seitron
Innovation Technology

USE AND MAINTENANCE

COOL GUARDIAN

REFRIGERANT GAS DETECTOR

INDEX

1.0 IMPORTANT INFORMATION

1.1 About this manual

◊ This manual describes the features, operation, and maintenance of the Cool Guardian gas detector.
◊ Read this operation and maintenance manual before using the instrument. The operator must be familiar with the manual and follow its directions carefully.
◊ This operation and maintenance manual is subject to change as a result of technical improvements-the manufacturer assumes no responsibility for any content or printing errors.

Respect your environment, think before you print the full manual.

1.2 Safety Warnings.

WARNING!
Read the information carefully and set up appropriate measures to ensure safety so as to avoid any danger to people and property.
Not observing these directions may cause danger to people, the plant, or the environment and may result in loss of liability.

WARNING! Proper disposal
Provide proper disposal of the battery pack at the end of their life only through the appropriate containers. This device should not be disposed of as municipal waste. Follow the requirements of current national law.

2.0 SAFETY

2.1 Security check

- Before using the product, it is essential to read and follow carefully the instructions in the manual.
- It is important to use the product only for the purposes specified in the document and in accordance with the stated conditions.
- If alarm conditions occur or limits are exceeded, the sensor must be recalibrated to ensure reliable performance.
- If the product is installed in an unenclosed environment with extreme temperature or humidity, recalibration is required.
- Gas flow path obstructions can cause a reduction or lack of gas detection and trigger alarms. Therefore, it is advisable to perform routine inspections and functional checks to ensure the proper operation of the gas detector.
- Except for maintenance operations described in the manual, the product should not be opened or serviced by unauthorized personnel to avoid voiding the warranty.
- It is operator's responsibility to maintain compliance with laws, rules, and regulations related to the use of the product.
- Only original parts and accessories provided by the manufacturer should be used to ensure the proper functioning of the product and maintain the validity of the warranty.
- The product must be activated only within an environment equipped with a risk-based alarm signaling system.
- It is mandatory to read and pay attention to the instructions in this user and maintenance manual.

2.2 Permitted Use of the Product

The Cool Guardian transmitter is a refrigerant gas detection device intended to be installed in defined and permanent locations in unclassified and non-hazardous areas for continuous monitoring of the area (external or internal) in the event of refrigerant gas leaks.

2.3 Prohibited Use of the Product

The use of Cool Guardian in application areas other than those mentioned in paragraph 2.2 "Permitted Use of the Product" is at the operator's risk, and the manufacturer assumes no responsibility for any loss, damage, or costs that may result.

The product is not certified or approved for operation in oxygen-enriched atmospheres, as this could cause personal injury or death. The product is not designed to be used in hazardous environments and does not provide intrinsic safety in such situations.

Cool Guardian must not be used in classified Ex zones.

Do not use the following substances in the immediate vicinity of the device:
- alcohol, gasoline
- solvents and thinners
- adhesives, paints, and silicone products
- cleaning detergents
- perfumes
- sprays in general

3.0 PRODUCT DESCRIPTION

3.1 General Information

A refrigerant gas detector is an essential tool for industries involved in refrigeration systems and HVAC (heating, ventilation, and air conditioning) equipment. These detectors are designed to monitor the presence of refrigerant gases within an environment. The operating principle of a refrigerant gas detector involves the use of sensors specifically calibrated to detect and measure the concentration of these gases in the air. When a refrigerant gas is present, the sensor detects it and triggers an alarm and/or a visual indication, alerting personnel to the potential leak.
There are several reasons why industries should use refrigerant gas detectors. First and foremost, by promptly identifying and reporting any refrigerant gas leaks, these detectors help ensure the safety of workers and the surrounding environment. Refrigerant gases can be harmful to human health and contribute to environmental degradation if released into the atmosphere. By using a detector, companies can prevent potential health risks and take necessary actions to mitigate leaks, thus protecting both employees and the ecosystem.
Additionally, refrigerant gas leaks can have significant economic implications for companies. Undetected leaks lead to refrigerant waste, which not only increases operational costs but also damages the overall efficiency of refrigeration systems. By using a gas detector, industries can identify leaks at an early stage, minimizing them and maximizing the lifespan and performance of their equipment. This proactive approach to leak detection also helps companies comply with environmental regulations and reduce their carbon footprint, promoting a sustainable and responsible image.
In conclusion, a refrigerant gas detector is a crucial tool for industries managing refrigeration systems. By utilizing this instrument, companies can prioritize worker safety, protect the environment, optimize operational efficiency, and comply with regulatory requirements. Investing in a refrigerant gas detector is a wise decision that can prevent potential hazards, minimize costs, and promote the sustainability of the sector.

The main features for this product are:

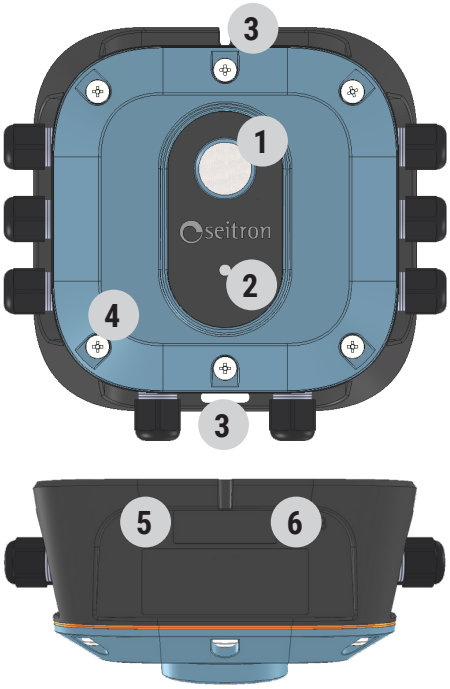
- Designed to detect refrigerant gas leaks in the environment for which it is calibrated (see marking on device for gas type and flow rate).
- Compact design, making it easy to fix on the wall.
- The sensor of the detector is positioned on the cover.
- Configurable analog output via the **Seitron Guard** App (4-20 mA / 0-10 Vdc).
- Three relay outputs for Alarm and Fault indications.
- RS-485 interface for communication with Modbus® RTU protocol (up to 32 detectors can be connected).
- Integrated acoustic and visual alarms to comply with refrigeration regulations.
- The Seitron Guard mobile app (available for Android and iOS) allows users to interface via Bluetooth® with the gas detector to facilitate device commissioning, configuration, and maintenance.

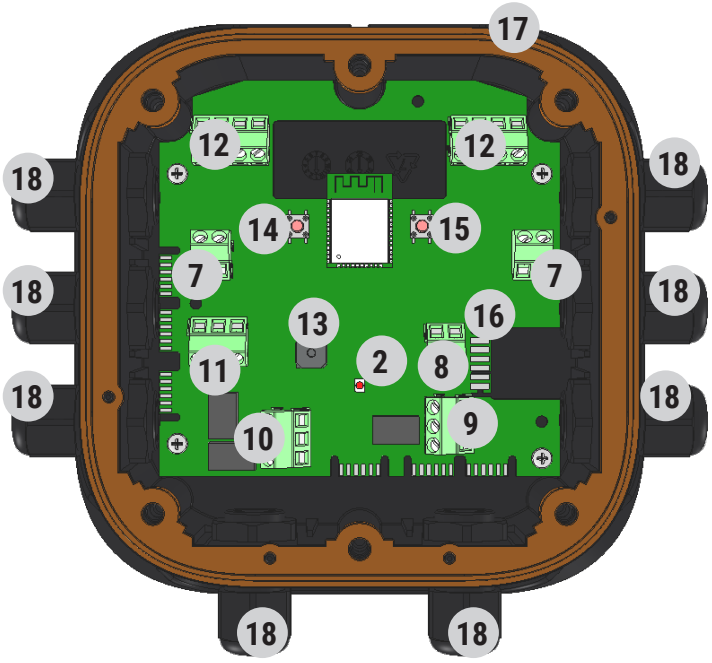
Main functions:

- Continuous monitoring of the surrounding environment for the presence of refrigerant gases.

3.1 Components

The instrument is equipped with a user interface consisting of: **one multicolor LED, one buzzer, two magnetic switches, and Bluetooth communication.**





COMPONENTS DESCRIPTION	
1	Sensitive Element.
2	Multicolor LED for transmitter status indication.
3	Wall mounting screw locations.
4	Screws for access to internal parts of the product.
5	Magnetic button “A”.
6	Magnetic button “B”.
7	Power terminals (x2).
8	Configurable analog output terminals 4-20 mA / 0-10 V via the Seitron Guard App.
9	Relay 1 (voltage-free changeover contacts): Alarm 1 threshold.
10	Relay 2 (voltage-free changeover contacts): Alarm 2 threshold.
11	Relay 3 (voltage-free changeover contacts): Alarm 3 threshold.
12	RS-485 port terminals with Modbus® RTU protocol (x2).
13	Buzzer for acoustic signaling.
14	Tactile button “SW1” (corresponding to magnetic button “A”).
15	Tactile button “SW2” (corresponding to magnetic button “B”).
16	Flat cable connection to the sensor.
17	Rubber gasket.
18	M16 cable glands (x8) for cable entry, with corresponding plugs included (x8).

