GP/GS 0808™

Hot Swap
CompactPCI System

User's Guide

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Again, thank you for your committment to I-Bus Corporation. We appreciate your business and look forward to continuing to work with you and helping you reach your goals.

Table of Contents

Introduction

Welcome to the I-Bus/Phoenix family of CompactPCI computer systems. This manual provides information necessary to set up and maintain your GP/GS 0808.

The GP/GS 0808 System is a CompactPCI platform equipped with either an I-Bus/Phoenix Intel, or a Sun Microsystems Ultra Sparc single board computer (SBC). The system provides seven expansion slots in addition to the one slot or two slot SBC.

The GP/GS 0808 is intended to meet the need for an entry level CompactPCI system for telecommunications, telephony, data communications, Internet, industrial or medical applications. The integrated enclosure houses a PICMG H.110 compliant backplane, redundant 400W power supplies, front accessible drive bays for three 5.25" half height and two 3.5" devices. The enclosure supports 80mm depth rear I/O boards.

Figure 1-1: GP/GS 0808 CompactPCI System

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❑ **Enclosure**

  ◦ Designed for EIA RS-310 19"and 23" rack mounts

  ◦ Detachable rack mount brackets can be positioned for front flush mount or mid-chassis rack mount

  ◦ A single rack mount bracket design is used for both 19" and 23" racks.

  ◦ The rack mount brackets incorporate mounting keyways for temporary hanging of the chassis.

  ◦ Basic configuration:

    - Space for seven expansion slots, plus a one or two slot SBC, justified right (total opening 7.20" front and rear).

    - Total rack height is 8U (14.00" / 355.6mm).

    - Eurocard 6U card cage, per PICMG 2.0 R3.0 *CompactPCI* specification.

    - 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 14.00" high, 17.00" wide, 12.00" deep.

    - support for 80mm depth rear I/O boards.

  ◦ Right of the backplane, mounting provisions for three 5.25" half height drives and two 3.5" (1" thick) drives.

  ◦ Optional drive cooling blower at the enclosure rear, hot-pluggable.

  ◦ Drives may be mounted or replaced without dismounting the enclosure from the rack.

  ◦ Cool air intake incorporates a removable, washable filter element.

  ◦ Enclosure front panel incorporates a main switch, rated for AC or DC, plus an LED indication of power-on.

  ◦ The main switch is protected from accidental trip.

  ◦ Backplane cooling blower is hot-pluggable via a single tray.

  ◦ Main power inputs are in the rear of the enclosure.

Chapter 2 - Specifications

D   **Power Subsystem**

    GDual (N+1 redundant) power supplies, delivering a maximum of 400W throughput from either AC or DC main power input.

    GAC input range: 90-132VAC and 180-264VAC, 47-63Hz, auto sensing, auto ranging.

    GDC input range: -36 to -72 Vdc.

    GInternal Power Factor Correction (PFC) to meet IEC EN61000-3 Amendment 14 requirements for harmonic distortion and flicker.

    GMaximum loads: +5VDC @ 50A, +3.3VDC @ 27A, +12VDC @ 18A, -12VDC @ 1A, combined total output not to exceed 400W; combined total output of +5V and +3.3V not to exceed 250W

    GMinimum loads: +5VDC @ 4A, +3.3VDC @ 0.5A, +12VDC @ 1A, -12VDC @ 0.0A.

    GRipple: 50mV for +5V and 3.3V, 100mV for +12V, 150mV for $-12V$.

    GRegulation: ±5% for +5V, +3.3V, and +12V; ±10% for $-12V$.

    GMTBF: 100,000 hrs, full load at 25^0C (MIL-217).

    GOperating temperature range: 0^0C-50^0C.

D   **Environmental**

    GSystem operating temperature range 0ºC to 40ºC short-term operating temp –5ºC to 55ºC. non-operating temp –40ºC to 70ºC.

    Goperating humidity 5-85% @ 40ºC (non-condensing).

    G non-operating humidity 0-95% @ 40ºC (non-condensing).

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

    Gnon-operating altitude 40,000 ft.

    Goperating vibration 0.25g @ 2-100 Hz, 1.5g @ 100-500 Hz. storage/transport vibration 2g @ 5-500 Hz.

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

    Gstorage/transport shock 30g @ 11 msec.

