

# **3+1 U CPCI Serial System**

## **User's Manual**



**Product Number:**

**24579-416/417/418/419/420/421/422/423/424**

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# 1 Safety

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


## 1.1 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>
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	<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>
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	<p><b>Danger of electrostatic discharge!</b></p> <p><i>Static electricity can damage sensitive components in a system. To avoid damage, wear ESD wrist straps or at regular intervals touch blank enclosure parts.</i></p>
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## 1.2 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>
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- Service personnel must know the necessary electrical safety, wiring and connection practices for installing this equipment.
- Install this equipment only in compliance with local and national electrical codes.

## 1.3 References and Architecture Specifications

- User Guide Schroff CPCI Serial Backplanes  
Order no.: 63972-333
- User Manual Power Backplanes  
Order no.: 63972-334
- User Manual 19" Power Supply 11098-538  
Order no.: 63972-335

## 1.4 Product Definition

The Schroff CPCI Serial system subracks are available in various backplane and PSU configurations and consist of:

- A shielded subrack with front and rear card cage for 3 U boards according to CompactPCI Standard CPCI Serial (CPCI-S.0)
- 1...9 slot 3 U CPCI Serial backplanes with or without Rear I/O
- 1...2 Power Backplanes with SSI-type connector
- 1...2 CPCI Serial plug-in power supplies (300 W) with wide range input and SSI-type connector
- Power input module with IEC 320-C14 connector, mains/line switch, mains/line filter and fuses
- Fan Trays with or without Fan Control Module (FCM) with 3 axial Fans for the active cooling of the boards and the power supplies



*The system 24579-421 is described as an example below in this manual.*

*The system includes:*

- 9 slot CPCI Serial backplane with Rear I/O
- 2 power backplanes
- 2 CPCI Serial PSUs (300 W)
- Fan tray with Fan Control Module (FCM2) and Display.

*All pictures in this manual may differ from the latest series.*

### Available Configurations

Slots	1 x 300 W PSU				2 x 300 W PSU			
	No Fan Control		FCM & Display		No Fan Control		FCM & Display	
	w/o Rear I/O	with Rear I/O	w/o Rear I/O	with Rear I/O	w/o Rear I/O	with Rear I/O	w/o Rear I/O	with Rear I/O
1	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
2	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
3	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
4	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
5	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
6	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
7	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
8	On Request	On Request	On Request	On Request	On Request	On Request	On Request	On Request
9	24579-416	24579-424	24579-417	24579-423	24579-418	24579-422	24579-419	24579-421

