NuPRO-935A

Full-Sized PICMG 1.0 SBC
Intel® Q35/ICH9 Chipset

User's Manual



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Revision History

Revision	Release Date	Description of Change(s)
2.00	2008/08/29	Initial release
2.01	2008/10/29	Correct Board Layout (COM1/2)
2.02	2009/05/13	Update OS support, driver locations, add TPM driver installation
2.03	2010/07/03	Correct BIOS Power Button Mode description; correct CPU Fan connector, GbE connector, Floppy connector pin definitions; correct COM1 connector label (CN6); correct memory and heatsink/fan installation instructions; update addresses
2.04	2011/04/26	Remove Mini-DIN PS/2 KB/MS and legacy cables for boards with ordering numbers ending in “xx40” and higher; update addresses

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Preface

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Using this Manual

Audience and Scope

The NuPRO-935A 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-935A, its features, applications, and specifications, including functional descriptions and board layout.

Chapter 2, Hardware Information: Provides technical information on connectors, jumpers and pin assignments for configuring the NuPRO-935A.

Chapter 3, Getting Started: Illustrates how to install components on the NuPRO-935A.

Chapter 4, Driver Installation: Provides information on how to install the NuPRO-935A device drivers.

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 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-935A is a PICMG 1.0 industrial SBC supporting the next-generation Intel® Core 2 Quad/Duo and Intel® Celeron® processors in the LGA775 package to deliver a high performance platform for a wide array of industrial automation applications. The NuPRO-935A supports processing speeds up to 3.0 GHz and high-bandwidth network connectivity with PCI Express®-based gigabit LAN.

These advanced features, coupled with a dual-channel DDR2 system memory architecture and diverse I/O storage make the NuPRO-935A suitable for industrial automation and automation control applications requiring a standardize, easy-to-deploy, and cost-effective SBC.

1.2 Features

- Supports Intel® Core™2 Duo/ Core™2 Quad, processors in LGA775 package
- TPM hardware security chip (NuPRO-935A/DV only)
- Dual 10/100/1000Mbps Ethernet (NuPRO-935A/LV supports single GbE)
- Optional HD audio kit (DB-Audio2 daughter board)
- 5 USB 2.0 ports
- Supports 2 SATA II ports
- Watchdog Timer, Hardware Monitor
- 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 Quad, Core™2 Duo, Celeron® in LGA775 Socket
FSB	• 800/1066/1333 MHz
Chipset	• Intel® 82Q35 Graphics Memory Controller Hub • Intel® ICH9 I/O Controller Hub
Memory	• Two 240-pin DIMM sockets support 667/800MHz 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-935A/DV only)
I/O Interfaces	
IDE	• One-channel UDMA 33, ATA-66/100 support • One 40-pin IDE connector (1 device only)
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 RS-232, one RS232/422/485/485+, by onboard pin-header) • 2 Gigabit Ethernet RJ45 ports (optional) • 1 VGA port • PS/2 Keyboard/Mouse* • 1 Parallel port • 1 Floppy port
ISA	• PCI-to-ISA Bridge: IT8888 (DMA not supported)



* A Mini-DIN PS/2 KB/MS connector is not supported on boards with ordering numbers ending in “xx40” and higher. See “PS/2 Keyboard/Mouse Port” on page 14 for more information.

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Display	
VGA	• GMA 3100 integrated in Q35 GMCH
VRAM	• Shared system memory up to 256 MB
CRT	• External Dsub-15 connector, resolution up to 2048 x 1536 @ 75 Hz
Ethernet	
Controller	• Intel® 82566DM and Intel® 82573L (NuPRO-935A/LV supports 82566DM only)
Ports	• Two RJ-45 Ethernet ports (NuPRO-935A/LV supports 1x GbE)
Mechanical and Environment	
Form Factor	• Standard full-size PICMG 1.0 SBC
Dimensions	• 338 x 122 mm (L x W)
Operating Temp.	• 0ºC to 60ºC
Storage Temp.	• -20ºC to 80ºC
Relative Humidity	• 5% to 90% non-condensing both operating and non-operating
Safety	• CE, FCC Class A

Table 1-1: NuPRO-935A General Specifications

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1.4 Power Consumption

Test Configuration	
CPU	Intel® Core 2 Quad processor Q6600 2.40 GHz
Memory	Transcend DDR2 800 1GB x2
Graphics	Intel ® 82Q35 Graphics Memory controller
SATA Channel	Seagate ST3808110AS Barracuda 7200.9 80GB
Power Supply	COOLMAX FL-480ATX 450W

DOS (idle)				
Power Req.	+5V	+12V	CPU +12V	Total
Current (A)	3.37A	367.9mA	3.24A	—
Watts (W)	16.87W	4.42W	38.88	60.17W
Windows XP, Idle				
Power Req.	+5V	+12V	CPU +12V	Total
Current (A)	3.203A	233,6mA	1.578A	—
Watts (W)	16.02W	2.80W	18.94W	37.76W
Windows XP, KPower				
Power Req.	+5V	+12V	CPU +12V	Total
Current (A)	3.276A	533.0mA	7.616A	—
Watts (W)	16.38W	6.4W	91.39W	114.17W
Windows XP, BurnIn Test 5.3				
Power Req.	+5V	+12V	CPU +12V	Total
Current (A)	3.708A	555.1mA	5.728A	—
Watts (W)	18.54W	6.66W	68.74W	93.94W

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1.5 Block Diagram

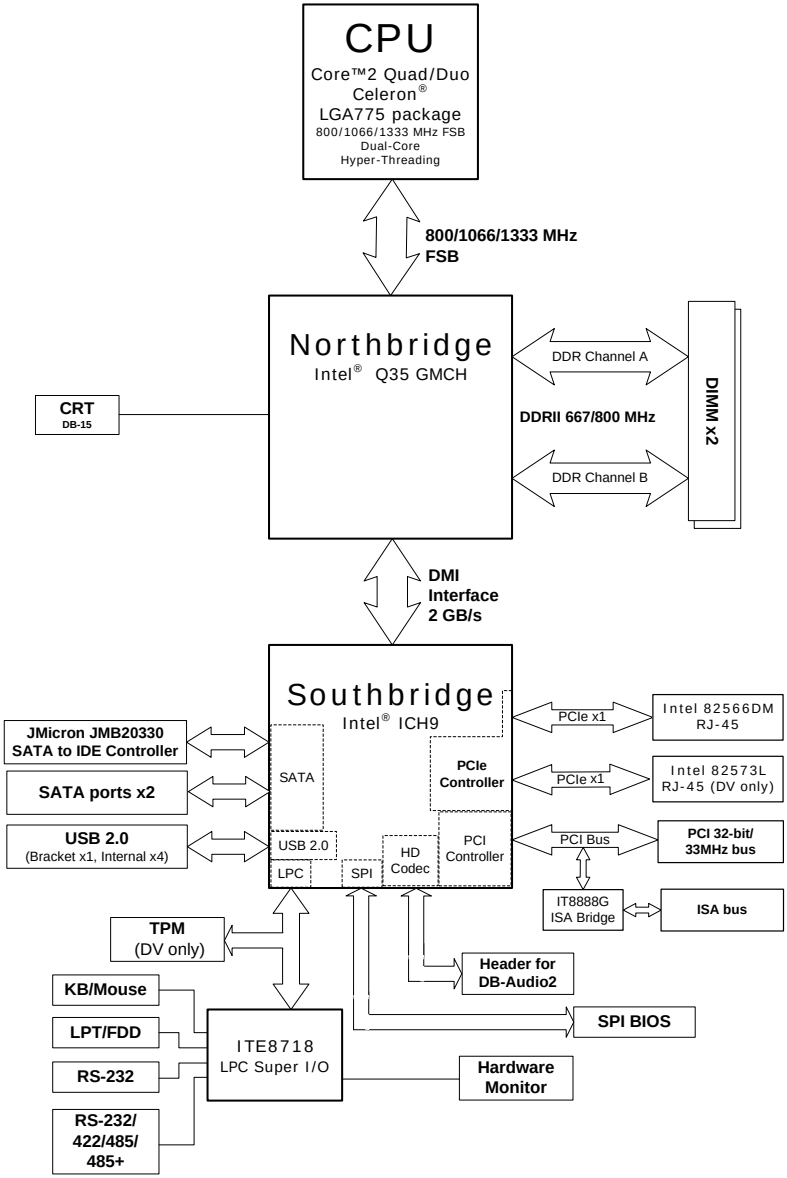


Figure 1-1: NuPRO-935A Block Diagram

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1.6 Functional Description

Processor Support

The NuPRO-935A is a single processor design for the latest Intel Yorkfield/Wolfdale/Conroe Processor family, starting from 1.8 GHz core frequency with future option up to 3.0 GHz. With one LGA775 socket, the CPU connects with Intel Q35 MCH through the 800/1066/1333 MHz Front Side Bus (FSB).

Intel® Q35 + ICH9 Express chipset

The Intel® Q35 Express chipset provides the vital interfaces for the SBC. The Intel® Q35 comes with purpose-built capabilities designed specifically to address the key needs of the industrial computing environment and delivers improved system performance and comes with the integrated Intel® Graphics Media Accelerator 3100 engine that promotes advanced 3D, 2D, and video capabilities and cost-effective system building. The chipset also supports high-bandwidth interfaces including as PCI Express®, Serial ATA, and USB 2.0, as well as dual-channel DDR2 system memory.

Intel® Graphics Media Accelerator 3100

The Intel® Graphics Media Accelerator (GMA) 3100 revolutionizes integrated graphics with new capabilities that provide significant increase in graphics performance. With support for DirectX 9 hardware acceleration, core frequency of 400 MHz, and up to 256 MB of video memory, the Intel GMA 3100 provides a cost-effective and high-performance graphics solution.

Dual-channel DDR2 memory

To meet the requirements of memory-intensive applications, the NuPRO-935A has a dual-channel memory architecture supporting DDR2 667/800 MHz 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-935A uses two Gigabit Ethernet controllers (Intel® 82566DM, 82573L) connected to the PCI-E x1 bus of the ICH9. 82566DM is a single port Gigabit Ethernet Physical Layer Transceiver (PHY) that connects to its MAC through a dedicated interconnects. Both 82566DM and 82573L support operation at data rates of 10/100/1000 Mbps. Utilizing its wide bandwidth, the Gigabit LAN controller allows up to 1 Gbps of data transfer rate for superior network communications.

Serial ATA II technology

Storage is efficient and secure with the Serial ATA II interface. Utilizing the Intel® ICH9, the NUPRO-935A supports up to two Serial ATA II devices capable of reading/writing data at up to 3 Gbps. The SATA specification improves chassis airflow via thinner and more flexible cables with lower pin count.

Universal Serial Bus (USB) 2.0

The NUPRO-935A 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 built-in, proactive hardware monitoring system in the ASIC 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 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

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timer caused the reset event. The WDT register is cleared during the power-on sequence to enable the operating system to take appropriate action when the watchdog generates a reboot.

Trusted Platform Module

The NuPRO-935A optionally supports TPM ver. 1.2 (Trusted Platform Module) for secure storage of keys, passwords and digital certificates. Systems supporting TPM offer improved hardware-based security in numerous applications, such as file and folder encryption, local password management, S-MIME e-mail, VPN and PKI authentication and wireless authentication for 802.1x and LEAP.

