PATTON Electronics Co.

Model 6676
ForeFront Xtreme Chassis Assembly

User Guide

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Compliance Information

Radio and TV Interference

The Model 6676 ForeFront™ Xtreme™ Chassis generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The Model 6676 ForeFront Xtreme has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 6676 ForeFront Xtreme Chassis causes interference to radio or television reception, which can be determined by disconnecting the cables, try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna, and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

Industry Canada Notice

The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations. Repairs to some certified equipment should be made by an authorized maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the ground connections of the power utility, telephone lines and internal metallic water pipe system, are connected together. This protection may be particularly important in rural areas.

Users should not attempt to establish or modify ground connections themselves, instead they should contact the appropriate electric inspection authority or electrician.

FCC Part 68 Compliance Statement

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. Refer to the plug-in cards' user guide for details.

CE Notice

The CE symbol on your Patton Electronics equipment indicates that it is in compliance with the Electromagnetic Compatibility (EMC) directive and the Low Voltage Directive (LVD) of the European Union (EU). A Certificate of Compliance is available by contacting Technical Support.

About this guide

This manual is a comprehensive hardware reference tool for the Patton Electronics 6U cPCI Redundant Backplane/Midplane and Chassis line of products.

Audience

This guide is intended for the following users:

- System developers installing and integrating the products into their systems
- Operators
- Installers
- Maintenance technicians

Structure

This guide contains the following chapters and appendices:

- Chapter 1, "Introduction" on page 11 provides an overview of the product
- Chapter 2, "Installation checklist" on page 25 provides a quick set-up checklist for installing the Model 6676.
- Chapter 3, "Maintenance" on page 31 provides a quick set-up checklist, tips for troubleshooting, warranty information, and where to get help.
- Chapter 4, "Contacting Patton for assistance" on page 35 contains information on contacting Patton technical support for assistance
- Appendix A, "Replacement parts and accessories" on page 39 provides model numbers and descriptions for replaceable components and accessories
- Appendix B, "Glossary" on page 41 defines terms and acronyms used in this document.
- Appendix C, "Bibliography" on page 47 provides a list publications used in conjunction with this manual

For best results, read the contents of this guide *before* you install the enclosure.

Precautions

Notes and cautions, which have the following meanings, are used throughout this guide to help you become aware of potential problems. *Warnings* relate to personal injury issues, and *Cautions* refer to potential property damage.

Note Calls attention to additional or noteworthy information or tips.

The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.

The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.

The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.

The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

This symbol and the CAUTION heading indicates a situation where damage to equipment can be caused by electrostatic discharge.

This symbol and the IMPORTANT heading provides information which should be followed for best results when installing, configuring, or operating the Patton product.

Style conventions used in this document

Cross-references, figure titles, and table titles are hyperlinked. This means that if you have the on-line version of this document, you can click on the cross-reference and it will "jump" you to that reference within the document. This feature only works with references to sections/tables/figures within this document. References to other documents (for example, *PICMG 2.5 R1.0 CompactPCI Computer Telephony Specification*) are not hyperlinked.

Specific safety-related terms, traceable to certain safety regulatory agency requirements (i.e., IEC950 and harmonized derivative specifications) are used within this manual. Refer to the referenced document for a definition of these terms.

Typographical conventions used in this document

This section describes the typographical conventions and terms used in this guide.

General conventions

The procedures described in this manual use the following text conventions:

Table 1. General conventions

Convention	Meaning
Garamond blue type	Indicates a cross-reference hyperlink that points to a figure, graphic, table, or section heading. Clicking on the hyperlink jumps you to the reference source. When you have finished with the source, click on the **Go to Previous View** button in the Adobe® Acrobat® Reader toolbar to return to your starting point.
Garamond italicized type	Indicates the names of options on pull-down menus, names of menu bar options, or the names of fields or windows.
Garamond bold type	Indicates the names of command buttons that execute an action.
< >	Angle brackets indicate function and keyboard keys, such as <SHIFT>, <CTRL>, <C>, and so on.
`Are you ready?`	All system messages and prompts appear in the `Courier` font as the system would display them.
`% dir *.*`	Bold Courier font indicates where the operator must type a response or command

Mouse conventions

The following conventions are used when describing mouse actions:

Table 2. Mouse conventions

Convention	Meaning
Left mouse button	This button refers to the primary or leftmost mouse button (unless you have changed the default configuration).
Right mouse button	This button refers the secondary or rightmost mouse button (unless you have changed the default configuration).
Point	This word means to move the mouse in such a way that the tip of the pointing arrow on the screen ends up resting at the desired location.
Click	Means to quickly press and release the left or right mouse button (as instructed in the procedure). Make sure you do not move the mouse pointer while clicking a mouse button.
Double-click	Means to press and release the same mouse button two times quickly
Drag	This word means to point the arrow and then hold down the left or right mouse button (as instructed in the procedure) as you move the mouse to a new location. When you have moved the mouse pointer to the desired location, you can release the mouse button.

Chapter 1 Introduction

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Introduction

Thank you for purchasing Patton Electronics Co. Model 6676 ForeFront Xtreme Chassis (see figure 1). The Model 6676 ForeFront Xtreme Chassis is a modular 9U x 19 inch rackmount subrack-type packaging system adaptable to a wide array of product configurations.

ForeFront Xtreme Chassis features include:

- Fully compatible with all Patton ForeFront modules
- EMI shielding on entire assembly, with continuous chassis ground
- Lightweight and durable aluminum alloy construction, suitable for rugged environments
- Front mounting flanges for 19 in. rack mount environments

Figure 1. Model 6676

The ForeFront Xtreme Chassis offers a low cost, turnkey solution for customers desiring seventeen 6U x 160mm slots (two separate cPCI bus segments: one segment having 8 slots, the other 9 slots; only the power and alarm buses are common to both cPCIs) in the least possible vertical rack space. The superior design also accepts four 3U plug-in power supplies for N+1 redundancy. The power supplies are configured for external DC power input.

