

CPCI/CPCI Serial Hybrid System 3+1 U (PICMG 2.30, CPCIS.0) **User's Manual**



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1 Safety

1.1 Intended Application

The CompactPCI (CPCI/CPCI PlusIO/CPCI Serial) system, described in this manual, is intended as a platform for a microcomputer system based on the CompactPCI Standards PICMG 2.0 Rev.3, CPCI PlusIO PICMG 2.30 and CPCI Serial CPCIS.0.

The case systems are designed for protection class IP 20 and can be used only in the resp. environments.

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/CPCI PlusIO/CPCI Serial 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 finished system complies with the safety regulations currently applicable in the country it is going to be used.
- the finished system 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.

1.2.1 Safety Symbols used in this document

	<p>Hazardous voltage!</p> <p><i>This is the electrical hazard symbol. Familiarise yourself with the danger of electrical voltages and the safety precautions to avoid accidents before starting to work with parts that carry dangerous voltages.</i></p>
	<p>Caution!</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>Danger of electrostatic discharge!</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>

1.3 General Safety Precautions

	<p>Warning!</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! 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.

2 Product Definition

The Schroff CPCI system consists of:

- A shielded subrack with front and rear card cage for 3 U boards according to IEEE 1101.x, IEC 20297.x and the CompactPCI Standards PICMG 2.0 Rev.3, PICMG 2.30 CPCI PlusIO and CPCI Serial (CPCIS.0)
- An 8 slot 3 U CPCI/CPCI Plus hybrid backplane (23007-601)
- An ATX power supply (300 W) with wide range input, IEC320-C14 connector and mains/line switch
- 1 U Fan Tray with 2 axial Fans (140 m³/h (85 cfm)) for the active cooling of the boards
- Drive holder for an optional slim line DVD drive
- Drive holder for an optional 3.5" HDD

2.1 References and Architecture Specifications

- User Manual CPCI Backplanes
Order no.: 73972-101
- User Guide Schroff CPCI/CPCI Serial Backplanes 23007-601
Order no.: 63972-273

Further information can also be found in the catalogue „Electronic Packaging“ and on the internet under www.schroff.biz

2.2 System Overview

Figure 1: System Overview



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- | | | | |
|---|--|---|----------------------------------|
| 1 | Drive holder with front panel for an optional 3.5" HDD | 5 | Front panel 3 U, 8 HP |
| 2 | Drive holder for an optional slim line DVD drive | 6 | Front panel 3 U, 4 HP |
| 3 | ATX Power Supply | 7 | Front Card cage with guide rails |
| 4 | Fan Tray with 2 fans | | |

2.3 Subrack

The 4 U chassis is based on the Schroff europacPRO system with EMC shielding. The front card cage enables the assembly of:

- 3 CPCI peripheral boards (3 U, 4 HP, 160 mm deep)
- 1 CPCI PlusIO CPU board (3 U, 4 HP, 160 mm deep)
- 4 CPCI Serial peripheral boards (3 U, 4 HP, 160 mm deep)
- 3 CPCI Rear I/O Boards (3 U, 4 HP, 80 mm deep).

Note: The backplane supports Rear I/O only at the CPCI peripheral slots. Rear I/O at the 4 CPCI Plus slots is possible, when the backplane is equipped with the respective connectors (assembly option).