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1.7 Mechanical Drawing

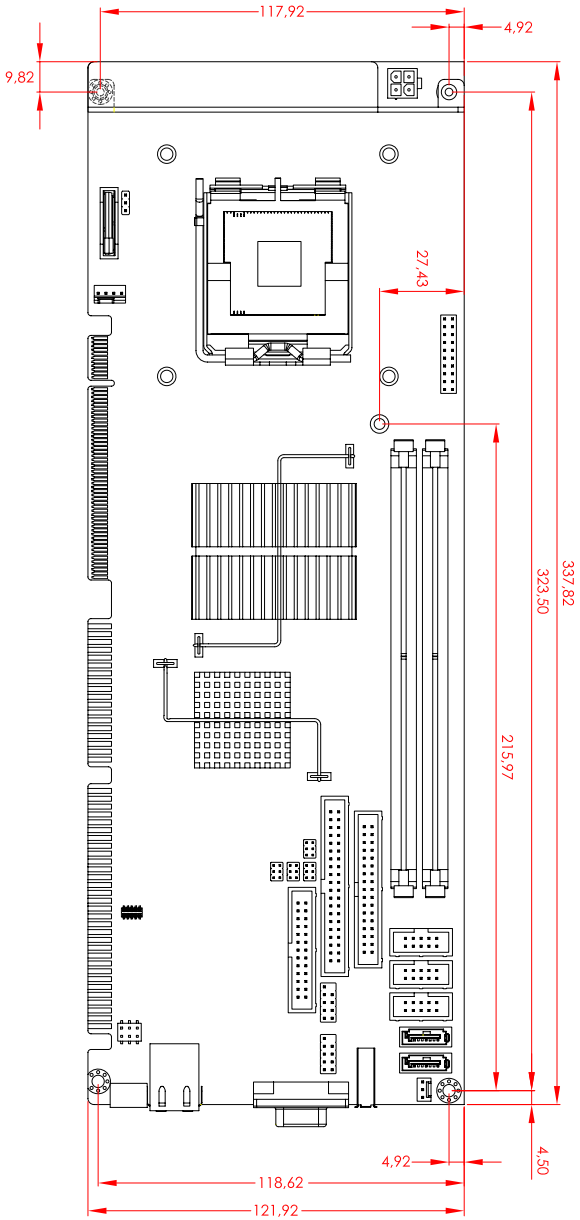


Figure 1-2: NuPRO-935A Board Dimensions (top view)

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1.8 I/O Connectivity

I/O	Bracket	Onboard	Golden Finger	Remarks
USB1	Y	—	—	
VGA	Y	—	—	DB-15
GbE1 (RJ-45)	Y (with LED indication)	—	—	Act/Link/Speed
GbE2 (RJ-45)	Y (with LED indication)	—	—	Act/Link/Speed
PS/2 KB/MS1*	Y	—	—	—
KB/MS	—	Y	—	2.54 pitch
USB2/3	—	Y	—	2.54 pitch
USB4/5	—	Y	—	2.54 pitch
COM1/2	—	Y	—	2.54 pitch
Printer port	—	Y	—	—
IDE	—	Y	—	—
Floppy	—	Y	—	—
SATA-300 1/2	—	Y	—	—
ISA	—	—	Y	—
PCI 32-bit/33 MHz	—	—	Y	4 slots

NOTE:

* Not supported on boards with ordering numbers ending in “xx40” 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-935A
- SATA cable x2
- SATA Power cable x1
- 2-port USB cable with bracket x1
- COM+Print cable with bracket x1
- COM cable with bracket x1
- PS/2 Y cable x1*
- IDE cable x1*
- Floppy cable x1*
- ADLINK All-in-One Driver DVD
- User's manual



* Not included with ordering numbers ending in "xx40" and higher. See "PS/2 Keyboard/Mouse Port" on page 14 for more information.



The NuPRO-935A 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-935A board lay-out, connector pin assignments, and jumper settings.

2.1 Rear Panel I/O Ports

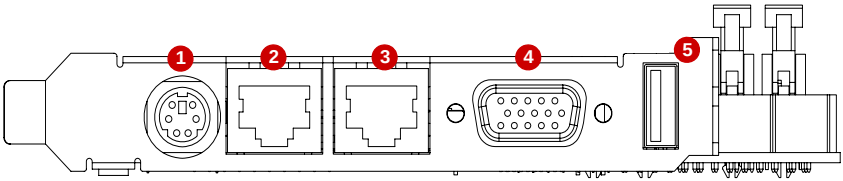


Figure 2-1: Rear Panel I/O Ports

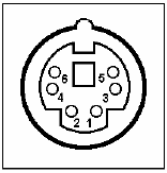
	Connector	Description
1	PS/2 KB/MS port	Connects a PS/2 mouse and keyboard[1]
2	Gigabit LAN port (RJ-45)	Provides Gigabit Ethernet connection
3	Gigabit LAN port (RJ-45)	Provides Gigabit Ethernet connection (not supported on NuPRO-935A/LV)
4	VGA port	This 15-pin port connects to a CRT or LCD monitor.
5	USB 2.0 port	High-speed USB ports available for connecting USB devices

NOTE:

[1] A Mini-DIN PS/2 KB/MS connector is not supported on boards with ordering numbers ending in “xx40” and higher. See “PS/2 Keyboard/Mouse Port” below.

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PS/2 Keyboard/Mouse Port

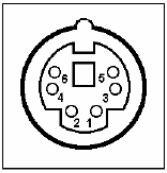


Pin #	Signal	Function
1	KBDAT	Keyboard Data
2	MSDAT	Mouse Data
3	GND	Ground
4	KBMS5V	Power
5	KBCLK	Keyboard Clock
6	MSCLK	Mouse Clock

For boards without a Mini-DIN PS/2 KB/MS connector, customers wishing to use a PS/2 type keyboard and mouse may purchase a PS/2 cable with bracket (P/N: 30-01019-2000) which connects to the External Keyboard/Mouse Connector (CN19).

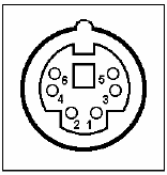


PS/2 Mouse Port on bracket (green)



Pin #	Signal	Function
1	MSDATA	Mouse Data
2	NC	not connected
3	GND	Ground
4	+5V	Power
5	CLK	Clock
6	NC	not connected

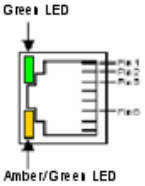
PS/2 Keyboard Port on bracket (purple)



Pin #	Signal	Function
1	KBDATA	Keyboard Data
2	NC	not connected
3	GND	Ground
4	+5V	Power
5	CLK	Clock
6	NC	not connected

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LAN (RJ-45) Ports

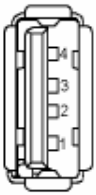


Pin #	10BASE-T/100BASE-TX	1000BASE-T
1	TX+	BI_DA+
2	TX-	BI_DA-
3	RX+	BI_DB+
4	--	BI_DC+
5	--	BI_DC-
6	RX-	BI_DB-
7	--	BI_DD+
8	--	BI_DD-

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

ACT/LINK LED		SPEED LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10 Mb connection
Green	Linked	Amber	100 Mb connection
Blinking	Data Activity	Green	1 Gb connection

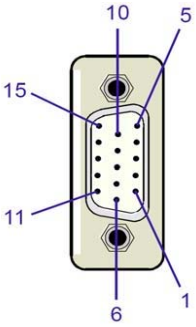
USB Connector



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

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VGA Port



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

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2.2 Board Layout

The illustrations below show the locations of connectors, slots, and jumpers on the NuPRO-935A.

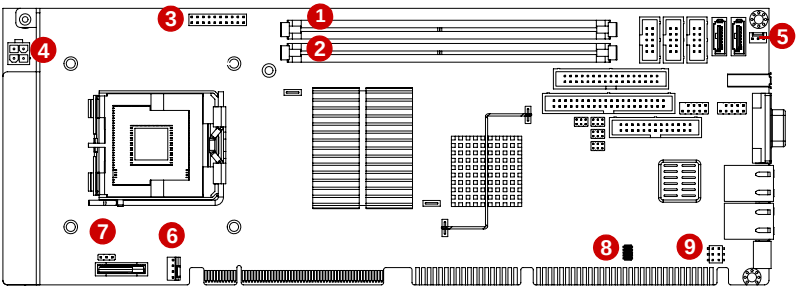


Figure 2-2: Connectors and Jumpers Pt. 1

	Connector	Description
1	DIMM1	240-pin DDR2 DIMM slot
2	DIMM2	240-pin DDR2 DIMM slot
3	CN1	System Panel connector
4	CN7	ATX 12V Power connector
5	FAN1	System Fan connector
6	FAN2	CPU Fan connector
7	JP5	Clear CMOS
8	CN17	LPC port connector
9	CN19	External Keyboard/Mouse connector

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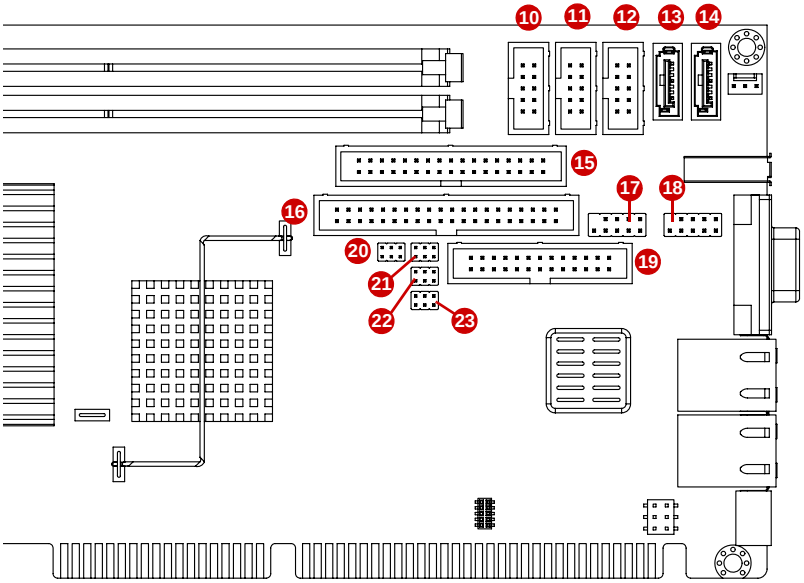


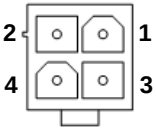
Figure 2-3: Connectors and Jumpers Pt. 2

	Connector	Description
10	CN4	HD Audio Daughter Board connector
11	CN5	COM2 connector
12	CN6	COM1 connector
13	CN2	Serial ATA connector
14	CN3	Serial ATA connector
15	CN8	Floppy port connector
16	CN10	IDE connector
17	CN11	USB1 pin header
18	CN12	USB2 pin header
19	CN13	LPT connector
20	JP1	COM1 mode jumper
21	JP2	COM1 mode jumper
22	JP3	COM1 mode jumper
23	JP4	COM1 mode jumper

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2.3 Onboard Connectors

ATX 12V Power Connector (CN7)



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 34.

