



NexCOBOT Co., Ltd.

**Intelligent Platform & Services Business Unit**  
**Embedded Computing (Industrial Motherboard)**

**NEX 813**

User Manual

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# PREFACE

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## Acknowledgements

NEX 813 is a trademark of Nexcobot 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



### NexCOBOT RoHS Environmental Policy and Status Update

NexCOBOT 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, NexCOBOT 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 NexCOBOT development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NexCOBOT 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 NexCOBOT 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 NexCOBOT naming convention.

## Warranty and RMA

### NexCOBOT Warranty Period

NexCOBOT manufactures products that are new or equivalent to new in accordance with industry standard. NexCOBOT warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NexCOBOT.

### NexCOBOT Return Merchandise Authorization (RMA)

- Customers shall enclose the “NexCOBOT 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 “NexCOBOT 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, NexCOBOT 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 NexCOBOT 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

NexCOBOT 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: NexCOBOT 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 NexCOBOT 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, NexCOBOT will return it to the customer without any charge.

#### Board Level

- Component fee: NexCOBOT 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, NexCOBOT 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 NexCOBOT products, visit NexCOBOT's website at [www.nexcobot.com](http://www.nexcobot.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.

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www.nexcom.com

## Package Contents

Before continuing, verify that the NEX 813 package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	NEX 813 Motherboard	1
2	SATA Cable	2
3	COM Port Cable	1
4	I/O Shield	1

## Optional Accessories

Item	Part Number	Name
1	60233SIO88X00	COM Port Cable



### Heat Spreader:

The heatspreader acts as a thermal coupling device to the module and is thermally coupled to the CPU via a thermal gap filler. On some modules, it may also be thermally coupled to other heat generating components with the use of additional thermal gap fillers. Although the heatspreader is the thermal interface where most of the heat generated by the module is dissipated, it is not to be considered as a heatsink. It has been designed as a thermal interface between the module and the application specific thermal solution.

## Ordering Information

The following information below provides ordering information for NEX 813.

### **NEX 813 (P/N: 6879G0008130F)**

Micro-ATX Form Factor, 8th/9th Generation Intel® Core™ LGA1151  
Processor Supports Power 95W max. DDR4 2666/2400/2133 MHz max  
128GB, 2 x HDMI, 1 x DP, 1 x VGA, 2 x GbE LAN, 6 x USB 3.2 (Gen 2),  
4 x USB 3.2 (Gen 1), 1 x M.2 Key E (PCIe/USB), 1 x M.2 Key M (PCIex4/  
SATA3), Onboard TPM 2.0.

# CHAPTER 1: PRODUCT INTRODUCTION

## Overview



## Key Features

- 8th/9th Generation (Coffee Lake-S, Coffee Lake-S Refresh) Intel® Core™ i9/i7/i5/i3/Pentium® processors, 14nm, LGA1151 socket, Max.95W
- 4 x DDR4 U-DIMM memory Socket with non-ECC support, up to 128 GB 2666MHz
- Supports triple display: 2 x HDMI, 1 x DP, 1 x VGA
- Dual Intel® GbE LAN ports, 6 x USB 3.2 (Gen 2), 4 x USB 3.2 (Gen 1), 3 x USB 2.0, 5 x RS232, 1 x RS232/485/422, 4 x SATA3.0, 1x HD Audio
- 1 x PCIe16, 2 x PCIe4, 1 x PCIe1, 1 x M.2 (2230 Key E), 1 x M.2 (2280 Key M)
- Onboard TPM 2.0

## Hardware Specifications

### CPU Support

- 8th/9th Generation (Coffee Lake-S, Coffee Lake-S Refresh) Intel® Core™ i9/i7/i5/i3 Pentium Processors, socket LGA1151, Max. 95W

### Chipset

- Intel® Q370 Express Chipset

### Main Memory

- 4 x DDR4 U-DIMM memory Socket with non-ECC support, up to 128 GB 2666MHz

### BIOS

- AMI (UEFI)

### Display

- 2 x HDMI1.4b connector (resolution up to 4096x2160@24Hz/2560x1600@60Hz, with digital audio)
- 1 x DP connector (resolution up to 4096x2160@24Hz/3840x2160@60Hz, with digital audio)
- 1 x VGA connector (resolution up to 1920x1080@60Hz)

Tip: Multiple display: HDMI+VGA+DP, HDMI+HDMI+VGA, HDMI+HDMI+DP

### System

- 1 x PS/2 combo, 6 x USB3.2 (Gen 2), 4 x USB3.2 (Gen 1)
- 5 x RS232, 1 x RS232/485/422 & (COM1, supports 5V/12V/RI optional)
- Realtek ALC897 6-Channel HDA Codec

- 1 x Front panel header, 8 bit digital I/O (In/Out programmable), WDT, chassis intrusion, 3 x FAN connector, on board TPM 2.0

### Storage

- 4 x SATA3.0 (6.0Gb/s) ports, supports RAID 0/1/5/10
- 1 x M.2 2280 Key M (PCIex4/SATA3)

### Expansion Slots

- 1 x PCIex16, 2 x PCIex4 (open edge), 1 x PCIex1 (open edge),
- 1 x M.2 2230 Key E (PCIex1/USB2.0)

