



NexCOBOT Co., Ltd.

Intelligent Platform & Services Business Unit
Embedded Computing (Industrial Motherboard)
NEX 816
User Manual

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PREFACE

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Acknowledgements

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Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance



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.
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 816 package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	NEX 816 Motherboard	1
2	SATA Cable	2
3	COM Port Cable	1
4	I/O Shield	1

Optional Accessories

Item	Name	Part Number
1	SATA Cable	60233ATA48X00
2	COM Cable	60233SIO88X00



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 816.

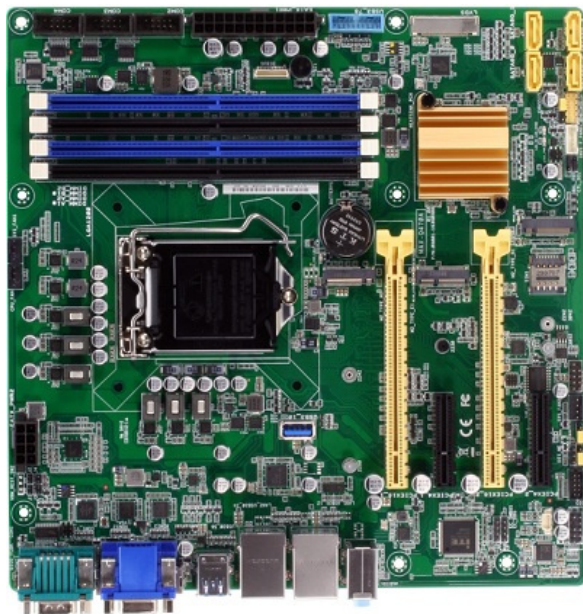
NEX 816 (P/N: 6879G0008160F)

Micro ATX Form Factor, 10th Generation Intel® Core™ LGA1200 Processor, VGA, 3 x HDMI, 4 x U DIMM, 2 x USB3.2 Gen2, 7 x USB3.2 Gen1, 2 x USB2.0, 2 x GbE LAN, 4 x COM, 2 x PCIe16, 2 x PCIe4, 3 x M.2



CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- Intel® 10th Generation (Comet Lake S) Core™ i9/i7/ i5 /i3, Pentium 14nm LGA 1200 socket Processor, Max. 10-Core 80W
- 4 x U DIMM DDR4 with non ECC 2933/2666/2400MHz up to 128GB
- Supports triple displays: 3 x HDMI, VGA , LVDS
- 2 x Intel® GbE LAN port, 2 x USB 3.2 Gen2, 7 x USB 3.2 Gen1, 2 x USB 2.0, 3 x RS232, 1 x S232/485/422, 4 x SATA3.0, 1 x HD Audio
- 1 x PCIe [x16], 1 x PCIe [x16] (8 lanes), 1 x PCIe [x4], 1 x PCIe [x4] (2 lanes), 3 x M.2, Micro SIM card x 1, TPM 2.0 (Optional)

Hardware Specifications

CPU Support

- Intel® 10th generation (Comet Lake S) core™ i9 /i7/ i5 /i3, Pentium 14nm LGA 1200 socket Processor, Max. 10-core 80W

Chipset

- Intel® Q470E Express Chipset

Main Memory

- 4 x DDR4 U-DIMM memory socket with non ECC support, up to 128 GB 2933/2666/2400MHz

BIOS

- AMI (UEFI)

Display

- 3 x HDMI1.4b connector (resolution Up to 4096 x 2160 @60/24 Hz with digital audio)
- 1 x VGA connector (resolution up to 1920x1080@60Hz)
- LVDS (resolution up to 1920x1080@60Hz)

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

System

- 2 x USB 3.2 Gen2, 7 x USB 3.2 Gen1, 2 x USB 2.0
- 3 x RS232, 1 x RS232/485/422
- 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, TPM 2.0 (Optional)

Storage

- 4 x SATA3.0 (6.0Gb/s) port, supports RAID 0/1/5/10
- M.2 2280/2242 Key M (PClex4) x 1

Expansion Slots

- PCIe 3.0 [x16] slot (16 lanes) (8 lanes when dual use PCIe [x16]) x 1, PCIe 3.0 [x16] (8 lanes) x 1,
- PCIe 3.0 [x4] slot x 1, PCIe 3.0 [x4] slot (2 lanes) x 1, M.2 2230 Key E PCIe /CNVI) x 1
- M.2 2280/2242 Key M (PClex4) x 1, M.2 3042/3052/2242 Key B (PCIe / USB3.2/SATA) x 1, Micro SIM card slot x 1

Edge I/O

- 2 x USB 3.2 Gen2 port (10 Gbps), 4 x USB 3.2 Gen1 port (5 Gbps)
- 1 x VGA, 3x HDMI (2.0 x 1, 1.4 x 2)
- 2 x RJ45
 - Intel® PHY i219LM Giga LAN x 1 (supports Intel® AMT 12.0)
 - Intel® i211AT Giga LAN x 1
- 1 x DB-9 COM
- 1 x HD audio connector (1 x Line Out + MIC + Line In 3.5mm Jack)

