



**NEXCOM International Co., Ltd.**

**Intelligent Platform & Services Business Unit**  
**Embedded Computing (Industrial Motherboard)**  
**NEX 913**  
User Manual

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# PREFACE

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## Acknowledgements

NEX 913 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 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 2011/65/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 2013 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.

### 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 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 the equipment from any AC outlet before cleaning or installing a component inside the chassis. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. To prevent electrostatic build-up, leave the board in its anti-static bag until you are ready to install it.
5. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
6. Keep the board away from humidity.
7. Put the board on a stable surface. Dropping it or letting it fall may cause damage.
8. Wear anti-static wrist strap.
9. Do all preparation work on a static-free surface.
10. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
11. Hold the board only by its edges. Be careful not to touch any of the components, contacts or connections.
12. All cautions and warnings on the board should be noted.
13. Use the correct mounting screws and do not over tighten the screws.
14. 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](http://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.

## 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

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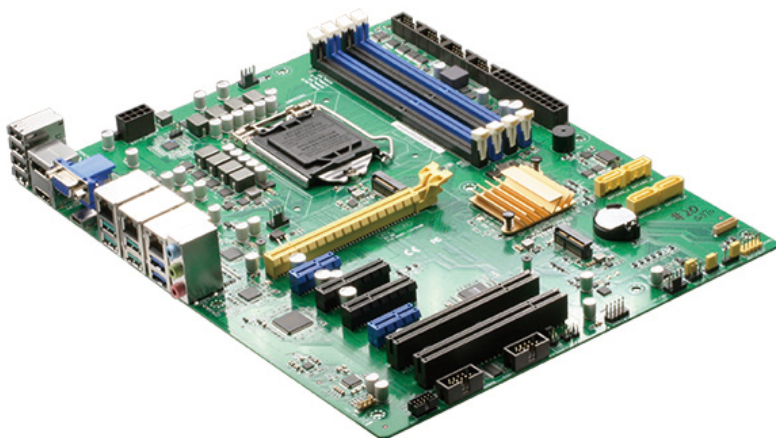
## Package Contents

Before continuing, verify that the NEX 913 package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	NEX 913 Motherboard	1
2	SATA Cable	1
3	Driver CD	1
4	I/O Shield	1

# CHAPTER 1: PRODUCT INTRODUCTION

## Overview



## Key Features

- Support socket LGA1151 for 8th/9th generation Intel® Core™ processors
- Support a maximum of 95W power
- DDR4 2666/2400/2133 MHz, up to 64GB max.
- Support three independent displays: HDMI x 1, VGA x 1, DP x 1, USB Type-C x 1 (optional)
- Dual Intel® Gigabit Ethernet, I211AT x 1 (optional I211AT x 2), I219LM x 1
- USB 3.1 Gen2 ports x 4, USB 3.1 Gen1 ports x 2, USB 2.0 ports x 4
- M.2 E-key (PCIe x1/USB 2.0/CNVi) x 1, M.2 M-key (PCIe x4/SATA3) x 1
- Onboard TPM (optional)

## Hardware Specifications

### CPU Support

- Socket LGA1151, 8th/9th generation Intel® Core™ i9/i7/i5/i3 processors and Intel® Pentium® processors, max. 95W.

### Chipset

- Intel® Q370 Express Chipset

### Main Memory

- 4 x DIMMs, support DDR4 2666/2400/2133 MHz up to 64GB max., non-ECC, un-buffered system memory, dual channel memory architecture

### BIOS

- AMI BIOS
- 1 x 256Mbit Flash ROM

### Ethernet

- Intel® PHY I219LM GbE LAN x 1 (supports Intel® AMT 12.0)
- Intel® I211AT GbE LAN x 1 (BOM optional: I211AT x 2)
- RJ45 x 2 (BOM optional: RJ45 x 3)

### Display

- 1 x HDMI connector (resolution up to 4096 x 2160 @ 24Hz or 2560 x 1600 @ 60 Hz)
- 1 x DisplayPort connector (resolution up to 4096 x 2160 @ 24 Hz or 3840 x 2160 @ 60 Hz)
- 1 x VGA (resolution up to 1920 x 1200 @ 60Hz)

### Expansion Slots

- 1 x PCIe 3.0 x16, 2 x PCIe 3.0 x4 (open edge), 2 x PCIe 3.0 x1 (open edge), 2 x PCI
- 1 x M.2 2230 E-key (PCIe x1/USB 2.0/CNVi)
- 1 x M.2 2280 M-key (PCIe x4/SATA3)

### Edge I/O Interfaces

- 1 x HDMI
- 1 x VGA
- 1 x DisplayPort
- 1 x USB Type-C (optional)
- 4 x USB 3.1 Gen2 ports (10 Gbps)
- 2 x USB 3.1 Gen1 ports (5 Gbps)
- 4 x USB 2.0 ports
- 2 x RJ45 connectors (BOM optional 3 x RJ45)
- 1 x Audio Jack: Line-in/Line-out/Mic-in

### I/O Interfaces

- Storage: 4 x SATA III (6.0Gb/s) ports, support RAID 0/1/5/10; 1 x M.2 2280 M-key (PCIe x4/SATA3)
- USB: 1 x USB 2.0 header, supports additional 2 USB ports (2x5-pin header, pitch=2.54mm)
- Serial: 5 x RS-232 headers; 1 x RS-232/422/485 (COM1, supports 5V/12V/RI optional)
- GPIO: 1 x 8-bit digital I/O interface (in/out programmable)

## Interfaces

- 1 x 4-pin CPU fan connector; 2 x 4-pin chassis fan connectors
- 1 x Chassis Intrusion
- 1 x AT/ATX mode select jumper
- 1 x Front panel header; 1 x clear CMOS jumper
- 1 x Speaker header (line-out)

## System Monitor

- 4 voltages (for +3.3V, +5V, +12V and Vcore)
- 2 temperatures (CPU and system temperature)
- 2 fan speeds (CPU and system fan)

## Power Requirements

- 1 x 24-pin ATX connector,
- 1 x 8-pin ATX 12V power connector

## Dimensions

- ATX form factor
- Dimension: 305mm (L) x 244mm (W) (12" x 9.6")

## Environment

- Board level operating temperatures: 0°C to 60°C
- Storage temperatures: -40°C to 85°C
- Relative humidity:
  - 0% to 90% (operating, non-condensing)

