Enless Wireless
Smart Building Radio Sensors

IoT
M2M

ENERGY EFFICIENCY

SETUP GUIDE

169MHz WIRELESS MBUS PRODUCTS

DTM14_j

M-Bus wireless

Guide for configuration and installation of 169MHz WMbus products

FOR MORE INFORMATION CONTACT US

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contact@enless.fr **:EMAIL**

www.enless-wireless.com

Enless Wireless
Smart Building Radio Sensors

PRODUCTS COVERED

AMBIENT TRANSMITTERS

- TX TEMP AMB 700-021
- TX TEMP HUM AMB 700-022
- TX CO2 / TEMP / HUM AMB 700-023

TEMPERATURE TRANSMITTERS

- TX TEMP INS 800-021
- TX TEMP CONT 800-022
- TX TEMP IMM 400-012

SMART-METERING TRANSMITTERS

- TX PULSE 400-005
- TX PULSE ATEX 400-006
- TX PULSE ATEX 400-007 GAZPAR
- TX PULSE LED 800-014

ANALOGUE & CONTACT TRANSMITTERS

- TX 4/20mA 400-008
- TX 0-5V 400-009
- TX CONTACT 400-011

REPEATER

- RX REPEATER 600-001

MODBUS RECEIVERS

- RX MODBUS RS232 500-002
- RX MODBUS RS485 500-022

SUMMARY

PRODUCTS DESCRIPTION

PREPARING FOR INSTALLATION

INSTALLATION

APPENDIX (PAGE 14)

PRODUCTS DESCRIPTION

AMBIENT TRANSMITTERS

References

- TX TEMP AMB 700-021
- TX TEMP HUM AMB 700-022
- TX CO2 TEMP HUM AMB 700-023

Weight
125gr

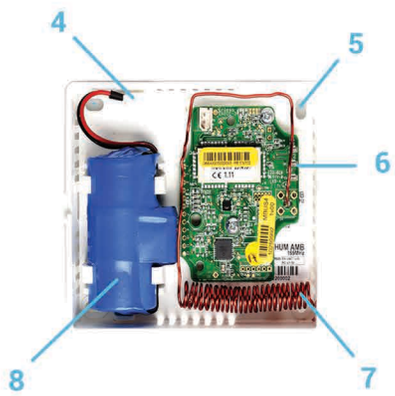
Battery
C ype 3,6V Lithium

Transmission power
125mW

ID
8 numbers under the barcode

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 TRANSMITTERS

References

- TX TEMP INS 800-021
- TX TEMP CONT 800-022
- TX TEMP IMM 400-012

Weight
196gr

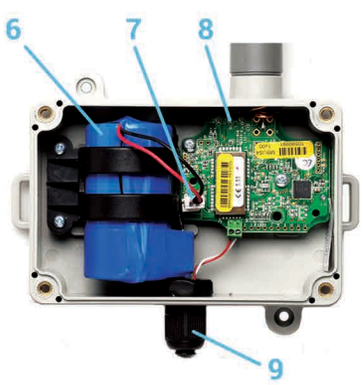
Battery
D type 3,6V Lithium

Transmission power
500mW

ID
8 numbers under the barcode

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 / immersion probes

PRODUCTS DESCRIPTION

SMART METERING AND CONTACT TRANSMITTERS

References

- TX PULSE 400-005
- TX PULSE ATEX 400-006
- TX PULSE ATEX 400-007 GAZPAR
- TX PULSE LED 800-014
- TX CONTACT 400-011

Weight
196gr

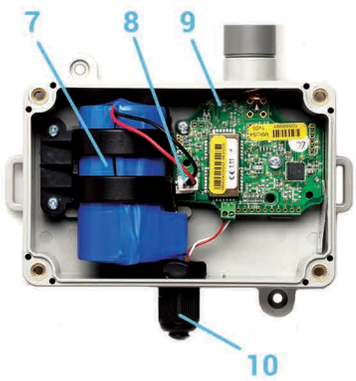
Battery
D type 3,6V Lithium
D type 3,6V Lithium (ATEX)

