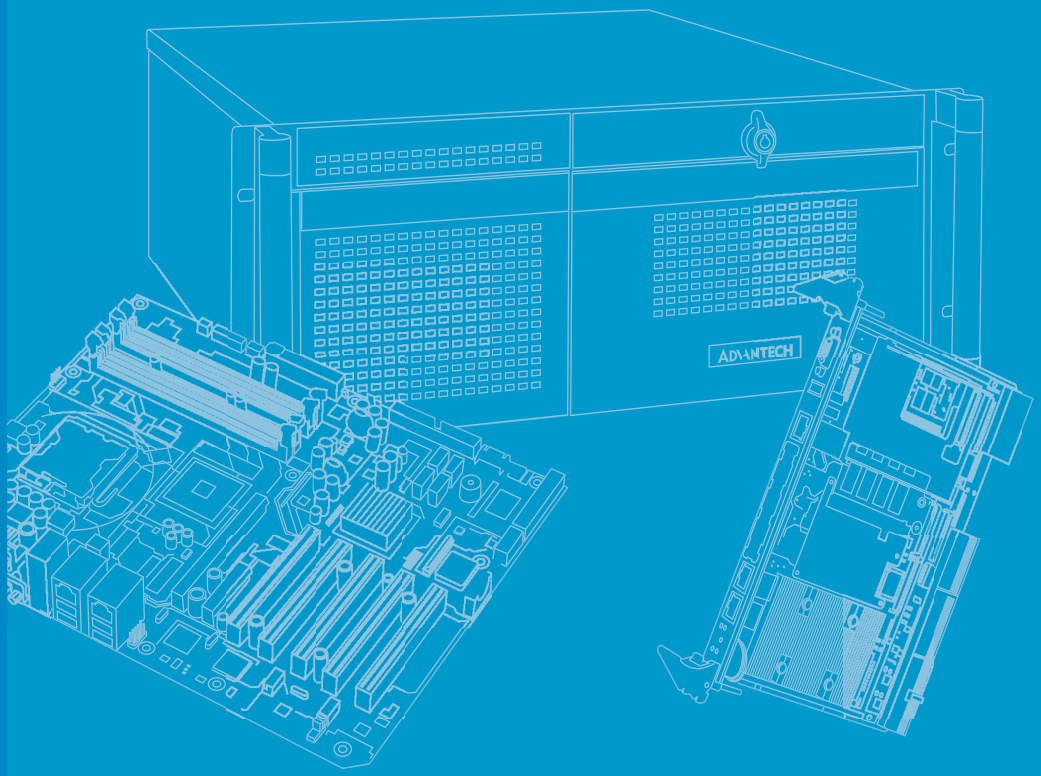

User Manual

MIC-330V2

3U CompactPCI® Serial with Intel® 11th Gen. Processor Blade

ADVANTECH

Enabling an Intelligent Planet

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Acknowledgments

Product Warranty (2 years)

Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Part No. 2001033020 Edition 1
Printed in China February 2025

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In this event, users are required to correct the interference at their own expense.

FM

This equipment has passed FM certification. According to the National Fire Protection Association, work sites are categorized into different classes, divisions, and groups based on hazard considerations. This equipment is compliant with the specifications for Class I, Division 2, Groups A, B, C, and D indoor hazards.

Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support to obtain the latest product information.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before calling:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Warnings, Cautions, and Notes

Warning! *Warnings indicate conditions that if not observed can cause personal injury!*

Caution! *Cautions are included to help prevent hardware damage and data losses. For example,*

"Batteries are at risk of exploding if incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions."

Note! *Notes provide additional optional information.*

Document Feedback

To assist us with improving this manual, we welcome all comments and constructive criticism. Please send all feedback in writing to support@advantech.com.

Packing List

Before system installation, check that the items listed below are included and in good condition. If any item does not accord with the list, contact your dealer immediately.

