

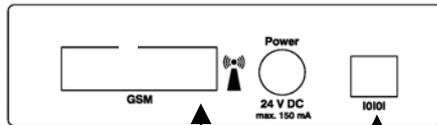
# CMC-TC GSM Unit

## DK 7320.820

### Important note:

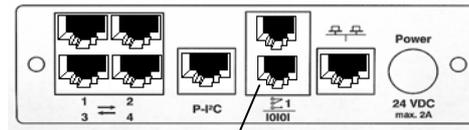
For reasons of clarity, these user instructions contain only the most significant details and information and similarly cannot address every conceivable case with regard to installation, operation and maintenance. Subject to technical modifications without prior notice. In case of ambiguity, the wording of the corresponding German text is to prevail.

Accessory:  
**GSM Unit 7320.820**



SIM card slot and aerial connection

Processing Unit:  
**PU 7320.100** from software version 1.10



Connecting cable RJ 12/ RJ 12, enclosed

### Description:

If an alarm situation arises, the CMC-TC GSM Unit (in conjunction with an inserted SIM card) is able to provide for wireless notification by SMS. The receipt of a defined SMS, furthermore, can be used to authorise access to the enclosure.

It is to be noted that the aerial of the GSM Unit must lie within the reception and transmission range of the selected mobile communication network at all times and must not be left shielded as a result of other installation measures, e.g. metallic enclosure. In this case, the aerial cable of the GSM Unit must be extended to permit the aerial to be installed outside the shielded space. A sufficient signal quality must be available at all times to enable proper reception and transmission.

As no network provider is able to guarantee the 100% availability of the network in a particular area, Rittal is similarly unable to guarantee 100% alarm notification by SMS. The following cases are examples for situations in which the transmitted SMS fails to reach the intended recipient:

1. The mobile phone is not logged into a network, has been switched off or has switched itself off automatically because its battery is empty.
2. If a mobile phone is used with a prepaid card, it may happen that the number is not obtainable because the credit on the card is exhausted or else the card has expired after a contractually agreed period. In some cases the SIM card may then be permanently disabled. To be able to exclude this possibility, the user of the GSM Unit must ensure that a corresponding credit is maintained on the prepaid card at all times. Rittal recommends users not to rely on prepaid cards and instead to conclude a standard contract.



We must point out furthermore, that the GSM Unit will attempt to send the defined SMS regardless of the signal quality of the mobile network connection. In the case of a poor signal quality, it is thus possible that the sent SMS fails to reach its intended recipient. The signal quality can be checked as a percentage value via a browser or via Telnet. Please note that, for technical reasons, only one GSM Unit or one Display Unit can be operated at a Processing Unit.

Moreover, access via Hyperterminal is only possible after the Display Unit or GSM Unit has been deactivated, as all components communicate via the serial interface. After accessing the PU via Hyperterminal, it is also imperative to log out properly – simply closing the window is not sufficient, as the connection is not reset and the PU continues to wait for further inputs via Hyperterminal at the front interface. During this time, all communication with the GSM Unit is interrupted.

The GSM Unit is recognised and initialised automatically by the PU software from version 1.10.

The CMC-TC GSM Unit is connected to the RS232 interface port on the rear of the Processing Unit (PU) with the enclosed RJ 12 cable and also receives its +24 V DC power supply via this cable. The enclosed aerial is connected to the aerial connection of the GSM Unit. The aerial provides the connection to the mobile communication network. The transmission frequencies 1800 MHz and 900 MHz are supported. The local mobile network provider chosen must operate on the basis of one of these two frequency standards. Depending on the provider chosen and the services offered, it may be possible to have the SMS read by voice computer to a fixed-network subscriber or else forwarded as an e-mail or fax message. Please consult your individual provider for further details.

The CMC-TC GSM Unit can be fixed to any plane surface of an enclosure with the enclosed, self-adhesive Velcro strips. Further available options are a 1 U mounting unit DK 7320.440 for the 482.6 mm (19") level and an individual mounting unit DK 7320.450 for attaching to the system frame in the enclosure.

