EWSense Gate & Temp

Wireless temperature sensor with access point.



USER MANUAL

9MA00281.00

The information given in this document contains general descriptions and/or technical characteristics concerning the performance of the products found in it. This document is not intended to replace these products nor must it be used to determine their suitability and reliability for any users' specific applications. Each user or integrator is responsible for performing the risk analysis, evaluation and appropriate and complete testing of the products according to the specific application or use in question. Eliwell and its sister companies or subsidiaries shall not be legally or economically liable for any incorrect use of the information contained in this documentation.
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The installation and use of this product must comply with all applicable state, regional and local safety regulations. For safety reasons and to ensure greater compliance with the data of the documented system, component repairs must be performed exclusively by the manufacturer.

When using devices for applications with technical safety requirements, comply with the relevant instructions.

Failure to use Eliwell software or other software approved by Eliwell with our hardware products can result in injury, damage or incorrect operating results.

Failure to comply with this information can result in injury or damage to the equipment.

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INFORMATION ABOUT THE MANUAL

Document objective

This document describes the **EWSense Temp** wireless temperature sensors, the **EWSense Gate** access points and relative accessories, including information on installation and cabling.

Use this document to:

- Install and use the **EWSense Gate** access points.
- Install and use the **EWSense Temp** wireless temperature sensors.
- Connect the **EWSense Gate** access points to a programming device fitted with **Device Manager** software.
- Become familiar with the **EWSense Gate** access point functions.

NOTE: Read this document and all related documents carefully before installing, operating or carrying out maintenance work on the controller.

Note regarding validity

This document is valid for **Device Manager** (**v.6.1.10 or subsequent version**).

The technical characteristics of the devices described in this manual can also be consulted on line.

The characteristics illustrated in this manual should be identical to those which can be consulted on line.
In line with our policy of continuous improvement, we may revise the contents to improve clarity and accuracy.

If you see any discrepancies between the manual and the information consulted on line, please use the latter as a reference.

Related documents

Document title	Reference document code
EWSense Gate 8L instructions sheet	9IS54564
EWSense Temp 8L instructions sheet	9IS54565
EWSense Temp & Gate user manual	9MA00281 (IT) 9MA10281 (EN)

You can download these technical publications and other technical information from our website at:
www.eliwell.com

SAFETY INFORMATION

Important information

Read these instructions carefully and visually inspect the equipment to familiarise yourself with the device before attempting to install it, put it into operation or service it. The following warning messages may appear anywhere in this documentation or on the equipment to warn of potential dangers or to call attention to information that can clarify or simplify a procedure.



The addition of this symbol to a danger warning label indicates the existence of an electrical danger that could result in personal injury should the user fail to follow the instructions.



This is the safety warning symbol. It is used to warn the user of the potential dangers of personal injury. Observe all the safety warnings that follow this symbol to avoid the risk of serious injury or death.

⚠ DANGER

DANGER indicates a dangerous situation which, if not prevented, **may cause** serious injury or death**.**

⚠ WARNING

WARNING indicates a potentially dangerous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially dangerous situation which, if not avoided, **can result in minor** or moderate injury.

NOTICE

NOTICE used in reference to procedures not connected to physical injuries.

NB

Electrical equipment must be installed, used and repaired by qualified personnel only.
Eliwell accepts no responsibility for any consequences resulting from the use of this material.
A qualified person is someone who has specific skills and knowledge regarding the structure and the operation of electrical equipment and who has received safety training on how to avoid the inherent dangers.

Permitted use

These products are used to read the temperature and wireless transmission of detected data.

For safety reasons, the device must be installed and used in accordance with the instructions provided. In particular, parts carrying dangerous voltages must not be accessible under normal conditions.

The device must be adequately protected from water and dust with regard to the application, and must only be accessible using tools (with the exception of the front panel).

The device is also suitable for use in commercial and household refrigeration appliances and/or similar equipment and has been tested for safety aspects in accordance with the harmonised European reference standards.

Prohibited use

Any use other than that described in the previous paragraph, Permitted Use, is strictly forbidden.

Liability and residual risks

The liability of Eliwell is limited to the correct and professional use of the product according to the directives referred to herein and in the other supporting documents, and does not cover any damage (including but not limited to) the following causes:

- unspecified installation/use and, in particular, in contravention of the safety requirements of established legislation or specified in this document;
- use on equipment which does not provide adequate protection against electrocution, water and dust in the actual installation conditions;
- use on equipment in which dangerous components can be accessed without the use of specific tools;
- installation/use on equipment which does not comply with established legislation and technical standards.

Disposal



The equipment (or product) must be subjected to separate waste collection in compliance with the local legislation on waste disposal.

Information regarding the EWSense Gate product

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Turn off all devices, including connected devices, before removing any covers or doors, or installing/uninstalling accessories, hardware, cables, or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before powering the unit back up, fit back and fix all the covers, hardware components and wiring.
- Check the earthing connections on all earthed devices.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

This device is designed to operate outside of any dangerous location.
Install this device only in areas known to be free from dangerous surroundings.

⚠ DANGER

POTENTIAL FOR EXPLOSION

Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

LOSS OF CONTROL

- Comply with all the standards regarding accident protection and the local applicable safety directives.
- Every implementation of this device must be tested individually and completely in order to check its proper operation before putting it in service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and operate this equipment in an enclosure properly rated for its intended environment.
- Do not use this equipment in safety-critical machine functions.
- Do not disassemble, repair, or modify this equipment.
- Do not connect any wiring to unused connections or connections defined as Unconnected (N.C.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Install and use this equipment in compliance with the environmental conditions described in the section relative to operating limitations.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not use this equipment in safety-critical machine functions.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: In order to monitor any loss of data resulting from an interruption in **EWSense Gate** and **EWSense Temp** communication, provide the supervision system with an alarm signal.

Information regarding the EWSense Temp product

Holes in the rubber or damage to the plastic will lead to a loss of performance and compromise the safety features of the controller.

⚠ WARNING

BATTERY LIQUID LEAKS AND FOOD CONTAMINATION

- Do not use sharp tools to operate the sensor.
- Comply with the temperature and humidity ranges indicated in the “Technical Data” section.
- Do not expose the sensor to heat sources or water.
- Do not subject the sensor to mechanical stress.
- Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The device was not intended for use in contact with food.

⚠ WARNING

RISK OF FOOD CONTAMINATION

- Do not use the EWSense Temp in contact with food.
- Do not use the EWSense Temp with clamp or screw fixing in “food zone” applications (as defined in the NSF standard).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

DEAD BATTERY

The device must be replaced after 2 years from the date of production to guarantee correct operation.

Failure to follow these instructions can result in equipment damage.

CHAPTER 1
INTRODUCTION

1.1. General description

The **EWSense Temp** wireless temperature sensor and the **EWSense Gate** access points are the compact solution in the **Eliwell** platform environment of transducers suitable for reading temperatures in the refrigeration and air conditioning industry.

NOTE: In this manual, the photos are purely for the purpose of showing the **EWSense Gate** and **EWSense Temp** products. The dimensions shown in the figures are not to scale.

The **EWSense Gate & Temp** range includes:

- **EWSense Gate** access points
- **EWSense Temp** wireless temperature sensors

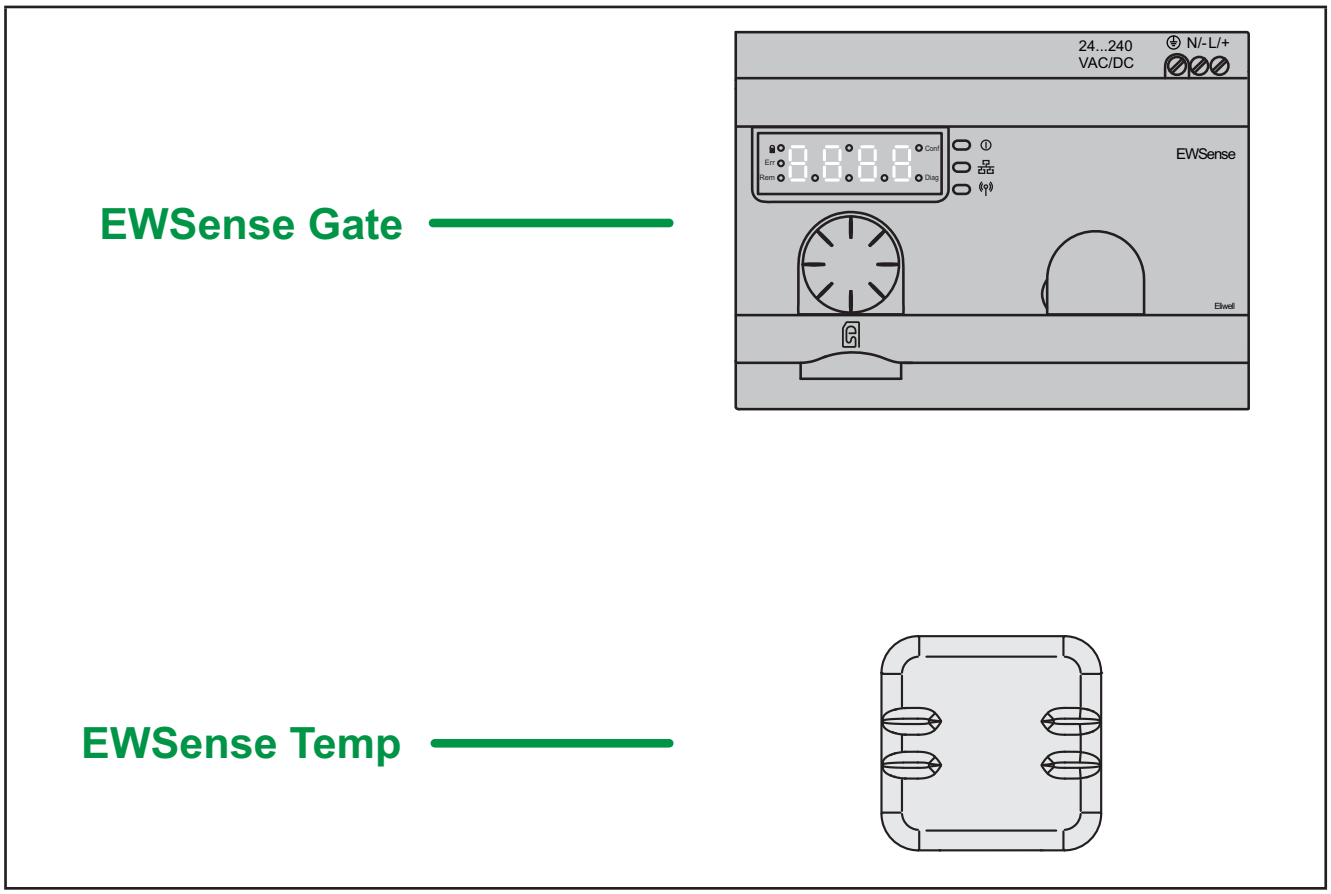
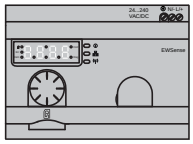


Fig. 1. EWSense Gate & EWSense Temp

The **EWSense Gate** access point provides the possibility of downloading the data relative to **EWSense Temp** and the change in parameters via SD Card and 1 spilt RS-485 (EIA/TIA 485) serial port. In association with the hardware, it is possible to download the **Device Manager** software, which allows users to change the hardware configuration according to need.	The **EWSense Temp** sensors read the temperature of the environment in which they are installed and transmit them to the **EWSense Gate** access point.

1.1.1. Technical Specifications



EWSense Gate is available with 1 split RS-485 (EIA/TIA 485) Modbus communication serial port and an SD memory card input with a minimum of a 16 Mb memory.

The **EWSense Gate** format guarantees maximum flexibility and easy installation.

The power supply is 24...240 Vac/dc.



EWSense Temp allows for the temperature to be read in environments where it is installed and transmit information via wireless to the **EWSense Gate** access point.

The various assemblies allow for a number of application environments.

1.1.2. Main features

- Temperature reading with range -30.... 55 °C (-22 ... 131 °F)
- Possibility of installing the access point at a maximum of 100m from the wireless sensors
- Possibility of communicating via modbus with supervision system via 2 RJ45 ports
- Saving data on an SD memory card of minimum 16 Mb.

	Power supply	Number of I/O	Type of I/O	Display
EWSense Gate	24 ... 240 Vac/dc	3	**EWSense Gate** has 3 inputs that include: • 1 split RS-485 (EIA/TIA 485) port fitted with 2 RJ45 connectors • (SD) memory card slot for expanding the internal memory	4-figure display
EWSense Temp	Internal battery (Not replaceable)	---	**EWSense Temp** is fitted with Wireless ZigBee 3.0 Green Power for the communication of data detected with **EWSense Gate**.	---

CHAPTER 2
MECHANICAL INSTALLATION

2.1. Before starting

Before installing your system, read this chapter carefully. The use and application of information contained in this document requires experience in the design and programming of automated control systems. Only the user, the machine manufacturer or the system integrator can be familiar with all the process conditions and therefore only they are able to determine which automation equipment and relative safety devices and interlocks can be used in a correct and efficient manner. When the automation and control equipment and any other relative equipment or software are selected for a particular application, the applicable local, regional and national standards and regulations must also be taken into consideration. Caution must be used concerning compliance with all safety information, other electrical requirements or laws which may apply to your machine or process when using this device.

The use and application of information contained in this document requires experience in the design and programming of automated control systems. Only the user, the machine manufacturer or the system integrator can be familiar with all the conditions and factors present during installation and set up, preparing, starting-up and servicing the machine or process and therefore only they are able to determine which automation equipment and relative safety devices and interlocks can be used in a correct and efficient manner. When the automation and control equipment and any other relative equipment or software are selected for a particular application, the user or integrator must also bear in mind the applicable local, regional and national standards and regulations.

⚠ WARNING

REGULATORY INCOMPATIBILITY

Make sure that all equipment used and the systems designed comply with all applicable local, regional and national laws.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.2. Disconnection from the power supply

All options and modules must be assembled and installed before installing the control system on an assembly rail, the panel door or other assembly surface. Before dismantling the equipment, remove the control systems from the assembly rail, plate or panel.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Turn off all devices, including connected devices, before removing any covers or doors, or installing/uninstalling accessories, hardware, cables, or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before powering the unit back up, fit back and fix all the covers, hardware components and wiring.
- Check the earthing connections on all earthed devices.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

2.3. Operating environment

This device is designed to operate outside of any dangerous location. Install this device only in areas known to be free from dangerous surroundings.

⚠ DANGER

POTENTIAL FOR EXPLOSION

Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Install and use this equipment in compliance with the environmental conditions described in the section relative to operating limitations.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

EWSense Temp: Holes in the rubber or damage to the plastic will lead to a loss of performance and compromise the safety features of the controller.

⚠ WARNING

BATTERY LIQUID LEAKS AND FOOD CONTAMINATION

- Do not use sharp tools to operate the sensor.
- Comply with the temperature and humidity ranges indicated in the “Technical Data” section.
- Do not expose the sensor to heat sources or water.
- Do not subject the sensor to mechanical stress.
- Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.4. Comments concerning installation

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Install and operate this equipment in an enclosure appropriately rated for its intended environment.
- When making a power line connection, observe local and national regulations corresponding to the nominal current and voltage of the device being used.
- Do not use this equipment in safety-critical machine functions.
- Do not disassemble, repair, or modify this equipment..
- Do not install the devices in places subject to high humidity and/or dirt.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For mechanical sizes see **4.2.2. Mechanical dimensions on page 29**.

The **EWSense Gate** access points will be fitted to the DIN rail or panel assembly.

The **EWSense Temp** sensors will be fitted with double-sided tape, screw with metal plate or clamp.

When handling the equipment, use caution to avoid damage caused by electrostatic discharge. In particular, the unshielded connectors and, in certain cases, the open circuit boards are extremely vulnerable to electrostatic discharge.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO ELECTROSTATIC DISCHARGE

- Keep the device in the protective packaging until ready for installation.
- The device must only be installed in type-approved casings and/or in points that prevent accidental access and provide protection from electrostatic discharge as defined in IEC 1000-4-2.
- When handling sensitive equipment, use an antistatic bracelet or equivalent earthed protective device against electrostatic discharge.
- Before handling the device, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.5. EWSense Gate assembly on DIN rail

The instrument will be fitted on the DIN rail complying with EN/IEC 60715 regulations.

1. Move the locking clip device outwards (lever with a screwdriver in the specific compartment).
2. Then install the instrument on the DIN rail.
3. Press the locking clip device inwards to bring it back to locked position.

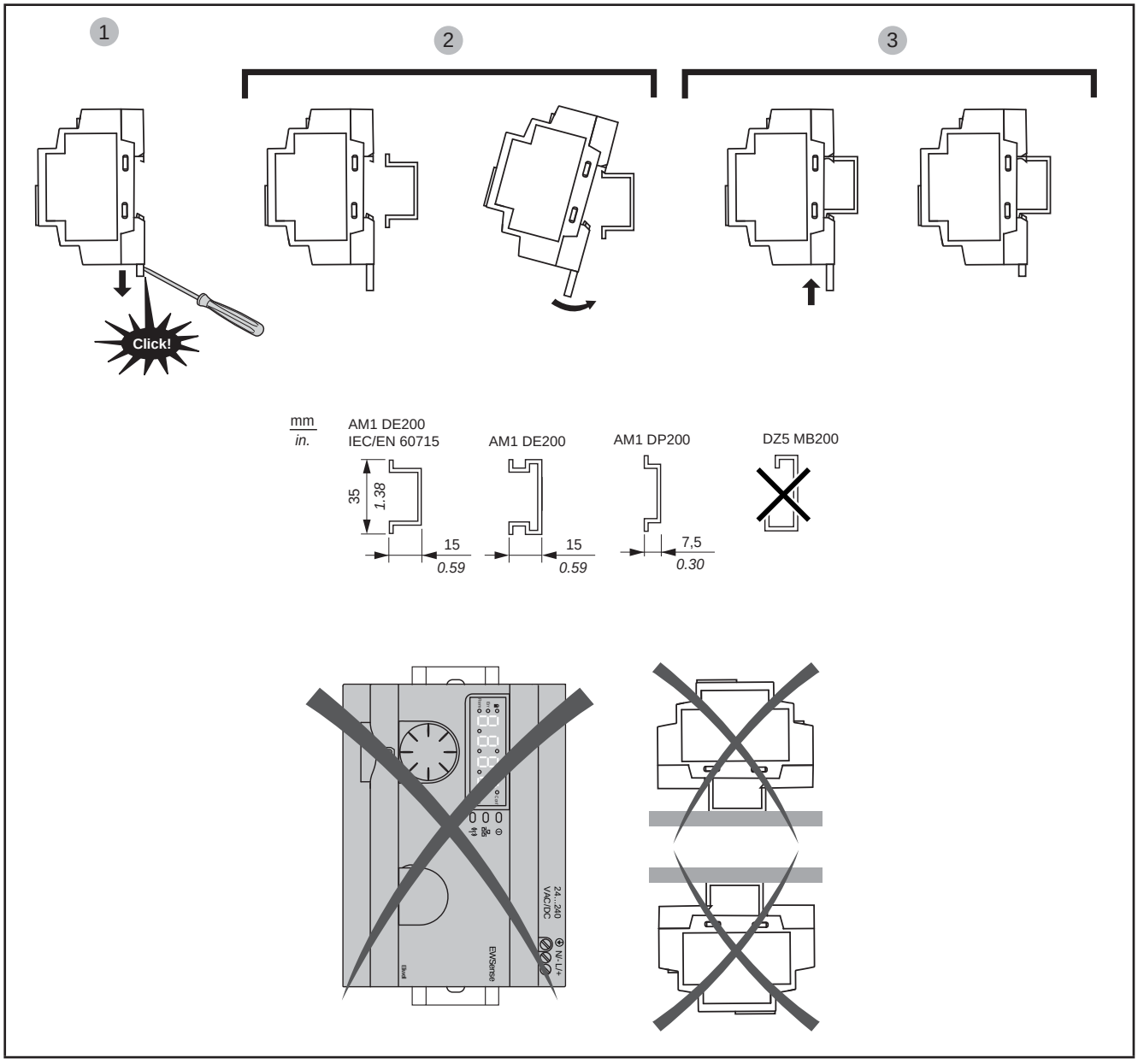


Fig. 2. Installation of EWSense Gate on DIN rail

The **EWSense Gate** access point was designed as an IP20 classification product and must only be installed in type-approved cabinets and/or in points that block access to unauthorised persons.

Respect the distances between:

- The **EWSense Gate** access point and all the sides of the cabinet (including the panel door).
- The **EWSense Gate** access point terminal boards and the wiring raceways. These distances reduce the electromagnetic interference between the controller and the wiring raceways.
- The **EWSense Gate** access point and the other heat-generating devices installed in the same cabinet.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Place the devices dissipating the most heat in the top of the cabinet and ensure suitable ventilation.
- Do not place this equipment near or above any devices which could cause overheating.
- Install the device in a point that guarantees the minimum distances from all structures and adjacent equipment as indicated in this document.
- Install all equipment in conformity with the technical specifications given in the respective documentation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

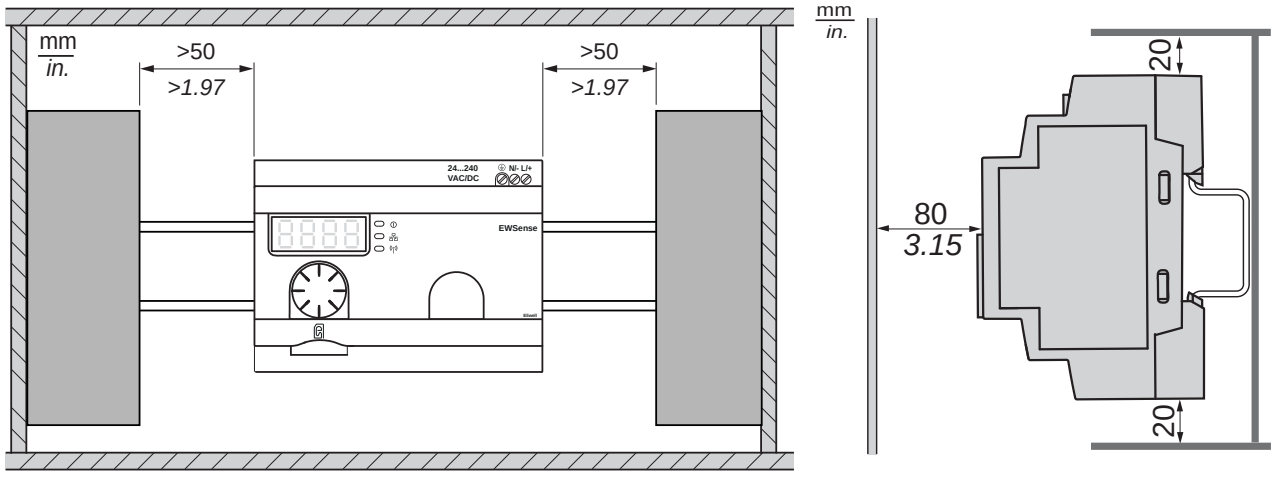


Fig. 3. Distances

NOTE: In order to improve signal reception, comply with the positioning indicated above.

