cPCI-3965 Series

Low Power 3U CompactPCI® Intel® Core™2 Duo Processor Blade with Dual Independent Display

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	2009/01/21	Initial Release
2.01	2009/11/10	Add CPU support, correct LAN, DVI-D, SATA on DB, J1, J2 pin definitions

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Preface

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Using this Manual

Audience and Scope

The cPCI-3965 User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating industrial grade single board computers.

Manual Organization

This manual is organized as follows:

Chapter 1, Introduction: Introduces the cPCI-3965, its features, block diagrams, and package contents.

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

Chapter 3, Functional Description: Describes the cPCI-3965 main functions.

Chapter 4, Board Interfaces: Describes the cPCI-3965 board interfaces.

Chapter 5, Getting Started: Describes the installation of components to the cPCI-3965 and rear transition modules.

Chapter 6, Driver Installation: Provides information on how to install the cPCI-3965 device drivers under Windows 2000/XP.

Chapter 7, Utilities: Describes the utilities of the cPCI-3965 Series.

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

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

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

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Conventions

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


NOTE:

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


CAUTION:

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


WARNING:

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

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1 Introduction

1.1 Overview

The cPCI-3965 Series is a 3U CompactPCI single board computer in single slot (4HP) or dual slot (8HP) width form factor featuring the Mobile Intel® GME965 Express chipset and low power Core™2 Duo or Celeron® processor(s) with 800MHz front-side bus (FSB). The cPCI-3965 provides two SO-DIMM sockets for up to 4GB of non-ECC memory, VGA + DVI dual display, true IDE CompactFlash slot, and 2.5” SATA HDD (8HP cPCI-3965D). Front panel I/O includes 2x USB, 2x GbE, VGA, and additional 2x USB, COM, KB/MS, and DVI for the 8HP cPCI-3965D model.

The optional Rear Transition Module (RTM) provides 2x SATA, 1x GbE, 2x USB, and 1x COM. Two lanes PCI-Express x1 are routed to J2 and to the layer 2 board-to-board connector to allow custom I/O expansion, such as additional LAN port, or graphics functions. The cPCI-3965 Series is ideally suited for factory automation, and other industrial applications.

1.2 Features

- 3U CompactPCI SBC in 4HP or 8HP width form factor
- Single Core™ 2 Duo 2.2GHz processor, 4MB L2 cache
- Front Side Bus 533/667/800MHz
- Intel® GME965 Memory Controller Hub and ICH8M I/O Hub
- Dual Channel DDR2 unbuffered non-ECC SDRAM at 667MHz
- Two stacked SO-DIMM sockets for maximum 4GB memory
- 32bit/33MHz CompactPCI Interface based on PCI specifications
- One analog VGA and one digital DVI port on front panel (DVI on 8HP only)
- Two PCI-Express® Gigabit Ethernet egress ports, one port can be configured to RTM by software
- One EIDE CompactFlash socket
- 2.5” SATA HDD onboard on 8HP SBC and two 7-pin SATA ports on RTM

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1.3 Block Diagram

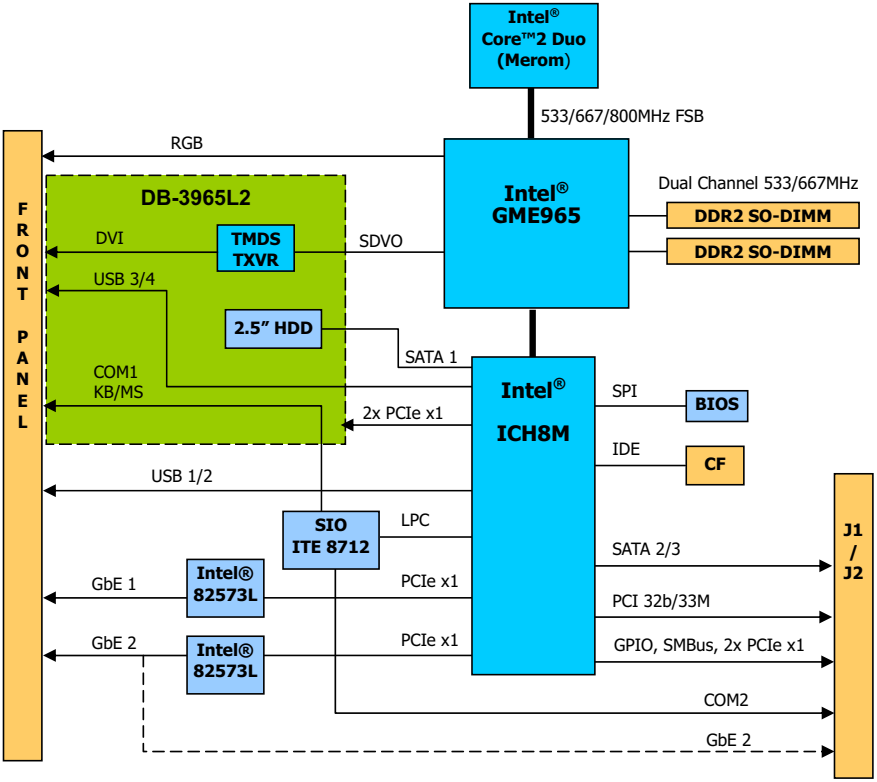


Figure 1-1: cPCI-3965 Series Functional Block Diagram

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1.4 Product List

Products in the cPCI-3965 Series include:

SBC

- cPCI-3965: 4HP (single-slot) width 3U CompactPCI featuring Core™2 Duo or Celeron® processor; 512MB, 1GB, 2GB or 4GB memory by SO-DIMM; CompactFlash socket; 2x USB; 2x GbE; VGA.
- cPCI-3965D: 8HP (dual-slot) width 3U CompactPCI with Core™2 Duo or Celeron® processor, SO-DIMM 512MB/1GB/2GB/4GB memory, CompactFlash slot, 2x USB, 2x GbE, and VGA. The DB-3965L2 riser card onboard provides 2x USB, COM, PS/2 KB/MS, DVI.

Rear Transition Module

- cPCI-R3920-1: 4HP width, 50mm depth Rear Transition Module for cPCI-3965 SBCs with COM, 2x USB, GbE, 2x SATA
- cPCI-R3920T-1: 4HP width, 80mm depth Rear Transition Module for cPCI-3965 SBCs with COM, 2x USB, GbE, 2x SATA

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1.5 Package Contents

The cPCI-3965 is packaged with the following components. If any of the items on the contents list are missing or damaged, retain the shipping carton and packing material and contact the dealer for inspection. Please obtain authorization before returning any product to ADLINK. The packing contents of the cPCI-3965 Series are non-standard configurations and may vary depending on customer requests.

CPU module

- The cPCI-3965 Series CPU Module
  - CPU, RAM specifications will differ depending on options selected
  - Thermal module is assembled on the board
- Y-cable for PS/2 combo port (8HP version only)
- RJ-45 to DB9 cable (8HP version only)
- 2.5” HDD accessory pack (8HP version only)
- ADLINK All-in-One CD
- User’s manual

Rear Transition Module

- The cPCI-R3920-1 or cPCI-R3920T-1 RTM


NOTE:

The contents of non-standard cPCI-3965 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-3965 SBC Specifications

CompactPCI® Standards	• PICMG® 2.0 CompactPCI® Rev. 3.0 • PICMG® 2.1 Hot Swap Specification Rev.2.0
Mechanical	• Standard 3U CompactPCI® • Board size: 100mm x 160mm • Single slot (4HP, 20.32mm); Dual slot (8HP, 40.64mm) width • CompactPCI® connectors with J1, J2
Processor	• µFC-PGA Intel® Core™2 Duo 2.2GHz (T7500), 4MB L2 cache, FSB 800MHz • µFC-BGA Intel® Core™2 Duo 1.6GHz (L7500), 4MB L2 cache, FSB 800MHz • µFC-BGA Intel® Core™2 Duo 1.06GHz (U7500), 2MB L2 cache, FSB 533MH • µFC-PGA Intel® Celeron® 2.0GHz (550), 1MB L2 cache, FSB 533MHz • Passive heatsink
Chipset	• Intel® GME965 Memory Controller Hub (MCH) • Intel® ICH8M I/O Controller Hub (ICH)
Host Memory	• Dual channel DDR2-667 unbuffered non-ECC memory • Two SO-DIMM sockets (stacked type) • Maximum up to 4GB capacity
CompactPCI Bus	• PCI 32bit/ 33MHz; 3.3V, 5V universal V I/O • Supports operation in system slot only
Gigabit Ethernet	• Two PCI-Express x1 Intel® 82573L Gigabit Ethernet controllers • Two egress 10/100/1000BASE-T ports, one port is configurable to J2 (RTM) by software setting
Graphics	• GMA X3100 integrated in GME965 GMCH • Shared system memory up to 384 MB • One analog RGB port on front panel with up to 32bit, 2048x1536 resolution@ 75Hz • One DVI-D port on front panel (8HP version only)
Serial Port	• Up to two 16C550 compatible RS-232 serial ports from Super I/O IT8712F • One RJ-45 port on front panel, one DB-9 port on rear panel
Storage Interface[1]	• CompactFlash Type II socket onboard • 2.5” SATA HDD connector onboard (8HP version only) • Two 7-pin SATA signal connectors on RTM

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BIOS	• AMI® Core 8 16Mbit SPI flash memory
Faceplate I/O	**4HP (cPCI-3965):** • 2x USB 2.0 ports • 2x 10/100/1000BASE-T Ethernet ports • Analog DB-15 VGA port **8HP (cPCI-3965D):** • 4x USB 2.0 ports • 2x 10/100/1000BASE-T Ethernet ports • Analog DB-15 VGA port • RJ45 RS-232 port • PS/2 Keyboard/ Mouse combo port • DVI-D port **cPCI-R3920(T)-1:** • 2x USB 2.0 ports • 10/100/1000BASE-T Ethernet port • DB-9 RS-232 serial port (TTL level)
OS Compatibility	• Microsoft Windows XP Professional SP2 • Microsoft Windows Server 2003 • Fedora Core 7 • Other OS support upon request
Environmental	• Operating Temperature (with forced air flow)[2]: Standard: 0°C to 60°C Extended temperature: -20°C to 70°C • Storage Temperature: -40°C to 85°C • Humidity: 20% to 90%@60°C non-condensing • Shock: 15G peak-to-peak, 11ms duration, non-operating • Vibration[1]: Operating 1.88Grms, 5-500Hz, each axis w/o hard drive.
EMI	• CE EN55022 • FCC Class A

1. The hard drive limits the operational vibration. When application requires higher specification for anti-vibration, it is recommended to use a flash disk.
2. ADLINK-certified thermal design. The thermal performance is dependent on the chassis cooling design. Forced airflow with 3.92 m/s is required. Temperature limit of optional mass storage devices may affect the thermal specification.

NOTE: Specifications are subject to change without prior notice.