The rear of the chassis provides four 6U x 80mm slots for transition modules. Cooling is provided by the specially designed model 6670-FT plug-in fan tray module.

Description of chassis front side

There are 17 6U x 160mm slots at the front of the chassis (see figure 2). Front-entry ForeFront modules, in accordance with PICMG 2.0 CompactPCI specifications, are plugged into these slots.

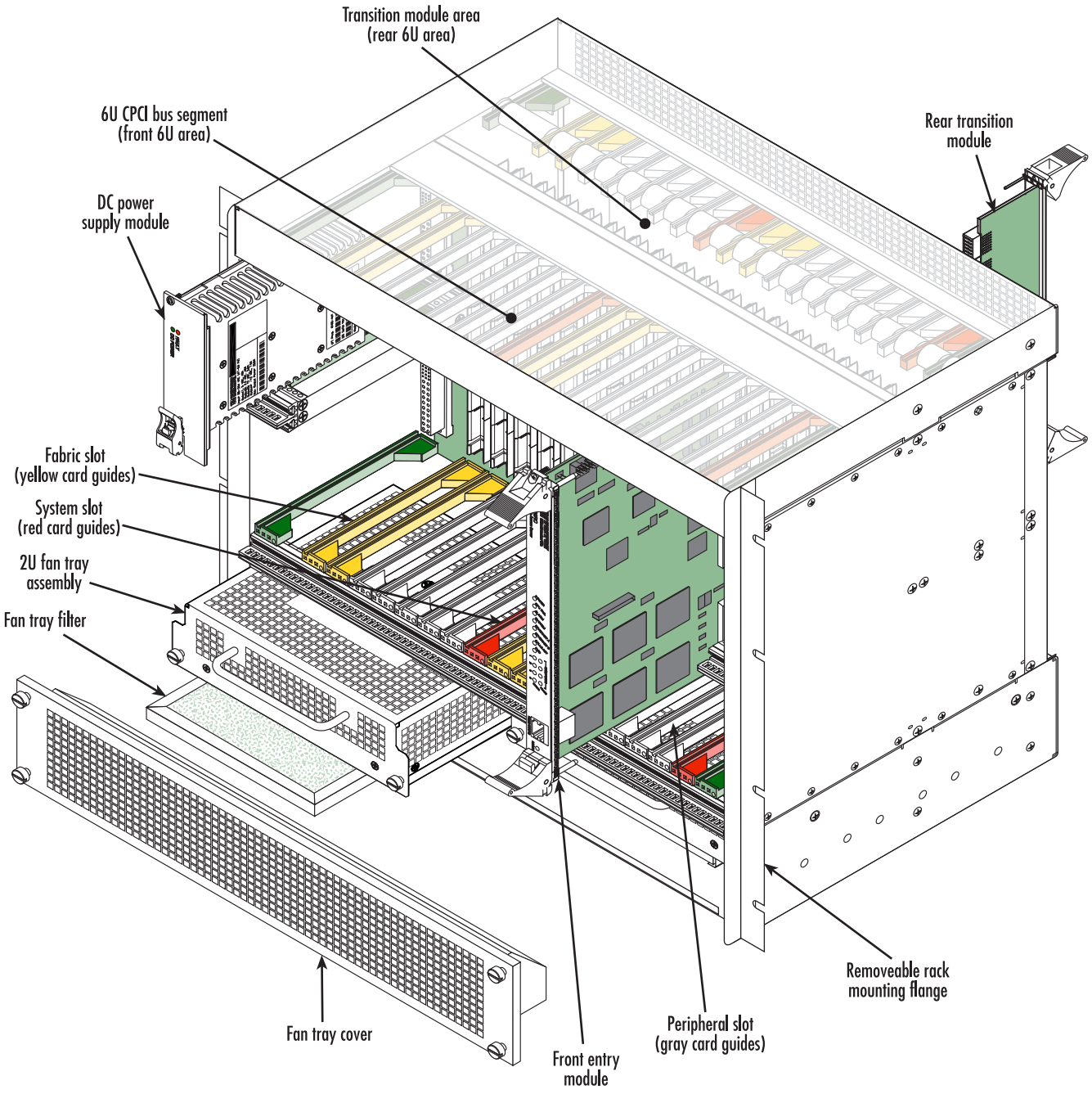

Figure 2. Model 6676 ForeFront Xtreme Chassis

The front of the chassis also provides four slots suitable for Model 6160 (DC) 3Ux8HP ForeFront power supplies (see figure 2 on page 14). The Model 6160 power supply is described more completely in the Model 6160 and 6161 User Manual.

All slots provide 4HP module spacing and are on 0.80 in. centers (except for the power supply slots, which are offset 0.1" as per PICMG 2.11 standard). Card guides are molded plastic with metallic ESD contacts per *CompactPCI PICMG 2.0 R3.0 & IEEE 1101.10*.

