NEXCOM International Co., Ltd.

Industrial Computing Solutions

Embedded Computing (Industrial Motherboard)

NEX 613

User Manual

NEXCOM International Co., Ltd.
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www.nexcom.com

Contents

Preface

Copyright

Disclaimer

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Acknowledgements

NEX 613 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B 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 B 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

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 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.

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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 needle-nose 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 this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. CAUTION: 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.

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

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

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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Package Contents

Before continuing, verify that the NEX 613 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	20G00061300X0	ASSY NEX613-DB		1
2	6011100A41X00	NEX 600 Series Inner Box VER:A	303x265x85mm B FLUTE	1
3	6011101ABBX00	NEX 600 Series Outside Carton VER:A	530x305x430mm AB FLUTE 14KG	1
4	6013300092X00	NEX 600 Series EPE	270x255x60mm WHITE	1
5	6012200052X00	PE Zipper Bag #8	170x240mm,W/China RoHS SYMBOL	1
6	60177A0322X00	(N)NEX613 Quick Reference Guide VER:A	KRAMER	1
7	602DCD0701X00	(N)NEX613 DVD Driver VER:1.0		1

Ordering Information

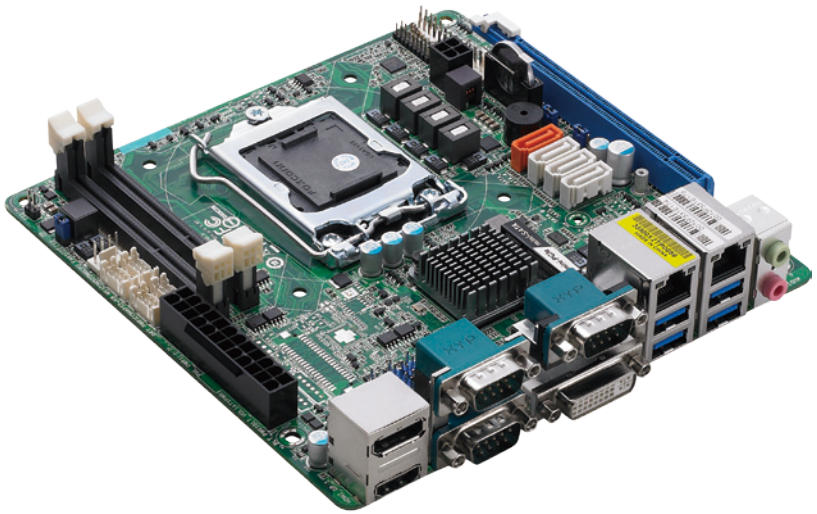
The following information below provides ordering information for NEX 613.

NEX 613-20PBK (P/N: 10G00061300X0)

Bulk-Packed 20x pcs Mini-ITX, LGA1150 of 4th Generation Intel® Core™ i7/i5/i3/ Pentium®/ Celeron® processors, Q87 with 2x DDR3/ SO-DIMM, HDMI/ DP/ DVI-I, PCIe x16/ mPCIe, 4x SATA3.0, 4x USB 3.0/ 8x USB 2.0, 2x GbE, 7x COM, mSATA, and ATX Power Input.

Chapter 1: Product Introduction

Overview



Key Features

- 4th Generation Intel® Core™ processor family
- Intel® Q87 Chipset
- 2x 204-pin SO-DIMM support DDR3 1333/1600Mhz up to 16GB system memory
- Support DisplayPort/ HDMI/ DVI-I three displays
- 2x Intel® GbE, 4x SATA3.0, 1x mSATA, 12x USB3.0/ 2.0, 7x COM, 8x GPIO
- 1x PCIe x16 (Gen. 3.0), 1x mPCIe
- Support AT/ ATX mode by ATX Power Input

Hardware Specifications

CPU Support

- Socket LGA1150, 4th generation Intel® Core™ i7/i5/i3/ Pentium®/ Celeron® processors

Main Memory

- 2x 204-pin SO-DIMM support DDR3 1333/1600Mhz up to 16GB system memory

Chipset

- Intel® Q87 Platform Controller Hub

BIOS

- AMI BIOS UEFI
- Plug and play support

On-board LAN

- 1x Intel® I217LM PHY for AMT 9.0
- 1x Intel® I210 PCI Express Gigabit Ethernet
- Support boot from LAN (PXE)
- 2x RJ45 with LEDs

Display

- 4th generation Intel® Core™ socket LGA1150 processors integrated
- HD 4600 graphics engine
- 1x HDMI
- 1x DisplayPort

Expansion

- 1x PCIex16 (Gen. 3.0)
- 1x mPCIe

I/O Interface

- Serial port: 7 ports
  COM1/2/3: RS232/422/485 with DB9 male connector on edge I/O
  COM4/5/6/7: RS232 2x 5/ 2.54mm box header
- USB 2.0/ 3.0: 12 ports
  4x USB 3.0 ports by edge connectors
  8x USB 2.0 ports by 2x 5-pin header pitch 2.54mm
- GPIO: Support 4x GPI and 4x GPO with TTL level (0/5V)
- Onboard Power LED and HDD Active LED Pin Header
- 1x 4-pin fan connector (for CPU)
- 1x 4-pin fan connector (for System)
- 1x 18-pin header for TPM
- 1x Keyboard/ Mouse pin header
- Onboard Buzzer/ SMBus2.0/ reset SW/ On & Off switch button

Edge I/O Interfaces

- 1x DisplayPort + HDMI
- 2x stack DB9 connector for COM1 & COM2
- 1x DB9 male connector for COM3 + DVI-I connector
- 2x RJ45 with dual stack USB 3.0 (blue)
- Line-out/ MIC-in phone jack

Watchdog Timer

- Watchdog timeout can be programmable by Software from 1 second to 255 seconds and from 1 minute to 255 minutes
  (Tolerance 15% under room temperature 25°C)

Storage

- 4x SATA3.0 ports with RAID 0,1,5,10 function

On-board RTC

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

Power Input

- Support AT and ATX mode

Power Requirements

- Power requirement: ATX Input, jumper AT/ ATX (default) mode
- Onboard 2x 12-pins standard ATX version 2.0 power connector

Dimensions

- Mini-ITX M/B form factor
- 170mm (L) x 170mm (W)