Transmission power
250mW (400-006)
500mW

ID
8 numbers under the barcode

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

ANALOGUE TRANSMITTERS

References

- TX 4/20 400-008
- TX 0-5V 400-009

Weight
196gr

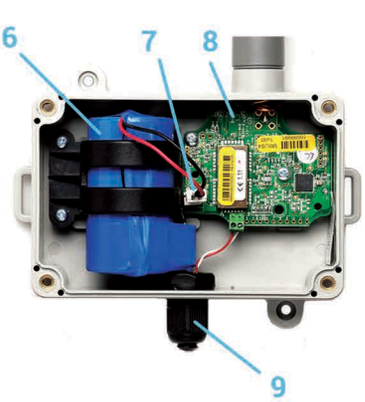
Battery
D type 3,6V Lithium

Transmission power
500mW

ID
8 numbers under the barcode

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 analogue probes

PRODUCTS DESCRIPTION

MODBUS RECEIVERS

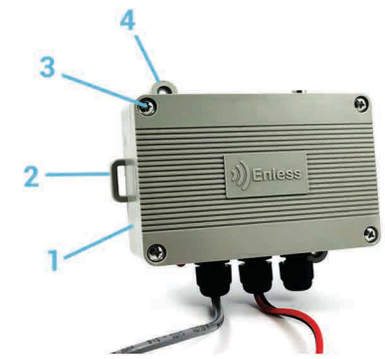
References

• RX MODBUS RS232 500-002
• RX MODBUS RS485 500-022

Weight
196gr

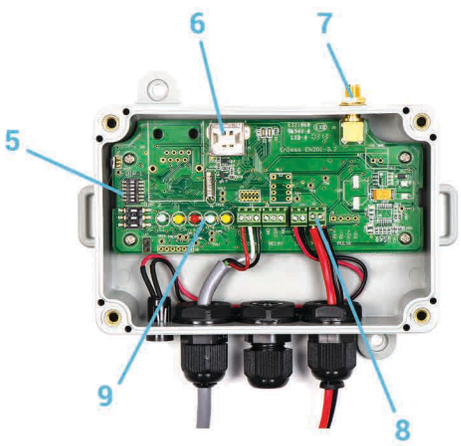
Power supply
from 7.5 to 24VDC maximum

ID
8 numbers under the barcode



CASING CLOSED

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



CASING OPENED

5) DIP Switches
6) USB Port
7) SMA connector for antenna
8) Power supply terminal block
9) LED lights (L1, L2, L3)

REPEATER

Reference

• RX REPEATER 600-001

Weight
196gr

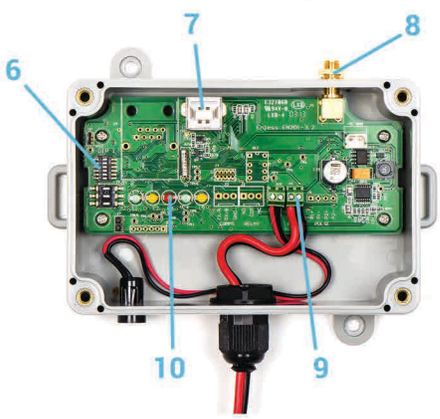
Power supply
from 7.5 to 24VDC maximum

Transmission power
500mW

ID
8 numbers under the barcode

CASING CLOSED

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



CASING OPENED

6) DIP Switches
7) USB Port
8) SMA connector for antenna
9) Power supply terminal block
10) LED lights (L1, L2, L3)

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PREPARING FOR INSTALLATION

At the outset

Before starting the configuration of the transmitters, please download our Field Configuration Tool (F.C.T.) software.

Our F.C.T. Software is available in the following link: https://enless-wireless.com/ressources/Enless%20Field%20Installation.zip

⚠ WARNING : If you face some issues in installing F.C.T., please consult the Appendix #7.

What you'll need

- ☑ Transmitters & receiver to install
- ☑ Long range antenna for receiver
- ☑ Phillips screwdriver
- ☑ Flat screwdriver (2mm)

Installation steps

Receiver preparation

You are going to prepare and configure your receiver before installing the transmitters.

Products configuration

You will first have to create a configuration file from which you will determine the configurations of your transmitters and validate that they communicate with your Modbus receiver.

Transmitters installation

Once the configuration file is edited, you can install your transmitters and validate that they communicate with your receiver.

Pairing the transmiters to the receiver

Once the validation is done, you can pair your transmitters to your receiver. You will then be able to view the Modbus registers in which the transmitters hold their information.

Paring the receiver to the PLC / Gateway

Once all the steps below have been completed, you have to configure the communication interface of your receiver (RS232 or RS485) and connect it to the PLC.

RECEIVER PREPARATION

The first step consists of preparing the Modbus receiver for transmitter installation.

You are going to configure the receiver in USB mode, to validate that it behaves correctly during its power supply and connection to the PC .

