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DK temperature/humidity sensor



7010.120

Assembly and operating instructions

ENCLOSURES

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SOFTWARE & SERVICES

FRIEDHELM LOH GROUP



Foreword

Dear Customer,

Thank you for choosing our temperature/humidity sensor!

We wish you every success.

Yours

Rittal GmbH & Co. KG

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

Contents

1	Notes on documentation.....	4
1.1	CE labelling	4
1.2	Storing the documents	4
1.3	Symbols used in these operating instructions ...	4
1.4	Associated documents	4
1.5	Area of validity	4
2	Safety instructions.....	5
2.1	General safety instructions.....	5
2.2	Service and technical staff	5
3	Product description.....	6
3.1	Functional description and components	6
3.1.1	Function	6
3.1.2	Components	6
3.2	Intended use, foreseeable misuse.....	6
3.3	Scope of supply	6
4	Transport and handling.....	7
4.1	Transport.....	7
4.2	Unpacking.....	7
5	Installation.....	8
5.1	Safety instructions.....	8
5.2	Siting location requirements.....	8
5.3	Installation procedure	8
5.3.1	Installation notes.....	8
5.3.2	Installation with the provided bracket on the enclosure frame	8
5.3.3	Installation with the provided bracket on a punched section with mounting flange	10
5.3.4	Installation on a top-hat rail.....	10
5.4	Connection of the sensor	10
6	Operation.....	12
6.1	Activating the temperature/humidity sensor	12
6.2	Operating and display elements.....	12
6.3	LED displays	12
6.3.1	Multi-LED displays.....	12
6.3.2	LED displays on the CAN bus connection	12
6.4	Operating from the Rittal embedded device website	12
6.4.1	Device	12
6.4.2	Temperature	13
6.4.3	Humidity.....	13
6.4.4	Dew Point.....	13
7	Storage and disposal	15
7.1	Storage	15
7.2	Disposal	15
8	Technical specifications.....	16
9	Customer service addresses	17

1 Notes on documentation

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1 Notes on documentation

1.1 CE labelling

Rittal GmbH & Co. KG hereby confirms that the temperature/humidity 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.



of the individual parameters on the Rittal embedded device website. Depending on the set language, the displays on the Rittal embedded device website may be different (see assembly and operating instructions for the Rittal embedded device used).

1.2 Storing the documents

The assembly and operating 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 will result in death or severe injury.



Warning!
A dangerous situation which may cause death or serious injury if the instructions are not followed.



Caution!
A dangerous situation which may lead to (minor) injuries if the instructions are not followed.



Note:
Important notices and indication of situations which may result in 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 Guide
- Assembly and operating instructions of the Rittal embedded device used

1.5 Area of validity

This documentation shows the English screenshots. English terminology is also used in the descriptions

2 Safety instructions

2.1 General safety instructions

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

- The temperature/humidity sensor may only be assembled and installed by properly trained specialists.
- The casing of the temperature/humidity sensor must not be opened!
- The temperature/humidity sensor must not come into contact with water, aggressive or flammable gases and vapours!
- The temperature/humidity sensor can be used only within the limits of the specified technical data!
- The temperature/humidity sensor may only be supplied with the required operating voltage via the CAN bus.
- The temperature/humidity sensor must not be used in locations where children might be present.
- Use only original Rittal products or products recommended by Rittal in conjunction with the temperature/humidity sensor.
- Please do not make any changes to the temperature/humidity sensor that are not described in this manual or in the associated manuals.
- The operational safety of the temperature/humidity sensor is guaranteed only for its approved use. 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.
- Other than these general safety instructions, ensure you also observe the specific safety instructions when the tasks described in the following chapters are performed.

REACH safety information in accordance with Regulation (EC) No 1907/2006

- The product contains the SVHC "Lead – CAS no. 7439-92-1".
- The manufacturer specifies that no health risks of any kind arise during use of the product when handled properly.
- After use, the product must be disposed of properly in accordance with the applicable statutory regulations.

