
**IoT
M2M**

ENERGY EFFICIENCY

SETUP GUIDE

**SIGFOX HIGH
POWER RC Z1
PRODUCTS**

DTM16_i

 **Enless Wireless**
Smart Building Radio Sensors

BIGGER BATTERIES FOR BETTER AUTONOMY


**Guide for configuration and
installation of Sigfox High
Power RC Zone 1 products**



**FOR MORE INFORMATION
CONTACT US**

www.enless-wireless.com

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contact@enless.fr :EMAIL



PRODUCTS COVERED

AMBIENT TRANSMITTERS

- TX TEMP HUM AMB SIGFOX HP 100-002
- TX CO2 TEMP HUM AMB SIGFOX HP 100-013

TEMPERATURE TRANSMITTER

- TX TEMP CONT SIGFOX HP 100-000

METERING AND CONTACT TRANSMITTERS

- TX PULSE SIGFOX HP 100-009
- TX PULSE ATEX SIGFOX HP 100-010
- TX PULSE LED SIGFOX HP 100-011
- TX CONTACT SIGFOX HP 100-012



SUMMARY

PRODUCTS DESCRIPTION

AMBIENT TRANSMITTERS	3
TEMPERATURE TRANSMITTER	3
METERING AND CONTACT TRANSMITTERS	4

PREPARING FOR INSTALLATION

MATERIALS NEEDED AND INSTALLATION STEPS	5
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INSTALLATION

TRANSMITTERS CONFIGURATION	6
TRANSMITTERS INSTALLATION	9

APPENDIX (PAGE 11)

POSITIONING AND ATTACHING THE TRANSMITTERS	Appendix 1
CONNECTING THE TX PULSE TO THE METER(S)	Appendix 2
CONNECTION AND INSTALLATION OF PULSE LED TRANSMITTER	Appendix 3
CALIBRATION STEP BEFORE USE OF TX CO2 TEMP HUM AMB 100-013	Appendix 4

PRODUCTS DESCRIPTION

AMBIENT TRANSMITTERS

References

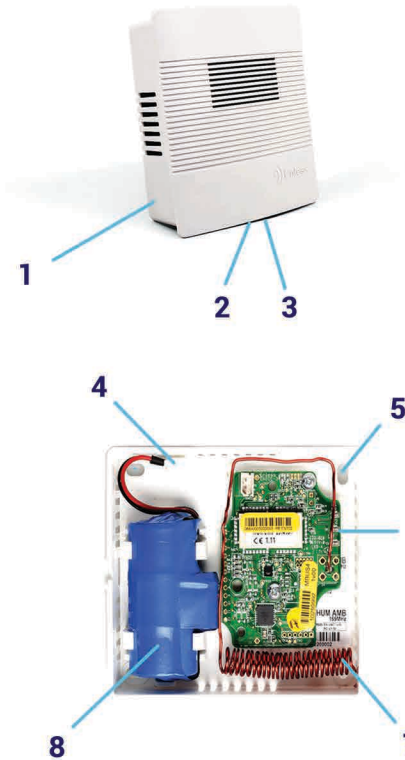
TX TEMP HUM AMB SIGFOX HP 100-002
Product Certificate
P_0043_8450_01

TX CO2 TEMP HUM AMB SIGFOX HP 100-013
Product Certificate
P_0043_7A99_01

Weight
125gr

Batteries
C type 3,6V Lithium battery

ID and PAC
Displayed on the label



CASING CLOSED

- 1) ID Label
- 2) Hood closing screw
- 3) Closing tab for housing

CASING OPENED

- 4) Connector for battery plug
- 5) Hole for wall fixation
- 6) LED lights (L1, L2, L3)
- 7) Antenna
- 8) Switchable battery