## Certifications

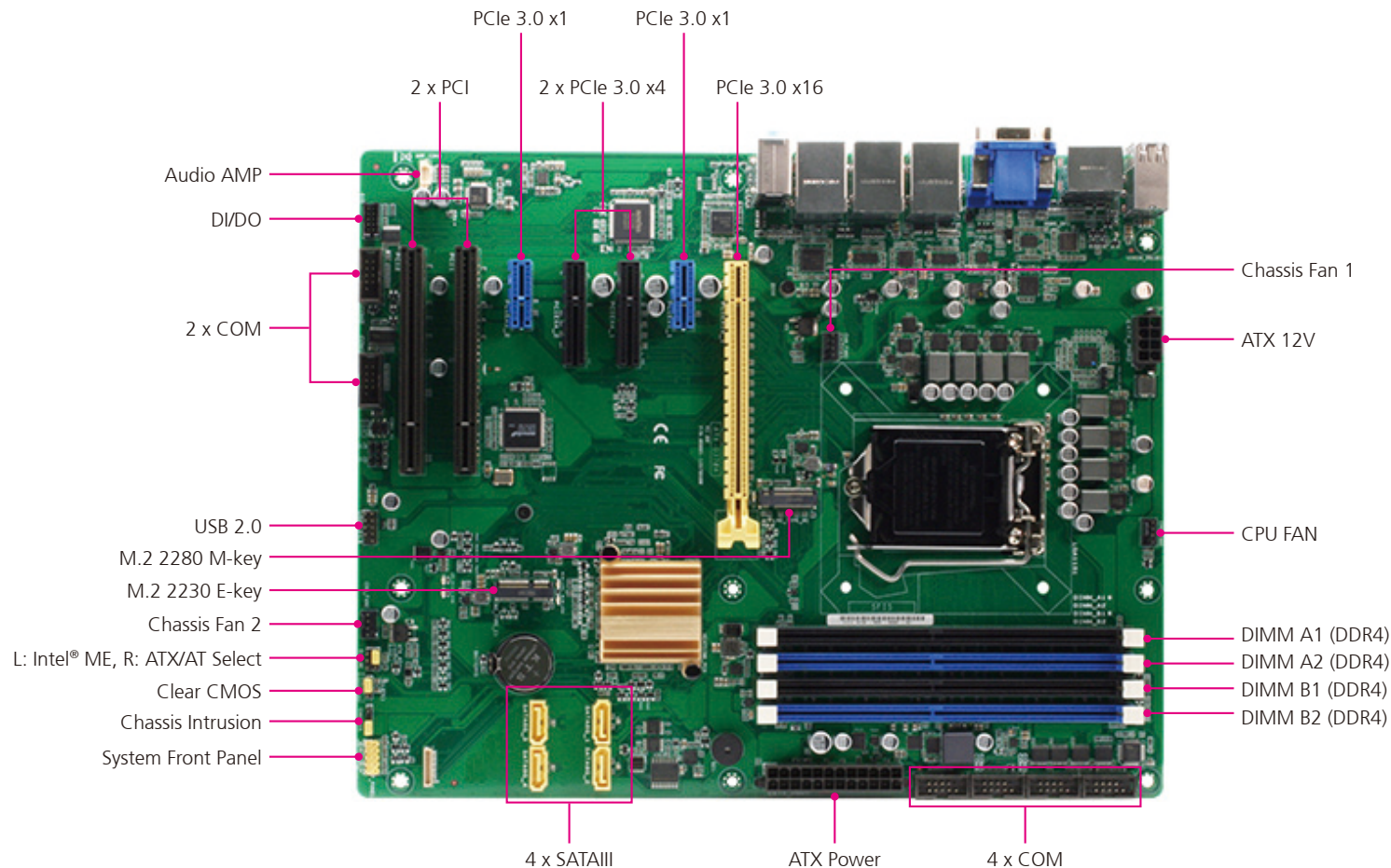
- Meet CE/FCC Class A

## Operating System Support

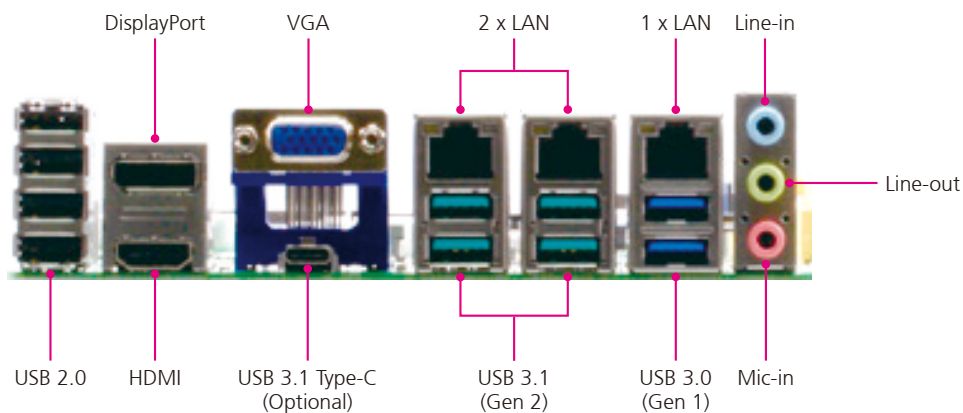
- Windows® 10 64-bit
- Linux Ubuntu 64-bit (18.04.1/Kernel 4.8.0)



## Knowing Your NEX 913



## Edge I/O View



## CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the NEX 913 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:

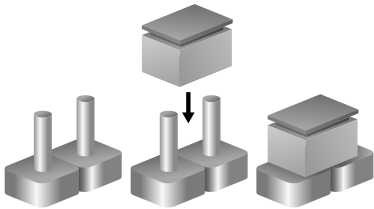
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

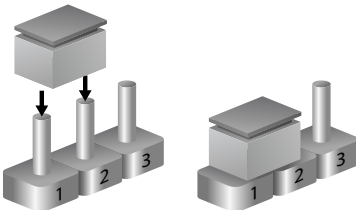
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

