

# RCMFM-3

## Intelligent multifunctional CO<sub>2</sub> room sensor, PoM



The RCMFM-3 are intelligent room sensors featuring adjustable CO<sub>2</sub>, temperature, and relative humidity ranges. The used algorithm generates an output value based on the measured T, rH and CO<sub>2</sub> 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<sub>2</sub>, 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<sub>2</sub>
- Suitable for residential and commercial buildings
- For indoor use only

### Article codes

| Article code | Supply voltage | I <sub>max</sub> | 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 °C                        |                      |
|                      | Relative humidity               | 0–95 % rH (non-condensing)     |                      |
|                      | CO <sub>2</sub> range           | 400–2.000 ppm                  |                      |
| Accuracy             |                                 |                                | ±0,5 °C (5–50 °C)    |
|                      |                                 |                                | ±6 % rH (20–80 % rH) |
|                      | 400–2.000 ppm CO <sub>2</sub>   | ±(50 ppm + 3 % of the reading) |                      |
|                      | 2.001–5.000 ppm CO <sub>2</sub> | ±(40 ppm + 5 % of the reading) |                      |
| Protection standard  | IP30 (according to EN 60529)    |                                |                      |

### How to configure



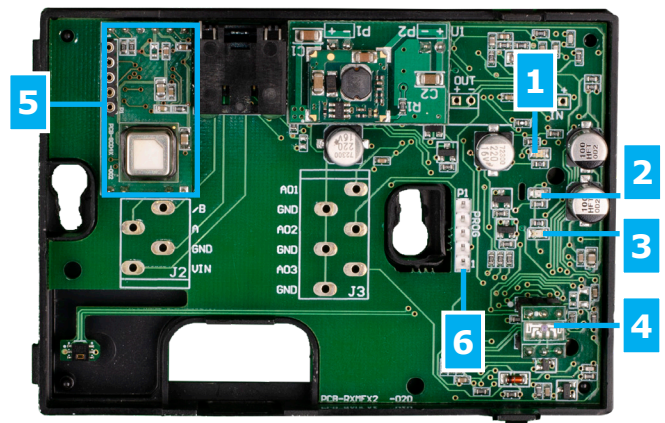
Via a Sentera Internet Gateway you can connect your installation to the SenteraWeb HVAC cloud and:




- 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

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 <sub>2</sub> 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 <sub>2</sub> is higher than or equal to Alert 1 level |
| 3 - Green LED                      | On   | Measured temperature or relative humidity value is within range or CO <sub>2</sub> level is lower than Alert 1 level                |
| 4 - Ambient light sensor           |  | Low light intensity / Active / Standby  |
| 5 - CO <sub>2</sub> sensor element |  | To measure CO <sub>2</sub> concentration, self-calibrating  |
| 6 - PROG header, P1                |  | Put a jumper on pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters                           |
|                                    |  | 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<sub>2</sub> 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.

