NEXCOM International Co., Ltd.

Network and Communication Solutions

Network Security Appliance

NSA 5181

User Manual

NEXCOM International Co., Ltd.
Published October 2021

www.nexcom.com

CONTENTS

Preface

Chapter 1: Product Introduction

Chapter 2: Jumpers and Connectors

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Chapter 3: System Setup

Chapter 4: BIOS Setup

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PREFACE

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Acknowledgements

NSA 5181 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

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

Declaration of Conformity

FCC

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

CE

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

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force in to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

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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.

Repair Service Charges for Out-of-Warranty Products

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

System Level

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

Board Level

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

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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.

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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.

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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.

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Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

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

Warning!

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

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

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

Conventions Used in this Manual

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

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Global Service Contact Information

Headquarters

NEXCOM International Co., Ltd.
9F, No. 920, Chung-Cheng Rd.,
ZhongHe District, New Taipei City, 23586,
Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7782
www.nexcom.com

Asia

Taiwan

NexAIoT Co., Ltd.

Taipei Office
13F, No.920, Chung-Cheng Rd.,
ZhongHe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7796
Fax: +886-2-8226-7792
Email: sales@nexcom.com.tw
www.nexcom.com.tw

NexAIoT Co., Ltd.

Taichung Office
16F, No.250, Sec. 2, Chongde Rd.,
Beitun Dist.,
Taichung City 406, R.O.C.
Tel: +886-4-2249-1179
Fax: +886-4-2249-1172
Email: sales@nexcom.com.tw
www.nexcom.com.tw

NexCOBOT Taiwan Co., Ltd.
13F, No.916, Chung-Cheng Rd.,
ZhongHe District,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7796
Fax: +886-2-8226-7792
Email: sales@nexcom.com.tw
www.nexcom.com.tw

GreenBase Technology Corp.
13F, No.922,Chung-Cheng Rd.,
Zhonghe Dist.,
New Taipei City, 23586, Taiwan, R.O.C.
Tel: +886-2-8226-7786
Fax: +886-2-8226-7900
Email:sales@nexcom.com.tw
www.nexcom.com.tw

China

NEXSEC Incorporated
Floor 5, No.4, No.7 fengxian middle Rd.,
(Beike Industrial Park), Haidian District,
Beijing, 100094, China
Tel: +86-10-5704-2680
Fax: +86-10-5704-2681
Email: sales@nexcom.cn
www.nexcom.cn

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NEXCOM Shanghai
Room 603/604, Huiyinmingzun Plaza Bldg., 1,
No. 609, Yunlin East Rd.,
Shanghai, 200062, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: sales@nexcom.cn
www.nexcom.cn

NEXCOM Surveillance Technology Corp.
Floor 5, Building C, ZhenHan Industrial Zone,
GanKeng Community, Buji Street,
LongGang District,
ShenZhen, 518112, China
Tel: +86-755-8364-7768
Fax: +86-755-8364-7738
Email: steveyang@nexcom.com.tw
www.nexcom.cn

NEXCOM United System Service
Room 603/604, Huiyinmingzun Plaza Bldg. 1,
No. 609, Yunlin East Rd.,
Shanghai, 200062, China
Tel: +86-21-5278-5868
Fax: +86-21-3251-6358
Email: renwang@nexcom.com.tw
www.nexcom.cn

NEXGOL
1st Floor, Building B4, Electronic 2nd Area,
(Phoenix Lake Industrial Park), Yongchuan Dist.,
Chongqing City, 402160, China
Tel: +86-23-4960-9080
Fax: +86-23-4966-5855
Email: sales@nexcobot.com
www.nexgol.com/NexGoL

Beijing NexGemo Technology Co.,Ltd.
5th Floor, Gemotech Building, No.1, Development Rd.,
Changping International Information Industry Base,
Changping District,
Beijing,102206, China
Tel: +86-10-8190-9399
Fax:+86-10-8190-9456

Japan
NEXCOM Japan
9F, Tamachi Hara Bldg.,
4-11-5, Shiba Minato-ku,
Tokyo, 108-0014, Japan
Tel: +81-3-5419-7830
Fax: +81-3-5419-7832
Email: sales@nexcom-jp.com
www.nexcom-jp.com

Europe
United Kingdom
NEXCOM EUROPE
10 Vincent Avenue,
Crownhill Business Centre,
Milton Keynes, Buckinghamshire
MK8 0AB, United Kingdom
Tel: +44-1908-267121
Fax: +44-1908-262042
Email: sales.uk@nexcom.eu
www.nexcom.eu

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Package Contents

Before continuing, verify that the NSA 5181 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	19S00518100X0	NSA 5181 ASSY		1
2	50311F0206X00	P Head Screw M2x5L Long Fei	Head DIA5.4 w/Washer Nylok NI	3
3	5044440031X00	Rubber Foot Kang Yang:RF20-5-4P	19.8x18x5.0mm	4
4	6012200052X00	PE Zipper Bag #8	170x240mm, w/China RoHS Symbol	1
5	6012200053X00	PE Zipper Bag #3	100x70mm, w/China RoHS Symbol	1
6	6023309081X00	Cable EDI:232091081804-RS	COM Port. DB9 Female to RJ45 8P8C L:1800mm	1
7	5040210036X00	Ear Set for NSA 5181 VER:A Panadvance	53.85x43x22mm SECC T=2.0mm Panting Pantone 295U	1
8	5040150001X00	NSA 7135 AL Handle VER:A Panadvance	78x58x8mm	1
9	6014605965X00	Outside Carton Label for NSA 5181 VER:A Label Jet	60x60mm ART Paper	2

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Ordering Information

The following below provides ordering information for NSA 5181.

Barebone

NSA 5181 (P/N: TBC)

Supports 8th generation Intel® Xeon®/Core™/Pentium® processors, 4 DDR4 memory slots, M.2/mSATA socket, USB ports, HDMI port, 4 PCIe x8 LAN expansion slots (front), w/o LCM and single ATX PSU

Model	P/N Controller	Interface	Type	Port Number	Bypass/Segment	Expansion Slot	Location Slot
NX 140F	10S20140F01X0	XL710-BM1	PCIe x8	4 SFP+	None	None	1,2
NX 142F	10S20142F01X0	XL710-BM1	PCIe x8	4 SFP+	2 bypass	None	1,2
NX 120F	10S20120F00X0	X710-BM2	PCIe x8	2 SFP+	None	None	1,2
NI 140F	10SK000NI02X0	i350AM4x1	PCIe x8	4 SFP	None	None	All Slot
NI 180F	10S10180F01X0	i350AM4x2	PCIe x8	8 SFP	None	None	2
NI 142C	10SK000NI03X0	i350AM4x1	PCIe x8	4 Copper	2 bypass	None	All Slot
NI 180C	10S10180C01X0	i350AM4x2	PCIe x8	8 Copper	None	None	2
NI 184C	10S10184C01X0	i350AM4x2	PCIe x8	8 Copper	4 bypass	None	2
NI 142F	10S10142F01X0	i350AM4x1	PCIe x8	4 SFP	2 bypass	None	All Slot
NI 121F	10S10121F01X0	i350AM2x1	PCIe x8	2 SFP	1 bypass	None	All Slot
NI 140C	10S10140C01X0	i350AM4x1	PCIe x8	4 Copper	None	None	All Slot
NC220Q28M	10S30022002X0	MT27708A0-FDCF-CE	PCIe x16	2 QSFP28	None	None	1,2

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Chapter 1: Product Introduction

Overview

Key Features

- 1U and 19” workstation rack mount system
- 8th generation Intel® Xeon®/Core™/Pentium®
- Support up to four LAN modules
- Optional (1+1) redundant PSU
- Support IPMI 2.0
- Support Intel® RST® ready

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Hardware Specifications

Main Board

- NSB 5180
- Support 8th generation Intel® Xeon®/Core™/Pentium® processors
- Intel® C246
- Support IPMI 2.0 (optional)

Main Memory

- 4 x DDR4 2666 memory DIMM support ECC/non-ECC memory, max. 64GB

LAN Features

- Swappable LAN modules
- Support Intel® i350/Intel® XL710 copper/fiber ports
- Support 10/100/1000/10G/100G link speed
- LAN bypass
  * Please see LAN module list for more information

I/O Interface-Front

- Power status/HDD status/2 x GPIO status LEDs
- 2 x Management ports (LAN chip: Intel® i210)
- 2 x USB 2.0 ports
- 1 x RJ45 type console port
- 1 x Reset button
- 4 x PCIe Gen.3 LAN module slots (x8, x8 or x4x4, x4, x4)

I/O Interface-Rear

- 1 x HDMI port
- 1 x Power button switch
- 1 x USB 2.0 port

Storage

- 1 x 2.5" HDD/SSD internal bay
- 1 x M.2 slot (B-Key)
- 1 x mSATA slot

Power Input

- 250W single ATX PSU (main SKU)
- 220W (1+1) redundant PSU (optional SKU)

Chassis Dimensions

- Chassis dimension: 438 mm x 480mm x 44mm
- Carton dimension : 550 mm x 655 mm x 225mm

Weight

- Without packing: 7.5kg
- With packing: 10.5kg

Certifications

- CE approval
- FCC Class A
- UL

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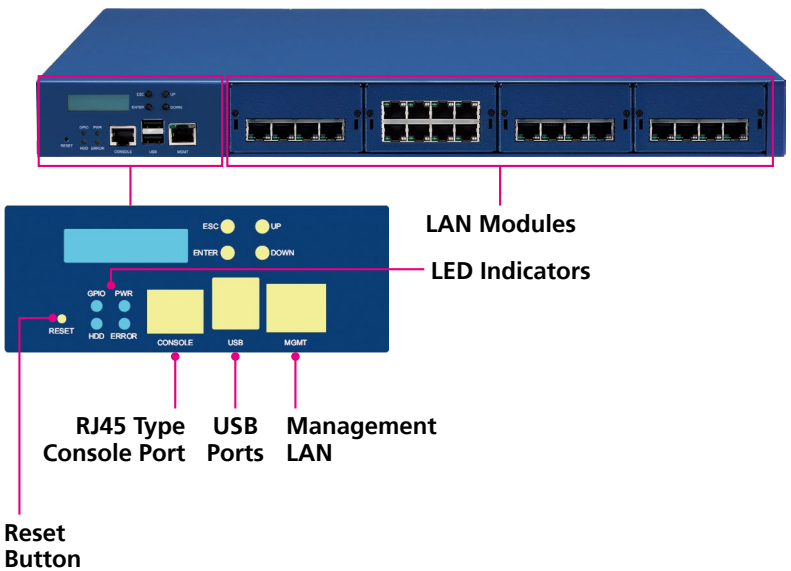
Knowing Your NSA 5181

Front Panel



Reset Button
Press to restart the system.

