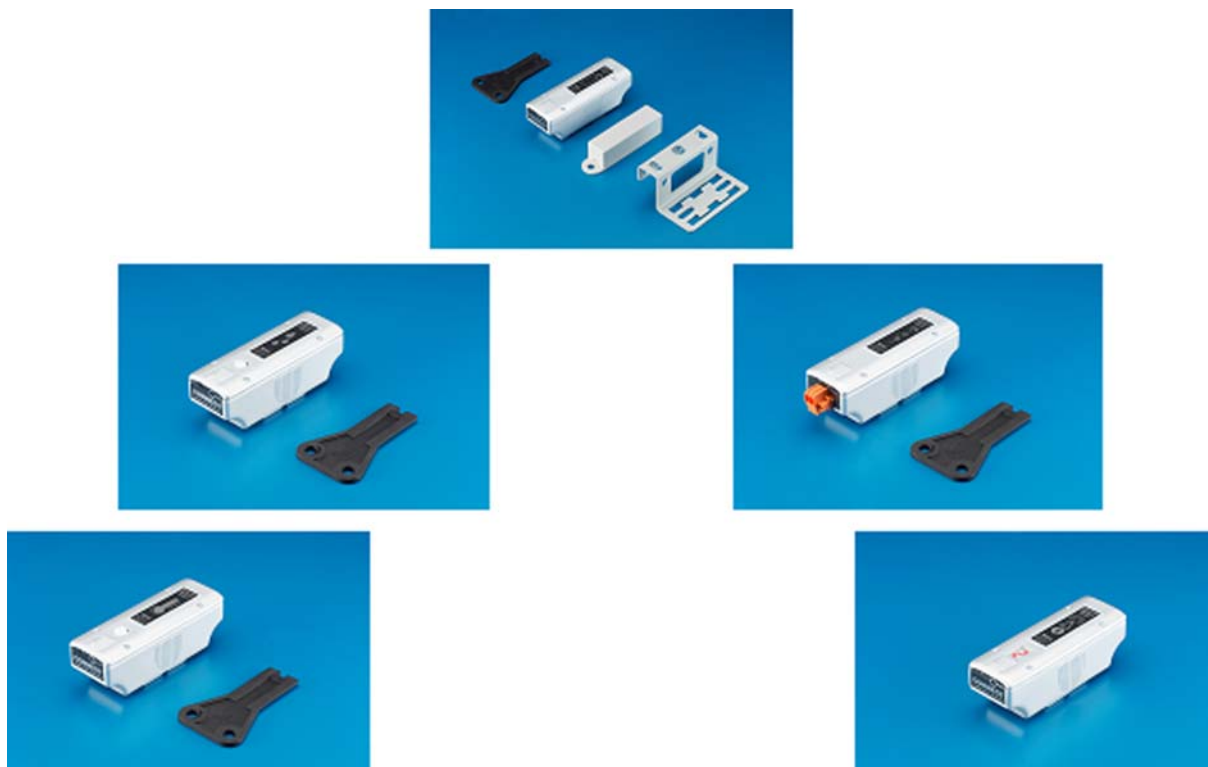


EN	Wireless Temperature Sensor	DK 7320.505
	Wireless Humidity Sensor	DK 7320.515
	Wireless Access Sensor	DK 7320.535
	Wireless Digital Input Sensor	DK 7320.585
	Wireless Measuring System (Performance) Sensor	DK 7320.242

Assembly, Installation and Operation



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FRIEDHELM LOH GROUP

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1 Documentation Notes

The audience for this guide is the technical specialists familiar with the assembly, installation and operation of the wireless sensors.

- You should read this operating guide prior to the commissioning and store the guide so it is readily accessible for subsequent use.

Rittal cannot accept any liability for damage and operational malfunctions that result from the non-observance of this guide.

1.1 Associated Documents

The guides for other CMC-TC components and their safety notes also apply together with this guide.

1.2 Retention of the Documents

This guide and all associated documents are part of the product. They must be given to the operator of the unit and must be stored so they are available when needed.

1.3 Used Symbols

The following safety and other notes are used in this guide:

Symbol for a handling instruction:

- This bullet point indicates that you should perform an action.

