cPCI-3630 Series

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

User's Manual



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Leading EDGE COMPUTING

Revision History

Revision	Release Date	Description of Change(s)
1.0	16-06-2020	Initial release

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Preface

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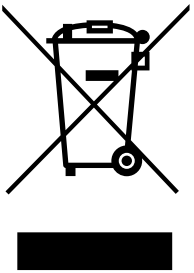
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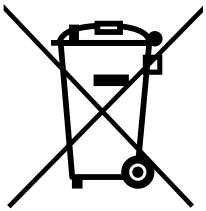
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Conventions

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 ADLINK cPCI-3630 Series is a 3U CompactPCI® 2.0 processor blade featuring the 64-bit Intel Atom® Processor X Series SoC (formerly Apollo Lake) and soldered DDR3L-1600 MHz ECC memory up to 8GB.

Available in single-slot (4HP) or dual-slot (8HP) width form factors, the cPCI-3630 Series utilizes various daughter boards to provide a broad range of I/O functionality. Faceplate I/O on the single-slot (4HP) version includes 2x USB 3.0, 2x RJ-45 GbE and 1x VGA port (common to all versions). Additional faceplate I/O on the dual-slot (8HP) versions include 2x USB 2.0, 1x COM, 1x PS/2 KB/MS and Line-in/Line-out on the cPCI-3630D; 2x DisplayPorts, 1x COM via RJ-45 connector, 1x KB/MS and USB 2.0 port on the cPCI-3630G; 2x GbE via MIL-STD M12 connectors and 1x COM on the cPCI-3630T; and 2x GbE in RJ-45 connectors and 1x COM on the cPCI-3630TR. Another dual-slot option is the cPCI-3630S with an additional XMC site on layer 2. There is also a cPCI-3630N single-slot option that provides LED indicators only with no I/O on the faceplate.

The Intel Atom® Processor X Series integrates the low-power 9th generation graphics engine and provide excellent graphics, media and display support. Storage options include an onboard 32GB SSD (optional), mSATA socket and 2.5" SATA drive space on the layer 2 riser card (cPCI-3630D/G/T/TR). One optional PCI 32-bit/66 MHz PCIe x1 XMC site is available on the dual-slot cPCI-3630S 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-3630 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-3630 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
- 64-bit quad-core Intel Atom® x7-E3950 Processor SoC (1.6GHz, TDP 12W) or dual-core Intel Atom® x5-E3930 Processor SoC (1.3GHz, TDP 6.5W)
- Graphics and memory controllers integrated in SoC
- Compatible with PICMG 2.0 CompactPCI R3.0 and PICMG 2.1 Hot Swap R2.0
- Dual channel DDR3L-1600 soldered SDRAM with ECC up to 8GB
- 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 (cPCI-3630S only)
- Supports SEMA for system health monitoring
- 1x USB 3.0, 2x LAN and 1x VGA on front panel
- VGA port on front panel switchable to rear I/O by BIOS setting
- 2x GbE ports on front panel switchable to rear I/O by BIOS setting
- Additional 2x GbE via MIL-STD M12 connectors on 8HP model (cPCI-3630T only)
- Additional 2x GbE via RJ-45 connectors on 8HP model (cPCI-3630TR only)
- Line-in and Line-out on front panel (cPCI-3630D only)
- Optional onboard SATA SSD
- 2.5" SATA 3 Gb/s direct connector on 8HP version (cPCI-3630D/G/M/S/T/TR)

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1.3 Model Number Decoder

Blades

cPCI-3630XX / E3950 / M4 / S32

(A) (B) (C) (D)

(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-3630L2
- **TR** = Dual-slot width, 1x VGA, 1x USB 3.0, 2x GbE on layer 1; 2x GbE via RJ-45 connectors, 1x COM (RS-232/422/485), and 1x 2.5” SATA drive space on layer 2 DB-3630L2
- **G** = Dual-slot width, 1x VGA, 1x USB 3.0, 2x GbE on layer 1; 2x DisplayPort connectors, 1x COM (RS-232/422/485) via RJ-45 connector, 1x PS/2 KB/MS, 1x USB 2.0 and 1x 2.5” SATA drive space on layer 2 DB-3970L2
- **M** = Dual-slot width, 1x VGA, 1x USB 3.0, 2x GbE on layer 1; 1x 100-pin multi-signal connectors and 1x 2.5” SATA drive space on layer 2 DB-3970L2
- **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
- **Other** = ODM/OEM project code

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(B) CPU Code

- ▷ **E3950** = Quad-core Intel Atom® x7-E3950 Processor
- ▷ **E3930** = Dual-core Intel Atom® x7-E3930 Processor

(C) Memory Size Code

- ▷ **M4** = 1x 4GB DDR3L-1600 soldered ECC SDRAM
- ▷ **M8** = 1x 8GB DDR3L-1600 soldered ECC SDRAM

(D) Daughter Board Storage Device Code*

- ▷ Blank = default with no onboard storage
- ▷ S32 = soldered onboard 32GB SSD

*For more options, contact your ADLINK representative.

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 the faceplate of the blade.

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1.4 Package Contents

The cPCI-3630 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-3630 Series non-standard configurations will vary depending on customer requests.

Processor Blade

- The cPCI-3630 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 cPCI-3630D/G only)
- DisplayPort to DVI-I cable and RJ-45 to COM cable (8HP cPCI-3630G only)
- 2.5" SATA drive accessory pack (8HP cPCI-3630D/G/T/TR 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-3630 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-3630 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	• Quad-core Intel Atom® x7-E3950 Processor, 1.60 GHz Base frequency, 2.00GHz Burst frequency, 2MB L2 cache, TDP 12W • Dual-core Intel Atom® x7-E3930 Processor, 1.30 GHz Base frequency, 1.80GHz Burst frequency 2MB L2 cache, TDP 6.5W • Passive heatsink
Memory	• Dual channel DDR3L-1600 ECC soldered memory • Up to 8GB
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® X Series 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-3630D)
Serial Ports	• One RS-232/422/485 serial port on faceplate (cPCI-3630D/G/T/TR) • cPCI-3630D supports RS-485+ • cPCI-3630T supports RS-485 with flow control
XMC	• One PCIe x1 XMC site (cPCI-3630S)
Audio	• Line-in/Line-out on faceplate by Realtek ALC262 High Definition Audio codec (cPCI-3630D only)

Table 2-1: cPCI-3630 Processor Blade Specifications

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Faceplate I/O	**4HP (cPCI-3630)** • 1x USB 3.0 port • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port **4HP (cPCI-3630N)** • LEDs only (Power, HDD, WDT, GP, GbE), no I/O **8HP (cPCI-3630D)** • 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-3630G)** • 1x USB 3.0 port • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port • 2x DisplayPorts • 1x RJ-45 RS-232/422/485 port • 1x PS/2 KB/MS • 1x USB 2.0 **8HP (cPCI-3630T)** • 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-3630TR)** • 1x USB 3.0 port • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port • 2x GbE via RJ-45 ports • DB-9 RS-232/422/485 port **8HP (cPCI-3630S)** • 1x USB 3.0 ports • 2x 10/100/1000BASE-T Ethernet ports • 1x VGA port • XMC site

Table 2-1: cPCI-3630 Processor Blade Specifications

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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, dual 16Mbit SPI flash memory
OS Compatibility	• Microsoft Windows 10 64-bit • Yocto 2.0 • QNX 7.0 • VxWorks 7.0 • Other OS support by request
Environmental	• Operating Temperature[2]: Standard: -40°C to 70°C (fanless) Extreme: -40°C to +85°C (forced air flow by screening) • 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	• EN50121-3-2 • EN50155 • FCC Class A

Table 2-1: cPCI-3630 Processor Blade Specifications

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.

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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-3630
Graphics	• VGA switched from cPCI-3630
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-3630 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-3630 Blade

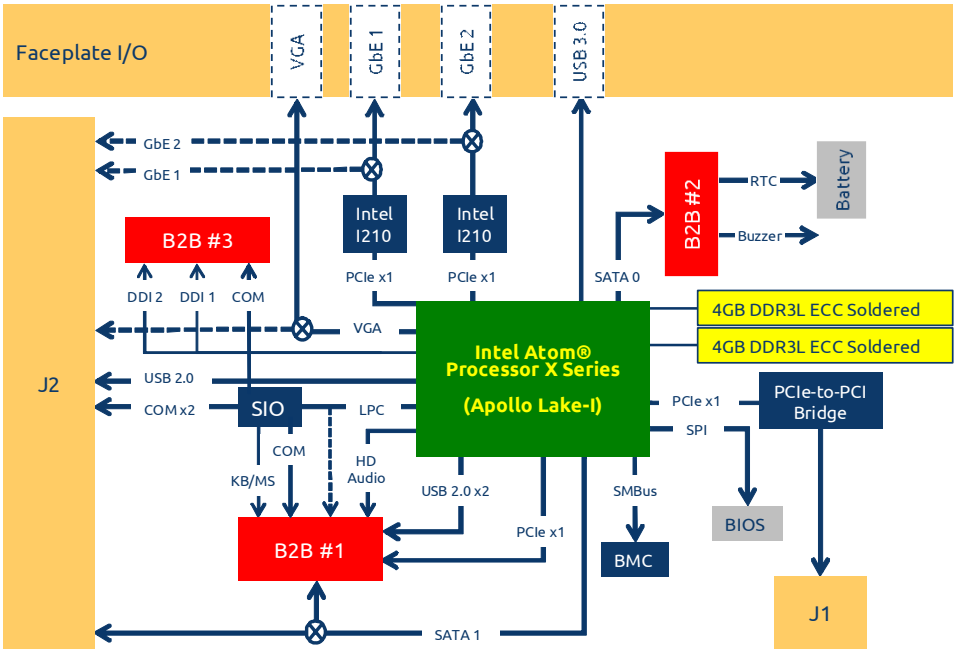


Figure 2-1: cPCI-3630 Blade Functional Block Diagram

cPCI-3630D Daughter Board (DB-3610L2)

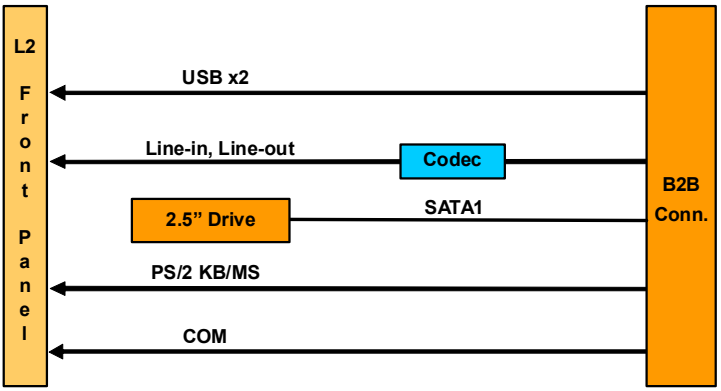


Figure 2-2: cPCI-3630D Daughter Board Functional Block Diagram

cPCI-3630T Daughter Board (DB-3620L2)