D **Safety Agency**

G UL 1950, Recognized Component

G cUL or CSA 950 Approved

G TUV EN 60950 Certified

G CE Certified

G FCC Class A

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 ┌─────────────────────────────────────────────┐
 │⊘           FAN TRAY              ⊘           │
 ├─────────────────────────────────────────────┤
 │ P P P P P P P  S                            │
 │ E E E E E E E  Y    ┌──────────────┐        │
 │ R R R R R R R  S    │  5.25" DRIVE │        │
 │ I I I I I I I  T    └──────────────┘        │
 │ ...                                          │
 └─────────────────────────────────────────────┘
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(FAN TRAY, PERIPHERAL I/O SLOT ×7, SYSTEM SLOT, 5.25" DRIVE ×3, 3.5" DRIVE ×2, POWER SUPPLY ×2, COOL AIR INTAKE)
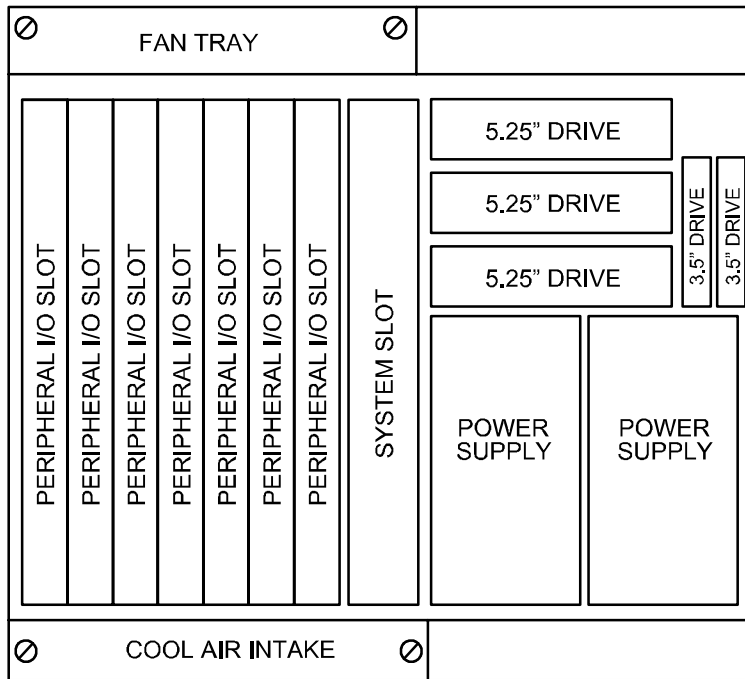
Figure 3-1: GP/GS 0808 Drawing
(Showing Basic Components)

Chapter 2 - Specifications

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This chapter discusses the removal and installation of the CPU board module, add-in board modules, rear I/O modules, backplane, system blower, 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.

**"Hot swap: Wahrend des Betriebs wechselbar.
Nur "hot-swap" - fahige Komponenten durfen im Betrieb getauscht werden. Vor arbeiten am System fahren Sie es herunter und schalten es aus. Ehe Sie am System arbeiten, entfernen Sie die Stromversorgung indem Sie den Netzstecker ziehen.**

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electronic 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.**

Chapter 3 - Hardware

CPU Board

In the GP/GS 0808, the CPU board is mounted in the right hand slot. The GP/GS 0808 supports either a SunSPARC or an Intel based SBC Module. (With the single slot SBC, the space to the right of the SBC must be covered with a filler panel.) The 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 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 3-2: I-Bus/Phoenix IBC 2600 (Castor) CPU Board
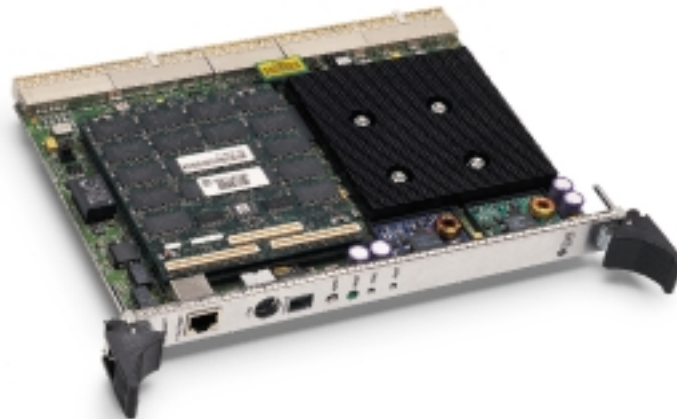
Figure 3-3: SunSPARC Ultra IIi CPU Board

Chapter 3 - Hardware

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.

