# cPCI-6615 Series

Ultra Low Power 6U CompactPCI®
Dual-Core Intel® Atom™Processor Blade

**User's Manual**




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# Revision History

| Revision | Release Date | Description of Change(s) |
|---|---|---|
| 2.00 | 2012/02/03 | Initial release |

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# Preface

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## Using this Manual

### Audience and Scope

The cPCI-6615 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, Introduction:** Introduces the cPCI-6615, its features, block diagrams, and package contents.

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

**Chapter 3, Functional Description:** Describes the cPCI-6615 main functions.

**Chapter 4, Board Interfaces:** Describes the cPCI-6615 board interfaces.

**Chapter 5, Getting Started:** Describes the installation of components to the cPCI-6615 and rear transition modules.

**Chapter 6, Driver Installation:** Provides information on how to install the cPCI-6615 device drivers.

**Chapter 7, Utilities:** Describes the utilities of the cPCI-6615 Series.

**Chapter 8, BIOS Setup:** Describes basic navigation for the AMIBIOS®8 BIOS setup utility.

**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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# 1 Introduction

## 1.1 Overview

The cPCI-6615 Series is a 6U CompactPCI single board computer in single-slot (4HP) or dual-slot (8HP) width form factor featuring the Intel® Atom™ D525 processor with ICH8M I/O Controller Hub. The cPCI-6615 provides single channel DDR3-800 socket-type memory up to 4GB, integrated graphics on the CPU, IDE CompactFlash slot, and 2.5” SATA drive space shared with one site.

Front panel I/O includes 3x USB, 3x GbE, 1x COM (RS-232/422/485 selectable) for the 4HP cPCI-6615 model, and additional 1x USB, 1x COM (RS-232 only), 1x P/S2 and 1x VGA for the 8HP cPCI-6615D model. Onboard I/O includes 1x 7-pin SATA connector, 1x CompactFlash slot and 1x PMC site (not available concurrently with 2.5" drive).

The cPCI-6615 provides the following I/O to the optional Rear Transition Module (RTM): 1x VGA (switched from front panel), 2x GbE (switched from front panel), 6x USB, 1x SATA, 2x COM, 1x PS/2 KB/MS, High Definition Audio and SMBus signals routed through the J3 connector; LVDS from the Intel® Atom™ processor and 5x GPIO pins from ICH8M routed through the J5 connector (available I/O dependent on RTM model).

The cPCI-6615 Series is ideally suited for factory automation, machine making, transportation and other industrial applications.

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## 1.2 Features

- 6U CompactPCI blade in 4HP or 8HP width form factor
- Supports Dual-Core (four-thread) Intel® Atom processor, up to 1.8GHz, 1MB L2 cache, TDP 13W
- Graphics and memory controllers integrated in processor
- ICH8M I/O Hub
- Single channel DDR3-800 up to 4GB in two SODIMM sockets
- 32-bit/33MHz CompactPCI Interface based on PCI specifications
- Optional PMC slot supporting PCI-X 64-bit/133MHz from PCI-Express x4 via PCIe-to-PCI-X bridge (PI7C9X130)
- VGA port on front switchable to rear I/O by jumper setting
- Three PCI-Express® Gigabit Ethernet egress ports, GbE1/2 routable to J3 by BIOS setting
- One IDE CompactFlash socket
- One SATA connector for 2.5" SATA drive onboard on 4HP/8HP blade, shares space with PMC site
- One 7-pin SATA connector onboard and one SATA port routed to J3

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## 1.3 Block Diagram

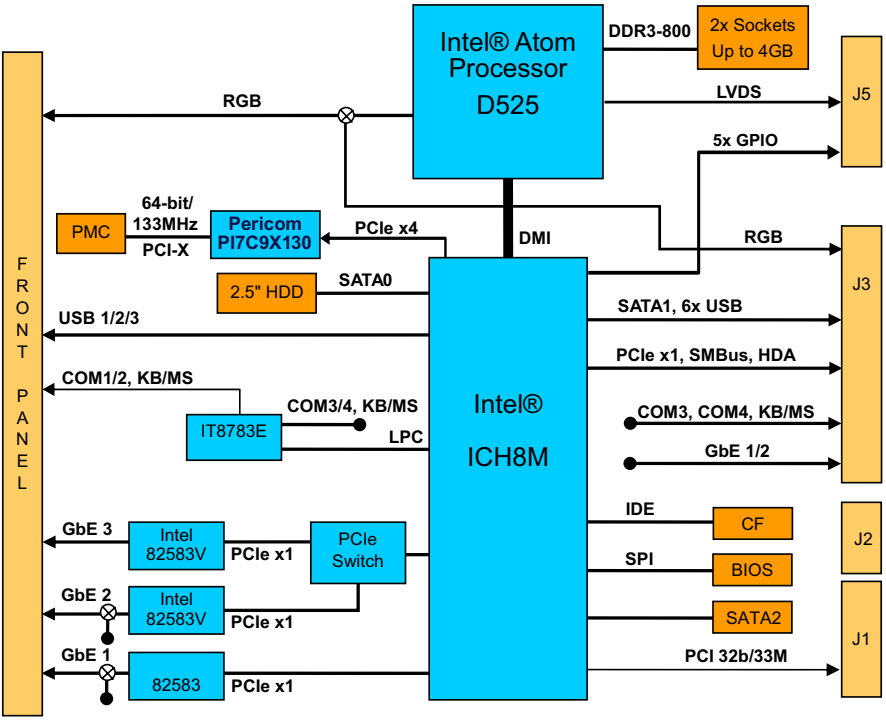



**Figure 1-1: cPCI-6615 Series Functional Block Diagram**

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## 1.4 Product List

Products in the cPCI-6615 Series include:

### Processor Blade

- **cPCI-6615/D525:** 4HP width (single-slot) 6U CompactPCI featuring Atom™ D525 processor; up to 4GB memory in two SODIMM sockets; 3x USB; 3x GbE; 1x COM (RS-232/422/485); onboard VGA box header; onboard SATA connector; onboard CompactFlash slot. The SATA adapter DB-6920SAT provides connectivity for 2.5" drive (shares space with PMC slot).
- **cPCI-6615D/D525:** 8HP width (dual-slot) 6U CompactPCI featuring Atom™ D525 processor; up to 4GB memory in two SODIMM sockets; 4x USB; 3x GbE; 2x COM (one RS-232/422/485 selectable); 1x VGA; onboard SATA connector; onboard CompactFlash slot. The SATA adapter DB-6920SAT provides connectivity for 2.5" drive (shares space with PMC slot).

### Rear Transition Module

- **cPCI-R6002:** 4HP width, 50mm depth Rear Transition Module with 2x COM (1x DB-9 on faceplate, 1x 10-pin header onboard), 2x USB, 2x GbE, VGA converted from DVI-I port and 2x 7-pin SATA connectors.

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## 1.5 Package Contents

The cPCI-6615 is packaged with the following components. If any of the items on 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 the cPCI-6615 Series are non-standard configurations and may vary depending on customer requests.

### Processor Blade

- The cPCI-6615 Series Processor Blade
  - Memory specifications will differ depending on options selected
  - Thermal module is assembled on the board
- 2.5” HDD accessory pack
- CompactFlash accessory pack
- Y-cable for PS/2 combo port (8HP version only)
- ADLINK All-in-One CD
- User’s manual

### Rear Transition Module

- The cPCI-R6002 RTM




The contents of non-standard cPCI-6615 configurations may vary depending on the customer’s requirements.




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-6615 Specifications

| | |
|---|---|
| **CompactPCI Standards** | • PICMG® 2.0 CompactPCI® Rev. 3.0<br>• PICMG® 2.1 Hot Swap Specification Rev.2.0\<br>• PICMG® 2.16 Packet Switch Backplane R1.0 (optional) |
| **Mechanical** | • Standard 6U CompactPCI®<br>• Board size: 233.33mm x 160mm<br>• Single-slot (4HP, 20.32mm); Dual-slot (8HP, 40.64mm) width<br>• CompactPCI® connectors with J1, J2 J3 and J5 |
| **Processor** | • µFC-BGA dual-core Intel® Atom™ Processor D525 1.8 GHz, 1MB L2 cache, TDP 13W<br>• Passive heatsink |
| **Chipset** | • Intel® ICH8M I/O Controller Hub (ICH) |
| **Memory** | • Single channel DDR3-800 unbuffered non-ECC memory<br>• Two SODIMM Sockets<br>• Maximum up to 4GB capacity (dependent on memory process technology) |
| **BIOS** | • AMIBIOS8® 16Mbit SPI flash memory |
| **CompactPCI Bus** | • PCI 32bit/ 33MHz; 3.3V, 5V universal V(I/O)<br>• Supports operation in system slot only |
| **Gigabit Ethernet** | • Three PCI-Express x1 Intel® 82583V Gigabit Ethernet controllers<br>• Three egress 10/100/1000BASE-T ports and optional two GbE ports switchable to J3 (RTM) by BIOS setting |
| **Graphics** | • Integrated in Intel® Atom™ Processor<br>• DB-15 VGA port on front panel for 8HP, switchable to J3 (RTM) by jumper setting<br>• Onboard VGA box header for 4HP version (routed to J3 by default)<br>• Analog monitor support up to QXGA 2048x1536 @60Hz, 32-bit<br>• Single LVDS channel supporting resolution up to 1366x768 |
| **Serial Ports** | • Up to four serial ports from Super I/O ITE8783<br>• One RS-232/422/485 on front panel for 4 HP and one additional RS-232 on front for 8HP<br>• Two serial ports (RS-232) routed to J3 |
| **Storage Interface[1]** | • CompactFlash Type II socket onboard (IDE)<br>• 2.5” SATA HDD connector onboard |
| **BIOS** | • AMIBIOS8® 64Mbit SPI flash memory |

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| | |
|---|---|
| **PMC** | • One PCI-X 64-bit/133MHz PMC site |
| **Audio** | • High Definition Audio signal by Intel ICH8M routed to J3 |
| **Faceplate I/O** | **4HP (cPCI-6615):**<br>• 3x USB 2.0 ports<br>• 3x 10/100/1000BASE-T Ethernet ports<br>• 1x RS-232/422/485<br>**8HP (cPCI-6615D):**<br>• 4x USB 2.0 ports<br>• 3x 10/100/1000BASE-T Ethernet ports<br>• Analog DB-15 VGA port<br>• 1x RS-232/422/485<br>• 1x RS-232<br>• PS/2 Keyboard/ Mouse combo port |
| **OS Compatibility** | • Microsoft Windows XP, 7 32/64-bit<br>• Wind River VxWorks 6.8 w/SMP<br>• Red Hat Enterprise Linux 6<br>• Other OS support upon request |
| **Power Requirement** | • 5V only for power up |
| **Environmental** | • Operating Temperature (with forced air flow)[2]:<br>- Standard: 0°C to 60°C<br>- Extended: -20°C to 85°C<br>Storage Temperature: -40°C to 85°C<br>• Humidity: 95% non-condensing<br>• Shock: 15G peak-to-peak, 11ms duration, non-operating<br>• Vibration[1]: Operating 2Grms, 5-500Hz, each axis w/o HDD |
| **EMI** | • CE EN55022<br>• FCC Class A |

1. Hard drive limits operational vibration. When application requires higher vibration specification, it is recommended to use a flash disk.
2. ADLINK-certified thermal design. The thermal performance is dependent on the chassis cooling design. Forced airflow with 3.2 m/s is required. Temperature limit of optional mass storage devices may affect the thermal specification.

NOTE: Specifications are subject to change without prior notice.

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## 2.2 I/O Connectivity Table

| Function | cPCI-6615 (4HP) | | cPCI-6615D (8HP) | |
|---|---|---|---|---|
| | Faceplate | Onboard | Faceplate | Onboard |
| **Gigabit Ethernet** | Y x3(1) | | Y x3(1) | |
| **COM** | Y x1(2) | | Y x2(2) | |
| **USB 2.0** | Y x3 | | Y x4 | |
| **VGA** | | Y x1 | Y(3) | |
| **Serial ATA** | | Y x2 (7-pin & 22-pin) | | Y x2 (7-pin & 22-pin) |
| **CF** | | Y | | Y |
| **PS/2 KB/MS** | | | Y x1 | |
| **PMC** | Y | | Y | |
| **GP LED** | Y x2 | | Y x2 | |
| **Power LED** | Y | | Y | |
| **HDD LED** | Y | | Y | |
| **Reset Button** | Y | | Y | |

1. Two GbE signals are switchable to rear by BIOS setting
2. One RS-232/422/485 selectable by BIOS setting
3. VGA is switchable to rear by jumper

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## 2.3 Power Requirements

In order to guarantee stable operation of the system, it is recommended that significantly more power be provided than required. **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 of each voltage.

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 | | | |

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## Power Consumption

This section provides information on the power consumption of cPCI-6615 Series when using the Intel® Atom processor D525 with 4GB DDR3 memory and ASD25-MLC64G SSD. The cPCI-6615 is powered by 5V only. Power consumption under Windows XP was measured using PassMark BurnInTest 6.0.

| Intel® Atom™ Processor D525 | | |
|---|---|---|
| **OS/Mode** | **Current 5V** | **Total Power** |
| DOS/Idle mode | 3.285A | 16.42W |
| Windows XP, Idle mode | 3.357A | 16.78W |
| Windows XP, 100% CPU usage | 3.668A | 18.34W |
| Windows XP, Total System | 3.931A | 19.65W |

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# 3 Functional Description

The following sections describe the cPCI-6615 Series features and functions.

