



NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (Industrial Motherboard)

NEX 980

User Manual

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PREFACE

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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.

Global Service Contact Information

Headquarters

NEXCOM International Co., Ltd.

15F, No. 920, Chung-Cheng Rd.,
ZhongHe District, New Taipei City, 23586,
Taiwan, R.O.C.

Tel: +886-2-8226-7786

Fax: +886-2-8226-7782

www.nexcom.com

America

USA

NEXCOM USA

2883 Bayview Drive, Fremont CA 94538,
USA

Tel: +1-510-656-2248

Fax: +1-510-656-2158

Email: sales@nexcom.com

www.nexcom.com

Asia

Taiwan

Central Taiwan Office

16F, No.250, Sec. 2, Chongde Rd.,
Beitun Dist., Taichung City 406, R.O.C.

Tel: +886-4-2249-1179

Fax: +886-4-2249-1172

Email: sales@nexcom.com.tw

www.nexcom.com.tw

Japan

NEXCOM Japan

9F, Tamachi Hara Bldg., 4-11-5, Shiba Minato-ku,
Tokyo, 108-0014, Japan

Tel: +81-3-5419-7830

Fax: +81-3-5419-7832

Email: sales@nexcom-jp.com

www.nexcom-jp.com

China

NEXCOM China

2F, Block 4, Venus Plaza, Bldg. 21,
ZhongGuanCun Software Park, No. 8,
Dongbeiwang West Rd., Haidian District,
Beijing, 100193, China

Tel: +86-10-8282-5880

Fax: +86-10-8282-5955

Email: sales@nexcom.cn

www.nexcom.cn

Shanghai Office

Room 1505, Greenland He Chuang Bldg.,
No. 450 Caoyang Rd.,
Shanghai, 200062, China

Tel: +86-21-6150-8008

Fax: +86-21-3251-6358

Email: sales@nexcom.cn

www.nexcom.cn

Nanjing Office

Hall C, Block 17, Tian Xing Cui Lang Bldg.,
No. 49 Yunnan North Rd.,
Nanjing, 210018, China

Tel: +86-25-8315-3486

Fax: +86-25-8315-3489

Email: sales@nexcom.cn

www.nexcom.cn

Shenzhen Office

Western Room 708, Block 210,
Tairan Industry & Trading Place,
Futian Area, Shenzhen,
518040, China

Tel: +86-755-8332-7203

Fax: +86-755-8332-7213

Email: sales@nexcom.cn

www.nexcom.cn

Wuhan Office

1-C 1804/ 1805, Mingze Liwan,
No. 519 South Luoshi Rd.,
Hongshan District,
Wuhan, 430070, China

Tel: +86-27-8722-7400

Fax: +86-27-8722-7400

Email: sales@nexcom.cn

www.nexcom.cn

Chengdu Office

9F, Shuxiangxie, Xuefu Garden,
No.12 Section 1, South Yihuan Rd.,
Chengdu, 610061, China
Tel: +86-28-8523-0186
Fax: +86-28-8523-0186
Email: sales@nexcom.cn
www.nexcom.cn

Europe

France

NEXCOM France

La Grande Arche-Paroi Nord,
92044 Paris La Défense, France
Tel: +33 (0) 1 40 90 33 35
Fax: +33 (0) 1 40 90 31 01
Email: sales.fr@nexcom.eu
www.nexcom.eu

Germany

NEXCOM GmbH
Leopoldstraße Business Centre,
Leopoldstraße 244,
80807 Munich, Germany
Tel: +49-89-208039-278
Fax: +49-89-208039-279
Email: sales.de@nexcom.eu
www.nexcom.eu

Italy

NEXCOM ITALIA S.r.l
Via Gaudenzio Ferrari 29,
21047 Saronno (VA), Italia
Tel: +39 02 9628 0333
Fax: +39 02 9286 9215
Email: nexcomitalia@nexcom.eu
www.nexcomitalia.it

United Kingdom

NEXCOM EUROPE

10 Vincent Avenue,
Crownhill Business Centre,
Milton Keynes, Buckinghamshire MK8 0AB,
United Kingdom
Tel: +44-1908-267121
Fax: +44-1908-262042
Email: sales.uk@nexcom.eu
www.nexcom.eu

CHAPTER 1: PRODUCT INTRODUCTION

Thank you for purchasing NEXCOM NEX 980 motherboard, a reliable motherboard produced under NEXCOM's consistently stringent quality control. It delivers excellent performance with robust design conforming to NEXCOM's commitment to quality and endurance.

In this manual, chapter 1 and 2 contain introduction of the motherboard and step-by-step guide to the hardware installation. Chapter 3 and 4 contain the configuration guide to BIOS setup and information of the Support CD.



Because the motherboard specifications and the BIOS software might be updated, the content of this manual will be subject to change without notice.

In case any modifications of this manual occur, the updated version will be available on NEXCOM website without further notice. You may find the latest VGA cards and CPU support lists on NEXCOM website as well.

NEXCOM website <http://www.nexcom.com>

If you require technical support related to this motherboard, please visit our website for specific information about the model you are using.

1.1 Package Contents

NEXCOM NEX 980 Motherboard
(ATX Form Factor: 12.0-in x 9.6-in, 30.5 cm x 24.4 cm)
NEXCOM NEX 980 Driver CD
NEXCOM NEX 980 Jumper setting instruction
1 x I/O Panel Shield



NEXCOM Reminds You...

To get better performance in Windows® 8/ 8 64-bit/ 7/ 7 64-bit, it is recommended to set the BIOS option in Storage Configuration to AHCI mode.

