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T E C H N O L O G I E S

FCC Required Exhibit 12

CMC-TC Wireless I/O-Unit
DK 7320.240
User Manual (UserMan)

Version 1.01

NA-08-0000-0025-1.01

Chirp it.

Document Information

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Trademarks

Life Support Policy

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Nanotron Technologies GmbH customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Nanotron Technologies GmbH for any damages resulting from such improper use or sale.

Electromagnetic Interference / Compatibility

Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed, or otherwise configured for electromagnetic compatibility.

To avoid electromagnetic interference and/or compatibility conflicts, do not use this device in any facility where posted notices instruct you to do so. In aircraft, use of any radio frequency devices must be in accordance with applicable regulations. Hospitals or health care facilities may be using equipment that is sensitive to external RF energy.

With medical devices, maintain a minimum separation of 15 cm (6 inches) between pacemakers and wireless devices and some wireless radios may interfere with some hearing aids. If other personal medical devices are being used in the vicinity of wireless devices, ensure that the device has been adequately shielded from RF energy. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

CAUTION! Electrostatic Sensitive Device. Precaution should be used when handling the device in order to prevent permanent damage.

FCC User Information

Statement according to FCC part 15.19:

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.

Statement according to FCC part 15.21:

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

RF exposure mobil:

The internal / external antennas used for this mobile transmitter must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

Statement according to FCC part 15.105:

This equipment has been tested and found to comply with the limits for a Class A and 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 and 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 instructions as provided in the user manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. 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 or her own expense.

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 connected.
- Consult the dealer or an experienced technician for help.

EN **CMC-TC Wireless I/O-Unit**
DK 7320.240
Assembly, Installation and Operation

1 Table of Contents

2   Documentation Notes

The audience for this guide is the technical specialists familiar with the assembly, installation and operation of the CMC-TC Wireless I/O-Unit.

- 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.

2.1   Associated Documents

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

This guide can also be downloaded from www.rimatrix5.com in the Internet and is also present as file on the CD-ROM of the Processing Unit II:

German: 7320240VXXd.pdf

English: 7320240VXXe.pdf

To view the guide you require the Acrobat Reader program; Acrobat Reader can be downloaded from www.adobe.com

2.2   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.

2.3   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.

3   Safety Notes

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

- Assembly and installation of the CMC-TC Wireless I/O-Unit, in particular for wiring the enclosures with mains power, may be performed only by a trained electrician. Other tasks associated with the CMC-TC Wireless I/O-Unit, such as the assembly and installation of system components with tested standard connectors, and the operation and configuration of the CMC-TC Wireless I/O-Unit 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 accident prevention. Also observe any company-internal regulations (work, operating and safety regulations).

- Prior to working at the CMC-TC system, it must be disconnected from the power supply and protected against being switched on again.

- Use only genuine or recommended parts and accessories (see Section 4.5 Accessories). The use of other parts can void the liability for any resulting consequences.

- Do not make any changes to the CMC-TC Wireless I/O-Unit 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 (see Section 14 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 Rittal CMC-TC must be installed in a housing or enclosure with a higher IP protection category.

- The operation of the CMC-TC system 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.

4 Unit Description

The Computer Multi Control Top Concept Wireless I/O-Unit is an "intelligent" enclosure monitoring system installed in its own housing mounted on the enclosure. The enclosure monitoring system uses the various connected sensors to perform the complete physical monitoring of the enclosure, namely, temperature, humidity, access control and digital input module. All this information is transferred using SNMP to a management station where it can be administered. The CMC-TC Wireless I/O-Unit can also be used as a repeater. The direct connection of the CMC-TC power pack starts this function.

4.1 Housing

The CMC-TC Wireless I/O-Unit is contained in its own housing that can be fastened with the supplied Velcro strips to the inner side of the side wall, to the punched sections with mounting flanges or to the shelf of the enclosure. Mounting units (see Section 4.5.1 "Required Accessories") can also be used to install the housing.
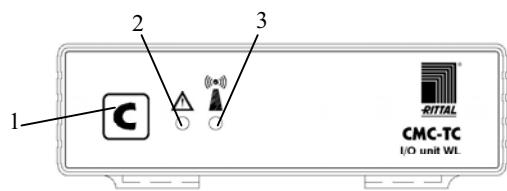

Fig. 1   CMC-TC Wireless I/O-Unit front side

Key

1   Acknowledge key (C key)

2   Status LED

- Off   No operating voltage is present or repeater mode
- Green   OK sensor status
- Orange   Warning sensor status
- Red   Alarm sensor status
- Flashing green/orange/red
                            Configuration change
- Flashing red   System is in reset

3   Wireless connection LED

- Off   No operating voltage is present
- Green   Normal operation
- Green interrupted briefly for some time [ms] ->
                            a data package is being sent
- Orange   System is in repeater mode
- Red   System in repeater mode has lost the
                            base station
- Flashing red   System is in reset
- Flashing green/orange/red
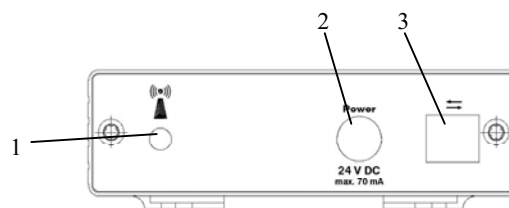   System is in the log-in mode

Fig. 2   CMC-TC Wireless I/O-Unit rear side

Key

1   Antenna connection
2   Power supply (optional)
3   Interface to Processing Unit II

4.2 Power Supply

The CMC-TC Wireless I/O-Unit is supplied with power from the connected Processing Unit II. The connection is established using an RJ45 cable. A selection of various RJ45 cables is described in Section 4.5 "Accessories".

All connected sensors have their own battery integrated in each sensor.

If you connect the CMC-TC Wireless I/O-Unit directly to a CMC-TC power unit, it operates as a repeater.

4.3 Connectable Sensors

Sensor	Model No.
Temperature sensor	DK 7320.505
Humidity sensor	DK 7320.515
Access sensor	DK 7320.535
Digital input module	DK 7320.585

Tab. 1   Connectable Sensors

4.4 Scope of supply

The unit will be delivered in a packaging unit in fully-assembled state.

- Check the delivered components for completeness.
- Check that the packaging does not show any signs of damage.

Quantity	Designation
1	Wireless I/O-Unit
2	Self-adhesive Velcro fasteners 90 x 15 mm
1	Antenna
1	Operating instructions

Tab. 2   Scope of supply

4.5 Accessories

4.5.1 Required Accessories

Depending on the country-specific specifications, you require an appropriate connection cable for the power pack of the CMC-TC PU II.

