# Manual for Sigfox sensors - Common parts

# What is Sigfox?

Understanding the Sigfox Connectivity Technologies.

Please find **this link** for understanding Sigfox Connectivity Technologies.

# Troubleshooting for Sigfox Communication

This is the troubleshooting for Sigfox communication of Sigfox-ready sensors with FW versions listed below:

| No. | Phenomena | Reason | Solutions |
|---|---|---|---|
| 1 | Node does not send RF to the base station periodically, LED does not blink | • No power supply or battery ran out<br>• The configuration sending cycle is incorrect | • Check that each battery is empty OR not installed correctly<br>• Check the power supply<br>• Check the send cycle configuration |
| 2 | Node does not send RF to the base station according to the alarm, LED does not blink | • The alarm threshold values are incorrect and/or disabled alarm function<br>• Running out of the number of alarms set for the day | • Check alarm threshold values and alarm enable<br>• Check the configuration for the maximum number of alarms per day |
| 3 | Node does not send RF to the base station when activated by the magnetic switch, LED does not blink | • The magnetic switch has malfunctioned<br>• Or place the Magnet key in not right position | • Locate the correct position for the magnet key<br>• Read the status of the magnetic switch via Modbus (when powering or attaching the battery) to see if the magnetic switch is working. |
| 4 | Node has blinked LED when sending RF but the base station cannot receive | • Out of the number of RF packages of uplink per day (max 140 packages/day) | • Check on the base station whether the event message exceeds the number of RF packets |
| 5 | Node has sent RF but the LED does not blink | • LED malfunction | • Contact manufacturer |
| 6 | The node does not send RF and the RF module is hot | • Insert the battery in the wrong direction<br>• Electronics got problem | • Check battery polarity |
| 7 | RSSI is weak and often loses data | • Distance between Node and Base station is far or there are many obstructions<br>• Connection to Antenna problem | • Check the location of the Sigfox node and distance to the base station<br>• Check the antenna connector in the PCB |
| 8 | The measurement values from the sensor do not change and keep constant values for a long time | • Sensor got failure<br>• Sensor cable broken<br>• The sensor connector is not connected firmly | • Check sensor cable and connector<br>• If the issue still exists, please contact the manufacturer for a warranty or replace the new sensor |

# Offline configuration for Sigfox Sensors

## THIS IS **OBSOLETE** MANUAL

**Please access https://www.iot.daviteq.com/wireless-sensors for updated manual**

Instructions for offline configuration of the Daviteq Sigfox-Ready sensors. Please follow the following steps.

**Note: THE SENSOR IS ONLY ACTIVE FOR CONFIGURATION IN THE FIRST 60 SINCE POWER UP BY BATTERY OR PLUGGING THE CONFIGURATION CABLE.**

# 1. Prepare equipment and tools

The following items must be prepared for configuration.

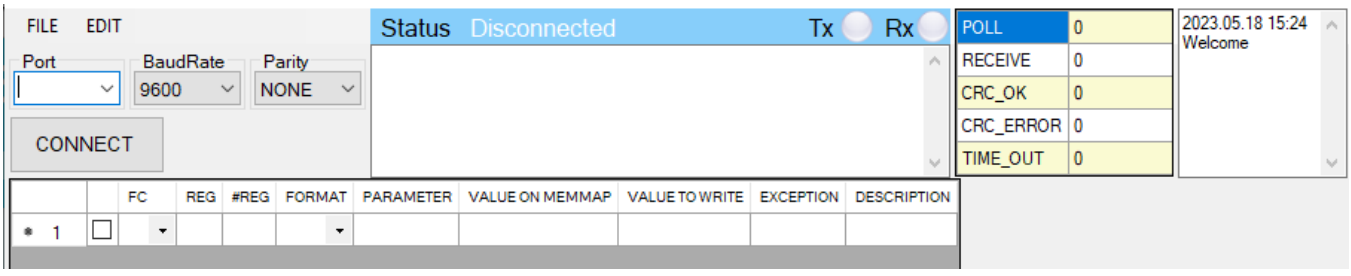
1. A PC using the Windows OS (Win7 or above versions). The PC is installed with the COM port driver of the Modbus configuration cable (if needed). The driver is at link: **Modbus Configuration Cable COM port driver for PC** and the instruction to install the driver at link: **How to install the driver**
2. A Modbus configuration cable;
3. Tools to open the housing of Sigfox-ready sensors (L hex key or screwdriver)

# 2. Download and launch Daviteq Modbus configuration software

- Click the link below to download Daviteq Modbus configuration software:

**https://filerun.daviteq.com/wl/?id=yDOjE5d6kqFIGNVVlMdFg19Aad6aw0Hs**

- After downloading the software, unzip the file named: **Daviteq Modbus Configuration Tool.zip** and then copy the extracted folder to the storage drive for long-term use.
- Open the folder, double click on the file **Daviteq Modbus Configuration Tool Version.exe** to launch the software and the software interface as below:




**Note:** The software only runs on Microsoft Windows OS (win7 and above).

# 3. Connect the cable and configure the sensor

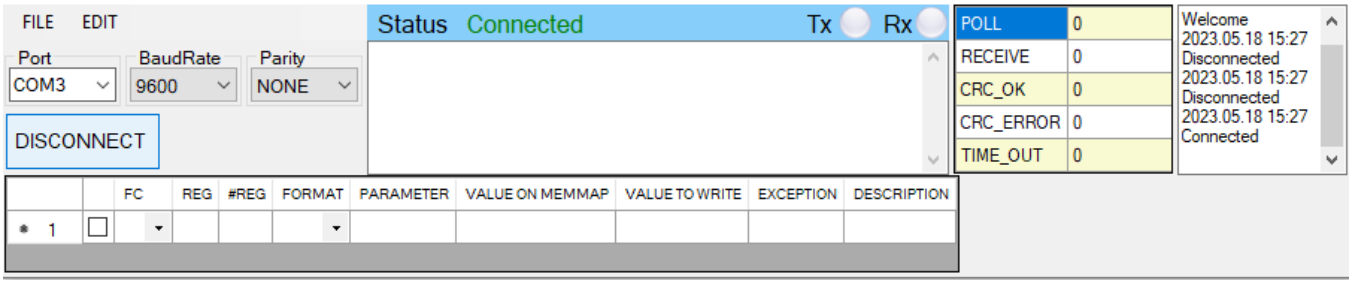
**Step 1:** Connect USB plug of Modbus configuration cable to USB socket of the PC


- Use the configuration cable (Item code: TTL-LRW-USB-01).