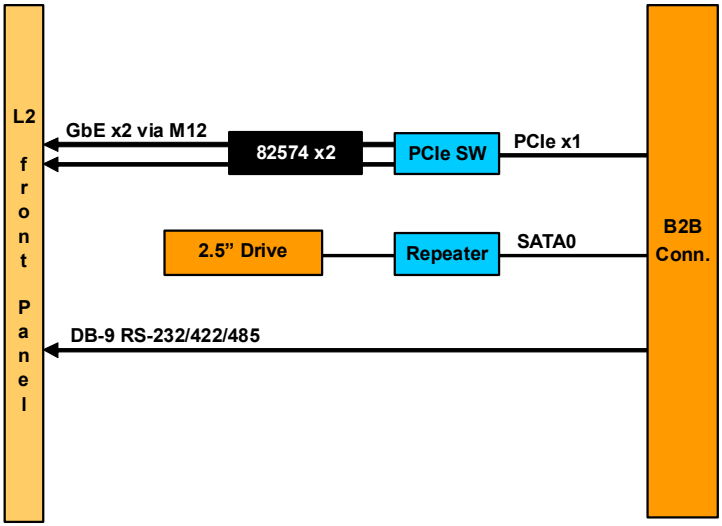


Figure 2-3: cPCI-3630T Daughter Board Functional Block Diagram

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cPCI-R3610(T) RTM

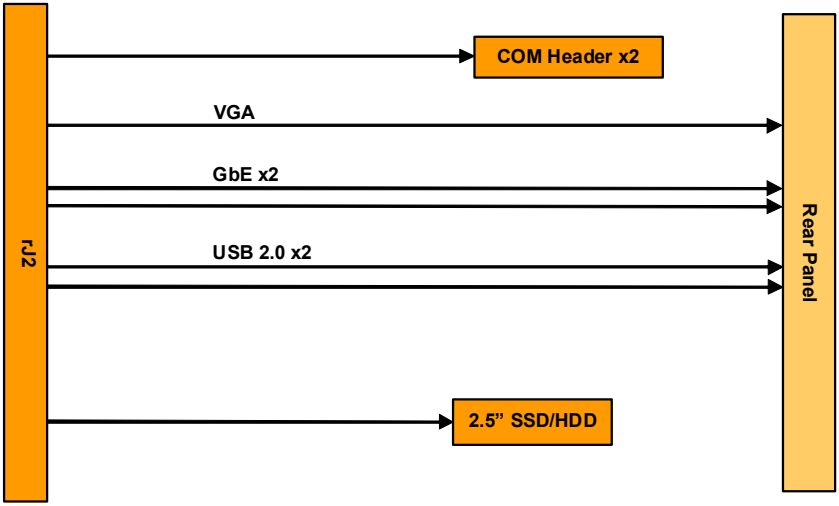


Figure 2-4: cPCI-R3610 RTM Functional Block Diagram

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2.4 I/O Connectivity Table

Function	cPCI-3630 (4HP)		cPCI-3630D (8HP)		cPCI-3630G (8HP)		cPCI-3630S (8HP)	
	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard
GbE	Y x2	—	Y x2	—	Y x2	—	Y x2	—
COM	—	—	Y (DB-9)	—	Y (RJ-45)	—	—	—
USB 3.0	Yx1	—	Yx1	—	Yx1	—	Y x1	—
USB 2.0	—	—	Yx1	—	Yx1	—	—	—
VGA	Y	—	Y	—	Y	—	Y	—
DisplayPort	—	—	—	—	Y x2	—	—	—
Serial ATA	—	—	—	Y (for 2.5” drive)	—	Y (for 2.5” drive)	—	—
PS/2 KB/MS	—	—	Y	—	Y	—	—	—
Line-in	—	—	Y	—	—	—	—	—
Line-out	—	—	Y	—	—	—	—	—
XMC	—	—		—	—	—	Y	Y
LED	Y x5	—	Y x5	—	Y x5	—	Y x5	—
Reset Button	Y	—	Y	—	Y	—	Y	

Function	cPCI-3630T (8HP)		cPCI-3630TR (8HP)		cPCI-R3610(T) (RTM)	
	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard
GbE	Y x2	—	Y x4	—	Y x2(1)	—
COM	Y (DB-9)	—	Y (DB-9)	—	Y x2	—
USB 3.0	Yx1	—	Yx1	—	—	—
USB 2.0	—	—		—	Y x2	—
VGA	Y	—	Y	—	Y(2)	—
DisplayPort	—	—	—	—	—	—
Serial ATA	—	Y (for 2.5” drive)	—	Y (for 2.5” drive)	—	Y x1 (7-pin)(3)
PS/2 KB/MS	—	—	—	—	—	—
Line-in	—	—	—	—	—	—
Line-out	—	—	—	—	—	—
XMC	—	—	—	—	—	—
LED	Y x5	—	Y x5	—	—	—
Reset Button	Y	—	Y	—	—	—

Table 2-3: cPCI-3630 I/O Connectivity

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Notes for cPCI-3630 Connectivity Table.

1. Switched from faceplate by BIOS setting.
2. VGA switched from faceplate by BIOS setting.
3. SATA1 signal switched from cPCI-3630 by BIOS; SATA2 not connected.

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 the cPCI-3630 Series when using Intel Atom® X Series processors with 8GB DDR3L-1600 ECC soldered memory and 2.5" SSD. The cPCI-3630 is powered by 5V. Power consumption in Max mode was measured by running Intel Thermal Analysis Tool (TAT).

Windows 10 64-bit	**Atom x7-E3950**		**Atom x5-E3940**		**Atom x5-E3930**	
OS/Mode	Current in 5V (A)	Total Power (W)	Current in 5V (A)	Total Power (W)	Current in 5V (A)	Total Power (W)
Idle mode EIST enabled	1.1	5.5	1.05	5.25	0.97	4.85
Typical EIST enabled	4.06	20.3	3.24	16.2	2.73	13.65
Max EIST enabled	4.75	23.75	3.79	18.95	3.1	15.5

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3 Functional Description

The following sections describe the cPCI-3630 Series features and functions.

3.1 Processors

The cPCI-3630 Series supports the Intel Atom® X Series processor which utilizes 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	x7-E3950	x5-E3930
Base Frequency	1.60GHz	1.30GHz
Burst Frequency	2.00GHz	1.8GHz
L2 Cache	2MB	2MB
No. of Core/Thread	4/4	2/2
Maximum Power (TDP(1))	12W	6.5W
$T_{junction,MAX}$(2)	110°C	110°C
Operating Temperature Range	-40°C to 85°C	-40°C to 85°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

Technology	x7-E3950	x5-E3930
Intel® Turbo Boost Technology	No	No
Intel® vPro Technology Eligibility	No	No
Secure Boot	Yes	Yes
Intel® Hyper-Threading Technology	No	No
Intel® Virtualization Technology	Yes	Yes
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes
Intel® VT-x with Extended Page Tables (EPT)	Yes	Yes
Intel® 64 Architecture	Yes	Yes
Instruction Set	64-bit	64-bit
Enhanced Intel SpeedStep® Technology	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes
Intel® HD Audio Technology	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes
Intel® Rapid Storage Technology	No	No
Intel® Smart Connect Techology	No	No
Intel® Stable Image Platform Program (SIPP)	No	No
Intel® Smart Response Technology	No	No
Intel® Virtualization Technology for Itanium (VT-i)	No	No

Security & Reliability

Technology	x7-E3950	x7-E3930
Intel® AES New Instructions	Yes	Yes
Secure Key	Yes	Yes
Intel® Trusted Execution Technology	No	No
Intel® Execute Disable Bit	Yes	Yes
Anti-Theft Technology	No	No
Intel® OS Guard	No	No

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Interfaces

- Dual channel of DDR3L-1600 memory
- Memory DDR3L data transfer rates of 1600 MT/s
- ECC soldered memory
- Maximum 8GB 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

Graphics

The graphics is integrated in the processor and based on Intel® HD Graphics 50X technology, enabling substantial gains in performance and lower power consumption.

Features	x7-E3950	x7-E3930
Processor Graphics	Intel HD Graphics 505	Intel HD Graphics 500
Graphics Base Frequency	500 MHz	400 MHz
Graphics Burst Frequency	650 MHz	550 MHz
Graphics Video Max Memory	2GB	2GB
Execution Units	18	12
Intel® OS Guard	No	No
4K Support	Yes, at 60Hz	Yes, at 60Hz
Max Resolution (DP)	4096x2160 @60Hz	4096x2160 @60Hz
DirectX Support	Yes	Yes
OpenGL Support	Yes	Yes
Intel Quick Sync Technology	Yes	Yes
Intel® InTru™ 3D Technology	No	No
Intel® Clear Video HD Technology	Yes	Yes
Intel® Clear Video Technology	Yes	Yes
Device ID	0x5A84	0x5A85

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3.2 XMC

The cPCI-3630S model supports one XMC site for front panel I/O expansion. 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 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

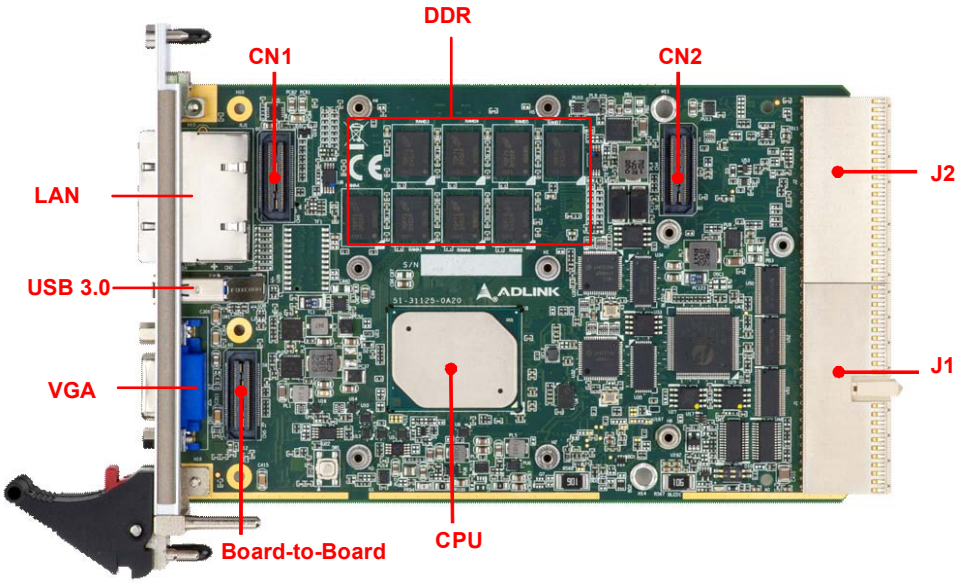
The cPCI-3630 is provided with a 3.0V “coin cell” lithium battery for the Real Time Clock (RTC). The battery sockets are located on the storage daughter board near the J1 and J2 connectors. The battery must be replaced with an identical battery or a battery type recommended by the manufacturer. A Rayovac 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-3630 Series Board Layout



CPU	Intel® Atom™ Processor	**LAN1**	Ethernet RJ-45 connector
CN1	To DB-3610L2 connector	**LAN2**	Ethernet RJ-45 connector
CN2	To DB-3SSD	**USB**	USB 3.0 port
J1	CompactPCI connector J1	**VGA**	DB-15 female VGA connector
J2	CompactPCI connector J2		

Figure 4-1: cPCI-3630 Series Board Layout

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4.2 cPCI-3630 Blade Assembly Layout

This section describes the final assembly layout of the single slot cPCI-3630 blade with the storage daughter board.