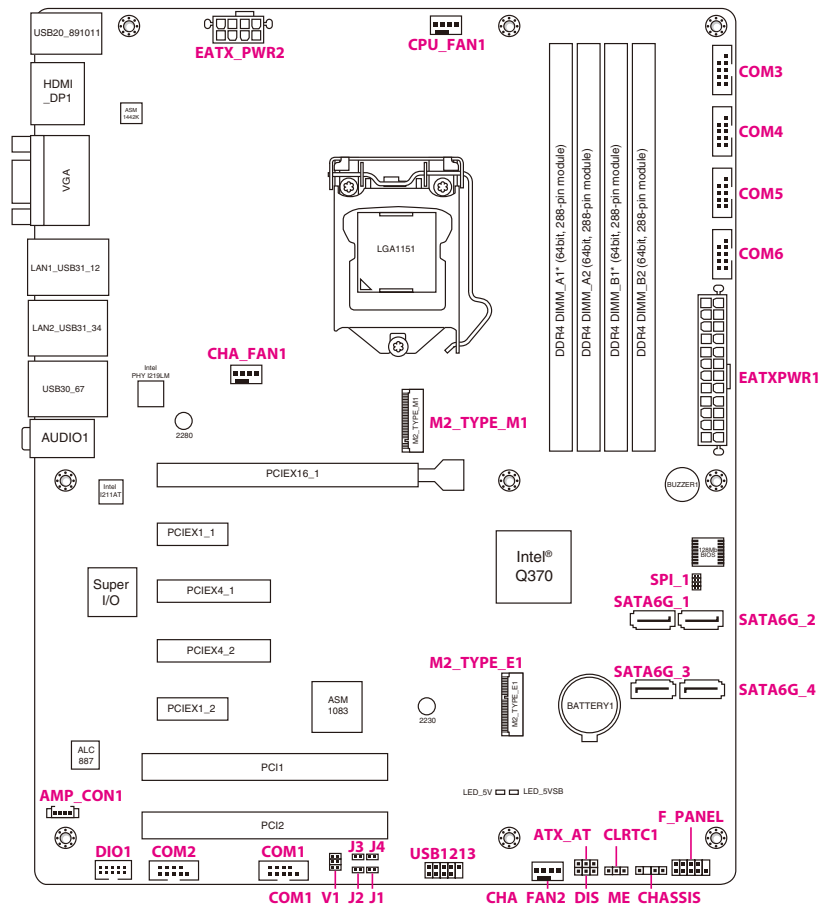


Three-Pin Jumpers: Pins 1 and 2 are Short



## Locations of the Jumpers and Connectors

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





# Jumpers

## CMOS Clear Selection

Connector type: 1x3 3-pin header  
Connector location: CLRTC1

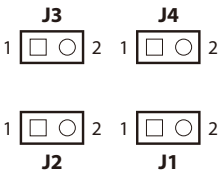


Pin	Settings
1-2 On	Normal
2-3 On	Clear CMOS

1-2 On: default

## COM1 RS422/485 Terminator

Connector type: 1x2 2-pin header  
Connector location: J1, J2, J3 and J4



Pin	Settings
J1, J2, J3, J4 All Off	RS232
J1, J2, J3, J4 All On	RS485/RS422 with terminator

J1, J2, J3, J4 On: default



### AT/ATX Mode Selection

Connector type: 1x3 3-pin header  
Connector location: ATX\_AT



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

1-2 On: default

### Chassis Intrusion

Connector type: 1x4 4-pin header  
Connector location: CHASSIS



Pin	Definition
1	+5VSB_MB
2	NA
3	Chassis Signal
4	GND

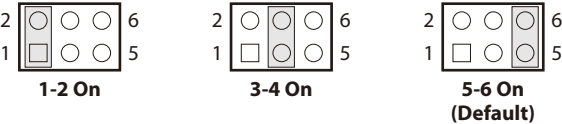
3-4 On: default





### COM1 Ring/+5V/+12V Selection

Connector type: 2x3 6-pin header  
Connector location: COM1\_V1



Pin	Definition
1-2 On	+12V
3-4 On	+5V
5-6 On	Ring

5-6 On: default

### Intel® ME

Connector type: 1x3 3-pin header  
Connector location: DIS\_ME



Pin	Settings
1-3 Off	Enable ME Flash Security
1-2 On	Enable ME Flash Security
2-3 On	Disable ME Flash Security

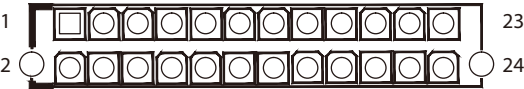
1-3 Off: default



# Connector Pin Definitions

## 24-pin ATX Power Connector

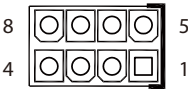
Connector type: 2x12 24-pin boxed header  
Connector location: EATX\_PWR1



Pin	Definition	Pin	Definition
1	+3 Volts	2	+3 Volts
3	+3 Volts	4	-12 Volts
5	GND	6	GND
7	+5 Volts	8	PSON#
9	GND	10	GND
11	+5 Volts	12	GND
13	GND	14	GND
15	Power OK	16	-5 Volts
17	+5V Standby	18	+5 Volts
19	+12 Volts	20	+5 Volts
21	+12 Volts	22	+5 Volts
23	+3 Volts	24	GND

## 8-pin ATX Power Connector

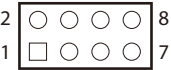
Connector type: 2x4 8-pin boxed header  
Connector location: EATX\_PWR2



Pin	Definition	Pin	Definition
1	GND	2	+12V
3	GND	4	+12V
5	GND	6	+12V
7	GND	8	+12V

BIOS Programmable Connector

Connector type: 2x4 8-pin header  
Connector location: SPI\_1



Pin	Definition	Pin	Definition
1	+3V_SPI	2	GND
3	SPI_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	NC	8	NC

CPU Fan Connector

Connector type: 1x4 4-pin header  
Connector location: CPU\_FAN1



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



### Chassis Fan Connectors

Connector type: 1x4 4-pin header  
Connector location: CHA\_FAN1 and CHA\_FAN2



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

### Audio Amplifier Connector

Connector type: 1x4 4-pin header  
Connector location: AMP\_CON1

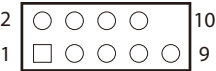


Pin	Definition	Pin	Definition
1	ROUTP	2	ROUTN
3	LOUTN	4	LOUTP



System Panel Connector

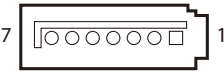
Connector type: 2x5 10-pin header  
Connector location: F\_PANEL



