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CE

PSM Power System Module
DK 7856.201 / 7200.001
Installation and Operating Instructions

Status June 2005 -

Table of contents

0 Introduction

The stable flows of information and production are the 'lifelines' of an enterprise. Loss of data or failure of function and production can cause extensive and in many cases life-threatening damage. Therefore, it is the declared company objective to ensure maximum safety and reliability.

RITTAL offers the support needed to achieve this goal: by means of universal competence in effective prevention, comprehensive safety, and centralised organisation, i.e. teamwork for IT safety and reliability! This results in an optimum combination of power management and administration, enclosure monitoring, server administration, and climate control components.

The solution for power management is RITTAL PSM. This concept includes complete power distribution system of the enclosure, i.e. feed, distribution, and protection.

The system is made complete by its sophisticated modular structure. A basic installation can be implemented in next to no time. As system requirements grow, it is easy to add simple plug-in modules, including various country versions.

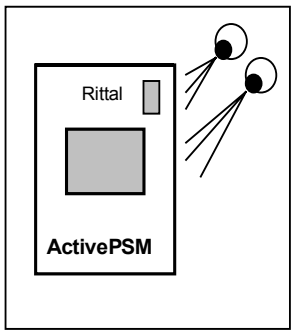
The essential features of RITTAL PSM are:

- Two separate 3~ feeds, which facilitates a redundant structure
- 96A of power available; 48A per feed
- 7 plug-in modules can be installed over a length of 2m, corresponding to 42 fully insulated IEC 320 slots
- Shockproof design, i.e. it is even possible to partially equip the strip
- Modular design, simple installation
- Complete compatibility with the RITTAL enclosure systems

An “active” plug-in module is now being added to the PSM system. The following functions can be implemented with the new module.

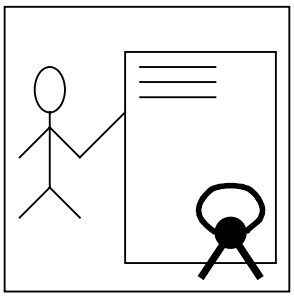
- 8 IEC320 C13 slots, individually switchable
- Local power measurement 0-20A with display on two-digit display
- Integrated monitored fuse
- LED display for the power supply circuit
- Ability to set limit values for power
- Ethernet-ready in connection with the CMC-TC

1 Safety advice



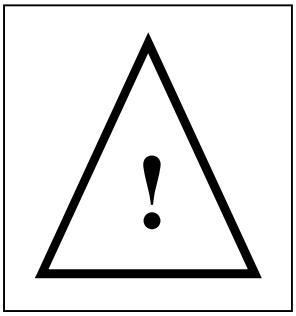
General notes

The installation and operating instructions contain basic information for installing, putting into operation, and operating the RITTAL PSM. It is a must to make the instructions available to the installation technician and the administrative operating personnel and that they should read these carefully. RITTAL cannot accept liability for personal injury and material damage resulting from non-observance of the safety advice in the installation and operating instructions.
It is essential to observe not only the general safety advice given in this chapter, but also the special safety advice given in the other chapters.



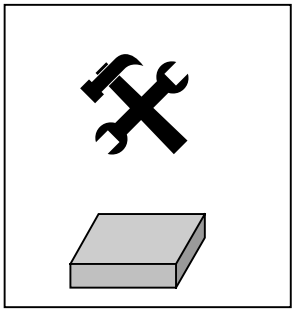
Personnel qualification and authorisation

Operation and any changes may be carried out only by authorised specialist personnel or by authorised trained operating personnel.



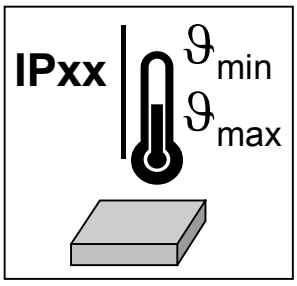
Risks due to non-observance of safety advice

Non-observance of the safety advice may result in risks for the personnel, as well as to the RITTAL PSM together with the connected equipment. Non-observance of the safety advice leads to the loss of the right to claim for any and all damages.



Working on the PSM

The generally applicable electrical regulations of the country in which the unit is installed and operated must be observed, as well as the existing national regulations for the prevention of accidents and any existing internal rules (work, operating, and safety regulations) of the operator. Prior to working at the unit, it must be disconnected from the supply and secured against reconnection. Original accessories and accessories authorised by the manufacturer ensure safety. The use of other parts may void the liability for resulting consequences. Repair work on the unit may be done only by RITTAL or by authorised personnel.



Operating reliability

The operating reliability of the product supplied is warranted only if used as intended. The limit values quoted in the technical data (see Appendix **B Technical data**) must not be exceeded under any conditions. This applies particularly to the allowed ambient temperature range and the allowed IP protection category. For applications with a higher specified IP protection category, the PSM must be installed in an enclosure or cabinet of a higher IP protection category, which complies with the specified protection category. Operation of the PSM system in direct contact with water, aggressive media, or inflammable gases or fumes is prohibited.

2 Service and service address

Rittal is always available to provide service and assistance on technical and other matters concerning the product range. You can also contact us by e-mail at the address given below.

RITTAL GmbH & Co. KG PM IT-Service
Auf dem Stützelberg

D-35745 Herborn
Germany

http://www.RITTAL.de

Email: **Info@RITTAL.de**

Attention: Please, always quote the article numbers in the reference line!

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Additional information on the RITTAL PSM can be downloaded from the RITTAL home page and the CMC-TC home page.