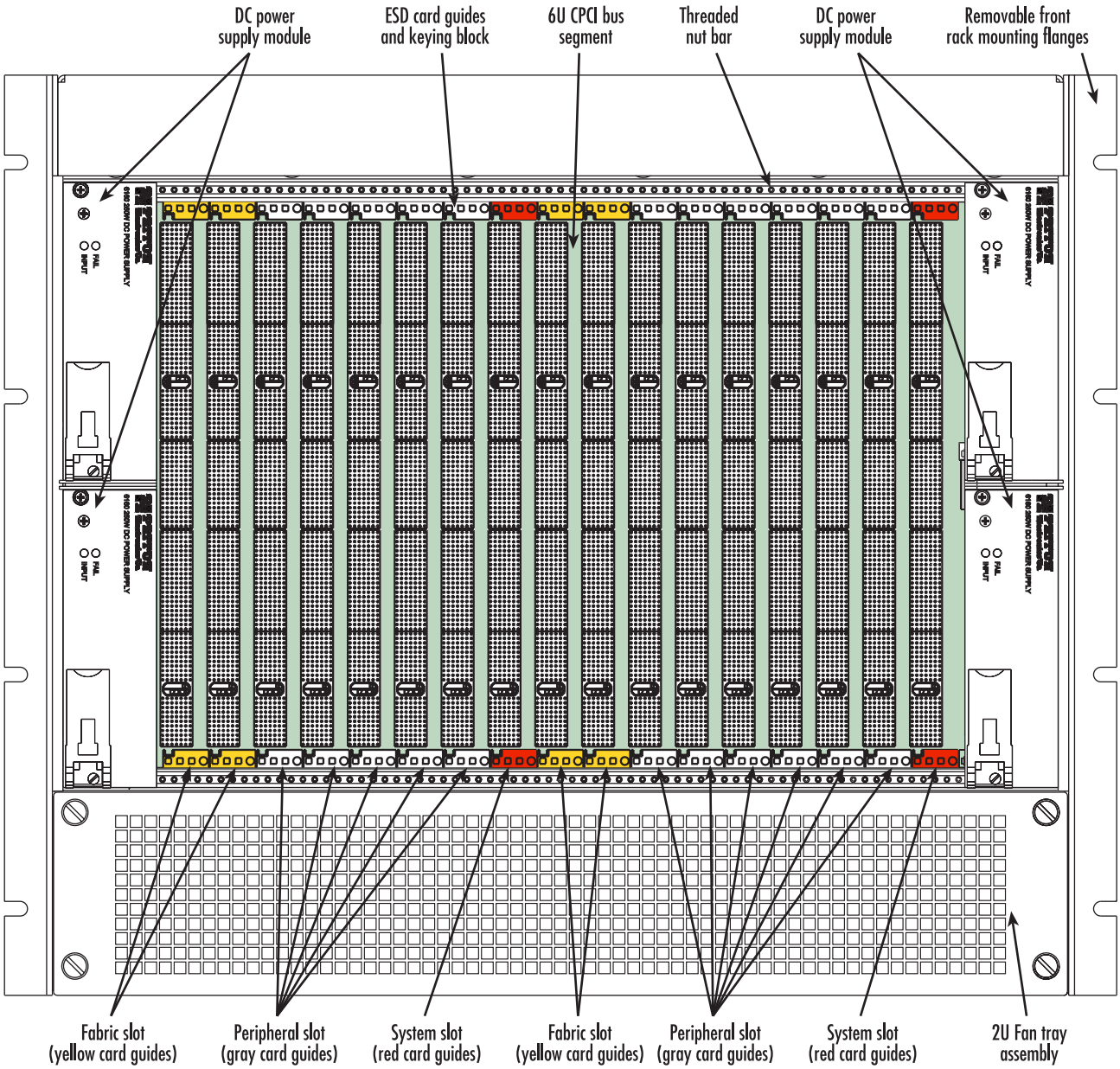

Figure 3. Front view of chassis

Description of chassis rear side

The rear of the Model 6676 chassis provides seventeen 6U x 80mm slots for ForeFront rear transition modules for rear-panel I/O (see figure 3). See section "ForeFront AIS blades" on page 20 for more information.