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

RJ45 Type Console Serial Port
Used to connect RJ45 type console devices.

USB Ports
Used to connect USB 2.0 devices.

Management LAN Port
Management LAN port used for managing the system.

LAN Modules
Four LAN module bays to install add-on network modules.

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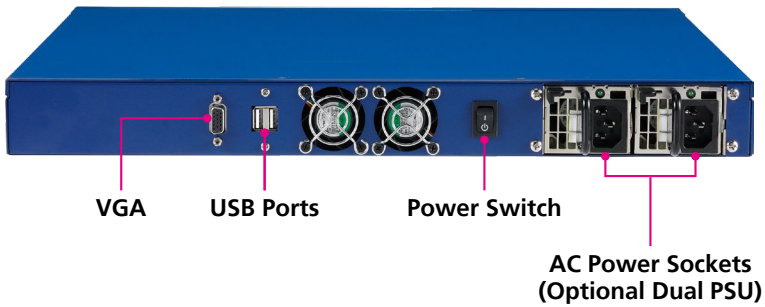
Rear Panel



VGA
Used to connect an analog VGA monitor.

USB Ports
Used to connect USB 2.0/1.1 devices.

Power Switch (Optional)
Press to power-on or power-off the system.

AC Power Sockets (Optional Dual PSU)
Used to plug an AC power cord to power the system. Default configuration is a single ATX power supply unit (PSU). Dual redundant PSU is optional.

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Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the NSA 5181 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.

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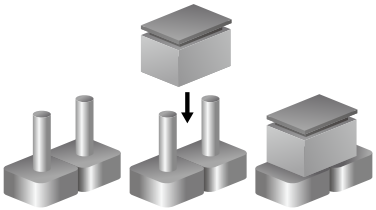
Jumper Settings

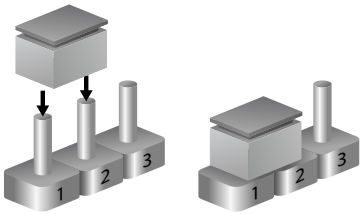
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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



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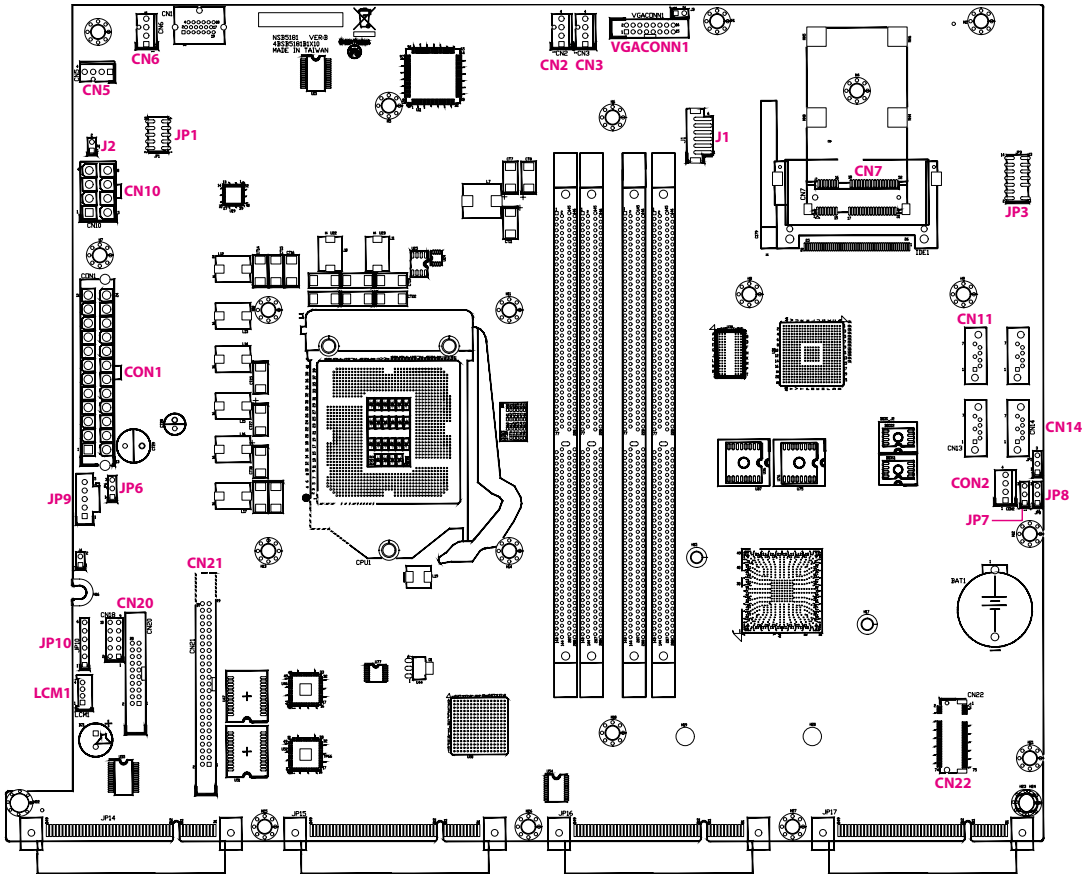
Locations of the Jumpers and Connectors

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



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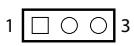
Jumpers

AT/ATX Mode Select

Connector type: 1x3 3-pin header
Connector location: JP6

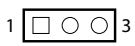


Pin	Settings
1-2 On	ATX Mode
2-3 On	AT Mode

Pin	Definition
1	+3V3_CPLD
2	AT_ATX_SEL
3	GND

Protected RTC

Connector type: 1x3 3-pin header
Connector location: JP7



Pin	Definition
1	NC
2	SRTCRST_N
3	GND

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CMOS Clear

Connector type: 1x3 3-pin header
Connector location: JP8

Pin	Definition
1	NC
2	RTCRST_N
3	GND

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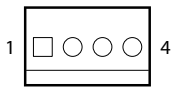
Connector Pin Definitions

Internal Connectors

Fan Connectors

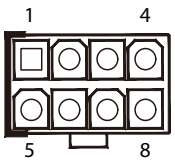
Connector type: 1x4 4-pin Wafer, 2.54mm pitch
Connector location: CN2, CN3, CN5 and CN6



Pin	Definition
1	GND
2	+P12V
3	SYSFAN_TACH
4	SYSFAN_CTL

8-pin Internal 12V Power Connector

Connector type: 2x4 8-pin boxed header, 4.2mm pitch
Connector location: CN10



Pin	Definition	Pin	Definition
1	GND	2	GND
3	GND	4	GND
5	+P12V	6	+P12V
7	+P12V	8	+P12V

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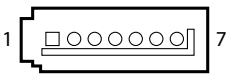
SATA Connectors

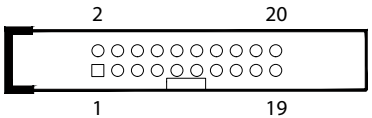
Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: CN11 and CN14



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

IO Board Connector

Connector type: 2x10 20-pin header, 2.0mm pitch
Connector location: CN20



Pin	Definition	Pin	Definition
1	GND	2	+P3V3
3	+P3V3	4	GND
5	Reset BTN	6	NA
7	NA	8	NA
9	NA	10	NA
11	Error LED	12	NA
13	GPIO LED	14	NA
15	HDD LED	16	LAN 1G LED
17	Power LED	18	GND
19	+P5V	20	+P5V

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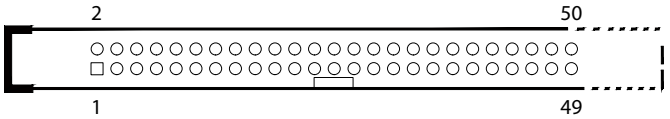
IO Board Connector

Connector type: 2x25 50-pin header, 2.0mm pitch
Connector location: CN21



Pin	Definition	Pin	Definition
1	GND	2	PHY_MXP0
3	PHY_MXN0	4	GND
5	PHY_MXN1	6	PHY_MXP1
7	GND	8	PHY_MXP2
9	PHY_MXN2	10	GND
11	PHY_MXN3	12	PHY_MXP3
13	GND	14	LAN ACT LED
15	LAN 100M LED	16	GND
17	NA	18	NA
19	GND	20	NA
21	NA	22	GND
23	NA	24	NA
25	GND	26	NA

Pin	Definition	Pin	Definition
27	NA	28	GND
29	NA	30	NA
31	+P3V3	32	+P5V
33	+P5V	34	+P5V
35	+P5V	36	+P5V
37	GND	38	USB2_2P
39	USB2_2N	40	GND
41	USB2_3P	42	USB2_3N
43	GND	44	RJ45_CTS
45	RJ45_DSR	46	RJ45_DTR
47	RJ45_RXD	48	RJ45_RTS
49	RJ45_TXD	50	RJ45_DCD

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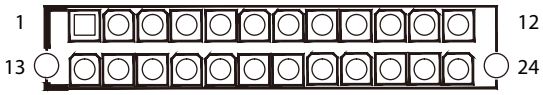
24-pin Internal ATX Power Connector

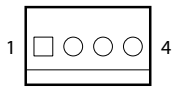
Connector type: 2x12 24-pin boxed header, 4.2mm pitch
Connector location: CON1



Pin	Definition	Pin	Definition
1	+P3.3V	2	+P3.3V
3	GND	4	+P5V
5	GND	6	+P5V
7	GND	8	PW-OK
9	+P5_AUX	10	+P12V
11	+P12V	12	+P3.3V
13	+P3.3V	14	NC
15	GND	16	PS-ON
17	GND	18	GND
19	GND	20	NC
21	+P5V	22	+P5V
23	+P5V	24	GND

SATA Power Connector

Connector type: 1x4 4-pin Wafer, 2.54mm pitch
Connector location: CON2



Pin	Definition
1	+P12V
2	GND
3	GND
4	+P5V

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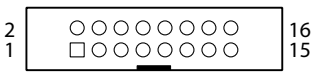
VGA Connector

