cPCI-6636 Series

Value 6U CompactPCI®
Intel® Xeon® E3, Core™ i7/i3 Processor Blade

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
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0.2	2020-01-03	Add Chapters 5-9; update Power Requirements
0.3	2025-01-10	Update BIOS settings

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Preface

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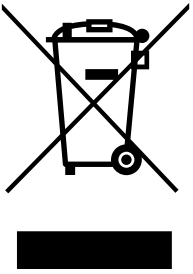
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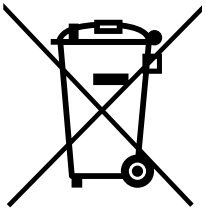
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Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.

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

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

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

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Table of Contents

Revision History ii

Preface iii

List of Figures ix

List of Tables xi

1 Introduction 1

1.1 Overview 1
1.2 Features 2
1.3 Model Number Decoder 4
1.4 Package Contents 5

2 Specifications 7

2.1 cPCI-6636 Series Specifications 7
2.2 Block Diagrams 10
2.3 I/O Connectivity Table 11
2.4 Power Requirements 12

3 Functional Description 15

3.1 Processors 15
3.2 Chipset 18
3.3 XMC 19
3.4 Intel® Turbo Boost Technology 19
3.5 Intel® Hyper-Threading Technology 20
3.6 Battery 20

4 Board Interfaces 21

4.1 cPCI-6636(D) Component Side Layout 21
4.2 cPCI-6636D/DZ Assembly Layoutt 22

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4.3 cPCI-6636(D/DZ) Faceplate I/O 23
4.4 Connector Pin Assignments 25
4.5 Switches and Buttons 38

5 Getting Started 43
5.1 CPU and Heatsink 43
5.2 CFast Card Installation 44
5.3 2.5" SATA Drive Installation 47
5.4 XMC Installation (cPCI-6636D/DZ only) 50
5.5 Installing the cPCI-6636(D/DZ) to the Chassis 55

6 Driver Installation 57
6.1 cPCI-6636 Drivers 57

7 Utilities 59
7.1 Watchdog Timer 59

8 BIOS Setup Utility 65
8.1 Starting the BIOS 65
8.2 Main Setup 67
8.2.1 BIOS Information 68
8.2.2 Processor Information 68
8.2.3 PCH Information 68
8.2.4 SPI Clock Frequency 69
8.2.5 System Management 69
8.2.6 System Date and Time 72
8.3 Advanced 73
8.3.1 Trusted Computing 73
8.3.2 AMT Configuration 73
8.3.3 PCH-FW Configuration 74
8.3.4 IT8786 Super IO Configuration 74
8.3.5 Serial Port Console 76
8.3.6 CPU Configuration 79
8.3.7 SATA Configuration 80

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8.3.8 Network Stack Configuration 82
8.3.9 CSM Configuration 83
8.3.10 USB 84
8.4 Chipset 85
8.4.1 PCH-IO Configuration 87
8.5 Security 89
8.5.1 Password Description 89
8.5.2 *Secure Boot Menu 89
8.6 Boot 90
8.7 Save & Exit 91
8.7.1 Save Options 91

9 Checkpoints & Beep Codes 93
9.1 Checkpoint Ranges 93
9.2 Standard Checkpoints 93
9.3 OEM-Reserved Checkpoint Ranges 102

Important Safety Instructions 103

Getting Service 105

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List of Figures

Figure 2-1: cPCI-6636 Series Functional Block Diagram..... 10
Figure 4-1: cPCI-6636(D) Component Side Layout 21
Figure 4-2: cPCI-6636D/DZ Assembly Layout..... 22
Figure 4-3: cPCI-6636(D/DZ) Faceplate I/O 23
Figure 4-4: cPCI-6636 Series Switch Locations - Component Side. 38
Figure 4-5: cPCI-6636 Series Switch Locations - Solder Side..... 39

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List of Tables

Table 2-1: cPCI-6636 Series Specifications 7
Table 2-2: cPCI-6636(D/DZ) I/O Connectivity..... 11
Table 4-1: cPCI-6636(D) Front Panel System LED Descriptions ... 24
Table 4-2: LAN1/2 RJ-45 GbE Pin Definitions..... 25
Table 4-3: LAN LED Status Definitions..... 25
Table 4-4: USB 3.0 Pin Definitions 26
Table 4-5: cPCI-6636(D) COM Pin Definitions 26
Table 4-6: cPCI-6636(D) COM RJ-45 to DB-9 Cable Pin Definitions27
Table 4-7: cPCI-6636DZ COM1/2 Pin Definitions..... 27
Table 4-8: cPCI-6636DZ COM3/4 Pin Definitions..... 28
Table 4-9: cPCI-6636DZ COM5/6 Pin Definitions..... 28
Table 4-10: cPCI-6636DZ COM RJ-45 to 2x DB-9 Cable Pin Definitions 29
Table 4-11: DVI-I Connector Pin Definition..... 30
Table 4-12: Serial ATA 7-pin Connector Pin Definition..... 31
Table 4-13: Serial ATA Connector with power Pin Definition..... 31
Table 4-14: CFast Socket Pin Definition 32
Table 4-15: XMC Connector Pin Definition 33
Table 4-16: CompactPCI J1 Connector Pin Definition..... 34
Table 4-17: CompactPCI J2 Connector Pin Definition..... 35
Table 4-18: CompactPCI J3 Connector Pin Definition..... 36
Table 4-19: CompactPCI J5 Connector Pin Definition..... 37

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1 Introduction

1.1 Overview

The ADLINK cPCI-6636 Series is a 6U CompactPCI® processor blade based on the Intel® Xeon® E3 and 6th Generation Intel® Core™ i7/i3 Processors with Intel® HM170 or CM236 Chipsets. When paired with the Intel® CM236, the cPCI-6636 supports ECC memory. The cPCI-6636 supports up to 16GB onboard DDR4-2133 memory and 16GB DDR4-2133 via SODIMM. Total memory capacity is up to 32GB of DDR4-2133. The cPCI-6636 is a highly integrated processor blade fit for mission critical applications in industries ranging from automation to defence.

The cPCI-6636 Series supports flexible I/O interfaces with the cPCI-6636 in single-slot (4HP) and cPCI-6636D/DZ in dual slot (8HP) width form factors. Faceplate I/O for the cPCI-6636 (4HP) includes 2x GbE supported by an Intel® i219LM PHY controller and Intel® i210IT Ethernet controller, 3x USB 3.0, 1x RJ-45 serial port, and 1x DVI-I. Onboard I/O includes one 2.5" SATA drive space, one 7-pin SATA connector, and one CFast slot by adapter board. The cPCI-6636D (8HP) has identical I/O to the single-slot version, except that an XMC connector via PCIe x8 adapter board is supported in place of the CFast slot. A third configuration, the cPCI-6636DZ, supports 8x USB 3.0, 2x GbE, 6x serial TX/RX and 2x VGA on the faceplate, and the same onboard I/O as the two-slot "D" version. The cPCI-6636 Series supports with 66/64-bit PCI signaling. Additional signals including additional 3x SATA, up to 4x Ethernet ports, USB 2.0, PCIe x4, audio, display, and serial signals to rear J3 and J5 (DZ version supports no rear I/O). Graphics support is integrated on the Intel® processor with VGA and DVI-I options. Rear display output signal is reserved to J3 and J5 as option.

Rear I/O signals are available on cPCI-6636 and cPCI-6636D which are equipped with CompactPCI J3 and J5 connectors. Available to the RTM are up to 2x GbE to J3 by Intel® I210IT Ethernet controllers for PICMG 2.16, and an additional 2x GbE switchable to rear from the front panel for a total of up to 4x Ethernet to rear J3 and J5. Also available are 1x VGA to J3, 1x TMDS to J5, 2x SATA 1.5 Gb/s to J3, 1x SATA 1.5 Gb/s to J5, 6x USB 2.0 to

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J3, 10x GPIO to J3 and J5, HDA and KB/MS to J3, and serial ports to J5. For PCIe expansion, the cPCI-6636 offers one PCIe x4 or 4x PCIe x1 to J5.

The ADLINK 8HP cPCI-6636DZ only supports operation in host slots, whereas the cPCI-6636 and cPCI-6636D operate independently in both host and peripheral slots without CompactPCI bus communication (satellite mode), making it ideal for high density computing platforms. Moreover, the cPCI-6636 supports remote manageability by SEMA for system health monitoring over the Internet.

The cPCI-6636 Series offers outstanding computing power from the latest Intel® processors and is an ideal solution for military, automation and other robust computing applications that require the highest computing power in a rugged, reliable CompactPCI system.

1.2 Features

- 6U CompactPCI blade in 4/8HP width form factor
- 14nm uFC-BGA Intel® Processor
  - Intel ® Xeon® E3-1505M v5, 2.8/3.7GHz, 4C/8T, GT2, 8M, 45W (35W by cTDP)
  - Intel ® Core™ i7-6820EQ 2.8/3.5GHz, 4C/8T, GT2, 8M, 45W
  - Intel ® Core™ i3-6100E 2.7GHz, 2C/4T, GT2, 3M, 35W
- One channel DDR4-2133 soldered SDRAM with ECC up to 16GB; one channel with one socket SO-DIMM DDR4-2133 ECC memory up to 16GB (ECC is supported by default on cPCI-6636 and cPCI-6636D, Core™ i7 SKUs do not support ECC)
- Supports up to two independent displays
- cPCI-6636, cPCI-6636D support one DVI-I on front panel, additional 2x DVI routed to J3 and J5
- cPCI-6636DZ support 2x VGA on front panel, no rear I/O graphics
- 64-bit/66MHz CompactPCI interface based on PCI specifications, universal V(I/O)
- cPCI-6636DZ supports operation in host slot only

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- cPCI-6636, cPCI-6636D support satellite mode operation in host and peripheral slots
- One PCIe x8 Gen3 XMC site on cPCI-6636D and cPCI-6636DZ
- Supports SEMA for system health monitoring
- 2x Gigabit Ethernet egress ports on faceplate provided by an Intel® I219LM and I210IT GbE controller via PCIe x1 and two additional Gigabit Ethernet ports Intel® I210IT routed to J3 (PICMG 2.16 compliant); all four GbE can be routed to rear
- 1x 2.5" SATA drive space and one 7-pin SATA on all cPCI-6636 Series
- 1x CFast slot on cPCI-6636 single-slot version
- 1x XMC slot on cPCI-6636D and cPCI-6636DZ
- 2x SATA 1.5 Gb/s to J3, 1x SATA 1.5 Gb/s to J5
- 6x USB 2.0, HDA, KB/MS, RS-232 to J3
- RS-232 TX/RX to J5
- 10x GPIO to J3 and J5
- TPM 2.0 support (Infineon SLB 9665XT2.0), not supported by cPCI-6636DZ

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1.3 Model Number Decoder

cPCI-ET6636SLXX/6820E/MX-X/X

(A) (B) (C) (D)(E)(F)

(A) Operating Temperature Code

Blank = 0°C to +60°C

ET= -20°C to +70°C (for CPUs with TDP below 37W only)

(B) Configuration Code

Blank = cPCI-6636 single slot with I/O (DVI-I, COM, USB 3.0 x3, GbE x2), CFast slot, and J3/J5

D = cPCI-6636D dual slot with I/O (DVI-I, COM, USB 3.0 x3, GbE x2), XMC slot, and J3/J5

DZ = cPCI-6636DZ dual slot with I/O (VGA x2, COM x6, USB 3.0 x8, GbE x2) and XMC slot, without J3/J5

(C) CPU Code

1505Mv5= Xeon® E3-1505M v5

6820E = Core™ i7 6820EQ

6100E = Core™ i3 6100E

(D) Onboard Memory Capacity Code

M4 = 4GB onboard memory

M8 = 8GB onboard memory

M16 = 16GB onboard memory

(E) SODIMM Memory Capacity Code

4 = 4GB SODIMM

8 = 8GB SODIMM

16 = 16GB SODIMM

(F) Other information

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1.4 Package Contents

The cPCI-6636 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-6636 Series non-standard configurations will vary depending on customer requests.

cPCI-6636(D) Processor Blade

- Processor Blade
  - CPU and memory specifications will differ depending on options selected
  - Thermal module is assembled on the board
- RJ-45 to DB-9 COM adapter cable (P/N: 30-01020-0200)
- 2.5" SATA drive accessory pack (P/N: 58-99097-0010)
- 2.5” SATA adapter board (P/N: 59-37571-0000)
- CFast accessory pack (P/N: 58-99300-0000, cPCI-6636 only)
- DB-CFAST adapter board (P/N: 59-37572-0000, cPCI-6636 only)

cPCI-6636DZ Processor Blade

- Processor Blade
  - CPU and memory specifications will differ depending on options selected
  - Thermal module is assembled on the board
- 2x RJ-45 to DB-9 COM adapter cable (P/N: 30-25044-1020)
- 2.5" SATA drive accessory pack (P/N: 58-99097-0010)
- 2.5” SATA adapter board (P/N: 59-37571-0000)

Rear Transition Module

- Dependent on the module selected

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NOTE:

The contents of non-standard cPCI-6636 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-6636 Series Specifications

CompactPCI® Standards	• PICMG® 2.0 CompactPCI® Rev. 3.0 • PICMG® 2.1 Hot Swap Specification Rev. 2.0 • PICMG® 2.16 Packet Switching Backplane Rev. 1.0
Mechanical	• Standard 6U CompactPCI® • Board size: 233mm x 160mm • Single/dual-slot (4/8HP, 20.32/40.64mm) • CompactPCI® connectors: J1, J2, J3, J5 (cPCI-6636, cPCI-6636D) • CompactPCI® connectors with J1, J2 connectors (cPCI-6636DZ)
Processor	• Intel® Xeon® E3-1505M v5 Processor, dual core, dual thread, 2.7 GHz, 3MB Smart Cache, TDP 35W • Intel® Core™ i7-6820EQ Processor, quad core, eight thread, 2.8 GHz (3.5 GHz Turbo), 8MB Smart Cache, TDP 45W (**Note:** does not support ECC) • Intel® Core™ i3-6100E Processor, dual core, four thread, 2.7 GHz, 3MB Smart Cache, TDP 35W • Passive heatsink
Chipset	• cPCI-6636(D): Mobile Intel® CM236 Chipset (w/ ECC) • cPCI-6636DZ: Mobile Intel® HM170 Chipset (w/o ECC)
Memory	• Dual channel DDR4-2133 SDRAM, up to 32GB non-ECC memory via 2x SODIMMs • One channel soldered onboard up to 16GB; one channel ion SO-DIMM socket, up to 16GB • ECC supported by CM236 PCH on cPCI-6636(D) only (**Note:** Core™ i7 SKUs do not support ECC)
Graphics	• Intel® HD Graphics 530 integrated on Intel® Core™ i7-6820EQ and Core™ i3-6100E processors • Intel® HD Graphics P530 integrated on Intel® Xeon® processor E3-1505M v5 • 1-slot versions: one DVI-I port • 2-slot version: two VGA ports on front panel

