NuPRO-730

Full-Sized PICMG 1.0 SBC
Intel® GME965/ICH8M Chipset

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	2008/10/31	Initial Release
2.01	2009/03/13	Correct LVDS pin definition
2.02	2009/08/06	Correct GbE pin definition; add extended temperature range support
2.03	2009/08/19	Correct LAN, FAN1, LVDS, Floppy, COM1 and System Panel pin def'n; correct LPT connector and COM jumper drawings
2.04	2011/09/07	Correct BIOS Power Button Mode description; remove Mini-DIN PS/2 KB/MS for boards with ordering numbers ending in “xx30” and higher; update addresses

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Preface

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Using this Manual

Audience and Scope

The NuPRO-730 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-730, its features, applications, and specifications, including functional descriptions and board layout.

Chapter 2, Hardware Information: Provides technical information on connectors and jumpers as well as pin assignments for configuring the NuPRO-730 and any attached external devices.

Chapter 3, Getting Started: Illustrates how to install components on the NuPRO-730, specifically, CPU, memory modules, operating systems and drivers.

Chapter 4, Driver Installation: Provides information on how to install the NuPRO-730 device drivers under Windows 2000/XP.

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

Appendix A, Watchdog Timer: Presents information on understanding and configuring the embedded 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-730 is a PICMG 1.0 industrial SBC supporting the Intel® Core™2 Duo and Celeron® M processors in the Micro-FCPGA package to deliver a low power, high performance platform for a wide array of industrial automation applications. The NuPRO-730 supports processing speeds up to 2.5 GHz and high-bandwidth network connectivity with PCI Express®-based Gigabit Ethernet. The NuPRO-730 supports an extended operating temperature range of -20ºC to 70ºC for applications in harsh environments.

These advanced features, coupled with a dual-channel DDR2 system memory architecture and diverse I/O storage make the NuPRO-730 suitable for industrial automation and automation control applications requiring a standardized, easy-to-deploy, and cost-effective SBC.

1.2 Features

- Supports Intel® Core™2 Duo and Celeron® M processors in Micro-FCPGA package (Socket P)
- TPM hardware security chip (NuPRO-730/DV only)
- Dual 10/100/1000Mbps Ethernet (NuPRO-730/LV supports single GbE)
- 5 USB 2.0 ports (1 on faceplate, 4 internal)
- 2 ports SATA 3 Gb/s
- Watchdog Timer, Hardware Monitor
- Optional HD audio kit (DB-Audio2 daughter board)
- Extended temperature support (-20ºC to 70ºC operating)
- RoHS compliant



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

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1.3 Specifications

System	
CPU/Cache	• Intel® Core™2 Duo, Celeron® M in Micro-FCPGA package (Socket P)
FSB	• 533/800 MHz
Chipset	• Intel® GME965 Graphics Memory Controller Hub • Intel® ICH8M I/O Controller Hub
Memory	• Two 200-pin SO-DIMM sockets support 533/667 MHz DDR2 (up to 4GB)
BIOS	• AMI BIOS in 16-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 (NuPRO-730/DV only)
I/O Interfaces	
IDE	• One 40-pin ATA-100 IDE connector (2 devices, when no CF card installed))
CompactFlash	• One CF card slot onboard (no IDE device support if CF card installed)
Serial ATA	• Two SATA ports, data rate up to 3 Gb/s
I/O Ports	• 1 USB 2.0 port on rear panel, four onboard • 2 Serial ports (one RS232/422/485/485+, one RS-232, by onboard pin-header) • 2 Gigabit Ethernet RJ45 ports (LV supports 1x GbE) • 1 VGA port • PS/2 Keyboard/Mouse* • 1 Parallel port • 1 Floppy port
ISA	• PCI-to-ISA Bridge: IT8888 (DMA not supported)


NOTE:

* A Mini-DIN PS/2 KB/MS connector is not supported on boards with ordering numbers ending in “xx30” and higher. See “PS/2 Keyboard/Mouse Port” on page 14. for more information.

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Display	
VGA	• GMA X3100 integrated in GME965 GMCH
VRAM	• Shared system memory up to 256 MB
CRT	• External Dsub-15 connector, resolution up to 2048 x 1536 @ 75 Hz
Ethernet	
Controller	• Dual Intel® 82573L (LV supports 1x LAN only) • supports Preboot Execution Environment (PXE), Wake-On-LAN (LAN1 only)
Ports	• Two RJ-45 Ethernet ports (NuPRO-730/LV supports 1x LAN only)
Mechanical and Environment	
Form Factor	• Standard full-size PICMG 1.0 SBC
Dimensions	• 338 x 122 mm (L x W)
Operating Temp.	• -20ºC to 70ºC
Storage Temp.	• -40ºC to 80ºC
Relative Humidity	• 10% to 90% non-condensing both operating and non-operating
Safety	• CE, FCC Class A

Table 1-1: NuPRO-730 General Specifications

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1.4 Power Consumption

Intel® Core 2 Duo Mobile processor T7500, 2.2GHz

Test Configuration	
CPU	Intel® Core 2 Duo Mobile processor T7500, 2.2GHz
Memory	Kingston KVR667D2S5 DDR2 667MHz 2GB x2
Graphics	Intel® X3100 GMA
SATA Channel	Seagate Barracuda 7200.10 160GB
Backplane	HPCI-8S4
Power Supply	LEMACS HG2-6350P 350W

DOS			
Power Req.	+5V	+12V	Total
Current (A)	2.98A	0.473A	3.45A
Watts (W)	14.9W	5.676W	20.58W
Linux, Idle			
Power Req.	+5V	+12V	Total
Current (A)	3.07A	0.285A	3.35A
Watts (W)	15.35W	3.42W	18.77W
Windows XP, Idle			
Power Req.	+5V	+12V	Total
Current (A)	3.08A	0.525A	3.60A
Watts (W)	15.4W	6.3W	21.7W
Windows® XP, CPU 100% Usage			
Power Req.	+5V	+12V	Total
Current (A)	3.56A	2.29A	5.85A
Watts (W)	17.8W	27.48W	45.28W

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Intel® Celeron processor 550, 533 MHz

Test Configuration	
CPU	Intel® Celeron processor 550, 533 MHz
Memory	Kingston KVR667D2S5 DDR2 667MHz 2GB x2
Graphics	Intel® X3100 GMA
SATA Channel	Seagate Barracuda 7200.10 160GB
Backplane	HPCI-8S4
Power Supply	LEMACS HG2-6350P 350W

DOS			
Power Req.	+5V	+12V	Total
Current (A)	3.12A	1.061A	4.18A
Watts (W)	15.6W	12.732W	28.33W
Linux, Idle			
Power Req.	+5V	+12V	Total
Current (A)	3.23A	0.497A	3.73A
Watts (W)	16.15W	5.964W	22.11W
Windows XP, Idle			
Power Req.	+5V	+12V	Total
Current (A)	2.97A	0.486A	3.45A
Watts (W)	14.85W	5.832W	20.68W
Windows® XP, CPU 100% Usage			
Power Req.	+5V	+12V	Total
Current (A)	3.23A	1.341A	4.57A
Watts (W)	16.15W	16.092W	32.24W

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1.5 Block Diagram

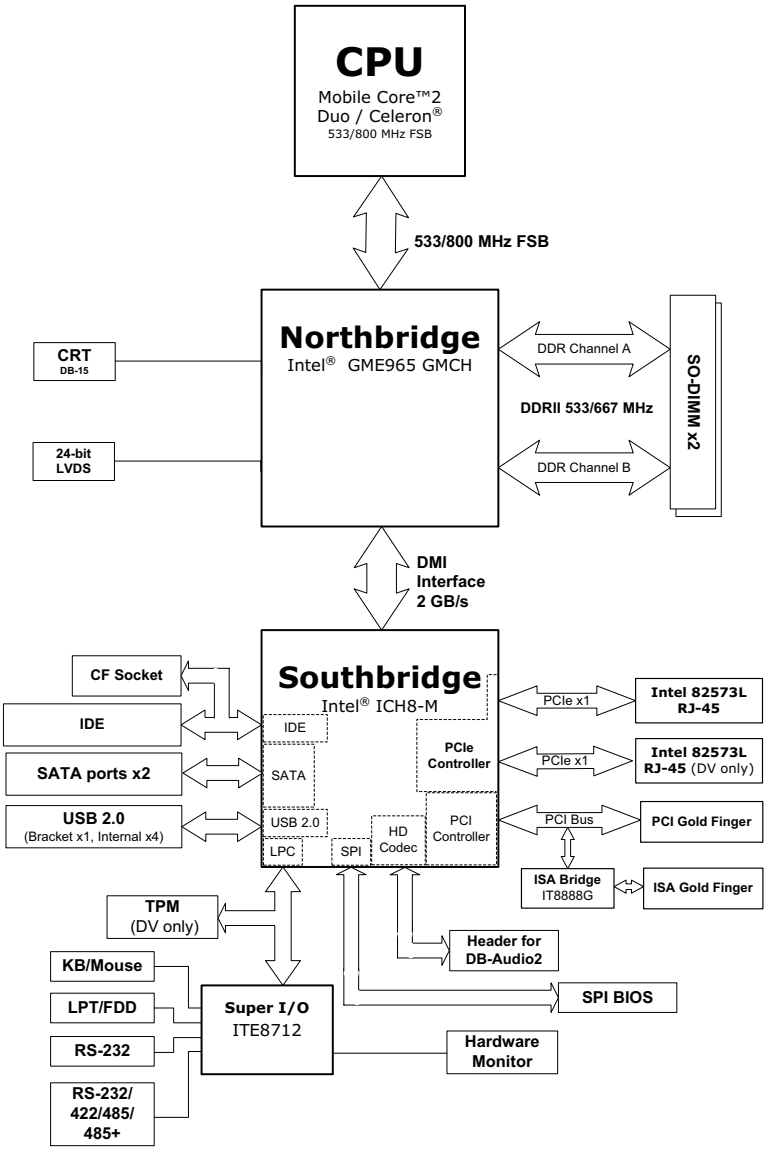


Figure 1-1: NuPRO-730 Block Diagram

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1.6 Functional Description

Processor Support

The NuPRO-730 is a single processor design for the Intel Merom/Penryn Mobile Processor family, with one Micro-FCPGA socket (Socket P). Supported processors include the Intel® Core™2 Duo processor T9300/T8300/T7500, and Intel® Celeron® M processor 530. The CPU interfaces with the Intel® GME965 MCH through the 533/800 MHz Front Side Bus (FSB).

Mobile Intel® GME965 + ICH8M Express chipset

The Mobile Intel® GME965 Express chipset provides excellent flexibility for developers of embedded applications by offering outstanding graphics and I/O bandwidth, asset management capabilities, storage speed and reliability. The Mobile Intel GME965 Express Chipset features dual-channel DDR2 memory, 800/533MHz system bus, PCI Express x16 graphics ports and PCI Express x1 I/O ports, Serial ATA, and Hi-Speed USB 2.0 connectivity.

Mobile Intel® Graphics Media Accelerator X3100

The Mobile Intel® Graphics Media Accelerator (GMA) X3100 provides increased graphics performance with Intel® Clear Video Technology, graphics core speeds up to 500 MHz, enhanced graphics and 3D rendering performance, and improved high-definition video playback. With support for DirectX 9 hardware acceleration, LVDS, Analog CRT, and Dynamic Video Memory Technology (DVMT 4.0), the Mobile Intel® GMA X3100 provides a cost-effective and high-performance graphics solution.

Dual-channel DDR2 memory

To meet the requirements of memory-intensive applications, the NuPRO-730 has a dual-channel memory architecture supporting DDR2 533/667 MHz SO-DIMMs. The high-bandwidth memory specification, meets the requirements of the latest 3D graphics, multimedia, and network application, and boosts system performance by eliminating bottlenecks.

