NEXCOM International Co., Ltd.

Network and Communication Solutions

Telecom Communication Appliance

TCA 5170 Series

User Manual

NEXCOM International Co., Ltd.
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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.

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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.

NEXCOM Return Merchandise Authorization (RMA)

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

Repair Service Charges for Out-of-Warranty Products

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

System Level

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

Board Level

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

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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 skilled person.

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.

    "ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions."

18. This equipment is not suitable for use in locations where children are likely to be present.

    Cet équipement ne convient pas à une utilisation dans des lieux pouvant accueillir des enfants.

19. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

    Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.

20. Use certified and rated Laser Class I for Optical Transceiver product.

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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

America
USA
NEXCOM USA
2883 Bayview Drive,
Fremont CA 94538, USA
Tel: +1-510-656-2248
Fax: +1-510-656-2158
Email: sales@nexcom.com
www.nexcom.com

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Package Contents

Before continuing, verify that the TCA 5170 series package that you received is complete. Your package should have all the items listed in the following table.

Item	Part Number	Name	Qty
1	19CA0517000X0	TCA 5170	1
2	50311F0100X00	Round Head Screw with Spring for M.2 (3042 & 2230) Device Installation	2
3	50311F0206X00	P Head Screw M2X5L for M.2 (2280) Device Installation	1
4	5040150001X00	Hook Handle (For retrieving LAN module)	1
5	5044440031X00	Rubber Foot Set	4
6	6012200052X00	PE Zipper Bag #8	1
7	6012200053X00	PE Zipper Bag #3	1
8	603USB0082X00	USB Cable	1
9	5040210035X00	Ear Set (2) + Screws	1
10	6014605588X00	Outside Carton Label for TCA 5170	2

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Ordering Information

The following below provides ordering information for the TCA 5170 series.

TCA 5170 (P/N: 10CA0517000X0)

1U Intel® Xeon® D-2123IT w/o QAT, w/ 4 x 10GbE & 8 x 1GbE LAN ports, 2 LAN module slots, wo/ LCM

TCA 5170B (P/N: 10CA0517002X0)

1U Intel® Xeon® D-2177NT w/ QAT, w/ 4 x 10GbE & 8 x 1GbE LAN ports, 2 LAN module slots, wo/ LCM

TCA 5170C (P/N: 10CA0517003X0)

1U Intel® Xeon® D-2146NT w/ QAT, w/ 4 x 10GbE & 8 x 1GbE LAN ports, 2 LAN module slots, wo/ LCM

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	All Slot
NI 140F	10SK000NI02X0	i350AM4x1	PCIe x8	4 SFP	None	None	All Slot
NI 180F	10S10180F01X0	i350AM4x2	PCIe x8	8 SFP	None	None	All Slot
NI 142C	10SK000NI03X0	i350AM4x1	PCIe x8	4 Copper	2 bypass	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
NI 121F	10S10121F01X0	i350AM2x1	PCIe x8	2 SFP	1 bypass	None	All Slot

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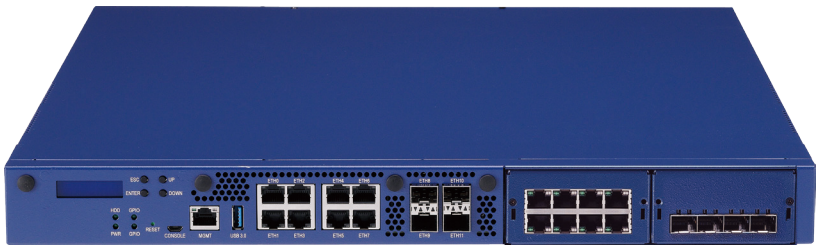
Chapter 1: Product Introduction

Overview



Key Features

- Intel® Xeon® D-2123IT SoC, BGA type (TCA 5170)
- Intel® Xeon® D-2177NT SoC, BGA type (TCA 5170B)
- Intel® Xeon® D-2146NT SoC, BGA type (TCA 5170C)
- 8 x DDR4-2400 RDIMM (TCA 5170)
- 8 x DDR4-2666 RDIMM (TCA 5170B)
- 8 x DDR4-2133 RDIMM (TCA 5170C)
- 1 x 2.5 SSD, 1 x M.2 2280
- 8 x GbE RJ45 & 4 x 10GbE Fiber
- 2 x LAN modules
- Redundant power supply
- Supports Intel® QAT (TCA 5170B and TCA 5170C)
- Intel® Select Solution for uCPE with ADVA Ensemble Connector (TCA 5170)
- Intel® Select Solution for uCPE with CentOS (TCA 5170B)

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Hardware Specifications

Main Board

TCA 5170

- Intel® Xeon® Skylake-D SoC, BGA type
  - D-2123IT, 4 cores w/ o QAT

TCA 5170B

- Intel® Xeon® Skylake-D SoC, BGA type
  - D-2177NT, 14 cores w/ QAT

TCA 5170C

- Intel® Xeon® Skylake-D SoC, BGA type
  - D-2146NT, 8 cores w/ QAT

Main Memory

TCA 5170

- 8 x DDR4 2400 RDIMM sockets, up to 256GB

TCA 5170B

- 8 x DDR4 2666 RDIMM sockets, up to 256GB

TCA 5170C

- 8 x DDR4 2133 RDIMM sockets, up to 256GB

Storage

- 1 x 2.5" internal SSD/HDD bay
- 1 x M.2 2280 M key, supports SATA and PCIe x4 signal

I/O Interface-External

- Button: power & reset
- LED: power/HDD/2 x GPIO
- 1 x USB 3.0 port
- 1 x Micro USB type console
- 8 x GbE RJ45 ports
  - 2 x LAN bypass pairs (TCA 5170 and TCA 5170B)
- 4 x 10GbE fiber ports
- 2 x PCIe x8 LAN module slots
- 1 x Management port
- 4 x SMA connectors for antennas
- 3 x Fixed smart fans
- 2 x Power inlets
- LCM module (optional)

I/O Interface-Internal

- 1 x M.2 2230 E key
- 1 x M.2 3042 B key with SIM slot

Power

- 450W 1+1 redundant power supply

Dimensions and Weight

- Chassis dimension (mm): 438 x 480 x 44
- Package dimension (mm): 632 x 567 x 203
- Without packing: 8kg
- With packing: 12kg

Environment

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

Certifications

- CE/FCC Class A

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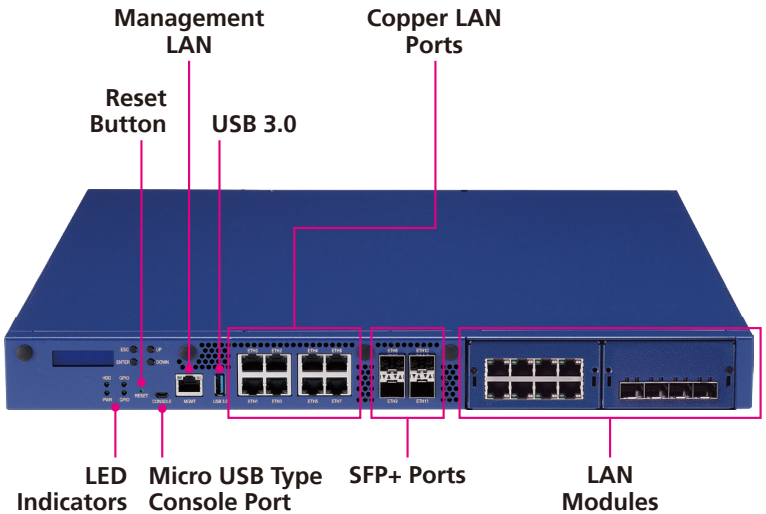
Knowing Your TCA 5170 Series

Front Panel



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

Reset Button
Press to restart the system.

Micro USB Type Console Serial Port
Used to connect Micro USB type console devices.

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

USB 3.0 Port
Used to connect USB 3.0/2.0 devices.

Copper LAN Ports
Used to connect network devices.

SFP+ Ports
Used to connect SFP+ modules for connecting fiber optic network devices.

LAN Modules
Two PCIe x8 LAN module bays to install add-on network modules.

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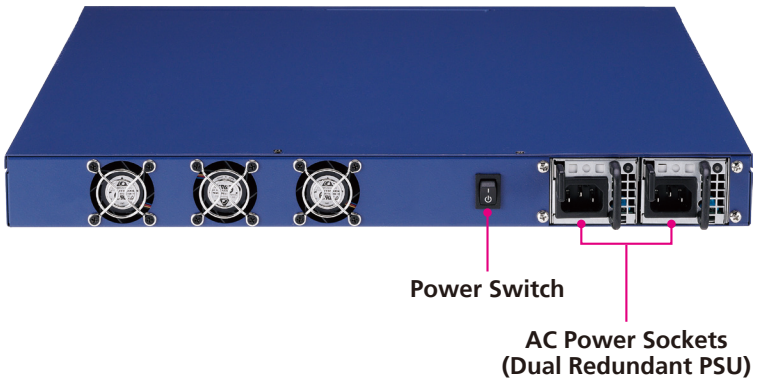
Rear Panel



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

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

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Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the TCA 5170 series 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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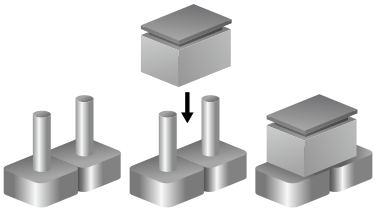
Jumper Settings

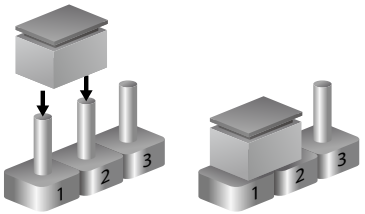
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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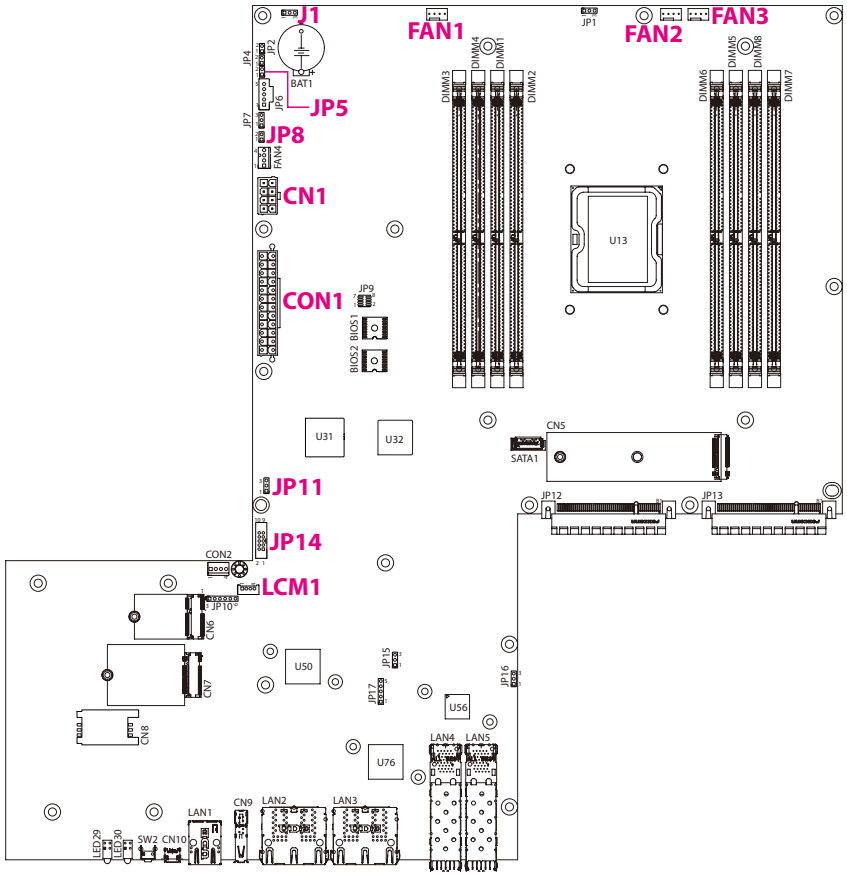
Locations of the Jumpers and Connectors

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



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Jumpers

RTC Clear

Connector type: 1x3 3-pin header
Connector location: J1

Pin	Definition
1	PU_RST_RTCRST_N
2	RST_RTCRST_N
3	GND

AT/ATX Mode Select

Connector type: 1x3 3-pin header
Connector location: JP11

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

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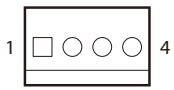
Connector Pin Definitions

Internal Connectors

Fan Connectors

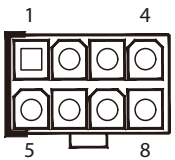
Connector type: 1x4 4-pin wafer header
Connector location: FAN1, FAN2 and FAN3



Pin	Definition
1	GND
2	P12V
3	TACH
4	PWM

8-pin Internal 12V Power Connector

Connector type: 2x4 8-pin boxed header
Connector location: CN1



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

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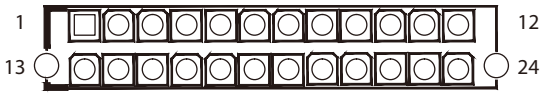
24-pin Internal ATX Power Connector

