LoRaWAN DRY CONTACTS

Transceiver Digital Interface

Guide utilisateur / User Guide

Version 2.0.0

Ce Guide utilisateur s'applique à partir des versions logicielles suivantes :
This User Guide applies from the following firmware versions:

Version RTU : V01.04.00
Version APP : V01.03.04

PRODUCTS AND REGULATORY INFORMATION

Document Information	
Title	LoRaWAN DRY CONTACTS - User Guide
Sub-title	/
Document type	User Guide
Version	2.0.0

This document applies to the following products :

Nom	Référence	Version firmware
LoRaWAN DRY CONTACTS 868	ARF8170BA	Version RTU : V01.04.00 Version APP : V01.03.04

EN

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TECHNICAL SUPPORT

Website
Our website contains a lot of useful information: information on modules and wireless modems, user guides, and configuration software and technical documents which can be accessed 24 hours a day.

E-mail
If you have technical problems or cannot find the required information in the provided documents, contact our Technical Support by e-mail. Use our dedicated e-mail address (arf@adeunis.com) rather than any personal e-mail address of our staff. This ensures that your request will be processed as soon as possible.

Helpful Information when Contacting Technical Support
When contacting Technical Support, please have the following information ready:
- Product type
- Firmware version (for example V1.0)
- A clear description of your question or the problem
- A short description of the application

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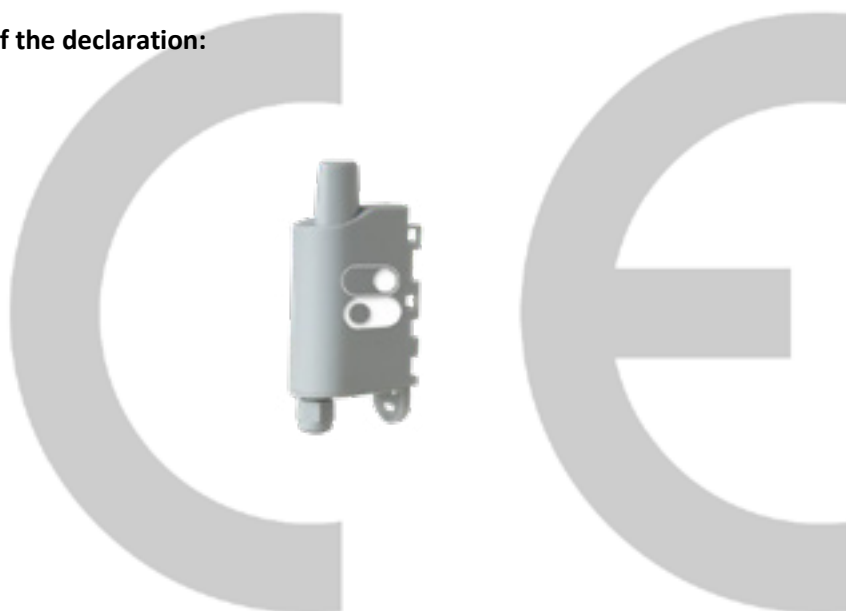
EU Declaration of Conformity

WE

adeunis
283 rue LOUIS NEEL
38920 Crolles, France
04.76.92.01.62
www.adeunis.com

Declare that the DoC is issued under our sole responsibility and belongs to the following product:

Apparatus model/Product: DRY CONTACTS LoRaWAN
Type: ARF8170AA, ARF8170BA

Object of the declaration:

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
Directive 2014/53/UE (RED)

The following harmonised standards and technical specifications have been applied:

Title:	Date of standard/specification
EN 300 220-2 V3.1.1	2017/02
EN 301 489-1 V2.1.1	2016/11
EN 301 489-3 V2.1.0	2016/09
EN 62368-1	2014
EN 62311	2008

Otober, 5th,2017   Monnet Emmanuel, Certification Manager

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INTRODUCTION

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Fax +33 (0)4 76 04 80 87

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ENVIRONMENTAL RECOMMENDATIONS

All superfluous packaging materials have been eliminated. We have done everything possible to make it easy to separate the packaging into three types of materials: cardboard (box), expanded polystyrene (filler material) and polyethylene (packets, foam protective sheets). Your device is composed of materials that can be recycled and reused if it is dismantled by a specialist company. Please observe local regulations concerning the manner in which waste packaging material, used batteries and your obsolete equipment are disposed of.

WARNINGS

Valid for products indicated in the declaration of conformity

Read the instructions in the manual.

The safety of this product is only guaranteed when it is used in accordance with its purpose. Maintenance should only be carried out by qualified persons.

Please note: Do not install the equipment close to a heat source or in damp conditions.

Please note: When the equipment is open, do not carry out any operations other than the ones set out in this document.

Please note: Do not open the product as there is a risk of electrical shock.

Please note: For your own safety, you must ensure that the equipment is switched off before carrying out any work on it.

Please note: For your own safety, the power supply circuit must be SELV (Safety Extra Low Voltage) and must be from limited power sources.

Please note: When the aerial is installed outside, it is essential to connect the cable screen to the building's earth. We recommend using lightning protection. The protection kit chosen must permit the coaxial cable to be earthed (eg: coaxial lightning arrester with earthing of the cable at different places on the aerial at the base of pylons and at the entrance, or just before entering the premises).

The product must be equipped with a switching mechanism so that the power can be cut. This must be close to the equipment. Any electrical connection of the product must be equipped with a protection device against voltage spikes and short-circuits.

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RECOMMANDATIONS REGARDING USE

- Before using the system, check that the power supply voltage shown in the user manual corresponds to your supply. If it doesn't, please consult your supplier.
- Place the device against a flat, firm and stable surface.
- The device must be installed in a location that is sufficiently ventilated so that there is no risk of internal heating and it must not be covered with objects such as newspapers, cloths, curtains, etc.
- The device's aerial must be free and at least 10 cm away from any conducting material.
- The device must never be exposed to heat sources such as heating equipment.
- Do not place the device close to objects with naked flames such as lit candles, blowtorches, etc.
- The device must not be exposed to harsh chemical agents or solvents likely to damage the plastic or corrode the metal parts.

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DISPOSAL OF WASTE BY USERS IN PRIVATE HOUSEHOLDS WITHIN THE EUROPEAN UNION

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste by taking it to a collection point designated for the recycling of electrical and electronic appliances. Separate collection and recycling of your waste at the time of disposal will contribute to conserving natural resources and guarantee recycling that respects the environment and human health. For further information concerning your nearest recycling centre, please contact your nearest local authority/town hall offices, your household waste collection company or the shop where you bought the product

This symbol on the devode or its packaging means the use of a DC voltage.

Warning: If the charger is used with any other batteries or products whatsoever, there is a risk of an explosion. After use, the batteries must be disposed of at an appropriate recycling centre. They must not be thrown away to degrade in the environment. When batteries are replaced, the device must be corectly implemented.

Warning for Switzerland : the annex 4.10 of SR 814.013 Standad must be applied for batteries.

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1. PRODUCT PRESENTATION

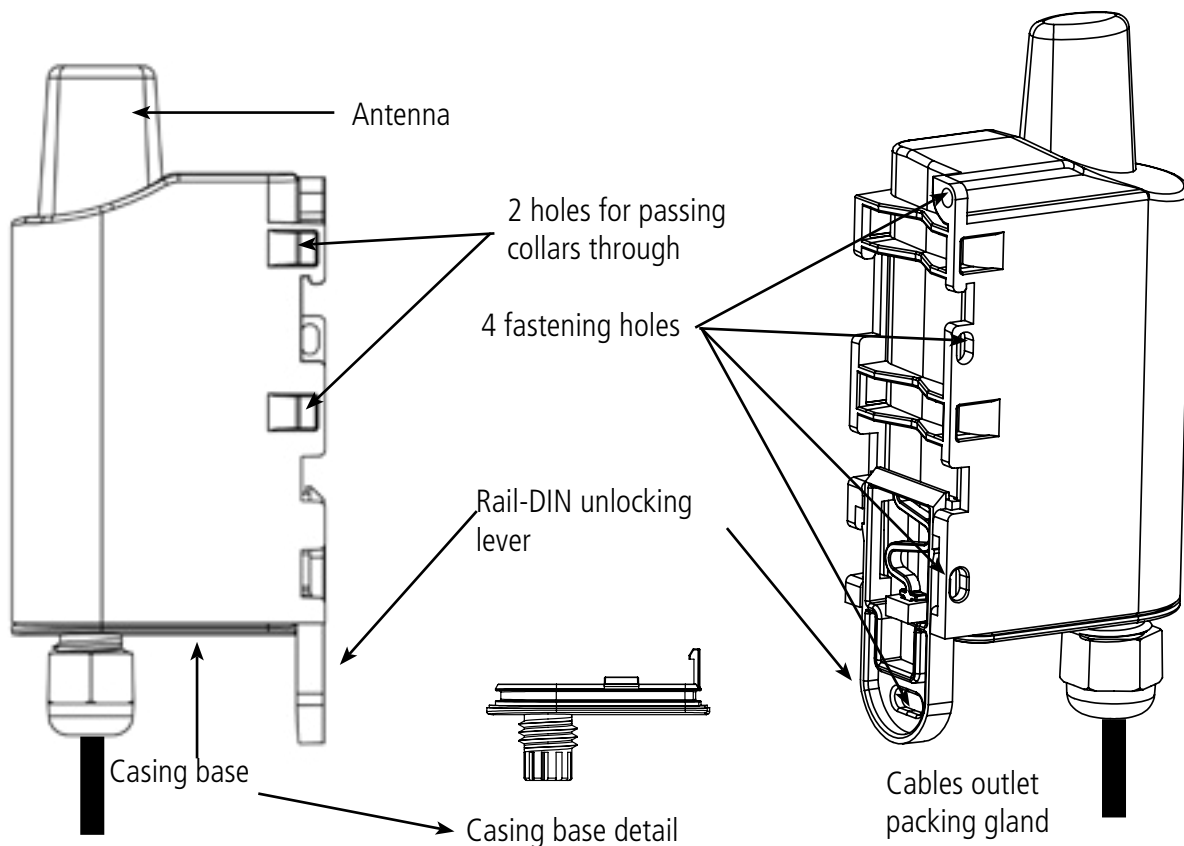IMPORTANT NOTE: The LoRaWAN DRY CONTACTS can only be started with a magnet.

Description:

• The adeunis® LoRaWAN DRY CONTACTS is a ready-to-use radio transmitter enabling the user on one hand to transfer statuses and alarms on a LoRa network and on the other to control relays via the same network.
• This product meets the needs of users who require to remotely monitor (or control) simple on-off digital data: detection of door opening, presence, machine starting, warning, etc.
• The use of the LoRaWAN protocol allows you to integrate the LoRaWAN DRY CONTACTS into any network that is already deployed.
• Four digital inputs/outputs can be supported by a single LoRaWAN DRY CONTACTS transmitter.
• The product emits the data either periodically or in an event-related way on a change of state.
• The configuration of the transmitter is accessible by the user via a micro-USB port, allowing in particular a choice of modes of transmission, periodicity or type of interface (input/output).
• The LoRaWAN DRY CONTACTS is powered by a replaceable internal battery.

IMPORTANT NOTE: The LoRaWAN DRY CONTACTS is delivered by default with OTAA configuration, allowing the user to declare his/her product to a LoRaWAN operator. For an ABP procedure, please contact our Sales Department with the necessary information.