## 3.1 Processor

The cPCI-6615 Series supports the Intel® Atom™ Processor D525 built on 45-nm Hi-K process technology. The processor is designed for a two-chip platform as opposed to the traditional three-chip platforms (processor, GMCH and ICH). The two-chip platform consists of a processor and the chipset and enables higher performance, lower cost, easier validation, and improved x-y footprint.

| Features | Atom™ D525 |
|---|---|
| Clock | 1.8 GHz |
| L2 cache | 1MB |
| No. of Core(s) | 2 |
| Max. Power (TDP[1]) | 13W |
| $T_{junction, Max.}$[2] | 100°C |

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® Atom™ Processor D525

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

- One die, primary 32-kB instructions cache and 24-kB write-back data cache
- Intel® Hyper-Threading Technology (2 threads per core)
- On die 2x512-kB, 8-way L2 cache
- Support IA 32-bit and Intel® 64 architecture
- Intel® SSE2 and SSE3 and SSSE3 support
- Micro-FCBGA8 packaging technologies
- Thermal management support via Intel® Thermal Monitor 1 (TM1)

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The following list outlines the key features of system memory support:

- Single channel DDR3 memory at data transfer rates of 800 M/Ts
- I/O Voltage of 1.5V Non-ECC, unbuffered DDR3
- 512Mb. 1-Gb, and 2-Gb DDR3 DRAM technologies supported
- 2 SO-DIMMs, maximum 4GB memory capacity supported

The following list outlines the key graphics features:

- The integrated graphics controller contains a refresh of the 3rd generation graphics core
- Intel® Dynamic Video Memory Technology 4.0
- DirectX 9 compliant Pixel Shader v2.0
- 400-MHz render clock frequency
- Analog RGB display output up to resolution up to 2048x1536 @ 60Hz
- Single LVDS channel supporting resolutions up to 1366x768, 18bpp

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## 3.2 Chipset

### Intel® ICH8 Mobile I/O Controller Hub

The ICH8M provides extensive I/O support. Functions and capabilities include:

- Provides 6 PCI Expressx1 ports, supporting the PCI Express Base Specification, Revision 1.1. Each Root Port supports 2.5GB/s bandwidth in each direction. The cPCI-6615 utilizes two PCI Express x1 ports for two Gigabit Ethernet controllers; routes two PCI Express x1 ports to the board-to-board connector and one PCI Express x1 port to the J2 connector for expansion capability.
- Enhanced DMA controller, interrupt controller, and timer functions
- Integrated Serial ATA host controller with independent DMA operation on three ports
- Integrated IDE controller supports Ultra ATA100/66/33
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C devices
- Supports Intel® Matrix Storage Technology
- PCI Local Bus Specification, Revision 2.3 support for 33MHz PCI operations

## 3.3 Super I/O

The ITE IT8783E Super I/O is on a Low Pin Count interface supporting PS/2 keyboard/mouse; three 16C550-compatible serial ports; hardware monitor function to monitor CPU voltage, CPU temperature, power supply voltages and system temperature; and Watchdog Timer with time resolution from minimum 1 second or minute to maximum 65635 seconds or minutes on the cPCI-6615.

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## 3.4 Battery

The cPCI-6615 is provided with a 3.0V “coin cell” lithium battery for the Real Time Clock (RTC). The battery socket is equipped onboard. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer. A Rayovac BR2032 is equipped onboard by default.

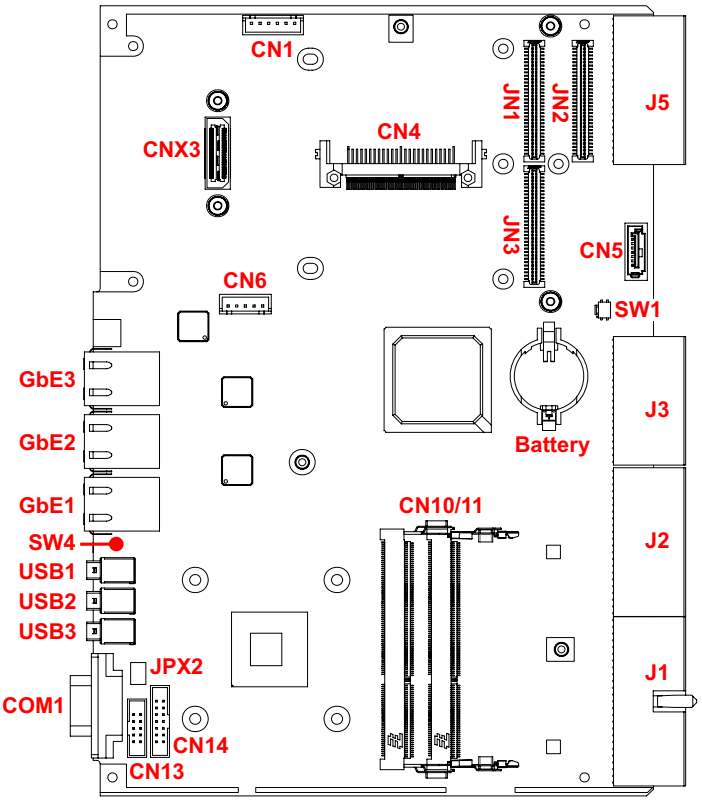
## 3.5 PMC

The cPCI-6615P Series supports one PMC site for front panel I/O expansion. The PMC site provides a maximum 64-bit/133MHz PCI-X bus link using a Pericom PI7C9X130 PCI-Express-to-PCI-X bridge and PCI-Express x4 link. The PMC site requires 12V to power up.

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# 4 Board Interfaces

## 4.1 cPCI-6615 Board Layout




| | | | |
|---|---|---|---|
| **CN1** | PS/2 KB/MS box header | **COM1** | COM1 port |
| **CN4** | CompactFlash card slot | **J1/J2/J3/J5** | CompactPCI connectors |
| **CN5** | SATA connector | **JN1~JN3** | PMC connectors |
| **CN6** | USB box header | **JPX2** | VGA mode jumper |
| **CN10/11** | DDR3 SODIMM sockets | **GbE1~3** | Gigabit Ethernet ports |
| **CN13** | COM2 box header | **SW1** | Load BIOS default switch |
| **CN14** | VGA box header | **SW4** | Reset button (back side) |
| **CNX3** | DB-6920 SATA connector | **USB1~3** | USB ports |

**Figure 4-1: cPCI-6615 Board Layout**



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## 4.2 cPCI-6615 Assembly Layout

This section illustrates the assembly layout of single slot cPCI-6615 blade.

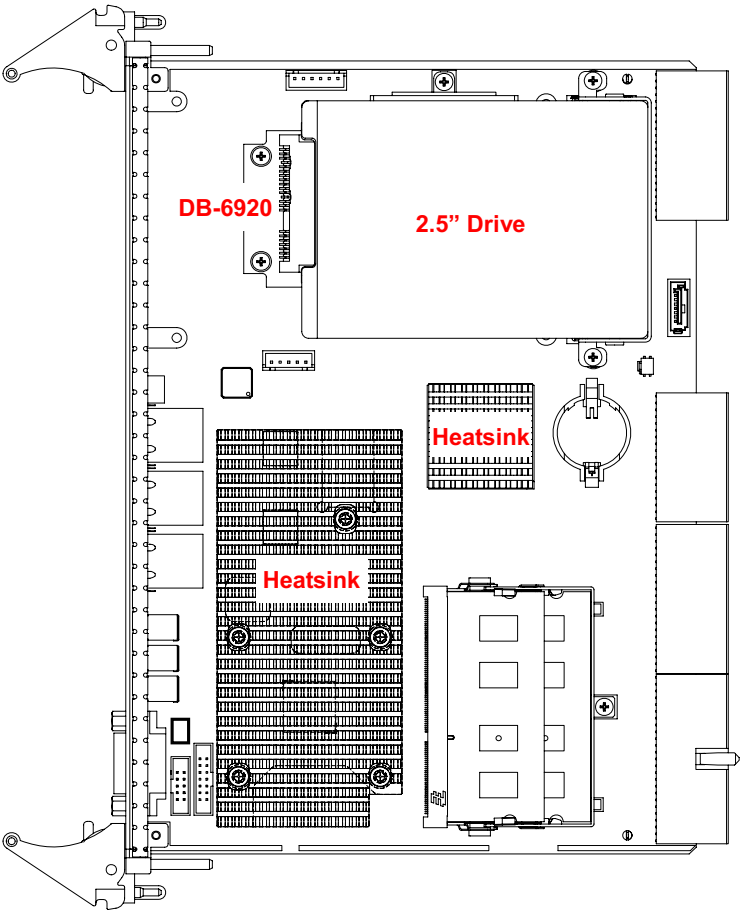
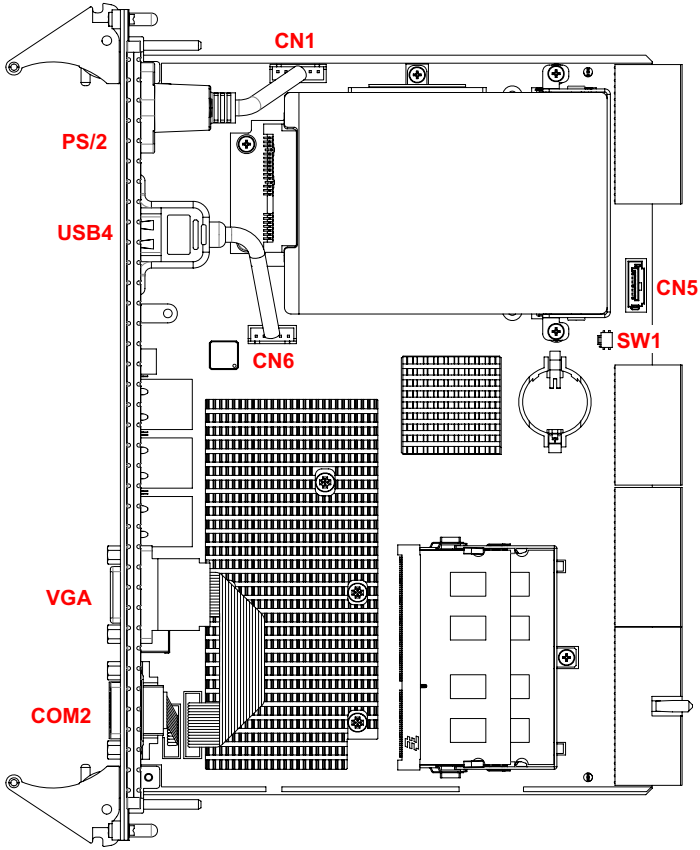



**Figure 4-2: cPCI-6615 Assembly Layout**

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## 4.3 cPCI-6615D Assembly Layout

The dual-slot width cPCI-6615D blade is comprised of the cPCI-6615 single-slot main board and an expanded front panel with the following additional I/O: 1x PS/2 KB/MS port, 1x USB port, 1x COM port and 1x VGA port.



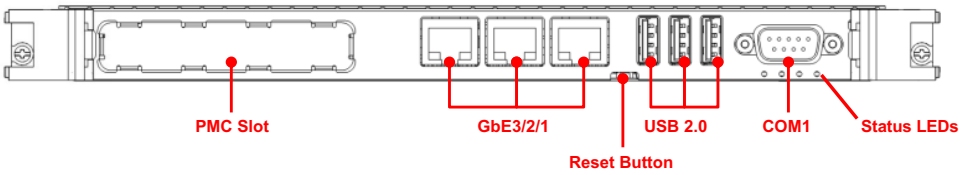

| | | | |
|---|---|---|---|
| **CN1** | PS/2 KB/MS pin header | **PS/2** | PS/2 Keyboard/Mouse |
| **CN5** | SATA connector | **USB4** | USB port from CN6 |
| **CN6** | USB pin header | **VGA** | VGA port |
| **COM2** | COM port | **SW1** | Load BIOS default switch |

**Figure 4-3: cPCI-6615D Assembly Layout**

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## 4.4 cPCI-6615(D) Front Panel

**cPCI-6615**




**cPCI-6615D**

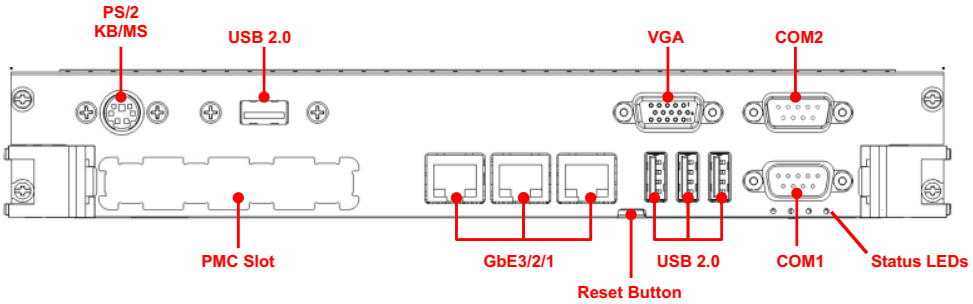



**Figure 4-4: cPCI-6615(D) Front Panel Layout**

### Status LEDs

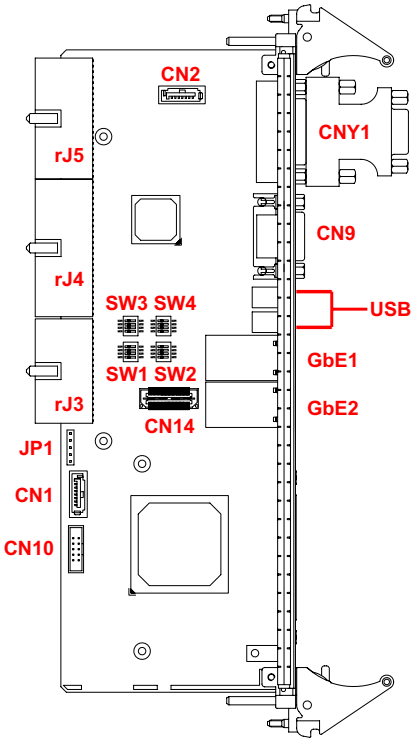



| LED | Color | Condition | Indication |
|---|---|---|---|
| WDT (W) | Red | Off | No Watchdog event |
| | | Blinking | Watchdog event alert |
| HDD (H) | Amber | Off | No HDD activity |
| | | Blinking | Data read/write in process |
| GPIO (G) | Blue | Off | GPIO is off |
| | | On | GPIO is enabled |
| Power (P) | Green | Off | System is off |
| | | On | System is on |