CPU Fan Connector (FAN2)



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

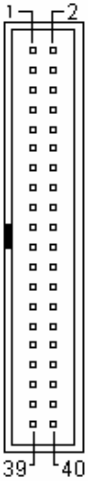
System Fan Connector (FAN1)



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

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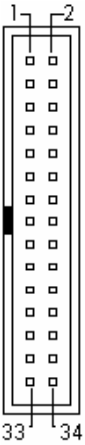
IDE Connector (CN10)



Pin #	Signal	Pin #	Signal
1	Reset IDE	2	Ground
3	Host data 7	4	Host data 8
5	Host data 6	6	Host data 9
7	Host data 5	8	Host data 10
9	Host data 4	10	Host data 11
11	Host data 3	12	Host data 12
13	Host data 2	14	Host data 13
15	Host data 1	16	Host data 14
17	Host data 0	18	Host data 15
19	Ground	20	NC
21	DRQ0 / DRQ1	22	Ground
23	Host IOW	24	Ground
25	Host IOR	26	Ground
27	IOCHRDY	28	Host ALE
29	DACK0 / DACK1	30	Ground
31	IRQ14 / IRQ 15	32	No connect
33	Address 1	34	No connect
35	Address 0	36	Address 2
37	Chip select 0	38	Chip select 1
39	Activity	40	Ground

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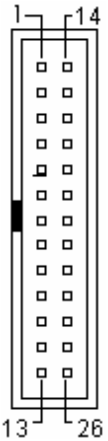
Floppy disk drive connector (CN8)



Pin #	Signal	Pin #	Signal
1	GND	2	Extended Density
3	GND	4	NC
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	GND	30	Read Data
31	GND	32	Side 1
33	GND	34	Disk Change

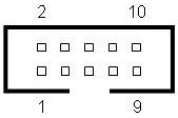
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Parallel Port (CN13)



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

HD Audio Daughter Board Connector (CN4)

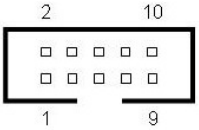


Pin #	Signal	Function
1	GND	Ground
2	AUD_BCLK	Audio Clock
3	GND	Ground
4	ICH_AUD_SDIN0	Audio Data Input
5	P5V	+ 5V
6	ICH_AUD_SDOUT	Audio Data Output
7	P5V_AUD	+ 5V
8	P3V3_DVDD	3.3V
9	AUD_SYNC	Audio Synchronous
10	AUD_RST-L	Audio Reset

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

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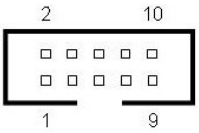
COM1 Connector (RS-422/485/485+) (CN6)



Pin #	Signal	Functions
1	TX-	Transmit (-)
2	NC	Not Connected
3	TX+	Transmit (+)
4	NC	Not Connected
5	RX+	Receive (+)
6	NC	Not Connected
7	RX-	Receive (-)
8	NC	Not Connected
9	GND	Ground
10	NC	Not Connected

Note: See Section 2.4 for COM1 mode jumper settings.

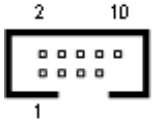
COM1/COM2 Connector (RS-232) (CN5/6)



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

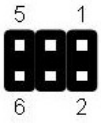
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USB 2.0 Connector (CN11-12)



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

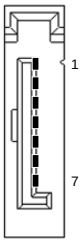
External Keyboard/Mouse Connector (CN19)



Pin #	Signal	Function
1	KDAT	Keyboard data
2	KCLK	Keyboard clock
3	MDAT	Mouse data
4	MCLK	Mouse data
5	P5V_KM	+5 V
6	GND	Ground

For use with PS/2 cable with bracket (P/N: 30-01019-2000).

Serial ATA Connectors (CN2-3)

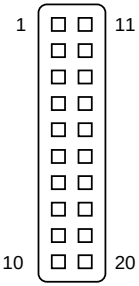


Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

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System Panel Connector (CN1)

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



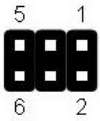
Pin #	Signal	Function	Pin Group
1	P5V	Power for +5v	Power LED
2	NC		
3	HC_PLED-	Power LED signal	
4	NC		
5	GND	Ground	
6	GND	Ground	ATX Power Connector
7	NC		
8	ATX_PSO	Power-on signal for	
9	P5V_SB_A	Power for +5v	
10	PMEJ	Power control signal	
11	HC_SPKR	Speaker signal	Chassis Speaker
12	NC		
13	NC		
14	P5V	Power for +5v	
15	HC_RSTB	RESET signal	Reset Button
16	GND	Ground	
17	HDLED_P	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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2.4 Jumpers

COM1 mode Jumper Settings (JP1-4)

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

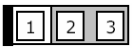


#	RS-232	RS-422	RS-485	RS-485+
JP1	1-3, 2-4	3-5, 4-6	3-5, 4-6	3-5, 4-6
JP2	1-3, 2-4	3-5, 4-6	3-5, 4-6	3-5, 4-6
JP3	1-2	3-4	5-6	5-6
JP4	-	1-3, 2-4	1-3, 2-4	3-5, 4-6

Clear CMOS (JP5)

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-935A (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.

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RTC status	Connection	JP5
Normal	1 – 2	
Clear CMOS	2 – 3	

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3 Getting Started

This chapter provides information on how to install components on the NuPRO-935A SBC.

3.1 Installing the CPU

The NuPRO-935A supports a single Intel® Core™2 Quad/Duo, Pentium® D, or Celeron® processor via the surface mount LGA775 socket (Socket T).

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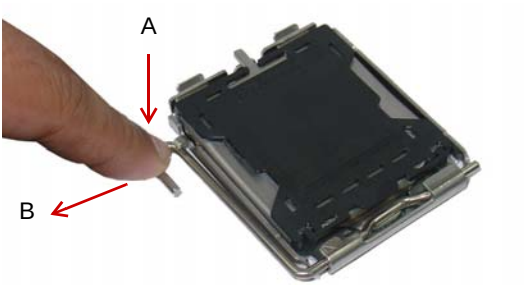
Disconnect all power supply to the board before installing a CPU to prevent damaging the board and CPU.

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).



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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

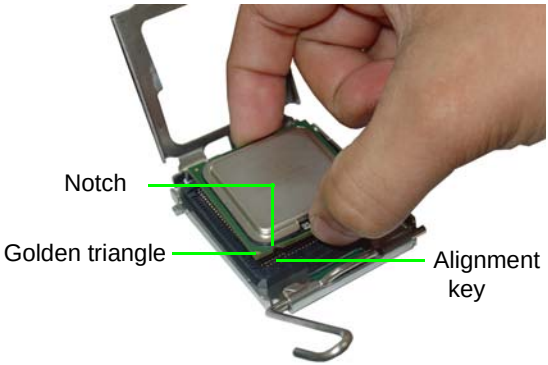


4. Use your thumb to push and remove the protective socket cover (plastic) from the load plate



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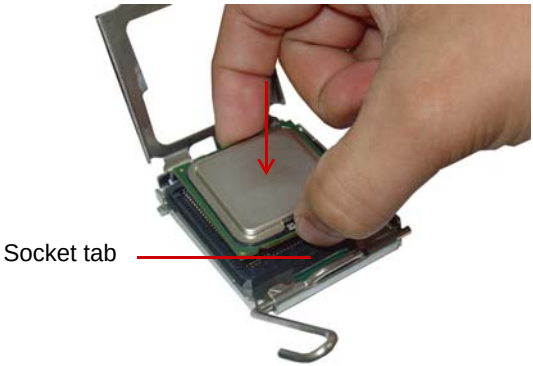
5. Position the CPU over the socket, then match the notches on the CPU side with the alignment keys on the socket. The golden triangle on the CPU must be positioned on the bottom-left corner of the socket .



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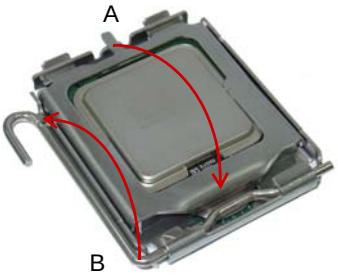
The CPU fits the socket in only one orientation. DO NOT force it into the socket to avoid damaging it.

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



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



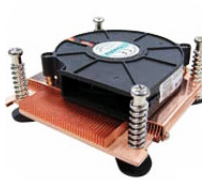
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3.2 Installing the CPU Fan and Heatsink

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 SBC. Failure to install a CPU fan and heatsink may damage the system host board and/or the CPU.

The following CPU fan and heatsink assemblies are recommended for use with the NuPRO-935A:



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



2U LGA 775 CPU Cooler
Dimensions:
- Heatsink: 89 x 83 x 68 mm
- Fan: 60 x 60 x 25 mm

Heatsink: Copper base + copper skived fin
Fan speed: 6800 RPM
Fan airflow: 35.3 CFM
Noise level: 46 dBA
Part number: 32-20066-0000



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

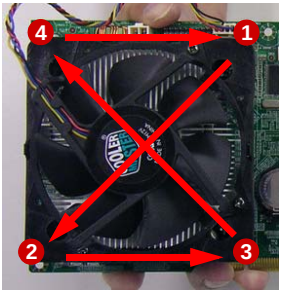
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CPU Fan/Heatsink Installation

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.

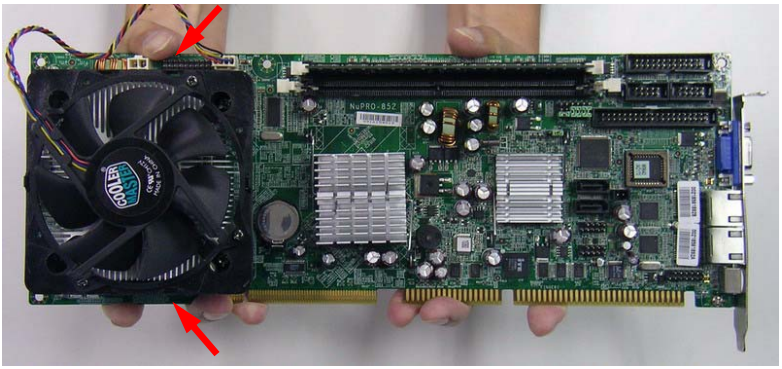
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4. Connect the CPU fan cable to the CPU fan connector on the SBC labeled FAN2 (see “Board Layout” on page 16).

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.

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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-935A 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-935A, 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-935A supports up to 4 GB of DDR2 800/667 MHz memory modules in 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.

WARNING:

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-935A allows you to install 512 MB, 1GB and 2GB 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.

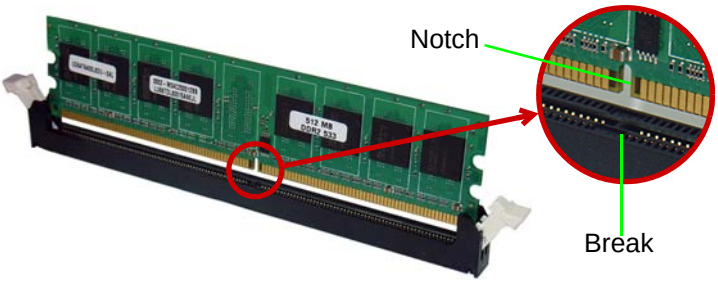
To install a memory module:

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

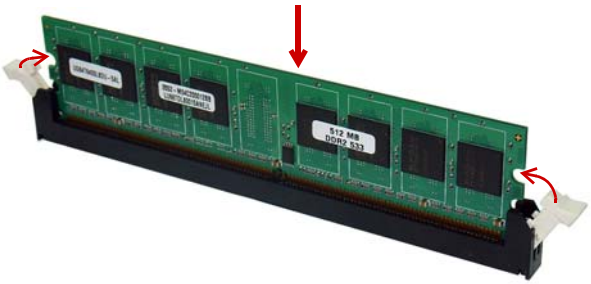


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3. Align the memory module on the socket making sure that the notch matches the break on the socket.



