



NEXCOM International Co., Ltd.

Network and Communication Solutions

Network Security Appliance

NSA 7141

User Manual

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PREFACE

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Acknowledgements

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Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance



NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 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. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the “NEXCOM RMA Service Form” with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the “NEXCOM RMA Service Form” for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as “Out of Warranty.”
- Any products returned by NEXCOM to other locations besides the customers’ site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

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System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection to protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. Do not place heavy objects on the equipment.
16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
17. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.
2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
 - Product name and serial number
 - Detailed information of the peripheral devices
 - Detailed information of the installed software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

Conventions Used in this Manual



Warning:

Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.



Caution:

Information to avoid damaging components or losing data.



Note:

Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the NSA 7141 package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Description	Qty
1	6023309081X00	Cable EDI: 232091081804-RS	COM Port. DB9 Female to RJ45 8P8C L:1800mm	1
2	5040210035X00	Ear Set for NSA 7141 VER:A Panadvance	43x32x22mm SECC T=2.0mm Color:295U Powder and Liquid	1
3	5044440031X00	Rubber Foot Kang Yang:RF20-5-4P	19.8x18x5.0mm	4
4	19S00714102X0	NSA 7141 ASSY		1
5	60111A0627X00	Inner Carton for NSA 7141-LM VER:A YI GIA	747x560x180mm AB Flute 18kg	1
6	60111A0628X00	Outside Carton for NSA 7141-LM VER:A YI GIA	773x588x221mm B Flute 16kg	1
7	6013301175X00	EPE Front for NSA 7141-LM VER:A Sentenel	560x260x180mm	1
8	6013301176X00	EPE Rear For NSA 7141-LM VER:A Sentenel	560x260x180mm	1
9	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
10	5040150001X00	NSA 7135 AL Handle VER:A Panadvance	78x58x8mm	1
11	60110A0229X00	Accessory Box for S2216/S2224 VER:A YI GIA	284x207x42mm B Flute 14kg	1
12	6014606099X00	Outside Carton Label for NSA 7141 VER:A Lable Jet	60x60mm ART Paper	2

Ordering Information

The following information below provides ordering information for NSA 7141.

Barebone

NSA 7141 (P/N: 10S00714102X0)

LAN Modules

Model	P/N	Interface	Type	Port Number	Bypass/Segment	Expansion Slot	Location Slot
NX 140F	10S20140F01X0	XL710-BM1	PCIe x8	4 SFP+	None	None	All Slot
NX 120F	10S20120F00X0	X710-BM2	PCIe x8	2 SFP+	None	None	All Slot
NI 180F	10S10180F01X0	i350AM4x2	PCIe x8	8 SFP	None	None	All Slot
NI 180C	10S10180C01X0	i350AM4x2	PCIe x8	8 Copper	None	None	All Slot
NI 184C	10S10184C01X0	i350AM4x2	PCIe x8	8 Copper	4 bypass	None	All Slot
NI 142F	10S10142F01X0	i350AM4x1	PCIe x8	4 SFP	2 bypass	None	All Slot
NV 120F	10S50120F01X0	XXV710-AM2	PCIe x8	2 SPF28	None	None	All Slot
NC 220Q28M	10S30022002X0	MT27708A0-FDCF-CE	PCIe x16	2 QSFP28	None	None	1,2/3,4
NC 220FMS3	10S30022008X0	MT27808A0-FCCF-CE	PCIe x16	2 QSFP28	None	None	1,2/3,4

CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- 1U compact rackmount
- Single Intel® Xeon® Scalable processor family, up to 140W
- 8 x DDR4 RDIMM, support 2133/2400/2666, up to 256 GB
- 4 x PCIe x8 LAN module slots, up to 100G QSFP28
- 2 x 2.5" SSD/HDD internal brackets
- 1 x M.2 2242 B key
- 1 x FHHL PCIe x16 expansion slot
- 3 Swappable fans
- 450W redundant power supply
- TPM module option

Hardware Specifications

Main Board

- PCH C621
- Single Intel® Xeon® scalable processor family
- 1 x PCIe x16 expansion slot

LAN Features

- Optional LAN module
- Support 1GbE/10GbE/25GbE/40GbE/100GbE link speed
- LAN Bypass:

* Please see LAN module list information

I/O Interface-Front

- Power status/HDD status/HW monitor/GPIO LEDs
- 1 x Power button and 1 x reset button
- 1 x Micro USB type and 1 x RJ45 type console port
- 1 x VGA
- 2 x Management LAN ports
- 2 x USB 3.0 ports
- 4 x LAN module slots (x8, x8, x8, x8 or x16, x8, x8)

I/O Interface-Rear

- 1 x PCIe x16 expansion slot
- 3 x Swappable system fans

Main Memory

- 8 x DDR4 RDIMM, support 2133/2400/2666, up to 256 GB
- 2 x Intel® Optane™ DC persistent memory (Apache Pass)

Storage

- 2 x 2.5" internal SSD/HDDs
- 1 x SATA DOM
- 1 x M.2 2242 B-Key

Power Input

- 450W redundant power supply

Dimensions

- Chassis dimension: 438 mm x 600 mm x 44 mm
- Packing dimension: 773 mm x 588 mm x 221 mm

Weight

- Without packing: 10.91kg
- With packing: 14kg

Environment

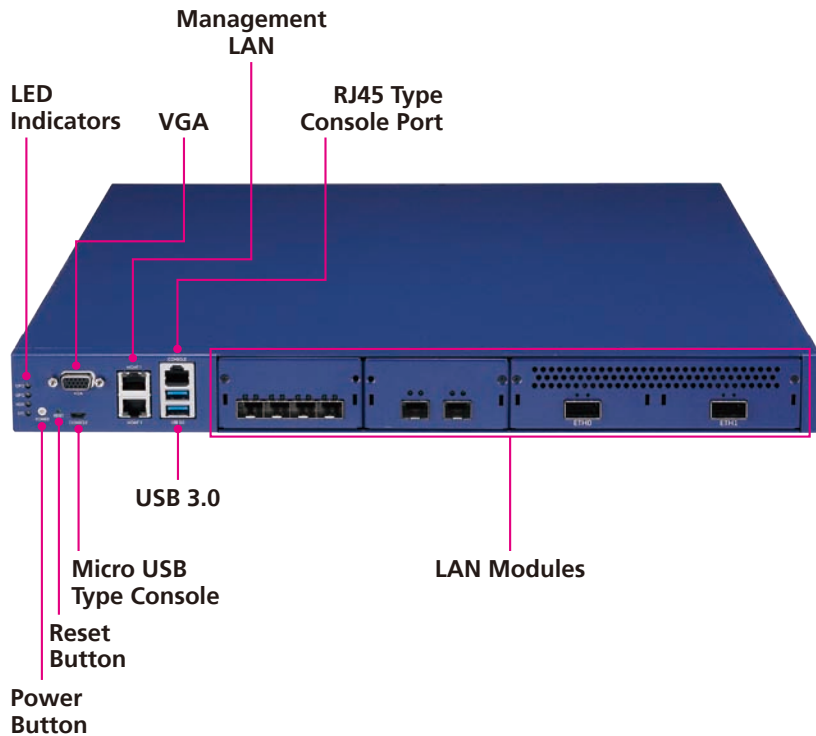
- Operating temperature: 0°C~40°C
- Storage temperature: -20°C~80°C
- Relative humidity: 10%~90% non-condensing

Certifications

- CE approval
- FCC Class A

Knowing Your NSA 7141

Front Panel



LED Indicators

Indicates the power status, storage drive and GPIO activity of the system.

VGA

Used to connect an analog VGA monitor.

Management LAN Ports

Two LAN ports used for managing the system.

RJ45 and Micro USB Type Console Serial Port

Used to connect console devices with RJ45 and Micro USB type connection.

Power Button

Press to power-on or power-off the system.

Reset Button

Press to restart the system.

USB 3.0 Ports

Used to connect USB 3.0/2.0/1.1 devices.

LAN Modules

Four PCIe x8 LAN module bays to install add-on network modules (supports x8/x8/x8/x8 or x16/x8/x8 PCIe bifurcation).

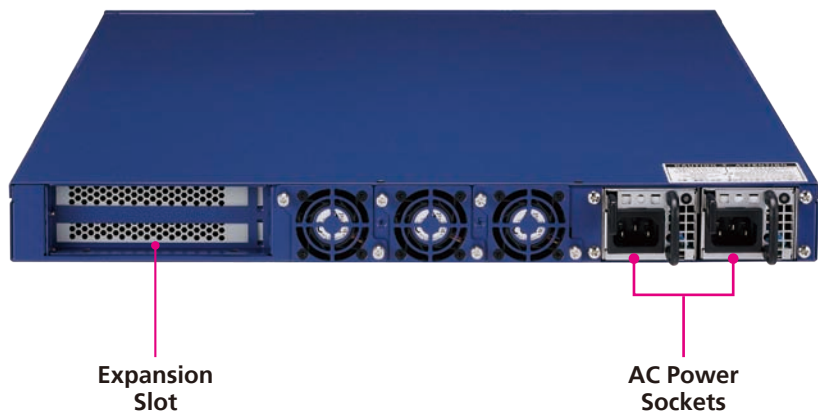
Rear Panel

Expansion Slot

Used to install a PCI Express x16 add-on card.

AC Power Sockets

Dual redundant power supply sockets, plug an AC power cord here before turning on the system.



CHAPTER 2: JUMPERS AND CONNECTORS

This chapter describes how to set the jumpers and connectors on the NSA 7141 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:

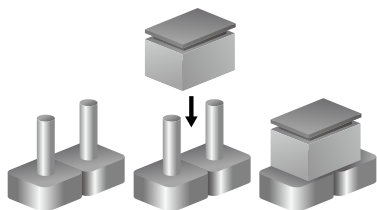
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal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

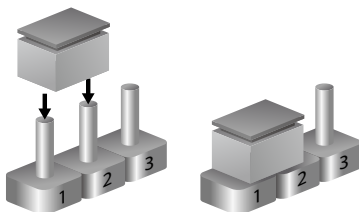
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

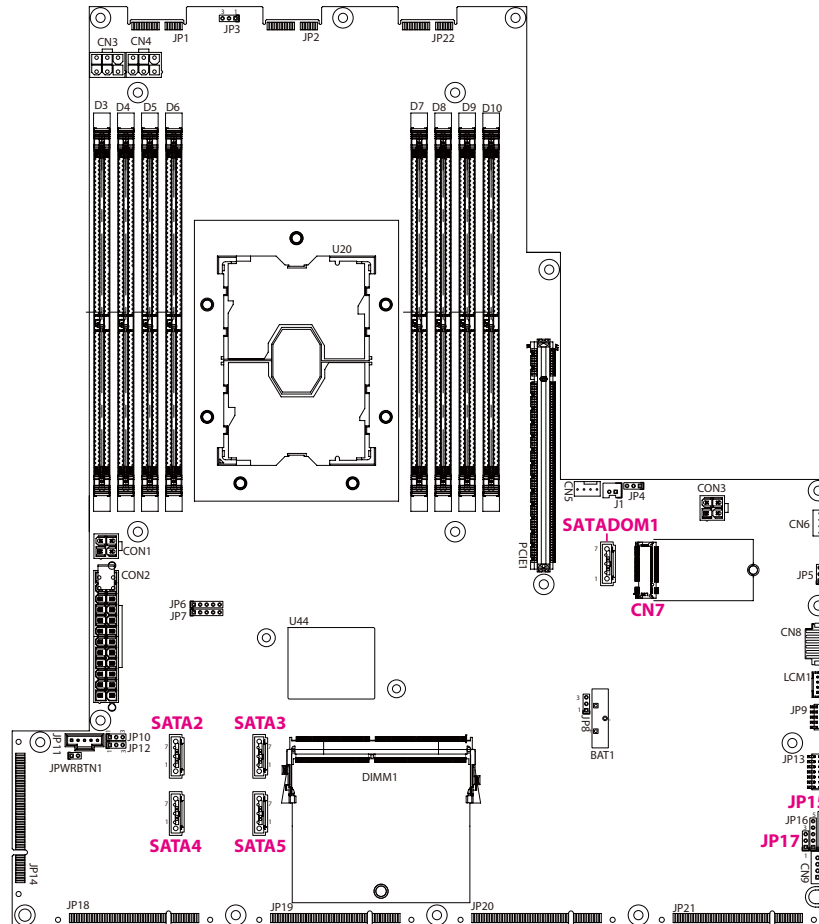


Three-Pin Jumpers: Pins 1 and 2 are Short



Locations of the Jumpers and Connectors

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



Jumper

AT/ATX Mode Selection

Connector type: 1x3 3-pin header

Connector location: JP17



Pin	Definition
1	P3V3
2	AT/ATX
3	GND

Internal Connectors

CPLD Programming/CPLD Boundary Scan Header

Connector type: 1x6 6-pin header

Connector location: JP15

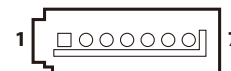


Pin	Definition	Pin	Definition
1	P3V3	2	GND
3	JTAG_PLD_TCK	4	JTAG_PLD_TDO
5	JTAG_PLD_TDI	6	JTAG_PLD_TMS