### Edge I/O

- 1 x PS/2 combo
- 4 x USB3.2 (Gen 1)
- 2 x HDMI, 1x DP, 1x VGA
- 2 x RJ45
  - Intel® PHY i219LM Giga LAN x1 (supports Intel AMT 12.0)
  - Intel® i210AT Giga LAN x1
- 6 x USB 3.2 (Gen 2)
- 1 x HD audio connector (1x Line-out+MIC+Line-in 3.5mm jack)

### Internal I/O

- 2 x USB (2x5 2.54mm pin header)
- 6 x serial ports
  - 5 x RS232, 1 x RS232/485/422
- 1 x 8-bit digital I/O
- HA Audio:
  - 1 x speaker header (Line-out)

## Power Requirement

- 1 x 24-pin ATX power connector
- 1 x 8-pin (2x4) ATX 12V power connector
- Supports both AT and ATX power supply mode

## Dimensions

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

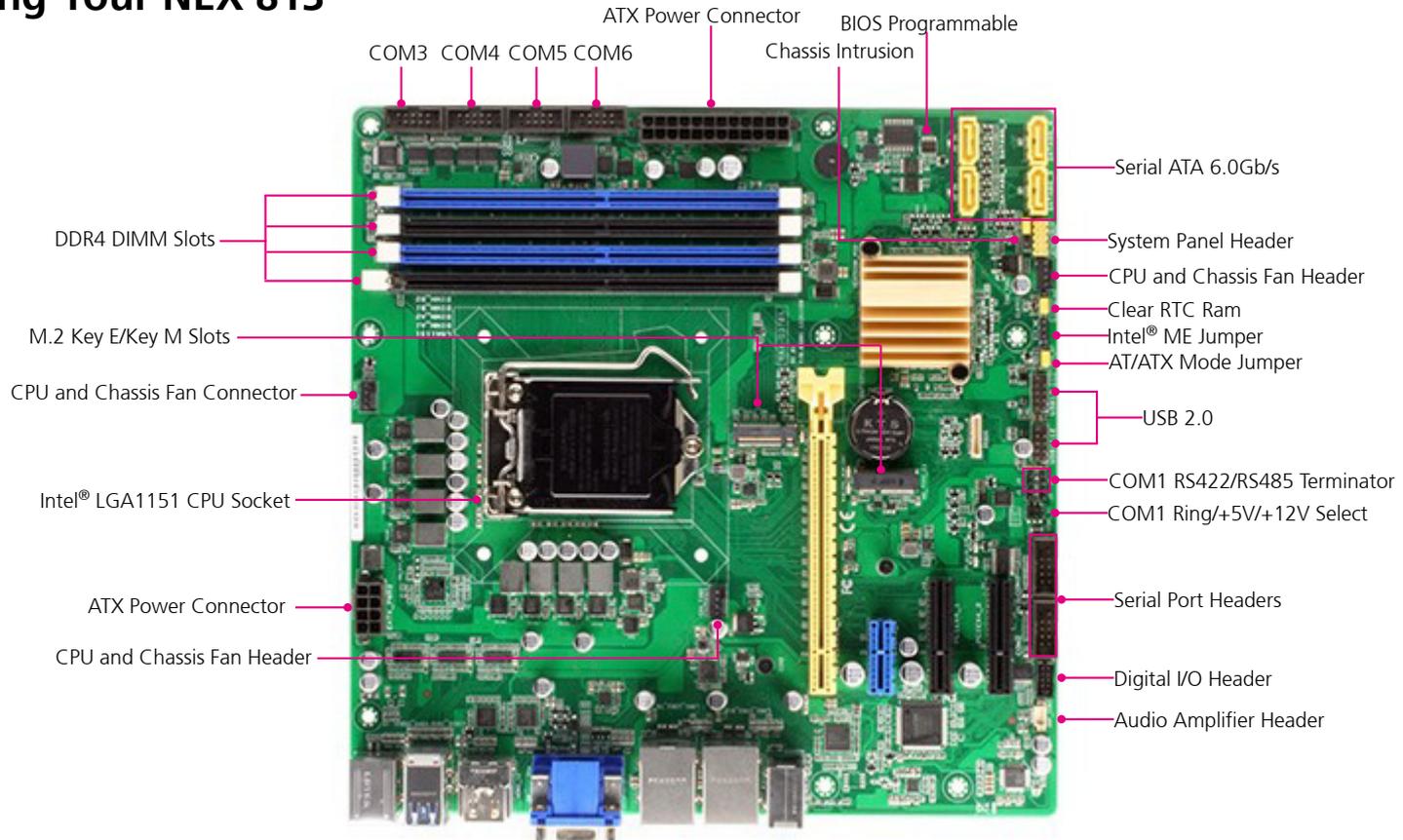
## Environment

- Board level operating temperature: 0°C to 60°C
- Storage temperature: -40°C to 85°C
- Relative humidity:
  - 10% to 95% (operating, non-condensing)
  - 5% to 95% (non-operating, non-condensing)