Safety and other notes:



Danger!
Immediate danger to health and life!



Warning!
Possible danger for the product and the environment!



Note!
Useful information and special features.

2 Safety Notes

Observe the subsequent general safety notes for the installation and operation of the unit:

Assembly and installation of the wireless sensor, in particular for wiring the enclosures with mains power, may be performed only by a trained electrician. Other tasks associated with the wireless sensor, such as the assembly and installation of system components with tested standard connectors, and the operation and configuration of the wireless sensor may be performed only by instructed personnel.

Observe the valid regulations for the electrical installation for the country in which the unit is installed and operated, and the national regulations for acci-

dent prevention. Also observe any company-internal regulations (work, operating and safety regulations). Use only genuine or recommended parts and accessories. The use of other parts can void the liability for any resulting consequences.

Do not make any changes to the wireless sensor that are not described in this guide or in the associated guides.

Do not make any changes to the system components that are not described in this guide or in the associated guides.

The operational safety of the unit is guaranteed only for its approved use. The limit values stated in the technical specifications may not be exceeded under any circumstances. In particular, this applies to the permitted ambient temperature range and to the permitted IP protection category. When used with a higher required IP protection category, the wireless sensor must be installed in a housing or enclosure with a higher IP protection category. The IP protective cover can also be used.

The operation of the wireless sensor in direct contact with water, aggressive materials or inflammable gases and vapours is prohibited.

In addition to these general safety notes, also observe any special safety notes listed for the specific tasks in the individual sections.



Danger!
The sensor contains a battery and consequently may never come in contact with fire! Explosion danger!

3 Unit Description

The wireless sensors can be used for monitoring the temperature (7320.505), humidity (7320.515), access (7320.535), external signals 10-30 V DC (7320.585) and wireless connection quality (7320.242).

Up to 16 wireless sensors can be connected to a Wireless I/O-Unit. The temperature and humidity sensor is mounted behind a protective membrane. The temperature sensor or the humidity sensor send a signal every 60 seconds and 120 seconds, respectively. The access sensor and the digital input send a message when a status change occurs. The wireless measuring system has a digital display with a display range 0 to 9. The value of the display provides information about the wireless connection quality. The wireless measuring system has the same design as the wireless sensor. This allows the measuring system to be installed instead of the sensors to evaluate the wireless connection quality. A measuring system must be available for commissioning the wireless sensor network. After the com-

missioning, the measuring system can also be used for other installations.

All sensors contain a long-life 3.6 V lithium primary cell that can be replaced if necessary.

The sensors are installed using the supplied attachment bracket, which, for example, can be fastened to the enclosure frame. The sensors are simply plugged onto this bracket. If a higher IP degree of protection is required, the sensors (temperature/humidity/access) can be simply upgraded with the IP protective cover.

The battery and the wireless connection quality of the sensors are monitored.

3.1 Housing

The wireless sensor is located in its own housing.

Explanation of the key and LED:

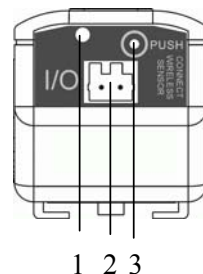


Fig. 1 Wireless sensor operator panel

Key

- 1 **LED** for the status display for reset and learn mode
 - briefly flashing once: Wireless connection check OK or registration successful
 - flashing three times: Wireless connection check not OK or registration not successful
 - flashing quickly: Switch off operation.
 - flashing once (long): switched between NC to NO (only digital input sensor)
- 2 **2-pole connection socket**, only digital input.
- 3 **Control key** for the programming mode and reset.

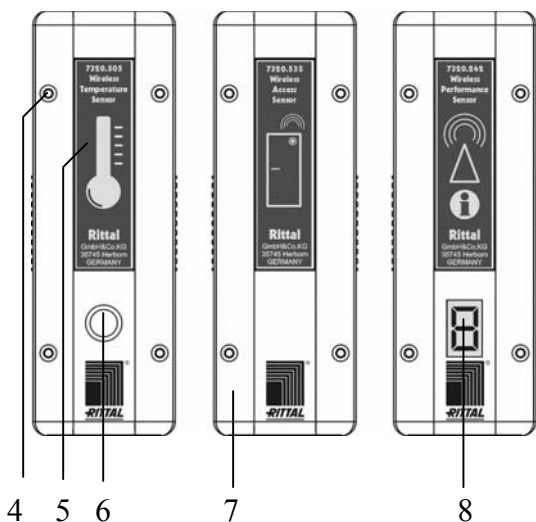


Fig. 2 Wireless sensor from above

- 4 **Housing screws** for replacing the 3.6 V lithium primary cell.