Table 2-1: cPCI-6636 Series Specifications

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Gigabit Ethernet	• One PCIe x1 Intel® I2199LM GbE PHY and two three PCIe x1 Intel® I210IT Gigabit Ethernet controllers • Three Two egress 10/100/1000BASE-T ports on front panel, one supporting Intel® AMT 9.0 by I219LM PHY controller • Two 10/100/1000BASE-T ports to rear by default • and tTheTwo front two 10/100/1000BASE-T ports switchable to rear for PICMG 2.16. (Total up to four GbE ports to rear total)
CompactPCI Bus	• PCI 64-bit/66MHz; 3.3V, 5V universal V I/O • All models support Host mode operation as a master in host slots and cPCI-6636(D) support Satellite mode operation as a standalone computer without connection to the PCI bus
Serial Ports	• cPCI-6636DZ: three RJ-45 on faceplate (converts to 6x RS-232 TX/RX by adapter) • cPCI-6636(D): one RJ-45 RS-232/422/485, one RS-232 TX/RX to J3, one RS-232 TX/RX to J5
USB 3.0	• cPCI-6636(D): three USB 3.0 ports on faceplate • cPCI-6636DZ: eight USB 3.0 ports on faceplate
XMC	• cPCI-6636D and cPCI-6636DZ: one XMC site
Audio	• High definition audio routed to J3
Storage Interfaces[1]	• One onboard 2.5" SATA connector supporting SATA 6Gb/s drive on all models • 1-slot cPCI-6636 supports onboard CFast slot • One SATA 3Gb/s 7-pin connector onboard on all models • cPCI-6636(D): two SATA 3Gb/s channels routed to J3
BIOS	• AMI UEFI BIOS, 128Mbit SPI flash memory
OS Compatibility	• Microsoft Windows 7 64-bit • Microsoft Windows 10 64-bit • Ubuntu 16.10.64-bit • Fedora 22, 64-bit • Other OS support upon request

Table 2-1: cPCI-6636 Series Specifications

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Faceplate I/O	**cPCI-6636 (4HP)** • 3x 10/100/1000BASE-T Ethernet ports • 1x DVI-I port & 1x DVI-D port • 3x USB 3.0 ports • 1x USB 2.0 port • 1x RJ-45 serial port supporting RS-232/422/485 **cPCI-6636D (8HP)** • 2x 10/100/1000BASE-T Ethernet ports • 1x DVI-I port • 3x USB 3.0 ports • 1x RJ-45 serial port supporting RS-232/422/485 • 1x XMC slot **cPCI-6636DZ (8HP)** • 2x 10/100/1000BASE-T Ethernet ports • 2x VGA ports • 8x USB 3.0 ports • 3x RJ-45 serial port supporting 6x RS-232 TX/RX • 1x XMC slot
Environmental	• Operating Temperature (with forced air flow)[2]: Standard: -20°C to +60°C Extended: -20°C to +70°C with 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[1]: 2Grms, 5-500Hz, each axis, operating (w/o hard drive)
EMI	• FCC Class A • CE EN55032

Table 2-1: cPCI-6636 Series 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 Block Diagrams

cPCI-6636 Series Processor Blade

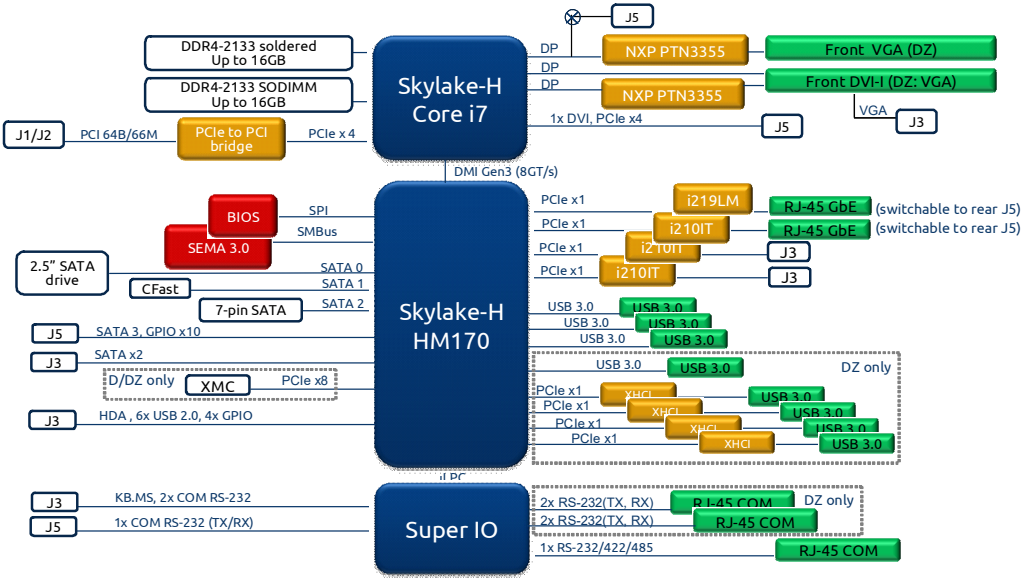


Figure 2-1: cPCI-6636 Series Functional Block Diagram

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2.3 I/O Connectivity Table

Function	cPCI-6636 (4HP)		cPCI-6636D (8HP)		cPCI-6636DZ (8HP)	
	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard
GbE	Y x2		Y x2		Y x2	
COM	Y x1 (RJ-45)		Y x1 (RJ-45)		Y x3 (RJ-45)	
USB 3.0	Y x3		Y x3		Y x8	
DVI-I	Y x1		Y x1			
VGA					Y x2	
SATA		Y x2 (one for 2.5” drive, one 7-pin SATA connector)		Y x2 (one for 2.5” drive, one 7-pin SATA connector)		Y x2 (one for 2.5” drive, one 7-pin SATA connector)
CFast		CFast				
XMC				Y x1		Y x1
LEDs	Y x3		Y x3		Y x3	
Reset Button	Y		Y		Y	

Table 2-2: cPCI-6636(D/DZ) I/O Connectivity

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2.4 Power Requirements

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

The tolerance of the voltage lines described in the CompactPCI specification (PICMG 2.0 R3.0) is +5%/-3% for 5V, 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

Intel® Core i7™-6820EQ: BIOS EIST Enabled, cTDP Normal

OS/Mode	Current @ 3.3V	Current @ 5V	Total Power
Windows 10/Idle mode	1.66 A	1.1 A	10.97 W
Windows typical mode	1.74 A	11.94 A	65.44 W
Windows max mode	1.70 A	11.8 A	61.51W

Intel® Xeon® CPU E3-1505M v5: BIOS EIST Enabled, cTDP Normal

OS/Mode	Current @ 3.3V	Current @ 5V	Total Power
Windows 10/Idle mode	1.80 A	0.70 A	9.44 W
Windows typical mode	1.85 A	12.48 A	68.51 W
Windows max mode	1.85 A	10.83 A	60.26 W

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3 Functional Description

The following sections describe the cPCI-6636 Series features and functions.

3.1 Processors

The 6th Generation Intel® Core™ processor family is the state of art 64-bit, multi-core mobile processor built on 14 nanometer process technology. Based on the advanced microarchitecture, the processor is designed for a two-chip platform. The two-chip platform consists of a processor and platform controller hub (PCH). The platform enables higher performance, lower cost, easier validation, and improved x-y footprint. The processor includes an integrated display engine, processor graphics and integrated memory controller.

Features	Xeon® E3-1505M v5	Core™ i7-6820EQ	Core™ i3-6100E
Clock Speed	2.8 GHz	2.8GHz	2.7 GHz
Max. Single Core Turbo Freq.	3.7 GHz	3.5GHz	NA
Last Level Cache	8MB Smart Cache	8MB Smart Cache	3MB Smart Cache
No. of Core/Thread	4/8	4/8	2/4
Maximum Power (TDP(1))	45W/35W by cTDP	45W	35W
DMI	8 GT/s DMI3	8 GT/s DMI3	8 GT/s DMI3
$T_{junction,MAX}$(2)	100°C	100°C	100°C
Socket Supported	FCBGA1440	FCBGA1440	FCBGA1440
Processor Graphics	Intel® HD Graphics P530	Intel® HD Graphics 530	Intel® HD Graphics 530
Graphics Base/Max Freq.	350 MHz / 1.05 GHz	350 MHz /1 GHz	350 MHz /950 MHz
Graphics Video Max Memory	1.7 GB	64 GB	64 GB
DirectX	12	12	12
OpenGL	4.4	4.5	4.5

(see notes on next page)

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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.

Supported Technologies

Feature	Xeon® E3-1505M v5	Core™ i7-6820EQ	Core™ i3-6100E
Intel® Turbo Boost Technology	2.0	2.0	No
Intel® vPro Technology	Yes	Yes	No
Intel® Hyper-Threading Technology	Yes	Yes	Yes
Intel® Virtualization Technology (Intel® VT-x)	Yes	Yes	Yes
Intel® Virtualization Technology for Directed I/O (Intel® VT-d)	Yes	Yes	Yes
Intel® VT-x with Extended Page Tables (EPT)	Yes	Yes	Yes
Intel® TSX-NI	Yes	Yes	Yes
Intel® 64 Architecture	Yes	Yes	Yes
Instruction Set	64-bit	64-bit	64-bit
Instruction Set Extensions	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2	Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2
Enhanced Intel SpeedStep® Technology	Yes	Yes	Yes
Thermal Monitoring Technologies	Yes	Yes	Yes
Intel Flex Memory Technologies	Yes	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes	Yes

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Feature	Xeon® E3-1505M v5	Core™ i7-6820EQ	Core™ i3-6100E
Intel® Stable Image Platform Program (SIPP)	Yes		
Intel® Smart Response Technology	Yes		

Interfaces

- Two channels of DDR4-2133 ECC memory(cPCI-6636(D) only, Core™ i7 SKUs do not support ECC)
- Memory DDR4 data transfer rates of 2133 MT/s
- 64-bit wide channels
- DDR4 I/O Voltage of 1.2V
- 4Gb, and 8Gb DDR4 DRAM technologies are supported for x8 devices. Using 8Gb device technologies, the largest memory capacity possible is 16 GB
- The PCI Express port(s) are fully-compliant with the PCI Express Base Specification, Revision 2.0.
- 8 GT/s point-to-point DMI interface to PCH is supported

Graphics

The Intel® HD Graphics 530 for Core™ i7 and Core™ i3 and Intel® HD Graphics P530 for Xeon® E3-1505M v5 is integrated in the processor enabling substantial gains in performance and lower power consumption.

- DX12 support
- OpenGL 4.4/4.5, OpenCL 1.2 support
- Graphics Base Frequency: 3500 MHz
- Graphics Max Dynamic Frequency: 1.05 GHz for Xeon® E3-1505M v5, Core™ i7 and 950MHz 1GHz for Core™ i37 and 950MHz for Core™ i3Celeron®
- Graphics Video Max Memory: Uup to 64GB
- Supports Intel® InTru™ 3D Technology, Intel® Quick Sync Video, Intel® Clear Video HD Technology, Intel® Clear Video Technology

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3.2 Chipset

The cPCI-6636(D) are equipped with Mobile Intel® CM236 Chipset and cPCI-6636DZ is equipped with Mobile Intel® HM170 Chipset. Functions and capabilities include:

Feature	Mobile Intel® CM236 Chipset	Mobile Intel® HM170 Chipset
Bus Speed	8 GT/s DMI3	8 GT/s DMI3
TDP	3.67 W	2.6 W
# of DIMMs per channel	2	2
Intel® Clear Video Technology	Yes	Yes
PCI Support	No	No
PCI Express Revision	3.0	3.0
PCI Express Configurations	x1, x2, x4	x1, x2, x4
Max # of PCI Express Lanes	20	16
RAID Configuration	0/1/5/10	0/1/5/10
Intel® Virtualization Technology for Directed I/O (VT-d)	Yes	Yes
Intel® vPro™ Technology	Yes	No
Intel® ME Firmware Version	11.0	11.0
Intel® HD Audio Technology	Yes	Yes
Intel® Rapid Storage Technology	Yes	Yes
Intel® Rapid Storage Technology enterprise	Yes	No
Intel® Smart Response Technology	Yes	Yes

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Feature	Mobile Intel® CM236 Chipset	Mobile Intel® HM170 Chipset
Intel® Stable Image Platform Program (SIPP)	Yes	Yes
Intel® Smart Sound Technology	Yes	Yes
Intel® Trusted Execution Technology	Yes	No

3.3 XMC

The cPCI-6636D/DZ supports one PCIe x8 XMC site for front panel I/O expansion.

3.4 Intel® Turbo Boost Technology

Intel® Turbo Boost Technology is a feature that allows the processor to opportunistically and automatically run faster than its rated operating core and/or render clock frequency when there is sufficient power headroom, and the product is within specified temperature and current limits. The Intel Turbo Boost Technology feature is designed to increase performance of both multi-threaded and single-threaded workloads. The processor supports a Turbo mode where the processor can use the thermal capacity associated with package and **run at power levels higher than TDP power for short durations**. This improves the system responsiveness for short, bursty usage conditions.

Turbo Mode availability is independent of the number of active cores; however, the Turbo Mode frequency is dynamic and dependent on the instantaneous application power load, the number of active cores, user configurable settings, operating environment, and system design. If the power, current, or thermal limit is reached, the processor will automatically reduce the frequency to stay with its TDP limit.

