cPCI-3620 Series

Low-Power 3U CompactPCI®
Quad-Core Intel® Atom™ Processor Blade

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
1.00	16/02/2016	Initial release

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Preface

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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.



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



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



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 ADLINK cPCI-3620 Series is a 3U CompactPCI® processor blade featuring a quad-core Intel® Atom SoC and 4GB of soldered DDR3L-1333 ECC.

Available in single-slot (4HP) or dual-slot (8HP) width form factors, the cPCI-3620 Series utilizes various daughter boards to provide a broad range of I/O functionality. Faceplate I/O on the single-slot (4HP) version includes 1x USB 3.0, 2x RJ-45 GbE and 1x VGA port (common to all versions). Faceplate I/O on the dual-slot (8HP) version includes additional 2x USB 2.0, 1x COM, 1x PS/2 KB/MS and Line-in/Line-out on the cPCI-3620D or additional 2x GbE via MIL-STD M12 connectors and 1x COM on the cPCI-3620T. Another dual-slot option is the cPCI-3620S with an additional XMC site on layer 2. There is also a single-slot option that provides LED indicators only with no I/O on the faceplate (cPCI-3620N).

Graphics support is integrated on the SoC. Storage options include an onboard 32GB SSD (optional) and 2.5" SATA drive on layer 2 riser card (cPCI-3620D/T). One optional PCI 32-bit/66 MHz PCIe x1 XMC site is available on the dual-slot cPCI-3620S version.

Rear I/O signals to J2 include 2x GbE, 1x VGA, 1x USB 2.0, 2x COM, 1x SATA 3 Gb/s, providing for expansion with an optional Rear Transition Module (RTM).

The cPCI-3620 is an ideal solution for transportation, military, factory automation and other industrial applications that require optimal computing performance for data transfer with lower power consumption. The ADLINK cPCI-3620 provides high manageability, supports Satellite mode operation as a standalone blade in peripheral slots, and features ADLINK's Smart Embedded Management Agent (SEMA) for system health monitoring.

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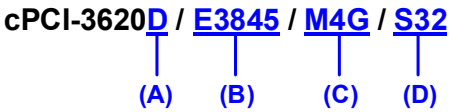
1.2 Features

- 3U CompactPCI blade in 4HP or 8HP width form factor
- Intel® Atom™ Processor E3845 SoC (4 cores, 2M L3 cache, 1.9 GHz)
- Graphics and memory controllers integrated in SoC
- Compatible with PICMG 2.0 CompactPCI R3.0 and PICMG 2.1 Hot Swap R2.0
- 4GB single channel DDR3L-1333 soldered ECC SDRAM
- 32-bit, 33/66MHz CompactPCI interface, universal V(I/O)
- Supports Satellite mode operation as a standalone blade in peripheral slots
- Optional 32-bit, 66MHz PCIe x1 XMC site
- Supports SEMA for system health monitoring
- VGA port on faceplate switchable to rear I/O by BIOS setting
- 2x GbE ports on faceplate switchable to rear I/O by BIOS setting
- Additional 2x GbE via MIL-STD M12 connectors on 8HP model (cPCI-3620T)
- 2x USB 2.0, 1x COM and 1x PS/2 KB/MS on faceplate
- Line-in and Line-out on faceplate (cPCI-3620D)
- Optional onboard 32GB SATA SSD or mSATA socket on daughter board (mSATA by request only)
- 2.5” SATA 3 Gb/s direct connector on 8HP version (cPCI-3620D/T)

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1.3 Model Number Decoder

Blades



(A) Configuration Code

- ▷ **Blank** = Single-slot width, 1x VGA, 1x USB 3.0, 2x GbE
- ▷ **D** = Dual-slot width, 1x VGA, 1x USB 3.0, 2x GbE on layer 1; 2x USB 2.0, 1x COM (RS-232/422/485), 1x PS/2 KB/MS, Line-in, Line-out and 2.5" SATA drive space on layer 2 DB-3610L2
- ▷ **T** = Dual-slot width, 1x VGA, 1x USB 3.0, 2x GbE on layer 1; 2x GbE via MIL-STD M12 connectors, 1x COM (RS-232/422/485), and 1x 2.5" SATA drive space on layer 2 DB-3620L2
- ▷ **S** = Dual-slot width, 1x VGA, 1x USB 3.0, 2x GbE on layer 1; XMC site on layer 2 DB-3UMC.
- ▷ **N** = Single-slot width, no I/O ports on layer 1.

(B) CPU Code

- ▷ **E3845** = Quad-core Intel® Atom™ Processor E3845 SoC

(C) Memory Size Code

- ▷ **M4G** = 1x 4GB DDR3L-1333 soldered ECC SDRAM

(D) Storage*

- ▷ Blank = default with no onboard storage
- ▷ S32 = soldered onboard 32GB SSD on daughter board
- ▷ MS = mSATA socket on daughter board (by request)

*For more options, contact your ADLINK representative.

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RTMs

cPCI- R3610T

(A)

(A) Model Code

- **Blank** = Dual-slot width, 50mm depth 3U RTM with 2x COM, 1x USB 2.0, 1x SATA 3Gb/s, 1x VGA, 2x GbE
- **T** = Dual-slot width, 80mm depth 3U RTM with 2 x COM, 1x USB 2.0, 1x SATA 3Gb/s, 1x VGA, 2x GbE

NOTE:

2x GbE, 1x VGA and 1x SATA signals on RTM are switched from faceplate of blade.

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1.4 Package Contents

The cPCI-3620 is packaged with the following components. If any of the following items 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 cPCI-3620 Series non-standard configurations will vary depending on customer requests.

Processor Blade

- The cPCI-3620 Series Processor Blade
  - CPU and memory specifications will differ depending on options selected
  - Thermal module is assembled on the board
- Y-cable for PS/2 combo port (8HP version only)
- 2.5" SATA drive accessory pack (8HP version only)

Rear Transition Module

- cPCI-R3610: 8HP width, 50mm depth Rear Transition Module with 2x COM, 1x USB 2.0, 2x GbE, 1x SATA, 1x VGA
- cPCI-R3610T: 8HP width, 80mm depth Rear Transition Module with 2x COM, 1x USB 2.0, 2x GbE, 1x SATA, 1x VGA



NOTE:

The contents of non-standard cPCI-3620 configurations may vary depending on the customer's requirements.



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-3620 Processor Blade Specifications

CompactPCI® Standards	• PICMG® 2.0 CompactPCI® Rev. 3.0 • PICMG® 2.1 Hot Swap Specification Rev. 2.0
Mechanical	• Standard 3U CompactPCI® • Board size: 100mm x 160mm • Single slot (4HP, 20.32mm); Dual slot (8HP, 40.64mm)
Processor	• Intel® Atom™ Processor E3845, quad-core, 1.91 GHz, 2MB cache, TDP 10W • Passive heatsink
Memory	• 4GB single channel DDR3L-1333 ECC soldered memory
CompactPCI Bus	• PCI 32-bit, 33/66MHz; 3.3V, 5V universal V I/O • Supports operation in system slot as master or in peripheral slot as standalone blade without connectivity to CompactPCI bus (Satellite mode)
Gigabit Ethernet	• Two PCIe x1 Intel® I210 Gigabit Ethernet controllers (2 additional GbE by M12 connectors optional) • Two egress 10/100/1000BASE-T ports on faceplate • Two egress 10/100/1000BASE-T ports routed to rear transition module (switched from faceplate)
Graphics	• Integrated on Intel® Atom™ processor • VGA on faceplate switchable to J2 (RTM) by BIOS setting • Analog support up to QXGA 2560x1600 @60Hz, 32-bit • Single display
USB	• Up to three USB faceplate ports (cPCI-3620D)
Serial Ports	• One RS-232/422/485 serial port on faceplate • cPCI-3620D supports RS-485+ • cPCI-3620T supports RS-485 with flow control
PMC/XMC	• One 32-bit/66MHz PMC site or PCIe x1 XMC site (cPCI-3620S)
Audio	• Line-in/Line-out on faceplate by Realtek ALC262 High Definition Audio codec (cPCI-3620D only)
Storage Interfaces[1]	• Optional onboard 32GB SSD or mSATA socket on daughter board (mSATA by request) • One SATA 3Gb/s direct connector for 2.5" drive (8HP version)
BIOS	• AMI EFI BIOS, 64Mbit SPI flash memory

Table 2-1: cPCI-3620 Processor Blade Specifications

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Faceplate I/O	**4HP (cPCI-3620)** • 1x USB 3.0 port • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port **4HP (cPCI-3620N)** • LEDs only (Power, HDD, WDT, GP, GbE), no I/O **8HP (cPCI-3620D)** • 1x USB 3.0 ports • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port • 2x USB 2.0 ports • DB-9 RS-232/422/485 port • PS/2 Keyboard/Mouse combo port • Line-in and Line-out port **8HP (cPCI-3620T)** • 1x USB 3.0 ports • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port • 2x GbE via MIL-STD M12 ports • DB-9 RJ-45 RS-232/422/485 port **8HP (cPCI-3620S)** • 1x USB 3.0 ports • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port • PMC/XMC site
OS Compatibility	• Microsoft Windows 7 32/64-bit • Microsoft Windows 8 32/64-bit • Red Hat Enterprise Linux 6.5, 64-bit • Fedora 20, 64-bit • VxWorks 6.1 (5.5 by request) • Other OS support by request
Environmental	• Operating Temperature[1]: Standard: -40°C to 70°C (fanless) Extreme: -40°C to +85°C (forced air flow) • Storage Temperature: -50°C to 100°C • Humidity: 95% @60°C non-condensing • Shock: 20G peak-to-peak, 11ms duration, non-operating • Vibration[2]: 2Grms, 5-500Hz, each axis, operating (w/o hard drive)
EMI	• EN55022 • EN50155 • FCC Class A

Table 2-1: cPCI-3620 Processor Blade Specifications

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1. The storage device limits the operational vibration tolerance. When the application requires higher specification for anti-vibration, it is recommended to use a flash storage device.
2. ADLINK-certified thermal design. The thermal performance is dependent on the chassis cooling design. Sufficient forced air-flow is required. Temperature limits of optional mass storage devices may also affect the thermal specification.

2.2 cPCI-R3610(T) RTM Specifications

Mechanical	Board Size • cPCI-R3610: 100mm x 50mm • cPCI-R3610T: 100mm x 80mm Dual-slot (8HP, 40.64mm) (optional single slot upon request)
Gigabit Ethernet	• Two GbE ports switched from cPCI-3620
Graphics	• VGA switched from cPCI-3620
Serial Ports	• Two serial ports on I/O panel from pin header
Storage Interfaces	• One 7-pin Serial ATA port (SATA1 signal switched from cPCI-3620 by BIOS
Faceplate I/O	• 1x USB 2.0 ports • 2x 10/100/1000BASE-T Ethernet ports • Analog DB-15 VGA port • 2x COM ports

Table 2-2: cPCI-R3610(T) RTM Specifications


NOTE:

Specifications are subject to change without prior notice.