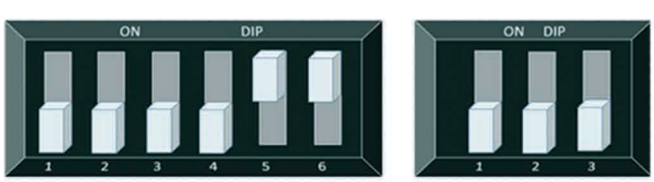
Please follow these steps

Open the receiver casing

To open the receiver casing, use a Philips screwdriver to remove the four screws on the four corners.

Configure the receiver in USB mode

Position the switches as follows :



DIP1: 5 and 6 ON, the other switches must be OFF
DIP2: Switches 1, 2 and 3 must be OFF

Connecting an antenna to the receiver

For better reception quality, we recommend you to use a long-range antenna.

References:

•ANT REN SMA HP INT 169 1000-027

Power the receiver

You can power the receiver:

- With the 12V Enless Power Supply - recommended
- With a power supply from 7.5V to 24V maximum

⚠ **Do not exceed 24VDC**

⚠ **Please provide at least 1AMP when powering the receiver**

Connect the power supply to the power terminal block of the receiver

Validate the LED behaviour of the receiver

L1 **L2** **L3** **L4** **L5** successively blink while powering when the receiver starts.

Then, **L5** remains on.

The external LED blink every 20 seconds.

Connect the receiver to your PC

Connect the receiver to your PC with the USB cable supplied.

When you connect the receiver to the USB port of your PC, the receiver driver should install automatically.

If this is not the case, you can download the driver corresponding to your configuration at this address:

http://www.ftdichip.com/Drivers.D2XX.html

Then check the COM port number you are connected to: (Control Panel / Peripherals and Printers).

PRODUCTS CONFIGURATION

Start the F.C.T software

• Enter a user name and click **OK**.

• Click **"Refresh List"** in the COM tab. The communication port is displayed, select it.

• Click **"Connect to COM Port"**. A message in the dialog box tells you that you are successfully connected.

Edit your configuration file

The products to install must be added to your configuration file

Configuring the transmitters

• Please add the transmitters by clicking **Edit / View** on the corresponding family.

• A new window appears. Please click this button to add a transmitter : 

• Please configure your transmitters by filling in the following boxes :

Address: It corresponds to the ID on the label (under the barcode)

Tx Time (1 to 250 min): Frequency of data sending

Re-Try (0 or 1): 0 by default, when set to 1, two frames will be sent instead of one (increased battery consumption)

Pulse count 1 / Pulse count 2: These configuration fields apply to pulse transmitters. These are the index values of counters 1 and 2 (if you do not want to start pulse recovery from 0 put the current pulse count on the meter)

Wake time (in seconds): This configuration field applies to analogue transmitters (4-20mA / 0-5V / 0-10V). This is the wake-up time of the analogue sensor

Configuring the receiver

• Please add your receiver by clicking **Edit / View** on the corresponding family

• A new window appears. Please click this button to add a receiver : 

• Please configure your receiver by filling in the following boxes :

Address
It corresponds to the ID on the label (under the barcode)

Modbus Address
Value between 1 and 254. The value 1 is given as an indication

Baud Rate
The possible values are 2400, 4800, 9600, 19200, 38400 bps. The default value is 19200.

Parity
None (default value) / Even / Odd

Stop bits
Possible values are 1 or 2

Data bits
The only posible value is 8

Modbus Table 1
You must specify the number of the first register from which the values of the transmitters will be saved in the table. The value of this first register can be between 0 and 64500. The default value is 31000.

Modbus Table 2
This table only applies to the "TX ENERGY + PULSE" values. Please refer to the installation aid sheet of this transmitter for more information.

Once your configuration file is complete, your transmitters and receiver should appear as UNCONFIGURED.

So we can now move on to the installation of the transmitters.

TRANSMITTERS INSTALLATION

Transmitters have been added to your configuration file.

You must now activate them and validate that they communicate with your Modbus receiver.

Transmitters activation procedure

On the FCT Software
Click on **Start configuration**.

Power the first transmitter of your choice
Move at least 3 metres away from the Modbus receiver, then connect your transmitter battery.

Check the LED set of your transmitter
When it is powered, L1 / L2 / L3 successively blink. Then L1 blinks every two seconds. The transmitter switches to installation mode. It tries to connect to the receiver for 1 minute.

If the LED's are not blinking, unplug the battery, wait for at least 1 min and try to plug it in again.