Composition of the package
The product is supplied in a cardboard box containing the following items:
top casing, electronic card, casing base plate,
cable gland, 3 gland seals, 2 CBLZ 2.2 x 19mm screws, 2 Fischer SX4 plugs,

1.1. General description

Antenna

2 holes for passing collars through

4 fastening holes

Rail-DIN unlocking lever

Casing base

Casing base detail

Cables outlet packing gland

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1.2. Dimensions

Values in millimetres

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90
107
49,50
27

1.3. Electronic board

Internal antenna

RF module
LoRaWAN protocol

Internal battery

SAFT LS 14500

USB port for product configuration

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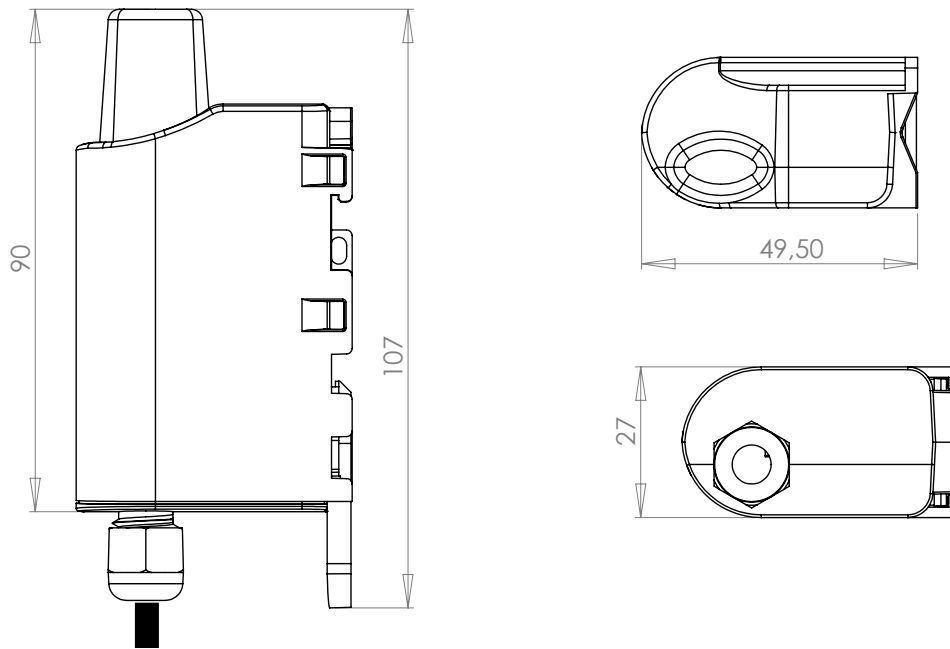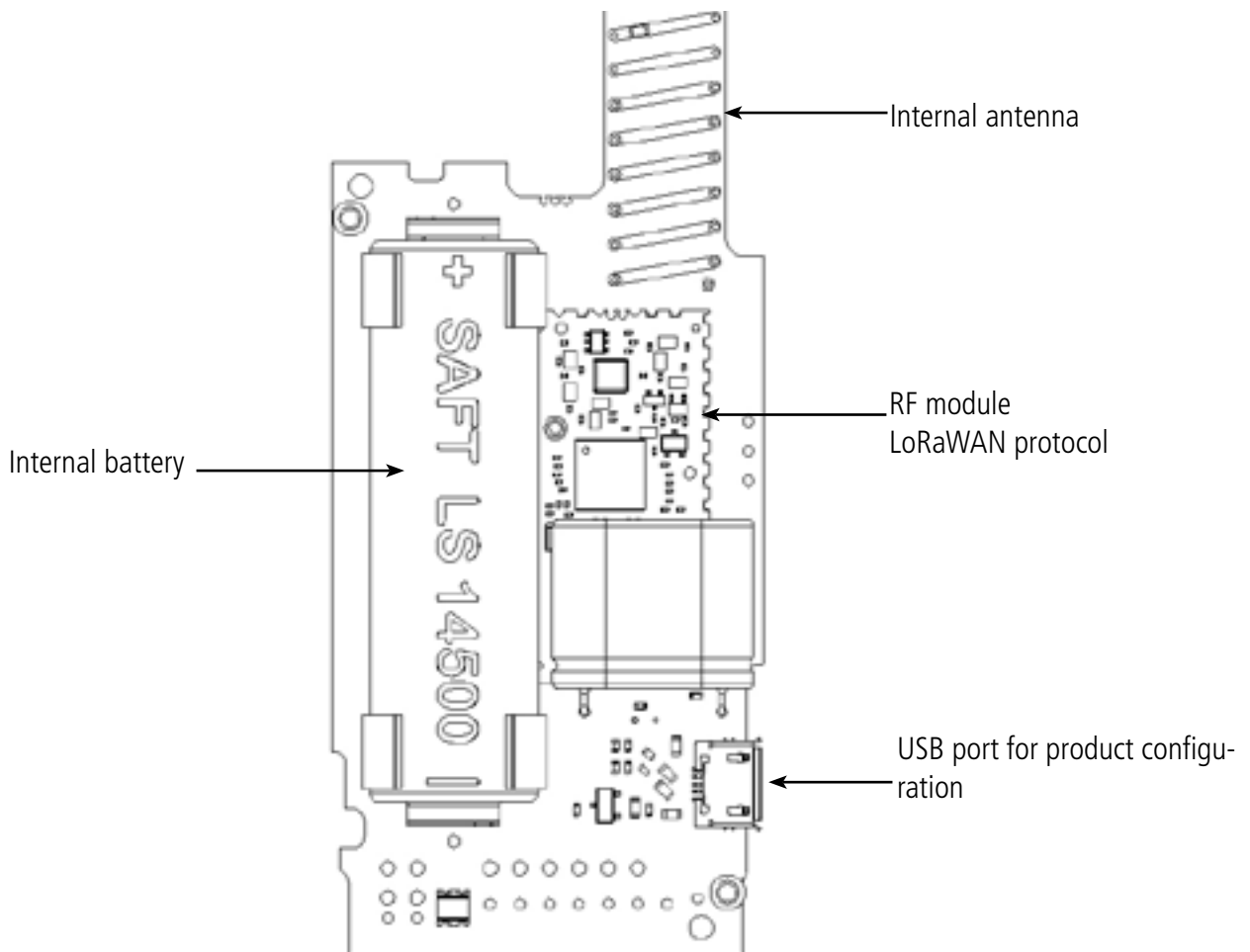
1.4. Technical Specifications

1.4.1 General characteristics

Parameters	Value
Supply voltage	Nominal 3.6V
Power supply:	Removable battery version: SAFT LS14500
Maximum power	90mA
Working temperature	-25°C / +70°C
Dimensions:	105 x 50 x 27mm
Weight	90g
Casing	IP 67
Radio standards	EN 300-220, EN 301-489, EN 60950
Cable length	70cm + 10cm of bare wire

1.4.2 Autonomy

Event mode:

Operating conditions:	Number of items / events per day	Autonomy SF7	Autonomy SF12
Product shelf life before use: Maximum 1 year. Calculations performed at a temperature of 20°C	140	7.1 years	9 month
	100	8.4 years	1 year
	50	10.9 years	2 years
	20	13.4years	4 years
	10	14.5 years	6.5 years
	2	15.4 years	12.2 years

Periodic mode:

Operating conditions:	Number of items per day	Number of events per day	Autonomy SF7	Autonomy SF12
Product shelf life before use: Maximum 1 year. Calculations performed at a temperature of 20°C	140	2000	4.1 years	8 month
	140	1000	5.3 years	9 month
	140	500	6.2 years	9 month
	100	2000	4.5 years	11 month
	100	1000	5.9 years	1 year
	100	500	7.1 years	1 year
	50	2000	5 years	1.6 years
	50	1000	7 years	1.8 years
	50	100	10.6 years	1.9 years
	20	1000	7.8 years	3.4 years
	20	100	12.6 years	4 years
	20	50	13.1 years	4 years
	10	1000	8.1 years	4.8 years
	10	100	13.5 years	6.3 years
	10	20	14.3 years	6.5 years
	2	1000	8.3 years	7.3 years
	2	100	14.2 years	11.5 years
	2	20	15.2 years	12.1 years

The above values are estimations based on certain conditions of use and environment. They do not represent a commitment on the part of adeunis®.

1.4.3 Physical interface characteristics

1.4.3.01   Digital input interfaces

The schematic diagram of the digital input interfaces is the following:
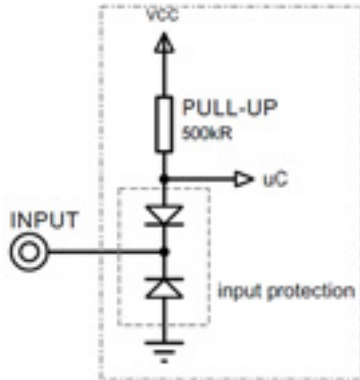
Absolute maximum values		Units
Minimum input current	- 0,7	V
Maximum input current	+50	V

Electrical characteristics		Unité
Minimum input voltage	0	V
Maximum input voltage	24	V
Equivalent input resistance	500	kΩ
Input frequency	10	Hz
High input level current consumption	0	µA
Low input level current consumption	6	µA

Values higher than the absolute maxima would damage the product.

1.4.3.02   Digital output interfaces

The schematic diagram of the digital interfaces is the following:

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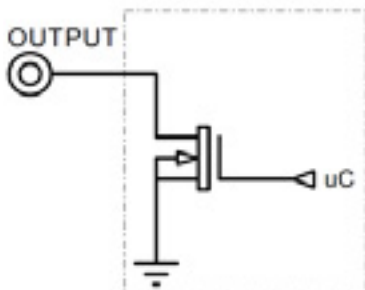
Absolute maximum values		Units
Minimum charging voltage	-0,7	V
Maximum charging voltage	+50	V
Maximum dissipation current (DC)	150	mA

Electrical characteristics		Units
Minimum charging voltage	0	V
Maximum charging voltage	24	V
Maximum recommended dissipation current	100	mA
Maximum output frequency	10	Hz
Current consumption at high output	0	µA
Current consumption at low output	5	µA

Values higher than the absolute maxima would damage the product.
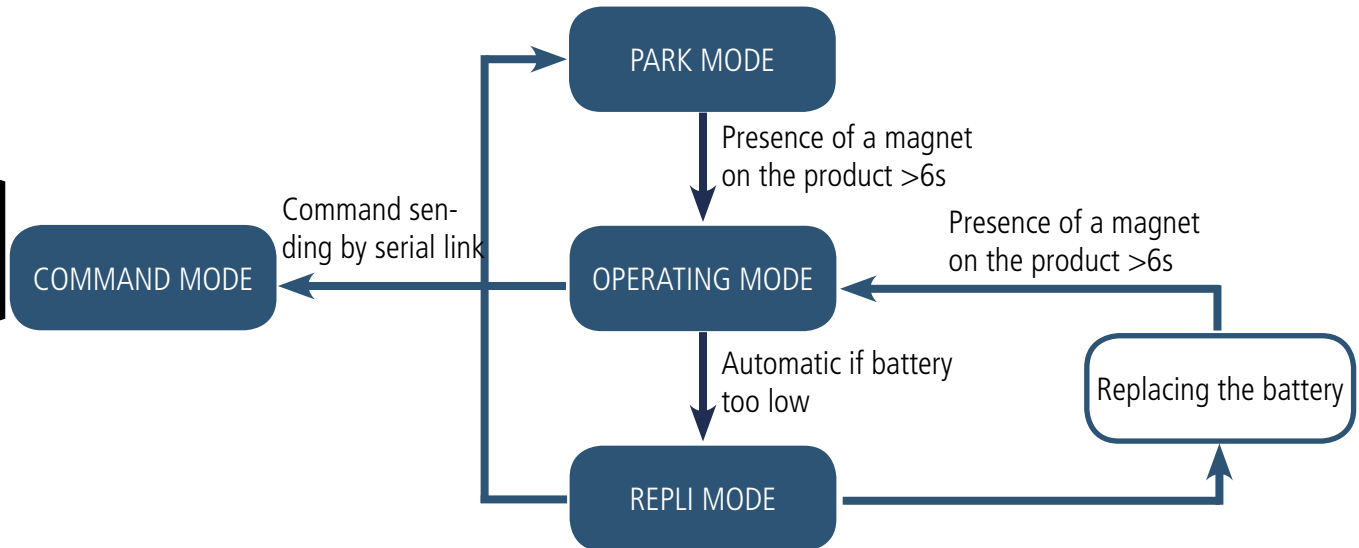
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2. PRODUCT OPERATION

2.1. Global operation

Important: adeunis® use the most significant byte first format.

The product has several operating modes:

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PARK MODE

Presence of a magnet
on the product >6s

Command sen-
ding by serial link

COMMAND MODE

OPERATING MODE

Presence of a magnet
on the product >6s

Automatic if battery
too low

Replacing the battery

REPLI MODE

2.1.1 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 of higher than 6 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 (see paragraph 4.1).

2.1.2 COMMAND MODE

This mode allows the user to configure the registers of the product.
To enter this mode, connect a cable to the micro-USB port of the product and enter the command mode by an AT command (see paragraph 3).

2.1.3 OPERATING MODE

There are two possible modes of operation:

• TEST mode:
This mode allows the user to perform tests of the product more quickly by reducing the time scales of production mode and modifying the behaviour of the LEDs (see paragraph 2.2.6).

• 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.

To switch from one mode to the other the user changes the value of a register

PRODUCTION MODE

COMMAND MODE

COMMAND MODE

TEST MODE
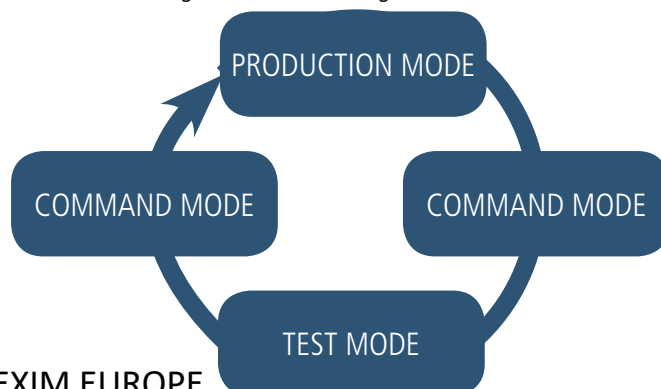
The return to the production mode is done by the ATO command or by disconnecting the USB cable

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2.1.4 REPLI mode

The product enters this very low consumption mode following the detection of a level of battery that is too low. In this mode the product wakes up every 5 seconds to make the red LED flash twice.
The replacement of the battery (if the product is a replaceable battery version) followed by the application of the magnet takes the product out of this mode to return it to the operating mode.