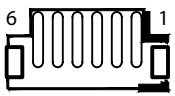
Connector type: 2x8 16-pin header, 2.0mm pitch
Connector location: VGACONN1



Pin	Definition	Pin	Definition
1	DACROA_B	2	DACGOA_B
3	DACBOA_B	4	NC
5	GND	6	GND
7	GND	8	GND
9	VGA_5V	10	GND
11	NC	12	DDC_DATAO_B
13	AHSYNCO_B	14	AVSYNCO_B
15	DDC_CLKO_B	16	NC

Rear USB 2.0 Connector

Connector type: 1x6 6-pin header, 2.0mm pitch
Connector location: J1



Pin	Definition	Pin	Definition
1	+P5V_USB_P01	2	USB2N0_C
3	USB2P0_C	4	USB2N1_C
5	USB2P1_C	6	GND

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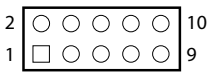
Power Button

Connector type: 1x2 2-pin header, 2.54mm pitch
Connector location: J2

Pin	Definition
1	GND
2	FP_PWR_BTN_N

GPIO Pin Header

Connector type: 2x5 10-pin header, 2.0mm pitch
Connector location: JP1



Pin	Definition	Pin	Definition
1	+P3V3	2	GND
3	SW_GPIN1	4	SW_GPOUT1
5	SW_GPIN2	6	SW_GPOUT2
7	SW_GPIN3	8	SW_GPOUT3
9	SW_GPIN4	10	SW_GPOUT4

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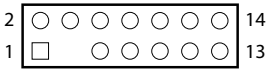
TPM Header

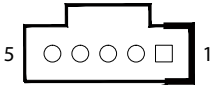
Connector type: 2x7 14-pin header, 2.0mm pitch
Connector location: JP3



Pin	Definition	Pin	Definition
1	GND	2	CLK_LPC_TPM_R
3		4	LPC_FRAME_R1_N
5	LPC_AD2_R1	6	RST_TPM_R1_N
7	LPC_AD1_R1	8	LPC_AD3_R1
9	GND	10	LPC_AD0_R1
11	INT_SERIRQ_R1	12	+P3V3
13	GND	14	GND

PMBUS

Connector type: 1x5 5-pin header, 2.54mm pitch
Connector location: JP9



Pin	Definition	Pin	Definition
1	PSU_PMB_CLK	2	PSU_PMB_DAT
3	NC	4	GND
5	NC		

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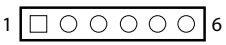
CPLD JTAG Pin Header

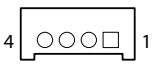
Connector type: 1x6 6-pin header, 2.54mm pitch
Connector location: JP10



Pin	Definition	Pin	Definition
1	+P3V3_CPLD	2	GND
3	JTAG_PLD_TCK	4	JTAG_PLD_TDO
5	JTAG_PLD_TDI	6	JTAG_PLD_TMS

LCM

Connector type: 1x4 4-pin header, 2.0mm pitch
Connector location: LCM1



Pin	Definition
1	GND
2	SP_LCM_RXD
3	SP_LCM_TXD
4	+P5V

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Mini-PCIe Connector (mSATA)

Connector location: CN7

Pin	Definition	Pin	Definition
1	WAKE#	2	3.3VSB
3	COEX1	4	GND
5	COEX2	6	1.5V_3
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
17	REV10/UIM_C8	18	GND
19	REV9/UIM_C4	20	WDISABLE#
21	GND	22	PERST
23	mSATA_RP	24	3.3VSB_1
25	mSATA_RN	26	GND

Pin	Definition	Pin	Definition
27	GND	28	1.5V_2
29	GND	30	SMB_CLK
31	mSATA_TN	32	SMB_DAT
33	mSATA_TP	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	3.3VSB_4	40	GND
41	3.3VSB_5	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	REV4	46	LED_WPAN#
47	REV3	48	1.5V_1
49	REV2	50	GND
51	REV1	52	3.3VSB_2

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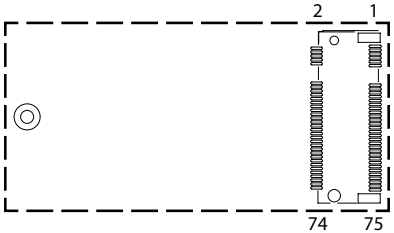
M.2 B-Key Connector

Connector location: CN22



Pin	Definition	Pin	Definition
1	CONFIG_3	2	3.3V_1
3	GND	4	3.3V_2
5	GND	6	POWER_OFF#
7	USB_D+	8	W_DISABLE1#
9	USB_D-	10	GPIO_9/DAS/DSS#
11	REFCLK-	12	B KEY
13	B KEY	14	B KEY
15	B KEY	16	B KEY
17	B KEY	18	B KEY
19	B KEY	20	GPIO_5
21	CONFIG_0	22	GPIO_6
23	GPIO_11	24	GPIO_7
25	DPR	26	GPIO_10
27	GND	28	GPIO_8
29	PERn1/USB3.00-Rx-/SSIC-RxN	30	UIM_RESET
31	PERp1/USB3.00-Rx+/SSIC-RxP	32	UIM_CLK
33	GND	34	UIM_DATA
35	PERn1/USB3.00-Tx-/SSIC-TxN	36	UIM_PWR
37	PERp1/USB3.00-Tx+/SSIC-TxP	38	M2_DEVSLP_R
39	GND	40	GPIO_0

Pin	Definition	Pin	Definition
41	PERn0/SATA-B+	42	GPIO_1
43	PERp0/SATA-B-	44	GPIO_2
45	GND	46	GPIO_3
47	PERn0/SATA-A-	48	GPIO_4
49	PERp0/SATA-A+	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKn	54	PEWAKE#
55	REFCLKp	56	NC
57	GND	58	NC
59	ANTCTL0	60	COEX3
61	ANTCTL1	62	COEX2
63	ANTCTL2	64	COEX1
65	ANTCTL3	66	SIM_DETECT
67	RESET#	68	SUSCLK(32KhZ)
69	CONFIG_1	70	3.3V_3
71	GND	72	3.3V_4
73	GND	74	3.3V_5
75	CONFIG_2		

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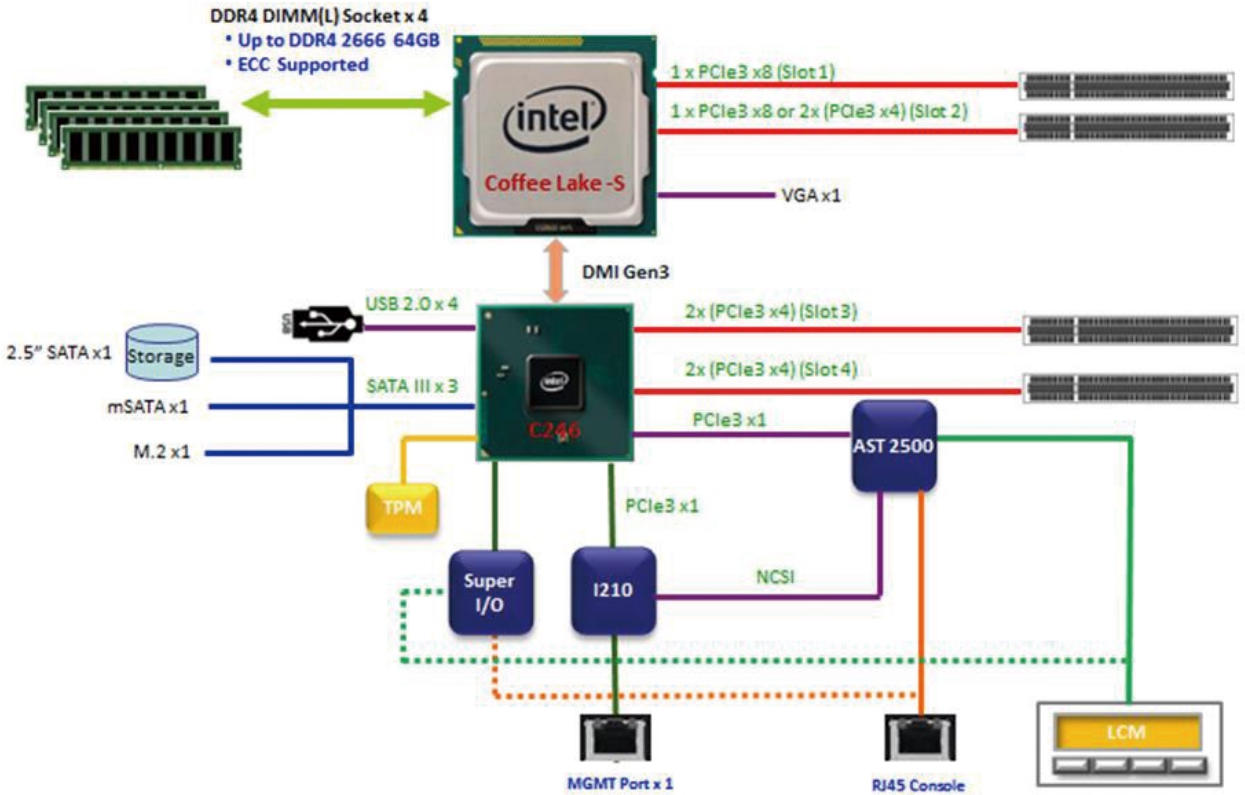
Block Diagram



