NEXCOM International Co., Ltd.

Intelligent Platform & Services Business Unit

AI Edge Computer

AIEdge-X®500

User Manual

NEXCOM International Co., Ltd.
Published August 2021

www.nexcom.com

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PREFACE

Copyright

Disclaimer

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Acknowledgements

AIEdge-X®500 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 to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

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

How to recognize NEXCOM RoHS Products?

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

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

Warranty and RMA

NEXCOM Warranty Period

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

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.

Warnings

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

Cautions

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

Safety Information

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

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

Installation Recommendations

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

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

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

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

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. **CAUTION:** DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

18. Ensure to connect the power cord of the power adapter to a socket-outlet with earthing connection.

Technical Support and Assistance

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

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

Warning!

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

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

Conventions Used in this Manual

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

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

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Package Contents

Before continuing, verify that the AIEdge-X®500 package that you received is complete. Your package should have all the items listed in the following table.

Item	Name	Qty
1	Thermal Pad	1
2	Screw	1
3	EPE	2
4	Carton	1
5	PE	1

Ordering Information

The following below provides ordering information for AIEdge-X®500.

AIEdge-X®500 (P/N: 10W20X5000X0)
Industrial AI Computer powered by 8th/9th Generation Intel® Core™ processor, with large storage and optional NVIDIA graphics card

Chapter 1: Product Introduction

AIEdge-X®500

Overview

Key Features

- LGA1151 socket for 8th/9th Generation Intel® Core™ processor (35W/65W)
- 4 x 2.5 inch HDD/SSD slots, support RAID 0/1/5/10
- Expandable PCIe x16/PCIe x4/PCI slots, perfect for graphics cards
- Suitable for all kinds of AI applications
- 1 x Intel® I219-LM GbE PHY and 1 x Intel® I211 Gigabit Ethernet Controller
- Supports Intel® AMT

Hardware Specifications

CPU Support

- Supports 8th/9th generation Intel® Core™ socket type processor up to 65W (LGA1151)
  - Intel® Core™ i3-8100T, 3.10 GHz, 4 Core, 35W
  - Intel® Core™ i5-8500T, 2.10 GHz, 6 Core, 35W
  - Intel® Core™ i7-8700T, 2.40 GHz, 6 Core, 35W
  - Intel® Core™ i3-9100TE, 2.20 GHz, 4 Core, 35W
  - Intel® Core™ i5-9500TE, 2.20 GHz, 6 Core, 35W
  - Intel® Core™ i7-9700TE, 1.80 GHz, 8 Core, 35W
  - Intel® Core™ i3-8300, 3.70 GHz, 4 Core, 65W
  - Intel® Core™ i5-8500, 3.00 GHz, 6 Core, 65W
  - Intel® Core™ i7-8700, 3.20 GHz, 6 Core, 65W
  - Intel® Core™ i3-9300, 3.70 GHz, 4 Core, 65W
  - Intel® Core™ i5-9500, 3.00 GHz, 6 Core, 65W
  - Intel® Core™ i7-9700, 3.00 GHz, 8 Core, 65W

Chipset

- Intel® PCH Q370

Graphics

- Intel® HD Graphics 630 series

Main Memory

- 2 x 260-pin SO-DIMM sockets, support DDR4 2400/2666 non-ECC, unbuffered memory up to 64G (single socket max. 32GB)

I/O Interface - Internal

- 3 x COM, support RS232
- 2 x USB 3.1 via box header
- 6 x USB 2.0 via JST connector
- 8-Channel GPIO

I/O Interface - Front

- 1 x Power button with LED
- 1 x Reset button
- 1 x HDMI 2.0
- 2 x USB 3.0
- 1 x USB 2.0
- 2 x RJ45 with LEDs for Gigabit LAN (Intel® I219-LM GbE PHY and Intel® I211 Gigabit Ethernet controller)
- 1 x COM4, supports RS232/422/485

Graphics & Display

- Intel® UHD Graphics 630 (internal)
- Optional NVIDIA graphics card display via PCIe x16 (up to RTX 3090)

Graphics Card Dimensions

- Supports up to 327 x 140 x 55.6 mm card dimensions (350W GPU)

Storage

- 4 x SATA 2.5" HDD/SSD with RAID 0/1/5/10
- M.2 2280 Key M (SATA/PCIe)

Expansion

- 1 x PCIe x16 slot
- 1 x PCIe x4 slot
- 1 x PCI slot

Power Supply

- 1 x internal 800W ATX power supply
- Input: 100VAC to 240VAC
- Output: +12VDC
- Supports AT/ATX via jumper setting (default: ATX)

Environment

- Operating temperature: 0°C to 45°C (active cooling design)
- Storage temperature: -20°C to 80°C
- Humidity: 10 to 90% (non-condensing)
- Shock protection: 50G peak acceleration, 11ms according to IEC60068-2-27
- Vibration protection:
  Random: 2Grms @ 5~500 Hz, IEC60068-2-64 (with SSD)
  Sinusoidal: 2G @ 5~500 Hz, IEC60068-2-6 (with SSD)

Certification

- CE Approval
- FCC Class A
- LVD

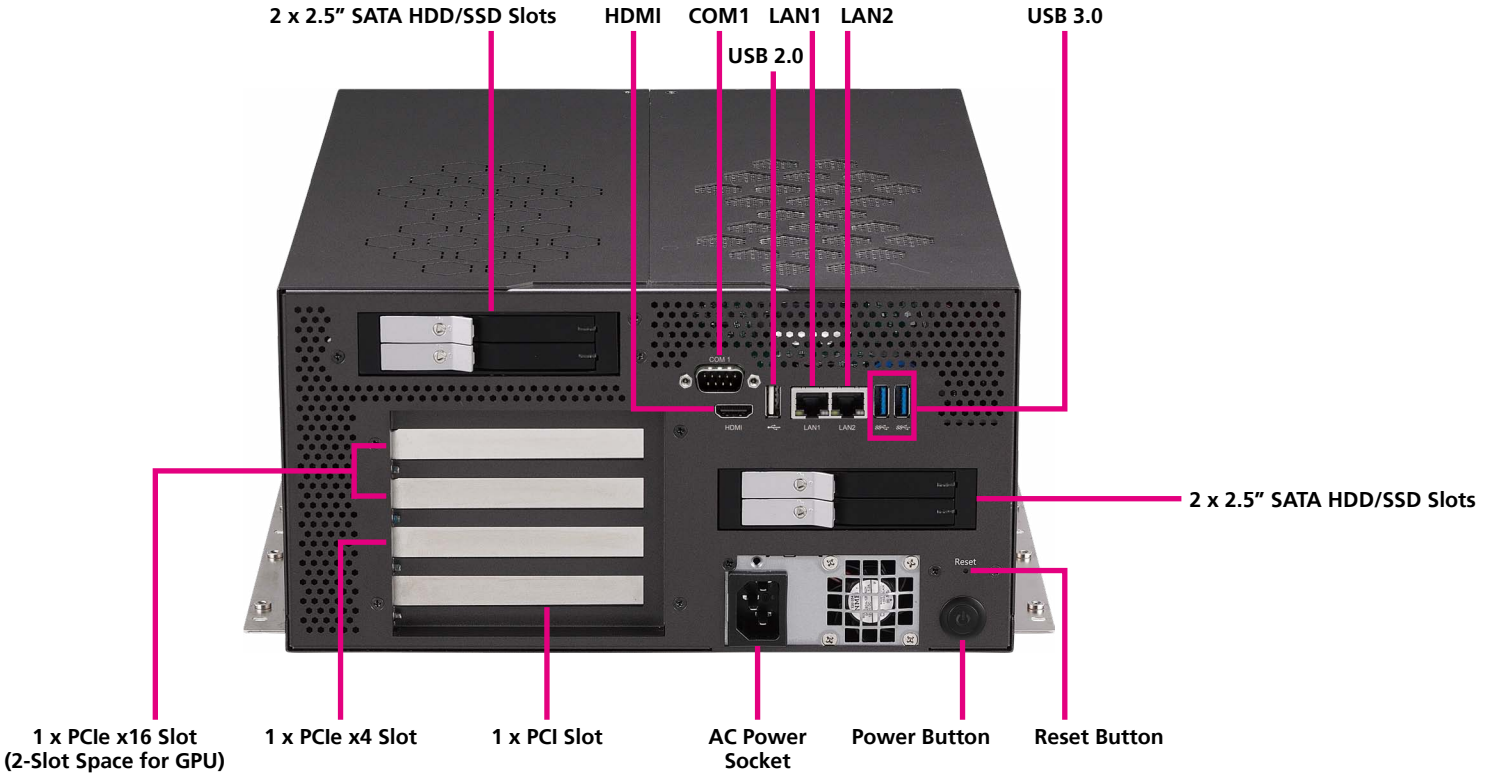
Dimensions

- 360mm x 290mm x 150mm (L x W x H)

