NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (Industrial Motherboard)

NEX 608

User Manual

NEXCOM International Co., Ltd.
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Contents

PREFACE

Copyright

Disclaimer

The information in this document is subject to change without prior notice and does not represent commitment from NEXCOM International Co., Ltd. However, users may update their knowledge of any product in use by constantly checking its manual posted on our website: http://www.nexcom.com. NEXCOM shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of any product, nor for any infringements upon the rights of third parties, which may result from such use. Any implied warranties of merchantability or fitness for any particular purpose is also disclaimed.

Acknowledgements

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Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2002/95/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needlenose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect the equipment from an AC power outlet prior to installing a component inside the chassis.
4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
5. Keep the board away from humidity.
6. Put the board on a stable surface. Dropping it or letting it fall may cause damage.
7. Do not leave the board in either an unconditioned environment or in a above 60°C storage temperature as this may damage the board.
8. Wear an antistatic wrist strap.
9. Do all preparation work on a static-free surface.
10. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.
11. All cautions and warnings on the board should be noted.
12. Use the correct mounting screws and do not over tighten the screws.
13. Keep the original packaging and the anti-static bag; in case the board has to be returned for repair or replacement.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Conventions Used in this Manual

Warning: Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution: Information to avoid damaging components or losing data.

Note: Provides additional information to complete a task easily.

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http://www.nexcom-jp.com

Package Contents

Before continuing, verify that the NEX 608 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	60233PRT16X00	PRINT CABLE BEST	PRINT 25 to 2.0mm 26PIN L:150mm	1
2	60233SIO23X00	CABLE EDI:12221001211-RS	COM PORT 9PIN to HOUSING 10PIN PIT:2.0mm L:120mm	1
3	60233ATA23X00	SATA CABLE BEST:148-0707-380	Standard L:250mm	1
4	60233IDE27X00	IDE CABLE EDI:12224403512-RS	44P to 44P PIT:2.0mm L:350mm+-10mm	1

NEX 608 Optional Fan Kit

Item	Part Number	Name	Description	Qty
1	10G00060803X0	CPU HEATSINK + Thermal Pad + Sponge		1

Ordering Information

The following provides ordering information for NEX 608.

- **NEX608 (P/N : 10G00060804X0) RoHS Compliant**
  Mini-ITX, Intel® Atom™ Dual Core D525 processor, 1x DDR3 SODIMM, 3x GbE, 4x COM, 1x Mini PCIe, 1x PCI, DC24V input

Chapter 1: Product Introduction

Overview

Key Features

- Onboard Intel® Atom™ Dual Core D525 Processor
- 1x DDR3 SODIMM, up to 2GB
- Dual display: VGA and LVDS (18/24-bit)
- 3x Gigabit Ethernet LAN
- SATA RAID 0/1
- 4x COMs, 6x USB 2.0, 1x LPT
- Single DC 24V power input

Hardware Specifications

CPU
- Onboard Intel® Atom™ Dual Core D525 (1.8GHz, 1M Cache) processor

Platform Control Hub
- Intel® NH82801HBM (ICH8M)

Main Memory
- 1x 204-pin DDR3 SODIMM socket
- Supports up to 2GB DDR3 800MHz memory; non-ECC and unbuffered

Onboard LAN
- 3x Realtek RTL8111L Gigabit Ethernet LAN controllers
- Supports boot from LAN and Wake on LAN
- 3x RJ45 ports with LED

Onboard Audio
- Realtek ALC888 High Definition CODEC
- 1x Line-out phone jack
- 1x Mic-in phone jack

Display
- Intel® D525 integrated graphic engine
  - Supports DirectX 9, with Intel Clear Video Technology on MPEG2 hardware acceleration
- Analog VGA interface
  - 1x DB15 VGA port
  - Supports up to 2048x1563 @ 60Hz resolution
- LVDS interface
  - Supports single 18/24-bit LVDS channel

Edge I/O
- 1x PS/2 mouse port
- 1x PS/2 keyboard port
- 3x DB9 RS232 COM ports (COM1/2/4)
- 1x DB15 VGA port
- 3x LAN ports
- 2x USB 2.0 ports
- 1x Line-out jack
- 1x Mic-in jack

Internal I/O
- 1x RS232/422/485 COM connector (COM3)
- 3x 10-pin USB connectors (1 port supports USB DOM)
- 8x GPIO 10-pin connector, GPI 0~3 and GPO 0~3, with TTL Level (0/5 V)
- 1x connector for power LED and HDD active LED
- 1x 26-pin parallel connector
- 1x 3-pin fan connector for CPU
- 1x mini-din connector for PS2 keyboard and mouse
- Onboard buzzer / SMBus 2.0 / reset

Watchdog Timer
- Watchdog timeout is programmable by software from 1 sec to 255 sec and from 1 min to 255 minutes (Tolerance 15% under 25°C room temperature)

Storage
- 2x SATA connectors (from ICH8M)
- 2x SATA connectors (from Silicon Image 3132 SATA RAID controller
  - Supports RAID 0 and RAID 1

Expansion
- 1x Mini PCIe socket
- 1x PCI32 slot

Power Input
- Supports AT and ATX modes (default: ATX)

Power Requirements
- Power requirement: +24V DC input
- One 4-pin power connector

Onboard RTC
- On-chip RTC with battery backup
- 1x External Li-Ion battery

System Monitor
- Monitors voltages, temperatures and fan speeds
  - 4 voltages (Vcore, +12V, +3.3V, +5V)
  - 2 temperatures (for CPU and 2 external temperature sensors)
  - 2 fan speeds

Dimensions
- Mini-ITX form factor
- 170mm (L) x 170mm (W)

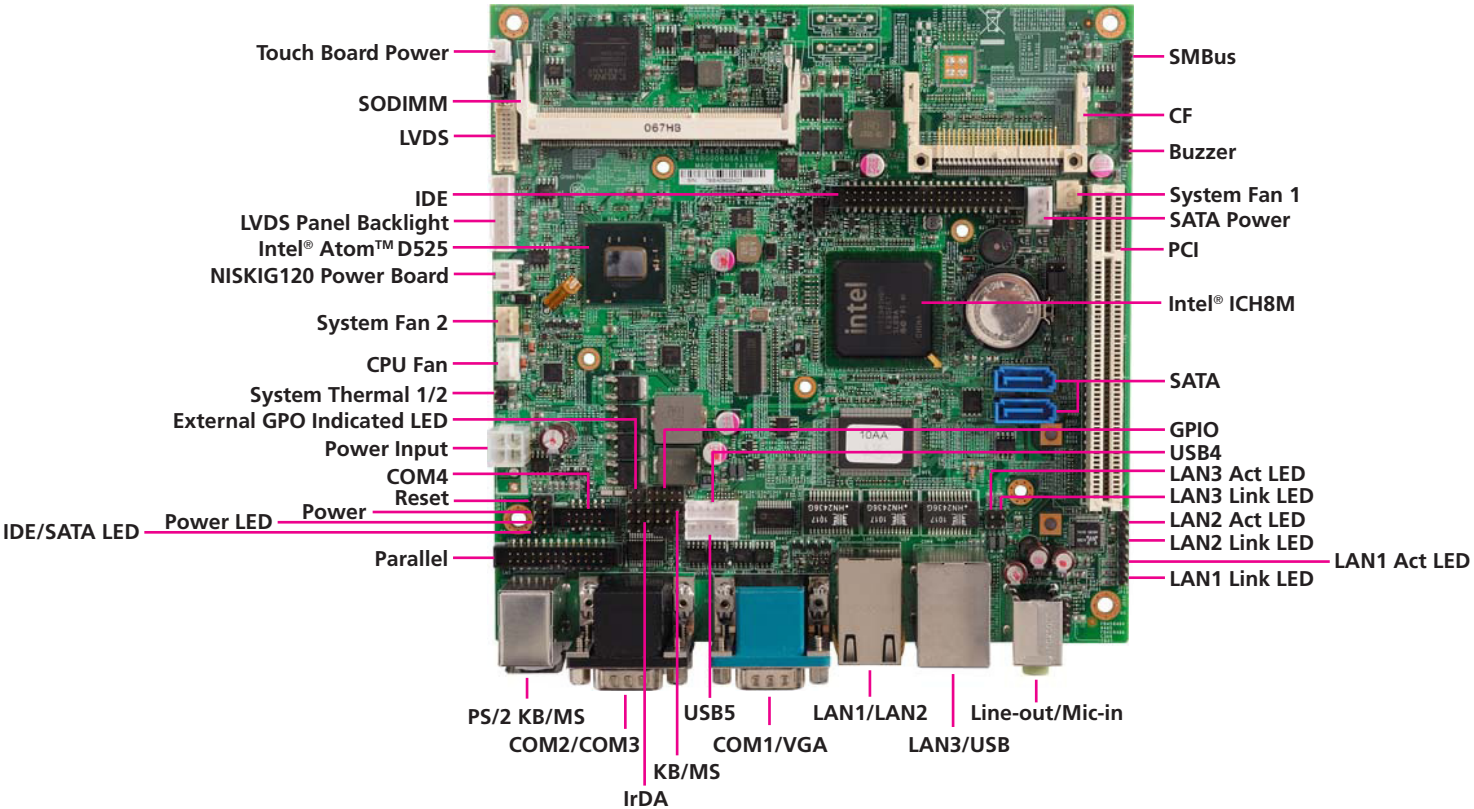
BIOS
- AMI BIOS
- Plug & Play support
- Advanced Power Management
- Advanced Configuration & Power Interface
- 8Mbits SPI ROM

