RCMFM-3
Intelligent multifunctional CO_2 room sensor, PoM

The RCMFM-3 are intelligent room sensors featuring adjustable CO_2, temperature, and relative humidity ranges. The used algorithm generates an output value 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 and actuator powered damper. They are Power over Modbus supplied and all parameters are accessible via Modbus RTU.

Key features

- Selectable CO_2, temperature and relative humidity ranges
- Outputs available via Modbus RTU input registers
- A bootloader for firmware updates using Modbus RTU communication
- Ambient light sensor with adjustable 'active' and 'standby' level
- 3 LEDs with adjustable light intensity for status indication
- 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 voltage	Imax	Connection type
RCMFM-3	24 VDC, PoM	30 mA	RJ45 socket

Technical specifications

Supply voltage		24 VDC, Power over Modbus
Typical range of use	Temperature	0—50 ºC
	Relative humidity	0—95 % rH (non-condensing)
	CO_2 range	400—2.000 ppm
Accuracy		±0,5 ºC (5—50 ºC)
		±6 % rH (20—80 % rH)
	400—2.000 ppm CO_2	±(50 ppm + 3 % of the reading)
	2.001—5.000 ppm CO_2	±(40 ppm + 5 % of the reading)
Protection standard		IP30 (according to EN 60529)

How to configure

Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:

- Easily change the parameter settings of the connected devices remotely
- Define users and give them access to monitor the installation via a standard web browser
- Log data - create diagrams and export logged data
- Receive alerts or warnings when measured values exceed alert ranges or when errors occur
- Create different regimes for your ventilation system - e.g. day-night regime

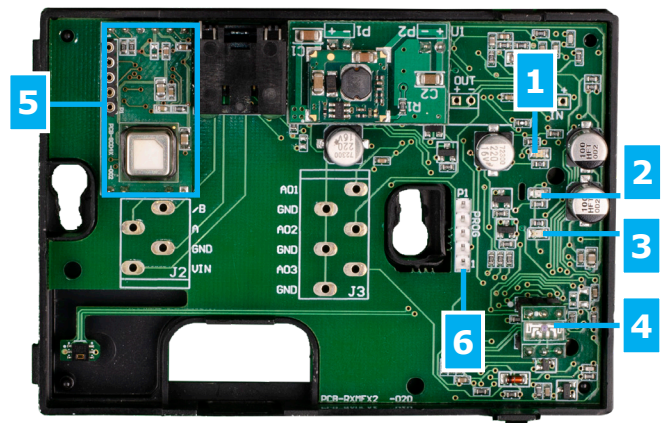The 3SModbus software platform allows for monitoring and configuring the unit's parameters.

You can download it from the following link:

https://www.sentera.eu/en/3SMCenter

Please refer to the Modbus Register Map of the product for more details regarding the Modbus registers.

Settings and indications

1 - Red LED	On	Measured temperature or relative humidity values are out of range or CO_2 is higher than or equal to Alert 2 level
	Blinking	Communication with one of the sensors fails
2 - Yellow LED	On	Measured temperature or relative humidity values are in the alert range or CO_2 is higher than or equal to Alert 1 level
3 - Green LED	On	Measured temperature or relative humidity value is within range or CO_2 level is lower than Alert 1 level
4 - Ambient light sensor		Low light intensity / Active / Standby
5 - CO_2 sensor element		To measure CO_2 concentration, self-calibrating
6 - PROG header, P1	1 2 3 4 5	Put a jumper on 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 on 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.

Wiring and connections

RJ45 socket (Power over Modbus)

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

Standards

- Low Voltage Directive 2014/35/EU
  - 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 transmitters with integrated or remote signal conditioning

- WEEE 2012/19/EU

- RoHs Directive 2011/65/EU
  - EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Operational diagrams
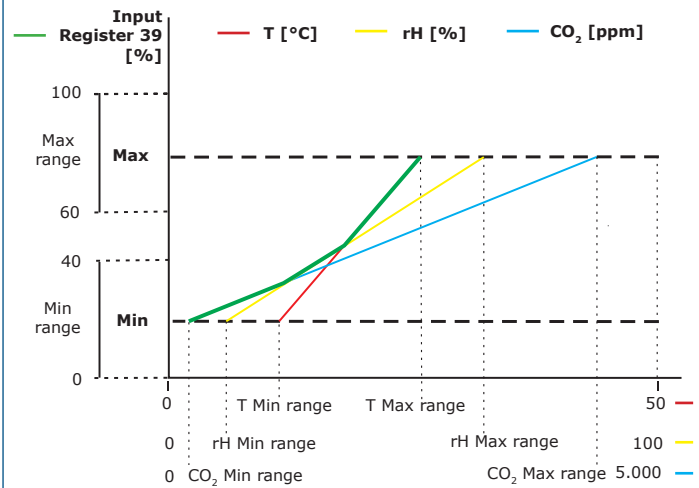
Note: The output changes automatically depending on the highest of the T, rH or CO$_2$ values, i.e. the highest of the three output values controls the output signal. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO$_2$ value only.