## 1.5 System Overview

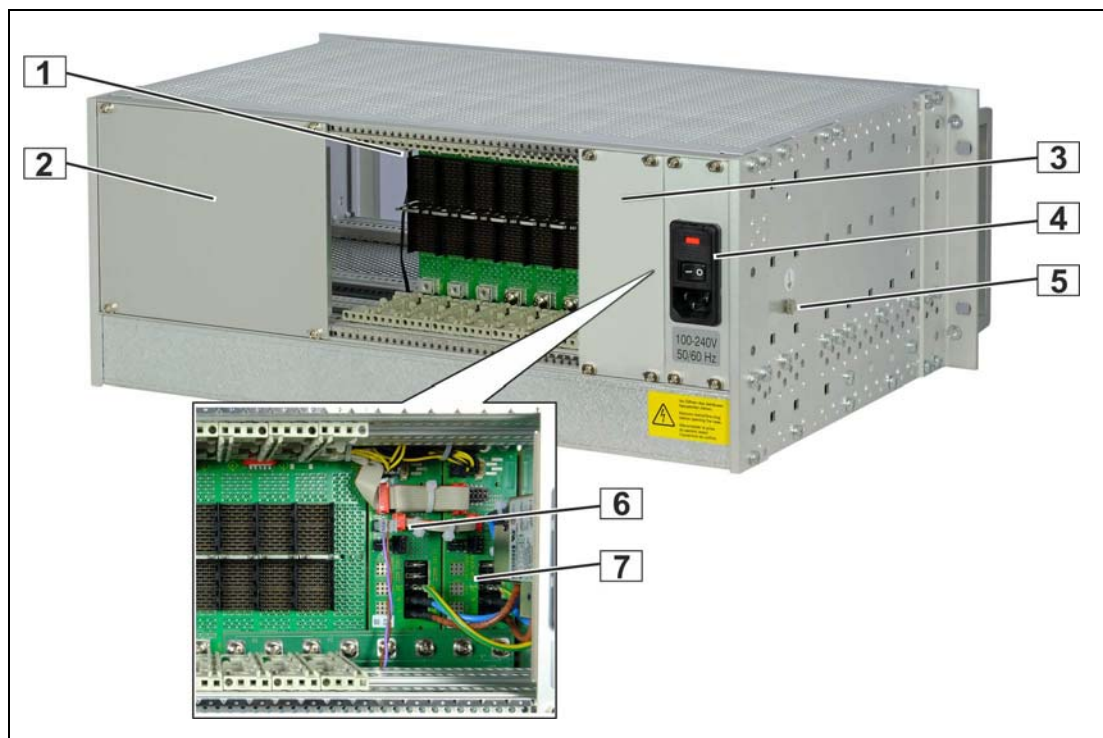
Figure 1: Front View



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- |   |                   |   |                          |
|---|-------------------|---|--------------------------|
| 1 | PSU 1             | 6 | Front Panel 32 U         |
| 2 | PSU 2             | 7 | Display                  |
| 3 | Fan Tray          | 8 | 9 Slot CPCI-S Backplane  |
| 4 | Power Backplane 1 | 9 | Fan Control Module (FCM) |
| 5 | Power Backplane 2 |   |                          |