- MIC-330V2 all-in-one single board computer (CPU heatsink included) x1

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Ordering Information

Board	Front Panel			Onboard Features						Others	
	USB (Type-C)	LAN (RJ45)	LAN (M12)	CPU	Memory Onboard	SODIMMI Socket	ECC	SATA (M.2)	Width Height	To P6 Con. GbE Signal	TPM
MIC-330V2-A1S1	3	2	-	Xeon® W-11865MLE	32GB	Yes (Max 32GB)	Yes	2	4HP	2	Yes
MIC-330V2-B1S1	3	2	-	Core™ i7-11850HE	32GB	No	No	2	4HP	2	No
MIC-330V2-C1S1	3	2	-	Xeon® W-11865MRE	32GB	Yes (Max 32GB)	Yes	2	4HP	2	Yes
MIC-330V2-B2D1	3	2	2	Core™ i7-11850HE	32GB	Yes (Max 32GB)	No	1	8HP	2	No

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
5. Protect the equipment from humidity.
6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. Do not cover the openings.
8. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
9. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
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 from transient overvoltage.
12. Never pour 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 any of the following occurs, have the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated the equipment.
    - The equipment has been exposed to moisture.
    - The equipment is malfunctioning, or does not operate according to the user manual.
    - The equipment has been dropped and damaged.
    - The equipment shows obvious signs of breakage.
15. Do not leave the equipment in an environment with a storage temperature of below -40 °C (-40 °F) or above 85 °C (185 °F) as this may damage the components. The equipment should be kept in a controlled environment.
16. CAUTION: Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
17. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: These instructions are provided according to IEC 704-1 standards. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Safety Precautions - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from the PC chassis before manual handling. Do not touch any components on the CPU card or other cards while the PC is powered on.
- Disconnect the power before making any configuration changes. A sudden rush of power after connecting a jumper or installing a card may damage sensitive electronic components.

We Appreciate Your Input

Please let us know of any aspect of this product, including the manual, which could use improvement or correction. We appreciate your valuable input in helping make our products better.

Contents

Chapter 1

Hardware Configuration

This chapter describes how to configure MIC-330V2 hardware.

1.1 Introduction

Advantech MIC-330V2 series is a high-performance 3U 4HP/8HP CompactPCI® Serial CPU board featuring an Intel® 11th Generation Mobile Xeon® or Core™ processor with 8 cores and 16 threads, providing significant performance and power efficiency.

The MIC-330V2 front panel is equipped with two 2.5G Ethernet ports and three 10GT/s USB Type-C ports, two of which also support DisplayPort Alternate Mode. In addition, two extra M12 X-code GbE ports are available via the configuration-two mezzanine card (M-2 for short).

On-board mass storage is mounted on a low-profile mezzanine expansion card, which accommodates one or two M.2 2280 sockets at high-speed SATA Gen3.

MIC-330V2 supports up to 64GB DDR4 ECC RAM. Up to 32GB of memory-down is provided for rugged applications, and another 32GB is available via the DDR4 ECC SODIMM socket.

The 11th Generation Xeon® and Core™ processors are accompanied by the RM590E Mobile PCH, maximizing high-speed I/O resources (e.g., PCI Express®, SATA, USB): up to two PCIe Gen3 x8 slots, four PCIe Gen3 x4 slots, two PCIe Gen3 x1 slots, eight USB 2.0 ports, four USB 3.2 Gen1 ports, two SATA Gen3 ports, and two GbE ports to the CompactPCI® Serial backplane for peripheral high-speed I/O expansion such as storage, graphics, and Ethernet.

1.2 Specifications

1.2.1 Key Features Summary

- **PICMG® CompactPCI® Serial (CPCI-S.0) CPU card**
- **Form factor:** Single size Eurocard (board dimensions 100 x160mm)
- **Mounting height:** 3U
- **Front panel width:**
  - Standard 4HP version with Mezzanine-1 side card
  - Standard 8HP version with Mezzanine-2 side card
- **Front panel I/O (4HP):**
  - 3 x USB type-C port, with two ports supporting DisplayPort Alternate Mode;
  - 2 x 2.5GbE (RJ45) with TSN/TCC enabled, and 1 x RJ45 port (LAN1) supports AMT by option BOM
- **Front panel I/O (8HP):** Supports another two M12 X-code GbE Ethernet ports on mezzanine side card-2(M-2)
- Backplane communication via PCI Express® Gen3, SATA Gen3, USB 2.0/3.2 Gen1, Gigabit Ethernet
- Local Mezzanine expansion option

1.2.2 Processor

Intel® 11th Generation Mobile Xeon®/Core™ processor with RM590E PCH platform. Please find detailed info. for Xeon/Core i7 processor configurations as below:

Table 1.1: Processor Type

Intel CPU Model Number	# Cores	# Threads	Base Freq. (Configurable)		Max Turbo Frequency	Cache	TDP (Configurable)		ECC Memory Supported	Package Size
			Configurable TDP-down	Configurable TDP-up			Configurable TDP-down	Configurable TDP-Up		
Xeon® W-11865MLE	8	16	1.50GHz(Non-configurable)		4.50GHz	24MB	25W(Non configurable)		Yes	50*26.5 mm
Xeon® W-11865MRE	8	16	2.10GHz	2.6GHz	4.70GHz	24MB	35W	45W	Yes	
Xeon® W-11555MRE	6	12	2.10GHz	2.6GHz	4.50GHz	12MB	35W	45W	Yes	
Xeon® W-11155MRE	4	8	1.90GHz	2.4GHz	4.40GHz	8MB	35W	45W	Yes	
Core™ i7-11850HE	8	16	2.10GHz	2.6GHz	4.70GHz	24MB	35W	45W	No	

Note! *Because power consumption and thermal restrictions vary between different CompactPCI-Serial systems, please double check these items before installing a higher speed CPU not listed in the table above.*

1.2.3 Chipset

The mobile Intel® RM590E chipset provides excellent flexibility for developers of embedded applications by offering I/O bandwidth over previous Intel chipsets, which offers up to 8 GT/s for fast access to peripheral devices. It delivers outstanding system performance through high bandwidth interfaces such as PCI Express Gen3(8GT/s), Serial ATA Gen3(6GT/s) and Hi-Speed USB 3.2 Gen1(5GT/s)/Gen2(10GT/s) and USB 2.0.

1.2.4 Memory

Integrated memory controller up to dual channel, 64GB/3200MHz frequency support.

- DDR4 soldered memory up to 32GB
- DDR4 soldered memory up to 32GB, also add ECC SO-DIMM memory module socket up to 32GB, total 64GB on a single board

The following table lists the So-DIMM modules that have been tested with MIC-330V2.

Table 1.2: So-DIMM Modules Type

Brand	Size	Speed	Vendor Part Number	ECC	Pin Count
Kingston	4GB	DDR4-2400	KVR24S17S6/4	Non ECC	260 pin
Micron	4GB	DDR4-3200	MTA4ATF51264HZ-2G6E1	Non ECC	260 pin
Kingston	16GB	DDR4-2666	CBD26D4S9D8ME	Non ECC	260 pin
Advantech	32GB	DDR4-2666	AQD-SD4U32GN26-SB	Non ECC	260 pin
Advantech	4GB	DDR4-3200	SQR-SD4N4G3K2SNPCB	Non ECC	260 pin
Advantech	8GB	DDR4-3200	SQR-SD4N8G3K2SNBCB	Non ECC	260 pin
Advantech	32GB	DDR4-3200	SQR-SD4N32G3K2SNAB	Non ECC	260 pin
Micron	8GB	DDR4-3200	MTA8ATF1G64HZ-3G2	ECC	260 pin
Kingston	16GB	DDR4-3200	CBD32D4S2S8HA	Non ECC	260 pin
SAMSUNG	32GB	DDR4-3200	M471A4G43AB1-CWE1	Non ECC	260 pin

Note! *ECC support is optional on different processor spec. Please consult your local sales.*

1.2.5 Graphics

Integrated graphics engine with max 3 independent displays in processor

- **Front 2 displays:** Two ports are available from the MIC-330V2 front panel, via Type-C ports (DP Alt Mode), For monitors w/o Type-C video connector, you can use an adapter cable that support Type-C to DisplayPort™, Suitable Type-C cable connectors can be screw locked optionally via M2 threads in the front panel (single screw connector type for ports 1-3).
- Rear 1 display reserved.
- **Resolution:** 7680 x 4320 @60Hz (DisplayPort)

1.2.6 Ethernet

MIC-330V2 is equipped with several high-performance PCI-Express based network interface controllers which provide full IEEE802.3 compliant 10/100/1000/2.5G Base-T Ethernet interfaces.

- Up to 6 Ethernet networking interfaces in total
- 2 x 2.5GbE RJ45 available on front 4HP, TSN/TCC enable, and also 2.5G LAN1 supports AMT by option BOM.
- Additional 2 x GbE interfaces to backplane by P6 on M-1 side card
- Additional 4 x GbE Ethernet networking interfaces when with M-2 side card: 2 x M12 X-code GbE on 8HP front panel, and the other 2 x GbE interfaces to back-plane by P6 (2x M12 X-code GbE on front 8HP can switch to 2 x GbE interfaces to backplane P6)

1.2.7 Storage Interface

MIC-330V2 provides up to 4 SATA Gen3 interfaces in total.