2.2. Application operation

2.2.1 Transmission on change of state

The product allows the transmission of a frame after a change of state on one of its inputs according to the following diagram:
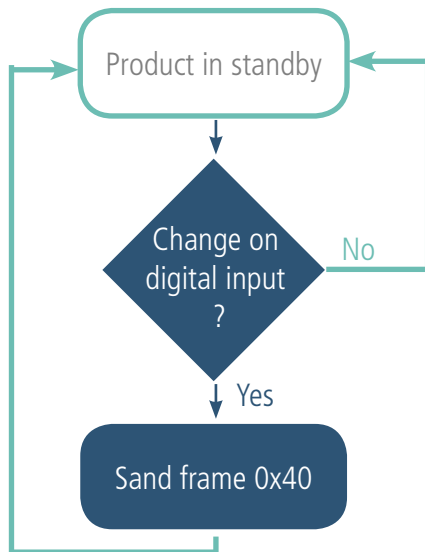
The monitoring of events on the enabled inputs continues even during transmission of the frame.

The settings associated with this mode of operation are:
• The configurations of the different digital inputs (registers 320 to 323).

A complete list of the registers can be found in paragraph 3.4.

E.g.:

Register	Value encoding	Value	Result
S320	Hexadecimal	0x76	Input TOR1 configuration: • Event mode • Detection of high and low edges • No waiting* period of 1 second
S321	Hexadecimal	0x00	Input TOR2 configuration: • Disabled • No waiting* period
S322	Hexadecimal	0xB4	Input TOR3 configuration: • Event mode • Detection of high edges only • Waiting* period of 20 second
S323	Hexadecimal	0x32	Input TOR4 configuration: • Periodic mode • Counting of low edges only • Waiting* period of 50 milliseconds

* Waiting* period (or debounce time): minimum time for taking into account a change of state. For example if this period is 10ms, all pulses (high or low level) whose duration is less than 10ms will not be taken into account. This technique prevents rebounces on a change of state.

In this example inputs TOR1 and TOR3 are in event mode while TOR4 is in periodic mode.

IMPORTANT NOTE:
If during the course of the transmission of a frame due to an event on input TOR1, an event occurs on input TOR3 the product will send a new frame after a wait of 20 seconds. Conversely an event on input TOR4 (periodic mode) will not cause of new transmission immediately but it will be counted.

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2.2.2 Periodic transmission

The product allows the measurement and the periodic transmission of the values of the sensors according to the following diagram:
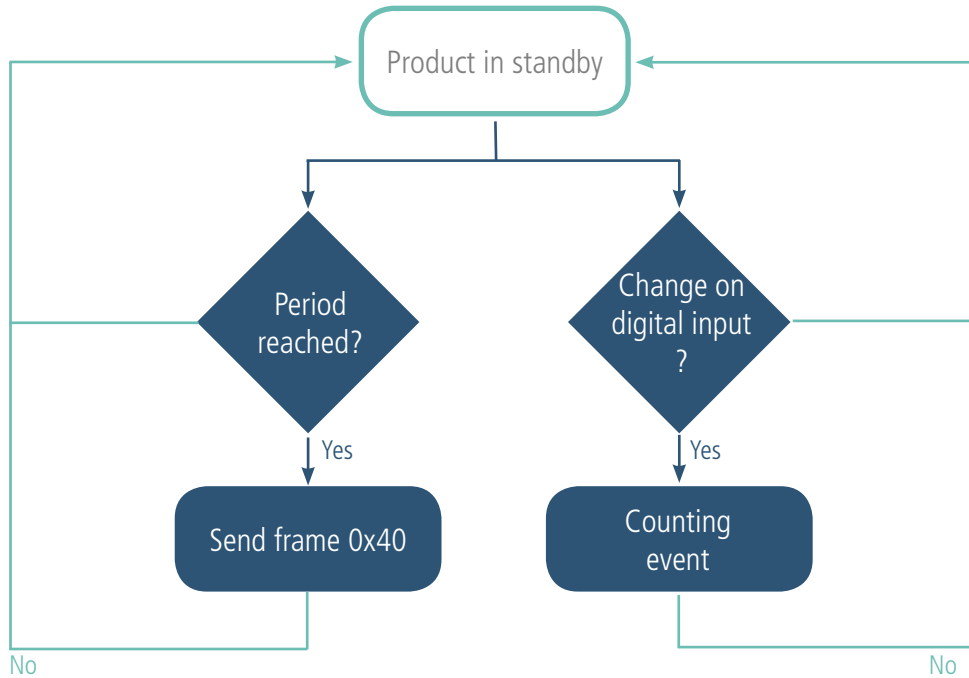
The settings associated with this mode of operation are:
• The transmission period (register 301).
• The configurations of the different digital inputs (registers 320 to 323).

A complete list of the registers can be found in paragraph 3.4.

E.g.:

Register	Value encoding	Value	Résults
S301	Decimal	6	Periodic mode with a period of 6x10min = 60 minutes
S320	Hexadecimal	0x73	Input TOR1 configuration: • Periodic mode • Detection of high and low edges • Waiting* period of 1 second
S322	Hexadecimal	0x00	Input TOR2 configuration: • Disabled • No waiting* period
S321	Hexadecimal	0xB4	Input TOR3 configuration: • Event mode • Detection of high edges only • Waiting* period of 20 second
S323	Hexadecimal	0x32	Input TOR4 configuration: • Periodic mode • Counting of low edges only • Waiting* period of 50 milliseconds

In this example inputs TOR1 and TOR4 are in periodic mode while TOR3 is in event mode.

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2.2.3 Operation of the counters

The counters represent, depending on the configuration, the number of high and low, low only or high only edges.
They are coded on 2 bytes therefore limited to a value of 65,535 the user must therefore be vigilant on the periodicity of sending in order not to exceed 65,535 events between two transmissions. The counters will remain blocked at the value 65,535 (no loopback.).

Example of values of the counters in several situations of use:
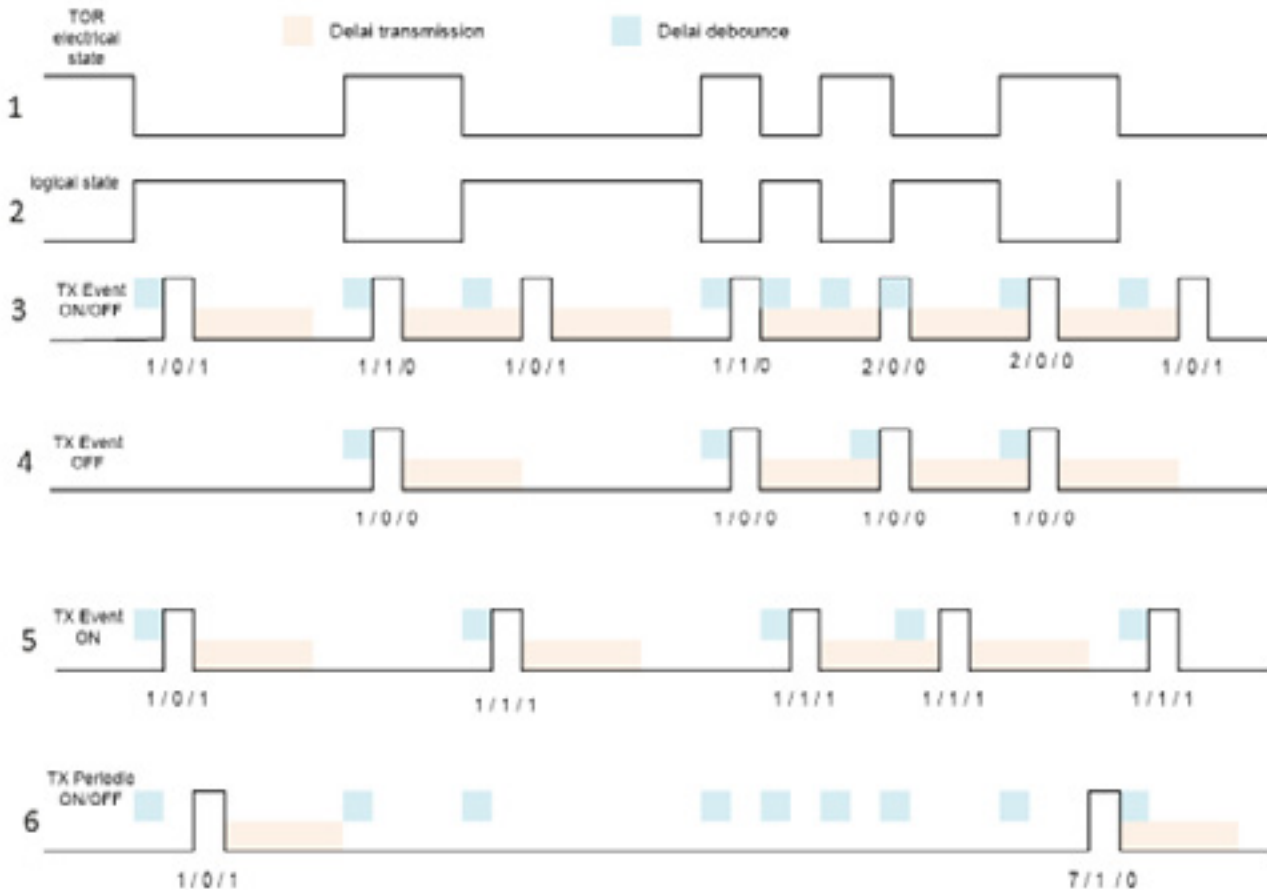
The 3 figures under the pulses are: the number of events / the previous state / the current state.

Explanation:
• The first line represents the electrical signal, as it is a Vdc pull-up resistor the state of the logical signal (logical state) on the second line is reversed.
• The third line is a digital input set in event mode to count the high and low edges (ON/OFF).
• The fourth line is a digital input set in event mode to count the low edges (OFF) only.
• The fourth line is a digital input set in event mode to count the high edges (OFF) only.
• The sixth line is a digital input set in periodic mode to count only the high and low edges (ON/OFF).

2.2.4 Control of the product output(s)

The product allows you to configure all or a part of the digital connections as outputs to control them from the network by a downlink frame according to the following diagram:

The settings associated with this mode of operation are:
• The configurations of the different digital inputs (registers 320 to 323).

A complete list of the registers can be found in paragraph 3.4.

E.g.:

Register	Value encoding	Value	Result
S320	Hexadecimal	0x73	Input TOR1 configuration: • Periodic mode • Detection of high and low edges • Waiting* period of 1 second
S321	Hexadecimal	0x07	Input TOR2 configuration: • Output (Default state = 1/close) • No waiting* period
S322	Hexadecimal	0xB4	Input TOR3 configuration: • Event mode • Detection of high edges only • Waiting* period of 20 second
S323	Hexadecimal	0x32	Input TOR4 configuration: • Periodic mode • Counting of low edges only • Waiting* period of 50 milliseconds

In this example TOR2 is configured as an output with a state by default at 1.

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2.2.5 Transmission of a daily Keep Alive frame

In the event mode only, 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 according to the following diagram:
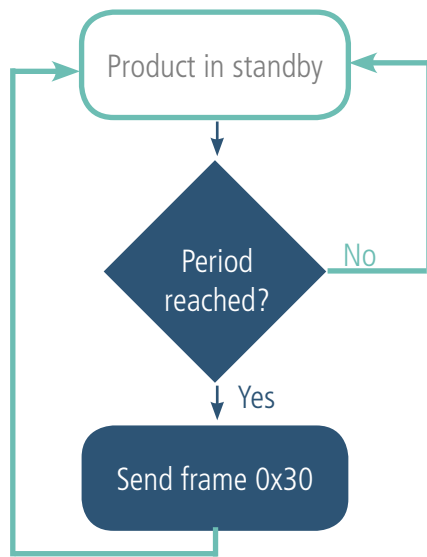
If one of the inputs is in periodic mode there is no Keep Alive frame transmission.

The settings associated with this mode of operation are:
• The setting of the period of transmission of the Keep Alive frame (once per hour to once per day) (register 300).

A complete list of the registers can be found in paragraph 3.4.

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E.g.:

Register	Value encoding	Value	Result
S300	Decimal	72	The Keep Alive frame is sent every: 72x10=720min i.e. 12h (or twice per day)

2.2.6 TEST Mode

This mode allows the user to perform tests of the product more quickly by reducing the time scales of the production mode and modifying the behaviour of the LEDs.

