



# RCMFM-2R

## Intelligent CO<sub>2</sub> room sensor

The RCMFM-2R are intelligent room sensors featuring adjustable temperature, relative humidity and CO<sub>2</sub> 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

- 24 VDC power supply via RJ45 (PoM)
- Selectable temperature, relative humidity and CO<sub>2</sub> ranges
- Fan speed control based on temperature, relative humidity and CO<sub>2</sub>
- Bootloader for updating the firmware via Modbus RTU communication
- Day / night detection via ambient light sensor
- Modbus RTU communication
- Replaceable CO<sub>2</sub> sensor element
- 3 LEDs for status indication with adjustable light intensity
- Long-term stability and accuracy

### Technical specifications

|                      |                           |                                |
|----------------------|---------------------------|--------------------------------|
| Supply voltage       | 24 VDC, Power over Modbus |                                |
| Typical field of use | Temperature range         | 0–50 °C                        |
|                      | Relative humidity range   | 0–95 % rH (non-condensing)     |
|                      | CO <sub>2</sub> 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                      |                                |

### 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 |        |                                     |



### Area of use

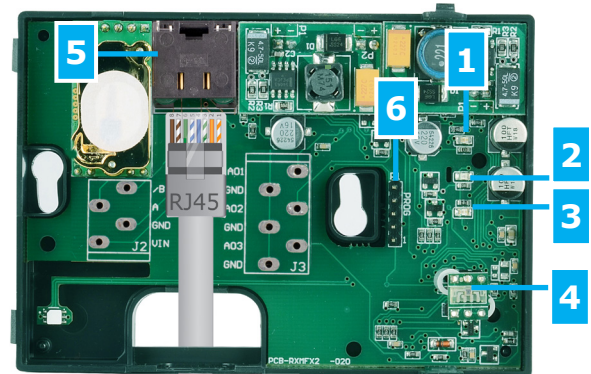
- Demand controlled ventilation based on measured temperature, relative humidity and CO<sub>2</sub>
- Suitable for residential and commercial buildings
- For indoor use only

### Article codes

| Article code | Supply      | Connection type | Imax  |
|--------------|-------------|-----------------|-------|
| RCMFM-2R     | 24 VDC, PoM | RJ45            | 50 mA |



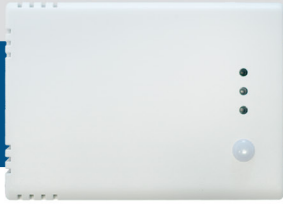
### Settings and indications



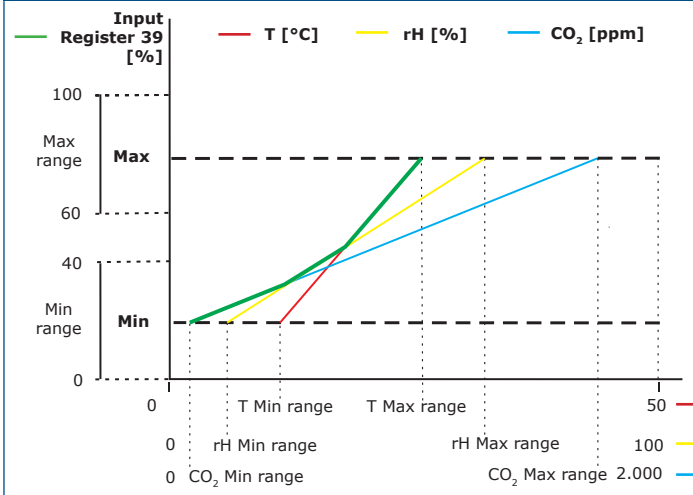
|                          |          |   |
|--------------------------|----------|---|
| 1 - Red LED              | On       | Measured temperature, relative humidity or CO <sub>2</sub> values are out of range                          |
|                          | Blinking |   |
| 2 - Yellow LED           | On       | Measured temperature, relative humidity or CO <sub>2</sub> values are in the alert range                    |
| 3 - Green LED            | On       | Measured temperature, relative humidity or CO <sub>2</sub> 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 - PROG header, P1      |          | Put a jumper onto pins 1 and 2 and wait for at least 5 seconds to reset the Modbus communication parameters |
|                          |          | 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<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.