TEMPERATURE TRANSMITTER

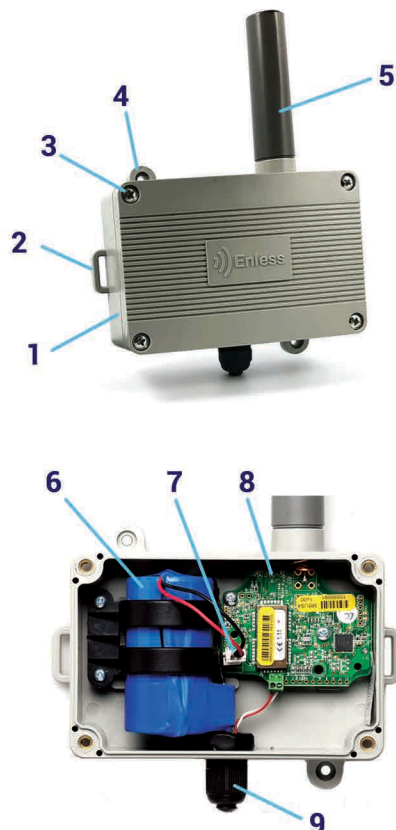
References

TX TEMP CONT SIGFOX HP 100-000
Product Certificate
P_0043_8CDA_01

Weight
196gr

Batteries
D type 3,6V Lithium battery

ID and PAC
Displayed on the label



CASING CLOSED

- 1) ID Label
- 2) Loop for fixing collar
- 3) Hood closing screw
- 4) Hole for wall fixation
- 5) Antenna

CASING OPENED

- 6) Switchable battery
- 7) Connector for battery plug
- 8) LED lights (L1, L2, L3)
- 9) Cable gland for contact probe(s)

PRODUCTS DESCRIPTION

METERING AND CONTACT TRANSMITTERS

References

TX PULSE SIGFOX HP
100-009
Product Certificate
P_0043_CEFD_01

TX PULSE ATEX SIGFOX
HP 100-010
Product Certificate
P_0043_CEFD_01

TX PULSE LED SIGFOX HP
100-011
Product Certificate
P_0043_FAD6_01

TX CONTACT SIGFOX HP
100-012
Product Certificate
P_0043_687B_01

Weight
196gr

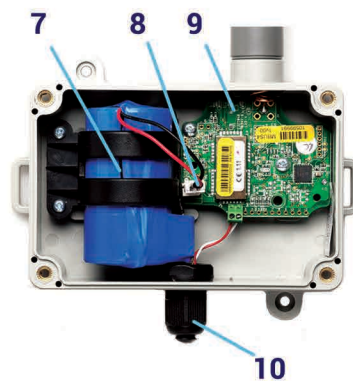
Batteries
D type 3,6V Lithium
battery

ID and PAC
Displayed on the label



CASING CLOSED

- 1) ID Label
- 2) Loop for fixing collar
- 3) Hood closing screw
- 4) Hole for wall fixation
- 5) Antenna
- 6) Meter connection cable



CASING OPENED

- 7) Switchable battery
Replacement batteries can be supplied by Enless Wireless (contact@enless.fr)
Warning: There is a risk of explosion if the replacement battery is incorrect, so please do not hesitate to contact us. Dispose of used batteries according to the instructions.
- 8) Connector for battery plug
- 9) LED lights (L1, L2, L3)
- 9) Cable gland for meter and contact connection cables



PREPARING FOR INSTALLATION

At the outset

Before you begin configuring transmitters, you will need to purchase a Sigfox subscription for each device you want to install.

You can purchase Sigfox subscriptions at this address:

<https://buy.sigfox.com/>

What you'll need

- ✓ Transmitters to install
- ✓ Classic Cruciform Screwdriver
- ✓ ID, PAC and certificate numbers of products to install

Installation steps

Transmitters configuration

You will have to categorise the products by group of families.

You will create a group by product family to install.

You will apply a configuration to each product family.

You will then add your transmitters and associate them with their corresponding families.

Transmitters installation

Once your transmitters are added, you will be able to install them.

The installation involves connecting the transmitters and using their LED reaction and from the Sigfox Backend, validating that the frames are correctly sent.

TRANSMITTERS CONFIGURATION



Sigfox products are configured from the Sigfox backend portal.

