cPCI-6880 Series

Low Power 6U CompactPCI Processor Blade with 45nm Intel® Core™2 Duo Processor

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	2009/07/29	Initial Release
2.01	2010/03/17	Correct block diagram, serial port specification, GbE pin definition, cPCI-R6000P RTM board layout, assembly and front panel drawings, J1 pin definition, Mode Switch settings, Status LED label; add PMC connector pin definitions
2.02	2011/04/26	Remove TMDS signals from J5 pinout; correct Hot Swap LED default status; update addresses

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Preface

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Using this Manual

Audience and Scope

The cPCI-6880 User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating CompactPCI systems.

Manual Organization

This manual is organized as follows:

Chapter 1, Overview: Introduces the cPCI-6880, its features, block diagrams, and package contents.

Chapter 2, Specifications: Presents detailed specification information, and power consumption.

Chapter 3, Functional Description: Describes the cPCI-6880's main functions.

Chapter 4, Board Interfaces: Describes the cPCI-6880 board interfaces, pin definitions, and jumper settings.

Chapter 5, Getting Started: Describes the installation instructions of the cPCI-6880.

Chapter 6, Driver Installation: Describes the driver installation procedures.

Chapter 7, Utilities: Describes the Watchdog Timer and Preboot Execution Environment functions.

Chapter 8, BIOS Setup Utility: Describes the AMIBIOS®8 BIOS setup utility.

Chapter 9, IPMI User Guide: Provides relevant information for the baseboard management controller (BMC) of the Intelligent Platform Management Interface (IPMI).

Important Safety Instructions: Presents safety instructions all users must follow for the proper setup, installation and usage of equipment and/or software.

Getting Service: Contact information for ADLINK's worldwide offices.

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



NOTE:

Additional information, aids, and tips that help users perform tasks.



CAUTION:

Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



WARNING:

Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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Table of Contents

Revision History ii

Preface iii

List of Tables xi

List of Figures xiii

1 Overview 1

1.1 Introduction 1
1.2 Features 2
1.3 Block Diagram 3
1.4 Product List 4
1.5 Package Contents 5

2 Specifications 7

2.1 cPCI-6880 SBC Specifications 7
2.2 cPCI-R6000 RTM Specifications 10
2.3 I/O Connectivity Table 12
2.4 Power Requirements 14

3 Functional Description 17

3.1 CPU 17
3.2 Chipset 20
3.3 DVI 22
3.4 Super I/O 22
3.5 Battery 23
3.6 PMC Site 23
3.7 Onboard USB Flash 23
3.8 FWH Flash Memory & Failover 24

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4 Board Interfaces 25
4.1 cPCI-6880 SBC Board Layout 25
4.2 cPCI-6880 SBC Front Panel 26
4.3 cPCI-6880 SBC Assembly Layout 27
4.4 cPCI-R6000 RTM Board Layout 28
4.5 cPCI-R6000 RTM Front Panel 29
4.6 cPCI-R6000D RTM Board Layout 30
4.7 cPCI-R6000D RTM Front Panel 31
4.8 cPCI-R6000D RTM Assembly Layout 32
4.9 cPCI-R6000P RTM Board Layout 33
4.10 cPCI-R6000P RTM Front Panel 34
4.11 Connector Pin Assignments 35
4.12 Switch and Jumper Settings 55

5 Getting Started 59
5.1 CPU and Heatsink 59
5.2 Memory Module Installation 60
5.3 Hard Drive Installation 61
5.4 CompactFlash Card Installation 66
5.5 Installing the cPCI-6880 SBC to the Chassis 69
5.6 Installing the cPCI-R6000 RTM to the Chassis 70

6 Driver Installation 71
6.1 Driver Installation Procedure 71
6.2 SCSI Driver 72

7 Utilities 73
7.1 Watchdog Timer 73
7.2 Preboot Execution Environment (PXE) 78

8 BIOS Setup Utility 79
8.1 Starting the BIOS 79
8.2 Main Setup 83
8.3 Advanced BIOS Setup 84

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8.4 Advanced PCI/PnP Settings 93
8.5 Boot Settings 94
8.6 Security Setup 97
8.7 Chipset Setup 100
8.8 Exit Menu 104

9 IPMI User Guide 107
9.1 Introduction 107
9.2 Summary of Commands Supported by BMR-AVR-cPCI . 107
9.3 OEM Commands Summary Table 109
9.4 CompactPCI Address Map 113
9.5 Communications with IPMC 114
9.6 IPMI Sensors List 114
9.7 Relevant Documents 115

Important Safety Instructions 117

Getting Service 119

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List of Tables

Table 2-1: SBC I/O Connectivity 12
Table 2-2: RTM I/O Connectivity 13
Table 2-3: CompactPCI Input Voltage Characteristics 14
Table 2-4: Idle Mode Power Consumption 15
Table 2-5: 100% CPU Usage Power Consumption 15
Table 4-1: cPCI-6880 Front Panel Status LED Descriptions ... 26
Table 4-2: USB Connector Pin Definition 35
Table 4-3: RJ-45 Serial Port Pin Definition 35
Table 4-4: PS/2 Keyboard/Mouse Connector Pin Definition 35
Table 4-5: GbE Connector Pin Definitions 36
Table 4-6: GbE LED CN4, CN5 Status Definitions 36
Table 4-7: GbE LED CN20-R, CN21-R Status Definitions 36
Table 4-8: COM1-2 Serial Port Connector Pin Definition 37
Table 4-9: Onboard Serial Port Connector Pin Definition 37
Table 4-10: DVI-I Connector Pin Definition (J6) 38
Table 4-11: DVI-I (Analog only) Connector Pin Def'n (CNY1) ... 39
Table 4-12: SATA Connector Pin Definition 39
Table 4-13: DB-6910SAT SATA Connector Pin Definition 40
Table 4-14: PMC Connector Pin Definitions 42
Table 4-15: 68-pin SCSI Pin Definition 43
Table 4-16: Floppy Connector Pin Definition 44
Table 4-17: PIM Connector (JN1-R) Pin Definition 45
Table 4-18: PIM Connector (JN2-R) Pin Definition 46
Table 4-19: CompactFlash Connector Pin Definition 47
Table 4-20: DB-6880CF, DB-6920CF/SAT Connector Pin Def'n 48
Table 4-21: DB-R6000L2 Connector Pin Definition 49
Table 4-22: CompactPCI J1 Connector Pin Definition 50
Table 4-23: CompactPCI J2 Connector Pin Definition 51
Table 4-24: CompactPCI J3 Connector Pin Definition 52
Table 4-25: CompactPCI J4 Connector Pin Definition 53
Table 4-26: CompactPCI J5 Connector Pin Definition 54
Table 4-27: Mode Switch Settings 55
Table 4-28: COM1/Debug Switch Settings 56
Table 4-29: USB Flash Data Protection Switch Settings 56

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List of Figures

Figure 1-1: cPCI-6880 Series Block Diagram 3
Figure 4-1: cPCI-6880 SBC Board Layout 25
Figure 4-2: cPCI-6880 Series Front Panel Layout 26
Figure 4-3: cPCI-6880 SBC Assembly Layout 27
Figure 4-4: cPCI-R6000 RTM Board Layout 28
Figure 4-5: cPCI-R6000 RTM Front Panel 29
Figure 4-6: cPCI-R6000D RTM Board Layout 30
Figure 4-7: cPCI-R6000D RTM Front Panel 31
Figure 4-8: cPCI-R6000D RTM Assembly Layout 32
Figure 4-9: cPCI-R6000P RTM Board Layout 33
Figure 4-10: cPCI-R6000P RTM Front Panel 34

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1 Overview

1.1 Introduction

The cPCI-6880 Series is a 6U CompactPCI single board computer in single slot (4HP) width form factor featuring a low power Intel® mobile chipset and 45nm Core™2 Duo processor with high performance 1066MHz front-side bus (FSB). The cPCI-6880 provides up to 8GB dual channel DDR2-667/800 memory capacity, one channel of soldered onboard memory up to 4GB, and the other channel via SODIMM socket. The cPCI-6880 Series implements the Mobile Intel® GM45 Memory Controller Hub and ICH9M I/O Hub for optimal performance.

The cPCI-6880 Series supports a 64bit/66MHz CompactPCI bus, one PMC site with 64-bit/66MHz PCI bus, four PCI-Express gigabit Ethernet ports (two on front panel, two for PICMG 2.16), a SATA connector for an onboard 2.5” SATA HDD (or CompactFlash socket via adapter), onboard 4GB USB NAND flash for solid-state storage, and SCSI RAID 1 support via the Rear Transition Module (RTM). For flexibility of use, the cPCI-6880 Series can be installed in a standard CompactPCI system slot as system master, or peripheral slot as PCI device. The cPCI-6880 Series is ideally suited for factory automation, transportation and military applications.

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1.2 Features

- 6U CompactPCI SBC in 4HP width form factor
- Intel® Core™2 Duo or Celeron® processor, up to 2.53GHz in µFC-PGA package (Socket P)
- Front Side Bus 1066/800/667 MHz depending on processor
- Mobile Intel® GM45 Graphics Memory Controller Hub and ICH9M I/O Controller Hub
- Dual Channel DDR2 non-ECC SDRAM at 667 or 800MHz
- One channel for soldered memory up to 4GB; one channel for SO-DIMM socket up to 4GB memory (max. 8GB total)
- 64-bit/66MHz CompactPCI Interface based on PCI specifications, 3.3V and 5V signaling
- Supports operation in system slot as system master or in peripheral slot with connectivity to CompactPCI bus
- One PMC site with 64-bit/66MHz PCI bus, 3.3V VIO only
- DVI-I port on front panel to support digital or analog graphics output
- Single channel LVDS interface support: 1x18 bpp (LVDS signals are routed to J5 connector)
- Four PCI-Express® Gigabit Ethernet ports, two at front, two for PICMG 2.16
- One SATA connector for onboard 2.5” SATA HDD and onboard 4GB USB NAND flash for storage options
- Optional CompactFlash socket by DB-CF-SB adapter
- Optional -20~70°C extended temperature support
- SCSI RAID 1 support on RTM
- High definition audio ports on RTM
- Up to three SATA ports on RTM

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1.3 Block Diagram

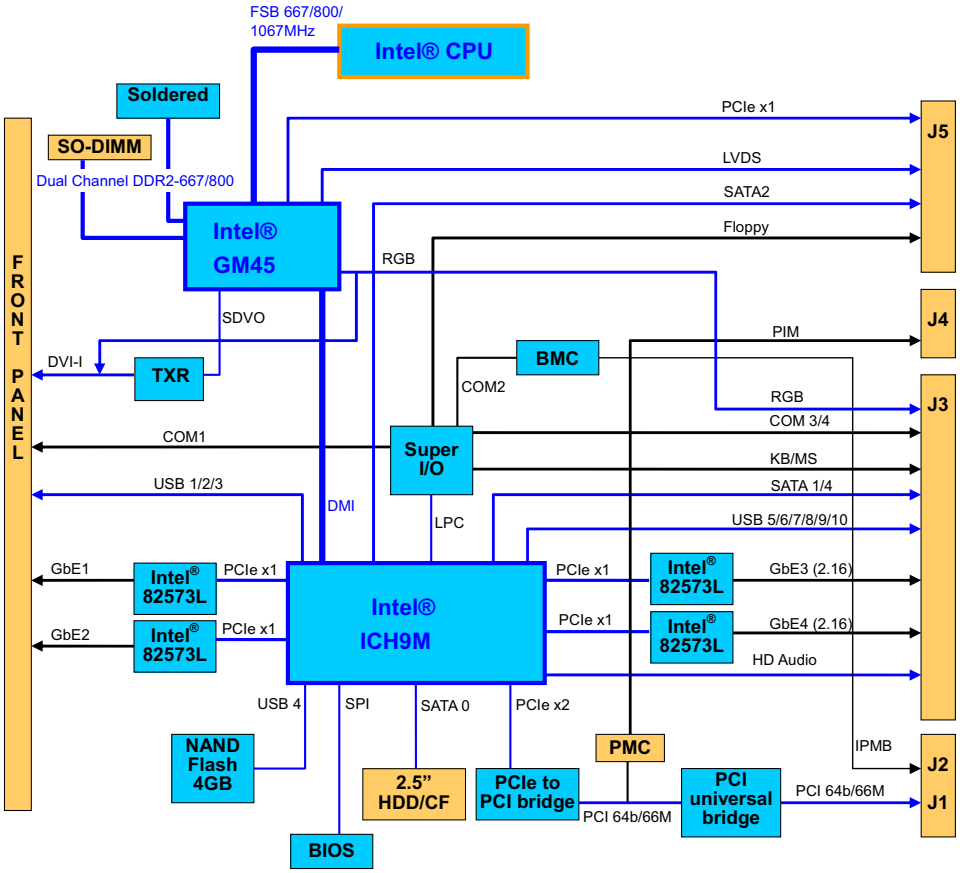


Figure 1-1: cPCI-6880 Series Block Diagram

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1.4 Product List

Products included in the cPCI-6880 Series include:

Processor Blade

- **cPCI-6880:** 4HP (single-slot) width 6U CompactPCI featuring single Intel® Core™2 Duo or Celeron processor; 1GB, 2GB or 4GB soldered onboard memory and additional 1GB, 2GB or 4GB by SO-DIMM socket; embedded 4GB USB NAND flash onboard; removable SATA connector adapter (DB-6920SAT); one PMC site and I/O: 3x USB, 2x GbE, RJ-45 COM, DVI-I; equipped with J1, J2, J3, J5 connectors **without PIM support**.
- **cPCI-6880P:** 4HP (single-slot) width 6U CompactPCI featuring single Intel® Core™2 Duo or Celeron processor; 1GB, 2GB or 4GB soldered onboard memory and additional 1GB, 2GB or 4GB by SO-DIMM socket; embedded 4GB USB NAND flash onboard; removable SATA connector adapter (DB-6920SAT); one PMC site and I/O: 3x USB, 2x GbE, RJ-45 COM, DVI-I; equipped with J1, J2, J3, J4, J5 connectors **with PIM support**.

Rear Transition Modules

- **cPCI-R6000:** 4HP width Rear Transition Module for CPCI-6880 SBCs with VGA, 2x COM, 3x USB, 2x GbE, SCSI, 2x SATA, and Floppy
- **cPCI-R6000P:** 4HP width Rear Transition Module for CPCI-6880 SBCs with VGA, 2x COM, 3x USB, 2x GbE, PIM, 2x SATA, and Floppy **(supports cPCI-6880P only)**
- **cPCI-R6000D:** 8HP width Rear Transition Module for CPCI-6880 SBCs with VGA, 2x COM, 3x USB, 2x GbE, SCSI, 2x SATA, and Floppy. The DB-R6000L2 riser card provides 2x USB, KB/MS, Mic-in, Line-out and removable SATA direct connector (DB-6920SAT) for 2.5” SATA HDD direct connection.

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Adapter Kits

- **DB-CF-SA:** CompactFlash socket kit for RTM cPCI-R6000D, including DB-6920CF adapter board, card guide and screws to replace SATA adapter with Compact-Flash socket
- **DB-CF-SB:** CompactFlash socket kit for SBC cPCI-6880, including DB-6880CF adapter board, card guide and screws to replace SATA adapter with CompactFlash socket

1.5 Package Contents

The cPCI-6880 is packaged with the components listed below (RTMs and adapter kits are optional). If any of the items in the contents list are missing or damaged, retain the shipping carton and packing material and contact the dealer for inspection. Please obtain authorization before returning any product to ADLINK. The packing contents of non-standard configurations may vary depending on customer requests.

Processor Blade

- The cPCI-6880 Series Processor Blade
  - CPU, RAM will differ depending on options selected
  - Thermal module is assembled on the board
- RJ-45 to DB-9 cable
- DVI to D-sub VGA adapter
- DB-6920SAT SATA adapter card
- 2.5” SATA HDD mounting kit, including HDD bracket and screws for HDD and adapter card
- ADLINK All-in-One CD
- User’s manual

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Rear Transition Module

- The cPCI-R6000, cPCI-R6000P or cPCI-R6000D RTM
- The DB-SATA kit (cPCI-R6000D only)
- 2.5” HDD bracket (cPCI-R6000D only)
- Y-cable for PS/2 combo port (8HP version only)
- DVI to VGA (DB-15) adapter
- Ultra-320 SCSI cable (cPCI-R6000, cPCI-R6000D only)

Adapter Kits

- The DB-CF-SA kit (for cPCI-R6000D RTM)
  - DB-6920CF adapter board
  - Screw pack
  - CF card guide
- The DB-CF-SB kit (for SBC cPCI-6880)
  - DB-6880CF adapter board
  - Screw pack
  - CF card guide


NOTE:

The contents of non-standard cPCI-6880 configurations may vary depending on customer requests.


CAUTION:

This product must be protected from static discharge and physical shock. Never remove any of the components except at a static-free workstation. Use the anti-static bag shipped with the product when putting the board on a surface. Wear an anti-static wrist strap properly grounded on one of the system's ESD ground jacks when installing or servicing system components.

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2 Specifications

2.1 cPCI-6880 SBC Specifications

CompactPCI Standard	PICMG® 2.0 CompactPCI® Rev. 3.0 PICMG® 2.1 Hot Swap Specification Rev.2.0 PICMG® 2.9 System Management Bus Rev. 1.0 PICMG® 2.16 Packet Switching Backplane Rev.1.0
Mechanical	Standard 6U CompactPCI®
	Board size: 233.23 mm x 160mm
	Single slot (4HP, 20.32mm) width
	CompactPCI® connectors J1, J2, J3 and J5 for cPCI-6880; CompactPCI® connectors J1, J2, J3, J4 and J5 for cPCI-6880P
Processor	Intel® 45nm Core™2 Duo processor T9400, 6MB L2 cache, 2.53GHz, 1066MHz FSB in µFC-PGA package (Socket P)
	Intel® 45nm Core™2 Duo processor P8400, 3MB L2 cache, 2.26GHz, 1066MHz FSB in µFC-PGA package (Socket P)
	Intel® 65nm Core™2 Duo processor T7500, 4MB L2 cache, 2.2GHz, 800MHz FSB in µFC-PGA package (Socket P)
	Intel® Celeron® Processor T3100, 45nm dual-core, 1MB L2 cache, 1.93GHz, 800MHz FSB in µFC-PGA package (Socket P)
	Intel® 65nm Celeron Processor 575, single-core, 1MB L2 cache, 2.0GHz, 667MHz FSB in µFC-PGA package (Socket P)
	Passive heatsink with forced air cooling
Chipset	Mobile Intel® GM45 Express Chipset with 82GM45 Graphics and Memory Controller Hub and 82801IBM I/O Controller Hub (ICH9M)
Memory	Dual channel DDR2-667/800 non-ECC memory One channel for soldered onboard memory, up to 4GB One channel for single SO-DIMM socket, up to 4GB Maximum 8GB capacity
CompactPCI Bus	PCI 64-bit/ 66MHz; V(I/O) 3.3V and 5V signaling Supports operation in system slot or in peripheral slot with connectivity to CompactPCI bus (Universal Mode)
PMC	One PCI 64-bit/ 66MHz PMC site, V(I/O) 3.3V only
Ethernet	Four PCI-Express® x1 Intel® 82573L GbE controllers Two 10/100/1000BASE-T egress ports Two 10/100/1000BASE-T PICMG 2.16 ports

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Graphics	Integrated in Intel® GM45 Express Chipset (GMCH) Intel® Gen 5.0 integrated graphics engine Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0) Microsoft® Direct X 10 support DVI-I port on front panel, supporting digital and CRT output Analog RGB up to QXGA
Serial Ports	One 16C550 compatible RJ-45 RS-232 port on front panel Two serial ports routed to rear I/O
Storage Interfaces	USB NAND Flash 4GB onboard (supports standard operating temperature range only)
	2.5” SATA HDD direct connector onboard
	Optional CompactFlash Type II socket onboard[1]
BIOS	AMIBIOS®8, dual 16Mbit SPI flash memory
IPMI Interface	Supports PICMG® 2.9 secondary system management bus IPMI functions implemented as defined by IPMI Spec. v1.5; ATmega128L-8AU Baseboard Management Controller (BMC) with 128KB programmable in-system flash, 4KB EEPROM, and 4KB internal SDRAM
Faceplate I/O	3x USB 2.0 ports 2x 10/100/1000BASE-T Ethernet ports DVI-I port (supports VGA port via DVI-to-VGA adapter) RJ-45 serial port PMC slot
Onboard Peripherals	Serial ATA connector (optional CompactFlash socket)[1] USB NAND Flash 4GB
Supported OS	Windows XP Professional Windows XP x64 Edition Windows Vista x64 Edition Red Hat Enterprise 5.1 Other OS support upon request
Operating Temperature[2]	0°C to 60°C standard -20°C to 70°C extended temperature (optional)
Storage temperature	-40°C to 85°C
Humidity	20% to 95% non-condensing
Shock	15G peak-to-peak, 11ms duration, non-operating
Vibration[3]	Operating: 1.88Grms. 5 to 500Hz, each axis (without HDD)
Compliance	CE EN55022, FCC Class A

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Notes:

1. The SATA HDD connector comes in a removable adapter design (DB-6920SAT) and can be replaced with a Compact-Flash socket adapter (DB-6880CF) to accommodate a CF card. The 2.5” hard drive space is reserved. A CompactFlash card and SATA HDD cannot be used/connected simultaneously.
2. ADLINK-certified thermal design. The thermal performance is dependent on the chassis cooling design. Forced airflow with 16 CFM is required. Temperature limit of optional mass storage devices may affect the thermal specification.
3. The hard drive limits the operational vibration tolerance. When application requires higher specification for anti-vibration, it is recommended to use a solid state drive (SSD), CompactFlash card, or onboard USB NAND flash.