3 PSM Power System Module

3.1 Description

The Power System Module PSM provides revolutionary energy management for IT racks. The modular power supply system makes it possible to supply energy through a vertical rail with three-phase power supply. The Power System Modules simply snap into this rail.

3.2 Design

The new module is equipped with an electronic system that makes it possible to implement various functions. The construction is exactly like that of the other modules. That means that the new module can be combined as desired with existing installations.

The plug-in modules can now be snapped into any position in the existing matrix of the racks. The modules lock via the locking tabs on the ends. They cannot be disconnected unless they have first been unlocked. To unlock, the tabs must be pressed **simultaneously** at both ends. Only then can the module be removed from the rack.

Depending on the direction in which the modules are inserted, it is possible to select feed I or II (redundancy, compare instructions PSM).

Condition: The customer must ensure that feeds are connected on both sides.

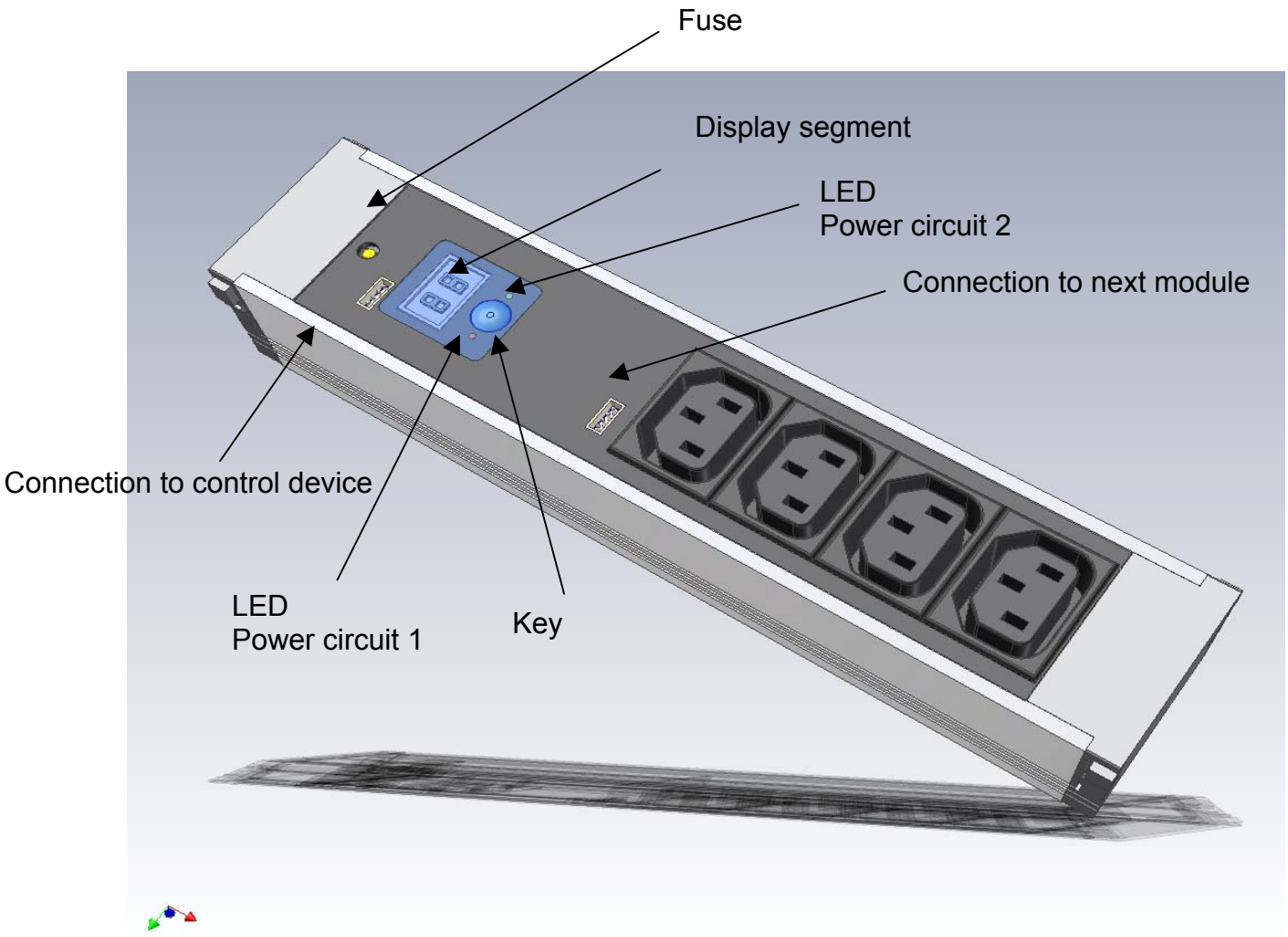
3.3 Functions

An “active” plug-in module has now been added to the PSM system. The following functions can be implemented with the new module.

- 8 IEC320 C13 slots, individually switchable
- Local power measurement 0-15A with display on two-digit display
- Integrated monitored fuse
- LED display for the power supply circuit
- Ability to set limit values for power
- Ethernet-ready in connection with the CMC-TC
- Optimised cable management

4 Description

Description of the connections on the module



- The fuse is set up as a 10A circuit breaker.
- The key can be used to read and set power limit values.
- The LED's show the power circuits supplied by the module.
- The connecting outlets can be used to cascade multiple modules or to connect to the CMC. (See Chapter 10-15).

