

# Rittal – The System.

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## CMC III Universal Sensor



DK 7030.190

## Assembly and operating instructions

ENCLOSURES

POWER DISTRIBUTION

CLIMATE CONTROL

IT INFRASTRUCTURE

SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



# Foreword

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## Foreword

Dear Customer,

Thank you for choosing our CMC III universal sensor (referred to hereafter as "universal sensor")!

We wish you every success.

Yours

Rittal GmbH & Co. KG

Rittal GmbH & Co. KG  
Auf dem Stuetzelberg

35745 Herborn  
Germany

Tel.: +49(0)2772 505-0  
Fax: +49(0)2772 505-2319

E-mail: [info@rittal.com](mailto:info@rittal.com)  
[www.rittal.com](http://www.rittal.com)  
[www.rittal.de](http://www.rittal.de)

We are always happy to answer any technical questions regarding our entire range of products.

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## 1 Notes on documentation

### 1.1 CE labelling

Rittal GmbH & Co. KG hereby confirms that the CMC III universal sensor is compliant with the EU EMC Directive 2014/30/EU. An appropriate declaration of conformity has been prepared. It can be provided on request.



### 1.2 Storing the documents

The operating, installation and maintenance instructions as well as all applicable documents are an integral part of the product. They must be passed to those persons who are engaged with the unit and must always be available and on hand for the operating and maintenance personnel.

### 1.3 Symbols used in these operating instructions

The following symbols are used in this documentation:



**Danger!**

**A dangerous situation in which failure to comply with the instructions causes death or severe injury.**



**Warning!**

**A hazardous situation which may lead to death or serious injury if the instructions are not followed.**



**Caution!**

**A hazardous situation which may lead to (minor) injuries if the instructions are not followed.**



**Note:**

Identification of situations that can lead to material damage.

- This symbol indicates an "action point" and shows that you should perform an operation or procedure.

### 1.4 Associated documents

- Installation and Short User's Guide
- CMC III Processing Unit/CMC III Processing Unit Compact assembly and operating instructions

## 2 Safety instructions

### 2.1 General safety instructions

Please observe the subsequent general safety instructions for the installation and operation of the system:

- Use only original Rittal products or products recommended by Rittal in conjunction with the universal sensor.
- Please do not make any changes to the universal sensor that are not described in this manual or in the associated manuals.
- The operational safety of the universal sensor is guaranteed only for its approved use. The technical specifications and limit values stated may not be exceeded under any circumstances. In particular, this applies to the specified ambient temperature range and IP degree of protection.
- The universal sensor may not be opened. The unit does not contain any parts that need servicing.
- Operating the system in direct contact with water, aggressive materials or inflammable gases and vapours is prohibited.
- Other than these general safety instructions, ensure you also observe the specific safety instructions when the tasks described in the following chapters are performed.

### 2.2 Service and technical staff

- The mounting, installation, commissioning, maintenance and repair of this unit may only be performed by qualified mechanical and electro-technical trained personnel.
- Only properly instructed personnel may work on a unit while in operation.

# 3 Product description

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## 3 Product description

### 3.1 Function description and components

#### 3.1.1 Function

The universal sensor contains the following components:

- one analogue input 4 mA...20 mA as well as
- two digital inputs or
- two S<sub>0</sub> bus energy counters or
- one digital input and one S<sub>0</sub> bus energy counter or
- one Wiegand interface 56 bit or 86 bit

The interfaces can be configured via the CMC III Processing Unit website. The universal sensor provides the values measured to the connected CMC III Processing Unit. The universal sensor has an identification that allows it to be detected automatically by the CMC III Processing Unit.



Note:

In the following text the designation "CMC III Processing Unit" refers to both the "CMC III Processing Unit" and also the "CMC III Processing Unit Compact". All of the text passages which only apply for one of the two variants are labelled accordingly.

#### 3.1.2 Components

The device consists of a compact plastic housing in RAL 7035 with a ventilated front in RAL 9005.

### 3.2 Proper use, foreseeable misuse

The universal sensor serves exclusively to record data via one of the available interfaces. It may only be used together with the CMC III Processing Unit. Any other use is not permitted.

### 3.3 Scope of supply

- CMC III universal sensor
- Accessories provided (fig. 1)
- Installation and Short User's Guide

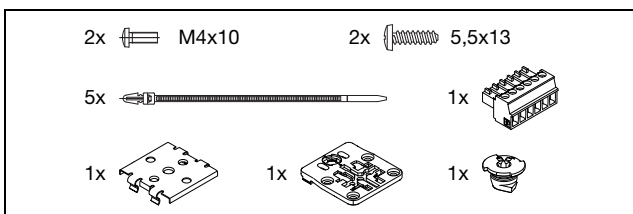


Fig. 1: Accessories provided

## 4 Transport and handling

### 4.1 Transport

The unit is delivered in a carton.