It is obtained by positioning register S306 at the value 2 in the COMMAND mode. Once out of the command mode, the product returns to the previously defined application behaviour but with the following changes:

- register S300: the periodicity of the Keep Alive frame is expressed in groups of twenty seconds instead of tens of minutes. Hence in test mode when register 300 = 144, the Keep Alive frame is no longer sent every 144x10min=1440 minutes or 24h but every 144x20s=2880 seconds or 48 minutes.
- register S301: the periodicity of the sending of data (periodic mode) is expressed in groups of twenty seconds instead of tens of minutes. Hence in test mode when register 301 = 1, the data frame is no longer sent every 10min but every 20 seconds.
- In the event mode with transmission on threshold overrun the monitoring period of inspection by the sensors, normally 10 minutes is now, in TEST mode, set to 100 seconds.
- The LEDS also have different behaviour, allowing a visual feedback to the user in the event of transmission and reception of frames (see paragraph 2.3 for more details).

A complete list of the registers can be found in paragraph 3.4.

E.g.:

Register	Value encoding	Value	Result
S306	Decimal	2	The product is in TEST mode
S300	Decimal	72	The Keep Alive frame is sent every: 72x20=1440s = 24 minutes
S301	Decimal	6	Periodic mode with a period of 6x20 = 120s = 2 minutes

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2.3. Operation of the LEDs

Mode	LED red state	LED green state
Transmission of frame (TEST mode only)		ON during the transmission cycle
Reception of frame (TEST mode only)	ON during the reception of a downlink frame	
Product in Park mode	OFF	OFF
Magnet detection process (1 to 6 seconds)	OFF	ON from detection of the magnet up to a maximum of 1 second
Product start (after detection of the magnet)	OFF	Rapid flashing 6 cycles, 100 ms ON / 100 ms OFF
Joining process (Lora product)	During the JOIN phase: flashing: 50ms on / 1 s off If the JOIN phase is complete (JOIN accept): flashing: 50ms on / 50ms Off (6x)	During the JOIN phase: flashing: 50ms on / 1 s off (just after the red LED) If JOIN phase is complete (JOIN accept): flashing: 50ms on / 50ms off (just before the red LED)
Switching to the Command mode	Continuously lit	Continuously lit
Battery level low	Flashing (0.5s ON every 60s)	
Product faulty (return to factory)	Fixed ON	
Product in production mode (TEST mode only)	50ms ON / 50 s OFF	50ms ON / 50 s OFF (just before the red LED)
Product in REPLI mode	Flashing (100ms ON / 100ms OFF) x 2 every 5s	

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3.   DEVICE CONFIGURATION

The device can be configured using the USB connector. This connection allows you to communicate with the device via a virtual com port and to transmit AT commands in order to modify the parameters of the device.

WARNING : the USB connection does not supply power to the product, it induces a consumption of the product as long as the one is connected. It is therefore important not to leave the product connected too long.

3.1.   Connecting the device to a computer

Connect the product to the USB input of a computer. The product has a Type B micro USB connector.
During connection, the device must be recognised by the computer as a Virtual Com Port (VCP) device.
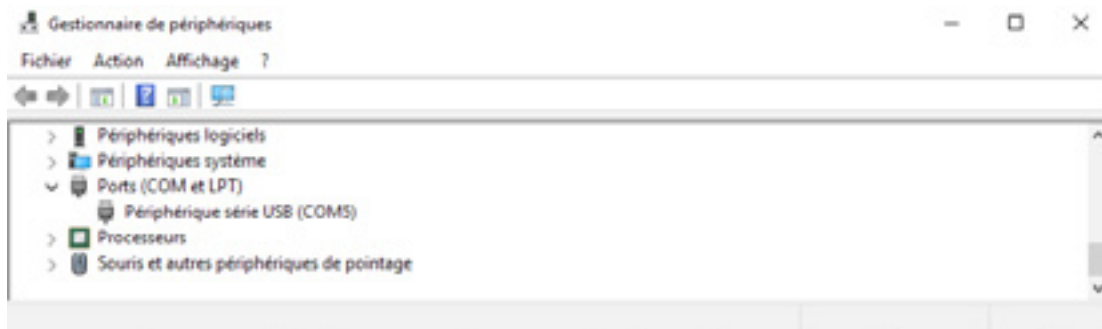
Using Windows: Verification that the device has been recognised to be functioning properly can be obtained by consulting the device manager. You should see the USB series device with a corresponding COM port number appear during connection.

If you are not able to see a device of this type, you must install the USB driver for this device, available to download from our website: https://www.adeunis.com/produit/dry-contacts/

Select:
* Driver USB-STM32_x64, if your computer is a 64 bits system
* Driver USB-STM32, if your computer is a 32 bits system

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3.2. Command mode

Use a COM port terminal in order to communicate with the device. We use the HERCULES COM port soft terminal available to download for free by clicking on the following link: http://www.hw-group.com/devices/hercules/index_en.html

- With Hercules, select the "Serial" tab, then configure the serial port with the following serial parameters:

Parameters	Value
Rate	115 200 bps
Parity	None
Data	8
Stop Bit	1

- Select the serial port on which the device has been created with Windows (Name).
- Click on the "Open" button to open the serial port.

NOTE INFORMATION : If the com port has been opened correctly, Hercules will display the message "Serial COM3 port opened". Alternatively, "Serial port com opening error" will be displayed, meaning either that the com port is already open for another application, or it does not exist.

You must send a specific frame in order to move the device to configuration mode.
Frame expressed in hexadecimals: 0x2B 0x2B 0x2B
or « +++ »

For Hercules, this frame must be entered in one of the 3 lines available at the bottom. The hexadecimal format must be expressed using a "$" in this program, which gives us the following frame: $2B$2B$2B

Send the transition frame in command mode in order to switch the device to configuration mode by clicking on the SEND button.

After a few seconds, You must see the 2 LEDs light up permanently.

On the com port terminal, you should also have "CM" feedback for Command Mode.
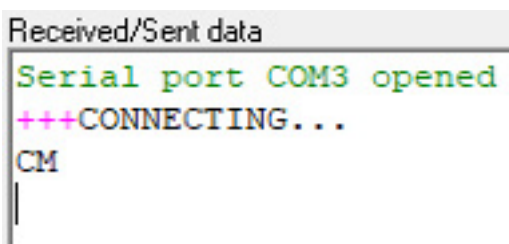
Sending a character on Hercules is displayed in magenta and receiving a character is displayed in black. If you do not see sending characters, this is probably because ECHO is not active on this program. To activate the option in the accessible menu, right click in the viewing window.

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3.3. AT Commands

A command starts with 2 ASCII characters: "AT", followed by one or more characters and data (see the list below for the syntax of AT commands available on the modem).
Each command must finish with a "CR" or "CR" "LF" – both are acceptable.
(CR indicates: Carriage Return, LF indicates: Line Feed)

Once the command has been received, the modem will feedback:
<cr><lf> "Data" for ATS type playback control <n> ?, AT/S or AT/V
"O" <cr><lf>, for any other command when this has been accepted.
"E" <cr><lf>, if it refuses the command due to a syntax error, unknown command, unknown range, invalid parameter, etc.
"CM" <cr><lf>, if it accepts the input in command mode

Table of AT commands:

Command	Description	Reply example
+++	Input request in command mode	CONNECTING... <cr><lf> CM<cr><lf>
ATPIN <PIN>	Gives access to AT commands if register S304 is different of 0	
AT/V	Feeds back the version of the APPLICATIF and RTU software	APP_8230EAA_PRG1706_V01.02.02:RTU_RTU_WM-BUS_868_PRG_1601_V00.00.03 Or APP_8181AAA_PRG1701_V01.00.02:RTU_8120AAB_PRG_1701_V01.00.01
AT/N	Feeds back the type of network	"LoRa" or "SIGFOX" or « WMBUS »
ATS<n>?	Feeds back the content of the n range	Sn=y where y represents the content of the n range
AT/S	Edits the content of all of the user ranges in the form of a list.	/
ATS<n>=<m>	Transfers the m value to the n range	«O»<cr><lf> if Ok, «E»<cr><lf> if error, «W»<cr><lf> if coherency error
AT&W	Saves the current configuration to non-volatile memory.	«O»<cr><lf>, «W»<cr><lf> if coherency error
ATO	Exit command mode	«O»<cr><lf>, «W»<cr><lf> if coherency error
ATT63 PROVIDER	Unblock the operating range	«O»<cr><lf>

Example of a set of commands and corresponding responses that can be seen on the terminal:

Command syntax	Description	Response Syntax to Next Line
+++	Input request in command mode	CONNECTING... CM
ATS221=1	Request to switch to activation OTAA mode	O
ATS214=0018B200	Change APP_EUI MSB	E -> This command is not validated (register no unlocked)
ATT63 PROVIDER	Unblock the operating range	O
ATS214=0018B200	Change APP_EUI MSB	O
ATS215?	Feeds back the value of the S215 range	S200=44512451
AT&W	Memory request for the state range	O
ATO	Output request in command mode	O

Interpretation of the above example: the user wanted to change the beginning of the APP_EUI after having made a command not allowed (answer (E), the registers were unblocked to change this register. An audit of the second part of the APP_EUI is performed and a backup of settings before exit is performed. As soon as the product exits from the command mode, the product makes a request to join.

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3.4. Description of the registers

On switching on the product works according to the last saved configuration (Factory Configuration if it is the first start, or if this configuration has not been changed). Commands such as Modification TTY<n>=<M> or ATR allow you to change the content of the registers: <n> representing the number of the register and <m> the value to be assigned. This latter is either a decimal value or a hexadecimal value consistent with the «encoding» column of the tables below.

Examples:
• ATS300=6 assigns the decimal value 6 in register 300
• ATS320=2 assigns the hexadecimal value 0x02 in register 320

It is imperative to save the parameters with the command AT&W before exiting the Command mode otherwise all changes will be lost.

IMPORTANT: The registers that are not documented (that can appear in the list following the AT/S command) in the paragraphs that follow are reserved and must not be changed.

EN

3.4.1 Function registers

The list of registers below allows you to change the behaviour of the product application.

Register	0Size (bytes)	Description	Codage	Details
300	1	Transmission period of the Keep Alive frame	Decimal	Default: 144 Min/max: 1 to 255: Units: X 10min if S306=1 X 20s if S306=2
301	1	Transmission period of event counters	Decimal	Default: 72 Min/max: 1 to 255 Unit: x 10min if S306=1 x 20s if S306=2
303	1	Confirmed mode activation	Decimal	Default : 0 (desactivated) Values : 0 (desactivated) à 1 (activated)
304	2	PIN code	Decimal	Default : 0 (disabled) Min/max : 0 to 9999 PIN code used with ATPIN command. Value 0 disables the PIN code. IMPORTANT: The product does not have a mechanism to unlock the PIN code if it is activated and the code is forgotten.
306	1	Global operation	Decimal	Default: 0 Allows the product to be switched into one of the following modes: • 0:PARK MODE • 1: PRODUCTION MODE • 2:TEST MODE • 3: REPLY MODE

320	1	Input TOR1 configuration:	Hexadecimal	Default : 0x46 Bits 0 to 3: Type • 0 = Disabled • 1 = Input - Periodic Mode - High edge • 2 = Input - Periodic Mode - Low edge • 3 = Entrée - Periodic Mode - High and low edge • 4 = Entrée - Event Mode - High edge • 5 = Entrée - Event Mode - Low edge • 6 = Entrée - Event Mode - High and low edge • 7 =Output (Default state = 1/close) • 8 = Output (Default state = 0/close) Bits 4 to 7: Duration of the waiting period • 0: None 　• 8: 2 s • 1: 10 ms 　• 9: 5 s • 2: 20 ms 　• A: 10 s • 3: 50 ms 　• B: 20 s • 4: 100 ms 　• C: 40 s • 5: 200 ms 　• D: 60 s • 6: 500 ms 　• E: 5 min. • 7: 1 s 　• F: 10 min. WARNING : if none of the TOR inputs is configured (value = Disabled), the product will send the configuration frame 0x10 periodically (period defined by register 300).
321	1	Configuration of the input TOR2	Hexadecimal	See details of register 320
322	1	Configuration of the input TOR3	Hexadecimal	See details of register 320
323	1	Configuration of the input TOR4	Hexadecimal	See details of register 320

3.4.2 Registres réseau

The list of registers below allows you to change the behaviour of the product application. This list is accessible in Provider mode following execution of the ATT63 Provider command.
These registers must be handled with caution because they could cause problems of communication or of non-compliance with the legislation in force.

