



Rotary IQ

# INSTALLATION MANUAL

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**Senzary LLC**  
2114 N Flamingo Road #626  
Pembroke Pines, 33028  
[www.senzary.com](http://www.senzary.com)

**Phone:**  
1-833-SENZARY  
**Email Address:**  
support@senzary.com

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# Bob Assistant Overview

The Bob Assistant is a low-power LoRaWAN™ (a type of low-power, wide-area wireless network) compatible vibration sensor for indoor and outdoor predictive maintenance industrial applications, coupled with a temperature sensor for environmental conditions, a push-button, and an RGB LED light for user interface.



Bob Assistant **measures and analyzes vibrations, temperature, and movement** to detect abnormal behaviors for a wide range of industrial machines, with artificial intelligence **capable of detecting operating anomalies before a failure occurs**. Its “Edge AI” allows it to analyze the vibrations coming from your machine. This vibration data is then optimized and secured to guarantee the device’s ability to function independently for several years.

Equipped with a dust and waterproof casing, the Bob Assistant is very easy to install and **does not require any configuration**. Simply place the Bob Assistant on your machine, start it, and after a few hours of learning, it will be able to detect any abnormal behaviors from your machine.

## Tests and Qualifications :

CE marked product;  
Storage Class 1.2 ETSI EN 300 019 Part 1.1  
Transport Class 2.3 ETSI EN 300 019 Part 1.2  
Use Class 5.2 ETSI EN 300 019 Part 1.5

## Radio :

LoRa SF6-SF12  
LoRa 1.0 Class A, Class C (compatible)  
LoRa sensitivity: -137 dBm

## Temperature ranges :

Storage: -40°C to +85°C  
How it works : -20°C to +50°C

## Case :

Enclosure IP 68 Polyamide  
Borrowing: 76 x 79 x 23 mm (incl. fixing lugs)  
Weight: 75 grams

## Sensor :

Accelerometer and 6-axis gyroscope  
Embedded temperature sensor  
Sampling frequencies: 800Hz and 25 600Hz  
Vibration measurement from 0Hz to 12400 Hz

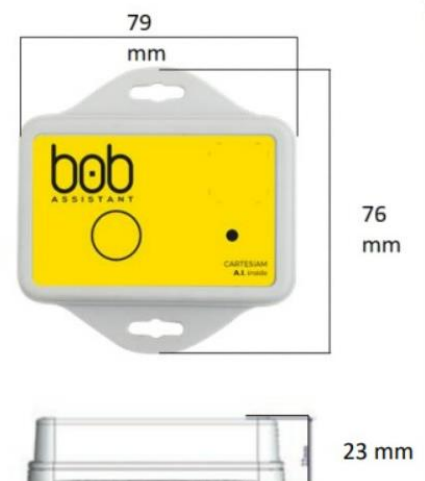
## Firmware :

Automatic learning and reporting by embedded Artificial Intelligence by Cartésiam  
Alarm Threshold on vibration anomaly  
Peak frequency and FTT reports  
Restart or complete learning  
Setup reporting period

## Power supply :

AA 2000mAh battery (replaceable)

Nominal autonomy : > 2 years  
(2 samples every 5 minutes and 8 transmissions per day)



# Purpose Of Predictive Maintenance

When a machine starts breaking down, vibration drift is the first measurable symptom:

## Symptom

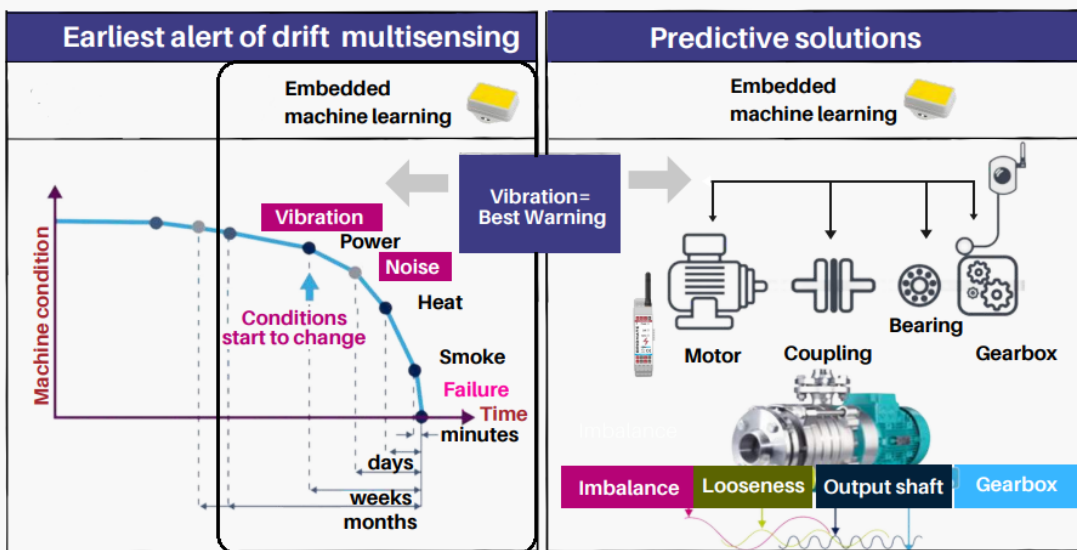
Machines communicate their deteriorating situation: Ultrasound, Vibration, Noise, Heat. The problem is that people cant listen. But our sensors do. And machine learning helps identify and predict the failures



## Rotary IQ is the solution to listen to your machines.

Power, energy, vibrations, ultrasound, shock, accelerometer, temperature, humidity

- Early detection
- Wireless
- 50-500 m
- Months of battery
- Remote diagnostic
- Machine learning



The Bob sensor uses AI to predict when equipment breakdowns might occur. In the process, saving costs in machine evaluations.

However, a distinction must be made between breakdowns due to wear and tear (slow drift) and breakage (fast drift). In certain cases, the vibration/movement/temperature anomalies can occur only a few days before the failure. Your maintenance team will be able to analyze and intervene on the equipment when the Bob Assistant reports an anomaly.

# Differentiating Factors Of The Bob Assistant



## SIMPLE

Unlike traditional predictive maintenance sensors, the Bob Assistant has zero infra, zero wiring, and zero configuration. To install Bob, simply place it on your equipment. Bob can then work autonomously for several years.



## INTELLIGENT

Bob uses its AI to learn quickly and learn well! It applies analysis algorithms embedded in its sensor to understand and monitor all of your equipment.