### 4.2 Unpacking

- Remove the unit's packaging materials.



Note:

After unpacking, the packaging materials must be disposed of in an environmentally friendly way. It consists of the following materials:

Polyethylene film (PE film), cardboard.

- Check the unit for any damage that occurred during transport.



Note:

Damage and other faults, e.g. incomplete delivery, should immediately be reported to the shipping company and to Rittal GmbH & Co. KG in writing.

- Remove the unit from the PE film.
- Remove the protective film from the front cover of the device.

## 5 Installation

### 5.1 Safety instructions

- Please observe the valid regulations for installation in the country in which the universal sensor is installed and operated, and the national regulations for accident prevention. Please also observe any company-internal regulations, such as work, operating and safety regulations.
- The technical specifications and limit values stated must not be exceeded under any circumstances. In particular, this applies to the specified ambient temperature range and IP degree of protection.
- If a higher IP protection class is required for a special application, the universal sensor must be installed in an appropriate housing or in an appropriate enclosure with the required IP degree of protection.

### 5.2 Siting location requirements

To ensure the correct function of the unit, the conditions for the installation site of the unit specified in section 8 "Technical specifications" must be observed.

### Electromagnetic interference

- Interfering electrical installations (high frequency) should be avoided.

### 5.3 Installation procedure

There are generally several options for installing the universal sensor:

1. Installation on the frame of the enclosure or IT enclosure using the bracket included.
2. Installation with the provided bracket on a system chassis.
3. Installation on a top-hat rail using the bracket included along with a spring clip.

#### 5.3.1 Installation notes

- The universal sensor must be positioned so that it is ventilated with an adequate amount of air and the ventilation slots are not covered.

#### 5.3.2 Installation with the provided bracket on the enclosure frame

The provided bracket is used for installation on the frame of an IT enclosure.

- For installation on a TS IT enclosure, break off the protruding lugs at the rear of the bracket.

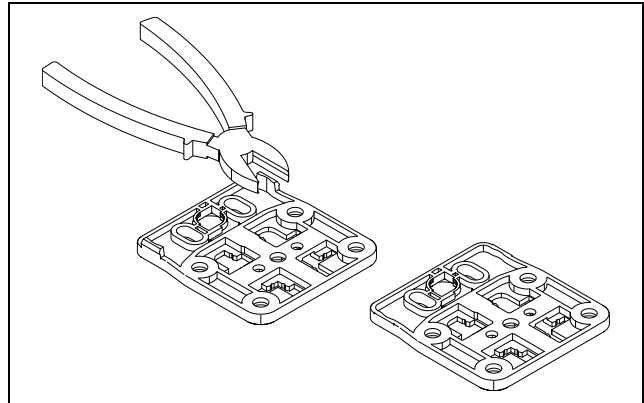


Fig. 2: Preparing the bracket for installation on a TS IT enclosure

- Place the universal sensor on the bracket from above.

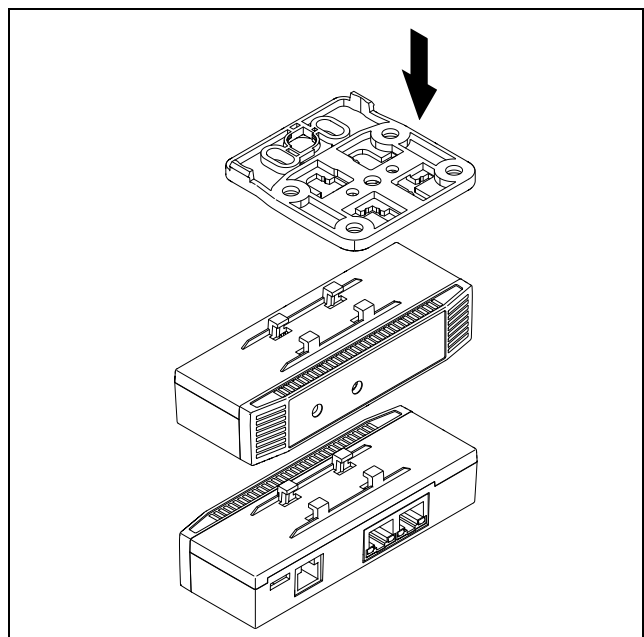


Fig. 3: Attaching the sensor to the bracket

- Move the sensor sideways slightly on the bracket so that it latches into place.

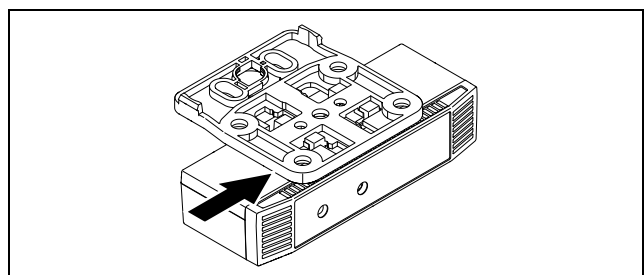


Fig. 4: Latching the sensor into place on the bracket

- Fasten the bracket, including universal sensor, at the desired position in the enclosure or the IT enclosure by making a quarter-turn of the connector.