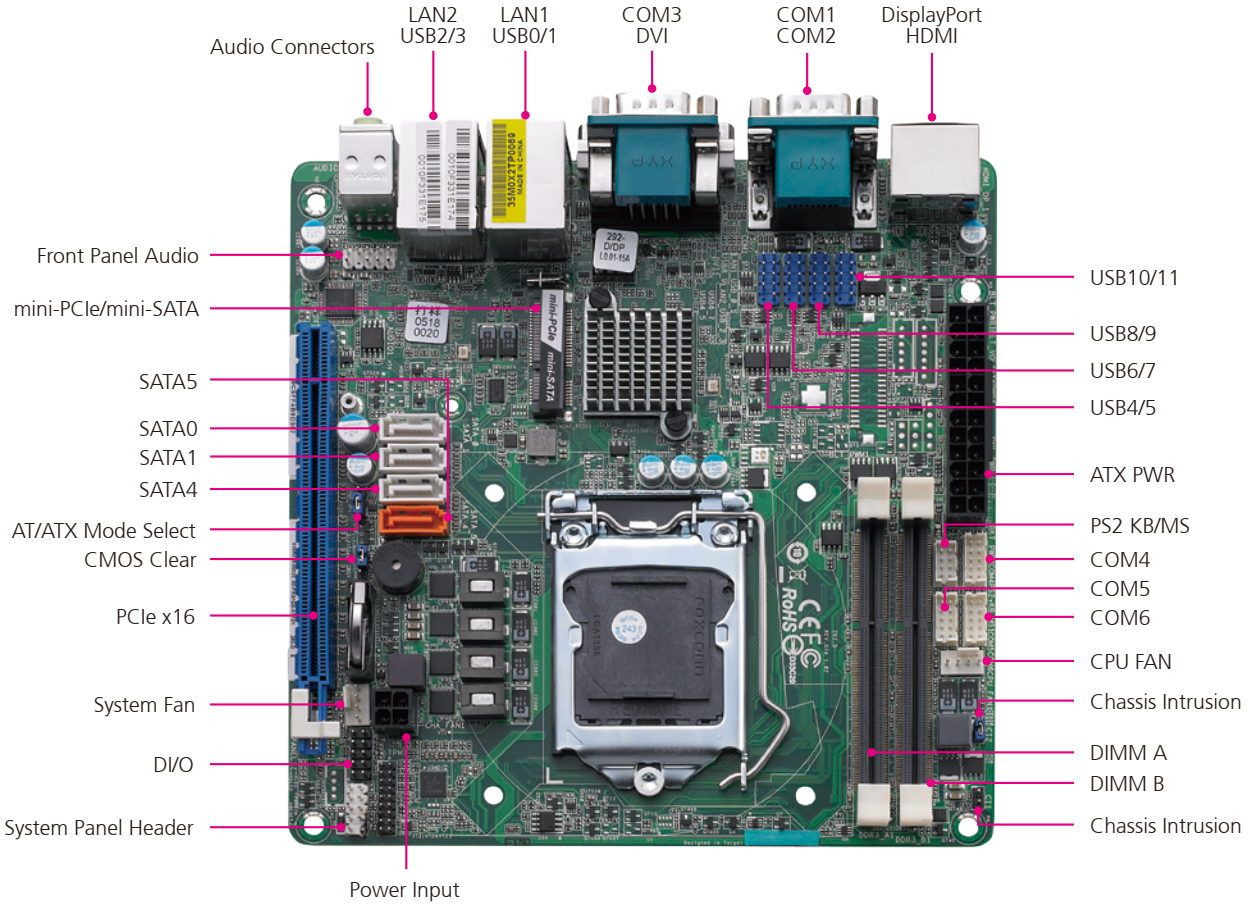
Environment

- Operating temperatures: 0°C to 60°C
- Storage temperature: -20°C to 85°C
- Relative humidity: operating 10% to 90%, non-condensing

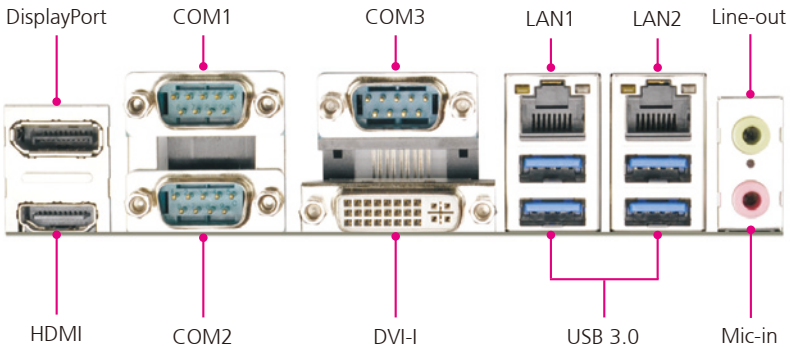
Certifications

- CE approval
- FCC Class A

Knowing Your NEX 613



Edge I/O View



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NEX 613 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 environments 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 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:

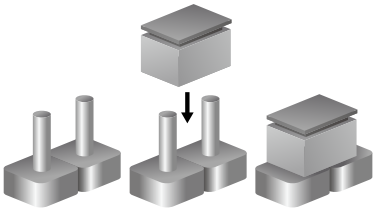
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal 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

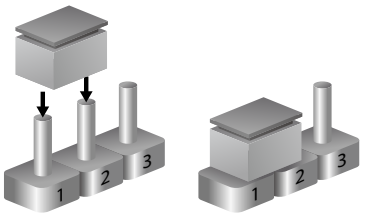
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

