



Installation guide

Proprietary  LoRa

Version DTM83_a

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Products covered



Ambient transmitters

- TX T&H AMB 600-021
- TX CO2 / VOC / T&H AMB 600-023



Rugged temperature transmitters

- TX TEMP INS 600-031
- TX TEMP CONT1 600-032
- TX TEMP CONT2 600-232
- TX T&H 600-034



Smart metering transmitters

- TX PULSE 600-036
- TX PULSE ATEX 600-037
- TX PULSE LED 600-038



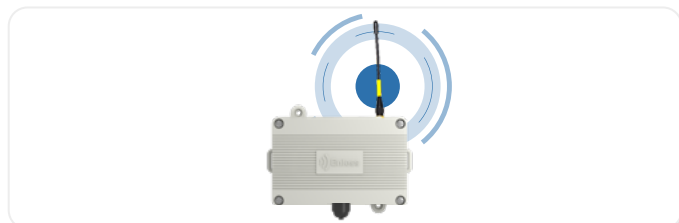
Industrial transmitters

- TX 4/20mA 600-035
- TX CONTACT 600-039
- TX IO 600-040
- TX MODBUS 600-041



Receivers

- RX MODBUS 500-302
- RX BACNET 500-312

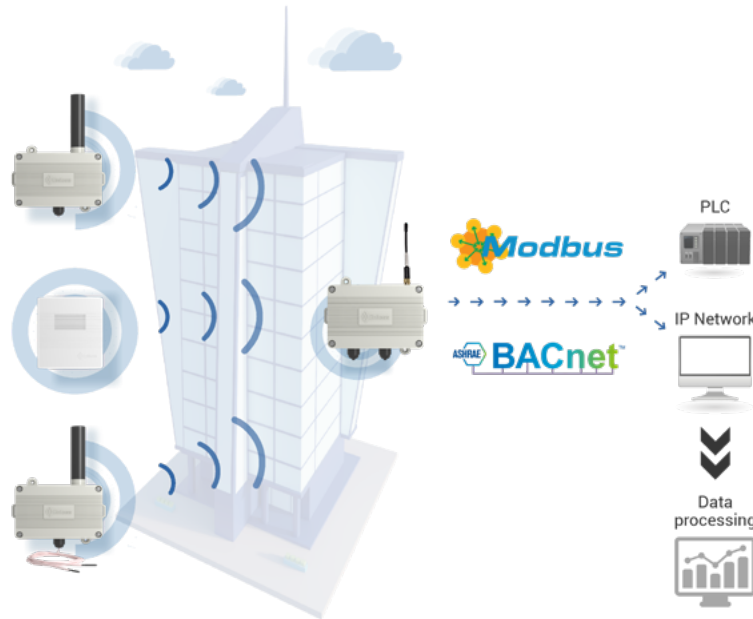


Repeater

- RX REPEATER 600-301

Information concerning the LoRa proprietary mode

When using the proprietary LoRa mode, the transmitters communicate with an Enless receiver (Modbus or BACnet) in order to feed the data to a PLC / BMS.



When used with the Modbus receiver, the transmitters send their information to the receiver. This latter then stores the data from the transmitters in its Modbus Table. It is then connected to a PLC using Modbus RTU RS232/RS485 or an IP network.



When used with the BACnet receiver, the transmitters send the data to the receiver. This latter then converts the data from the Enless sensors into BACnet objects. The BACnet receiver can be connected to the BACnet network or a PLC in several modes (BACnet IP / BACnet MSTP).



Enless sensors can also be used in public or private LoRaWAN mode. Please consult the LoRaWAN mode installation guide for more details.

I. Installation procedure

The principle for the configuration of the products is identical when using either a Modbus receiver or a BACnet receiver.

Installation steps:

- ✓ Configuring your PC's Ethernet parameters
- ✓ Setting up the receiver and accessing the configuration server
- ✓ Declaring and configuring the sensors
- ✓ Sensor activation
- ✓ Checking data reception from the sensors
- ✓ Configuring the receiver parameters (Modbus or BACnet)
- ✓ Connecting the receiver to the PLC or the BMS

Equipment needed:



Enless sensors and receiver



Long range 868MHz antenna for the receiver



Power supply for the receiver (7.5 to 24VDC)



RJ45 Ethernet cable



Cross-head screwdriver



Flat head screwdriver (Diameter: 2.5mm)

There are specific installation procedures for the TX IO 600-040 and TX MODBUS 600-041. Please refer to the table of contents to find the installation procedures for these products.

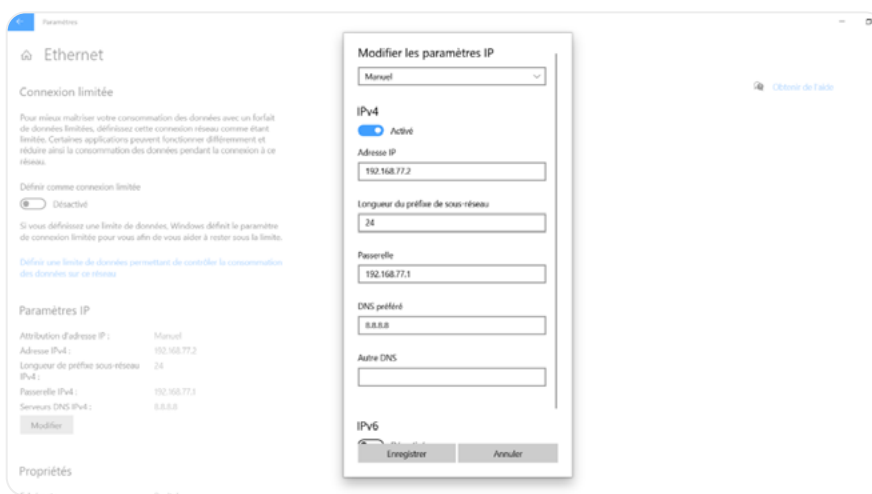




Configuring your PC's Ethernet parameters

The products are configured using the embedded server in the receiver. You will need to access the configuration interface of your RX MODBUS or RX BACNET. This configuration will also apply for accessing the TX IO 600-040 and TX MODBUS 600-041 configuration servers.

On your PC, configure the Ethernet parameters so that the configuration server is accessible. The configuration server is accessible at the address **192.168.77.77**



Sample IP parameters:

- IP Address: **192.168.77.2**
- Length of the sub-network prefix: **24**
- Default gateway: **192.168.77.1**
- Preferred DNS: **8.8.8.8**
- Sub-network mask (if available): **255.255.255.0**

Once these parameters have been input, the IP configuration server must be accessible from your browser at the address **192.168.77.77** (please avoid using Microsoft Edge).



Need Help?

We can answer the most frequently asked technical questions at our Help Desk. Please contact us and use the search bar whenever you need to.



Setting up the receiver and access to the configuration server

Connecting the long-range antenna to the receiver

Before doing anything else, remember to connect the long-range antenna (Ref.: ANT REN SMA LR 868MHz 1000-008) to the receiver's SMA connector.

Powering the receiver

Open the receiver unit by unscrewing the 4 screws in the cover and then apply external power to your receiver (power supply between 7.5 and 24VDC). You can use our 12V power supply unit (Ref.: POWER 1000-002).

Connect your power supply to the POWER terminal block on the receiver.

- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

Power consumption is normally less than 50mA at 12V. Peaks of 500mA may occur during the sensor installation phase. To prevent any problems, maintain 1A 12V on the power supply terminal.

Connecting the receiver to the PC

The receiver is not supplied with an RJ45 Ethernet cable and you will have to provide an RJ45 cable for the installation. Connect the RJ45 cable to the port on your receiver and to the Ethernet port on your PC.

LEDs on the receiver

Once the receiver is powered up and connected to your PC, you can check the product is working correctly by means of its LEDs:

External LEDs

LED	Behaviour	Meaning
Red	Flashes every 1 min	The receiver is operating
Green - Ethernet port	Flash	The receiver is connected to the Ethernet network
Orange - Ethernet port	Flash	The receiver is sending data to the Ethernet network

Internal LEDs

LED	Behaviour	Meaning
A	Flashes	The receiver has received a message
B	Flashes	The receiver has transmitted a message
C	ON	The receiver power supply is on

Accessing the configuration server

Using your browser, enter the following address: **192.168.77.77** to access the configuration server.



Declaring and configuring the sensors

TX CONFIG tab

The first stage, after accessing the configuration server, will be to declare the transmitters you want to pair with the receiver. You can pair up to a maximum of 50 transmitters with the receiver.

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Only those receivers with firmware version **X.X.8864** and above can manage 50 sensors. Previous versions can manage 40 sensors.

The transmitters are declared by clicking on the « **+Add Sensor** » button in the server's « **TX CONFIG** » tab. Input the configuration information.

The screenshot shows the 'Add Sensor' form with the following fields and callouts:

- Tx Type:** A dropdown menu with 'TX T&H AMB 600-021' selected. Callout: 'Select the type of sensor'.
- Location:** An empty text input field. Callout: 'Enter the location of the sensor (E.g.: office)'.
- LoRa ID:** An empty text input field. Callout: 'Input the LoRa ID (stated on the transmitter label)'.
- Periodicity:** A dropdown menu with '1 minute' selected. Callout: 'Select the transmission period'.
- + Advanced:** A button to expand the form. Callout: 'Bring up the advanced options. See advanced functionalities in the Appendix'.
- Save Changes:** A blue button at the bottom. Callout: 'Button for registering the parameters'.

Repeat the operation for each of the sensors to be configured. The list of sensors you have declared is shown on the page.

You can adjust the configuration of a transmitter or delete it at any time using the edit or delete buttons. We recommend that you export your configuration file in the CSV format to keep a record of your configuration.

The screenshot shows the 'Transmitter Configuration' table with the following data:

Type	Location	LoRa ID	Periodicity	
TX T&H AMB 600-021	TEST	11065	5 mins	[Edit] [Delete]
TX PULSE AT&X 600-037	TEST	9325	5 mins	[Edit] [Delete]
TX CO2 AMB 600-023	TEST	14401	5 mins	[Edit] [Delete]

Buttons: Export CSV, Import CSV, + Add Sensor

The configuration of your sensors is now complete.

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There are specific installation procedures for the TX IO 600-040 and TX MODBUS 600-041. Please refer to the table of contents to find the installation procedures for these products.



Sensor activation

Open the cases of the transmitters you wish to activate.



Check that the transmitters are set to the proprietary LoRa mode. Check that the jumper of each transmitter is correctly positioned on the two pins and that it is in the proprietary LoRa mode (**See appendices**). If it is not correctly positioned, make sure you position it correctly before you activate the product..

Activating the first transmitter (your choice)

*Connect the battery of one of your transmitters and check the LEDs.

See next paragraph.

*For the TX IO 600-040 and TX MODBUS 600-041 transmitters, please refer to their specific installation procedures (cf. Contents).

Meaning of the sensor indicator LEDs

Phase 1 Sensor start-up			Phase 2 Dialogue with the receiver		
L1	L2	L3	L1	L2	L3
Flashes every 5s	Flashes when the sensor sends a message	Flashes when the receiver responds	Flashes every 5s	Flashes when the sensor sends a message	Flashes when the receiver responds

Phase 3 Installation status			
	L1	L2	L3
Success strong signal	OFF	OFF	ON (30s)
Success weak signal	OFF	ON (30s)	OFF
Installation failed	ON (30s)	OFF	OFF

Phase 4 Operation		
L1	L2	L3
Flashes every 1 minute if an alarm	Flashes with each frame sent	Flashes every 1 minute




Repeat this operation for each of the transmitters you want to activate.



Do not power up all the sensors simultaneously. Power them up one at a time and wait until each one is working correctly before powering up the next one.

Sensor activation

Transmitter Configuration

	Type TX PULSE ATEX 600-037
	Type TX CO2 AMB 600-023
	Type TX TEMP INS 600-031

Check the activation of the transmitters from the server

In the « **CONFIG TX** » tab, refresh the page on your browser. A confirmation button should be shown in front of the transmitters you have just activated. A red button means that the configuration is being captured. Wait a moment and then refresh the page if green buttons are not displayed.