## CONNECTED

Bob communicates across LoRaWAN® networks, perfectly adapted to the Internet of Things (IoT). The maximum range for minimal energy consumption and long battery life!



## SECURED

Your equipment production data is safe with Bob. It retains it and sends only encrypted scan reports.

| WHAT BOB DOES  | WHAT BOB DOES NOT DO  |
|--|---|
| <ul style="list-style-type: none"> <li>• Measuring operating time</li> <li>• Detecting vibration drifts in relation to a <b>reference</b></li> <li>• Predicting the levels of drift in the more or less long term</li> <li>• Sending alarms</li> </ul> | <ul style="list-style-type: none"> <li>• Diagnosing the cause of a failure (bearing, belt, etc.)</li> <li>• Send raw vibration data</li> <li>• Store raw data</li> <li>• Repairing the fault</li> </ul> |

# 1) Quick Start-up Guide

## 1.1 What's in the box

- KERLINK IFEMTOCELL Gateway 1x
- NKE- Bob Assistant 1x
- Magnets and nuts for Bob Assistant 2x

## 1.2 Setting up your device online – IOTLOGIQ SETUP

This video will show you

- Setting up an account
- Adding your Bob sensor
- Using your mobile app
- Configure alerts and reports



Click on image for video

### 1.2.1 Account and location (company address) creation





#### Sign Up

First Name

Last Name

Email

Password 

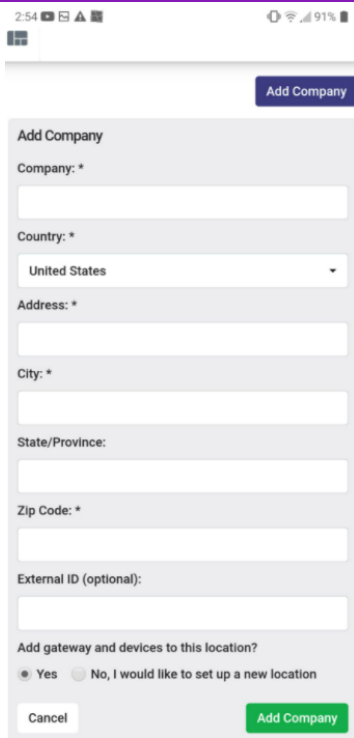
 Mobile Phone Number

I agree to the [Terms of Service](#)

**NEXT**

[Sign In](#)

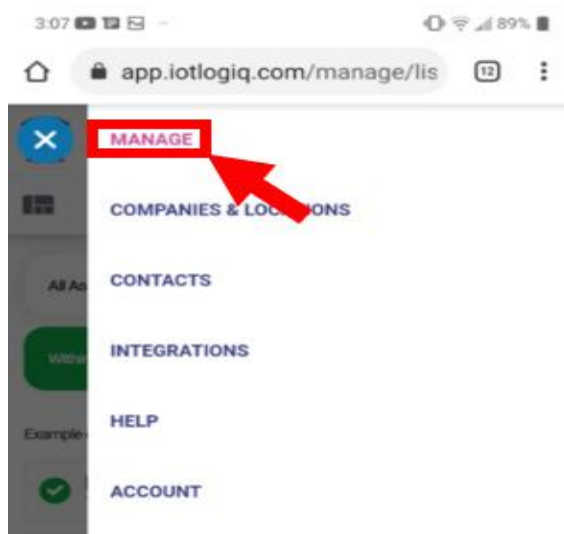
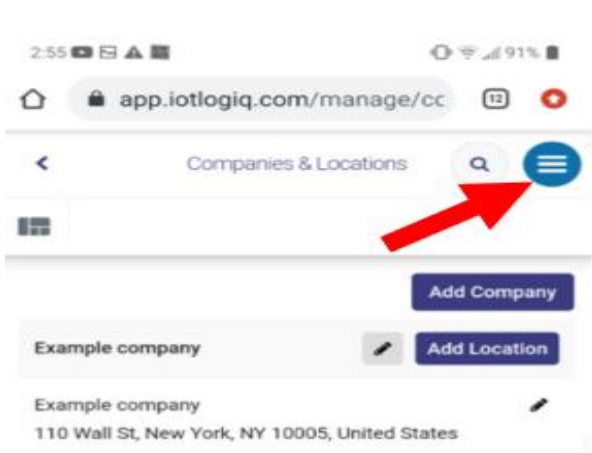
To add and view data and performance of any sensors provided by Sensary LLC, first create an account at [app.iotlogiq.com](http://app.iotlogiq.com)



Include your company information and location to continue. This will allow you to allocate, track and manage all devices in your specified location.

At least ONE location must be created to associate a sensor to the account

### 1.2.2 Adding devices to the selected location

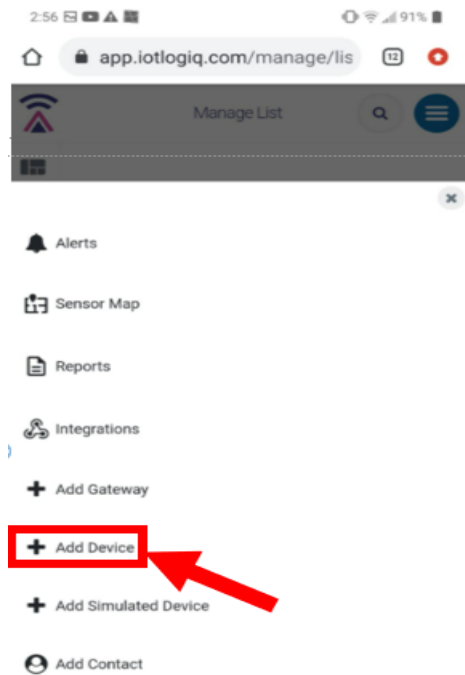
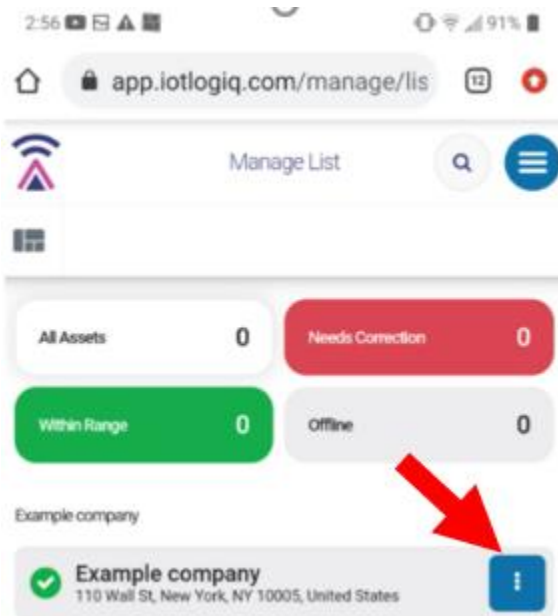



To add the Bob Assistant sensor to the list of devices used by your company, go to the **MANAGE LIST** page. Here you will be able to manage and track the performance of each device. To access this, click on:



icon on the upper right side and click on **MANAGE**.

