NuPRO-A301

Full-Sized PICMG 1.0 SBC
Intel® 945GC/ICH7 Chipset

User's Manual

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Recycled Paper

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Revision History

Revision	Release Date	Description of Change(s)
2.00	2010/01/19	Initial Release

Preface

Disclaimer

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Using this Manual

Audience and Scope

The NuPRO-A301 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-A301, 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-A301 and any attached external devices.

Chapter 3, Getting Started: Illustrates how to install components on the NuPRO-A301, specifically, CPU, memory modules, operating systems and drivers.

Chapter 4, Driver Installation: Provides information on how to install the NuPRO-A301 device drivers under Windows 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.

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-A301 is a PICMG 1.0 industrial SBC supporting the Intel® Core™2 Duo, Pentium® Dual Core, Pentium® 4, and Celeron® processors in the LGA775 package to deliver a high performance platform for a wide array of industrial automation applications. The NuPRO-A301 supports Serial ATA at 3 Gb/s data transfer rate and high-bandwidth network connectivity with PCI Express®-based Gigabit Ethernet.

These advanced features, coupled with a dual-channel DDR2 system memory architecture and diverse I/O storage make the NuPRO-A301 suitable for factory automation and intelligent transportation system applications requiring a standardized, easy-to-deploy, and cost-effective SBC.

1.2 Features

- Supports Intel® Core™2 Duo, Pentium® Dual Core, Pentium® 4, and Celeron® processors in LGA775 package
- 10/100/1000Mbps Ethernet
- Optional AC'97 audio daughter board (IP-ALCS20)
- 4 USB 2.0 ports via pin header
- 4 ports SATA 3 Gb/s
- 1 channel IDE supports ATA 33/66/100/
- Watchdog Timer, Hardware Monitor
- RoHS compliant

To purchase the optional IP-ALCS20 audio daughter board, please contact your ADLINK sales representative.

1.3 Specifications

System	
CPU (LGA775)	• Intel® Core™2 Duo E4300, 1.8GHz, 800MHz FSB, 2MB L2 Cache, 65nm, 65W • Intel® Pentium® Dual Core E2160, 1.8GHz, 800MHz FSB, 1MB L2 Cache, 65nm, 65W • Intel® Celeron® 440, 2.0GHz, 800MHz FSB, 512KB L2 Cache, 65nm, 35W • Intel® Pentium® 4 651, 3.4GHz, 800MHz FSB, 2MB L2 Cache, 65nm, 95W • Intel® Pentium® 4 551, 3.4GHz, 800MHz FSB, 1MB L2 Cache, 90nm, 84W • Intel® Pentium® 4 531, 3.0GHz, 800MHz FSB, 1MB L2 Cache, 90nm, 84W • Intel® Celeron® D 352, 3.2GHz, 533MHz FSB, 512KB L2 Cache, 65nm, 95W • Intel® Celeron® D 341, 2.93GHz, 533MHz FSB, 256KB L2 Cache, 90nm, 84W
Chipset	• Intel® 945GC Graphics Memory Controller Hub • Intel® ICH7 I/O Controller Hub
Memory	• Dual-channel DDR2 533/667 MHz, 2x DIMM slots up to 2 GB
BIOS	• AMIBIOS in 16-Mbit Flash
Audio	• Realtek ALC655 AC'97 audio support via optional daughter board
Watch Dog Timer	• 1-255 second or 1-255 minute programmable, can generate system reset.
Hardware Monitor	• CPU/System temperature, fan speed and onboard DC voltage
I/O Interfaces	
IDE	• One 40-pin ATA 33/66/100 IDE connector
Serial ATA	• Four SATA ports, data rate up to 3 Gb/s
I/O Ports	• 4 USB 2.0 ports four onboard via pin header • 2 Serial ports (one RS-232/422/485, one RS-232 • 1 Gigabit Ethernet RJ45 port • 1 VGA port • PS/2 Keyboard/Mouse • 1 Parallel port • 1 Floppy port
ISA	• PCI-to-ISA Bridge: IT8888 (DMA not supported)

Display	
VGA	• GMA 950 integrated in 945GC GMCH
VRAM	• Shared system memory up to 224 MB
CRT	• External Dsub-15 connector, resolution up to 2048 x 1536 @ 75 Hz
Ethernet	
Controller	• Intel® 82574L PCIe network controller, supports Wake-On-LAN
Mechanical and Environment	
Form Factor	• Standard full-size PICMG 1.0 SBC
Dimensions	• 340.6 x 122 mm (L x W)
Operating Temp.	• 0ºC to 60ºC
Storage Temp.	• -20ºC to 80ºC
Relative Humidity	• 10% to 90% non-condensing both operating and non-operating
Safety	• CE, FCC Class A

1.4 Mechanical Drawing

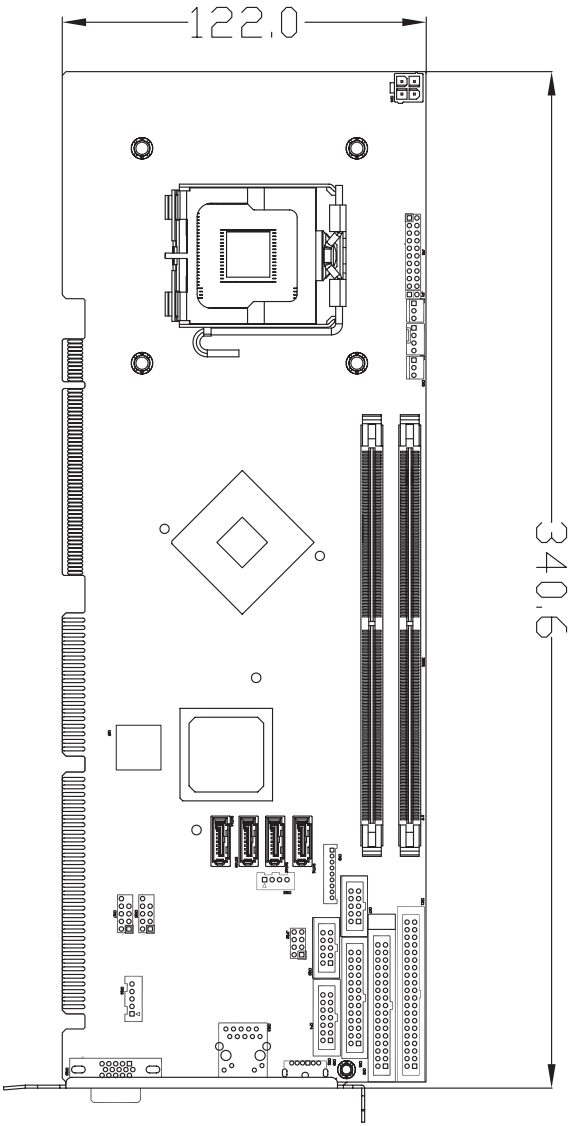

Figure 1-1: NuPRO-A301 Board Dimensions (top view)