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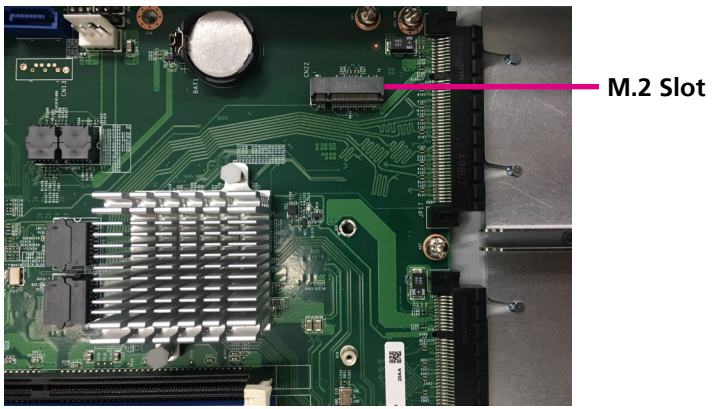
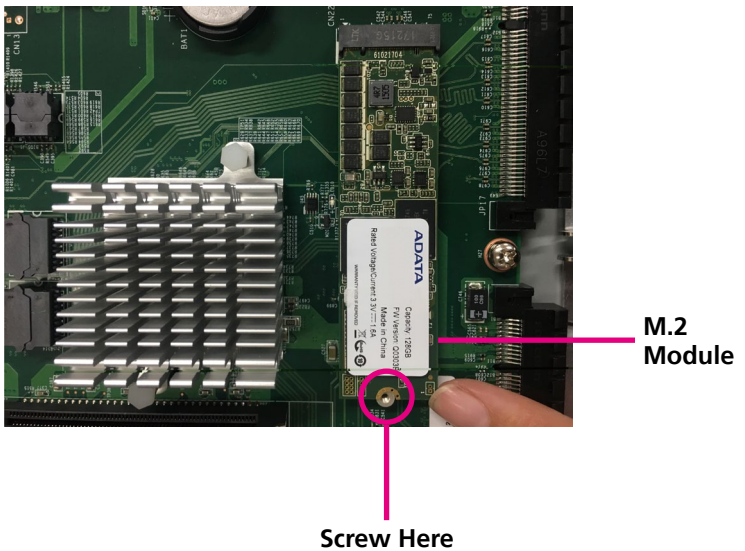
Chapter 3: System Setup

Installing an M.2 Module

1. With the chassis cover removed, locate the M.2 slot on the motherboard.



2. Insert the M.2 module until it is completely seated into the slot and secure the module with a screw.



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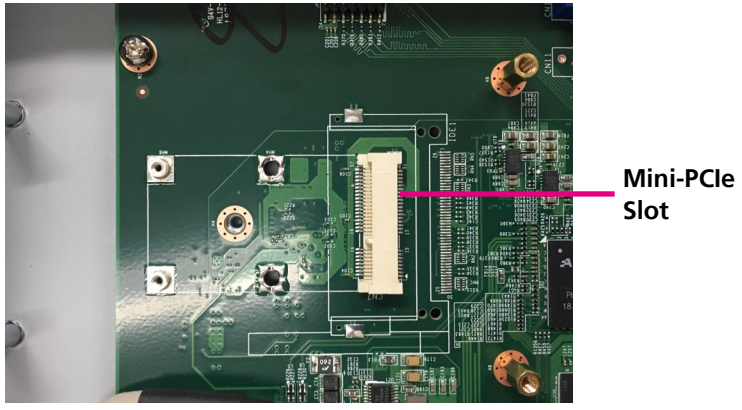
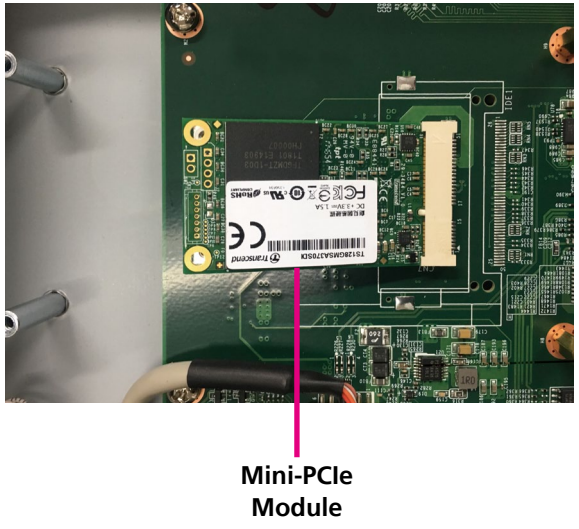
Installing a Mini-PCIe Module

1. With the chassis cover removed, locate the mini-PCIe slot on the motherboard.



2. Insert the mini-PCIe module until it is completely seated into the slot and secure the module with a screw.



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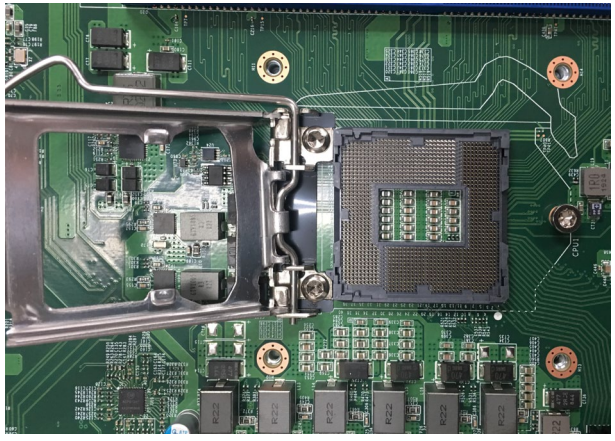
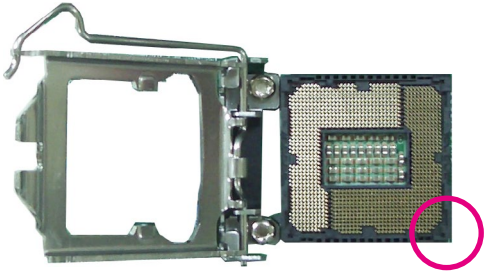
Installing a CPU

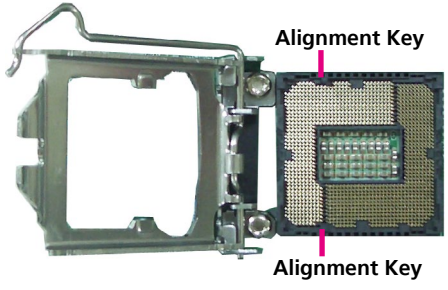
1. Locate the CPU socket and unlock it by pushing the load lever down, moving it sideways until it is released from the retention tab; then lift the load lever up.



2. Insert the CPU into the socket. The triangular edge on the CPU must align with the corner of the CPU socket shown on the photo.



The CPU's notch will at the same time fit into the socket's alignment key.



- Handle the CPU by its edges and avoid touching the pins.
- The CPU will fit in only one orientation and can easily be inserted without exerting any force.

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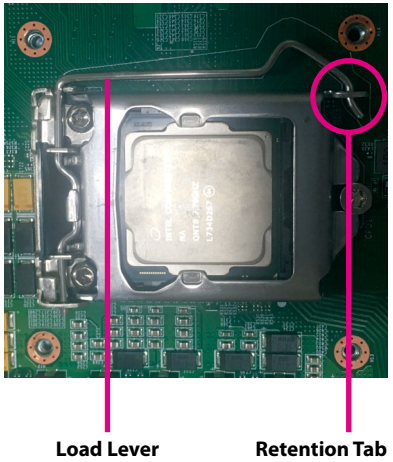
3. Close the load plate and then hook the load lever under the retention tab.



Do not force the CPU into the socket. Forcing the CPU into the socket may bend the pins and damage the CPU.

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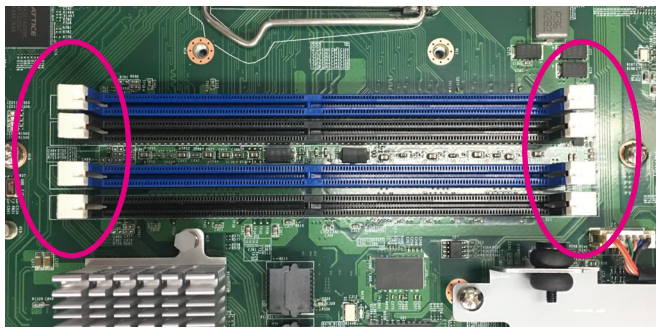
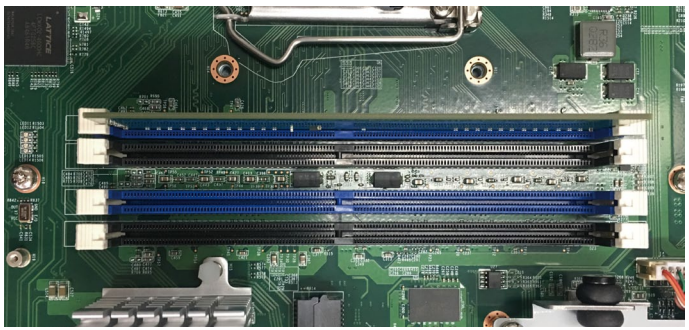
Installing DIMM Memory Modules

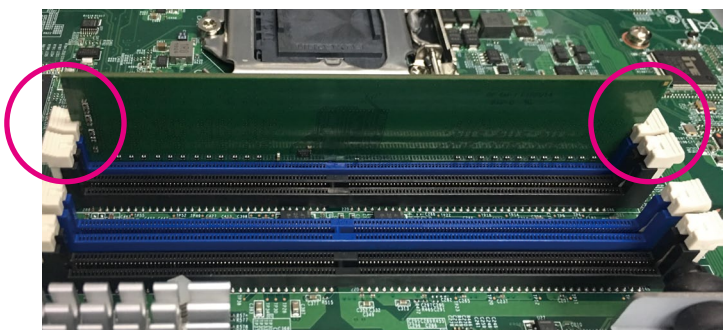
1. Locate the DIMM sockets on the motherboard and release the locks.



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.