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2.2 I/O Connectivity Table

Function	cPCI-3965 (4HP)		cPCI-3965D (8HP)		cPCI-R3920(T)-1 (4HP)	
	Faceplate	Onboard	Faceplate	Onboard	Faceplate	Onboard
Gigabit Ethernet	Y x2		Y x2		Y[1]	
COM 1			Y (RJ-45)			
COM 2					Y (DB-9)	
USB 2.0	Y x2		Y x4		Y x2	
VGA	Y		Y			
DVI			Y			
Serial ATA				Y (2.5” HDD)		Y x2 (7-pin)
Compact Flash		Y		Y		
PS/2 KB/MS			Y			
USB Flash		Y		Y		
GP LED	Y x2		Y x2			
Reset Button	Y		Y			

1. Software switchable from front GbE1 port.

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2.3 Power Requirements

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

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

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

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Power Consumption

This section provides information on the power consumption of cPCI-3965 Series when using the Intel® Core™2 Duo T7500, U7500 and Celeron® 550 processors with 2x 2GB SO-DIMM and onboard 60GB SATA hard drive. The system was tested in Idle Mode and Full Loading Mode under Windows XP.

Intel® Core™2 Duo T7500			
OS/Mode	**Current 3.3V**	**Current 5V**	**Total Power**
DOS/Idle mode	0.68A	4.43A	24.39W
Linux/Idle mode	0.67A	2.62A	15.31W
Windows XP/ Idle mode	0.67A	2.64A	15.41W
Windows® XP, CPU 100% Usage	0.75A	6.2A	33.47W

Intel® Core™2 Duo U7500			
OS/Mode	**Current 3.3V**	**Current 5V**	**Total Power**
DOS/Idle mode	0.76A	2.56A	15.3W
Linux/Idle mode	0.75A	2.14A	13.17W
Windows XP/ Idle mode	0.75A	2.23A	13.65W
Windows® XP, CPU 100% Usage	0.78A	3.43A	19.72W

Intel® Celeron® 550			
OS/Mode	**Current 3.3V**	**Current 5V**	**Total Power**
DOS/Idle mode	0.67A	4.33A	28.86W
Linux/Idle mode	0.67A	3.23A	18.36W
Windows XP/ Idle mode	0.70A	3.25A	18.56W
Windows® XP, CPU 100% Usage	0.72A	5.04A	27.58W

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3 Functional Description

The following sections describe the cPCI-3965 Series features and functions.

3.1 Processors

The cPCI-3965 Series supports the Intel® Core™2 Duo T7500, L7500, U7500, and Celeron® 550 processors. The table below lists their general specifications and power ratings.

Features	Core™2 Duo T7500	Core™2 Duo L7500	Core™2 Duo U7500	Celeron® 550
Clock	2.2GHz	1.6GHz	1.06GHz	2.0GHz
L2 cache	4MB	4MB	2MB	1MB
FSB	800MHz	800MHz	533MHz	533MHz
Max. Power (TDP[1])	35W	17W	10W	27W
$T_{junction, MAX}$[2]	100°C	100°C	100°C	100°C

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

Intel® Core™2 Duo Processor T7500

The Intel® Core™2 Duo T7500 processor is a high-performance, low-power processor based on the Intel® Core™ microarchitecture and 65-nm process technology. The Intel Core™2 Duo processor supports the Mobile Intel® 965 Express Chipset and Intel® 82801HBM ICH8M Controller Hub Based Systems.

The following list outlines the key features of this processor:

- Dual core processor for mobile applications with enhanced performance
- Intel architecture with Intel® Wide Dynamic Execution
- On-die, primary 32-KB instruction cache and 32-KB write-back data cache in each core
- On-die, up to 4-MB second level shared cache with advanced transfer cache architecture

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- L1 Cache to Cache (C2C) transfer
- Streaming SIMD Extensions 2 (SSE2), Streaming SIMD Extensions 3 (SSE3) and Supplemental Streaming SIMD Extensions 3 (SSSE3)
- 800-MHz Source-Synchronous Front Side Bus (FSB)
- Advanced power management features including Enhanced Intel SpeedStep® Technology and Dynamic FSB frequency switching.
- Intel Enhanced Deeper Sleep state with P_LVL5 I/O support
- Digital Thermal Sensor (DTS)
- Intel® 64 Technology
- Enhanced Intel® Virtualization Technology
- Intel® Dynamic Acceleration Technology
- Enhanced Multi Threaded Thermal Management (EMTTM)
- Execute Disable Bit support for enhanced security

Intel® Celeron® Processor 550

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

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

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3.2 Chipset

The cPCI-3965 Series incorporates the Mobile Intel® GME965 Memory Controller Hub (MCH) and ICH8 Mobile (ICH8M) I/O Controller Hub.

Intel® GME965 Memory Controller Hub

The following outlines the key features of GME965 MCH.

Processor Support

- Intel® Core™2 Duo Mobile Processor for Mobile Intel 965 Express Chipset Family
- 533 MHz and 800 MHz FSB support
- Intel® Dynamic Front Side Bus Frequency Switching
- 36-bit interface to addressing, allowing the CPU to access the entire 64GB of the (G)MCH memory address space.

System Memory Support

- Supports dual-channel DDR2 SDRAM
- One SO-DIMM connector or module per channel
- Maximum 4GB memory supported
- 64-bit side per channel
- Support for DDR2 at 667MHz and 533 MHz
- 256-Mb, 512-Mb, and 1-Gb memory technologies supported
- Support for x8 and x16 devices
- No support for ECC

Direct Management Interface

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

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Integrated Graphics

- Mobile Intel® Graphics Media Accelerator X3100 (Mobile® Intel® GMA X3100)
- Supports a QXGA maximum resolution of 2048x1536 at 60Hz, 32-bpp reduced blanking timing (driver limited)
- Supports Analog TV-Out, LVDS, Analog CRT and SDVO (the cPCI-3965 implements analog CRT and SDVO only)
- Intel® Smart 2D Display Technology (Intel® S2DDT)
- Video Capture via x1 concurrent PCI Express port
- Dynamic Video Memory Technology (DVMT 4.0; 384 Maximum)
- Microsoft DirectX 9
- SGI OpenGL 1.5
- Display Hot Plug support
- Two SDVO ports supported (the cPCI-3965D is designed with a DVI 1.0 port for External Digital Monitor)

Intel® ICH8 Mobile I/O Controller Hub

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

- Provides 6 PCI Expressx1 ports, supporting the PCI Express Base Specification, Revision 1.1. Each Root Port supports 2.5GB/s bandwidth in each direction. The cPCI-3965 utilizes two PCI Expressx1 ports for two Gigabit Ethernet controllers and routes two PCI Express x1 ports to board-to-board connector and J2 connector for expansion capability
- Enhanced DMA controller, interrupt controller, and timer functions
- Integrated Serial ATA host controller with independent DMA operation on three ports
- Integrated IDE controller supports Ultra ATA100/66/33
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C devices
- Supports Intel® Matrix Storage technology
- PCI Local Bus Specification, Revision 2.3 support for 33MHz PCI operations

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3.3 DVI

The Silicon Image SDVO PanelLink Transmitter Sil1362 is designed into the cPCI-3965 to convert SDVO signals to a DVI interface. The Sil1362A is fully compliant with Intel SDVO 1.0 and DVI 1.0.

3.4 Super I/O

The ITE IT8712F Super I/O is on a Low Pin Count interface supporting PS/2 keyboard/mouse; two 16550-compatible serial ports; hardware monitor function to monitor CPU voltage, CPU temperature, power supply voltages and system temperature; and Watch Dog Timer with time resolution from minimum 1 second to maximum 255 minutes.

3.5 Battery

The cPCI-3965 is provided with a 3.0V “coin cell” lithium battery for the Real Time Clock (RTC). The battery socket is equipped on the DB-3965CF daughter board. The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer. A Panasonic CR2032 is equipped on board by default

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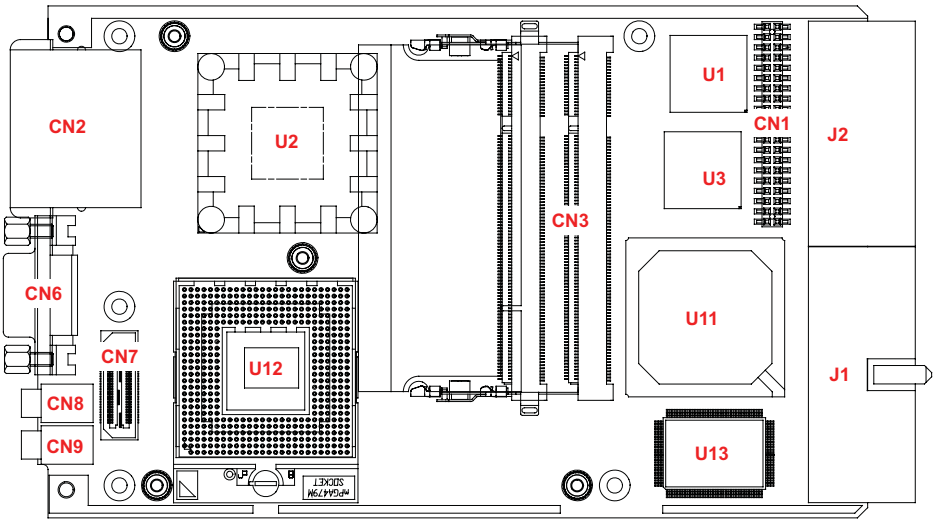
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4 Board Interfaces

This chapter illustrates the board layout, connector pin assignments, and jumper settings to familiarize users with the cPCI-3965 Series.

4.1 cPCI-3965 SBC Board Layout



U12	CPU socket	**U13**	Super I/O
U2	North Bridge Intel® GME965	**CN3**	Stacked SO-DIMM socket
U11	South Bridge Intel® ICH8M	**CN1**	To DB-3965CF connector
U1/3	GbE Controller Intel® 82573L	**CN7**	To DB-3965L2 connector
CN2	Dual RJ-45 GbE ports	**CN8/9**	USB ports
CN6	VGA connector	**J1/J2**	CompactPCI connectors

Figure 4-1: cPCI-3965 Board Layout

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4.2 cPCI-3965 SBC Assembly Layout

This section describes the final assembly layout of the single slot cPCI-3965.