5 Commencing operation

Note:
Please follow the steps in Chapter 10-15 “Commencing operation of the Active PSM”.

6 Maintenance

The RITTAL PSM is a maintenance-free system that does not need to be opened for the purposes of installation or operation. If the housing or any of the accessory components are opened, all warranty and liability claims become void.

7 Cleaning

The RITTAL PSM system can be cleaned using a dry cloth. The use of aggressive substances such as cleaning petrol, acids, etcetera for cleaning will cause destruction of the unit.

8 Disposal

Since the Rittal PSM consists mainly of the components aluminium and plastic, the device should be disposed of through electronic waste recycling when no longer needed. Upon disposal, the feed lines should be cut.

9 Monitoring the PSM bus via browser

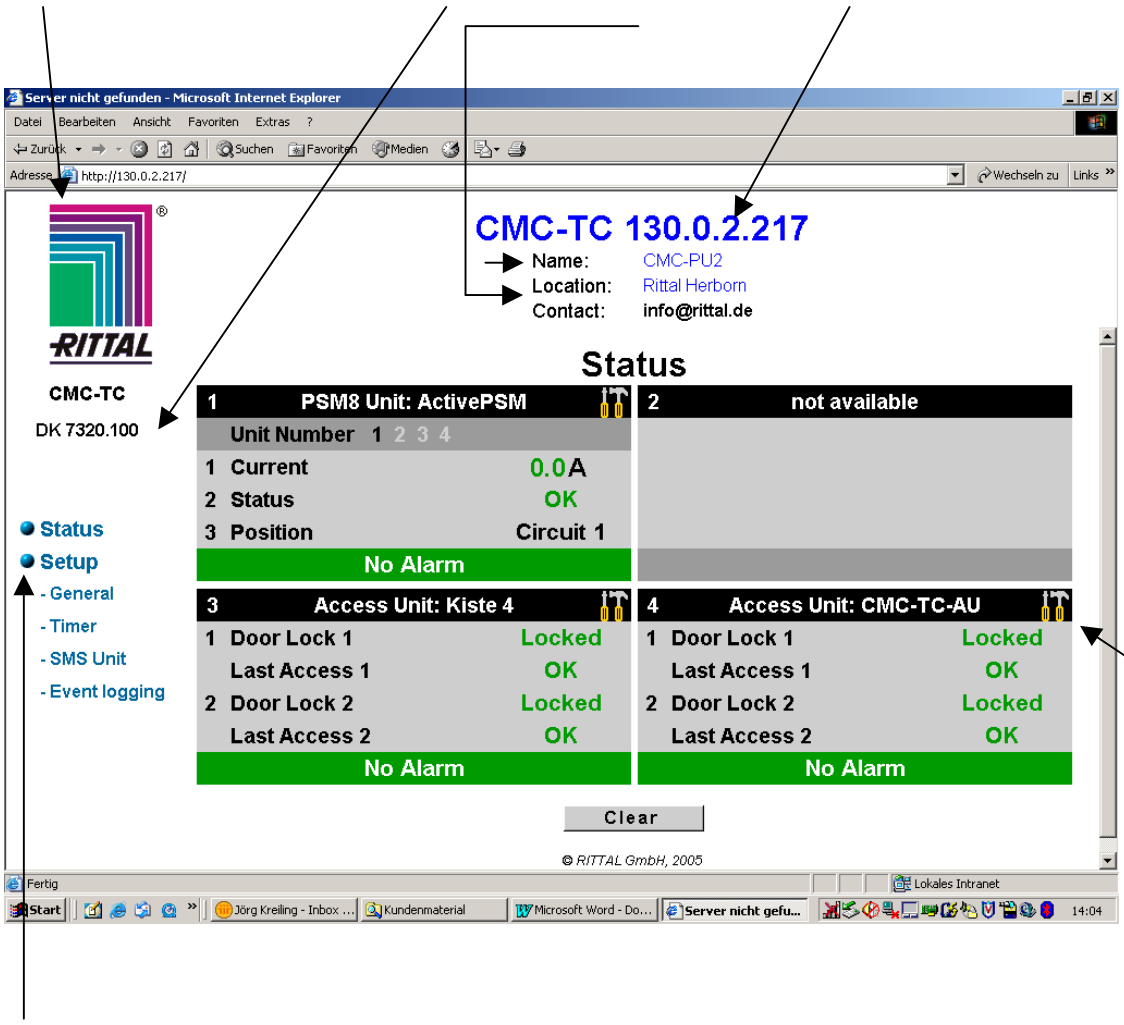
Explanation of the status window

Display:
RITTAL logo

Display:
Name
Product series (DK)
Item number

Display:
Location
Administrator

Display:
IP address



Calling up submenu:

- Items 1-3

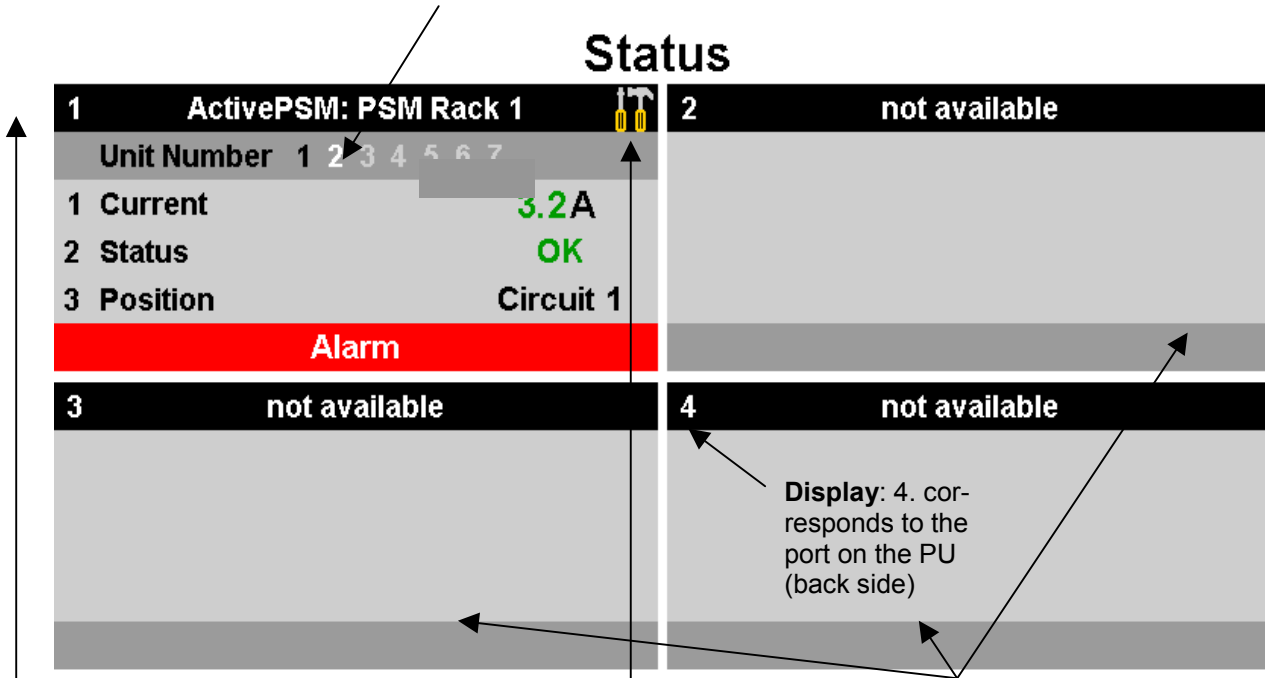
Calling up menu items:

- Status
- Setup

9.1 Explanation of the status window – structure of the individual fields

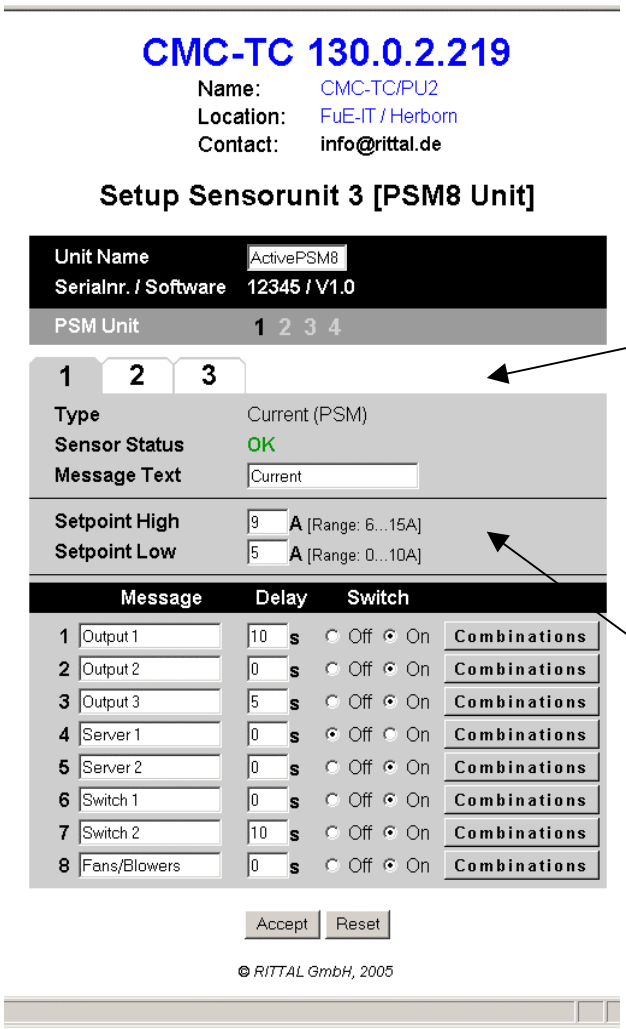
Note on colours:

Green	Okay	White:	Shows the modules connected
Yellow	Warning	Black:	Shows the values of the currently selected module, e.g. 1
Red	Alarm	Gray:	Shows the available slots; no modules connected



9.2 Submenu configuration

Note: this section deals only with the structure of the submenu. A detailed description of the Active PSM module follows.



