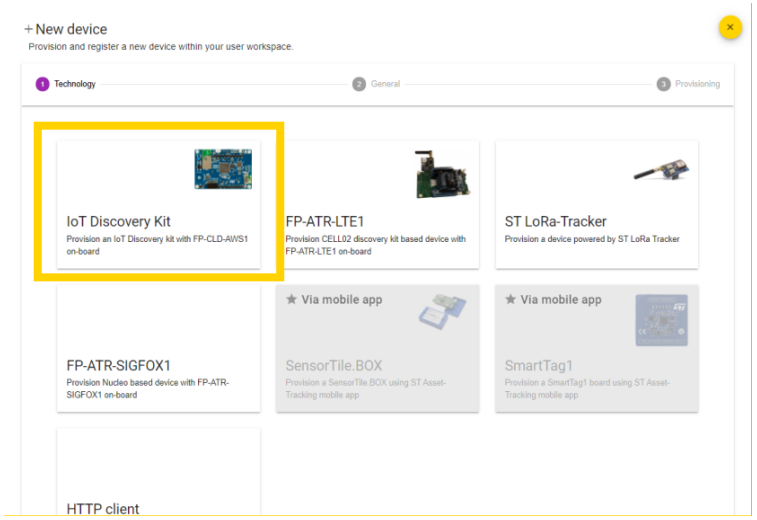


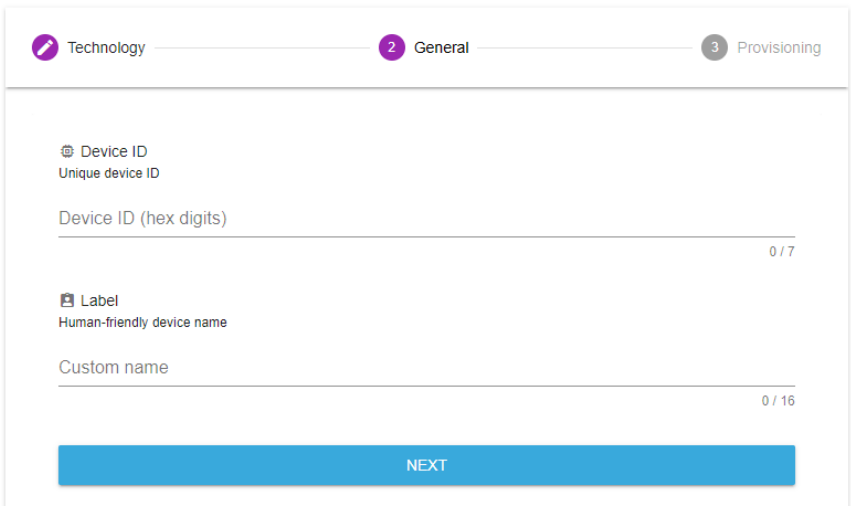
2. Follow the guide at https://www.st.com/en/embedded-software/fp-cld-aws1.html#documentation to flash the device according to the board used (B-L4S5I-IOT01A, STEVAL-STWINKIT1(B))