- Connect the USB-A plug into the USB-A socket of the PC

**Step 2:** On the configuration software, choose the relevant **Port** (the USB port which is the cable plugged in) and set the **BaudRate: 9600, Parity: none**

**Step 3:** Click the " **Connect** " button to connect the software to the sensor. After a successful connection, the **connected status**(green text) will show on the software.



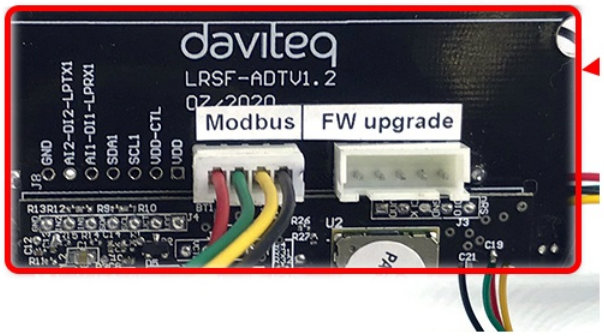

**Step 4:** Import the configuration file for the sensor to the software: click menu**File/ Import New** and then browse the relevant sensor template file (csv file) and click **Open** to import the template file.

⚠ Each sensor type has its own template file. Refer to the sensor's manual to download the correct file.

⚠ The sensor is only active for configuration for 60 seconds since plugging the configuration cable or the power supply into the sensor.

**Step 5:** Open the housing of the sensor and quickly plug the connector of the configuration cable into sensor's modbus configuration port. After plugging the connector, the software will read the parameter values automatically.


- Open the housing of the sensor.

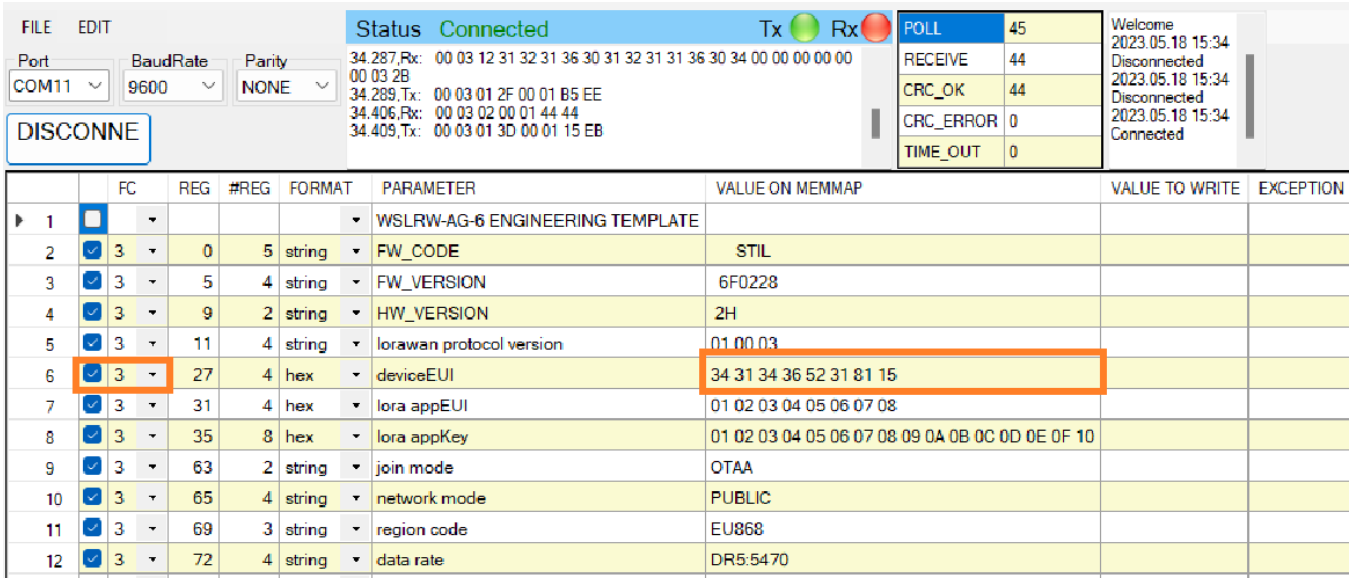



- Plug the cable connector into sensor's modbus configuration port.
Note: this port is located at a different location, depends on the sensor type

> ⚠ The sensor is only active for configuration for 60 seconds since plugging the configuration cable or the power supply into the sensor.

**Step 6:** Read the current value of the parameter with function 3

- At the relevant row of the parameter, check box **3** on column **FC** to read the value of the parameter. The read value is shown on **VALUE ON MEMMAP** column.

