

WIRELESS ROOM SENSOR COSTERWIRELESS

SAR 010 Eng.



- Measures room temperature without wires
- Wall-mounted or placed anywhere convenient
- NTC10 kΩ sensing element incorporated
- Powered by lithium battery (life at least 7 years)
- Up to 16 room sensors can be used with a single receiver

1. APPLICATION

SAR 010 radio room sensor (no wires required) is designed for measuring the temperature of the space in which it is installed without the need for any wired connections.

It is particularly useful where it is impossible, or too costly, to carry out traditional cabling.

It is possible to install up to 16 SAR 010 sensors in different spaces of the same building, so the system provides a solution when it is necessary to measure several temperatures at the same time in order to regulate the heating in a more balanced manner.

2. COSTERWIRELESS FAMILY

SAR 010 belongs to the COSTERWIRELESS family which consists of several devices from which real wireless systems can be constructed.

In the second part of this Data Sheet the whole family is described.

3. TECHNICAL DATA

• Electrical

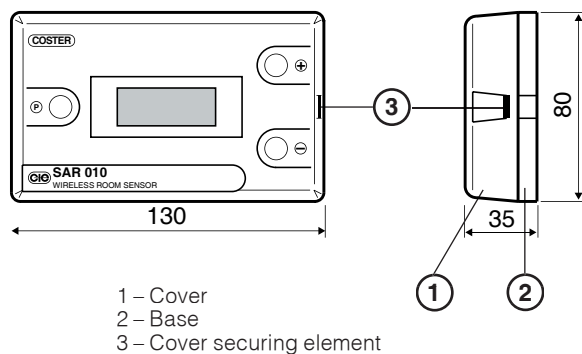
Power supply from lithium battery	3,6 V~
Battery life	at least 7 years
Temperature sensor	NTC 10 kΩ
Electromagnetic compatibility	CEE 93/68
Transmission frequency	433 MHz
Emission power	within the standards
Measurement range of room sensor	0...40 °C
Construction standards	Italian Electrotech. Committee (CEI)

• Settings

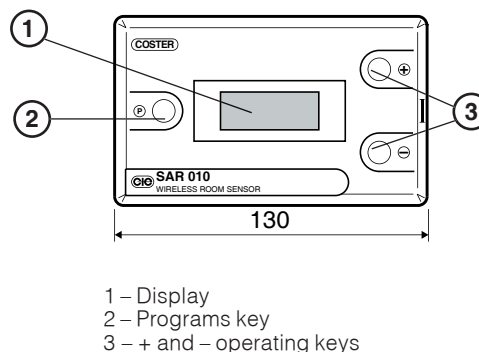
Identifying address of sensor	1...16
Group to which sensors belong	1...16
Interval between two readings	1...3...15 minuti
Duration of test	1...5...30
Protection	IP 30
Dimensions	130 x 80 x 35
Weight	220g

The data in bold type are factory (DEFAULT) settings

4. OVERALL DIMENSIONS



5. FACIA



WARNING : THE SENSOR IS SUPPLIED WITH THE BATTERY DISCONNECTED SO AS NOT TO DEplete IT AND ALSO TO AVOID MAKING USELESS TRANSMISSIONS.
TO CONNECT THE BATTERY AND POWER THE SENSOR MOVE UPWARDS THE JUMPER LOCATED AT THE SIDE OF THE BATTERY.
CHECK THAT THE BATTERY IS CONNECTED BY THE LIGHTING UP OF THE DISPLAY.

6. OPERATION

SAR 010 measures the room temperature continuously and sends the measurement via radio at regular intervals programmable from 1 to 15 minutes.

The interval between transmissions is necessary to conform to the regulations (the radio occupation must be very low) and to avoid overloading the battery. During the transmission SAR 010 sends a code containing all the data necessary on the measurement and for the identification of the sensor.

The code comprises:

- IDENTIFICATION OF THE TRANSMITTER (ADDRESS)
- THE GROUP OF SENSORS to which it has been assigned, so that the receiver processes only the measurements coming from the sensors in its group.
- MEASUREMENT OF THE TEMPERATURE

TESTING: a system of testing is provided to ensure that the sensor is recognized by its receiver. Should too great a distance, or obstacles, hinder reception, it will be necessary to provide for the installation of one or more repeaters in intermediate positions.

7. SITING OF THE SENSOR

SAR 010 is essentially a room sensor and so has to be installed in a position which represents as far as possible the temperature of the space in which it is placed..

8. INSTALLATION

SAR 010 can be fixed to the wall with two screws through the black plastic base (after the electronic module has been removed).

Alternatively, it can simply be placed on any suitable flat surface; this permits moving it if the position should prove not to be the most representative one for the room temperature..