Register	Description	Coding	Details
201	Spreading Factor (SF) by default	Decimal	Default: 12 (868) or 10 (915) depending on the reference of the product Min/max: 4 to 12 Unit: None
214	LORA APP-EUI (first part – MSB)	Hexadecimal	Default: 0 Key encoded on 16 characters. Each register contains a part of the key. Used during the join phase in OTAA mode E.g.: APP-EUI = 0018B244 41524632 • S214 = 0018B244 • S215 = 41524632
215	LORA APP-EUI (second part – LSB)	Hexadecimal	

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216	LORA APP-KEY (first part – MSB)	Hexadecimal	Default: 0 Key encoded on 32 byte characters. Each of the 4 registers contains 8 characters. Used during the join phase in OTAA mode E.g.: APP-KEY = 0018B244 41524632 0018B200 00000912 • S216 = 0018B244 • S217= 41524632 • S218 = 0018B200 • S219 = 00000912
217	LORA APP-KEY (second part – MID MSB)	Hexadecimal	
218	LORA APP-KEY (third part– MID LSB)	Hexadecimal	
219	LORA APP-KEY (fourth part – LSB)	Hexadecimal	
220	LoRaWAN Options	Hexadecimal	Default: 5 Bit 0: Activation of the ADR ON(1)/OFF(0) Bit 1: Reserved Bit 2: DUTYCYCLE ON(1)/DUTYCYCLE OFF(0) Bit 3 to 7: Reserved WARNING : Deactivation of the Duty Cycle may result in a violation of the conditions of use of the frequency band, depending on the use of the product, thus violating the regulations in force. In the case of disabling the Duty Cycle, the responsibility is transferred to the user
221	Mode of activation	Decimal	Défaut : 1 Choice: (see NOTE1 after the board) • 0 : ABP • 1: OTAA
222	LORA NWK_SKEY (first part – MSB)	Hexadecimal	Default: 0 Parameter encoded on 16 bytes. Each of the 4 registers contains 4 bytes.
223	LORA NWK_SKEY (second part - MID MSB)	Hexadecimal	
224	LORA NWK_SKEY (third part - MID LSB)	Hexadecimal	
225	LORA NWK_SKEY (fourth part – LSB)	Hexadecimal	
226	LORA APP_SKEY (first part – MSB)	Hexadecimal	Default: 0 Parameter encoded on 16 bytes. Each of the 4 registers contains 4 bytes.
227	LORA APP_SKEY (second part - MID MSB)	Hexadecimal	
228	LORA APP_SKEY (third part - MID LSB)	Hexadecimal	
229	LORA APP_SKEY (fourth part – LSB)	Hexadecimal	
250	Configuration Canal 0	Decimal (868) Hexadecimal (915)	Default: 1 Obligatory LoRaWAN operating channel Do not change this value
251	Configuration Canal 1	Decimal (868) Hexadecimal (915)	Default: 1 (868) ; 0 (915) Obligatory LoRaWAN operating channel Do not change this value
252	Configuration Canal 2	Decimal (868) Hexadecimal (915)	Default: 1 Obligatory LoRaWAN operating channel Do not change this value
253	Configuration Canal 3	Decimal (868) Hexadecimal (915)	Default: 0 (868); 1 (915) 0: Channel disabled Other: User configuration (Note2)

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254	Configuration Canal 4	Decimal (868) Hexadecimal (915)	Default: 0 (868); 1 (915) 0: Channel disabled Other: User configuration (Note2)
255	Configuration Canal 5	Decimal (868) Hexadecimal (915)	Default: 0 (868); 1 (915) 0: Channel disabled Other: User configuration (Note2)
256	Configuration Canal 6	Decimal (868) Hexadecimal (915)	Default: 0 (868); 1 (915) 0: Channel disabled Other: User configuration (Note2)
257	Configuration RX2	Decimal (868) Hexadecimal (915)	Default : 1 0 : Channel disabled 1 : Default configuration: LoRaWAN Autre : User configuration
258	Type of tape (only in 915)	Decimal	Default: 3 Min/max: 0 to 3
280	NETWORK ID	Hexadecimal	Default: 0 Lecture seule
281	DEVICE ADDRESS	Hexadecimal	Default: 0

EN

NOTE 1 :

The «Over The Air Activation» (OTAA) mode uses a join phase before being able to transmit on the network. This mode uses the APP_EUI (S214 and S215) and APP_KEY (S216 to S219) codes during this phase to create the keys for network communication.
Once this phase is completed, the codes APP_sKEY, NWK_sKEY and Device address will be present in the corresponding registers.
A new join phase is started every time the product comes out of Command mode, a reset is performed or the product is turned on.

Codes:

• APP_EUI identifier for global use (provided by default by adeunis®)
• APP_KEY device application key (provided by default by adeunis®)

The «Activation by personalization» (ABP) mode has no join phase; it transmits directly on the network using the codes NWK_sKEY (S222 to S225), APP_sKEY (S226 to S229) and Device address (S281) to communicate.

Codes:

• NWK_sKEY network session key (provided by default by adeunis®)
• APP_sKEY applicative session key (provided by default by adeunis®)
• DEVICE ADDRESS Address of the device in the network (provided by default by adeunis®)

NOTE 2:

By default, channels 0 to 2 use the default settings of the LoRaWAN network; the other 4 channels are inactive. A register value different from 0 or 1 allows the channel to be configured as follows:

Bit	7	6	5	4	3	2	1	0
Description	Channel frequency						DR Max	DR Min
E.g.:	868100						5	3

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Data Rate value (DR)	Description
0	SF12
1	SF11
2	SF10
3	SF9
4	SF8
5	SF7
6	SF7 – BW 250kHz
7	FSK 50 kps

The example given allows the user to configure a frequency of 868.1 Hz and authorizes a SF 7 to 9. The command to be sent to perform this operation is:
ATS250=86810053<cr>

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4. DESCRIPTION OF THE FRAMES

4.1. Uplink frames

All of the uplink frames of the product to the network (uplink) always have a size of 11 bytes.

4.1.1 Fixed bytes

The first two bytes of the frame are systematically dedicated to indicate the frame code and the status as presented below:

0	1	2	3	4	5	6	7	8	9	10
Code	Status	PAYLOAD								

4.1.1.01 Byte code

This byte contains the code associated with the frame to facilitate its decoding by the data system.

4.1.1.02 Status Byte

The status byte is broken down in the following way:

Alarm Status	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
	Frame Counter			Réservé	Command Output	HW	Low Bat	Config
No Error	0x00 to 0x07			X	0	0	0	0
Configuration done				X	0	0	0	1
Low bat				X	0	0	1	0
HW Error				X	0	1	0	0
Command Output Done				X	1	0	0	0

Details of the fields:

- Frame counter: Frame counter, it increments at each transmission and allows the user to see quickly if a frame has been lost. It counts from 0 to 7 before looping back.

- Command Output Done: bit at 1 if at least one output has been properly controlled.

- HW: This bit is set to 1 when a hardware error has occurred, for example a writing problem in the EEPROM, a reading problem on the ADC, etc. The product must be returned in to the service dept.

- Low Bat: bit at 1 if the battery voltage is less than 2.5V, otherwise 0. This information remains permanent.

- Config: bit at 1 if a configuration was carried out during the last downlink frame, otherwise 0. This bit returns to 0 as from the next frame.

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E.g.:

A value of the status byte equal to 0xAB (= 10101011 in binary) gives:
- Bit 7 at 5 = 101 = 0x05 i.e. a frame counter at 5
- Bit 4 at 0 = 01011 in binary is the validation of the configuration, a low battery alarm and a successful exit command.

4.1.2 Product configuration data frames

Following reception of a downlink frame with the code 0x10 or on switching to the operating mode (from the Park or Command Mode), the next frames (0x10) representing the application configuration of the product are transmitted:

0	1	2	3	4	5	6	7	8	9	10
Code	Status	PAYLOAD								
0x10	Cf Status	S300	S301	S320	S321	S322	S323	S306	X	X
0x10	0xAB	0x90	0x48	0x73	0x00	0xB4	0x32	0x01		

Description of the frame:

- Byte 2: register 300, periodicity of the Keep Alive frame, expressed in tens of minutes
- Byte 3: register 301, periodicity of transmission (periodic mode), expressed in tens of minutes
- Byte 4: register 320, configuration of input TOR1
- Byte 5: register 321, configuration of input TOR2
- Byte 6: register 322, configuration of input TOR3
- Byte 7: register 323, configuration of input TOR4
- Byte 8: register 306, product mode (Park, Standard (production), Test or REPLI)

In the example in grey this gives:

- Byte 2=0x90: register 300, Keep Alive frame transmitted every 12 hours

- Byte 3=0x48: register 301, periodical transmissions are made every 0x48=72 in decimal x 10 minutes = 720 minutes i.e. every 12 hours

- Byte 4=0x73: register 320:
  - TOR1 configured in periodic mode
  - Counting of high and low edges
  - Waiting period of 1 second

- Byte 5=0x00: register 321:
  - TOR2 disabled
  - No waiting period

- Byte 6=0xB4: register 322:
  - TOR3 configured in event mode
  - Detection of high edges only
  - Waiting period of 20 second

- Byte 7=0x32: register 323:
  - TOR4 configured in periodic mode
  - Counting of low edges only
  - Waiting period of 50 milliseconds

- Byte 8=0x01: register 306, Production mode in progress

In this example, given that inputs TOR1 and TOR4 are configured in periodic mode, the transmission period of the Keep Alive frame has no impact because it is not emitted.

WARNING **:** if none of the TOR inputs is configured (value = Disabled), the product will send the configuration frame 0x10 periodically (period defined by register 301).

4.1.3 Network configuration data frames

Following reception of a downlink frame with the code 0x02 or on switching to the operating mode (from the Park or Command Mode), the next frame (0x20) representing the network configuration of the product is transmitted:

0	1	2	3	4	5	6	7	8	9	10
Code	Status	PAYLOAD								
0x20	Cf Status	ADR	MODE	X	X	X	X	X	X	X
0x20	0xAB	0x01	0x01							

Description of the frame:

- Byte 2: activation of the Adaptive Data Rate: ON (value = 1) or OFF (value = 0)
- Byte 3: connection mode: ABP (value = 0) or OTAA (value = 1)

In the example in grey this gives:

- Byte 2=0x01: The Adaptive Data Rate is enabled
- Byte 3=0x01: OTAA connection mode

4.1.4 Keep Alive frame

This frame (0x30) is only issued when the different digital outputs are configured in the event mode or in output and at the frequency defined by register 300.

0	1	2	3	4	5	6	7	8	9	10
Code	Status	PAYLOAD								
0x30	Cf Status	X	X	X	X	X	X			X
0x30	0xAB									

As the example shows it only contains the value of the status byte.

4.1.5 Reply frame to a register value request in a downlink frame

Following reception of a downlink frame with the code 0x40, the frame 0x31 is transmitted.
It contains all the values of the registers requested in the downlinl frame 0x40.

- Frame (0x40) sent to the product (downlink) :

0	1	2	3	4	5	...	n
Code	PAYLOAD						
0x40	CONFID1	CONFID2	CONFID3	X	X	X	CONFIDn

The CONFIDX (8bits) fields represent the indices of the registers to be sent. The corresponding register is 300 + CONFIDX value.

- Response frame (0x31) from the product:

0	1	2	3	4	5	...	11
Code	Status	PAYLOAD					
0x31	Cf. Status	VALUE1	VALUE1	VALUE2	VALUE3	VALUE3	X

In this example: CONFID1 is a 2-byte register, CONFID2 a 1-byte register and CONFID3 a 2-byte register.
If an error is detected in the request, the returned 0x31 frame will be empty.

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4.1.6 Data Frame

This frame (0x40) contains the values measured on the different digital outputs.