1.5 Block Diagram

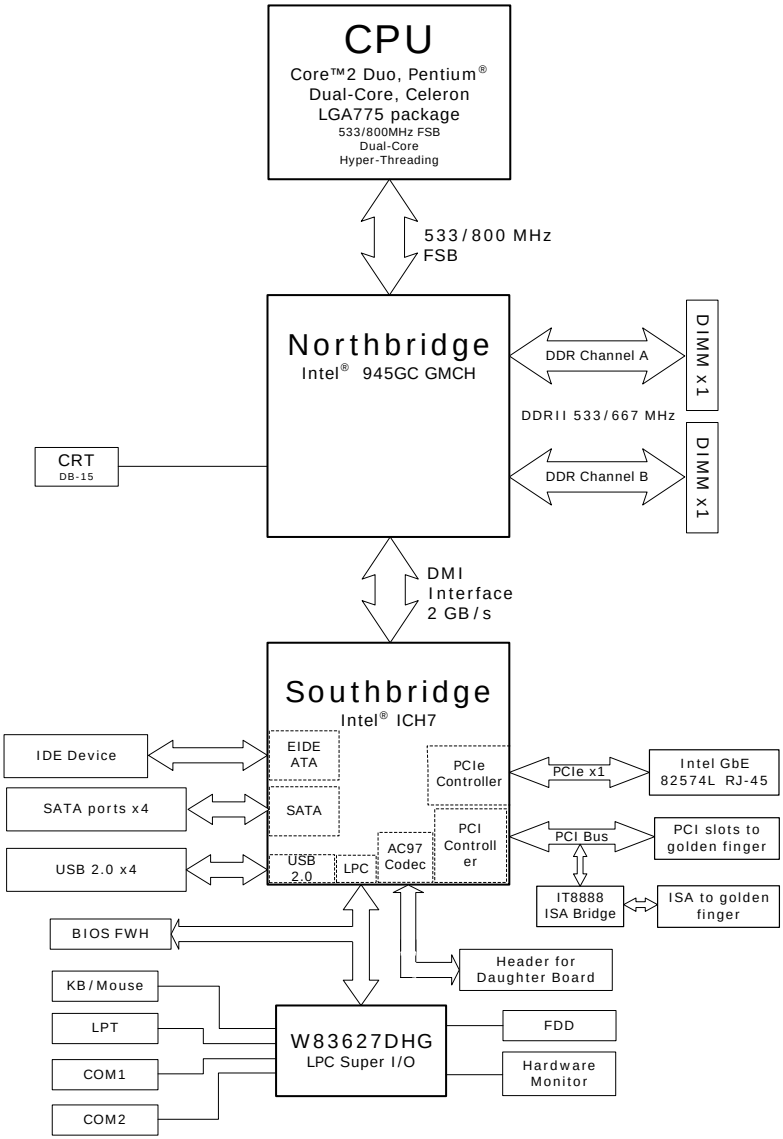

Figure 1-2: NuPRO-A301 Block Diagram

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2 Hardware Information

This chapter provides information on the NuPRO-A301 board lay-out, connector pin assignments, and jumper settings.

2.1 Rear Panel I/O Ports

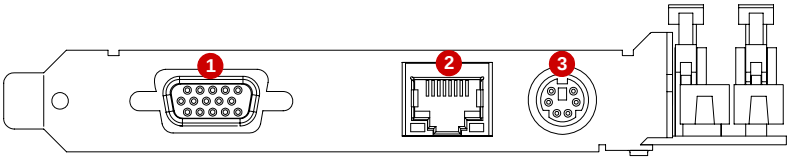
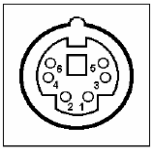


Figure 2-1: Rear Panel I/O Ports

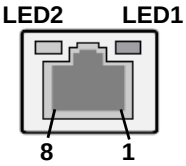
	Connector	Description
1	VGA port	15-pin port connects to a CRT or LCD monitor
2	Gigabit LAN port	Provides Gigabit Ethernet connection (RJ-45)
3	PS/2 KB/MS port	Connects a PS/2 mouse and keyboard

PS/2 Keyboard/Mouse Port



Pin #	Signal	Function
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	KM_VCC(P5V)	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

LAN (RJ-45) Ports

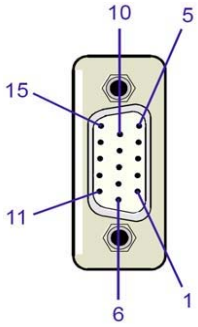


Pin #	10BASE-T/ 100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-

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

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

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

2.2 Board Layout

The illustrations below show the locations of connectors, slots, and jumpers on the NuPRO-A301.

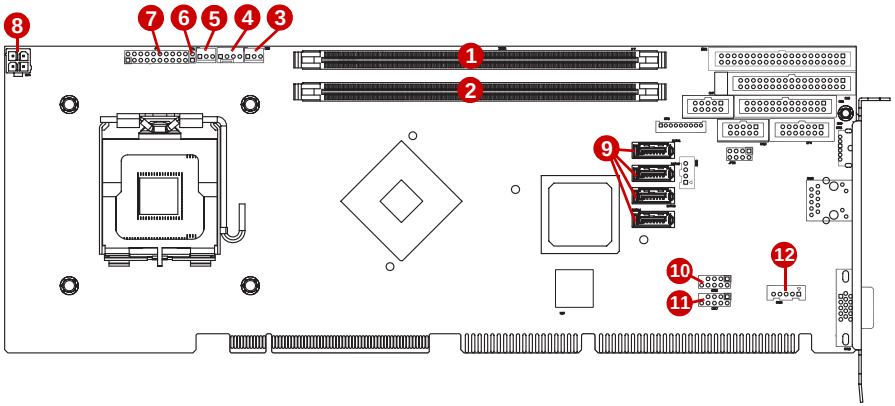


Figure 2-2: Connectors and Jumpers Pt. 1

	Connector	Description
1	DIMM1	240-pin DDR2 DIMM1 slot
2	DIMM2	240-pin DDR2 DIMM2slot
3	CN3	Chassis Fan connector
4	CN1	CPU Fan connector
5	CN2	Power Fan connector
6	JP1	AT ALWAYS_ON jumper
7	JPB1	Front Panel connector
8	CN4	ATX 12V Power connector
9	SATA1-4	Serial ATA connectors
10	CN15	USB0/1 pin-header
11	CN17	USB2/3 pin-header
12	CN16	External KB connector

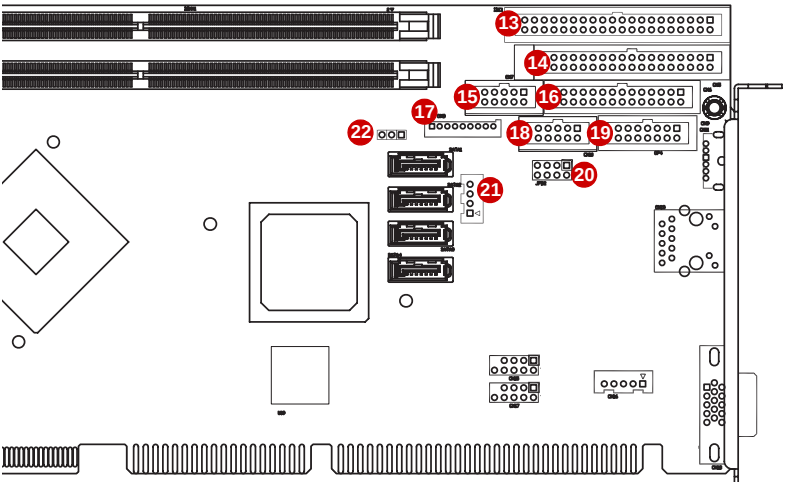
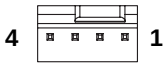


Figure 2-3: Connectors and Jumpers Pt. 2

	Connector	Description
13	IDE1	IDE connector
14	CN5	Floppy Port connector
15	CN7	COM1 connector
16	CN6	Parallel Port connector
17	CN8	Audio connector
18	CN10	GPIO connector
19	CN9	COM2 connector
20	JPB2	COM2 Mode Select jumper
21	CN12	ATX_PWRON# connector
22	JP2	Clear CMOS jumper

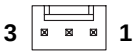
2.3 Onboard Connectors

CPU Fan Connector (CN1)



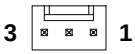
Pin #	Signal
1	GND
2	Fan power (+12V)
3	Fan Tachometer
4	Fan Speed Control

Power Fan Connector (CN2)



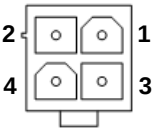
Pin #	Signal
1	GND
2	Fan power (+12V)
3	Fan Tachometer

Chassis Fan Connector (CN3)



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

ATX 12V Power Connector (CN4)

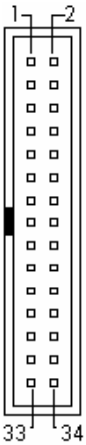


Pin #	Signal
1	GND
2	GND
3	+12V DC
4	+12V DC

NOTE:

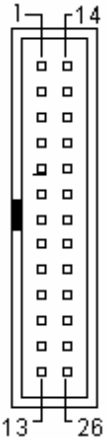
The ATX 12V power connector must be connected to provide sufficient power to the SBC in either ATX or AT modes.