Connector type: 2x12 24-pin boxed header
Connector location: CON1



Pin	Definition	Pin	Definition
1	+3.3V	2	+3.3V
3	GND	4	+5V
5	GND	6	+5V
7	GND	8	PW-OK
9	+5VSB	10	+12V
11	+12V	12	+3.3V
13	+3.3V	14	-12V
15	GND	16	PS-ON
17	GND	18	GND
19	GND	20	RES/-5V
21	+5V	22	+5V
23	+5V	24	GND

Power Button

Connector type: 1x2 2-pin header
Connector location: JP8

Pin	Definition
1	FP_PWRBTN_R_N
2	GND

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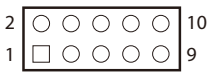
Reset Button

Connector type: 1x2 2-pin header
Connector location: JP5

Pin	Definition
1	PCH_SYS_RESET_N_R
2	GND

GPIO Pin Header

Connector type: 2x5 10-pin header
Connector location: JP14



Pin	Definition	Pin	Definition
1	P5V	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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LCM

Connector type: 1x4 4-pin header
Connector location: LCM1

Pin	Definition
1	GND
2	SP_UART1_RXD
3	SP_UART1_TXD
4	P3V3

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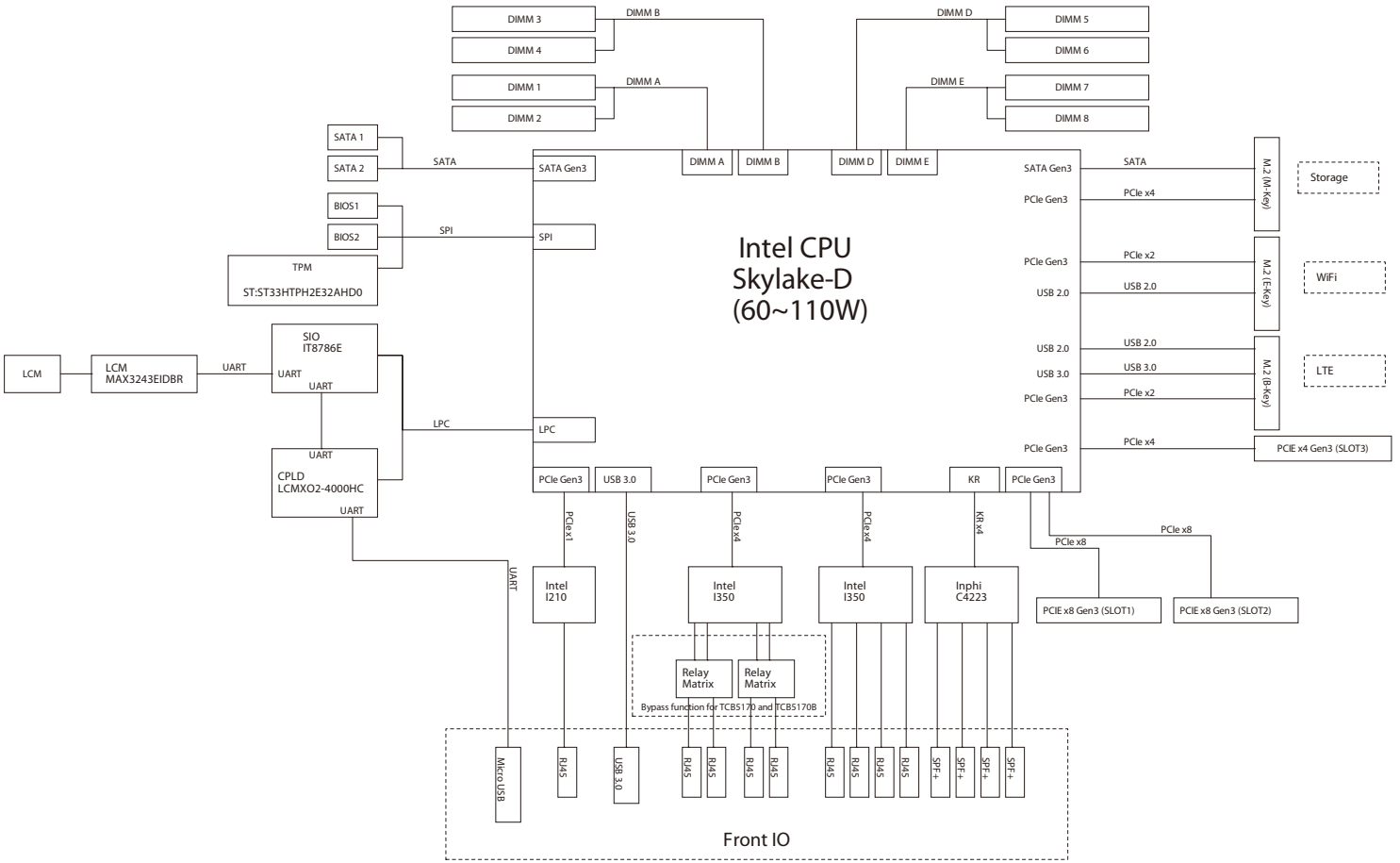
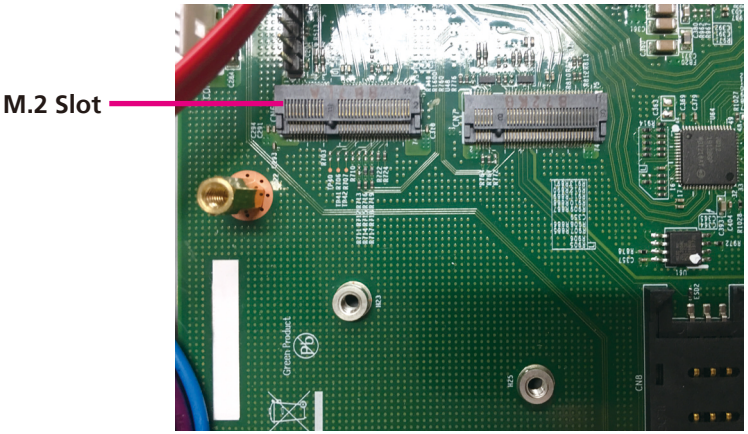
Block Diagram



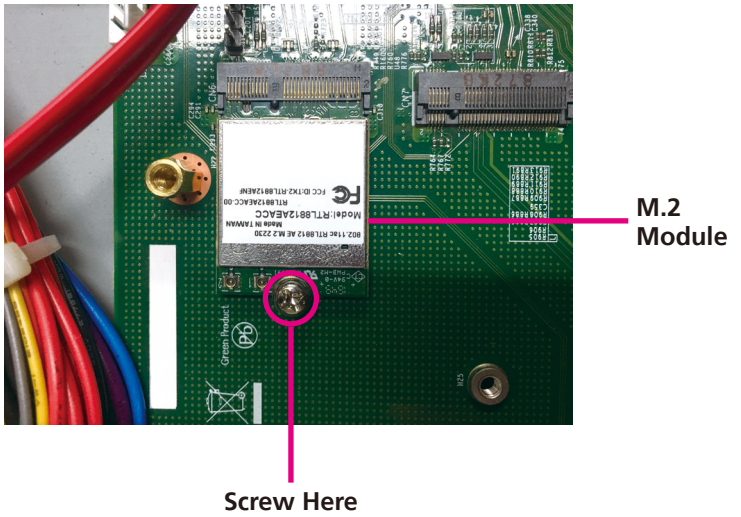
Chapter 3: System Setup

Installing an M.2 2230/3042 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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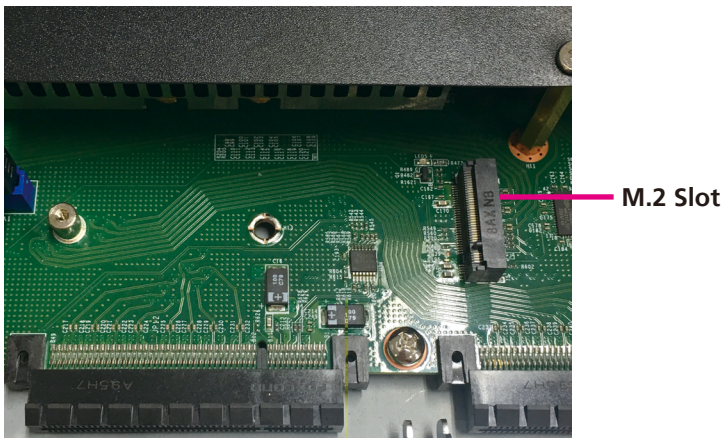
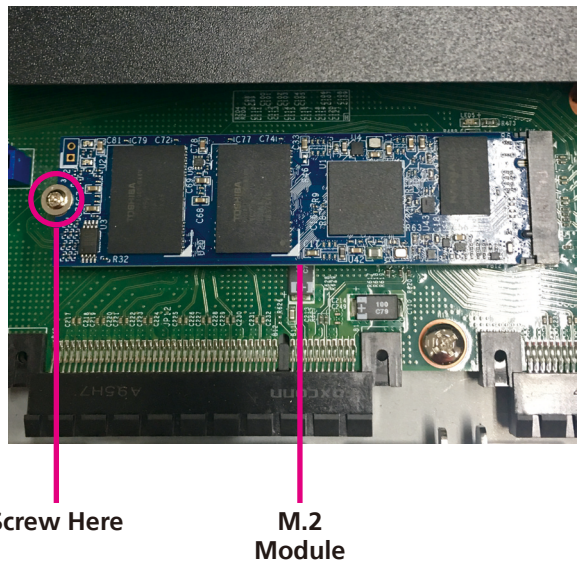
Installing an M.2 2280 Module

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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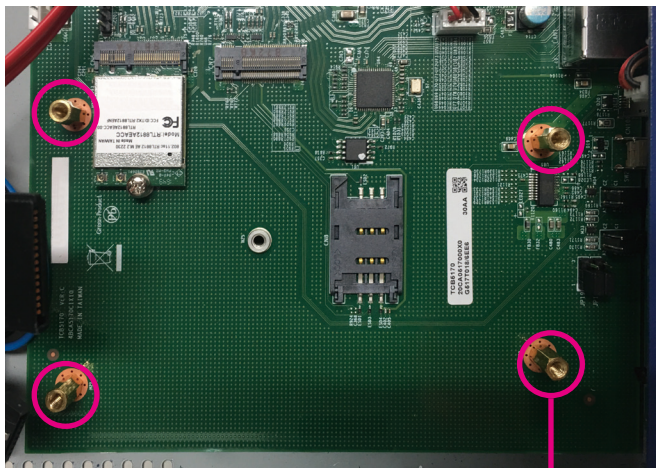
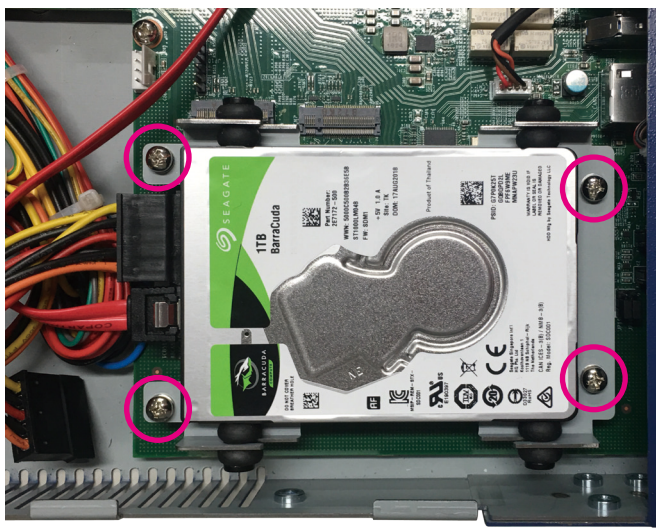
Installing a 2.5" SATA Storage Drive

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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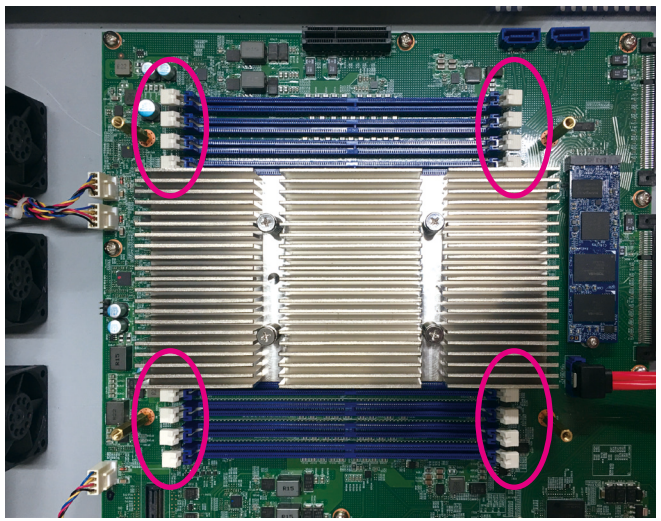
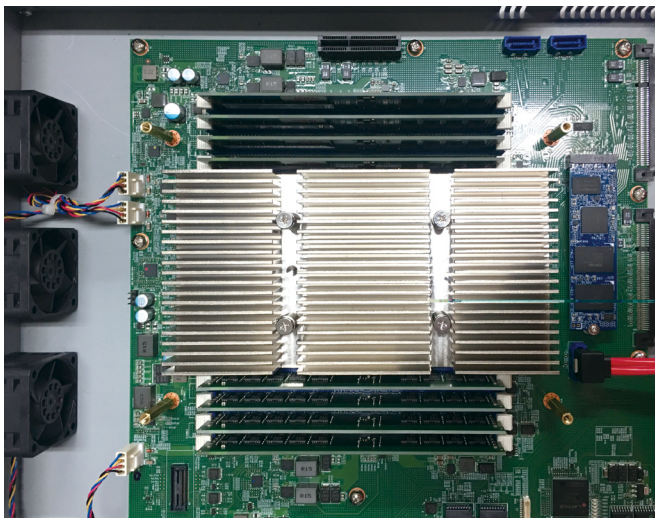
Installing DIMM Memory Modules

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.



