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FORCE COMPUTERS
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Centellis Series 4000

System's Guide

P / N 216000 Revision AA
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Using This Manual

This System's Guide is intended for users qualified in electronics or electrical engineering. Users must have a working understanding of Peripheral Component Interconnect (PCI), Compact Peripheral Component Interconnect (CPCI), and telecommunications.

Conventions

Notation	Description
1234	All numbers are decimal numbers
Bold	Character format used to emphasize a word
Italics	Character format for references and for table and figure descriptions.
Note:	No danger encountered. Pay attention to important information marked using this layout.
Caution 	Possibly dangerous situation: slight injuries to people or damage to objects possible
Danger 	Dangerous situation: injuries to people or severe damage to objects possible

Abbreviations

Abbreviation	Description
CPCI	Compact PCI
EMI	Electromagnetic Interference
HH	Half-height
PICMG	PCI Industrial Computer's Manufacturer Group
RTB	Rear Transition Board
TDM	Time Division Multiplexer

Revision History

Order No.	Revision	Date	Description
209375	1.0	April 1998	First print
209375	2.0	May 1998	Added space requirements for installation
209375	3.0	November 1999	Editorial changes
213106	AA	July 2000	Added safety notes for PSU 250W DC (see the "Safety Notes" section on page xxiii and the "Sicherheitshinweise" section on page xxix) Added section 2.6 "Mounting the Capacitor onto the DC PSU" on page 13 Added information on PSU 250W DC (table 3 "Power Requirements" on page 15) Deleted section "Circuit Schematics" Deleted German translations of all chapters except for the "Safety Notes" ("Sicherheitshinweise") Editorial changes
213106	AB	November 2000	New structure and new layout, Editorial changes

Order No.	Revision	Date	Description
214749	AA	March 2001	Safety Notes: Maximum power consumption value changed to 250W in the “Expansion” section on page xxv and in the “Ausbau / Erweiterung” section on page xxxi, safety notes on voltage selector switch added to “Safety Notes” on page xxiii and “Sicherheitshinweise” on page xxix, safety notes on installation in an unpowered and in a powered system in the “Installation” section on page 2-1 and on page xxxi added Chapter Introduction: Information on new CPCI H.110 backplane added to section “Backplane” on page 1-4, sentence “The four 6U / 4TE slots have...” in section “Backplane” on page 1-4 changed to “The rear I / O slots...”, information on 250W AC PSU added to the “Power Supply Unit” section on page 1-5, section “Standard Interfaces” on page 1-6 modified, information on new 250W AC PSU and on new H110 backplane added to section “Overview” on page 1-5, note added to the “Standard Compliance” section on page 1-6, standards corrected in the “Standard Compliance” section on page 1-6, variants added to the “Order Numbers” section on page 1-8 (p.t.o.)

Order No.	Revision	Date	Description
			(continued) Chapter Installation: Note added to the “Power Requirements” section on page 2-5, values for the 200W AC PSU’s replaced by values for the 250W AC PSU in Table 4 “Power Requirements” on page 2-5, operating value for relative humidity in Table 3 “Environmental Requirements” on page 2-4 changed from “10% to 95%” to “20% to 80%”, heading “Boards” changed to “Installing Boards into the Standard 4/5-Slot CPCI Backplane”, safety notes and procedure steps switch power off/on added to the “Installing Boards into the Standard 4/5-Slot CPCI Backplane” section on page 2-12, Figure 5 and Figure 5 description changed, section “Installing Boards into the H.110 4-Slot Backplane” on page 2-14 added, sentence “Make sure to connect the capacitor to 0V and to ground” to “...to return and to frame ground”, DC power connector changed in Figure 9 “DC PSU” on page 2-19 Chapter Controls, Indicators, and Connectors: Position of video and Ethernet connector changed in figures 9 and 15, DC power connector in figure 15 changed, safety note added to section “Voltage Selector” on page 3-5, DC power connector and pinout in figure 16 changed, video connector pinout in figure 18 changed, sections “H.110 Backplane” on page 3-9 and “Optional CPCI Backplane” on page 3-18 added

Order No.	Revision	Date	Description
214749	AB	March 2001	Safety Notes: Maximum power consumption value changed from 250W to 220W in the “Expansion” section on page xxv and in the “Ausbau / Erweiterung” section on page xxxi Chapter Introduction: Note deleted in the “Standard Compliance” section on page 1-6, VCCI Class B corrected to Class A on page 1-6, standards modified in Table 1 “Standard Compliance” on page 1-6, 250W changed to 220W in the “Power Supply Unit” section on page 1-5 for AC and DC power supply, 250W changed to 220W in section “Overview” on page 1-5 for AC and DC power supply Chapter Installation: Note deleted in the “Power Requirements” section on page 2-5, non-operating temperature value for relative humidity in Table 3 “Environmental Requirements” on page 2-4 changed from “+20°C to +40°C” to “+20°C to +55°C”, 250W changed to 220W in Table 4 “Power Requirements” on page 2-5 for AC and DC power supply Chapter Controls, Indicators and Connectors: Voltage selector switch changed in Figure 9 on page 3-4 and in Figure 11 on page 3-5, title of Figure 11 on page 3-5 changed to “Voltage Selector Switch in 115V or 230V Position” Editorial changes: Type errors corrected

Order No.	Revision	Date	Description
214749	AC	May 2001	Corrected the “Safety Notes” section on page xxiii and the “Sicherheitshinweise” section on page xxix; Added the “Hot Swap” section on page xxiv and the “Laufendes System” section on page xxx; Combined contents of former “Overview” section with “Features” section in “Features” on page 1-3; Moved standard interfaces section to the “Features” section on page 1-3; Corrected power supply information in the “Power Supply Unit” section on page 1-5; Added Figure 2 “Sample of System Identification Label” on page 1-7 and Figure 3 “Sample of System Identification Label (Voltage Information)” on page 1-7; Added Figure “Action Plan” on page 2-3; Corrected data in Table 4 “Power Requirements” on page 2-5; Removed capacitor information from the “Installation” chapter; Removed voltage selector information from the “Power Switch” section on page 3-4; Added the “Index” section on page I-1; Editorial changes;
216000	AA	November 2001	Revised the “Safety Notes” section on page xxiii and the “Sicherheitshinweise” section on page xxix Updated the “Order Numbers” section on page 1-8 Restructured the “Installation” section on page 2-1; changed the “Action Plan” section on page 2-3; added information on grounding screw in the “Installing the System” section on page 2-6 Restructured the “Controls, Indicators, and Connectors” section on page 3-1 Deleted JP2 connector description from the “H.110 Backplane” section on page 3-9 Standard CPCI backplane becomes optional backplane DC PSU becomes optional New page layout Editorial changes

Other Sources of Information

Company	www.	Document
PICMG	picmg.com	CompactPCI Specification PICMG 2.0 R2.1
Force Computers	forcecomputers.com	PENT / CPCI-735 Installation Guide (P / N 215889)
		SPARC / CPCI-550 Installation Guide (P / N 214798)
		SPARC / CPCI-550 Reference Guide (P / N 214799)



Safety Notes

This section provides safety precautions to follow when installing, operating, and maintaining the Centellis Series 4000.

We intend to provide all necessary information to install and handle the Centellis Series 4000 in this System's Guide. However, as the product is complex and its usage manifold, we do not guarantee that the given information is complete. If you need additional information, ask your Force Computers representative.

The Centellis Series 4000 has been designed to meet the standard industrial safety requirements. It must not be used except in its specific area of office telecommunication industry, industrial control, and development.

Only personnel trained by Force Computers or persons qualified in electronics or electrical engineering are authorized to install, maintain, and operate the Centellis Series 4000. The information given in this manual is meant to complete the knowledge of a specialist and must not be taken as replacement for qualified personnel.

System Installation

To avoid system damage check whether the system meets the following requirements before installing the system:

- **Table 4 "Power Requirements" on page 2-5**
- **Table 3 "Environmental Requirements" on page 2-4**

Observe the following general safety notes when installing:

- ***Restricted access area* – The Centellis Series 4000 is only to be installed in a restricted access area.**
- ***Installation codes* – This unit must be installed in accordance with the *National Electrical Code, Articles 110-16, 110-17, and 110-18* and the *Canadian Electrical Code, Section 12*.**
- ***Conductor ampacity* – According to *UL 1950, Annex NAE (NEC Article 645-5(a))*, the branch-circuit conductors supply must have an ampacity of not less than 125 percent of the total connected load. As such, if the equipment is rated 16A, the minimum conductor ampacity shall not be less than 20A. Per *NEC Article 310-15* and *Table 310-16*, the minimum American Wire Gauge (AWG) suitable is 14 AWG. Note that although the 14 AWG is rated for 20A, the overcurrent protection device for 14 AWG shall not exceed 15A.**



- ***Overcurrent protection*** **– A readily accessible listed branch-circuit overcurrent protective device 20A must be incorporated in the building wiring. This is only valid if the minimum conductor is 12 AWG. Per *NEC Table 310-16*, the ampacity of 12 AWG is 25A with the overcurrent protection device not exceeding 20A.**

If the rack is equipped with stabilizing devices, make sure that they are installed and extended so that the rack is secure. Then proceed to mount or service the system.

Racks or pull-out slides can topple over when uneven loading of mechanical equipment occurs in a rack. Therefore, make sure to mount the system in the lowest part of the rack, if it is the only system in the rack and to start with the heaviest component at the bottom when mounting several systems in one rack.

To prevent injury keep your back straight and have two people lift the system.

Board Installation

In order to avoid damage to the board and/or the system, only install CPCI CPU baords into slot 1 marked with a triangle and install CPCI H.110 I/O boards into slots 2-4 marked with a circle.

The system will be damaged if RTBs installed into the rear slots do not correspond to the boards installed into the same slots from the system's front. Therefore, always make sure that the RTBs and boards installed into the same slots from the system's front and rear do correspond.

Hot Swap

Only personnel trained by Force Computers or persons qualified in electronics or electrical engineering are authorized to install a board or to remove it from a running system. Otherwise, damage to personnel and/or to the system may occur.

Removing a board from a system slot leads to a system breakdown and data loss. Therefore, installation into and removal from a powered system is only possible for I/O slots (slots 2-4).

As long as the blue hot-swap LED is off, the board is in normal operation and must not be removed from a running system.



Operation

To ensure proper cooling always operate the system in a horizontal position.

To avoid tripping over power cables the power plug has to be near the system and must be easily accessible.

To avoid electric shock make sure that contacts and cables of the system cannot be touched while the system is operating.

To ensure proper cooling and undisturbed airflow through the system keep clear at least 50 mm adjacent to the sides containing the cooling vents.

To ensure proper air flow within the system and proper EMI shielding the front panel door of the Centellis Series 4000 must be closed .

Opening

Only personnel trained by Force Computers or qualified persons in electronics or electrical engineering are authorized to open the system.

To avoid electric shock when opening the chassis it is not sufficient to switch off the main function switch because it does not remove the AC line voltage from the system. Therefore, before opening the chassis, an authorized person must check that the system is powered off and that the system's main power connector is disconnected.

Expansion

To avoid electric shock verify that the system is powered off and the power cables are disconnected from the power supply units before you remove the mass storage module from the chassis. Switching off the main function switch is not sufficient because it does not remove the AC line voltage from the system.

To avoid an overload of the system check the total power consumption of all components, i.e. the installed CPU boards and drives (see the technical specification of the respective components).

Ensure that any individual output current of any source stays within its acceptable limits (see the technical specification of the respective source).



Cabling

Never change the system's cabling as delivered by Force Computers.

The cabling should follow existing cable paths using existing or similar cable fastenings. It must not break the airflow through the chassis.

The cabling should comply to the standards used for the existing cabling wherever applicable.

Check proper function of the system after cabling extensions.

If in doubt concerning cabling, ask your local Force Computers representative.

RJ-45 Connector

The boards installed in the Centellis Series 4000 use the RJ-45 connector only for twisted-pair Ethernet (TPE). Note that connecting the telephone line to the Ethernet connector on one of the installed boards may destroy your telephone as well as your Centellis Series 4000 system. Therefore make sure that TPE connectors near your working area are clearly marked as network connectors. In addition, observe the following safety notes:

- **Make sure the TPE bushing of the system is connected only to safety extra low voltage circuits (SELV circuits).**
- **Verify that the length of an electric cable connected to a TPE bushing does not exceed 100 meters.**
- **If in doubt, ask your system administrator.**

PSU

A protector (10A / 250V) needs to be integrated in the supply circuit.

Battery Exchange

Incorrect exchange of Lithium batteries can result in a hazardous explosion. For a description of how to exchange the battery, see the Installation Guide of the respective board.

Always use the same type of Lithium battery as is already installed.



Environment

Always dispose of old boards or systems according to your country's legislation, if possible in an environmentally acceptable way.

EMC

The system has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules respectively EN 55022 Class A. These limits are designed to provide reasonable protection against harmful interference when the system is operated in a commercial, business or industrial environment.

The system generates and uses radio frequency energy and, if not installed properly and used in accordance with this System's Guide, may cause harmful interference to radio communications. Operating the system 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.

To ensure proper EMC shielding operate the system only with free slots covered with blind panels.

VCCI

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Interference (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.