4.0 TECHNICAL FEATURES

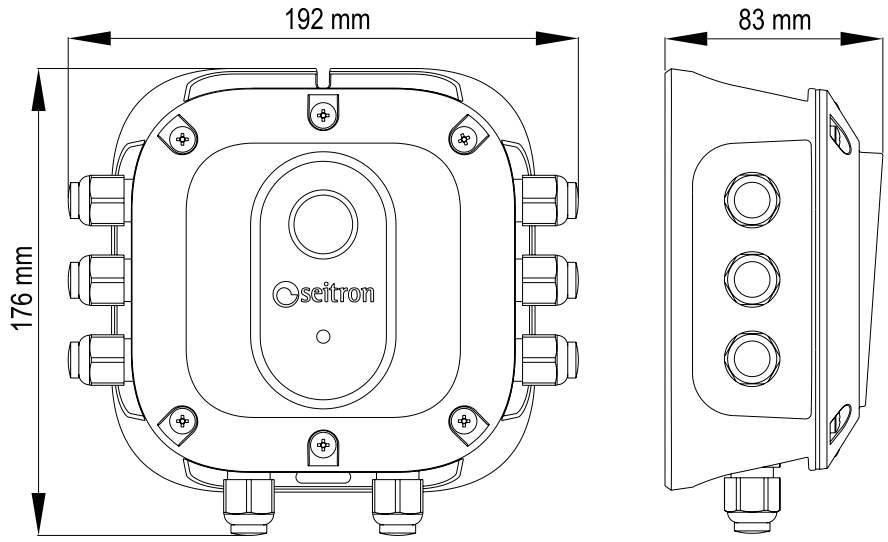
Power Supply Voltage:	12 .. 24 Vac ±10% or 12 .. 24 Vdc ±10%
Power absorption:	5 W
Relay Outputs:	Contact Rating: 3 x 1A 30 Vac (voltage-free).
Analog Output:	4-20mA / 0-10 Vdc / 1-5 Vdc / 0-5 Vdc / 2-10 Vdc configurable via Seitron Guard App.
Communication Port:	RS-485 with Modbus® RTU protocol. Up to 32 devices connectable.
Frequency:	2.4 .. 2.5 GHz
Modulation:	DSSS / OFDM / MIMO-OFDM
Max. Transmitted RF Power:	<100 mW
Buzzer:	100 dB @10 cm
Detected Gas:	Refer to detector marking.
Full Scale:	Refer to detector marking.
Sensor Warm-up Time:	Dependent on sensor type (minimum 3 minutes).
Protection Rating:	IP65 (with cables / plugs inserted into cable glands).
Operating Temperature*:	-40 .. +50 °C
Operating Humidity:	20% .. 90% RH (non-condensing).
Operating Pressure Range:	800 .. 1100 hPa

STORAGE

Temperature:	-40 .. +50 °C
Humidity:	20% .. 90% RH (non-condensing).

*: The actual operating temperature depends on the type of sensor used to detect the target gas.

4.1 Dimensions



5.0 INSTALLATION

5.1 General Information

To securely mount the transmitter on a wall, use appropriate accessories such as screws and wall plugs suitable for the mounting surface. Ensure that the transmitter's cover part with the roof is facing upwards to protect the sensor from potential dust buildup.
When considering the functional performance of the device, it's important to carefully plan the placement of transmitters within the environment being monitored.
Pay special attention to:

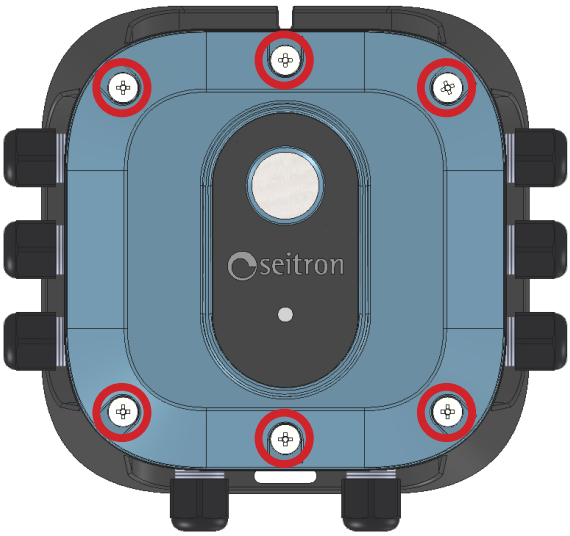
- Possible openings in walls and ceilings and air currents
- Composition and shape of the environment
- Size of the area to be protected
- Accessibility required for maintenance
- Gas density (whether heavier or lighter than air)
- Gas emission rate (flow)

The sensor's response time is closely related to its position in the environment and the type of gas being detected.
For gases to be detected, it's necessary to assess their relative density to air and position the transmitter accordingly.

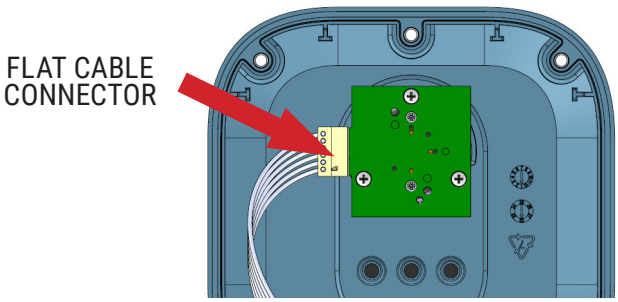
CAUTION
During the electrical connection phase, DO NOT let the cover/sensor hang from the flat cable. Doing so could damage the product.

5.2 Mechanical installation - Access to internal parts

1. Securely mount the transmitter on the wall using the two screw locations indicated with the number (3) in the '3.1 Components' section.
2. Unscrew the 6 screws on the cover to remove it from the base and access the internal parts of the transmitter.



3. Disconnect the flat cable from the sensor to avoid leaving the cover hanging on the flat cable.



4. Set aside the cover and rubber gasket so that they can be reinstalled later.
5. Proceed with the wiring of the electrical part as described in the following section.

5.3 Electrical connections

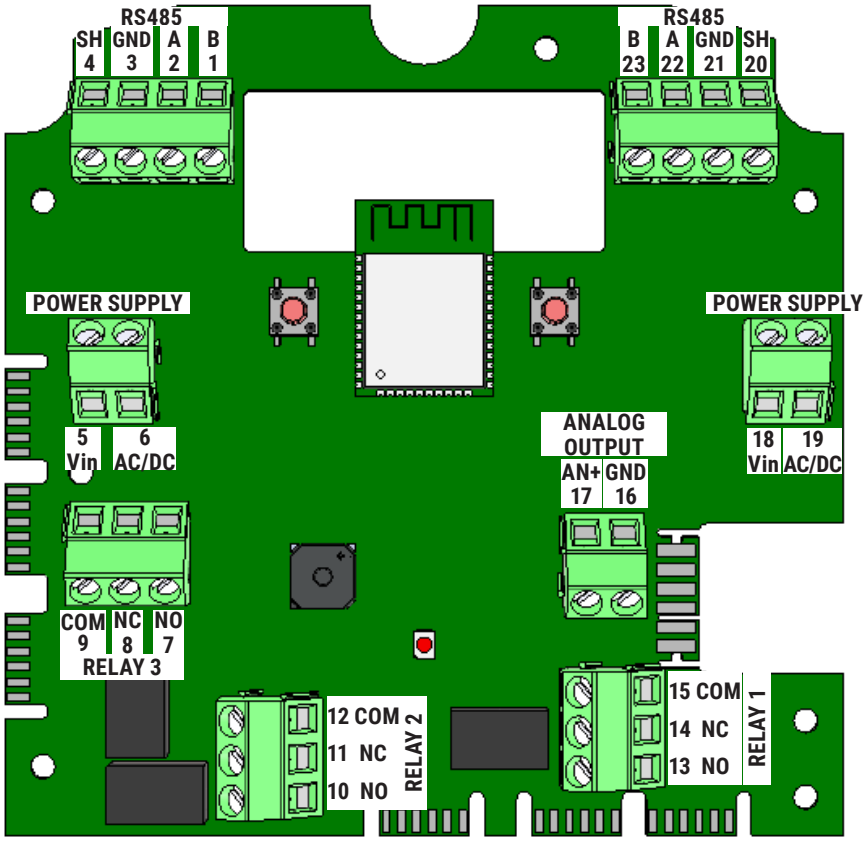
CAUTION

- **The installation and electrical connection of the device must be performed by qualified personnel and in compliance with current laws.**
- **Before making any connections, ensure that the power supply is disconnected.**
- **Through the RS-485 interface (RS-485 input terminals 1..4 - RS-485 output terminals 20..23 or vice versa), up to 32 devices can be connected. Connections must be made with twisted and shielded pair cables with characteristics equivalent to BELDEN 9841 or BELDEN 9842 cables. The total length of the RS-485 network must not exceed 1000 meters.**
- **All other connections must be made with cables of suitable section for the correct sizing of the system.**
- **With a single power supply, it is possible to power up to a maximum of 3 devices, using the Vin AC/DC terminals (power input terminals 5 and 6 - power output terminals 18 and 19 or vice versa).**
- **The maximum resistance applicable as a load on the 4-20 mA output line when the transmitter's power supply is 9.6 Vdc/Vac is 350 Ohms.**
- **Do not use the same conduit for signal and power cables.**

