SATEVIS | BEANAIR® SENSORS BRAND

WIRELESS IOT INCLINOMETER SENSORS

SATEVIS® ALPHA-INC
WIRELESS IOT BI-AXIS INCLINOMETER
SCALABLE MEASURING RANGE
(±30° AND ±55°)

SATEVIS® ALPHA-INC
WIRELESS IOT TRI-AXIS INCLINOMETER
SCALABLE MEASURING RANGE
(±10° AND ±85°)

IOT INDOOR GATEWAY | IOT OUTDOOR GATEWAY | IOT SOLAR GATEWAY

QUICKSTART

Contents

1. TECHNICAL SUPPORT

For general contact, technical support, to report documentation errors and to order manuals, contact **SATEVIS®** Technical Support Center (STSC) at:
tech-support@beanair.com

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For detailed information about where you can buy the **BeanAir®** equipment/software or for recommendations on accessories and components visit:
www.satevis-systems.com
To register for product news and announcements or for product questions contact **SATEVIS®** Technical Support Center (STSC).
Our aim is to make this user manual as helpful as possible. Please keep us informed of your comments and suggestions for improvements. **SATEVIS®** appreciates feedback from the users.

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Such changes will, nevertheless be incorporated into new editions of this document.

2. VISUAL SYMBOLS DEFINITION

Symbols	Definition
	Caution or Warning – Alerts the user with important information about SATEVIS® wireless IOT Sensors. if this information is not followed, the equipment /software may fail or malfunction
	Danger – This information MUST be followed if not you may damage the equipment permanently or bodily injury may occur.
	Tip or Information – Provides advice and suggestions that may be useful when installing SATEVIS Wireless IOT Sensors.

3. ACRONYMS AND ABBREVIATIONS

AES	Advanced Encryption Standard
CCA	Clear Channel Assessment
CSMA/CA	Carrier Sense Multiple Access/Collision Avoidance
GTS	Guaranteed Time-Slot
kSps	Kilo samples per second
LDCDA	Low duty cycle data acquisition
LLC	Logical Link Control
LQI	Link quality indicator
MAC	Media Access Control
PER	Packet error rate
POE	Power Over Ethernet
RF	Radio Frequency
SD	Secure Digital
UPS	Uninterruptible power supply
USB OTG	USB On The Go
WDAQ	Wireless DAQ
WSN	Wireless Sensor Networks

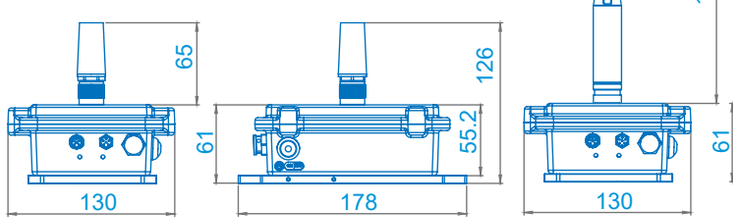
4. SATEVIS® ALPHA-INC

4.1.1 Unbox your SATEVIS® ALPHA-INC

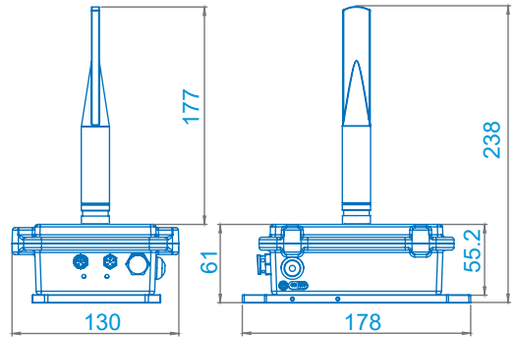
Open the Device box

4.1.2 Drawing

Small Form Factor **Antenna 2dBi**



High Gain **Antenna 5dBi**



4.2 Device Overview

4.2.1 Non-Contact Buttons and LEDS description

The Device is provided with :
-2 M8 cap
-M8 to USB cable
-1 Magnet
-1x 25cm Self-Fusing Tape
-High Gain Antenna 5dBi or Small Form Factor Antenna 2dBi

Use the Magnet to:
- Hello ! :Check sensor status
- Sensor Zeroing: Automatic Zero offset

PRODUCT OVERVIEW

4.2.2 How to Change the battery pack

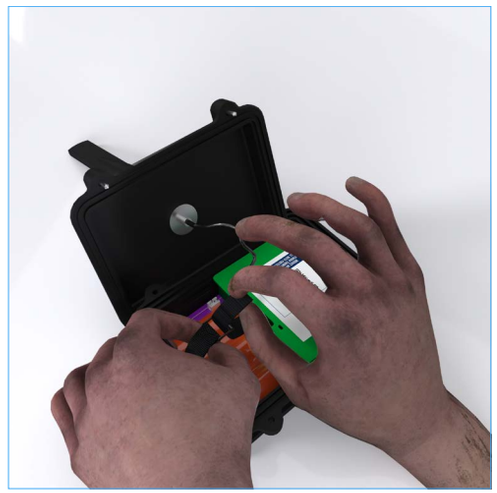


Figure 1 and 2 : Unscrew the Lid and detach the battery by loosening the "Hook-and-loop strap".