Please go to the following address: <https://backend.sigfox.com/>

Register on the Sigfox backend server.

EDIT FAMILY GROUPS

Firstly, you will have to edit family groups to differentiate the types of transmitters. Every transmitter has to be associated with the group that corresponds to its family type.

The configuration of a family group determines the default parameters for every transmitter that will be associated to this group.

Example:

You will edit a family group for temperature transmitters.

You will configure the default periodicity of this group at 30 minutes.

When you configure a temperature transmitter you will associate this transmitter to the temperature transmitter's family group.

The messages that will be sent to the temperature transmitter during the installation phase will signal to retrieve the configuration parameters from the temperature transmitters group.

The transmitter will then be configured at 30 minutes periodicity.

If you don't want all the temperature transmitters to be configured the same way it is possible to separately modify the transmitters configuration.

To do so, before starting the transmitters installation you have to modify the configuration of the family group that will be associated to this transmitter.

Device type tab

The list of groups that you've previously created is displayed. Choose the group in which you wish to modify the configuration and click EDIT. Modify the group's configuration and then click OK.

You can now install the transmitter, which will be given this new configuration

To edit a family group, please follow the steps below :

- On the main page, click **DEVICE TYPE**, then click **NEW** New
- Confirm the folder in which you wish to save the family group.

TRANSMITTERS CONFIGURATION



Complete the different fields :

DEVICE TYPE INFORMATION

Name : name the family group by function of the type of transmitters to install (temperature and humidity, PT100 or pulse)

Description : provide a description for the group.

Contract : indicate your sigfox subscription.

DOWNLINK DATA

Downlink mode : choose DIRECT.

Downlink data in hexa : determines the content of the message which will be sent back to the device (ACK)

1) The first byte defines the nature of the transmitter to be installed :

- 01 = température (100-001 / 100-003)
- 02 = temperature & humidity (100-002)
- 03 = PT100 temperature (100-000)
- 04 = pulse (100-009 / 100-010 / 100-011 / 100-017)
- 05 = contact (100-012)
- 06 = CO2, temperature, humidity (100-013)

2) The second byte defines the time period in hours (0-23). Data needs to be in HEX format (01 for 1 hour)

3) The third byte defines the time period in hours (0-59). Data needs to be in HEX format (1E for 30mn)

4) The last 10 numbers are unused. Keep them as 0.

Device type information

Name

Description

Keep-alive (in minutes)

Contract

Alert email

Downlink data

Downlink mode

Downlink data in hexa

Expression must either include hexadec

1 2 3 4

Payload display

Select below the most suitable parsing mode for the

Payload parsing

Custom configuration

Ok Cancel

PAYLOAD DISPLAY

This tab defines the way messages sent by the transmitters will be displayed.

Payload parsing: Choose Custom grammar

Custom configuration : See below

You can configure the way the messages are displayed.

On the table below, we suggest predefined codes to fill in the Custom configuration field. This code is adapted to a correct display of data frames.

TEMPERATURE

Device_Type::uint:8 Firmware_Version_Battery_status_byte::uint:8 Temperature::uint:16:little-endian

TEMPERATURE & HUMIDITY

Device_Type::uint:8 Firmware_Version_Battery_status_byte::uint:8 Temperature::uint:16:little-endian Humidity::uint:16:little-endian

CO2, TEMPERATURE & HUMIDITY

Device_Type::uint:8 Firmware_Version_Battery_status_byte::uint:8 CO2::uint:16:little-endian Temperature::uint:16:little-endian Humidity::uint:16:little-endian Last_min_CO2::uint:16:little-endian CO2_sample_count::uint:8

PULSE

Device_Type::uint:8 Firmware_Version_Battery_status_byte::uint:8 Puls_count_1::uint:32:little-endian Puls_count_2::uint:32:little-endian Puls_status_byte::uint:8

PT100

Device_Type::uint:8 Firmware_Version_Battery_status_byte::uint:8 Temperature::uint:16:little-endian

CONTACT

Device_Type::uint:8 Firmware_Version_Battery_status_byte::uint:8 Puls_count_1::uint:32:little-endian

TRANSMITTERS CONFIGURATION



- As soon as the configuration parameters are set, press **OK**.
- Go back to **DEVICE TYPE** page and make sure your group is displayed in the list.