Environment
- Operating temperature: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative Humidity
  Operating: 10% - 90%, non-condensing
  Non-operating: 5% - 95%, non-condensing

Operating Systems
- Microsoft
  Windows XP Professional for Embedded Systems
  Windows Embedded Standard 2009
  Windows 7 Professional for Embedded Systems
  Windows Embedded Standard 7
- Linux
  Fedora Core 12
  Ubuntu 10.10

Certifications
- CE approval
- FCC Class A

Getting to Know NEX 608



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NEX 608 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers Screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

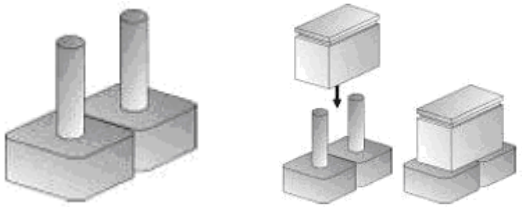
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

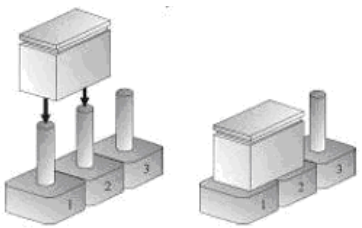
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is **short**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **open**.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)

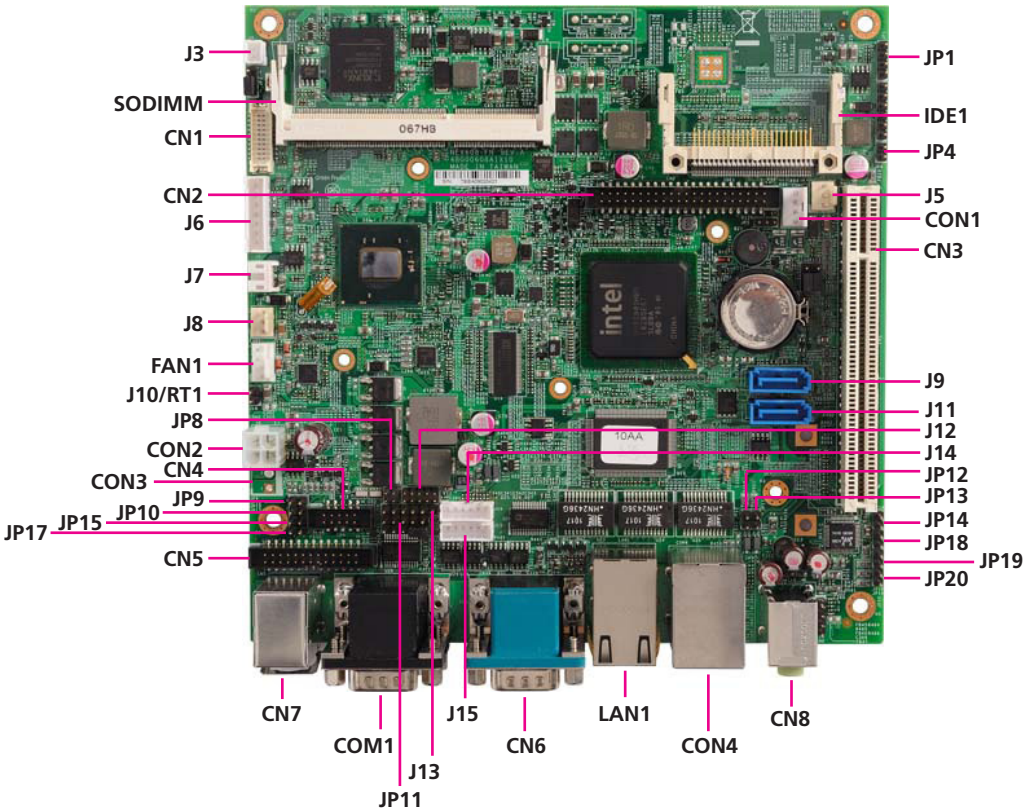


Three-Pin Jumpers: Pins 1 and 2 Are Short



Locations of the Jumpers and Connectors

The figure below shows the locations of the jumpers and connectors.



Jumpers

Power Type Select

Connector size: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP7

Pin	Definition
1-2 On	AT
2-3 On	ATX

2-3 On: default

LVDS Backlight Power Select

Connector size: 1x3 3-pin header, 2.54 mm pitch
Connector location: JP2

Pin	Definition
1-2 On	+3.3V
2-3 On	+5V

1-2 On: default

COM4 RS232 RI# Power Select

Connector size: 1x5 5-pin header, 2.54 mm pitch
Connector location: JP16

Pin	Definition
1-2 On	+5V
2-3 On	+12V
4-5 On	Enable
5	Disable

4-5 On: default

RTC Clear

Connector size: 1x3 3-pin header, 2.0 mm pitch
Connector location: JP6

Pin	Settings
1-2 On	Normal
2-3 On	CMOS Clear

1-2 On: default

Pin	Definition
1	NA
2	VCC3P3RTC
3	BATT_GND

CF Card Master/Slave Select

Connector size: 1x3 3-pin header, 2.0 mm pitch
Connector location: JP5

Pin	Definition
1-2 On	Master
2-3 On	Slave

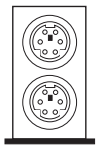
1-2 On: default

Connector Pin Definitions

External I/O Interfaces

PS/2 Keyboard and PS/2 Mouse Ports

Connector size: PS/2, Mini-DIN-6
Connector location: CN7



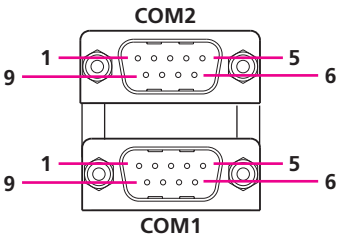
PS/2 Mouse

PS/2 Keyboard

Pin	Definition	Pin	Definition
1	Keyboard Data	7	Mouse Data
2	NC	8	NC
3	GND	9	GND
4	+5VSB	10	+5VSB
5	Keyboard Clock	11	Mouse Clock
6	NC	12	NC

COM2 and COM3 Ports (RS232)

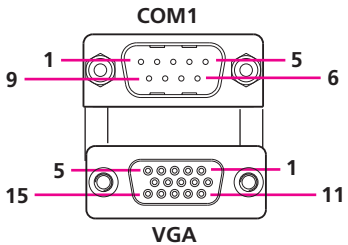
Connector type: DB-9 port, 9-pin D-Sub
Connector location: COM1



Pin	Definition	Pin	Definition
1	DCD2	10	DCD1
2	RXD2	11	RXD1
3	TXD2	12	TXD1
4	DTR2	13	DTR1
5	GND	14	GND
6	DSR2	15	DSR1
7	RTS2	16	RTS1
8	CTS2	17	CTS1
9	RI2	18	RI1

COM1 and VGA Ports

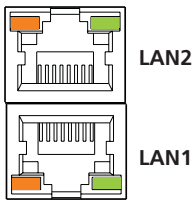
Connector type: DB-9 port, 9-pin D-Sub (COM1)
DB-15 port, 15-pin D-Sub (VGA)
Connector location: CN6



