GP1013™

Hot Swap
CompactPCI System

User's Guide

095-20088-00 Rev. B

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Customer Service

Headquarters: I-Bus/Phoenix, A Maxwell Technologies Company
8888 Balboa Ave.
San Diego, CA 92123
Telephone: (858) 503-3000 (800) 382-4229 (in the U.S.)
Direct Sales: (888) 307-7892
Tech. Support: (877) 777-IBUS (4287)
FAX: (858) 503-3005
E-Mail: **info@ibus.com**
sales@ibus.com
manuals@ibus.com
WEB: www.ibus.com

European Headquarters, Israel:
I-Bus/Phoenix
Units 2-3 Kingscroft Court
Ridgway, Havant
Hampshire PO9 1LS, UK
Telephone: +44 (0) 23 9242 4800
FAX: +44 (0) 23 9242 4801
E-Mail: sales@ibus.co.uk
support@ibus.co.uk

France, Italy: I-Bus/Phoenix France
B.P. 45 Valbonne
06901 Sophia Antipolis CEDEX
France
Telephone: +33 (0) 493 004 360
FAX: +33 (0) 493 004 369
E-Mail: ventes.fr@ibus.com
support.fr@ibus.com

Germany, Switzerland, Austria
I-Bus/Phoenix Germany
Peter-Henlein-Strasse 4
D-82140 Olching
Germany
Telephone: +49 (0) 81-42 46 79 0
FAX: +49 (0) 81-42 49 79 99
E-Mail: sales@ibus-deutschland.de

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team for
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Chapter 1 - Introduction

Welcome to the I-Bus/Phoenix family of CompactPCI computer systems. This manual provides information necessary to set up and maintain the GP1013.

The GP1013 System is a CompactPCI platform equipped with an I-Bus/Phoenix Castor t single board computer (SBC). The GP1013 series includes a PICMG H.110 compliant backplane, front pluggable 300W N+1 redundant power supplies, and configurable drive bays for up to eight 5.25" half height drives.

Options include -48 Vdc input, integrated RAID controller, and an eight disk drive bay.

Figure 1-1: GP1013 CompactPCI System

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Specifications

D **Overview**

- GThe I-Bus GP1013 system is a CompactPCI platform equipped with a single system board SBC.
- GIt is designed to meet NEBS Level 3 specifications for central office rackmount computer systems.
- GThe GP1013 system accommodates an Intel Pentium III Castor SBC with 12 expansion slots, and the corresponding 80mm rear I/O boards.
- GThe GP1013 system includes a PICMG H.110 compliant backplane, front pluggable, 300W N+1 redundant power supplies, configurable drive bays for up to four 5.25” half height drives and one 3.5” third height drive, or up to eight 5.25” half height drives.
- GOptions include -48 Vdc power input and a RAID controller.
- GThe system comes with the Microsoft Windows NT or Windows 2000 operating system preinstalled.
- GFigure 2-1 shows the configuration for the GP1013:

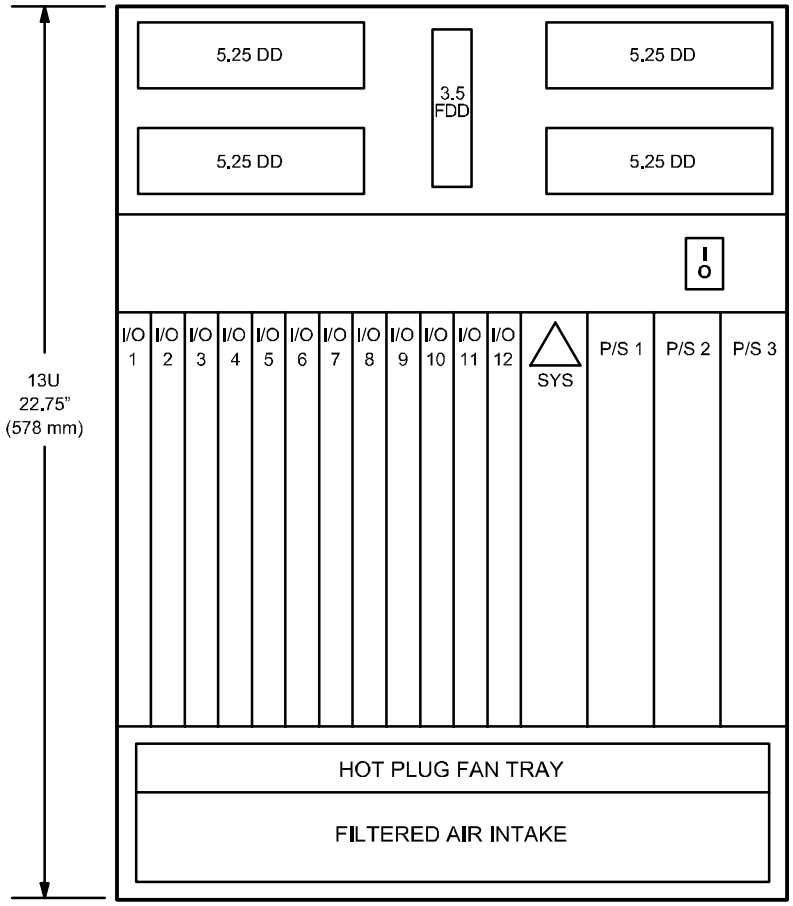

Figure 2-1: GP1013 Configuration
(Front View)

D **MECHANICAL**

G ENCLOSURE

Designed for EIA RS-310 19”and 24” racks.

Detachable rackmount brackets can be positioned for front flush mount or mid-chassis mount.

A separate rackmount bracket design is used for either 19” or 24” racks, both left and right sides, incorporating mounting keyways for temporary hanging of the chassis.

Enclosure front panel incorporates an AC main switch shrouded to prevent accidental trip, plus LEDs indicating power supply output status.

The front panel can be configured to display a variety of status LEDs (up to 30).

Backplane cooling fans are hot pluggable via a single tray.

The cool air intake incorporates a user removable, washable filter element.

Main input and circuit breaker are on the rear of the enclosure.

GBASIC CHASSIS CONFIGURATION

Eurocard 6U card cage, per PICMG 2.0 Rev 3.0 CompactPCI specification.

Space for a total of 12 CompactPCI I/O slots and a 2-slot SBC, plus three 8HP power supplies.

Total rack height is 13U (22.75”/577.9 mm) with the 5-drive bay, or 14U (24.50”/622.3mm) with the 8-drive bay.

Cool air intake is in front below the backplane card cage.

Hot air exhaust is in the rear above the 6U backplane.

Overall dimensions are 22.75”, or 24.50” High, 17.00” Wide, 12.00” deep.

GUPPER DRIVE BAYS

The 5 drive bay mounts four 5.25” half height drives horizontally and one 3.5” third height vertically with the drives capable of being mounted or replaced without dismounting the enclosure from the rack.

The 8 drive bay mounts eight 5.25” half height drives vertically. In this configuration the chassis must be dismounted from the rack to replace or add drives, unless the drives are mounted in shuttles

Mounts up to four exhaust fans on a rear hot-plug bracket.