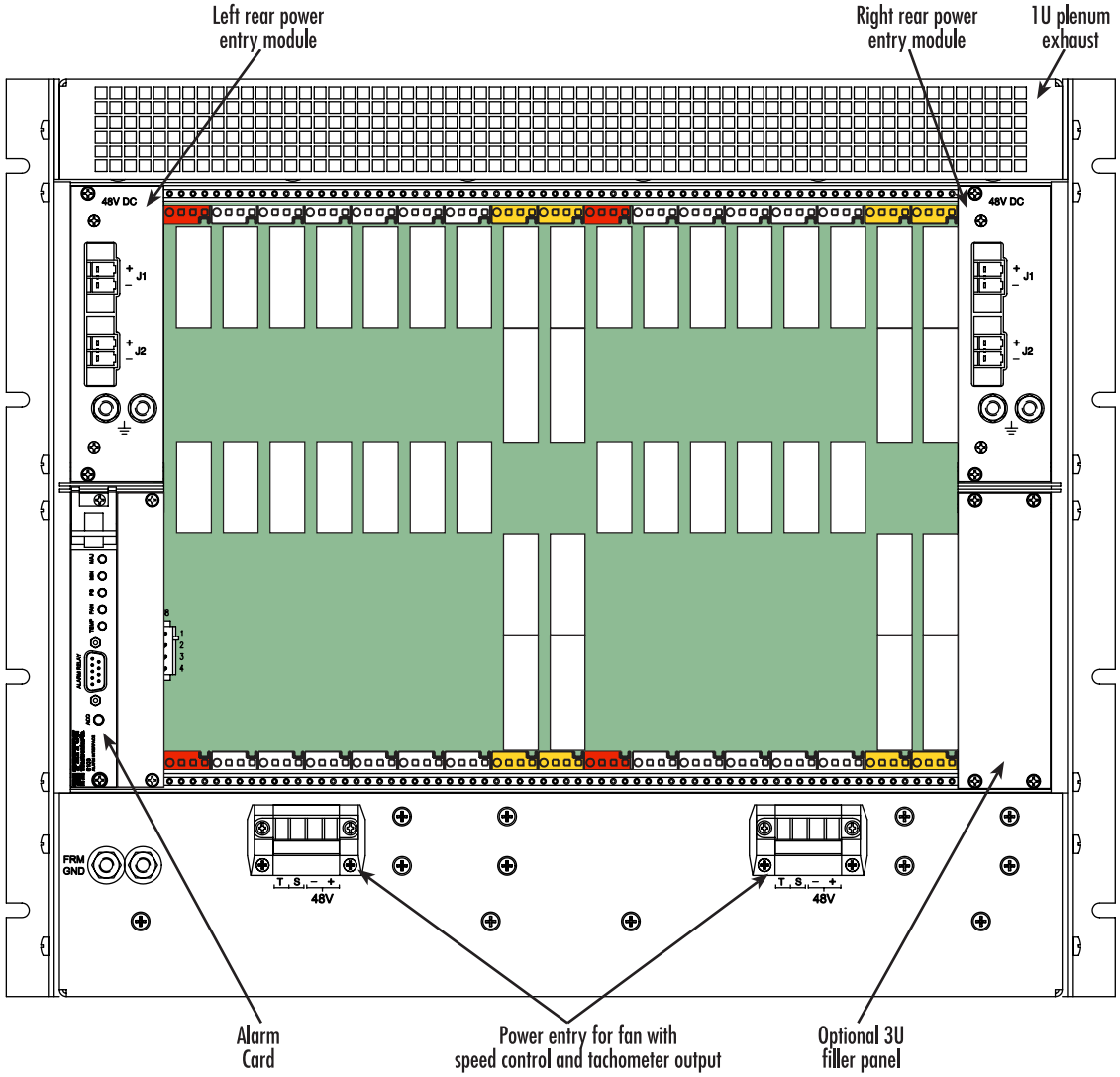

Figure 4. Rear view of chassis

All slots provide 4HP module spacing and are on 0.80 in. centers. Card guides are molded plastic with metallic ESD contacts at the bottom of the chassis per *CompactPCI PICMG 2.0 R3.0 & IEEE 1101.10*. Cardguides provide keying and alignment in accordance with IEEE 1101.10, section 8.

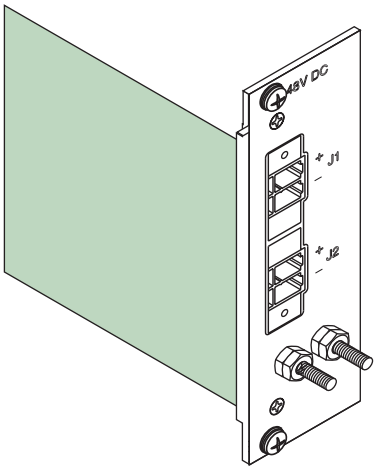

Figure 5. DC rear power entry module (2 per Model 6676)

A set of 3U slots allocated for two Patton Model 6112/HOR (DC) rear power entry modules (see figure 5).

Electromagnetic compatibility (EMC)

The Model 6676 ForeFront Xtreme is designed to provide the highest level of EMC performance—in terms of both interference and susceptibility. The chassis has the following design features to mitigate the effects of electromagnetic interference (EMI):

- All gaskets, contacts, and contact surfaces are electrically conductive.
- The mating surfaces of the EMC chassis and the EMC plug-in unit front panels and/or optional EMC filler panels are also conductive by use of gaskets/strips.
- All chassis and plug-in contact surfaces are connected to a common chassis ground.

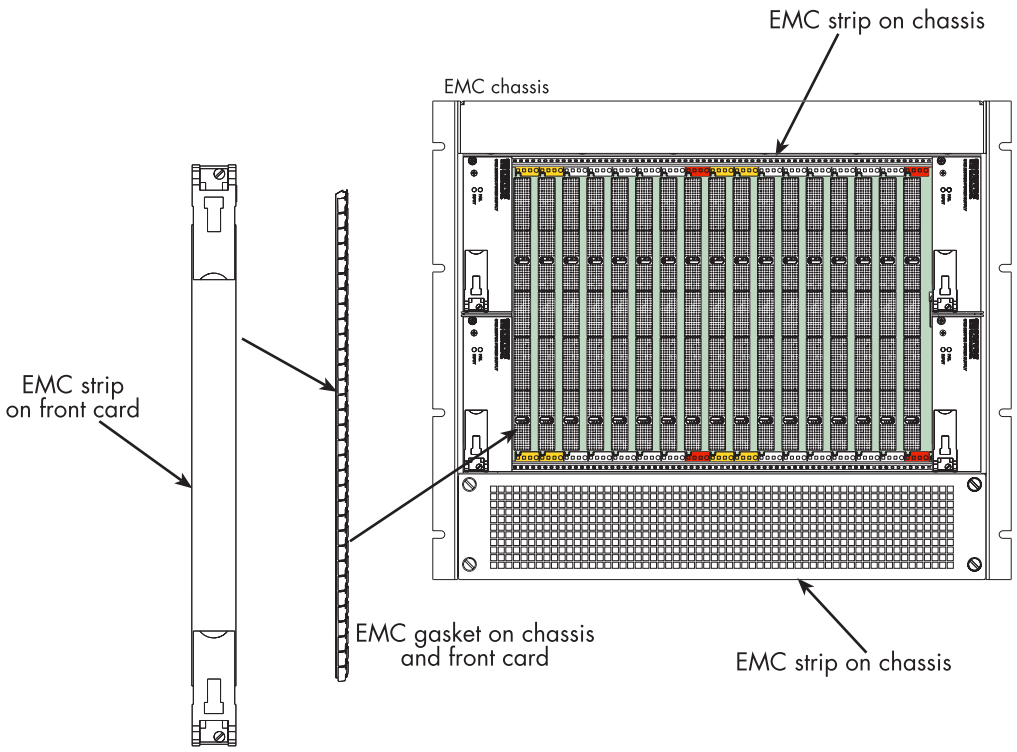

Figure 6. EMC strip and gasket on chassis and cards

The EMC strip on the left side of the board (see figure 6) mates with the EMC gasket attached to the chassis when it is plugged into the first slot. Each board mates together with corresponding gaskets/strips.

Note EMC gaskets/strips are in reverse order at the rear of the 6U chassis. That is, the EMC strip is on the left of the chassis and the EMC gasket is on the right. Consequently, rear transition boards are likewise in reverse order to the front-entry boards. The EMC gasket is on the left, and the EMC strip is on the right.

In addition, all aluminum and steel components of the subrack are surface treated and conductive. Top, bottom, sides and rear EMC covers provide mechanical protection and EMC shielding on the subrack. Retaining clips ensure conductive connection.