SATA DOM Connector

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

Connector location: SATADOM1

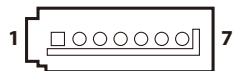


Pin	Definition	Pin	Definition
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	P5V		

SATA Connectors

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

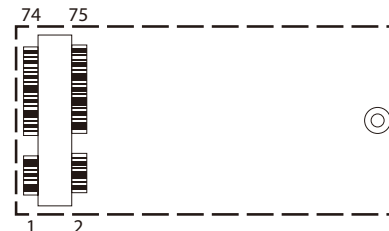
Connector location: SATA2, SATA3, SATA4 and SATA5



Pin	Definition	Pin	Definition
1	GND	2	TXP
3	TXN	4	GND
5	RXP	6	RXN
7	GND		

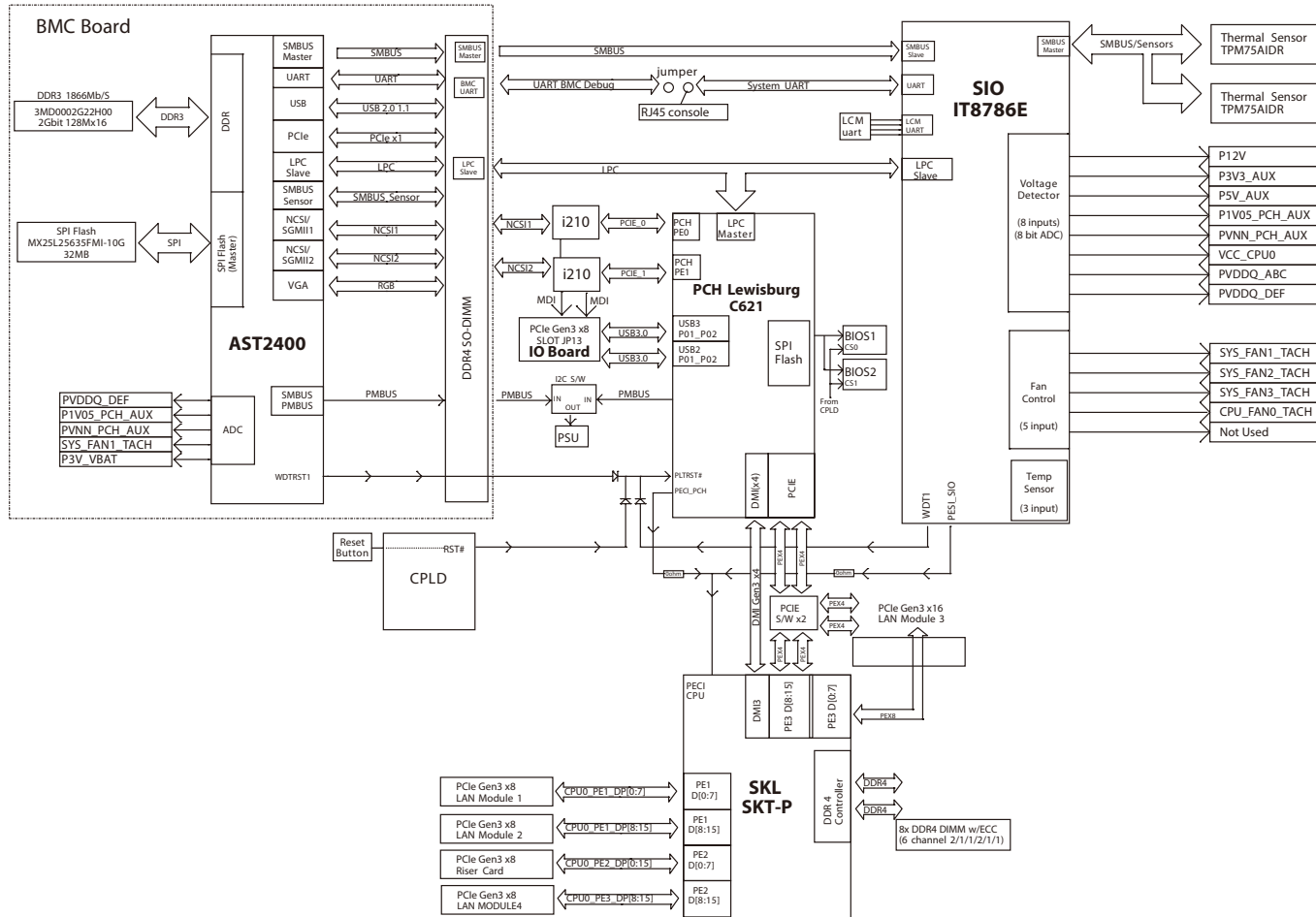
M.2 Slot

Connector location: CN7



Pin	Definition	Pin	Definition
2	P3V3	45	GND
3	GND	47	SATA TXP/TXN
4	P3V3	49	SATA TXP/TXN
5	GND	51	GND
27	GND	57	GND
33	GND	70	P3V3
38	DEVS LP	71	GND
39	GND	72	P3V3
41	SATA RXP/RXN	73	GND
43	SATA RXP/RXN	74	P3V3

Block Diagram



CHAPTER 3: SYSTEM SETUP

Removing the Chassis Cover



Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. Remove the screws on the top and sides of chassis then put them in a safe place for later use.

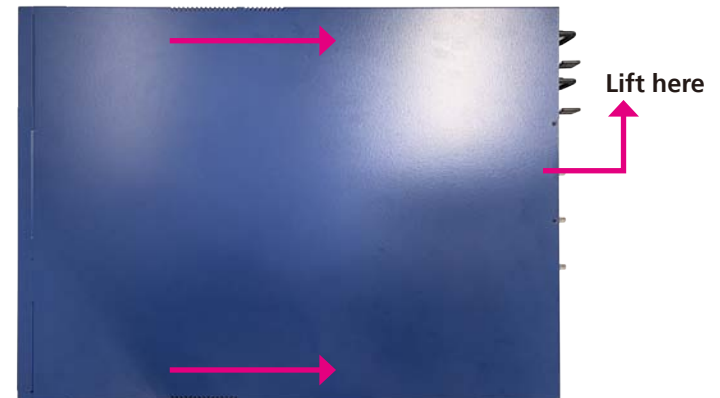


Screws on the top



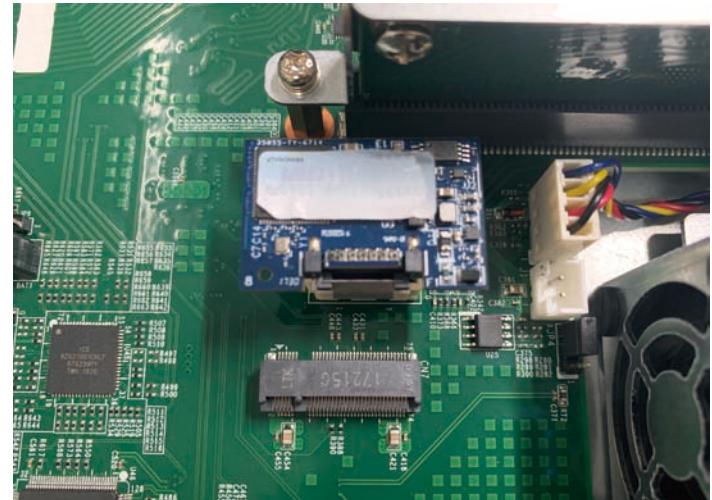
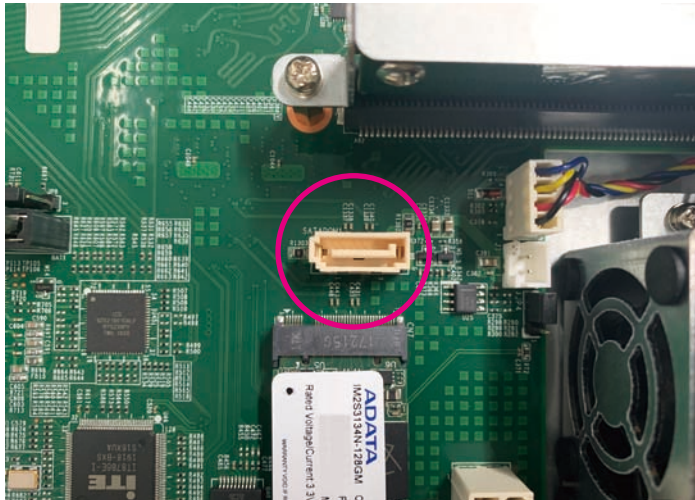
Screws on the sides

2. Gently slide the cover outwards, then lift up the cover to remove it.



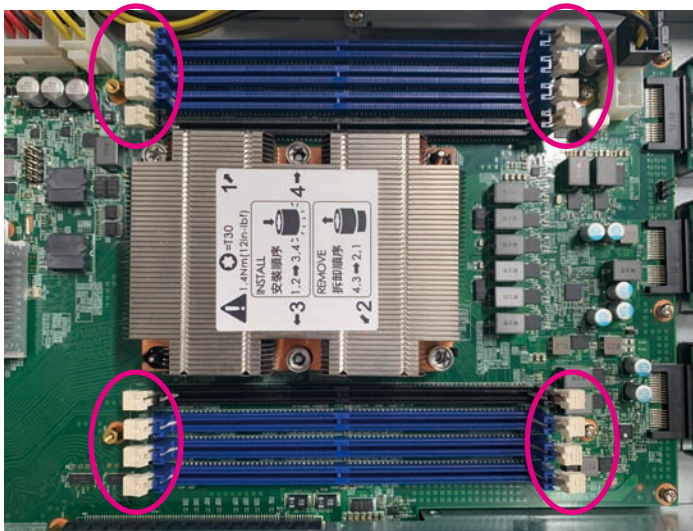
Installing a SATA DOM

1. Locate the SATA DOM connector on the motherboard.
2. Install the SATA DOM module to the connector.

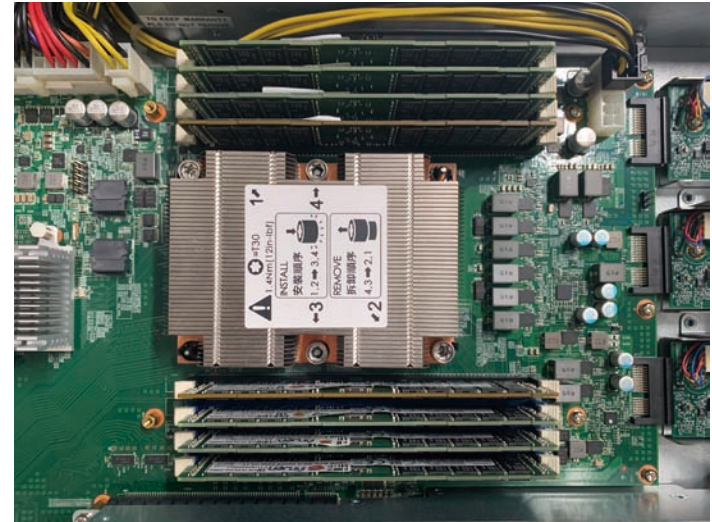


Installing DIMM Memory Modules

1. Locate the DIMM sockets on the motherboard and release the locks.



2. Insert the module into the socket at an 90 degree angle. Apply firm even pressure to each end of the module until it slips into the socket. While pushing the module into position, the locks will close automatically.