No further components are required to operate the CMC-TC GSM Unit with the Processing Unit.



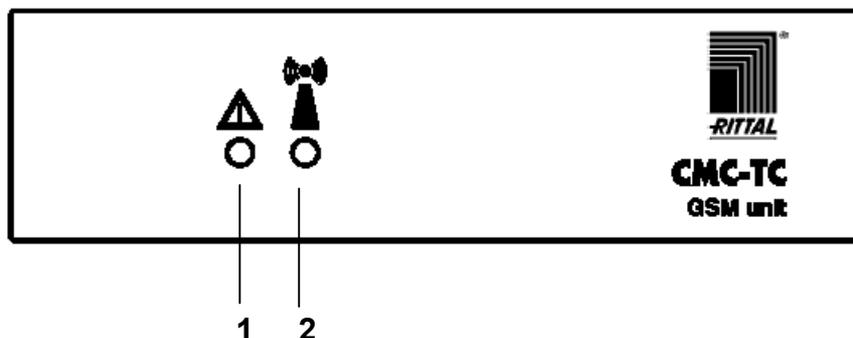
## Conditions for use / safety notes:

- The CMC-TC GSM Unit is only to be used in connection with the Rittal CMC-TC system.
- Observe the contents of the user instructions / safety notes supplied with the Processing Unit (7320.100) and these product-specific instructions. Particular attention is drawn to the conditions for use, safety information and warranty notes contained therein.
- Cables must always be routed separately from lines carrying mains voltage.
- The CMC-TC GSM Unit must only be used under ambient conditions within the specified permissible range.
- The CMC-TC GSM Unit must not be opened. It does not contain any parts which require servicing.
- Before making connections, ensure that the CMC-TC GSM Unit is suitable for use with the available Processing Unit.
- Safety devices and provisions must never be rendered ineffective.
- Avoid any direct contact of the CMC-TC GSM Unit with water (e.g. condensation), oily contamination or aggressive substances.
- The CMC-TC GSM Unit must not be used in environments subject to inflammable gases or vapours. Protection against water, spraying, etc. is to be ensured through installation in an enclosure or rack.
- The CMC-TC system must be disconnected from the power supply when the connection is made between the CMC-TC GSM Unit and the PU.
- The CMC-TC GSM Unit must be installed properly in accordance with the separate mounting instructions.
- The EMC immunity can be improved by way of additional measures. Please consult our head office for further information.
- In environments with an increased level of electromagnetic disturbance (e.g. industrial environments), suitable additional protection measures are able to guarantee the required electromagnetic compatibility. Please consult our head office for further information.
- The conditions for use / safety notes listed in the instructions must be observed under all circumstances.
- In case of damage attributable to non-observance of these instructions / conditions for use or of the instructions pertaining to the Processing Unit 7320.100, all warranty claims will become null and void. Rittal accepts no liability whatsoever for consequential damage!
- Rittal accepts no liability whatsoever for property damage or personal injury attributable to improper handling or non-observance of the safety notes. In such cases, all warranty claims will become null and void!

## Description of the CMC-TC GSM Unit 7320.820

### Front side:

The GSM Unit incorporates a GSM module from the company Wavecom, which is addressed by the PU by way of special AT commands. There is no provision for manual operation of the GSM Unit; the front of the unit thus presents only 2 LEDs serving as status indicators:



#### 1 Duo-LED red / green:

This LED is controlled via AT commands through the PU software and is used to signal the current status of the GSM Unit:

- red: The LED lights red during initialisation of the GSM Unit and later also in case of inferior signal quality.
- orange: The LED switches to orange during the sending of an SMS.
- green: The LED switches to green following successful initialisation of the GSM Unit and indicates that it is ready for operation.