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 Functional description and components

3.1.1 Function

The temperature/humidity sensor is used to measure the temperature and relative air humidity at the operational location. It provides the temperature and relative air humidity values measured at the connected Rittal embedded device. The temperature/humidity sensor has an identification that allows it to be detected automatically by the Rittal embedded device.

3.1.2 Components

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

3.2 Intended use, foreseeable misuse

The temperature/humidity sensor must only be used for measuring the temperature and relative humidity and only in conjunction with Rittal embedded devices (software version 10.0.0 or above). Envisaged deployment locations are enclosures and enclosure systems, as well as racks for the installation of server and network technology in secure and technology rooms. The temperature/humidity sensor must only be combined and operated with the intended Rittal system accessories and cables (see Assembly and Operating Instructions for the CMC III Processing Unit – Document D-0000-00000553-00). Any other use is not permitted.

The unit is state of the art and built according to recognised safety regulations. Nevertheless, incorrect use may result in damage to or faults with the system and other material assets.

Consequently, the unit must only be used properly and in a technically sound condition! Any malfunctions which impair safety should be rectified immediately! Follow the operating instructions!

The intended use also includes the observance of the documentation provided and fulfilling the inspection and maintenance conditions.

Rittal GmbH & Co. KG is not liable for any damage which may result from failure to comply with the documentation provided. The same applies to the non-observance of the valid documentation for any deployed accessories and the Rittal embedded device.

Inappropriate use may result in danger. Inappropriate use includes:

- Use of impermissible tools.
- Improper operation.
- Improper rectification of malfunctions.

- Use of accessories not approved by Rittal GmbH & Co. KG.

3.3 Scope of supply

- Temperature/humidity sensor
- Accessories provided (fig. 1)
- Installation and Short User Guide

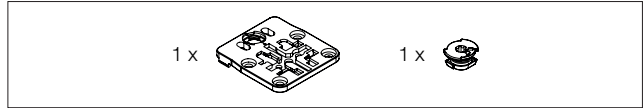


Fig. 1: Accessories provided

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. They consist of the following materials: Polyethylene film (PE film), cardboard.

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



Note:

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

- 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 temperature/humidity sensor is installed and operated, and the national regulations for accident prevention. Please also observe any internal company 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 temperature/humidity 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 unit functions correctly, 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 temperature/humidity sensor:

1. Installation on the frame of the enclosure or IT enclosure using the bracket included.
2. Installation with the provided bracket on a punched section with mounting flange.
3. Optional: Installation on a top-hat rail using the bracket included along with a spring clip (accessories).

5.3.1 Installation notes

- Precise temperature measurement with the internal sensor requires adequate air circulation inside the enclosure or the IT enclosure. In addition, the temperature/humidity sensor must be positioned so that it is ventilated with an adequate amount of air and the ventilation slots are not covered.
- Ensure that the temperature/humidity sensor is installed only in one of the shown positions.

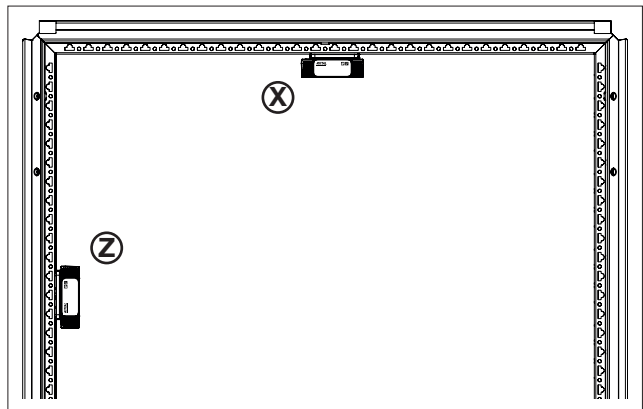


Fig. 2: Mounting positions

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.

