User Guide | TEMP / TEMP2S ARF8180AR_ | LoRaWAN EU863-870

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Etat	Terminé
Zone	

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PRODUCTS AND REGULATORY INFORMATION

💡 This document applies to the following products :

TEMP ARF8180ARA LoRaWAN 863-870 with ambient probe and remote probe
TEMP ARF8180ARB LoRaWAN 863-870 with two external probes

Part numbers: ARF8180ARA and ARF8180ARB

APP version: 1.2.X

Document Information	
Title	TEMP/TEMP2S ARF8180AR LoRaWAN EU863-870 - User guide
Document type	User Guide
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DOCUMENTATION GUIDE

PREAMBLE

DISCLAIMER

TECHNICAL SUPPORT

RECOMMENDATIONS

INTRODUCTION

https://s3-us-west-2.amazonaws.com/secure.notion-static.com/d02fec75-85b2-42df-9318-8eba4803ad00/EU_declaration_of_conformity_(TEMP_LoRaWAN_CE868_ARF8180AR).pdf

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1. PRODUCT PRESENTATION

IMPORTANT NOTE: The TEMP LoRaWAN 863-870 can be started with a magnet or switching the product in PRODUCTION mode using the IoT Configurator.

1.1. General Description

The TEMP is a ready-to-use sensor that allows measuring temperatures and transmitting them over a wireless network.

This product is available in two versions: one version includes an ambient temperature probe and a remote contact temperature probe, and another version includes two remote temperature probes.

These products meet the needs of users who want to remotely monitor the internal and external temperatures of a storage room, cold rooms, or any spaces requiring a product resistant to varying environmental conditions.

The use of the LoRaWAN protocol allows integrating the TEMP into any existing network.

The product transmits sensor data either periodically or event-based, triggered by exceeding high and/or low thresholds.

The configuration of the transmitter can be accessed by the user locally via a USB-C port or remotely via the network, allowing for choices in transmission modes, periodicity, and trigger thresholds.

The TEMP is powered by either a replaceable internal battery or an external power supply.

The product is compatible with Class C of the LoRaWAN network and can be used on this class if powered by external power supply.

This product is compatible with Adeunis' **Device Management** platform KARE and the KARE+ service for **Over-The-Air** updates of a sensor fleet. This Adeunis sensor management offering allows for **operational cost optimization** by timely on-site interventions and avoiding unnecessary travels, **strengthening a business model** by ensuring product longevity and adjusting configurations, and **enhancing end-customer satisfaction** by enabling uninterrupted service delivery.

1.2. Features

- Two available product versions for temperature measurement and identification of losses:
  - 1 ambient probe + 1 remote probe
  - 2 remote probes
- Periodic or threshold-based alarm modes
- Configurable keep alive frame
- Local or remote configuration
- Timestamping

- Network test at startup
- Join phase customization
- Integrated mounting system: DIN rail, tube, wall, clamp

NOTE 1

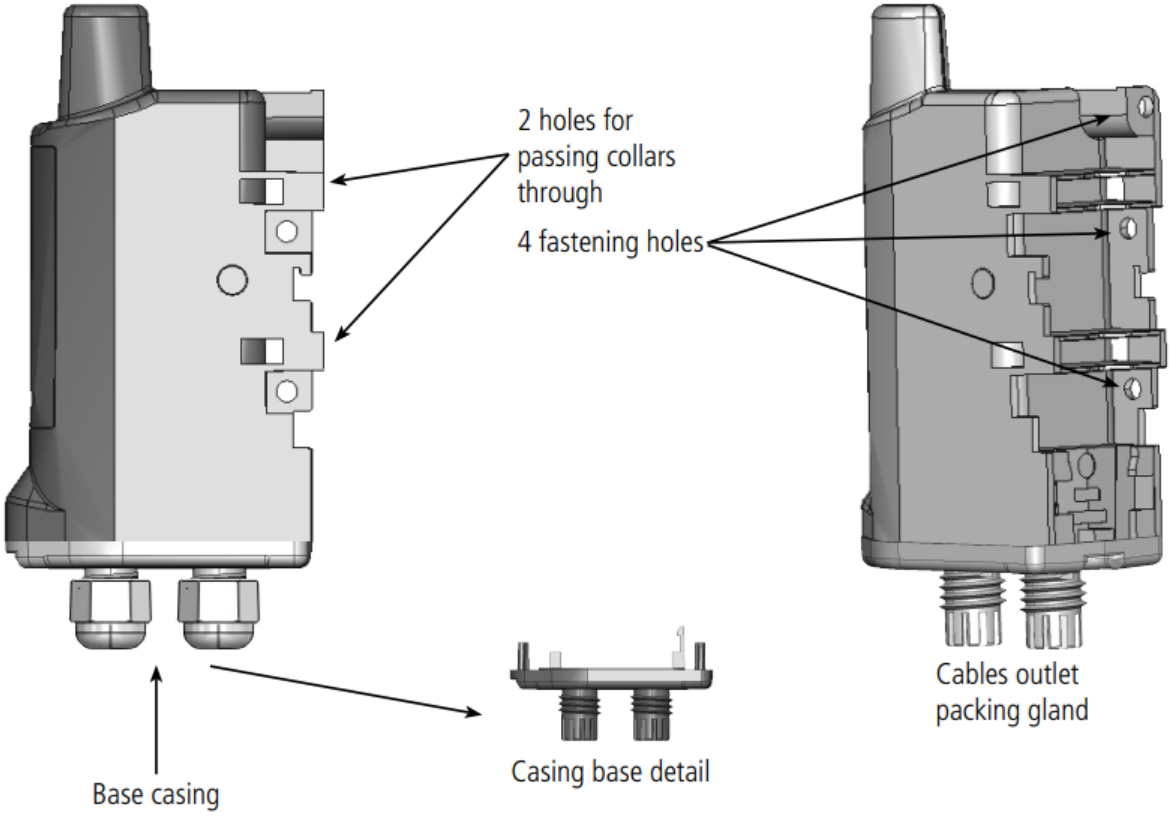
The TEMP comes by default with an Over-The-Air Activation (OTAA) configuration, allowing the user to register their product with a LoRaWAN operator.

1.3. Package content

The product is delivered in a cardboard package and includes the following items:

- Upper casing, electronic board, casing soleplate, and battery pack
- 2 Torx 10 screws for the soleplate
- Cable gland locknut and 2 cable gland seals

1.4. Casing presentation



1.4.1 Environmental Conditions and Protection Rating

The product enclosure has been tested to ensure a certain level of dust and water resistance.

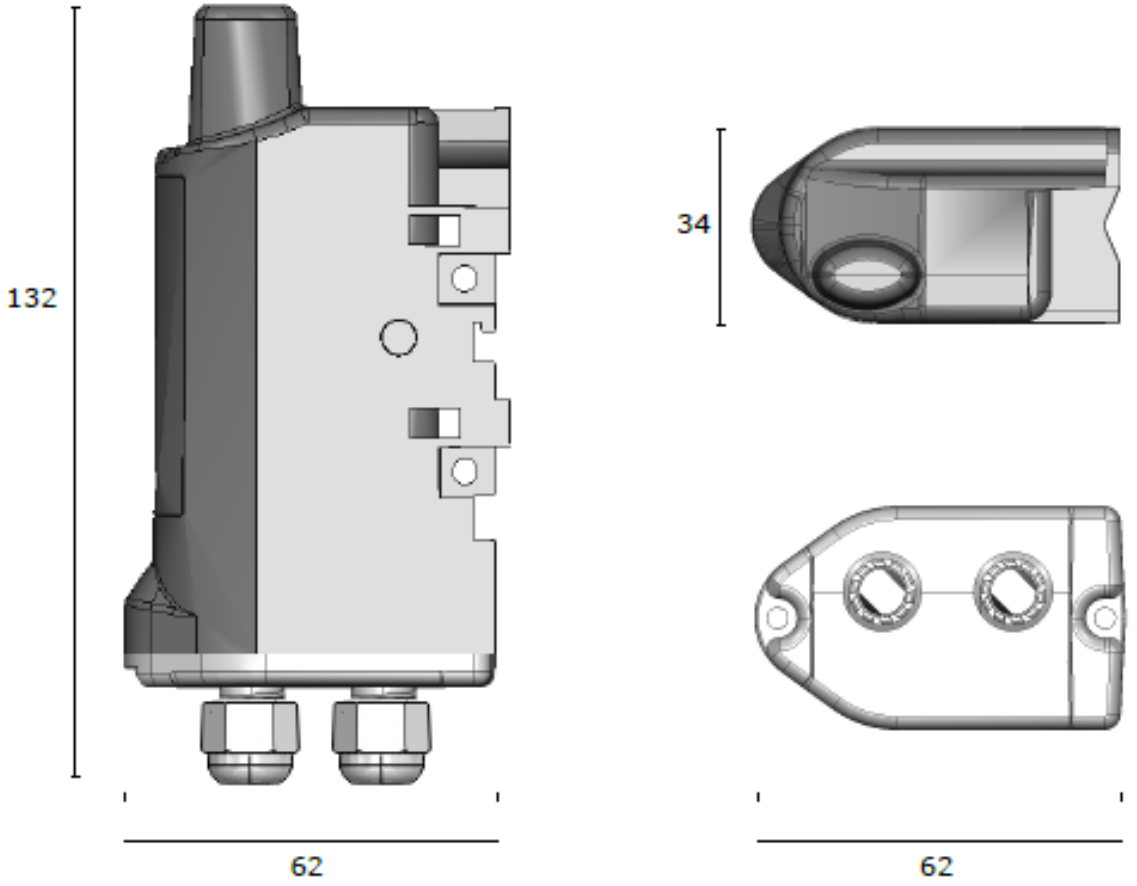
- For dust: Level 6 guarantees complete dust tightness.
- For water: Level 8 guarantees at least water resistance up to one meter for 1 hour.

Therefore, we can guarantee the water resistance of our IP68 enclosure for immersions less than or equal to this duration. Any use of our sensor outside the criteria mentioned above cannot be guaranteed by Adeunis.