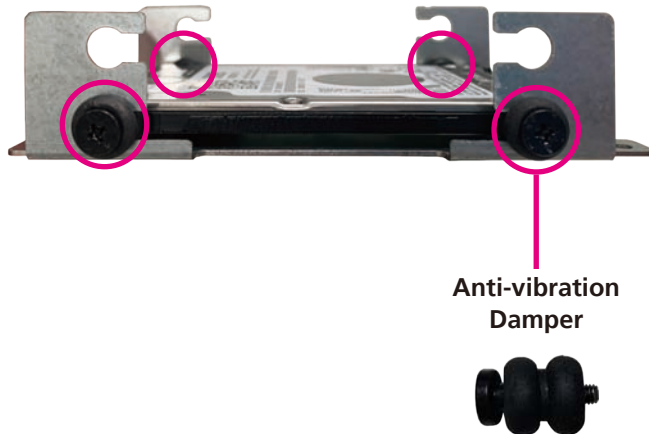


Installing a 2.5" SATA Storage Drive

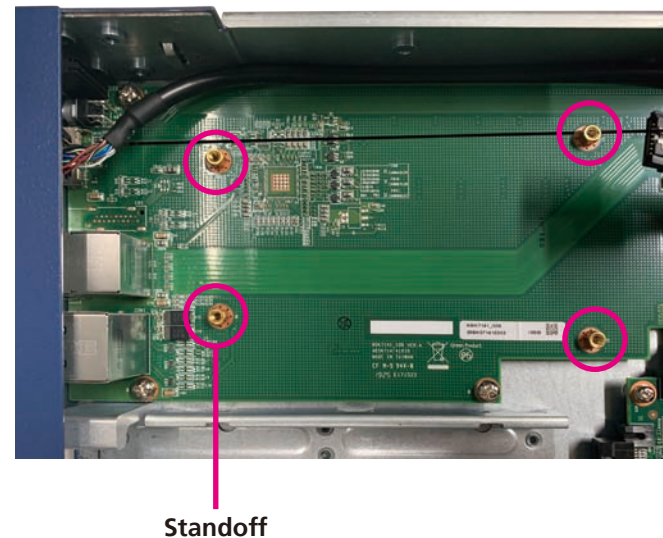


Please correctly follow the below instructions and noted items to avoid making unnecessary damages.

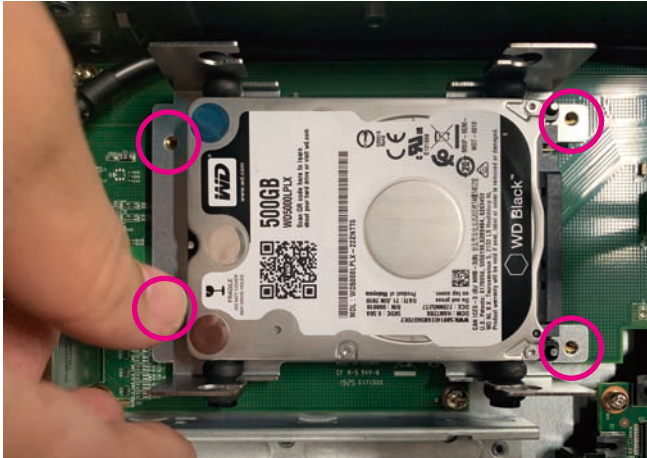
1. Install the anti-vibration dampers to the mounting holes on the storage drive bracket. Align the mounting holes on the storage drive to the holes on the dampers, then fasten screws through the dampers to secure the storage drive.



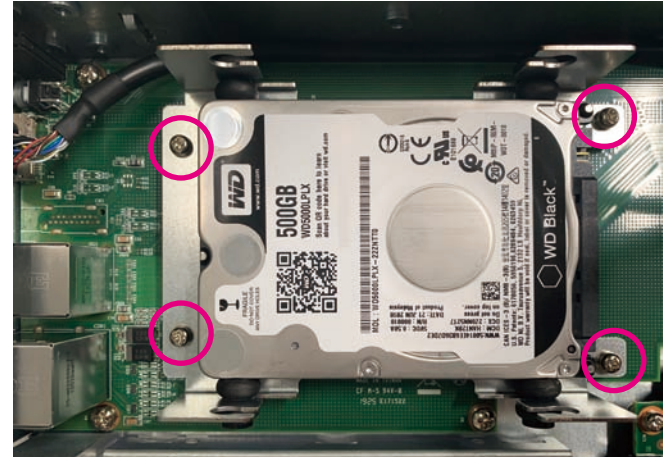
2. Locate the standoffs for securing the storage drive bracket in the chassis.



3. Align the mounting holes on the bracket to the standoffs in the chassis.



4. With the mounting holes aligned, secure the bracket to the chassis with mounting screws.

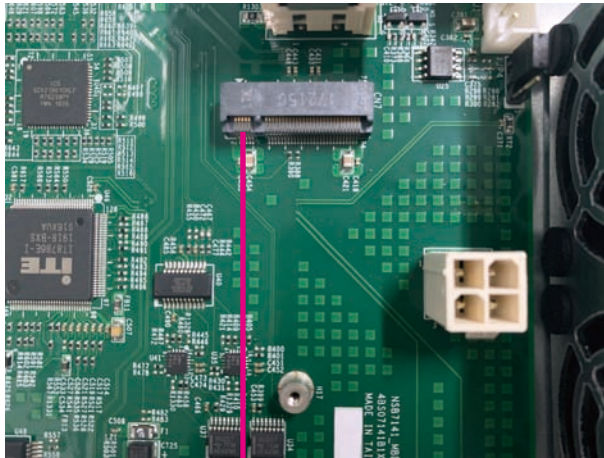


5. Connect the SATA data and power cables to the respective connectors on the motherboard and the other ends of the cables to the connectors on the storage drive.



Installing an M.2 Module

1. Locate the M.2 slot on the motherboard.



M.2 Slot

2. Insert the M.2 module into the mini-PCI Express slot at a 45-degree angle until the gold-plated connector on the edge of the module completely appears inside the slot.



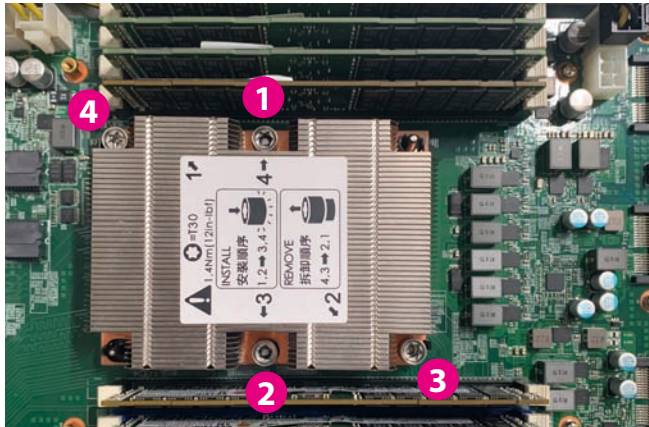
M.2 Module

3. Push the module down and then secure it with a mounting screw.

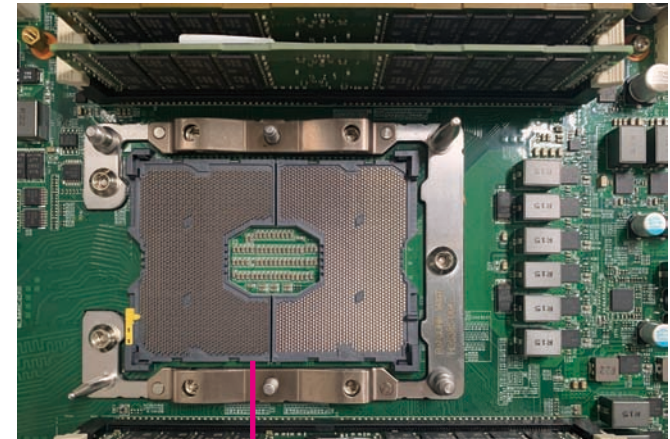


Installing a CPU (LGA 3647)

1. Locate the LGA 3647 CPU socket on the motherboard and remove the mounting screws in the order marked below.



2. The CPU socket is readily accessible after you have removed the heatsink.

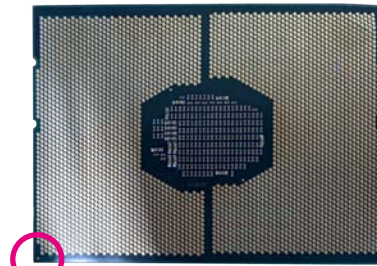


CPU Socket

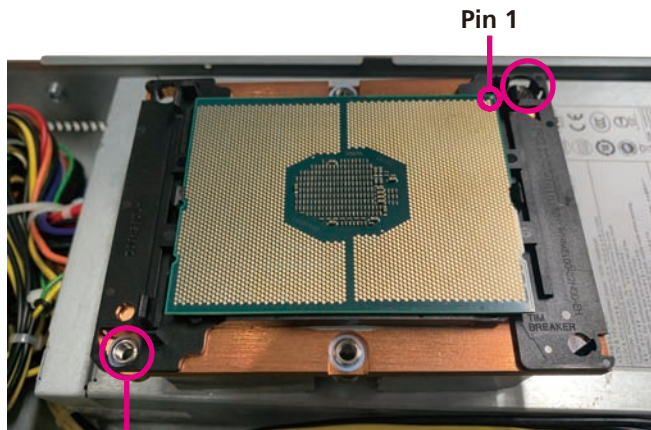


- Make sure all power cables are unplugged before you install the CPU.
- The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

- Place the top side of the CPU onto the processor-heatsink-module (PHM), with pin 1 (marked by a triangular edge) on the CPU aligned to either one of the bevels on the PHM.