Cool air intake is in the front of the drive bay; hot air exhaust is in the rear of the drive bay. Drive cooling air is filtered at intake; filter is user removable and washable.

GPOWER SUBSYSTEM

N+1 redundant power supplies, delivering up to 600W throughput from AC or DC main input.

Forced current sharing for +5V, +3.3V and +12V; diodes are internal to the pluggable supply.

AC input range: 90-264VAC, 47-63Hz, auto sensing, auto ranging.

Internal Power Factor Correction (PFC) to meet IEC EN61000-3 requirements for harmonic distortion and flicker.

GPLUGGABLE SUPPLY

Maximum loads: +5VDC @ 30A; +3.3VDC @ 45A; +12VDC @ 12A; -12VDC @ 3A. Combined total output not to exceed 300W; combined total output of +5V and +3.3V not to exceed 200W.

No minimum loads required for normal operation.

Ripple: 50mV for +5V and 3.3V, 100mV for +12V and –12V.

Load regulation: ±2% for +5V, +3.3V and +12V; ±5% for –12V.

Line regulation: ±0.5% for all outputs.

MTBF: 100,000 hrs, full load at 25°C (MIL-STD 217).

Size: CompactPCI 6U X 8HP (1.6” wide).

Interface connector: Positronics PCI38M400A1, mate on power backplane is Positronics PCI38F300A1.

GPOWER BACKPLANE

Accepts up to three pluggable supplies.

Input power connector: AMP 350715-1, pin 1 chassis ground, pin 2 AC line, pin 3 AC neutral.

DC output: 8 headers, Molex 39-28-1203; also individual M4 screw terminals, rated 25A; 4 for +5V, 5 for +3.3V, 1 each for +12V and –12V, and 10 for DC return.

Size: 11.10” high, 4.80” wide.

- FANS
  - Card Area - 2 fans at 85 cfm
  - Power Subsystem - 4 fans at 23 cfm plus one fan at 49 cfm
  - 5-drive Module - 2 fans at 23 cfm
  - 8-drive Module - 4 fans at 23 cfm

- **HARDWARE**
  - CPU BOARD
    - The system consists of a single Intel Pentium III Castor SBC connected to the CompactPCI backplane.
  - CompactPCI BACKPLANE
    - PICMG 2.0 Rev 2.1, PICMG 2.1 Rev 1.0 hot swap-compliant, and PICMG 2.5 Rev 1.0 computer telephony compliant backplane modules are used as the system backplane.
    - GP1013 backplane consists of one 6-slot and one 7-slot CompactPCI backplane modules.
    - The two backplane modules are combined into one backplane by a separate CompactPCI Bridge Module and H.110 Bridge Module.
    - A separate power supply backplane is used to accept up to three pluggable power supply modules.
    - Power is connected to each CompactPCI Backplane Module through a power cable assembly.

- **SOFTWARE**
  - The system is preloaded with either Windows 2000 or Windows NT 4.0 operating system software.
  - Hot Swap Kit software is optional.

- **ENVIRONMENTAL**
  - TEMPERATURE
    - Operating temp 0°C to 40°C.
    - Short-term operating temp –5°C to 55°C.
    - Non-operating temp –40°C to 70°C.
  - HUMIDITY
    - Operating humidity 5-85% @ 40°C (non-condensing).
    - Non-operating humidity 0-95% @ 40°C (non-condensing).

G ALTITUDE

Operating altitude 6000 ft at operating temp, 15,000ft at derated temp.

Non-operating altitude 40,000 ft.

G VIBRATION/SHOCK

Operating vibration 0.25g @ 2-100 Hz, 1.5g @ 100-500 Hz.

Storage/transport vibration 2g @ 5-500 Hz.

Operating shock 10g @ 11 msec, and NEBS earthquake zone 4.

Storage/transport shock 30g @ 11 msec

D **SAFETY AGENCY**

UL 1950, Recognized Component.

cUL or CSA 950 Approved.

TUV EN 60950 Certified.

CE Certified.

FCC Class A.

Chapter 3 - Hardware

This chapter discusses the removal and installation of the CPU board module, add-in board modules, rear I/O modules, backplane, fan tray, system fans, and air filter.

CAUTION!

Unless working on hot-swap components, always shut down the system and turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

CAUTION!

Connector pins on CompactPCI **backplanes are extremely delicate and can easily be bent. Precise alignment and proper insertion/ejection procedures are critical in order to avoid bending backplane pins.**

CPU Board

The I-Bus/Phoenix Castor t CPU module is mounted through the front of the enclosure. It is held in place with two injector/ejector handles that stabilize the board when they are engaged. It is also secured by two captive screws located on the CPU board module's faceplate. See the following instructions if the CPU module needs to be removed for maintenance or replacement

Removal and installation of the CPU board module

1 Shut down the system and turn off the main system power.

2 Place the chassis on an ESD-safe work surface.

3 Loosen the two screws on the CPU board module's faceplate.
Note: When loosened, the screws should be pushed inward to prevent obstructing the movement of the injector/ejector handles.

4 Completely retract the injector/ejector handles by pressing them away from each other.
Note: Some force may be required.

5 Slide the CPU board module out of the chassis.

6 Using the module guides, slide the new CPU board into the chassis, making sure to align the two guide pins with the round holes in the card guides inside the chassis.

7 Engage the injector/ejector handles by pressing them towards each other.
Note: Again, some force may be required.

8 Secure the CPU board module by tightening the two captive screws.

Figure 3-1: CPU Board Module

Add-in boards

CAUTION!

Unless working on hot-swap components, always shut down the system and turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

CAUTION!

Connector pins on CompactPCI **backplanes are extremely delicate and can easily be bent. Precise alignment and proper insertion/ejection procedures are critical in order to avoid bending backplane pins.**

All add-in board modules are mounted through the front of the enclosure. They are held in place with two injector/ejector handles that stabilize the boards when they are engaged.

The GP1013 provides for full hot swap of add-in boards, supporting Pigeon Point Systems Hot Swap Kit software. The following steps should be taken to remove and install add-in boards on systems running the Pigeon Point software.

1 The system must be running a Full Hot Swap compliant operating system. Examples are
   a) Microsoft Windows 2000 (Advanced Server, Server, Professional)
   b) Microsoft Windows NT with a Hot Swap Manager

2 Choose which card is to be hot swapped.

3 Toggle the bottom injector/ejector handle of the card down or activate the hot swap thumb switch.

4 The card's blue LED should light, indicating that the card is safe to remove.

5 Remove the card as normal.

To insert or re-insert a card back into that slot, the following must be done.

1 Insert the card.

2 The blue LED will light momentarily and should diminish after full insertion is complete.

3 The operating system should recognize the card and accomplish the correct steps to allocate resources and load drivers.

For hot swap instructions on other third party hot swap software, consult the applicable instruction manual for the software.