Figure 2: Rear View



12315802

- |   |                      |   |                   |
|---|----------------------|---|-------------------|
| 1 | Temperature Sensor   | 5 | Ground Terminal   |
| 2 | Front Panel 32 U     | 6 | Power Backplane 2 |
| 3 | Front Panel 12 U     | 7 | Power Backplane 1 |
| 4 | AC mains/line module |   |                   |

## 1.6 Subrack

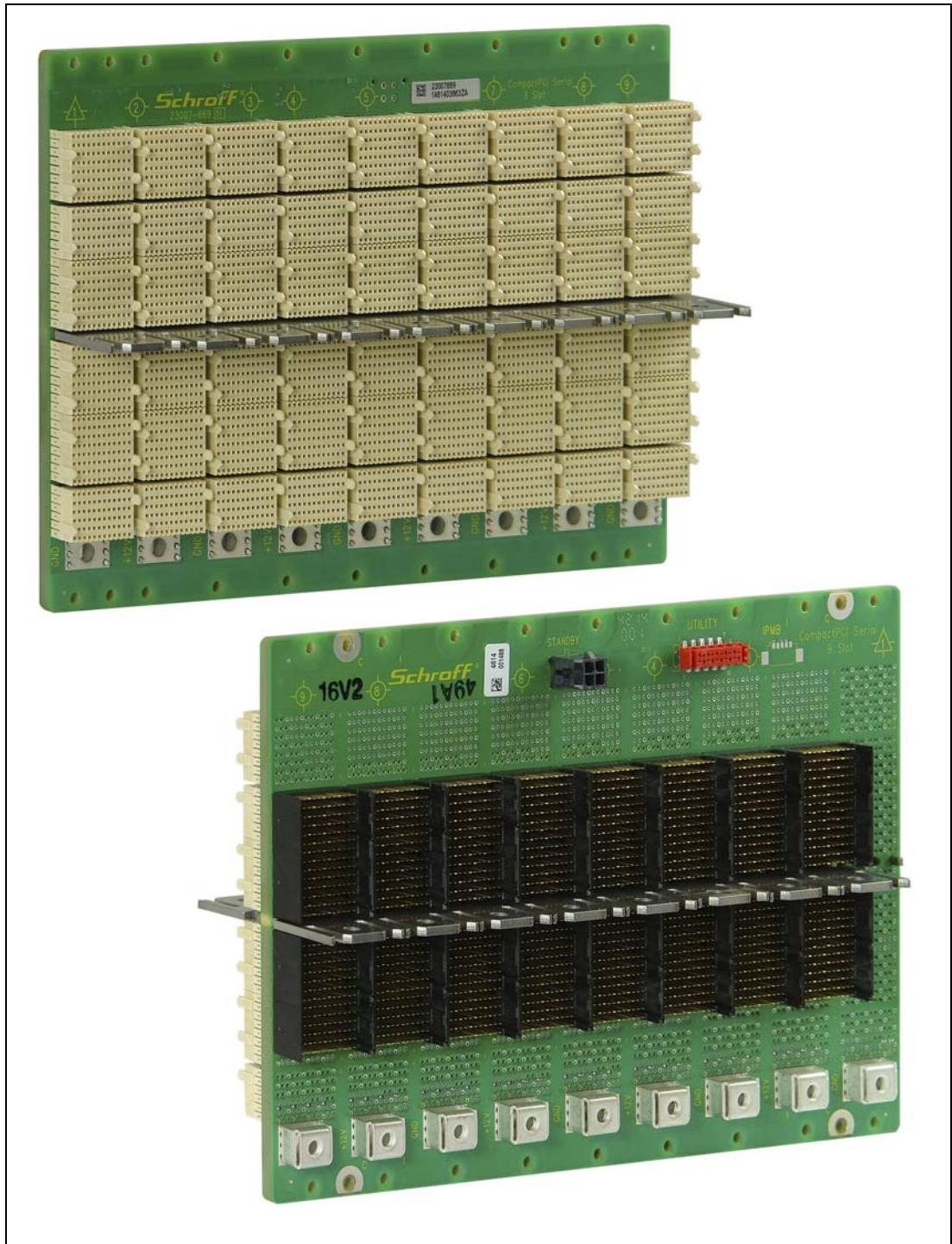
The 4 U chassis is based on the Schroff europacPRO system with EMC shielding. The front card cage provides 9 CPCI Serial slots.