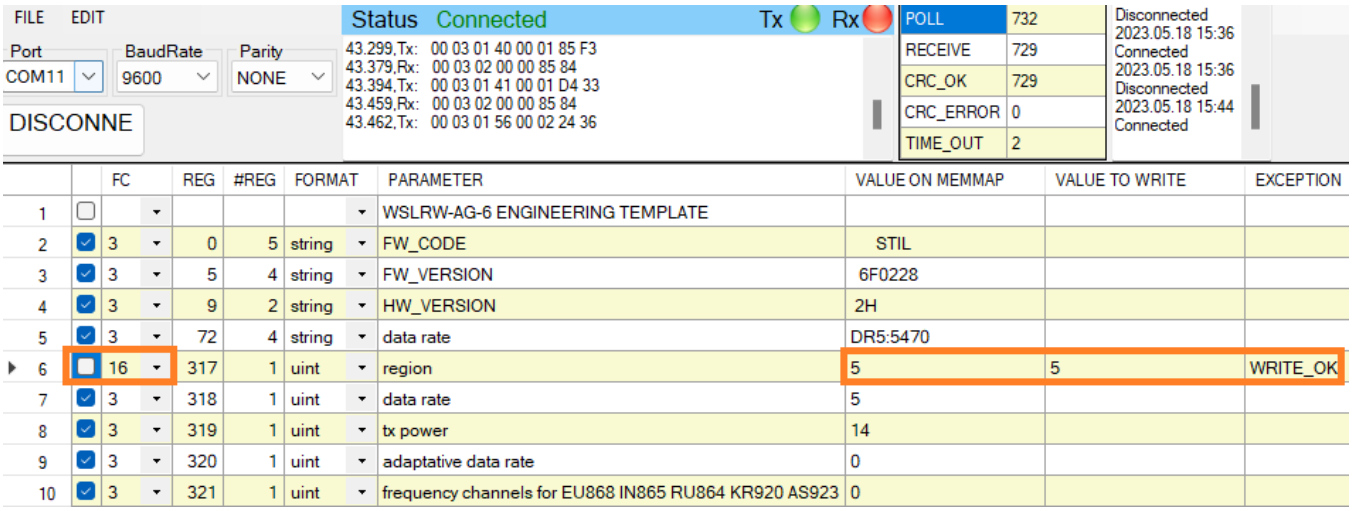



| | | FC | REG | #REG | FORMAT | PARAMETER | VALUE ON MEMMAP | VALUE TO WRITE | EXCEPTION |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | | | | | WSLRW-AG-6 ENGINEERING TEMPLATE | | | |
| 2 | ☑ | 3 | 0 | 5 | string | FW_CODE | STIL | | |
| 3 | ☑ | 3 | 5 | 4 | string | FW_VERSION | 6F0228 | | |
| 4 | ☑ | 3 | 9 | 2 | string | HW_VERSION | 2H | | |
| 5 | ☑ | 3 | 11 | 4 | string | lorawan protocol version | 01 00 03 | | |
| 6 | ☑ | 3 | 27 | 4 | hex | deviceEUI | 34 31 34 36 52 31 81 15 | | |
| 7 | ☑ | 3 | 31 | 4 | hex | lora appEUI | 01 02 03 04 05 06 07 08 | | |
| 8 | ☑ | 3 | 35 | 8 | hex | lora appKey | 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 | | |
| 9 | ☑ | 3 | 63 | 2 | string | join mode | OTAA | | |
| 10 | ☑ | 3 | 65 | 4 | string | network mode | PUBLIC | | |
| 11 | ☑ | 3 | 69 | 3 | string | region code | EU868 | | |
| 12 | ☑ | 3 | 72 | 4 | string | data rate | DR5:5470 | | |

> ⚠ The sensor is only active for configuration for 60 seconds since plugging the configuration cable or the power supply into the sensor. After 60 seconds, the TIME_OUT text will show on EXCEPTION column of the software.

**Step 7:** Write the new setting to the parameter with function 16

- Double click on the column **VALUE TO WRITE** of the parameter and input the new setting of the parameter
- Uncheck the tick on the **FC** column of the parameter, click on the arrow, select **16** and then check on the **FC** column to write a new setting to the parameter. The **WRITE_OK** text will show on **EXCEPTION** column if the software successfully writes the setting.




| | | FC | REG | #REG | FORMAT | PARAMETER | VALUE ON MEMMAP | VALUE TO WRITE | EXCEPTION |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | | | | | WSLRW-AG-6 ENGINEERING TEMPLATE | | | |
| 2 | ☑ | 3 | 0 | 5 | string | FW_CODE | STIL | | |
| 3 | ☑ | 3 | 5 | 4 | string | FW_VERSION | 6F0228 | | |
| 4 | ☑ | 3 | 9 | 2 | string | HW_VERSION | 2H | | |
| 5 | ☑ | 3 | 72 | 4 | string | data rate | DR5:5470 | | |
| 6 | ☐ | 16 | 317 | 1 | uint | region | 5 | 5 | WRITE_OK |
| 7 | ☑ | 3 | 318 | 1 | uint | data rate | 5 | | |
| 8 | ☑ | 3 | 319 | 1 | uint | tx power | 14 | | |
| 9 | ☑ | 3 | 320 | 1 | uint | adaptative data rate | 0 | | |
| 10 | ☑ | 3 | 321 | 1 | uint | frequency channels for EU868 IN865 RU864 KR920 AS923 | 0 | | |

- Repeat step 6 to read the setting of the parameter for checking.

> ⚠ The sensor is only active for configuration for 60 seconds since plugging the configuration cable or the power supply into the sensor. After 60 seconds, the TIME_OUT text will show on EXCEPTION column of the software.

> ⚠ For some critical parameters of the sensor, the password in "password for setting" must be written before writing the new settings to these parameters.

> ⚠ Only read/write registers are allowed to write.

# 4. Troubleshooting

| No. | Phenomena | Reason | Solutions |
|---|---|---|---|
| 1 | The status on the software always shows **Disconnected** although the configuration cable is connected to the PC | • The selected COM port is incorrect.<br>• The cable is defective | • Select the correct COM port to which the configuration cable connects to PC<br>• Check the cable |
| 2 | The software reads no value after importing the right template and connecting the right cable. | • The cable is defective or lost connection<br>• The USB port is defective<br>• There is no power supply to the sensor via configuration cable<br>• The sensor or sensor port is defective | • Check or replace the new configuration cable<br>• Check USB port<br>• Check the power line of the cable<br>• Check the sensor and sensor port |
| 3 | No COM port appears in the Port list | • No configuration cable is plugged into the PC<br>• The cable driver is not installed on the PC | • Plug the cable to the PC<br>• Install the driver for the PC |
| 4 | The parameter table on the software is empty | • The template file has not been imported | • Go to File/Import New to import the template file |

| | | | |
|---|---|---|---|
| 5 | The parameter table on the software does NOT match the memory map table of the sensor. | • The wrong template file was imported. | • Go to the correct manual page of the product and download the right template file, then import the template file into the software. |

# 5. List of Configuration Template Files for various Sigfox-Ready Sensors

Please find **this link** for the template file of each Sigfox-Ready sensor.

**END.**

# List of Configuration template files of Sigfox-Ready Sensors

## THIS IS **OBSOLETE** MANUAL

**Please access https://www.iot.daviteq.com/wireless-sensors for updated manual**

Each Sigfox-Ready Sensor has a template file for Offline configuration. Please find below the list.