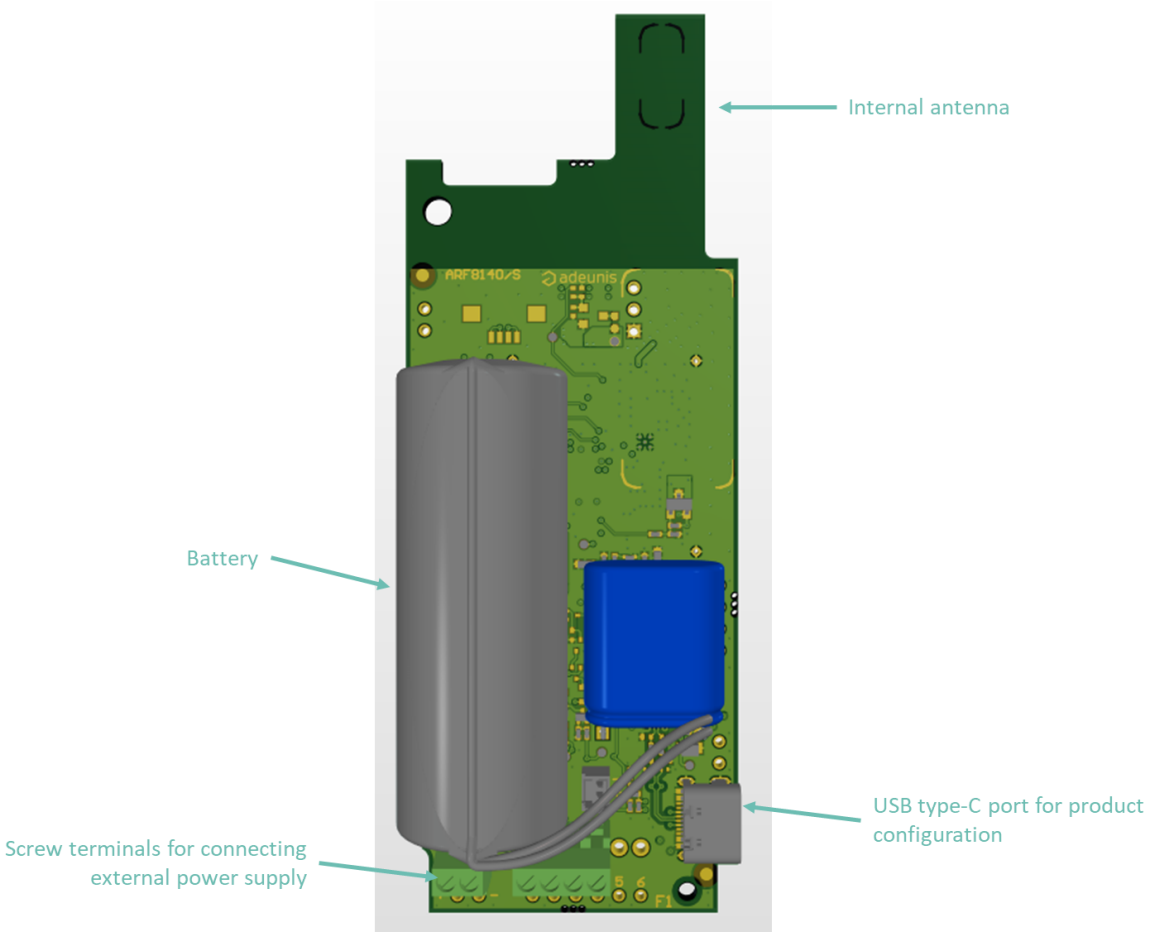
> 📌 **NOTE**
>
> The IP68 protection rating does not guarantee protection against condensation due to ambient humidity and temperature variations. Prolonged exposure to high temperature variations and/or high relative humidity can lead to premature product failure.

1.5. Dimensions

Values in millimeters

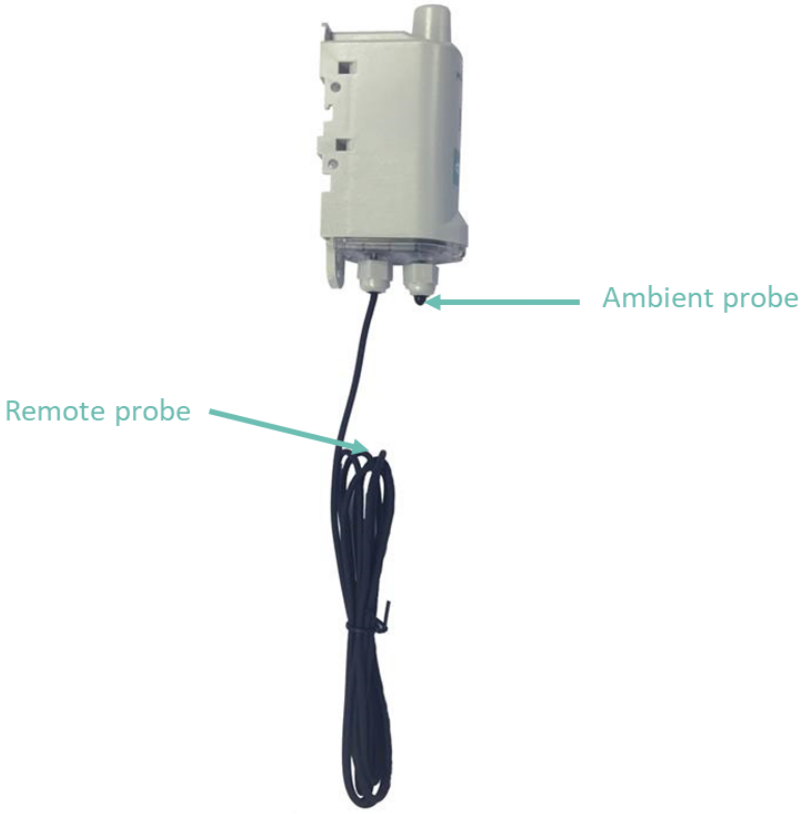


1.6. Electronic board

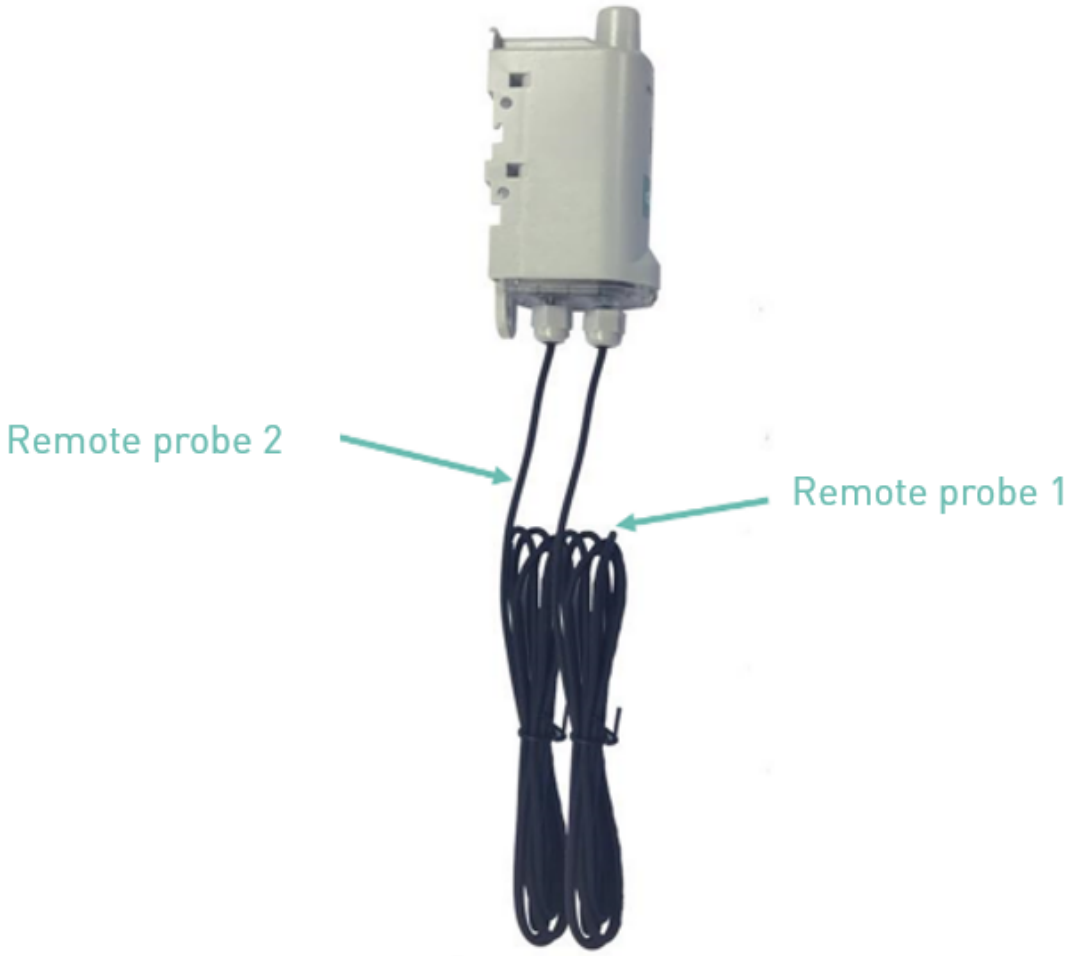


1.7. Two versions of the product

Product with ambient probe and remote probe



Product with two external probes

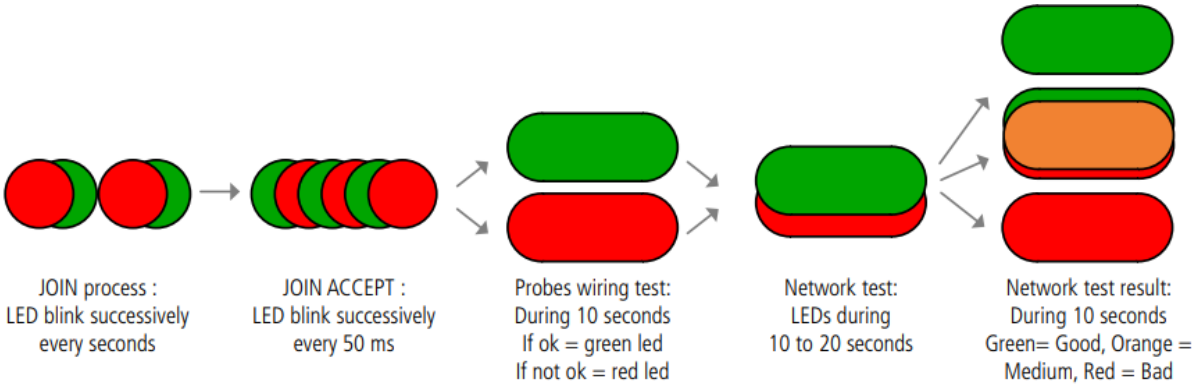


1.8. Operation of the LEDs

Mode	LED red state	LED green state
Product in PARK mode	OFF	OFF
Magnet detection process (1 to 6 seconds)	OFF	ON from detection of the mag- net up to a maximum of 1 sec
Product start (after detection of the magnet)	OFF	Rapid flashing 6 cycles, 100 ms ON / 100 ms OFF

Mode	LED red state	LED green state
Joining process	During the JOIN phase: flashing: 50 ms on / 1 sec off If the JOIN phase is complete (JOIN accept): flashing: 50 ms on / 50 ms Off (6x)	During the JOIN phase: flashing: 50 ms on / 1 sec off (just after the red LED) If JOIN phase is complete (JOIN accept): flashing: 50 ms on / 50 ms off (just before the red LED)
Detection of the correct wiring of the probes at startup	10 seconds ON if a default is detected	10 seconds ON if no default is detected
Network Quality test running	10 to 20 sec ON	10 to 20 sec ON
Network Quality test result	Bad coverage : 10 sec ON Medium coverage : 10 sec ON Good coverage : OFF	Bad coverage : OFF Medium coverage : 10 sec ON Good coverage : 10 sec ON
Magnet Detection in Production Mode	OFF	Flashing 50ms ON / 50ms OFF after 3 seconds of magnet presence
Product configured in Class C - No external power detected at startup	ON	OFF
Low battery level	Flashing 500 ms ON every 60 seconds	OFF
Switching to the Command mode	ON	ON
Product faulty (return to factory)	ON	OFF

LEDs scenario for a sensor configured in Class A OTAA:



1.9. Power Supply

1.9.1 Power Supply Type

The IP68 TEMP can be powered by a FANSO ER18505H battery or an external power source through a 2-point terminal block (external power supply not included).