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Gigabit Ethernet

The NuPRO-730 implements the Intel® 82573L Gigabit Ethernet Controller connected to the PCI-E x1 bus of the ICH8M. Two Ethernet ports support 10/100/1000 Mbps data transfer rates (NuPRO-730/LV supports 1x GbE).

Serial ATA

Utilizing the Intel® ICH8M, the NUPRO-730 supports up to two Serial ATA devices capable of data transfer at up to 3 Gb/s and supporting Legacy, AHCI, and Combined modes of operation. The SATA specification improves chassis airflow via thinner and more flexible cables with lower pin count.

Universal Serial Bus (USB) 2.0

The NUPRO-730 incorporates the Universal Serial Bus (USB) 2.0 specification that increases peripheral connection speed from 12 Mbps (USB 1.1) to 480 Mbps. USB 2.0 is backward compatible with USB 1.1.

Hardware monitoring

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

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Trusted Platform Module

The NuPRO-730 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.

Software

The NuPRO-730 is compatible with most major operating systems. ADLINK provides additional drivers for ADLINK peripherals. Hardware and software drivers may be found in the ADLINK All-in-One DVD.

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1.7 Mechanical Drawing

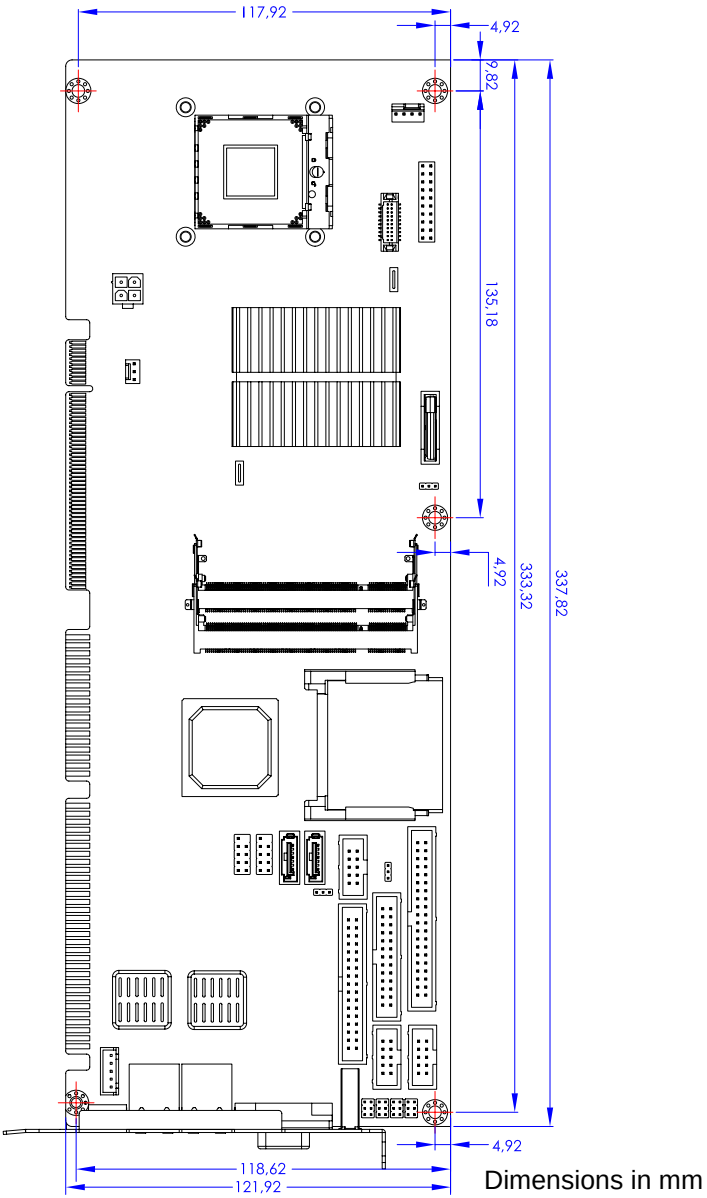


Figure 1-2: NuPRO-730 Board Dimensions (top view)

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1.8 I/O Connectivity

I/O	Bracket	Onboard	Golden Finger	Remarks
USB4	Y	—	—	
VGA	Y	—	—	DB-15
GbE1 (RJ-45)	Y	—	—	Act/Link/Speed LEDs
GbE2 (RJ-45)	Y (DV only)	—	—	Act/Link/Speed LEDs
PS/2 KB/MS (2)	Y	—	—	—
KB/MS	—	Y	—	2.54 pitch
USB0/1	—	Y	—	2.54 pitch
USB2/3	—	Y	—	2.54 pitch
COM1/2	—	Y	—	2.54 pitch
Printer port	—	Y	—	—
IDE	—	Y	—	2 devices (1)
Floppy	—	Y	—	—
CF	—	Y	—	see Note 1
SATA-300 1/2	—	Y	—	—
ISA	—	—	Y	—
PCI 32-bit/33 MHz	—	—	Y	4 slots

Note 1: No IDE device support if CF card installed.

Note 2: A Mini-DIN PS/2 KB/MS connector is not supported on boards with ordering numbers ending in “xx30” and higher. See “PS/2 Keyboard/Mouse Port” on page 14. for more information.

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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-730
- PS/2 Y cable x1*
- SATA cable x2
- SATA Power cable x1
- IDE cable x1
- Floppy cable x1
- 2-port USB cable with bracket x1
- COM+Print cable with bracket x1
- COM cable with bracket x1
- ADLINK All-in-One Driver DVD
- User's manual



* Not included with ordering numbers ending in "xx30" and higher. See "PS/2 Keyboard/Mouse Port" on page 14. for more information.



The NuPRO-730 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-730 board layout, connector pin assignments, and jumper settings.

2.1 Rear Panel I/O Ports

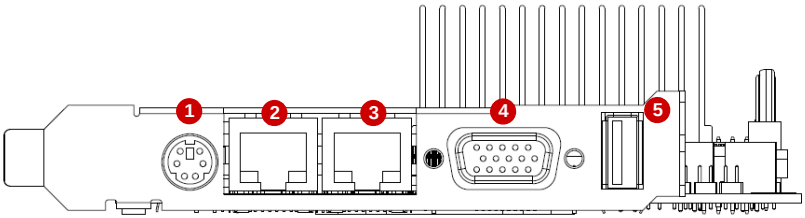


Figure 2-1: Rear Panel I/O Ports

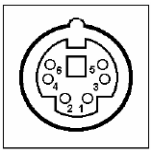
	Connector	Description
1	PS/2 KB/MS port	Connects PS/2 mouse and keyboard via Y cable*
2	Gigabit LAN1 port (RJ-45)	Provides Gigabit Ethernet connection
3	Gigabit LAN2 port (RJ-45)	Provides Gigabit Ethernet connection (not supported on NuPRO-730/LV)
4	VGA port	Connects to a CRT or LCD monitor
5	USB 2.0 port	High-speed USB 2.0 port

NOTE:

* A Mini-DIN PS/2 KB/MS connector is not supported on boards with ordering numbers ending in “xx30” and higher. See “PS/2 Keyboard/Mouse Port” below.

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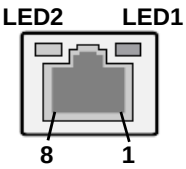
PS/2 Keyboard/Mouse Port



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

For boards without a Mini-DIN PS/2 KB/MS connector, customers wishing to use a PS/2 type keyboard may use the “External Keyboard Connector (CN10)” on page 20. Mouse support is provided by USB port.

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-

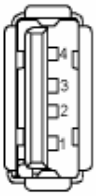
Refer to the table below for the LAN port LED definitions.

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

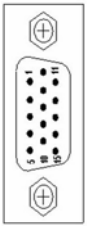
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USB Connector

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



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

The illustrations below show the locations of connectors, slots, and jumpers on the NuPRO-730.

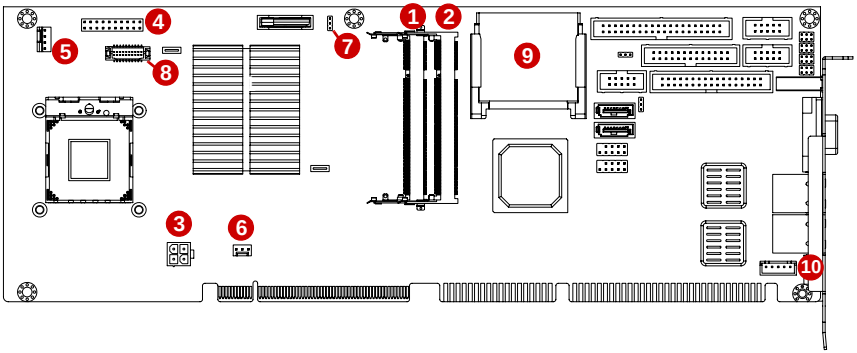


Figure 2-2: Connectors and Jumpers Pt. 1

	Connector	Description
1	DIMM1	200-pin DDR2 SO-DIMM slot
2	DIMM2	200-pin DDR2 SO-DIMM slot
3	CN21	ATX 12V Power connector
4	CN16	System Panel connector
5	FAN1	CPU Fan connector
6	FAN2	System Fan connector
7	JBAT1	Clear CMOS jumper
8	J1	LVDS connector
9	CN22	CompactFlash card slot
10	CN10	External Keyboard connector

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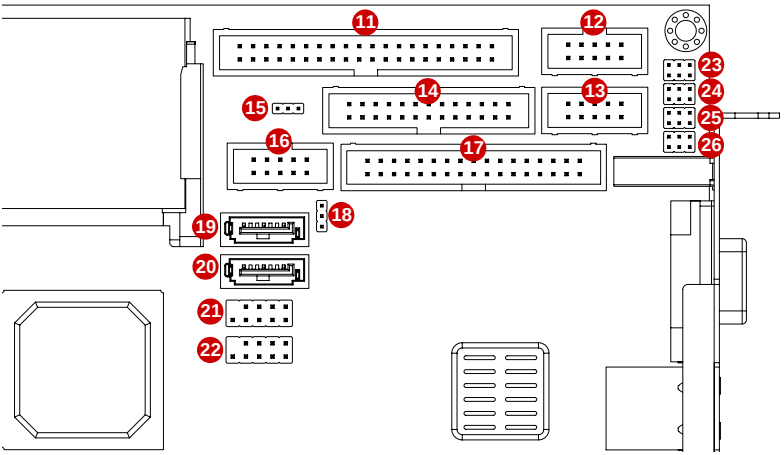


Figure 2-3: Connectors and Jumpers Pt. 2

	Connector	Description
11	CN3	IDE connector
12	CN17	COM1 connector
13	CN18	COM2 connector
14	CN15	Parallel Port connector
15	JP3	CF Master/Slave jumper
16	CN19	HD Audio Daughter Board connector
17	CN14	Floppy connector
18	JP6	reserved (pins 2-3 shorted - default setting)
19	CN5	SATA0 connector
20	CN7	SATA1 connector
21	CN9	USB0 pin header
22	CN11	USB1 pin header
23	JP1	COM1 mode jumper
24	JP2	COM1 mode jumper
25	JP4	COM1 mode jumper
26	JP5	COM1 mode jumper

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2.3 Onboard Connectors

ATX 12V Power Connector (CN21)



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

NOTE: The ATX 12V power connector must be connected to provide sufficient power to the SBC in either ATX or AT modes . See “Installing the Power Connectors” on page 31.

CPU Fan Connector (FAN1)



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

System Fan Connector (FAN2)

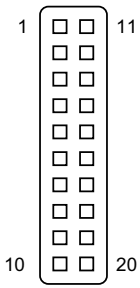


Pin #	Signal
1	GND
2	Fan power (+12V)
3	Fan Tachometer

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System Panel Connector (CN16)

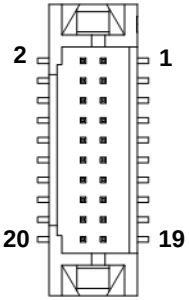
Connects to chassis-mounted buttons, speakers, and LEDs.