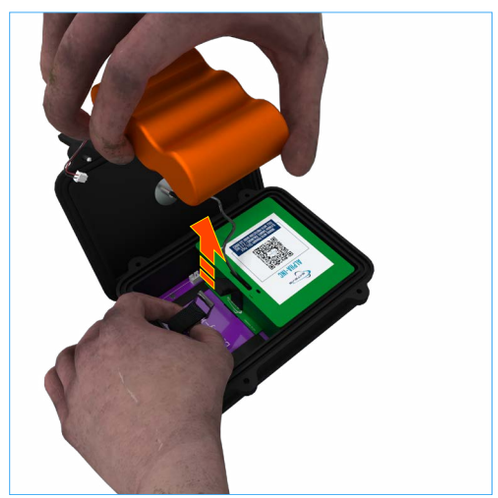


Figure 3 : Remove the Battery-Pack

Figure 4 : You will find the "Battery-Remover" under the battery pack.

Figure 5: direct the "Battery-Pack Remover " towards the JST connector.

Figure 6 : Make sure the "battery-Remover" groove surrounds the connector.

Figure 7 :carefully lift the connector upwards, and remove the battery-pack connector.

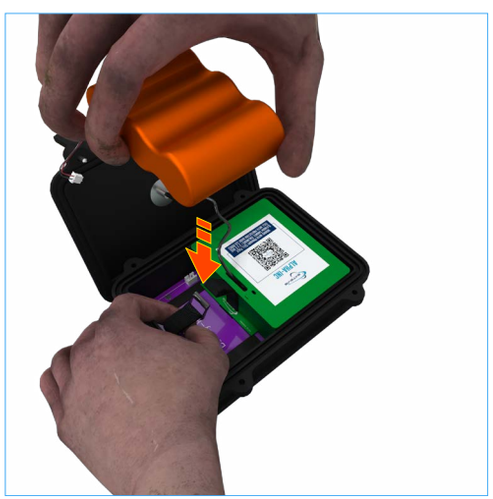


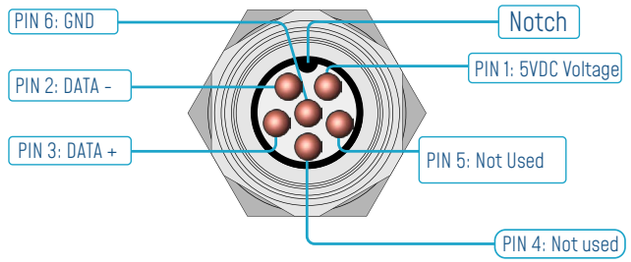
Figure 8 : Insert a new battery-pack and close the device.

- Battery pack should be changed at your office in a dry environment, you will avoid to bring humidity inside Satevis® casing;
- Use only Lithium Thionyl Chloride non-rechargeable battery pack (max Voltage 11 V) , with reverse current protection diode for each individual cell;
- Never pull the battery connector from the connector, you will damage it.

Satevis® sensor can be powered from battery pack or USB power. If it's powered from USB , there is no need to keep the battery power ON .

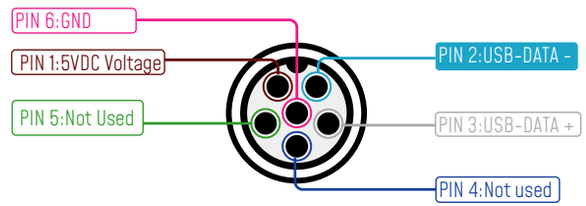
4.2.3 Interface for External Power supply

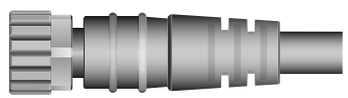
M8 6pin Socket (MALE, A-CODING)- Pin assignation



Interface Name	M8 Pin assignation
5VDC Voltage	PIN 1
DATA -	PIN 2
DATA +	PIN 3
Not used	PIN 4
Not Used	PIN 5
GND	PIN 6

M8 6pin Plug (FEMALE, A-CODING)- Pin assignation



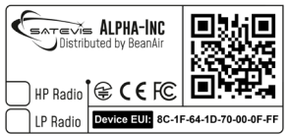


M8-6Pins Plug

Interface Name	5VDC Voltage	USB DATA -	USB DATA +	Not used	Not Used	GND
M8 Pin assignation	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6
Wire Color (A-coding)	BROWN	WHITE	GREY	BLUE	GREEN	PINK

