NuPRO-E330

Full-Size PICMG 1.3 Intel® Core™ i7/i5/i3
Q57 Express Chipset SHB

User's Manual



Manual Rev.: 2.01

Revision Date: January 6, 2011

Part No: 50-13066-1010

Recycled Paper

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Revision History

Revision	Release Date	Description of Change(s)
2.00	2010/05/28	Initial Release
2.01	2011/01/06	Update specifications: memory, temperature, OS support; delete IDE, Turbo Boost; correct dimensions, Floppy/Parallel connector layout, graphics card driver path

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Preface

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Using this Manual

Audience and Scope

The NuPRO-E330 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:

Preface: Presents important copyright notifications, disclaimers, trademarks, and associated information on the proper understanding and usage of this document and its associated product(s).

Chapter 1, Introduction: Introduces the NuPRO-E330, its features, applications, and specifications, including functional descriptions and board layout.

Chapter 2, Hardware Information: Provides technical information on connectors and jumpers for configuring the NuPRO-E330.

Chapter 3, Getting Started: Illustrates how to install components on the NuPRO-E330 such as CPU, heatsink, and memory modules.

Chapter 4, Driver Installation: Provides information on how to install the NuPRO-E330 device drivers.

Chapter 5, BIOS Setup: Describes basic navigation for the AMIBIOS®8 BIOS setup utility.

Appendix A, Watchdog Timer: Presents information on implementing the watchdog timer.

Appendix B, System Resources: Presents information on I/O mapping, IRQ routing, and resource allocation.

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 ADLINK NuPRO-E330 is a PICMG 1.3 System Host Board (SHB) supporting the next-generation Intel® Core™ i7/i5/i3 and Pentium® processors in LGA1156 package to deliver a scalable high performance platform for a wide array of industrial applications. The NuPRO-E330 supports 32nm and 45nm process CPUs at up to 3.33GHz with integrated graphics and memory controllers, Direct Media Interface (DMI) and Flexible Display Interface (FDI) connectivity to the Intel® Q57 Express Chipset. Dual-channel DDR3 1066/1333 MHz memory is supported up to a maximum of 8 GB in two DIMM slots.

These advanced features, coupled with PCI Express® x16 expansion capability, dual PCI Express®-based Gigabit Ethernet, PCI Express Mini Card slot and diverse I/O and storage make the NuPRO-E330 ideal for instrumentation and automation control applications.

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1.2 Features

- Supports Intel® Core™ i7/i5/i3 and Pentium® processors in LGA1156 package
- Integrated Intel® HD Graphics on dual core 32nm (Clarkdale) processors
- PCI Express® x16 expansion capability via backplane
- PCI Express Mini Card slot
- Dual Gigabit Ethernet
- 9x USB 2.0 ports (1x on bracket, 4x onboard, 4x on backplane)
- 6x SATA 3 Gb/s ports (4x onboard, 2x on backplane)
- 6x COM ports (including 1x RS-232/422/485/485+)
- Watchdog Timer, Hardware Monitor
- Optional HD audio kit (DB-Audio2 daughter board)
- TPM hardware security chip
- RoHS compliant



NOTE:

To purchase the optional DB-Audio2 daughter board, please contact your ADLINK sales representative.

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1.3 Specifications

System	
CPU	Intel® Core™ i7/i5/i3 and Pentium® Dual Core processors in LGA1156 package: • Intel® Core™ i7-860 Processor, 2.80 GHz, 8M Cache, 45nm, 95W, 4 cores/8 threads • Intel® Core™ i5-750 Processor, 2.66 GHz, 8M Cache, 45nm, 95W, 4 cores/4 threads • Intel® Core™ i5-660 Processor, 3.33 GHz, 4M Cache, 32nm, 73W, 2 cores/4 threads, HD Graphics • Intel® Core™ i3-540 Processor, 3.06 GHz, 4M Cache, 32nm, 73W, 2 cores/4 threads, HD Graphics • Intel® Pentium® G6950 Processor, 2.80 GHz, 3M Cache, 32nm, 73W, 2 cores/2 threads, HD Graphics
Chipset	• Intel® Q57 Platform Controller Hub
Memory	• Two 240-pin DIMM sockets support dual-channel 1066MHz DDR3 (up to 8 GB)
BIOS	• AMI BIOS in 32-Mbit SPI Flash
Audio	• Intel® High Definition Audio support via DB-Audio2 daughter board
Watch Dog Timer	• 1-255 second or 1-255 minute programmable and can generate system reset.
Hardware Monitor	• CPU/System temperature, fan speed and onboard DC voltage
TPM	• Infineon SLB 9635 TT 1.2
Operating Systems	• Windows® XP, Vista 32/64-bit, 7 32/64-bit,Server 2008; Fedora™ 10

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I/O Interfaces	
Serial ATA	• 6x SATA 3 Gb/s ports (4x onboard, 2x on backplane)
I/O Ports	• 1x USB 2.0 port on rear panel, 4x via onboard header, 4x via backplane • 6x serial ports via onboard pin-header (5x RS-232, 1x RS-232/422/485/485+) • 2x Gigabit Ethernet RJ45 ports • 1 VGA port (Dsub-15) • PS/2 Keyboard/Mouse (Mini-DIN 6-pin) • 1 Parallel port • 1 Floppy port
PCIe/PCI	• PCIe-x16, PCIe-x4 and PCI 32bit/33MHz via golden fingers • PCI Express Mini Card slot
Display	
Integrated Graphics	• Integrated Intel® HD Graphics on dual core 32nm (Clarkdale) processors
External Graphics	• PCI Express x16 or onboard PCI Express Mini Card slot for optional mPCIe-8770
Ethernet	
Controller	• Dual Gigabit Ethernet (Intel® 82578DM Gigabit Ethernet PHY, Intel® 82574L Gigabit Ethernet Controller) • Supports Preboot Execution Environment (PXE), Wake-On-LAN, and Intel® AMT 6.0 on LAN1 (82578DM)
Ports	• Two RJ-45 Ethernet ports
Mechanical and Environment	
Form Factor	• Standard full-size PICMG 1.3 SHB
Dimensions	• 338 x 126 mm (L x W)
Operating Temp.	• 0ºC to 60ºC
Storage Temp.	• -20ºC to 80ºC
Relative Humidity	• 10% to 90% non-condensing
Safety	• CE, FCC Class A

Table 1-1: NuPRO-E330 General Specifications

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1.4 Block Diagram

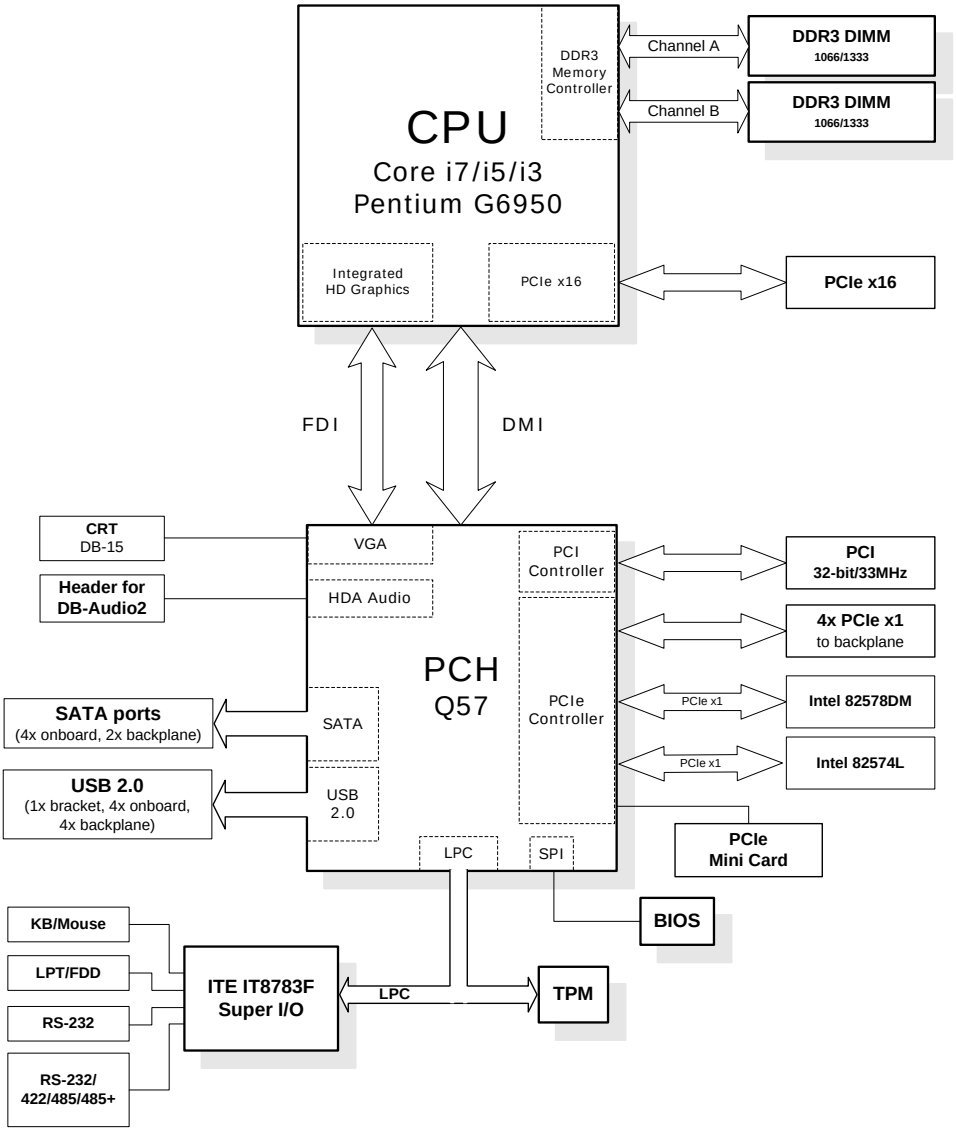


Figure 1-1: NuPRO-E330 Block Diagram

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1.5 Functional Description

Processor Support

The NuPRO-E330 is a single processor design for the latest Intel Clarkdale (32nm) and Lynnfield (45nm) processors in LGA1156 socket (Intel® Core™ i7/i5/i3, Pentium® G6950). An integrated memory controller supports dual channel 1066/1333 MHz DDR3 and integrated Intel® HD Graphics is supported on dual core 32nm (Clarkdale) processors. The CPU provides a PCI Express x16 for external graphics or expansion. Direct Media Interface (DMI) and Flexible Display Interface (FDI) provide connectivity to the Intel® Q57 Express Chipset.

Intel® Q57 Express Chipset

The Intel® BD82Q57 Platform Controller Hub (PCH) combines with the processor to provide a compact yet powerful 2-chip solution. Direct Media Interface (DMI) is the chip-to-chip connection between the processor and PCH. Intel® Flexible Display Interface carries display traffic from the integrated graphics in the processor to the legacy display connectors in the PCH. The PCH supports all other required interfaces including PCI Express, Serial ATA, USB 2.0, PCI, LPC, and SPI.

Dual-Channel DDR3 Memory

To meet the requirements of memory-intensive applications, the NuPRO-E330 has a dual-channel memory architecture supporting DDR3 1066/1333 MHz DIMMs. The key advantages of DDR3 are the higher bandwidth and the increase in performance at lower power than DDR2. DDR3 memory technology meets the requirements of the latest 3D graphics, multimedia, and network application, and boosts system performance by eliminating bottlenecks.

Gigabit Ethernet

The NuPRO-E330 utilizes an Intel® 82578DM Gigabit Ethernet PHY and Intel® 82574L Gigabit Ethernet Controller connected to the PCI-E bus of the Q57 PCH. Intel® AMT 6.0 (82578DM on LAN1), Wake-on-LAN and PXE are supported.

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Serial ATA

The NuPRO-E330 provides six Serial ATA ports with data transfer rates of up to 3.0 GB/s. Intel® Rapid Storage Technology supports AHCI and RAID 0/1/5/10 functionality.

Universal Serial Bus (USB) 2.0

The NuPRO-E330 provides nine USB 2.0 ports supporting transfer speeds up to 480 Mbps. All ports are high-speed, fullspeed, and low-speed capable.

Hardware monitoring

A built-in, proactive hardware monitoring system in the Super I/O monitors the CPU temperature, system fan speed, and voltage levels to prevent overheating and/or component damage, effect timely failure detection, and ensure stable supply of current for critical components.

Watchdog Timer

The watchdog timer (WDT) monitors system operations based on user-defined configurations. The WDT can be programmed for different time-out periods, such as from 1 to 255 seconds or from 1 to 255 minutes. The WDT generates a reset signal, then a reset request, after failure to strobe it within the programmed time period. A register bit may be enabled to indicate if the watchdog timer caused the reset event. The WDT register is cleared during the power-on sequence to enable the operating system to take appropriate action when the watchdog generates a reboot.

Trusted Platform Module

The NuPRO-E330 optionally supports TPM ver. 1.2 (Trusted Platform Module) for secure storage of keys, passwords and digital certificates. Systems supporting TPM offer improved hardware-based security in numerous applications, such as file and folder encryption, local password management, S-MIME e-mail, VPN and PKI authentication and wireless authentication for 802.1x and LEAP.

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Intel® Active Management Technology

Intel® Active Management Technology (Intel® AMT) is hardware-based technology for remotely managing and securing PCs out-of-band. Intel® AMT includes hardware-based remote management, security, power-management, and remote-configuration features. Intel® AMT allows remote access to a system when traditional techniques and methods are not available.