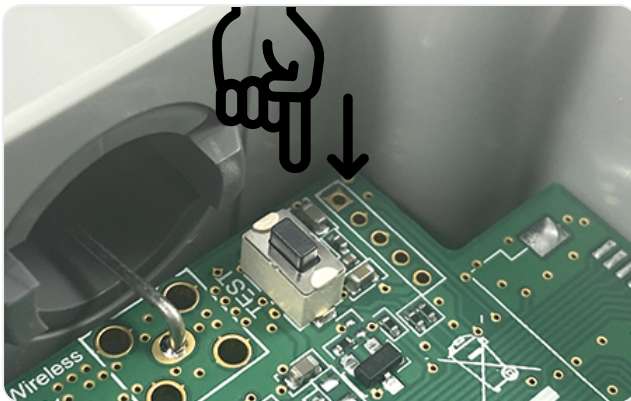
Checking data reception from the sensors NETWORK tab

Device Type	Last Seen	Device ID	Location	Data 1	Data 2	Data 3	Data 4	Data 5	Signal Quality	RSSI	Battery
TX PULSE ATEX 600-037	3 mins ago	9325	TEST	0	0	0	0000	0000	📶	-50 dBm	🔋
TX CO2 448 900-023	3 mins ago	14431	TEST	26.6 °C	47.4 %	0 ppm	479 ppm	0000	📶	-52 dBm	🔋
TX TEMP 916 600-031	3 mins ago	8738	TEST	26.0 °C				0000	📶	-53 dBm	🔋

« NETWORK » tab

In the « **NETWORK** » tab, the frames from the transmitters you have powered up will be sent at the periodicity you have configured. This tab allows you to check the correct reception of the sensor data frames.

We recommend that you use this page as a site auditing tool, to check that the RSSI signal levels for the sensor reception are correct.



Push button

Position the transmitters in the locations where they will be installed on the site. Use the push button situated on the sensor's electronic circuit board to force a test frame transmission.

LED L2 flashes when you press the push button. This means that a frame has been sent by the transmitter. The « **NETWORK** » tab should show whether the test frame has been correctly received.

- Up to -105 dBm**
Strong signal
- Between -106 and -112 dBm**
Medium signal
- Above -112 dBm**
Weak signal
(Repeater must be installed)

RSSI signal

By checking the RSSI signal levels on the server, you can see whether repeaters need to be installed.

The installation procedure for the repeaters is given in the **appendices**.

Once these checks have been performed, you can complete the final installation of the transmitters.



Positioning and attaching the sensors

Positioning

Correctly positioning the sensors is very important and significantly impacts on the quality of the radio wave propagation. If your transmitter is incorrectly positioned, you limit the radio coverage distance.

To maximise the performance of the transmitter, follow the guidelines given below:



- Position the transmitters as high up as possible.
- We recommend that the transmitters are positioned at a height of at least 1.50m.
- Check that the transmitter's antenna is always pointing upwards.

Affixing

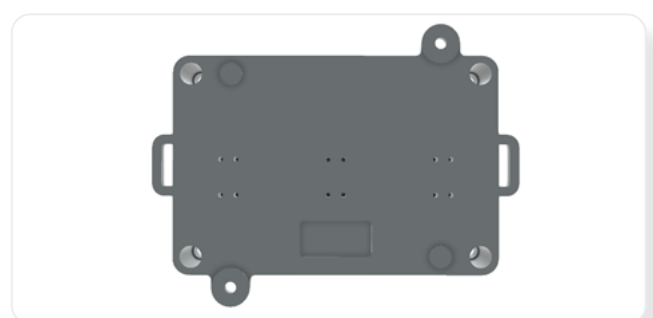
The transmitters are affixed using wall lugs. These are designed to be secured using screws. The ambient transmitter lugs (white casing) are inside the transmitters. For the rugged transmitters (grey casing), you can also use the securing clamps on the sides of the casing.

Ambient sensors



The transmitters are affixed using wall lugs. These are designed to be secured using screws and are on the inside of the transmitter.

Rugged sensors



The product can be attached using the clamps, the lugs and screws, or by means of a DIN rail.



Configuring the receiver parameters

RX CONFIG tab

Once the configuration and activation of the sensors has been completed, the final step is to set the communication parameters of the receiver prior to connecting it to the PLC.

As stated above, Enless has two references for its LoRa receivers:

- RX MODBUS 500-302
- RX BACNET 500-312

There are different configuration options for these two receivers.

For both of them, using the configuration server, go to the « **RX CONFIG** » tab.



Configuring the RX MODBUS 500-302

The screenshot shows the 'RX CONFIG' tab in the Enless Wireless configuration tool. It features a 'Receiver configuration' section with fields for 'Bits Per Second' (9600), 'Data Bits' (8), 'Stop Bits' (1), and 'Parity' (None). There is also a 'Modbus ID' field set to 1 and a 'Start Address' field set to 31000. Below these are radio buttons for 'RS232' and 'RS485', with 'RS485' selected. An 'Advanced Settings' section includes radio buttons for 'SERIAL', 'MODBUS', 'BACNET', and 'DHCP ON', with 'MODBUS' selected. A 'SAVE CHANGES' button is at the bottom.

Receiver Modbus ID

1st register in which the data from the transmitters will be incremented in the Modbus table.

Sets the communication interface for the receiver when you want to communicate in RTU: RS232 / RS485

IP parameters for Modbus IP communication

Matches the receiver's communication parameters with those of your PLC

The screenshot shows the 'MODBUS view' tab. On the left, there is a list of transmitters: '9325 - TX PULSE ATEX 600-037', '14401 - TX CO2 AMB 600-023', and '8738 - TX TEMP INS 600-031'. The main area displays a table of registers with columns for 'Register n', 'Hex value', 'Dec value', and 'Details'. A 'Download' button is in the top right corner.

Register n	Hex value	Dec value	Details
24	0000	0	Device ID HI
25	246d	9325	Device ID LO
26	050c	1292	Tx Type & / Version 12
27	0000	0	Status
28	0000	0	Alarm Status
29	0000	0	
30	0000	0	Ch1 Count HI 0 pulses
31	0000	0	Ch1 Count LO 0 pulses
32	0000	0	
33	0000	0	Ch2 Count HI 0 pulses
34	0000	0	Ch2 Count LO 0 pulses
35	0000	0	
36	0000	0	OC Count HI 0 pulses
37	0000	0	OC Count LO 0 pulses
38	0000	0	
39	0000	0	
40	0000	0	
41	0002	2	Transmission Counter 2
42	fff0	-50	Received RSSI value -90 dBm

When you have finished configuring the receiver, you can click on the « **MODBUS** » tab to access the receiver's table. When you select a transmitter on the left of the screen, the registers to which its data is sent are displayed in the Modbus table. You can save this Modbus table using the « **Download** » button.



Configuring the RX BACNET 500-312

BACnet receiver configuration

Bits Per Second: 115200
 Data Bits: 8
 Stop Bits: 1
 Parity: None

Device Mode Object Mode

Select your communication protocol:-

MSTP MSTP + BBMD
 IP IP + MSTP
 DHCP OFF DHCP ON

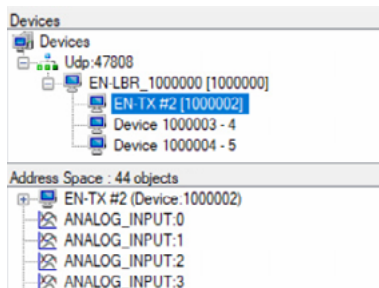
IP Address: 192.168.1.77
 Subnet Mask: 255.255.255.0
 Gateway: 0.0.0.0
 UDP Port: 47808
 Network: 1
 Virtual Network: 2
 Device Identifier: 1000000
 TX Identifier Base: 1000001
 MSTP Address: 1

Alternative RX BACnet operating modes

Device Mode

Each sensor paired with the receiver will be shown as a BACnet device on the network during discover. Only those sensor objects paired with the receiver will be accessible after discover.

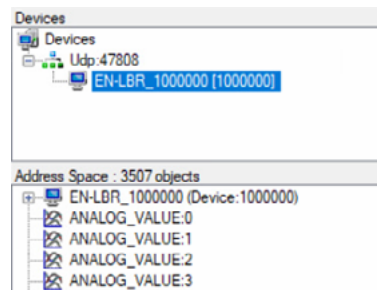
Example of discover in Device Mode with YABE



Object Mode

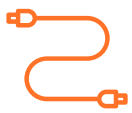
The receiver will display all the BACnet objects it can contain during discover.

Example of discover in Object Mode with YABE



When you modify the configuration of your receivers, you should restart the receiver so that the changes can be applied. It is restarted using the « **REBOOT** » button in the Admin tab on the « **RX CONFIG** » page.





Connecting the receiver to the PLC or the BMS

The configuration phase is complete.
 You can now connect the receiver to the PLC.

Connecting to the PLC

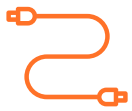
RX MODBUS 500-302		
TCP/IP connection		
Use the RJ45 Ethernet port on the receiver to connect in TCP/IP		
RS485 RTU connection		
Receiver terminal	Description	Connecting to the PLC
A	RS485 – A	RS485 – A
B	RS485 - B	RS485 - B
GND	Signal GND	Signal GND
RS232 RTU connection		
Receiver terminal	Description	Connexion à l'automate
Tx	Transmission output	Rx
Rx	Reception input	Tx
GND	GND Signal	GND Signal

RX BACNET 500-312		
TCP/IP connection		
Use the RJ45 Ethernet port on the receiver to connect in TCP/IP		
MSTP connecting		
Receiver terminal	Description	Connecting to the PLC
A	RS485 – A	RS485 – A
B	RS485 - B	RS485 - B
GND	GND signal	GND signal

Apply external power to your receiver (power supply between 7.5 and 24 VDC).
 We recommend using our 12V power supply unit (Ref.: POWER 1000-002).
 Connect your power supply to the POWER terminal block on the receiver.

- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

To prevent any problems, maintain 1A 12V on the power supply terminal.



Connecting the receiver to the PLC or the BMS

LEDs on the receiver

Once the receiver is powered up and connected to your PLC, you can check it is working correctly by means of its LEDs. The behaviour of the receiver LEDs is described below:

LED	Behaviour	Meaning
A	Flashes	The receiver has received a message
B	Flashes	The receiver has transmitted a message
C	ON	The receiver power supply is on
D	Flashes	Communication message transmitted
E	Flashes	Communication message received
F	OFF	Functionality not defined

II. Specific installation procedure for the TX IO 600-040

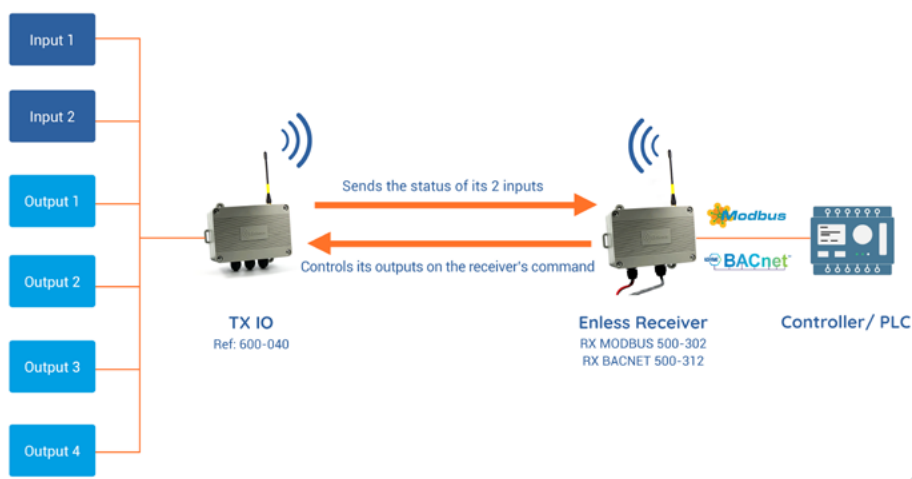
Operating modes of the TX IO 600-040

The TX IO gives Enless integrators a number of control options. The 2 relay input and 4 relay outputs of the TX IO can be controlled remotely. It can be used in 3 distinct modes that can be configured from the server embedded in the transmitter.