5. Device commissioning on your cloud software (Example with TTN)

5.1 Reading the QR Code



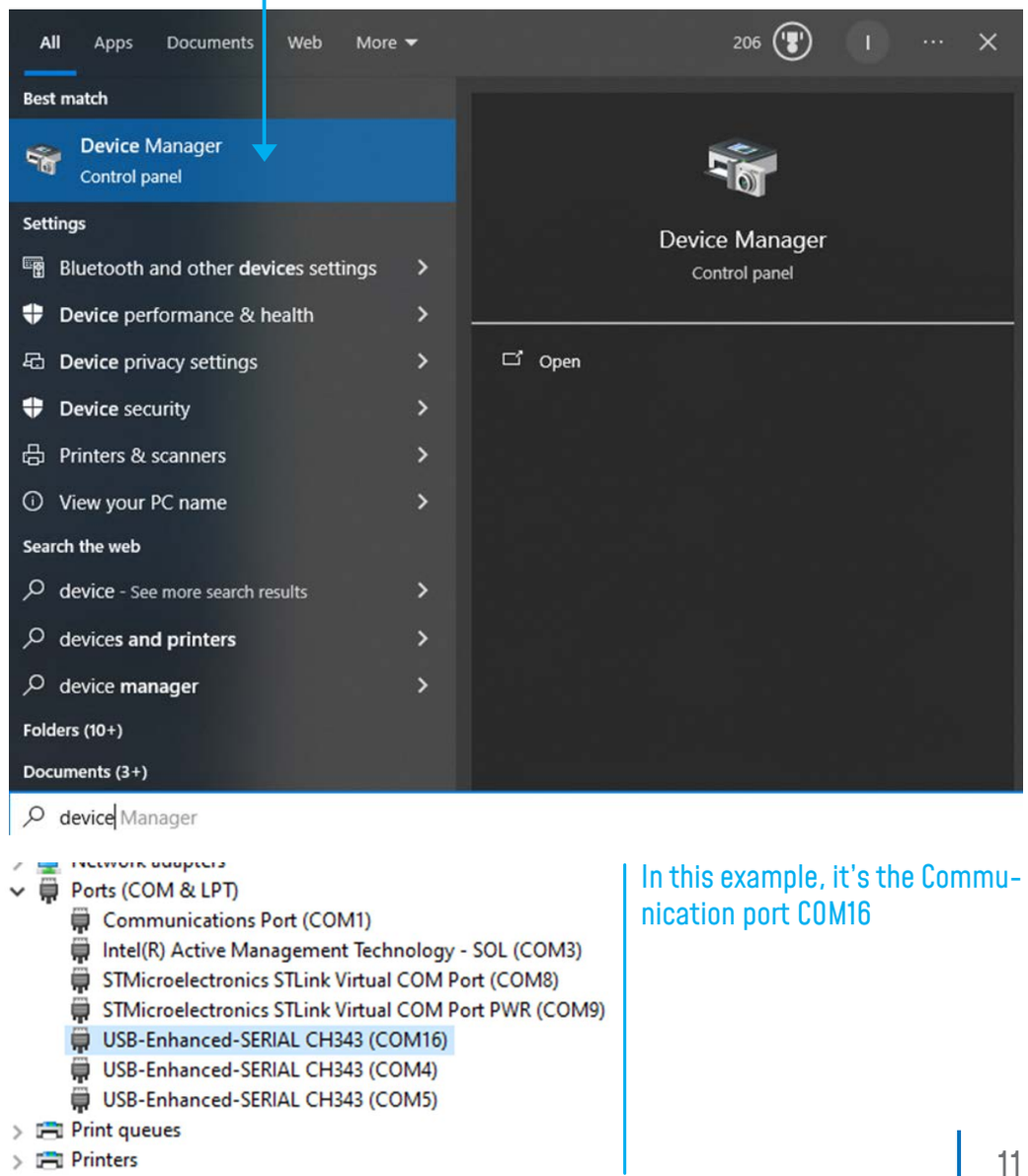
Scan the QR code to get the Device EUI and the default Join EUI.Join EUI can be changed from Satevis® LINK software.
Antenna frequency is displayed on the antenna base