Internal I/O

- 2 x USB2.0 (2x5 2.54mm pin header)
- 2 x USB3.2 Gen 1 (2x5 2.54mm pin header)
- 1 x USB3.2 Gen 1 Type A (vertical) connector
- 4 x Serial port
 - 3 x RS232, 1 x RS232/485/422
- 1 x 8bit digital I/O
- HA audio:
 - 1 x speaker header (Line out)



Power Requirement

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

Dimensions

- Micro ATX form factor, 9.6"x9.6" (244 mm x 244 mm)

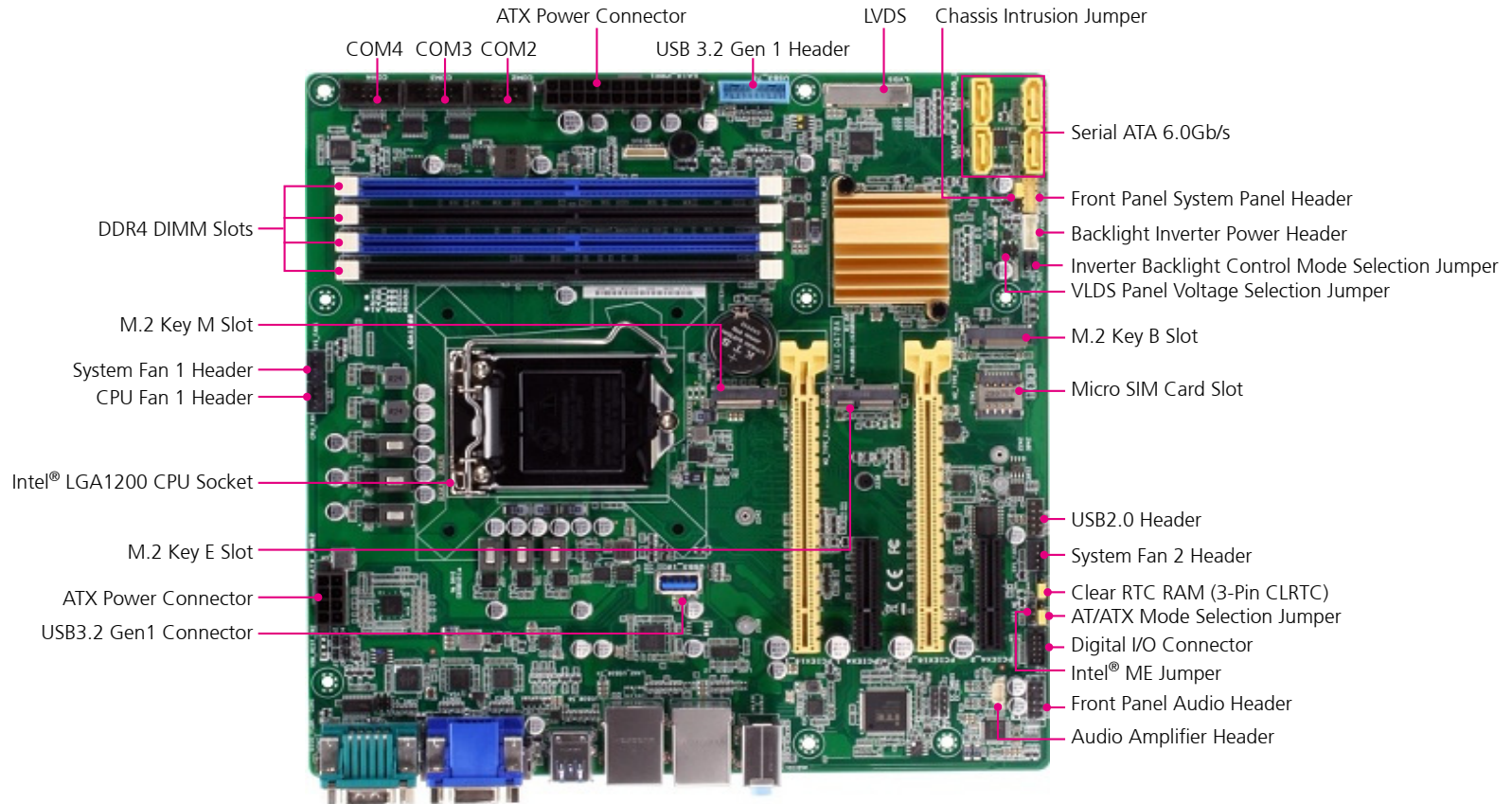
Environment

- 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)

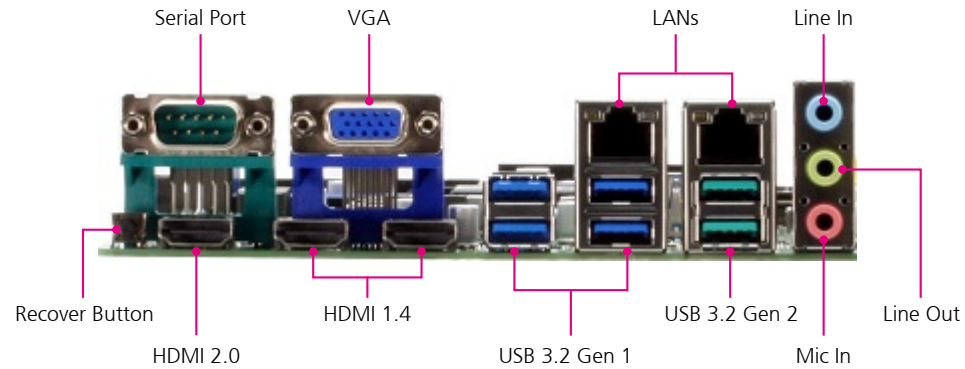
Certifications

- Meet CE/FCC Class A

Knowing Your NEX 816



Edge I/O View



CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the NEX 816 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:

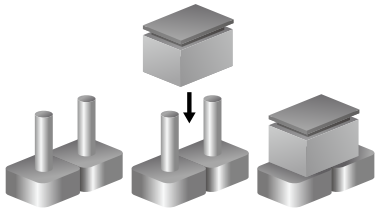
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

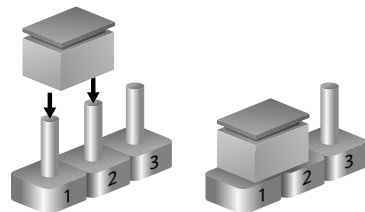
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

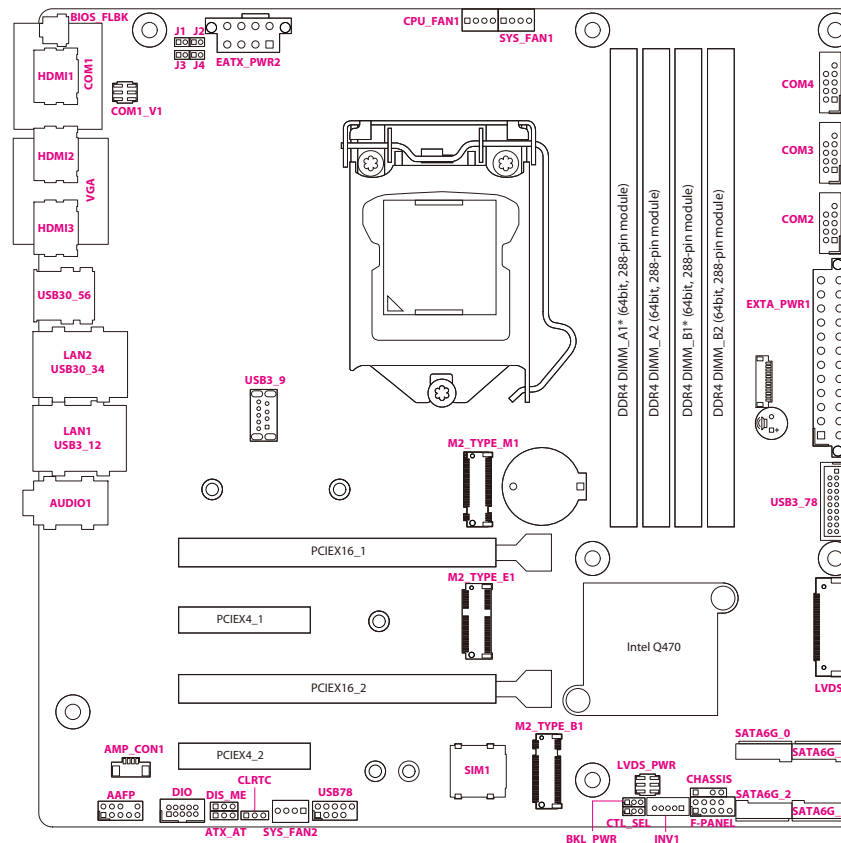


Three-Pin Jumpers: Pins 1 and 2 are Short



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.

Inverter Voltage Selection

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



Pin	Settings
1-2 On	12V
2-3 On	5V (default)

Chassis Intrusion

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



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

Inverter Backlight Control Mode Selection

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



Pin	Settings
1-2 On	DC voltage control (default)
2-3 On	PWM voltage control

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

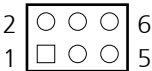
1. Unplug the power cord when the computer is switched off.
2. Move the jumper cap from pins 1-2 (default) to pins 2-3 and stay for 5–10 seconds, then move the cap back to pins 1-2.
3. Power on the computer and enable the BIOS for configuration.



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

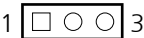
Connector type: 2x3 6-pin header
Connector location: COM1_V1



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

Intel® ME (Management Engine) Selection

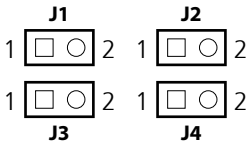
Connector type: 1x3 3-pin header
Connector location: DIS_ME



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

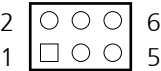
Connector type: 1x2 2-pin header
Connector location: J1, J2, J3, and J4



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

LVDS Panel Voltage Selection

Connector type: 2x3 6-pin header
Connector location: LVDS_PWR

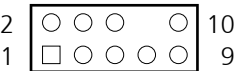


Pin	Settings
1-2 On	3V (default)
3-4 On	12V
5-6 On	5V

Internal Connector Pin Definitions

Front Panel Audio Header

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



Pin	Definition	Pin	Definition
1	A_MIC2_L	2	A_GND
3	A_MIC2_R	4	NC
5	A_LINE2_R	6	A_JD_MIC2
7	A_JD_FRONT	8	
9	A_LINE2_L	10	A_JD_LINE2



CAUTION:
Set the type of front panel to [HD Audio](#) in the BIOS when connecting the high-definition front panel audio module to this header.