Note!

Please consult the operating manual for the Rittal replacement battery.



Danger!

Immediate danger to health and life!
Only genuine Rittal spare parts may be used.

- 5 **System designation** The label contains the information about the model number and the sensor icon.
- 6 **Membrane** The probe for the temperature or the humidity sensor is located behind the membrane. The membrane should not be touched, it could be damaged.
- 7 The **access sensor** is operated using Hall sensors and must be fastened together with the permanent magnet included in the package in accordance with the installation guide.
- 8 The **LED display of the measuring system** shows the digits 0 to 9. 0 indicates no signal received, whereas 9 indicates that the best signal is received.

3.2 Register Wireless Sensor with Wireless I/O-Unit

Before the sensor can be installed and used, it must be connected to a Wireless I/O-Unit. This requires that the Wireless I/O-Unit is placed in programming mode (Press the "C" key for three seconds).



Note!

Refer to the Wireless I/O-Unit 7320.240 operating manual for details.

The wireless sensor must be placed near the Wireless I/O-Unit.

If a repeater is used, the sensor must still be first registered directly with the Base Unit!

The control key, see Figure 1 (3), on the wireless sensor must be pressed 1 second to place the system in registration mode.

If the LED of the sensor flashes once briefly, the registration was successful.

If the LED of the sensor flashes briefly three times successively, the registration was not successful and must be repeated. The sensor switches itself off automatically.

If the registration was successful, the sensor can be used with the Wireless I/O-Unit and the Processing Unit II.

If the sensor has been already used with a different I/O-Unit, he has to be resetted first (see Chapter 3.3)



Note!

For details of the registration, refer to the operating manuals for the Wireless I/O-Unit and the Processing Unit II.

3.2.1 Additional Digital Input

Normally Closed (NC)

The digital input 7320.585 has the "Normally Closed" (NC) function in its delivered state.

"OK" will be signalled for the NC function when a voltage between 10 V and 30 V is present at the terminal, see Figure 1 (2).

If no voltage is present at the terminal, see Figure 1 (2), the system will signal "Alarm".

Normally Open (NO)

If the digital input 7320.585 is to be operated in the NO mode, the sensor must be reprogrammed. The key on the wireless sensor, see Figure 1 (3), must be pressed for two seconds. This changes the function. The change is represented as a sensor change in the Wireless I/O-Unit and must be acknowledged on the Processing Unit II.

An alarm will be signalled for the NO function when a voltage between 10 V and 30 V is present at the terminal, see Figure 1 (2).

If no voltage is present at the terminal, Figure 1 (2), the system signals "OK".

A new change of the function requires that the described process is repeated.

Terminals for signal input 10 to 30 V DC

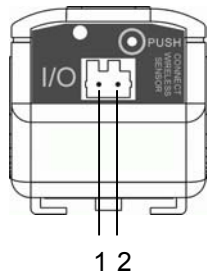


Fig. 3 Digital input terminal

- 1 The + pole of the external 10 to 30 V DC signal must be connected to this terminal.
- 2 The earth (Gnd) of the external 10 to 30 V DC signal must be connected to this terminal.

The externally monitored system must provide the 10 to 30 V DC voltage.



Warning!

The safety of the appliance is only given if the external circuit connected to the digital input sensor is protected against exceeding currents >2A by adequate external means.

If only a potential-free contact is available, the Rittal 24 V DC power pack 7320.425 can also be used for the voltage signal.