Pin #	Signal	Function	Pin Group
1	P5V	Power for +5v	Power LED
2	NC		
3	HC_PLED-L	Power LED signal	
4	NC		
5	GND	Ground	
6	GND	Ground	ATX Power Connector
7	NC		
8	ATX_PSON-L	Power-on signal for ATX	
9	P5V_SB_ATX	Power for +5V Standby	
10	PMEJ	Power control signal	
11	HC_SPKR	Speaker signal	Chassis Speaker
12	NC		
13	NC		
14	P5V	Power for +5v	
15	HC_RSTBN-L	RESET signal	Reset Button
16	GND	Ground	
17	HDLED_PWR	Hard Disk LED signal	Hard Disk LED
18	P5V	Power for +5v	
19	HC_PBTNJ	Power-on signal	Power-on Button
20	GND	Ground	

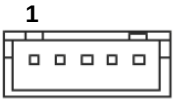
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LVDS Connector (J1)



Pin #	Signal	Pin #	Signal
1	Ground	2	Power
3	Ground	4	Power
5	Data3P	6	Ground
7	Data3N	8	Ground
9	Ground	10	Data0N
11	Clock P	12	Data0P
13	Clock N	14	Ground
15	Ground	16	Data1N
17	Data2P	18	Data1P
19	Data2N	20	Ground

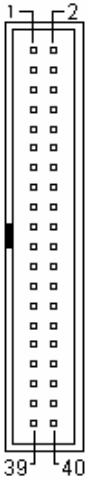
External Keyboard Connector (CN10)



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

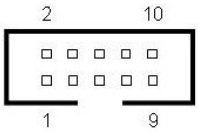
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IDE Connector (CN3)



Pin #	Signal	Pin #	Signal
1	Reset	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC
21	Request	22	Ground
23	I/O Write	24	Ground
25	I/O Read	26	Ground
27	I/O Ready	28	Cable Select
29	DMA Acknowledge	30	Ground
31	Interrupt Request	32	No Connect
33	Device Address 1	34	ATA 66/100
35	Device Address 0	36	Device Address 2
37	Chip Select 1	38	Chip Select 3
39	Device Active	40	Ground

COM1 Connector (RS-422/485/485+) (CN17)

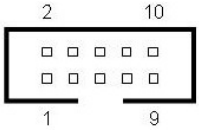


Pin #	RS-422/485+	RS-485
1	TXD-	Data-
2	NC	NC
3	TXD+	Data+
4	NC	NC
5	RXD+	NC
6	NC	NC
7	RXD-	NC
8	NC	NC
9	GND	GND
10	NC	NC

NOTE: See Section 2.4 for COM1 mode jumper settings.

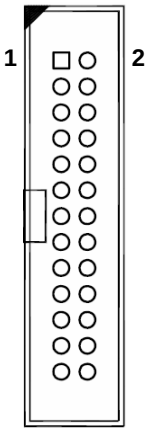
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COM1/COM2 Connector (RS-232) (CN18)



Pin #	Signal	Functions
1	DCD	Data Carrier Detect
2	DSR	Data Set Ready
3	RXD	Receive Data
4	RTS	Request to Send
5	TXD	Transmit Data
6	CTS	Clear to Send
7	DTR	Data Terminal Ready
8	RI	Ring Indicate
9	GND	Ground
10	NC	No Connect

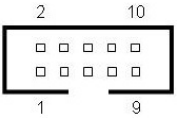
Parallel Port (CN15)



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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HD Audio Daughter Board Connector (CN19)

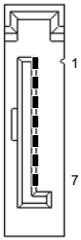


Pin #	Signal	Function
1	GND	Ground
2	AUD_BCLK	Audio Clock
3	GND	Ground
4	ICH_AUD_SDIN0	Audio Data Input
5	P5V	+ 5V
6	ICH_AUD_SDOUT	Audio Data Output
7	P5V_AUD	+ 5V
8	P3V3_DVDD	3.3V
9	AUD_SYNC	Audio Synchronous
10	AUD_RST-L	Audio Reset

NOTE:

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

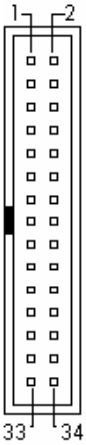
Serial ATA Connectors (CN5/7)



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

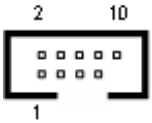
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Floppy Drive Connector (CN14)



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

USB 2.0 Connectors (CN9/11)



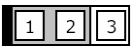
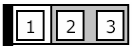
Pin #	Signal	Pin #	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB01+
7	GND	8	GND
9	Key	10	NC

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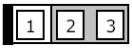
2.4 Jumpers

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) Unplug the NuPRO-730 (2) short the JP1 pin 2-3 (3) turn the power on. After power on, remove the jumper cap from pin 2-3 and reinstall it to pin 1-2.

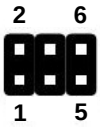
RTC status	Connection	JBAT1
Normal (default)	1 – 2	
Clear CMOS	2 – 3	

CF Master/Slave (JP3)

RTC status	Connection	JP3
Master (default)	1 – 2	
Slave	2 – 3	

COM1 mode Jumper Settings (JP1, 2, 4, 5)

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	3-5, 4-6	3-5, 4-6	3-5, 4-6
JP2	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
JP5	-	1-3, 2-4	1-3, 2-4	3-5, 4-6

JP6 Reserved

Leave pins 2-3 shorted for normal operation.

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3 Getting Started

This chapter provides information on how to install components on the NuPRO-730 SBC. Note that the photos below are for instructional purposes and may not accurately represent the board you have purchased.

3.1 Installing the CPU

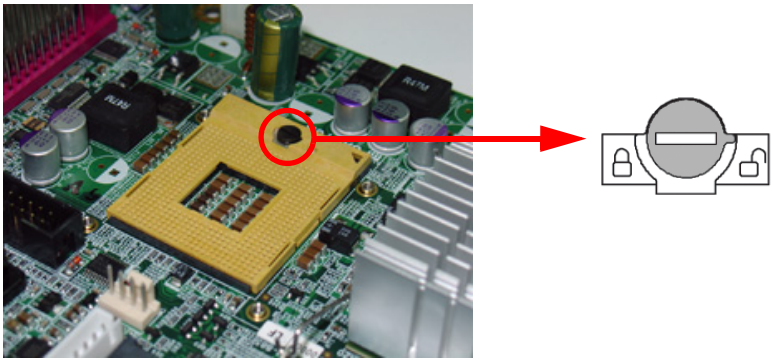
The NuPRO-730 implements a 478-pin Socket P mobile processor socket for Intel® Core™2 Duo and Celeron® M processors.



When installing, carefully hold the CPU by its edges and do not force the CPU into the socket to avoid bending the pins.

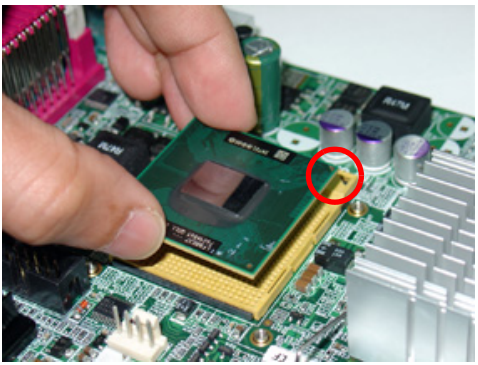
To install the CPU:

1. Locate the CPU socket. If the socket is locked, use a flathead screwdriver to turn the CPU lock screw counter-clockwise to the unlocked position.



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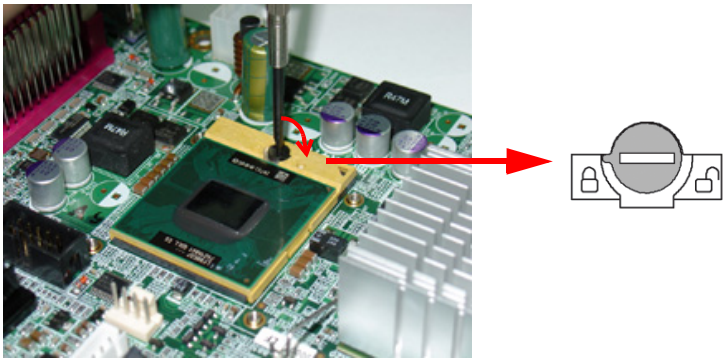
2. Align the gold triangle at the upper-right corner of the CPU with the triangular mark at the upper-right corner of the socket. Gently place the CPU into the socket. It should drop into the socket without having to apply any downward force.



CAUTION:

You should not have to press down on the processor. If the processor does not drop completely into the socket, turn the CPU lock screw to the unlocked position until the processor drops completely in.

3. While gently holding the processor down with your finger, turn the CPU lock screw clockwise to lock the CPU in place.



3.2 Installing the CPU Fan and Heatsink

CAUTION:

The CPU requires a chassis with an airflow inlet and maximum internal ambient temperature of 60° C. A especially-designed CPU fan and heatsink must be installed before using the board. Failure to install a CPU fan and heatsink may damage the system host board and/or the CPU.

To install the CPU fan and heatsink:

1. Apply thermal grease evenly on top of the installed CPU.
2. Position the heatsink on top of the installed CPU until the heatsink screws match the screw holes on the board.

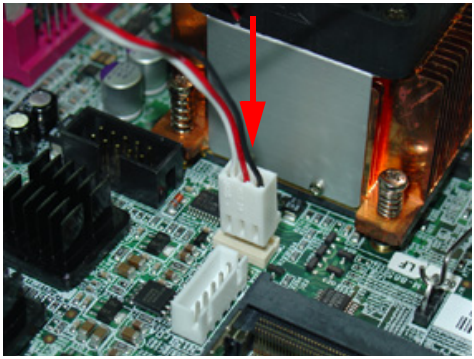


3. Tighten the heatsink's spring-loaded screws in a diagonal sequence until it is securely attached to the board.



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4. Connect the CPU fan cable to the CPU fan connector on the board (FAN1).



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3.3 Installing the Power Connectors

Refer to **Section 2.3 Onboard Connectors** on page 18 for detailed information on connectors and pin definitions referred to below.

ATX 12V Power Connector

The NuPRO-730 requires +12V DC power connected to CN7 for proper operation in either ATX or AT modes . If necessary, order a ATX12V Convert Cable from ADLINK for use with Molex 4-pin power connectors (P/N 30-00006-0000).

System Panel Connector

Before powering up the NuPRO-730, connect the necessary signals from the backplane to the System Panel Connector (CN1). The ATX Power Connector pin group (pins 6-10) and Power On Button pin group (pins 19-20) must be connected for the system to power up in ATX mode.

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3.4 Installing Memory Modules

The NuPRO-730 supports up to 4 GB of DDR2 667/533 MHz memory modules via two 200-pin DDR2 SO-DIMM slots..


NOTE:

Due to the stacked configuration of the SO-DIMM slots, when installing two memory modules, install the first module in the lower slot DIMM1.

Memory Configuration Options

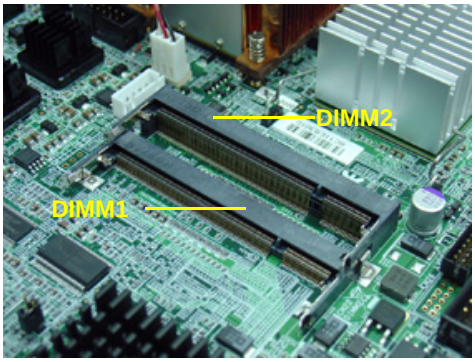
The NuPRO-730 allows you to install 512 MB, 1GB and 2GB unbuffered non-ECC DDR2 modules into the SO-DIMM sockets:

- Channel A: DIMM1
  Channel B: DIMM2
- For dual-channel configuration, the capacity of memory module installed in each 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 of the same brand and model.

