CT-31 Series

3U Rugged Conduction-Cooled CompactPCI®
Dual-Core Intel® Atom™ Processor Blade

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	2011/11/15	Initial release

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Preface

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Using this Manual

Audience and Scope

The CT-31 User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating CompactPCI systems.

Manual Organization

This manual is organized as follows:

Chapter 1, Introduction: Introduces the CT-31, 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 CT-31 main functions.

Chapter 4, Board Interfaces: Describes the CT-31 board interfaces.

Chapter 5, Driver Installation: Provides information on how to install the CT-31 device drivers.

Chapter 6, Utilities: Describes the utilities of the CT-31 Series.

Chapter 7, 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 CT-31 Series is a 3U Rugged Conduction-Cooled CompactPCI single board computer in single-slot (4HP) width form factor featuring the ultra low voltage Intel® Atom™ N450 or D510 processor with ICH8M I/O Controller Hub. The CT-31 provides single channel DDR2-667/800 soldered onboard memory up to 2GB, integrated graphics on the CPU and IDE CompactFlash slot.

The optional Rear Transition Module (RTM) provides 2x SATA, 2x GbE, 1x USB, 2x COM, and VGA ports. One PCI-Express x1 port, GPIO and SMBus signals are routed to the J2 connector.

Designed for stability and packaged in a rugged conduction-cooled format, the CT-31 is suitable for long life applications situated in extreme environments. It can withstand extreme temperatures, shock, and vibration under operation, and its components have been selected from embedded technology programs to offer long-term availability. The CT-31 Series is ideally suited for transportation and military applications.

1.2 Features

- 3U Rugged Conduction-Cooled CompactPCI blade in 4HP width form factor
- Supports Dual-Core or Single-Core Intel® Atom™ processor, up to 1.66GHz
- Graphics and memory controllers integrated in processor
- ICH8M I/O Hub
- Single channel DDR2-667/800 SDRAM soldered onboard, up to 2GB
- 32bit/33MHz CompactPCI Interface based on PCI specifications
- VGA port to RTM
- Two PCI-Express Gigabit Ethernet ports to RTM
- One IDE CompactFlash socket

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1.3 Block Diagram

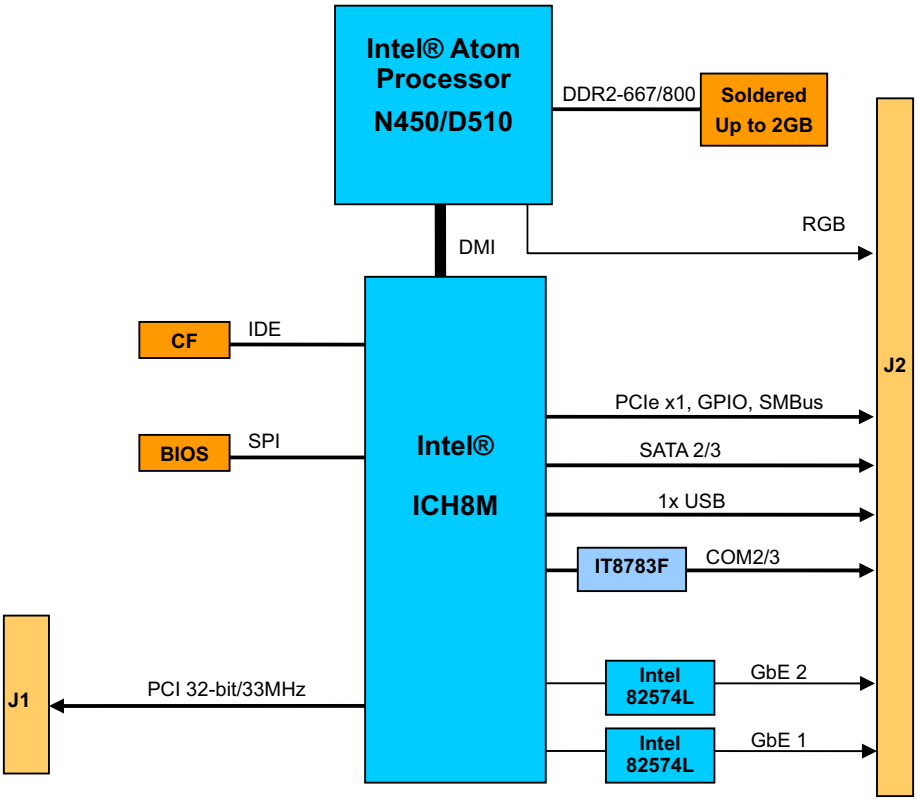


Figure 1-1: CT-31 Series Functional Block Diagram

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1.4 Product List

Products in the CT-31 Series include:

Processor Blade

- **CT-31:** 4HP width (single-slot) 3U Conduction-Cooled CompactPCI blade featuring the Intel® Atom™ N450 or D510 processor, 1GB or 2GB memory soldered onboard, and CompactFlash socket.

Rear Transition Module

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

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1.5 Package Contents

The CT-31 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 CT-31 Series are non-standard configurations and may vary depending on customer requests.

Processor Blade

- The CT-31 Series Processor Blade
  - CPU, RAM specifications will differ depending on options selected
  - Thermal module is assembled on the board
- ADLINK All-in-One CD
- User's manual

Rear Transition Module

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


NOTE:

The contents of non-standard CT-31 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 CT-31 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) • CompactPCI® connectors with J1, J2
Processor	• µFC-BGA Intel® Atom™ Processor N450 1.66GHz, 512KB L2 cache, TDP 5.5W • µFC-BGA dual-core Intel® Atom™ Processor D510 1.66GHz, 1MB L2 cache, TDP 13W
Chipset	• Intel® ICH8M I/O Controller Hub (ICH)
Memory	• Single channel unbuffered non-ECC memory soldered onboard, up to 2GB capacity (dependent on memory process technology) • DDR2-667 for N450 processor, DDR2-800 for D510 processors
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® 82574L GbE controllers • Two 10/100/1000BASE-T ports to J2 (RTM)
Graphics	• Integrated in Intel® Atom™ Processor • VGA port to J2 (RTM) • Analog monitor support up to QXGA 2048x1536 @60Hz 32-bit
Serial Ports	• Two 16C550 compatible serial ports from Super I/O IT8783 to J2 (RTM)
BIOS	• AMIBIOS8® 16Mbit SPI flash memory
Onboard Interfaces	**CT-31:** • EIDE CompactFlash slot **cPCI-R3610T:** • 2x 7-pin SATA ports • 2x 10-pin RS-232/422/485(+) box headers (connected to Faceplate I/O)

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Faceplate I/O	**CT-31:** • N/A **cPCI-R3610T:** • 2x USB 2.0 ports • 10/100/1000BASE-T Ethernet port • 2x DB-9 RS-232/422/485(+) serial ports
OS Compatibility	• Microsoft Windows XP Professional, x64 Edition • Microsoft Windows Vista x64 Edition • Microsoft Windows 7 x86 Edition • Red Hat Enterprise Linux 5.3 • Fedora 12 • Other OS support upon request
Environmental	• Operating Temperature: -40°C to 85°C (at card edge) • Storage Temperature: -40°C to 85°C • Humidity: 90% non-condensing • Shock: 40G peak-to-peak, 11ms duration, 3-axes, operating • Vibration: 5Grms, 22-2000Hz, 3-axes (1 hr. per axis), with CompactFlash card, operating • Conformal Coating: Yes
EMI	• CE EN55022 • FCC Class A


NOTE:

Specifications are subject to change without prior notice.

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2.2 Power Requirements

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

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

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

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Power Consumption

This section provides information on the power consumption of CT-31 Series when using Intel® Atom™ processors with 1GB soldered DDR2 memory and onboard 80GB SATA hard drive. The CT-31 is powered by 5V only. Power consumption at 100% CPU usage was measured using K-Power.

Intel® Atom™ Processor N450		
OS/Mode	**Current 5V**	**Total Power**
DOS/Idle mode	2.83A	14.15W
Linux/Idle mode	2.38A	11.90W
Windows XP/ Idle mode	2.49A	12.45W
Windows® XP, 100% CPU Usage	3.04A	15.20W

Intel® Atom™ Processor D510		
OS/Mode	**Current 5V**	**Total Power**
DOS/Idle mode	3.00A	15.00W
Linux/Idle mode	3.26A	16.30W
Windows XP/ Idle mode	3.21A	16.05W
Windows® XP, 100% CPU Usage	3.87A	19.35W

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3 Functional Description

The following sections describe the CT-31 Series features and functions.