0	1	2	3	4	5	6	7	8	9	10
Code	Status	PAYLOAD								
0x40	Cf Status	Informations TOR1		Informations TOR2		Informations TOR3		Informations TOR4		Details
0x40	0xAB	0x00F1		0x0002		0x0001		0x0000		0x9C

Description of the frame:

- Byte 2 and 3: Information on the TOR1
- If configured as an input (event or Periodic mode): these bytes contain the value of the event counter of Input TOR1
- If configured as an output: current state of the output TOR1

- Byte 4 and 5: Information on TOR2
- If configured as an input (event or Periodic mode): these bytes contain the value of the event counter of Input TOR2
- If configured as an output: current state of the output TOR2

- Byte 6 and 7: Information on TOR3
- If configured as an input (event or Periodic mode): these bytes contain the value of the event counter of Input TOR3
- If configured as an output: current state of the output TOR3

- Byte 8 and 9: Information on TOR4
- If configured as an input (event or Periodic mode): these bytes contain the value of the event counter of Input TOR4
- If configured as an output: current state of the output TOR4

- Byte 10: Details: detailed information on the states of the TORs:
- <0> TOR1: Current state
- <1> TOR1: State at the sending of the previous frame
- <2> TOR2: Current state
- <3> TOR2: State at the sending of the previous frame
- <4> TOR3: Current state
- <5> TOR3: State at the sending of the previous frame
- <6> TOR4: Current state
- <7> TOR4: State at the sending of the previous frame

In the example in grey this gives:

- Byte 2 and 3=0X00F1: value of the event counter of input TOR1 equal to 241

- Byte 4 and 5=0X00F1: value of the event counter of input TOR2

- Byte 6 and 7=0x0001: current state of output TOR3 (because it is configured as an output in this example)

- Byte 8 and 9=0x0000: input disabled in this example

- Byte 10=1001 1100 (0x9C): which gives:
- <0> TOR1: Current state = 0
- <1> TOR1: State at the sending of the previous frame = 0
- <2> TOR2: Current state = 1
- <3> TOR2: State at the sending of the previous frame = 1
- <4> TOR3: Current state = 1
- <5> TOR3: State at the sending of the previous frame = 0
- <6> TOR4: Current state = 0
- <7> TOR4: State at the sending of the previous frame = 1

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4.1.7 Summary of the conditions of transmission of uplink frames

The table below summarizes the conditions of the transmission of the different uplink frames:

Code	Description	Sending conditions
0x10	Product configuration data frames	• Start-up of the product • Exit from the configuration mode (AT Command) • Reception of a downlink frame 0x01 • Periodically if the inputs are disabled (period defined by the register 300)
0x20	Frame of information on the network configuration	• Start-up of the product • Exit from the configuration mode (AT Command) • Reception of a downlink frame 0x02
0x30	Keep Alive frame	• Periodically if all the TORs are configured in event mode or as outputs
0x31	Reply frame to a register value request in a downlink frame	• Reception of a downlink frame 0x40
0x40	Data Frame	• Start-up of the product • Event on an input configured in event mode • The end of the period on input configured in periodic mode

4.2. Downlink frames

LoRaWAN technology makes it possible to transmit information to the product from the network (downlink frame).
The class A of the LoRaWAN specification allows the product to receive information from the network by proposing two listening windows after each uplink communication (uplink frame).

4.2.1 Product configuration request frame

This frame allows us to inform the product via the network that it must resend the product configuration uplink frame (0x10).

0	1	2	3	4	5	6	7
Code	PAYLOAD						
0x01	X	X	X	X	X	X	X

4.2.2 Network configuration request frame

This frame allows us to inform the product via the network that it must resend the network configuration uplink frame (0x20).

0	1	2	3	4	5	6	7
Code	PAYLOAD						
0x02	X	X	X	X	X	X	X

4.2.3 Output control frame

This frame allows us to change the state of the TORs configured as outputs.

0	1	2	3	4	5	6	7
Code	PAYLOAD						
0x03	output status	X	X	X	X	X	X
0x03	0x05	X	X	X	X	X	X

Description of the frame:

- Byte 1: States to be applied to the TORs
    - Bit 0: State to be applied to TOR1
    - Bit 1: State to be applied to TOR2
    - Bit 2: State to be applied to TOR3
    - Bit 3: State to be applied to TOR4
- Bits 4 to 7: reserved

If the channel is configured as an output, the corresponding bit in the downlink frame 0x03 is taken into account, otherwise it is simply ignored.

In the example in grey this gives:

Description of the frame:

- Byte 1=0x05 i.e. 0101 in binary which gives:
    - Bit 0=1 => TOR1 state set to 1 if TOR1 is configured as an output otherwise no change
    - Bit 1=0 => TOR2 state set to 0 if TOR2 is configured as an output otherwise no change
    - Bit 2=1 => TOR3 state set to 1 if TOR3 is configured as an output otherwise no change
    - Bit 3=0 => TOR4 state set to 0 if TOR4 is configured as an output otherwise no change
- Bits 4 to 7: reserved

4.2.4 Specific register value request frame

This frame (0x40) allows to inform the product via the network that it must send the values of specific registers in a uplink frame (0x31).

0	1	2	3	4	5	…	n
Code	PAYLOAD						
0x40	CONFID1	CONFID2	CONFID3	X	X	X	CONFIDn

Description of the frame:
- Bytes 1 to N : CONFIDX (8bits): indice of the register to be sent. The corresponding register is 300 + CONFIDX value. For example, if CONFID1 = 20, the product will send back the value of register number 320.

The associated uplink frame has the code 0x31 (see paragraphe 4.1.5).

0	1	2	3	4	5	…	11
Code	PAYLOAD						
0x31	Status	VALUE1	VALUE1	VALUE2	VALUE3	VALUE3	X

In this example: CONFID1 is a 2-byte register, CONFID2 a 1-byte register and CONFID3 a 2-byte register.
If an error is detected in the request, the returned 0x31 frame will be empty.

IMPORTANT : The user can specify several CONFIDs in his downlink frame but it is his responsibility to verify that according to the protocol the size of the data available in a downlink frame will be large enough to contain all the desired data. Otherwise, the application will only send the first values.

4.2.5 Frame for updating the value of specific registers

This frame (0x41) allows to change the value of requested registers.

0	1	2	3	4	5	…	n
Code	PAYLOAD						
0x41	CONFID1	CONFID1 value	CONFID2	CONFID2 value (MSB)	CONFID2 value (LSB)	…	CONFIDn value

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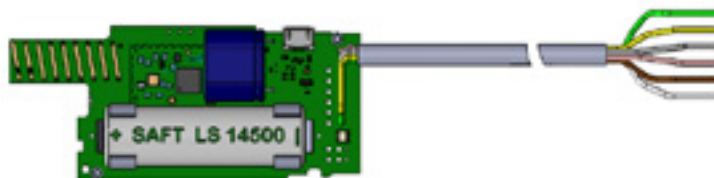
Description of the frame :

- Byte 1: CONFID1 (8bits) : indice of the first register to change. The corresponding register is 300 + value of CONFIDX. For example, if CONFID1 = 20, the product will change the value of register number 320.
- Byte 2: value to assign to CONFID1 : in this example, its value has a size of 1 byte
- Byte 3: CONFID2 (8bits) : indice of the second register to change. The corresponding register is 300 + value of CONFIDX.
- Bytes 4 and 5: value to assign to CONFID2 : in this example, its value has a size of 2 bytes
- …

The product does not return any uplink frame following the reception of a downlink frame 0x41. However, the Config bit of the status byte (see section 4.1.1.2) will be set to 1 in the next scheduled uplink frame (periodic or alarm or keep alive frame) if all was well done.

IMPORTANT: the value 0xFF for a CONFIDX will stop the reading of the downlink frame. Only the bytes preceding this value 0xFF will be taken into account. This mechanism can be useful when you need to work in fixed downlink frame lengths and you do not want to use all available bytes.

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5. PREPARATION AND START-UP

5.1. Cable description
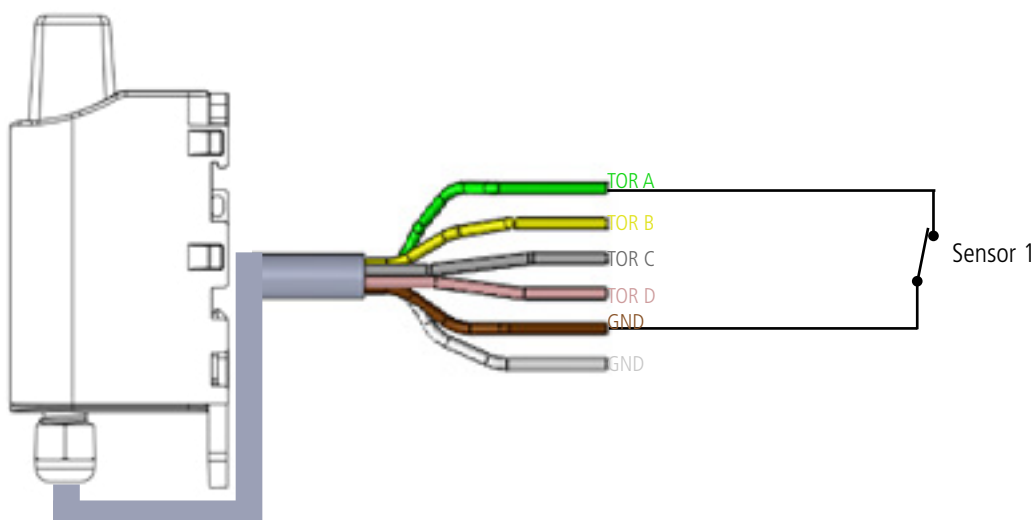

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Zoom on the cables:


TOR A
TOR B
TOR C
TOR D
GND
GND
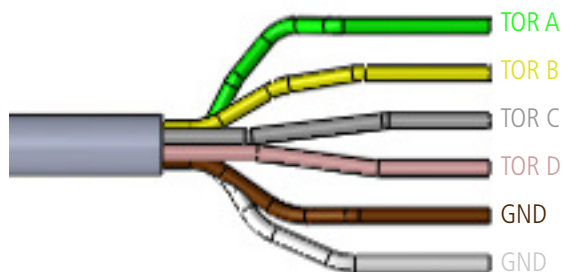
5.2. Example of Input Wiring

The following example shows the wiring to be performed to recover the open or closed state of the sensor 1:

TOR A
TOR B
TOR C
TOR D
GND
GND

Sensor 1

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5.3. Example of output wiring

The Dry Contact product outputs can be configured as outputs for controlling the equipment. The outputs are open collector outputs. It is therefore necessary to add an output relay to control equipment as the product is not able to provide a product output voltage directly.

The following example shows the wiring to be installed for controlling lighting: such as a 24V bulb
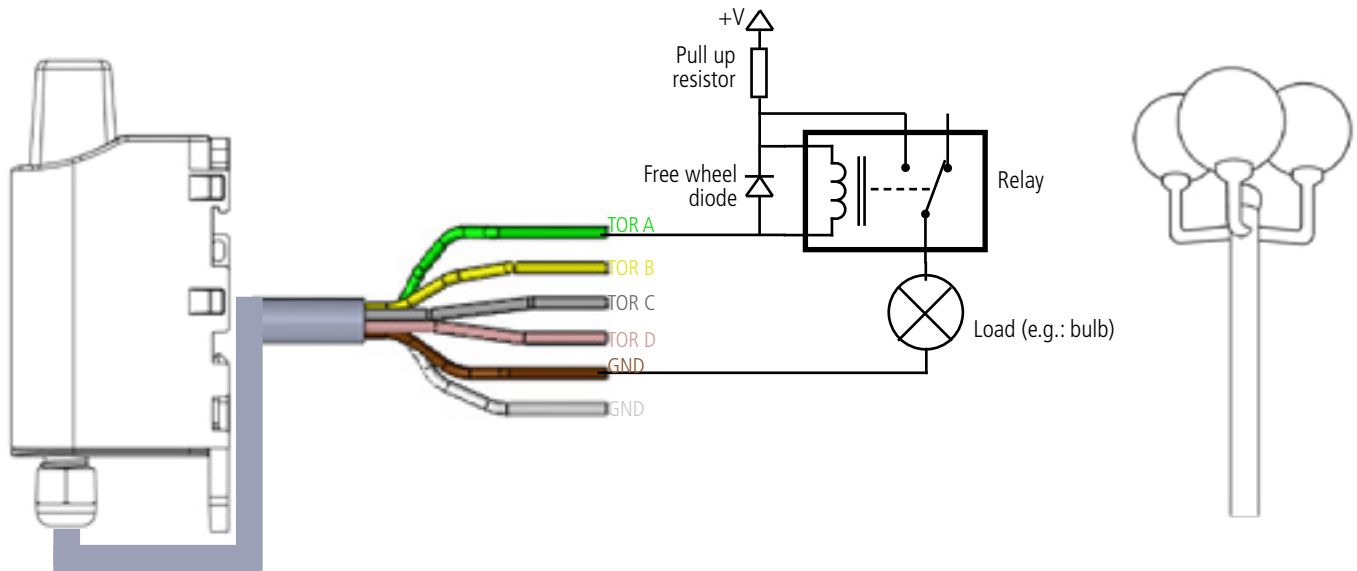
The maximum supply voltage accepted by the product is 24V

To control the outputs by a downlink frame, the product must be configured correctly and a downlink frame must be preloaded into the server to be transferred to the product at its next wake up.

You will find a few examples of downlink frames below:

Description	Frame	Etat TOR A	Etat TOR B	Etat TOR C	Etat TOR D	Description
E.g.:	03 00	0	0	0	0	All outputs at 0
	03 01	1	0	0	0	Digital output A at 1 --> RELAY ACTUATION
	03 0F	1	1	1	1	All outputs at 1

Each bit of the second byte of the frame is the command of a digital output

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5.4. Starting up the product using a magnet

Once the product has been configured and its assembly has been finalised, the product is ready to be started up.
The start-up is carried out using a magnet which you place on the upper part of the product (cf. the diagram below). The magnet must be held in position for at least 6 seconds so as to confirm the start-up of the product. When the magnet is well detected, the green LED lights up for 1 second.