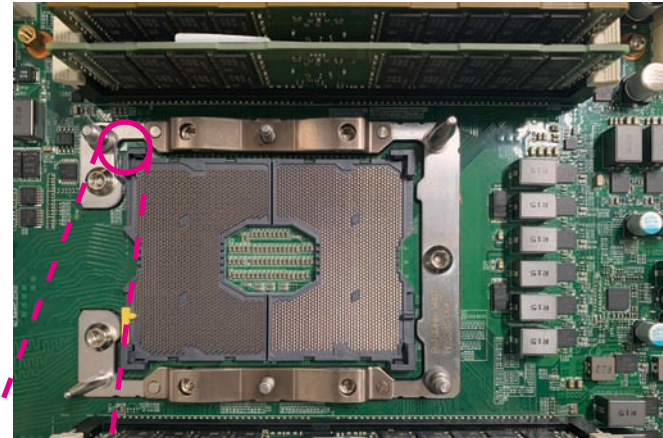


Pin 1

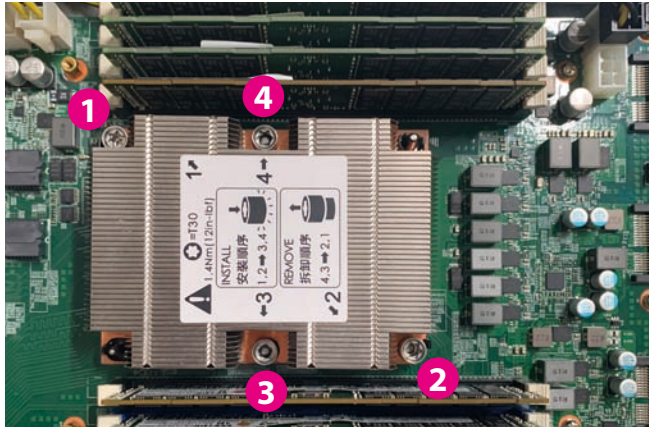


Bevel

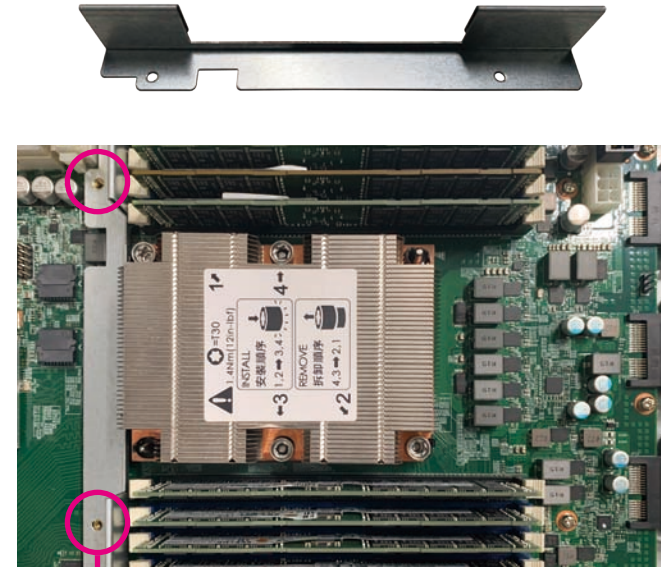
- Insert the PHM into the socket. Pin 1 on the CPU must align with the corner of the CPU socket (marked by a triangular edge) as shown on the photo.



5. Secure the mounting screws in the order marked below.



6. Align the bracket to the standoffs.



Standoff

7. Secure the bracket with screws.



CHAPTER 4: BIOS SETUP

This chapter describes how to use the BIOS setup program for NSA 7141. 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.

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.


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 1998 to 9999.

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.

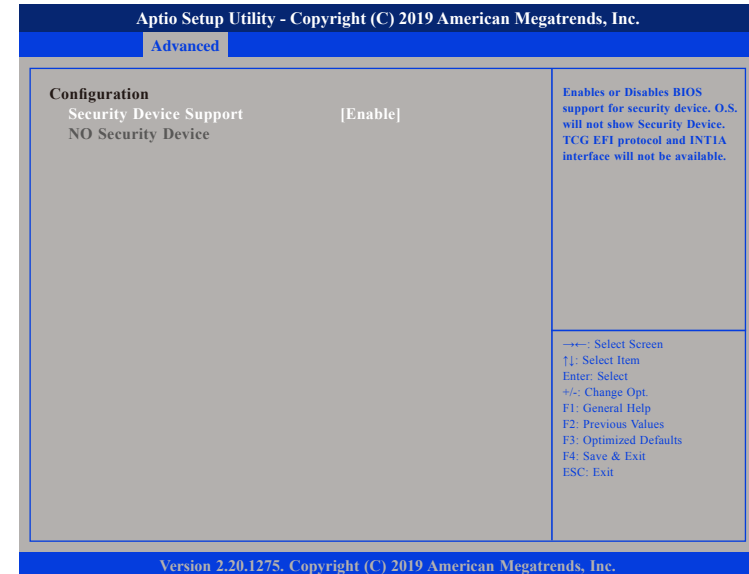


Setting incorrect field values may cause the system to malfunction.



Trusted Computing

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

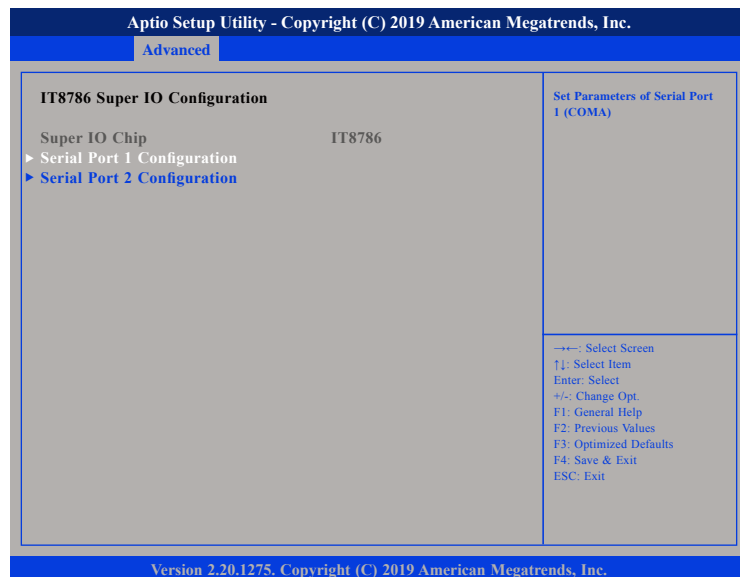


Security Device Support

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.

IT8786 Super IO Configuration

This section is used to configure the serial port.



Super IO Chip

Displays the Super I/O chip used on the board.

Serial Port 1 Configuration

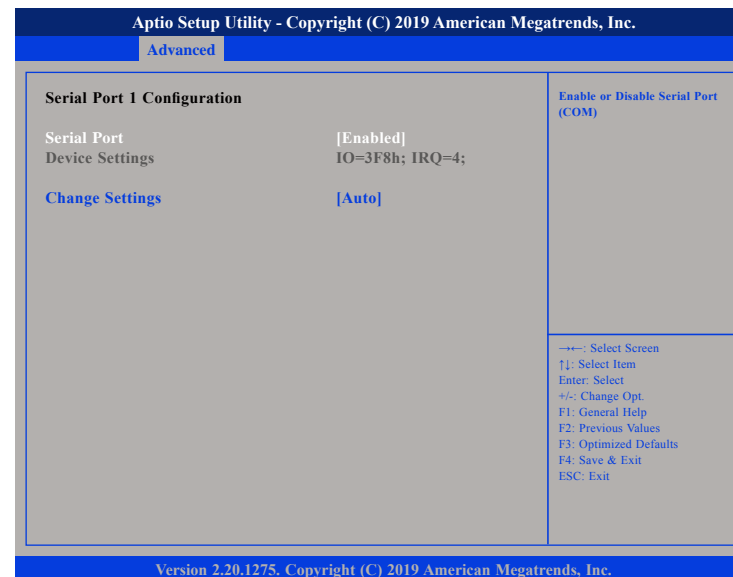
Configuration settings for serial port 1.

Serial Port 2 Configuration

Configuration settings for serial port 2.

Serial Port 1 Configuration

This section is used to configure serial port 1.



Serial Port

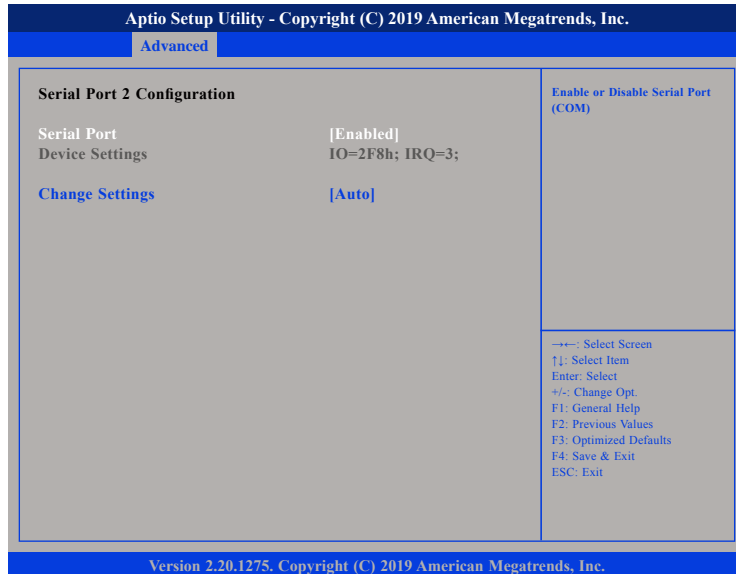
Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Serial Port 2 Configuration

This section is used to configure serial port 2.



Serial Port

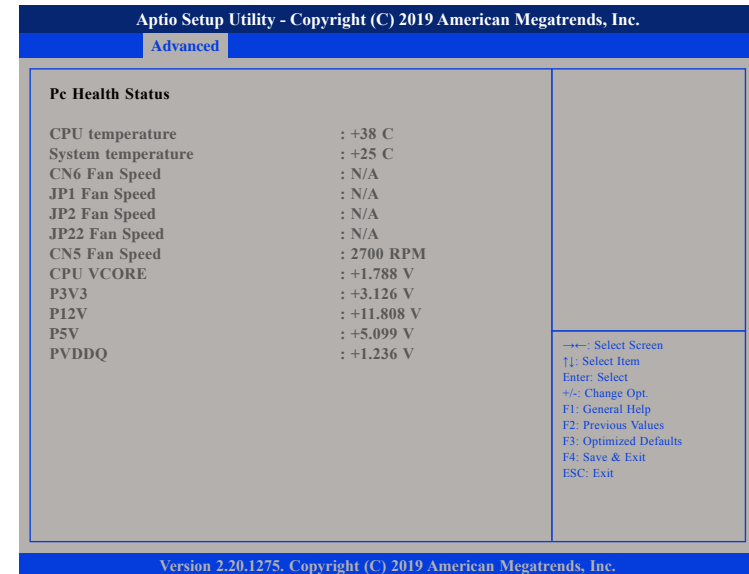
Enables or disables the serial port.

Change Settings

Selects an optimal setting for the Super IO device.

Hardware Monitor

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



CPU and System temperature

Detects and displays the current CPU and system temperature.

Fan Speed (CN6, JP1, JP2, JP22 and CN5)

Detects and displays the current fan speeds of the fans connected to CN6, JP1, JP2, JP22 and CN5.

CPU VCORE to PVDDQ

Detects and displays the output voltages.

Serial Port Console Redirection

This section is used to configure the serial port that will be used for console redirection.