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2.3 Block Diagrams

cPCI-3620 Blade

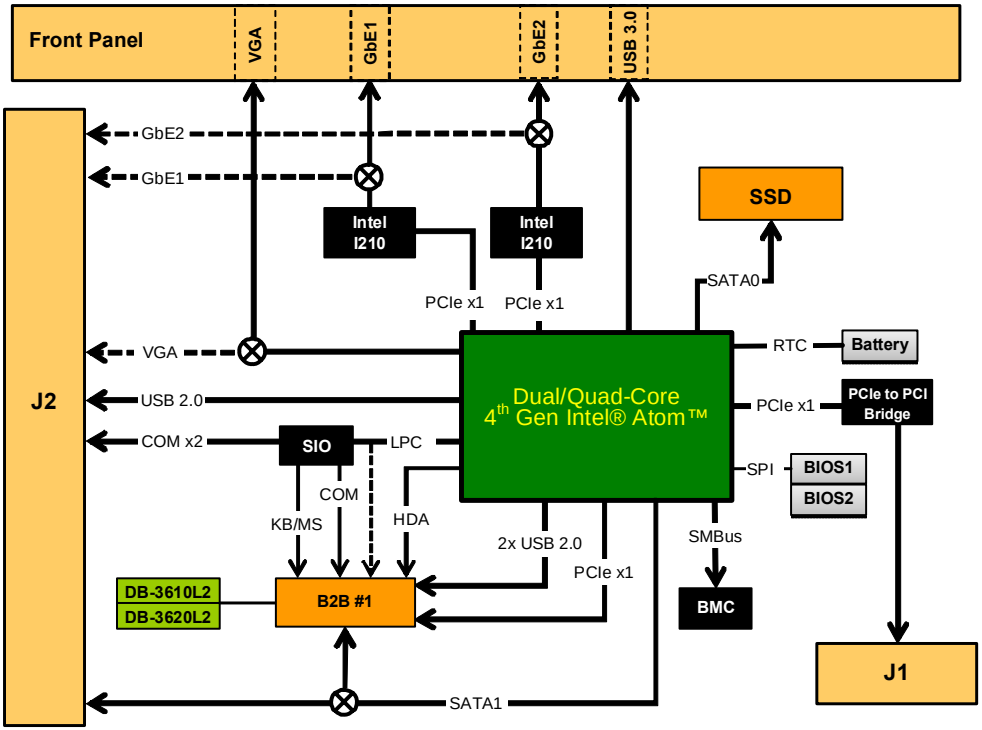


Figure 2-1: cPCI-3620 Blade Functional Block Diagram

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cPCI-3620D Daughter Board

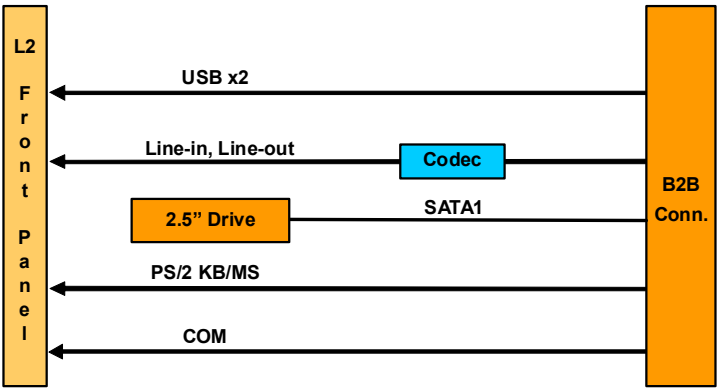


Figure 2-2: cPCI-3620D Daughter Board Functional Block Diagram

cPCI-3620T Daughter Board

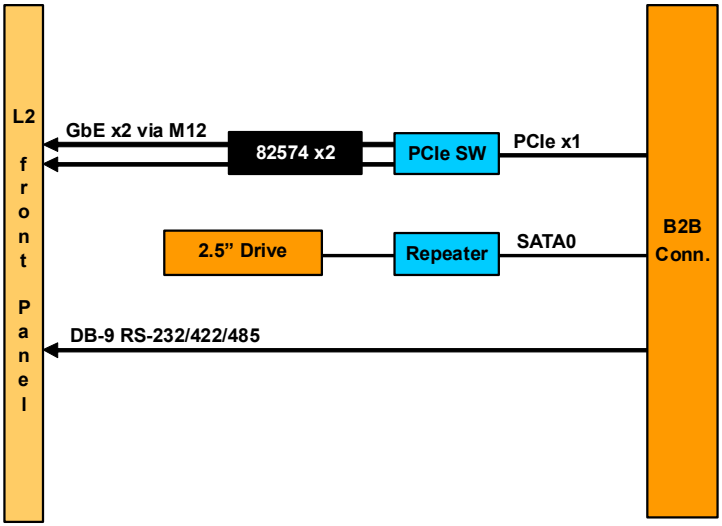


Figure 2-3: cPCI-3620T Daughter Board Functional Block Diagram

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cPCI-R3610(T) RTM

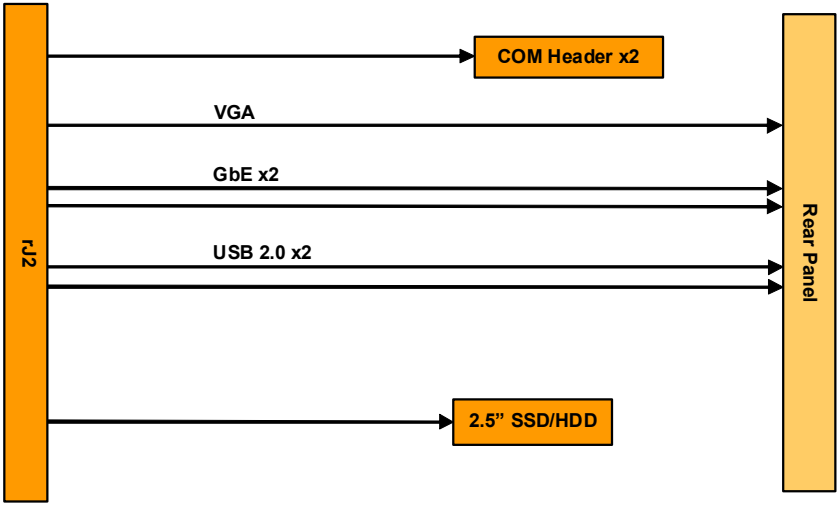


Figure 2-4: cPCI-R3610 RTM Functional Block Diagram

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2.4 I/O Connectivity Table

Function	cPCI-3620 (4HP)		cPCI-362D (8HP)		cPCI-3620T (8HP)	
	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard
Gigabit Ethernet	Y x2		Y x2		Y x2	
COM			Y (DB-9)		Y (DB-9)	
USB 3.0	Yx1		Yx1		Yx1	
USB 2.0			Y x2			
VGA	Y		Y		Y	
Serial ATA				Y (for 2.5" drive)		Y (for 2.5" drive)
PS/2 KB/MS			Y			
Line-in			Y			
Line-out			Y			
LED	Y x5		Y x5		Y x5	
Reset Button	Y		Y		Y	

Table 2-3: cPCI-3620 I/O Connectivity

Function	cPCI-3620S (8HP)		R3610(T) (RTM)	
	Faceplate	Onboard	Faceplate	Onboard
Gigabit Ethernet	Y x2		Y x2(1)	
COM			Y x2	
USB 3.0	Y x1			
USB 2.0			Y x2	
VGA	Y		Y(2)	
Serial ATA				Y x1 (7-pin)(3)
PS/2 KB/MS				
Line-in				
Line-out				
PMC/XMC	Y	Y		
LED	Y x5			
Reset Button	Y			

Table 2-3: cPCI-3620 I/O Connectivity (cont'd)

1. Switched from faceplate by BIOS setting.
2. VGA switched from faceplate by BIOS setting.
3. SATA1 signal switched from cPCI-3620 by BIOS; SATA2 not connected.

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2.5 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 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-3620 Series when using the Intel® Atom™ processors with 4GB DDR3L-1333 ECC soldered memory and a 2.5" SATA SSD. The cPCI-3620 is powered by 5V. Power consumption at 100% CPU usage was measured using the Intel Thermal Analysis Tool (TAT).

Intel® Atom™ E3845 (quad-core)		
OS/Mode	**Current 5V**	**Total Power**
DOS/Idle mode	1.82 A	9.1 W
Windows 8/Idle mode	1.71 A	8.55 W
Windows 8/Typical	2.7A	13.5W
Windows 8/100% CPU usage	3.0 A	15 W


NOTE:

Connecting a USB device with an external power supply (e.g. a powered USB hub) to the cPCI-3620 may result in an unintended boot up from a shutdown state. This is due to the low power requirements of the "Bay Trail" CPU and 5V power design of the cPCI-3620.

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3 Functional Description

The following sections describe the cPCI-3620 Series features and functions.

3.1 Processors

The cPCI-3620 Series supports the Intel® Atom™ processor E3845 which utilize 22nm process technology with 3-D Tri-Gate transistor to deliver significant improvement in computational performance and energy-efficiency in intelligent systems. Based on a new micro-architecture, the processor is designed for a one-chip platform. This system-on-chip (SoC) solution platform brings enhanced graphics, greater performance, lower cost, easier validation, and improved x-y footprint to a broad range of intelligent systems. The processor includes an Integrated Display Engine, Processor Graphics and Integrated Memory Controller.

Features	Atom™ E3845
Clock	1.91GHz
L2 Cache	2MB
No. of Cores/Threads	4/4
Max. Power (TDP[1])	10W
$T_{junction, MAX}$[2]	110°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.

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Supported Technologies

Features	Atom™ E3845
Intel® vPro Technology	No
Intel® Hyper-Threading Technology	No
Intel® Virtualization Technology	Yes
Intel® Virtualization Technology for Directed I/O	No
Intel® 64 Architecture	Yes
Intel® HD Audio Technology	Yes
Intel® Data Protection Technology – Intel® AES New Instructions	Yes
Intel® Trusted Execution Technology	No
Intel® Execute Disable Bit	Yes

Interfaces

- Single channel of DDR3L-1333 memory
- Memory DDR3 data transfer rates of 1333 MT/s
- ECC soldered memory
- Maximum 4GB memory capacity supported
- 64-bit wide channels
- DDR3L I/O Voltage of 1.35V
- PCI Express port(s) are fully-compliant with the PCI Express Base Specification, Revision 2.0

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Graphics

The graphics is integrated in the processor and based on Intel® HD Graphics 4000 technology, enabling substantial gains in performance and lower power consumption.

- DirectX 11 support
- OpenGL 4.0 support
- Graphics Base Frequency: 542 MHz
- Graphics Max Dynamic Frequency: 792 MHz
- Full HD video playback
- Maximum resolution of 2560x1600@60Hz

3.2 PMC/XMC

The cPCI-3620S models support one PMC or XMC site for face-plate I/O expansion. The PMC site provides a maximum 32-bit/66MHz PCI bus link using a Pericom PI7C9X130 PCI-Express-to-PCI bridge and PCI-Express x1 link. The PMC site supports +3.3V signaling only. The XMC site provides a PCI-Express x1 lane.

3.3 Intel® Virtualization Technology

Intel® Virtualization Technology (VT-x) allows one hardware platform to function as multiple “virtual” platforms. It offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions. Hardware-based Intel® Virtualization Technology (Intel® VT-x) improves the fundamental flexibility and robustness of traditional software-based virtualization solutions by accelerating key functions of the virtualized platform. This efficiency offers benefits to the IT, embedded developer, and intelligent systems communities.

3.4 Intel® AES New Instructions

Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) is a new encryption instruction set that improves on the Advanced Encryption Standard (AES) algorithm and accelerates the encryption of data in the Intel Atom Processor E3800 product family. Encryption is frequently recommended as the best way to

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secure business-critical data, and AES is the most widely used standard when protecting network traffic, personal data, and corporate IT infrastructures. AES is a widely-deployed encryption standard when protecting network traffic, personal data, and corporate IT infrastructures; and Intel® AES-NI can be used to accelerate the AES encryption.

3.5 Battery

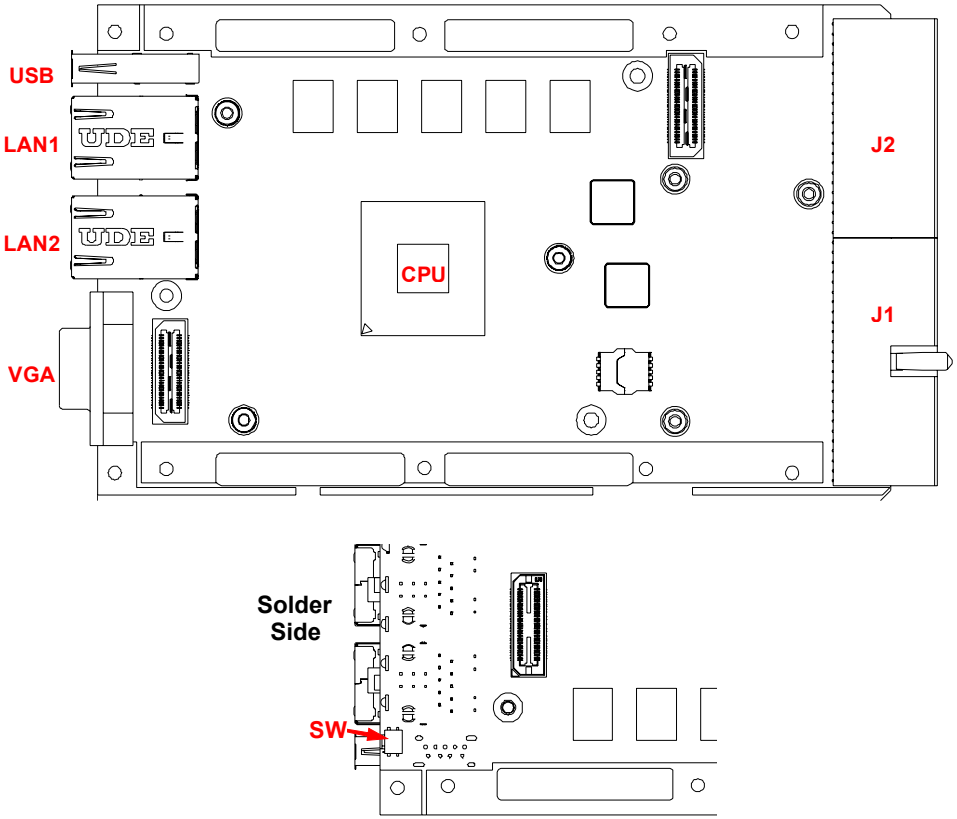
The cPCI-3620 is provided with a 3.0V “coin cell” lithium battery for the Real Time Clock (RTC). The battery sockets are located on the storage daughter board near the J1 and J2 connectors. The battery must be replaced with an identical battery or a battery type recommended by the manufacturer. A Rayovac BR2032 is equipped on board by default, and a Gold Capacitor (Panasonic EECS5R5H105) is optionally available.

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4 Board Interfaces

This chapter illustrates the board layout, connector pin assignments, and jumper settings.

4.1 cPCI-3620 Series Board Layout



CPU	Intel® Atom™ Processor	**LAN1**	Ethernet RJ-45 connector
J1	CompactPCI connector J1	**LAN2**	Ethernet RJ-45 connector
J2	CompactPCI connector J2	**VGA**	DB-15 female VGA connector
USB	USB 3.0 port	**SW**	Reset Button

Figure 4-1: cPCI-3620 Series Board Layout

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4.2 cPCI-3620 Blade Assembly Layout

This section describes the final assembly layout of the single slot cPCI-3620 blade with the storage daughter board.