The detector is normally powered by a power supply with output at 12-24 Vdc / 12-24 Vac, with a possible backup system.

The analog output, terminals 16 and 17, can only be configured via the Seitron Guard App.
The detector leaves the factory with the analog output configured in 4..20 mA mode.

1. Locate terminal blocks.



2. Make the electrical connections, running the cables through the opening of the cable glands, following the directions below.

Creating an RS-485 Network

This section provides instructions for wiring a network of devices using the RS-485 interface with Modbus® RTU communication protocol.
Address configurations, baud rate, and parity settings can be set exclusively via the Seitron Guard app.

RS-485 CONNECTION CABLES

RS-485 network connections must be made with twisted and shielded pair cables with characteristics equivalent to BELDEN 9841 or BELDEN 9842 cables, as indicated in the following table:

TYPE	NO. COUPLES.	RESISTOR IN DC		NOMINAL IMPEDANCE (Ohm)	NOMINAL CAPACITY		AWG
		CONDUCTORS Ohm/km	SHIELD Ohm/km		BETWEEN CONDUCTORS pF/m	BETWEEN CONDUCTORS AND SHIELD pF/m	
BELDEN 9841	1	78,7	11,0	120	42,0	75,5	24 (0,25 mmq)
BELDEN 9842	2	78,7	7,2	120	42,0	75,5	24 (0,25 mmq)

- The total length of the RS-485 network must not exceed 1000 meters.
- The cable shield should be connected at only one end to the SH (shield) terminal on the first transmitter. A second ground connection would not ensure equipotentiality of the shield.
- Do not use the same conduit for RS-485 network cables and power or other high-power cables.
- It is not necessary to connect the device grounds together in an RS-485 network
- Sometimes, the simplicity of RS-485 wiring leads to neglecting simple precautions, which can be sources of errors or even cause network communication failures.

POWER CABLES

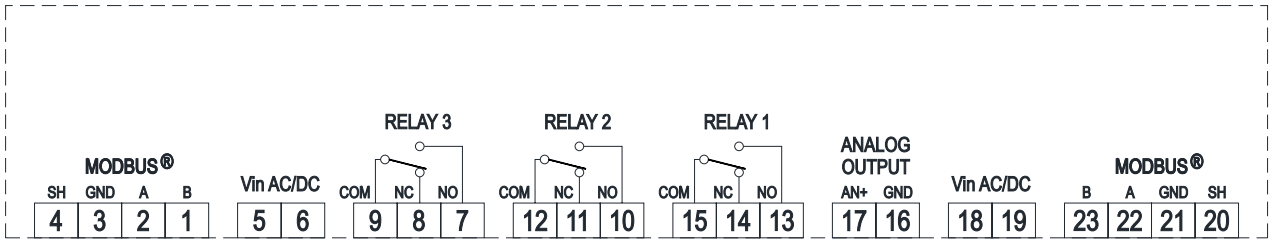
- Use flame-retardant cables of adequate cross-section, never less than 2.5 mm². Calculate the cable cross-section based on the length and number of connected transmitters, ensuring it falls within the power supply range that guarantees proper functioning of the devices.
- To avoid the use of conductors with a large cross-section, it is possible to power point-to-point devices using individual power supplies.
- In case of communication problems, for example with point-to-point power supply and devices not electrically grounded, it can be helpful to electrically connect the grounds of the devices together.
- In the case of devices with a grounded power supply (e.g., PCs), connecting the ground and earth together can cause problems.

EXAMPLES OF CONNECTION ERRORS

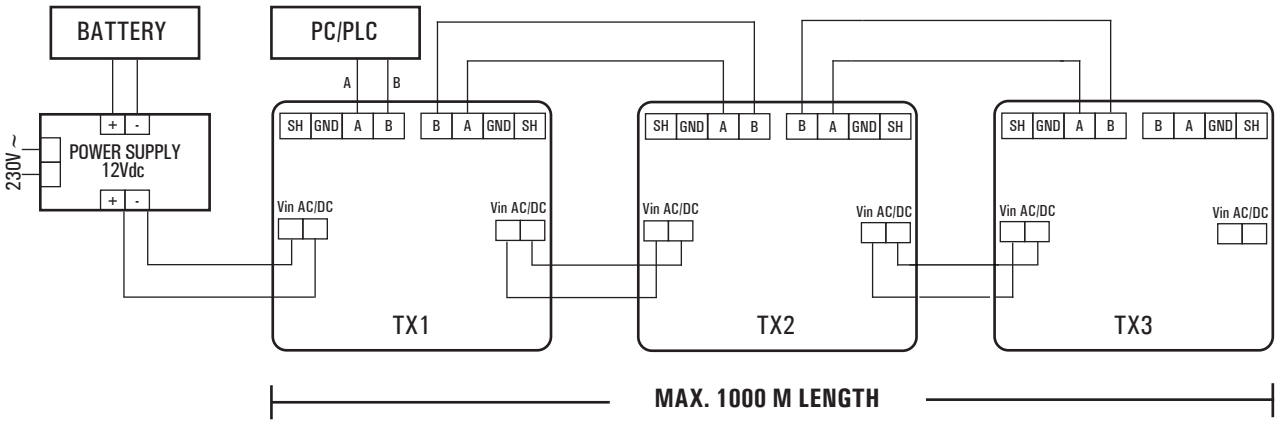
- Passing power and network cables inside the same duct.
- Passing cables near strong sources of interference, such as near power cables of electric motors or contactors.
- Ground and earth cables connected together.
- False contacts or improper electrical connections in junction boxes.
- Using cables unsuitable for RS-485 data transmission, such as non-twisted cables.
- Using cables with an inadequate cross-section.
- Excessive voltage drops on the power cable.

After wiring, it is recommended to perform a calibration test or functional verification of the device.

Wiring diagram



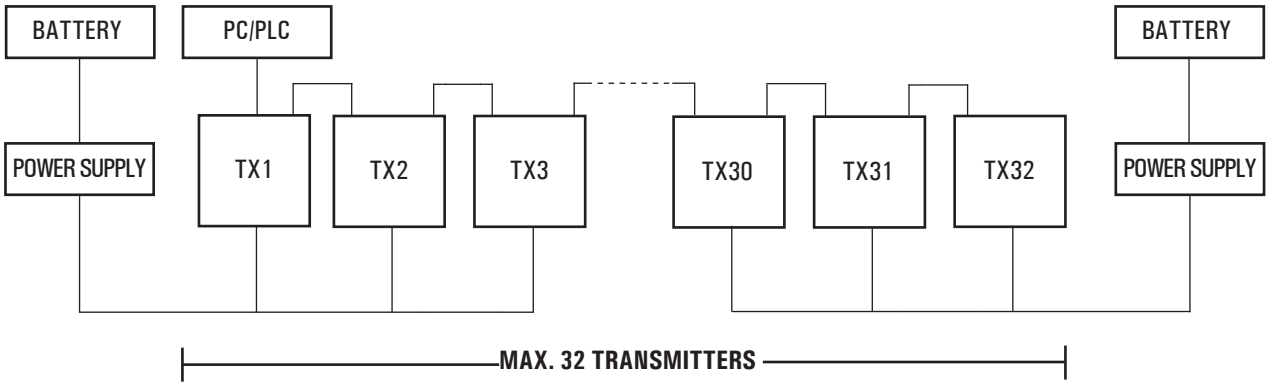
Example of implementing an RS-485 network with a 12 Vdc power supply, backup battery, and 3 transmitters