9. SETTING

SAR 010 normally displays the temperature measured (e.g. **20.5c**), or the address (e.g. **In 1**) according to how the display has been programmed (see below).

For an instantaneous reading, press + key: the new temperature or the address will appear.

Indications regarding the temperature sensor: faulty or off the scale:

Sensor fault = **-- : --** (in central position)

Temperature below 0 °C = **-- : --** (in low position)

Temperature above 40 °C = **-- : --** (in high position)

Press P for at least 9 seconds: Prog appears : indicates you are entering programming.

As soon as you release P key you pass to :

first page programming: In : 1 appears - this is identifying address with + and – keys choose address.

If only one sensor leave address 1 (factory setting)

If several sensors belonging to same group: enter a different address for each sensor starting from 1 and increasing (2, 3, 3 etc) up to the last sensor..

Press P: Gr 1 appears: this is Group to which sensor belongs; with + and – keys choose group.

If there is only one sensor leave Group 1 (factory setting).

If there are several sensors belonging to different groups, for each group enter the same number but a different numbers for each of the different groups.

For GROUP OF SENSORS is meant the set of all the sensors which have to be processed by the same receiver (obviously it will be calibrated for the same group).

A typical application would be a building which has two different heating flows (e.g. for the two wings of the same building); each flow will have to be regulated according to the sensor installed in the wing for which it is responsible.

The groups are necessary because a sensor in GROUP A can be detected by the receiver in GROUP B; the latter, detecting that it is a transmission not originating in its own GROUP, rejects it.

There are 16 GROUPS (and 16 ADDRESSES) and so the most complex system can have 256 sensors and 16 receivers. This complex system of transmissions and receptions (including any repeaters required) does not suffer from any internal interference.o.

Press P: PA 3 appears: this is the interval (PAusa) between one transmission and another (in minutes);

with + and – keys choose the desired value. It is suggested that the factory setting (3 minutes) is more than sufficient to track the room temperature which has very high time constants. Higher values permit a longer battery life.

Press P: di : tE appears: this is an indication of what you want on the first page; with + and – keys choose between **tE** = indication of temperature and **In** = indication of address.

Press P: Co 5 appears: this is the time (in minutes) available for testing; with + and – keys choose the duration of the test (factory setting: 5 minutes)..

With this operation you can test the radio link between the transmitting sensor and its receiver. For the whole duration of the test you can see the temperature measured, alternating with the address of the sensor.

For example: **21.5c...co:1** means that the sensor is being tested, has address number 1 and at that moment is measuring 21.5°C.

By pressing + and – keys you can lengthen or shorten the times of testing.

At the same time the receiver of the group to which the sensor belongs indicates the address that is being tested and the temperature value measured (see Technical Data Sheet for URX 918 receiver).

In any complex system it is necessary to test one sensor at a time for each group in order to avoid overlappings which are difficult to interpret.

Press P : XX P appears: this is the version of the unit's software.

If you want to exit the testing before the expiry time :

Press P to return to the first page; however, you automatically return to the first page 15 minutes after pressing any key.

SYSTEM OF RADIO-TRANSMITTING SENSORS (WIRELESS) COMPATIBLE WITH CONTROLLERS

C ← BUS

COSTERWIRELESS

COSTERWIRELESS is a system which includes (at the date of this document) four devices for providing HVAC zones with sensors or other devices without hard wiring (WIRELESS).

A typical application would comprise a room sensor and/or outside sensor without wires. This is very convenient because it is often very difficult to lay cables in existing buildings.

WIRELESS SENSORS AVAILABLE AT PRESENT : OUTSIDE sensor and ROOM sensor.

1. SYSTEM COMPONENTS

1.1 SAR 010 room sensor

- Sensor for measurement of room temperature.
- Sensor can be wall-mounted or simply laid in a convenient position
- Provided with a lithium battery (life at least 7 years)
- System provides for use of up to 16 room sensors with a single receiver

1.2 SER 001 outside sensor

- Sensor for measurement of outside temperature.
- Sensor is waterproof (IP55) and can be wall-mounted
- Provided with a lithium battery (life at least 7 years)
- System provides for use of up to 16 outside sensors with a single receiver

1.3 URX 918 universal receiver

- Receiver can be configured for any type of sensor..
- Can service up to 16 sensors of the same type.
- Processes measurements received from sensors to provide:
 - mean value
 - minimum value
 - maximum value
- Provided with a data logger for recording all data from receiving sensors.
- An output compatible with all COSTER controllers
- Provided with C-Bus for Telemangement..