REGISTER A TRANSMITTER

Once you've configured the family group you can register your first transmitter

Click device, then click **NEW** New

Confirm the folder in which you wish to register the transmitter.

Fill in the different fields:

DEVICE INFORMATION

TX TEMP HUM AMB

ID : 000F374A

PAC : DC1C808406A1AD7B



13110041

Identifier : ID displayed on the transmitters label.

Name : name of the transmitter.

PAC : PAC number displayed on the transmitter's label.

Product certificate : The product certificate number is available on the product data sheet. You can download the product data sheets at www.enless-wireless.com
You can also find the product certificate numbers on the products description section of this user guide.

Type : indicate the family group to which the transmitter belongs. You will have previously created this group.

Device information

Identifier (hex!)

Name

PAC

End product certificate ⓘ

Where can I find the end product certificate?

Type

Lat (-90° to +90°)

Lng (-180° to +180°)

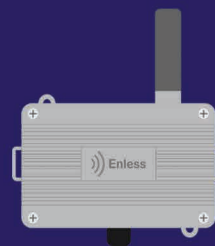
Map

Activable ⓘ

- Once you have filled all the fields, click **OK**. A new page opens and the device's information is displayed.

The configuration part is finished, you can now move on to the installation step.

INSTALL THE TRANSMITTERS



You have completed the configuration section for the transmitter(s)

You can proceed to the installation of the transmitters. On the page containing the information of the transmitter to be installed, please click on the **MESSAGE** tab.

CONNECT YOUR TRANSMITTER

You can now connect the battery of the previously configured transmitter.

You can refer to the LEDs of the transmitter to understand more about the installation status.

STARTING PHASE	L1	L2	L3	TIME
Phase 1	OFF	ON	OFF	10 seconds maximum
Phase 2	OFF	Flashes	OFF	20 seconds maximum
Phase 3	Flashes	OFF	OFF	3 minutes maximum

INSTALLATION STATUS	L1	L2	L3	TIME
Downlink received - good signal	OFF	ON	ON	30 seconds
Downlink received - weak signal	ON	ON	ON	30 seconds
Downlink not received	OFF	Flashes	Flashes	30 seconds

* The LED set of the TX CO2 TEMP HUM AMB SIGFOX HP 100-013 transmitter is different. Please refer to Appendix 4 for more information.



The fact that the transmitter does not receive a downlink can be explained in several ways:

- Incorrect configuration of the downlink (See previous step - page 7)
- No Sigfox network coverage

If the transmitter does not correctly recover its downlink but is positioned in an area covered by the network, it will transmit at the default frequency (60 min)

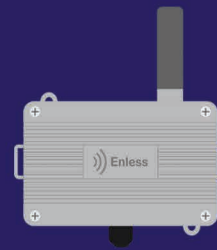
When the transmitter retrieves its downlink, it means that it correctly accounted for its configuration parameter.

Repeat for all transmitters to be installed and have been configured or declared.

If the transmitter does not take its downlink, you can disconnect the transmitter, wait at least 1 min and recharge it.

If this does not change the behaviour of the transmitter, see the left inset.

INSTALL THE TRANSMITTERS



VALIDATE DATA RECEPTION

In parallel with the LEDs, you can follow the frames arriving on the **MESSAGES** page on the Sigfox Backend.

The first frames start arriving on the backend. In the **CALLBACKS** column, the arrow informs you of the status of the Sigfox server response.