LED indication of CO$_2$ sensor (default setting)
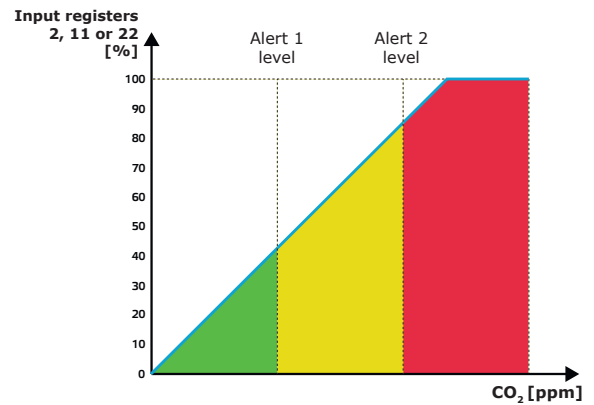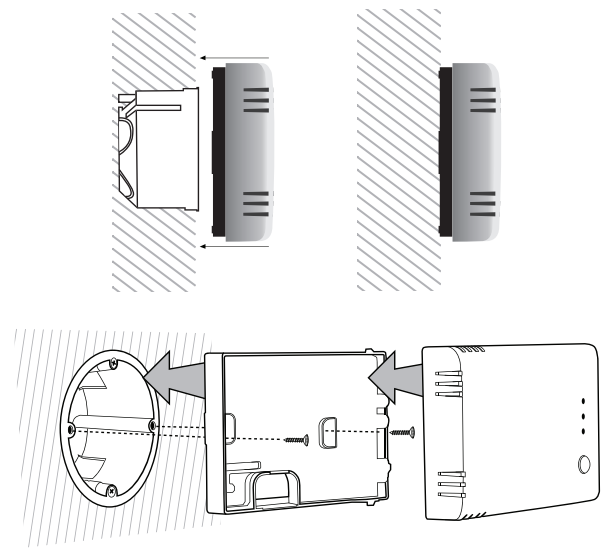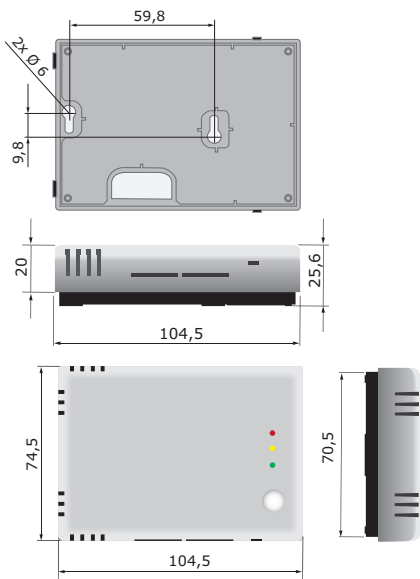

LED indication of temperature and humidity sensor
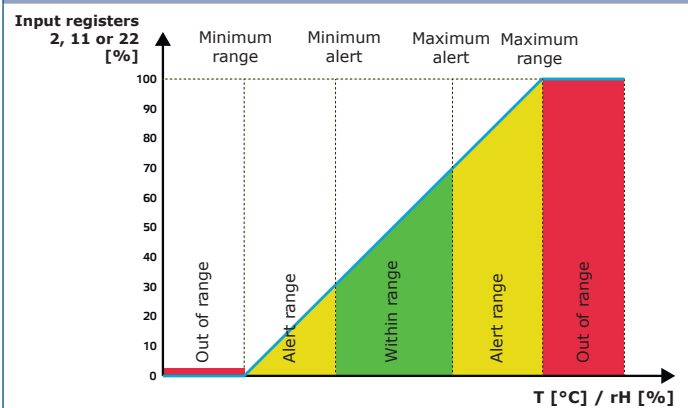
Global trade item numbers (GTIN)

Packaging	RCMFM-3
Unit	05401003018910
Carton	05401003303009
Box	05401003504437

Fixing and dimensions

Packaging
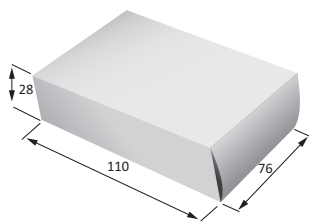
Article	Packaging	Length [mm]	Width [mm]	Height [mm]	Net weight	Gross weight
RCMFM-3	Unit (1 pc.)	110	76	28	0,087 kg	0,100 kg
	Carton (24 pcs.)	492	177	85	2,088 kg	2,55 kg
	Box (144 pcs.)	590	380	505	12,528 kg	16,29 kg