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1.6 Mechanical Drawing

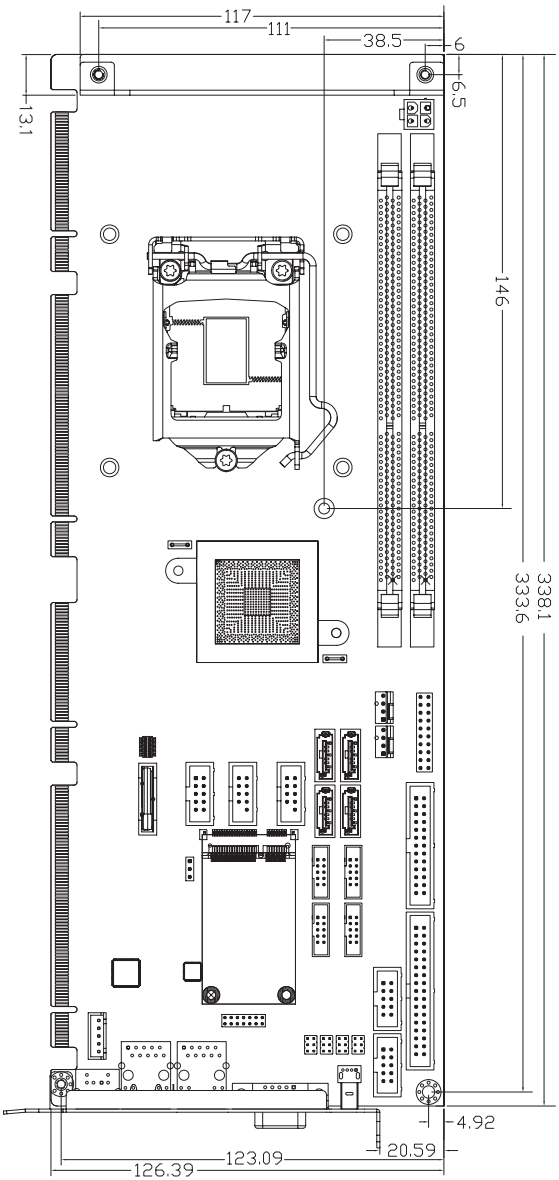


Figure 1-2: NuPRO-E330 Board Dimensions

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1.7 I/O Connectivity

I/O	Bracket	Onboard	Golden Finger	Remarks
VGA	Y	—	—	DB-15
LAN1/2 (RJ-45)	Y	—	—	Act/Link/Speed LEDs
PS/2 KB/MS	Y	—	—	—
KB header	—	Y	—	—
USB Rear Panel	1	—	—	
USB headers	—	4	—	2.54” pitch
USB backplane	—	—	4	—
COM1-2	—	Y	—	2.54” pitch
COM3-6	—	Y	—	2.00" pitch
Parallel port	—	Y	—	—
Floppy port	—	Y	—	—
SATA	—	4	2	—
PCIe x4	—	—	Y	—
PCIe x16	—	—	Y	—
PCIe Mini Card	—	Y	—	—
PCI 32bit/33MHz	—	—	Y	—

Table 1-2: NuPRO-E330 I/O Connectivity

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1.8 Power Consumption

Intel® Core™ i7-860 Processor, 2.80 GHz

Test Configuration	
CPU	Intel® Core™ i7-860 Processor, 2.80 GHz (4 cores)
Memory	Unigen MUUUDM8000ACELPAA DDR3 1333MHz 2x 1GB in 2 DIMM slots
Graphics	mPCIe-8770 PCIe Mini Card VGA graphics
SATA Channel 1	Seagate Barracuda 7200.10 160GB
Power Supply	LEMACS HG2-6350P 350W
Backplane	ADLINK EBP-5E1

DOS (idle)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	4.500	0.915	2.100	—
Watts (W)	54.00	4.58	6.93	65.51
Windows XP, logon screen (idle)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	1.824	0.575	2.620	—
Watts (W)	21.89	2.87	8.65	33.41
Windows XP, CPU Stress (Intel Power Thermal Utility)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	9.450	0.797	2.580	—
Watts (W)	113.40	3.99	8.51	125.90
Windows XP, Total System Stress (BurnIn Test 6.0)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	5.620	1.202	2.481	—
Watts (W)	67.44	6.01	8.19	81.64

Table 1-3: Core™ i7-860 Processor Power Consumption

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Intel® Core™ i3-540 Processor, 3.06 GHz

Test Configuration	
CPU	Intel® Core™ i3-540 Processor, 3.06 GHz (2 cores)
Memory	Unigen MUUUDM8000ACELPAA DDR3 1333MHz 2x 1GB in 2 DIMM slots
Graphics	Integrated on CPU
SATA Channel 1	Seagate Barracuda 7200.10 160GB
Power Supply	LEMACS HG2-6350P 350W
Backplane	ADLINK EBP-5E1

DOS (idle)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	3.342	0.750	1.583	—
Watts (W)	40.10	3.75	5.23	49.08
Windows XP, logon screen (idle)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	1.602	0.730	1.572	—
Watts (W)	19.22	3.65	5.19	28.06
Windows XP, CPU Stress (Intel Power Thermal Utility)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	4.990	0.726	1.645	—
Watts (W)	59.88	3.63	5.43	68.94
Windows XP, Total System Stress (BurnIn Test 6.0)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	3.360	1.199	1.644	—
Watts (W)	40.32	5.99	5.43	51.74

Table 1-4: Core™ i3-540 Processor Power Consumption

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Intel® Pentium® G6950 Processor, 2.80 GHz

Test Configuration	
CPU	Intel® Pentium® G6950 Processor, 2.80 GHz (2 cores)
Memory	Unigen MUUUDM8000ACELPAA DDR3 1333MHz 2x 1GB in 2 DIMM slots
Graphics	Integrated on CPU
SATA Channel 1	Seagate Barracuda 7200.10 160GB
Power Supply	LEMACS HG2-6350P 350W
Backplane	ADLINK EBP-5E1

DOS (idle)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	3.030	0.751	1.640	—
Watts (W)	36.36	3.76	5.41	45.53
Windows XP, logon screen (idle)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	1.594	0.728	1.621	—
Watts (W)	19.13	3.64	5.35	28.12
Windows XP, CPU Stress (Intel Power Thermal Utility)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	4.522	0.722	1.635	—
Watts (W)	54.26	3.61	5.40	63.27
Windows XP, Total System Stress (BurnIn Test 6.0)				
Power Req.	+12V	+5V	+3.3V	Total
Current (A)	3.044	1.640	1.568	—
Watts (W)	36.53	8.20	5.17	49.90

Table 1-5: Pentium® G6950 Processor Power Consumption

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1.9 Package Contents

Before unpacking, check the shipping carton for any damage. If the shipping carton and/or contents are damaged, inform your dealer immediately. Retain the shipping carton and packing materials for inspection. Obtain authorization from the dealer before returning any product to ADLINK.

- NuPRO-E330
- PS/2 Y cable x1
- SATA cable x2
- SATA power cable x1
- Floppy cable x1
- 2-port USB cable with bracket x1
- 2-port COM cable with bracket (2.00mm pitch) x2
- COM+Print cable with bracket (2.54mm pitch) x1
- COM cable with bracket (2.54mm pitch) x1
- ADLINK All-in-One Driver DVD
- User's manual



The NuPRO-E330 must be protected from static discharge and physical shock. Never remove any of the socketed parts except at a static-free workstation. Use the anti-static bag shipped with the product to handle the board. Wear a grounded wrist strap when installing and/or servicing.

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2 Hardware Information

This chapter provides information on the NuPRO-E330 board lay-out, connector pin assignments, and jumper settings.

2.1 Rear Panel I/O Ports

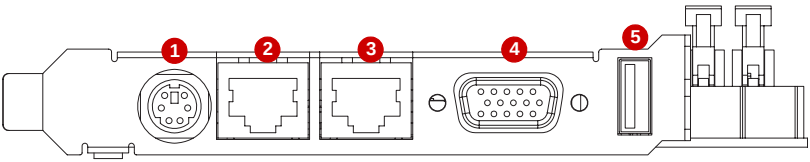
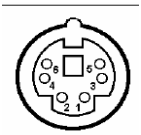


Figure 2-1: Rear Panel I/O Ports

	Connector	Description
1	PS/2 KB/MS port	Connects PS/2 mouse and keyboard via Y cable
2	LAN2 port (RJ-45)	Gigabit Ethernet
3	LAN1 port (RJ-45)	Gigabit Ethernet (supports Intel® AMT)
4	VGA port	DB-15 connector for CRT or LCD monitor
5	USB 2.0 port	High-speed USB 2.0 port

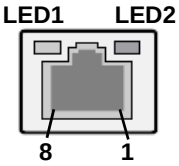
PS/2 Keyboard/Mouse Port



Pin #	Signal	Function
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	KBMS5V	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

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LAN (RJ-45) Ports

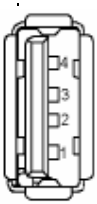


Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-

Refer to the table below for the LAN port LED definitions.

LED1		LED2	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10 Mb connection
On	Linked	Green	100 Mb connection
Blinking	Data Activity	Amber	1 Gb connection

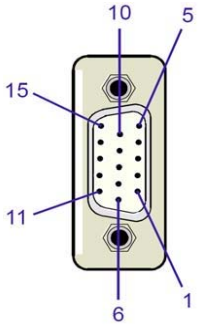
USB Connector



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

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VGA Port



Pin #	Signal
1	Red
2	Green
3	Blue
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	+5 V
10	Ground
11	NC
12	DDC DAT
13	HSYNC
14	VSYNC
15	DDC CLK

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2.2 Board Layout

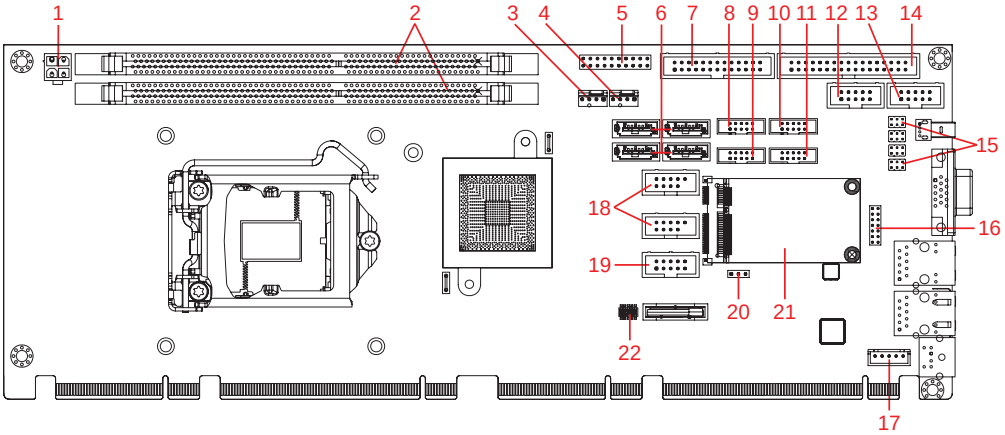


Figure 2-2: Connectors and Jumpers

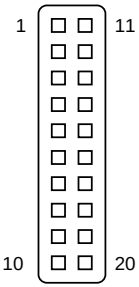
	Connector	Description
1	CN4	ATX 12V Power connector
2	DIMM1/2	DDR3 DIMM slots
3	FAN2	FAN2 connector
4	FAN1	FAN1 connector
5	CN1	System Panel pin header
6	CN7/8/10/11	SATA connectors
7	CN2	Parallel Port connector
8	CN13	COM6 connector
9	CN14	COM5 connector
10	CN17	COM4 connector
11	CN18	COM3 connector
12	CN5	COM2 connector
13	CN6	COM1 connector
14	CN3	Floppy connector
15	JP1-4	COM1 mode jumpers
16	JP6	PCIe Mini Card VGA connector
17	CN25	Keyboard connector
18	CN19/20	USB connectors
19	CN12	Audio connector
20	JBAT1	Clear CMOS
21	Slot1	PCIe Mini Card slot
22	CN23	Debug use only

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2.3 Onboard Connectors

System Panel Connector (CN1)

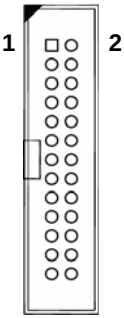
Connects to chassis-mounted buttons, speakers, and LEDs.



Pin #	Signal	Function	Pin Group
1	WDSPK	Speaker signal	Chassis Speaker
2	NC		
3	NC		
4	+5V	Power	
5	NC		
6	GND	Ground	Key Lock
7	KEYLOCK	Keyboard lock	
8	PLED	Power LED signal	Power LED
9	NC		
10	+5V	Power LED pull-up	
11	GND	Ground	Reset Button
12	RESETBT	RESET signal	
13	NC		
14	GND	Ground	Power Button
15	POWERBT	Power-on signal	
16	NC		
17	NC		
18	HDDLED	Hard Disk LED signal	HDD LED
19	+3.3V	Hard Disk LED pull-up	
20	NC		

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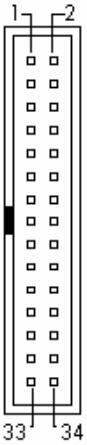
Parallel Port Connector (CN2)



Pin #	Signal	Pin #	Signal
1	Line Printer Strobe	2	Auto-Feed
3	Parallel Data 0	4	Error
5	Parallel Data 1	6	Initialize
7	Parallel Data 2	8	Select
9	Parallel Data 3	10	Ground
11	Parallel Data 4	12	Ground
13	Parallel Data 5	14	Ground
15	Parallel Data 6	16	Ground
17	Parallel Data 7	18	Ground
19	Acknowledge	20	Ground
21	Busy	22	Ground
23	Paper Empty	24	Ground
25	Select	26	NC

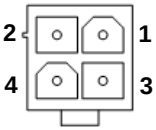
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Floppy Disk Drive Connector (CN3)



Pin #	Signal	Pin #	Signal
1	GND	2	Extended Density
3	GND	4	No Connect
5	NC	6	NC
7	GND	8	Index
9	GND	10	Motor A Select
11	GND	12	NC
13	GND	14	Drive A Select
15	GND	16	NC
17	GND	18	Step Direction
19	GND	20	Step Pulse
21	GND	22	Write Data
23	GND	24	Write Gate
25	GND	26	Track 0
27	GND	28	Write Protect
29	NC	30	Read Data
31	GND	32	FDD Head Select
33	NC	34	Disk Change

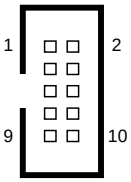
ATX 12V Power Connector (CN4)



Pin #	Signal
1	GND
2	GND
3	+12V DC
4	+12V DC

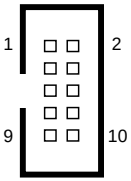
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COM Connector (RS-232) (CN5/6/13/14/17/18)



Pin #	RS-232 Signal
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	NC

COM1 Connector (RS-422/485/485+) (CN6)



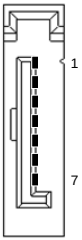
Pin #	RS-422/485+	RS-485
1	TXD-	Data-
2	NC	NC
3	TXD+	Data+
4	NC	NC
5	RXD+	NC
6	NC	NC
7	RXD-	NC
8	NC	NC
9	GND	GND
10	NC	NC

Note: See “COM1 Mode Jumper Settings (JP1-4)” on page 25.