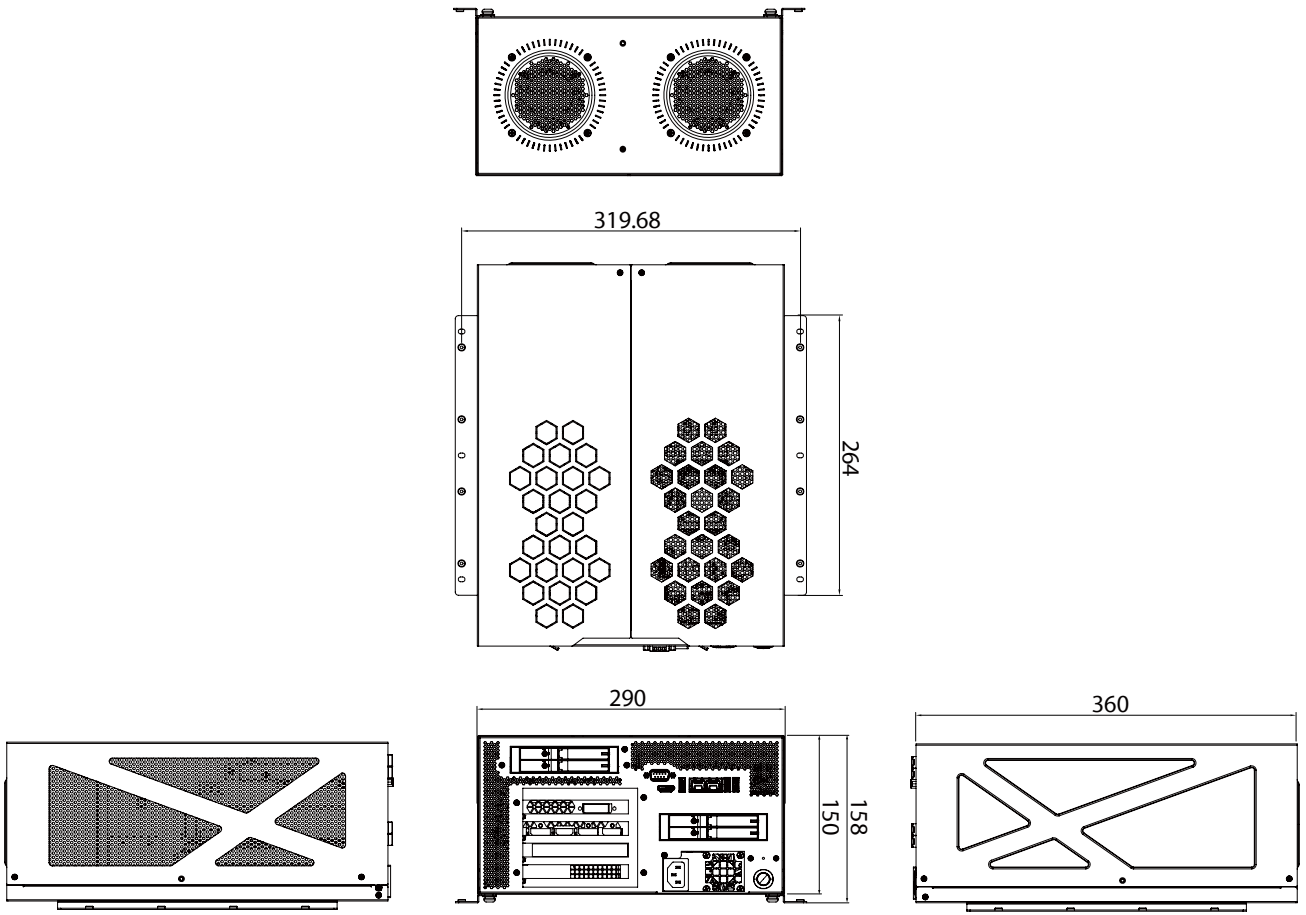
Operating System

- Windows 10/Linux

Physical Features



Mechanical Dimensions



Chapter 2: Jumpers and Connectors

This chapter lists the locations of the jumpers and connectors for AIEdge-X®500.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

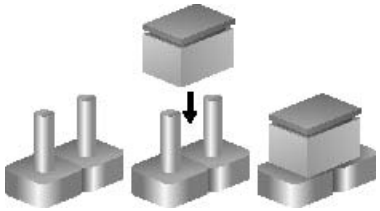
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

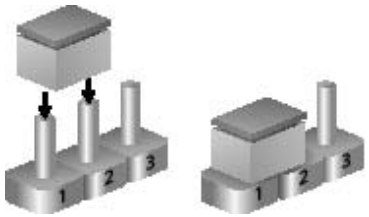
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just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

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



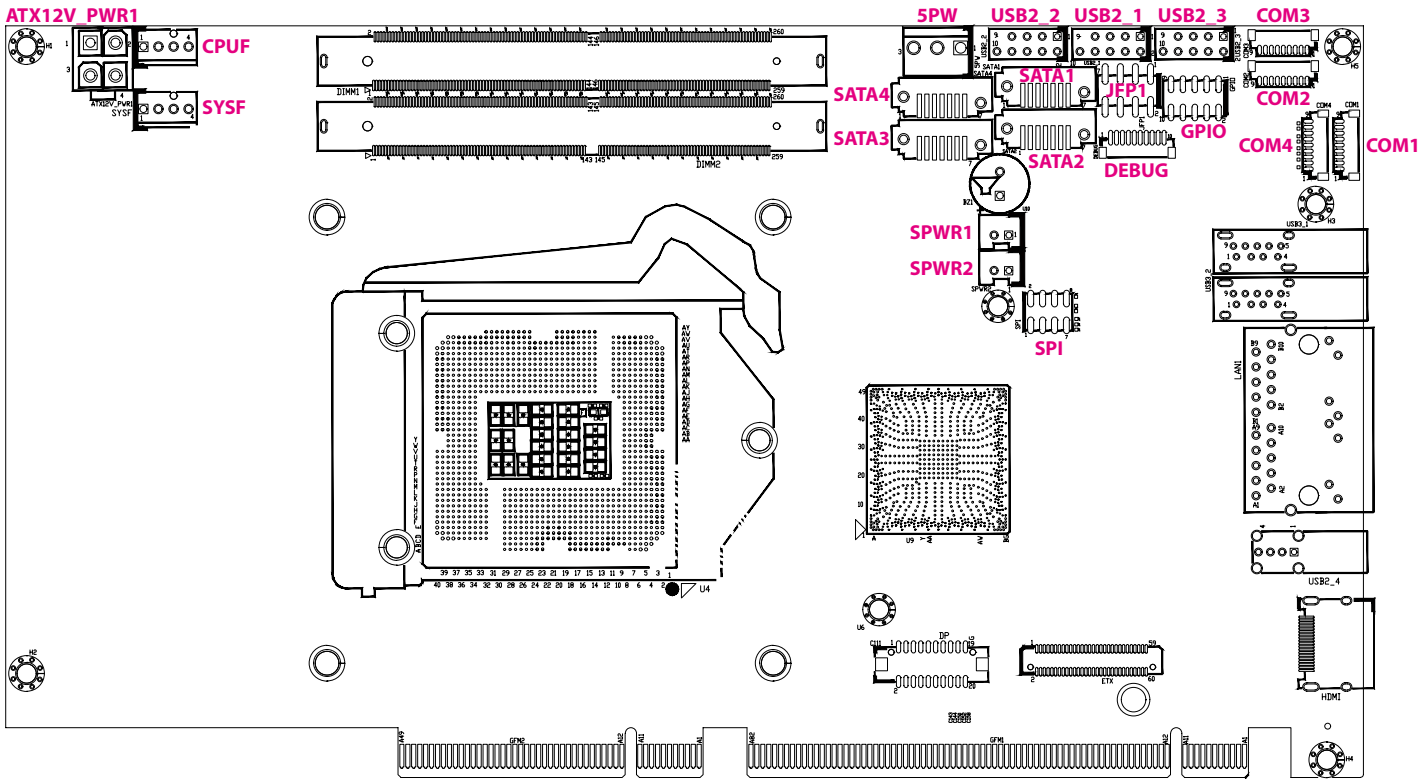
Three-Pin Jumpers: Pins 1 and 2 are Short