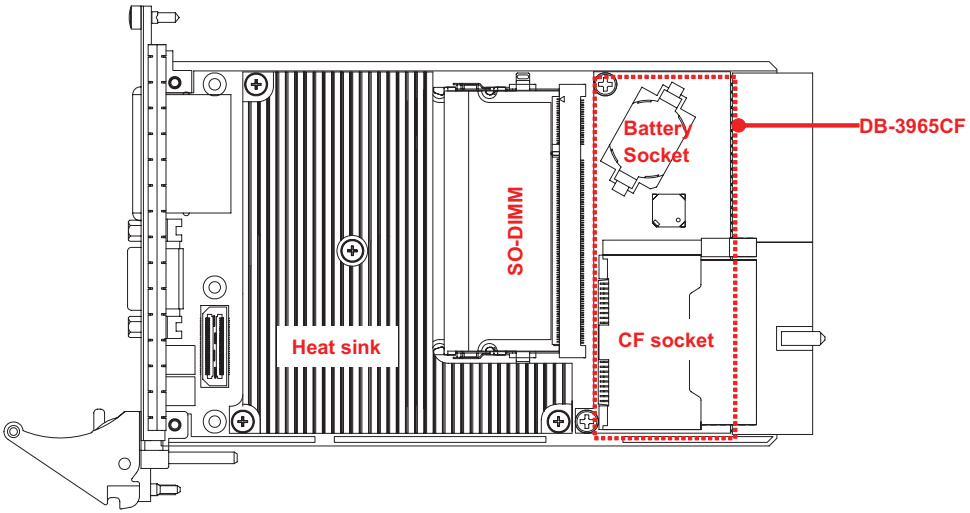
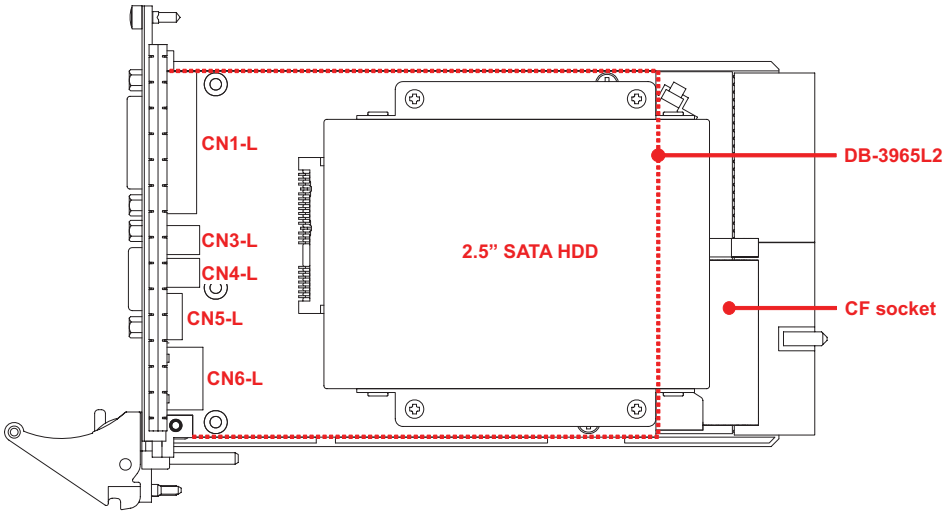


Figure 4-2: cPCI-3965 SBC Assembly Layout

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4.3 cPCI-3965D SBC Board Layout

The dual-slot width cPCI-3965D is comprised of the cPCI-3965 single-slot main board and the DB-3965L2 riser card to expand I/O connectivity with PS/2, COM, 2x USB ports and a DVI port.



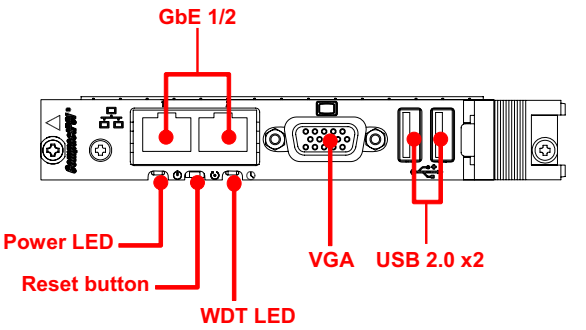
CN1-L	DVI-D connector	**CN5-L**	PS/2 Keyboard Mouse Combo port
CN3/4-L	USB connectors	**CN6-L**	RJ-45 serial port

Figure 4-3: cPCI-3965D Board Layout

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4.4 cPCI-3965, cPCI-3965D SBC Front Panel

cPCI-3965



cPCI-3965D

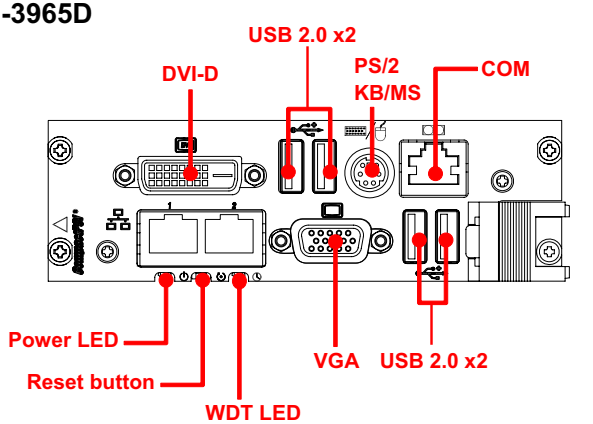


Figure 4-4: cPCI-3965, cPCI-3965D Front Panel Layout

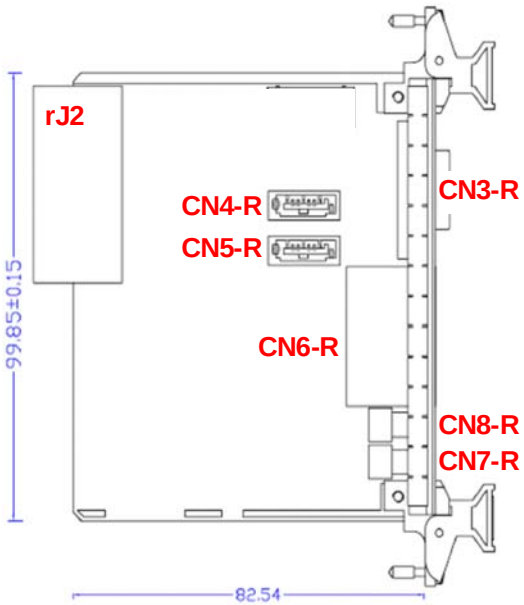
System LEDs

LED	Color	Condition	Indication
Power	Green	OFF	System is off
		ON	System is on
WDT	Red	OFF	No Watchdog event
		Blinking	Watchdog event alert

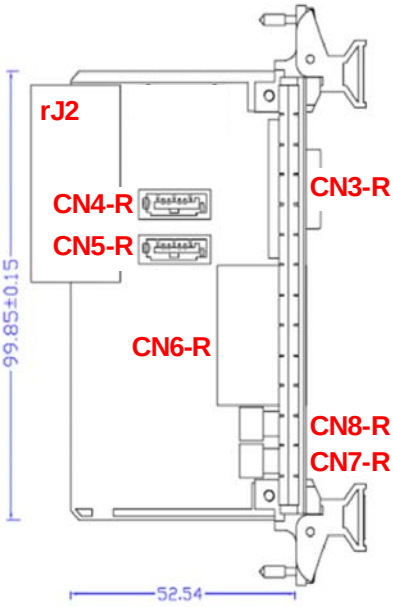
Table 4-1: cPCI-3965 Front Panel System LED Descriptions

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4.5 cPCI-R3920(T)-1 RTM Board Layout



cPCI-R3920T-1



cPCI-R3920-1

CN3-R	RS-232 port	**CN6-R**	Ethernet port (single)
CN4/5-R	SATA port	**CN7/8-R**	CN7/8-R USB port
rJ2	CompactPCI connector		

Figure 4-5: cPCI-R3920(T)-1 RTM Board Layout

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4.6 cPCI-R3920(T)-1 RTM Front Panel

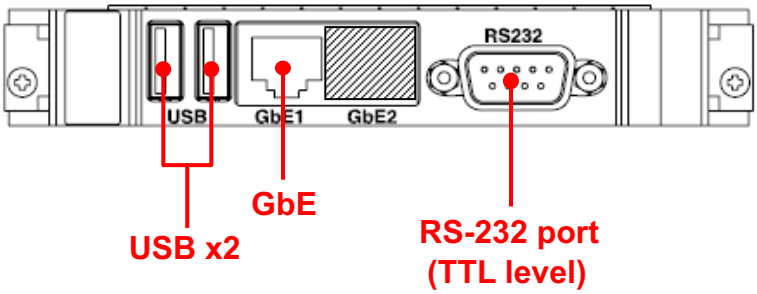


Figure 4-6: cPCI-R3920(T)-1 RTM Front Panel

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4.7 Connector Pin Assignments

USB Connectors (CN8, CN9, CN3-L, CN4-L, CN7-R, CN8-R)

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

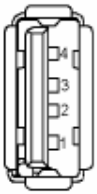


Table 4-2: USB Connector Pin Definition

DB-15 VGA Connector (CN6)

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

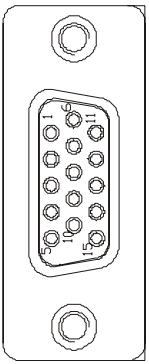


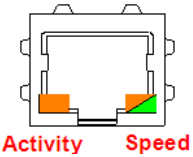
Table 4-3: VGA Connector Pin Definition

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RJ-45 Gigabit Ethernet Connectors (CN2, CN6-R)

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

Table 4-4: GbE Connector Pin Definitions



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

Table 4-5: CN2 Ethernet LED Status Definitions

NOTE:

There are no LEDs on the LAN connector of the cPCI-R3920(T)-1 (CN6-R).