Electrostatic discharge (ESD) protection

The 6676 ForeFront Xtreme chassis provides ESD protection in compliance with IEEE 1101.10. ESD contacts are embedded inside and in the front section of card guides for making early as possible contact with a discharge strip on one or both, the upper and/or lower edge of the plug-in board/module. Only the card guides located at the bottom rail of the chassis (right vertical rail for the 6U chassis), both front and rear (when there is a transition module present in the chassis), contain the ESD clips. The ESD clip in the card guide is connected to the Chassis GND (ground).

There is an alignment/ESD pin on the injector/ejector handle of boards (see figure 7).

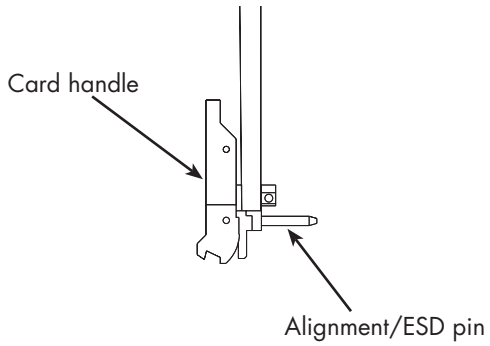

Figure 7. Alignment/ESD pin on card handle

The alignment pin does the following:

- Ensures that the connectors are correctly aligned before they engage
- Provides solid/protected keying
- Provides board ESD contact
- Ensures that the EMC gasket is properly aligned (see "Electromagnetic compatibility (EMC)" on page 17)
- Ensures that when the board is inserted in the card guide, an integrated ESD clip discharges ESD from the board to the right vertical rail chassis ground.

Hot-swap capability

Hot-swapping is the capability of removing and replacing components without turning off the system. Hot-swap capability is becoming increasingly important in systems requiring continuous operation at some level. Because boot times of many popular operating systems are long, the hot-swap capability is crucial for high-end PC servers, and even more so for telecommunication systems, such as base stations, where board-level exchanges must be made without any downtime. CompactPCI supports dynamic configuration to allow hot removal/insertion of boards without interrupting backplane transactions or disturbing DC voltages in the power system.

The hot-swap feature is implemented on the cPCI boards, not on the backplane. The backplane remains passive. Therefore, CompactPCI boards either are or are not hot-swappable.

Major system components

Model 6676 ForeFront Xtreme Chassis major system components consist of the following:

- Up to 17 ForeFront blades comprising a wide variety of front-entry and rear-entry modules (see section "ForeFront AIS blades" on page 20 for details)
- A mid-plane that provides power and I/O for the ForeFront blades (see section "Mid-plane architecture" on page 21)
- Two power supply modules (see section "Power supply module" on page 22)
- Two fan tray module (see section "Fan tray module" on page 22)

ForeFront AIS blades

The ForeFront Xtreme Chassis accommodates up to 17 ForeFront AIS blades (each comprising a front-entry module and a rear-entry module). The following blades are available:

- 3096RC—ForeFront AIS blade that offers G.SHDSL and T1/E1 WAN ports
- 3196RC—ForeFront AIS blade that offers iDSL and T1/E1 WAN ports
- 3125RC—ForeFront AIS remote access server blade that provides 96 or 120 ports for dial-up access
- 2616RC—ForeFront AIS E1/T1 DACS
- 6511RC—ForeFront AIS Matrix Switch with STM-1/OC-3 trunk interface
- 6081RC—ForeFront AIS EdgeROUTE Network Access Server

The front-entry boards route I/O through the mid-plane to the rear-entry modules (see figure 8).

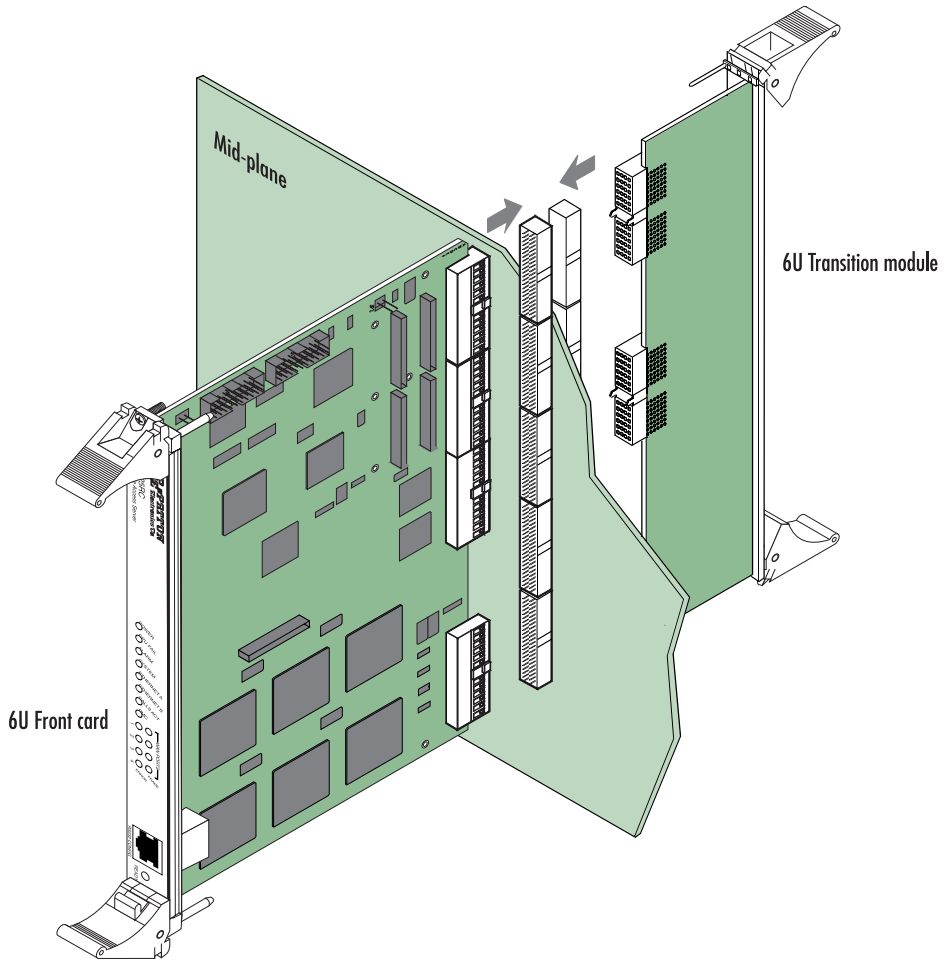

Figure 8. Front/rear modules and mid-plane interface

Mid-plane architecture

The mid-plane consists of two H.110 bus segments that support 17 6U slots (eight 6U modules for one segment and nine 6U modules for the other). Both H.110 buses have 20.32 mm (0.8 inch) board center-to-center spacing. The 6U cards are stacked vertically in the chassis. Power is distributed equally to the H.110 bus segments from both power supplies.