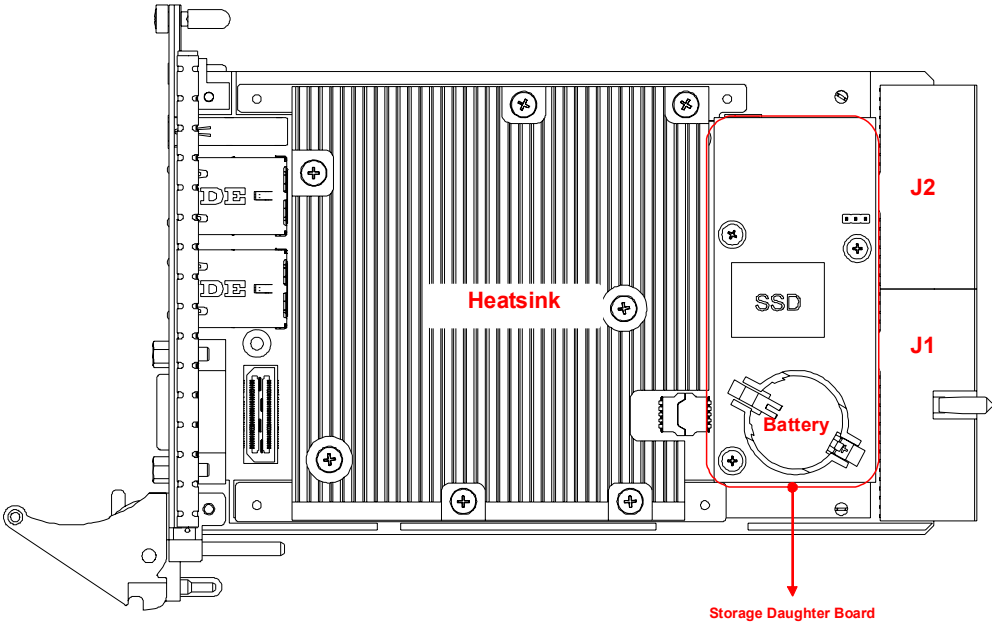


Figure 4-2: cPCI-3620 Blade Assembly Layout

BT1	Battery	**J1**	CompactPCI connector J1
		J2	CompactPCI connector J2

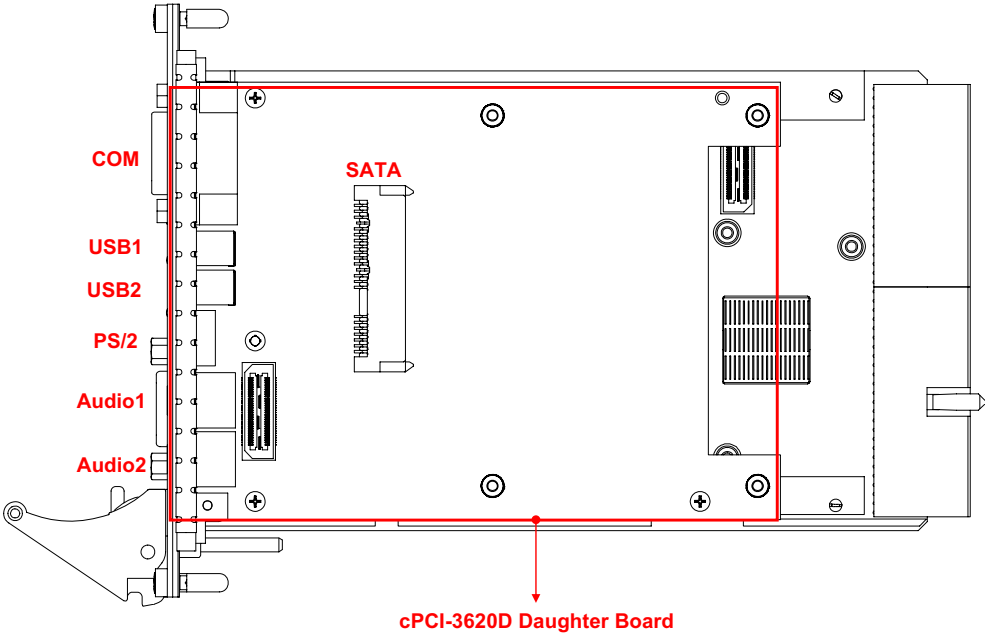
NOTE:

The onboard SSD on the storage daughter board is optional. A daughter board with only an RTC battery and no onboard SSD is also available. Please contact your ADLINK representative for more information.

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4.3 cPCI-3620D Blade Assembly Layout

The dual-slot width cPCI-3620D is comprised of the cPCI-3620 single-slot main board and the cPCI-3620D daughter board to expand I/O connectivity with PS/2, COM, 2x USB, Line-in, and Line-out ports.



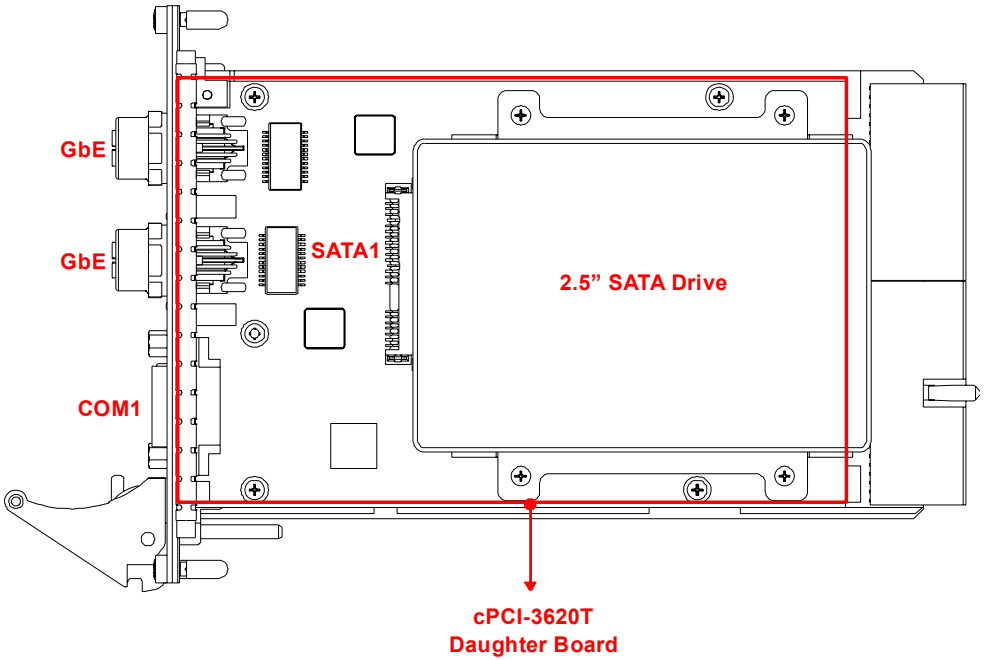
COM	DB-9 COM port	**Audio1**	Line-out port
USB1/2	USB 2.0 connectors	**Audio2**	Line-in port
PS/2	PS/2 KB/MS Combo port	**SATA**	22-pin SATA connector

Figure 4-3: cPCI-3620D Blade Assembly Layout

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4.4 cPCI-3620T Blade Assembly Layout

The dual-slot width cPCI-3620T is comprised of the cPCI-3620 single-slot main board and the cPCI-3620T Daughter Board to expand I/O connectivity with COM, 2x GbE with M12 MIL-STD connectors



GbE	M12 MIL-STD connectors	**COM1**	DB-9 COM port
SATA1	22-pin SATA connector		

Figure 4-4: cPCI-3620T Blade Assembly Layout

NOTE:

A 2.5” SATA drive is not included by default. Please contact your ADLINK representative if you require a storage drive.

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4.5 cPCI-3620N Blade Assembly Layout

The single slot cPCI-3620N provides LED indicators only with no I/O on the faceplate

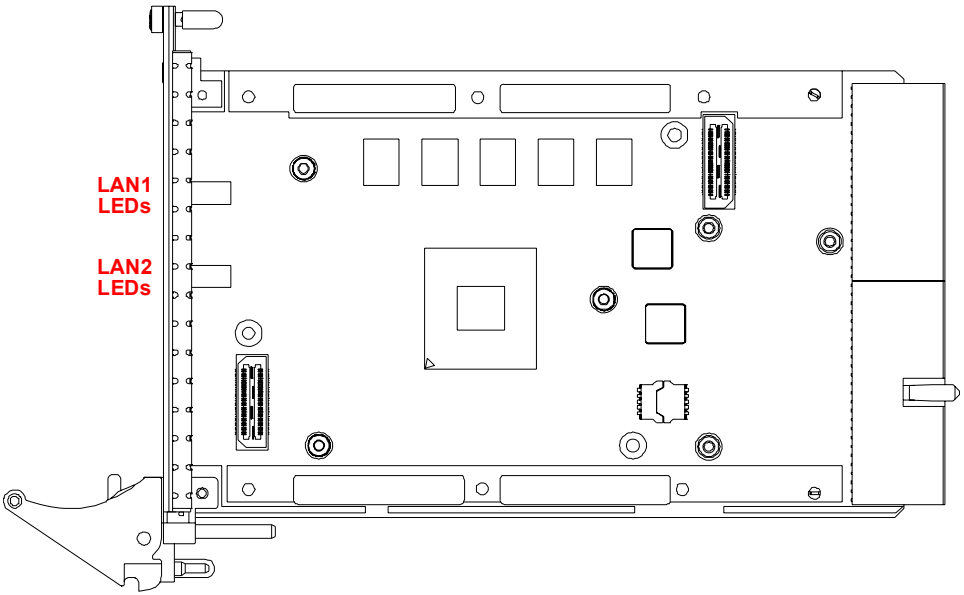


Figure 4-5: cPCI-3620N Blade Assembly Layout

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4.6 cPCI-3620 Series Faceplate

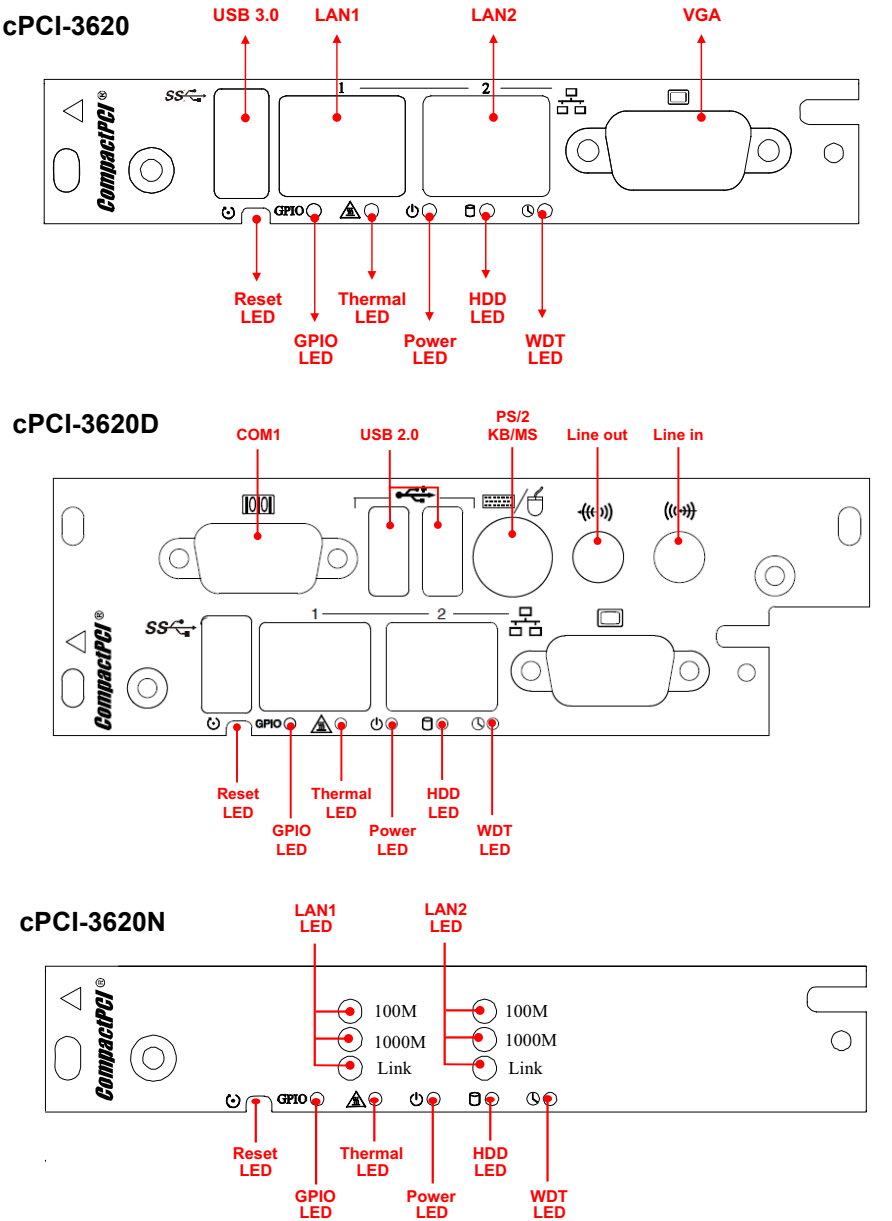
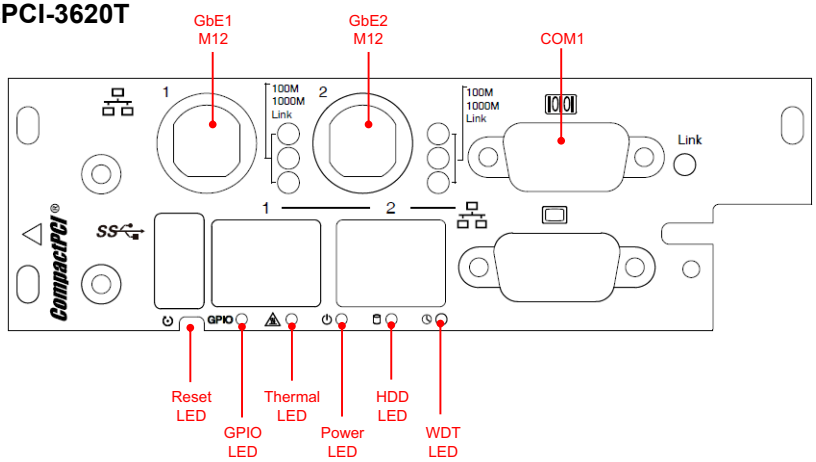