**"Hot swap: Wahrend des Betriebs wechselbar.
Nur "hot-swap" - fahige Komponenten durfen im Betrieb getauscht werden. Vor arbeiten am System fahren Sie es herunter und schalten es aus. Ehe Sie am System arbeiten, entfernen Sie die Stromversorgung indem Sie den Netzstecker ziehen.**

CAUTION!

Electrostatic discharge (ESD) may damage memory chips, programmed devices, and other electronic 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 GP/GS 0808 provides for full hot swap of add-in boards to PICMG 2.1 R1.0 and PICMG 2.12 R1.0 standards, 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 extinguish 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.**

> **"Hot swap: Wahrend des Betriebs wechselbar.
> Nur "hot-swap" - fahige Komponenten durfen im Betrieb
> getauscht werden. Vor arbeiten am System fahren Sie es
> herunter und schalten es aus. Ehe Sie am System arbeiten,
> entfernen Sie die Stromversorgung indem Sie den Netzstecker
> ziehen.**

CAUTION!

> **Electrostatic discharge (ESD) may damage memory chips,
> programmed devices, and other electronic 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 GP/GS 0808 is configured to support rear I/O transition modules. As
an optional feature, a rear transition module for the SBC you
haveordered may be installed.

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.

Castor   SunSPARC

Figure 3-4: Rear I/O Transition Modules

Backplane

Backplane Connector Pin Assignments

The GP/GS 0808 supports an 8-slot CompactPCI™ backplane. See
Appendix 1, Tables A1-1 thru A1-5 for connector information for the
CompactPCI™ backplane.

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

Backplane Cooling Blower

Removal and Replacement of Backplane Cooling Blower.

The backplane cooling blower tray is located above the backplane card
cage and is accessible from the front. See Figure 3-1. It can be
removed by backing out the two thumb screws that hold it in place and
drawing it out. The replacement tray can be slid back into its place and
the thumb screws tightened.

If the GP/GS 0808 is operating at the time the blower is to be replaced, insert the replacement blower immediately upon removing the current one so as to avoid overheating. (This procedure will require having the replacement blower in a separate blower tray. Otherwise, the system should be shut down to allow time for installing the new blower in the blower tray.)

Figure 3-5: Blower Tray Partially Withdrawn

Chassis Filters

The cool air intake filter is front accessible and is located below the backplane card cage. To access and remove the filter, back out the two thumb screws on the cool air intake cover and remove it. Then remove the three small nuts that secure the clips holding the filter in place.

Clean the chassis filter once a month or whenever dust accumulates on it. Failure to do so may cause the unit to overheat and fail. The filter may be washed, but it should be thoroughly dried before replacing it in the chassis.

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Chapter 4 - Power Distribution

This chapter discusses the power supply for the GP/GS 0808 and provides installation and removal instructions.

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.

**"Hot swap: Wahrend des Betriebs wechselbar.
Nur "hot-swap" - fahige Komponenten durfen im Betrieb getauscht werden. Vor arbeiten am System fahren Sie es herunter und schalten es aus. Ehe Sie am System arbeiten, entfernen Sie die Stromversorgung indem Sie den Netzstecker ziehen.**

Power Supply

Chassis DC power is provided by two modular power supplies operating in an N+1 arrangement, with capability of delivering up to 400 W from either supply. These are modular plug-in units, providing for easy removal and replacement.

The LED beside the ON/OFF power switch on the front of the computer indicates the status of power supply to the computer. When this LED is green, it indicates that both power supplies are OK and functioning normally. If this is the case, the green LEDs on both power supplies will be ON. If either power supply should fail, there will be an audible alarm signal and the LED on the front panel will change to red. At the same time, the LED on the failed power supply will go out to indicate which unit must be replaced.

Alarm Cut-Out (ACO) Switch

The audible alarm may be silenced by pressing the square red momentary contact pushbutton on the rear of the unit.. Doing so will cause the LED on the front panel to change back to green.

IT IS IMPORTANT TO REMEMBER THAT THE GREEN LED THAT WAS RESTORED BY PRESSING THE ACO SWITCH DOES <u>NOT</u> INDICATE THAT BOTH POWER SUPPLIES ARE NOW FUNCTIONING NORMALLY. PROCEED WITH THE REPLACEMENT OF THE FAULTY POWER SUPPLY.

Removing and installing the power supply modules

It is only necessary to shut the system down if both power supply modules are to be removed and replaced. If only one has failed, the other can supply the entire system load (maximum 400 W).

1 Turn OFF the input power switch on the module to be replaced and disconnect its power cord/cable.

2 Lift up the latch handle located in the bottom center of the power supply faceplate and withdraw the power supply from the chassis.