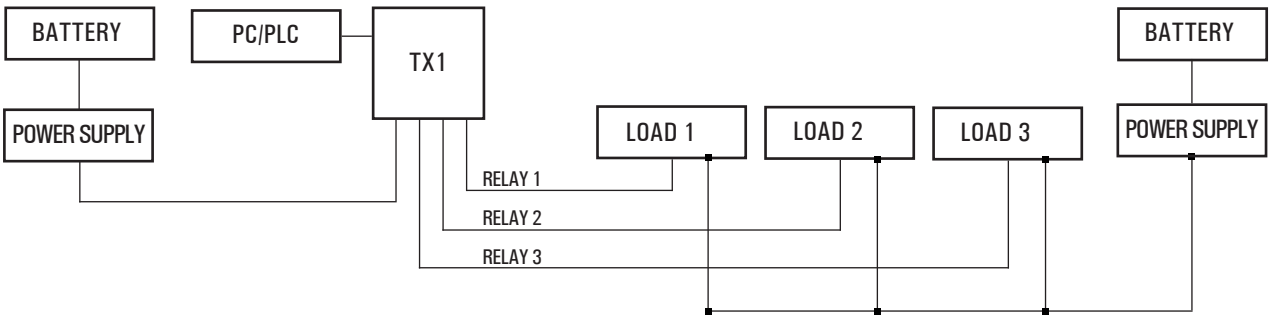
WARNING!

IN THIS EXAMPLE, THE 12 Vdc POWER SUPPLY CAN POWER A MAXIMUM OF 3 DEVICES AND IS SIZED TO DELIVER A MAXIMUM POWER OF 30 W.

Example of a logical diagram for implementing an RS-485 network with a power supply, backup battery and 32 transmitters



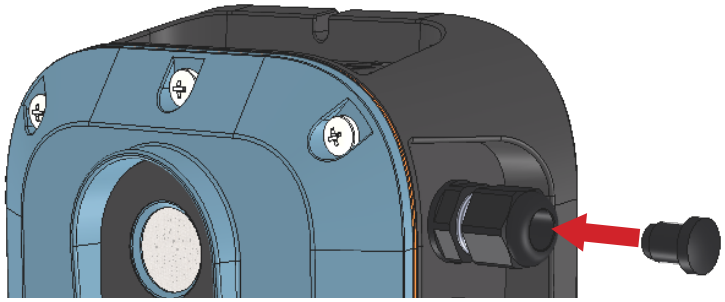
Example of logic diagram of connecting loads to the transmitter with separate power supply



5.4 Mechanical Installation - Closure

1. Remove all excess cables from the housing before securely fastening the cable glands.
   ALWAYS ensure that all cable glands are tightly secured and that unused cable glands are capped.
2. Place the rubber gasket on the base of the transmitter. Ensure that the gasket is correctly inserted, aligning the 4 holes of the gasket with the 4 pins on the product base.
3. Reconnect the flat cable connector to the sensor.
4. Ensure that no cables interfere with the sensor module.
5. Reposition the cover and screw in the six screws that keep it closed.

IMPORTANT
To achieve an adequate seal, the cover screws must be tightened to 15-20 lbf in (1.5-2.0 Nm).



6.0 COMMISSIONING

After completing the installation of the device in its final location and checking all connections for power and network, proceed as follows:

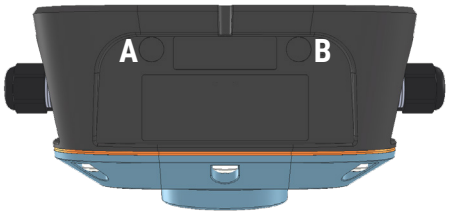
1. Power the device.
   The green LED flashes slowly (1 flash per second) indicating the warm-up phase, allowing the sensor to stabilize. After the warm-up phase, the LED remains solid green.
   The duration of the sensor warm-up phase varies and depends on the gas detected by the device.
   During normal operation and in the absence of alarm and/or fault conditions, the LED remains solid green.
2. At the first installation, it is necessary to configure the main parameters of the transmitter in the “Configuration” menu of the Seitron Guard App:
   - Alarms
   - Modbus® (in case of connection of the transmitter to the RS-485 network)
   - Analog output (in case the analog output is used)
   - Manual gas calibration (if the App is not used for sensor calibration)
   - Manual bump (if the App is not used for performing the sensor Bump test)
   - Analog output calibration (if the analog output is used)

For all details, see section “9.0 SEITRON GUARD APPLICATION”.

3. After completing the installation and configuration, **the manufacturer requires performing a Bump test to verify the device’s functionality**.
   If the Bump test fails, it is necessary to proceed with the gas sensor calibration.
   For all details regarding the execution of the Bump Test and Calibration, see the Quick Start Guide.

7.0 BUTTON FUNCTIONALITY

The following table summarizes the functions of the magnetic buttons "**A**" and "**B**":



The magnetic buttons "**A**" and "**B**" are activated by bringing the magnet, supplied with the calibration kit ACKC01, close to their respective locations.
The table shows the activation times for the functions, indicated by the LED lighting up in a specific color, starting from the initial condition of the LED being solid green.

	A	B	LED (solid)
Activation of Bluetooth® for pairing with the App.	1 < .. < 5 s		White
Deactivation of Bluetooth® if previously activated.	5 < .. < 10 s		Yellow
Starting Bump test from the transmitter, measurement acquisition in progress. Automatic exit for result.		1 < .. < 5 s	White
Input/output Zero calibration from transmitter (with Bluetooth® deactivated).	5 < .. < 10 s		Yellow
Input/output Span calibration from transmitter (with Bluetooth® deactivated).		5 < .. < 10 s	Yellow
Transmitter reboot.		10 < .. < 20 s	Fuchsia
Password reset.	> 20 s		Azure
Modbus® parameter reset.		> 20 s	Azure
Alarm reset (with latching activated).	SEQUENCE 10 < .. < 20 s Release and Repress 10 < .. < 20 s		Fuchsia Fuchsia

8.0 STATE DIAGNOSTIC LED

The device communicates with the user through a multicolored LED and a buzzer, which indicate the various states of the detector and the possible activation of alarm and/or fault relays.
Below is a summary table with the combinations of all possible LED states, buzzer, and relay outputs:

STATUS	OUTPUTS				
	LED	BUZZER	RELAY 1	RELAY 2	RELAY 3
Sensor warm up	Green 1 blink/s	OFF	OFF	OFF	OFF
Measure	Solid green on	OFF	OFF	OFF	OFF
Bluetooth activated	Solid green on	ON 1 beep / s	OFF	OFF	OFF
App connected	Blue 1 blink/s	OFF	OFF	OFF	OFF
Bump test in progress	Green 5 blinks/s	OFF	OFF	OFF	OFF
Bump test completed with positive result	Green 5 blinks/s	ON continuous 3 s	OFF	OFF	OFF
Bump test completed with negative result	Green 5 blinks/s	ON 5 beep	OFF	OFF	OFF
Zero calibration from transmitter enabled	Solid blue on	OFF	OFF	OFF	OFF
Zero calibration from transmitter, acquisition in progress	Blue 5 blinks/s	OFF	OFF	OFF	OFF
Zero calibration end from transmitter with positive result	Blue 1 blink/2 s	OFF	OFF	OFF	OFF
End Zero calibration from transmitter with negative result	RGB 1 blink/s	OFF	OFF	OFF	OFF
Span calibration from transmitter enabled	Solid red on	OFF	OFF	OFF	OFF
Span calibration from transmitter, acquisition in progress	Red 5 flashes/s	OFF	OFF	OFF	OFF
End Span calibration from transmitter with positive result	Red 1 blink/2 s	OFF	OFF	OFF	OFF
End calibration Span from transmitter with negative result	RGB 1 blink/s	OFF	OFF	OFF	OFF
ALARM 1 - MINIMUM threshold crossing	Red 1 blink/s	ON 1 beep / s	ON	OFF	OFF
ALARM 2 - MAXIMUM threshold exceeded	Red 2 flashes/s	ON 2 beep / s	ON	ON	OFF
Sensor not detected	RGB 1 blink/s	OFF	OFF	OFF	ON
Measurement error	Green 2 flashes/s	OFF	OFF	OFF	ON
Sensor communication error	Blue solid on	OFF	OFF	OFF	ON
Password reset	RGB 5 blinks/s	OFF	OFF	OFF	OFF
Modbus® parameters reset	RGB 5 blinks/s	OFF	OFF	OFF	OFF

9.0 SEITRON GUARD APPLICATION

Cool Guardian uses a mobile device application that allows users to interface with the gas transmitter.
The operating systems supported by the App are as follows:

Android from version 5.0 and higher

iOS from version 15.0 and higher

9.1 Installing and Starting the Seitron Guard App

See what is stated in the quick start guide.

