

# **CPCI PSB System Subrack 10 U**

## **User Manual**



**Product Number:**  
**24579-028**

---

Rev.	Date updated	Change
R1.0	November 21, 2007	Initial release
R1.1	October 30, 2009	Second CMM slot removed

Impressum:

Schroff GmbH

D-75334 Straubenhardt, Germany

The details in this manual have been carefully compiled and checked.

The company cannot accept any liability for errors or misprints. The company reserves the right to amendments of technical specifications due to further development and improvement of products.

Copyright © 2007

All rights and technical modifications reserved.

---

## Table of Contents

<b>1</b>	<b>Safety .....</b>	<b>1</b>
1.1	Intended Application .....	1
1.2	Safety Instructions .....	2
1.3	Safety Symbols used in this document .....	2
1.4	General Safety Precautions .....	2
1.5	References and Architecture Specifications .....	3
<b>2</b>	<b>Product Definition .....</b>	<b>4</b>
2.1	Mechanical Overview .....	5
2.2	Subrack .....	5
2.3	CPCI PSB Backplane .....	6
2.4	Power Supply .....	7
2.4.1	Grounding .....	8
2.4.2	Power Supply .....	9
2.5	Thermals .....	11
2.6	Fan Control Module (FCM) .....	12
2.7	Chassis Monitoring Module (CMM) -optional- .....	13
<b>3</b>	<b>Installation .....</b>	<b>14</b>
3.1	Unpacking .....	14
3.1.1	Ensuring Proper Airflow .....	14
3.2	Rack-Mounting .....	15
3.3	Initial Operation .....	16
<b>4</b>	<b>Service .....</b>	<b>17</b>
4.1	Technical support and Return for Service Assistance .....	17
4.2	Declaration of Conformity .....	17
4.3	Scope of delivery .....	18
4.4	Accessories .....	18
4.5	Spare Parts .....	18
<b>5</b>	<b>Technical Data .....</b>	<b>19</b>



# 1 Safety

## 1.1 Intended Application

The CompactPCI (CPCI) system subrack, described in this manual, is intended as a platform for a microcomputer system based on the CompactPCI Standard PICMG 2.0 Rev.3 and PICMG 2.16.

The CPCI system subracks are designed for protection class IP 20 and can be used only in the resp. environments.

For higher protection requirements, a.e. IP 54/55 you must install the system subrack in a protective case.

CPCI system subracks are not end-products, so there is no valid approval for this unit. In order to enable stand-alone functionality, additional elements are required. An operational system is achieved only by way of appropriate CPCI boards.

The completion and final testing of the units have been carried out, or at least supervised, by qualified technicians. These instructions are directed exclusively to these qualified technicians i.e. engineers, trained and qualified electricians etc.




Make sure that:

- the assembled unit complies with the safety regulations currently applicable in the country it is going to be used.
- the overall unit complies with all other regulations and specifications at the place and country of use, e.g. interference limits, approval by the telecommunications authorities.


## 1.2 Safety Instructions

The intended audience of this User's Manual is system integrators and hardware/software engineers.

## 1.3 Safety Symbols used in this document

	<p><b>Hazardous voltage!</b></p> <p><i>This is the electrical hazard symbol. It indicates that there are dangerous voltages inside the Shelf.</i></p>
	<p><b>Caution!</b></p> <p><i>This is the user caution symbol. It indicates a condition where damage of the equipment or injury of the service personnel could occur. To reduce the risk of damage or injury, follow all steps or procedures as instructed.</i></p>
	<p><b>Danger of electrostatic discharge!</b></p> <p><i>The Shelf contains static sensitive devices. To prevent static damage you must wear an ESD wrist strap.</i></p>

## 1.4 General Safety Precautions

	<p><b>Warning!</b></p> <p><i>Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.</i></p> <p><i>This equipment is designed in accordance with protection class 1!</i></p> <p><i>It must therefore be operated only with protective GND/earth connection!</i></p>
---	---

- Service personnel must know the necessary electrical safety, wiring and connection practices for installing this equipment in a telecommunication environment.
- Install this equipment only in compliance with local and national electrical codes.