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3.5 Intel® Hyper-Threading Technology

Intel® Hyper-Threading Technology allows an execution core to function as two logical processors. While some execution resources (such as caches, execution units, and buses) are shared, each logical processor has its own architectural state with its own set of general-purpose registers and control registers. This feature must be enabled using the BIOS and requires operating system support. Intel recommends enabling Hyper-Threading Technology with Microsoft Windows 7, and disabling Hyper-Threading Technology using the BIOS for all previous versions of Windows operating systems.

3.6 Battery

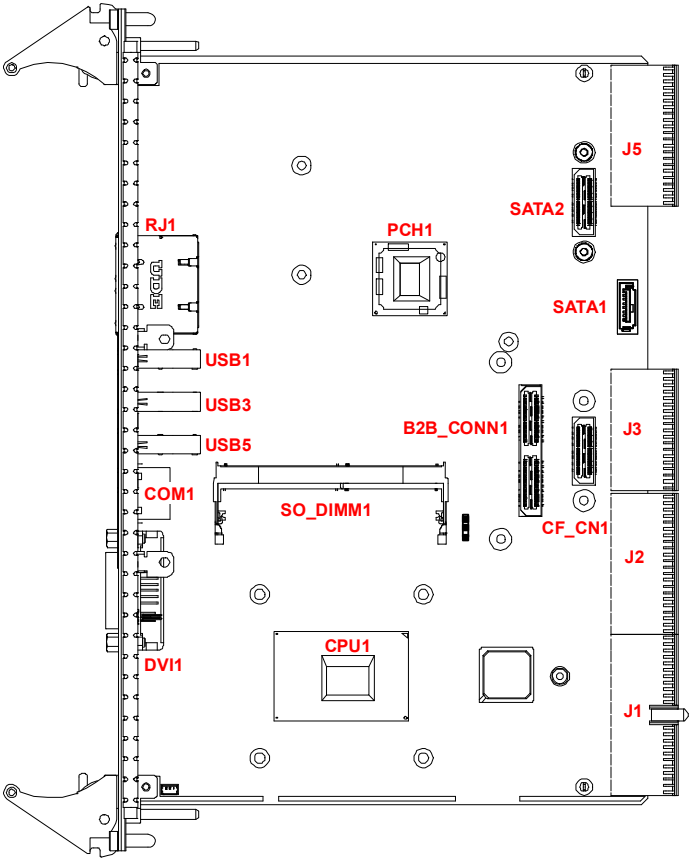
The cPCI-6636(D/DZ) is equipped with a 3.0V "coin cell" lithium battery for the real time clock (RTC). The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer. A Rayovac BR2032 is equipped on board by default.

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4 Board Interfaces

This chapter illustrates the board layout, connector pin assignments, and jumper settings to familiarize users with the cPCI-6636 Series.

4.1 cPCI-6636(D) Component Side Layout



CPU1	Intel® processor	**PCH1**	Intel® PCH
SO_DIMM1	Memory socket	**J1/J2/J3/5**	CompactPCI connectors
CF_CN1 (CPCI-6636)	CFast board-to-board connector	**B2B_CONN1 (cPCI-6636D/DZ)**	XMC board-to-board connector
SATA1	7-pin SATA connector	**SATA2**	SATA board-to-board connector

Figure 4-1: cPCI-6636(D) Component Side Layout

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4.2 cPCI-6636D/DZ Assembly Layoutt

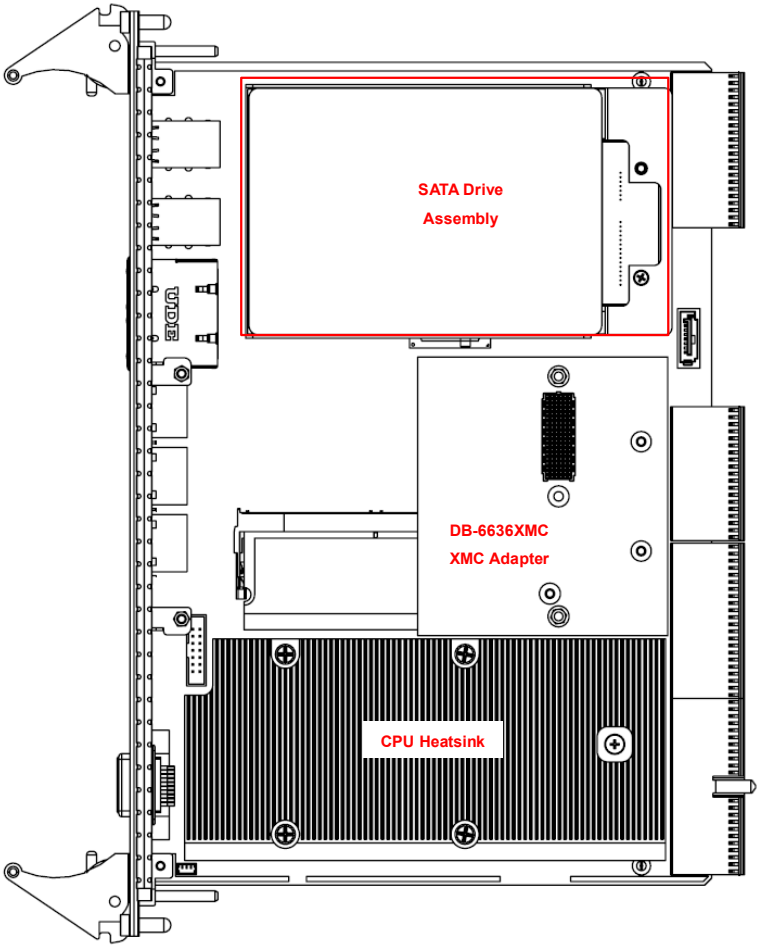
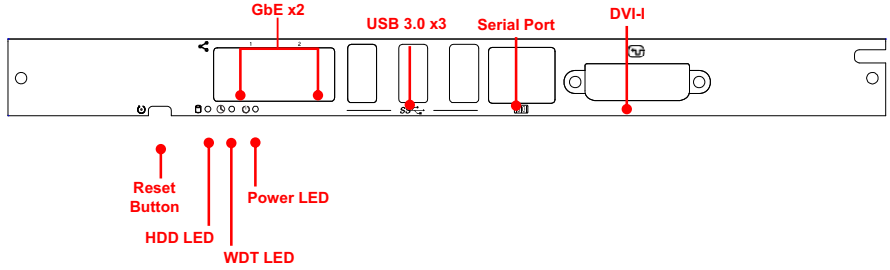


Figure 4-2: cPCI-6636D/DZ Assembly Layout

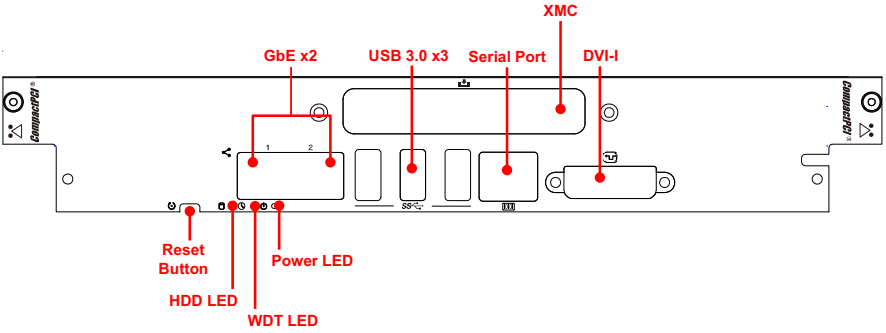
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4.3 cPCI-6636(D/DZ) Faceplate I/O

cPCI-6636



cPCI-6636D



cPCI-6636DZ

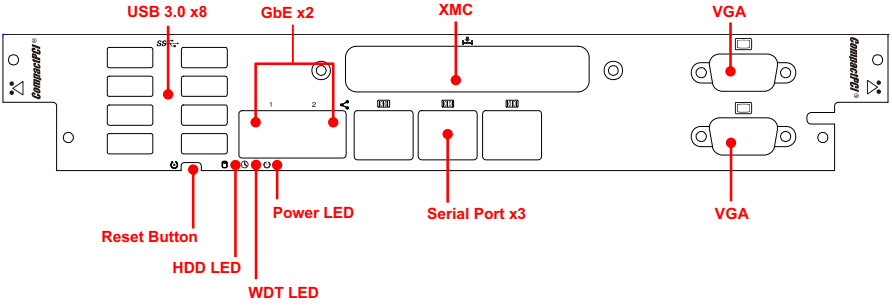


Figure 4-3: cPCI-6636(D/DZ) Faceplate I/O

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System LEDs

LED	Color	Condition	Indication
Power 	Green/ Red	Off	System is off
		Red	System Power ready (PWGD)
		Green	Post OK
WDT 	Orange	Off	No Watchdog event
		Blinking	Watchdog event alert
HDD 	Yellow	Off	No CF/CFast/SATA HDD activity
		Blinking	Data read/write in process for CFast/ SATA drive

Table 4-1: cPCI-6636(D) Front Panel System LED Descriptions

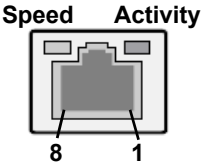
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4.4 Connector Pin Assignments

LAN1/2 RJ-45 GbE 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 4-2: LAN1/2 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	Amber	ON
	Active	Amber	Blinking

Table 4-3: LAN LED Status Definitions

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USB 3.0 Connectors

Pin #	Signal Name
1	VCC
2	Data-
3	Data+
4	GND
5	RX_N
6	RX_P
7	GND
8	TX_N
9	TX_P

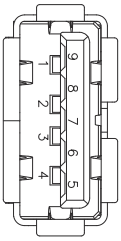


Table 4-4: USB 3.0 Pin Definitions

cPCI-6636(D) COM1 (RJ-45)

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

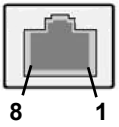


Table 4-5: cPCI-6636(D) COM Pin Definitions

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cPCI-6636(D) COM RJ-45 to DB-9 Cable

(P/N: 30-01020-0200)

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

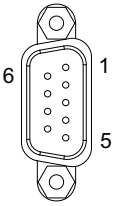


Table 4-6: cPCI-6636(D) COM RJ-45 to DB-9 Cable Pin Definitions

cPCI-6636DZ COM1-6 (RJ-45)

The three RJ-45 ports on the cPCI-6636DZ carry two sets of RX/TX signals each. From right to left: COM1/2, COM3/4 and COM5/6.

COM1/2

Pin #	RS-232
1	P5V
2	COM1_RX
3	COM1_TX
4	GND
5	P5V
6	COM2_RX
7	COM2_TX
8	GND

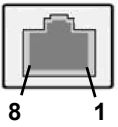


Table 4-7: cPCI-6636DZ COM1/2 Pin Definitions

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COM3/4

Pin #	RS-232
1	P5V
2	COM3_RX
3	COM3_TX
4	GND
5	P5V
6	COM4_RX
7	COM4_TX
8	GND

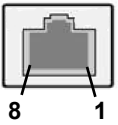


Table 4-8: cPCI-6636DZ COM3/4 Pin Definitions

COM5/6

Pin #	RS-232
1	P5V
2	COM3_RX
3	COM3_TX
4	GND
5	P5V
6	COM4_RX
7	COM4_TX
8	GND

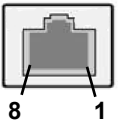
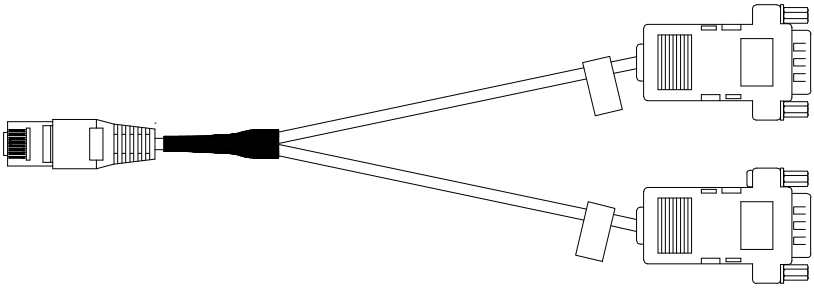


Table 4-9: cPCI-6636DZ COM5/6 Pin Definitions

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cPCI-6636DZ COM RJ-45 to 2x DB-9 Cable

(P/N: 30-25044-1020)



The DB-9 connectors are labeled “01” and “02”. Connector “01” corresponds to the odd numbered COM signal on the RJ-45 connector, and connector “02” corresponds to the even numbered COM signal (i.e. “a” = “odd”, “b” = “even”).

Pin #	DB-9 “01”	DB-9 “02”
1	-	-
2	COMa_RX	COMb_RX
3	COMa_TX	COMb_TX
4	-	-
5	GNDa	GNDb
6	-	-
7	-	-
8	-	-
9	-	-

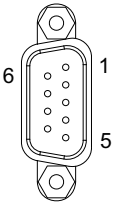
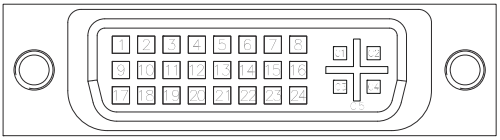


Table 4-10: cPCI-6636DZ COM RJ-45 to 2x DB-9 Cable Pin Definitions

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DVI-I Connector



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

Table 4-11: DVI-I Connector Pin Definition

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Serial ATA 7-pin Connector (SATA1)

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

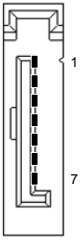


Table 4-12: Serial ATA 7-pin Connector Pin Definition

Serial ATA Connector with Power

2.5” SATA adapter board (P/N: 59-37571-0000)

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

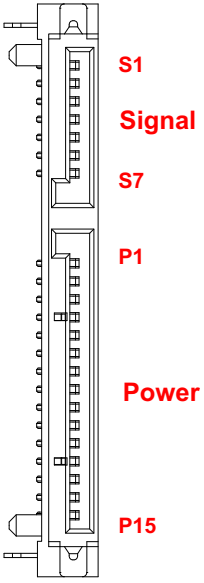


Table 4-13: Serial ATA Connector with power Pin Definition

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CFast Socket

DB-CFast adapter board (P/N: 59-37572-0000)

Pin #	Signal Name
Ground	S1
SATA_TX-P	S2
SATA_TX-N	S3
Ground	S4
SATA_RX-N	S5
SATA_RX-P	S6
Ground	S7
CFast_CDI	P1
Ground	P2
NC	P3
NC	P4
NC	P5
NC	P6
Ground	P7
CFast_LED1	P8
CFast_LED2	P9
NC	P10
NC	P11
NC	P12
+3.3V	P13
+3.3V	P14
Ground	P15
Ground	P16
CFast_CDO	P17

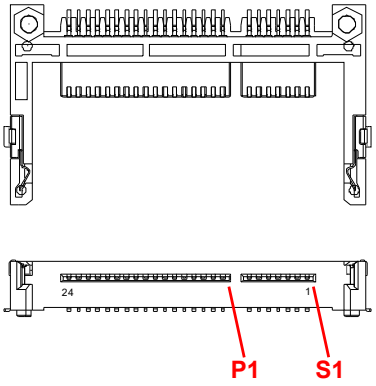
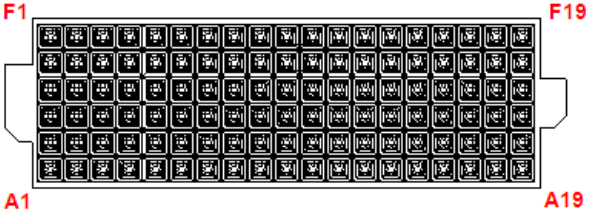


Table 4-14: CFast Socket Pin Definition

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XMC Connector on Daughter Board

cPCI-6636D/DZ only.