3.1 Processor

The CT-31 Series supports the Intel® Atom™ Processor N400 and D500 Series processors built on 45-nm Hi-K process technology. The processor is designed for a two-chip platform as opposed to the traditional three-chip platforms (processor, GMCH, and ICH). The two-chip platform consists of a processor and the chipset and enables higher performance, lower cost, easier validation, and improved x-y footprint.

Features	Atom™ N450	Atom™ D510
Clock	1.66GHz	1.66GHz
L2 cache	512KB	1MB
No. of Core(s)	1	2
Max. Power (TDP[1])	5.5W	13W
$T_{junction, MAX}$[2]	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® Atom™ Processor N450

Included in this family of processors is an integrated memory controller, integrated graphics processing unit and integrated I/O (such as DMI) on a single silicon die.

The following list outlines the key features of this processor:

- One die, primary 32-kB instructions cache and 24-kB write-back data cache
- Intel® Hyper-Threading Technology (2 threads)
- On die 512-kB, 8-way L2 cache
- Support IA 32-bit and Intel® 64 architecture
- Intel® SSE2 and SSE3 and SSSE3 support

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- Micro-FCBGA8 packaging technologies
- Thermal management support via Intel® Thermal Monitor 1 (TM1) and Intel® Thermal Monitor 2 (TM2)
- Enhanced Intel® SpeedStep Technology (EIST)
- Support L2 dynamic cache sizing

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

- One channel DDR2 memory
- Memory DDR2 data transfer rates of 667 MT/s
- Non-ECC, unbuffered DDR2
- 512Mb. 1-Gb,and 2-Gb DDR2 DRAM technologies supported
- Maximum of 2-GB memory capacity supported
- Maximum 1-GB memory capacity on one SO-DIMM or Memory Down

The following list outlines the key graphics features:

- The integrated graphics controller contains a refresh of the 3rd generation graphics core
- Intel® Dynamic Video Memory Technology 4.0
- Directx* 9 compliant Pixel Shader v2.0
- 200-MHz render clock frequency
- Analog RGB display output up to resolution up to 1400x1050 @ 60Hz

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Intel® Atom™ Processor D510

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

- One die, primary 32-kB instructions cache and 24-kB write-back data cache
- Intel® Hyper-Threading Technology (2 threads per core)
- On die 2 x512-kB, 8-way L2 cache for D510 dual-core processor
- Support IA 32-bit and Intel® 64 architecture
- Intel® SSE2 and SSE3 and SSSE3 support
- Micro-FCBGA8 packaging technologies
- Thermal management support via Intel® Thermal Monitor 1 (TM1)

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

- One channel DDR2 memory
- Memory DDR2 data transfer rates of 667 and 800 MT/s
- Non-ECC, unbuffered DDR2
- I/O Voltage of 1.8V for DDR2
- 512Mb. 1-Gb,and 2-Gb DDR2 DRAM technologies supported

The following list outlines the key graphics features:

- The integrated graphics controller contains a refresh of the 3rd generation graphics core
- Intel® Dynamic Video Memory Technology 4.0
- Directx* 9 compliant Pixel Shader v2.0
- 400-MHz render clock frequency
- Analog RGB display output up to resolution up to 2048x1536 @ 60Hz

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3.2 Chipset

Intel® ICH8 Mobile I/O Controller Hub

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

- Provides 6 PCI Expressx1 ports, supporting the PCI Express Base Specification, Revision 1.1. Each Root Port supports 2.5GB/s bandwidth in each direction. The CT-31 utilizes two PCI Express x1 ports for two Gigabit Ethernet controllers; routes two PCI Express x1 ports to the board-to-board connector and one PCI Express x1 port to the J2 connector for expansion capability.
- Enhanced DMA controller, interrupt controller, and timer functions
- Integrated Serial ATA host controller with independent DMA operation on three ports
- Integrated IDE controller supports Ultra ATA100/66/33
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I2C devices
- Supports Intel® Matrix Storage Technology
- PCI Local Bus Specification, Revision 2.3 support for 33MHz PCI operations

3.3 Super I/O

The ITE IT8783F Super I/O is on a Low Pin Count interface supporting PS/2 keyboard/mouse; three 16C550-compatible serial ports; hardware monitor function to monitor CPU voltage, CPU temperature, power supply voltages and system temperature; and Watchdog Timer with time resolution from minimum 1 second or minute to maximum 65635 seconds or minutes on the CT-31.

3.4 Battery

The CT-31 is provided with a 5.5V Gold Capacitor for the Real Time Clock (RTC). The Gold Capacitor is mounted on the DB-3610CF daughter board.

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4 Board Interfaces

This chapter illustrates the board layout, connector pin assignments, and jumper settings to familiarize users with the CT-31 Series.

4.1 CT-31 Blade Layout

CT-31 Assembly Layout

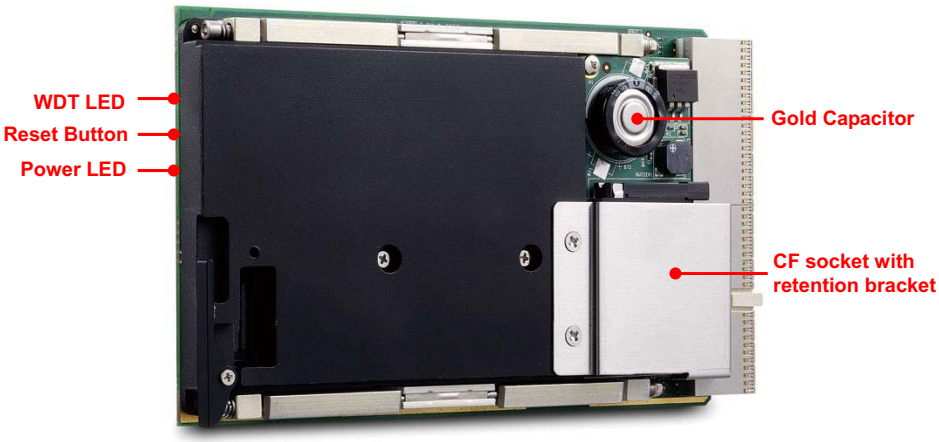


Figure 4-1: CT-31 Assembly Layout

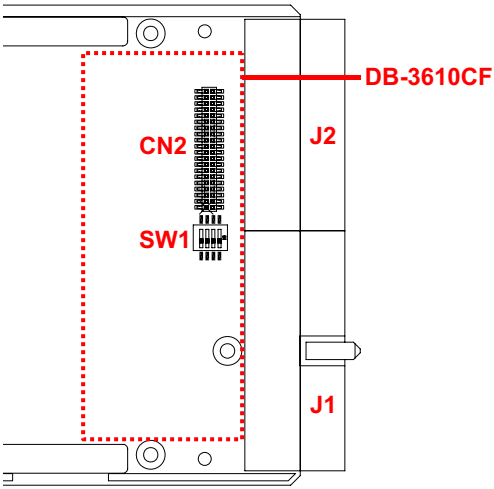
System LEDs

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: CT-31 System LED Descriptions

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CT-31 PCB Layout



CN2	DB-3610CF connector
SW1	VGA/GPIO Mode Switch (SW3 on solder side)
J1/J2	CompactPCI connectors

Figure 4-2: CT-31 PCB Layout

To access SW1, see “Removing the DB-3610CF Adapter Board” on page 21.

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4.2 CT-31 Connector Pin Assignments

CompactFlash Connector on DB-3610CF

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

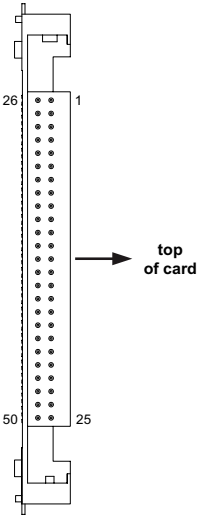


Table 4-2: CompactFlash Connector Pin Definition

DB-3610CF Connector (CN2)

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

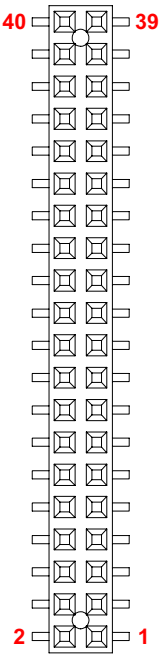


Table 4-3: DB-3610CF Connector Pin Definition

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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 4-4: CompactPCI J1 Connector Pin Definition