2.6. EWSense Gate panel assembly

To assemble the panel, proceed as follows (refer to **Fig. 4 on page 18**):

1. Remove the panel assembly hooks.
2. Install **EWSense Gate** on the grid or on the plate using the screws, as shown in the figure below.

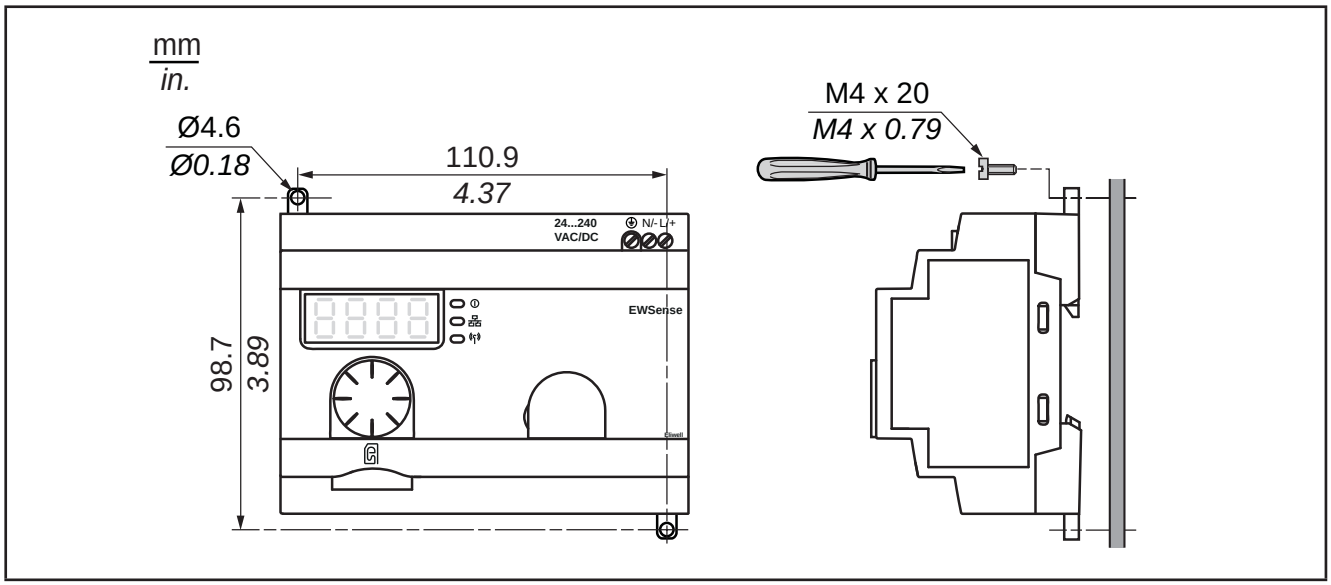


Fig. 4. EWSense Gate panel assembly

2.7. EWSense Temp Assembly

The instrument will be fitted with double-sided tape, screw with metal plate and/or assembly with clamp (refer to **Fig. 5 on page 19**).

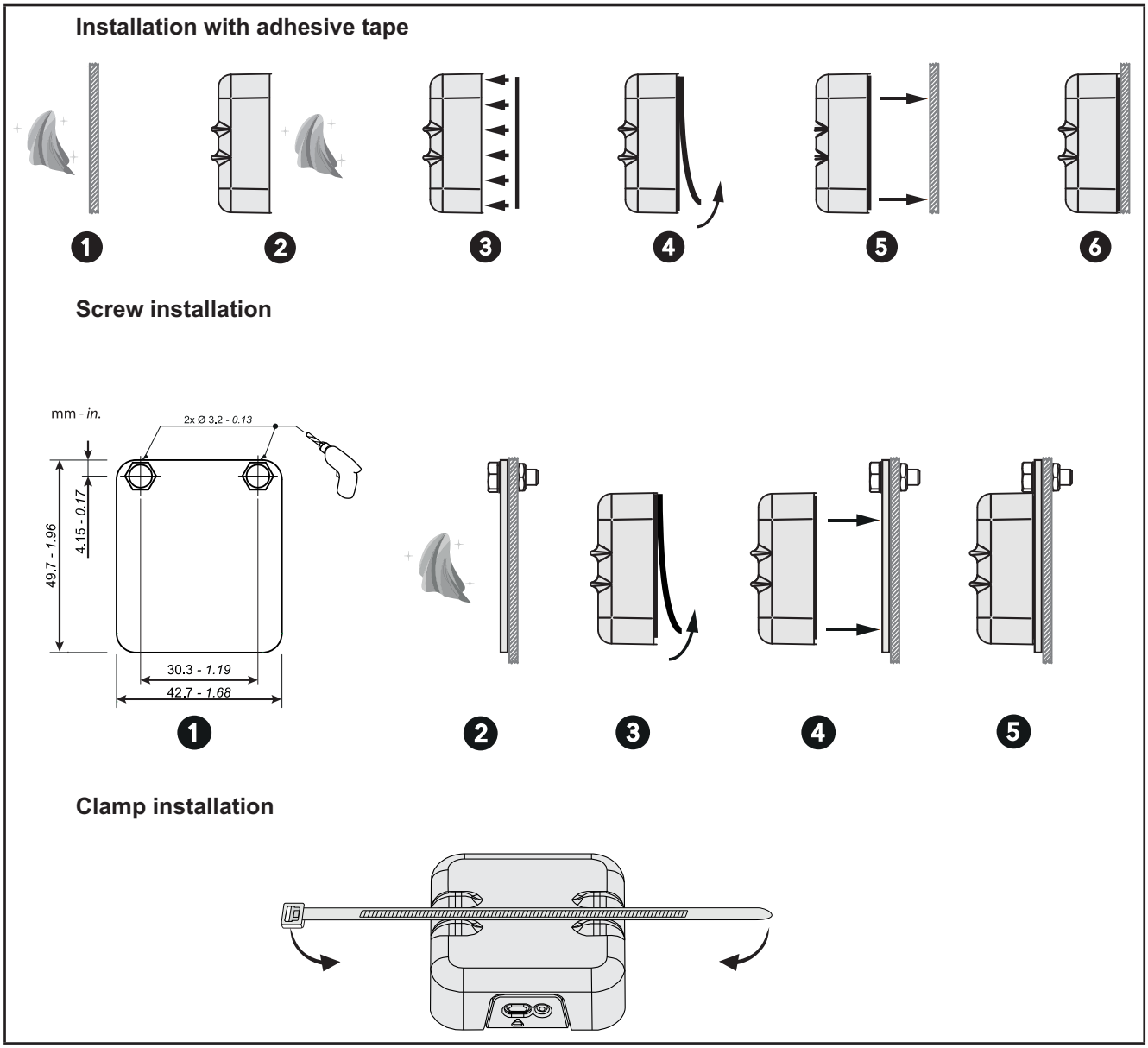


Fig. 5. EWSense Temp Assembly

Holes in the rubber or damage to the plastic will lead to a loss of performance and compromise the safety features of the controller.

⚠ WARNING

BATTERY LIQUID LEAKS AND FOOD CONTAMINATION

- Do not use sharp tools to operate the sensor.
- Comply with the temperature and humidity ranges indicated in the “Technical Data” section.
- Do not expose the sensor to heat sources or water.
- Do not subject the sensor to mechanical stress.
- Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The device was not intended for use in contact with food.

⚠ WARNING

RISK OF FOOD CONTAMINATION

- Do not use the EWSense Temp in contact with food.
- Do not use the EWSense Temp with clamp or screw fixing in “food zone” applications (as defined in the NSF standard).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

2.8. EWSense Temp Position

Position **EWSense Gate** and **EWSense Temp** and check that the intensity of the signal received from **EWSense Gate** (ZBRN12) is stronger than -70 dBm (Good Connection).

The following figure shows the installation positions recommended in free field:

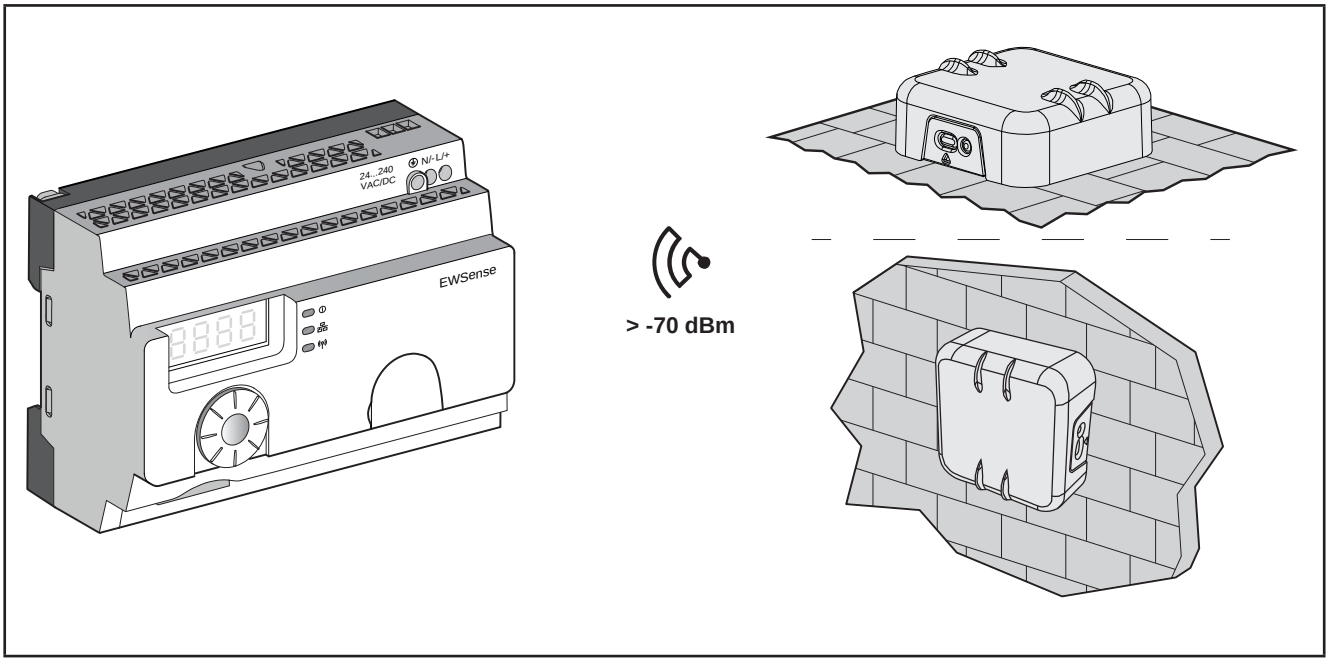
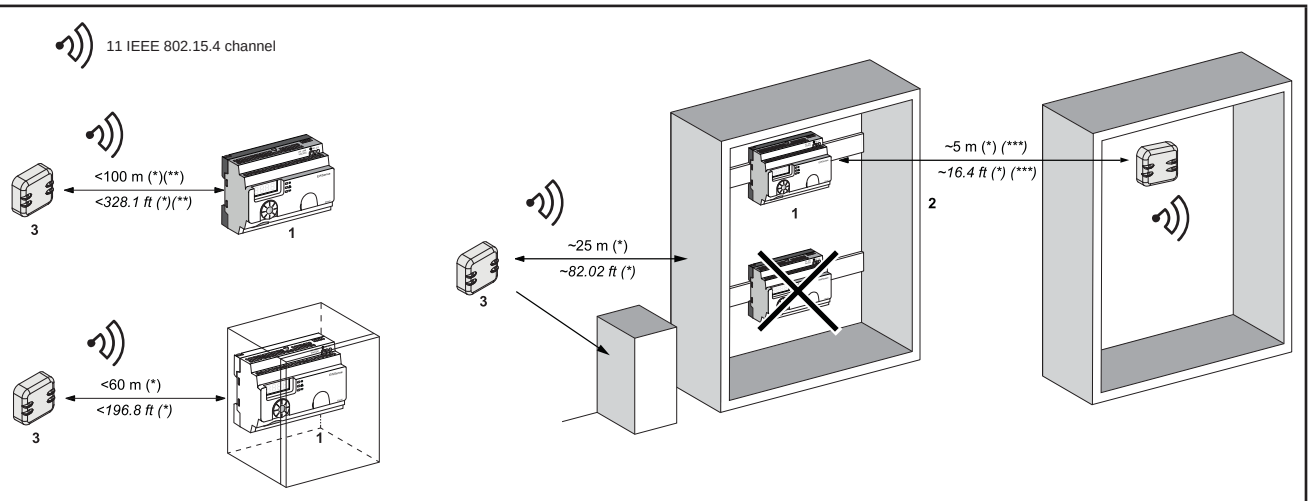


Fig. 6. EWSense Temp Position

2.9. Maximum distances

The following figure indicates the maximum distances permitted between **EWSense Temp** and **EWSense Gate**:



1 - EWSense Gate
2 - Metal cabinet
3 - EWSense Temp

(*): Typical values that can be changed depending on where they are applied.
(**): Free field (free of any obstacles or electromagnetic interference).
(***): The maximum distances depend on the product dimensions.

NOTE: Reception is reduced if the access point is located in a metal cabinet.

Fig. 7. Maximum distance installation

In a metal cabinet, the ideal position of the access point is on the upper side. This position allows for obstacles to be avoided and for improved reception.

The level of abatement of the signal depends on the material through which the signal passes:

Material	Abatement
Glass window	10...20% (*)
Plaster wall	30...45% (*)
Brick wall	60% (*)
Reinforced concrete wall	70...80% (*)
Metal structure	60...100% (*)
(*) The specified values are given only as an indication. The real values depend on the thickness and nature of the material.	

CHAPTER 3
ELECTRICAL CONNECTIONS

3.1. Best wiring practices

The following information describes the guidelines for wiring and the best practices to follow when using the **EWSense Temp** and the **EWSense Gate** access points.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Turn off all devices, including connected devices, before removing any covers or doors, or installing/uninstalling accessories, hardware, cables, or wires.
- Always use a properly rated voltage sensing device to confirm the power is off where and when indicated.
- Before powering the unit back up, fit back and fix all the covers, hardware components and wiring.
- Ensure there is a good earth connection.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

LOSS OF CONTROL

- Comply with all the standards regarding accident protection and the local applicable safety directives.
- Every implementation of this device must be tested individually and completely in order to check its proper operation before putting it in service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

3.1.1. Wiring guidelines

The following regulations must be complied with for wiring:

- The communication wiring must be kept separate from the electrical wiring. These two types of wirings must be kept in separate raceways.
- Check that the operating conditions and surroundings comply with the specification values.
- Use wires of the correct diameter and suited to the voltage and current requirements.
- Use copper conductors (obligatory).
- Use twisted-pair shielded wires for networks and field buses.

Use shielded wires, correctly earthed for the communication connections. If shielded wires cannot be used for these connections, the electromagnetic interference may deteriorate the signal. Deteriorated signals can result in the instrument and attached equipment operating incorrectly.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Lay the communication cables separately from the power cables.
- Reduce the length of the connections as far as possible and avoid winding them round electrically connected parts.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

3.1.2. Rules for screw-type terminal boards

The table below illustrates the types of cables and wire sections for a screw-type terminal board with **7.62 (0.3 in.) spacing**:

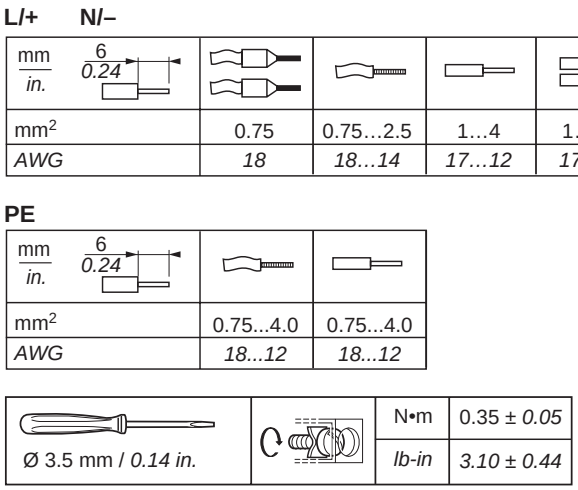


Fig. 8. 7.62 mm (0.3 in.) spacing

⚠ ⚠ DANGER

LOOSE WIRING CAN RESULT IN ELECTRIC SHOCK

Tighten the connections in compliance with the technical specifications for pairs.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

For the earthed protection wiring (PE), use a wire that is no longer than 300 mm (11.8 in.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ DANGER

FIRE HAZARD

Use only the recommended wire sections for current capacity of the electrical power.

Failure to follow these instructions will result in death or serious injury.

3.1.3. Specific considerations for handling

When handling the equipment, use caution to avoid damage caused by electrostatic discharge. In particular, the unshielded connectors and in certain cases the open circuit boards are extremely vulnerable to electrostatic discharge.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION DUE TO ELECTROSTATIC DISCHARGE

- Store the equipment in the protective packaging until ready for installation.
- The device must only be installed in type-approved casings and/or in points that prevent accidental access and provide protection from electrostatic discharge as defined in IEC 1000-4-2.
- When handling sensitive equipment, use an antistatic bracelet or equivalent earthed protective device against electrostatic discharge.
- Before handling the device, always discharge the static electricity from the body by touching an earthed surface or type-approved antistatic mat.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

3.2. Wiring diagrams

Incorrect wiring will cause irreversible damage to the **EWSense Gate**.

NOTICE

INOPERABLE DEVICE

Before switching on the electrical power, check all the wiring connections.

Failure to follow these instructions can result in equipment damage.

3.2.1. EWSense Gate

It is possible to connect the power supply to any standard power supply including 24...240 Vac/Vdc.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Stick to the wiring diagram shown immediately after this message.

Failure to follow these instructions will result in death or serious injury.

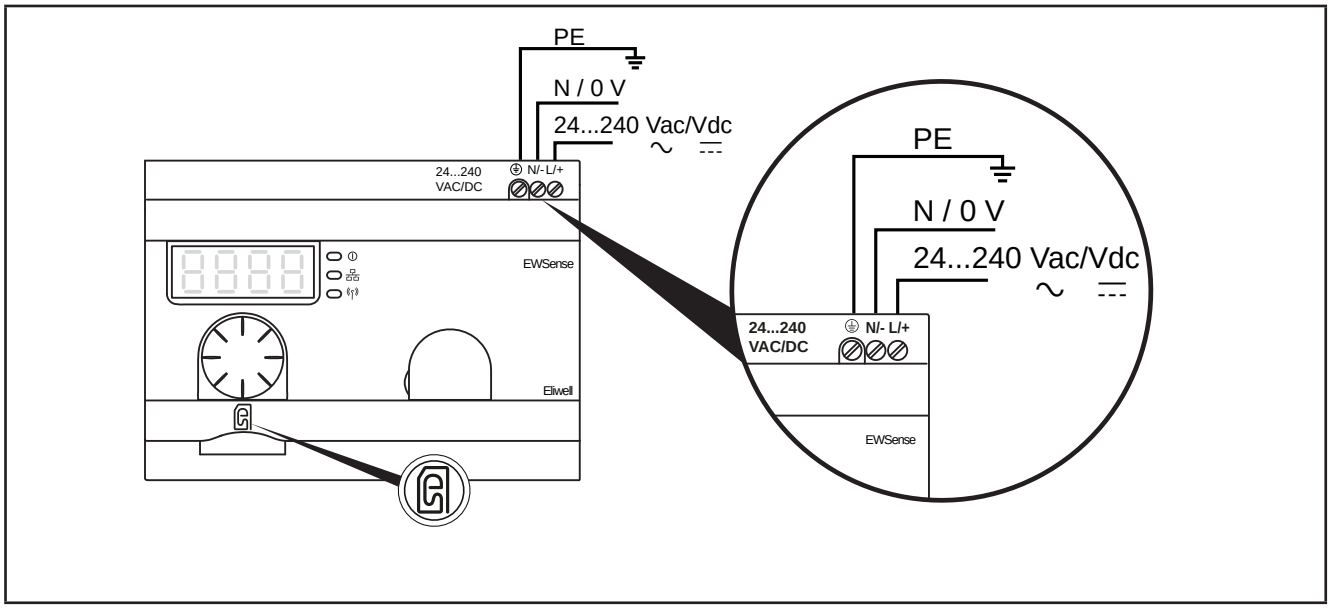


Fig. 9. EWSense Gate

POWER SUPPLY	24 ... 240 Vac/dc
N/-	Neutral connection
L/+	Phase connection
PE	Earth connection
SD	Slot for SD card

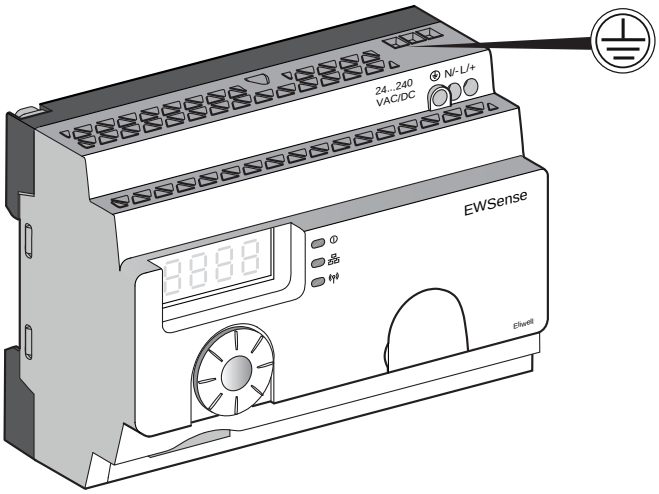


Fig. 10. EWSense Gate earth connection

⚠ ⚠ DANGER

RISK OF ELECTRIC SHOCK

Always use the earth connection on the side of the device for safe earthing.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

For the earthed protection wiring (PE), use a wire that is no longer than 300 mm (11.8 inches).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Provide the product with voltage with a power line protected by a disconnector with max. 16 A intervention and an automatic disconnector on earthed faults.
- An easily accessible disconnection device should be installed externally to the apparatus.
- Install this product in an electric cabinet and lock it.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CHAPTER 4
TECHNICAL DATA

All components in the **EWSense Gate** access points system meet the European Community (CE) requirements for open devices. They must be installed in a casing or other designated place to suit the environmental conditions and minimise the risk of involuntary contact with high voltages. Use metal casings to improve the immunity of the **EWSense Gate** system to electromagnetic fields. This device meets the CE requirements indicated in the table below.