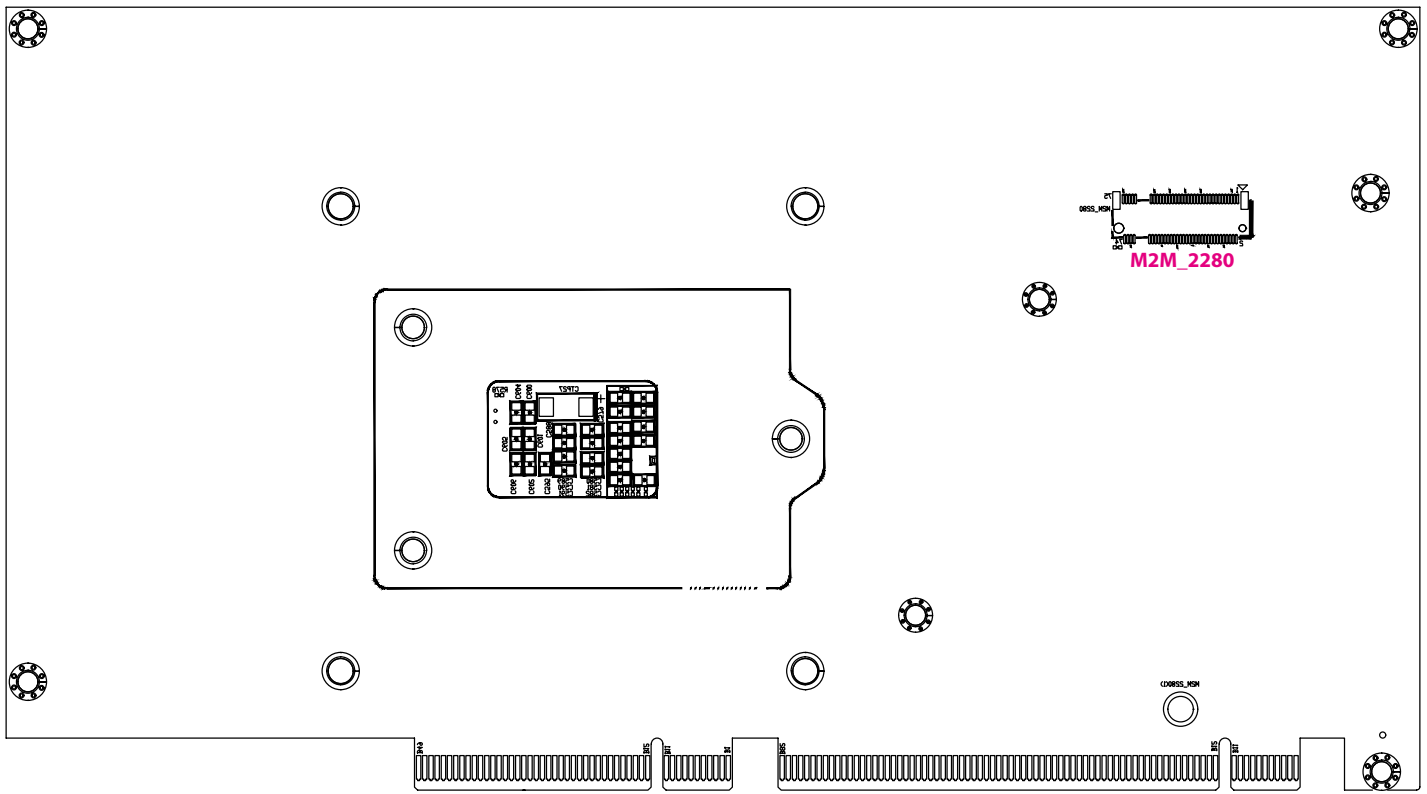
Locations of the Jumpers and Connectors for AIEdge-X®500

The figure below is the top and bottom view of the mainboard used in AIEdge-X®500. It shows the locations of the jumpers and connectors.

Top View



Bottom View



Jumpers

AT/ATX Mode Select

Connector type: 1x3 3-pin header, 2.54mm pitch
Connector location: ATATX

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

2-3 On: default

Internal Connectors

SPI Connector

Connector type: 2x4 8-pin header, 2.0mm pitch
Connector location: SPI

Pin	Definition	Pin	Definition
1	NC	2	S_RTCRST#
3	+3V3_SPI	4	GND
5	SPI_CS#_R	6	SPI_CLK_R
7	SPI_DO_R	8	SPI_DI_R

Front Panel Connector

Connector type: 2x4 8-pin header, 2.54mm pitch
Connector location: JFP1

Pin	Definition	Pin	Definition
1	HDD_LED	2	PWR_LED
3	HDD_LED#	4	GND
5	GND	6	SHB_PWR_BTN#
7	SHB_RST_BTN#	8	GND

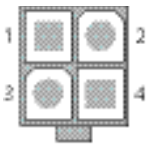
DC IN Connector

Connector type: 1x3 3-pin Wafer, 3.96mm pitch
Connector location: 5PW

Pin	Definition
1	+5V
2	GND
3	+5V

12V Power Connector

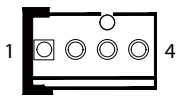
Connector type: 2x2 4-pin header, 3.5mm pitch
Connector location: ATX12V_PWR1



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

CPU Fan Connector

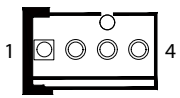
Connector type: 1x4 4-pin Wafer, 2.54mm pitch
Connector location: CPUF



Pin	Definition
1	GND
2	+12V
3	FANIN1
4	FANOUT1

System Fan Connector

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



Pin	Definition
1	GND
2	+12V
3	FANIN2
4	FANOUT2

GPIO Connector

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

Pin	Definition	Pin	Definition
1	+5VGPIO	2	GND
3	GPIO70	4	GPIO71
5	GPIO72	6	GPIO73
7	GPIO74	8	GPIO75
9	GPIO76	10	GPIO77

USB Connector

Connector type: 2x5 10-pin header, 2.54mm pitch
Connector location: USB2_1

Pin	Definition	Pin	Definition
1	+5V_USB2_12	2	+5V_USB2_12
3	USB2N_5	4	USB2N_6
5	USB2P_5	6	USB2P_6
7	GND	8	GND
		10	NC

USB Connector

Connector type: 2x5 10-pin header, 2.54mm pitch
Connector location: USB2_2

Pin	Definition	Pin	Definition
1	+5V_USB2_12	2	+5V_USB2_12
3	USB2N_7	4	USB2N_8
5	USB2P_7	6	USB2P_8
7	GND	8	GND
		10	NC

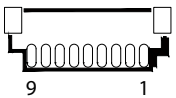
USB Connector

Connector type: 2x5 10-pin header, 2.54mm pitch
Connector location: USB2_3

Pin	Definition	Pin	Definition
1	+5V_USB2_34	2	+5V_USB2_34
3	USB2N_9	4	USB2N_10
5	USB2P_9	6	USB2P_10
7	GND	8	GND
		10	NC

COM Port Connector

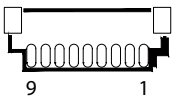
Connector type: 1x9 9-pin header, 1.0mm pitch
Connector location: COM1



Pin	Definition	Pin	Definition
1	COM_RI#	2	COM_CTS#
3	COM_RTS#	4	COM_DSR#
5	GND	6	COM_DTR#
7	COM_TXD	8	COM_RXD
9	COM_DCD#		

COM Port Connector

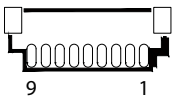
Connector type: 1x9 9-pin header, 1.0mm pitch
Connector location: COM2



Pin	Definition	Pin	Definition
1	COM_RI#	2	COM_CTS#
3	COM_RTS#	4	COM_DSR#
5	GND	6	COM_DTR#
7	COM_TXD	8	COM_RXD
9	COM_DCD#		

COM Port Connector

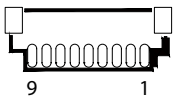
Connector type: 1x9 9-pin header, 1.0mm pitch
Connector location: COM3



Pin	Definition	Pin	Definition
1	COM_RI#	2	COM_CTS#
3	COM_RTS#	4	COM_DSR#
5	GND	6	COM_DTR#
7	COM_TXD	8	COM_RXD
9	COM_DCD#		

COM Port Connector

Connector type: 1x9 9-pin header, 1.0mm pitch
Connector location: COM4



Pin	Definition	Pin	Definition
1	+5V	2	COM_CTS#
3	COM_RTS#	4	COM_DSR#
5	GND	6	COM_DTR#
7	COM_TXD	8	COM_RXD
9	COM_DCD#		

SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: SATA1

Pin	Definition	Pin	Definition
1	GND	2	S_SATA_TXP0
3	S_SATA_TXN0	4	GND
5	S_SATA_RXN0	6	S_SATA_RXP0
7	GND		

SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: SATA2

Pin	Definition	Pin	Definition
1	GND	2	S_SATA_TXP1
3	S_SATA_TXN1	4	GND
5	S_SATA_RXN1	6	S_SATA_RXP1
7	GND		

SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: SATA3

Pin	Definition	Pin	Definition
1	GND	2	S_SATA_TXP2
3	S_SATA_TXN2	4	GND
5	S_SATA_RXN2	6	S_SATA_RXP2
7	GND		

SATA Connector

Connector type: Standard Serial ATA 7P (1.27mm, SATA-M-180)
Connector location: SATA4

Pin	Definition	Pin	Definition
1	GND	2	S_SATA_TXP3
3	S_SATA_TXN3	4	GND
5	S_SATA_RXN3	6	S_SATA_RXP3
7	GND		

SATA Power Connector

Connector type: 1x2 2-pin header JST, 2.5mm pitch
Connector location: SPWR1

Pin	Definition
1	+5V
2	GND

SATA Power Connector

Connector type: 1x2 2-pin header JST, 2.5mm pitch
Connector location: SPWR2

Pin	Definition
1	+5V
2	GND

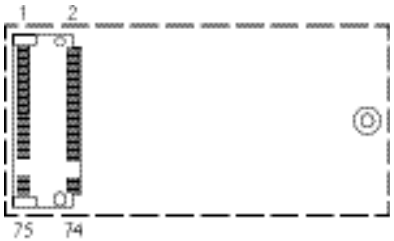
80 Port Connector

Connector type: 1x10 10-pin header, 1.0mm pitch
Connector location: DEBUG

Pin	Definition	Pin	Definition
1	GND	2	PLTRST#_BUFF_1
3	CLKOUT_LPC1	4	LFRAME#
5	LPC_D3	6	LPC_D2
7	LPC_D1	8	LPC_D0
9	SERIRQ_R	10	+3V3