## 1.5 References and Architecture Specifications

- User Manual CPCI Backplane 23006-610  
Order no.: 73972-089
- User Manual CPCI Backplanes  
Order no.: 73972-101
- User Manual Fan Control Module (FCM)  
Order no.: 73972-083
- User Manual Power Supply  
Order no.: 73972-077
- User Manual Chassis Monitoring Module (CMM)  
Order no.: 73972-084

For more information see the catalogue „Electronic Packaging“ and at [www.schroff.biz](http://www.schroff.biz)

## 2 Product Definition

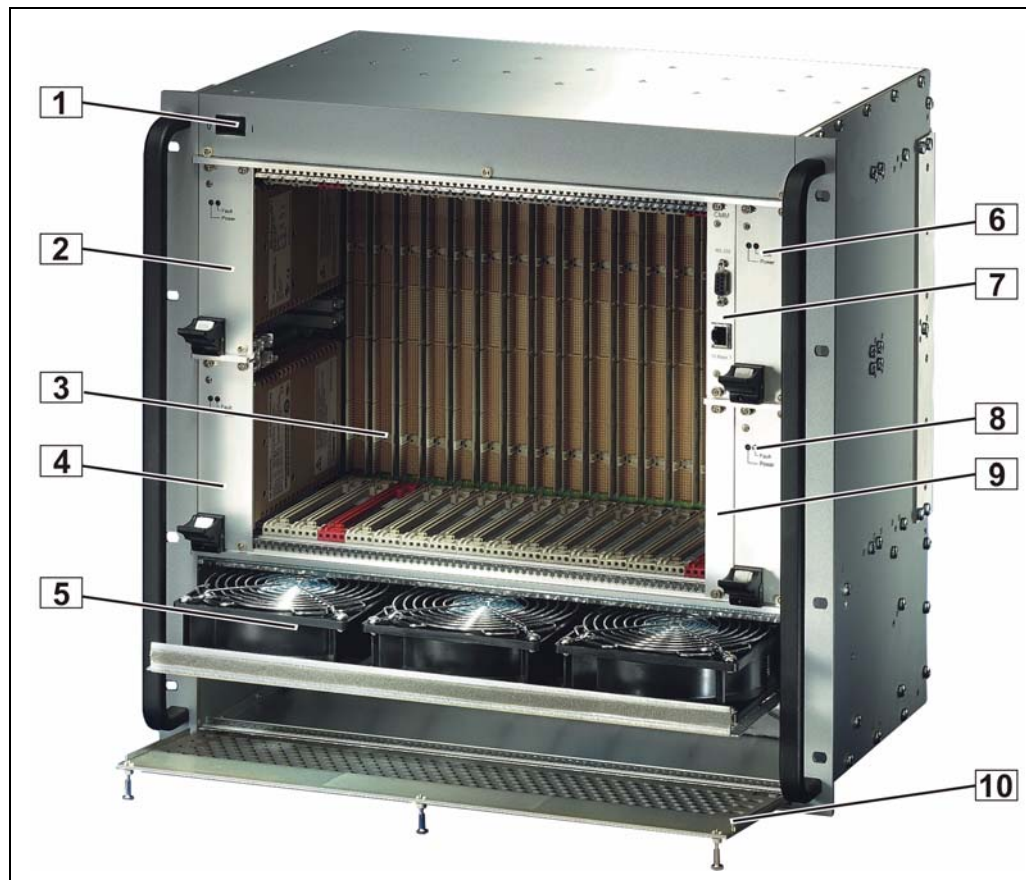
The Schroff CPCI system subrack consists of:

- A shielded 19" subrack with front assembly area for 6 U front boards according to CompactPCI Standard PICMG 2.0 Rev.3 and PICMG 2.16
- A 6 U CPCI PSP Backplane (PICMG 2.16)  
2/14 slot (2 Fabric (Switch) and 14 Node Slots)
- Two 19" plug-in power supply with wide range input
- Speed controlled fans for cooling the boards
- Fan Control Module (FCM) for fan monitoring/controlling
- Display module
- Mains/line switch
- Rear assembly area for 6 U, 4 HP Rear I/O Modules



## 2.1 Mechanical Overview

Figure 1: Mechanical Overview



10006813

- |   |                                  |    |  |
|---|----------------------------------|----|--|
| 1 | DC Switch                        | 6  | Power Supply #2                            |
| 2 | Power Supply #1                  | 7  | Chassis Monitoring Module (CMM) (optional) |
| 3 | Front card cage with guide rails | 8  | Power Supply #4 (optional)                 |
| 4 | Power Supply #3 (optional)       | 9  | Front panel 3 U / 1 HP                     |
| 5 | Drawer with Fans                 | 10 | Bottom-hinged front panel, perforated      |