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CompactPCI J2 Connector

Pin	Z	A	B	C	D	E	F
22	GND	GA4	GA3	GA2	GA1	GA0	GND
21	GND	CLK6	GND	LAN1_TXDP0	LAN1_TXDN0	CK_ PCIE-N	GND
20	GND	CLK5	GND	LAN1_TXDP2	GND	CK_ PCIE-P	GND
19	GND	GND	GND	LAN1_TXDN2	LAN1_TXDP1	LAN1_TXDN1	GND
18	GND	PCIE_TXP2	LAN1_TXDP3	LAN1_TXDN3	GND	P3V3	GND
17	GND	PCIE_TXN2	GND	PRSTJ	REQ6#	GNT6#	GND
16	GND	GPIO0	PCIE_ RXP2	USB6-P	GND	PCIE_RST#	GND
15	GND	RGB_BLUE	PCIE_ RXN2	USB6-N	REQ5#	GNT5#	GND
14	GND	GPIO1	NC	USB_5_OC#	SATA_TX-N1	COM2_RI#	GND
13	GND	LAN2_TXDP0	GND	SATA_TX-P1	COM2_DTR#	COM2_CTS#	GND
12	GND	GPIO2	LAN2_TXDN0	USB5-P	SATA_RX-N1	COM2_SOUT	GND
11	GND	LAN2_TXDP1	GND	SATA_RX-P1	COM2_RTS#	COM2_SIN	GND
10	GND	GPIO3	LAN2_TXDN1	USB5-N	GND	COM2_DSR#	GND
9	GND	VSY/ GPIO4	GND	RGB_GREEN	COM2_DCD#	COM3_RI#	GND
8	GND	HSY/ GPIO5	LAN2_TXDP2	LAN2_TXDN2	GND	COM3_DTR#	GND
7	GND	RGB_RED	GND	+5V	COM3_CTS#	COM3_SOUT	GND
6	GND	DDC_CLK/ GPIO6	LAN2_TXDP3	LAN2_TXDN3	GND	CON3_RTS#	GND
5	GND	DDC_DAT/ GPIO7	GND	SATA_TX_N2	COM3_SIN	COM3_DSR#	GND
4	GND	V(I/O)	SATA_RX-P2	SATA_RX-N2	SATA_TX_P2	COM3_DCD#	GND
3	GND	CLK4	GND	GNT3#	REQ4#	GNT4#	GND
2	GND	CLK2	CLK3	SYSEN#	GNT2#	REQ3#	GND
1	GND	CLK1	GND	REQ1#	GNT1#	REQ2#	GND

Table 4-5: CompactPCI J2 Connector Pin Definition

COM port
VGA (shared w/ GPIO pin 4-7 by switch selection)
Serial ATA
USB port
PCI-Express x1
Ethernet port

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4.3 CT-31 Switch Settings

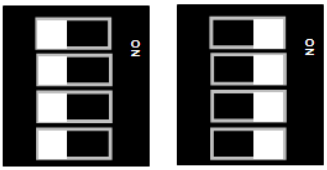
Clear CMOS Switch (SW4)

The CT-31 comes with a Clear CMOS switch to reset the CMOS values to default. The switch is located on solder side of the board, under the "CE" logo. Press the switch to clear the CMOS and reset the values to default.



VGA/GPIO Mode Switches (SW1, SW3)

The VGA and GPIO 4~7 signals to J2 share the same pins and are selected by switch settings. SW1 is located on the CT-31 component side (see “CT-31 PCB Layout” on page 14) and SW3 is located on the solder side behind SW1 (see “Removing the DB-3610CF Adapter Board” on page 21). When the switches are set to VGA mode, the VGA signals are available to J2, and there are only four GPIO signals connected to J2 (GPIO 0~3). When the switches are set to GPIO mode, there are eight GPIO signals connected to J2 and VGA output to the RTM is not available. The switches are set to VGA mode by default.



SW1 **SW3**

Mode	SW1	SW3
VGA (default)	All OFF	All ON
GPIO 4~7	All ON	All OFF

Table 4-6: VGA/GPIO Mode Switch Settings

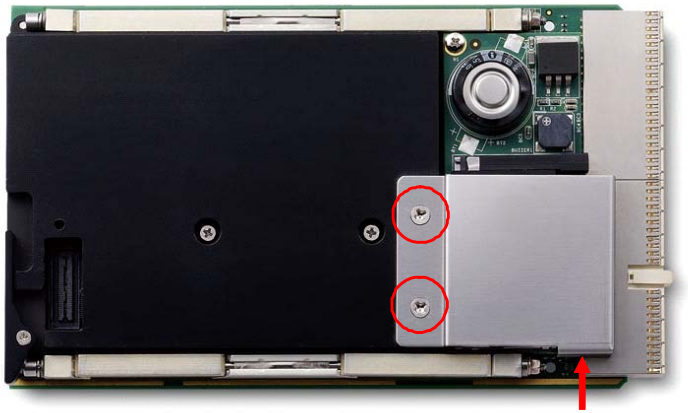
NOTE: To enable VGA output on the RTM, *Onboard VGA Output Select* must be set to *Rear* in the BIOS *Advanced Chipset Settings*.

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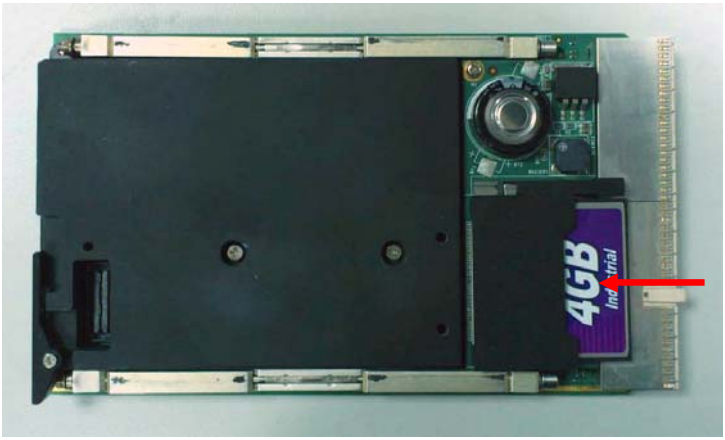
4.4 DB-3610CF Adapter Board

Installing a CF Card

1. Remove the two screws securing the CF retention bracket. Note the flange indicated by the arrow.



2. Insert the CF card into the slot as indicated by the arrow.

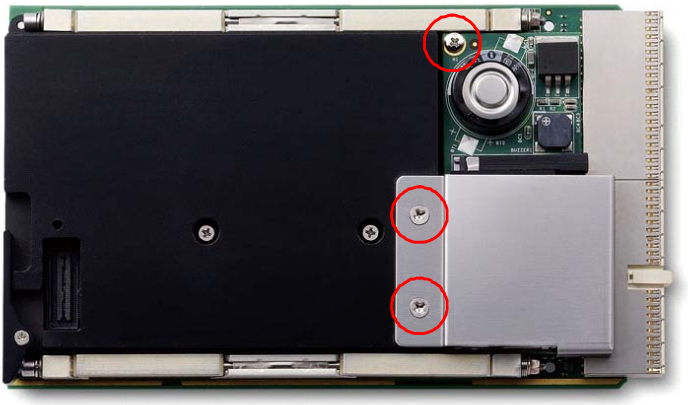


3. Replace the retention bracket with securing the two screws removed in Step 1. Make sure the bracket lies flat on the CF card socket and the flange is under the DB-3610 PCB.

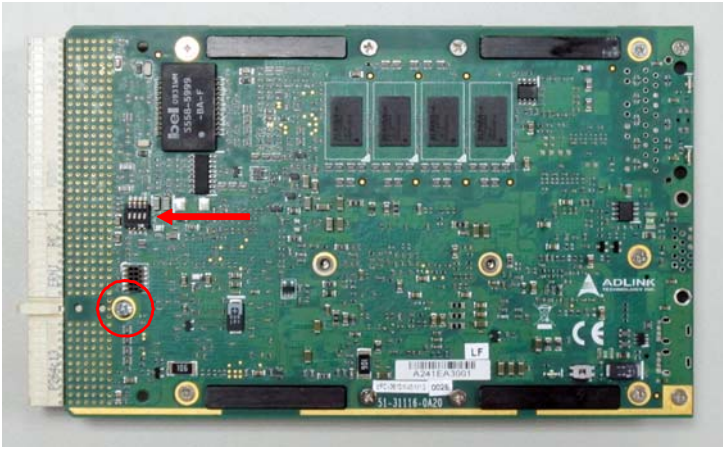
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Removing the DB-3610CF Adapter Board