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PS/2 Keyboard/Mouse Connector (CN5-L)

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

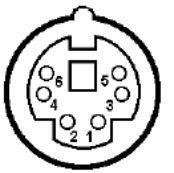


Table 4-6: PS/2 Keyboard/Mouse Connector Pin Definition

RJ-45 Serial Port (CN6-L)

Pin #	RS-232
1	DCD#, Data carrier detect
2	RTS#, Request to send
3	DSR#, Dataset ready
4	TXD, Transmit Data
5	RXD, Receive Data
6	GND, Ground
7	CTS#, Clear to send
8	DTR#, Data Terminal Ready

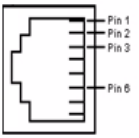


Table 4-7: RJ-45 Serial Port Connector Pin Definitions

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DB-9 Serial Port (CN3-R)

Pin #	RS-232
1	Not used
2	RXD, Request to send
3	TXD , Dataset ready
4	Not used
5	IsoGND, Isolated ground
6	Not used
7	Not used
8	Not used
9	Not used

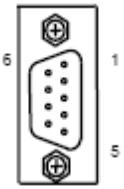
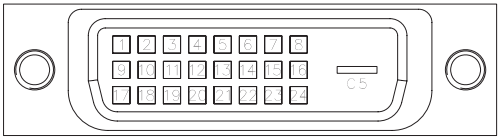


Table 4-8: DB-15 Serial Port Connector Pin Definition

DVI-D Connector (CN1-L)



Pin #	Signal	Pin #	Signal
1	DVI_TDC2-N	16	DVI_HTPLG
2	DVI_TDC2-P	17	DVI_TDC0-N
3	GND	18	DVI_TDC0-P
4	NC	19	GND
5	NC	20	NC
6	DDCCLK_5V	21	NC
7	DDCDAT_5V	22	GND
8	NC	23	DVI_TLC-P
9	DVI_TDC1-N	24	DVI_TLC-N
10	DVI_TDC1-P	C1	NC
11	GND	C2	NC
12	NC	C3	NC
13	NC	C4	NC
14	P5V	C5	GND
15	GND		

Table 4-9: DVI-D Connector Pin Definition

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Serial ATA Connectors on RTM (CN4-R, CN5-R)

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

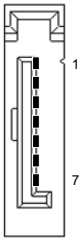


Table 4-10: Serial ATA Connector on RTM Pin Definition

Serial ATA Connector on DB-3965L2

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

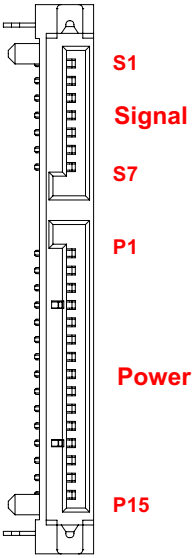


Table 4-11: Serial ATA Connector on DB-3965SAT Pin Definition

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CompactFlash Connector on DB-3965CF

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

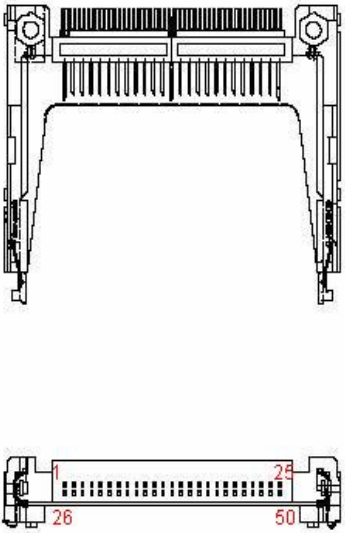


Table 4-12: CompactFlash Connector Pin Definition

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DB-3965CF Connector (CN1)

Signal Name	Pin #	Pin #	Signal Name
IDE_D7	1	2	IDE_D8
IDE_D6	3	4	IDE_D9
IDE_D5	5	6	IDE_D10
IDE_D4	7	8	IDE_D11
IDE_D3	9	10	IDE_D12
IDE_D2	11	12	IDE_D13
IDE_D1	13	14	IDE_D14
IDE_D0	15	16	IDE_D15
GND	17	18	GND
IDE_REQ-L	19	20	IDE_66DECT
IDE_IOW-L	21	22	IDE_RST-L
IDE_IOR-L	23	24	SPKR
IDE_IORDY	25	26	SIO_SPKR
IDE_ACK-L	27	28	GND
IDE_IRQ	29	30	VCC_RTC
IDE_A1	31	32	GND
IDE_A0	33	34	USB4-P
IDE_A2	35	36	USB4-N
IDE_CS1-L	37	38	P5V
IDE_CS3-L	39	40	P5V

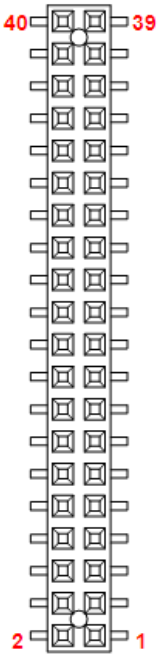


Table 4-13: DB-3965CF Connector Pin Definition

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DB-3965L2 Connector (CN7)

Signal Name	Pin #	Pin #	Signal Name
USB3-N	1	2	SDVOB_RED-N
USB3-P	3	4	SDVOB_RED-P
GND	5	6	GND
USB2-N	7	8	SDVOB_GREEN-N
USB2-P	9	10	SDVOB_GREEN-P
GND	11	12	GND
SATA_ICH_RX-N0	13	14	SDVOB_BLUE-N
SATA_ICH_RX-P0	15	16	SDVOB_BLUE-P
GND	17	18	GND
SATA_TX-P0	19	20	SDVOB_CLK-N
SATA_TX-N0	21	22	SDVOB_CLK-P
GND	23	24	GND
PCIE_TXN5	25	26	SDVOB_INT-N
PCIE_TXP5	27	28	SDVOB_INT-P
GND	29	30	GND
PCIE_RXN5	31	32	SDVO_FLDSTALL-N
PCIE_RXP5	33	34	SDVO_FLDSTALL-P
GND	35	36	SDVO_CTRLCLK
PCIE_RXN2	37	38	SDVO_CTRLDATA
PCIE_RXP2	39	40	USB_OC2-L
GND	41	42	COM1_DCD-L
PCIE_TXN2	43	44	COM1_RI-L
PCIE_TXP2	45	46	COM1_CTS-L
GND	47	48	COM1_DTR-L
MSCLK	49	50	COM1_RTS-L
MSDATA	51	52	COM1_DSR-L
KBCLK	53	54	COM1_SOUT
KBCDATA	55	56	COM1_SIN
P5V	57	58	P3V3
P5V	59	60	P3V3

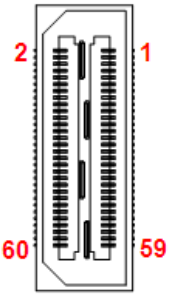


Table 4-14: DB-3965L2 Connector Pin Definition

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CompactPCI J1 Connector

Pin	Z	A	B	C	D	E	F
25	GND	+5V	REQ64#	ENUM#	+3.3V	+5V	GND
24	GND	CPCI_AD1	+5V	CPCI_VIO	CPCI_AD0	ACK64#	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	VIO	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	NC	NC	GND	CPCI_PERR-L	GND
16	GND	CPCI_DEVSEL-L	CPCI_PCIXCAP	VIO	CPCI_STOP-L	CPCI_LOCK-L	GND
15	GND	P3V3	CPCI_FRAME-L	CPCI_IRDY-L	NC	CPCI_TRDY-L	GND
12-14	Key						
11	GND	CPCI_AD18	CPCI_AD17	CPCI_AD16	GND	CPCI_CBE-L2	GND
10	GND	CPCI_AD21	GND	P3V3	CPCI_AD20	CPCI_AD19	GND
9	GND	CPCI_CBE-L3	NC	CPCI_AD23	GND	CPCI_AD22	GND
8	GND	CPCI_AD26	GND	VIO	CPCI_AD25	CPCI_AD24	GND
7	GND	CPCI_AD30	CPCI_AD29	CPCI_AD28	GND	CPCI_AD27	GND
6	GND	CPCI_REQ-L0	GND	P3V3	CPCI_CLK0	CPCI_AD31	GND
5	GND	NC	NC	CPCI_RESET-L	GND	CPCI_GNT-L0	GND
4	GND	NC	CPCI_HEALTHY-L	VIO	NC	NC	GND
3	GND	CPCI_IRQA-L	CPCI_IRQB-L	CPCI_IRQC-L	P5V	CPCI_IRQD-L	GND
2	GND	cPCI_TCK-L	P5V	cPCI_TMS-L	NC	cPCI_TDI-L	GND
1	GND	P5V	NC	cPCI_TRST-L	P12V	P5V	GND

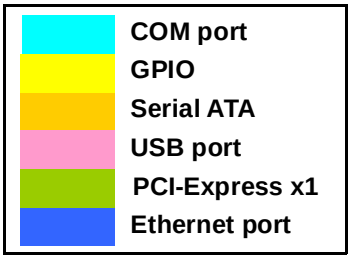
Table 4-15: CompactPCI J1 Connector Pin Definition

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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	COM2_RXD	COM2_RTS-L	GPIO7	GND
20	GND	CPCI_CLK5	GND	COM2_TXD	COM2_DSR-L	GPIO6	GND
19	GND	CLK100_REAR-P	CLK100_REAR-N	I2C_DAT	I2C_CLK	SMB_ALERT-L	GND
18	GND	COM2_DCD-L	COM2_RI-L	GND	COM2_CTS-L	COM2_DTR-L	GND
17	GND	USB6-P	USB6-N	J2_RST-L	CPCI_REQ-L6	CPCI_GNT-L6	GND
16	GND	P5V	P5V	DEG-L	GND	GPIO5	GND
15	GND	USB5-P	USB5-N	FAL-L	CPCI_REQ-L5	CPCI_GNT-L5	GND
14	GND	SATA_TX-P2	SATA_TX-N2	GND	SATA_ICH_RX-P2	SATA_ICH_RX-N2	GND
13	GND	SATA_TX-P1	SATA_TX-N1	V(I/O)	SATA_ICH_RX-P1	SATA_ICH_RX-N1	GND
12	GND	USB7-N	USB7-P	GND	USB8-N	USB8-P	GND
11	GND	USB_OC3-L	NC	V(I/O)	USB9-N	USB9-P	GND
10	GND	PCIE_RXP3	PCIE_RXN3	GND	PCIE_TXP3	PCIE_TXN3	GND
9	GND	PCIE_RXP4	PCIE_RXN4	V(I/O)	PCIE_TXP4	PCIE_TXN4	GND
8	GND	LANA_TXDP0	LANA_TXDN0	GND	LANA_TXDP2	LANA_TXDN2	GND
7	GND	LANA_TXDP1	LANA_TXDN1	V(I/O)	LANA_TXDP3	LANA_TXDN3	GND
6	GND	NC	NC	GND	NC	NC	GND
5	GND	NC	NC	V(I/O)	NC	NC	GND
4	GND	V(I/O)	GPIO1	GPIO2	GPIO3	GPIO4	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 4-16: CompactPCI J2 Connector Pin Definition

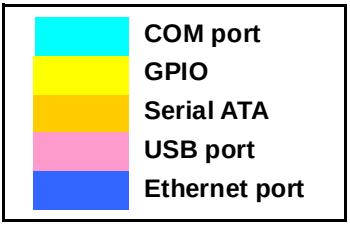


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cPCI-R3920(T)-1 rJ2 Connector

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CPCI_CLK6	GND	COM2_RXD	NC	GPIO7	GND
20	GND	CPCI_CLK5	GND	COM2_TXD	NC	GPIO6	GND
19	GND	CLK100_REAR-P	CLK100_REAR-N	I2C_DAT	I2C_CLK	SMB_ALERT-L	GND
18	GND	NC	NC	GND	NC	NC	GND
17	GND	USB6-P	USB6-N	J2_RST-L	CPCI_REQ-L6	CPCI_GNT-L6	GND
16	GND	P5V	P5V	DEG-L	GND	GPIO5	GND
15	GND	USB5-P	USB5-N	FAL-L	CPCI_REQ-L5	CPCI_GNT-L5	GND
14	GND	SATA_TX-P2	SATA_TX-N2	GND	SATA_ICH_RX-P2	SATA_ICH_RX-N2	GND
13	GND	SATA_TX-P1	SATA_TX-N1	GND	SATA_ICH_RX-P1	SATA_ICH_RX-N1	GND
12	GND	NC	NC	GND	NC	NC	GND
11	GND	NC	NC	GND	NC	NC	GND
10	GND	NC	NC	GND	NC	NC	GND
9	GND	NC	NC	GND	NC	NC	GND
8	GND	LANA_TXDP0	LANA_TXDN0	GND	LANA_TXDP2	LANA_TXDN2	GND
7	GND	LANA_TXDP1	LANA_TXDN1	GND	LANA_TXDP3	LANA_TXDN3	GND
6	GND	NC	NC	GND	NC	NC	GND
5	GND	NC	NC	GND	NC	NC	GND
4	GND	V(I/O)	GPIO1	GPIO2	GPIO3	GPIO4	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: cPCI-R3920(T)-1 rJ2 Connector Pin Definition