4.1. General Specifications

4.1.1. EWSense Gate

	Standard	Min.	Max.
Supply voltage	24...240 Vac/Vdc	21	264
Power supply frequency	50/60 Hz	47	63
Absorbed power	3.3 W	---	---
Surrounding operating temperature	---	-25 °C (-13 °F)	55 °C (131 °F)
Non condensation relative humidity (at 55 °C (131 °F))	95% RH	---	---
Surrounding storage temperature:	---	-40 °C	70 °C

Classification		
Standard	Compliance with standards	R&TTE 1999/5/EC, LVD 2006/95/EC, EMC2004/108/EC
		EN/IEC 60947-1, EN/IEC 60947-5-1, EN/IEC60950-1, IEC61131-2, EN 300440-2, EN300489-3, EN300328, EN62311
		UL 508 (USA), CSA C22-2 no. 14 (Canada), CCC (China), Gost (Russia)
	Radio certifications	FCC (USA), CSA, RSS (Canada), C-Tick (Australia), ANATEL (Brazil), SRRC (China), MIC (Japan)
Certification bodies		
UL	USA	UL508, 17th edition
CSA	CANADA	CSA C22.2, No. 142-M2000
C-Tick	AUSTRALIA	---
GOST	RUSSIA	---
ANATEL	BRAZIL	---
FCC	USA	---
SRRC	CHINA	---
CCC	CHINA	---
MIC	JAPAN	---
RSS	CANADA	---
Installation		on DIN Omega bar support, panel assembly
Pollution class		2 (normal)
Enclosure rating		IP20
Impact resistance		Swept sine wave acceleration: 11 ms 30 gn (IEC 60068-2 27)
Vibration resistance		±3.5 mm (±0.13 in.): 5 - 8.14 Hz 1 gn: 8.14 - 150 Hz if fitted to a panel 2 gn: 8.45 - 150 Hz if fitted on a DIN rail (IEC 60068-2-6)

Immunity against short interruptions (in compliance with IEC 61000-4-11)	10 ms
Dialectric strength with others	3000 Vac / 4250 Vdc (input-output) 1500 Vac / 2150 Vdc (input-PE*)
Short-circuit protection	Yes (internal, non-replaceable 2 A, 250 V fuse)
(*) PE = protection earthing	
Altitude requirements	Operation: 0 - 2000 m (6561.66 ft) Storage: 0 - 3000 m (9842.49 ft)
	Can only be used at altitudes no higher than 2000 m (6561.66 ft). 
	Can only be used in areas that do not have a tropical climate. 

4.1.2. EWSense Temp

	Standard	Min.	Max.
Operating/storage surrounding temperature	---	-30 °C (-22 °F)	55 °C (131 °F)
Operating/storage humidity (in the absence of condensation) RH	---	0%	95%
Accuracy	±1 °C (1.8 °F) max	---	---

Classification		
Standard	Compliance with standards	IEC 60950, EN 61000-6-1, EN 61000-6-3, EN 61326-1, EN 62311:2007, ETSI EN 301 489-1, ETSI EN 301 489-17, ETSI EN 300 328
	Radio certifications	---
Permitted use		Wireless temperature sensor
IP protection rating		IP65
Installation		With double-sided tape, clamp or screw
Wireless technology		ZigBee 3.0 Green Power
Operating frequency		2.405 GHz
Maximum output power		4 dBm
Range of transmission		100 m (328.08 ft) in free field
Measuring and transmission period		2 minutes
Measurement range		-30 ... 55 °C (-22 ... 131 °F)

NOTICE

DEAD BATTERY

The device must be replaced after 2 years from the date of production to guarantee correct operation.

Failure to follow these instructions can result in equipment damage.

4.2. Device characteristics

4.2.1. Serial ports

	Label	Description
Serial ports	**RS485**	1 split RS-485 (EIA/TIA 485) port fitted with 2 RJ45 connectors.

4.2.2. Mechanical dimensions

	Length (L) mm (in.)	Depth (d) mm (in.)	Height (H) mm (in.)	Notes
EWSense Gate dimensions	121 (4.76)	69.6 (2.74)	89 (3.50)	---
EWSense Temp dimensions	40.1 (1.57)	39.1 (1.54)	16.35 (0.65)	---

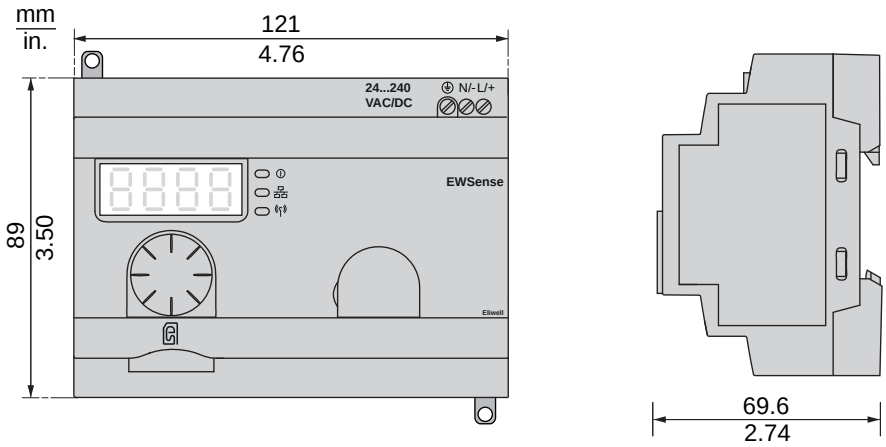


Fig. 11. EWSense Gate

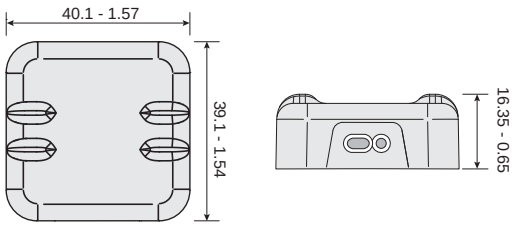


Fig. 12. EWSense Temp

CHAPTER 5
USER INTERFACE

The interface, comprising the front cover of the controller, allows you to perform all operations needed to use the device.

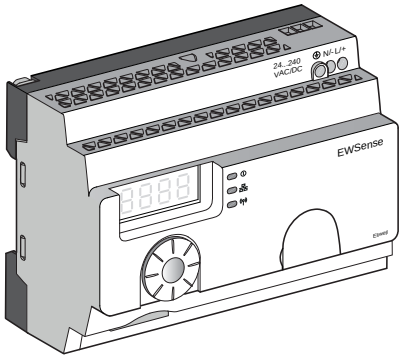
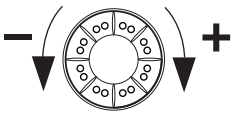


Fig. 13. EWSense Gate

5.1. Keys

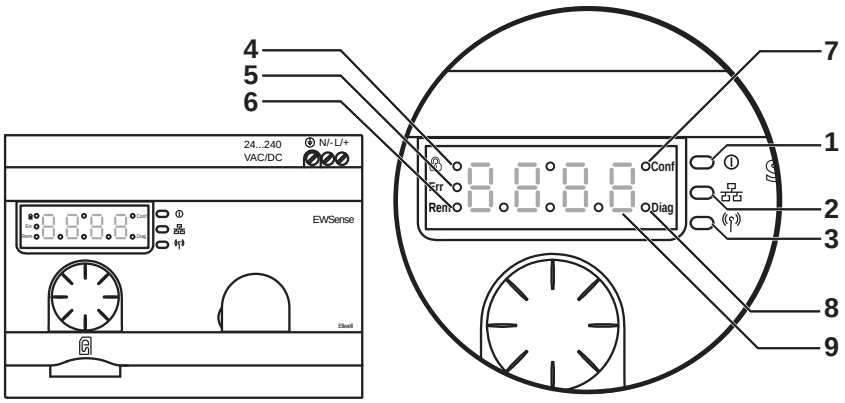
Key	Description
	Turn the selection dial clockwise/anti-clockwise to navigate the menu and increase/decrease the parameter values
 = *ENT* Single Click	Press the selection dial for at least 3 seconds to validate the input of the parameters
 = *ESC* Double Click	Press the selection dial twice to return to the previous menu
 Long press	• Press the selection dial for at least 3 seconds to return to the Instantly ready mode • When the access point is in Ready mode, press the dial for more than 3 seconds to block the user interface • When the access point is blocked, press the selection dial for more than 3 seconds to block the user interface

5.2. LEDs and Display

The display has 9 LEDs split into 3 categories:

- States and operating modes;
- Communication;
- Signal.

5.2.1. LED



	Description	Colour	Function
1	Switch on	Green	**On**: the unit is on. **Off**: the unit is off.
2	Communication	Yellow	**Blinking:** the communication for the Modbus serial line was detected on the bus. **Off:** no communication was found on the bus for the Modbus serial line.
3	Radio signal strength	Green-Yellow	The colour of the LED indicates the radio signal strength. See 5.2.2. Radio signal strength LED on page 32.
4	User interface lock	Red	**On:** user interface is locked. **Off:** the interface is unlocked.
5	Err (Error detected)		**On:** error found. **Off:** no sign of errors.
6	Remote configuration		**On: EWSense Gate** is in automatic learning mode and is serial configured. **Off:** the access point is not remotely configured.
7	Configuration mode		**On:** the Configuration menu is active. **Off:** the Configuration menu is not active.
8	Diagnostics mode		**On:** the Diagnostics menu is active. **Off:** the Diagnostics menu is not active.
9	Display		**Slow flashing:** the value of the parameters can be changed using the selection dial. **Fast flashing 3 times:** the parameters setting was done properly.

5.2.2. Radio signal strength LED

The following figure shows the LED status of radio signal strength at the end of the pairing with **EWSense Gate**. See CHAPTER 7 on page 43:

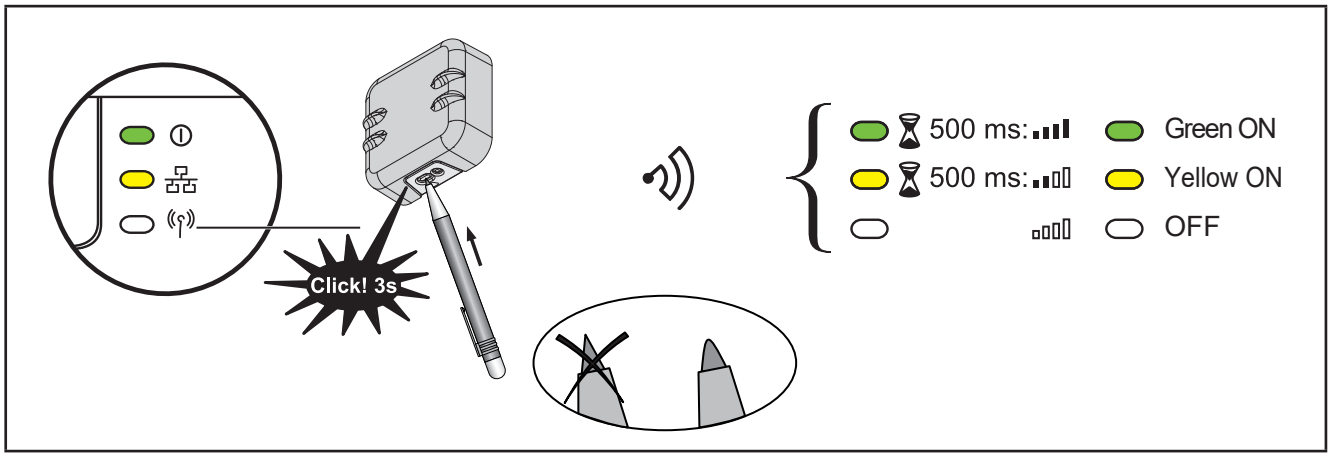


Fig. 14. Radio signal strength LED

5.3. First switch-on



When first switching on, the controller runs a lamp test to check its own integrity and that it is working correctly.

The Lamp Test lasts for a few seconds. In this short time, all the LEDs and figures on the display flash at the same time.

On the main screen the device displays the letters **rdy** (ready).
The instrument cannot be set in stand by.

5.4. Access to folders - Menu structure

Folders are arranged into menus.
Access is defined by the keys on the front cover (see **5.1. Keys on page 30**).
The methods of accessing the different menu sections is given below (or in the chapters indicated).

The device has three menus:

- Configuration menu;
- Diagnostics menu;
- SD card menu.

5.5. CONFIGURATION Menu (ConF label)

EWSense Gate has a CONFIGURATION menu to configure the channels.
When you access this menu, the configuration LED comes on.

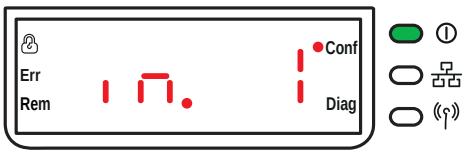


Fig. 15. LED configuration menu

NOTE: In this example, the value 1 represents the total number of configured channels.

5.5.1. Menu structure

The configuration menu allows you to configure the channels.

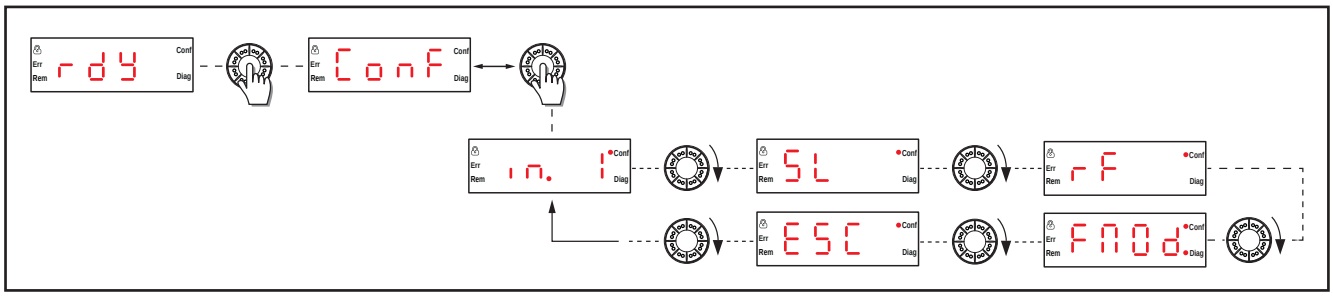
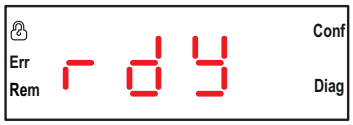


Fig. 16. Structure of the configuration menu

Label	Description
ConF	Configuration menu.
in. 1	Channel configuration menu.
SL	Serial line configuration menu.
rF	Radio transmission configuration menu.
FAOd	Factory mode menu. Allows you to return the device factory setting.
ESC	Go back to previous level.

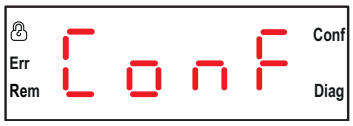
Channel configuration

Channel configuration



Press the dial to access the channel configuration menu from the main display.



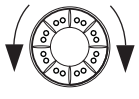


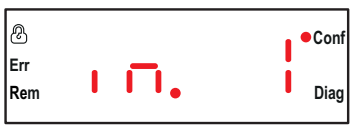
Example of configuration menu display. Press the dial only once to access a list of the various folders.
The **ConF** label will appear on the screen.

(Turn the dial to scroll through the other labels to find the one required).

It allows you to carry out the following operations:

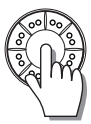
- Automatic acquisition.
- Deleting automatic acquisition.
- Manual acquisition.
- Deleting manual acquisition.



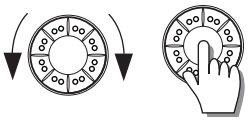


The number of channels already configured is displayed on this level (in the example: 1 configured channel).

Press the dial to configure a channel.







Turn the dial until you find a free channel and then press it to enter the configuration.

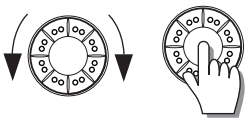
NOTE: The already configured/paired channels are identified with the presence of the “underscore” before the last digit on the display.





Press the dial to configure the required channel.



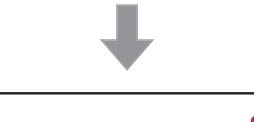


The **tySo** label will appear.

NOTE: the last digits on the display, will flash.

Turn the dial to find the **tyEt** label then press the dial.





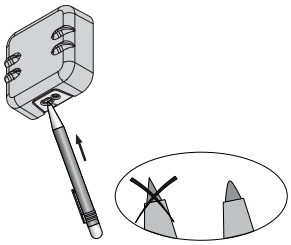
The **tyEt** label will flash 4 times, then the **t** label will appear.



Automatic pairing mode.

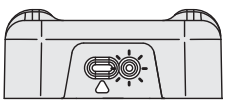
Press the dial to start the pairing with **EWSense Temp**.





Use a blunt instrument to press the key on the **EWSense Temp** for 3 seconds.

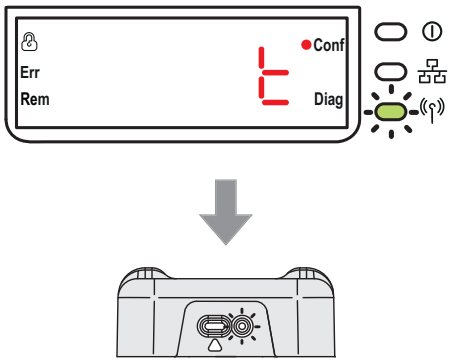




The **EWSense Temp** led will flash twice.

From this point onwards, the pairing procedure has started between **EWSense Gate** and **EWSense Temp**.





After approx. 30 seconds, the “Radio signal strength” LED will flash 3 times on the **EWSense Gate** display.

After another 10 seconds, the **EWSense Temp** LED will flash twice to confirm the pairing has taken place.

Serial line configuration

Via this menu, it is possible to carry out the following configurations:

- Manual transmission speed;
- Manual frame format;
- Automatic transmission speed;
- Automatic frame format.

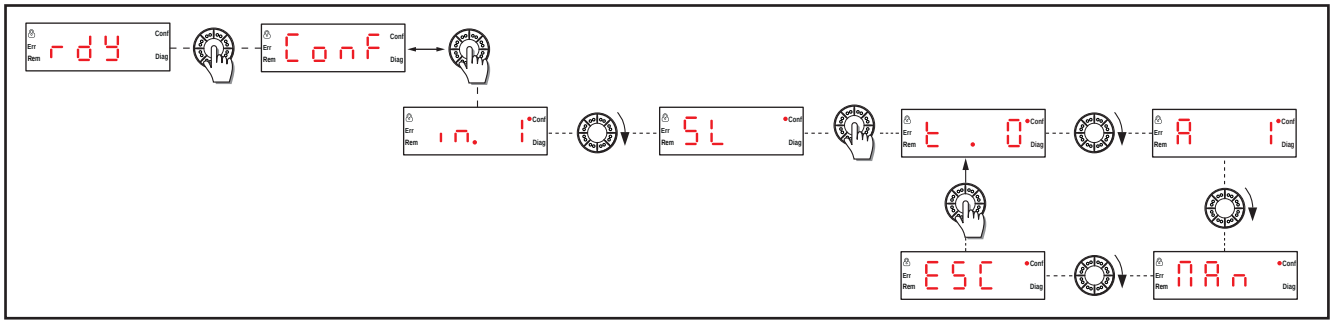


Fig. 17. Structure of the serial line configuration menu

Serial line configuration

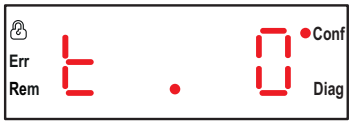
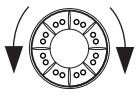


Table selection to identify the Modbus unit (UID).

- **t.0** = Only UID to access the network (1 ... UID ... 247).
- **t.1** = UID: channel + 5
- **t.2** = UID: channel + 65
- **t.3** = UID: channel + 125
- **t.4** = UID: channel + 185

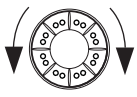
NOTE: Setting **t.1, t.2, t.3, t.4,** each **EWSense Temp** has its own Modbus identification unit (UID) and each **EWSense Gate** has its own table selection value. This mode limits the number of accesses to the same four network.

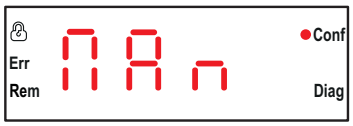




Slave address menu.

This allows you to set the slave address.