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Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for the TCA 5170 series. 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

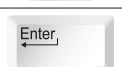
When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- 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 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.

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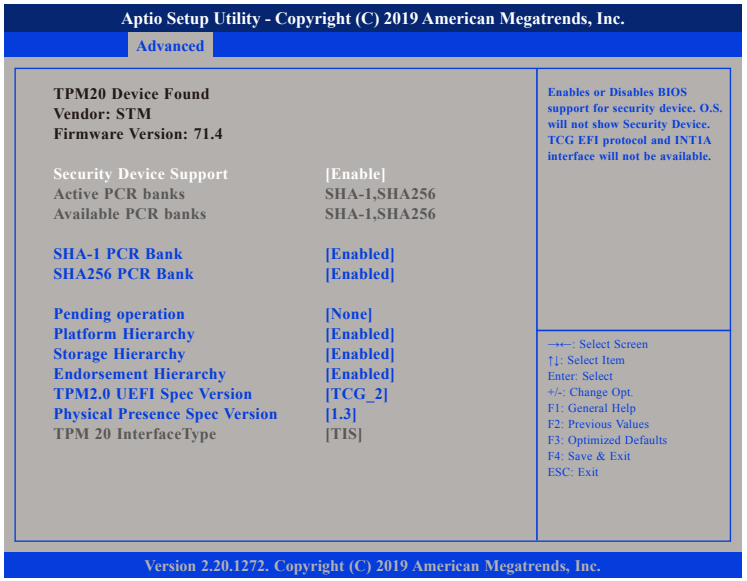
Advanced

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.

Trusted Computing

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



Security Device Support

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

SHA-1 PCR Bank

Enables or disables SHA-1 PCR Bank.

SHA256 PCR Bank

Enables or disables SHA256 PCR Bank.

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Pending operation
Schedules an operation for the security device.

Platform Hierarchy
Enables or disables platform hierarchy.

Storage Hierarchy
Enables or disables storage hierarchy.

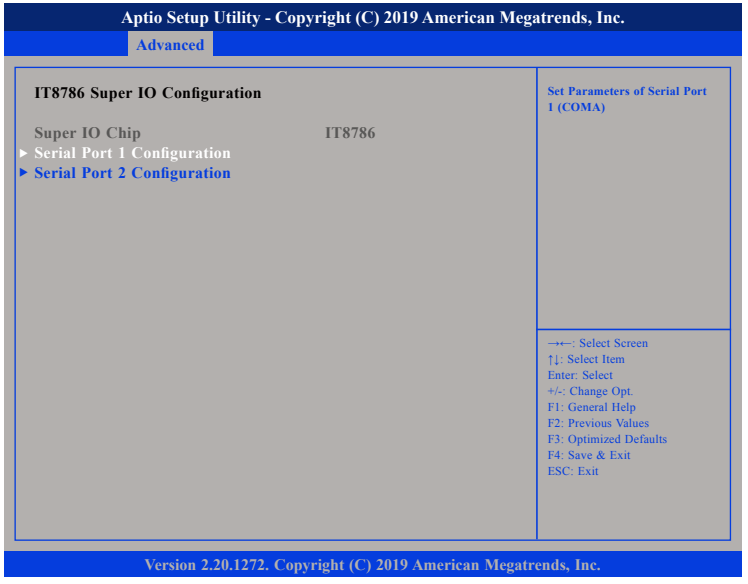
Endorsement Hierarchy
Enables or disables endorsement hierarchy.

TPM2.0 UEFI Spec Version
Configures the TPM2.0 UEFI spec version.

Physical Presence Spec Version
Configures the physical presence spec version.

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.

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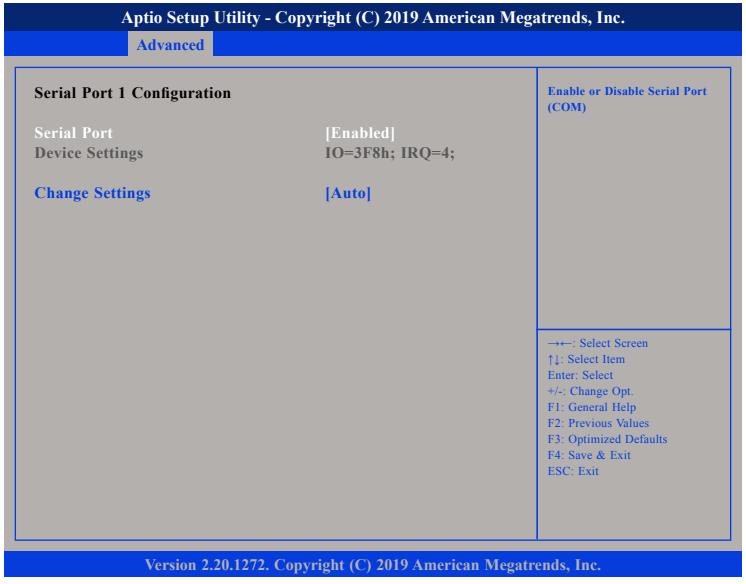
Serial Port 1 Configuration

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.

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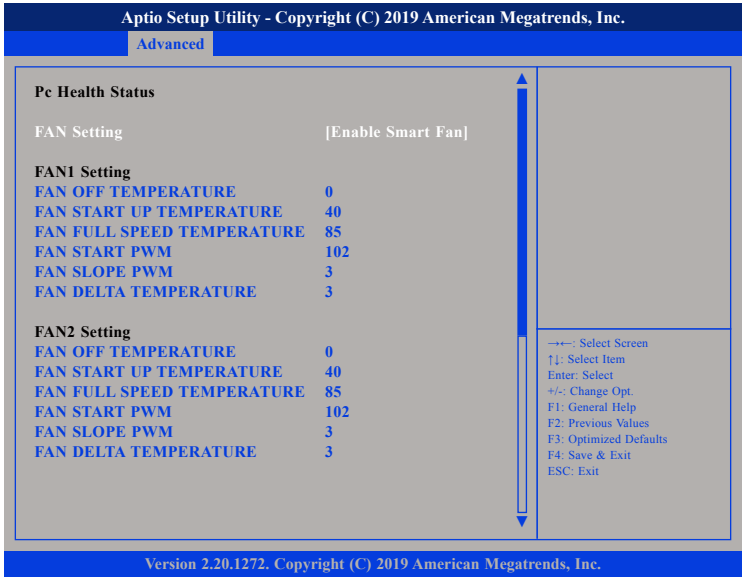
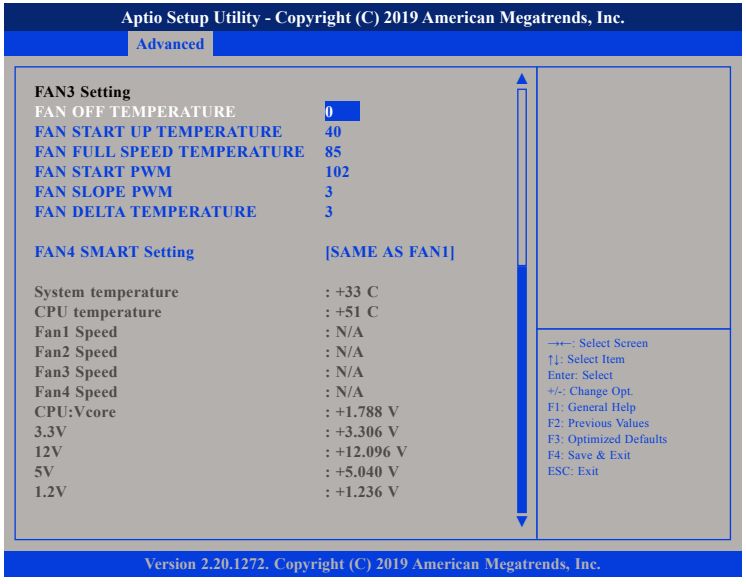
Hardware Monitor

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





FAN Setting
Configures the operating mode of the fan.

FAN OFF TEMPERATURE
Configures the temperature to turn the fan off.

FAN ON TEMPERATURE
Configures the temperature to turn the fan on.

FAN FULL SPEED
Configures the temperature to run the fan at full speed.

FAN START PWM
Configures the start PWM value of the fan. This is used to set the starting fan speed.

FAN SLOPE PWM
Configures the slope PWM value of the fan. This is used to control the rate of the fan speed based on temperature changes.

FAN DELTA TEMPERATURE
Configures the delta temperature of the fan.

FAN4 SMART Setting
Configures the smart fan setting of FAN4.

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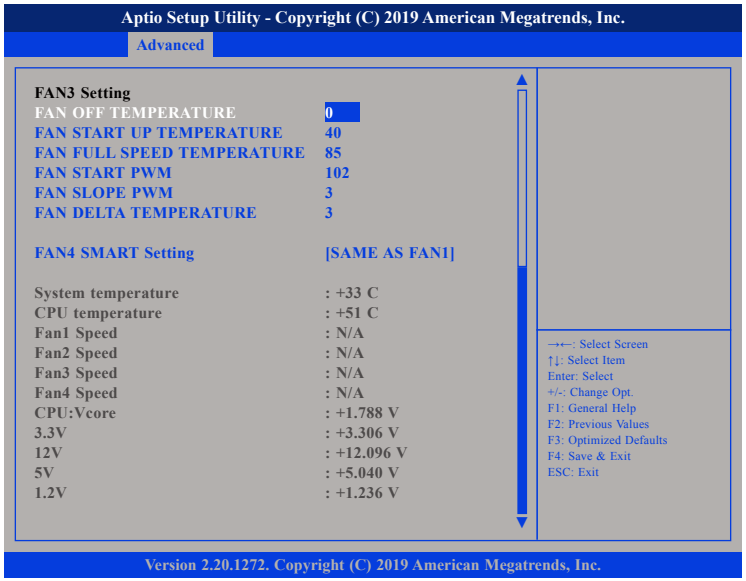
Hardware Monitor Cont.



System and CPU temperature

Detects and displays the current system and CPU temperature.

Fan1 to Fan4 Speed

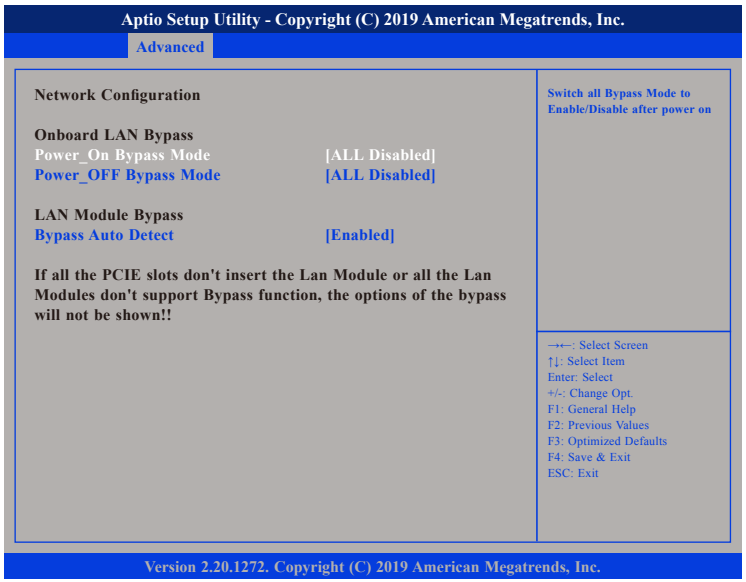
Detects and displays the current fan1 to fan4 speed.

CPU:Vcore to 1.2V

Detects and displays the output voltages.

Network Configuration

This section is used to configure the network bypass settings.



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.

Bypass Auto Detect

Enables or disables automatic LAN Bypass function.