- The USB-C port cannot be used to recharge the battery.

The certified external power supply reference for use with the product by Adeunis is **GS05E-USB - Wall Mount AC Adapters 5W 5V 1A W/Euro Plug WallMount USB Output from Mean Well**.

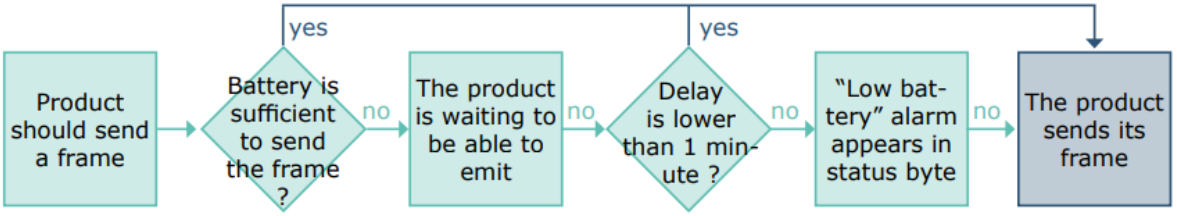
If another external power supply reference is chosen to work with the product, it must strictly adhere to the characteristics mentioned in the “electrical characteristics” table and comply with the following standards:

- EN/IEC 62368-1
- EN 61000-3-2, EN 61000-4-2, EN 61000-4-4, EN 61000-4-5

The user must independently certify the compatibility of this power supply with the product.

1.9.2 Low battery management

When the product detects that the battery is not anymore in capacity to deliver the energy needed to send a frame (extreme temperatures or end-of-life of the battery) it waits to be in capacity to transmit. If it detects that the delay generated is longer than 1 minute it informs the user via the “battery low” flag in the status byte of each frame.



The battery low alarm is switching off if the battery is replaced or when the temperature conditions are favorable for the proper functioning of the battery.

2. TECHNICAL SPECIFICATIONS

2.1 General characteristics

Mechanical Characteristics	
Dimensions	132 × 62 × 34 mm
Weight	148g for the product version with 1 Remote probe 185g for the product version with 2 remote probes
Enclosure	IP 68 Indoor/Outdoor Use
Mounting System	DIN rail, pipe, wall, collar

Electrical Characteristics	
Battery Power	Battery Type: FANSO ER18505H+W36mm+51021 connector Nominal voltage: 3.6 V Max. current : 200 mA Capacity : 4000 mAh
External Power Supply (not included)	Input range: 4.5 V to 6.5 V Max. current: 200 mA Min. current Class A: 6 V → 2 mA Min. current Class C: 6 V → 35 mA
USB power supply	Nominal voltage: 5 V Max. current: 200 mA

Operating Conditions	
Operating Range	-25°C / +70°C when powered by a battery -25°C / +40°C when powered by an external power supply
Operating Altitude	2000 m or less

RF Characteristics	
LoRaWAN Region	EU 863-870 MHz
LoRaWAN Specification	1.0.4
LoRaWAN Class	Class A and Class C (with connected external power supply)
Max Transmission Power	+14 dBm
Sensitivity SF7	-130 dBm
Application Port (downlink)	1
Timestamp Daily Drift within [-10°C and 60°C]	< 3 seconds per day

2.2. Probes characteristics

Characteristics	
Ambient probe - temperature range	-25°C /+70°C
Remote probe - sensor temperature range	-55°C..+155°C
Remote probe - wire temperature range	-30°C+105°C
Remote probe - wire length	2m
Precision [0°C/+60°C]	+/- 0,2°C
Precision [-35°C/0°C]	+/- 0,5°C
Precision [-55°C/-35°C]	-0,6 /+0,8°C
Precision [+60°C/105°C]	+/- 2°C

CAUTION: Allow a few minutes for the probe to come back to room temperature before any manual operations to avoid mechanical damages. In addition, please respect the minimum and maximum temperatures for the sensor and the wire (cf. Table here-above).

3. AUTONOMY

Usage conditions :

No data historization (transmission period = sampling period)

Nb of frame per day	Event per day	Autonomy (years) SF7	Autonomy (years) SF12
2	0	> 15	> 15
2	10	> 15	> 15
24	0	> 15	11.8
24	10	> 15	11.8

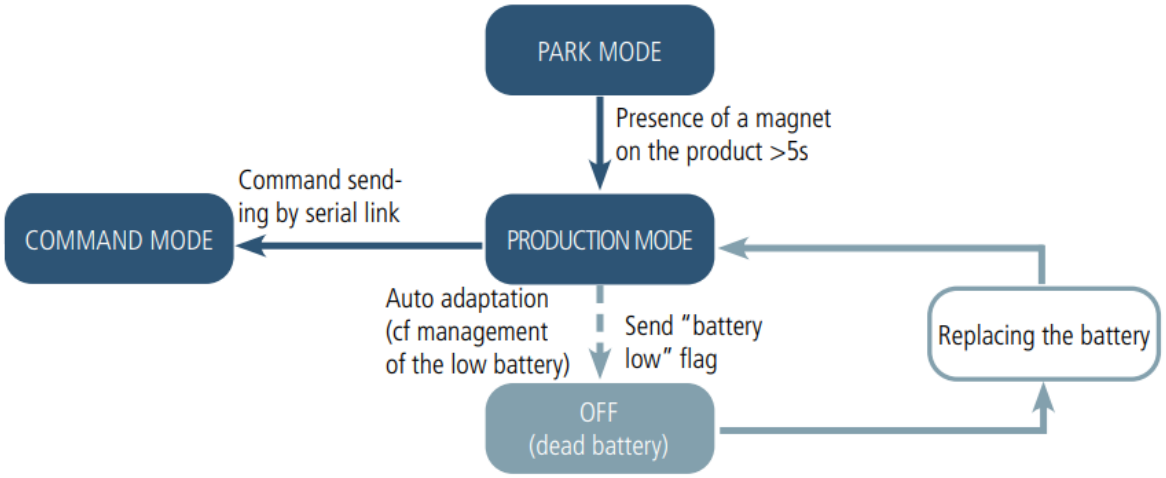
Nb of frame per day	Event per day	Autonomy (years) SF7	Autonomy (years) SF12
48	0	> 15	6.7
48	10	> 15	6.7
144	0	> 15	2.4
144	10	> 15	2.4

The above values are estimates made under certain conditions of use and environment (25°C and 1 year of storage). They do not represent a commitment on the part of Adeunis.

4. PRODUCT OPERATION

4.1. Global operation

The product has several operating modes:



4.1.1 PARK mode

The product is delivered in PARK mode, it is in standby mode and its consumption is minimal. To switch the product out of the Park Mode pass a magnet across it for a duration higher than 5 seconds. The green LED illuminates to indicate the detection of the magnet and then flashes quickly during the product starting phase.
The device then sends its configuration and data frames.

4.1.2 COMMAND mode

This mode allows you to configure the registers of the product.

Please note that it is necessary to install the official Silabs driver, which is available here: **Silabs USB to UART Bridge VCP Drivers**.

To enter this mode, you need to connect a cable to the USB-C port of the product and use the IoT Configurator.

To exit this mode, you can either use the disconnect function in the IoT Configurator or disconnect the USB-C cable. The product will then return to its previous mode, either PARK or PRODUCTION.

4.1.3 PRODUCTION mode

This mode allows the user to operate the product in its final use. It should allow a maximum of autonomy to the product.

4.2. JOIN process

4.2.1 Start-up of the product, JOIN process and configuration

The product start the JOIN process after entering PRODUCTION mode (after the detection of the magnet or after the exit of the command mode).

By default, the device make 10 successive trials, in case of failure the device waits for 12 hours and then restarts the process. This process will be repeated until the device receive an accept from the gateway called Join Accept.

It is possible to configure the JOIN process through the IoT Configurator. With the App you can decide :

- How many trials you want for each authentication attempt,
- The delay maximum between 2 attempts,
- The weighting factor, used to reduce the delay for the first

Registers concerned by the configuration:

- S312: Maximum delay between 2 authentication attempts
- S313: Weighting factor for initial authentication attempts
- S314: Number of tries for each authentication attempt

Example:

Register	Encoding	Value	Result
S312	0x2A30	10800	The maximum delay between each attempts is 4 hours.
S313	0x04	4	The weighting factor indicated that the first attempt will be spaced by 1 hour, then it will increase after each attempt until it reaches the maximum delay specified in S312.
S314	0x0F	15	Each attempt is composed by 15 successive trials

4.2.2 Launch a JOIN process remotely

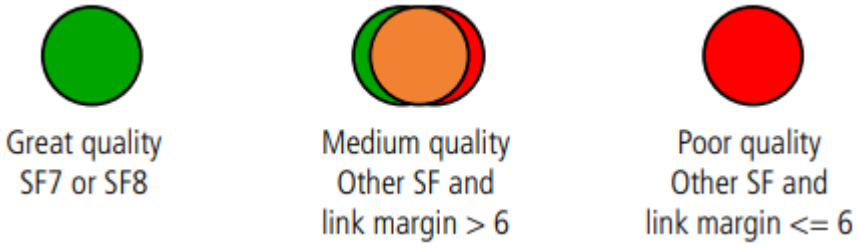
The product receives a 0x48 downlink frame and restart after a defined delay (indicated in the frame).

This function of restart enables the device to start a JOIN process remotely. It can be useful for a change of operator or when you have to restart a gateway.

To know the content of the 0x48 frame refers to the Technical Reference Manual (TRM) of the product.

4.3. Network quality test

During the JOIN Process, a device configured in Class A OTAA will make a network quality test (patented algorithm). When the test is running the device shows the 2 LEDs green and red simultaneously (from 10 to 20 seconds).



The result of the test is given by the devices after around 20 seconds following the Join Accept. It is visible through the sole thanks to the LED.

With this information the installer know the quality of the network and can move the product to a place with a better coverage.