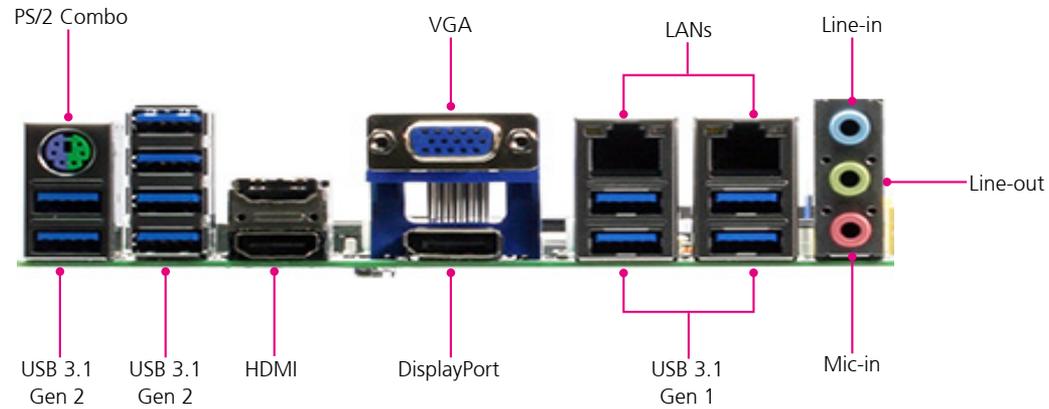
## Certifications

- Meet CE/FCC Class A

# Knowing Your NEX 813



## Edge I/O View



## CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the NEX 813 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:

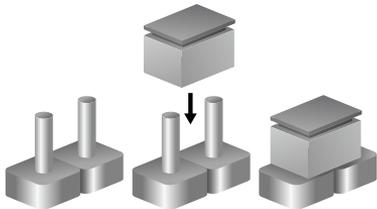
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

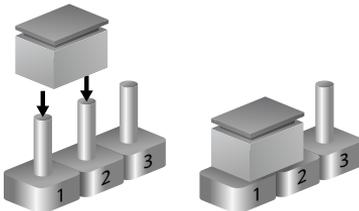
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

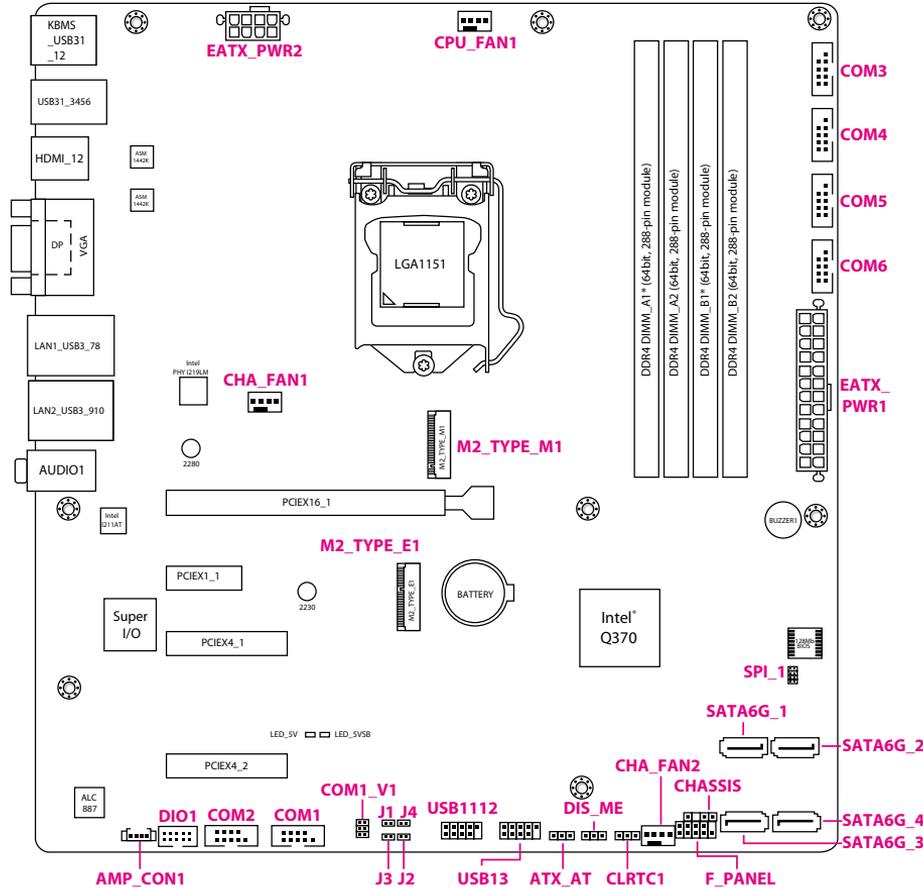


Three-Pin Jumpers: Pins 1 and 2 are Short



# Locations of the Jumpers and Connectors

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

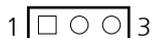


## Jumpers

### AT/ATX Mode Selection

Connector type: 1x3 3-pin header

Connector location: ATX\_AT



Pin	Settings
1-2 On	ATX mode (default)
2-3 On	AT mode



**Note:**

Switching between [AT](#) and [ATX modes](#) should be consistent with the settings in BIOS.