3. While pushing the module into position, the locks will close automatically.



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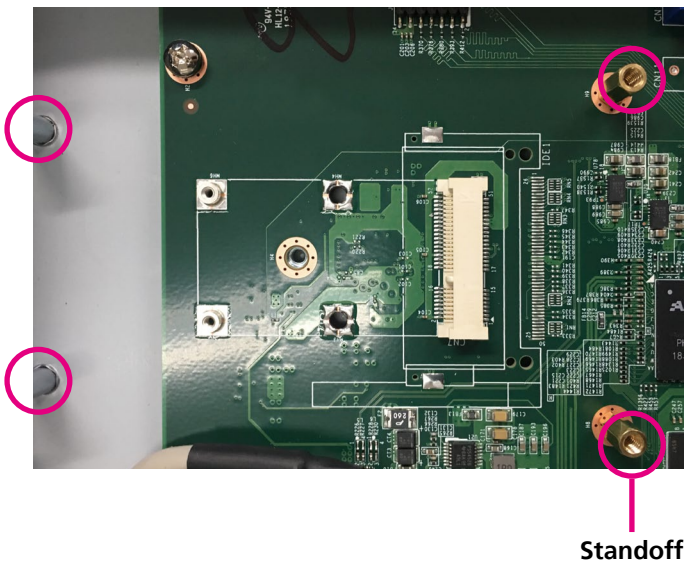
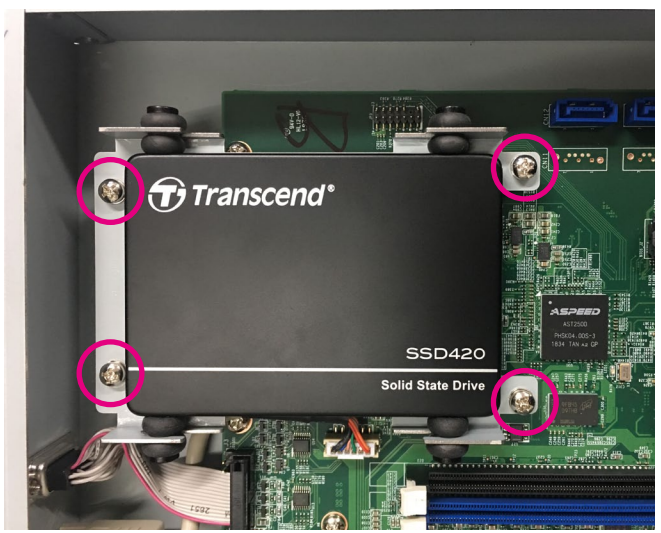
Installing a 2.5" SATA Storage Drive

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

1. Install the SATA storage drive onto the storage drive bracket and align the mounting holes on the bracket to the standoffs in the chassis.



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



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Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for NSA 5181. 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.

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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

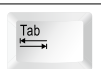
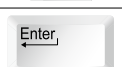
When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- 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

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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 

.

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BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter to accept or enter the submenu.

Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

System Date

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

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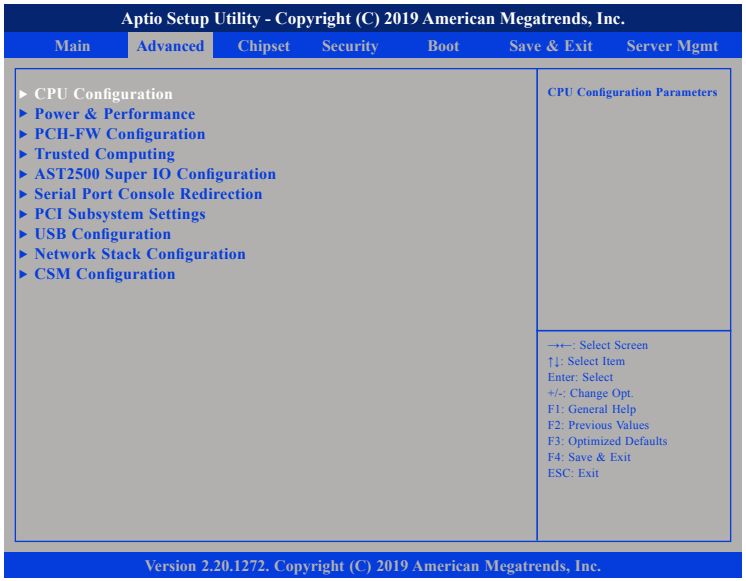
Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



CPU Configuration

This section is used to configure the CPU.

Hardware Prefetcher

Turns on or off the MLC streamer prefetcher.

Intel (VMX) Virtualization Technology

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

Hyper-Threading

Enables or disables hyper-threading technology.

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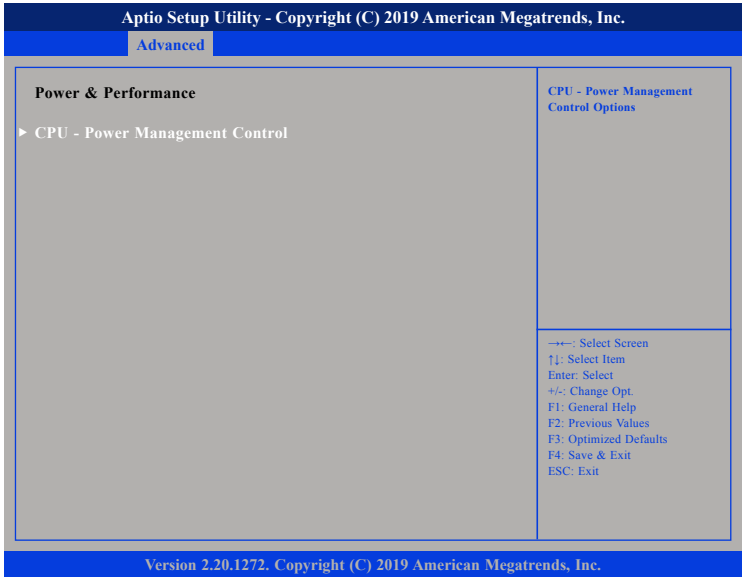
Power & Performance

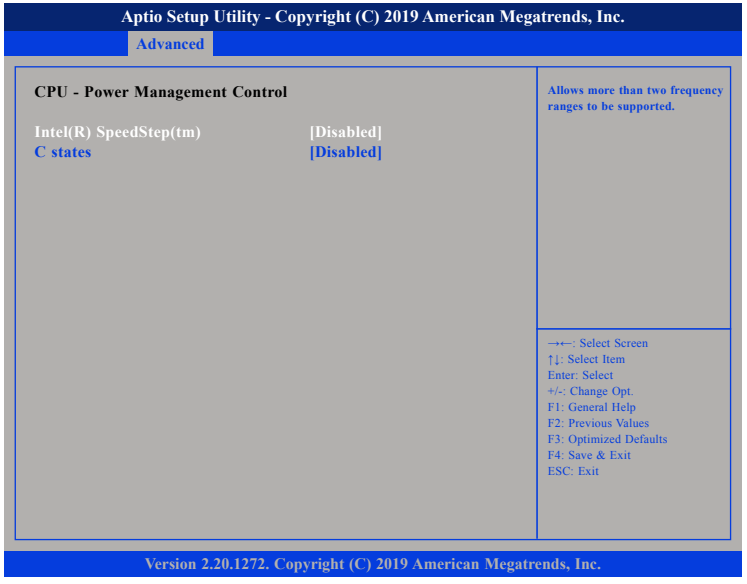
This section is used to configure the CPU power management features.



CPU - Power Management Control

Enters the CPU - Power Management Control submenu.

CPU - Power Management Control



Intel® SpeedStep™

Enables or disables Intel SpeedStep.

C States

Enables or disables C-States support for power saving.

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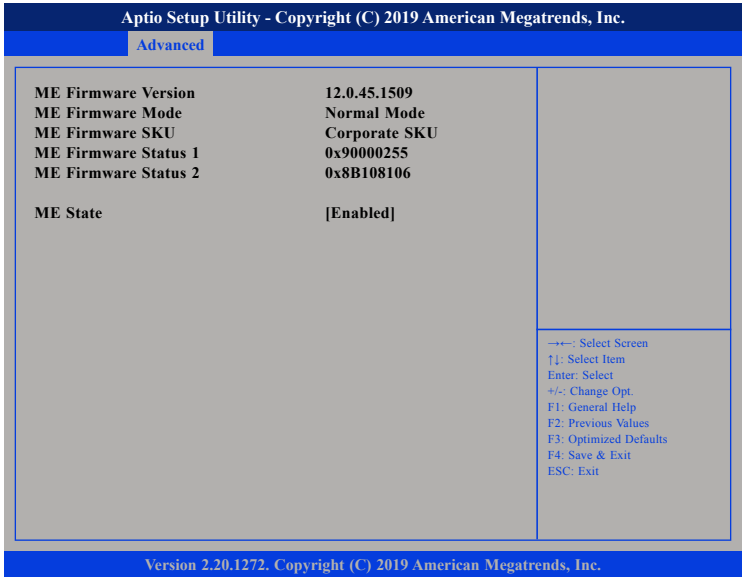
PCH-FW Configuration

This section is used to configure the firmware update options.

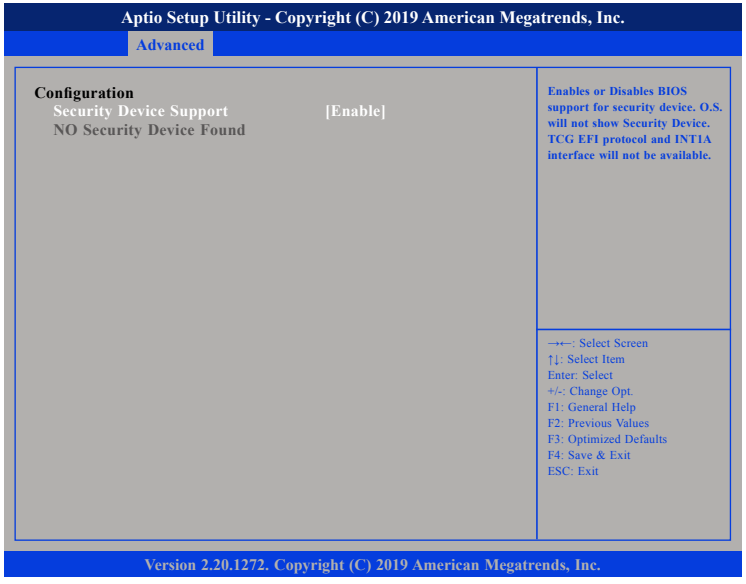


ME State

Displays the status of ME state. When the status is disabled, ME will be placed into ME Temporarily Disabled Mode.

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.

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AST2500 Super IO Configuration

This section is used to configure the serial port.