DEVICE EUI: 8C-1F-64-1D-70-00-0F-FF

5.2 Change your Lora settings with Satevis® LINK Software

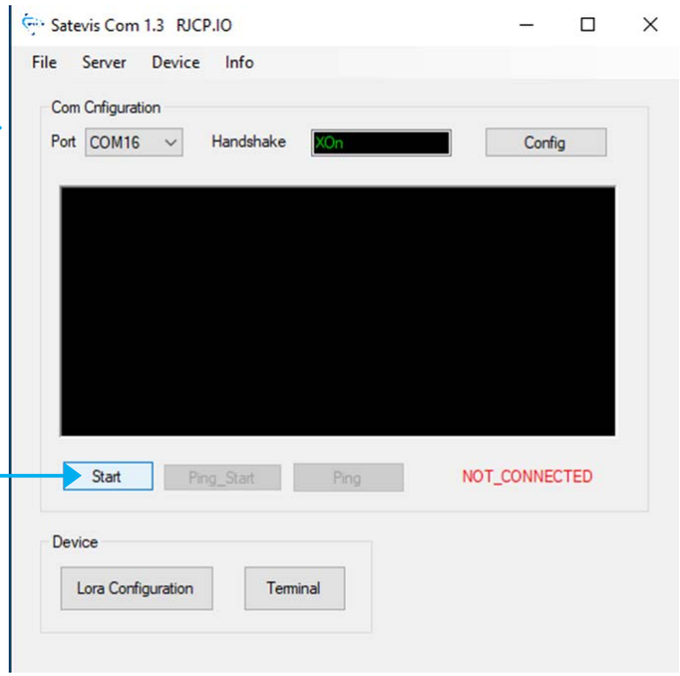
1. Connect your Satevis® device to your PC/Laptop with USB /M8 cable adapter provided with it

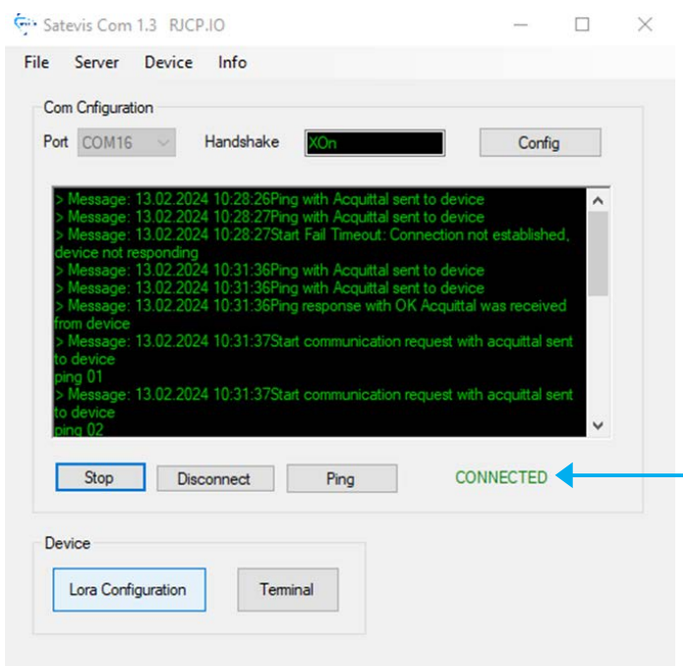
2. Click on device manager, and check with communication port number is used by your Satevis® device.



In this example, it's the Communication port COM16

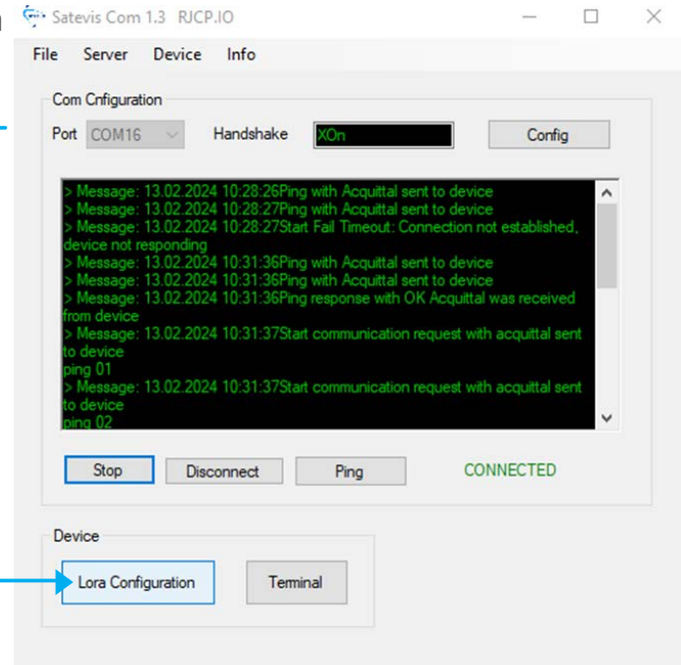
3. Launch your Satevis® communication software by clicking on start