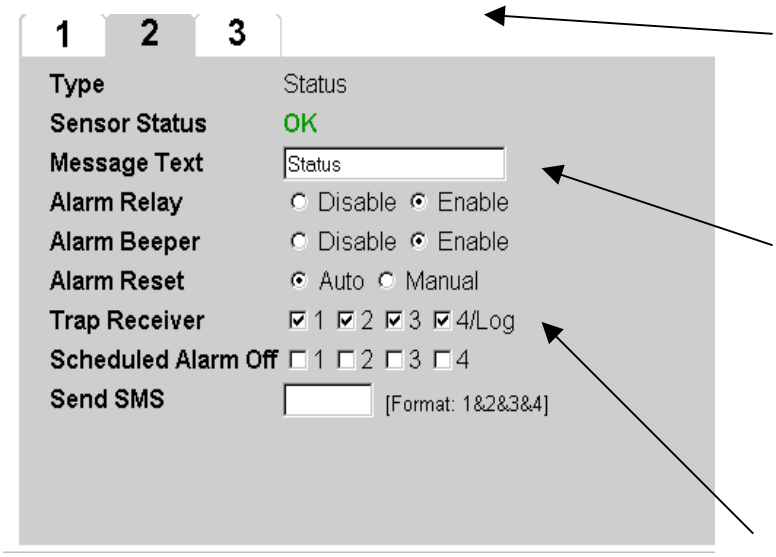
Number:

- Type:
  Shows the submenu which is currently activated.
- Sensor Status:
  If values are above or below limits, the display shows “too low” or “too high”. Otherwise: **OK**
- Message text (1-20 characters can be selected, e.g. power alarm).

Setting:

- Maximum upper limit for strength of current
- Minimum lower limit for strength of current
- Delay switching time

- **Message**
  20 characters to assign names
- **Delay**
  Reboot function to set up after which time the relay output avtivates independently.
- **Switch**
  Connected devices can be manual switched on and off here.
- **Combinations**
  Two free selectable input signal (and/or) can be linked and after the condition is fulfilled the relay output can be switched on and off here.



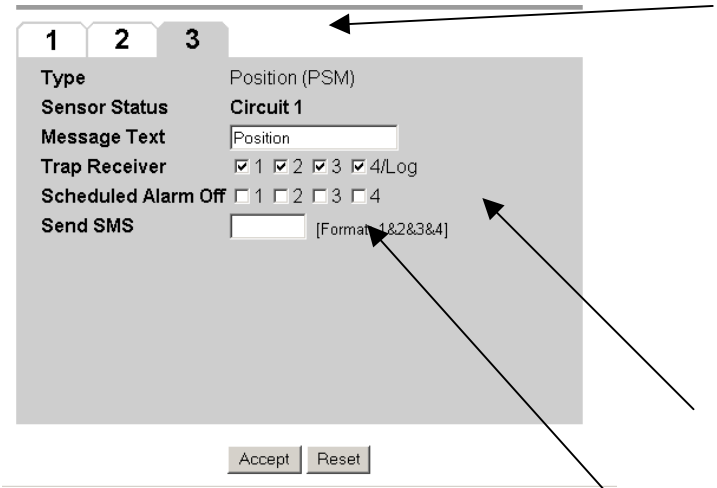
Number:

- Type:
  Shows the submenu which is currently activated
- Sensor Status:
  If values are above or below limits, the display shows „too low“ or „too high“. Otherwise: OK
- Alarm message, when power supply is switched off and fuse is disconnected
- Message text (1-20 characters can be selected)

Setting:

- Alarm Relay
  Yes = Enable; No = Disable
- Alarm Beeper
  Yes = Enable; No = Disable
- Automatic reset for alarms or manual reset by activating the C-key
- Trap Receiver 1-4 or activate Log-Function 4

- Allocation of SMS receiving telephone number, e.g. 1&3
- Scheduled Alarm off according to an alarm combination with real-time clock
  Please see instructions of
  PUIII DK7320.100, chapter G3



Number:

- Type:
  Shows the submenu which is currently activated
- Sensor Status:
  Shows the power circuit to which the module is connected to.
- Message text (1-20 characters can be selected)
-

Setting:

- Trap Receiver 1-4 or activate Log-Function 4
- Allocation of SMS receiving telephone number, e.g. 1&3
- Scheduled Alarm off according to an alarm combination with real-time clock. Please see instructions of PUIII DK7320.100, chapter G3

10 Rittal PSM Power System Module

10.1 Brief description of the PSM

The Power System Module PSM provides revolutionary energy management for IT racks.

The modular power supply system permits energy supply through a vertical rail with a three-phase feed; the Power System Module simply snaps into this rail.

10.2 Description of the Active Power System Module (Active PSM)

The Active Power System Module, or ActivePSM, ensures an optimal power supply with the help of the PSM busbar.

The PSM busbar can be snapped directly into the vertical rail of the Rittal FlexRack(i) enclosure, and can also be retrofitted in other existing racks.

For this purpose a **Fastener Kit DK 7856.011** or **Hinged Fastener Kit DK7856.012** is needed. They ensure fast, easy installation in the TS-type enclosure.

Functions:

- The Active PSM is able to do measurements of overall current in a range from 0 to 15 A.
- The display for power measurement uses a 2-digit 7-segment display.
- Up to a current of 9.9 A, it shows a figure after the decimal point; starting at 10 A the decimal place is ignored.
- The current of the Active PSM is monitored for minimum and maximum limit values. If the value is above or below these limits, there is an alarm message by means of a blinking 7-segment display, LED, and beeper. Optionally this alarm status can be forwarded to the CMC-TC. The maximum and minimum current values can be set locally via the key or optionally via the CMC-TC.
- The busbars are switched using a bi-stable relay, i.e. the relay retains its switching position even in case of power failures.
- Optionally the individual current outlets can be switched on and off via the CMC-TC. This function is used to reboot connected equipment.
- Power and fuses are monitored via voltage measurement behind the fuse; the relay switching position is also monitored.

After a power outage the individual current outlets switch in sequentially to avoid power surges.

If there is a power outage, the current switching positions are stored internally so that the last status is switched on with a time delay when the power returns.

If there are multiple active modules, the individual modules are switched on with a time delay. The time interval depends upon the BUS address selected.