Indication	L1	L2	L3	Period	Time
Installation	Flash	OFF	OFF	2s	max 2mn
Success	OFF	ON	ON	N/A	30s
Success - low RSSI	ON	ON	ON	N/A	30s
Failure	OFF	Flash	Flash	1s	30s

** The LED set of the transmitter TX CO2 TEMP HUM AMB 700-023 is different.*
Please refer to Appendix 4 for more information.

Follow the messages in the dialog box
To learn more about the status of the installation, you can also refer to the messages received in the software dialog box.

Transmitter LEDs allow you to understand more about the status of the installation. The following table shows the possible combinations of LEDs and their meanings.

Once the installation success is confirmed, you can connect the battery of the next transmitter to activate it and repeat the process for all transmitters to activate fully.

When all transmitters have been installed, they appear as CONFIGURED on your configuration file.

The receiver remains UNCONFIGURED.
Its activation will be completed in the following steps.

Stop the installation
Once the installation of the transmitters is over, you can click on the button "**Stop Configuration**".

If you cannot install the transmitters or if you see a TIMEOUT message in the FCT software dialog box, please check the following :

- Check that the COM port you are connected to corresponds to the COM port selected in the software.
- Check that your receiver is powered externally in addition to the USB power supply.
- Confirm that you are far enough (3m or more) away from the receiver when connecting the transmitter batteries.

TRANSMITTERS INSTALLATION

Validate the installation of transmitters

On the F.C.T software
Click **Configuration status.**
A new window opens.

Transmitters that have been activated appear in green.

The Modbus receiver will turn green when you pair with the transmitters (see next step).

Save your configuration file

We recommend you to back up your configuration file.

This is useful if you need to return to site after installation to add (or remove) transmitters to your existing configuration without having to reinstall from the beginning

On the FCT software
Click on **Save configuration file**.

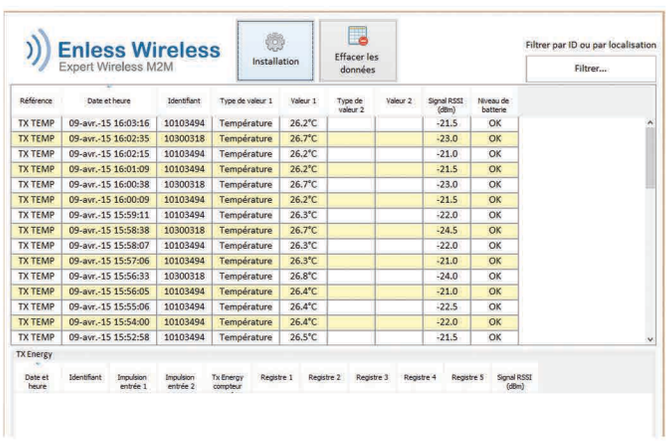
The position of the transmitters in this configuration file does not reflect the addressing order of the transmitters in the Modbus table. The addressing order of the Modbus table is described later in this set up guide.

Position and connect the transmitters

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

Validate data reception

On the FCT software
Click on **View network**
A new window opens



Référence	Date et heure	Identifiant	Type de valeur 1	Valeur 1	Type de valeur 2	Valeur 2	Signal RSSI (dBm)	Niveau de batterie
TX TEMP	09-avr.-15 16:03:16	10103494	Température	26.2°C			-21.5	OK
TX TEMP	09-avr.-15 16:02:35	10300318	Température	26.7°C			-23.0	OK
TX TEMP	09-avr.-15 16:02:15	10103494	Température	26.2°C			-21.0	OK
TX TEMP	09-avr.-15 16:01:09	10103494	Température	26.2°C			-21.5	OK
TX TEMP	09-avr.-15 16:00:38	10300318	Température	26.7°C			-23.0	OK
TX TEMP	09-avr.-15 16:00:09	10103494	Température	26.2°C			-21.5	OK
TX TEMP	09-avr.-15 15:59:11	10103494	Température	26.3°C			-22.0	OK
TX TEMP	09-avr.-15 15:58:38	10300318	Température	26.7°C			-24.5	OK
TX TEMP	09-avr.-15 15:58:07	10103494	Température	26.3°C			-22.0	OK
TX TEMP	09-avr.-15 15:57:06	10103494	Température	26.3°C			-21.0	OK
TX TEMP	09-avr.-15 15:56:33	10300318	Température	26.8°C			-24.0	OK
TX TEMP	09-avr.-15 15:56:05	10103494	Température	26.4°C			-21.0	OK
TX TEMP	09-avr.-15 15:55:06	10103494	Température	26.4°C			-22.5	OK
TX TEMP	09-avr.-15 15:54:00	10103494	Température	26.4°C			-22.0	OK
TX TEMP	09-avr.-15 15:52:58	10103494	Température	26.5°C			-21.5	OK

Date et heure	Identifiant	Impulsion entrée 1	Impulsion entrée 2	Tx Energy compteur	Registre 1	Registre 2	Registre 3	Registre 4	Registre 5	Signal RSSI (dBm)

The frames sent by transmitters are displayed in real time according to the transmission periodicity chosen.