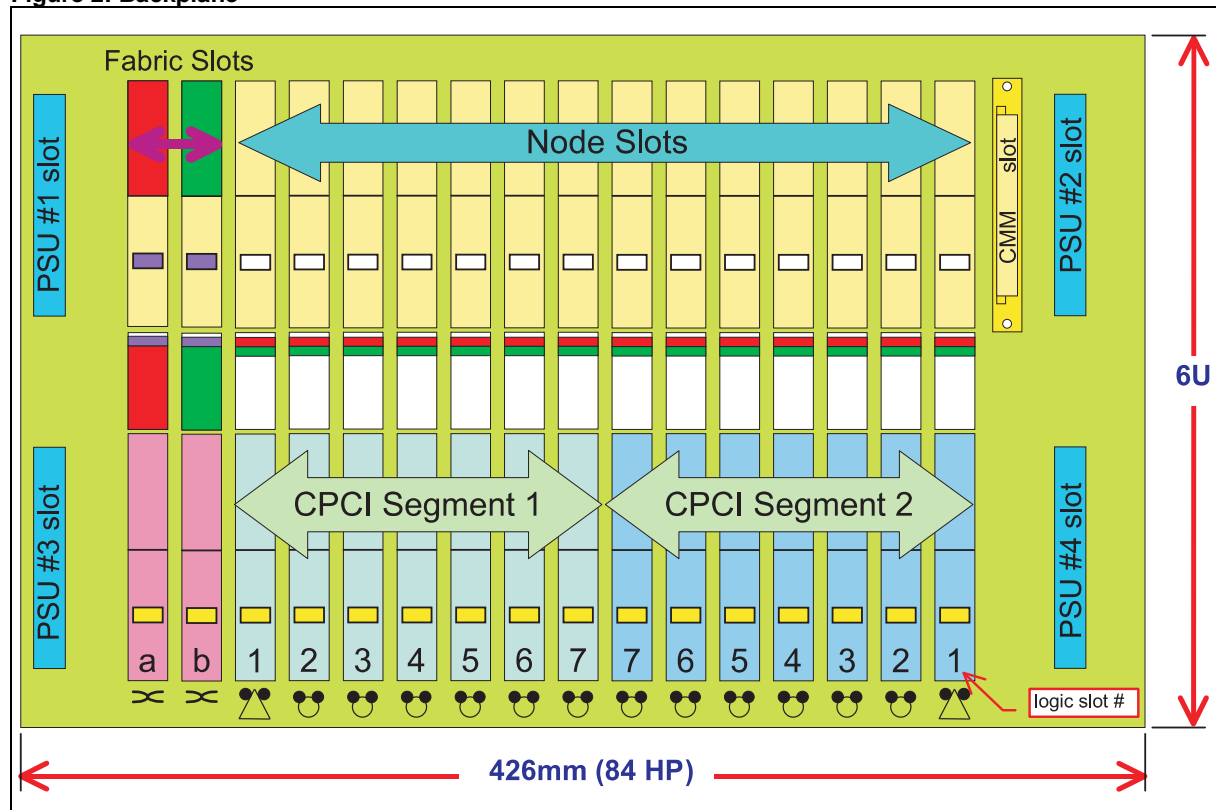
## 2.2 Subrack

The 10 U 19" system based on the Schroff europacPro System with EMC shielding. The front card cage provides space for the installation of 14 CPCI (Node) boards and 2 Switch boards.

The lower guide rails are fitted with ESD clips.

## 2.3 CPCI PSB Backplane

Figure 2: Backplane



12307811

The 6 U Backplane provides:



- 2 Fabric Slots placed left to the Node Slots including optional Link between both
- 14 Node Slots
- 1 slot for a Chassis Monitoring Module (CMM)
- 4 PSU Slots acc. to PICMG 2.11 for 4 x 3 U PSUs
- CompactPCI bus (PICMG2.0 R.3.0) is implemented at Node Slots; two independent segments with System Slot left and right

Applicable Specifications:

- PICMG 2.16 R1.0 Packed Switched Backplane
- PICMG 2.0 R3.0 CPCI Core Specification
- PICMG 2.01 R2.0 Hot Swap
- PICMG 2.09 R1.0 System Management Bus
- PICMG 2.10 R1.0 Keying
- PICMG 2.11 R1.0 Power Interface Specification

For more information see the Backplane's User Manual, Order No.: 73972-089/-101, in the catalogue and at [www.schroff.biz](http://www.schroff.biz)

## 2.4 Power Supply

	<b>Hazardous voltage!</b> <i>Parts of the power supply may be exposed with hazardous voltage. Always remove mains/line connector before carry out any assembly work.</i>
	<b>Caution!</b> <i>Your system has not been provided with a AC power cable. Purchase a AC power cable that is approved for use in your country. The AC power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.</i>


The subrack system has 19" AC power supplies with wide range input.