	COM1	COM2	COM3	COM4	COM5	COM6
Connector	CN6	CN5	CN18	CN17	CN14	CN13
Pitch	2.54 mm	2.54 mm	2.00 mm	2.00 mm	2.00 mm	2.00 mm

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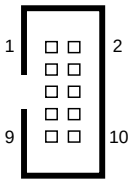
Serial ATA Connectors (CN7/8/10/11)



Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

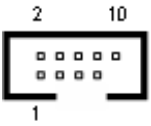
HD Audio Daughter Board Connector (CN12)

This connector is designed for use with the ADLINK DB-Audio2 daughter board.



Pin #	Signal	Function
1	GND	Ground
2	AUD_BCLK	Audio Clock
3	GND	Ground
4	ICH_AUD_SDIN1	Audio Data Input
5	P5V	+ 5V
6	ICH_AUD_SDOUT	Audio Data Output
7	P5V_AUD	+ 5V
8	P3V3_DVDD	3.3V
9	AUD_SYNC	Audio Synchronous
10	AUD_RSTJ	Audio Reset

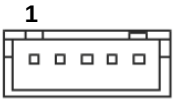
USB 2.0 Connectors (CN19/20)



Pin #	Signal	Pin #	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	NC

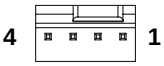
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External Keyboard Connector (CN25)



Pin #	Signal	Function
1	KBCLK	Keyboard Clock
2	KBDATA	Keyboard Data
3	NC	—
4	GND	Power
5	+5 V	Power

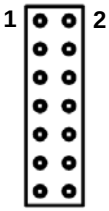
Fan Connectors (FAN1/2)



Pin #	Signal
1	GND
2	Fan power (+12V)
3	Fan Tachometer
4	Fan Speed Control

PCIe Mini Card VGA Connector (JP6)

This header is connected to the optional mPCIe-8770 to provide graphics output to the VGA connector on the rear panel.



Pin #	Signal	Pin #	Signal
1	NC	2	CRTDAT
3	NC	4	CRTCLK
5	GND	6	CRTR
7	GND	8	CRTG
9	GND	10	CRTB
11	GND	12	CRTHS
13	GND	14	CRTVS

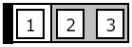
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2.4 Jumpers

Clear CMOS (JBAT1)

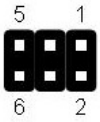
The CMOS RAM data contains the date / time and BIOS setting information. CMOS is powered by the onboard button cell battery. To erase the CMOS RAM data:

1. Power down and disconnect power from the system.
2. Short pins 2-3 on JP1.
3. Reconnect power and power up the system.
4. After power up, remove the jumper cap from pins 2-3 and reinstall it to pins 1-2.

RTC status	Connection	JBAT1
Normal	1 – 2	
Clear CMOS	2 – 3	

COM1 Mode Jumper Settings (JP1-4)

Short the jumper pins according to the following settings to set COM1 to RS-232/422/485/485+ mode:



	RS-232	RS-422	RS-485	RS-485+
JP1	-	1-3, 2-4	1-3, 2-4	3-5, 4-6
JP2	1-3, 2-4	3-5, 4-6	3-5, 4-6	3-5, 4-6
JP3	1-3, 2-4	3-5, 4-6	3-5, 4-6	3-5, 4-6
JP4	1-2	3-4	5-6	5-6

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3 Getting Started

This chapter provides information on how to install components on the NuPRO-E330 SHB.

3.1 Installing the CPU

The NuPRO-E330 supports an Intel® Core™ i7/i5/i3 or Pentium® processor in an LGA1156 socket.

WARNING:

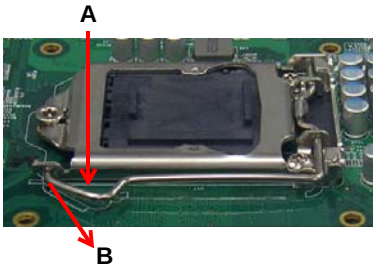
Disconnect all power to the board before installing a CPU to prevent damaging the board and CPU.

Do not touch socket contacts. Damaging the contacts voids the product warranty. Follow the installation instructions carefully to avoid damaging the board components.



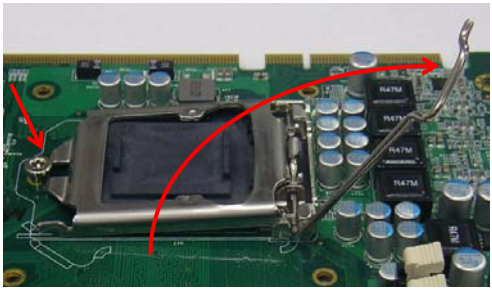
To install the CPU:

1. Press down on the locking arm (A), then push it away from the socket to disengage it from the retention tab (B).

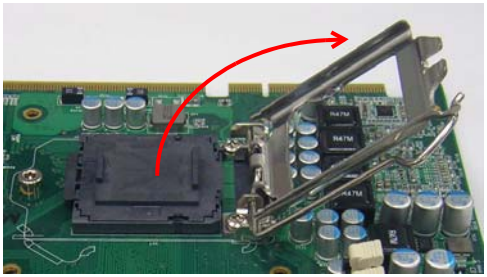


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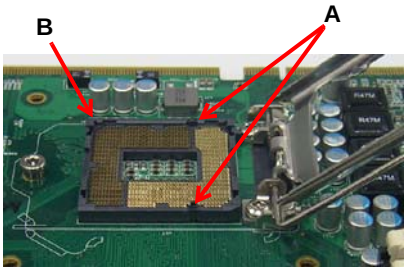
2. Raise the locking arm to unlock the load plate.



3. Lift the load plate to uncover the socket.



4. Remove the plastic protective cover from the socket. Note the locations of the alignment keys (A) and Pin 1 indicator (B).

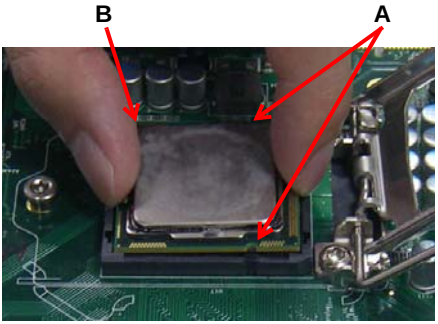


WARNING:

DO NOT touch socket contacts.

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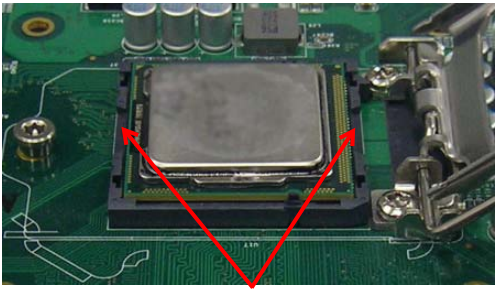
5. Hold the CPU using thumb and forefinger as shown. Position the CPU over the socket, matching the notches on the sides of the CPU with the alignment keys on the socket (A). The golden triangle on the CPU must be positioned at the corner of the socket with the Pin 1 indicator as shown (B).



WARNING:

The CPU fits into the socket in only one orientation. DO NOT force it into the socket to avoid causing damage.

6. Carefully place the CPU into the socket vertically. The socket has cutouts for your fingers to fit into.

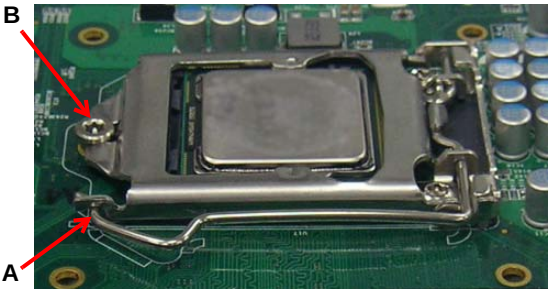


Cutouts

7. Gently lower the load plate. Make sure the front edge of the plate is under the screw as indicated.



8. Lower the locking arm and fasten it to the retention tab (A). The load plate should be locked underneath the screw as shown (B)..



3.2 Installing the CPU Fan and Heatsink



The CPU requires a chassis with an airflow inlet and maximum internal ambient temperature of 50° C. A especially-designed CPU fan and heatsink must be installed before using the SHB. Failure to install a CPU fan and heatsink may damage the system host board and/or the CPU.

When the CPU fan installation procedures presented here are inconsistent with the installation procedures you obtained from the CPU fan and heatsink package, follow the latter.

To install the CPU fan:

1. Apply thermal grease evenly on top of the installed CPU.
2. Lower the CPU fan to the CPU, then secure it using the provided attachments or screws.
3. Connect the CPU fan cable to the CPU fan connector on the SHB labeled FAN2 (see “Board Layout” on page 18).

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3.3 Installing Memory Modules

The NuPRO-E330 supports up to 8 GB of DDR3 1066/1333 MHz memory modules in two DIMM sockets. A DDR3 module has a 240-pin footprint compared to the legacy 184-pin DDR DIMM. DDR3 modules are notched to facilitate correct installation in the DIMM sockets.

WARNING:

Disconnect all power to the board before installing a memory module to prevent damaging the board and memory module .

Memory Configuration Options

The NuPRO-E330 supports 1GB, 2GB and 4GB unbuffered non-ECC DDR3 DIMMs in the following configurations:

- Channel A: DIMM1
  Channel B: DIMM2
- For dual-channel configuration, the total size of memory module installed per channel must be the same (DIMM1 = DIMM2).
- It is recommended that you install DIMMs with the same CAS latency. For maximum compatibility, install memory modules with the same brand, model, and/or rating.

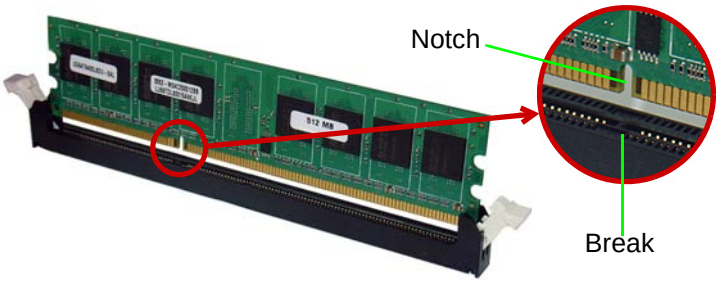
To install a memory module:

1. Locate the DIMM sockets on the motherboard.
2. Press the socket's retaining clips outward to unlock.

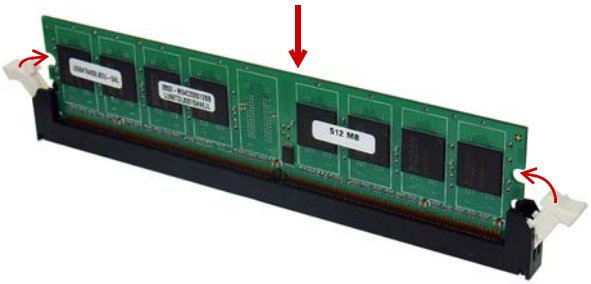


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3. Align the memory module on the socket making sure that the notch matches the break on the socket.



4. Insert the module firmly into the slot until the retaining clips snap back inwards and the module is securely seated.



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4 Driver Installation

This chapter provides information on how to install the NuPRO-E330 device drivers under Windows XP. The device drivers are located in the following ADLINK All-in-One DVD directories:

Chipset	\NuPRO\NuPRO-E330\Chipset\
Display	\NuPRO\NuPRO-E330\VGA\ \Add-On Card\mPCIe-8770\
Ethernet	\NuPRO\NuPRO-E330\Ethernet\
TPM	\NuPRO\NuPRO-E330\TPM\
.Net Framework	\NuPRO\NuPRO-E330\Others\
Rapid Storage	\NuPRO\NuPRO-E330\Others\
iAMT	\NuPRO\NuPRO-E330\Others\
Audio	\Audio Daughter Board\DB-Audio2\

Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.

NOTE:

In order to enable RAID or AHCI mode, you must pre-install the Intel® Rapid Storage Technology driver during the Windows* installation process. using the F6 installation method.
*Not required for Windows Vista and Windows 7.

4.1 Intel® Rapid Storage Technology Driver

1. Create a floppy image as described in the F6Readme.txt file contained in **X:\NuPRO\NuPRO-E330\Others\ F6_SATA_Floppy_Install_Image_WinXP32_WinVISTA32_ IRST 9.5.0.1037.zip**.
2. During Windows installation, press **F6** when you see the message "*Press F6 if you need to install a third party SCSI or RAID driver.*" Then press **S** to *Specify Additional Device*.
3. Insert the floppy disk and follow the remaining instructions. Leave the disk in until the system has rebooted and copied the necessary files, then remove the disk.