This allows you to manually set the transmission and frame speed.

Transmission speed:

- **Auto** = Activates the automatic detection mode, all the parameters are automatically set.
- **1.2** = 1200 bps
- **2.4** = 2400 bps
- **4.8** = 4800 bps
- **9.6** = 9600 bps
- **19.2** = 19200 bps
- **38.4** = 38400 bps
- **115** = 115200 bps

Allows you to select the frame format from the list:

- **Auto** = Activates the automatic detection mode
- **8E1** = Even parity
- **8o1** = Uneven parity
- **8n2** = No parity.

Radio parameters configuration

This menu allows for radio transmission configuration.
Via this menu, it is possible to carry out the following configurations:

- RF Mode (radio frequency);
- Communication channel;
- Level of transmission strength;
- Pan ID (identification of personal area).

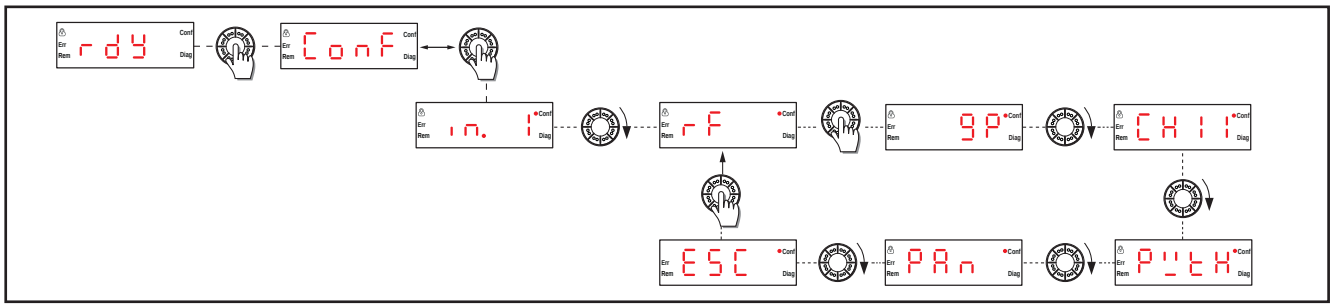


Fig. 18. Structure of the radio parameters configuration menu

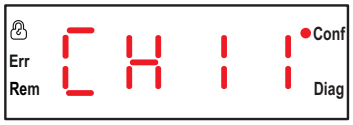
Radio parameters configuration



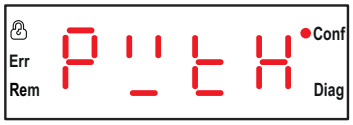
Selection of frequency radio transmission operating mode.

OFF = Transmission disabled

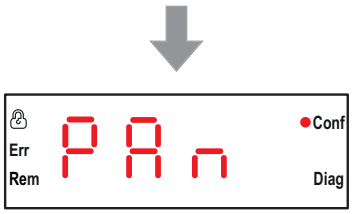
gP = Green Power.



Selects the communication channel of the radio frequency transmission.



Configuration of the radio frequency transmission strength.



Configuration of the personal area identification (**PAn ID**).

Factory mode reset menu

Via this menu, it is possible to return the device to factory setting.

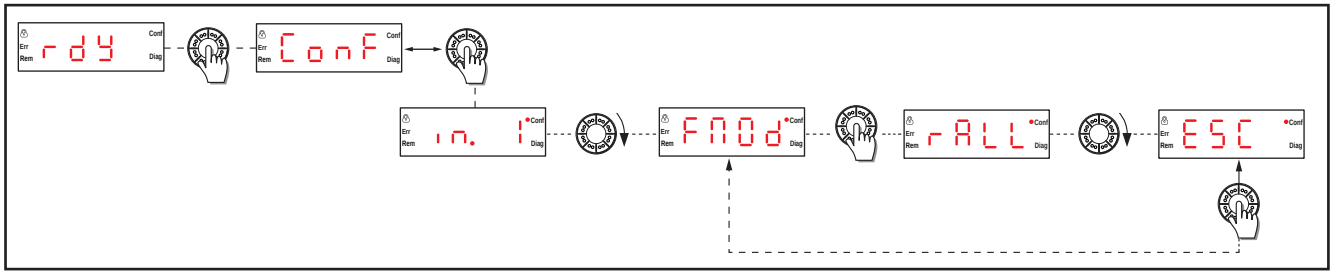
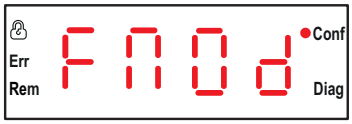


Fig. 19. Structure of the factory mode menu

Factory mode reset



It allows you to carry out the following operations:

- Reset all the parameters to the predefined value.
- Set the communication parameters.
- Set all the parameters.



Reset all the parameters to the predefined setting.

Press the selection dial to proceed to reset, after which select **yES** to confirm and start the procedure of resetting the factory data.

5.6. DIAGNOSTICS Menu (dIAg label)

The Diagnostics menu supplies information on various device settings and on the status of detected errors. When the Diagnostics menu is activated, the Diagnostics LED comes on.

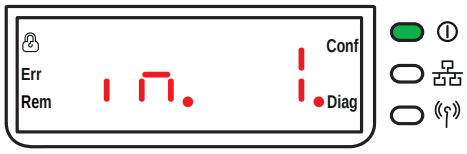


Fig. 20. LED Diagnostics menu

5.6.1. Menu structure

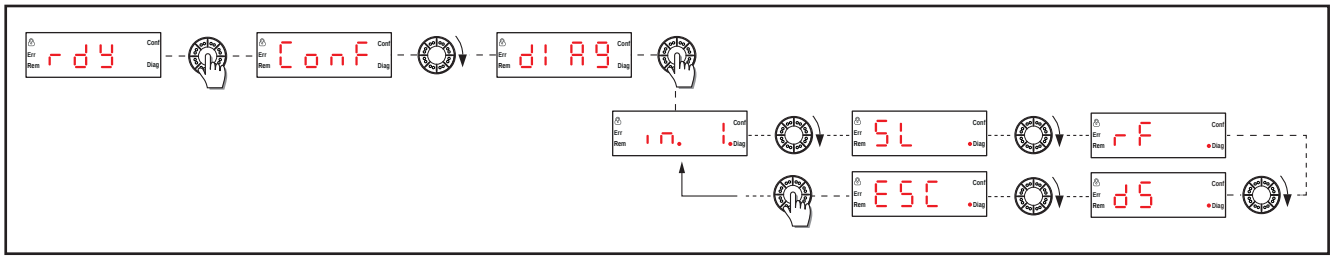


Fig. 21. Structure of the diagnostics menu

Label	Description
in. 1(*)	Diagnostics of the configured channel status.
SL	Diagnostics of information relating to the serial line.
rF	Diagnostics of the radio transmission.
dS	Diagnostics of the device status.
ESC	Go back to previous level.

(*) **NOTE**: the value displayed after the **in** label, varies according to the number of configured channels; in this example, it is a configured channel.

Diagnostics of the inputs status

In this menu it is possible to view the inputs/configured channels status and view the free channels.

The information displayed is:

- Connection with **EWSense Temp**;
- Identification of the **EWSense Temp** connected to the channel;
- Reception signal strength;
- Code of any detected alarms.

Diagnostics of information relating to the serial line

Information on the serial line can be viewed in this menu:

- Current transmission speed;
- Setting formed by the frame in the list.

Diagnostics of information relating to the product

The device status can be viewed in this menu:

- Code of detected error (**Erxx**);
- Product version (**r 32**);
- Firmware version (**3.00**);
- Version of factory configuration (**00001**).

NOTE: Press the selection dial when the error detected parameter code is selected to reset a detected error.

5.7. SD Card Menu (SD label)

This menu is only displayed when the SD memory card is properly inserted in **EWSense Gate**.

The SD card menu allows a backup to be made and reset the parameters of the associations and network.

5.7.1. Menu structure

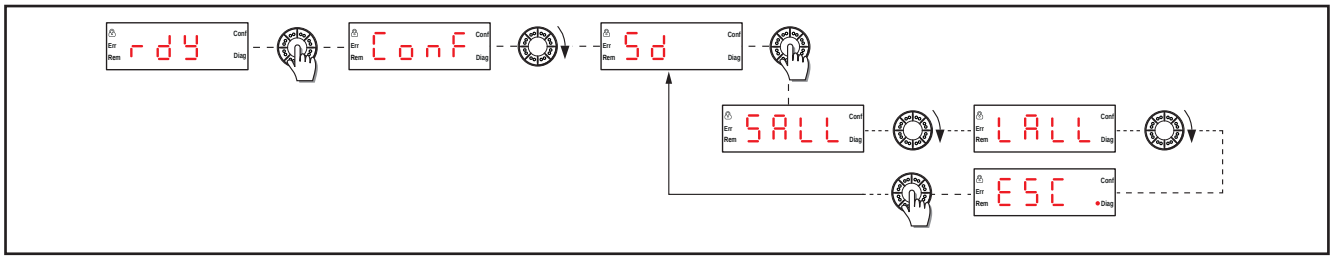


Fig. 22. Structure of the SD card menu

Label	Description
SALL	This allows for all the parameters in the SD card to be saved. In order to confirm this parameter, select **yES** from the sub menu. In order to return to the previous level, press **nO**.
LALL	Load all the parameters from the SD card. In order to confirm this parameter, select **yES** from the sub menu. In order to return to the previous level, press **nO**.
ESC	Go back to previous level.

NOTE: The SD card menu is only displayed if the card is inserted in the device.

CHAPTER 6
SD CARD

The SD card is a memory card (16 MB minimum capacity).

⚠ CAUTION

UNINTENDED EQUIPMENT OPERATION

- In exposing the SD card to:
  - Electrostatic or electromagnetic sources.
  - Heat, direct solar light, water or humidity.
  - High radiations. High radiation sources can delete the content of the SD card.
- Do not subject the SD card to impact.

Failure to follow these instructions can result in injury or equipment damage.

Below are the instructions to insert the SD card in the **EWSense Gate**:

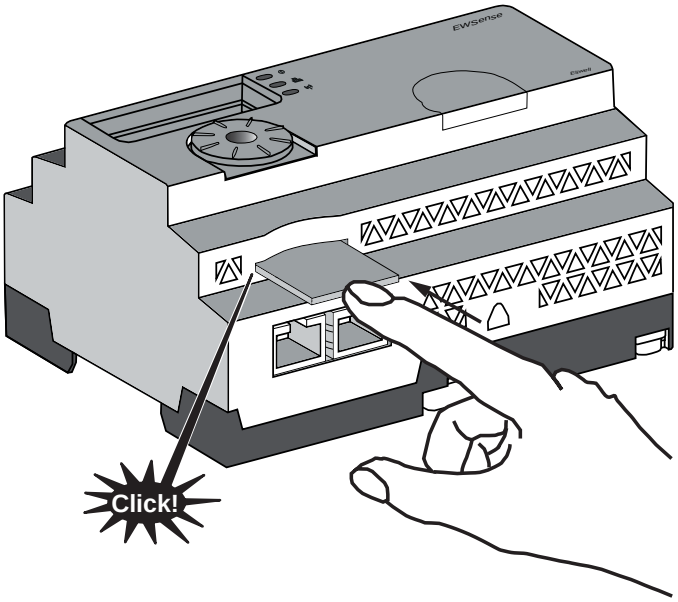


Fig. 23. SD card installation

Push the SD card and insert it in the SD slot of the access point. Make sure the SD card is properly inserted with the contacts facing upwards.

Below are the instructions to remove the SD card from the **EWSense Gate**:

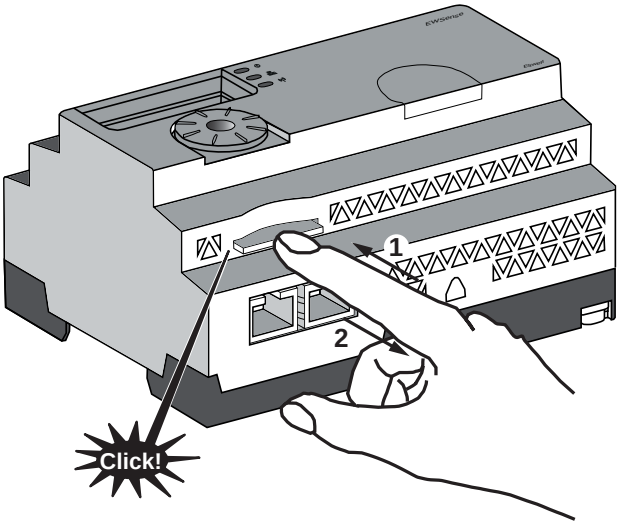


Fig. 24. SD card removal

Push the SD card and remove it from the SD slot of the access point.

6.7.1. Functions

Supported functions

The SD car supports the following functions:

- Written protection;
- Dynamic detection;
- Saving and loading the configuration and network parameters.

Saving and loading the configuration

The following procedure describes the saving of configuration and network parameters:

Step	Action
1	Insert an empty SD card in the **EWSense Gate**
2	In the **SD card** menu, click on Save all (**SALL**)
3	2 sub folders are created in the SD card: • \device: stores the ZBRNXDEV.csv configuration parameters file. • \net: stores the ZBRNXNET.csv configuration parameters file **NOTE**: The .csv files can be manually saved and loaded in **EWSense Gate** at a later date.

Before copying the .csv files in **EWSense Gate** (precisely the ZBRNXNET.csv network parameter files) from the SD card, the ZBRNXDEV.csv file needs to be loaded in the SD card.

Step	Action
1	Insert an empty SD card in the **EWSense Gate**
2	In the **SD card** menu, click on Save all (**SALL**)
3	Copy the ZBRNXNET.csv file from the PC to the SD card
4	Insert the SD card in the **EWSense Gate**, go to the **SD card** menu and click on Load all (**LALL**).

The following procedure describes the loading of the device's configuration and network parameters:

Step	Action
1	Insert an SD card in the **EWSense Gate**.
2	Make sure that the files to be loaded are in the sub folders of the right **SD card** (if there are none in the SD card, create the sub folders \device and \net): • \device: stores the ZBRNXDEV.csv configuration parameters file • \net: stores the ZBRNXNET.csv configuration parameters file **NOTE**: The ZBRNXDEV.csv file is the same file used in the DTM Import/Export function.
3	In the **SD card** menu, click on Load all (**LALL**).
4	Reset all the previously configured channels and perform the commissioning procedure once again.

6.7.2. Management of files and diagnostics

Management of files

The following table shows the names of the files with the path used in the SD card:

Path	Description
\device	Folder containing the configuration file.
ZBRNXDEV.csv	Name of the configuration file.
\net	Folder containing the network file.
ZBRNXNET.csv	Name of the network file.

Diagnostics

The following table shows the diagnostics information of the SD card:

Code of detected error	Indication on the device	Cause
0: no error found.	---	The SD card is inserted in the access point.
0: no error found.	---	The SD card is not inserted in the access point.
1: the SD card is not accessible.	The **Error** LED comes on.	The SD card is not compatible.
2: the SD card is protected in writing.	The **Error** LED comes on.	The SD card is protected in writing.
3: insufficient space on the SD card.	The **Error** LED comes on.	Insufficient space on the SD card.
4: invalid communication configuration file	The **Error** LED comes on.	The ZBRNXNET.csv file format is invalid.
5: invalid configuration file.	The **Error** LED comes on.	The ZBRNXDEV.csv file format is invalid.
6: indicates that in the appropriate directory of the SD card there is more than 1 configuration file available.	The **Error** LED comes on.	During resetting, in the devices or network directory, more than 1 configuration file is stored; this condition is not permitted.
7: the configuration file is not available in the SD card.	The **Error** LED comes on.	During resetting of the configuration files, there is no file in the device and network directories.

CHAPTER 7
PAIRING WITH EWSense Temp

Keep to the procedure described below when pairing is to be made between **EWSense Gate** and **EWSense Temp**:

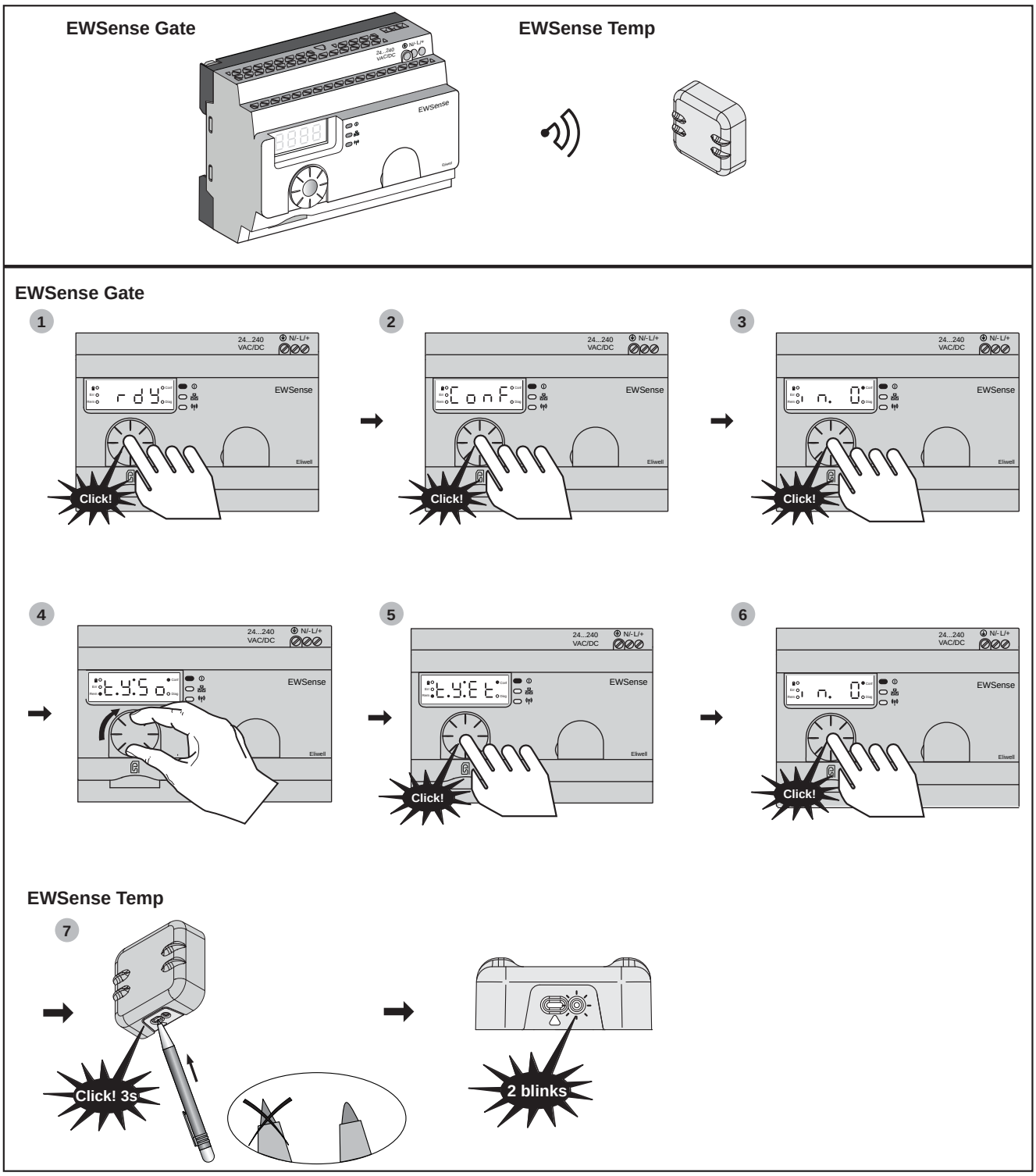


Fig. 25. Pairing between **EWSense Gate** and **EWSense Temp**

Holes in the rubber or damage to the plastic will lead to a loss of performance and compromise the safety features of the controller

⚠ WARNING

BATTERY LIQUID LEAKS AND FOOD CONTAMINATION

- Do not use sharp tools to operate the sensor.
- Comply with the temperature and humidity ranges indicated in the “Technical Data” section.
- Do not expose the sensor to heat sources or water.
- Do not subject the sensor to mechanical stress.
- Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The device was not intended for use in contact with food.

⚠ WARNING

RISK OF FOOD CONTAMINATION

- Do not use the EWSense Temp in contact with food.
- Do not use the EWSense Temp with clamp or screw fixing in “food zone” applications (as defined in the NSF standard).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

In order to verify that the pairing has occurred between **EWSense Gate** and **EWSense Temp** follow the procedure below:

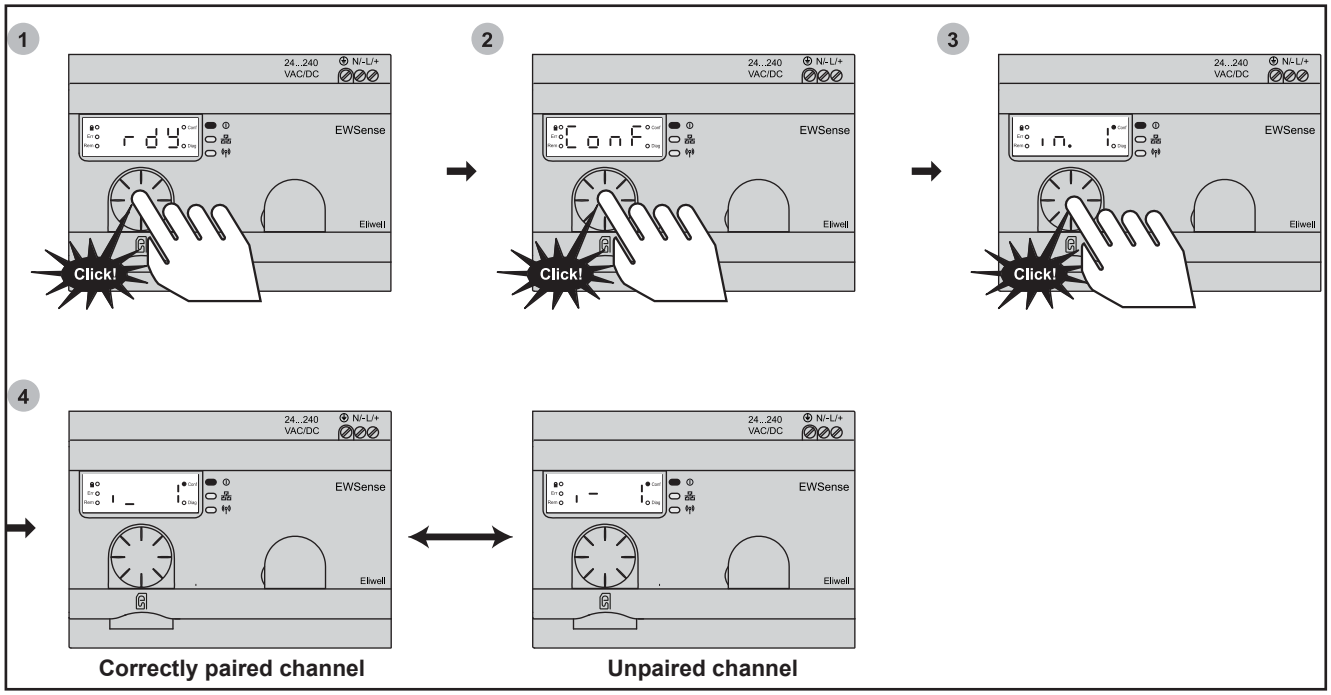


Fig. 26. Check pairing between **EWSense Gate** and **EWSense Temp**

NOTE: The number shown after **in**, indicates the number of occupied channels (number of sensors paired to the **EWSense Gate**).