By default, the TX IO is delivered ready to use in the remote control mode.

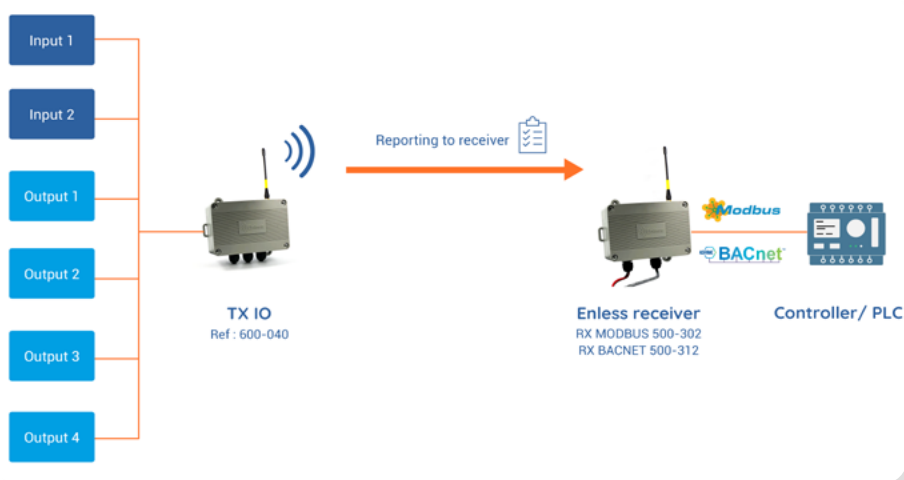
To change the TX IO mode, access its configuration server (same procedure as accessing the receiver servers described on **page 7** above).

Mode 1: Remote control (default mode)



The TX IO transmitter sends the input statuses to the receiver, and manages its outputs as controlled by the receiver. When the TX IO is configured in this mode, it acts like any other Enless transmitter with the additional functionality of being able to receive a receiver message to control the 4 relay outputs.

Mode 2: Local control



The TX IO manages its outputs based on the input values and sends report messages to the receiver. The TX IO can be configured to map digital inputs to the relay outputs subject to a configurable timing. This makes it possible to prevent the relay sending spontaneous messages triggered by momentary changes in the input status.

Mode 3: D2D (Device to Device)



The TX IO dialogues with the Enless LoRa sensors (maximum of 4) and controls its outputs based on the configured alarm thresholds for the transmitters.

To change the TX IO use mode, access its configuration server (same procedure as accessing the receiver servers described on **page 7** above).

Installation procedure for the TX IO in remote control mode

Declaring and configuring the TX IO from the receiver server

The declaration procedure for the TX IO is the same as for the other transmitters. See **page 8** above.

Activating the TX IO

Once it has been declared on the receiver interface, you can activate the TX IO by powering it up.

The TX IO can be powered either by:

- An Enless 12V power unit ref': POWER 1000-002 (Recommended)
- A main power supply of 7.5 to 24V / 1A

Use only CE certified power units.





Connect the power supply to the POWER terminal block on the TX IO.

- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

Check the TX IO LEDs

The TX IO attempts to dialogue with the receiver and its LEDs (inside the housing) show the installation status.

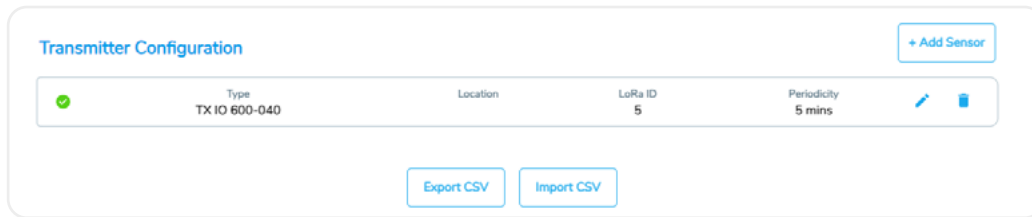
Installation status

				
Behaviour	Always ON	ON	ON	ON
Meaning	Sensor powered	Installation failed	Installation successful but weak radio signal	Installation successful and strong signal

Checking the TX IO activation from the receiver server

In the « **TX CONFIG** » tab, refresh the page on your browser. A confirmation button should appear in front of the TX IO you have just activated (**Capture 1**).

A red button means that the configuration is being captured. Wait a moment and then refresh the page if a green button is not displayed.



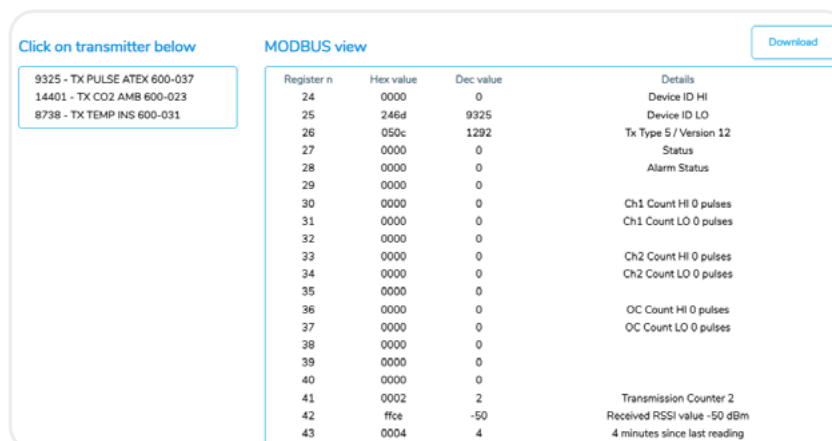
In the « **NETWORK** » tab, the frames from the TX IO you have powered up will be sent at the periodicity you have configured. This tab allows you to check the correct reception of the TX IO data frames.



Viewing the Modbus table

Click on the « **MODBUS** » tab. When you select the TX IO on the left of the screen, the registers to which its data is sent are displayed in the Modbus Table.

You can export and save this Modbus table using the « **Download** » button.



Controlling the relays

With the RX MODBUS 500-302

The relays are controlled by writing in the relay Status registers in the Modbus table. For example, you can activate relay 1 by changing the value of the corresponding status register (0 = OFF / 1 = ON).

With the RX BACNET 500-312

The relays are controlled by writing in the relay Status objects. You can, for example, activate relay 1 by changing the value of the corresponding status object (0 = OFF / 1 = ON).

Optional stage - Viewing the status of the inputs and outputs from the server

The procedure for accessing the TX IO configuration server is identical to that for the receiver. The default address for accessing the TX IO is **192.168.77.77** (please avoid using Microsoft Edge).

In the « **STATUS** » tab you can view the display of the state of the digital inputs and the count since powering up. At the bottom of the tab, you can see the display of the ON or OFF status of the relays and the number of times the state has switched since the TX IO was turned on.

You can test the state of the relays by clicking on the « **Toggle Relay** » button. The relay is triggered for one second.

Inputs		
Input	Status	Count
Input 1	OFF	4
Input 2	OFF	14

Outputs			
Relay	Status	Count	Button
Relay 1	OFF	4	Toggle Relay
Relay 2	OFF	2	Toggle Relay
Relay 3	OFF	2	Toggle Relay
Relay 4	OFF	2	Toggle Relay

Installation procedure for the TX IO in local control mode

In this mode the TX IO can be configured to map the digital inputs to the relay outputs subject to a configurable timing.

TX IO power supply

The TX IO can be powered either by:

- An Enless 12V power unit Ref.: POWER 1000-002 (Recommended)
- A main power supply of 7.5 to 24V / 1A

Use only CE certified power units.

Connect the power supply to the POWER terminal block on the TX IO.

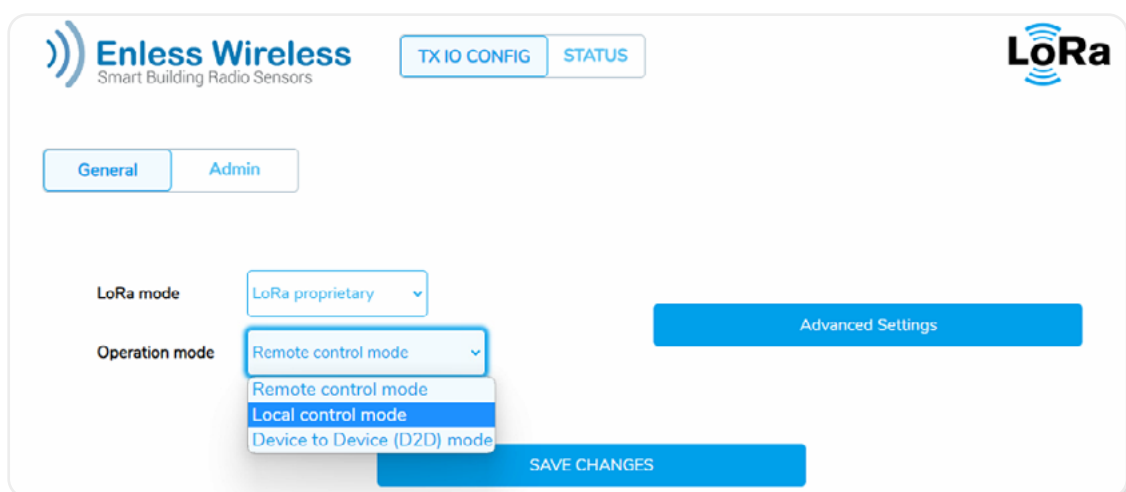
- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

Accessing the TX IO configuration server

The procedure for accessing the TX IO configuration server is identical to that for the receiver. The default address for accessing the TX IO is **192.168.77.77** (Please avoid Microsoft Edge).

Selecting the Local Control Mode

Select the « **Local Control** » mode using the « **TXIO CONFIG** » interface. Once selected, restart your TX IO so that the change in mode can be applied, by means of the « **REBOOT** » button in the « **ADMIN** » tab of the TX IO server.



Configuring the TX IO parameters using its embedded server

In the « **TX IO CONFIG** » tab, configure your relays by selecting for each relay:

- The input: Input 1 or Input 2
- The relay mode: Normally closed or normally open

Normally closed: Corresponds with a closed idle state. When the status is at 0, the relay is closed. When the status is at 1, the relay is open.

Normally open: Corresponds with an open idle state. When the status is at 0, the relay is open. When the status is at 1, the relay is closed.

- Time period: 1 sec, 5 sec, 10 sec, 30 sec, 60 sec or 120 sec.

The screenshot shows the 'General' tab of the configuration interface. It includes two tabs: 'General' and 'Admin'. Under 'General', there are two dropdown menus: 'LoRa mode' set to 'LoRa proprietary' and 'Operation mode' set to 'Device to Device (D2D) mode'. To the right, there is a table for configuring four relays:

	Device ID	Relay Mode	Alarm Type
Relay 1	11065	Normally Open	High Temp
Relay 2	5987	Normally Open	High Temp
Relay 3	28567	Normally Open	High analog(mA)
Relay 4	--Disabled--	Normally Closed	--Disabled--

At the bottom of the configuration area is a blue button labeled 'Advanced Settings'.

Click on « **Advanced Settings** » to save the configuration.

Viewing the status of the inputs and outputs

In the « **STATUS** » tab you can view the display of the state of the digital inputs and the relays, as well as the number of changes of state since powering up.

You can test the state of the relays by clicking on the « **Toggle Relay** » button. The relay is triggered for one second.

The TX IO is now configured, you can now turn the power off.

The screenshot shows the 'STATUS' tab with two sections: 'Inputs' and 'Outputs'.

Inputs:

Input	Status	Count
Input 1	OFF	4
Input 2	OFF	14

Outputs:

Relay	Status	Count	Button
Relay 1	OFF	4	Toggle Relay
Relay 2	OFF	2	Toggle Relay
Relay 3	OFF	2	Toggle Relay
Relay 4	OFF	2	Toggle Relay

Declaring and configuring the TX IO on the receiver server

See page 8 for the same procedure as the other transmitters.