Figure 4-6: cPCI-3620, cPCI-3620D, cPCI-3620N Faceplate Layout

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cPCI-3620T



cPCI-3620S

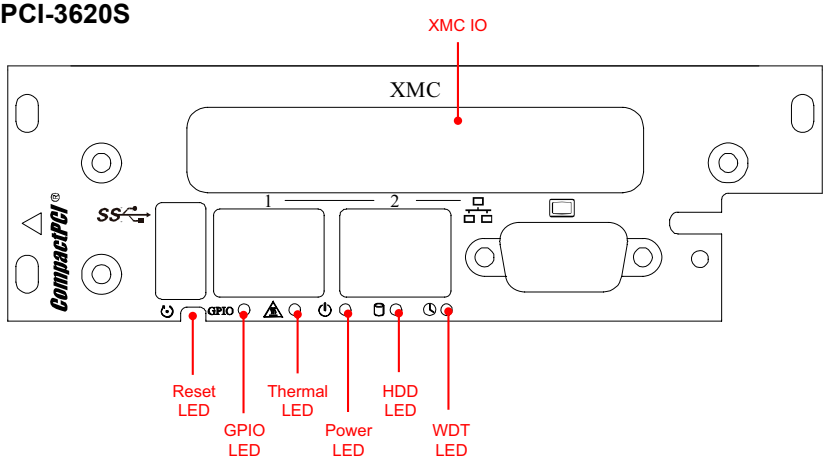


Figure 4-7: cPCI-3620T, cPCI-3620S Faceplate Layout

System LEDs

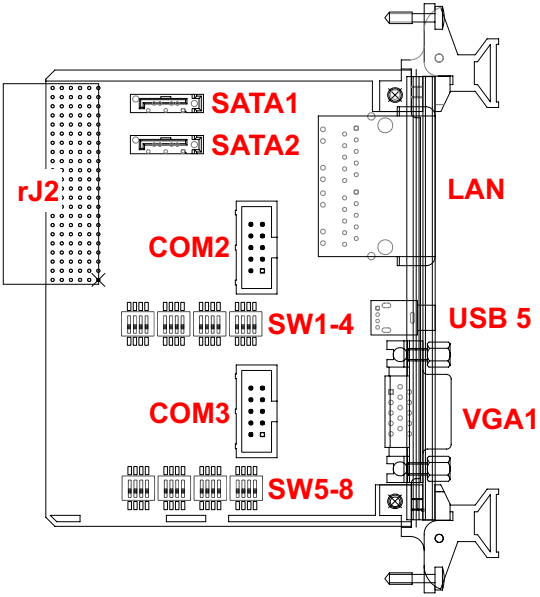
LED	Color	Condition	Indication
Power[1] 	Green/ Red	OFF	System is off
		Green	Post OK
WDT[2] 	Orange	OFF	No Watchdog event
		Blinking	Watchdog event alert
HDD[3] 	Blue	OFF	No SATA drive activity
		Blinking	Data read/write in process for CF/CFast/ SATA HDD
Thermal[4] 	Red	OFF	Board temperature is below 85°C
		ON	Board temperature equals or exceeds 85°C
GPIO[5]	Yellow	OFF	Defined by user
		ON/Blinking	Defined by user

Table 4-1: cPCI-3620 Faceplate System LED Descriptions

1. Power LED is controlled by hardware power.
2. WDT LED is controlled by BMC (SEMA), and users can define it using SEMA.
3. HDD LED is controlled by the SoC.
4. Thermal LED is controlled by BMC (SEMA); the system will continue to operate when the LED is triggered.
5. GPIO LED is controlled by BIOS.

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4.7 cPCI-R3610(T) RTM Board Layout



COM2	RS-232/422/485 port	**LAN1/2**	Dual Ethernet ports
COM3	RS-232/422/485 port	**VGA1**	VGA port
SATA1	SATA port switched from front by BIOS (SATA2 not connected)	**USB**	USB 2.0 port
rJ2	CompactPCI connector	**SW1-8**	Switches

(cPCI-R3610 is 50mm deep and cPCI-R3610T is 80mm deep)

Figure 4-8: cPCI-R3610(T) RTM Board Layout

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4.8 cPCI-R3610(T) RTM Faceplate

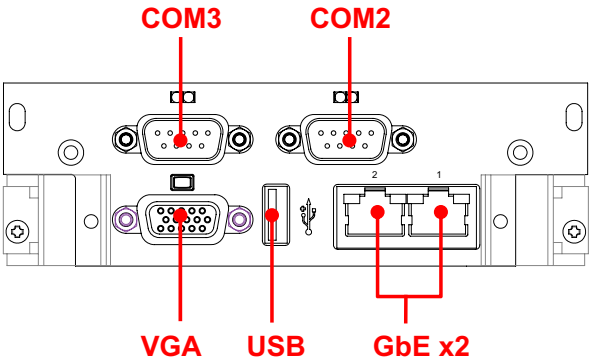


Figure 4-9: cPCI-R3610(T) RTM Faceplate

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4.9 Connector Pin Assignments

USB 2.0 Connectors

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

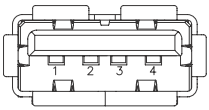
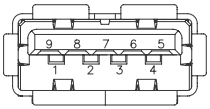


Table 4-2: USB 2.0 Pin Definition

USB 3.0 Connectors

Pin #	Signal Name
1	USB3.0_P5VA
2	USB2_CMAN
3	USB2_CMAP
4	GND
5	USB3A_CMRXN
6	USB3A_CMRXP
7	GND
8	USB3A_CMTXN
9	USB3A_CMTXP



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DB-15 VGA Connector

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		

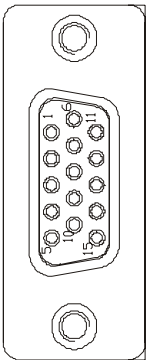


Table 4-3: VGA Pin Definition

PS/2 Keyboard/Mouse Connector

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

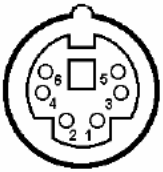


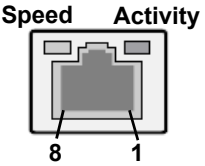
Table 4-4: PS/2 Keyboard/Mouse Pin Definition

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RJ-45 Gigabit Ethernet Connectors

Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	LAN_TX0+
2	TX-	LAN_TX0-
3	RX+	LAN_TX1+
4	—	LAN_TX2+
5	—	LAN_TX2-
6	RX-	LAN_TX1-
7	—	LAN_TX3+
8	—	LAN_TX3-

Table 4-5: RJ-45 GbE Pin Definitions



Status		Speed LED (Green/Amber)	Activity LED (Yellow)
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	Orange	On
	Active	Orange	Blinking

Table 4-6: LAN Status LED Definitions

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M12 Gigabit Ethernet Connectors

Pin #	Signal
1	DN3
2	DP3
3	DN2
4	DP2
5	DN1
6	DP1
7	DN0
8	DP0



Table 4-7: RJ-45 GbE Pin Definitions

cPCI-3620D/T Serial Ports

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	—	—

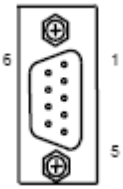


Table 4-8: cPCI-3620D/T COM1 (DB-9) Pin Definition

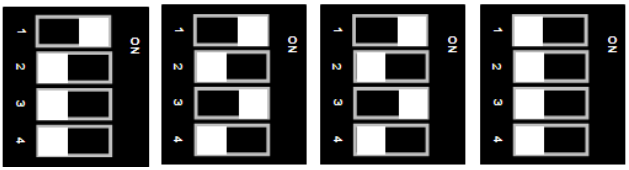
NOTE:

The COM mode setting for cPCI-3620D models is set using SW1~SW4. See *"cPCI-3620D COM1 Mode Selection Switches (SW1~SW4)" on page 35*. The COM mode setting for cPCI-3620T models is set using SW1. See *"cPCI-3620T COM1 Mode Selection Switch (SW1)" on page 36*.

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cPCI-3620D COM1 Mode Selection Switches (SW1~SW4)

These switches set the cPCI-3620D COM1 to RS-232 full modem, RS-422, RS-485, or RS-485+ half-duplex mode. Switches SW1~SW4 are located on the top edge of the DB-3610L2 board. RS-232 full modem is set by default.



SW1 SW2 SW3 SW4

Mode	Pin	SW1	SW2	SW3	SW4
RS-232	1	ON	ON	ON	OFF
	2	OFF	OFF	OFF	OFF
	3	OFF	ON	ON	OFF
	4	OFF	OFF	OFF	OFF
RS-422	1	OFF	OFF	OFF	ON
	2	ON	ON	ON	OFF
	3	OFF	OFF	OFF	ON
	4	OFF	ON	ON	OFF
RS-485	1	OFF	OFF	OFF	ON
	2	OFF	ON	ON	OFF
	3	ON	OFF	OFF	ON
	4	OFF	ON	ON	OFF
RS-485+	1	OFF	OFF	OFF	OFF
	2	OFF	ON	ON	ON
	3	ON	OFF	OFF	OFF
	4	OFF	ON	ON	ON

Table 4-9: cPCI-3620D COM1 Mode Selection Switch Settings

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cPCI-3620T COM1 Mode Selection Switch (SW1)

These switches set the cPCI-3620T COM1 to RS-232 full modem, RS-422 or RS-485. Switch SW1 is located next to the COM1 connector on the DB-3620L2 board. RS-232 full modem is set by default.

SW1



Mode	Pin	SW1
RS-232	1	ON
	2	OFF
RS-422	1	ON
	2	ON
RS-485	1	OFF
	2	ON

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Serial ATA Connector on DB-3610L2

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	NC
P12	GND
P13~P15	NC

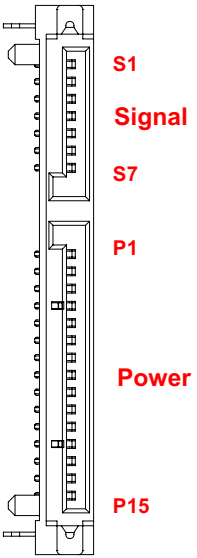


Table 4-10: Serial ATA Connector on DB-3610L2 Pin Definition

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PMC Connector on DB-3UMC (JN1/2)

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

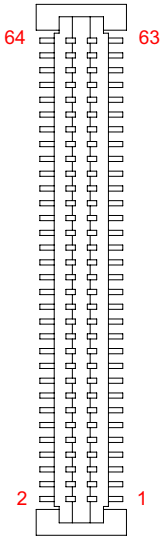


Table 4-11: PMC Connector Pin Definitions

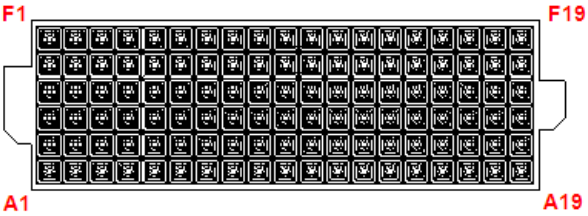
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Pin#	JN1 Signal	JN2 Signal
33	PCIX_FRAME-L	GND
34	GND	NC
35	GND	PCIX_TRDY-L
36	PCIX_IRDY-L	P3V3
37	PCIX_DEVSEL-L	GND
38	P5V	PCIX_STOP-L
39	PCIX_PCIXCAP	PCIX_PERR-L
40	PCIX_LOCK-L	GND
41	NC	P3V3
42	NC	PCIX_SERR-L
43	PCIX_PAR	PCIX_CBE-L1
44	GND	GND
45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

Table 4-11: PMC Connector Pin Definitions (cont'd)

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XMC Connector on DB-3UMC (JN3)



Pin#	A	B	C	D	E	F
1	RXP	RXN	3.3V	NC	NC	VPWR
2	GND	GND	Not used	GND	GND	PCIE_RST-L
3	NC	NC	3.3V	NC	NC	VPWR
4	GND	GND	Not used	GND	GND	Not used
5	NC	NC	3.3V	NC	NC	VPWR
6	GND	GND	Not used	GND	GND	+12V
7	NC	NC	3.3V	NC	NC	VPWR
8	GND	GND	Not used	GND	GND	-12V
9	NC	NC	Not used	NC	NC	VPWR
10	GND	GND	Not used	GND	GND	GA0
11	TXP	TXN	Not used	NC	NC	VPWR
12	GND	GND	GA1	GND	GND	Not used
13	NC	NC	3.3V	NC	NC	VPWR
14	GND	GND	GA2	GND	GND	Not used
15	NC	NC	Not used	NC	NC	VPWR
16	GND	GND	Not used	GND	GND	Not used
17	NC	NC	Not used	NC	NC	NC
18	GND	GND	Not used	GND	GND	Not used
19	CK-P	CK-N	Not used	Not used	Not used	Not used