Audio Amplifier Header

Connector type: 1x4 4-pin header
Connector location: AMP_CON1

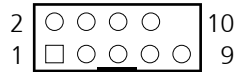


Pin	Definition	Pin	Definition
1	ROUTP	2	ROUTN
3	LOUTN	4	LOUTP

Serial Port Headers

Connector type: 2x5 10-pin header

Connector location: COM2~4



COM2

Pin	Definition	Pin	Definition
1	DDCD2#	2	RRXD2
3	TTXD2	4	DDTR2#
5	GND	6	DDSR2#
7	RRTS2#	8	CCTS2#
9	RRI2#	10	

COM3

Pin	Definition	Pin	Definition
1	DDCD3	2	DRXD3
3	DTXD3	4	DDTR3
5	GND	6	DDSR3
7	DRTS3	8	DCTS3
9	DRI3	10	

COM4

Pin	Definition	Pin	Definition
1	DDCD4	2	DRXD4
3	DTXD4	4	DDTR4
5	GND	6	DDSR4
7	DRTS4	8	DCTS4
9	DRI4	10	

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



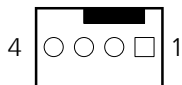
Note:

The COM module is purchased separately.

CPU Fan Header

Connector type: 1x4 4-pin header

Connector location: CPU_FAN1



Pin	Definition	Pin	Definition
1	GND	2	VCC
3	SENSE	4	PWM



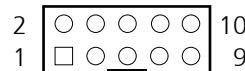
CAUTION:

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

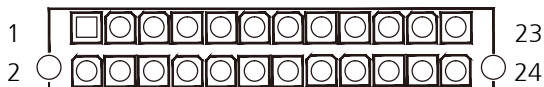


Pin	Definition	Pin	Definition
1	DIO_I#1	2	DIO_I#2
3	DIO_I#3	4	DIO_I#4
5	DIO_O#5	6	DIO_O#2
7	DIO_O#7	8	DIO_O#4
9	+5V	10	GND

24-pin ATX Power Connector

Connector type: 2x12 24-pin boxed header

Connector location: EATX_PWR1

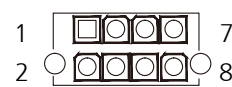


Pin	Definition	Pin	Definition
1	+3 Volts	2	+3 Volts
3	+3 Volts	4	-12 Volts
5	GND	6	GND
7	+5 Volts	8	PSON#
9	GND	10	GND
11	+5 Volts	12	GND
13	GND	14	GND
15	Power OK	16	-5 Volts
17	+5V Standby	18	+5 Volts
19	+12 Volts	20	+5 Volts
21	+12 Volts	22	+5 Volts
23	+3 Volts	24	GND

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



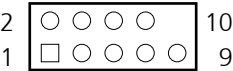
Note:

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	HDLED+	2	PLED+
3	HDLED_D-	4	PLED-
5	GND	6	F_PWRBTN#
7	RSTCON#_PANEL	8	GND
9	NC	10	

Backlight Inverter Power Header

Connector type: 1x5 5-pin header
Connector location: INV1



Pin	Definition
1	+BLVCC
2	VCON
3	GND
4	GND
5	INV_ENABKL

M.2 Key B Socket

Connector location: M2_TYPE_B1

**Note:**

The M.2 module is purchased separately.
The M.2 Key B slot supports type 3042/3052 PCIe/USB/SATA storage devices.

M.2 Key E Socket

Connector location: M2_TYPE_E1

**Note:**

The M.2 module is purchased separately.
The M.2 Key E slot supports type 2230 PCIe/CNVI module devices.

M.2 Key M Socket

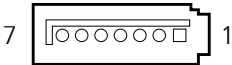
Connector location: M2_TYPE_M1



Note:
The M.2 module is purchased separately.
The M.2 Key M slot supports type 2280/2242 PCIe 3.0 x4 storage devices.

Serial ATA 6.0Gb/s Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: SATA6G_0~3



Pin	Definition	Pin	Definition
1	GND	2	RSATA_TXP
3	RSATA_TXN	4	GND
5	RSATA_RXN	6	RSATA_RXP
7	GND		



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

System Fan Header

Connector type: 1x4 4-pin header

Connector location: SYS_FAN1, SYS_FAN2



Pin	Definition	Pin	Definition
1	GND	2	VCC
3	SENSE	4	PWM



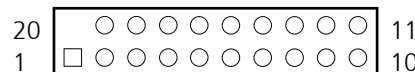
CAUTION:

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!

USB 3.2 Gen 1 Header

Connector type: 2x10 20-pin header

Connector location: USB3_78



Pin	Definition	Pin	Definition
1	+5V_USB3_78	11	S_USB_PP12
2	S_U3RXDN7	12	S_USB_PN12
3	S_U3RXDP7	13	GND
4	GND	14	S_U3TXDP8
5	S_U3TXDN7	15	S_U3TXDN8
6	S_U3TXDP7	16	GND
7	GND	17	S_U3RXDP8
8	S_USB_PN11	18	S_U3RXDN8
9	S_USB_PP11	19	+5V_USB3_78
10	GND	20	



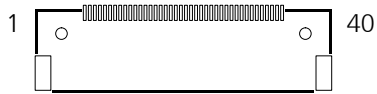
CAUTION:

This header's specification is based on xHCI. You may install the related drive to fully support the USB 3.2 port under Windows® 7. The connected USB 3.2 device will run in xHCI mode.