Circuit diagram for the use of a potential-free contact with a 24 V power pack

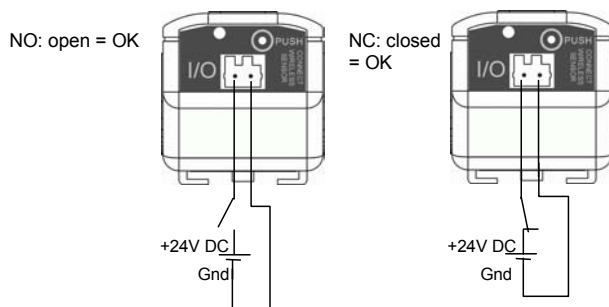


Fig. 4 Circuit diagram for the digital input

Alarm output behaviour for a wireless malfunction

If a short-term wireless malfunction occurs between the Digital Input Sensor and the Wireless I/O-Unit, alarms or alarm changes will be represented in the alarm log as follows.

1. Alarm will be ended during the wireless malfunction: The alarm will be indicated on the PUII until the next Lifecheck.
2. Alarm begins during the malfunction: The PUII signals the alarm only after the next Lifecheck.

3. Complete, terminated alarm process during the malfunction: The malfunction will be indicated on the PUII after the next Lifecheck by an entry being made in the alarm log.
4. Two or more complete, terminated alarms during the malfunction: One (!) alarm will be signalled on the PUII after the next Lifecheck.

3.2.2 Additional Wireless Measuring System Sensor

The wireless measuring system has a digital display with a display range 0 to 9. The value of the display provides information about the wireless connection quality. The wireless measuring system has the same design as the wireless sensor. This allows the measuring system to be installed instead of the sensors to evaluate the wireless connection quality.

A measuring system must be available for commissioning the wireless sensor network. After the commissioning, the measuring system can also be used for additional installations, for example, for extensions or changes. The wireless measuring system is registered once and then reused afterwards with the Wireless I/O-Unit or it is registered with a different wireless sensor network. The latter requires that the wireless measuring system sensor is switched off (see Section 3.3) and re-registered with a new Wireless I/O-Unit. The measuring system is trained with the Wireless I/O-Unit like a normal sensor. The result can be seen on the sensor display, see Figure 2 (8).

Operation of the measuring system once it has been trained with the Wireless I/O-Unit:

1. Press the key, see Figure 1 (3), 1 second
-> the most recent measurement result is displayed
-> the number 1 flashes in the display
2. Press the key, see Figure 1 (3), several times to select the digits 1 to 5
 - Digit 1 selected = measuring cycle duration 1 minute
 - Digit 2 selected = measuring cycle duration 5 minutes
 - Digit 3 selected = measuring cycle duration 10 minutes
 - Digit 4 selected = measuring cycle duration 1 hour
 - Digit 5 selected = measuring cycle duration 10 hours
- > The measurement begins after 30 seconds.
- > The flashing of the point in the display signals that a test package is being received.
- > The measurement result is displayed at the end of the measurement cycle. The **LED display of the measuring system** shows the digits 0 to 9. This corresponds to a percentage value of 0 to 100%

sent packages received from the Wireless I/O-Unit. 0 indicates no signal received, whereas 9 indicates that the best signal is received. A detailed coding of the display values is contained in Table Tab. 1.

-> After a measurement, the measuring system switches itself off automatically.

-> If the wireless measuring system sensor has been switched off for a longer period of time or has been used for a different I/O-Unit in the meantime, the sensor must be retrained.

Display	Successful received packages [%]	Evaluation
9	100	OK
8	99-98	OK
7	97-96	conditionally suitable, repeater necessary
6	95-94	conditionally suitable, repeater necessary
5	93-92	conditionally suitable, repeater necessary
4	91-90	conditionally suitable, repeater necessary
3	89-80	not suitable
2	79-50	not suitable
1	49-25	not suitable
0	<25	not suitable

Tab. 1 Measured value display -> receiving quality assignment

3.3 Switch Off Wireless Sensor and Reset to Factory Settings

To reset a wireless sensor to its factory settings, the key, see Figure 1 (3), on the wireless sensor must be pressed continually for five seconds until the sensor LED flashes continually. The key can then be released.

This switches off the wireless sensor and restores the factory settings so the wireless sensor can be used for a new setup on a Wireless I/O-Unit.