1. Remove the two screws securing the CF retention bracket and the screw next to the Gold Capacitor.

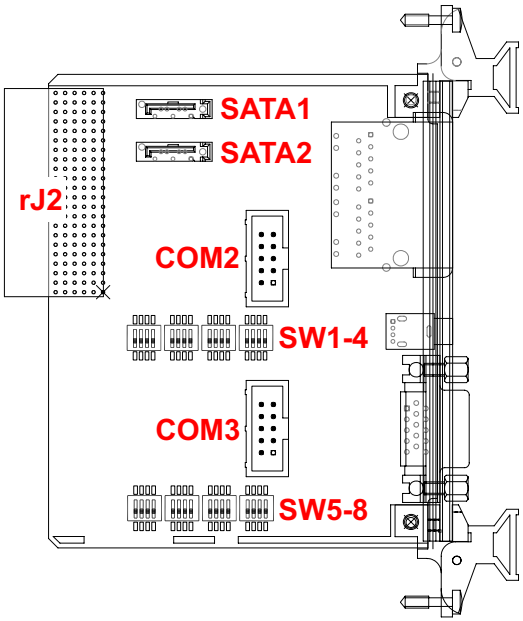


2. Remove the screw indicated on the solder side of the board. Note the location of SW3 (VGA/GPIO Mode Switch).



3. Lift the DB-3610CF Adapter Board from the CT-31 main assembly.

4.5 cPCI-R3610T RTM Board Layout



COM2/3	COM box headers	**rJ2**	CompactPCI connector
SATA1/2	SATA ports	**SW1-8**	Switches

Figure 4-3: cPCI-R3610T RTM Board Layout

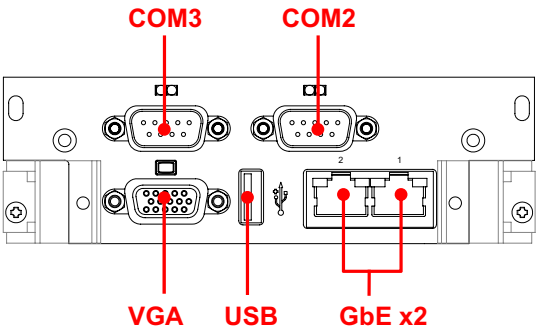


Figure 4-4: cPCI-R3610T RTM Front Panel

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4.6 cPCI-R3610T RTM Connector Pin Assignments

USB Connector on RTM

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

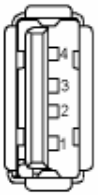


Table 4-7: USB Connector Pin Definition

VGA Connector on RTM (DB-15)

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		

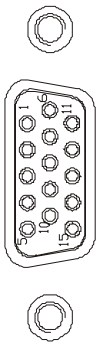
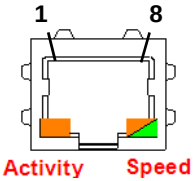


Table 4-8: VGA Connector Pin Definition

Gigabit Ethernet Connectors on RTM (RJ-45)

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 4-9: GbE Connector 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 4-10: Ethernet Status LED Definitions

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Serial Port DB-9 Connector on RTM (COM2-3)

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

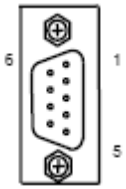


Table 4-11: DB-9 Serial Port Connector Pin Definition

Serial Port Box Header on RTM (COM2/3)

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

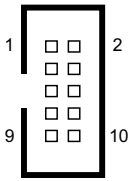


Table 4-12: cPCI-R3610T Serial Port Box Header Pin Definition

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Serial ATA Connectors on RTM

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



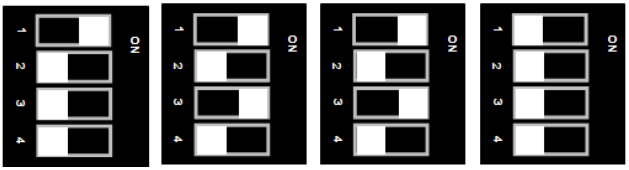
Table 4-13: Serial ATA Connector Pin Definition

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4.7 cPCI-R3610T RTM Switch Settings

COM2 Mode Selection Switches on RTM (SW1~SW4)

These switches on the RTM set COM2 to RS-232 full modem, RS-422, RS-485, or RS-485+ half-duplex mode. RS-232 full modem is set by default. See “cPCI-R3610T RTM Board Lay-out” on page 22 for switch locations.



SW1 SW2 SW3 SW4

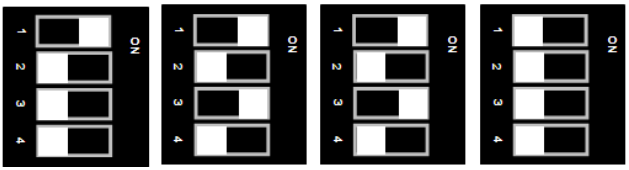
Mode	Pin	SW1	SW2	SW3	SW4
RS-232	1	OFF	ON	ON	ON
	2	OFF	OFF	OFF	OFF
	3	OFF	ON	ON	OFF
	4	OFF	OFF	OFF	OFF
RS-422	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	ON
	3	ON	OFF	OFF	OFF
	4	OFF	ON	ON	OFF
RS-485	1	ON	OFF	OFF	OFF
	2	OFF	ON	ON	OFF
	3	ON	OFF	OFF	ON
	4	OFF	ON	ON	OFF
RS-485+	1	OFF	OFF	OFF	OFF
	2	ON	ON	ON	OFF
	3	OFF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

Table 4-14: COM2 Mode Selection Switch Settings

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COM3 Mode Selection Switches on RTM (SW5~SW8)

These switches on the RTM set COM3 to RS-232 full modem, RS-422, RS-485, or RS-485+ half-duplex mode. RS-232 full modem is set by default. See “cPCI-R3610T RTM Board Layout” on page 22 for switch locations.



SW5 **SW6** **SW7** **SW8**

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

Table 4-15: COM3 Mode Selection Switch Settings

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5 Driver Installation

The CT-31 drivers are available on the ADLINK All-In-One CD at **X:\cPCI\cPCI-3610**, or from the ADLINK website (**http://www.adlinktech.com**). This section describes the driver installation procedures for Windows® XP.

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\infinst911autol.exe**.
3. Install the VGA driver and utilities by running the program **...\Graphics\[CPU type]\ winxp.zip\setup.exe**.
4. Install the LAN driver by running the program **…\LAN\PROXP.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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6 Utilities

6.1 Watchdog Timer

This section describes the operation of the CT-31's watchdog timer (WDT). The primary function of the WDT is to monitor the CT-31'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 CT-31 custom WDT circuit is implemented using the internal I/O of the ITE SuperIO IT8783 which is at 2Eh of LPC. The basic functions of the WDT include:

- Starting the timer countdown
- Enabling or disabling WDT
- Enabling or disabling WDT countdown LED ON
- Reloading the timeout value to keep the watchdog from timing out
- Setting the range of the timeout period from 1 second or minute to maximum 65635 seconds or minutes
- Sending a RESET signal to the system when the watchdog times out

Using the Watchdog in an Application

The following section describes using the WDT functions in an application. The WDT reset function is explained in the previous section. This can be controlled through the registers in the CT-31'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 count-down 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\CT-31\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>

#define IT8783_ID1 0x87
#define IT8783_ID2 0x83

static unsigned int IT8783_ioPort = 0x2e;

//Check index port
void Enter_IT8783_Config(unsigned int flag)
{
   if(flag) IT8783_ioPort = 0x4e;

   switch(IT8783_ioPort)
   {
      case 0x2E:  //Address port = 0x2E, enter keys =
      0x87, 0x01, 0x55, 0x55
         outportb(0x2E, 0x87);
         outportb(0x2E, 0x01);
         outportb(0x2E, 0x55);
         outportb(0x2E, 0x55);
         break;
      case 0x4E:  //Address port = 0x4E, enter keys =
      0x87, 0x01, 0x55, 0xAA
         outportb(0x4E, 0x87);
         outportb(0x4E, 0x01);
         outportb(0x4E, 0x55);
         outportb(0x4E, 0xAA);
         break;
      default:
         break;
       }
}

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

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```
   outportb(IT8783_ioPort, 0x02);
   outportb(IT8783_ioPort+1, 0x02);
}

//Check chip
void Get_IT8783_ID(unsigned int &ID1, unsigned int &ID2)
{
   outportb(IT8783_ioPort, 0x20);
   ID1 = inportb(IT8783_ioPort+1);
   outportb(IT8783_ioPort, 0x21);
   ID2 = inportb(IT8783_ioPort+1);
}