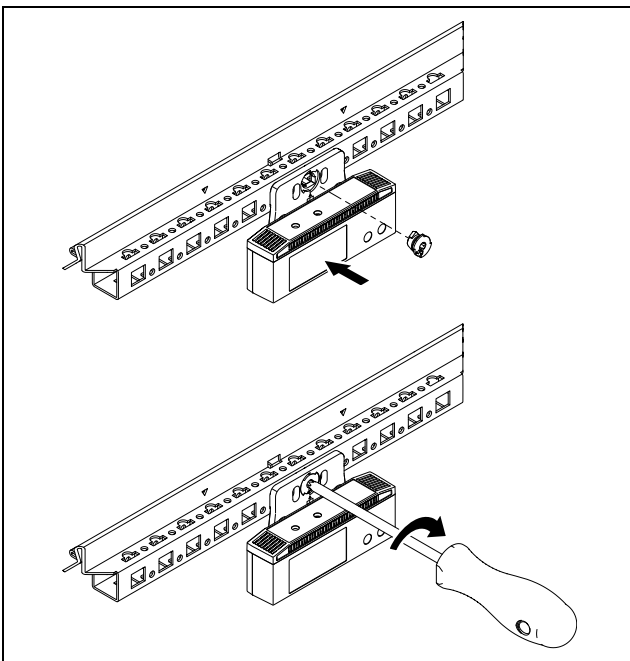


Fig. 5: Mounting the sensor in the enclosure or IT enclosure

- Optionally secure the bracket using the two screws included in the scope of delivery.

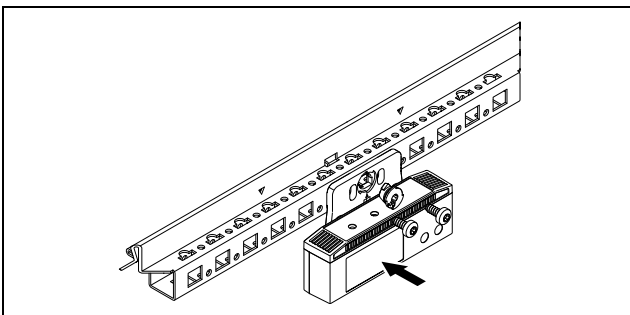


Fig. 6: Optional securing of the bracket

### 5.3.3 Installation with the provided bracket on a system chassis

The provided bracket is used for installation on a system chassis.

- Place the universal sensor on the bracket from above and latch it similar to the installation on the enclosure frame.
- Fasten the bracket, including universal sensor, at the desired position in the enclosure on the system chassis by making a quarter-turn of the connector.

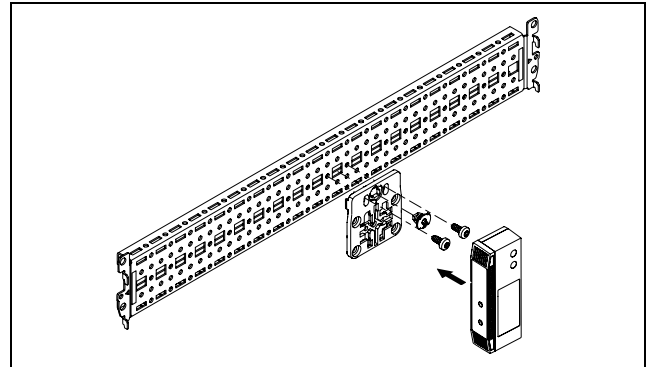


Fig. 7: Fastening the sensor to a system chassis

- Also **always** secure the bracket with the two provided bolts.

### 5.3.4 Installation on a top-hat rail

The sensor can also be mounted on a top-hat rail using the bracket along with the spring clip included in the scope of delivery.

- First screw the bracket onto the spring clip provided for installation on a top-hat rail.
- Then place the universal sensor on the bracket and latch it into place.

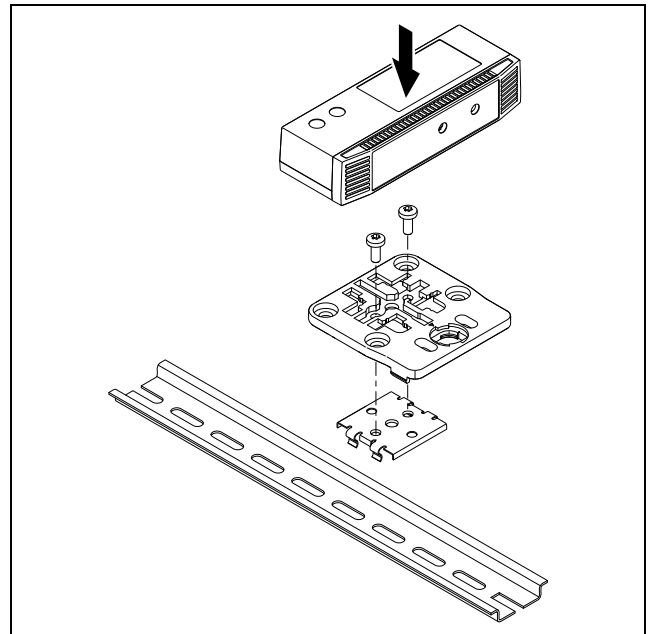


Fig. 8: Fastening the bracket to the spring clip

- Latch the spring clip into place at the desired position on the top-hat rail.

