XL-PSB

CompactPCI® Platform

Technical Reference Manual
Version 1.0, May 2002

Note: The latest releases of the Technical Reference Manuals are available at:
ftp://ftp.kontron.ca/Support/Product_Manuals/

kontron
www.kontron.com

Ref. : M6203_TECH

UNPACKING AND SAFETY PRECAUTIONS

UNPACKING

Follow these recommendations while unpacking:

1. After opening the box, save it with the packing material for possible future shipment
2. Inspect the cabinet for damage. If there is any damage, or items are missing, notify KONTRON immediately.

SAFETY PRECAUTIONS

STATIC ELECTRICITY

Since static electricity can damage the boards, the following precautions should be taken:

- Keep boards in their antistatic package, until you are ready to install them.
- Touch a grounded surface or wear a grounding wrist strap before removing the boards from their packages; this will discharge any static electricity that may have built up in your body.
- Handle the boards by the edges.

STORAGE ENVIRONMENT

Electronic boards are sensitive devices. Do not handle or store devices near strong electrostatic, electromagnetic, magnetic or radioactive fields.

POWER-SUPPLY

Before any installation or setup, ensure that the boards are unplugged from power sources or subsystems.
If the system is already running and a board or power-supply must be swapped or simply removed, the only removable devices under power-on status must be HA (hot swappable) featured.

Instructions for the Installation and Removal of Assemblies and Components



Repairs on the device may only be carried out by authorized qualified personnel. Unauthorized opening or unqualified repairs can result in considerable risk to the user (electrocution, fire).



Assemblies with electrostatically sensitive devices (ESD) can be identified by the illustrated sticker:

This applies especially to ISA/PCI cards.

When handling assemblies with ESD warnings, the following instructions must be observed:

1. You must discharge static electricity (e.g., by touching an earthen object) before working with assemblies.
2. Devices and tools used must be free from static charges.
3. Pull out the main plug before connecting or disconnecting assemblies.
4. Only hold the assemblies at the edge.
5. Do not touch any connection pins or conductors on the assembly.

Safety Instructions

Please read carefully and observe the instructions for your own safety and correct use of the device.
In order to maintain this condition and ensure safe operation, the instructions and warnings contained in this manual and on the device must be observed.

The unit is built and tested in accordance with EN60950/UL60950/CSA22.2 No.950 and left the works in a safe condition.

We shall be exempted from our guarantee obligations if the user fails to observe the safety instructions.
We can only guarantee the safety, reliability, and performance of the system if all of the following safety instructions are observed:

1. The system must be used in accordance with the instructions for use.
2. Maximum recommended ambient temperature (Tmra) = 45°C

   Elevated Operating Ambient Temperature - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the Tmra = 45°C.
3. **Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
4. **Mechanical Loading** - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
5. **Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
6. The electrical installations in the room must correspond to the requirements of the respective regulations.
7. Make sure that there are no cables, particularly main cables, in areas where people can trip over them.
8. Keep the main power inlet connector of the system or the main socket, from which the system is powered, easily accessible, so at least one can be used as disconnect device.
9. Only use the main cable supplied with the system.
10. Make sure that the DC/AC operation voltage cited in the manual corresponds to the DC/AC voltage supplied and that the maximum value is not exceeded even briefly.
11. When setting up the unit and accessories, observe the local or national regulations for workstation ergonomics.

12. Do not set up the system where it is exposed in the proximity of heat sources, or in a damp location. Make sure the system has adequate ventilation and that the ambient temperature is in the range specified for the system.
13. Properly secure cables and connectors.
14. It must be assumed that safe operation is no longer possible if the system:
    - has visible damage or
    - no longer operates

    In these cases the system must be shut down and secured against unintentional operation.
15. If extensions are made to the system, legal stipulations and system specifications must be observed.
16. Assembly, extensions, new settings, alterations, or repairs may only be carried out by qualified people.
17. Adjustment, maintenance, or repair on the open system may only be carried out by qualified personnel familiar with the associated dangers.
18. The system must be switched off before removing and/or installing any components.
19. Only original accessories approved by the company may be used.
20. The safety of the system must be re-evaluated by competent authorities when adding components that were not part of the delivered configuration.
21. Ensure that reliable Earthling path is maintained in rack system. This unit is intended to be connected to Earth ground.

FCC Rules

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.



This equipment is certified class 1 laser.

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PART 1

1 PRODUCT DESCRIPTION

1. PRODUCT OVERVIEW
2. PRODUCT SPECIFICATIONS
3. COMPATIBILITY WITH KONTRON PRODUCTS
4. INSTALLING HOT SWAPPABLE MODULES

1.1 Product Overview

The Kontron XL-PSB is an 8U, 19" rackmount CompactPCI platform designed with state-of-the-art technology and unparalleled versatility and built to be fully reliable and scalable.

It's an entry- to medium-level solution for OEMs who require robust and cost-effective systems today, but can easily migrate to Kontron's XL-VHDS platform for high-end , high availability requirements tomorrow.

The XtreamLink family of CompactPCI platforms can provide developers with all the requirements for innovative convergence networking solutions..

Features	Benefits
PICMG 2.16-compliant packet switching backplane with redundant hot-swap Ethernet switch cards	High performance and reliability. This may be significantly increased when used with Kontron's 2.16-compliant boards
Two H.110 telephony buses	Support for a variety of computer telephony applications such as media and VoIP gateways.
Two 64-bit cPCI buses	Capacity and scalability. Allows for future expansion and upgrades.
Redundant hot-swap power supplies	Increased serviceability.
Hot-swap fan tray with three 150CFM fans	Fans may be serviced without system shutdown.

Options include two power-supplies, and one hot-swappable fan tray. It supports all Kontron's PICMG 2.16 compliant SBCs.