Removal and installation of non-hot swap add-in boards for systems without hot swap software installed,

1 Shut down the system and turn off the main system power.

2 Place the chassis on an ESD-safe work surface

3 Loosen the screws on the add-in board's faceplate, if any.

4 Completely retract the injector/ejector handles of the add-in board module by pressing them away from each other.
Note: Some force may be required.

5 Slide the add-in board module out of the chassis.

6 Using the module guides, slide the new add-in board into the chassis, making sure to align the two guide pins with the round holes in the card guides inside the chassis.

7 Engage the injector/ejector handles by pressing them towards each other.
Note: Again, some force may be required.

Note: If you do not plan on immediately replacing a removed add-in board, you must close the space left open with a filler panel in order to maintain EMI specifications.

Rear I/O Transition Modules

CAUTION!

Unless working on hot-swap components, always shut down the system and turn OFF all power and disconnect the power cord before working on the system.

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electrical components. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

CAUTION!

Connector pins on CompactPCI **backplanes are extremely delicate and can easily be bent. Precise alignment and proper insertion/ejection procedures are critical in order to avoid bending backplane pins.**

The GP1013 is configured to support rear I/O transition modules. As an optional feature, the Castor rear transition module may be installed.

NOTE, however, that because of the location of the rear mounted bridge that connects the two segments of the backplane, slots 6 through 10 are not available for rear I/O transition modules.

Removal and installation of the rear I/O modules

1 Shut down the system and turn off the main system power.

2 Place the chassis on an ESD-safe work surface

3 Loosen the two screws on the rear I/O module's faceplate as much as possible.

Note: The screws are captive to the faceplate and cannot be completely removed. (Note: some modules may not have screws on the faceplate).

4 Completely retract the injector/ejector handles by pressing them away from each other.

Note: This may require some force.

5 Slide the rear I/O module out of the chassis.

6 Using the module guides, slide the new rear I/O module into the chassis, making sure to align the two guide pins with the round holes in the card guides inside the chassis.

7 Engage the injector/ejector handles by pressing them towards each other.
Note: Again, some force may be required.

8 Secure the rear I/O module by tightening the two faceplate screws if they are present.

Note: If you do not plan on immediately replacing a removed I/O module, you must close the space left open with a filler panel in order to maintain EMI specifications.

9 Turn on the main system power.

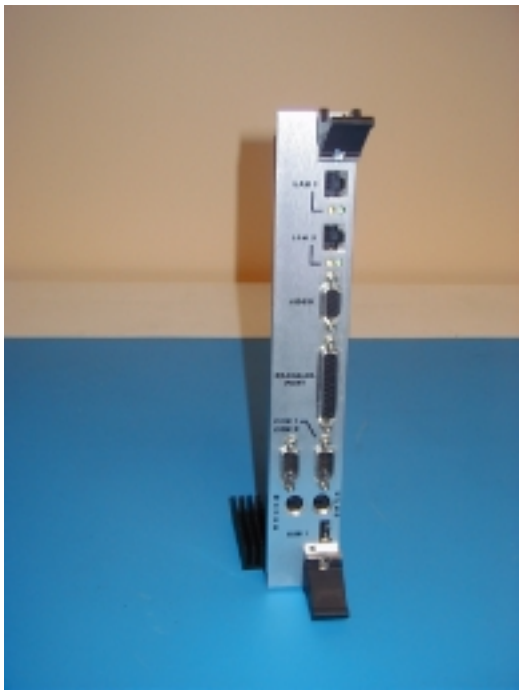

Figure 3-2: Rear I/O Transition Module

Backplane

Backplane Connector Pin Assignments

The GP1013 supports a 13-slot CompactPCI backplane, accessible by removing the top of the chassis. See Appendix 1, Tables A1-1 thru A1-5 for connector information for the CompactPCI backplane.

Backplane Configuration

On the rear of the backplane at the top of each slot there is a set of 5 jumpers that set the slot's geographic address. The geographic address should be set so that (as viewed from the front) the leftmost slot in the system (the GP1013 system consists of two backplanes connected by a bridge module) has geographic address "1," and the address increments by 1 for each slot to the right. Thus, for the GP1013 the system slot has geographic address "13," since it is in the far right slot when viewed from the front.

Each backplane also has one additional set of 5 jumpers, identified as JP11, that set the backplane's shelf address. This set is located between two of the slots near the top of the backplane and is an optional feature to identify a specific system in a rack of many systems.

Table A1-6 in Appendix 1 shows how to set the geographic and shelf address jumpers. The pin numbers refer to the pins in the 2x5 set of jumpers at the top of each slot.

In addition, the backplane has jumpers for clock routing, reset and voltage sensing. Table A1-7 gives these settings for the left hand 6-slot portion of the backplane and Table A1-8 for the right hand 7-slot portion.

Location of the jumpers for the 7-slot portion of the backplane is shown in Figure 3-3, and for the 6-slot portion in Figure 3-4.

Do not attempt to remove the backplane from the chassis. Except for the settings described above, the backplane is not a user serviceable item. Please contact I-Bus/Phoenix Technical Support for further information.