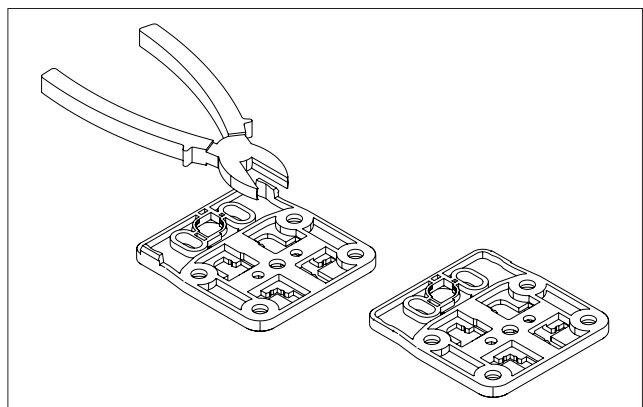


Fig. 3: Preparing the bracket for installation on a TS IT enclosure

- Place the temperature/humidity sensor on the bracket from above.

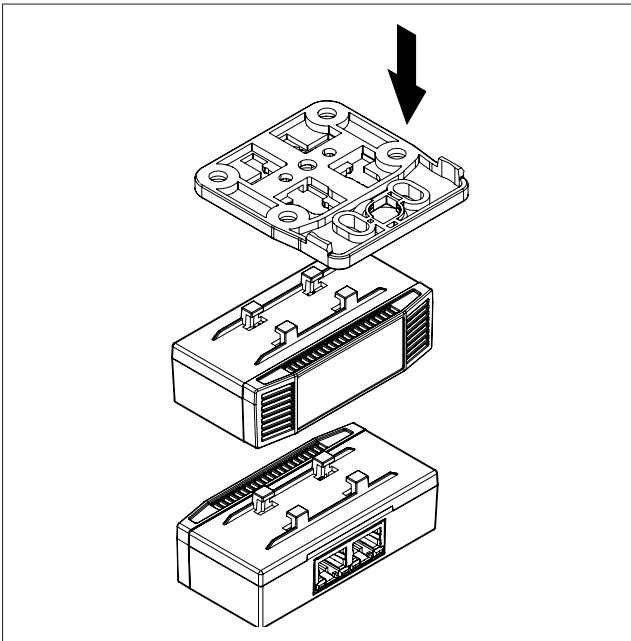


Fig. 4: Attaching the sensor to the bracket

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

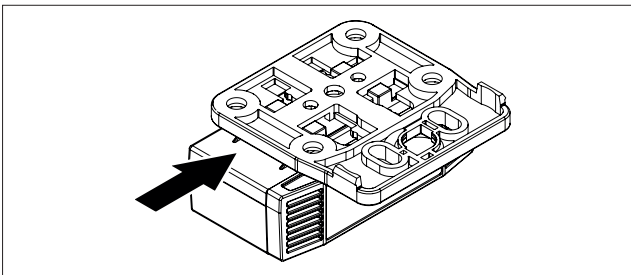


Fig. 5: Latching the sensor into place on the bracket

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

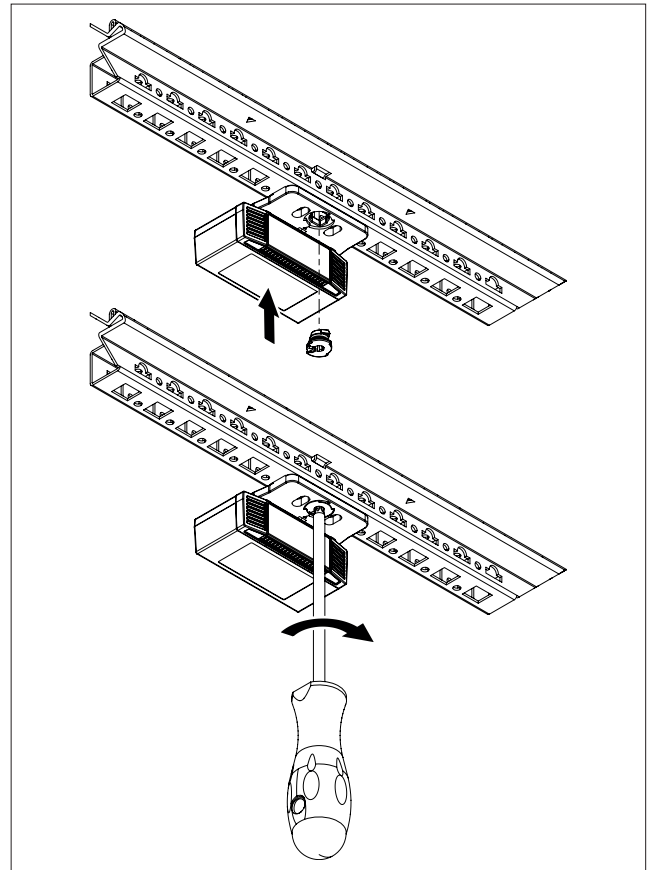


Fig. 6: Mounting the enclosure section "X"