4	If the **i_ x** (*), is displayed, the pairing has been done correctly.
	If the **i¯ x** (*), is displayed, the pairing has NOT been done correctly.

(*) With **x** we mean the channel number whose correct pairing is being verified.

CHAPTER 8
CONFIGURATION VIA DEVICE MANAGER

It is possible to configure **EWSense Gate** even via **Device Manager**.

The software allows you to carry out the following operations:

- Change parameters;
- Pre-configure the **EWSense Temp** address;
- Gather data on the temperature read from **EWSense Temp**;
- View the information relative to the channel resources;
- View product related information;
- View stored errors;
- View occupied channels and addresses of relative paired **EWSense Temp**.

8.1. Pairing with EWSense Temp from Device Manager

The procedure subsequently described indicates how to pair **EWSense Temp** with **EWSense Gate** via the use of **Device Manager:**

1. Connect **EWSense Gate** to the PC via the RJ45 connector and serial converter/RS-485, as described in the following figure.

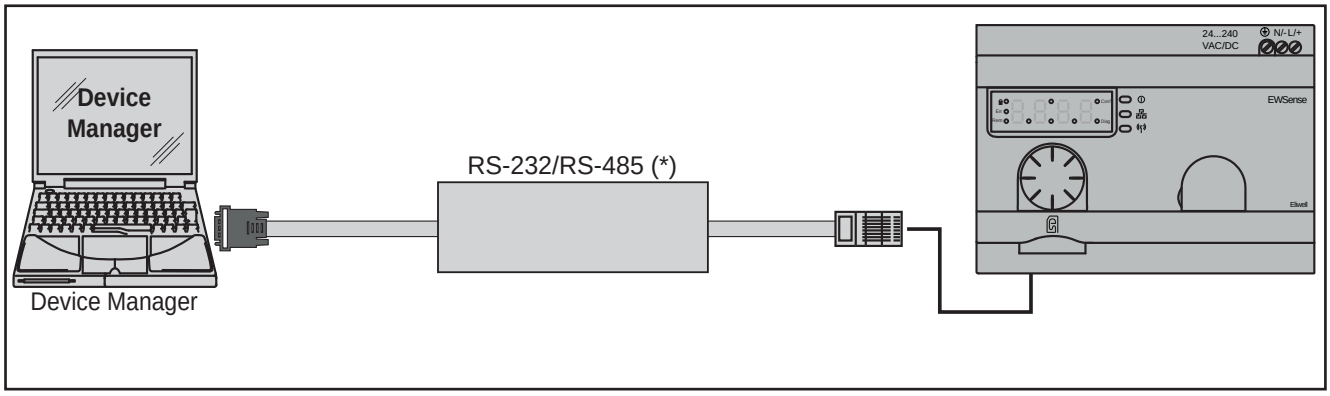


Fig. 27. EWSense Gate Connection with PC

The use of a converter with a virtual COM port may lead to operating problems linked to the combination between Operating System, driver, type of converter used and PC hardware.

NOTICE

UNINTENDED EQUIPMENT OPERATION

Do not use a converter with virtual COM port for PC.

Failure to follow these instructions can result in equipment damage.

2. Open **Device Manager**; once opened the following screen will appear:

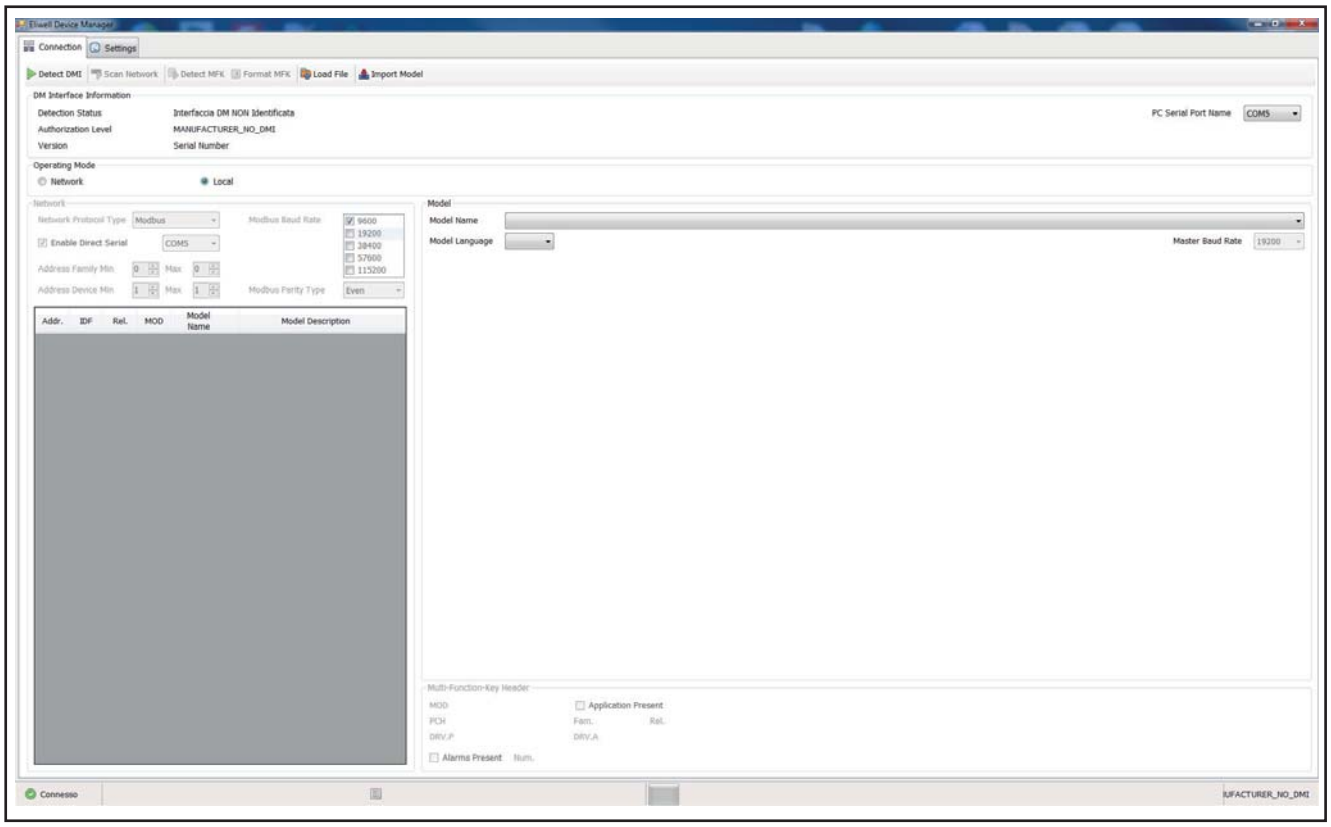


Fig. 28. Main Device Manager screen

3. Set "**NETWORK**" in the operative mode section.
4. Set the COM port in which the **EWSense Gate** is connected (e.g. COM4)

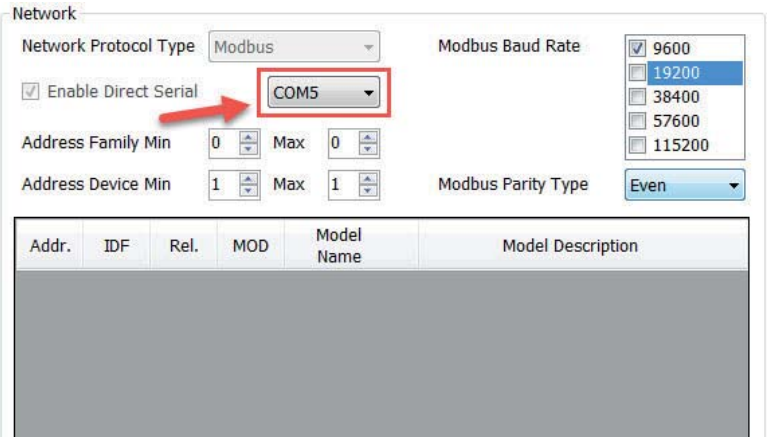


Fig. 29. COM port selection

5. Set the Baud Rate at the speed at which EWSense Gate is configured (by default = 19200 bit/s).

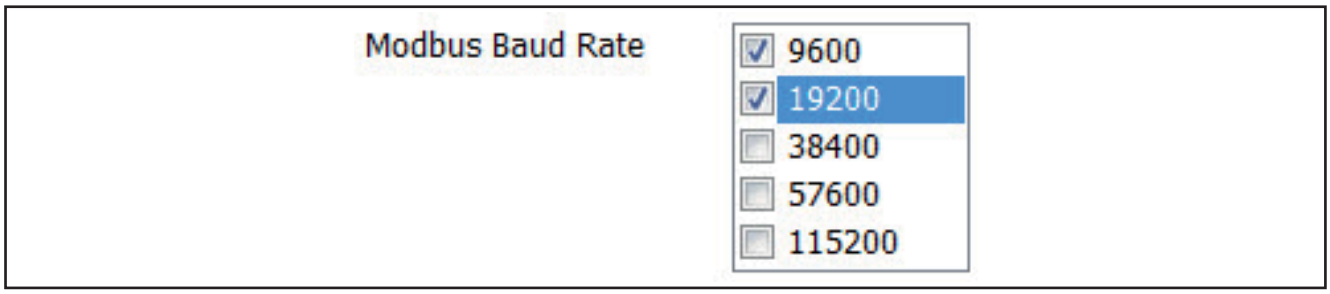


Fig. 30. Baud Rate Selection

Note: the 9600 option cannot be excluded.

6. Set the **EWSense Gate** communication address (by default 0001).

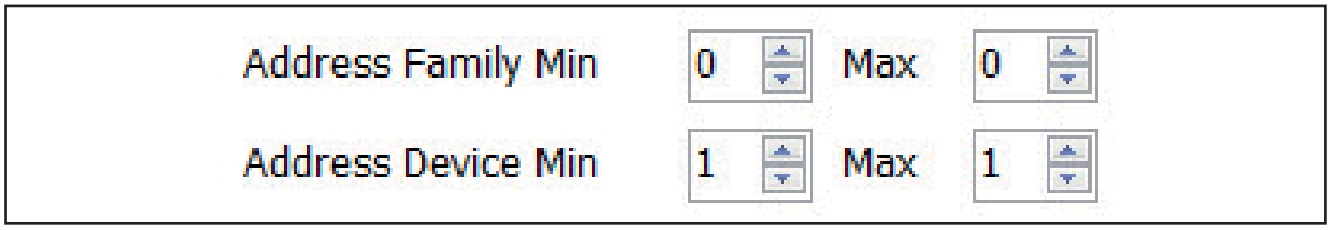


Fig. 31. Select communication address

Note: Check the communication address from the device (see SL menu).

7. Press “Network Scan” to activate the scan and detect **EWSense Gate**.



Fig. 32. Network scanning

8. Once the network scan has finished, if the PC detects EWSense Gate, a line will appear in the list of models.

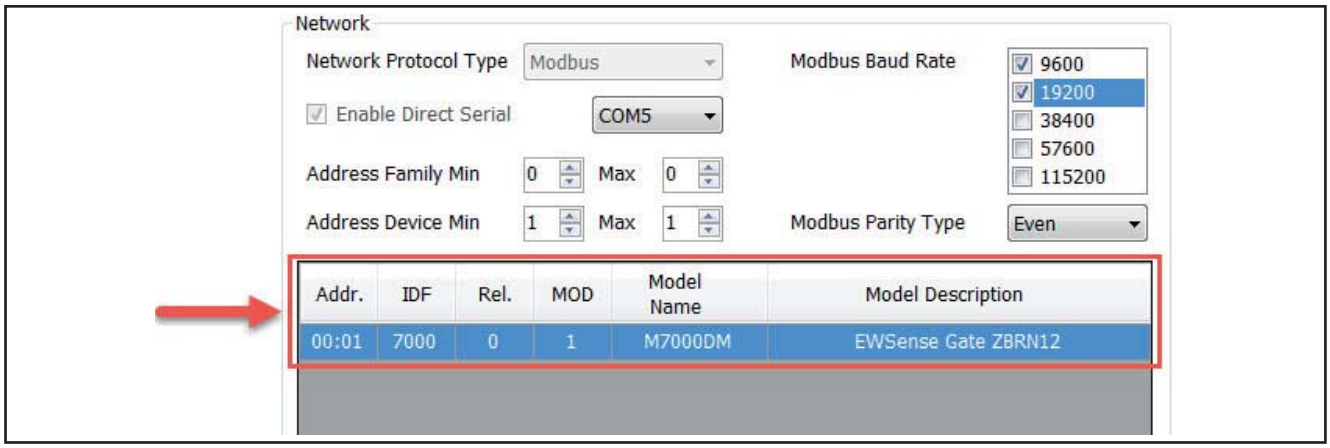


Fig. 33. EWSense Gate detection

9. Enter the parameter folder.

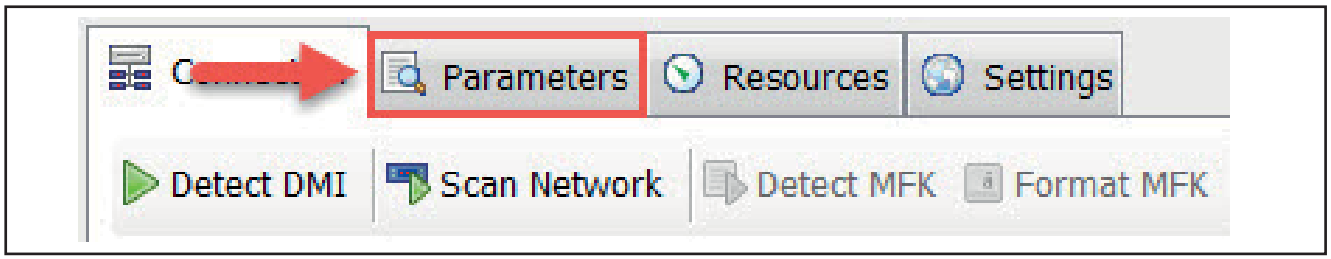


Fig. 34. Select the parameter folder

10. Press the "**Commissioning**" key and the following screen will appear:

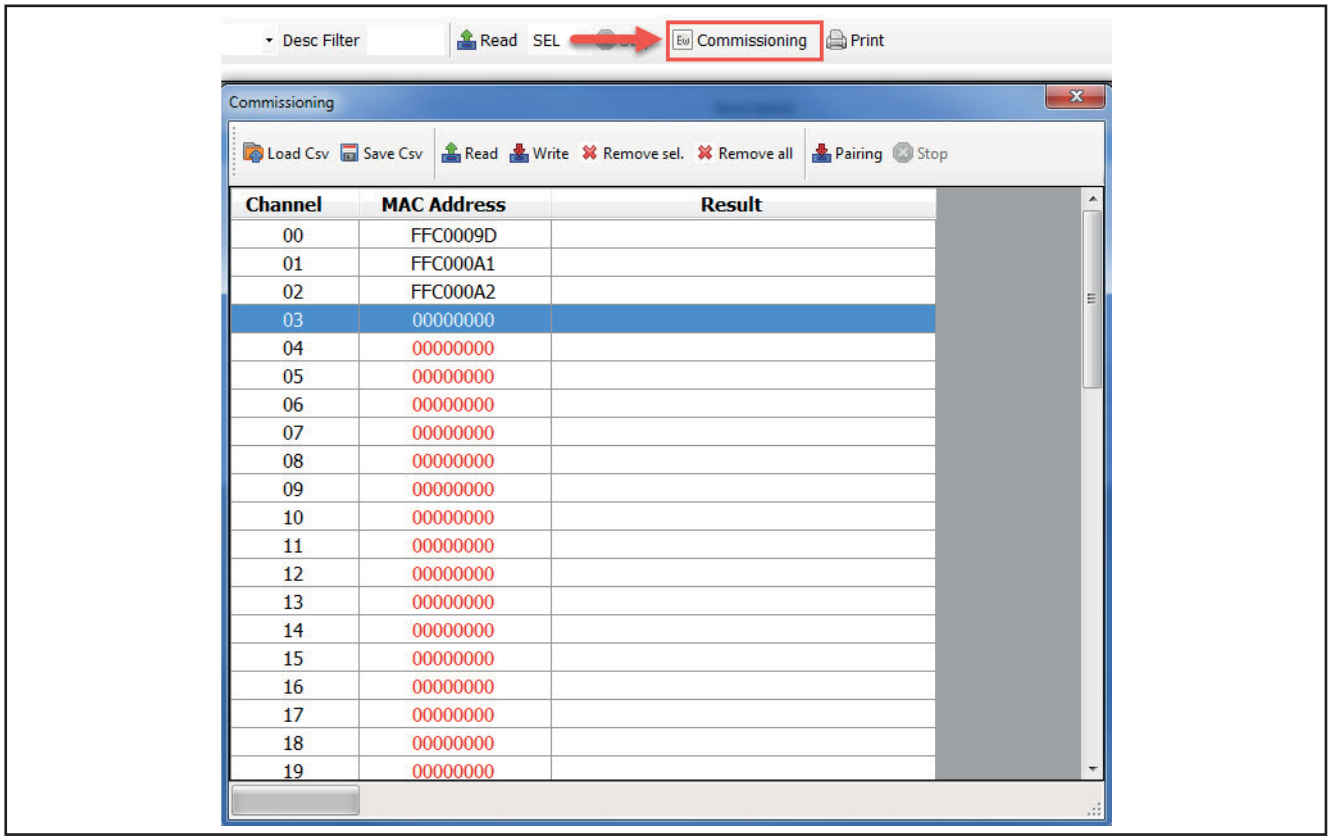


Fig. 35. Channel status

The channel status can be viewed on this screen.
In the example, the 00, 01 and 02 channels are occupied by a **EWSense Temp**, while all the other channels are free.

11. In order to associate a sensor with a channel, double click on the desired channel in the **MAC Address** column and insert the identification found on the **EWSense Temp** label.

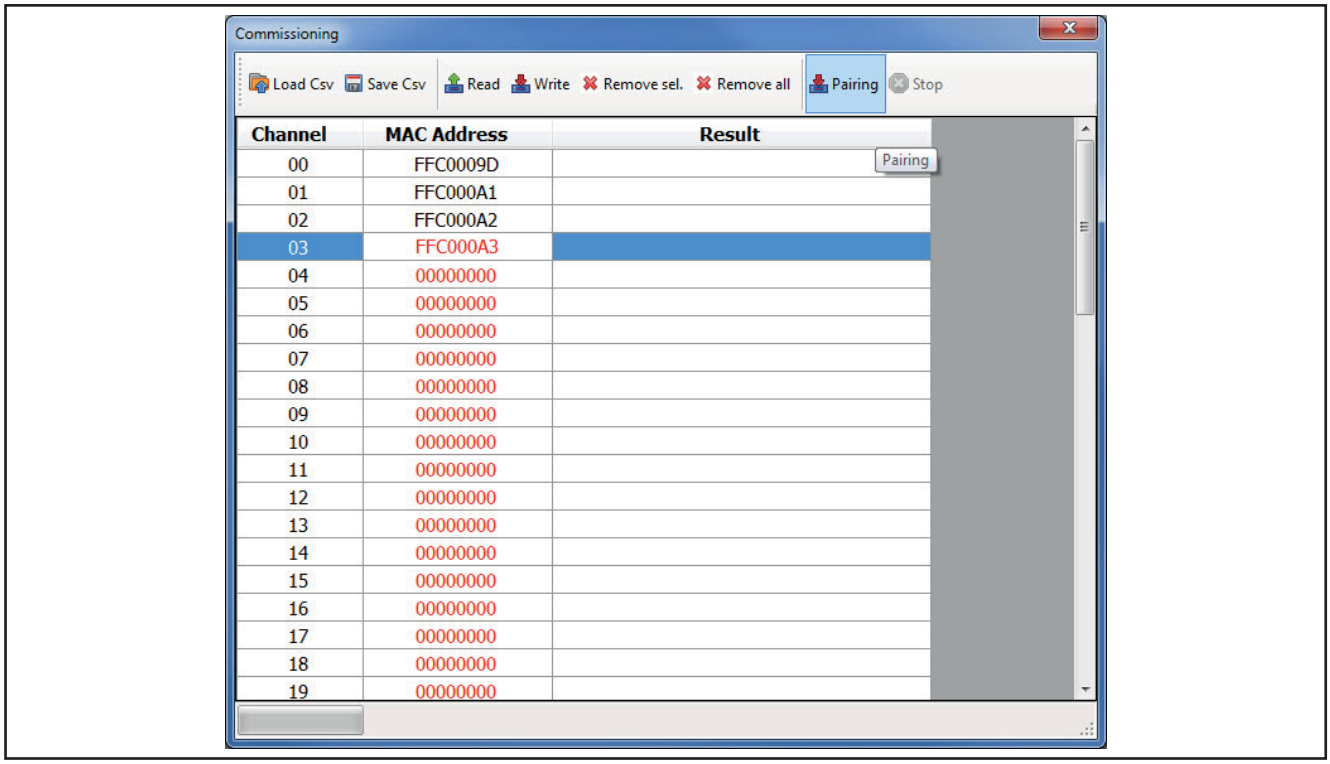


Fig. 36. MAC Address Insertion

12. Press the **Write** key. This way, **Device Manager** will occupy the selected channel (e.g. 01 channel) with the address inserted.