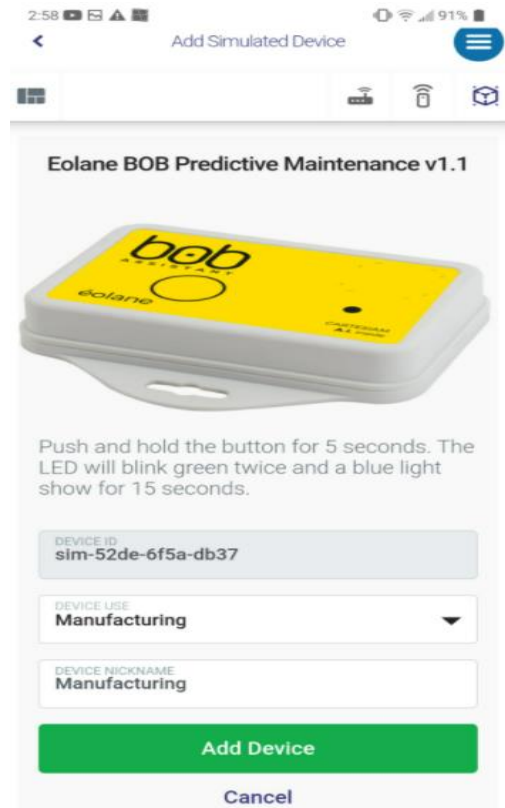
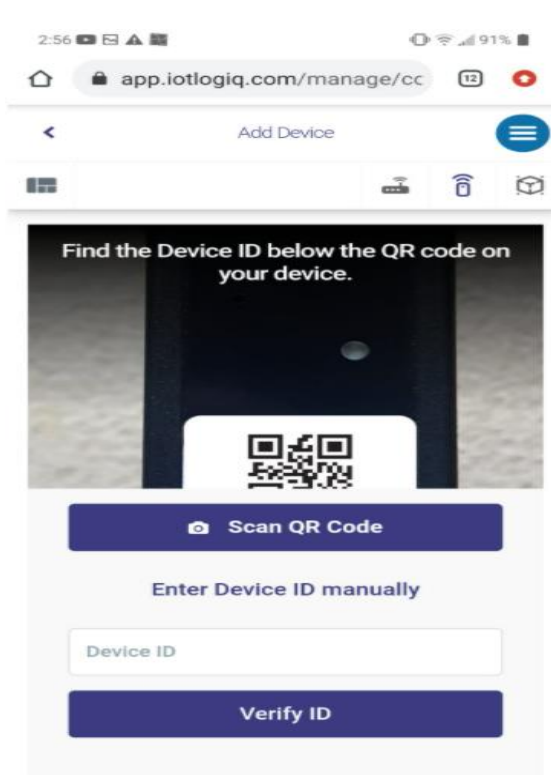




To set up the Bob Assistant sensor to your company, tap on the  button. Then tap on the option.

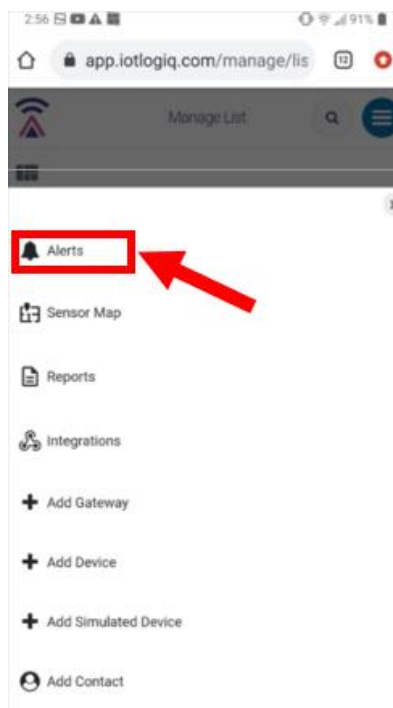
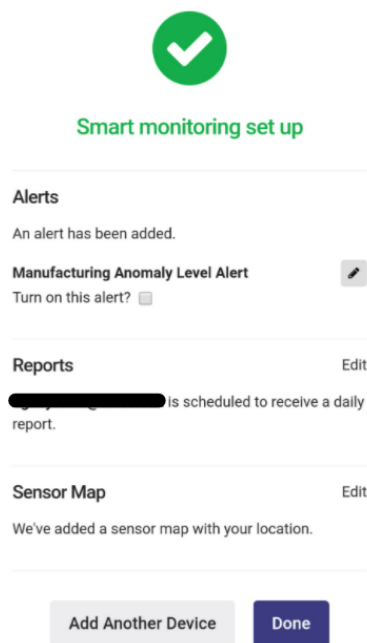
### + Add Device



You will then be taken to an Add Device page. Scan the QR code or enter the Device ID to add the sensor.



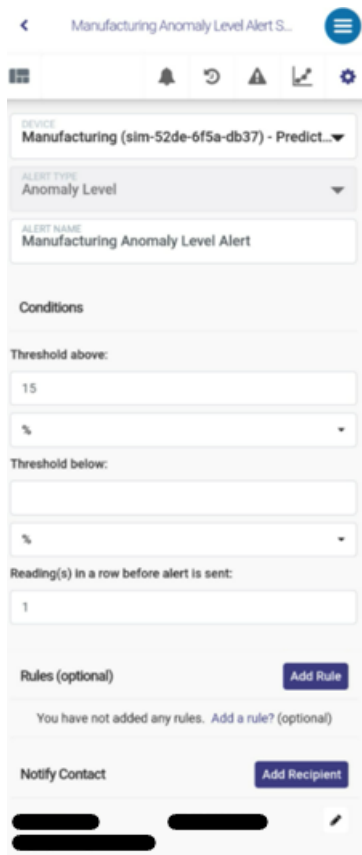


### 1.2.3 Setting up the alert system



You will then be directed to the **Smart monitoring set up** page, where you can edit alert and report settings. An alternative way to set up and edit alerts is to return to the **MANAGE** page by tapping on the  icon on the upper right side. Here, tap on the  button for your device, and then the

 **Alerts** button. Then add or edit an alarm.



The **Anomaly Level Alert Settings** page allows for editing of alert notifications sent to you.