Once the LoRaWAN DRY CONTACTS unit validates its start-up, it immediately transmits status frames followed by a data frame (according the defined periodicity).

Position of the magnet for starting up the product
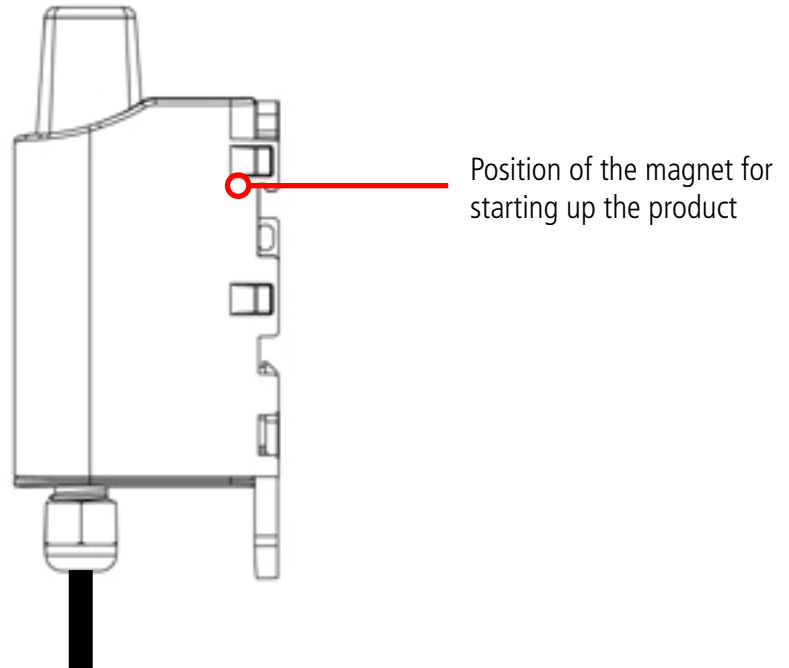
5.5. Replacing the battery

When the low battery indicator is activated (indicator in the frame or flashing of the red LED), it is possible to change the internal battery of the unit.

It is important to use a battery of the same reference, SAFT LS14500.

Procedure to change the battery:

1. Follow the instructions in the previous paragraphs to open the unit
2. Remove the battery and replace it with the new one respecting the polarity as indicated on the electronic card
3. Close the unit
4. Restart the product with the magnet as for a first start

After this procedure the product will behave as during a first start.

Battery location
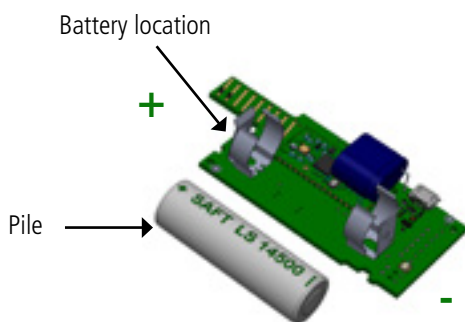
Disposition of the battery on the card

+

Pile

-

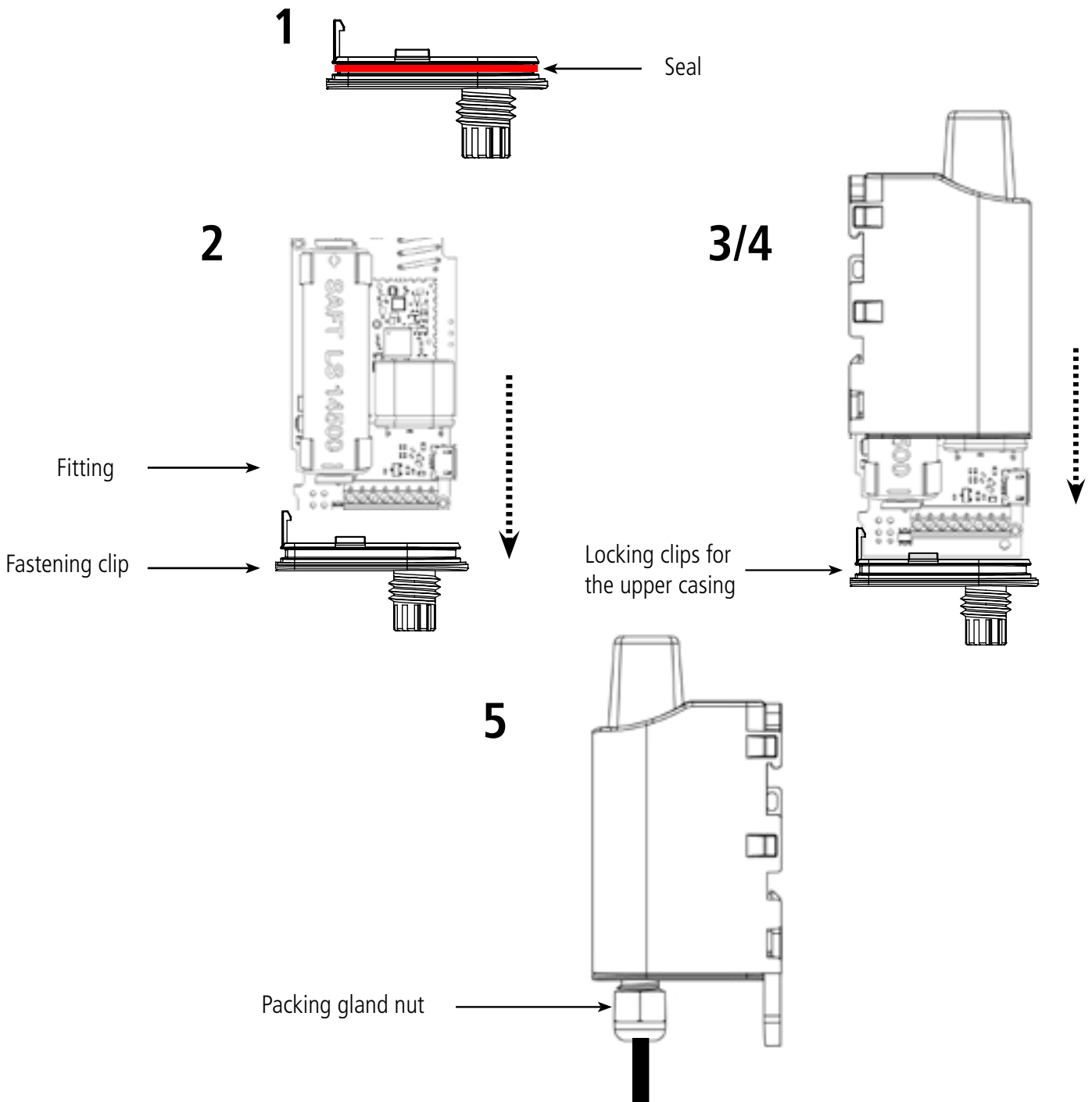## DISTRIBUTED BY TEXIM EUROPE
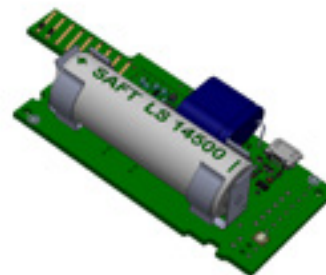
5.6. Closing the casing

Once previous stages have been carried out, you can close the casing of the LoRaWAN DRY CONTACTS

Procedure:
1. Make sure that the seal is properly positioned on the base
2. Clip the electronic board onto the casing's base. Make sure that the fastening clip is properly locked into the board's fitting.
3. Insert the upper part of the casing. Inside this part there are guide rails for the board. Make sure that the board is properly positioned within these guides.
4. Once the board is in position, lower the upper cover and lock it onto the casing's base. Strong pressure will enable both parts to be clipped together and will enable protection level IP67 to be ensured.
5. Finish the assembly by locking the packing gland's nut in position

1 — Seal

2
Fitting
Fastening clip

3/4
Locking clips for the upper casing

5
Packing gland nut

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## 6. INSTALLATION AND USE

6.1. Correct positioning of the product transceivers

There are two key rules for optimising radio ranges.
- The first one consists of positioning your product as high as possible.
- The second one consists of limiting the number of obstacles in order to avoid excessive attenuation of the radio wave.

Position: To the extent possible, install the transmitter at a minimum height of 1.50 m and do not attach it to the wall.

Obstacles: Ideally, the product must be 20 cm away from any obstacle and, if possible, near an opening (the closer the obstacle is, the more the emitted power will be absorbed). All the materials encountered by a radio wave will attenuate it. Bear in mind that metal (metal cabinets, beams, etc.) and concrete (reinforced concrete, partitions, walls, etc.) are the most critical materials for the propagation of radio waves.

20 cm

150 cm

Optimised positioning   Low radio range
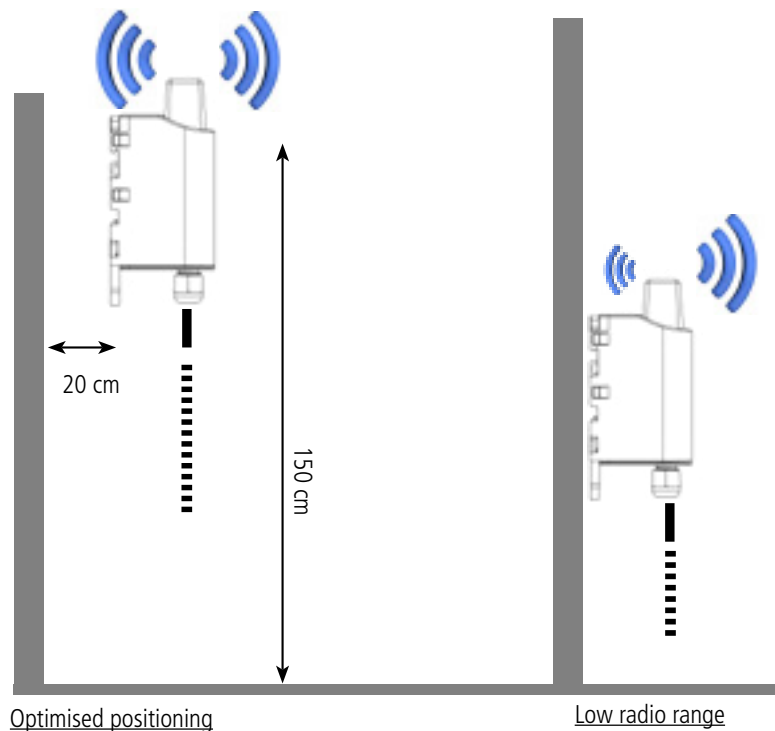
6.2. Types of fastenings

The product offers 3 fastening methods that enable numerous ways of positioning it depending on the environment where it has to be deployed.

6.2.1 Tube or mast fastenings

As explained in section 4.1, the best radio performance is achieved by positioning the product as high as possible.

The fastening collar fastenings enable the product to be fastened on a mast or tube under completely safe conditions

Holes for fastening collars

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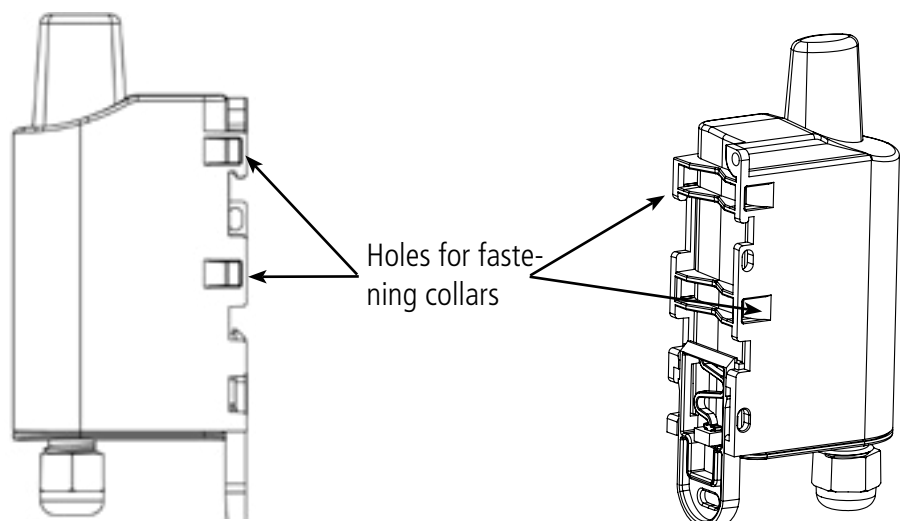
To optimise fastening onto a tube or mast, we recommend you remove the Rail-DIN locking/unlocking lever.

To remove it, pull the lever down until the locking pins are opposite a freed-up part and then remove the lever.