4.4. Transmission modes

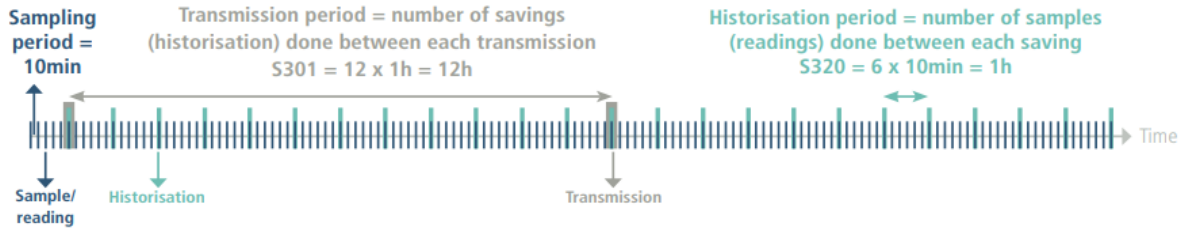
The product allows to measure temperature on 2 probes or 1 probes only, to save the information and to send it according to 3 modes of emission.

	Periodical transmission	Over threshold transmission	Periodical and over threshold transmission
Definition	The periodical transmission allows the temperature to be collected according to a specified period of time, to be saved and sent on a	The over threshold transmission enables to read the temperature according to a specified period of time but to **send the alarm frame only if**	**Mix of the 2 modes** to measure temperature regularly in order to be alerted if a threshold is over passed and to save the information to

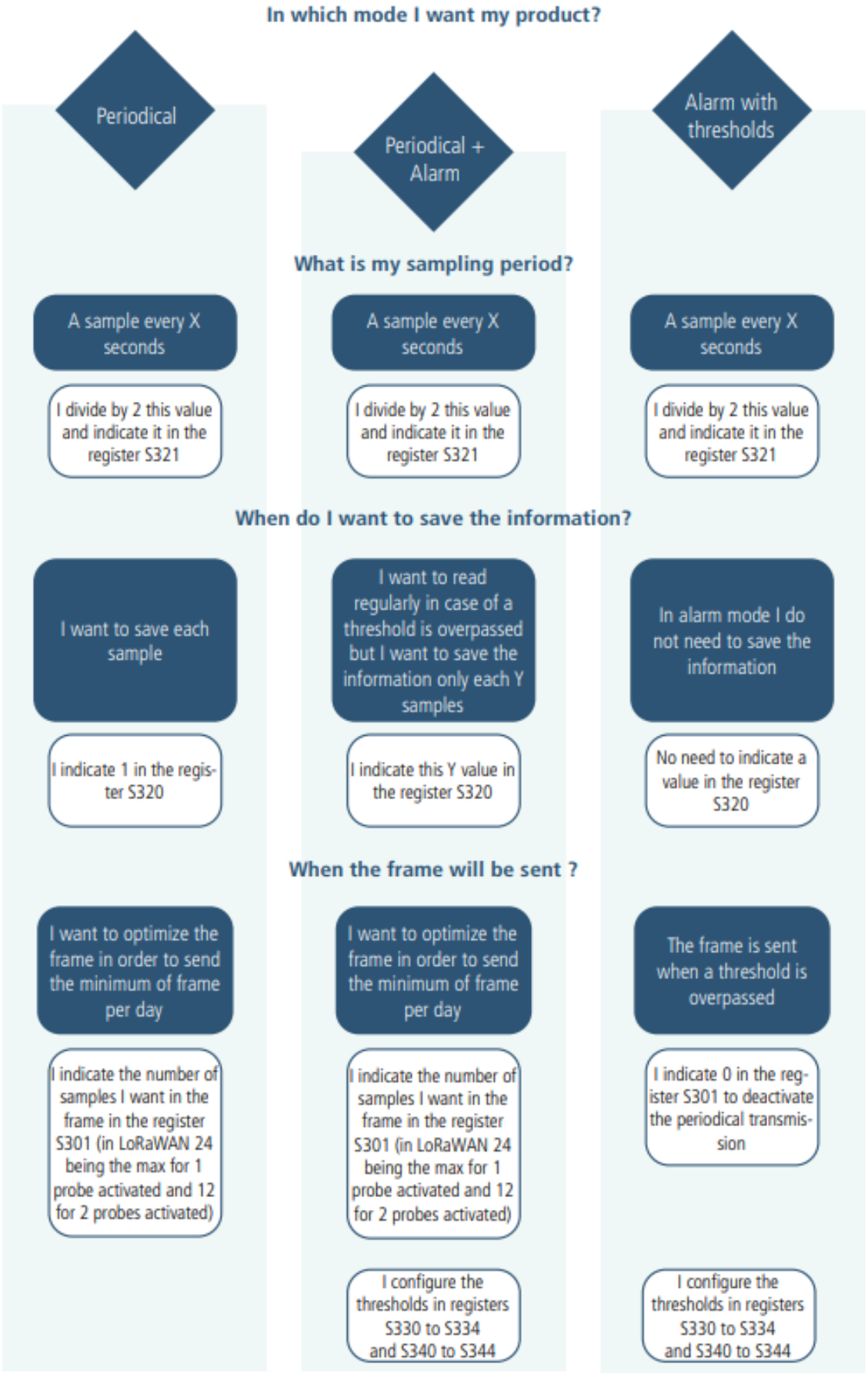
	Periodical transmission	Over threshold transmission	Periodical and over threshold transmission
	regular basis for **analysis over time**.	**a threshold is over passed**.	make analysis over time.
Example	I want to measure my temperature on the 2 probes every 30 minutes. I want to minimize the number of frame per day and to optimize the autonomy so I prefer to send the maximum of data in each frame without loosing data.	I want that the product send me an alarm if the temperature is lower than 10°C on probe 1.	I want to know the temperature on the 2 probes along the day and be informed if the temperature go under 10°C on the probe 1. The product will send me a frame twice a day with the temperature measured each hour and an alarm if the temperature is under 10°C on the probe 1.
Associated configuration	• **Sampling period** (S321) = 900 (900s x2 =1800 seconds so 30 minutes) • **Number of samples before saving** (S320) = 1 (1 saving at each reading) • **Number of saving before transmission** (S301) = 12 (12 savings per frame)	• **Sampling period** (S321) = 300 (300s x2 =10 minutes) • **Number of saving before transmission** (S301) = 0 (no periodical transmission) • Alarm temperature on probe 1 (S330) = 1 (low threshold) • Low threshold on	• **Sampling period** (S321) = 300 (300s x2 =10 min) • **Number of samples before saving** (S320) = 6 (6 × 10 min = 1h) • **Number of saving before trans- mission** (S301) = 12 (12 X 1h = 12h) • Alarm

	Periodical transmission	Over threshold transmission	Periodical and over threshold transmission
	• Probe 1 alarm (S330) = 0 (alarm disabled) • Probe 2 alarm (S340) = 0 (alarm disabled)	probe 1(S333) = 100 (in tenth of °C) • Low threshold hysteresis on probe 1 (S334) = 50 (in tenth of °C) the alarm is raised only if my temperature exceeds 15 °C.	temperature on probe 1 (S330) = 1 (low threshold) • Low threshold on probe 1 (S333) = 100 (in tenth of °C) • Low threshold hysteresis on probe 1 (S334) = 50 (in tenth of °C) the alarm is raised only if my temperature exceeds 15 °C.

WARNING: the number of data per frame depends on the network used. Here the case is available on a LoRaWAN Network.



To program registers, here are the steps to follow depending on the chosen mode.

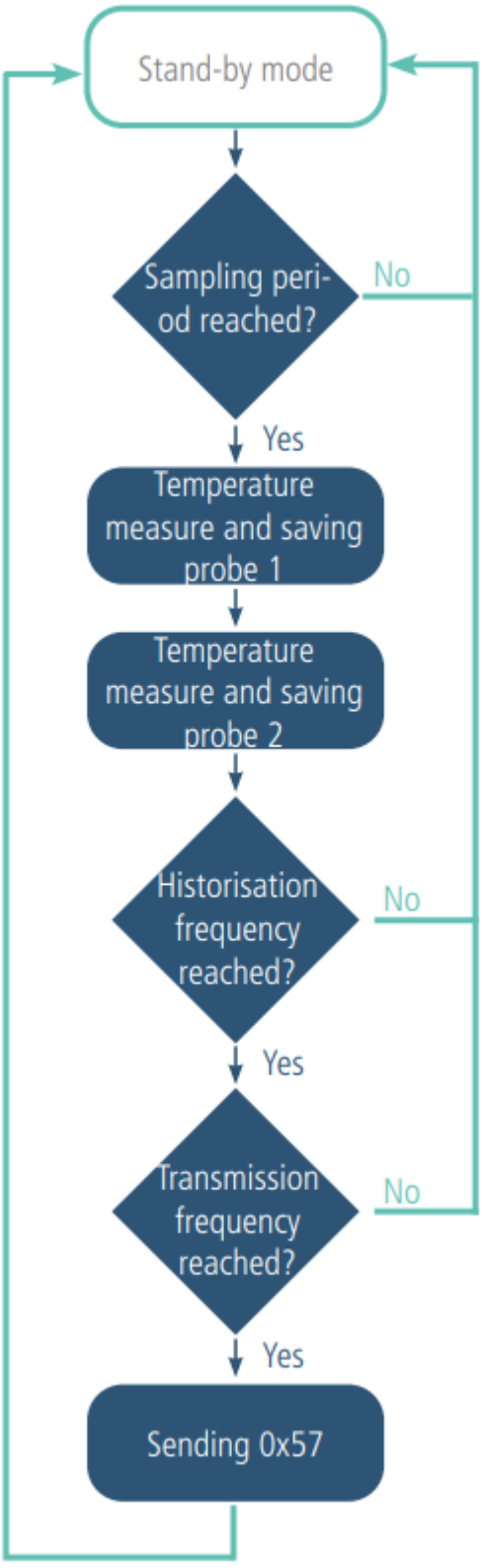

In which mode I want my product?
Periodical
Periodical + Alarm
Alarm with thresholds
What is my sampling period?
A sample every X seconds
I divide by 2 this value and indicate it in the register S321
A sample every X seconds
I divide by 2 this value and indicate it in the register S321
A sample every X seconds
I divide by 2 this value and indicate it in the register S321
When do I want to save the information?
I want to save each sample
I indicate 1 in the register S320
I want to read regularly in case of a threshold is overpassed but I want to save the information only each Y samples
I indicate this Y value in the register S320
In alarm mode I do not need to save the information
No need to indicate a value in the register S320
When the frame will be sent ?
I want to optimize the frame in order to send the minimum of frame per day
I indicate the number of samples I want in the frame in the register S301 (in LoRaWAN 24 being the max for 1 probe activated and 12 for 2 probes activated)
I want to optimize the frame in order to send the minimum of frame per day
I indicate the number of samples I want in the frame in the register S301 (in LoRaWAN 24 being the max for 1 probe activated and 12 for 2 probes activated)
I configure the thresholds in registers S330 to S334 and S340 to S344
The frame is sent when a threshold is overpassed
I indicate 0 in the register S301 to deactivate the periodical transmission
I configure the thresholds in registers S330 to S334 and S340 to S344

Example of possible configurations:

Case (no 100% alarm) with 2 probes activated	Associated con- figuration	Theoretical number of periodical frame sent per day
• Reading/sampling : 10 minutes • Historisation : every hour (so each 6 readings) • Transmission : twice a day (each 2 historisations)	• 321 = 300 • 320 = 6 • 301 = 12	2 frames
• Reading/sampling : 10 minutes • Historisation : at each reading • Transmission : maximum allowed per frame (here in LoRaWAN 863-870)	• 321 = 300 • 320 = 1 • 301 = 12	12 frames
• Reading/sampling : 5 minutes • Historisation : every 15 minutes (so each 3 readings) • Transmission : every hour (so each 4 historisations)	• 321 = 150 • 320 = 3 • 301 = 4	24 frames
• Reading/sampling : each hour • Historisation : at each reading • Transmission : at each historisation	• 321 = 1800 • 320 = 1 • 301 = 1	24 frames
• Reading/sampling : each hour • Historisation : at each e reading • Transmission : every 4 hours (so each 4 historisations)	• 321 = 1800 • 320 = 1 • 301 = 4	6 frames
• Reading/sampling : every 10 seconds • Historisation : every minutes (so each 6 readings) • Transmission : every 10 minutes (so each 10 historisations)	• 321 = 5 • 320 = 6 • 301 = 10	144 frames
• Reading/sampling : every minute • Historisation : at each reading • Transmission : every 10 minutes (so each 10 historisations)	• 321 = 30 • 320 = 1 • 301 = 10	144 frames

4.4.1 Periodical transmission with or without historisation

The product enables to measure and send the data from the probe following the diagram below :



The product allows the activation or deactivation of a probe. Therefore, the 0x57 frame will differ based on whether one or two probes are activated.