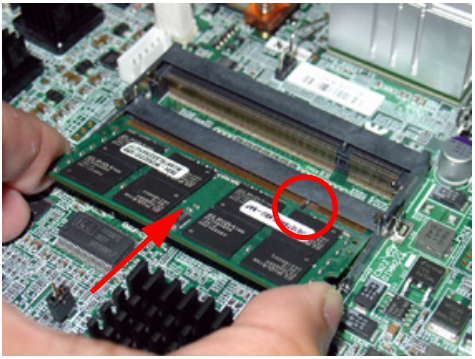
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To install a memory module:

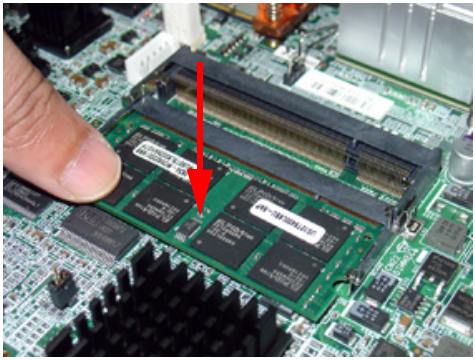
1. Locate the SO-DIMM slots on the board.



2. Position the memory module in the slot at a 45° angle and align the notch on the module with the “key” on the slot.



3. Insert the memory module to the slot, then gently press until the retaining clips snap into place and the module is securely seated.



4. Install the second memory module, if required.

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4 Driver Installation

This chapter provides information on how to install the NuPRO-730 device drivers under Windows 2000/XP. The device drivers are located in the following ADLINK All-in-One DVD directories:

Chipset driver	\NuPRO\NuPRO-730\Chipset\
Display driver	\NuPRO\NuPRO-730\VGA\
LAN driver	\NuPRO\NuPRO-730\Ethernet\
ISA driver	\NuPRO\NuPRO-730\ISA\
TPM driver	\NuPRO\NuPRO-730\TPM\Win32\
Audio driver	\Audio Daughter Board\DB-Audio2\

4.1 Intel® GME965 Express Chipset Driver

This section describes the installation of the Intel® GME965 Express chipset driver.

1. Locate the directory **X:\NuPRO\NuPRO-730\Chipset** from the ADLINK All-in-One DVD, select the operating system, then start the installation by double-clicking **infinst_autol.exe**.
2. When the initial installation window appears, click **Next** to display the license agreement. When prompted, click **Yes** to continue.
3. Click **Next** on the Readme Information screen to begin installing the INF files.
4. When installation is complete, click **Finish**. Restart the system when prompted.
5. After restart, follow screen instructions to complete installation. Windows displays a found new hardware window and automatically installs the required drivers. If the **New Hardware Found** dialog box appears and prompts you to locate the location of the drivers, point it to the relevant directory.
6. Restart the system when prompted.

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4.2 Display Driver

This section describes the installation of the Mobile Intel® Graphics Media Accelerator (GMA) 3000 driver.

To install the display drivers:

1. Locate the display drivers from this directory **X:\NuPRO\NuPRO-730\VGA**, then double-click on the **win2k_xp1434.exe** file to start installation.
2. Follow screen instructions to complete installation, then restart the system if prompted.

4.3 LAN Driver

Follow these instructions to install the LAN driver.

1. Locate the LAN drivers from the directory **X:\NuPRO\NuPRO-730\Ethernet**, then double-click on the **PRO2KXP.exe** file to start installation.
2. Follow screen instructions to complete installation, then restart the system if prompted.

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4.4 ISA Driver

Follow these instructions to install the ISA driver.

1. Open the **Device Manager** on your system.
2. Right click on '**Other PCI Bridge Devices**'.
3. A dialog box will appear. Select '**Update Driver...**'
4. The '**Hardware Update Wizard**' dialog box will open. Read the instructions and then click option 3, '**No, not this time**', then click '**Next**' to continue.
5. The next screen will prompt you to search for the location of the drivers for your device. Click option 2, '**Install from a list or specific location (Advanced)**' and then click '**Next**'.
6. Locate the following folder on the ADLINK All-in-One DVD: **X:\NuPRO\NuPRO-730\ISA.** Press '**Next**' to install the inf file (*ite.inf*).
7. After successfully installing the files, the '**Hardware Update Wizard**' will display the '**Completing the Hardware Update Wizard**' screen. Click '**Finish**'.

4.5 TPM Driver

Follow these instructions to install the TPM driver.

1. Locate the LAN drivers from the directory **X:\NuPRO\NuPRO-730\TPM\Win32**, then double-click on the file **setup.exe** to start installation.
2. Follow screen instructions to complete installation, then restart the system if prompted.

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4.6 Audio Driver

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



Before installing the audio driver, check the BIOS settings to make sure that audio is enabled: **Chipset > South Bridge Configurations > HDA Controller** (see Section 5.7.2).

1. Place the ADLINK All-in-One DVD to the optical drive.
2. Locate the audio drivers from the directory **X:\Audio Daughter Board\DB-Audio2**, then double-click on the **setup.exe** file to start installation.
3. Follow 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 board
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.

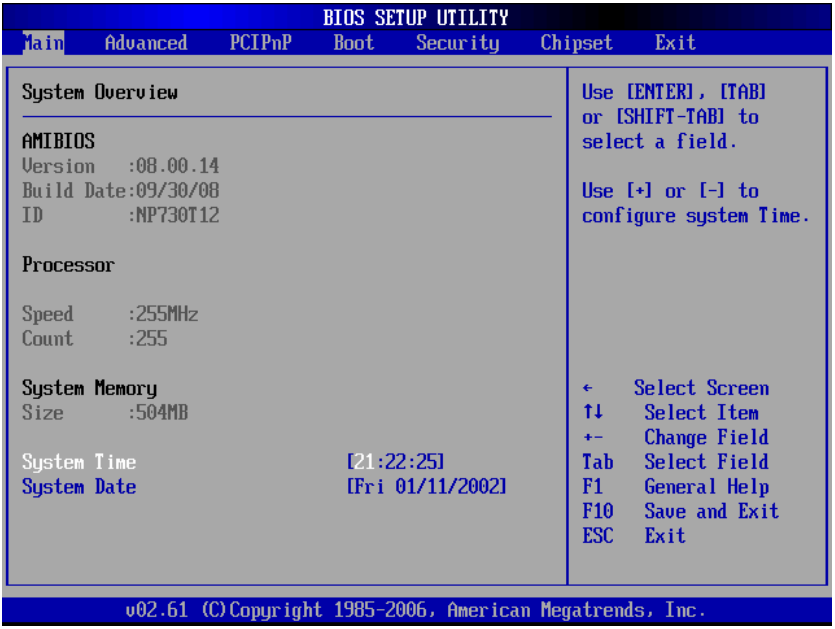
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Setup Menu

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.

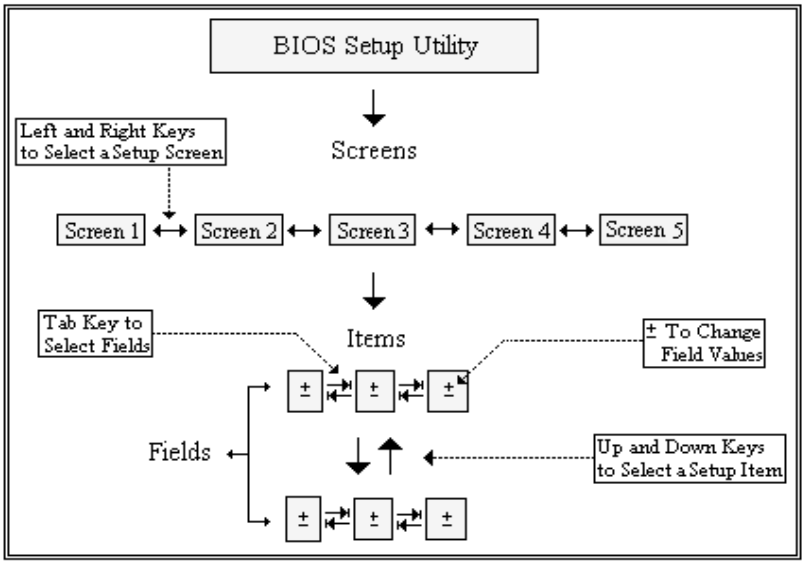


Navigation

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.

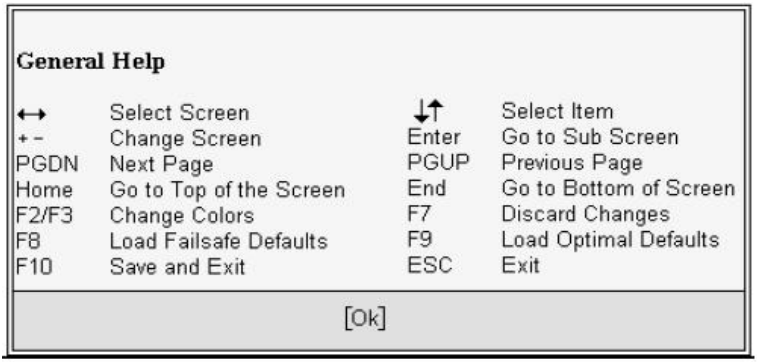
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the board to boot up with the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

Hotkey Descriptions

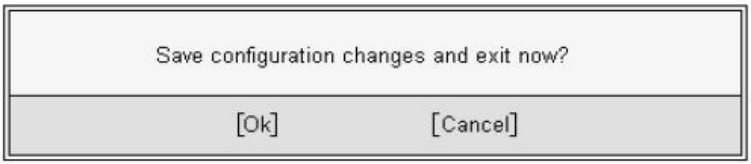
F1 The < F1 > key allows you to display the General Help screen.

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

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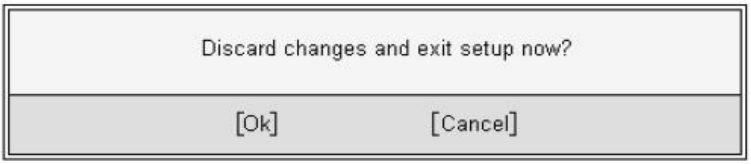


F10 The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:



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:



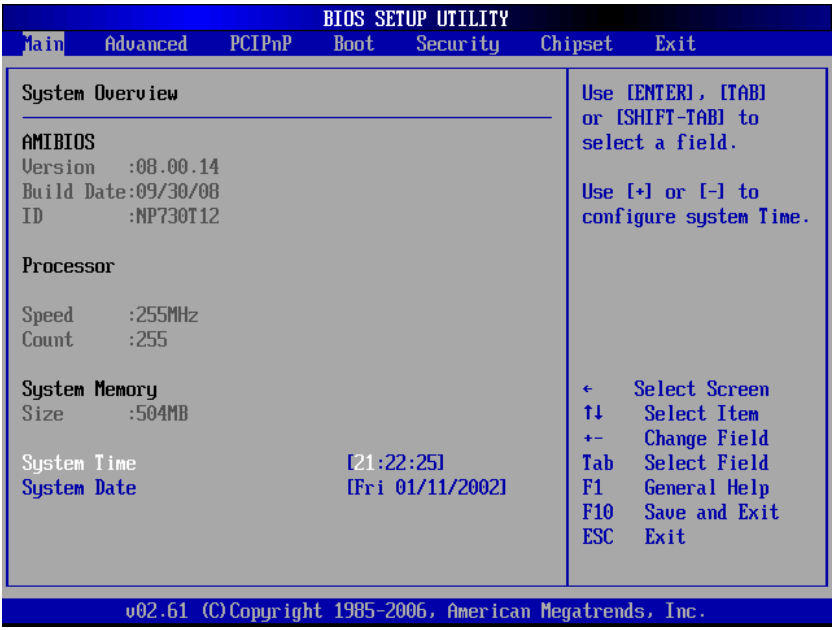
Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

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.