# 5 Installation

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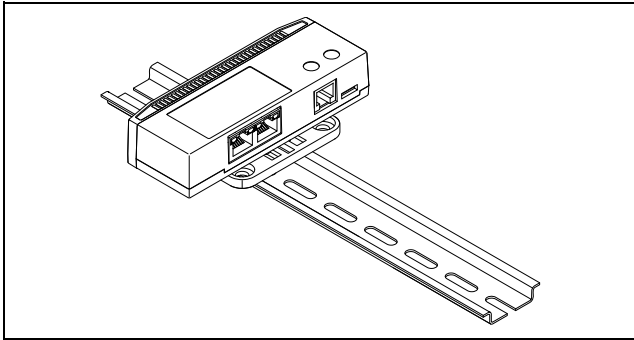


Fig. 9: Sensor with spring clip on the top-hat rail

## 5.4 Connecting the sensor

The CAN bus connection supplies the universal sensor with the necessary operating voltage. A separate power supply unit does not need to be connected.

- Connect an external device to the universal interface as per the following descriptions (fig. 10, item 4).
- Observe the pin assignment of the universal interface.

| Pin   | Signal             |
|-------|--------------------|
| Pin 1 | +24 V              |
| Pin 2 | GND                |
| Pin 3 | 4 mA...20 mA input |
| Pin 4 | 4 mA...20 mA GND   |
| Pin 5 | Digital Input 1    |
| Pin 6 | Digital Input 2    |

Tab. 1: Pin allocation of the universal interface



**Note:**  
You can also connect multiple devices to the universal interface if the pin allocation permits this (see section 3.1.1 "Function").

### Digital inputs

- Connect a potential-free switching contact (Digital Input 1) to Pin 5.  
This enables the fault message output from an external device to be evaluated, for example.
- If necessary, connect a second potential-free switching contact (Digital Input 2) to Pin 6.
- Configure the digital inputs depending on whether a normally closed or normally open contact is connected to the associated connection (see section 6.4.2 "Interface" and section 6.4.4 "Input\_1 or Input\_2").

### S<sub>0</sub> bus energy counter

- Connect an energy counter with an S<sub>0</sub> interface (EnergyMeter\_1) to Pin 2 and Pin 5.
- If necessary, connect a second energy counter with an S<sub>0</sub> interface (EnergyMeter\_2) to Pin 2 and Pin 6.

- Configure the energy counter (see section 6.4.2 "Interface" and section 6.4.5 "EnergyMeter\_1 and EnergyMeter\_2").

### Wiegand interface

- Connect a reading device with a Wiegand interface (Wiegand) to Pin 5 and Pin 6.
- If necessary, use Pin 1 and Pin 2 as a 24 V interface for the reading device.
- Configure the reading device (see section 6.4.2 "Interface").

- Use a CAN bus connection cable to connect the universal sensor to a CAN bus interface on the CMC III Processing Unit or the neighbouring component on the CAN bus (fig. 10, item 2).

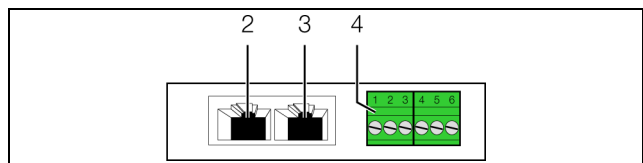


Fig. 10: Rear of the universal sensor

### Key

- 2 CAN bus connection, 24 V
- 3 CAN bus connection, 24 V
- 4 Universal interface

The following CAN bus connection cables from the CMC III accessories can be used:

- DK 7030.090 (length 0.5 m)
- DK 7030.091 (length 1 m)
- DK 7030.092 (length 1.5 m)
- DK 7030.093 (length 2 m)
- DK 7030.480 (length 3 m)
- DK 7030.490 (length 4 m)
- DK 7030.094 (length 5 m)
- DK 7030.095 (length 10 m)

The software is updated, if necessary, after being connected. The status LED of the universal sensor glows blue throughout the entire update process and also flashes purple while the sensor itself receives an update. In addition, the status LED of the CMC III Processing Unit flashes white and a corresponding message appears on the website.