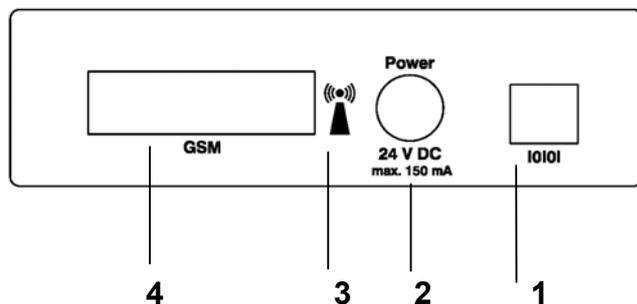
#### 2 Green LED with aerial symbol:

This LED is controlled directly by the GSM module and signals the status of the GSM module:

- off: The GSM module is switched off or else not logged into a network
- slow flashing: The module is logged into a network
- rapid flashing: Data transmission in progress

## Description of the CMC-TC GSM Unit 7320.820

### Rear side:



- 1 The CMC-TC GSM unit is connected to the Processing Unit via the RS232 interface port using the enclosed RJ 12/RJ 12 connecting cable. The connecting cable provides the +24 V DC power supply and carries the data exchange with the Processing Unit.
- 2 The separate 24 V DC power supply connection is reserved for future further developments of the CMC-TC system.
- 3 Symbol for the GSM aerial connection
- 4 SIM card slot with aerial connection

### Technical data:

GSM/GPRS 900/1800 class 2

Maximum power consumption: 150 mA

Max. length of connecting cable: 2 m

Rated voltage 24 V DC with supply from the Processing Unit

Shock 1g

Operating temperature range: +5°C to +45°C

Protection category: IP 40



## Initial start-up

Important note: The following description applies for **software version V1.10** for the Processing Unit DK 7320.100, which is the version required to operate the GSM Unit.

### ▪ Initial start-up

The following measures are to be taken before the GSM Unit is connected to the Processing Unit:

- a) Insert a SIM card into the SIM card slot of the GSM module. You must possess the following information pertaining to the SIM card used:
  - PIN code: The PIN code serves to enable the SIM card and to authorise it to log into a GSM network. If you should wish to change the current PIN code, this can be done by inserting the SIM card into a mobile phone and then using the functions provided by the phone for this purpose.
  - PUK code (recommended), to be able to unlock the SIM card again in case of problems.
  - Subscriber number: The subscriber number of the card must be known in order to be able to send an SMS to the GSM module.
  - Call number of the SMS service centre of your chosen network provider, in order to be able to send SMS messages.
  
- b) Enter the following data into the Processing Unit via the Hyperterminal or Telnet menu 'General configuration > SMS configuration':
  - PIN code (4-digit decimal number) of the SIM card
  - Call number of the SMS service centre
  - Up to 4 phone numbers to which an SMS is to be sent
  - In addition, this menu option can be used to specify whether or not an SMS is to be sent in the case of so-called unit messages (e.g. 'Unit detected', 'Configuration change', etc.).
  
- c) For each sensor or output, you can specify the phone number(s) to which an SMS is to be sent (each status change causes an SMS to be sent). This is done via the menu option 'Sensor Units > Unit xyz > Sensor abc > Send SMS'. The actual assignment is performed by entering a string in the form '1&4', for example. In this particular case, a status change for the sensor concerned would send an SMS to the phone numbers 1 and 4.  
 You may note, however, that it is also possible to edit and adapt these specifications at any time later.

**IMPORTANT:** *As with a mobile phone, the SIM card will be locked if an incorrect PIN code is entered three times in succession. In this case, the card can only be unlocked by entering the so-called PUK (Personal Unblocking Key). This can be achieved by inserting the SIM card into a mobile phone and by entering the PUK and a new PIN code when requested to do so. To avoid this situation, it is imperative to ensure that the correct PIN code is entered in the PU before connecting the GSM Unit.*



The actual procedure for entering the above settings is described below in the section Settings.

The GSM Unit can only be connected after these settings have all been entered in the PU (the GSM module possesses automatic baud rate detection). As the serial interface of the chip is used for various purposes (Hyperterminal, Display Unit, etc.), the transmission settings are also left unchanged (9600 baud / no parity / 8 stop bits / no handshake). The GSM module sets itself automatically to this baud rate. The software of the CMC-TC/PU polls this interface cyclically to detect whether a device has been connected; it may therefore take up to a minute for the GSM Unit to be found, if it is connected during operation. It is thus better to switch off the PU, plug in the GSM Unit and then to restore the power supply; in this case, the GSM Unit is recognised immediately.