Pin	Definition	Pin	Definition
1	HDD_LED+	2	P_LED+
3	HDD_LED-	4	P_LED-
5	GND	6	PWRBTN#
7	RSTCON#	8	GND
9	NC	10	

Serial ATA 6.0Gb/s Connector 1

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)  
Connector location: SATA6G\_1



Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP1
3	RSATA_TXN1	4	GND
5	RSATA_RXN1	6	RSATA_RXP1
7	GND		

Serial ATA 6.0Gb/s Connector 2

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)  
Connector location: SATA6G\_2



Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP2
3	RSATA_TXN2	4	GND
5	RSATA_RXN2	6	RSATA_RXP2
7	GND		

Serial ATA 6.0Gb/s Connector 3

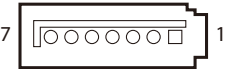
Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)  
Connector location: SATA6G\_3



Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP3
3	RSATA_TXN3	4	GND
5	RSATA_RXN3	6	RSATA_RXP3
7	GND		

Serial ATA 6.0Gb/s Connector 4

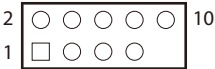
Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)  
Connector location: SATA6G\_4



Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP4
3	RSATA_TXN4	4	GND
5	RSATA_RXN4	6	RSATA_RXP4
7	GND		

USB 2.0 Connectors

Connector type: 2x5 10-pin header  
Connector location: USB1213



Pin	Definition	Pin	Definition
1	+5V_USB	2	+5V_USB
3	USB2_DN13	4	USB2_DN12
5	USB2_DP13	6	USB2_DP12
7	GND	8	GND
9		10	NC



### COM1 Internal Serial Port Connector

Connector type: 2x5 10-pin header  
Connector location: COM1



Pin	Definition	Pin	Definition
1	DCD# (422TXD-/485TXD-)	2	RXD (422TXD+/485TXD+)
3	TXD (422RXD+)	4	DTR# (422RXD-)
5	GND	6	DSR#
7	RTS#	8	CTS#
9	Ring/+5V/+12V	10	

### COM2 to COM6 Internal Serial Port Connectors

Connector type: 2x5 10-pin header  
Connector location: COM2, COM3, COM4, COM5 and COM6



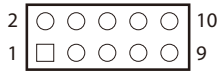
Pin	Definition	Pin	Definition
1	DCD#	2	RXD
3	TXD	4	DTR#
5	GND	6	DSR#
7	RTS#	8	CTS#
9	Ring	10	





## Digital I/O Connector

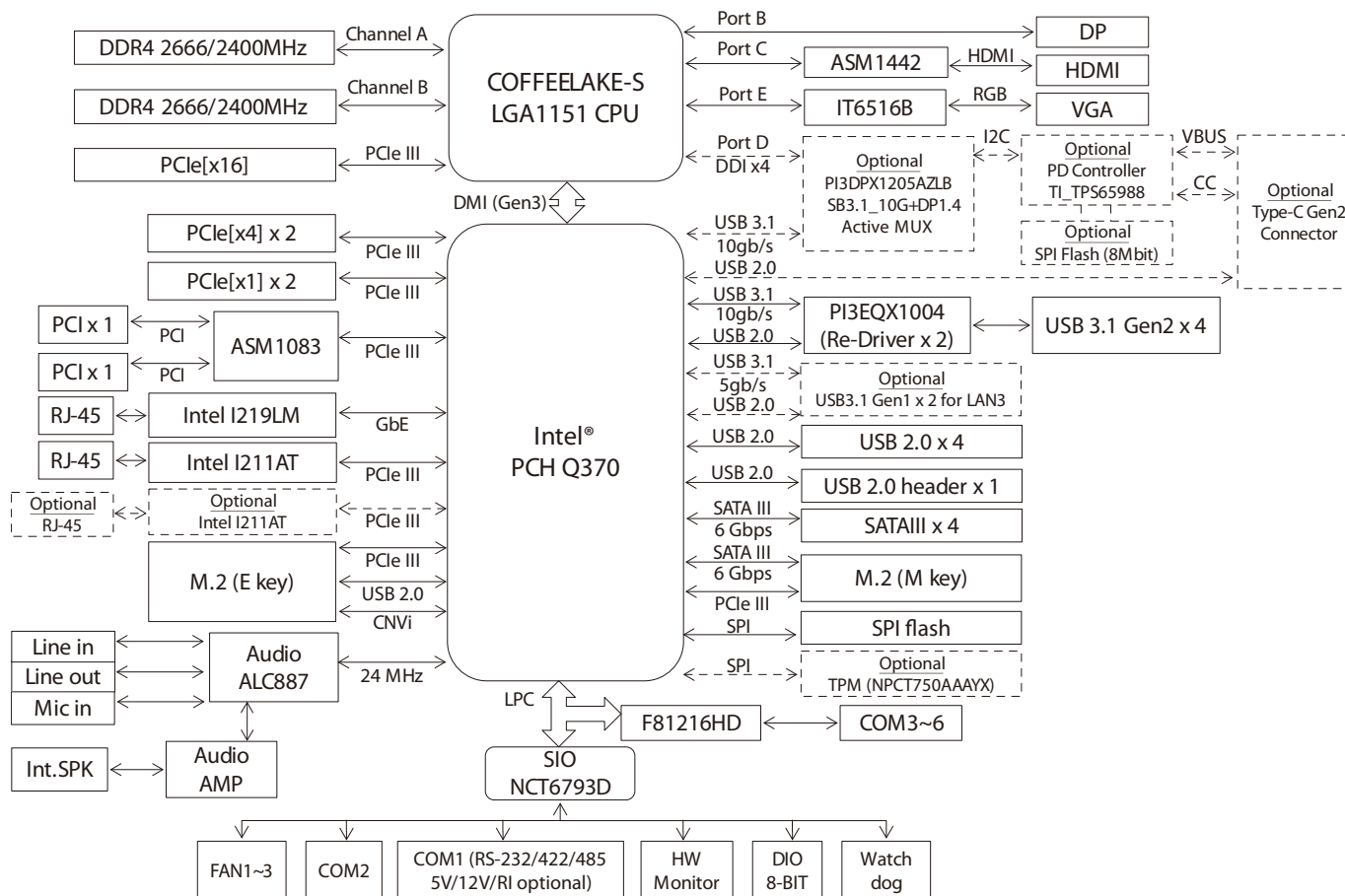
Connector type: 2x5 10-pin header  
Connector location: DIO1



Pin	Definition	Pin	Definition
1	DIO_P#1 (In_1)	2	DIO_P#2 (In_2)
3	DIO_P#3 (In_3)	4	DIO_P#4 (In_4)
5	DIO_P#5 (Out_1)	6	DIO_P#6 (Out_2)
7	DIO_P#7 (Out_3)	8	DIO_P#8 (Out_4)
9	+5V	10	GND



## Block Diagram



## CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for NEX 913. 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 website at [www.nexcom.com.tw](http://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  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 2005 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.