Pin	Definition	Pin	Definition
1	Analog RED	13	HSYNC
2	Analog GREEN	14	VSYNC
3	Analog BLUE	15	DDCCLK
4	NC	16	DCD
5	GND	17	RXD
6	GND	18	TXD
7	GND	19	DTR
8	GND	20	GND
9	+5V	21	DSR
10	GND	22	RTS
11	NC	23	CTS
12	DDCDAT	24	RI

LAN1 and LAN2 Ports

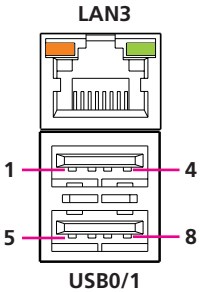
Connector type: RJ45 port with LEDs
Connector location: LAN1



Pin	Definition	Pin	Definition
1	+5V	11	MDI1+
2	Data 3-	12	MDI2+
3	Data 3+	13	MDI2-
4	GND	14	MDI1-
5	+5V	15	MDI3+
6	Data 2-	16	MDI3-
7	Data 2+	17	+3.3VSB
8	GND	18	ACTIVITY LED
9	MDI0+	19	+3.3VSB
10	MDI0-	20	LINK LED

LAN3 and USB0/1 Ports

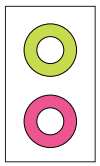
Connector type: RJ45 port with LEDs (LAN3)
Dual USB port, Type A (USB0/1)
Connector location: CON4



Pin	Definition	Pin	Definition
1	+5V	11	MDI1+
2	Data 1-	12	MDI2+
3	Data 1+	13	MDI2-
4	GND	14	MDI1-
5	+5V	15	MDI3+
6	Data 0-	16	MDI3-
7	Data 0+	17	+3.3VSB
8	GND	18	ACTIVITY LED
9	MDI0+	19	+3.3VSB
10	MDI0-	20	LINK LED

AC'97 Phone Jacks

Connector type: 1x2 Ear Phone jack
Connector location: CN8



Pin	Definition	Pin	Definition
1	GND	22	LINE-OUT-RIGHT
2	MIC1-IN	23	NC
3	NC	24	NC
4	NC	25	LINE-OUT-LEFT
5	MIC2-IN		

Internal Connectors

System Fan1 and System Fan2 Connectors

Connector size: 1x3, 3-pin Wafer, 2.54 mm pitch
Connector location: J5 (Fan1) and J8 (Fan2)

Pin	Definition
1	GND
2	+12V
3	SENSE

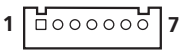
System Thermal 1/2 Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: J10/RT1

Pin	Definition
1	Thermal Pin
2	Thermal GND

LVDS Panel Backlight Connector

Connector type: 1x7 JST, 7-pin header, 2.5 mm pitch
Connector location: J6



Pin	Definition
1	+5V
2	+12V
3	+12V
4	Panel Backlight Brightness Control
5	GND
6	GND
7	Panel Backlight Enable

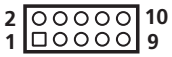
External Keyboard/Mouse Connector

Connector type: 1x6 6-pin header, 2.54 mm pitch
Connector location: J13

Pin	Definition
1	+5V
2	Mouse Clock
3	Mouse Data
4	Keyboard Data
5	Keyboard Clock
6	GND

GPIO Connector

Connector type: 2x5 10-pin header, 2.0 mm pitch
Connector location: J12



Pin	Definition	Pin	Definition
1	+5V	6	GP25(Pin59)_output2
2	GND	7	GP22(Pin56)_Input3
3	GP20(Pin52)_Input1	8	GP26(Pin60)_output3
4	GP24(Pin58)_output1	9	GP23(Pin57)_Input4
5	GP21(Pin54)_Input2	10	GP27(Pin61)_output4

USB4 and USB5 Connectors

Connector type: 1x6 6-pin boxed header, JST-2.0mm-M-180
Connector location: J14 (USB4) and J15 (USB5)

J14

Pin	Definition	Pin	Definition
1	+5V	4	Data 3-
2	Data 2-	5	Data 3+
3	Data 2+	6	GND

J15

Pin	Definition	Pin	Definition
1	+5V	4	Data 5-
2	Data 4-	5	Data 5+
3	Data 4+	6	GND

Line-in Connector

Connector type: 1x4 4-pin header, 2.54 mm pitch
Connector location: J16

Pin	Definition
1	LINE-IN-RIGHT
2	NC
3	GND
4	LINE-IN-LEFT

Reset Button Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP9

Pin	Definition
1	RESET
2	GND

Power Button Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP10

Pin	Definition
1	Power ON
2	GND

External GPO Indicated LED Connector

Connector type: 2x2 4-pin header, 2.0 mm pitch
Connector location: JP8

Pin	Definition
1	GP25(Pin59)_output2
2	GND
3	GP24(Pin58)_output1
4	GND

IrDA Connector

Connector type: 1x5 5-pin header, 2.54 mm pitch
Connector location: JP11

Pin	Definition
1	+5V
2	CIRRX
3	IRRX
4	GND
5	IRTX

SMBus Connector

Connector type: 1x4 4-pin header, 2.54 mm pitch
Connector location: JP1

Pin	Definition
1	+3.3V
2	SMB_CLOCK
3	SMB_DATA
4	GND

External Link LEDs

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP20 (LAN1), JP18 (LAN2) and JP13 (LAN3)

Pin	Definition
1	+3.3VSB
2	LINK LED

External Activity LEDs

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP19 (LAN1), JP14 (LAN2) and JP12 (LAN3)

Pin	Definition
1	+3.3VSB
2	ACTIVITY LED

External Buzzer Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP4

Pin	Definition
1	SPEAKER
2	+5V

Power LED Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP15

Pin	Definition
1	+5V
2	GND

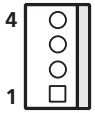
IDE and SATA LED Connector

Connector type: 1x2 2-pin header, 2.54 mm pitch
Connector location: JP17

Pin	Definition
1	+5V
2	IDE LED

CPU Fan Connector

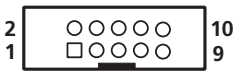
Connector type: 1x4, 4-pin Wafer, 2.54 mm pitch
Connector location: FAN1



Pin	Definition
1	GND
2	+12V
3	SENSE
4	NC

COM4 Connector

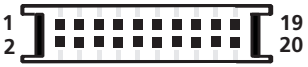
Connector type: 2x5 10-pin boxed header, 2.0 mm
Connector location: CN4



Pin	Definition	Pin	Definition
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

LVDS Channel A Connector

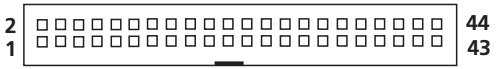
Connector type: 2x10 20-pin, 2.00mm pitch
Connector location: CN1



Pin	Definition	Pin	Definition
1	DDCPCLK	11	RXCLK+
2	DDCPDATA	12	RX1-
3	VDD	13	RXCLK-
4	RX0+	14	GND
5	RX3+	15	GND
6	RX0-	16	BACKLIGHT
7	RX3-	17	RX2+
8	VDD	18	BACKLIGHT
9	GND	19	RX2-
10	RX1+	20	GND

IDE Connector

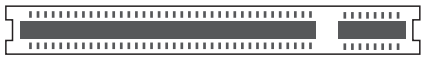
Connector size: 2x22 44-pin header, 2.0 mm pitch
Connector location: CN2



Pin	Definition	Pin	Definition
1	Reset#	23	IOW#
2	GND	24	GND
3	Data 7	25	IOR#
4	Data 8	26	GND
5	Data 6	27	IOCHRDY
6	Data 9	28	GND
7	Data 5	29	DMA ACK#
8	Data 10	30	GND
9	Data 4	31	Interrupt
10	Data 11	32	NC
11	Data 3	33	Disk Address 1
12	Data 12	34	DMA66 Detect
13	Data 2	35	Disk Address 0
14	Data 13	36	Disk Address 2
15	Data 1	37	HDCCS1#
16	Data 14	38	HDCCS3#
17	Data 0	39	HDD Active #
18	Data 15	40	GND
19	GND	41	+5V
20	NC	42	+5V
21	DMA REQ	43	GND
22	GND	44	NC