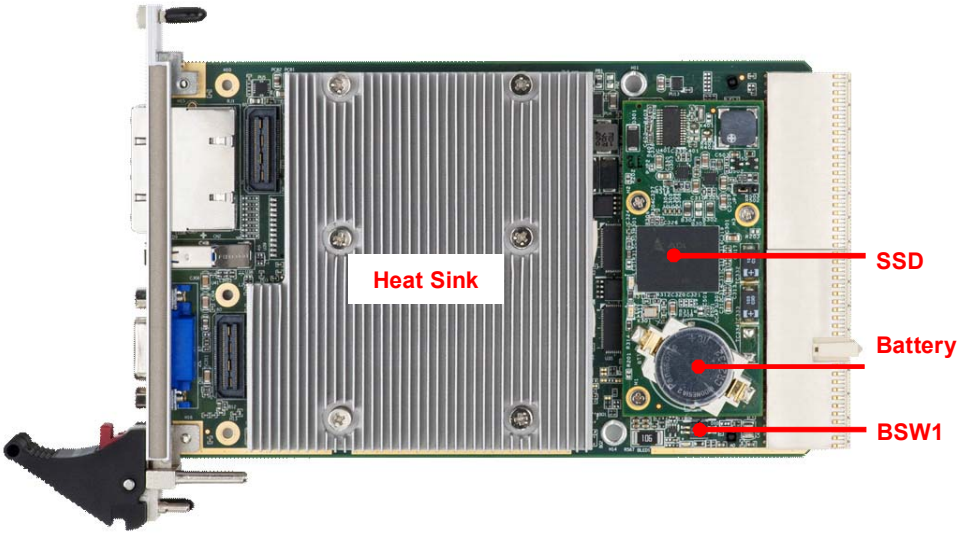


Figure 4-2: cPCI-3630 Blade Assembly Layout

BSW1	BIOS setting switch

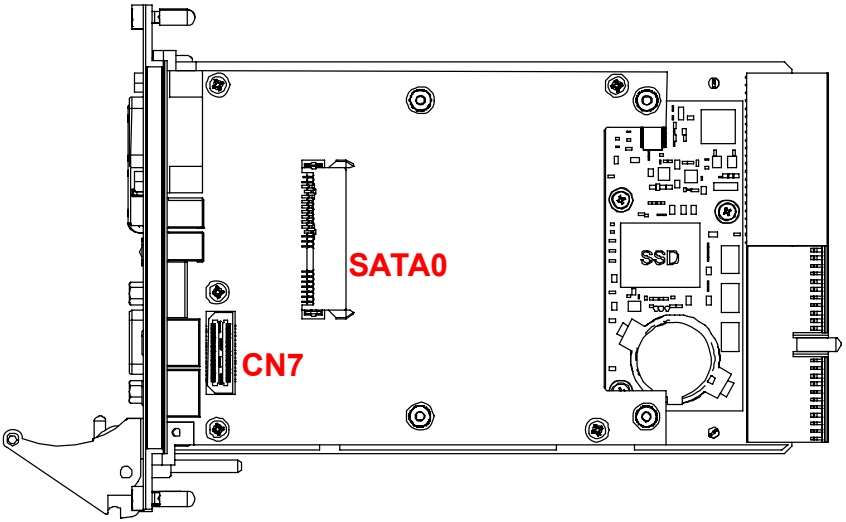
NOTE:

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-3630D Blade Assembly Layout

The dual-slot width cPCI-3630D is comprised of the cPCI-3630 single-slot main board and the DB-3610L2 riser card to expand I/O connectivity with PS/2, COM, 2x USB, Line-in, and Line-out ports, and provide mounting space for a 2.5” SATA drive.



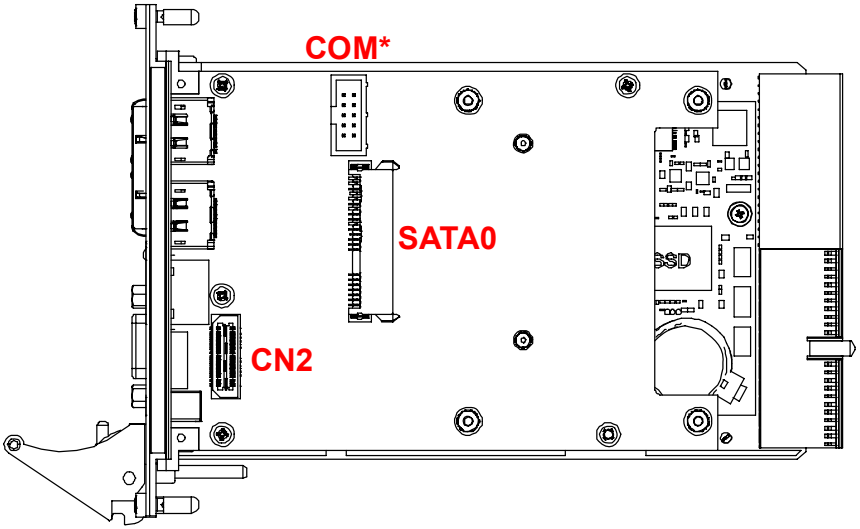
CN7	Board-to-board connector	**SATA0**	22-pin SATA connector

Figure 4-3: cPCI-3630D Blade Assembly Layout

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4.4 cPCI-3630G Blade Assembly Layout

The dual-slot width cPCI-3630G is comprised of the cPCI-3630 single-slot main board and the DB-3970L2 riser card to expand I/O connectivity with two DisplayPorts, COM, PS/2 KB/MS, USB 2.0 ports, and provide mounting space for a 2.5" SATA drive. An onboard header is provided for COM port expansion.



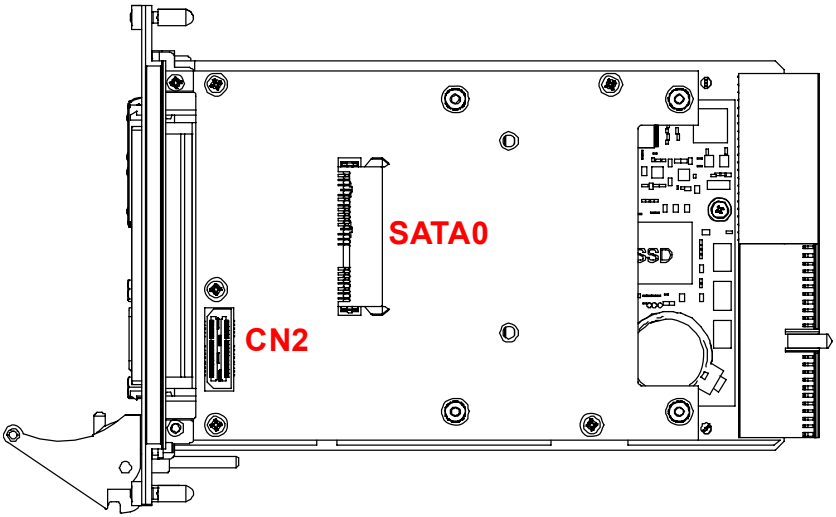
CN2	Board-to-board connector	**SATA0**	22-pin SATA connector
COM*	Reserved for COM port expansion		

Figure 4-4: cPCI-3630G Blade Assembly Layout

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4.5 cPCI-3630M Blade Assembly Layout

The dual-slot width cPCI-3630M is comprised of the cPCI-3630 single-slot main board and the DB-MAX riser card to expand I/O connectivity with one 100-pin connector and provide mounting space for a 2.5” SATA drive.



CN7	Board-to-board connector	**SATA0**	22-pin SATA connector

Figure 4-5: cPCI-3630M Blade Assembly Layout

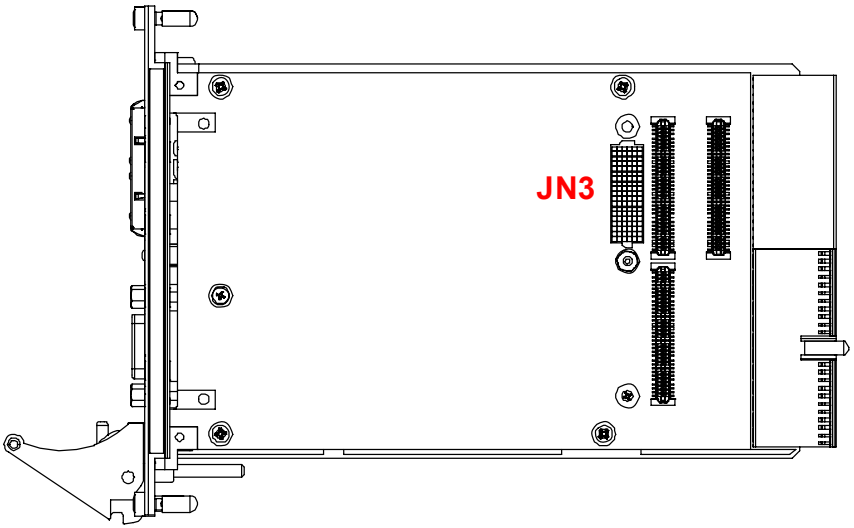
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4.6 cPCI-3630N Blade Assembly Layout

The single-slot width cPCI-3630N is comprised of the cPCI-3630 single-slot main board but with faceplate I/O replaced by LAN status LEDs for rear I/O.

4.7 cPCI-3630S Blade Assembly Layout

The dual-slot width cPCI-3630S is comprised of the cPCI-3630 single-slot main board and the DB-3UMC riser card to expand I/O connectivity with an XMC connector. The PMC connectors on the board have no function.



JN3	XMC connector

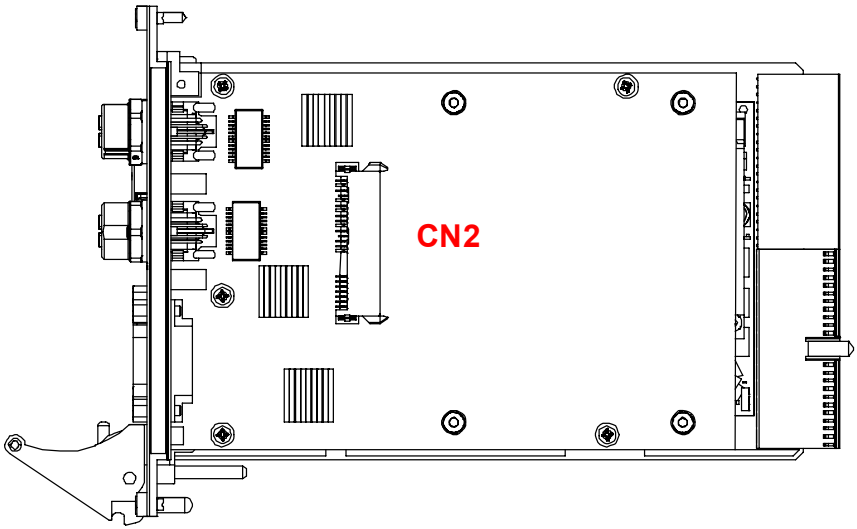
Figure 4-6: cPCI-3630S Blade Assembly Layout

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4.8 cPCI-3630T Blade Assembly Layout

The dual-slot width cPCI-3630T is comprised of the cPCI-3630 single-slot main board and the DB-3620L2 riser card to expand I/O connectivity with COM, 2x GbE with M12 MIL-STD connectors, and provide mounting space for a 2.5" SATA drive.