Floppy Port Connector (CN5)



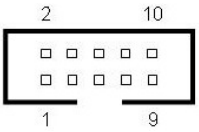
Pin #	Signal	Pin #	Signal
1	GND	2	Extended Density
3	GND	4	No Connect
5	NC	6	Data Rate
7	GND	8	Index
9	GND	10	Motor A Select
11	GND	12	Drive B Select
13	GND	14	Drive A Select
15	GND	16	Motor B Select
17	GND	18	Step Direction
19	GND	20	Step Pulse
21	GND	22	Write Data
23	GND	24	Write Gate
25	GND	26	Track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

Parallel Port Connector (CN6)



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

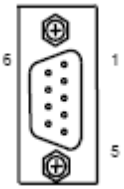
COM1 Connector (RS-232) (CN7)



Pin #	Signal
1	COM1C_DCD#
2	COM1C_DSR#
3	COM1C_RXD
4	COM1C_RTS#
5	COM1C_TXD
6	COM1C_CTS#
7	COM1C_DTR#
8	COM1C_RI#
9	GND
10	GND

COM1 DB-9 connector on bracket

Pin #	RS-232
1	COM1C_DCD#
2	COM1C_RXD
3	COM1C_TXD
4	COM1C_DTR#
5	GND
6	COM1C_DSR#
7	COM1C_RTS#
8	COM1C_CTS#
9	COM1C_RI#



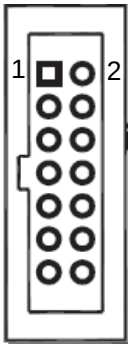
Audio Daughter Board Connector (CN8)

Pin #	Signal
1	+12V
2	VCC3V3
3	AC_SYNC
4	AC_SDOUT
5	GND
6	AC_BCLK
7	GND
8	AC_RST#
9	AC_SDIN0

NOTE:

This connector is designed for use with the IP-ALCS20 audio daughter board.

COM2 Connector (RS-232/422/485) (CN9)

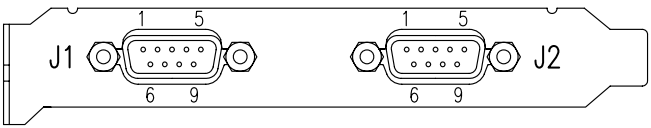


Pin #	Signal
1	COM2C_DCD#
2	COM2C_DSR#
3	COM2C_RXD
4	COM2C_RTS#
5	COM2C_TXD
6	COM2C_CTS#
7	COM2C_DTR#
8	COM2C_RI#
9	GND
10	GND
11	COM2_TX+
12	COM2_TX-
13	COM2_RX+
14	COM2_RX-

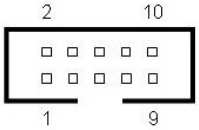
Note: See “COM2 Mode Jumper Settings (JPB2)” on page 21.

COM2 DB-9 connectors on bracket

Pin #	RS-232 (J1)	RS-422/485 (J2)
1	COM2C_DCD#	COM2_TX-
2	COM2C_RXD	COM2_TX+
3	COM2C_TXD	COM2_RX-
4	COM2C_DTR#	COM2_RX+
5	GND	NC
6	COM2C_DSR#	NC
7	COM2C_RTS#	NC
8	COM2C_CTS#	NC
9	COM2C_RI#	NC



GPIO Connector (CN10)

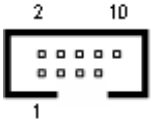


Pin #	Signal
1	VCC5V
2	ISO_I1
3	ISO_O1
4	ISO_I2
5	ISO_O2
6	ISO_I3
7	ISO_O3
8	ISO_I4
9	ISO_O4
10	EXT_VSS

ATX_PWRON# Connector (CN12)

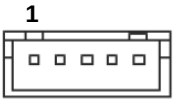
Pin #	Signal
1	NC
2	5VSB
3	ATX_PWRON#
4	GND

USB 2.0 Connectors (CN15/17)



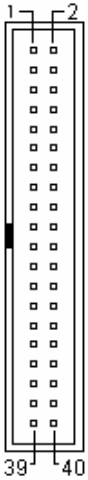
Pin #	Signal	Pin #	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	NC

External Keyboard Connector (CN16)



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

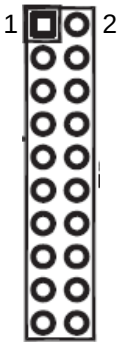
IDE Connector (IDE1)



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

Front Panel Connector (JPB1)

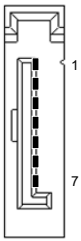
Connects to chassis-mounted buttons, speakers, and LEDs



Pin #	Signal	Pin #	Signal
1	VCC5V	2	SPKR
3	NC	4	BUZZ
5	GND	6	NC
7	NC	8	VCC5V
9	GND	10	RSTBTN#
11	GND	12	GND
13	NC	14	HD_LED#
15	ATX_PWRON#	16	VCC5V
17	5VSB	18	EXT_PBTN#
19	PCI_PME#	20	GND

Note: Pins 2-4 are shorted by default to set the audio output to the onboard buzzer. To use the chassis speaker, connect to pins 2, 4, 6, and 8.

Serial ATA Connectors (SATA1-4)



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

2.4 Jumpers

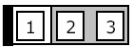
AT ALWAYS_ON (JP1)

The default setting for this jumper is ATX mode operation (pins 1-2 OPEN). For AT mode operation, short pins 1 and 2).

Pin #	Signal
1	DUAL_5V
2	ALWAYS_ON

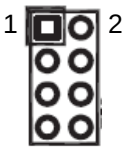
Clear CMOS (JP2)

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-A301 (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	

COM2 Mode Jumper Settings (JPB2)

Short the jumper pins according to the following settings to set COM2 to RS-232/422/485 mode



Pin #	RS-232	RS-422 w/ Term.	RS-485 w/ Term.	RS-422 w/o Term.	RS-485 w/o Term.
1-2	OFF	ON	ON	OFF	OFF
3-4	OFF	ON	ON	OFF	OFF
5-6	OFF	ON	OFF	ON	OFF
7-8	ON	OFF	OFF	OFF	OFF

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3 Getting Started

This chapter provides information on how to install components on the NuPRO-A301 SBC.

3.1 Installing the CPU

The NuPRO-A301 supports a single Intel® Core™2 Duo, Pentium® Dual Core, Pentium® 4, and Celeron® processor via the surface mount LGA775 socket (Socket T).