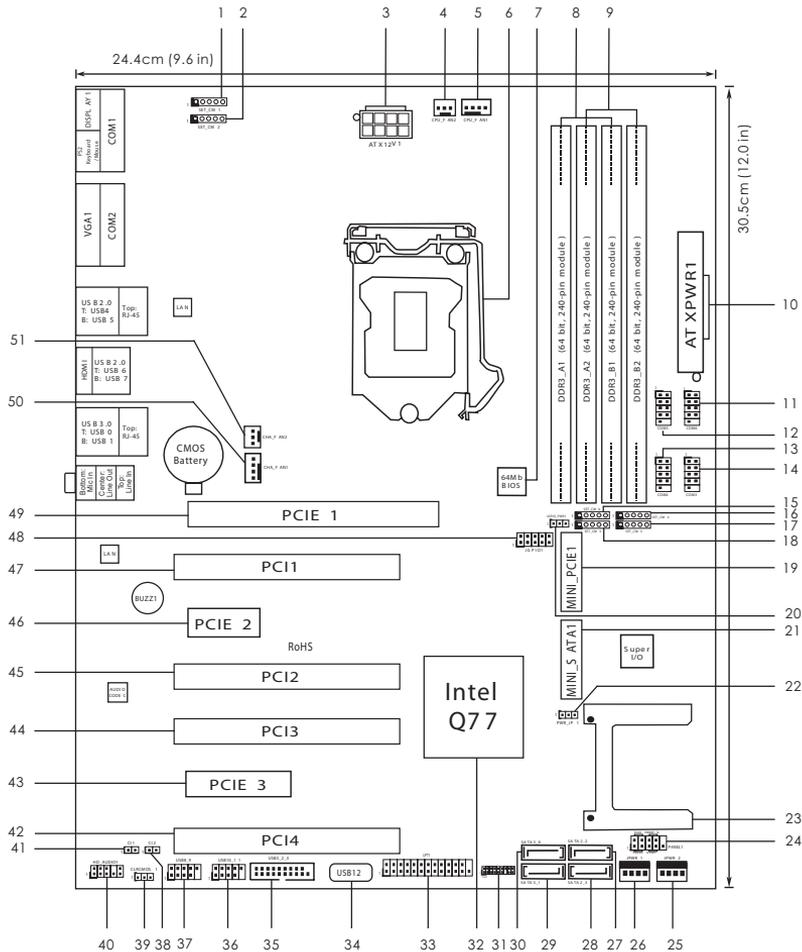
1.2 Specifications

Form Factor	Dimensions	ATX (12.0-in x 9.6-in)
Processor System	CPU	Socket LGA1155 for Intel® Core™ i7/i5/i3/ Celeron® (Sandy Bridge and Ivy Bridge)
	Core Number	(By CPU, Max 4)
	Max Speed	(By CPU)
	L3 Cache	(By CPU)
	Chipset	Q77
	BIOS	UEFI
Expansion Slot	PCI	4
	Mini-PCIE	1
	PCIE	1 (x16) + 1 (x1) + 1 (x4)
	CF Card Socket	0
	CFast Card Socket	1
Memory	Technology	Dual Channel DDR3 1066/1333/1600 MHz SDRAM
	Max.	32GB
	Socket	Long DIMM x 4
Graphics	Controller	Intel® HD Graphics (By CPU)
	VRAM	Shared Memory
	DSub	Support max resolution 2048x1536
	LVDS	N/A
	HDMI	Support HDMI 1.4a, max resolution 1920x1200
	DVI	N/A
	Display Port	Support max resolution 2560x1600
Multi Display	Yes	

Ethernet	Interface	10/100/1000 Mbps
	Controller	GbE LAN1: Intel® 82579LM/V, LAN2: Intel® 82583V
	Controller	RJ-45 x 2 w/ LED
SATA	Max Data Transfer Rate	SATA2 X2 (3.0Gb/S), SATA3 X2 (6.0Gb/S), Support RAID0/1/5/10
Rear I/O	VGA	1
	HDMI	1
	DVI	0
	Display Port	1
	Ethernet	2
	USB	6 (USB 2.0 x4, USB 3.0 x2)
	Audio	3 (Mic-In, Line-Out, Line-In)
Serial	2 (RS-232/422/485)	
	PS/2	1 (Combo)
Internal Connector	USB	7 (USB 2.0 x4, USB 3.0 x2; Vertical Type x1)
	LVDS/ Inverter	0
	VGA	1
	Serial	4 (RS-232)
	SATA	4 (SATA2 X2, SATA3 X2), Support RAID 0/1/5/10
	m-SATA	1
	Mini-PCIE	1 (Support half-size card)
	Parallel	1
	IrDA	0
	GPIO	4 x GPI + 4 x GPO
	SATA PWR Output Con	2
Speaker Header	1	

Watchdog Timer	Output	Output from super I/O to drag RESETCON#
	Interval	256 Segments, 0,1,2...255 Sec/Min
Power Requirements	Input PWR	ATX PWR (8 + 24)
	Power On	AT/ATX Supported -AT : Directly PWR on as power input ready -ATX : Press button to PWR on after power input ready
Environment	Temperature	0°C – 60°C

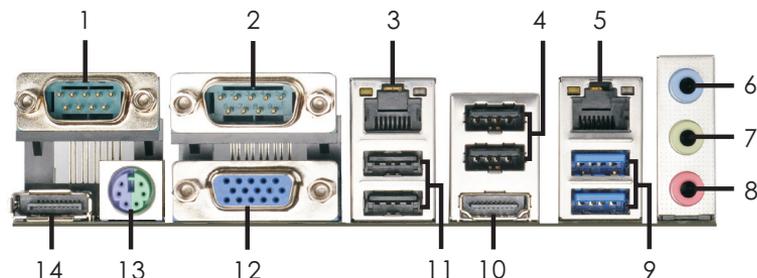
1.3 Motherboard Layout



- 1 COM Port Signal/Power Setting Jumper (For COM1)
- 2 COM Port Signal/Power Setting Jumper (For COM2)
- 3 ATX 12V Power Connector
- 4 3-Pin CPU FAN Connector (+12V)
- 5 4-Pin CPU FAN Connector (+12V)
- 6 CPU Socket
- 7 Flash Memory (64Mb)
- 8 2 x 240-pin DDR3 DIMM Slots (DDR3_A1, DDR3_B1)
- 9 2 x 240-pin DDR3 DIMM Slots (DDR3_A2, DDR3_B2)
- 10 24-pin ATX Power Input Connector
- 11 RS232 Port 4 Pin Header (COM6)
- 12 RS-232 Port 4 Pin Header (COM5)
- 13 RS-232 Port 4 Pin Header (COM4)
- 14 RS-232 Port 4 Pin Header (COM3)
- 15 COM Port Signal/Power Setting Jumper (For COM6)
- 16 COM Port Signal/Power Setting Jumper (For COM4)
- 17 COM Port Signal/Power Setting Jumper (For COM3)
- 18 COM Port Signal/Power Setting Jumper (For COM5)
- 19 Mini-PCIE Slot
- 20 Digital Input/ Output Power Select
- 21 Mini-SATA Slot
- 22 ATX/AT Mode Selection
- 23 CFast Card Socket
- 24 System Panel Header
- 25 SATA Power Connector 2
- 26 SATA Power Connector 1
- 27 SATA2 Connector (SATA2_2)
- 28 SATA2 Connector (SATA2_3)
- 29 SATA3 Connector (SATA3_1)
- 30 SATA3 Connector (SATA3_0)
- 31 TPM Header