Note: When select cPCI-3630T/cPCI-3630TR with mSATA daughter board, strongly recommend to pre-installed mSATA module during production.



CN2	22-pin SATA connector

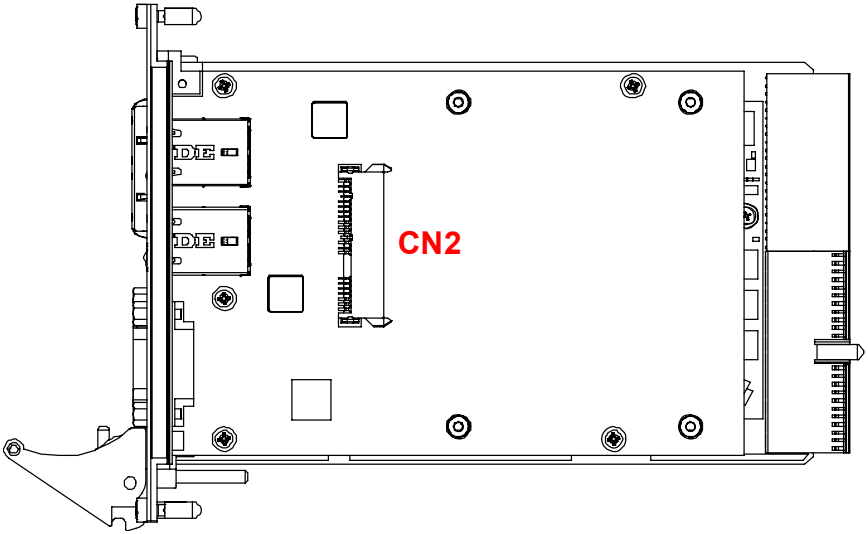
Figure 4-7: cPCI-3630T Blade Assembly Layout

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4.9 cPCI-3630TR Blade Assembly Layout

The dual-slot width cPCI-3630TR is comprised of the cPCI-3630 single-slot main board and the DB-3620TRL2 riser card to expand I/O connectivity with COM, 2x GbE connectors, and provide mounting space for a 2.5" SATA drive.

Note: When select cPCI-3630T/cPCI-3630TR with mSATA daughter board, strongly recommend to pre-installed mSATA module during production.



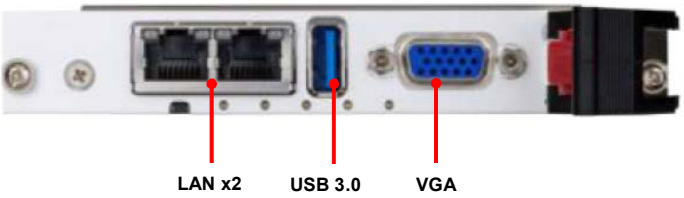
CN2	22-pin SATA connector

Figure 4-8: cPCI-3630TR Blade Assembly Layout

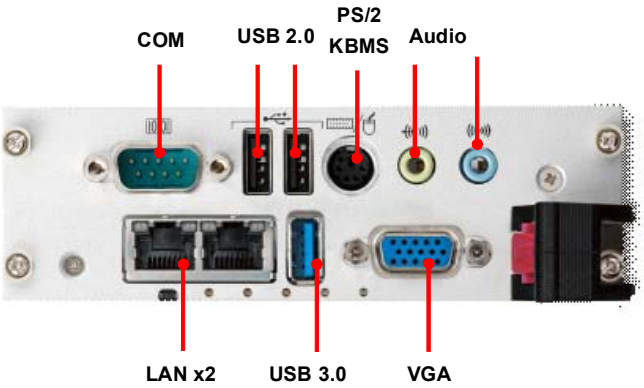
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4.10 cPCI-3630 Series Faceplate

cPCI-3630



cPCI-3630D



cPCI-3630G

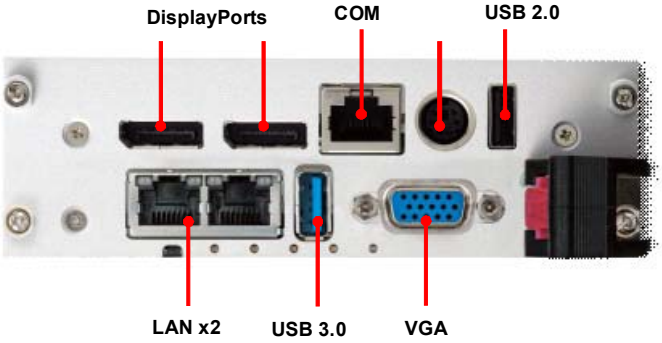
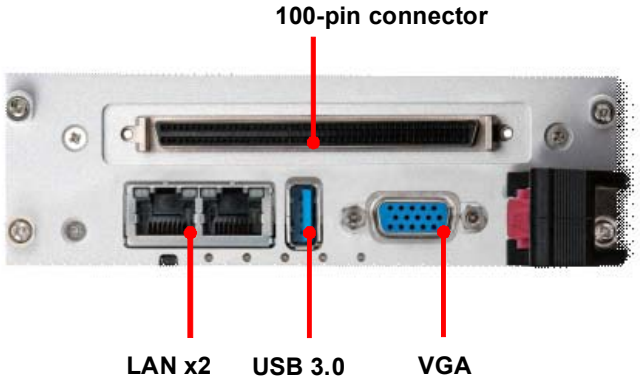


Figure 4-9: cPCI-3630, cPCI-3630D/G Faceplate Layout

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cPCI-3630M



cPCI-3630N

No I/O, only LAN status LEDs



cPCI-3630S

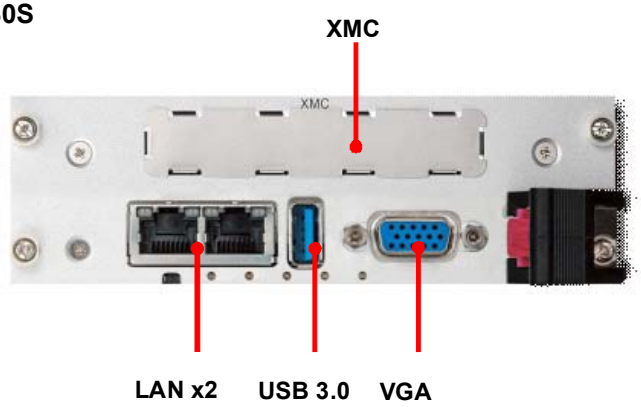
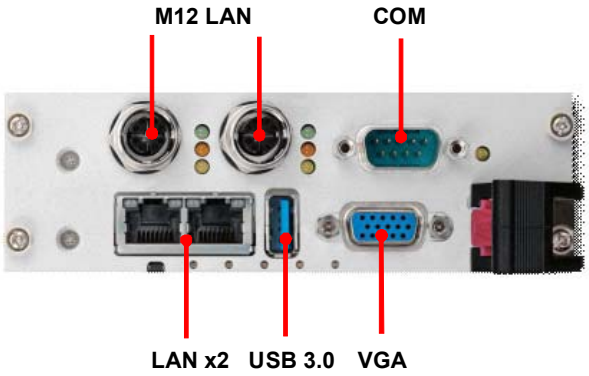


Figure 4-10: cPCI-3630M/N/S Faceplate Layout

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cPCI-3630T



cPCI-3630TR

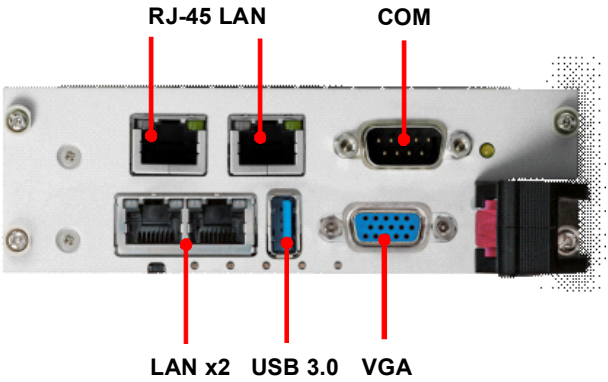
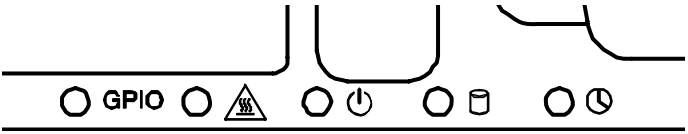


Figure 4-11: cPCI-3630T(R) Faceplate Layout

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System LEDs



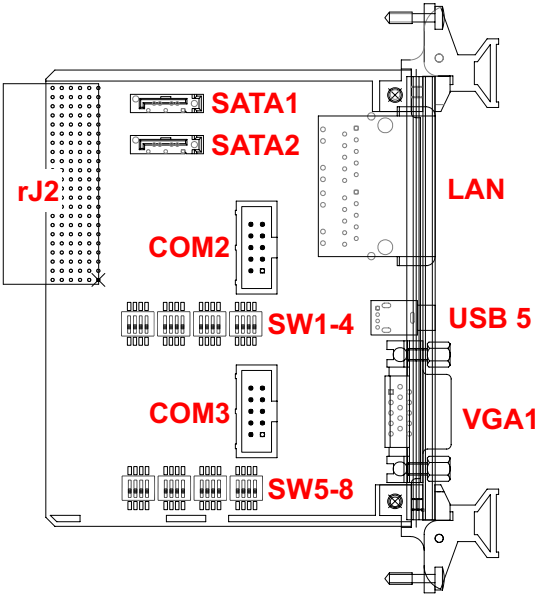
LED	Color	Condition	Indication
GPIO[1]	Yellow	OFF	Defined by user
		ON/Blinking	Defined by user
Thermal[2]	Red	OFF	Board temperature is below 85°C
		ON	Board temperature equals or exceeds 85°C
Power[3]	Green/ Red	OFF	System is off
		Green	Post OK
HDD[4]	Blue	OFF	No SATA drive activity
		Blinking	Data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

Table 4-1: cPCI-3630 Faceplate System LED Descriptions

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

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4.11 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 4-12: cPCI-R3610(T) RTM Board Layout

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4.12 cPCI-R3610(T) RTM Faceplate

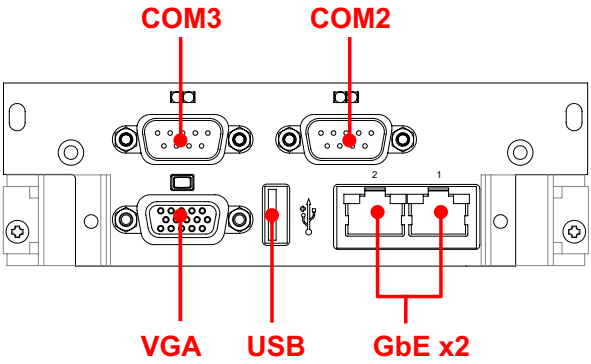


Figure 4-13: cPCI-R3610(T) RTM Faceplate

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4.13 cPCI-3630 Blade Connector Pin Assignments