The power supplies are plugged-in in two dedicated slots at the left and right side of the backplane. The power supplies contact via a P47 connectors to the backplane.

The power input is provided by a AC mains/line module with IEC 320-C14 connector, integrated mains/line fuses and line filter.

With a DC switch at the front side you can switch the power supply to standby mode, i.e. the supply voltages to the backplane are shut off.

Maximum fuse value is 10 A.

	<b>Warning!</b> <i>The fuse value has been determined in factory for the maximum power delivered by the power supply. The fuse value must be changed to the actual current of the complete equipped system.</i>
---	--

## 2.4.1 Grounding

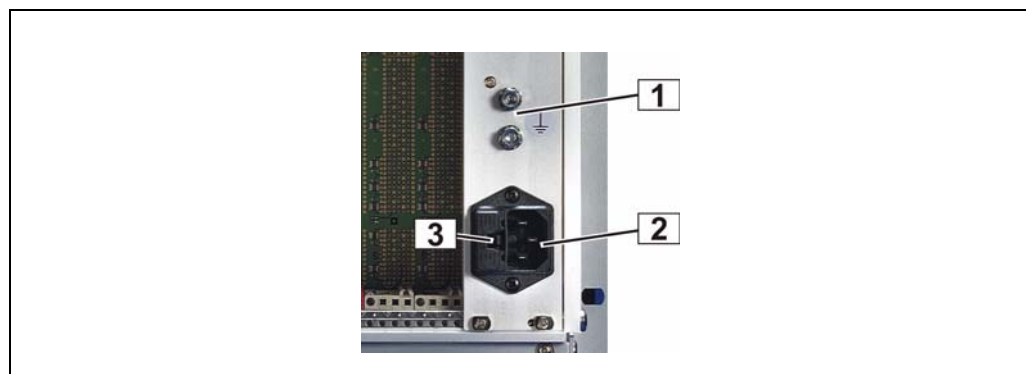


### Caution!

*The unit is designed in accordance with protection class 1! It must therefore be operated with protective earth/GND connection. Use only a three conductor AC power cable with a protective earth conductor that meets the IEC safety standards!*

The subrack provides two M5 studs to connect a double-lug ground terminal cable. These M5 studs are only for equipotential bonding. Grounding is achieved through the protective earth conductor of the power cable!

Figure 3: AC Terminal - Grounding



10006812

- |   |                           |   |       |
|---|---------------------------|---|-------|
| 1 | Ground terminal           | 3 | Fuses |
| 2 | AC Connector (IEC320-C14) |   |       |