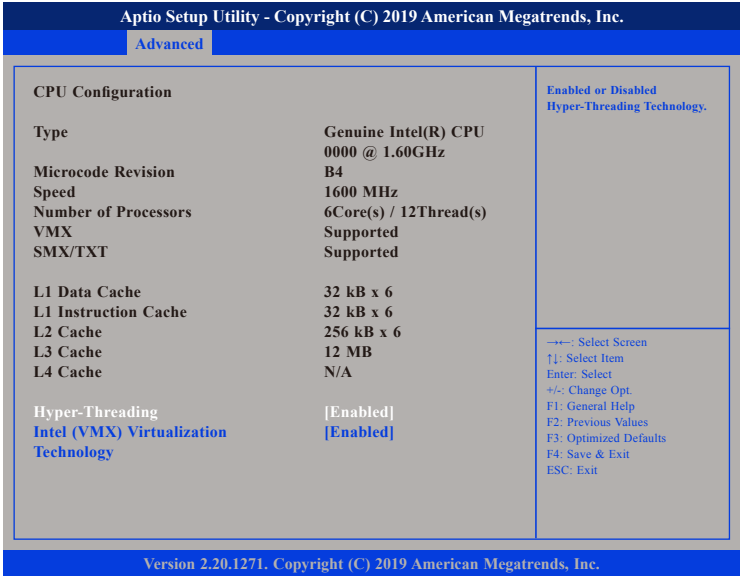


Case Open Warning

Enables or disables case open warning detection function.

CPU Configuration

This section is used to configure the CPU settings.



Hyper-Threading

Enables or disables hyper-threading technology.

Intel® (VMX) Virtualization Technology

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



Trusted Computing

This section is used to configure Trusted Platform Module (TPM) settings.

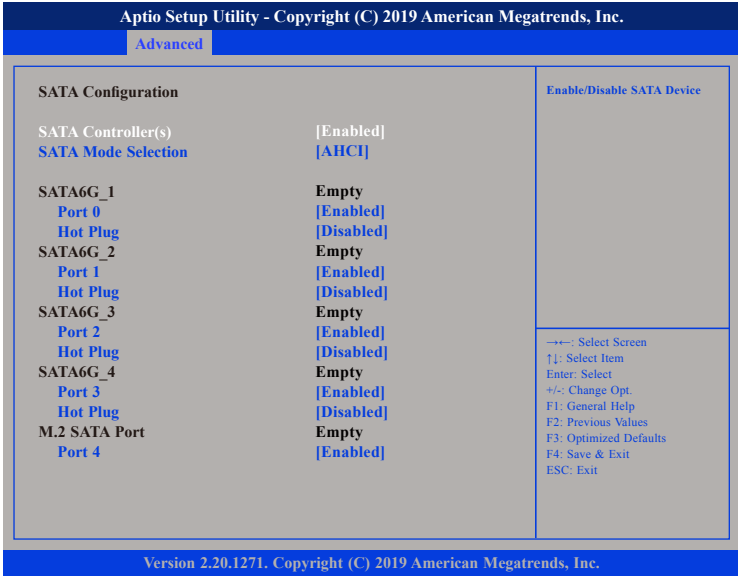


Security Device Support

Enables or disables BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

SATA Configuration

This section displays information of the SATA drives.



SATA Controller(s)

Enables or disables SATA device.

SATA Mode Selection

Configures the SATA controller as AHCI mode.

Port 0 to Port 4

Enables or disables SATA port 0, port 1, port 2, port 3 or port 4.

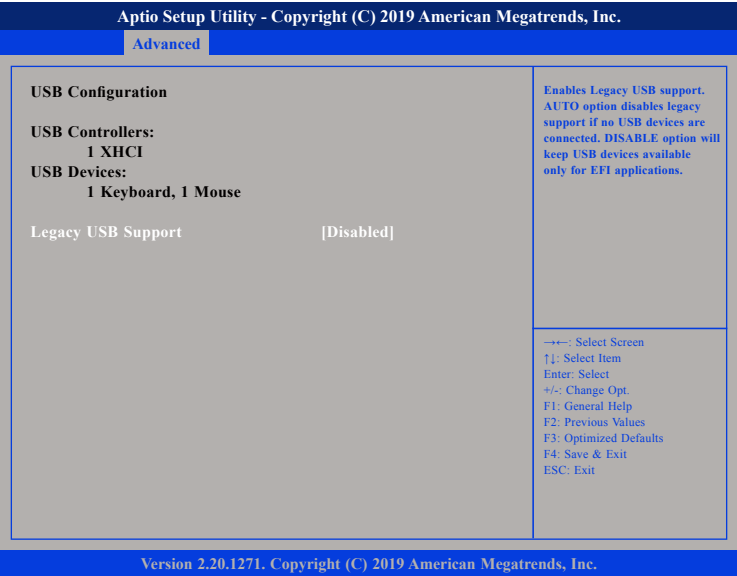
Hot Plug

Enables or disables hot plugging feature on SATA port 0, port 1, port 2, port 3 or port 4.



### USB Configuration

This section is used to configure the USB.