USB 2.0 Connectors

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

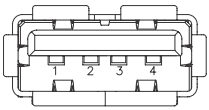
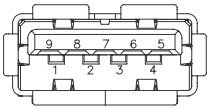


Table 4-2: USB 2.0 Pin Definition

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		

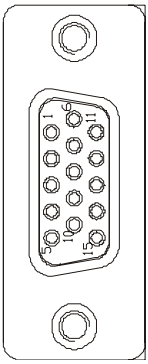


Table 4-3: VGA Pin Definition

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

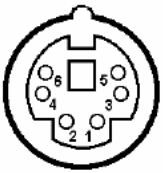


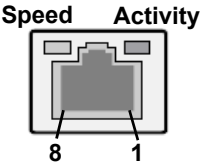
Table 4-4: PS/2 Keyboard/Mouse Pin Definition

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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-3630D/T(R) 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	—	—

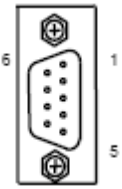


Table 4-8: cPCI-3630D/T(R) COM1 (DB-9) Pin Definition

NOTE:

The COM mode setting for cPCI-3630D models is set using SW1-SW4. See *"cPCI-3630D COM1 Mode Selection Switches (SW1-SW4)" on page 49*. The COM mode setting for cPCI-3630T(R) models is set using SW1. See *"cPCI-3630T(R) COM1 Mode Selection Switch (SW1)" on page 50*.

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cPCI-3630M 100-pin I/O Connector

Pin #	Signal	Pin #	Signal
1	GND	2	USB9_CN-N
3	USB9_CN-P	4	GND
5	USB1_CN-N	6	USB1_CN-P
7	GND	8	GND
9	TMDS_I2C_DATA	10	TMDS_I2C_CLK
11	GND	12	TMDSB_DATA2B
13	TMDSB_DATA2	14	GND
15	TMDSB_DATA1B	16	TMDSB_DATA1
17	GND	18	TMDSB_DATA0B
19	TMDSB_DATA0	20	GND
21	TMDSB_CLKB	22	TMDSB_CLK
23	GND	24	P5V_DVI1
25	TMDSB_HPD	26	GND
27	NC	28	NC
29	GND	30	TMDS_I2C_DATA
31	TMDS_I2C_CLK	32	GND
33	TMDSB_DATA2B	34	TMDSB_DATA2
35	GND	36	TMDSB_DATA1B
37	TMDSB_DATA1	38	GND
39	TMDSB_DATA0B	40	TMDSB_DATA0
41	GND	42	TMDSB_CLKB
43	TMDSB_CLK	44	GND
45	P5V_DVI2	46	TMDSB_HPD
47	GND	48	NC
49	NC	50	GND
51	P5V_USB_1_9	52	P5V_USB_1_9
53	P5V_USB_1_9	54	P5V_USB_1_9
55	GND	56	GND
57	GND	58	P5V_KBMS
59	MSCLK_CN	60	MSDATA_CN
61	KBCLK_CN	62	KBDATA_CN

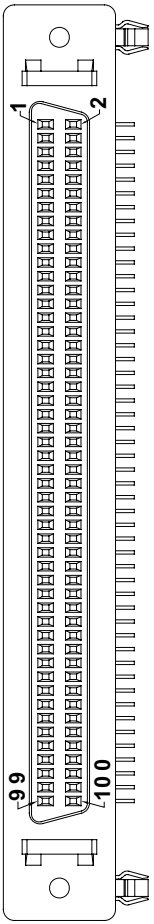


Table 4-9: cPCI-3630M 100-pin I/O Connector Pin Definition

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Pin #	Signal	Pin #	Signal
63	GND	64	GND
65	COM1_RXD_CN	66	COM1_CTS-L_CN
67	GND	68	COM1_TXD_CN
69	COM1_RTS-L_CN	70	GND
71	COM1_DTR-L_CN	72	COM1_DSR-L_CN
73	COM1_DCD-L_CN	74	GND
75	COM2_RXD_CN	76	COM2_CTS-L_CN
77	GND	78	COM2_TXD_CN
79	COM2_RTS-L_CN	80	GND
81	COM2_DTR-L_CN	82	COM2_DSR-L_CN
83	COM2_DCD-L_CN	84	AGND_AU
85	NC	86	NC
87	NC	88	NC
89	NC	90	NC
91	NC	92	AGND_AU
93	L_IN_R	94	L_IN_L
95	L_IN_JD	96	AGND_AU
97	HP_R	98	HP_L
99	HP_JD	100	AGND_AU

Table 4-9: cPCI-3630M 100-pin I/O Connector Pin Definition

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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

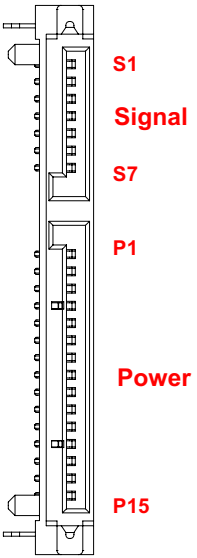
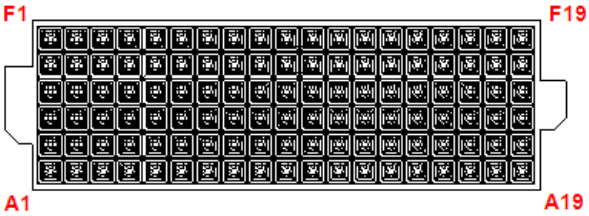


Table 4-10: Serial ATA Connector on DB-3610L2 Pin Definition

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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 4-11: XMC Connector Pin Definition

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CompactPCI J1 Connector

Pin	Z	A	B	C	D	E	F
25	GND	P5V	P5V	CPCI_ENUM#	NC	P5V	GND
24	GND	CPCI_AD1	P5V	V(I/O)	CPCI_AD0	P5V	GND
23	GND	NC	CPCI_AD4	CPCI_AD3	P5V	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	BMC_I2C_CLK	BMC_I2C_DATA	GND	CPCI_PERR_L	GND
16	GND	CPCI_DEVSEL_L	GND	V(I/O)	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	V(I/O)	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	V(I/O)	CPCI_INTP	NC	GND
3	GND	CPCI_INTA_L	CPCI_INTB_L	CPCI_INTC_L	P5V	CPCI_INTD_L	GND
2	GND	NC	P5V	NC	NC	NC	GND
1	GND	P5V	N12V	NC	P12V	P5V	GND

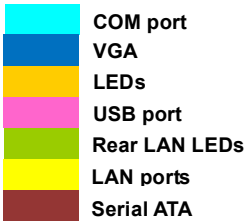
Table 4-12: CompactPCI J1 Connector Pin Definition

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CompactPCI J2 Connector

Pin	Z	A	B	C	D	E	F
22	GND	BMC_GPI4	BMC_GPI3	BMC_GPI2	BMC_GPI1	BMC_GPI0	GND
21	GND	CPCI_CLK6	GND	LAN1_MDI_P0	LAN1_MDI_N0	USB5_P	GND
20	GND	CPCI_CLK5	GND	LAN1_MDI_P2	GND	R_LAN2_1000-L_USB5_N	GND
19	GND	GND	GND	LAN1_MDI_N2	LAN1_MDI_P1	LAN1_MDI_N1	GND
18	GND	R_LAN2_100-L	LAN1_MDI_P3	LAN1_MDI_N3	GND	P3V3	GND
17	GND	R_LAN2_LINK/ACT-L	GND	RST_BTN-L	CPCI_REQ_L6	CPCI_GNT_L6	GND
16	GND	GPIO0	R_LAN1_100-L	USB4_P_DEG	GND	R_LAN1_1000-L	GND
15	GND	VGA_BACK_B	R_LAN1_LINK/ACT-L	USB4_N_FAL	CPCI_REQ_L5	CPCI_GNT_L5	GND
14	GND	GPIO1	USB_P4_OC#	USB_P3_OC#	SATA_TXN_J2	COM3_RI-L	GND
13	GND	LAN2_MDI_P0	GND	SATA_TXP_J2	COM3_DTR-L	COM3_CTS-L	GND
12	GND	GPIO2_R	LAN2_MDI_N0	USB3_P	SATA_RXN_J2	COM3_SOUT	GND
11	GND	LAN2_MDI_P1	GND	SATA_RXP_J2	COM3_RTS-L	COM3_SIN	GND
10	GND	GPIO3_R	LAN2_MDI_N1	USB3_N	GND	COM3_DSR-L	GND
9	GND	VGA_BACK_VSY	GND	VGA+BACK+G	COM3_DCD-L	COM4_RI-L	GND
8	GND	VGA_BACK_HSY	LAN2_MDI_P2	LAN2_MDI_N2	GND	COM4_DTR-L	GND
7	GND	VGA_BACK_R	GND	P5V	COM4_CTS-L	COM4_SOUT	GND
6	GND	VGA_BACK_CLK	LAN2_MDI_P3	LAN2_MDI_N3	GND	CON4_RTS-L	GND
5	GND	VGA_BACK_DAT	GND	HDD_LED_SATATXN2	COM4_SIN	COM4_DSR-L	GND
4	GND	V(I/O)	PWR_LED_SATARXP2	WDT_LED_SATARXN2	GP_LED_SATATXP2	COM4_DCD-L	GND
3	GND	CPCI_CLK4	CPI_GND_L3	CPCI_GNT_L3	CPCI_REQ_L4	CPCI_GNT_L4	GND
2	GND	CPCI_CLK2	CPCI_CLK3	CPCI_SYSEN-L	CPCI_GNT_L2	CPCI_REQ_L3	GND
1	GND	CPCI_CLK1	GND	CPCI_REQ_L1	CPCI_GNT_L1	CPCI_REQ_L2	GND

Table 4-13: CompactPCI J2 Connector Pin Definition



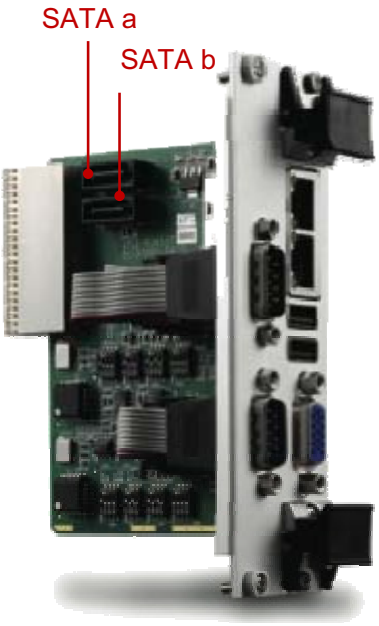
CompactPCI J2 Connector Legend

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Rear I/O Compatibility

Some of the cPCI-3630 J2 pins are designed to serve dual functions for the cPCI-R3610(T) RTM that are available by BOM option.