PCI Slot

Connector size: 2x62 3.3V slot
Connector location: CN3



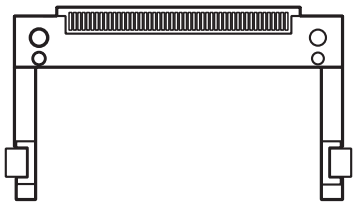
Pin	Definition	Pin	Definition
A1	GND	B1	-12V
A2	+12V	B2	GND
A3	+5V	B3	GND
A4	+5V	B4	NC
A5	+5V	B5	+5V
A6	Interrupt A#	B6	+5V
A7	Interrupt C#	B7	Interrupt B#
A8	+5V	B8	Interrupt D#
A9	NC	B9	Connector capacitance 10pf to Ground
A10	+5V	B10	Request#1
A11	NC	B11	Connector capacitance 10pf to Ground
A12	GND	B12	GND
A13	GND	B13	GND
A14	Grant#1	B14	Clock1
A15	Reset#	B15	GND
A16	+5V	B16	Clock0
A17	Grant#0	B17	GND
A18	GND	B18	Request#0

Pin	Definition	Pin	Definition
A19	Power Management Event#	B19	+5V
A20	Address and Data 30	B20	Address and Data 31
A21	+3.3V	B21	Address and Data 29
A22	Address and Data 28	B22	GND
A23	Address and Data 26	B23	Address and Data 27
A24	GND	B24	Address and Data 25
A25	Address and Data 24	B25	+3.3V
A26	Initialization Device Select	B26	Command & Byte Enable#3
A27	+3.3V	B27	Address and Data 23
A28	Address and Data 22	B28	GND
A29	Address and Data 20	B29	Address and Data 21
A30	GND	B30	Address and Data 19
A31	Address and Data 18	B31	+3.3V
A32	Address and Data 16	B32	Address and Data 17
A33	+3.3V	B33	Command & Byte Enable#2
A34	Frame#	B34	GND
A35	GND	B35	Initiator Ready#
A36	Target Ready#	B36	+3.3V
A37	GND	B37	Device Select#
A38	Stop#	B38	GND
A39	+3.3V	B39	Lock#
A40	+5V	B40	Parity Error#
A41	+5V	B41	+3.3V
A42	GND	B42	System Error#
A43	Parity	B43	+3.3V

Pin	Definition	Pin	Definition
A44	Address and Data 15	B44	Command & Byte Enable#1
A45	+3.3V	B45	Address and Data 14
A46	Address and Data 13	B46	GND
A47	Address and Data 11	B47	Address and Data 12
A48	GND	B48	Address and Data 10
A49	Address and Data 9	B49	GND
A50	Connector Key	B50	Connector Key
A51	Connector Key	B51	Connector Key
Pin	Definition	Pin	Definition
A52	Command & Byte Enable#0	B52	Address and Data 8
A53	+3.3V	B53	Address and Data 7
A54	Address and Data 6	B54	+3.3V
A55	Address and Data 4	B55	Address and Data 5
A56	GND	B56	Address and Data 3
A57	Address and Data 2	B57	GND
A58	Address and Data 0	B58	Address and Data 1
A59	+5V	B59	+5V
A60	+5V	B60	+5V
A61	+5V	B61	+5V
A62	+5V	B62	+5V

CompactFlash Socket

Connector type: 1x50, 50-pin CompactFlash Type 2 socket
Connector location: IDE1



Pin	Description	Pin	Description
1	GND	26	GND
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	HDCCS1#	32	HDCCS3#
8	GND	33	N/C
9	GND	34	IOR#
10	GND	35	IOW#
11	GND	36	+5V
12	GND	37	Interrupt
13	+5V	38	+5V
14	GND	39	Pull down 1K to GND
15	GND	40	NC
16	GND	41	Reset#
17	GND	42	IOCHRDY
18	Disk Address 2	43	DMA REQ
19	Disk Address 1	44	DMA ACK#
20	Disk Address 0	45	HDD Active#
21	Data 0	46	DMA66 Dectec
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	NC	49	Data 10
25	GND	50	GND

Touch Board Power Connector

Connector type: 1x2, 2-pin header, JST 2.0 mm pitch
Connector location: J3

Pin	Definition
1	+5V
2	GND

NISKIG120 Power Board Connector

Connector type: 1x3, 3-pin boxed header, JST 2.0 mm pitch
Connector location: J7

Pin	Definition
1	GND
2	I_PWRBTN#
3	SLP_S3#

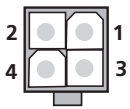
SATA Power Connector

Connector size: 1x4, 4-pin Wafer, 2.54 mm pitch
Connector location: CON1

Pin	Definition
1	+12V
2	GND
3	GND
4	+5V

Power Input Port

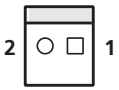
Connector type: 2x2, 4-pin, 3.96mm
Connector location: CON2



Pin	Definition
1	GND
2	GND
3	+24V
4	+24V

Power Output Connector

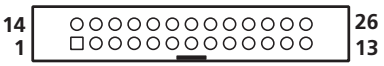
Connector size: 1x2, 2-pin Wafer, 2.54 mm pitch
Connector location: CON3



Pin	Definition
1	+24V
2	GND

Parallel Connector

Connector size: 2x13, 26-pin box header, 2.0 mm pitch
Connector location: CN5



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

SATA Ports

Connector type: Standard Serial ATAII 7P (1.27mm, SATA-M-180)
Connector location: J1, J2, J9 and J11

Pin	Definition
1	GND
2	SATA_TX_P
3	SATA_TX_N
4	GND
5	SATA_RX_P
6	SATA_RX_N
7	GND

Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for NEX 608. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM Web site at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the Setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

This program should be executed under the following conditions:

- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the Setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

```
TO ENTER SETUP BEFORE BOOT
PRESS <CTRL-ALT-ESC>
Press the <Del> key to enter Setup:
```

Legends

Key	Function
Right and Left arrows	Moves the highlight left or right to select a menu.
Up and Down arrows	Moves the highlight up or down between submenus or fields.
<Esc>	Exits to the BIOS Setup Utility.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Selects a field.
<F1>	Displays General Help.
<F10>	Saves and exits the Setup program.
<Enter>	Press <Enter> to enter the highlighted submenu.

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

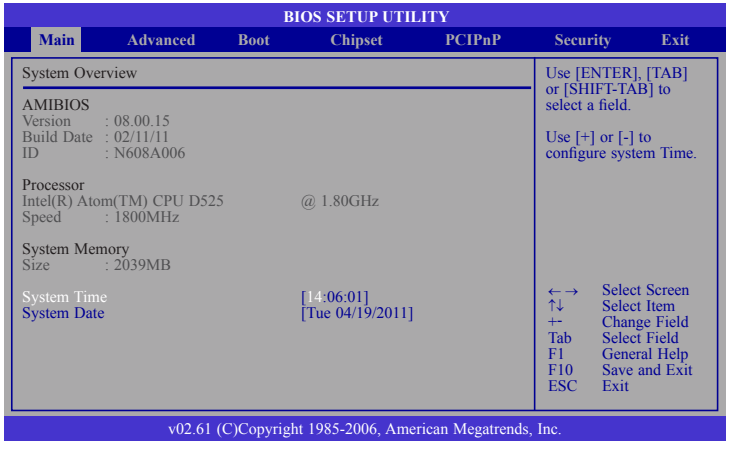
When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from six setup functions and one exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.



AMI BIOS

Displays the detected BIOS information.

Processor

Displays the detected processor information.

System Memory

Displays the detected system memory information.

System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

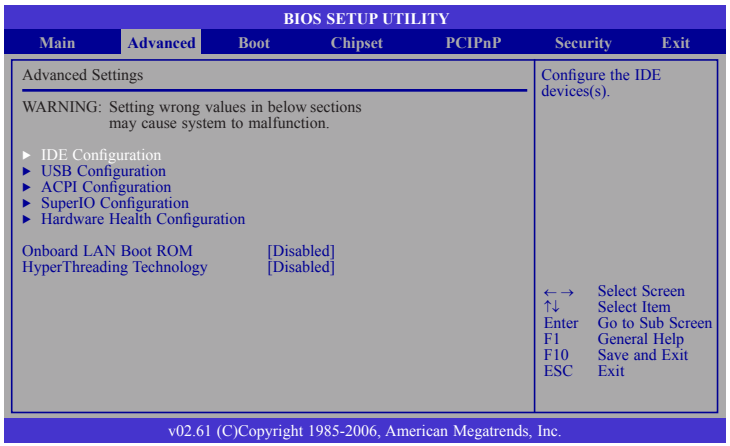
System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



IDE Configuration

This section is used to configure the IDE drives.