Specifications are subject to change without prior notice.

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2.2 cPCI-R6000 RTM Specifications

Mechanical	Standard 6U CompactPCI® rear I/O
	Board size: 233.23 mm x 80mm
	Single-slot (4HP, 20.32mm) or dual-slot (8HP, 40.64mm) width
	CompactPCI® connectors rJ3 and rJ5 on cPCI-R6000(D) CompactPCI® connectors rJ3, rJ4 and rJ5 on cPCI-R6000P
Rear Panel I/O	**cPCI-R6000 (4HP)**
	2x USB2.0 ports 2x 10/100/1000BASE-T Ethernet ports DVI-I port (analog signal only) DB-15 serial port External 68-pin SCSI socket
	cPCI-R6000P (4HP)
	2x USB 2.0 ports 2x 10/100/1000BASE-T Ethernet ports DVI-I port (analog signal only) DB-15 serial port PIM (rear PMC) slot
	cPCI-R6000D (8HP)
	4x USB 2.0 ports 2x 10/100/1000BASE-T Ethernet ports DVI-I port (analog signal only) DB-15 serial port PS/2 Keyboard Mouse port Mic-in, Line-out ports

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Onboard Peripherals	**cPCI-R6000 (4HP)**
	USB 2.0 5-pin header RS-232 10-pin header (Tx, Rx signals only) Internal 68-pin SCSI socket 2x 7-pin Serial ATA connectors Floppy connector
	cPCI-R6000P (4HP)
	USB 2.0 5-pin header RS-232 10-pin header (Tx, Rx signals only) Floppy connector 2x 7-pin Serial ATA connectors Rear PMC connectors (PIM)
	cPCI-R6000D (8HP)
	USB 2.0 5-pin header RS-232 10-pin header (Tx, Rx signal only) Internal 68-pin SCSI socket 2x 7-pin Serial ATA connectors Floppy connector Serial ATA direct connector (optional CF socket)[1]
SCSI	**cPCI-R6000-965, cPCI-R6000-965D**
	LSI® Logic LSI53C1020 PCI-X Ultra320 SCSI Controller Integrated RAID on PCI-X 64-bit/133MHz bus
	320MB per second data transfer rate
	Supports RAID 1 (mirroring)

Notes:

1. The Serial ATA connector comes in a removable adapter design (DB-6920SAT) and can be replaced by a CompactFlash socket adapter (DB-6920CF). The CompactFlash and SATA HDD share the same space and cannot be installed simultaneously.

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2.3 I/O Connectivity Table

SBC

Function	cPCI-6880(P)	
	Faceplate	Board
Gigabit Ethernet	Y x2	
COM 1	Y(RJ-45)	
USB 2.0	Y x2	
PMC		Y
DVI-I	Y	
Serial ATA		Y
Compact Flash		Optional(1)
USB Flash		Y
GP LED	Y x4	
Reset Button	Y	

Table 2-1: SBC I/O Connectivity

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RTM

Function	cPCI-R6000 (4HP)		cPCI-R6000P (4HP)		cPCI-R6000D (8HP)	
	Faceplate	Board	Faceplate	Board	Faceplate	Board
Gigabit Ethernet	Y x2 (2.16)		Y x2 (2.16)		Y x2 (2.16)	
COM 2	Y (DB-9)		Y (DB-9)		Y (DB-9)	
COM 4				Y (10-pin)		Y (10-pin)
USB 2.0	Y x2	Y (5-pin)	Y x2	Y (5-pin)	Y x4	Y (5-pin)
PIM				Y		
VGA	Y		Y		Y	
Serial ATA		Y x2 (7-pin)		Y x2 (7-pin)		Y x3(2)
Compact Flash						opt.(3)
PS/2 KB/MS					Y	
Mic-in					Y	
Line-out					Y	
SCSI	Y	Y			Y	Y
Floppy		Y		Y		Y

Table 2-2: RTM I/O Connectivity

Notes:

1. Optional CompactFlash socket adapter kit (DB-CF-SB) for CompactFlash card installation (2.5”HDD and CF share the same space and cannot be installed simultaneously)
2. Two 7-pin SATA connectors for external HDDs and one connector for onboard 2.5” SATA HDD
3. Optional CF socket adapter kit (DB-CF-SA) for additional CF socket (CF and 2.5” HDD share the same space and cannot be installed simultaneously)

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2.4 Power Requirements

In order to guarantee a stable functionality of the system, it is recommended to provide more power than the system requires. **An industrial power supply unit should be able to provide at least twice as much power as the entire system requires of each voltage**. An ATX power supply unit should be able to provide at least three times as much power as the entire system requires.

The tolerance of the voltage lines described in the CompactPCI specification (PICMG 2.0 R3.0) is +5%/ -3% for 5, 3.3 V and ±5% for ±12V. This specification is for power delivered to each slot and it includes both the power supply and the backplane tolerance.

Voltage	Nominal Value	Tolerance	Max. Ripple (P - P)
5V	+5.0 VDC	+5% / -3%	50 mV
3.3V	+3.3 VDC	+5% / -3%	50 mV
+12V	+12 VDC	+5% / -5%	240 mV
-12V	-12 VDC	+5% / -5%	240 mV
V I/O (PCI I/O Buffer Voltage)	+3.3 VDC or +5 VDC	+5% / -3%	50 mV
GND			

Table 2-3: CompactPCI Input Voltage Characteristics

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Power Consumption

This section provides information on the power consumption of cPCI-6880 Series with different CPUs, 2GB soldered onboard memory, 2GB SO-DIMM memory, 100GB onboard SATA HDD and cPCI-R6000 installed. The systems were tested in Idle Mode and Full Load Mode under Windows XP running Intel Thermal Analysis Tool. The cPCI-6880 is powered by 5V, 3.3V and optional + 12V.

Idle Mode under Windows XP

CPU	Core 2 Duo T9400		Core 2 Duo T7500		Core 2 Duo P8400		Celeron 575	
Voltage (V)	Current (A)	Power (W)	Current (A)	Power (W)	Current (A)	Power (W)	Current (A)	Power (W)
+3.3	2.136	7.0488	2.112	6.9696	2.114	6.9762	2.105	6.9465
+5	2.577	12.885	2.578	12.89	2.62	13.1	3.136	15.68
+12V	0.0342	0.4104	0.0345	0.414	0.0334	0.4008	0.0344	0.4128
Total		20.3442		20.2736		20.477		23.0393

Table 2-4: Idle Mode Power Consumption

100% CPU Usage under Windows XP

CPU	Core 2 Duo T9400		Core 2 Duo T7500		Core 2 Duo P8400		Celeron 575	
Voltage (V)	Current (A)	Power (W)	Current (A)	Power (W)	Voltage (A)	Current (W)	Power (A)	Current (W)
+3.3	2.204	7.2732	2.177	7.1841	2.171	7.1643	2.171	7.1643
+5	8.463	42.315	8.751	43.755	6.233	31.165	5.108	25.54
+12V	0.0351	0.4212	0.0329	0.3948	0.0318	0.3816	0.0332	0.3984
Total		50.0094		51.3339		38.7109		33.1027

Table 2-5: 100% CPU Usage Power Consumption

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3 Functional Description

The following sections describe the cPCI-6880 Series features and functions.

3.1 CPU

The following table lists the processors supported by the cPCI-6880 Series and their power ratings.

Features	Intel® Core™2 Duo T9400	Intel® Core™2 Duo P8400	Intel® Core™2 Duo T7500	Intel® Celeron® T3100	Intel® Celeron® 575
Clock	2.53 GHz	2.26 GHz	2.2 GHz	1.93 GHz	2.0 GHz
L2 cache	6MB	3MB	4MB	1MB	1MB
FSB	1066MHz	1066MHz	800MHz	800MHz	667MHz
Max. Power (TDP[1])	35W	25W	35W	35W	31W
$T_{junction_MAX}$ [2]	105°C	105°C	100°C	105°C	100°C
Process	45nm	45nm	65nm	45nm	65nm
# of cores	2	2	2	2	1

Notes:

1. The highest expected sustainable power while running known power intensive applications. TDP is not the maximum power that the processor can dissipate.
2. The maximum supported operating temperature.

Intel® Core™2 Duo Processor

The Intel® Core™2 Duo mobile processors are high-performance, low-power processors based on the Intel® Core™ microarchitecture for Intel® Centrino® 2 technology. The following list outlines the key features of this processor:

- Dual-core processor for mobile with enhanced performance
- Supports Intel architecture with Intel® Wide Dynamic Execution
- Supports L1 cache-to-cache (C2C) transfer
- On-die, primary 32-KB instruction cache and 32-KB, write-back data cache in each core

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- The processor in DC-XE, standard voltage (SV) and LV have an on-die, up to 6-MB second-level, shared cache with Advanced Transfer Cache architecture
- The processor in ULV single-core and dual-core have an on-die, up to 3-MB second-level, shared cache with Advanced Transfer Cache architecture
- Streaming SIMD extensions 2 (SSE2), streaming SIMD extensions 3 (SSE3), supplemental streaming SIMD extensions 3 (SSSE3) and SSE4.1 instruction sets
- The processor in DC-XE, SV and LV are offered at 1066-MHz, source-synchronous front side bus (FSB)
- Advanced power management features including Enhanced Intel SpeedStep® Technology and dynamic FSB frequency switching
- Digital thermal sensor (DTS)
- Intel® 64 architecture
- Supports enhanced Intel® Virtualization Technology
- Enhanced Intel® Dynamic Acceleration Technology and Enhanced Multi-Threaded Thermal Management (EMTTM)
- Supports PSI2 functionality
- SV processor offered in Micro-FCPGA and Micro-FCBGA packaging technologies
- Execute Disable Bit support for enhanced security
- Intel® Deep Power Down low-power state with P_LVL6 I/O support
- Support for Intel® Trusted Execution Technology
- Half ratio support (N/2) for core to bus ratio

Intel® Celeron® Processor T3100

The Intel® Celeron® Processor T3100 is a dual-core and 45nm process CPU that provides a low-cost mobile computing solution. The following list provides some of the key features of this processor:

- Dual-Core processor for mobile with enhanced performance
- Supports Intel architecture with Intel® Wide Dynamic Execution
- On-die, primary 32-KB instruction cache and 32-KB write-back data cache in each core

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- L1 Cache to Cache (C2C) transfer
- On-die, 1-MB second level shared cache with advanced transfer cache architecture
- Streaming SIMD Extensions 2 (SSE2), Streaming SIMD Extensions 3 (SSE3) and Supplemental Streaming SIMD Extensions 3 (SSSE3)
- 800-MHz Source-Synchronous Front Side Bus (FSB)
- Digital Thermal Sensor (DTS)
- Intel® 64 Technology
- PSI2 functionality
- Execute Disable Bit support for enhanced security
- Half ratio support (N/2) for Core to Bus ratio
- Intel® Deeper Sleep low-power state with P_LVL4 I/O Support (SFF processor only) processor only)

Intel® Celeron® Processor 575

The following list provides some of the key features of this processor:

- Single core
- On-die, primary 32-KB instruction cache and 32-KB write-back data cache
- On-die, 1-MB second level shared cache with advanced transfer cache architecture
- 667-MHz source-synchronous front side bus (FSB)
- Supports Intel® architecture with dynamic execution
- Data prefetch logic
- Micro-FCPGA packaging technology
- MMX™ technology, Streaming SIMD Extensions (SSE), Streaming SIMD Extensions 2 (SSE2), Streaming SIMD Extensions 3 (SSE3), and Supplemental Streaming SIMD Extensions 3 (SSSE 3)
- Digital Thermal Sensor (DTS)
- Execute Disable Bit support for enhanced security
- Intel® 64 architecture (formerly Intel® EM64T)
- Architectural and performance enhancements of the Core microarchitecture.

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3.2 Chipset

The cPCI-6880 Series incorporates the Mobile Intel® GM45 Graphics Memory Controller Hub (GMCH) and 82801IBM ICH9 Mobile (ICH9M) I/O Controller Hub.

Intel® GM45 Graphics Memory Controller Hub

The following outlines the key features of GM45 GMCH.

Processor Support

- Intel® Core™2 Extreme, Intel® Core™2 Quad, and Intel® Core™2 Duo mobile processors based on the 45-nm process
- Intel® Pentium® Dual Core and Intel® Celeron® mobile processors on 45 nm technology
- Intel® Celeron® 575 processors on 65 nm technology
- 667-MHz, 800-MHz and 1066-MHz FSB
- Support for Dynamic FSB Frequency Switching
- Support for Intel® Virtualization Technology (Intel® VT) for Directed I/O (Intel® VT-d) (DMA)
- 36-bit interface to addressing, allowing the CPU to access the entire 64 GB of the GMCH's memory address space

System Memory Support

- Supports DDR2 and DDR3 SDRAM (DDR2 only in cPCI-6880)
- Support for DDR2 at 667 MHz and 800 MHz
- Support for DDR3 at 667, 800 and 1066 MHz
- Support for DDR3 at 667 MHz when FSB is 667 MHz only
- Two Memory Channel Configurations supported in Dual-channel Asymmetric
- 8-GB maximum memory support
- Support for x8 and x16 DDR2 and DDR3 devices
- 64-bit wide per channel
- No support for ECC

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Direct Management Interface

- Chip-to-chip interface between (G)MCH and 82801 GMB/GHM
- Configurable as x2 or x4 DMI lanes
- 2-GB/s (1-GB/s each direction) point-to-point interface to ICH
- 32-bit downstream address

Integrated Graphics

- Intel Gen 5.0 integrated graphics engine with ten, fully-programmable cores
- 533-MHz core render clock @ 1.05-V core voltage
- Supports iHDMI/DVI, DP, TV-Out, LVDS, CRT and SDVO (the cPCI-6880 implements analog CRT, SDVO and LVDS only)
- Intel® Dynamic Video Memory Technology (Intel® DVMT 5.0)
- Microsoft DirectX10 support
- Single channel LVDS interface support: 1x18 bpp (LVDS signals are routed to J5 connector)
- Integrated 300-MHz DAC analog CRT
- Analog monitor support up to QXGA
- Support for CRT Hot-Plug

Intel® ICH9 Mobile I/O Controller Hub

The ICH9M provides extensive I/O support. Functions and capabilities include:

- ACPI Power Management Logic Support
- Integrated Serial ATA host controllers with independent DMA operation on up to four ports and AHCI support.
  - Supports data transfer rates of up to 3.0 Gb/s (300 MB/s).
  - The SATA controller contains two modes of operation – a legacy mode using I/O space, and an AHCI* mode using memory space. Software that uses legacy mode will not have AHCI* capabilities.

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- Provides 6 PCI Express x1 ports, supporting the PCI Express Base Specification, Revision 1.1. Each Root Port supports 2.5GB/s bandwidth in each direction (5 GB/s concurrent). The cPCI-6880 utilizes four PCI Express ports 3-6 for four Gigabit Ethernet controllers and configures the PCI Express ports 1-2 to PCI-Express x2 for connecting PCI Express to PCI bridge to support 64bit/66MHz CompactPCI bus..
- Enhanced DMA controller, interrupt controller, and timer functions
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C devices
- Supports Intel® High Definition Audio
- Supports Intel® Virtualization Technology for Directed I/O
- PCI Local Bus Specification, Revision 2.3 support for 33MHz PCI operations

* AHCI is a new programming interface for SATA host controllers. Platforms supporting AHCI may take advantage of performance features such as no master/slave designation for SATA devices—each device is treated as a master—and hardware-assisted native command queuing. AHCI also provides usability enhancements such as Hot-Plug. AHCI requires appropriate software support (e.g., an AHCI driver) and for some features, hardware support in the SATA device or additional platform hardware.

3.3 DVI

The Silicon Image SDVO PanelLink Transmitter Sil1362 is designed into the cPCI-6880 to convert the SDVO signal to a DVI interface. The Sil1362A is fully compliant with Intel SDVO 1.0 and DVI 1.0.

3.4 Super I/O

The ITE IT8783F Super I/O is on a Low Pin Count interface supporting PS/2 keyboard/mouse, three 16C550-compatible serial ports, floppy drive interface, hardware monitor function to monitor CPU voltage, CPU temperature, power supply voltages and system temperature, and Watch Dog Timer with time resolution from minimum 1 second or minute to maximum 65,535 seconds or minutes.

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3.5 Battery

The cPCI-6880 is provided with a 3.0V coin cell lithium battery for the Real Time Clock (RTC). The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer. A Panasonic CR2032 is equipped on board by default.

3.6 PMC Site

The cPCI-6880 series supports a PMC site for front panel I/O expansion. The PMC site provides a 64-bit/66MHz PCI bus link using a Tundra Tsi384 PCI-Express-to-PCI bridge. The PMC site supports +3.3V signaling only.

The JN1 and JN2 connectors provide the signals for the 32-bit PCI bus. The JNX1 connector provides the 64 bit extension for the PMC interface. The optional JN3 connector equipped in the cPCI-6880P version supports user defined I/O signals and is routed to the CompactPCI J4 connector to rear I/O.

3.7 Onboard USB Flash

The cPCI-6880 provides a 4GB USB interface solid state NAND flash device onboard as a mass storage or boot device option. The cPCI-6880 uses one SST 4GB NAND Flash device on IDE bus which is converted from USB to IDE controller. The 4GB USB flash supports installation of Windows XP embedded or Linux operating systems or can simply be used as a storage device like a USB flash drive. Below are the key features of the SST NAND Flash:

- Low Current Operations:
  - Active mode: 85mA Typical
  - Sleep mode: 160 uA Typical
- Data security through user-selectable protection zones with advance NAND management technology.
- 10 Million write cycles
- Data retention for 3 years
- Multi-tasking Technology enables fast sustained write performance (Host-to=Flash) for up to 8MByte/sec

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- Fast Sustained read performance (Flash-to-Host) for up to 30 MByte/sec
- 0 °C to 70 °C operating temperature

3.8 FWH Flash Memory & Failover

The cPCI-6880 series is designed with two onboard 16Mbit redundant SPI serial Flash devices for failover purposes, the BIOS1 FWH and BIOS2 FWH. The system BIOS will be flashed to both BIOS1 and BIOS2 FWHs at the factory. The BIOS1 device is the default boot BIOS. If the BIOS1 FWH fails to boot, the system will trigger the flash recovery procedure that will display the following messages on screen, indicating that the contents of the BIOS2 FWH are being copied to the BIOS1 FWH.



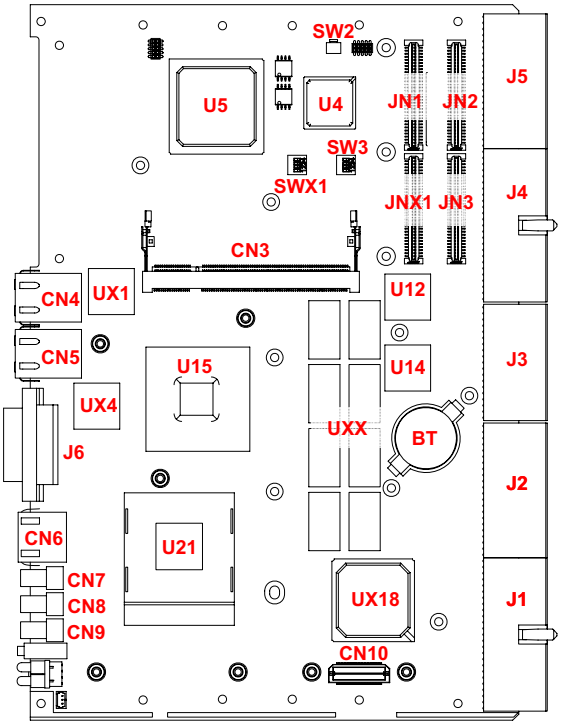
After the flash recovery procedure is complete, the display will show “Booting BIOS1...” and then the system will reboot automatically.

If the BIOS1 FWH fails to be properly flashed with the contents of the BIOS2 FWH or the BIOS1 FWH is not functional, the display will show “Booting BIOS2...” and the system will boot directly from the BIOS2 FWH.