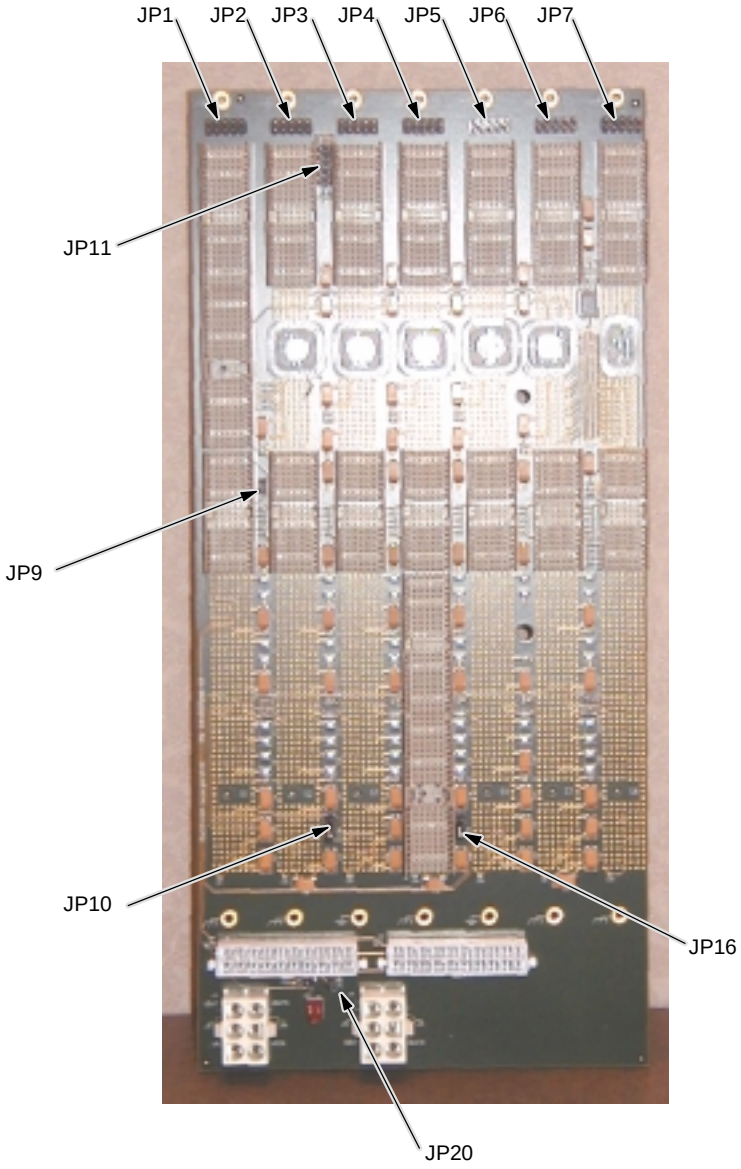

Figure 3-3: Jumper Location 7-Slot Backplane Segment

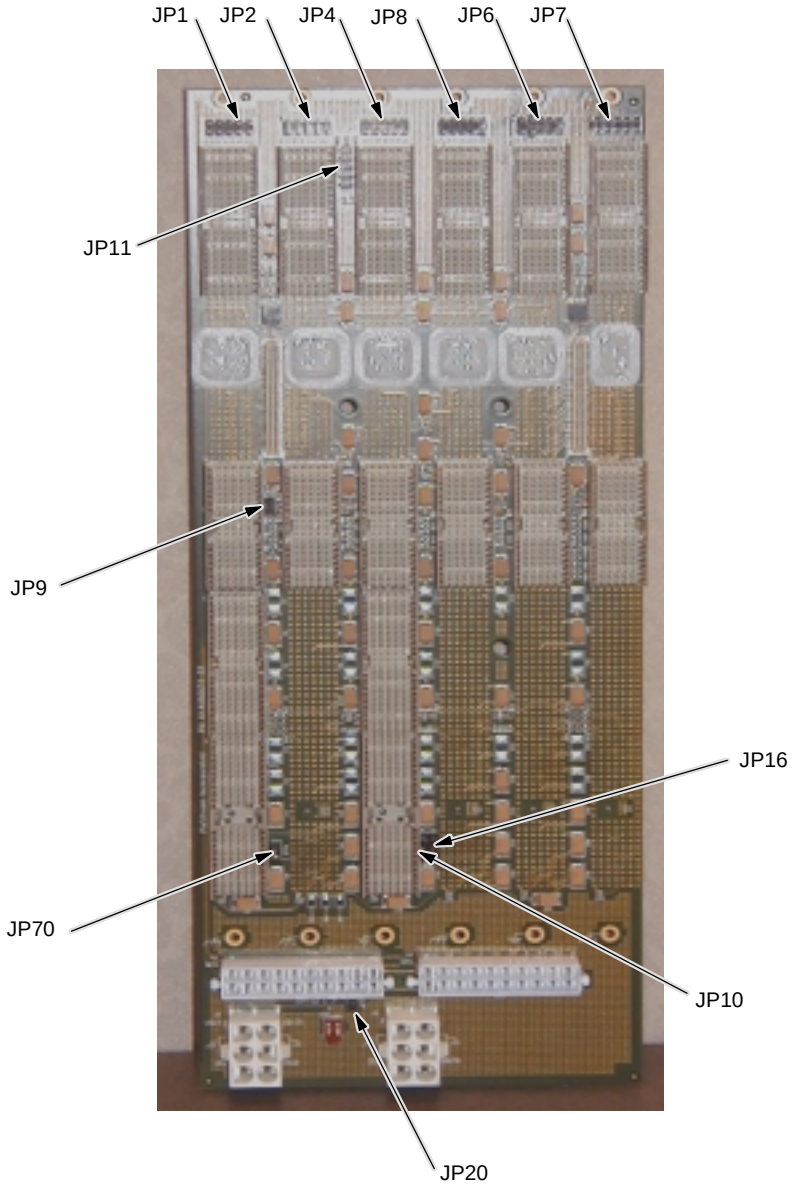

Figure 3-4: Jumper Location 6-Slot Backplane Segment

Fan Plenum and Chassis Fan

Figure 3-5: Fan Tray
(partially withdrawn)

Removal and installation of the hot-swap fan tray

Note: Removing the fan tray interrupts power to all chassis fans. As a result, you should have another fan tray ready to install immediately after the first one is removed to prevent the unit from overheating.

1 Loosen the two captive thumb screws located on either side of the fan access door at the front of the enclosure.

2 Open the access door.

3 Slide the fan tray out of the chassis.

4 Carefully align the right and left hand edges of the fan tray with their guide slots in the chassis and slide the replacement fan tray into the chassis and press firmly to engage the power connectors at the rear of the chassis. If the system is energized and the tray is correctly aligned, the fans will immediately start running as contact is made with the rear power connectors.

5 Close the access door and tighten the two captive thumb screws.

Removing/installing a fan

1 Remove the fan tray.

2 Remove the screws securing the fan and its two finger guards to the fan tray, taking care not to lose any of the flat washers.

3 Swap out the old fan for a new one and place it between the two finger guards.

Note: The arrow indicating the fan air direction.

4 Orient finger guard mounting spokes toward the fan.

5 Secure the new fan and the finger guards to the fan tray using the same screws and flat washers removed in step 2.

Note: The washer goes between the finger guard and the fan tray.

6 Install the fan tray in the chassis.

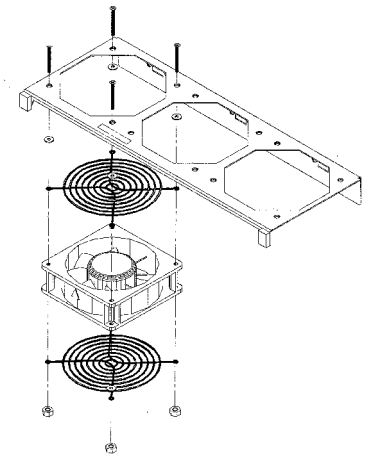

Figure 3-6: Fan Subassembly

Chassis Filters

Using a vacuum cleaner or compressed air, clean the chassis filters once a month or whenever dust accumulates on them. Failure to do so will cause the unit to overheat and fail.

Removing/Installing the chassis filters

1 Loosen the two captive thumb screws located on either side of the fan access door at the front of the chassis.

2 Open the access door.

3 Remove the filter from the filter plate and clean it.

4 Replace the filter in the filter plate and completely close the fan access door.

Note: This may require some force.

5 Secure it with the captive thumb screws.

Chapter 4 - Power Distribution

This chapter discusses the power supply, power switch, and input circuit breaker, and provides installation and removal instructions for each.

CAUTION!

Unless working with hot-swap components, always shut down the system, turn OFF all power, and disconnect the power cords before working on the system.

Power Supplies

Chassis DC power is provided by three 300W AC input hot swap, current sharing power supplies in an N+1 configuration. One of the power supplies may be removed and replaced with the system power on without interrupting the system, provided the remaining supplies are sufficient to power all of the CPU, drives and add-in cards installed in the system.