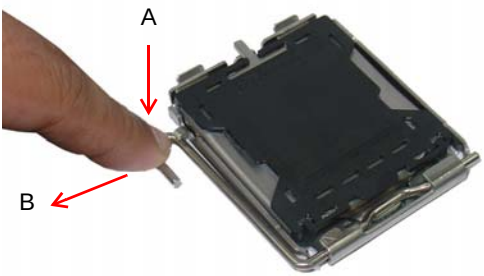
WARNING:

Disconnect all power supply 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 SBC components.

To install the CPU:

1. Press the load lever (A), then disengage it from the retention tab (B).

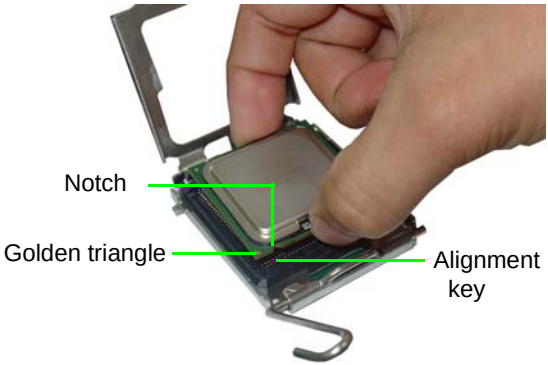


2. Lift and rotate the load lever to a 135° angle

3. Lift the load plate to a 100° angle using your thumb and forefinger

4. Use your thumb to push and remove the protective socket cover (plastic) from the load plate

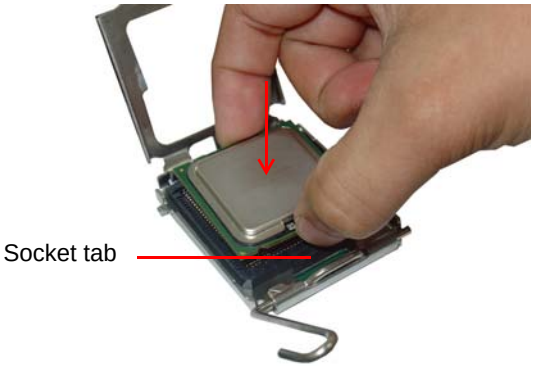
5. Position the CPU over the socket, then match the notches on the CPU side with the alignment keys on the socket. The golden triangle on the CPU must be positioned on the bottom-left corner of the socket .



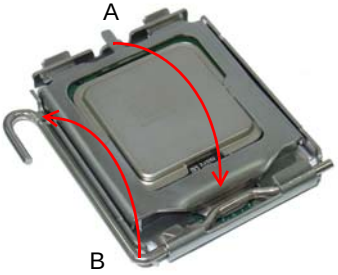
WARNING:

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

6. Carefully place the CPU on the socket in a vertical motion. The socket has tabs that accommodate your fingers during installation .



7. Close the load plate (A), then fasten the load lever on the retention tab (B) .

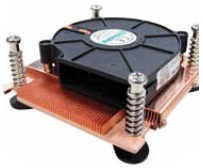


3.2 Installing the CPU Fan and Heatsink

CAUTION:

The NuPRO-A301 requires a chassis with an airflow inlet and maximum internal ambient temperature of 60° C. A recommended CPU fan and heatsink must be installed before using the SBC. Failure to install a CPU fan and heatsink may damage the CPU and/or the SBC.

The following CPU fan and heatsink assemblies are recommended for use with the NuPRO-A301:



1U LGA 775 CPU Cooler
Dimensions:
- Heatsink: 92 x 87.6 x 28 mm
- Fan: 75 x 75 x 15 mm

Heatsink: Copper base + copper skived fin
Fan speed: 5500 RPM
Fan airflow: 10.48 CFM
Noise level: 51 dBA
Part number: 32-20065-0000

3U LGA 775 CPU Cooler
Dimensions:
- Heatsink: 100 x 100 x 70 mm
- Fan: 90 x 90 x 25 mm

Heatsink: Aluminum extrusion
Fan speed: 4500 RPM
Fan airflow: 57.7 CFM
Noise level: 47.5 dBA
Part number: 32-20058-0000 + 34-30381-0000

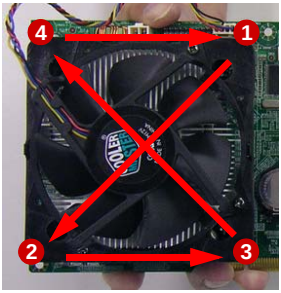
Copper-Core Cooler
Dimensions: 115 x 115 x 61.4 mm
Heatsink: Aluminum extrusion+copper core
Fan speed: 4500 RPM
Fan airflow: 76.9 CFM
Noise level: 49 dBA
Part number: 32-20086-0000

CPU Fan/Heatsink Installation

When the CPU fan/heatsink installation procedures presented here are inconsistent with the installation procedures included with the CPU fan and heatsink package, follow the latter.

To install the CPU fan/heatsink:

1. Attach the backplate included with the fan/heatsink to the bottom side of the SBC. If necessary, remove the paper strip(s) from the self-adhesive pads to secure the backplate to the SBC.
2. Remove the cover or plastic protector from the CPU-side of the heatsink if necessary. The heatsink may have a thermal interface material pre-applied. If not, a packet of thermal grease will be supplied with the heatsink. Apply thermal grease evenly on top of the installed CPU if required.
3. Carefully lower the CPU fan/heatsink onto the CPU and align the captive screws with the mounting holes of the backplate. Ensure the fan cable is on the side closest to the fan connector. Begin threading each screw into the backplate, then gradually tighten the screws in a criss-cross pattern until they are fully secured (see diagram below).



CAUTION:

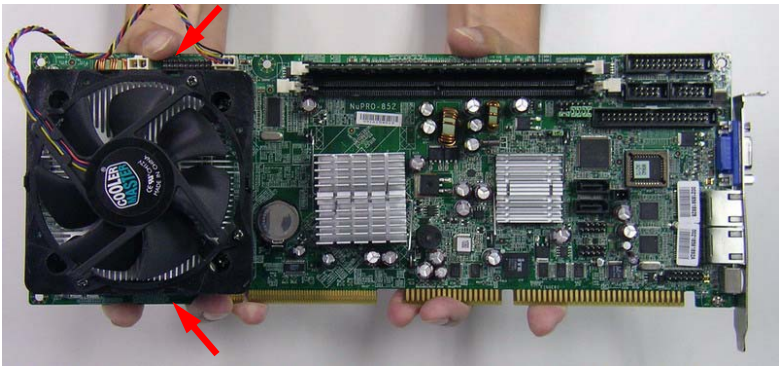
Fully tightening a screw at one corner before beginning to tighten the other screws may cause uneven pressure to be applied to the CPU and damage the component and/or SBC.

4. Connect the CPU fan cable to the CPU fan connector on the SBC labeled CN1 (see “Board Layout” on page 10).

Note: Do not use fan/heatsinks with *push-pin* type attachments. They may exert too much tension on the PCB and cause the board to flex, resulting in damage to the SBC.

Holding the SBC with Fan/Heatsink Installed

When the fan/heatsink is installed, always hold the SBC with two hands by the card edges. Make sure to support the weight of the fan/heatsink to prevent the board from bending, resulting in damage to circuitry and/or components.



CAUTION:

Failure to properly support the weight of the fan/heatsink assembly when installed on the SBC may cause the board to flex and result in damage to circuitry and/or components.

3.3 Installing the Power Connectors

Refer to **Section 2.2 Board Layout** on page 10 and **Section 2.3 Onboard Connectors** on page 12 for detailed information on connectors and pin definitions referred to below.

ATX 12V Power Connector

The NuPRO-A301 requires +12V DC power connected to CN4 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).