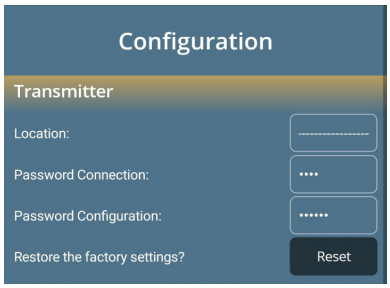
Each device is identified by a unique MAC code, which appears when pairing the transmitter with the Seitron Guard App or on the Home screen.
Only one transmitter can be connected to the App at a time.

The menus on the App's home screen and the transmitter parameters that can be configured through the App are explained in detail below.

9.1.1 Configuration menu

At the first installation, it is necessary to proceed with the configuration of the main transmitter parameters found in the 'Configuration' menu.
To save all the changes made to the configuration, press the 'Save' button at the bottom of the page.
The configurable parameters available in this menu are as follows:

Transmitter data configuration



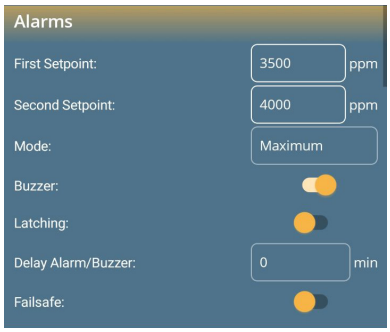
Location: Enter a name that easily identifies the transmitter.

Password Connection: It is possible to modify the password to access the App menus.

Password Configuration: It is possible to modify the password to access the configuration menus.

Restore the factory settings? By pressing Reset, all device parameters are set to factory conditions.

Alarm configuration



First setpoint: Lower alarm threshold.
The set value must be lower than the Second setpoint value.

Second setpoint: Upper alarm threshold.
The set value must be higher than the First setpoint value.

Mode: **Maximum**: the alarm triggers when the set threshold is exceeded (Default).
Minimum: the alarm triggers when the gas concentration falls below the set threshold value.

Buzzer: Enable/Disable the buzzer (**default enabled**)

Latching: Setting the relay reset mode. This parameter allows setting the mode for resetting the relays in case an abnormal condition is detected.

Enabled: If the relay is activated, it remains activated even if the triggering event is removed, meaning the relay is 'latched'. To reset the relay, refer to the table in Chapter 7.0 BUTTON CONFIGURATION.

Disabled (default): If the relay is activated and subsequently the triggering event disappears, the relay returns to its previous state, meaning the event is not stored.

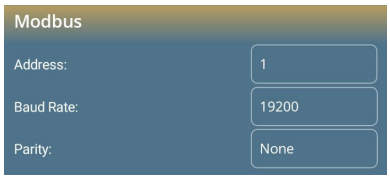
Alarm/Buzzer Delay: It is possible to set a delay time (in minutes) for signaling the alarm through the LED and the buzzer in case the alarm threshold is exceeded (either the first or second threshold). This is useful for very brief alarms that are considered tolerable by the user. In any case, it can be set from 0 to 15 minutes. The default setting is 0 minutes.

Failsafe mode: This parameter allows setting the logic of relay operation:

Disabled (default): the relays are energized in case of an abnormal event.

Enabled: the relays are normally energized. In case of an abnormal event, the relays are de-energized. Use this mode when a 'positive' logic is required, so that even in the event of a power failure, the relays are de-energized to ensure a higher level of safety.

Modbus® RTU configuration in the RS-485 network



Address: Set the transmitter's address (Default 1). It's important to ensure that all transmitters connected to the RS-485 interface have unique addresses to avoid conflicts.

Baud Rate: Set the transmission speed (Default 9600).

Parity: Set the parity bit of communication (Default: None).

Analog output configuration

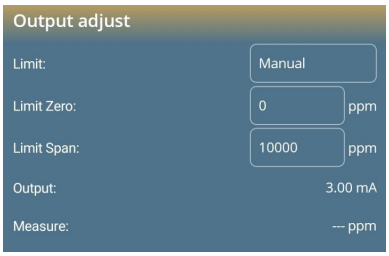
Set the signal to be applied to the analog output of the transmitter.

Once the output has been set, it is necessary to press the "Save" button (at the bottom of the page) to save the change and update the data shown in the next menu "Output Setting".

Select from:
4 - 20 mA (Default)
0 - 10 V
1 - 5 V
0 - 5 V
2 - 10 V

Analog output setting configuration

Sets the limit of Zero (minimum) and Span (maximum) relative to the sensor reading interval associated with the analog output.



Limit: **Auto**: Limits are set automatically according to the sensor (data cannot be changed).
Manual: Limits can be changed according to the needs of the installation.

Limit Zero: Minimum sensor reading limit associated with minimum analog output limit (in the example 0 ppm is associated with 4 mA).

Limit Span: Maximum sensor reading limit associated with maximum analog output limit (in the example 10000 ppm is associated with 20 mA).

Output: Voltage/current value present at the analog output terminals.

Measure: Real-time measurement of target gas concentration.

Configuration Manual Gas Calibration (from transmitter)

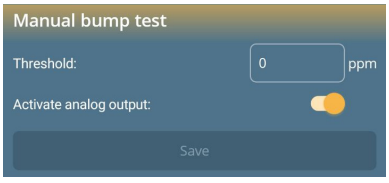
Set the gas concentration that will be used for performing the sensor calibration, starting the procedure from the transmitter.

Concentration Span: Gas concentration to be applied to the transmitter sensor being calibrated.

WARNING! the data entered in this parameter will not be considered if the calibration procedure is carried out through the App.

Manual Bump Test Configuration (from transmitter)

Set the gas concentration that will be used to perform the sensor bump test, starting the procedure from the transmitter.



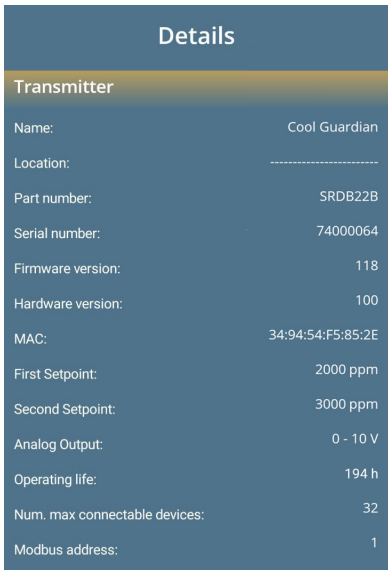
Threshold: Gas concentration to be applied to the transmitter sensor during bump test.

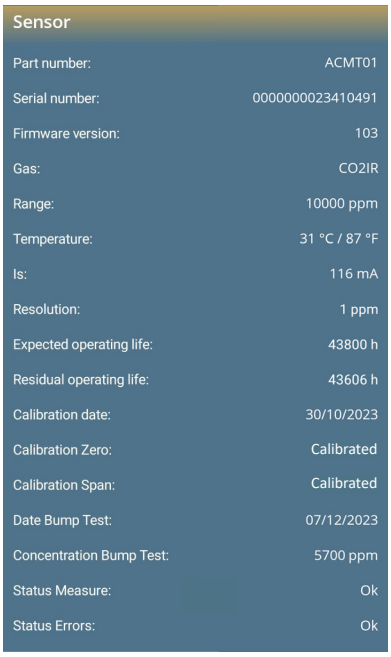
Activate analog output: If enabled, the analog output of the transmitter remains activated during the bump test. (Default disabled - yellow dot on the left).

WARNING! the data entered in this parameter will not be considered if the bump test procedure will be performed through the App.

9.1.2 Details

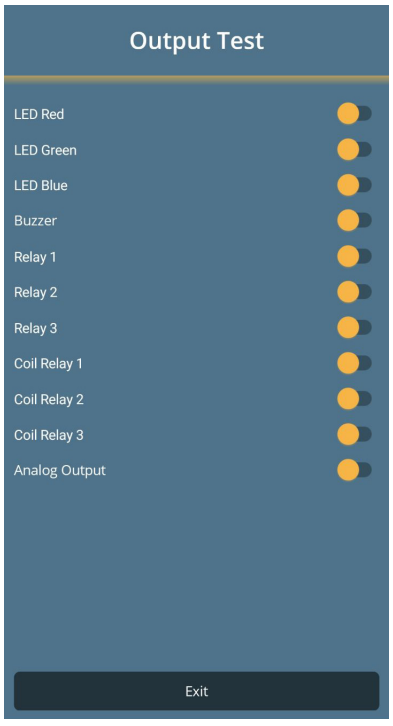
This screen summarizes all the information about the transmitter and its sensor.