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



Variations

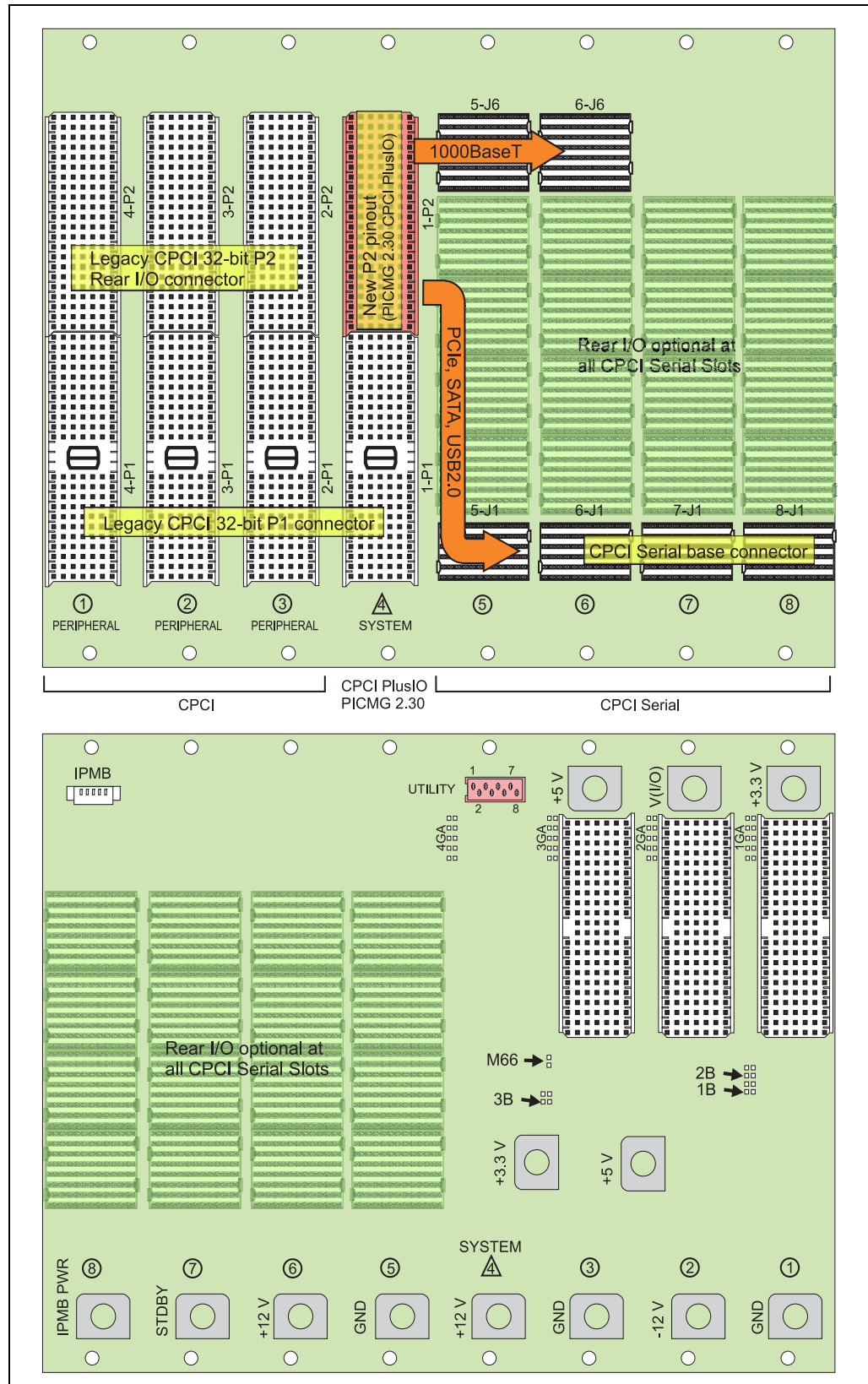
The Schroff assembly service can customize your system with:

- Different Backplane configurations
- Drive mounting cassettes
- Special power supplies

More information in the catalogue or at www.schroff.biz

2.4 CPCI/CPCI Serial Hybrid Backplane

Figure 2: Backplane front and rear view



2.4.1 Backplane topology

The CPCI/CPCI Serial hybrid backplane is splitted into a CPCI and a CPCI Serial section with a shared CPCI PlusIO system slot in the middle between the CPCI and CPCI Serial section.

The former Rear I/O pins of the system slot connector P2 are used for the routing of serial links (SATA, USB2, PCIe, ETH) to the J1 and J6 connectors of the CPCI Serial slots as defined in the PICMG 2.30 CPCI PlusIO specification.

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

Rear I/O at all CPCI peripheral slots at connector P2. Rear I/O at the CPCI Serial slots (connectors 5-J2...8-J5) is possible as an assembly option on request.