**Alert name:** Create names for the type of alert being set up.

**Threshold above:** If vibration and temperature go above the listed percentage of the norm, an alert notification will be set off.

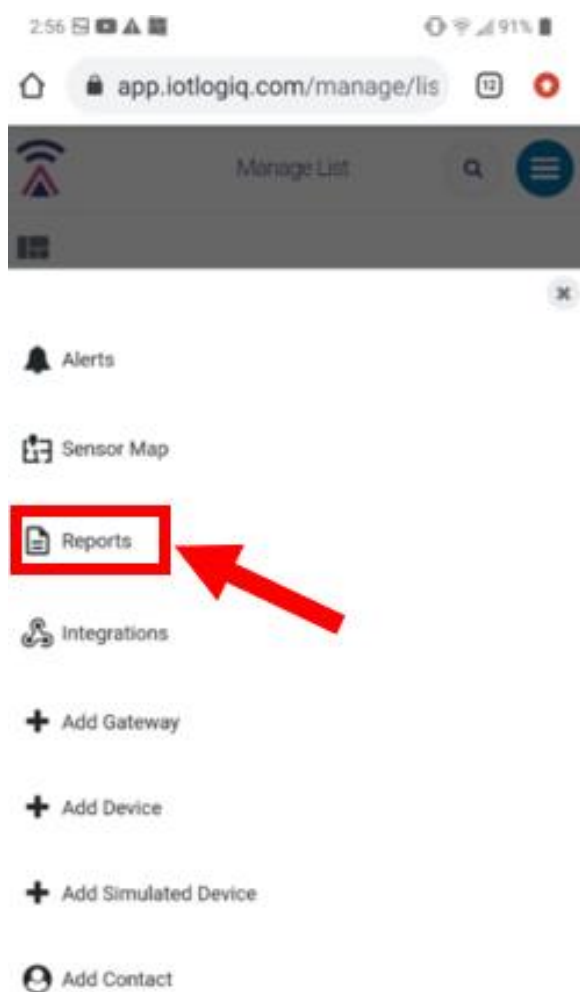
**Threshold below:** If vibration and temperature go below the listed percentage of the norm, an alert notification will be set off.

**Reading(s) in a row before alert is sent:** Change the number of times an anomaly in vibration/temperature/movement has to go above or below the threshold for an alarm to be sent

**Rules (optional):** Specific conditions for the alert to be set off can be edited here




**Notify Contact:** Set up who receives notifications here

## 1.2.4 Setting up the report system

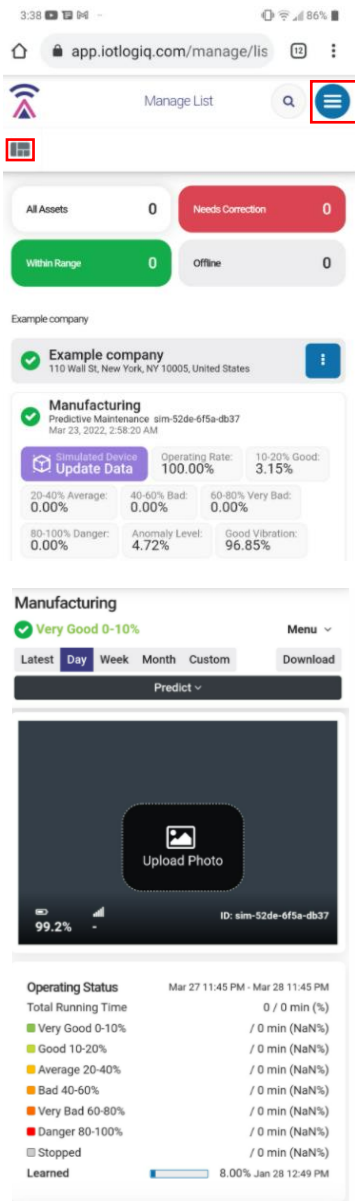



The screenshot displays the configuration page for a 'Summary Report'. The page includes the following sections and controls:

- REPORTS:** A dropdown menu set to 'Summary Report'.
- LOCATIONS:** A dropdown menu set to 'Example company - 110 Wall St, New York, NY...'.
- REPORT NAME:** A text field containing 'Example company Summary Report'.
- Frequency:** A section for configuring the report's frequency.
- Send Report:** A dropdown menu set to 'Daily'.
- Select Time:** Time selection controls showing '07' for the hour and '00' for the minutes, with 'AM' selected.
- Custom Message:** A text input field for a custom message.
- Devices & Reading Times:** A section for selecting devices and setting reading times.
- Choose Devices:** A dropdown menu set to 'Manufacturing (sim-52de-6f5a-db37)'.
- Manufacturing:** A button labeled 'All available reading times' and another labeled 'Set Reading Times'.
- Recipients:** A section for adding recipients, with an 'Add Recipient' button and two redacted recipient names.
- Bottom Bar:** Three buttons: 'Cancel', 'Delete Report', and 'Save'.


The Summary Report page allows you to edit the type of report received and the frequency it is received. To access the summary report page, return to the **MANAGE** page by tapping on the  icon on the upper right side. Here, tap on the  button of your device, and then the  Reports button. Then add or edit a report.

## 1.2.5 Tracking the Bob Assistant



To view the status of all devices added, tap the  icon on the upper right side. Then tap **MANAGE**. Then tap on your company name to view all devices associated with said company.

Tap on your device to see detailed and historical reports given by the Bob Assistant.

To view more detailed data in the form of columns, click on the  icon on the upper left side of the **MANAGE** page.

Select your device on the list of options shown.

The dashboard shown allows you to download data, view the operating status, view reports, anomaly distributions, and average unnatural vibration reports.

## 1.3 Gateway installation guide

The gateway serves as a wireless access portal that allows the Bob Assistant to connect to the cloud. Without it, you will not be able to access your device online. With its LoraWancompatibility, the gateway can be placed up to 100 meters away from the Bob Assistant.