Activating the TX IO

Once it has been declared on the receiver interface, you can activate the TX IO by powering it up.

The TX IO can be powered either by:

- An Enless 12V power unit Ref.: POWER 1000-002 (Recommended)
- A main power supply of 7.5 to 24V / 1A

Use only CE certified power units.





Connect the power supply to the POWER terminal block on the TX IO.

- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

Check the TX IO LEDs

The TX IO attempts to dialogue with the receiver and its LEDs (inside the housing) show the installation status:

Statut de l'installation




				
Behaviour	Always ON	ON	ON	ON
Meaning	Sensor powered	Installation failed	Installation successful but weak radio signal	Installation successful and strong signal

Checking the TX IO activation from the receiver server

In the « TX CONFIG » tab, refresh the page on your browser. A confirmation button should be shown in front of the TX IO you have just activated.

A red button means that the configuration is being captured. Wait a moment and then refresh the page if a green button is not displayed.

Transmitter Configuration + Add Sensor

	Type TX IO 600-040	Location	LoRa ID 5	Periodicity 5 mins	 
---	-----------------------	----------	--------------	-----------------------	---

Export CSV
Import CSV

In the « **NETWORK** » tab, the frames from the TX IO you have powered up will be sent at the periodicity you have configured. This tab allows you to check the correct reception of the TX IO data frames.

View Network Clear Data Download

Device Type	Last Seen	Device ID	Location	Data 1	Data 2	Data 3	Data 4	Data 5	Signal Quality	RSSI	Battery
1 + TX IO 600-040	Just now	5		0	0		8000	0000		-62 dBm	

Viewing the Modbus table

Click on the « **MODBUS** » tab. When you select the TX IO on the left of the screen, the registers to which its data are sent are displayed in the Modbus Table.

You can save this Modbus table using the « **Download** » button.

Click on transmitter below MODBUS view Download

9325 - TX PULSE ATEX 600-037
14401 - TX CO2 AMB 600-023
8738 - TX TEMP INS 600-031

Register n	Hex value	Dec value	Details
24	0000	0	Device ID HI
25	246d	9325	Device ID LO
26	050c	1292	Tx Type 5 / Version 12
27	0000	0	Status
28	0000	0	Alarm Status
29	0000	0	
30	0000	0	Ch1 Count HI 0 pulses
31	0000	0	Ch1 Count LO 0 pulses
32	0000	0	
33	0000	0	Ch2 Count HI 0 pulses
34	0000	0	Ch2 Count LO 0 pulses
35	0000	0	
36	0000	0	OC Count HI 0 pulses
37	0000	0	OC Count LO 0 pulses
38	0000	0	
39	0000	0	
40	0000	0	
41	0002	2	Transmission Counter 2
42	ffce	-50	Received RSSI value -50 dBm
43	0004	4	4 minutes since last reading

Installation procedure for the TX IO in D2D mode

In D2D mode the TX IO dialogues with the Enless LoRa sensors (maximum of 4) and controls its outputs based on the configured alarm thresholds for the transmitters.

TX IO power supply

The TX IO can be powered either by:

- An Enless 12V power unit Ref.: POWER 1000-002 (Recommended)
- A main power supply of 7.5 to 24V / 1A

Use only CE certified power units.

Connect the power supply to the POWER terminal block on the TX IO.

- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

Accessing the TX IO configuration server

The procedure for accessing the TX IO configuration server is identical to that for the receiver. The default address for accessing the TX IO is **192.168.77.77** (please avoid Microsoft Edge).

Selecting the D2D mode

Select the D2D operating mode using the « **TX IO CONFIG** » interface. Once selected, restart your TX IO so that the change in mode can be applied, using the « **REBOOT** » button in the « **ADMIN** » tab of the TX IO server.

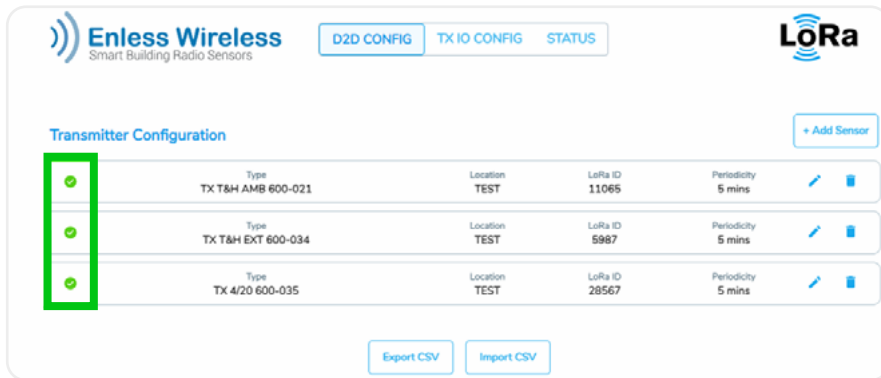
Declaring and configuring the transmitter alarm thresholds

In the « **CONFIG D2D** » tab, you must declare the transmitters you want to pair with the TX IO. The procedure is the same as for declaring transmitters on a receiver (see **page 8**).

The alarm thresholds are configured in the advanced options.
(See the **Appendices**).

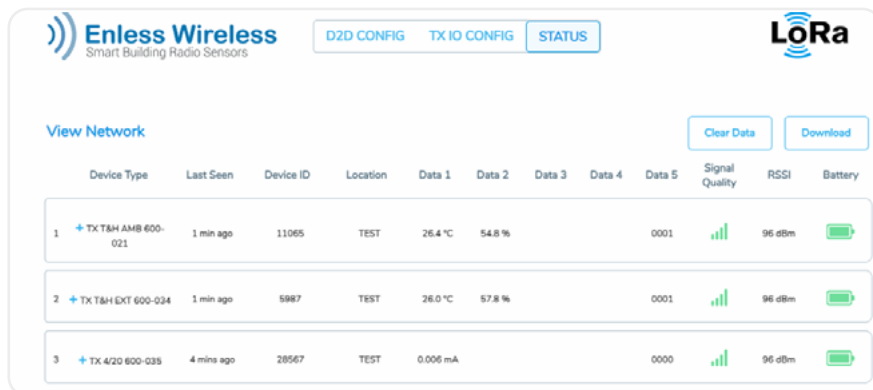
Sensor activation

The activation of the sensors is described on **page 9** above.



Checking data reception from the sensors

In the « **STATUS** » tab, in the transmitter's « **NETWORK** » tab, the frames from the transmitters you have powered up will be sent at the periodicity you have configured. This tab allows you to check the correct reception of the transmitter data frames. We recommend that you use this page as a site auditing tool, to check that the RSSI signal levels for the sensor reception are correct.



Configuring the relays

In the « **TX IO CONFIG** » tab, the relays can be associated with the alarm thresholds of the sensors you have configured.

To do this, select for each relay:

- The ID of the configured transmitter
- The relay mode: Normally closed or normally open
 - Normally closed:** Corresponds with a closed idle state. When the status is at 0, the relay is closed. When the status is at 1, the relay is open.
 - Normally open:** Corresponds with an open idle state. When the status is at 0, the relay is open. When the status is at 1, the relay is closed.
- The type of alarm to trigger a relay.

The screenshot shows the 'TX IO CONFIG' tab in the Enless Wireless web interface. It features a navigation bar with 'D2D CONFIG', 'TX IO CONFIG', and 'STATUS'. Below the navigation, there are tabs for 'General' and 'Admin'. The main configuration area includes:

- LoRa mode:** A dropdown menu set to 'LoRa proprietary'.
- Operation mode:** A dropdown menu set to 'Device to Device (D2D) mode'.
- Device ID:** A table with four rows for Relay 1 through Relay 4. Relay 1 has ID 11065, Relay 2 has 5987, Relay 3 has 28567, and Relay 4 is set to '--Disabled--'.
- Relay Mode:** A table with four rows. Relay 1, 2, and 3 are set to 'Normally Open', while Relay 4 is set to 'Normally Closed'.
- Alarm Type:** A table with four rows. Relay 1 and 2 are set to 'High Temp', Relay 3 is set to 'High analog(mA)', and Relay 4 is set to '--Disabled--'.

At the bottom of the configuration area, there are two buttons: 'Advanced Settings' and 'SAVE CHANGES'.

Viewing the output states

In the « **STATUS** » tab, in the « **Outputs** » section you can display the ON or OFF status of the relays and the number of times the state has been switched since the TX IO was turned on. You can test the state of the relays by clicking on the « **Toggle Relay** » button. The relay is triggered for one second.

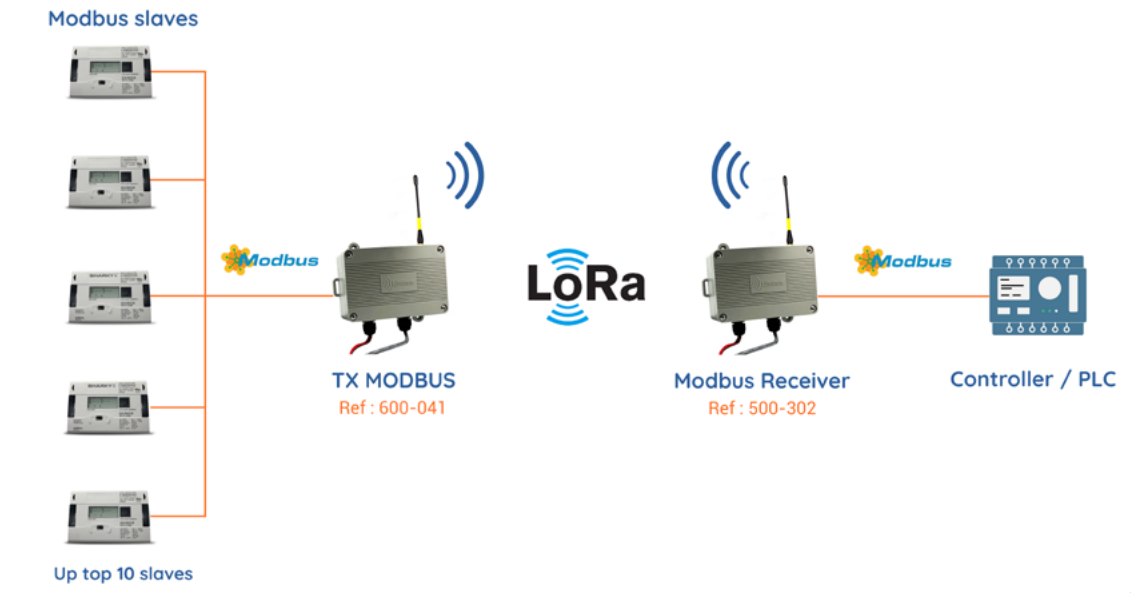
The screenshot shows the 'Outputs' section in the STATUS tab. It displays a table with the following data:

Relay	Status	Count	Button
Relay 1	ON	1	Toggle Relay
Relay 2	OFF	0	Toggle Relay
Relay 3	OFF	0	Toggle Relay
Relay 4	OFF	0	Toggle Relay

III. Specific installation procedure for the TX MODBUS 600-041

Operating modes of the TX MODBUS 600-041

The TX Modbus can read / write to 60 Modbus registers. These registers can cover a maximum of 10 Modbus slaves. The TX MODBUS will communicate with an Enless RX MODBUS, in the proprietary LoRa mode.



Installation procedure for the TX MODBUS

Declaring and configuring the TX Modbus using the receiver interface:

Go to the receiver configuration server (see **pages 6 and 7** for the procedure for accessing the receiver server). On the receiver configuration server, the « **TX Config** » tab allows you to declare and configure the TX MODBUS which will be shown on the receiver.

To configure your TX MODBUS, click on the « **+Add Sensor** » button. A new window is opened.