### Chassis Intrusion

Connector type: 1x4 4-pin header

Connector location: CHASSIS



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

Pin	Settings
1-2 On	Enable
3-4 On	Disable (default)

## RTC RAM Clear

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



Pin	Settings
1-2 On	Normal (default)
2-3 On	Clear RTC

### Erase the RTC RAM

1. Unplug the power cord when the computer is switched off.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3 and stay for 5–10 seconds, then move the cap back to pins 1-2.
3. Power on the computer and enable the BIOS for configuration.

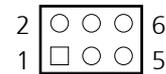


#### CAUTION:

DO NOT remove the cap from the default position of the CLRTC1 jumper, except when cleaning the RTC RAM. The system boot may fail if doing so. Moreover, if you fail to clean the CMOS data by removing the jumper cap, please remove the onboard battery first and then remove the jumper again to clean the CMOS data. Reinstall the battery when the cleaning process is done.

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

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



Pin	Settings
1-2 On	+12V
3-4 On	+5V
5-6 On	Ring (default)

## Intel® ME (Management Engine) Selection

Connector type: 1x3 3-pin header

Connector location: DIS\_ME

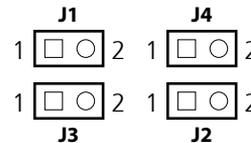


Pin	Settings
1-2-3 Off	Enabled ME flash security (default)
1-2 On	Enabled ME flash security
2-3 On	Disabled ME flash security

## COM1 RS422/485 Terminator Selection

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 (default)

## Internal Connector Pin Definitions

### Audio Amplifier Header

Connector type: 1x4 4-pin header

Connector location: AMP\_CON1



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

### Chassis Fan Header

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

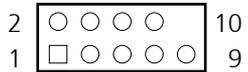


#### CAUTION:

DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

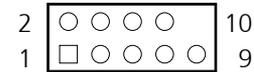
## COM1 to COM2 Serial Port Headers

Connector type: 2x5 10-pin header  
Connector location: COM1, COM2



## COM3 to COM6 Serial Port Headers

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



### 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	RI/+5V/+12V	10	

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

### COM2

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

## CPU Fan Header

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



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

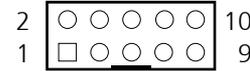


### CAUTION:

DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors!

## Digital I/O Header

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

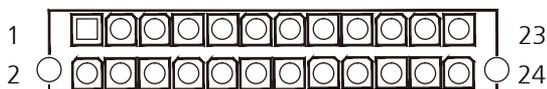


Pin	Definition	Pin	Definition
1	DIO_P#1 (In_1)	2	DIO_P#2 (In_2)
3	DIO_P#3 (In_3)	4	DIO_P#4 (In_4)
5	DIO_P#5 (Out_1)	6	DIO_P#6 (Out_2)
7	DIO_P#7 (Out_3)	8	DIO_P#8 (Out_4)
9	+5V	10	GND

## 24-pin ATX Power Connector

Connector type: 2x12 24-pin boxed header

Connector location: EATX\_PWR1

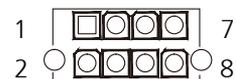


Pin	Definition	Pin	Definition
1	+3 Volts	2	+3 Volts
3	+3 Volts	4	-12 Volts
5	GND	6	GND
7	+5 Volts	8	PSON#
9	GND	10	GND
11	+5 Volts	12	GND
13	GND	14	GND
15	Power OK	16	-5 Volts
17	+5V Standby	18	+5 Volts
19	+12 Volts	20	+5 Volts
21	+12 Volts	22	+5 Volts
23	+3 Volts	24	GND

## 8-pin ATX Power Connector

Connector type: 2x4 8-pin boxed header

Connector location: EATX\_PWR2



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



### Note:

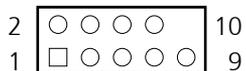
For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later) and provides a min. power of 330W.

We recommend that you use a PSU with higher power output when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

## Front/System Panel Header

Connector type: 2x5 10-pin header

Connector location: F\_PANEL

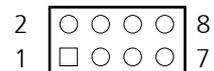


Pin	Definition	Pin	Definition
1	HDD_LED+	2	PWR_LED+
3	HDD_LED-	4	PWR_LED-
5	GND	6	PWR_BTN#
7	RSTCON#	8	GND
9	NC	10	

## BIOS Programmable Header

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

## M.2 Key E Socket

Connector location: M2\_TYPE\_E1



## M.2 Key M Socket

Connector location: M2\_TYPE\_M1



**Note:**

The M.2 module is purchased separately.  
The M.2 Key E slot supports type 2230 Wi-Fi devices.



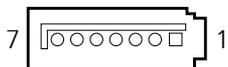
**Note:**

The M.2 module is purchased separately.  
The M.2 Key M slot supports PCIe 3.0 x4 and SATA mode design and type 2280 storage devices.

## Serial ATA 6.0Gb/s Connector 1

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

Connector location: SATA6G\_1

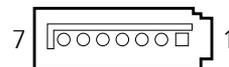


Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP1
3	RSATA_TXN1	4	GND
5	RSATA_RXN1	6	RSATA_RXP1
7	GND		

## 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		



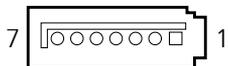
### Note:

To use hot-plug and NCQ, configure the [SATA Mode Selection](#) item to **AHCI** in BIOS.