⬇️ Indicates that the downlink retrieve is in progress

⬇️ Indicates that the downlink has been successfully retrieved

Time	Data / Decoding	Location	Link quality	Callbacks
2018-06-05 13:50:36	02210601a401 Device_Type: 2 Firmware_Version_Battery_status_byte: 33 Temperature: 262 Humidity: 420	📍	📶	⬆️
2018-06-05 13:20:04	02210501a801 Device_Type: 2 Firmware_Version_Battery_status_byte: 33 Temperature: 261 Humidity: 424	📍	📶	⬆️
2018-06-05 12:49:28	02210401ab01 Device_Type: 2 Firmware_Version_Battery_status_byte: 33 Temperature: 260 Humidity: 427	📍	📶	⬆️
2018-06-05 12:18:55	434f4e46494702 Device_Type: 67 Firmware_Version_Battery_status_byte: 79 Temperature: 17996 Humidity: 18249	📍	📶	⬆️⬇️

The messages should be sent in function of the configured periodicity (here every 30mn).

DECODING DATA FRAMES

To receive the decoding file related to our data frames, please contact our sales department (contact@enless.fr).

POSITION AND CONNECT YOUR TRANSMITTERS

For the positioning and connection of your transmitters, please refer to our appendix pages.



APPENDIX

Positioning and fixing products

Appendix 1

- Positioning the transmitters
- Attaching the transmitters

Connecting products

Appendix 2 and 3

- Connection of pulse transmitters to pulse counters
- Connection and installation of pulse LED transmitter

Tx CO2 Temp Hum Amb calibration modes

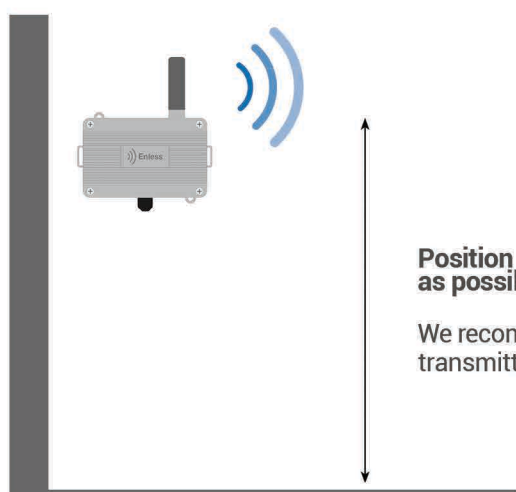
Appendix 4

POSITIONING AND FIXING PRODUCTS

Positioning

The correct positioning of transmitters is very important and has a significant influence on the quality of transmission of radio waves. If your transmitter is incorrectly positioned you will reduce the radio coverage distance.

To maximise the transmitters' performance please follow the instructions described below:



Ensure that the transmitter antenna is always up

Position the transmitters as high as possible

We recommend positioning the transmitters at least 1.50m high

Fixing

The transmitters are fixed using the wall fixing lugs.

These lugs are provided for fixing with screws.

The lugs of the ambient transmitters are inside the transmitters.

For rugged transmitters you can also use the clamp collar loop on the side of the case.



CONNECTION OF PULSE TRANSMITTERS TO PULSE COUNTER



Reminder regarding the use of the transmitter TX PULSE ATEX SIGFOX HP 100-010

According to the ATEX Directive 1999/92 / EC only personnel trained to work in hazardous areas are allowed to install the transmitter TX PULSE ATEX SIGFOX HP 100-010. No changes can be made to the transmitter.

Special conditions for a safe use

Dans le cas d'une installation avec un compteur gaz, les fils de sortie du transmetteur TX PULSE ATEX SIGFOX HP 100-010 doivent être raccordés à un matériel de sécurité intrinsèque certifié. Cette combinaison doit être compatible avec les règles de sécurité intrinsèques Uo, Io, Po, Co, Lo spécifiées sur l'étiquette apposée sur le transmetteur.

Certifications

The TX PULSE ATEX SIGFOX HP 100-010 transmitter is ATEX certified.

<Ex> II 1 G

Ex ia IIC T3 Ga

-20°C ≤ Tamb ≤ +55°C

LCIE 14 ATEX 3013 X

Uo: 3,9V; Io: 926mA; Po: 153mW; Co: 63µF; Lo: 42µH

The TX PULSE ATEX SIGFOX HP 100-010 transmitter is conform to the norms : EN60079-0 et EN6079-11

Battery

The TX PULSE ATEX SIGFOX HP 100-010 transmitter comes with a battery BAT LS33600.