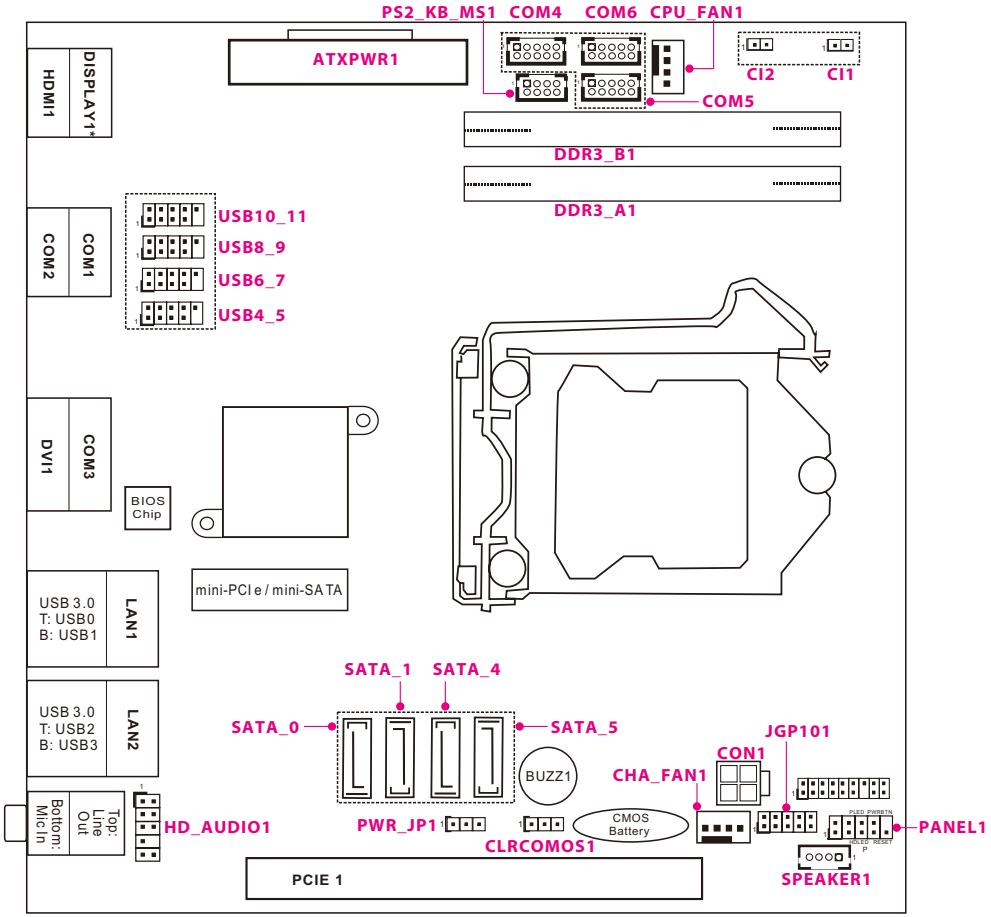


Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors

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



Jumpers

CMOS Clear Select

Connector type: 1x3 3-pin header
Connector location: CLRCOMOS1

Pin	Settings
1-2	Normal
2-3	Clear CMOS

ATX/AT Mode Jumper

Connector type: 1x3 3-pin header
Connector location: PWR_JP1

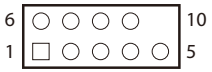
Pin	Settings
1-2	AT Mode
2-3	ATX Mode

Connector Pin Definitions

Internal Connectors

System Panel Header

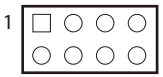
Connector type: 2x5 10-pin header
Connector location: ANEL11



Pin	Definition	Pin	Definition
1	HDLED+	2	HDLED-
3	GND	4	RESET#
5	GND	6	PLED+
7	PLED-	8	PWRBTN#
9	GND	10	

PS2 Keyboard and Mouse Pin Header

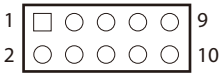
Connector type: 2x4 8-pin header
Connector location: PS2_KB_MS1



Pin	Definition	Pin	Definition
1	KBCLK	2	+5V
3	KBDATA	4	+5V
5	MSDATA	6	GND
7	MSCLK	8	GND

COM4/COM5/COM6: RS-232 Port 4 Pin Headers

Connector type: 2x5 10-pin header
Connector location: COM4, COM5 and COM6



Pin	Definition	Pin	Definition
1	DDCD#1	2	RRXD1
3	TTXD1	4	DDTR#1
5	GND	6	DDSR#1
7	RRTS#1	8	CCTS#1
9	COM PWR	10	NC

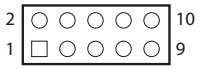
Chassis Intrusion Pin Headers

Connector type: 1x2 2-pin header
Connector location: CI1 and CI2

Pin	Definition
1	Signal
2	GND

Digital Input/Output Pin Headers

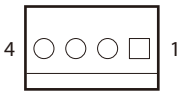
Connector type: 2x5 10-pin header
Connector location: JGP101



Pin	Definition	Pin	Definition
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

4-Pin Chassis Fan Connector

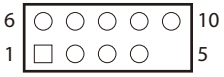
Connector type: 1x4 4-pin header
Connector location: CPU_FAN1 and CHA_FAN1



Pin	Definition	Pin	Definition
1	GND	2	+12V
3	CPU_FAN_SPEED	4	FAN_SPEED_CONTROL

USB2.0 Connectors

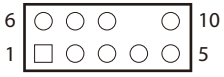
Connector type: 2x5 10-pin header
Connector location: USB4_5, USB6_7, USB8_9 and USB10_11