Sicherheitshinweise

Dieser Abschnitt enthält Sicherheitshinweise, die bei Einbau, Betrieb und Wartung des Centellis Series 4000 zu beachten sind.

Wir sind darauf bedacht, alle notwendigen Informationen zum Einbau und zum Umgang mit dem Centellis Series 4000 in diesem Handbuch bereit zu stellen. Da es sich jedoch bei dem Centellis Series 4000 um ein komplexes Produkt mit vielfältigen Einsatzmöglichkeiten handelt, können wir die Vollständigkeit der im Handbuch enthaltenen Informationen nicht garantieren. Falls Ihnen Informationen fehlen sollten, wenden Sie sich bitte an Ihren Vertreter von Force Computers.

Das Centellis Series 4000 erfüllt die für die Industrie geforderten Sicherheitsvorschriften und darf ausschliesslich für Anwendungen in der Telekommunikationsindustrie, im Zusammenhang mit Industriesteuerungen und in der Entwicklung verwendet werden.

Einbau, Wartung und Betrieb dürfen nur von durch Force Computers ausgebildetem oder im Bereich Elektronik oder Elektrotechnik qualifiziertem Personal durchgeführt werden. Die in diesem Handbuch enthaltenen Informationen dienen ausschliesslich dazu, das Wissen von Fachpersonal zu ergänzen, können dieses jedoch nicht ersetzen.

Systeminstallation

Bevor Sie das System installieren, überprüfen Sie, ob folgende Anforderungen erfüllt werden:

- **Tabelle 3 “Environmental Requirements” auf Seite 2-4**
- **Tabelle 4 “Power Requirements” auf Seite 2-5**

Falls der Schaltschrank mit Kippsicherungen ausgestattet werden kann, stellen Sie sicher, dass diese auch installiert und ausgefahren sind, um einen sicheren Stand des Schranks zu gewährleisten. Beginnen Sie erst danach mit dem Einbau oder der Wartung des Systems.

Der Schaltschrank kann umkippen oder Auszieheinheiten können herausfallen, wenn eine ungleiche Gewichtsverteilung der Systeme innerhalb des Schranks auftritt. Bauen Sie das System deshalb ganz unten im Schrank ein, wenn es das einzige System im Schrank ist. Wenn mehrere Systeme in einen Schrank eingebaut werden sollen, plazieren Sie das schwerste System ganz unten und die leichteren weiter oben.



Um Ihren Rücken nicht unnötig zu beanspruchen, heben Sie das System zu zweit und halten Sie beim Heben Ihren Rücken gerade.

Boardinstallation

Um Schäden an Boards und/oder dem System zu vermeiden, dürfen ausschließlich CPCI CPU Boards in den mit einem Dreieck gekennzeichneten Steckplatz 1 und CPCI H.110 I/O Boards in die mit einem Kreis gekennzeichneten Steckplätze 2-4 installiert werden.

Das System wird beschädigt, wenn die RTBs nicht zu den von vorne in das System installierten Boards passen. Stellen Sie deshalb sicher, daß RTBs und Boards, die von vorne und hinten in den gleichen Slot des Systems eingebaut werden, stets zueinander passen.

Laufendes System

Lediglich von Force Computers eingewiesene oder im Bereich Elektrotechnik oder Elektronik qualifizierte Personen sind befugt, Boards während des Betriebs zu installieren oder zu entfernen. Personen und/oder das System könnten sonst geschädigt werden.

Das Installieren und Entfernen eines Boards im laufenden Betrieb ist nur bei den I/O Steckplätzen (Steckplätze 2-4) möglich. Entfernt man ein Board aus einem Systemsteckplatz, kommt es zu einem Systemzusammenbruch und Datenverlust.

Solange die blaue hot-swap LED nicht leuchtet, befindet sich das Board noch im Normalbetrieb und darf nicht aus dem laufenden System entfernt werden.

Betrieb

Um eine ausreichende Lüftung zu gewährleisten, muss das System während des Betriebs waagerecht stehen.

Um ein Stolpern über Netzkabel zu verhindern, muss sich der Netzstecker in der Nähe des Systems befinden und leicht zugänglich sein.

Um einen elektrischen Schlag zu verhindern, stellen Sie sicher, dass Kontakte und Kabel des Systems während des Betriebs nicht berührt werden können.



Damit die Lüftungsschlitze an Vorder- und Rückseite des Systems freigehalten werden und eine ausreichende Lüftung des Systems gewährleistet ist, muss an den Seiten der Lüftungsschlitze des Systems ein Freiraum von mindestens 50 mm eingehalten werden.

Um ausreichenden Luftstrom und EMI Schutz zu gewährleisten, muss die Vorderklappe des Centellis Series 4000 Systems geschlossen sein,.

Öffnen

Das System darf ausschließlich von durch Force Computers ausgebildetem oder im Bereich Elektronik oder Elektrotechnik qualifiziertem Personal geöffnet werden.

Um einen elektrischen Schlag beim Öffnen des Systems zu vermeiden, genügt es nicht, das System über den Ein/Ausschalter abzuschalten, da auch in abgeschaltetem Zustand noch eine Netzspannung anliegt. Bevor Sie das System öffnen, muss eine qualifizierte Person sichergestellt haben, dass das System ausgeschaltet und der Netzstecker gezogen ist.

Ausbau/Erweiterung

Um einen elektrischen Schlag zu vermeiden, überzeugen Sie sich, dass das System ausgeschaltet ist und die Stromkabel von den Netzteilen entfernt sind, bevor Sie die Speichermodule aus dem System entfernen. Es genügt nicht, das System über den Ein/Ausschalter abzuschalten, da auch in abgeschaltetem Zustand noch eine Netzspannung anliegt.

Um eine Überlastung des Systems zu verhindern, überprüfen Sie die gesamte aufgenomme Leistung aller eingebauten Komponenten, also z.B. der installierten CPU Boards und Laufwerke (siehe die technischen Daten der entsprechenden Komponente).

Stellen Sie sicher, dass der Ausgangsstrom jedes Verbrauchers innerhalb der zulässigen Grenzwerte liegt (siehe die technischen Daten des entsprechenden Verbrauchers).

Verkabelung/Kabelführung

Verändern Sie nie die von Force Computers ausgelieferte Verkabelung des Systems.

Stellen Sie sicher, dass die Verkabelung schon existierenden Kabelführungen folgt und bestehende oder ähnliche Befestigungen



verwendet. Die Kabel dürfen den Luftstrom innerhalb des Systems nicht unterbrechen.

Die Verkabelung sollte wenn möglich den Standards der schon vorhandenen Verkabelung entsprechen.

Überprüfen Sie nach der Erweiterung der Verkabelung, ob das System ordnungsgemäß arbeitet.

Falls Sie Fragen bezüglich der Verkabelung haben, wenden Sie sich an Ihren Vertreter von Force Comuters.

RJ-45 Stecker

Die Boards, die in dem Centellis verwendet werden, benutzen RJ-45 Stecker nur für Twisted-Pair-Ethernet (TPE) Verbindungen. Beachten Sie, dass ein versehentliches Anschließen einer Telefonleitung an einen solchen TPE Stecker sowohl das Telefon als auch das Centellis Series 4000 zerstören kann. Deshalb müssen TPE Stecker eindeutig als solche gekennzeichnet werden, um ein Vertauschen auszuschließen. Beachten Sie darüberhinaus die folgenden Hinweise:

- **Die Länge des mit dem Centellis Series 4000 verbundenen Twisted-Pair-Ethernet-Kabels darf 100 m nicht überschreiten.**
- **Das Centellis Series 4000 darf über die TPE Stecker nur mit einem Sicherheits-Kleinspannungs-Stromkreis (SELV) verbunden werden.**
- **Bei Fragen wenden Sie sich an Ihren Systemverwalter.**

PSU

In AC-Systemen muß eine Schutzvorrichtung (10A / 250V) im Versorgungsstromkreis eingebaut werden.

Batteriewechsel

Ein unsachgemäßer Wechsel von Lithium Batterien kann zu gefährlichen Explosionen führen. Eine Beschreibung, wie der Batteriewechsel durchzuführen ist, finden Sie im Installationshandbuch des jeweiligen Boards.

Verwenden Sie beim Batteriewechsel den selben Batterietyp, der bereits eingesetzt wurde.



Umweltschutz

Entsorgen Sie alte Boards und Systeme gemäß der in Ihrem Land gültigen Gesetzgebung, wenn möglich umweltfreundlich.

EMV

Das System wurde getestet und erfüllt die für digitale Geräte der Klasse A gültigen Grenzwerte gemäß den FCC-Richtlinien Abschnitt 15 bzw. EN 55022 Klasse A. Diese Grenzewerte sollen einen angemessenen Schutz vor Störstrahlung beim Betrieb des Systems in Geschäfts-, Gewerbe- sowie Industriebereichen gewährleisten.

Das System arbeitet im Hochfrequenzbereich und erzeugt Störstrahlung. Bei unsachgemäßem Einbau und anderem als in diesem Handbuch beschriebenen Betrieb können Störungen im Hochfrequenzbereich auftreten. Warnung! Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen. In diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen.

Freie Steckplätze müssen mit einer Blende abgeschirmt werden.

VCCI

Das Centellis Series 4000 ist ein Gerät der Klasse A gemäß dem Standard des Voluntary Control Council for Interference von Information Technology Interference (VCCI). Wird das System in Wohngegenden betrieben, können Störungen im Hochfrequenzbereich auftreten. In einem solchen Fall ist der Benutzer verpflichtet, entsprechende Gegenmaßnahmen zu ergreifen.



1

Introduction

Features

The Centellis Series 4000 is a CompactPCI-based computer platform designed in 3U high and 19” wide format. It is a high-performance computer system, fully compliant with the CompactPCI standard and capable of fulfilling the requirements of a wide variety of industrial applications such as:

- Development platform (Windows NT, UNIX)
- Graphic workstation
- Interoffice automation
- Process automation
- Scientific application
- Telecommunication application

The system contains a 220W power supply for 100V-240V at 50 Hz-60 Hz AC input or a 220W power supply for -48V to -60V DC (optional).

The two fans in the Centellis Series 4000 provide forced air cooling to prevent the components from overheating.

The picture below provides an overview of the location of the components in the Centellis Series 4000.

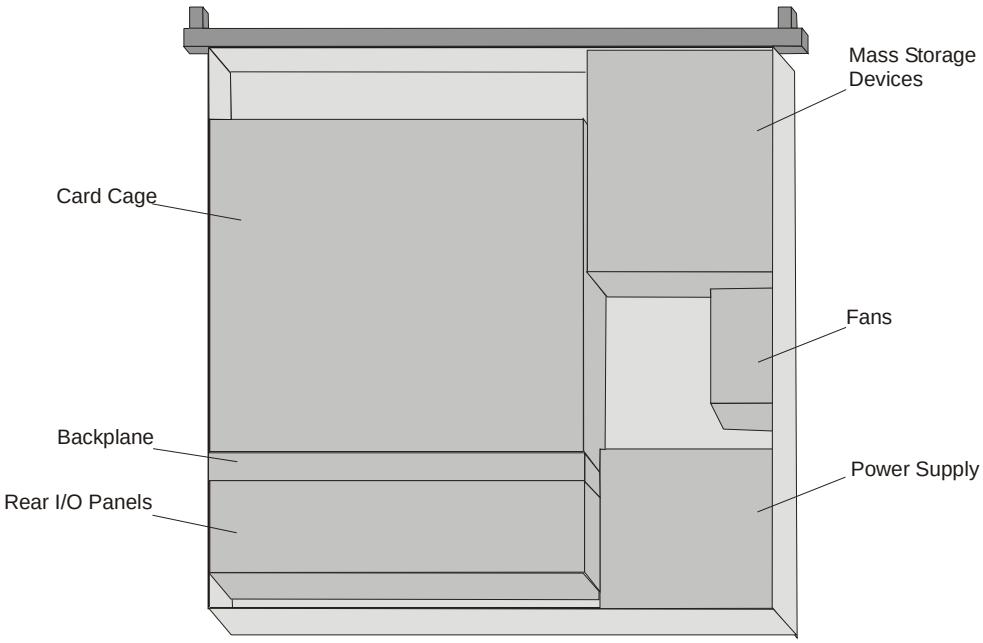


Figure 1: *System Top View with Cover Removed*

Backplane

The standard Centellis Series 4000 is delivered with a H.110 backplane It contains four 6U slots where the system slot is the first slot from the bottom of the chassis. A CPCI backplane that contains three 6U slots and two 3U slots accessible from the front is optional.

System and I/O boards are plugged into the Centellis Series 4000 backplane via card cage houses.

The backplane's rear offers space to mount rear I/O panels which provide additional interfaces. The rear I/O slots have guide grooves for inserting user-defined 80 mm interface cards directly into the rear connectors of the CPCI backplane.

Mass Storage Devices

The system contains a drive module which is easily assembled and disassembled with accessibility from the front and which houses the following mass storage devices.

- One 5.25” / HH (HH = half-height)
- One 3.5” / HH
- One 3.5” slim line

The chassis itself is able to hold two more 3.5” slim line drives (factory option).

Standard Compliance

Standard	Description
FCC Part 15 Class B VCCI Class B CE Class B(EN 55022)	EMC requirements
EN 60950 UL / cUL 1950	Legal safety requirements

Mechanical Data

The following table provides an overview of the dimensions and weight of the Centellis Series 4000.