M.2 Connector (M-Key)

Connector location: M2M_2280



Pin	Definition	Pin	Definition
1	GND	2	+3VSB
3	GND	4	+3VSB
5	S_PCIE_RXN20	6	NC
7	S_PCIE_RXP20	8	NC
9	GND	10	DSS#_1
11	PCIE_TXN20	12	+3VSB
13	PCIE_TXP20	14	+3VSB
15	GND	16	+3VSB
17	S_PCIE_RXN19	18	+3VSB
19	S_PCIE_RXP19	20	NC
21	GND	22	NC
23	PCIE_TXN19	24	NC
25	PCIE_TXP19	26	NC
27	GND	28	NC
29	S_PCIE_RXN18	30	NC
31	S_PCIE_RXP18	32	NC
33	GND	34	NC
35	PCIE_TXN18	36	NC
37	PCIE_TXP18	38	DEVSLP_0

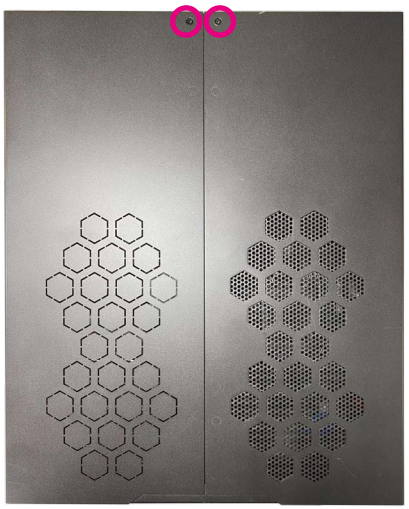
Pin	Definition	Pin	Definition
39	GND	40	NC
41	S_PCIE_RXP17	42	NC
43	S_PCIE_RXN17	44	NC
45	GND	46	NC
47	PCIE_TXN17	48	NC
49	PCIE_TXP17	50	PERST#1
51	GND	52	SRCCLKREQ_N11
53	S_CLKOUT_PCIE_N11	54	PEWAKE_N1
55	S_CLKOUT_PCIE_P11	56	NC
57	GND	58	NC
67	NC	68	SUSCLK2
69	PEDET_1	70	+3VSB
71	GND	72	+3VSB
73	GND	74	+3VSB
75	GND		

Chapter 3: System Setup

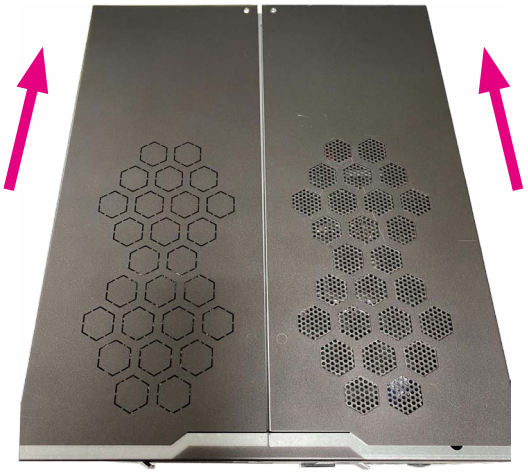
Removing the Two Top Covers from the Chassis

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

1. Remove the six mounting screws around the chassis.

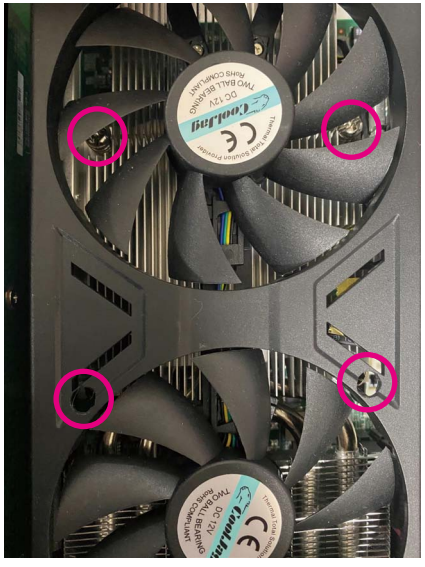


2. Slide out the two top covers, then lift up the covers to remove them.

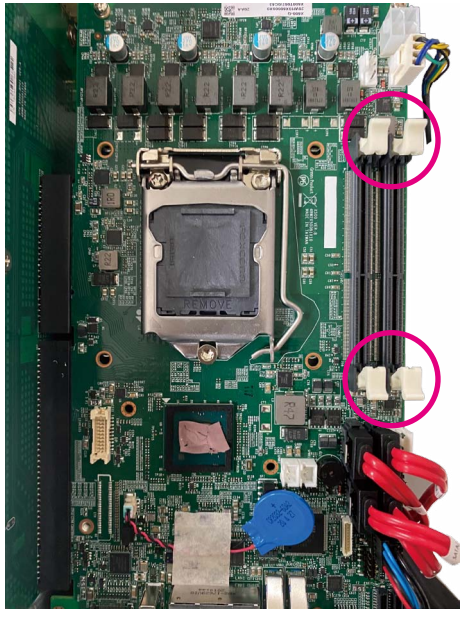


Installing a Memory Module

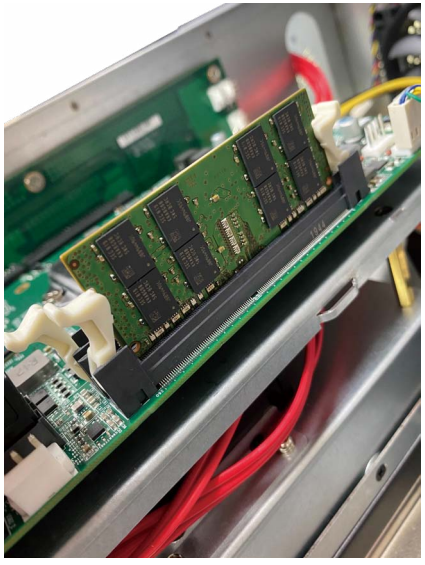
1. With the two top covers removed, loosen the four screws on the heat sink fan, then remove it to access the memory slots.



2. Release the locks on the memory slots.

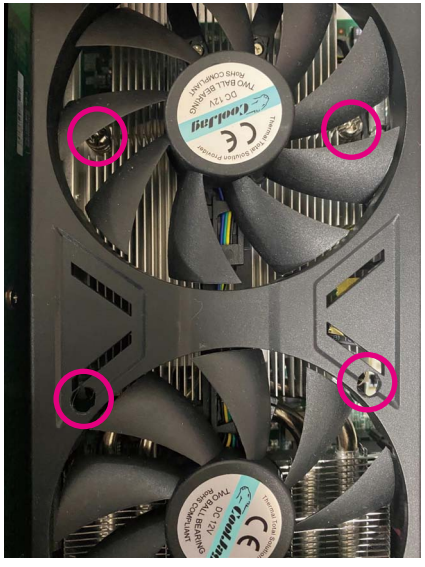


3. Insert the module into the socket at a 90 degree angle. Apply firm even pressure to each end of the module until it slips into the slot. While pushing the module into position, the locks will close automatically.

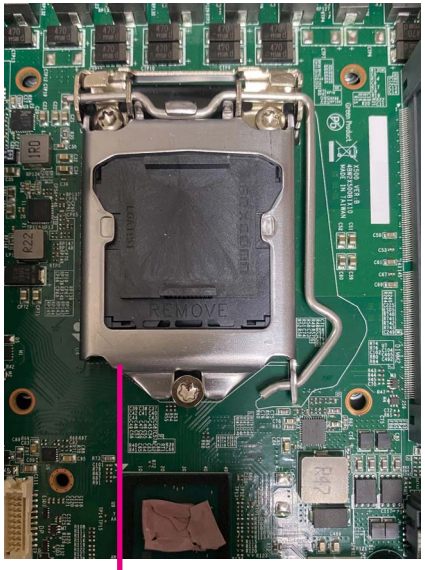


Installing a CPU

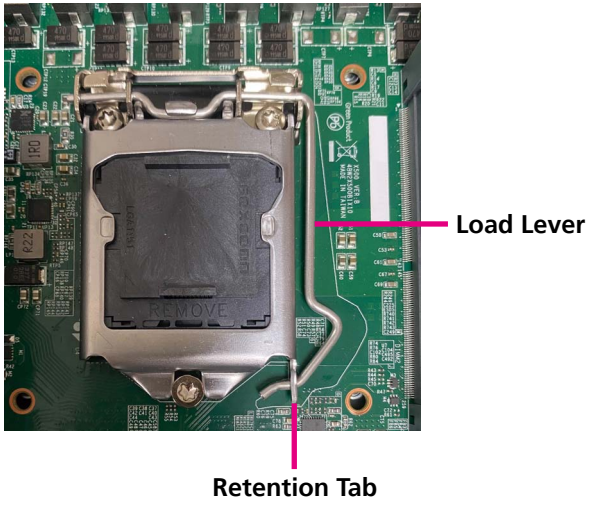
1. With the two top covers removed, loosen the four screws on the heat sink fan, then remove the heat sink.