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Serial Port Console Redirection

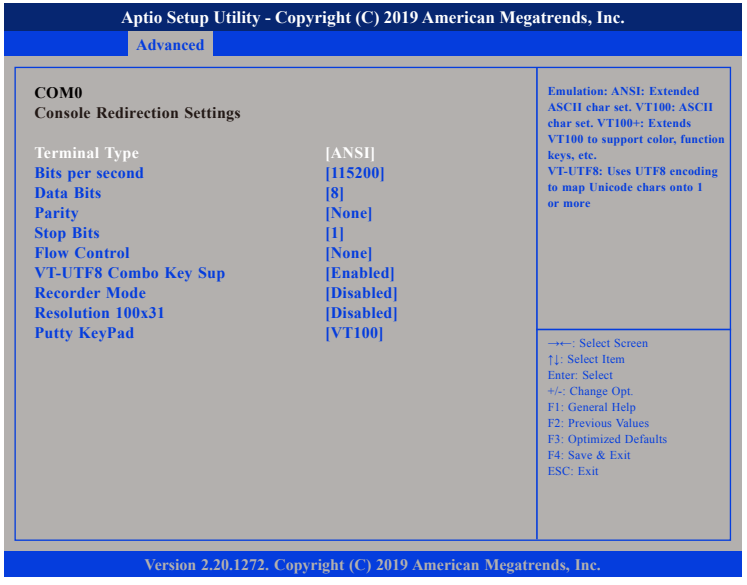
This section is used to configure the serial port that will be used for console redirection.

Console Redirection

Enables or disables console redirection 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.

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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. (Only if the system supports 64-bit PCI decoding.)

SR-IOV Support
Enables or disables SR-IOV support.

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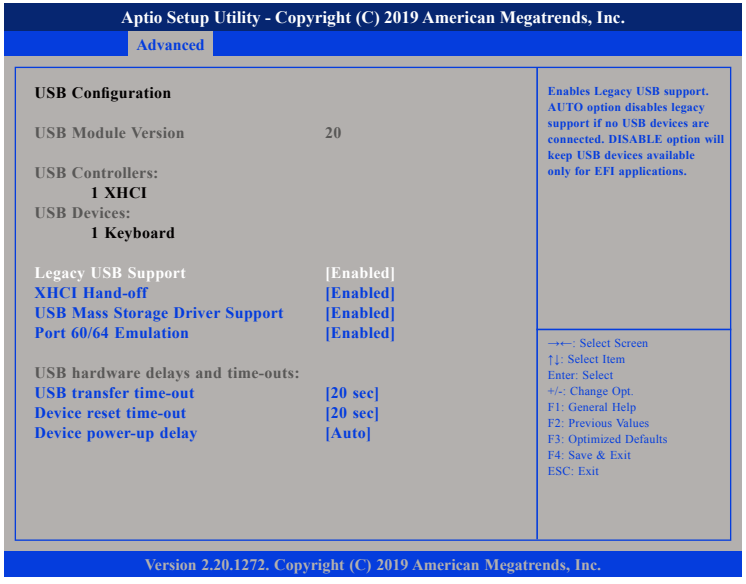
USB Configuration

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 device driver support.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for complete USB keyboard legacy support for non-USB aware OS.

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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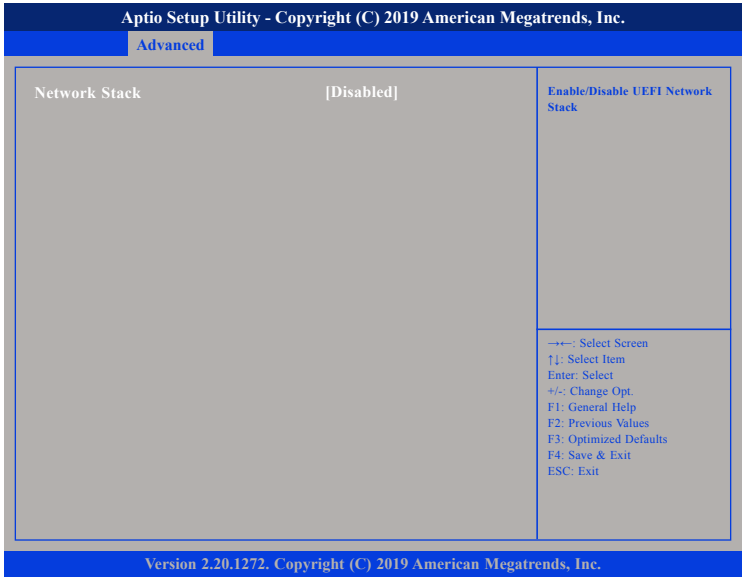
Network Stack Configuration

This section is used to configure the network stack.



Network Stack

Enables or disables UEFI network stack.

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.

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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.

Network
Controls the execution of UEFI and Legacy PXE OpROM.

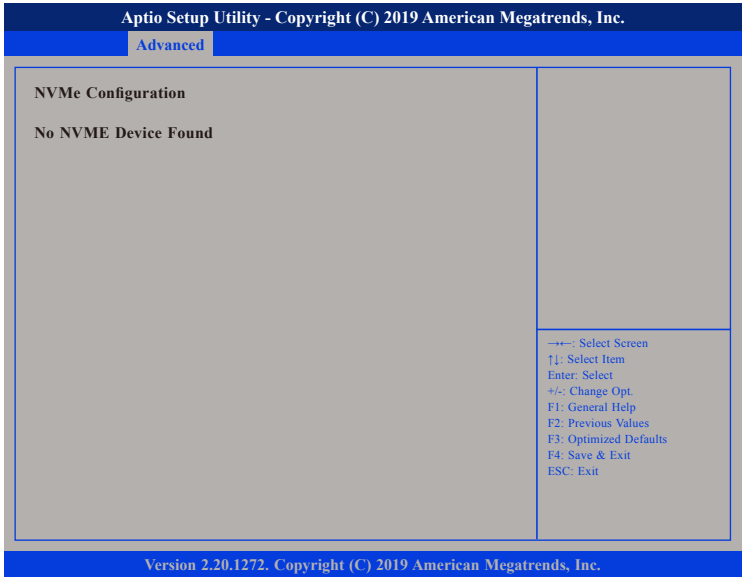
Storage
Controls the execution of UEFI and Legacy Storage OpROM.

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.

NVMe Configuration

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



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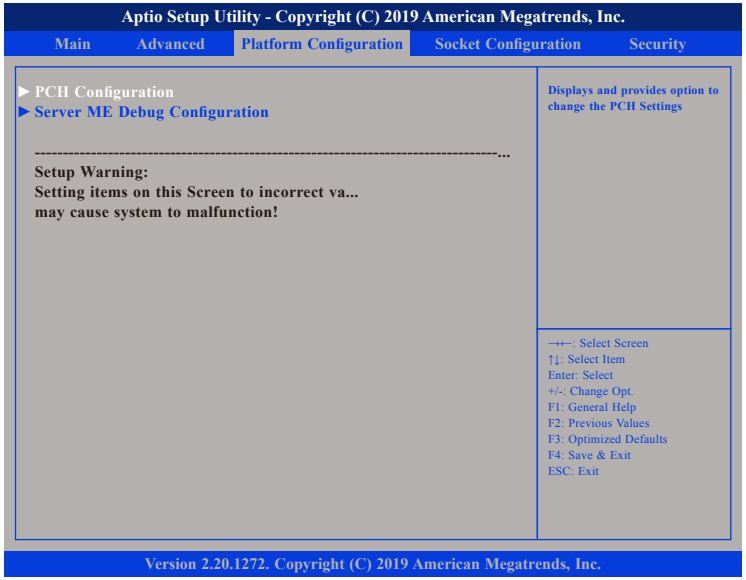
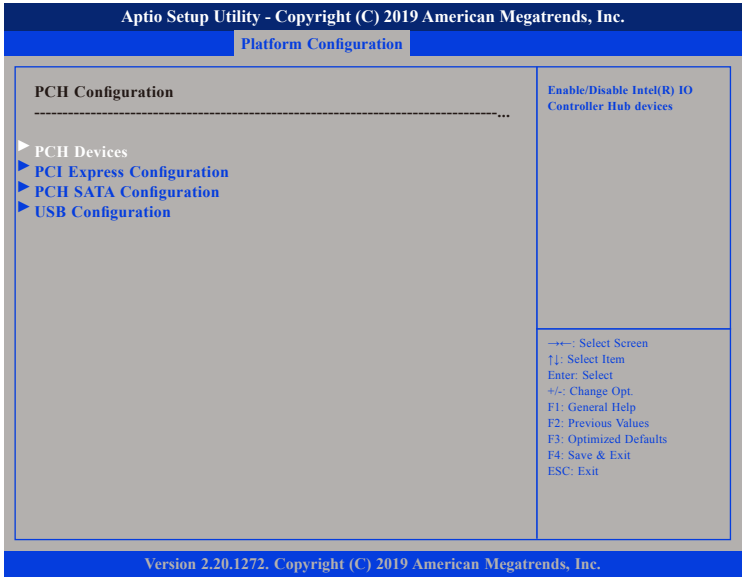
Platform Configuration



PCH Configuration
Enters the PCH 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.

USB Configuration
Enters the USB Configuration submenu.

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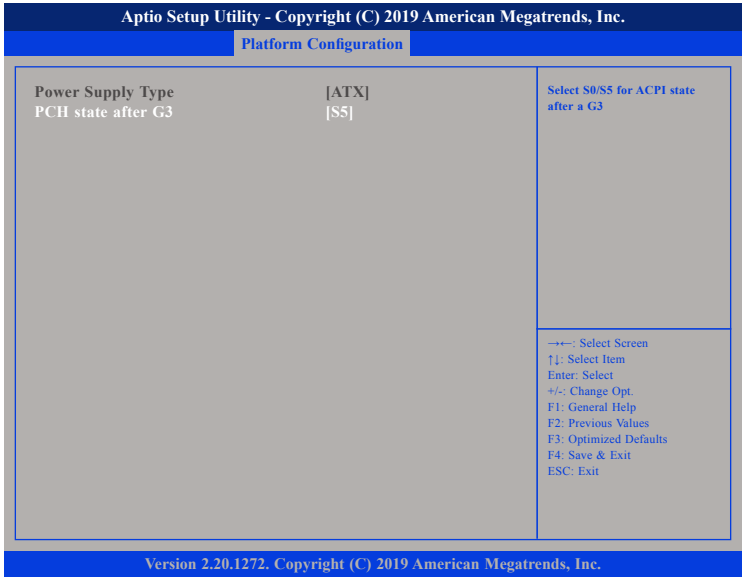
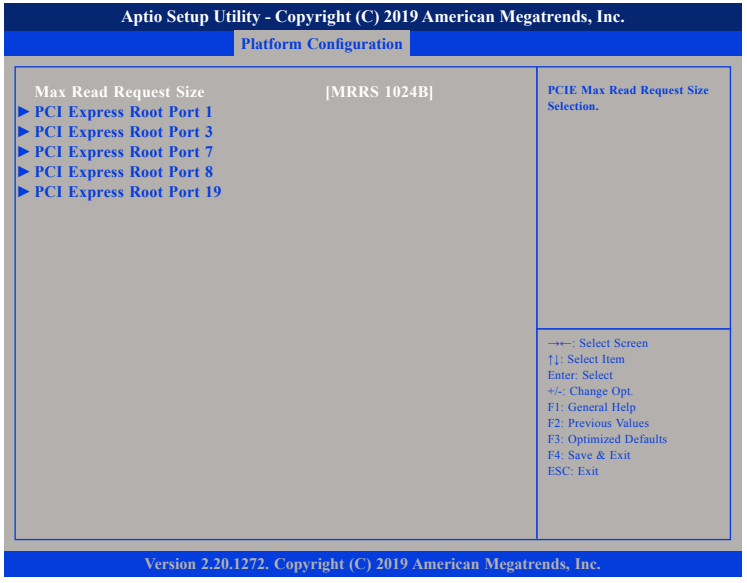
PCH Devices



State After G3
Configures the PCH state after G3.

PCI Express Configuration



Max Read Request Size
Configures the PCIe max read request size.

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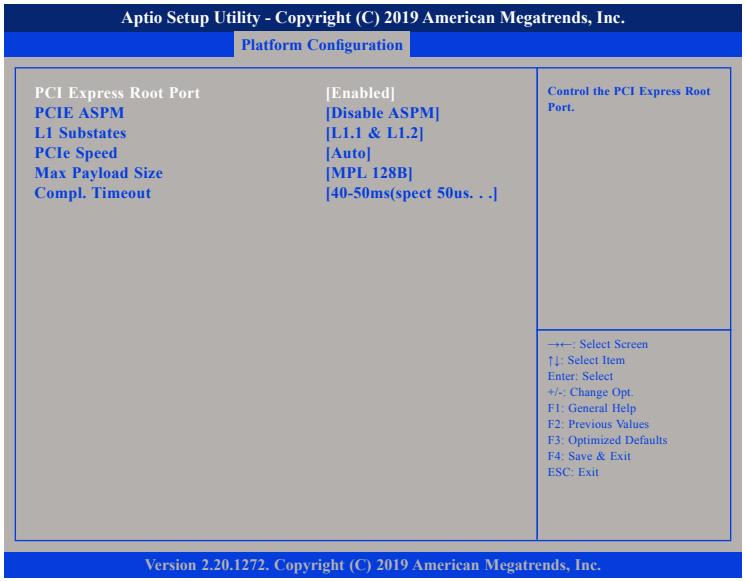
PCI Express Root Port 1, 3, 7, 8 and 19



PCI Express Root Port
Enables or disables the PCI Express root port.