This periodic transmission can occur with or without data historization.

Historization enables the user to extend the interval between two transmissions in order to further optimize the product's autonomy.

Maximum number of samples per frame:

- 24 when only one probe is activated and timestamping is enabled (set 24 in register S301)
- 22 when only one probe is activated and timestamping is disabled (set 22 in register S301)
- 12 when both probes are activated and timestamping is enabled (set 12 in register S301)
- 11 when both probes are activated and timestamping is disabled (set 11 in register S301)

REMINDER

The parameters associated with this operating mode are:

- The sampling period (register 321), the backup frequency (register 320), and the transmission frequency (register 301).
- The activation or deactivation of the probes (register 324).

Example without historisation :

Register	Encoding	Value	Result
S321	Decimal	1800	1 sample every hour (1800 × 2 seconds = 60 minutes)
S320	Decimal	1	1 historisation for each sample
S301	Decimal	1	1 transmission for each historisation

Register	Encoding	Value	Result
S324	Decimal	3	The 2 probes are activated

In this example:

- 1 sample (reading) every hour (1800 × 2 seconds = 60 minutes)
- 1 historisation at each sample and the frame is sent immediately (so every hour)
- The 2 probes are activated so the product will read the temperature on the 2 probes every

Example with historisation:

Register	Encoding	Value	Result
S321	Decimal	1800	1 sample every hour (1800 × 2 seconds = 60 minutes)
S320	Decimal	1	1 historisation for each sample
S301	Decimal	12	1 transmission every 12 historisations
S324	Decimal	3	The 2 probes are activated

In this example:

- A sample (reading) every hour (1800×2secondes = 60 minutes)
- An historisation done at each sampling (so every hours)
- A transmission is done every 12 historisations (so every 12 hours, so 2 times a day)
- The 2 probes are activated so the product will read the temperature on the 2 probes every

4.4.2 Periodical transmission with redundancy

The product enables to add redundancy in the frame sent (cf diagram bellow). Thanks to the redundancy the product will save samples locally in order to resend them in the next frame.

Parameters associated to this mode:

- Sampling period (register 321), historisation frequency (register 320) and transmission frequency (register 301)
- Activation of the probes (register 324).
- Number of samples to be repeated from a frame to another (register 323).

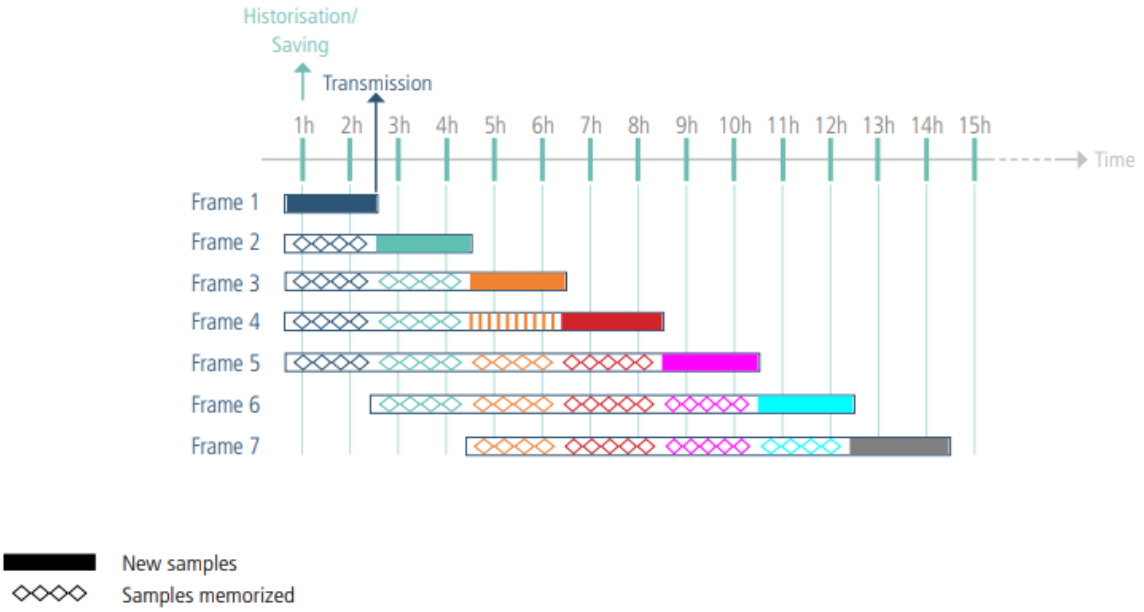
When redundancy is activated, the frame will contain the number of bytes corresponding to the total number of samples, so S301+S323. At the start-up of the product, bytes assigned to the redundant samples will be filled with zeros as long as there is no memorized samples.

Example with redundancy:

Register	Encoding	Value	Result
S321	Decimal	1800	A sample every hour (1800 × 2 seconds = 60 minutes)
S320	Decimal	1	1 historisation at each sampling
S301	Decimal	2	1 transmission every 2 historisations
S324	Decimal	3	The 2 probes are activated
S323	Decimal	4	4 samples are repeated in each frame

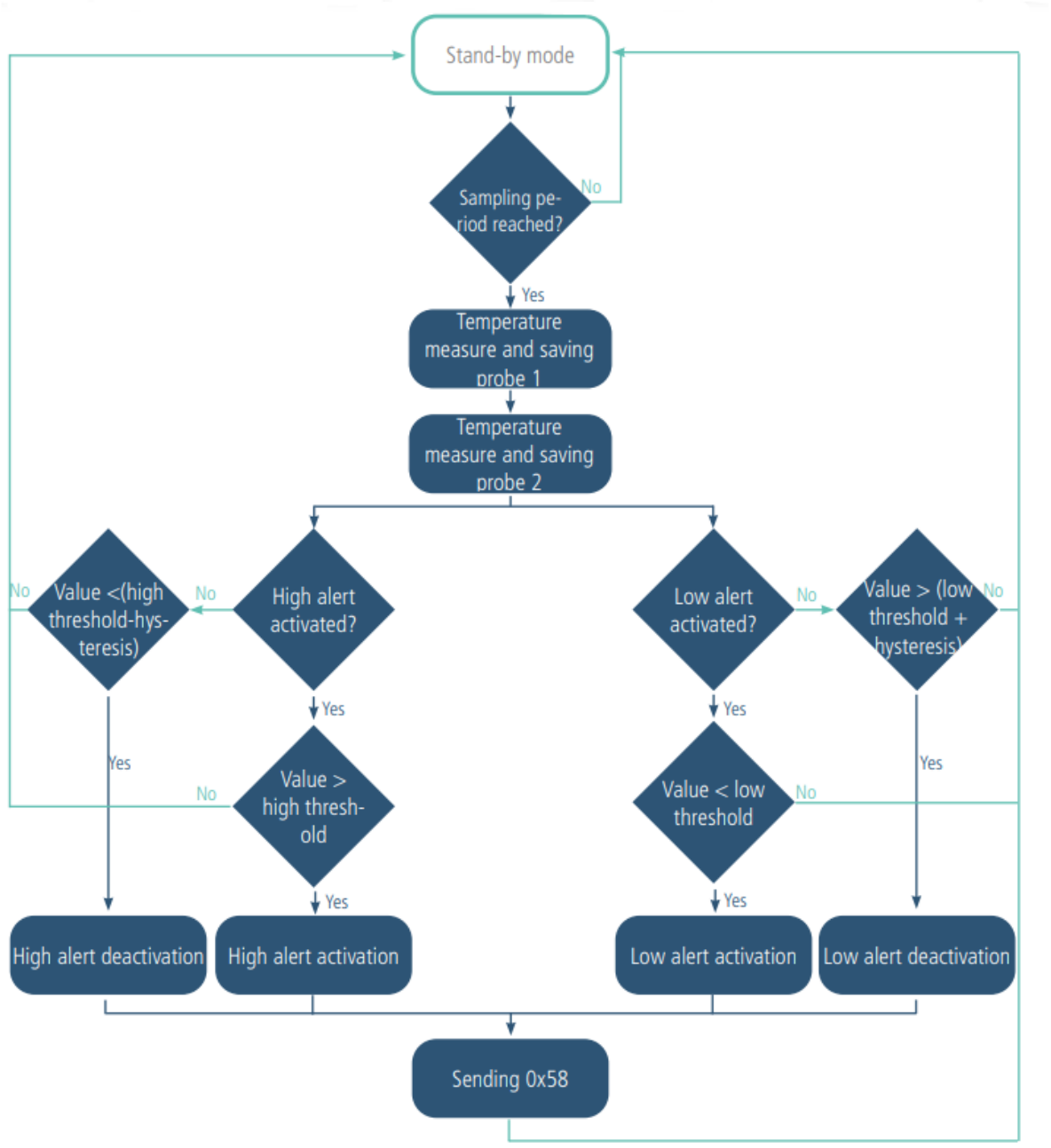
In this example:

- A sample (reading) every hours (1800 × 2 seconds = 60 minutes)
- A historisation at each sampling
- A transmission done every 2 historisations (so every 2 hours)
- 2 probes are activated
- The product will send 2 new samples measured every hour and 4 memorized