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 4-15: XMC Connector Pin Definition

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CompactPCI J1 Connector

Pin	Z	A	B	C	D	E	F
25	GND	P5V	CPCI_REQ64-L	CPCI_ENUM-L	P3V3	P5V	GND
24	GND	CPCI_AD1	P5V	CPCI_VIO_STB	AD0	CPCI_ACK64-L	GND
23	GND	P3V3	CPCI_AD4	CPCI_AD3	P5V	CPCI_AD2	GND
22	GND	CPCI_AD7	GND	P3V3	CPCI_AD6	CPCI_AD5	GND
21	GND	P3V3	CPCI_AD9	CPCI_AD8	CPCI_M66EN	CPCI_CBE-L0	GND
20	GND	CPCI_AD12	GND	CPCI_VIO_STB	CPCI_AD11	CPCI_AD10	GND
19	GND	P3V3	CPCI_AD15	CPCI_AD14	GND	CPCI_AD13	GND
18	GND	CPCI_SERR-L	GND	P3V3	CPCI_PAR	CPCI_CBE-L1	GND
17	GND	P3V3	IPMB_CLK	IPMB_DAT	GND	CPCI_PERR-L	GND
16	GND	CPCI_DEVSEL-L	GND	CPCI_VIO_STB	CPCI_STOP-L	CPCI_LOCK-L	GND
15	GND	P3V3	CPCI_FRAME-L	CPCI_IRDY-L	CPCI_BDSEL-L	CPCI_TRDY-L	GND
12-14	Key Area						
11	GND	CPCI_AD18	CPCI_AD17	CPCI_AD16	GND	CPCI_CBE-L2	GND
10	GND	CPCI_AD21	GND	P3V3	CPCI_AD20	CPCI_AD19	GND
9	GND	CPCI_CBE-L3	CPCI_IDSEL	CPCI_AD23	GND	CPCI_AD22	GND
8	GND	CPCI_AD26	GND	CPCI_VIO_STB	CPCI_AD25	CPCI_AD24	GND
7	GND	CPCI_AD30	CPCI_AD29	CPCI_AD28	GND	CPCI_AD27	GND
6	GND	CPCI_REQ-L0	CPCI_PRESENT-L	P3V3	CPCI_CLK0	CPCI_AD31	GND
5	GND	NC	NC	CPCI_RET-L	GND	CPCI_GNT-L0	GND
4	GND	P5V_IPMB	CPCI_HEALTHY-L	CPCI_VIO_STB	CPCI_INTP	CPCI_INTS	GND
3	GND	CPCI_INTA-L	CPCI_INTB-L	CPCI_INTC-L	P5V	CPCI_INTD-L	GND
2	GND	GND	P5V	NC	NC	NC	GND
1	GND	P5V	N12V	NC	P12V	P5V	GND

Table 4-16: 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	CPCI_CLK6	GND	NC	NC	NC	GND
20	GND	CPCI_CLK5	GND	NC	GND	NC	GND
19	GND	GND	GND	IPMB_DAT	IPMB_CLK	IPMB_PWR	GND
18	GND	NC	NC	NC	GND	NC	GND
17	GND	NC	GND	J2_RST-L	CPCI_REQ-L6	CPCI_GNT-L6	GND
16	GND	NC	NC	CPCI_DEG-L	GND	NC	GND
15	GND	NC	GND	CPCI_FAL-L	CPCI_REQ-L5	CPCI_GNT-L5	GND
14	GND	CPCI_AD35	CPCI_AD34	CPCI_AD33	GND	CPCI_AD32	GND
13	GND	CPCI_AD38	GND	CPCI_VIO	CPCI_AD37	CPCI_AD36	GND
12	GND	CPCI_AD42	CPCI_AD41	CPCI_AD40	GND	CPCI_AD39	GND
11	GND	CPCI_AD45	GND	CPCI_VIO	CPCI_AD44	CPCI_AD43	GND
10	GND	CPCI_AD49	CPCI_AD48	CPCI_AD47	GND	CPCI_AD46	GND
9	GND	CPCI_AD52	GND	CPCI_VIO	CPCI_AD51	CPCI_AD50	GND
8	GND	CPCI_AD56	CPCI_AD55	CPCI_AD54	GND	CPCI_AD53	GND
7	GND	CPCI_AD59	GND	CPCI_VIO	CPCI_AD58	CPCI_AD57	GND
6	GND	CPCI_AD63	CPCI_AD62	CPCI_AD61	GND	CPCI_AD60	GND
5	GND	CPCI_CBE-L5	CPCI_DEV64-L	CPCI_VIO	CPCI_CBE-L4	CPCI_PAR64	GND
4	GND	CPCI_VIO	NC	CPCI_CBE-L7	GND	CPCI_CBE-L6	GND
3	GND	CPCI_CLK4	GND	CPCI_GNT-L3	CPCI_REQ-L4	CPCI_GNT-L4	GND
2	GND	CPCI_CLK2	CPCI_CLK3	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 4-17: CompactPCI J2 Connector Pin Definition

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CompactPCI J3 Connector

Pin	Z	A	B	C	D	E	F
19	GND	P5V	P5V	P12V	P5V	P5V	GND
18	GND	LAN4_MDI0_P	LAN4_MDI0_N	GND	LAN4_MDI2_P	LAN4_MDI2_N	GND
17	GND	LAN4_MDI1_P	LAN4_MDI1_N	GND	LAN4_MDI3_P	LAN4_MDI3_N	GND
16	GND	LAN3_MDI0_P	LAN3_MDI0_N	GND	LAN3_MDI2_P	LAN3_MDI2_N	GND
15	GND	LAN3_MDI1_P	LAN3_MDI1_N	GND	LAN3_MDI3_P	LAN3_MDI3_N	GND
14	GND	USB_OC5-L	USB_OC6-L	USB_OC7-L	USB_OC8-L	USB_OC9-L	GND
13	GND	USB8-P	USB8-N	GND	USB9-P	USB9-N	GND
12	GND	USB6-P	USB6-N	GND	USB7-P	USB7-N	GND
11	GND	USB4-P	USB4-N	GND	USB5-P	USB5-N	GND
10	GND	USB_OC4-L	CRT_CLK	CRT_DAT	CRT_HSYNC	CRT_VSYNC	GND
9	GND	COM3_CTS-L	COM3_RI-L	CRT_BLUE	CRT_RED	CRT_GREEN	GND
8	GND	COM3_RXD	COM3_TXD	COM3_DTR-L	COM3_DSR-L	COM3_RTS-L	GND
7	GND	COM4_TX	COM4_RX	COM3_DCD-L	GPIO	GPIO	GND
6	GND	SATA1_RXPC	SATA1_RXNC	GND	SATA0_RXPC	SATA0_RXNC	GND
5	GND	GND	GND	NC	GND	GND	GND
4	GND	SATA1_TXPC	SATA1_TXNC	GND	SATA0_TXPC	SATA0_TXNC	GND
3	GND	KBDATA	KBCLK	GPIO2	MSDATA	MSCLK	GND
2	GND	A_HDA_SDIN1	AUD_SDIN2	NC	AUD_DOCK_EN-L	AUD_DOCK_RST-L	GND
1	GND	A_HDA_RST-L	A_HDA_SYNC	A_HDA_BIT_CLK	A_HDA_SDOUT	A_HDA_SDIN0	GND
	Z	A	B	C	D	E	F

Table 4-18: CompactPCI J3 Connector Pin Definition

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CompactPCI J5 Connector

Pin	Z	A	B	C	D	E	F
22	GND	LAN2_MDI_P0	LAN2_MDI_N0	GND	LAN2_MDI_P2	LAN2_MDI_N2	GND
21	GND	LAN2_MDI_P1	LAN2_MDI_N1	GND	LAN2_MDI_P3	LAN2_MDI_N3	GND
20	GND	LAN1_MDI_P0	LAN1_MDI_N0	GND	LAN1_MDI_P2	LAN1_MDI_N2	GND
19	GND	LAN1_MDI_P1	LAN1_MDI_N1	GND	LAN1_MDI_P3	LAN1_MDI_N3	GND
18	GND	DVID_CLKP	DVID_CLKN	GND	GND	GND	GND
17	GND	DVID_TXP1	DVID_TXN1	GND	COM2_TX	COM2_RX	GND
16	GND	DVID_SDA	DVID_SCL	DVID_HPD	GND	GND	GND
15	GND	DVID_TXP2	DVID_TXN2	GND	SATA_RX3_P_C	SATA_RX3_N_C	GND
14	GND	DVID_TXP0	DVID_TXN0	GND	SATA-TX3_P_C	SATA-TX3_N_C	GND
13	GND	LAN3_LED_ 100-L	LAN4_LED_ 100-L	REAR_GPIO6	LAN4_LED_ 1000-L	LAN3_LED_1 000-L	GND
12	GND	DVI_SDA_RTM	DVI_SCL_RTM	DVI_HPD_RTM	RTM_HDD_LED	RTM_WDT_LED	GND
11	GND	DVIB_TX2_P_ C	DVIB_TX2_N_ C	GND	DVIB_CLK_P_C	DVIB_CLK_N_C	GND
10	GND	DVIB_TX0_P_ C	DVIB_TX0_N_ C	GND	DVIB_TX1_P_C	DVIB_TX1_N_C	GND
9	GND	REAR_GPIO1	REAR_GPIO2	REAR_GPIO3	REAR_GPIO4	REAR_GPIO5	GND
8	GND	LAN3_ACT-L	REAR_GPIO7	LAN4_ACT-L	REAR_GPIO8	REAR_GPIO9	GND
7	GND	GND	GND	BAT_RTM	GND	GND	GND
6	GND	CLK_REAR-P	CLK_REAR-N	GND	PLTRST_REAR-L	GPIO	GND
5	GND	GND	GND	GND	GND	GND	GND
4	GND	PCIE_TX8-P	PCIE_TX8-N	GND	PCIE_RX8-P	PCIE_RX8-N	GND
3	GND	PCIE_TX7-P	PCIE_TX7-N	GND	PCIE_RX7-P	PCIE_RX7-N	GND
2	GND	PCIE_TX6-P	PCIE_TX6-N	GND	PCIE_RX6-P	PCIE_RX6-N	GND
1	GND	PCIE_TX5-P	PCIE_TX5-N	GND	PCIE_RX5-P	PCIE_RX5-N	GND
	Z	A	B	C	D	E	F

Table 4-19: CompactPCI J5 Connector Pin Definition


NOTE:

GPIO signals to J5 are from the PCH. Contact ADLINK for information on how to control these GPIO.