To access the internet, the device can be connected in the following ways:

-Through Ethernet connection: Plug the gateway into an ethernet connection through an RJ45 cable (not included)

-Through a 4G/3G cellular connection (only applicable for select gateways): Insert a USIM (not included) with a data subscription (not included) to the gateway

*Note that both configurations can be used in parallel.*

**Example:**



Ethernet cable, power supply and LoRa antenna connections



USIM card inserted

Once the LoRa RF antenna, the Ethernet cable (if used) or the 4G/3G (with USIM card inserted) and the power supply jack connector are plugged, the Wirnet™ iFemtoCell-evolution can be powered ON by connecting the power supply.

**1.3.1 LED**



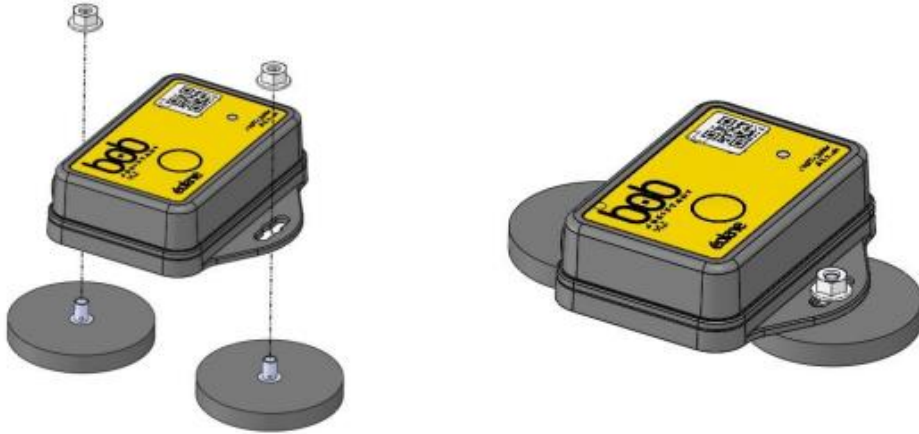
If both LED 1 and LED 2 are solid green and do not blink, the device is operational.

For more information on interpreting the gateway's LED lights see [§3.3.7 How do I interpret the gateway's LED lights?](#)

## 1.4 Bob Assistant assembly

### 1.4.1 Magnets - default configuration

Bob Assistant is delivered with a magnet kit, so you can put your device on your machine out of the box. To assemble, follow the image below:



Default configuration: -

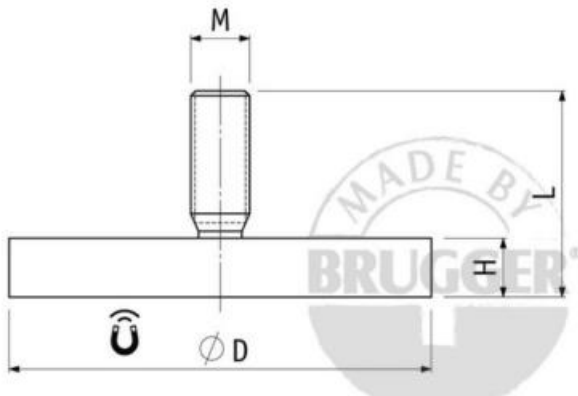
Magnet (x2):

- Manufacturer: BRUGGER MAGNET
- Reference: A22AG-KsM4x6

Nut (x2):

- Manufacturer: BOSSARD
- Reference: BN11207 / 3061765

Validated references:



These magnet references have been successfully tested as compliant with ETSI 300-019 class 5.2 when mounted on Bob ASSISTANT.

**Class 5.2:** all types of road vehicles used in areas with a well-developed road system, except tracked vehicles, motorcycles, scooters, and other vehicles with low mass. The equipment can be mounted on surfaces that may be subjected to flying stones. The equipment may be mounted on passenger car instrument panels to which high-frequency vibrations from the engine, or from other parts connected to the engine, may be transmitted. This class also applies to forklift trucks and trains with soft suspension and shock reducing buffers

| Manufacturer | Reference    | Pull Force (kg) | Size (DxHxL / M)     | Comments                                     |
|--------------|--------------|-----------------|----------------------|--|
| BRUGGER      | A43AG-KsM4x6 | 10              | 43x6x12mm / M4x6     | Rubber coated magnet (outdoor use, max 60°C) |
| BRUGGER      | A22AG-KsM4x6 | 6               | 22x6x12.5mm / M4x6.5 | Rubber coated magnet (outdoor use, max 60°C) |
| ECLIPSE      | E1053/NEO    | 14              | 20x6x15.5mm/ M4x9.5  | Neodymium magnet (indoor use, max 80°C)      |
| ECLIPSE      | E1054/NEO    | 20              | 25x7x16.5mm / M5x9.5 | Neodymium magnet (indoor use max 80°C)       |

## 1.5 Quick installation guide



Click on image for video

**To install the Bob Assistant, simply place it on the device you're measuring.**

The first step when you install Bob ASSISTANT on a machine you want to monitor will be to start the device, and make sure that:

- o the LoraWanNetwork is reachable ( TWO GREEN LIGHTS ON YOUR GATEWAY )
- o there is a certain vibration level of the machine

Refer to [§ 1.5.1 Turning Bob Assistant ON](#) for further instruction on how to turn the device on

**Please be advised:**

**o if the vibration level was high enough at startup, but then is going below the minimum level of detection in the first 7 days, the device might get stuck in a Learning Session. In this case, we suggest changing Bob location on the machine to put it as close as possible to the vibration source, or on a less vibration-insulated element.**

**o If a new machine cycle appears after the first seven days (e.g. production rate increase), it might be considered by Bob ASSISTANT as an anomaly. In this case, you will have to send a Downlink command to Bob ASSISTANT in order to add this cycle to the dataset.**

Note: Bob Assistant can learn up to 32 different patterns of operation. It will learn automatically during first SEVEN days, but you can also send a message to add a new learning pattern if a new operating scheme will be added. ( different material, additional speed or other change affecting the performance of the motor being monitored )



### 1.5.1 Turning Bob Assistant ON

To turn the device on, push and hold the button for 5 seconds. The LED will blink green twice and a blue light will show for 15 seconds.