//WDT and LED program
void IT8783_3_WDTRun(unsigned int count_value, unsigned
     int PLEDflag)   //for CT-31
{
   unsigned long tempCount;
   unsigned int registerValue;

   outportb(IT8783_ioPort, 0x07);
   outportb(IT8783_ioPort+1, 0x07);// Device 7

   outportb(IT8783_ioPort, 0xf8);
   outportb(IT8783_ioPort+1, 0x00);// PLED mapping to
      nothing, disable PLED function

   if(PLEDflag == 1)
   {
      outportb(IT8783_ioPort, 0x2D);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue |= 0x01;       // set Pin109 is GPIO
      function GP60
      outportb(IT8783_ioPort+1, registerValue);

      outportb(IT8783_ioPort, 0xC5);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue &= 0xfe;      // set GP60 is alternate
      function
```

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```
   outportb(IT8783_ioPort+1, registerValue);

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

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

   outportb(IT8783_ioPort, 0xf9);
   registerValue = inportb(IT8783_ioPort + 1);
   registerValue |= 0x02;
   registerValue &= 0xfb;
   outportb(IT8783_ioPort+1, registerValue);
}
outportb(IT8783_ioPort, 0x71);
registerValue = inportb(IT8783_ioPort + 1);
registerValue |= 0xD0;  // set Mouse & Keyboard
   interrupt Enable
outportb(IT8783_ioPort+1, registerValue);

outportb(IT8783_ioPort, 0x73);
outportb(IT8783_ioPort+1, count_value); // set WDT
   count LSB
tempCount = tempCount >> 8;
outportb(IT8783_ioPort, 0x74);
outportb(IT8783_ioPort+1, count_value); // set WDT
   count MSB

if(count_value >= 60)
{
   outportb(IT8783_ioPort, 0x72);
   registerValue = inportb(IT8783_ioPort+1);
   registerValue &= 0x8f;
   registerValue |= 0x10; //enable WDT output through
   PowerOK!
   outportb(IT8783_ioPort+1, registerValue); // set
   WDT count is minute

   tempCount = count_value / 60;
   if((count_value%60) > 30)
```

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```
            tempCount++;
         if(tempCount > 65535)
            tempCount = 65535;
         printf("WDT timeout in %d minutes.\n", tempCount);
      }
      else
      {
         outportb(IT8783_ioPort, 0x72);
         registerValue = inportb(IT8783_ioPort+1);
         registerValue |= 0x80;

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

         outportb(IT8783_ioPort+1, registerValue); // set
         WDT count is second
      }