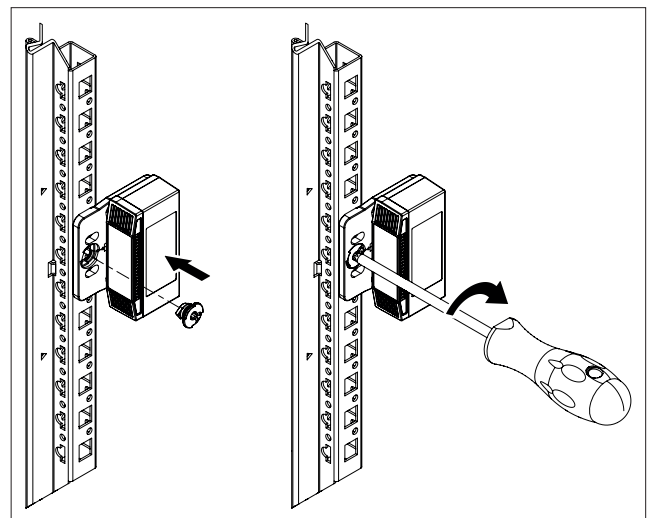


Fig. 7: Mounting the enclosure section "Z"

- Optionally secure the bracket using the two screws M5.5 x 13.

5 Installation

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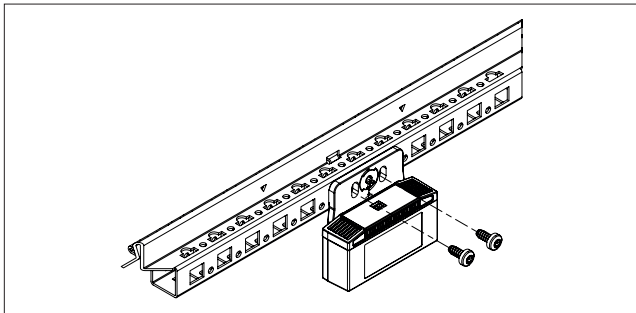


Fig. 8: Optional securing of the bracket (enclosure section "X" or enclosure section "Z")

5.3.3 Installation with the provided bracket on a punched section with mounting flange

The provided bracket is used for installation on a punched section with mounting flange.

- Place the temperature/humidity sensor on the bracket from above and latch it similar to the installation on the enclosure frame.
- Fasten the bracket, including temperature/humidity sensor, at the desired position in the enclosure on the punched section with mounting flange by making a quarter-turn of the connector.

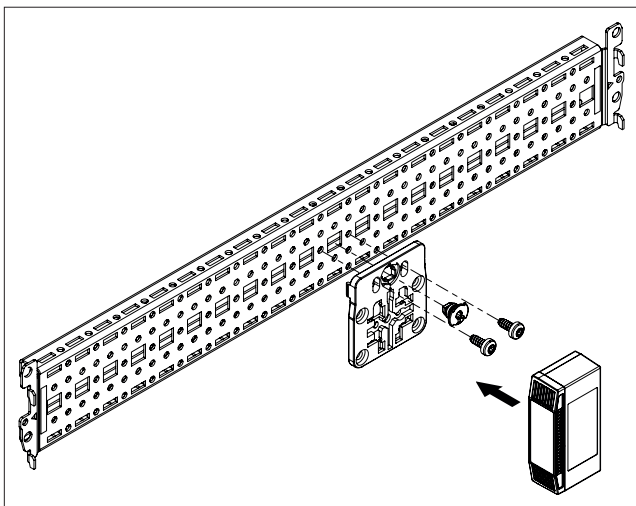


Fig. 9: Fastening the sensor to a punched section with mounting flange

- Optionally secure the bracket using the two screws M5.5 x 13 similar to the installation on the enclosure frame.