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4.5 Switches and Buttons

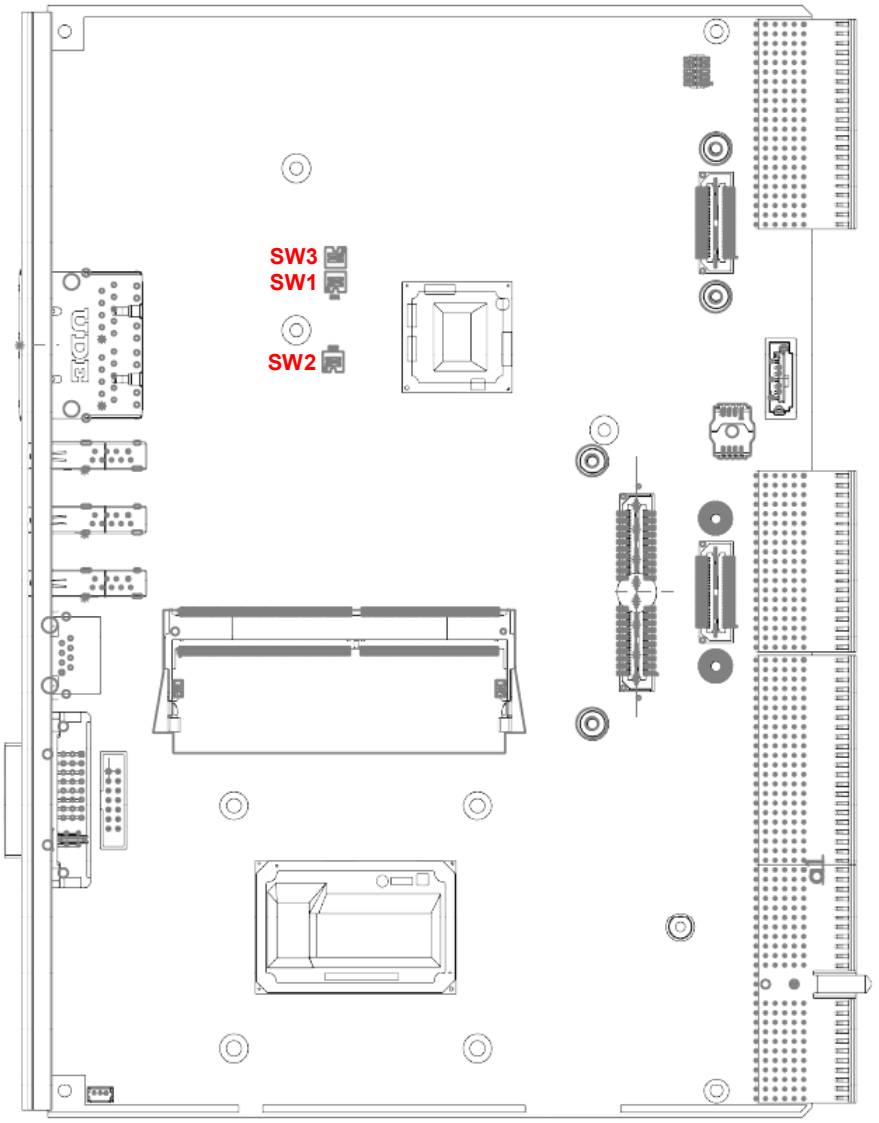


Figure 4-4: cPCI-6636 Series Switch Locations - Component Side

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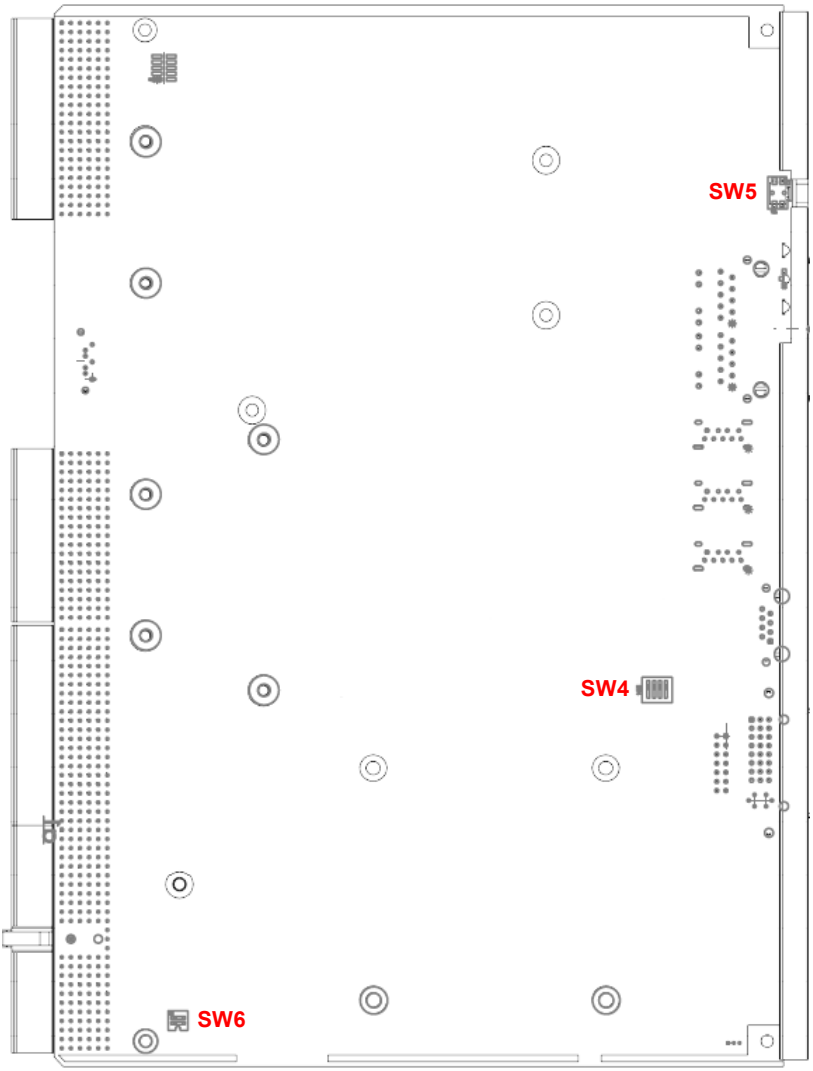


Figure 4-5: cPCI-6636 Series Switch Locations - Solder Side

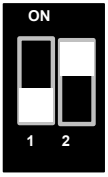
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VGA Signal Front/Rear Switch (SW1 Pin 1, Reserved)

VGA functionality is controlled by BIOS.

BIOS Protection Switch (SW1 Pin 2)

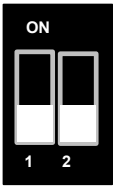
Enabling BIOS protection prevents changes to be made to the BIOS settings (disabled by default).



SW1 Pin	ON	OFF
1	Reserved	Reserved (default)
2	BIOS Protection Disabled (default)	BIOS Protection Enabled

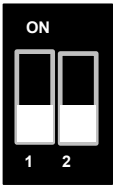
Debug Switch (SW2, Reserved)

The default setting for SW2 is 1 OFF, 2 OFF. Do not change the settings unless instructed by ADLINK.



LAN (RJ1) Front/Rear Switch (SW3, Reserved)

Default all OFF.

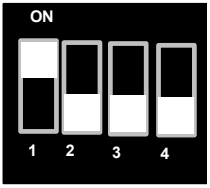


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COM1 Mode Switch (SW4)

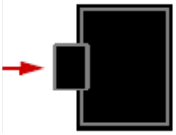
cPCI-6636(D) only.

Pin	Function
1 OFF, 2 ON (default)	RS-232
1 ON, 2 OFF	RS-485
1 ON, 2 ON	RS-422
3	OFF (Reserved)
4	OFF (Reserved)



System Reset Button (SW5)

Press switch SW5 to reset the system.

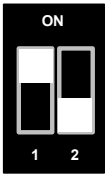


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Force Ejector Handle Closed Switch (SW6)

Switch SW6 allows the ejector handle state to be forced "closed" so that blades without ejector handles (e.g. conduction cooled) will power on when inserted into the chassis.

Pin	ON	OFF
1	Force the ejector handle state to "closed" (default)	On/Off state is controlled by the ejector handle
2	NC	NC (default)



NOTE:

When the On/Off state is controlled by the ejector handle (Pin 1 OFF), make sure to properly shut down the OS before opening the handle. If the ejector handle is opened while the OS is operating, power will be cut immediately, resulting in possible system corruption and data loss.

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5 Getting Started

This chapter describes the following installation procedures for the cPCI-6636(D):

- CFast card (cPCI-6636 only)
- 2.5” SATA drive
- XMC module

5.1 CPU and Heatsink

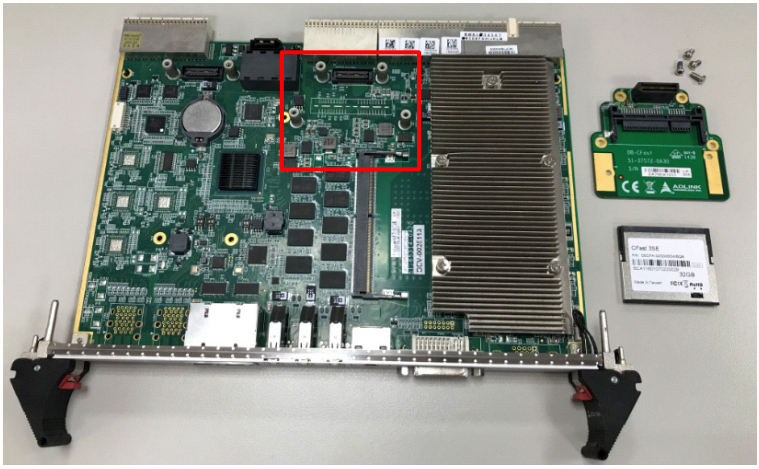
The cPCI-6636 Series come with CPU and heatsink pre-installed. Removal of heatsink/CPU by users is not recommended. Please contact your ADLINK service representative for assistance.

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5.2 CFast Card Installation

The cPCI-6636 provides space to install a CFast card or a Compact-Flash card (optional). Follow the instructions below to install a CFast to the cPCI-6636(D/DZ).

1. A CFast card can be installed in the location marked below.



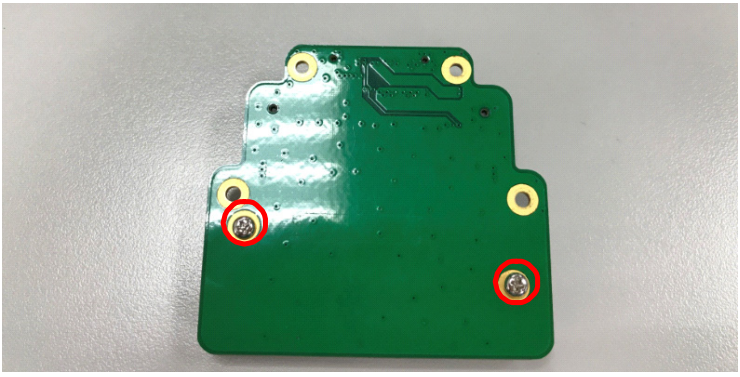
2. Insert the CFast card into the slot on the DB-CFast daughter board.



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3. Turn the DB-CFast daughter board assembly over and place it on top of retention bracket with the holes aligned as shown. Secure the bracket with two of the six screws included in the kit (M2.5, L4 P/N: 33-01007-0040).





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4. Install the CFast daughter board assembly to the cPCI-6636 main board by pressing it onto the board-to-board connector in the location shown below. Secure it with the remaining 4 screws (M2.5, L4, P/N: 33-01007-0040).

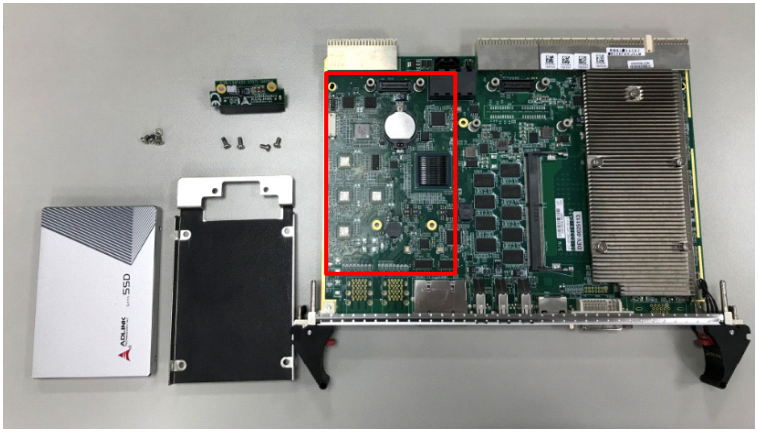


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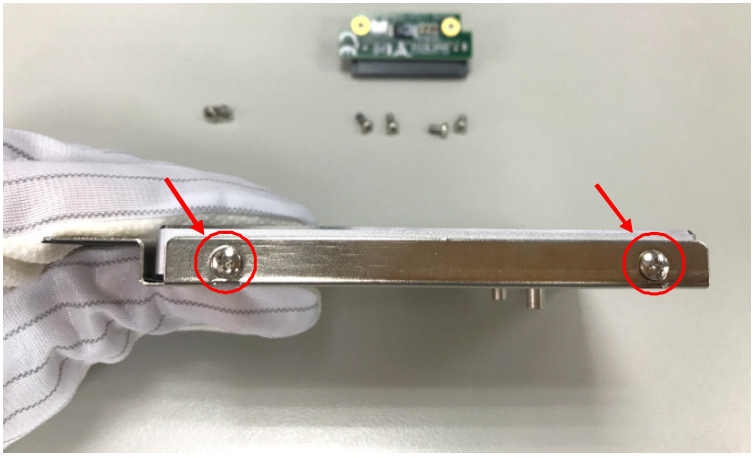
5.3 2.5" SATA Drive Installation

The cPCI-6636(D/DZ) provides space to install a 2.5” SATA drive.

1. A 2.5” SATA drive can be installed on the cPCI-6636(D/DZ) in the location shown below. The items in the 2.5” SATA drive accessory pack are shown on the left.



2. Secure the 2.5" SATA drive to the drive bracket by fastening two screws on each side of the bracket as indicated below (M3 L4, P/N: 33-03104-0040).



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3. Attach the SATA adapter board to the connectors on the SATA drive.

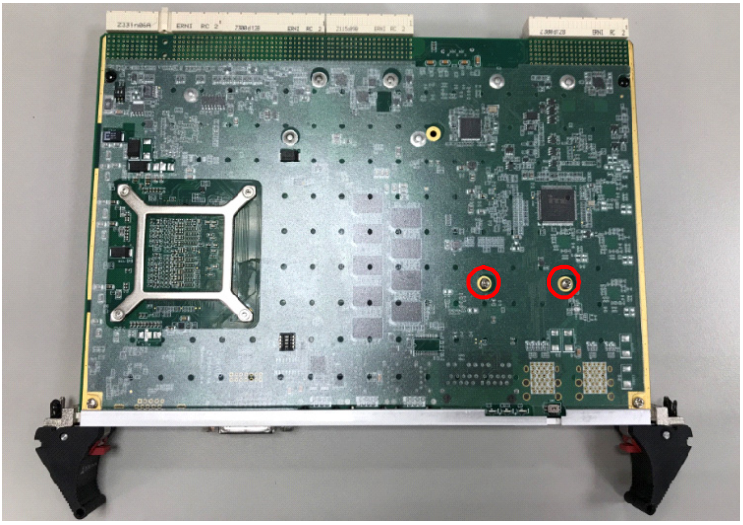


4. Install the SATA drive bracket assembly onto the cPCI-6630(D/DZ) by pressing it onto the board-to-board connector in the location shown below. Fasten two screws as circled as below (M2.5 L6, round head, P/N: 33-01200-0060).



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5. Turn the board over and finish securing the SATA drive bracket assembly by fastening the remaining two screws (M2.5 L6, round head, P/N: 33-01200-0060) as shown below.



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5.4 XMC Installation (cPCI-6636D/DZ only)

The cPCI-6636D/DZ provides space to install one XMC module. Follow the steps below to install an XMC module.