By controlling the RSSI signal levels, you will be able to determine if repeaters need to be installed.

Until -70 dBm
Excellent signal

From -70 to -90 dBm
Correct signal

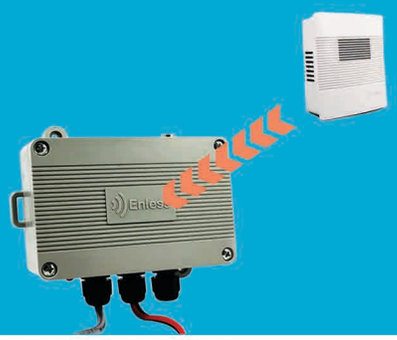
Beyond -90 dBm
Low signal

Beyond -90dBm we recommend to install a repeater between the transmitter and the receiver to secure the reception of data (see appendix).

Warning, the visualisation of the transmitters' frames on the view network tab can only be done when the switches are set on USB mode.

Once this validation is complete, you can switch to pairing the transmitters with the receiver.

PAIRING TRANSMITTERS TO THE RECEIVER



To pair the transmitters, carefully follow the steps below.

On the F.C.T software

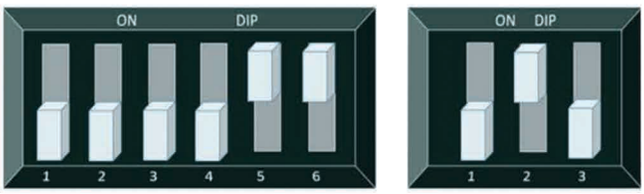
Click on **Disconnect** button.

Power off the receiver

Unplug the receiver from the USB port and turn off the power from its main power supply.

Position the receiver's switches

Position the Modbus receiver's switches in pairing mode :



DIP 1 : switchs 5 and 6 ON, the others OFF
DIP 2 : switchs 1 and 3 OFF, 2 ON

Power on the receiver

Reconnect the receiver to its main power supply and then reconnect it to the USB port of your computer.
LED L5 flashes.
You have 1 minute to install the receiver (see below).

On the F.C.T software

Refresh the port com list and click on the **Connect** button.
Then click the **Start configuration** button.
The receiver installation will start automatically.

Validate the installation of the receiver

The messages in the dialog box indicates the success or failure of the receiver installation:

```
Configuration Started
INSTALL REQUEST for Receiver 20400353
INSTALL SUCCESS for Receiver 20400353
```

You can also refer to the LED behaviour of the receiver :

- Successful installation, L1 and L3 flash 5 times
- Failed to install, L1, L3 and L5 flash 5 times

Once the installation success is confirmed, the Modbus receiver appears as CONFIGURED on your configuration file.

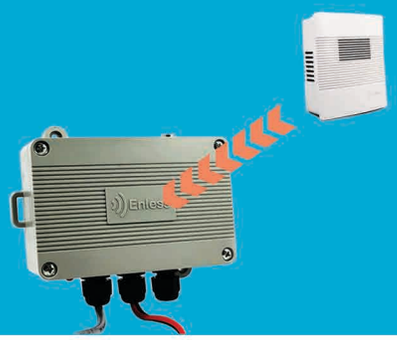
You can click on the **Stop Configuration** button.

Your transmitters have been paired to the Modbus receiver.

The transmitters information will be sent and stored in the receiver's Modbus table.

To determine the registers of the Modbus table in which the values of the transmitters are stored, you can use the **Modbus Table** function.