The lower guide rails of the card cage are equipped with ESD clips.



## 1.7 Backplane

Figure 3: Example: 9 Slot Backplane with rear I/O, Systemslot left



## 1.8 Topology of a 9 Slot Backplane

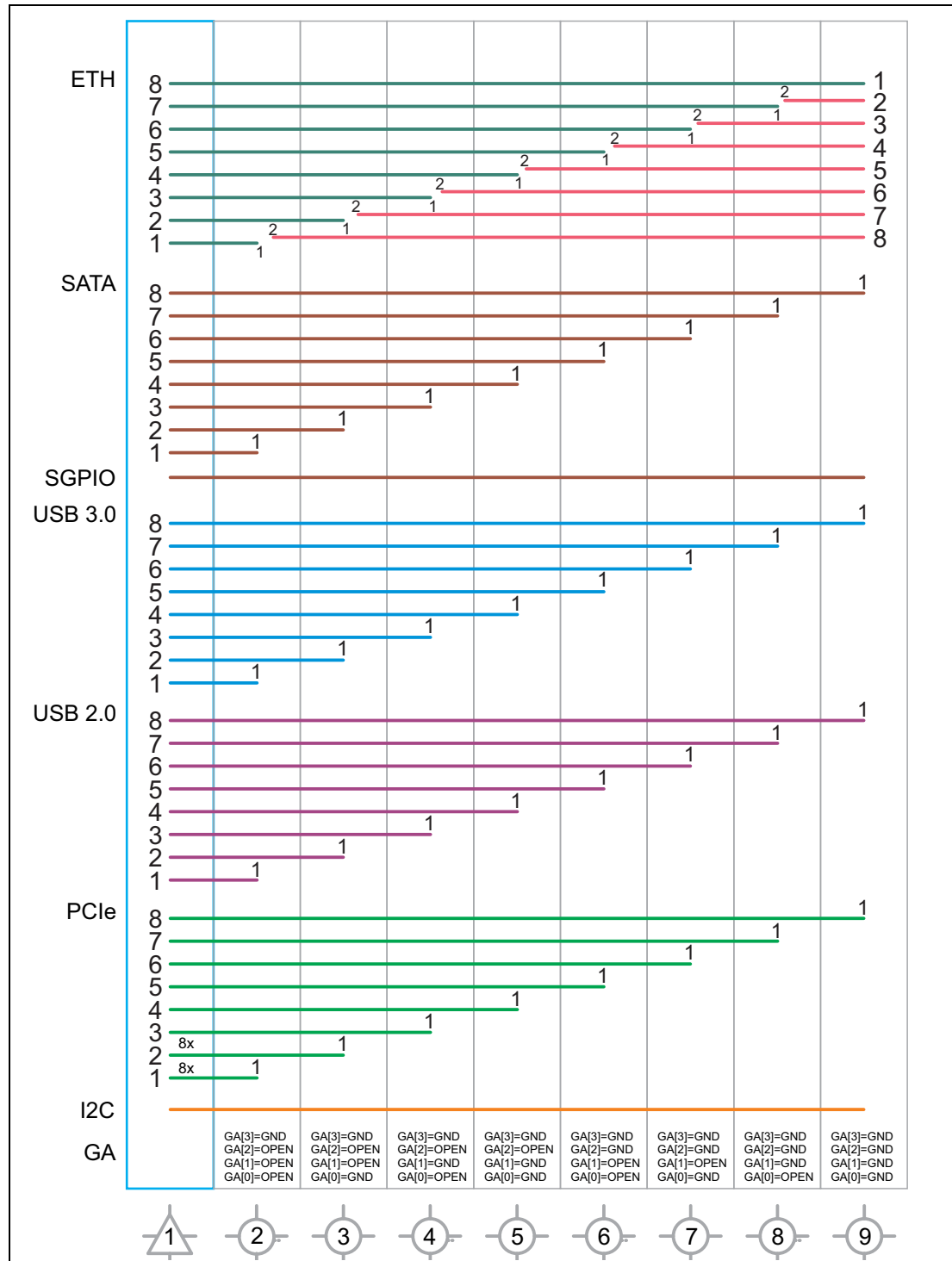
The CPCI Serial backplane with 9 slots supports the full set of serial links at all slots.