Removing and installing the power supply module

1 Loosen the two screws on the power supply module's faceplate as much as possible.

Note: The screws are captive to the faceplate and cannot be completely removed.

2 Completely retract the injector/ejector handles by pressing them away from each other.

Note: This may require some force.

3 Slide the power supply module out of the chassis.

4 Slide the replacement power supply module into the chassis, making sure to align the guide pins to their card guides.

5 Engage the injector/ejector handles by pressing them toward each other.

6 Secure the power supply module by tightening the two faceplate screws.

Chapter 4 - Power Distribution

Input Circuit Breaker

The following instructions apply to all input circuit breakers.

The main power switch is an input circuit breaker located on the rear panel. However, the front panel switch can be used to power down the unit. This switch is wired in series with the rear panel circuit breaker. To avoid shock hazard, turn off both the power supply switch and the circuit breaker.

Removing/Replacing the input circuit breaker

1 Shut down the system and turn off the main system power.

2 Disconnect the power cord/cable.

3 Remove the four screws that mount the breaker plate to the rear panel.

4 Gently pull the breaker plate away from the rear panel until the circuit breaker and the quick-disconnect terminals can be easily accessed.

5 With the wires still connected, squeeze the spring clips on the sides of the old circuit breaker, pushing it through the front of the breaker plate until it pops out the front of the plate.

6 Remove the wires, one by one from the old circuit breaker, and attach each one to the new circuit breaker as it is removed from the old breaker, placing it on the correct terminal.

7 Push the new circuit breaker back into position in the breaker plate until the spring clips on the breakers side snap into place.

8 Re-install the plate.

9 Plug in the power cord or reinstall the power cable.

10 Turn the power on.

Chapter 5 - Drive Bay

This chapter describes the removal and installation of the drives

Removing/installing the drives

Figure 5-1: Five Drive Bay

For the Five Drive Bay

Note: The FDD is secured with one screw at the right of the drive. It is held to its mounting plate by four screws. When replacing the FDD/ mounting plate assembly, ensure that t;he offset tab at the rear edge of the mounting plate engaages the corresponding slot.

1 Shut down the system and turn off the main system power.

2 Remove the rear drive fan tray by loosening the thumb screws on either end of the bracket.

3 Disconnect the power and interface cables from the drive to be replaced.

4 Open the front drive filter door.

5 Remove the desired drive by loosening/removing the two screws (one on either side of the drive) that secure the drive to the module.

6 Pull the drive forward

7 Remove the drive mounting brackets from each side of the drive by loosening their mounting screws.

8 Secure the mounting brackets to the new drive with the screws removed in step 7

9 Place the drive back into the module by sliding the drive bracket flanges into the guides.

10 Secure with the two screws removed in step 5

11 Plug the power and interface cables, removed in step 3 into the new drive.

12 Replace and secure the drive fan tray.

13 Close the drive filter door.

14 Turn the power on.

Figure 5-2: Eight Drive Bay
(Hard Drives Mounted in Shuttles)

For the Eight Drive Bay

Note: The following instructions assumes the drives are not mounted in a removable drive shuttle. If this is not the case, refer to the shuttle manufacturer's product manual for proper removal/installation instructions.

1 Shut down the system and turn off the main system power. If the system is rack mounted, remove it from the rack.

2 Remove the drive fan tray by loosening the thumb screws on either end of the bracket.

3 Disconnect the power and interface cables from all drives.

4 Remove the drive module from the chassis top by removing the six screws from each side panel and lifting it off the chassis. Be careful of the serrated metal gasketing. It is delicate and easily damaged, and it is sharp.

5 Disconnect the cables to the front panel power switch and display circuit board assembly.

6 Place the drive module on its side on another ESD safe work surface. Open the drive filter door.

7 Remove the four mounting screws holding the desired drive to the module. Be sure to save the flat washers and insulating grommets (if applicable).

8 Mount the replacement drive using the hardware removed in step 7 above. Be sure to replace the insulating grommets and flat washers if applicable.

9 Carefully place the drive module on top of the chassis, replugging the cables to front panel components.

10 Insert and tighten the six screws on each side panel.

11 Reconnect all drive power and interface cables.

12 Replace and secure the drive fan tray. Close and secure the drive filter door.

13 Turn the power on.

Software

The GP1013 is preloaded with Microsoft Windows 2000 or Windows NT 4.0 Operating System. For software configuration support on this platform, refer to the software manufacturer's Installation and Configuration manual.

For Pigeon Point or other third party Hot Swap Kit software, refer to the appropriate User's Manual.

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P1 Connector Pin Assignments (System Slot)

Pin #	Z	A	B	C	D	E	F
25	GND	VCC	REQ 64	ENUM	VCC3	VCC	GND
24	GND	AD[1]	VCC	V(I/O)	AD[0]	ACK64_	GND
23	GND	VCC3	AD[4]	AD[3]	VCC	AD[2]	GND
22	GND	AD[7]	GND	VCC3	AD[6]	AD[5]	GND
21	GND	VCC3	AD[9]	AD[8]	M66EN	C/BE[0]_	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	VCC3	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR_	GND	VCC3	PAR	C/BE[1]	GND
17	GND	VCC3	IPMB_SCL	IPMB_SDA	GND	PERR	GND
16	GND	DEVSEL_	GND	V(I/O)	STOP_	LOCK_	GND
15	GND	VCC3	FRAME_	IRDY_	GND	TRDY_	GND
Key 12-14							
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]_	GND
10	GND	AD[21]	GND	VCC3	AD[20]	AD[19]	GND
9	GND	C/BE[3]	GND	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ_	GND	VCC3	CLK0	AX[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	PCI_RST_	GND	GNT0	GND
4	GND	IPMB_PWR	HEALTHY	V(I/O)	INTP	INTS	GND
3	GND	INTA_	INTB_	INTC_	VCC	INTD_	GND
2	GND	TCK	VCC	TMS	TDO	TDI	GND
1	GND	VCC	-12V	TRST_	+12V	VCC	GND

Table A1-1: P1 Connector Pin Assignments (System Slot)

P1 Connector Pin Assignments (I/O Slot)