Only this model of battery can be used with the TX PULSE ATEX SIGFOX HP 100-010 transmitter.

This battery model is available from Enless Wireless.

33520 Bruges (France). Téléphone : 05 56 37 97 47 – Mail : contact@enless.fr

Warning - Potential Electrostatic Charge Hazard

The TX PULSE ATEX SIGFOX HP 100-010 should only be cleaned with a damp cloth.

Pulse transmitters are supplied with 4 wires and have two pulse inputs. They can be connected to 2 counters simultaneously.



Compatibility with:

- Dry contact interface counters
- 50mseconds minimum
- 10Hz maximum

Meter Connection

Counter 1 on input 1:

The wires for input 1 are labelled A + and A-

- A+ is connected to the transmitter's PULSE 1 INP terminal block
- A- is connected to the GND terminal of the transmitter

Counter 2 on input 2 :

The wires for input 2 are labelled B + and B-

- B+ is connected to the PULSE 2 INP terminal of the transmitter
- B- is connected to the GND terminal of the transmitter

CONNECTION OF PULSE TRANSMITTERS TO PULSE COUNTER



Reminder regarding the use of the transmitter TX PULSE ATEX SIGFOX HP 100-017 GAZPAR

According to the ATEX Directive 1999/92 / EC only personnel trained to work in hazardous areas are allowed to install the transmitter TX PULSE ATEX SIGFOX HP 100-017 GAZPAR. No changes can be made to the transmitter.

Special conditions for a safe use

Dans le cas d'une installation avec un compteur gaz, les fils de sortie du transmetteur TX PULSE ATEX SIGFOX HP 100-017 GAZPAR doivent être raccordés à un matériel de sécurité intrinsèque certifié. Cette combinaison doit être compatible avec les règles de sécurité intrinsèques Uo, Io, Po, Co, Lo spécifiées sur l'étiquette apposée sur le transmetteur.

Certifications

The TX PULSE ATEX SIGFOX HP 100-017 GAZPAR transmitter is ATEX certified.

<Ex> II 1 G

Ex ia IIC T3 Ga

-20°C ≤ Tamb ≤ +55°C

LCIE 14 ATEX 3013 X

Uo : 3.9V Io : 9,799 mA Po : 9,55 mW Co : 633 µF Lo : 350 mH

The TX PULSE ATEX SIGFOX HP 100-017 GAZPAR transmitter is conform to the norms : EN60079-0 et EN6079-11

Battery

The TX PULSE ATEX SIGFOX HP 100-017 GAZPAR transmitter comes with a battery BAT LS33600.

Only this model of battery can be used with the TX PULSE ATEX SIGFOX HP 100-017 GAZPAR transmitter.

This battery model is available from Enless Wireless.

33520 Bruges (France). Téléphone : 05 56 37 97 47 – Mail : contact@enless.fr

Warning - Potential Electrostatic Charge Hazard

The TX PULSE ATEX SIGFOX HP 100-017 GAZPAR should only be cleaned with a damp cloth.

Pulse transmitters are supplied with 4 wires and have two pulse inputs. They can be connected to 2 counters simultaneously.



Compatibility with:

- Dry contact interface counters
- 50mseconds minimum
- 10Hz maximum

Meter Connection

Counter 1 on input 1:

The wires for input 1 are labelled A + and A-

- A+ is connected to the transmitter's PULSE 1 INP terminal block
- A- is connected to the GND terminal of the transmitter

Counter 2 on input 2 :

The wires for input 2 are labelled B + and B-

- B+ is connected to the PULSE 2 INP terminal of the transmitter
- B- is connected to the GND terminal of the transmitter

CONNECTION AND INSTALLATION OF PULSE LED TRANSMITTER



1 KNOW YOUR METER



Indicator light

Find the flashing diode on the meter. The optical reader is positioned on this diode. The optical reader can only interpret LED flashes with a **minimum flash duration of 3ms and a maximum of 100ms**.