   }
```

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7 BIOS Setup

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

7.1 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.

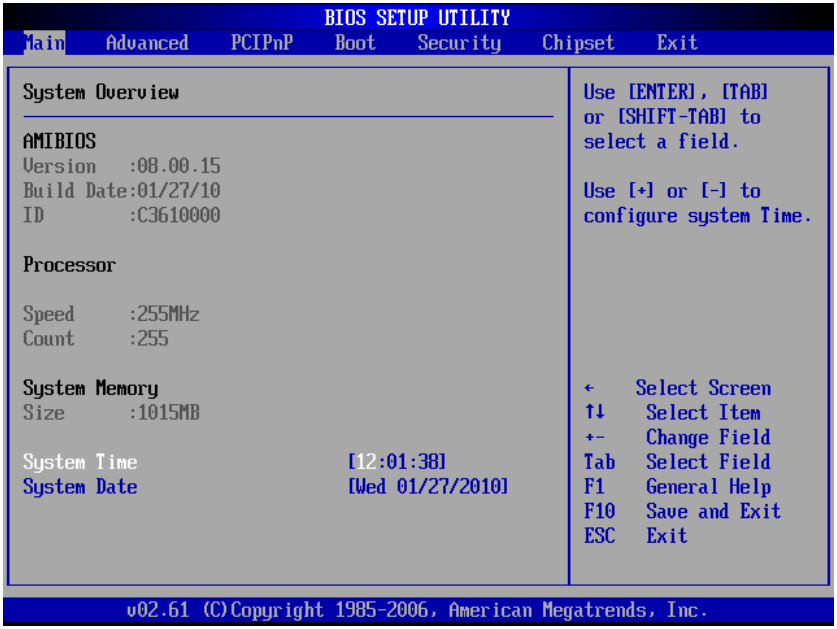
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Setup Menu

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.

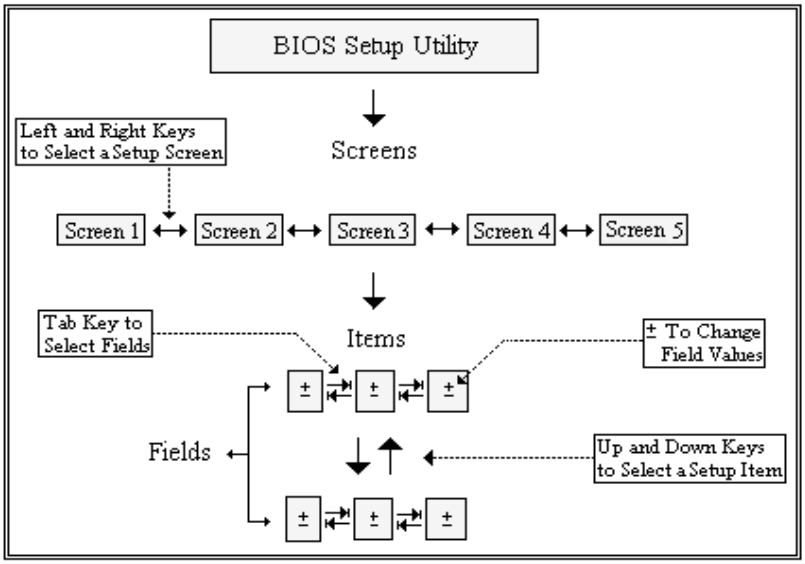


Navigation

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.

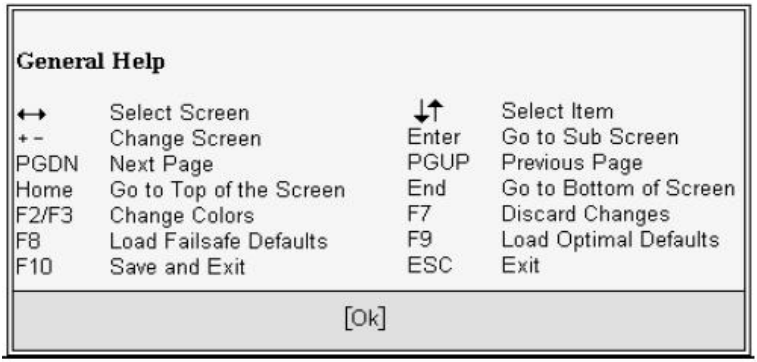
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the motherboard to boot up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

Hotkey Descriptions

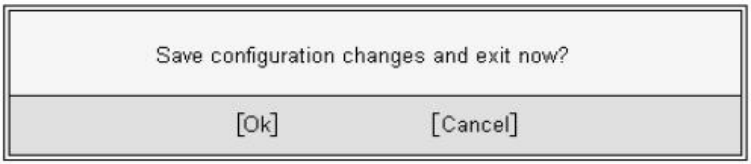
F1 The < F1 > key allows you to display the General Help screen.

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

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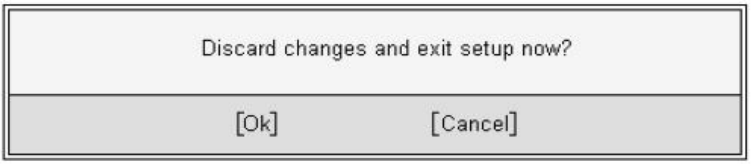


F10 The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:



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:



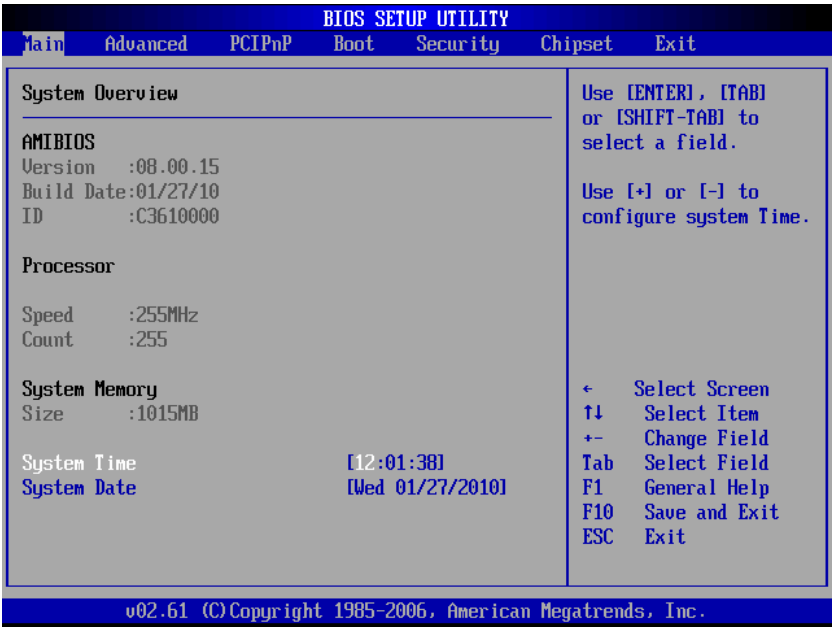
Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

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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7.2 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.

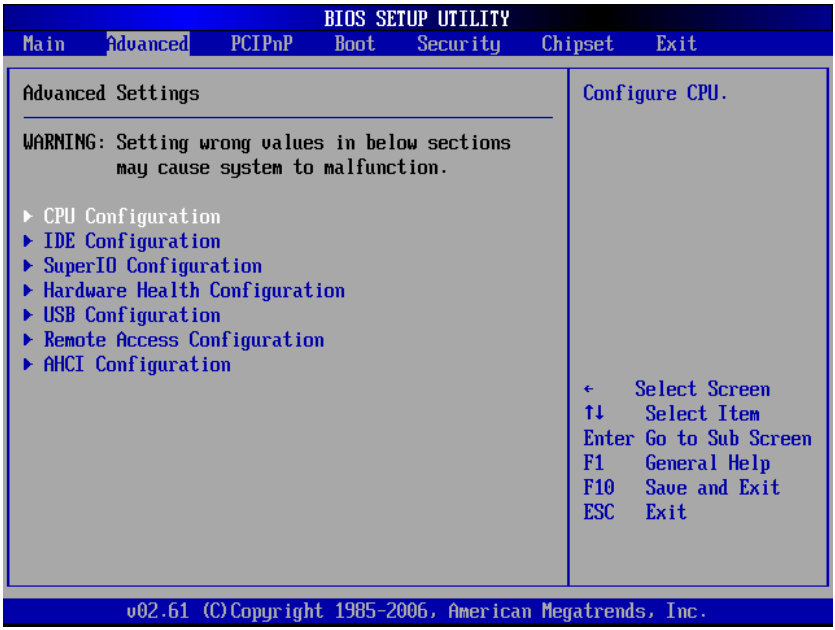
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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7.3 Advanced BIOS Setup

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

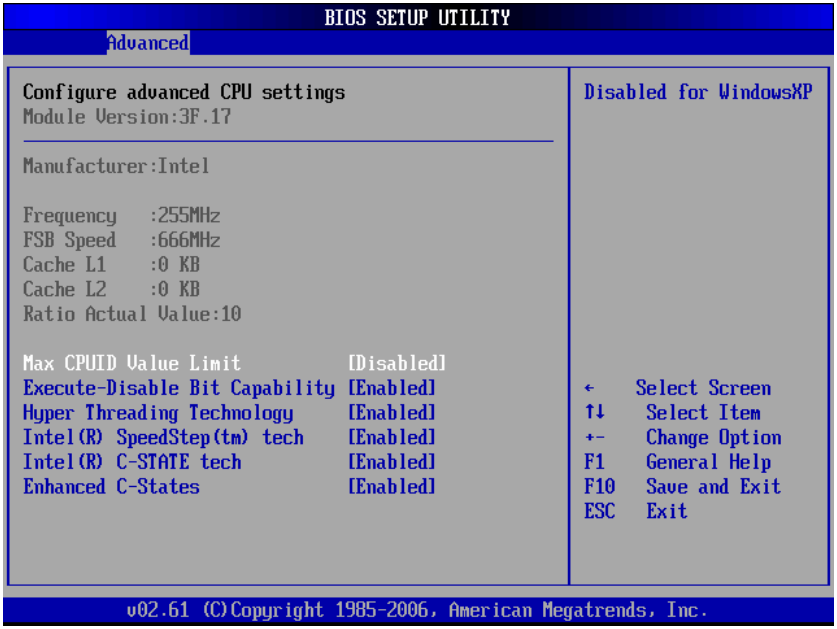
The sub menus are described on the following pages.



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7.3.1 CPU Configuration

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



Max CPUID Value Limit

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

When Enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor sup-

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ports a higher CPUID input value. When Disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

Execute-Disable Bit Capability

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

Hyper-Threading Technology

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

Intel® Speedstep™ Tech

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

Intel® C-State Tech

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

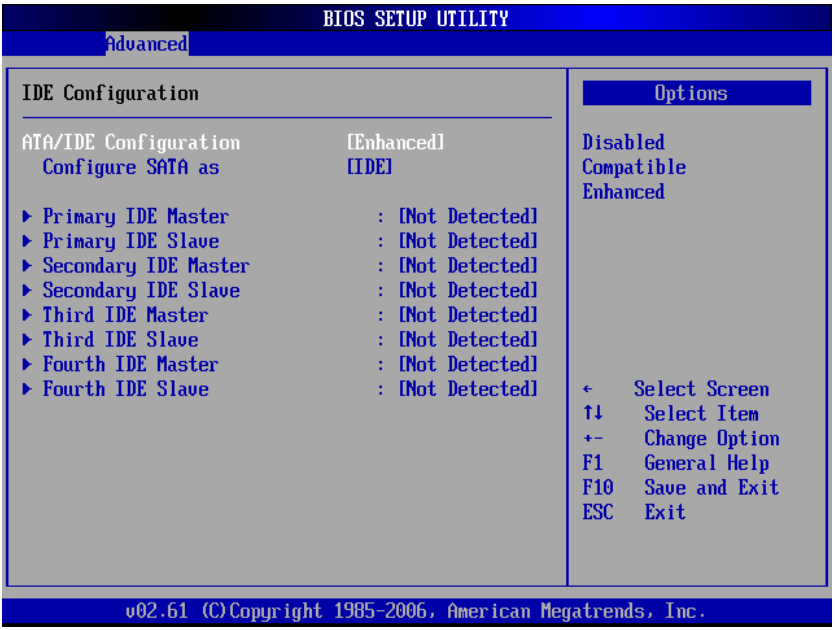
Enhanced C-State Tech

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

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7.3.2 IDE Configuration