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4.2 Intel® Q57 Express Chipset Driver

This section describes the installation of the Intel® Q57 Express chipset driver.

1. Locate the directory **X:\NuPRO\NuPRO-E330\Chipset** on the ADLINK All-in-One DVD, and extract the file **setup.exe** from the following archive: **Chipset driver_Intel_INF_Update_Utility_All_WinOS_ v9.1.1.1020.zip**.
2. Run the program **setup.exe** and follow the onscreen instructions. Restart the system if prompted.

4.3 Display Driver

Integrated Intel® HD Graphics

This section describes the driver installation for the Integrated Intel® HD Graphics on dual core 32nm (Clarkdale) processors.

Follow these instructions to install the display driver:

1. Locate the directory **X:\NuPRO\NuPRO-E330\VGA** on the ADLINK All-in-One DVD, and extract the file **setup.exe** from the following archive: **VGA_driver_Intel_Integrated_Graphics_Windows2000_WinXP_v6.14.10.5101.zip**.
2. Run the program **setup.exe** and follow the onscreen instructions. Restart the system if prompted.
3. Locate the directory **X:\NuPRO\NuPRO-E330\Others** on the ADLINK All-in-One DVD, and extract the file **Microsoft_Net_Framework_v3.5_SP1.exe** from the following archive: **Microsoft_Net_Framework_v3.5_SP1.zip**
4. Run the program **Microsoft_Net_Framework_v3.5_SP1.exe** and follow the onscreen instructions.Restart the system if prompted.

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mPCIe-8770 Graphics Card

This section describes the driver installation for the mPCIe-8770 graphics card.

Follow these instructions to install the display driver:

1. Locate the directory **X:\NuPRO\Add-On Card\mPCIe-8770** on the ADLINK All-in-One DVD, and extract the file **Z11 Driver/R1.11.03_WHQL_for All/xgirun.exe** from the following archive:
   Mini PCIe-8770_VGA_driver_Z11_All_WinOS.zip.
2. Run the program **xgirun.exe** and follow the onscreen instructions. Restart the system if prompted.

4.4 Ethernet Driver

Follow these instructions to install the Ethernet driver.

1. Locate the directory **X:\NuPRO\NuPRO-E330\Ethernet** on the ADLINK All-in-One DVD, and extract the file **Autorun.exe** from the following archive:
   Network_driver_Intel_Network_Adapter_All_WinOS_v14.8.zip.
2. Run the program **Autorun.exe** and follow the onscreen instructions. Restart the system if prompted.

4.5 Intel® Rapid Storage Technology Utility

Follow these instructions to install the Intel® Rapid Storage Technology utility.

1. Locate the directory **X:\NuPRO\NuPRO-E330\Others** on the ADLINK All-in-One DVD, and extract the file **setup.exe** from the following archive:
   Intel_Rapid_Storage_Technology_All_WinOS_v9.5.0.1037.zip.
2. Run the program **setup.exe** and follow the onscreen instructions. Restart the system if prompted.

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4.6 Intel® Active Management Technology

Follow these instructions to install the Intel® Active Management Technology driver.

1. Locate the directory **X:\NuPRO\NuPRO-E330\Others** on the ADLINK All-in-One DVD, and extract the file **setup.exe** from the following archive: **iAMT_Intel_Management_Engine_Interface_SOL_driver_All_WinOS_v6.0.0.1195.zip**.
2. Run the program **setup.exe** and follow the onscreen instructions. Restart the system if prompted.

4.7 TPM Driver

Follow these instructions to install the TPM driver.

1. Locate the directory **X:\NuPRO\NuPRO-E330\TPM** on the ADLINK All-in-One DVD, and extract the file **setup.exe** from the following archive: **ST_TPM_All_WinOS_v3.5.SP1.zip**.
2. Run the program **setup.exe** and follow the onscreen instructions. Restart the system if prompted.

4.8 Audio Driver

Follow these instructions to install the audio driver for the optional DB-Audio2 daughter board.


NOTE:

Before installing the audio driver, check the BIOS settings to make sure that audio is enabled: **Chipset > PCH Configuration > HDA Controller** (see “PCH Configuration” on page 68).

1. Place the ADLINK All-in-One DVD to the optical drive.
2. Locate the audio driver from the directory **X:\Audio Daughter Board\DB-Audio2**, then double-click on the **setup.exe** file to start installation.
3. Follow the screen instructions to complete installation, then restart the system if prompted.

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5 BIOS Setup

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

5.1 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.

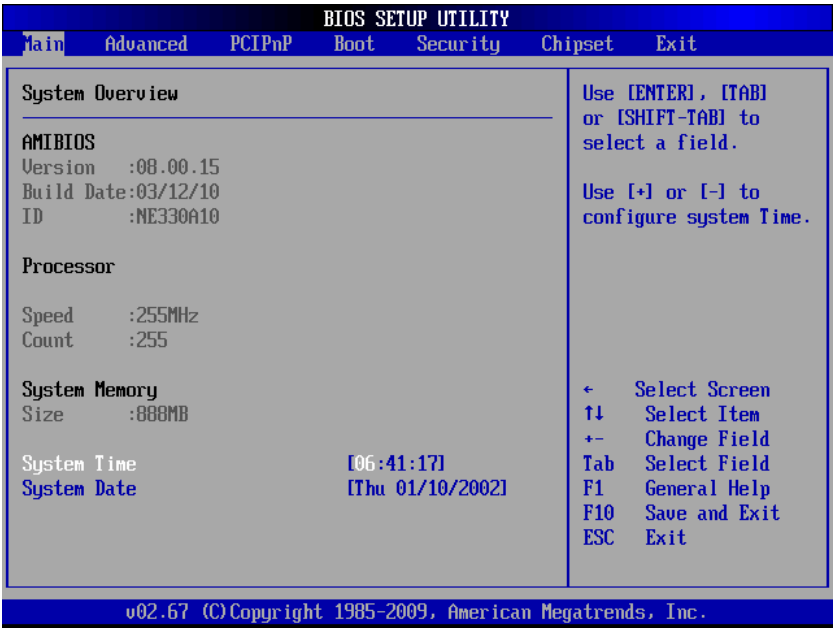
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Setup Menu

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.

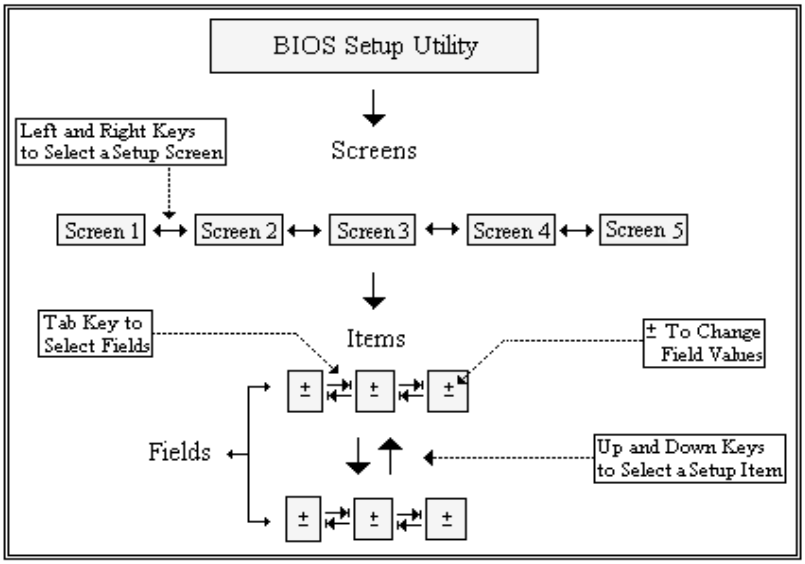


Navigation

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.

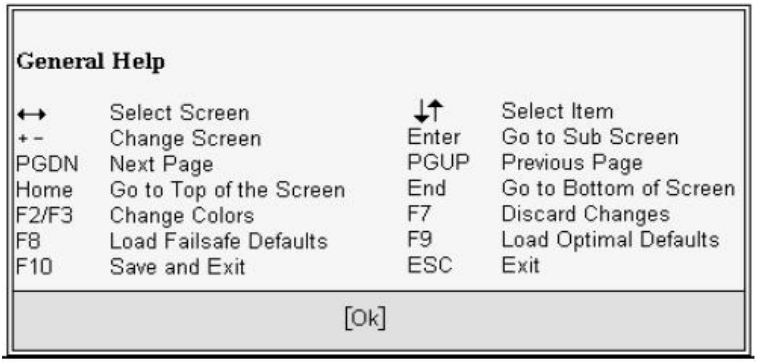
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the motherboard to boot up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

Hotkey Descriptions

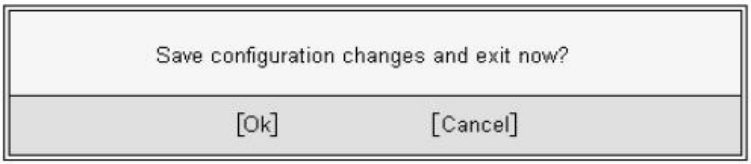
F1 The < F1 > key allows you to display the General Help screen.

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

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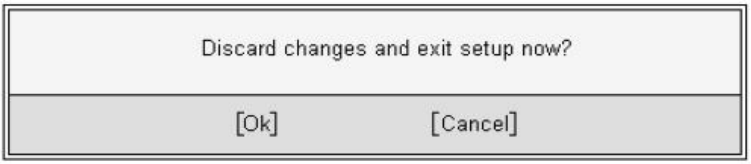


F10 The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:



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:



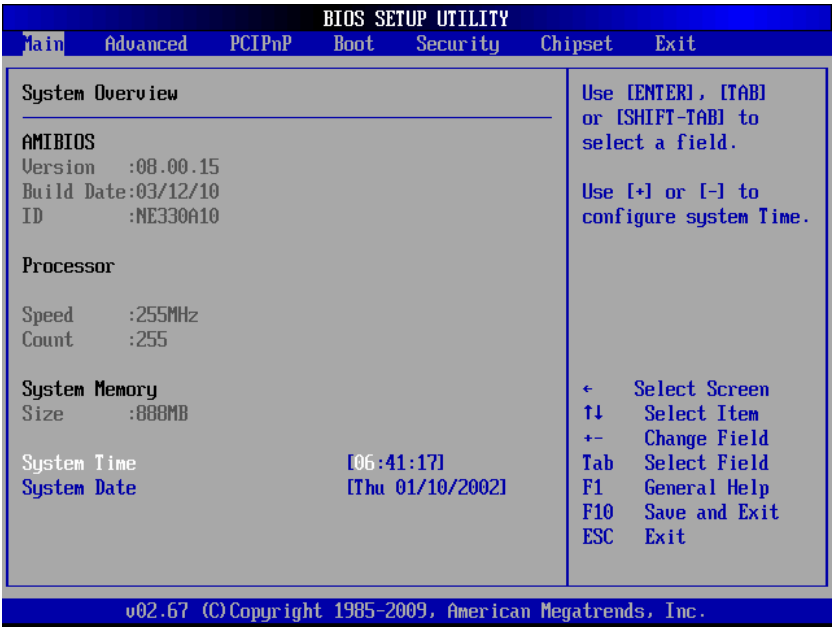
Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

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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5.2 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.

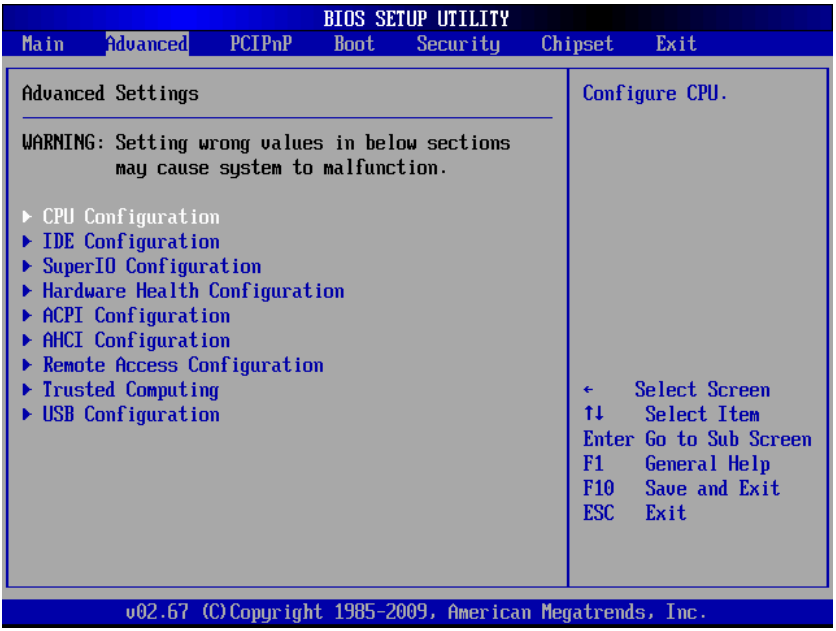
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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5.3 Advanced BIOS Setup

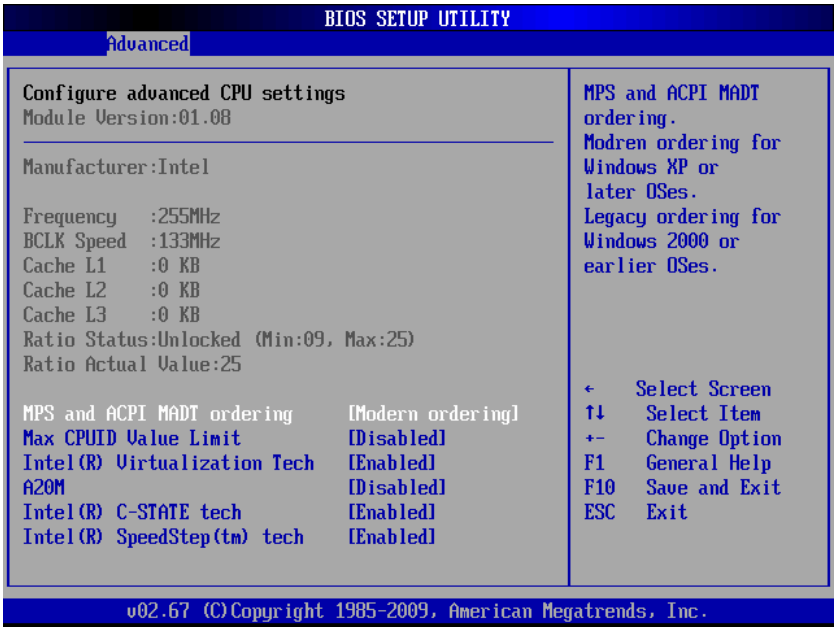
Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the < Arrow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

The sub menus are described on the following pages.



