SENTERA CONTROLS

RCMFX-2R
Intelligent CO_2 room sensor

The RCMFX-2R are intelligent multifunctional room sensors featuring adjustable temperature, relative humidity and CO_2 ranges. The used algorithm controls a single analogue / modulating output based on the measured T, rH and CO_2 values, which can be used to directly control an EC fan, an AC fan speed controller or an actuator powered damper. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block
- Selectable temperature, relative humidity and CO_2 ranges
- Fan speed control based on temperature, humidity and CO_2 measurements
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Day / night detection via ambient light sensor
- Replaceable CO_2 sensor element
- 3 LEDs for status indication with adjustable light intensity
- Long-term stability and accuracy

Area of use

- Demand controlled ventilation based on temperature, relative humidity and CO_2
- Suitable for residential and commercial buildings
- For indoor use only

Article codes

Article code	Supply	Imax
RCMFG-R	18—34 VDC	100 mA
	15—24 VAC ±10%	105 mA
RCMFF-R	18—34 VDC	100 mA

Technical specifications

| Analogue / modulating output	0—10 VDC mode: min. load 50 kΩ ($R_L \geq 50$ kΩ)
	0—20 mA mode: max. load 500 Ω ($R_L \leq 500$ Ω)
	PWM (open-collector type) mode: 1 kHz, min. load 50 kΩ ($R_L \geq 50$ kΩ), PWM voltage level: 3,3 VDC or 12 VDC
Typical range of use	Temperature range — 0—50 °C
	Relative humidity range — 0—95 % rH (non-condensing)
	CO_2 range — 400—2.000 ppm
Accuracy	± 0,4 °C (range 0—50 °C)
	± 3% rH (range 0—100 %)
	± 30 ppm (range 400—2.000 ppm)
Protection standard	IP30 (according to EN 60529)

Standards

CE

- Low Voltage Directive 2014/35/EC
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements

- EMC directive 2014/30/EU:
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
  - EN 61000-6-1:2007 Electromagnetic compatibility (EMC) - Part 6-1:Generic standards - Immunity for residential, commercial and light industrial environments
  - EN 61000-6-3:2007 Electromagnetic compatibility (EMC) - Part 6-3:Generic standards - Emission standard for residential, commercial and light-industrial environments Amendments A1:2011 and AC:2012 to EN 61000-6-3
  - EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
  - EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

- WEEE 2012/19/EC

- RoHs Directive 2011/65/EC

Indications
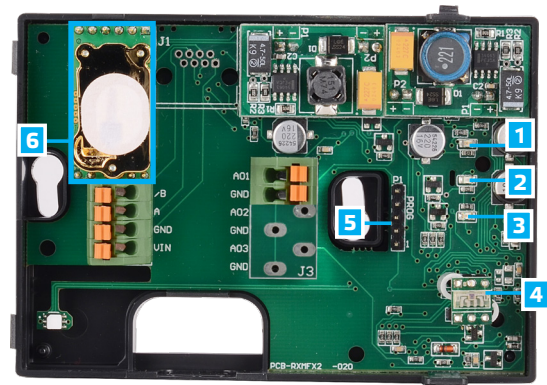
1 - Red LED	On	Measured temperature, relative humidity or CO_2 values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or CO_2 values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (Modbus timeout > 0 seconds)
3 - Green LED	On	Measured temperature, relative humidity or CO_2 values are within range
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - PROG header, P1	1 2 3 4 5	Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters
	1 2 3 4 5	Put a jumper onto pins 3 and 4 and restart the supply to enter bootloader mode
6 - CO_2 sensor element		Replaceable in case of faulty operation

Note: By default, the LED indicators visualise the measured CO_2 level. When the sensor is in bootloader mode, the green and yellow LEDs flash alternately. During the firmware download, the red LED is flashing additionally.

Wiring and connections

Article type	RCMFF-R	RCMFG-R	
VIN	18—34 VDC	18—34 VDC	15—24 VAC ±10%
GND	Ground	Common ground	AC ~
A	Modbus RTU (RS485), signal A		
/B	Modbus RTU (RS485), signal /B		
AO1	Analogue / modulating output - T, rH or CO_2 (0—10 VDC / 0—20 mA / PWM)		
GND	Ground AO1	Common ground	
Connections	Spring contact terminal blocks, cable cross section: 1,5 mm^2		

Attention! The -F version of the product is not suited for 3-wire connection. It has separate grounds for power supply and analogue output. Connecting both grounds together might result in incorrect measurements. Minimum 4 wires are required to connect -F type sensors.

The -G version is intended for 3-wire connection and features a 'common ground'. This means that the ground of the analogue output is internally connected with the ground of the power supply. For this reason, -G and -F types cannot be used together on the same network. Never connect the common ground of -G type articles to other devices powered by a DC voltage. Doing so might cause permanent damage to the connected devices.