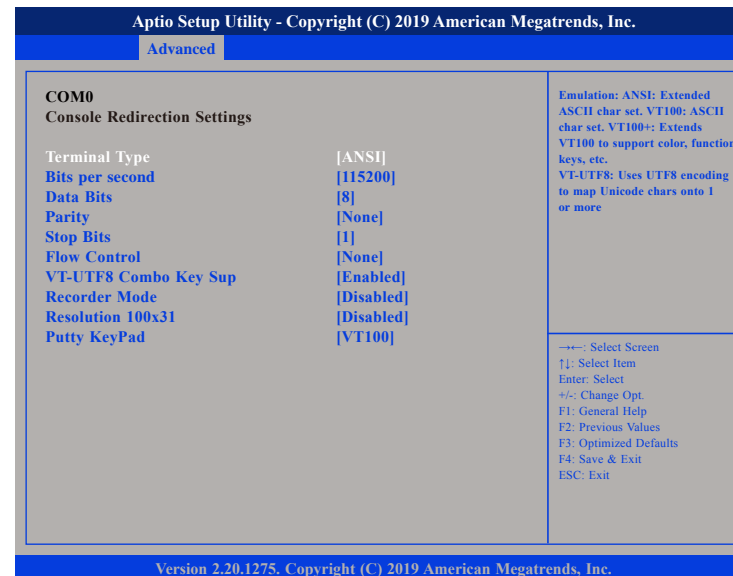


Console Redirection

Enables or disables console redirection for COM0.

Console Redirection Settings (COM0)

Specifies how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.



Terminal Type

ANSI Extended ASCII character set.
 VT100 ASCII character set.
 VT100+ Extends VT100 to support color, function keys, etc.
 VT-UTF8 Uses UTF8 encoding to map Unicode characters onto 1 or more bytes.

Bits Per Second

Selects the serial port transmission speed. The speed must match the other side. Long or noisy lines may require a lower speed.

Data Bits

The options are 7 and 8.

Parity

A parity bit can be sent with the data bits to detect some transmission errors.

Even Parity bit is 0 if the number of 1's in the data bits is even.

Odd Parity bit is 0 if number of 1's in the data bits is odd.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data and the receiving buffers are full, a "stop" signal can be sent to stop the data flow.

VT-UTF8 Combo Key Support

Enables or disables VT-UTF8 combo key support.

Recorder Mode

When this field is enabled, only text will be sent. This is to capture the terminal data.

Resolution 100x31

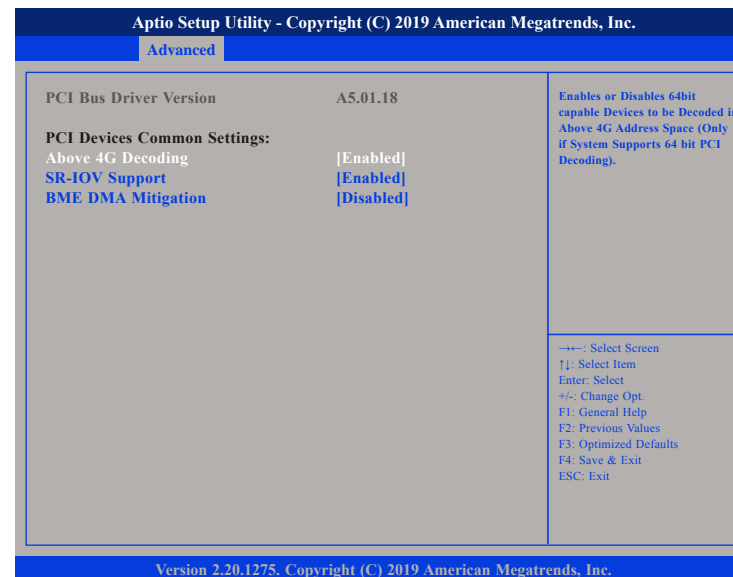
Enables or disables extended terminal resolution.

Putty KeyPad

Selects the Putty keyboard emulation type.

PCI Subsystem Settings

This section is used to configure the PCI.



Above 4G Decoding

Enables or disables decoding of 64-bit devices in 4G address space. (Only if the system supports 64-bit PCI decoding.)

SR-IOV Support

Enables or disables SR-IOV support.

BME DMA Mitigation

Enables or disables the function to re-enable bus master attribute during PCI enumeration for PCI bridges after SMM is locked.

CSM Configuration

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



CSM Support

This field is used to enable or disable CSM support, if Auto option is selected, based on OS, CSM will be enabled or disabled automatically.

GateA20 Active

Upon Request GA20 can be disabled using BIOS services.
 Always Do not allow disabling of GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

This field is used to set display mode for Option ROM. The options are Force BIOS and Keep Current.

INT19 Trap Response

Allows Option ROMs to trap Interrupt 19 when enabled.

Immediate Execute the trap right away.
 Postponed Execute the trap during legacy boot.

HDD Connection Order

Configures the HDD handles to be adjusted.

Network

Controls the execution of UEFI and Legacy PXE OpROM.

Storage

Controls the execution of UEFI and Legacy Storage OpROM.

Video

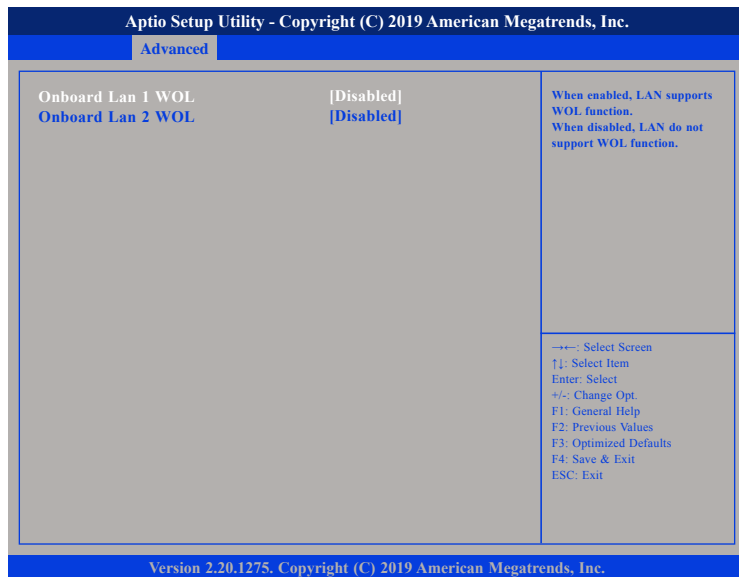
Controls the execution of UEFI and Legacy Video OpROM.

Other PCI Devices

Configures the OpROM execution policy for devices other than Network, Storage or Video.

Wake On LAN (WOL) Settings

This section is used to configure the Wake on LAN feature.



Onboard Lan 1 WOL

Enables or disables the Wake on LAN feature on LAN 1.

Onboard Lan 2 WOL

Enables or disables the Wake on LAN feature on LAN 2.

Network Stack Configuration

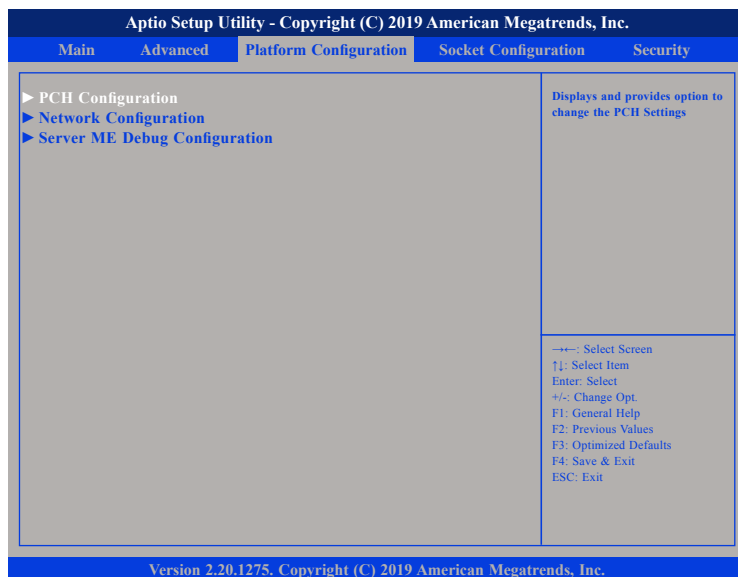
This section is used to configure the network stack.



Network Stack

Enables or disables UEFI network stack.

Platform Configuration



PCH Configuration

Enters the PCH Configuration submenu.

Network Configuration

Enters the Network Configuration submenu.

Server ME Debug Configuration

Enters the Server ME Debug Configuration submenu.

PCH Configuration



PCH Devices

Enters the PCH Devices submenu.

PCI Express Configuration

Enters the PCI Express Configuration submenu.

PCH SATA Configuration

Enters the PCH SATA Configuration submenu.

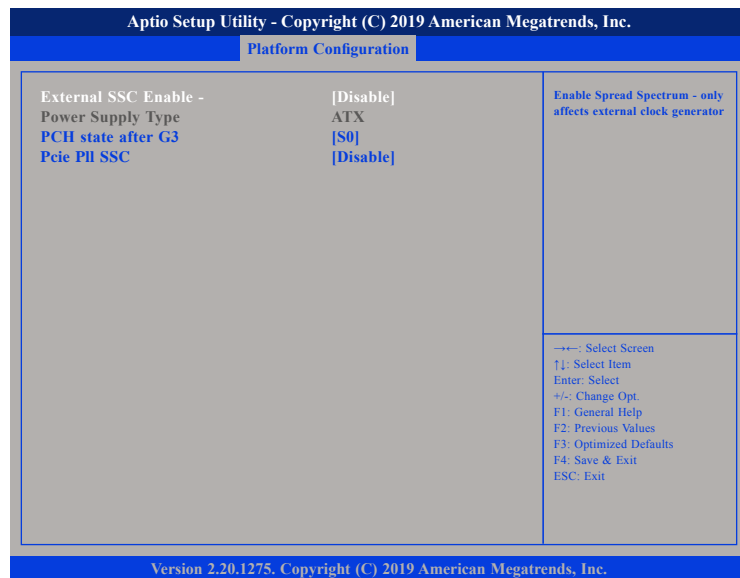
PCH sSATA Configuration

Enters the PCH sSATA Configuration submenu.

USB Configuration

Enters the USB Configuration submenu.

PCH Devices



External SSC Enable

Enables or disables spread spectrum clock. Only affects external clock generator.

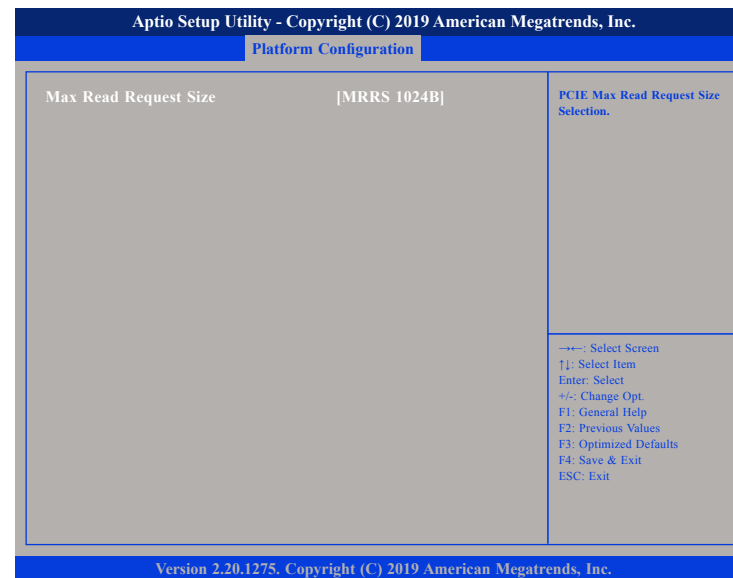
PCH state after G3

Configures the PCH state after G3.

Pcie Pll SSC

Enables or disables PCIe Phase Locked Loop for spread spectrum clock.