| SKU# | Product Description | FW Ver. | Link to download Configuration Template File | Remarks |
|---|---|---|---|---|
| WSSFC-AC | Sigfox-Ready AC Current Sensor | 1.0 | ***Template file for WSSFC-AC-FW 1.0-HW 1.0*** | |
| WSSFC-AC | Sigfox-Ready AC Current Sensor | 3.0 | ***Template file for WSSFC-AC-FW 3.0*** | |
| WSSFC-AG | Sigfox-Ready Accelerometer-Gyro Sensor | 1.0 | ***Template file for WSSFC-AG-FW 1.0-HW 1.0*** | |
| WSSFC-ATH | Sigfox-Ready integrated ambient humidity and temperature sensor | 1.0 | ***Template file for WSSFC-ATH-FW 1.0- HW 1.0*** | |
| WSSFC-CAP10 | Sigfox-Ready high precision capacitance fuel level sensor | 1.0 | ***Template file for WSSFC-CAP10-FW 1.0 HW 1.0*** | |
| WSSFC-CO2 | Sigfox-Ready Industrial CARBON DIOXIDE GAS SENSOR, NDIR Type | 1.0 | ***Template file for WSSFC-CO2-FW 1.0- HW 1.0*** | |
| WSSFC-LPC | Sigfox-Ready People counter, Lidar technology | 1.0 | ***Template file for WSSFC-LPC-FW 1.0- HW 1.1*** | |
| WSSFC-LPC | Sigfox-Ready People counter, Lidar technology | 2.0 | ***Template file for WSSFC-LPC-FW 2.0- HW 2.0*** | |
| WSSFC-G4F-NH3 | Sigfox-Ready Gas Sensor, 4-Seri, Ceiling mount type, NH3 | 6.0 | ***Template file for WSSFC-NH3-FW 6.0-HW 2.0*** | |
| WSSFC-PPS | Sigfox-Ready Process Pressure Sensor | 1.0 | ***Template file for WSSFC-PPS-FW 1.0- HW 1*** | |
| WSSFC-ULC | Sigfox-Ready Ultrasonic level sensor for liquid or flat surface | 1.2 | ***Template file for WSSFC-ULC-FW 1.2- HW 1.1*** | |
| WSSFC-V1A | Sigfox-Ready Single Axis Vibration Sensor, 10 KHz Piezo technology | 1.0 | ***Template file for WSSFC-V1A-FW 1.0- HW 1.1*** | |
| WSSFCEX-PPS | Sigfox-Ready Process Pressure Sensor with Exd approval | 1.01 | ***Template file for WSSFCEX-PPS-FW 1.01-HW 1.0*** | |

| | | | | |
|---|---|---|---|---|
| WSSFCEX-GHC | Sigfox-Ready Flammable Gas Sensor with Exd approval | 2 | ***Template file for WSSFCEX-GHC-FW 2-HW 1*** | |
| WSSFC-ULA | Sigfox-Ready Ultrasonic level for solid waste | 2 | ***Template file for WSSFC-ULA-FW 2-HW 2*** | |

**END.**

# Common notes in installation of Sigfox-Ready Sensors

The common instructions for all kinds of Daviteq Sigfox-Ready Sensor. Please see below.

## 1. HOW DO YOU GET A STRONG RF SIGNAL?

To maximize the transmission distance, the ideal condition is Line-of-sight (LOS) between the Sigfox-Ready sensor and the Sigfox Base station. In real life, there may be no LOS condition. However, the Sigfox-Ready sensor still communicates with the Base station, but the distance will be reduced significantly.

> ⚠ **DO NOT** install the wireless sensor or its antenna inside a completed**metallic** box or housing because the RF signal can not pass through the metallic wall. The housing is made from Non-metallic materials like plastic, glass, wood, leather, concrete, and cement...is acceptable.

## 2. INSTALL BATTERIES FOR SIGFOX-READY SENSOR

### 2.1 INSTALL BATTERIES FOR SIGFOX-READY SENSOR WITH BLUE BOX HOUSING


*Steps for battery installation:*

**Step 1:** Using L hex key to unscrew M4 screws at the side of the housing and carefully pull out the top plastic housing in the vertical direction


**Step 2:** Insert 02 x AA 1.5VDC battery, please take note the poles of the battery

> **ATTENTION:**
>
> REVERSED POLARITY OF BATTERIES IN 10 SECONDS CAN DAMAGE THE SENSOR CIRCUIT!!!


**Step 3:** Insert the top plastic housing and locking by L hex key

> **ATTENTION:**

When reinstalling the cover, pay attention to put the PCB edge into the middle slot of the box inside as shown below)

## 2.2 INSTALL BATTERIES FOR SIGFOX-READY SENSOR WITH WHITE BOX HOUSING, 6 X AA BATTERIES (SENSOR -LPC)


*Steps for battery installation:*

**Step 1:** Use flat head screws to push into 2 reed joints


**Step 2:** Open the housing, then insert 06 x AA 1.5VDC battery, please take note of the poles of the battery

> **ATTENTION:** REVERSED POLARITY OF BATTERIES IN 10 SECONDS CAN DAMAGE THE SENSOR CIRCUIT!!!


**Step 3:** Insert the top plastic housing (Please note the 2 reed joints)


## 2.3 INSTALL BATTERIES FOR SIGFOX-READY SENSOR WITH BLACK BOX HOUSING, 2 X AA BATTERIES (SENSOR -ULA)


*Steps for battery installation:*

**Step 1:** Use a screwdriver to open the 4 screws on the underside of the housing


**Step 2:** Open the housing, then insert 02 x AA 1.5VDC battery

**ATTENTION:** REVERSED POLARITY OF BATTERIES IN 10 SECONDS CAN DAMAGE THE SENSOR CIRCUIT!!!

**Step 3:** Insert the plastic housing and locking the 4 screws by screwdriver

## 2.4 INSTALL BATTERIES FOR SIGFOX-READY SENSOR WITH EXD-

## APPROVED HOUSING WSSFCEX-...

Depends on the design of each device. Each device may need 1 pc of Type C or Type D battery. Please check the specification of that device. We recommend the below batteries to be used with our devices.

| | |
|---|---|
| LS 26500 Lithium battery<br>  <br><br>-60°C..+85°C working temperature<br>Low self-discharge rate<br>7.7 Ah Capacity | LS 33600 Lithium battery<br>  <br><br>-60°C..+85°C working temperature<br>Low self-discharge rate<br>17.0 Ah Capacity |

***Steps for battery installation:***

> **DANGER:**
>
> **DO NOT REPLACE BATTERY AT HAZARDOUS LOCATION!**
>
> **DO NOT OPEN THE COVER AT HAZARDOUS LOCATION!**
>
> **ONLY OPEN COVER AND REPLACE BATTERY IN SAFE AREA!**