**Table 4-1: cPCI-6615 Front Panel Status LED Descriptions**

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## 4.5 cPCI-R6002 RTM Layout




| | | | |
|---|---|---|---|
| **CN1~2** | SATA connectors | **JP1** | USB pin header |
| **CN9** | COM3 DB-9 connector | **GbE1/2** | GbE RJ-45 connectors |
| **CN10** | COM4 box header | **rJ3/rJ4/rJ5** | CompactPCI connectors |
| **CN14** | Board-to-Board connector | **SW1~4** | PICMG 2.16 switches |
| **CNY1** | VGA connector | **USB** | USB ports |

**Figure 4-5: cPCI-R6002 RTM Board Layout**

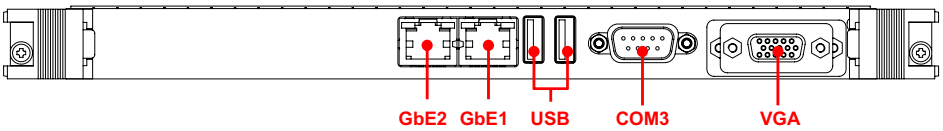



**Figure 4-6: cPCI-R6002 RTM Front Panel Layout**

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## 4.6 Connector Pin Assignments

### USB Connectors (USB1~4)

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

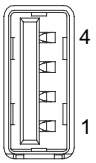



**Table 4-2: USB Connector Pin Definition**

### USB Onboard Box Header (CN6)

(for cable to connector on 8HP front panel)

| Pin # | Signal Name |
|---|---|
| 1 | P5V_USB_2_3 |
| 2 | GND |
| 3 | USB3_CN-P |
| 4 | USB3_CN-N |
| 5 | GND |

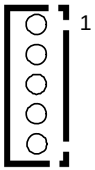



**Table 4-3: USB Onboard Box Header Pin Definition**

### VGA Connector (cPCI-6615D layer 2)

| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Red | 1 | 2 | Green |
| Blue | 3 | 4 | N.C. |
| GND | 5 | 6 | GND |
| GND | 7 | 8 | GND |
| +5V. | 9 | 10 | GND |
| N.C. | 11 | 12 | CRTDATA |
| HSYNC | 13 | 14 | VSYNC |
| CRTCLK | 15 | | |

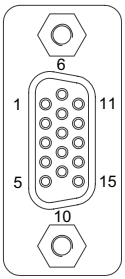



**Table 4-4: VGA Connector Pin Definition**

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### VGA Onboard Box Header (CN14)
(for cable to connector on 8HP front panel)

| Pin # | Signal Name | Pin # | Signal Name |
|---|---|---|---|
| 1 | P5V | 2 | CON_DATA |
| 3 | NC | 4 | CON_DDCCLK |
| 5 | VGA_GND | 6 | CON_RED |
| 7 | VGA_GND | 8 | CON_GREEN |
| 9 | VGA_GND | 10 | CON_BLUE |
| 11 | VGA_GND | 12 | CON_HSYNC |
| 13 | VGA_GND | 14 | CON_VSYNC |

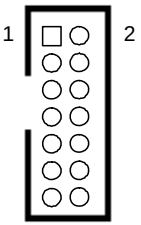



**Table 4-5: VGA Onboard Box Header**

### PS/2 Keyboard/Mouse Connector (cPCI-6615D layer 2)

| 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 |

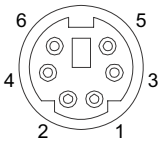



**Table 4-6: PS/2 Keyboard/Mouse Connector Pin Definition**

### PS/2 KB/MS Onboard Box Header (CN1)
(for cable to connector on 8HP front panel

| Pin # | Signal Name |
|---|---|
| 1 | KBDATA |
| 2 | MSDATA |
| 3 | GND |
| 4 | +5V |
| 5 | KBCLK |
| | MSCLK |

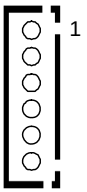



**Table 4-7: PS/2 KB/MS Onboard Box Header Pin Definition**

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### RJ-45 Gigabit Ethernet Connectors (GbE1~3)

| Pin # | 10BASE-T/ 100BASE-TX | 1000BASE-T |
|---|---|---|
| 1 | TX+ | GBEn_TXDP0 |
| 2 | TX- | GBEn_TXDN0 |
| 3 | RX+ | GBEn_TXDP1 |
| 4 | -- | GBEn_TXDP2 |
| 5 | -- | GBEn_TXDN2 |
| 6 | RX- | GBEn_TXDN1 |
| 7 | -- | GBEn_TXDP3 |
| 8 | -- | GBEn_TXDN3 |

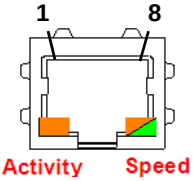



**Table 4-8: GbE Connector Pin Definitions**

| 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 4-9: GbE LED Status Definitions**

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### COM1 Connector (DB-9)

| Pin # | RS-232 | RS-422 | RS-485 |
|---|---|---|---|
| 1 | DCD-L | TXD- | TXD- |
| 2 | RXD | TXD+ | TXD+ |
| 3 | TXD | RXD+ | — |
| 4 | DTR-L | RXD- | — |
| 5 | GND | GND | GND |
| 6 | DSR-L | — | — |
| 7 | RTS-L | — | — |
| 8 | CTS-L | — | — |
| 9 | RI-L | — | — |

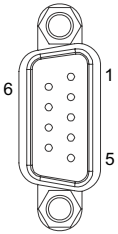



**Table 4-10: COM1 Connector Pin Definition**

NOTE: See the BIOS section for Serial Port Mode settings.

### COM2 Connector (DB-9 - cPCI-6615D layer 2)

| Pin # | RS-232 |
|---|---|
| 1 | DCD-L |
| 2 | RXD |
| 3 | TXD |
| 4 | DTR-L |
| 5 | GND |
| 6 | DSR-L |
| 7 | RTS-L |
| 8 | CTS-L |
| 9 | RI-L |

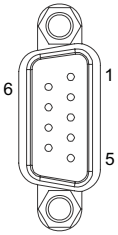



**Table 4-11: COM2 Connector Pin Definition**

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## COM2 Onboard Serial Port Connector

| Pin # | RS-232 |
|---|---|
| 1 | DCD-L |
| 2 | DSR-L |
| 3 | RXD |
| 4 | RTS-L |
| 5 | TXD |
| 6 | CTS-L |
| 7 | DTR-L |
| 8 | RI-L |
| 9 | GND |
| 10 | NC |

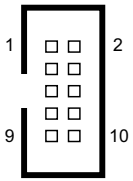



**Table 4-12: COM2 Onboard Box Header Definition**

## Serial ATA Connectors (CN5)

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




**Table 4-13: 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 |

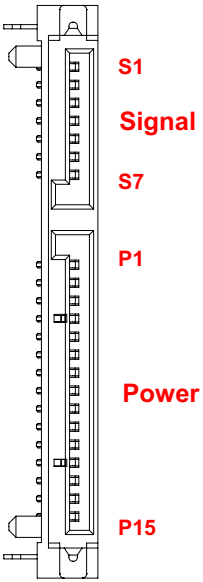



**Table 4-14: DB-6920SAT SATA Connector Pin Definition**

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## CompactFlash Connector

| Signal Name | Pin# | Pin# | Signal Name |
|---|---|---|---|
| GND | 1 | 26 | CD1 |
| IDE_PDD3 | 2 | 27 | IDE_PDD11 |
| IDE_PDD4 | 3 | 28 | IDE_PDD12 |
| IDE_PDD5 | 4 | 29 | IDE_PDD13 |
| IDE_PDD6 | 5 | 30 | IDE_PDD14 |
| IDE_PDD7 | 6 | 31 | IDE_PDD15 |
| IDE_CS1-L | 7 | 32 | IDE_CS3-L |
| GND | 8 | 33 | GND |
| GND | 9 | 34 | IDE_IOR-L |
| GND | 10 | 35 | IDE_IOW-L |
| GND | 11 | 36 | VCC_CF |
| GND | 12 | 37 | IDE_IRQ |
| VCC_CF | 13 | 38 | VCC_CF |
| GND | 14 | 39 | PCSEL |
| GND | 15 | 40 | NC |
| GND | 16 | 41 | IDE_RST-L |
| GND | 17 | 42 | IDE_IORDY |
| IDE_DA2 | 18 | 43 | IDE_REQ-L |
| IDE_DA1 | 19 | 44 | IDE_ACK-L |
| IDE_DA0 | 20 | 45 | CFDACT |
| IDE_PDD0 | 21 | 46 | CF33 |
| IDE_PDD1 | 22 | 47 | IDE_PDD8 |
| IDE_PDD2 | 23 | 48 | IDE_PDD9 |
| CF_MODE | 24 | 49 | IDE_PDD10 |
| GND | 25 | 50 | GND |

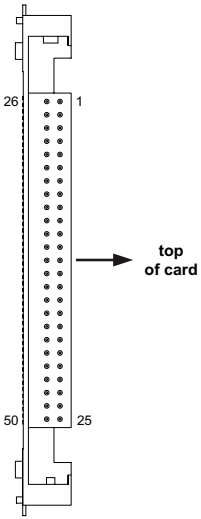



**Table 4-15: CompactFlash Connector Pin Definition**

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## PMC Connector (JN1, JN2, JN3)

| Pin# | JN1 Signal | JN2 Signal | JN3 Signal |
|---|---|---|---|
| 1 | PMC_TCK | P12V | NC |
| 2 | N12V | PMC_TRST-L | GND |
| 3 | GND | PMC_TMS | GND |
| 4 | PCIX_INTA-L | NC (PMC_TDO) | PCIX_CBE-L7 |
| 5 | PCIX_INTB-L | PMC_TDI | PCIX_CBE-L6 |
| 6 | PCIX_INTC-L | GND | PCIX_CBE-L5 |
| 7 | PMC_MOD-L1 | GND | PCIX_CBE-L4 |
| 8 | P5V | NC | GND |
| 9 | PCIX_INTD-L | NC | PMC_VIO |
| 10 | NC | NC | PCIX_PAR64 |
| 11 | GND | PMC_MOD-L2 | PCIX_AD63 |
| 12 | P3V3_PMCAUX | P3V3 | PCIX_AD62 |
| 13 | CLK66_PCIX_PMC | PMC_RST-L | PCIX_AD61 |
| 14 | GND | PMC_MOD-L3 | GND |
| 15 | GND | P3V3 | GND |
| 16 | PCIX_GNT-L0 | PMC_MOD-L4 | PCIX_AD60 |
| 17 | PCIX_REQ-L0 | PMC_PME-L | PCIX_AD59 |
| 18 | P5V | GND | PCIX_AD58 |
| 19 | PMC_VIO | PCIX_AD30 | PCIX_AD57 |
| 20 | PCIX_AD31 | PCIX_AD29 | GND |
| 21 | PCIX_AD28 | GND | GND |
| 22 | PCIX_AD27 | PCIX_AD26 | PCIX_AD56 |
| 23 | PCIX_AD25 | PCIX_AD24 | PCIX_AD55 |
| 24 | GND | PCIX_AD23 | PCIX_AD54 |
| 25 | GND | PMC_IDSEL | PCIX_AD53 |
| 26 | PCIX_CBE-L3 | PCIX_AD23 | GND |
| 27 | PCIX_AD22 | P3V3 | GND |
| 28 | PCIX_AD21 | PCIX_AD20 | PCIX_AD52 |
| 29 | PCIX_AD19 | PCIX_AD18 | PCIX_AD51 |
| 30 | P5V | GND | PCIX_AD50 |
| 31 | PCIX_FRAME-L | PCIX_AD16 | PCIX_AD49 |
| 32 | PCIX_AD17 | PCIX_CBE-L2 | GND |