9.1.3 Output test

In this screen you can manually check each individual signal from the transmitter.
For this purpose, activate/deactivate the switches and observe the corresponding output turn on or off on the device.



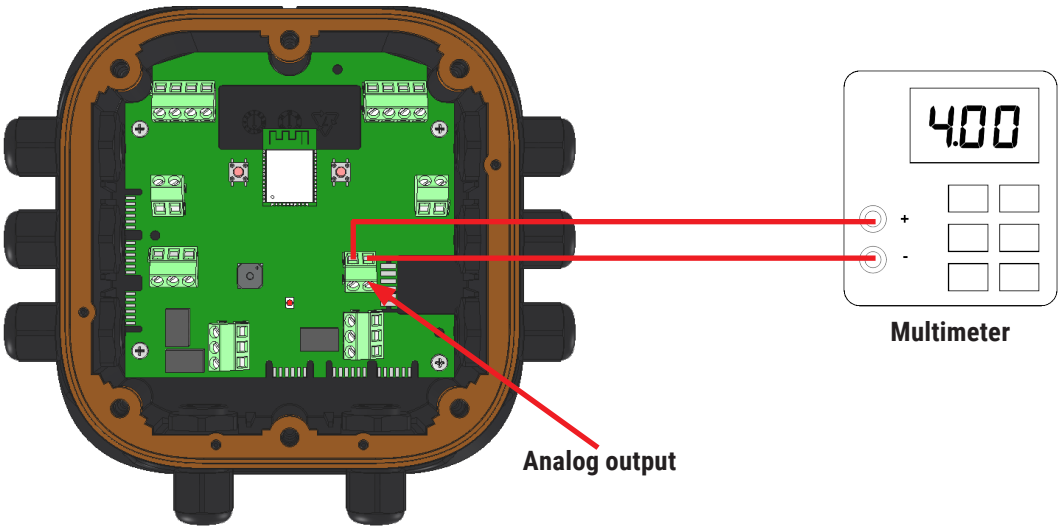
Example:
Clicking on the switch related to the Red LED verifies on the connected transmitter that the LED has actually turned on red.

9.1.4 Output Calib. (Analog Output Calibration)

The transmitter generates an analog output signal in voltage or current, according to the configured settings. Calibrating the analog output of the transmitter is important to ensure accurate and reliable performance, as it corrects any inaccuracies caused by various hardware factors.
In this menu, you can perform zero adjustment to correct any inaccuracies at the minimum value (4 mA or 1 V) and span adjustment to correct any inaccuracies at the maximum value (20 mA or 10.5 V).

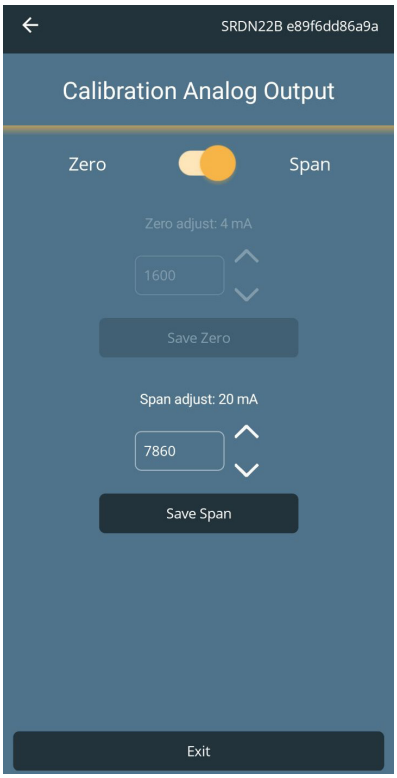
Procedure:

1. Connect a multimeter to the analog output of the transmitter (terminals 16 and 17) or to the terminals of the connected load.



2. Accessing the “Analog Output Calibration” screen, the Zero adjustment is selected.
   Read the output value on the multimeter; if it does not match the expected value indicated in the “Zero Adjust” row, proceed with the adjustment using the two arrows until the expected value is read on the multimeter.
   Once the Zero adjustment is complete, press “Save Zero“.

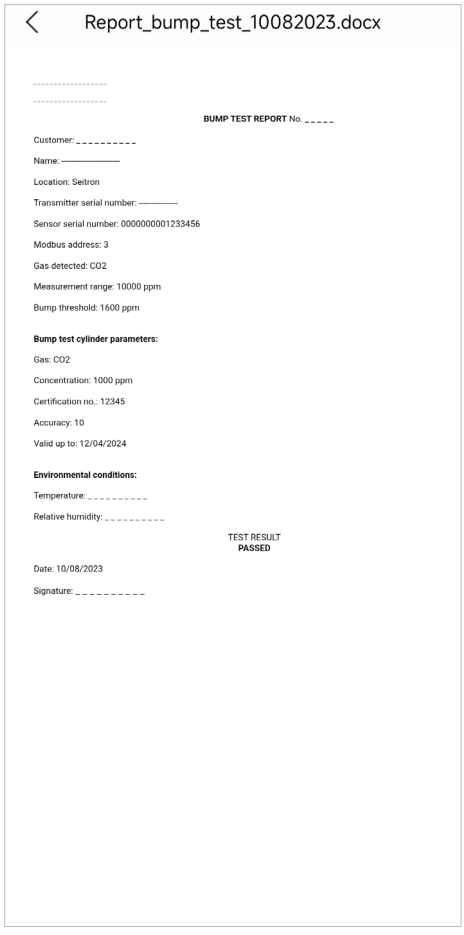
3. By pressing the yellow dot, you move to the Span adjustment.
   Read the output value on the multimeter; if it does not match the expected value indicated in the “Span Adjust” row, proceed with the adjustment using the two arrows until the expected value is read on the multimeter. Once the Span adjustment is complete, press “Save Span”.



9.1.5 Bump

This menu allows to configure and perform the sensor Bump test.
The Bump test is an essential procedure in order to verify the device correct operation.
For the Bump test procedure refer to what is described in the Quick Start Guide.

	DESCRIPTION
1	Code of the sensor installed on the transmitter.
2	Gas concentration in ppm detected in real time by the sensor.
3	Information on sensor status and date of the last bump test performed.
4	Gas concentration threshold for bump test, set by the user.
5	Fill in the details related to the gas cylinder in use: Gas: Name of the gas Concentration: Gas concentration Certification N.: Gas cylinder certificate number Accuracy: Gas preparation uncertainty Expiration date: Cylinder expiration date
6	This side of the screen shows the procedure for performing the Bump test.
7	Starts the sensor bump test.
8	Once the Bump test is successfully completed, it is possible to view the report.
9	If the Bump Test is successfully completed it can share the report.
9	Bump test report example:


Report_bump_test_10082023.docx

BUMP TEST REPORT No. _____

Customer: _____

Name: _____

Location: Seitron

Transmitter serial number: _____

Sensor serial number: 0000000001233456

Modbus address: 3

Gas detected: CO2

Measurement range: 10000 ppm

Bump threshold: 1600 ppm

Bump test cylinder parameters:

Gas: CO2

Concentration: 1000 ppm

Certification no.: 12345

Accuracy: 10

Valid up to: 12/04/2024

Environmental conditions:

Temperature: _____

Relative humidity: _____

TEST RESULT
PASSED

Date: 10/08/2023

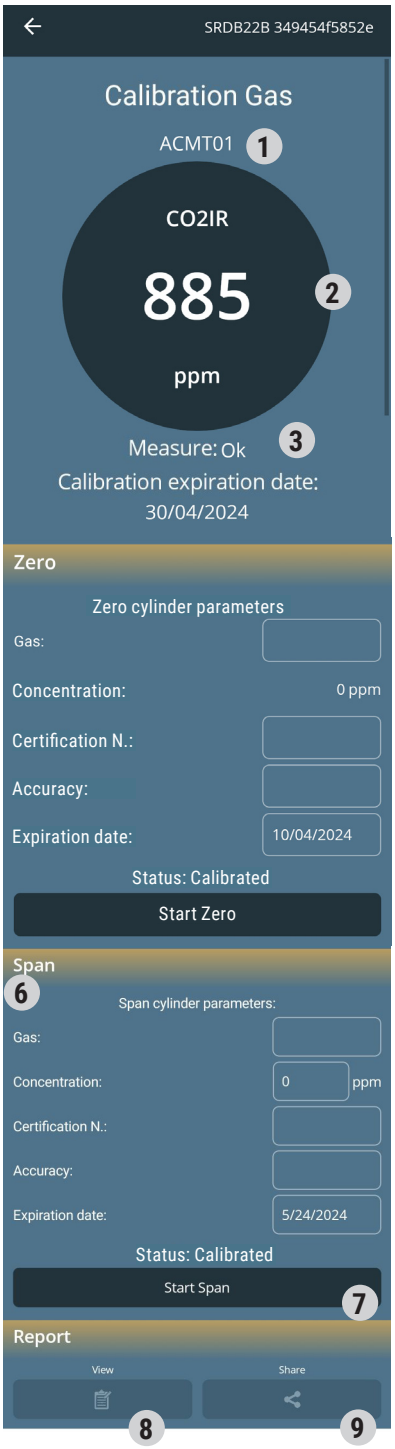
Signature: _____

If the Bump test gives a negative result, it is necessary to proceed with the gas sensor calibration.