Click on « **+Advanced** » to configure the slave and the registers the TX Modbus will read/write to:

The screenshot shows the 'Add Sensor' configuration window. The main form includes fields for 'Tx Type' (TX MODBUS 600-041), 'Localisation' (TEST), 'ID LoRa' (20), 'Périodicité' (5 minutes), and 'Nouvelle config' (Off). Below this is a section for 'Communication parameters' with fields for 'ID Modbus' (1), 'Vitesse' (115200), 'Parité' (none), 'Bit de stop' (1), and 'Bit de données' (8). At the bottom is a table for 'Configuring the registers' with 6 rows, each containing a 'Numéro de registre', 'Taille de registre' (16 bits), and 'Type de registre' (Input, Hold, or Coil). A blue 'Enregistrer' button is at the bottom.

Select the type of sensor

Enter the location of the TX

Input the LoRa ID (stated on the transmitter label)

Select the transmission period

Click on the +Advanced button to configure the registers to read/write on the slave

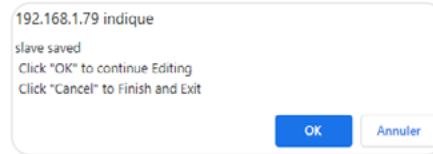
Select a slave number between 1 and 10

Enter a Modbus ID for the slave (between 1 and 254)

Communication parameters

Configuring the registers:
Enter the addresses of the registers to read/write on the slave (Maximum of 6 registers per slave).
Select the size and type of each register

When you click on « **Save** », a message is displayed :



If you want to declare other slaves on the same TX Modbus, you can click on « **OK** » and continue by entering another slave number.

Register number	Register size	Register type
Register 1	16 bits	Input
Register 2	16 bits	Input
Register 3	16 bits	Hold
Register 4	16 bits	Hold
Register 5	16 bits	Coil
Register 6	16 bits	Coil

Once you have completed the configuration, you can click on « **Save Changes** », then Cancel to end and quit.



The RX MODBUS 500-302 receiver can handle a maximum of 50 transmitters. Each slave configured on a TX MODBUS equates with a transmitter in the receiver's Modbus table.

Several slaves can be configured with the same Modbus ID in order to read or write in more than 6 registers on that slave.

Activating the TX Modbus

TX Modbus power supply

The TX Modbus can be powered either by:

- An Enless 12V power unit
Ref.: POWER 1000-002 (Recommended)
- A main power supply of 7.5 to 24V.
Electrical power characteristic for a 12Vdc power supply to the TX Modbus: 1A max.

Use only CE certified 12V power units

Connect the power supply to the POWER terminal block on the TX Modbus:

- Black wire connected to the 0V terminal
- Red wire connected to the V+ terminal

Check the TX Modbus LEDs

When you power it up, the TX Modbus attempts to dialogue with the receiver. You can refer to the TX Modbus LEDs to find out more about the installation status..

Installation phase:

LED	Behaviour	Meaning
A	OFF	
B	OFF	
C	Flashes every 5 seconds	
D	Flashes when a message is sent	ON for 30 seconds if the installation is successful but signal weak
E	Flashes when a message is received	ON for 30 seconds if the installation is successful
F	OFF during the installation sequence	ON for 30 seconds if the installation fails

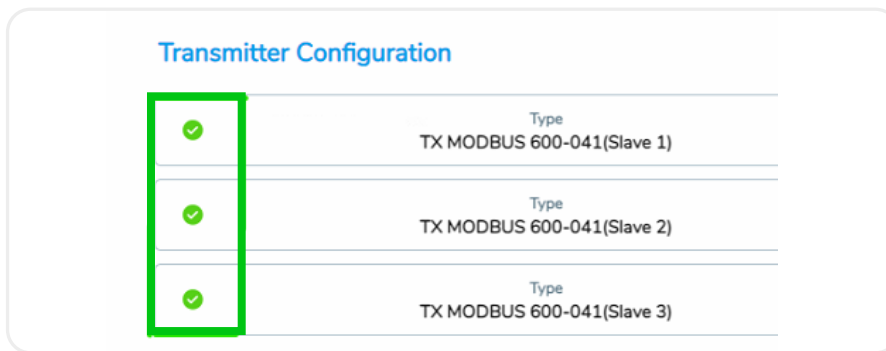
Normal operation:

A	B	C	D	E	F
Flashing when the message is sent on Comms	Flashing when the message is received on Comms	ON	Flashing when the message is sent on RF	Flashing when the message is received on RF	OFF

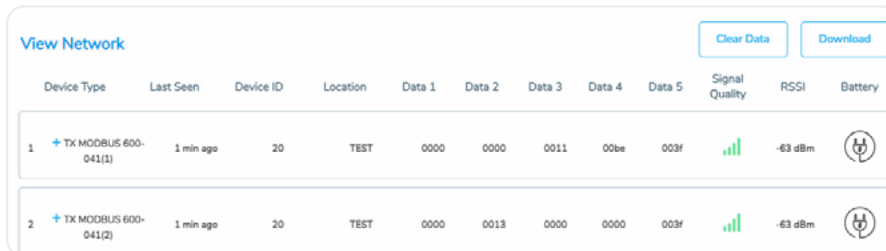
Checking the TX MODBUS activation from the receiver server

In the « **TX CONFIG** » tab, refresh the page on your browser. A validation button should be shown in front of the TX Modbus slaves you have just activated.

A red button means that the configuration is being captured. Wait a moment and then refresh the page if green buttons are not displayed.



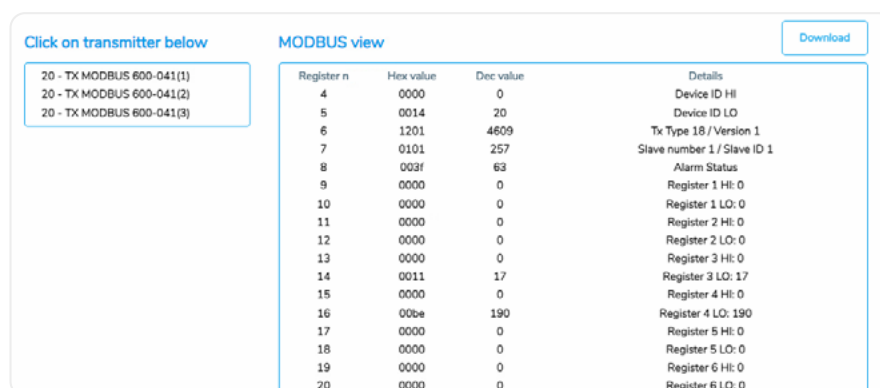
In the « **NETWORK** » tab, the frames with the content of the registers of the slaves read by the TX Modbus you have powered up will be sent at the periodicity you have configured. This tab allows you to check the correct reception of the TX Modbus frames.



We recommend that you use this page as a site auditing tool, to check that the RSSI signal levels for the frame reception are correct

Viewing the Modbus table

Click on the « **MODBUS** » tab. When you select a transmitter on the left of the screen, the registers to which its data are sent are displayed in the Modbus Table. You can save this Modbus table using the « **Download** » button.



Writing in the Modbus table

The registers of the Modbus table can be written to for each slave.

N.B.: The writing can only be to "Hold" or "Coil" type registers.

Optional stage: Checking the parameters and the status of the slaves from the TX Modbus server.

The procedure for accessing the TX MODBUS configuration server is identical to that for the receiver. The default address for accessing the TX MODBUS is **192.168.77.77**.

The « **SLAVE SET UP** » tab on the TX Modbus server will show how the reading of the slaves has been configured from the receiver.

Slave No	Modbus ID	Register 1	Baudrate	Parity	Stop Bits	Data Bits
Slave 1	1	1	115200	N	1	8
Slave 2	2	11	115200	N	1	8
Slave 3	3	21	115200	N	1	8
Slave 4	-	-	-	-	-	-
Slave 5	-	-	-	-	-	-
Slave 6	-	-	-	-	-	-
Slave 7	-	-	-	-	-	-
Slave 8	-	-	-	-	-	-

The « **SLAVE STATUS** » will show you the data read by the TX Modbus on the slaves. You can confirm the capture of these same data and values in the registers in the Modbus table of the receiver.

Slave No	Alarm Status	Reg 1 HI	Reg 1 LO	Reg 2 HI	Reg 2 LO	Reg 3 HI	Reg 3 LO	Reg 4 HI	Reg 4 LO	Reg 5 HI	Reg 5 LO	Reg 6 HI	Reg 6 LO
Slave 1	003f	0000	0000	0000	0000	0000	0011	0000	00be	0000	0000	0000	0000
Slave 2	003f	0000	0000	0000	0013	0000	0000	0000	0000	0000	00be	0000	0000
Slave 3	0015	0000	0000	0000	0007	0000	0000	0000	0046	0000	0000	0000	02bc
Slave 4	003f	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Slave 5	003f	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Slave 6	003f	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Slave 7	003f	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
Slave 8	003f	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000

APPENDICES



Safety recommendations

- The safety of Enless products can only be guaranteed if they are used for their intended purpose. They must only be serviced by qualified persons.
- There is a risk of an explosion if the sensor batteries are replaced with incorrect reference replacements. Please refer to **Appendix page 26** for details on replacing the sensor batteries.
- The sensors must be installed in an adequately ventilated environments to ensure there is no danger of internal overheating. They must not be covered with things such as newspapers, cloth, curtains, etc.
- Sensors must never be exposed to high temperature sources (E.g.: attached to heating equipment, etc.)
- Do not place the sensors near objects that generate flames (E.g.: candles, blowpipes, etc.)
- The sensors must not be exposed to aggressive chemical agents or solvents that may damage plastic or corrode metal parts.

Reminder relating to the use of the TX PULSE ATEX 600-037 transmitter

As required by the ATEX 1999/92/EC Directive, only persons trained for working in hazardous areas are authorised to install the TX PULSE ATEX 600-037 transmitter. The TX PULSE ATEX 600-037 transmitter must not be modified in any way.

Special conditions for safe operation

When used with a gas meter, the output wires of the TX PULSE ATEX 600-037 transmitter must be connected to certified intrinsically safe equipment. This combination must be compatible with the Uo, Io, Po, Co, Lo intrinsic safety regulations specified on the label attached to the transmitter.

Certification

The TX PULSE ATEX 600-037 transmitter is ATEX certified:



II 1 G

Ex ia IIC T3 Ga

LCIE 14 ATEX 3013 X

-20°C ≤ Tamb ≤ +55°C

Battery: 3,6 V Ramway ER34615 only.

Uo:3,9 V ; Io : 11,47 mA ; Po : 11,18 mW ; Co : 617 µF : Lo : 270 mH.

Battery

The TX PULSE ATEX 600-037 transmitter is delivered with a RAMWAY ER34615 model battery.

Only the RAMWAY ER34615 battery can be used with the TX PULSE ATEX 600-037 transmitter. These batteries can be obtained from Enless Wireless - 45 ter avenue de Verdun 33520, Bruges (France).

Telephone: 05 56 37 97 47 – email: contact@enless.fr

WARNING - POTENTIAL RISK OF STATIC DISCHARGE

The TX PULSE ATEX 600-037 transmitter must only be cleaned using a damp clothe.