Pin #	Z	A	B	C	D	E	F
25	GND	VCC	REQ 64	ENUM	VCC3	VCC	GND
24	GND	AD[1]	VCC	V(I/O)	AD[0]	ACK64_	GND
23	GND	VCC3	AD[4]	AD[3]	VCC	AD[2]	GND
22	GND	AD[7]	GND	VCC3	AD[6]	AD[5]	GND
21	GND	VCC3	AD[9]	AD[8]	M66EN	C/BE[0]_	GND
20	GND	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	GND	VCC3	AD[15]	AD[14]	GND	AD[13]	GND
18	GND	SERR_	GND	VCC3	PAR	C/BE[1]	GND
17	GND	VCC3	IPMB_SCL	IPMB_SDA	GND	PERR	GND
16	GND	DEVSEL_	GND	V(I/O)	STOP_	LOCK_	GND
15	GND	VCC3	FRAME_	IRDY_	BD_SEL_	TRDY_	GND
Key 12-14							
11	GND	AD[18]	AD[17]	AD[16]	GND	C/BE[2]_	GND
10	GND	AD[21]	GND	VCC3	AD[20]	AD[19]	GND
9	GND	C/BE[3]	IDSEL	AD[23]	GND	AD[22]	GND
8	GND	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	GND	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	GND	REQ_	GND	VCC3	CLK	AX[31]	GND
5	GND	BRSVP1A5	BRSVP1B5	PCI_RST_	GND	GNT	GND
4	GND	IPMB_PWR	HEALTHY	V(I/O)	INTP	INTS	GND
3	GND	INTA_	INTB_	INTC_	VCC	INTD_	GND
2	GND	TCK	VCC	TMS	TDO	TDI	GND
1	GND	VCC	-12V	TRST_	+12V	VCC	GND

Table A1-2: P1 Connector Pin Assignments (I/O Slot)

P1 Signal Descriptions

General	VCC	5V power
	VCC3	3.3V power
	+12V	12V power
	-12V	-12V power
	V(I/O)	5V or 3.3V power
	GND	To digital signal ground plane
	PCI_RST_	Master reset
PCI Bus Signals	AD(31:0)	32 bit Address/Data bus
	C/BE(3:0)_	Command/Byte Enable bus
	PAR	Bus parity
	BRSVPxxx	PCI bus reserved signals
PCIbus arbitration signals	GNT0_	Bus grant 0
	REQ0_	Bus request 0
Interrupt Request Signals	INTA_, INTB_, INTC_, INTD_	
PCI Bus transaction control signals	FRAME_	Cycle Frame
	TRDY_	Target Ready
	IRDY_	Initiator Ready
	STOP_	Target/Initiator transaction stop bit
	IDSEL	Initialization Device Select
	LOCK_	Resource Lock bit
	DEVSEL_	Device Select
PCI bus error reporting signals	PERR_	Data Parity Error
	SERR_	System Error
PCI bus speed signals	M66EN	66MHz bus enable
PCI bus clock	CLK0	
System Management Bus	IPMB_SCL	
	IPMB_SDA	
	IPMB_PWR	
64-bit Extension Signals	REQ64_	Request 64-bit Transfer
	ACK 64_	Acknowledge 64-bit Transfer

JTAG/Boundary Scan Signals	TCK	Test Clock
	TDI	Test Input
	TDO	Test Output
	TMS	Test Mode Select
	TRST_	Test Reset
IDE Interrupts	INTP	Primary Interrupt
	(IRQ14)	INTS Secondary Interrupt
	IRQ15)	
Hot Swap compatible signals	ENUM_	System Enumeration
	BD_SEL_	Board Slot Control
	HEALTHY_	Board Healthy

P2 Connector Pin Assignments (System Slot)

Pin #	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	RSV	RSV	RSV	GND
20	GND	CLK5	GND	RSV	GND	RSV	GND
19	GND	GND	GND	RSV	RSV	RSV	GND
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND	BRSVP2E18	GND
17	GND	BRSVP2A17	GND	PRST	REQ6	GNT6_	GND
16	GND	BRSVP2A16	BRSVP2B16	DEG_	GND	BRSVP2E16	GND
15	GND	BRSVP2A15	GND	FAL_	REQ5	GNT5	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]	GND	V(I/O)	C/BE[4]_	PAR64	GND
4	GND	V(I/O)	BRSVP2B4	C/BE[7]_	GND	C/BE[6]_	GND
3	GND	CLK4	GND	GNT3_	REQ4_	GNT4_	GND
2	GND	CLK2	CLK3	SYSEN_	GNT2_	REQ3_	GND
1	GND	CLK1	GND	REQ1_	GNT1_	REQ2_	GND

_ = signal is active low

“ = signal is not currently used

Table A1-3: P2 Connector Pin Assignments (System Slot)

P2 Connector Pin Assignments (I/O Slot)

Pin #	Z	A	B	C	D	E	Z
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	RSV"	RSV"	RSV"	RSV	RSV	GND
20	GND	RSV"	RSV"	RSV"	GND	RSV	GND
19	GND	RSV"	RSV"	RSV"	RSV	RSV	GND
18	GND	BRSVP2A18	BRSVP2B18	BRSVP2C18	GND	BRSVP2E18	GND
17	GND	BRSVP2A17	GND	RSV"	RSV	RSV	GND
16	GND	BRSVP2A16	BRSVP2B16	RSV"	GND	BRSVP2E16	GND
15	GND	BRSVP2A15	GND	RSV"	RSV	RSV	GND
14	GND	AD[35]	AD[34]	AD[33]	GND	AD[32]	GND
13	GND	AD[38]	GND	V(I/O)	AD[37]	AD[36]	GND
12	GND	AD[42]	AD[41]	AD[40]	GND	AD[39]	GND
11	GND	AD[45]	GND	V(I/O)	AD[44]	AD[43]	GND
10	GND	AD[49]	AD[48]	AD[47]	GND	AD[46]	GND
9	GND	AD[52]	GND	V(I/O)	AD[51]	AD[50]	GND
8	GND	AD[56]	AD[55]	AD[54]	GND	AD[53]	GND
7	GND	AD[59]	GND	V(I/O)	AD[58]	AD[57]	GND
6	GND	AD[63]	AD[62]	AD[61]	GND	AD[60]	GND
5	GND	C/BE[5]	GND	V(I/O)	C/BE[4]_	PAR64	GND
4	GND	V(I/O)	BRSVP2B4	C/BE[7]_	GND	C/BE[6]_	GND
3	GND	RSV"	GND	RSV"	RSV	RSV	GND
2	GND	RSV"	RSV"	UNC	RSV	RSV	GND
1	GND	RSV"	GND	RSV"	RSV	RSV	GND

_ = signal is active low

" = signal is not currently used

Table A1-4: P2 Connector Pin Assignments (I/O Slot)

P2 Signal Descriptions

General	V(I/O)	5V or 3.3V power
	GND	To digital ground plane
PCI Bus Signals (64-bit extension)	AD(32:63)	Address/Data bus
	C/BE(4:7)_	Command/Byte Enable bus
	PAR64	64-bit Bus parity
	BRSVPxxx	PCI bus reserved signals
PCI bus arbitration signals	GNT(6:1)_	Bus grants
	REQ(6:1)_	Bus requests
PCI bus clocks	CLK(6:1)	
Miscellaneous signals	PRST_	Push Button Reset
	DEG_	Degrade signal (Power Supply)
	FAL_	Supply Fail Signal (Power Supply)
	GA(4:0)	Geographic Addressing
	SYSEN_	System slot identification (Grounded at the system slot)
	64EN_	64-bit bus enable

P3, P4, P5 Connectors Pin Assignments (System Slot)