4.4.3 Transmission on threshold overpassed

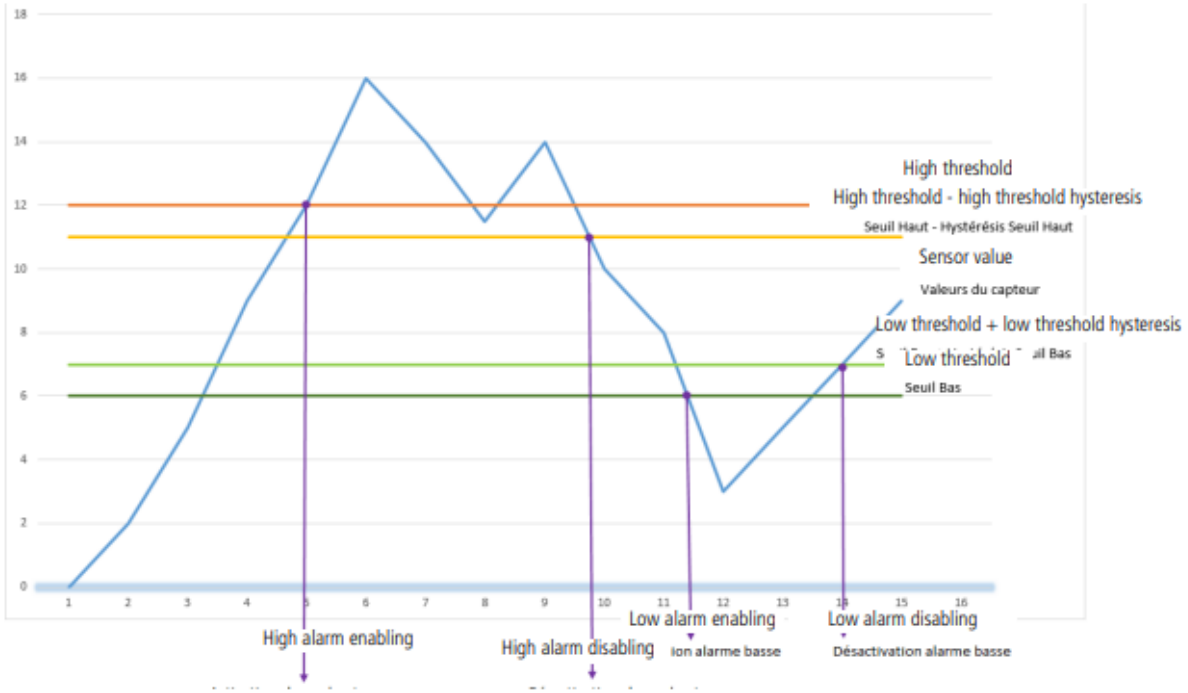
The product enables the detection of a threshold overpassed (high and low) for each probe, as described in the diagram below:



The sampling period (reading) enables to determine when the product will do the temperature measure and so the frequency at which the product will detect an overpassed threshold.

The product will send the frame when a threshold is overpassed but also when temperature comes back to normal (cf status alarm).

Explication of the thresholds and their hysteresis:



The settings associated with this mode of operation are:
• Sampling period (register 321).
• The activation of the probes (register 324).
• Alarm configuration of the probe 1 (register 330) and probe 2 (register 340).
• High threshold of the probe 1 (register 331) and probe 2 (register 341).
• Hysteresis for the high threshold of the probe 1 (register 332) and probe 2 (register 342).
• Low threshold of the probe 1 (register 333) and probe 2 (register 343).
• Hysteresis for the low threshold of the probe 1 (register 334) and probe 2 (register 344).
Example :

Register	Encoding	Value	Result
S301	Decimal	0	Alarm mode
S321	Decimal	1800	A sample of the temperature every hour
S324	Decimal	3	The 2 probes are activated
S330	Decimal	3	An alarm is activated on high and low threshold on the probe 1

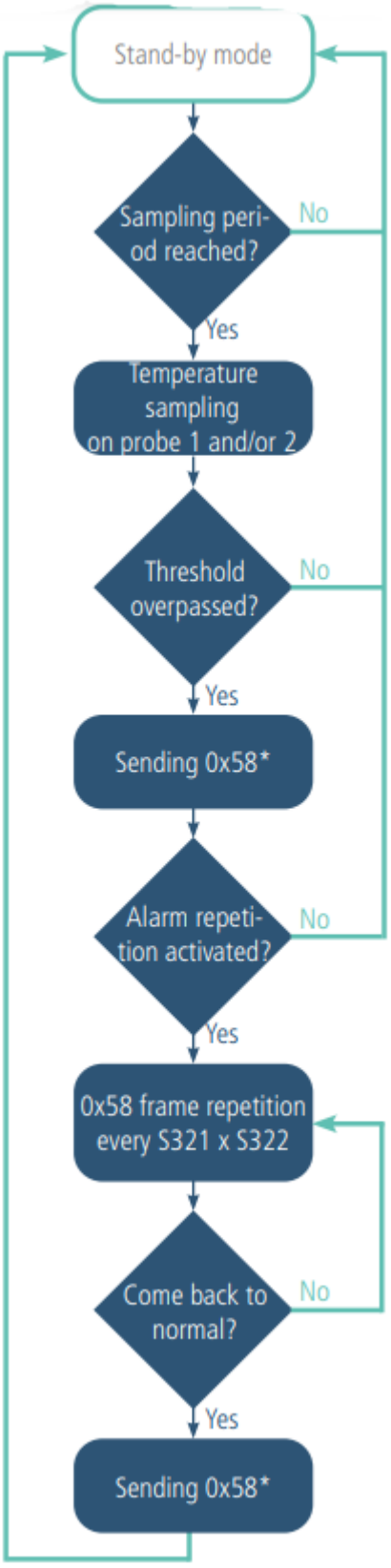
Register	Encoding	Value	Result
S331	Decimal	700	High threshold is 70°C
S332	Decimal	50	Hysteresis of the high threshold is 5°C, so the come back to normal is at 65°C
S333	Decimal	100	Low threshold is 10°C
S334	Decimal	20	Hysteresis of the low threshold is 2°C, so the come back to normal is at 12°C
S340	Decimal	2	An alarm is activated on high threshold only on probe 2
S341	Decimal	235	High threshold is 23.5°C
S342	Decimal	35	Hysteresis of the high threshold is 3.5°C, so the come back to normal is at 20°C
S343	Decimal	0	No low threshold determined
S344	Decimal	0	No low threshold determined

In this example:

- The product measure the temperature on the 2 probes every hour
- On probe 1, there is a high alert at 70°C with a come back to normal at 65°C and a low alert at 10°C with a come back to normal at 12°C
- On probe 2, there is only a high alert at 5°C with a come back to normal at 20°C.

4.4.4 Transmission on threshold overpassed with alarm repetition

The product enables the detection of a threshold overpassed (high and low) for each probe and to repeat this alert depending on a determined period (register S321 x S322).



Settings associated to this operating mode are:

- Sampling period (register 321),

- Alarm repetition (register 322),
- Activation of the probes (register 324).
- Alarm configuration on probe 1 (register 330) and probe 2 (register 340).
- High threshold on the probe 1 (register 331) and probe 2 (register 341).
- Hysteresis for high threshold on probe 1 (register 332) and probe 2 (register 342).
- Low threshold on the probe 1 (register 333) and probe 2 (register 343).
- Hysteresis for low threshold on probe 1 (register 334) and probe 2 (register 344).

Example:

Registers	Encoding	Value	Result
S301	Decimal	0	Alarm mode
S324	Decimal	1	Only probe 1 is activated
S330	Decimal	3	High and low threshold activated on probe 1
S331	Decimal	700	High threshold is 70°C
S332	Decimal	50	Hysteresis for high threshold is 5°C, the come back to normal is at 65°C
S333	Decimal	100	Low threshold is 10°C
S334	Decimal	20	Hysteresis for low threshold is 2°C, the come back to normal is at 12°C
S321	Decimal	300	A sampling is done every 10 minutes (300 × 2 seconds = 10 minutes)
S322	Decimal	2	Alarm will be sent every 2 sampling if always activated

In this example:

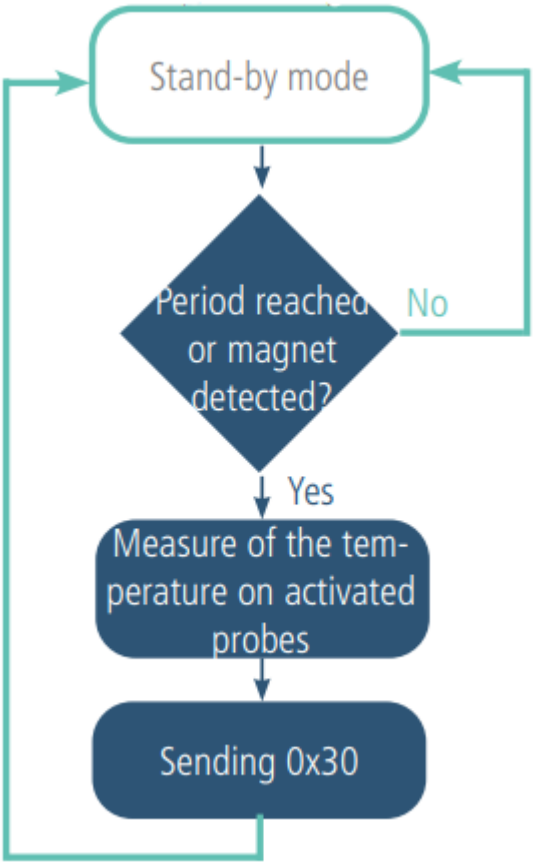
- The product measure temperature only on probe 1
- On probe 1, there is a high threshold at 70°C with a come back to normal at 65°C and a low threshold at10°C with a come back to normal at 12°C

- A sampling (reading) every 10 minutes (300 × 2 seconds = 10 minutes)
- As long as the alarm is active (threshold always overpassed), this alarm will be repeated every 2 samples (so every 20 minutes).

*The “alarm status” byte gives the information if the alert is activated or not and so allows to dissociate a 0x58 frame sent to alert that the threshold is overpassed from a 0x58 frame sent to inform about come back to normal.

4.4.5 Transmission of the Keep Alive frame

In the event mode, it is possible that the product would never send data frames. So to be sure that it is working properly a Keep Alive frame is transmitted regularly (following diagram). Furthermore, in order to enable to measure the temperature on demand it is possible to cause the sending of this frame using a magnet on the product during 3 seconds (at the same place of the start-up) or sending a 0x05 frame.



Parameters associated to this operating mode :

- Activation of the probes (register 324).
- Transmission period of the keep alive frame, from 20 seconds to 7 days (register 300).