Description of the products

Ambient transmitters

Product references

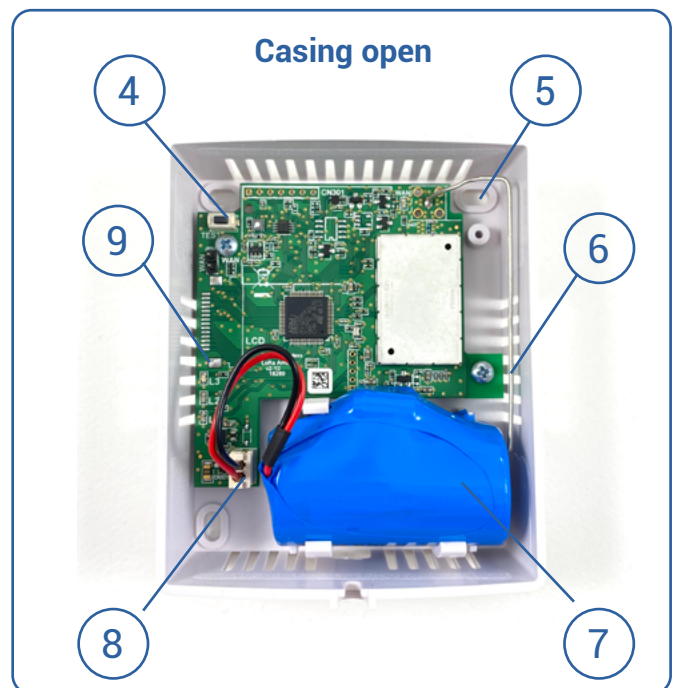
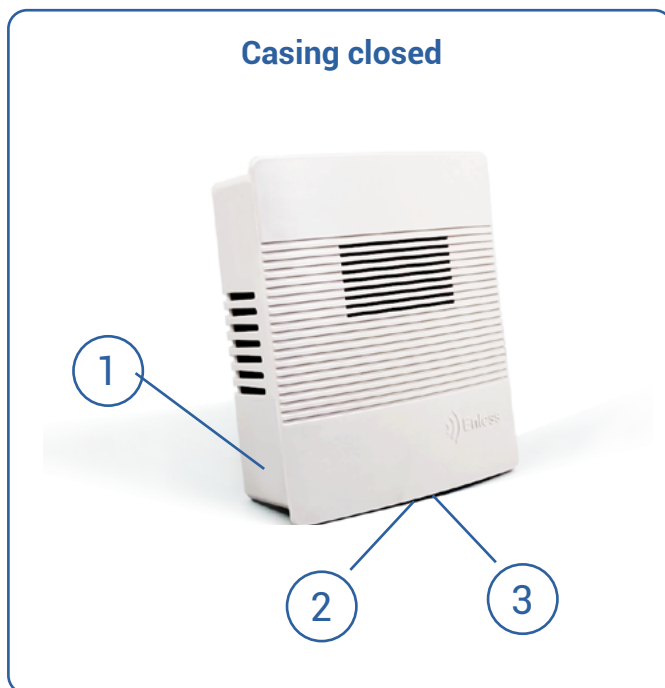
TX T&H AMB 600-021
TX CO2/VOC/T&H AMB 600-023

Applications

Measuring Comfort &
Indoor Air Quality

Identification

LoRa ID (on the sensor label)



1. ID label
2. Cover closing screw
3. Closing tab for casing

4. Push button to test the sending of data frames
5. Hole for wall fixing
6. Antenna
7. Replaceable battery
8. Connector for battery plug
9. LED indicator lights (L1, L2, L3)

Description of the products

Temperature transmitters

Product references

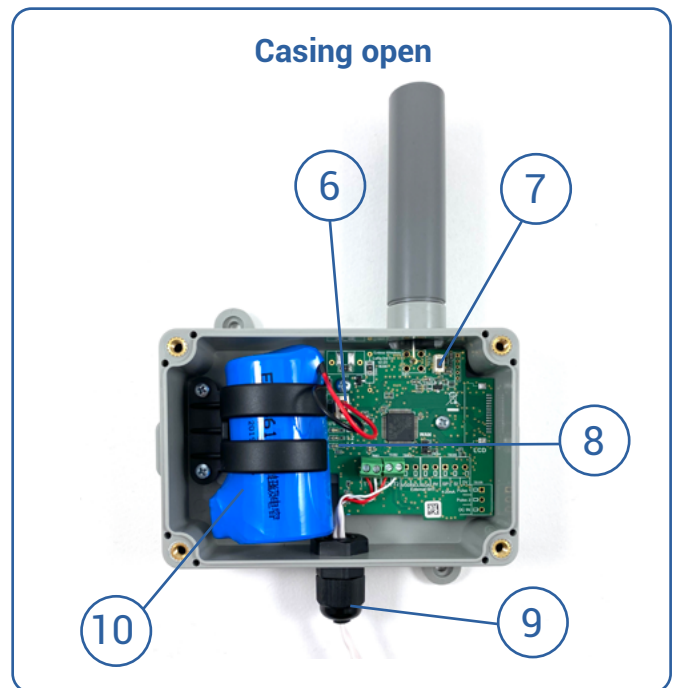
TX TEMP INS 600-031
TX TEMP CONT1 600-032
TX TEMP CONT2 600-232
TX T&H EXT 600-034

Applications

Temperature measurements in outdoor or industrial environments

Identification

LoRa ID (on the sensor label)



1. ID label
2. Loop for fixing collar
3. Cover closing screw
4. Hole for wall fixing
5. Antenna

6. Connector for battery plug
7. Push button to test the sending of data frames
8. LED indicator lights (L1, L2, L3)
9. Cable gland for contact and external probes (contact or temperature humidity)
10. Replaceable battery

Description of the products

Remote meter reading transmitters

Product references

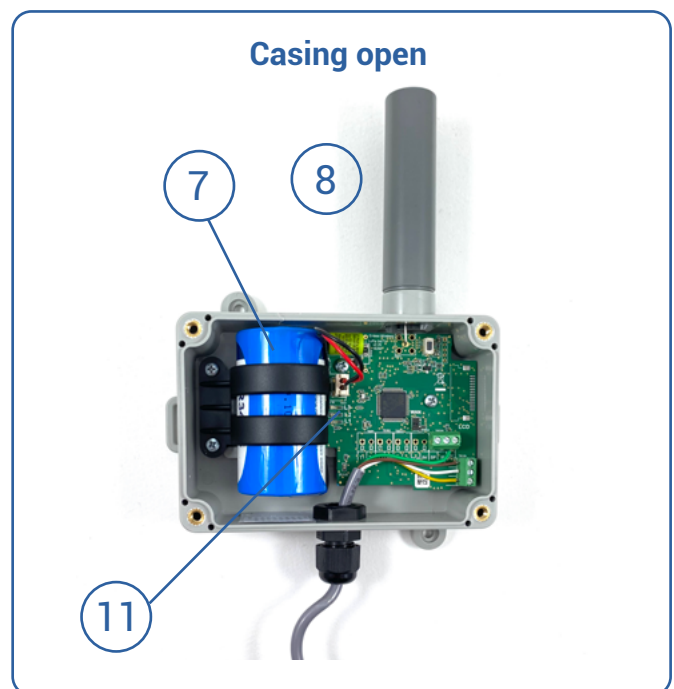
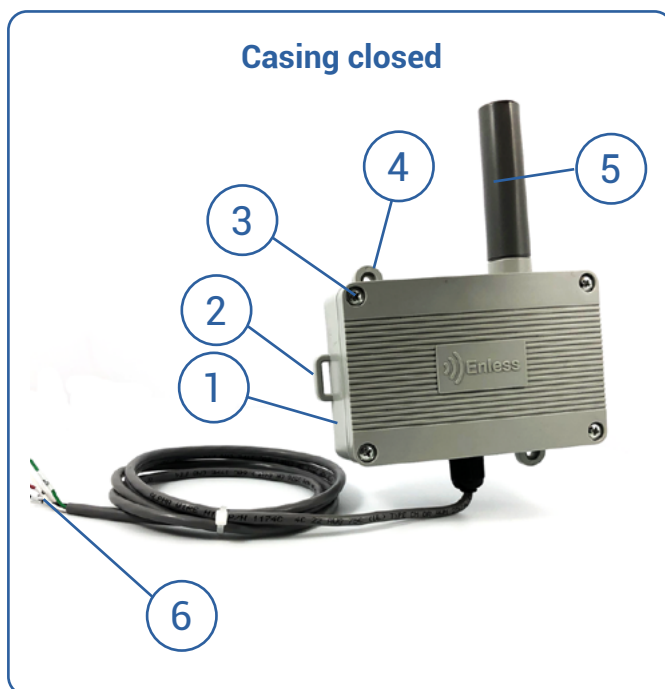
TX PULSE 600-036
TX PULSE ATEX 600-037
TX PULSE LED 600-038

Applications

Smart meter reading
(water, Electricity, gas,
etc.)

Identification

LoRa ID (on the sensor
label)



1. ID label
2. Loop for fixing collar
3. Cover closing screw
4. Hole for wall fixing
5. Antenna
6. Meter connection cable / contact cable

7. Replaceable battery
The ATEX battery for the TX PULSE HP ATEX 600-037 is available from Enless Wireless (contact@enless.fr)*
8. Connector for battery plug
9. Push button to test the sending of data frames
10. Cable gland for connection cables (meter or contact)
11. LED indicator lights (L1, L2, L3)

* Important: There is a risk of explosion if the replacement battery is not the correct type. Used batteries must be disposed of as instructed

Description of the products

Industrial transmitters

Product references

TX 4/20mA 600-035

Application

Reading analogue signals
4/20mA

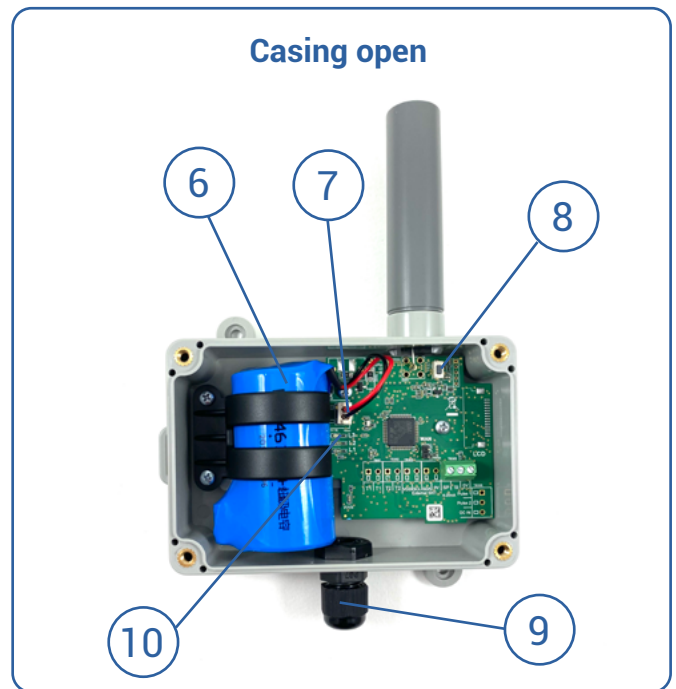
Identification

LoRa ID (on the sensor label)

Casing closed



Casing open



1. ID label
2. Loop for fixing collar
3. Cover closing screw
4. Hole for wall fixing
5. Antenna

6. Replaceable battery
7. Connector for battery plug
8. Push button to test the sending of data frames
9. Cable gland for analogue probe 4/20mA
10. LED indicator lights (L1, L2, L3)

Description of the products

Industrial transmitters

Product references

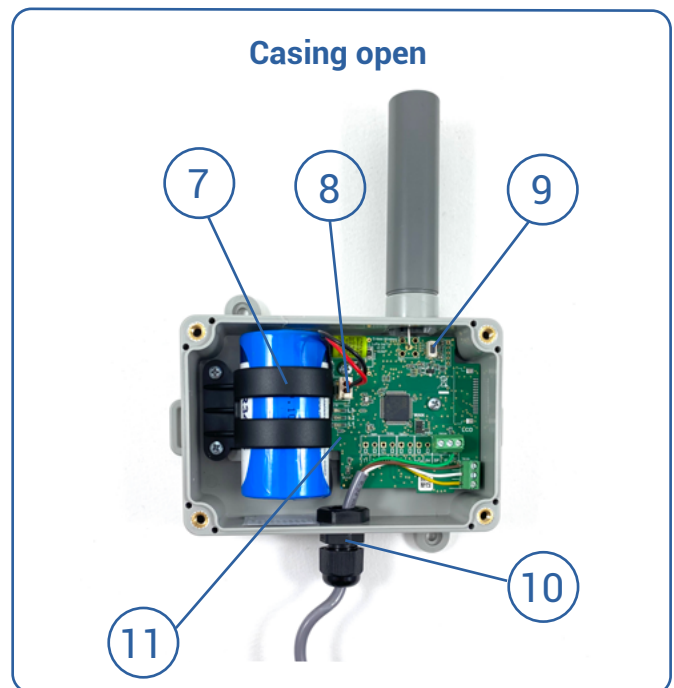
TX CONTACT 600-039

Application

Detecting changes of state
(ON/OFF)

Identification

LoRa ID (on the sensor label)



1. ID label
2. Loop for fixing collar
3. Cover closing screw
4. Hole for wall fixing
5. Antenna
6. Connecting cable for the ON-OR-OFF interface (dry contact)

7. Replaceable battery
8. Connector for battery plug
9. Push button to test the sending of data frames
10. Cable gland for connection cables (meter or contact)
11. LED indicator lights (L1, L2, L3)

Description of the products

Industrial transmitters

Product references

TX IO 600-040

Application

Controlling radio output relays

Identification

LoRa ID (on the sensor label)

Casing closed



Casing open

Visuals to follow...