3.4 Functions and Settings on the PUII Web Page

3.4.1 General Overview (Status Window)

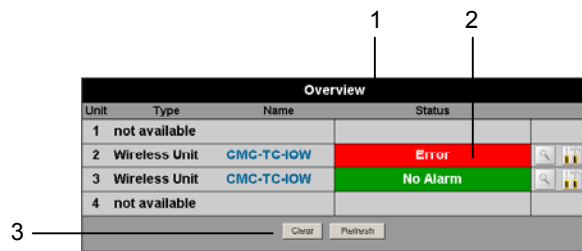


Fig. 5 Overview display browser window

Key

- 1 Overview display.
- 2 Status of the I/O-Unit: The status of all wireless sensors of the I/O-Unit is summarised. The most critical status is always displayed

"No Alarm" = All sensors are OK

"Warning" = At least one sensor has issued a warning

"Alarm" = At least one sensor has issued an alarm

"Error" = The sensor is out of range or does not have connection with the Wireless I/O-Unit.

- 3 Clear button: Acknowledge events. Click the Clear button to acknowledge configuration changes of all connected sensors. Refresh button: All sensors are refreshed. This causes the CMC-TC PU to be re-queried and the Web page rebuilt.

3.4.2 Sensor Overview (Status Window)

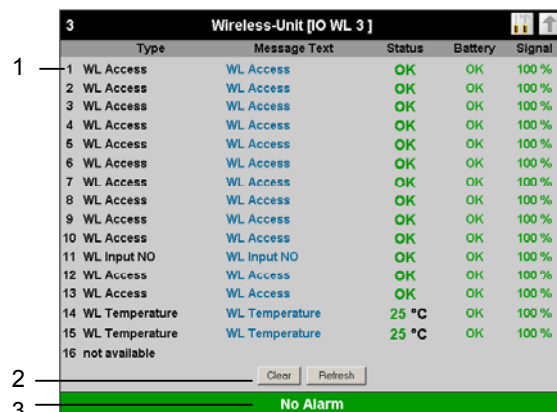


Fig. 6 Sensors overview

Key

- 1 Sensors of the PUII unit, up to 16 wireless sensors are grouped here.
- 2 Clear button: Acknowledge events. Click the Clear button to acknowledge configuration changes of all connected sensors. Refresh button: All sensors are refreshed. This causes the CMC-TC PU to be re-queried and the Web page rebuilt.
- 3 Status line: The status of all wireless sensors of the PUII is summarised. The most critical status is always displayed.

"OK" = All sensors are OK

"Warning" = At least one sensor has issued a warning

"Alarm" = At least one sensor has issued an alarm

"Error" = The sensor is out of range or does not have connection with the Wireless I/O-Unit.

3.4.3 General View (Sensor Configuration)

You can individually set the attached sensors. Because the structure of the configuration overview is generally always identical, it is shown here as an example.

To reach this page, click the  tool icon or click the sensor name directly.