The serial links (SATA/SAS, USB2/3, PCIe) are arranged as a Single Star architecture.

Ethernet is implemented by 4 differential pairs in Single Star routing to support 10/100/1000/10GBase-T.

More information in the Schroff Backplane manual, order no.: 63972-333

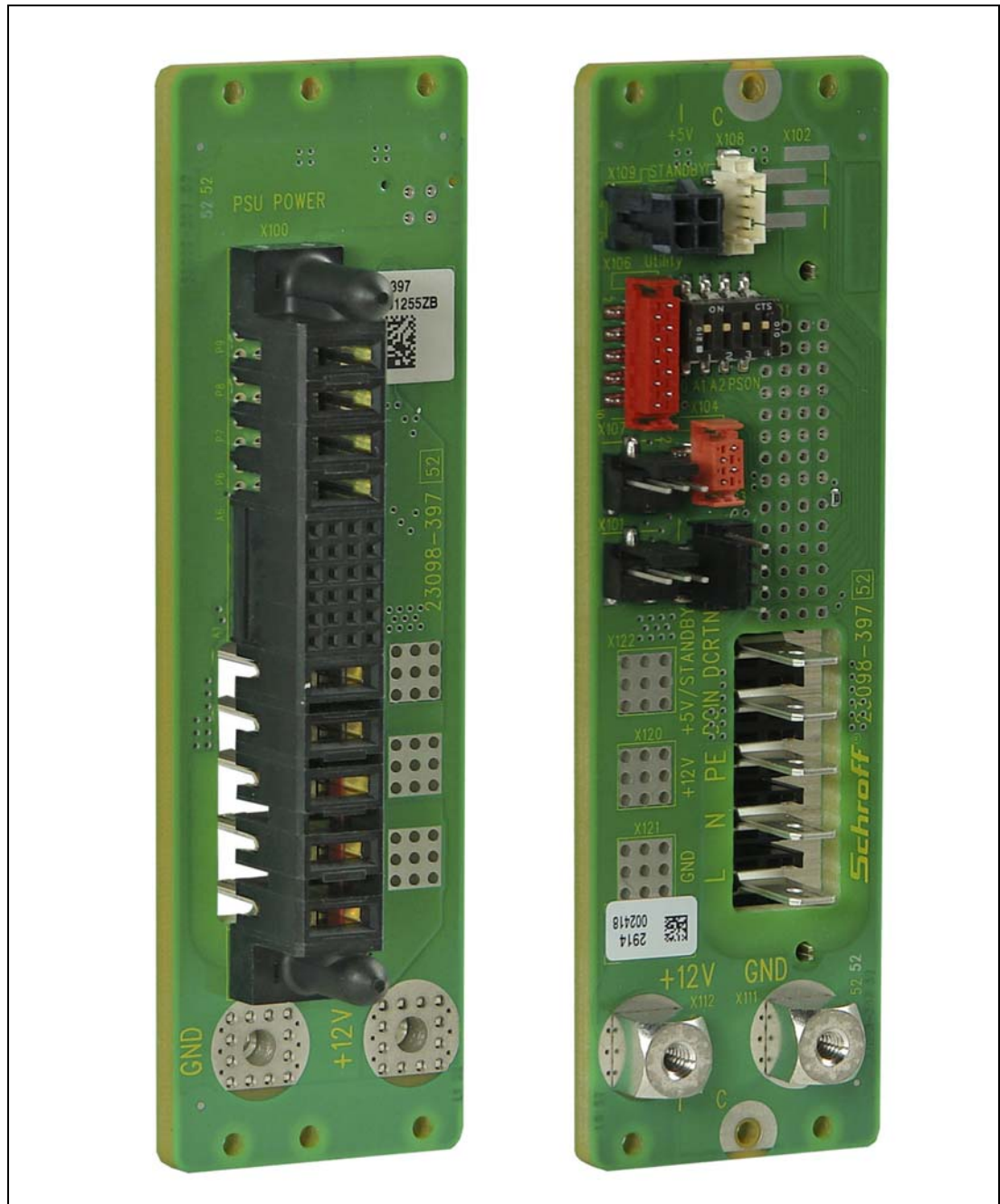
Figure 4: Backplane Topology



## 1.9 Power Backplane

The Schroff CompactPCI Serial power backplane accepts a pluggable power supply with SSI-type connector. The power backplane provides +12 V payload power and for wake-up events an additional +5 V Standby voltage. More information in the backplane's user manual, order no.: 63972-334

Figure 5: Power Backplane



## 1.10 Power Supply



### Hazardous voltage!

Parts of the power supply may be exposed with hazardous voltage. Always remove mains/line connector before carry out any assembly work.



### Caution!

Your system has not been provided with a AC power cable. Purchase an 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.

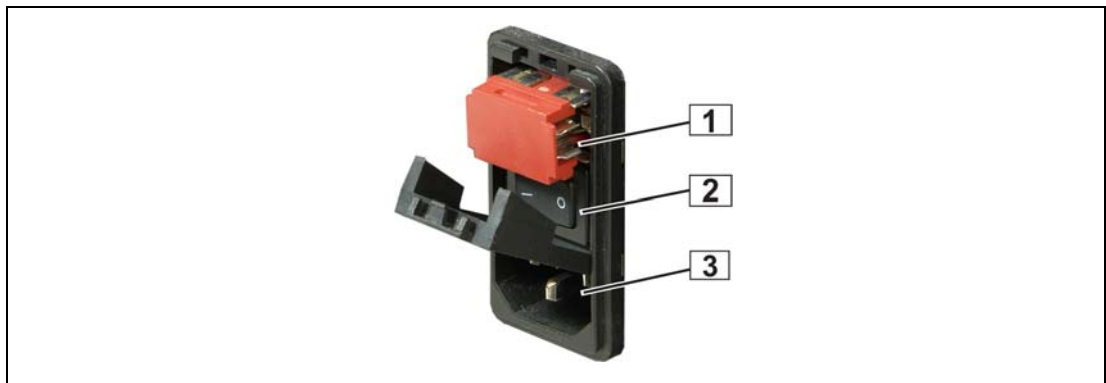
The CPCI Serial system is powered by 300 W CPCI Serial plug-in power supplies with wide range input (100 - 240 VAC). They provide 12 V payload power and 5 V standby power for CPCI Serial boards.

The power supplies are plugged-in in dedicated slots at the left front side. The power supply contacts via a SSI-type connector to a Power backplane.

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

The fuse rating is 10 A slow blow (10AT).

**Figure 6: AC mains/line module**



12309010

- 1 Fuse holder
- 2 Mains/line switch

- 3 AC Connector (IEC320-C14)

1.10.1 CPCI Plug-In AC Power Supply

Figure 7: Power Supply




Table 1: Data AC Power Supply

Input voltage nominal	100 - 240 VAC
Mains Frequency	50 / 60 Hz
Output (max.)	300 W
Output voltages	5.0 V - 2.5 A 12.0 V - 25 A
Ripple	< 1 % Peak/Peak
Cooling	Requires Airflow > 10 CFM for 300 W Output

More information in the user manual order no.: 63972-335

1.10.2 Grounding/Earthing

	<p><b>Caution!</b></p> <p>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!</p>
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## 2 Cooling