**Step 1:** Turn the front cover of the sensor counter-clockwise;


**Step 2:** Carefully take out the front cover of the sensor

**Step 3:** Insert the  battery, please take note the polarity of battery

> **ATTENTION:**
>
> **REVERSED POLARITY OF BATTERIES IN 10 SECONDS CAN DAMAGE THE SENSOR CIRCUIT!!!**


**Step 4:** Turn the front cover of the sensor clockwise to close fully.


**NOTES:**

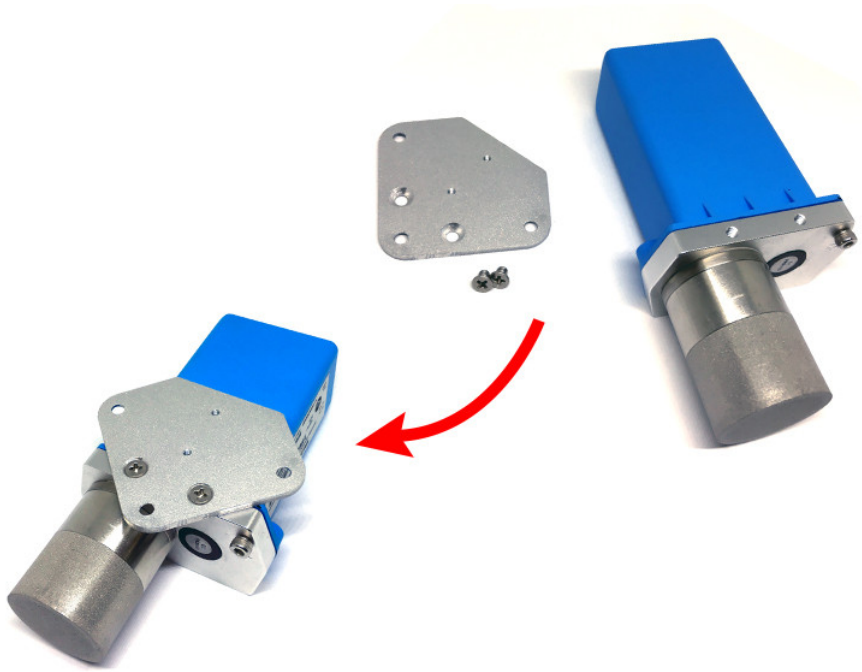
Using 2mm hex key to lock the cover to prevent the unattended opening.


# 3. MOUNTING FOR SIGFOX-READY SENSOR

## 3.1 MOUNTING FOR SIGFOX-READY SENSOR WITH BLUE BOX HOUSING

The following are the steps for the Sigfox-ready sensor with a Blue box housing design.