Dimensions	Value
Width	
without handles	440 mm
with handles	483 mm
Height	
without feet	135 mm
with feet	150 mm
Length	
without handles	443 mm
with handles	481 mm
Distance between mounting holes (handles only)	448 mm
Weight (incl. PSU)	approx. 18 kg

Ordering Information

When ordering variants or spare parts for the Centellis Series 4000 use the order numbers given on the following pages. To make sure that you are ordering spare parts that can be used with your system, check the system identification label placed at the rear side of the system to find information about the system variant, its order number and revision.



Figure 2: *Sample of System Identification Label*



Figure 3: *Sample of System Identification Label (Voltage Information)*

Product Nomenclature

In the following, you find the key for the product name extensions.

Table 1: *Nomenclature*

Centellis 4xxx ss/ccc-ddd-HD/AC	
xxx	CPU
ss	Server software
ccc	Clock frequency in MHz
ddd	DRAM in MBytes

Order Numbers

Consult your local sales representative to check the possibility of combinations.

Table 2: *Ordering Information Excerpt*[1)]

Order No.	Centellis Series 4000	Description
109254	Centellis 4735 W2/700SVGA-512-HD/AC	700 MHz Pentium III mobile processor with 512 MBytes DRAM and Windows 2000 factory installed on a min. 10 GByte EIDE HDD, CD-ROM and floppy drive, SVGA, AC PSU, 4x6U slots H.110 backplane, documentation
109877	Centellis 4550 S8/500-512-HD/AC	500 MHz ULTRASparc-IIe with 512 MBytes DRAM and Solaris 8 factory installed on a min. 18 GByte SCSI HDD, DVD and floppy drive, AC PSU, 4x6U slots H.110 backplane, documentation

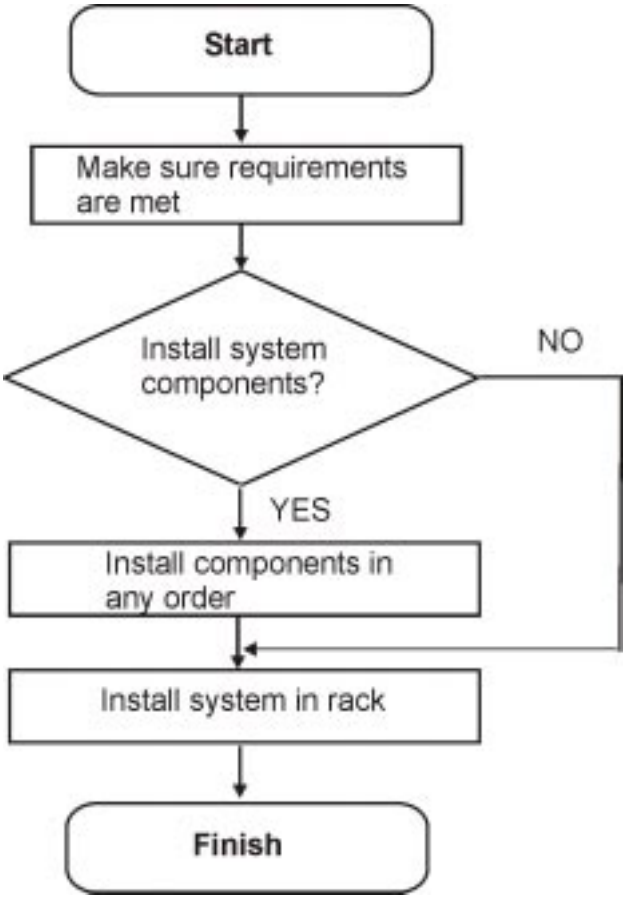
1) Status November 2001

2

Installation

Action Plan

To install the system and system components, the following steps are required and will be described in detail in the sections of this chapter.



Requirements

To ensure proper function of the Centellis Series 4000, make sure the system meets the environmental and power requirements listed in this section before you start it up.

Environmental Requirements

The environmental values must be tested and proven in the used system configuration.

Note: Operating temperatures refer to the temperature of the air circulating within the system and not to component temperatures.

Table 3: *Environmental Requirements*

Feature	Operating	Non-Operating
Temperature	5°C to 40°C	–25°C to +65°C
Temp. Change	+/-0.25°C/min	+/-0.25°C/min
Rel. Humidity	20% to 80% non-condensing at +20°C to +40°C	5% to 95% non-condensing at +20°C to +55°C
Altitude	-300 m to +3000 m	-300 m to +12000 m
Vibration 10-15 Hz 15-150 Hz	 0.5 mm amplitude 0.5 g	 1 mm amplitude 1.0 g
Shock	5 g/11 ms halfsine	15 g/11 ms halfsine
Free Fall	100 mm/3 axis	1200 mm/all edges and corners

Power Requirements

The standard Centellis Series 4000 is delivered with an AC power supply. A DC power supply is optional.

Table 4: *Power Requirements*

Centellis Series 4000	**PSU 220W AC**	**PSU 220W DC**
Nominal Input Voltage	100 - 240V AC	-48V to -60V DC
Operating Voltage Range	90 - 264V AC	-40 to -72V DC
Input Current	4 - 2A (RMS) AC	10A
Line Frequency	50 - 60 Hz	—
DC Output Voltages and Currents		
+3.3V	16 A	15A
+5V	25 A	30A
+12V	13 A	15A
-12V	0.8 A	2A
$+5V_{sb}$	2.0 A	1.2A
-5V	0.3A	2A
Output Power		
Total output power	220W	220W
+3.3V and +5V combined	145W	150W
Efficiency	70% (typical)	> 65%

Installing the System

The Centellis Series 4000 can either be used as desktop station or it can be installed in a 19” rack.

Observe the following general safety notes when installing the Centellis Series 4000 into a 19” rack.

Caution



- ***Restricted access area* – The Centellis Series 4000 is only to be installed in a restricted access area.**
- ***Installation codes* – This unit must be installed in accordance with the *National Electrical Code, Articles 110-16, 110-17, and 110-18* and the *Canadian Electrical Code, Section 12*.**
- ***Conductor ampacity* – According to *UL 1950, Annex NAE (NEC Article 645-5(a))*, the branch-circuit conductors supply must have an ampacity of not less than 125 percent of the total connected load. As such, if the equipment is rated 16A, the minimum conductor ampacity shall not be less than 20A. Per *NEC Article 310-15 and Table 310-16*, the minimum American Wire Gauge (AWG) suitable is 14 AWG. Note that although the 14 AWG is rated for 20A, the overcurrent protection device for 14 AWG shall not exceed 15A.**
- ***Overcurrent protection* – A readily accessible listed branch-circuit overcurrent protective device 20A must be incorporated in the building wiring. This is only valid if the minimum conductor is 12 AWG. Per *NEC Table 310-16*, the ampacity of 12 AWG is 25A with the overcurrent protection device not exceeding 20A.**

Installing the Centellis Series 4000

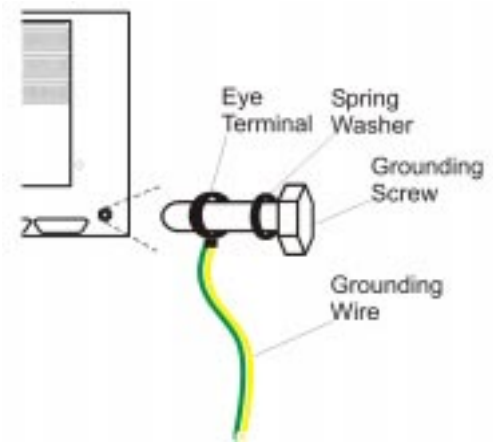
Caution



To avoid system damage check whether the system meets the following requirements before installing the system:

- **Table 4 “Power Requirements” on page 2-5**
- **Table 3 “Environmental Requirements” on page 2-4.**

1. Insert system into rack
2. Fix system with two screws on each side
3. Loosen grounding screw on system back side



4. Attach eye terminal with grounding wire of rack to grounding screw of chassis
   Make sure to use an UL-listed eye terminal for a 6 mm bolt that can be used with a 4 mm^2 grounding wire
5. Refix grounding screw to chassis
6. Connect power cable

Removing the Centellis Series 4000

1. Disconnect power cable
2. Loosen screws
3. Pull out system using handles

Installing Components

The Centellis Series 4000 system allows to replace the drive module and install or remove boards in any order.

The hinged front panel door protects the interior against dust and impurities and has spring gaskets for EMI protection. It is opened easily by loosening the knurl screws. After opening the front panel door you can easily access the card cage.

H.110 4-Slot Backplane

The H.110 backplane supports full hot-swap. That means that I/O boards can be installed into or removed from a running system to maintain or replace a board.

Caution



- **Only personnel trained by Force Computers or persons qualified in electronics or electrical engineering are authorized to install a board or to remove it from a running system. Otherwise, damage to personnel and/or to the system may occur.**
- **Installation into and removal from a powered system is only possible for I/O slots (slots 2-4). Removing a board from a system slot leads to a system breakdown and data loss.**

Installation in a Non-Powered System

System and non-hot-swappable I/O boards must always be installed or removed according to the description below. Hot-swappable I/O boards may be installed or removed according to this description, however, they can also be installed or removed in a running system.

Installing Boards

1. Switch off system power
2. Unfasten two screws on front panel door
3. Open front panel door

Caution



- **In order to avoid damage to the board and/or the system, only install CPCI CPU baords into slot 1 marked with a triangle and install CPCI H.110 I/O boards into slots 2-4 marked with a circle.**
- **The system will be damaged if RTBs installed into the rear slots do not correspond to the boards installed into the same slots from the system's front. Therefore, always make sure that the RTBs and boards installed into the same slots from the system's front and rear do correspond.**

4. Insert board into appropriate slot according to board's Installation Guide

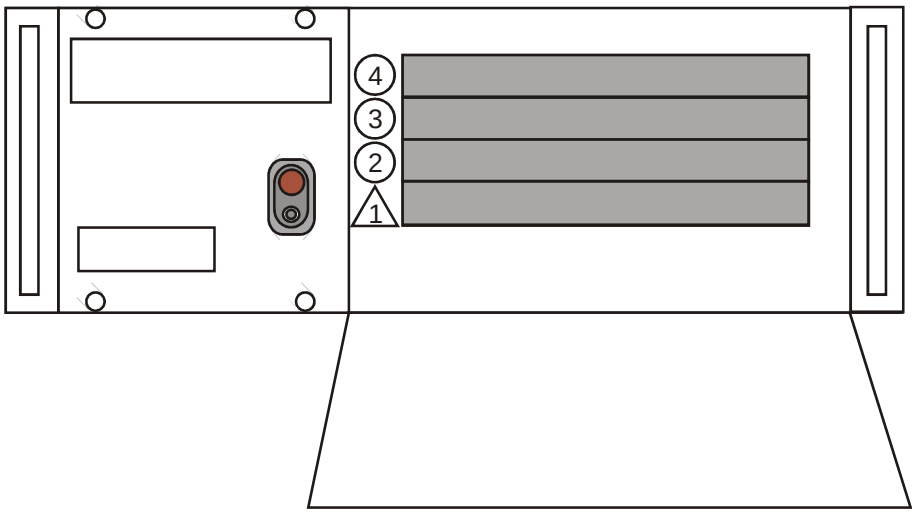


Figure 4: *Slots on CPCI 4-Slot H.110 Backplane (Front View)*

5. Close front panel door
6. Fasten screws on front panel door
7. Switch system power on

Removing Boards

1. Switch system power off
2. Unfasten two screws on front panel door
3. Open front panel door
4. Remove board according to board's Installation Guide
5. Close front panel door

6. Fasten screws on front panel door
7. Switch system power on

Installation in a Powered System under Hot-Swap Conditions

If you want to install a hot-swappable I/O board into or remove it from an I/O slot, follow the instructions in this section.

Installing Boards

1. Unfasten two screws on front panel door
2. Open front panel door
3. Check board configuration (switch settings, memory and PMC modules)

Caution



Installation of a board under hot-swap conditions is only possible for I/O slots.

4. Insert board into I/O slot of powered system according to board's Installation Guide
   The hot-swap LED stays blue until the board software connection process has been completed.