Accessories	Designation	P. of	Required	Model No.
Power supply for operation as a repeater	Installation power pack 24 V IEC 100-230 V AC, UL approval, 3 A SELV	1	Yes, depending on power supply	7320.425
	Installation power pack 24 V IEC 48 V DC	1		7320.435
Connection cable for power pack	Connection cable IEC connector Country version D	1	Yes, once for power pack	7200.210
	Connection cable IEC connector Country version GB	1		7200.211
	Connection cable IEC connector Country version F/B	1		7200.210
	Connection cable IEC connector Country version CH	1		7200.213
	Connection cable IEC connector Country version USA/CDN, UL approval FT1/VW1	1		7200.214
	Extension cable IEC connector and socket	1		7200.215
Assembly	1 U mounting unit	1	Optional	7320.440
	1 U single mounting unit with strain relief	1		7320.450
Connection cable	RJ45; 0.5 m	1	1	7320.470
	RJ45; 2.0 m			7320.472
	RJ45; 5.0 m			7320.475

Tab. 3   Required accessories

4.5.2 Optional Accessories

Accessories	Max. required number of items	Model No.
External antenna	1	DK 7320.421
Wireless measuring unit	1	DK 7320.242

Tab. 4   Optional accessories

4.6 Proper Use

The Rittal CMC-TC Wireless I/O-Unit serves as an enclosure monitoring system for the monitoring and administration of various enclosure parameters.

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.

5 Assembly

5.1 Assembly Notes

Install the CMC-TC Wireless I/O-Unit in an enclosure or in a suitable housing system so that it also has additional protection from external effects. Also consider the permitted ambient temperature and humidity operational areas and the application-related required IP degree of protection (see Chapter 14 Technical Specifications).

> 👉 **Note!**
> If you want to use the unit in reapeater mode please register the repeater unit at the I/O-Unit before installation. In registration mode the range is limited to 5m.
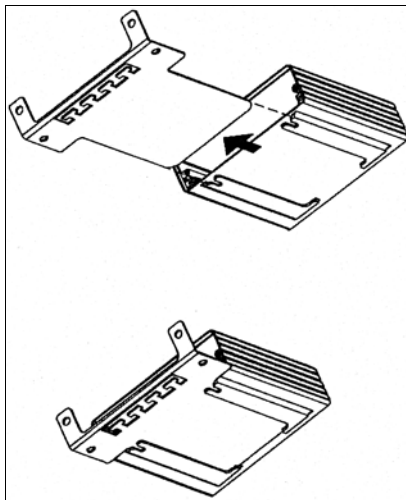
5.2 Assembling CMC-TC

Fig. 3   Assembly with the mounting module

- Move the CMC-TC Wireless I/O-Unit on the retaining plate of the mounting module. Ensure that the retaining plate sits between the guide rails of the CMC-TC Wireless I/O-Unit.
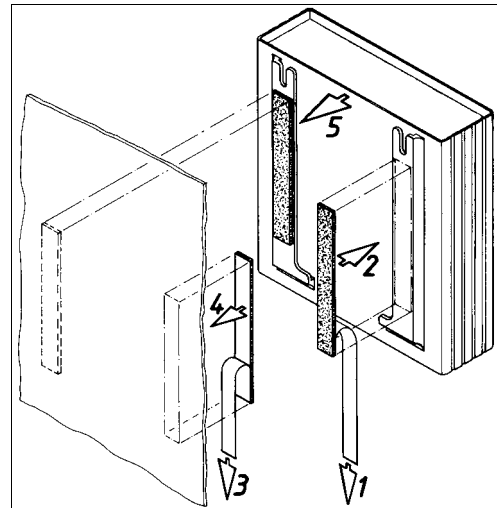

Fig. 4   Assembly with Velcro fasteners

- Take the self-adhesive Velcro fasteners from the supplied accessories and remove the protective foil from the Velcro fasteners.
- Ensure that the adhesion surfaces are free from grease and dust.
- Attach the Velcro fasteners to the housing of the CMC-TC Wireless I/O-Unit and position the CMC-TC Wireless I/O-Unit at the required attachment location.

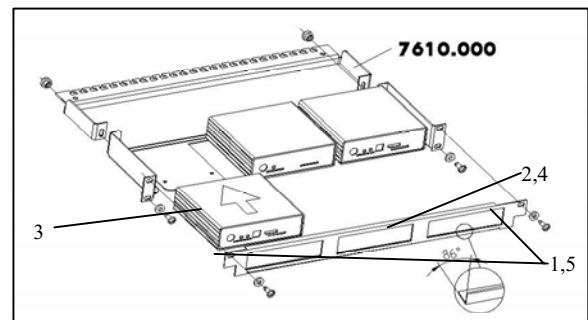*Fig. 5   Assembly with 1 U mounting unit*

1. Remove the two upper screws of the trim piece.
2. Remove the trim piece.
3. Move the CMC-TC Wireless I/O-Unit on the retaining plate of the mounting unit. Ensure that the retaining plate sits between the guide rails of the CMC-TC Wireless I/O-Unit.
4. Replace the trim piece on the mounting unit.
5. Screw the trim piece back on the 1 U mounting unit.

6 Installation

Danger!
The assembly and installation may be performed only by trained specialists.

6.1 Safety and Other Notes

– The Rittal CMC-TC system may be operated only with connected protective earth conductor. The protective earth conductor connection is made by plugging in the IEC connection cable. This requires that the IEC connection cable at the power supply side be connected with the protective earth conductor.

– The electrical connection voltage and frequency must conform to the rated values specified at the rear of the housing and in the technical specifications (see page 19).

– Before commencing work on the Rittal CMC-TC system, it must be disconnected from the mains power supply and protected against being reconnected.

– Protect the connection cables using cable ties on the used housing or enclosure.

– To prevent unnecessary cable losses, the used cable lengths must not exceed the lengths specified in the technical specifications (see Chapter 14, page 19).

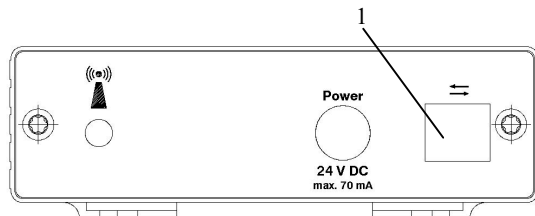### 6.2 Connecting the Voltage Supply

Fig. 6   Connecting the voltage supply

Key

1   Power supply connection

You must connect the CMC-TC Wireless I/O-Unit to the CMC-TC Processing Unit using the RJ45 connection cable mentioned in Section 4.5.1 "Required Accessories".

• Insert the plug connector of the RJ45 connection cable in the socket, as shown above, of the CMC-TC Wireless I/O-Unit.
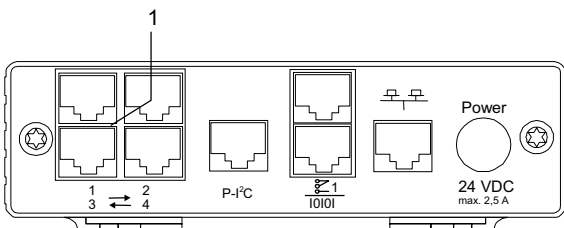

Fig. 7   Connecting to the CMC-TC Processing Unit with software version as of V. 2.46

Key

1   CMC-TC units connection

• Insert the other end of the RJ45 connection cable in a free RJ45 socket with number 1 to 4 of the CMC-TC Processing Unit.