Pin	Definition	Pin	Definition
1	PWR	2	-
3	+	4	GND
5		6	PWR
7	-	8	+
9	GND	10	NC

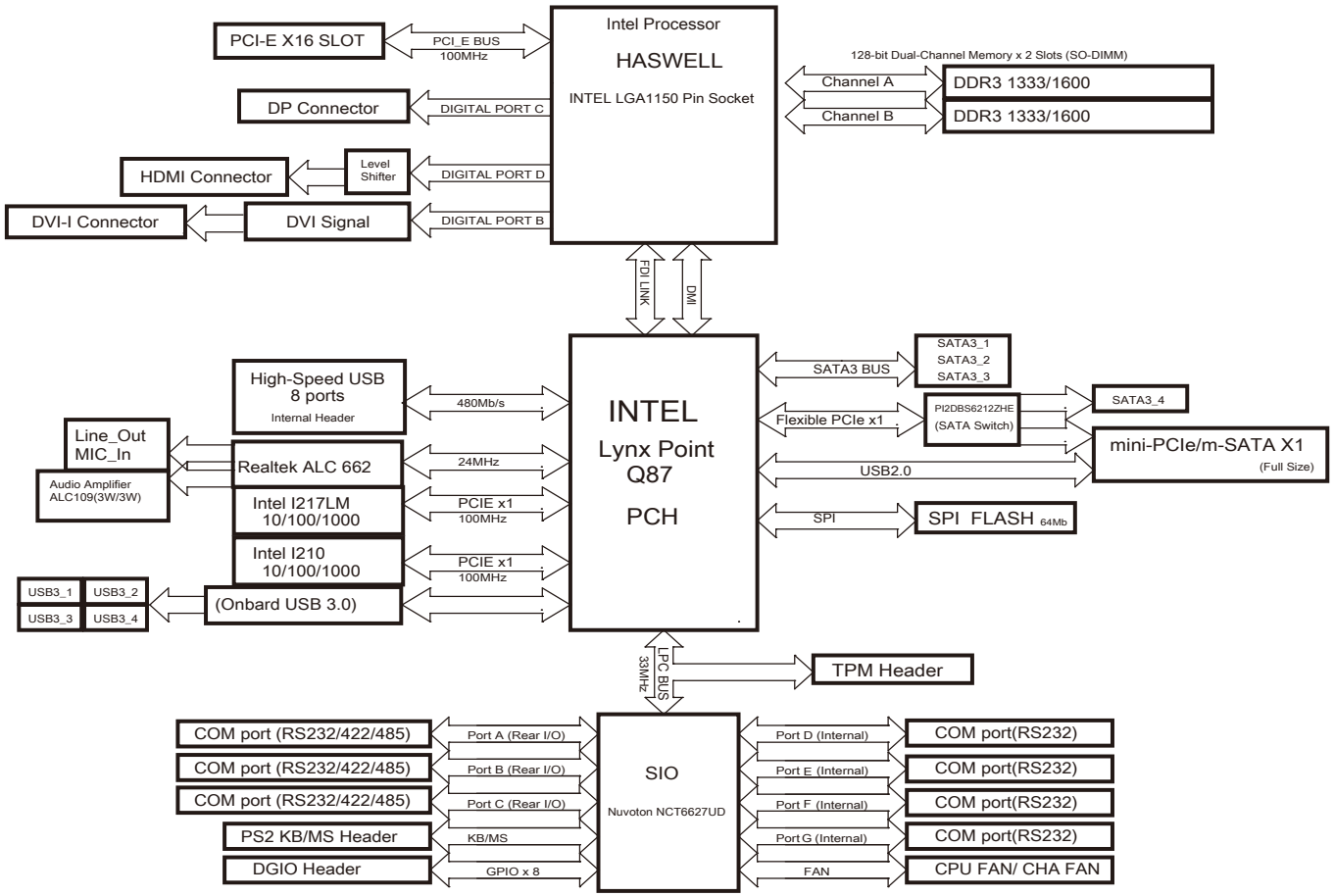
Front Panel Audio Header

Connector type: 2x5 10-pin header
Connector location: HD_AUDIO1



Pin	Definition	Pin	Definition
1	MIC2_L	2	MIC2_R
3	OUT2_R	4	J_SENSE
5	OUT2_L	6	GND
7	PRESENCE#	8	MIC_RET
9		10	OUT_RET

Block Diagram



Chapter 3: BIOS Setup

This chapter describes how to use the BIOS setup program for the NEX 613. 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.

Press the 

key to enter Setup:

Legends

Key	Function
	Moves the highlight left or right to select a menu.
	Moves the highlight up or down between sub-menu or fields.
	Exits the BIOS Setup Utility.
	Scrolls forward through the values or options of the highlighted field.
	Scrolls backward through the values or options of the highlighted field.
	Selects a field.
	Displays General Help.
	Load previous values.
	Load optimized default values.
	Saves and exits the Setup program.
	Press <Enter> to enter the highlighted sub-menu

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 

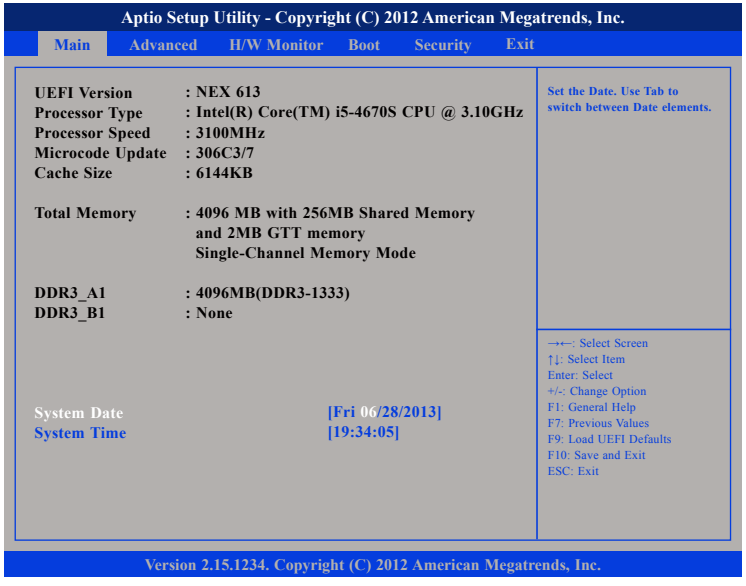
.

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 several setup functions and one exit. 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.



System Date

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

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.

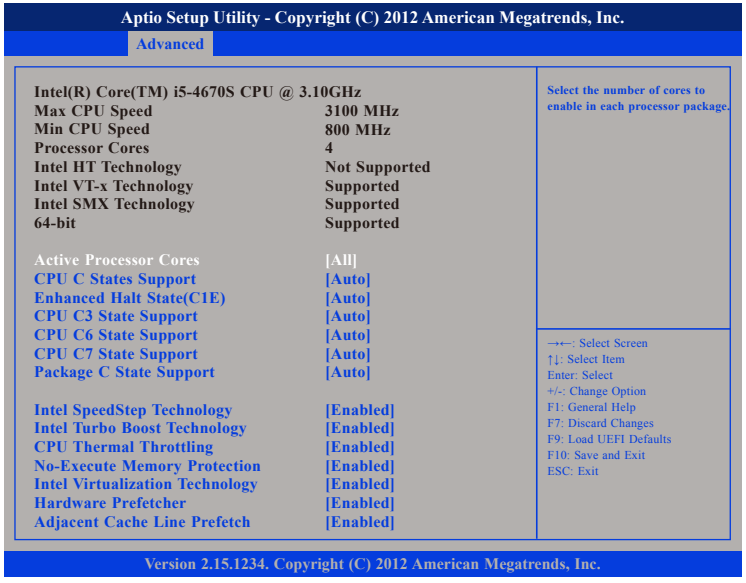
Advanced

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.