P3, P4, and P5 are used for the purpose of providing access to the rear I/O. There is no connection on the backplane to these connectors at the system slot. The P3, P4, and P5 connector pinouts are unique to the CP1500 Sparc CPU board and described in the SPARCengine CP1500 360MHz/440MHz Technical Reference and Manual, located at the Sparc web site: http://www.sun.com/microelectronics/SPARCengineCP/1500

P4 Connector Pin Assignments (Computer Telephony Bus) (I/O Slot)

Pin #	Z	A	B	C	D	E	F
25	NP	SGA4	SGA3	SGA2	SGA1	SGA0	FG
24	NP	GA4	GA3	GA2	GA1	GA0	FG
23	NP	+12V	CT_Reset_	CT_EN_	-12V	CT_MC	FG
22	NP	RSV	RSV	RSV	RSV	RSV	FG
21	NP	-SELVbat	RSV	RSV	RSV	SELVBatRtn	FG
20	NP	NP	NP	NP	NP	NP	NP
19	NP	NP	NP	NP	NP	NP	NP
18	NP	VRG	NP	NP	NP	VRGRtn	NP
17	NP	NP	NP	NP	NP	NP	NP
16	NP	NP	NP	NP	NP	NP	NP
15	NP	-Vbat	NP	NP	NP	VBatRtn	NP
Key 12-14							
11	NP	CT_D29	CT_D30	CT_D31	V(I/O)	CT_FRAME_A_	GND
10	NP	CT_D27	VCC3	CT_D28	VCC	CT_FRAME_B_	GND
9	NP	CT_D24	CT_D25	CT_D25	GND	FR_COMP_	GND
8	NP	CT_D21	CT_D22	CT_D23	VCC	CT_C8_A	GND
7	NP	CT_D19	VCC	CT_D20	GND	CT_C8_B	GND
6	NP	CT_D16	CT_D17	CT_D18	GND	CT_NETREF_1	GND
5	NP	CT_D13	CT_D14	CT_D15	VCC3	CT_NETREF_2	GND
4	NP	CT_D11	VCC	CT_D12	VCC3	SCLK	GND
3	NP	CT_D8	CT_D9	CT_D10	GND	SCLKx2	GND
2	NP	CT_D4	CT_D5	CT_D6	CT_D7	GND	GND
1	NP	CT_D0	VCC3	CT_D1	CT_D2	CT_D3	GND

_ = signal is active low

Table A1-5: P4 Connector Pin Assignments (Computer Telephony Bus) (I/O Slot)

P4 Signal Descriptions (Computer Telephony Bus)(I/O Slot)

General	VCC	5V power
	VCC3	3.3V power
	V(I/O)	5V or 3.3V power
	+12V	12V power
	-12V	-12V power
	GND	To digital signal ground plane
	FG	To chassis (frame) ground
	SGA(4:0)	Shelf enumeration bus signals
	GA(4:0)	Slot ID signals; not bussed
	RSV	Reserved pin
	NP	Pin and pad to Not be Populated
H.110 TDM Bus (Computer Telephony)	CT_Dxx	H.110 TDM bus signals (8Mfpbs)
	CT_C8A	8.192 MHz data clock
	CT_C8_B	Redundant 8.192 MHz data clock
	CT_FRAME_A_8	kHz frame clock
	CT_FRAME_B_	Redundant 8kHz frame clock
	CT_NETREF_1	8kHz, 1.544MHz or 2.048MHz telecom network timing reference
	CT_NETREF_2	Secondary 8kHz,1.544MHz or 2.048MHz telecom network timing reference
	CT_MC	2Mbps message channel
	FR_COMP_	8kHz SCbus compatibility frame clock
	SCLK	8.192MHz SCbus compatibility data clock
	SCLKx2	Skewed 8.192MHz SCbus compatibility data clock
	CT_EN_	Logical equivalent of the CPCI signal BD_SEL_ on P1
	CT_Reset	Reset for use by CT Front Cards that do not populate P1

Telecom Power Bus	-Vbat	Telecom power source
	VbatRtn	Telecom power source return
	-SELVbat	Short loop battery (voltage within SELV limits)
	SELVbatRtn	Short loop battery return (voltage within SELV limits)
Telecom Ringing Bus	VRG	Bussed ringing voltage
	VRGRtn	Bussed ringing voltage return for VRG

Backplane Slot Address Settings

Physical Slot / Shelf Number	Pins 1,2	Pins 3,4	Pins 5,6	Pins 7,8	Pins 9,10
1	Shorted	Shorted	Shorted	Shorted	Open
2	Shorted	Shorted	Shorted	Open	Shorted
3	Shorted	Shorted	Shorted	Open	Open
4	Shorted	Shorted	Open	Shorted	Shorted
5	Shorted	Shorted	Open	Shorted	Open
6	Shorted	Shorted	Open	Open	Shorted
7	Shorted	Shorted	Open	Open	Open
8	Shorted	Open	Shorted	Shorted	Shorted
9	Shorted	Open	Shorted	Shorted	Open
10	Shorted	Open	Shorted	Open	Shorted
11	Shorted	Open	Shorted	Open	Open
12	Shorted	Open	Open	Shorted	Shorted
13	Shorted	Open	Open	Shorted	Open

Table A1-6: Geographic and Shelf Address Jumper Settings

Appendix 1 - Technical Reference

Jumper Definitions, 6-Slot Board

Reference Designator	Peripheral board in Slot 6 (backplane driven by rear mounted bridge in slot 6)
JP70	Open
JP10	2 & 3 shorted
JP16	2 & 3 shorted
JP20	This jumper controls local +12V sensing from the ATX connectors to the +12V plane. Shunting this jumper removes interoperability with PC-ATX power supplies and allows power supply backplanes to sense the +12V plane.
JP9	This 2-pin jumper controls the pushbutton reset function defined in the CompactPCI specification. When open the pushbutton reset signal floats. When shorted the pushbutton reset Signal is grounded.

Table A1-7: Jumper Definitions, 6-Slot Board

Jumper Definitions, 7-Slot Board

Reference Designator	System board in Slot 7 (CLK0-6 generated)
JP10	2 & 3 shorted
JP16	2 & 3 shorted
JP20	This jumper controls local +12V sensing from the ATX connectors to the +12V plane. Shunting this jumper removes interoperability with PC-ATX power supplies and allows power supply backplanes to sense the +12V plane.
JP9	This 2-pin jumper controls the pushbutton reset function defined in the CompactPCI specification. When open the pushbutton reset signal floats. When the pushbutton reset Signal is grounded.

Table A1-8: Jumper Definitions, 7-Slot Board

B

backplane: A device inside the chassis that contains slots, or sockets, for plugging in I/O cards or cables.

bidirectional parallel port: An eight-bit port that can be used for an input as well as an output device.

bus: One or more electrical conductors that transmit power or binary data to the various sections of a computer or any common pathway between hardware devices. A computer bus connects the CPU to its main memory and the memory banks that reside on the control units of the peripheral devices. It is made up of two parts. Addresses are sent over the address bus to signal a memory location, and the data is transferred over the data bus to that location.