After connection to the power supply, the Status LED of the CMC-TC Wireless I/O-Unit flashes automatically. As soon as it is connected, the Status LED illuminates alternately red, yellow and green.

6.3 Antenna Adjustment

The antenna of the I/O-Unit should always be adjusted parallel to the antennas of the sensors. If all sensors are aligned vertical, the I/O-Unit antenna must be also aligned vertical.

Warning!
FCC certification is valid only for the 2.4 GHz omnidirectional antenna model IW-144 having a maximum 2 dBi gain. An antenna having the same specifications as model IW-144 but with a gain of less than 2 dBi is an acceptable substitute.

7 Commissioning

7.1 CMC-TC Wireless I/O-Unit Commissioning

Log in to the CMC-TC Processing Unit as described in Section 8.1.1 Login Using a Browser.
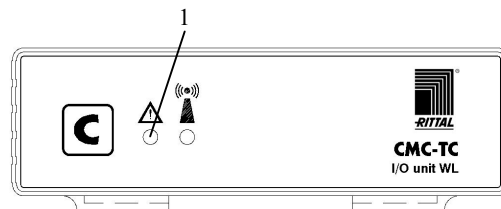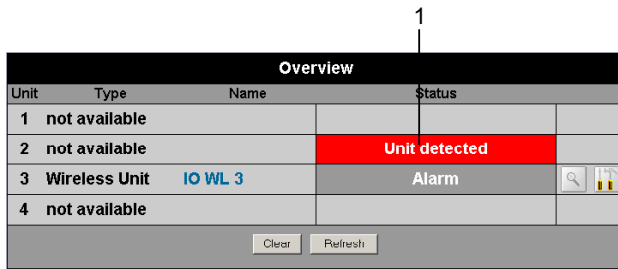

Fig. 8   Commissioning

Key

1   Status LED

Once the CMC-TC Wireless I/O-Unit has been connected to the power supply, the Status LED of the CMC-TC Wireless I/O-Unit flashes alternately with the colours red, yellow and green.
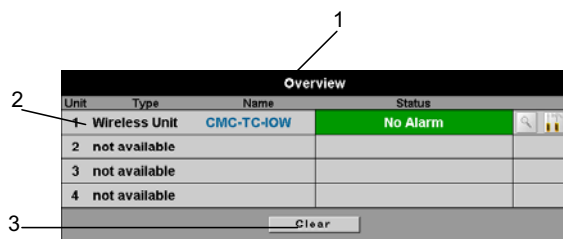
Fig. 9   Unit detection browser window

Key

1   Status display of the sensor island

The "Unit detected" message appears in the browser window of the Processing Unit.

Continue to press the *C key* on the Processing Unit until the Status LED of the CMC-TC Wireless I/O-Unit switches to a continuous green.

Fig. 10   Overview display browser window

Key

1   Overview display
2   Status of the I/O-Unit
3   Clear button

The CMC-TC Wireless I/O-Unit has now been detected.
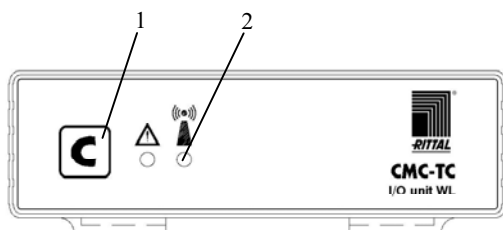
7.2   Registering Sensors

Fig. 11   Wireless I/O-Unit (programming status)

Key

1   C key
2   Wireless connection LED

Press the *C key* on the Wireless I/O-Unit for three seconds. The wireless connection LED now flashes alternately red, yellow and green. The CMC-TC Wireless I/O-Unit is now in programming mode.
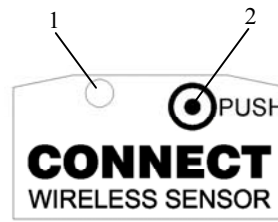

Fig. 12   Wireless sensor (lower side)

Key

1   Status LED
2   Micro pushbutton

Press the Sensor micro-pushbutton (Push) located on the lower side one second. The Status LED on the sensor illuminates once briefly. If the registration process was successful, the Wireless Connection LED of the CMC-TC Wireless I/O-Unit flashes green for approximately two seconds, then alternately red, yellow, green. Simultaneously, the Status LED on the CMC-TC Wireless I/O-Unit flashes alternately red, yellow and green.
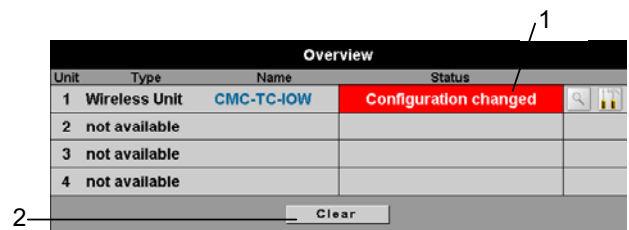
> **Note!**
> During the registration process, the distance between the sensor and the Wireless I/O-Unit may not exceed 5 m, because the I/O-Unit operates with reduced transmission power in this mode.
>
> No other I/O-Unit within a 5 m range must be in registration mode during the registration process.

> **Note!**
> For the commissioning of the sensors, please observe information provided in the Wireless Sensors manual.

Fig. 13   Sensor identification

Key

1   Status display of the sensor island
2   Clear button

"Configuration changed" appears in the browser window. Press the *Clear* button (possibly several times). The sensor is now registered to the I/O-Unit. To test the registration, click in the overview display the name of the I/O-Unit (here: CMC-TC-IOW). The overview of the registered sensors is now displayed.

7 Commissioning

☞ **Note!**
A newly registered sensor receives the sensor position with the smallest free sensor position number.

Sensors have to be registered at the main I/O-Unit, not at possibly used repeaters.
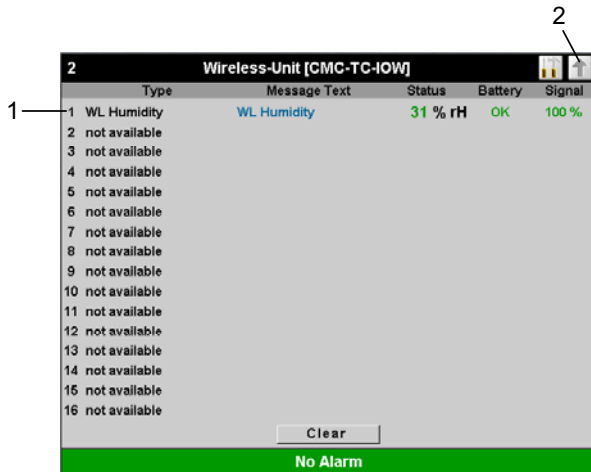
Fig. 14   Registered sensors overview

Key

1   Registered sensors
2   Up button

Click the Up button to return to the overview display.