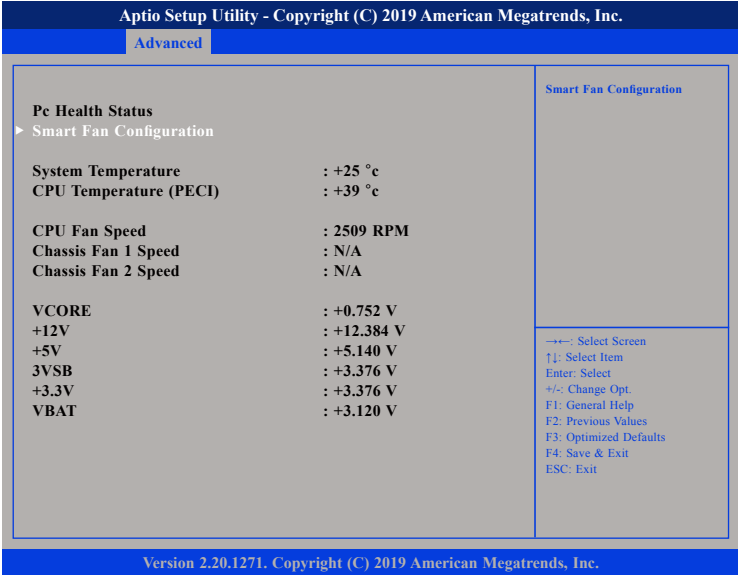


#### Legacy USB Support

- Enable Enables Legacy USB.
- Auto Disables support for Legacy when no USB devices are connected.
- Disable Keeps USB devices available only for EFI applications.

### Hardware Monitor

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



#### System Temperature

Detects and displays the current system temperature.

#### CPU Temperature (PECI)

Detects and displays the current CPU temperature.

#### Chassis Fan 1 Speed and Chassis Fan 2 Speed

Detects and displays the current chassis fan 1 and fan 2 speed.





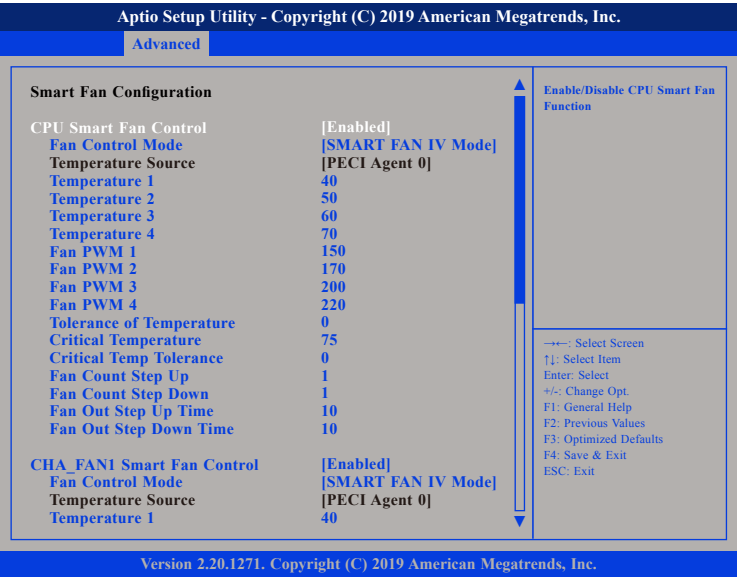
**CPU Fan Speed**

Detects and displays the current CPU fan speed.

**VCORE to VBAT**

Detects and displays the output voltages.

**Smart Fan Configuration**



**CPU Smart Fan Control**

Enables or disables CPU smart fan function.

**Fan Control Mode (For CPU Fan)**

Configures the fan mode of the CPU fan. The options are Manual Mode, Thermal Cruise Mode (automatic fan mode), Speed Cruise Mode and SMART FAN IV Mode.

**Temperature Source (For CPU Fan)**

Selects the temperature source.

**Temperature 1 to Temperature 4 (For CPU Fan)**

Configures the temperature setting.

**Fan PWM 1 to Fan PWM 4 (For CPU Fan)**

Configures the amount of fan PWN for Smart Fan IV Mode.

**Tolerance of Temperature (For CPU Fan)**

Configures the tolerance of target temperature.

**Critical Temperature (For CPU Fan)**

Configures the time that Fan Out requires for reducing its value by one step.

**Critical Temp Tolerance (For CPU Fan)**

Configures the tolerance of critical temperature.

**Fan Count Step Up and Step Down (For CPU Fan)**

Configures the value for fan count step up and step down.

**Fan Out Step Up Time and Step Down Time (For CPU Fan)**

Configures the time that Fan Out requires for increasing (step up time) or reducing (step down time) its value by one step with an interval of 0.1 second.

**CHA\_FAN1 Smart Fan Control**

Enables or disables chassis 1 smart fan function.

**Fan Control Mode (For Chassis Fan 1)**

Configures the fan mode of the CPU fan. The options are Manual Mode, Thermal Cruise Mode (automatic fan mode), Speed Cruise Mode and SMART FAN IV Mode.

**Temperature Source (For Chassis Fan 1)**

Selects the temperature source.

**Temperature 1 to Temperature 4 (For Chassis Fan 1)**

Configures the temperature setting.

**Fan PWM 1 to Fan PWM 4 (For Chassis Fan 1)**

Configures the amount of fan PWN for Smart Fan IV Mode.

**Tolerance of Temperature (For Chassis Fan 1)**

Configures the tolerance of target temperature.

**Critical Temperature (For Chassis Fan 1)**

Configures the time that Fan Out requires for reducing its value by one step.

**Critical Temp Tolerance (For Chassis Fan 1)**

Configures the tolerance of critical temperature.

**Fan Count Step Up and Step Down (For Chassis Fan 1)**

Configures the value for fan count step up and step down.

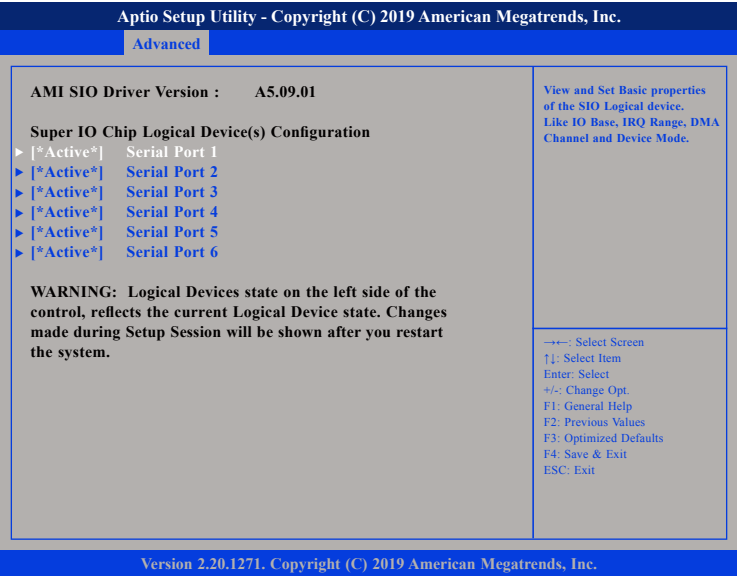
**Fan Out Step Up Time and Step Down Time (For Chassis Fan 1)**

Configures the time that Fan Out requires for increasing (step up time) or reducing (step down time) its value by one step with an interval of 0.1 second.