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5.3.1 CPU Configuration



MPS and ACPI MADT Ordering

Multi-Processing and ACPI functions support.

Modern ordering is for Windows XP or later operating systems.
Legacy ordering is for Windows 2000 or earlier operating systems.

Max CPUID Value Limit

Enable this option to allow compatibility with older operating systems.

Intel® Virtualization Tech

When enabled, Intel® Virtualization Technology (Intel® VT) makes a single system appear as multiple independent systems to software. This allows for multiple, independent operating systems to be running simultaneously on a single system.

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A20M

A20M# asserted low forces bit 20 of the physical address to be zero for all on-chip cache or external memory accesses. Legacy operating systems and APs may need A20M enabled.

Intel® C-STATE Tech

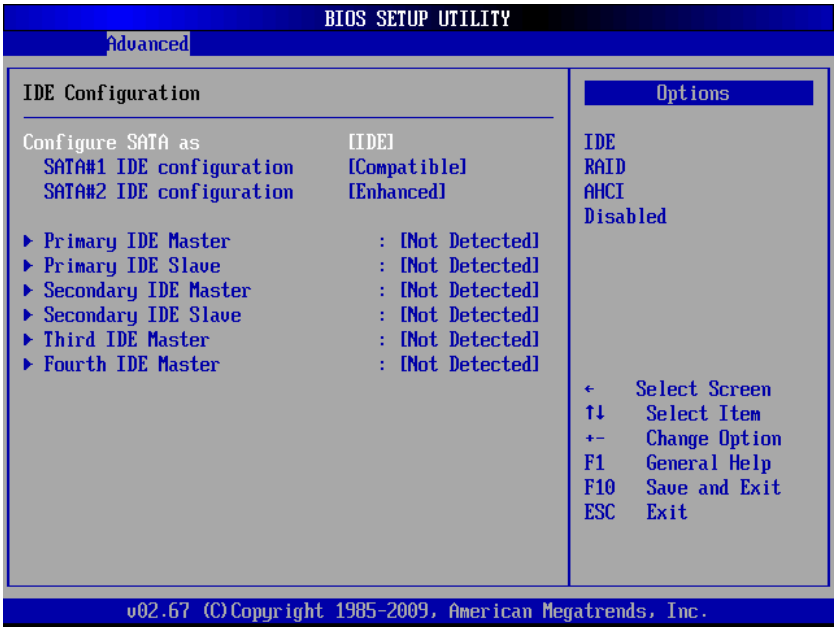
C-states are processor power states within the S0 system state that provide for various levels of power savings.

Intel® SpeedStep™ Tech

This option allows you to enable or disable Intel® SpeedStep Technology.

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5.3.2 IDE Configuration



Configure SATA as

Options: IDE, RAID, AHCI, Disabled

SATA#1 IDE Configuration

When running in Compatible mode, SATA channels 1, 2, 3 and 4 can be configured as legacy IDE channels.

SATA#2 IDE Configuration

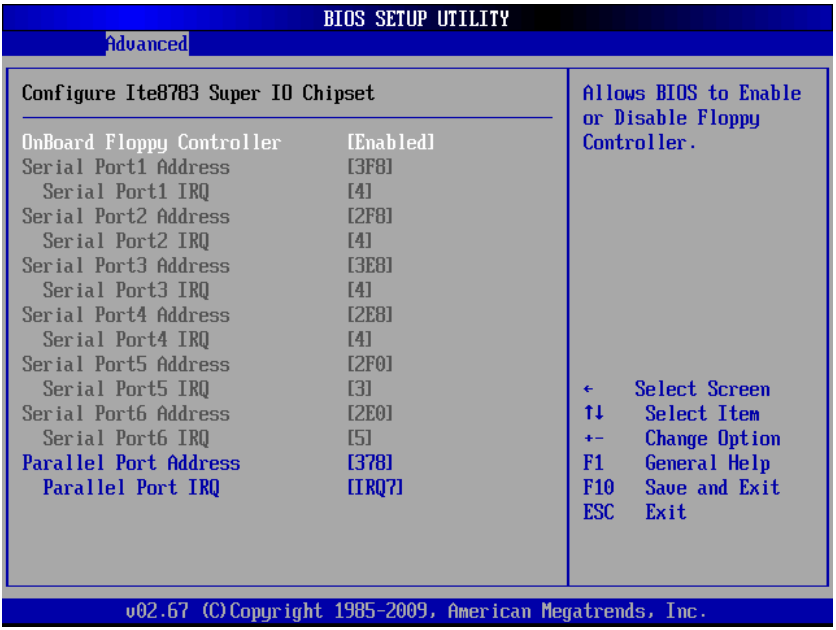
When running at compatible mode, SATA channels 5 and 6 can be configured as legacy IDE channels.

IDE Master/Slave

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

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5.3.3 Super IO Configuration



OnBoard Floppy Controller

Select this option to Enable or Disable the onboard floppy controller.

Serial Port1-6 Address/IRQ

Specifies the serial port addresses. The options are:

- Port1-2: 3F8, 2F8, 3E8, 2E8, Disabled
- Port3-6: 3F8, 2F8, 3E8, 2E8, 2F0, 2E0, Disabled

IRQ settings are fixed as shown.

Parallel Port Address/IRQ

This option specifies the base I/O port address and IRQ of the parallel port.

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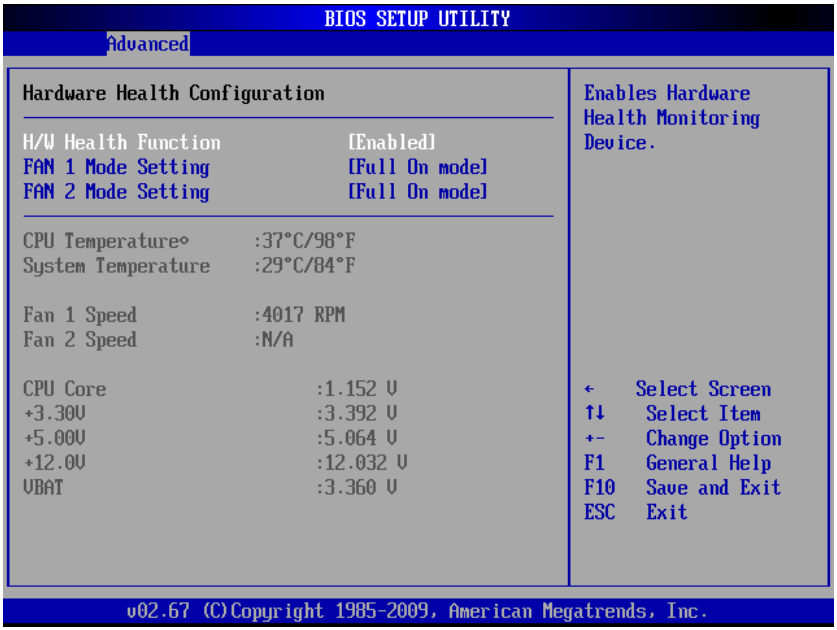
5.3.4 Hardware Health Configuration

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.

Fan 1/2 Mode Setting

Three modes are provided for each fan: Full On mode, Automatic mode, and PWM Manually mode. Full On mode runs the fan at full speed. Automatic mode is Smart Fan mode. PWM Manually mode runs the fan at the set speed.

Full On Mode



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Automatic Mode



Temperature 1 Limit of OFF

When the temperature (°C) is higher than the set value, Fan1/2 will run at Start PWM speed. When the temperature is lower than the set value, Fan1/2 will stop.

Temperature 1 Limit of Start

When the temperature (°C) is higher than the set value, Fan1/2 will increase its speed by Slope PWM 1 value.

Fan 1/2 Start PWM

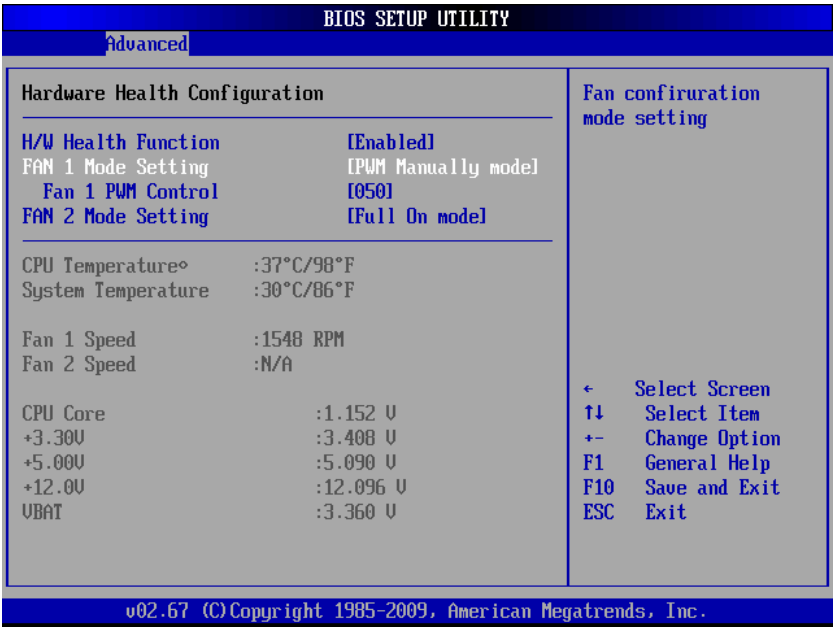
Sets a value to control the fan speed between Limit of OFF and Limit of Start. Minimum is 0 and Maximum is 127.

Slope PWM 1/2

The Slope PWM Value sets the rate of increase the fan speed when the temperature is above Limit of Start.

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PWM Manually Mode

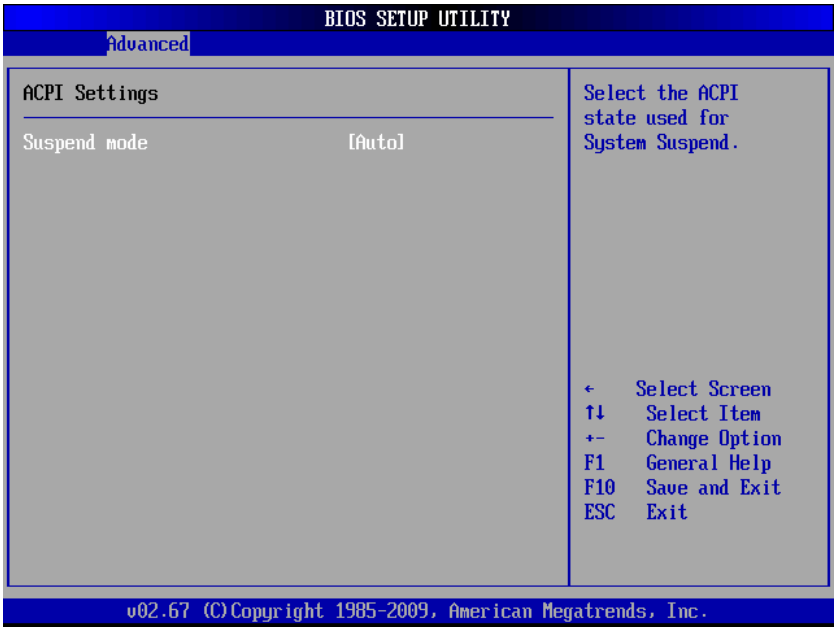


Fan 1/2 PWM Control

Sets a value to control the fan speed. Minimum is 0 and Maximum is 127.

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5.3.5 ACPI Settings



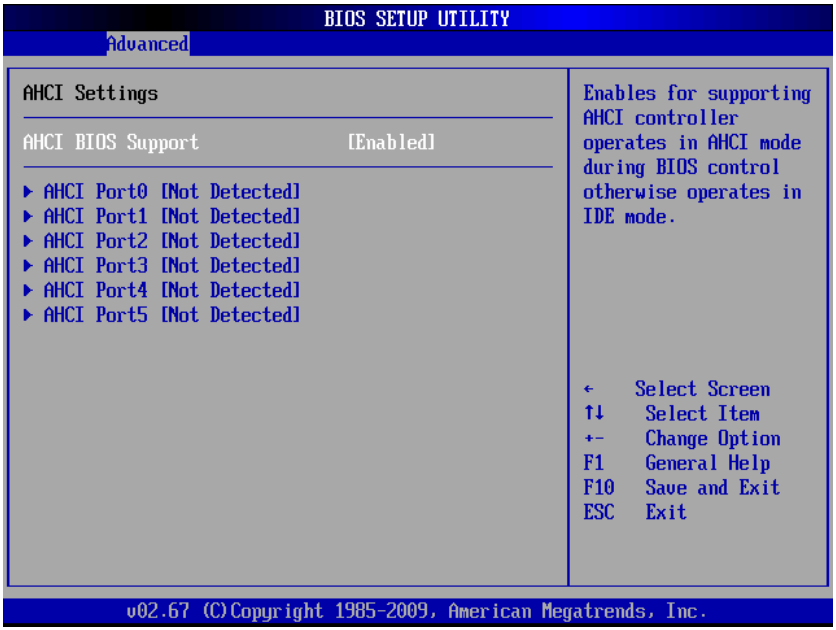
Suspend Mode

Allows you to select the ACPI state to be used for system suspend. Options: Auto, S1, and S3.