7.3   Removing Sensors

To remove a sensor from the I/O-Unit, first switch off the sensor. To do this, press the *key* on the sensor for at least five seconds until the Status LED flashes very quickly.

To perform an immediate removal, switch off the sensor as described above. On the configuration page in your web browser, switch to the sensor configuration.

To do this, click first in the main overview on the sensor island / I/O-Unit to which the sensor to be removed is connected (Fig. 15). You must be logged in as administrator to use this function.

Fig. 15   Main page overview

Key

1   Sensor island / I/O-Unit

Click in the sensor overview on the name of the sensor to be removed.

Fig. 16   Sensor Overview

Key

1   Sensor

You now see the sensor configuration page.

Fig. 17   Sensor configuration

Key

1   Info button

Click the *Info* button to reach the sensor information page.

Fig. 18 Sensor Information

Key

1 *Remove Sensor* button

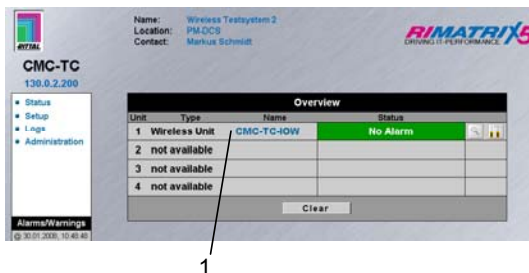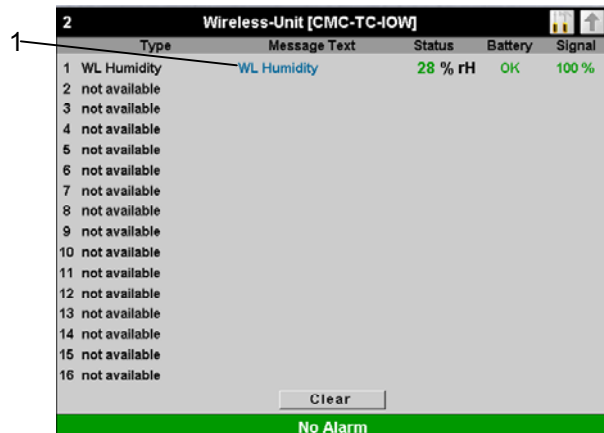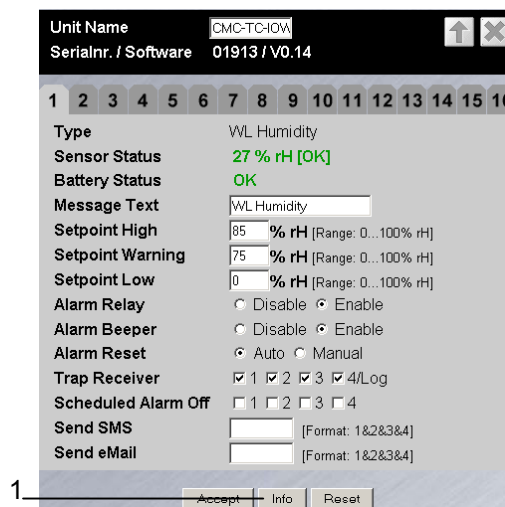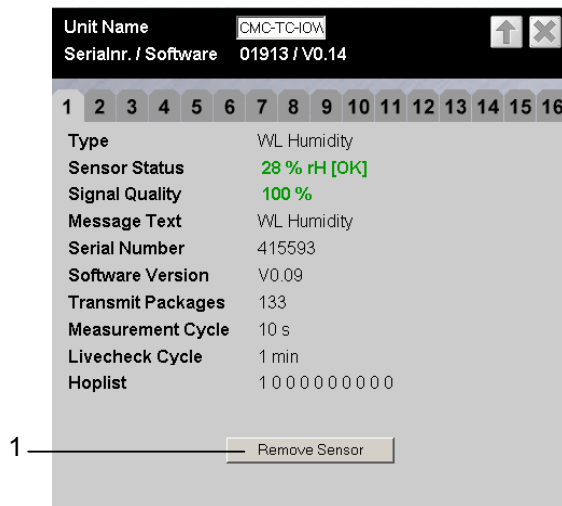Click the *Remove Sensor* button to remove the sensor from the I/O-Unit.

> **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.

The sensor has now been removed and will no longer be listed in the sensor overview. To reconnect the sensor, proceed as described in Section 7.2.
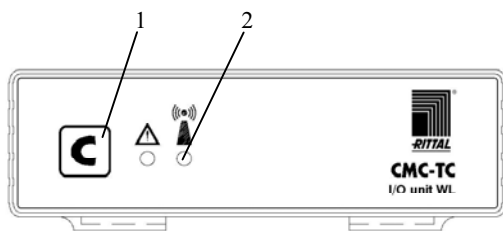
7.4 Closing Programming Mode

Fig. 19 Closing programming mode

Key

1 C key
2 Wireless connection LED

To close the programming mode, press the C key on the CMC-TC Wireless I/O-Unit for two seconds. The Wireless Connection LED will change to green. If the programming mode is not closed manually, the CMC-TC Wireless I/O-Unit returns automatically to normal mode two minutes after the last registration action.

7.5 Tips and Notes for the Sensor Placement

To prevent malfunctions and to ensure reliable operation, the sensors should be positioned as described in Subsection 7.5.1. Detailed fundamental information for the used wireless technology is described in Subsection 7.5.2.

Before starting the measurement, all I/O-Units and repeaters must be installalled and all antennas must be aligned.

7.5.1 Tips for the Calibration of the Sensor Locations

To ensure the best possible reception of the individual sensors, the suitability of each sensor location must be tested in advance using the wireless measuring system sensor (DK 7320.242).
Procedure:

i. Place the I/O-Unit into operation at the planned location as described in Section 7.1.
Tip: Before starting the calibration, successively connect all sensors to the I/O-Unit. This causes the sensors to be placed in front of the measuring system sensor in the registration list of the Processing Unit II. This simplifies the subsequent administration.

ii. Connect the wireless measuring system sensor to the I/O-Unit (see Section 7.2). To do this, proceed as follows:
Place the I/O-Unit in programming mode (press the *C key* for three seconds) > press the *key* on the wireless sensor for five seconds (resets the sensor) > press the *key* on the wireless sensor 1 second > the LED flashes once briefly > sensor is registered > leave programming mode of the I/O-Unit (press the *C key* for two seconds, the wireless connection LED on the I/O-Unit lights up green).

iii. Place the sensor attachment bracket at the required sensor location (true for all sensor types). The sensor front side edge must point later in the I/O-Unit direction.

iv. Place the measuring system sensor on the attachment bracket. The sensor position during the measurement must be the same as the operation position.

v. Perform a one-minute measurement with the measuring system sensor: Press the *key* on the measuring system sensor > the result of the previous measurement will be displayed for five seconds > "1" flashes in the display (indicates the one-minute measurement) > if a different number is displayed flashing, press the *key* several times until the "1" appears > the measurement

starts after 5 seconds > the measurement result (0-9) will be displayed after one minute.
(Details for the measurement and measuring times are contained in the operating instructions of the wireless sensors.)

vi. Measurement result 8-9: The connection is suitable for the productive operation. Remove the measuring system sensor and place the required sensor (temperature, humidity, access or digital input) on the attachment bracket.

vii. Measurement result 0-7: Sensor location not suitable. Change the position of the sensor, use a repeater (see Chapter 9) or use an external antenna. Then repeat the measurement.

viii. Repeat steps iii. to vii. for each additional sensor.

