SATEVIS | BeanAir® Sensors Brand

α·iNC

Wireless IOT Inclinometer Sensors

Satevis® Alpha-INC SK
Wireless IOT Tri-Axis Inclinometer
Scalable Measuring Range
(±10° and ±85°)

Satevis® Alpha-INC SK
Wireless IOT Bi-Axis Inclinometer
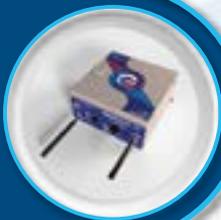### Scalable Measuring Range
(±30° and ±55°)

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

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.

Disclaimer

The information contained in this document is the proprietary information of SATEVIS®. The contents are confidential and any disclosure to persons other than the officers, employees, agents or subcontractors of the owner or licensee of this document, without the prior written consent of BeanAir® Sensors, is strictly prohibited.

BeanAir® Sensors makes every effort to ensure the quality of the information it makes available. Notwithstanding the foregoing, BeanAir® Sensors does not make any warranty as to the information contained herein, and does not accept any liability for any injury, loss or damage of any kind incurred by use of or reliance upon the information.

BeanAir® Sensors disclaims any and all responsibility for the application of the devices characterized in this document, and notes that the application of the device must comply with the safety standards of the applicable country, and where applicable, with the relevant wiring rules.

BeanAir® Sensors reserves the right to make modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to programs and/or equipment at any time and without notice.

Such changes will, nevertheless be incorporated into new editions of this document. Copyright: Transmittal, reproduction, dissemination and/or editing of this document as well as utilization of its contents and communication thereof to others without express authorization are prohibited. Offenders will be held liable for payment of damages. All rights are reserved.
Copyright © SATEVIS® 2024

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.
ℹ️	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-SK
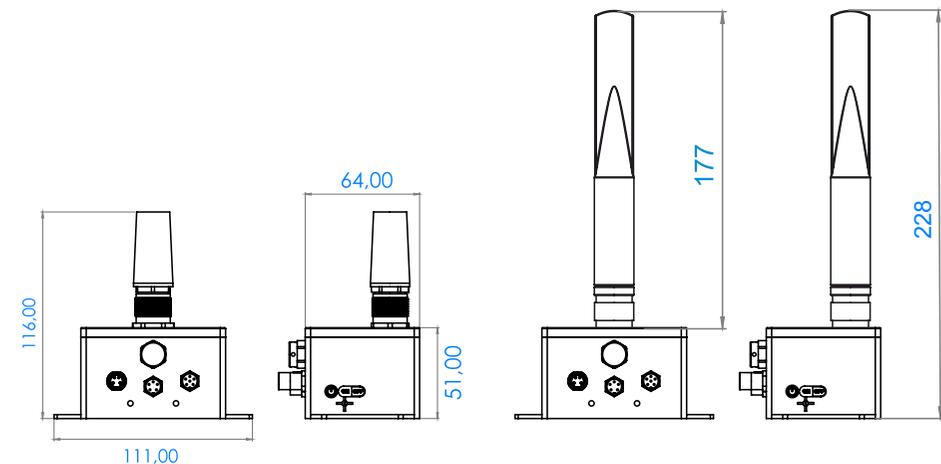
4.1.1 Unbox your SATEVIS® ALPHA-INC-SK

Open the Device box

4.1.2 Drawing

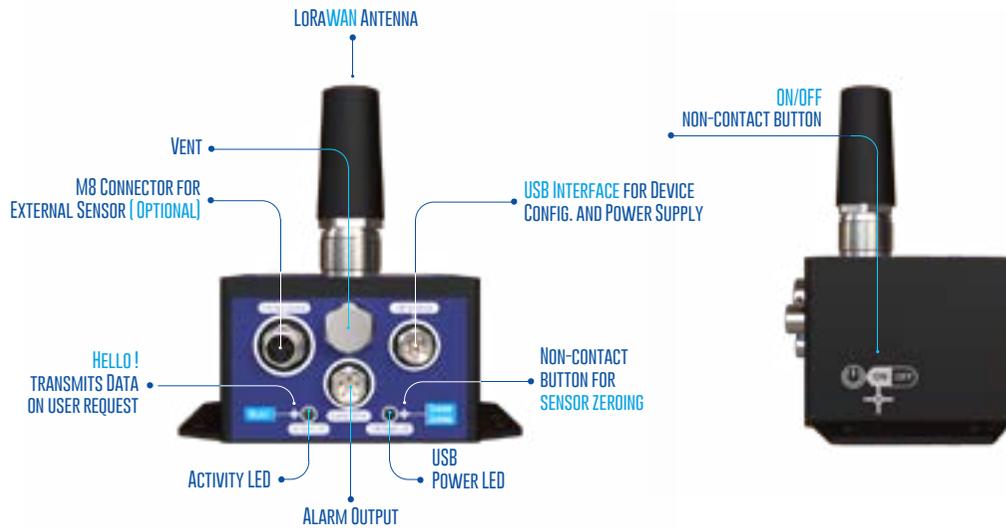Small Form Factor **Antenna 2dBi**   High Gain **Antenna 5dBi**