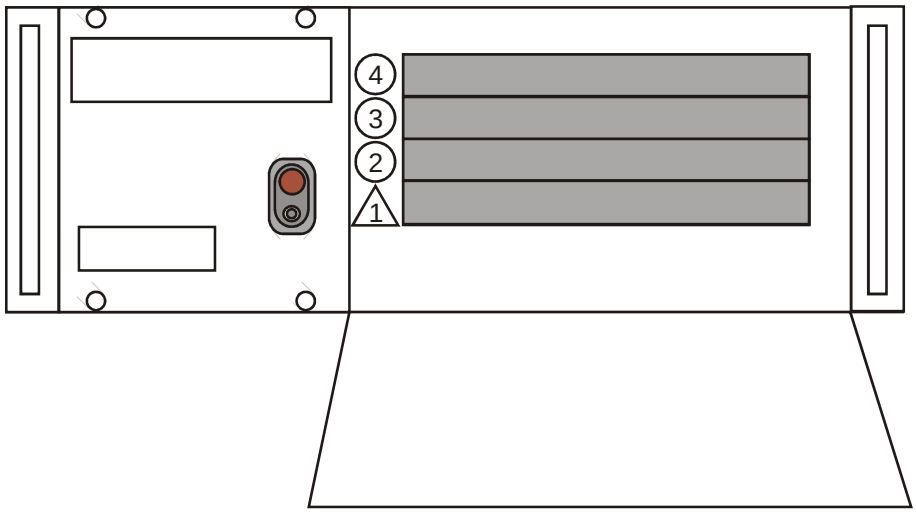


Figure 5: *Slots on CPCI 4-Slot H.110 Backplane (Front View)*

5. Close front panel door
6. Fasten screws on front panel door

Removing Boards

1. Unfasten two screws on front panel door
2. Open front panel door
3. Perform software disconnection according to board's Installation Guide
4. Open lower front panel handle
5. Wait until hot-swap LED turns blue

Caution



- **Removing a board from a system slot leads to a system breakdown and data loss. Therefore, installation into and removal from a powered system is only possible for I/O slots (slots 2-4).**
- **As long as the blue hot-swap LED is off, the board is in normal operation and must not be removed.**

6. Remove board from I/O slot
7. Close front panel door
8. Fasten screws on front panel door

Optional CPCI Backplane

Rear transition boards are installed from the system's rear according to the respective rear transition board's Installation Guide.

Installing Boards

Caution



The optional CPCI backplane does not support hot swap, so make sure the system power is switched off before inserting boards.

1. Switch off system power
2. Unfasten two screws on front panel door
3. Open front panel door

Caution

- **In order to avoid damage to the board and/or the system, only install CPU baords into slot 1 marked with a triangle and install I/O boards into slots 2-5 marked with a circle.**
- **The system will be damaged if RTBs installed into the rear slots do not correspond to the boards installed into the same slots from the system's front. Therefore, always make sure that the RTBs and boards installed into the same slots from the system's front and rear do correspond.**

4. Insert board into appropriate slot according to board's Installation Guide

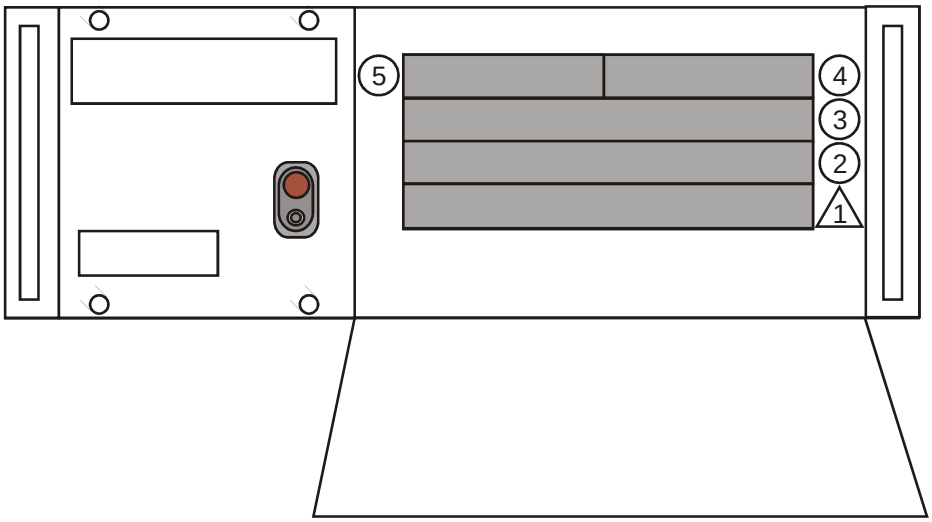


Figure 6: *Slots on Standard Backplane (Front View)*

5. Close front panel door
6. Fasten screws on front panel door
7. Switch on system power

Removing Boards

Caution

The optional CPCI backplane does not support hot swap, so make sure the system power is switched off before removing boards.

1. Switch off system power
2. Unfasten two screws on front panel door

3. Open front panel door
4. Remove board according to board's Installation Guide
5. Close front panel door
6. Fasten screws on front panel door
7. Switch on system power

Mass Storage Devices

The drive module is capable of holding up to three mass storage devices (1 x 5.25” / HH, 1 x 3.5” / HH, and 1 x 3.5” slim line) which can be interfaced via floppy, SCSI, or enhanced IDE connections.

Removing Mass Storage Devices

Danger



- **Only personnel trained by Force Computers or qualified persons in electronics or electrical engineering are authorized to open the system.**
- **To avoid electric shock when opening the chassis it is not sufficient to switch off the main function switch because it does not remove the AC line voltage from the system. Therefore, before opening the chassis, an authorized person must check that the system is powered off and that the system’s main power connector is disconnected.**

1. Open chassis to gain access to mass storage devices
2. Verify that power cord is removed from power plug
3. Remove six screws at system’s bottom

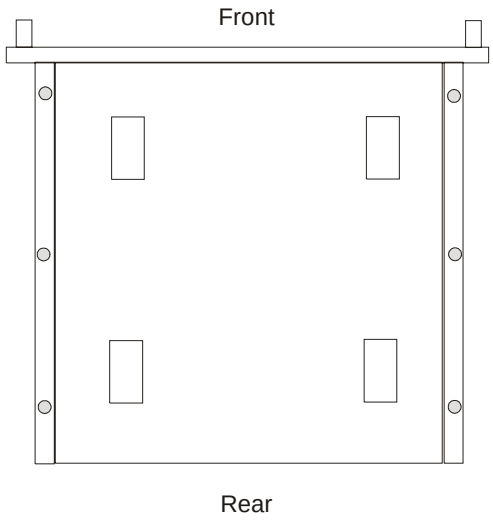
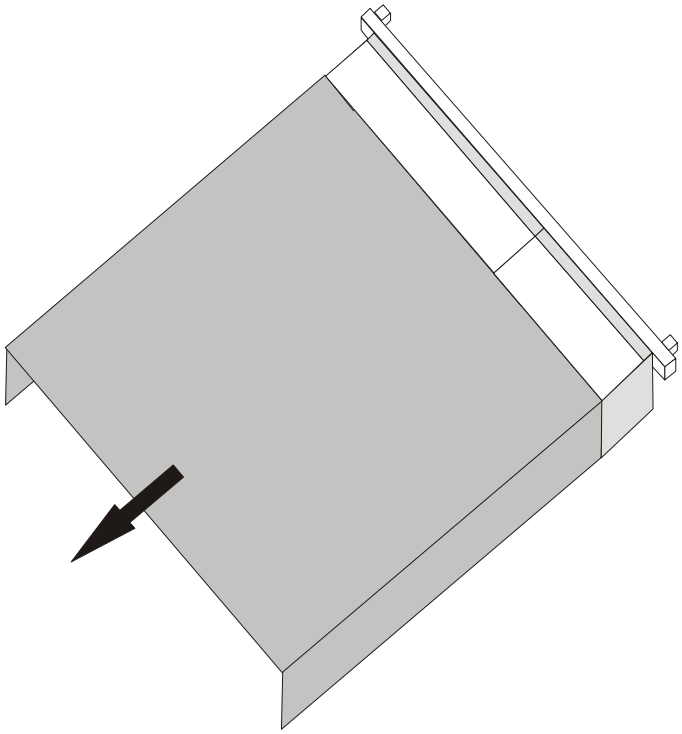
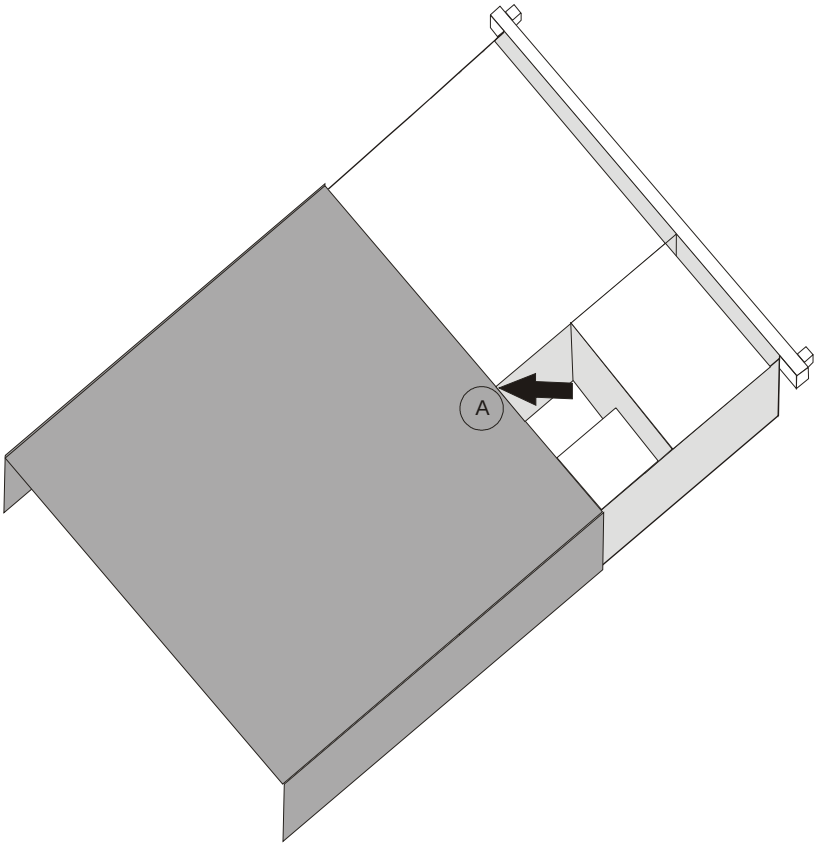


Figure 7: *System Bottom View*

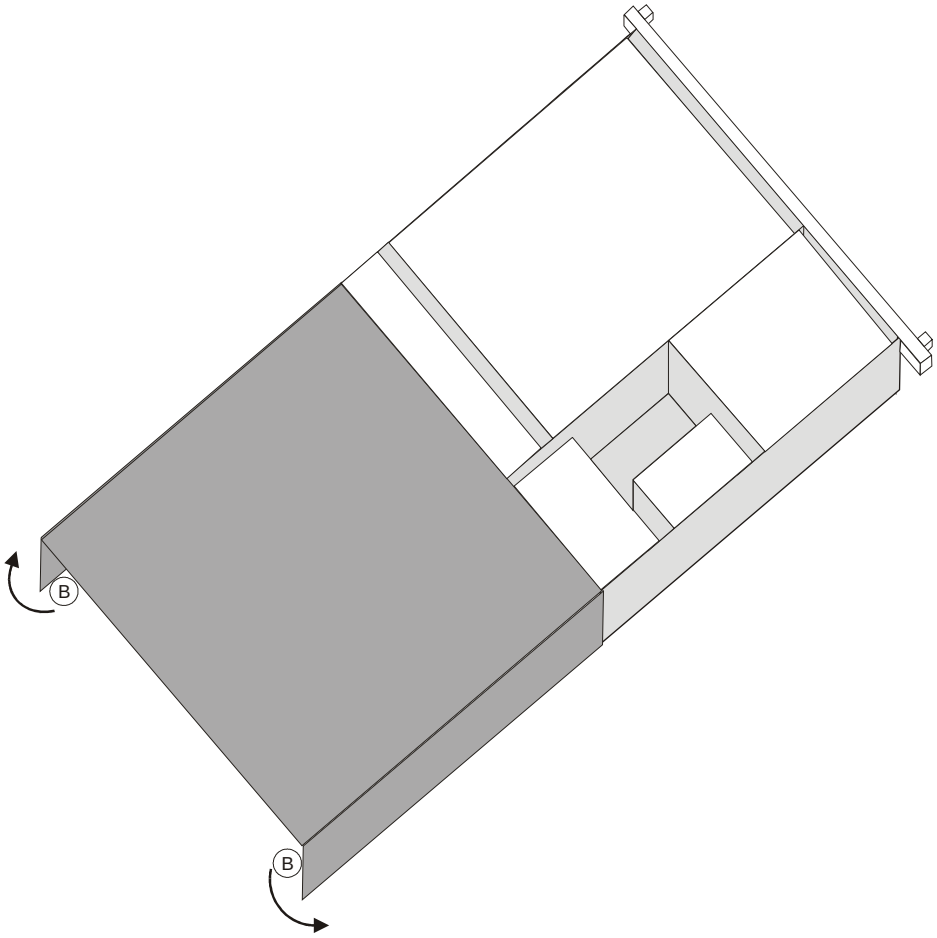
4. Carefully move cover on top of system towards system's rear



5. When cover is almost half removed, pull up cover slightly at location A to be able to move it easily over components



6. When cover is almost entirely removed, pull edges of cover on side of chassis slightly apart (location B)



7. To remove cover entirely, pull up cover slightly again
8. Remove cabling from behind mass storage devices

9. Remove four screws on front

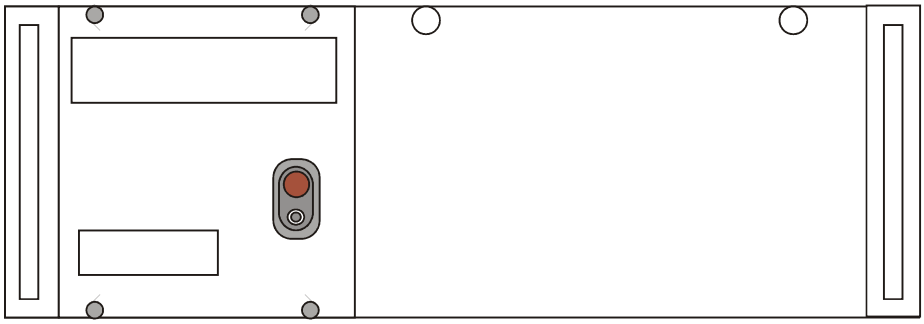


Figure 8: *Front Panel with Screws*

10. Remove mass storage devices

Installing Mass Storage Devices

1. Insert mass storage devices
2. Fasten four screws at front
3. Connect cables from behind mass storage devices
4. Push cover from system's rear towards front
5. Make sure cover snaps in at front panel
6. Fasten six screws at system's bottom
7. Connect power cord

3

Controls, Indicators, and Connectors

Front Panel

The front panel of a Centellis Series 4000 system contains the main function switch, the front panel door, and the mass storage devices.