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4 Board Interfaces

4.1 cPCI-6880 SBC Board Layout



U21	CPU socket	**CN10**	SATA/CF adapter card conn.
U15	GM45 GMCH	**CN3**	SO-DIMM socket
U5	ICH9M I/O Controller Hub	**JN1-3/JNX1**	PMC connectors[1]
U4	PCIe-to-PCI Bridge	**J1-J5**	CompactPCI connectors[2]
U12/14, UX1/4	Intel 82573L GbE controllers	**SW2**	Clear CMOS button
UX18	PCI to PCI universal Bridge	**SW3/SWX1**	Switches
UXX	Soldered memory chips	**CN4/5**	LAN ports
BT	Battery	**CN6**	COM port
J6	DVI-I connector	**CN7-9**	USB ports

Figure 4-1: cPCI-6880 SBC Board Layout

1. JN3 is populated on cPCI-6880P only
2. J4 is populated on cPCI-6880P only

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4.2 cPCI-6880 SBC Front Panel

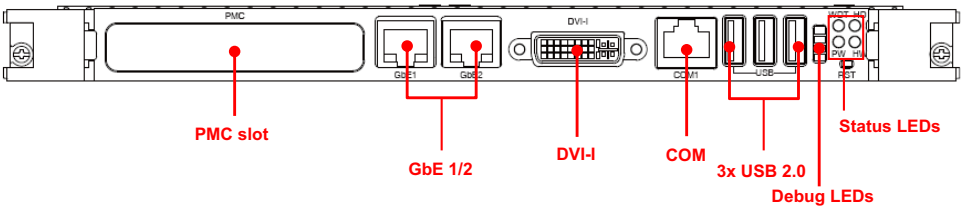
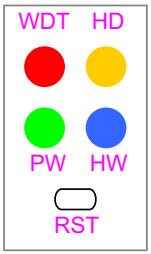


Figure 4-2: cPCI-6880 Series Front Panel Layout

Status LEDs



LED	Color	Condition	Indication
Power (PW)	Green	OFF	System is off
		ON	System is on
		Blink	Failure to power on (Payload power failure)
Hot Swap (HW)	Blue	OFF	Handles closed, System is on
		Fast Blink	Preparing to shut down system (LED: 0.1s on, 0.9s off)
		ON	Handles open and SBC ready to be removed
		Slow Blink[1]	Voltages out of tolerance: 3.3V, 5V, 12V, 1.5V over ±5% (LED: 2s on, 1s off)
WDT (WDT)	Red	OFF	No Watchdog event
		ON	Watchdog event alert
HDD (HD)	Amber	OFF	No HDD activity
		Blink	Data read/write in process

Table 4-1: cPCI-6880 Front Panel Status LED Descriptions

Note[1]: Disabled by default. See “OemSetBlueLEDLongBlinking” on page 110.

Debug LEDs

These LEDs are for debugging purposes. When the system is in normal operation, LEDs #2 and #3 are always ON.



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4.3 cPCI-6880 SBC Assembly Layout

This section describes the final assembly layout of the cPCI-6880 Series. The cPCI-6880 is equipped by default with a removable DB-6920SAT adapter card to directly mount a 2.5” SATA hard drive to the SBC. The DB-6920SAT can be replaced by the DB-6880CF adapter board to provide a CompactFlash slot. Please contact your sales representative to purchase the DB-6880CF adapter and screw pack.

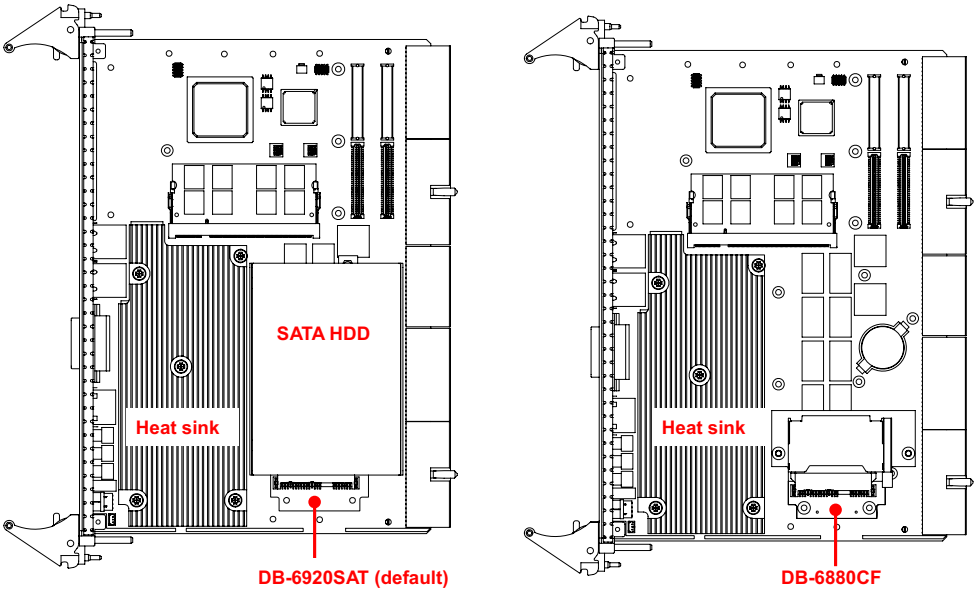
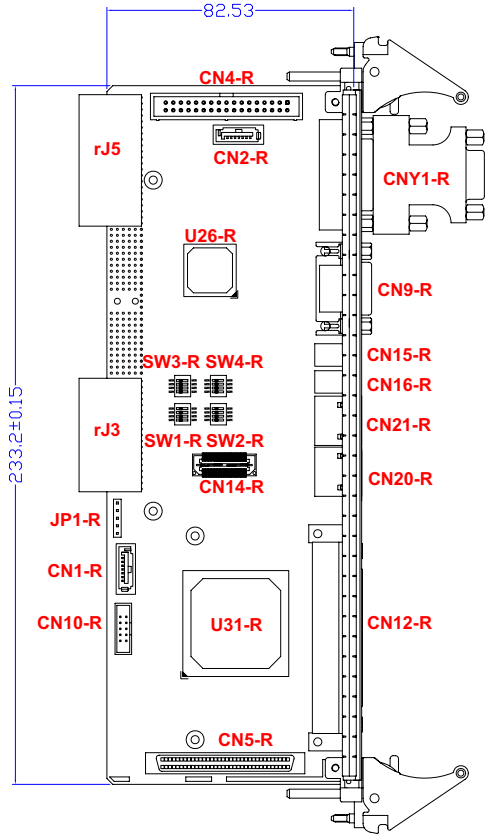


Figure 4-3: cPCI-6880 SBC Assembly Layout

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4.4 cPCI-R6000 RTM Board Layout



U26-R	PCIe-to-PCI bridge	**CN14-R**	DB-R6000L2 connector[1]
U31-R	LSI53C1020 SCSI controller	**CN12-R**	External SCSI connector
JP1-R	USB pin header (5-pin)	**CN15/16-R**	USB ports
CN1/2-R	SATA port (7-pin)	**CN20/21-R**	GbE ports
CN5-R	Internal SCSI connector	**CNY1-R**	DVI to VGA adapter
CN9-R	Serial port	**rJ3/5**	CompactPCI Connectors
CN10-R	Serial pin header (10-pin)	**SW1~4-R**	Switches
CN4-R	Floppy connector		

Figure 4-4: cPCI-R6000 RTM Board Layout

1. Used for cPCI-R6000D – shown here for clarity.

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4.5 cPCI-R6000 RTM Front Panel

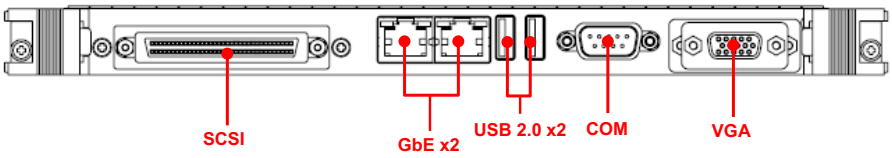
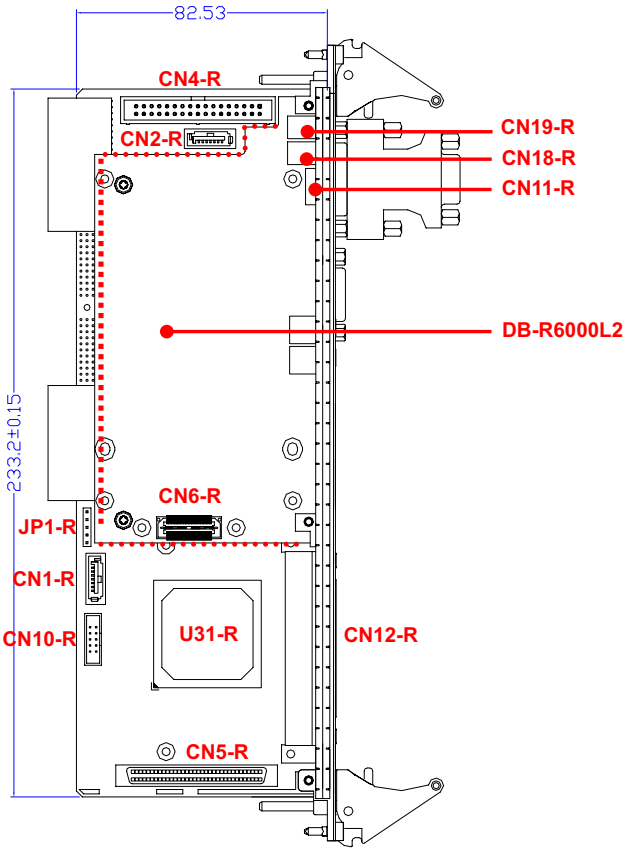


Figure 4-5: cPCI-R6000 RTM Front Panel

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4.6 cPCI-R6000D RTM Board Layout



CN1/2-R	SATA port (7-pin)	**CN11-R**	PS/2 KB/MS port
CN4-R	Floppy connector	**CN12-R**	External SCSI connector
CN5-R	Internal SCSI connector	**CN18/19-R**	USB ports
CN6-R	DB-6920SAT/ DB-6920CF connector	**JP1-R**	USB pin header (5-pin)
CN10-R	Serial pin header (10-pin)		

Figure 4-6: cPCI-R6000D RTM Board Layout

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4.7 cPCI-R6000D RTM Front Panel

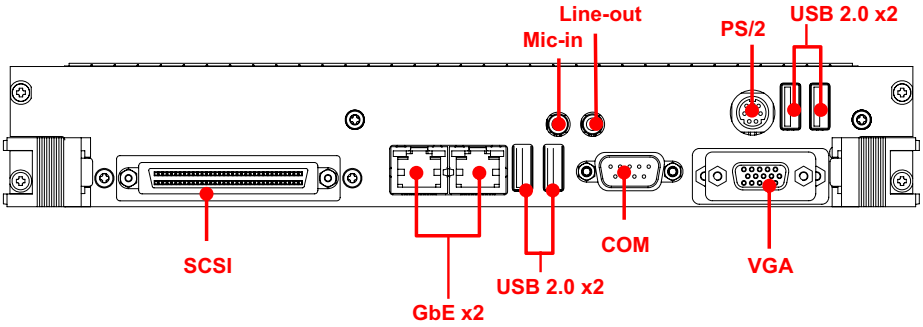


Figure 4-7: cPCI-R6000D RTM Front Panel

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4.8 cPCI-R6000D RTM Assembly Layout

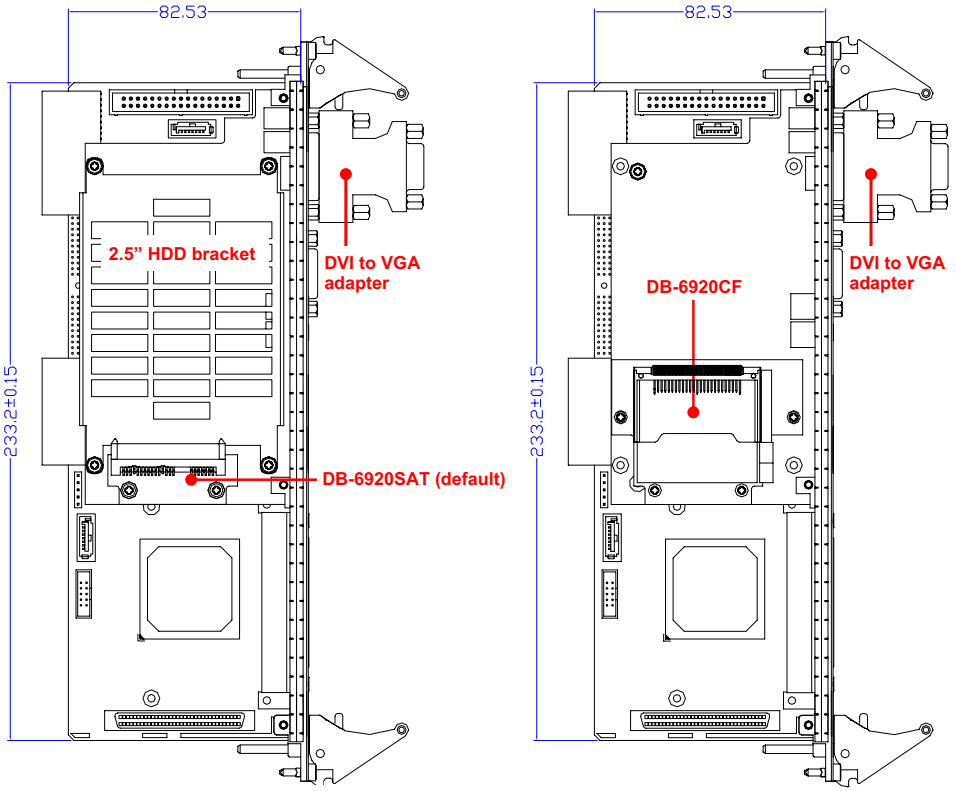
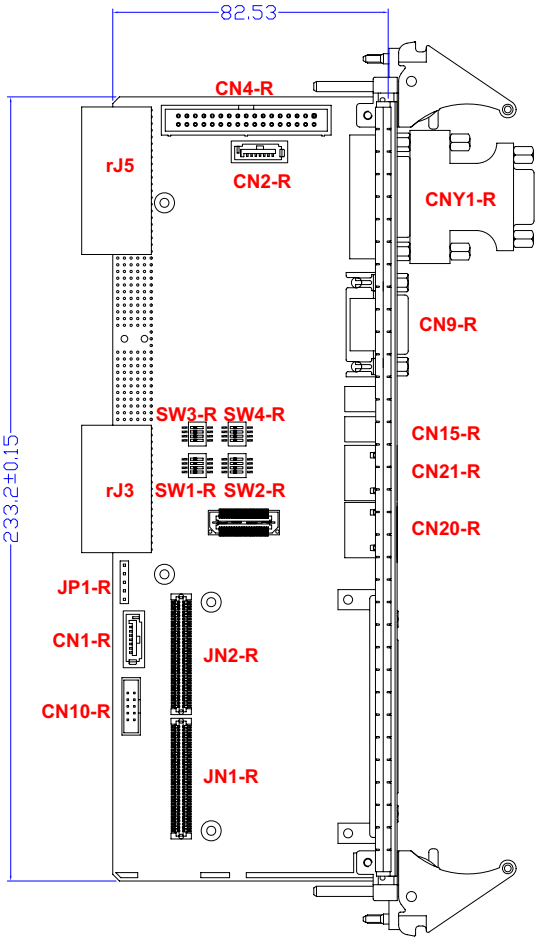


Figure 4-8: cPCI-R6000D RTM Assembly Layout

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4.9 cPCI-R6000P RTM Board Layout



JP1-R	USB pin header (5-pin)	**CN15/16-R**	USB ports
CN1/2-R	SATA port (7-pin)	**CN20/21-R**	GbE ports
JN1/2-R	PIM connectors	**CNY1-R**	DVI-to-VGA adapter
CN9-R	Serial port (DB-9)	**rJ3/5**	CompactPCI Connectors
CN10-R	Serial pin header (10-pin)	**SW1~4-R**	Switches
CN4-R	Floppy connector		

Figure 4-9: cPCI-R6000P RTM Board Layout

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4.10 cPCI-R6000P RTM Front Panel

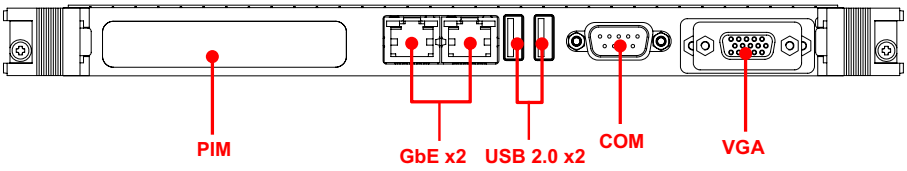


Figure 4-10: cPCI-R6000P RTM Front Panel

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4.11 Connector Pin Assignments

USB Connectors (CN7-9, CN2-L, CN3-L, CN15-R, CN16-R, JP1-R)

Pin #	Signal Name
1	Vcc
2	UV0-
3	UV0+
4	GND

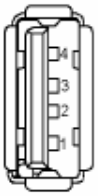


Table 4-2: USB Connector Pin Definition

RJ-45 Serial Port (CN-6)

Pin #	Signal Name
1	DCD#, Data carrier detect
2	RTS#, Request to send
3	DSR#, Data set ready
4	TXD, Transmit data
5	RXD, Receive data
6	GND, ground
7	CTS#, Clear to send
8	DTR#, Data terminal ready

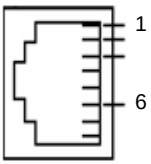


Table 4-3: RJ-45 Serial Port Pin Definition

PS/2 Keyboard/Mouse Connector (CN11-R)

Pin #	Signal	Function
1	KBDATA	Keyboard Data
2	MSDATA	Mouse Data
3	GND	Ground
4	+5V	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

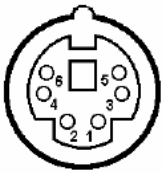


Table 4-4: PS/2 Keyboard/Mouse Connector Pin Definition

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RJ-45 Gigabit Ethernet Connectors (CN4, CN5, CN20-R, CN21-R)

Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-

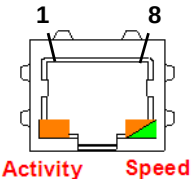


Table 4-5: GbE Connector Pin Definitions

Status (CN4, CN5)		Speed LED (Green/Amber)	Activity LED (Amber)
Network link is not established or system powered off		OFF	OFF
10 Mbps	Link	OFF	ON
	Active	OFF	Blinking
100 Mbps	Link	Green	ON
	Active	Green	Blinking
1000 Mbps	Link	Amber	ON
	Active	Amber	Blinking

Table 4-6: GbE LED CN4, CN5 Status Definitions

Status (CN20-R, CN21-R)		Speed LED (Green/Amber)	Activity LED (Amber)
Network link is not established or system powered off		OFF	OFF
10 Mbps	Link	OFF	ON
	Active	OFF	Blinking
100 Mbps	Link	Amber	ON
	Active	Amber	Blinking
1000 Mbps	Link	Green	ON
	Active	Green	Blinking

Table 4-7: GbE LED CN20-R, CN21-R Status Definitions

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DB-9 Serial Port (CN9-R)

Pin #	RS-232
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	IsoGND, Isolated ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator

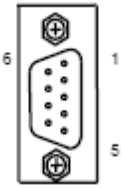


Table 4-8: COM1-2 Serial Port Connector Pin Definition

Onboard Serial Port Connector (CN10-R)

Pin #	RS-232
1	Not used
2	Not used
3	RXD, Receive data
4	Not used
5	TXD, Transmit data
6	Not used
7	Not used
8	Not used
9	IsoGND, Isolated ground
10	Not used

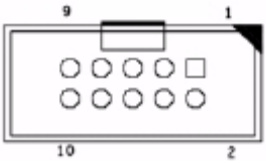
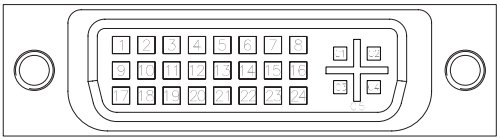


Table 4-9: Onboard Serial Port Connector Pin Definition

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DVI-I Connector (J6)

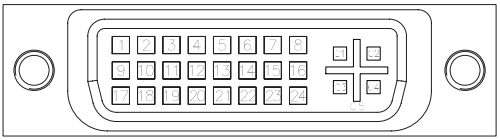


Pin #	Signal	Pin #	Signal
1	TMDS Data2-	16	Hot Plug Detect
2	TMDS Data2+	17	TMDS Data0-
3	TMDS Data2/4 Shield	18	TMDSData0+
4	TMDS Data4-	19	TMDS Data0/5 Shield
5	TMDS Data4+	20	TMDS Data5-
6	DDC Clock [SCL]	21	TMDS Data5+
7	DDC Data [SDA]	22	TMDS Clock Shield
8	Analog vertical sync	23	TMDS Clock +
9	TMDS Data1-	24	TMDS Clock -
10	TMDS Data1+	C1	Analog Red
11	TMDS Data1/3 Shield	C2	Analog Green
12	TMDS Data3-	C3	Analog Blue
13	TMDS Data3+	C4	Analog Horizontal Sync
14	+5 V Power	C5	Analog GND Return
15	GND		

Table 4-10: DVI-I Connector Pin Definition (J6)

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DVI-I (Analog only) Connector (CNY1-R)



Pin #	Signal	Pin #	Signal
1	NC	16	NC
2	NC	17	NC
3	GND	18	NC
4	NC	19	GND
5	NC	20	NC
6	DDCCLK_5V	21	NC
7	DDCDAT_5V	22	GND
8	VSYNC	23	NC
9	NC	24	NC
10	NC	C1	Analog Red
11	GND	C2	Analog Green
12	NC	C3	Analog Blue
13	NC	C4	Analog Horizontal Sync
14	+5 V Power	C5	Analog GND Return
15	GND		