### Serial ATA 6.0Gb/s Connector 3

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

Connector location: SATA6G\_3

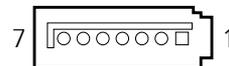


Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP3
3	RSATA_TXN3	4	GND
5	RSATA_RXN3	6	RSATA_RXP3
7	GND		

### Serial ATA 6.0Gb/s Connector 4

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

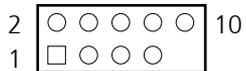
Connector location: SATA6G\_4



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 Connector

Connector type: 2x5 10-pin header  
Connector location: USB1112



Pin	Definition	Pin	Definition
1	+5V_USB	2	+5V_USB
3	USB2_DN12	4	USB2_DN11
5	USB2_DP12	6	USB2_DP11
7	GND	8	GND
9		10	NC

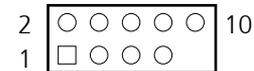


### CAUTION:

Never connect a 1394 cable to the USB connector. Doing so will damage the motherboard.

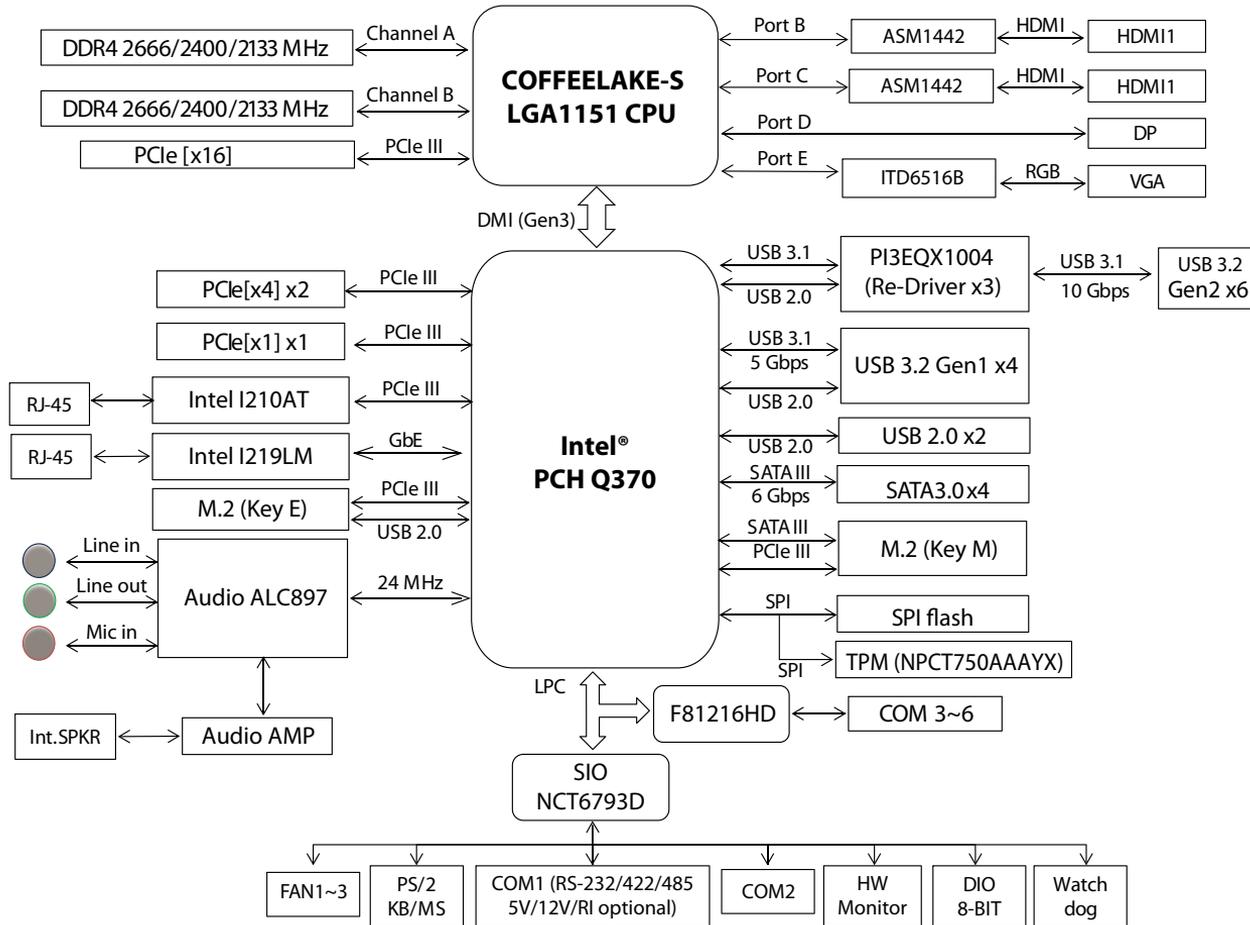
## USB 2.0 Connector

Connector type: 2x5 10-pin header  
Connector location: USB13



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

# Block Diagram



# CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for NEX 813. 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 NexCOBOT website at [www.nexcobot.com](http://www.nexcobot.com).