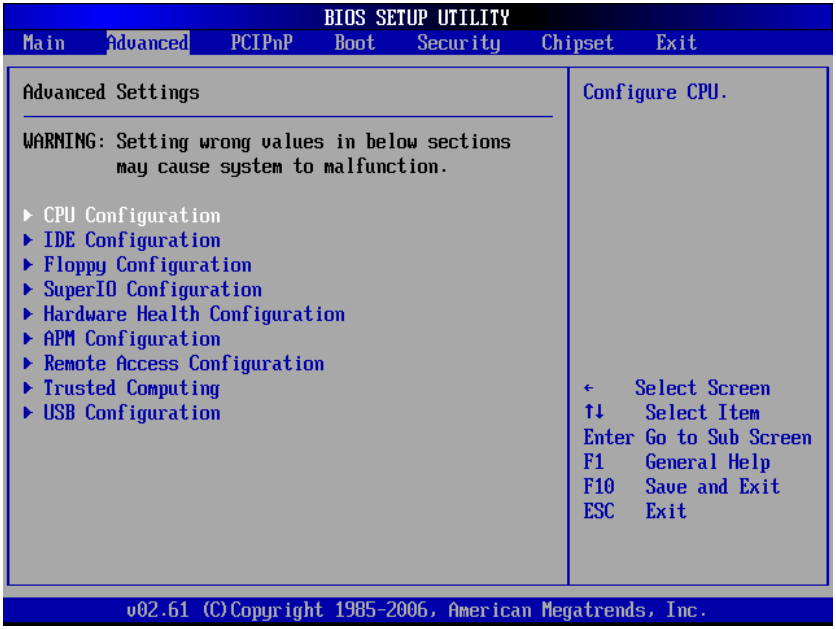
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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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.

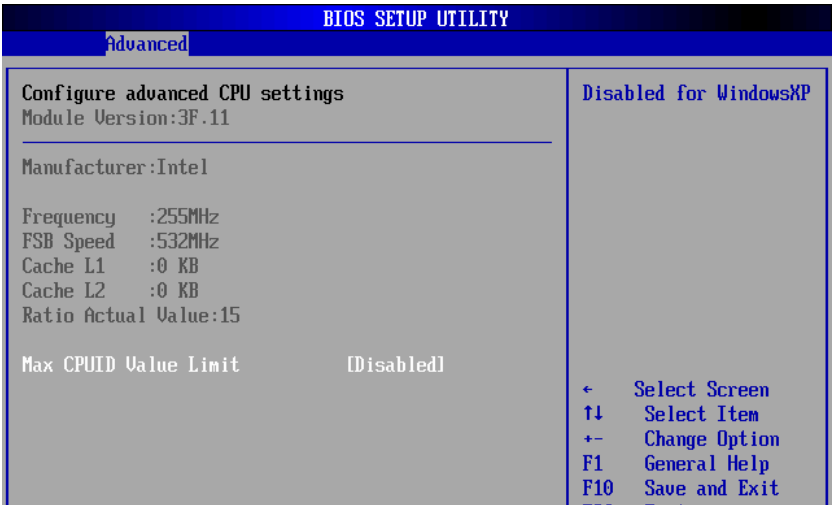
The sub menus are described on the following pages.



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5.3.1 CPU Configuration

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

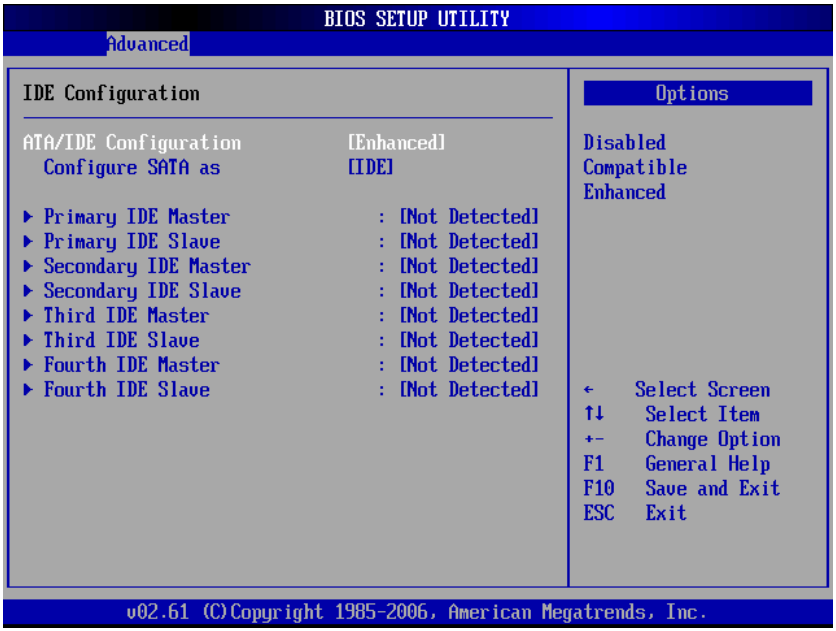
When the computer is booted up, the operating system executes the CPUID instruction to identify the processor and its capabilities. Before it can do so, it must first query the processor to find out the highest input value CPUID recognized. This determines the kind of basic information CPUID can provide 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 supports a higher CPUID input value. When Disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

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5.3.2 IDE Configuration

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



ATA/IDE Configuration

This item specifies whether the IDE channels should be initialized in Compatible or Enhanced mode of operation. The settings are **Disabled**, **Compatible** and **Enhanced**.

Configure SATA as

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

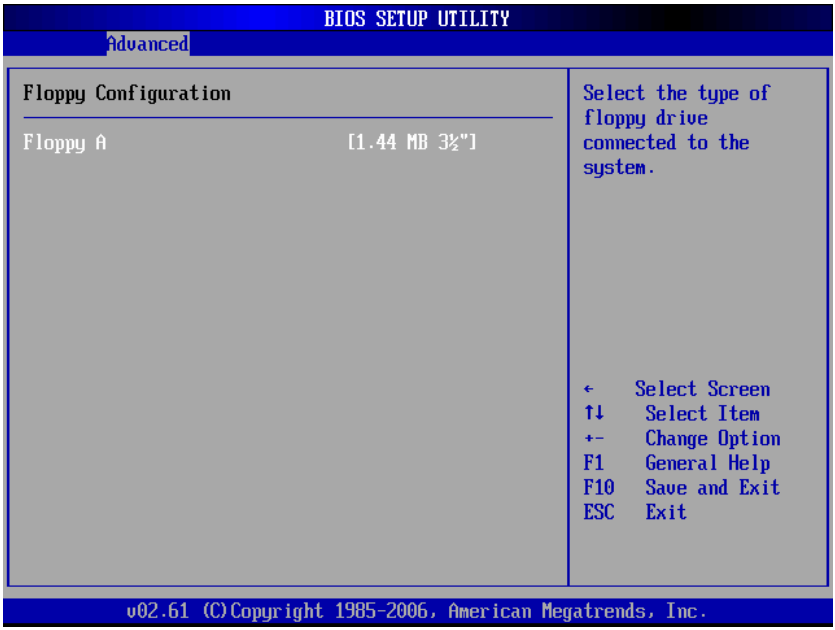
IDE Master/Slave

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

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5.3.3 Floppy Configuration

You can use this screen to specify options for the Floppy 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. The settings are described on the following pages. The screen is shown below.

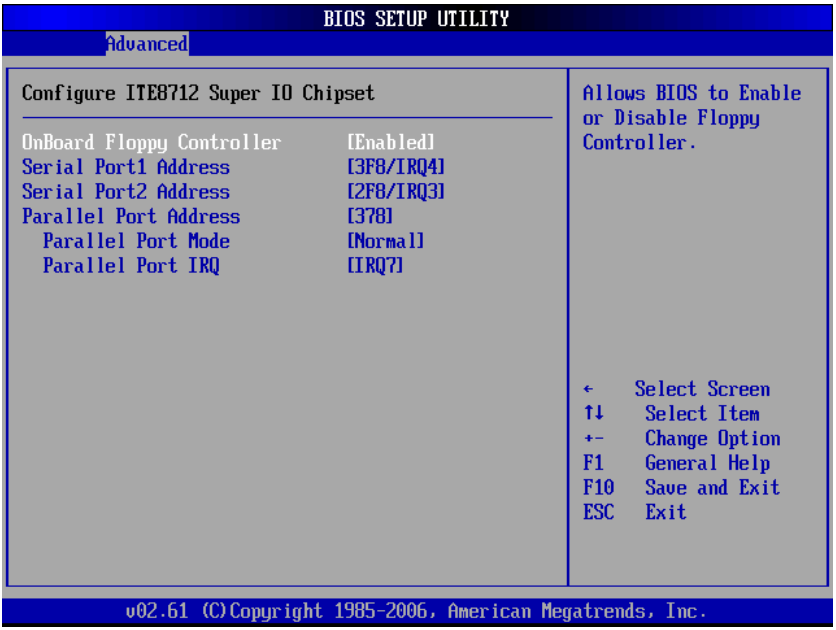


Options: 360 KB 5 ¼”, 1.2 MB 5 ¼”, 720 KB 3 ½”, 1.44 MB 3 ½”, 2.88 MB 3 ½”.

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5.3.4 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.



Onboard Floppy Controller

Options: Disabled, Enabled

Serial Port1 Address

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

Serial Port2 Address

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

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if Serial Port1 uses 3F8/IRQ4, the option, the 3F8/IRQ4 will not appear in the options of Serial Port2.

Parallel Port Mode

This option specifies the parallel port mode.

- **Normal**: Set this value to allow the standard parallel port mode to be used.
- **EPP**: The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
- **ECP**: The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric Bi-directional communication.
- **EPP+ECP:** Allow the parallel port to support both the ECP and EPP modes simultaneously.

Parallel Port IRQ

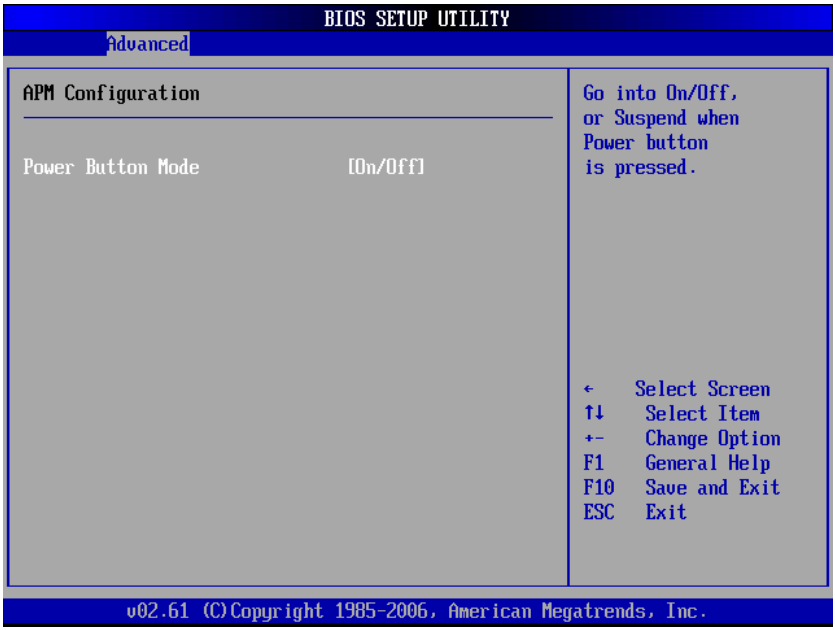
This option specifies the IRQ used by the parallel port.

- **IRQ5:** Set this value to allow the serial port to use Interrupt 5.
- **IRQ7:** Set this value to allow the serial port to use Interrupt 7. The majority of parallel ports on computer systems use IRQ7 and I/O Port 378H as the standard setting.

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5.3.5 APM Configuration

Select the Advanced tab from the setup screen to enter the APM Configuration Setup screen. You can display the APM Setup options by highlighting it using the < Arrow > keys.