Table 4-11: DVI-I (Analog only) Connector Pin Definition (CNY1)

Serial ATA Connectors (CN1-R, CN2-R)

Pin #	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

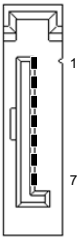


Table 4-12: SATA Connector Pin Definition

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Serial ATA Connector on DB-6920SAT

Pin #	Signal
S1	GND
S2	TX+
S3	TX-
S4	GND
S5	RX-
S6	RX+
S7	GND
P1	NC
P2	NC
P3	NC
P4	GND
P5	GND
P6	GND
P7	5V
P8	5V
P9	5V
P10	GND
P11	Reserved
P12	GND
P13~P15	12V

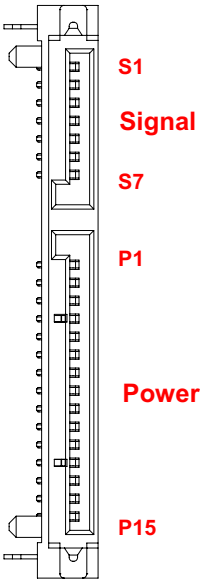


Table 4-13: DB-6910SAT SATA Connector Pin Definition

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

PMC Connector (JN1, JN2, JN3, JNX1)

Pin#	JN1 Signal	JN2 Signal	JN3 Signal	JNX1 Signal
1	PMC_TCK	P12V	PIO1	NC
2	N12V	PMC_TRST-L	PIO2	GND
3	GND	PMC_TMS	PIO3	GND
4	PCIX_INTA-L	NC (PMC_TDO)	PIO4	PCIX_CBE-L7
5	PCIX_INTB-L	PMC_TDI	PIO5	PCIX_CBE-L6
6	PCIX_INTC-L	GND	PIO6	PCIX_CBE-L5
7	PMC_MOD-L1	GND	PIO7	PCIX_CBE-L4
8	P5V	NC	PIO8	GND
9	PCIX_INTD-L	NC	PIO9	PMC_VIO
10	NC	NC	PIO10	PCIX_PAR64
11	GND	PMC_MOD-L2	PIO11	PCIX_AD63
12	P3V3_PMCAUX	P3V3	PIO12	PCIX_AD62
13	CLK66_PCIX_PMC	PMC_RST-L	PIO13	PCIX_AD61
14	GND	PMC_MOD-L3	PIO14	GND
15	GND	P3V3	PIO15	GND
16	PCIX_GNT-L0	PMC_MOD-L4	PIO16	PCIX_AD60
17	PCIX_REQ-L0	PMC_PME-L	PIO17	PCIX_AD59
18	P5V	GND	PIO18	PCIX_AD58
19	PMC_VIO	PCIX_AD30	PIO19	PCIX_AD57
20	PCIX_AD31	PCIX_AD29	PIO20	GND
21	PCIX_AD28	GND	PIO21	GND
22	PCIX_AD27	PCIX_AD26	PIO22	PCIX_AD56
23	PCIX_AD25	PCIX_AD24	PIO23	PCIX_AD55
24	GND	PCIX_AD23	PIO24	PCIX_AD54
25	GND	PMC_IDSEL	PIO25	PCIX_AD53
26	PCIX_CBE-L3	PCIX_AD23	PIO26	GND
27	PCIX_AD22	P3V3	PIO27	GND
28	PCIX_AD21	PCIX_AD20	PIO28	PCIX_AD52
29	PCIX_AD19	PCIX_AD18	PIO29	PCIX_AD51
30	P5V	GND	PIO30	PCIX_AD50
31	PCIX_FRAME-L	PCIX_AD16	PIO31	PCIX_AD49
32	PCIX_AD17	PCIX_CBE-L2	PIO32	GND

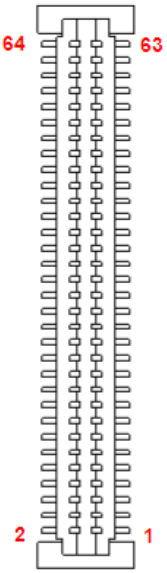


Table 4-14: PMC Connector Pin Definitions

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Pin#	JN1 Signal	JN2 Signal	JN3 Signal	JNX1 Signal
33	PCIX_FRAME-L	GND	PIO33	GND
34	GND	NC	PIO34	PCIX_AD48
35	GND	PCIX_TRDY-L	PIO35	PCIX_AD47
36	PCIX_IRDY-L	P3V3	PIO36	PCIX_AD46
37	PCIX_DEVSEL-L	GND	PIO37	PCIX_AD45
38	P5V	PCIX_STOP-L	PIO38	GND
39	PCIX_PCIXCAP	PCIX_PERR-L	PIO39	GND
40	PCIX_LOCK-L	GND	PIO40	PCIX_AD44
41	NC	P3V3	PIO41	PCIX_AD43
42	NC	PCIX_SERR-L	PIO42	PCIX_AD42
43	PCIX_PAR	PCIX_CBE-L1	PIO43	PCIX_AD41
44	GND	GND	PIO44	GND
45	PMC_VIO	PCIX_AD14	PIO45	GND
46	PCIX_AD15	PCIX_AD13	PIO46	PCIX_AD40
47	PCIX_AD12	PCIX_M66EN	PIO47	PCIX_AD39
48	PCIX_AD11	PCIX_AD10	PIO48	PCIX_AD38
49	PCIX_AD9	PCIX_AD8	PIO49	PCIX_AD37
50	P5V	P3V3	PIO50	GND
51	GND	PCIX_AD7	PIO51	GND
52	PCIX_CBE-L0	NC	PIO52	PCIX_AD36
53	PCIX_AD6	P3V3	PIO53	PCIX_AD35
54	PCIX_AD5	NC	PIO54	PCIX_AD34
55	PCIX_AD4	NC	PIO55	PCIX_AD33
56	GND	GND	PIO56	GND
57	PMC_VIO	NC	PIO57	GND
58	PCIX_AD3	NC	PIO58	PCIX_AD32
59	PCIX_AD2	GND	PIO59	NC
60	PCIX_AD1	NC	PIO60	NC
61	PCIX_AD0	PCIX_ACK64-L	PIO61	NC
62	P5V	P3V3	PIO62	GND
63	GND	GND	PIO63	GND
64	PCIX_REQ64-L	NC	PIO64	NC

Table 4-14: PMC Connector Pin Definitions (cont'd)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

68-pin SCSI Connector (CN12-R)

Signal	Pin #	Pin #	Signal
SCSI-SDP12	1	35	SCSI-SDN12
SCSI-SDP13	2	36	SCSI-SDN13
SCSI-SDP14	3	37	SCSI-SDN14
SCSI-SDP15	4	38	SCSI-SDN15
SCSI-SDP1-P1	5	39	SCSI-SDP1-N1
SCSI-SDP0	6	40	SCSI-SDN0
SCSI-SDP1	7	41	SCSI-SDN1
SCSI-SDP2	8	42	SCSI-SDN2
SCSI-SDP3	9	43	SCSI-SDN3
SCSI-SDP4	10	44	SCSI-SDN4
SCSI-SDP5	11	45	SCSI-SDN5
SCSI-SDP6	12	46	SCSI-SDN6
SCSI-SDP7	13	47	SCSI-SDN7
SCSI-SDP0-P0	14	48	SCSI-SDP0-N0
GND	15	49	GND
DIFFSEN	16	50	NC
P3V3_SCSI	17	51	P3V3_SCSI
P3V3_SCSI	18	52	P3V3_SCSI
NC	19	53	NC
GND	20	54	GND
SCSI-SATN-P	21	55	SCSI-SATN-N
GND	22	56	GND
SCSI-SBSY-P	23	57	SCSI-SBSY-N
SCSI-SACK-P	24	58	SCSI-SACK-N
SCSI-SRST-P	25	59	SCSI-SRST-N
SCSI-SMSG-P	26	60	SCSI-SMSG-N
SCSI-SSEL-P	27	61	SCSI-SSEL-N
SCSI-SCD-P	28	62	SCSI-SCD-N
SCSI-SREQ-P	29	63	SCSI-SREQ-N
SCSI-SIO-P	30	64	SCSI-SIO-N
SCSI-SDP8	31	65	SCSI-SDN8
SCSI-SDP9	32	66	SCSI-SDN9
SCSI-SDP10	33	67	SCSI-SDN10
SCSI-SDP11	34	68	SCSI-SDN11

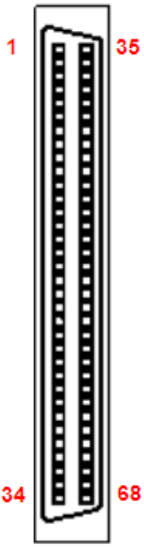


Table 4-15: 68-pin SCSI Pin Definition

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Floppy Connector 34-pin (CN4-R)

Pin #	Signal	Pin #	Signal
1	GND	2	Extended Density
3	GND	4	No Connect
5	NC	6	Data Rate
7	GND	8	Index
9	GND	10	Motor A Select
11	GND	12	Drive B Select
13	GND	14	Drive A Select
15	GND	16	Motor B Select
17	GND	18	Step Direction
19	GND	20	Step Pulse
21	GND	22	Write Data
23	GND	24	Write Gate
25	GND	26	Track 0
27	GND	28	Write Protect
29	GND	30	Read Data
31	GND	32	Side 1
33	GND	34	Disk Change

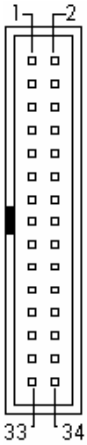


Table 4-16: Floppy Connector Pin Definition

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

PIM Connector (JN1-R)

Pin#	Signal Name	Signal Name	Pin#
1	PIM1	PIM2	2
3	PIM3	PIM4	4
5	PIM5	PIM6	6
7	PIM7	PIM8	8
9	PIM9	PIM10	10
11	PIM11	PIM12	12
13	PIM13	PIM14	14
15	PIM15	PIM16	16
17	PIM17	PIM18	18
19	PIM19	PIM20	20
21	PIM21	PIM22	22
23	PIM23	PIM24	24
25	PIM25	PIM26	26
27	PIM27	PIM28	28
29	PIM29	PIM30	30
31	PIM31	PIM32	32
33	PIM33	PIM34	34
35	PIM35	PIM36	36
37	PIM37	PIM38	38
39	PIM39	PIM40	40
41	PIM41	PIM42	42
43	PIM43	PIM44	44
45	PIM45	PIM46	46
47	PIM47	PIM48	48
49	PIM49	PIM50	50
51	PIM51	PIM52	52
53	PIM53	PIM54	54
55	PIM55	PIM56	56
57	PIM57	PIM58	58
59	PIM59	PIM60	60
61	PIM61	PIM62	62
63	PIM63	PIM64	64

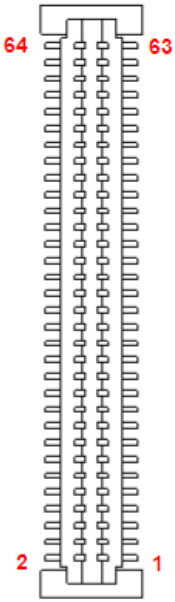


Table 4-17: PIM Connector (JN1-R) Pin Definition

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PIM Connector (JN2-R)

Pin#	Signal Name	Signal Name	Pin#
1	NC	NC	2
3	NC	NC	4
5	P5V	NC	6
7	NC	NC	8
9	NC	P3V3	10
11	NC	NC	12
13	GND	NC	14
15	NC	NC	16
17	NC	GND	18
19	NC	NC	20
21	P5V	NC	22
23	NC	NC	24
25	NC	P3V3	26
27	NC	NC	28
29	GND	NC	30
31	NC	NC	32
33	NC	GND	34
35	NC	NC	36
37	P5V	NC	38
39	NC	NC	40
41	NC	P3V3	42
43	NC	NC	44
45	GND	NC	46
47	NC	NC	48
49	NC	GND	50
51	NC	NC	52
53	P5V	NC	54
55	NC	NC	56
57	NC	P3V3	58
59	NC	NC	60
61	NC	NC	62
63	NC	NC	64

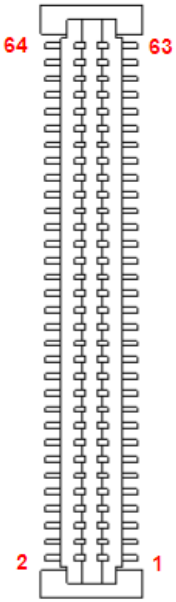


Table 4-18: PIM Connector (JN2-R) Pin Definition

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CompactFlash Connector (CN13)

Signal Name	Pin#	Pin#	Signal Name
GND	1	26	GND
DD3	2	27	DD11
DD4	3	28	DD12
DD5	4	29	DD13
DD6	5	30	DD14
DD7	6	31	DD15
CS1J	7	32	CS3J
GND	8	33	GND
GND	9	34	SDIORJ
GND	10	35	SDIOWJ
GND	11	36	5V
GND	12	37	IRQ15
5V	13	38	5V
GND	14	39	PCSEL
GND	15	40	NC
GND	16	41	BRSTDRVJ
GND	17	42	SDIORDY
DA2	18	43	NC
DA1	19	44	SDACKJ
DA0	20	45	IDEACTJ
DD0	21	46	DIAG
DD1	22	47	DD8
DD2	23	48	DD9
IOIS16J	24	49	DD10
GND	25	50	GND

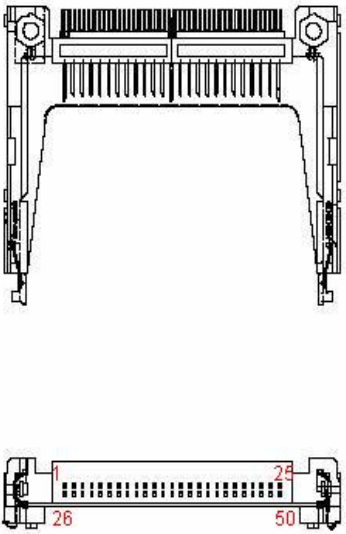


Table 4-19: CompactFlash Connector Pin Definition

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

DB-6880CF, DB-6920CF/SAT Connector (CN10, CN6-R)

Signal Name	Pin #	Pin #	Signal Name
GND	1	2	GND
GND	3	4	GND
GND	5	6	GND
GND	7	8	GND
GND	9	10	GND
GND	11	12	GND
GND	13	14	GND
GND	15	16	GND
GND	17	18	GND
GND	19	20	GND
GND	21	22	GND
GND	23	24	GND
GND	25	26	GND
GND	27	28	GND
GND	29	30	GND
P3V3	31	32	P5V
P3V3	33	34	P5V
P3V3	35	36	P5V
P3V3	37	38	P5V
P1V8	39	40	NC
P1V8	41	42	NC
P1V8	43	44	NC
GND	45	46	GND
GND	47	48	SATA-TXN0
GND	49	50	SATA-TXP0
SATA-RXN0	51	52	GND
SATA-RXP0	53	54	GND
GND	55	56	RESET#
GND	57	58	GND
GND	59	60	GND

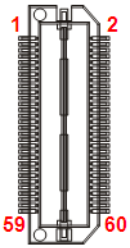


Table 4-20: DB-6880CF, DB-6920CF/SAT Connector Pin Definition

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

DB-R6000L2 Connector (CN14)

Signal Name	Pin #	Pin #	Signal Name
SATA-T1P	1	2	USB-P3
SATA-T1N	3	4	USB-N3
GND	5	6	GND
SATA-R1P	7	8	USB-OC3#
SATA-R1N	9	10	GND
GND	11	12	GND
GND	13	14	USB-P2
HAD_RST-L	15	16	USB-N2
HAD_SYNC	17	18	GND
HAD_SDOUT	19	20	USB-OC2#
HAD_BIT_CLK	21	22	GND
HAD_SDIN0	23	24	PS2-KBC
GND	25	26	PS2-KBD
HAD_SDIN1	27	28	PS2-MSD
HAD_SDIN2	29	30	PS2-MSC
HAD_SDIN3	31	32	GND
GND	33	34	RESET#
GND	35	36	GND
GND	37	38	GND
GND	39	40	GND
GND	41	42	GND
GND	43	44	GND
GND	45	46	GND
GND	47	48	GND
GND	49	50	GND
P5V	51	52	P1V8
P5V	53	54	P1V8
P5V	55	56	P1V8
P5V	57	58	NC
P5V	59	60	NC
GND	61	62	GND

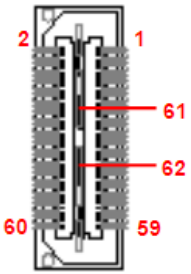


Table 4-21: DB-R6000L2 Connector Pin Definition

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CompactPCI J1 Connector Pin Assignment

Pin	Z	A	B	C	D	E	F
1	GND	+5V	-12V	TRST#	+12V	+5V	GND
2	GND	TCK#	+5V	TMS#	NC	TDI#	GND
3	GND	IRQA#	IRQB#	IRQC#	+5V	IRQD#	GND
4	GND	+5V_IPMB	HEALTHY#	V(I/O)	NC	NC	GND
5	GND	NC	NC	RESET#	GND	GNT0#	GND
6	GND	REQ0#	GND	+3.3V	CLK0	AD31	GND
7	GND	AD30	AD29	AD28	GND	AD27	GND
8	GND	AD26	GND	V(I/O)	AD25	AD24	GND
9	GND	CBE3#	IDSEL	AD23	GND	AD22	GND
10	GND	AD21	GND	+3.3V	AD20	AD19	GND
11	GND	AD18	AD17	AD16	GND	CBE2#	GND
12-14	Key						
15	GND	+3.3V	FRAME#	IRDY#	BDSEL#	TRDY#	GND
16	GND	DEVSEL#	PCIXCAP	V(I/O)	STOP#	LOCK#	GND
17	GND	+3.3V	IPMB_CLK	IPMB_DAT	GND	PERR#	GND
18	GND	SERR#	GND	+3.3V	PAR	CBE1#	GND
19	GND	+3.3V	AD15	AD14	GND	AD13	GND
20	GND	AD12	GND	VIO	AD11	AD10	GND
21	GND	+3.3V	AD9	AD8	M66EN	CBE0#	GND
22	GND	AD7	GND	+3.3V	AD6	AD5	GND
23	GND	+3.3V	AD4	AD3	+5V	AD2	GND
24	GND	AD1	+5V	V(I/O)	AD0	ACK64#	GND
25	GND	+5V	REQ64#	ENUM#	+3.3V	+5V	GND

Table 4-22: CompactPCI J1 Connector Pin Definition

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CompactPCI J2 Connector Pin Assignment

Pin	Z	A	B	C	D	E	F
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
4	GND	V(I/O)	NC	CBE7#	GND	CBE6#	GND
5	GND	CBE5#	GND	V(I/O)	CBE4#	PAR64	GND
6	GND	AD63	AD62	AD61	GND	AD60	GND
7	GND	AD59	GND	V(I/O)	AD58	AD57	GND
8	GND	AD56	AD55	AD54	GND	AD53	GND
9	GND	AD52	GND	V(I/O)	AD51	AD50	GND
10	GND	AD49	AD48	AD47	GND	AD46	GND
11	GND	AD45	GND	V(I/O)	AD44	AD43	GND
12	GND	AD42	AD41	AD40	GND	AD39	GND
13	GND	AD38	GND	V(I/O)	AD37	AD36	GND
14	GND	AD35	AD34	AD33	GND	AD32	GND
15	GND	NC	GND	FAL#	REQ5#	GNT5#	GND
16	GND	NC	NC	DEG#	GND	NC	GND
17	GND	NC	GND	RSTBTN#	REQ6#	GNT6#	GND
18	GND	NC	NC	NC	GND	NC	GND
19	GND	GND	GND	NC	NC	NC	GND
20	GND	CLK5	GND	NC	GND	NC	GND
21	GND	CLK6	GND	NC	NC	NC	GND
22	GND	GA4	GA3	GA2	GA1	GA0	GND

Table 4-23: CompactPCI J2 Connector Pin Definition

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CompactPCI J3 Pin Assignment