- 32 Intel® Q77 Chipset
- 33 Printer Port Header
- 34 USB2.0 Port (USB12)
- 35 USB3.0 Header (USB3_2_3)
- 36 USB2.0 Header (USB10_11)
- 37 USB2.0 Header (USB8_9)
- 38 Chassis Intrusion Header 2
- 39 Clear CMOS Header
- 40 Front Panel Audio Header
- 41 Chassis Intrusion Header 1
- 42 PCI Slot
- 43 PCI Express Slot
- 44 PCI Slot
- 45 PCI Slot
- 46 PCI Express Slot
- 47 PCI Slot
- 48 Digital Input/ Output Pin Header
- 49 PCI Express Slot
- 50 4-Pin Chassis FAN Connector (+12V)
- 51 3-Pin Chassis FAN Connector (+12V)

1.4 I/O Panel



- | | |
|-------------------------|-----------------------------|
| 1 COM Port (COM1) | 8 Microphone (Pink) |
| 2 COM Port (COM2) | 9 USB 3.0 Ports (USB3_01) |
| * 3 LAN RJ-45 Port | 10 HDMI Port (HDMI1) |
| 4 USB 2.0 Ports (USB67) | 11 USB 2.0 Ports (USB45) |
| * 5 LAN RJ-45 Port | 12 D-Sub Port (VGA1) |
| 6 Line In (Light Blue) | 13 PS/2 Mouse/Keyboard Port |
| 7 Line out (Lime) | ** 14 DisplayPort (DP1) |

* There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.

LAN Port LED Indications

Activity/ Link LED		SPEED LED		ACT/LINK LED	SPEED LED
Status	Description	Status	Description		
Off	No Link	Off	10Mbps connection		
Blinking	Data Activity	Orange	100Mbps connection		
On	Link	Green	1Gbps connection		

LAN Port

CHAPTER 2 : INSTALLATION

This is an ATX form factor (12.0" x 9.6", 30.5 x 24.4 cm) motherboard. Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.



Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so may cause physical injuries to you and damages to motherboard components.

2.1 Screw Holes

Place screws into the holes to secure the motherboard to the chassis.



Do not over-tighten the screws! Doing so may damage the motherboard.

2.2 Pre-installation Precautions

Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Unplug the power cord from the wall socket before touching any components.
- To avoid damaging the motherboard's components due to static electricity, NEVER place your motherboard directly on the carpet or the like. Also

remember to use a grounded wrist strap or touch a safety grounded object before you handle the components.

- Hold components by the edges and do not touch the ICs.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that comes with the component.



Before you install or remove any component, ensure that the power is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

2.3 Installation of Memory Modules (DIMM)

This motherboard provides four 240-pin DDR3 (Double Data Rate 3) DIMM slots, and supports Dual Channel Memory Technology. For dual channel configuration, you always need to install identical (the same brand, speed, size and chip-type) DDR3 DIMM pair in the slots of the same color. In other words, you have to install identical DDR3 DIMM pair in Dual Channel (DDR3_A1 and DDR3_B1; Blue slots) or identical DDR3 DIMM pair in Dual Channel (DDR3_A2 and DDR3_B2; White slots), so that Dual Channel Memory Technology can be activated. This motherboard also allows you to install four DDR3 DIMMs for dual channel configuration, and please install identical DDR3 DIMMs in all four slots. You may refer to the Dual Channel Memory Configuration Table below.

Dual Channel Memory Configuration

	DDR3_A1 (Blue Slot)	DDR3_A2 (White Slot)	DDR3_B1 (Blue Slot)	DDR3_B2 (White Slot)
(1)	Populated	-	Populated	-
(2)	-	Populated	-	Populated
(3)*	Populated	Populated	Populated	Populated

* For configuration (3), please install identical DDR3 DIMMs in all four slots.



1. If you want to install two memory modules, for optimal compatibility and reliability, it is recommended to install them in the slots of the same color. In other words, install them either in the set of blue slots (DDR3_A1 and DDR3_B1), or in the set of white slots (DDR3_A2 and DDR3_B2).
2. If only one memory module or three memory modules are installed in the DDR3 DIMM slots on this motherboard, it is unable to activate the Dual Channel Memory Technology.
3. If a pair of memory modules is NOT installed in the same Dual Channel, for example, installing a pair of memory modules in DDR3_A1 and DDR3_A2, it is unable to activate the Dual Channel Memory Technology .
4. It is not allowed to install a DDR or DDR2 memory module into DDR3 slot; otherwise, this motherboard and DIMM may be damaged.
5. Some DDR3 1GB double-sided DIMMs with 16 chips may not work on this motherboard. It is not recommended to install them on this motherboard.

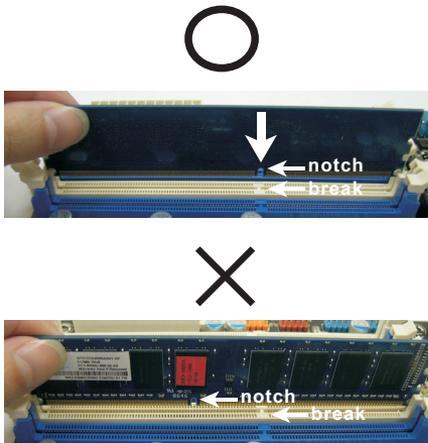
Installing a DIMM



Please make sure to disconnect power supply before adding or removing DIMMs or the system components.

Step 1. Unlock a DIMM slot by pressing the retaining clips outward.

Step 2. Align a DIMM on the slot such that the notch on the DIMM matches the break on the slot.



The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation.

Step 3. Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

2.4 Expansion Slots (PCI, PCI Express, Mini-PCIe and CFast Card Slots)

There are 4 PCI slots, 3 PCI Express slots, 1 mini-PCIe slot and 1 CFast card socket on this motherboard.

PCI slots:

PCI slots are used to install expansion cards that have the 32-bit PCI interface.

PCIe slots:

- PCIE1 (PCIe x16 slot; Blue) is used for PCI Express x16 lane width graphics cards.
- PCIE2 (PCIe x1 slot; White) is used for PCI Express cards with x1 lane width cards, such as Gigabit LAN card and SATA2 card.
- PCIE3 (PCIe x4 slot; White) is used for PCI Express x4 lane width graphics cards.
- MINI_PCIE1 (mini-PCIe slot) is used for PCI Express mini cards.

CFast card socket:

- CFAST1 (CFast card socket) is used for CFast cards.

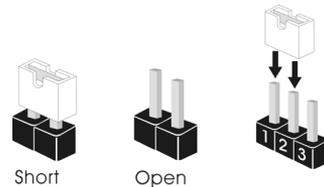
Installing an expansion card

- Step 1. Before installing the expansion card, please make sure that the power supply is switched off or the power cord is unplugged. Please read the documentation of the expansion card and make necessary hardware settings for the card before you start the installation.
- Step 2. Remove the system unit cover (if your motherboard is already installed in a chassis).