The first process step is the initialisation of the module (red status LED lights); if the GSM module has been able to log into a network, the green LED with the aerial symbol starts to flash. At the end of the initialisation phase, the status LED also switches to green.

Following successful initialisation, the unit checks continuously whether the status of any of the sensors or outputs changes. If one or more phone numbers have been defined for a particular sensor, an SMS will be sent to the corresponding recipient(s) if a change is detected.

Furthermore, it checks whether any SMS has been received. If an incoming SMS is detected, it will be evaluated and a corresponding action performed if the syntax is found to be correct. For additional security, it checks at the same time whether the phone number of the sender is to be found in its list of recipient phone numbers. An action is only actually performed if this check is positive.

The reception signal quality, finally, is also monitored constantly. If the signal strength is insufficient, the status LED is switched to red.

## Settings

### ▪ Via Telnet

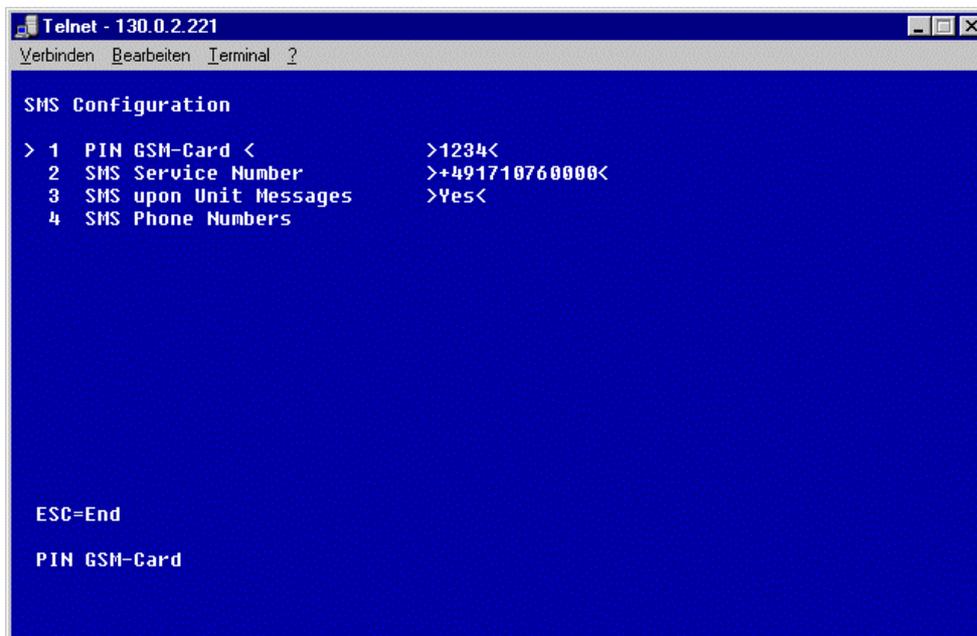
The menu 'General configuration / SMS configuration' can be used to enter the following values required to operate the GSM Unit:

- PIN Code: 4-digit PIN code to enable the SIM card.
- SMS Service Number: Telephone number of the SMS service centre of your chosen network provider; this number is supplied with the SIM card.
- Unit Messages: If this option is enabled, an SMS will also be sent in the case of so-called 'Unit Messages' (e.g. Timeout,



Configuration change, etc.). Such SMS messages are sent to all recipient phone numbers.

- SMS Phone Numbers: Permits specification of up to 4 recipient phone numbers. **IMPORTANT:** These numbers must be entered in their **international format** (in the example here: +49 for Germany, no leading zero in front of the dialling code).