4.2 Device Overview
4.2.1 Non-Contact Buttons and LEDS description

The Device is provided with :
-2x M8 Cap for USB & Easy-Sense sockets
-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

LoRaWAN Antenna
Vent
M8 Connector for External Sensor (Optional)
Hello ! transmits Data on user request
Activity LED
Alarm Output
USB Power LED
USB Interface for Device Config. and Power Supply
Non-contact button for sensor zeroing
ON/OFF NON-CONTACT BUTTON

4.2.2 How to Power SATEVIS® Device

Figure 1 : Unscrew the 4 screws from the lid

Figure 2 : Hold the base of the casing securely then remove the battery by pulling the Hook-and-loop strap
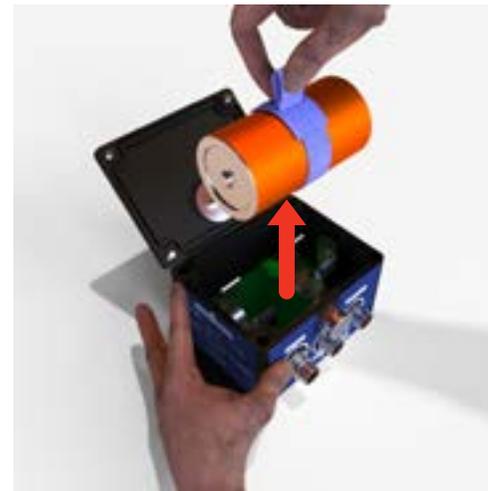
Figure 3 : Please do not use screwdrivers or other tools to remove the battery, as this may damage the circuit board.

Figure 4 : Carefully replace the new Battery Type D-Type (only Lithium Thionyl-Chloride), then make sure that the case is securely closed.

Satevis ® device can be powered from both USB and Battery Power. If you Power from USB , you don't need to power on battery power.

4.2.3 How to Deploy

1

1-Make sure, all the **M8 caps** are screwed on the **M8 socket.**

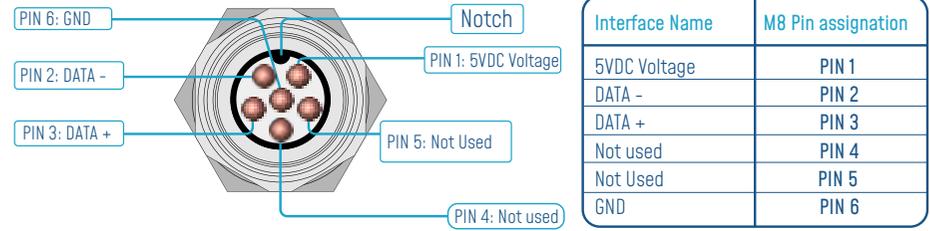**2-**To improve antenna water-proofness, wrap the antenna connector with **Self-Fusing Tape**.

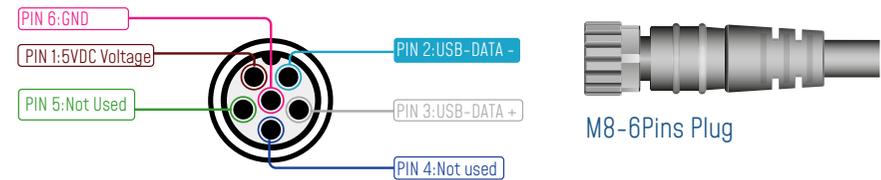**3-**The **Connector-Shield** can be screwed on the sensor Magnetic-base (Optional).