1. J2 pin C15 serves N_FAL (default) and USB4_N (optional), and pin C16 serves P_DEG (default) and USB4_P (optional). Please contact ADLINK if USB4 signals are required.
2. J2 pins B2, B3, B4, C3 serve dual function for SATA b (default) and rear PWR LED, WDT LED, GP LED and HDD LED (optional). Please contact ADLINK if rear LED signals are required (SATA b will not function if modified).



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4.14 cPCI-R3610(T) RTM Connector Pin Assignments

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	—	—	—

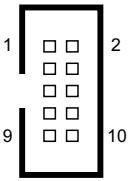


Table 4-14: cPCI-R3610(T) Serial Port Pin Header DefinitionX

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	—	—

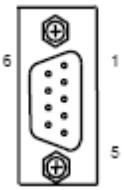


Table 4-15: cPCI-R3610(T) COM2/3 (DB-9) Pin Definition

NOTE:

See *"cPCI-R3610(T) COM2 Mode Selection Switches (SW1-SW4)" on page 51* and *"cPCI-R3610(T)COM3 Mode Selection Switches (SW5-SW8)" on page 52* for COM2/3 mode 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 4-16: cPCI-R3610(T) Serial ATA Connector Pin Definition

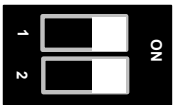
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4.15 Switch and Jumper Settings

BSW1 BIOS Failsafe Switch

The BSW1 pin 2 is set to ON by default (boot from SPI0). It is not recommend to change the setting of pin 2 unless the user is sure that SPI0 has malfunctioned. In this situation, set BSW1 pin 2 to OFF to boot from SPI1.

BSW1



BSW1	ON	OFF
Pin 1	Boot from SPI0 (Default)	Boot from SPI1
Pin 2	Normal BIOS (Default) To boot from SPI0	Failsafe BIOS To boot from SPI1 when SPI0 has failed to boot

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

cPCI-3630S only: This jumper is located on the DB-3UMC board near JN1/2 PMC connectors and selects the XMC VPWR setting. 5V is set by default.

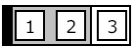
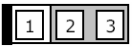
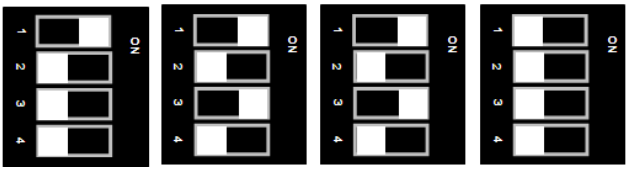
Mode	Connection	JPX1
+5V (Default)	1 – 2	
+12V	2 – 3	

Table 4-17: XMC VPWR Select Jumper Settings

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cPCI-3630D COM1 Mode Selection Switches (SW1-SW4)

These switches set the cPCI-3630D 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 (default)	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 4-18: cPCI-3630D COM1 Mode Selection Switch Settings

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cPCI-3630T(R) COM1 Mode Selection Switch (SW1)

These switches set the cPCI-3630T(R) COM1 to RS-232 full modem, RS-422 or RS-485. Switch SW1 is located next to the COM1 connector on the DB-3630L2 board. RS-232 full modem is set by default.

SW1

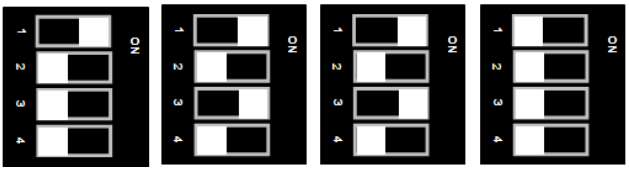


Mode	Pin	SW1
RS-232	1	ON
	2	OFF
RS-422	1	ON
	2	ON
RS-485	1	OFF
	2	ON

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cPCI-R3610(T) COM2 Mode Selection Switches (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 33 for switch locations.



SW1 SW2 SW3 SW4

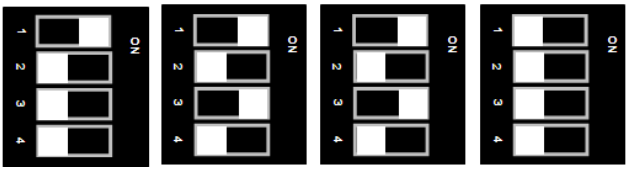
Mode	Pin	SW1	SW2	SW3	SW4
RS-232	1	OFF	ON	ON	ON
	2	OFF	OFF	OFF	OFF
	3	OFF	ON	ON	OFF
	4	OFF	OFF	OFF	OFF
RS-422	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	ON
	3	ON	OFF	OFF	OFF
	4	OFF	ON	ON	OFF
RS-485	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	OFF
	3	ON	OFF	OFF	ON
	4	OFF	ON	ON	OFF
RS-485+	1	OFF	OFF	OFF	OFF
	2	ON	ON	ON	OFF
	3	OFF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

Table 4-19: COM2 Mode Selection Switch Settings

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cPCI-R3610(T)COM3 Mode Selection Switches (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 33 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 4-20: COM3 Mode Selection Switch Settings

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5 Getting Started

This chapter describes the following installation procedures for the cPCI-3630 and rear transition module:

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

5.1 CPU and Heatsink

The cPCI-3630 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.

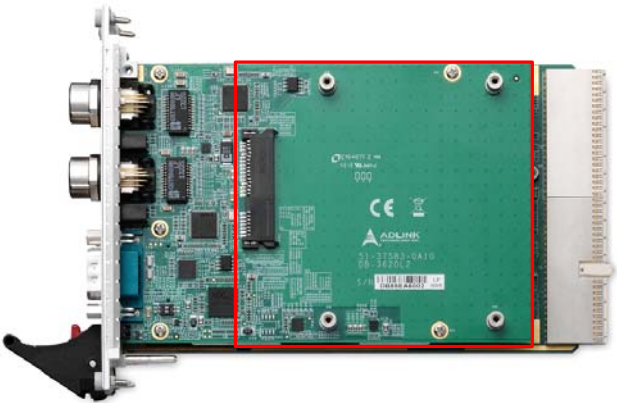
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5.2 SATA Drive Installation

The 2-slot cPCI-3630D/G/M/T(R) versions provide space to install a slim type 2.5" Serial-ATA storage drive.

Installing a SATA Drive

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-3630D/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-3630D/T with four M2.5 screws provided.



5.3 XMC Card Installation

The cPCI-3630S 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-3630S, 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-3630 to the Chassis

The cPCI-3630 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-3630 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-3630 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-3630 drivers are available from the ADLINK website at https://www.adlinktech.com/Products/CompactPCI/3UCompactPCI2_0Blades/cPCI-3630. ADLINK provides validated drivers for Windows 10. We recommend using these drivers to ensure compatibility.

6.1 cPCI-3630 Drivers

The following describes the cPCI-3630 driver installation procedures for Windows 10. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.

1. Install the ME driver by extracting and running the program in **Intel_ME_Win10x64_v11.8.50.3425**.
2. Install the **chipset driver** by extracting and running the program in **Intel_Chipset_Win10x64_v10.1.1.38_public.zip**.
3. Install the **graphics driver** and utilities by extracting and running the program in **Intel_Graphics_Win10x64_v23.20.16.5018.zip**.
4. Install the **LAN driver** by running the program in **Intel_LAN_Win10x64_v23.1.zip**.
5. Install the **audio driver** and utilities by extracting and running the program in **Realtek_Audio_Win10x64_v.R279**.

VGA noise Issue with older versions of Ubuntu OS



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: https://www.adlinktech.com/Products/Industrial_IoT_and_Cloud_solutions/SEMA(SmartEmbeddedManagementAgent)/SEMA.



NOTE:

The cPCI-3630 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-3630 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-3630 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: https://www.adlinktech.com/Products/Industrial_IoT_and_Cloud_solutions/SEMA(SmartEmbeddedManagementAgent)/SEMA.

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://www.picmg.org/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.

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.

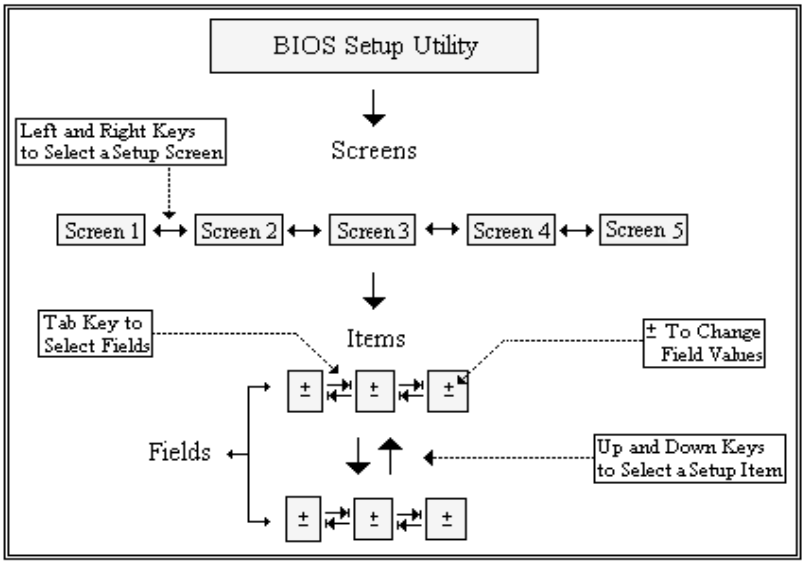
The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed" options cannot be configured, "Blue" options can be.

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. The Main BIOS Setup menu is shown below.

Main	Advanced	Chipset	Security	Boot	Save & Exit
- BIOS Information - System Information - PCH Information - Board Information ► - System Date - System Time	- CPU Configuration ► - Power Management ► - System Management ► - Thermal Management ► - Watchdog Timer ► - CSM Configuration ► - Serial Console Redirection ► - USB ► - Network ► - Miscellaneous ► - Trusted Computing - NCT6106D Super IO Configuration ►	- North Bridge ► - Sourth Bridge ► - Uncore Configuration ► - South Cluster Configuration ►	- Setup Administrator Password - User password - Secure Boot Menu ►	- Boot Configuration ►	- Save Options - Boot Override ►

NOTE:

► indicates a submenu
Gray text indicates info only

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8.2.1 BIOS Information

Feature	Options	Description
BIOS Vendor	Info only	BIOS vendor
BIOS Version	Info only	ADLINK BIOS version
Build Date	Info only	Date the BIOS was built
MRC Version	Info only	Platform MRC Version
GOP Version	Info only	Platform GOP Version
TXE FW Version	Info only	Apollo Lake TXE Firmware Version
BIOS Boot Source	Info only	Show Boot SPI for ADLINK Dual BIOS Design

8.2.2 System Information

Feature	Options	Description
Project Name	Info only	Display Project Name
CPU Board Version	Info only	Display CPU Board Version
CPU Brand String	Info only	Display INTEL CPU Brand Information
CPU Frequency	Info only	Display CPU Frequency
Total Memory	Info only	Display Current System installed Memory Size
Memory Frequency	Info only	Display Memory Frequency Information
SOC SKU	Info only	Display Apollo Lake SOC Steeping Version

8.2.3 Board Information

Feature	Options	Description
Serial Number	Info only	Shows the Product Board Serial Number.
Manufacturing Date	Info only	Shows the Product Board Manufacturing Date.
Last Repair Date	Info only	Shows the Product last repair date.
MAC ID	Info only	Shows LAN MAC address on product board.