Master or Slave : cPCI-DT64 with CTM80-2

Slave Only : DMXP-64GX with CTM80-STD series

The XL-PSB is ideal for OEMs and systems integrators seeking platforms to shorten their time-to-market.

Power-supply options include a 350 W AC version, in single or redundant configuration. The front loaded 2U fan tray is hot-swappable and features a cooling capacity of over 450 CFM.

The XL-PSB supports up to fourteen (14) processor boards, that is, two (2) system processor and up to twelve (12) peripheral processors, and 2 fabric slots for Ethernet switches in a single 8U 19-inch chassis.

Kontron's XL-PSB feature set includes:

- Front loaded hot swappable 2U fan tray
- One type of power supply

  - One or two redundant, hot swappable power supplies.

The fan-tray is a 2U-rackmount fan, which operates like a drawer and it is intended to vent the individual subracks. The insertion and removal is performed from the front of the system. The fan tray is equipped with:

- Three fans with two LEDs:
- A green power on LED which lights up when the fans are functioning properly
- A red alarm LED which lights up when at least one of the fans has failed.

1.2 XL-PSB Product Specifications

<table>
<tr><th colspan="4">XL-PSB Technical Specifications</th></tr>
<tr><td>CPU Boards</td><td colspan="3">Boards supported are:
• cPCI-DMXP64GX CompactPCI Peripheral Processor
• cPCI-DT64 CompactPCI System and Peripheral Processor</td></tr>
<tr><td>Backplane</td><td colspan="3">Conforms to 2.0 R3.0 CompactPCI specifications; also designed to support PICMG Hot-Swap specifications
Supports 32-bit and 64-bit PCI architectures
Two 6U cPCI system slots with 2.16 support
Twelve (12) cPCI peripheral slots with H.110 bus and 2.16 support
Two Fabric slots for 2.16 Ethernet switches</td></tr>
<tr><td rowspan="3">Rear Panel</td><td rowspan="2">cPCI-DMXP64GX</td><td>cTM80-STD1S</td><td>CompactPCI Transition Module, Single Slot (4HP) form factor</td></tr>
<tr><td>cTM80-STD2S</td><td>CompactPCI Transition Module, Dual Slot (8HP) form factor</td></tr>
<tr><td>cPCI-DT64</td><td>cTM80-2</td><td>Transition Module for cPCI-DT64
Single and Dual Slot form factor</td></tr>
<tr><td>Data Storage</td><td colspan="3">cMC Series of Mezzanines with hard disk, floppy and bridge</td></tr>
<tr><td>System power input</td><td colspan="3">100 to 240VAC, 5A @ 50/60 Hz</td></tr>
<tr><td rowspan="2">Power Supply</td><td colspan="2">Input Voltage
Power Factor
Input Current</td><td>AC: 100 to 240 VAC @ 50/60 Hz
0.99 at full load and nominal line
5A maximum @ 100VAC</td></tr>
<tr><td colspan="2">Output Power Ratings</td><td>+5V / 30A, +3.3V / 3A, +12V / 12A, -12V / 3A</td></tr>
</table>

XL-PSB Technical Specifications (continued)			
Accessibility	Front	Power supplies, fans, CPU and I/O boards	
	Rear	Transition I/O board and power input	
	I/O	Front and/or rear capable depending on card selection	
Thermal	Front loaded hot swap 2U fan tray with three 150CFM fans and fan monitoring LEDs.		
Material and Finish	Chassis:	1.5 mm cold rolled steel sheet, clear zinc plated, and painted black	
	Covers:	1 mm cold rolled steel sheet, clear zinc plated, and painted black	
	Plastic Guide Rails:	Polycarbonate (UL94 V-1)	
	Front Panel	2.5 mm aluminum extruded, clear chromate	
	Injector/Ejector Handle	Fiber glass reinforced PBTB (UL94-V0)	
Ventilation	Hot swappable with lock sensor and LED's for monitoring		
	Bottom-to-top, positive pressure, forced air cooling using 12 VDC brushless, ball-bearing fans, 3 mounted in front removable fan tray.		
	Thermal results and airflow characteristics will vary according to placement and height of components on installed boards.		
	Front air inlet and top air exhaust		
	Removable, washable, foam filter (300 ppi filtration)		
Environmental		**Operating**	**Storage and Transit**
	Temperature	0°C to +45°C (32°F to 113°F)	-40°C to +70°C (-40°F to 158°F)
	Humidity	5 % to 90 % @ 45°C/113°F non-condensing	0 % to 95 % @ 40°C/104°F non-condensing
	Altitude	Meet or exceed Bellcore GR-63	
	Shock	15 G max. at 11msec duration, 3-axis	
	Vibration	1 G max., 5 Hz to 500 Hz, 3-axis	
	Acoustic noise	55 dB at 1 m in front of system at full load	

XL-PSB Technical Specifications (continued)		
Physical	Dimensions Construction Finish Weight	355 mm x 483 m x 297 mm (14”h (8U) x 19”w x 11.7”d) Heavy-gauge steel Zinc-plated with black powder coat Approximately 40 lbs
Warranty	2 years	
Safety	UL 60950 3rd edition, CE Mark to EN60950, CSA C22.2 No 950	
EMI/EMC	FCC47 CFR Part 15, Subpart B, CISPR22 Class A CE Mark to EN 55022 Class A, EN61000-3-2, EN61000-3-3 / EN55024	

1.3 Slot Functionality

Slot type	System Slot	Node Slot	Fabric Slot
Slot Location	1, 9	2-7, 10-15	8, 16
CompactPCI	System	Peripheral	Peripheral
H.110	No	Yes	No
2.16 Link	Dual Node	Dual Node	Standard Fabric
Rear I/O	P3, P4, P5	P3, P5	P3, P4, P5

1.4 Compatibility with Kontron products

The XL-PSB industrial enclosure is a member of the KONTRON CompactPCI product family.