Applicable Specifications:

- 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 2.30 CPCI PlusIO
- PICMG CPCI Serial (CPCIS.0)

More information in the manual for the backplane order no.: 63972-273

Figure 3: Backplane serial link routing

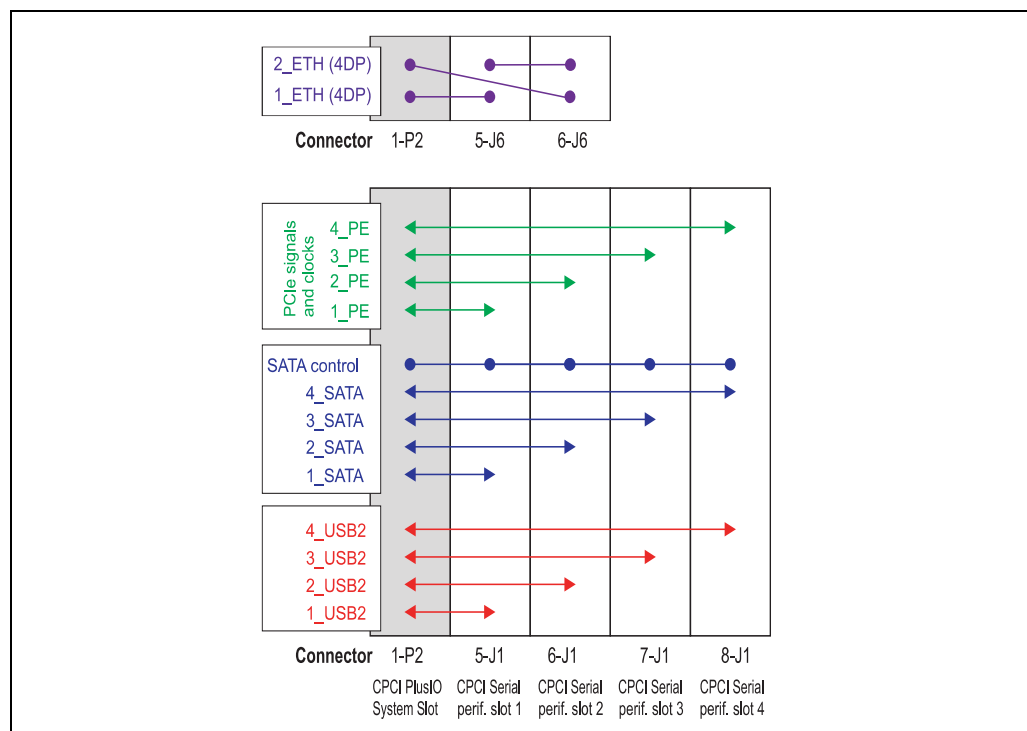


Table 1: Pinout Connector 1-P2 (System Slot)

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	2_ETH_B+	1_ETH_D+	1_ETH_B+	GND
20	GND	CLK5	GND	2_ETH_B-	1_ETH_D-	1_ETH_B-	GND
19	GND	GND	GND	2_ETH_A+	1_ETH_C+	1_ETH_A+	GND
18	GND	2_ETH_D+	2_ETH_C+	2_ETH_A-	1_ETH_C-	1_ETH_A-	GND
17	GND	2_ETH_D-	2_ETH_C-	PRST#	REQ6#	GNT6#	GND
16	GND	4_PE_CLK-	2_PE_CLK+	DEG#	GND	reserved	GND
15	GND	4_PE_CLK+	2_PE_CLK-	FAL#	REQ5#	GNT5#	GND
14	GND	3_PE_CLK-	1_PE_CLK+	4_PE_CLKE#	SATA_SCL	reserved	GND
13	GND	3_PE_CLK+	1_PE_CLK-	3_PE_CLKE#	SATA_SDO	SATA_SL	GND
12	GND	4_PE_Rx00+	1_PE_CLKE#	2_PE_CLKE#	SATA_SDI	4_SATA_Rx+	GND
11	GND	4_PE_Rx00-	4_PE_Tx00+	4_USB2+	4_SATA_Tx+	4_SATA_Rx-	GND
10	GND	3_PE_Rx00+	4_PE_Tx00-	4_USB2-	4_SATA_Tx-	3_SATA_Rx+	GND
9	GND	3_PE_Rx00-	3_PE_Tx00+	3_USB2+	3_SATA_Tx+	3_SATA_Rx-	GND
8	GND	2_PE_Rx00+	3_PE_Tx00-	3_USB2-	3_SATA_Tx-	2_SATA_Rx+	GND
7	GND	2_PE_Rx00-	2_PE_Tx00+	2_USB2+	2_SATA_Tx+	2_SATA_Rx-	GND
6	GND	1_PE_Rx00+	2_PE_Tx00-	2_USB2-	2_SATA_Tx-	1_SATA_Rx+	GND
5	GND	1_PE_Rx00-	1_PE_Tx00+	1_USB2+	1_SATA_Tx+	1_SATA_Rx-	GND
4	GND	VIO	1_PE_Tx00-	1_USB2-	1_SATA_Tx-	reserved	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Table 2: Pinout Connector x-P1 (Legacy CPCI Slots)