## 2.4.2 Power Supply

Figure 4: Power Supply

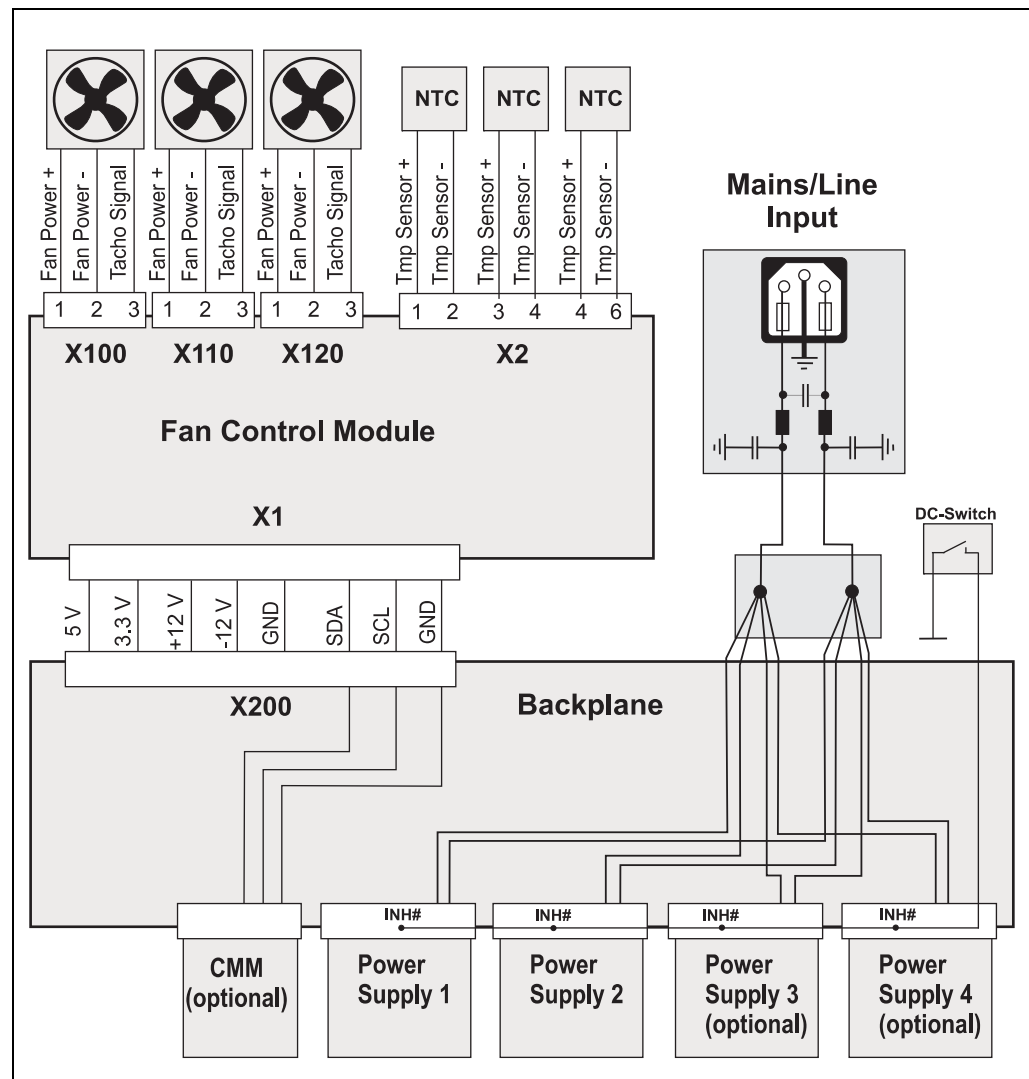


10006814

Table 1: Data AC Power Supply

Input voltage nominal	100 - 240 VAC
Mains Frequency	50 / 60 Hz
Output (max.)	250 W
Output voltages	3.3 V - 40 A 5.0 V - 40 A 12.0 V - 5.5 A -12.0 V - 2 A
Ripple	< 1 %
Dynamic response	< 1 % or 60 mV
Recovery time to within 1%	< 300 µsec
Overvoltage protection	for all voltages 120 – 130 % U > 5 V
Overcurrent protection	105 – 130 % of rated output current
Hold-up time	>= 20 ms

Figure 5: Block Diagram



12307813

## 2.5 Thermals

The front boards are cooled by forced air convection through 3 speed controlled 24 VDC axial fans (290 m<sup>3</sup>/h (170 cfm) each).

The fans are assembled on a drawer behind the perforated front panel at the bottom of the system.

The air enters the subrack at the lower front into the bottom air plenum turns 90° upward and passes an air filter. As the air passes across the hot components on the Front Boards, heat is carried away by forced convection. The air exits the Subrack at the top, is drawn into the upper plenum, turns 90°, and is exhausted out the rear of the subrack.