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5.3.6 AHCI Configuration

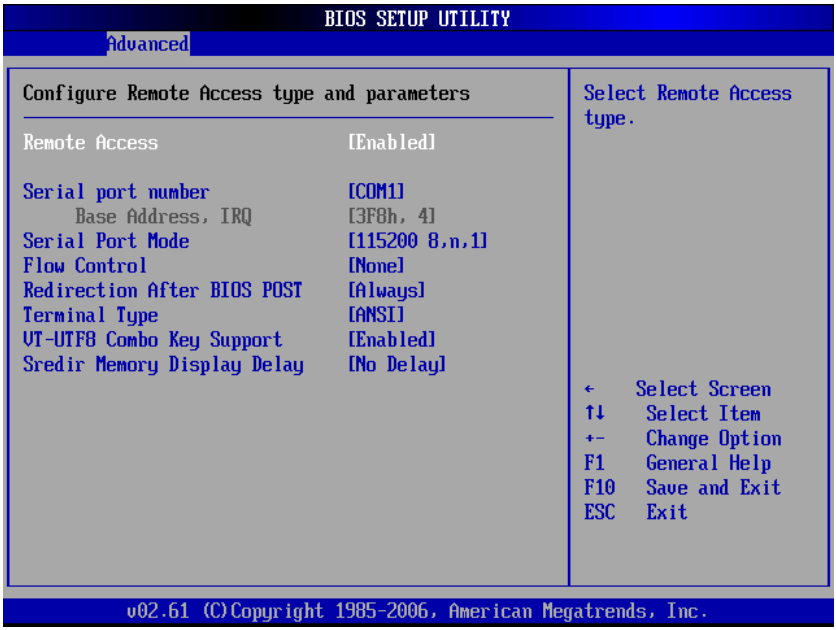
You can use this screen to select options for the AHCI Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option.



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5.3.7 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. You can set the value for this option to COM1 or COM2.

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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.

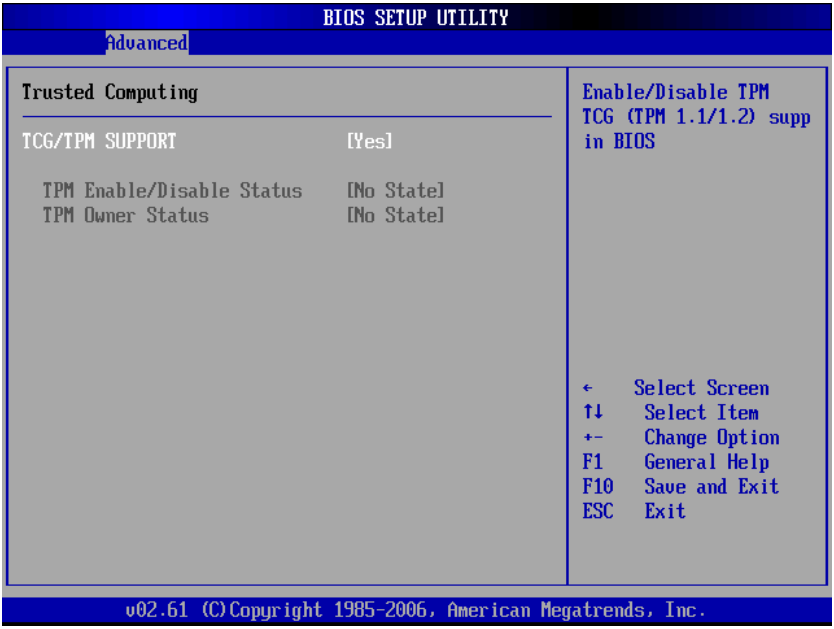
Sredir Memory Display Delay

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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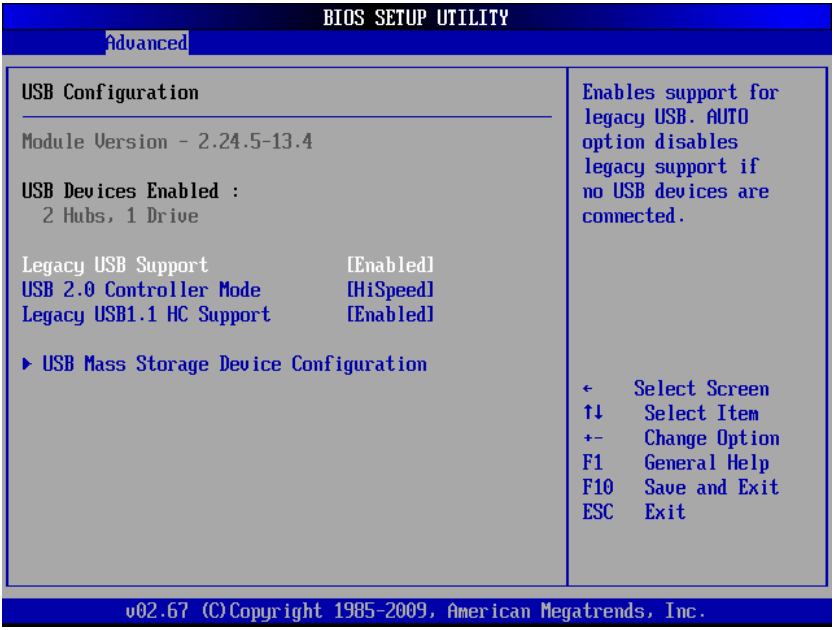
5.3.8 Trusted Computing

Trusted computing is an industry standard to make personal computers more secure through a dedicated hardware chip, called a Trusted Platform Module (TPM). This option enables or disables the TPM support.



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5.3.9 USB Configuration



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

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USB 2.0 Controller Mode

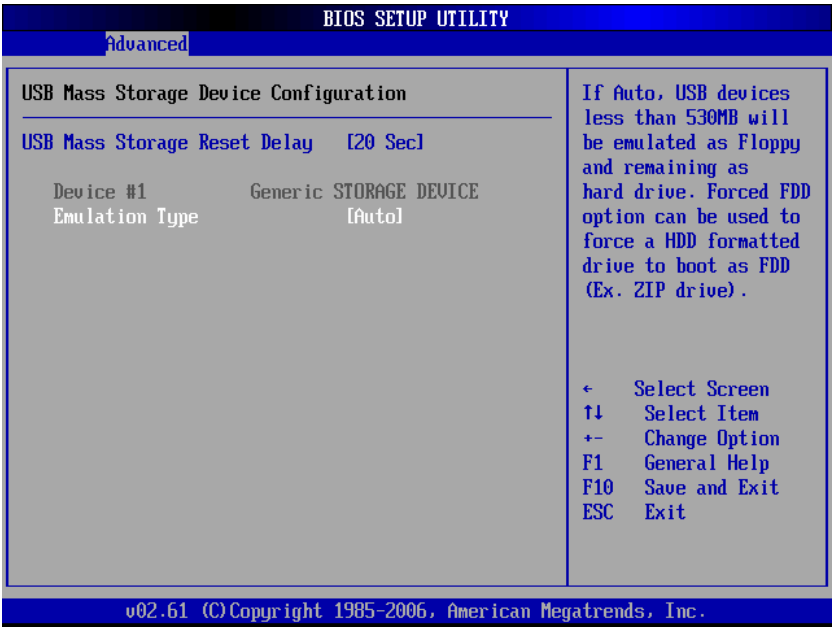
The USB 2.0 Controller Mode configures the data rate of the USB port. The options are FullSpeed (12 Mbps) and HiSpeed (480 Mbps).

Legacy USB 1.1 HC Support

Enables/disables legacy USB 1.1 host controller support.

USB Mass Storage Device Configuration

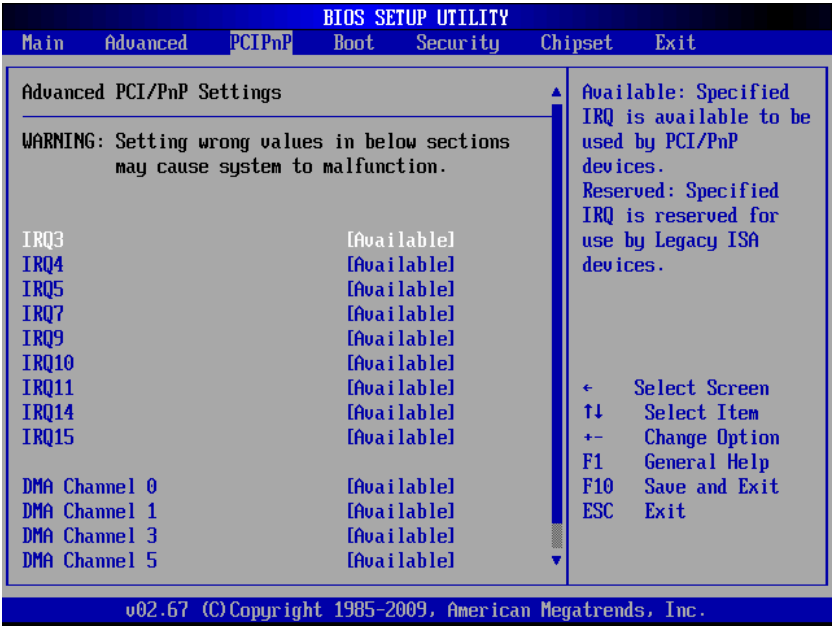
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB 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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5.4 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.



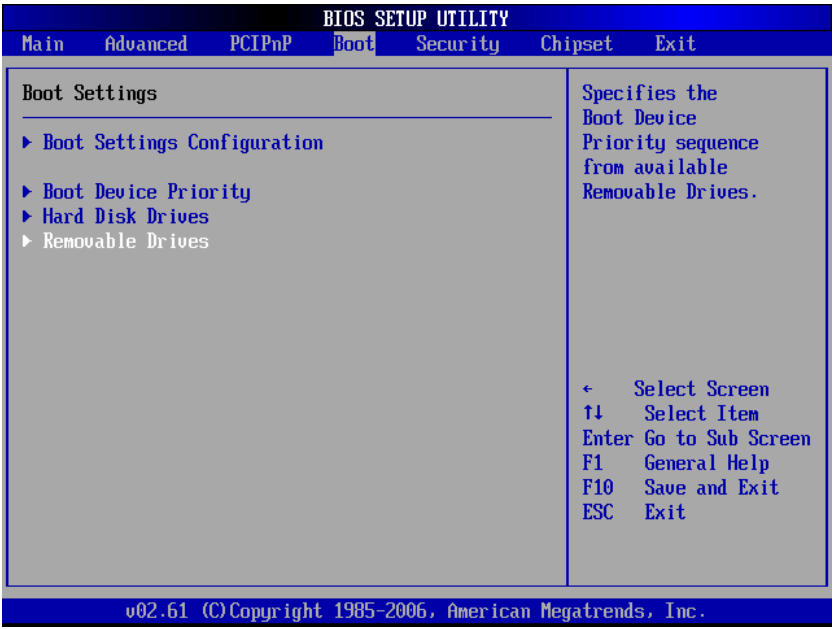
5.4.1 IRQ/DMA

Set this value to allow the IRQ settings to be modified. Available – This setting allows the specified IRQ/DMA to be used by a PCI/PnP device. Reserved – This setting allows the specified IRQ/DMA to be used by a legacy ISA device.

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5.5 Boot Settings

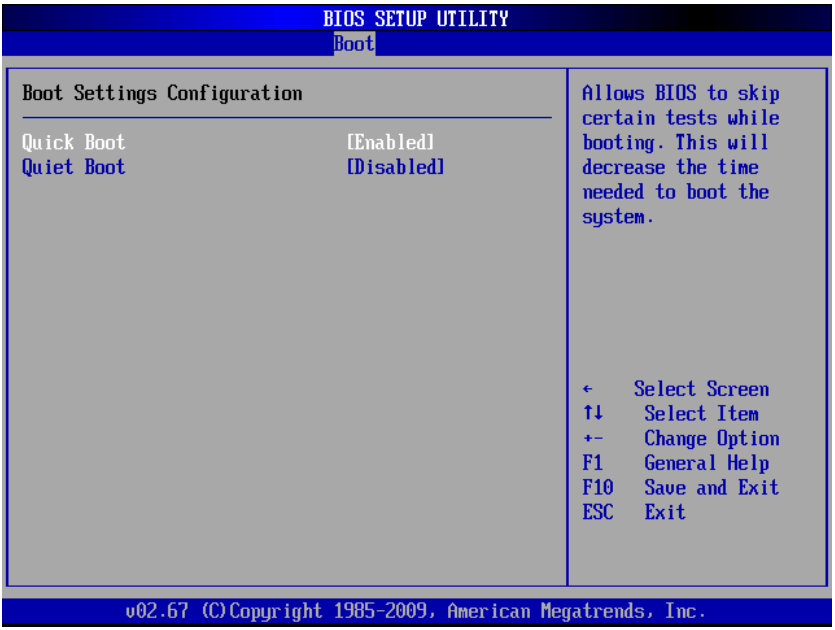
Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The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



5.5.1 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.

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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 full-screen 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 full-screen logo.