2

25CM

3

4.2.4 Interface for External Power supply
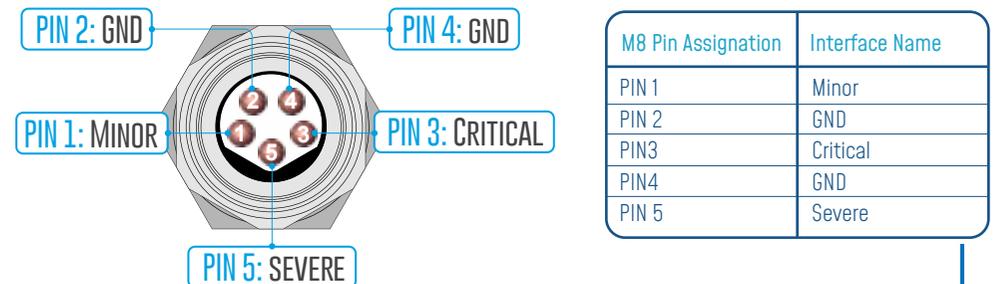
M8 6pin Socket (MALE, A-CODING)- Pin assignation

PIN 6: GND
PIN 2: DATA -
PIN 3: DATA +
Notch
PIN 1: 5VDC Voltage
PIN 5: Not Used
PIN 4: Not used

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

PIN 6:GND
PIN 1:5VDC Voltage
PIN 5:Not Used
PIN 2:USB-DATA -
PIN 3:USB-DATA +
PIN 4:Not used

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

4.2.5 Alarm Output Wiring Code

**M8 5pin Socket (MALE, A-CODING)- Pin assignation**

PIN 2: GND
PIN 4: GND
PIN 1: MINOR
PIN 3: CRITICAL
PIN 5: SEVERE

M8 Pin Assignation	Interface Name
PIN 1	Minor
PIN 2	GND
PIN3	Critical
PIN4	GND
PIN 5	Severe

M8 5pin PLUG (FEMALE, A-CODING)- Pin assignation

PIN 4:GND

PIN 3: Critical

PIN 2:GND

PIN 1:Minor

PIN 5:Severe

M8-5 Pins Plug

Interface Name	MINOR	GND	CRITICAL	GND	SEVERE
M8 Pin assignation	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5
Wire Color (A-coding)	GREY	RED	BLACK	WHITE	BLUE

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

5.1 Reading the QR Code
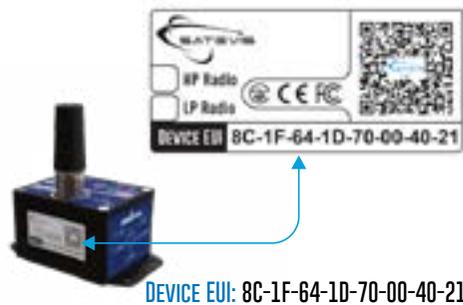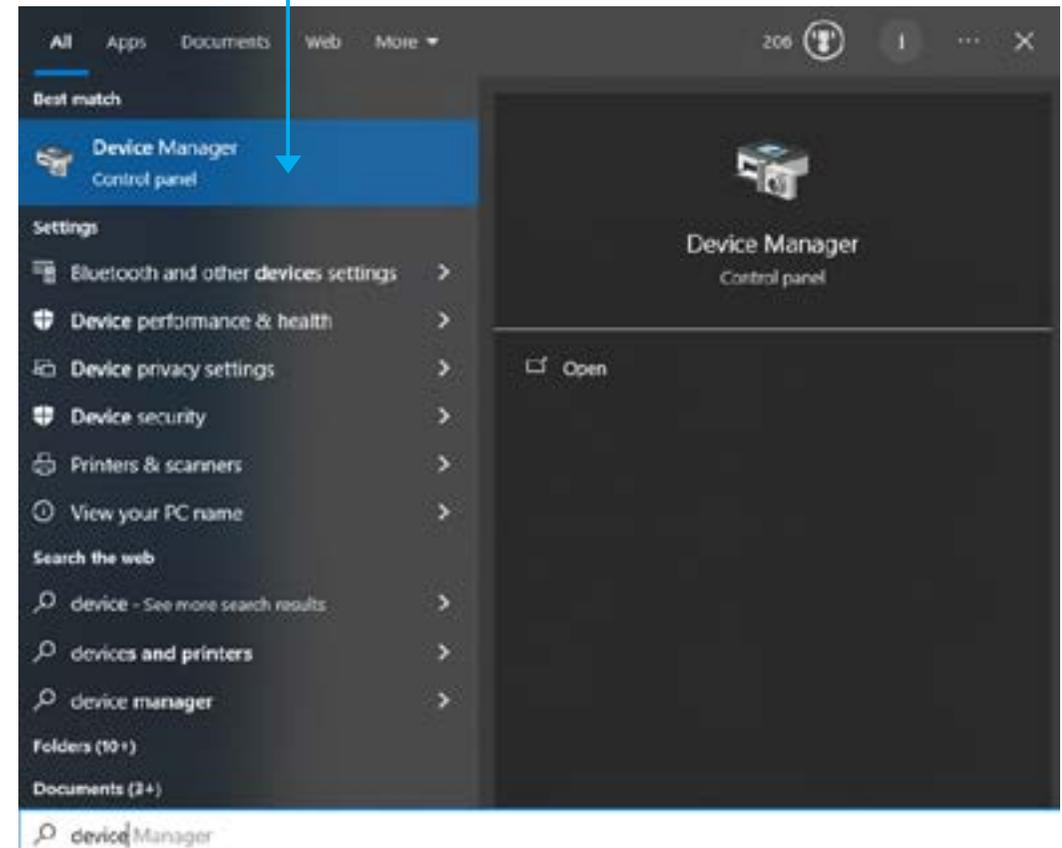
Scan the QR code to get the Device EUI . AppEUI (or JoinEUI) ,AppKey and Frequency Region, are available on Satevis® LINK Software