Power Button Mode

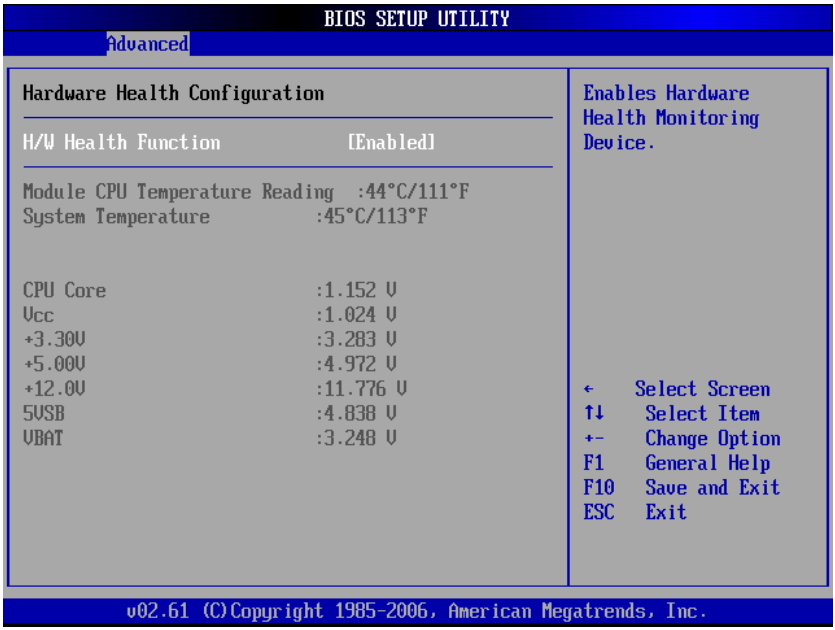
This option specifies the effect when the power button pressed.

- **On/Off:** The system is powered down immediately if the power button is pressed.
- **Suspend:** The system is powered down if the power button is pressed for more than four seconds. Pressing the button momentarily (for less than 4 seconds) will put the system in "suspend" mode.

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5.3.6 Hardware Health Configuration

This option displays the current status of all of the monitored hardware devices / components such as voltages and temperatures.



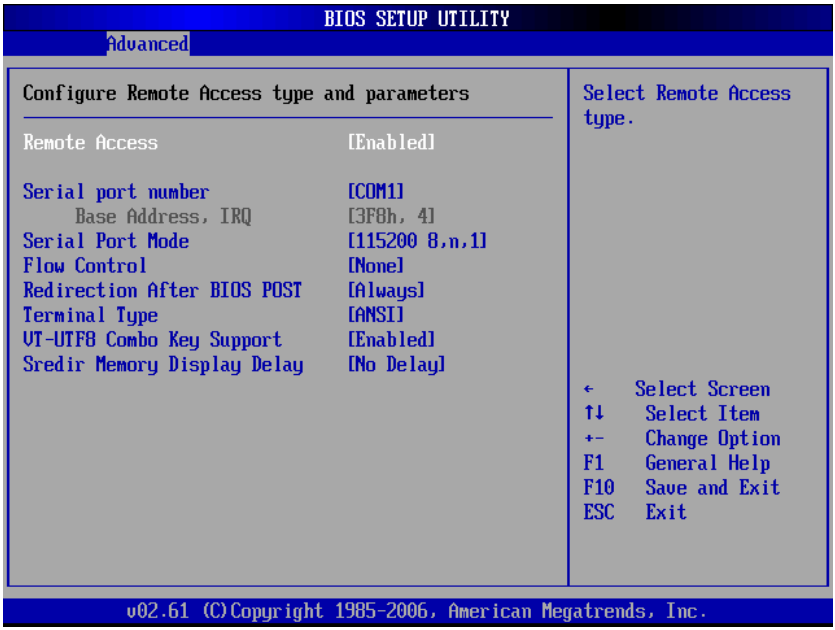
H/W Health Function

Select this option to Enable or Disable the BIOS Hardware Health Monitoring function.

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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. Once both serial ports are configured to disabled, you should set this value to Disabled or it may cause abnormal boot.

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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.


NOTE:

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

Serial Port Mode

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

Flow Control

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

Redirection After BIOS POST

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

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

Terminal Type

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

VT-UTF8 Combo Key Support

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

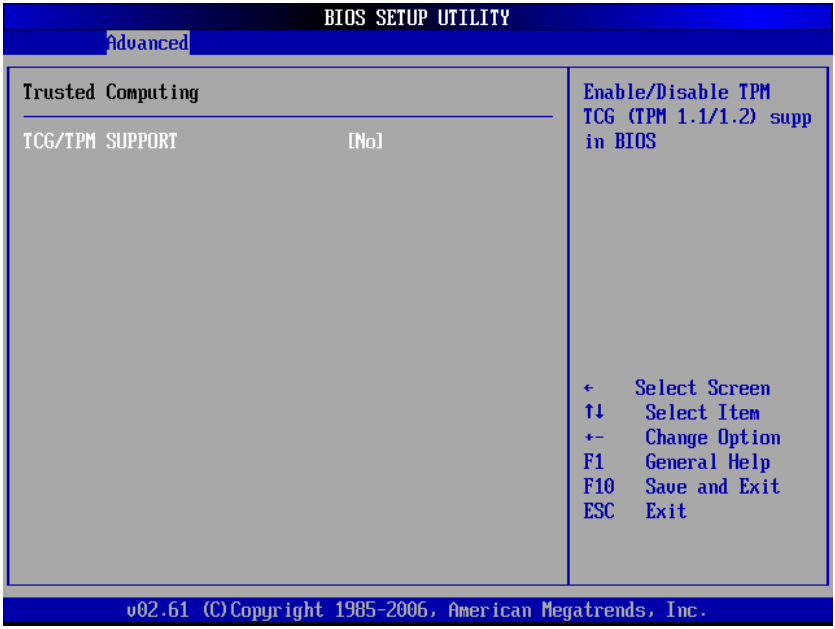
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Sredir Memory Display Delay

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.

5.3.8 Trusted Computing

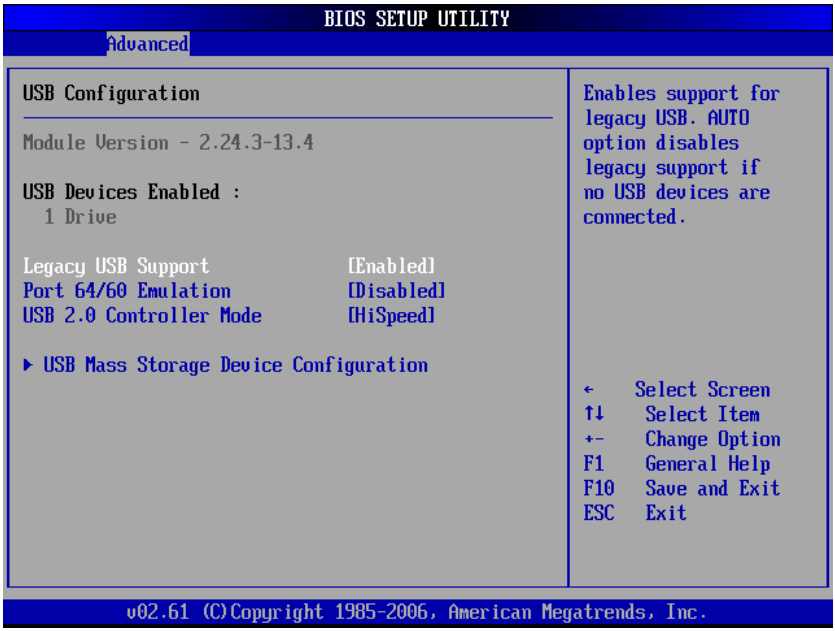
Trusted computing is an industry standard to make personal computers more secure through a dedicated hardware chip, called a Trusted Platform Module (TPM). This option enables or disables the TPM support.



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5.3.9 USB Configuration

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.

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- **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.

Port 64/60 Emulation

This option uses USB to receive the IO port 64/60 trap to emulate the legacy keyboard controller.

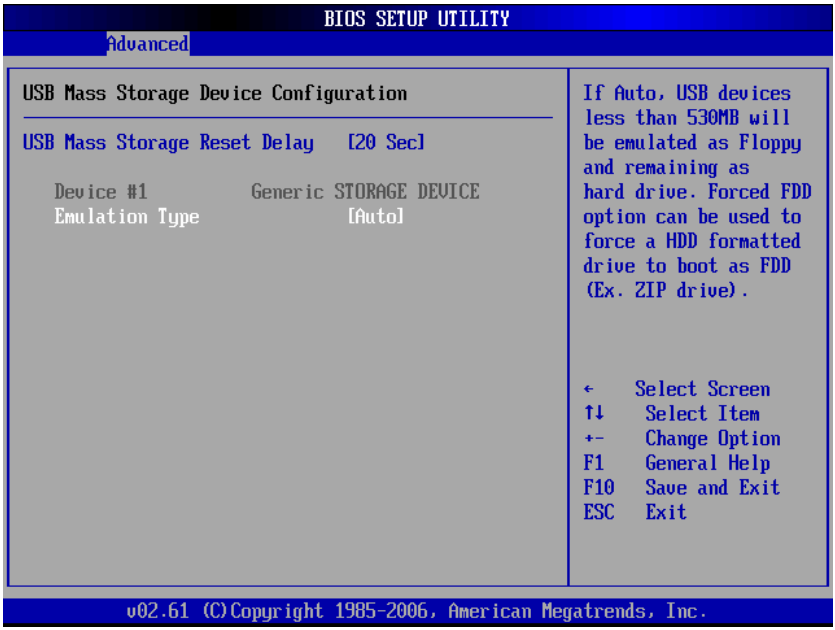
USB 2.0 Controller Mode

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

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USB Mass Storage Device Configuration

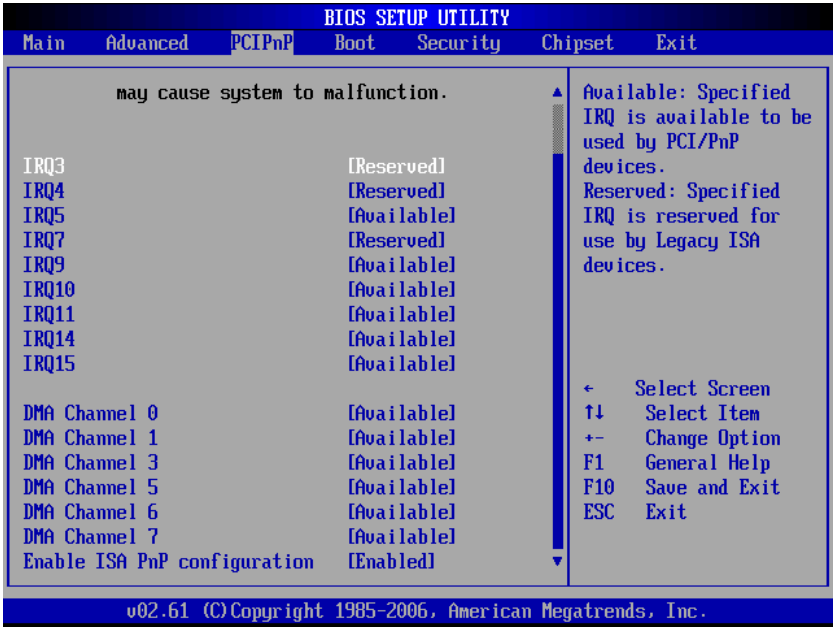
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB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

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



IRQ/DMA

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.