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### Wiring and connections

#### 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 |        |                                     |

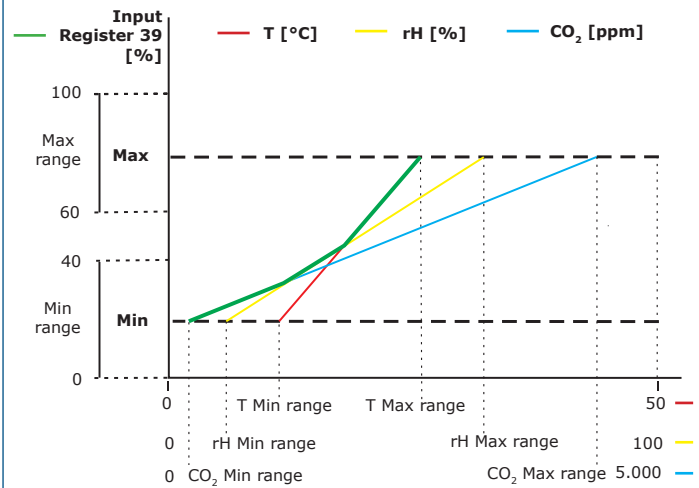


### Standards



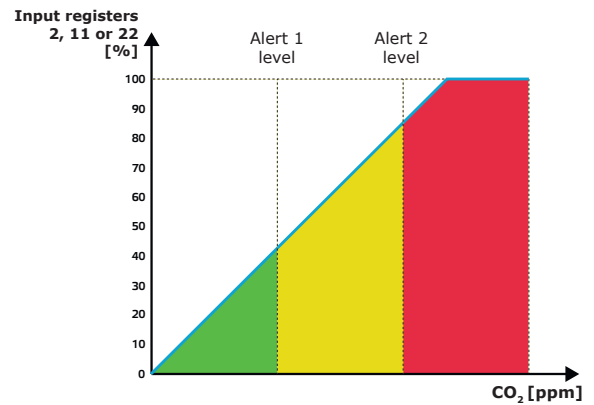
- Low Voltage Directive 2014/35/EU
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC Directive 2014/30/EU
  - EN 60730-1:2011 Automatic 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

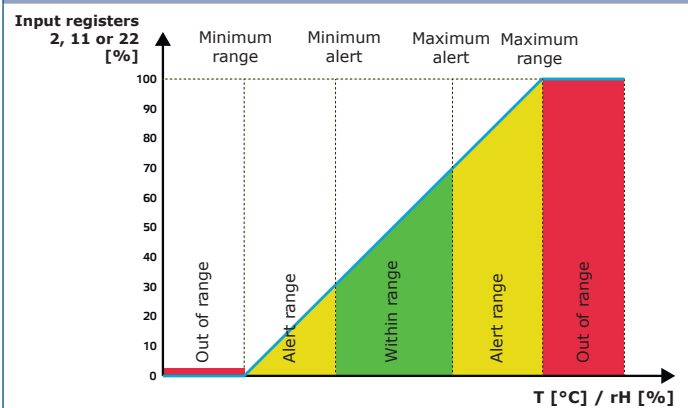


**Note:** The output changes automatically depending on the highest of the T, rH or CO<sub>2</sub> values, i.e. the highest of the three output values controls the output signal. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is also possible to control the output based on the measured CO<sub>2</sub> value only.

#### LED indication of CO<sub>2</sub> sensor (default setting)



#### LED indication of temperature and humidity sensor





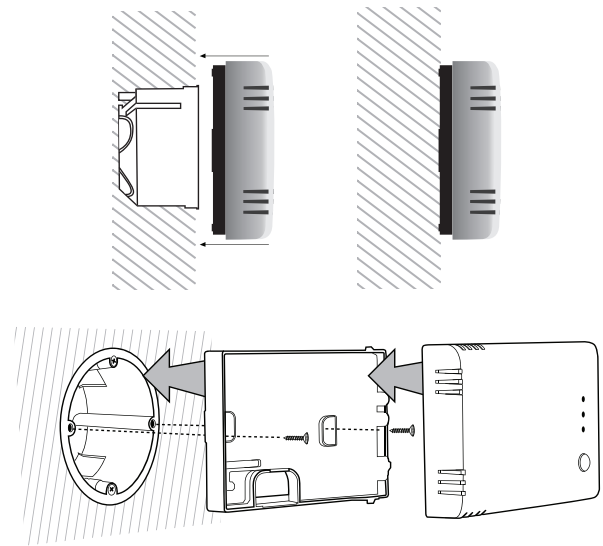
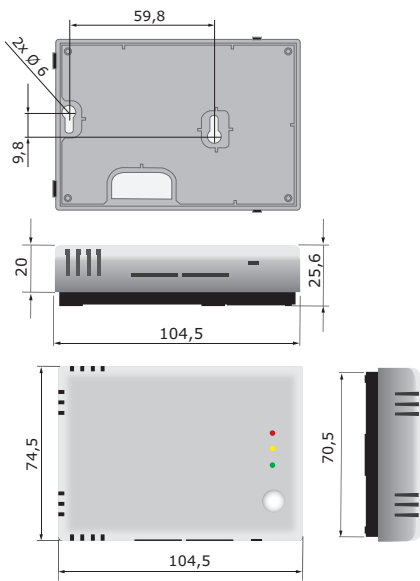
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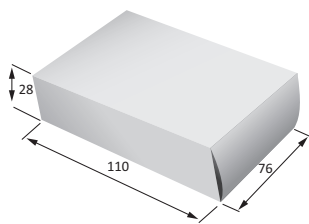
## Global trade item numbers (GTIN)

| 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     |