Front Panel Connector

Before powering up the NuPRO-A301, connect the necessary signals from the backplane to the Front Panel Connector (JPB1). The ATX Power Connector pin group (pins 11, 13, 15, 17, 19) and Power On Button pin group (pins 18, 20) must be connected for the system to power up in ATX mode.

3.4 Installing Memory Modules

The NuPRO-A301 supports up to 2 GB of DDR2 533/667 MHz memory modules via two DDR2 DIMM sockets. A DDR2 module has a 240-pin footprint compared to the legacy 184-pin DDR DIMM. DDR2 modules are notched to facilitate correct installation on the DIMM sockets.

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

Memory Configuration Options

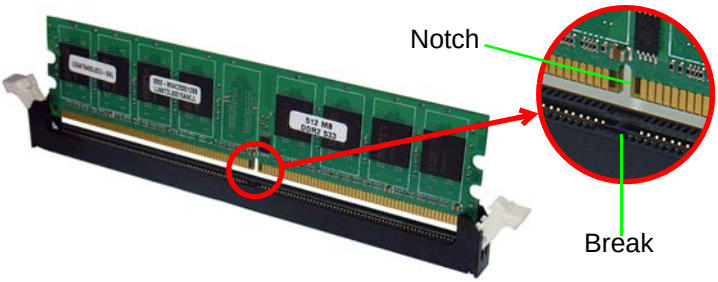
The NuPRO-A301 allows you to install 512 MB, and 1GB unbuffered non-ECC DDR2 DIMMs into the DIMM sockets following these configuration options:

- 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.

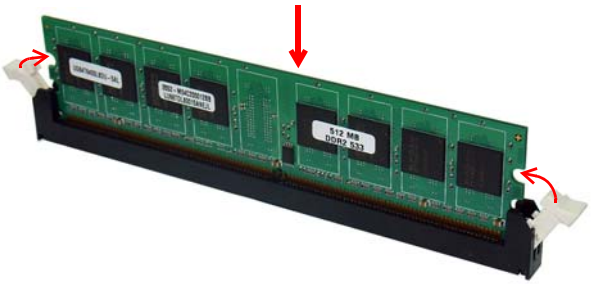
To install a memory module:

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

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.



4 Driver Installation

This chapter provides information on how to install the NuPRO-A301 device drivers under Windows XP. The device drivers are located in the following ADLINK CD directories:

Chipset driver	\Chipset\
Display driver	\VGA\
LAN driver	\Ethernet\
ISA driver	\ISA\
Audio driver	\Audio\

4.1 Intel® 945G Express Chipset Driver

This section describes the installation of the Intel® 945G Express Chipset driver.

1. Locate the file **X:\Chipset\infinst_autol.zip** from the ADLINK CD, extract the contents, then start the installation by double-clicking **setup.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.

4.2 Display Driver

This section describes the installation of the Mobile Intel® Graphics Media Accelerator (GMA) 950 driver.

To install the display drivers:

1. Locate the driver on the ADLINK CD: **X:\VGA\win2k_xp14324.zip**, extract the contents, then start the installation by double-clicking **setup.exe**.
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 fon the ADLINK CD: **X:\Ethernet\PRO2KXP_v13_1_2.rar**, extract the contents, then start the installation by double-clicking **PRO2KXP_v13_1_2.exe**.
2. Follow screen instructions to complete installation, then restart the system if prompted.

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 CD: **X:\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 Audio Driver

Follow these instructions to install the audio driver for the optional IP-ALCS20 daughter board.


NOTE:

Before installing the audio driver, check the BIOS settings to make sure that audio is enabled: **Integrated Peripherals > Onboard Device > AC97 Audio** (see AC97 Audio on p. 50).

1. Locate the driver on the ADLINK CD: **X:\Audio\WDM_R203.zip**, extract the contents, then double-click on the **setup.exe** file to start installation.
2. Follow screen instructions to complete installation, then restart the system if prompted.

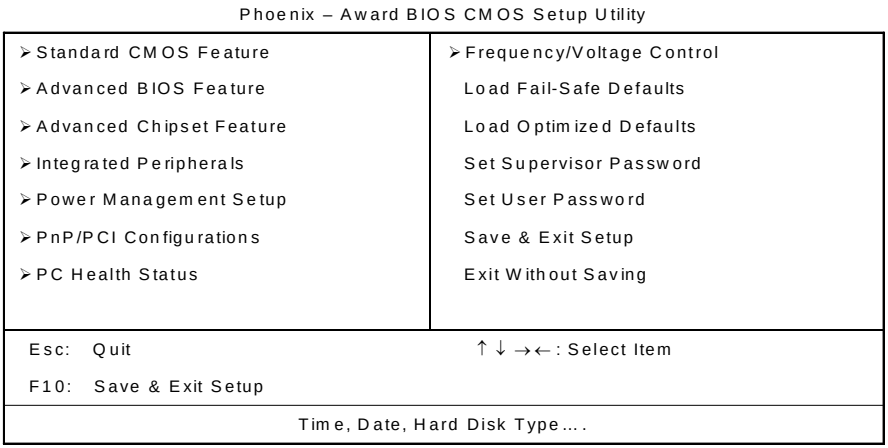
5 BIOS Setup

The following chapter describes basic navigation for the Phoenix AwardBIOS 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 during the Power-On-Self-Test (POST) to enter the Setup utility.
3. After you press the < Delete > key, the main BIOS Setup Menu will be displayed.



Navigation

Use the keys described below to navigate through the BIOS Setup Utility

Key(s)	Function Description
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
Esc	Return to the main menu from a sub-menu or prompts you to quit the setup program.
← , →	Move to the item on the left or right
↑ , ↓	Move to previous or next item
Enter	Brings up a selection menu for the highlighted field.
+ or PgUp	Moves the cursor to the first field
- or PgDn	Moves the cursor to the last field
F5	Loads the previous values
F6, F7	Loads the fail-safe / optimized defaults
F10	Saves changes and exits Setup

Submenus

Note that a right pointer symbol (▶) appears to the left of certain fields. This pointer indicates that you can display a submenu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

5.2 Standard CMOS Features

The main menu includes the following setup categories. Recall that some systems may not include all entries.

Phoenix – Award BIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy):	Thu, Nov, 20 2008	Item Help
Time (hh:mm:ss):	16:19:20	
➢ IDE Channel 0 Master	None	Menu Level ➢
➢ IDE Channel 0 Slave	None	
➢ SATA Channel 0	None	Change the day, month, year and Century
➢ SATA Channel 1	None	
➢ SATA Channel 2	None	
➢ SATA Channel 3	None	
Drive A	None	
Video	EGA/VGA	
Halt On	All, But Keyboard	
Based Memory	640K	
Extended Memory	523264K	
Total Memory	524288K	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Date/Time

Use this option to change the system time and date. 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.

IDE Channel Master/Slave

This selection brings up the configuration submenu of the designated device.

IDE HDD Auto-detection: Press Enter to auto-detect the HDD on the selected channel.

IDE Channel 0 Master/Slave: (None/Auto/Manual) Selecting 'manual' allows the user to set the remaining fields on the submenu.

PRECOMP=65535 means NONE.

Capacity: Auto display disk size Disk drive capacity (approximated).

Disk size is usually slightly greater than the size of a formatted disk given by a disk checking program.

Access Mode: (CHS/LBA/Large/Auto) Selects the access mode for a hard disk The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

Cylinder: (Min = 0, Max = 65535) Sets the number of cylinders for a hard disk.

Head: (Min = 0, Max = 255) Sets the number of read/write heads

Precomp: (Min = 0, Max = 65535)

Setting a value of 65535 means no hard disk

Landing zone: (Min = 0, Max = 65535)

Setting a value of 65535 means no hard disk

Sector: (Min = 0, Max = 255) Number of sectors per track

SATA Channel

This selection brings up the configuration submenu of the designated device.