When building a basic environment around the XL-PSB, the system may be composed of any of the following products (this may vary depending on product availability and product life):

XL-PSB Compatible Products	
cPCI-DMXP64GX cPCI-DT64	6U peripheral processor board, dual CPU, hot swappable 6U system or peripheral processor board, dual CPU, hot swappable
cMC series	Mezzanine Cards
cTM80-STD series (use with cPCI-DMXP64GX)	CompactPCI Transition Modules
cTM80-2 (use with cPCI-DT64)	CompactPCI Transition Modules
PCI-350AC	350 W AC removable Power Supply
PCI-350ACR	Two (redundant) 350 W AC removable Power Supplies

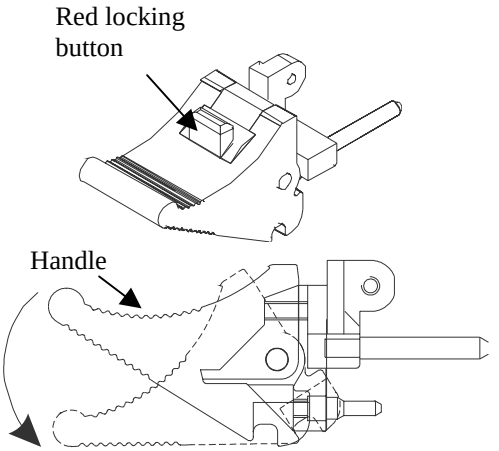
1.5 Installing Hot Swappable Boards

1. Choose a free slot on the on the front of the chassis.

> ➢ **Warning**
>
> An appropriate slot must be selected accordingly to the board being inserted. A mechanical keying is provided to prevent the wrongful insertion of components (boards or power supply) into the unit. If you feel resistance when inserting the board, verify the keying.

2. Remove the front plate of the slot where you intend to insert the board.
3. Align the board with the guide-rails and gently slide it in until it touches the backplane connector.
4. Insert the board's connector into the backplane connector by simultaneously pressing on the front plate and lifting up on the handle until the retaining clip of the handle hooks into the chassis.
5. Fasten the board using the front-plate fixing screw to secure the board to the system chassis.

To remove the board from the chassis, proceed as follows:



- Remove the front plate fixing screw.
- Press the red locking button to disengage the retaining clip.
- Wait until the blue LED lights.
- Press the handle to act as a lever to disengage the CompactPCI connector from the backplane.
- Pull on the handle and gently remove the board.

> ➢ **Warning**
>
> Some mechanical parts of the guide-rail are fragile (shield contacts and clips). Do not use force to insert and connect a CompactPCI board. If there is any mechanical resistance while you insert a board, first ensure here is no mechanical obstacle and check for the alignment of all parts.

PART 2

2 FEATURES

1. CHASSIS DESCRIPTION
2. CABINET FEATURES
3. DEVICE LOCATIONS
4. OVERALL DIMENSIONS
5. BACKPLANE
6. POWER SUPPLIES
7. FAN TRAY
8. REAR-PANEL I/O

2.1 Chassis Description

The chassis features sixteen CompactPCI slots (two 6U master SBC, twelve 6U slave boards, and two fabric boards), and two power-supply modules (350 W), a horizontal slot for a fan tray located at the bottom, and a rear-panel I/O.

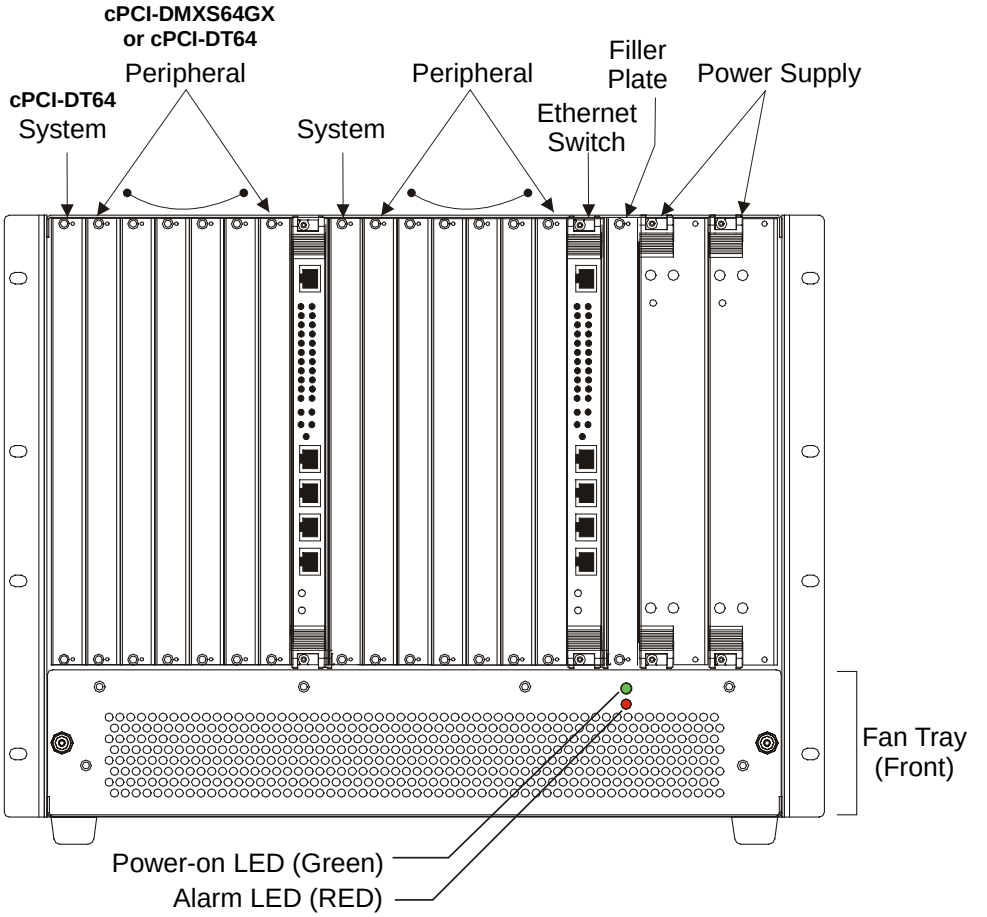
Peripherals		
Description	**Dimensions**	**Location**
Power Supplies		
Power Supply 1	6U x 8HP	Slots 18 and 19
Power Supply 2	6U x 8HP	Slots 20 and 21
CompactPCI Boards		
Single Board Computer (System) Single Board Computer (Peripheral)	6U x 4 or 8HP 6U x 4 or 8HP	CPCI slots 1 and 9 CPCI slots 2 to 7 and 10 to 15
2.16 Fabric Slots (Ethernet Switch)	6U x 4HP	CPCI slots 8 and 16
Rear-Panel I/O (not available in H110 configuration)		
Rear-Panel I/O Adapter Board	6U x 4HP or 8HP	Back of chassis
Fan Tray		
Fan Tray	2U x 84HP	Bottom of chassis