Furthermore the ActivePSM is used to analyse the power frequency and assess the system configuration status. Analysing the power frequency makes it possible to pre-set the limit values for maximum current.

(50 Hz in Europe → limit value 10A; 60 Hz America → limit value 15A)

To analyse the system configuration status, it is necessary to rotate the orientation of the 7-segment display by 180° to provide readability. Thus it is also possible to assess the feed (normal / USP).

In addition to the LED display there is a message via the CMC-TC. The ActivePSM is connected to the CMC-TC via a BUS link. It is also used to implement the power supply.

Up to four modules can be connected to one sensor unit connection of the CMC-TC. If the ActivePSM is operated without the CMC-TC, the power is supplied via the CMC-TC power unit (e.g. DK 7201.210). Up to 4 modules can be operated with one power unit.

The connection to the next module is via a cable link. For this purpose each module has two plug-in connectors. The cable link also provides the power and the BUS connection.

The BUS addresses 1-4 are assigned, like the assignment of the power limit values, via the local key (see also “Setting menu for key”).

Data transferred to and from the CMC-TC:

- Present module power level
- Change/check power limit value
- Fuse failure
- Joint switching of the power outlets (on/off); query of switching position
- Configuration status
- Present voltage

11 Display and controls of the Active PSM

- 2-digit 7-segment display, number height 10 mm, colour: red
  The 7-segment display shows the actual current level. In addition, in setting mode, it shows the setting parameters.
  Up to a value of 9.9 A the value is displayed with one decimal place; starting at 10A as a two-digit whole number without a decimal place.
  In case of error this display blinks.
  Note that changes in the configuration status also change the reading direction of the 7-segment display.

- Two 3-colour LED's (green, orange, red), labelled as "I" and "II".
  These LED's blink in accordance with the configuration status of the module.

  Green: OK
  Orange: Warning, fuse triggered or power failure.
  Rot: Power is over/under maximum or minimum limit.

- Key
  The key is used to enter or change the limit values, the BUS address, and to set the reading direction of the display.
  Briefly press the key to change the set value or setting level.
  Press longer (about 5 sec.) to confirm the value or preselected setting level.

11.1 Meaning of the displays

Display blinks	=> Above or below power limit values
Display shows 0.0	=> No device is connected to the ActivePSM.
Display shows e.g.3.2	=> Devices are connected; the current "used" by them is 3.2 A.
Display shows n.P.	=> "no Power" means that the PSM strip is not being supplied with power, or the fuse has been triggered.

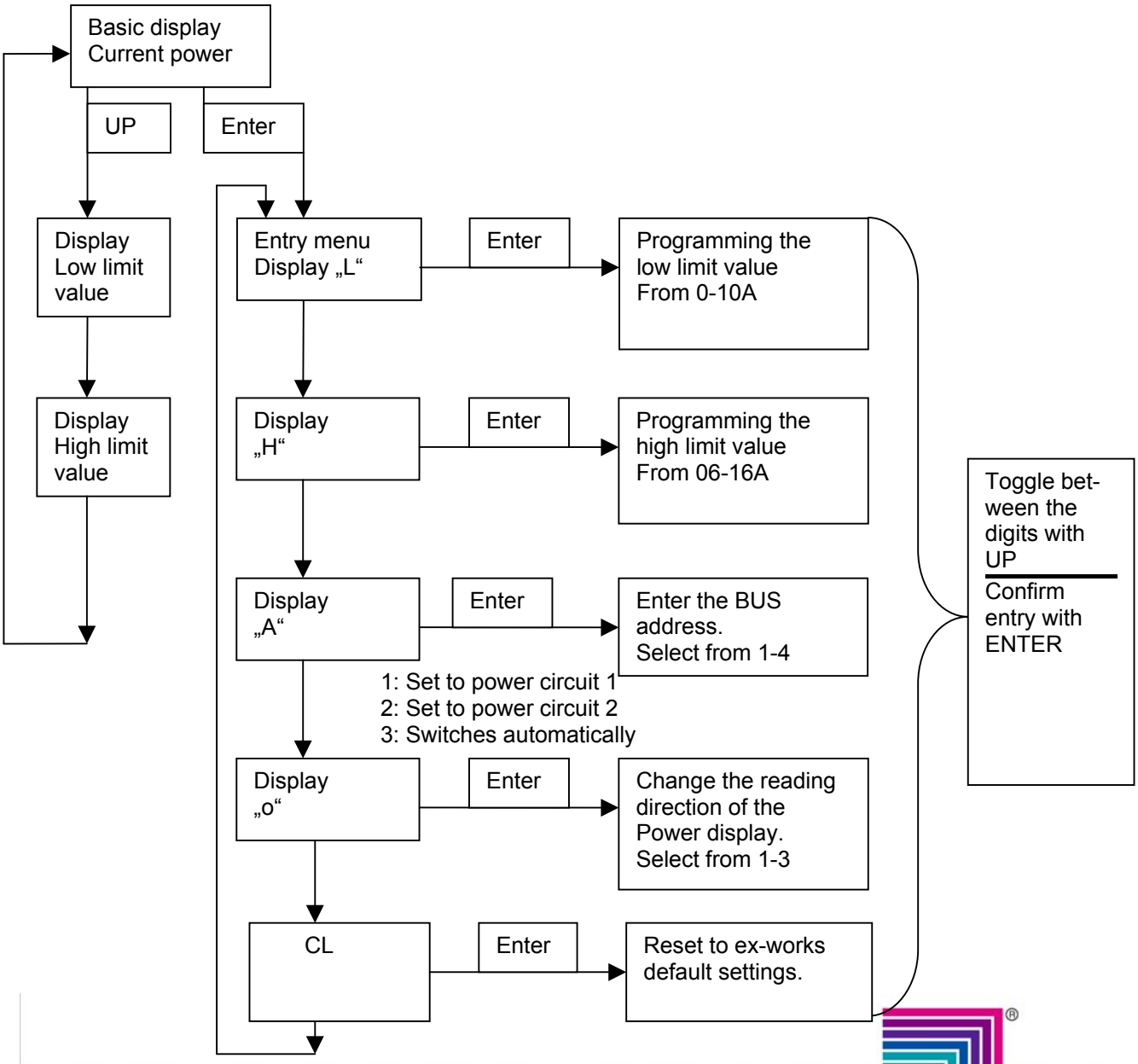
LED display, green	Everything is OK.
LED display, red	Limit value exceeded
LED display, orange	No power, or fuse triggered