CPU Configuration

This section is used to configure the CPU.



Active Processors Cores
Select the number of cores to enable in each processor package.

CPU C States Support
Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Enhanced Halt State (C1E)
Enable Enhanced Halt State (C1E) for lower power consumption.

CPU C3 State Support
Used to enable or disable CPU C3 (ACPI C2) report to OS.

CPU C6 State Support
Used to enable or disable CPU C6 (ACPI C6) report to OS.

CPU C7 State Support
Used to enable or disable CPU C7 (ACPI C7) report to OS.

Package C State Support
Selected option will program into C State package limit register.

Intel® SpeedStep Technology
Enables or disables Intel® SpeedStep.

Intel® Turbo Boost Technology
Enables or disables Intel® Turbo Boost.

CPU Thermal Throttling
Enables or disables internal thermal control of the CPU to prevent overheating.

No-Execute Memory Protection
Enables or disables No-Execute Memory Protection, enabling it will prevent data pages from being used by malicious software.

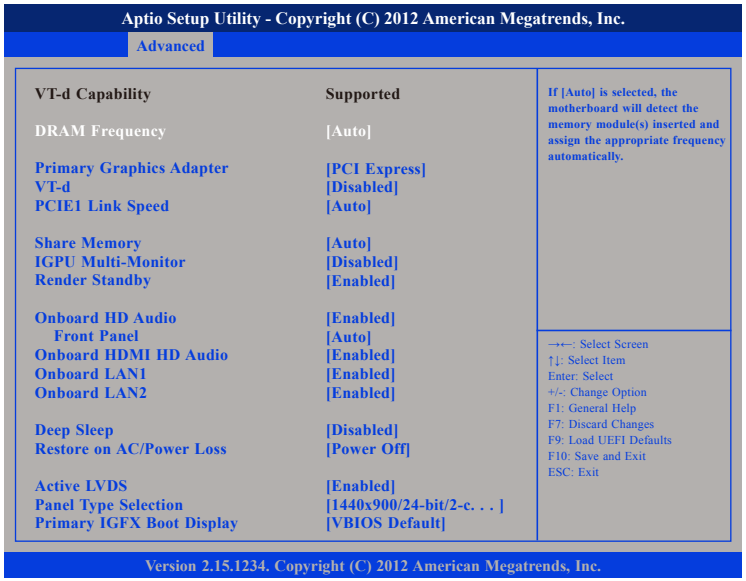
Intel® Virtualization Technology
When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher
Turns on or off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch
Enables or disables the adjacent cache line prefetch.

Chipset Configuration

This section is used to configure the chipset features.



DRAM Frequency
Select Auto to automatically set DRAM frequency.

Primary Graphics Adapter
Selects which primary graphics adapter to boot the system.

VT-d
Enables or disables Intel® VT-d technology.

PCIE1 Link Speed
Configures the PCIE1 link speed.

Share Memory
Configures the amount of memory shared to the onboard graphics.

IGPU Multi-Monitor
Enables or disables the onboard graphics.

Render Standby
Enables or disables render standby of onboard graphics.

Onboard HD Audio
Enables or disables the onboard HD audio, setting auto will automatically disable the onboard HD audio when an external sound card is installed.

Front Panel
Enables or disables the onboard HD audio front panel.

Onboard HDMI HD Audio
Enables or disables the onboard HDMI HD audio.

Onboard LAN1 to LAN2
Enables or disables onboard LAN1 and LAN2.

Deep Sleep
Enables or disables deep sleep (S4/S5). Deep sleep for mobile platforms is supported in DC only, and supported in AC only for desktop platforms.

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.

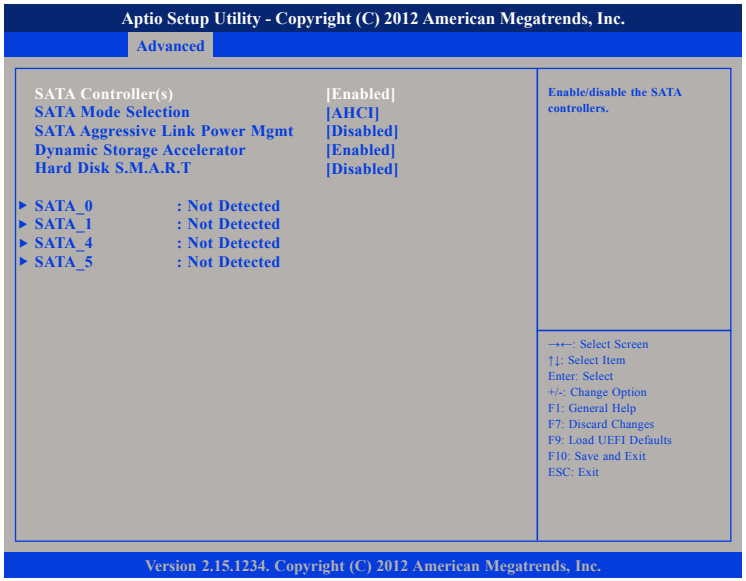
Active LVDS
Enables or disables LVDS.

Panel Type Select
Selects the panel type used by the onboard graphics by selecting the appropriate setup item.

Primary IGFX Boot Display
Select the video device which will be activated during POST. Has no effect if external graphics is present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display.

Storage Configuration

This section is used to configure the storage features.



SATA Controller(s)
Enables or disables the SATA controller.

SATA Mode Selection
Configures the SATA as IDE, AHCI or RAID mode.

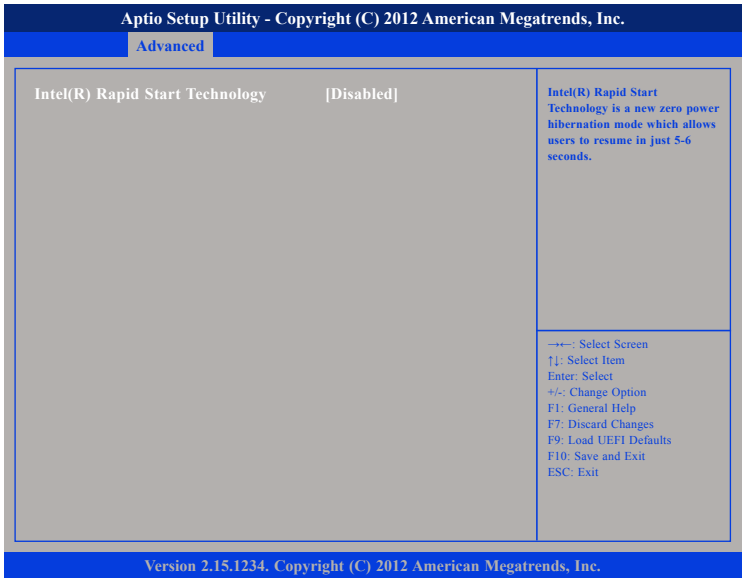
IDE This option configures the Serial ATA drives as Parallel ATA physical storage device.
RAID This option allows you to create RAID or Intel Matrix Storage configuration on Serial ATA devices.
AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

SATA Aggressive Link Power Management
Enables or disables the SATA aggressive link power management.