Super IO Chip

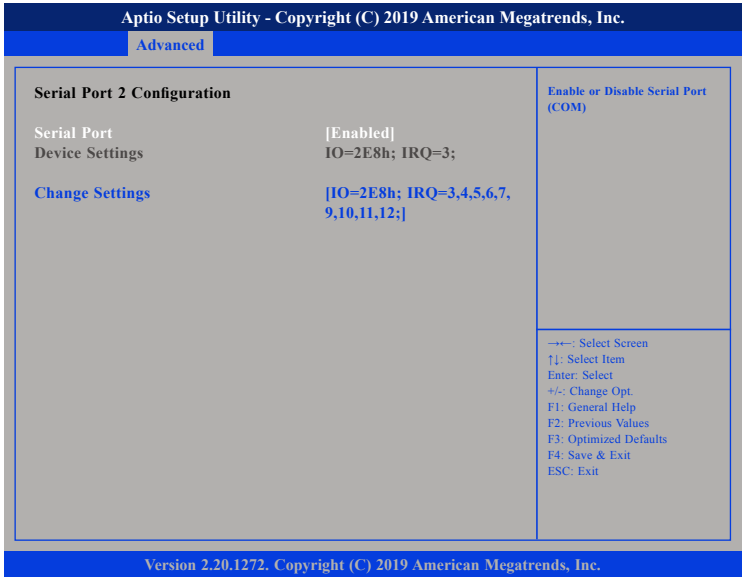
Displays the Super I/O chip used on the board.

Serial Port 2 Configuration

Configuration settings for serial port 2.

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.

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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.

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.

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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.

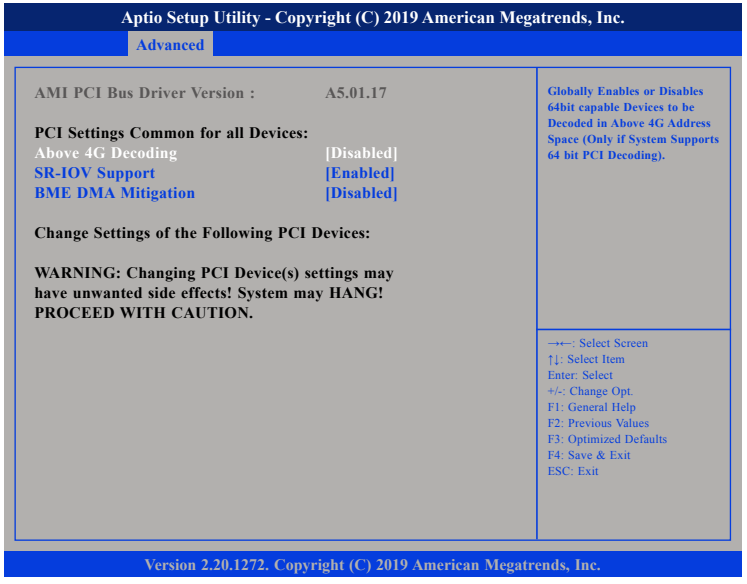
Recorder Mode
When this field is enabled, only text will be sent. This is to capture the terminal data.

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.

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.

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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.

XHCI Hand-off

This is a workaround for OSs that does not support XHCI hand-off. The XHCI ownership change should be claimed by the XHCI driver.

USB Mass Storage Driver Support

Enables or disables USB mass storage driver support.

USB transfer time-out

The time-out value for control, bulk, and Interrupt transfers.

Device reset time-out

Selects the USB mass storage device's start unit command timeout.

Device power-up delay

Maximum time the value will take before it properly reports itself to the Host Controller. "Auto" uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

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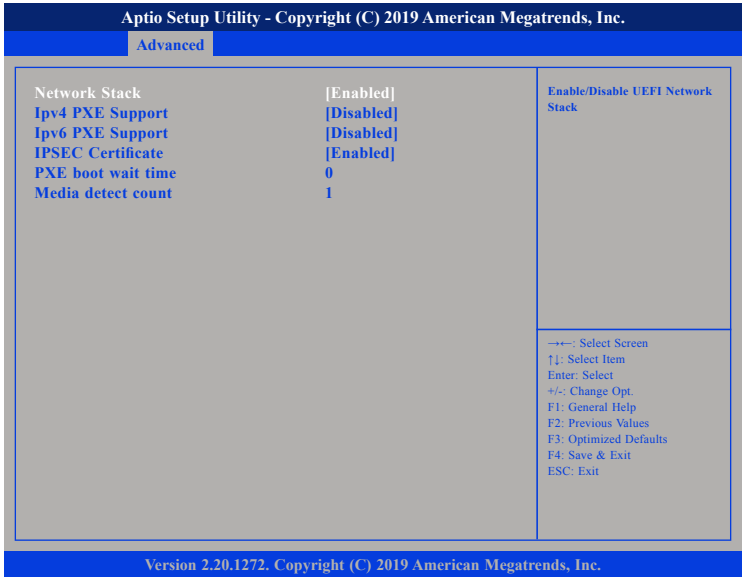
Network Stack

This section is used to configure the network stack.



Network Stack
Enables or disables UEFI network stack.

Ipv4 PXE Support
Enables or disables IPv4 PXE support. If disabled, the IPv4 boot option will not be created.

Ipv6 PXE Support
Enables or disables IPv6 PXE support. If disabled, the IPv6 boot option will not be created.

IPSEC Certificate
Enables or disables IPSEC certificate.

PXE boot wait time
Configures the wait time to press the ESC key to abort the PXE boot.

Media detect count
Configures the number of times the media will be checked.

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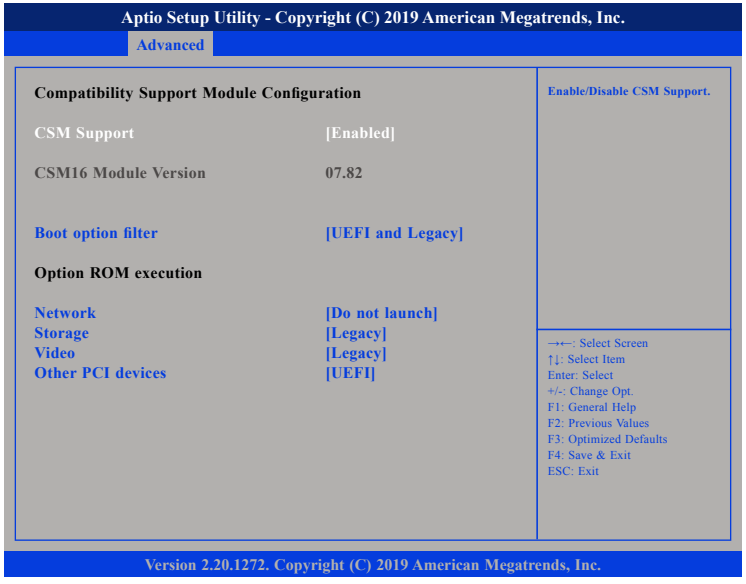
CSM Configuration

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.

Boot option filter

Configures which devices the system will boot from.

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.

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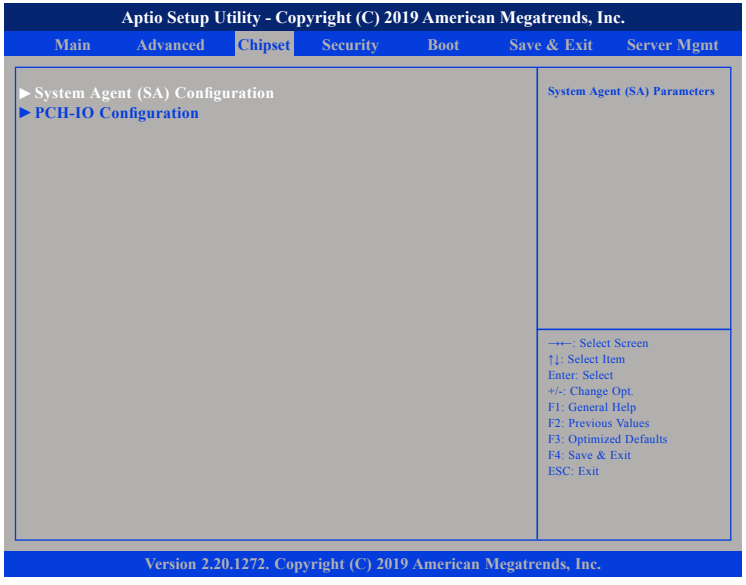
Chipset

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
This field is used to configure System Agent (SA) parameters.

PCH-IO Configuration
This field is used to configure PCH parameters.

System Agent (SA) Configuration

Memory Configuration
Configures the memory settings.

Graphics Configuration
Configures the graphics chip settings.

PEG Port Configuration
Configures the PEG Port settings.

VT-d
Enables or disables VT-d function on MCH.

X2APIC Opt Out
Enables or disables X2APIC mode.

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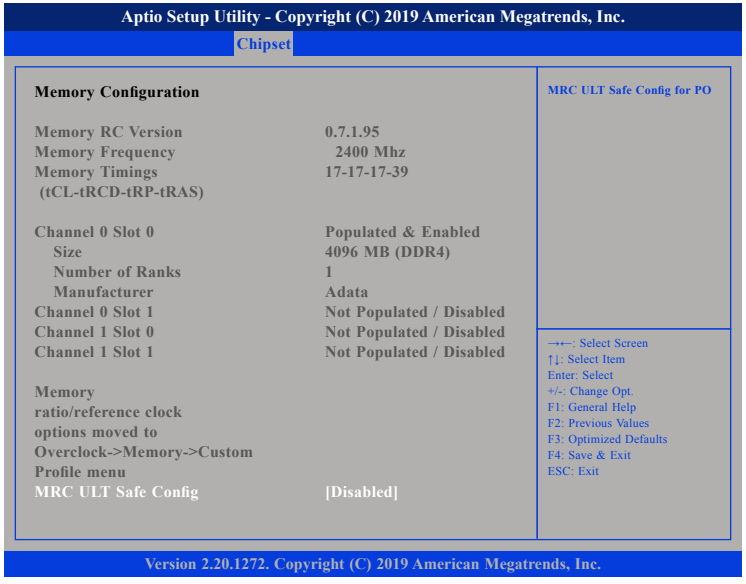
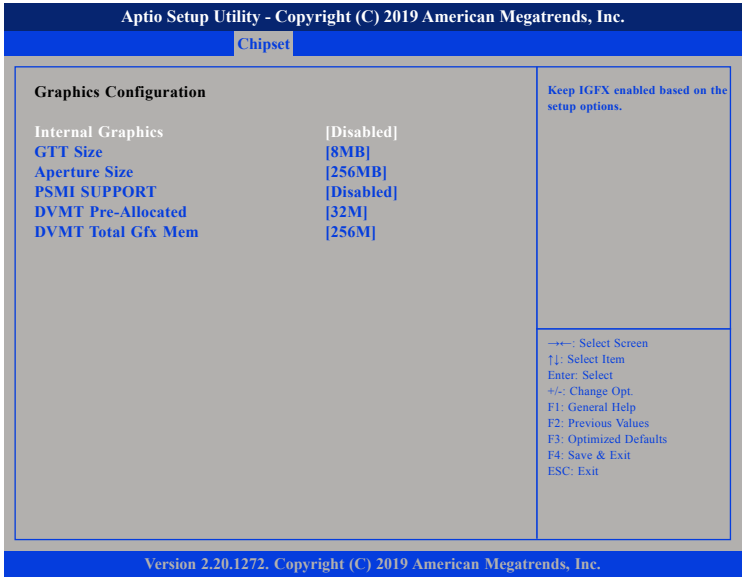
Memory Configuration



Memory Configuration
Detects and displays information of the memory installed in the system.