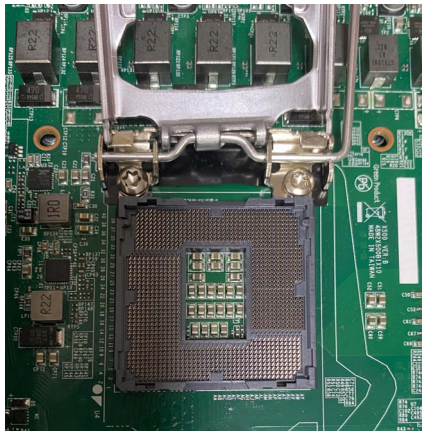
2. The CPU socket is readily accessible after you have removed the heat sink.



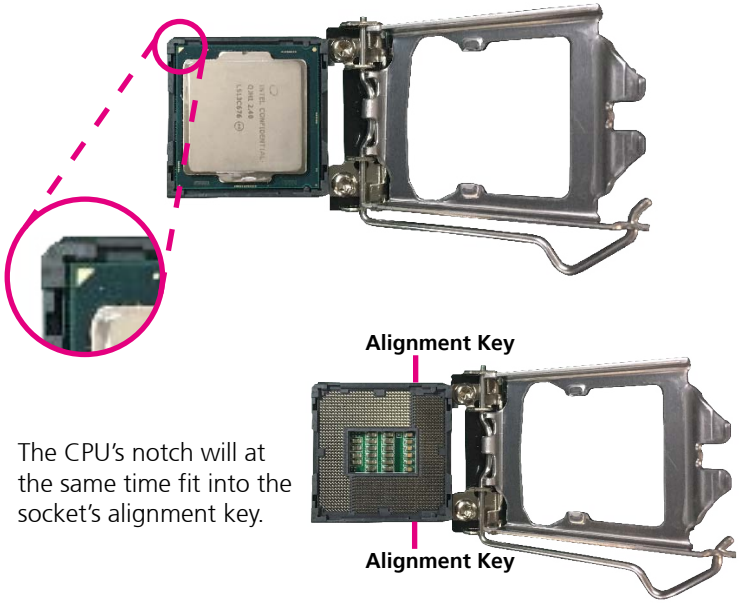
3. Unlock the socket by pushing the load lever down, moving it sideways until it is released from the retention tab; then lift the load lever up.



4. Lifting the load lever will at the same time lift the load plate. After lifting the load lever, remove the protective cap from the CPU socket.



5. 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.

CAUTION!

- 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.

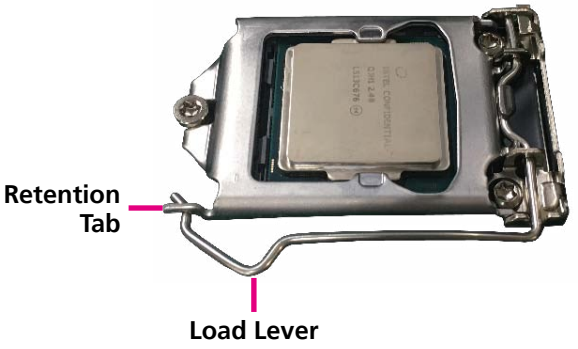
6. Close the load plate and then push the load lever down.

   While closing the load plate, make sure the front edge of the load plate slides under the retention knob.

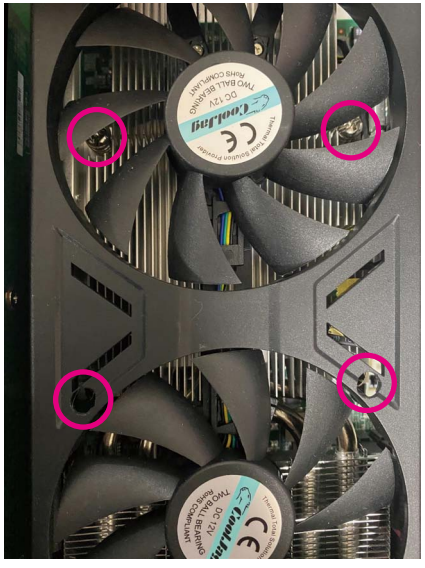
CAUTION!

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

7. Hook the load lever under the retention tab.

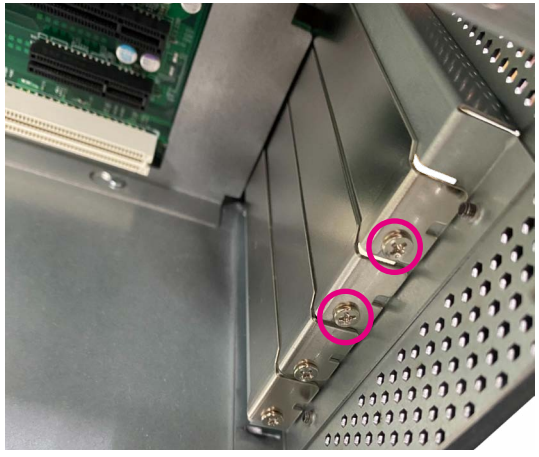


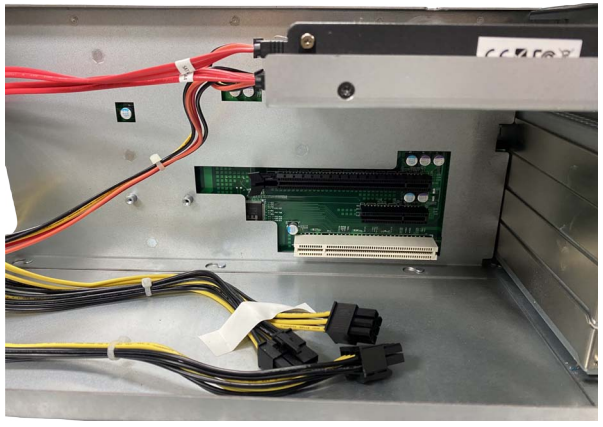
8. Reinstall the CPU heat sink fan with the four mounting screws removed earlier.



Installing an Add-on Card

1. Remove the two screws on the brackets as shown below, then plug the add-on card (using a graphics card as an example in the following steps) into the PCIe slot.





2. Plug in the 6+2-pin power cable for the graphics card if necessary, then refasten the two screws on the graphics card bracket to secure the card firmly.

Installing a 2.5” Storage Drive (External)

1. Locate the storage drive bay on the front panel. Unlock the drive bay by turning the screw lock to the unlocked position using the tool in the accessory pack.

2. Gently pull out the handle to release the drive bay cover, then insert the storage drive into the drive bay. Once the storage drive is fully seated inside the drive bay, close and resecure the cover.

Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for AIEdge X®500. 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 items such as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

Entering Setup

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

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <Del> allows you to enter Setup.

Press the  key to enter Setup:

Legends

Key	Function
	Moves the highlight left or right to select a menu.
	Moves the highlight up or down between sub-menus or fields.
	Exits the BIOS Setup Utility.
	Scrolls forward through the values or options of the highlighted field.
	Scrolls backward through the values or options of the highlighted field.
	Selects a field.
	Displays General Help.
	Load previous values.
	Load optimized default values.
	Saves and exits the Setup program.
	Press <Enter> to enter the highlighted sub-menu

Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

Submenu

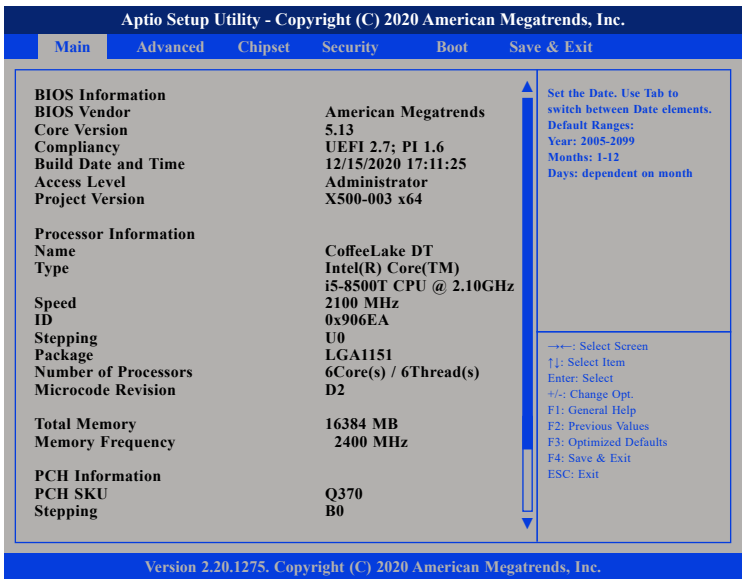
When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press  .