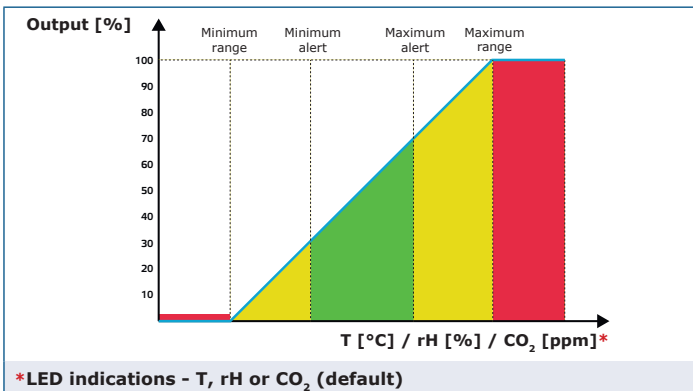
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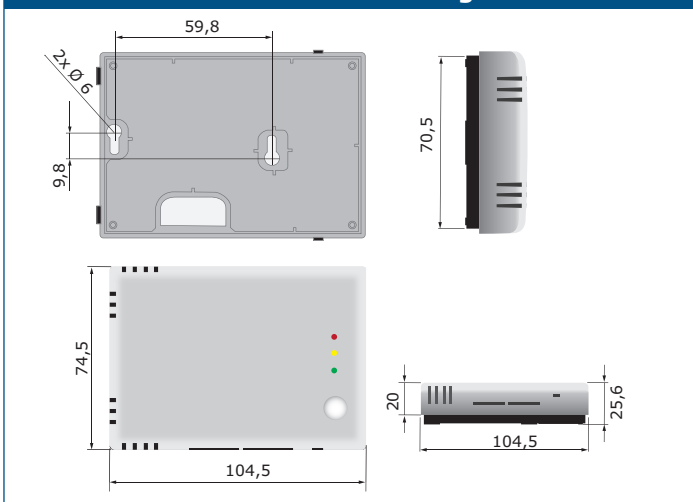
### Operational diagram



**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. See the green line in the operational diagram above. One or multiple sensors can be deactivated. E.g. it is possible to control the output based on the measured CO<sub>2</sub> value only.



### Fixing and dimensions



### Modbus registers



The Sensistart 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.

### Standards

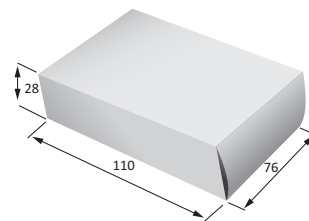


- Low Voltage Directive 2014/35/EU
  - EN 60529:1991 Degrees of protection provided by enclosures (IP Code) Amendment AC:1993 to EN 60529
  - EN 60730-1:2011 Automatic electrical controls for household and similar use - Part 1: General requirements
- EMC directive 2014/30/EU:
  - EN 60730-1:2011 Automatic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

• WEEE 2012/19/EU

• RoHS Directive 2011/65/EU

### Packaging



| Article  | Packaging        | Length [mm] | Width [mm] | Height [mm] | Net weight | Gross weight |
|----------|------------------|-------------|------------|-------------|------------|--------------|
| RCMFM-2R | Unit (1 pc.)     | 110         | 76         | 28          | 0,080 kg   | 0,102 kg     |
|          | Carton (24 pcs.) | 485         | 177        | 85          | 1,92 kg    | 2,588 kg     |
|          | Box (144 pcs.)   | 510         | 410        | 270         | 11,52 kg   | 16,76 kg     |

### Global trade item numbers (GTIN)

| Packaging | RCMFM-2R       |
|-----------|----------------|
| Unit      | 05401003010976 |
| Carton    | 05401003301661 |
| Box       | 05401003502488 |