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



4 Driver Installation

This chapter provides information on how to install the NuPRO-935A device drivers under Windows XP/Vista. The device drivers are located in the following ADLINK All-in-One DVD directories:

Chipset Driver	\NuPRO\NuPRO-935A\Chipset\
Display Driver	\NuPRO\NuPRO-935A\VGA\
LAN Driver	\NuPRO\NuPRO-935A\Ethernet\
ISA Driver	\NuPRO\NuPRO-935A\ISA\
TPM Driver	\NuPRO\NuPRO-935A\TPM\
Audio Driver	\Audio Daughter Board\DB-Audio2\

4.1 Intel® Q35 Express Chipset Driver

This section describes the installation of the Intel® Q35 Express chipset driver.

1. Locate the directory **X:\NuPRO\NuPRO-935A\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, browse 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 Intel® Graphics Media Accelerator (GMA) 3000 driver.

To install the display driver:

1. Locate the display driver from this directory **X:\NuPRO\NuPRO-935A\VGA**, then double-click on the **Setup.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 driver from the directory **X:\NuPRO\NuPRO-935A\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 driver 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-935A\ISA.** Press '**Next**' to install the inf files.
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 TPM driver from the directory **X:\NuPRO\NuPRO-935A\TPM** and run **Setup.exe** to start installation.
2. Follow the 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.


NOTE:

Before installing the audio driver, check the BIOS settings to make sure that audio is enabled: **Chipset > South Bridge Configurations > HDA Controller** (see Section 5.7.1).

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

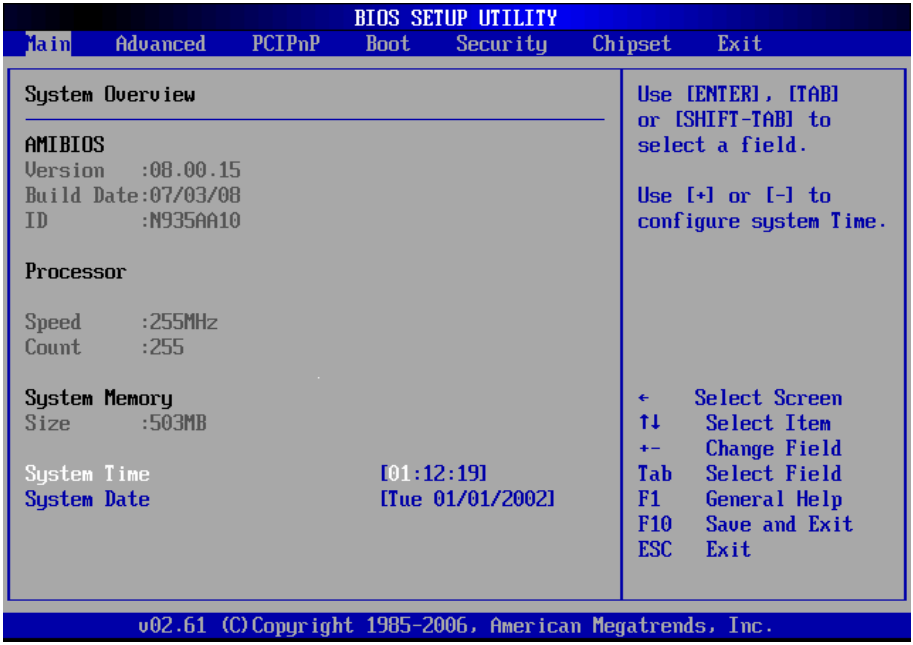
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Setup Menu

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.

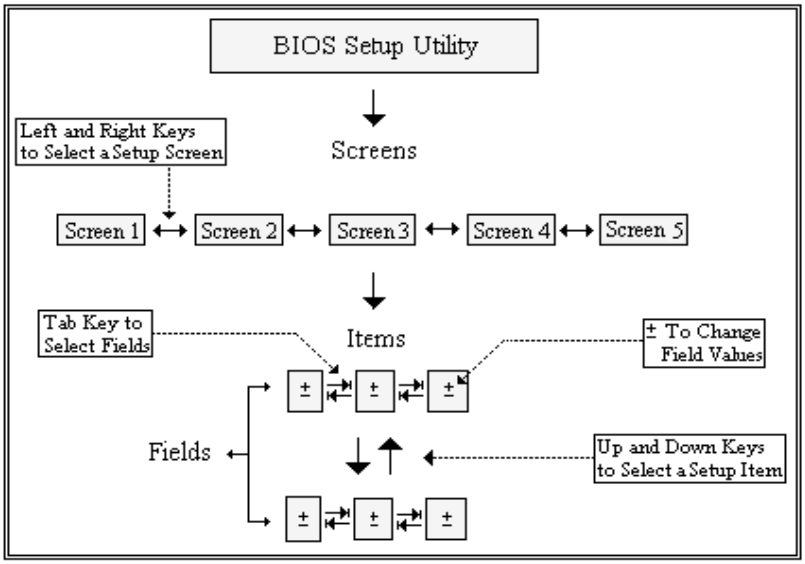


Navigation

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.

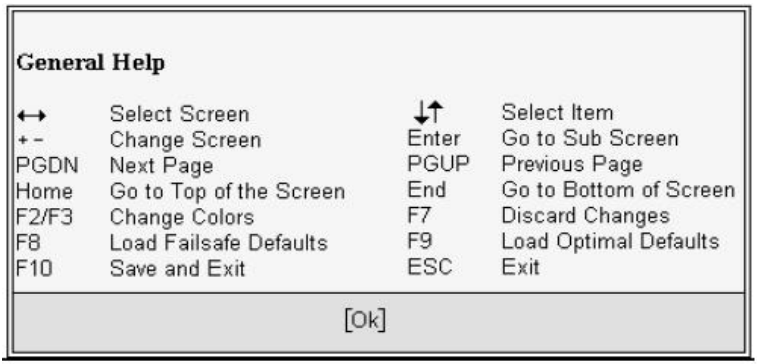
The < F8 > key on your keyboard is the Fail-Safe key. It is not displayed on the key legend by default. To set the Fail-Safe settings of the BIOS, press the < F8 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The Fail-Safe settings allow the system to boot up with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

Hotkey Descriptions

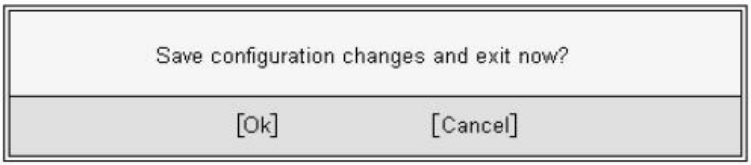
F1 The < F1 > key allows you to display the General Help screen.

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

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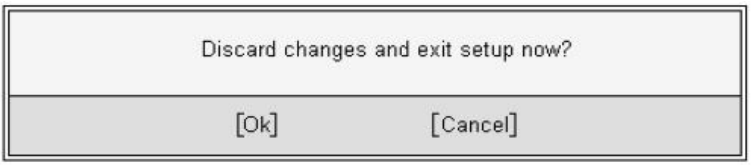


F10 The < F10 > key allows you to save any changes you have made and exit Setup. Press the < F10 > key to save your changes. The following screen will appear:



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:



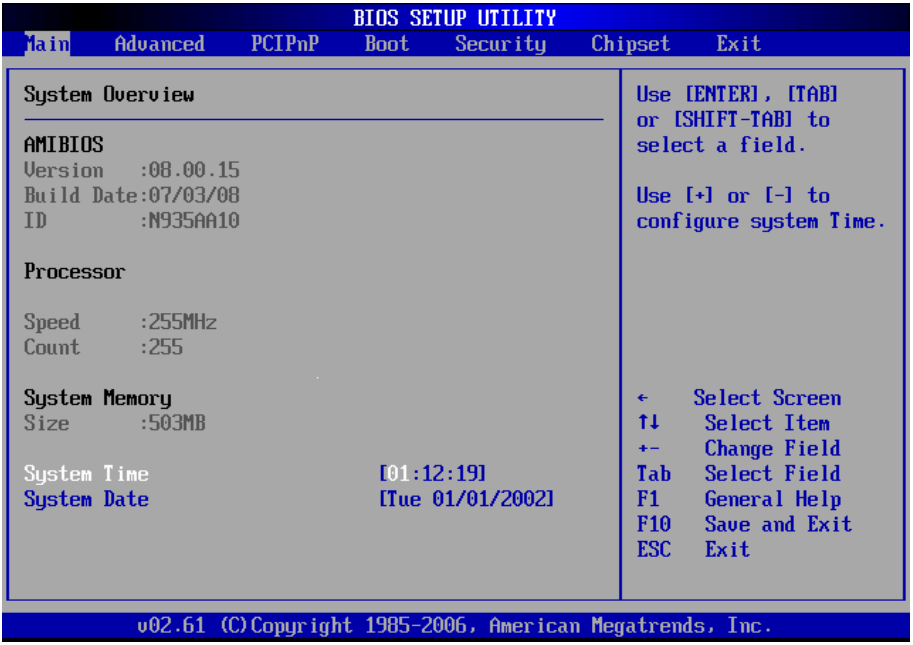
Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

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.

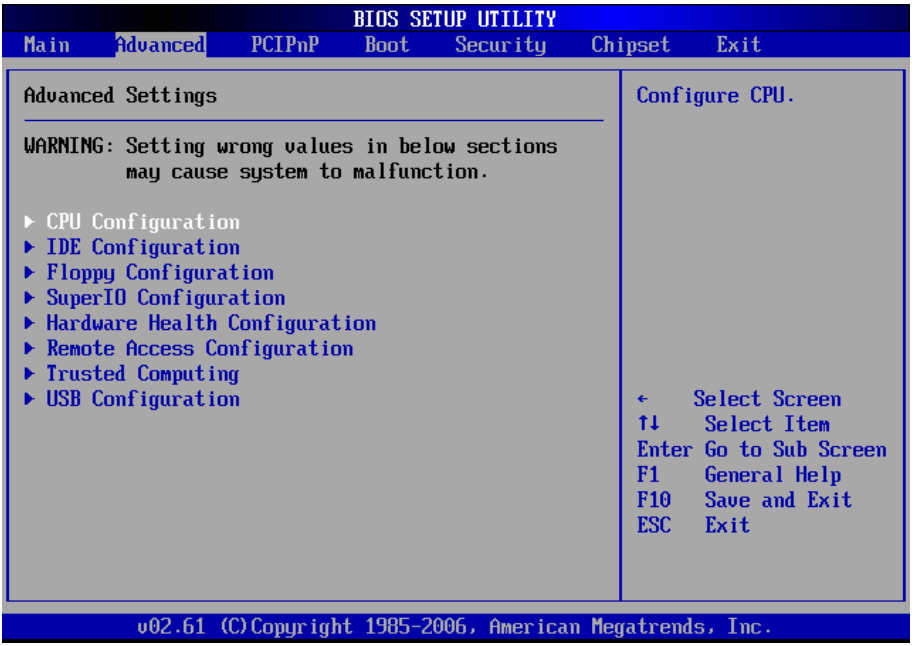
Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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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.