PCIE ASPM
Enables or disables PCIe Active State Power Management support.

L1 Substates
Configures the L1 Substates settings.

PCIe Speed
Configures the speed of the PCI Express port.

Max Payload Size
Configures the PCIe maximum payload size.

Compl. Timeout
Configures the PCIe Completion Timer timeout setting.

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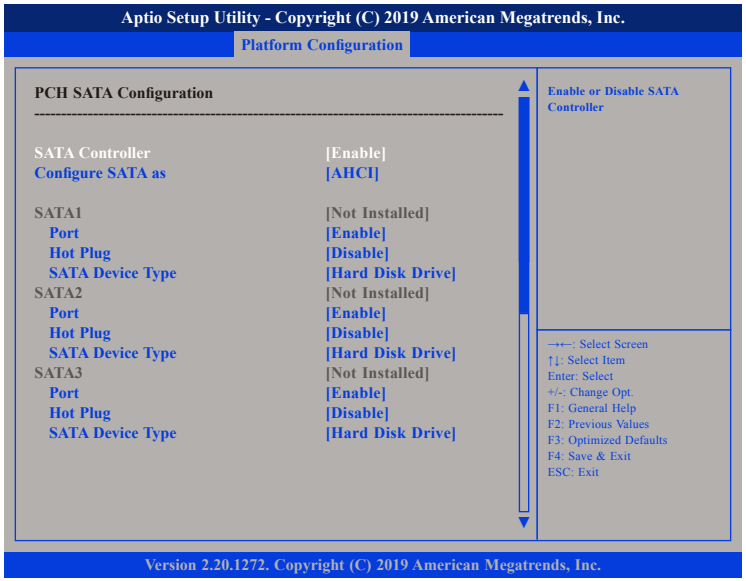
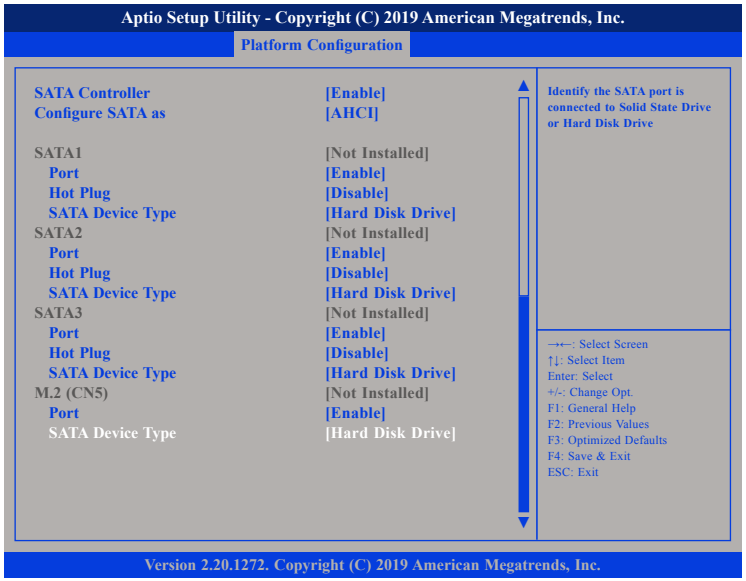
PCH SATA Configuration





SATA Controller(s)
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.

Port
Enables or disables SATA port 1, 2, 3 or the M.2 port.

Hot Plug
Enables or disables hot plugging feature on SATA port 1 to port 3.

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

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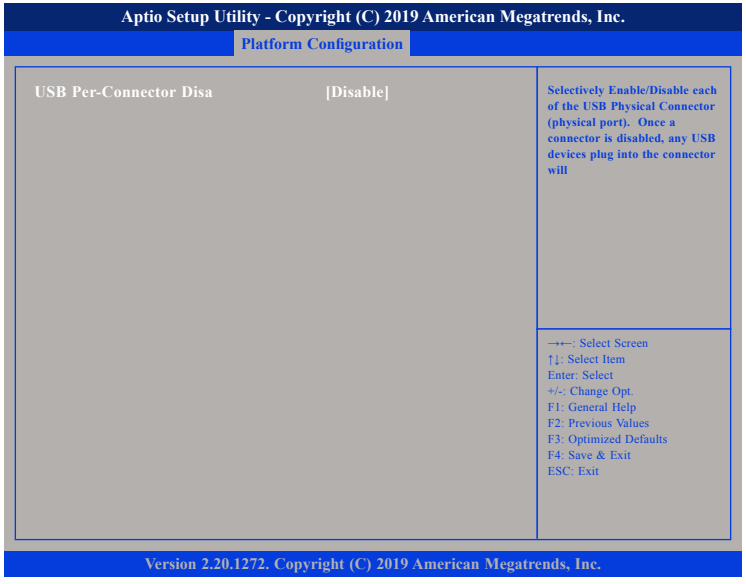
USB Configuration (PCH)



USB Per-Connector Disable
Provides the option to enable or disable each USB connector.

Server ME Debug Configuration

Server ME General Configuration
Enters the Server ME General Configuration submenu.

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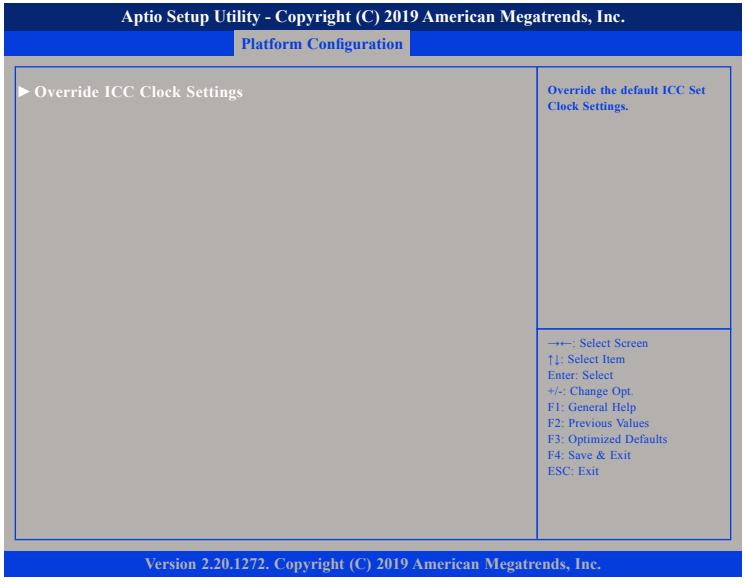
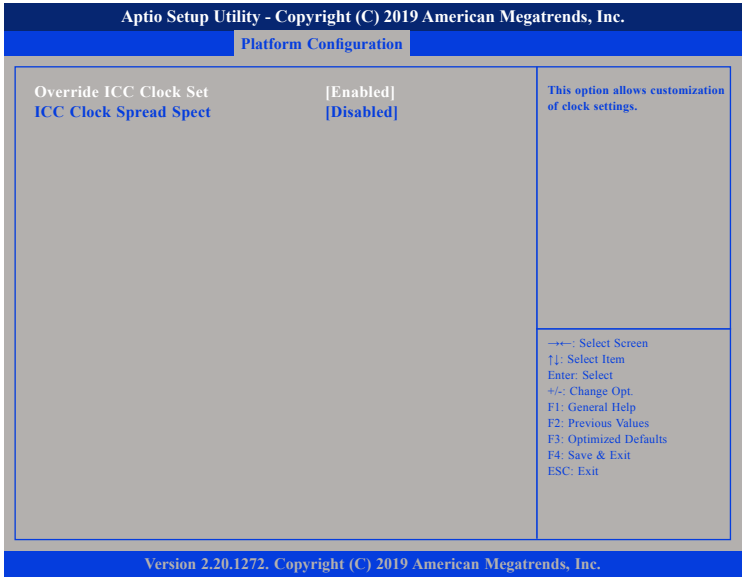
Server ME General Configuration



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.

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Socket Configuration

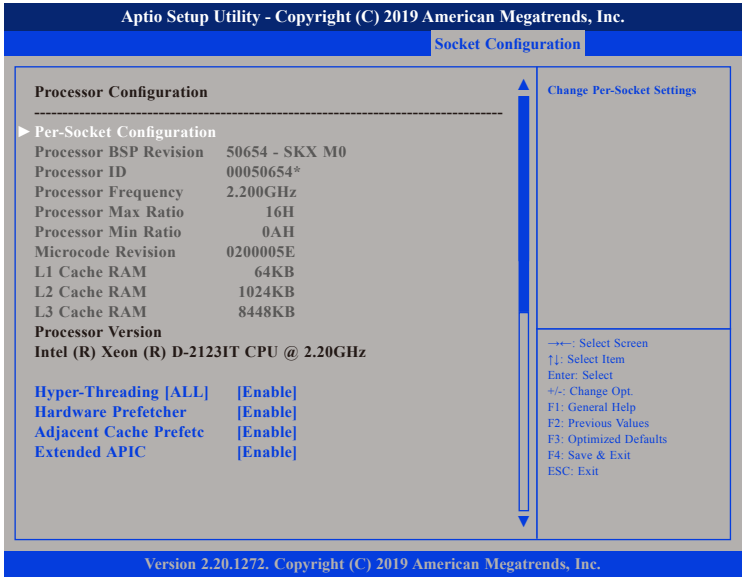
Processor Configuration
Enters the Processor Configuration submenu.

Memory Configuration
Enters the Memory Configuration submenu.

IIO Configuration
Enters the IIO Configuration submenu.

Advanced Power Management Configuration
Enters the Advanced Power Management Configuration submenu.

Processor Configuration



Hyper-Threading [ALL]
Enables or disables hyper-threading technology.

Hardware Prefetcher
Enables or disables the MLC streamer prefetcher.

Adjacent Cache Prefetcher
Enables or disables prefetching of adjacent cache lines.

Extended APIC
Enables or disables extended APIC support.

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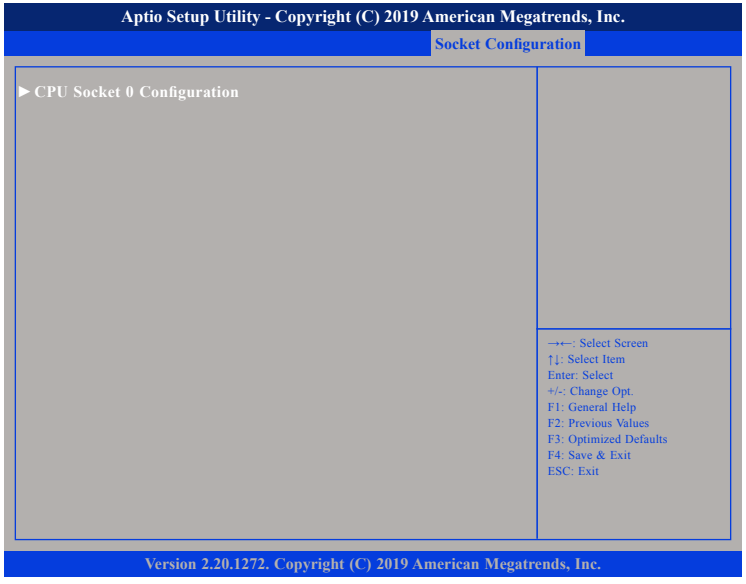
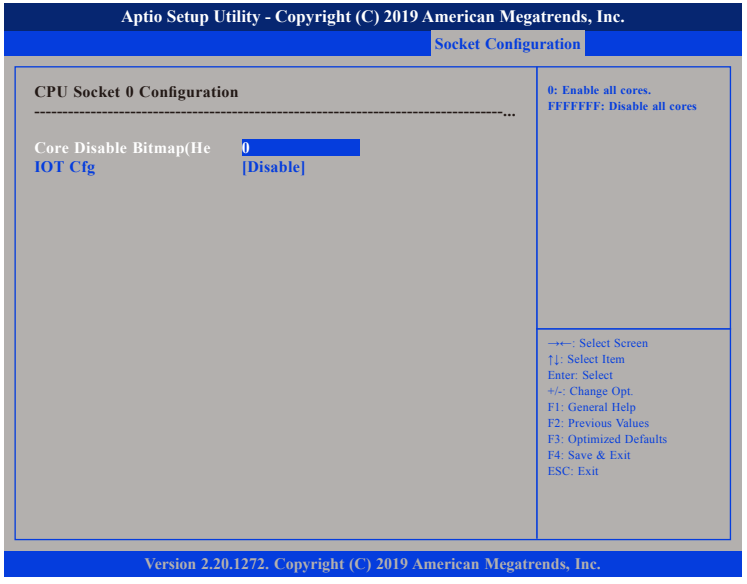
Per-Socket Configuration



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. FFFFFFF means disable all cores.

IOT Cfg

Enables or disables IOT Cfg.