### SIO Configuration

This section is used to configure the serial ports.



#### [\*Active\*] Serial Port 1 to [\*Active\*] Serial Port 6

Enters the submenu of [\*Active\*] Serial Port 1 to [\*Active\*] Serial Port 6.

#### [\*Active\*] Serial Port 1



#### Use This Device

Enables or disables the serial port.

#### Possible:

Configures the base address for the serial port.

#### Mode

Configures the serial port mode to RS232, RS422 or RS485.

[\*Active\*] Serial Port 2

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Advanced

Serial Port 2 Configuration

Use This Device [Enabled]

Logical Device Settings:  
Current: IO=3E8h; IRQ=7;

Possible: [Use Automatic Settings]

Mode : [RS232]

WARNING: Disabling SIO Logical Devices may have unwanted side effects.  
PROCEED WITH CAUTION.

Enable or Disable this Logical Device.

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Use This Device

Enables or disables the serial port.

Possible:

Configures the base address for the serial port.

Mode

Configures the serial port mode to RS232.

[\*Active\*] Serial Port 3

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Advanced

Serial Port 3 Configuration

Use This Device [Enabled]

Logical Device Settings:  
Current: IO=240h; IRQ=11;

Possible: [Use Automatic Settings]

Mode : [RS232]

WARNING: Disabling SIO Logical Devices may have unwanted side effects.  
PROCEED WITH CAUTION.

Enable or Disable this Logical Device.

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Use This Device

Enables or disables the serial port.

Possible:

Configures the base address for the serial port.

Mode

Configures the serial port mode to RS232.

[\*Active\*] Serial Port 4

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Advanced

Serial Port 4 Configuration

Use This Device [Enabled]

Logical Device Settings:  
Current: IO=248h; IRQ=11;

Possible: [Use Automatic Settings]

Mode : [RS232]

WARNING: Disabling SIO Logical Devices may have unwanted side effects.  
PROCEED WITH CAUTION.

Enable or Disable this Logical Device.

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Use This Device

Enables or disables the serial port.

Possible:

Configures the base address for the serial port.

Mode

Configures the serial port mode to RS232.

[\*Active\*] Serial Port 5

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Advanced

Serial Port 5 Configuration

Use This Device [Enabled]

Logical Device Settings:  
Current: IO=250h; IRQ=11;

Possible: [Use Automatic Settings]

Mode : [RS232]

WARNING: Disabling SIO Logical Devices may have unwanted side effects.  
PROCEED WITH CAUTION.

Enable or Disable this Logical Device.

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Use This Device

Enables or disables the serial port.

Possible:

Configures the base address for the serial port.

Mode

Configures the serial port mode to RS232.

[\*Active\*] Serial Port 6



Use This Device

Enables or disables the serial port.

Possible:

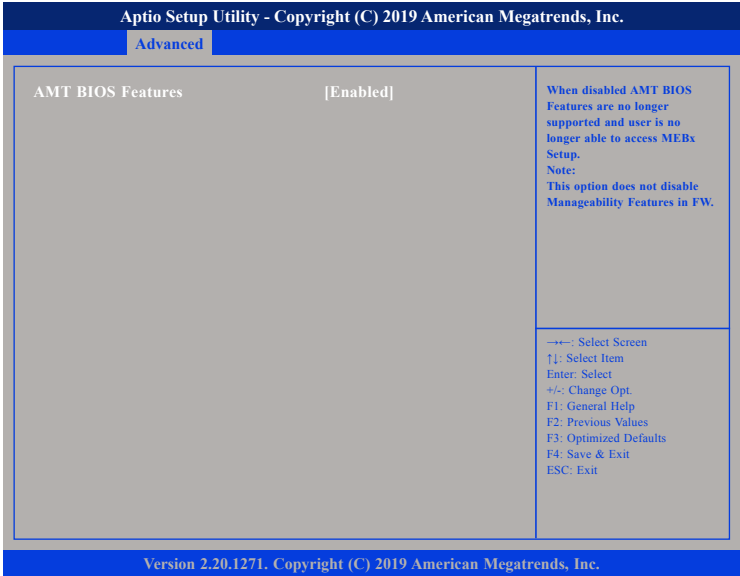
Configures the base address for the serial port.

Mode

Configures the serial port mode to RS232.

AMT Configuration

This section is used to configure Active Management Technology (AMT) settings.



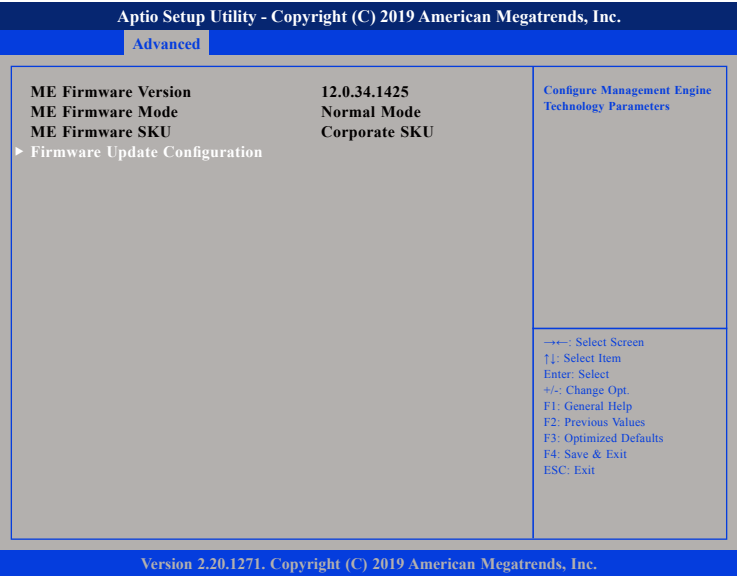
AMT BIOS Features

Enables or disables AMT BIOS features. When disabled, user will no longer be able to access MEBx setup.