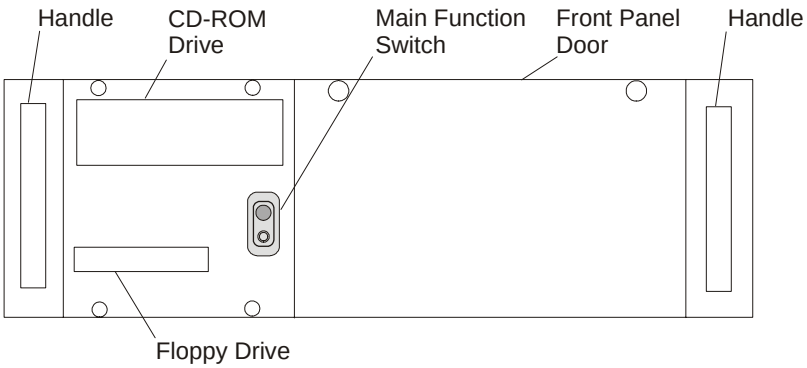


Figure 9: *System Front View*

The main function switch is used to disconnect the AC power from the system if the back panel power switch is set to ON.

Danger



Switching off the main function switch does not remove the line voltage from the system. Always unplug the power cord to remove the line voltage from the system.

Back Panel

The back panel of a standard Centellis Series 4000 comes with an AC power supply. A DC power supply is optional.

AC Back Panel

The following picture provides an overview of the back panel with AC power supply which contains power factor correction (PFC).

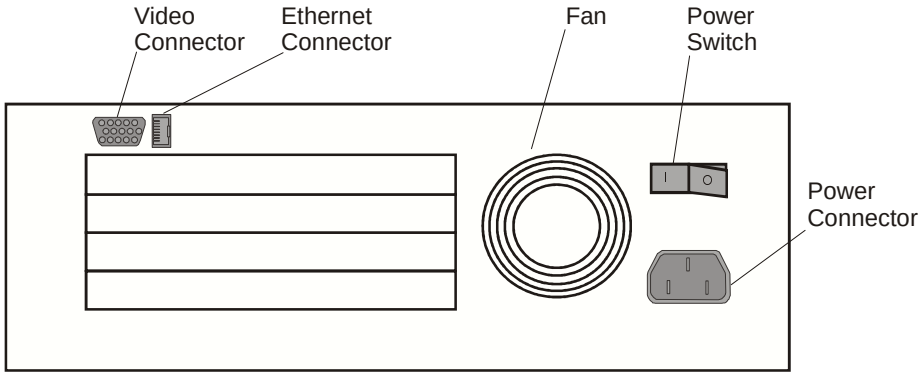


Figure 10: *Back Panel AC Power*

Power Switch

The power switch is available on the AC back panel of the Centellis Series 4000 and is used to disconnect AC power from the power supply.

Danger



Switching off the power switch does not remove the line voltage from the system. Remove the power cord to remove the line voltage from the system.

Figure 11: *Power Switch*

The applied voltage (100V-240V at 50 Hz-60 Hz AC) automatically switches the voltage range of the AC power supply for the complete voltage range.

Connectors

The Centellis Series 4000 provides the following connectors on the back panel:

- AC power
- Ethernet (optional, depends on the installed boards)
- Video (optional, depends on the installed boards)

AC Power

The AC power input connector is available on a back panel with AC power supply.

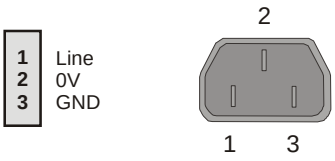


Figure 12: *AC Power Connector*

Ethernet Connector

The ethernet connector is an RJ-45 connector and only available separately if it is not provided by the rear I/O panel delivered together with the system.

1	TPE0
2	TPE1
3	TPE2
4	n.c.
5	n.c.
6	TPE3
7	n.c.
8	n.c.



Figure 13: *Ethernet Connector*

Video Connector

The video connector is a HD D-Sub connector and only available separately if it is not provided by the rear I/O panel delivered together with the system.

1	red
2	green
3	blue
4	n.c.
5	GND
6	red GND
7	green GND
8	blue GND
9	+5V
10	GND
11	n.c.
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

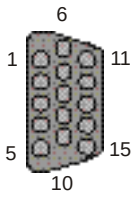


Figure 14: *Video Connector*

DC Back Panel

The following picture provides an overview of the optional back panel with DC power supply.

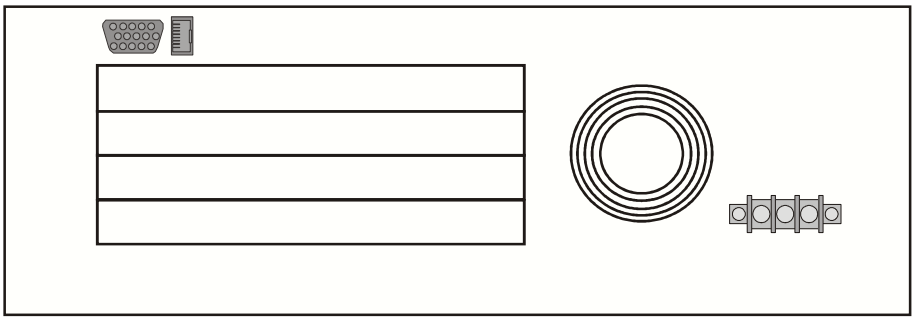


Figure 15: *Back Panel DC Power*

The Centellis Series 4000 provides the following connectors on the DC back panel:

- DC power
- Ethernet (optional, depends on installed boards)
- Video (optional, depends on installed boards)

DC Power

The DC power input connector is on a back panel with DC power supply.

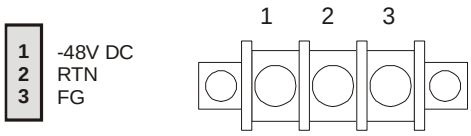


Figure 16: *DC Power Connector*

Ethernet Connector

The ethernet connector is an RJ-45 connector and only available separately if it is not provided by the rear I/O panel delivered together with the system.

1	TPE0
2	TPE1
3	TPE2
4	n.c.
5	n.c.
6	TPE3
7	n.c.
8	n.c.



Figure 17: *Ethernet Connector*

Video Connector

The video connector is a HD D-Sub connector and only available separately if it is not provided by the rear I/O panel delivered together with the system.

1	red
2	green
3	blue
4	n.c.
5	GND
6	red GND
7	green GND
8	blue GND
9	+5V
10	GND
11	n.c.
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

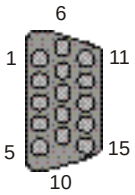


Figure 18: *Video Connector*

H.110 Backplane

The H.110 CPCI backplane provides both CompactPCI connectors and non-CompactPCI connectors.

CompactPCI Connectors

The following two figures show the location and the enumeration of the CompactPCI connectors on the front and the rear side of the backplane which allows to connect a CPU and I/O boards as well as rear transition boards.

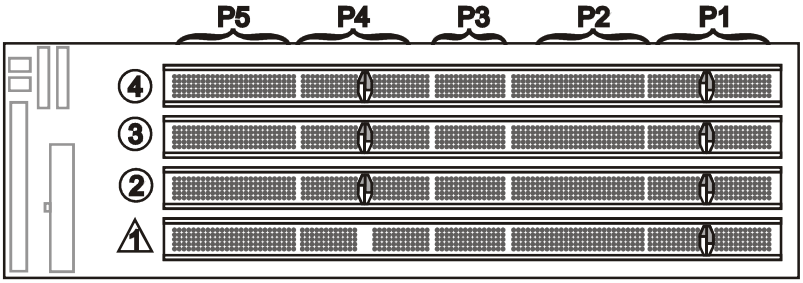


Figure 19: *CompactPCI Connectors on Front Side of H.110 Backplane*

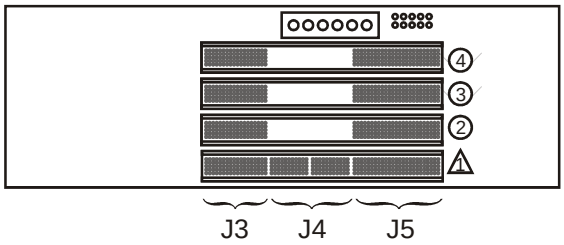
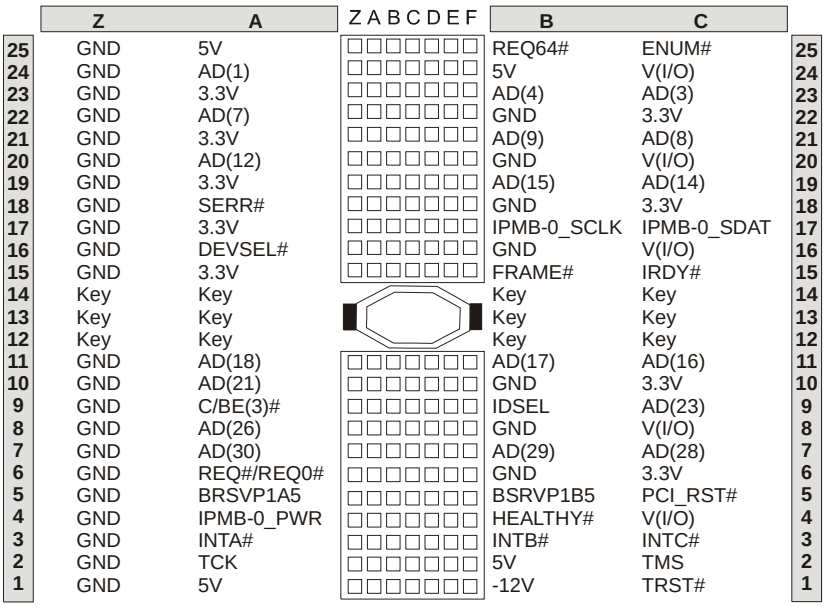


Figure 20: *CompactPCI Connectors on Rear Side of H.110 Backplane*

The H.110-specific time division multiplexer (TDM) bus signals are listed in the following figures. If H.110 TDM bus signals are not described here, there are no special electrical requirements pertaining to the backplane that apply to that signal. The routing of all shelf enumeration bus signals fulfils the H.110 specification. The shelf enumeration bus signal pinnings are placed on a 10-pin shrouded header.

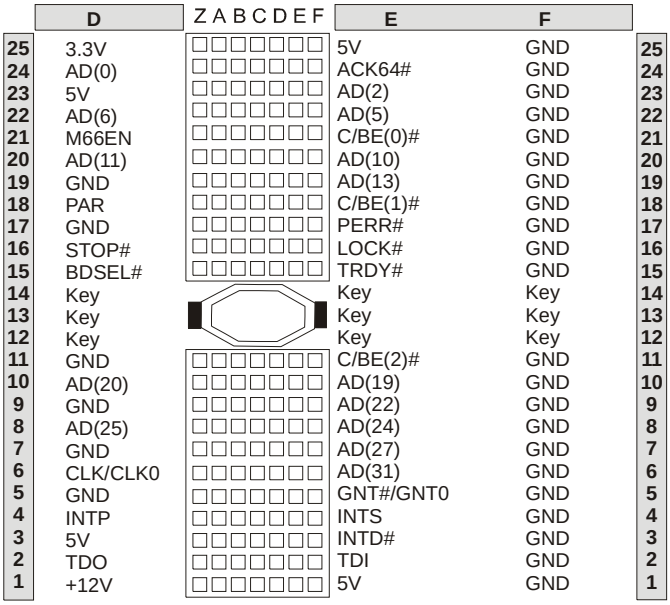
The following figures show the pin counts and pin assignments of the CompactPCI connectors.

Note: Row F and Z GND pins of the CompactPCI connectors are long length as is standard for CompactPCI. The length of all other pins complies to the CompactPCI specification. IPMB_ signals are bussed from slot 1 to slot 4 (A4, B17, C17).