1.4 UTR 908 Universal repeater

- Repeater serves to amplify the radio signals.
- One or more repeaters permit greater distances between transmitters and receivers

2. APPLICATION

- **The system for room temperature** is useful when it is necessary to measure room temperature in different spaces of the building to be heated (e.g. classrooms in a school) in order to ensure that all the zones have the correct contractual temperature.

This measurement is useful both for checking the temperature curve, obtained by means of the receiver data logger, and for having available the necessary data for a balanced operation of the HVAC site.

It avoids overheating a particular zone just because it is more favoured than another from the thermal point of view. Greater comfort is obtained with the maximum energy saving.

- **The system for outside temperature** is useful when you want to measure the temperature at one or two points, without laying cables; in particular when the north / north-west side of the building is a long way from the boiler room.

3. SYSTEM HARDWARE

No.	Description	Model	Sensing element t°	Code	Data sheet
	Room temperature sensor COSTERWIRELESS	SAR 010	NTC 10 kΩ	–	N 310
	Outside temperature sensor COSTERWIRELESS	SER 001	NTC 1kΩ	–	N 320
	Universal receiver COSTERWIRELESS	URX 918	–	–	N 351
	Universal repeater COSTERWIRELESS	UTR 908	–	–	N 350

NOTE : At present the COSTERWIRELESS family comprises these four basic devices: it is planned to enlarge this family with new sensors and/or controls in order to provide a much more comprehensive WIRELESS system.

4. GLOBAL INFORMATION ON THE SYSTEM

The system comprises four components, each having special functions; for each device there is a Technical Data Sheet which describes the device itself and its method of use.

This type of installation comprises a minimum of two elements (transmitter and receiver) and a maximum practically without limits.

However, any system will require at least a receiver (e.g. URX 918); the Data Sheet for this device will provide information on the device itself plus detailed information on the entire system.

For example, all the operations necessary for testing the various devices which have to communicate with each other.

5. OPERATION OF SYSTEM

The system can carry out numerous functions, for example :

5.1 Measurement and recording of room temperature of a space

Components : 1 **SAR 010** WIRELESS SENSOR
1 **URX 918** WIRELESS RECEIVER

With this combination the room sensor measures the temperature and sends it via radio to the receiver.

The receiver records the temperature at preset intervals, and converts it to a signal compatible with all the COSTER controllers. If the distance exceeds a certain value, it is necessary to insert between the sensor and the receiver one or more **UTR 908** repeaters.

The repeater is of the universal type and so can handle any type and number of sensors and any type and number of receivers. Essentially, it is a transmitter which repeats faithfully everything it receives, after having amplified it.

5.2 Measurement and recording of room temperature of several spaces (max.16 for each system)

Components: up to 16 **SAR 010** WIRELESS SENSORS
1 **URX 918** WIRELESS RECEIVER

The room sensors measure the temperature and send it to the receiver.

The receiver records all the temperatures at adjustable intervals, calculates their mean value, minimum and maximum, and converts one of these values into a signal compatible with all the COSTER controllers.

With this function the COSTER controller can ensure that the temperature in the various heated zones does not exceed, or fall below, a set value.

By using a mean value the heated zones are kept at the mean value of all the temperatures measured.

The receiver can handle up to 16 sensors of the same type.

If the distance is too great it is necessary to insert, between sensor and receiver, one or more UTR 908 repeaters.

Essentially, this is a transmitter which faithfully repeats all the signals it receives after having amplified them.

5.3 Measurement & recording of outside temperature with one or more sensors

Components: 1 or more **SER 001** WIRELESS SENSORS
1 **URX 918** WIRELESS RECEIVER

For outside temperature the information given above for room temperature applies.

When you require an outside temperature measurement representative of the whole building, you can use more outside sensors, on the lines described for room temperature.

6. DISTANCE BETWEEN TRANSMITTERS, RECEIVERS & REPEATERS.

Both the receiver and transmitter are greatly miniaturised, operate at a frequency of 433 MHz and at an output rating permitted by the regulations.

The maximum distances between any one transmitter and its receiver can be established as follows :

- **transmitter & receiver in sight:** this means that the transmitter “sees” the receiver since there is no obstacle between them. Max. distance: 35 metres
- **transmitter & receiver not in sight:** this means that between transmitter & receiver there are obstacles e.g. walls, doors, ceilings. This is the most common situation because the devices are installed in the buildings. In this situation, establishing the maximum distance is very, difficult since the type of obstacle can influence the radio waves differently. Max. distance: 15/25 metres
In practice, the maximum distance indicated must always be checked

Should the actual site require longer distances, or if the obstacles have a great deal of influence on the radio transmission, it is necessary to interpose a repeater or repeaters .

Each repeater doubles the maximum distance between sender and receiver

For more detailed technical information kindly refer to the Technical Data Sheets for the individual components.

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