**Step 1:** Install the bracket on the sensor

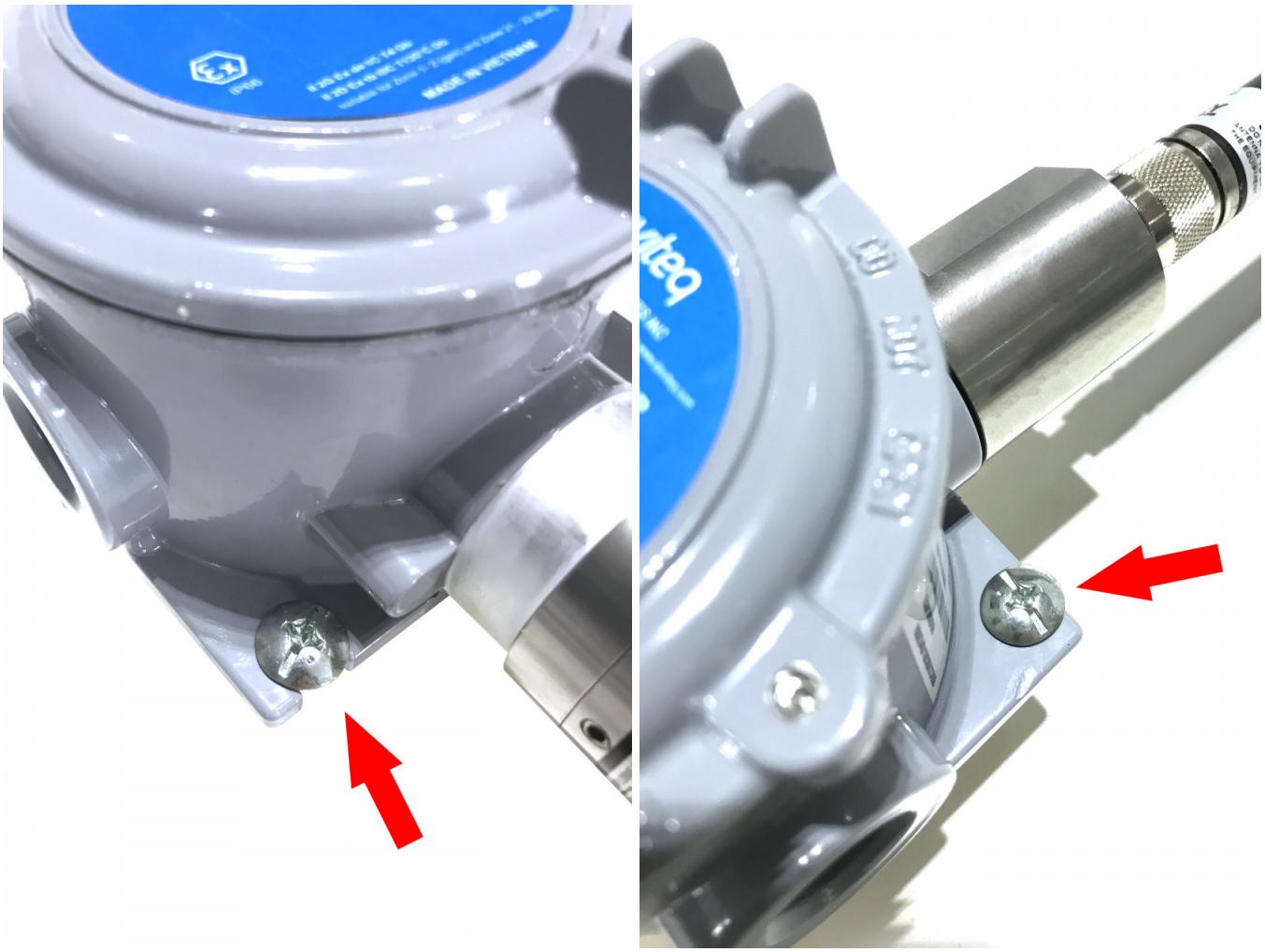


**Step 2:** Determine the mounting position and secure the sensor with the included screws


**Step 3:**Grounding the sensor


## 3.2 MOUNTING FOR SIGFOX-READY SENSOR WITH WHITE BOX HOUSING

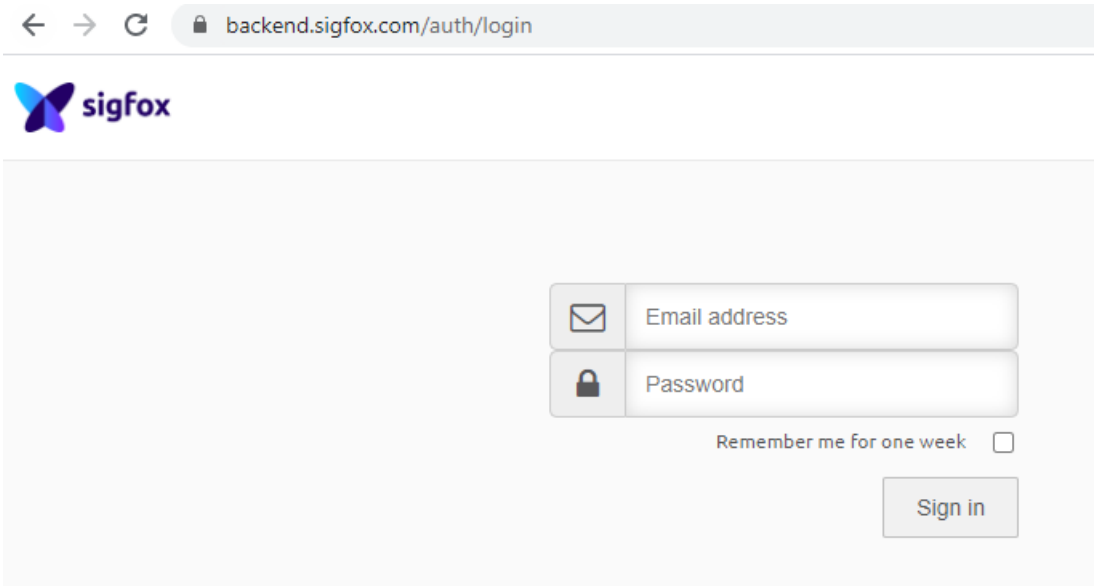
## 3.3 MOUNTING FOR SIGFOX-READY SENSOR WITH EXD-APPROVED HOUSING



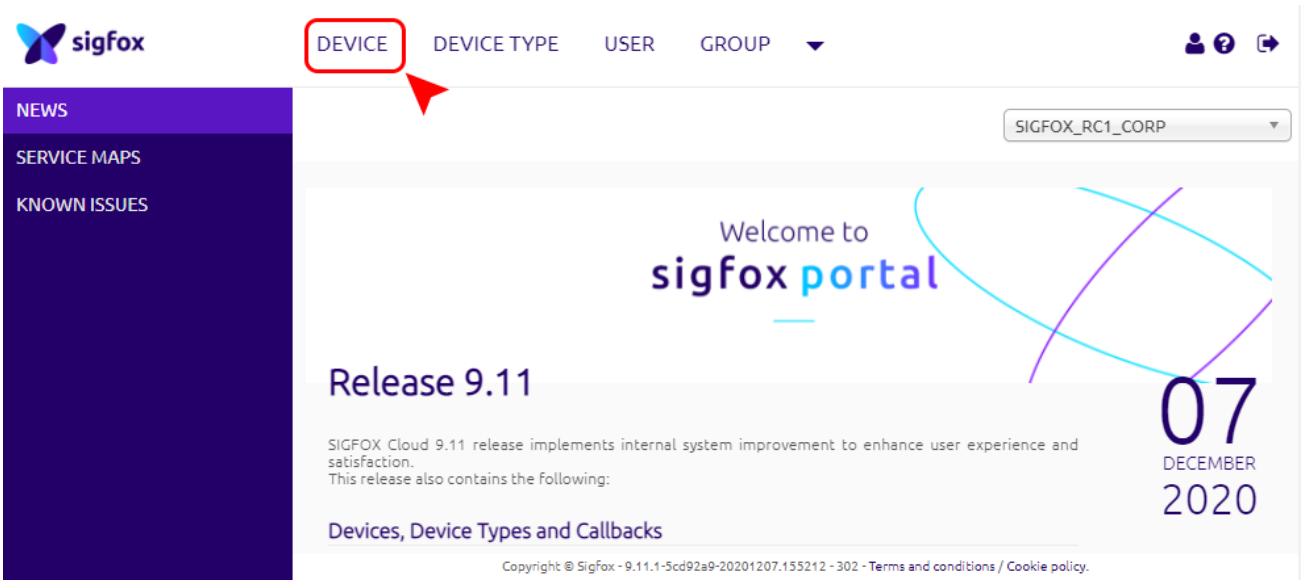
## 4. ADDING A SIGFOX-READY SENSOR TO SIGFOX BACK-END SYSTEM

This instruction is applied to all kinds of Sigfox-Ready sensors produced by Daviteq.

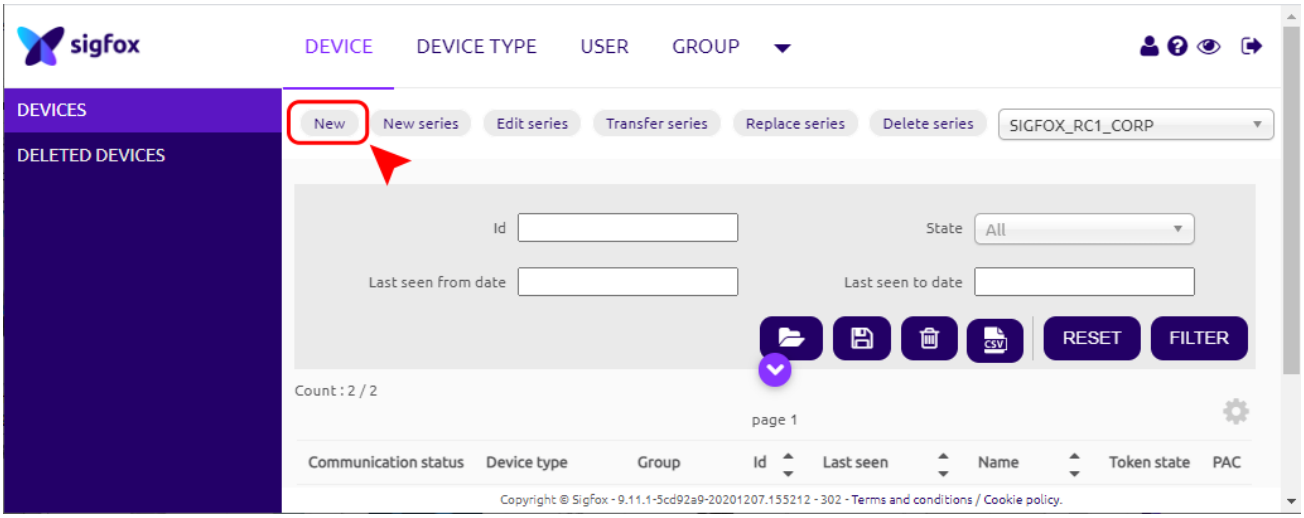
**Step 1:** Log in to the sigfox backend website