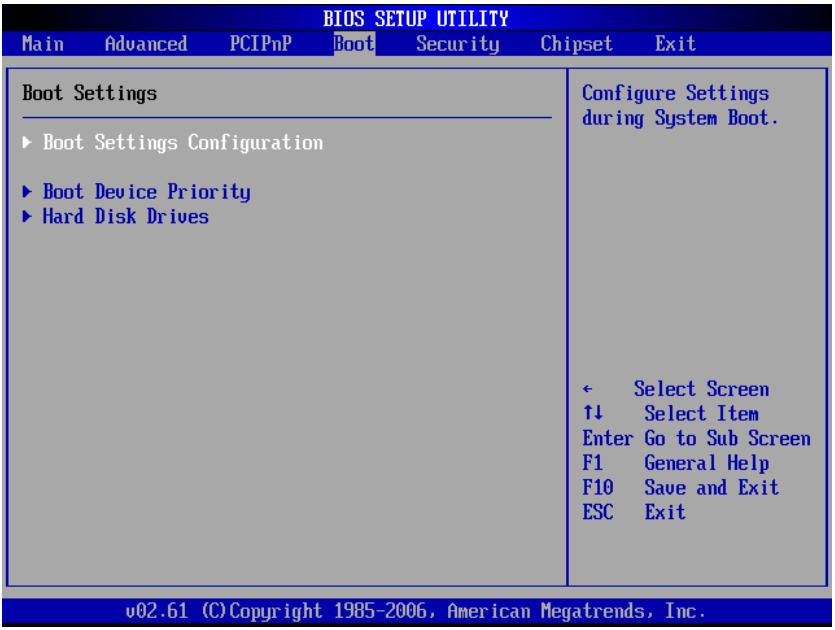
Enable ISA PnP Configuration

This option allows you to Enable or Disable the ISA PnP function.

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5.5 Boot Settings

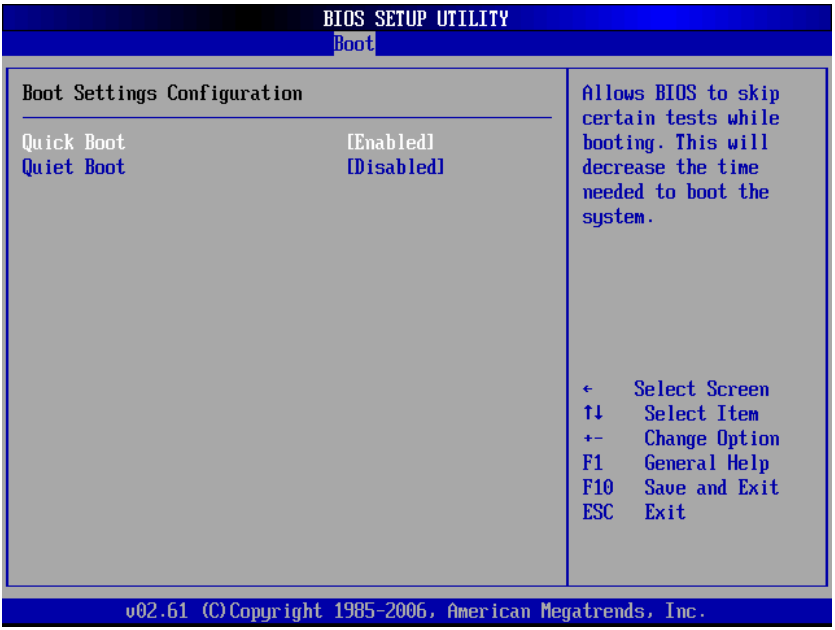
Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The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



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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.



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

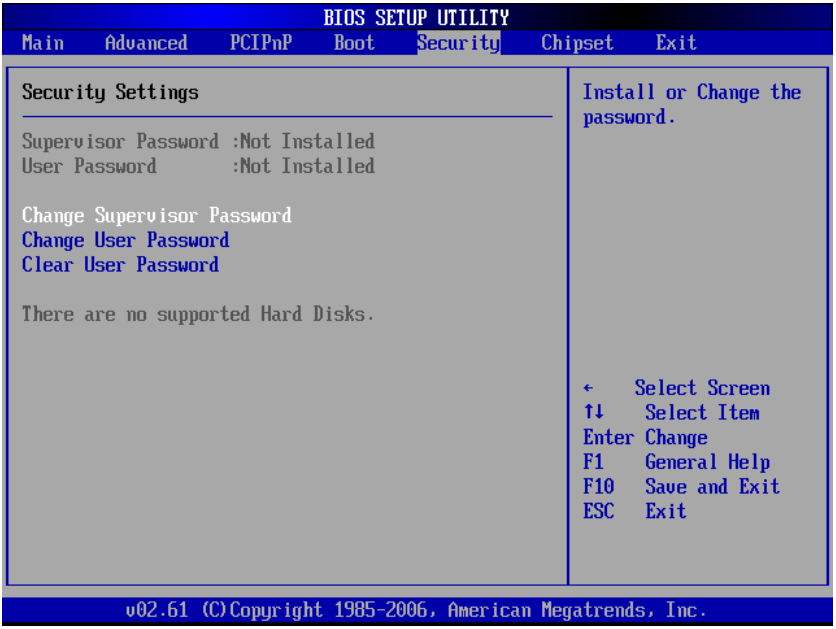
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

5.5.3 Hard Disk Drives

Allows you to set the Boot Priority of hard disk drives. 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.

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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.

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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5.7 Advanced Chipset Settings

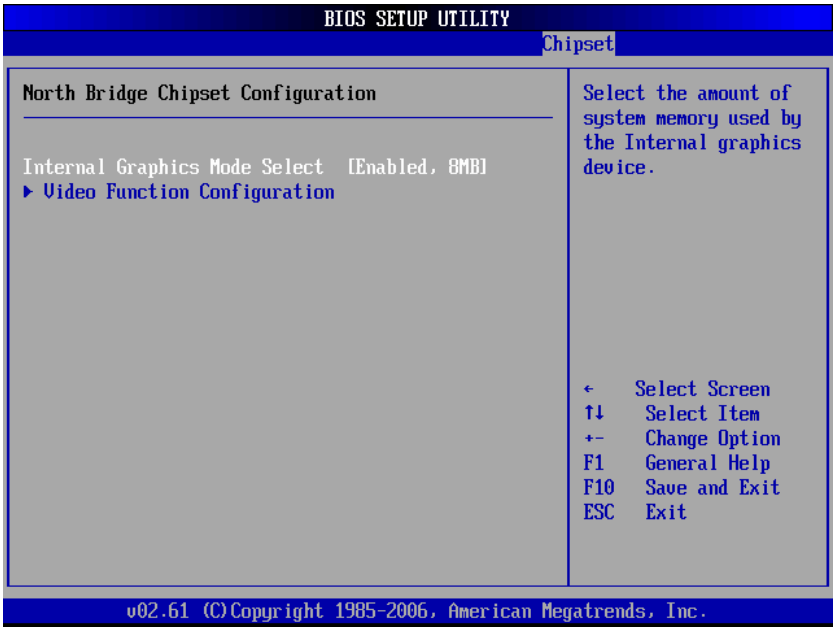
Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of the items in the left frame of the screen to go to the sub menu for that item. The Chipset BIOS Setup screen is shown below.



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5.7.1 North Bridge Configuration

You can use this screen to select options for the North Bridge 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.

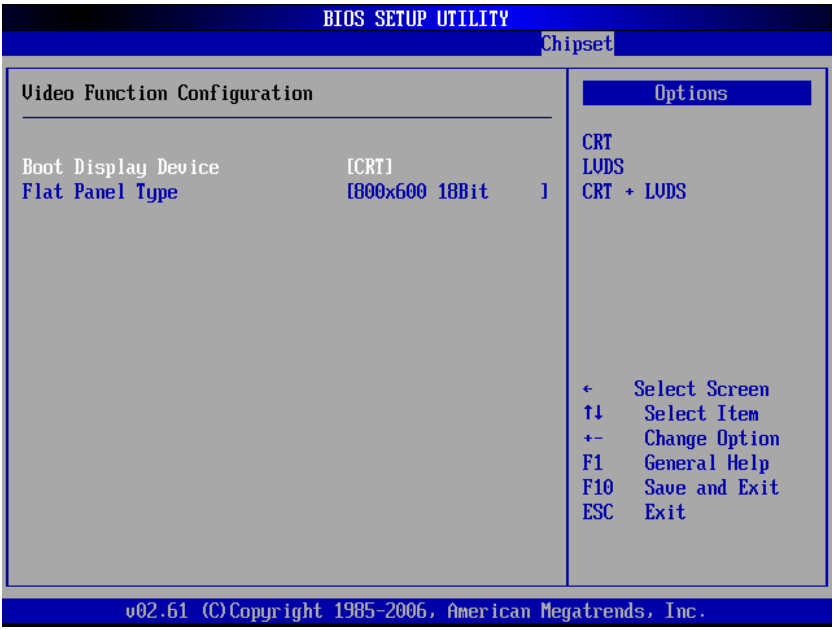


Internal Graphics Mode Select

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

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Video Function Configuration



Boot Display Device

This item allows the user to configure the type of external display used.

Flat Panel Type

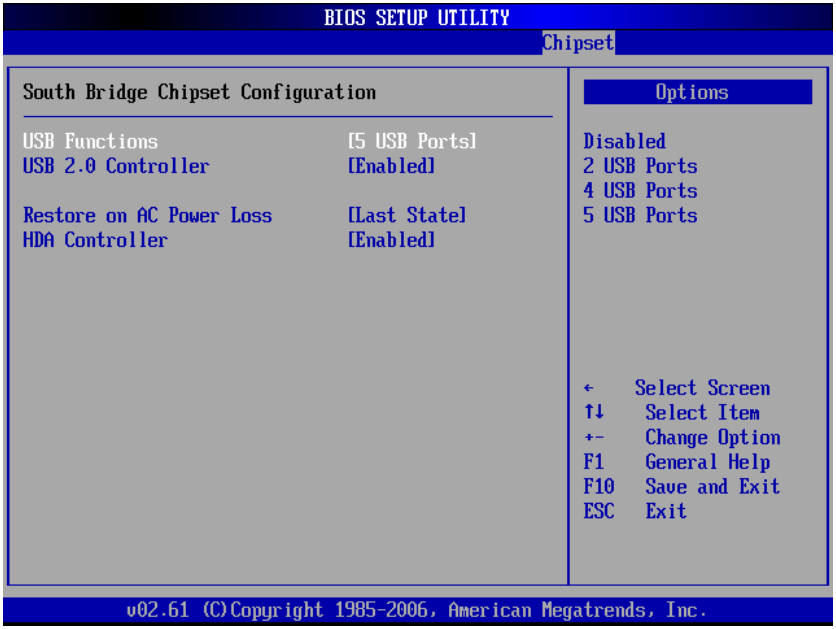
When LVDS is selected from Boot Display Device, this option allows you to set the resolution and timing settings for output to the LVDS interface.

Options: 640x480 18-bit, 800x600 18-bit, 1024x768 18-bit, 1280x1024 18-bit, 640x480 24-bit, 800x600 24-bit, 1024x768 24-bit, 1280x1024 24-bit

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5.7.2 South Bridge Configuration

You can use this screen to select options for the South Bridge 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.



USB Functions

Set this value to allow the system to Disable or select the number of onboard USB ports.

USB 2.0 Controller

Enabled will open USB 2.0 functionality to all USB ports. If USB Function is set to Disabled, this option has no effect.

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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.

HDA Controller

Set this value to Enable/Disable the HDA Controller.