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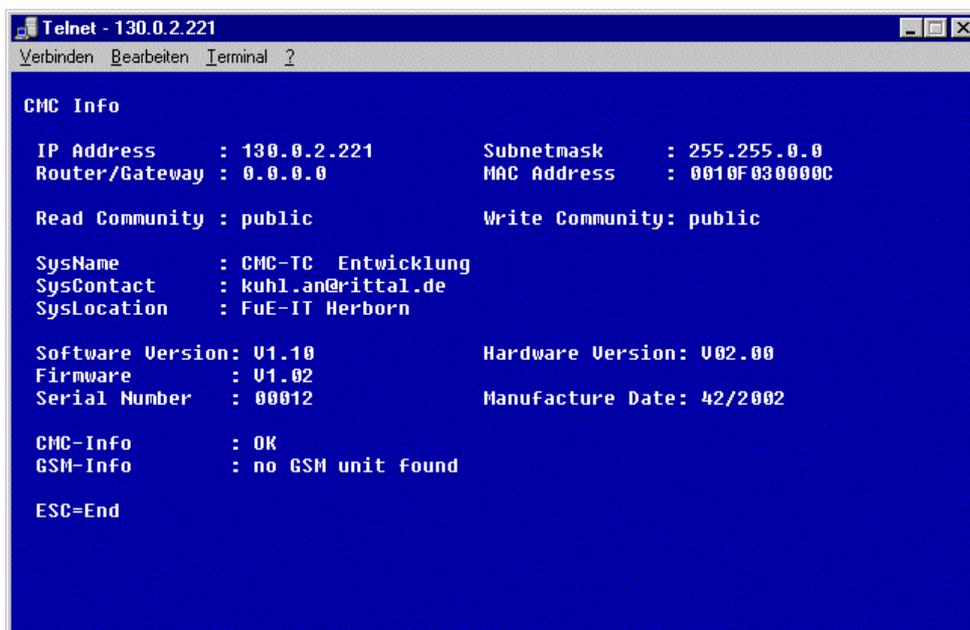
Telnet - 130.0.2.221
Verbinden Bearbeiten Terminal ?

SMS Configuration

> 1 PIN GSM-Card <                >1234<
> 2 SMS Service Number             >+491710760000<
> 3 SMS upon Unit Messages         >Yes<
> 4 SMS Phone Numbers

ESC=End
PIN GSM-Card
  
```

Fig. 1 Setting the GSM parameters via Telnet



```

Telnet - 130.0.2.221
Verbinden Bearbeiten Terminal ?

CMC Info

IP Address      : 130.0.2.221      Subnetmask     : 255.255.0.0
Router/Gateway  : 0.0.0.0           MAC Address    : 0010F030000C

Read Community  : public          Write Community: public

SysName        : CMC-TC Entwicklung
SysContact     : kuhl.an@rittal.de
SysLocation    : FuE-IT Herborn

Software Version: U1.10           Hardware Version: U02.00
Firmware       : U1.02
Serial Number   : 00012           Manufacture Date: 42/2002

CMC-Info      : OK
GSM-Info      : no GSM unit found

ESC=End
  
```

Fig. 2 GSM info display

The Telnet function 'Info Page' can be used to display the status information for the GSM Unit (Display: GSM Info). The following status returns are possible:

- **No GSM unit found:** No GSM Unit was found at the serial interface.
- **GSM unit found:** A GSM Unit has been found and initialisation is running.
- **GSM unit o.k. [Signal 80%]:** The GSM Unit has been initialised correctly and is functioning normally; the signal strength is in this example 80%.
- **Sending SMS:** An SMS is being sent.
- **Receiving SMS:** An SMS is being received.
- **GSM unit timeout:** No response from the GSM Unit.
- **PIN is missing:** The initialisation detected that no PIN code has been entered.
- **Service number missing:** The initialisation detected that no service centre number has been entered.
- **Wrong PIN:** The PIN code entered in the PU does not match the code on the SIM card.
- **PUK needed:** An incorrect PIN code has been entered 3 times; the SIM card must be unlocked with the corresponding PUK (Personal Unblocking Key).
- **Not registered:** The GSM Unit was unable to log into the network (e.g. because the SIM card has expired or because no valid network was found).

```

Telnet - 130.0.2.221
Verbinden Bearbeiten Terminal ?