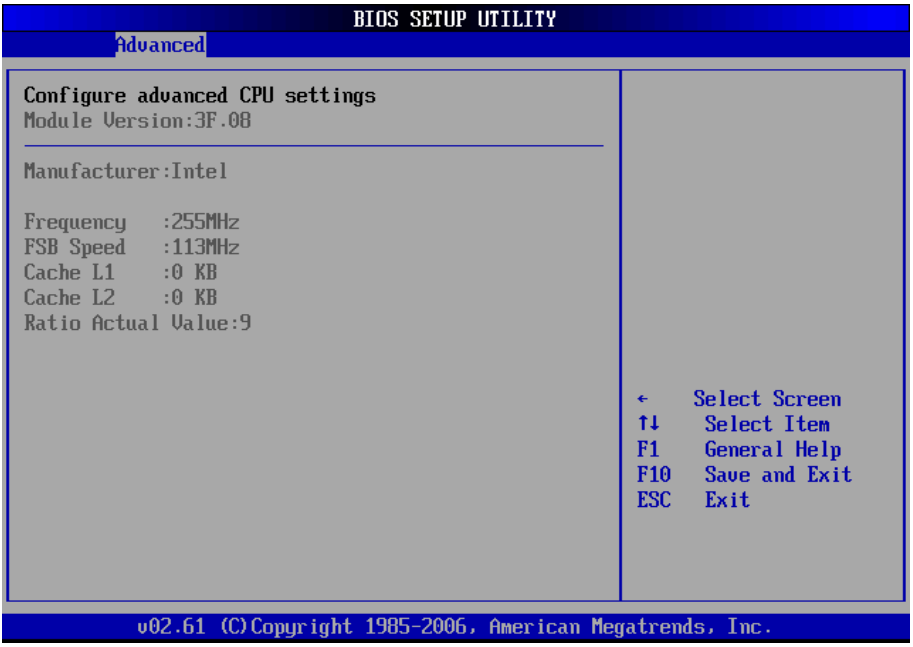
The sub menus are described on the following pages.



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5.3.1 CPU Configuration

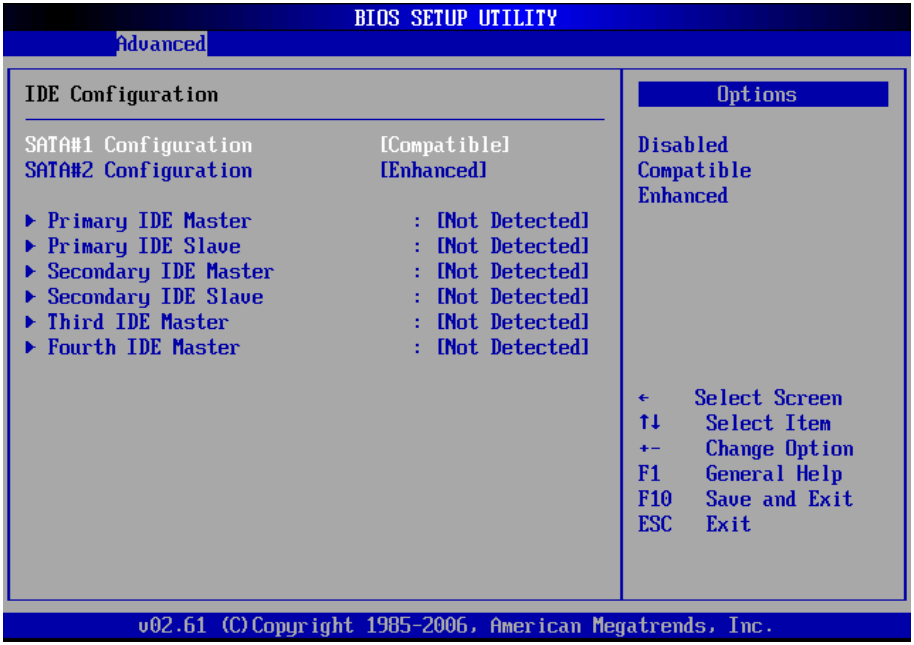
You can use this screen to select options for the CPU Configuration Settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described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



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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.



SATA Configuration

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

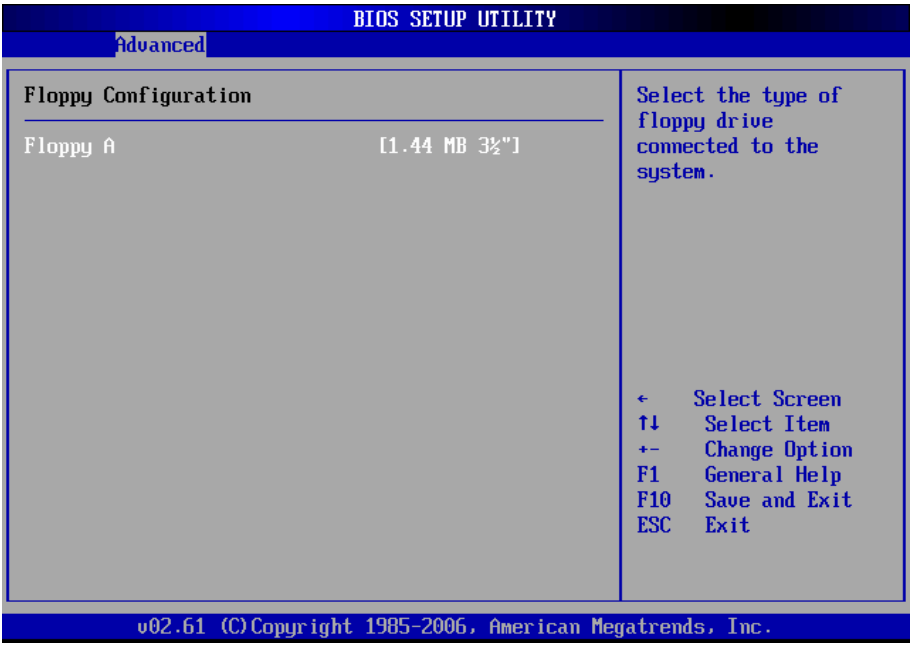
IDE Master/Slave

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

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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.

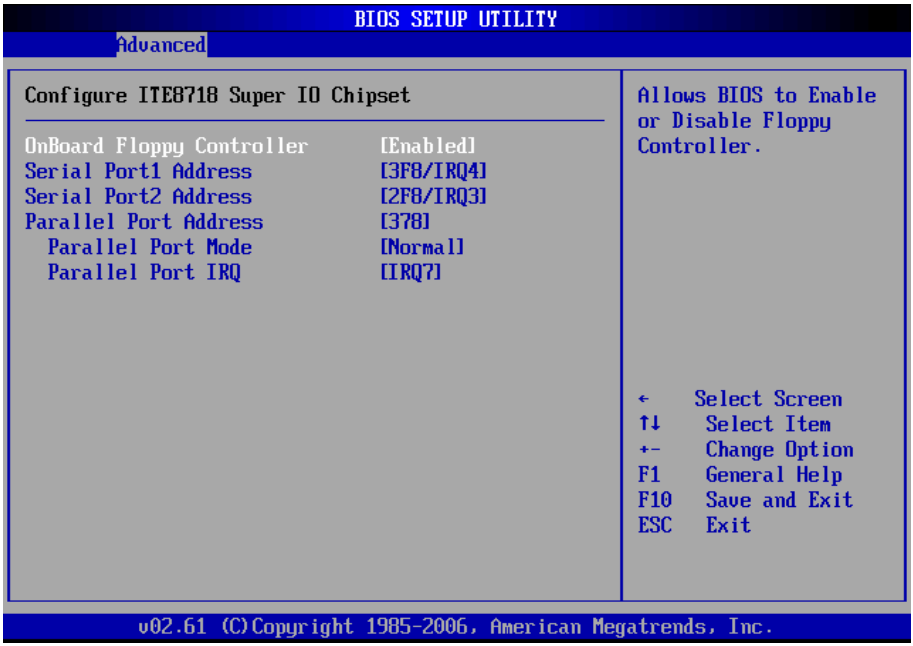


Options: 360 KB 5 ¼”, 1.2 MB 5 ¼”, 720 KB 3 ½”, 1.44 MB 3 ½”, 2.88 MB 3 ½”.

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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

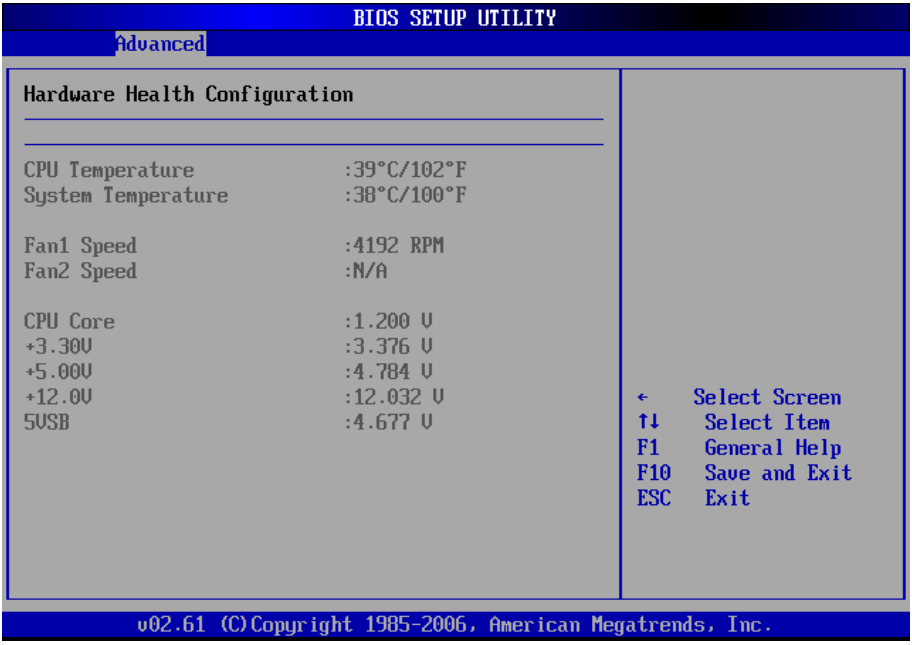
This option specifies the IRQ used by the parallel port.