IDE Auto-detection: Press Enter to auto-detect the device on the selected channel.

Extended IDE Drive: (None/Auto) Selecting 'manual' allows the user to set the remaining fields on the submenu. Select the type of fixed disk.

Access Mode: (Large/Auto) Selects the access mode for a hard disk

Drive A

Specifies the capacity and physic al size of diskette drive A. Do not select [None] if you are using a floppy disk drive. Configuration options: [None] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

Video

This category detects the type of adapter used for the primary monitor that matches your video display card and monitor.

- EGA / VGA: Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA, or PGA monitor adapters
- CGA 40: Color Graphics Adapter, power up in 40 column mode
- CGA 80: Color Graphics Adapter, power up in 80 column mode
- MONO: Monochrome adapter, includes high resolution monochrome adapters

Halt On

During the Power On Self Test (POST), the computer stops if the BIOS detects a hardware error. The BIOS can be instructed to ignore certain errors during POST and continue the bootup process. The options are as follows:

- **No errors:** POST does not stop for any errors.
- **All errors:** POST stops for any nonfatal error and will prompt the user to take any corrective measures.
- **All, But Keyboard:** POST does not stop for a keyboard error, but stops for all other errors.
- **All, But Diskette:** POST does not stop for diskette drive errors, but stops for all other errors.
- **All, But Disk/Key:** POST does not stop for a keyboard or disk errors, but stops for all other errors.

Base Memory

Displays the amount of conventional memory detected during boot up.

Extended Memory

Displays the amount of extended memory detected during boot up.

Total Memory

Displays the total memory available on the system.

5.3 Advanced BIOS Features

This section allows users to configure the Advanced BIOS Features of the system.

Phoenix – Award BIOS CMOS Setup Utility
Advanced BIOS Features

➢ CPU Feature	Press Enter	Item Help
➢Hard Disk Boot Priority	Press Enter	
Virus Warning	Disabled	Menu Level ➢
CPU L1&L2 Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Hard Disk	
Second Boot Device	CDROM	
Third Boot Device	LS120	
Boot Other Device	Enabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Security Option	Setup	
MPS Version Control For OS	1.4	
OS Select For DRAM > 64MB	Non-OS2	
Report No FDD For WIN 95	No	
Small Logo (EPA) Show	Disabled	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

CPU Features

Phoenix - AwardBIOS CMOS Setup Utility
CPU Features

Delay Prior to Thermal	16 Min	Item Help
Thermal Management	Thermal Monitor 1	
Limited CPUID MaxVal	Disabled	Menu Level ➢➢
Execute Disable Bit	Enabled	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Delay Prior to Thermal

Options: 4/8/16/32 minutes.

Limit CPUID MaxVal

Set Limit CPUID MaxVal to 3. This should be disabled for WinXP

Execute Disable Bit

When disabled, forces the XD feature flag to always return 0

Hard Disk Boot Priority

Sets hard disk boot device priority, such as Pri. Master, Pri. Slave, USBHDD0, USBHDD1, USBHDD2, and Bootable Add-in Cards.

Virus Warning

Enables or disables the virus warning for IDE Hard Disk boot sector protection. If this function is enabled and someone attempts to write data into this area, the BIOS will show a warning message on screen and alarm beep.

CPU L1 & L2 Cache

Enables or disables the CPU L1 & L2 Cache. Enabling this feature speeds up memory access.

Quick Power On Self Test

Speeds up the Power On Self Test (POST). If enabled, the BIOS will shorten the test time or skip some check items during POST.

First/Second/Third Boot Device

Pressing <Enter> displays the Boot Device Menu. The BIOS will attempt to load the operating system from the selected devices in sequence.

Boot Other Device

Enables the BIOS to boot from a second or third device if booting from the first device fails. When disabled the BIOS will not attempt to boot from alternative devices.

Boot-Up NumLock Status

Selects the power on state for system NumLock. Options: On/Off

Gate A20 Option

Gate A20 is a device used to address memory above 1 MB. The options are Fast and Normal. The Fast setting is controlled by a chipset specific method. Normal setting is controlled by keyboard controller or chipset hardware.

Security Option

Selects whether a password is required every time the system boots or only when setup is entered. Options include:

- **System:** The system will not boot without password access and access to Setup will be denied if an incorrect password is entered at the prompt.
- **Setup:** The system will boot, but access to Setup will be restricted without password access.

MPS Version Control for OS

This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.

MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future. In addition, MPS 1.4 introduces support for a secondary PCI bus without requiring a PCI bridge.

OS Select for DRAM > 64MB

Select the type of operating system for systems with greater than 64MB of RAM. Options: Non-OS2, OS2

Report No FDD for Win95

Options: No/Yes.

Small Logo (EPA) Show

This item allows you enabled/disabled display of the small EPA logo during POST.

5.4 Advanced Chipset Features

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

DRAM Timing Selectable	By SPD	Item Help
X CAS Latency Time	Auto	
X DRAM RAS# To CAS# Delay	Auto	Menu Level ➢
X DRAM RAS# Precharge	Auto	
X Precharge dealy (tRAS)	Auto	
X System Memory Frequency	By SPD	
SLP_S4# Assertion Width	1 to 2 Sec.	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
** VGA Setting **		
PEG/OnChip VGA Control	Auto	
On-Chip Frame Buffer Size	8MB	
DVMT Mode	DVMT	
DVMT/FIXED Memory Size	128MB	
Boot Display	Auto	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

DRAM Timing Selectable

Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to "By SPD" enables DRAM timing to be determined automatically by BIOS based on the configurations on the SPD. Selecting Manual allows users to configure these fields manually.

SLP_S4# Assertion Width

This item allows you to set the SLP_S4# Assertion Width. Options: 4 to 5 sec., 3 to 4 sec., 2 to 3 sec., 1 to 2 sec.

System BIOS Cacheable

Selecting “Enabled” allows caching of the system BIOS ROM at F0000h- FFFFFh, resulting in better system performance. However, if any program writes data to this memory area, a system error may occur. The options are “Enabled”, and “Disabled”.

Video BIOS Cacheable

Selecting “Enabled” allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this

memory area, a system error may result. Options: Enables, Disabled

Memory Hole at 15M-16M

Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is “Disabled”.

VGA Settings

PEG/Onchip VGA Control

The options are “Auto”, “Onchip VGA” or “PEG Port”.

On-Chip Frame Buffer Size

The On-Chip Frame Buffer Size can be set to 1 MB or 8 MB. This memory is shared with the system memory.

DVMT Mode

Use this field to select the memory to allocate for video memory. The options are “Fixed”, “DVMT” and “BOTH”.

DVMT/FIXED Memory Size

Specify the size of DVMT/system memory to allocate for video memory.

Boot Display

This item allows you to select the boot display device. The options are "Auto" and "CRT".

5.5 Integrated Peripherals

Phoenix – Award BIOS CMOS Setup Utility
Integrated Peripherals

➢ PCI Express Lan	Press Enter	Item Help
➢ On Chip IDE Device	Press Enter	
➢ Onboard Device	Press Enter	Menu Level ➢
➢ Super IO Device	Press Enter	
Watch Dog Timer Select	Disabled	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

PCI Express LAN

Phoenix – Award BIOS CMOS Setup Utility
PCI Express Lan

82574L Giga Lan_1	Enabled	Item Help
PCI Express PME	Enabled	
82574L PXE ROM	DIsabled	Menu Level ➢

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

82574L Giga LAN_1

Use this field to Enabled/Disable the LAN device

PCI Express PME

Options: Enabled/Disabled.