Table 4-12: XMC Connector Pin Definition

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CompactPCI J1 Connector

Pin	Z	A	B	C	D	E	F
25	GND	+5V	REQ64#	ENUM#	NC	+5V	GND
24	GND	CPCI_AD1	+5V	CPCI_VIO	CPCI_AD0	ACK64#	GND
23	GND	NC	CPCI_AD4	CPCI_AD3	NC	CPCI_AD2	GND
22	GND	CPCI_AD7	GND	NC	CPCI_AD6	CPCI_AD5	GND
21	GND	NC	CPCI_AD9	CPCI_AD8	CPCI_M66EN	CPCI_CBE-L0	GND
20	GND	CPCI_AD12	GND	VIO	CPCI_AD11	CPCI_AD10	GND
19	GND	NC	CPCI_AD15	CPCI_AD14	GND	CPCI_AD13	GND
18	GND	CPCI_SERR-L	GND	NC	CPCI_PAR	CPCI_CBE-L1	GND
17	GND	NC	NC	NC	GND	CPCI_PERR-L	GND
16	GND	CPCI_DEVSEL-L	GND	VIO	CPCI_STOP-L	CPCI_LOCK-L	GND
15	GND	NC	CPCI_FRAME-L	CPCI_IRDY-L	CPCI_BDSEL#	CPCI_TRDY-L	GND
12-14	Key						
11	GND	CPCI_AD18	CPCI_AD17	CPCI_AD16	GND	CPCI_CBE-L2	GND
10	GND	CPCI_AD21	GND	NC	CPCI_AD20	CPCI_AD19	GND
9	GND	CPCI_CBE-L3	NC	CPCI_AD23	GND	CPCI_AD22	GND
8	GND	CPCI_AD26	GND	VIO	CPCI_AD25	CPCI_AD24	GND
7	GND	CPCI_AD30	CPCI_AD29	CPCI_AD28	GND	CPCI_AD27	GND
6	GND	CPCI_REQ-L0	GND	NC	CPCI_CLK0	CPCI_AD31	GND
5	GND	NC	NC	CPCI_RESET-L	GND	CPCI_GNT-L0	GND
4	GND	NC	CPCI_HEALTHY-L	VIO	CPCI-INTP	NC	GND
3	GND	CPCI_IRQA-L	CPCI_IRQB-L	CPCI_IRQC-L	+5V	CPCI_IRQD-L	GND
2	GND	cPCI_TCK-L	+5V	NC	NC	cPCI_TDI-L	GND
1	GND	+5V	-12V	NC	+12V	+5V	GND

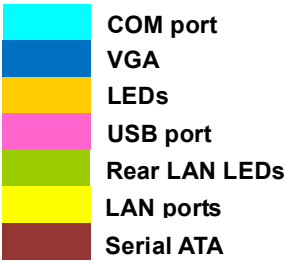
Table 4-13: CompactPCI J1 Connector Pin Definition

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CompactPCI J2 Connector

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	LAN1_TXDP0	LAN1_TXDN0	NC	GND
20	GND	CLK5	GND	LAN1_TXDP2	GND	R_LAN2_1000-L	GND
19	GND	GND	GND	LAN1_TXDN2	LAN1_TXDP1	LAN1_TXDN1	GND
18	GND	R_LAN2_100-L	LAN1_TXDP3	LAN1_TXDN3	GND	+3.3V	GND
17	GND	R_LAN2_LINK/ACT-L	GND	PRSTJ	REQ6#	GNT6#	GND
16	GND	GPIO0	R_LAN1_100-L	USB6-P	GND	R_LAN1_1000-L	GND
15	GND	RGB_BLUE	R_LAN1_LINK/ACT-L	USB6-N	REQ5#	GNT5#	GND
14	GND	GPIO1	USB_6_OC#	USB_5_OC#	SATA_TX-N1	COM2_RI#	GND
13	GND	LAN2_TXDP0	GND	SATA_TX-P1	COM2_DTR#	COM2_CTS#	GND
12	GND	GPIO2	LAN2_TXDN0	USB5-P	SATA_RX-N1	COM2_SOUT	GND
11	GND	LAN2_TXDP1	GND	SATA_RX-P1	COM2_RTS#	COM2_SIN	GND
10	GND	GPIO3	LAN2_TXDN1	USB5-N	GND	COM2_DSR#	GND
9	GND	VSY	GND	RGB_GREEN	COM2_DCD#	COM3_RI#	GND
8	GND	HSY	LAN2_TXDP2	LAN2_TXDN2	GND	COM3_DTR#	GND
7	GND	RGB_RED	GND	+5V	COM3_CTS#	COM3_SOUT	GND
6	GND	DDC_CLK	LAN2_TXDP3	LAN2_TXDN3	GND	CON3_RTS#	GND
5	GND	DDC_DAT	GND	HDD_LED	COM3_SIN	COM3_DSR#	GND
4	GND	V(I/O)	Power_LED	WDT_LED	GP_LED	COM3_DCD#	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Table 4-14: CompactPCI J2 Connector Pin Definition



CompactPCI J2 Connector Legend

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cPCI-R3610(T) RTM Serial Ports

Serial Port Pin Headers (COM2/3)

Pin #	RS-232	RS-422	RS-485(+)
1	DCD-L	TXD-	TXD-
2	DSR-L	—	—
3	RXD	TXD+	TXD+
4	RTS-L	—	—
5	TXD	RXD+	—
6	CTS-L	—	—
7	DTR-L	RXD-	—
8	RI-L	—	—
9	GND	GND	GND
10	—	—	—

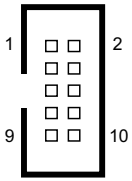


Table 4-15: cPCI-R3610(T) Serial Port Pin Header Definition

Serial Port DB-9 Connectors (COM2/3)

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	—	—

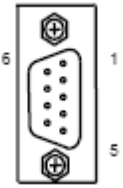
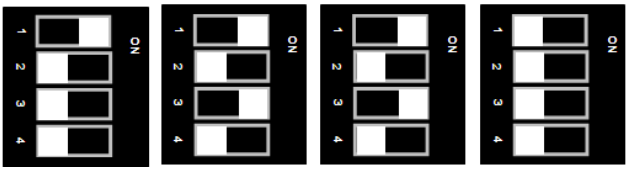


Table 4-16: cPCI-R3610(T) COM2/3 (DB-9) Pin Definition

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COM2 Mode Selection Switches on RTM (SW1~SW4)

These switches on the RTM select COM2 to be RS-232 full modem, RS-422, RS-485, or RS-485+ half-duplex mode. RS-232 full modem is set by default. See “cPCI-R3610(T) RTM Board Layout” on page 29 for switch locations.



SW1 SW2 SW3 SW4

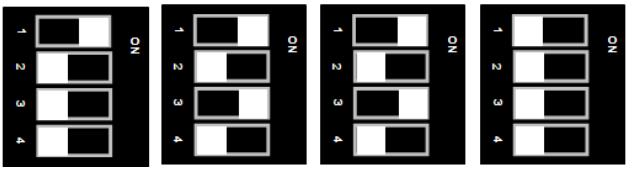
Mode	Pin	SW1	SW2	SW3	SW4
RS-232	1	OFF	ON	ON	ON
	2	OFF	OFF	OFF	OFF
	3	OFF	ON	ON	OFF
	4	OFF	OFF	OFF	OFF
RS-422	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	ON
	3	ON	OFF	OFF	OFF
	4	OFF	ON	ON	OFF
RS-485	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	OFF
	3	ON	OFF	OFF	ON
	4	OFF	ON	ON	OFF
RS-485+	1	OFF	OFF	OFF	OFF
	2	ON	ON	ON	OFF
	3	OFF	OFF	OFF	ON
	4	ON	ON	ON	OFF

Table 4-17: COM2 Mode Selection Switch Settings

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COM3 Mode Selection Switches on RTM (SW5~SW8)

These switches on the RTM select COM3 to be RS-232 full modem, RS-422, RS-485, or RS-485+ half-duplex mode. RS-232 full modem is set by default. See “cPCI-R3610(T) RTM Board Layout” on page 29 for switch locations.



SW5 SW6 SW7 SW8

Mode	Pin	SW5	SW6	SW7	SW8
RS-232	1	OFF	ON	ON	ON
	2	OFF	OFF	OFF	OFF
	3	OFF	ON	ON	OFF
	4	OFF	OFF	OFF	OFF
RS-422	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	ON
	3	ON	OFF	OFF	OFF
	4	OFF	ON	ON	OFF
RS-485	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	OFF
	3	ON	OFF	OFF	ON
	4	OFF	ON	ON	OFF
RS-485+	1	OFF	OFF	OFF	OFF
	2	ON	ON	ON	OFF
	3	OFF	OFF	OFF	ON
	4	ON	ON	ON	OFF

Table 4-18: COM3 Mode Selection Switch Settings

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Serial ATA Connectors on RTM

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

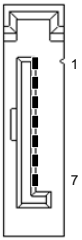


Table 4-19: Serial ATA Connector on RTM

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4.10 Jumper Settings

XMC VPWR Select Jumper on DB-3UMC (JPX1)

This jumper is located on the DB-3UMC board near JN1/2 and selects the XMC VPWR setting. 5V is set by default.

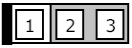
Mode	Connection	JPX1
+5V (Default)	1 – 2	
+12V	2 – 3	

Table 4-20: XMC VPWR Select Jumper Settings

PMC V(I/O) Select Jumper on DB-3UMC (JPX2)

This jumper is located on the DB-3UMC board near JN1/2 and selects the PMC V(I/O) setting. 3.3V is set by default.

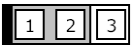
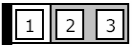
Mode	Connection	JPX2
+5V	1 – 2	
+3.3V (Default)	2 – 3	

Table 4-21: PMC V(I/O) Select Jumper Settings

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5 Getting Started

This chapter describes the following installation procedures for the cPCI-3620 and rear transition module:

- CPU and Heatsink
- 2.5" SATA storage drive
- PCI Mezzanine Card
- Processor blade installation to chassis
- RTM installation to chassis

5.1 CPU and Heatsink

The cPCI-3620 Series come with CPU and heatsink pre-installed. Removal of heatsink/CPU by users is not recommended. Please contact your ADLINK service representative for assistance.

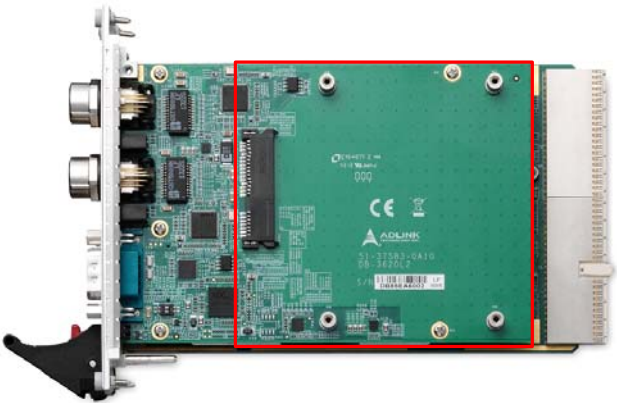
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5.2 SATA Drive Installation

The cPCI-3620D/T 2-slot versions provide space to install a slim type 2.5" Serial-ATA storage drive.

Installing a SATA Drive - cPCI-3620D/T

1. A 2.5" SATA drive can be assembled in the location marked as below.



2. Prepare a 2.5" SATA drive and locate the brackets and screws in the accessory kit.



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3. Screw the brackets to the 2.5" SATA drive with the four with M3 screws provided.



4. Align the drive assembly with the cPCI-3620D/T and insert it into the onboard SATA connector until it is properly seated.



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5. Secure the hard drive assembly to the cPCI-3620D/T with four M2.5 screws provided.



5.3 PMC/XMC Card Installation

The cPCI-3620S provides one PMC/XMC slot designed to support 3.3V or 5V V(I/O) (default 3.3V) and 5V or 12V VPWR (default 5V). Before you install the PMC/XMC card on the cPCI-3620S, please make sure that the PMC V(I/O) jumper JPX2 and XMC VPWR jumper JPX1 on the DB-3UMC daughter board have been correctly set.

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5.4 Installing the cPCI-3620 to the Chassis

The cPCI-3620 may be installed in a system or peripheral slot of a 3U 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-3620 ejector handles.
4. **Remove the black plastic caps securing the mounting screws to the faceplate.**
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 faceplate.
7. Connect the cables and peripherals to the board, and then turn the chassis on if necessary.

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5.5 RTM Installation - cPCI-R3610(T)

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-3620 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-3620 drivers are available from the ADLINK website at (**http://www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1335**). ADLINK provides validated drivers for Windows 8. We recommend using these drivers to ensure compatibility. The VxWorks BSP can be downloaded from the cPCI-3620 product page on the ADLINK website (link above).

6.1 cPCI-3620 Drivers

The following describes the cPCI-3620 driver installation procedures for Windows 8. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.