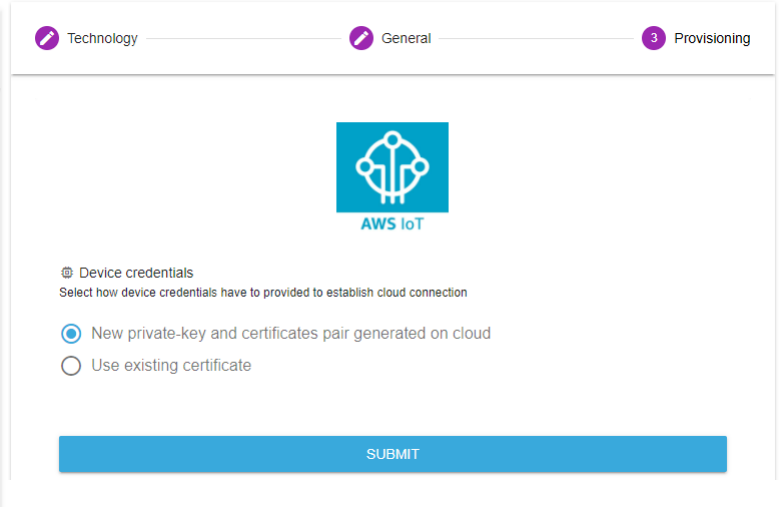
Register the device

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







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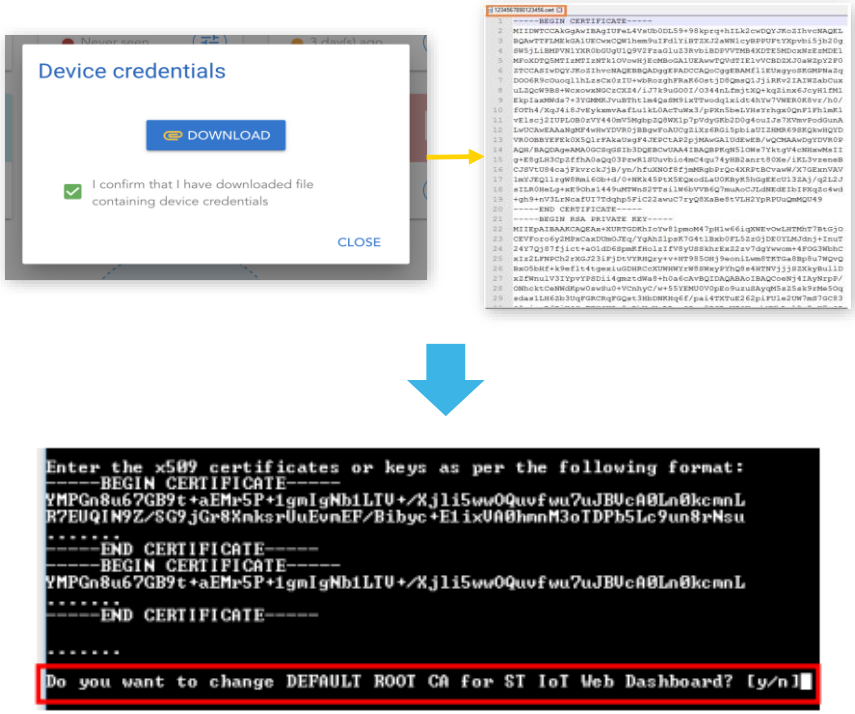
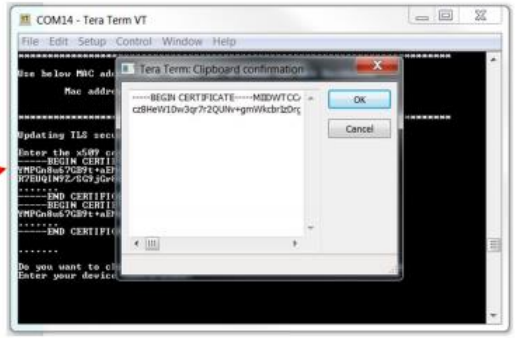
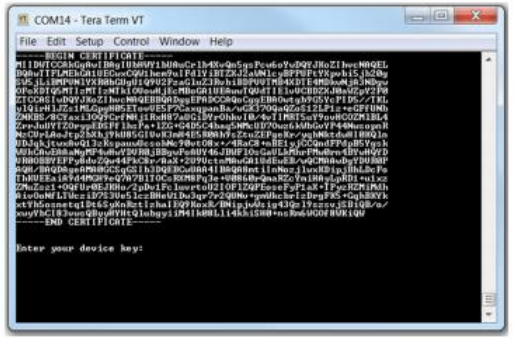
Configure the device