82574L PXE ROM

This item allows you to set the status of the PXE ROM. Options: Enable/Disabled

On Chip IDE Device

Phoenix – Award BIOS CMOS Setup Utility
OnChip IDE Device

IDE HDD Block Mode	Enabled	Item Help
IDE DMA transfer Access	Enabled	
On-Chip Primary PCI IDE	Enabled	Menu Level ➢
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	If you IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
On-Chip Serial ATA Setting		
On-Chip Serial ATA	Enhanced Mode	
SATA Port Speed Setting	Disabled	
X PATA IDE Mode	Primary	
SATA Port	P1, P3 is Secondary	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

IDE HDD Block Mode

If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

IDE DMA Transfer Access

Use this field to enable or disable IDE DMA transfer access.

On-Chip Primary PCI IDE

Enable/disable the Primary IDE channel.

IDE Primary/Secondary Master/Slave PIO/UDMA Mode

Each IDE channel has both a master and a slave, making four IDE devices possible. Because two IDE devices may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting “Auto” will allow auto detection to ensure optimal performance.

On-Chip Serial ATA

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

SATA Port Speed Settings

The item controls the maximum access speed allowed for the connected SATA devices, with the GEN I setting used for SATA-150 type devices and GEN II used for SATA II type devices.

Onboard Device

Phoenix – Award BIOS CMOS Setup Utility
Onboard Device

USB Keyboard Support	Enabled	Item Help
USB Mouse Support	Enabled	
AC97 Audio	Disabled	Menu Level ➢

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

USB Keyboard Support

Select “Enabled” if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard. Options: Enabled, Disabled.

USB Mouse Support

Select “Enabled” if your system contains a Universal Serial Bus (USB) controller and you have a USB mouse. Options: Enabled, Disabled.

AC97 Audio

The item allows you to enable the AC'97 audio function. Options: Enabled, Disabled.

Super I/O Device

Phoenix – Award BIOS CMOS Setup Utility
Super IO Device Setup

Onboard FDC Controller	Enabled	Item Help
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
Onboard Parallel Port	378/IRQ7	Menu Level ➢
Parallel Port Mode	SPP	
X EPP Mode Select	EPP1.7	
X ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	
Watch Dog Timer Select	Disabled	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

Onboard FDC Controller

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

Onboard Serial Port 1/ Port 2

The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.

Onboard Parallel Port

This field sets the address of the on-board parallel port connector. You can select “378/IRQ7”, “278/IRQ5”, “3BC/IRQ7”, or “Disabled”. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The single board computer can support up to three parallel ports.

Parallel Port Mode

This field allows you to set the operation mode of the parallel port. The setting “Normal” allows normal speed operation, but in one direction only. “EPP” allows bidirectional parallel port operation at maximum speed. “ECP” allows the parallel port to operate in bidirectional mode and at a speed faster than the maximum data transfer rate. “ECP + EPP” allows normal speed operation in a two-way mode.

PWRON After PWR-Fail

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

Watch Dog Timer Select

The item allows you to enable watch dog timer function. The options are: Disabled/10 Sec/20 Sec/30 Sec/40 Sec/1 Min/2 Min/4 Min.

5.6 Power Management Setup

Phoenix – Award BIOS CMOS Setup Utility
Power Management Setup

ACPI Function	Enabled	Item Help
Power Management	User Define	
Video Off Method	DPMS	Menu Level ➢
Video Off In Suspend	YES	
Suspend Type	Stop Grant	
MODEM Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
Wake-Up by PCI Card	Enabled	
Power On by Ring	Disabled	
Resume by Alarm	Disabled	
X Date (of Month) Alarm	0	
X Time(hh:mm:ss) Alarm	0 : 0 : 0	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

ACPI Function

This function enables PCs to implement Power Management functions through the operating system and also provides the opportunity to integrate the interface for controlling power management and Plug-n-Play features on system devices. The options are “Enabled” and “Disabled”.

Power Management

There are three settings for Power Management: Min. Power Saving, Max. Power Saving, and User Defined

Video Off Method

Use this to select the method to turn off the video. The options are “Blank Screen”, “V/H SYNC+ Blank”, and “DPMS”.

Video Off In Suspend

When the system is in suspend mode, the video will turn off. Options: “No” and “Yes”.

Suspend Type

Select the suspend type. Options: Stop Grant, Pwron suspend.

MODEM Use IRQ

This determines the IRQ in which the MODEM can use. Options: NA, 3, 4, 5, 7, 9, 10, 11.

Suspend Mode

Enable/disable system suspend. When “Enabled” and after the set time of system inactivity. All devices except the CPU will be shut off. Options: Disabled, 1 Min, 2 Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min.

HDD Power Down

When “Enabled” and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active. Options: Disabled, 1-7 mins.

Soft-Off by PWR-BTTN: Configures the power button:

- Instant-Off: The power button functions as a normal power-on/-off button.
- Delay 4 Sec: The system is turned off if the power button is pressed for more than four seconds. Pressing the button momentarily (for less than 4 seconds) will switch the system to “suspend” mode.

Wake-Up by PCI card

An input signal from PME on the PCI card awakens the system from a soft off state. Options: “Enabled” and “Disabled”.

Power On by Ring

Select “Enabled” to power on the system from a soft off state by an input signal on the serial Ring Indicator (RI) line. Options: “Enabled” and “Disabled”.

Resume by Alarm

When “Enabled”, set the date and time at which the RTC (real-time clock) alarm awakens the system from suspend mode. Options: “Enabled” and “Disabled”.

5.7 PnP/PCI Configurations

Phoenix – Award BIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Installed	No	Item Help
Init Display First	PCI Slot	
Reset Configuration Data	Disabled	Menu Level ➢
Resources Controlled By	Auto (ESCD)	
X IRQ Resources	Press Enter	
X DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	
INT Pin 1 Assignment	Auto	
INT Pin 2 Assignment	Auto	
INT Pin 3 Assignment	Auto	
INT Pin 4 Assignment	Auto	
INT Pin 5 Assignment	Auto	
INT Pin 6 Assignment	Auto	
INT Pin 7 Assignment	Auto	
INT Pin 8 Assignment	Auto	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

PNP OS Installed

If all your operating systems support Plug & Play (PnP), select **Yes** so that they can take over the management of device resources. If you are using a non-PnP-aware OS or not all of the operating systems you are using support PnP, select **No** to let the BIOS handle it instead.

Init Display First

This item allows you to choose the first display interface to initiate while booting. Options: “PCI Slot” or “Onboard”.

Reset Configuration Data

The default is “Disabled”. Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.

Resource Controlled By

The options are “Auto(ESCD)” or “Manual”. Choosing “Manual” requires you to choose resources from the following sub-menus.

"Auto(ESCD)" automatically configures all of the boot and Plug and Play devices.

PCI/VGA Palette Snoop

"Disabled" by default. This function determines if the graphics card should allow VGA palette snooping by a fixed function display card. It is only useful if a fixed-function display card that requires a VGA-compatible graphics card to be present.

INT Pin 1/2/3/4/5/6/7/8 Assignment

The options: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15

5.8 PC health Status

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

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

System Temperature	32ºC/89ºF	Item Help
CPU Temperature	56ºC/132ºF	
System Fan Speed	0 RPM	
CPU Fan Speed	4326 RPM	Menu Level ➢
PWR Fan Speed	0 RPM	
CPU Vcore	1.28V	
VDIMM	1.90V	
+12V	11.17V	
5VSB	4.69V	
VCC5	4.83V	
VCC3	3.26V	
VBAT	3.20V	

↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help

F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults

5.9 Frequency/Voltage Control

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

Auto Detect PCI CLK	Enabled	Item Help
Spread Spectrum	Disabled	
		Menu Level ➢
↑↓→←Move Enter: Select +/-/PU/PD: Value F10: Save ESC: Exit F1: General Help		
F5: Previous Values F6: Fail-safe defaults F7: Optimized Defaults		

Auto Detect PCI Clk

This item allows you to enable/disable the auto detect PCI clock function.