Dynamic Storage Accelerator
Enables or disables dynamic storage accelerator, enabling it will increase HDD and SSD I/O performance.

Hard Disk S.M.A.R.T
Enables or disables hard disk S.M.A.R.T feature.

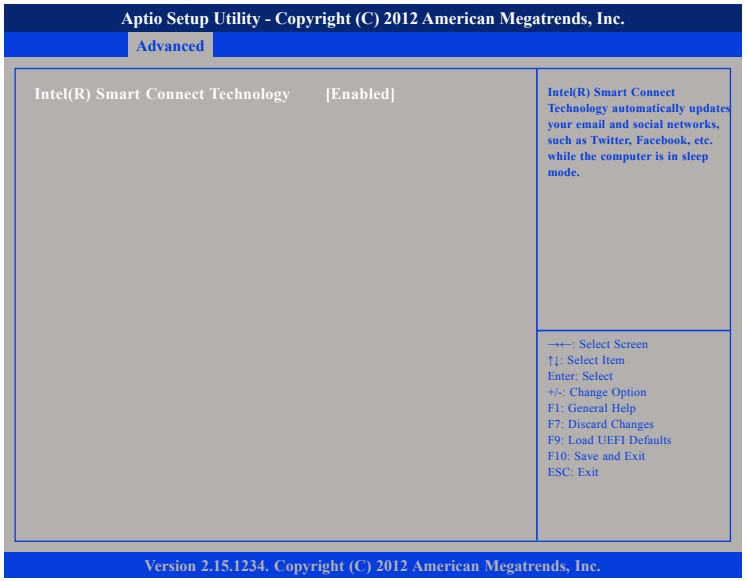
Intel® Rapid Start Technology



Intel® Rapid Start Technology

Enables or disables 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.

Intel® Smart Connect Technology

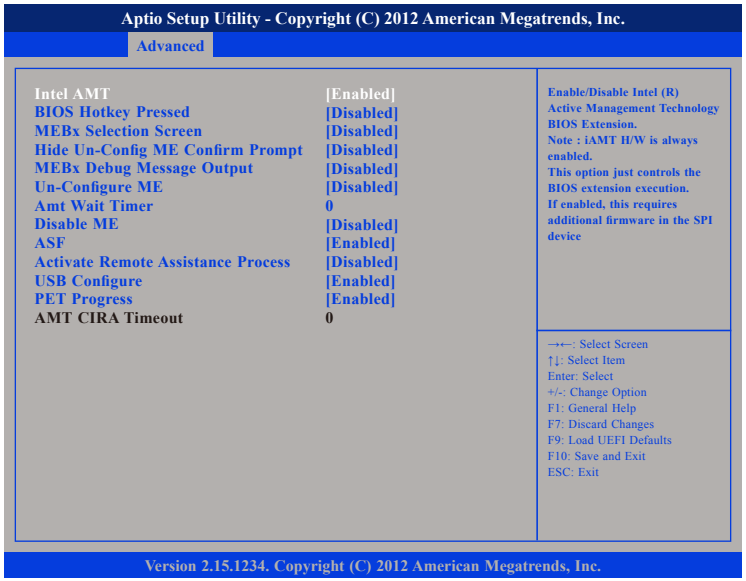


Intel® Smart Connect Technology

Enables or disables 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.

Intel® AMT Technology

This section is used to configure the AMT function.



Intel® AMT
Enables or disables Intel® Active Management Technology.

BIOS Hotkey Pressed
Enables or disables BIOS hotkey pressed.

MEBx Selection Screen
Enables or disables MEBx selection screen.

Hide Un-Configure ME Confirm Prompt
Hide Un-Configure ME without password confirmation prompt.

MEBx Debug Message Output
Enables or disables MEBx debug message output.

Un-Configure ME
Enables or disables Un-configure ME without password.

AMT Wait Timer
Set timer to wait before sending ASF_GET_BOOT_OPTIONS.

Disable ME
Set ME to Soft Temporary Disabled.

ASF
Enables or disables alert specification format.

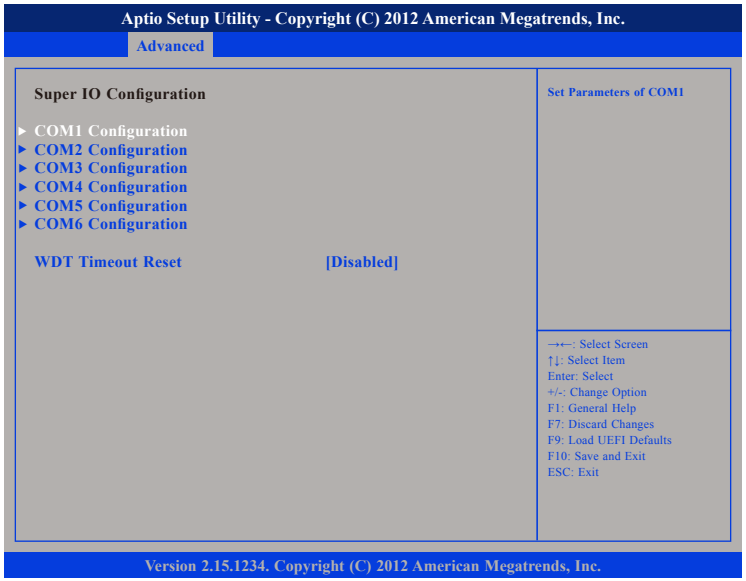
Activate Remote Assistance Process
Enables or disables Trigger CIRA boot.

USB Configure
Enables or disables USB configure function.