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5.5.2 Boot Device Priority

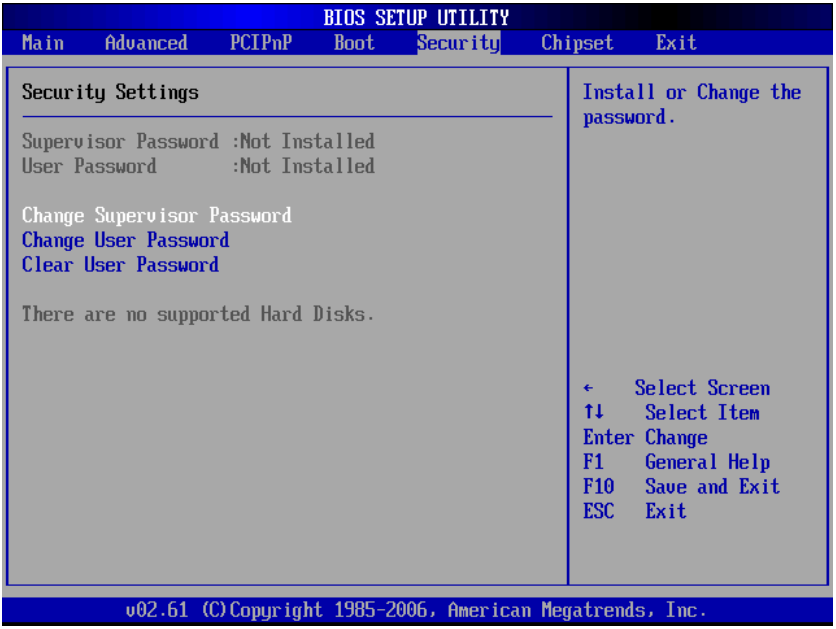
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

5.5.3 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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5.6 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.

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5.7 Chipset Setup

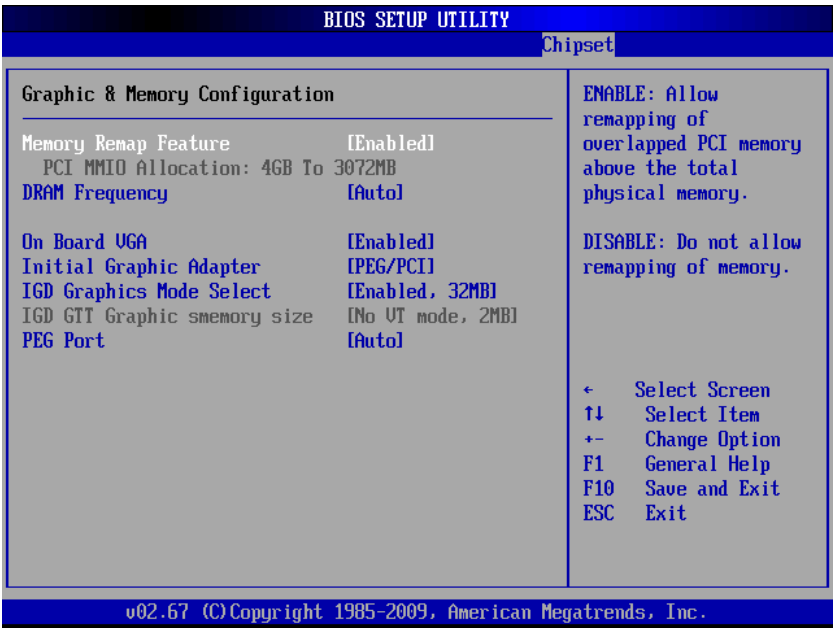
Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of the items in the left frame of the screen to go to the sub menu for that item. The Chipset BIOS Setup screen is shown below.



NOTE: The Power Button Mode option is not available in this BIOS kernel.

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5.7.1 Graphics and Memory Configuration



Memory Remap Feature

This item allows remapping of over lapped PCI memory above the total physical memory (enable/disable).

DRAM Frequency

This item allows the user to configure the DRAM frequency.

On Board VGA

This item allows the user to enable/disable the built-in graphics.

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Initial Graphics Adapter

Select which graphics controller to use as the primary boot device. (“PCI” includes PCI slot and PCI Express x1/x4 slot, and PCIe Mini Card. PCI will be first.)

- **IGD:** Integrated graphics only.
- **PCI/IGD:** Detect PCI graphics first, then integrated graphics, then PCI Express x16 graphics.
- **PCI/PEG:** Detect PCI graphics first, then PCI Express x16 graphics, then integrated graphics.
- **PEG/IGD:** Detect PCI Express x16 graphics first, then integrated graphics, then PCI.
- **PEG/PCI:** Detect PCI Express x16 graphics first, then PCI graphics, then integrated graphics.

IGD Graphics Mode Select

Selects the amount of system memory used by the integrated graphics device.

PEG Port

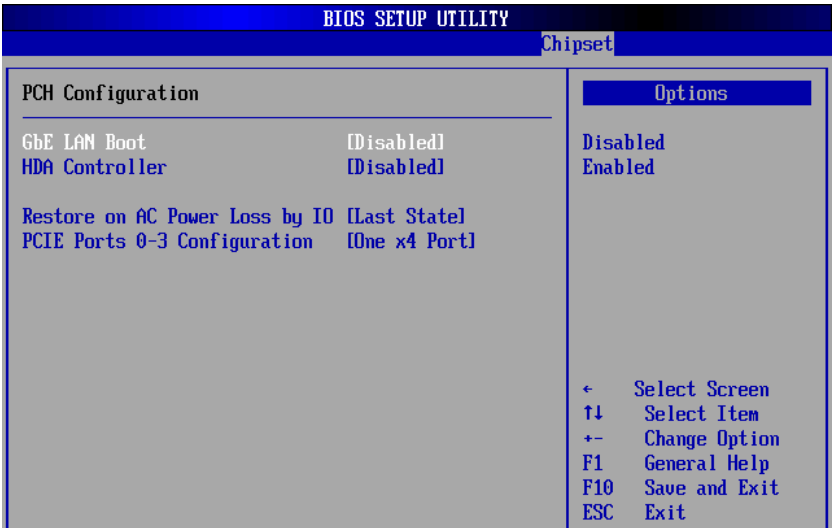
This field allows you to select whether or not to use the PCI Express x16 graphics card.

Disabled: Disables the PCI Express x16 graphics card.

Auto: The BIOS checks to see if a PCI Express x16 graphics card is installed and the system boots up using the graphics device in the order set in **Initial Graphics Adapter**.

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5.7.2 PCH Configuration



GbE LAN Boot

Invoke the onboard LAN's PXE ROM to enable boot from LAN. The options are Enabled and Disabled.

HDA Controller

Set this value to Enable/Disable the HD Audio Controller.

Restore on AC Power Loss

Determines which state the computer enters when AC power is restored after a power loss. The options for this value are Last State, Power On and Power Off.

- **Power Off:** Set this value to always power off the system while AC power is restored.
- **Power On:** Set this value to always power on the system while AC power is restored.
- **Last State:** Set this value to power off/on the system depending on the last system power state while AC power is restored.

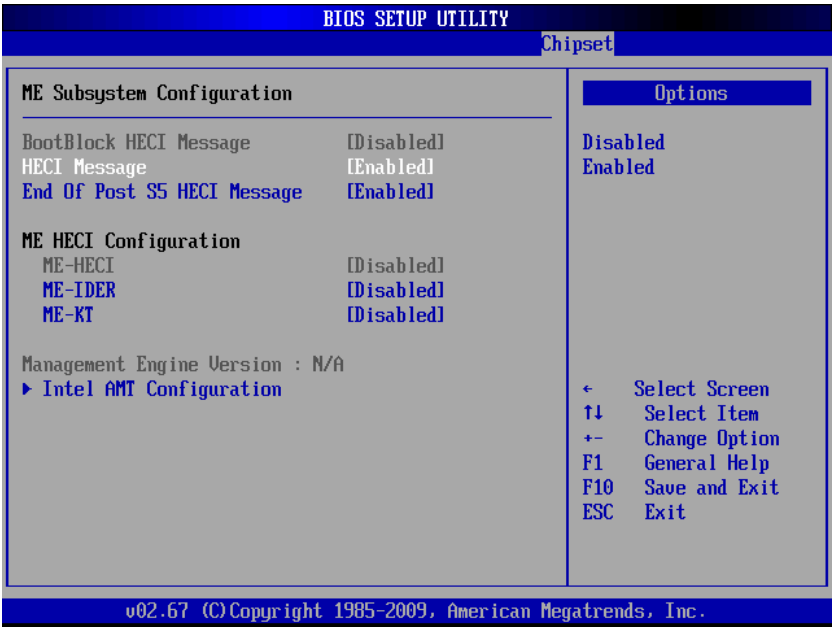
PCIE Ports 0-3 Configuration

Sets the south bridge PCIe controller to one x4 slot or four x1 slots.

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5.7.3 Management Engine Subsystem

This section describes the Intel® Active Management Technology BIOS settings Do not modify these settings unless you are an advanced user. (HECI: Host Embedded Communication Interface)



BootBlock HECI Message

During bootblock step, function sends one message through the HECI circular buffer.

HECI Message

Function sends one message through the HECI circular buffer.

End of Post S5 HECI Message

During end of post S5, function sends one message through the HECI circular buffer.

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ME-HECI

The HECI bus allows the Host OS to communicate directly with the Manage Engine (ME) integrated in the chipset.

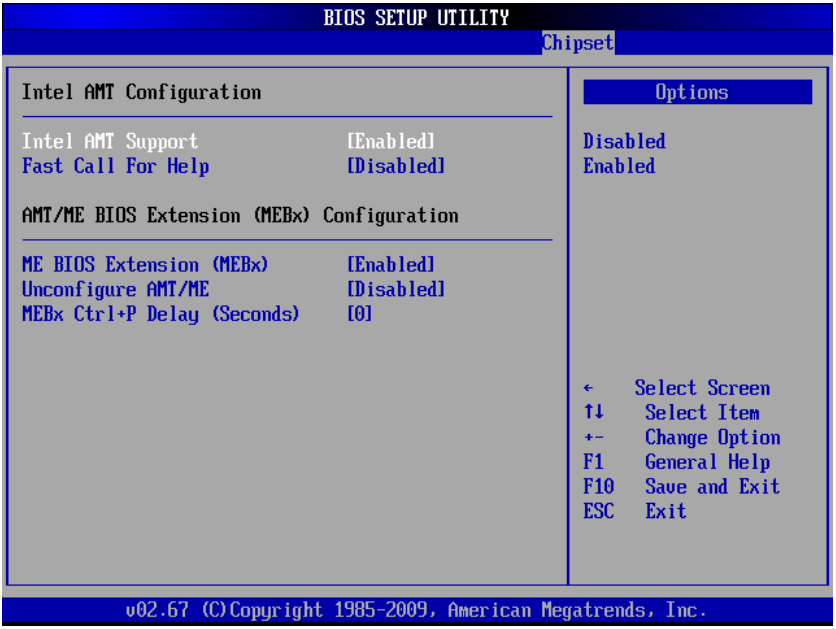
ME-IDER

Enable/Disable ME IDE Redirection support.

ME-KT

Enable/Disable ME KT (keyboard/text) support.

Intel AMT Configuration



Intel AMT Support

This item allows the user to Enable/Disable the Intel AMT function.

Fast Call For Help

This item allows the user to Enable/Disable fast call for help.

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ME BIOS Extension

This item allows the user to Enable/Disable ME BIOS extension.

Unconfigure AMT/ME

This item allows the user to unconfigure the AMT/ME function.

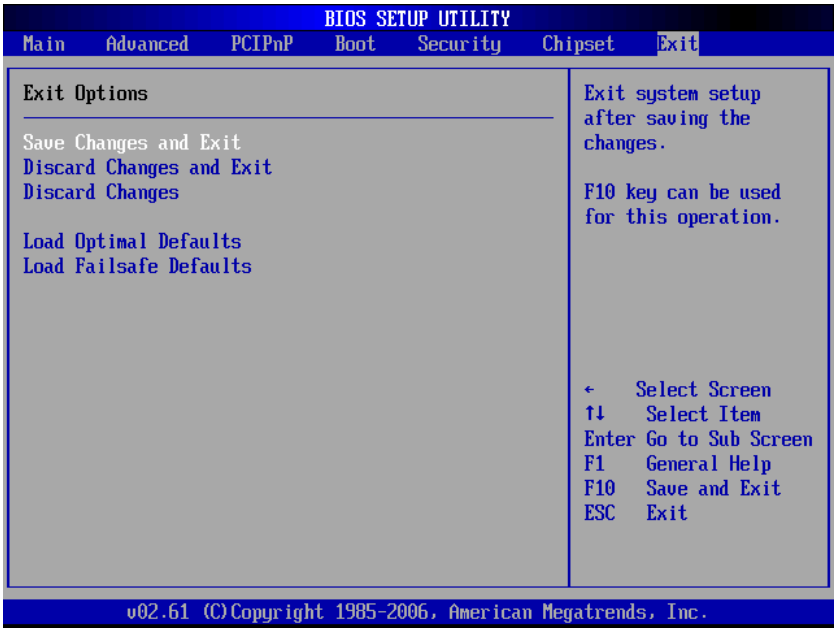
MEBx Ctrl+P Delay

This item allows the user to configure the delay time to wait before MEBx (seconds).

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5.8 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.

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Discard Changes and Exit

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

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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Appendix A - Watchdog Timer

A sample program for configuring the NuPRO-E330's watchdog timer is included on the ADLINK All-in-One DVD in the following directory: **\NuPRO\NuPRO-E330\WDT**.