5.3.4 Installation on a top-hat rail

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

- First screw the bracket onto the spring clip for installation on a top-hat rail using two screws M4 x 10.
- Then place the temperature/humidity sensor on the bracket and latch it into place.

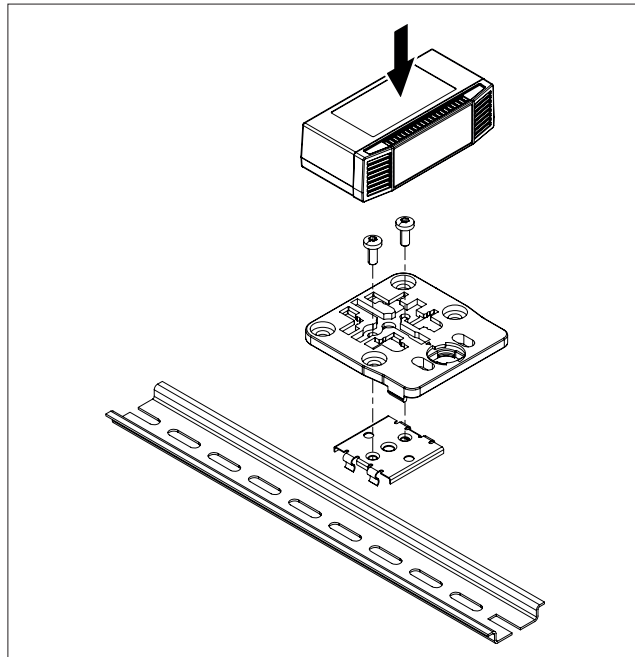


Fig. 10: Fastening the bracket to the spring clip

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

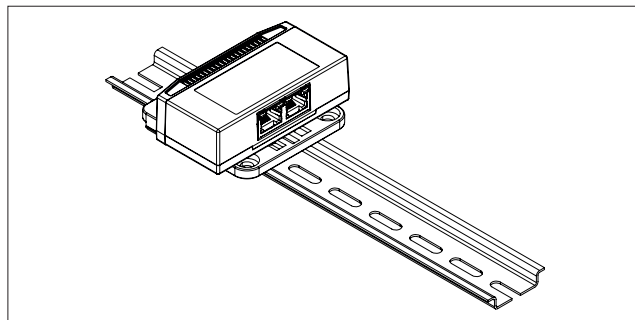


Fig. 11: Sensor with spring clip on the top-hat rail

5.4 Connection of the sensor

The temperature/humidity sensor is supplied with the necessary operating voltage via the CAN bus connection. A separate power supply unit does not need to be connected.

- Use a CAN bus connection cable to connect the temperature/humidity sensor to a CAN bus interface on the Rittal embedded device or the neighbouring component on the CAN bus (fig. 12, item 2, 3).

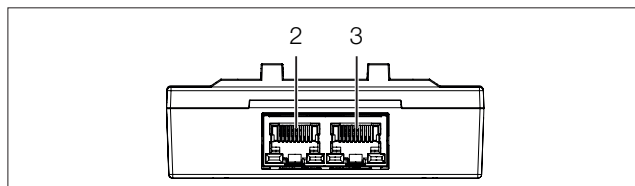


Fig. 12: Rear of the temperature/humidity sensor

Key

- 2 CAN bus connection, 24 V $\overline{\text{---}}$, 1 A
- 3 CAN bus connection, 24 V $\overline{\text{---}}$, 1 A

The following CAN bus connection cables are available from Rittal:

- 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)



Note:

The multi-LED of the temperature/humidity sensor lights red continuously for approx. 10 seconds while the average value of the temperature is being determined.



Note:

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

The sensor software is updated, if necessary, after being connected. The status LED of the temperature/humidity sensor glows blue throughout the entire update process, while the sensor itself is being updated. In addition, the status LED of the Rittal embedded device 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 bus connection of the sensor light green.
2. The multi-LED of the sensor behind the front panel flashes blue and also green, yellow or red depending on the status of the sensor.