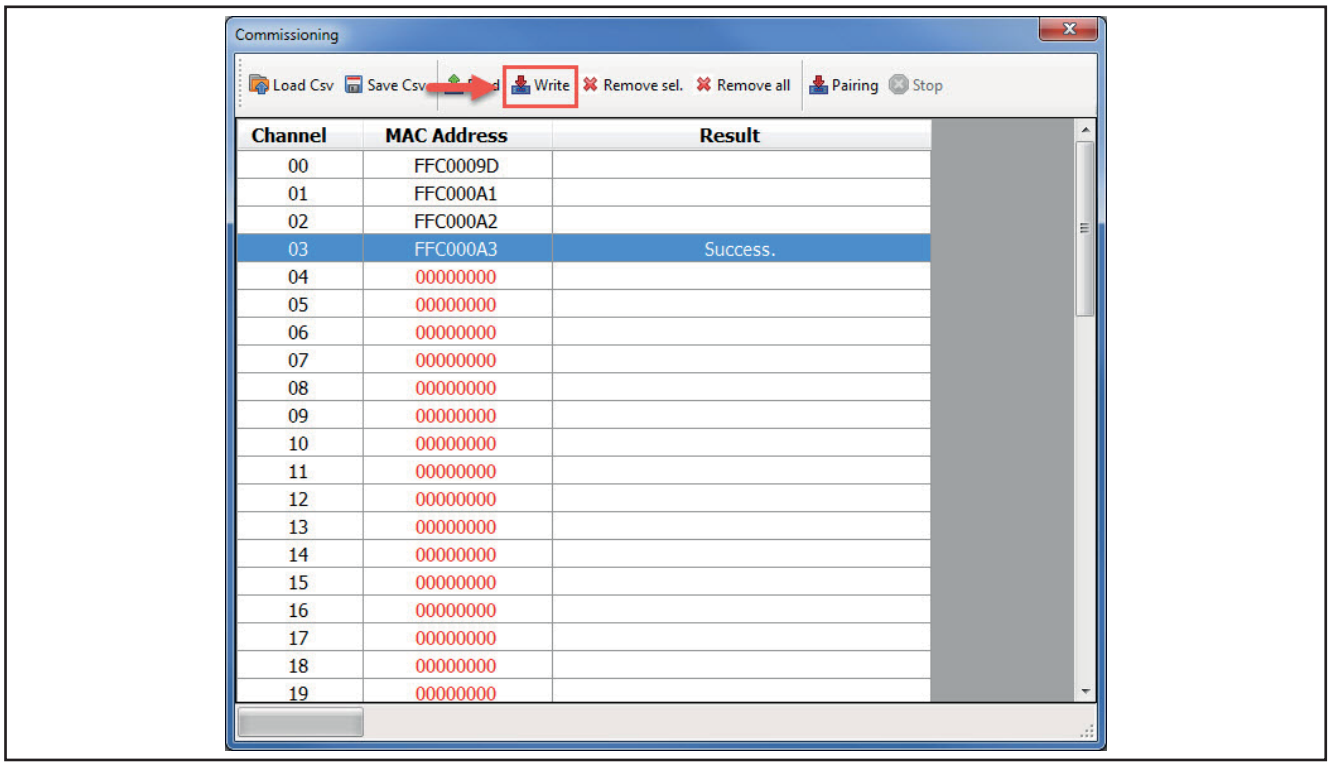


Fig. 37. MAC Address writing

13. If the operation is successful, the word **Success** will appear in the **Outcome** column.
14. Press the **Association** key to make the pairing.

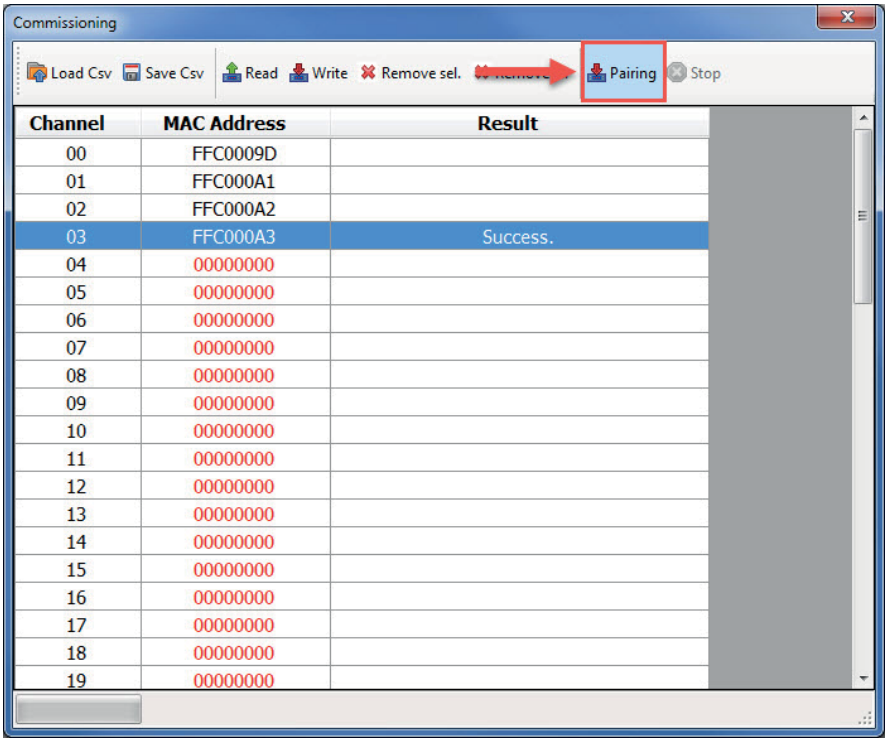


Fig. 38. MAC Address writing

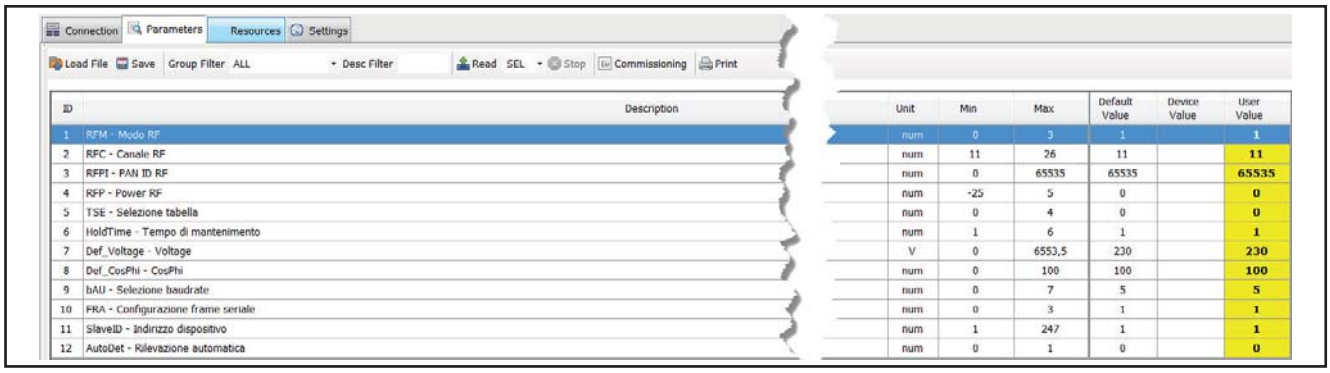
NOTE: During association, the menu will remain locked.

15. Within 120 seconds, press the pairing key on **EWSense Temp**.
16. With the operation complete, that is **EWSense Temp** paired with **EWSense Gate**, the writing **Operation carried out** will appear in the **Outcome** column.

8.2. PARAMETER Folder

From **Device Manager** it is possible to read the parameter configuration of **EWSense Gate**. The list of parameters is described at CHAPTER 9 on page 55.
NOTE: it is not possible to change the parameters via **Device Manager**.

The screen which will appear there will be the following:



ID	Description	Unit	Min	Max	Default Value	Device Value	User Value
1	RFM - Modo RF	num	0	3	1		1
2	RFC - Canale RF	num	11	26	11		11
3	RFPI - PAN ID RF	num	0	65535	65535		65535
4	RFP - Power RF	num	-25	5	0		0
5	TSE - Selezione tabella	num	0	4	0		0
6	HoldTime - Tempo di mantenimento	num	1	6	1		1
7	Def_Voltage - Voltage	V	0	6553,5	230		230
8	Def_CosPhi - CosPhi	num	0	100	100		100
9	bAU - Selezione baudrate	num	0	7	5		5
10	FRA - Configurazione frame seriale	num	0	3	1		1
11	SlaveID - Indirizzo dispositivo	num	1	247	1		1
12	AutoDet - Rilevazione automatica	num	0	1	0		0

Fig. 39. Parameter folder

The following commands are available in this folder:

Command	Description
Load File	Allows you to load the .DAX file.
Save	Allows you to save a .DAX file (the configuration of the parameters map in use is saved).
Desc Filter	Allows you to set a filter on the parameters list.
Read	Read the configured values on **EWSense Gate**.
SEL ALL	Descending list that allows for the selection of two items: • **SEL**: Manual selection of individual lines on the parameters table; • **ALL**: Automatically selects all the lines on the parameters table.
Commissioning	Grants access to the reading window of the **EWSense Gate** channels' status and the pairing with **EWSense Temp**. On opening this window, the channels' status will automatically be read, recording any addresses found.
Print	Allows you to proceed with printing the parameters list.

8.2.1. Commissioning

The **Commissioning** window is as follows:

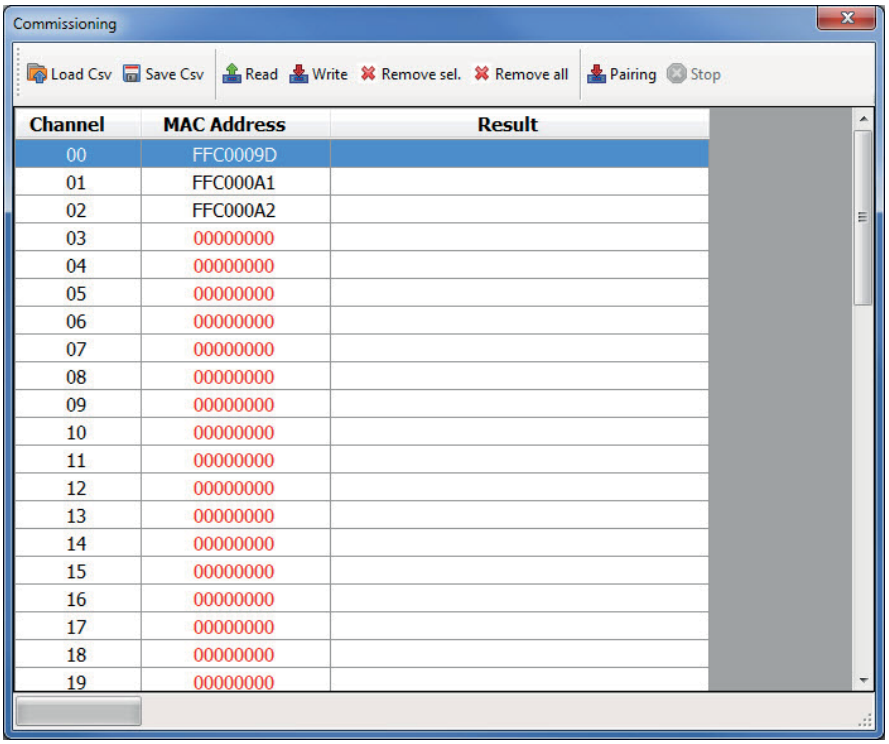


Fig. 40. Commissioning Window

The commands available in this window are as follows:

Command	Description
Load Csv	Load the “ZBRNXNET.csv” file containing the MAC Addresses to be written on **EWSense Gate**.
Save Csv	Save a .CSV file containing the list of containing the list of MAC Addresses on **EWSense Gate**.
Read	Start reading the **EWSense Gate** channels’ status.
Write	Start writing the MAC Addresses inserted in the channels on **EWSense Gate**.
Remove sel.	Remove the selected MAC Addresses.
Remove all	Remove all the MAC Addresses.
Pairing	Start the association with **EWSense Temp** and **EWSense Gate**.
Stop	The test can be used only during the association with **EWSense Temp**. It allows you to interrupt the pairing between **EWSense Gate** and **EWSense Temp**.

8.3. RESOURCES Folder

The **Resources** window is as follows:

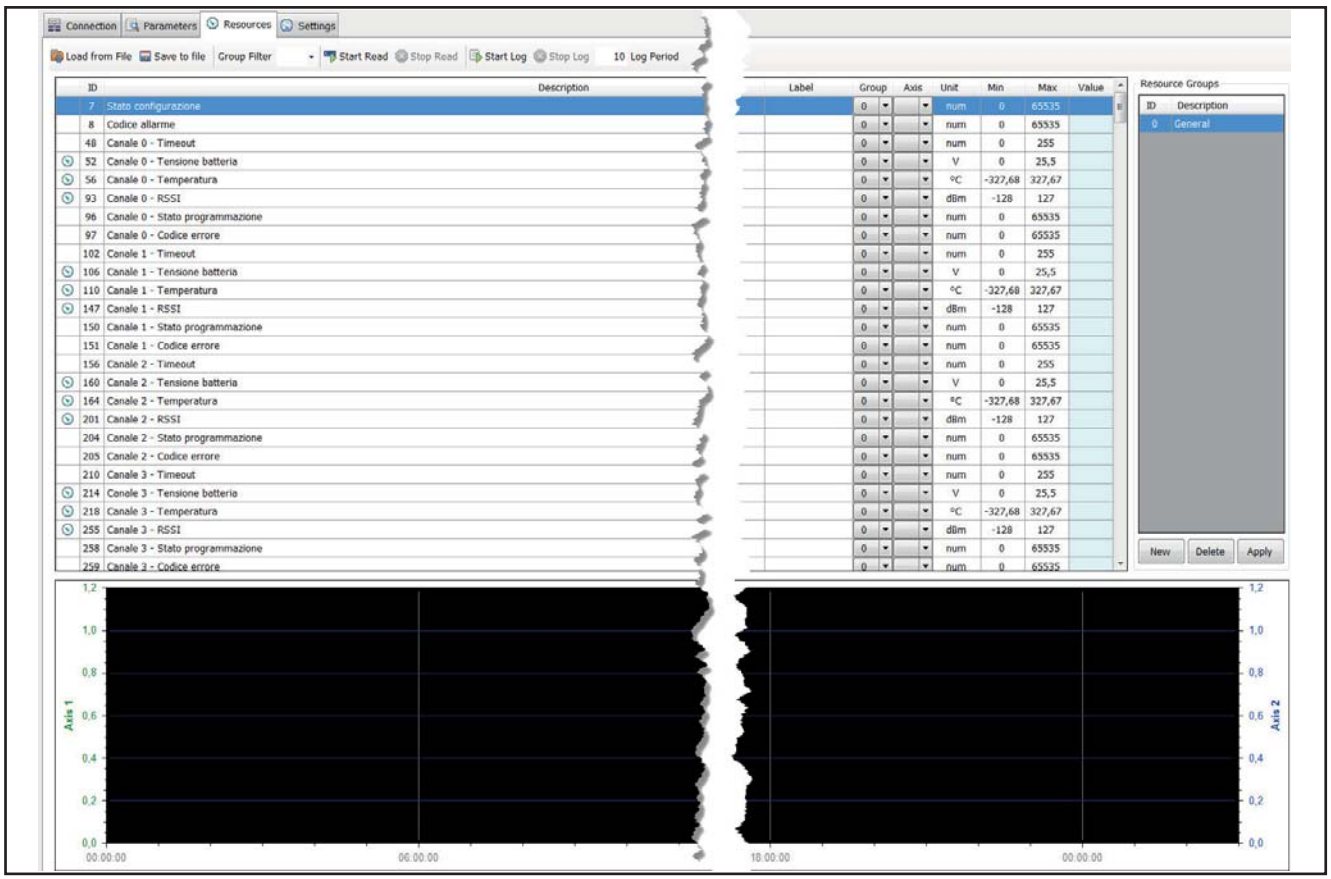


Fig. 41. Resources Window

In this window it is possible to see the data gathered by the paired **EWSense Temp**.
The information that can be read is:

- Device identification;
- Firmware version;
- Configuration status;
- Alarm code;
- Industrial configuration version;
- Time-out;
- **EWSense Temp** battery voltage;
- Temperature read;
- RSSI (indicator of the reception signal strength).

A graph can be set up to view the trend of the following data:

- Battery voltage;
- Temperature;
- RSSI.

Both axes of the graph can be configured.

8.3.1. Display of the reception signal strength (RSSI)

The reception signal strength from **EWSense Temp** can be checked in the **Resources** file.

The value is indicated in the **RSSI** line for each channel.

NOTE: For good reception, the value of **RSSI** must be stronger than -70 dBm (Good Connection).

NOTE: If “-128” is indicated for the **Value** column, the channel has not been configured.

8.3.2. Commands

The following commands are available:

Command	Description
Load from File	Load file .DAX.
Save to file	Save file .DAX.
Group Filter	Select the resource group to view.
Start Read	Start reading the **EWSense Temp** values.
Stop Read	Interrupt the reading.
Start Log	Start the log. Once pressed, you will be asked to save a .txt file where all the log information will be written.
Stop Log	Interrupt the log.
10 Log Period	Set the Log period.

Resource groups can be created using the following panel. This function allows you to view resource groups set and filter for groups.

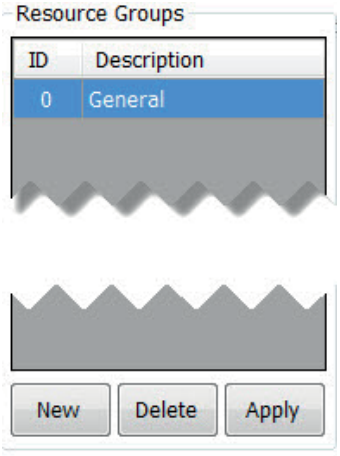


Fig. 42. Groups

The **New** key allows you to create a new group.
Note: once a new group has been created, it is essential to set the new group.
Press the **apply** key to make the changes effective.
Select the required group to eliminate a group and press the **Eliminate** push button.

CHAPTER 9
PARAMETERS (PAR)

Parameter setting allows for the configuration of **EWSense Gate**.

The **EWSense Gate** parameters can be changed via:

- Device.
- SD Card (via ZBRNXNET.csv file).

9.3.1. Parameters table

LABEL	DESCRIPTION	RANGE	DEFAULT	M.U.
RFM	RF Mode. • **OFF** (0) = Transmission disabled. • **gP** (1) = Green Power.	OFF/gP	1	num
RFC	RF Channel. **NOTE:** (only for USA and Canada) Channel 26 unusable.	11...26	11	num
RFPI	PAN ID RF.	0....65535	65535	num
RFP	RF transmission strength.	-25...5	0	num
TSE	Table selection.	0...4	0	num
Holdtime	Holding time.	1...6	1	num
Def_Voltage	Voltage.	0...6553.5	230	V
Def_CosPhi	CosPhi.	0...100	100	num
bAU	Baudrate selection. • **Auto** (0) = Automatic. • **1.2** (1) = 1200 bps. • **2.4** (2) = 2400 bps. • **4.8** (3) = 4800 bps. • **9.6** (4) = 9600 bps. • **19.2** (5) = 19200 bps. • **38.4** (6) = 38400 bps. • **115** (7) = 115200 bps.	Auto / 1,2 2,4 / 4,8 9,6 / 19,2 38,4 / 115	5	num
FRA	Modbus parity bit selection. • **Auto** (0) = Automatic. • **8e1** (1) = Even. • **8o1** (2) = Odd. • **8n2** (3) = None.	Auto / 8e1 8o1 / 8n2	1	num
SlaveID	Device address.	1...247	1	num
AutoDet	Auto detection.	0/1	0	num

CHAPTER 10
MODBUS COMMUNICATION

This chapter describes the Modbus layout, the communication and status LEDs, the line termination mode, the settings and supported functions.

10.1. Configuration with Modbus RTU

The Modbus protocol is a master-slave protocol. It allows for a single master to request answers from the slaves or react to the request. The master can address the individual slaves or send a broadcast message to all the slaves. The slaves return a message (answer) to the requests that are posed to them individually. The slaves do not answer the broadcast requests coming from the master.

NOTE: The Modbus standard used by **Eliwell** employs the RTU code for data transmission.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Do not use more than 1 master on the Modbus network. If several masters manage to communicate on simultaneous network, the I/O may operate irregularly.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

10.1.1. Data format (RTU)

The coding model used defines the structure of messages transmitted on the network and the way in which this information is deciphered. The coding type is usually chosen according to specific parameters (baud rate, parity, etc.) some devices only support certain coding models. However, the model use must be the same as those used for all devices, connected to a Modbus network.

Parameter setting allows the integral configuration of the device.
Changes can be made via:

- Device.
- SD Card.
- Sending data via Modbus protocol directly to an individual controller or broadcasting it using the address 0 (broadcast).

For the connection diagram using Modbus see **Wiring the Modbus serial line on page 58**.

10.1.2. Serial ports

The following figure shows the connectors of the serial line.