Description of the products

Industrial transmitters

Product references

TX MODBUS 600-041

Application

Read/write Modbus registers

Identification

LoRa ID (on the sensor label)

Casing closed



Casing open



Description of the products

Receivers

Product references

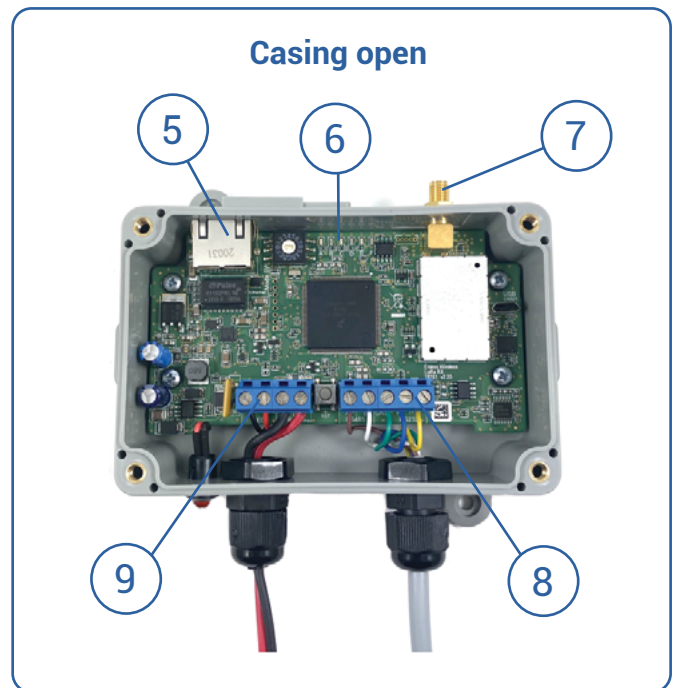
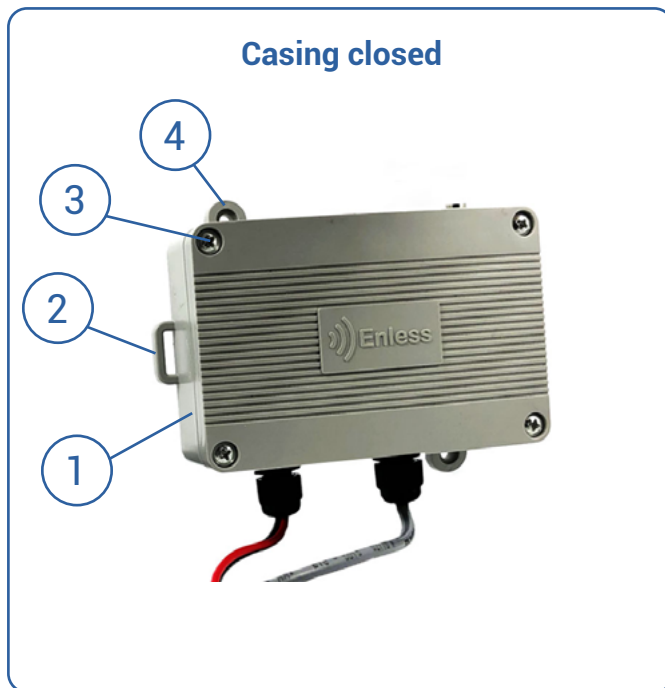
RX MODBUS 500-302
RX BACNET 500-312

Application

Receiving messages from
Enless sensors

Identification

Serial number with 8
numbers



1. ID label
2. Loop for fixing collar
3. Hood closing screw
4. Hole for wall fixing

5. Ethernet connector for access to embedded IP server and communication via Modbus IP or BACnet IP
6. LED lights (A,B,C,D,E,F)
7. SMA connector for antenna
8. Communication cable terminal block (RS232/RS485)
9. Power supply terminal block

Description of the products

Repeater

Product references

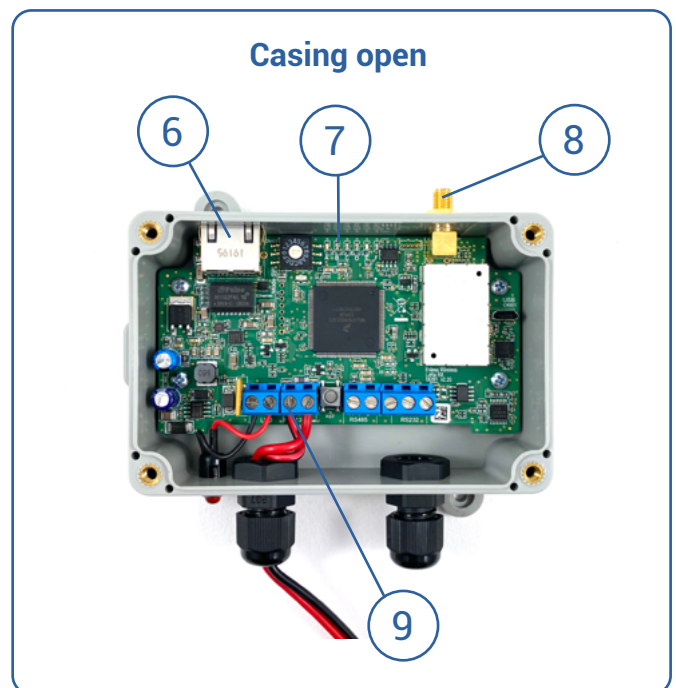
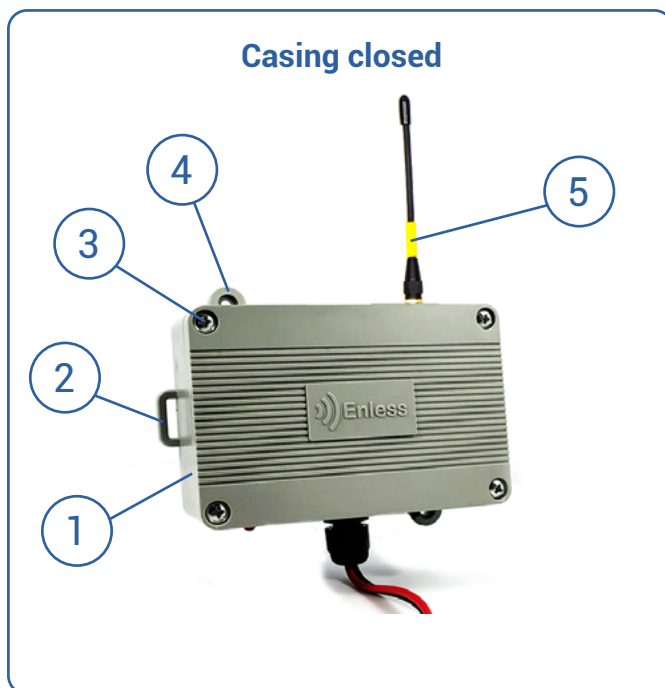
RX REPEATER 600-301

Application

Amplifying the signal from Enless transmitters

Identification

Serial number with 8 numbers



1. ID label
2. Loop for fixing collar
3. Hood closing screw
4. Hole for wall fixing
5. Antenna

6. Ethernet cable (only for firmware update)
7. LED lights (A,B,C,D,E,F)
8. SMA connector for antenna
9. Power supply cable gland

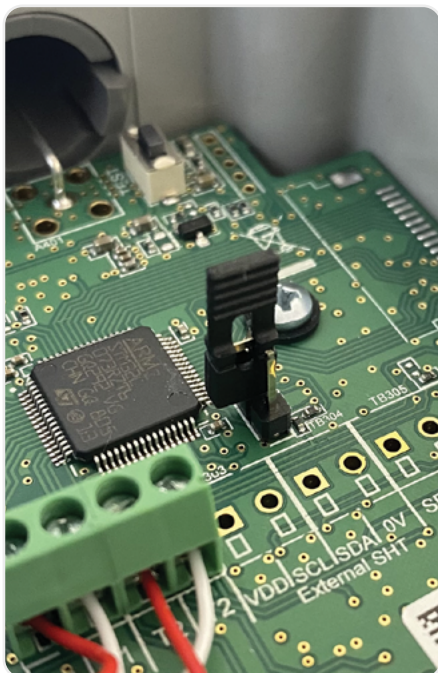
Selecting the communication mode (proprietary LoRa or LoRaWAN)

This document will describe the procedure for installing sensors using the proprietary LoRa mode. This means it is essential that your sensors must communicate using the proprietary LoRa mode.

The communication mode is selected by means of a jumper on the electronic board in each sensor. See example below:

LoRaWAN mode

Jumper positioned on a single pin.



Proprietary LoRa mode

Jumper positioned on the two pins.



You must power down the transmitter before changing the position of the jumper.

If you want to use our products in the LoRaWAN mode, please refer to the LoRaWAN mode sensor installation guide.



Calibrating the CO2 transmitters (TX 600-023)

Our TX CO2 COV T&H AMB 600-023 sensors are delivered pre-calibrated. You can recalibrate these manually on a fresh-air basis if you observe a divergence in the CO2 values over time.

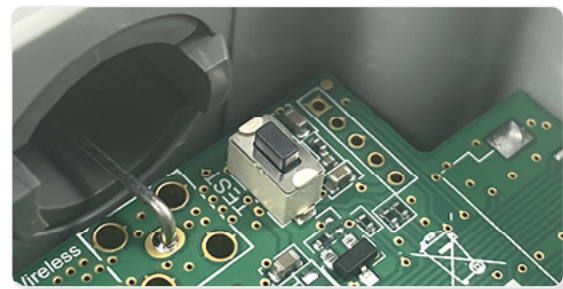
To guarantee the best possible calibration, we recommend that the equipment is calibrated following the procedure described below:

1



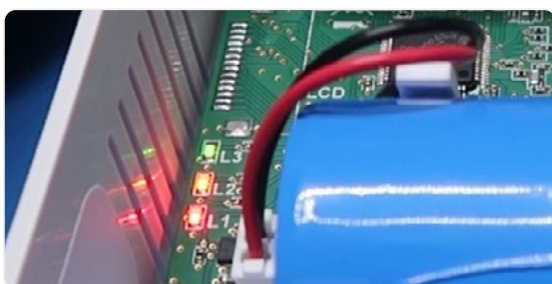
With the transmitter powered up, place it on a table near a window, with the window open to ensure that the air in which the transmitter is being calibrated is fresh.

2



Hold down the push button located on the transmitter's electronic card for 15 seconds. Do not release the button until the L1, L2, L3 LEDs come on. This indicates that the calibration process is active.

3



Move away from the transmitter and allow the calibration to complete. This process takes around 3 minutes.

4



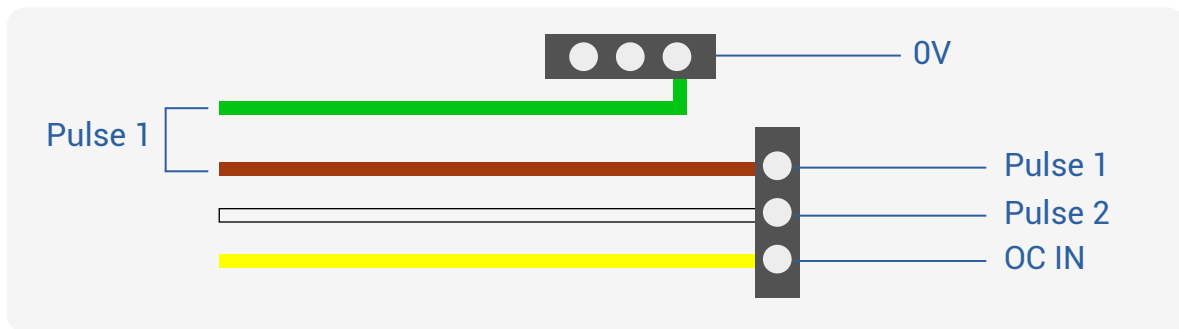
When the LEDs have stopped flashing, this means that the calibration has been completed. You can now take the transmitter and install it in its intended position.