**Note:**  
No settings can be modified as long as the update process is running.

The update of the sensor is complete when the following conditions have been fulfilled:

1. The LEDs on the CAN bus connection of the sensor light green.

2. The multi-LED of the sensor behind the front panel flashes blue and green, yellow or red, depending on the condition of the sensor.

Further components are connected as a daisy chain.

- If necessary, connect another component (e.g. another sensor type) to the second, free CAN bus interface of the universal sensor (fig. 10, item 3).

**Status change display:**

- The two green and the two red CAN bus LEDs on the CAN bus connection flash.
  - The multi-LED of the Processing Unit flashes continually in the sequence green – orange – red.
  - The multi-LED of the universal sensor flashes blue continuously.
- Press the "C" key on the CMC III Processing Unit (an initial audio signal will sound) and keep it pressed for approx. 3 seconds until a second audio signal is heard.



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Note:

See section 6.3.1 "Multi-LED displays" for a list of all of the multi-LED displays.

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## 6 Operation

### 6.1 Activating the universal sensor

After connecting the universal sensor to a neighbouring component using a CAN bus connecting cable, the universal sensor starts automatically (see section 5.4 "Connecting the sensor"). A separate switch-on is not required.

### 6.2 Operating and display elements

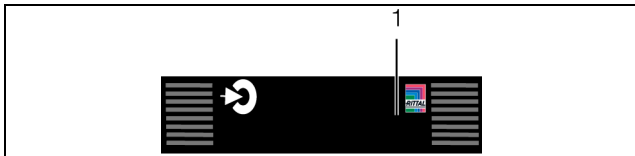


Fig. 11: Front of the universal sensor

#### Key

1 Multi-LED for status display

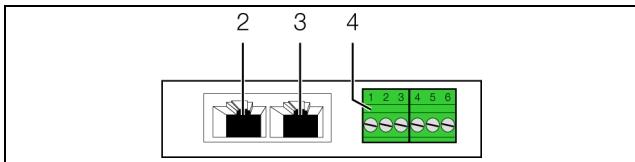


Fig. 12: Rear of the universal sensor

#### Key

2 CAN bus connection, 24 V  $\overline{\text{---}}$   
 3 CAN bus connection, 24 V  $\overline{\text{---}}$   
 4 Universal interface

### 6.3 LED displays

A multi-LED for the status display is integrated into the front of the universal sensor (fig. 11, item 1). Further LEDs are located at the rear on the CAN bus connection (fig. 12, item 2 and item 3).

#### 6.3.1 Multi-LED displays

The status of the universal sensor can be read on the multi-LED.

#### Continuously lit

| Colour | Status                 |
|--------|------------------------|
| Red    | Invalid measured value |

Tab. 2: Multi-LED continuously lit

#### Flashing codes

| Colour | Status  |
|--------|---|
| Green  | When the measured value changes or, at the latest, every 5 seconds. |

Tab. 3: Multi-LED flashing codes

| Colour | Status  |
|--------|---|
| Orange | The universal sensor has the "warning" status.<br>Fast flashing: upper limit value overshoot.<br>Slow flashing: lower limit value undershoot. |
| Red    | The universal sensor has the "alarm" status.<br>Fast flashing: upper limit value overshoot.<br>Slow flashing: lower limit value undershoot.   |
| Blue   | Communication via the CAN bus.  |

Tab. 3: Multi-LED flashing codes

### 6.3.2 LED displays on the CAN bus connection

A red and a green LED are located on the CAN bus connection. They display the status of the CAN bus.

| Colour                   | Status                                  |
|--------------------------|---|
| Green (continuously lit) | Communication via the CAN bus possible. |
| Red (flashing)           | Transmission fault.                     |

Tab. 4: LEDs for the CAN bus connection

### 6.4 Operating the CMC III Processing Unit from the website

After logging on to the CMC III Processing Unit, the web interface for operating the device is displayed.

- First select the "CMCIII-UNI" entry in the navigation area.

Similar to the CMC III Processing Unit, the **Configuration** tab can be used to individually configure the access rights for the universal sensor (**Access Rights** button) and the alarm messages (**Alarm Configuration** button).

The Observation tab is used to configure all of the settings for the universal sensor, such as the limit values for warning and alarm messages.

In the following sections 6.4.1 "Device" to 6.4.5 "EnergyMeter\_1 and EnergyMeter\_2", only those parameters which you can modify are described. There are also display values that provide information.

#### 6.4.1 Device

General settings for the universal sensor are configured at the "Device" level.

| Parameter   | Explanation                                    |
|-------------|--|
| Description | Specific description of the universal sensor.  |
| Location    | Installation location of the universal sensor. |

Tab. 5: Settings in the "Device" level

In addition, parameters that provide detailed information about the universal sensor, such as the version of the deployed software and hardware, are also displayed. You should have such information available, in particular to permit fast troubleshooting of queries with Rittal.