The main AC power is drawn into the chassis components through an IEC power plug with 2-stage filter, fuse holder and power switch. All features are provided at the rear of the chassis. The chassis may be used either as a desktop system or a rack-mount bay.

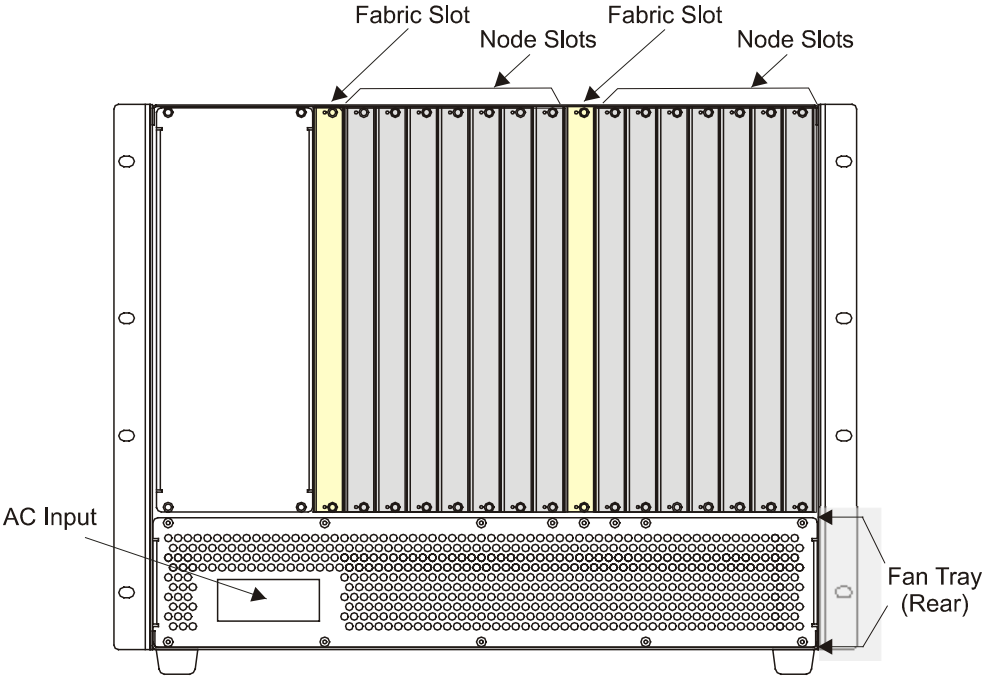
The mechanical format of the system boards is 6U-form factor (Eurocard format), which complies with the CompactPCI design specification and takes advantage of the existent enclosures, card-cages, and fixtures widely used in applications such as communications, military, and medical.