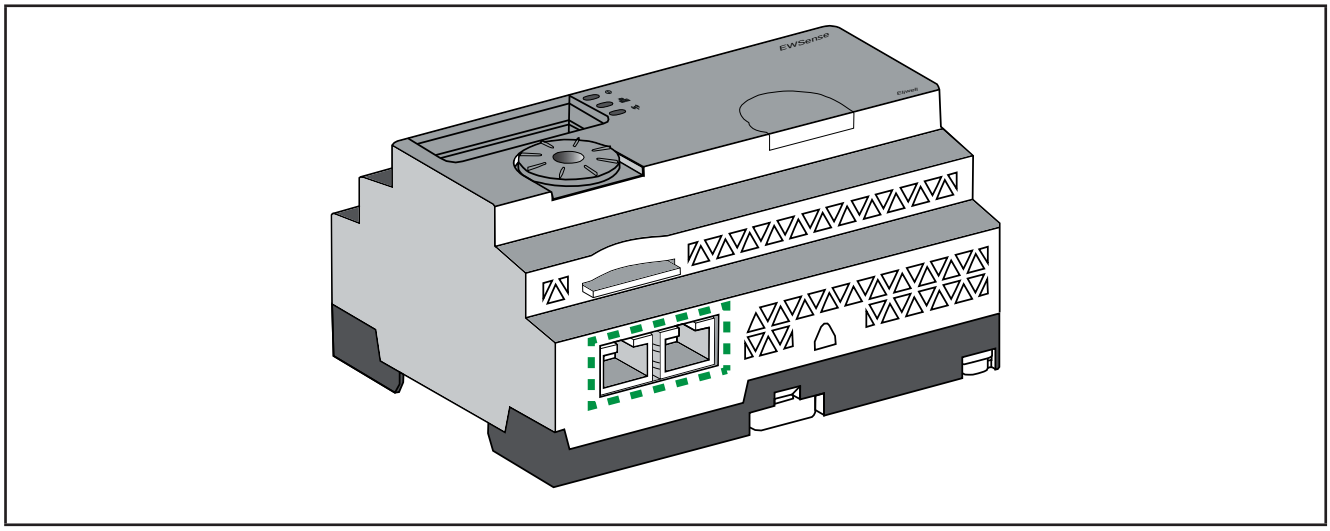


Fig. 43. RJ45 connectors of the serial line

EWSense Gate has a communication port of the Modbus serial line fitted with 2 RJ45 connectors. This port allows for the devices to be wired without using a hub.

RJ45 layout description

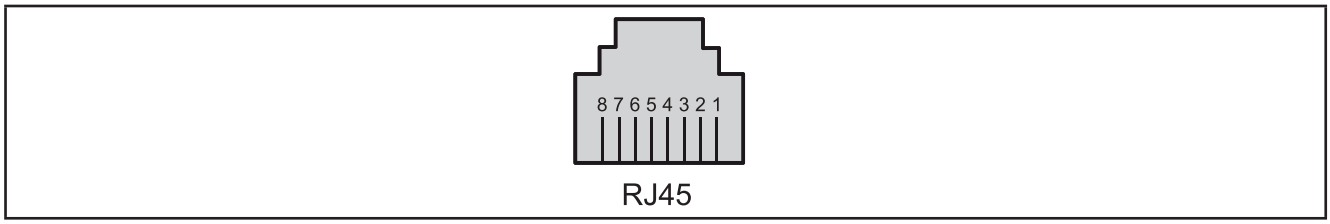


Fig. 44. RJ45 connectors layout

Pin RJ45	Signal	Description
1	Reserved	---
2	Reserved	---
3	Reserved	---
4	D1	D1 (A+)
5	D0	D0 (B-)
6	Reserved	---
7	Reserved	Reserved (5 - 24 Vdc)
8	Common	Common signal and power supply

Wiring the Modbus serial line

EWSense Gate can be connected directly to a supervision system at a max. distance of 20 m (65.62 ft), as illustrated in the following figure:

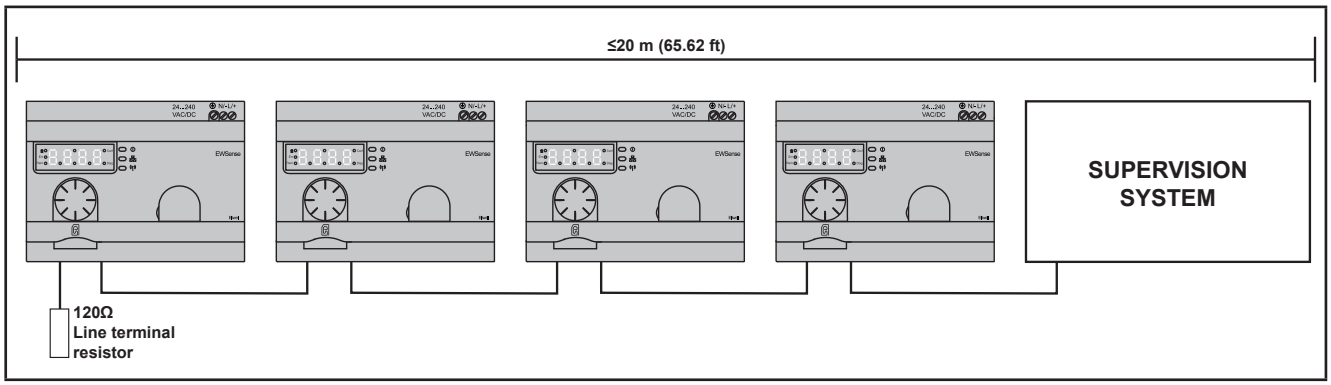


Fig. 45. Modbus serial line maximum length

The following figure indicates the correct procedure to connect and disconnect the Modbus serial line wire in the RJ45 connector:

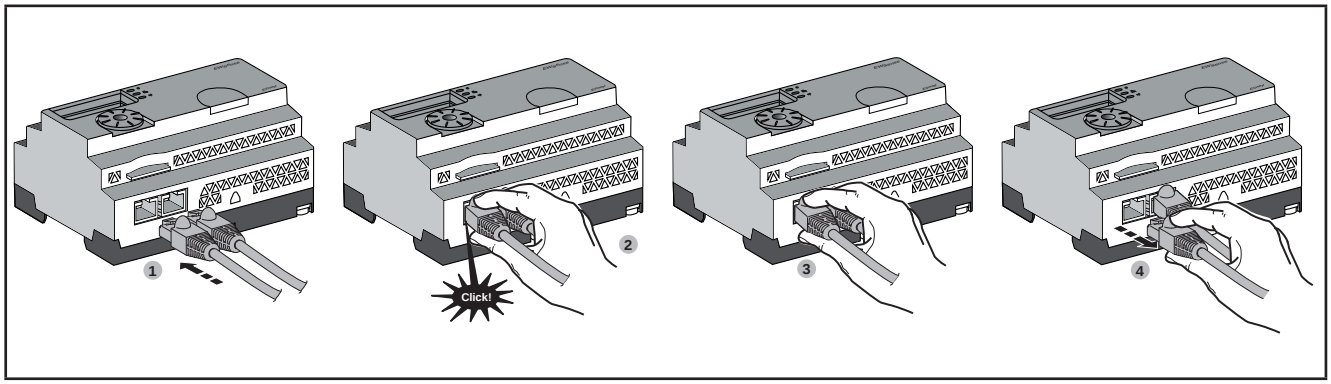


Fig. 46. Modbus serial line connection on the RJ45 connector

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use a Modbus serial line wire of no more than 20m in length (65.62 ft).
- Add a 120 Ohm termination line if EWSense Gate is located at the end of the Modbus serial line.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: In order to monitor any loss of data resulting from an interruption in **EWSense Gate** and **EWSense Temp** communication, provide an alarm signal in the supervision system.

10.2. Modbus settings and supported functions

Structure of Modbus messages

The Modbus protocol uses 16 bit (registers) words split in 2 bytes of 8 bits each. A Modbus message starts with a heading followed by a 1 byte address. A Modbus message uses a Modbus function as first byte. The following table supplies the full structure of an RTU Modbus message:

	Modbus Messages		
Address	**Function code**	**Data**	**CRC**
1 byte	1 byte	N-byte field	2 byte

List of the supported commands

The following table provides a list of the Modbus commands:

Modbus Command [dec (Hex) index]	Sub function: Modbus Encapsulated Interface	Command description
01 (0001 H)	---	Reading the spools.
03 (0003 H)	---	Reading of the maintenance registers.
06 (0006 H)	---	Writing of a single register.
16 (0010 H)	---	Writing of n registers.
23 (0017 H)	---	Writing/reading of n registers.
43 (002BH)	**14 (000EH)**	Device identification reading.

NOTE: The registers can be read or written only if they are adjacent.

Spool reading (01):
This function code allows you to read the content of one or more spool statuses of non-consecutive spools in a slave.

Reading of the maintenance registers (03):
This function code allows you to read the content of one or more adjacent registers in a slave.

Writing of a register (06):
This function code is used to write the content of a register in a slave.

Writing of n registers (16):
This function code allows you to read the content of one or more non-consecutive registers in a slave.

Reading/Writing of n registers (23):
This function code is used to carry out a combination of reading and writing of n registers.

Identification (43 Modbus Encapsulated Interface 14):
This function code allows you to read the identification and other information relative to the physical description of a slave.

List of identification registers

The Modbus identification registers are listed in the table below:

Identification	Register Name	Value	Data type
00 (0000 H)	VendorName	Schneider Electric	String ASCII
01 (0001 H)	ProductCode	ZBRN12: 052849	
02 (0002 H)	MajorMinorRevision	1.0 for the first official version	
03 (0003 H)	VendorUrl	http://www.schneider-electric.com	
04 (0004 H)	ProductName	EWSense	
05 (0005 H)	ModelName	ZBRN12	

Interruption code

Function code	Interruption code	Description
03 H	02 H	One of the registers is non-existent.
	03 H	Incorrect register number.
	04 H	Value not available.
06 H	02 H	The register is non-existent.
	04 H	Invalid value or register in read only.
10 H	02 H	The register is non-existent.
	03 H	Incorrect register number.
	04 H	Invalid value or register in read only.
16 H	02 H	The register is non-existent.
	04 H	Invalid value or register in read only.
17 H	02 H	The register is non-existent.
	03 H	Incorrect register number.
	04 H	Invalid value or register in read only.
2B H	01 H	Modbus Encapsulated Interface different from 14.
	02 H	The identification is non-existent.
	03 H	Identification > 4 or = 0.

10.3. Storage mapping

All the addresses below are expressed in the standard IEC %MW format.
Add 1 to each address to access the Modbus registers.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Do not write or read the addresses of the registers not mentioned in this document.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

All the registers used are 16 bit.

Input channels

Register address	Name	Access type	Input channel	Channel status	Description
0	Register of input 1	R	0...15	0: disabled 1: enabled	Store the status (0 or 1) of the input channels from 0 to 15.
1	Register of input 2	R	16...31	0: disabled 1: enabled	Store the status (0 or 1) of the input channels from 16 to 31.
2	Register of input 3	R	32...47	0: disabled 1: enabled	Store the status (0 or 1) of the input channels from 32 to 47.
3	Register of input 4	R	48...59	0: disabled 1: enabled	Store the status (0 or 1) of the input channels from 48 to 59.
R = Read only.					

Register of input 1:

A 16 bit register stores the status of the channels from 0 to 15. A bit is assigned to an input channel to store the input status as 0 to 1.

Register of input 2:

A 16 bit register stores the status of the channels from 16 to 31. A bit is assigned to an input channel to store the input status as 0 to 1.

Register of input 3:

A 16 bit register stores the status of the channels from 32 to 47. A bit is assigned to an input channel to store the input status as 0 to 1.

Register of input 4:

A 16 bit register stores the status of the channels from 48 to 59. A bit is assigned to an input channel to store the input status as 0 to 1.

NOTE: 12 bit of the 16 bit of the register are used to store the input channel status.

Channel configuration

Register address	Name	Access type	Input channel	Channel status	Description
6000	Waiting time	RW	---	**0**: 100 ms **1**: 200 ms **2**: 300 ms **3**: 400 ms **4**: 500 ms **5**: 1 s	Store the waiting time for all the input channels.
6100-6159	List of settings	RW	0...59	Bit from 0 to 7: **0**: the channel is disabled. **1**: the transmitter 1 type is used. Bit from 8 to 15 not used.	Store the type of transmitter used.
6160-6399	Reserved	---	---	---	---
6400-6519	ID/MAC transmitter addresses	RW	0...59	**srcID0**: indicates the first byte of the MAC address. **srcID1**: indicates the second byte of the MAC address. **srcID2**: indicates the third byte of the MAC address. **srcID3**: indicates the fourth byte of the MAC address.	Stores the MAC addresses of the transmitters. 2 registers are used to store the MAC address of 1 transmitter. Example: ID transmitter (written on the label of the transmitter) = 030079B1. 6410–6411 registers, channel of input 5. 6410: st**o**re 0300 (2 bytes of the ID transmitter). 6411: store 79B1 (2 bytes of the ID transmitter).
RW = Reading and writing.					

Waiting time:

a 16 bit register stores the waiting time of the input channels.

List of settings:

a 16 bit register stores the details of the transmitters used.

Transmitter addresses/MAC:

Two 16 bit registers store the MAC address of the transmitters.

The first byte of the MAC address is stored in 8 bit of the register 1.

The second byte of the MAC address is stored in 8 bit of the register 1.

The third byte of the MAC address is stored in 8 bit of the register 2.

The fourth byte of the MAC address is stored in 8 bit of the register 2.

Sensors data

Channel	Register address	Name	Access type	Description
Channel 0	**10**	Type	R	Sensor type.
	11	RSSI	R	Wireless signal strength.
	12	Timestamp 1	R	Every time the EWSense Gate receives a data from EWSense Temp, it records the internal time counter value in Timestamp. This value remains stored in the memory until a new data is received from EWSense Temp. **Timestamp value** is composed by two WORD • **Timestamp 1** = most significant WORD • **Timestamp 2** = least significant WORD Timestap is an adimensional number (from 0 to 2^32) which represents the circular internal time counter from device power-on. To convert the Timestamp value in seconds, multiply by **0,032.**
	13	Timestamp 2	R	
	14	Battery voltage	R	Sensor battery voltage level.
	16	Temperature	R	Temperature read by the sensor.
Channel 1	**43**	Type	R	Sensor type.
	44	RSSI	R	Wireless signal strength.
	45	Timestamp 1	R	Timestamp value. Same as channel **0**.
	46	Timestamp 2	R	
	47	Battery voltage	R	Sensor battery voltage level.
	49	Temperature	R	Temperature read by the sensor.
Channel 2	**76**	Type	R	Sensor type.
	77	RSSI	R	Wireless signal strength.
	78	Timestamp 1	R	Timestamp value. Same as channel **0**.
	79	Timestamp 2	R	
	80	Battery voltage	R	Sensor battery voltage level.
	82	Temperature	R	Temperature read by the sensor.
Channel 3	**109**	Type	R	Sensor type.
	110	RSSI	R	Wireless signal strength.
	111	Timestamp 1	R	Timestamp value. Same as channel **0**.
	112	Timestamp 2	R	
	113	Battery voltage	R	Sensor battery voltage level.
	115	Temperature	R	Temperature read by the sensor.
Channel 4	**142**	Type	R	Sensor type.
	143	RSSI	R	Wireless signal strength.
	144	Timestamp 1	R	Timestamp value. Same as channel **0**.
	145	Timestamp 2	R	
	146	Battery voltage	R	Sensor battery voltage level.
	148	Temperature	R	Temperature read by the sensor.
Channel 5	**175**	Type	R	Sensor type.
	176	RSSI	R	Wireless signal strength.
	177	Timestamp 1	R	Timestamp value. Same as channel **0**.
	178	Timestamp 2	R	
	179	Battery voltage	R	Sensor battery voltage level.
	181	Temperature	R	Temperature read by the sensor.
Channel 6	**208**	Type	R	Sensor type.
	209	RSSI	R	Wireless signal strength.
	210	Timestamp 1	R	Timestamp value. Same as channel **0**.
	211	Timestamp 2	R	
	212	Battery voltage	R	Sensor battery voltage level.
	214	Temperature	R	Temperature read by the sensor.

Channel	Register address	Name	Access type	Description
Channel 7	**241**	Type	R	Sensor type.
	242	RSSI	R	Wireless signal strength.
	243	Timestamp 1	R	Timestamp value. Same as channel **0**.
	244	Timestamp 2	R	
	245	Battery voltage	R	Sensor battery voltage level.
	247	Temperature	R	Temperature read by the sensor.
Channel 8	**274**	Type	R	Sensor type.
	275	RSSI	R	Wireless signal strength.
	276	Timestamp 1	R	Timestamp value. Same as channel **0**.
	277	Timestamp 2	R	
	278	Battery voltage	R	Sensor battery voltage level.
	280	Temperature	R	Temperature read by the sensor.
Channel 9	**307**	Type	R	Sensor type.
	308	RSSI	R	Wireless signal strength.
	309	Timestamp 1	R	Timestamp value. Same as channel **0**.
	310	Timestamp 2	R	
	311	Battery voltage	R	Sensor battery voltage level.
	313	Temperature	R	Temperature read by the sensor.
Channel 10	**340**	Type	R	Sensor type.
	341	RSSI	R	Wireless signal strength.
	342	Timestamp 1	R	Timestamp value. Same as channel **0**.
	343	Timestamp 2	R	
	344	Battery voltage	R	Sensor battery voltage level.
	346	Temperature	R	Temperature read by the sensor.
Channel 11	**373**	Type	R	Sensor type.
	374	RSSI	R	Wireless signal strength.
	375	Timestamp 1	R	Timestamp value. Same as channel **0**.
	376	Timestamp 2	R	
	377	Battery voltage	R	Sensor battery voltage level.
	379	Temperature	R	Temperature read by the sensor.
Channel 12	**406**	Type	R	Sensor type.
	407	RSSI	R	Wireless signal strength.
	408	Timestamp 1	R	Timestamp value. Same as channel **0**.
	409	Timestamp 2	R	
	410	Battery voltage	R	Sensor battery voltage level.
	412	Temperature	R	Temperature read by the sensor.
Channel 13	**439**	Type	R	Sensor type.
	440	RSSI	R	Wireless signal strength.
	441	Timestamp 1	R	Timestamp value. Same as channel **0**.
	442	Timestamp 2	R	
	443	Battery voltage	R	Sensor battery voltage level.
	445	Temperature	R	Temperature read by the sensor.
Channel 14	**472**	Type	R	Sensor type.
	473	RSSI	R	Wireless signal strength.
	474	Timestamp 1	R	Timestamp value. Same as channel **0**.
	475	Timestamp 2	R	
	476	Battery voltage	R	Sensor battery voltage level.
	478	Temperature	R	Temperature read by the sensor.
Channel 15	**505**	Type	R	Sensor type.
	506	RSSI	R	Wireless signal strength.
	507	Timestamp 1	R	Timestamp value. Same as channel **0**.
	508	Timestamp 2	R	
	509	Battery voltage	R	Sensor battery voltage level.
	511	Temperature	R	Temperature read by the sensor.

Channel	Register address	Name	Access type	Description
Channel 16	**538**	Type	R	Sensor type.
	539	RSSI	R	Wireless signal strength.
	540	Timestamp 1	R	Timestamp value. Same as channel **0**.
	541	Timestamp 2	R	
	542	Battery voltage	R	Sensor battery voltage level.
	544	Temperature	R	Temperature read by the sensor.
Channel 17	**571**	Type	R	Sensor type.
	572	RSSI	R	Wireless signal strength.
	573	Timestamp 1	R	Timestamp value. Same as channel **0**.
	574	Timestamp 2	R	
	575	Battery voltage	R	Sensor battery voltage level.
	577	Temperature	R	Temperature read by the sensor.
Channel 18	**604**	Type	R	Sensor type.
	605	RSSI	R	Wireless signal strength.
	606	Timestamp 1	R	Timestamp value. Same as channel **0**.
	607	Timestamp 2	R	
	608	Battery voltage	R	Sensor battery voltage level.
	610	Temperature	R	Temperature read by the sensor.
Channel 19	**637**	Type	R	Sensor type.
	638	RSSI	R	Wireless signal strength.
	639	Timestamp 1	R	Timestamp value. Same as channel **0**.
	640	Timestamp 2	R	
	641	Battery voltage	R	Sensor battery voltage level.
	643	Temperature	R	Temperature read by the sensor.
Channel 20	**670**	Type	R	Sensor type.
	671	RSSI	R	Wireless signal strength.
	672	Timestamp 1	R	Timestamp value. Same as channel **0**.
	673	Timestamp 2	R	
	674	Battery voltage	R	Sensor battery voltage level.
	676	Temperature	R	Temperature read by the sensor.
Channel 21	**703**	Type	R	Sensor type.
	704	RSSI	R	Wireless signal strength.
	705	Timestamp 1	R	Timestamp value. Same as channel **0**.
	706	Timestamp 2	R	
	707	Battery voltage	R	Sensor battery voltage level.
	709	Temperature	R	Temperature read by the sensor.
Channel 22	**736**	Type	R	Sensor type.
	737	RSSI	R	Wireless signal strength.
	738	Timestamp 1	R	Timestamp value. Same as channel **0**.
	739	Timestamp 2	R	
	740	Battery voltage	R	Sensor battery voltage level.
	742	Temperature	R	Temperature read by the sensor.
Channel 23	**769**	Type	R	Sensor type.
	770	RSSI	R	Wireless signal strength.
	771	Timestamp 1	R	Timestamp value. Same as channel **0**.
	772	Timestamp 2	R	
	773	Battery voltage	R	Sensor battery voltage level.
	775	Temperature	R	Temperature read by the sensor.
Channel 24	**802**	Type	R	Sensor type.
	803	RSSI	R	Wireless signal strength.
	804	Timestamp 1	R	Timestamp value. Same as channel **0**.
	805	Timestamp 2	R	
	806	Battery voltage	R	Sensor battery voltage level.
	808	Temperature	R	Temperature read by the sensor.