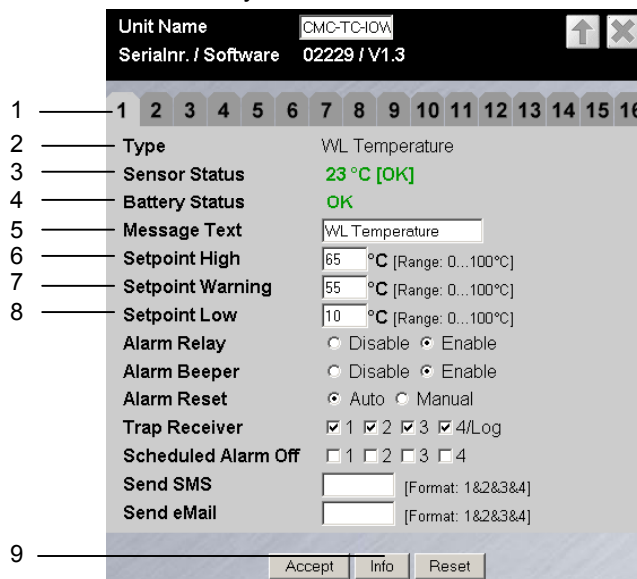


Fig. 7 Configuring the sensor – overview

Key

- 1 Sensor connection number.
- 2 Connected sensor type.
- 3 Current status of the connected sensor.
"red": The battery must be replaced
"green": The battery is operational.
- 4 The battery status
- 5 This message text will also be transferred when a status change is sent and serves as information for the recipient of the message to identify the sensor. You can delete the specified text and add your own message text (e.g. TempSensorRack1).
- 6 The highest upper temperature/humidity limit, which, when exceeded, causes an alarm message to be issued (only for temperature and humidity sensors).
- 7 Mean temperature/humidity limit, which, when exceeded, causes a warning message to be issued (only for temperature and humidity sensors).
- 8 The lowest lower temperature/humidity limit, which, when undershot, causes an alarm message to be issued (only for temperature and humidity sensors).
- 9 The "Info" button is used to reach the information menu of the sensor.



Note!

For details, please refer to the operating manuals for the Wireless I/O-Unit and the Processing Unit II.

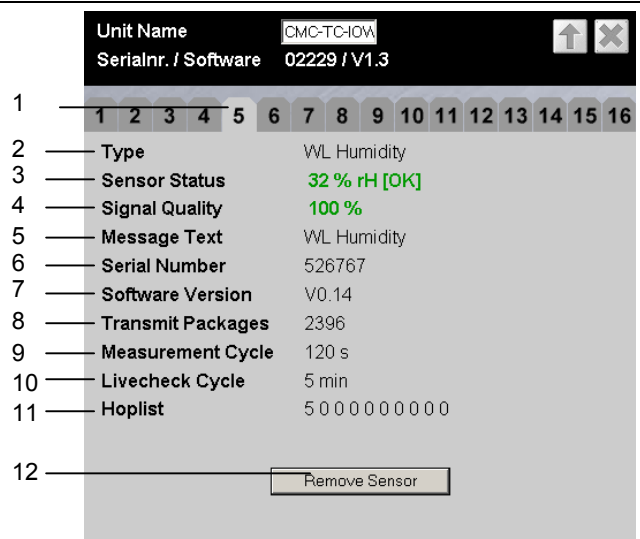


Fig. 8 Information for the Wireless Sensor

The information menu is reached using the Info button, see Fig. 7, item 9

Key

- 1 Sensor connection number.
- 2 Connected sensor type.
- 3 Current status of the connected sensor.
- 4 Signal quality, the wireless connection from the sensor to the Wireless I/O-Unit is displayed as a percentage value.
0-49% = red = inadequate signal quality
50-79% = orange = critical signal quality
80-100% = green = adequate signal quality
- 5 Information: "Message text" for the sensor.
- 6 Information: Serial number of the sensor.
- 7 Information: Software version of the sensor.
- 8 Information: The number of data packages of this sensor that have been received by the I/O-Unit since the commissioning of the sensor or since the last restart of the Wireless I/O-Unit.
- 9 Information: The time separation of the data packages to the measured values.
- 10 Information: The time interval with which the connection from the wireless sensor to the Wireless I/O-Unit is checked.
- 11 Information of the hoplist; the information route via existing repeaters is displayed.
1st position: Sensor connection number
2nd - 10th position: The repeater number in accordance with the connection sequence. The route with the best connection quality is chosen automatically. The repeaters can be registered as sensors and so receive a number. They are listed in connection sequence until the hoplist ends with the "0". The free numbers are filled with zeros. The digit "0" is always the Wireless I/O-Unit connected as central system to the Processing Unit II.

- 12 The *Remove Sensor* button can be used to remove the current sensor from the I/O-Unit.



Note

The communications timing between the I/O-Unit and the sensor can require that *Remove Sensor* must be clicked several times before the remove command is accepted.

4 Accessories

4.1 Required Accessories

The operation of the sensor always requires a Wireless I/O-Unit, a Processing Unit II and a measuring system sensor with the appropriate connection accessories.



Note!

For details, please refer to the operating manuals for the Wireless I/O-Unit and the Processing Unit II.

4.2 Optional Accessories

Accessories	Required number of items	Model No.
IP protective cover	1	DK 7320.245

Tab. 2 Optional accessories

The protective cover 7320.245 can be used optionally for the following sensors:

- temperature (7320.505)
- humidity (7320.515)
- access (7320.535)

This increases the protection category of the sensors from IP40 to IP54.