Onboard LAN BIOS Init

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

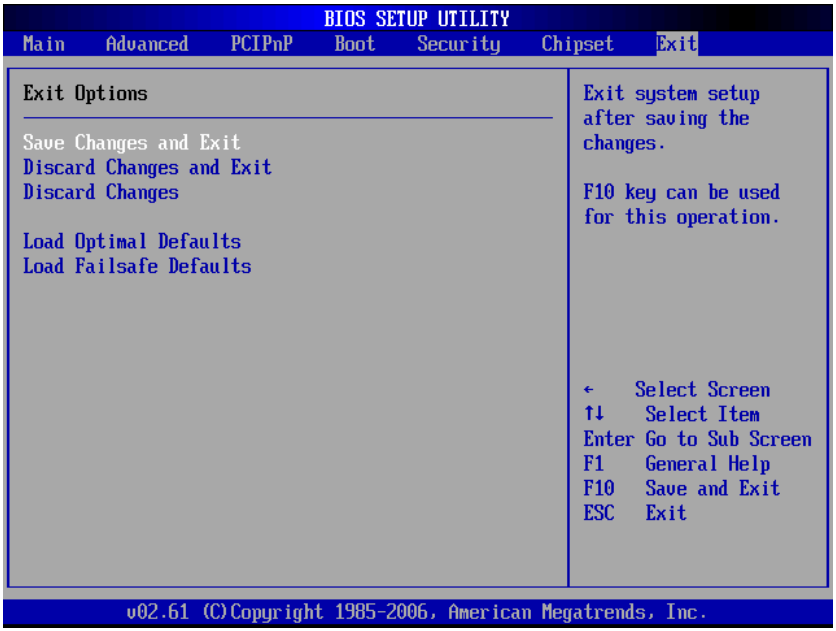
Boot Graphics Adapter Priority

Selects the graphics device to use on bootup. Selecting IGD will boot using the Integrated Graphics Device. Selecting PCI/IGD will boot the PCI VGA card if available. The BIOS checks to see if a PCI graphics card is installed. If one is present, the board will boot using that card. Otherwise, it defaults to the IGD.

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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-730's watchdog timer is included on the ADLINK All-in-One DVD in the following directory: **\NuPRO\NuPRO-730\WDT**.

A.1 Sample Code

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

static unsigned int IT8712_ioPort = 0x2e;

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

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

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

     outportb(IT8712_ioPort, 0x02);
```

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

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

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

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

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

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

                tempCount = count_value;
```

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

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

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

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

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Appendix B - System Resources

B.1 System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
(4GB-2MB)	FFE00000 – FFFFFFFF	2 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
15MB – 16MB	F00000 – FFFFFF	1 MB	ISA Hole
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 82573L PXE option ROM when onboard LAN boot ROM is enabled (LAN1) CC800 – CD7FFF: Intel 82573L PXE option ROM when onboard LAN boot ROM is enabled (LAN2)
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

Note (1): Entire D0000H segment except PXE occupied area can be forwarded to ISA bus.

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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
000-01F	DMA controller 1, 8237A-5 equivalent
020-02D and 030-03F	Interrupt controller 1, 8259 equivalent
02E-02F	LPC SIO (ITE8718) configuration index/data registers
040-05F	Timer, 8254-2 equivalent
060, 062, 064, 066, 068-06F	8742 equivalent (keyboard)
061, 063, 065, 067	NMI control and status
070-07F	Real Time Clock Controller(bit 7 -NMI mask)
080-091	DMA page register
092	Reset (Bit 0)/ Fast Gate A20 (Bit 1)
93-9F	DMA page registers continued
0A0-0B1 and 0B4-0BF	Interrupt controller 2, 8259 equivalent
0B2 and 0B3	APM control and status port respectively
0C0-0DF	DMA controller 2, 8237A-5 equivalent
0E0-0EF	Available
0F0	Co-processor error register
0F1	N/A
0F2-0F3	N/A
0F4	IDE ID port
0F5-0F7	N/A
0F8	IDE Index port
0F9-0FB	N/A
0FC	IDE Data port
0FD-0FF	N/A
100-179	Available
180-181	Default AIM4 SRAM control register (may be remapped)
182-1EF	Available
1F0-1F7	Primary IDE Controller (AT Drive)
1FB-22F	Available
230 -277	Available

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Hex Range	Device
278-27F	Parallel Port 2
280-2F7	Available
2F8-2FF	Serial Port 2
300-36F	Available
370-377	Alt. Floppy Disk Controller
378-37F	Parallel Port 1
380-3AF	Available
3B0-3BB and 3BF	Mono/VGA mode video
3BC-3BE	Reserved for parallel port
3C0-3DF	VGA registers
3E0-3EF	Available
3F0-3F7	Primary Floppy disk controller
3F8-3FF	Serial port 1
4D0	Master PIC Edge/Level Trigger register
4D1	Slave PIC Edge/Level Trigger register
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	SMBus base address for SB
480	GPIO Base Address for SB
800	PM (ACPI) Base Address for SB
860	Alias for ICH TCO base address
0A00~0AFF	Reserved for SIO functions base address (ex: PME, GPIO etc)
200-23Fh	Reserved for ISA
240-25Fh	Reserved for ISA
280-28Fh	Reserved for ISA
2A0-2DFh	Reserved for ISA
300-33Fh	Reserved for ISA
380-39Fh	Reserved for ISA

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	Cascade interrupt from slave PIC	N/A	No
3	Serial Port 2 (COM2) / PCI / ISA	IRQ3 via SERIRQ, IRQ3 at ISA bus	Note (1)
4	Serial Port 1 (COM1) / PCI / ISA	IRQ4 via SERIRQ, IRQ4 at ISA bus	Note (1)
5	Parallel Port 2 (LPT2) / PCI / ISA	IRQ5 via SERIRQ, IRQ5 at ISA bus	Note (1)
6	Floppy Drive Controller	IRQ6 via SERIRQ	No
7	Parallel Port 1 (LPT1) / PCI / ISA	IRQ7 via SERIRQ, IRQ7 at ISA bus	Note (1)
8	Real-time clock	N/A	No
9	SCI / PCI	IRQ9 via SERIRQ, IRQ9 at ISA bus	Note (1), (2)
10	PCI / ISA	IRQ10 via SERIRQ, IRQ10 at ISA bus	Note (1)
11	PCI / ISA	IRQ11 via SERIRQ, IRQ11 at ISA bus	Note (1)
12	PS/2 Mouse / PCI / ISA	IRQ12 via SERIRQ, IRQ12 at ISA bus	Note (1)
13	Math Processor	N/A	No
14	Primary IDE controller / PCI / ISA	IRQ14 via SERIRQ, IRQ14 at ISA bus	Note (1)
15	Secondary IDE controller / PCI / ISA	IRQ15 via SERIRQ, IRQ15 at ISA bus	Note (1)

Table B-4: IRQ Lines PIC Mode

Note (1): These IRQs can be used for PCI devices when onboard device is disabled. If IRQ is from ISA, user must reserve IRQ for ISA in BIOS setup menu.

Note (2): BIOS does not open IRQ 9 setting for ISA bus.

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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	Cascade interrupt from slave PIC	N/A	No
3	Serial Port 2 (COM2) / PCI / ISA	IRQ3 via SERIRQ, IRQ3 at ISA bus	Note (1)
4	Serial Port 1 (COM1) / PCI / ISA	IRQ4 via SERIRQ, IRQ4 at ISA bus	Note (1)
5	Parallel Port 2 (LPT2) / PCI / ISA	IRQ5 via SERIRQ, IRQ5 at ISA bus	Note (1)
6	Floppy Drive Controller	IRQ6 via SERIRQ	No
7	Parallel Port 1 (LPT1) / PCI / ISA	IRQ7 via SERIRQ, IRQ7 at ISA bus	Note (1)
8	Real-time clock	N/A	No
9	SCI / PCI	IRQ9 via SERIRQ, IRQ9 at ISA bus	Note (1), (2)
10	PCI / ISA	IRQ10 via SERIRQ, IRQ10 at ISA bus	Note (1)
11	PCI / ISA	IRQ11 via SERIRQ, IRQ11 at ISA bus, SMBus Controller	Note (1)
12	PS/2 Mouse / PCI / ISA	IRQ12 via SERIRQ, IRQ12 at ISA bus	Note (1)
13	Math Processor	N/A	No
14	Primary IDE controller / PCI / ISA	IRQ14 via SERIRQ, IRQ14 at ISA bus	Note (1)
15	Secondary IDE controller / PCI / ISA	IRQ15 via SERIRQ, IRQ15 at ISA bus	Note (1)
16	N/A	PCI Slot 1/2/3/4, PCIE Port 0/1/2/3/4/5 UHCI Controller 4/6, PEG Root Port, IGD	Yes

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IRQ#	Typical Interrupt Resource	Connected to Pin	Available
17	N/A	PCI Slot 1/2/3/4, PCIE Port 0/1/2/3/4/5, PEG Root Port,	Yes
18	N/A	PCI Slot 1/2/3/4, PCIE Port 0/1/2/3/4/5 UHCI Controller 3, PEG Root Port, SATA Host controller, Thermal Controller, EHCI Controller #2	Yes
19	N/A	PCI Slot 1/2/3/4, PCIE Port 0/1/2/3/4/5 UHCI Controller 2/7, PEG Root Port	Yes
20	N/A	ICH8M internal GBE controller	No
21	N/A	UHCI Controller 5, ICH8M HDA	No
23	N/A	UHCI Controller 1, 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. If IRQ is from ISA, user must reserve IRQ for ISA in BIOS setup menu.

Note (2): BIOS does not open IRQ 9 setting for ISA bus.

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PCI Interrupt Request Routing

Bus #	Device #	Function #	Routing	Description
00h	00h	00h	N/A	Intel 965 GME GMCH Host-Hub Interface Bridge
00	01H	00H	Internal	PEG Root Port
02	00H	0FFH	N/A	PEG Port
00h	02h	00h	Internal	Intel Integrated Graphics Device
00h	02h	01h	Internal	Intel Integrated Graphics Device (Function 1)
00h	03h	00h	Internal	HECI Host #1
00h	03h	01h	Internal	HECI Host #2
00h	03h	02h	Internal	IDE Controller
00h	03h	03h	Internal	KT Controller
00h	19h	00h	Internal	GbE Controller
00h	1Ah	00h	Internal	Intel USB UHCI Controller 4
00h	1Ah	01h	Internal	Intel USB UHCI Controller 5
00h	1Ah	07h	Internal	Intel USB EHCI Controller 1
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	02h	Internal	Intel ICH Express Root port 2
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	1Dh	00h	Internal	Intel USB UHCI Controller 0
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	07h	Internal	Intel USB EHCI Controller 2
00h	1Eh	00h	N/A	Intel Hub Interface to PCI Bridge
00h	1Fh	00h	N/A	Intel LPC Interface Bridge
00h	1Fh	01h	N/A	IDE Controller
00h	1Fh	02h	Internal	Intel SATA Host /Raid controller
00h	1Fh	03h	Internal	Intel SMBus Controller

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Bus #	Device #	Function #	Routing	Description
00h	1Fh	06h	Internal	Thermal Controller
01h	07h	0FFh	external	ITE8888 PCI to ISA bridge
01h	0Ch	0FFh	external	PCI slot 4
01h	0Dh	0FFh	external	PCI slot 3
01h	0Eh	0FFh	external	PCI slot 2
01h	0Fh	0FFh	external	PCI slot 1
04h	00h	0FFh	Internal	PCIE Port #0
05h	00h	0FFh	Internal	PCIE Port #1
06h	00h	0FFh	Internal	PCIE Port #2
07h	00h	0FFh	Internal	PCIE Port #3
08h	00h	0FFh	Internal	PCIE Port #4
09h	00h	0FFh	Internal	PCIE Port #5

Table B-6: PCI Interrupt Request Routing

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PCI Interrupt Routing Map

PIRQ	A	B	C	D	E	F	G	H
INT Line	INTA	INTB	INTC	INTD				
PEG Root Port	INTA	INTB	INTC	INTD				
VGA	X							
SATA Controller			X	X				
SMBUS Controller		X						
Thermal Controller			X					
UHCI 0								X
UHCI 1				X				
UHCI 2			X					
UHCI 3	X							
UHCI4	X							
UHCI 5						X		
EHCI 1								X
EHCI 2			X					
HDA						X		
Intel GBE								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				
PCI Slot1	INTB	INTC	INTD	INTA				
PCI Slot2	INTC	INTD	INTA	INTB				
PCI Slot3	INTD	INTA	INTB	INTC				
PCI Slot4	INTA	INTB	INTC	INTD				

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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