- **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 Hardware Health Configuration

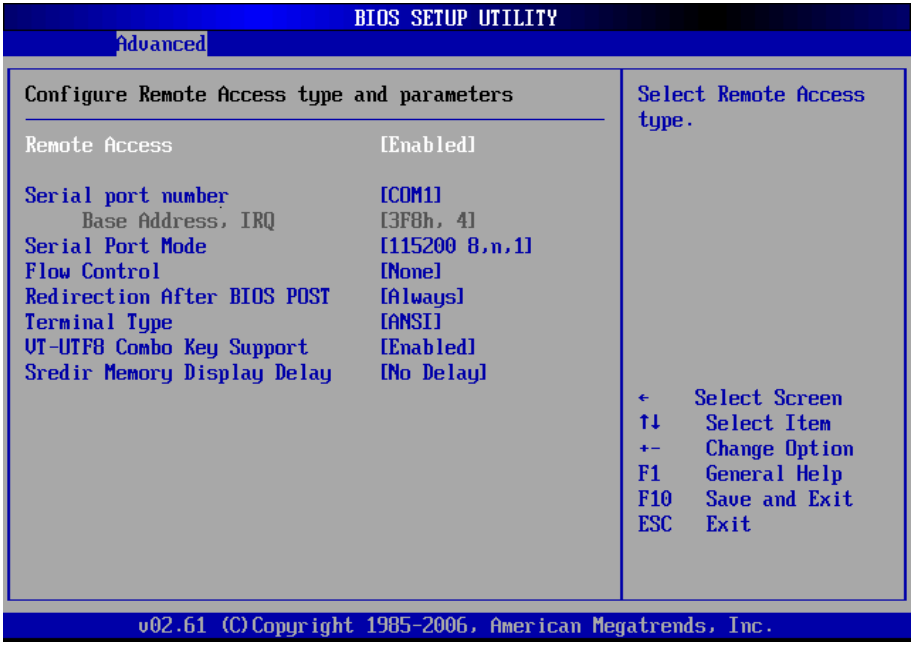
This option displays the current status of all of the monitored hardware devices / components such as voltages and temperatures.



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5.3.6 Remote Access Configuration

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



Remote Access

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

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

Serial Port Number

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

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Serial Port Mode

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

Flow Control

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

Redirection After BIOS POST

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

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

Terminal Type

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

VT-UTF8 Combo Key Support

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

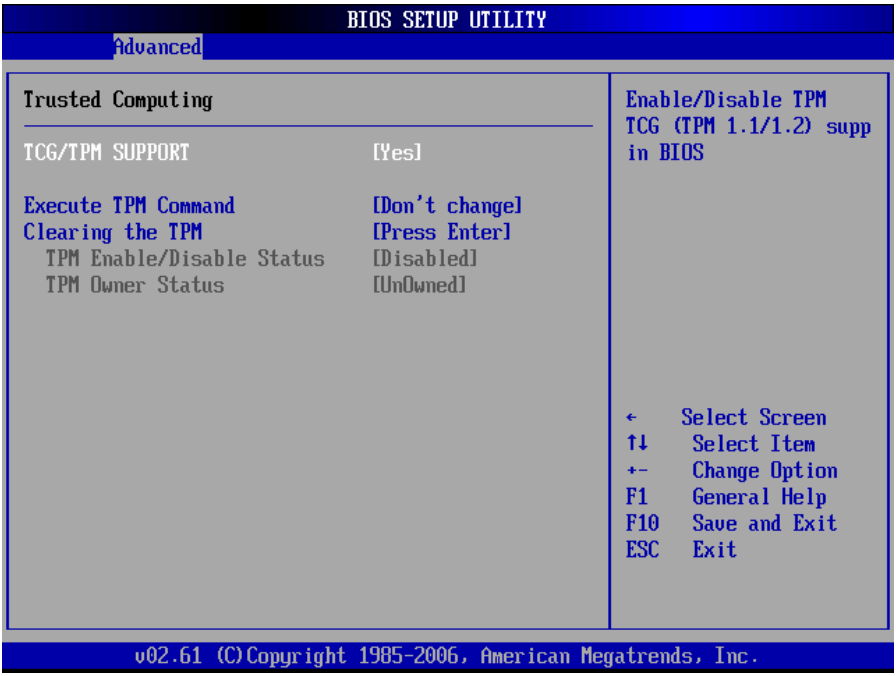
Sredir Memory Display Delay

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

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5.3.7 Trusted Computing

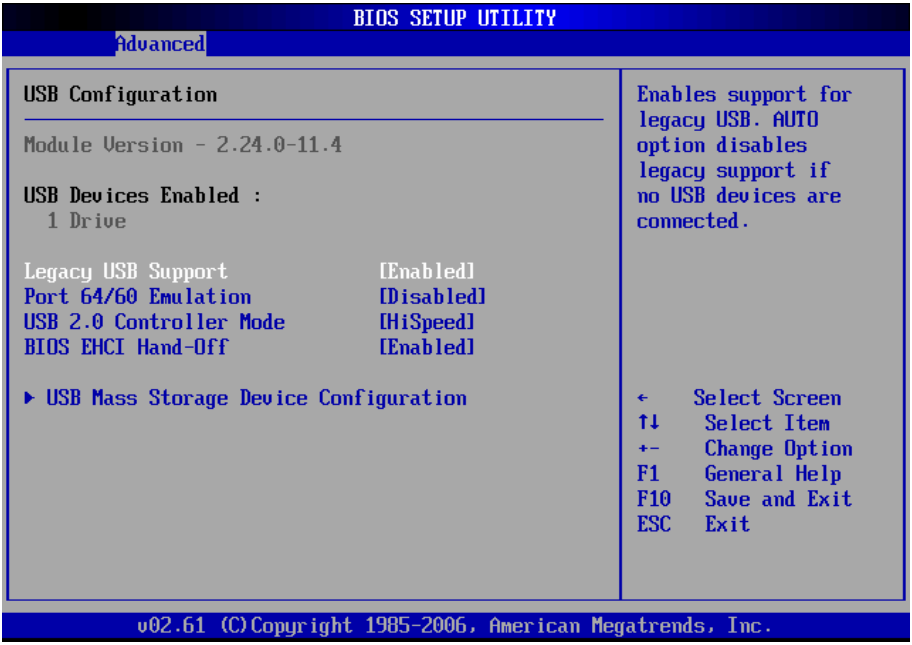
Trusted computing is an industry standard to make personal computers more secure through a dedicated hardware chip, called a Trusted Platform Module (TPM). This option enables or disables the TPM support.



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5.3.8 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

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there are no USB drivers loaded on the system. Set this value to enable or disable the Legacy USB Support.

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

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).

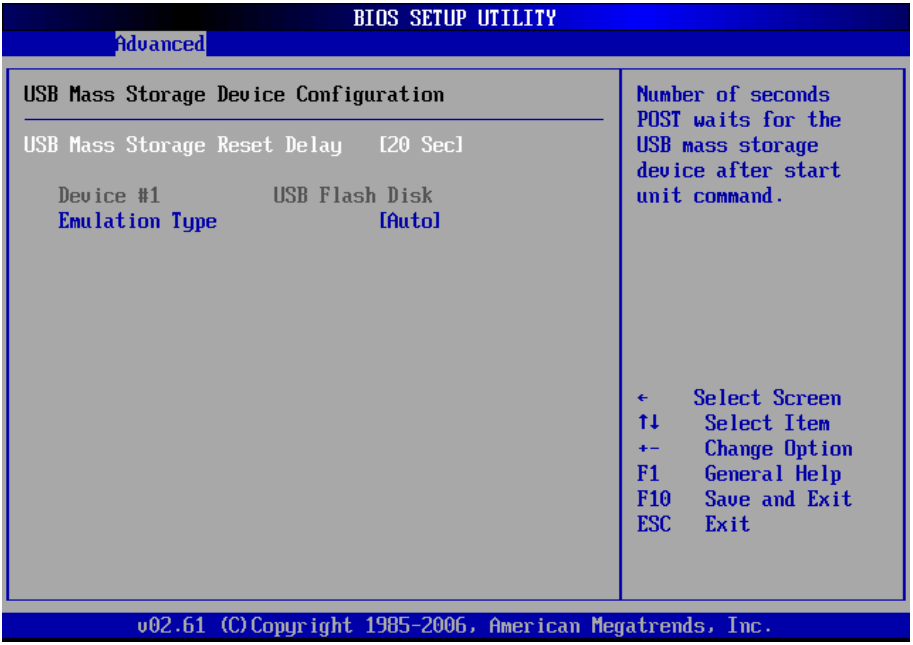
BIOS EHCI hand-off

This option provides a workaround for operating systems without ECHI hand-off support. The EHCI ownership change should claim by EHCI driver.

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USB Mass Storage Device Configuration

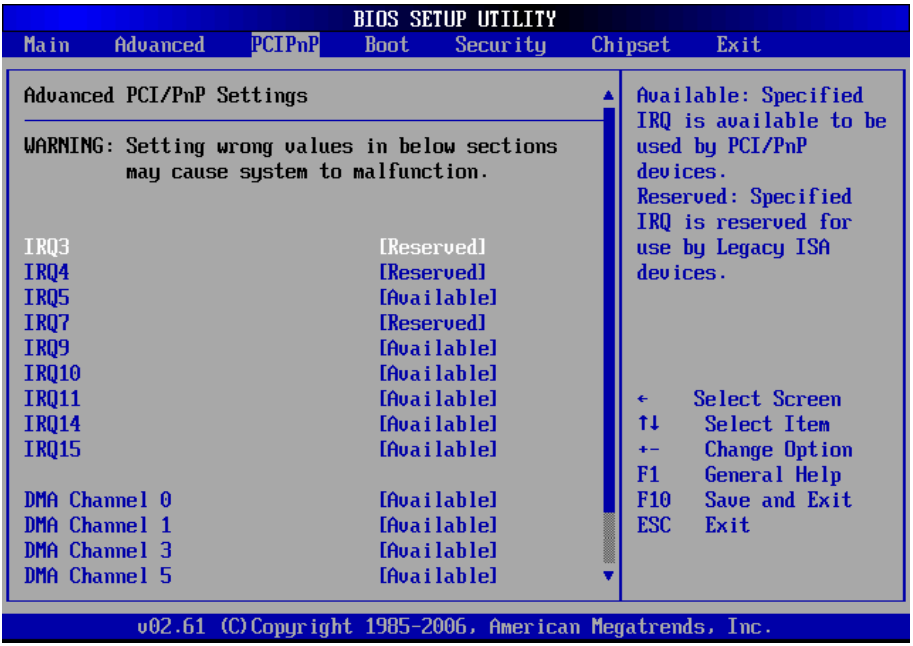
This is a submenu for configuring the USB Mass Storage Class Devices when BIOS finds they are in use on USB ports. Emulation Type can be set according to the type of attached USB mass storage device(s). If set to Auto, USB devices less than 530MB will be emulated as Floppy and those greater than 530MB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