Temperature Sensor

> 1 Status <                >OK<
  2 Value                   >24 C<
  3 Setpoint High           >50 C<
  4 Setpoint Warning        >40 C<
  5 Setpoint Low            >10 C<
  6 Message Text            >Temperature Sensor<
  7 Alarm Relay             >Enabled<
  8 Beeper                  >Enabled<
  9 Trap Receiver 1         >Enabled<
  A Trap Receiver 2         >Enabled<
  B Trap Receiver 3         >Enabled<
  C Trap Receiver 4/Log     >Enabled<
  D Alarm Reset             >Auto<
  E Send SMS                >1&3<

ESC=End

Status
  
```

Fig. 3 Setting the sensor parameters via Telnet

For each sensor or actuator it is possible to specify that one or more SMS messages be sent in case of a status change.

This is done via the menu option 'Send SMS'. In the above example, it is specified that an SMS be sent to the recipient phone numbers 1 and 3. If more than one phone number is to be specified, the numbers must be separated with a '&' and the string must not contain spaces. If SMS notification is to be ensured for all status changes, the menu option 'Alarm Reset' must be set to 'Auto'.

## ▪ Via a browser

Via the menu option 'GSM Unit', it is also possible to use a Web browser to enter the settings described in the section 'Via Telnet'; the line 'GSM Info' displays the current status of the GSM Unit (see section 'Via Telnet').

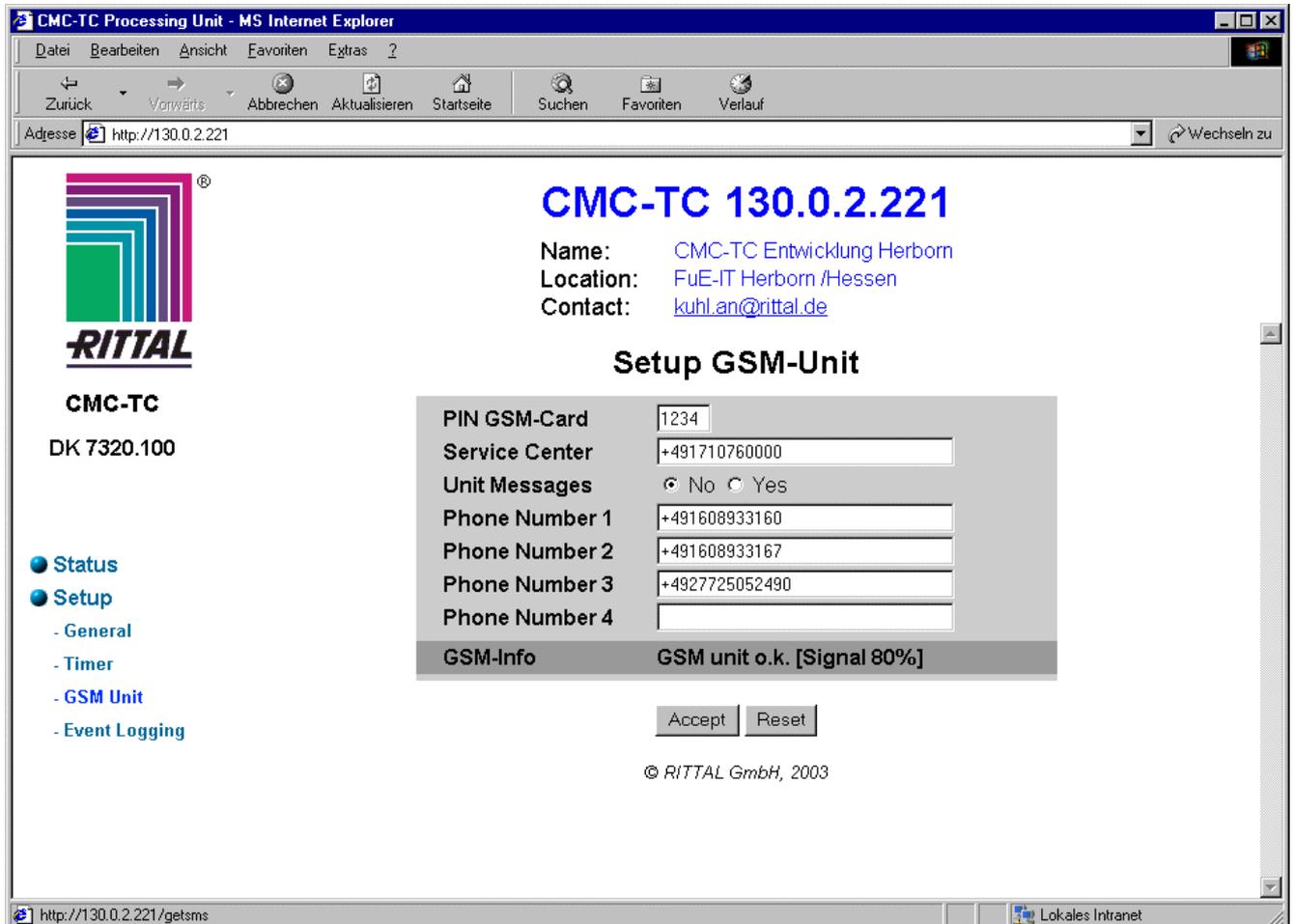


Fig. 4 GSM Unit settings via a Web browser



CMC-TC Processing Unit - MS Internet Explorer

Adresse <http://130.0.2.221>

**CMC-TC 130.0.2.221**

Name: [CMC-TC Entwicklung](#)  
 Location: [FuE-IT Herborn](#)  
 Contact: [kuhl.an@rittal.de](mailto:kuhl.an@rittal.de)

**Setup Sensorunit 4 [IO Unit]**

Unit Name	CMC-TC-IOU		
Serialnr. / Software	00255 / V1.2		
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Type	Temperature Sensor		
Sensor Status	24 °C [OK]		
Message Text	Temperature Sensor		
Setpoint High	50 °C [Range: 0...100°C]		
Setpoint Warning	40 °C [Range: 0...100°C]		
Setpoint Low	10 °C [Range: 0...100°C]		
Alarm Relay	<input type="radio"/> disable <input checked="" type="radio"/> enable		