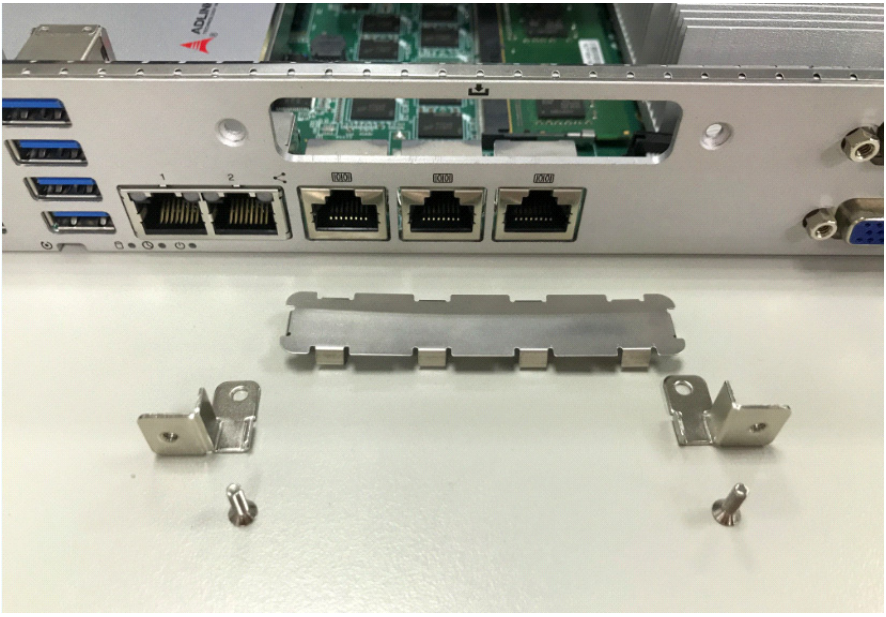
1. An XMC module can be installed on the cPCI-6636D/DZ in the location indicated below.



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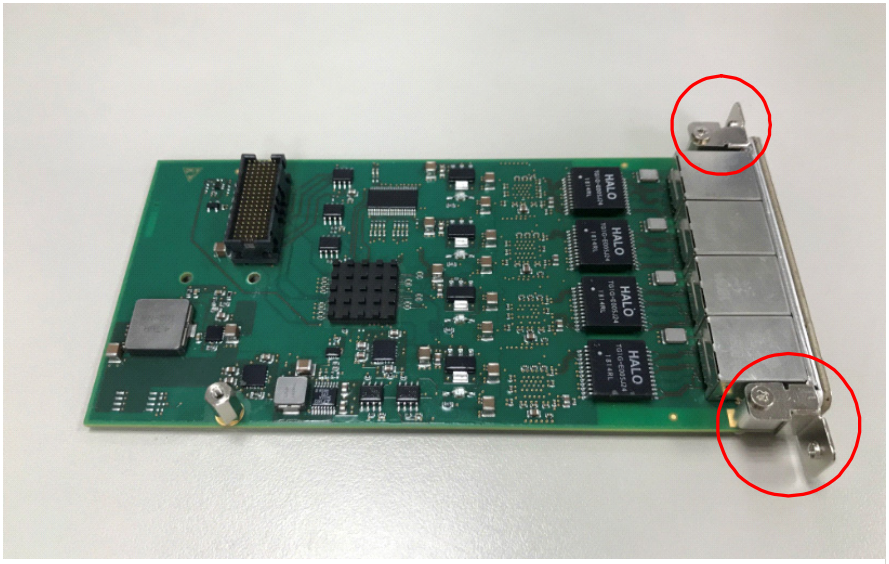
2. Remove the XMC filler plate and the screws securing two brackets to the front panel as shown below.

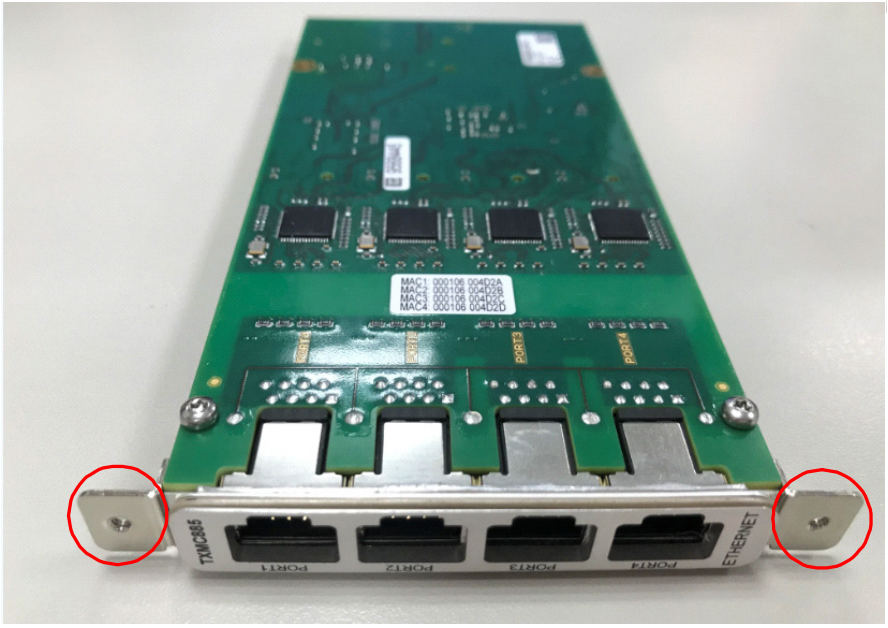




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3. Secure the two brackets removed in Step 2 above to the XMC card as shown below.

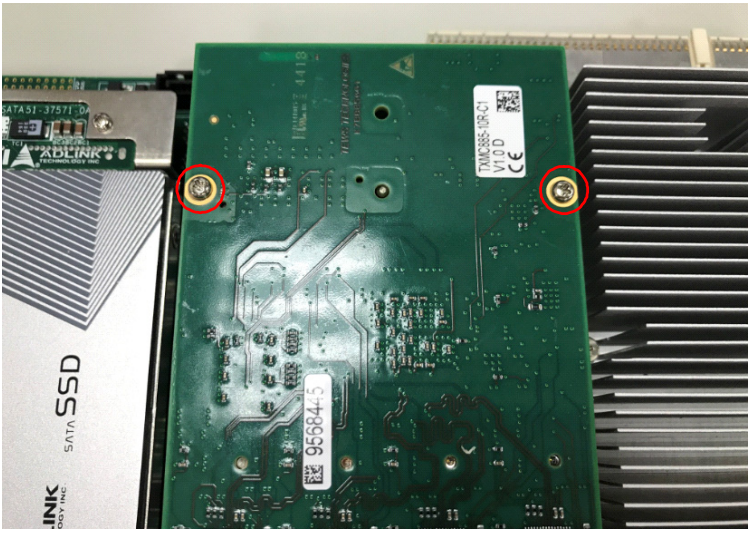




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4. Align the connector on the XMC card with the connector on the XMC daughter board, press down firmly, and secure it with two screws as indicated below.





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5. Fasten the two screws removed in Step 2 above to the front panel to complete securing the XMC card to the cPCI-6636D/DZ. Set aside the XMC filler plate so it can be replaced if the XMC card is uninstalled.



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5.5 Installing the cPCI-6636(D/DZ) to the Chassis

The 8HP cPCI-6636DZ only supports operation in host slots, whereas the cPCI-6636 and cPCI-6636D can operate independently in both host and peripheral slots without CompactPCI bus communication (satellite mode). 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-6636 ejector handles.
4. **Remove the black plastic caps securing the mounting screws to the front panel.**
5. Align the module's top and bottom edges to the chassis card guides, and then carefully slide the module into the chassis. A slight resistance may be felt when inserting the module. If the resistance it too strong, check if there are bent pins on the backplane or if the board's connector pins are not properly aligned with connectors on the backplane. Then push the board until it is completely flush with the chassis.
6. Push the ejector handles outwards to secure the module in place, and then fasten the screws on the module front panel.
7. Connect the cables and peripherals to the board, and then turn the chassis on if necessary.

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6 Driver Installation

The cPCI-6636 drivers can be downloaded from the ADLINK website (**http://www.adlinktech.com**). ADLINK provides validated drivers for Windows 7 and Windows 10. We recommend using these drivers to ensure compatibility. VxWorks BSP and QNX BSP can also be downloaded from the cPCI-6636 product page on the ADLINK website.

6.1 cPCI-6636 Drivers

The driver installation procedure for Windows 10 is described below. Note that since Intel does not support EHCI on the 6th generation Intel® Core™ platform (formerly "Skylake"), it is recommended to use a PS/2 KB/MS to install the Windows OS.

1. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.
2. Install the **chipset driver** by 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 drivers** by extracting and running the program in **…\Intel_Chipset_Win10x64_v23.1.zip**.
5. Install the **Intel Rapid Storage Technology Utility** by extracting and running the program in **…\Intel_RST_Win10x64_ v15.2.0.1020.zip**.
6. Install the **Intel® Management Engine Interface driver** for Intel® AMT support by extracting and running the program in **…\Intel_ME_Win10x64_11.8.50.3425.zip**.
7. Install the **audio driver** and utilities by extracting and running the program in **…\Realtek_Audio_Win10x64_v.R279.zip**.

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7 Utilities

7.1 Watchdog Timer

This section describes the operation of the cPCI-6636's watch dog timer (WDT). The primary function of the WDT is to monitor the cPCI-6636 operation and to reset the system if a software application fails to function as programmed. The following WDT functions may be controlled using a software application:

- enabling and disabling
- reloading timeout value

The cPCI-6636 custom WDT circuit is implemented using the internal IO of the ITE Super I/O IT8786 which is at 2Eh of LPC. The basic functions of the WDT include:

- Starting the timer countdown.
- Enabling or disabling WDT.
- Enable or disable WDT countdown LED ON.
- Reloading the timeout value to keep the watch dog from timing out.
- Setting the range of the timeout period from 1 to 15300 seconds.
- Sending a RESET signal to system when the watch dog times out

Using the Watchdog in an Application

The following section describes the WDT functions in an application. These can be controlled through the registers in the cPCI-6636 Super I/O.

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

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Sample Code

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

typedefunsigned charBYTE;

void EnterConfig()
{
   outportb(SIO_CONFIG_INDEX, 0x87);
   outportb(SIO_CONFIG_INDEX, 0x01);
   outportb(SIO_CONFIG_INDEX, 0x55);
   outportb(SIO_CONFIG_INDEX, 0x55);
}

void ExitConfig()
{
   outportb(SIO_CONFIG_INDEX, 0x02);
   outportb(SIO_CONFIG_DATA, 0x02);
}

void LDNSelection(BYTE LDN)
{
   outportb(SIO_CONFIG_INDEX, 0x07);
   outportb(SIO_CONFIG_DATA, LDN);
}

void SIOBasicIORead(
   BYTE LDN,
   BYTE Register,
   BYTE *Data)
{
   LDNSelection(LDN);
   outportb(SIO_CONFIG_INDEX, Register);
   *Data = inportb(SIO_CONFIG_DATA);
}

void SIOBasicIOWrite(
   BYTE LDN,
   BYTE Register,
   BYTE Data)
{
```


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```
   LDNSelection(LDN);
   outportb(SIO_CONFIG_INDEX, Register);
   outportb(SIO_CONFIG_DATA, Data);
}

BOOL StringToByte(char *string, BYTE *value)
{
   BYTE i, temp;
   *value = 0;
   for(i=0; string[i]!=NULL; ++i) {
        if(i>1) { printf("Digital count error!\n");
   return 0; }
        *value <<= 4;
        temp = toupper(string[i]);
        if(temp >='0' && temp <='9')
             *value += temp - '0';
        else if(temp >='A' && temp <='F')
             *value += temp - 'A' + 0x0a;
        else {
             printf("Input char[%c] is illegal!\n",
   string[i]);
             return 0;
        }
   }
   return1;
}

BOOL StringToWORD_Dec(char *string, WORD *value)
{
   BYTE i;
   WORD temp;

   *value = 0;
   for(i=0; string[i]!=NULL; ++i) {
        if(i>4) { printf("Digital count error!\n");
   return 0; }
        *value *= 10;
        temp = toupper(string[i]);
        if(temp >='0' && temp <='9')
             *value += temp - '0';
        else {
```


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```
                printf("Input char[%c] is illegal!\n",
    string[i]);
                return 0;
           }
    }
    if(temp > 65535) {
         printf("Input number is large than
    65535!\n");
    }
    return1;
}

int IT8786_WatchDog(int argc, char *argv[])
{
    BYTE    bTemp, bUnit;
    WORD wWdtimer;

    printf("ADLINK WatchDog DOS Utility [Version
    1.00]\n\n");
    if((argc != 3) && strcmp(argv[1], "/?")) {
         printf("Invalid command, please type /? to
    get the details.\n");
         return 0;
    }
    if(!strcmp(argv[1], "/?")) {
         printf("WatchDog [argument1]
    [argument2]\n\n");
         printf("argument1 :\n");
         printf("    1 - Second\n");
         printf("    0 - Minute\n");
         printf("argument2 :\n");
         printf("    Time-out value\n\n");
         printf("Example below for 10 seconds.\n");
         printf("    WatchDog 1 10\n");
         printf("Example below for 3 minutes.\n");
         printf("    WatchDog 0 3\n");
         return 0;
    }

    StringToByte(argv[1], &bUnit);
    if((bUnit != 0) && (bUnit != 1)) {
```


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```
        printf("Argument1 is a invalid
    number[%d].\n", bUnit);
        return 1;
    }

    StringToWORD_Dec(argv[2], &wWdtimer);

    EnterConfig();

// Implement  Watch Dog
    SIOBasicIORead(0x07, 0x29, &bTemp);
    bTemp &= ~BIT6; // default function = KRST
    SIOBasicIOWrite(0x07, 0x29, bTemp);

// Config settings
    if(bUnit) {
        bTemp = 0xd0; // second
    } else {
        bTemp = 0x50; // minute
    }
    SIOBasicIOWrite(0x07, 0x72, bTemp);

// Set timer value
    SIOBasicIOWrite(0x07, 0x74,
    (BYTE)(wWdtimer>>8));
    SIOBasicIOWrite(0x07, 0x73, (BYTE)wWdtimer);

// Program led blinking
    SIOBasicIORead(0x07, 0x25, &bTemp);
    bTemp |= BIT2;
    SIOBasicIOWrite(0x07, 0x25, bTemp);

    SIOBasicIOWrite(0x07, 0xF8, 0x0A);

    ExitConfig();

    return 0;
}
```


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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.


NOTE:

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

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.