Parameters

If it is a tariff meter higher than 36 kVA, it is necessary to know the transformation ratio of your meter. Use the buttons next to the digital display to read the value corresponding to the TC ratio (parameter n°6 or n°16 or n°64)

2 SETTING UP THE SENSOR



Fixing the viewfinder

Clean the meter around the flashing diode. Affix the viewfinder by pointing the diode through the hole (the viewfinder is supplied with an adhesive).



Locking the reader

Clip the reader into the viewfinder and exert equal force across the entire surface of the sensor.



Checking

Once you power up your transmitter, the red LED will light up periodically for 20 seconds and then the green diode will take over.

3 CONSUMPTION CALCULATION IN WATT-HOUR (Wh)

The pulse optical reader records 1 pulse every 5 flashes.

Calculation method = (A x 5) x B x C x D

A : Number of pulses

B : Pulse weight

Example : 0.1W/pulse. In this case, indicate 0.1 for B value in the below calculation.

C : TC ratio – Current transformation ratio

In general 1 for residential meters.

Can be another value for industrial meters (check this parameter on the meter's settings).

D : TT ratio – Tension transformation ratio

In general 1 for residential meters.

Can be another value for industrial meter (check this parameter on the meter's settings).



The calculation formula below allows a calculation of consumption in Watt-hour (Wh).

To get a value in Kilowatt-hour (kWh), you just need to divide the value per 1000.

CALIBRATION STEP BEFORE USE OF TX CO2 TEMP HUM AMB SIGFOX HP 100-013

Our TX CO² TEMP HUM AMB 100-013 transmitters switch between two modes when you power them :

- Communication mode
- Calibration mode

⚠ Each mode will be activated every other time when powering the transmitter.

⚠ **Prior calibration is mandatory before any first use.** Before installing your CO₂ transmitter, you will have to force the calibration on a “fresh air” basis (preferably outdoors).

Calibration mode

N.B. In calibration mode, the transmitter cannot be installed or communicate with the Sigfox servers.

For best results when activating the calibration mode, please position your transmitter in a location where the ppm content will be low (if possible outdoors).

The calibration procedure takes about one hour per transmitter.

In this mode, the behaviour of the LEDs when you power the transmitter is the following:

L1, L2 and L3 successively flash

L2 stays ON for 10 seconds

L2 flashes during 20 seconds

L1, L2 and L3 stay on for 1 minute and then go out. The transmitter begins calibration.

Once the calibration is complete (approximately 1h), the L1, L2 and L3 LEDs flash every 5 seconds.

When you power the transmitter, if the LEDs L1, L2 and L3 flash then L1 flashes in turn, this means that you are in communication mode (see next step). In this case, disconnect the transmitter for at least 1 minute and then recharge it. You will switch to calibration mode.

Once the calibration procedure is completed, disconnect the transmitter.

You can now switch to communication mode so that the transmitter is able to communicate with the Sigfox BackEnd. To switch to communication mode, you have to disconnect the transmitter, wait at least 1 min and then reconnect it.

Communication mode

In communication mode, the previously calibrated transmitters are ready for installation and communication.

In this mode, the behaviour of the LEDs is identical to the one described below :

STARTING PHASE	L1	L2	L3	TIME
Phase 1	OFF	ON	OFF	10 seconds maximum
Phase 2	OFF	Flashes	OFF	20 seconds maximum
Phase 3	Flashes	OFF	OFF	3 minutes maximum

INSTALLATION STATUS	L1	L2	L3	TIME
Downlink received - Good signal	OFF	OFF	ON	30 seconds
Downlink received - weak signal	ON	OFF	ON	30 seconds
Downlink not received	OFF	OFF	Flashes	30 seconds

If when you power the transmitter, the LEDs L1, L2, L3 behave as described on the left, this means that you are in calibration mode.

In this case, disconnect the transmitter, wait at least 1 min and then reconnect it. You will switch to communication mode.