Alarm Beeper	<input type="radio"/> disable <input checked="" type="radio"/> enable		
Alarm Reset	<input checked="" type="radio"/> Auto <input type="radio"/> Manual		
Trap Receiver	<input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4/Log		
Send SMS	1&3 [Format: 1&2&3&4]		

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Fig. 5 Sensor settings via a Web browser

This is the browser window used to specify the recipient phone number(s) to which an SMS is to be sent in case of a status change (the format for inputs is 1&2&3&4 for all 4 recipients).

## SMS functions

### ▪ Sending an SMS

For each sensor or output it is possible to specify whether or not an SMS is to be sent in case of a status change. This settings can be made via a Hyperterminal or Telnet menu ('Sensor Units > Unit xyz > Sensor abc > Send SMS') or alternatively via a Web browser. To this end, a string is entered for each sensor or actuator with the following format: e.g. 1&2&4, to specify that the SMS be sent to the recipient phone numbers 1, 2 and 4.

The SMS which is sent comprises the following information:

- Date / time
- System designation and name
- Name and number of the unit
- Name of the sensor / output
- Status messages (e.g. Alarm / too high / too low, etc.)

The following is an example for such an SMS:

*28.02.2002 14:33 'CMC-TC Development Office' Enclosure 1 (01): Temperature sensor: too high'*

This SMS is sent to either one or several recipient phone numbers, as specified. A phone number may be the number of a mobile phone or that of any fixed-network subscriber. In the latter case, the SMS is read to the recipient by a voice computer (subject to the availability of this service from your chosen network provider).

Please note that the Processing Unit reserves space for up to 10 outgoing SMS messages. The SMS messages are sent in the order in which the corresponding status changes were recorded. Approx. one minute is to be calculated for the sending of each SMS. If there are already 10 SMS messages to be sent, any further SMS messages will be deleted.

### ▪ Receiving an SMS

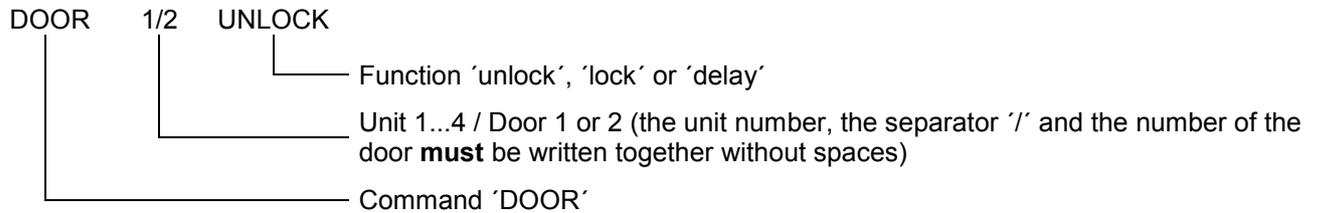