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Board Information > Runtime Statistics

Feature	Options	Description
Total Runtime	Info only	Shows total runtime after system fist boot.
Current Runtime	Info only	Shows total runtime of current boot
Power Cycles	Info only	Shows total system power cycles.
Boot Cycles	Info only	Shows total system boot cycles
Boot Reason	Info only	Shows Boot reason after system last shut down.

8.2.4 System Date and Time

Feature	Options	Description
System Date	MM/DD/YYYY	Requires the alpha-numeric entry of the day of the week, day of the month, calendar month, and all 4 digits of the year, indicating the century and year (Fri XX/XX/20XX).
System Time	HH/MM/SS	Presented as a 24-hour clock setting in hours, minutes, and seconds.
Access Level	Info only	Shows what access level is used to enter BIOS setup menu.

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8.3 Advanced

This menu contains the settings for most of the user interfaces in the system.

8.3.1 CPU Configuration

Feature	Options	Description
Socket 0 CPU Information	Submenu	Manufacturer, model, speed
CPU Speed	Info only	Display CPU Speed.
64-Bit	Info only	Display Microcode Patch.
CPU Power Management	Submenu	CPU Power Management options.
Active Processor Cores	**Disabled** Enabled	Number of cores to enable in each processor package
Intel Virtualization Technology	Disabled **Enabled**	When enabled, a VWM can utilize the additional hardware capabilities provided by Vanderpool Technology.
VT-d	**Disabled** Enabled	Enable/Disable CPU VT-d.
Bi-directional PROCHOT	Disabled **Enabled**	When a processor thermal sensor trips (either core), the PROCHOT# will be driven. If bi-direction is enabled, external agents can drive PROCHOT# to throttle the processor
Thermal Monitor	Disabled **Enabled**	Enable/Disable Thermal Monitor.
Monitor Mwait	Disabled Enabled **Auto**	Enable/Disable Monitor Mwait
P-STATE Coordination	**HW_ALL** SW_ALL SW_ANY	Change P-STATE Coordination type.
DTS	Disabled **Enabled**	Enable/Disable Digital Thermal Sensor.

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CPU Configuration > Socket 0 CPU Information

Feature	Options	Description
Socket 0 CPU Information	Info only	Socket 0 CPU Information.
CPU Signature	Info only	Display CPU Signature.
Microcode Patch	Info only	Display CPU Microcode Patch.
Max CPU Speed	Info only	Display Max CPU Speed
Min CPU Speed	Info only	Display Min CPU Speed.
Processor Cores	Info only	Display Number of CPU Cores
Intel HT Technology	Info only	Display support Intel HT Technology or not.
Intel VT-x Technology	Info only	Display support Intel VT-x Technology or not
L1 DATA Cache	Info only	Display CPU L1 DATA Cache.
L1 Code Cache	Info only	Display CPU L1 Code Cache.
L2 Cache	Info only	Display CPU L2 Cache
L3 Cache	Info only	Display CPU L3 Cache

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CPU Configuration > CPU Power Management

Feature	Options	Description
EIST	Disabled **Enabled**	Enable/Disable Intel Speedstep.
Turbo Mode	Disabled **Enabled**	Turbo Mode.
Boot Performance mode	**Max Performance** Max Battery	Select the performance state that the BIOS will set before handoff.
C-States	Disabled **Enabled**	Enable/Disable C States
Enhanced C-States	Disabled **Enabled**	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.
Max Package C State	**PC2** PC1 C0	Controls the Max Package C State that the processor will support
Max Core C State	**Fused value** Core C10 Core C9 Core C8 Core C7 Core C6 Core C1 Unlimited	This option controls the Max Core C State that cores will support..
C-State Auto Demotion	Disabled **C1**	Configure C-State Auto Demotion
C-State Un-demotion	Disabled **C1**	Configure C-State Un-demotion.
Power Limit 1 Enable	Disabled **Enabled**	Enable/Disable Power Limit 1.
Power Limit 1	Info only	Display CPU Power Limit 1 level
Power Limit 1 Clamp Mode	Disabled **Enabled**	Enable/Disable Power Limit 1 Clamp Mode
Power Limit 1 Power	**Auto**	Power Limit 1 in watts. Auto will program Power Limit 1 based on silicon default support value
Power Limit 1 Time Window	**Auto**	Power Limit 1 Time Window Value in Seconds. Auto will program Power Limit 1 based on silicon default support value

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8.3.2 Power Management

Feature	Options	Description
Enable ACPI Auto Configuration	**Disabled** Enabled	Enable/disable BIOS ACPI auto configuration function
Enable Hibernation	Info only	Enable/disable system ability to hibernate. This option may be not effective with some OSes..
Lock Legacy Resources	**Disabled** Enabled	Enable or Disables Lock of Legacy Resources.
Power Consumption	Submenu	Power Consumption.

Power Management > Power Consumption

Feature	Options	Description
Current Input Current	Info only	Display input current.
Current Input Power	Info only	Display input power.
V-CORE	Info only	Display actual VCORE voltage
VGFX	Info only	Display actual VGFX voltage
VMEM	Info only	Display actual VMEM voltage.
5VSB	Info only	Display actual 5VSB voltage.
VIN	Info only	Display actual VIN voltage
5V	Info only	Display actual 5V voltage
3.3V	Info only	Display actual 3.3V voltage
3.3VSB	Info only	Display actual 3.3VSB voltage

8.3.3 System Management

Feature	Options	Description
Version	Info only	Show System SEMA Version
SEMA Firmware	Info only	Show SEMA Firmware Version
Build Date	Info only	Show SEMA Firmware Build date
SEMA Bootloader	Info only	Show SEMA Bootloader Version.
Build Date	Info only	Show SEMA Bootloader Build date.
SEMA Features	Submenu	SEMA Features.
Flags	Submenu	Flags.

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System Management > SEMA Features

Feature	Options
Uptime & Power Cycles Counter	Info only
System Restart Event	Info only
1024 Bytes User-Flash	Info only
Watchdog	Info only
Temperatures	Info only
Voltage Monitor	Info only
Display Backlight Control	Info only
Power-Up Watchdog	Info only
Power Monitor (current sense)	Info only
Boot Counter	Info only
Dual-BIOS	Info only
Power-Up to last state	Info only
DTS register available	Info only
DTS offset registers programmable	Info only
TIVA BMC	Info only
PEC protocol	Info only

System Management > Flags

Feature	Options	Description
BMC Flags	Info only	Show BMC Flags
BIOS Select	Info only	Show Current BIOS of Dual BIOS
AT/ATX-Mode	Info only	Show Boot under AT or ATX mode
Exception Code	Info only	Show Exception Code.

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8.3.4 Thermal Management

Feature	Options	Description
Temperature and Fan Speed	Submenu	Temperature and Fan Speed
Critical Trip Point	**Disabled** 80 C 90 C 95 C	The value is the temperature threshold of the Critical Trip Point.
Passive Trip Point	**Disabled** 70 C 80 C 90 C	The value is the temperature threshold of the Passive Cooling Trip Point.

Thermal Management > Temperature and Fan Speed

Feature	Options	Description
CPU Temperature	Info only	
Current	Info only	
Board Temperature	Info only	
Current	Info only	
Startup	Info only	
Min	Info only	
Max	Info only	

8.3.5 Watchdog Timer

Feature	Options	Description
Power-Up Watchdog	**Disabled** Enabled	The Power Up Watchdog resets the system after a certain amount of time after power up. Pressing F12 during start up disables the Power Up Watchdog.
TimeOut	**65535**	Here you can enter the time the Power Up Watchdog should wait until it resets the system.The value range starts by 24 and ends by 65535.

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8.3.6 CSM Configuration

Feature	Options	Description
Compatibility Support Module Configuration	**Disabled** Enabled	Enable/Disable CSM Support
CSM16 Module Version	Info only	Display CSM16 Module Version.
GateA20 Active	**Upon Request** Always	Upon Request: GA20 can be disabled using BIOS services. Always: do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.
Boot option filter	**UEFI and Legacy** Legacy only UEFI only	This option controls Legacy/UEFI ROMs priority
Option ROM execution	Info only	
Network	Do not launch **UEFI** Legacy	Controls the execution of UEFI and Legacy PXE OpROM
Storage	Do not launch **UEFI** Legacy	Controls the execution of UEFI and Legacy Storage OpROM
Video	Do not launch **UEFI** Legacy	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device	Do not launch **UEFI** Legacy	Determines OpROM execution policy for devices other than Network, Storage, or Video

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8.3.7 Serial Console Redirection

Feature	Options	Description
COM1	Info only	
Console Redirection	Enabled **Disabled**	Console Redirection Enable or Disable.
Console Redirection Settings	Submenu	
COM2	Info only	
Console Redirection	Enabled **Disabled**	Console Redirection Enable or Disable.
Console Redirection Settings	Submenu	
COM3	Info only	
Console Redirection	Enabled **Disabled**	Console Redirection Enable or Disable.
Console Redirection Settings	Submenu	
COM4	Info only	
Console Redirection	Enabled **Disabled**	Console Redirection Enable or Disable.
Console Redirection Settings	Submenu	
Legacy Console Redirection Settings	Submenu	

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Serial Console Redirection > Console Redirection Settings

Feature	Options	Description
Console Redirection Settings	Info only	
Terminal Type	VT100 VT100+ VT-UTF8 **ANSI**	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 **115200**	Selects serial port transmission speed. The speed must be matched on the remote computer. Long or noisy lines may require lower speeds.
Data Bits	7 **8**	Select Data Bits.
Parity	**None** Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if the num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection.
Stop Bits	**1** 2	Stop bit indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
Flow Control	**None** Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
VT-UTF8 Combo Key Support	Disabled **Enable**	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
Recorder Mode	**Disabled** Enable	With this mode enabled only text will be sent. This is to capture Terminal data.
Resolution 100x31	**Disabled** Enable	Enables or disables extended terminal resolution
Legacy OS Redirection	**80x24** 80x25	On Legacy OS, the Number of Rows and Columns supported redirection
Putty KeyPad	**VT100** LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.

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Feature	Options	Description
Redirection After BIOS Post	**Always Enabled** BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then the Legacy Condole Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable.