The wireless sensors now have an adequate connection to the I/O-Unit. This completes the installation of the system.

If problems in the wireless area occur during the installation of the system, Subsection 7.5.4 describes the appropriate troubleshooting for correcting the fault.

7.5.2 Introduction to the Wireless Data Transmission for the Rittal Wireless Sensor Network

This section describes the principles of the associated wireless technology that can be useful for setting up the wireless installation.

The sensor system operates with a frequency of 2.4 GHz. This means an optical consideration is helpful for an initial planning for suitable installation locations and distances.

The wireless signal is considered as being a light beam with a dispersion characteristic appropriate for light.
If you follow this model, it becomes clear that a direct line-of-sight connection between the base and the sensor is the most favourable installation variant. Walls, furnishings, etc., in the vicinity can, however, act as a "mirror" that reflects the signal like light. In this case, not only the original signal, but also reflected signals from various directions arrive at the receiving point. It is possible that the sent data are incorrectly combined in the receiver. This effect is called multi-path reception and can cause major impairment of the reception quality.
This means even a line-of-sight connection between the transmitter and the receiver is no guarantee for a good connection.

Signal weakening

Even without obstacles, the sent wireless signal is subject to a natural attenuation. The electric and magnetic field strengths reduce by the factor $1/r^2$. This means for distances exceeding approximately 1 m, the signal strength reduces by the factor 4 when the distance is doubled. Consequently, at 10 m distance from the transmitter, only 1/100 of the signal strength compared with that at 1 m distance will be received.

Any object through which the wireless signal needs to penetrate causes an absorption of the signal (optical model: the light will be weaker). Whereas lightweight partition walls and doors cause only small signal attenuation, masonry walls and coated glass, persons or animals cause more signal attenuation; metal causes large signal attenuation. Metal grids act like metal walls.
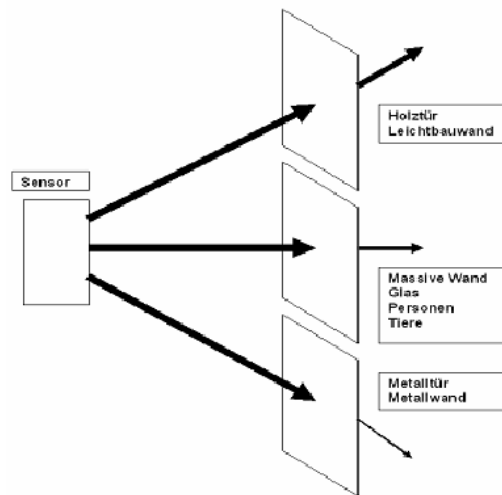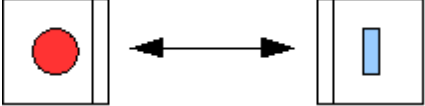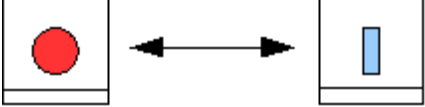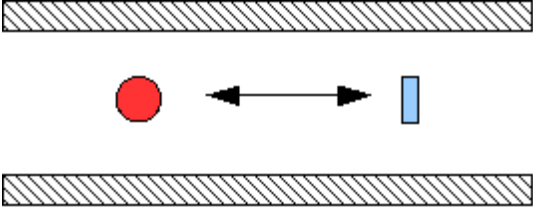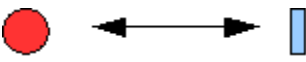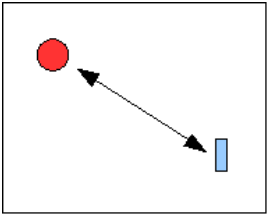

Fig. 20   Absorption of the wireless signal by various materials

Subsection 7.5.3 provides a general estimate of what ranges can be expected for certain installation situations.

7.5.3 Wireless System Range Estimate

Table 5 provides an indication of the expected ranges for certain installation scenarios.

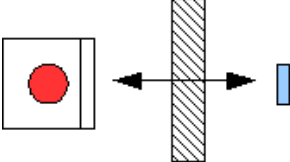| Scenario	Sensor range	
Single enclosure	for steel door (closed)	up to 20m
	for steel door (70% vented)	up to 35m
	for glazed door	up to 45m
Single enclosure (side)	for steel door (closed)	up to 20m
	for steel door (70% vented)	up to 25m
	for glazed door	up to 25m
	Note: These values are highly dependent on the ambient reflection	
Enclosure suite	for steel door (closed)	up to 6m
	for steel door (70% vented)	up to 20m
	for glazed door	up to 30m
Enclosure suite (side)	for steel door (closed)	up to 6m
	for steel door (70% vented)	up to 10 m
	for glazed door	up to 10 m
	Note: These values are highly dependent on the ambient reflection	
Adjoining room (masonry: thickness 30 cm, concrete)	for steel door (closed)	up to 6m
	for steel door (70% vented)	up to 8m
	for glazed door	up to 10 m
Corridor (line of sight, LOS)		up to 50 m
Outdoor (line of sight, LOS)		up to 200m
Industrial building (line of sight, LOS)		up to 50 m

Tab. 5   Wireless ranges

Key

| Sensor

● Receiver
with standard antenna

☐ RACK
Front
(Door)

7.5.4 Troubleshooting

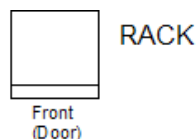| Fault	Possible cause	Testing and rectification
Sensor signal is not received.	Sensor does not send.	Send a test packet by briefly pressing the key on the sensor. LED must flash once. If necessary, test the battery state using PUII.
	Sensor lies outside the range of the I/O-Unit.	Test the wireless link using the "wireless measuring system". If the display value is smaller than "8", change the installation location. Alternatively, use a repeater or an external antenna.
	Sensor has been removed or interchanged.	Replace the sensor or/and re-register.
	Incorrect or no sensor registered to the I/O-Unit.	Check the sensor list on the Processing Unit web page. If necessary, re-register the sensor.
	Antenna not connected correctly.	Check the antenna installation, plug connectors and the laying of the antenna cable.
	I/O-Unit is installed in a shielded area.	Test the wireless link using the "wireless measuring system". If the display value is smaller than "8", use an external antenna.
	Interfering transmitter (continuous transmitter) present.	Test the wireless link using the "wireless measuring system". Display value should be 8-9 in the vicinity of the I/O-Unit. If necessary, rectify the interfering transmitter.
Sensor is sometimes not received.	Sensor lies in the fringe range of the I/O-Unit.	Test the wireless link using the "wireless measuring system". If the display value is smaller than "8", change the installation location or use a repeater.
	Sensor lies in the fringe range of the I/O-Unit.	Increase the power reserves of the wireless link: Mount the base and the sensor as high as possible to minimise the absorbing characteristics of the floor, and the effect of objects and persons.
	Intermittent change of the ambient conditions (enclosure, door, objects, persons, interfering transmitter, etc.).	Increase the power reserves of the wireless link: Change the installation location of the sensor or the I/O-Unit (the other sensors of the I/O-Unit then must be recalibrated) or use repeaters. If necessary, rectify the interfering transmitter.
	The installation location of the sensor changes periodically (mobile sensor).	Change the installation location of the sensor so that it lies in the receiving area.
	Interfering transmitter sometimes present.	Rectify or switch off the interfering transmitter.