## 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.

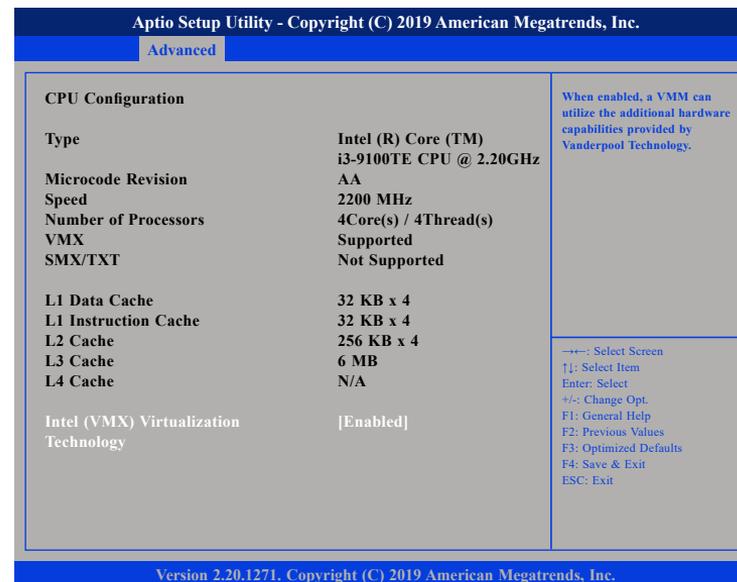


### Case Open Warning

Enables or disables case open warning detection function.

## CPU Configuration

This section is used to configure the CPU settings.

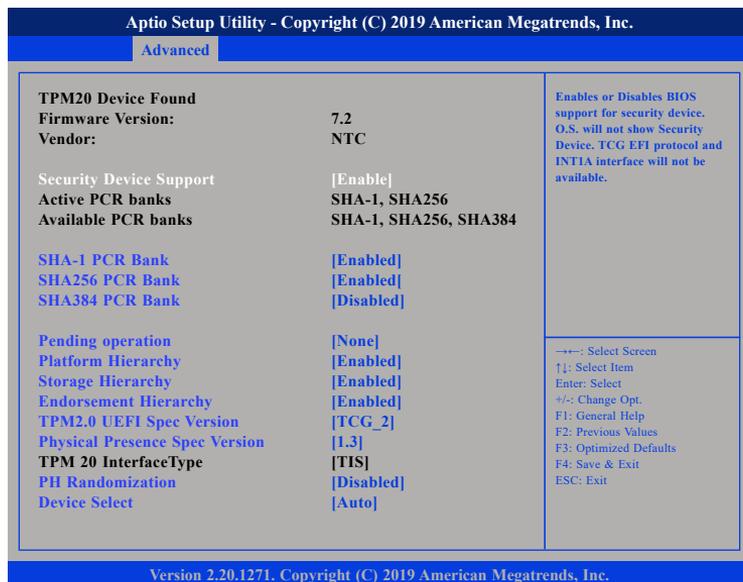


### Intel® (VMX) Virtualization Technology

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.

### SHA-1 PCR Bank

Enables or disables SHA-1 PCR Bank.

### SHA256 PCR Bank

Enables or disables SHA256 PCR Bank.

### SHA384 PCR Bank

Enables or disables SHA384 PCR Bank.

### Pending operation

Schedules an operation for the security device.

### Platform Hierarchy

Enables or disables platform hierarchy.

### Storage Hierarchy

Enables or disables storage hierarchy.

### Endorsement Hierarchy

Enables or disables endorsement hierarchy.

### TPM2.0 UEFI Spec Version

Configures the TPM 2.0 UEFI spec version.

### Physical Presence Spec Version

Configures the physical presence spec version.

### PH Randomization

Enables or disables PH randomization.

### Device Select

Configures the TPM version. TPM 1.2 will restrict support to TPM 1.2 devices and TPM 2.0 will restrict support to TPM 2.0 devices. Auto will support both TPM 1.2 and 2.0 devices with the default set to TPM 2.0 devices if not found, and TPM 1.2 devices will be enumerated.

## 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 or RAID mode.

### Port 0 to Port 4

Enables or disables SATA port0, 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, and port 3.

## USB Configuration

This section is used to configure the USB.



### Legacy USB Support

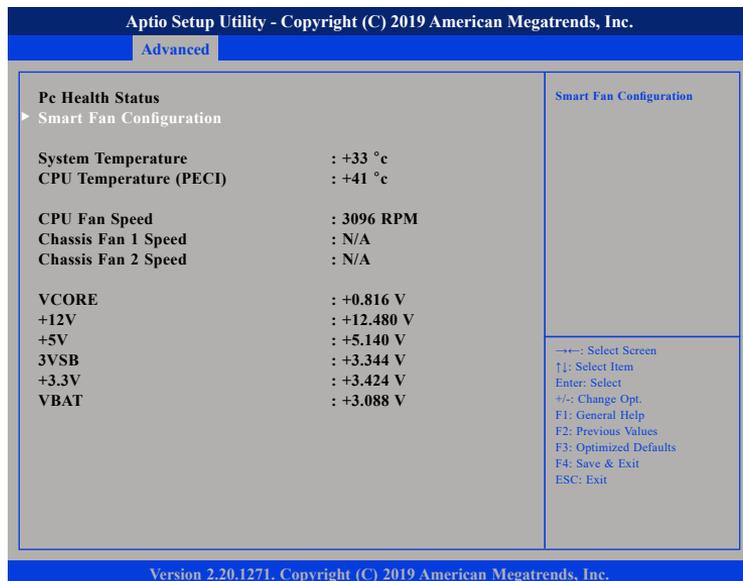
Enable Enables Legacy USB.