### 6.4.2 Interface

The desired interface type for the two inputs is configured on the "Interface" level.

| Parameter | Explanation   |
|-----------|---|
| Config    | Select the Interface type. The following options are available.<br>Digital Input: Digital input<br>S0 Interface: Energy counter with S <sub>0</sub> interface<br>Wiegand 56: Reading device with Wiegand interface 56 bit<br>Wiegand 86: Reading device with Wiegand interface 86 bit |

Tab. 6: Settings in the "Interface" level

The status for the "Input\_1", "Input\_2", "EnergyMeter\_1" and "EnergyMeter\_2" levels changes in accordance with the selection.

 Note:  
If you connect a reading device with a Wiegand interface to the universal sensor then you must select the "Wiegand 56" or "Wiegand 86" entry for **both** inputs. No further settings need to be made for the reading device.

### 6.4.3 Airflow (analogue)

The settings for the analogue sensor are configured at the "Airflow (analogue)" level.


| Parameter         | Explanation   |
|-------------------|---|
| DescName          | Specific description of the analogue sensor.  |
| SetPtHigh-Alarm   | Upper limit for which an alarm message is issued when exceeded.   |
| SetPtHigh-Warning | Upper limit for which a warning message is issued when exceeded.  |
| SetPtLow-Warning  | Lower limit for which a warning message is issued when fallen below.  |
| SetPtLow-Alarm    | Lower limit for which an alarm message is issued when fallen below.   |
| Hysteresis        | The necessary percentage deviation for falling below or exceeding the limit to trigger a status change (see the assembly, installation and operating instructions for the CMC III Processing Unit). |

Tab. 7: Settings in the "Airflow (analogue)" level

The following parameters are also displayed for the analogue sensor:

| Parameter | Explanation   |
|-----------|---|
| Value     | Currently measured value.                                       |
| Status    | Current status of the sensor, taking account of the hysteresis. |

Tab. 8: Displays in the "Airflow (analogue)" level

 Note:  
If the value "0" is entered for all limit values at the "Analogue" level, the status of the analogue sensor is always "OK".

If "0" is not entered for all of the limit values, then the measurement value is evaluated as follows:

| Current [mA]             | Value | Status               |
|--------------------------|-------|----------------------|
| $I < 3.00$               | 0%    | 24 (MSG_PROBE_OPEN)  |
| $3.00 < I < 4.00$        | 0%    | OK / warning / alarm |
| $4.00 \leq I \leq 20.00$ | X%    | OK / warning / alarm |
| $20.00 < I < 21.00$      | 100%  | OK / warning / alarm |
| $21.00 < I$              | 0%    | 26 (MSG_PROBE_SHORT) |


Tab. 9: Evaluation of the measurement value

### 6.4.4 Input\_1 or Input\_2

The separate settings for the two integrated digital inputs are configured at the "Input\_1" and "Input\_2" levels. The "Digital Input" entry must have been selected on the "Interface" level.

| Parameter | Explanation  |
|-----------|--|
| DescName  | Specific description of the associated input.  |
| Logic     | Selection of the input switching logic. The following options are available.<br>0: Off / 1: On<br>0: On / 1: Off<br>0: OK / 1: Alarm<br>0: Alarm / 1: OK |
| Delay     | Time delay after which the status message changes.   |

Tab. 10: Settings in the "Input\_1" and "Input\_2" levels

 Note:  
If a reader unit with Wiegand interface is connected to the universal sensor, the variable "Input 1" must be properly configured in the alarm configuration in order to be able to send text messages and e-mails.

# 6 Operation

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The following parameters are also displayed for the two inputs:

| Parameter | Explanation   |
|-----------|---|
| Value     | The current state of the input (0 or 1).  |
| Status    | "Inactive" is displayed if the S <sub>0</sub> interface or the Wiegand interface is activated. When digital input is activated, this displays the status as per the "Logic" parameter (depending on the actual state of the input). |

Tab. 11: Displays in the "Input\_1" and "Input\_2" levels

### 6.4.5 EnergyMeter\_1 and EnergyMeter\_2

The settings for the two energy counters are configured separately on the "EnergyMeter\_1" and "EnergyMeter\_2" levels. The "S0 Interface" entry must have been selected on the "Interface" level.

| Parameter              | Explanation                                 |
|------------------------|---|
| DescName               | Specific description of the energy counter. |
| S <sub>0</sub> _Factor | Number of pulses per kWh.                   |

Tab. 12: Settings in the "EnergyMeter\_1" and "EnergyMeter\_2" levels

The following parameters are also displayed for the two energy counters:

| Parameter | Explanation   |
|-----------|---|
| Value     | Currently measured energy value.  |
| Status    | "Inactive" is displayed if the digital input or the Wiegand interface is activated. "Active" is displayed if the S <sub>0</sub> interface is activated. |

Tab. 13: Displays in the "EnergyMeter\_1" and "EnergyMeter\_2" levels

## **7 Storage and disposal**

### **7.1 Storage**

If the device is not used for a long period, Rittal recommends that it is disconnected from the mains power supply and protected from damp and dust.