2.2 Device Locations

2.2.1 Front View



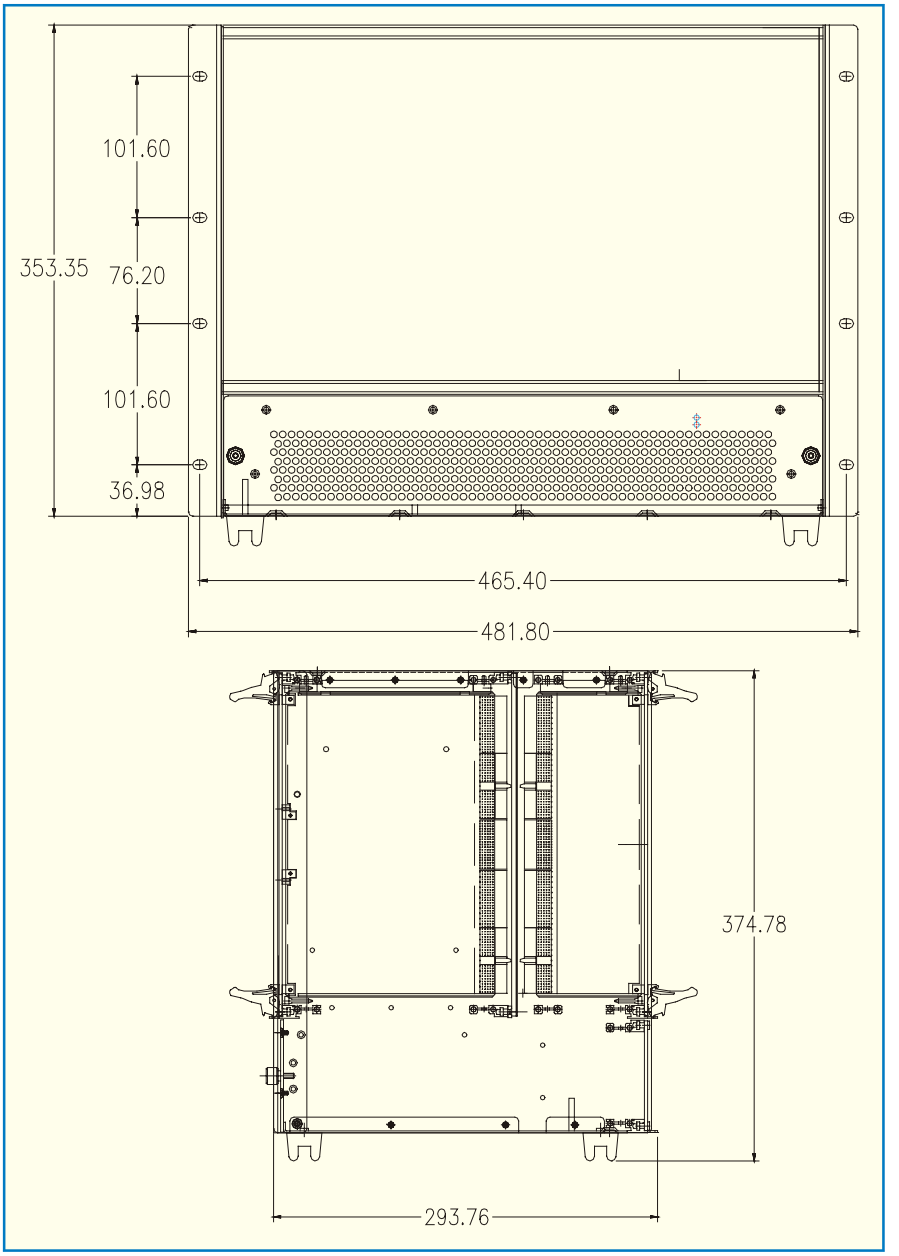
2.2.2 Rear View



Peripheral : cPCI-DMXP64GX with CTM80-STD 1S / 2S (Single / Dual Slot)
or cPCI-DT64 with CTM80-2

System : cPCI-DT64 with CTM80-2

2.3 Overall Dimensions



2.4 Backplane

2.4.1 PICMG 2.16 Packet Switching Backplane

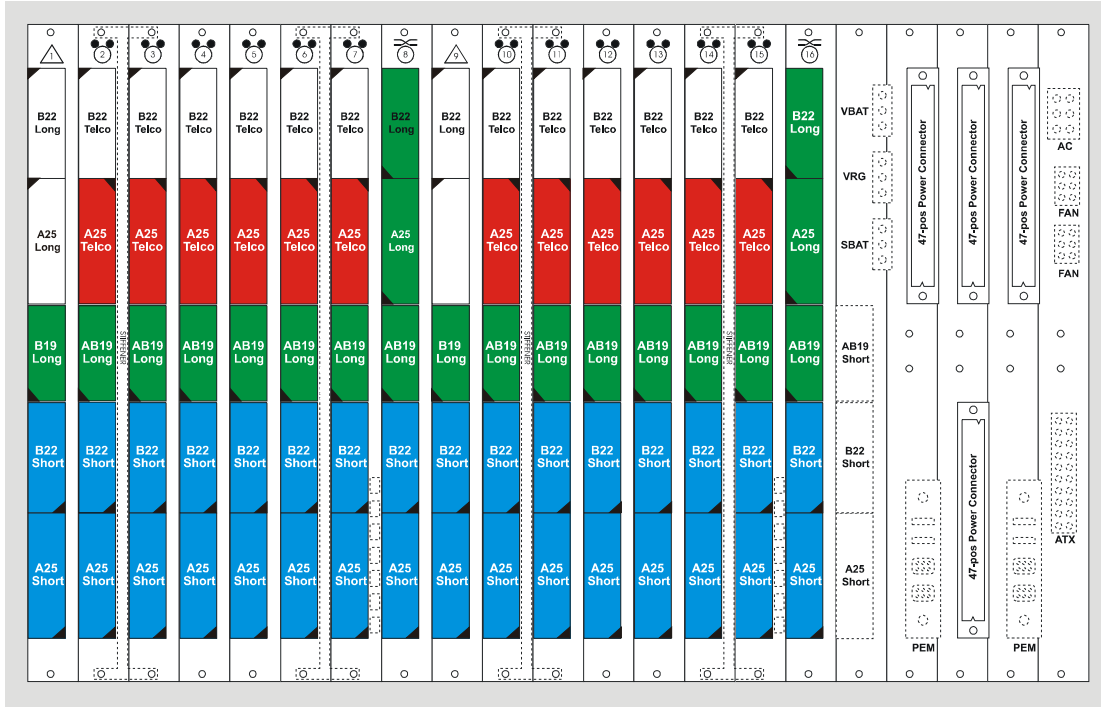
cBP 16R SPECIFICATIONS	
Designation	CompactPCI Passive Backplane
CompactPCI Slots	System Slots 2 CompactPCI 6U form factor System slot (64-bit) Peripheral Slots 12 CompactPCI 6U form factor Peripheral slot (64-bit) with H110 support
2.16 Slots	2 Fabric slots 14 Node slots
CompactPCI Connector Layout	Conforms to PICMG 2.0 R2.1 CompactPCI™ specification Conforms to IEC 917 and IEC 1076-4-101
Cooling	Fan Tray Interface
(1) Rear Panel I/O	Each slot provides rear-panel I/O on CompactPCI connectors. System slots (P3, P4, P5), peripheral slots (P3, P5).
Power Supply Connectors	Up to two 350 W power supplies in-rack connectors
Operating Temperature	0°C to 45°C - 5 % to 95 % Non-condensing Relative Humidity