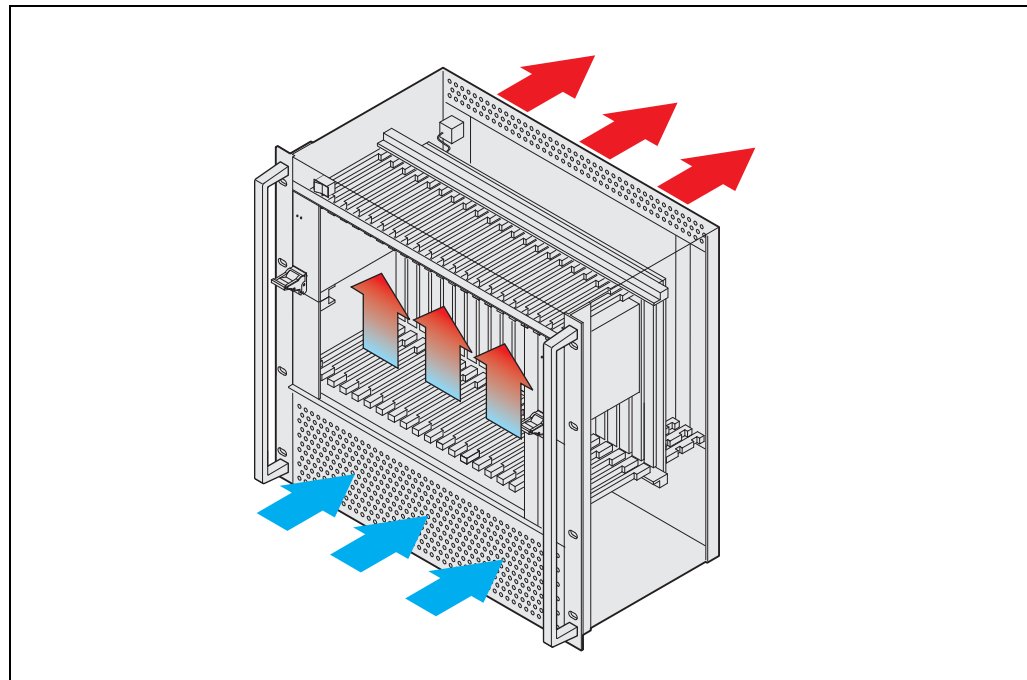
The fan speed is controlled by the Fan Control Module (FCM) depending on the exhaust temperature. 3 NTC temperature sensors are located above the card cage.



**Caution!**

*To maintain proper airflow, all open slots must be covered with filler panels. The filler panel should include an airflow baffle that extends to backplane.*

**Figure 6: Airflow**



12307814

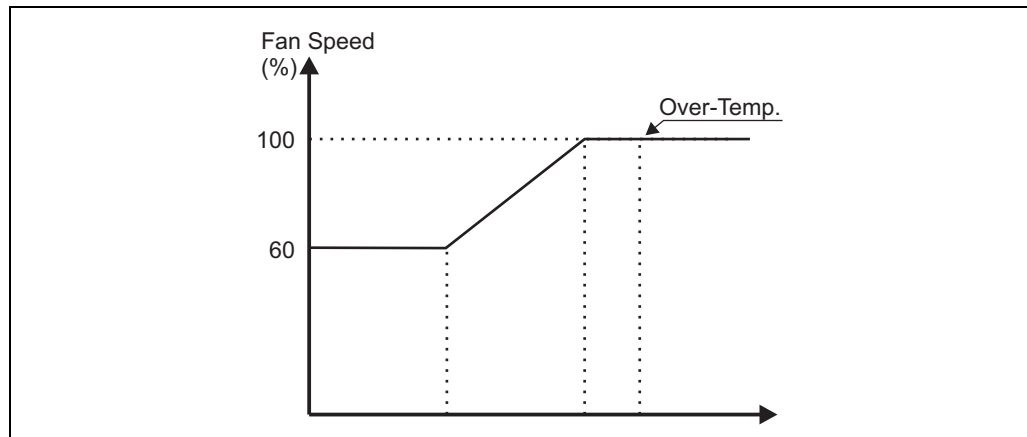
## 2.6 Fan Control Module (FCM)

The Fan Control Module (FCM):

- Monitors and controls up to four fans
- Monitors the signals from up to four temperature sensors
- Speed up the fans in case of a failure of one fan
- Is able to communicate with the optional Chassis Monitoring Module (CMM)

Up to four NTC temperature sensors can be connected to the FCM. The highest temperature level is the reference for the fan speed. If one or more sensors exceed 60° C the output for the temperature fail LED and a digital output are activated. Since the fan speed is temperature controlled by the FCM, the fans rotate with the lowest speed possible. Lower speeds reduce acoustic noise and increase the longevity of the fans.