In addition to the 17 6U slots, there are two 3U x 160 mm slots on the front right and two 3U x 160 slots on the left of the ForeFront Xtreme Chassis. These slots support two Model 6160 or 6161 DC power supply modules (see figure 3 on page 15).

On the rear of the chassis, the top left and top right slots are for the rear power entry modules (see figure 4 on page 16). The bottom left slot is used for the Patton Model 6103 Alarm Card.

Power supply module

The ForeFront Xtreme Chassis is equipped with two Model 6160 or 6161 DC power supply modules (see figure 3 on page 15) and two Model 6112/HOR (DC) rear power entry modules (see figure 9).

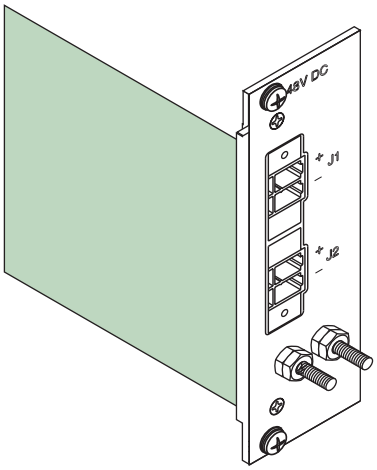

Figure 9. DC rear power entry module

Fan tray module

ForeFront Xtreme Chassis cooling is provided by two Model 6670-FT Plug-In Fan Tray Modules (see figure 10) which are positioned for optimum side-to-side air flow through the subrack. Each fan tray is hot-swappable.

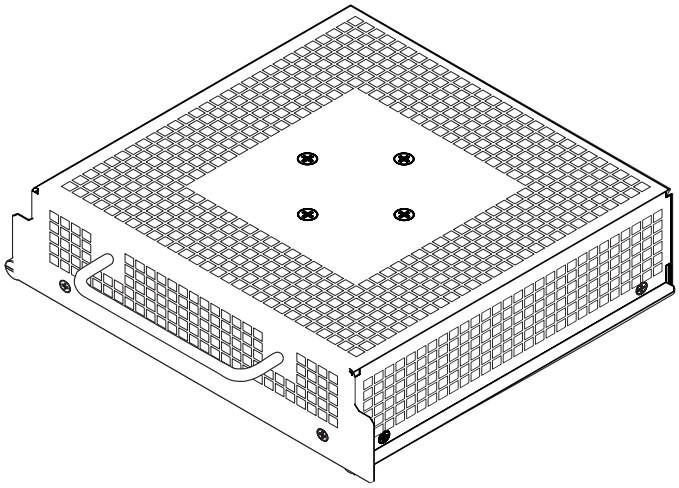

Figure 10. Model 6670-FT fan tray module

System specifications

This section provides the following specifications:

- Model 6676 chassis specifications (see section "6U chassis specifications")
- Power input and power supply specifications (see section "Power input and power supply specifications" on page 24)
- Fan tray specifications (see section "Fan tray specifications" on page 24)

6U chassis specifications

Table 3. 6U chassis materials specifications

Item	Description
Physical	• Height—9U (15.75 in./40 cm) • Width—19 in. (standard EIA rack mount) • Depth—11.70 in. (29.70 cm)
DC interface	Rear DC interface panel includes dual ground lugs and -48V DC power interface for N+1 redundant power operation.
Slot configuration	• Front—6U x 160 mm slots, Qty: 17 • Rear—6U X 80 mm slots, Qty: 17 Slots are on 0.80 in. (2.0 cm) centers, except power slots are 1.6 in. (4.1 cm) center
Module keying and alignment	4HP module spacing, cardguide provides for keying and alignment pin in accordance with IEEE 1101.10, section 6
Card guides	Molded plastic with snap-in ESD contacts for plug-in module and injector/ejector handle alignment pin
Plug-in unit injector/ejector handles	Subrack dimensional format accepts modules with injector/ejector handles as specified in IEEE 1101.10, section 8
Operating environment	32–122°F (0–50°C), 5–95% relative humidity, non-condensing

Power input and power supply specifications

Table 4. Power input specifications

Item	Description
Power input	-48 VDC nominal (-36 to -72V)
Maximum current	20 A per power input
Power supply fusing	Power supply fusing is not user-replaceable

Table 5. Power supply specifications

Power supply model	Power (watts)	Height (Profile)	Input voltage	+5V current	+3.3V current	+12V current	-12V current
6160 DC	250	3U	36–75 VDC	40A	40A	5.5A	1.5A
6161 DC	300	3U	36–72 VDC	30A	40A	5.0A	1.0A

Fan tray specifications

Table 6. Fan tray specifications

Item	Description
Physical	Height: 2.25 in. (6.35 cm) Width: 8.25 in. (20.96 cm) Depth: 19.0 in. (22.86 cm)
Power requirements	1.05 A at 48 VDC (50 W)
Performance	280 CFM per fan
Reliability	59,434 hours at 122°F (50°C)
Operating environment	32–122°F (0–50°C), 5–95% relative humidity, non-condensing
Fan tray model no.	6670-FT
Replacement air filter part no.	6670-AF-6 (6-pack)

Chapter 2 Installation checklist

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6U quick set-up checklist

The Model 6676 Mid-plane & Chassis can be easily configured according to your system requirements. Due to the broad application possibilities, the following checklist is provided as a quick set-up guideline.