### **7.2 Disposal**

Since the universal sensor consists mainly of the "housing" and "circuit board" parts, the device must be passed on to the electronic waste recycling system for disposal.

# 8 Technical specifications

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## 8 Technical specifications

| Technical specifications    |                     | CMC III universal sensor                   |
|-----------------------------|---------------------|--|
| Model no.                   |                     | DK 7030.190                                |
| W x H x D (mm)              |                     | 110 x 30 x 40                              |
| Operating temperature range |                     | 0 °C...+55 °C                              |
| Storage temperature         |                     | -45 °C...+85 °C                            |
| Operating humidity range    |                     | 5%...95% relative humidity, non-condensing |
| Protection category         |                     | IP 30 to IEC 60 529                        |
| Inputs and outputs          | CAN bus (RJ 45)     | 2 x  |
|                             | Universal interface | 1 x  |
| Operation/signals           | LED display         | OK / warning / alarm / network status      |

Tab. 14: Technical specifications



### **9 Customer service addresses**

For technical queries, please contact:

Tel.: +49(0)2772 505-9052

E-mail: [info@rittal.com](mailto:info@rittal.com)

Homepage: [www.rittal.com](http://www.rittal.com)

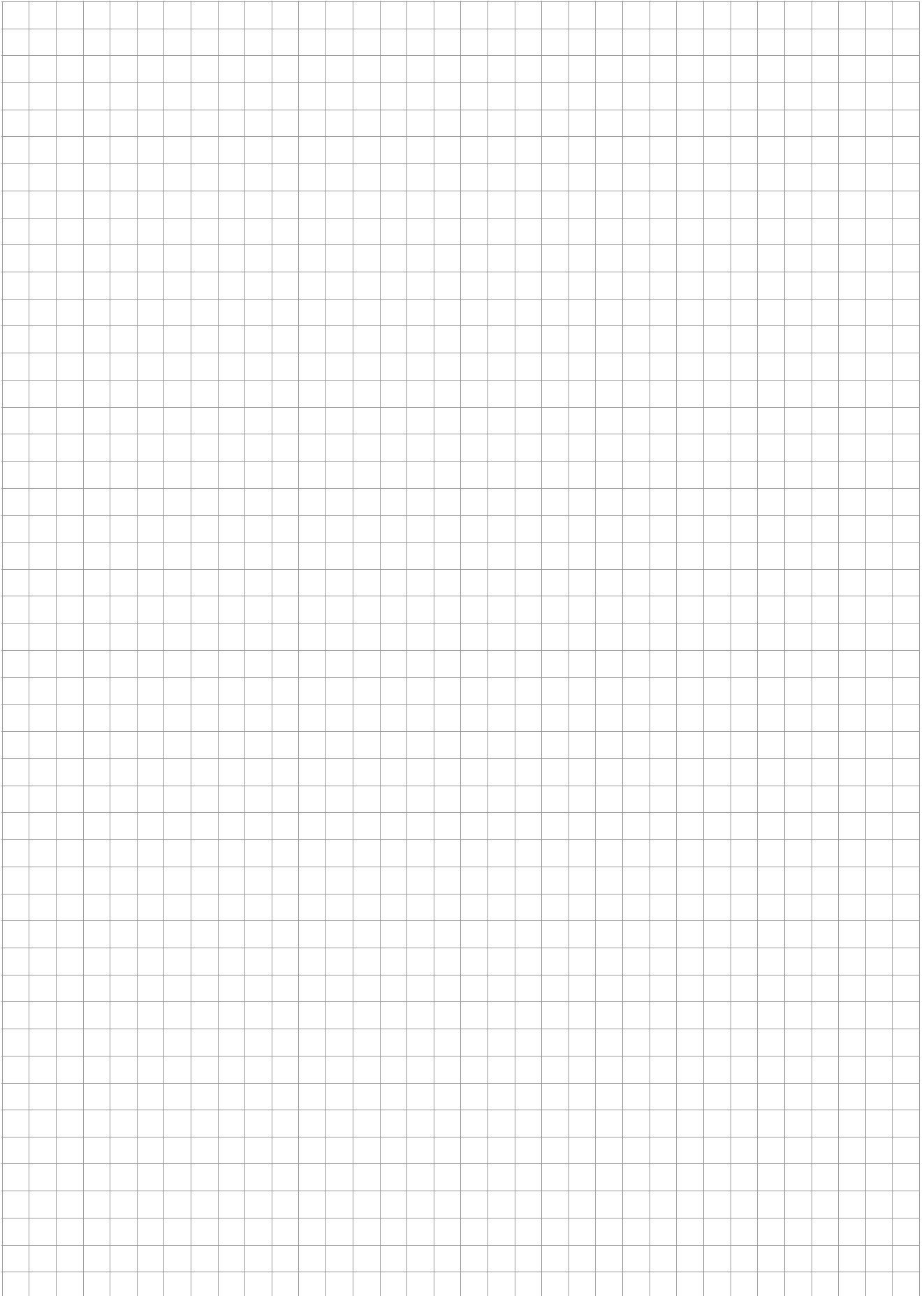
For complaints or service requests, please contact:

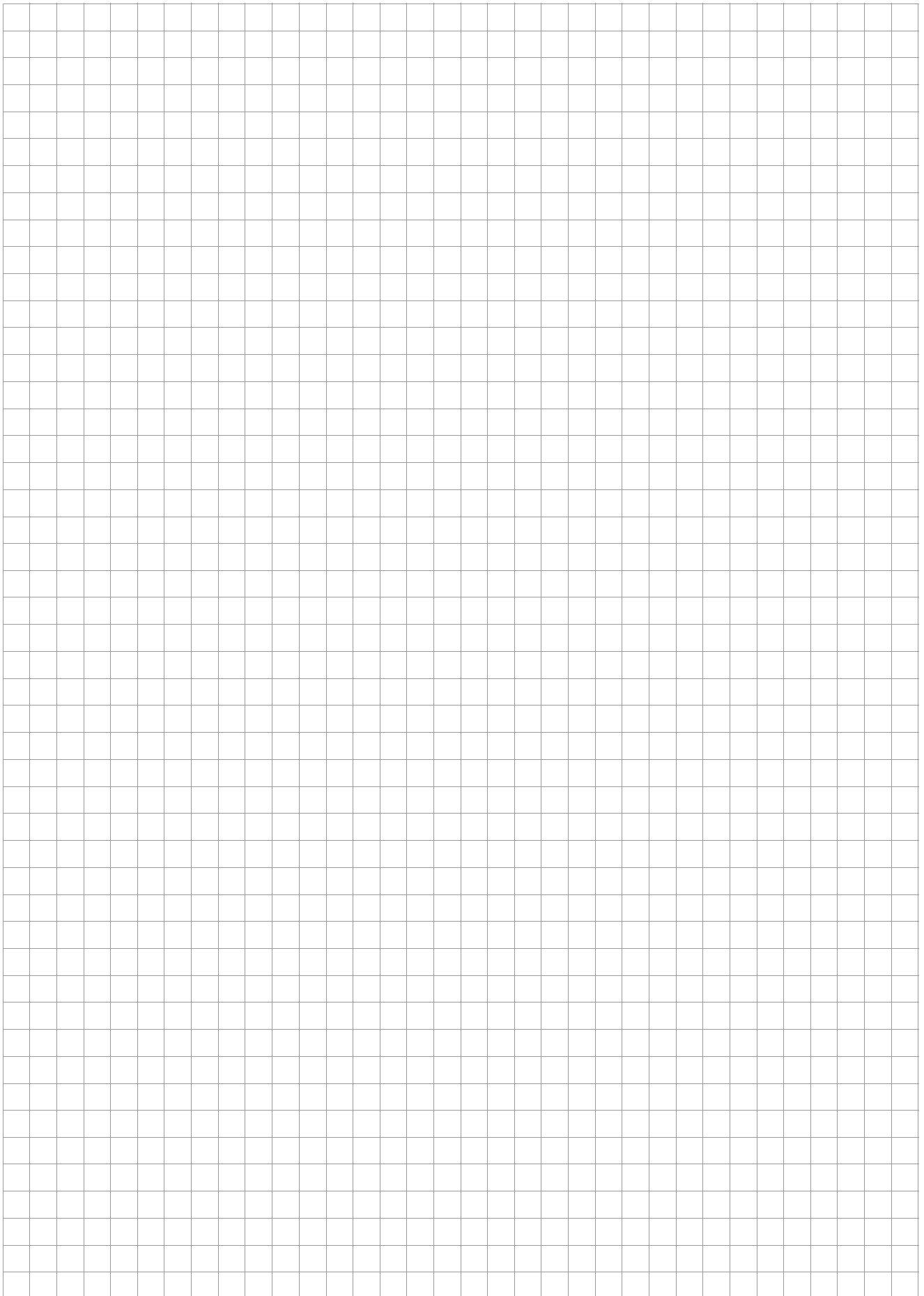
Tel.: +49(0)2772 505-1855

E-mail: [service@rittal.de](mailto:service@rittal.de)

# Notes

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# Rittal – The System.

Faster – better – everywhere.

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- Power Distribution
- Climate Control
- IT Infrastructure
- Software & Services

You can find the contact details of all Rittal companies throughout the world here.



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Auf dem Stuetzelberg · 35745 Herborn · Germany  
Phone +49 2772 505-0  
E-mail: [info@rittal.de](mailto:info@rittal.de) · [www.rittal.com](http://www.rittal.com)

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