USB Configuration

This section is used to configure USB devices.

ACPI Configuration

This section is used to configure the Advanced ACPI configuration.

Super IO Configuration

This section is used to configure the I/O functions supported by the onboard Super I/O chip.

Hardware Health Configuration

This section is used to configure the hardware monitoring events such as temperature, fan speed and voltages.

Onboard LAN Boot ROM

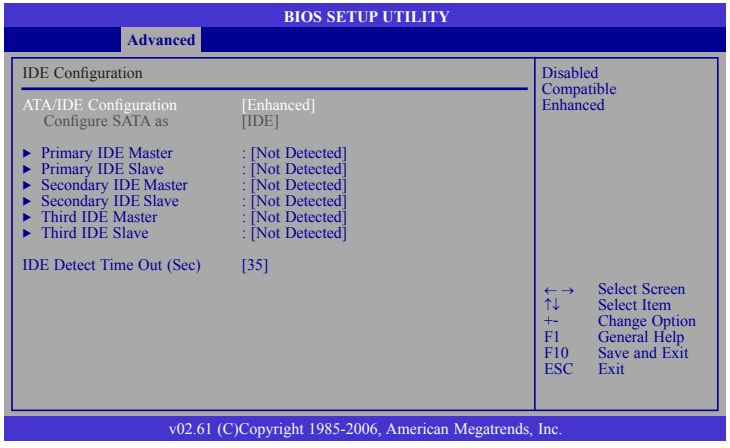
Enable this field if you wish to use the boot ROM (instead of a disk drive) to boot-up the system and access the local area network directly. If you wish to change the boot ROM's settings, type the <Shift> and <F10> keys simultaneously when prompted during boot-up. Take note: you will be able to access the boot ROM's program (by typing <Shift> + <F10>) only when this field is enabled.

HyperThreading Technology

Enable this field for Windows XP and Linux which are optimized for Hyper-Threading technology. Select disabled for other OSes not optimized for Hyper-Threading technology.

IDE Configuration

This section is used to configure the IDE drives.



ATA/IDE Configuration

This field is used to configure the IDE drives. The options are Disabled, Compatible and Enhanced.

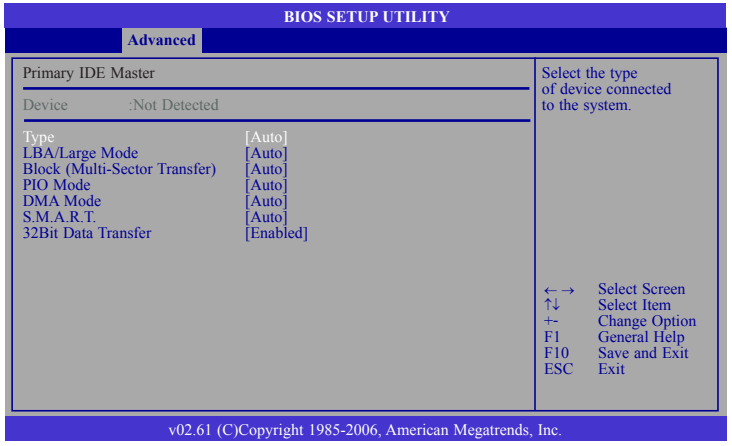
Configure SATA As

IDE This option configures the Serial ATA drives as Parallel ATA physical storage device.

AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

Primary IDE Master to Third IDE Slave

When you enter the BIOS Setup Utility, the BIOS will auto detect the existing IDE devices then displays the status of the detected devices. To configure an IDE drive, move the cursor to a field then press <Enter>.



Type

Selects the type of IDE drive connected to the system.

LBA/Large Mode

Auto	The LBA mode will automatically be enabled, that is, if the LBA mode was not previously disabled.
Disabled	Disables the LBA mode.

Block (Multi-Sector Transfer)

Auto	Data transfer to and from the device occurs multiple sectors at a time.
Disabled	Data transfer to and from the device occurs one sector at a time.

PIO Mode

Selects the data transfer mode. PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto	The BIOS will automatically set the system according to your hard disk drive's timing.
Mode 0-4	You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

DMA Mode

Selects the DMA mode.

Auto	Automatically detects the DMA mode.
SWDMAn	SingleWord DMAn.
MWDMAn	MultiWord DMAn.
UDMAn	Ultra DMAn.

S.M.A.R.T.

The system board supports SMART (Self-Monitoring, Analysis and Reporting Technology) hard drives. SMART is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. SMART is supported in ATA/33 or later hard drives. The options are Auto (default), Enabled and Disabled.

32Bit Data Transfer

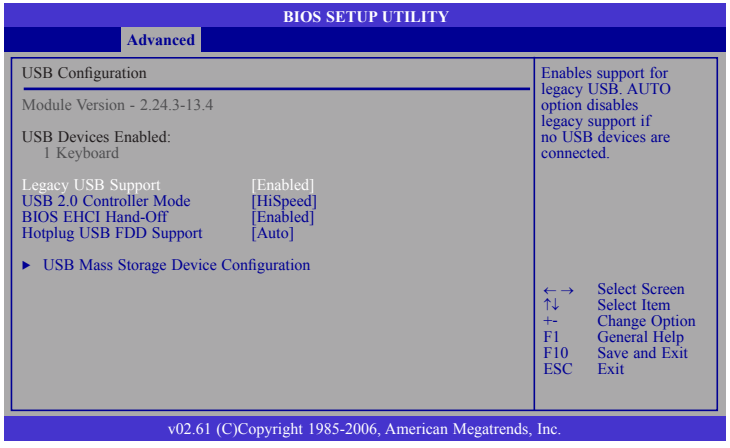
Enables or disables 32-bit data transfer.

IDE Detect Time Out (Sec)

Selects the time out value for detecting ATA/ATAPI devices.

USB Configuration

This section is used to configure USB devices.



Legacy USB Support

Due to the limited space of the BIOS ROM, the support for legacy USB keyboard (in DOS mode) is by default set to Disabled. With more BIOS ROM space available, it will be able to support more advanced features as well as provide compatibility to a wide variety of peripheral devices.

If a PS/2 keyboard is not available and you need to use a USB keyboard to install Windows (installation is performed in DOS mode) or run any program under DOS, set this field to Enabled.

USB 2.0 Controller Mode

Sets the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps).

BIOS EHCI Hand-Off

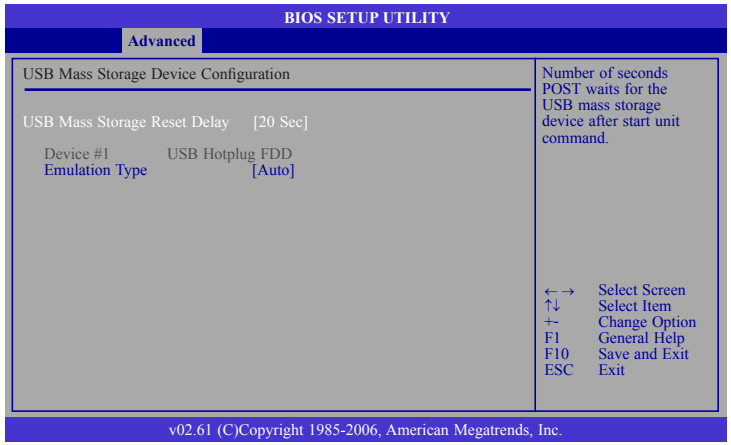
Enable this field when using operating systems without the EHCI hand-off support.

Hotplug USB FDD Support

Creates a dummy device that will be associated with the hot pluged FDD later. Selecting Auto will create a dummy device only if there is no USB FDD present.

USB Mass Storage Device Configuration

Configures the USB mass storage class devices.



USB Mass Storage Reset Delay

Selects the number of seconds POST waits for the USB mass storage device after the start unit command.