Pin	Z	A	B	C	D	E	F
1	GND	HDA_RST#	HDA_SYNC	HDA_BIT_CLK	HDA_SDOUT	HDA_SDIN0	GND
2	GND	HDA_SDIN1	HDA_SDIN2	NC	HDA_DOCK_EN#	HDA_DOCK_RST#	GND
3	GND	KBDATA	KBCLK	NC	MSDATA	MSCLK	GND
4	GND	SATA-TX4+	SATA-TX4-	GND	SATA-TX1+	SATA-TX1-	GND
5	GND	GND	GND	NC	GND	GND	GND
6	GND	SATA-RX4+	SATA-RX4-	GND	SATA-RX1+	SATA-RX1-	GND
7	GND	COM4-TX	COM4-RX	COM3-DCD#	IPMB_CLK	IPMB_DAT	GND
8	GND	COM3-RX	COM3-TX	COM3-DTR#	COM3-DSR#	COM3-RTS#	GND
9	GND	COM3-CTS#	COM3-RI#	RGB-BLUE	RGB-RED	RGB-GREEN	GND
10	GND	USB-OC4#	RGB-DDCCLK	RGB-DDCDAT	RGB-HSYNC	RGB-VSYNC	GND
11	GND	USB-P4+	USB-P4-	GND	USB-P5+	USB-P5-	GND
12	GND	USB-P6+	USB-P6-	GND	USB-P7+	USB-P7-	GND
13	GND	USB-P8+	USB-P8-	GND	USB-P9+	USB-P9-	GND
14	GND	USB-OC5#	USB-OC6#	USB-OC7#	USB-OC8#	USB-OC9#	GND
15	GND	LAN2_TXD1+	LAN2_TXD1-	GND	LAN2_TXD3+	LAN2_TXD3-	GND
16	GND	LAN2_TXD0+	LAN2_TXD0-	GND	LAN2_TXD2+	LAN2_TXD2-	GND
17	GND	LAN3_TXD1+	LAN3_TXD1-	GND	LAN3_TXD3+	LAN3_TXD3-	GND
18	GND	LAN3_TXD1+	LAN3_TXD0-	GND	LAN3_TXD2+	LAN3_TXD2-	GND
19	GND	P5V	P5V	P12V	P5V	P5V	GND

Table 4-24: CompactPCI J3 Connector Pin Definition



High Definition audio
Keyboard/Mouse
Serial ATA
Serial ports
USB ports
Ethernet ports
RGB

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CompactPCI J4 Connector Pin Assignment

Pin	Z	A	B	C	D	E	F
1	GND	PMC IO:61	PMC IO:63	NC	PMC IO:62	PMC IO:64	GND
2	GND	PMC IO:57	PMC IO:59	NC	PMC IO:58	PMC IO:60	GND
3	GND	NC	NC	NC	NC	NC	GND
4	GND	PMC IO:53	PMC IO:55	NC	PMC IO:54	PMC IO:56	GND
5	GND	PMC IO:49	PMC IO:51	NC	PMC IO:50	PMC IO:52	GND
6	GND	NC	NC	NC	NC	NC	GND
7	GND	PMC IO:45	PMC IO:47	NC	PMC IO:46	PMC IO:48	GND
8	GND	PMC IO:41	PMC IO:43	NC	PMC IO:42	PMC IO:44	GND
9	GND	NC	NC	NC	NC	NC	GND
10	GND	PMC IO:37	PMC IO:39	NC	PMC IO:38	PMC IO:40	GND
11	GND	PMC IO:33	PMC IO:35	NC	PMC IO:34	PMC IO:36	GND
12-14	Key						
15	GND	PMC IO:29	PMC IO:31	NC	PMC IO:30	PMC IO:32	GND
16	GND	PMC IO:25	PMC IO:27	NC	PMC IO:26	PMC IO:28	GND
17	GND	NC	NC	NC	NC	NC	GND
18	GND	PMC IO:21	PMC IO:23	NC	PMC IO:22	PMC IO:24	GND
19	GND	PMC IO:17	PMC IO:19	NC	PMC IO:18	PMC IO:20	GND
20	GND	NC	NC	NC	NC	NC	GND
21	GND	PMC IO:13	PMC IO:15	NC	PMC IO:14	PMC IO:16	GND
22	GND	PMC IO:9	PMC IO:11	NC	PMC IO:10	PMC IO:12	GND
23	GND	NC	NC	NC	NC	NC	GND
24	GND	PMC IO:5	PMC IO:7	NC	PMC IO:6	PMC IO:8	GND
25	GND	PMC IO:1	PMC IO:3	NC	PMC IO:2	PMC IO:4	GND

Table 4-25: CompactPCI J4 Connector Pin Definition

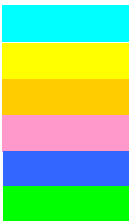


J4 connector on cPCI-6880P only.

CompactPCI J5 Pin Assignment

Pin	Z	A	B	C	D	E	F
1	GND	PCIE-TX+	PCIE-TX-	GND	PCIE-RX+	PCIE-RX-	GND
2	GND	NC	NC	GND	NC	NC	GND
3	GND	NC	NC	GND	NC	NC	GND
4	GND	NC	NC	GND	NC	NC	GND
5	GND	GND	GND	GND	GND	GND	GND
6	GND	PCIE-CLK+	PCIE-CLK-	GND	RESET#	NC	GND
7	GND	GND	GND	RTC	GND	GND	GND
8	GND	LVDS_DATA3-	LVDS_DATA3+	NC	LVDS_CLK	LVDS_DATA	GND
9	GND	GPIO1	GPIO2	GPIO3	GPIO4	GPIO5	GND
10	GND	NC	NC	GND	NC	NC	GND
11	GND	NC	NC	GND	NC	NC	GND
12	GND	NC	NC	NC	NC	NC	GND
13	GND	LAN2_100#	LAN3_100#	NC	LAN3_1G#	LAN2_1G#	GND
14	GND	NC	NC	GND	SATA-TX5+	SATA-TX5-	GND
15	GND	NC	NC	RTM_ID0	SATA-RX5+	SATA-RX5-	GND
16	GND	MTR0#	INDEX#	RTM_ID1	NC	DENSEL#	GND
17	GND	DIR#	NC	RTM_ID2	DRVA#	NC	GND
18	GND	TRK0#	WGATE#	DETECT#	WDATA#	STEP#	GND
19	GND	DSKCHG#	HDSEL#	NC	RDATA#	WRPORT#	GND
20	GND	LVDS_DATA0-	LVDS_DATA0+	GND	LVDS_DATA1-	LVDS_DATA1+	GND
21	GND	LVDS_DATA2-	LVDS_DATA2+	GND	LVDS_CLK-	LVDS_CLD+	GND
22	GND	NC	LAN2_LINK_ACT#	+3.3V	LAN3_LINK_ACT#	+3.3V	GND

Table 4-26: CompactPCI J5 Connector Pin Definition



PCI-Express x1
GPIO
Serial ATA
Floppy
Ethernet port
LVDS

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4.12 Switch and Jumper Settings

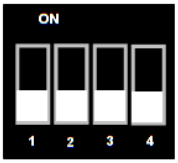
Clear CMOS Switch (SW2)

Press the switch SW2 to clear the CMOS and reset the CMOS values to default.



Mode Switch (SW3)

The Switch SW3 is a multi purpose switch that allows users to define the board operating mode. Four pins independently control the mode setting. All pins are set to OFF by default.



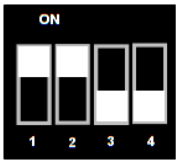
Pin#	Status	Description
1	OFF	When the system does not include a CMM (Chassis Management Module), set this pin to OFF to allow IPMI to run in "without CMM mode".
	ON	When the system includes a CMM, set this pin to ON to allow IPMI to run in "with CMM mode".
2	OFF	The board is controlled by IPMI with boot-up/shutdown (recommended).
	ON	The board is not controlled by IPMI with bootup/shutdown.
3	OFF	The cPCI-6880 cannot boot-up when installed in a peripheral slot when there is no host board in the system slot.
	ON	The cPCI-6880 is able to boot-up when installed in a peripheral slot when there is no host board in the system slot.
4	OFF	Universal Mode: The cPCI-6880 in a peripheral slot has CompactPCI bus communication with the host board in the system slot. The cPCI-6880 can boot-up in a peripheral slot and be recognized by the host board in the system slot as a PCI device.
	ON	Satellite Mode: The cPCI-6880 in a peripheral slot has no CompactPCI bus communication with the host board in the system slot. The cPCI-6880 behaves as a standalone blade in the peripheral slot.

Table 4-27: Mode Switch Settings

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COM1/Debug Switch (SWX1)

Switch SWX1 sets the RJ-45 serial port (CN6) as a standard RS-232 serial port or as an IPMI debugging port.



Mode	1	2	3	4
RS-232 COM port (default)	ON	ON	OFF	OFF
IPMI debugging port	OFF	OFF	ON	ON

Table 4-28: COM1/Debug Switch Settings

USB Flash Data Protection Switch (SWY1)

Switch SWY1 can be set to Write Protect Mode to protect the data stored on onboard USB NAND flash from inadvertent system writes or erases, and from viruses. The Write Protect Mode feature protects the full address space of the data stored on the flash media.



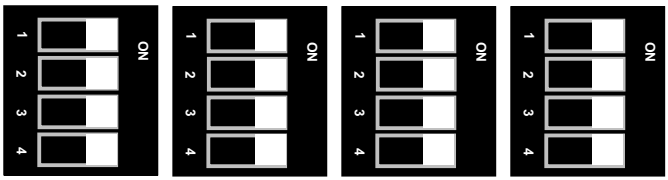
Mode	1	2
Data overwrite is allowed (default)	ON	OFF
Data overwrite is not allowed	ON	ON

Table 4-29: USB Flash Data Protection Switch Settings

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PICMG 2.16 Switches (SW1-R ,SW2-R, SW3-R, SW4-R)

The cPCI-R6000(D) supports GbE3 and GbE4 on either the 2.16 backplane or via Rear I/O. The PICMG® 2.16 backplane and rear I/O cannot be accessed simultaneously. Switches SW1-R to SW4-R must be set to connect GbE3 and GbE4 to either the 2.16 backplane or to the RTM. The following table shows how to set the switches to enable GbE3 and GbE4 for either the 2.16 backplane or the RTM. All switches are set to ON by default.



SW1-R SW2-R SW3-R SW4-R

Connect GbE3/4 to	GbE3 (SW1-R, SW2-R)	GbE4 (SW3-R, SW4-R)
PICMG® 2.16 Backplane	All OFF	All OFF
Rear faceplate RJ-45 connectors (default)	All ON	All ON

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5 Getting Started

This chapter describes the installation of the following components to the cPCI-6880 and rear transition modules:

- Memory module
- 2.5” SATA hard drive
- CompactFlash card
- cPCI-6880 CPU module installation to chassis
- RTM installation to chassis

5.1 CPU and Heatsink

The cPCI-6880 Series comes with CPU and heatsink pre-installed. Uninstalling the heatsink is not recommended. If it is necessary to do so, please check that the thermal pad is not damaged before you re-install the heatsink to the board. Contact ADLINK to obtain the appropriate thermal pad for the cPCI-6880 or for any other assistance.

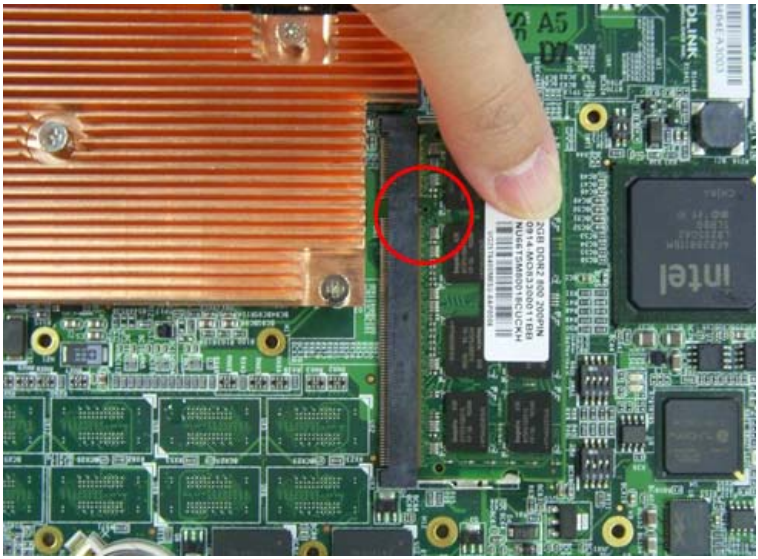
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5.2 Memory Module Installation

The cPCI-6880 Series supports dual channel DDR2-667/800 memory without ECC. One channel is assigned to soldered onboard memory, and the other one channel is assigned to a 200-pin SO-DIMM socket. **Contact your ADLINK sales representative for qualified SO-DIMM memory module information**.

Installing the Memory Module

Align the notch in the memory module with the key on the SO-DIMM slot. Press down on the module until it is properly seated in the socket.



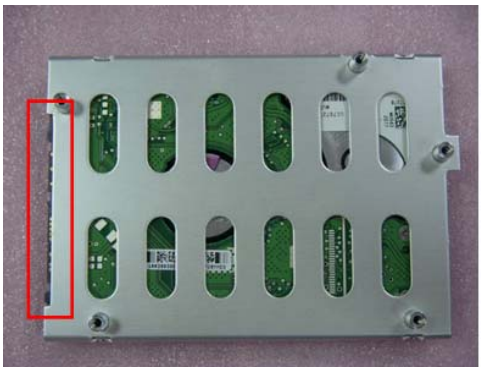
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5.3 Hard Drive Installation

The cPCI-6880 and cPCI-R6000D provide space to install a slim type 2.5” Serial-ATA hard drive.

Installing a SATA Hard Drive - cPCI-6880

1. Attach the SATA hard drive to the HDD bracket provided by securing the four screws as shown below. Make sure to orient the hard drive with the connectors at the end of the bracket with the cut-out indicated by the red box.





2. Attach the DB-6920SAT adapter board to the hard drive connectors.



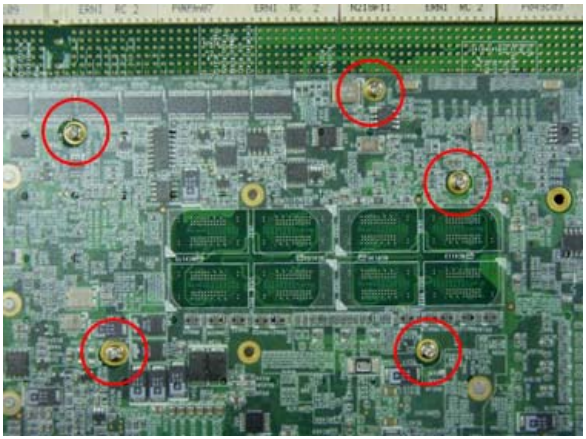
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3. Position the hard drive assembly on the cPCI-6880 so that the standoffs on the hard drive align with the screw holes on the board, and the connector on the DB-6920SAT adapter board is aligned with the board-to-board connector (CN10).
4. Press the DB-6920SAT adapter to the board-to-board connector until it is properly seated. Secure the adapter to the board with the two screws provided.



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5. Secure the hard drive with five screws from the board's solder side.



CAUTION:

When removing the hard drive, be careful to grasp the adapter board and lift upwards in a vertical motion to disconnect it from the board-to-board connector. This will avoid damaging the adapter board and connectors.

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Installing a SATA Hard Drive - cPCI-R6000D RTM

1. Attach the DB-6920SAT adapter board to the hard drive connectors.



2. Screw the hard drive to the bracket provided as shown.



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3. Align the hard drive and bracket assembly with the board-to-board connector and standoffs and press down until it is properly seated. Secure the adapter and hard drive with 6x screws as shown.



CAUTION:

When removing the hard drive, be careful to grasp the adapter board and lift upwards in a vertical motion to disconnect it from the board-to-board connector. This will avoid damaging the adapter board and connectors.

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5.4 CompactFlash Card Installation

CompactFlash storage is required by some industrial applications for its resistance to vibration and convenient installation/replacement. The cPCI-6880 and cPCI-R6000D support a removable CompactFlash socket in the same space of 2.5” SATA HDD. Contact your sales representative to purchase a CompactFlash socket kit (DB-CF-SB for CPCI-6880, DB-CF-SA for cPCI-R6000D) that provides an internal CF card slot.

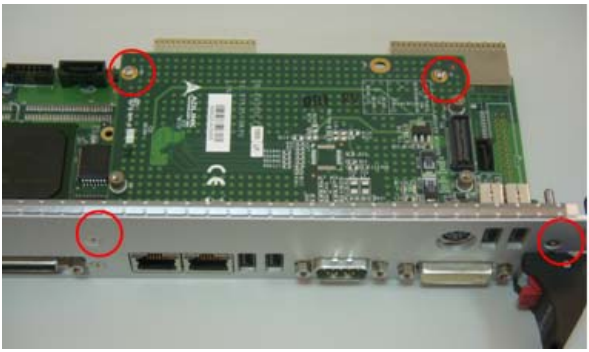
Installing a CF card - cPCI-6880

Press the CF adapter (DB-6880CF) to the board-to-board connector (CN10) until it is properly seated. Insert the CF card into the CF slot on the adapter then install the card retaining bracket with the 2 screws provided to prevent the CF card from sliding out of the slot.

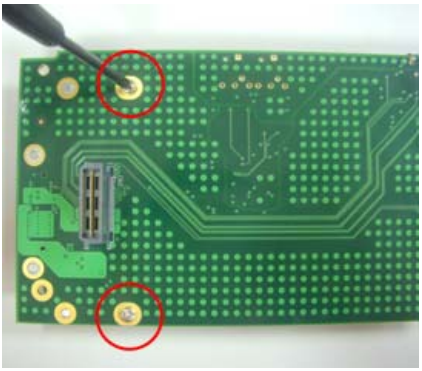
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Installing a CF card - cPCI-R6000D RTM

1. Remove the Layer 2 Adapter DB-R6000L2 by loosening the 4 screws as shown below.



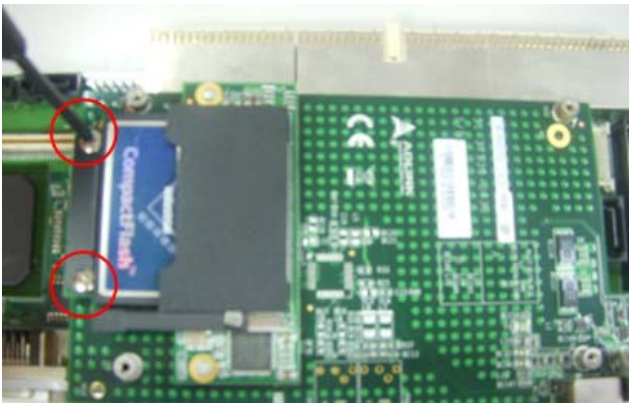
2. Install the DB-6920CF adapter to the RTM using the board-to-board connector.
3. Secure the DB-6920CF to the RTM using two screws from the solder side of Layer 2 Adapter of RTM.



4. Reinstall the Layer 2 Adapter to the RTM.

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5. Insert the CF card into the CF slot on the adapter, then replace the card retaining bracket to prevent the CF card from sliding out of the slot.



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5.5 Installing the cPCI-6880 SBC to the Chassis

The cPCI-6880 may be installed in a system or peripheral slot of a 6U CompactPCI chassis. These instructions are for reference only. Refer to the user guide that comes with the chassis for more information.

1. Be sure to select the correct slot depending on the operational purpose of the module. The system power may now be powered on or off.
2. Remove the blank face cover from the selected slot, if necessary.
3. Press down on the release catches of the cPCI-6880 ejector handles.
4. **Remove the black plastic caps securing the mounting screws to the front panel.**
5. Align the module's top and bottom edges to the chassis card guides, and then carefully slide the module into the chassis. A slight resistance may be felt when inserting the module. If the resistance it too strong, check if there are bent pins on the backplane or if the board's connector pins are not properly aligned with connectors on the backplane. Then push the board until it is completely flush with the chassis.
6. Push the ejector handles outwards to secure the module in place, and then fasten the screws on the module front panel.
7. Connect the cables and peripherals to the board, and then turn the chassis on if necessary.

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5.6 Installing the cPCI-R6000 RTM to the Chassis

The installation and removal procedures for a RTM are the same as those for CompactPCI boards. Because they are shorter than front boards, pay careful attention when inserting or removing RTMs.

Refer to previous sections for peripheral connectivity of all I/O ports on the RTM. When installing the cPCI-6880 Series and related RTMs, make sure the RTM is the correct matching model.


NOTE:

You must install the correct RTM to enable functions (I/O interfaces) on the rear panel. Installation of non-compatible RTMs may damage the system board and/or other RTMs.

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6 Driver Installation

The cPCI-6880 drivers are available from the ADLINK All-In-One CD at **X:\cPCI\cPCI-6880**, the cPCI-R6000(D) drivers are available at **X:cPCI\cPCI-R6000(D)**, or from the ADLINK website (**http://www.adlinktech.com**). ADLINK provides validated drivers for chipset, graphics, LAN, and SATA/AHCI on Windows XP Professional, Windows XP x64 Edition and Windows Vista x64 Edition.

6.1 Driver Installation Procedure

The following describes the driver installation procedures for Windows XP.

1. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.



In order to enable AHCI mode, you must pre-install the Intel® Matrix Storage Manager driver using the F6 installation method described in **...\SATA AHCI\readme.txt**.

2. Install the **chipset driver** by extracting and running the program in **...\Chipset\Windows XP & Vista\ Intel_INF_Update_Utility_All_WinOS_v9.0.0.1008.zip**.
3. Install the **graphics driver** and utilities by extracting and running the program in **...\Graphics\Windows XP Professional\ Intel_Graphics_Adapter_WinXP32_v14.38.1.zip**.
4. Install the **LAN drivers** by extracting and running the program in **…\LAN\Windows XP Professional\ Intel_Network_Adapter_WinXP32_Win2003_v14.0.zip**.
5. Install the **Intel Matrix Storage Manager Utility** by extracting and running the program in **…\SATA AHCI\ Intel_Matrix_Storage_Manager_All_WinOS_v8.8.0.1009.zip**.
6. Install the **SCSI driver** for RTM cPCI-R6000(D) if required. Refer to **“SCSI Driver” on page 72**.