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5 Getting Started

This chapter describes the installation procedures for the cPCI-3965 and rear transition module:

- Memory module
- 2.5” SATA Hard Drive Disk
- CPU module installation to chassis
- RTM installation to chassis

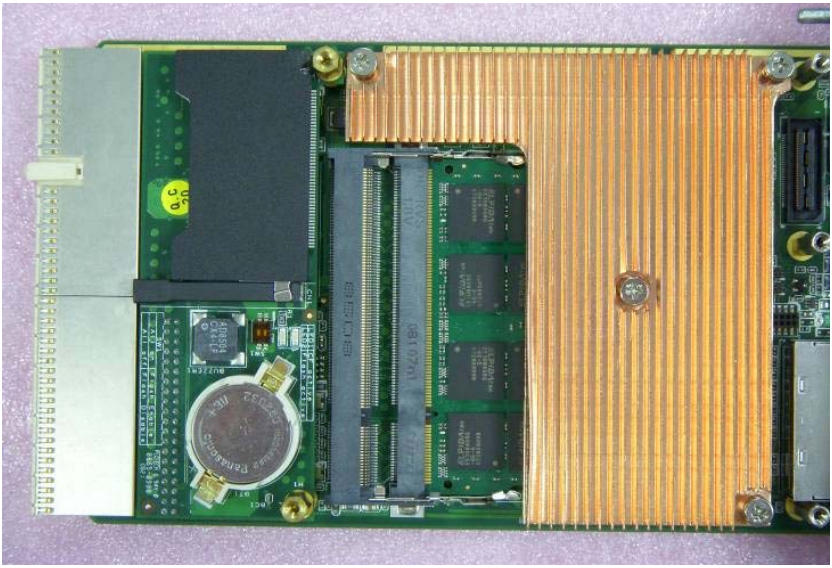
5.1 CPU and Heatsink

The cPCI-3965(D) Series come with CPU(s) 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 Memory Module Installation

The cPCI-3965 Series supports DDR2-667 unbuffered non-ECC memory modules via two stacked-type SO-DIMM sockets. The SO-DIMM modules have a 200-pin footprint and are notched to facilitate correct installation in the SO-DIMM sockets. At lease one memory module will be pre-installed in the lower socket as shown below.



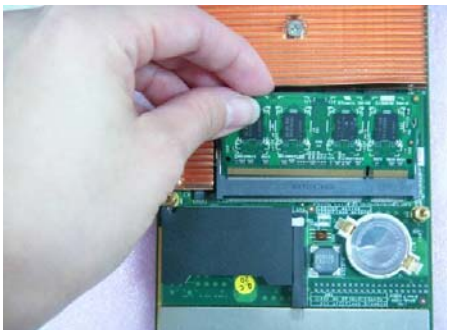
NOTE:

The front panel and the layer 2 PCB (DB-3965L2) should be removed before installing memory modules to the cPCI-3965D dual slot version.

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Installing the Memory Modules

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





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5.3 Hard Drive Installation

The cPCI-3965D dual slot version provides space to install a slim type 2.5” Serial-ATA hard drive.

Installing a Hard Drive - cPCI-3965D

1. Attach the hard drive to the bracket provided using four screws as shown.



2. Align the hard drive assembly with the cPCI-3965D as shown and insert it into the onboard Serial ATA connector until it is properly seated. Secure the bracket and hard drive assembly to the standoffs using the four screws provided.





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5.4 Installing the cPCI-3965 to the Chassis

The cPCI-3965 may be installed in a system or peripheral slot of a 3U CompactPCI chassis. These instructions are for reference only. Refer to the user guide that comes with the chassis for more information.

1. Be sure to select the correct slot depending on the operational purpose of the module. The system power may now be powered on or off.
2. Remove the blank face cover from the selected slot, if necessary.
3. Press down on the release catches of the cPCI-3965 ejector handles.
4. **Remove the black plastic caps securing the mounting screws to the front panel.**
5. Align the module's top and bottom edges to the chassis card guides, and then carefully slide the module into the chassis. A slight resistance may be felt when inserting the module. If the resistance it too strong, check if there are bent pins on the backplane or if the board's connector pins are not properly aligned with connectors on the backplane. Then push the board until it is completely flush with the chassis.
6. Push the ejector handles outwards to secure the module in place, and then fasten the screws on the module front panel.
7. Connect the cables and peripherals to the board, and then turn the chassis on if necessary.

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5.5 RTM Installation - cPCI-R3920(T)-1

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

Refer to previous sections for peripheral connectivity of all I/O ports on the RTM. When installing the cPCI-3965 Series and related RTMs, make sure the RTM is the correct matching model.


NOTE:

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

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6 Driver Installation

The cPCI-3965 drivers are available from the ADLINK All-In-One CD at **X:\cPCI\cPCI-3965**, or from the ADLINK website (**http://www.adlinktech.com**). The following describes the driver installation procedures for Windows® XP and Windows® Server 2003:

1. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.
2. Install the chipset driver by running the program **...\Chipset\infinst_autol[9.0.0.1008].exe**.
3. Install the VGA driver and utilities by running **...\Graphics\Windows XP Professional\win2k_xp1434.exe**.
4. Install the LAN drivers by running the program **…\LAN\Windows XP Professional\PRO2KXP[13.0].exe**.

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

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7 Utilities

7.1 Watchdog Timer

This section describes the operation of the cPCI-3965's watchdog timer (WDT). The primary function of the WDT is to monitor the cPCI-3965's operation and to reset the system if a software application fails to function as programmed. The following WDT functions may be controlled using a software application:

- enabling and disabling
- reloading timeout value

The cPCI-3965 custom WDT circuit is implemented using the internal I/O of the ITE SuperIO IT8712F which is at 2Eh of LPC. The basic functions of the WDT include:

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

Using the Watchdog in an Application

The following section describes using the WDT functions in an application. The WDT reset function is explained in the previous section. This can be controlled through the registers in the cPCI-3965's SuperIO.

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

For a detailed programming sample, refer to the sample code provided in the ADLINK All-In-One CD. You can find it in the following directory: **X:\cPCI\cPCI-3965\WDT**.

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Sample Code

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

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

static unsigned int IT8712_ioPort = 0x2e;

void Enter_IT8712_Config(unsigned int flag)
{
     if(flag) IT8712_ioPort = 0x4e;
     else IT8712_ioPort = 0x2e;

     switch(IT8712_ioPort)
     {
          case 0x2E:  //Address port = 0x2E, enter keys =
     0x87, 0x01, 0x55, 0x55
               outportb(0x2E, 0x87);
               outportb(0x2E, 0x01);
               outportb(0x2E, 0x55);
               outportb(0x2E, 0x55);
               break;
          case 0x4E:  //Address port = 0x4E, enter keys =
     0x87, 0x01, 0x55, 0xAA
               outportb(0x4E, 0x87);
               outportb(0x4E, 0x01);
               outportb(0x4E, 0x55);
               outportb(0x4E, 0xAA);
               break;
          default:
               break;
        }
}

void Exit_IT8712_Config(unsigned int flag)
{
     if(flag) IT8712_ioPort = 0x4e;

     outportb(IT8712_ioPort, 0x02);
     outportb(IT8712_ioPort+1, 0x02);
}
```

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```
void Get_IT8712_ID(unsigned int &ID1, unsigned int &ID2)
{
     outportb(IT8712_ioPort, 0x20);
     ID1 = inportb(IT8712_ioPort+1);
     outportb(IT8712_ioPort, 0x21);
     ID2 = inportb(IT8712_ioPort+1);
}

void IT8712_WDTRun(unsigned int count_value)
{
     unsigned int tempCount, registerValue;

     outportb(IT8712_ioPort, 0x07);
     outportb(IT8712_ioPort+1, 0x07);// Device 7

     if(count_value >= 60)
     {
          outportb(IT8712_ioPort, 0x72);
          registerValue = inportb(IT8712_ioPort+1);
          registerValue &= 0x7f;
          registerValue |= 0x40; //enable WDT output
     through KBRST
          outportb(IT8712_ioPort+1, registerValue); //
     set WDT count is minute

          tempCount = count_value / 60;
          if((count_value%60) > 30)
               tempCount++;
          if(tempCount > 255)
               tempCount = 255;
          printf("WDT timeout in %d minutes.\n",
     tempCount);
     }
     else
     {
          outportb(IT8712_ioPort, 0x72);
          registerValue = inportb(IT8712_ioPort+1);
          registerValue |= 0x80;
```

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

      outportb(IT8712_ioPort+1, registerValue); //
set WDT count is second
}

outportb(IT8712_ioPort, 0x71);
registerValue = inportb(IT8712_ioPort + 1);
registerValue |= 0x60;// set Mouse & Keyboard
interrupt Enable
outportb(IT8712_ioPort+1, registerValue);