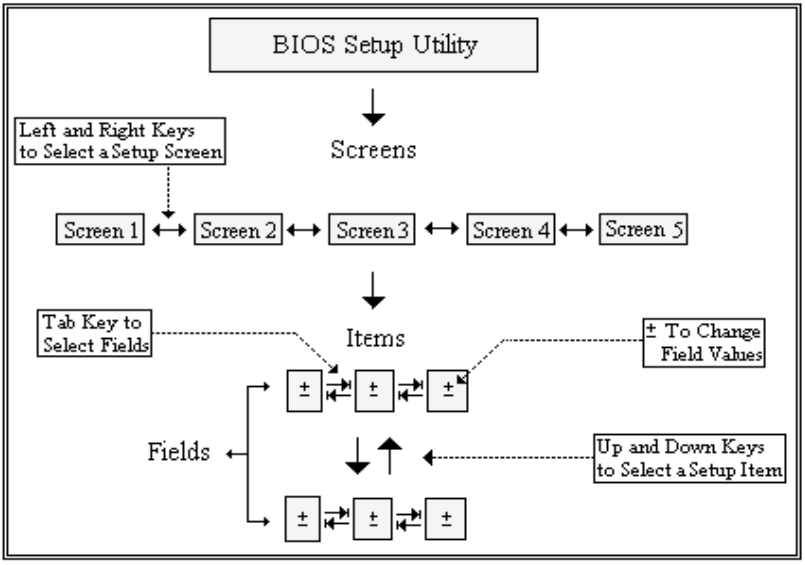
The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed" options cannot be configured, "Blue" options can be.

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 - Processor Information - PCH Information - SPI Clock Frequency - System Management ► - System Date - System Time	- *Trusted Computing ► - AMT Configuration ► - PCH-FW Configuration ► - IT8786 Super IO Configuration ► - Serial Port Console Redirection ► - CPU Configuration ► - SATA Configuration ► - Network Stack Configuration ► - CSM Configuration ► - USB Configuration ►	- System Agent (SA) Configuration ► - PCH-IO Configuration ►	- Administrator Password - User Password	- Boot Configuration - Boot Option Priorities - Driver Option Priortites	- Save Options ► - Default Options ► - Boot Override ►


NOTE:

► indicates a submenu
Gray text indicates info only

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8.2.1 BIOS Information

Feature	Options	Description
BISO Vendor	Info only	BIOS vendor
Core Version	Info only	Vendor BIOS version
Compliancy	Info only	Compliance with UEFI specification
Project Name	Info only	ADLINK product name
BIOS Version	Info only	ADLINK BIOS version.
Build Date and Time	Info only	Date the BIOS was built
Access Level	Info only	User access level

8.2.2 Processor Information

Feature	Options	Description
Name	Info only	Display CPU Brand Name.
Brand String	Info only	Display CPU Signature.
Frequency	Info only	Display CPU Frequency.
Processor ID	Info only	Display CPU ID.
Stepping	Info only	Display CPU Stepping.
Number of Processors	Info only	Display number of Processors.
Microcode Revision	Info only	Display Microcode Revision.
GT Info	Info only	Display GT info of Intel Graphics.
IGFX VBIOS Version	Info only	Display VBIOS Version.
Memory RC Version	Info only	Display Memory RC Version.
Total Memory	Info only	Display installed memory size.
Memory Frequency	Info only	Display Memory Frequency.

8.2.3 PCH Information

Feature	Options	Description
PCH Name	Info only	Display PCH name.
PCH SKU	Info only	Display PCH SKU.
Stepping	Info only	Display PCH stepping.
LAN PHY Revision	Info only	Displays LAN PHY Revision.
ME FW Version	Info only	Display version of ME.
ME Firmware SKU	Info only	Display ME Firmware Kit SKU number.
System Management	Submenu	

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8.2.4 SPI Clock Frequency

Feature	Options	Description
DOFR Support	Info only	Display DOFR support status
Read Status Clock Frequency	Info only	Displays the Read Status Clock Frequency.
Write Status Clock Frequency	Info only	Displays the Write Status Clock Frequency.
Fast Read Status Clock Frequency	Info only	Displays the Fast Read Clock Frequency.

8.2.5 System Management

PCH Information System Management

Feature	Options	Description
System Management	Info only	
Version	Info only	Display version.

Board Information

Board Information	Info only	Description
SEMA Firmware	Read only	Display SEMA Firmware.
Build Date	Read only	Display SEMA firmware build date.
SEMA Boot loader	Read only	Display SEMA boot loader.
Build Date	Read only	Display SEMA boot loader build date.
Hardware Version	Read only	Display SEMA hardware Version.
Serial Number	Read only	Display SEMA serial Number.
Manufacturing Date	Read only	Display SEMA manufacturing date.
Last Repair Date	Read only	Display SEMA last repair date.
MAC ID	Read only	Display SEMA MAC ID

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Temperatures and Fan Speed

Feature	Options	Description
Temperatures and Fan	Info only	
CPU Temperature	Info only	
Current	Read only	Display CPU current temperature.
Startup	Read only	Display CPU startup temperature.
Min	Read only	Display CPU min temperature.
Max	Read only	Display CPU max temperature.
Board Temperatures	Info only	
Current	Read only	Display board current temperature.
Startup	Read only	Display board startup temperature.
Min	Read only	Display board min temperature.
Max	Read only	Display board max temperature.

Power Consumption

Feature	Options	Description
Power Consumption	Info only	
Current Input Current	Read only	Display input current.
Current Input Second Current	Read only	Display input second current.
Current Input Power	Read only	Display input power.
VCC_CORE	Read only	Display actual voltage of the VCC_CORE.
VCC_GT	Read only	Display actual voltage of the VCC_GT.
1V0_A	Read only	Display actual voltage of the 1V0_A.
VDDQ	Read only	Display actual voltage of the VDDQ.
VRTC	Read only	Display actual voltage of the VRTC.
V3P3S	Read only	Display actual voltage of the V3P3S.
V3P3A	Read only	Display actual voltage of the V3P3A.
V5_S	Read only	Display actual voltage of the V5_S.
VCCST	Read only	Display actual voltage of the VCCST
0V95_VCCIO	Read only	Display actual voltage of the 0V95_VCCIO
1V0_VCCSTG	Read only	Display actual voltage of the 1V0_VCCSTG
VCCSA	Read only	Display actual voltage of the VCCSA
V5VSB	Read only	Display actual voltage of the V5VSB
V12	Read only	Display actual voltage of the V12

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Runtime Statistics

Feature	Options	Description
Runtime Statistics	Info only	
Total Runtime	Read only	The returned value specifies the total time in minutes the system is running in S0 state.
Current Runtime	Read only	The returned value specifies the time in seconds the system is running in S0 state. This counter is cleared when the system is removed from the external power supply.
Power Cycles	Read only	The returned value specifies the number of times the external power supply has been shut down
Boot Cycles	Read only	The Bootcounter is increased after a HW- or SW-Reset or after a successful power-up.
Boot Reason	Read only	The boot reason is the event which causes the reboot of the system.

Flags

Feature	Options	Description
Flags	Info only	
BMC Flags	Read only	
BIOS Select	Read only	Display the selection of current BIOS ROM.
ATX/AT-Mode	Read only	Display ATX/AT-Mode.
Exception Code	Read only	System exception reason.

Power Up

Feature	Options	Description
Power Up	Info only	
Power Up watchdog Attention: F12 disables the Power Up Watchdog.	Enabled **Disabled**	The Power-Up Watchdog resets the system after a certain amount of time after power-up.

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8.2.6 System Date and Time

Feature	Options	Description
System Date	Weekday, 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

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8.3 Advanced

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

8.3.1 Trusted Computing

Feature	Options	Description
Security Device Support	**Enabled** Disabled	Enables or Disables BIOS support for security device. When disabled OS wil not show Security Device. TCG EFI protocol and INT1A interface will not be available
Active PCR banks	Info only	
Available PCR banks	Info only	
SHA-1 PCR Bank	**Enabled** Disabled	Enable or Disable SHA-1 PCR Bank
SHA256 PCR Bank	**Enabled** Disabled	Enable or Disable SHA256 PCR Bank
Pending operation	**None** TPM Clear	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	**Enabled** Disabled	Enable or Disable Platform Hierarchy
Storage Hierarchy	**Enabled** Disabled	Enable or Disable Storage Hierarchy
Endorsement Hierarchy	**Enabled** Disabled	Enable or Disable Endorsement Hierarchy
TPM2.0 UEFI Spec Version	TCG_1_2 **TCG_2**	Select the TCG2 Spec Version Support,\n\r\n\rTCG_1_2: the Compatible mode for Win8/Win10,\n\r\n\rTCG_2: Support new TCG2 protocol and event format for Win10 or later
Physical Presence Spec Version	**1.2** 1.3	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
TPM 20 InterfaceType	**TIS**	Select the Communication Interface to TPM 20 Device.
Device Select	**Auto** TPM 1.2 TPM 2.0	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated

Note: This feature is not supported by cPCI-6636DZ.

8.3.2 AMT Configuration

Feature	Options	Description
Intel AMT	**Enabled** Disabled	Enable/Disable Intel(R) Active Management Technology BIOS Extension. Note: iAMT H/W is always enabled. This option controls the BIOS extension execution. If enabled, additional firmware is required in the SPI device.

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8.3.3 PCH-FW Configuration

Feature	Options	Description
ME FW Version	Info only	Display version of ME.
ME Firmware Mode	Info only	Display ME Firmware mode status.
ME Firmware Type	Info only	Display ME Firmware type.
ME Firmware SKU	Info only	Display ME Firmware Kit SKU number.
PTT Capability / State	Info only	Display PTT Capability and State.
NFC Support	Info only	Display NFC Support status.

8.3.4 IT8786 Super IO Configuration

Feature	Options	Description
Super IO Chip	Info only	
Serial Port 1 Configuration Serial Port Device Settings Change Settings[1]	 **Enabled** Disabled IO=3F8h; IRQ=4 **Auto** IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	 Enable/Disable Serial Port (COM). Fixed configuration of serial port. Select an optimal setting for Super IO device.
Serial Port 2 Configuration Serial Port Device Settings Change Settings[1]	 **Enabled** Disabled IO=2F8h; IRQ=3 **Auto** IO=2F8h; IRQ=3 IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	 Enable/Disable Serial Port (COM). Fixed configuration of serial port. Select an optimal setting for Super IO device.

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Feature	Options	Description
Serial Port 3 Configuration		
Serial Port	**Enabled** Disabled	Enable/Disable Serial Port (COM).
Device Settings	IO=3E8h; IRQ=5	Fixed configuration of serial port.
Change Settings[1]	**Auto** IO=3E8h; IRQ=5 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12 IO=2F0h; IRQ=3,4,5,6,7,10,11,12 IO=2E0h; IRQ=3,4,5,6,7,10,11,12	Select an optimal setting for Super IO device.
Serial Port 4 Configuration		
Serial Port	**Enabled** Disabled	Enable/Disable Serial Port (COM).
Device Settings	IO=2E8h; IRQ=7	Fixed configuration of serial port.
Change Settings[1]	**Auto** IO=2E8h; IRQ=7 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12 IO=2F0h; IRQ=3,4,5,6,7,10,11,12 IO=2E0h; IRQ=3,4,5,6,7,10,11,12	Select an optimal setting for Super IO device.
* Serial Port 5 Configuration		
Serial Port	**Enabled** Disabled	Enable/Disable Serial Port (COM).
Device Settings	IO=2E0h; IRQ=6	Fixed configuration of serial port.
* Serial Port 6 Configuration		
Serial Port	**Enabled** Disabled	Enable/Disable Serial Port (COM).
Device Settings	IO=2E8h; IRQ=7	Fixed configuration of serial port.

Note: *These items are only supported by cPCI-6636DZ.

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8.3.5 Serial Port Console

Feature	Options	Description
Serial Port Console	Info only	
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	
COM5 *	Info only	
Console Redirection	Enabled **Disabled**	Console Redirection Enable or Disable.
Console Redirection Settings	Submenu	
COM6 *	Info only	
Console Redirection	Enabled **Disabled**	Console Redirection Enable or Disable.
Console Redirection Settings	Submenu	

Note: *These items are only supported by cPCI-6636DZ.

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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.
Data Bits	7 **8**	Select Data Bits.
Parity	**None** Even Odd Mark Space	Select Parity.
Stop Bits	**1** 2	Select number of stop bits.
Flow Control	**None** Hardware RTS/CTS	Select flow control.
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.
Redirection After BIOS Post	**Always Enabled** BootLoader	The settings specify if BootLoader is selected than Legacy console redirection is disabled before booting to Legacy OS. Default value is Always Enable which means Legaacy console Redirection is enabled for Legacy OS.

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Legacy Console Redirection Settings

Feature	Options	Description
Legacy Serial Redirection Port	**COM1** COM2 COM3 COM4 *COM5 *COM6	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

Note: *These items are only supported by cPCI-6636DZ.

Console Redirection Settings

Feature	Options	Description
Out-of-Band Mgmt Port	**COM1** COM2 COM3 *COM4 *COM5 *COM6	Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
Terminal	VT100 VT100+ **VT-UTF8** ANSI	
Bits per second	9600 19200 38400 57600 **115200**	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Flow Control	**None** Hardware RTS/CTS Software Xon/Xoff	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.
Data Bits	Info only	
Parity	Info only	
Stop Bits	Info only	

Note: *These items are only supported by cPCI-6636DZ.