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



ATA/IDE Configuration

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

Configure SATA as

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

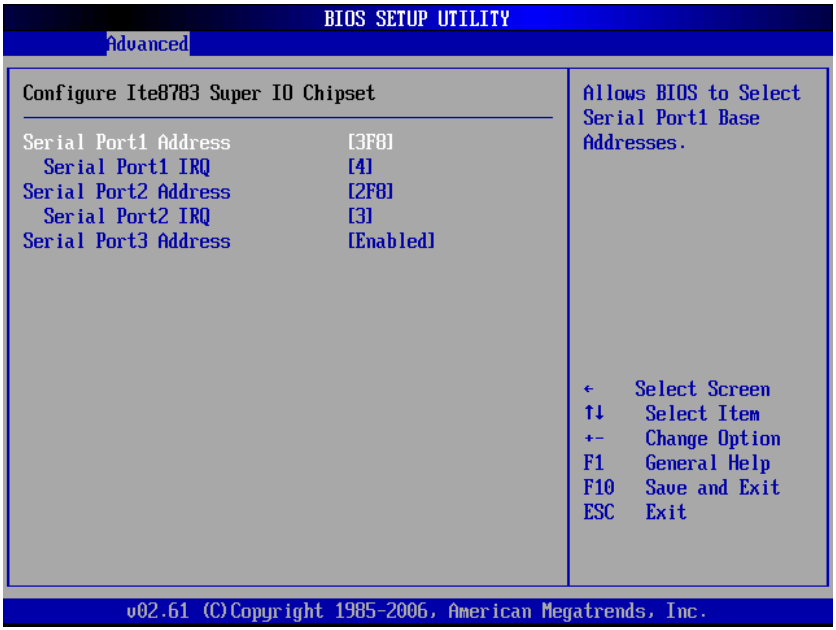
IDE Master/Slave

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

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7.3.3 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 Port1/2 Address

Select an address for Serial Port1/2.
Port1 Options: 3F8, 3E8, 2E8, Disabled.
Port2 Options: 2F8, 3E8, 2E8, Disabled.

Serial Port1/2 IRQ

Select an IRQ for Serial Port1/2.
Options: 3, 4, 10, 11.

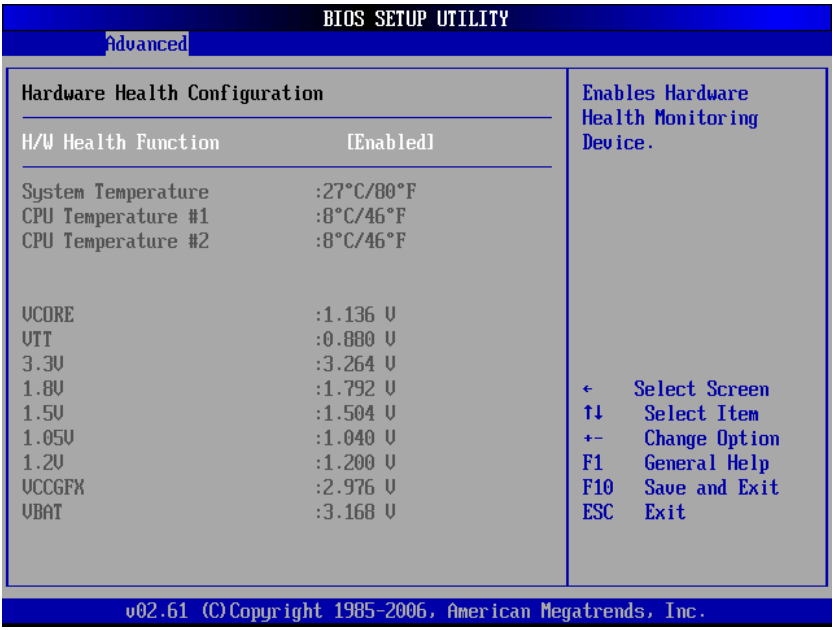
Serial Port3

Enable or disable Serial Port3 (address/IRQ: 3E8/10).

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7.3.4 Hardware Health Configuration

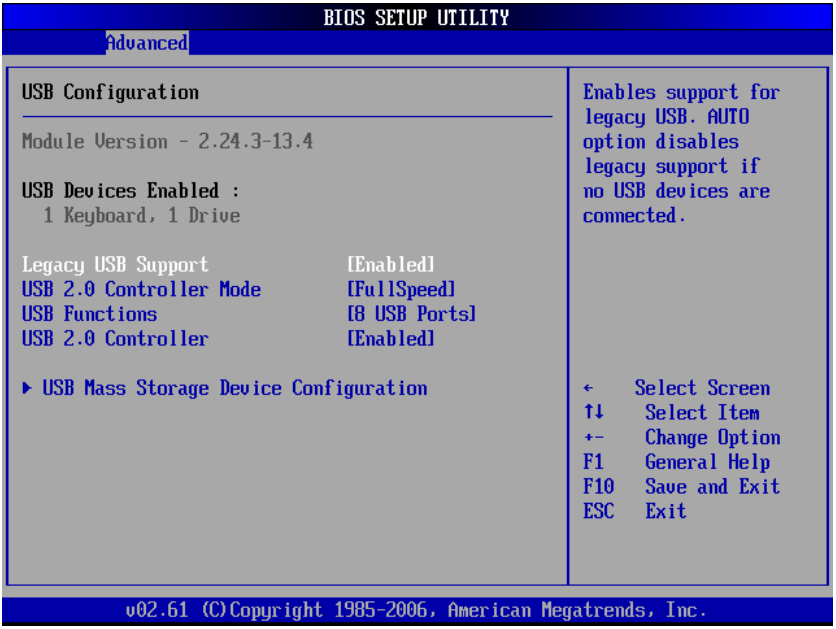
This option displays the current status of all of the monitored hardware devices/components such as voltages and temperatures. The options are Enabled and Disabled.



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7.3.5 USB Configuration

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



Legacy USB Support

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

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

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

USB 2.0 Controller Mode

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

USB Functions

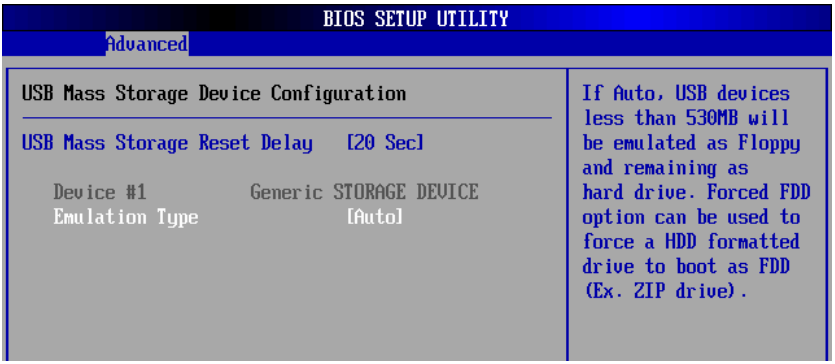
Set the value to allow the system to disable, enabled and select a set number of onboard USB ports.

USB 2.0 Controller

Enable or disable USB 2.0 functionality to all USB ports.

USB Mass Storage Device Configuration

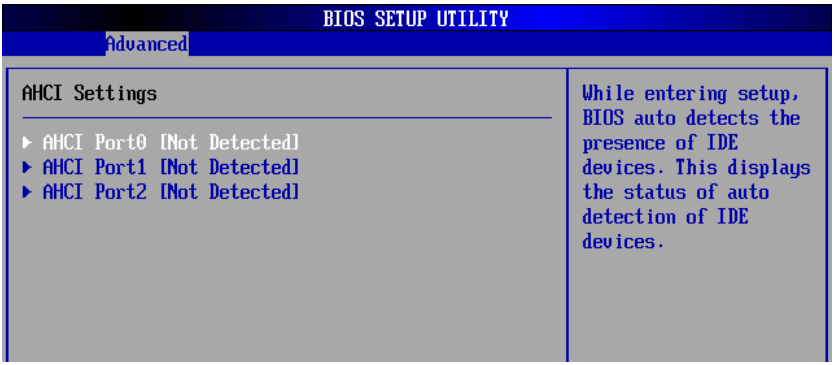
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB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

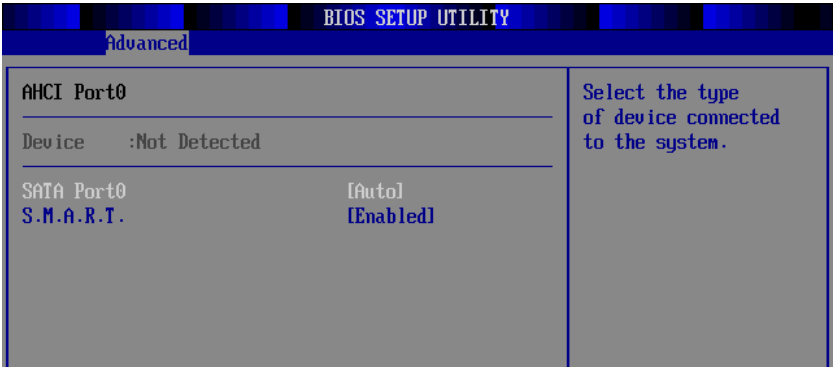


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7.3.6 AHCI Configuration

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





SATA Port0/1/2

Select the type of device connected to the system.

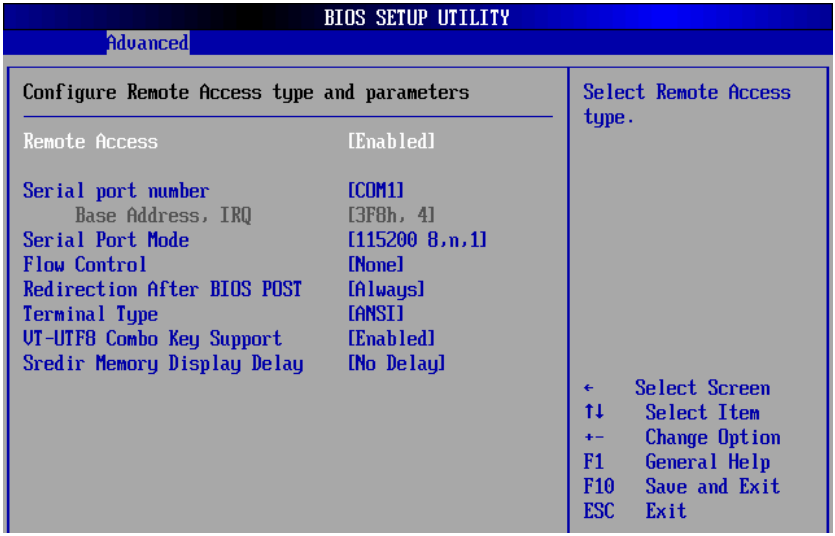
S.M.A.R.T

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

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7.3.7 Remote Access Configuration

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



Remote Access

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

NOTE: Enabling Remote Access requires a dedicated serial port connection. When the assigned serial port is disabled, Remote Access should also be disabled to prevent the system from booting abnormally.