- 2 x on board 2280 SATA M.2 socket on M-1 side card;
- 1 x on board 2280 SATA M.2 socket on M-2 side card;
- Additional 2 x SATA Gen3 interfaces to backplane by P3

1.2.8 USB Ports

MIC-330V2 provides up to 2 x USB 3.2 Gen2(for front Type-C 1/2 port), 1 x USB 3.1 Gen2(for front Type-C 3 port), 4 x USB 3.2 Gen1 and 8 x USB 2.0 interfaces in total to backplane.

- 2 x USB 3.2 Gen2(10GT/s data transfer rate) interfaces derived from the Tiger Lake H processor and wired to Type-C front panel connectors, both of them multiplexed with video output signals (DP Alt Mode).
- 1 x USB 3.1 Gen2(10GT/s data transfer rate) interfaces derived from the PCH and wired to Type-C front panel connectors.
- Additional 4 x USB 3.2 Gen 1(5GT/s data transfer rate) interfaces provided by the PCH are wired to the CompactPCI® Serial backplane connectors, which means USB3.2 is available on the peripheral slot 2~5(System slot left) or on the peripheral slot 5~8 (system slot right and TTL 9 slots)
- 8 x USB2.0 interfaces to backplane, hence USB2.0 is available on each peripheral slot.

1.2.9 FRAM

Fe-RAM function with MB85RS1MT (128-bit x 8, up to 30MHz maximum bus frequency) on M-2 card.

1.2.10 TPM

MIC-330V2 with Xeon W-11865MLE and W-11865MRE processor support TPM function, which follow TPM 2.0 SPEC.

1.2.11 RTC and Battery

MIC-330V2 use coin battery or on board super capacitor to keep CMOS data (date/time/password)

- Coin battery (3V/220 mAh, CR2032B) on M-1 side card
- Coin battery(3V/220 mAh with WIRE) on M-2 side card

1.2.12 BIOS

256Mb SPI flash containing a specific AMI BIOS FW meets industrial and embedded system requirements.

1.2.13 Front Panel I/O

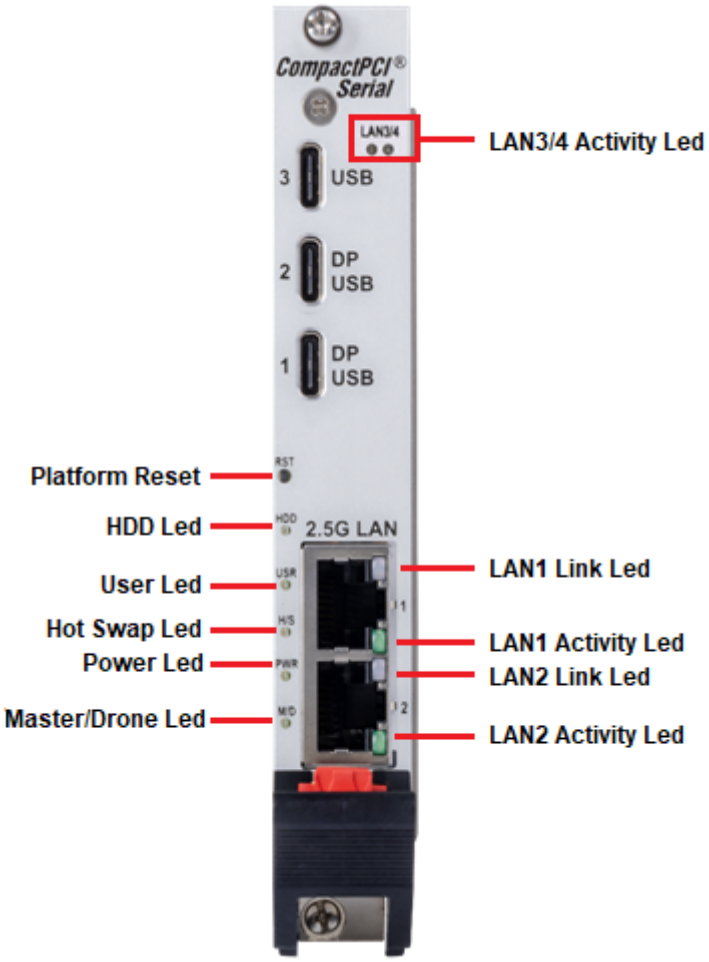
For MIC-330V2, it can provide the I/O ports on front panel as described below:

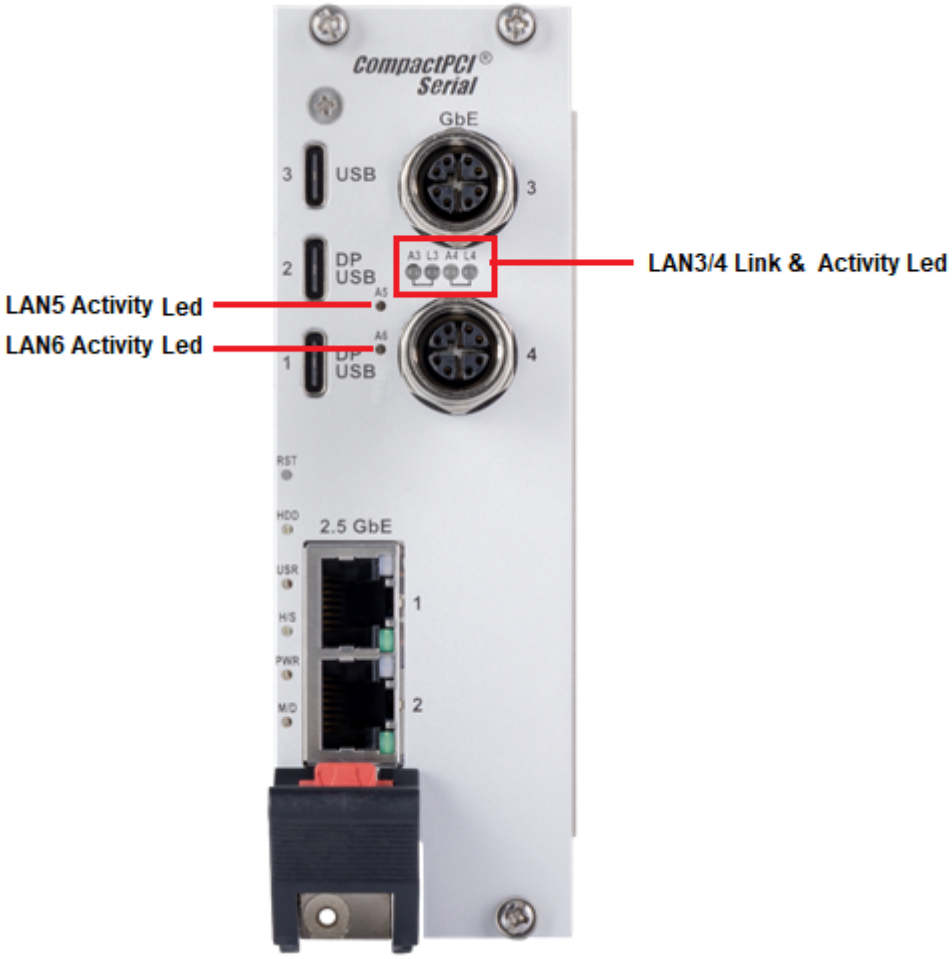
- 2 x USB 3.2 Type-C ports (port 1/2) and 1 x USB 3.1 Type-C port (port 3) on front 4HP, two of them (port 1/2) support Display Port alternate mode
- 2 x 2.5GbE (RJ45) on front 4HP
- Additional 2 x GbE(M12 X-code) on mezzanine side card 2 (M-2)

1.2.14 M/D, PWR, HDD, Hot-swap & LAN LEDs

Front panel provide Many LEDs for indication, please check details as below table:

Table 1.3: Front Panel LEDs Indication		
Layer	**Name**	**Description**
4HP	HDD (Yellow)	Indicates HDD Read/Write
	USR (Green)	Used for customer, default green on after power on
	H/S (Blue)	Indicates the board is ready to be hot-swapped
	PWR (Green)	Indicates power status
	M/D (Green)	Indicates Master or Drone mode status When the green led on, it indicates a board is inserted into peripheral slots
	LAN1/LAN2(Green/ Orange)	Indicates Ethernet Transmission Rate 2.5Gbps: Green; 1000Mb/s: Orange;100Mb/s & 10Mb/s: LED off
	LAN1/LAN2 (Green)	Green Blink when activate
Mezzanine-1 Card	LAN3/4 (Green)	Green Blink when activate
Mezzanine-2 Card	L3/L4(Orange)	1000Mb/s:Orange;100Mb/s &10Mb/s: LED off
	A3/A4/A5/A6(Green)	Green Blink when activate





1.2.15 CompactPCI® Serial Backplane Resources

MIC-330V2 is a CPU card that followed PICMG® CPCI-S.0 standard, and provides high speed Interfaces for peripheral cards extension, details as shown below:

Table 1.4: Interfaces to backplane

CPCI-S connector	Interfaces
P1	1 x PCIe3.0 x8 of lower 4-Lane, 1 x USB 3.2 gen 1, 1 x USB 2.0
P2	1 x PCIe3.0 x8 of upper 4-Lane, 1 x PCIe3.0 x8, 3 x USB 2.0, reserved up to 5 x GPIO
P3	3 x USB 3.2 gen 1, 4 x USB 2.0, 2 x SATA 3.0, 1 x DP 1.4a signal reserved
P4	4 x PCIe3.0 x4
P5	2 x PCIe3.0 x1, 8 x PCIe clock and clock REQ
P6	Up to 2 x GbE on Mezzanine Card

1.2.16 Environmental & Regulatory Specifications

MIC-330V2 can meet environmental & regulatory specifications as below:

- **Operating temperature:**
  - -40°C ~ 70°C (-40°F ~158°F) (EN50155 OT4 +85°C for 10 minutes), industrial product support
  - -25°C ~70°C (-13°F ~158°F), commercial product support

Note! *The operating temperature range of the MIC-330V2 depends on the installed processor and the airflow through the chassis.*

- **Storage Temperature:** -40 ~ 85°C (-40 ~ 185°F)
- **Humidity:** 95% @ 40°C (non-condensing)
- **Humidity (Non-operating):** 95% @ 60°C (non-condensing)
- **Random Vibration:** 5~500Hz, 2Grms, 3 axes (operation test with M.2 SSD, Without so-dimm slot memory)
- **Shock (Operation):** 10G, 11ms
- **Board size:** 100mm x 160mm (3U)
- **Width:** 4HP/8HP
- **Weight:**
  - MIC-330V2-A1S1(0.52Kg)
  - MIC-330V2-B1S1(0.80Kg)
  - MIC-330V2-C1S1(0.52Kg)
- **Long term availability**
- **Coating on request**
- **RoHS compliant**
- **EMC & Safety:** design to meet EN50155/EN50121-4

1.2.17 Compact Mechanical Design

The MIC-330V2 is equipped with a set of high-speed expansion interface connectors, which can be optional used to attach either a low profile mezzanine module (fits into the 4HP front panel envelope).