Pins

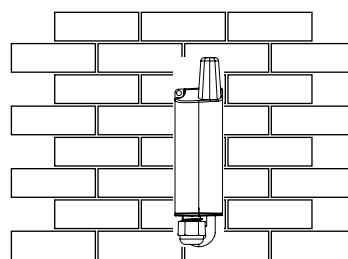Freed up part

EN
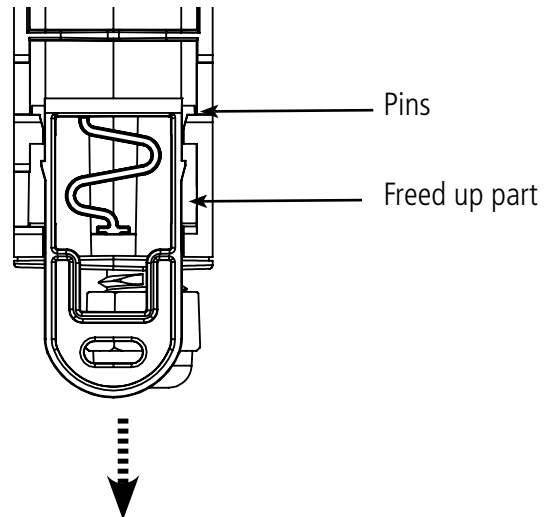
6.2.2 Fixing with screws

The product is delivered with 2 CBLZ 2.2 x 19 mm screws and 2 SX4 wall plugs. Use these products or equivalent products in order to fasten your product onto a flat support.

Two positions may be selected: Laid flat or on its edge.
• Placing it on its edge enables the product to be placed at a distance from its support and helps achieve better propagation of the radio waves.
• If you opt for laying it flat, make sure you remove the Rail-DIN locking/unlocking lever, as explained above

Location of the screws for fastening it laid flat

Location of the screws for fastening it on its edge
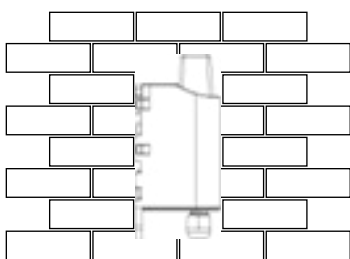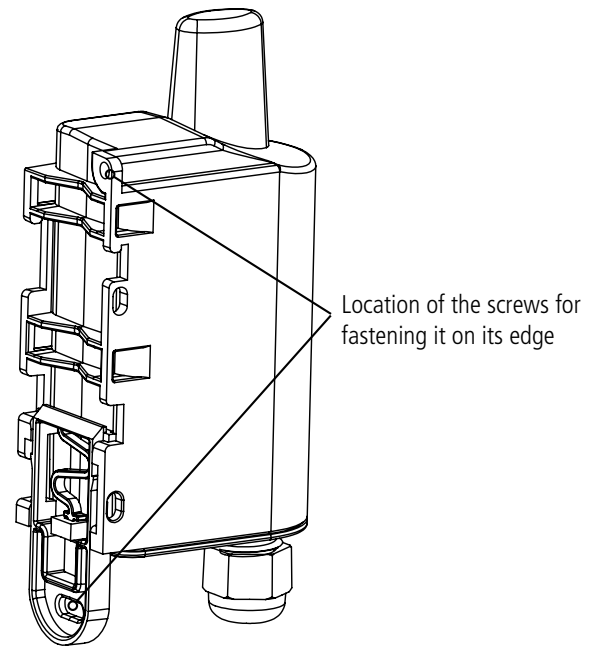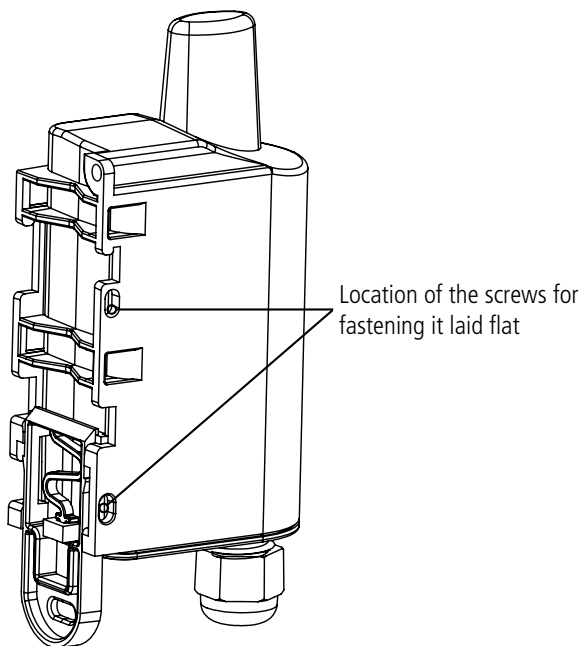
Fastening laid flat

Fastening on its edge
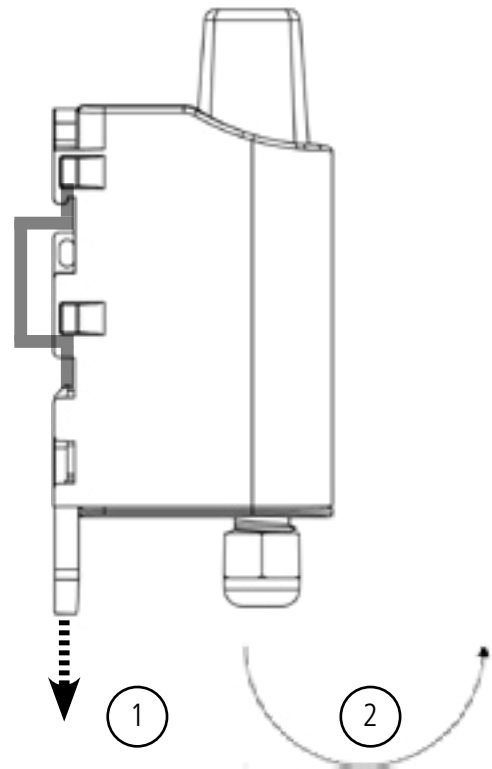
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6.2.3 DIN-Rail fixing

This system, integrated into the casing, enables the product to be fastened onto a standard 35 mm rail.
- To fit the casing, place the upper inserts on the rail and lower the product to clip it into position.
- To remove the product, pull the unlocking lever down and disengage the product from the rail.
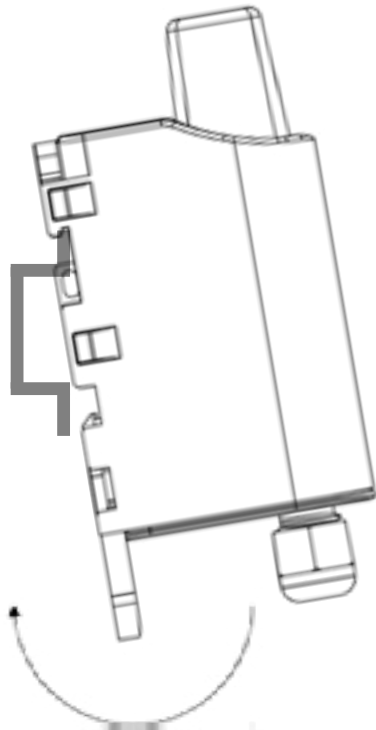
Locking onto the DIN-Rail   Unlocking

7. DOCUMENT HISTORY

Version	Contents
V1.0.0	Creation
V1.0.1	Update Declaration of Conformity
V1.2.0	Update Part 3
V2.0.0	Changes after update RTU - V01.01.01 & APP - V01.04.00

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DEUTSCH
Vorschriften

DE

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Wenn Sie unseren technischen Support kontaktieren, halten Sie bitte folgende Informationen bereit:
- Produkttyp
- Firmware-Version
- Klare Beschreibung Ihrer Frage oder Ihres Problems
- Ihre vollständigen Kontaktdaten

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UMWELTSCHUTZHINWEISE

Es wurden alle überflüssigen Verpackungsmaterialien vermieden. Wir haben uns bemüht, dass die Verpackung leicht in drei Materialarten getrennt werden kann: Pappe (Schachtel), expandiertes Polystyrol (Puffermaterial) und Polyethylen (Tüten, Schaumstoff-Schutzlage). Ihr Gerät besteht aus recycelbaren Materialien, die im Falle einer Demontage durch ein Fachunternehmen wiederverwendet werden können. Bitte beachten Sie die vor Ort geltenden Vorschriften zur Entsorgung der Verpackungsabfälle, verbrauchten Batterien und Ihres Altgeräts.

WARNHINWEISE

Lesen Sie die Hinweise in dieser Anleitung.

Die Sicherheit dieses Produkts wird nur für eine bestimmungsgemäße Verwendung gewährleistet. Die Wartung darf nur von einer qualifizierten Person durchgeführt werden.

Achtung: Das Gerät nicht in der Nähe einer Wärme- oder Feuchtigkeitsquelle installieren.
Achtung: Bei Öffnung des Geräts keine anderen als die in dieser Anleitung vorgesehenen Vorgänge durchführen.

Achtung: Das Produkt nicht öffnen – Gefahr eines Stromschlags.

Achtung: Zu Ihrer Sicherheit muss vor jedem technischen Eingriff am Gerät dieses stromlos geschaltet werden.

Achtung: Zu Ihrer Sicherheit muss der Stromversorgungskreis des Produkts vom Typ SELV (Sicherheitskleinspannung) sein und es sich um Stromquellen mit begrenzter Leistung handeln.

Bitte beachten Sie: Wenn die Antenne draußen installiert ist, ist es notwendig, den Kabelschirm mit der Erdung des Gebäudes zu verbinden. Wir empfehlen den Blitzschutz. Der gewählte Schutzkit muss das Koaxialkabel wie geerdet haben (zB: Koaxial-Blitzableiter mit Erdung des Kabels an verschiedenen Stellen auf der Antenne an der Basis von Pylonen und am Eingang oder kurz vor dem Betreten der Räumlichkeiten).

Das Produkt muß mit einem Schaltmechanismus zum Abschalten des elektrischen Stroms ausge-stattet werden, welche sich in der Nähe der Ausrüstung befinden muss. Jede elektrische Verbin-dung des Produktes muß mit einer Schutzvorrichtung gegen Spannungsspitzen und Kurzschlüsse ausgestattet werden.

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GEBRAUCHSHINWEISE

- Überprüfen Sie vor Benutzung des Systems, ob die in dessen Betriebsanleitung angegebene Versorgungsspannung mit Ihrer Stromquelle übereinstimmt. Falls nicht, wenden Sie sich an Ihren Lieferanten.
- Stellen Sie das Gerät auf eine ebene, feste und stabile Oberfläche.
- Das Gerät muss an einem ausreichend belüfteten Standort installiert werden, um jedes Risiko einer internen Überhitzung auszuschließen, und es darf nicht mit Objekten wie Zeitungen, Decken, Gardinen usw. abgedeckt werden.
- Das Gerät darf auf keinen Fall Hitzequellen wie Heizgeräten ausgesetzt werden.
- Stellen Sie das Gerät nicht in der Nähe brennender Gegenstände wie Kerzen, Lötbrennern, usw. auf.
- Das Gerät darf keinen aggressiven Chemikalien oder Lösungsmitteln ausgesetzt werden, die den Kunststoff angreifen oder die Metallteile korrodieren könnten.
- Das Terminal muss am Gürtel mit Hilfe eines dafür vorgesehenen Clips getragen werden.

ENTSORGUNG VON ABFÄLLEN DURCH DIE NUTZER IN PRIVATHAUSHALTEN IN DER EUROPÄISCHEN UNION

Dieses Symbol auf dem Produkt oder auf seiner Verpackung bedeutet, dass dieses Produkt nicht mit anderem Hausmüll entsorgt werden darf. Stattdessen obliegt es Ihrer Verantwortung, Ihre Abfälle zu einer benannten Sammelstelle für die Wiederverwertung von Elektro- und Elektronikaltgeräten zu bringen. Getrenntes Sammeln und Recyceln bei der Entsorgung Ihrer Abfälle trägt zur Bewahrung der natürlichen Ressourcen und zu einer umweltverträglichen Wiederverwertung sowie zum Schutz der menschlichen Gesundheit bei. Für weitere Informationen zum nächstgelegenen Recyclingzentrum wenden Sie sich an das nächste Rathaus, den Entsorgungsdienst für Haushaltsabfälle oder das Geschäft, in dem Sie das Produkt gekauft haben.

 Dieses Symbol auf dem devode Gerät oder seiner Verpackung bedeutet den Gebrauch einer Gleichstrom-Spannung.

 Achtung: Es besteht Explosionsgefahr, wenn die Batterien durch einen falschen Typ ersetzt werden. Entsorgen Sie die Batterien gemäß den Gebrauchshinweisen. Beim Wechsel der Batterien muss das Produkt wieder richtig und ordnungsgemäß zusammengebaut werden.

 WICHTIG für die Schweiz: Für die Batterien muss Anhang 4.10 der Norm SR 814.013 Anwendung finden.

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