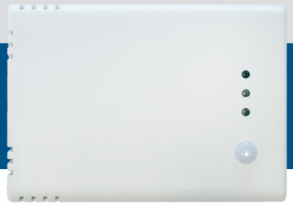


RCMFH-2R

Intelligent CO_2 room sensor

The RCMFH-2R are intelligent 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. They feature 24 VDC power supply and an ambient light sensor. All parameters are accessible via Modbus RTU.

Key features

- Spring contact terminal block or RJ45 connection
- Selectable temperature, relative humidity and CO_2 ranges
- Fan speed control based on temperature, relative humidity and CO_2
- Bootloader for updating the firmware via Modbus RTU communication
- Modbus RTU communication
- Day / Night detection via ambient light sensor. Ambient light sensor with adjustable 'active' and 'standby' level
- 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 level in residential and commercial buildings
- For indoor use only

Technical specifications

Analogue / modulating output		0—10 VDC mode: $R_L \geq 50$ kΩ
		0—20 mA mode: $R_L \leq 500$ Ω
		PWM 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)

Article codes

Article code	Supply voltage	Imax	Connection type
RCMFH-2R	24 VDC	100 mA	RJ45 or terminal block

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.

Wiring diagram

RJ45 socket (Power over Modbus)

Pin 1	24 VDC	Supply voltage
Pin 2		
Pin 3	A	Modbus RTU communication, signal A
Pin 4		
Pin 5	/B	Modbus RTU communication, signal /B
Pin 6		
Pin 7	GND	Ground, supply voltage
Pin 8		

Terminal Block 1

VIN	Supply voltage 24 VDC
GND	Supply voltage, ground
A	Modbus RTU communication, signal A
/B	Modbus RTU communication, signal /B

Terminal Block 2

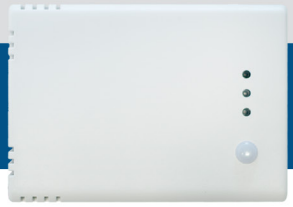
AO1	Analogue / modulating output (0—10 VDC / 0—20 mA / PWM)
GND	Ground AO1

Attention! *The unit needs to be supplied via the RJ45 connector or via the connection terminals. Do not connect the device via the RJ45 connector and the terminal block simultaneously!*