VLDS Connector

Connector type: 1x40 40-pin header

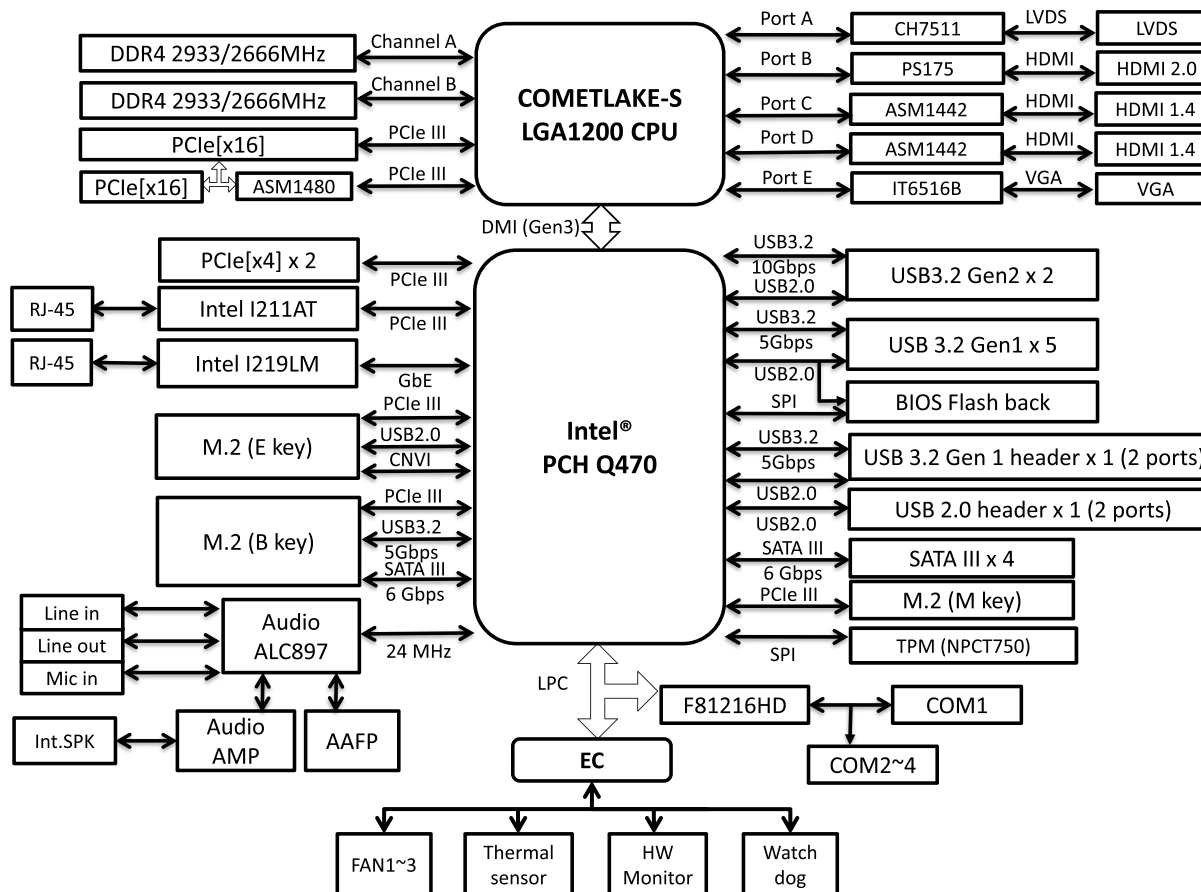
Connector location: VCDS



Pin	Definition	Pin	Definition
1	LVDS0_D3+	11	LVDS1_D2+
2	LVDS0_D3-	12	LVDS1_D2-
3	LVDS0_D2+	13	LVDS1_D1+
4	LVDS0_D2-	14	LVDS1_D1-
5	LVDS0_D1+	15	LVDS1_D0+
6	LVDS0_D1-	16	LVDS1_D0-
7	LVDS0_D0+	17	GND
8	LVDS0_D0-	18	+V_PANEL
9	LVDS1_D3+	19	+V_PANEL
10	LVDS1_D3-	20	+V_PANEL

Pin	Definition	Pin	Definition
21	NC	31	SPC1
22	+3V	32	INV_ENABKL
23	GND	33	VCON
24	GND	34	LVDS1_CLK+
25	GND	35	LVDS1_CLK-
26	LVDS0_CLK+	36	+BLVCC
27	LVDS0_CLK-	37	+BLVCC
28	GND	38	+BLVCC
29	GND	39	NC
30	GND	40	SPD1

Block Diagram



CHAPTER 3: BIOS SETUP

This chapter describes how to use the BIOS setup program for NEX 816. 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.

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 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.