Fixing and dimensions
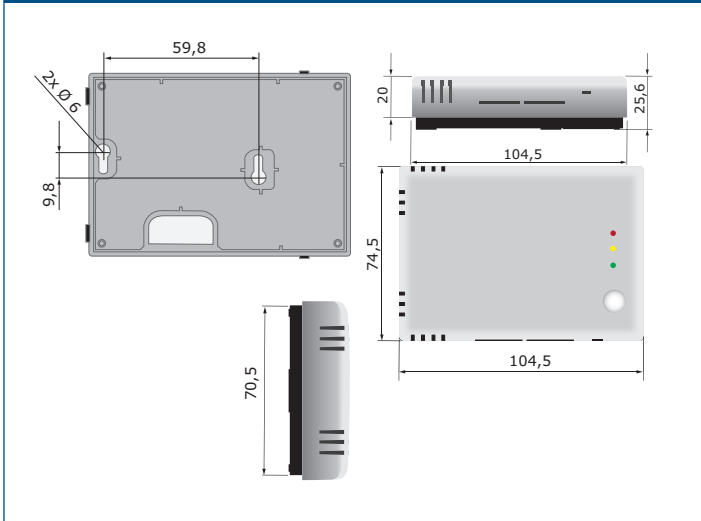
Modbus registers

The Sensistant Modbus configurator allows you to easily monitor and/or configure Modbus parameters.

The parameters of the unit can be monitored / configured through the 3SModbus software platform. You can download it from the following link:
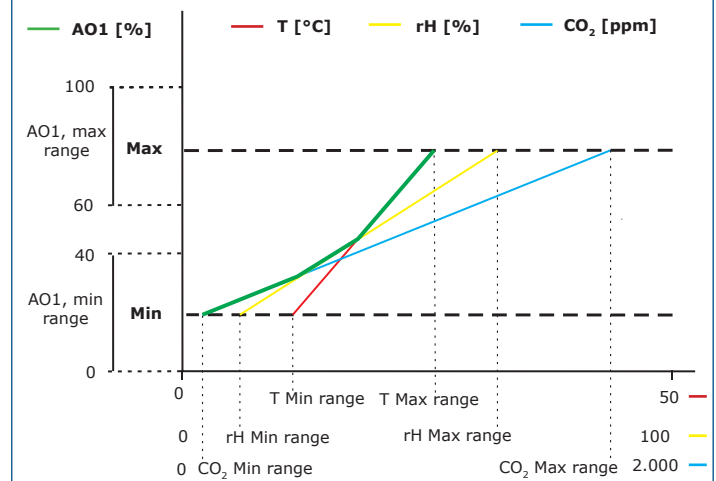
https://www.sentera.eu/en/3SMCenter

For more information about the Modbus registers, please refer to the product Modbus Register Map.

Global trade item numbers (GTIN)

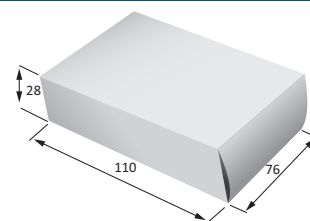| Packaging	RCMFF-R	RCMFG-R
Unit	05401003010945	05401003010952
Carton	05401003301630	05401003301647
Box	05401003502457	05401003502464

Operational diagram

Note: The output changes automatically depending on the highest of the T, rH or CO_2 values, i.e. the highest of the three output values controls the output. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g it is also possible to control the output based on the measured CO_2 value only.
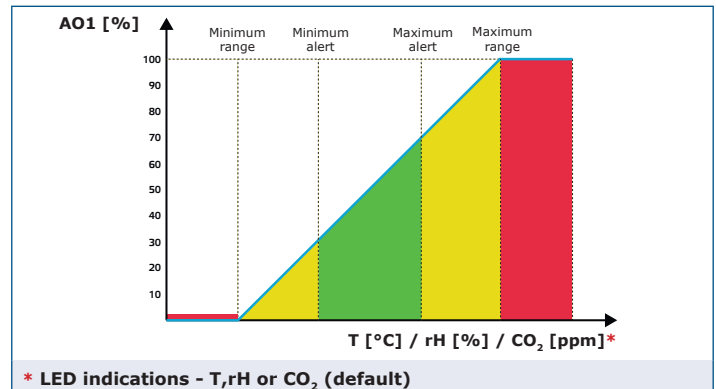
* LED indications - T,rH or CO_2 (default)

Packaging

Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFF-R RCMFG-R	Unit (1 pc.)	110	76	28	0,085 kg	0,117 kg
	Carton (24 pcs.)	492	182	84	2,04 kg	2,54 kg
	Box (144 pcs.)	514	414	274	12,24 kg	16,04 kg