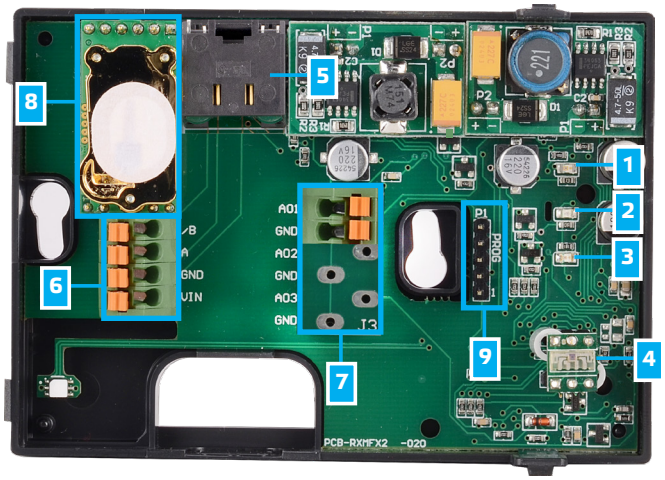
SENTERA CONTROLS

RCMFH-2R

Intelligent CO_2 room sensor



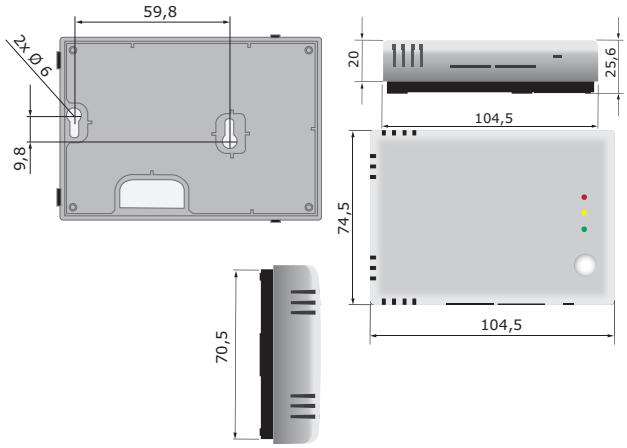
Indications



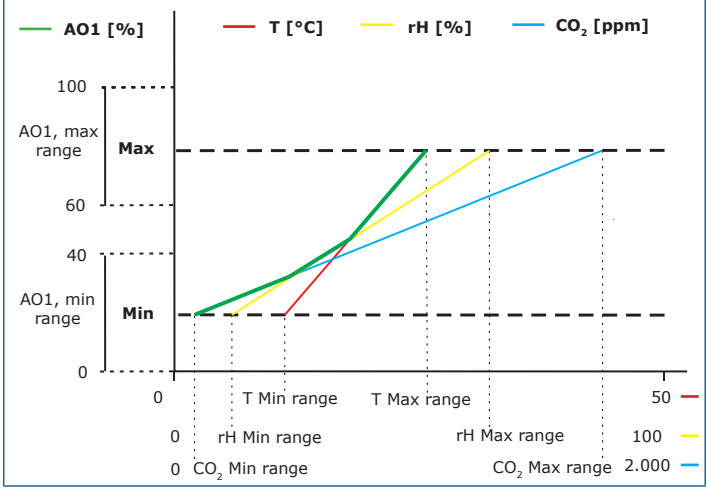
1 - Red LED	On	Measured temperature, relative humidity or CO_2 values are out of range
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature, relative humidity or CO_2 values are in the alert range
	Blinking	Modbus communication has stopped and HR8 is activated (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 - RJ45 socket		Modbus communication with connected Master devices and PoM-voltage supply (24 VDC)
		Blinking LEDs indicate that packages are transmitted via Modbus RTU communication
6 - Terminal block input connection		24 VDC supply voltage and Modbus RTU signal
7 - Output connection		AO1 - Temperature, relative humidity or CO_2
8 - CO_2 sensor element		Replaceable in case of faulty operation
9 - 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

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.

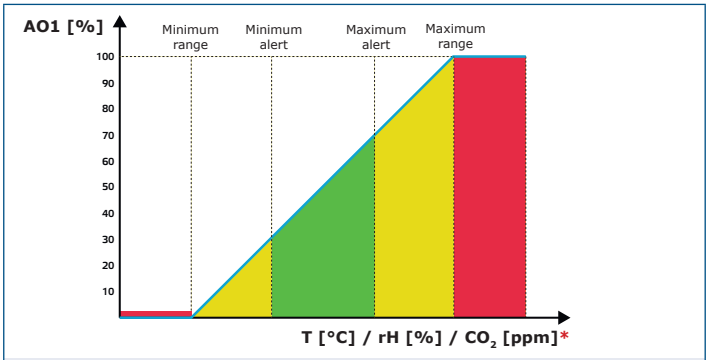
Fixing and dimensions



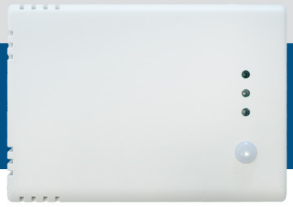
Operational diagram



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. One or multiple sensors can be deactivated. E.g. it is possible to control the output based on the measured CO_2 value only.*



***LED indications - T, rH or CO_2 (default)**



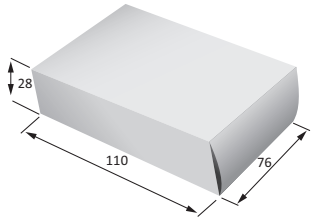
RCMFH-2R

Intelligent CO_2 room sensor

Standards

- Low Voltage Directive (LVD) 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
- Electromagnetic compatibility Directive (EMC) 2014/30/EC
  - 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

Packaging



Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFH-2R	Unit (1 pc.)	110	76	28	0,085 kg	0,100 kg
	Carton (24 pcs.)	492	182	84	2,04 kg	2,54 kg
	Box (144 pcs.)	510	410	270	12,24 kg	16,04 kg

Global trade item numbers (GTIN)

Packaging	RCMFH-2R
Unit	05401003010969
Carton	05401003301654
Box	05401003502471