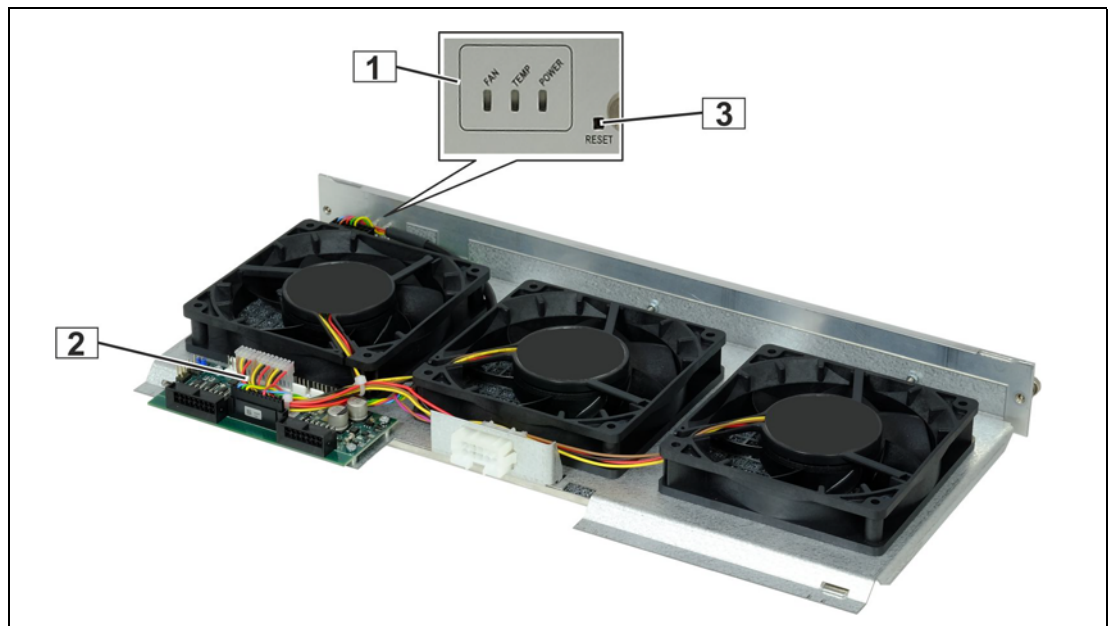
The CPCI Serial boards and the power supplies are cooled by forced air convection through three 12 VDC axial fans located in a hot-swappable fan tray.

2 different fan trays are available:

- Fan Tray with Fan Control Module (FCM), status LEDs and RESET button (3 fans with 220 m<sup>3</sup>/h (130 cfm)).
- Fan Tray with constant speed fans (3 fans with 140 m<sup>3</sup>/h (85 cfm)).

An air filter is available as an option for both fan trays.

**Figure 8: Fan Tray with FCM**



12315803

- |   |   |   |                           |
|---|---|---|---------------------------|
| 1 | <i>Display with Status LEDs</i>                     | 2 | <i>Fan Control Module</i> |
| 3 | <i>RESET Push Button (Grounds the PRST# signal)</i> |   |                           |

The fan speed is determined by a temperature sensor above the card cage. Up to 40 °C the PWM is 20%, from 40 °C to 60 °C the PWM is increased continuously from 20% to 100%.

This control characteristics can be changed by a DIP switch on the FCM. (See user manual, order no.: 63972-312)

## 2.1 Air Filter

An air filter is available as an option. The air filter can be fixed with a mounting frame at the bottom of the fan tray.

The filter meets the requirements of the Telcordia Technologies Generic Requirements GR-78-CORE specification.

Figure 9: Fan Tray with Air Filter



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1 Air Filter with mounting frame