Pin	Z	A	B	C	D	E	F
25	GND	+5V	REQ64#	ENUM#	+3.3V	+5V	GND
24	GND	AD[1]	+5V	VIO	AD[0]	ACK64#	GND
23	GND	+3.3V	AD[4]	AD[3]	+5V	AD[2]	GND
22	GND	AD[7]	GND	+3.3V	AD[6]	AD[5]	GND
21	GND	+3.3V	AD[9]	AD[8]	M66EN	C/BE[0]#	GND
20	GND	AD[12]	GND	VIO	AD[11]	AD[10]	GND
19	GND	+3.3V	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR#	GND	+3.3V	PAR	C/BE[1]#	GND
17	GND	+3.3V	IPMB_SCL	IPMB_SDA	GND	PERR#	GND
16	GND	DEVSEL#	GND	VIO	STOP#	LOCK#	GND
15	GND	+3.3V	FRAME#	IRDY#	GND	TRDY#	GND
14	GND						GND
13	GND						GND
12	GND						GND
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	GND	AD[21]	GND	+3.3V	AD[20]	AD[19]	GND
9	GND	C/BE[3]#	GND	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	VIO	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ0#	GND	+3.3V	CLK0	AD[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	RST#	GND	GNT0#	GND
4	GND	IPMB_PWR	HEALTHY#	VIO	INTP	INTS	GND
3	GND	INTA#	INTB#	INTC#	+5V	INTD#	GND
2	GND	TCK	+5V	TMS	TDO	TDI	GND
1	GND	+5V	-12V	TRST	+12V	+5V	GND

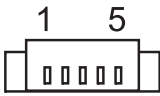
Table 3: Pinout Connector x-J6 (CPCI Serial ETH Connector)

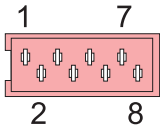
Pin	A	B	C	D	E	F	G	H	I	J	K	L
8												
7												
6												
5												
4												
3												
2	GND	2_ETH_A+	2_ETH_A-	GND	2_ETH_B+	2_ETH_B-	GND	2_ETH_C+	2_ETH_C-	GND	2_ETH_D+	2_ETH_D-
1	1_ETH_A+	1_ETH_A-	GND	1_ETH_B+	1_ETH_B-	GND	1_ETH_C+	1_ETH_C-	GND	1_ETH_D+	1_ETH_D-	GND

Table 4: Pinout Connector x-J1 (CPCI Serial Base Connector)



Pin	A	B	C	D	E	F	G	H	I	J	K	L
6	GND			GND			GND			GND		
5	PE_Rx00+	PE_Rx00-	GND	PE_Tx00+	PE_Tx00-	GND			GND			GND
4	GND	USB2+	USB2-	GND	PE_CLK+	PE_CLK-	GND	SATA_Rx+	SATA_Rx-	GND	SATA_Tx+	SATA_Tx-
3	n.c.	n.c.	GND	n.c.	n.c.	GA1	SATA_SDI	SATA_SDO	GA2	SATA_SCL	SATA_SL	GA3
2	GND	IPMB_SCL	IPMB_SDA	GND			GND	RST_IN#	WAKE_IO#	GND	PE_CLKE#	
1	IPMB_PWR	STNDBY	GA0	+12V	+12V	GND	+12V	+12V	GND	+12V	+12V	GND