3 Insert the replacement fully into the chassis.

4 Reconnect the power cord/cable to the new module and turn ON its input power switch.

Figure 4-1: Dual Modular Power Supplies
(One Partially Withdrawn)

This chapter describes the removal and installation of the drives.

Removing/installing the drives

The GP/GS 0808 provides for two 3.5" 1" thick drives, plus three 5.25" half height drives. Normally, the 3.5" drive spaces will contain one floppy disk drive and possibly one other removable disk drive. Two of the 5.25" drives will normally be hard drives, with the third being a CD-ROM. The hard drives are normally installed in removable shuttles as shown in Figure 5-1.

Figure 5-1: Drive Bay
(One hard drive shuttle partially withdrawn)

Chapter 5 - Drive Bay

To remove and replace the hard drives contained in shuttles.

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

2   Withdraw the hard drive shuttle and carefully take note of the positions of all the cable and wire connectors. Then disconnect the power and data cables from the hard drive within the shuttle.

3   Reconnect the power and data cables correctly and replace the hard drive in the shuttle.

4   Re-insert the drive shuttle into the space from which it was withdrawn.

To remove and replace other drives it is necessary to remove the front panel. Perform the following steps:

1   Open the front door (if the system is equipped with a front door; otherwise go to step 4.)

2   Pull down and disengage the spring loaded upper hinge.

3   Tilt out and remove the door.

4   The front panel is held in place by three screws along its bottom edge and two at the top. Remove these screws.

5   The bottom edge of the front panel may now be tilted forward and upward until the upper edge of the panel may be disengaged and the panel removed.

6   Note that there are two captive thumb screws that secure the 5.25" drive module and the 3.5" drive module respectively. These screws may be backed out so that the modules can be withdrawn and the drives themselves replaced.

7   Reverse the above procedure to replace the drive modules, the front panel, and the front door.

Software

The GP/GS 0808 can be preloaded with any one of the several I-Bus/Phoenix supported operating systems. 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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Appendix 1 - Technical Reference

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)

Appendix 1 - Technical Reference

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)

Appendix 1 - Technical Reference

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

Appendix 1 - Technical Reference

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

Appendix 1 - Technical Reference

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

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

Appendix 1 - Technical Reference

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)

Appendix 1 - Technical Reference

P2 Signal Descriptions

General	V(I/O)	5V or 3.3V power
	GND	To digital ground plane
PCI Bus Signals	AD(32:63)	Address/Data bus
(64-bit extension)	C/BE(4:7)_	Command/Byte Enable bus
	PAR64	64-bit Bus parity
	BRSVPxxx	PCI bus reserved signals
PCI bus arbitration	GNT(6:1)_	Bus grants
signals	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 single-board computer installed in the system.. I-Bus/Phoenix Intel CPU pinouts are described in the User's Manual for the particular SBC. The CP1500 Sparc CPU board pinouts ane described in the SPARCengine CP1500 360MHz/440MHz Technical Reference and Manual, located at the Sparc web site:
http://www.sun.com/microelectronics/SPARCengineCP/1500.

Appendix 1 - Technical Reference

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

Appendix 1 - Technical Reference

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

B

backplane: A device inside the chassis that contains slots, or sockets, for plugging in 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 are 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: A data storage device. 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. (There is no hold-down bar in CompactPCI systems.)

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.

Appendix 2 - Glossary of Terms

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.

Appendix 2 - Glossary of Terms

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

R

RAID (Redundant Array 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 are 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 warrants this product to be free of defects in material and workmanship for an initial period of one (1) year from date of delivery to the original purchaser from I-Bus.

During this period, I-Bus 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 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 manufactured product, such as power supply, backplanes, other chassis components, or CPUs. I-Bus is not liable for any defects in material or workmanship of any peripherals, products or parts which I-Bus does not design or manufacture. However, I-Bus will honor the original manufacturer's warranty for these products.

I-Bus will analyze the defective component and the customer will be charged.

Receipt of damaged goods voids the I-Bus 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, if such parts or products are provided under this warranty agreement. In the event a defect is not related to the I-Bus manufactured product, I-Bus 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 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 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 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 facility, or to an authorized I-Bus 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 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:

<div align="center">

I-Bus (see page 2 for I-Bus address)
ATTENTION: RMA REPAIR DEPT.
RMA ####

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Appendix 4 - Limited Warranty

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Appendix 5 - 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 5 - FCC Information

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Castor User's Guide