Example:

Register	Encoding	Value	Result
S300	Decimal	8640	The keep alive frame is sent every: 8640×10 seconds =1440min so 24h (so once per day)

4.5. Class C LoRaWAN

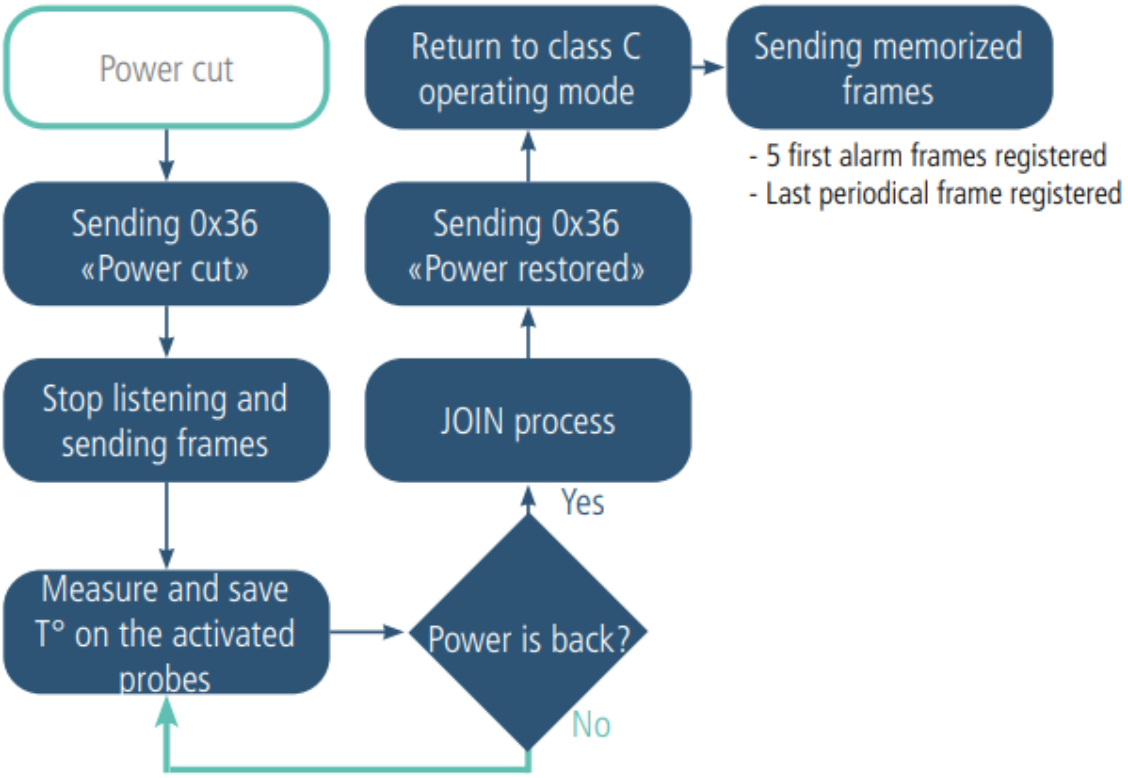
The TEMP product is in class A by default but can be switched to Class C by configuration.

The class C enables the product to be in constant listening when it is not transmitting (no need for an uplink to receive a downlink). Thanks to this mode it is possible to measure at any moment remotely the temperature (manually with a downlink).

WARNING

T**his mode can be activated only if the product is supplied by an external supply.**

When the product is running in Class C, if the supply is cut off, the product enter in safety mode and activate a degraded mode (explained in the here-under diagram) that still allows the product to ensure continuity of measurement :



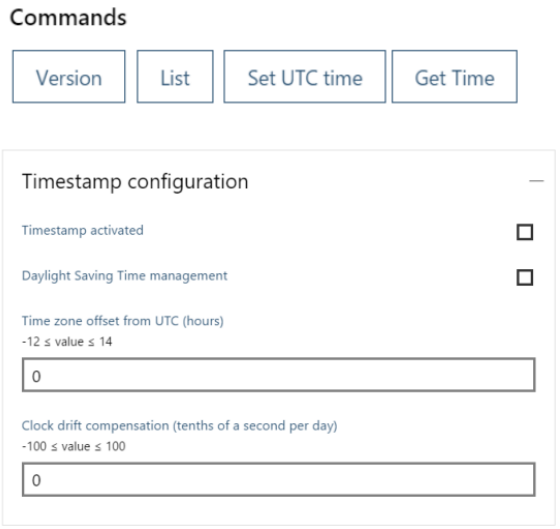
WARNING

A battery must be present and connected in the product to enable this “back-up’ mode.

4.6. Timestamp of the data

The sensor can integrate the timestamp of the data in the frame if this option is activated. Timestamp is given in EPOCH 2013 (please, refer to the TRM of the product to know the content of each frame).

To configure the timestamp, you have to set the UTC time first, via Downlink or through the Advanced Menu of the IoT Configurator.



Then you an activate the timestamp in the Applicative parameters and choose if you want to set the timezone and if you want that the product take into account the Daylight Saving Time.

5. REGISTERS AND FRAME DESCRIPTION

To know the content of the registers and of each frames (uplink and downlink) of the product, refers to the TECHNICAL REFERENCE MANUAL of the TEMP product, available on the adeunis website

https://www.adeunis.com/en/produit/temp-temperature/

https://www.adeunis.com/en/produit/temp-2s-temperature-2/

6. CONFIGURATION AND INSTALLATION

6.1. Configuration and installation of the transmitter

To configure the product locally, it is recommended to use the IoT Configurator application (available for Android and Windows).

- Google Play: **IoT Configurator App**
- Windows 10: **Download Here**

The product can also be configured remotely by sending downlink frames through the network. For this, refer to the TECHNICAL REFERENCE MANUAL of the product, available online on the product's webpage

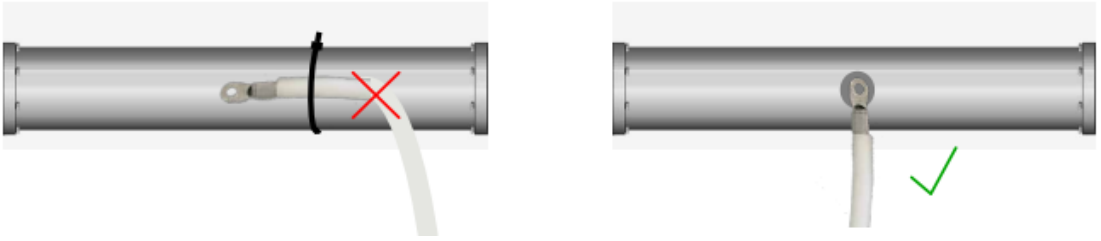
https://www.adeunis.com/en/produit/temp-temperature/

https://www.adeunis.com/en/produit/temp-2s-temperature-2/

6.2. Installation of the remote probe

To ensure an optimal performance of the remote probe, please, follow the installation recommendations here-after:

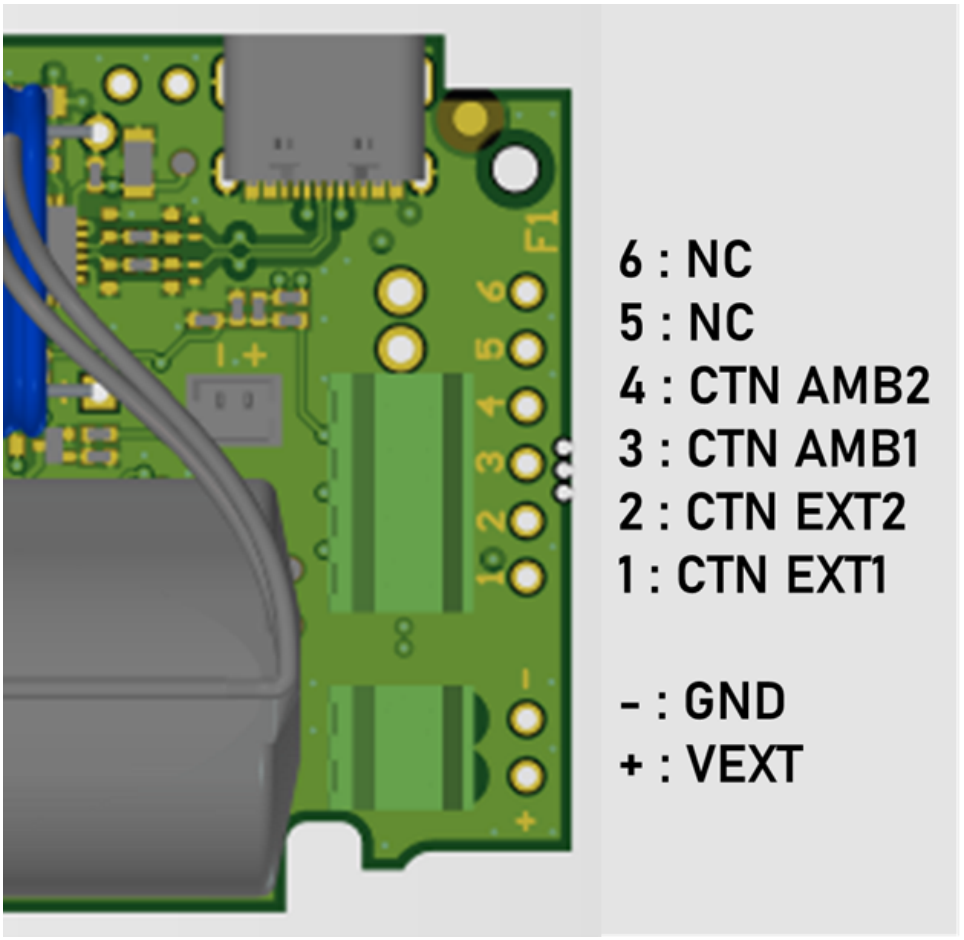
- Install the contact probe either in a thermowell or flat on the surface to be monitored
- Place the probe to be sure that it is the reinforced section that is in contact with hot surfaces and not the wire (cf illustration hereunder)
- Use the appropriate fixation for the monitored surface (thermal paste, heat resistant collars)



WARNING : the probe must be manipulated at room temperature, risk of damage if handled in negative temperatures or above 90°C