PET Progress
Enables or disables PET Events progress to receive PET event.

Super IO Configuration

This section is used to configure the serial ports.



COM1 to COM6 Configuration

Configures the parameters of COM1 to COM6.

WDT Timeout Reset

Enables or disables the Watchdog Timer timeout to reset the system.

ACPI Settings

This section is used to configure ACPI settings.

Suspend to RAM

Select disable for ACPI suspend type S1. It is recommended to select auto for ACPI S3 power saving.

Check Ready Bit

Enables or disables Check Ready Bit.

ACPI HPET Table

Enables or disables ACPI HPET Table.

PS/2 Keyboard Power On
Enables or disables PS/2 keyboard to turn on the system from the power-soft-off mode.

PCI Devices Power On
Enables or disables PCI devices to turn on the system from the power-soft-off mode.

Wake From Onboard LAN 2
Enables or disables wake up from onboard LAN 2.

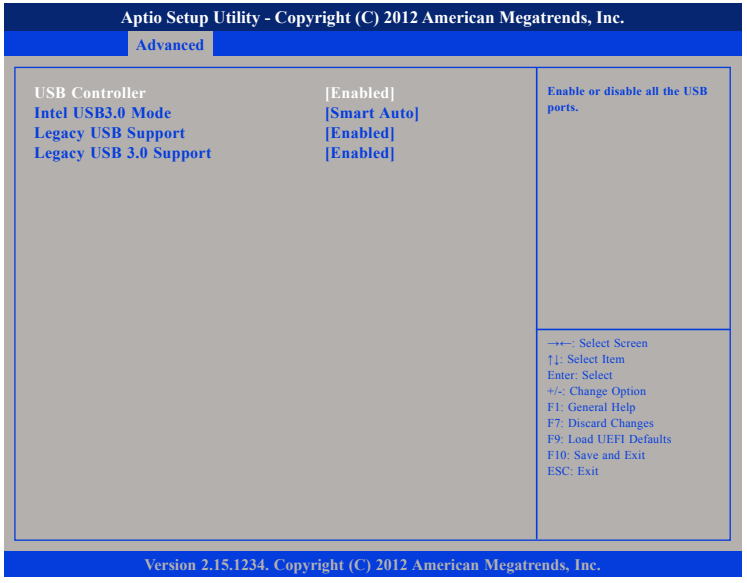
RTC Alarm Power On
Enables or disables real time clock (RTC) to power on the system.

USB Keyboard/Remote Power On
Enables or disables USB Keyboard/Remote to power on the system.

USB Mouse Power On
Enables or disables USB mouse to power on the system.

USB Configuration

This section is used to configure the USB.



USB Controller
Enables or disables all the USB ports.

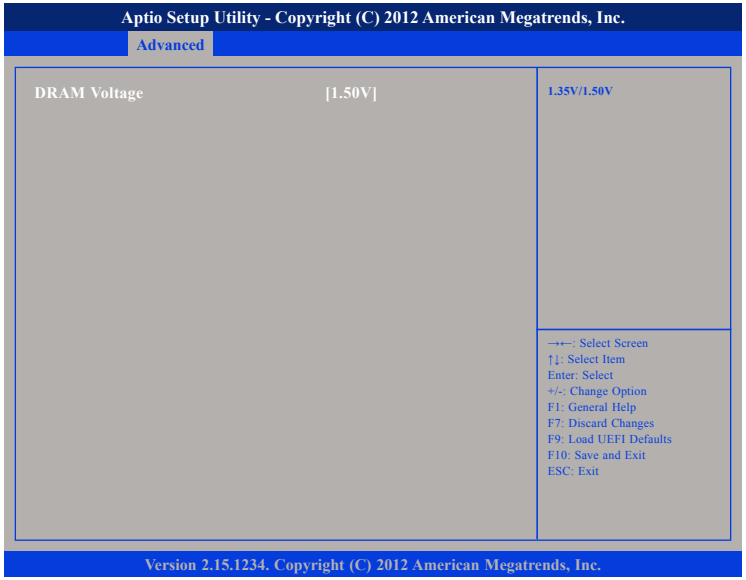
Intel® USB3.0 Mode
Enables or disables USB 3.0 mode.

Legacy USB Support
Enabled Enables Legacy USB.
Auto Disables support for Legacy when no USB devices are connected.
Disabled Keeps USB devices available only for EFI applications.

Legacy USB 3.0 Support
Enables or disables legacy support for USB 3.0 devices.

Voltage Configuration

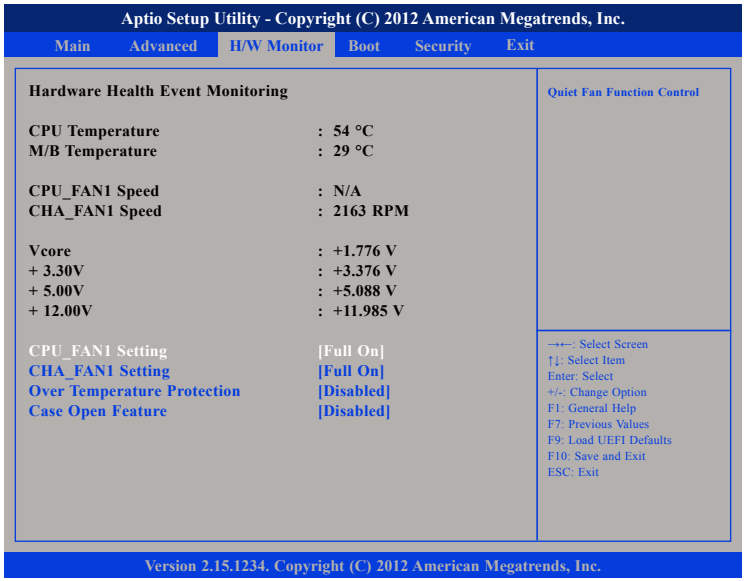
This section is used to configure the DRAM voltage.



DRAM Voltage
Selects the DRAM voltage value.

H/W Monitor

This section is used to monitor hardware status such as temperature, fan speed and voltages.



CPU Temperature
Detects and displays the current CPU temperature.

M/B Temperature
Detects and displays the current motherboard temperature.

CPU_FAN1 Speed
Detects and displays CPU_FAN1 speed.

CHA_FAN1 Speed
Detects and displays CHA_FAN1 speed.