1. Before beginning Windows installation, save the AHCI driver to a USB flash drive. During Windows installation, install the AHCI driver from the USB flash drive when prompted.
2. Install the **chipset driver** by extracting and running the program in **...\Chipset\Intel Chipset Device Software_WinAllOS_9.4.4.1005.zip**.
3. Install the **graphics driver** and utilities by extracting and running the program in **...\Graphics\Intel®_HD Graphics_Install_Win8_64bit_10.18.10.3366.zip**.
4. Install the **LAN driver** by running the program in **…\LAN\Intel(R)_Network_Connection_Win8_64_12.6.47.1.exe**.
5. Install the **audio driver** and utilities by extracting and running the program in **…\Audio\Realtek_High Definition Audio_Win7_8_64_6.0.1.6873.zip**.

Drivers for the USB Serial Converter and PCI Simple Communication Controller must be manually installed (e.g. using the Windows Device Manager). Drivers can be downloaded from the cPCI-3620 product page on the ADLINK website (link above)

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VGA noise Issue with older versions of Ubuntu OS


NOTE:

The VGA port may exhibit noise when the system is running an older version of the Ubuntu OS. This is due to a graphics driver compatibility issue with the new Intel® Atom CPU (reproducible on the Intel Customer Reference Board). ADLINK recommends installing the latest version of Ubuntu (e.g. 14.04 LTS).

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7 Utilities

7.1 SEMA

Hardware monitoring and Watchdog Timer functionality are provided by ADLINK's Smart Embedded Management Agent (SEMA), which operates via a Board Management Controller and communicates with the CPU through the SMBus. A graphical user interface program and command line interface are available to allow you to communicate with SEMA. Please refer to the SEMA user's manuals, available for download from the SEMA product page: **http://www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1274**.


NOTE:

The cPCI-3620 does NOT support the following SEMA functions:

- Save data in write-protectable flash ROM
- LVDS backlight control
- Smart Fan control and fan speed

Due to limitations of the Intel "Bay Trail" platform, SEMA can only obtain CPU temperature readings when the OS is running.

7.2 Preboot Execution Environment (PXE)

The cPCI-3620 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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7.3 Watchdog Timer

The watchdog timer on the cPCI-3620 can be implemented in the following ways:

- SEMA GUI
- SEMA CLI
- Embedded Application Programming Interface (EAPI) library functions
- SEMA library functions

Please refer to the SEMA Software Manual for detailed information: **http://www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1274**.

EAPI Library Sample Code

Make sure you have installed the SEMA driver and application. When installing, please check the “Install EAPI” option.

Include the relevant header files

```
#ifndef _WIN32
#include "linux/EApiOs.h"
#else /* _WIN32 */
#include "winnt/EApiOs.h"
#endif /* _WIN32 */
#include "EApi.h"
```

Initialize the EAPI

```
EApiLibInitialize();
```

Call the EAPI function

```
uint32_t status=EApiWDogStart(Delay,EventTimeout,
  ResetTimeout);
```

For detailed information on the PICMG EAPI Library, please refer to the **PICMG EAPI - Embedded Application Programming Interface specification**: http://picmg.staging.wedu.com//wp-content/uploads/COM_EAPI_R1_0.pdf.

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8 BIOS Setup Utility

The following chapter describes basic navigation for the AMI EFI 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.



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.

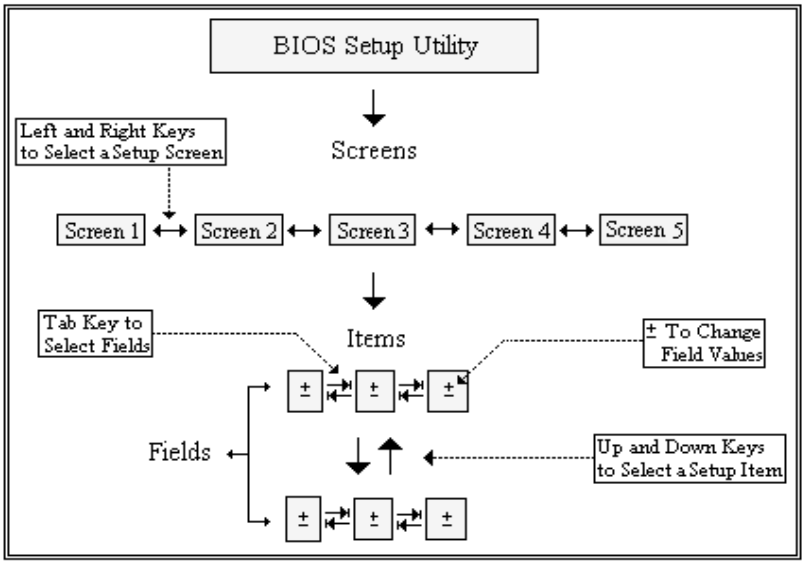
The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.



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

→←	Left/Right. The Left and Right < Arrow > keys allow you to select a setup screen. For example: Main screen, Advanced screen, Chipset screen, and so on.
↑↓	Up/Down The Up and Down < Arrow > keys allow you to select a setup item or sub-screen.
+-	Plus/Minus The Plus and Minus < Arrow > keys allow you to change the field value of a particular setup item. For example: Date and Time.
Tab	The < Tab > key allows you to select setup fields.
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. 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.

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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.



Board Information

BIOS Vendor

Display the BIOS vendor

Core Version

Display the BIOS core version

BIOS Version

Display the current BIOS revision

Build Data and Time

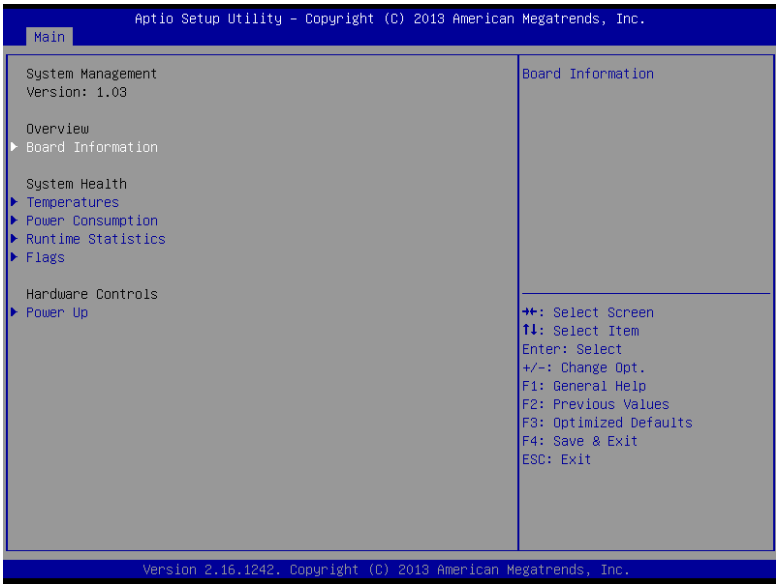
Display the BIOS build data

Memory Information

Display the system memory data.

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System Management



Board Information

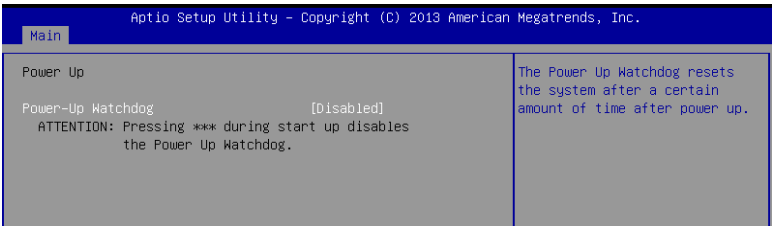
Display information from SEMA via the SMBus: SEMA Firmware, SEMA Bootloader, Build Date, Hardware Version, Serial Number, Manufacturing Date, Last Repair Date, MAC ID

System Health

Displays CPU and Board Temperatures, Power Consumption, Runtime Statistics, BMC Flags.

Power Up

Enable/Disable the Power-Up Watchdog.



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System Language

Choose the system default language.

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.



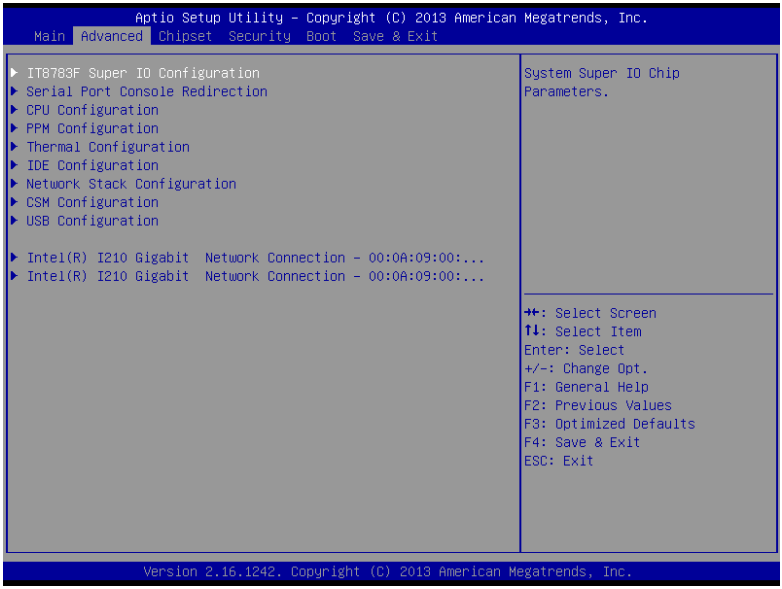
NOTE:

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.



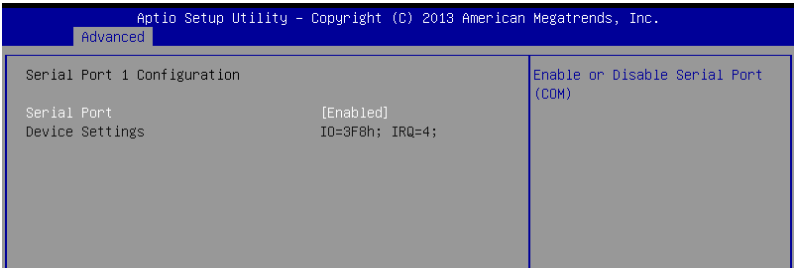
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8.3.1 Super IO Configuration

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 Port1-3 Configuration

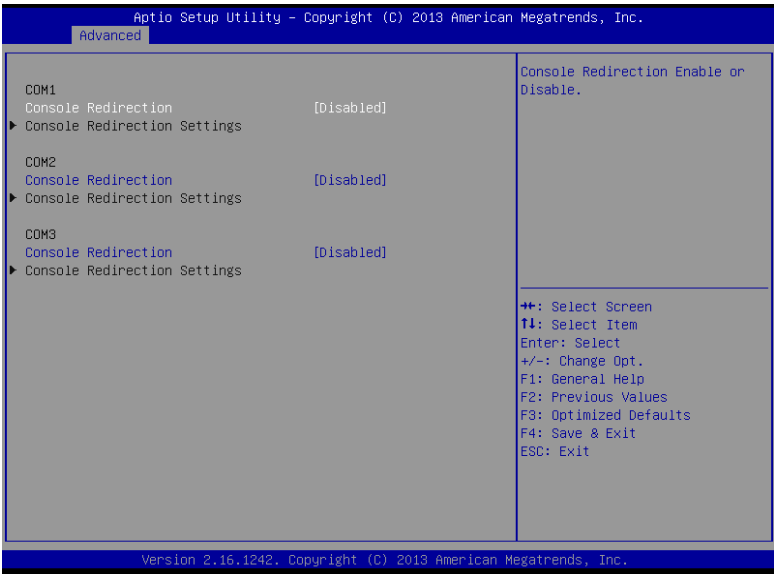


This option enables/disables Serial Ports 1-3, which have fixed I/O port addresses and IRQs: Port1: IO=3F8, IRQ=4, Port2: IO=2F8, IRQ=3, Port3: IO=3E8, IRQ=5.

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8.3.2 Serial Port Console Redirection

These settings specify how the host computer and the remote computer will exchange data. Both computers should have the same or compatible settings. The screen is shown below.

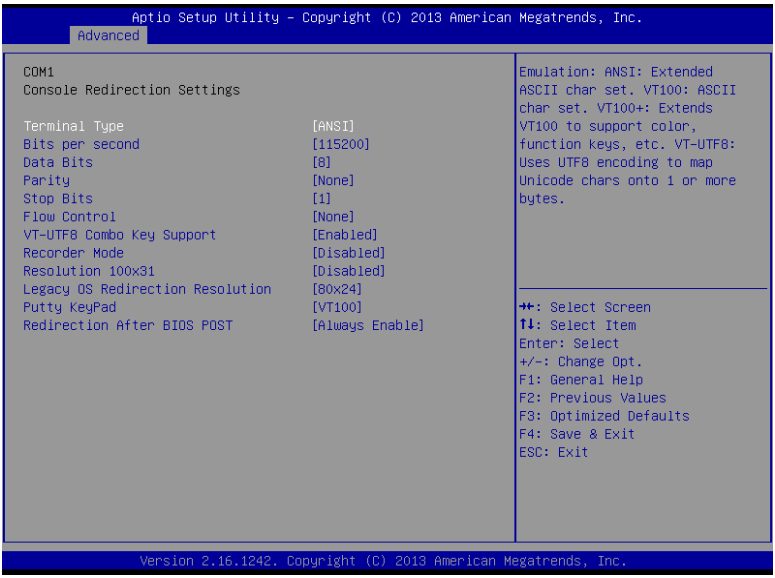


COM1/COM2/COM3 Console Redirection

Enable or disable console redirection on COM1/2/3.