A.1 Sample Code

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

static unsigned int IT8783_ioPort = 0x2e;

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;
   }
}

void Exit_IT8783_Config(unsigned int flag)
{
   if(flag) IT8783_ioPort = 0x4e;

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

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```
}

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);
}


void IT8783_WDTRun(unsigned int count_value, unsigned int
     PLEDflag)   //for NuPRO-E330
{
   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, 0x27);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue |= 0x80;  // set Pin09 is GPIO
      function GP37
      outportb(IT8783_ioPort+1, registerValue);

      outportb(IT8783_ioPort, 0xc2);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue &= 0x7fb; // set GP37 is alternate
      function
      outportb(IT8783_ioPort+1, registerValue);

      outportb(IT8783_ioPort, 0xca);
      registerValue = inportb(IT8783_ioPort + 1);
      registerValue |= 0x80;  // set GP42 is output
      outportb(IT8783_ioPort+1, registerValue);
```

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```
   outportb(IT8783_ioPort, 0xf8);
   outportb(IT8783_ioPort+1, 0x1f);// PLED mapping to
   GP37

   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 &= 0xfe;
outportb(IT8783_ioPort+1, registerValue);

outportb(IT8783_ioPort, 0x72);
registerValue = inportb(IT8783_ioPort + 1);
registerValue &= 0xdf;
outportb(IT8783_ioPort+1, registerValue);

if(count_value >= 60)
{
   outportb(IT8783_ioPort, 0x72);
   registerValue = inportb(IT8783_ioPort+1);
   registerValue &= 0x8f;
   registerValue |= 0x40; //enable WDT output through
   PRST
   outportb(IT8783_ioPort+1, registerValue); // set
   WDT count is minute

   tempCount = count_value / 60;
   if((count_value%60) > 30)
      tempCount++;
   if(tempCount > 65535)
      tempCount = 65535;
   printf("WDT timeout in %d minutes.\n", tempCount);
}
else
{
   outportb(IT8783_ioPort, 0x72);
```

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```
      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
   }

   outportb(IT8783_ioPort, 0x71);
   registerValue = inportb(IT8783_ioPort + 1);
   registerValue |= 0x60;  // set Mouse & Keyboard
      interrupt Enable
   outportb(IT8783_ioPort+1, registerValue);

   outportb(IT8783_ioPort, 0x73);
   outportb(IT8783_ioPort+1, tempCount); // set WDT count
      LSB

}
```

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Appendix B - System Resources

B.1 System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
(4GB-8MB)	FFE00000 – FFFFFFFF	8 MB	High BIOS Area
(4GB-18MB) – (4GB-17MB-1)	FEE00000 – FEEFFFFF	1 MB	FSB Interrupt Memory Space
(4GB-20MB) – (4GB-19MB-1)	FEC00000 – FECFFFFF	1 MB	APIC Configuration Space
960 K – 1024 K	F0000 – FFFFF	64 KB	System BIOS Area
896 K – 960 K	E0000 – EFFFF	64 KB	Extended System BIOS Area
768 K – 896 K	C0000 – DFFFF	128 KB	PCI expansion ROM area C0000 – C7FFF: Onboard VGA BIOS CB800 – CC7FFF: Intel 82578DM PXE option ROM when onboard LAN boot ROM is enabled.
640 K – 768 K	A0000 – BFFFF	128 KB	Video Buffer & SMM space
0 K – 640 K	00000 – 9FFFF	640 KB	DOS Area

Table B-1: System Memory Map

B.2 Direct Memory Access Channels

Channel Number	Data Width	System Resource
0	8-bits	Parallel port(1)
1	8-bits	Parallel port(1)
2	8-bits	Diskette drive(1)
3	8-bits	Parallel port(1)
4		Reserved - cascade channel
5	16-bits	Open
6	16-bits	Open
7	16-bits	Open

Table B-2: Direct Memory Access Channels

Note (1): DMA channel 0/1/3 is selected when using parallel port. Floppy and parallel port cannot be used at the same time.

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B.3 IO Map

Hex Range	Device
000-00F, 081-09F, 0C0-0DF	DMA controller 1, 8237A-5 equivalent
020-021, 0A0-0A1	Interrupt controller 1, 8259 equivalent
040-043	Timer, 8254-2 equivalent
060, 062, 064, 066, 068-06F	8042 Keyboard
061	System Speaker
070-071	Real Time Clock Controller(bit 7 -NMI mask)
0F0-0FF	Co-processor error register
2E0-2E7	Serial port 6
2E8-2EF	Serial port 4
2F0-2F7	Serial port 5
2F8-2FF	Serial port 2
1F0-1F7, 3F6	Primary IDE Controller (AT Drive)
378-37F	Parallel port
3F0-3F7	Alt. Floppy Disk Controller
3B0-3BB,	Mono/VGA mode video
3C0-3DF	VGA registers
3E0-3E8	Serial port 3
3F0-3F7	Primary Floppy disk controller
3F8-3FF	Serial port 1
378-37F	Printer Port (LPT 1)
170-177, 376	Secondary IDE Channel
CF8-CFB	PCI configuration address register (32 bit I/O only)
CF9	Reset Control register (8 bit I/O)
CFC-CFF	PCI configuration data register
400-41F	SMBUS
500-57F	GPIO
800-87F	SB_PM_BASE_ADDRESS
A00-A3F	SIO_PME_BASE_ADDRESS

Table B-3: IO Map

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B.4 Interrupt Request (IRQ) Lines

IRQ Lines PIC Mode

IRQ#	Typical Interrupt Resource	Connected to Pin	Available
0	Counter 0	N/A	No
1	Keyboard controller	N/A	No
2	No	N/A	No
3	Serial Port 5 (COM5)	IRQ3 via SERIRQ	No
4	Serial Port 1, 2, 3, 4 (COM1, 2, 3, 4) / PCI	IRQ4 via SERIRQ	Note (1)
5	Serial Port 6 (COM6)	IRQ5 via SERIRQ	No
6	Floppy Drive Controller	IRQ6 via SERIRQ	No
7	Parallel port	IRQ7 via SERIRQ	No
8	Real-time clock	N/A	No
9	SCI / PCI	IRQ9 via SERIRQ	Note (1)
10	No	N/A	No
11	No	N/A	No
12	PS/2 Mouse / PCI	IRQ12 via SERIRQ	Note (1)
13	Math Processor	N/A	No
14	Primary IDE controller / PCI	IRQ14 via SERIRQ	Note (1)
15	Secondary IDE controller / PCI	IRQ15 via SERIRQ	Note (1)

Table B-4: IRQ Lines PIC Mode

Note (1): These IRQs can be used for PCI devices when onboard device is disabled.

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IRQ Lines APIC Mode

IRQ#	Typical Interrupt Resource	Connected to Pin	Available
0	Counter 0	N/A	No
1	Keyboard controller	N/A	No
2	No	N/A	No
3	Serial Port 5 (COM5)	N/A	No
4	Serial Port 1, 2, 3, 4 (COM1, 2, 3, 4)	IRQ4 via SERIRQ	Note (1)
5	Serial Port 6 (COM6)	IRQ5 via SERIRQ	No
6	Floppy Drive Controller	IRQ6 via SERIRQ	No
7	Parallel port	IRQ7 via SERIRQ	No
8	Real-time clock	N/A	No
9	SCI / APCI	IRQ9 via SERIRQ	Note (1)
10	No	N/A	No
11	No	N/A	No
12	PS/2 Mouse	IRQ12 via SERIRQ	Note (1)
13	Math Processor	N/A	No
14	Primary IDE controller	IRQ14 via SERIRQ	Note (1)
15	Secondary IDE controller	IRQ15 via SERIRQ	Note (1)
16	N/A	PCIE Port 0/4, EHCI Controller 2, UHCI Controller 2, P.E.G Root Port 1/3/5/6, I.G.D, NAND Controller, HECI Host 1/2	Yes
17	N/A	PCIE Port 1/5, KT Controller	Yes
18	N/A	PCIE Port 2/6, UHCI Controller 3/6, SATA Host controller, SMBus Controller, Thermal Controller, IDER Controller	Yes
19	N/A	PCIE Port 3/7, UHCI Controller 1/7, SATA Host controller#1	Yes
20	N/A	GBE controller, PCI Slot 4	No

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IRQ#	Typical Interrupt Resource	Connected to Pin	Available
21	N/A	UHCI Controller 5, PCI Slot 1/5	No
22	N/A	High Definition Audio Controller, PCI Slot 2/6	No
23	N/A	UHCI Controller 4, EHCI Controller 1	No

Table B-5: IRQ Lines APIC Mode

Note (1): These IRQs can be used for PCI devices when onboard device is disabled.

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PCI Configuration Space Map

Bus #	Device #	Function #	Routing	Description
00h	00h	00h	N/A	Intel Q57 GMCH Host Hub Interface Bridge
00h	01H	00h	Internal	P.E.G.#1 Root Port
01h	00H	FFh	N/A	P.E.G.#1 Port
00h	02h	00h	Internal	Intel Integrated Graphics Device
00h	03h	00h	Internal	P.E.G.#3 Root Port
03h	00h	FFh	Internal	P.E.G.#3 Port
00h	04h	00h	Internal	P.E.G.#4 Root Port
04h	00h	FFh	Internal	P.E.G.#4 Port
00h	05h	00h	Internal	P.E.G.#5 Root Port
05h	00h	FFh	Internal	P.E.G.#5 Port
00h	06h	00h	Internal	P.E.G.#6 Root Port
06h	00h	FFh	Internal	P.E.G.#6 Port
00h	16h	00h	Internal	HECI Host #1
00h	16h	01h	Internal	HECI Host #2
00h	16h	02h	Internal	IDER Controller
00h	16h	03h	Internal	KT Controller
00h	19h	00h	Internal	GbE Controller
00h	18h	00h	Internal	NAND Controller
00h	1Ah	00h	Internal	Intel USB EHCI Controller #2
00h	1Ah	01h	Internal	Intel USB UHCI Controller #5
00h	1Ah	02h	Internal	Intel USB UHCI Controller #6
00h	1Ah	03h	Internal	Intel USB UHCI Controller #7
00h	1Bh	00h	Internal	High Definition Audio controller
00h	1Ch	00h	Internal	Intel ICH Express Root port #0
00h	1Ch	01h	Internal	Intel ICH Express Root port #1
00h	1Ch	03h	Internal	Intel ICH Express Root port #3
00h	1Ch	04h	Internal	Intel ICH Express Root port #4
00h	1Ch	05h	Internal	Intel ICH Express Root port #5
00h	1Ch	06h	Internal	Intel ICH Express Root port #6
00h	1Ch	07h	Internal	Intel ICH Express Root port #7
00h	1Dh	00h	Internal	Intel USB EHCI Controller #1

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Bus #	Device #	Function #	Routing	Description
00h	1Dh	01h	Internal	Intel USB UHCI Controller #1
00h	1Dh	02h	Internal	Intel USB UHCI Controller #2
00h	1Dh	03h	Internal	Intel USB UHCI Controller #3
00h	1Dh	04h	Internal	Intel USB UHCI Controller #4
00h	1Eh	00h	N/A	Intel Hub Interface to PCI Bridge
00h	1Fh	00h	N/A	Intel LPC Interface Bridge
00h	1Fh	02h	Internal	Intel SATA Host /Raid controller
00h	1Fh	03h	Internal	Intel SMBus Controller
00h	1Fh	05h	Internal	Intel Host SATA controller1
00h	1Fh	06h	Internal	Thermal Controller
20h	00h	FFH	Internal	PCIE Port #0
21h	00h	FFh	Internal	PCIE Port #1
22h	00h	FFh	Internal	PCIE Port #2
23h	00h	FFh	Internal	PCIE Port #3
24h	00h	FFh	Internal	PCIE Port #4
25h	00h	FFh	Internal	PCIE Port #5
26h	00h	FFh	Internal	PCIE Port #6
27h	00h	FFh	Internal	PCIE Port #7
1Eh	0Fh	FFh	Slot	PCI Slot 1
1Eh	0Eh	FFh	Slot	PCI Slot 2
1Eh	0Dh	FFh	Slot	PCI Slot 3
1Eh	0Ch	FFh	Slot	PCI Slot 4
1Eh	0Bh	FFh	Slot	PCI Slot 5
1Eh	0Ah	FFh	Slot	PCI Slot 6
1Eh	09h	FFh	Slot	PCI Slot 7

Table B-6: PCI Configuration Space Map

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PCI Interrupt Routing Map

PIRQ	A	B	C	D	E	F	G	H
PEG Root Port 1	INTA	INTB	INTC	INTD				
PEG Root Port 3	INTA	INTB	INTC	INTD				
PEG Root Port 4	INTA	INTB	INTC	INTD				
PEG Root Port 5	INTA	INTB	INTC	INTD				
PEG Root Port 6	INTA	INTB	INTC	INTD				
IGD	X							
SATA Controller			X	X				
SATA Controller1				X				
SMBus Controller			X					
Thermal Controller			X					
HDA Controller							X	
GbE Controller					X			
NAND Controller	X							
HECI Host #1	X							
HECI Host #2	X							
IDER Controller			X					
KT Controller		X						
PCIE port 0	INTA	INTB	INTC	INTD				
PCIE port 1	INTB	INTC	INTD	INTA				
PCIE port 2	INTC	INTD	INTA	INTB				
PCIE port 3	INTD	INTA	INTB	INTC				
PCIE port 4	INTA	INTB	INTC	INTD				
PCIE port 5	INTB	INTC	INTD	INTA				
PCIE port 6	INTC	INTD	INTA	INTB				
PCIE port 7	INTD	INTA	INTB	INTC				
PCI slot 1	INTF	INTG	INTH	INTE				
PCI slot 2	INTG	INTH	INTE	INTF				
PCI slot 3	INTH	INTE	INTF	INTG				
PCI slot 4	INTE	INTF	INTG	INTH				
PCI slot 5	INTF	INTG	INTG	INTE				
PCI slot 6	INTH	INTG	INTE	INTF				
PCI slot 7	INTH	INTE	INTF	INTG				

Table B-7: PCI Interrupt Routing Map

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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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