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



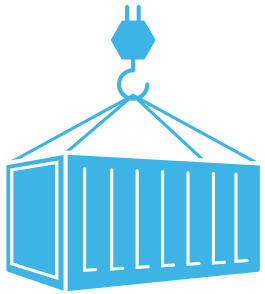




Generic HTTP device

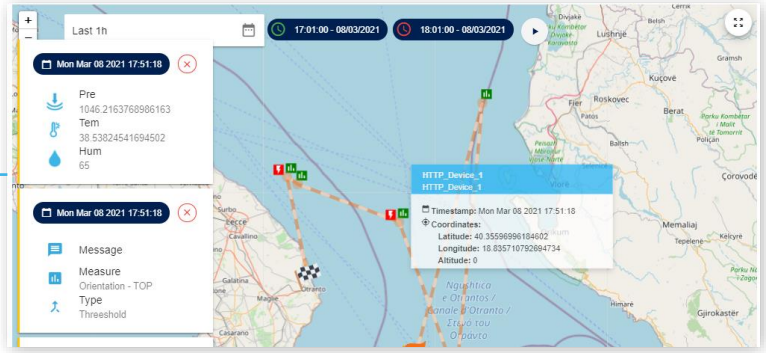
HTTP device provisioning
Prerequisites

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



HTTP
Client device

DSH-ASSETRACKING



Wi-Fi device provisioning
Steps

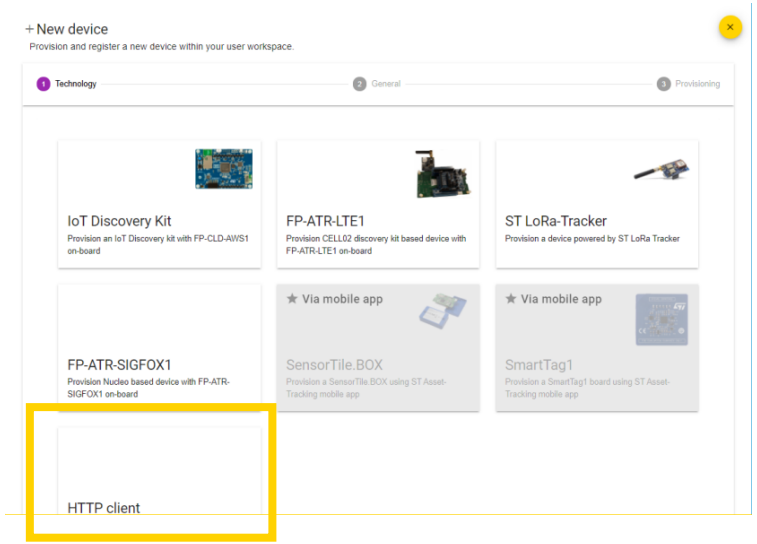
Follow these steps for the Wi-Fi device provisioning:

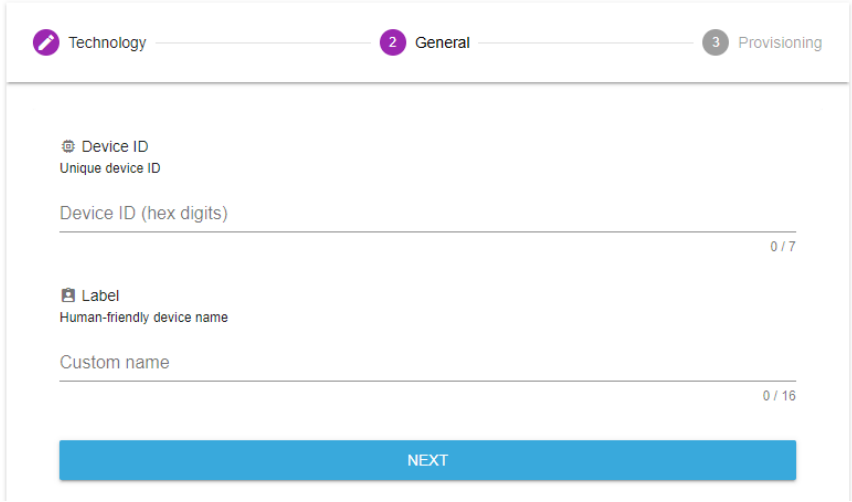
1. Register the device
2. Create the api-key
3. Send the data