2.5 Backplane Functionality Review

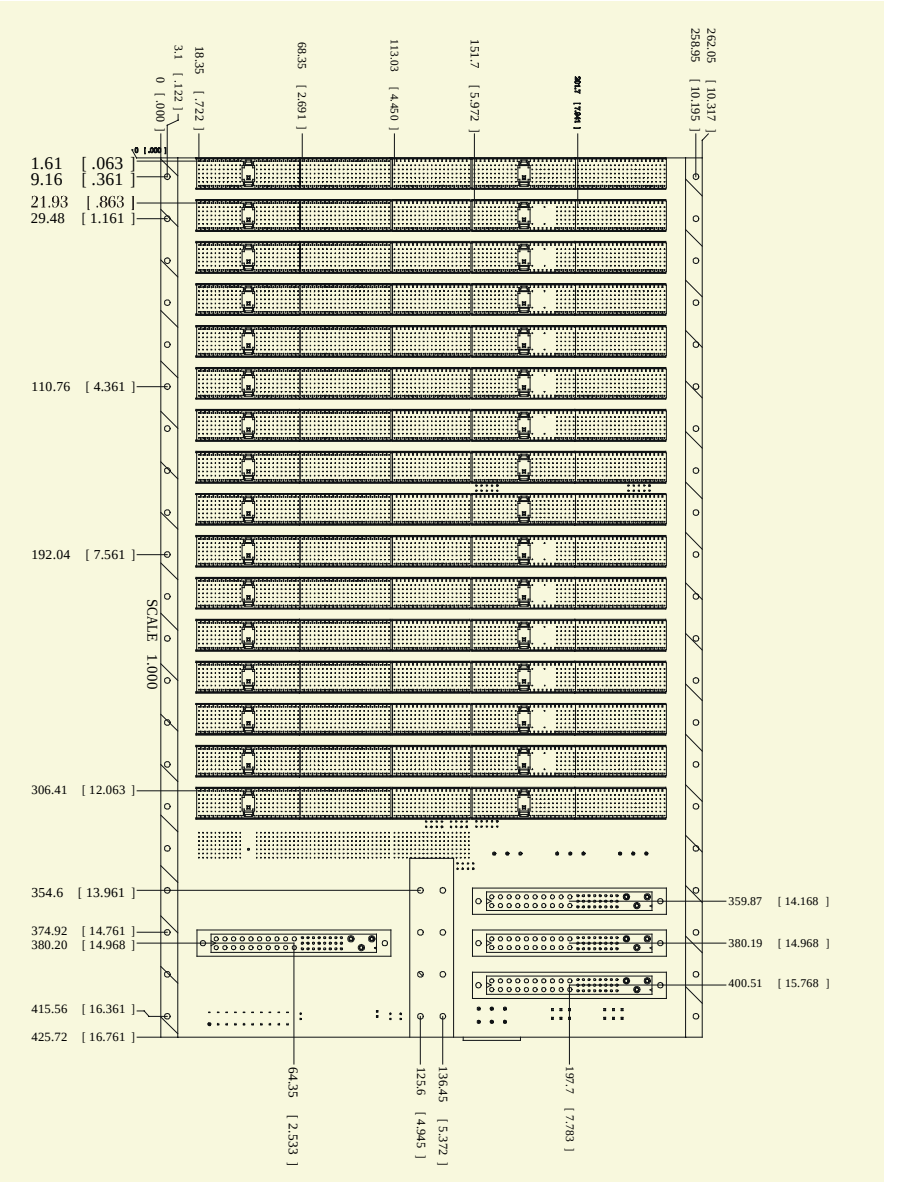
- H110 Telephony Bus
- PICMG 2.16 Bus
- PCI Bus: 33MHz/64-Bits

Master or Slave CPU Board:
DT-64 with 2.16 option
and 6701 RTM

Slave / Stand alone CPU Board :
DMXP-64GX with 2.16 option
CTM-80STD with 2.16 option



2.6 cBP-16R Assembly Top View Diagram



2.7 Power Supplies

The platform supports the following power supplies:

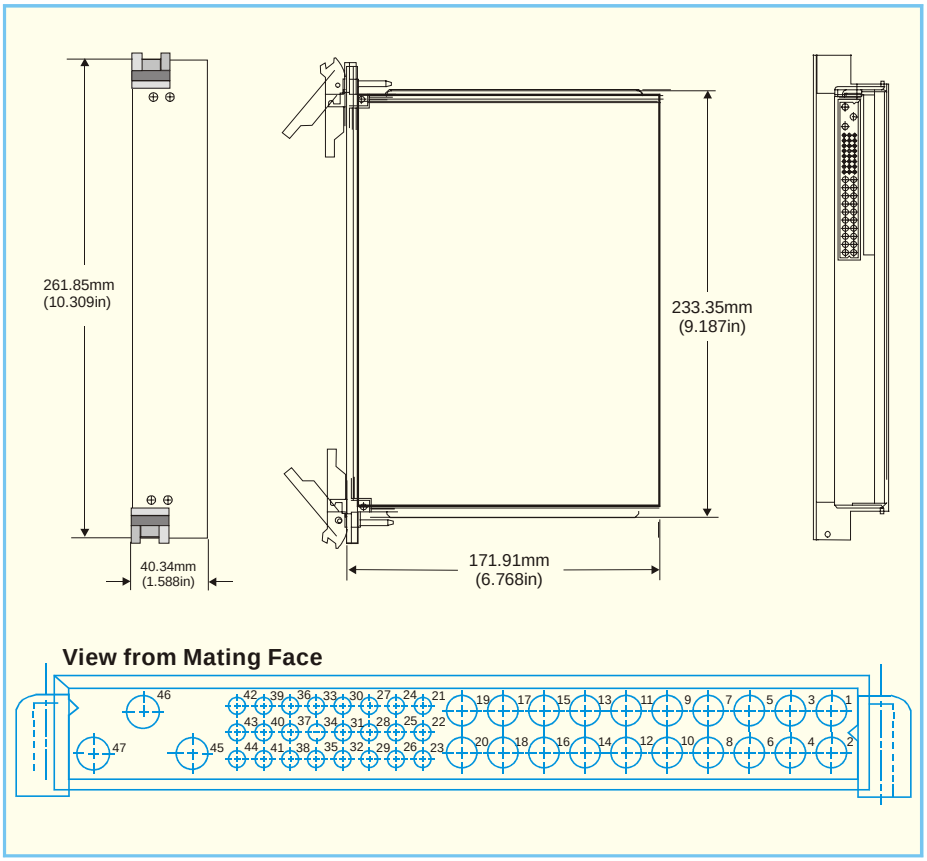
- cPS350AC – 350 W AC removable power supply
- cPS350ACR Two (redundant) 350 W AC removable power supplies

The 350 W removable power supply module operates in load sharing redundant mode and features hot-swap capabilities that allow on-site replacement of defective modules while the system remains powered on.

If the redundant power supply fails, the red LED indicator will alert the user of the need for maintenance.



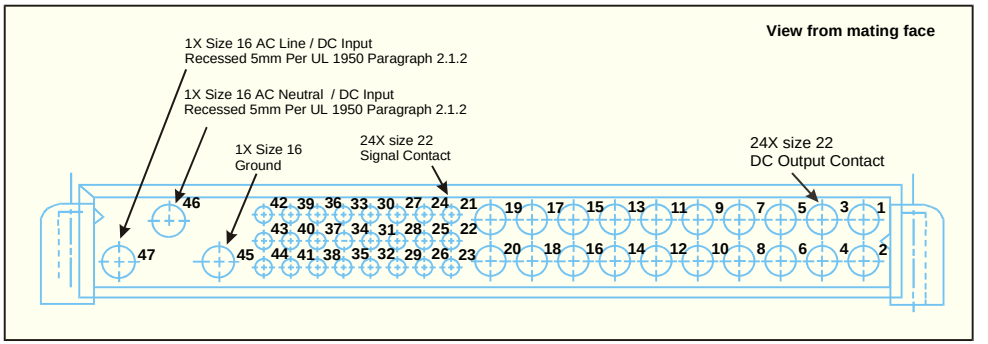
2.7.1 Power Supply Dimensions



2.7.2 Positronics PC9-47M400A1 Connector Pinout

Pin No.	Designation	Pin No.	Designation
1	+5 V	25	Not Used
2	+5 V	26	Not Used
3	+5 V	27*	Enable
4	+5 V	28	Not Used
5	GND	29	Not Used
6	GND	30	+5 V Sense
7	GND	31	Not Used
8	GND	32	Not Used
9	GND	33	+3.3 V Sense
10	GND	34	Sense Return
11	GND	35	Not Used
12	GND	36	+12 V Sense
13	+3.3 V	37	Not Used
14	+3.3 V	38	DEG#
15	+3.3 V	39	Inhibit
16	+3.3 V	40	Not Used
17	+3.3 V	41	Not Used
18	+3.3 V	42	Fail#
19	GND	43	Not Used
20	+12 V	44	Not Used
21	-12 V	45**	Safety Ground
22	GND	46	AC Neutral
23	Not Used	47	AC Line
24	GND		

* Pin 27 is a last mate, first break pin.
** Pin 45 is a first mate, last break pin.



2.7.3 350 W Power Supply Specifications

cPS Specifications		
Input Specifications	**Input Voltage**	AC: 90 to 264VAC, 47 to 63 Hz
	Power Factor	0.99 at full load and nominal line
	Input Current	Cold start: 18A at 115VAC, 36A at 220VAC Hot start: 80A for one-half cycle, under specified conditions
	Input Protection	Internal line fuse: AC, 10A; DC, 20A
	Input Transient Protection	Meets IEC1000-4-5, Level 3; IEC1000-4-4, Level 2; IEEE-587
	I/O Connectors	OPTIONAL: Two DIN M 24/8 type connectors Positronic 47 pin
Output Specifications	**Output Voltage & Current Ratings**	Output Vdc factory preset to ± 0.5% of nominal. See output power ratings table
	Current Share	Single wire connection; V1, V2 and V3
	Overshoot/Undershoot	Less than 1.0% at turn-on or turn-off Less than 3.0% for 50-100% step load change
	Start-up Time	Less than 4 seconds
	Efficiency	110Vac input: 70% typical measured at full-load 220Vac input: 74% typical measured at full-load 48Vdc input: 75% typical measured at full-load
	Regulation	Load: 0.5% with remote sense, 2% without Line: 0.1% over entire operating range
	Hold-Up Time	Ac input: 20ms minimum at full-load and low line
	Minimum Load	Minimum load not required
	Overcurrent Protection	All outputs set to 105-125% of full rated load with automatic recovery
	Overtemperature Protection	Automatic shutdown with auto recovery