PAIRING TRANSMITTERS TO THE RECEIVER



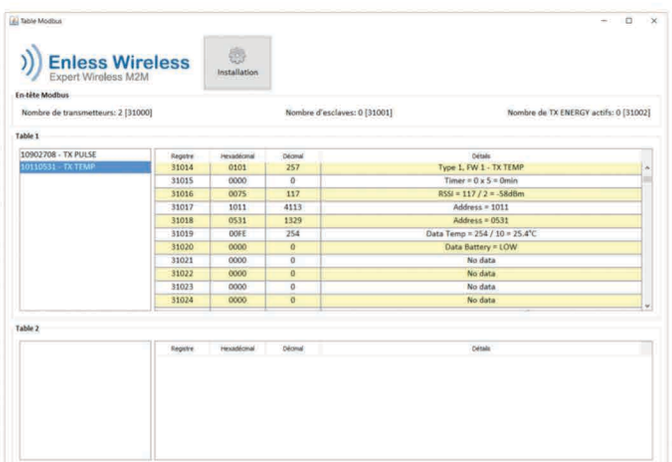
Visualize the Modbus table

The visualisation of the Modbus table is carried out from the FCT software

On the F.C.T software
Click the **Modbus Map** tab

A new window opens.

This window contains the contents of the Modbus table of the receiver.



For each transmitter, you will find the addresses of the registers to be addressed as well as the calculation methods to be applied for each register.

The values will increment in the table after receiving the first frames of data

You have completed the configuration and pairing of the products.

All you have to do is choose the interface of your receiver and connect it to your PLC (see next steps).

INSTALLATION OF THE RECEIVER WITH THE PLC

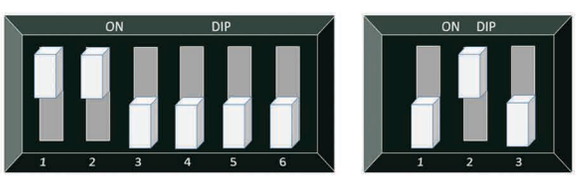
The configuration phase is now complete.

Please disconnect your receiver from its power supply and from the USB port of the PC.

Configuring the Modbus receiver interface

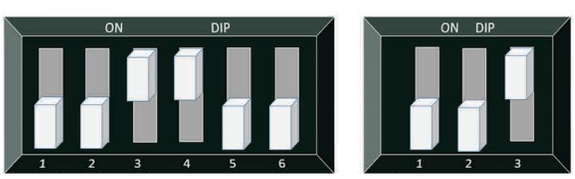
You must configure the Modbus receiver interface according to the chosen communication mode.

RS232 interface



DIP 1 : 1 et 2 ON, les autres OFF
DIP 2 : 1 et 3 OFF, 2 sur ON

RS485 interface



DIP 1 : 3 et 4 ON, les autres OFF
DIP 2 : 1 et 2 OFF, 3 sur ON

Connecting the receiver to the PLC

RS232 connection

- GND wire connected to the receiver's GND terminal
- TX wire connected to the RX terminal block of the Modbus receiver and to the TX terminal block of the PLC
- RX wire connected to the TX terminal block of the Modbus receiver and to the RX terminal block of the PLC

RS485 connection

- Wire 1: TX connected to terminal block TX / A
- Wire 2: RX connected to terminal block RX / B

Receiver power supply

The Modbus receiver can be powered by:
- An Enless 12V Power Supply Reference: POWER 1000-002 - Recommended
- A main power supply from 7.5 to 24V maximum

⚠ **Do not exceed 24VDC**

⚠ **Please provide at least 1AMP when powering the receiver**

In both cases, the wires will be connected to the POWER terminal of the Modbus receiver:
- Black wire connected to the terminal GND (Ground)
- Red wire connected to the terminal block + VE

LED combination of the receiver

Please refer to the LED combinations of the Modbus receiver.

Installation mode	L1	L2	L3	L4	L5	Period
Phase 1	OFF				Flash	1mn
Phase 2	Flash	OFF	Flash	OFF	Flash	5 times
Phase 3	OFF				ON	N/A

Normal mode	L1	L2	L3	L4	L5	Period
Data reception	OFF			Flash	ON	1 sec
Request from the PLC	Flash	OFF				1 sec
Receiver answer	OFF	Flash	OFF	OFF		N/A

The Modbus receiver is now operational. It receives data from the different transmitters associated with it.

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APPENDIX

Positioning and fixing the products

Appendix 1

- Positioning the transmitters
- Attaching the transmitters

Connecting products

Appendices 2 to 4

- Connection of pulse transmitters to pulse counters
- Connection and installation of Pulse LED transmitter
- Connecting probes to analogue transmitters.