Device #1

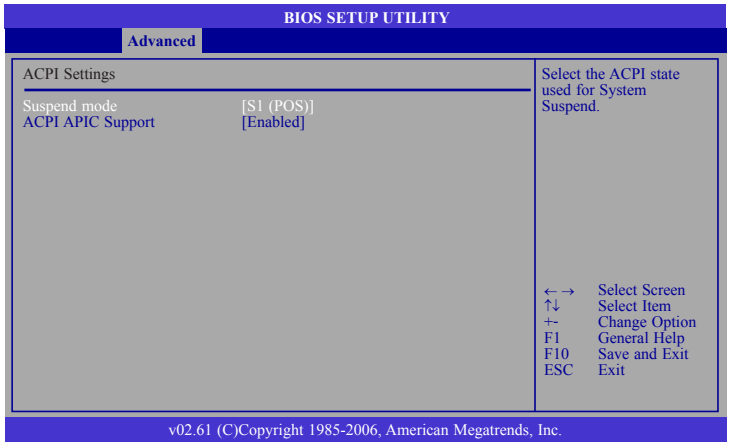
Displays the connected device.

Emulation Type

Auto	USB devices that are less than 530MB will be emulated as a floppy drive and the remaining as hard drives.
Forced FDD	Forces an HDD formatted drive to boot as FDD (e.g. ZIP drive)

ACPI Configuration

This section is used to configure the ACPI configuration.



Suspend Mode

This field is used to select the type of Suspend mode.

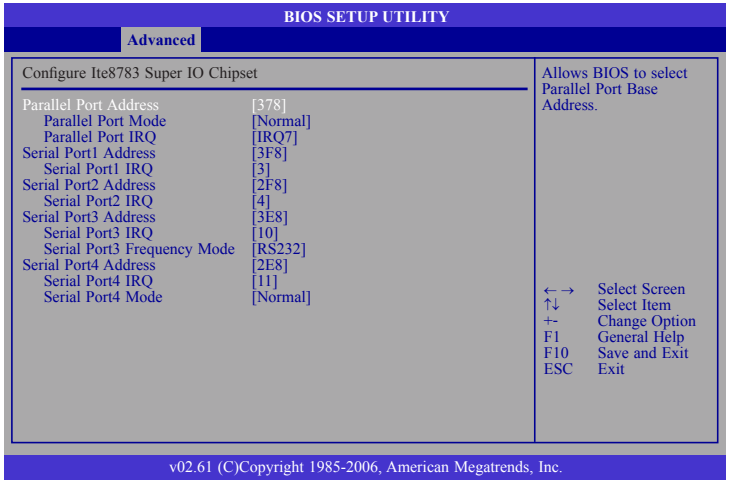
S1 (POS) Enables the Power On Suspend function.
S3 (STR) Enables the Suspend to RAM function.

ACPI APIC Support

Enables or disables the ACPI APIC function. It includes the ACPI APIC table pointer to RSDT pointer list.

Super IO Configuration

This section is used to configure the I/O functions supported by the on-board Super I/O chip.



Parallel Port Address

Selects the parallel port base address. The options are Disabled, 378, 278 and 3BC.

Parallel Port Mode

Selects the parallel port mode. The options are Normal, EPP, ECP and EPP+ECP.

Parallel Port IRQ

Selects an IRQ for the parallel port. The options are IRQ5 and IRQ7.

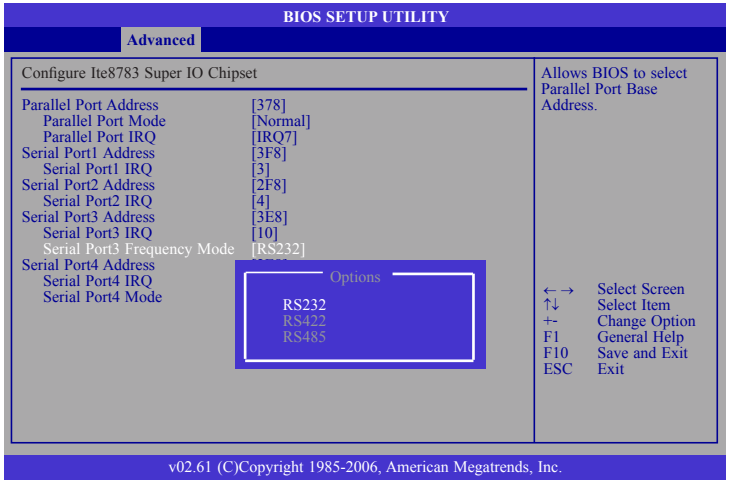
Serial Port1 Address to Serial Port4 Address

Selects the serial port base address. The options are Disabled, 3F8, 3E8 and 2E8.

Serial Port1 IRQ to Serial Port4 IRQ

Selects an IRQ for the onboard serial port. The options are 3, 4, 10 and 11.

Serial Port3 Frequency Mode



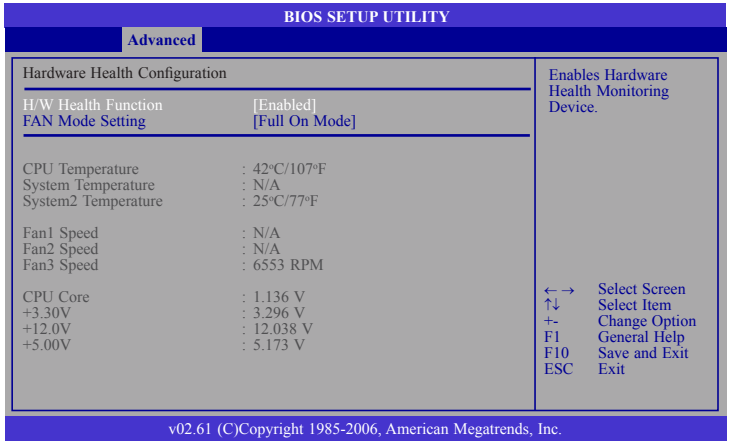
This field is used to select the frequency mode of serial port 3. The options are RS232, RS422 and RS485.

Serial Port4 Mode

Selects the mode of Serial Port4. The options are Normal, IrDA and ASK IR.

Hardware Health Configuration

This section is used to configure the hardware monitoring events such as temperature, fan speed and voltages.



H/W Health Function

Enables or disables the hardware monitoring function.

Fan Mode Setting

Configures the fan mode. The options are Full On Mode, Automatic Mode and PWM Manual Mode.

CPU Temperature to System2 Temperature

Detects and displays the current temperature of the CPU and the internal temperature of the system.

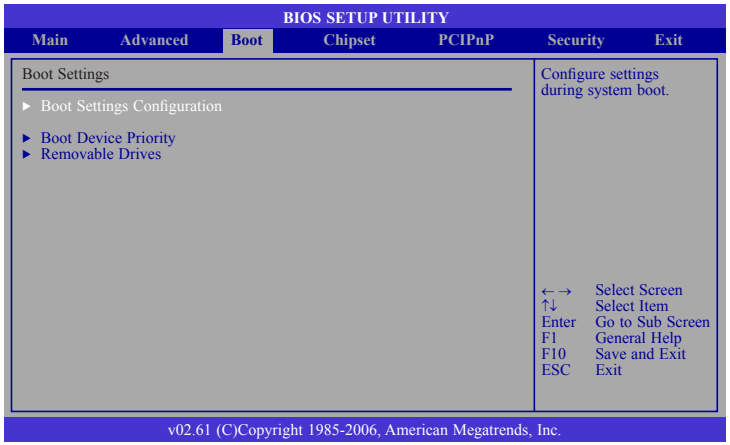
Fan1 Speed to Fan3 Speed

Detects and displays the speed of the cooling fans.

CPU Core to +5.00V

Detects and displays the output voltages.

Boot



Boot Settings Configuration

This section is used to configure settings during system boot.

Boot Device Priority

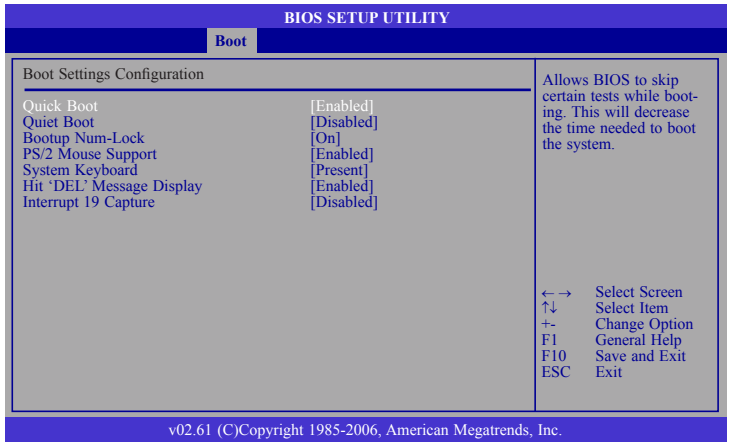
This section is used to select the boot priority sequence of the devices.