- Step 3. Remove the bracket facing the slot that you intend to use. Keep the screws for later use.
- Step 4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
- Step 5. Fasten the card to the chassis with screws.
- Step 6. Replace the system cover.

2.5 Jumpers Setup

The illustration shows how jumpers are setup. When the jumper cap is placed on pins, the jumper is “Short”. If no jumper cap is placed on pins, the jumper is “Open”. The illustration shows a 3-pin jumper whose pin1 and pin2 are “Short” when jumper cap is placed on these 2 pins.



Jumper	Setting	Description
Clear CMOS Jumper (3-pin CLRCMOS1) (see p.8, No. 39)	1_2 Default	2_3 Clear CMOS

Note: CLRCMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRCMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the password, date, time, user default profile and MAC address will be cleared only if the CMOS battery is removed.

Jumper	Setting	Description
ATX/AT Mode Selection (3-pin PWR_JP1) (see p.8, No. 22)	 1 2 3	1-2 : AT Mode 2-3 : ATX Mode
ATX/AT Mode Selection (3-pin PWR_JP1) (see p.8, No. 20)	 1 2 3	1-2 : +12V 2-3 : +5V
COM Port Signal/Power Setting Jumpers (5-pin SET_CM2: see p.8, No. 2) (5-pin SET_CM1: see p.8, No. 1) (5-pin SET_CM6: see p.8, No. 15) (5-pin SET_CM5: see p.8, No. 18) (5-pin SET_CM4: see p.8, No. 16) (5-pin SET_CM3: see p.8, No. 17)	 1	1-2 : +12V 2-3 : +5V 4-5 : RI#

2.6 Onboard Headers and Connectors



Onboard headers and connectors are NOT jumpers. Do NOT place jumper caps over these headers and connectors. Placing jumper caps over the headers and connectors will cause permanent damage of the motherboard!

Chassis Fan Connectors

(4-pin CHA_FAN1)

(see p.8, No. 50)



Please connect the fan cable to the fan connector and match the black wire to the ground pin.

(3-pin CHA_FAN2)

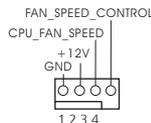
(see p.8, No. 51)



CPU Fan Connectors

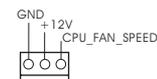
(4-pin CPU_FAN1)

(see p.8 No. 5)



(3-pin CPU_FAN2)

(see p.8 No. 4)



ATX 12V Power Input Connector

(8-pin ATX12V1)

(see p.8, No. 3)



Please connect an ATX 12V power supply to this connector.



Though this motherboard provides 8-pin ATX 12V power connector, it can still work if you adopt a traditional 4-pin ATX 12V power supply. To use the 4-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 5.

4-Pin ATX 12V Power Supply Installation



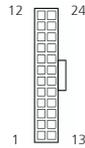
Though this motherboard provides 4-Pin CPU fan (Quiet Fan) support, the 3-Pin CPU fan still can work successfully even without the fan speed control function. If you plan to connect the 3-Pin CPU fan to the CPU fan connector on this motherboard, please connect it to Pin 1-3.



ATX Power Input Connector

(20-pin ATXPWR1)

(see p.8 No. 10)



Please connect an ATX power supply to this connector.

SATA2 Connectors

(SATA2_2: see p.8, No. 27)

(SATA2_3: see p.8, No. 28)

storage

SATA2 interface allows up to



These two Serial ATA2 (SATA2) connectors support SATA data cables for internal devices. The current

3.0 Gb/s data transfer rate.

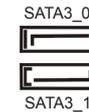
SATA3 Connectors

(SATA3_1: see p.8, No. 29)

(SATA3_0: see p.8, No. 30)

storage

SATA3 interface allows up to



These two Serial ATA3 (SATA3) connectors support SATA data cables for internal devices. The current

6.0 Gb/s data transfer rate.

mSATA Connector

(see p.8, No. 21)



This mSATA connector can be used to connect a Solid-State Drive (SSD) for an internal storage device. The current mSATA interface allows up to 3.0 Gb/s data transfer rate.

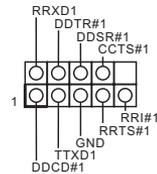
COM Port Headers

(9-pin COM5: see p.8 No. 12)

(9-pin COM6: see p.8 No. 11)

(9-pin COM4: see p.8 No. 13)

(9-pin COM3: see p.8 No. 14)



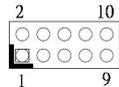
COM port headers support serial port modules.

Digital Input/

Output Pin Header

(9-pin JGPIO1)

(see p.8, No. 48)

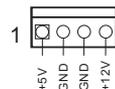


PIN	Signal Name	PIN	Signal Name
1	Digital Output 0	2	Digital Input 0
3	Digital Output 1	4	Digital Input 1
5	Digital Output 2	6	Digital Input 2
7	Digital Output 3	8	Digital Input 3
9	JGPIO_PWR1	10	GND

SATA Power Connectors

(4-pin JPWR1: see p.8, No. 26)

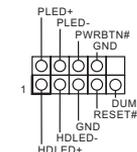
(4-pin JPWR2: see p.8, No. 25)



System Panel Header

(9-pin PANEL1)

(see p.8, No. 24)



This header accommodates several system front panel functions.



Though this motherboard provides 24-pin ATX power connector, it can still work if you adopt a traditional 20-pin ATX power supply. To use the 20-pin ATX power supply, please plug your power supply along with Pin 1 and Pin 13.



20-Pin ATX Power Supply Installation



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

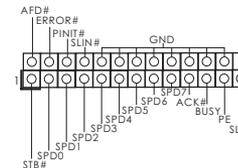
HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data. The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assignments are matched correctly.

Print Port Header

(25-pin LPT1)

(see p.8, No. 33)



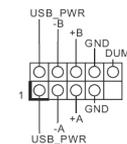
This is an interface for print port cable that allows convenient connection of printer devices.

USB 2.0 Headers

(USB12: see p.8, No. 34)

(9-pin USB8_9: see p.8, No. 37)

(9-pin USB10_11: see p.8, No. 36)

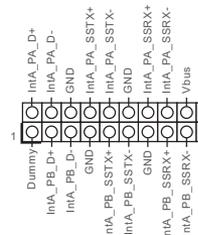


Besides four default USB 2.0 ports on the I/O panel, there are three USB 2.0 headers and one USB 2.0 port on this motherboard. Each USB 2.0 header can support two USB 2.0 ports.

USB 3.0 Header

(19-pin USB3_2_3)

(see p.8 No. 35)



Besides two default USB 3.0 ports on the I/O panel, there is one USB 3.0 header on this motherboard. This USB 3.0 header can support two USB 3.0 ports.