Repeater installation

Appendix 5

TX CO2 TEMP HUM AMB 700-023 calibration mode

Appendix 6

F.C.T. SOFTWARE INSTALLATION GUIDE

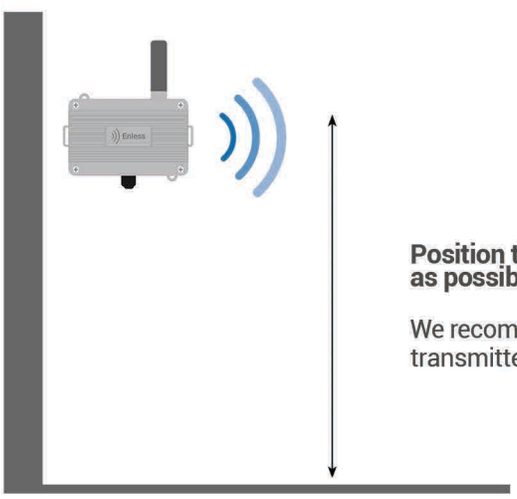
Appendix 7

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.

CONNECTING THE TX PULSE TO THE METERS

Reminder regarding the use of the transmitter TX PULSE ATEX 400-006

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 400-006. 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 400-006 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:2,55A; Po: 765mW; Co: 63µF; Lo: 5.5µH
The TX PULSE ATEX 400-006 transmitter is conform to the norms : EN60079-0 et EN6079-11

Battery

The TX PULSE ATEX 400-006 transmitter comes with a battery BAT LS33600.
Only this model of battery can be used with the TX PULSE ATEX 400-006 transmitter.

This battery model is available from Enless Wireless.
33520 Bruges (France). Phone : 05 56 37 97 47 – Mail : contact@enless.fr

Warning - Potential Electrostatic Charge Hazard

The TX PULSE ATEX 400-006 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

CONNECTING THE TX PULSE TO THE METERS

Reminder regarding the use of the transmitter TX PULSE ATEX 400-007 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 400-007 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 400-007 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 400-007 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 400-007 GAZPAR transmitter is conform to the norms : EN60079-0 et EN6079-11

Battery

The TX PULSE ATEX 400-007 GAZPAR transmitter comes with a battery BAT LS33600.
Only this model of battery can be used with the TX PULSE ATEX 400-007 GAZPAR transmitter.

This battery model is available from Enless Wireless.
33520 Bruges (France). Phone : 05 56 37 97 47 – Mail : contact@enless.fr

Warning - Potential Electrostatic Charge Hazard

The TX PULSE ATEX 400-007 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.

CONNECTING THE ANALOG PROBES

When installing an analogue transmitter, you must first connect the sensor to the transmitter.

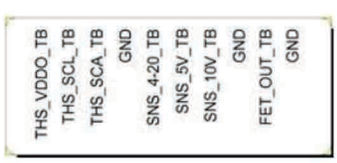
Open the transmitter housing, you will connect the analogue sensor to the transmitter terminal block.

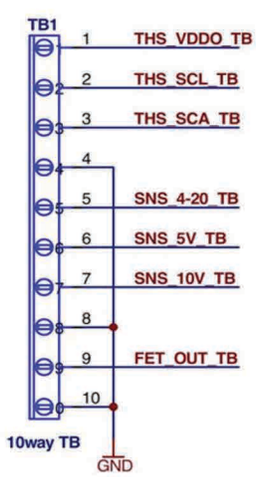
Refer to the label inside the transmitter, under the terminal block for connection.

Our transmitters cannot supply power for the analogue probe. You must power your analogue probe externally.

Connecting the probes

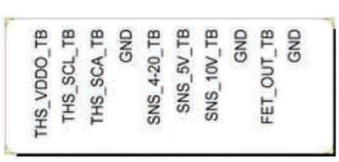
TX 4/20 mA

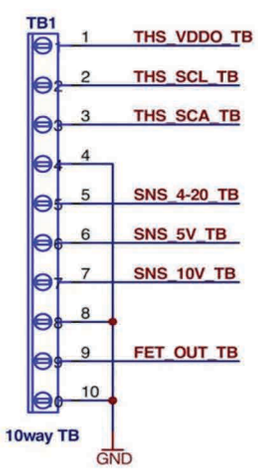




Please use the Pin4/8 GND terminal block, pin5 - 4-20mA Input, pin9 - Sensor Power.

TX 0-5 V





Please use the Pin4/8 GND terminal block, pin5 - 0-5V Input, pin9 - Sensor Power

Once the sensor is connected to the transmitter you can start configuring the transmitter.

REPEATER INSTALLATION

One or more transmitters remain out of range of the Modbus receiver.
You will have to install a repeater.