Further components are connected as a daisy chain.

■ When connecting other components to the CAN bus, please note the following restrictions:

- When installing sensors or other compatible components, the total current per CAN bus channel must not exceed 1 A.
- Electricity consumption of temperature/humidity sensor: 40 mA

■ If necessary, connect another component (e.g. another sensor type) to the second, free CAN bus interface of the temperature/humidity sensor (fig. 12, item 2, 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 Rittal embedded device flashes continually in the sequence green – yellow – red.
 - The multi-LED of the temperature/humidity sensor flashes blue continuously.
- Press the "C" key on the Rittal embedded device (an initial audio signal will sound) and keep it pressed for approx. 3 seconds until a second audio signal is heard.

6 Operation

6.1 Activating the temperature/humidity sensor

After connecting the temperature/humidity sensor to a neighbouring component using a CAN bus connecting cable, the temperature/humidity sensor starts automatically (see section 5.4 "Connection of the sensor"). Separate activation is not required.

6.2 Operating and display elements

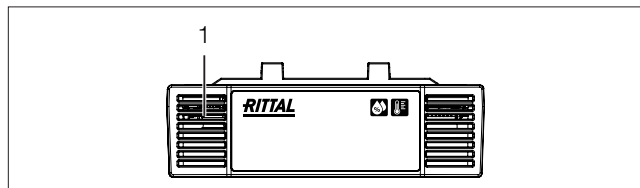


Fig. 13: Front of the temperature/humidity sensor

Key

1 Multi-LED for status display

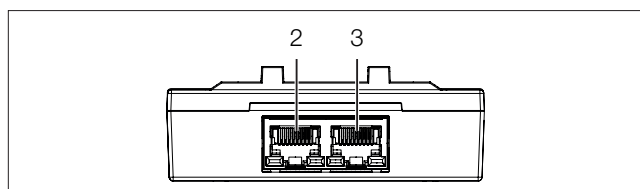


Fig. 14: Rear of the temperature/humidity sensor

Key

2 CAN bus connection, 24 V $\overline{\text{---}}$, 1 A
3 CAN bus connection, 24 V $\overline{\text{---}}$, 1 A

6.3 LED displays

A multi-LED for the status display is integrated into the front of the temperature/humidity sensor (fig. 13, item 1). Further LEDs are located at the rear on the CAN bus connection (fig. 14, item 2 and 3).

6.3.1 Multi-LED displays

The status of the temperature/humidity sensor can be read on the multi-LED.

Continuously lit

Colour	Status
Red	For approximately 10 seconds while the average temperature value is being determined the first time.
Red	Invalid measured value.
Blue	A temperature/humidity sensor software update is being carried out.

Tab. 1: Multi-LED continuously lit

Flashing codes

Colour	Status
Green	When the measured value changes or, at the latest, every 5 seconds.
Yellow	The temperature/humidity sensor has the "warning" status. Fast flashing: upper limit value overshoot. Slow flashing: lower limit value undershoot.
Red	The temperature/humidity sensor has the "alarm" status. Fast flashing: upper limit value overshoot. Slow flashing: lower limit value undershoot.
Blue	Communication via the CAN bus.

Tab. 2: 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. 3: LEDs for the CAN bus connection

6.4 Operating from the Rittal embedded device website

After logging on to the Rittal embedded device, the web interface for operating the device is displayed.

■ First select the "CMCX-HUM" entry in the navigation area.

Similar to the Rittal embedded device, the **Configuration** tab can be used to individually configure the access rights for the temperature/humidity sensor (**Device Rights** button) and the alarm messages (**Alarm Configuration** button).

The **Monitoring** tab is used to configure all of the settings for the temperature/humidity sensor, such as the limit values for warning and alarm messages. In the following sections 6.4.1 "Device" to 6.4.4 "Dew Point", 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 temperature/humidity sensor are configured at the "Device" level.

Parameter	Explanation
Description	Specific description of the temperature/humidity sensor.
Location	Installation location of the temperature/humidity sensor.