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8.3.6 CPU Configuration

Feature	Options	Description
CPU	Info only	Manufacturer, model, speed
CPU Signature	Info only	Display CPU Signature.
Microcode Patch	Info only	Display Microcode Patch.
Max CPU Speed	Info only	Display CPU Max Speed.
Min CPU Speed	Info only	Display CPU Min Speed.
CPU Speed	Info only	Display CPU Speed.
Processor Cores	Info only	Display Number of cores
Hyper Threading Technology	Info only	Display Hyper Threading Technology
Intel VT-X Technology	Info only	Display Intel VT-X Technology support or not.
Intel SMX Technology	Info only	Display Intel SMX Technology support or not.
64-bit	Info only	Display 64-bit support or not.
EIST Technology	Info only	Display EIST Technology support or not.
CPU C3 state	Info only	Display CPU C3 state support or not.
CPU C6 state	Info only	Display CPU C6 state support or not.
CPU C7 state	Info only	Display CPU C7 state support or not.
CPU C8 state	Info only	Display CPU C8 state support or not.
CPU C9 state	Info only	Display CPU C9 state support or not.
CPU C10 state	Info only	Display CPU C10 state support or not.
L1 Data Cache	Info only	Display cache info.
L1 Code Cache	Info only	Display cache info.
L2 Cache	Info only	Display cache info.
L3 Cache	Inf o only	Display cache info.
L4 Cache	Inf o only	Display cache info.
Hyper-threading	Disabled **Enabled**	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled only one thread per enabled core is enabled.
Active Processor Cores	**All** 1	Number of cores to enable in each processor package.
Intel Virtualization Technology	Disabled **Enabled**	Enable/Disable support for the Intel virtualization technology.
Intel(R) SpeedStep(TM)	Disabled **Enabled**	Allows more than two frequency ranges to be supported.
Turbo Mode	Disabled **Enabled**	Enable/Disable turbo mode.
Configurable TDP Boot Mode	**Nominal** Down Disabled	Configure TDP Mode as Nominal/Down/Disabled. Disabled option will set MSR to Nominal and MMIO to Zero.
CPU C states	**Disabled** Enabled	Enable or disable CPU C states

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8.3.7 SATA Configuration

Feature	Options	Description
SATA Controller(s)	**Enabled** Disabled	Enable/Disable SATA Device.
SATA Mode Selection	**AHCI** RAID	Determines how SATA controller(s) operate.
Software Feature Mask Configuration	Submenu	
SATA Controller Speed	**Default** Gen1 Gen2 Gen3	Indicates the maximum speed the SATA controller can support.
Serial ATA Port 0	Info only	
Software Preserve	Info only	
Port 0	Disabled **Enabled**	Enable/Disable SATA Port.
Serial ATA Port 1	Info only	
Software Preserve	Info only	
Port 1	Disabled **Enabled**	Enable/Disable SATA Port.
Serial ATA Port 2	Info only	
Software Preserve	Info only	
Port 2	Disabled **Enabled**	Enable/Disable SATA Port.
Serial ATA Port 3	Info only	
Software Preserve	Info only	
Port 3	Disabled **Enabled**	Enable/Disable SATA Port.
*Serial ATA Port 4	Info only	
Software Preserve	Info only	
Port 4	Disabled **Enabled**	Enable/Disable SATA Port.
*Serial ATA Port 5	Info only	
Software Preserve	Info only	
Port 5	Disabled **Enabled**	Enable/Disable SATA Port.

Note: *These items are not supported by cPCI-6636DZ.

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Software Feature Mask Configuration

Feature	Options	Description
RAID0	**Enabled** Disabled	Enable or disable RAID0 feature.
RAID1	**Enabled** Disabled	Enable or disable RAID1 feature.
RAID10	**Enabled** Disabled	Enable or disable RAID10 feature.
RAID5	**Enabled** Disabled	Enable or disable RAID5 feature.
Intel Rapid Recovery Technology	**Enabled** Disabled	Enable or disable Intel Rapid Recovery Technology.
OROM UI and BANNER	**Enabled** Disabled	If enable, then the OROM UI is shown. Otherwise, no OROM banner or information will be displayed if all disks and RAID volumes are Normal.
HDD Unlock	**Enabled** Disabled	If enabled, indicates that the HDD password unlock in the OS is enabled.
LED Locate	**Enabled** Disabled	If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS.
IRRT Only on eSATA	**Enabled** Disabled	If enabled, then only IRRT volumes can span internal and eSATA drives. If disabled, then any RAID volume can span internal and eSATA drives.
Smart Response Technology	**Enabled** Disabled	Enable or disable Smart Response Technology.
OROM UI Normal Delay	**2 Seconds** 4 Seconds 6 Seconds 8 Seconds	Select the delay time of the OROM UI Splash Screen in a normal status.
RST Force Form	Enabled **Disabled**	Enable/Disable Form for Intel Rapid Storage Technology.

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8.3.8 Network Stack Configuration

Feature	Options	Description
*Network Stack	Enabled **Disabled**	Enable/Disable UEFI network stack.
Ipv4 PXE Support	**Enabled** Disabled	Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created"
Ipv6 PXE Support	**Enabled** Disabled	Enable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot option will not be created"
PXE boot wait time	Info only	Wait time to press ESC key to abort the PXE boot
Media detect count	Info only	Number of times presence of media will be checked

Note: *These items are not supported by cPCI-6636DZ.

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8.3.9 CSM Configuration

Feature	Options	Description
CSM Support	**Enabled** Disable	This option controls if CSM will be launched.
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.
Option ROM Messages	**Force BIOS** Keep Current	Set display mode for Option ROM.
INT19 Trap Response	**Immediate** Postponed	BIOS reaction on INT19 trapping by Option ROM
Boot Option filter	**UEFI and Legacy** Legacy only UEFI only	This option controls what devices system can to boot.
Option ROM execution	Info only	
Network	**Do not launch** Legacy only UEFI only	Controls the execution of UEFI and Legacy PXE OpROM.
Storage	Do not launch UEFI only **Legacy**	Controls the execution of UEFI and Legacy Storage OpROM.
Video	Do not launch UEFI only **Legacy**	Controls the execution of UEFI and Legacy Video OpROM.
Other PCI devices	Do not launch **UEFI** Legacy	For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

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8.3.10 USB

Feature	Options	Description
USB Module Version	Info only	
USB Controllers	Info only	
USB Devices	Info only	X Drive, X Keyboards, X Mouse, X Hubs
Legacy USB Support	**Enabled** Disabled Auto	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 and setup.
XHCI Hand-off	**Enabled** Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by the XHCI OS driver.
USB Mass Storage Driver Support	**Enabled** Disabled	Enable/Disable USB Mass Storage Driver Support.

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8.4 Chipset

System Agent (SA) Configuration

Feature	Options	Description
System Agent Bridge Name	Info only	
SA PCIe Code Version	Info only	
VT-d	Info only	Check VT-d function support status.
VT-d	**Enabled** Disabled	VT-d capability
Graphics Configuration	Submenu	
PEG Port Configuration	Submenu	
Memory Configuration	Submenu	

Graphics Configuration

Feature	Options	Description
Graphics Configuration	Info only	
IGFX VBIOS Version	Info only	Display VBIOS Version.
*VGA Channel Switch [1]	Rear **Front**	Change VGA channel to front or rear.
Primary Display	**Auto** IGFX PEG PCIE	Select which of IGFX/PEG/PCIE Graphics device should be Primary Display or select SG for Switchable Gfx.
Internal Graphics	**Auto** Disabled Enable	Keep IGD enabled based on the setup options.

Note: *These items are not supported by cPCI-6636DZ.

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PEG Port Configuration

Feature	Options	Description
PEG Port Configuration	Info only	
PEG 0:1:0	Info only	Display PEG root port present status.
Enable Root Port	Disabled Enabled **Auto**	Change VGA channel to front or rear.
Max Link Speed	**Auto** Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max speed.
PEG 0:1:1	Info only	Display PEG root port present status.
Enable Root Port	Disabled Enabled **Auto**	Change VGA channel to front or rear.
Max Link Speed	**Auto** Gen1 Gen2 Gen3	Configure PEG 0:1:1 Max speed.

Memory Configuration

Feature	Options	Description
Memory RC Version	Info only	Display Memory Reference Code Version.
Memory Frequency	Info only	Display Memory Frequency.
Total Memory	Info only	Display Total Memory.
VDD	Info only	Display VDD value (mVolts)
DIMM#0	Info only	Display Memory in the DIMM.
DIMM#2	Info only	Display Memory in the DIMM.
Memory Timings (tCL-tRCD-tRP-tRAS)	Info only	Display Memory Timings
XMP Profile 1	Info only	Display XMP support status.
XMP Profile 2	Info only	Display XMP support status.

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8.4.1 PCH-IO Configuration

Feature	Options	Description
Intel PCH RC Version	Info only	Display PCH RC version.
Intel PCH SKU Name	Info only	Display PCH SKU.
Intel PCH Rev ID	Info only	Display PCH Rev ID
PCI Express Configuration	Submenu	
*HD Audio Configuration[1]	Submenu	
PCH LAN I219LM Controller	**Enabled** Disabled	Enable or disable onboard NIC.
*LAN#1 (Intel I219LM) [1]	Rear **Front**	LAN Select. Front: LAN to Front (Default). Rear: LAN to RTM.
*LAN#1 (Intel I210TI) [1]	Rear **Front**	LAN Select. Front: LAN to Front (Default). Rear: LAN to RTM.
High Precision Timer	**Enabled** Disabled	Enable or Disable the High Precision Event Timer.

Note: *These items are not supported by cPCI-6636DZ.

PCI Express Configuration

Feature	Options	Description
PCI Express Root Port 1	Submenu	
PCI Express Root Port 2-3[1]	Submenu	
PCI Port 4 is assigned to LAN I219LM	Info only	
PCIE Port 5-8 Configuration[1]	**4x1 Port** 1x4 Port	To configure PCI-E Port 5-7 of PCH.[4X1]:Port 5-8 (x1) and Port 8 (x1) / [1x2 2x1]:Port 5 (x2), Port 6 (disabled), Ports 7 and Port 8 (x1).
PCI Express Root Port 5-8[1]	Submenu	
PCI Express Root Port 11-14[2]	Submenu	

Notes: [1]These items are not supported by cPCI-6636DZ.
[2]These items are only supported by cPCI-6636DZ.

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PCI Express Configuration > PCI Express Root Port x

Feature	Options	Description
PCI Express Root Port x	Disabled **Enabled**	Control the PCI Express Root Port.
PCIe Speed	**Auto** Gen1 Gen2 Gen3	Select PCI Express port speed.

*HD Audio Configuration

Feature	Options	Description
HD Audio	Disabled **Enabled** Auto	Control Detection of the HD-Audio device. Disabled: HDA will be unconditionally disabled. Enabled: HDA will be unconditionally enabled. Auto: HDA will be enabled if present, disabled otherwise.

Note: *This item is not supported by cPCI-6636DZ.

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8.5 Security

8.5.1 Password Description

Feature	Options	Description
Administrator Password	Enter password	
User Password	Enter password	
Secure Boot menu	Submenu	

8.5.2 *Secure Boot Menu

System Mode	Info only	
Secure Boot	Info only	
Vender Keys	Info only	
Secure Boot	**Disabled** Enabled	Secure Boot can be enabled if 1.System running in User mode with enrolled Platform Key(PK) 2.CSM function is disabled
Secure Boot Mode	**Standard** Custom	Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot Keys

Note: *This item is not supported by cPCI-6636DZ.

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8.6 Boot

Feature	Options	Description
Boot Configuration		
Setup Prompt Timeout	**1**	Enable/Disable the onboard SATA controllers.
Bootup NumLock State	**On**	Select SATA controller mode.
Quiet Boot	Disabled **Enabled**	Enables or Disables Quiet Boot option.
Boot Option Priorities		
Fast Boot	**Disabled** Enable	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.
Driver Option Priorities		
New Boot Option Policy	**Default** Place First Place Last	Controls the placement of newly detected UEFI boot options.

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8.7 Save & Exit

8.7.1 Save Options

Feature	Options	Description
Save Changes and Exit		Exit system setup after saving the changes.
Discard Changes and Exit		Exit system setup without saving any changes.
Save Changes and Reset		Reset the system after saving the changes.
Discard Changes and Reset		Reset the system without saving any changes.
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 Defaults		Restore/Load Default values for all the setup options.
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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9 Checkpoints & Beep Codes

The eight User LEDs on the front panel display port 80h POST codes in hexadecimal during boot up. Users can use the POST codes to identify issues during the BIOS POST process.

9.1 Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	SEC errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

9.2 Standard Checkpoints

SEC Phase

Status Code	Description
0x00	Not used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading

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Status Code	Description
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization
SEC Error Codes	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not loaded

SEC Beep Codes

None

PEI Phase

Status Code	Description
Progress Codes	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-Memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)

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Status Code	Description
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other).
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed
0x32	CPU post-memory initialization is started
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)

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Status Code	Description
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F-0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started
PEI Error Codes	
0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error.
0x55	Memory not installed
0x56	Invalid CPU type or Speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU micro-code is not found or micro-code update is failed
0x5A	Internal CPU error
0x5B	reset PPI is not available
0x5C-0x5F	Reserved for future AMI error codes
S3 Resume Progress Codes	
0xE0	S3 Resume is stared (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call

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Status Code	Description
0xE4-0xE7	Reserved for future AMI progress codes
S3 Resume Error Codes	
0xE8	S3 Resume Failed
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC-0xEF	Reserved for future AMI error codes
Recovery Progress Codes	
0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found
0xF4	Recovery firmware image is loaded
0xF5-0xF7	Reserved for future AMI progress codes
Recovery Error Codes	
0xF8	Recovery PPI is not available
0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

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PEI Beep Codes

# of Beeps	Description
1	Memory not Installed
1	Memory was installed twice (InstallPeiMemory routine in PEI Core called twice)
2	Recovery started
3	DXEIPL was not found
3	DXE Core Firmware Volume was not found
4	Recovery failed
4	S3 Resume failed
7	Reset PPI is not available

DXE Phase

Status Code	Description
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)

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Status Code	Description
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE Initialization (South Bridge module specific)
0x74	South Bridge DXE Initialization (South Bridge module specific)
0x75	South Bridge DXE Initialization (South Bridge module specific)
0x76	South Bridge DXE Initialization (South Bridge module specific)
0x77	South Bridge DXE Initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E – 0x9F	Reserved for future AMI codes

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Status Code	Description
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable
0xA4	SCSI initialization is started
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes
DXE Error Codes	
0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error

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Status Code	Description
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found
0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Some of the Architectural Protocols are not available
5	No Console Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Reset protocol is not available
8	Platform PCI resource requirements cannot be met

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ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0x72	System is entering S5 sleep statue.
0x84 (xhci mode enabled)	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0x84 (xhci mode enabled)	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0x83 (xhci mode disabled)	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0x83 (xhci mode disabled)	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

9.3 OEM-Reserved Checkpoint Ranges

Status Code	Description
0x05	OEM SEC initialization before microcode loading
0x0A	OEM SEC initialization after microcode loading
0x1D – 0x2A	OEM pre-memory initialization codes
0x3F – 0x4E	OEM PEI post memory initialization codes
0x80 – 0x8F	OEM DXE initialization codes
0xC0 – 0xCF	OEM BDS initialization codes

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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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