Pinout IPMB/Utility connectors

IPMB Connector	
	
Pin	
1	IPMB_SCL
2	GND
3	IPMB_SDA
4	IPMB_PWR
5	

Utility Connector	
	
Pin	
1	GND
2	+5 V
3	+12 V
4	FAL#
5	-12 V
6	DEG#
7	+3.3 V
8	PRST#

2.5 Power Supply

	<p>Hazardous voltage!</p> <p><i>Parts of the power supply may be exposed with hazardous voltage. Always remove mains/line connector before carry out any assembly work.</i></p>
	<p>Caution!</p> <p><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></p>


Power is provided through a 300 W ATX power supply with wide range input, IEC 320-C14 connector and mains on/off switch. The power supply is located at the front to the left of the card cage behind a front panel.

2.5.1 ATX Power Supply

Table 5: Techn. Data

Input voltage	100 ... 240 VAC, active PFC
Input frequency	47...63 Hz
Input current	6 A (115 V) / 3 A (230 V)
Output (max)	5 V / 30 A; 3,3 V / 28 A, 12 V / 15 A, -12 V / 0,8 A)
Output (min)	5 V / 0,1 A; 3,3 V / 0,3 A, 12 V / 0 A, -12 V / 0,0 A)
Inrush Current	60/90 A (115/230 VAC)
Efficiency	>68% typical)
Overload protection	160% max, shut down
Overvoltage protection	+3,3 V (+3,5...+4,5 V), +5 V (+5,6...+6,8 V)
Ripple	+3,3 V 50 mV / +5 V 50 mV / +12 V 120 mV / -12 V 120 mV
Load regulation	+3,3 V ±5% / +5 V ±5% / +12 V ±5% / -12 V ±5%
Hold up time	>16 msec.
Power Good Signal	Power on delay 100...500 msec.
Dielectric Withstand	Input to frame ground 1800 VAC for 1 sec.
Derating	0...+50 °C
Storage temperature	-20...+65 °C
Humidity	20...80% RH, non-condensing
MTBF	>50.000 h at +25 °C, without fan
Safety	EN 60950 / UL 60950
EMV	CE
Fan	Ball bearing fan
Dimensions	140 x 150 x 86 mm, ±0,5mm

2.5.2 Grounding/Earthing

	<p>Caution!</p> <p><i>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!</i></p>
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2.6 Cooling

The boards are cooled by forced air convection through two 12 VDC axial fans (140 m³/h (85 cfm)).

The fans are located in a hot-swappable fan tray.