DEVICE EUI 8C-1F-64-1D-70-00-40-21

DEVICE EUI: 8C-1F-64-1D-70-00-40-21

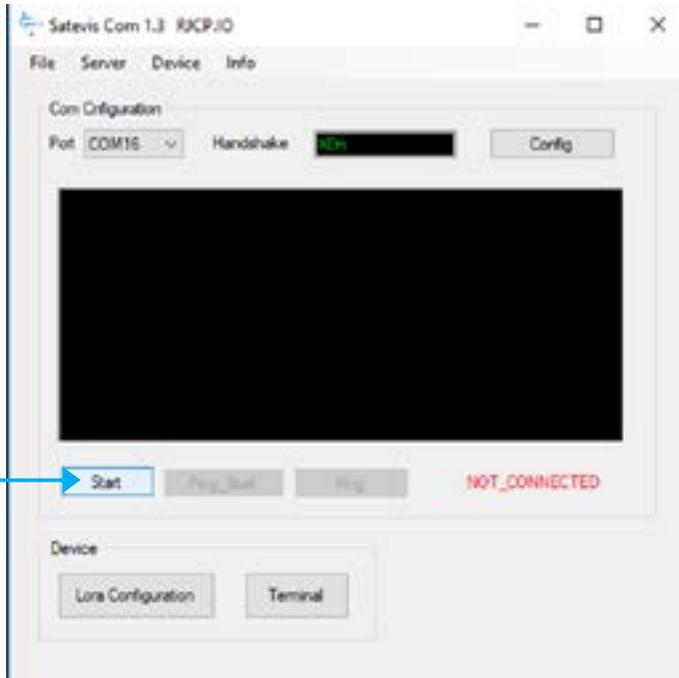## 5.2 Change your Lora settings with Satevis® LINK Software