Spread Spectrum

This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The options are “Disabled” and “Enabled”.

5.10 Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. Press <Y> to load the BIOS default values for the most stable, minimal-performance system operations.

5.11 Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory can change these defaults to meet its needs. Press <Y> to load the default values setting for optimal performance system operations.

5.12 Set Supervisor & User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press < Enter >. The “Enter Password:” message prompts you on the screen. Type the password, up to eight characters in length, and press < Enter >. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

5.13 Save & Exit Setup

This option allows you to determine whether to accept any modifications or not. Typing Y will quit the setup utility and save all changes into the CMOS memory. Typing N will return to the Setup Utility Main Screen.

5.14 Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing Y will quit the Setup utility without saving any modifications. Typing N will return to Setup utility.

Appendix A - Watchdog Timer

A sample program for configuring the NuPRO-A301's watchdog timer is included on the ADLINK CD in the **\WDT** directory.

A.1 Sample Code

```
begin:

;------------------------------------------------------
; Enter extended function mode, interrupt double-write
;------------------------------------------------------

mov dx, 2Eh
mov al, 87h
out dx, al
out dx, al

mov dx, 2Eh
mov al, 07h
out dx, al
mov dx, 2Fh
mov al, 08h
out dx, al

mov dx, 2Eh
mov al, 0F7h
out dx, al      ;device 8, CRF7
mov dx, 2Fh
mov al, 0C0h
out dx, al

mov dx, 2Eh
mov al, 0F5h    ;device 8, CRF5
out dx, al
mov dx, 2Fh
mov al, 00h     ;bit 3 -> 0 = second
                ;bit 3 -> 1 = minute


mov dx, 2Eh
mov al, 0F6h;device 8, CRF6
out dx, al
```

```
mov dx, 2Fh
mov al, 05h
out dx, al

;-------------------------------------------------------
; Exit extended function mode
;-------------------------------------------------------

mov dx, 2Eh
mov al, 0AAh
out dx, al
.exit

end
```

Appendix B - System Resources

B.1 Memory Map

Address Range (hex)	Description
00000h-9FFFFh	DOS Kernel Area
A0000h,BFFFFh	EGA and VGA Video Buffer (128KB)
C0000h-CFFFFh	EGA/VGA ROM
D0000h-DFFFFh	Adaptor ROM (PXE ROM)
E0000h-FFFFFh	System BIOS

Table B-1: Memory Map

B.2 Direct Memory Access Channels

Resource	Share	Device Desciption
DMA 02	Exclusive	Standard floppy disk controller
DMA 04	Exclusive	Direct memory access controller

Table B-2: Direct Memory Access Channels

B.3 IO Map

Hex Range	Share	Device Desciption
0000-000F	Exclusive	Direct memory access controller
0000-0CF7	Shared	PCI bus
0010-001F	Exclusive	Motherboard resources
0020-0021	Exclusive	Programmable interrupt controller
0022-003F	Exclusive	Motherboard resources
0040-0043	Exclusive	System timer
0044-005F	Exclusive	Motherboard resources
0060-0060	Exclusive	Std. 101/102-Key or Microsoft Natural PS/2 Keyboard
0061-0061	Exclusive	System speaker
0062-0063	Exclusive	Motherboard resources
0064-0064	Exclusive	Std. 101/102-Key or Microsoft Natural PS/2 Keyboard
0065-006F	Exclusive	Motherboard resources
0070-0073	Exclusive	System CMOS/real time clock
0074-007F	Exclusive	Motherboard resources
0080-0090	Exclusive	Direct memory access controller
0091-0093	Exclusive	Motherboard resources
0094-009F	Exclusive	Direct memory access controller
00A0-00A1	Exclusive	Programmable interrupt controller
00A2-00BF	Exclusive	Motherboard resources
00C0-00DF	Exclusive	Direct memory access controller
00E0-00EF	Exclusive	Motherboard resources
00F0-00FF	Exclusive	Numeric data processor
01F0-01F7	Exclusive	Primary IDE Channel
0274-0277	Exclusive	ISAPNP Read Data Port
0279-0279	Exclusive	ISAPNP Read Data Port
02F8-02FF	Exclusive	Communications Port (COM2)
0378-037F	Exclusive	Printer Port (LPT1)
03B0-03BB	Shared	Intel(R) 82945G Express Chipset Family
03C0-03DF	Shared	Intel(R) 82945G Express Chipset Family
03F0-03F5	Exclusive	Standard floppy disk controller
03F6-03F6	Exclusive	Primary IDE Channel

Hex Range	Share	Device Desciption
03F7-03F7	Exclusive	Standard floppy disk controller
03F8-03FF	Exclusive	Communications Port (COM1)
0400-04BF	Exclusive	Motherboard resources
04D0-04D1	Exclusive	Motherboard resources
0500-051F	Undetermined	Intel 82801G (ICH7) SMBus Controller - 27DA
0778-077B	Exclusive	Printer Port (LPT1)
0800-087F	Exclusive	Motherboard resources
0880-088F	Exclusive	Motherboard resources
0A79-0A79	Exclusive	ISAPNP Read Data Port
0D00-FFFF	Shared	PCI bus

Table B-3: IO Map

B.4 Interrupt Request (IRQ) Map

IRQ#	Connected to Pin
0	System Timer
1	Keyboard Controller
2	VGA and Link to Secondary PIC
3	Communications Port (COM2)
4	Communications Port (COM1)
5	PCI Device
6	Standard floppy disk controller
7	Parallel Port
8	System CMOS/ Real Time Clock
9	Microsoft ACPI-Compliant System
10	PCI Device
11	PCI Device
12	Microsoft PS/2 Mouse
13	Numeric data processor
14	Primary IDE Controller
15	Intel 82801G (ICH7) SMBus Controller - 27DA

Table B-4: IRQ Map

B.5 PCI Interrupt Routing Map

PIRQ	INT0	INT1	INT2	INT3
P.E.G. Root Port	LNKA:16	LNKB:17	LNKC:18	LNKD:19
I.G.D.	LNKA:16			
IDE Controller	LNKC:18			
SATA Host Controller		LNKD:19		
EHCI Controller	LNKH:23			
SMBus Controller		LNKD:19		
AC'97 Audio Controller	LNKB:17			
AC'97 Modem Controller		LNKE:20		
High Definition Audio Controller	LNKA:16			
LAN Controller	LNKE:20			
PCIE Port #0	LNKA:16	LNKB:17	LNKC:18	LNKD:19
PCIE Port #1	LNKB:17	LNKC:18	LNKD:19	LNKA:16
PCIE Port #2	LNKC:18	LNKD:19	LNKA:16	LNKB:17
PCIE Port #3	LNKD:19	LNKA:16	LNKB:17	LNKC:18
PCIE Port #4	LNKA:16	LNKB:17	LNKC:18	LNKD:19
PCIE Port #5	LNKB:17	LNKC:18	LNKD:19	LNKA:16
UHCI Controller #0	LNKH:23			
UHCI Controller #1		LNKD:19		
UHCI Controller #2			LNKC:18	
UHCI Controller #3				LNKA:16
Slot 1	LNKD:19	LNKA:16	LNKB:17	LNKC:18

Table B-5: PCI Interrupt Routing Map

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.

- 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.

Getting Service

Contact us should you require any service or assistance.

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