Removable Drives

This section is used to select the boot priority sequence of the removable drives.

Boot Settings Configuration

This section is used to configure settings during system boot.



Quick Boot

When Enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Quiet Boot

Enabled	Displays OEM logo instead of the POST messages.
Disabled	Displays normal POST messages.

Bootup Num-Lock

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

PS/2 Mouse Support

The options are Auto, Enabled and Disabled.

System Keyboard

Detects the presence or absence of the system keyboard.

Hit 'DEL' Message Display

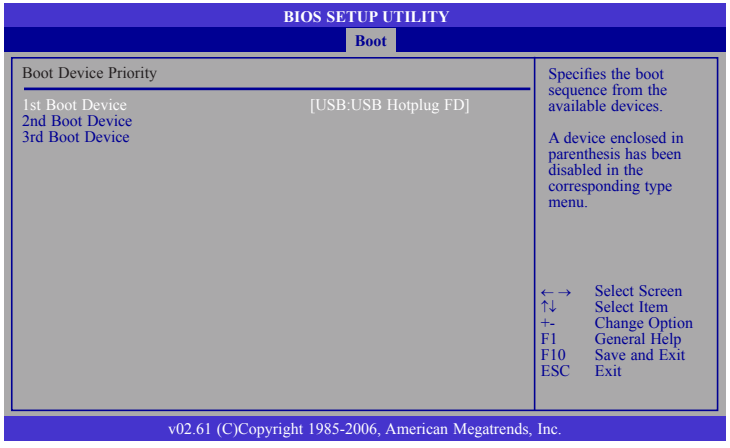
When enabled, the system displays the "Press DEL to run Setup" message during POST.

Interrupt 19 Capture

When enabled, it allows the optional ROM to trap interrupt 19.

Boot Device Priority

This section is used to select the boot priority sequence of the devices.

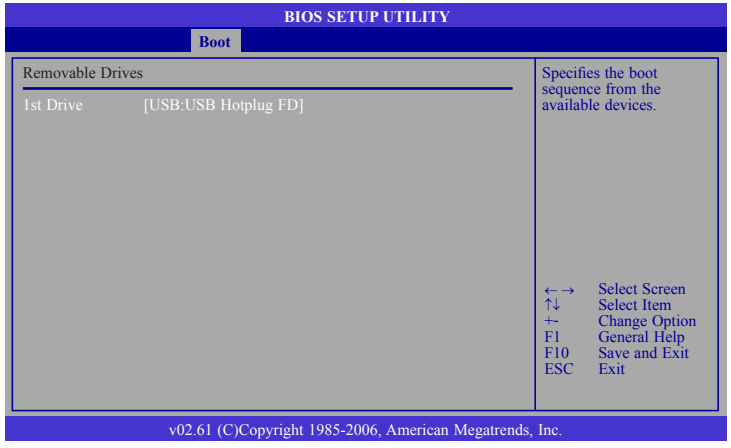


1st Boot Device to 3rd Boot Device

Selects the drive to boot first, second and third in the "1st Boot Device", "2nd Boot Device" and "3rd Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected.

Removable Drives

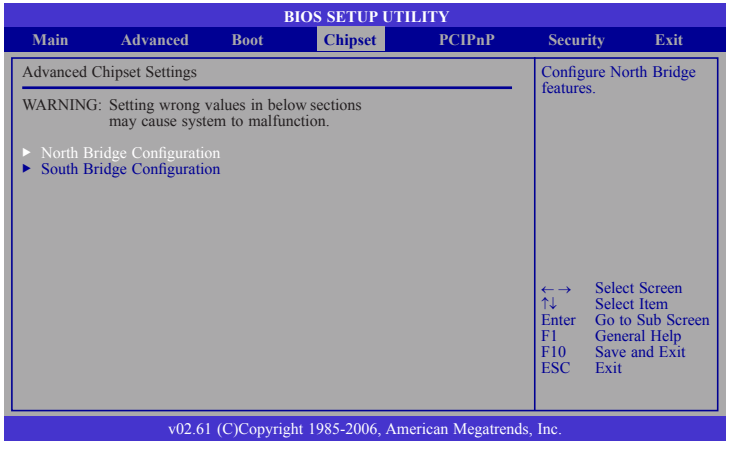
This section is used to select the boot priority sequence of the hard drives.



Chipset

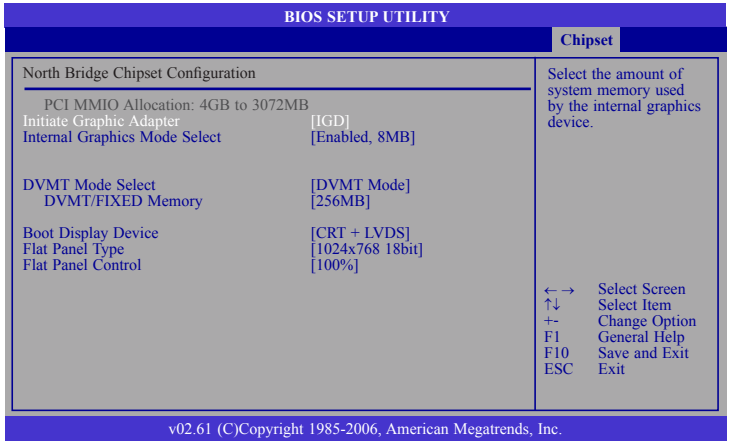
This section is used to configure the system based on the specific features of the chipset.

Setting incorrect field values may cause the system to malfunction.



North Bridge Configuration

This section is used to configure the north bridge features.



Initiate Graphic Adapter

Selects the graphics controller to use as the primary boot device.

Internal Graphics Mode Select

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

DVMT Mode Select

The options are Fixed mode and DVMT mode.

DVMT/Fixed Memory

This field is used to select the graphics memory size used by DVMT/Fixed mode.

Boot Display Device

This field is used to select the type of display to use when the system boots.

Flat Panel Type

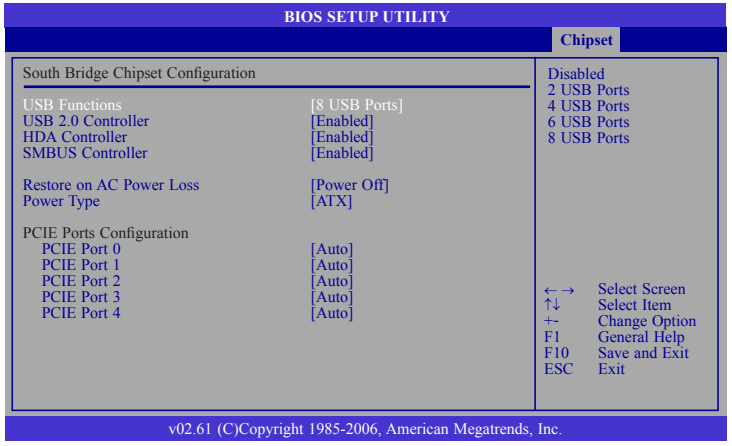
Selects the type of flat panel connected to the system.

Flat Panel Control

Selects the flat panel type.

South Bridge Configuration

This section is used to configure the south bridge features.



USB Functions

Enables or disables the selected USB ports. The options are 2 USB Ports, 4 USB Ports, 6 USB Ports, 8 USB Ports and Disabled.

USB 2.0 Controller

This field is used to enable or disable the Enhanced Host Controller Interface (USB 2.0).

HDA Controller

Enables or disables the onboard audio.

SMBUS Controller

Enables or disables the SMBUS.

Restore On AC Power Loss

Power Off	When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.
Power On	When power returns after an AC power failure, the system will automatically power-on.
Last State	When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Power Type

Selects the type of power used.

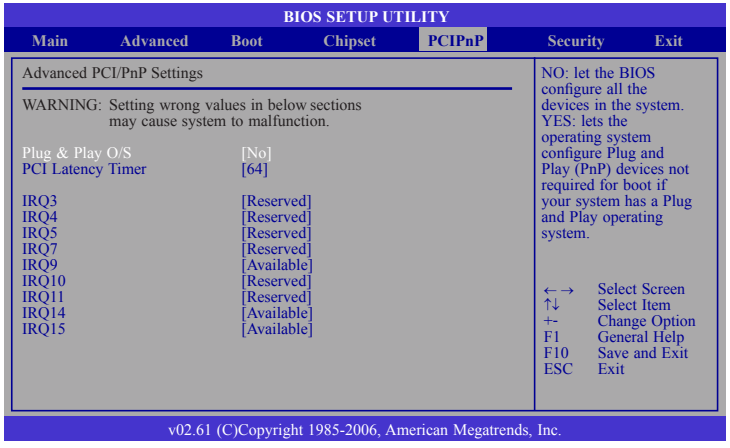
PCIE Port 0 to PCIE Port 4

Enables or disables the PCIE port.