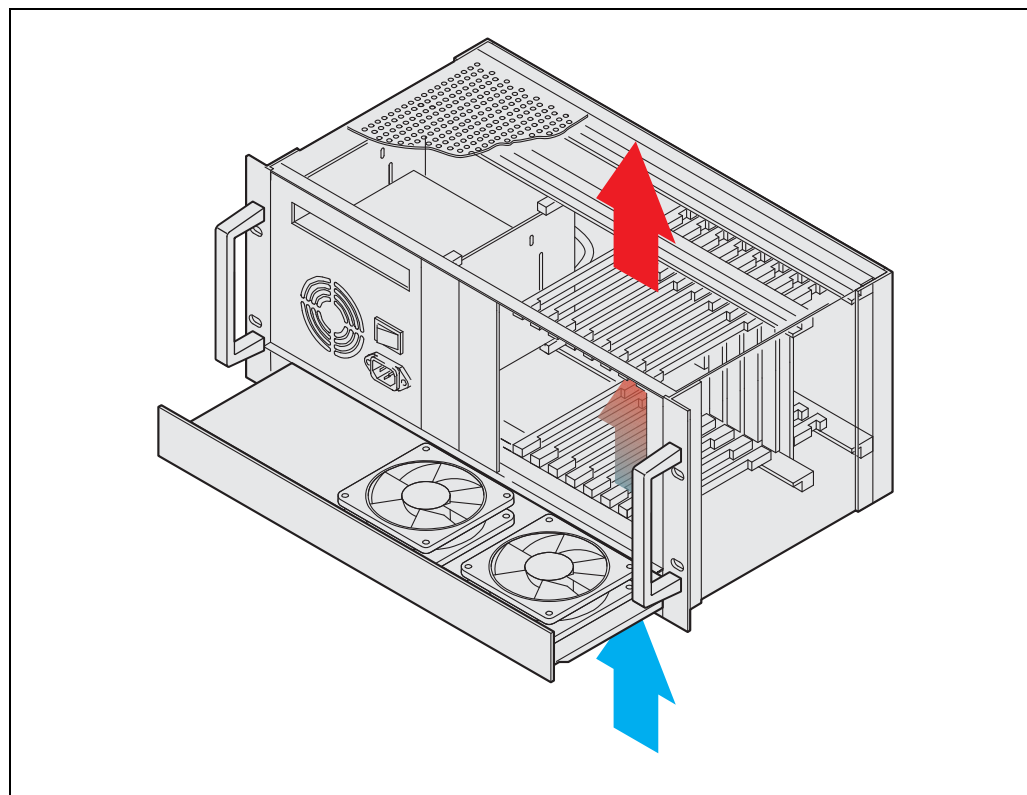
The operating temperature is from 0°C to 50°C.



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 4: Airflow



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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.



Filler Panels and Air Baffles

Air baffles and front panels with air baffles are available in the Schroff catalogue or at www.schroff.biz

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 Kit

A rack mounting kit comes with the system.

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 $< 0,1 \text{ Ohm}$.
- Switch on the system and check all CPCI voltages directly on the backplane connectors before the board assembly.
Note: The ATX power supply requires a minimum load!
- Plug-in the boards
- Cover all open Slots with filler panels.

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 or 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/CPCI Serial 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	Shielded europacPRO chassis 4 U / 84 HP with front handles
1	CPCI/CPCI Plus backplane (PICMG2.0 R.3.0, PICMG 2.30), 8 slot 3 U
1	Front card cage for max. 8 boards 3 U 160 mm deep IEEE guide rails inc. ESD clips)
1	Rear card cage for max. 3 CPCI peripheral boards 3 U 80 mm deep IEEE guide rails inc. ESD clips
1	300 W ATX power supply with input range of 100 VAC to 240 VAC, IEC320-C14 connector and mains/line switch. w4 voltages: 3,3 V / 28 A; 5 V / 30 A; 12 V / 15 A; -12 V / 0,8 A)
1	Complete AC/DC cabling
1	Fan Tray 1 HP with 2 fans 140 m³/h (85 cfm) each
1	Drive holder for a slim line DVD drive
1	Drive holder with front panel 3 U, 8 HP for a 3,5" HDD
2	Front panels 3 U, 4 HP
1	Front panel 3 U, 48 HP
1	19" rack mounting kit

Please order the power cable separately.

4.4 Accessories

Order No.	Description
20848-75x	Front panels for Rear I/O Boards, dimensions see catalogue
24579-033	Air filter kit
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.