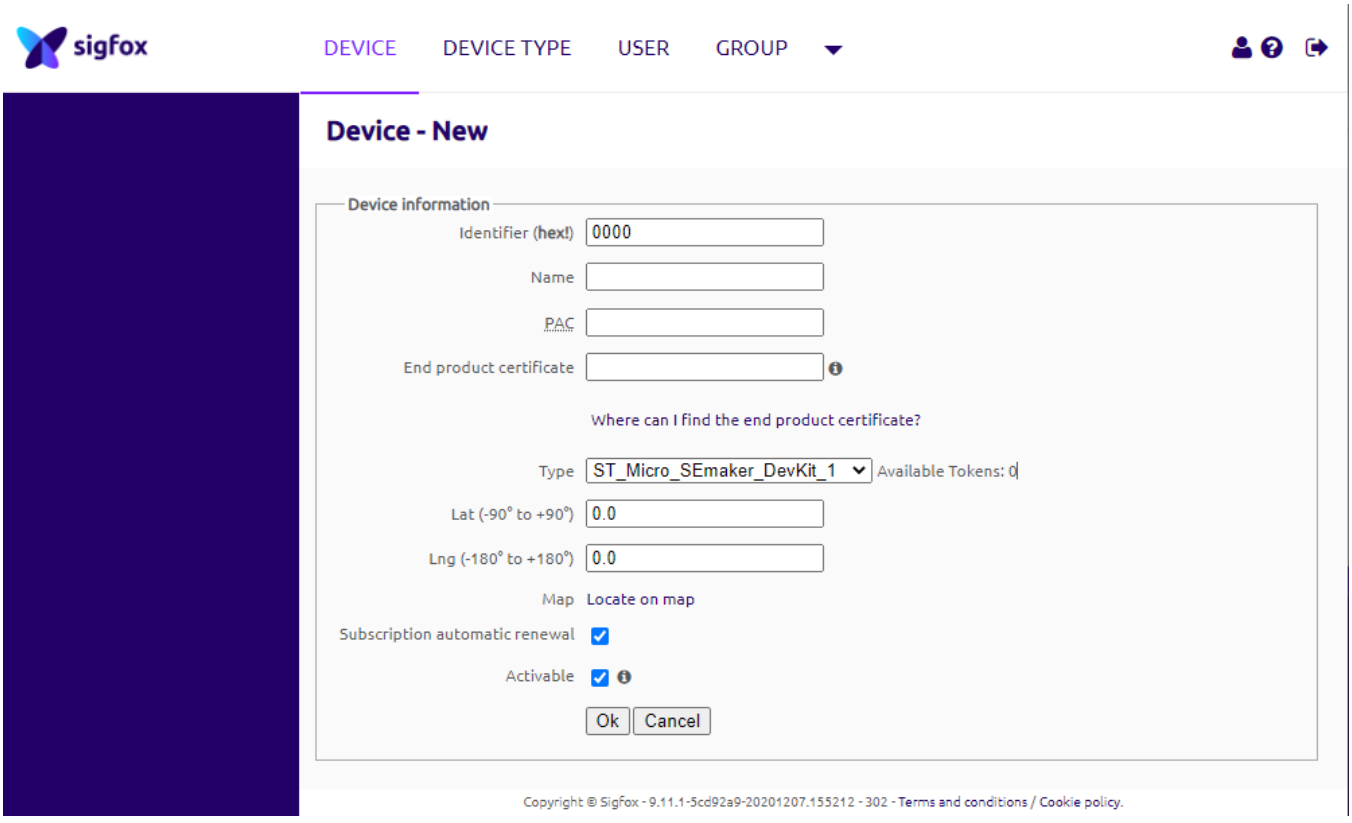

**Step 2:** Click on Device




**Step 3:** Click New → Select a group

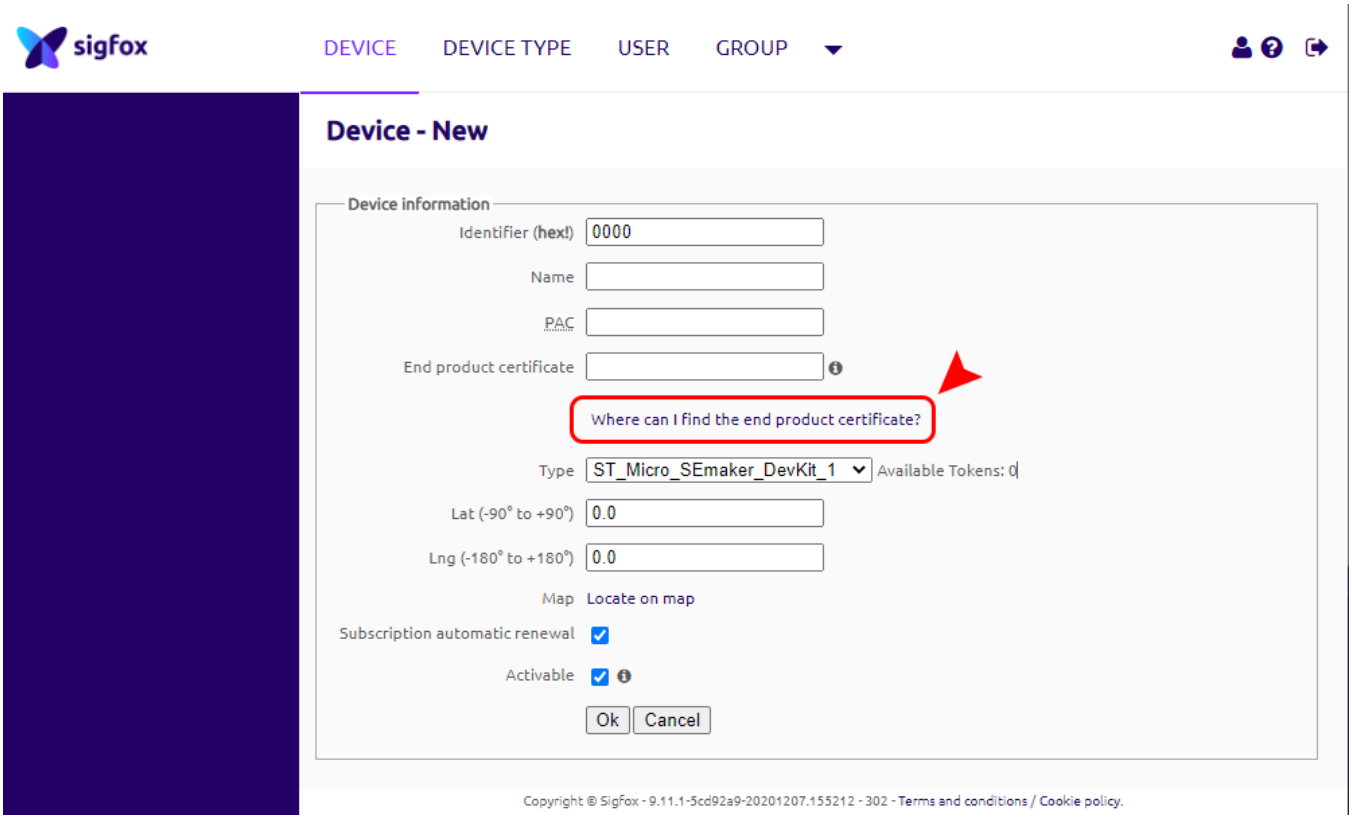



**Step 4:** Fill in the required information

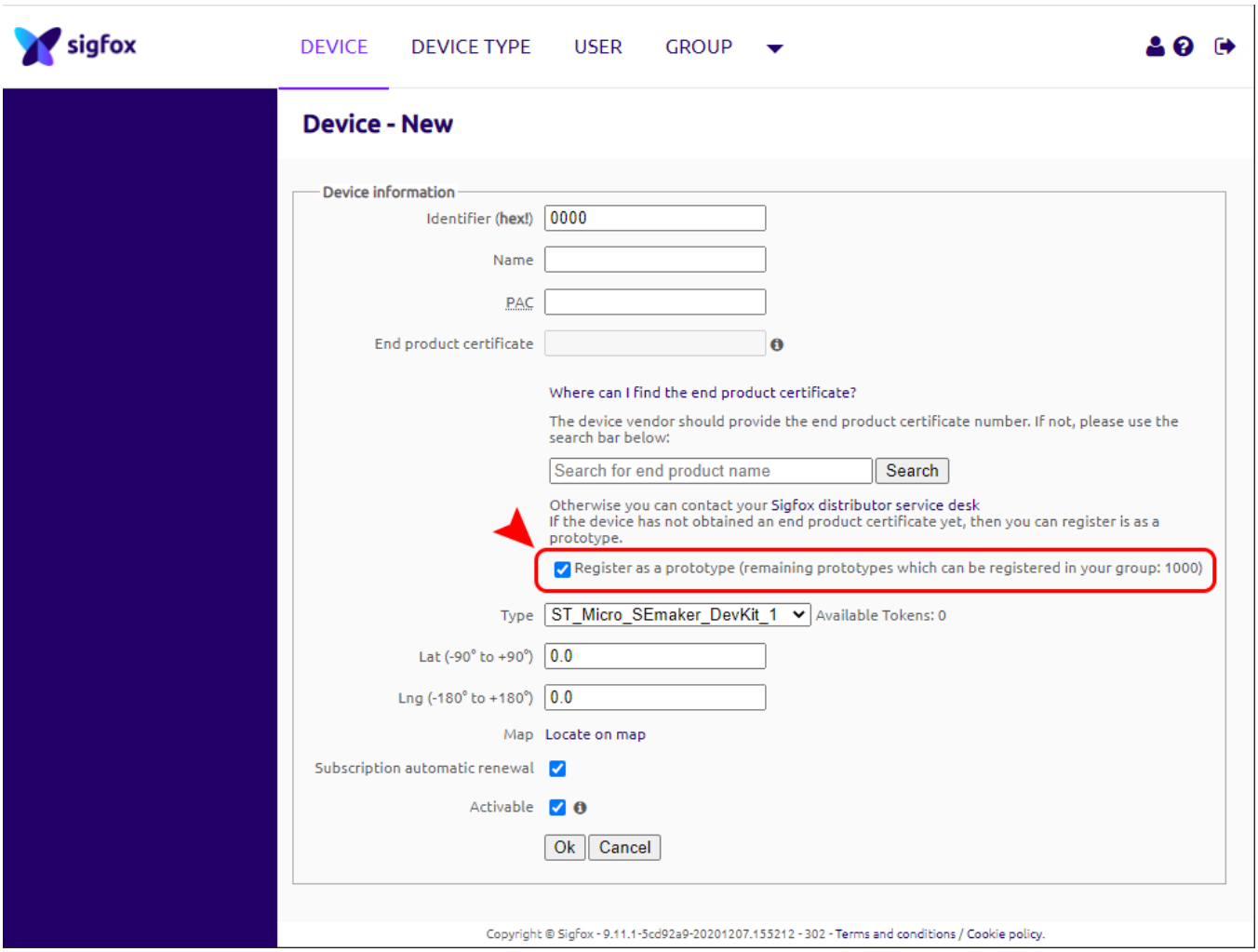


**Note:** Some of our products may not have end product certification in time, to add the product to Backend Sigfox please follow the steps below.

**Click on the text as shown below**




**Check the box as shown below to register as a prototype**


sigfox
DEVICE
DEVICE TYPE
USER
GROUP
Device - New
Device information
Identifier (hex!)
0000
Name
PAC
End product certificate
Where can I find the end product certificate?
The device vendor should provide the end product certificate number. If not, please use the search bar below:
Search for end product name
Search
Otherwise you can contact your Sigfox distributor service desk
If the device has not obtained an end product certificate yet, then you can register is as a prototype.
Register as a prototype (remaining prototypes which can be registered in your group: 1000)
Type
ST_Micro_SEmaker_DevKit_1
Available Tokens: 0
Lat (-90° to +90°)
0.0
Lng (-180° to +180°)
0.0
Map
Locate on map
Subscription automatic renewal
Activable
Ok
Cancel
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