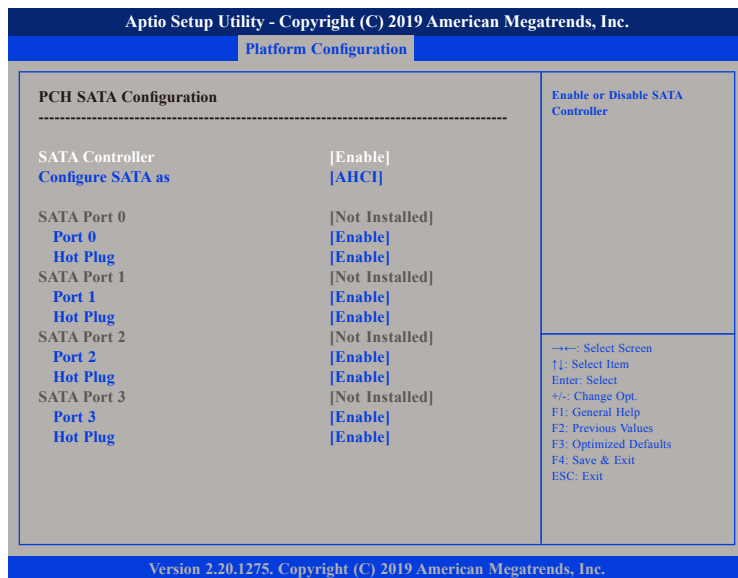
PCI Express Configuration



Max Read Request Size

Configures the PCIe max read request size.

PCH SATA Configuration



Port 0 to Port 3

Enables or disables SATA port 0 to port 3.

Hot Plug

Enables or disables hot plugging feature on SATA port 0 to port 3.

SATA Controller

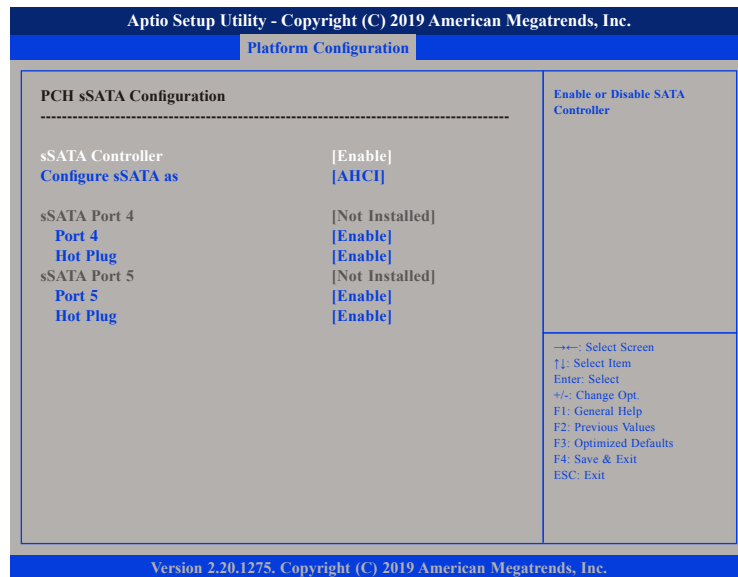
Enables or disables the SATA controller.

Configure SATA as

Configures the SATA mode.

AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

PCH sSATA Configuration



Port 4 to Port 5

Enables or disables SATA port 4 to port 5.

Hot Plug

Enables or disables hot plugging feature on SATA port 4 to port 5.

sSATA Controller

Enables or disables the SATA controller.

Configure sSATA as

Configures the SATA mode.

AHCI This option configures the Serial ATA drives to use AHCI (Advanced Host Controller Interface). AHCI allows the storage driver to enable the advanced Serial ATA features which will increase storage performance.

USB Configuration (PCH)



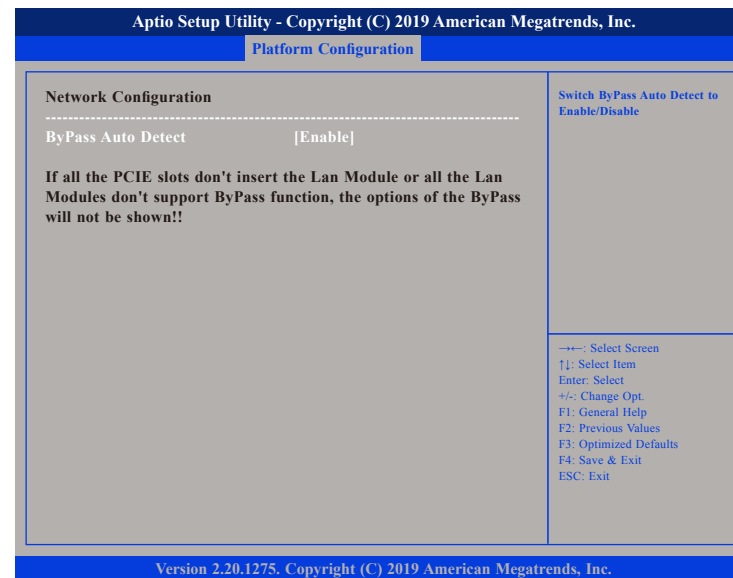
XHCI Manual Mode

Enables or disables XHCI manual mode.

USB Per-Connector Disable

Provides the option to enable or disable each USB connector.

Network Configuration



ByPass Auto Detect

Enables or disables automatic LAN Bypass function.

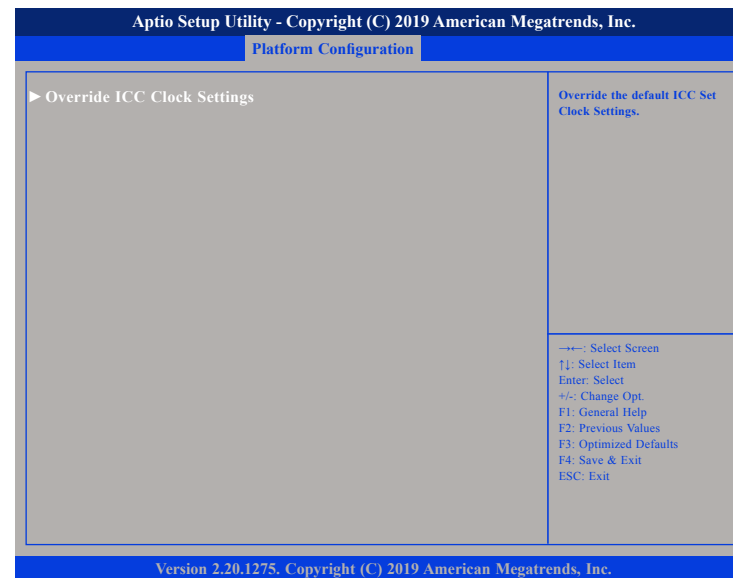
Server ME Debug Configuration



Server ME General Configuration

Enters the Server ME General Configuration submenu.

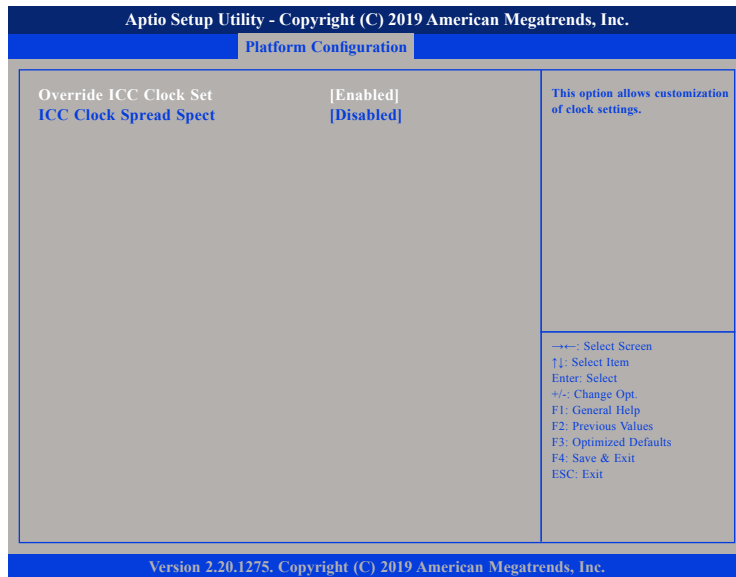
Server ME General Configuration



Override ICC Clock Settings

Enters the Override ICC Clock Settings submenu.

Override ICC Clock Settings



Override ICC Clock Settings

Provides the option to allow customization of clock settings.

ICC Clock Spread Spectrum

Enables or disables ICC Clock Spread Spectrum.

Socket Configuration



Processor Configuration

Enters the Processor Configuration submenu.

Common RefCode Configuration

Enters the Common RefCode Configuration submenu.

Memory Configuration

Enters the Memory Configuration submenu.

IIO Configuration and Advanced Power Management Configuration

Enters the IIO Configuration and Advanced Power Management Configuration submenu.

Processor Configuration

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.

Socket Configuration

Processor Configuration

► Per-Socket Configuration

Processor Revision	50656 - CLX B0
Processor Socket	Socket 0
Processor ID	00050656*
Processor Frequency	2.500GHz
Processor Max Ratio	19H
Processor Min Ratio	0AH
Microcode Revision	04000029
L1 Cache RAM	64KB
L2 Cache RAM	1024KB
L3 Cache RAM	28160KB

Processor 0 Version
Intel (R) Xeon (R) Gold 6248 CPU @ 2.50GHz

Hyper-Threading [ALL]	[Disable]
Enable Intel(R) TXT	[Disable]

Change Per-Socket Settings

--- 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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Hyper-Threading [ALL]

Enables or disables hyper-threading technology.

Enable Intel® TXT

Enables or disables Intel TXT support.

VMX

Enables or disables Virtual Machine Extensions.

Enable SMX

Enables or disables Secure Mode Extensions.

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.

Socket Configuration

Processor Frequency	2.500GHz
Processor Max Ratio	19H
Processor Min Ratio	0AH
Microcode Revision	04000029
L1 Cache RAM	64KB
L2 Cache RAM	1024KB
L3 Cache RAM	28160KB

Processor 0 Version
Intel (R) Xeon (R) Gold 6248 CPU @ 2.50GHz

Hyper-Threading [ALL]	[Disable]
Enable Intel(R) TXT	[Disable]
VMX	[Enable]
Enable SMX	[Disable]
Hardware Prefetcher	[Disable]
L2 RFO Prefetch Disable	[Disable]
Adjacent Cache Prefetcher	[Enable]
Extended APIC	[Disable]

Enable/disable extended APIC support

--- 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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Hardware Prefetcher

Enables or disables the MLC streamer prefetcher.

L2 RFO Prefetch Disable

Enables or disables L2 RFO prefetch.

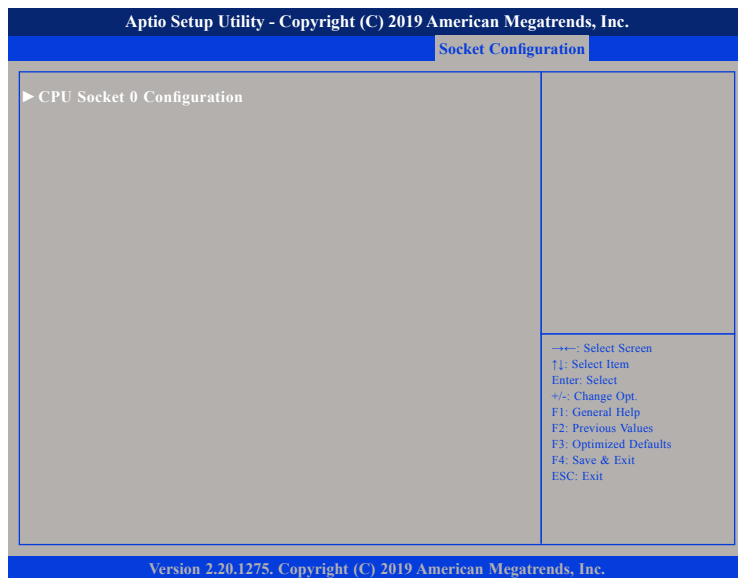
Adjacent Cache Prefetcher

Enables or disables prefetching of adjacent cache lines.