Tab. 6   Troubleshooting

8 Operation

The configuration of the individual sensors is described in the operating manual of the individual wireless sensors.

8.1 Access Using a Browser

Open your Web browser as usual. Enter the IP address of the Processing Unit in the address field and start to build the page.

8.1.1 Login Using a Browser
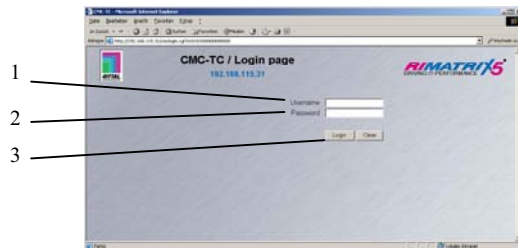
Fig. 21   Login window

Key

1   User name
2   Password
3   Login or Clear button

Enter in the login window the http user name and the http password of the Processing Unit. The use has to have administration rights.

The factory setting of the CMC-TC Processing Unit:
User name: admin
Password: admin

To confirm the input, click the Login button. To clear the input, click the Clear button.

8.1.2 Main Page View
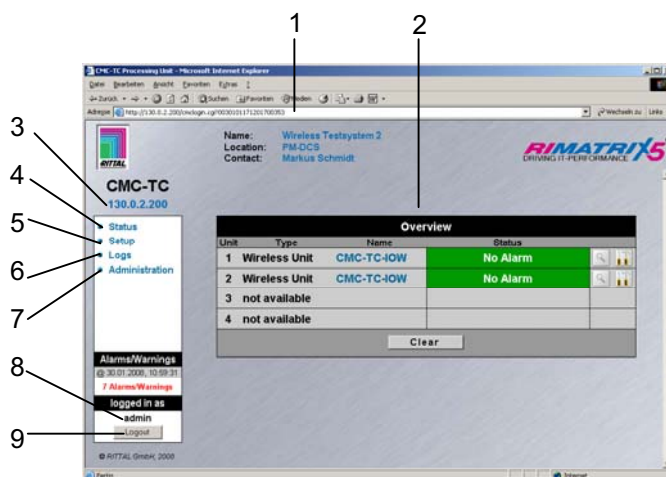
Fig. 22   Main page overview

Key

1   Address bar
2   Status window

3   IP address of the Processing Unit
4   Link to the main page view
5   Setup link
6   Log link
7   Administration link
8   User name
9   User logout

8.1.3 General Overview (Status Window)
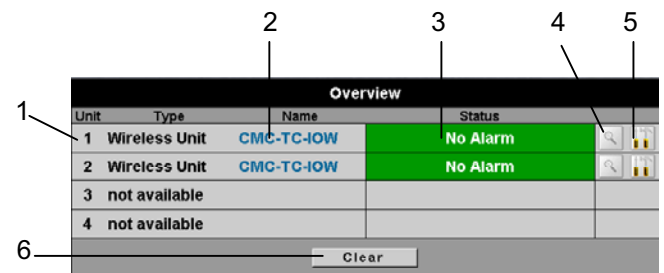
Fig. 23   I/O-Units overview

Key

1   Connection number and type of the I/O-Unit
2   Name of the I/O-Unit
3   Status display of the I/O-Unit
    green: No warning/alarm
    yellow: Warning
    red flashing: Alarm / error (timeout)
    red/yellow flashing: Configuration changed
4   Sensor overview link (see 8.1.4)
5   Sensor configuration link (see 8.1.5)
6   Clear – acknowledge events
    Click the Clear button to acknowledge configuration changes of all connected sensors. This causes the CMC-TC PU to be re-queried and the Web page rebuilt.

8.1.4 Sensor Overview
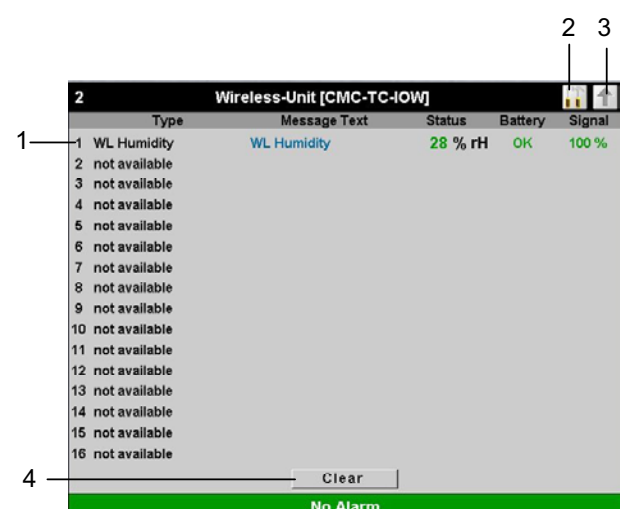
Fig. 24   Sensor Overview

Key

1 List of all sensors connected to the Processing Unit.
Clicking the sensor name displays the configuration page of the sensor

2 Link to the sensor configuration (see 8.1.5)

3 Link to the status window (see 8.1.3)

4 Clear – acknowledge events

8.1.5 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. 25 Configuring the sensor – overview

Key

1 Battery status
OK – battery OK
low – change battery

2 You can set for each sensor whether (enable) or not (disable) the alarm relay is to be switched for an alarm.

3 You can set for each sensor whether (enable) or not (disable) the integrated alarm beeper is to be activated for an alarm.

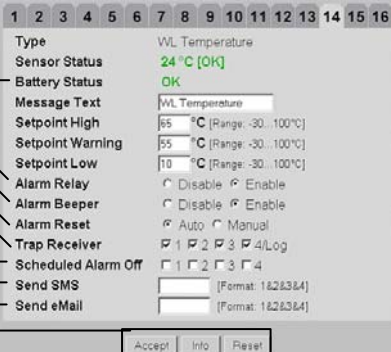4 You can set for each sensor type whether after a warning or alarm status the CMC-TC PU should self-acknowledge (auto) or the administrator must acknowledge manually (manual).

5 By clicking the individual option fields you can determine to which of the entered trap-receivers the traps for this sensor are to be sent.

6 By clicking the individual option fields you can set which alarm configuration is to be enabled or disabled. You can specify the individual functions in the "Setup – Timer" menu item and assign the associated scheduler.