Chassis Intrusion Header

(2-pin CI2: see p.8, No. 38)

(2-pin CI1: see p.8, No. 41)

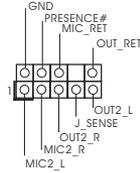


This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

Front Panel Audio Header

(9-pin HD_AUDIO1)

p.8 No. 40)

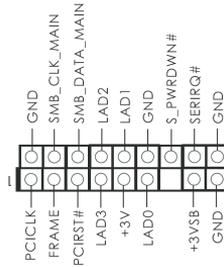


This is an interface for front panel audio cable that allows (see convenient connection and control of audio devices.

TPM Header

(17-pin TPM1)

(see p.8, No. 31)



This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.

2.7 SATA2/ SATA3 Hard Disks Installation

This motherboard adopts Intel® Q77 chipset that supports Serial ATA2 (SATA2) / Serial ATA3 (SATA3) hard disks and RAID (RAID 0, RAID 1, RAID 5 and RAID 10) functions. You may install SATA2/ SATA3 hard disks on this motherboard for internal storage devices. This section will guide you to install the SATA2/ SATA3 hard disks.

STEP 1: Install the SATA2/ SATA3 hard disks into the drive bays of your chassis.

STEP 2: Connect the SATA power cable to the SATA2 / SATA3 hard disk.

STEP 3: Connect one end of the SATA data cable to the motherboard's SATA2 / SATA3 connector.

STEP 4: Connect the other end of the SATA data cable to the SATA2/ SATA3 hard disk.

2.8 Hot Plug and Hot Swap Functions for SATA2 / SATA3 HDDs

This motherboard supports Hot Plug for SATA2 / SATA3 in RAID / AHCI mode. Intel® Q77 chipset provides hardware support for Advanced Host controller Interface (AHCI), a new programming interface for SATA host controllers developed through a joint industry effort.



What is Hot Plug Function?

If the SATA2 / SATA3 HDDs are NOT set for RAID configuration, it is called "Hot Plug" for the action to insert and remove the SATA2 / SATA3 HDDs while the system is still power-on and in working condition.

However, please note that it cannot perform Hot Plug if the OS has been installed into the SATA2 / SATA3 HDD.

What is Hot Swap Function?

If SATA2 / SATA3 HDDs are built as RAID 1 or RAID 5 then it is called "Hot Swap" for the action to insert and remove the SATA2 / SATA3 HDDs while the system is still power-on and in working condition.

2.9 Driver Installation Guide

To install the drivers to your system, please insert the support CD to your optical drive first. Then, the drivers compatible to your system can be auto-detected and listed on the support CD driver page. Please follow the order from top to bottom to install those required drivers. Therefore, the drivers you install can work properly.

CHAPTER 3: UEFI SETUP UTILITY

3.1 Introduction

This section explains how to use the UEFI Setup Utility to configure your system. The UEFI chip on the motherboard stores the UEFI Setup Utility. You may run the UEFI Setup Utility when you start up the computer. Please press <F2> or during the Power-On-Self-Test (POST) to enter the UEFI Setup Utility, otherwise, POST will continue with its test routines.

If you wish to enter the UEFI Setup Utility after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen.

3.1.1 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	To set up the system time/date information
Advanced	To set up the advanced UEFI features
H/W Monitor	To display current hardware status
Boot	To set up the default system device to locate and load the Operating System
Security	To set up the security features
Exit	To exit the current screen or the UEFI Setup Utility

Use <←> key or <→> key to choose among the selections on the menu bar, and then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

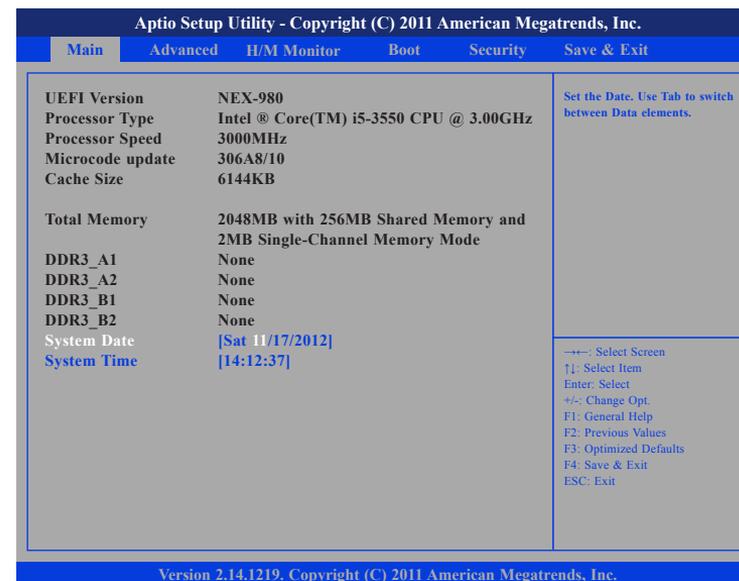
3.1.2 Navigation Keys

Please check the following table for the function description of each navigation key.

Navigation Key(s)	Function Description
← / →	Moves cursor left or right to select Screens
↑ / ↓	Moves cursor up or down to select items
+ / -	To change option for the selected items
<Enter>	To bring up the selected screen
<F1>	To display the General Help Screen
<F7>	Discard changes
<F9>	To load optimal default values for all the settings
<F10>	To save changes and exit the UEFI SETUP UTILITY
<F12>	Print screen
<ESC>	To jump to the Exit Screen or exit the current screen

3.2 Main Screen

When you enter the UEFI Setup Utility, the Main screen will appear and display the system overview.



3.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Northbridge Configuration, Southbridge Configuration, Storage Configuration, Intel ® Rapid Start Technology, Intel ® Smart Connect Technology, AMT Configuration, Super IO Configuration, ACPI Configuration, USB Configuration, Trusted Computing and Voltage Configuration.



Setting wrong values in this section may cause the system to malfunction.

Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, then you can update your UEFI only in a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

3.3.1 CPU Configuration



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Use this item to enable or disable Intel Turbo Boost Mode Technology. Turbo Boost Mode allows processor cores to run faster than marked frequency in specific conditions. The default value is [Enabled].

Long Duration Power Limit

Use this item to configure long duration power limit in watts. The default value is [Auto].

Long Duration Maintained

Use this item to configure time window which the long duration power is maintained. The default value is [Auto].

Short Duration Power Limit

Use this item to configure short duration power limit in watts. The default value is [Auto].

Primary Plane Current Limit

Use this item to configure the maximum instantaneous current allowed for the primary plane. The default value is [Auto].