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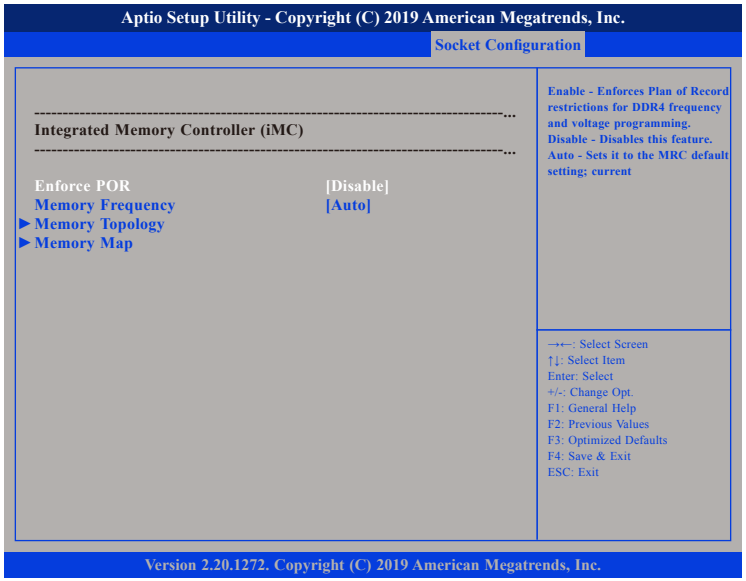
Memory Configuration

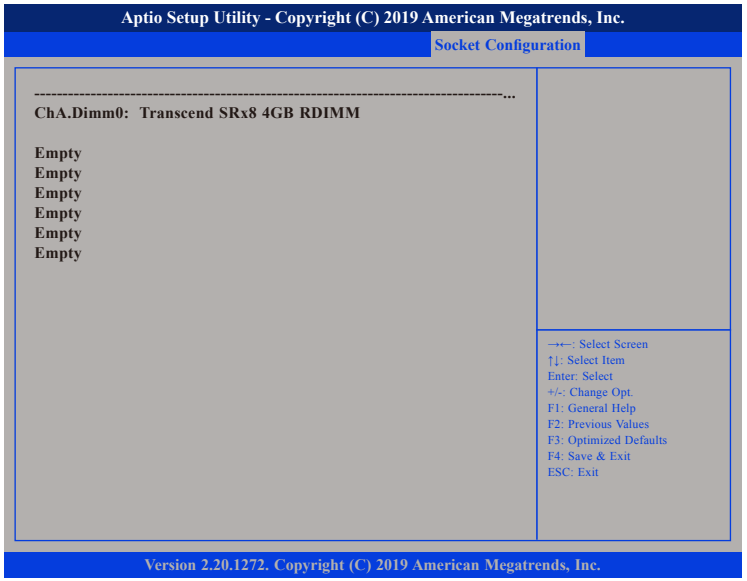


Enforce POR
Configures the Enforce Plan of Record options.

Enable	Enforces Plan of Record restrictions for DDR4 frequency and voltage programming.
Disable	Disables this feature.
Auto	Sets it to the MRC default setting. Current default setting is Enable.

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

Memory Topology



Detects and displays the information on the memory installed.

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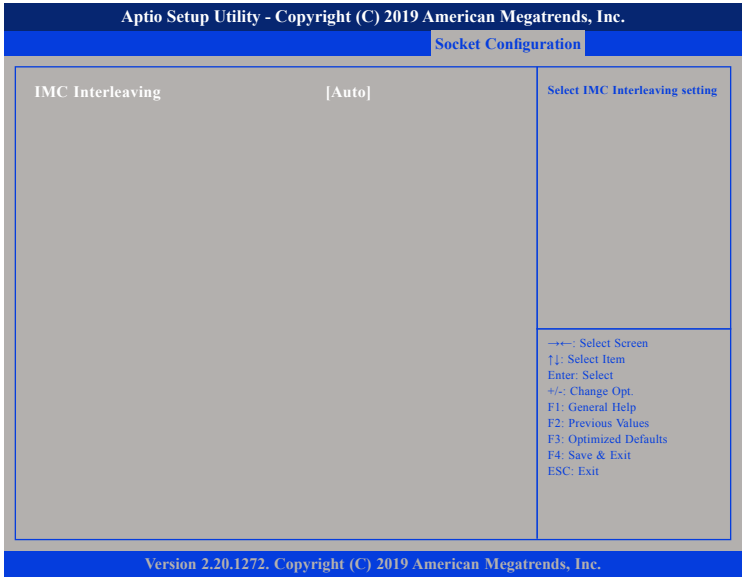
Memory Map



IMC Interleaving
Configures the IMC Interleaving setting.

IIO Configuration

Socket0 Configuration
Enters the Socket0 Configuration submenu.

IOAT Configuration
Enters the IOAT Configuration submenu.

IIO General Configuration
Enters the IIO General Configuration submenu.

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

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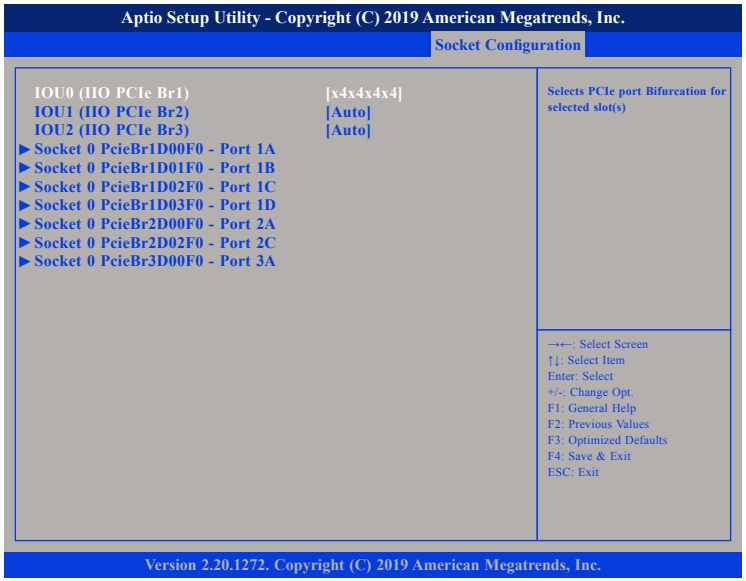
Socket0 Configuration

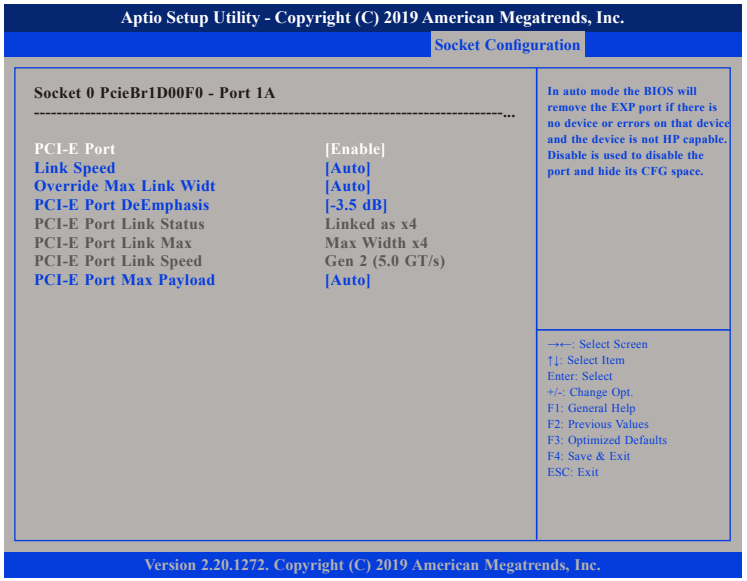


IOU0 (IIO PCIe Br1)
Port Bifurcation settings for IOU 0.

IOU1 (IIO PCIe Br2)
Port Bifurcation settings for IOU 1.

IOU2 (IIO PCIe Br3)
Port Bifurcation settings for IOU 2.

Socket 0 PcieBr1D00F0 - Port 1A



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.

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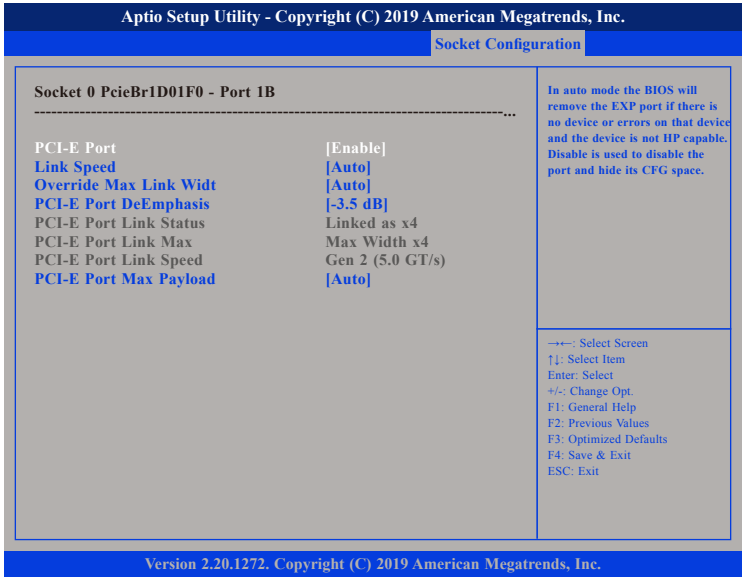
Socket 0 PcieBr1D01F0 - Port 1B



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.

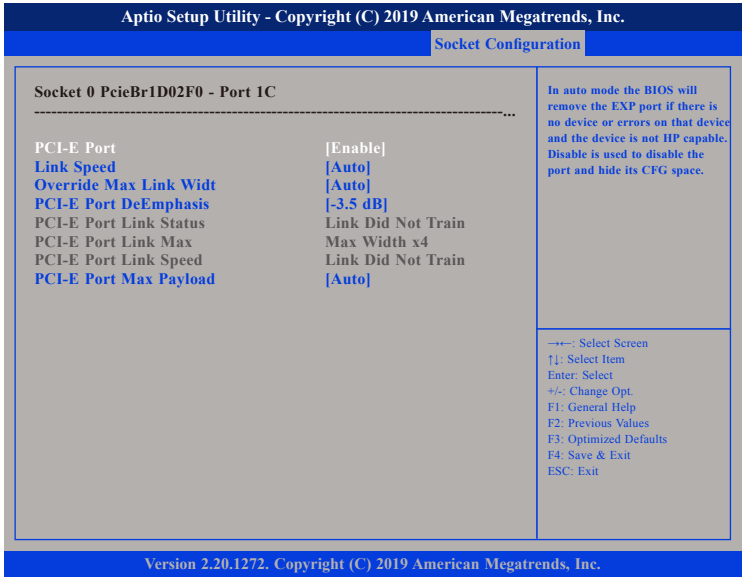
Link Speed
Configures the link speed for the PCIe port.

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



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.

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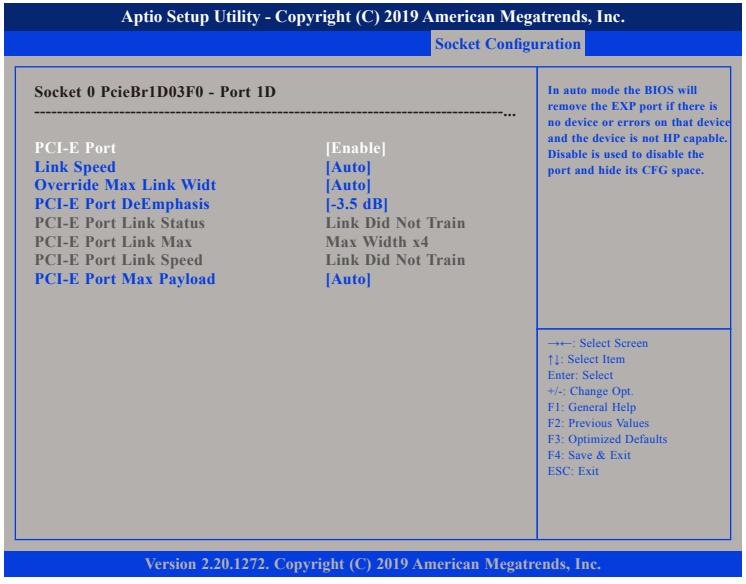
Socket 0 PcieBr1D03F0 - Port 1D



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.

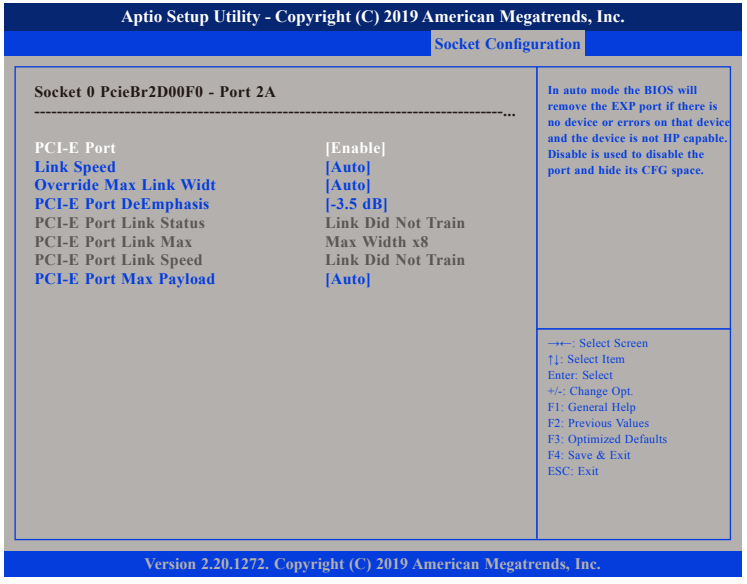
Link Speed
Configures the link speed for the PCIe port.