9.1.6 Gas Calib.

This menu allows to set and perform the sensor calibration.

For the actual performance of the sensor calibration refer to what is described in the Quick Start Guide.

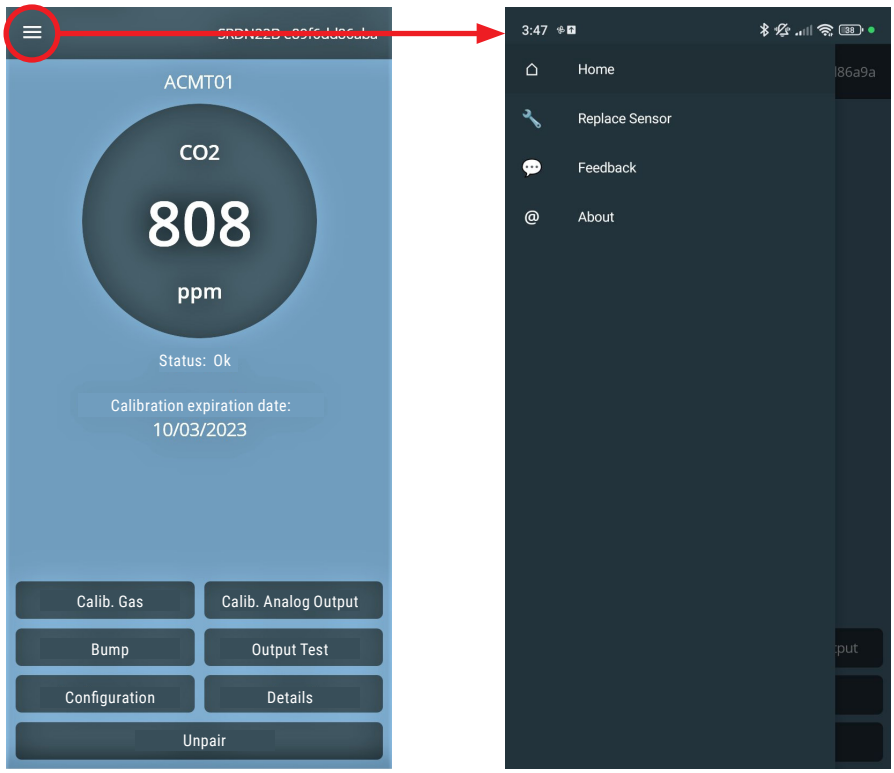


	DESCRIPTION
1	Code of the sensor installed on the transmitter.
2	Real-time gas concentration in ppm detected by the sensor.
3	Information on the sensor status and calibration expiration date.
4	Fill in the details related to the cylinder used for Zero calibration: Gas: Name of the gas Concentration: Gas concentration Certification N.: Gas cylinder certificate number Accuracy: Gas preparation uncertainty Expiration date: Cylinder expiration date
5	Starts Zero calibration of the sensor.
6	Fill in the data for the cylinder in use for Span calibration: Gas: Name of the gas Concentration: Gas concentration Certification N.: Gas cylinder certificate number Accuracy: Gas preparation uncertainty Expiration date: Cylinder expiration date
7	Starts sensor span calibration.
8	Once the Bump test is successfully completed, it is possible to view the report.
9	If the Bump Test is successfully completed it can share the report.

If sensor calibration fails it is mandatory to replace the sensor.

9.1.7 Additional menus

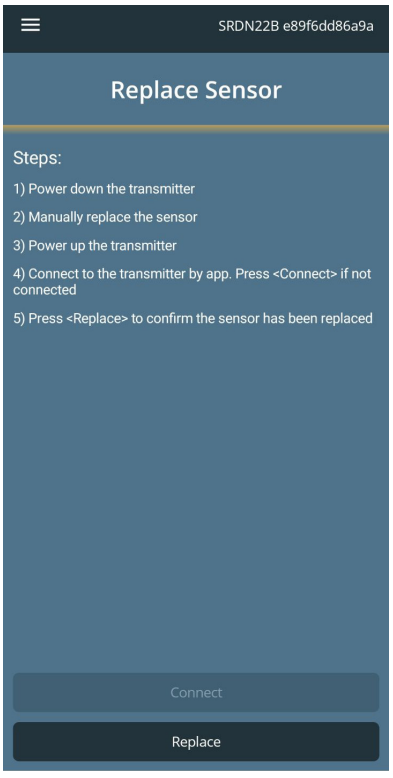
Pressing the button “ ☰ “ it is possible to access the additional section menu of the Seitron Guard App.



Sensor replacing

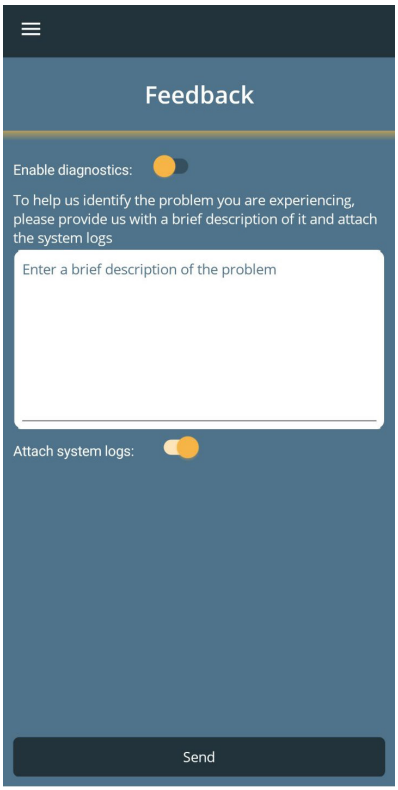
Once the transmitter sensor is replaced, through this menu the device acquires all the data of the newly installed sensor.

Once all the listed points are performed, pressing the “Replace” button the new sensor dare will be acquired and the old one will be erased.



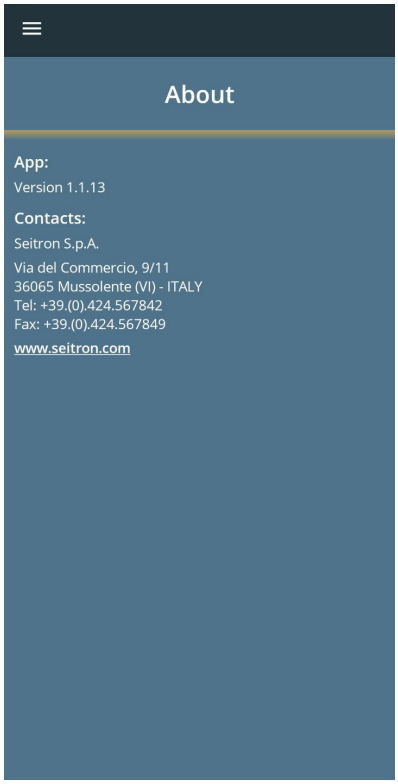
Feedback

In this screen it is possible to send a feedback to the Seitron service center in order to report an issue of the App. Please follow what is shown on the relevant screen:



About

This page lists the data about the installed App version and the manufacturer's contacts.



10.0 MAINTENANCE

The instrument maintenance procedure is mandatory in order to keep the standard of performance and safety of the instrument itself.
Periodically, maintenance must be carried out by qualified personnel who comply with the safety laws and regulations applicable at the location where the equipment is installed.
It is good practice to perform periodic checks to ensure that the device is functioning correctly and providing reliable information.
In this regard, the checks to be performed are as follows:

1. Run an output test (using the App).
2. Calibrate the analog output (through the App).
3. Perform a bump test on the sensor.
4. Calibrate the sensor.
5. Check the sensor's status.
6. Check how many operating hours the sensor has left (see details in the App). If the sensor is nearing the end of its lifespan, contact Seitron support to get a replacement sensor.

WARNING!
Seitron recommends calibrating the sensor every 6 months.
If the sensor calibration fails, the sensor needs to be replaced.

For performing the bump test and sensor calibration, refer to the quick start guide.

10.1 Cleaning

The transmitter cover has a hood designed to protect the sensor from dust buildup.
It's essential to clean the equipment regularly to prevent dust layers exceeding 5 mm.
Use only a soft cloth dampened with water to clean the device. Do not use solvents, soaps, or polishing products.