outportb(IT8712_ioPort, 0x73);
outportb(IT8712_ioPort+1, tempCount);
```

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7.2 Preboot Execution Environment (PXE)

The cPCI-3965 Series supports the Intel® Preboot Execution Environment (PXE) that is capable of booting up or executing an OS installation through an Ethernet ports. To use PXE, there must be a DHCP server on the network with one or more servers running PXE and MTFTP services. It could be a Windows® 2003 server running DHCP, PXE, and MTFTP services or a dedicated DHCP server with one or more additional servers running PXE and MTFTP services.

To build a network environment with PXE support:

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

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8 BIOS Setup

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

8.1 Starting the BIOS

To enter the setup screen, follow these steps:

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



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

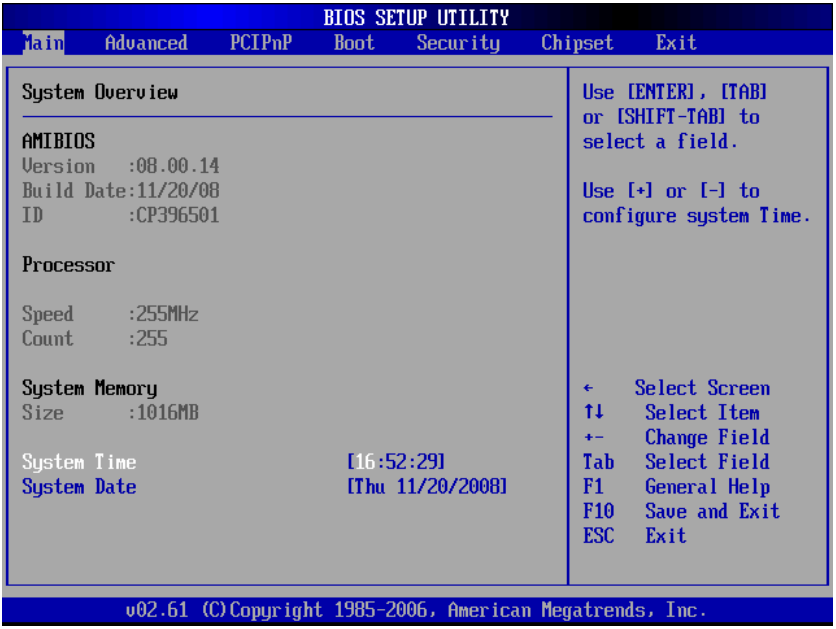
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Setup Menu

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

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

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

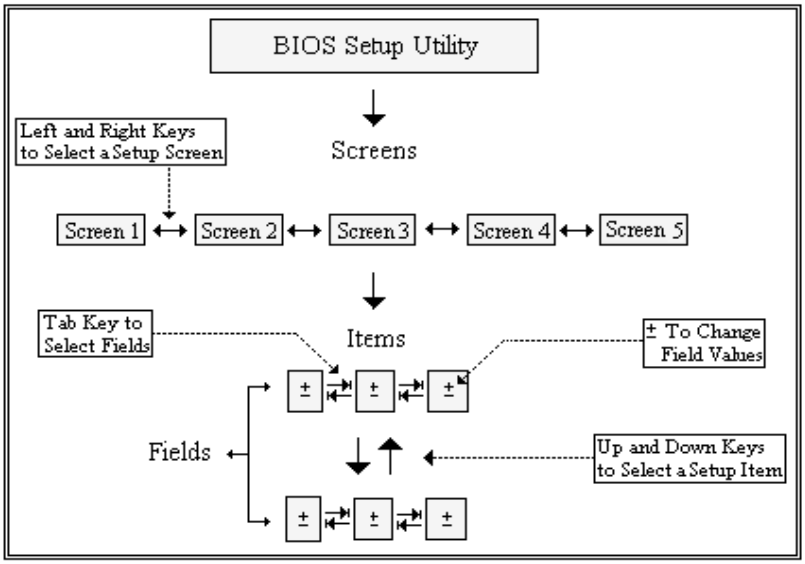


Navigation

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

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

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

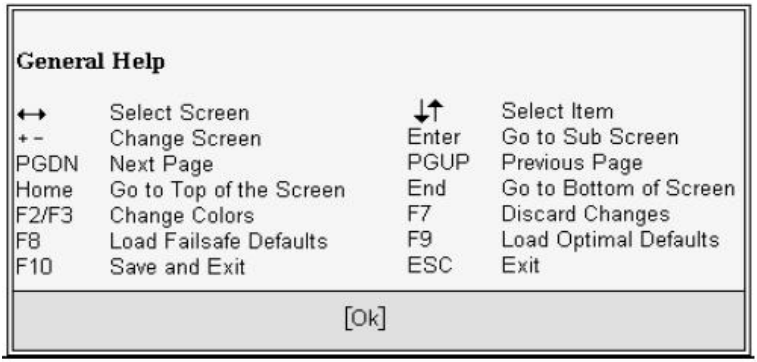
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the motherboard to boot up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

Hotkey Descriptions

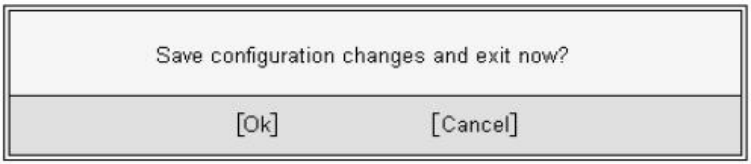
F1 The < F1 > key allows you to display the General Help screen.

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

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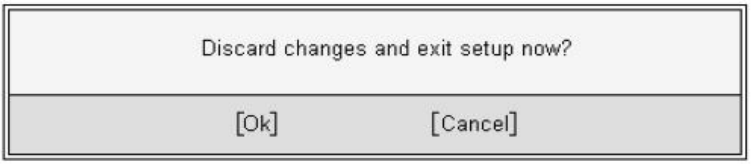


F10 The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:



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

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



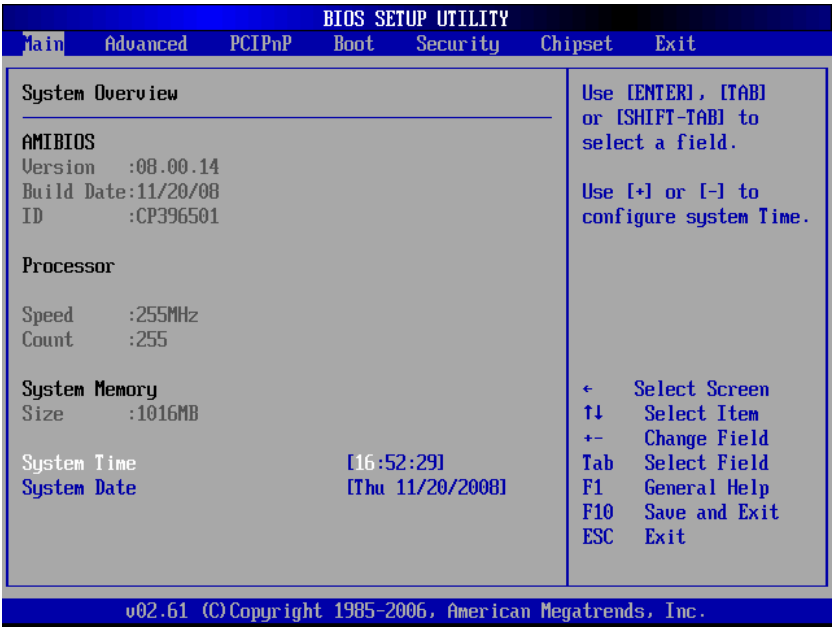
Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

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

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8.2 Main Setup

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



System Time/System Date

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

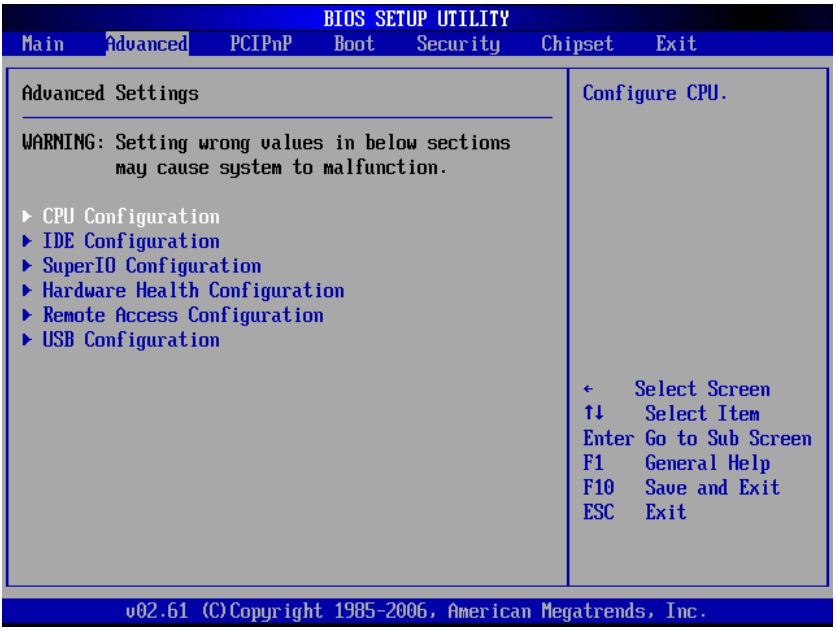
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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8.3 Advanced BIOS Setup

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

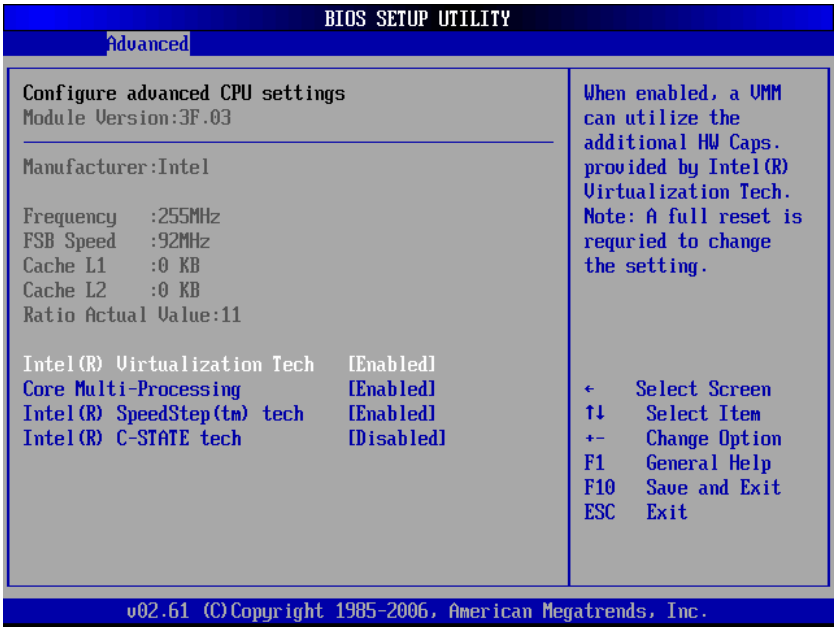
The sub menus are described on the following pages.



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8.3.1 CPU Configuration

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



Intel(R) Virtualization Tech

Intel Virtualization Technology is a set of platform features that support virtualization of platform hardware and multiple software environmentss. When enabled, it offers data center managers the ability to consolidate multiple workloads on one physical server system.

Core Multi-Processing

This item enables/disables multi-core processing functionality for multi-core processors.

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Intel®Speedstep™ Tech

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

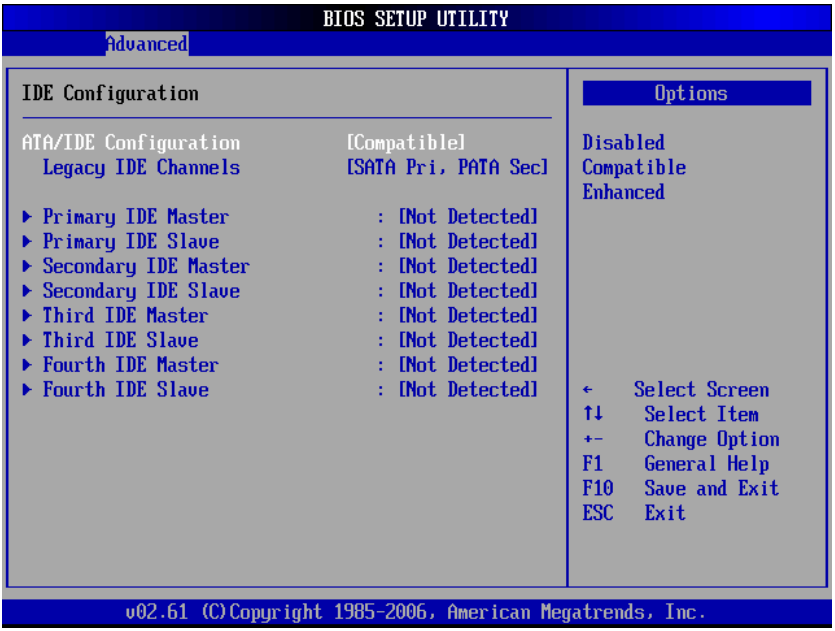
Intel® C-STATE Tech

This option allows you to enable or disabled Intel C-STATE function.

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8.3.2 IDE Configuration

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



ATA/IDE Configuration

This item specifies which mode the IDE channels should be initialized in. The settings are **Disabled**, **Compatible** and **Enhanced**. When running in Compatible mode, SATA channel can be configured as a legacy IDE channel.