1. **Install 9U chassis on rack**—the chassis front mounting flanges should be securely fastened to the rack with screws.
2. **Connect chassis ground**—The chassis must be grounded by #12 AWG ground wires attached to a reliable grounding source.
3. **Install power supply modules**—For *N*+1 power operation, install up to four Patton power supply modules at the front of the chassis.
4. **Install modules**—Plug the front-entry modules in the 6U slots at the front of the ForeFront Xtreme Chassis. Plug the alarm card in the left-hand slot at the back of the chassis, and plug the rear-entry cards in remaining slots, if needed.
5. **Wire rear panel for power.**

To avoid a potential shock hazard, connect the chassis ground before connecting power.

Power cable installation

This section describes installing the DC power and ground cables.

Verify that the installation site is in compliance with the following power requirements before installling the ForeFront Xtreme chassis:

- An approved external source must be rated a maximum of 72 VDC, 10 A and provide over current protection upstream of the equipment.
- An approved disconnect device with a minimum 3.0 mm contact separation must be provided upstream of the device and rated at least 75 VDC, 7.0 A and be located so it is accessible to the operator.
- This equipment shall be connected directly to the DC supply system bonding jumper from an earthing terminal bar or bus to which the DC supply system earthing electrode is connected.
- This equipment shall be located in the same immediate area as any other equipment that has a connection between the earthed conductor of the same DC supply circuit and the earthing conductor, and also the point of earthing of the DC system. The DC system shall not be earthed elsewhere.
- There shall be no switching or disconnecting devices in the earthed circuit conductor between the DC source and the point of connection of the earthing electrode conductor.

Installing the power cables

This section describes installing the power cables into the DC power input module. **Do not connect the remaining end of the power cables to the DC power source at this time.** Each DC power supply module comes with two power input terminal blocks (J1 +/- and J2 +/-). The Model 6676 can draw power from sources connected to either of these terminal blocks (inputs are *diode-ORed* and combined to provide for redundant power input). Although the power supply module is designed to operate normally with one power source, users may want to connect two independent power sources, one to each terminal block, to provide uninterrupted operation in the event of one source failure.

Remove power plugs from all power inputs prior to servicing.

Use AWG 12 copper conductors to feed power to the DC supply.

1. Connect the earth ground of the DC source to the grounding stud on the DC power supply as described in section "Grounding the Model 6676" on page 29.

2. Strip back the insulation on each of the supply wires approximately 1/4 inch.
3. Insert the stripped end of the positive lead into the *+J1* DC input of the terminal block. Tighten the screw until the power lead is firmly fastened. Repeat the procedure for the negative lead, using the *-J1* DC input" of the terminal block. Make sure that there is no exposed wire.

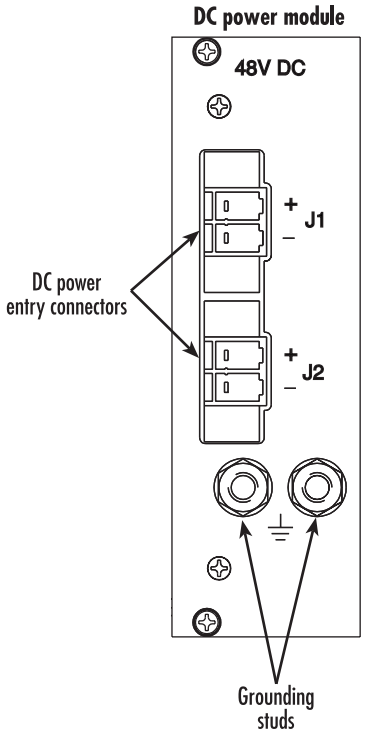

Figure 11. DC connector, -DC and +DC input view

4. Repeat steps 1 through 3 to install the remaining DC power connection on J2.

Grounding the Model 6676

Do the following:

1. Assemble a **ground wire** using #6 AWG wire with green-colored insulation and two ring terminals. Make the wire long enough to reach one of the following ground sources:
   - The building ground rod (generally located at the site's main service entrance)
   - Central office isolated ground plane
   - Central office isolated bonding network

To avoid the risk of personal injury, the distance between ground and the equipment rack must not exceed the distance specified in either local electrical codes or the National Electrical Code.

2. Install the ground wire between the grounding studs (see figure 11 on page 29 for DC power entry) and the grounding source.

Chapter 3 Maintenance

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Preventive Maintenance

Cleaning the fan filter

Periodically clean the filter on the Fan Tray Assembly (see figure 2 on page 18). The frequency of cleaning depends on the environmental conditions of where your equipment is located. Clean filter with a mild detergent and water, then air-dry, or you can use compressed air. It should be completely dry before reuse.

Spare filters (part no. 6670-AF-6) are available from Patton Electronics Company.

Troubleshooting

System won't power up

If the green LED on the power supply module does not light up, you should: remove the power supply module from the chassis, then plug it back in, making sure it is seated properly. If the green LED still does not illuminae, verify that the polarity is wired correctly at the back of the chassis.

If the green LED lights up on the power supply module, but the system still isn't powering-up, then the module may be faulty and should be returned to the manufacturer.

Chapter 4 Contacting Patton for assistance

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Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact Patton technical support for assistance.
- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about the RAS warranty and obtaining a return merchandise authorization (RMA).

Contact information

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems.

- Online support—available at **www.patton.com**.
- E-mail support—e-mail sent to **support@patton.com** will be answered within 1 business day
- Telephone support—standard telephone support is available from **8AM** to **5PM EST** (**8:00 to 17:00 UTC-5**), **Monday** through **Friday**, by calling **+1 (301) 975-1007**

Service

Patton Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model 6676. Technical Service hours: **8AM** to **5PM EST** (**8:00 to 17:00 UTC-5**), **Monday** through **Friday**.