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7. Install the **audio driver** for RTM cPCI-R6000D by extracting and running the program in **…\Audio\Professional\ Realtek_WDM_Audio_WinXP32_Win2003_v2.21.zip**.

We recommend using the drivers provided on the ADLINK All-in-One CD or downloading them from the ADLINK website to ensure compatibility. Contact ADLINK to get support for VxWorks BSP.

6.2 SCSI Driver

The SCSI driver is available from the ADLINK All-In-One CD at **X:cPCI\cPCI-R6000(D)\SCSI** or from the ADLINK website (**http://www.adlinktech.com**). The installation procedure for Windows XP is described below. It is not necessary to install the SCSI driver on Windows 2003 Server and Vista as it has a built-in driver.

1. Click **Start**, right-click on **My Computer**, then select **Properties** from the drop-down menu.
2. Click on the **Hardware** tab, then click **Device Manager.**
3. Right-click on the **SCSI Controller** item, then click **Properties** from the drop-down menu.
4. From the **General** tab, click **Reinstall Driver**.
5. Select **Yes, this time only** and click **Next** when the **Upgrade Device Driver Wizard** window appears.
6. Select **Install** from a list on specific location [Advanced], then click **Next**.
7. Uncheck **Search removable media** [floppy, CD-ROM...], and check **Include this location** in the search:, then click **Browse**.
8. Select the **xp_x86** folder from this directory on the ADLINK All-In-One CD: **…X:\cPCI\cPCI-R6000(D)\SCSI**.
9. Click **OK**, then click **Next**.
10. Click **Continue Anyway** to go on, and click **Finish** to complete the installation.

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7 Utilities

7.1 Watchdog Timer

This section describes the operation of the cPCI-6880's watchdog timer (WDT). The primary function of the WDT is to monitor the cPCI-6880's operation and to reset the system if a software application fails to function as programmed. The following WDT functions may be controlled using a software application:

- enabling and disabling
- reloading timeout value

The cPCI-6880 custom WDT circuit is implemented using the internal IO of the ITE SuperIO IT8783 which is at address 2Eh of LPC. The basic functions of the WDT include:

- Starting the timer countdown
- Enabling or disabling WDT
- Enabling or disabling WDT countdown LED ON
- Reloading the timeout value to keep the watchdog from timing out
- Setting the range of the timeout period from 1 to 65535 seconds or minutes
- Sending a RESET signal to the system when the watchdog times out

Using the Watchdog in an Application

The following section describes using the WDT functions in an application. The WDT reset function is explained in the previous section. This can be controlled through the registers in the cPCI-6880's SuperIO.

An application using the reset feature enables the watchdog function, sets the count-down period, and reloads the timeout value periodically to keep it from resetting the system. If the timer count-down value is not reloaded, the watchdog resets the system hardware after its counter reaches zero.

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For a detailed programming sample, refer to the sample code provided on the ADLINK All-In-One CD. You can find it in the following directory: **X:\cPCI\cPCI-6880\WDT**.

Sample Code

The sample program written in C shown below offers an interactive way to test the Watchdog Timer under DOS.

```
#include<stdio.h>
#include<dos.h>

#define IT8783_ID1 0x87
#define IT8783_ID2 0x83

static unsigned int IT8783_ioPort = 0x2e;

//Check index port
void Enter_IT8783_Config(unsigned int flag)
{
     if(flag) IT8783_ioPort = 0x4e;

     switch(IT8783_ioPort)
     {
          case 0x2E:  //Address port = 0x2E, enter keys =
     0x87, 0x01, 0x55, 0x55
               outportb(0x2E, 0x87);
               outportb(0x2E, 0x01);
               outportb(0x2E, 0x55);
               outportb(0x2E, 0x55);
               break;
          case 0x4E:  //Address port = 0x4E, enter keys =
     0x87, 0x01, 0x55, 0xAA
               outportb(0x4E, 0x87);
               outportb(0x4E, 0x01);
               outportb(0x4E, 0x55);
               outportb(0x4E, 0xAA);
               break;
          default:
               break;
          }
}
```

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```
//Exit index port
void Exit_IT8783_Config(unsigned int flag)
{
     if(flag) IT8783_ioPort = 0x4e;

     outportb(IT8783_ioPort, 0x02);
     outportb(IT8783_ioPort+1, 0x02);
}

//Check chip
void Get_IT8783_ID(unsigned int &ID1, unsigned int &ID2)
{
     outportb(IT8783_ioPort, 0x20);
     ID1 = inportb(IT8783_ioPort+1);
     outportb(IT8783_ioPort, 0x21);
     ID2 = inportb(IT8783_ioPort+1);
}

//WDT and LED blink program
void IT8783_WDTRun(unsigned int count_value, unsigned int
     PLEDflag)
{
     unsigned long tempCount;
     unsigned int registerValue;


     outportb(IT8783_ioPort, 0x07);
     outportb(IT8783_ioPort+1, 0x07);// Device 7

     outportb(IT8783_ioPort, 0xf8);
     outportb(IT8783_ioPort+1, 0x00);// PLED mapping to
     nothing, disable PLED function

     if(PLEDflag == 1)
     {
          outportb(IT8783_ioPort, 0x27);
          registerValue = inportb(IT8783_ioPort + 1);
          registerValue |= 0x80;   // set Pin09 is GPIO
     function GP37
          outportb(IT8783_ioPort+1, registerValue);

          outportb(IT8783_ioPort, 0xc2);
          registerValue = inportb(IT8783_ioPort + 1);
```

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```
      registerValue &= 0x7fb;         // set GP37 is
alternate function
      outportb(IT8783_ioPort+1, registerValue);

      outportb(IT8783_ioPort, 0xca);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue |= 0x80;          // set GP42 is
output
      outportb(IT8783_ioPort+1, registerValue);

      outportb(IT8783_ioPort, 0xf8);
      outportb(IT8783_ioPort+1, 0x1f);       // PLED
mapping to GP37

      outportb(IT8783_ioPort, 0xf9);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue |= 0x02;
      registerValue &= 0xfb;
      outportb(IT8783_ioPort+1, registerValue);
}
outportb(IT8783_ioPort, 0x71);
registerValue = inportb(IT8783_ioPort + 1);
registerValue |= 0xD0;                  // set Mouse
& Keyboard interrupt Enable
outportb(IT8783_ioPort+1, registerValue);

outportb(IT8783_ioPort, 0x73);
outportb(IT8783_ioPort+1, count_value); // set WDT
count LSB
tempCount = tempCount >> 8;
outportb(IT8783_ioPort, 0x74);
outportb(IT8783_ioPort+1, count_value); // set WDT
count MSB

if(count_value >= 60)
{
      outportb(IT8783_ioPort, 0x72);
      registerValue = inportb(IT8783_ioPort+1);
      registerValue &= 0x7f;
      registerValue |= 0x40; //enable WDT output
through KBRST
      outportb(IT8783_ioPort+1, registerValue); //
set WDT count is minute
```

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```
            tempCount = count_value / 60;
            if((count_value%60) > 30)
                  tempCount++;
            if(tempCount > 65535)
                  tempCount = 65535;
            printf("WDT timeout in %d minutes.\n",
      tempCount);
      }
      else
      {
            outportb(IT8783_ioPort, 0x72);
            registerValue = inportb(IT8783_ioPort+1);
            registerValue |= 0x80;

            tempCount = count_value;
            if(tempCount != 0)
            {
                  printf("WDT timeout in %d seconds.\n",
      tempCount);
                  registerValue |= 0x40; //Enable WDT
      output through KBRST
            }
            else
            {
                  printf("WDT is Disabled.\n");
                  registerValue &= 0xbf; //Disable WDT
      output through KBRST
            }