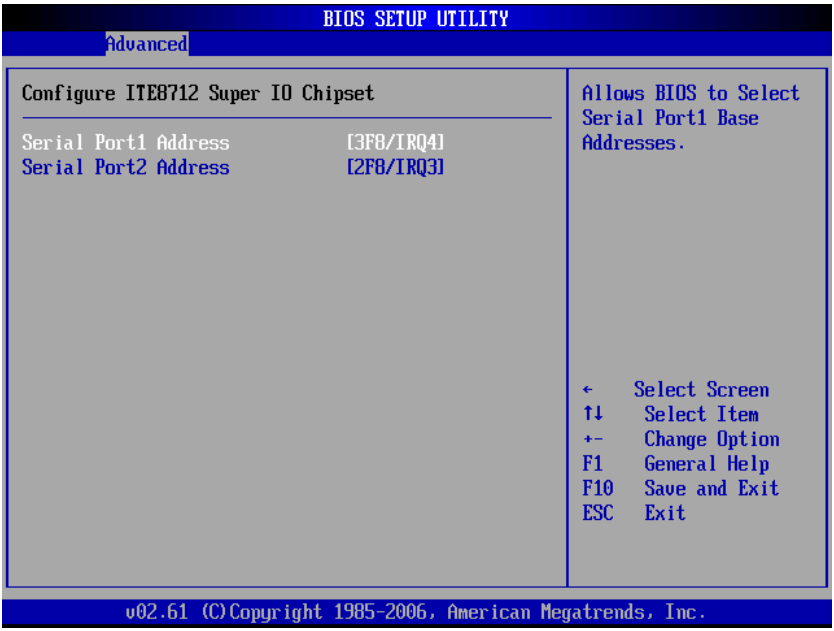
IDE Master/Slave

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

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8.3.3 Super IO Configuration

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



Serial Port1 Address

Select an address and a corresponding interrupt for Serial Port1. Options: 3F8/IRQ4, 3E8/IRQ4, 2F8/IRQ3, 2E8/IRQ3.

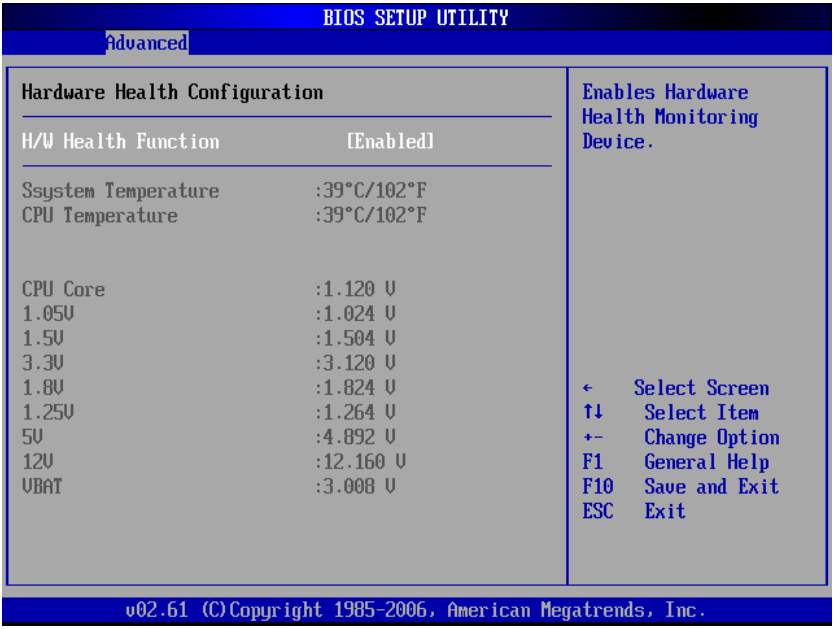
Serial Port2 Address

This option specifies the base I/O port address and Interrupt Request address of Serial Port2. The settings of Serial Port2 are the same as Serial Port1. However, the setting used by Serial Port1 will not be available for Serial Port2. For example, if Serial Port1 uses 3F8/IRQ4, the option, the 3F8/IRQ4 will not appear in the options of Serial Port2.

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8.3.4 Hardware Health Configuration

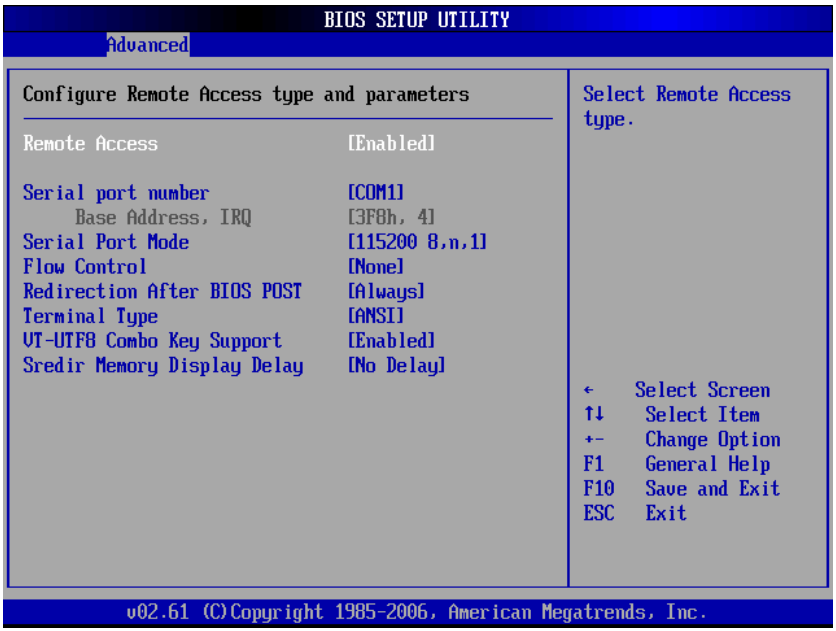
This option displays the current status of all of the monitored hardware devices/components such as voltages and temperatures. The options are Enabled and Disabled.



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8.3.5 Remote Access Configuration

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



Remote Access

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

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

Serial Port Number

Select the serial port you want to use for the remote access interface. You can set the value for this option to COM1, COM2 or COM3.

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

Serial Port Mode

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

Flow Control

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

Redirection After BIOS POST

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

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

Terminal Type

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

VT-UTF8 Combo Key Support

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

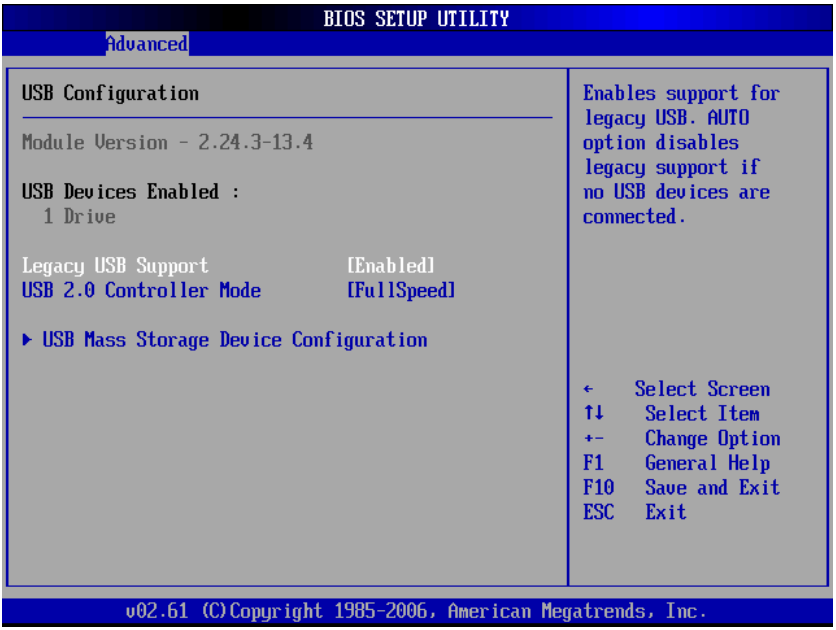
Sredir Memory Display Delay

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

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8.3.6 USB Configuration

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



Legacy USB Support

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

- **Disabled:** Set this value to prevent the use of any USB device in DOS or during system boot.

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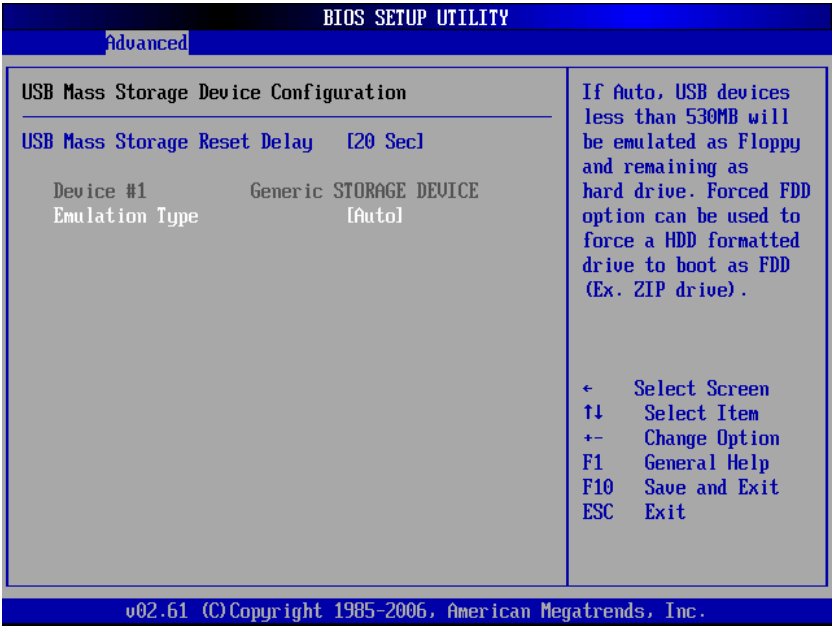
- **Enabled:** Set this value to allow the use of USB devices during boot and while using DOS.
- **Auto:** This option auto detects USB Keyboards or Mice and if found, allows them to be utilized during boot and while using DOS.

USB 2.0 Controller Mode

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

USB Mass Storage Device Configuration

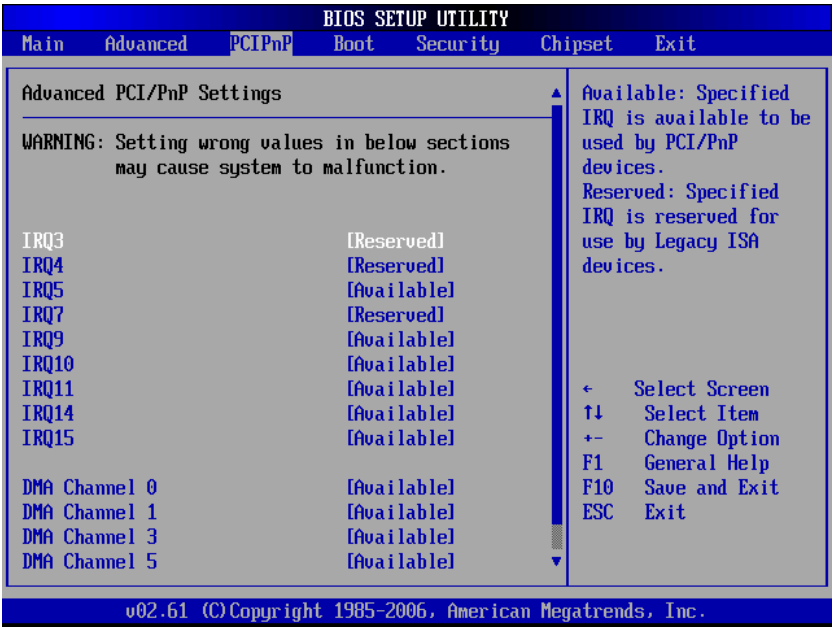
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB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



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8.4 Advanced PCI/PnP Settings

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



IRQ/DMA Channel

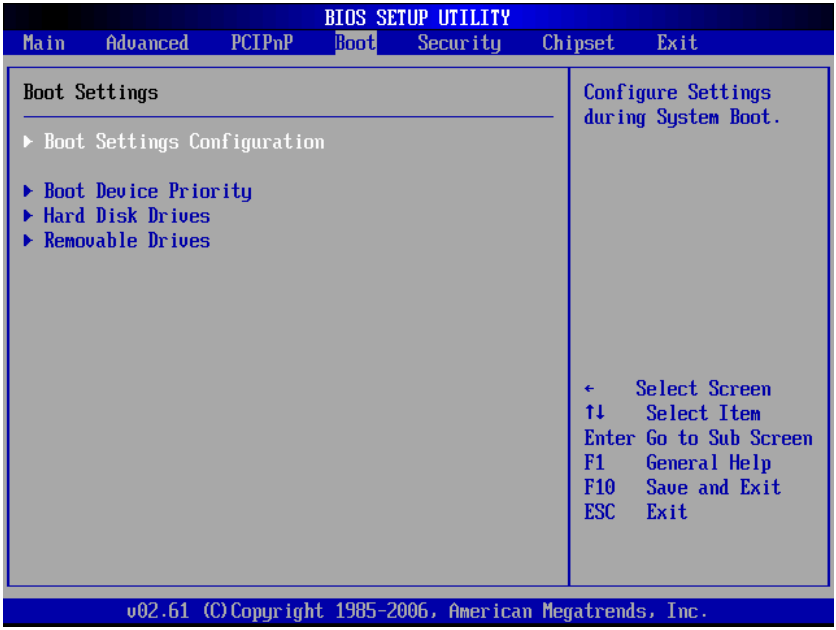
Set this value to allow the IRQ/DMA channel settings to be modified.

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

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8.5 Boot Settings

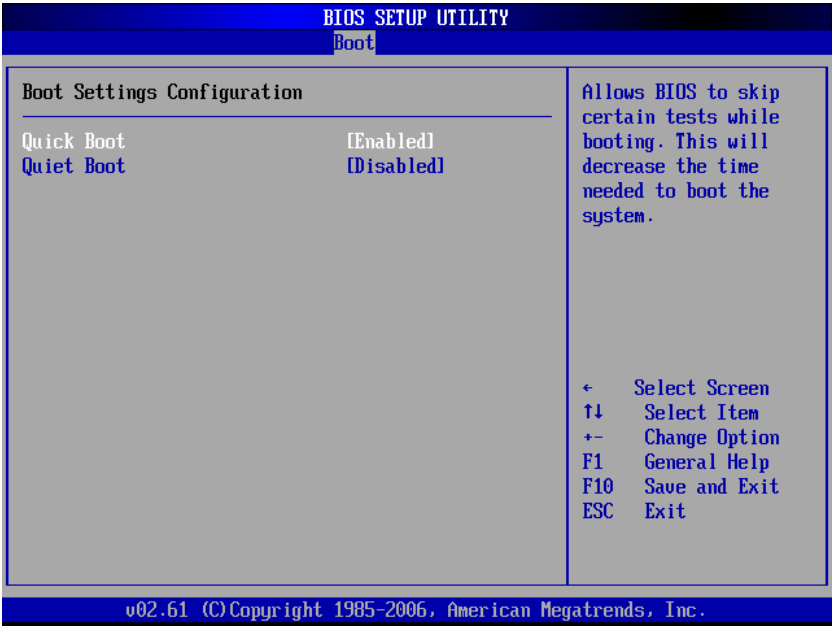
Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The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



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8.5.1 Boot Settings Configuration

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



Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during bootup for faster system boot.

Quiet Boot

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