Register the device

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

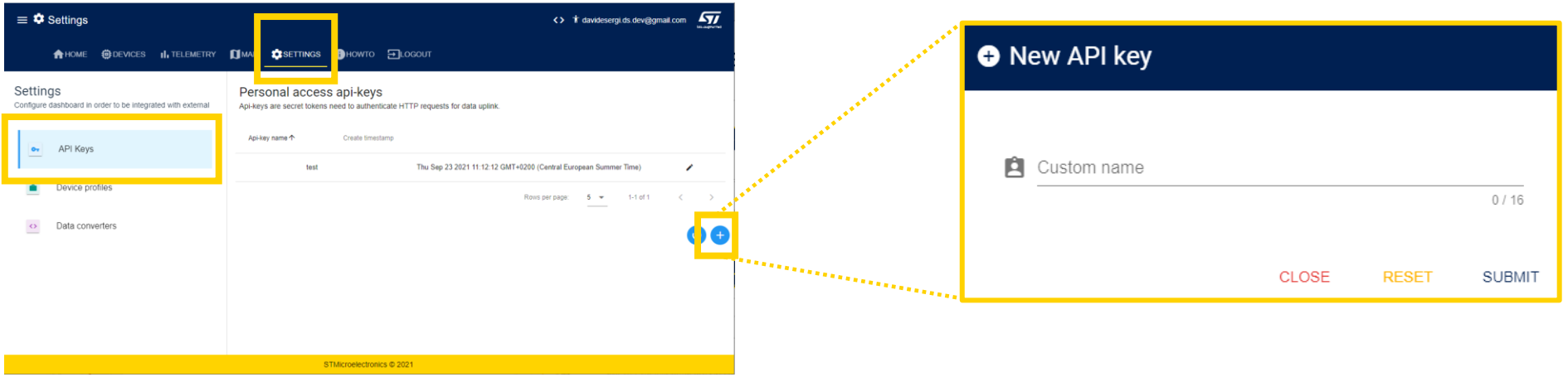
- *Custom name* as a human-friendly label
- *Device ID*



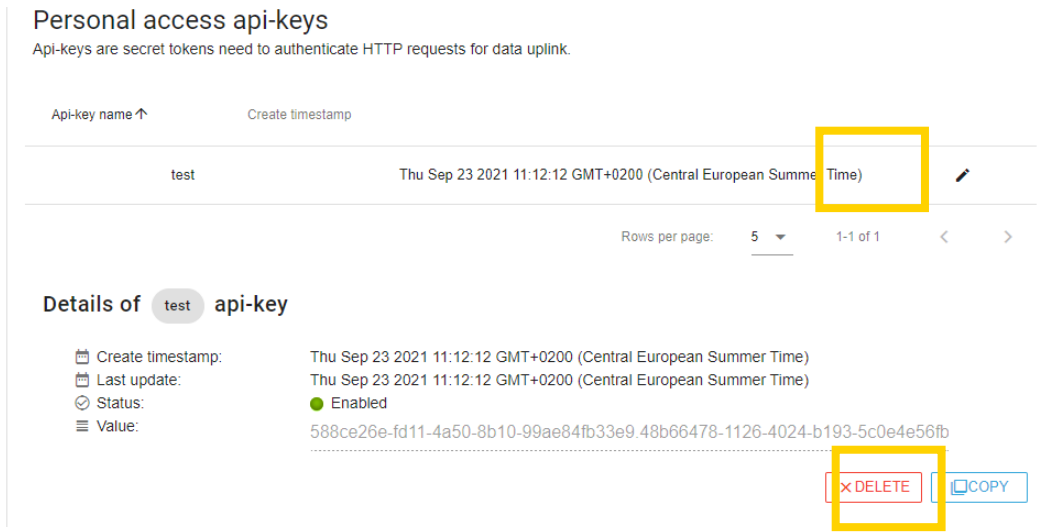


Configure the ST dashboard

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 **<u>api-key value</u>**



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 →

IoT Protocol
- Up stream message -

```
{
  "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>"
                                                "msg":"<event gui message>"
                                }
                }
  ]
}
```

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Thank you

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