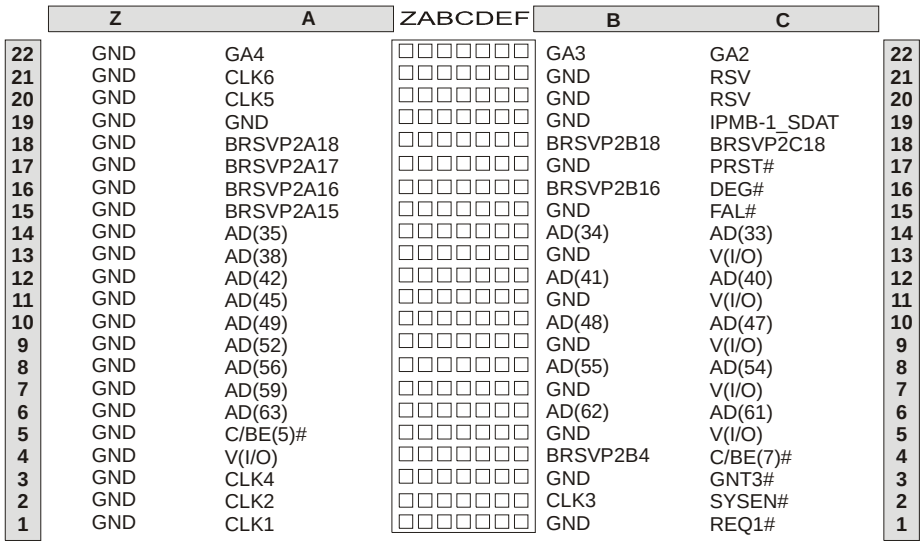
	Z	A	Z A B C D E F	B	C	
25	GND	5V		REQ64#	ENUM#	25
24	GND	AD(1)		5V	V(I/O)	24
23	GND	3.3V		AD(4)	AD(3)	23
22	GND	AD(7)		GND	3.3V	22
21	GND	3.3V		AD(9)	AD(8)	21
20	GND	AD(12)		GND	V(I/O)	20
19	GND	3.3V		AD(15)	AD(14)	19
18	GND	SERR#		GND	3.3V	18
17	GND	3.3V		IPMB-0_SCLK	IPMB-0_SDAT	17
16	GND	DEVSEL#		GND	V(I/O)	16
15	GND	3.3V		FRAME#	IRDY#	15
14	Key	Key		Key	Key	14
13	Key	Key		Key	Key	13
12	Key	Key		Key	Key	12
11	GND	AD(18)		AD(17)	AD(16)	11
10	GND	AD(21)		GND	3.3V	10
9	GND	C/BE(3)#		IDSEL	AD(23)	9
8	GND	AD(26)		GND	V(I/O)	8
7	GND	AD(30)		AD(29)	AD(28)	7
6	GND	REQ#/REQ0#		GND	3.3V	6
5	GND	BRSVP1A5		BSRVP1B5	PCI_RST#	5
4	GND	IPMB-0_PWR		HEALTHY#	V(I/O)	4
3	GND	INTA#		INTB#	INTC#	3
2	GND	TCK		5V	TMS	2
1	GND	5V		-12V	TRST#	1

Figure 21: *P1 Connector Pinout (Rows Z-C)*



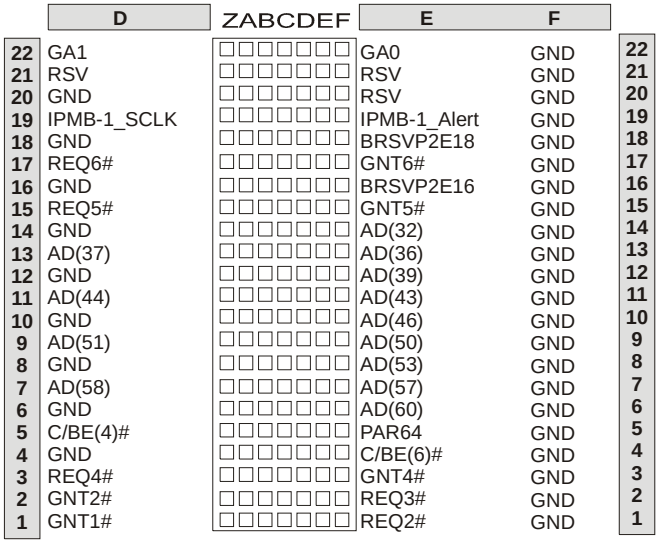
	D	E	F	
25	3.3V	5V	GND	25
24	AD(0)	ACK64#	GND	24
23	5V	AD(2)	GND	23
22	AD(6)	AD(5)	GND	22
21	M66EN	C/BE(0)#	GND	21
20	AD(11)	AD(10)	GND	20
19	GND	AD(13)	GND	19
18	PAR	C/BE(1)#	GND	18
17	GND	PERR#	GND	17
16	STOP#	LOCK#	GND	16
15	BDSEL#	TRDY#	GND	15
14	Key	Key	Key	14
13	Key	Key	Key	13
12	Key	Key	Key	12
11	GND	C/BE(2)#	GND	11
10	AD(20)	AD(19)	GND	10
9	GND	AD(22)	GND	9
8	AD(25)	AD(24)	GND	8
7	GND	AD(27)	GND	7
6	CLK/CLK0	AD(31)	GND	6
5	GND	GNT#/GNT0	GND	5
4	INTP	INTS	GND	4
3	5V	INTD#	GND	3
2	TDO	TDI	GND	2
1	+12V	5V	GND	1

Figure 22: *P1 Connector Pinout (Rows D-F)*



	Z	A	ZABCDEF	B	C	
22	GND	GA4		GA3	GA2	22
21	GND	CLK6		GND	RSV	21
20	GND	CLK5		GND	RSV	20
19	GND	GND		GND	IPMB-1_SDAT	19
18	GND	BRSVP2A18		BRSVP2B18	BRSVP2C18	18
17	GND	BRSVP2A17		GND	PRST#	17
16	GND	BRSVP2A16		BRSVP2B16	DEG#	16
15	GND	BRSVP2A15		GND	FAL#	15
14	GND	AD(35)		AD(34)	AD(33)	14
13	GND	AD(38)		GND	V(I/O)	13
12	GND	AD(42)		AD(41)	AD(40)	12
11	GND	AD(45)		GND	V(I/O)	11
10	GND	AD(49)		AD(48)	AD(47)	10
9	GND	AD(52)		GND	V(I/O)	9
8	GND	AD(56)		AD(55)	AD(54)	8
7	GND	AD(59)		GND	V(I/O)	7
6	GND	AD(63)		AD(62)	AD(61)	6
5	GND	C/BE(5)#		GND	V(I/O)	5
4	GND	V(I/O)		BRSVP2B4	C/BE(7)#	4
3	GND	CLK4		GND	GNT3#	3
2	GND	CLK2		CLK3	SYSEN#	2
1	GND	CLK1		GND	REQ1#	1

Figure 23: *P2 Connector Pinout (Rows Z-C)*



	D	ZABCDEF	E	F	
22	GA1		GA0	GND	22
21	RSV		RSV	GND	21
20	GND		RSV	GND	20
19	IPMB-1_SCLK		IPMB-1_Alert	GND	19
18	GND		BRSVP2E18	GND	18
17	REQ6#		GNT6#	GND	17
16	GND		BRSVP2E16	GND	16
15	REQ5#		GNT5#	GND	15
14	GND		AD(32)	GND	14
13	AD(37)		AD(36)	GND	13
12	GND		AD(39)	GND	12
11	AD(44)		AD(43)	GND	11
10	GND		AD(46)	GND	10
9	AD(51)		AD(50)	GND	9
8	GND		AD(53)	GND	8
7	AD(58)		AD(57)	GND	7
6	GND		AD(60)	GND	6
5	C/BE(4)#		PAR64	GND	5
4	GND		C/BE(6)#	GND	4
3	REQ4#		GNT4#	GND	3
2	GNT2#		REQ3#	GND	2
1	GNT1#		REQ2#	GND	1

Figure 24: *P2 Connector Pinout (Rows D-F)*

Note: Row F and Z GND pins of P2 are long length as is standard for CompactPCI. All other XxP2 pins shall be medium length. IPMB-1_SDAT(P2C19), IPMB-1_SCLK(P2D19), IPMB-1_Alert(P2E19) are signals of the second I^2C bus and are only implemented at slot 1. On the other slots (slots 2 to 4), these pins are reserved pins (RSV). The second I^2C bus is routed to P4, P5 and P6.

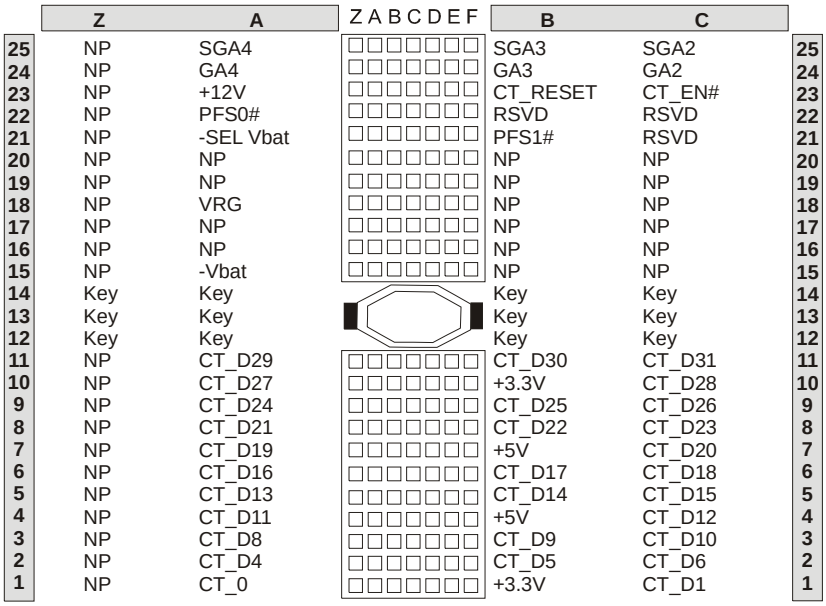


Figure 25: *P4 Connector Pinout (Rows Z-C)*

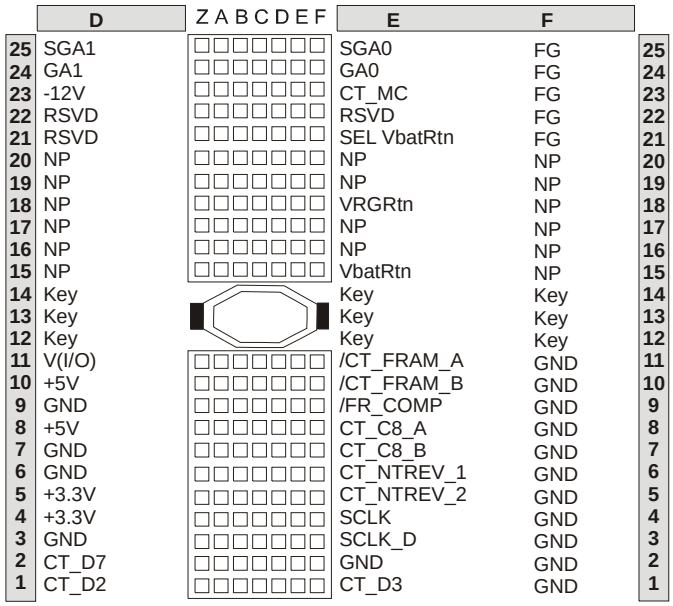
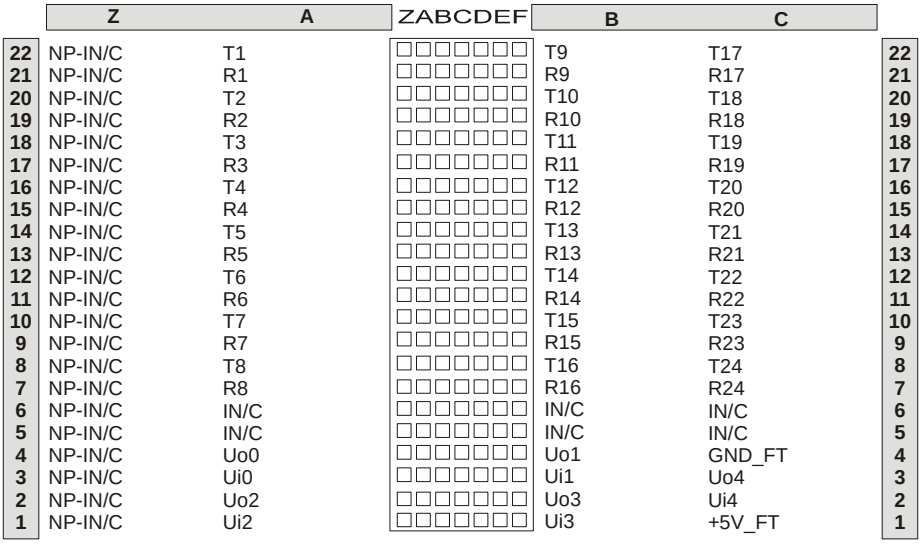
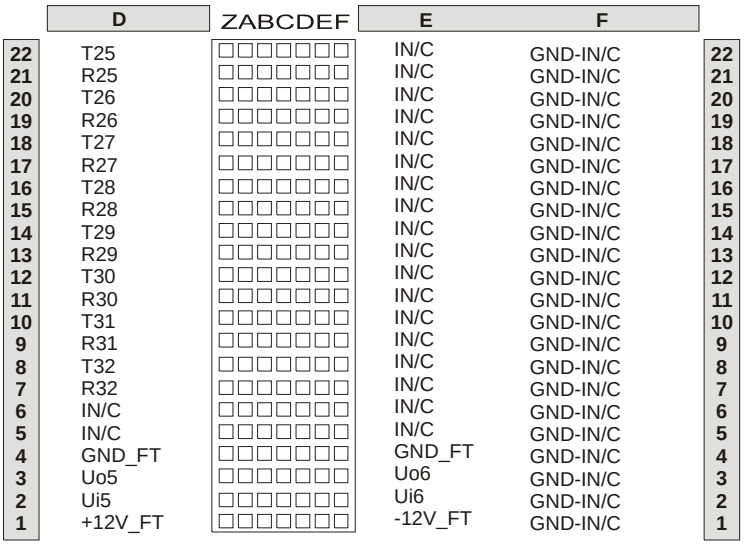