            outportb(IT8783_ioPort+1, registerValue); //
      set WDT count is second
      }
}
```

7.2 Preboot Execution Environment (PXE)

The cPCI-6880 series supports the Intel® Preboot Execution Environment (PXE) that is capable of booting up or executing an OS installation through an Ethernet ports. To use PXE, there must be a DHCP server on the network with one or more servers running PXE and MTFTP services. It could be a Windows® 2003 server running DHCP, PXE, and MTFTP services or a dedicated DHCP server with one or more additional servers running PXE and MTFTP services.

To build a network environment with PXE support:

1. Setup a DHCP server with PXE tag configuration
2. Install the PXE and MTFTP services
3. Make a boot image file on the PXE server (i.e. the boot server)
4. Enable the PXE boot function on the client computer

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8 BIOS Setup Utility

The following chapter describes basic navigation for the AMIBIOS®8 BIOS setup utility.

8.1 Starting the BIOS

To enter the setup screen, follow these steps:

1. Power on the motherboard
2. Press the < Delete > key on your keyboard when you see the following text prompt:
   < Press DEL to run Setup >
3. After you press the < Delete > key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as Chipset and Power menus.



Note: In most cases, the < Delete > key is used to invoke the setup screen. There are several cases that use other keys, such as < F1 >, < F2 >, and so on.

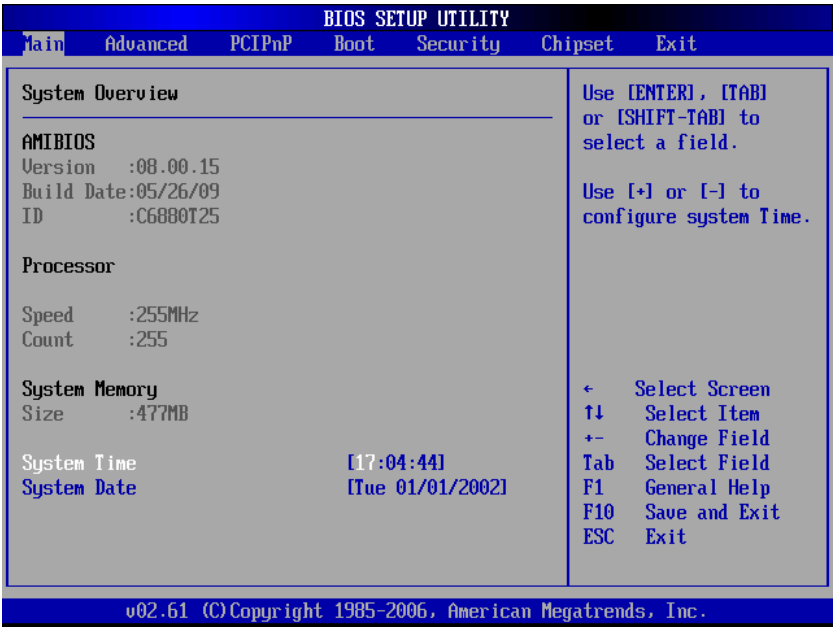
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Setup Menu

The main BIOS setup menu is the first screen that you can navigate. Each main BIOS setup menu option is described in this user's guide.

The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed" options cannot be configured, "Blue" options can be.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

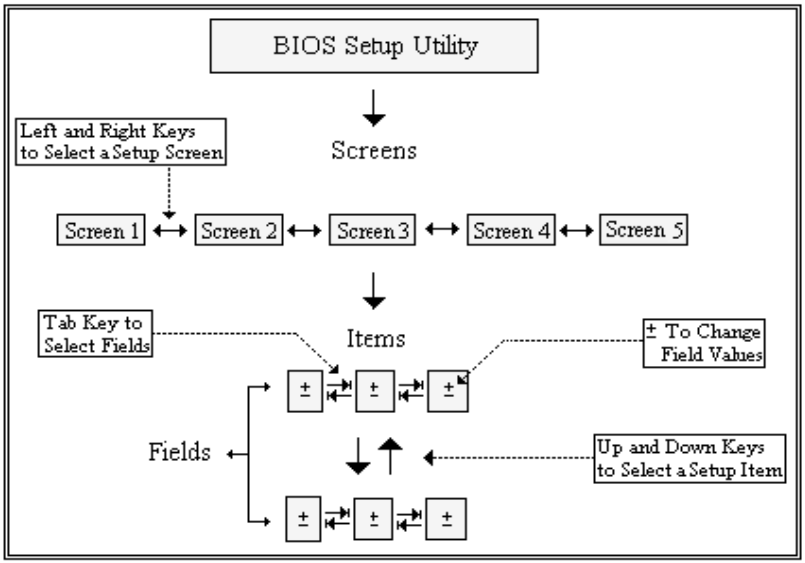


Navigation

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

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These keys include < F1 >, < F10 >, < Enter >, < ESC >, < Arrow > keys, and so on. .



Note: There is a hot key legend located in the right frame on most setup screens.

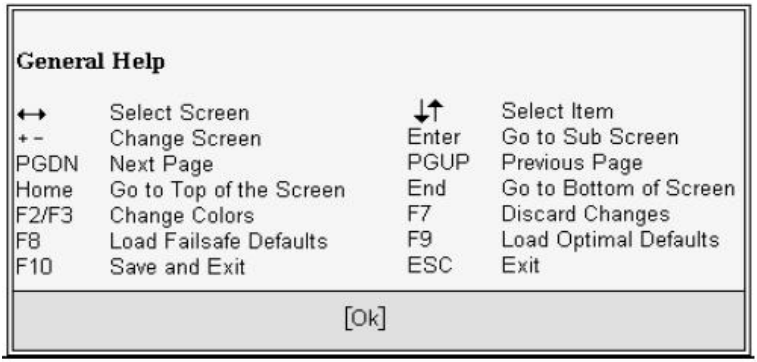
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the motherboard to boot up with the least amount of options set. This can lessen the probability of conflicting settings.

Hotkey Descriptions

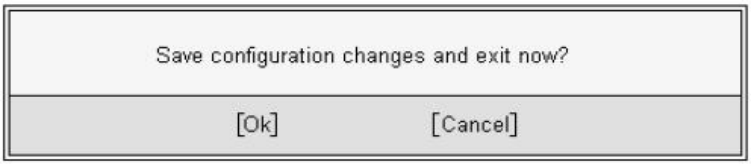
F1 The < F1 > key allows you to display the General Help screen.

Press the < F1 > key to open the General Help screen.

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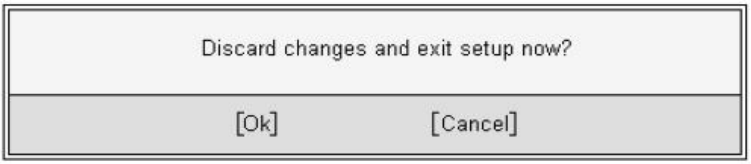


F10 The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:



Press the < Enter > key to save the configuration and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

ESC The < Esc > key allows you to discard any changes you have made and exit the Setup. Press the < Esc > key to exit the setup without saving your changes. The following screen will appear:



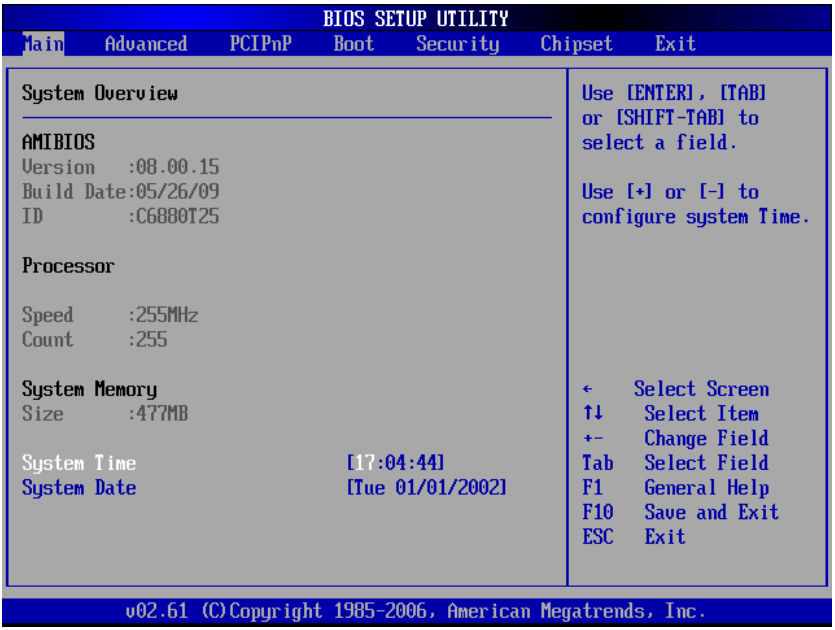
Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

Enter The < Enter > key allows you to display or change the setup option listed for a particular setup item. The < Enter > key can also allow you to display the setup sub-screens.

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8.2 Main Setup

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.



System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the < Arrow > keys. Enter new values using the keyboard. Press the < Tab > key or the < Arrow > keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

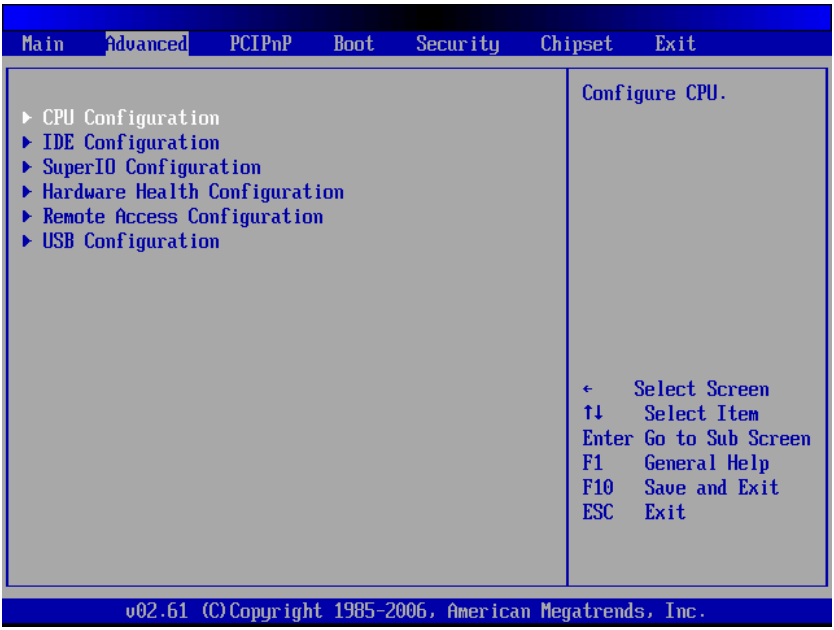
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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8.3 Advanced BIOS Setup

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the < Arrow > keys. The Advanced BIOS Setup screen is shown below.

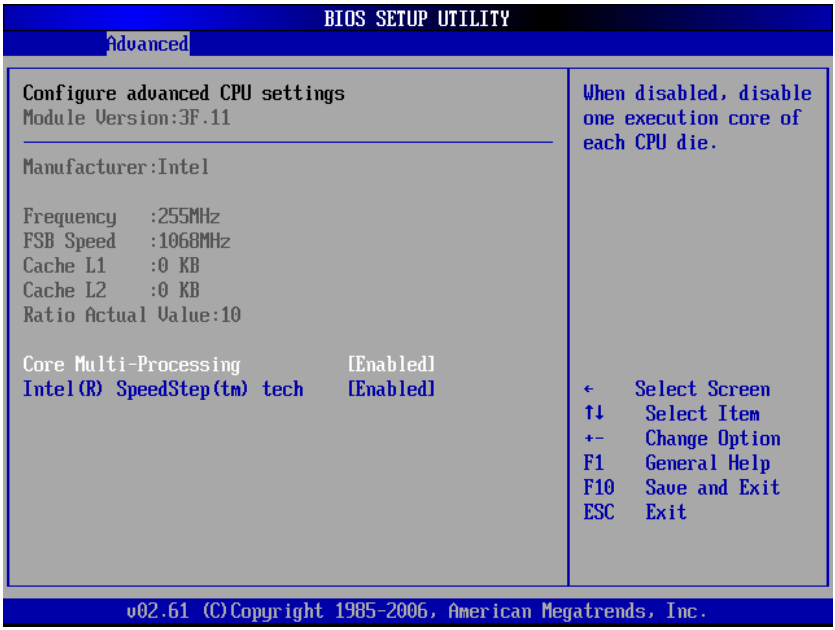
The sub menus are described on the following pages.



CPU Configuration

You can use this screen to select options for the CPU Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the CPU Configuration screen is shown below.

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Core Multi-Processing

This item enables/disables multi-core processing functionality for multi-core processors (default: Enabled).

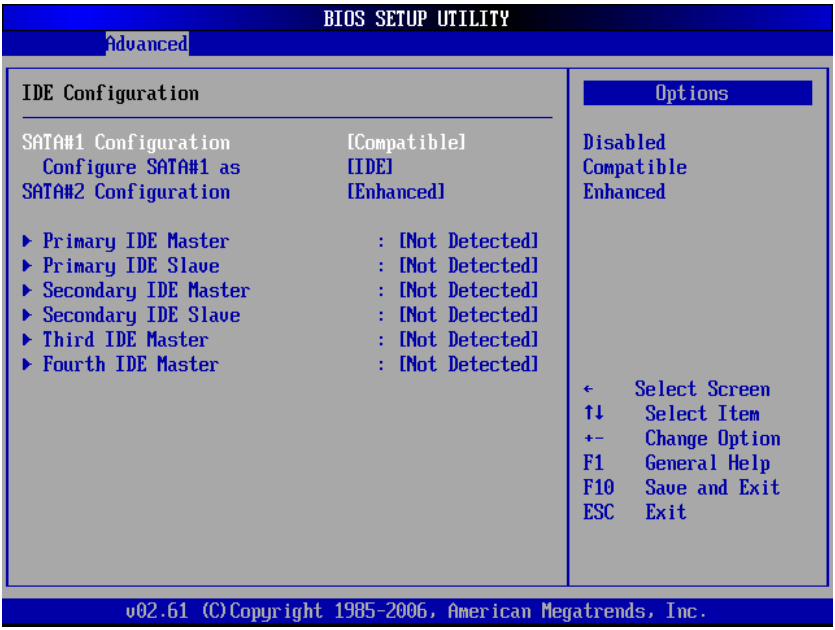
Intel®Speedstep™ Tech

Intel SpeedStep technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production (default: Enabled)..

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IDE Configuration

You can use this screen to select options for the IDE Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on the following pages. An example of the IDE Configuration screen is shown below.



SATA#1 Configuration

This item specifies whether the SATA#1 is initialized in Compatible or Enhanced mode of operation. The settings are **Disabled**, **Compatible** and **Enhanced** (default: Compatible).

Configure SATA#1 as

This item specifies whether the SATA#1 support IDEs or AHCI operation. The settings are IDE and AHCI (default: IDE).

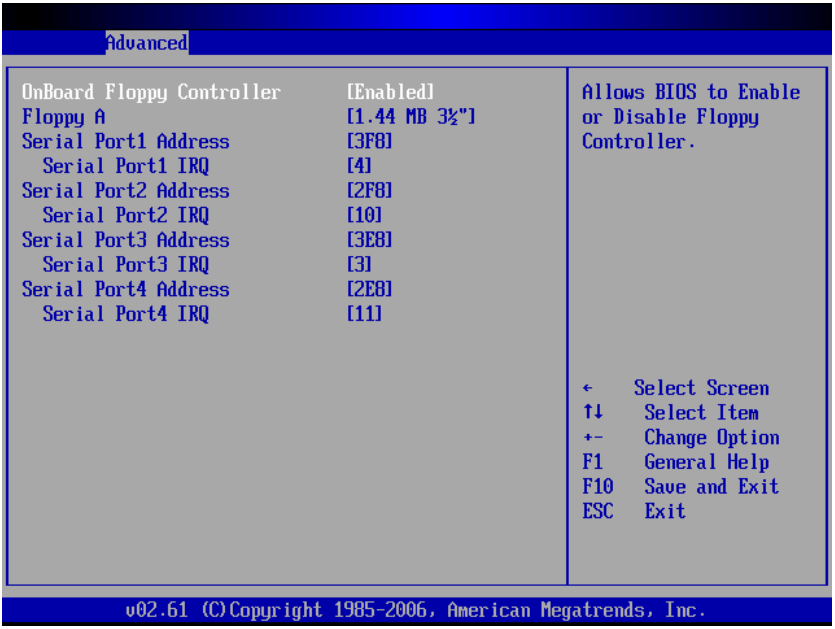
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SATA#2 Configuration

This item specifies whether the SATA#2 is initialized in Compatible or Enhanced mode of operation. The settings are **Disabled**, **Compatible** and **Enhanced** (default: Enhanced).

Super IO Configuration

You can use this screen to select options for the Super IO settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.



Onboard Floppy Controller

Options: Disabled, Enabled

Floppy Drive A

You can use this screen to specify options for the floppy drive settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the

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selected option. The settings are described on the following pages. The screen is shown below.

Options: Disabled, 360 KB 5 ¼", 1.2 MB 5 ¼", 720 KB 3 ½", 1.44 MB 3 ½", 2.88 MB 3 ½".

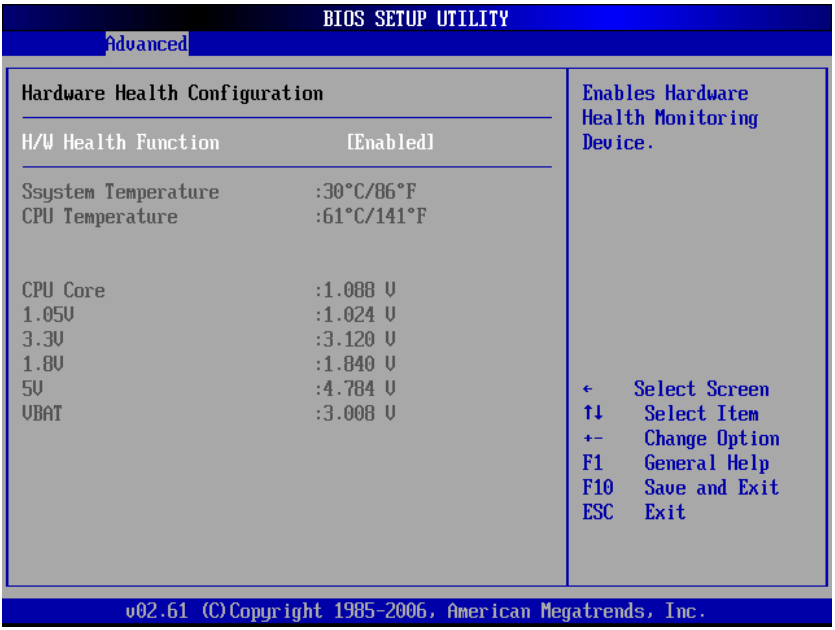
Serial Port1/2/3/4 Address/IRQ

Select an address and a corresponding interrupt for serial ports 1-4.

Address Options: 3F8, 3E8, 2F8, 2E8.
IRQ Options: 3, 4, 10, 11

Hardware Health Configuration

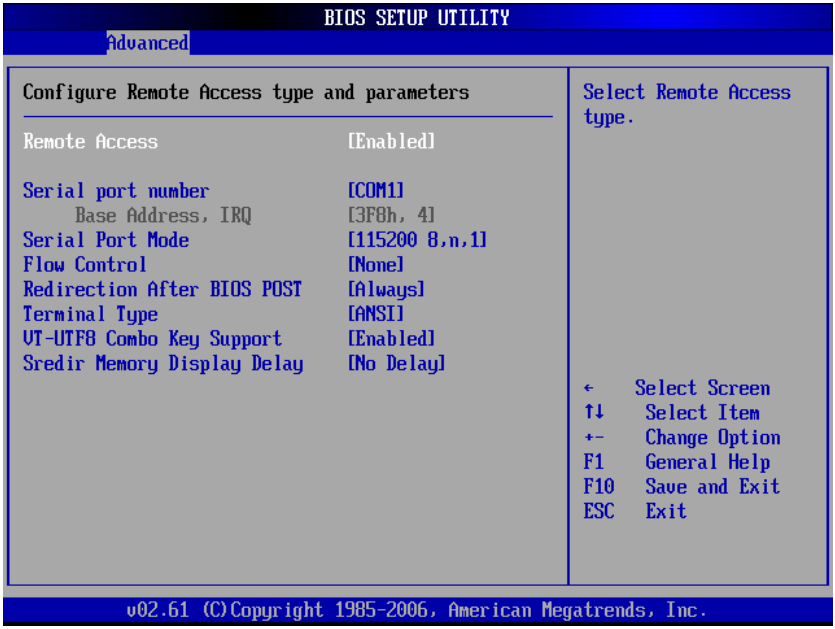
This option displays the current status of all of the monitored hardware devices/components such as voltages and temperatures. The options are Enabled and Disabled.



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Remote Access Configuration

Remote access configuration provides the settings to allow remote access by another computer to get POST messages and send commands through serial port access.



Remote Access

Select this option to **Enable** or **Disable** the BIOS remote access feature.

NOTE: Enabling Remote Access requires a dedicated serial port connection. Once both serial ports are configured to disabled, you should set this value to Disabled or it may cause abnormal boot.

Serial Port Number

Select the serial port you want to use for the remote access interface. You can set the value for this option to **COM1** or **COM2**.

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NOTE: If you have changed the resource assignment of the serial ports in Advanced> SuperIO Configuration, you must Save Changes and Exit, reboot the system, and enter the setup menu again in order to see those changes reflected in the Remote Access options.

Serial Port Mode

Select the baud rate you want the serial port to use for console redirection. The options are **115200 8,n,1**; **57600 8,n,1**; **19200 8,n,1**; and **09600 8,n,1**.

Flow Control

Set this option to select Flow Control for console redirection. The settings for this value are **None**, **Hardware**, or **Software**.

Redirection After BIOS POST

This option allows you to set Redirection configuration after BIOS POST. The settings for this value are **Disabled**, **Boot Loader**, or **Always**.

- **Disabled:** Set this value to turn off the redirection after POST
- **Boot Loader:** Set this value to allow the redirection to be active during POST and Boot Loader.
- **Always:** Set this value to allow the redirection to be always active.

Terminal Type

This option is used to select either VT100/VT-UTF8 or ANSI terminal type. The settings for this value are **ANSI**, **VT100**, or **VT-UTF8**.

VT-UTF8 Combo Key Support

This option enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals. The settings for this value are **Enabled** and **Disabled**.

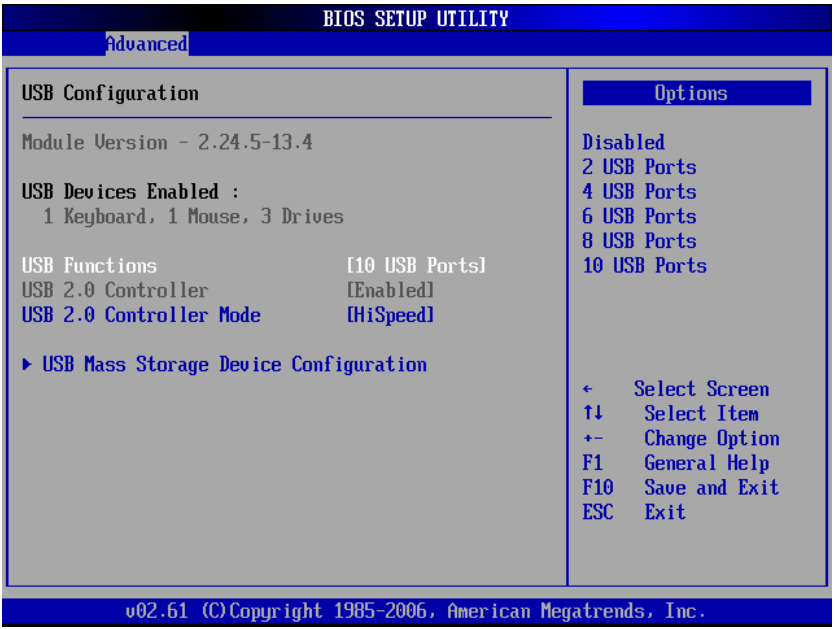
Sredir Memory Display Delay

This option gives the delay in seconds to display memory information. The options for this value are **No Delay**, **Delay 1 Sec**, **Delay 2 Sec**, or **Delay 4 Sec**.

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USB Configuration

You can use this screen to select options for the USB Configuration. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.



USB Functions

Set this value to allow the system to Disable, Enable, and select a set number of onboard USB ports.

USB 2.0 Controller

If USB Functions is set to Disabled, this option will have no effect. Setting this option to Enabled will allow USB 2.0 functionality to all USB ports.

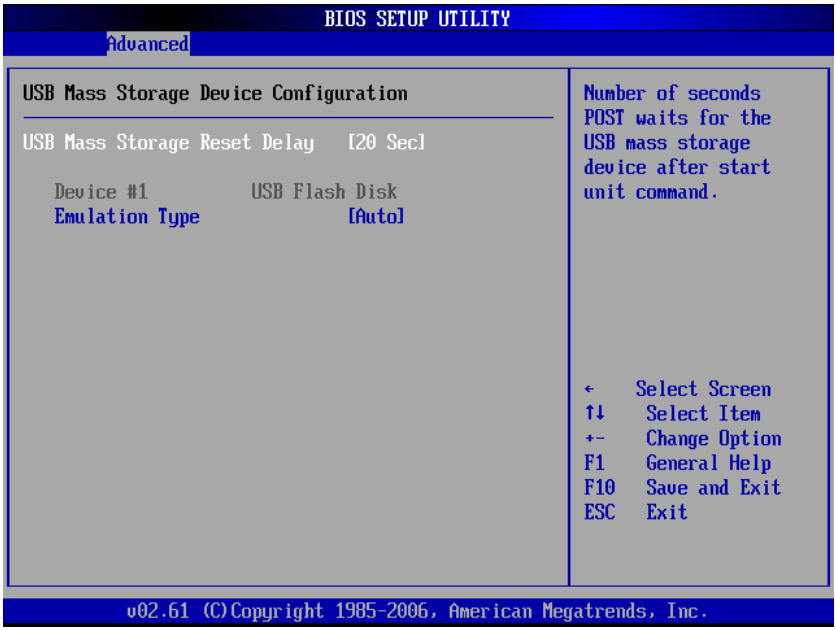
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USB 2.0 Controller Mode

The USB 2.0 Controller Mode configures the data rate of the USB port. The options are FullSpeed (12 Mbps) and HiSpeed (480 Mbps).

USB Mass Storage Device Configuration

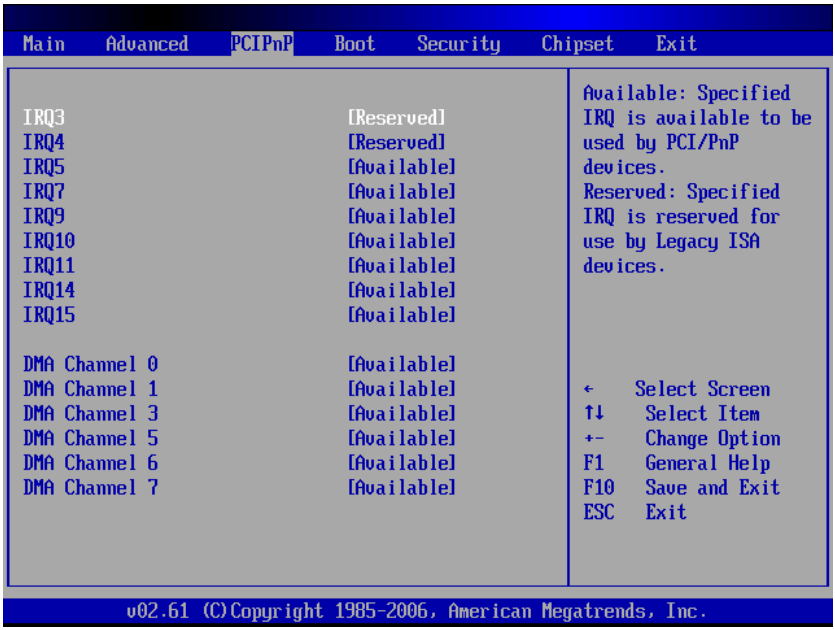
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB will remain as hard drive. The Forced FDD option can be used to force a hard disk type drive (such as a Zip drive) to boot as FDD.



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8.4 Advanced PCI/PnP Settings

Select the PCI/PnP tab from the setup screen to enter the Plug and Play BIOS Setup screen. You can display a Plug and Play BIOS Setup option by highlighting it using the < Arrow > keys. The Plug and Play BIOS Setup screen is shown below.



IRQ/DMA Channel

Set this value to allow the IRQ/DMA channel settings to be modified.

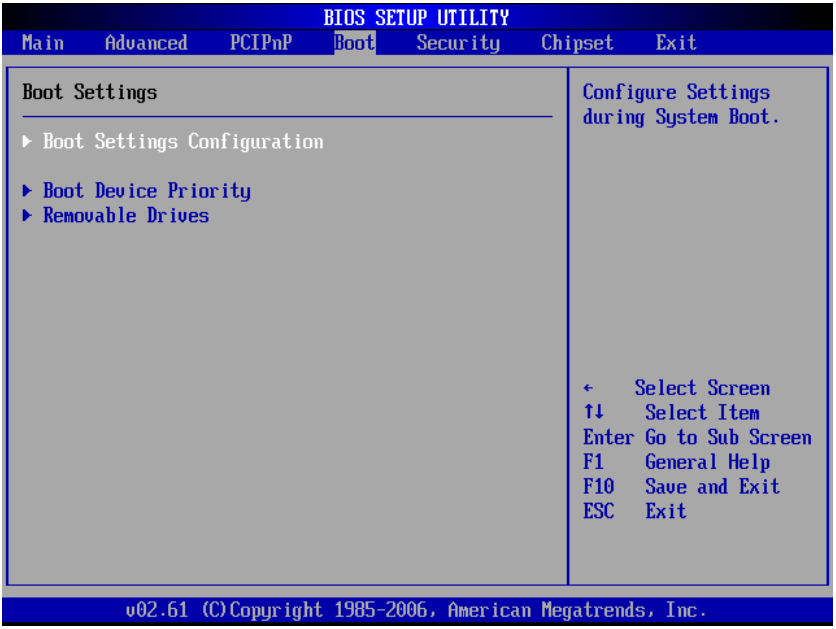
- **Available:** This setting allows the specified IRQ/DMA channel to be used by a PCI/PnP device.
- **Reserved:** This setting allows the specified IRQ/DMA channel to be used by a legacy ISA device.

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8.5 Boot Settings

Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys.

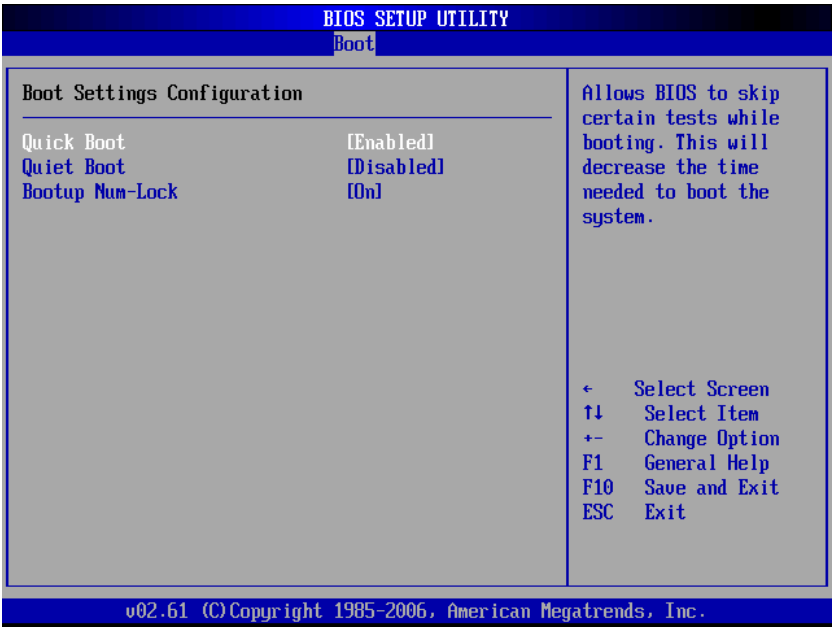
The Boot Settings screen is shown below:



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Boot Settings Configuration

Use this screen to select options for the Boot Settings Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages. The screen is shown below.



Quick Boot

Enabling this setting will cause the BIOS Power-On Self Test routine to skip some of its tests during bootup for faster system boot.

Quiet Boot

When this feature is **enabled**, the BIOS will display the OEM logo during the boot-up sequence, hiding normal POST messages. When it is **disabled**, the BIOS will display the normal POST messages, instead of the OEM logo.

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Bootup Num-Lock

This option sets the Num Lock status when the system is powered on. Setting it to On will turn on the Num Lock key when the system is booted up. Setting it to Off will not enable the Num Lock key on bootup.

Boot Device Priority

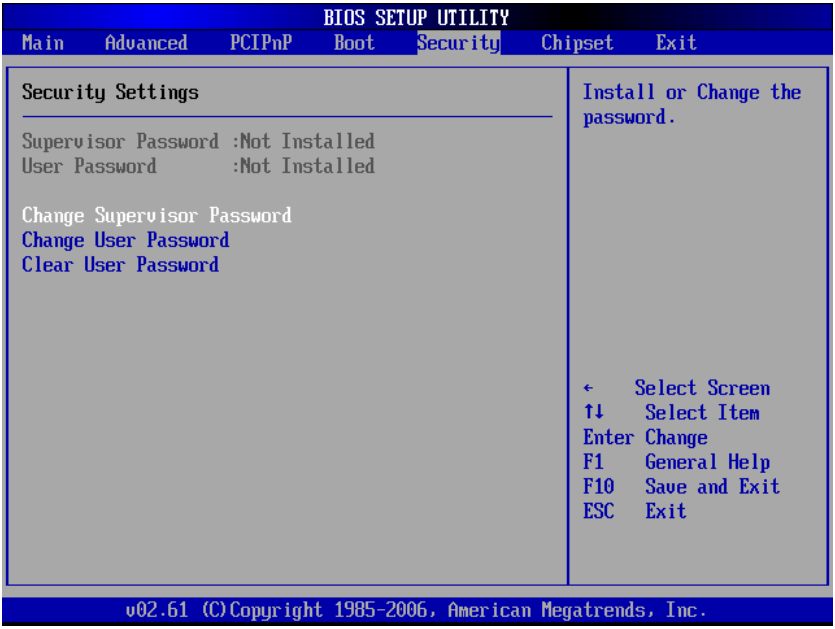
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

Boot Device Groups

The Boot devices are listed in groups by device type. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list. Only the first device in each device group will be available for selection in the Boot Device Priority option.

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8.6 Security Setup



Password Support

Two Levels of Password Protection

Provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

The system can be configured so that all users must enter a password every time the system boots or when Setup is executed, using either or either the Supervisor password or User password.

The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and re-configure.

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Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM.

To access the sub menu for the following items, select the item and press < Enter >:

- Change Supervisor Password
- Change User Password
- Clear User Password

Supervisor Password

Indicates whether a supervisor password has been set.

User Password

Indicates whether a user password has been set.

Change Supervisor Password

Select this option and press < Enter > to access the sub menu. You can use the sub menu to change the supervisor password.

Change User Password

Select this option and press < Enter > to access the sub menu. You can use the sub menu to change the user password.

Clear User Password

Select this option and press < Enter > to access the sub menu. You can use the sub menu to clear the user password.

Change Supervisor Password

Select Change Supervisor Password from the Security Setup menu and press < Enter >.

Enter New Password:

Type the password and press < Enter >. The screen does not display the characters entered. Retype the password as prompted and press < Enter >. If the password confirmation is incorrect, an

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error message appears. The password is stored in NVRAM after completes.

Change User Password

Select Change User Password from the Security Setup menu and press < Enter >.

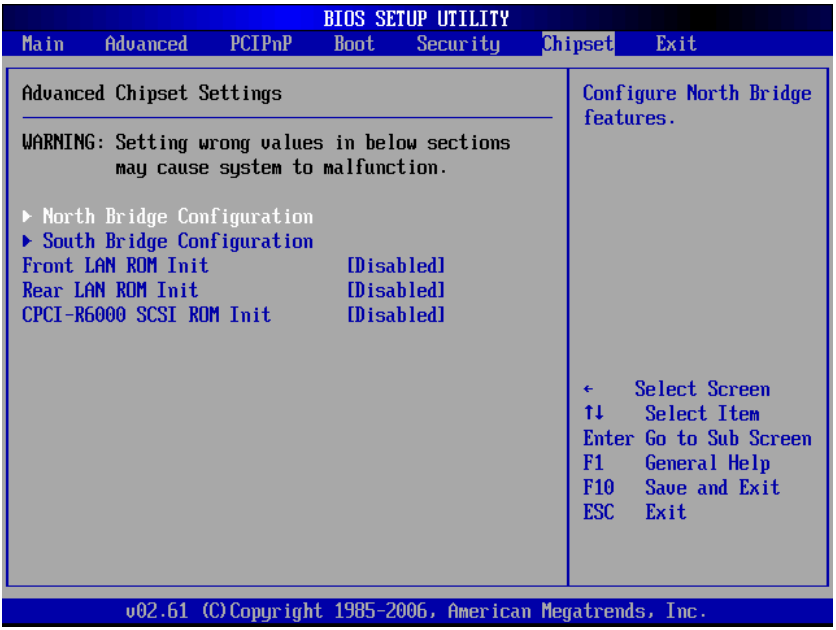
Enter New Password:

Type the password and press < Enter >. The screen does not display the characters entered. Retype the password as prompted and press < Enter >. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after completes.

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8.7 Chipset Setup

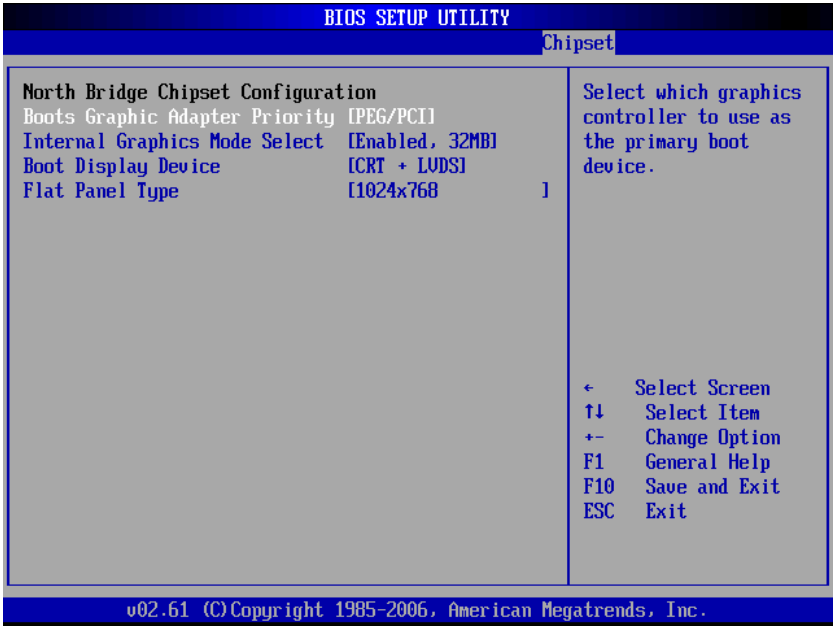
Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of the items in the left frame of the screen to go to the sub menu for that item. The Chipset BIOS Setup screen is shown below.



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North Bridge Configuration

You can use this screen to select options for the North Bridge Configuration. Use the up and down < Arrow > keys to select an item. Use the < Plus > and < Minus > keys to change the value of the selected option.



Boot Graphic Adapter Priority

Select which graphics controller to use as the primary boot device.

- IGD: Built-in chipset graphic only
- PCI/IGD: Detect PCI graphics first, then built-in chipset graphics (PCI includes PCI slot and PCI Express x1/x4 slot, PCI will be first)
- PCI/PEG: Detect PCI graphics first, then PCI Express x16 graphics
- PEG/IGD: Detect PCI Express x16 graphics first, then built-in chipset graphics
- PEG/PCI: Detect PCI Express x16 graphics first, then PCI graphics, then built-in chipset graphics

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Internal Graphics Mode Select

Select the amount of system memory (32M/64M/128M) used by the internal graphics device.

Boot Display Device

This item allows the user to configure the type of external display used.

- **CRT:** Only CRT display
- **CRT+DVI:** Both CRT and DVI display (default)
- **CRT+LVDS:** Both CRT and LVDS display

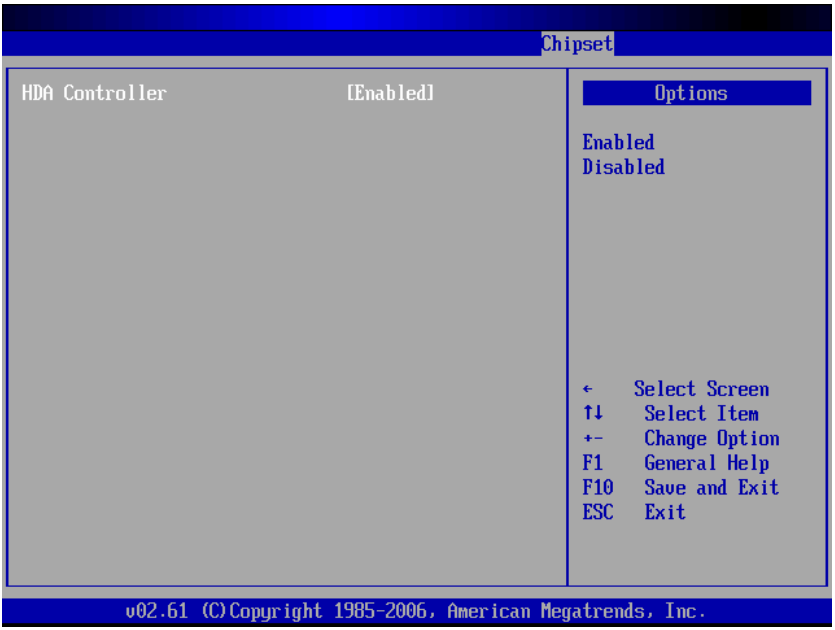
Flat Panel Type

When LVDS is selected from Boot Display Device, this option allows the output resolution to be set for the LVDS device you want to use. Available resolutions: 640x480, 800x600, 1024x768, 1280x1024.

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South Bridge Configuration

You can use this screen to select options for the South Bridge Configuration. Use the up and down < Arrow > keys to select an item. Use the < Plus > and < Minus > keys to change the value of the selected option.



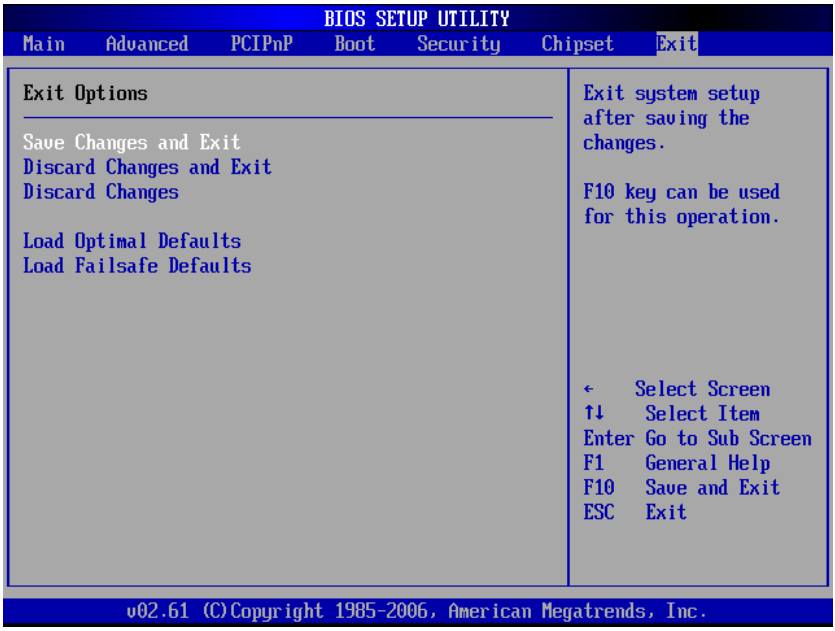
HDA Controller

Set this value to Enable/Disable the HDA Controller.

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8.8 Exit Menu

Select the Exit tab from the setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the < Arrow > keys. The Exit BIOS Setup screen is shown below.



Save Changes and Exit

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect.

Save Configuration Changes and Exit Now?

[Ok] [Cancel]

appears in the window. Select Ok to save changes and exit.

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

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Discard Changes and Exit Setup Now?

[Ok] [Cancel]

appears in the window. Select Ok to discard changes and exit.

Discard Changes

Select Discard Changes from the Exit menu and press < Enter >.

Select Ok to discard changes.

Load Optimal Defaults

Automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems.

Select Load Optimal Defaults from the Exit menu and press < Enter >.

Select Ok to load optimal defaults.

Load Failsafe Defaults

Automatically sets all Setup options to a complete set of default settings when you select this option. The Failsafe settings are designed for maximum system stability, but not maximum performance. Select the FailSafe Setup options if your computer is experiencing system configuration problems.

Select Load Fail-Safe Defaults from the Exit menu and press < Enter >.

Load FailSafe Defaults?

[Ok] [Cancel]

appears in the window. Select Ok to load FailSafe defaults.

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9 IPMI User Guide

9.1 Introduction

This chapter is written for those who already have a basic understanding of the newest implementation of the baseboard management controller (BMC) of the Intelligent Platform Management Interface (IPMI) specification rev. 1.5. It also describes the OEM extension IPMI command usages which are not listed in the IPMI specification.

9.2 Summary of Commands Supported by BMR-AVR-cPCI

The table below lists all the commands supported by the BMR-AVR-cPCI. The rightmost column indicates if the command is required by PICMG 3.0/ PICMG 2.9, or is optional.

Command	IPMI Spec	NetFn	CMD	IPM Controller Req (PICMG 2.9)
IPM Device "Global" Commands				
Get Device ID	17.1	App	01h	Mandatory
Cold Reset	17.2	App	02h	Optional
Warm Reset	17.3	App	03h	Optional
Get Self Test Results	17.4	App	04h	Mandatory
Get Device GUID	17.8	App	08h	Optional
Broadcast "Get Device ID"	17.9	App	01h	Mandatory
IPMI Messaging Support Commands				
Send Message	18.7	App	34h	Optional
BMC Watchdog Timer				
Reset Watchdog Timer	21.5	App	22h	Optional
Set Watchdog Timer	21.6	App	24h	Optional
Get Watchdog Timer	21.7	App	25h	Optional
Event Commands				
Set Event Receiver	23.1	S/E	00h	Optional
Get Event Receiver	23.2	S/E	01h	Optional

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Command	IPMI Spec	NetFn	CMD	IPM Controller Req (PICMG 2.9)
Platform Event (a.k.a. “Event Message”)	23.3	S/E	02h	Optional
Sensor Device Commands				
Get Device SDR Info	29.2	S/E	20h	Optional
Get Device SDR	29.3	S/E	21h	Optional
Reserve Device SDR Repository	29.4	S/E	22h	Optional
Set Sensor Hysteresis	29.6	S/E	24h	Optional
Get Sensor Hysteresis	29.7	S/E	25h	Optional
Set Sensor Threshold	29.8	S/E	26h	Optional
Get Sensor Threshold	29.9	S/E	27h	Optional
Set Sensor Event Enable	29.10	S/E	28h	Optional
Get Sensor Event Enable	29.11	S/E	29h	Optional
Get Sensor Event Status	29.13	S/E	2Bh	Optional
Get Sensor Reading	29.14	S/E	2Dh	Optional
Get Sensor Type	29.16	S/E	2Fh	Optional
FRU Device Commands				
Get FRU Inventory Area Info	28.1	Storage	10h	Optional
Read FRU Data	28.2	Storage	11h	Optional
Write FRU Data	28.3	Storage	12h	Optional

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9.3 OEM Commands Summary Table

Command	NetFn Code	Cmd Code
OemShowRevision	OEM (C0h)	12h
OemRescanGaInput	OEM (C0h)	22h
OemTestFunction	OEM (C0h)	30h
OemSetBlueLEDLongBlinking	OEM (C0h)	31h
OemReportGeoAddress	OEM (C0h)	F0h
OemEnableSmbus	OEM (C0h)	F2h
OemDisableSmbus	OEM (C0h)	F3h
OemDispDebugVariable	OEM (C0h)	F4h
OemResetHost	OEM (C0h)	F5h
OemPowerOff	OEM (C0h)	F6h
OemPowerOn	OEM (C0h)	F7h

OemShowRevision

This command is used to show the current information of the firmware including the firmware revision, the product ID, and additional features.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	12h	OEM defined command
Response	0	Complete Code	00h means OK
	1	A5h	Internal check byte. Always A5h
	2	*Firmware Rev	‘V’ in ASCII code for verification
	3	*Firmware Rev	Revision info high byte
	4	*Firmware Rev	Revision info low byte
	5	*Product ID	‘P’ in ASCII code for verification
	6	*Product ID	Product info high byte
	7	*Product ID	Product info low byte
	8	*Special info	‘S’ in ASCII code for verification
	9	*Special info	Addition info byte
	10	5Ah	Internal check byte. Always 5Ah

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OemRescanGaInput

This command is used to rescan the geo-address input pins and reset the IPMB address according to the input value.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	22h	OEM defined command
Response	0	Complete Code	00h means OK
	1	New IPMB address	New IPMB address value

OemTestFunction

Internal test purposes only.

OemSetBlueLEDLongBlinking

This command is used to enable or disable the slow blink of the blue Hot Swap LED when a voltage is detected to be over ±5% out of range for five seconds (see Table 4-1 on page 26). This function is set to disabled by default.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	31h	OEM defined command
	2	00h or 01h	00h: disable slow blink capability 01h: enable slow blink capability
Response	0	Complete Code	00h means OK

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OemReportGeoAddress

This command can report the IPMB address, the GA pin input status, and the event forwarding control value.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F0h	OEM defined command
Response	0	Complete Code	00h means OK
	1	IPMB address	IPMB address value
	2	GA value	GA pin input status
	3	Control value	Current control value of event forwarding

OemEnableSmbus

This command is used to turn on the I2C bus when it is off during boot up process. Usually BIOS will perform this command after booting in boards with ServerWorks chipset.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F2h	OEM defined command
Response	0	Complete Code	00h means OK

OemDisableSmbus

This command is used to shut down I2C bus access.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F3h	OEM defined command
Response	0	Complete Code	00h means OK

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OemDispDebugVariable

This command can report up to 5 interval values for debug purposes. For developers only.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F4h	OEM defined command
Response	0	Complete Code	00h means OK
	1	*Debug variable 1	
	2	*Debug variable 2	
	3	*Debug variable 3	
	4	*Debug variable 4	
	5	*Debug variable 5	

OemResetHost

This command is implemented to control the system's status if rebooting is required. Operators can control the system remotely.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F5h	OEM defined command
Response	0	Complete Code	00h means OK

OemPowerOff

This command is implemented to control the system's status if power-off is required. Operators can control the system remotely.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F6h	OEM defined command
Response	0	Complete Code	00h means OK

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OemPowerOn

This command is implemented to control the system's status if power-on is required. Operators can control the system remotely.

Action	Byte	Value	Description
Request	0	C0h	NetFn/LUN for OEM
	1	F7h	OEM defined command
Response	0	Complete Code	00h means OK

9.4 CompactPCI Address Map

Since more than one system may be installed in a single chassis, we allocate each IPMB address based on GA input as peripheral cards. The CompactPCI Peripheral Address Mapping Table is given below.

CompactPCI Peripheral Address Mapping			
Geo. Addr.	**IPMB Addr.**	**Geo. Addr.**	**IPMB Addr.**
0	**Disabled**	16	D0h
1	B0h	17	D2h
2	B2h	18	D4h
3	B4h	19	D6h
4	B6h	20	D8h
5	B8h	21	DAh
6	Bah	22	DCh
7	BCh	23	DEh
8	BEh	24	E0h
9	Coh	25	E2h
10	C4h	26	E4h
11	C6h	27	E6h
12	C8h	28	E8h
13	CAh	29	EAh
14	CCh	30	ECh
15	CEh	**31**	**Disabled**

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9.5 Communications with IPMC

Operating systems need to use a serial port to communicate with the IPMC. The resource setting of the serial port must be IO: 0x3E8 and IRQ: 3. The communication setting of the serial port must be BaudRate: 9600, DataBit: 8, ParityCheck: None, StopBit: 1, and FlowControl: None. In Windows XP, use “COM3” to communicate with the IPMC.

9.6 IPMI Sensors List

Sensor Number	Sensor name	Normal Reading	Remark
01h	BMC Watchdog		
02h	3.3V	3.3 V	
03h	5V	5 V	
04h	12V	12 V	
05h	1.5V	1.5 V	
06h	CPU0 Temp	40°C	
07h	CPU1 Temp	40°C	
08h	SYSTEM Temp	25°C	
09h	Power Good		
0ah	SYS_PWROK		
0bh	BIOS CHANGE		
0ch	BIOS POST ERROR		

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9.7 Relevant Documents

Document Title	Revision	Source
Intelligent Platform Management Interface Specification v1.5	Document Revision 1.1 February 20, 2002	Intel Corp. http://www.intel.com/design/servers/ipmi/license_ipmi.htm
PICMG 2.9 D1.0 CompactPCI System Management Specification	January 21, 2000	
Intelligent Platform Management Bus Communications Protocol Specification v0.9	Document Revision 0.15 June 24, 1997	Intel Corp. http://www.intel.com/design/servers/ipmi/license_ipmi.htm

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Important Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:
  - Turn off power and unplug any power cords/cables.
- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.

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- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.

A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries appropriately.

- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

Contact us should you require any service or assistance.

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路 166 號 9 樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park,
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology Beijing
Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室(100085)
Rm. 801, Power Creative E, No. 1, B/D
Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8625
Email: market@adlinktech.com

ADLINK Technology Shenzhen
Address: 深圳市南山区科技园南区高新南七道 数字技术园
A1 栋 2 楼 C 区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

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ADLINK Technology (Europe) GmbH
Address: Nord Carree 3, 40477 Duesseldorf, Germany
Tel: +49-211-495-5552
Fax: +49-211-495-5557
Email: emea@adlinktech.com

ADLINK Technology, Inc. (French Liaison Office)
Address: 15 rue Emile Baudot, 91300 Massy CEDEX, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology Japan Corporation
Address: 〒101-0045 東京都千代田区神田鍛冶町 3-7-4
神田 374 ビル 4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 서울시 서초구 서초동 1506-25 한도 B/D 2 층
2F, Hando B/D, 1506-25, Seocho-Dong, Seocho-Gu,
Seoul 137-070, Korea
Tel: +82-2-2057-0565
Fax: +82-2-2057-0563
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
Address: 84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
Address: No. 1357, "Anupama", Sri Aurobindo Marg, 9th Cross,
JP Nagar Phase I, Bangalore - 560078, India
Tel: +91-80-65605817
Fax: +91-80-22443548
Email: india@adlinktech.com

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