5 Proper Use

The Rittal Wireless sensors are used to monitor the temperature (7320.505), the humidity (7320.515), access (7320.535), 10-30 V DC signal as digital input (7320.585).

A use different from that described here is considered to be an improper use. Rittal cannot accept any liability for damage resulting from the improper use or the non-observance of this guide. The guides for the used accessories may apply.

6 Assembly

6.1 Assembly Notes

Install the wireless sensor in an enclosure or in a suitable housing system so that it also has additional protection from external effects. The sensor can also be equipped with the IP protective cover.

This cover provides dampness protection and improves protection against dust. Consider the permitted ambient temperature and humidity operational areas and the application-related required IP degree of protection.

6.2 Sensor Housing Installation

The attachment bracket included in the package is fastened to the enclosure frame using the included T25-Torx screws.

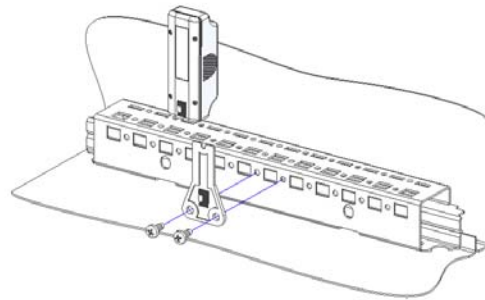


Fig. 9 Installation of the attachment bracket

To fasten the sensor, simply push it onto the attachment bracket.

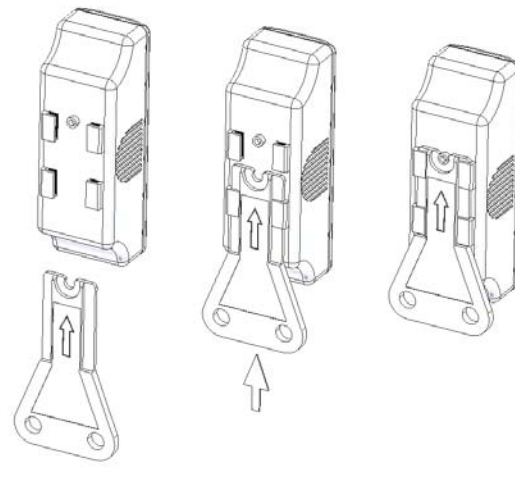


Fig. 10 Attaching the sensor to the attachment bracket

As an alternative to the screwed connection, the sensor can also be attached using the provided adhesive strips.

**Note!**

In this case, the surfaces to be glued must be cleaned using a cleaning cloth and an alcohol-based cleaning solution. To ensure a long-lasting adhesive connection, the cleaned surface and the adhesive surface may no longer be touched after the cleaning and before use of the adhesive strip.

6.3 Notes for the Installation of the Access Sensor 7320.535

For the installation of the access sensor, the package contains a separate installation drawing that shows the installation of the sensor and of the magnet in the various Rittal housings.

**Note!**

For the installation of the access sensor 7320.535, with closed door, the magnet must be positioned centrally on the sensor.

**Note!**

For the installation of the access sensor 7320.535 with the magnet, the function must be tested after the installation.

7 Maintenance and Cleaning

The Rittal Wireless Sensor may only be opened to replace the battery. Only genuine Rittal batteries may be used. For the replacement, the removal of four screws shown in Figure 2 item 4 allows the cover to be separated from the housing. The circuit board must be removed to give access to the battery plug connector. Ensure that the correct polarity is maintained when the battery is replaced. After it has been replaced, the housing with the seals must be closed securely.

**Note!**

The housing may only be opened in accordance with the operating manual for the Rittal replacement battery. For the replacement action, the service technician must be earthed with an earthing strap.

7.1 Cleaning

**Warning!****Danger of damage!**

Do not use any aggressive substances, such as white spirit, acid, etc., for cleaning because such substances can damage the unit.

Use a slightly moistened soft cloth to clean the housing.

8 Storage and Disposal

8.1 Storage

If the device is not used over an extended period of time, we recommend that the device is reset to set it into the initial state.