Extended APIC

Enables or disables extended APIC support.

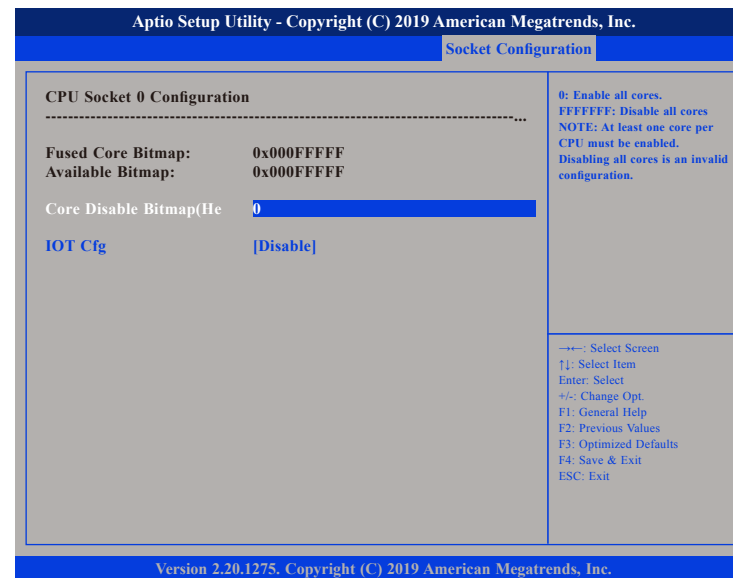
Per-Socket Configuration



CPU Socket 0 Configuration

Processor settings for the CPU on socket 0.

CPU Socket 0 Configuration



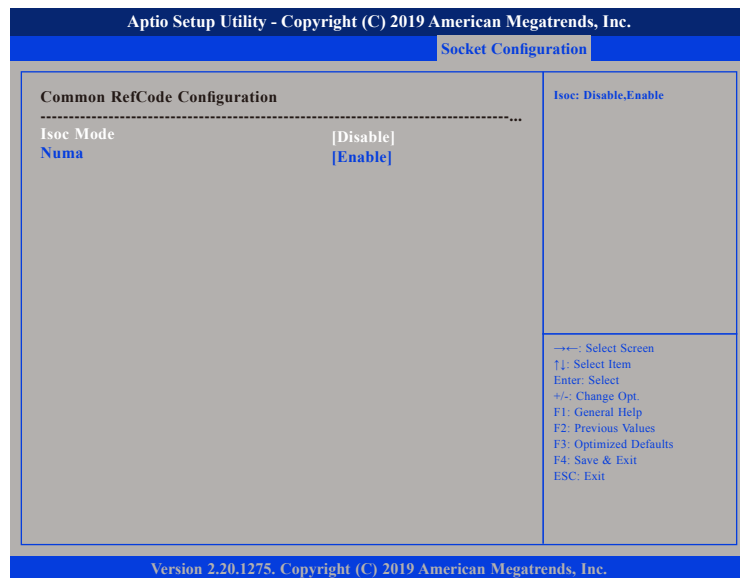
Cores Disable Bitmap

Provides the option to enable or disable all cores. 0 means enable all cores. FFFFFFFF means disable all cores.

IOT Cfg

Enables or disables IOT Cfg.

Common RefCode Configuration



Isoc Mode

Enables or disables Isochronous support.

Numa

Enables or disables Non-Uniform Memory Access support.

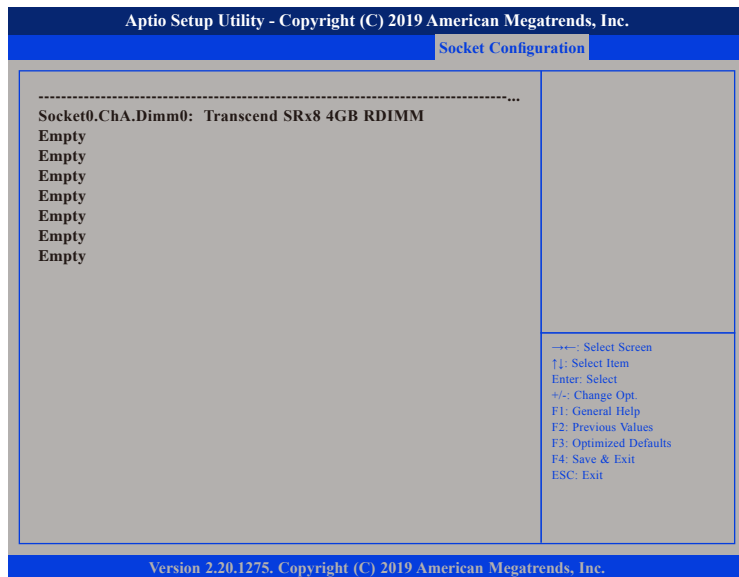
Memory Configuration



Memory Frequency

Configures the maximum frequency of the memory. Do not select Reserved.

Memory Topology



Detects and displays the information on the memory installed.

Memory Map



Volatile Memory Mode

Configures whether 1LM or 2LM memory mode should be enabled.

AppDirect cache

Enables or disables AppDirect cache.

eADR Support

Enables or disables eADR support.

1LM Memory Interleave

Configures the 1LM memory interleave granularity setting.

IMC Interleaving

Configures the IMC interleaving setting.

Channel Interleaving

Configures the channel interleaving setting.

Rank Interleaving

Configures the rank interleaving setting.

Socket Interleave Below 4GB

Enables or disables memory allocation between sockets.

I/O Configuration



Socket0 Configuration

Enters the Socket0 Configuration submenu.

IOAT Configuration

Enters the IOAT Configuration submenu.

I/O General Configuration

Enters the I/O General Configuration submenu.

Intel. VT for Directed I/O (VT-d)

Enters the Intel® VT for Directed I/O (VT-d) submenu.

Socket0 Configuration

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Socket Configuration		
IOU0 (IIO PCIe Br1)	[Auto]	Selects PCIe port Bifurcation for selected slot(s)
IOU1 (IIO PCIe Br2)	[Auto]	
IOU2 (IIO PCIe Br3)	[Auto]	
▶ Socket 0 PCIeBr0D00F0 - Port 0/DMI		
▶ Socket 0 PCIeBr1D00F0 - Port 1A		
▶ Socket 0 PCIeBr1D02F0 - Port 1C		
▶ Socket 0 PCIeBr2D00F0 - Port 2A		
▶ Socket 0 PCIeBr3D00F0 - Port 3A		
▶ Socket 0 PCIeBr3D02F0 - Port 3C		
IIO0 Redriver Control	[Auto Detect]	
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.		

IOU0 (IIO PCIe Br1)

Port Bifurcation settings for IOU 0.

IOU1 (IIO PCIe Br2)

Port Bifurcation settings for IOU 1.

IOU2 (IIO PCIe Br3)

Port Bifurcation settings for IOU 2.

IIO0 Redriver Control

Configures the redriver options for IIO0.

Socket 0 PCIeBr0D00F0 - Port 0/DMI

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.		
Socket Configuration		
Socket 0 PCIeBr0D00F0 - Port 0/DMI		Choose Link Speed for this PCIe port

Link Speed	[Auto]	
Override Max Link Width	[Auto]	
PCI-E Port DeEmphasis	[-3.5 dB]	
PCI-E Port Link Status	Linked as x4	
PCI-E Port Link Max	Max Width x4	
PCI-E Port Link Speed	Gen 3 (8.0 GT/s)	
PCI-E Port Max Payload	[256B]	
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit		
Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.		

Link Speed

Configures the link speed for the PCIe port.

Override Max Link Width

Configures the link speed to override the max link width set by bifurcation.

PCI-E Port DeEmphasis

Configures the de-emphasis control for the PCIe port.

PCI-E Port Max Payload

Configures the PCIe port maximum payload size.

Socket 0 PcieBr1D00F0 - Port 1A

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.	
Socket Configuration	
Socket 0 PcieBr1D00F0 - Port 1A	
PCI-E Port Link Speed Override Max Link Widt PCI-E Port DeEmphasis PCI-E Port Link Status PCI-E Port Link Max PCI-E Port Link Speed PCI-E Port Max Payload	[Enable] [Auto] [Auto] [-3.5 dB] Link Did Not Train Max Width x8 Link Did Not Train [256B]
In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.	
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.	

PCI-E Port

Enables or disables the PCIe port. In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

Link Speed

Configures the link speed for the PCIe port.

Override Max Link Width

Configures the link speed to override the max link width set by bifurcation.

PCI-E Port DeEmphasis

Configures the de-emphasis control for the PCIe port.

PCI-E Port Max Payload

Configures the PCIe port maximum payload size.

Socket 0 PcieBr1D02F0 - Port 1C

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.	
Socket Configuration	
Socket 0 PcieBr1D02F0 - Port 1C	
PCI-E Port Link Speed Override Max Link Widt PCI-E Port DeEmphasis PCI-E Port Link Status PCI-E Port Link Max PCI-E Port Link Speed PCI-E Port Max Payload	[Enable] [Auto] [Auto] [-3.5 dB] Link Did Not Train Max Width x8 Link Did Not Train [256B]
In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.	
→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.20.1275. Copyright (C) 2019 American Megatrends, Inc.	

PCI-E Port

Enables or disables the PCIe port. In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

Link Speed

Configures the link speed for the PCIe port.

Override Max Link Width

Configures the link speed to override the max link width set by bifurcation.

PCI-E Port DeEmphasis

Configures the de-emphasis control for the PCIe port.

PCI-E Port Max Payload

Configures the PCIe port maximum payload size.

Socket 0 PcieBr2D00F0 - Port 2A

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.

Socket Configuration

Socket 0 PcieBr2D00F0 - Port 2A

In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

PCI-E Port	[Enable]
Link Speed	[Auto]
Override Max Link Wid	[Auto]
PCI-E Port DeEmphasis	[-3.5 dB]
PCI-E Port Link Status	Link Did Not Train
PCI-E Port Link Max	Max Width x16
PCI-E Port Link Speed	Link Did Not Train
PCI-E Port Max Payload	[256B]

--- 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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PCI-E Port

Enables or disables the PCIe port. In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

Link Speed

Configures the link speed for the PCIe port.

Override Max Link Width

Configures the link speed to override the max link width set by bifurcation.

PCI-E Port DeEmphasis

Configures the de-emphasis control for the PCIe port.

PCI-E Port Max Payload

Configures the PCIe port maximum payload size.

Socket 0 PcieBr3D00F0 - Port 3A

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.

Socket Configuration

Socket 0 PcieBr3D00F0 - Port 3A

In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

PCI-E Port	[Enable]
Link Speed	[Auto]
Override Max Link Wid	[Auto]
PCI-E Port DeEmphasis	[-3.5 dB]
PCI-E Port Link Status	Link Did Not Train
PCI-E Port Link Max	Max Width x8
PCI-E Port Link Speed	Link Did Not Train
PCI-E Port Max Payload	[256B]

--- 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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PCI-E Port

Enables or disables the PCIe port. In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

Link Speed

Configures the link speed for the PCIe port.

Override Max Link Width

Configures the link speed to override the max link width set by bifurcation.

PCI-E Port DeEmphasis

Configures the de-emphasis control for the PCIe port.

PCI-E Port Max Payload

Configures the PCIe port maximum payload size.

Socket 0 PcieBr3D02F0 - Port 3C



PCI-E Port

Enables or disables the PCIe port. In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Disable is used to disable the port and hide its CFG space.

Link Speed

Configures the link speed for the PCIe port.