PCIPnP

This section is used to configure settings for PCI/PnP devices.

Setting incorrect field values may cause the system to malfunction.



Plug & Play O/S

Yes Configures Plug and Play (PnP) devices that are not required to boot in a Plug and Play supported operating system.
No The BIOS configures all the devices in the system.

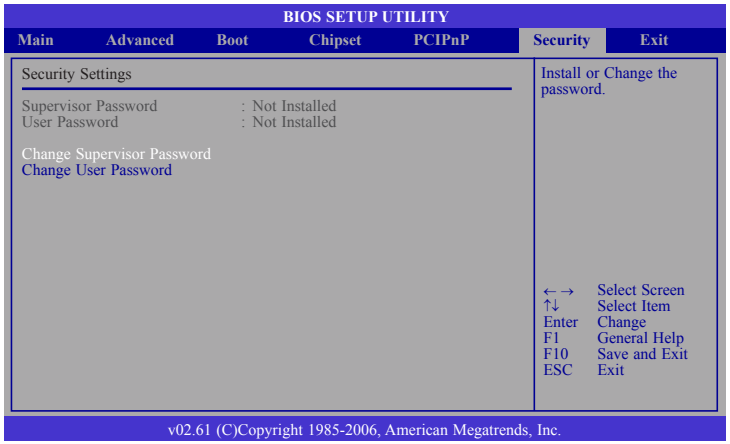
PCI Latency Timer

This feature is used to select the length of time each PCI device will control the bus before another takes over. The larger the value, the longer the PCI device can retain control of the bus. Since each access to the bus comes with an initial delay before any transaction can be made, low values for the PCI Latency Timer will reduce the effectiveness of the PCI bandwidth while higher values will improve it.

IRQ3 to IRQ15

Available The specified IRQ is available for PCI/PnP devices.
Reserved The specified IRQ is reserved for Legacy ISA devices.

Security



Change Supervisor Password

This field is used to set or change the supervisor password.

To set a new password:

1. Select the Change Supervisor Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.
3. Press <Enter> to confirm the new password.
4. When the Password Installed dialog box appears, select OK.

To change the password, repeat the same steps above.

To clear the password, select Change Supervisor Password then press <Enter>. The Password Uninstalled dialog box will appear.

If you forgot the password, you can clear the password by erasing the CMOS RTC (Real Time Clock) RAM using the RTC Clear jumper. Refer to chapter 2 for more information.

Change User Password

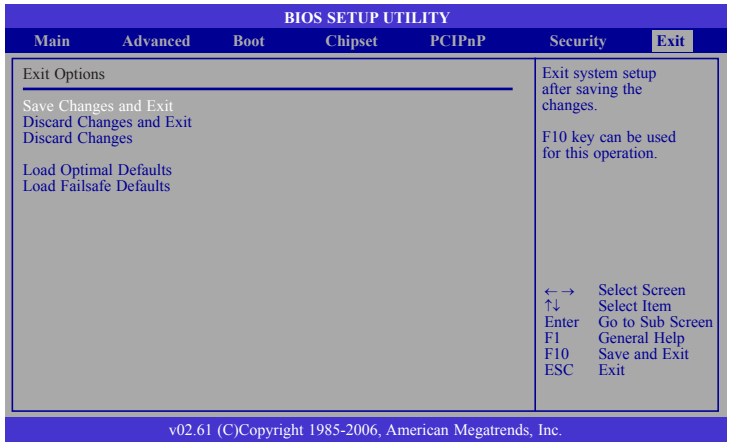
This field is used to set or change the user password.

To set a new password:

1. Select the Change User Password field then press <Enter>.
2. Type your password in the dialog box then press <Enter>. You are limited to eight letters/numbers.
3. Press <Enter> to confirm the new password.
4. When the Password Installed dialog box appears, select OK.

To change the password, repeat the same steps above.

Exit



Save Changes and Exit

To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F10> to save and exit Setup.

Discard Changes and Exit

To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Discard Changes

To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

Load Optimal Defaults

Loads the optimal default values from the BIOS ROM.

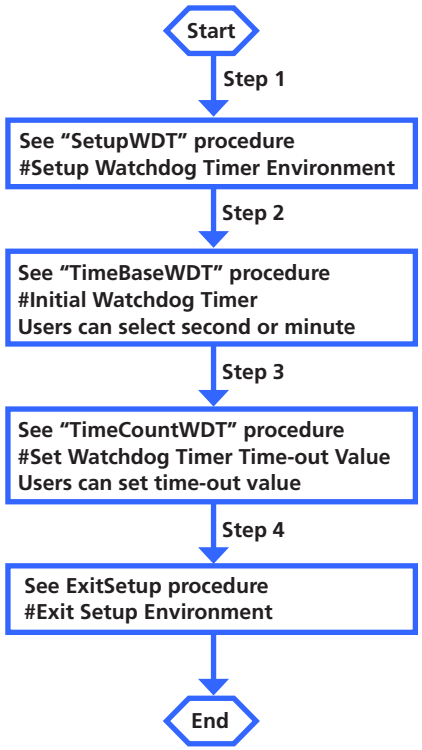
Load Failsafe Defaults

Loads the fail-safe default values from the BIOS ROM.

Appendix A: Watchdog Timer

WDT Programming Guide

NEX 608 Watchdog Function Configuration Sequence Description:



W83627 Watchdog Programming Guide

```
#define SUPERIO_PORT 0x2E
#define WDT_SET 0xF5
#define WDT_VALUE 0xF6

void main(void)
{
  #Enter SuperIO Configuration
    outportb(SUPERIO_PORT, 0x87);
    outportb(SUPERIO_PORT, 0x87);

  # Set LDN
    outportb(SUPERIO_PORT,0x07);
    outportb(SUPERIO_PORT+1 ,0x08);

  # Set WDT setting
    outportb(WDT_SET,0x04);    # Use the second to come down
                               # If choose the Minute, change value to
                               0x0C
  # Set WDT sec/min
    outportb(WDT_VALUE,0x05);              #Set 5 seconds
}
```

Appendix B: GPIO Programming Sample Code

GPIO Programming Sample Code

```
#define GPIO_PORT              0x50F
#define GPO1                                (1<<3)
#define GPO2                                (1<<4)

void main(void)
{
   #Set GPO to be low
     outportb(GPIO_PORT, (inportb(GPIO_PORT) & (~GPO1) & (~GPO2)
));
   # Set GPO to be high
     outportb(GPIO_PORT, (inportb(GPIO_PORT) | GPO1 |GPO2 ));
}
```

Appendix C: Brightness Control Programming Sample Code

Brightness Control Programming Sample Code

```
#define SUPERIO_PORT        0x2E
#define GPIO_LEVEL          0xF1
#define GPO31               (0x01 << 1)
#define GPO34               (0x01 << 4)
#define GPO35               (0x01 << 5)

#define Set_100
{ outportb(SUPERIO_PORT, GPIO_LEVEL); outportb(SUPERIO_PORT+1, 0x7D); }
#define Set_80
{ outportb(SUPERIO_PORT, GPIO_LEVEL); outportb(SUPERIO_PORT+1, 0x6F); }
#define Set_60
{ outportb(SUPERIO_PORT, GPIO_LEVEL); outportb(SUPERIO_PORT+1, 0x5F); }
#define Set_40
{ outportb(SUPERIO_PORT, GPIO_LEVEL); outportb(SUPERIO_PORT+1, 0x7F); }

void main(void)
{
  #Enter SuperIO Configuration
    outportb(SUPERIO_PORT, 0x87);
    outportb(SUPERIO_PORT, 0x87);
  # Set LDN
    outportb(SUPERIO_PORT,0x07);
    outportb(SUPERIO_PORT+1 ,0x09);
    Set_80;                    # Choose one of Set_100, Set_80, Set_60,
Set_40 .
}
```