Bob ASSISTANT is OFF by default when delivered. In order to start Bob ASSISTANT, you need to:

- Place Bob ASSISTANT on the machine you want to monitor (see [§1.4 Assembling Bob Assistant](#), [§2.1 Bob Assistant Assembly Options](#))
- Turn the device ON by pushing on the button for more than 2 seconds, the LED will then blink twice in green. You can then release the button, the device is ON

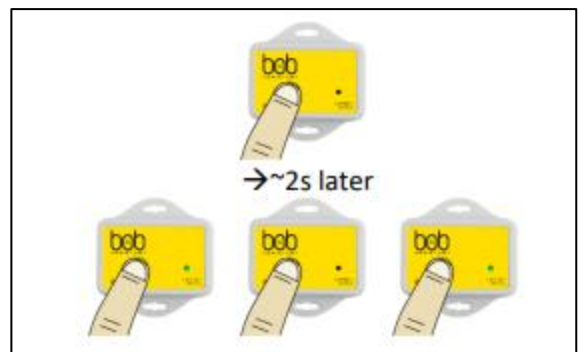
Once switched ON, Bob Assistant starts its initialization mode.

It then tries to reach the LoRaWAN Network using OTAA (Over The Air Activation) and ensures that the minimal perceived vibration level is sufficient ( $>0.01g$ ). During this mode, the LED is continuously blue ( ).

The initialization mode lasts for around 1 minute and 35 seconds (depending on LoRaWAN Network coverage) At the end of this initialization mode, if the device has reached the Lora Wan Network, and the perceived vibration level of the machine is sufficient ( $>0,01g$ ), then the device will blink 5 times in green , the LED will stay OFF and Bob Assistant is ready to start its duty and enter the Learning mode (see [§2.2.1 Learning stages](#))

Bob Assistant will then send a state message to warn that the device has started, and everything works fine.

Turn Bob Assistant ON  
(2 green LED blinks)



Start up and initialization  
(Continuous blue LED)



End of initialization  
(5 green LED blinks)





**Ensure that the machine connected to the Bob Assistant is vibrating. The device is going to try to connect to the LoRaWAN network 6 times. If it does not connect after 3 hours, try to reset the device by pushing the BUTTON for 15 seconds.**

(For troubleshooting help, see [§2.2.4 Troubleshooting](#))

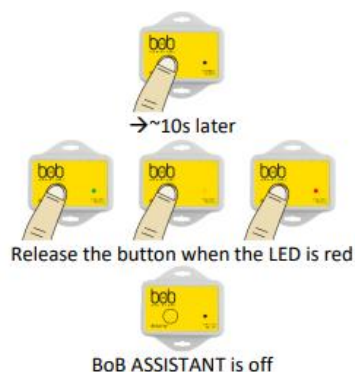
### 1.5.3 Turning Bob Assistant OFF

In case you need to move Bob Assistant from one machine to another and reset the vibration learning, it is possible to turn Bob Assistant off.

To do so, push the button for ~10/12s, until you see the green/yellow/red sequence on the LED. Once the LED is red, you can release the button, the device is off

Turn Bob Assistant is OFF (green->orange->red)

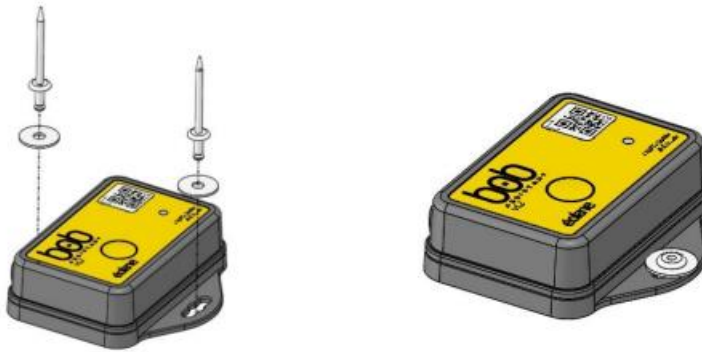
To turn Bob Assistant back on, follow the steps described in [§1.5.1 Turning Bob ASSISTANT ON](#)



## 2) Installation and configuration

### 2.1 Bob Assistant assembly options

#### 2.1.1 Rivet

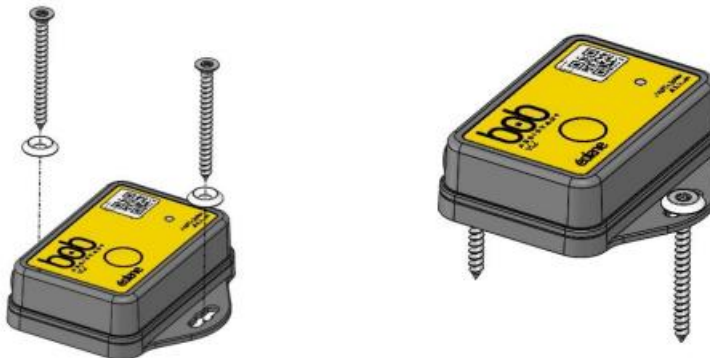


Rivet properties:  $\varnothing$ 4mm, length 7/10.2/13.3mm

Drilling:  $\varnothing$ 4.1mm /  $\varnothing$ 4.2mm

| Manufacturer | Reference          | Comments    |
|--------------|--------------------|-------------|
| BOSSARD      | BN 84545 / 8031215 | Ring washer |
| BOSSARD      | BN 1409 / 3206579  | Rivet       |

#### 2.1.2 Screw



| Manufacturer | Reference  | Comments                  |
|--------------|------------|---------------------------|
| BENE INOX    | 211309     | TF TORX 4x45mm wood screw |
| WURTH        | 0455000304 | Cup washer                |

### 2.1.3 Fixation plate

In order to fasten Bob ASSISTANT on a circular surface, a fixation plate has been designed. It can be fastened using hose clamps:



Default configuration:

- Fixation plate (x1):

- Manufacturer: EOLANE
- Reference: EOM1000200

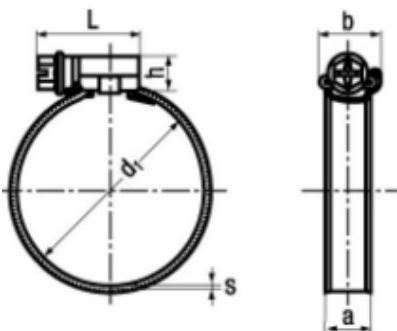
- Hex socket head cap screw M4x6 (x2)

- Manufacturer: BOSSARD
- Reference: BN 612 - 1208152

- Serrated lock washer M4 (x2):