MRC ULT Safe Config
Enables or disables MRC ULT Safe Config for PO.

Graphics Configuration



Internal Graphics
Keep IGD enabled based on the setup options.

GTT Size and Aperture Size
Configures the GTT memory size and the Aperture size.

PSMI SUPPORT
Enables or disables Power Supply Management Interface (PSMI) support.

DVMT Pre-Allocated
Configures the DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem
Configures the DVMT 5.0 total graphic memory size used by the IGD.

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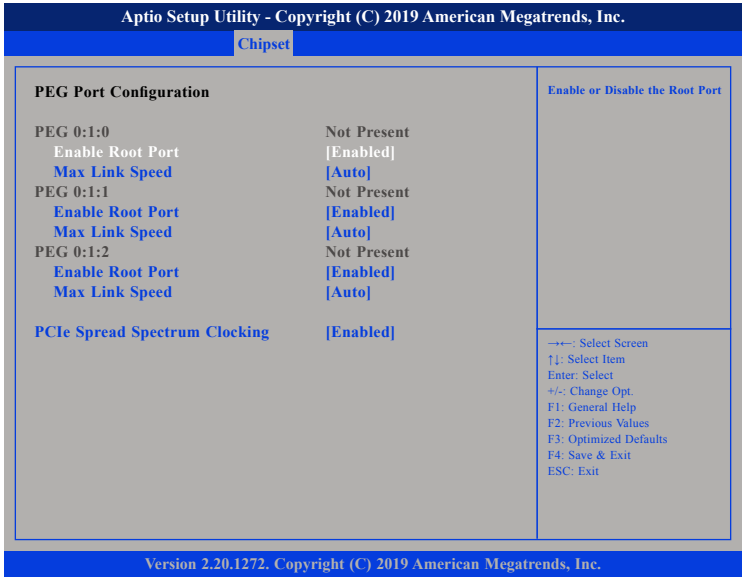
PEG Port Configuration



Enable Root Port (PEG 0:1:0, 0:1:1 and 0:1:2)
Enables or disables the root port.

Max Link Speed (PEG 0:1:0, 0:1:1 and 0:1:2)
Configures the maximum link speed of the PEG device.

PCIe Spread Spectrum Clocking
Enables or disables PCIe Spread Spectrum Clocking for compliance testing.

PCH-IO Configuration

SATA and RST Configuration
Enters the SATA and RST configuration sub-menu.

NETWORK CONFIGURATION
Enters the network configuration sub-menu.

State After G3
Configures the PCH state after G3.

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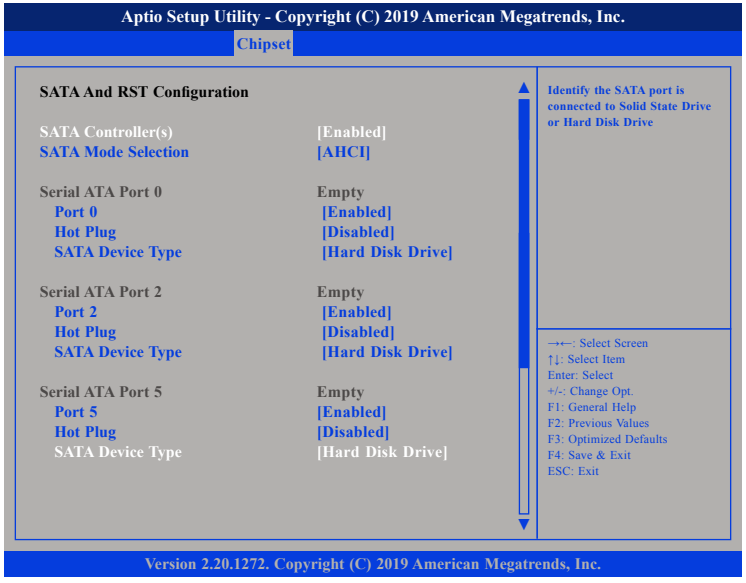
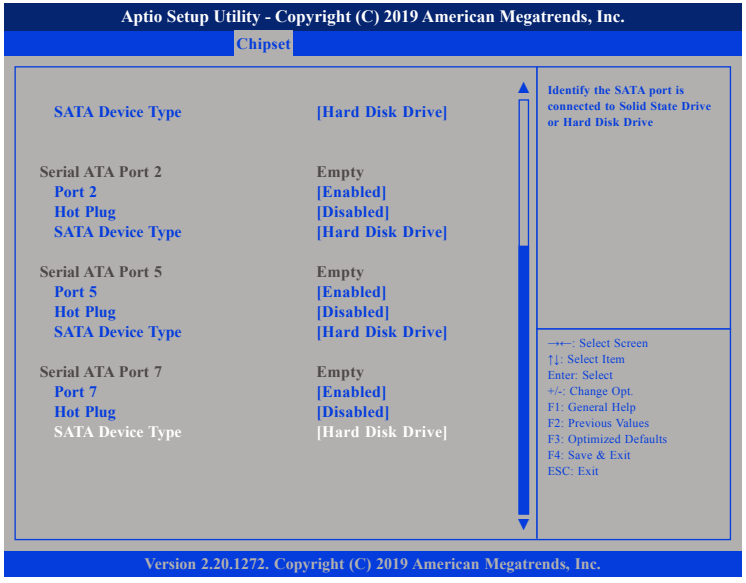
SATA And RST Configuration





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

SATA Mode Selection
Configures the SATA mode.

Port 0, Port 2, Port 5 and Port 7
Enables or disables SATA port 0, port 2, port 5 and port 7.

Hot Plug
Enables or disables hot plugging feature on SATA port 0, port 2, port 5 and port 7.

SATA Device Type
Identifies what type of SATA device is connected.

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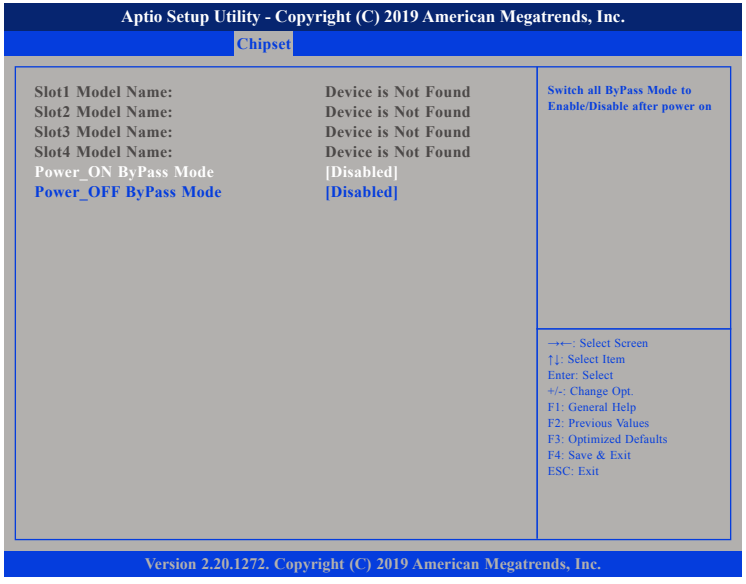
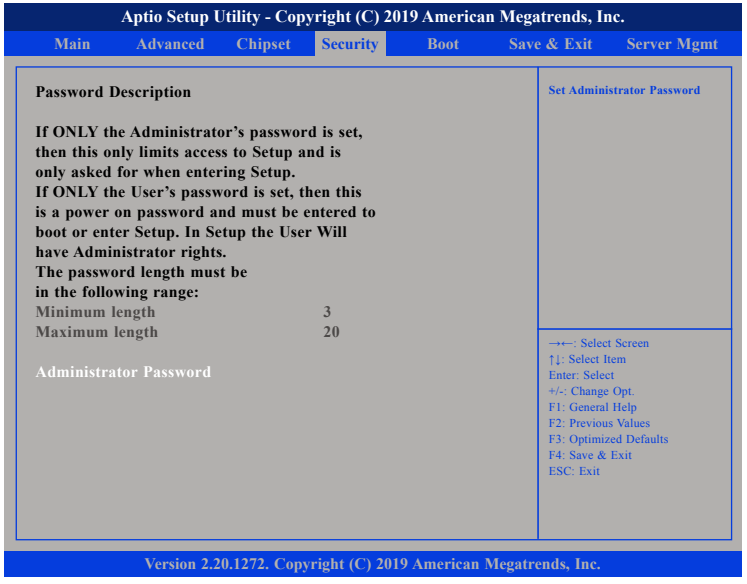
NETWORK CONFIGURATION



Power_ON ByPass Mode
Enables or disables the LAN module bypass mode after the system powers on.

Power_OFF ByPass Mode
Enables or disables the LAN module bypass mode after the system powers off.

Security



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

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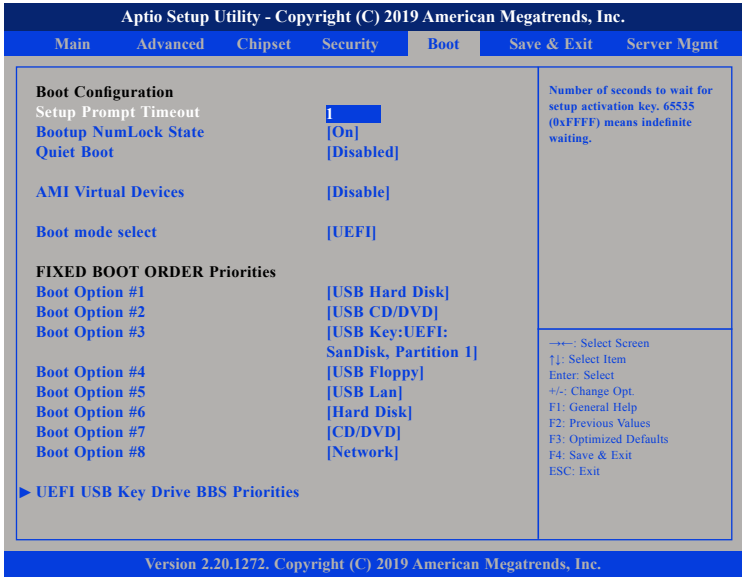
Boot



Setup Prompt Timeout
Selects the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes 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.