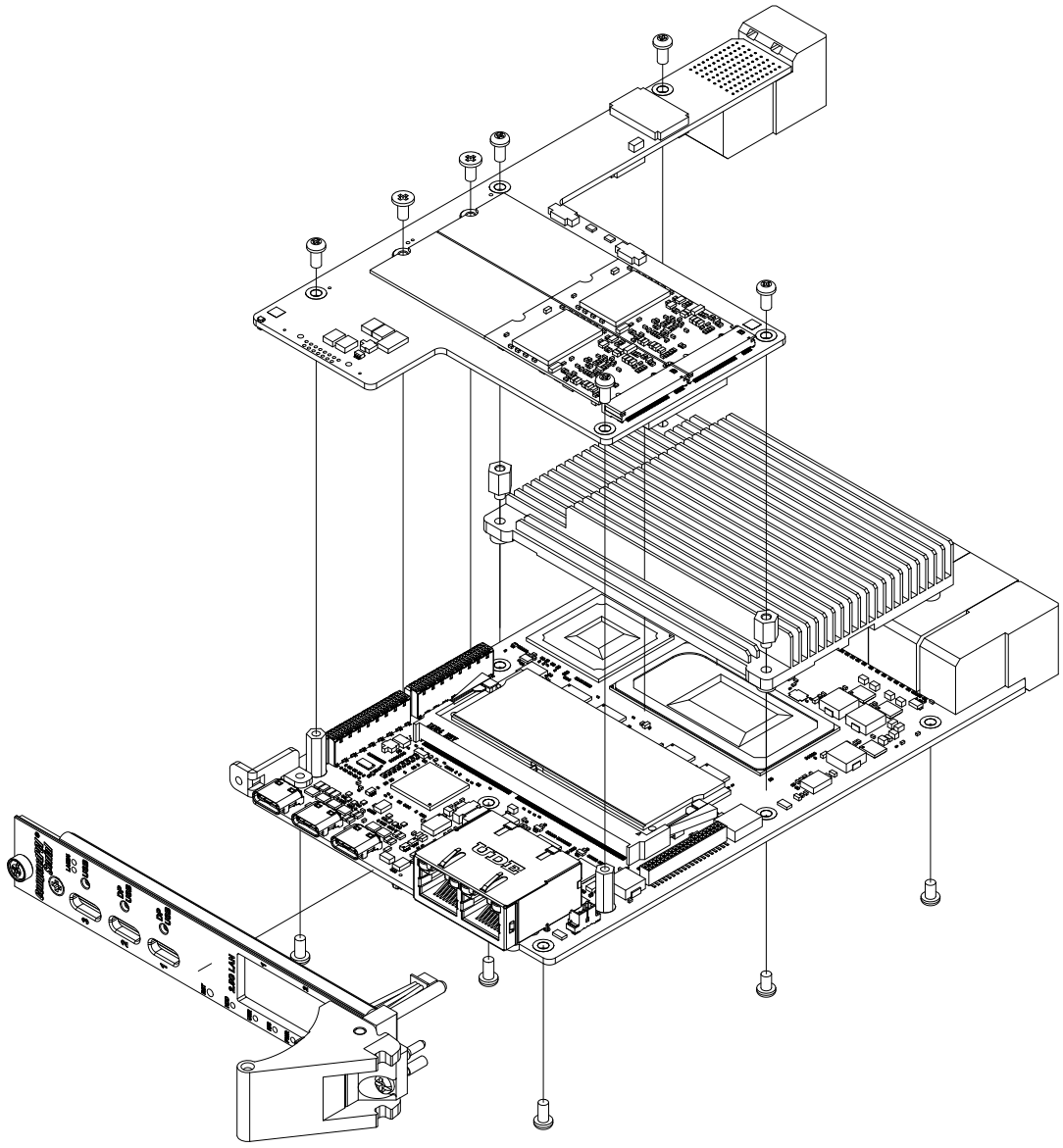


Figure 1.1 MIC-330V2 with M-1: 4HP front panel envelope, With SO-DIMM socket expansion