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COM1/2/3 Console Redirection Settings



Terminal Type

VT100+ is the preferred terminal type for out-of-band management. Configuration options: VT100, VT100+, VT-UTF8, ANSI.

Bits per Second

Select the bits per second you want the serial port to use for console redirection. The options are 115200, 57600, 38400, 19200, 9600.

Data Bits

Select the data bits you want the serial port to use for console redirection. Set this value to 7, 8.

Parity

Set this option to select Parity for console redirection. The settings for this value are None, Even, Odd, Mark, Space.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit.

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Communication with slow devices may require more than 1 stop bit. Set this value to 1 and 2.

Flow Control

Set this option to select Flow Control for console redirection. The settings for this value are None, Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Enables VT-UTF8 combination key support for ANSI/VT100 terminals.Set this value to Enabled/Disabled.

Recorder Mode

When this mode is enabled, only text will be sent. This is to capture terminal data. Set this value to Enabled/Disabled.

Resolution 100x31

Set this option to extended terminal resolution. Set this value to Enabled/Disabled.

Legacy OS Redirection

On legacy OS, the number of rows and columns supported for redirection. Set this value to 80x24, 80x25.

Putty Key Pad

Select FunctionKey and KeyPad on Putty. Set this value to VT100, LINUX, XTERMR6, SCO, ESCN, VT400.

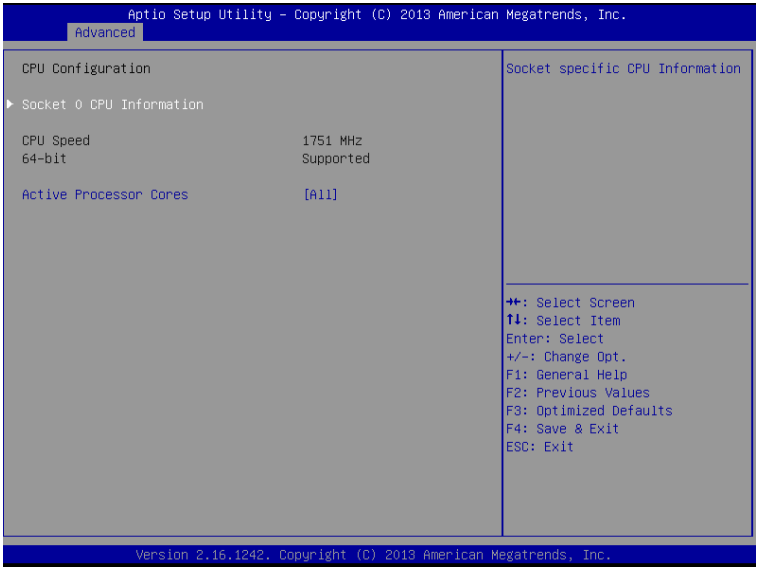
Redirection After BIOS POST

Available options: 'Disabled', 'During Boot Loader' or 'Always'. If 'BootLoader' is selected, redirection is disabled before booting to legacy OS. The default value is 'Always Enable' which enables redirection for legacy OS.

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8.3.3 CPU Configuration

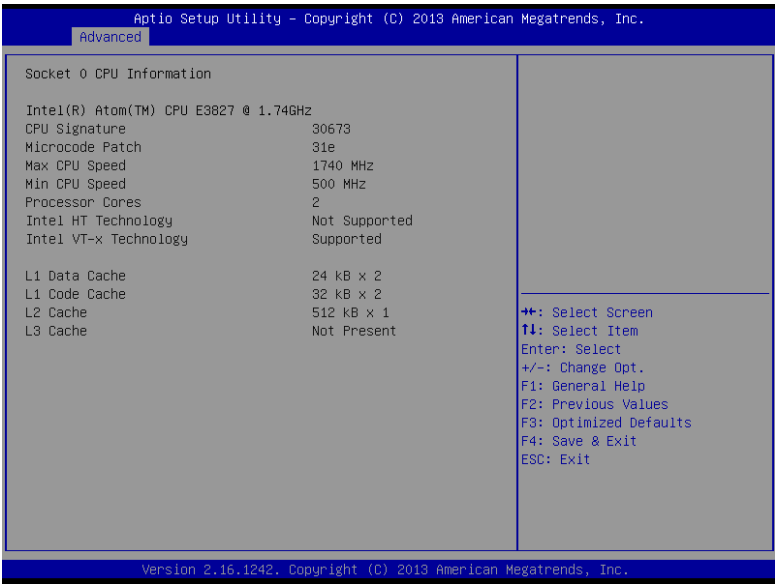
You can use this screen to select options for the CPU Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described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



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Socket 0 CPU Information

This page displays CPU information, including and CPU signature, Microcode Patch, Max/Min CPU speed, Processor Cores, and Intel HT/Intel VT-x support.

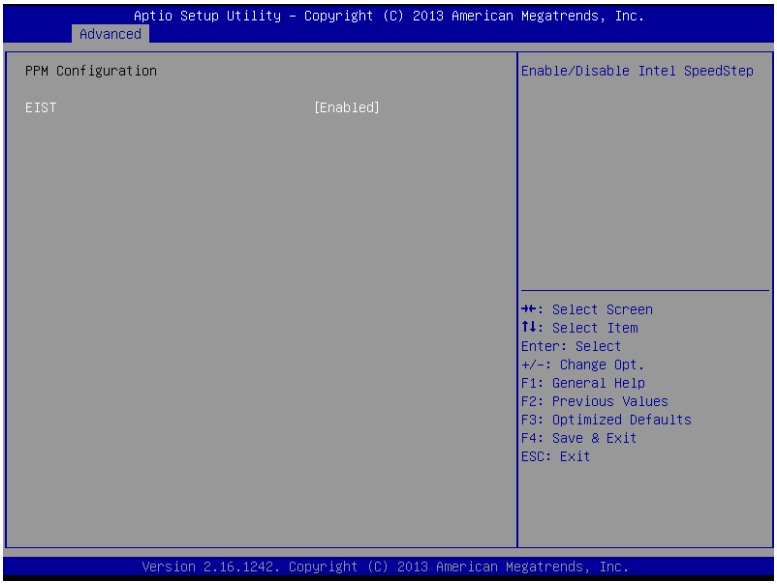


Active Processor Core

Select the number of active CPU cores ("All" or "1").

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8.3.4 PPM Configuration

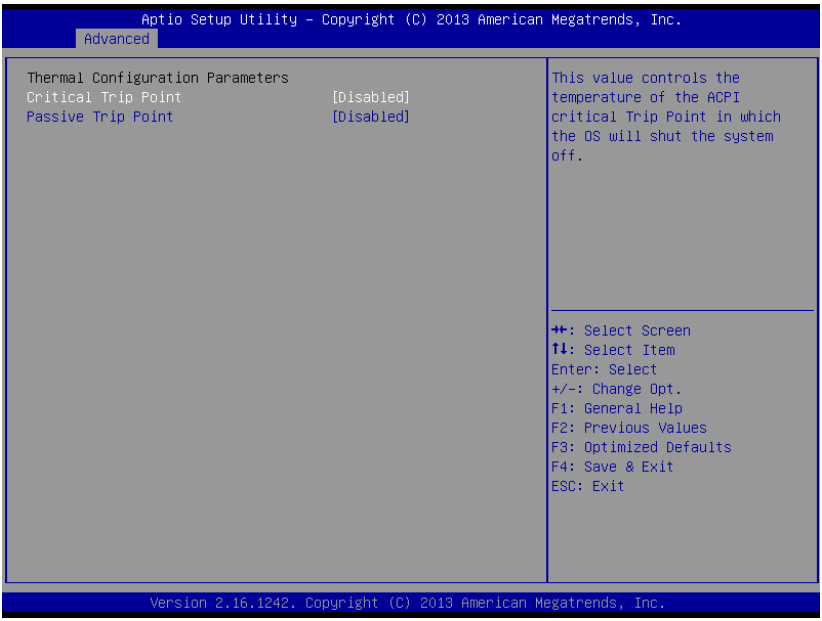


EIST

Enhanced 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.

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8.3.5 Thermal Configuration



Critical Trip Poin

Sets the temperature of the ACPI critical trip point at which the OS will shut down.

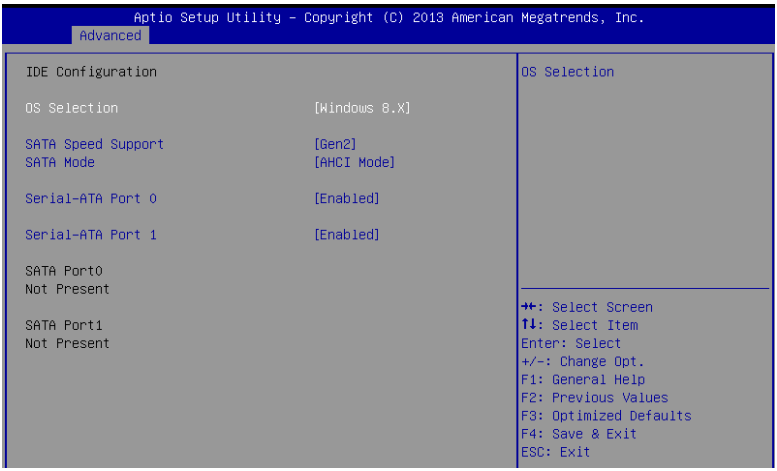
Passive Trip point

Sets the temperature of the ACPI passive trip point at which the OS will begin throttling the processor.

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8.3.6 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.



OS Selection

This item specifies support for Windows 8.x or Windows 7.

NOTE: This item also sets CSM Configuration > Boot Option Filter / Storage / Video to UEFI only or Legacy only.

SATA Speed Support

Set SATA supports to Gen1 or Gen2.

SATA Mode

Select IDE or AHCI mode.

Serial-ATA Port 0

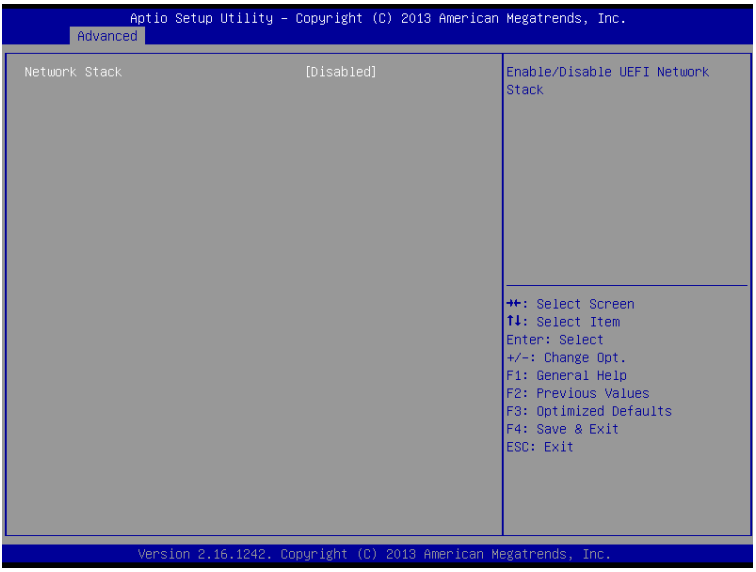
Enable/Disable Serial ATA Port 0

Serial-ATA Port 1

Enable/Disable Serial ATA Port 1

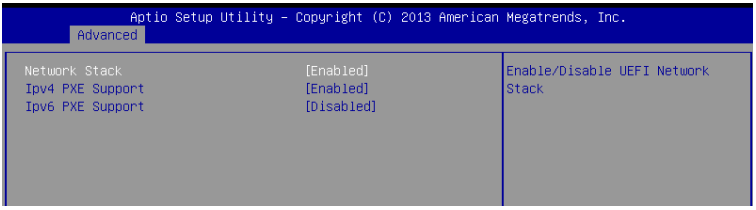
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8.3.7 Network Stack Configuration



Network stack

Enable/Disable the UEFI network stack.



IPv4 PXE Support

Enable/Disable IPv4 PXE Boot Support.

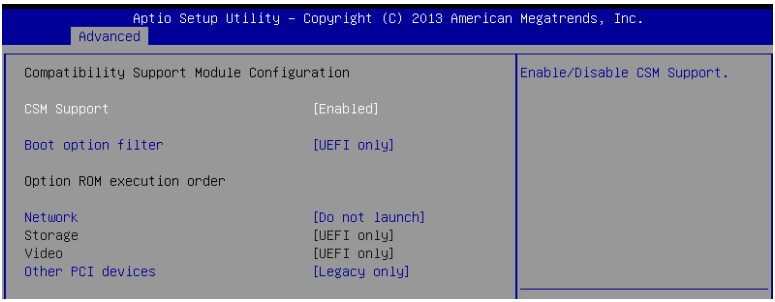
IPv6 PXE Support

Enable/Disable IPv6 PXE Boot Support.

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8.3.8 CSM Configuration

You can use this screen to select options for the Compatibility Support Module (CSM) settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option.



CSM Support

Enable/Disable CSM Support

Boot Option Filter

This option controls Legacy/UEFI ROM priority.