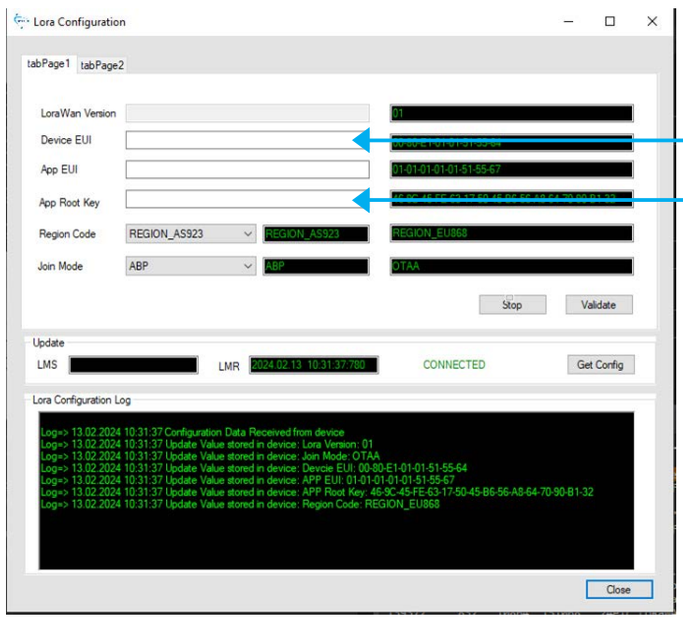




Your Satevis® software displays connected confirming to connection to your satevis® device