A detailed description of the setting menu of the ActivePSM can be found on the next page, "12 Setting menu for the local key".

12 Setting menu for the local key

Press key briefly = UP
Press key longer (ca. 4 sec.) = Enter

If no key is pressed for about 5 sec., the basic display returns.

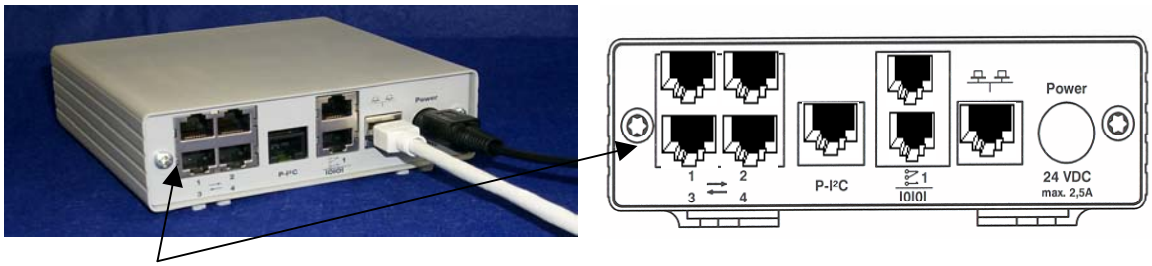


13 Connection of the Active PSM to the CMC-TC Processing Unit

The Active PSM is connected to the CMC-TC Processing Unit (or PU) via the BUS link. This connection is also used for power supply.

Power is supplied to the PU and the connections via a 24 V power unit. The power unit is plugged into the **Power** jack. The marker arrow ⇑ of the connector plug points to the jack label **Power**.

As soon as the PU is supplied with power, the alarm LED lights up green.



A special cable is used for the connection between the PU and the ActivePSM. These cables are included in the scope of supply.
The maximum cable length of 10m for the connection must not be exceeded, or Rittal can no longer ensure functionality.
The cable need simply be plugged into the jacks provided in the PU and the ActivePSM.

The network connection is done with a network cable and RJ 45 connector in the existing Ethernet network structure.
As soon as the link LED is green, there is a network connection.

- Up to 4 complete PSM strips can be connected to the PU.
- That means 42 insulated IEC 320 C13 slots can be implemented per strip.

If multiple modules are connected, each module must be assigned a unique address. The addresses go from 1-4. Please see Chapter 12 "Setting menu for local key".

14 Connection of the Active PSM without CMC-TC Processing Unit

The Active PSM can also be placed into operation without the CMC-TC Processing Unit (PU). To do this, a Rittal power unit is needed (e.g. DK 7201.210). The connecting cable is included in the scope of supply.

Connection of the power unit of the Active PSM

Connecting the modules to each other

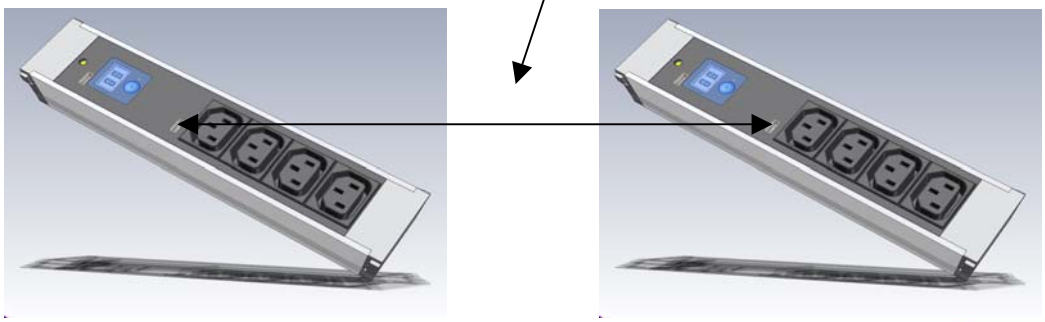
The individual modules are connected using cable links, which are connected to the plug-in connectors of the Active PSM. The cable links are included in the scope of supply.

Up to 4 modules can be connected to the bus. Each module is equipped with 8 slots and after a total outage of power each slot is switched sequentially .

If there is a total outage of power from the enclosure, this prevents the pre-fuse from switching off the circuit for the entire enclosure when power returns.

Connection of the first Active PSM from CMC-PU or from power unit (without CMC)

Connection of the modules via cable links.