**Figure 7: Diagram fan speed/temperature**



10006807

For more information see the FCM's User Manual, Order No.: 73972-083 and at [www.schroff.biz](http://www.schroff.biz)



## 2.7 Chassis Monitoring Module (CMM) -optional-

The Chassis Monitoring Module (CMM)

- monitors the three VME voltages
- can monitor two additional voltages with a range of  $\pm 24 V_{DC}$
- can monitor up to seven NTC temperature sensors
- can communicate with the Fan Control Module (FCM)
- provides 16 digital inputs
- provides 10 digital outputs

The CMM is an optional assembly and not included with the subrack by default. The CMM is a pluggable unit in the 3 U euroboard format with a 3 U/1 HP front panel and can be assembled at the front side.

The CMM allows communication and remote monitoring via RS-232 or Ethernet interface. The front panel provides a RJ45 connector (Ethernet) and a D-Sub9 connector (RS-232).

A user interface via HTML page is available.

The CMM can monitor the 4 CPCI voltages and two additional voltages (up to  $\pm 24 V_{DC}$ ). The error status can be displayed by LEDs, through the RS-232 serial interface or via ethernet as a HTML page.

Up to 7 NTC temperature sensors can be connected to the CMM. Two alarm thresholds between 20° C and 70° C can be set.

The CMM provides 16 digital inputs and 10 digital outputs for custom specific applications. Four digital outputs are open collector outputs, isolated by opto-couplers, six digital outputs are TTL-compatible non-isolated.

The CMM is connected to the FCM. The temperature values and the fan speeds are transferred to the CMM.

For more information see the CMM's User Manual, Order No.: 73972-084 and at [www.schroff.biz](http://www.schroff.biz)

## 3 Installation

### 3.1 Unpacking



**Caution!**

*When opening the shipping carton, use caution to avoid damaging the system.*

Consider the following when unpacking and storing the system:

- Leave the system packed until it is needed for immediate installation.
- After unpacking the system, save and store the packaging material in case the system must be returned.

If the packaging is damaged and possible system damage is present, report to the shipper and analyze the damage.

#### 3.1.1 Ensuring Proper Airflow



- Install the system in an open rack whenever possible. If installation in an enclosed rack is unavoidable, ensure that the rack has adequate ventilation.
- Maintain ambient airflow to ensure normal operation. If the airflow is blocked or restricted, or if the intake air is too warm, an over temperature condition can occur.
- Ensure that cables from other equipment do not obstruct the airflow through the systems.
- Use filler panels to cover all empty chassis slots. The filler panel prevents fan air from escaping out of the front of an open slot.



**Caution!**

*To maintain proper airflow, all open slots must be covered with filler panels. The filler panel should include an airflow baffle that extends to backplane.*

## 3.2 Rack-Mounting

	<p><b>Warning!</b></p> <p><i>Do NOT move the a full equipped system by yourself. Due to the weight at least two persons are needed to accomplish this task</i></p>
	<p><b>Warning!</b></p> <p><i>Do NOT stack the system on top of any other equipment. If the system falls, it can cause severe bodily injury and damage the equipment.</i></p>

This subrack system can be installed in 19" equipment racks. The rack must be accessible from the front and rear for equipment installation.

Mounting brackets and a rack mount kit come with the system. Allow sufficient clearance around the rack for system maintenance.

### Mounting Instructions:

- Ensure that the rack is constructed to support the weight and dimensions of the Shelf.
- Install any stabilizers that came with your equipment rack before mounting or servicing the system in the rack.
- Load the rack from the bottom to the top, with the heaviest system at the bottom, avoid uneven mechanical loading of the rack.
- We recommend to use also chassis support brackets.

### 3.3 Initial Operation



**Warning!**

*Voltages over 60 VDC can be present in this equipment. This equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.*

*This equipment is designed in accordance with protection class 1!  
It must therefore be operated only with protective GND/earth connection!*

Before starting the system with CPCI boards the following tests have to be done:

- Ensure that the unit does not get damaged during transport.
- Check the Protective Earth (PE) resistance, should be  $< 0,1 \text{ Ohm}$ .
- Switch on the system and check all CPCI voltages on the Backplane connectors before you plug in the CPCI boards.
- Plug in the CPCI boards.
- Cover all open Slots with filler panels.
- Tighten the rear panel mounting screws.
- Power-on the system and determine the actual current consumption.
- Replace the mains fuses suitable to the actual current.