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

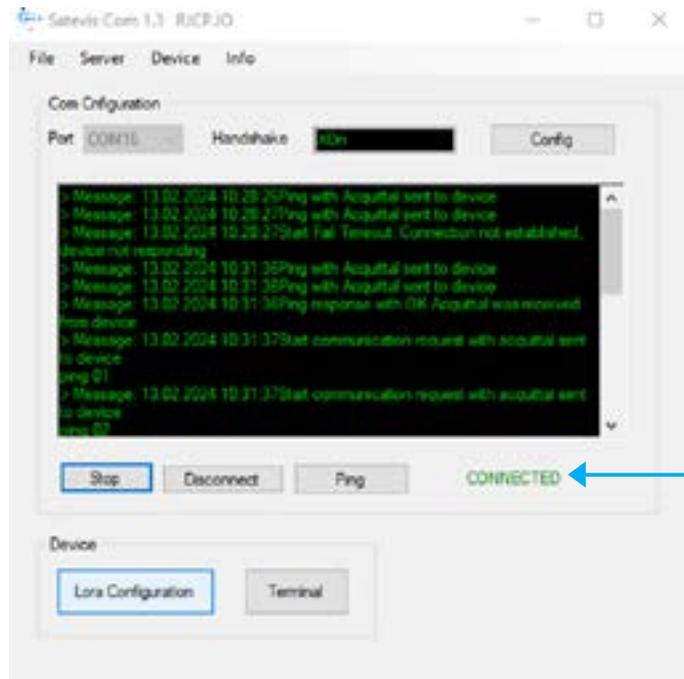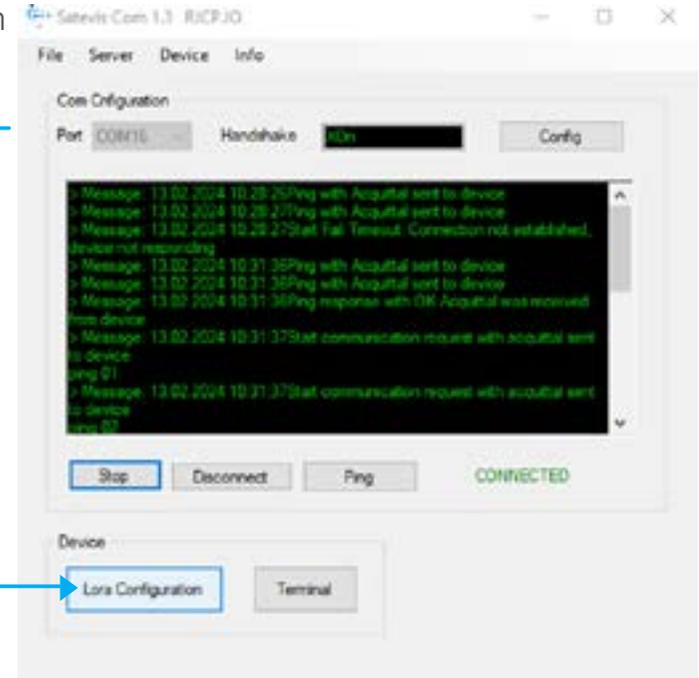**2.** Click on device manager, and check with communication port number is used by your Satevis® device.

All   Apps   Documents   Web   More ▾   206

Best match

Device Manager
Control panel

Settings

Bluetooth and other **devices** settings

Device performance & health

Device privacy settings

Device security

Printers & scanners

View your PC name

Search the web

device - See more search results

devices and printers

device manager

Folders (10+)

Documents (2+)

device Manager

Device Manager
Control panel

Open

Ports (COM & LPT)
Communications Port (COM1)
Intel(R) Active Management Technology - SOL (COM3)
STMicroelectronics STLink Virtual COM Port (COM8)
STMicroelectronics STLink Virtual COM Port PWR (COM9)
USB-Enhanced-SERIAL CH343 (COM16)
USB-Enhanced-SERIAL CH343 (COM4)
USB-Enhanced-SERIAL CH343 (COM5)
Print queues
Printers

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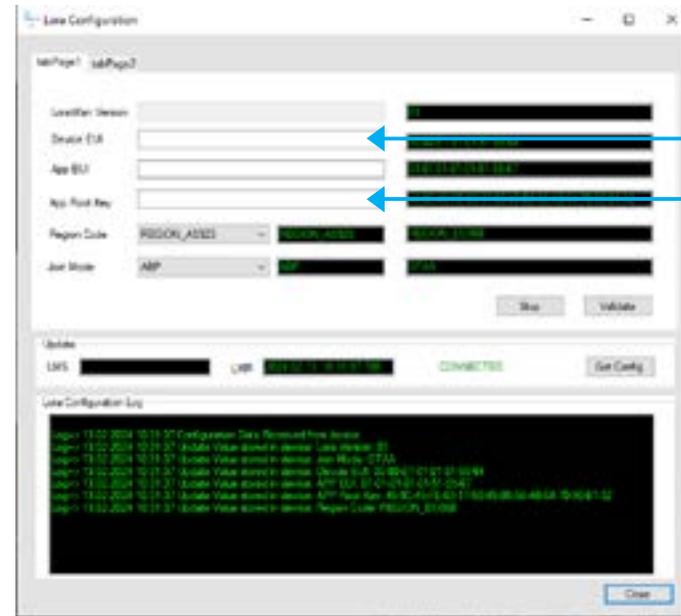
Join/App EUI , App Root Key can be changed from this field