When it is **disabled**, the BIOS will display the normal POST messages, instead of the OEM logo.

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8.5.2 Boot Device Priority

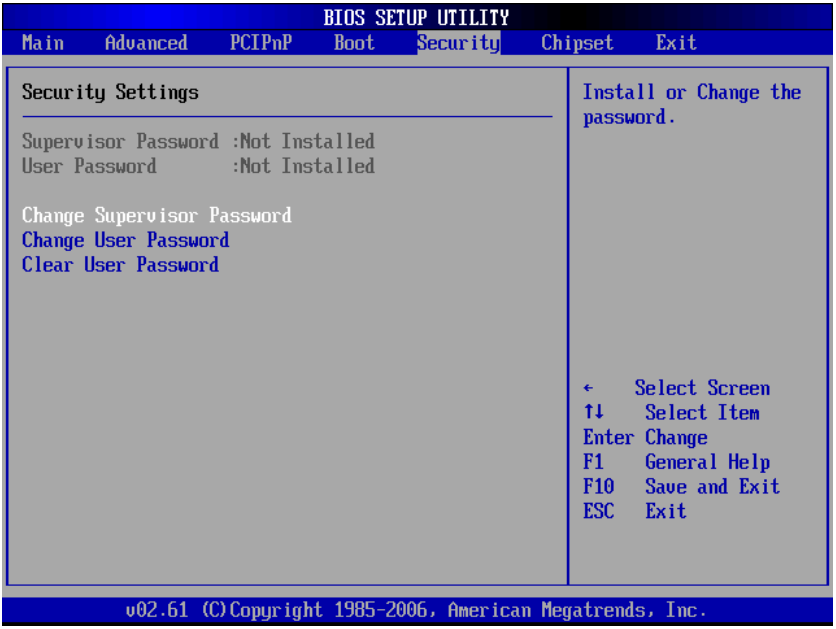
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

8.5.3 Boot Device Groups

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

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8.6 Security Setup



Password Support

Two Levels of Password Protection

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

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

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

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Remember the Password

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

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

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

Supervisor Password

Indicates whether a supervisor password has been set.

User Password

Indicates whether a user password has been set.

Change Supervisor Password

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

Change User Password

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

Clear User Password

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

Change Supervisor Password

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

Enter New Password:

Type the password and press < Enter >. The screen does not display the characters entered. Retype the password as prompted

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and press < Enter >. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after completes.

Change User Password

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

Enter New Password:

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

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8.7 Chipset Setup

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



USB Functions

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

USB 2.0 Controller

This option takes effect only when USB Functions are enabled. Enabling will allow USB 2.0 functionality to all USB ports.

LAN1 Output Select

Set the LAN1 output to Front or Rear.

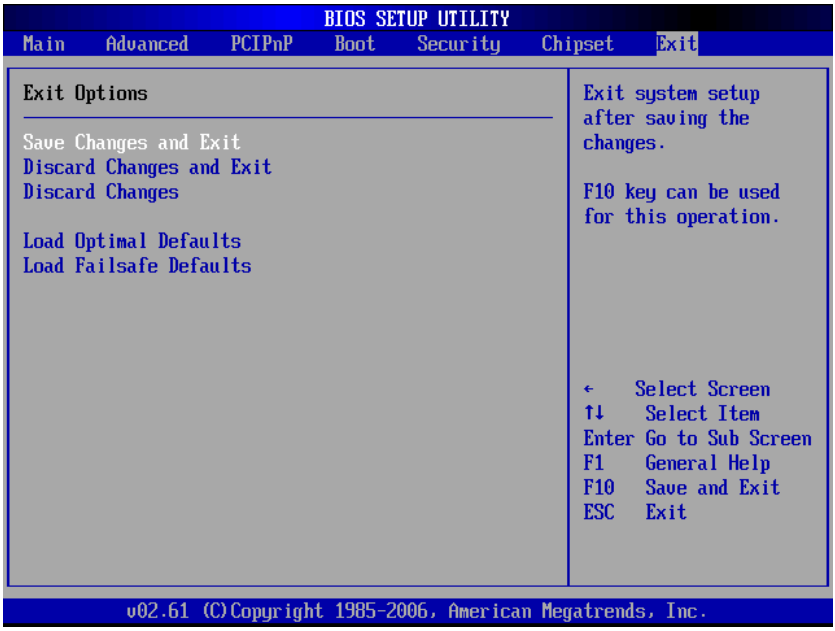
Onboard LAN BIOS Init

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

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8.8 Exit Menu

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



Save Changes and Exit

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

Save Configuration Changes and Exit Now?

[Ok] [Cancel]

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

Discard Changes and Exit

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

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Discard Changes and Exit Setup Now?

[Ok] [Cancel]

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

Discard Changes

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

Select Ok to discard changes.

Load Optimal Defaults

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

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

Select Ok to load optimal defaults.

Load Failsafe Defaults

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

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

Load FailSafe Defaults?

[Ok] [Cancel]

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

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Important Safety Instructions

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

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

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

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



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

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

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Getting Service

Contact us should you require any service or assistance.

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