- Manufacturer: BOSSARD
- Reference: BN 4880 – 1184040

Hose clamps references:



max value for width (a) = 15mm

| Manufacturer | Reference (family)  | Width (mm) | Comments            |
|--------------|---------------------|------------|---------------------|
| BOSSARD      | BN 20568 - DIN 3017 | 9          | European store      |
| BOSSARD      | BN 20569 - DIN 3017 | 12         | European store      |
| BOSSARD      | BN 949 - DIN 3017   | 9          | European / US store |
| BOSSARD      | BN 950 - DIN 3017   | 12         | European / US store |

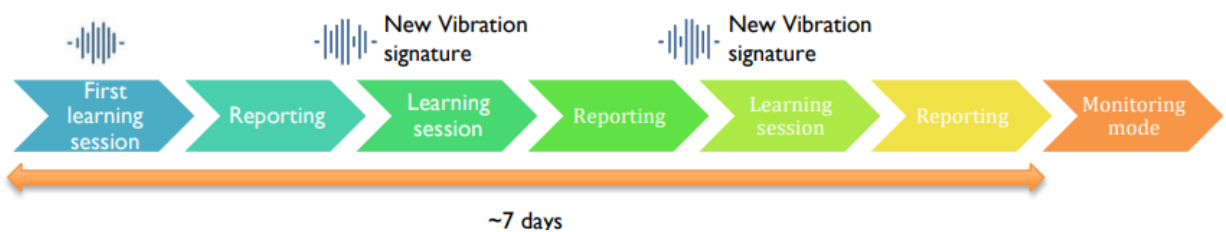
## 2.2 Bob Assistant fundamentals

### 2.2.1 Learning stages

Once the Bob Assistant is installed, it will start to learn the machine cycle(s). The Bob Assistant will start its first learning sessions which will last for a few hours (~1 to 4 hours for a machine with a simple vibration cycle, e.g. Air Conditioning unit).

In the next first seven days of operation, Bob Assistant will continue to its second learning session. This session takes ~7 days and will continue to monitor new vibration signatures and add them to the dataset.

**During a learning session, Bob Assistant will wake up every 60 seconds** (default values configurable). The device will also send messages to keep you posted on the learning percentage (0 to 100%).

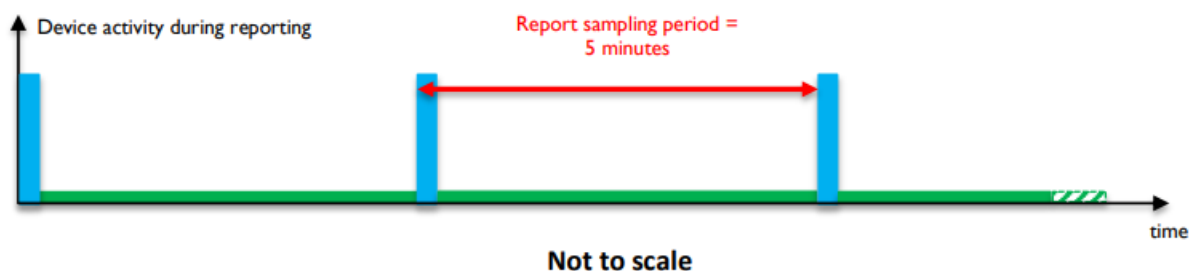


### 2.2.2 Reporting mode

After the first Learning session, Bob ASSISTANT will switch to the reporting mode, where it will analyze the machine vibration every 5 minutes:

Bob ASSISTANT will process each sample to define whether a new learning session is needed, or to prepare a report of the activity sent in periodic reports (every 3 hours, not configurable) concerning the health of the machine during this period, regarding:

- the operation time of the machine,
- its vibration level,
- the vibration drift percentage,
- and prediction on potential failure distance in time, based on the vibration analysis of the last 24 hours, the last 30 days, and the last 6 months



**The system will also report immediately when the machine starts and stops.**

## 2.2.3 Monitoring


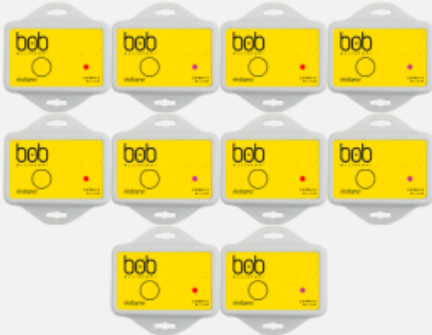

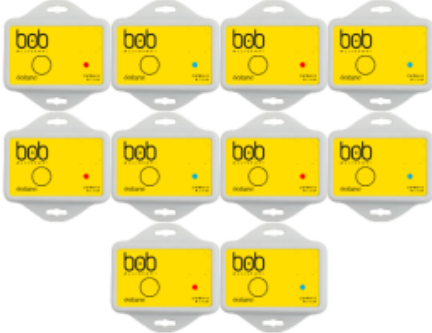

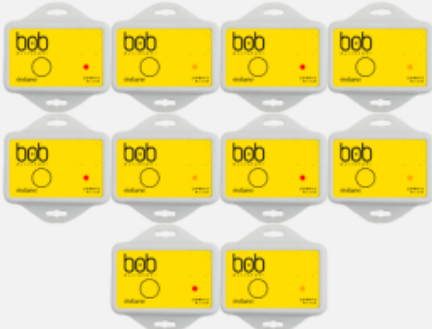
After the learning mode, Bob ASSISTANT will switch to Monitoring mode, where it will continue its reporting activity, and will start sending alarms if the drift in the vibration signature pass a defined threshold (default value is 25% drift).

For each signal sampling (every 5 minutes by default), Bob ASSISTANT will process the sampled signal, and compare it to its dataset.