Tab. 4: Settings at "Device" level

In addition, parameters that provide detailed information about the temperature/humidity sensor, such as its software and hardware versions, are also displayed. You should have such information available, in particular to enable rapid troubleshooting when requesting assistance from Rittal.

6.4.2 Temperature

The temperature settings are configured on the "Temperature" level.

Parameter	Explanation
DescName	Specific description of the temperature measured.
SetPtHigh-Alarm	Upper limit temperature for which an alarm message is issued when exceeded.
SetPtHigh-Warning	Upper limit temperature for which a warning message is issued when exceeded.
SetPtLow-Warning	Lower limit temperature for which a warning message is issued when fallen below.
SetPtLow-Alarm	Lower limit temperature for which an alarm message is issued when fallen below.
Hysteresis	The necessary percentage deviation for falling below or exceeding the limit temperature to trigger a status change (see the assembly and operating instructions for the Rittal embedded device).

Tab. 5: Settings at "Temperature" level

The following parameters are also displayed for the temperature/humidity sensor:

Parameter	Explanation
Value	Currently measured temperature value.
Status	Current status of the sensor regarding the temperature value, taking into account the hysteresis.

Tab. 6: Displays at "Temperature" level



Note:

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

6.4.3 Humidity

The humidity settings are configured on the "Humidity" level.

Parameter	Explanation
DescName	Specific description of the humidity measured.
SetPtHigh-Alarm	Upper limit for the humidity for which an alarm message is issued when exceeded.
SetPtHigh-Warning	Upper limit for the humidity for which a warning message is issued when exceeded.
SetPtLow-Warning	Lower limit for the humidity for which a warning message is issued when fallen below.
SetPtLow-Alarm	Lower limit for the humidity for which an alarm message is issued when fallen below.
Hysteresis	The necessary percentage deviation for falling below or exceeding the limit humidity to trigger a status change (see the assembly and operating instructions for the Rittal embedded device).

Tab. 7: Settings at "Humidity" level

The following parameters are also displayed for the temperature/humidity sensor:

Parameter	Explanation
Value	Currently measured humidity value.
Status	Current status of the sensor regarding the humidity value, taking into account the hysteresis.

Tab. 8: Displays at "Humidity" level



Note:

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

6.4.4 Dew Point

The dew point settings are configured on the "Dew Point" level.

Parameter	Explanation
DescName	Specific description of the dew point measured.

Tab. 9: Settings at "Dew Point" level

6 Operation

EN

The following parameters are also displayed for the temperature/humidity sensor:

Parameter	Explanation
Value	Currently measured dew point value.

Tab. 10: Displays at "Des Point" level

7 Storage and disposal

7.1 Storage

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

7.2 Disposal

Since the temperature/humidity 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

EN

8 Technical specifications

Technical specifications		DK temperature/humidity sensor
Model no.		7010.120
W x H x D (mm)		80 x 28 x 40
Operating temperature range		0 °C...+55 °C
Storage temperature		-20 °C...+70 °C
Operating humidity range		5%...95% relative humidity, non-condensing
Temperature measurement range		0 °C...+55 °C
Temperature measurement precision		±1 K at +25 °C
Temperature resolution		0.1 K
Humidity measurement range		1 % bis 99 % rF
Humidity measurement precision		±3% relative humidity in the range 20%...80% relative humidity at 25 °C
Protection category		IP 30 to IEC 60 529
Inputs and outputs	CAN bus (RJ 45)	2 x
Operation/signals	LED display	OK/warning/alarm/CAN bus status

Tab. 11: Technical specifications

9 Customer service addresses

For technical queries, please contact:

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

E-mail: info@rittal.de

Homepage: www.rittal.de

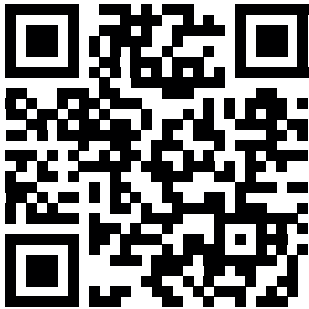
For complaints or service requests, please contact:

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

E-mail: service@rittal.de

Contact details can be found on the Rittal website at:

– <https://www.rittal.com/rittal-locations>



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