The repeater does not require any configuration!

Position your repeater

We recommend positioning your repeater midway between the transmitter and the Modbus receiver. Preferably use a long-range antenna and install it as high as possible. You can link multiple repeaters between them.

Power your repeater

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

- By a 12V power supply Ref: POWER 1000-02 - recommended
- By a main power supply from 7.5 to 24V maximum

⚠ **Make sure not to exceed 24 VDC**

Current specifications for 12 VDC receiver power supply: 1A Max
Use only a 12V CE certified power supply

In both cases, the wires will be connected on the Power block of the repeater:
• Black wire connected on the ground block (GND) • Red wire on the red block (+VE)

The external power indicator (red) lights up and flashes every 20 seconds.
The yellow L5 light (Power) on the electronic board lights up.
The L3 LED flashes each time a data frame is received from field-installed transmitters.

Validate data reception

The “View Network” window of the FCT software will show:

- Transmitters received without passing through the repeater
- Transmitters received via the repeater. The lines of the transmitters concerned are displayed in green with the indication (r) in front of the RSSI signal.

Référence	Date et heure	Identifiant	Type de valeur 1	Valeur 1	Type de valeur 2	Valeur 2	Signal RSSI (dBm)	Niveau de batterie
TX PULSE	30-sept.-16 18:10:42	10801908	[CSTD] Nombre d'impulsions entrée 1	[0011] 0	[CSTD] Nombre d'impulsions entrée 2	[0011] 0	(r) -53.5	LOW
TX PULSE	30-sept.-16 18:10:41	10801908	[CSTD] Nombre d'impulsions entrée 1	[0011] 0	[CSTD] Nombre d'impulsions entrée 2	[0011] 0	-78.0	LOW
TX PULSE	30-sept.-16 18:05:17	10801908	[CSTD] Nombre d'impulsions entrée 1	[0011] 0	[CSTD] Nombre d'impulsions entrée 2	[0011] 0	(r) -57.0	LOW
TX PULSE	30-sept.-16 18:05:12	10801908	[CSTD] Nombre d'impulsions entrée 1	[0011] 0	[CSTD] Nombre d'impulsions entrée 2	[0011] 0	-79.5	LOW
TX PULSE	30-sept.-16 17:59:48	10801908	[CSTD] Nombre d'impulsions entrée 1	[0011] 0	[CSTD] Nombre d'impulsions entrée 2	[0011] 0	(r) -53.5	LOW
TX PULSE	30-sept.-16 17:59:46	10801908	[CSTD] Nombre d'impulsions entrée 1	[0011] 0	[CSTD] Nombre d'impulsions entrée 2	[0011] 0	-78.0	LOW

CALIBRATION STEP BEFORE USE OF
TX CO2 TEMP HUM AMB 700-023

Our TX CO^2 TEMP HUM AMB 700-023 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 receiver.

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 flash successively.
- 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 receiver. 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 transmitters previously calibrated are ready for installation and communication.

In this mode, when you click "Start Installation" on the F.C.T. software and then power the transmitter, the behavior of the LEDs is described in the table below :

Indication	L1	L2	L3	Period	Time
Installation	Flash	OFF	OFF	2s	variable
Success	OFF	OFF	ON	N/A	30s
Success - low RSSI	ON	OFF	ON	N/A	30s
Failure	OFF	OFF	Flash	1s	30s

When you power the transmitter, if the L1, L2 and L3 LEDs flash and then stay fixed for 1 minute and you do not receive any message in the dialog box of the FCT software, it means that you are in calibration mode.

In this case, disconnect the transmitter, wait at least 1 min and then reconnect it.

F.C.T. SOFTWARE INSTALLATION GUIDE

Downloading the F.C.T. software

The F.C.T. installation software can be downloaded from :
https://enless-wireless.com/ressources/Enless%20Field%20Installation.zip

Two different versions are available (32bits vs 64bits). Make sure to download the version that matches your PC's operating system.

⚠ WARNING

The F.C.T software runs on JAVA. It is very important that the version of JAVA installed on your PC is the right one. If not, you may have difficulty installing or starting the F.C.T software.

If you receive an error message when starting the F.C.T software, we recommend that you uninstall the version of JAVA that is active on your computer.

You can download the correct version of JAVA here :
https://www.java.com/fr/download/manual.jsp

In 64 bits, prefer the version « Windows Offline (64 bits) ».

For any request regarding the installation of the F.C.T software, do not hesitate to contact our support : support@enless.fr .