4. Click on Lora Configuration to get Device EUI, Join EUI, App Root Key

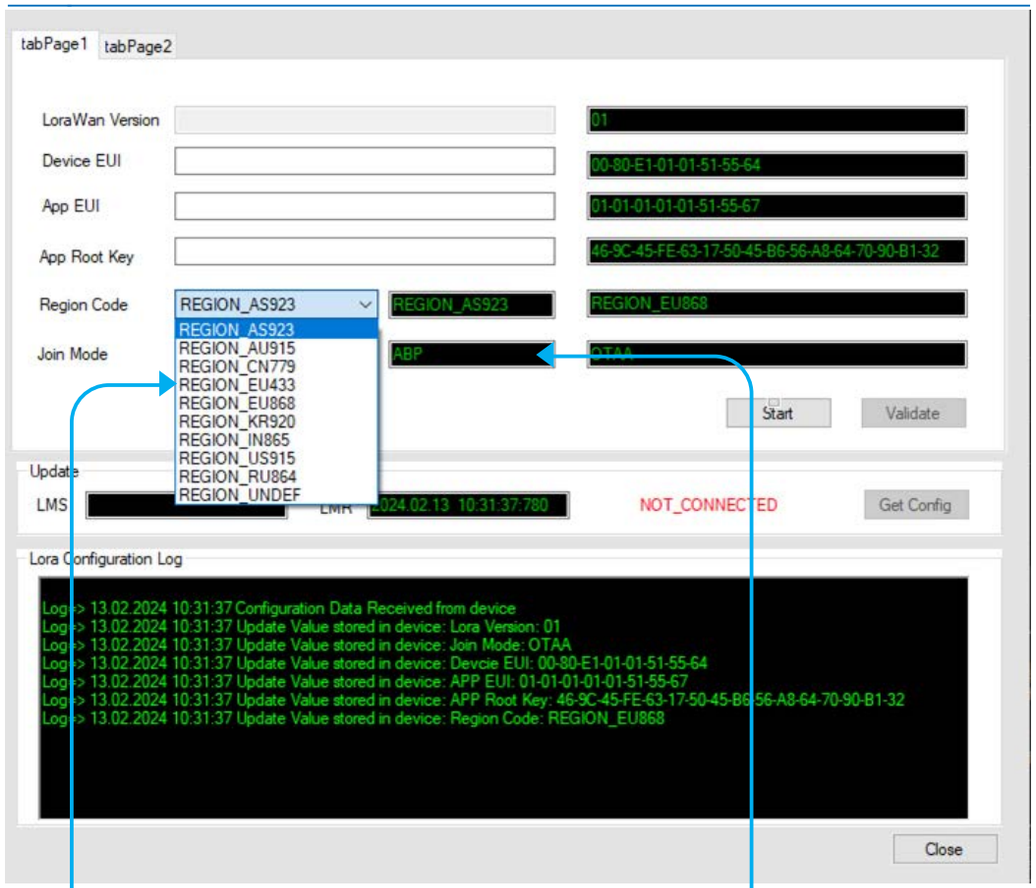




Join/App EUI , App Root Key can be changed from this field

Device EUI can not be changed as it contains our Manufacturer ID

5. REGION CODE can be changed from here, make sure your Antenna is compatible with this frequency.



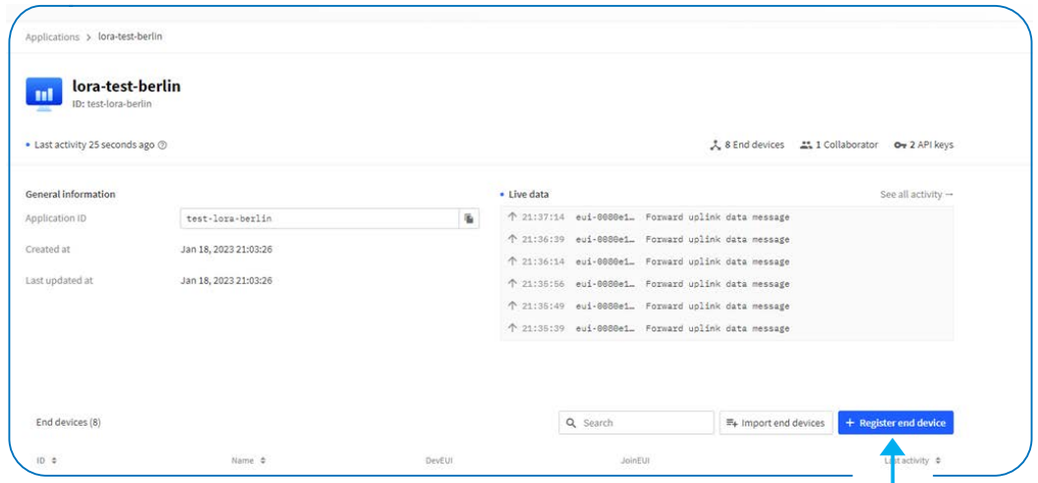
Two different antennas are proposed:

- 868MHZ (frequency range 863-870MHz) antenna covers: EU868 (Europe), IN865(India), RU864 (Russia)
- 915MHZ (Frequency Range 902-928MHz) antenna covers : US915 (North America), AU915 (Australia), KR920 (KOREA) and AS923(ASIA)

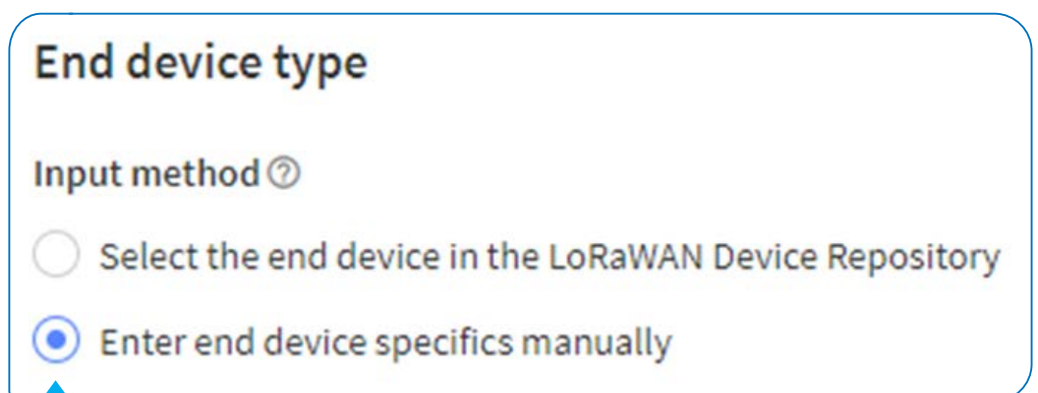
Join Mode is always OTAA as it's more secured than ABP.

AFTER VALIDATING YOUR NEW SETTINGS, YOUR DEVICE WILL RESTART WITH THESE NEW SETTINGS.