Serial Port Number

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

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

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Serial Port Mode

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

Flow Control

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

Redirection After BIOS POST

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

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

Terminal Type

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

VT-UTF8 Combo Key Support

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

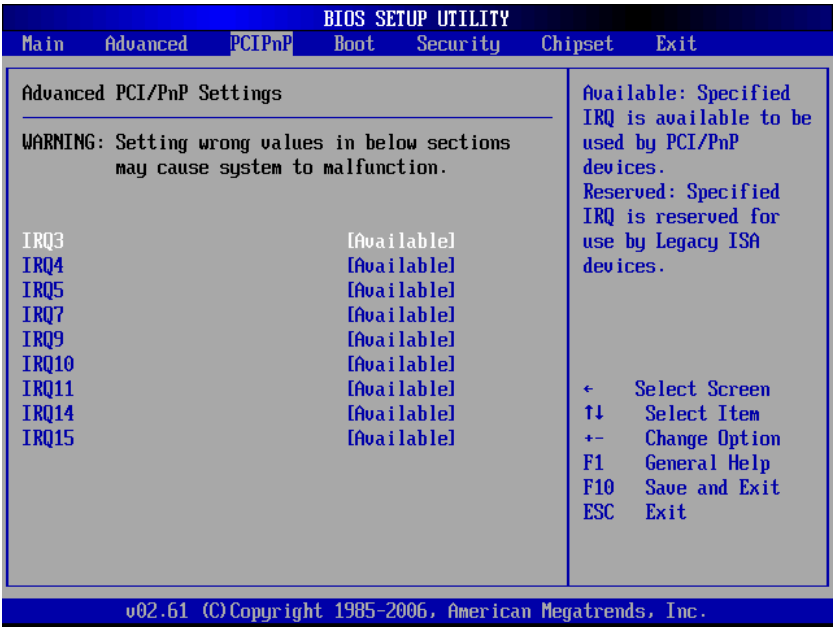
Sredir Memory Display Delay

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

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7.4 Advanced PCI/PnP Settings

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



IRQ Channel

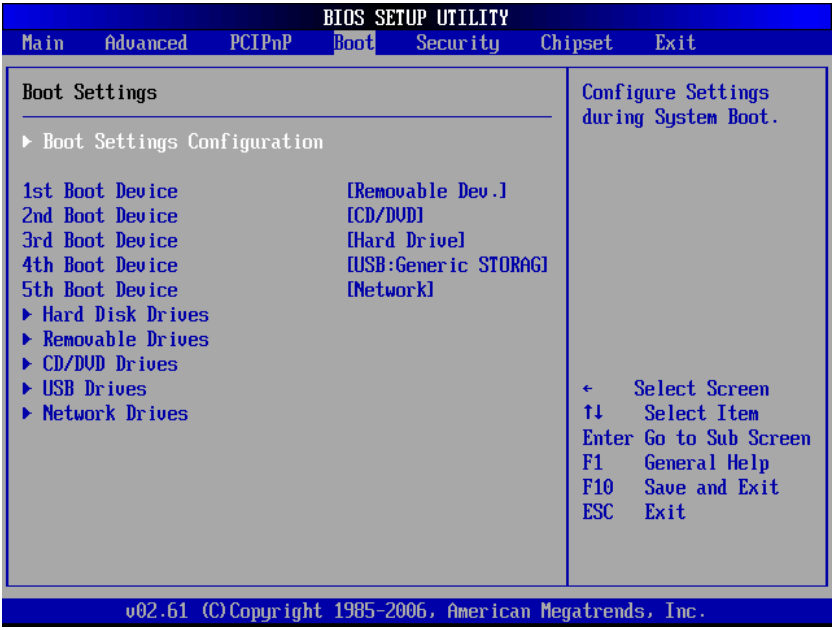
Set this value to allow the IRQ channel settings to be modified.

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

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7.5 Boot Settings

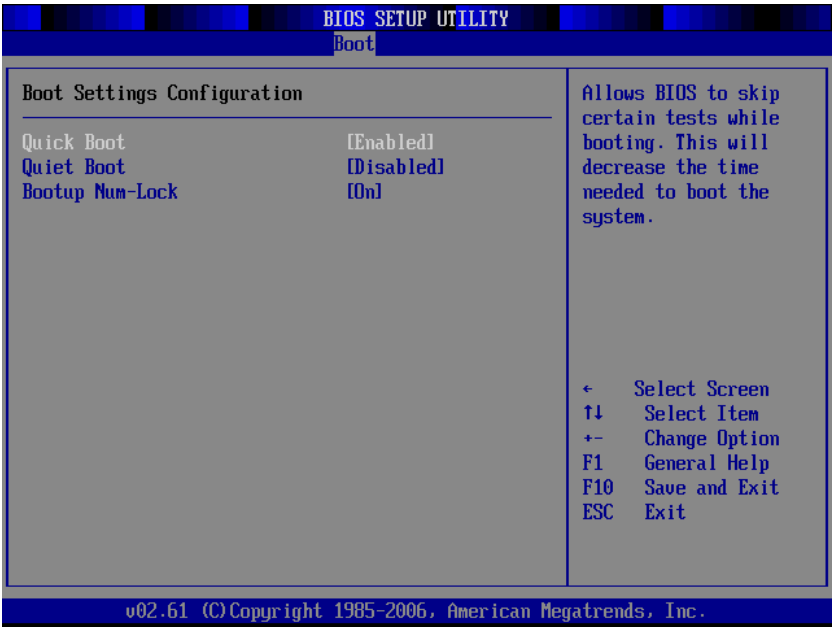
Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The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



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7.5.1 Boot Settings Configuration

Use this screen to select options for the Boot Settings Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option.



Quick Boot

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

Quiet Boot

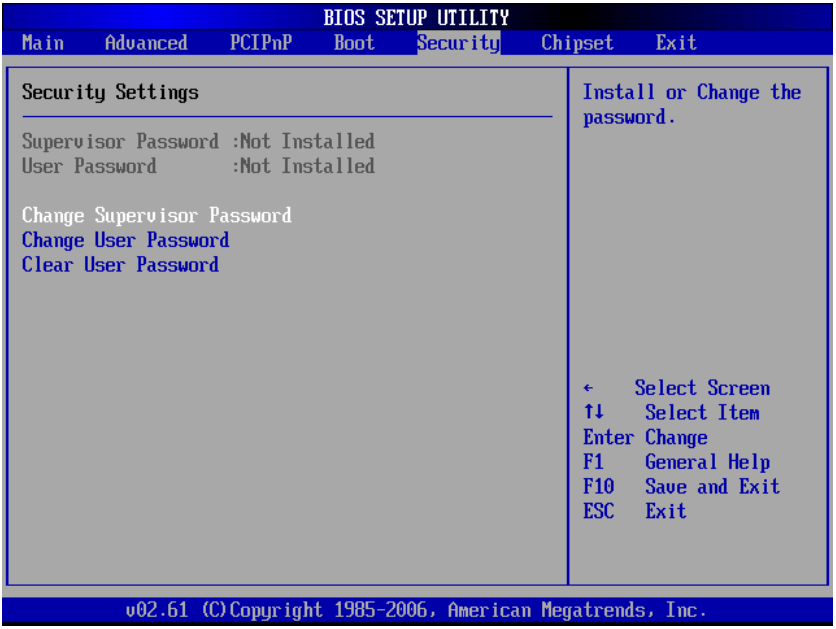
When this feature is **enabled**, the BIOS will display the OEM logo during the boot-up sequence, hiding normal POST messages. When it is **disabled**, the BIOS will display the normal POST messages, instead of the OEM logo.

Bootup Num-Lock

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

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7.6 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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7.7 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.



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.

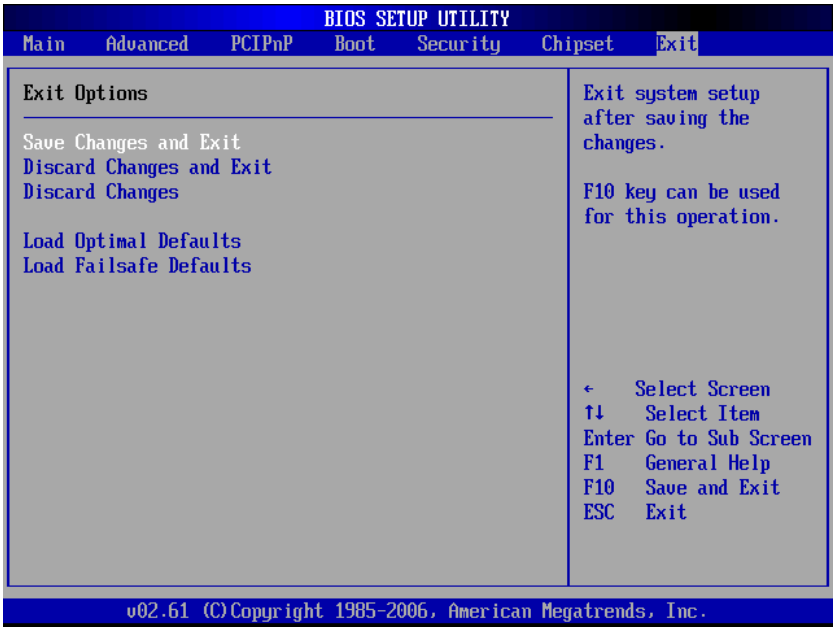
Initial Graphics Adapter

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

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7.8 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

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