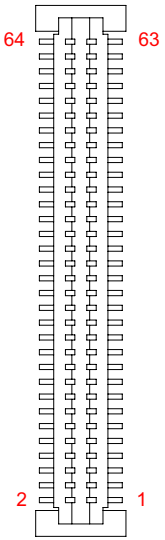



**Table 4-16: PMC Connector Pin Definitions**

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| Pin# | JN1 Signal | JN2 Signal | JN3 Signal |
|---|---|---|---|
| 33 | PCIX_FRAME-L | GND | GND |
| 34 | GND | NC | PCIX_AD48 |
| 35 | GND | PCIX_TRDY-L | PCIX_AD47 |
| 36 | PCIX_IRDY-L | P3V3 | PCIX_AD46 |
| 37 | PCIX_DEVSEL-L | GND | PCIX_AD45 |
| 38 | P5V | PCIX_STOP-L | GND |
| 39 | PCIX_PCIXCAP | PCIX_PERR-L | GND |
| 40 | PCIX_LOCK-L | GND | PCIX_AD44 |
| 41 | NC | P3V3 | PCIX_AD43 |
| 42 | NC | PCIX_SERR-L | PCIX_AD42 |
| 43 | PCIX_PAR | PCIX_CBE-L1 | PCIX_AD41 |
| 44 | GND | GND | GND |
| 45 | PMC_VIO | PCIX_AD14 | GND |
| 46 | PCIX_AD15 | PCIX_AD13 | PCIX_AD40 |
| 47 | PCIX_AD12 | PCIX_M66EN | PCIX_AD39 |
| 48 | PCIX_AD11 | PCIX_AD10 | PCIX_AD38 |
| 49 | PCIX_AD9 | PCIX_AD8 | PCIX_AD37 |
| 50 | P5V | P3V3 | GND |
| 51 | GND | PCIX_AD7 | GND |
| 52 | PCIX_CBE-L0 | NC | PCIX_AD36 |
| 53 | PCIX_AD6 | P3V3 | PCIX_AD35 |
| 54 | PCIX_AD5 | NC | PCIX_AD34 |
| 55 | PCIX_AD4 | NC | PCIX_AD33 |
| 56 | GND | GND | GND |
| 57 | PMC_VIO | NC | GND |
| 58 | PCIX_AD3 | NC | PCIX_AD32 |
| 59 | PCIX_AD2 | GND | NC |
| 60 | PCIX_AD1 | NC | NC |
| 61 | PCIX_AD0 | PCIX_ACK64-L | NC |
| 62 | P5V | P3V3 | GND |
| 63 | GND | GND | GND |
| 64 | PCIX_REQ64-L | NC | NC |

**Table 4-16: PMC Connector Pin Definitions (cont'd)**

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## DB-6920SAT Connector (CNX3)

| 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 |

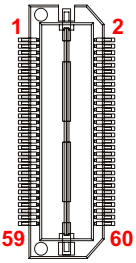



**Table 4-17: DB-6920SAT Connector Pin Definition**

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## CompactPCI J1 Connector Pin Assignment

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 25 | GND | P5V | P3V3 | CPCI_ENUM-L | NC | P5V | GND |
| 24 | GND | JCPCI_AD1 | P5V | CPCI_VIO | JCPCI_AD0 | P3V3 | GND |
| 23 | GND | NC | JCPCI_AD4 | JCPCI_AD3 | P5V | JCPCI_AD2 | GND |
| 22 | GND | JCPCI_AD7 | GND | NC | JCPCI_AD6 | JCPCI_AD5 | GND |
| 21 | GND | NC | JCPCI_AD9 | JCPCI_AD8 | CPCI_M66EN | JCPCI_CBE-L0 | GND |
| 20 | GND | JCPCI_AD12 | GND | CPCI_VIO | JCPCI_AD11 | JCPCI_AD10 | GND |
| 19 | GND | NC | JCPCI_AD15 | JCPCI_AD14 | GND | JCPCI_AD13 | GND |
| 18 | GND | JCPCI_SERR-L | GND | NC | JCPCI_PAR | JCPCI_CBE-L1 | GND |
| 17 | GND | NC | IPMB_PWR | IPMB_PWR | GND | JCPCI_PERR-L | GND |
| 16 | GND | JCPCI_DEVSEL-L | CPCI_PCIXCAP | CPCI_VIO | JCPCI_STOP-L | JCPCI_LOCK-L | GND |
| 15 | GND | NC | JCPCI_FRAME-L | JCPCI_IRDY-L | GND | JCPCI_TRDY-L | GND |
| 12-14 | GND | Key Area | | | | | Key |
| 11 | GND | JCPCI_AD18 | JCPCI_AD17 | JCPCI_AD16 | GND | JCPCI_CBE-L2 | GND |
| 10 | GND | JCPCI_AD21 | GND | NC | JCPCI_AD20 | JCPCI_AD19 | GND |
| 9 | GND | JCPCI_CBE-L3 | GND | JCPCI_AD23 | GND | JCPCI_AD22 | GND |
| 8 | GND | JCPCI_AD26 | GND | CPCI_VIO | JCPCI_AD25 | JCPCI_AD24 | GND |
| 7 | GND | GND | JCPCI_AD30 | JCPCI_AD29 | JCPCI_AD28 | JCPCI_AD27 | GND |
| 6 | GND | CPCI_REQ-L0 | CPCI_PRESENT-L | NC | CPCI_CLK0 | JCPCI_AD31 | GND |
| 5 | GND | NC | NC | JCPCI_RESET-L | GND | CPCI_GNT-L0 | GND |
| 4 | GND | IPMB_PWR | CPCI_HEALTHY-L | CPCI_VIO | NC | NC | GND |
| 3 | GND | JCPCI_IRQA-L | JCPCI_IRQB-L | JCPCI_IRQC-L | P5V | JCPCI_IRQD-L | GND |
| 2 | GND | CPCI_TCK | P5V | CPCI_TMS | NC | CPCI_TDI | GND |
| 1 | GND | P5V | NC | CPCI_TRST-L | NC | P5V | GND |

**Table 4-18: CompactPCI J1 Connector Pin Definition**

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## CompactPCI J2 Connector Pin Assignment

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 22 | GND | GA4 | GA3 | GA2 | GA1 | GA0 | GND |
| 21 | GND | CPCI_CLK6 | GND | NC | NC | NC | GND |
| 20 | GND | CPCI_CLK5 | GND | NC | GND | NC | GND |
| 19 | GND | GND | GND | NC | NC | NC | GND |
| 18 | GND | NC | NC | NC | GND | NC | GND |
| 17 | GND | NC | NI | R_PRSTJ | JCPCI_REQ-L6 | CPCI_GNT-L6 | GND |
| 16 | GND | NC | NC | DEG-L | GND | NC | GND |
| 15 | GND | NC | GND | FAL-L | JCPCI_REQ-L5 | CPCI_GNT-L5 | GND |
| 14 | GND | CPCI_AD35 | CPCI_AD34 | CPCI_AD33 | GND | CPCI_AD32 | GND |
| 13 | GND | CPCI_AD38 | GND | CPCI_VIO | CPCI_AD37 | CPCI_AD36 | GND |
| 12 | GND | CPCI_AD42 | CPCI_AD41 | CPCI_AD40 | GND | CPCI_AD39 | GND |
| 11 | GND | CPCI_AD45 | GND | CPCI_VIO | CPCI_AD44 | CPCI_AD43 | GND |
| 10 | GND | CPCI_AD49 | CPCI_AD48 | CPCI_AD47 | GND | CPCI_AD46 | GND |
| 9 | GND | CPCI_AD52 | GND | CPCI_VIO | CPCI_AD51 | CPCI_AD50 | GND |
| 8 | GND | CPCI_AD56 | CPCI_AD55 | CPCI_AD54 | GND | CPCI_AD53 | GND |
| 7 | GND | CPCI_AD59 | GND | CPCI_VIO | CPCI_AD58 | CPCI_AD57 | GND |
| 6 | GND | CPCI_AD63 | CPCI_AD62 | CPCI_AD61 | GND | CPCI_AD60 | GND |
| 5 | GND | CPCI_CBE-L5 | GND | CPCI_VIO | CPCI_CBE-L4 | CPCI_PAR64 | GND |
| 4 | GND | CPCI_VIO | NC | CPCI_CBE-L7 | GND | CPCI_CBE-L6 | GND |
| 3 | GND | CPCI_CLK4 | GND | CPCI_GNT-L3 | JCPCI_REQ-L4 | CPCI_GNT-L4 | GND |
| 2 | GND | CPCI_CLK2 | CPCI_CLK3 | SYSEN-L | CPCI_GNT-L2 | JCPCI_REQ-L3 | GND |
| 1 | GND | CPCI_CLK1 | GND | JCPCI_REQ-L1 | CPCI_GNT-L1 | JCPCI_REQ-L2 | GND |

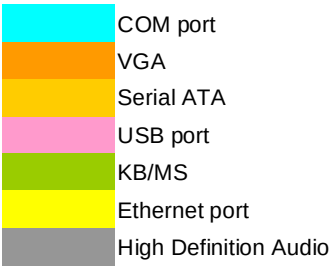
**Table 4-19: CompactPCI J2 Connector Pin Definition**

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## CompactPCI J3 Pin Assignment

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 19 | GND | P5V | P5V | P12V | P5V | P5V | GND |
| 18 | GND | GBE1_TXDP0 | GBE1_TXDN0 | GND | GBE1_TXDP2 | GBE1_TXDN2 | GND |
| 17 | GND | GBE1_TXDP1 | GBE1_TXDN1 | GND | GBE1_TXDP3 | GBE1_TXDN3 | GND |
| 16 | GND | GBE2_TXDP0 | GBE2_TXDN0 | GND | GBE2_TXDP2 | GBE2_TXDN2 | GND |
| 15 | GND | GBE2_TXDP1 | GBE2_TXDN1 | GND | GBE2_TXDP3 | GBE2_TXDN3 | GND |
| 14 | GND | USB_5_OC-L | USB_6_OC-L | USB_7_OC-L | USB_8_OC-L | USB_9_OC-L | GND |
| 13 | GND | USB8-P | USB8-N | GND | USB9-P | USB9-N | GND |
| 12 | GND | USB6-P | USB6-N | GND | USB7-P | USB7-N | GND |
| 11 | GND | USB4-P | USB4-N | GND | USB5-P | USB5-N | GND |
| 10 | GND | USB_4_OC-L | R_VGA_DDC_CLK | R_VGA_DDC_DAT | R_VGA_HSY | R_VGA_VSY | GND |
| 9 | GND | COM3_CTS-L | COM3_RI-L | R_VGA_B | R_VGA_R | R_VGA_G | GND |
| 8 | GND | COM3_SIN | COM3_SOUT | COM3_DTR-L | COM3_DSR-L | COM3_RTS-L | GND |
| 7 | GND | COM4_SOUT | COM4_SIN | COM3_DCD-L | SMB_CLK | SMB_DAT | GND |
| 6 | GND | SATA_J3_ICH_RX-P1 | SATA_J3_ICH_RX-N1 | GND | NC | NC | GND |
| 5 | GND | GND | GND | NC | GND | GND | GND |
| 4 | GND | SATA_ICH_J3_TX-P1 | SATA_ICH_J3_TX-N1 | GND | NC | NC | GND |
| 3 | GND | KBDATA | KBCLK | NC | MSDATA | MSCLK | GND |
| 2 | GND | HDA_SDIN1 | HDA_SDIN2 | NC | HDA_DOCK_EN-L | HDA_DOCK_RST-L | GND |
| 1 | GND | HDA_R_RST-L | HDA_R_SYNC | HDA_R_BIT_CLK | HDA_R_SDOUT | HDA_SDIN0 | GND |

**Table 4-20: CompactPCI J3 Connector Pin Definition**




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## CompactPCI J5 Pin Assignment

| Pin | Z | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| 22 | GND | NC | GBE2_LED_ACT-L | +3.3V | GBE1_LED_ACT-L | +3.3V | GND |
| 21 | GND | LA_DATA_N2 | LA_DATA_P2 | GND | LA_CLKN | LA_CLKP | GND |
| 20 | GND | LA_DATA_N0 | LA_DATA_P0 | GND | LA_DATA_N1 | LA_DATA_P1 | GND |
| 19 | GND | NC | NC | NC | NC | NC | GND |
| 18 | GND | NC | NC | RTM_DETECT-L | NC | NC | GND |
| 17 | GND | NC | NC | REAR_GPIO8 | NC | NC | GND |
| 16 | GND | NC | NC | REAR_GPIO7 | NC | NC | GND |
| 15 | GND | NC | NC | REAR_GPIO6 | NC | NC | GND |
| 14 | GND | NC | NC | GND | NC | NC | GND |
| 13 | GND | GBE2_LED_100-L | GBE1_LED_100-L | NC | GBE1_LED_1000-L | GBE2_LED_1000-L | GND |
| 12 | GND | NC | NC | NC | NC | NC | GND |
| 11 | GND | NC | NC | GND | NC | NC | GND |
| 10 | GND | NC | NC | GND | NC | NC | GND |
| 9 | GND | ICH_GPIO12 | ICH_GPIO13 | ICH_GPIO14 | ICH_GPIO22 | ICH_GPIO39 | GND |
| 8 | GND | NC | NC | GND | LDDC_CLK | LDDC_DATA | GND |
| 7 | GND | GND | GND | CN_VCC_RTCR | GND | GND | GND |
| 6 | GND | NC | NC | GND | NC | NC | GND |
| 5 | GND | GND | GND | GND | GND | GND | GND |
| 4 | GND | NC | NC | GND | NC | NC | GND |
| 3 | GND | NC | NC | GND | NC | NC | GND |
| 2 | GND | NC | NC | GND | NC | NC | GND |
| 1 | GND | NC | NC | GND | NC | NC | GND |

**Table 4-21: CompactPCI J5 Connector Pin Definition**

Ethernet port
GPIO
LVDS

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## 4.7 Switch and Jumper Settings

### Load BIOS Default Switch (SW1)

Press switch SW4 to load the default BIOS settings.The switch is located on the component side of the board, between the CompactPCI J3 and J5 connectors, next to the SATA connector (CN5).



### System Reset Switch (SW4)

Press switch SW4 to reset the system. The switch is located on the front panel, between GbE1 and the USB ports.



### VGA Mode Jumper (JPX2)

VGA output can be switched from the front panel (box header on 4HP model) to the RTM (J3) by jumper selection. On the 8HP version, VGA output is set to the front panel VGA port by default (pins 1 and 2 shorted). To send VGA output to the RTM (J3), remove the shunt shorting pins 1 and 2 (it can be placed on either pin for storage). On the 4HP model, VGA output is routed to J3 by default (pins 1 and 2 open).

NOTE:

If the system is booted into Windows OS without a VGA monitor connected, the graphics output will be set to LVDS. To set the display output signal to VGA, press Control+Alt+F1 after connecting the VGA monitor to the DB-15 connector.