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



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.

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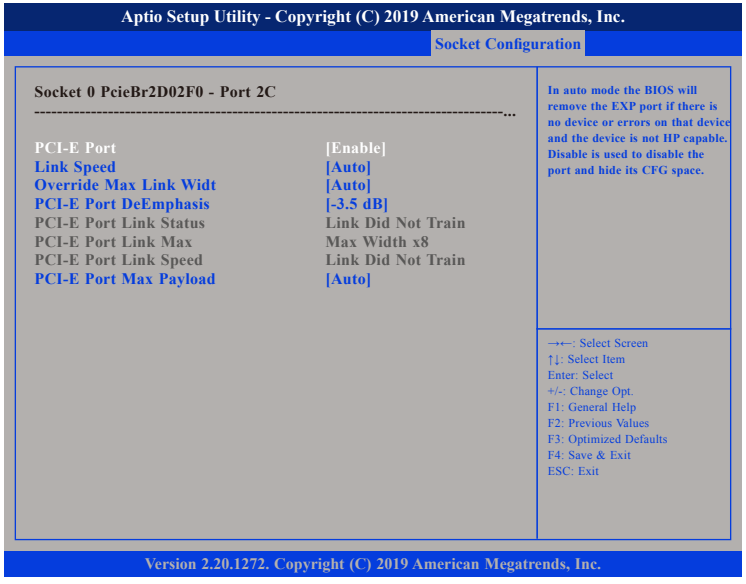
Socket 0 PcieBr2D02F0 - Port 2C



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.

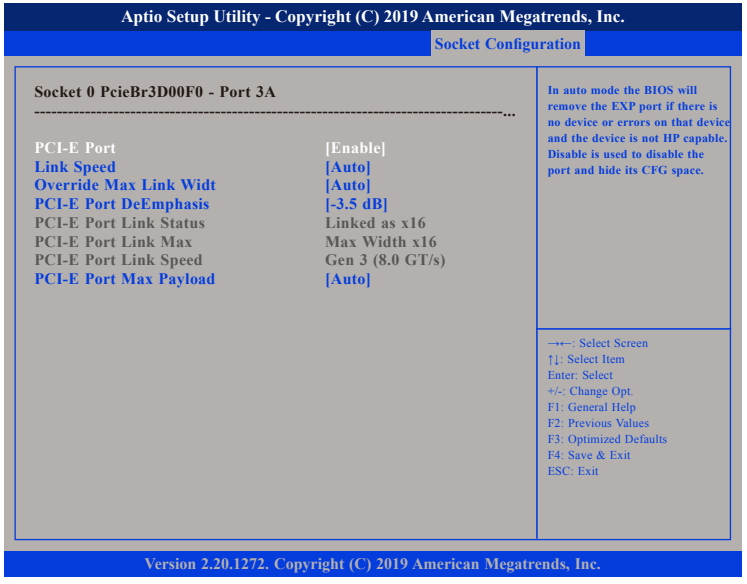
Link Speed
Configures the link speed for the PCIe port.

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



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.

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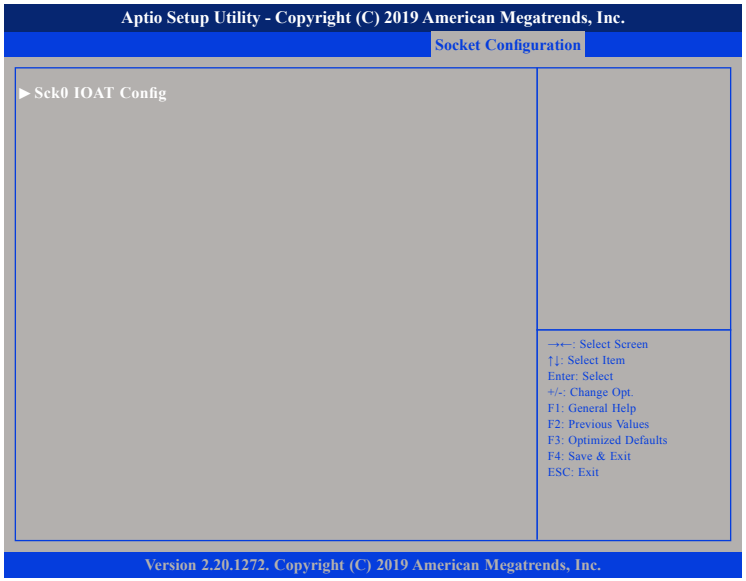
IOAT Configuration



Sck0 IOAT Config

Enters the Socket0 IOAT Configuration submenu.

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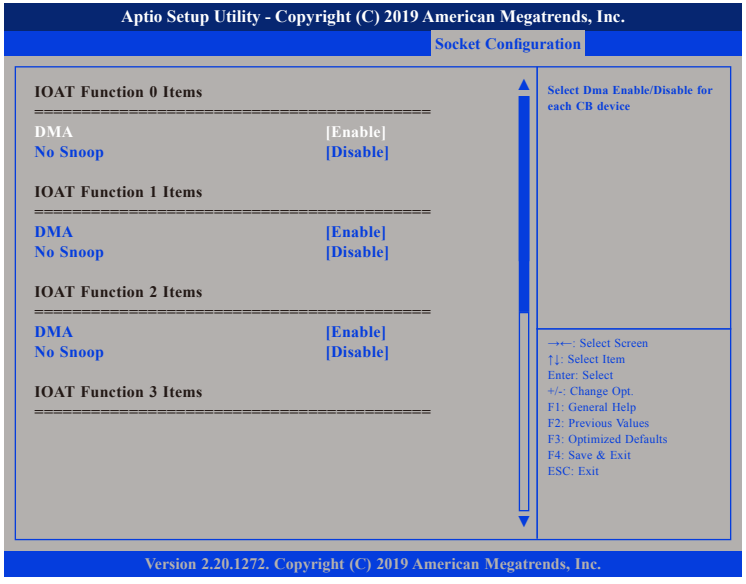
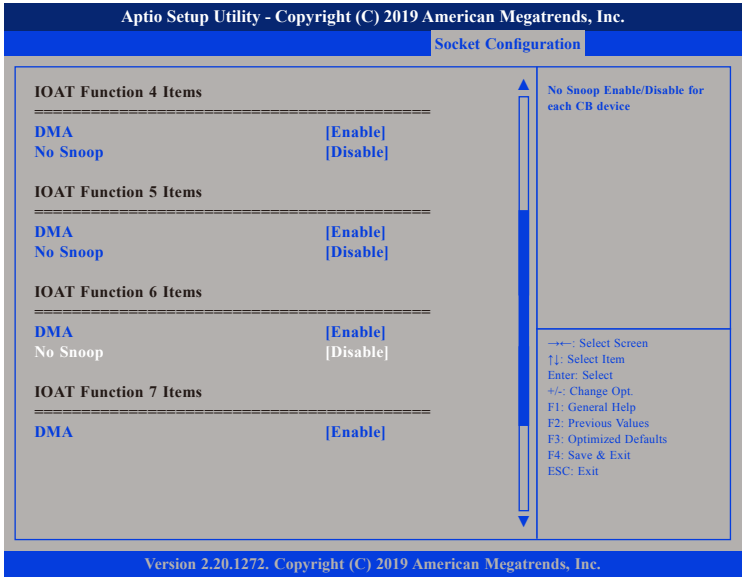
Sck0 IOAT Config





DMA
Enables or disables DMA.

No Snoop
Enables or disables No Snoop function for each CB device.

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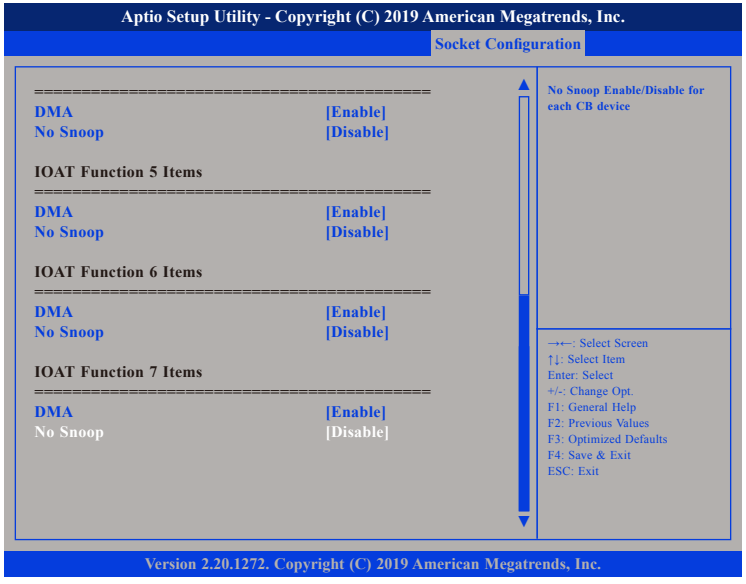
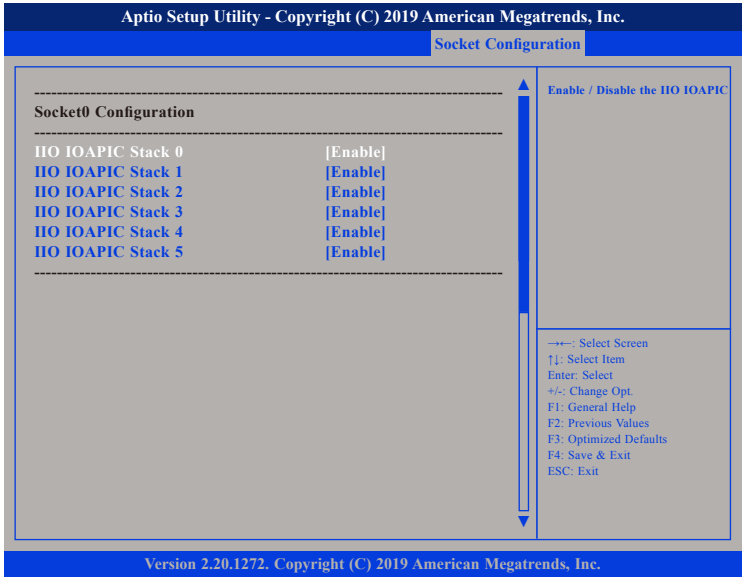
Sck0 IOAT Config Cont.



DMA
Enables or disables DMA.

No Snoop
Enables or disables No Snoop function for each CB device.

IIO General Configuration



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

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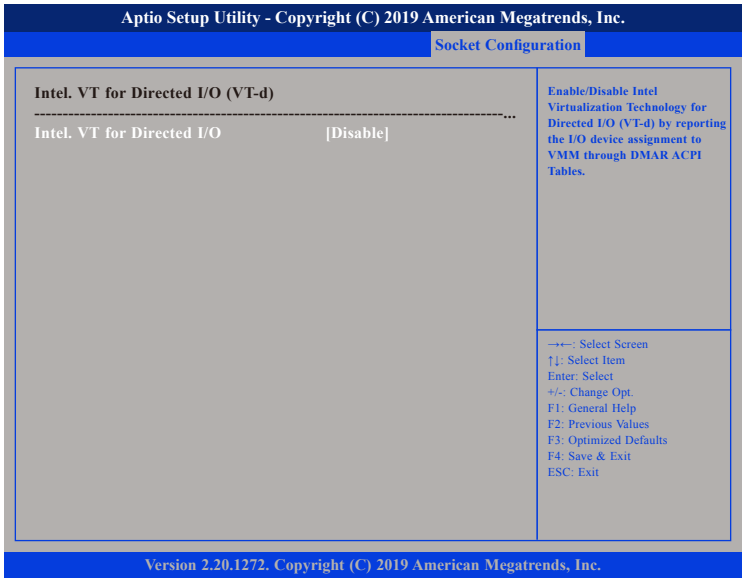
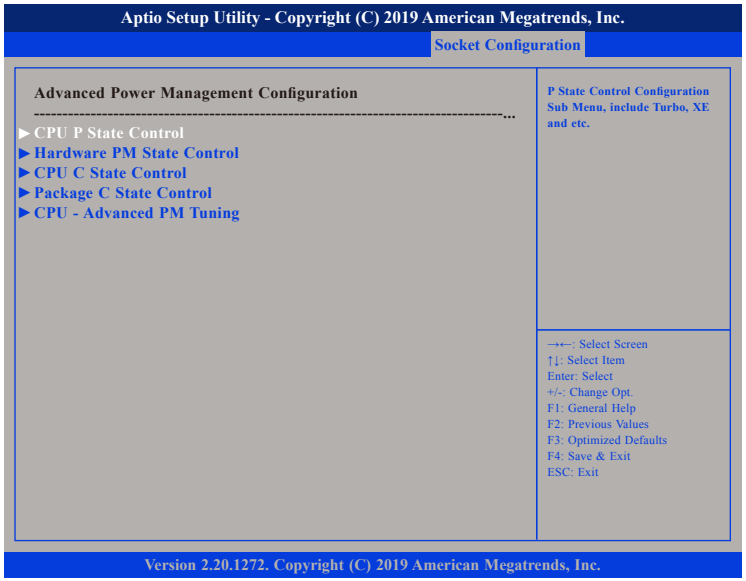
Intel. VT for Directed I/O (VT-d)



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 C State Control
Enters the CPU C State Control submenu.