Further information concerning the operating conditions is contained in the technical specifications.

8.2 Disposal

Because the wireless sensor contains a battery, the system must be given for disposal to a hazardous waste site. The country-specific regulations for disposal of the battery must be observed.

9 Customer Service

If you have any technical questions or questions concerning our product spectrum, contact the following service address:

Tel.: +49 (0)2772/505-1855
<http://www.rimatrix5.com>
 eMail: info@rittal.de

**Note!**

To allow us to process your enquiry quickly and correctly, please always specify the article number in the subject line for e-mails.

Further information and the current operating manuals can be downloaded from "Security" at www.rimatrix5.com

10 Technical Specifications

10.1 Temperature/Humidity and Access Sensor

Designation	7320.505/.515/.535
Housing	
Housing type	Plastic

Height	90 mm
Width	30 mm
Depth	30 mm
Protection category	IP 40 to EN 60529
Increased protection category through the use of an IP protective cover only for: 7320.505 7320.515 7320.535	IP 54 to EN 60529
Operational area / conditions	
Temperature	-25 to +65 °C
Humidity	10-90% rel. humidity
Storage temperature	-25 to +65 °C
Rated voltage	3.6 V DC
 Do not operate the sensor in direct contact with water/rain.	
 Do not operate the sensor when subjected to direct sunlight.	
Measuring tolerance	
Temperature sensor	+/- 3 °K
Humidity sensor tolerances at 20 °C	+/- 3% rel. humidity for the range 20-80% rel. humidity +/- 4% rh for the range 10-20% rh +/- 4% rel. humidity for the range 80-90% rel. humidity
Lithium primary cell	
Rated voltage	3.6 V DC
Operational lifetime at -5°C to +25°C	Up to 5 years. The operational lifetime of an access sensor depends on its frequency of activation.
Wireless technology	
Technology	Chirp

ISM band	2.4 GHz to 2.48 GHz
Regulation (CE)	R&TTE 1999/5/EG

Technical Specifications

10.2 Digital Input and Measuring System Sensor

Designation	7320.585/242
Housing	
Housing type	Plastic
Height	90 mm
Width	30 mm
Depth	30 mm
Protection category	IP 40 to EN 60529
Operational area / conditions	
Temperature	+5 to +45 °C
Humidity	10-90% rel. humidity
Storage temperature	-25 to +65 °C
Rated voltage	3.6 V DC
 Do not operate the sensor in direct contact with water/rain.	
 Do not operate the sensor when subjected to direct sunlight.	
Lithium primary cell	
Rated voltage	3.6 V DC
Operational lifetime Digital input at +5 °C to +25 °C	Up to 5 years. The operational lifetime depends on the frequency of activation.
Operational lifetime Measuring system sensor at +5 °C to +25 °C	Depends on the frequency of use
Wireless technology	
Technology	Chirp
ISM band	2.4 GHz to 2.48 GHz
Regulation (CE)	R&TTE 1999/5/EU

Technical Specifications

10.3 Measuring/Lifecheck Cycles

Measuring cycles	
Temperature sensor	60 seconds
Humidity sensor	120 seconds

Measuring cycles of the sensors

Lifecheck	
Temperature sensor	300 seconds
Humidity sensor	300 seconds
Access sensor	120 seconds
Digital input sensor	120 seconds

Lifecheck cycles of the sensors

11 Declarations of Conformity

This device satisfies the requirements of the following EU regulation:

1999/5/EU

Regulation for wireless systems and telecommunications terminals and the mutual recognition of their conformance

CE0681

Hereby Rittal declares, that CMC Wireless I/O-Unit and CMC Wireless sensor is in compliance with essential requirements and other relevant provisions of Directive 1999/5/EC.

In France, the operation is only permitted indoors.

Certification

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



FCC ID: SIFCMCSENS0108V2

Statement according to FCC part 15.21:

Modifications not expressly approved by this company could void the user's authority to operate the equipment.

Statement according to FCC part 15.105:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Statement according to FCC part 15.105:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- . Reorient or relocate the receiving antenna.
 - . Increase the separation between the equipment and receiver.
 - . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
 - . Consult the dealer or an experienced radio/TV technician for help.
-