7 Enter here the numbers 1 to 4 of the mobile wireless numbers that should receive an SMS when an alarm is issued. To create the mobile wireless numbers, please consult the operating manual of the CMC-TC Processing Unit. The numbers must be entered separated by an "&" character (e.g. 1&2&3&4).

8 Enter here the numbers 1 to 4 of the email adress that should receive an email when an alarm is issued. To create the email adress, please consult the operating manual of the CMC-TC Processing Unit. The numbers must be entered separated by an "&" character (e.g. 1&2&3&4).

9 Accepting the changes.
Info page for the specific wireless sensor.
(changes will not be accepted by clicking Info)
Reset all settings to the default values.

☞ **Note!**
Further setting possibilities are described in the Wireless Sensor operating manual.

8.1.6 Sensor Information
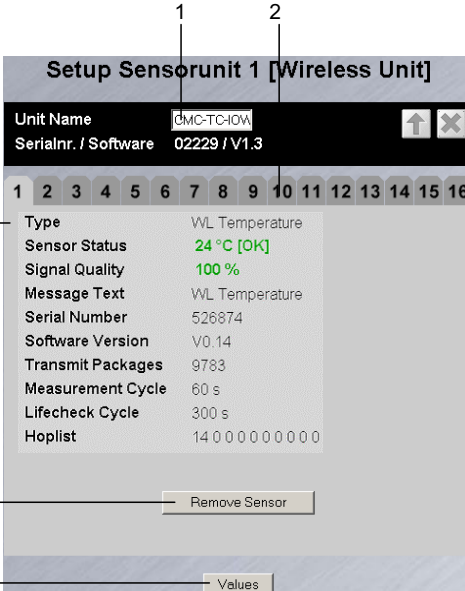
Fig. 26 Sensor information

Key

1 Name of the I/O-Unit to which the sensor is registered.

2 Tabs for additional sensors of the Processing Unit.

3 Detailed information for the selected sensor (here: Sensor 1)
Type: Sensor type
Sensor Status: Current measured value or status of the sensor
Signal Quality: Signal quality of the Sensor – I/O-Unit connection
Message Text: Message text for alarm messages
Serial Number: Serial number of the sensor
Software Version: Version number of the sensor software
Transmit Packages: Data packages transmitted from the sensor to the I/O-Unit
Measurement Cycle: Interval between two measurements
Lifecheck Cycle: Interval between the transmission of two Lifecheck packets. An Error will be reported after 4 consecutive lifecheck signal losses.

Hoplist: Information path of the sensor signal to the Wireless I/O-Unit. The individual repeater stations through which the sensor signal passes on the path to the I/O-Unit are listed here.

4   Button to remove the sensor from the I/O-Unit.

5   *Values* button returns to the sensor configuration (see 8.1.5).

9   Wireless I/O-Unit as Repeater

The CMC-TC Wireless I/O-Unit can also be used as a repeater for the Rittal CMC-TC wireless sensor network. This allows a long distance or a large area to be covered using wireless sensors.

☞   **Note!**
A maximum of nine CMC-TC Wireless I/O-Units with repeater function can be registered with a CMC-TC Wireless I/O-Unit using the CMC-TC Processing Unit.

9.1   Power Supply

Fig. 27   Power supply (repeater)
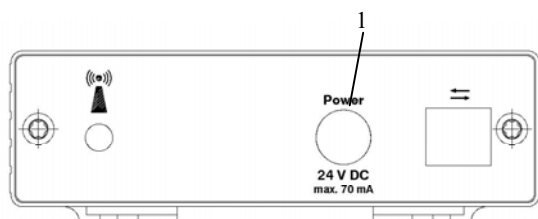
Key

1   Power supply connection

Use for the power supply a power unit described in Subsection 4.5.1 Required Accessories. Ensure that a country-specific connection cable is used.

9.2   Configuring a Wireless I/O-Unit as Repeater

Once you have connected the Wireless I/O-Unit to the power unit, it functions as a repeater. You must now register the Repeater Wireless I/O-Unit with the Wireless I/O-Unit using the CMC-TC Processing Unit (master). If the repeater has already been registered at a different I/O-Unit, you have to reset the repeater first. To reset, please press c key for 10 seconds until the status LED is flashing.

Press for two seconds the C key on the Wireless I/O-Unit (master). The wireless connection LED flashes red, yellow and green. You are now in programming mode. Now go to the Repeater Wireless I/O-Unit and press once the C key. You

now receive the "Configuration changed" message on the browser window. Click the Clear button two or three times until the message disappears. Click on the sensor overview pageon the sensor name. The following window now appears.
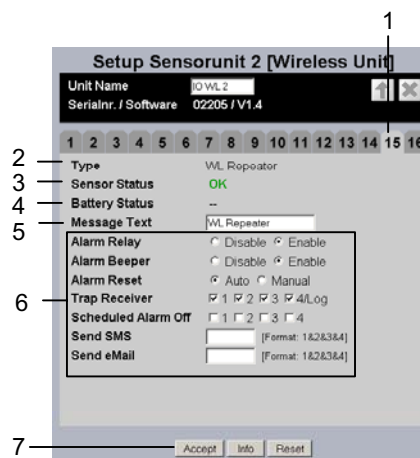
Fig. 28   Repeater status

Key

1   Tab: The repeater will be registered with a free port on the CMC-TC Wireless I/O-Unit (master).

2   Type: Sensor name (here: WL Repeater).

3   Sensor Status: The status of the CMC-TC Wireless I/O-Unit (repeater).

4   Battery Status: --.

5   Message Text: A name for the alarm message of the CMC-TC Wireless I/O-Unit (repeater) is defined here.

6   Additional cofiguration: see sensor configuration fig. 26.

7   Accept: Accept all changed settings.
Info: Call the information page of the CMC-TC Wireless I/O-Unit (repeater) (see 9.3 Repeater Information Page).
Reset: Reset all changed values.

☞   **Note!**
During the sensor registration the distance between repeater an Wireless I/O-Unit must not exceed 5m!

9.3   Repeater Information Page

The information page shows all important parameters of the CMC-TC Wireless I/O-Unit (repeater).

Fig. 29　Repeater information page

Key

1　Type: The type of the registered unit or the sensor.

2　Sensor Status: The current status of the unit
green: OK
red: Error

3　Signal Quality: The signal strength between the CMC-TC Wireless I/O-Unit (repeater) and the CMC-TC Wireless I/O-Unit on the Processing Unit (master).

4　Message Text: The entered message text for alarms.

5　Serial Number: The serial number of the CMC-TC Wireless I/O-Unit (repeater).

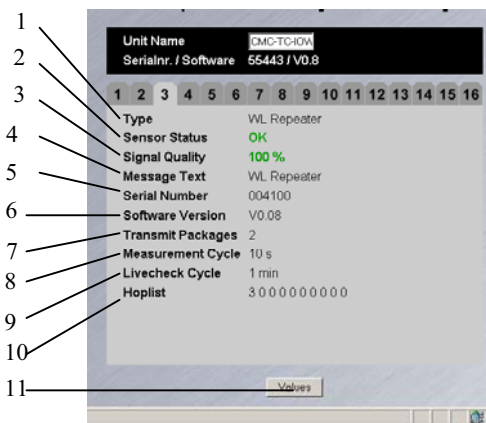6　Software Version: The software version of the CMC-TC Wireless I/O-Unit (repeater).