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# 5 Getting Started

This chapter describes the installation procedures for the cPCI-6615 and rear transition module:

- CompactFlash card installation
- Memory installation
- 2.5” SATA Hard Drive Disk installation
- PMC installation
- cPCI-6615 installation to chassis
- RTM installation to chassis

## 5.1 CPU and Heatsink

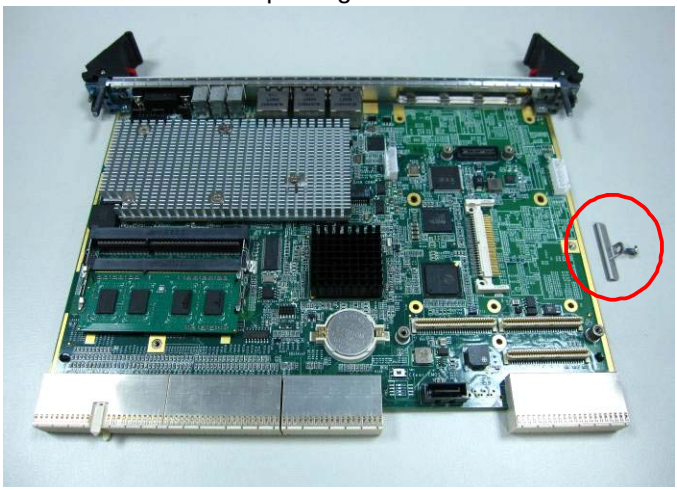
The cPCI-6615 Series come with CPU and heatsink are pre-installed. Removal of heatsink/CPU by users is not recommended. Please contact your ADLINK service representative for assistance.

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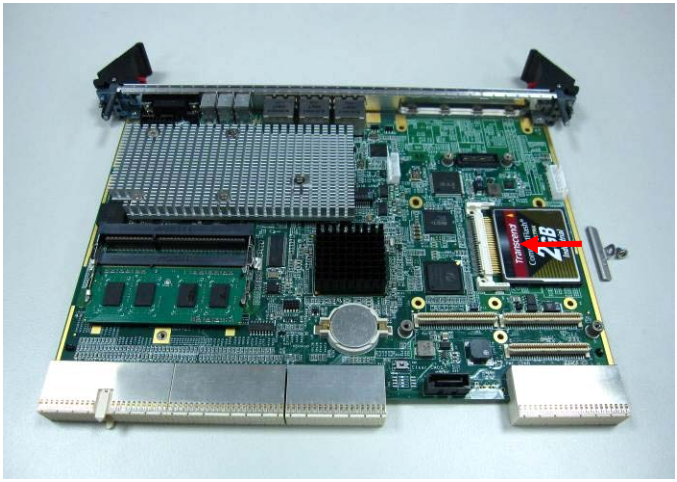
## 5.2 CompactFlash Card installation

The cPCI-6615 Series provides an onboard slot to install a CompactFlash card.

1. Prepare a CompactFlash card and locate the CF retension bracket in the package.

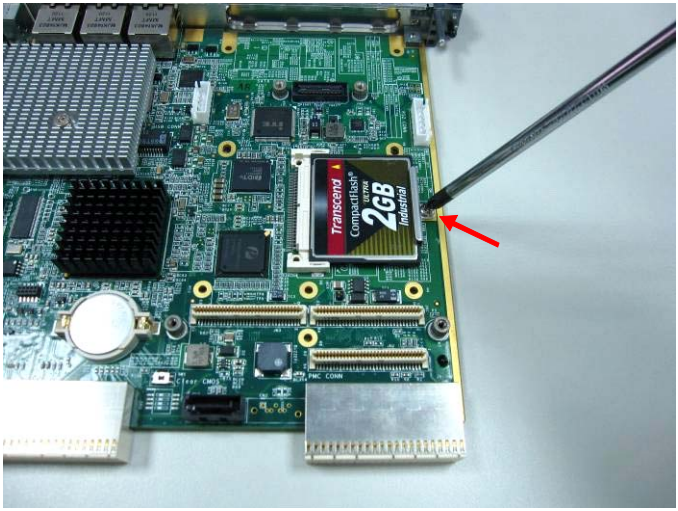


2. Insert the CompactFlash card into the slot.



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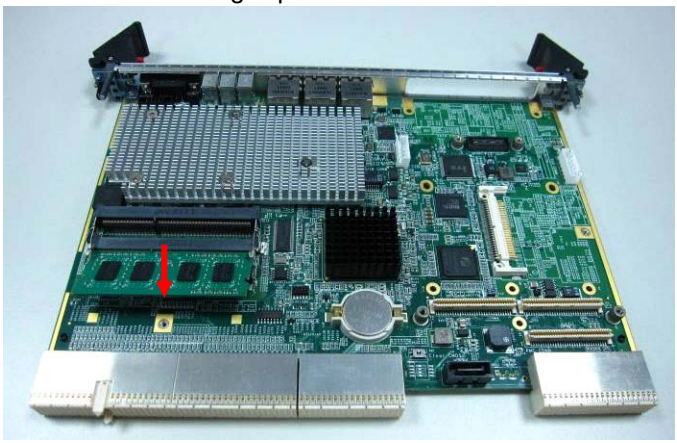
3. Align the CF retension bracket and secure it with the screw provided.



## 5.3 Memory Installation

The cPCI-6615 series provides two SO-DIMM sockets and a memory retention bracket to secure memory on the board.

1. Insert the memory modules(s) into the SO-DIMM socket at a 30° angle and press down the edge of the module until the retaining clips "click".



2. Slide in the memory retention bracket into place and secure it with the screw provided. The retention bracket will prevent all four SO-DIMM retaining clips from popping open.

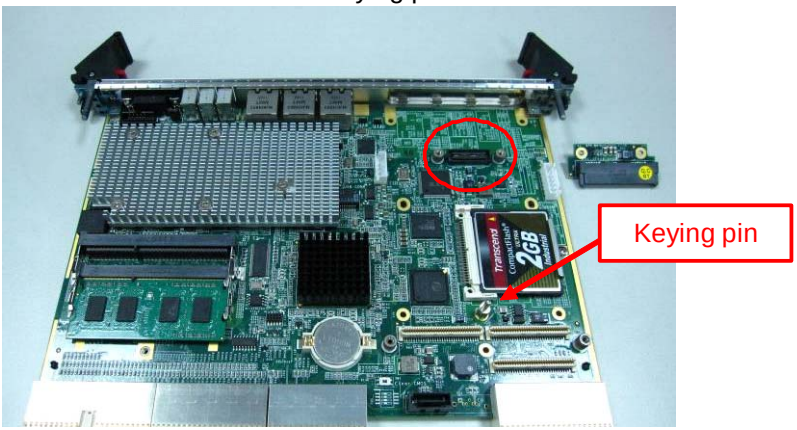


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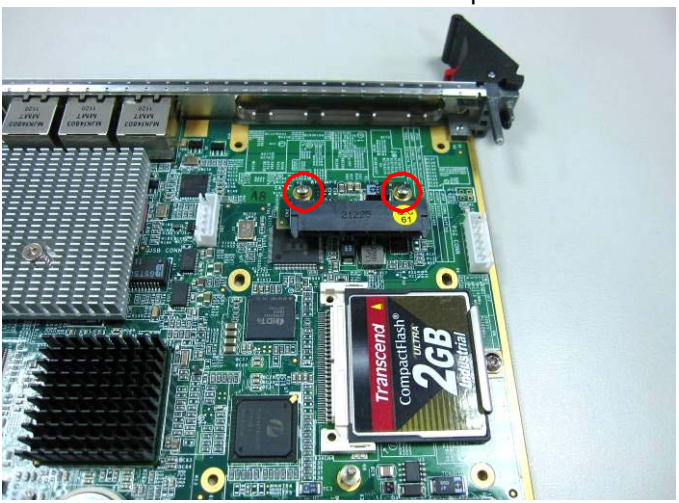
## 5.4 2.5" SATA Drive Installation

The cPCI-6615 provides space to install a slim type 2.5” SATA drive.

1. Locate the DB-6920SAT kit in the package (includes daughter board, 2 standoffs, drive bracket, 6 screws). Locate the onboard SATA connector (CNX3) as shown below. Remove the PMC keying pin indicated below.




2. Secure the DB-6920SAT daughter board to the onboard SATA connector CNX3 with two screws provided.



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3. Secure the two standoffs included with the DB-6920SAT to the underside of the SATA drive at the connector end as shown.

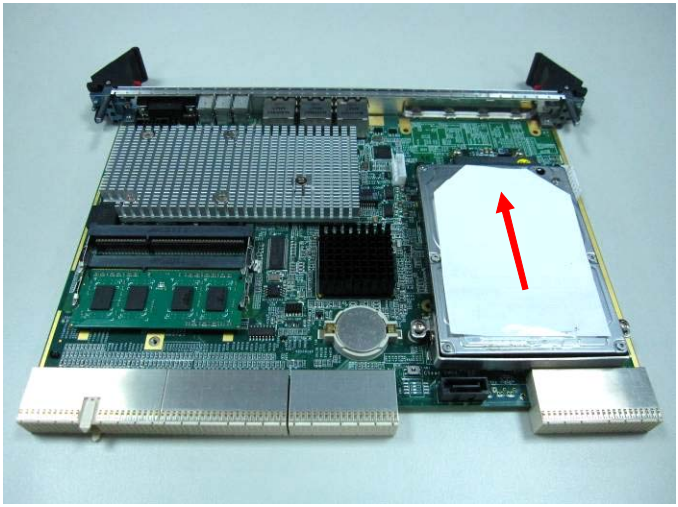


4. Secure the drive bracket with two screws shown as below.

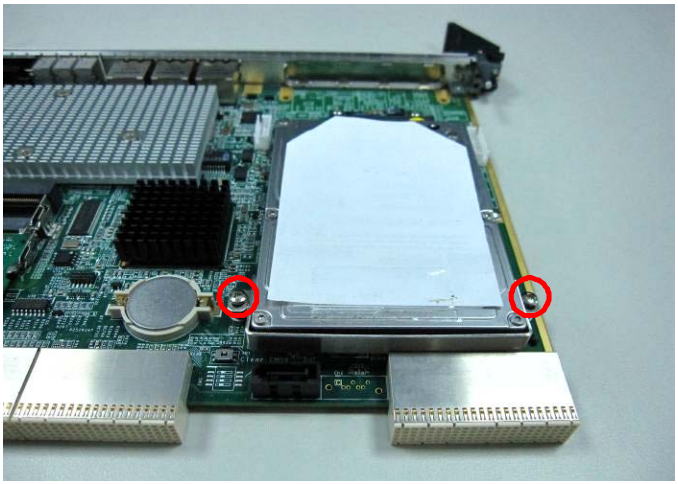


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5. Insert the drive assembly into the connectors on DB-6920SAT until it is properly seated.

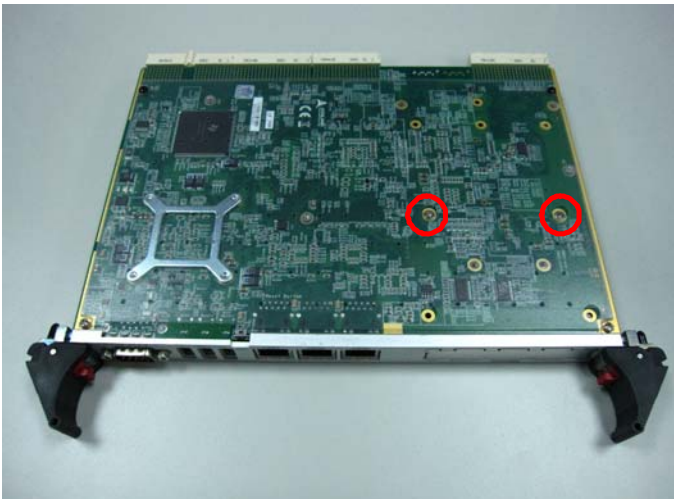


6. Secure the drive assembly to the cPCI-6615 by securing two screws to the drive bracket.



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7. Turn the cPCI-6615 blade over (solder side up) and secure two screws to the standoffs on the drive assembly shown as below.

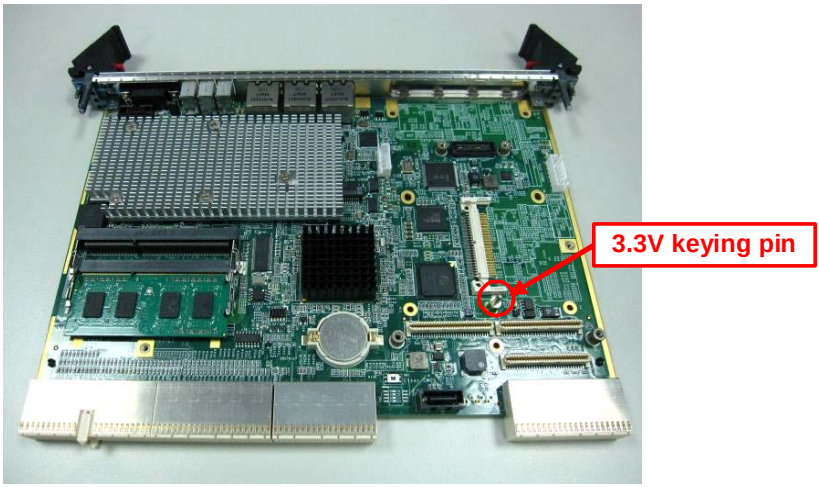


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## 5.5 PCI Mezzanine Card Installation

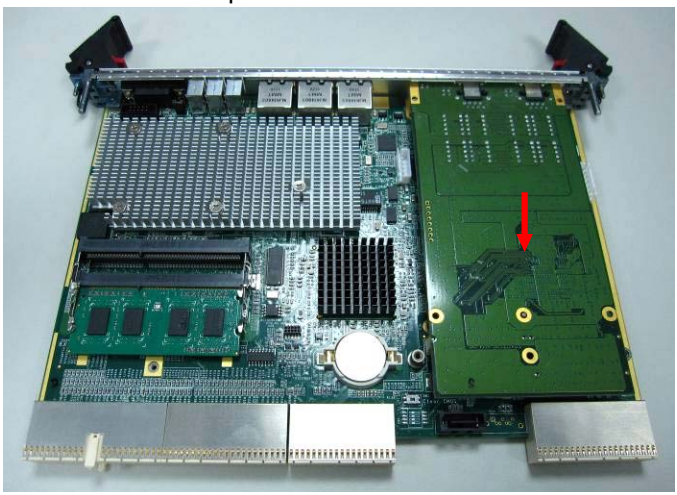
The PMC slot on the cPCI-6615 is designed to support 3.3V. Please contact ADLINK for 5V signalling support.