10.2 Sensor End-of-Life

From the date the transmitter is first activated, the countdown for the sensor's operating hours begins.

Seitron guarantees the sensor's proper functioning for up to 5 years of operation from the transmitter's initial use.

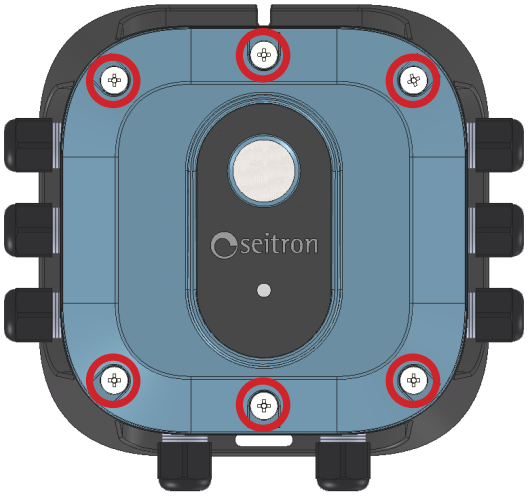
Once the expected operating hours are reached, the transmitter will notify the user that the sensor needs to be replaced.

10.3 Sensor replacement

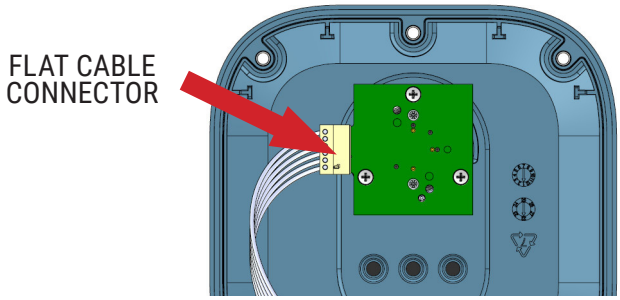
If the sensor installed on the transmitter needs to be replaced, proceed as follows.

WARNING!
- The sensor replacement must be performed by qualified personnel.
- Disconnect the power from the device before performing the replacement.

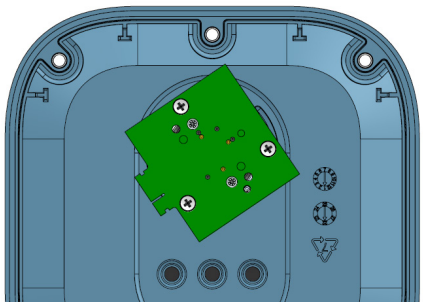
1. Access the internal parts by unscrewing the 6 screws of the cover.



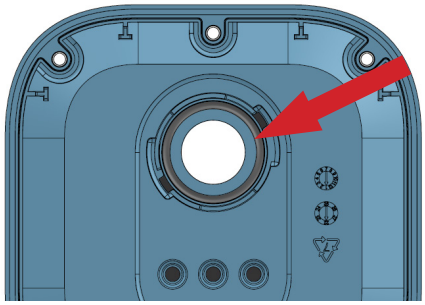
2. Disconnect the flat cable from the sensor.



3. Remove the sensor from the transmitter cover by turning the sensor to the left until it slides off.



4. Check that the O-ring is present in the appropriate seat of the cover; if in removing the sensor the O-ring has come out of the seat, it needs to be repositioned (see image).



5. Insert the new sensor, following the reverse order of the previously described steps (steps 4 - 3 - 2).

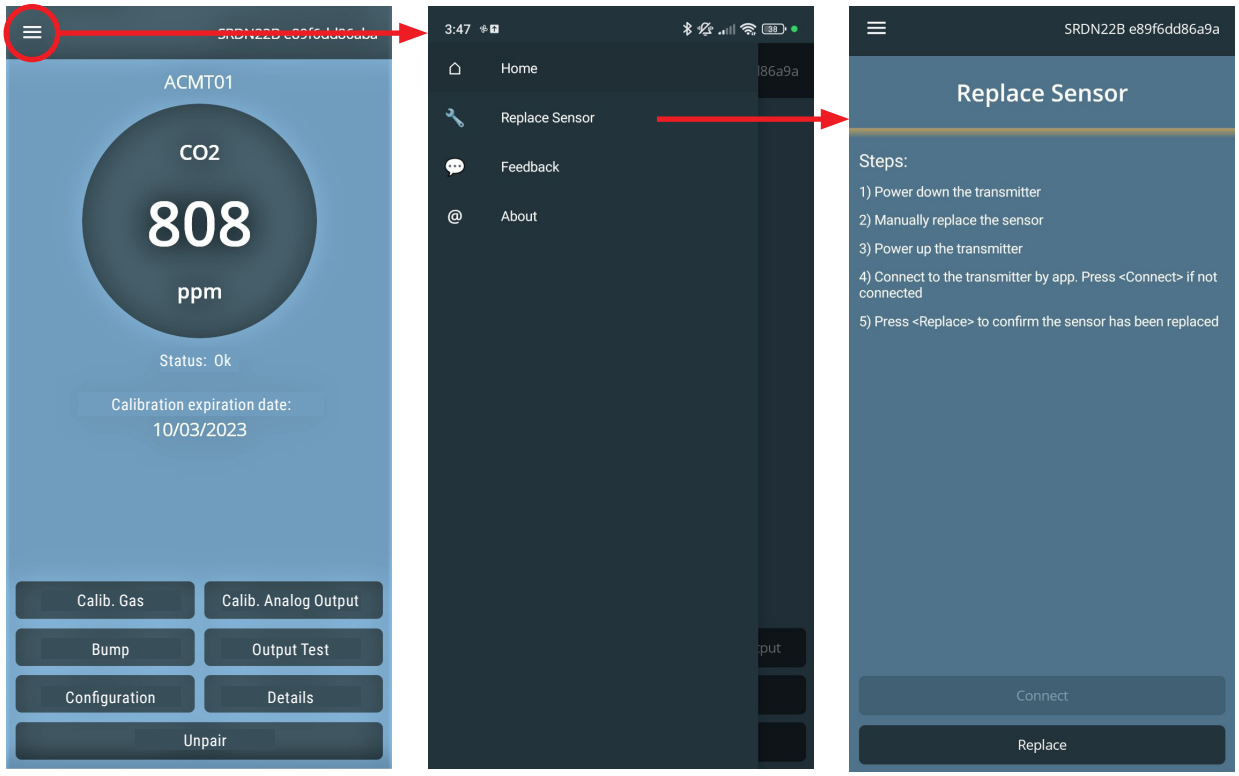
6. Place the rubber gasket on the base of the transmitter. Ensure the gasket is correctly positioned, aligning the 4 holes of the gasket with the 4 pins on the base of the product.

7. Make sure no cables interfere with the sensor module and close the cover.

8. Reattach the six screws that secure the cover.

   IMPORTANT
   To achieve proper sealing, the cover screws must be tightened to 15-20 lbf in (1.5-2.0 Nm).

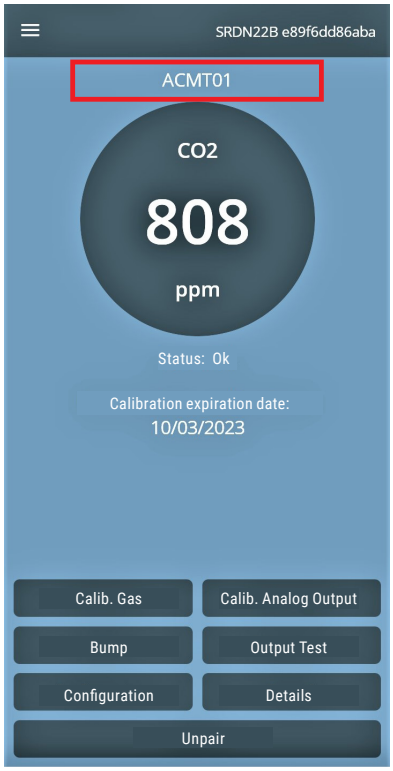
9. Pair the Seitron Guard App with the transmitter and access the “Sensor Replacement” menu:



After completing all the listed steps, pressing the “Replace” button will acquire the data from the new sensor and delete the old sensor’s data.

11.0 SPARE PARTS

The only available replacement parts are pre-calibrated sensors, ready to be replaced on the transmitter. The sensor code to purchase is displayed on the home screen or in the “Details” menu of the Seitron Guard App:



12.0 WARRANTY

The user is guaranteed against the product’s defects of conformity according to European Directive 2019/771 as well as the Seitron warranty terms, available online on the website www.seitron.com.
We invite the user to visit our website and check the latest version of technical documents, manuals and catalogs.

Seitron S.p.A. a socio unico
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Tel. 0424.567842 - info@seitron.it - www.seitron.com