A constant check is also made to determine whether any SMS has been received. If an SMS is detected, it is analysed and a corresponding action performed. The incoming SMS must observe a defined format to be recognised by the CMC-TC system. In addition, the phone number of the sender is checked against the 4 numbers in the list of SMS recipients; the corresponding command is only performed if the sender is identified as one of the defined recipients. For safety reasons, the fan cannot be switched off via SMS. The command 'Fan off' which is supported in connection with the Climate Unit 7320 is here changed to 'Fan Auto'. The new command causes the fan to be returned to temperature-controlled operation. The command 'Fan On' remains effective in the known manner.



The following commands are recognised by the CMC-TC PU:

**a) Door control:**

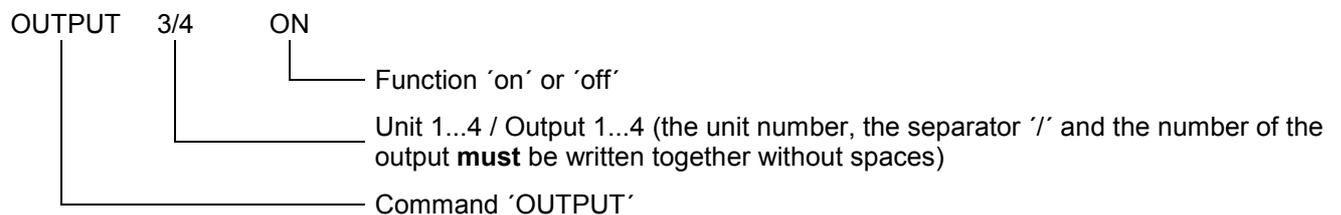
The functions 'unlock', 'lock' and 'delay' can be triggered. The format of the SMS must be as follows (here, for example, to open Door 2 via Access Unit 1 at Port 1 of the PU):



Upper and lower case characters are not distinguished. The individual words can be separated by spaces (but **not** the 'unit/door' numbers).

**b) Outputs (Universal output / Power switch):**

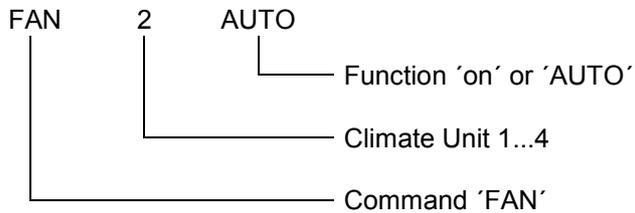
The functions 'on' and 'off' permit switching of the CMC-TC outputs. The format of the SMS must be as follows (here, for example, to activate Output 4 of IO Unit 3 at Port 3 of the PU):



Upper and lower case characters are not distinguished. The individual words can be separated by spaces (but **not** the 'unit/output' numbers).

**c) Fan control:**

The functions 'on' and 'AUTO' can be used to control the fan of a Climate Unit. The format of the SMS must be as follows (here, for example, to switch the fan of the Climate Unit at Port 2 of the PU to automatic control by the Climate Unit):



Upper and lower case characters are not distinguished. The individual words can be separated by spaces.

**d) Alarm reset:**

The command 'CLEAR' can be used to acknowledge a previous alarm. Upper and lower case characters are not distinguished.

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