CPU Ratio

Use this item to change the ratio value of this motherboard.

Intel SpeedStep Technology

Intel SpeedStep technology is Intel's new power saving technology. Processors can switch between multiple frequencies and voltage points to enable power saving. The default value is [Enabled]. Configuration options: [Enabled] and [Disabled]. If you install Windows® Vista™ / 7 / 8 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.

Secondary Plane Current Limit

Use this item to configure the maximum instantaneous current allowed for the secondary plane. The default value is [Auto].

Intel Hyper Threading Technology

To enable this feature, a computer system with an Intel processor that supports Hyper-Threading technology and an operating system that includes optimization for this technology, such as Microsoft® Windows® XP / Vista™ / 7 / 8 is required. Set to [Enabled] if using Microsoft® Windows® XP, Vista™, 7, 8, or Linux kernel version 2.4.18 or higher. This option will be hidden if the installed CPU does not support Hyper-Threading technology.

Active Processor Cores

Use this item to select the number of cores to enable in each processor package. The default value is [All].

Enhance Halt State (C1E)

All processors support the Halt State (C1). The C1 state is supported through the native processor instructions HLT and MWAIT and requires no hardware support from the chipset. In the C1 power state, the processor maintains the context of the system caches.

CPU C3 State Support

Use this to enable or disable CPU C3 (ACPI C2) report to OS.

CPU C6 State Support

Use this to enable or disable CPU C6 (ACPI C3) report to OS.

Package C State Support

Selected option will program into C State package limit register. The default value is [Auto].

CPU Thermal Throttling

You may select [Enabled] to enable CPU internal thermal control mechanism to keep the CPU from overheating.

No-Execute Memory Protection

No-Execution (NX) Memory Protection Technology is an enhancement to the IA-32 Intel Architecture. An IA-32 processor with “No Execute (NX) Memory Protection” can prevent data pages from being used by malicious software to execute codes. This option will be hidden if the current CPU does not support No-Execute Memory Protection.

Intel Virtualization Technology

When this option is set to [Enabled], a VMM (Virtual Machine Architecture) can utilize the additional hardware capabilities provided by Vanderpool Technology. This option will be hidden if the installed CPU does not support Intel Virtualization Technology.

Hardware Prefetcher

Use this item to turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

Use this item to turn on/off prefetching of adjacent cache lines.

3.3.2 North Bridge Configuration



DRAM Frequency

If [Auto] is selected, the motherboard will detect the memory module(s) inserted and assign the appropriate frequency automatically.

Primary Graphics Adapter

This allows you to select [Onboard], [PCI] or [PCI Express] as the boot graphic adapter priority. The default value is [PCI Express].

VT-d

Use this item to enable/disable Intel ® Virtualization Technology for Directed I/O.

PCIE1 Link Speed

This allows you to select PCIE 1 Link Speed. The default value is [Auto].

Share Memory

This allows you to set onboard VGA share memory feature. The default value is [Auto].

IGPU Multi-Monitor

This allows you to enable or disable IGPU Multi-Monitor. The default value is [Disabled]. If you wish to install a PCI Express card under Windows® XP / Vista™ OS, please disable this option.

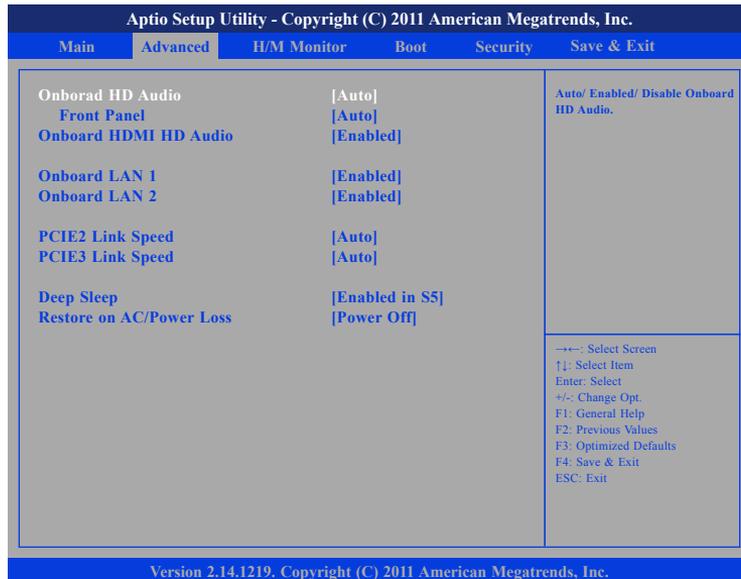
Render Standby

Use this to enable or disable Render Standby by Internal Graphics Device. The default value is [Enabled].

Deep Render Standby

This allows you to enable or disable Deep Render Standby. The default value is [Enabled].

3.3.3 South Bridge Configuration



Onboard HD Audio

Select [Auto], [Enabled] or [Disabled] for the onboard HD Audio feature. If you select [Auto], the onboard HD Audio will be disabled when PCI Sound Card is plugged.

Front Panel

Select [Auto] or [Disabled] for the onboard HD Audio Front Panel.

Onboard HDMI HD Audio

This allows you to enable or disable the Onboard HDMI HD Audio feature.

Onboard LAN 1

This allows you to enable or disable the Onboard LAN 1 feature.

Onboard LAN 2

This allows you to enable or disable the Onboard LAN 2 feature.

PCIE2 Link Speed

This allows you to select PCIE 2 Link Speed. The default value is [Auto].

PCIE3 Link Speed

This allows you to select PCIE 3 Link Speed. The default value is [Auto].

Deep Sleep

Mobile platforms support Deep S4/S5 in DC only and desktop platforms support Deep S4/S5 in AC only. The default value is [Disabled].

Restore on AC/Power Loss

This allows you to set the power state after an unexpected AC/power loss. If [Power Off] is selected, the AC/power remains off when the power recovers. If [Power On] is selected, the AC/power resumes and the system starts to boot up when the power recovers.

3.3.4 Storage Configuration



SATA Controller(s)

Use this item to enable or disable the SATA Controller feature.

SATA Mode Selection

Use this to select SATA mode. Configuration options: [IDE Mode], [AHCI Mode] and [RAID Mode]. The default value is [IDE Mode].



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

Hard Disk S.M.A.R.T.

Use this item to enable or disable the S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology) feature. Configuration options: [Disabled] and [Enabled].