BIOS Setup Utility

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

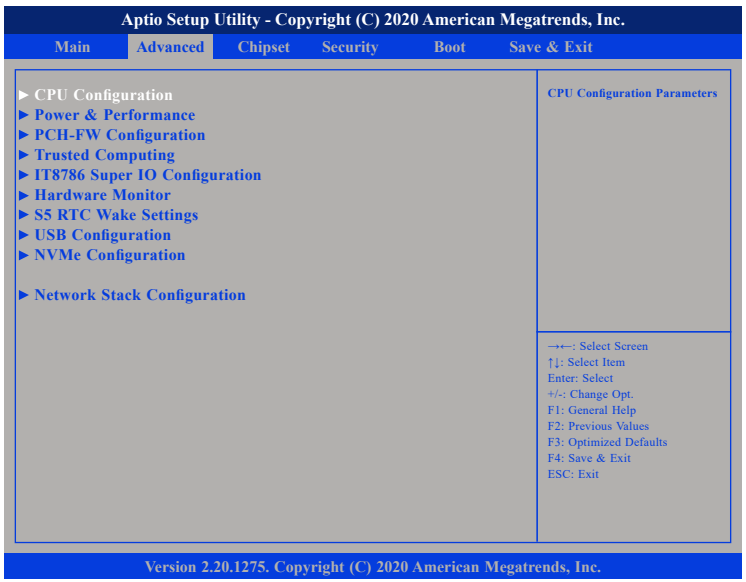
System Time

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.

Advanced

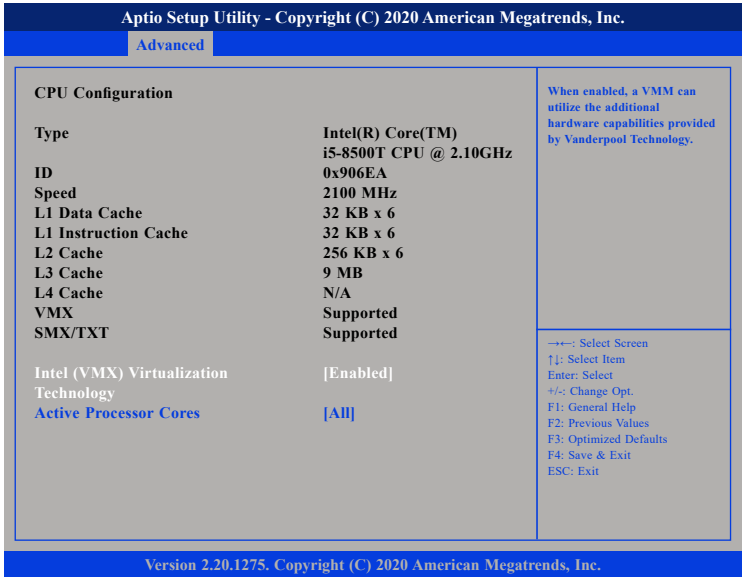
The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

Setting incorrect field values may cause the system to malfunction.



CPU Configuration

This section is used to view CPU status and configure CPU parameters.



Intel® (VMX) Virtualization Technology

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

Active Processor Cores

Select the number of cores to enable in each processor package.

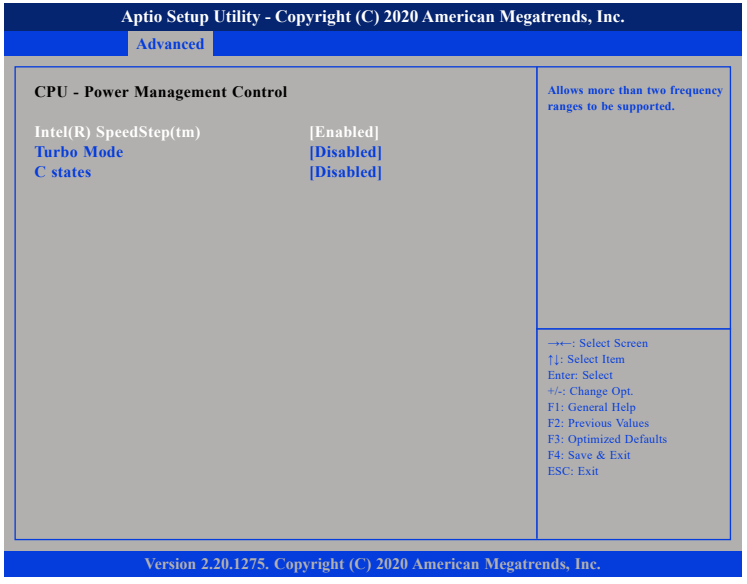
Power & Performance

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 technology.

Turbo Mode

Enables or disables turbo mode.

C states

Enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

PCH-FW Configuration

This section is used to configure the firmware update options.

ME State

Enables or disables ME state. When disabled, ME will be placed into ME Temporarily Disabled Mode.

Manageability Features State

Enables or disables Manageability Features State.

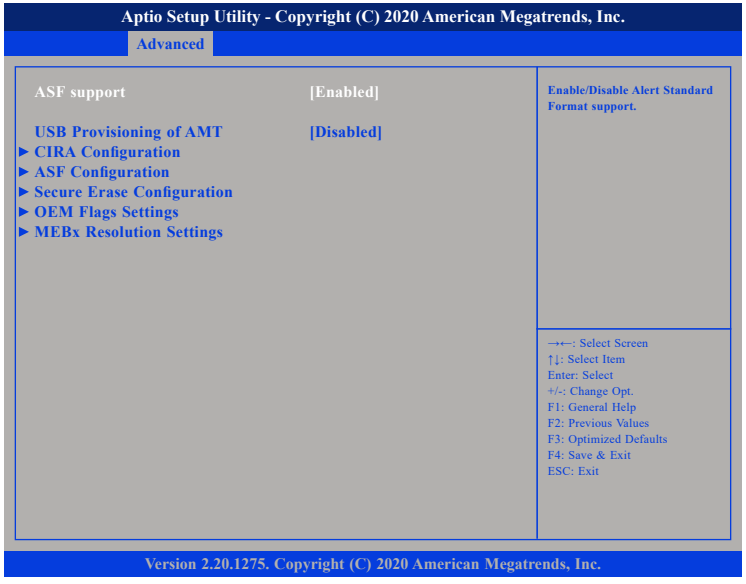
AMT BIOS Features

When disabled, AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Please note that this option does not disable Manageability Features in FW.

ME Unconfig on RTC Clear

When disabled, ME will not be unconfigured on RTC Clear.

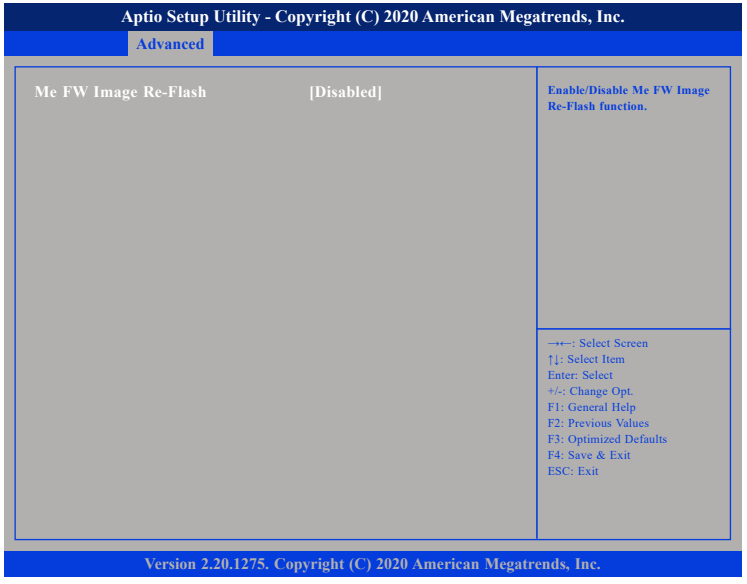
AMT Configuration



ASF support
Enables or disables Alert Standard Format support.

USB Provisioning of AMT
Enables or disables USB Provisioning of AMT.

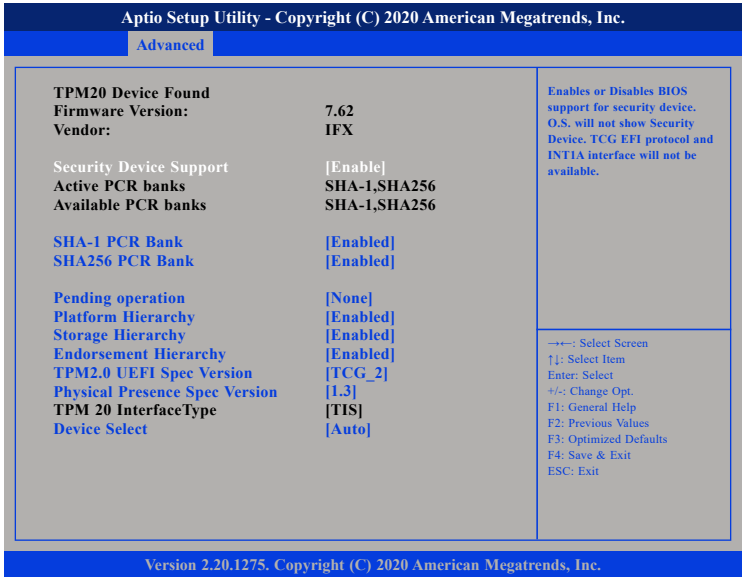
Firmware Update Configuration



Me FW Image Re-Flash
Enables or disables the ME firmware image re-flash function.