## 2.2.4 Troubleshooting

**Please be advised: If the LoraWan Network was unreachable or if the vibration level is below the minimum level, the device will not start its duty, but will go back to deep sleep mode. To restart the device, follow [§1.5.1 Turning Bob Assistant on](#)**

The following table summarizes the different sequences displayed by the LED, depending on the origin of the problem:

| Origin of the problem  | Corresponding LED sequence on BoB ASSISTANT  | Problem solving   |
|--|--|---|
| <p>LoRaWAN™ Network unreachable</p>             | <p>5x ●●</p>   | <ul style="list-style-type: none"> <li>- Check device declaration on the LoRaWAN™ Network Server (NS), make sure that DEV_EUI, APP_EUI and APP_Key are all correctly declared on the NS. If you did not receive the keys for your device, please contact us.</li> <li>- Check Network coverage on the BoB ASSISTANT installation location. If BoB ASSISTANT is out of range, you can either add a gateway if you run your own network, or contact your operator to check for solutions</li> </ul> |
| <p>Vibration level below the minimum level</p>  | <p>5x ●●</p>  | <p>Change BoB ASSISTANT location on the machine, and try to put it as close as possible to the vibration source, or on a less vibration-insulated element. BoB ASSISTANT perceives vibrations of very low amplitude (minimum 0.01g), there is surely a suitable place!</p>  |
| <p>Hardware problem</p>                         | <p>5x ●●</p>  | <p>In this case, BoB ASSISTANT must be replaced and we invite you to contact our support team</p>   |

# 3) Frequently Asked Questions

## 3.1 Which type of equipment is well suited for Bob ASSISTANT?

Bob ASSISTANT measures the vibrations of a machine and analyses its evolution over time. Vibration signature deviations are detected in real time and an alert is sent if the deviation exceeds a 25% threshold. In addition, the projections predict the level of anomaly in the coming weeks/months.

Bob ASSISTANT will also work very well on equipment with one or several stationary vibration regimes.



Air Compressor



Motor



Air conditioning group



Oven



Pump



Suction turbine



Central air treatment



Stove

On the other hand, equipment in motion or exhibiting random or time-varying vibration regimes will not be eligible for the Bob ASSISTANT offer:



Rolling/Moving stocks



Automated arms



Machine-tool / short cycles

## 3.2 What is the temperature limit?

The surface temperature of your equipment must not exceed 55°C.

## 3.3 When should Bob ASSISTANT be installed on the equipment?

Bob ASSISTANT performs a vibration signature training during the first 7 days after it is turned ON. During this period, it is crucial that the vibration signature is as close as possible to normal/representative machine operation. It is therefore strongly recommended to start Bob ASSISTANT on new equipment or most commonly, shortly after a maintenance operation..

### **3.4 Can we start Bob ASSISTANT on a machine that is not running?**

If your machine is stopped during installation, you can still position Bob ASSISTANT and start it. The learning procedure will start when the equipment is back on. You must still make sure that the vibration is sufficient at this position. In case of doubt, it is preferable to install Bob ASSISTANT on a machine in operation.

### **3.5 Can Bob ASSISTANT or the machine be moved without disrupting its operation?**

No. The learning of the vibration signature is closely linked to the positioning of the sensor on the machine, its orientation and its environment. Changing these conditions requires relearning which can be done by turning the product OFF and then back ON.

The addition of a vibrating machine near the monitored equipment can also disrupt the operation of Bob ASSISTANT and cause additional alerts.

### **3.6 What is the autonomy of Bob ASSISTANT sensors?**

In its standard use, Bob ASSISTANT's autonomy is a minimum of 2 years. The autonomy of Bob is estimated by counting the number of messages sent, in addition to embedded calculus. It is therefore not nominal because, depending on its use, a greater or lesser number of alerts may be sent.

If your machine has many stop and start cycles during the course of a day, the start/stop messages will be numerous and will have a strong impact on Bob ASSISTANT's autonomy. Beyond 8 start/stop per day, it is recommended to disable these messages. The time and operating rate will always be available in the reports sent every 3 hours.

In its normal operation, Bob ASSISTANT's autonomy is a minimum of 2 years.



### 3.7 How do I interpret the gateway's LED lights?



| LED                  | Specification  |                        |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|----------------------|--|------------------------|------------------------|-------------|--------|-------------|-----------|-------------|--------------------|----------|-----|---------------------|-----------|--------|--------------------|----------------|-------------------|---------------|-------------------|
| LED 1: Power/ Status | A solid Green for Power LED<br>A Status Red LED  |                        |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | <table border="1"> <thead> <tr> <th>Gateway Status</th> <th>"Status LED" Behaviour</th> </tr> </thead> <tbody> <tr> <td>Boot part 1</td> <td>Fix on</td> </tr> <tr> <td>Boot part 2</td> <td>Heartbeat</td> </tr> <tr> <td>Boot part 3</td> <td>Blink every second</td> </tr> <tr> <td>Run time</td> <td>Off</td> </tr> <tr> <td>Power down sequence</td> <td>Heartbeat</td> </tr> <tr> <td>Update</td> <td>Blink / 0.4 second</td> </tr> <tr> <td>Restore backup</td> <td>Blink / 2 seconds</td> </tr> <tr> <td>Restore stock</td> <td>Blink / 4 seconds</td> </tr> </tbody> </table> | Gateway Status         | "Status LED" Behaviour | Boot part 1 | Fix on | Boot part 2 | Heartbeat | Boot part 3 | Blink every second | Run time | Off | Power down sequence | Heartbeat | Update | Blink / 0.4 second | Restore backup | Blink / 2 seconds | Restore stock | Blink / 4 seconds |
|                      | Gateway Status   | "Status LED" Behaviour |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Boot part 1  | Fix on                 |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Boot part 2  | Heartbeat              |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Boot part 3  | Blink every second     |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Run time   | Off                    |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Power down sequence  | Heartbeat              |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Update   | Blink / 0.4 second     |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
|                      | Restore backup   | Blink / 2 seconds      |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
| Restore stock        | Blink / 4 seconds  |                        |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
| LED 2: Backhaul      | <p>RED during boot</p> <p>If the installed « applicative software » has been provided by Kerlink :</p> <ul style="list-style-type: none"> <li>• RED if applicative software is disconnected</li> <li>• GREEN blinking during applicative software connection</li> <li>• GREEN fix if applicative software is connected</li> </ul>  |                        |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |
| LED 3: LoRa Data     | <p>RED during boot</p> <p>If the installed « applicative software » has been provided by Kerlink is installed:</p> <ul style="list-style-type: none"> <li>• Applicative software management</li> <li>• Rx: GREEN blinking</li> <li>• Tx: RED blinking</li> </ul>   |                        |                        |             |        |             |           |             |                    |          |     |                     |           |        |                    |                |                   |               |                   |

## 3) Customer Support

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For additional information or if you need any assistance to use the product, please contact our customer support.

**Schedule a meeting with our customer support agents here:**

[Schedule a meeting link](#)

**Contact us:**

Phone: 1-833-SENZARY

Email Address: [support@senzary.com](mailto:support@senzary.com)

<https://www.senzary.com/contact-us/>