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.
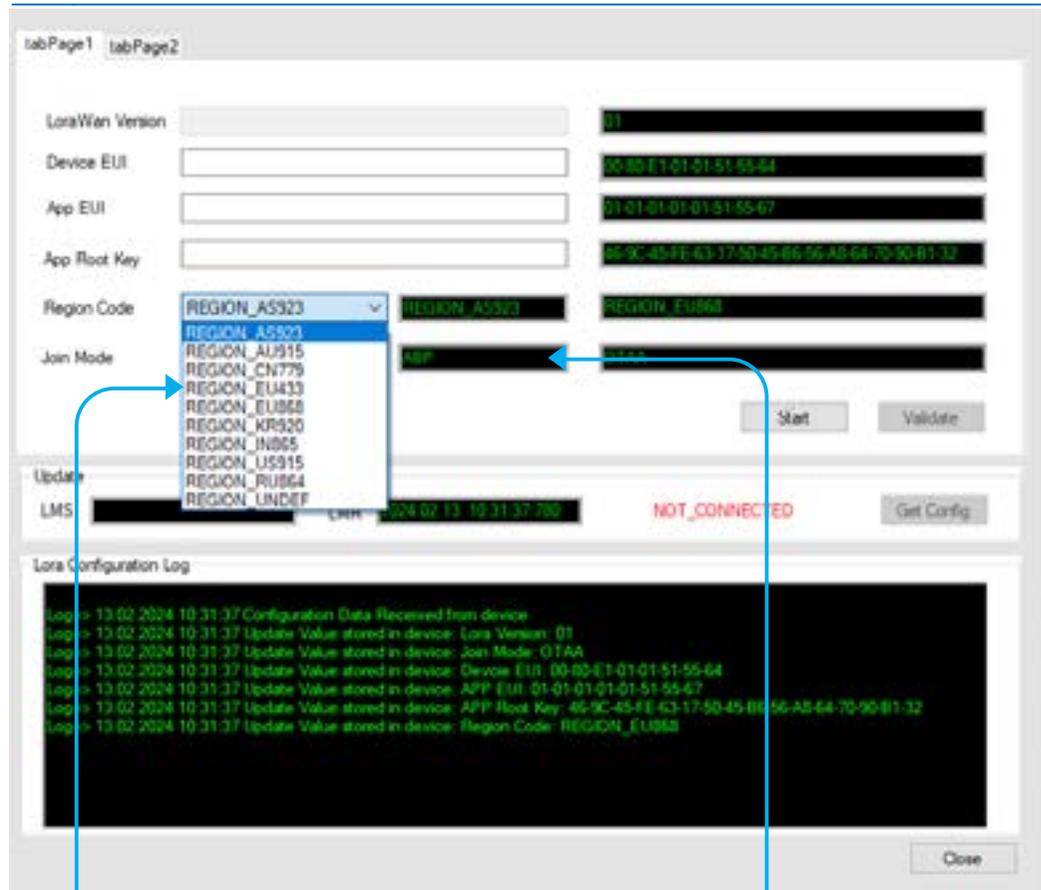
Two different antennas are proposed:

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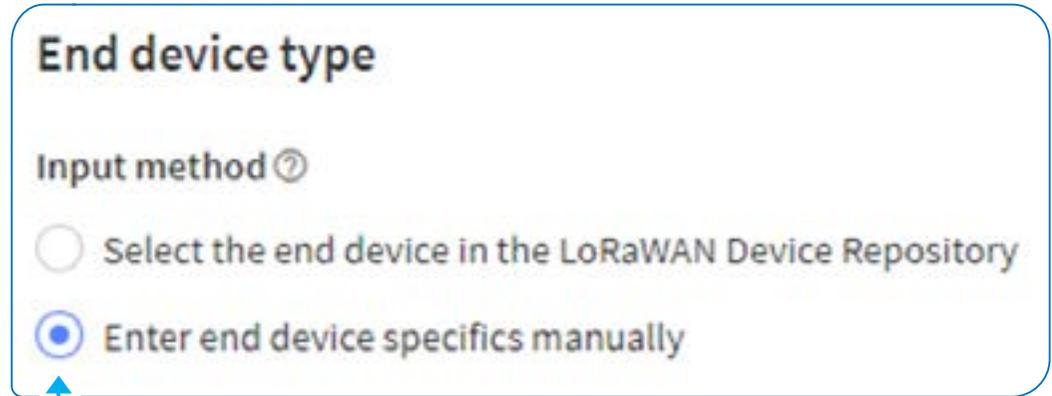
Join Mode is always OTAA as it's more secured than ABP.