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.

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.

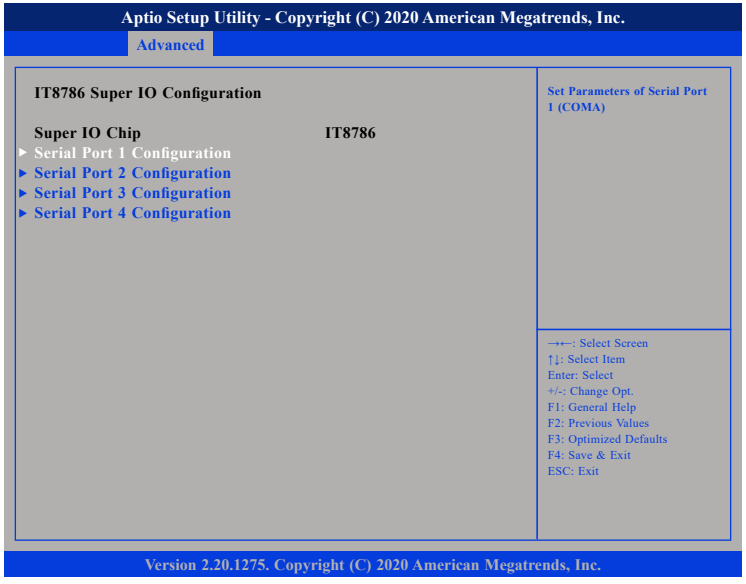
TCG_1_2:	The compatible mode for Windows 8/Windows 10.
TCG_2:	Support new TCG2 protocol and event format for Windows 10 or later.

Physical Presence Spec Version
Configures which physical presence spec version the OS will support. Please note that some HCK tests might not support 1.3.

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

IT8786 Super IO Configuration

This section is used to configure the serial ports.

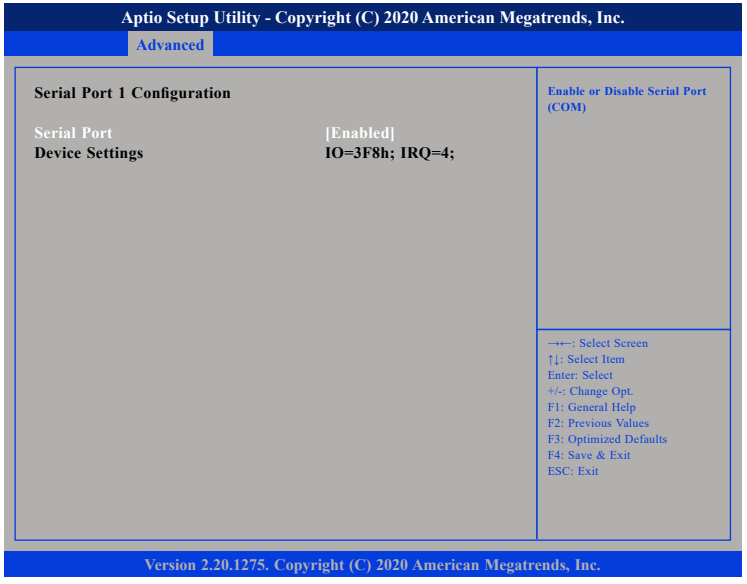


Super IO Chip

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

Serial Port 1 Configuration

This section is used to configure serial port 1.



Serial Port

Enables or disables the serial port.

Serial Port 4 Configuration

This section is used to configure serial port 4.

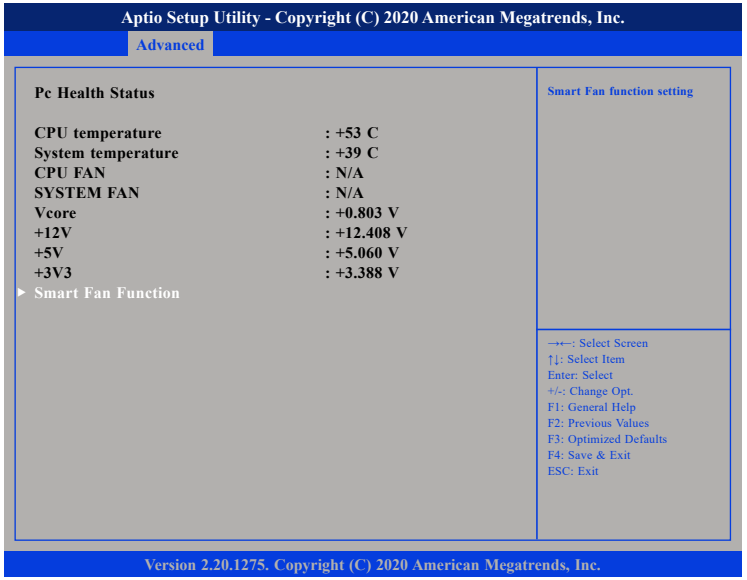
Serial Port
Enables or disables the serial port.

Onboard Serial Port 4 Mode
Select this to change the serial port mode to RS232, RS422 or RS485.

Terminal resistor
Enables or disables the terminal resistor.

Hardware Monitor

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



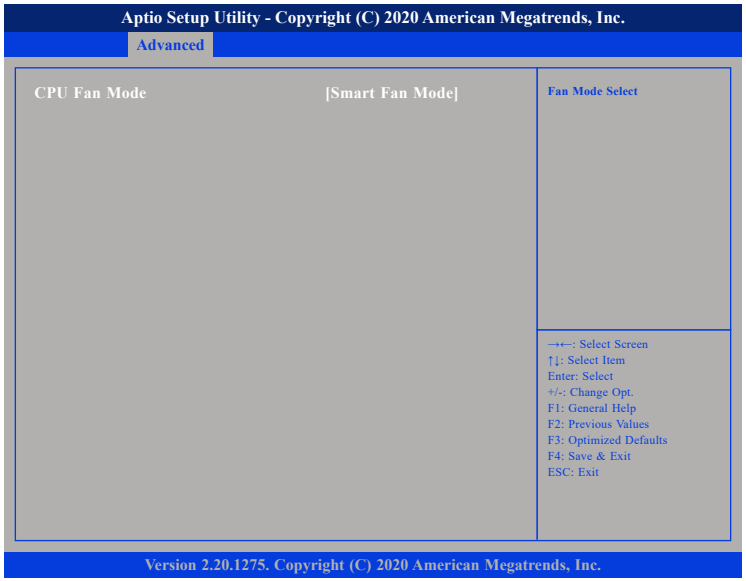
CPU temperature
Detects and displays the current CPU temperature.

System temperature
Detects and displays the current system temperature.

CPU FAN and SYSTEM FAN
Detects and displays the current fan speed of the CPU fan and system fan.

Vcore to +3V3
Detects and displays the output voltages.

Smart Fan Function

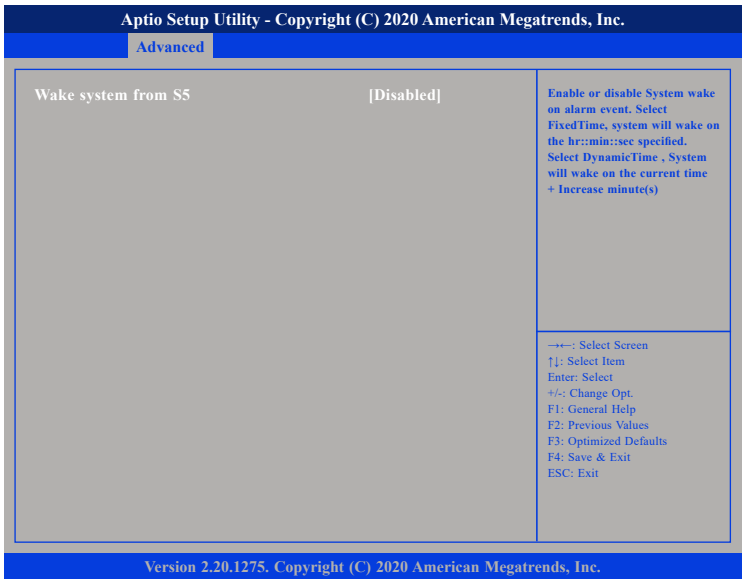


CPU Fan Mode

Configures the fan mode of the CPU fan.

S5 RTC Wake Settings

This section is used to configure system to wake from S5 using RTC alarm.