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.



## Chassis Fan 1 Speed and Chassis Fan 2 Speed

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

## VCORE to VBAT

Detects and displays the output voltages.

## System Temperature

Detects and displays the current system temperature.

## CPU Temperature (PECI)

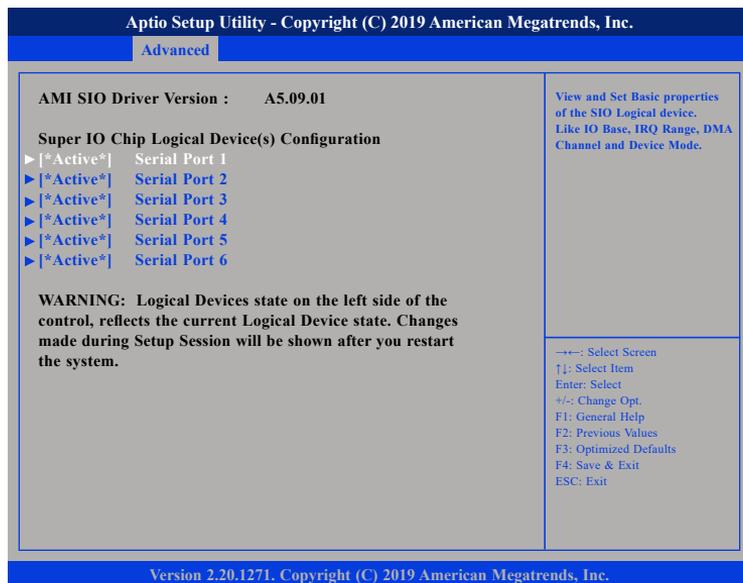
Detects and displays the current CPU temperature.

## CPU Fan Speed

Detects and displays the current CPU fan speed.

## SIO Configuration

This section is used to configure the serial ports.

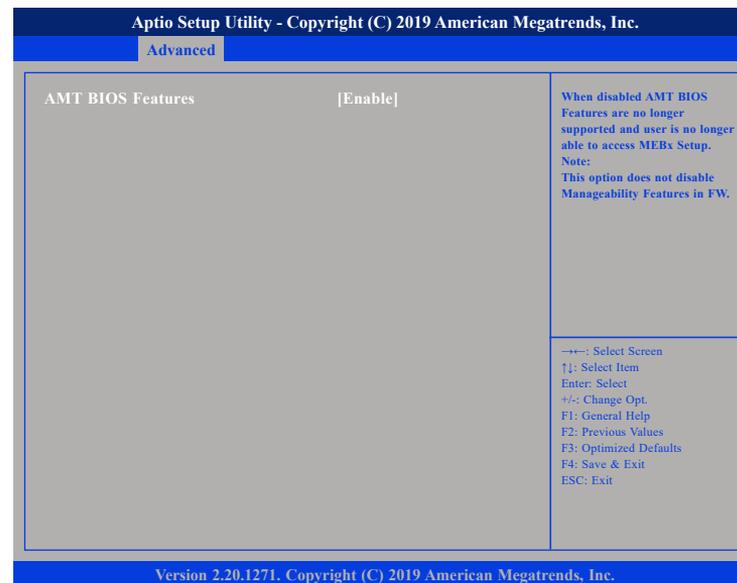


### [\*Active\*] Serial Port 1 to [\*Active\*] Serial Port 6

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

## AMT Configuration

This section is used to configure AMT settings

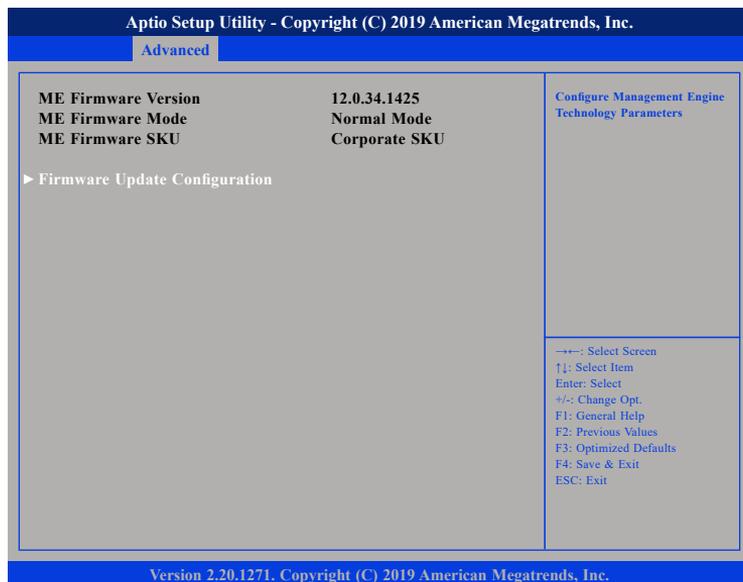


### AMT BIOS Features

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.