Vcore
Detects and displays the Vcore CPU voltage.

+ 3.30V
Detects and displays 3.3V voltage.

+ 5.00V
Detects and displays 5V voltage.

+ 12.00V
Detects and displays 12V voltage.

CPU_FAN1 Setting
Configures the speed of the CPU fan.

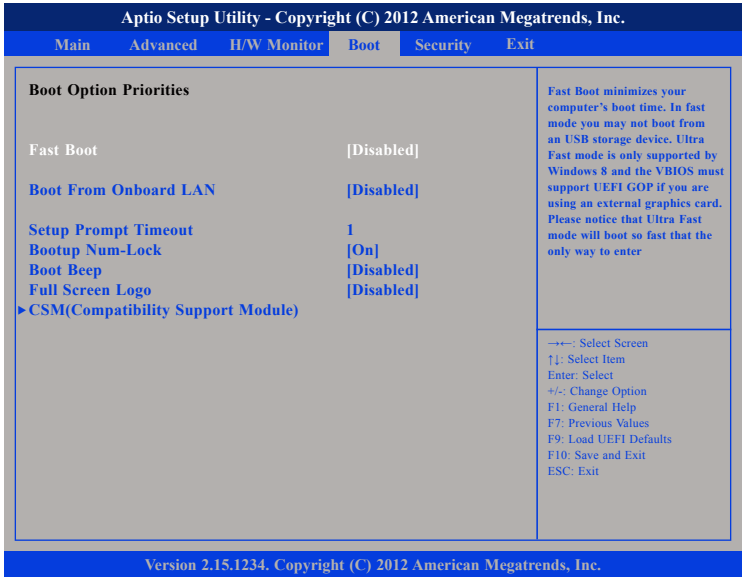
CHA_FAN1 Setting
Configures the speed of the chassis fan.

Over Temperature Protection
Enables or disables Over Temperature Protection.

Case Open Feature
Enables or disables the case open detection feature.

Boot

This section is used to configure the boot features.



Fast Boot

Fast boot minimizes your computer's boot time. The options are Disabled, Fast and Ultra Fast. In fast mode you may not boot from an USB storage device. Ultra Fast mode is only supported by Windows 8 and the VBIOS must support UEFI GOP if you are using an external graphics card.

Boot From Onboard LAN

Enables or disables Boot From Onboard LAN.

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0XFFFF) means indefinite waiting.

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.

Boot Beep

Enables or disables beep sound during system boot, a buzzer is needed.

Full Screen Logo

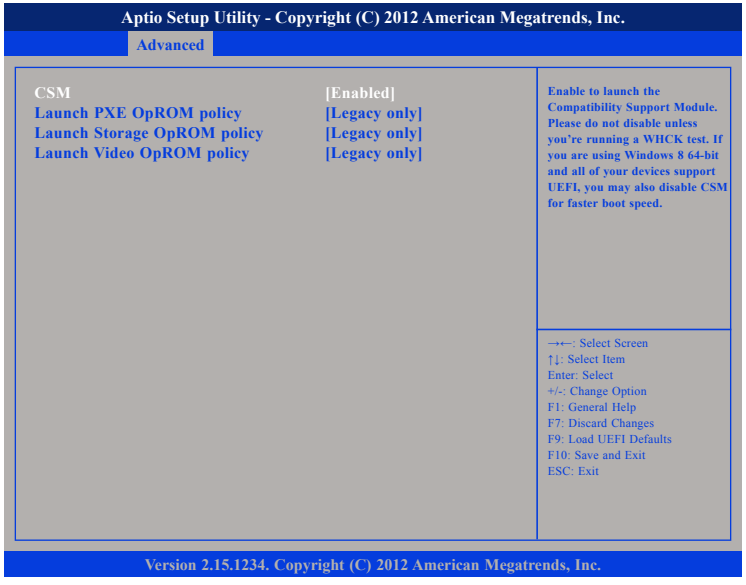
Enables or disables the display of OEM logo.

CSM (Compatibility Support Module)

Configuration for CSM, please disable CSM when Fast Boot is enabled.

Compatibility Support Module (CSM) Configuration

This section is used to configure the compatibility support module features.



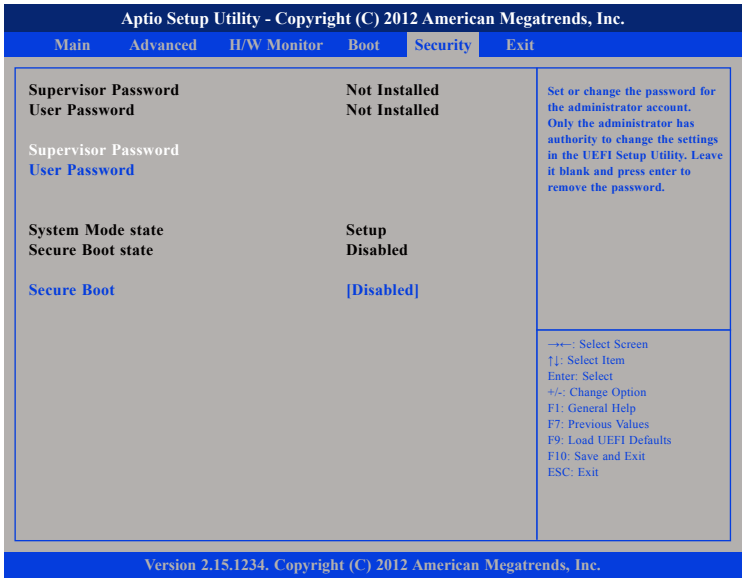
CSM
Enables or disables CSM. Enabled to launch the Compatibility Support Module. Please do not disable unless a WHCK test is running. If Windows 8 64-bit is used and all the devices support UEFI, CSM may be disabled for faster boot speed.

Launch PXE OpROM Policy
Enables or disables the boot option for legacy network devices.

Launch Storage OpROM Policy
Enables or disables the boot option for legacy storage devices.

Launch Video OpROM Policy
Enables or disables the boot option for legacy video devices.

Security



Administrator Password
Select this to reconfigure the administrator's password.

User Password
Select this to reconfigure the user's password.

Secure Boot
Enables or disables Secure Boot.

Exit

Save Changes and Exit
To save the changes and exit, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

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.

Discard Changes
To discard all the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Load UEFI Defaults
To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.