15 Summary of instructions for the Active PSM

- Current measured in the range of 0 – 15 A
- Display up to 9.9 A with one decimal place; starting with 10 A without decimal place
- Monitoring for maximum and minimum power limit value
- Setting limit value via CMC-TC or locally using the key
- Outlet power switched using bi-stable relays; even in case of power outage the switching position of the relay is not lost
- Switching of the individual slots via CMC-TC
- Monitoring of power / fuse and switching position of the relay
- After power failure the modules are switched in sequentially → avoids power surges
- The current switching position is stored → permits return to the last status
- Analysis of power frequency and configuration status
- Connection of up to four PSM strips to the CMC-TC
- CMC-TC provides the power supply; when operated without CMC-TC, power is supplied via the CMC-TC power unit (e.g. 7201.210)
- Individual modules are connected via cable links, which provide the power supply and BUS connection (address must be set using the key)
- Switching of the individual outlets in connection with the ISDN/GSM unit DK7320.820/830 using commercial cell-phones via SMS. Please check the instructions of the corresponding device for detailed information.

A Scope of supply / accessories

Plug-in module
Cascading cable to next module
Connecting cable to CMC-TC DK7320.100
Instructions

Required accessories:

Rittal PSM busbar	DK7856.010 or DK7856.020 only needed by using DK7856.201
Rittal power pack	DK7201.210 only for operation without CMC

Also required for operation via the CMC:

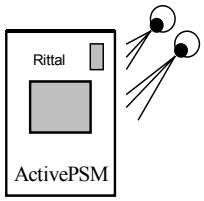
Rittal CMC-TC PUII	DK7320.100
Rittal power pack	DK7320.425

Software version V2.11 or higher

B Technical data

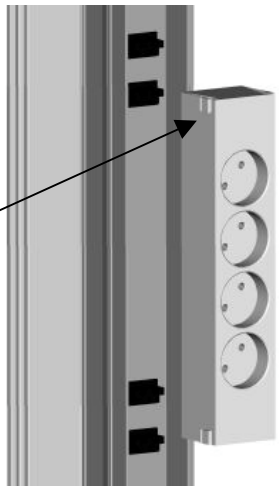
Plug-in module	Aluminium, anodised, plastic caps
Height	500mm
Width	50mm
Depth	45mm
Weight	500g
Earthing	Yes
Temp. application range	+ 5 °C to 45 °C/+ 41 °F to 113 °F
Humidity application range	5 % to 95 % relative humidity, not condensing
Storage temperature range	-20 °C to 60 °C/ - 4 °F to 140 °F
Power range	Single-phase 110-230VAC 50/60Hz
Max. current	10-16A for 230V, 10-15A for 110VAC, depending on country version, observe type plate.
Max. starting current	25A per slot with ohm resistive load, 4s with 10% ED (duty ratio)
Max. breaking capacity AC	4000VA per slot
Fuse	10A automatic, please observe type plate on the busbar!

C Fast start-up of the Active PSM DK7856.200

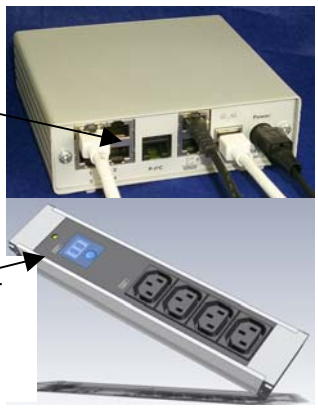


Note: Before installation and commencement of operations, please read and observe the instructions for installation and commencement of operations, including the safety advice. The operating instructions are available for download in two languages as PDF files at http://www.CMC-TC.com.

2. **Installation:** Before starting the installation, make sure the delivery is complete (see Appendix A Scope of supply). Furthermore, the installer must ensure compliance with the approved conditions of use, especially the ambient temperature and the required IP protection type (Appendix B Technical data).



3. **Integration of Active PSM and PSM busbar:** The Active PSM is placed in the centre of the plug-in connectors of the busbar and attached by applying slight pressure. The Active PSM is properly connected to the busbar when all four snap-in tabs of the ActivePSM are snapped into the busbar. For removal, all four tabs must be pulled back simultaneously and carefully removed from the busbar.
Please make sure that no devices are attached to the outlet jacks; otherwise all the devices will lose power.
Furthermore, the connection orientation of the Active PSM must be observed. Since the busbar permits redundant power supply, one is free to choose the connection orientation between circuit 1 and circuit 2.



4. **Power supply:** Power for the Active PSM is provided via the CMC-TC Processing Unit (PU) or via the Rittal power unit DK 7201.210. When power is supplied via the PU, the included patch cable Category 5 must be inserted in the RJ 45 jack of the PU and in the Molex connector of the ActivePSM (see “13 Connecting the Active PSM to the Processing Unit”).
If power is connected via the power unit, the outgoing cable of the power unit must be connected to the BUS connector of the Active PSM (see “14 Connecting the Active PSM without Processing Unit”).
As soon as the Active PSM has power, the display is 0.0A. Now, if various devices are connected to the power outlets, then the display shows the active current of the connected equipment.

5. **Calling up the Active PSM via browser:**
   - Start browser as usual.
   - Enter the IP address of the CMC-TC Processing Unit (PU).
     The PU window opens.
   - The status and settings can be queried via Status / Setup.
   - Changes are executed after the user name and password have been entered. Default setting: **cmc** und **cmc**
     (See also “9 Monitoring the PSM strip via browser.)
   - Detailed information about this topic can be found in the instructions for the CMC-TC Processing Unit.