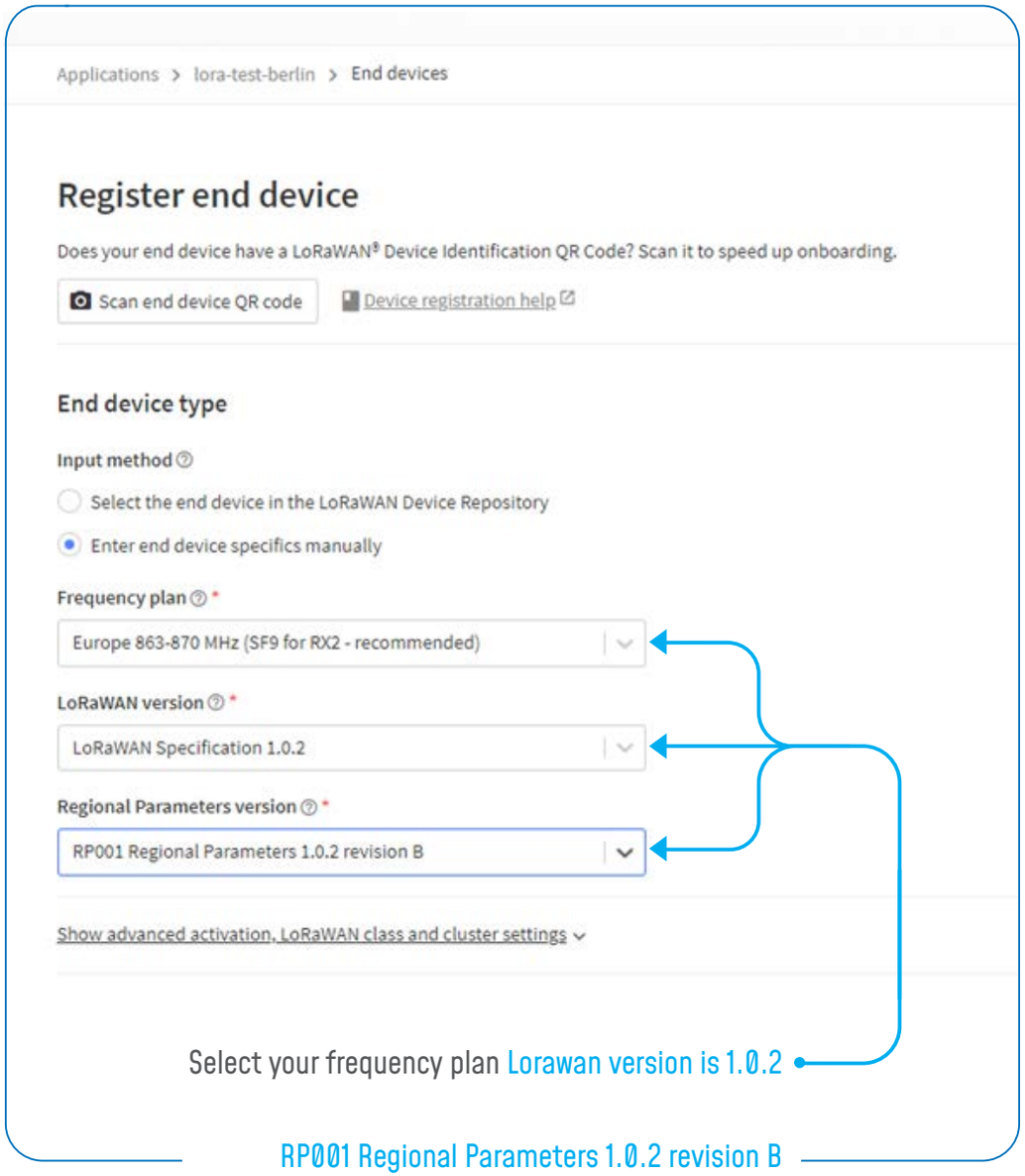
5.3 Register your Satevis® device on TTN



Click on Register end device



Click on Enter end device specs manually



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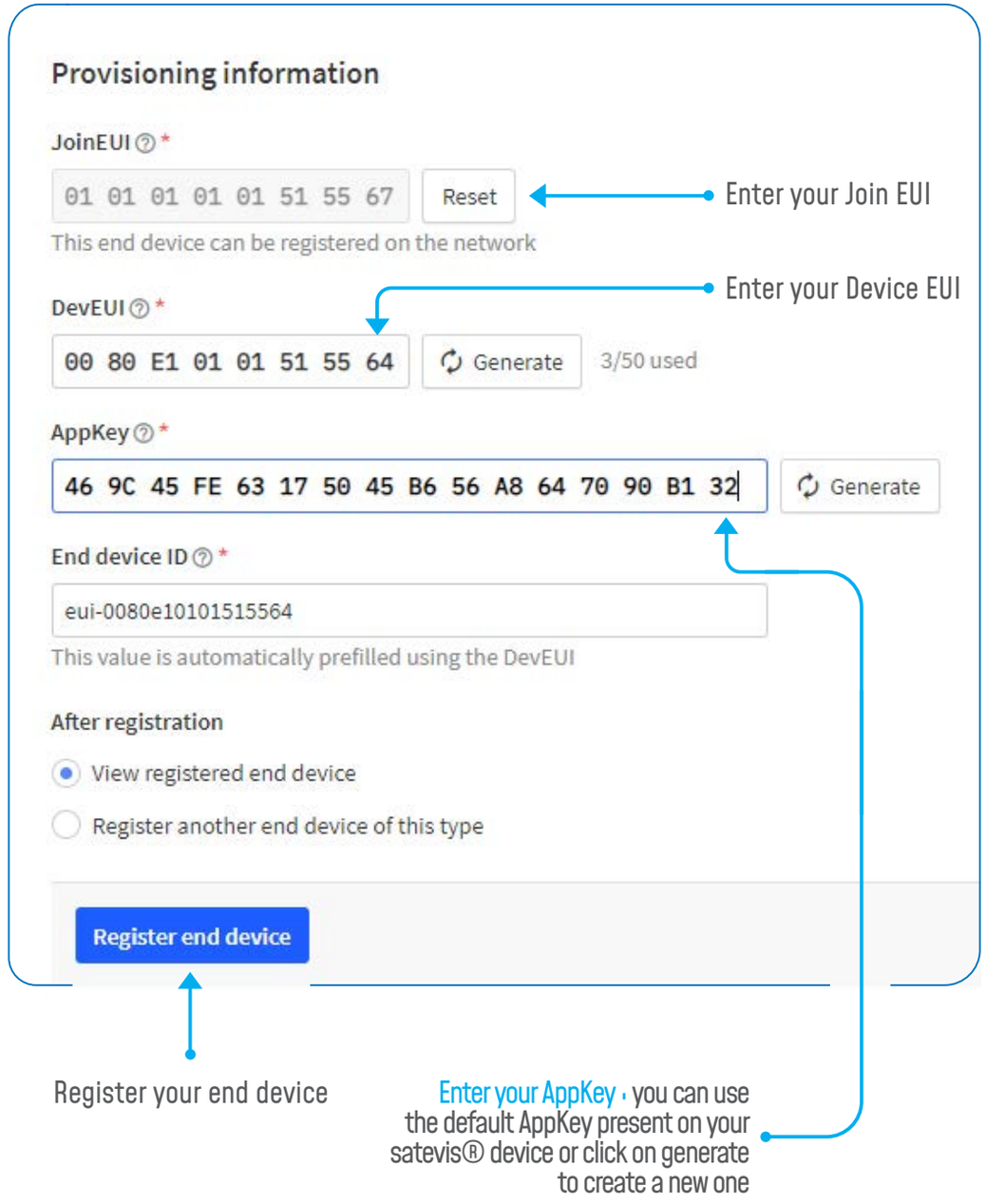