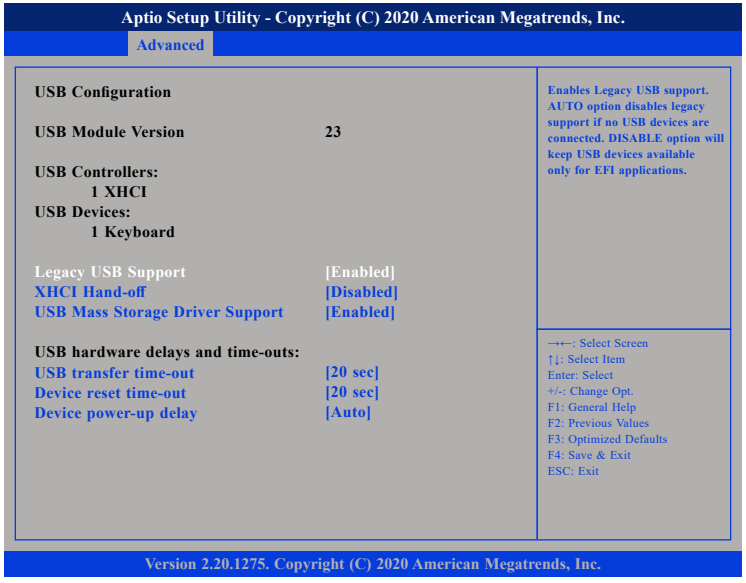


Wake System from S5

Enables or disables system wake on alarm event. When FixedTime is selected, system will wake on the hr::min::sec specified. When DynamicTime is selected, system will wake on the current time + Increase minute(s).

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

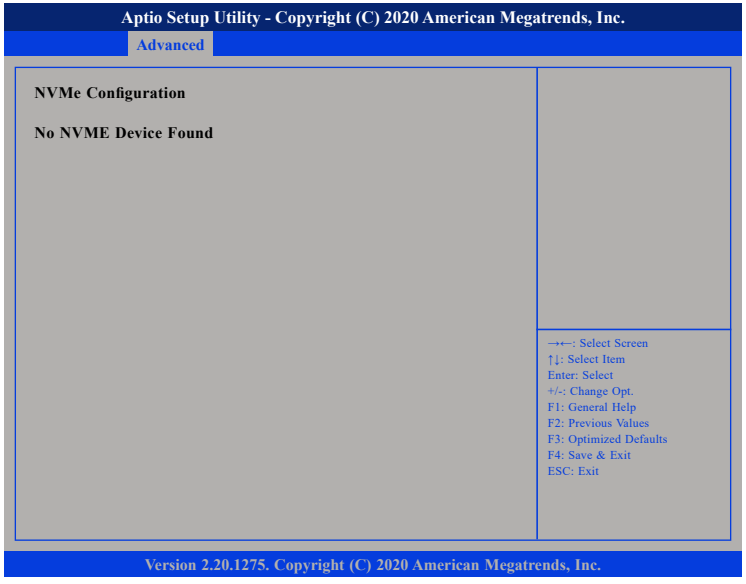
Selects the USB mass storage device's start unit command timeout.

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.

NVMe Configuration

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



Network Stack Configuration

This section is used to configure the network stack.

Network Stack

Enables or disables UEFI network stack.

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
System Agent (SA) parameters.

PCH-IO Configuration
PCH-IO parameters.

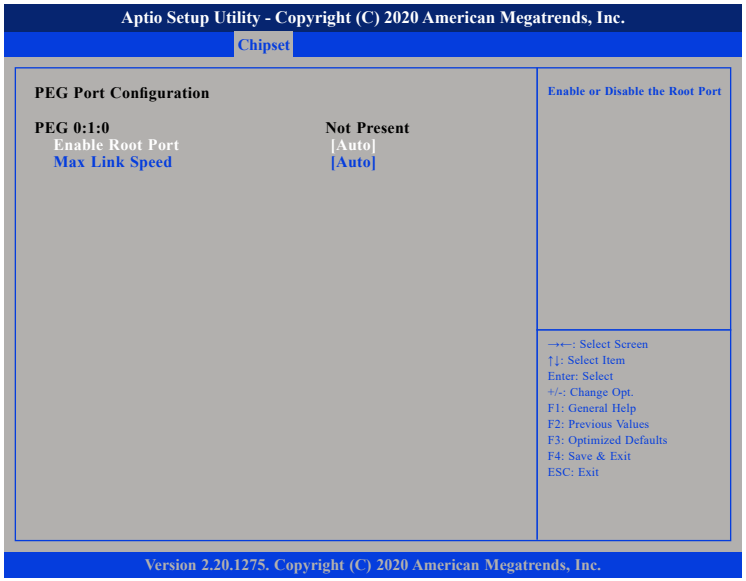
System Agent (SA) Configuration

This section is used to configure the System Agent (SA) configuration.

Graphics Configuration
Enters the Graphics Configuration submenu.

PEG Port Configuration
Enters the PEG Port Configuration submenu.

PEG Port Configuration



Enable Root Port
Enables or disables the root port.

Max Link Speed
Configures the maximum link speed of the PEG device.

PCH-IO Configuration

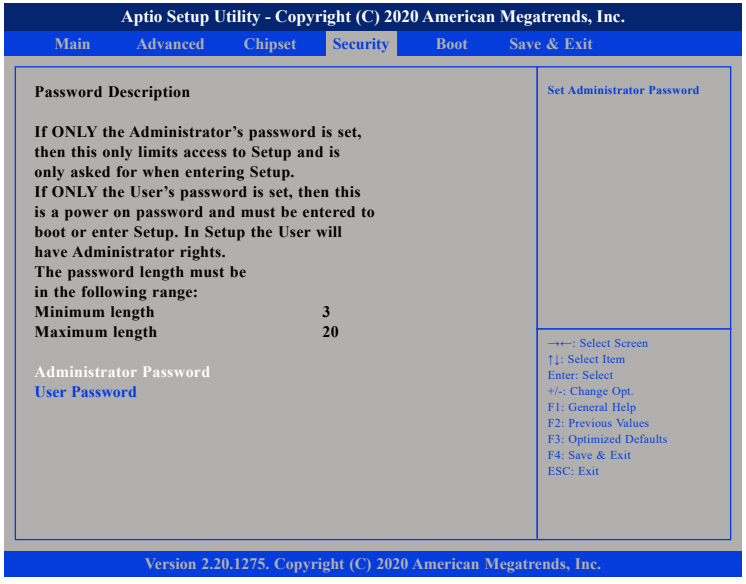
This section is used to configure PCH-IO configuration.

PCH LAN Controller
Enables or disables onboard NIC.

Wake on LAN Enable
Enables or disables integrated LAN to wake the system.

State After G3
Configures the power state when power is re-applied after a power failure (G3 state).

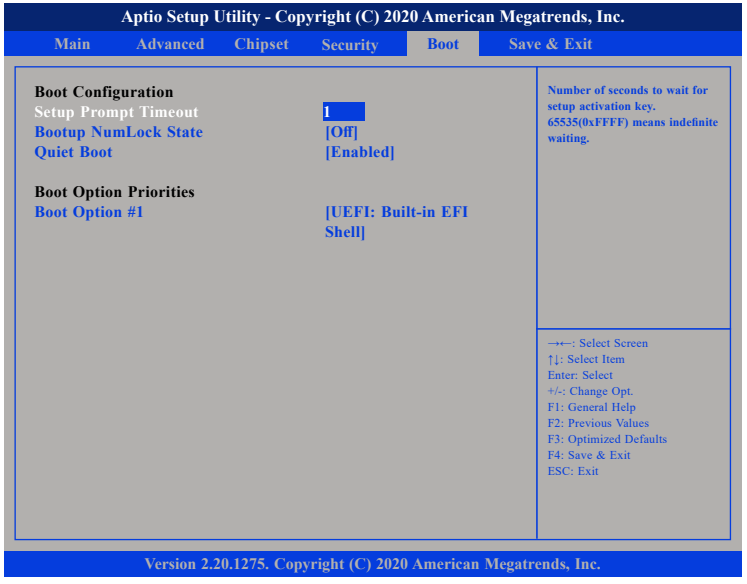
Security



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

User Password
Select this to reconfigure the user's password.

Boot



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

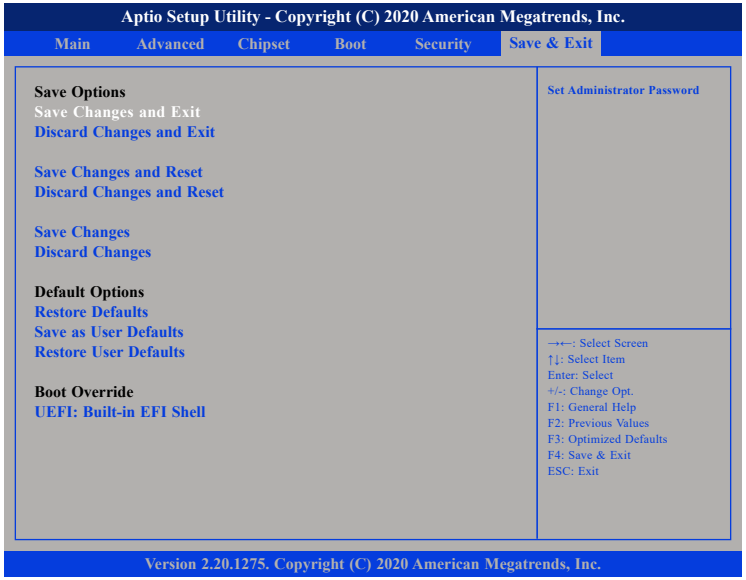
Bootup NumLock State
This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

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

Boot Option 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 Exit
To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

Discard Changes and Exit
To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

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.

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

Discard Changes
To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

Restore Defaults
To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Save as User Defaults
To use the current configurations as user default settings for the BIOS, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Restore User Defaults
To restore the BIOS to user 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>.