Network

Setting "OS_Select" to Windows 7 only supports PXE ROM boot. Setting "OS_Select" to Window 8 only supports EFI Network Stack

Storage

The Storage status is set by IDE Configuration > OS selection.

Video

The Video status is set by IDE Configuration > OS Selection.

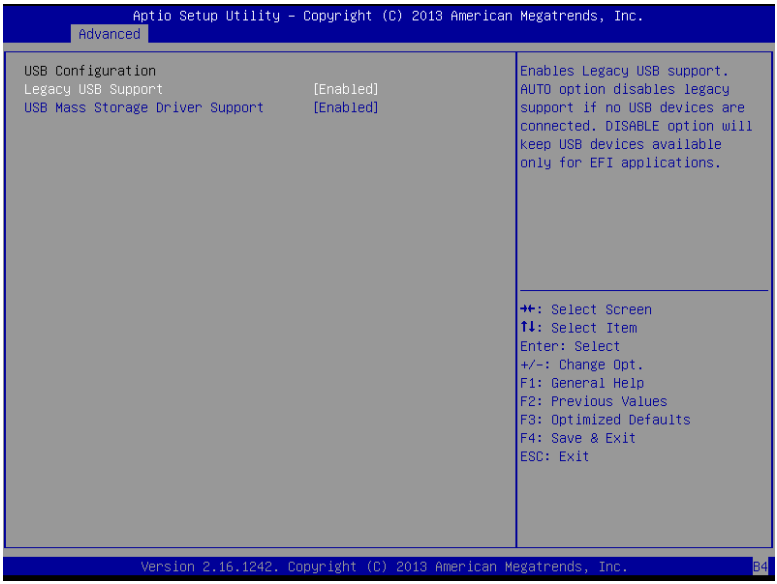
Other PCI devices

Determines OpROM execution policy for devices other than Network, Storage, or Video.

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8.3.9 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. The screen is shown below.



Legacy USB Support

Enables legacy USB support. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications. Set this value to Enabled/Disabled/Auto.

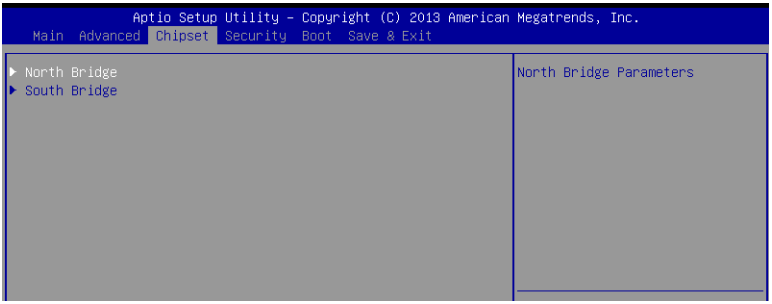
USB Mass Storage Driver Support

Enable/Disable USB mass storage driver support

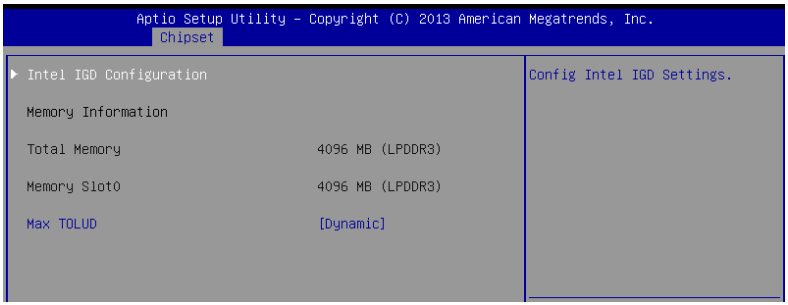
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8.4 Chipset Configuration

Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of Chipset BIOS Setup options by highlighting it using the < Arrow > keys. The Chipset BIOS Setup screen is shown below.



8.4.1 North Bridge



Memory Information

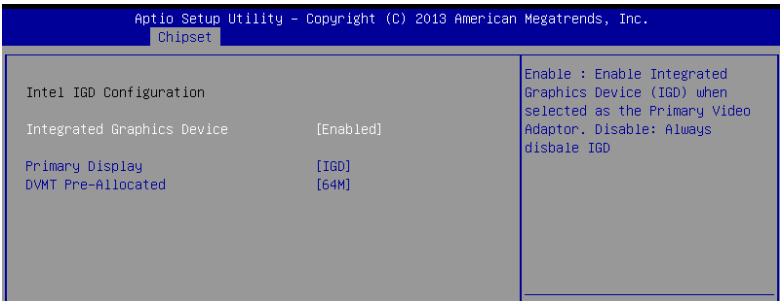
Displays the memory information.

Max ToLUD

Select IGD dynamic or fixed mmio size

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Intel IGD Configuration



Integrated Graphics Device

Enabled: Integrated Graphics Device (IGD) when selected as the primary graphics adapter. Disable: Always disable IGD

Primary Display

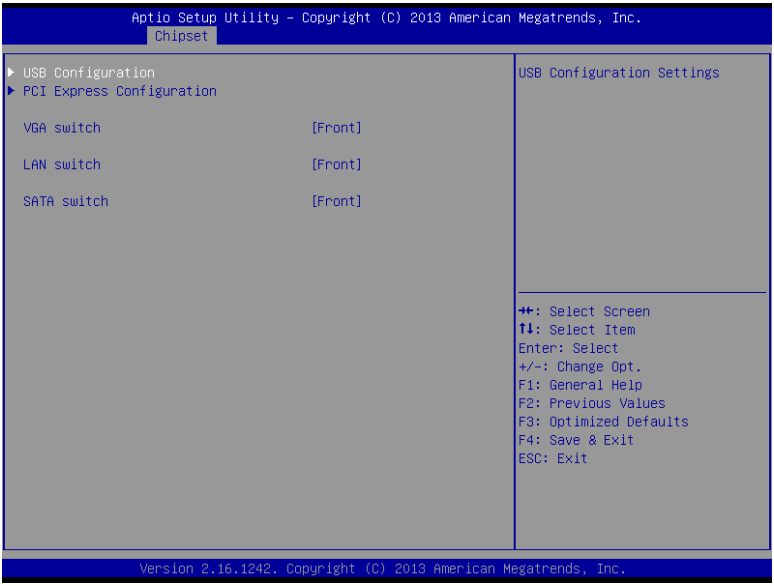
Select which graphics device (IGD/PCI) should be primary display

DVMT Pre-Allocated

Select DVMT Pre-Allocated (fixed) graphics memory size used by the internal graphics device.

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8.4.2 South Bridge



VGA Switch

Sets the VGA output to the faceplate or to rear IO.

LAN Switch

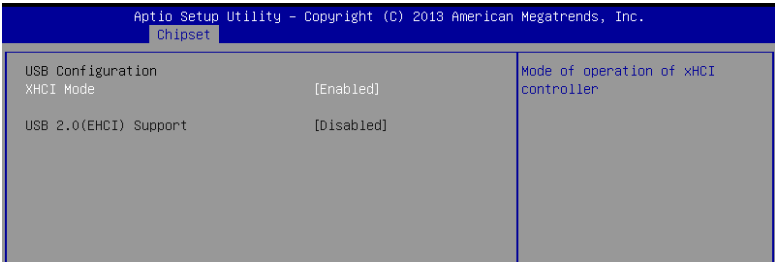
Sets the LAN1/2 output to the faceplate or to rear IO.

SATA Switch

Sets the SATA1 output to the front blade or to rear IO.

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USB Configuration

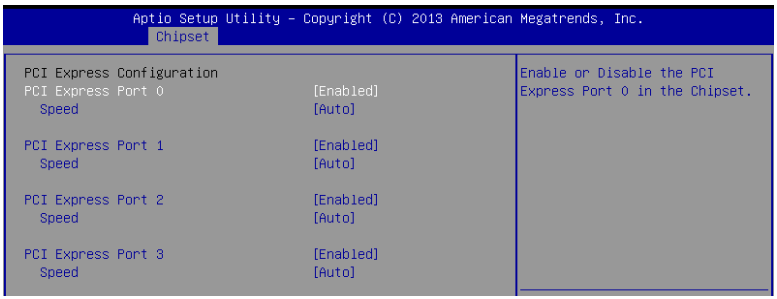


XHCI Mode

USB2.0 (EHCI)Support

The Intel “Bay Trail” platform only supports one XHCI/EHCI controller. If the OS selection is Windows 8, XHCI Mode must be enabled and USB 2.0 (EHCI) must be disabled. If the OS selection is Windows 7, USB 2.0 (EHCI) must be enabled and XHCI Mode must be disabled.

PCI Express Configuration



PCI Express Port 0/1/2/3

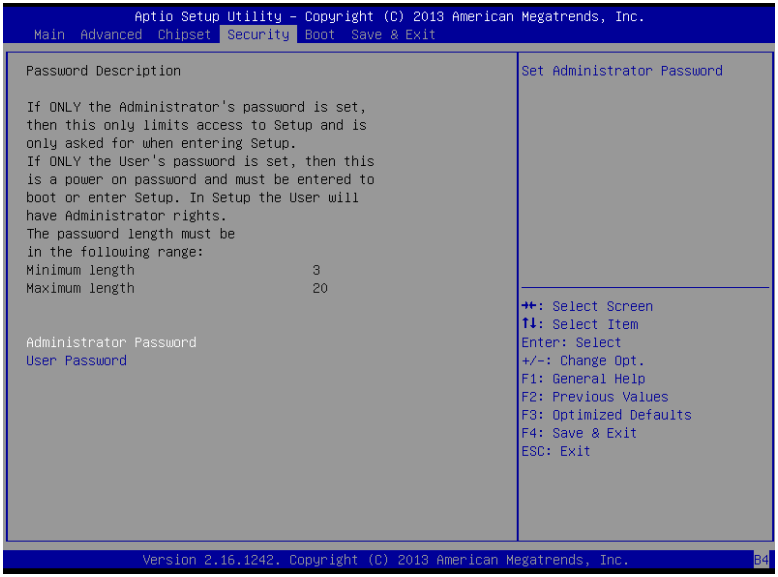
Enable/Disable PCI Express Port 0/1/2/3 on the chipset.

Speed

Configure the PCIe Port Speed.

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8.5 Security



Administrator, User Password

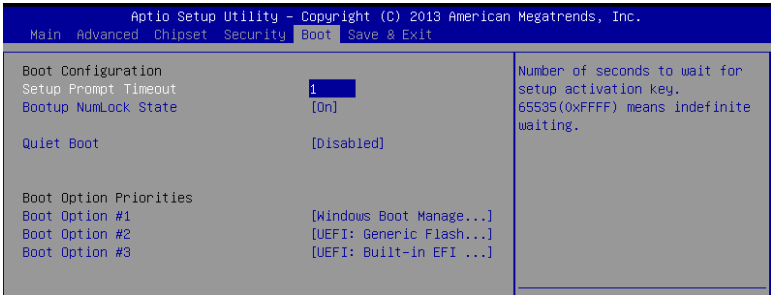
If only the administrator's password is set, then this only limits access to setup and is only asked for when entering setup.

If only the user's password is set, then this is a power on password and must be entered to boot or enter setup. In setup the user will have administrator rights.

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8.6 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 and display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The Boot Settings screen is shown below:



Setup Prompt Timeout

Number of seconds to wait for the setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state

Quiet Boot

- **Disabled** - Set this value to allow the computer system to display the POST messages.
- **Enabled** - Set this value to allow the computer system to display the OEM logo.

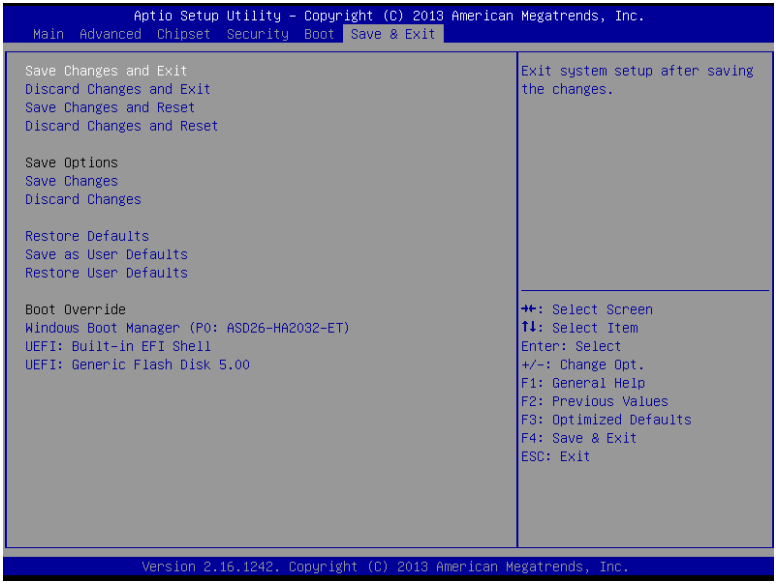
Boot Option Priorities

Set Boot Option #1-#3 boot priority.

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8.7 Save & Exit Menu

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



Save Changes and Exit/Reset

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

Discard Changes and Exit/Reset

Select this option to leave setup / reboot the computer without making any permanent changes to the system configuration.

Save Changes

Save Changes done so far to any of the setup options.

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Discard Changes

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

Select Ok to discard changes.

Restore 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.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

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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

Ask an Expert: http://askanexpert.adlinktech.com

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