Package C State Control
Enters the Package C State Control submenu.

CPU - Advanced PM Tuning
Enters the CPU - Advanced PM Tuning.

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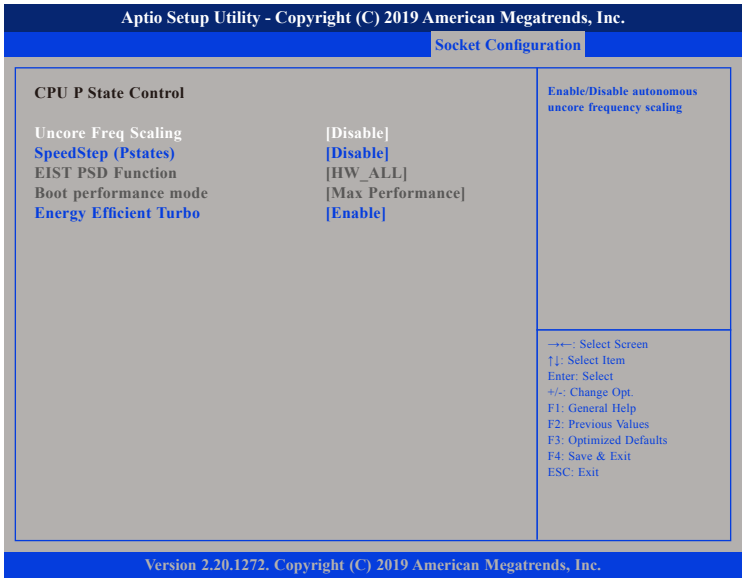
CPU P State Control

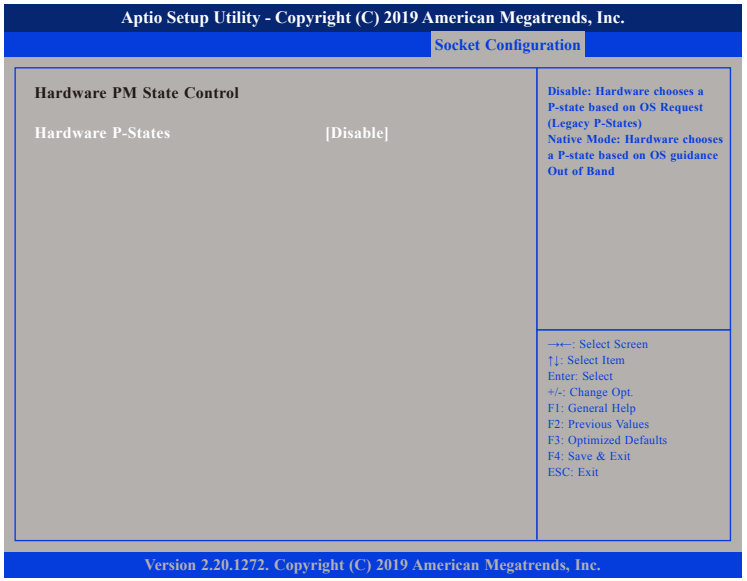


Uncore Freq Scaling
Enables or disables autonomous uncore frequency scaling.

SpeedStep (Pstates)
Enables or disables Intel® SpeedStep technology.

Energy Efficient Turbo
Enables or disables Energy Efficient Turbo.

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).

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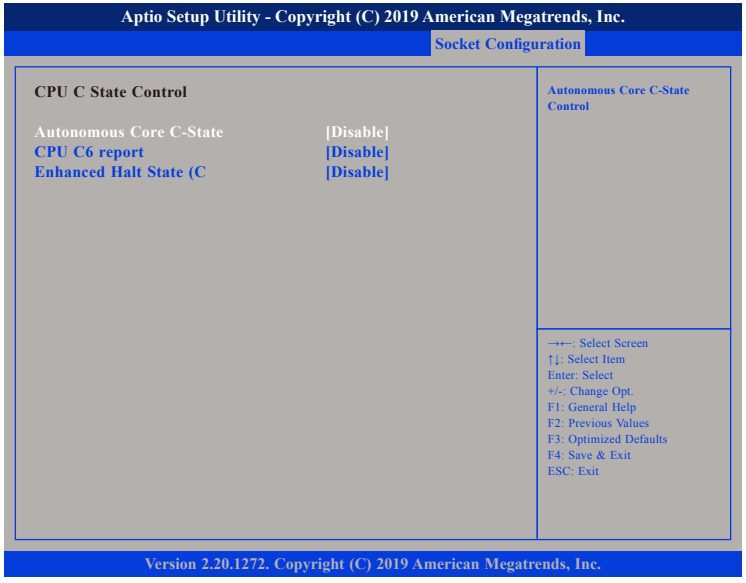
CPU C State Control

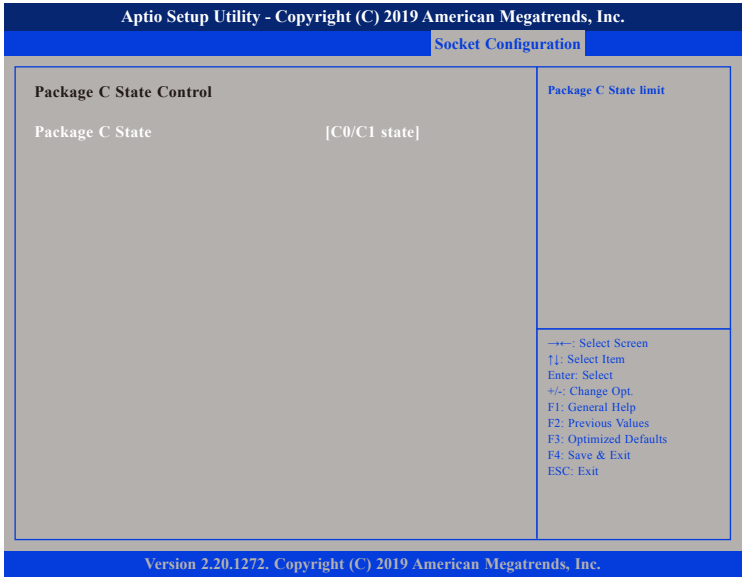


Autonomous Core C-State
Enables or disables autonomous core c-state control.

CPU C6 report
Enables or disables C6 report to the operating system.

Enhanced Halt State
Enables or disables Enhanced Halt State for lower power consumption.

Package C State Control



Package C State
Selected option will program into C State package limit register.

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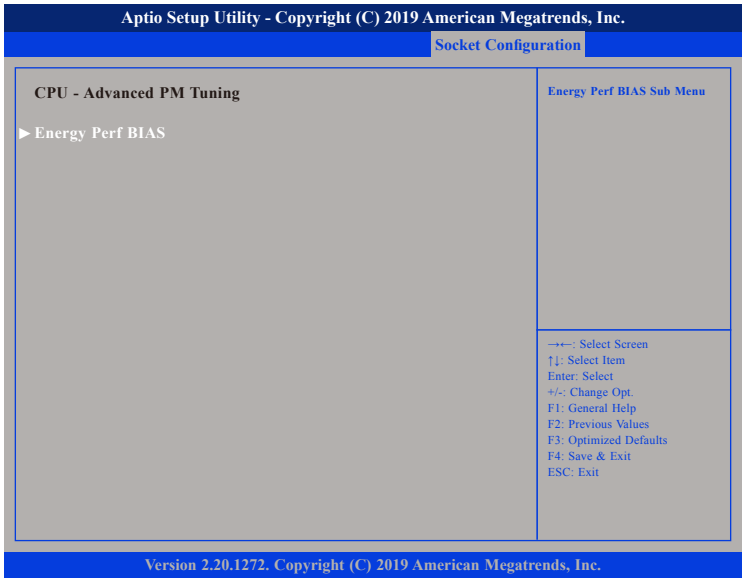
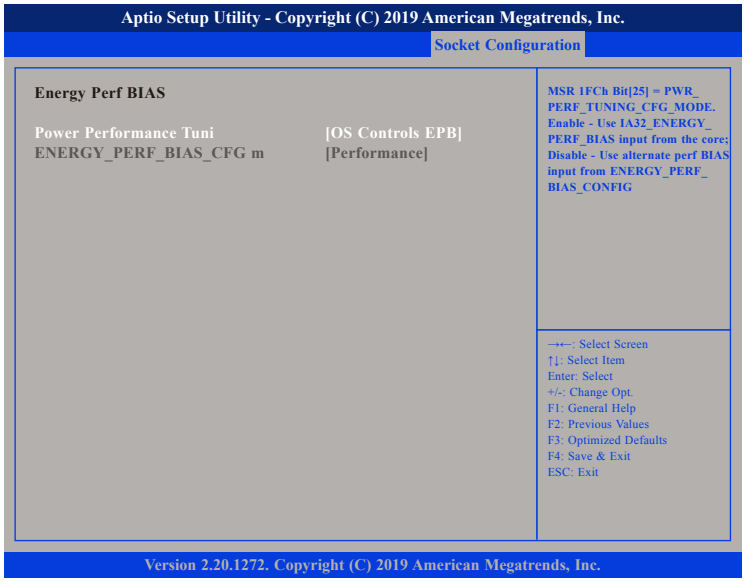
CPU - Advanced PM Tuning



Energy Perf BIAS
Enters the Energy Perf BIAS submenu.

Energy Perf BIAS



Power Performance Tuning
Configures whether to allow the BIOS or OS to control the power performance tuning.

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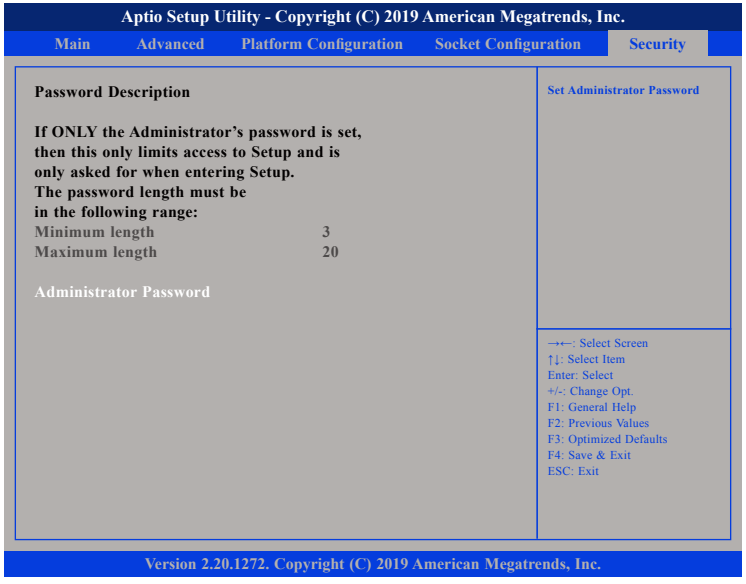
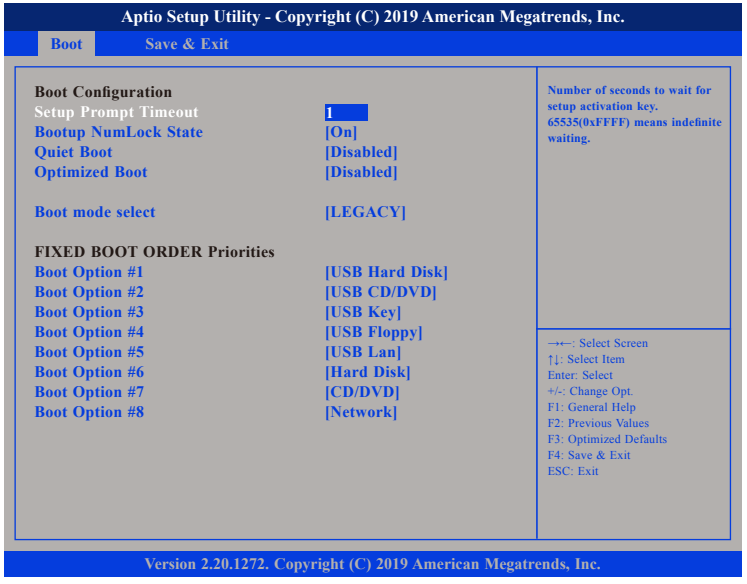
Security



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.

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Quiet Boot

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

Optimized Boot

Enables or disables optimized boot.

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.

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>.

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