1. Before installing a PMC module, keep the V(I/O) keying pin in place for module with 3.3V signaling.

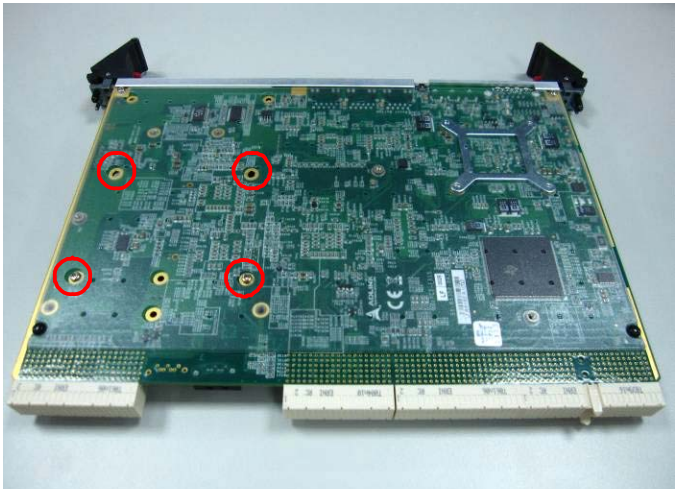



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2. Remove the PMC filler faceplate from the front panel. Align the male connectors of the PMC module (component-side down) to the female connectors of the cPCI-6615 and press down.



3. Secure the PMC module to the cPCI-6615 with four screws (provided with the card) from the bottom side of the board as indicated below.



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## 5.6 Installing the cPCI-6615 to the Chassis

The cPCI-6615 can be installed in a system 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 system slot to install the blade. The system power may be either 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-6615 ejector handles.
4. **Remove the black plastic caps securing the mounting screws to the front panel.**
5. Align the blade¡¦s top and bottom edges to the chassis card guides, and then carefully slide the blade into the chassis. A slight resistance may be felt when inserting the blade. 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 handle outwards to secure the blade in place, and then fasten the screws on the front panel.
7. Connect the cables and peripherals to the board, and then turn the chassis on if necessary.

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## 5.7 RTM Installation

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-6615 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-6615 drivers are available from the ADLINK All-In-One CD at **X:\cPCI\cPCI-6615**, or from the ADLINK website (**http://www.adlinktech.com**). This section describes the driver installation procedures for Windows® 7 32-bit.

1. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.
2. Install the chipset driver by running the program in the archive **...\Chipset\Intel_Chipset_Device_Software_WIN_All_1.0.0.2.zip.**
3. Install the Intel INF Update Utility by extracting and running the program in the archive **…\Chipset\Intel_INF_Update_Utility_All_WinOS_v9.1.1.1.1023.zip**
4. Install the VGA driver and utilities by running the program in the archive **...\Graphics\Intel_Graphics_Adapter_Win7_64_v8.14.10.2230.zip**.
5. Install the LAN driver by running the program in the archive **…\LAN\Intel_82583V_Gigabit_Network_Connection_Win_7_32.zip**.
6. Install the Audio driver by running the program in the archive **…\Audio\Realtek_High_Definition_Audio_Win7_Driver32_v6.0.1.6029.zip**

We recommend using the drivers provided on the ADLINK All-in-One CD or downloaded from the ADLINK website to ensure compatibility. Please download the VxWorks BSP from the ADLINK website.

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# 7 Utilities

## 7.1 Watchdog Timer

This section describes the operation of the cPCI-6615's watchdog timer (WDT). The primary function of the WDT is to monitor the cPCI-6615'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-6615 custom WDT circuit is implemented using the internal I/O of the ITE SuperIO IT8783 which is at 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 second or minute to maximum 65635 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-6615'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 countdown value is not reloaded, the watchdog resets the system hardware after its counter reaches zero.

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## 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;
       }
}

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

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```
   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 program
void IT8783_3_WDTRun(unsigned int count_value, unsigned
     int PLEDflag)   //for cPCI-3610
{
   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, 0x2D);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue |= 0x01;       // set Pin109 is GPIO
      function GP60
      outportb(IT8783_ioPort+1, registerValue);

      outportb(IT8783_ioPort, 0xC5);
      registerValue = inportb(IT8783_ioPort + 1);
```

```
    registerValue &= 0xfe;      // set GP60 is alternate
    function
    outportb(IT8783_ioPort+1, registerValue);

    outportb(IT8783_ioPort, 0xCD);
    registerValue = inportb(IT8783_ioPort + 1);
    registerValue |= 0x01;  // set GP60 is output
    outportb(IT8783_ioPort+1, registerValue);

    outportb(IT8783_ioPort, 0xf8);
    outportb(IT8783_ioPort+1, 0x30);// PLED mapping to
    GP60

    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 &= 0x8f;
   registerValue |= 0x10; //enable WDT output through
   PowerOK!
   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
   }