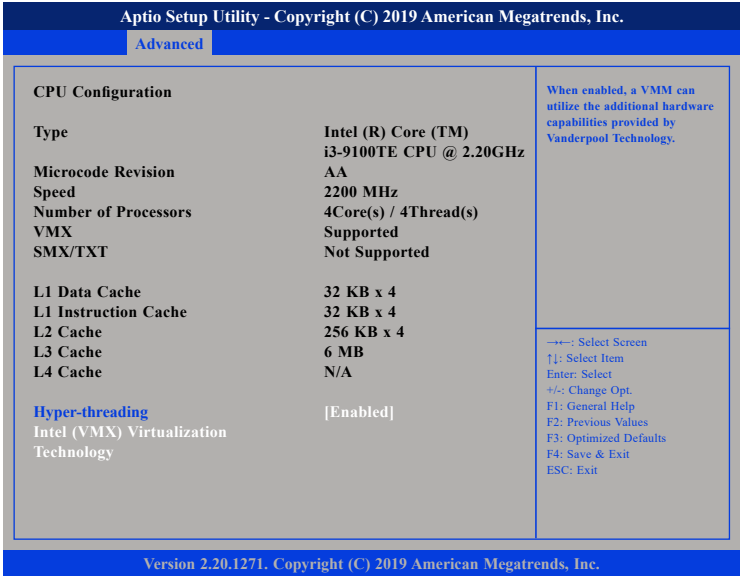


Case Open Warning

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.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Advanced		
TPM20 Device Found		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.
Firmware Version:	7.2	
Vendor:	NTC	
Security Device Support	[Enabled]	
Active PCR banks	SHA-1, SHA256	
Available PCR banks	SHA-1, SHA256, SHA384	
SHA-1 PCR Bank	[Enabled]	
SHA256 PCR Bank	[Enabled]	
SHA384 PCR Bank	[Disabled]	
Pending operation	[None]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	
Endorsement Hierarchy	[Enabled]	
TPM2.0 UEFI Spec Version	[TCG_2]	
Physical Presence Spec Version	[1.3]	
TPM 20 InterfaceType	[TIS]	
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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.

SATA Configuration

This section displays information of the SATA drives.

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Advanced

SATA Configuration

SATA Controller(s)
SATA Mode Selection

M.2 ATA Port
Port 1
Hot Plug

Serial ATA Port 2
Port 2
Hot Plug

Serial ATA Port 3
Port 3
Hot Plug

Serial ATA Port 4
Port 4
Hot Plug

Serial SATA Port 5
Port 5
Hot Plug

[Enabled]
[AHCI]

Empty
[Enabled]
[Disabled]

Empty
[Enabled]
[Disabled]

Empty
[Enabled]
[Disabled]

Empty
[Enabled]
[Disabled]

Empty
[Enabled]
[Disabled]

Enable/Disable SATA 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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SATA Controller(s)

Enables or disables SATA device.

SATA Mode Selection

Configures the SATA controller as AHCI or RAID mode.

M.2 SATA Port

Enables or disables the M.2 SATA port.

Port 1 to Port 5

Enables or disables SATA port1, port 2, port 3, port 4, or port 5.

Hot Plug

Enables or disables hot plugging feature on SATA port 1, port 2, port 3, port 4, or port 5.

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NEX 816 User Manual

USB Configuration

This section is used to configure the USB.

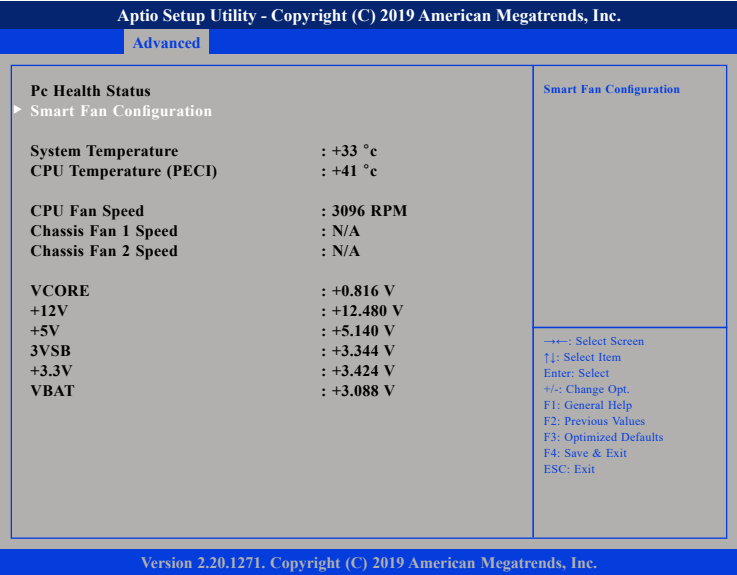


Legacy USB Support

- 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.



Smart Fan Configuration

Enters the Smart Fan Configuration submenu.

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.