After validating your new settings, your device will restart with these new settings.

14

5.3 Register your Satevis® device on TTN
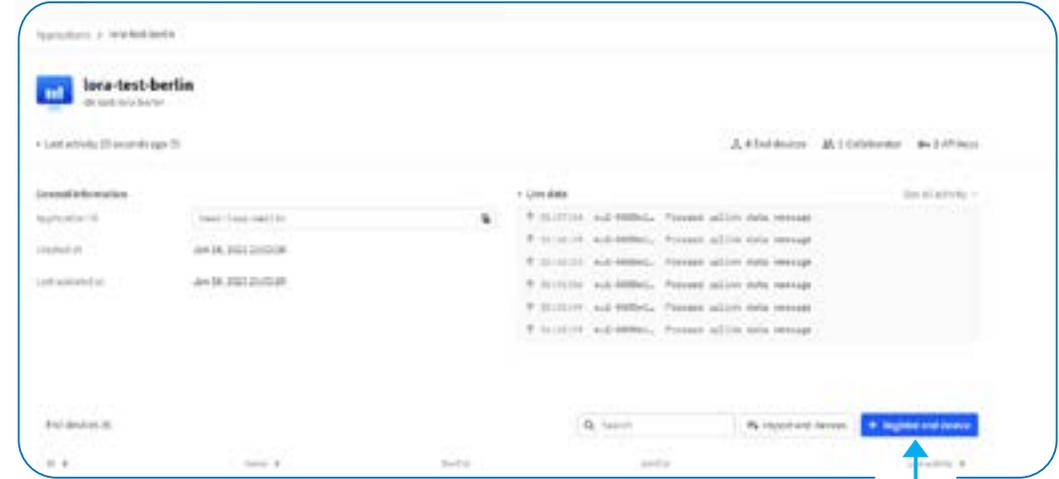
Click on Register end device

Click on Enter end device specs manually

15

Applications > lora-test-berlin > End devices

Register end device

Does your end device have a LoRaWAN® Device Identification QR Code? Scan it to speed up onboarding.

📷 Scan end device QR code   📖 Device registration help ⧉

End device type

Input method ⓘ
○ Select the end device in the LoRaWAN Device Repository
● Enter end device specifics manually

Frequency plan ⓘ *
Europe 863-870 MHz (SF9 for RX2 - recommended)   ∨

LoRaWAN version ⓘ *
LoRaWAN Specification 1.0.2   ∨

Regional Parameters version ⓘ *
RP001 Regional Parameters 1.0.2 revision B   ∨

Show advanced activation, LoRaWAN class and cluster settings ∨

Select your frequency plan Lorawan version is 1.0.2

RP001 Regional Parameters 1.0.2 revision B

Provisioning information

JoinEUI ⓘ *
01 01 01 01 01 51 55 67   Reset
This end device can be registered on the network

Enter your Join EUI

DevEUI ⓘ *
00 80 E1 01 01 51 55 64   ↻ Generate   3/50 used

Enter your Device EUI

AppKey ⓘ *
46 9C 45 FE 63 17 50 45 B6 56 A8 64 70 90 B1 32   ↻ Generate

End device ID ⓘ *
eui-0080e10101515564
This value is automatically prefilled using the DevEUI

After registration
● View registered end device
○ Register another end device of this type

Register end device

Register your end device

Enter your AppKey : you can use the default AppKey present on your satevis® device or click on generate to create a new one

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-SK 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.

Figure5-6 : When your Satevis® Sensor , is integrated with external alarm systems, the Hello function lets you test the connection by sending a short pulse to the alarm output ensuring proper functionality without triggering an actual alarm.

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-AL-PHA-INC-MR-PS.pdf

- Facing technical problems ?
Contact our technical support team at :

tech-support@beanair.com