}
```

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# 8 BIOS Setup

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.

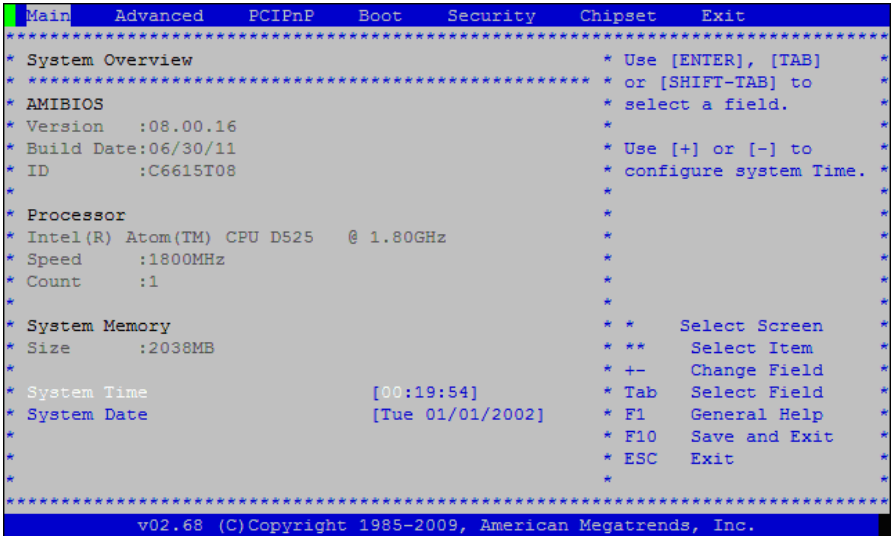
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## Setup Menu

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.

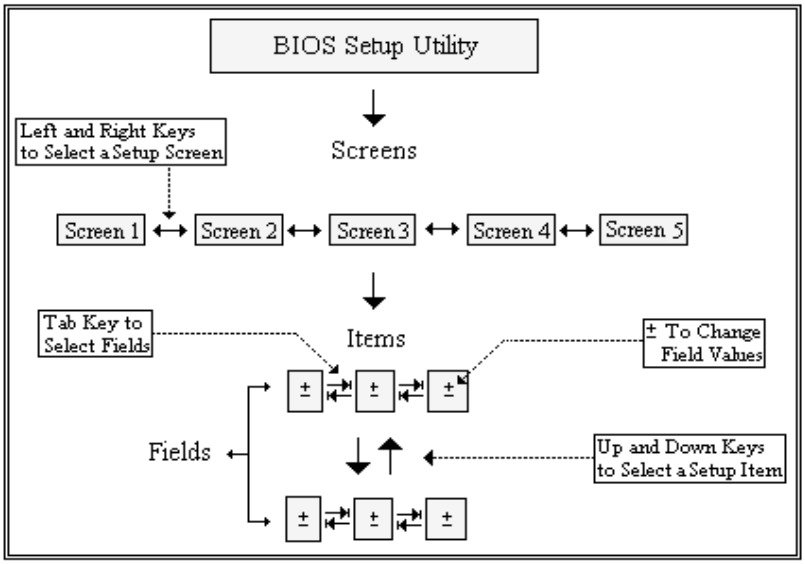



## Navigation

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.

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

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

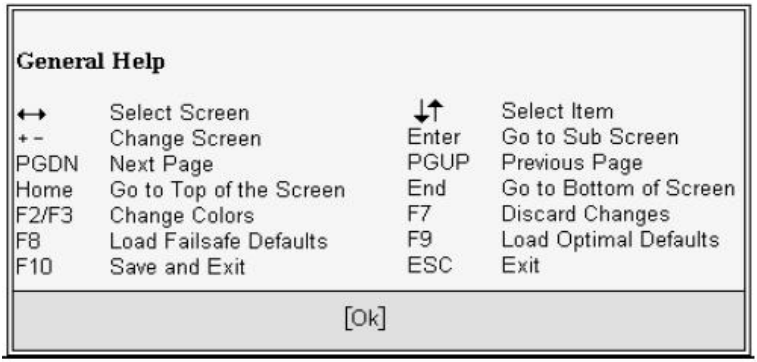
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the motherboard to boot up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

## Hotkey Descriptions

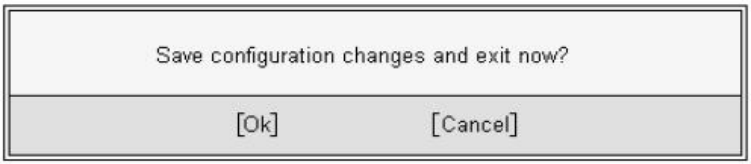
**F1** The < F1 > key allows you to display the General Help screen.

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

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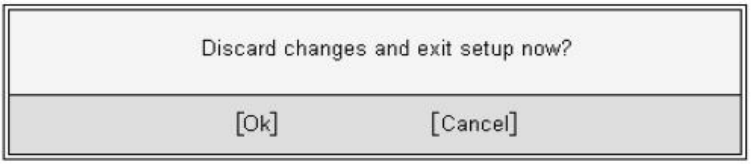



**F10** The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:




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:



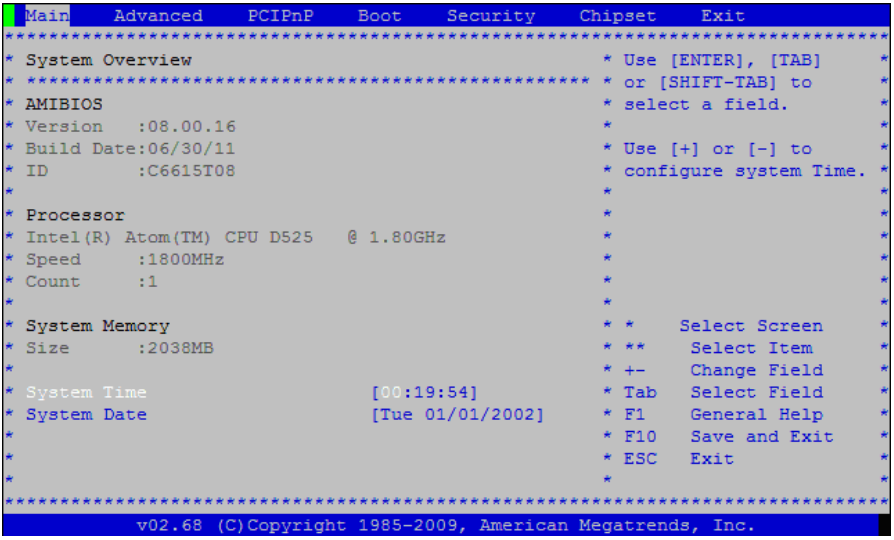

Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

**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.

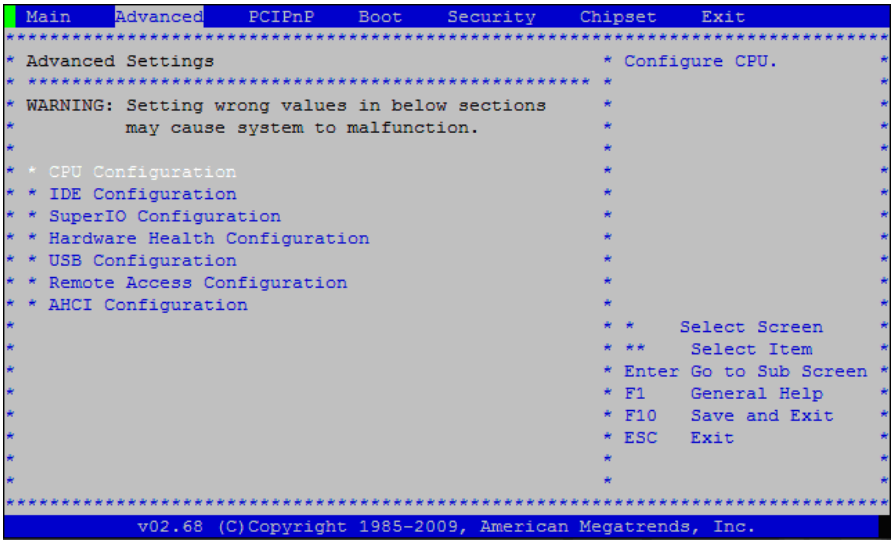
**Note:** The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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## 8.3 Advanced BIOS Setup

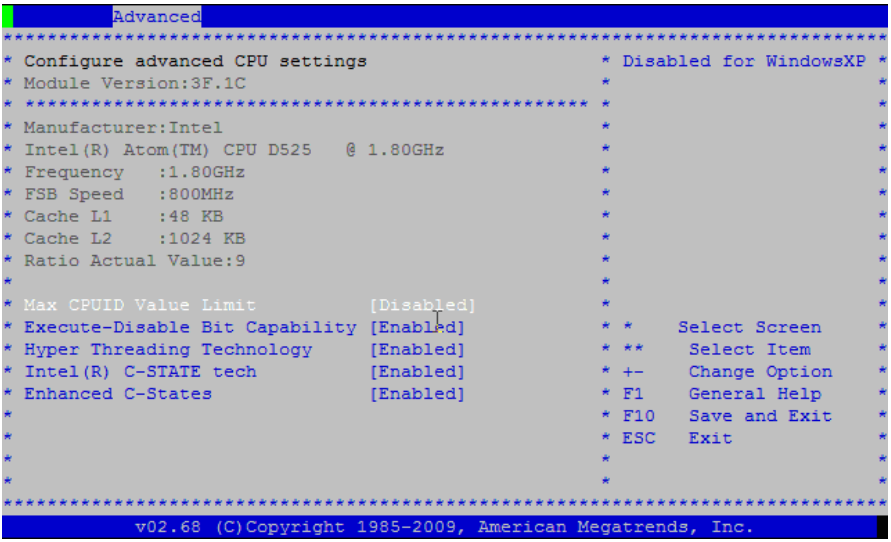
Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the < Arrow > keys. The Advanced BIOS Setup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

The sub menus are described on the following pages.



### 8.3.1 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.




**Max CPUID Value Limit**

When the computer is booted up, the operating system executes the CPUID instruction to identify the processor and its capabilities. Before it can do so, it must first query the processor to find out the highest input value CPUID recognized. This determines the kind of basic information CPUID can provide the operating system. This option allows you to circumvent problems with older operating systems.

When Enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When Disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

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### Execute-Disable Bit Capability

Intel's Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system. Execute Disable Bit allows the processor to classify areas in memory where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage and worm propagation.

### Hyper-Threading Technology

This item allow you to enable or disable Hyper-Threading Technology.

### 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.

### Intel® C-State Tech

This option allows you to enable or disable Intel® C-State function.

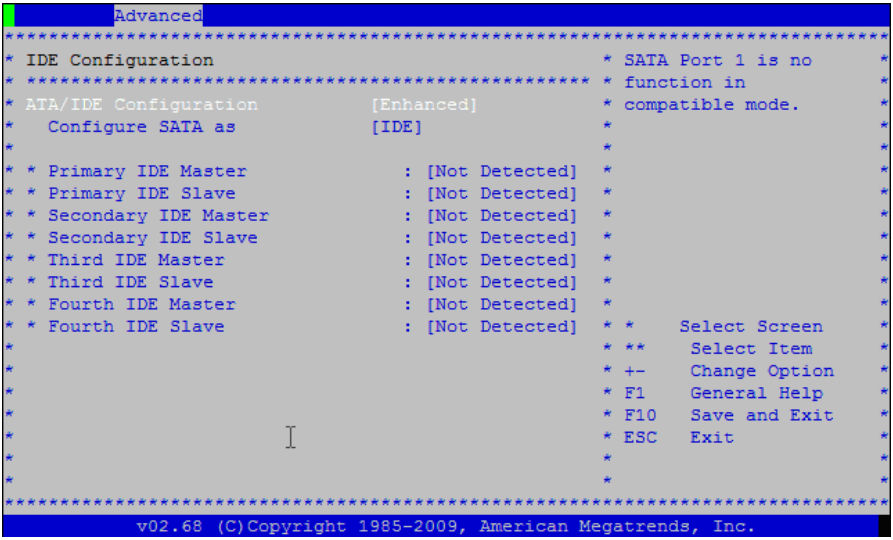
### Enhanced C-State Tech

This option allows you to enable or disable the Enhanced C-State function.

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### 8.3.2 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.




#### ATA/IDE Configuration

This item specifies which mode the ATA/IDE channels should be initialized in. The settings are **Disabled**, **Compatible** and **Enhanced**.

#### Configure SATA as

When running in Compatible mode, SATA channels can be configured as a legacy IDE channel.

NOTE: SATA1 does not support Compatible mode due to chipset limitation.

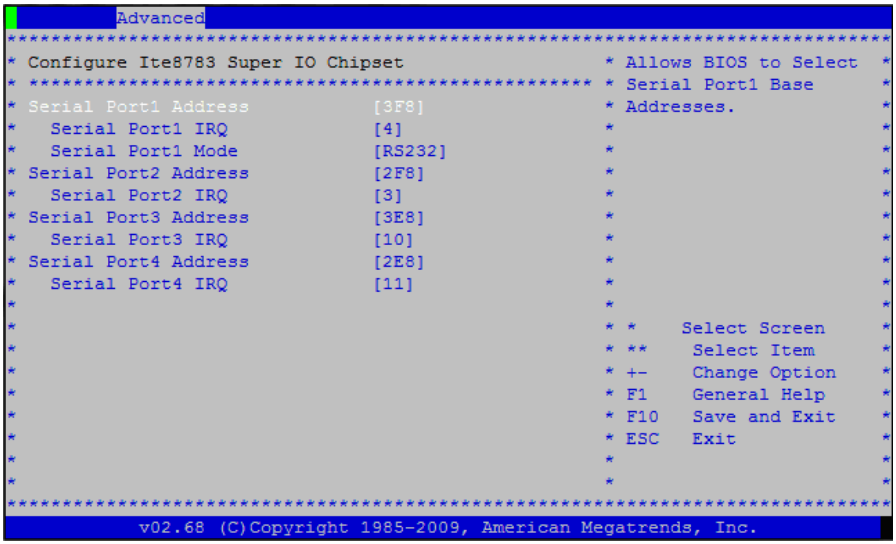
#### IDE Master/Slave

Select one of the hard disk drives to configure it. Press < Enter > to access its sub menu.

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### 8.3.3 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.




**Serial Port1 Address**

Select an address for Serial Port1. Options: 3F8/2F8/3E8/2E8.

**Serial Port1 Mode**

Sets the mode of Serial Port1 to RS-232/422/485.

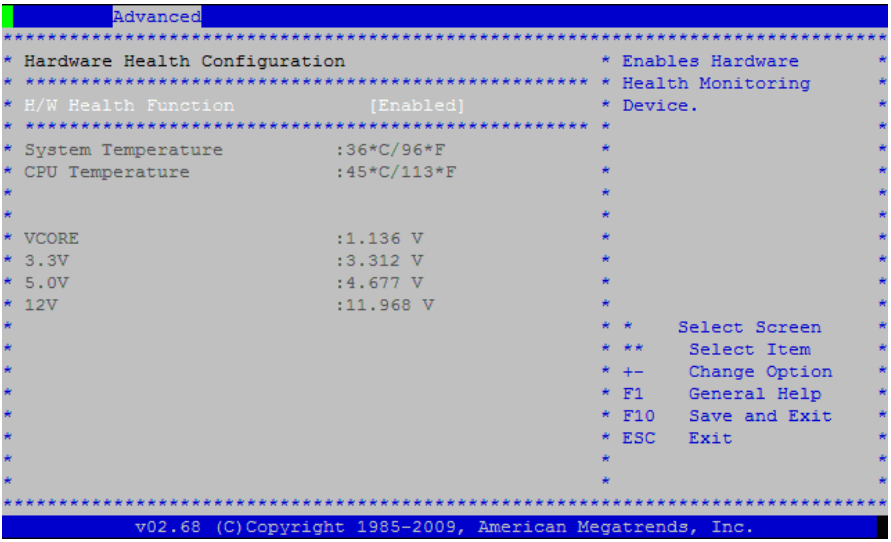
**Serial Port2~4 IRQ**

Sets the serial port IRQ. Options: 3, 4, 10, 11.

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### 8.3.4 Hardware Health Configuration

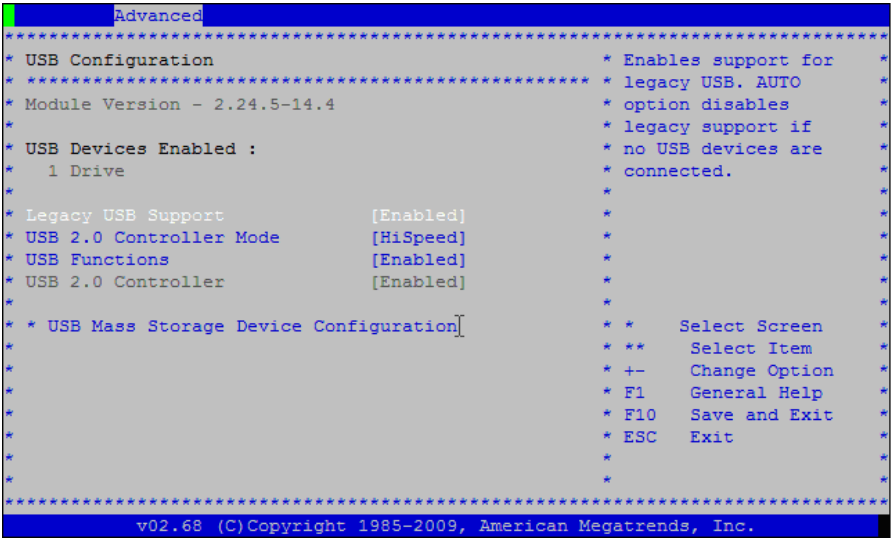
This option displays the current status of all of the monitored hardware devices/components such as voltages and temperatures. The options are Enabled and Disabled.




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### 8.3.5 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.




#### Legacy USB Support

Legacy USB Support refers to USB mouse and keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there are no USB drivers loaded on the system. Set this value to enable or disable the Legacy USB Support.

- **Disabled:** Set this value to prevent the use of any USB device in DOS or during system boot.