*The fuse value has been determined in factory for the maximum power delivered by the power supply. The fuse value must be adjusted to the actual current consumption of the completed system.*

*Maximum value is 10 A slow blow.*

## 4 Service

### 4.1 Technical support and Return for Service Assistance

For all product returns and support issues, please contact your Schroff sales distributor or [www.schroff.biz](http://www.schroff.biz).

We recommend that you save the packing material. Shipping without the original packing material might void the warranty.

### 4.2 Declaration of Conformity

SCHROFF CompactPCI systems are developed and manufactured according to EN 60950-1.

SCHROFF CompactPCI systems are not end-products with independent functionality as described in the definition of the EMC regulations, and therefore a CE marking is not required. However, when CPCI cards are assembled according to specification, the systems fulfill the requirements in accordance with EMC Directive 2004/108/EG and Low-voltage Directive 2006/95/EG.

Interference resistance and interference emissions are factors which are heavily influenced by the type and quantity of CPCI cards used in the system assembly. Through the use of high quality line filters and EMC optimized enclosure design, SCHROFF offers CPCI systems which serve as an ideal base for system integrators, which comply with the prescribed limits of EN 6100-6-3 and EN 61000-6-2

The systems are generally equipped with power supplies which possess CE markings in accordance with EN 60950-1, EN 61000-6-3, EN 61000-6-2).

Before delivery a high-voltage, protective earth and functionality test is carried out on each individual system.

## 4.3 Scope of delivery

Quantity	Description
1	19" subrack, shielded. (front handles: RAL 7016; 19"-brackets, top and base covers: Al (
1	CPCI PSB Backplane 6U 14 Node Slots, 2 Fabric Slots. Fabric Slots placed left to the Node Slots including optional Link between both 4 PSU Slots acc. to PICMG 2.11 for 4 x 3 U PSUs CompactPCI bus (PICMG2.0 R.3.0) is implemented at Node Slots; two independent segments with System Slot left and right
1	Front assembly area for max. 16 Boards 6 U 160mm deep guide rails incl. ESD-Clips (ESD-Clips assembled at front bottom)
1	Rear assembly area for the installation of max. 16 Rear I/O Boards 6 U, 4 HP.
1	AC mains/line module with IEC 320-C14 connector, mains fuses and line filter
2	19" plug-in power supplies each 250 W (with 4 voltages: 3.3 V / 40 A; 5 V / 40 A; 12 V / 5.5 A, -12 V / 2 A)
1	Complete AC/DC wiring
3	Speed controlled fans, assembled on front accessible drawer
1	FCM-Module for fan monitoring and controlling

## 4.4 Accessories

Parts-No.	Description
23207-022	Chassis Monitoring Module (CMM)
20848-7xx	Filler panel with EMC front plate for empty Slots, dimensions see catalogue
34562-8xx	Filler panel for empty Slots, dimensions see catalogue
24579-03x	Printed Circuit Board covers, dimensions see catalogue

## 4.5 Spare Parts

On request.

## 5 Technical Data

Table 2: Technical Data

<b>Dimensions</b>	
Height	443.70 mm (10 U)
Width	482.60 mm (19")
Depth	276.75 mm
Depth with handles	333.20 mm
<b>Weight</b>	
	18 Kg
<b>Power supply</b>	
Input voltage	100 VAC to 240 VAC
Mains frequency	50 / 60 Hz
Power consumption	up to 500/1000 W
<b>Cooling</b>	
3 x 24 VDC Fans	Each 290 m³/h (170 cfm)
<b>Ambient Temperature</b>	
Operating	0 °C to +40 °C
Storage	-40 °C to +85 °C
<b>Humidity</b>	
permissible Humidity	30 % to 80 %, non condensing
<b>EMC, the system meets the requirements for:</b>	
Emitted Interference	EN 55022
Interference Resistance	EN 55024
<b>Safety</b>	
Test voltage according to EN 60950	Input - Output: 4,3 kVDC Input- PE: 2,2 kVDC Output - PE: 0,7 kVDC Output - Output: 0,7 kVDC
Shock and Vibration:	EN 60068-2-6 and EN 60068-2-27
<b>Electromagnetic Shielding</b>	
Shielding attenuation	typ. 40 dB at 1 GHz if shielded front panels are used.







**SCHROFF GMBH**

**[www.schroff.biz](http://www.schroff.biz)**

**Langenalberstr. 96-100  
D-75334 Straubenhardt**

**Tel.: + 49 (0) 7082 794-0**

**Fax: +49 (0) 7082 794-200**