AMI Virtual Devices
Enables or disables AMI virtual devices.

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.

UEFI USB Key Drive BBS Priorities
Configures the boot device priority sequence from available UEFI USB key drives.

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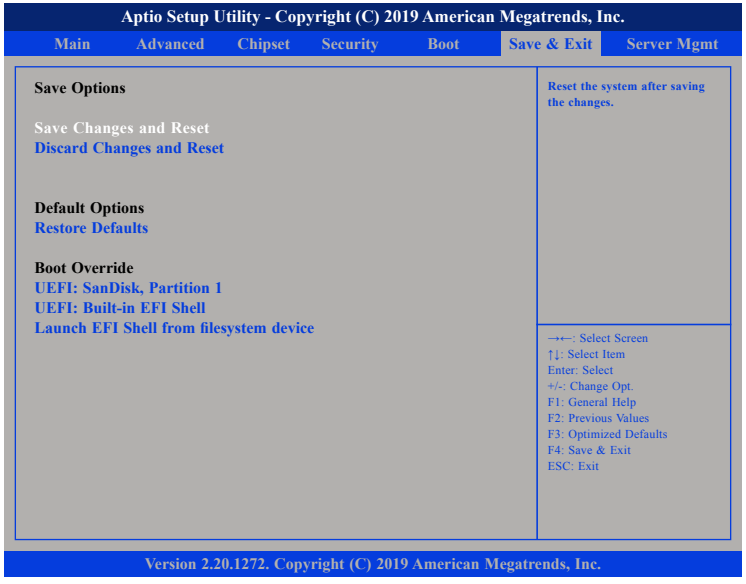
Save & Exit



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

Discard Changes and 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.

Boot Override
To bypass the boot sequence from the Boot Option List and boot from a particular device, select the desired device and press <Enter>.

Launch EFI Shell From Filesystem Device
To launch EFI shell from a filesystem device, select this field and press <Enter>.

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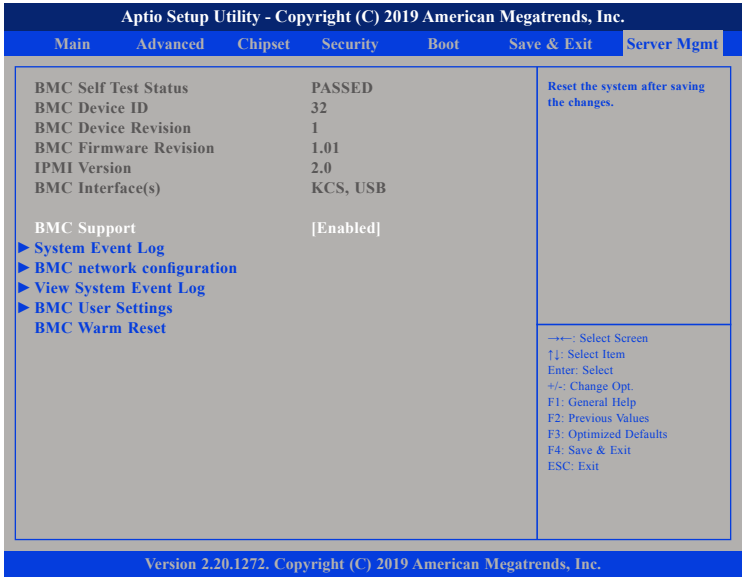
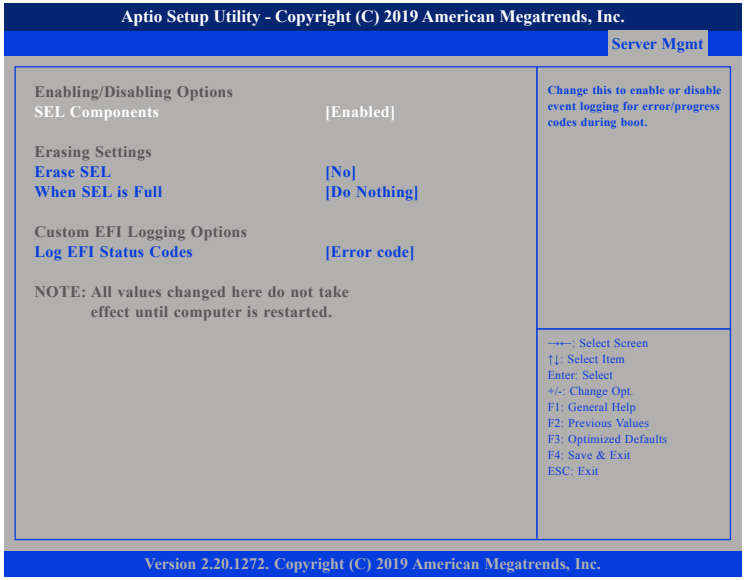
Server Mgmt



BMC Support
Enables or disables interfaces to communicate with BMC.

BMC Warm Reset
To perform a BMC warm reset, select this field then press <Enter>.

System Event Log



SEL Components
Enables or disables event logging for error/progress codes during boot.

Erase SEL
Configures the options for erasing SEL.

When SEL is Full
Configures the action to perform when SEL is full.

Log EFI Status Codes
Configures the options for logging EFI status codes.

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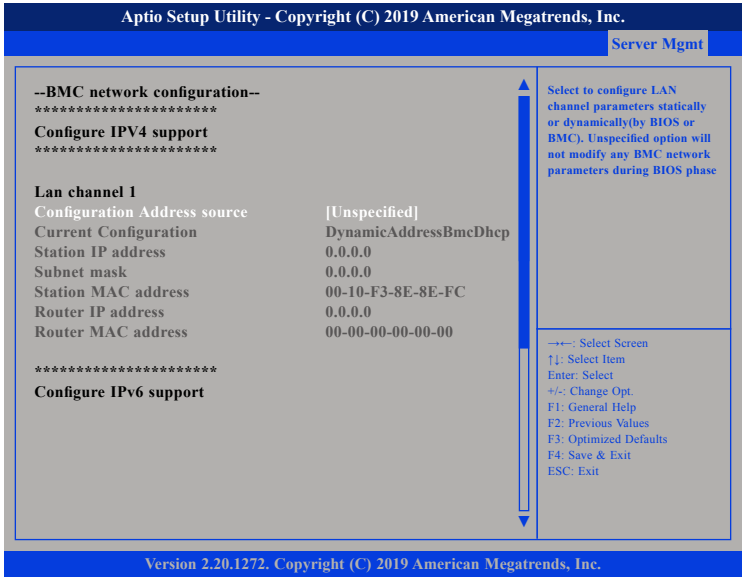
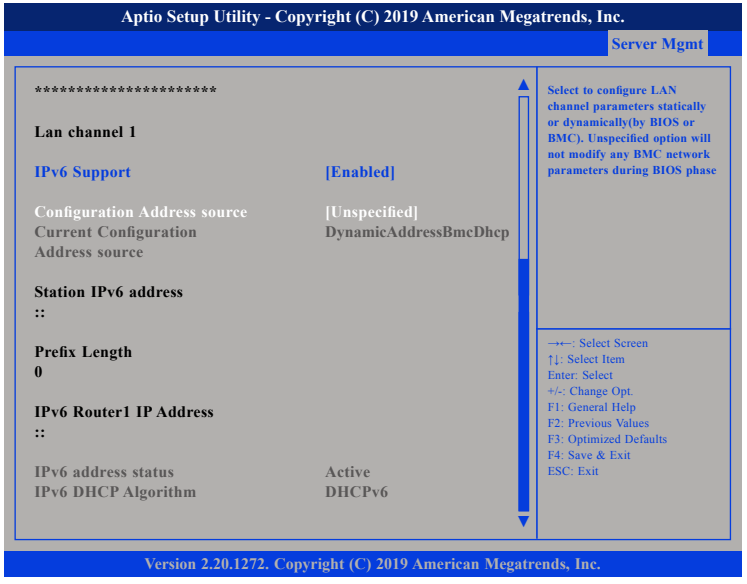
BMC Network Configuration



Configuration Address source

Select to configure LAN channel parameters statically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.

BMC Network Configuration Cont.



IPv6 Support

Enables or disables IPv6 support for LAN channel 1.

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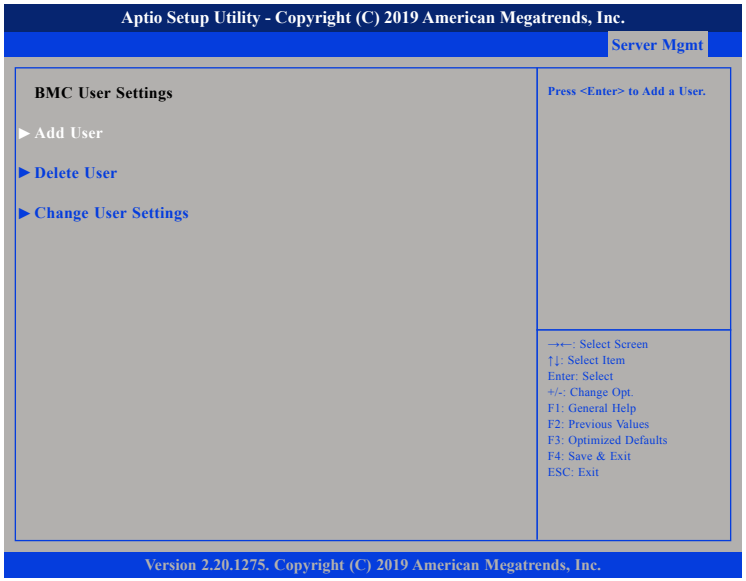
BMC User Settings



Add User
Option to add a user.

Delete User
Option to delete a user.

Change User Settings
Option to change user settings.

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