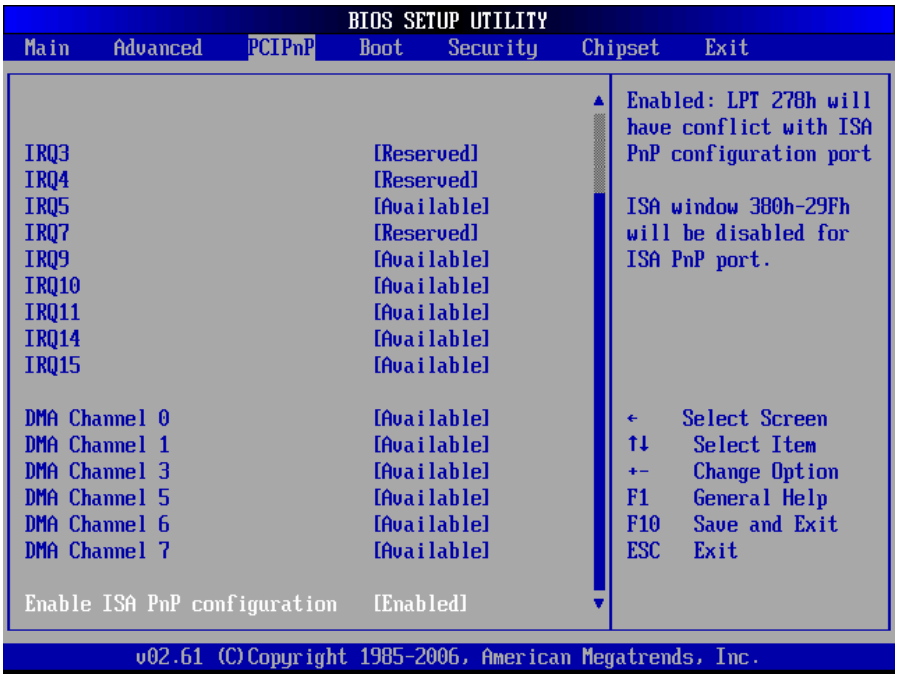
5.4.1 IRQ/DMA

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

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5.4.2 ISA Plug and Play

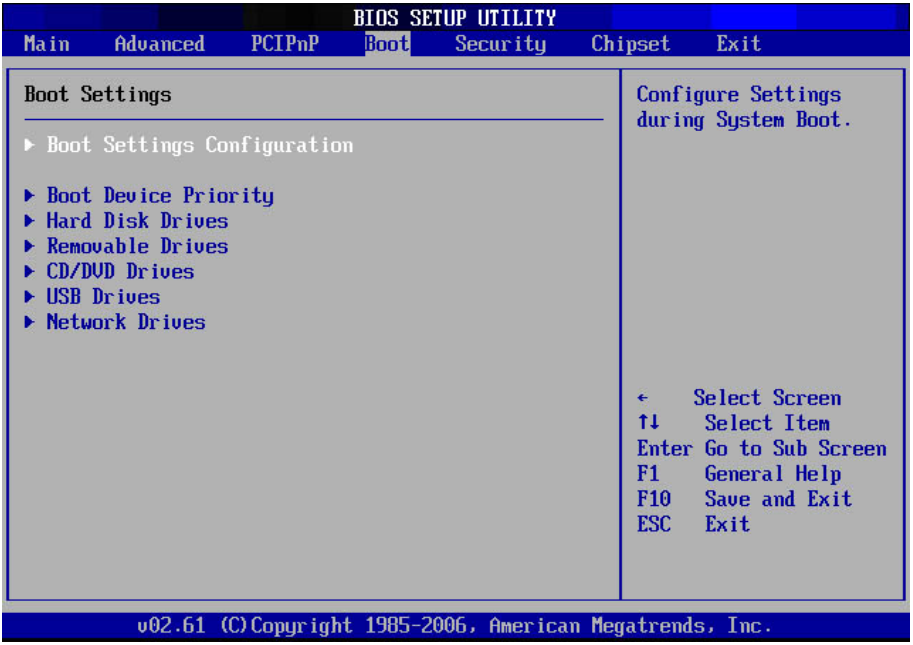
This setting enables/disables the ISA Plug and Play functionality.



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5.5 Boot Settings

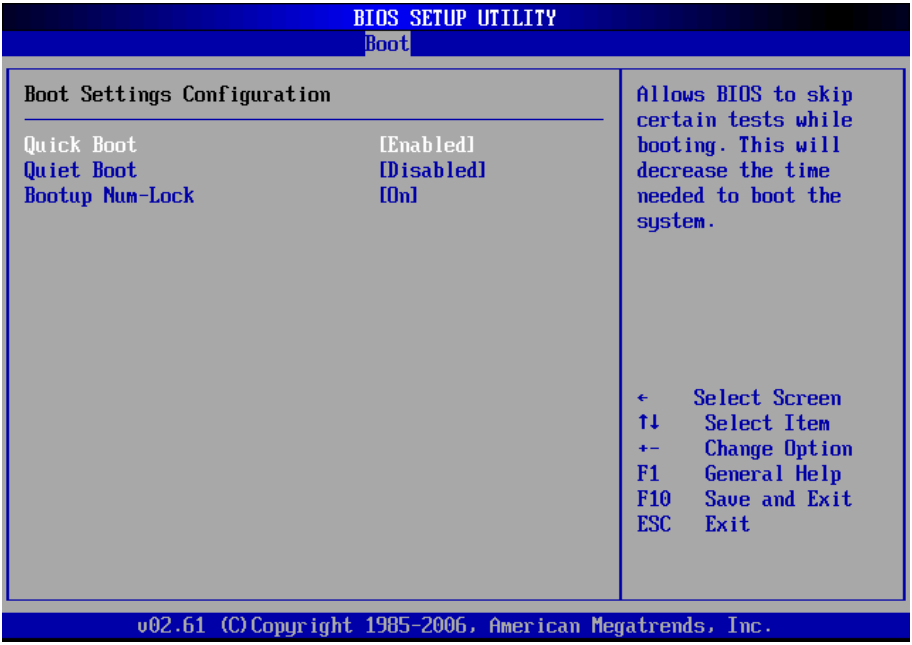
Select the Boot tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the < Arrow > keys. The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



5.5.1 Boot Settings Configuration

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

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Quick Boot

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

Quiet Boot

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

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Bootup Num-Lock

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

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5.5.2 Boot Device Priority

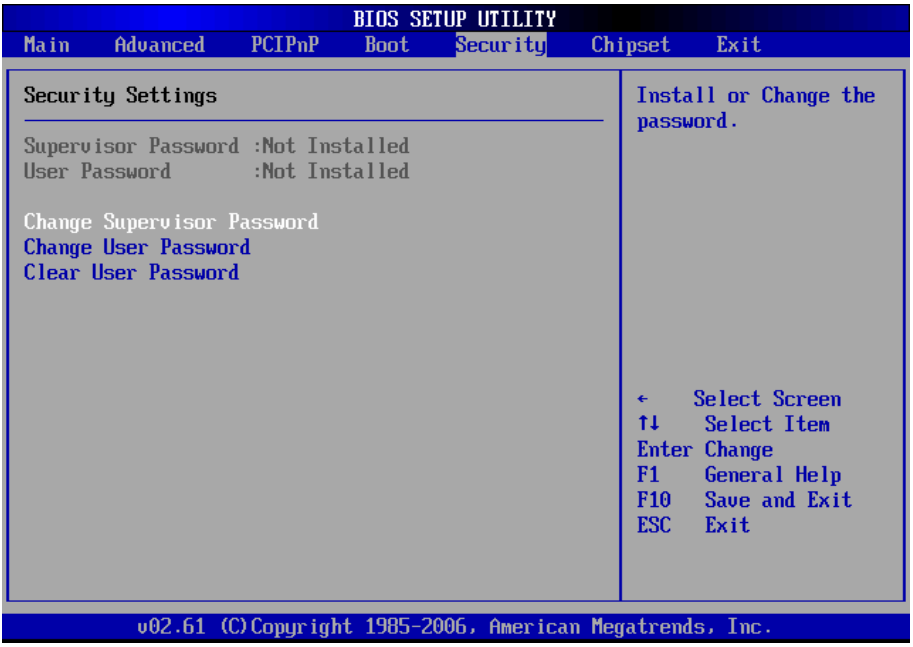
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

5.5.3 Boot Device Groups

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

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5.6 Security Setup



Password Support

Two Levels of Password Protection

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

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

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

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Remember the Password

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

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

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

Supervisor Password

Indicates whether a supervisor password has been set.

User Password

Indicates whether a user password has been set.

Change Supervisor Password

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

Change User Password

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

Clear User Password

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

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 >.

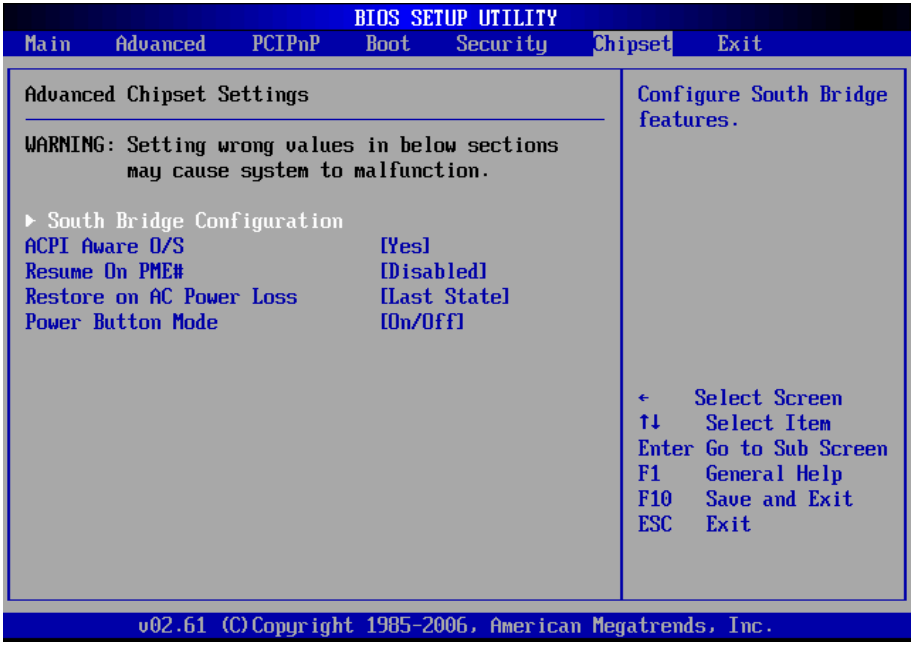
Enter New Password:

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 Chipset Setup

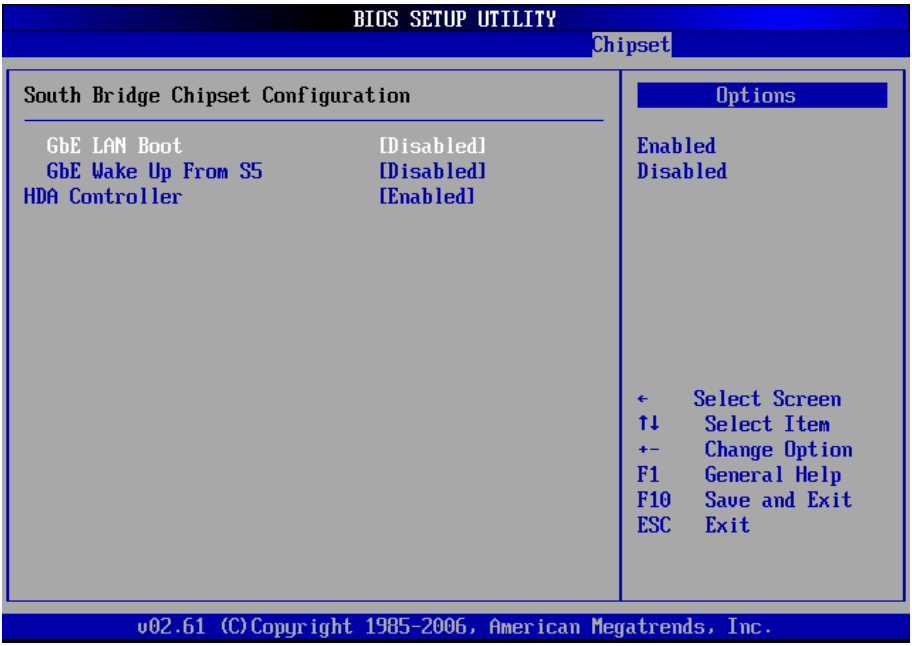
Select the Chipset tab from the setup screen to enter the Chipset BIOS Setup screen. You can select any of the items in the left frame of the screen to go to the sub menu for that item. The Chipset BIOS Setup screen is shown below.