## Power Management

This section is used to configure the power management features.



### Power Mode

Configures the power mode of the system.

### Restore AC Power Loss

Selects 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 RTC wake up from S5.

## 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

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Chipsset		
<b>Memory Configuration</b>		Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller
<b>Memory Frequency</b>	2400 MHz	
<b>Total Memory</b>	16384 MB	
<b>Channel 0 Slot 0</b>	Not Populated/Disabled	
<b>Channel 0 Slot 1</b>	Populated & Enabled	
<b>Size</b>	16384 MB (DDR4)	
<b>Number of Ranks</b>	2	
<b>Manufacturer</b>	Unknown	
<b>Channel 1 Slot 0</b>	Not Populated/ Disabled	
<b>Channel 1 Slot 1</b>	Not Populated/ Disabled	
<b>Max TOLUD</b>	(Dynamic)	←→: Select Screen
<b>Primary Display</b>	[Auto]	↑↓: Select Item
<b>Primary IGFX Boot Display</b>	[HDMI 1]	Enter: Select
<b>Secondary IGFX Boot Display</b>	[HDMI 2]	+/-: Change Opt.
<b>PCIEX16 Gen Speed</b>	[Auto]	F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

### 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\_1 Gen Speed

Configures the maximum link speed of the PEG device.

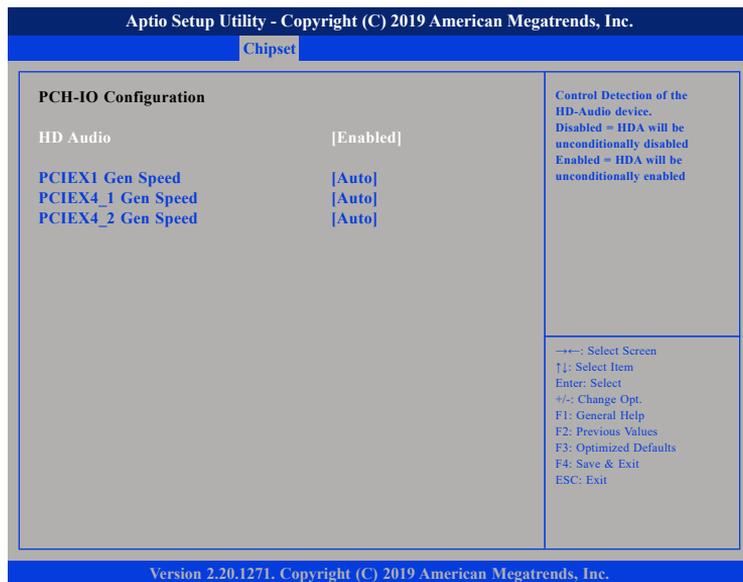
### Max TOLUD

Configures the maximum value of TOLUD.

### Primary Display

Select which of IGFX/PEG/PCI graphics device should be primary display or select 5G for switchable GFX.

## PCH-IO Configuration



### HD Audio

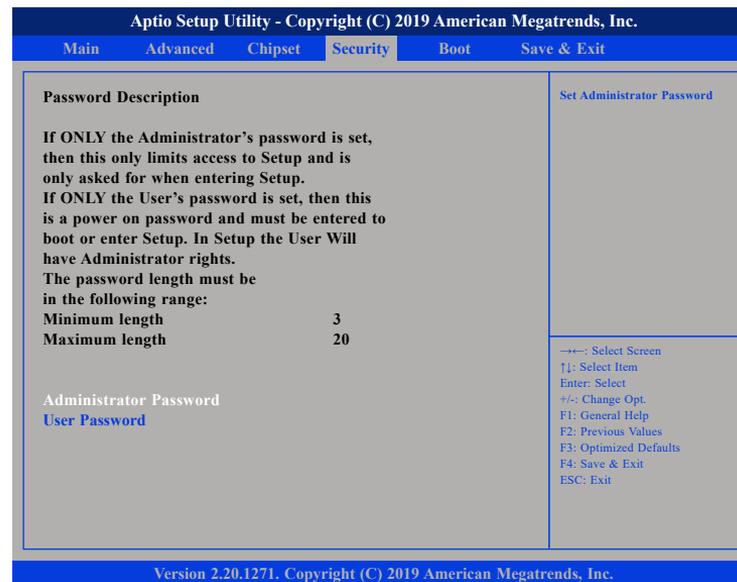
Control detection of the HD Audio device.

Disabled            HD Audio will be unconditionally disabled.  
 Enabled            HD Audio will be unconditionally enabled.

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

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

## Security



### Administrator Password

Selects this to reconfigure the administrator's password.

### User Password

Selects this to reconfigure the user's password.

## Boot



### Quiet Boot

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

### Launch PXE ROM

Controls the execution of UEFI and legacy network OpROM.

### Boot Option Priorities

Adjusts 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.

## 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.