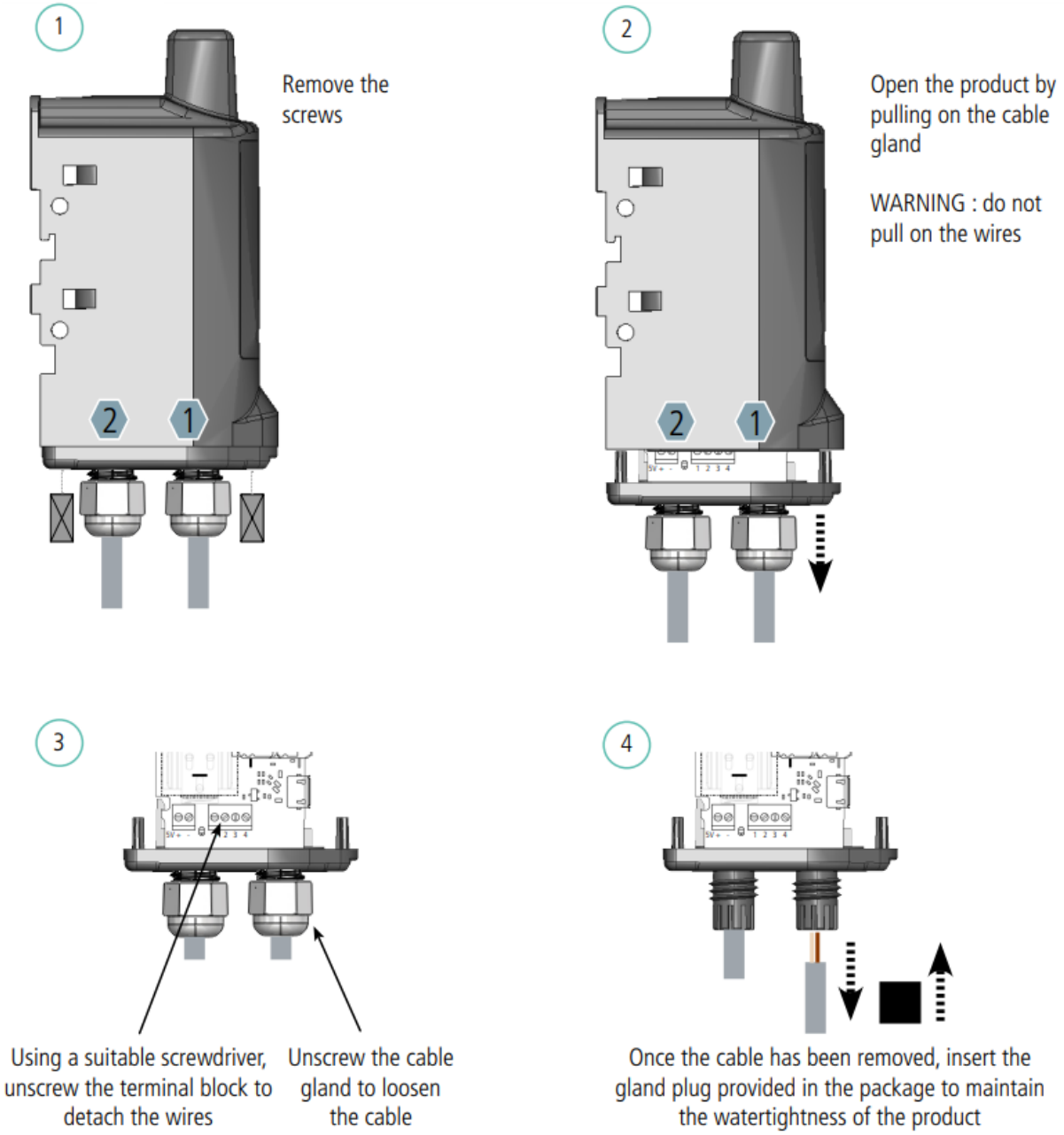
7. WIRING

7.1. Wires description



7.2. Disconnect a probe

To disconnect a probe, please follow these instructions:



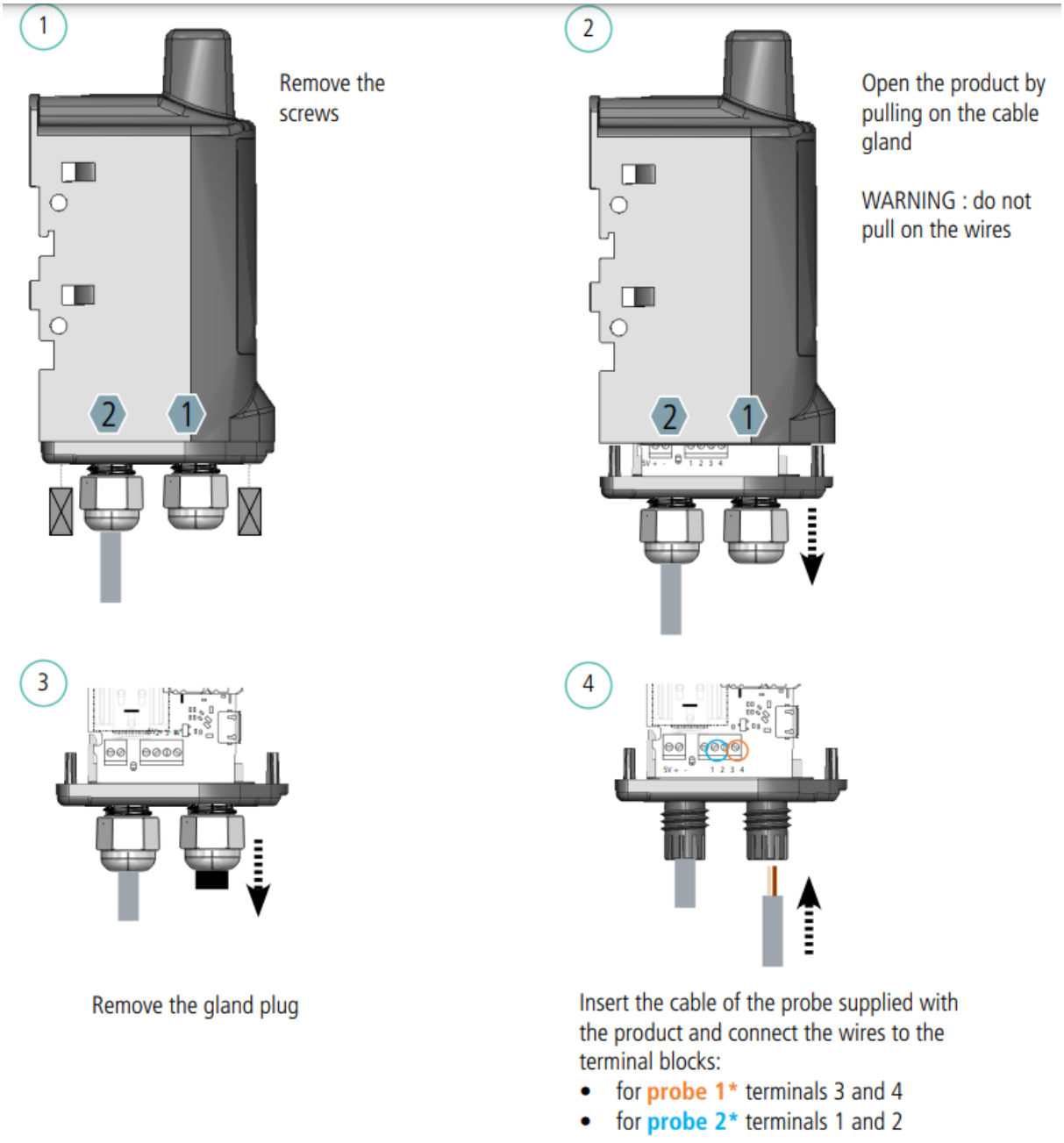
CAUTION

To maintain the IP 68 it is important to screw the cable glands fully and screw the screws with a PZ.1 head and a tightening torque of 0.9 N.m.

As a reminder the probe 1 is on the rounded side of the housing, the probe 2 is on the flat side of the housing.

7.2. Wiring a probe

In order to wire a probe, please follow these instructions:



CAUTION

To maintain the IP 68 it is important to screw the cable glands fully and screw the screws with a PZ.1 head and a tightening torque of 0.9 N.m.

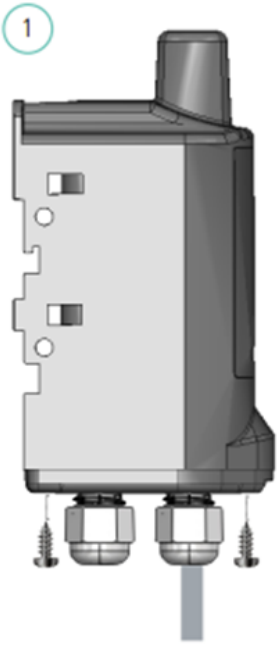
As a reminder the probe 1 is on the rounded side of the housing, the probe 2 is on the flat side of the housing.

*The wiring of the probes at the right place is important to match the associated registers and for the interpretation of the results (cf. Technical Reference Manual, Registers).

7.4. Wiring external supply

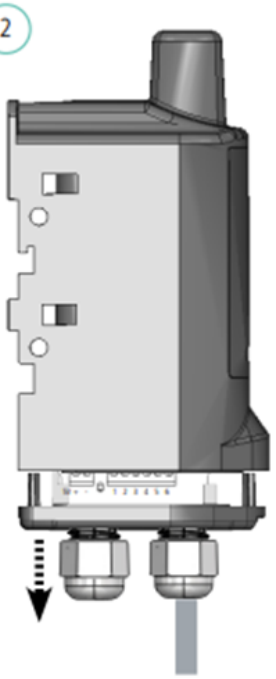
A terminal block is provided to power the product via an external power supply, allowing the use of LoRaWAN Class C (required for this mode), or simply to extend the product's autonomy or to transmit frames more frequently.

1



Remove screws

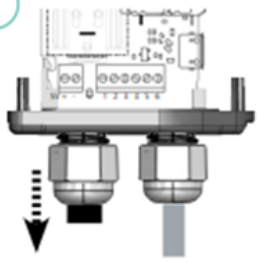
2



Open the device by pulling on the sole and the cable gland

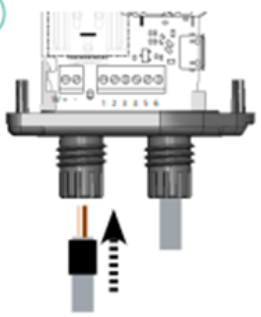
WARNING: do not pull on the wires

3

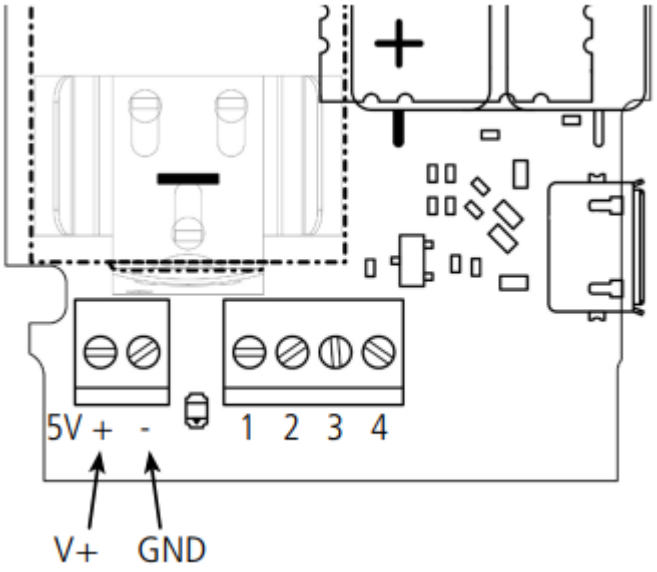


Remove the cable gland screw and the gland seal

4



Insert the wire with the correct seal and connect the supply on the "+" (V+) of the terminal block and the ground to the "-" (GND).



NOTES

To power the product via an external power supply it is necessary to disconnect a probe in order to pass the cable of the power supply in the cable gland.

It is not necessary to disconnect the battery when the external power supply is connected. For the Class C it is even advisable to keep it to benefit from the “back-up” mode in case of power failures.

CAUTION

To maintain the IP 68 it is important to screw the cable glands fully and screw the screws with a PZ.1 head and a tightening torque of 0.9 N.m.

8. DOCUMENT HISTORY

Version	Content
V1.0	Creation