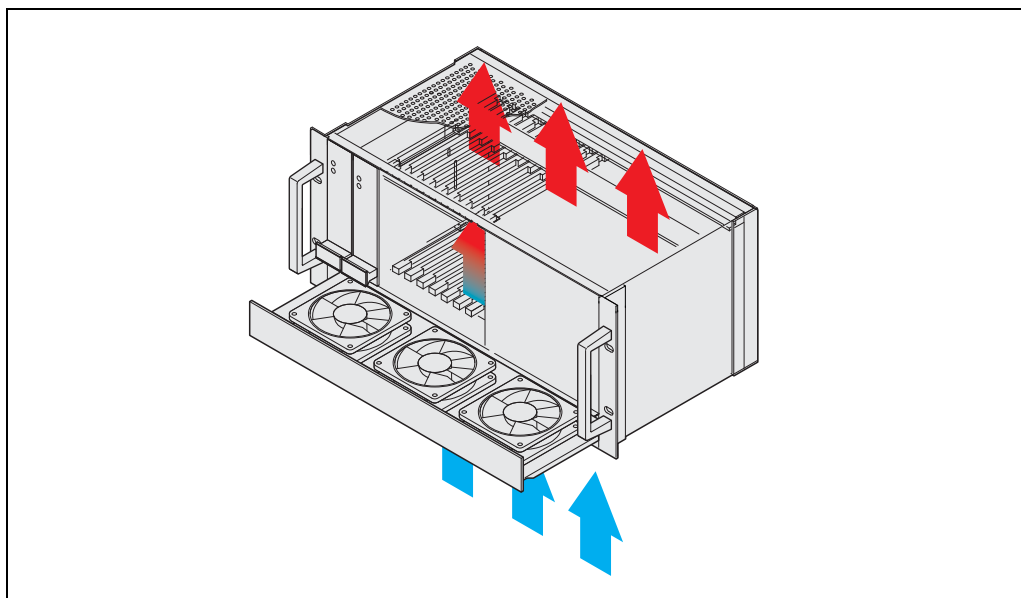
## 2.2 Airflow



### 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 10: Airflow



12315805

## 3 Installation

### 3.1 General Installation Guidelines

#### 3.1.1 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.

#### 3.1.2 Ensuring Proper Airflow

- 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 should include an airflow baffle that extends to backplane. The filler panel prevents fan air from escaping out of the front of an open slot.



## 3.2 Rack-Mounting

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

### Mounting Instructions:

- Ensure that the rack is constructed to support the weight and dimensions of the system.
- 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.

## 3.3 Initial Operation



### Warning!

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!

- Ensure that the system has not been damaged during transport, storage or assembly.
- Check the Protective Earth (PE) resistance, should be  $< 0,1 \text{ Ohm}$ .
- Plug-in the boards.
- Cover all open Slots with filler panels.
- Switch on the system.

## 4 Service

### 4.1 Technical support and Return for Service Assistance

We generally recommend to return the complete system. For all product returns and support issues, please contact your Schroff sales distributor.

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 (24579-421)

Quantity	Description
1	Shielded europacPRO chassis 4 U / 84 HP with front handles
1	CPCI Serial backplane 9 slot 3 U with Rear I/O
2	Power backplanes with SSI-type connector
1	Front card cage for max. 9 boards 3 U 160 mm deep IEEE guide rails inc. ESD clips)
1	Rear card cage for max. 9 boards 3 U 80 mm deep IEEE guide rails inc. ESD clips
2	300 W CPCI Serial plug-in power supply with input range of 100 VAC to 240 VAC
1	Power input module with IEC 320-C14 connector, mains/line switch, mains/line filter and fuses
1	Complete AC/DC cabling
1	Fan Tray 1 HP with FCM and 3 fans 220 m³/h (140 cfm) each
2	Front panel 3 U, 32 HP
1	Front panel 3 U, 12 HP

Please order the power cable separately.

### 4.4 Accessories

Order No.	Description
20848-75x	Front panels for Rear I/O Boards, dimensions see catalogue
24579-632	Air filter mounting frame
60713-471	Air filter
20848-7xx	Slot covers with front panel and EMC shielding for vacant slots. For dimensions, please see catalogue.
34562-8xx	Slot covers for vacant slots. For dimensions, please see catalogue.
24579-03x	Printed Circuit Board covers (solder side covers). For dimensions, please see catalogue

### 4.5 Spare Parts

On request.