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5.7.1 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.



GbE LAN Boot

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

GbE Wake Up From S5

Set onboard LAN boot wake up from power down mode. The options are Enabled and Disabled.

HDA Controller

Set this value to Enable/Disable the HDA Controller.

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5.7.2 Advanced Chipset Settings

ACPI Aware O/S

This option specifies which OS support ACPI. The options are Enabled and Disabled.

Resume On PME#

This option specifies if the PME#. event will generate a system wake event. The sub-options are Enabled and Disabled.

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.

Power Button Mode

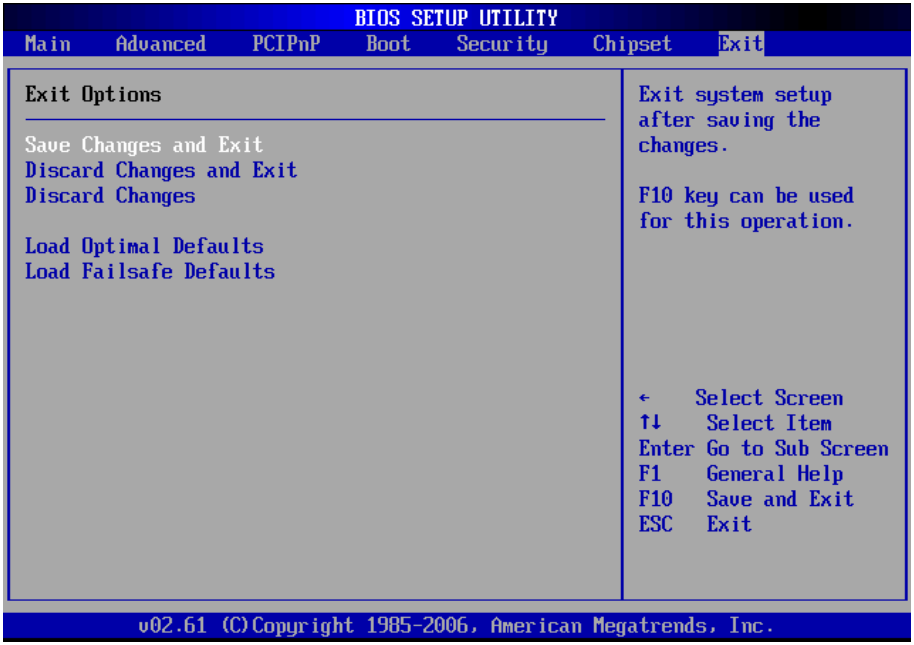
This option specifies the effect when the power button pressed.

- **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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5.8 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-935A's watchdog timer is included on the ADLINK All-in-One DVD in the following directory: **\NuPRO\NuPRO-935A\WDT**.

A.1 Sample Code

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

void WDTRUN(int config_port,int count_value);
void Enter_IT8718_Config(int config_port);
void Exit_IT8718_Config(int config_port);

void main(int argc,char *argv[])
{
   int number,DevID1,DevID2,chipflag=0;
   int ioport = 0x2E;//Default config_port = 0x2E

     if((argc==1) || ((argc == 3) && (*argv[2] !=
     '4') && (*argv[3] != 'E')) || (argc>3))
       {
          printf("ADLINK Watchdog Timer Utility
     of NuPRO-935A\n\n");
          printf("  Usage: ITE8718 value
     [4E]\n");
          printf("         value: 1 to 15300
     second.\n");
          printf("         Write 0 will disable
     watchdog timer.\n\n");
         printf("        4E - change IO port to
     0x4E. Default is 0x2E.\n");
          exit(1);
       }
     else
       {
          // User selected io port.
          if(argc==3) { ioport=0x4E;
                    printf("IOPORT Usage:0x4E
     \n");
                   }
```

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```
            //Detect ITE8718F.
              Enter_IT8718_Config(ioport);

           //Get Chip ID Byte 1 = 0x87, Gip ID Byte
      2 = 0x18
              outportb(ioport, 0x20);
              DevID1 = inportb(ioport+1);
              outportb(ioport, 0x21);
              DevID2 = inportb(ioport+1);

             if((DevID1 == 0x87) && (DevID2 ==
      0x18))
                chipflag = 1;

           if(chipflag == 0)
             {
              printf("ADLINK Watchdog Timer
      Utility of NuPRO-935A\n\n");
             printf("Can't find any ITE IT8718F on
      system!\n");
              Exit_IT8718_Config(ioport);
              exit(1);
           }
           else
             {
              printf("ADLINK Watchdog Timer
      Utility of NuPRO-935A\n\n");
              number=atoi(argv[1]);

              WDTRUN(ioport,number);
              Exit_IT8718_Config(ioport);
              }
       }
}

void Enter_IT8718_Config(int config_port)
{
      switch(config_port)
         {
           case 0x2E:
                //Address port = 0x2E, enter keys
      = 0x87, 0x01, 0x55, 0x55
```

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```
                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(0x2E, 0x87);
                outportb(0x2E, 0x01);
                outportb(0x2E, 0x55);
                outportb(0x2E, 0xAA);
                break;
           default:
                break;
         }
}
void Exit_IT8718_Config(int config_port)
{
     outportb(config_port, 0x02);
     outportb(config_port+1, 0x02);
}
void WDTRUN(int config_port,int count_value)
{
   int temp;
   int counter;

     //Select WDT device
       outportb(config_port, 0x07);
       outportb(config_port+1, 0x07);//device 7

     //Set second/minute mode
       outportb(config_port, 0x72);
       temp = inportb(config_port+1);

       if(count_value == 0)
           {
           counter = count_value;
           printf("WDT is Disabled.");
           outportb(config_port+1, temp);//WDT
     output through PWROK2 default is Disabled.
            }// end of (count_value == 0)
```

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```
        else if(count_value <= 60){
            temp = temp | 0x80;//chip's default is
        minute.
             counter = count_value;
             printf("WDT timeout in %d
        seconds.",counter);
    //       temp = temp | 0x40;//enable WDT output
        through KBRST
             temp = temp | 0x10;//enable WDT output
        through PWROK2 (pulse)
             outportb(config_port+1, temp);
             } // end of (count_value<=60)
         else if(((count_value>60) &&
        (count_value<=15300)) || (count_value >
        15300))
                   {
             //Count the timeout value
                 if(count_value > 15300)
                   count_value = 15300;
                 counter = count_value/60;
                 if((count_value%60)>30)
                  counter=counter+1;
             printf("WDT timeout in %d
        minutes.",counter);
    //       temp = temp | 0x40;//enable WDT output
        through KBRST
             temp = temp | 0x10;//enable WDT output
        through PWROK2 (pulse)
                 outportb(config_port+1, temp);
                  } // end of (count_value>60)

        //reset WDT by KB, MS interrupt
    //    outportb(config_port, 0x71);
    //    temp = inportb(config_port + 1);
    //    temp = temp | 0x60;//Bit 6 = KB interrupt,
        Bit 5 = MS interrupt
    //    outportb(config_port+1, temp);
        //Write count value
          outportb(config_port, 0x73);
          outportb(config_port+1, counter);

    } // end of WDTRUN
```

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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 82566DM PXE option ROM when onboard LAN boot ROM is enabled. CC800 – CD7FFF: Marvell 88E805 option ROM when onboard LAN boot ROM is enabled.
640 K – 768 K	A0000 – BFFFF	128 KB	Video Buffer & SMM space
0 K – 640 K	00000 – 9FFFF	640 KB	DOS Area

Table B-1: System Memory Map

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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	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, I.G.D	Yes
17	N/A	PCI Slot 1/2/3/4, PCIE Port 0/1/2/3/4/5, PEG Root Port,	Yes

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IRQ#	Typical Interrupt Resource	Connected to Pin	Available
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, SMBus 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, SATA Host controller, SATA Host controller#1,	Yes
20	N/A	ICH9 internal GBE controller	No
21	N/A	UHCI Controller 5	No
22	N/A	ICH9 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	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	02h	Internal	Intel USB UHCI Controller 7
00h	1Ah	07h	Internal	Intel USB EHCI Controller 2
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 1
00h	1Dh	01h	Internal	Intel USB UHCI Controller 2
00h	1Dh	02h	Internal	Intel USB UHCI Controller 3
00h	1Dh	03h	Internal	Intel USB UHCI Controller 6
00h	1Dh	07h	Internal	Intel USB EHCI Controller 1
00h	1Eh	00h	N/A	Intel Hub Interface to PCI Bridge
00h	1Fh	00h	N/A	Intel LPC Interface Bridge
00h	1Fh	02h	Internal	Intel SATA Host /Raid controller
00h	1Fh	03h	Internal	Intel SMBus Controller
00h	1Fh	05h	Internal	Intel Host SATA controller1
00h	1Fh	06h	Internal	Thermal Controller
01h	07h	0FFh	external	ITE8888 PCI to ISA bridage
01h	0Ch	0FFh	external	PCI slot 4

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Bus #	Device #	Function #	Routing	Description
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				
SATA Controller1				X				X
SMBUS Controller			X					
Thermal Controller			X					
UHCI 1								X
UHCI 2				X				
UHCI 3			X					
UHCI 4	X							
UHCI 5						X		
UHCI 6	X							X
UHCI 7				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.

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路 166 號 9 樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
Address: 上海市浦东新区张江高科技园区芳春路 300 号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park,
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology Beijing
Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室(100085)
Rm. 801, Power Creative E, No. 1, B/D
Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8625
Email: market@adlinktech.com

ADLINK Technology Shenzhen
Address: 深圳市南山区科技园南区高新南七道 数字技术园
A1 栋 2 楼 C 区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

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ADLINK Technology (Europe) GmbH
Address: Nord Carree 3, 40477 Duesseldorf, Germany
Tel: +49-211-495-5552
Fax: +49-211-495-5557
Email: emea@adlinktech.com

ADLINK Technology, Inc. (French Liaison Office)
Address: 15 rue Emile Baudot, 91300 Massy CEDEX, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology Japan Corporation
Address: 〒101-0045 東京都千代田区神田鍛冶町 3-7-4
神田 374 ビル 4F
KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho,
Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 서울시 서초구 서초동 1506-25 한도 B/D 2 층
2F, Hando B/D, 1506-25, Seocho-Dong, Seocho-Gu,
Seoul 137-070, Korea
Tel: +82-2-2057-0565
Fax: +82-2-2057-0563
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
Address: 84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
Address: No. 1357, "Anupama", Sri Aurobindo Marg, 9th Cross,
JP Nagar Phase I, Bangalore - 560078, India
Tel: +91-80-65605817
Fax: +91-80-22443548
Email: india@adlinktech.com

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