Override Max Link Width

Configures the link speed to override the max link width set by bifurcation.

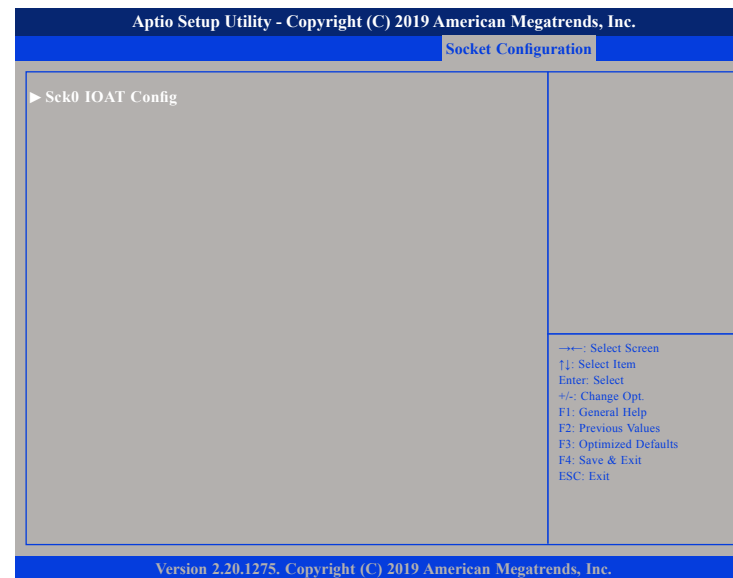
PCI-E Port DeEmphasis

Configures the de-emphasis control for the PCIe port.

PCI-E Port Max Payload

Configures the PCIe port maximum payload size.

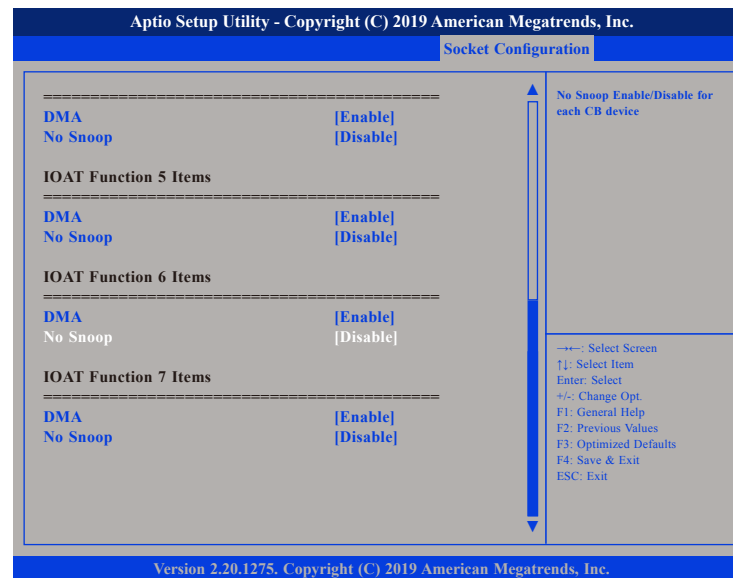
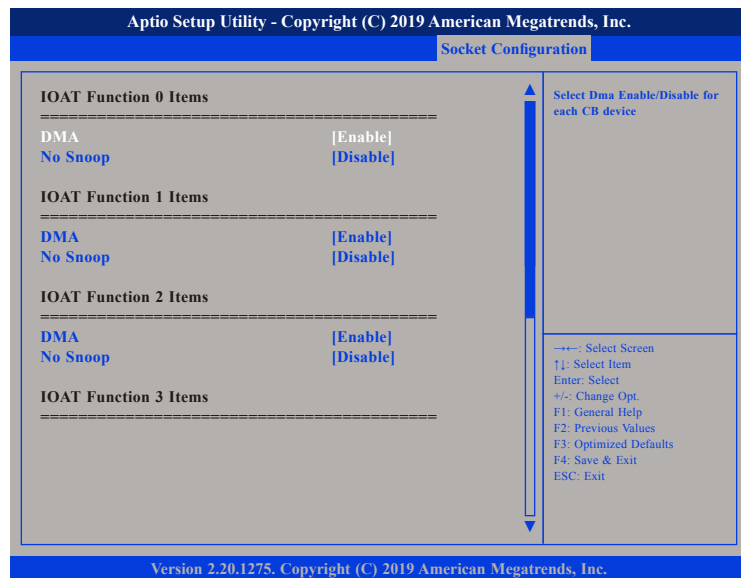
IOAT Configuration



Sck0 IOAT Config

Enters the Socket0 IOAT Configuration submenu.

Sck0 IOAT Config



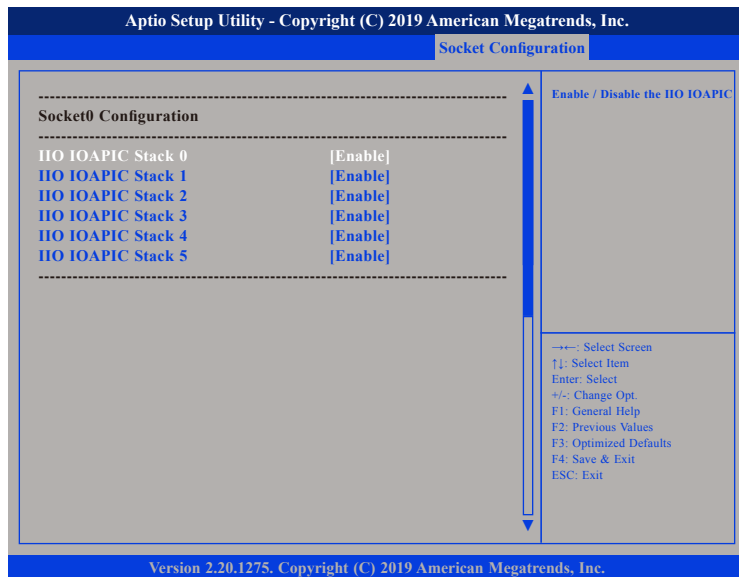
DMA

Enables or disables DMA.

No Snoop

Enables or disables No Snoop function for each CB device.

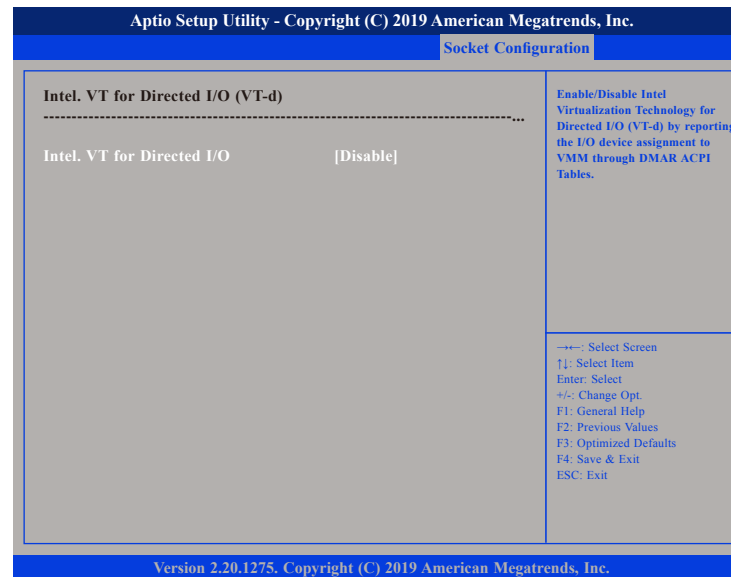
I/O General Configuration



I/O IOAPIC Stack 0 to I/O IOAPIC Stack 5

Enables or disables I/O Advanced Power Interface Configuration (I/OAPIC) for Stack 0 to Stack 5 of Socket 0.

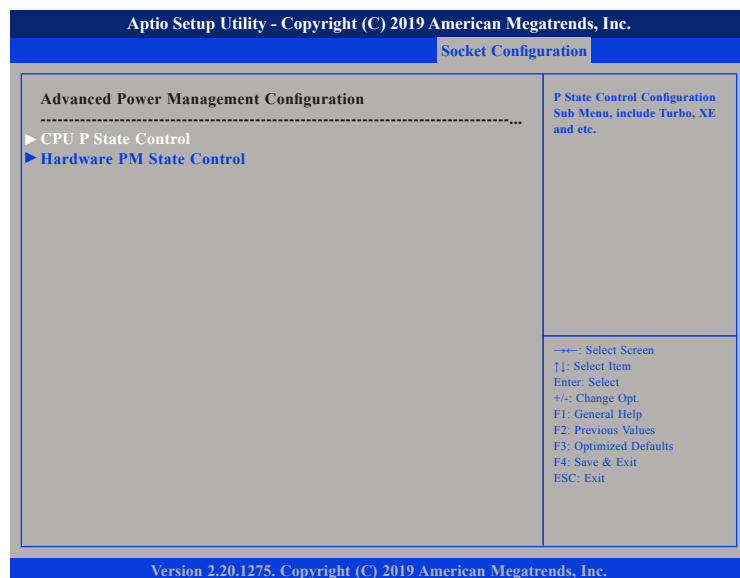
Intel. VT for Directed I/O (VT-d)



Intel. VT for Directed I/O

Enables or disables Intel® Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI tables.

Advanced Power Management Configuration



CPU P State Control

Enters the CPU P State Control submenu.

Hardware PM State Control

Enters the Hardware PM State Control submenu.

CPU P State Control



SpeedStep (Pstates)

Enables or disables Intel® SpeedStep technology.

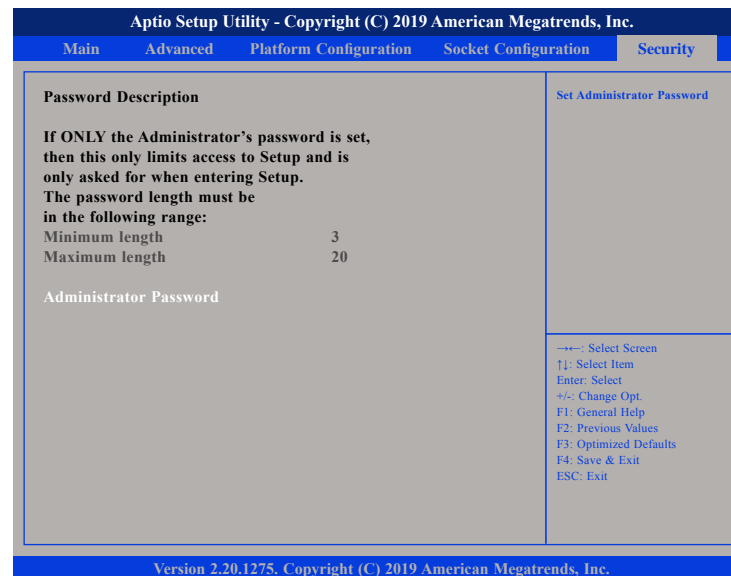
Hardware PM State Control



Hardware P-States

- Disable Hardware chooses a P-state based on OS Request. (Legacy P-States).
- Native Mode Hardware chooses a P-state based on OS guidance.
- Out of Band Mode Hardware autonomously chooses a P-state. (No OS guidance).

Security



Administrator Password

Select this to reconfigure the administrator's password.

Boot



Setup Prompt Timeout

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

Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

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

Boot mode select

Configures the boot mode option.

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.

USB Key Drive BBS Priorities

Adjust the boot sequence for USB devices. Boot Option #1 is the first boot device that the system will boot from, next will be Boot Option #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 Reset

To exit the Setup utility and reset 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.

Launch EFI Shell from Filesystem Device

To launch EFI shell from a filesystem device, select this field and press <Enter>.