7　Transmit Packages: The packages transferred to the CMC-TC Wireless I/O-Unit (master).

8　Measurement Cycle: The measurement interval (here every 10 seconds).

9　Lifecheck Cycle: The measurement interval for querying the reachability to the CMC-TC Wireless I/O-Unit (master). An Error will be reported after 4 consecutive lifecheck signal losses.

10　Hoplist: Information path of the sensor signal to the Wireless I/O-Unit. The individual repeater stations through which the sensor signal passes on the path to the I/O-Unit are listed here.

11　Values: You can return to the CMC-TC Wireless I/O-Unit (repeater) status page (see 9.2 Configuring a Wireless I/O-Unit as Repeater).

Hoplist example:

Fig. 30　Hoplist example (repeater)

The humidity sensor was registered on tab 2. The removed CMC-TC Wireless I/O-Unit (repeater) on tab 3. You see the following message in the hoplist:
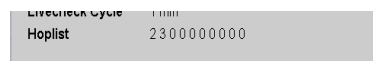
Fig. 31　Hoplist (repeater)

This means that the signals of the CMC-TC wireless humidity sensor on tab 2 using the CMC-TC Wireless I/O-Unit (repeater) on tab 3 go to the CMC-TC Wireless I/O-Unit (master).

To unregister the repeater from the I/O-Unit, you have to reset the repeater. To reset, please press C key for 10 seconds until the status LED is flashing.

10　Connecting an External Antenna

In difficult environments the external antenna can be used to increase signal perfromance of the CMC-TC Wireless I/O-Unit (see Subsection 4.5.2 Optional Accessories).
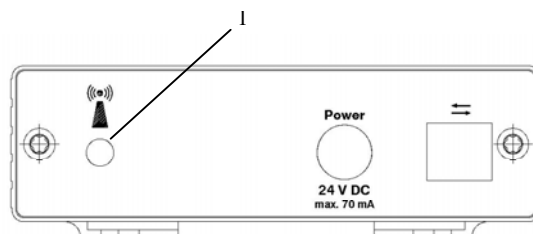
Fig. 32　Connecting an antenna

Key

1　Antenna connection

Unscrew the supplied antenna of the CMC-TC Wireless I/O-Unit and screw on the antenna plug of the external antenna.

The antenna of the I/O-Unit should always be adjusted parallel to the antennas of the sensors. If all sensors are aligned vertical, the I/O-Unit antenna must be also aligned vertical.

11　Maintenance and Cleaning

The Rittal CMC-TC Wireless Unit I/O-Unit is a maintenance-free system. The housing does not need to be opened for the installation or during operation.

☞　**Note!**

Opening the housing or any accessory components will void any warranty and liability claims.

11.1

11.2 Cleaning

⚠️ **Warning!**

Danger of damage!
**Do not use any aggressive sub-
stances, such as white spirit, acid,
etc., for cleaning because such sub-
stances can damage the unit.**

Use a slightly moistened soft cloth to clean the
housing.

12 Storage and Disposal

12.1 Storage

If the device is not used for a longer period, we
recommend that it is disconnected from the mains
power supply and protected from dampness and
dust.

If the sensors are not used for a longer period,
they should be switched off.

Further information concerning the operating con-
ditions is contained in the technical specifications.

12.2 Disposal

Because the CMC-TC Wireless Unit I/O-Unit con-
sists primarily of the housing and PCB, the unit
must be disposed of through the electronic waste
recycling system when it is no longer required.

13 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
E-mail: 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 and updates of the Rittal CMC-TC can
be downloaded from:
http://www.rimatrix5.de/service_support/download
s.asp

14   Technical Specifications

Designation	CMC-TC
Housing	
Housing type	Plastic covering with metal trim
Height	1 U / 44.5 mm
Width	136 mm
Depth	129 mm
Weight without packaging	approx. 0.6 kg
Potential equali-sation	- [2]
Earthing	- [2]
Protection category	IP 40 to EN 60529
Interfaces	
Pushbuttons	1 membrane pushbutton, ac-knowledge pushbutton
LED display	2 x (active/alarm, wireless con-nection)
Input	
Rated voltage / rated current	24 V DC, internal or 24 V for external power supply 120 mA
Operational area	
Temperature	+5 to +45 °C +42 to +113 °F
Storage tem-perature	-20 to +60 °C -4 to +140 °F
Humidity	10% – 90% rel. humidity, non-condensing

Technical Specifications

[1] Height units

[2] Not required because safety extra-low voltage
24 V DC

15 Technical Glossary

CMC-TC

CMC-TC (Computer Multi Control – Top Concept) is a Rittal product used to monitor network enclosure components.

Internet browser

An Internet browser can be used to display html pages (and pages that conform to a similar standard). In the case of CMC-TC PU II, they can be configured using a user interface displayed with an Internet browser.

Link

A link causes a jump to another Internet page or establishes a connection between two Internet pages.

SNMP (Simple Network Management Protocol)

The SNMP is a simple network management protocol based on TCP/IP. It was developed to monitor network components on a central management station.

Trap

Trap is the sending of SNMP messages.

Trap Receiver

The trap receiver is the receiver of SNMP messages.

16 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
CE0681①	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.

The internal / external antennas used for this mobile transmitter must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

FCC ID: SIFCMCBASE0108V2

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.

Revision History

Version	Date	Description/Changes
1.00	2008-04-15	Initial version.

About Nanotron Technologies GmbH

Nanotron Technologies GmbH develops world-class wireless products for demanding applications based on its patented Chirp transmission system - an innovation that guarantees high robustness, optimal use of the available bandwidth, and low energy consumption. Since the beginning of 2005, Nanotron's Chirp technology has been a part of the IEEE 802.15.4a draft standard for wireless PANs which require extremely robust communication and low power consumption.

ICs and RF modules include *nanoNET TRX Transceiver*, *nanoLOC TRX Transceiver*, and ready-to-use or custom wireless solutions. These include, but are not limited to, industrial monitoring and control applications, medical applications (Active RFID), security applications, and Real Time Location Systems (RTLS). *nanoNET* is certified in Europe, United States, and Japan and supplied to customers worldwide.

Headquartered in Berlin, Germany, *Nanotron Technologies GmbH* was founded in 1991 and is an active member of IEEE and the ZigBee alliance.

Further Information

For more information about this product and other products from Nanotron Technologies, contact a sales representative at the following address:

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Alt-Moabit 60
10555 Berlin, Germany
Phone: +49 30 399 954 - 0
Fax: +49 30 399 954 - 188
Email: sales@nanotron.com
Internet: www.nanotron.com