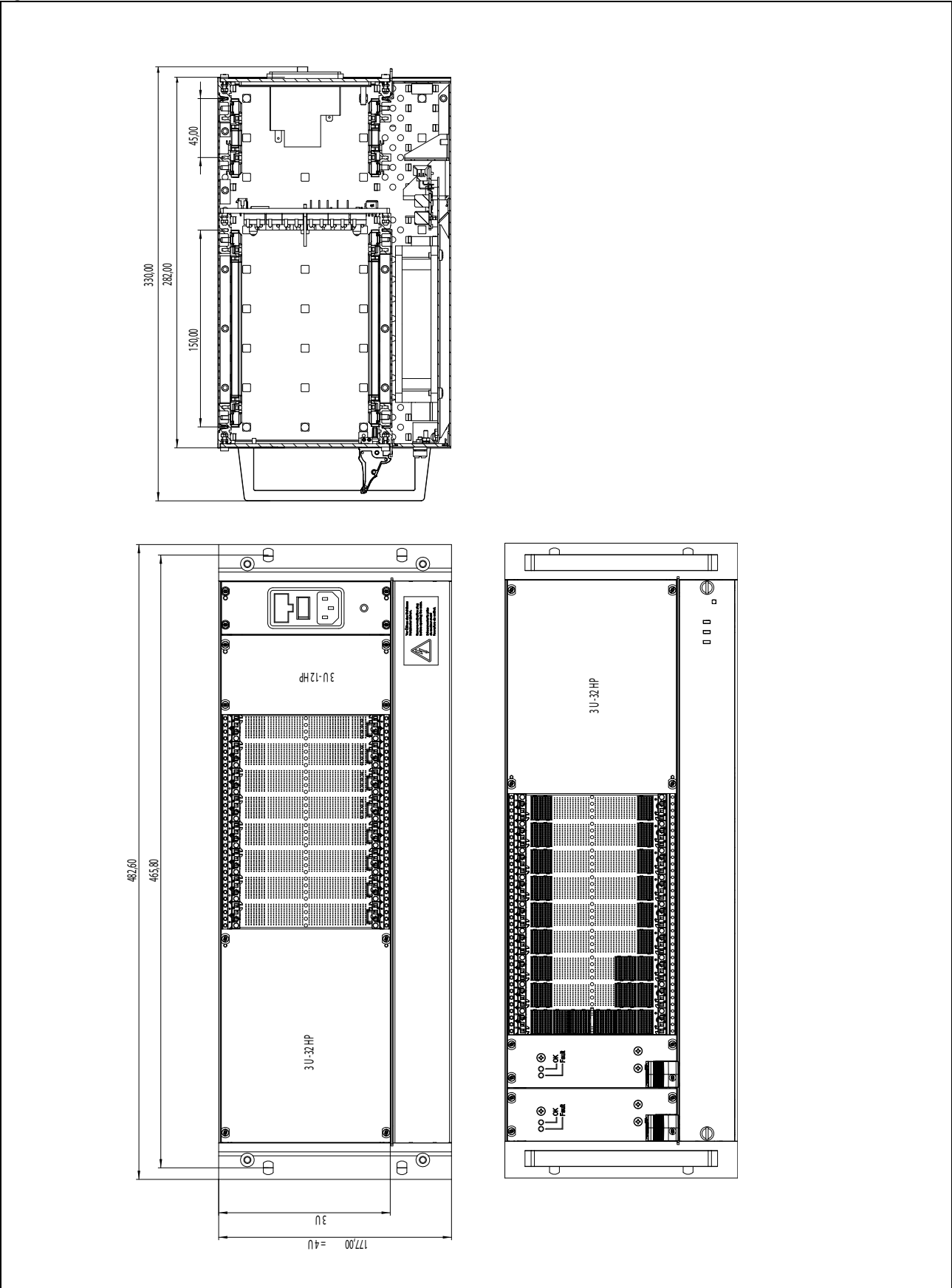
## 5 Technical Data

Table 2: Technical Data

<b>Dimensions</b>	
Height	177 mm (4 U)
Width	482.60 mm (19")
Depth (Card cage)	275 mm
Depth (Overall with handles)	330 mm
<b>Weight</b>	
Completely assembled	approx. 9 kg
<b>Power Supply</b>	
Input Voltage	100 VAC bis 240 VAC
Frequency	50 / 60 Hz
Power input	up to 600 W
<b>Ambient Temperature</b>	
Operation	+0 °C to +50 °C
Storage	-40 °C to +85 °C
<b>Humidity</b>	
Admissible humidity	30 % to 80 %, non-condensing
<b>EMC, fulfils requirements for:</b>	
Transient Emissions	EN 61000-6-3
Interference Resistance	EN 61000-6-2
<b>Safety</b>	
Test voltages according to EN 60950-1	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.

# 6 Dimensions

Figure 11: Dimensions







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