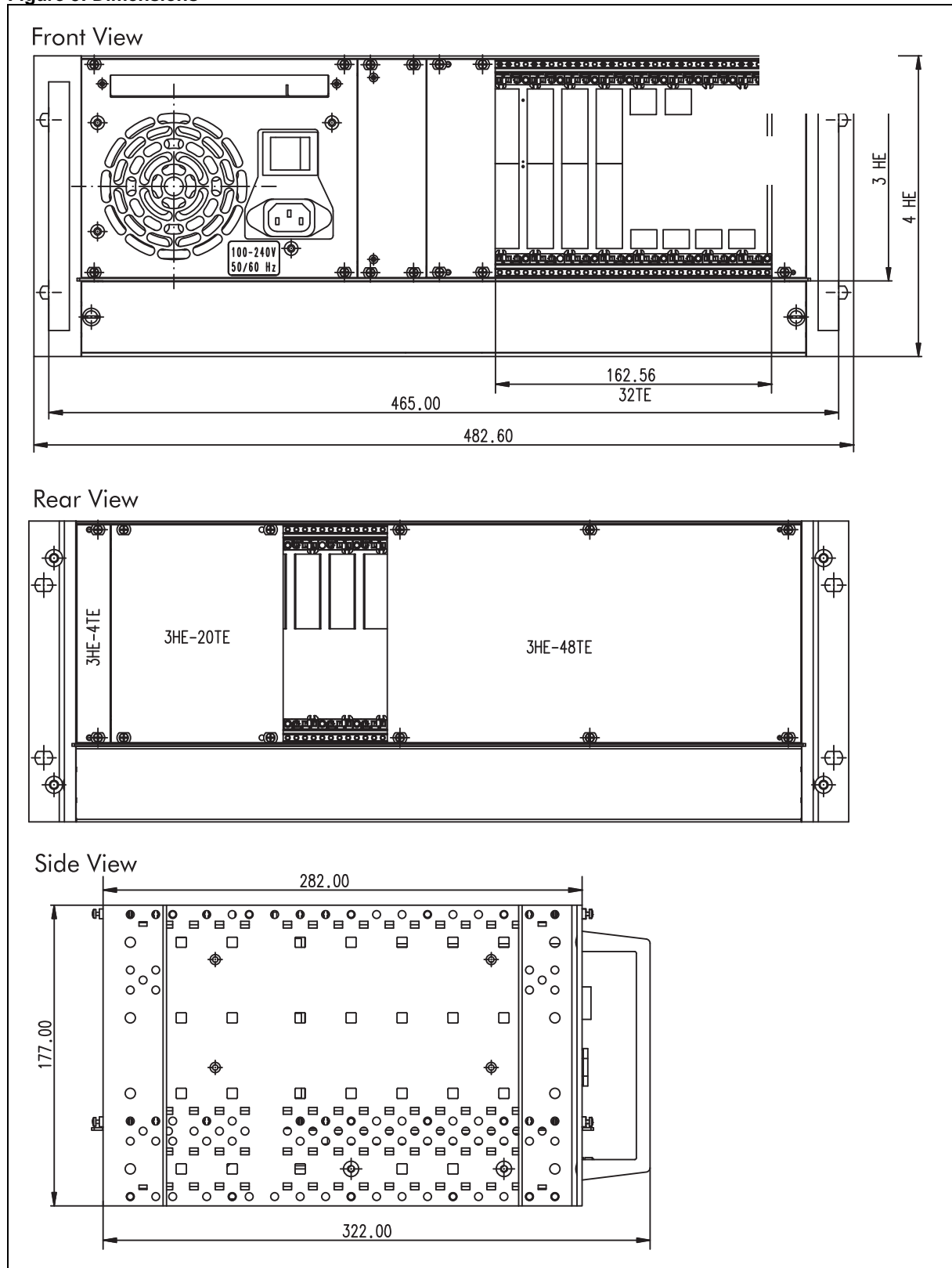
5 Technical Data

Table 6: Technical Data

Dimensions	
Height	4 U
Width	482.60 mm (19")
Depth (Card cage)	275 mm
Depth (Overall with handles)	322 mm
Weight	
Completely assembled	approx. 7,5 kg
Power Supply	
Input Voltage	100 VAC to 240 VAC
Frequency	50 / 60 Hz
Power input	up to 300 W
Cooling	
2 x 12 VDC fans	140 m ³ /h (85 cfm) each, free blow
Ambient Temperature	
Operation	+0 °C to +50 °C
Storage	-40 °C to +85 °C
Humidity	
Admissible humidity	30 % to 80 %, non-condensing
EMC, fulfils requirements for:	
Transient Emissions	EN 61000-6-3
Interference Resistance	EN 61000-6-2
Safety	
Test voltages 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
Electromagnetic Shielding	
Shielding attenuation	typ. 40 dB at 1 GHz if shielded front panels are used.

6 Dimensions

Figure 5: Dimensions





SCHROFF GMBH

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