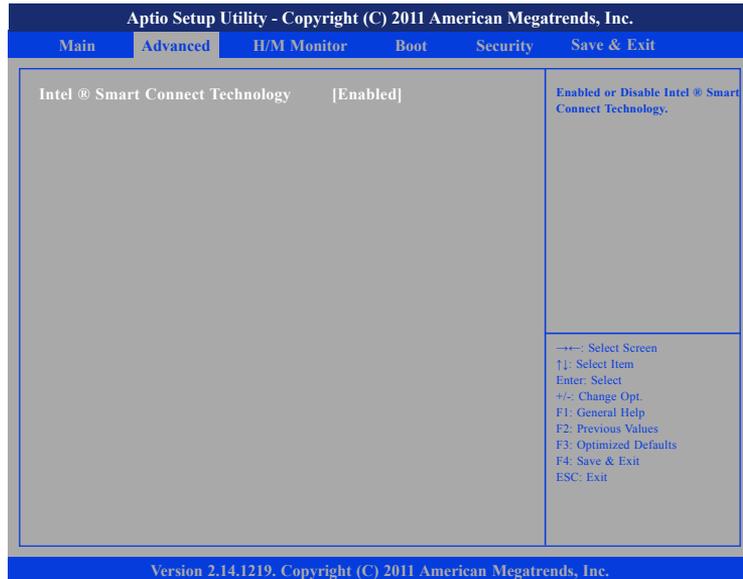
3.3.5 Intel® Rapid Start Technology



Intel® Rapid Start Technology

Use this item to enable or disable Intel® Rapid Start Technology. Intel® Rapid Start Technology is a new zero power hibernation mode which allows users to resume in just 5-6 seconds. The default is [Disabled].

3.3.6 Intel® Smart Connect Technology



Intel® Smart Connect Technology

Use this item to enable or disable Intel® Smart Connect Technology. Intel® Smart Connect Technology keeps your e-mail and social networks, such as Twitter, Facebook, etc. updated automatically while the computer is in sleep mode. The default is [Enabled].

3.3.7 AMT Technology



Intel AMT

Use this to enable or disable Intel® Active Management Technology BIOS Extension. The default is [Enabled].

BIOS Hotkey Pressed

Use this to enable or disable BIOS hotkey press. The default is [Disabled].

MEBx Selection Screen

Use this to enable or disable MEBx Selection Screen. The default is [Disabled].

Hide Un-Configure ME Confirmation

Hide Un-Configure ME without password confirmation prompt. The default is [Disabled].

MEBx Debug Message Output

Use this to enable or disable MEBx Debug Message Output. The default is [Disabled].

Un-Configure ME

Un-Configure ME without password. The default is [Disabled].

Amt Wait Timer

Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME

Set ME to Soft Temporary Disabled. The default is [Disabled].

ASF

Use this to enable or disable Alert Specification Format. The default is [Enabled].

Activate Remote Assistance Process

Trigger CIRA boot. The default is [Disabled].

USB Configure

Use this to enable or disable USB Configure function. The default is [Enabled].

PET Progress

User can enable or disable PET Events progress to receive PET events or not. The default is [Enabled].

WatchDog

Use this to enable or disable WatchDog Timer. The default is [Disabled].

3.3.8 Super I/O Configuration



COM1 Configuration

Use this to set parameters of COM1.

COM2 Configuration

Use this to set parameters of COM2.

COM3 Configuration

Use this to set parameters of COM3.

COM4 Configuration

Use this to set parameters of COM4.

COM5 Configuration

Use this to set parameters of COM5.

COM6 Configuration

Use this to set parameters of COM6.

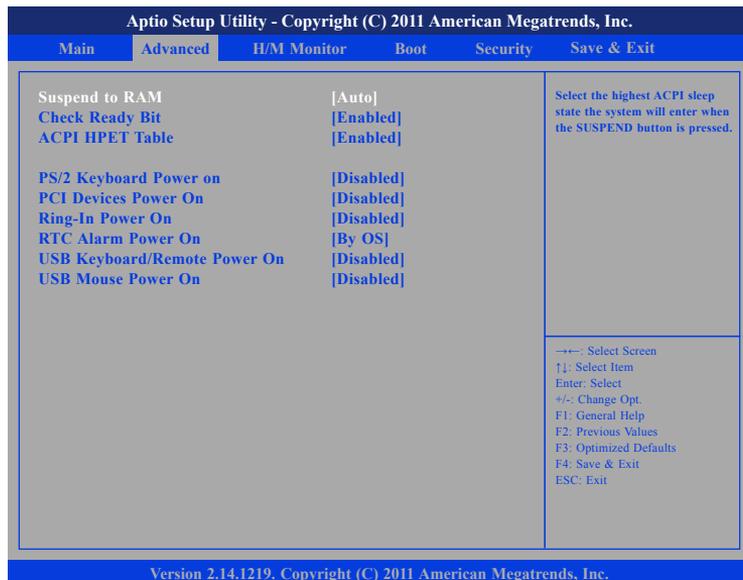
LPT1 Port Configuration

Use this set parameters of the onboard parallel port.

WDT Timeout Reset

This allows users to enable/disable the Watch Dog Timer timeout to reset system. The default value is [Disabled].

3.3.9 ACPI Configuration



Suspend to RAM

Use this item to select whether to auto-detect or disable the Suspend-to-RAM feature. Select [Auto] will enable this feature if the OS supports it.

Check Ready Bit

Use this item to enable or disable the feature Check Ready Bit.

ACPI HPET Table

Use this item to enable or disable ACPI HPET Table. The default value is [Enabled]. Please set this option to [Enabled] if you plan to use this motherboard to submit Windows® certification.

PS/2 Keyboard Power On

Use this item to enable or disable PS/2 keyboard to turn on the system from the power-soft-off mode.

PCI Devices Power On

Use this item to enable or disable PCI devices to turn on the system from the power-soft-off mode.

Ring-In Power On

Use this item to enable or disable Ring-In signals to turn on the system from the power-soft-off mode.

RTC Alarm Power On

Use this item to enable or disable RTC (Real Time Clock) to power on the system.

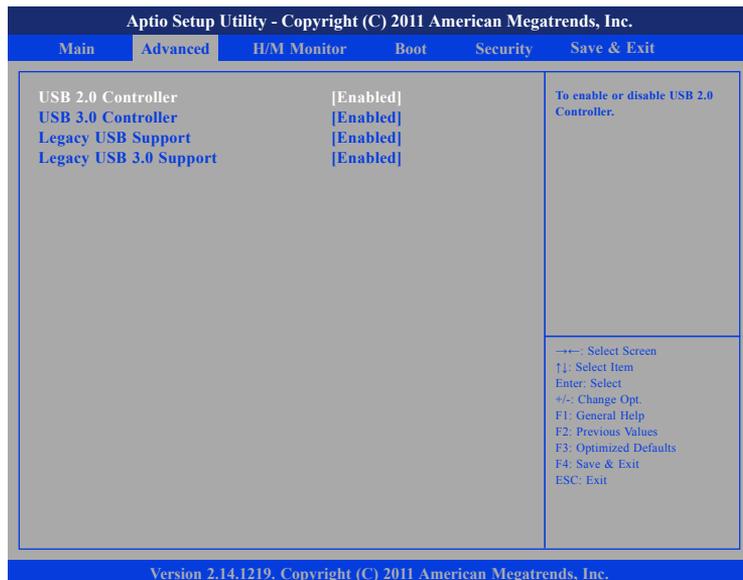
USB Keyboard/Remote Power On

Use this item to enable or disable USB Keyboard/Remote to power on the system.