Serial Console Redirection > Legacy Console Redirection Settings

Feature	Options	Description
Legacy Serial Redirection Port	**COM1** COM2 COM3 COM4	Select a COM port to display redirection of legacy OS and Legacy OPROM Messages

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8.3.8 USB

Feature	Options	Description
USB Module version	Info only	
USB Controllers:	Info only	
USB Devices:	Info only	.
Legacy USB Support	**Enabled** Disabled Auto	Enables Legacy USB support. Auto option disables legacy support if no USB devices are connected. Disabled option will keep USB devices available only for EFI applications.
XHCI Hand-off	**Enabled** Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	**Enabled** Disabled	Enable/Disable USB Mass Storage Driver Support.device.
USB hardware delays and time-outs:	Info only	
USB transfer time-out	1 sec 5 sec 10 sec **20 sec**	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec **20 sec** 30 sec 40 sec	USB mass storage device start unit command time-out.
Device power-up delay	**Auto** Manual	Maximum time the device will take before it properly reports itself to the host controller. 'AUTO' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

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8.3.9 Network

Feature	Options	Description
Network Stack	Enabled **Disabled**	Enables/Disable UEFI Network Stack.
IPv4 TXE PXE Support	Enabled **Disabled**	Enable IPv4 PXE Boot Support. If disabled IPV4 PXE Boot option will not be created.
IPv4 HTTP Support	Enabled **Disabled**	Enable IPv4 HTTP Boot Support. If disabled IPV4 HTTP Boot option will not be created.
IPv6 TXE Support	Enabled **Disabled**	Enable IPv6 PXE Boot Support. If disabled IPV6 PXE Boot option will not be created.
IPv6 HTTP Support	Enabled **Disabled**	Enable IPv6 HTTP Boot Support. If disabled IPV6 HTTP Boot option will not be created.
PXE boot wait time	0	Wait time to press ESC key to abort the PXE boot.
Media detect count	1	Number of times presence of media will be checked.

8.3.10 Miscellaneous

Feature	Options	Description
cPCI-3630 VGA Switch	**Front** Rear	cPCI-3630 VGA switch to Front or Rear.
cPCI-3630 SATA1 Switch	**Front** Rear	cPCI-3630 SATA switch to Front or Rear.
cPCI-3630 SATA2 Switch	**Front** Rear	cPCI-3630 SATA switch to Front or Rear.
cPCI-3630 LAN Switch	**Front** Rear	cPCI-3630 LAN switch to Front or Rear.

8.3.11 Trusted Computing

Feature	Options	Description
Security Device Support	Enabled **Disabled**	Enables or Disables BIOS support for security device. OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

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8.3.12 NCT6106D Super IO Configuration

Feature	Options	Description
Super IO Chip	Info only	
Serial Port 1 Configuration	Submenu	Set Parameters of Serial Port 1 (COMA).
Serial Port 2 Configuration	Submenu	Set Parameters of Serial Port 2 (COMB)
Serial Port 3 Configuration	Submenu	Set Parameters of Serial Port 3 (COMC)
Serial Port 4 Configuration	Submenu	Set Parameters of Serial Port 4 (COMD)

NCT6106D Super IO Configuration > Serial Port Configuration

Feature	Options	Description
Serial Port 1 Configuration	Info only	
Serial Port	**Enabled** Disabled	Enable or Disable Serial Port (COM)
Device Setting	Info only	Set Parameters of Serial Port (COM)
Change Setting	**Auto** IO=3F8;IRQ=4; IO=3F8;IRQ=3,4,5,7,9,10,11,12 IO=2F8;IRQ=3,4,5,7,9,10,11,12 IO=3E8;IRQ=3,4,5,7,9,10,11,12 IO=2E8;IRQ=3,4,5,7,9,10,11,12	Select an optimal setting for Super IO Device.
RS485/RS422 Support Enable	Enabled **Disabled**	Enable/Disable RSTN asserted for RS485/RS422 automatic direction control when transmitting data to or receiving data from RS485 transceiver.
RS485 RTS Inverse Support	Enabled **Disabled**	Enable/Disable RTS Inverse Control for RS485. Support DB-3620L2

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8.4 Chipset

Feature	Options	Description
North Bridge	Submenu	North Bridge Parameters.
South Bridge	Submenu	South Bridge Parameters.
Uncore Configuration	Submenu	Uncore Configuration.
South Cluster Configuration	Submenu	South Cluster Configuration

8.4.1 North Bridge

Feature	Options	Description
Total Memory	Info only	
Memory Vlotage	Info only	
Memory Slot0	Info only	
Memory Slot1	Info only	
Max TOLUD	**2 GB** 2.25 GB 2.5 GB 2.75 GB 3 GB	Maximum Value of TOLUD
Above 4GB MMIO BIOS assignment	Enabled **Disabled**	Enable/Disable above 4GB MemoryMappedIO BIOS assignment This is disabled automatically when Aperture Size is set to 2048MB.
PCIE VGA Workaround	Enabled **Disabled**	Enable it if your PCIe card cannot boot to DOS. This is for testing only.

8.4.2 South Bridge

Feature	Options	Description
Serial IRQ Mode	Quiet **Continuous**	Configure Serial IRQ Mode.
SMBus Support	**Enabled** Disabled	Enable/Disable SMBus Support.
OS Selection	**Windows** Intel Linux	Select the target OS.
PCI CLOCL Run	**Enabled** Disabled	Enables CLKRUN# logic to stop PCI clocks.

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8.4.3 Uncore Configuration

Feature	Options	Description
IGD Configuration	Info only	
Integrated Graphics Device	**Enabled** Disabled	Enable: Enable Integrated Graphics Device (IGD) when selected as the Primary Video Adaptor. Disable: Always disable IGD.
Primary Display	**IGD** PCIE HG	Select which of IGD/PCI Graphics device should be Primary Display.
Aperture Size	128MB **256MB** 512MB	Select the Aperture Size.
DVMT Pre-Allocated	**64MB** 96MB 128MB 160MB 192MB 224MB 256MB 288MB 320MB 352MB 384MB 416MB 448MB 480MB 512MB	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	128M **256M** MAX	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

8.4.4 South Cluster Configuration

Feature	Options	Description
HD-Audio Configuration	Submenu	HD-Audio Configuration Settings.
PCI Express Configuration	Submenu	PCI Express Configuration Settings.
SATA Drives	Submenu	Press <Enter> to select the SATA Device Configuration Setup options.
USB Configuration	Submenu	USB Configuration Settings.
Miscellaneous Configuration	Submenu	Enable/Disable Misc. Features

South Cluster Configuration > HD-Audio Configuration

Feature	Options	Description
HD-Audio Support	Disabled **Enabled**	Enable/Disable HD-Audio Support.

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South Cluster Configuration > PCI Express Configuration

Feature	Options	Description
PCIe Configuration	Info only	
Compliance Mode	**Disabled** Enabled	Compliance Mode Enable/Disable.
PCIe Express Root Port3	Submenu	Control the PCI Express Root Port. Auto: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIE root port Disable: Disable PCIE root port.
PCIe Express Root Port4	Submenu	Control the PCI Express Root Port. Auto: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIE root port Disable: Disable PCIE root port.
PCIe Express Root Port5	Submenu	Control the PCI Express Root Port. Auto: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIE root port Disable: Disable PCIE root port
PCIe Express Root Port5	Submenu	Control the PCI Express Root Port. Auto: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIE root port Disable: Disable PCIE root port

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South Cluster Configuration > PCI Express Configuration > PCIe Express Root PortX

Feature	Options	Description
PCIe Express Root PortX	Disabled **Enabled**	Control the PCI Express Root Port. Auto: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIE root port Disable: Disable PCIE root port.
ASPM	**Disable** L0s L1 L0sL1 Auto	PCI Express Active State Power Management settings.
Hot Plug	**Disabled** Enabled	PCI Express Hot Plug Enable/Disable.
PCIe Speed	**Auto** Gen1 Gen2	Configure PCIe Speed

South Cluster Configuration > SATA Drives

Feature	Options	Description
SATA Drives	Info only	
Chipset-SATA Controller Configuration	Info only	
Chipset SATA	Disabled **Enabled**	Enable/Disable the Chipset SATA Controller. The Chipset SATA Controller supports 2 black internal SATA ports (up to 3Gb/s supported per port).
SATA Mode Selection	**AHCI**	Determines how SATA Controller(s) operate.
SATA Interface Speed	Gen1 **Gen2** Gen3	Select SATA Interface Speed, CHV A1 always with Gen1 Speed.
SATA Port 0	Info only	
Software Preserve	Info only	
Port 0	Disabled **Enabled**	Enable or Disable SATA Port.
SATA Port 0 Hot Plug Capability	**Disabled** Enabled	If enabled, SATA port will be reported as Hit Plug capable.
Configured as eSATA	Info only	
SATA Device Type	**Hard Disk Drive** Solid State Drive	Identify the SATA port is connected to solid state drive or Hard Disk drive

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South Cluster Configuration > USB Configuration

Feature	Options	Description
XHCI Pre-Boot Driver	**Disabled** Enabled	Enable/Disable XHCI Pre-Boot Driver Support.
XHCI Mode	Disabled **Enabled**	Once disable, XHCI controller would be function disabled, none of the USB devices are detectable and usable during boot and in OS. Do not disable it unless for debug purpose.
USB Port Disable Override	**Disabled** Enabled	Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.
USB Port #0	Disabled **Enabled**	Enable/Disable USB port. Once disabled, any USB devices plug into the connector will not be detected by BIOS or OS.

South Cluster Configuration > Miscellaneous Configuration

Feature	Options	Description
High Precision Timer	Disabled **Enabled**	Enable or Disable the High Precision Event Timer.

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8.5 Security

8.5.1 Password Description

Feature	Options	Description
Setup Administrator Password	Enter password	Configure/Clear Administrator Password. When pressing enter, a menu will be popped up for creating new password. When password installed, press enter without inputting password, it will clear password.
User Password	Enter password	Set user Password
Secure Boot Menu	Submenu	Customizable Secure Boot settings
HDD Security Configuration:	Info only	

Security > Secure Boot Menu

Feature	Options	Description
System Mode	Info only	Show system Mode.
Secure Boot	Info only	Show Secure Boot status.
Secure Boot Control	**Disabled** Enabled	Secure Boot activated when platform Key (PK) is enrolled, system mode is User/Deployed, and CSM function is disabled.

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8.6 Boot

Feature	Options	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	**On** Off	Select the keyboard NumLock state after system boot.
Quiet Boot	Disabled **Enabled**	Enables or disables Quiet Boot option.
Fast Boot	**Disabled** Enabled	Enable or disabled Fast boot feature. Most probes are skipped to reduce time cost during boot.
New Boot Option Policy	**Default** Place First Place Last	Control the placement of newly detected UEFI boot options.
Boot mode select	Legacy **UEFI**	Select boot mode LEGACY/UEFI.
Boot Option #	Hard Disk	Sets the system boot order.
UEFI Hard Disk Drive BBS Priorities	Submenu	Specifies the Boot Device Priority sequence from available UEFI Hard Disk Drives.

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8.7 Boot

8.7.1 Reset Options

Feature	Options	Description
Save Changes and Reset	Save changes and reset the system.	Exit system setup after saving the changes.
Discard Changes and Reset	Reset the system without saving any changes.	Exit system setup without saving the changes.
Save Changes and Reset	Reset the system with saving any changes.	Reset the system after saving the changes.
Discard Changes and Reset	Reset the system and discard any changes.	Reset the system after without the changes.

8.7.2 Save Options

Feature	Options	Description
Save Changes		Save Changes done so far to any of the setup options.
Discard Changes		Discard Changes done so far to any of the setup options.
Restore Default		Restore/Load the Default values for all the setup options.
Save as User Default		Save the changes done so far as User Defaults.
Restore User Default		Restore the User Defaults to all the setup options.
Boot Override	Info Only	

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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

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