Chassis Fan 1 Speed and Chassis Fan 2 Speed

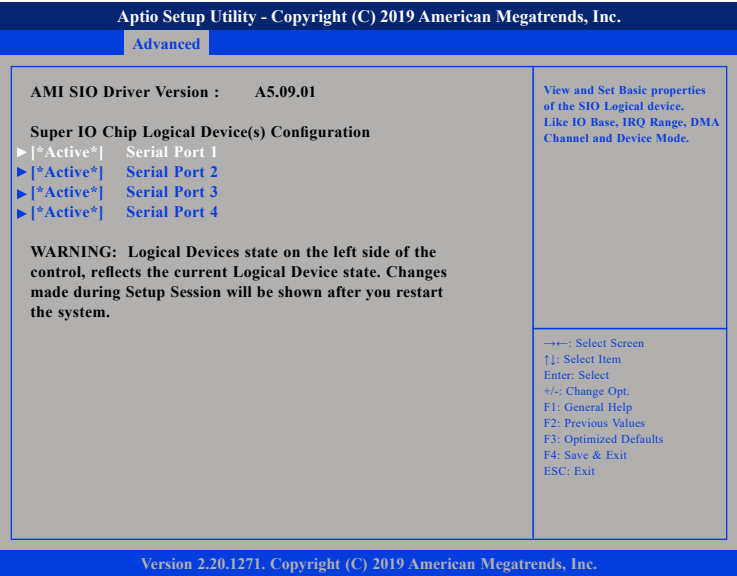
Detects and displays the current chassis fan 1 and fan 2 speed.

VCORE to VBAT

Detects and displays the output voltages.

SIO Configuration

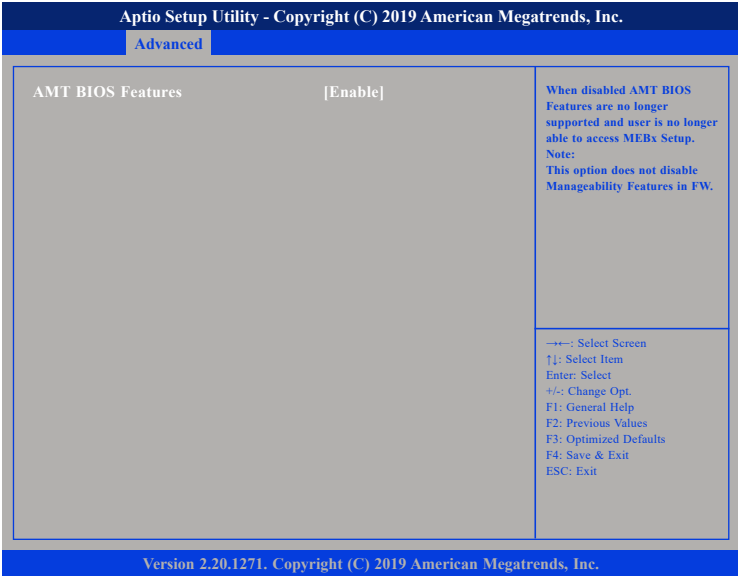
This section is used to configure the serial ports.



[*Active*] Serial Port 1 to [*Active*] Serial Port 4
Enters the submenu of [*Active*] Serial Port 1 to [*Active*] Serial Port 4.

AMT Configuration

This section is used to configure AMT settings

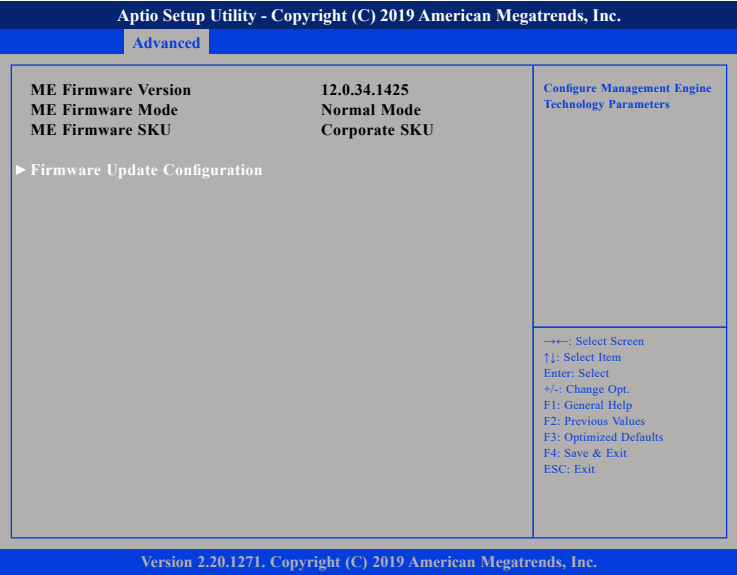


AMT BIOS Features
Enables or disables AMT BIOS features. When disabled, user will no longer be able to access MEBx setup.



PCH-FW Configuration

This section is used to configure the firmware update options.



Firmware Update Configuration

Enters the Firmware Update Configuration submenu.

NVMe Configuration

This section is used to display information on the NVMe devices installed.