USB Mouse Power On

Use this item to enable or disable USB Mouse to power on the system.

3.3.10 USB Configuration



The default value is [Enabled]. Please refer to below descriptions for the details of these four options: [Enabled] - Enables support for legacy USB. [Auto] - Enables legacy support if USB devices are connected. [Disabled] - USB devices are not allowed to use under legacy OS and UEFI setup when [Disabled] is selected. If you have USB compatibility issues, it is recommended to select [Disabled] to enter OS. [UEFI Setup Only] - USB devices are allowed to use only under UEFI setup and Windows / Linux OS.

Legacy USB 3.0 Support

Use this option to enable or disable legacy support for USB 3.0 devices. The default value is [Enabled].

USB 2.0 Controller

Use this item to enable or disable the use of USB 2.0 controller.

USB 3.0 Controller

Use this item to enable or disable the use of USB 3.0 controller.

Legacy USB Support

Use this option to select legacy support for USB devices. There are four configuration options: [Enabled], [Auto], [Disabled] and [UEFI Setup Only].

3.3.11 Trusted Computing



Current Status Information

Use this item to see TPM current status information, such as TPM enabled status, TPM active status and TPM owner status.

Configuration

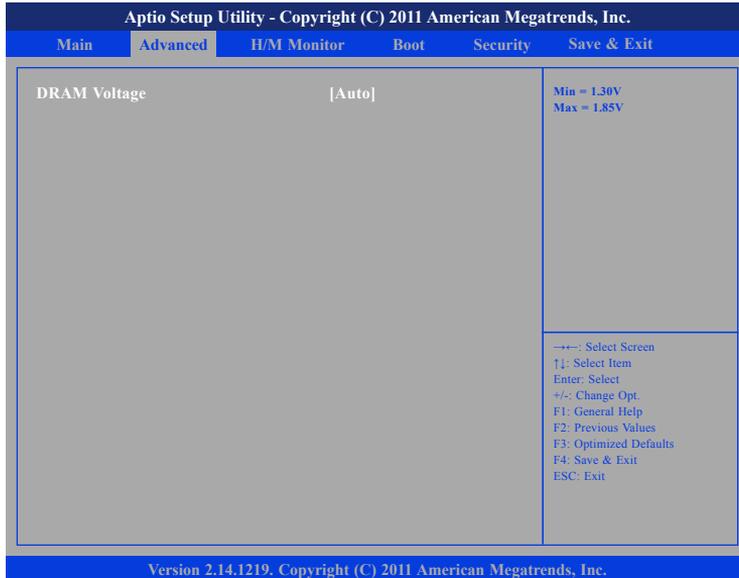
TPM Support

Use this item to enable or disable BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

TPM State

Use this item to enable or disable security device. Your computer will reboot during restart process in order to change state of the device.

3.3.12 Voltage Configuration



DRAM Voltage

Use this to select DRAM Voltage. The default value is [Auto].

3.4 Hardware Health Event Monitoring Screen

In this section, it allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



CPU_FAN1 & 2 Setting

This allows you to set CPU fan 1 & 2's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

CHA_FAN1 & 2 Setting

This allows you to set chassis fan 1 & 2's speed. Configuration options: [Full On] and [Automatic Mode]. The default value is [Full On].

Over Temperature Protection

Use this to enable or disable Over Temperature Protection. The default value is [Enabled].

Case Open Feature

This allows you to enable or disable case open detection feature. The default is value [Disabled].

Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

3.5 Boot Screen

In this section, it will display the available devices on your system for you to configure the boot settings and the boot priority.



Setup Prompt Timeout

This shows the number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup Num-Lock

If this item is set to [On], it will automatically activate the Numeric Lock function after boot-up.

PCI ROM Priority

Use this item to adjust PCI ROM Priority. The default value is [Legacy ROM].

Boot From Onboard LAN

Use this item to enable or disable the Boot From Onboard LAN feature.

Boot Failure Guard

Enable or disable the feature of Boot Failure Guard.

Boot Failure Guard Count

Use this item to configure Boot Failure Guard Count.

3.6 Security Screen

In this section, you may set, change or clear the supervisor/user password for the system.



3.7 Exit Screen



Save Changes and Exit

When you select this option, it will pop-out the following message, “Save configuration changes and exit setup?” Select [OK] to save the changes and exit the UEFI SETUP Utility.

Discard Changes and Exit

When you select this option, it will pop-out the following message, “Discard changes and exit setup?” Select [OK] to exit the UEFI SETUP Utility without saving any changes.

Discard Changes

When you select this option, it will pop-out the following message, “Discard changes?” Select [OK] to discard all changes.

Load UEFI Defaults

Load UEFI default values for all the setup questions. F9 key can be used for this operation.

Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shell64.efi) from one of the available filesystem devices.

CHAPTER 4: SOFTWARE SUPPORT

4.1 Install Operating System

This motherboard supports various Microsoft® Windows® operating systems: 8/ 8 64-bit/ 7/ 7 64-bit/ Vista™/ Vista™ 64-bit/ XP/ XP 64-bit. Because motherboard settings and hardware options vary, use the setup procedures in this chapter for general reference only. Refer your OS documentation for more information.

4.2 Support CD Information

The Support CD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard's features.

4.2.1 Running The Support CD

To begin using the support CD, insert the CD into your CD-ROM drive. The CD automatically displays the Main Menu if "AUTORUN" is enabled in your computer. If the Main Menu did not appear automatically, locate and double click on the file "ASSETUP.EXE" from the BIN folder in the Support CD to display the menus.

4.2.2 Drivers Menu

The Drivers Menu shows the available device's drivers if the system detects installed devices. Please install the necessary drivers to activate the devices.

4.2.3 Utilities Menu

The Utilities Menu shows the application software that the motherboard supports. Click on a specific item then follow the installation wizard to install it.

4.2.4 Contact Information

If you need to contact NEXCOM or want to know more about NEXCOM, you're welcome to visit NEXCOM's website at <http://www.nexcom.com>; or you may contact your dealer for further information.