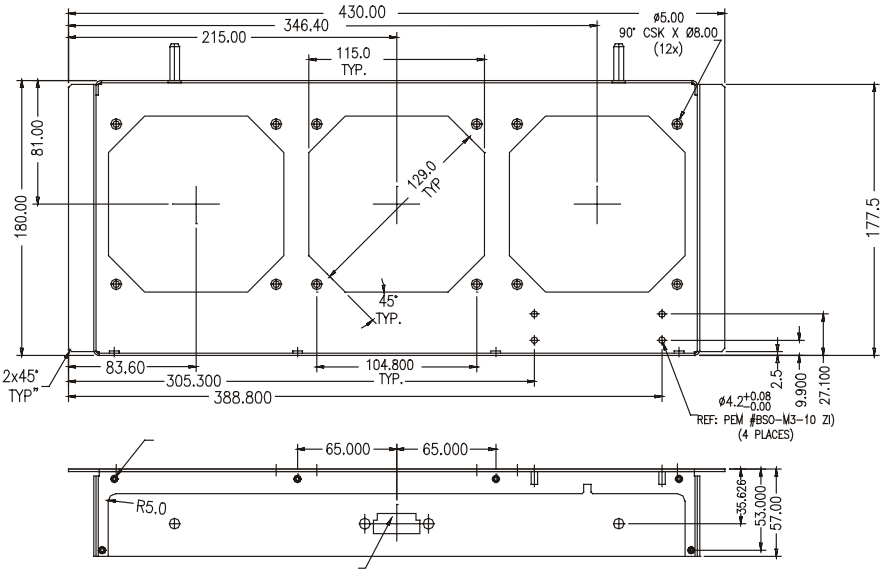
cPS Specifications (cont'd)		
Output Specifications	**Remote Sense**	Compensates for voltage drop of up to 0.5V to the load (V1 and V2)
	Overvoltage Protection	All outputs set at 125% of nominal. Reset by cycling input power, Inhibit or Enable
	Output Noise and Ripple	PARD: 1% or 100mVp-p, whichever is greater
	Harmonic Suppression	Meets EN6100-3-2
	Switching Frequency	Ac input, 200kHz; DC input, 150kHz

2.8 Fan Tray

A fan tray that contains three axial fans a permanent circulation of air within the chassis.

When the fans are functioning properly, the green LED is lit. A fault signal occurs when any fan fails (stops functioning) and is indicated by the red LED lighting up.

FAN TRAY	
Fan Quantity	3
Power-Supply	12VDC
Rated Current	0.82A
Front Plate	Power on LED : Green Alarm LED : Red
Total Air Displacement	450 CFM
Operating Temperature	-10°C to +55°C
Noise Level	51-52dB



2.9 Rear Panel I/O, CTM80-STD 1S and 2S

With standard CompactPCI boards, all connectors are located on the faceplate. Sometimes, this convenient feature is not acceptable because the faceplate must be free from cables and connectors. In this case, all cables are routed to an interconnection panel on the back of the chassis, known as a rear-panel I/O.

The rear-panel I/O duplicates all the I/O connections of the faceplate and provides some new ones.

This Rear Panel I/O must be used with the cPCI-DMXP64GX CompactPCI board. The following illustration shows a 4-HP configuration (1S) of the CTM-80STD.

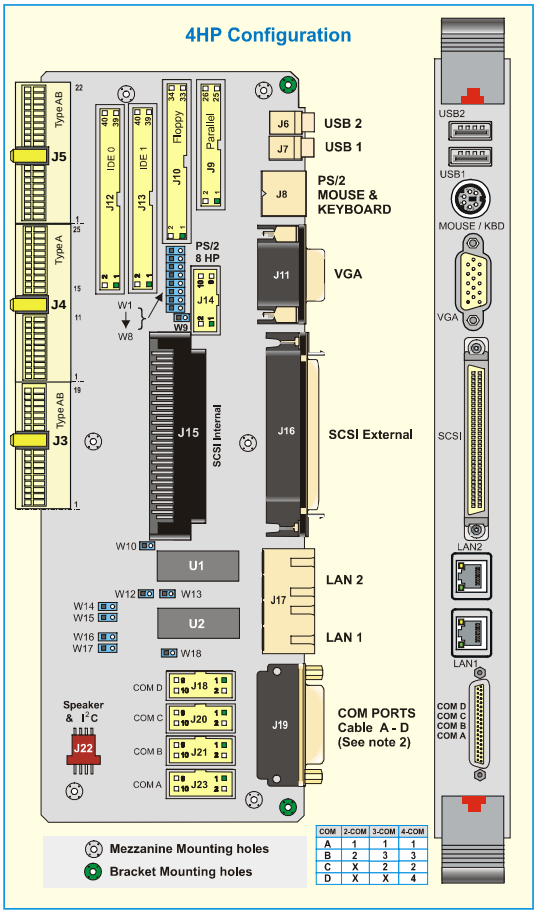
These connections are available on the CTM80-STD1S and 2S rear-panel I/O:

- COM 1-4 (see note)
- Parallel port
- Keyboard mini-DIN
- PS/2 Mouse
- Ethernet 1-2
- USB 1-2
- VGA
- Wide SCSI

Note:
Requires a special cable in 4HP configuration

The rear-panel I/O board also provides the following headers:

- Floppy 1
- IDE 1-2
- Wide SCSI
- PC speaker and I^2C



2.10 Rear Panel I/O (CTM80-2)

This Rear Panel I/O must be used with the cPCI-DT64 CompactPCI board.

The rear-panel I/O duplicates all the I/O connections of the faceplate and provides some new ones.

These connections are available on the CTM80 rear-panel I/O:

- COM1
- Keyboard mini-DIN
- PS/2 Mouse
- LAN 1 and 2
- USB 1 and 2
- VGA
- Wide SCSI

Note:
Requires a special cable in 4HP configuration

The rear-panel I/O board also provides the following headers:

- Floppy 1
- IDE 1-2
- Wide SCSI
- PC speaker and I^2C