PCH-FW Configuration

This section is used to configure the firmware update options.



Firmware Update Configuration

Enters the Firmware Update Configuration submenu.

Firmware Update Configuration



Me FW Image Re-Flash

Enables or disables the ME firmware image re-flash function.



Power Management

This section is used to configure the power management features.



Restore AC Power Loss

Select the AC power state when power is re-applied after a power failure.

RI Wake Event

Enables or disables the system to wake up from RI#.

RTC wake system from S5

Enables or disables the system to wake up from S5.

Fixed Time: System will wake on the hr:min:sec specified.

Dynamic Time: System will wake on the current time + increase minute(s).

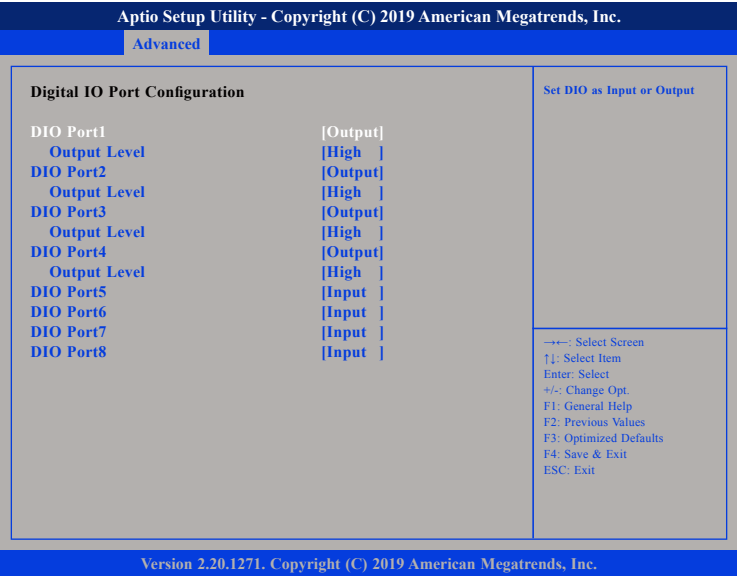






Digital IO Port Configuration

This section is used to configure digital I/O port settings.



DIO Port1 to DIO Port8

Configures DIO port1 to port8 as input or output.

Output Level

Configures the output level as high or low.

Chipset

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources.



System Agent (SA) Configuration

Enters the System Agent (SA) Configuration submenu.

PCH-IO Configuration

Enters the PCH-IO Configuration submenu.



System Agent (SA) Configuration

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Chipset

Memory Configuration

Memory Frequency

Total Memory

Channel 0 Slot 0

Channel 0 Slot 1

Channel 1 Slot 0

Channel 1 Slot 1

Size

Number of Ranks

Manufacturer

Max TOLUD

Primary Display

Primary IGFX Boot Display

PCIEX16 Gen Speed

2400 MHz

4096 MB

Not Populated / Disabled

Not Populated / Disabled

Not Populated / Disabled

Populated & Enabled

4096 MB (DDR4)

1

UnKnown

[Dynamic]

[Auto]

[VBIOS Default]

[Auto]

Maximum Value of TOLUD.  
Dynamic assignment would  
adjust TOLUD automatically  
based on largest MMIO length  
of installed graphic controller

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Max TOLUD

Configures the maximum value of TOLUD.

Primary Display

Select which IGFX/PEG/PCI graphics device should be the primary display or select SG for Switchable Gfx.

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.

PCIEX16 Gen Speed

Configures the maximum link speed of the PEG device.

PCH-IO Configuration

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Chipset

PCH-IO Configuration

HD Audio

PCIEX1\_1 Gen Speed

PCIEX1\_2 Gen Speed

PCIEX4\_1 Gen Speed

PCIEX4\_2 Gen Speed

[Enabled]

[Auto]

[Auto]

[Auto]

[Auto]

Control Detection of the  
HD-Audio device.  
Disabled = HDA will be  
unconditionally disabled  
Enabled = HDA will be  
unconditionally enabled

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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HD Audio

Control detection of the HD Audio device.

Disabled

HD Audio will be unconditionally disabled.

Enabled

HD Audio will be unconditionally enabled.

PCIEX1\_1, PCIEX1\_2, PCIEX4\_1 and PCIEX4\_2 Gen Speed

Configures the maximum PCIe speed of PCIEX1\_1, PCIEX1\_2, PCIEX4\_1 and PCIEX4\_2.

Security

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MainAdvancedChipsetSecurityBootSave & Exit

Password Description

If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.  
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User Will have Administrator rights.  
The password length must be in the following range:  
Minimum length3  
Maximum length20

Administrator Password  
User Password

Set Administrator Password

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Administrator Password

Select this to reconfigure the administrator’s password.

User Password

Select this to reconfigure the user’s password.

Boot

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MainAdvancedChipsetSecurityBootSave & Exit

Boot Configuration

Quiet Boot[Enabled]  
Launch PXE ROM[Do not launch]

FIXED BOOT ORDER Priorities

Boot Option #1[UEFI USB Key]  
Boot Option #2[UEFI Hard Disk]  
Boot Option #3[UEFI USB Hard Disk]  
Boot Option #4[UEFI Network]  
Boot Option #5[UEFI USB Lan]  
Boot Option #6[UEFI CD/DVD]  
Boot Option #7[UEFI USB CD/DVD]  
Boot Option #8[UEFI USB Floppy]  
Boot Option #9[USB Key]  
Boot Option #10[Hard Disk]  
Boot Option #11[USB Hard Disk]  
Boot Option #12[Network]  
Boot Option #13[USB Lan]  
Boot Option #14[CD/DVD]  
Boot Option #15[USB CD/DVD]  
Boot Option #16[USB Floppy]

Enables or disables Quiet Boot option

→←: Select Screen  
↑↓: Select Item  
Enter: Select  
+/-: Change Opt.  
F1: General Help  
F2: Previous Values  
F3: Optimized Defaults  
F4: Save & Exit  
ESC: Exit

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Quiet Boot

EnabledDisplays OEM logo instead of the POST messages.  
DisabledDisplays normal POST messages.

Launch PXE ROM

Controls the execution of UEFI and legacy PXE OpROM.

FIXED BOOT ORDER Priorities

Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

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# Save & Exit



## Save Changes and Reset

To save the changes and reset, 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.

## Restore Defaults

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