We recommend pressing on the push button using a screwdriver or a pen to make sure you do not damage the CO2 sensor with your finger!

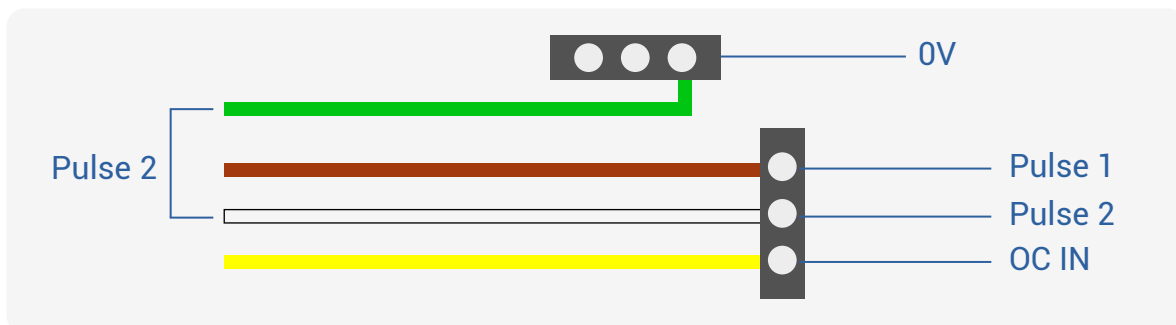
Connecting the TX PULSE to the pulse meters

The pulse transmitters can be wired in one of three ways:

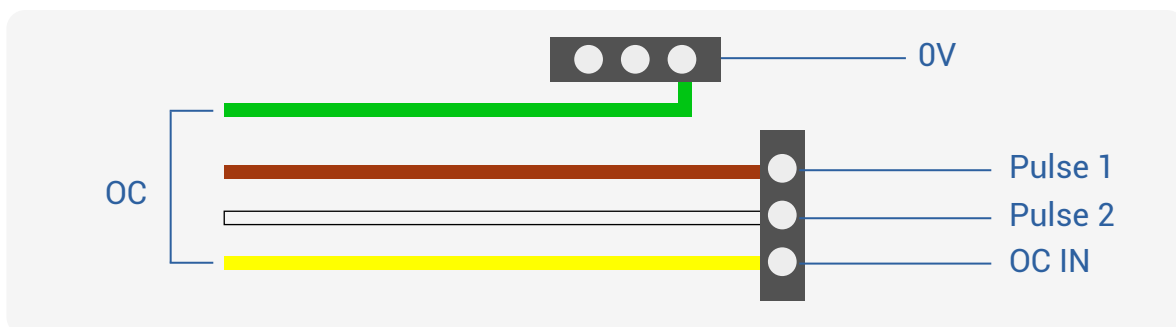
Using the Pulse 1 input (dry contact):



Using the Pulse 2 input (dry contact):



Using the OC input (open collector):



The TX PULSE 600-036 and TX PULSE ATEX 600-037 sensors are compatible with **dry contact or open collector pulse outputs.**

Pulse duration = **50ms minimum**

Pulse frequency = **10Hz maximum**

Connecting the TX PULSE LED to the electricity meter

1. Understanding your meter



Indicator lights

Find the flashing diode counter. This is where the optical reader will be placed. The head of the optical reader is only able to detect LED flashes with a minimum length of 3ms and a maximum of 100ms.

Parameters

If it is a tariff meter greater than 36 kVA, you need to find the transformation ratio of your meter. Use the buttons beside the digital display to read the value corresponding to the TC ratio (parameter 6, 16 or 64).

2. Installing the sensor



Attaching the viewfinder

Clean the meter around the flashing diode.

Affix the viewfinder with the diode visible through the hole (the viewfinder is supplied with an adhesive).

Locking the reader

Clip the reader into the viewfinder. 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 (next page)

3. Consumption calculation

The pulse optical reader records 1 pulse every 5 flashes.

$$\text{Calculation formula} = (A \times 5) \times B \times C \times D$$

A = Number of pulses measured

B = Pulse weight

Blue tariff: 0.1W/pulse. In this case, enter 0.1 for B value in the calculation below.

Other tariffs: Shown on the meter's interface (label or screen)

C = TC ratio (Current transformation)

Blue tariff: 1

Yellow tariff: 20, 40 or 100 (shown on the meter's interface)

D = TT ratio (Tension transformer)

Blue tariff: 1

Yellow tariff: 1

Green tariff: Shown on the meter's interface.



The calculation formula above is a calculation of consumption in Watt-hour (Wh). To get a value in Kilowatt-hour (kWh), you just need to divide the value by 1,000.

Connecting your 4/20mA probe to the TX 4/20 600-035 transmitter

When installing analogue transmitters, you must first connect the 4/20mA sensor to the transmitter.

Open the transmitter casing and connect the analogue sensor to the transmitter terminal. Refer to the label inside the transmitter under the terminal block for the connection.

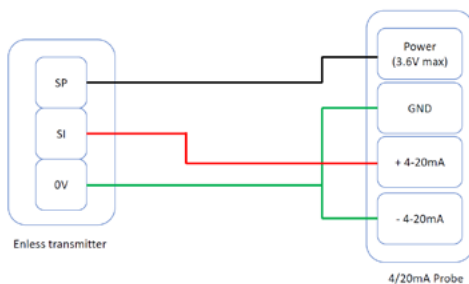
Connecting the probe

Transmitter Terminal	Description	Connecting to the PLC
SP	Power (+V)	Use SP and 0V to power the probe
SI	4/20mA (+I)	Use SP and 0V to power the probe
0V	Common 0-V	

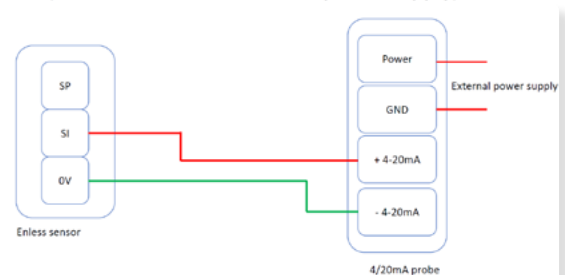
Once the probe is connected to the transmitter, you can start configuring the transmitter.

Cabling for the 4/20mA sensor to the TX 4/20mA 600-035 transmitter

Cabling for the LoRa 4-20mA transmitter (with the 4/20mA sensor power supply)



Cabling for the LoRa 4-20mA transmitter (without the 4/20mA sensor power supply)



Advanced transmitter functionalities

The advanced functionalities are displayed when you click the « **+Advanced** » button in the « **+Add Sensor** » window. Two types of advanced functionalities are available.

The screenshot shows the 'Add Sensor' configuration window with the following fields and options:

- Tx Type:** TX CO2/VOC/T&H AMB 600-023
- Location:** (empty text field)
- LoRa ID:** (empty text field)
- Periodicity:** 15 minutes
- Advanced:** (button)
- TWU Period (mins):** Off
- High Temp (°C):** Max 125.0
- Low Temp (°C):** Min 0.0
- High Hum (%):** Max 100
- Low Hum (%):** Min 0.0
- High VOC (ppb):** Max 4000
- Low VOC (ppb):** Min 0
- High CO2 (ppm):** Max 4000
- Low CO2 (ppm):** Min 0
- Save Changes:** (button)

Callout boxes highlight:

- A remote reconfiguration function (see explanation below)** (pointing to TWU Period)
- Alarm thresholds when thresholds are exceeded (see explanation below)** (pointing to the threshold fields)

Remote reconfiguration

When you activate this function, every 24 hours the transmitter will ask the receiver if a new configuration is available. If you have changed the configuration of the transmitter in question from the Modbus table of the receiver, then the transmitter will take its new periodicity without you having to reset the sensor manually after 24 hours.



It is possible to (re)configure the transmitters from the Modbus table of the receiver. To find out more, do not hesitate to consult our Help Desk:

www.enless-wireless.freshdesk.com/en/support/home

Type "**configuration from the Modbus table**" in the search box

Alarm thresholds

There are different alarm thresholds available for each type of transmitter. If you do not want to use this feature, do not fill in the fields for the alarm thresholds. Otherwise, fill in the fields with the high/low values of the selected thresholds. If the threshold is exceeded, the status byte in the Modbus table will indicate an alarm. (see Modbus table document).

Installing a signal repeater

RX REPEATER 600-301

If one or more transmitters are out of range of the Modbus receiver, you will need to install a repeater. **The repeater does not need to be configured!**



Position your repeater

We recommend that you position your repeater halfway between the transmitters and the Modbus receiver. As a preference, use a long-range antenna and install it as high as possible. It is possible to chain several repeaters together.

Power your repeater

Once positioned, power the repeater. The repeater can be powered either by:

- A 12V Power Charger Ref: POWER 1000-002 (Recommended)
- A 7.5 to 24V main power supply

Electrical power characteristic for a 12Vdc power supply to the Repeater: 1A max.
Use only CE certified 12V power supply units

In both cases, the wires will be connected to the repeater POWER terminal:

- Black wire connected to 0V terminal
- Red wire connected to V+ terminal

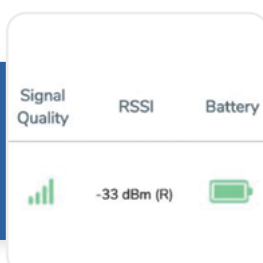
Interpreting the LED indicators

LEDs inside the casing

LA Flashes	The repeater has received a message
LB Flashes	The repeater has transmitted a message
LC ON	The Repeater power supply is on

LEDs outside the casing

External LED flashes every minute	The repeater has received a message
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On the configuration server, frames that pass through a repeater have (R) next to the RSSI signal value.



Procedure for resetting to the factory parameters

Procedure 1

Applicable for the following products:

- **RX MODBUS 500-302**
- **RX BACNET 500-312**
- **RX REPEATER 600-301**
- **TX MODBUS 600-041**


- ✓ Power down the product
- ✓ Position the rotary switch to position D
- ✓ Power up the product and wait for at least 30s
- ✓ Power down the product
- ✓ Position the rotary switch to position 0
- ✓ Power up the product and connect it to the PC over Ethernet
- ✓ Check that the Ethernet parameters of the PC are as follows:
 - IP Address: **192.168.77.2**
 - Length of the subnetwork prefix: **24**
 - Gateway: **192.168.77.1**
 - Preferred DNS: **8.8.8.8**
- ✓ Access the server using the browser at address **192.168.77.77**

Procedure 2 (TX IO)

Applicable for the following product:

- **TX IO 600-040**
- ✓ Press the push button until LEDs L1 and L2 light (around 15s)
- ✓ Release the push button and wait 30s
- ✓ Restart the product electrically (turn off power and then turn on again)
- ✓ Access the server using the browser at the address **192.168.77.77**

Replacing the batteries

	C battery with Molex connector	D battery with Molex connector
	BAT C 1000-028	BAT D 1000-029
TX T&H AMB 600-021	X	
TX CO2 VOC T&H 600-023		X
TX TEMP INS 600-031		X
TX TEMP CONT1 600-032		X
TX TEMP CONT2 600-232		X
TX T&H EXT 600-034		X
TX PULSE 600-036		X
TX PULSE ATEX 600-037		X
TX PULSE LED 600-038		X
TX CONTACT 600-039		X
TX 4/20mA 600-035		X

Frequently Asked Questions

ENLESS WIRELESS HELP DESK

- +150** articles available
- +3000** article consultations
- 80%** of technical questions are answered thanks to our articles

Answers to the most frequently asked questions can be found on our help Desk site:

<https://enless-wireless.freshdesk.com/en/support/home>

Type your question in the Help Desk search box. There are more than **150 FAQ articles to help you** – you will almost certainly find the answer to your question here.

Scan the QR code to access our Help Desk.