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

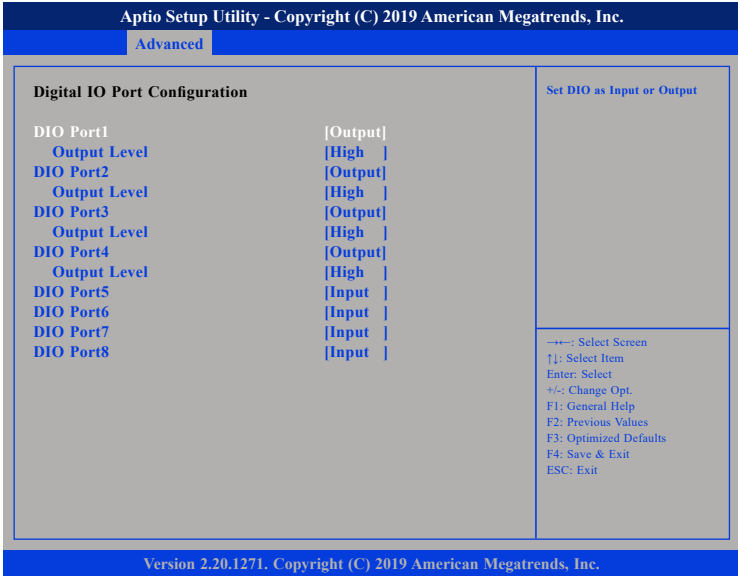
Enables or disables the system to wake up from RI.

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.		
Chipset		
Memory Configuration		Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller
Memory Frequency	2400 MHz	
Total Memory	16384 MB	
Channel 0 Slot 0	Not Populated/Disabled	
Channel 0 Slot 1	Populated & Enabled	
Size	16384 MB (DDR4)	
Number of Ranks	2	
Manufacturer	Unknown	
Channel 1 Slot 0	Not Populated/ Disabled	
Channel 1 Slot 1	Not Populated/ Disabled	
Primary Display	[Auto]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
PCIEX16_1 Gen Speed	[Auto]	
PCIEX16_2 Gen Speed	[Auto]	
LVDS	[Disabled]	
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Primary Display

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

PCIEX16_1/2 Gen Speed / PCIEX16_2 Gen Speed

Configures the maximum link speed of the PEG device.

LVDS

Enables the configuration options of LVDS.

PCH-IO Configuration

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Chipset		
PCH-IO Configuration		Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled
HD Audio	[Enabled]	
PCIEX1 Gen Speed	[Auto]	
PCIEX4_1 Gen Speed	[Auto]	
PCIEX4_2 Gen Speed	[Auto]	
		→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.		

HD Audio

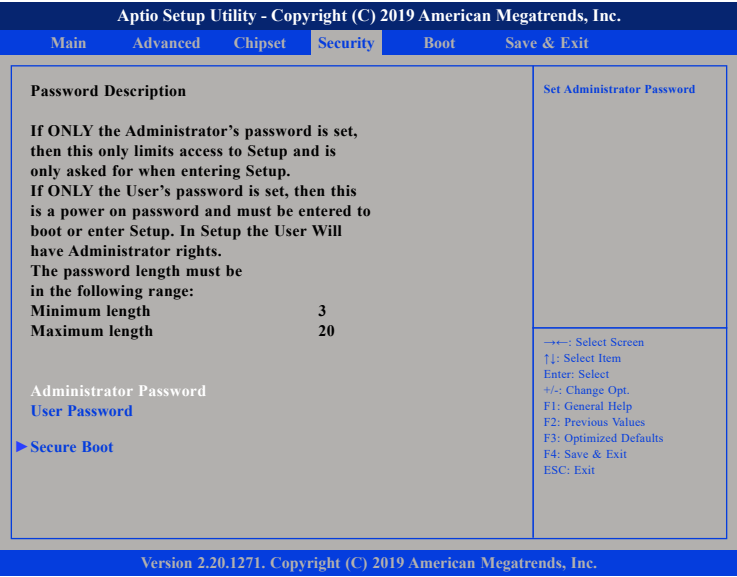
Control detection of the HD Audio device.

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

PCIEX4_1 / PCIEX4_2 Gen Speed

Configures the maximum PCIe speed of PCIEX4_1 and PCIEX4_2.

Security



Administrator Password

Selects this to reconfigure the administrator’s password.

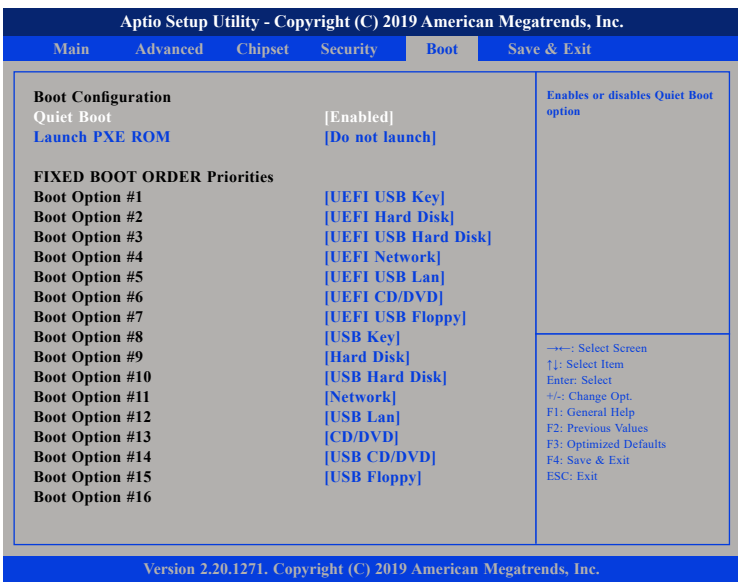
User Password

Selects this to reconfigure the user’s password.

Secure Boot

Enters the secure boot submenu.

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.