Figure 26: *P4 Connector Pinout (Rows D-F)*



	Z	A	ZABCDEF	B	C	
22	NP-IN/C	T1		T9	T17	22
21	NP-IN/C	R1		R9	R17	21
20	NP-IN/C	T2		T10	T18	20
19	NP-IN/C	R2		R10	R18	19
18	NP-IN/C	T3		T11	T19	18
17	NP-IN/C	R3		R11	R19	17
16	NP-IN/C	T4		T12	T20	16
15	NP-IN/C	R4		R12	R20	15
14	NP-IN/C	T5		T13	T21	14
13	NP-IN/C	R5		R13	R21	13
12	NP-IN/C	T6		T14	T22	12
11	NP-IN/C	R6		R14	R22	11
10	NP-IN/C	T7		T15	T23	10
9	NP-IN/C	R7		R15	R23	9
8	NP-IN/C	T8		T16	T24	8
7	NP-IN/C	R8		R16	R24	7
6	NP-IN/C	IN/C		IN/C	IN/C	6
5	NP-IN/C	IN/C		IN/C	IN/C	5
4	NP-IN/C	Uo0		Uo1	GND_FT	4
3	NP-IN/C	Ui0		Ui1	Uo4	3
2	NP-IN/C	Uo2		Uo3	Ui4	2
1	NP-IN/C	Ui2		Ui3	+5V_FT	1

Figure 27: *P5 Connector Pinout (Rows Z-C)*



	D	ZABCDEF	E	F	
22	T25		IN/C	GND-IN/C	22
21	R25		IN/C	GND-IN/C	21
20	T26		IN/C	GND-IN/C	20
19	R26		IN/C	GND-IN/C	19
18	T27		IN/C	GND-IN/C	18
17	R27		IN/C	GND-IN/C	17
16	T28		IN/C	GND-IN/C	16
15	R28		IN/C	GND-IN/C	15
14	T29		IN/C	GND-IN/C	14
13	R29		IN/C	GND-IN/C	13
12	T30		IN/C	GND-IN/C	12
11	R30		IN/C	GND-IN/C	11
10	T31		IN/C	GND-IN/C	10
9	R31		IN/C	GND-IN/C	9
8	T32		IN/C	GND-IN/C	8
7	R32		IN/C	GND-IN/C	7
6	IN/C		IN/C	GND-IN/C	6
5	IN/C		IN/C	GND-IN/C	5
4	GND_FT		GND_FT	GND-IN/C	4
3	Uo5		Uo6	GND-IN/C	3
2	Ui5		Ui6	GND-IN/C	2
1	+12V_FT		-12V_FT	GND-IN/C	1

Figure 28: *P5 Connector Pinout (Rows D-F)*

Non-CompactPCI Connectors

The H.110 CPCI backplane provides the following non-CompactPCI connectors:

- ATX power connector P1
- Fan power connector P2
- Power-on connector P3
- AUX1 connector P4 (optional)
- AUX2 connector P5 (optional)
- Service connector P6 (optional)
- Telecom power connector P7 (optional)

For the location of the non-CPCI connectors on the front and rear side of the H.110 CPCI backplane, refer to the following figures.

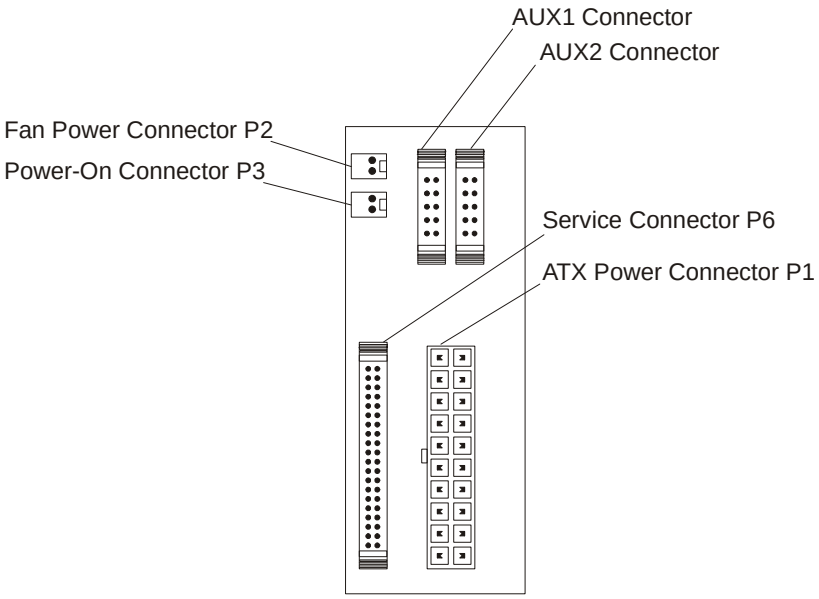


Figure 29: *Location of Non-CPCI Connectors on Front Side of H.110 Backplane*

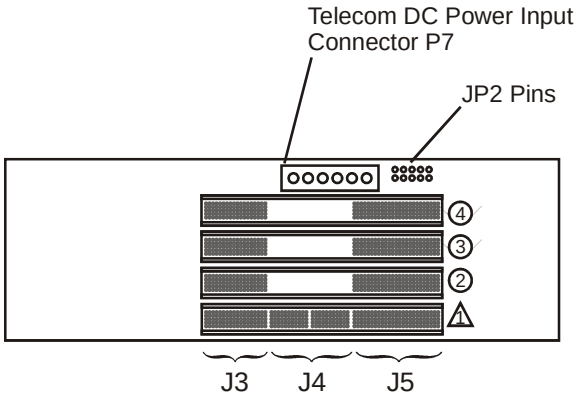


Figure 30: *Location of DC Power Input Connector on Rear Side of H.110 Backplane*

For the pin counts and pinouts of the connectors shown above, see the following figures.

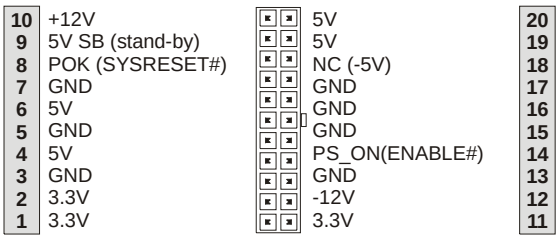


Figure 31: *P1 - ATX Power Connector Pinout*



Figure 32: *P2 - Fan Power Connector Pinout*



Figure 33: *P3 - Power-On Connector Pinout*

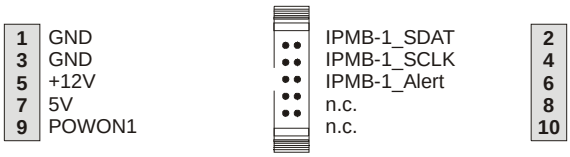


Figure 34: *P4 - AUX1 Connector Pinout*

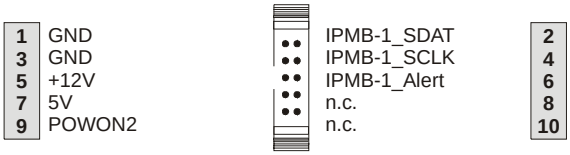


Figure 35: *P5 - AUX2 Connector Pinout*

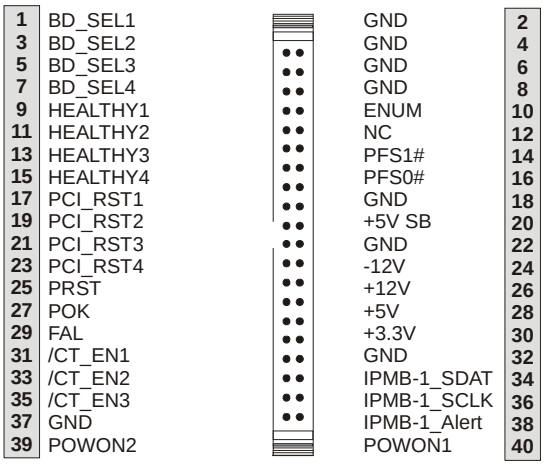


Figure 36: *P6 - Service Connector Pinout*

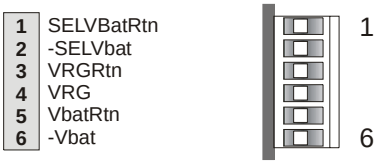


Figure 37: *P7 - Telecom DC Power Input Connector Pinout*

Optional CPCI Backplane

The optional CPCI backplane provides both CompactPCI connectors and non-CompactPCI connectors.

CompactPCI Connectors

The following two figures show the location and the enumeration of the CompactPCI connectors on the front and the rear side of the backplane.

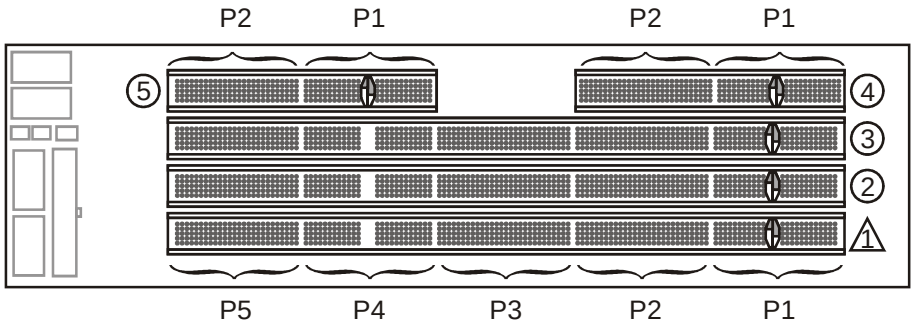


Figure 38: *CompactPCI Connectors on Front Side of CPCI Backplane*

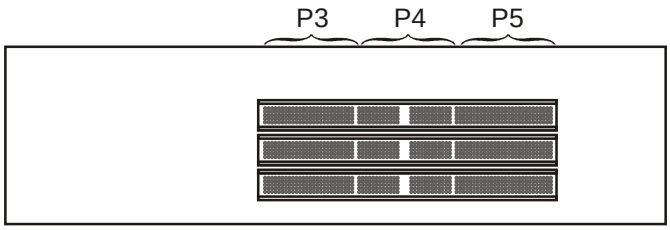
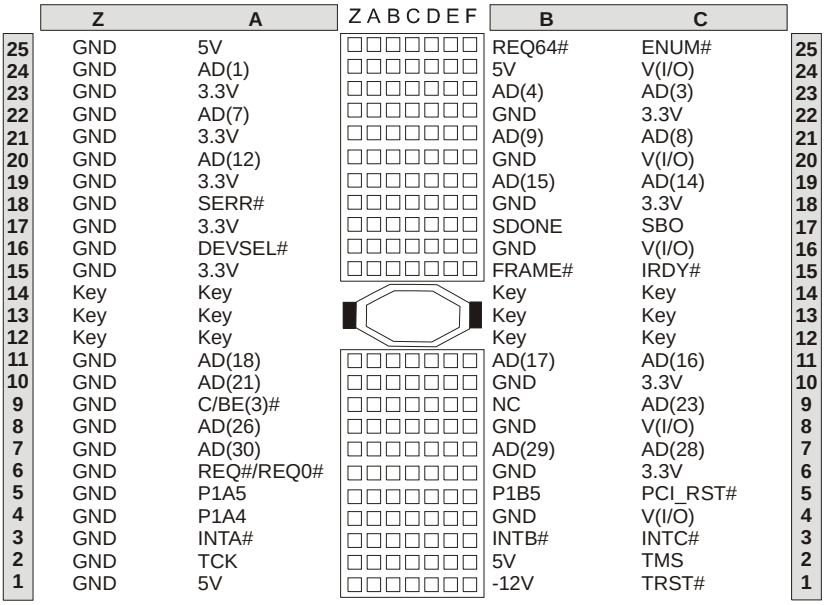


Figure 39: *CompactPCI Connectors on Rear Side of CPCI Backplane*

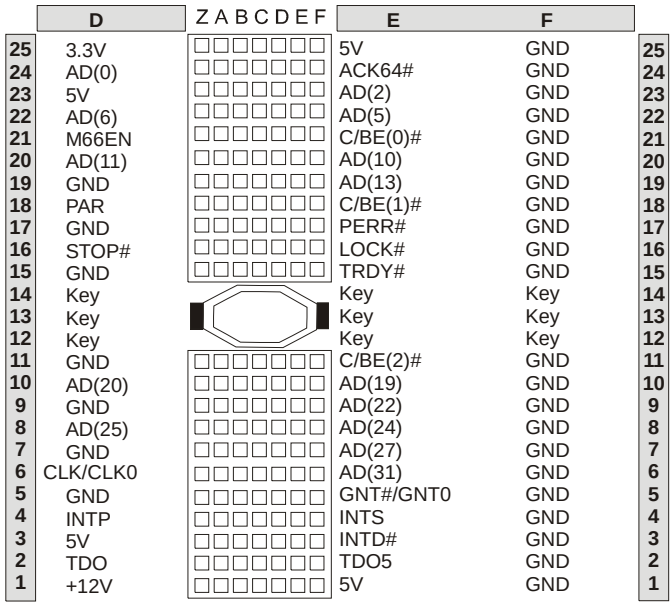
The following figures show the pin assignments of the CompactPCI connectors P1 and P2. The pin assignments of P3, P4, and P5 are user I/O interfaces and in accordance with the CompactPCI specification.