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics (for more information about warranty and non-warranty repairs, see section "Warranty Service and Returned Merchandise Authorizations (RMAs)"). All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Service at:

- Tel: **(301) 975-1007**
- E-mail: **support@patton.com**
- URL: **www.patton.com**

Note Packages received without an RMA number will not be accepted.

Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

Note If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

Warranty coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

Out-of-warranty service

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or other catastrophes may require replacement.

Returns for credit

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

Return for credit policy

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.
- 30 to 60 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).
- Over 60 days: Products will be accepted for repairs only.

RMA numbers

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at **www.patton.com**
- By calling **+1 (301) 975-1000** and speaking to a Technical Support Engineer
- By sending an e-mail to **returns@patton.com**

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

Shipping instructions

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

Patton Electronics Company
RMA#: xxxx
7622 Rickenbacker Dr.
Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

Appendix A **Replacement parts and accessories**

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Replacement parts

ForeFront chassis power supplies

Model	Description
6160	DC Power Supply, 250W
6161	DC Power Supply, 300W

ForeFront chassis fan/filter components

Model	Description
6670-FT	6U Fan Impeller Assembly (2 per chassis)
6670-AF-6	6U Air Filter (2 per chassis)

Accessories

Model	Description
6103	Alarm Card

Appendix B **Glossary**

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C

CFM
Cubic feet per minute—A measurement of how much air is moved through a fan.

CSA
Canadian Standards Association—Organization which operates a listing service for electrical and electronic materials and equipment. It is the body that establishes telephone equipment (and other) standards for use in Canada.

CT
Computer Telephony—is the adding of computer intelligence to the making, receiving, and managing of telephone calls.

D

Dual Redundant
An environment containing two power supplies, with fault tolerance such that one power supply may fail and the system will continue to operate.

E

EIA
Electronics Industry Association—Trade organization of manufacturers which sets standards for use of its member companies.

EMC
Electromagnetic Compatibility—Is the ability of equipment or systems to be used in their intended environment within designed efficiency levels without causing or receiving degradation due to unintentional EMI.

EMI
Electromagnetic Interference—any electromagnetic interference, periodic or random, narrow or broadband, which may have a disturbing influence on devices exposed to it.

EN
European Norms—Prefix assigned to documents adopted by the CE designating required standards (for example, EN 60950 is the safety specification (equivalent to UL 1950)).

ESD
Electrostatic Discharge—Discharge of a static charge on a surface or body through a conductive path to ground. Can be damaging to integrated circuits.

H

Hot-Swap
The capability of removing and replacing components without turning off the system. Hot-swap capability is increasingly important in systems used for applications such as telecommunications, which require that the system be operational at some level continuously.

HP
Horizontal Positioning—A unit of measurement used for the width of cPCI cards/modules. 1 HP = 0.2” wide

I

IEC
International Electrotechnical Committee

IEEE
Institute of Electrical and Electronics Engineers

K

Keying
A mechanical means of polarizing connectors in order to prevent similar connectors from being mated. This is necessary when 2 or more similar connectors must be connected to a backplane which requires that the board being connected is unique for a particular slot.

N

N+1 Redundant
An environment containing more than two power supplies, where the power supplies typically current share, with fault tolerance such that one power supply may fail and the system will continue to operate.

NEBS
Network Equipment Building Standards—Defines a rigid and extensive set of performance, quality, environmental and safety requirements developed by Bellcore, the R&D and standards organization owned by the seven regional Bell operating companies (RBOC's).

P

PCI
Peripheral Component Interconnect. A specification for defining between logic components. Typically used for interconnecting high-speed, PC-compatible chipset components. The PCI specification is issued through the PCI Special Interest Group (PCI SIG).

PCI SIG
Peripheral Component Interconnect Special Interest Group

PICMG
PCI Industrial Computers Manufacturers Group—a consortium of industrial computer product vendors who develop specifications for PCI-based systems and boards for use in industrial computing applications.

Platform
Describes the system environment, including the backplane and related enclosure.

S

SELV
Safety Extra Low Voltage—a term generally defined by the regulatory agencies as the highest voltage that can be contacted by a person and not cause injury. It is often specifically defined as 30 VAC or 42.4 VDC.

S-HAZ
Secondary Hazardous—any voltage within a system that is greater than 60VDC (42.4VAC-peak), NOT meeting the requirements for a LIMITED CURRENT CIRCUIT, or for a TNV CIRCUIT. Typical ringing voltage is considered SECONDARY HAZARDOUS unless it is current limited. Raw ringing is considered SECONDARY HAZARDOUS. (Refer to IEC950 or PICMG 2.5 R1.0 CompactPCI, Computer Telephony Specification for information.)

Shroud
A male connector body designed to fit over the extended tails of a long tail connector which allows a female connector to be mated from the rear side for midplane or rear I/O applications.

T

TDM
Time Division Multiplex—A technique for transmitting a number of separate data, voice and/or video signals simultaneously over one communications medium by quickly interleaving a piece of each signal one after another.

TNV
Telephone Network Voltages—any voltage present on the telephone network side of the isolation device on any device (for example, board) that connects to the telephone network.

U

U

An EIA unit of measurement equal to 1.75 in. (4.45 cm) for equipment racks.

W

Warm-Swap

An environment supporting removal and insertion of power supplies while under power, wherein the power supply is disabled during insertion and removal, avoiding the need for the connectors to make and break high current connections while under load.

Appendix C **Bibliography**

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Publications referenced in this guide

The following publications are used in conjunction with this manual.

- ECTF H.110 (CT Bus) Specification (Revision 1.0)
- CompactPCI Hot Swap Specification—PICMG 2.12 (Revision 1.0)
- CompactPCI Specification—PICMG 2.0 (Revision 3.0)
- Keying of CompactPCI Boards and Backplanes Specification—PICMG 2.10 (Revision 1.0)
- UL60950, Safety of Information Technology Equipment, including Electrical Business Equipment
- IEC 61076-4-101 (1995-05), Specification for 2mm Connector System
- IEEE 1101.10, IEEE Standard for Additional Mechanical Specifications for Microcomputers using IEEE 1101.1 Equipment Practice