- **Enabled:** Set this value to allow the use of USB devices during boot and while using DOS.

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- **Auto:** This option auto detects USB Keyboards or Mice and if found, allows them to be utilized during boot and while using DOS.

### 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 Functions

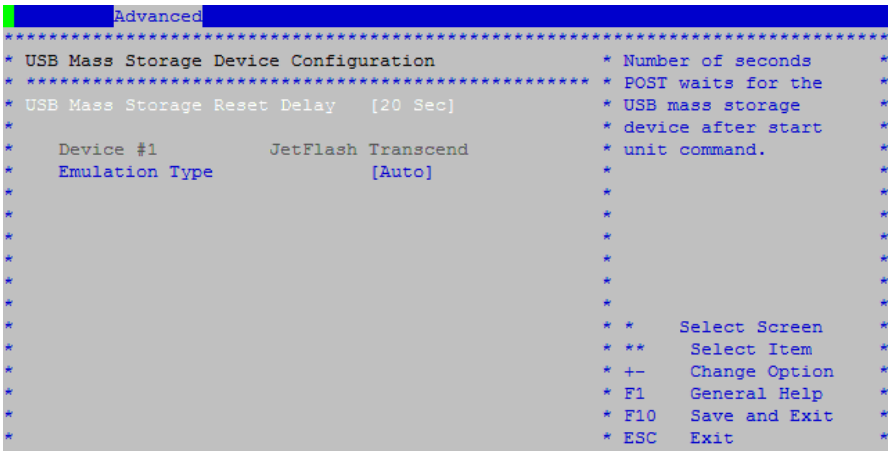
Set the value to allow the system to disable, enabled and select a set number of onboard USB ports.

### USB 2.0 Controller

Enable or disable USB 2.0 functionality to all USB ports.

### USB Mass Storage Device Configuration

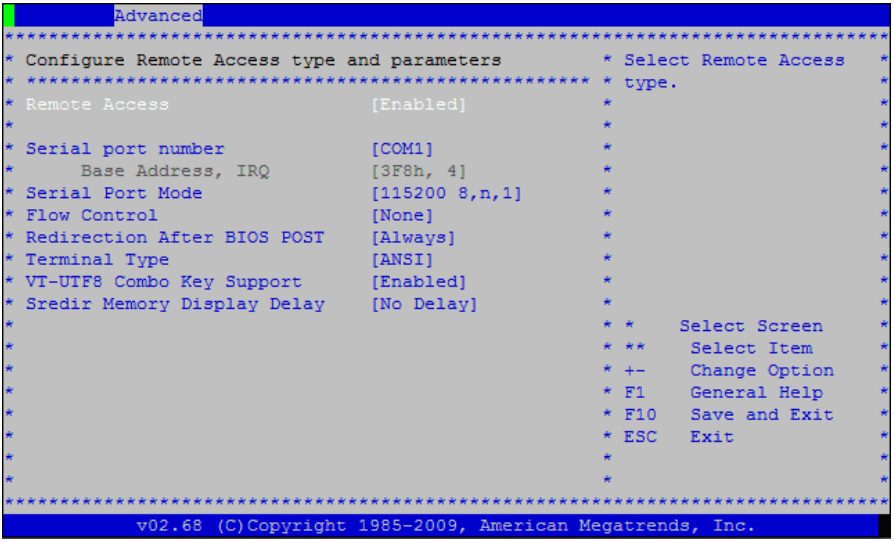
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB 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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### 8.3.6 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. When the assigned serial port is disabled, Remote Access should also be disabled to prevent the system from booting abnormally.

#### Serial Port Number

Select the serial port you want to use for the remote access interface. Options: COM1, COM2, COM3.

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 available Remote Access options.

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### 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 or Disabled.

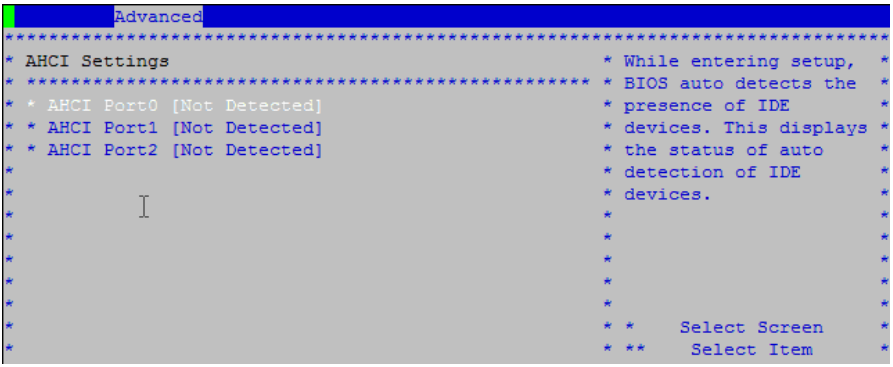
### Sredir Memory Display Delay

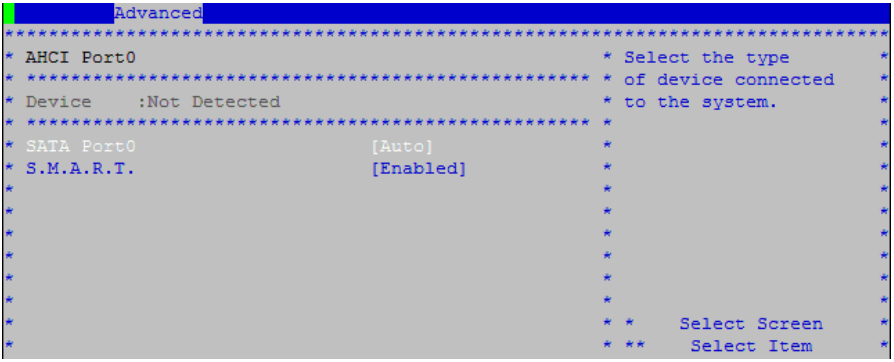
This option gives the delay in seconds to display memory information. The options for this value are No Delay, Delay 1 Sec, Delay 2 Sec, or Delay 4 Sec.

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### 8.3.7 AHCI Configuration

You can use this screen to select options for the AHCI Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option.




**SATA Port0/1/2**

Select the type of device connected to the system.

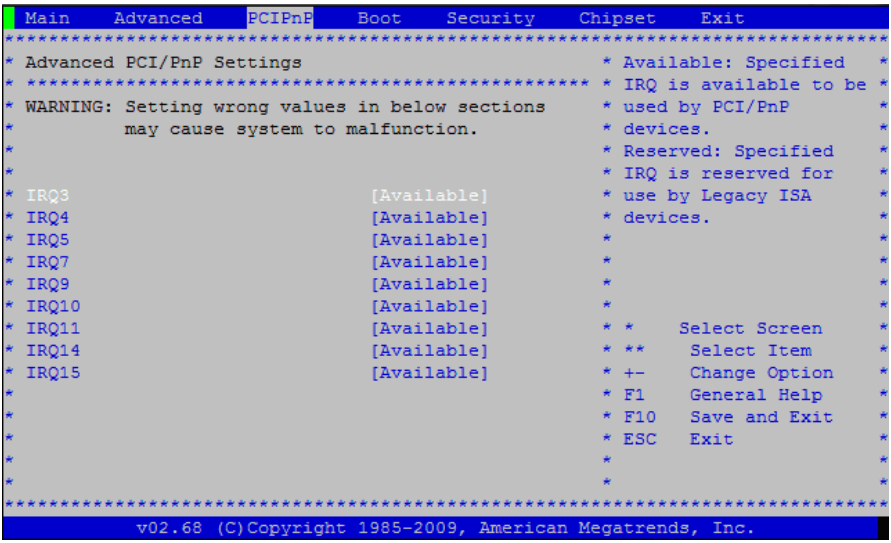
**S.M.A.R.T**

S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) is a utility that monitors your disk status to predict hard disk failure.

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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 Channel

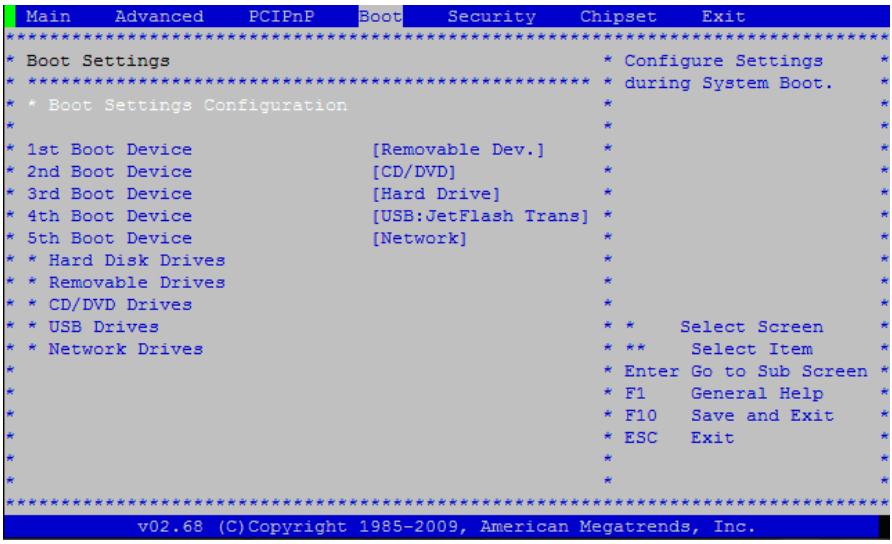
Set this value to allow the IRQ channel settings to be modified.

- **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

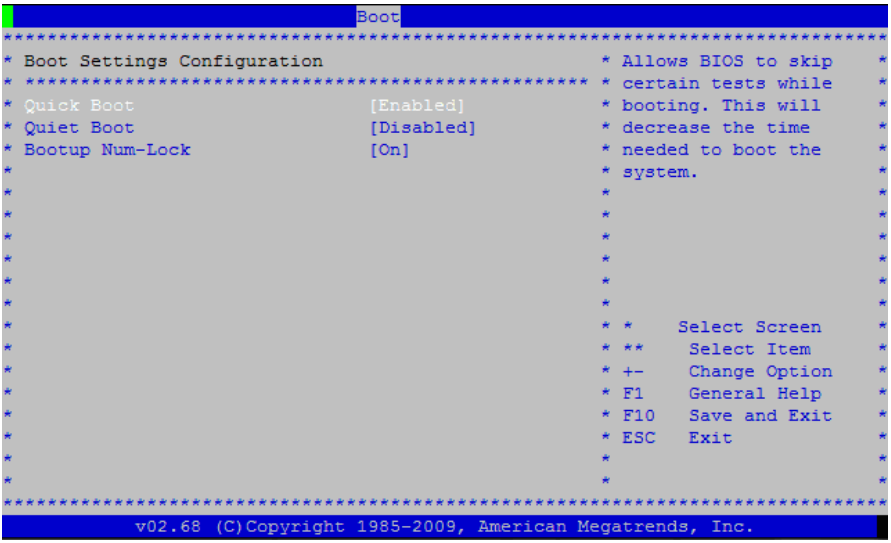
Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The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




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### 8.5.1 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.




#### 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

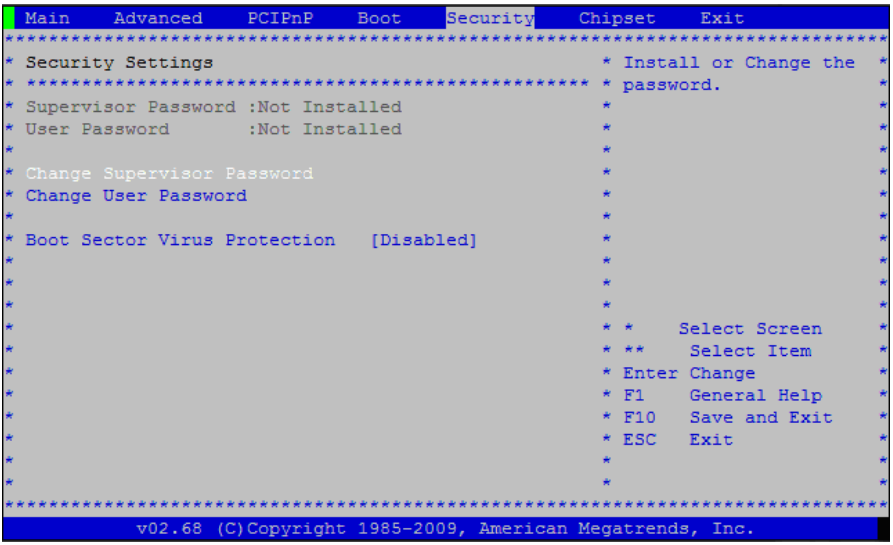
When this feature is **enabled**, the BIOS will display the OEM logo during the boot-up sequence, hiding normal POST messages. When it is **disabled**, the BIOS will display the normal POST messages, instead of the OEM logo.

#### Bootup Num-Lock

Allows you to select the power-on state for Num-Lock.

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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.

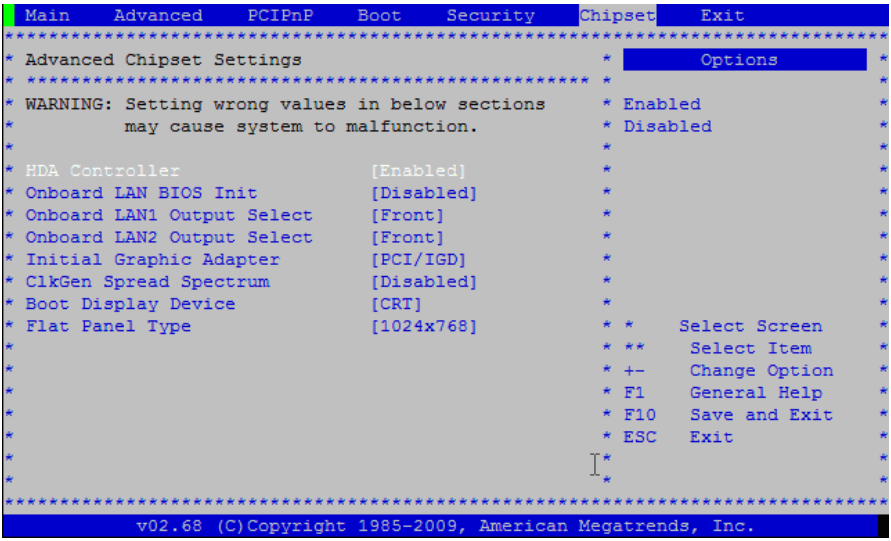
## Boot Sector Virus Protection

Enable or disable the boot sector virus protection function.

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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.




### HDA Controller

Set this value to Enable/Disable the HD Audio Controller.

### Onboard LAN BIOS Init

Set this value to enable/disable the invoking of onboard LAN's PXE ROM. Disabling can shorten the POST time by not initializing LAN PXE ROM. Enable it if boot from LAN is needed.

### Onboard LAN1/2 Output Select

Set the Onboard LAN1/2 output to Front or Rear.

### Initial Graphics Adapter

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

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### ClkGen Spread Spectrum

Set this value to Enable/Disable the ClkGen spread spectrum function.

### Boot Display Device

Select which device to use as the primary boot display device.

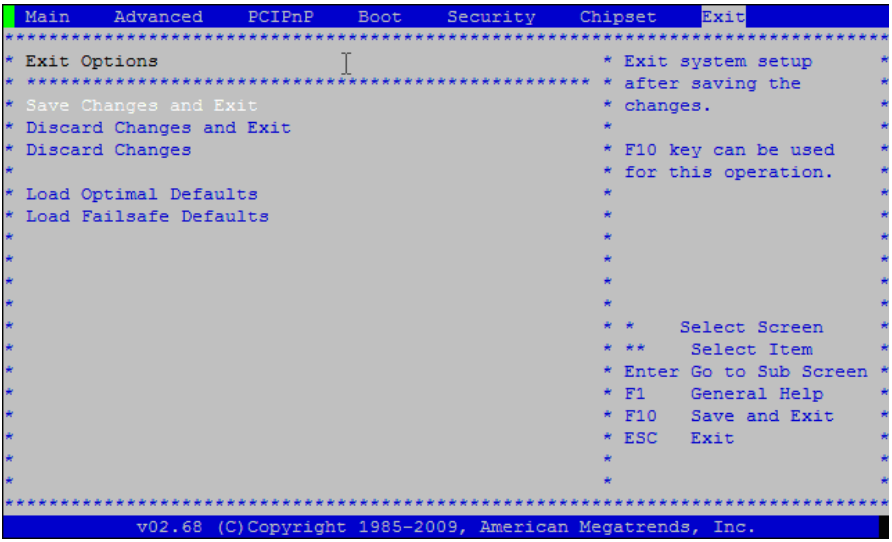
### Flat Panel Type

Select which resolution to display.

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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.

Discard Changes and Exit Setup Now?

[Ok] [Cancel]

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

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## 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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# 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.

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

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- 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.

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