Channel	Register address	Name	Access type	Description
Channel 25	**835**	Type	R	Sensor type.
	836	RSSI	R	Wireless signal strength.
	837	Timestamp 1	R	Timestamp value. Same as channel **0**.
	838	Timestamp 2	R	
	839	Battery voltage	R	Sensor battery voltage level.
	841	Temperature	R	Temperature read by the sensor.
Channel 26	**868**	Type	R	Sensor type.
	869	RSSI	R	Wireless signal strength.
	870	Timestamp 1	R	Timestamp value. Same as channel **0**.
	871	Timestamp 2	R	
	872	Battery voltage	R	Sensor battery voltage level.
	874	Temperature	R	Temperature read by the sensor.
Channel 27	**901**	Type	R	Sensor type.
	902	RSSI	R	Wireless signal strength.
	903	Timestamp 1	R	Timestamp value. Same as channel **0**.
	904	Timestamp 2	R	
	905	Battery voltage	R	Sensor battery voltage level.
	907	Temperature	R	Temperature read by the sensor.
Channel 28	**934**	Type	R	Sensor type.
	935	RSSI	R	Wireless signal strength.
	936	Timestamp 1	R	Timestamp value. Same as channel **0**.
	937	Timestamp 2	R	
	938	Battery voltage	R	Sensor battery voltage level.
	940	Temperature	R	Temperature read by the sensor.
Channel 29	**967**	Type	R	Sensor type.
	968	RSSI	R	Wireless signal strength.
	969	Timestamp 1	R	Timestamp value. Same as channel **0**.
	970	Timestamp 2	R	
	971	Battery voltage	R	Sensor battery voltage level.
	973	Temperature	R	Temperature read by the sensor.
Channel 30	**1000**	Type	R	Sensor type.
	1001	RSSI	R	Wireless signal strength.
	1002	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1003	Timestamp 2	R	
	1004	Battery voltage	R	Sensor battery voltage level.
	1006	Temperature	R	Temperature read by the sensor.
Channel 31	**1033**	Type	R	Sensor type.
	1034	RSSI	R	Wireless signal strength.
	1035	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1036	Timestamp 2	R	
	1037	Battery voltage	R	Sensor battery voltage level.
	1039	Temperature	R	Temperature read by the sensor.
Channel 32	**1066**	Type	R	Sensor type.
	1067	RSSI	R	Wireless signal strength.
	1068	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1069	Timestamp 2	R	
	1070	Battery voltage	R	Sensor battery voltage level.
	1072	Temperature	R	Temperature read by the sensor.
Channel 33	**1099**	Type	R	Sensor type.
	1100	RSSI	R	Wireless signal strength.
	1101	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1102	Timestamp 2	R	
	1103	Battery voltage	R	Sensor battery voltage level.
	1105	Temperature	R	Temperature read by the sensor.

Channel	Register address	Name	Access type	Description
Channel 34	**1132**	Type	R	Sensor type.
	1133	RSSI	R	Wireless signal strength.
	1134	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1135	Timestamp 2	R	
	1136	Battery voltage	R	Sensor battery voltage level.
	1138	Temperature	R	Temperature read by the sensor.
Channel 35	**1165**	Type	R	Sensor type.
	1166	RSSI	R	Wireless signal strength.
	1167	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1168	Timestamp 2	R	
	1169	Battery voltage	R	Sensor battery voltage level.
	1171	Temperature	R	Temperature read by the sensor.
Channel 36	**1198**	Type	R	Sensor type.
	1199	RSSI	R	Wireless signal strength.
	1200	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1201	Timestamp 2	R	
	1202	Battery voltage	R	Sensor battery voltage level.
	1204	Temperature	R	Temperature read by the sensor.
Channel 37	**1231**	Type	R	Sensor type.
	1232	RSSI	R	Wireless signal strength.
	1233	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1234	Timestamp 2	R	
	1235	Battery voltage	R	Sensor battery voltage level.
	1237	Temperature	R	Temperature read by the sensor.
Channel 38	**1264**	Type	R	Sensor type.
	1265	RSSI	R	Wireless signal strength.
	1266	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1267	Timestamp 2	R	
	1268	Battery voltage	R	Sensor battery voltage level.
	1270	Temperature	R	Temperature read by the sensor.
Channel 39	**1297**	Type	R	Sensor type.
	1298	RSSI	R	Wireless signal strength.
	1299	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1300	Timestamp 2	R	
	1301	Battery voltage	R	Sensor battery voltage level.
	1303	Temperature	R	Temperature read by the sensor.
Channel 40	**1330**	Type	R	Sensor type.
	1331	RSSI	R	Wireless signal strength.
	1332	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1333	Timestamp 2	R	
	1334	Battery voltage	R	Sensor battery voltage level.
	1336	Temperature	R	Temperature read by the sensor.
Channel 41	**1363**	Type	R	Sensor type.
	1364	RSSI	R	Wireless signal strength.
	1365	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1366	Timestamp 2	R	
	1367	Battery voltage	R	Sensor battery voltage level.
	1369	Temperature	R	Temperature read by the sensor.
Channel 42	**1396**	Type	R	Sensor type.
	1397	RSSI	R	Wireless signal strength.
	1398	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1399	Timestamp 2	R	
	1400	Battery voltage	R	Sensor battery voltage level.
	1402	Temperature	R	Temperature read by the sensor.

Channel	Register address	Name	Access type	Description
Channel 43	**1429**	Type	R	Sensor type.
	1430	RSSI	R	Wireless signal strength.
	1431	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1432	Timestamp 2	R	
	1433	Battery voltage	R	Sensor battery voltage level.
	1435	Temperature	R	Temperature read by the sensor.
Channel 44	**1462**	Type	R	Sensor type.
	1463	RSSI	R	Wireless signal strength.
	1464	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1465	Timestamp 2	R	
	1466	Battery voltage	R	Sensor battery voltage level.
	1468	Temperature	R	Temperature read by the sensor.
Channel 45	**1495**	Type	R	Sensor type.
	1496	RSSI	R	Wireless signal strength.
	1497	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1498	Timestamp 2	R	
	1499	Battery voltage	R	Sensor battery voltage level.
	1501	Temperature	R	Temperature read by the sensor.
Channel 46	**1528**	Type	R	Sensor type.
	1529	RSSI	R	Wireless signal strength.
	1530	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1531	Timestamp 2	R	
	1532	Battery voltage	R	Sensor battery voltage level.
	1534	Temperature	R	Temperature read by the sensor.
Channel 47	**1561**	Type	R	Sensor type.
	1562	RSSI	R	Wireless signal strength.
	1563	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1564	Timestamp 2	R	
	1565	Battery voltage	R	Sensor battery voltage level.
	1567	Temperature	R	Temperature read by the sensor.
Channel 48	**1594**	Type	R	Sensor type.
	1595	RSSI	R	Wireless signal strength.
	1596	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1597	Timestamp 2	R	
	1598	Battery voltage	R	Sensor battery voltage level.
	1600	Temperature	R	Temperature read by the sensor.
Channel 49	**1627**	Type	R	Sensor type.
	1628	RSSI	R	Wireless signal strength.
	1629	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1630	Timestamp 2	R	
	1631	Battery voltage	R	Sensor battery voltage level.
	1633	Temperature	R	Temperature read by the sensor.
Channel 50	**1660**	Type	R	Sensor type.
	1661	RSSI	R	Wireless signal strength.
	1662	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1663	Timestamp 2	R	
	1664	Battery voltage	R	Sensor battery voltage level.
	1666	Temperature	R	Temperature read by the sensor.
Channel 51	**1693**	Type	R	Sensor type.
	1694	RSSI	R	Wireless signal strength.
	1695	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1696	Timestamp 2	R	
	1697	Battery voltage	R	Sensor battery voltage level.
	1699	Temperature	R	Temperature read by the sensor.

Channel	Register address	Name	Access type	Description
Channel 52	**1726**	Type	R	Sensor type.
	1727	RSSI	R	Wireless signal strength.
	1728	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1729	Timestamp 2	R	
	1730	Battery voltage	R	Sensor battery voltage level.
	1732	Temperature	R	Temperature read by the sensor.
Channel 53	**1759**	Type	R	Sensor type.
	1760	RSSI	R	Wireless signal strength.
	1761	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1762	Timestamp 2	R	
	1763	Battery voltage	R	Sensor battery voltage level.
	1765	Temperature	R	Temperature read by the sensor.
Channel 54	**1792**	Type	R	Sensor type.
	1793	RSSI	R	Wireless signal strength.
	1794	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1795	Timestamp 2	R	
	1796	Battery voltage	R	Sensor battery voltage level.
	1798	Temperature	R	Temperature read by the sensor.
Channel 55	**1825**	Type	R	Sensor type.
	1826	RSSI	R	Wireless signal strength.
	1827	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1828	Timestamp 2	R	
	1829	Battery voltage	R	Sensor battery voltage level.
	1831	Temperature	R	Temperature read by the sensor.
Channel 56	**1858**	Type	R	Sensor type.
	1859	RSSI	R	Wireless signal strength.
	1860	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1861	Timestamp 2	R	
	1862	Battery voltage	R	Sensor battery voltage level.
	1864	Temperature	R	Temperature read by the sensor.
Channel 57	**1891**	Type	R	Sensor type.
	1892	RSSI	R	Wireless signal strength.
	1893	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1894	Timestamp 2	R	
	1895	Battery voltage	R	Sensor battery voltage level.
	1897	Temperature	R	Temperature read by the sensor.
Channel 58	**1924**	Type	R	Sensor type.
	1925	RSSI	R	Wireless signal strength.
	1926	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1927	Timestamp 2	R	
	1928	Battery voltage	R	Sensor battery voltage level.
	1930	Temperature	R	Temperature read by the sensor.
Channel 59	**1957**	Type	R	Sensor type.
	1958	RSSI	R	Wireless signal strength.
	1959	Timestamp 1	R	Timestamp value. Same as channel **0**.
	1960	Timestamp 2	R	
	1961	Battery voltage	R	Sensor battery voltage level.
	1963	Temperature	R	Temperature read by the sensor.
***R** = Read only.*				

Sensors MAC identifier

Register address	Channel	Name	Access type	Description
6200	Channel 0	Ch00MAC34	R	MAC address - most significant WORD
6201		Ch00MAC12	R	MAC address - least significant WORD
6202	Channel 1	Ch01MAC34	R	MAC address - most significant WORD
6203		Ch01MAC12	R	MAC address - least significant WORD
6204	Channel 2	Ch02MAC34	R	MAC address - most significant WORD
6205		Ch02MAC12	R	MAC address - least significant WORD
6206	Channel 3	Ch03MAC34	R	MAC address - most significant WORD
6207		Ch03MAC12	R	MAC address - least significant WORD
6208	Channel 4	Ch04MAC34	R	MAC address - most significant WORD
6209		Ch04MAC12	R	MAC address - least significant WORD
6210	Channel 5	Ch05MAC34	R	MAC address - most significant WORD
6211		Ch05MAC12	R	MAC address - least significant WORD
6212	Channel 6	Ch06MAC34	R	MAC address - most significant WORD
6213		Ch06MAC12	R	MAC address - least significant WORD
6214	Channel 7	Ch07MAC34	R	MAC address - most significant WORD
6215		Ch07MAC12	R	MAC address - least significant WORD
6216	Channel 8	Ch08MAC34	R	MAC address - most significant WORD
6217		Ch08MAC12	R	MAC address - least significant WORD
6218	Channel 9	Ch09MAC34	R	MAC address - most significant WORD
6219		Ch09MAC12	R	MAC address - least significant WORD
6220	Channel 10	Ch10MAC34	R	MAC address - most significant WORD
6221		Ch10MAC12	R	MAC address - least significant WORD
6222	Channel 11	Ch11MAC34	R	MAC address - most significant WORD
6223		Ch11MAC12	R	MAC address - least significant WORD
6224	Channel 12	Ch12MAC34	R	MAC address - most significant WORD
6225		Ch12MAC12	R	MAC address - least significant WORD
6226	Channel 13	Ch13MAC34	R	MAC address - most significant WORD
6227		Ch13MAC12	R	MAC address - least significant WORD
6228	Channel 14	Ch14MAC34	R	MAC address - most significant WORD
6229		Ch14MAC12	R	MAC address - least significant WORD
6230	Channel 15	Ch15MAC34	R	MAC address - most significant WORD
6231		Ch15MAC12	R	MAC address - least significant WORD
6232	Channel 16	Ch16MAC34	R	MAC address - most significant WORD
6233		Ch16MAC12	R	MAC address - least significant WORD
6234	Channel 17	Ch17MAC34	R	MAC address - most significant WORD
6235		Ch17MAC12	R	MAC address - least significant WORD
6236	Channel 18	Ch18MAC34	R	MAC address - most significant WORD
6237		Ch18MAC12	R	MAC address - least significant WORD
6238	Channel 19	Ch19MAC34	R	MAC address - most significant WORD
6239		Ch19MAC12	R	MAC address - least significant WORD
6240	Channel 20	Ch20MAC34	R	MAC address - most significant WORD
6241		Ch20MAC12	R	MAC address - least significant WORD
6242	Channel 21	Ch21MAC34	R	MAC address - most significant WORD
6243		Ch21MAC12	R	MAC address - least significant WORD
6244	Channel 22	Ch22MAC34	R	MAC address - most significant WORD
6245		Ch22MAC12	R	MAC address - least significant WORD
6246	Channel 23	Ch23MAC34	R	MAC address - most significant WORD
6247		Ch23MAC12	R	MAC address - least significant WORD
6248	Channel 24	Ch24MAC34	R	MAC address - most significant WORD
6249		Ch24MAC12	R	MAC address - least significant WORD
6250	Channel 25	Ch25MAC34	R	MAC address - most significant WORD
6251		Ch25MAC12	R	MAC address - least significant WORD

Register address	Channel	Name	Access type	Description
6252	Channel 26	Ch26MAC34	R	MAC address - most significant WORD
6253		Ch26MAC12	R	MAC address - least significant WORD
6254	Channel 27	Ch27MAC34	R	MAC address - most significant WORD
6255		Ch27MAC12	R	MAC address - least significant WORD
6256	Channel 28	Ch28MAC34	R	MAC address - most significant WORD
6257		Ch28MAC12	R	MAC address - least significant WORD
6258	Channel 29	Ch29MAC34	R	MAC address - most significant WORD
6259		Ch29MAC12	R	MAC address - least significant WORD
6260	Channel 30	Ch30MAC34	R	MAC address - most significant WORD
6261		Ch30MAC12	R	MAC address - least significant WORD
6262	Channel 31	Ch31MAC34	R	MAC address - most significant WORD
6263		Ch31MAC12	R	MAC address - least significant WORD
6264	Channel 32	Ch32MAC34	R	MAC address - most significant WORD
6265		Ch32MAC12	R	MAC address - least significant WORD
6266	Channel 33	Ch33MAC34	R	MAC address - most significant WORD
6267		Ch33MAC12	R	MAC address - least significant WORD
6268	Channel 34	Ch34MAC34	R	MAC address - most significant WORD
6269		Ch34MAC12	R	MAC address - least significant WORD
6270	Channel 35	Ch35MAC34	R	MAC address - most significant WORD
6271		Ch35MAC12	R	MAC address - least significant WORD
6272	Channel 36	Ch36MAC34	R	MAC address - most significant WORD
6273		Ch36MAC12	R	MAC address - least significant WORD
6274	Channel 37	Ch37MAC34	R	MAC address - most significant WORD
6275		Ch37MAC12	R	MAC address - least significant WORD
6276	Channel 38	Ch38MAC34	R	MAC address - most significant WORD
6277		Ch38MAC12	R	MAC address - least significant WORD
6278	Channel 39	Ch39MAC34	R	MAC address - most significant WORD
6279		Ch39MAC12	R	MAC address - least significant WORD
6280	Channel 40	Ch40MAC34	R	MAC address - most significant WORD
6281		Ch40MAC12	R	MAC address - least significant WORD
6282	Channel 41	Ch41MAC34	R	MAC address - most significant WORD
6283		Ch41MAC12	R	MAC address - least significant WORD
6284	Channel 42	Ch42MAC34	R	MAC address - most significant WORD
6285		Ch42MAC12	R	MAC address - least significant WORD
6286	Channel 43	Ch43MAC34	R	MAC address - most significant WORD
6287		Ch43MAC12	R	MAC address - least significant WORD
6288	Channel 44	Ch44MAC34	R	MAC address - most significant WORD
6289		Ch44MAC12	R	MAC address - least significant WORD
6290	Channel 45	Ch45MAC34	R	MAC address - most significant WORD
6291		Ch45MAC12	R	MAC address - least significant WORD
6292	Channel 46	Ch46MAC34	R	MAC address - most significant WORD
6293		Ch46MAC12	R	MAC address - least significant WORD
6294	Channel 47	Ch47MAC34	R	MAC address - most significant WORD
6295		Ch47MAC12	R	MAC address - least significant WORD
6296	Channel 48	Ch48MAC34	R	MAC address - most significant WORD
6297		Ch48MAC12	R	MAC address - least significant WORD
6298	Channel 49	Ch49MAC34	R	MAC address - most significant WORD
6299		Ch49MAC12	R	MAC address - least significant WORD
6300	Channel 50	Ch50MAC34	R	MAC address - most significant WORD
6301		Ch50MAC12	R	MAC address - least significant WORD
6302	Channel 51	Ch51MAC34	R	MAC address - most significant WORD
6303		Ch51MAC12	R	MAC address - least significant WORD
6304	Channel 52	Ch52MAC34	R	MAC address - most significant WORD
6305		Ch52MAC12	R	MAC address - least significant WORD

Register address	Channel	Name	Access type	Description
6306	Channel 53	Ch53MAC34	R	MAC address - most significant WORD
6307		Ch53MAC12	R	MAC address - least significant WORD
6308	Channel 54	Ch54MAC34	R	MAC address - most significant WORD
6309		Ch54MAC12	R	MAC address - least significant WORD
6310	Channel 55	Ch55MAC34	R	MAC address - most significant WORD
6311		Ch55MAC12	R	MAC address - least significant WORD
6312	Channel 56	Ch56MAC34	R	MAC address - most significant WORD
6313		Ch56MAC12	R	MAC address - least significant WORD
6314	Channel 57	Ch57MAC34	R	MAC address - most significant WORD
6315		Ch57MAC12	R	MAC address - least significant WORD
6316	Channel 58	Ch58MAC34	R	MAC address - most significant WORD
6317		Ch58MAC12	R	MAC address - least significant WORD
6318	Channel 59	Ch59MAC34	R	MAC address - most significant WORD
6319		Ch59MAC12	R	MAC address - least significant WORD
***R** = Read only.*				

Module diagnostics

Register address	Name	Access type	Channel status	Description
4000	Device name	R	**1**: Reserved **2**: ZBRN12	Store the device name.
4001	Firmware version	R	Example for 0121: V01.21	Store the firmware version.
4002	Communication protocol	R	**0001**: ZBRN12 (Modbus serial line) **0002**: Reserved	Store the communication protocol used from the access point.
4003	Configuration	R	**0**: the device is not configured from the user interface. **1**: the device is configured from the user interface.	Store the device configuration status.
4004	Error detected	R	**0**: no error found. **1**: the SD card is not accessible. **2**: the SD card is protected in writing. **3**: insufficient space on the SD card. **4**: invalid communication configuration file. **5**: invalid device configuration file. **6**: in the SD card there is more than 1 configuration file available. **NOTE**: There should only be 1 configuration file in the appropriate directory of the SD card (see page 138). **7**: the configuration file is not available in the SD card. **8**: the watchdog has reset the device. **9**: detection of a radio communication error. **10**: detection of a radio chip error. **11**: the access point does not support the communication module. **12**: the communication module is not responding. **13**: the communication module is not in the access point. **14**: double IP address. **15**: invalid IP address.	Store the code of detected error.
4006	Radio channel	R	**11**...**26**: the radio channel with frequency 2.405 GHz (channel 11 - 26 IEEE 802.15.4). **NOTE**: (only for USA and Canada) Channel 26 unusable.	Store the details of the radio channel.
4007	Radio signal strength	R	**1**: insufficient signal. **2**: satisfactory signal.	Store the details of the signal strength.
4008 **4009**	Radio counter	RW	2 registers to store the double word value. **4008**: store the most significant word. **4009**: store the least significant word. The value is increased each time the access point receives a radio signal from an associated device.	Store the details of 4009 radio counter.
R = Read only. **RW** = Reading and writing.				

Diagnostics of the Modbus serial line communication

Register address	Name	Access type	Channel status	Description
5000	Actual transmission speed	R	**1**: 1200 bps **2**: 2400 bps **3**: 4800 bps **4**: 9600 bps **5**: 19,200 bps **6**: 38,400 bps **7**: 115,200 bps	Store the transmission speed at which the data is sent.
5001	Actual frame setting	R	**1**: the format of the frame sent is 8 bit of data, even parity and 1 bit stop. **2**: the format of the frame sent is 8 bit of data, uneven parity and 1 bit stop. **3**: the format of the frame sent is 8 bit of data, no parity and 2 bit stop	Store the format of the frame of data received from the access point.
5002	Number of packets received	R	2 registers to store the value of the double word. **5002**: store the most significant word. **5003**: store the least significant word.	Store the number of packets received from the access point.
5003		R		
5004	Number of damaged packets received	R	2 registers to store the value of the double word. **5004**: store the most significant word. **5005**: store the least significant word.	Store the number of damaged packets received from the access point.
5005		R		
5006	Number of packets sent	R	2 registers to store the value of the double word. **5006**: store the most significant word. **5007**: store the least significant word.	Store the number of packets sent from transmitters.
5007		R		
5008	Number of damaged packets sent	R	2 registers to store the value of the double word. **5008**: store the most significant word. **5009**: store the least significant word.	Store the number of damaged packets sent from transmitters.
5009		R		
R = Read only.				

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