6. Sensor Installation

Satevis® device comes with a three-axis inclinometer, it can be easily mounted directly on both vertical and Horizontal structures

7. Sensor Zeroing

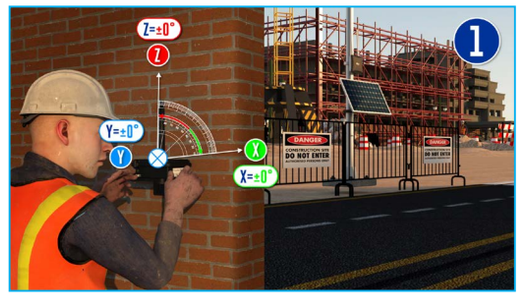

Figure 1 : Even if an angle bracket is used, it's sometimes difficult to bring a zero-offset on both X and Y axis (in the case if Z axis is on the same direction than Earth Gravity).. In some cases, the field operator can not spend too much time on this task.

Figure 2 : To enable the sensor zeroing function, hold the magnet on 'Sensor Zeroing" Label for more than 10s.

Figure 3 : The Activity LED blinks in blue, the sensor zeroing starts on both X and Y axis . When this process is done, the Activity led will blink again in blue color and transmits a data measurement to the Lorawan® network. If the sensor zeroing process is not done correctly (the device is moving) the Activity Led will blink in Red color.

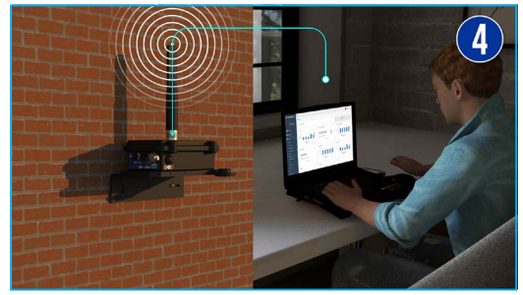

Figure 4 : The Sensor-zeroing process can be also done remotely from the cloud software.

8. Checking Sensor Status on site

Figure 1 : After installing the Alpha-Inc inclinometer, the field operator can check at any moment if the sensor is working properly

Figure 2 : By Holding the magnet on the 'Hello!' label for more than 10s, the sensor wakes-up and transmits to the Lorawan network the data measurement followed by the system diagnostic (battery status and network quality).

Figure 3 : The Activity Led blinks in green color, confirming that a data measurement is transmitted to the Lorawan network.

Figure 4 : The field operator can check on Satevis® Cloud software (or a third-party cloud software) if his sensor is working properly.

9. Where to find more Technical Information ?

- For mode technical litterature, please visit our White Paper Page: https://www.satevis-systems.com/white-paper.html
- Please refer to the SATEVIS® Alpha-INC-Kompakt user manual section for more information https://www.satevis-systems.com/files/User-Manual-SATEVIS-LORA-ALPHA-INC-MR-PS.pdf
- Facing technical problems ? Contact our technical support team at : tech-support@beanair.com

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