Note: Row F and Z GND pins are long length as is standard for CompactPCI.



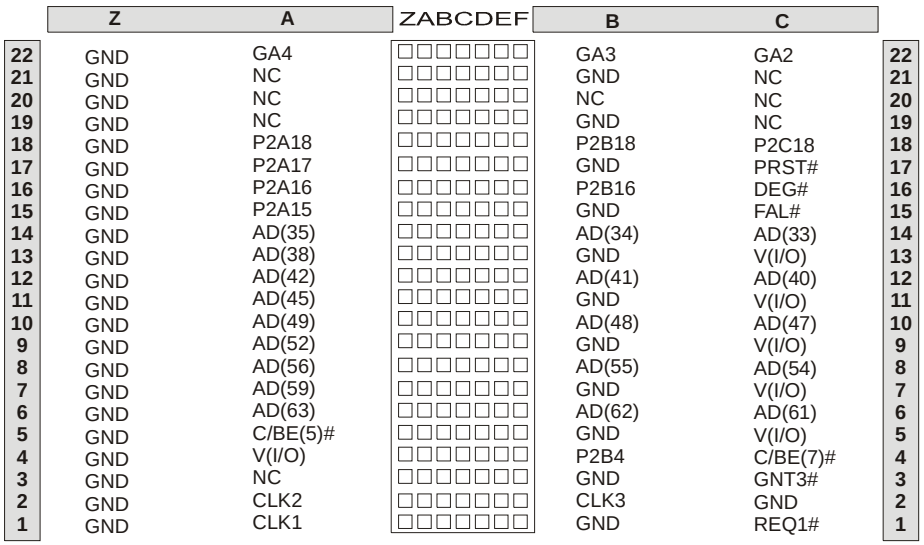
	Z	A	Z A B C D E F	B	C	
25	GND	5V		REQ64#	ENUM#	25
24	GND	AD(1)		5V	V(I/O)	24
23	GND	3.3V		AD(4)	AD(3)	23
22	GND	AD(7)		GND	3.3V	22
21	GND	3.3V		AD(9)	AD(8)	21
20	GND	AD(12)		GND	V(I/O)	20
19	GND	3.3V		AD(15)	AD(14)	19
18	GND	SERR#		GND	3.3V	18
17	GND	3.3V		SDONE	SBO	17
16	GND	DEVSEL#		GND	V(I/O)	16
15	GND	3.3V		FRAME#	IRDY#	15
14	Key	Key		Key	Key	14
13	Key	Key		Key	Key	13
12	Key	Key		Key	Key	12
11	GND	AD(18)		AD(17)	AD(16)	11
10	GND	AD(21)		GND	3.3V	10
9	GND	C/BE(3)#		NC	AD(23)	9
8	GND	AD(26)		GND	V(I/O)	8
7	GND	AD(30)		AD(29)	AD(28)	7
6	GND	REQ#/REQ0#		GND	3.3V	6
5	GND	P1A5		P1B5	PCI_RST#	5
4	GND	P1A4		GND	V(I/O)	4
3	GND	INTA#		INTB#	INTC#	3
2	GND	TCK		5V	TMS	2
1	GND	5V		-12V	TRST#	1

Figure 40: *P1 Connector Pinout (Rows Z-C)*



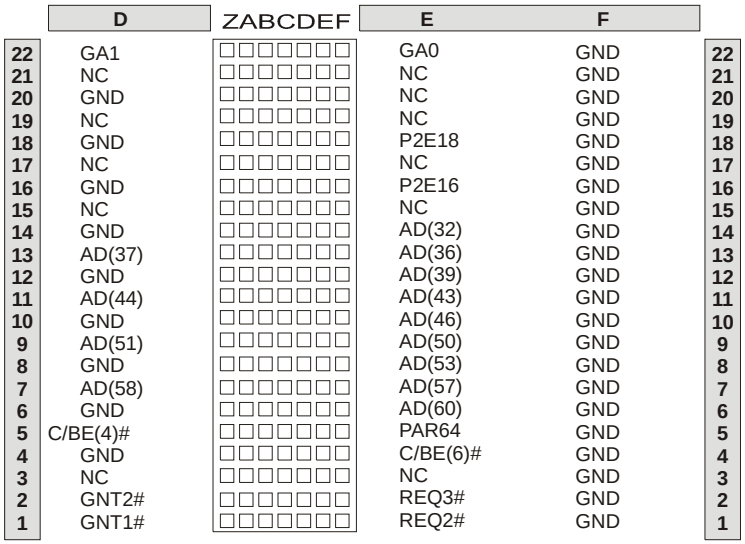
	D	Z A B C D E F	E	F	
25	3.3V		5V	GND	25
24	AD(0)		ACK64#	GND	24
23	5V		AD(2)	GND	23
22	AD(6)		AD(5)	GND	22
21	M66EN		C/BE(0)#	GND	21
20	AD(11)		AD(10)	GND	20
19	GND		AD(13)	GND	19
18	PAR		C/BE(1)#	GND	18
17	GND		PERR#	GND	17
16	STOP#		LOCK#	GND	16
15	GND		TRDY#	GND	15
14	Key		Key	Key	14
13	Key		Key	Key	13
12	Key		Key	Key	12
11	GND		C/BE(2)#	GND	11
10	AD(20)		AD(19)	GND	10
9	GND		AD(22)	GND	9
8	AD(25)		AD(24)	GND	8
7	GND		AD(27)	GND	7
6	CLK/CLK0		AD(31)	GND	6
5	GND		GNT#/GNT0	GND	5
4	INTP		INTS	GND	4
3	5V		INTD#	GND	3
2	TDO		TDO5	GND	2
1	+12V		5V	GND	1

Figure 41: *P1 Connector Pinout (Rows D-F)*



	Z	A	ZABCDEF	B	C	
22	GND	GA4		GA3	GA2	22
21	GND	NC		GND	NC	21
20	GND	NC		NC	NC	20
19	GND	NC		GND	NC	19
18	GND	P2A18		P2B18	P2C18	18
17	GND	P2A17		GND	PRST#	17
16	GND	P2A16		P2B16	DEG#	16
15	GND	P2A15		GND	FAL#	15
14	GND	AD(35)		AD(34)	AD(33)	14
13	GND	AD(38)		GND	V(I/O)	13
12	GND	AD(42)		AD(41)	AD(40)	12
11	GND	AD(45)		GND	V(I/O)	11
10	GND	AD(49)		AD(48)	AD(47)	10
9	GND	AD(52)		GND	V(I/O)	9
8	GND	AD(56)		AD(55)	AD(54)	8
7	GND	AD(59)		GND	V(I/O)	7
6	GND	AD(63)		AD(62)	AD(61)	6
5	GND	C/BE(5)#		GND	V(I/O)	5
4	GND	V(I/O)		P2B4	C/BE(7)#	4
3	GND	NC		GND	GNT3#	3
2	GND	CLK2		CLK3	GND	2
1	GND	CLK1		GND	REQ1#	1

Figure 42: *P2 Connector Pinout (Rows Z-C)*



	D	ZABCDEF	E	F	
22	GA1		GA0	GND	22
21	NC		NC	GND	21
20	GND		NC	GND	20
19	NC		NC	GND	19
18	GND		P2E18	GND	18
17	NC		NC	GND	17
16	GND		P2E16	GND	16
15	NC		NC	GND	15
14	GND		AD(32)	GND	14
13	AD(37)		AD(36)	GND	13
12	GND		AD(39)	GND	12
11	AD(44)		AD(43)	GND	11
10	GND		AD(46)	GND	10
9	AD(51)		AD(50)	GND	9
8	GND		AD(53)	GND	8
7	AD(58)		AD(57)	GND	7
6	GND		AD(60)	GND	6
5	C/BE(4)#		PAR64	GND	5
4	GND		C/BE(6)#	GND	4
3	NC		NC	GND	3
2	GNT2#		REQ3#	GND	2
1	GNT1#		REQ2#	GND	1

Figure 43: *P2 Connector Pinout (Rows D-F)*

Non-CompactPCI Connectors

The optional CPCI backplane provides the following non-CompactPCI connectors:

- Jumperfield connector JP1
- Fan power connector JP2
- Power-on connector JP3
- PS/2 power connectors BP1, BP2, BP3, and BP4
- ATX power connector

For the location of the non-CPCI connectors on the front side of the CPCI backplane, refer to the following figure.

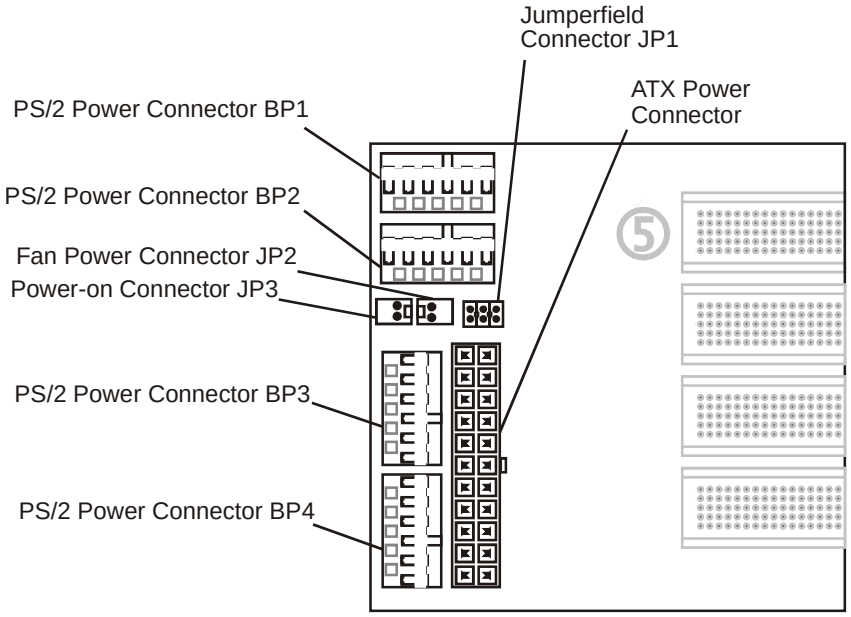


Figure 44: *Location of Non-CPCI Connectors on CPCI Backplane*

For the pin counts and pinouts of the connectors shown above, see the following figures.

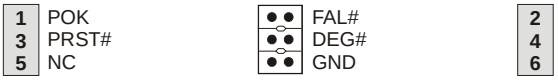


Figure 45: *JP1 - Jumperfield Connector Pinout*

1	GND
2	+12V



Figure 46: *JP2 - Fan Power Connector Pinout*

1	PS_ON
2	GND



Figure 47: *JP3 - Power-On Connector Pinout*

1	POK
2	5V
3	+12V
4	-12V
5	GND
6	GND

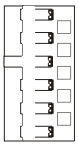


Figure 48: *BP1 - PS/2 Power Connector Pinout*

1	GND
2	GND
3	NC
4	5V
5	5V
6	5V

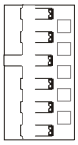


Figure 49: *BP2 - PS/2 Power Connector Pinout*

1	3.3V
2	3.3V
3	3.3V
4	GND
5	GND
6	GND

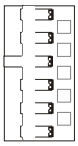


Figure 50: *BP3 - PS/2 Power Connector Pinout*

1	GND
2	GND
3	GND
4	3.3V
5	3.3V
6	3.3V

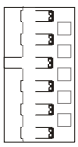


Figure 51: *BP4 - PS/2 Power Connector Pinout*

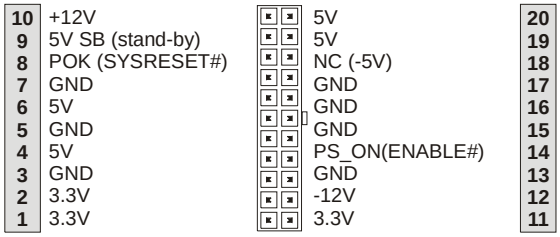


Figure 52: *ATX Power Connector Pinout*

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Product Error Report

Product:	Serial No.:
Date Of Purchase:	Originator:
Company:	Point Of Contact:
Tel.:	Ext.:
Address:	
Present Date:	
Affected Product: ❑ Hardware ❑ Software ❑ Systems	Affected Documentation: ❑ Hardware ❑ Software ❑ Systems
Error Description:	

This Area to Be Completed by Force Computers:

Date:

PR#:

Responsible Dept.: ❑ Marketing ❑ Production

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