C

card cage: A cabinet or metal frame that holds printed circuit cards.

CMOS (Complementary Metal Oxide Semiconductor): A technique of arranging transistors which uses very low power.

D

disk access LED: The LED located on the front control panel that indicates when the hard disk drive is active.

DRAM (Dynamic Random Access Memory): The main memory in your computer. It needs to be refreshed by a memory controller or it loses its information.

drive bay: Area in the chassis where drives are mounted.

E

electrostatic discharge (ESD): Stationary electrical charges in which no current flows. ESD can be prevented by wearing a wrist strap attached to a ground post on a static mat.

Appendix 2 - Glossary of Terms

EMI (ElectroMagnetic Interference): Noise generated by the switching action of the power supply and other system components. Conducted EMI is interference generally conducted into the power line, and is normally controlled with a line filter. Radiated EMI is that portion that radiates into free space, one way to suppress it is by enclosing circuitry in a metal case.

EPROM (Erasable Programmable Read Only Memory): A programmable device which stores information regardless of power.

expansion card: A printed circuit board that plugs into an expansion slot.

F

floppy drive: A device for reading the information contained on external, portable computer disks called floppy disks.

front control panel: The small panel on the front of the computer that contains the power switch, reset switch, Power ON LED, the disk access LED, and the keyboard connector.

H

hard drive: Data storage devices. Hard drives magnetically store computer data on spinning internal disks.

hold-down bar: A metal bar located in the I/O bay of the chassis. It is used to keep I/O cards firmly seated in their slots.

I

IDE (Integrated Drive Electronics): A standard of signalling and communicating with a device.

I/O card: A printed circuit board that plugs into an I/O slot.

I/O slot: A slot for plugging in additional I/O cards to expand the capability of a computer.

ISA: The original IBM/PC clone plug-in board standard.

K

keyboard connector: The five-pin connector located on the front control panel.

kilobyte (KB): 1,024 bytes.

L

LED: Light Emitting Diode. Long-lasting light emitters usually used as indicators.

load board: A board having specific resistance to current flow.

P

parallel port: I/O connector used to hook up a printer or other parallel interface device. The parallel port is usually a 25-pin female DB25 connector.

PCI(Peripheral Component Interconnect): An optional slot standard for plug-in boards

port: Ports are used to connect peripheral devices such as external drives and printers to your computer.

power good: Signal used to prevent the computer from starting until the power has stabilized. The power good line switches from 0 to +5 volts within one tenth to one half second after the power supply reaches normal voltage levels. Whenever low input voltage causes the output voltage to fall below operating levels, the power good signal goes back to zero.

power ON/diagnostic LED: The LED located on the front control panel that indicates that power is present in the computer.

power supply: Electrical system that converts AC current from the wall outlet into the DC currents required by the computer circuitry. In a personal computer, +5, -5, +12 and -12 voltages are generated.

power switch: Located on the front control panel, the power switch turns power ON to the computer.

R

RAID (Redundant Arrays of Independent Disks): A storage technology using an array of two or more disks to redundantly store information. If one disk fails in a RAID array, the unit continues to function without loss of data.

RAM (Random Access Memory): The memory used to execute applications while your computer is turned ON. When you turn your computer OFF, all data stored in RAM is lost.

real-time clock (RTC): A periodic interrupt used to derive local time.

reset switch: Button or key that reboots the computer. All current activities are stopped cold and any data in memory is lost.

retaining bracket: The bracket on the back of the chassis that holds connectors from the board, usually a DB9 for serial port, a DB25 for parallel port, and mini-DIN connectors for keyboard and mouse.

S

SCSI (Small Computer System Interface): A high speed, general purpose interface to storage devices.

serial port: A two-channel port, one channel used for ”In”transmissions and one for ”Out” transmissions.

W

watchdog timer: A device that watches for CPU inactivity and then resets the CPU after a specified duration of inactivity.

LIMITED WARRANTY

I-Bus/Phoenix warrants this product to be free of defects in material and workmanship for an initial period of two (2) years from date of delivery to the original purchaser from I-Bus/Phoenix.

During this period, I-Bus/Phoenix will, at its option, repair or replace this product at no additional charge to the purchaser, except as set forth in this warranty agreement.

I-Bus/Phoenix will, at its option, repair or replace this product at no additional charge to the purchaser, if the defect is related to the I-Bus/Phoenix manufactured product, such as power supply, backplanes, other chassis components, or CPUs. I-Bus/Phoenix is not liable for any defects in material or workmanship of any peripherals, products or parts which I-Bus/Phoenix does not design or manufacture. However, I-Bus/Phoenix will honor the original manufacturer's warranty for these products.

I-Bus/Phoenix will analyze the defective component and the customer will be charged in the following instances:

- No problem found: $75 (U.S. dollars).
- Damage: parts and labor at $75 per hour with a $100 minimum charge (U.S. dollars). Receipt of damaged goods voids the I-Bus/Phoenix warranty.

Repair parts and replacement products will be furnished on an exchange basis and will be either new or reconditioned. All replacement parts and products shall become the property of I-Bus/Phoenix, if such parts or products are provided under this warranty agreement. In the event a defect is not related to the I-Bus/Phoenix manufactured product, I-Bus/Phoenix shall repair or replace the defective parts at purchaser's cost and deliver the defective parts to the purchaser.

This Limited Warranty shall not apply if the product has been misused, carelessly handled, defaced, modified or altered, or if unauthorized repairs have been attempted by others.

The above warranty is the only warranty authorized by I-Bus/Phoenix and is in lieu of any implied warranties, including implied warranty of merchantability and fitness for a particular purpose.

In no event will I-Bus/Phoenix be liable for any such damage as lost business, lost profits, lost savings, downtime or delay, labor, repair or material cost, injury to person or property or any similar or dissimilar consequential loss or damage incurred by purchaser, even if I-Bus/Phoenix has been advised of the possibility of such losses or damages.

In order to obtain warranty service, the product must be delivered to the I-Bus/Phoenix facility, or to an authorized I-Bus/Phoenix service representative, with all included parts and accessories as originally shipped, along with proof of purchase and a Returned Merchandise Authorization (RMA) number.

The RMA number is obtained, in advance, from I-Bus/Phoenix Customer Service Department and is valid for 30 days. The RMA number must be clearly marked on the exterior of the original shipping container or equivalent. Purchaser will be responsible and liable for any missing or damaged parts. Purchaser agrees to pay shipping charges one way, and to either insure the product or assume the liability for loss or damage during transit. Ship to:

I-Bus/Phoenix

ATTENTION: RMA REPAIR DEPT.

RMA ####

8888 Balboa Avenue

San Diego, CA 92123

Appendix 3 - Limited Warranty

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Appendix 4 - FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This product was FCC verified under test conditions that included the use of shielded I/O cables and connectors between system components. To be in compliance with FCC regulations, the user must use shielded cables and connectors and install them properly.

Appendix 4 - FCC Information

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