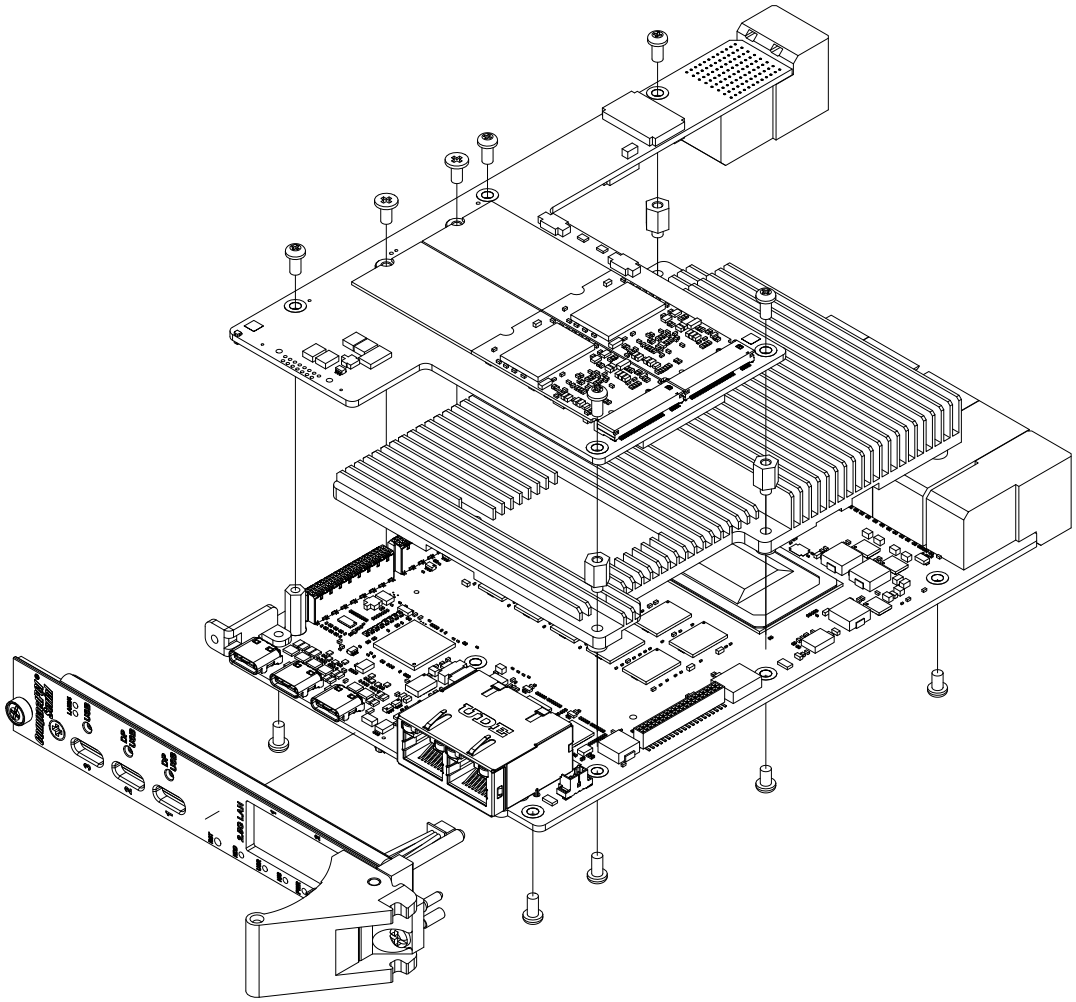


Figure 1.2 MIC-330V2 with M-1: 4HP front panel envelope, without SO-DIMM socket expansion

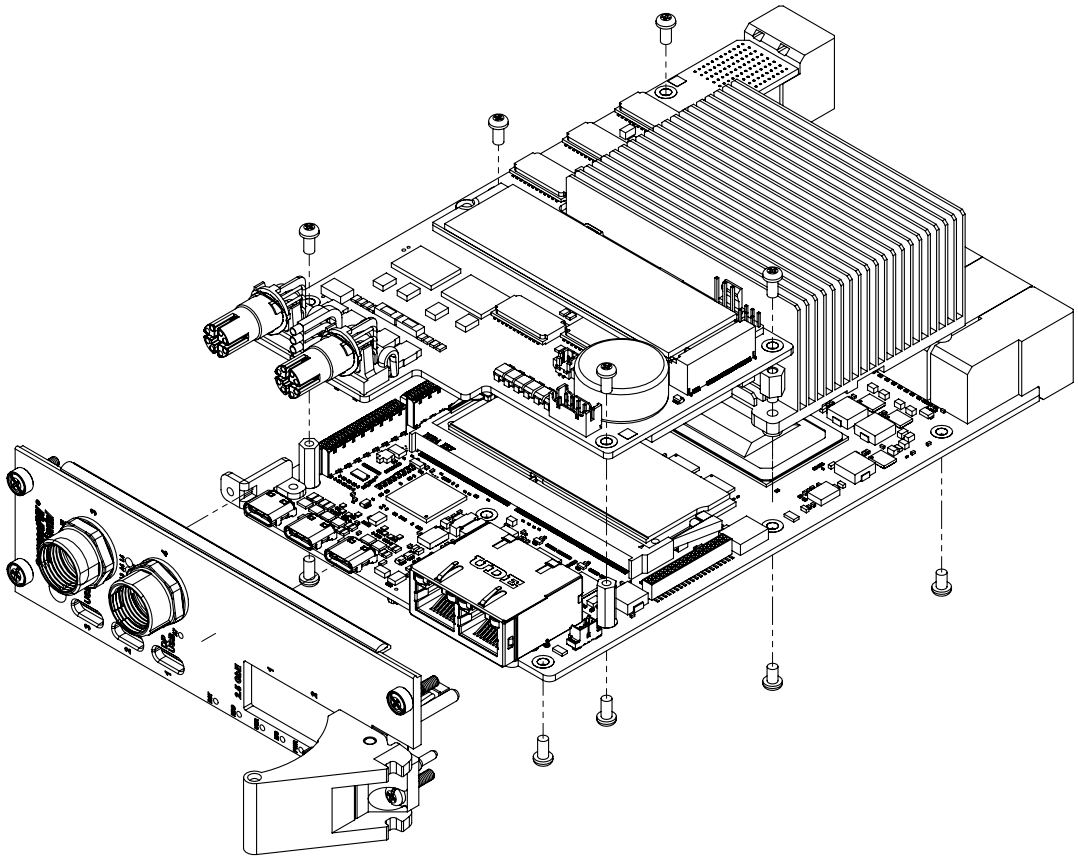


Figure 1.3 MIC-330V2 with M-2: 8HP front panel envelope, W/ 2x M12 GbE LAN ports in front panel

Forced-air cooling in the chassis is recommended for the MIC-330V2 board to optimize system stability and reliability, even though a specially designed Cu heatsink is already assembled in the unit. Please refer to the 3U CPCI-Serial chassis (MIC-300A series) available through sales or the Advantech website for fan solutions that provide sufficient airflow to cool the CPU blade. These solutions have already been validated based on EN50155-related test items.

1.2.18 Hardware Monitor

MIC-330V2 series have HWM management system, which used to monitor processor temperature and core voltage information, it's realized by EC (Embedded Controller).

1.3 Functional Block Diagram

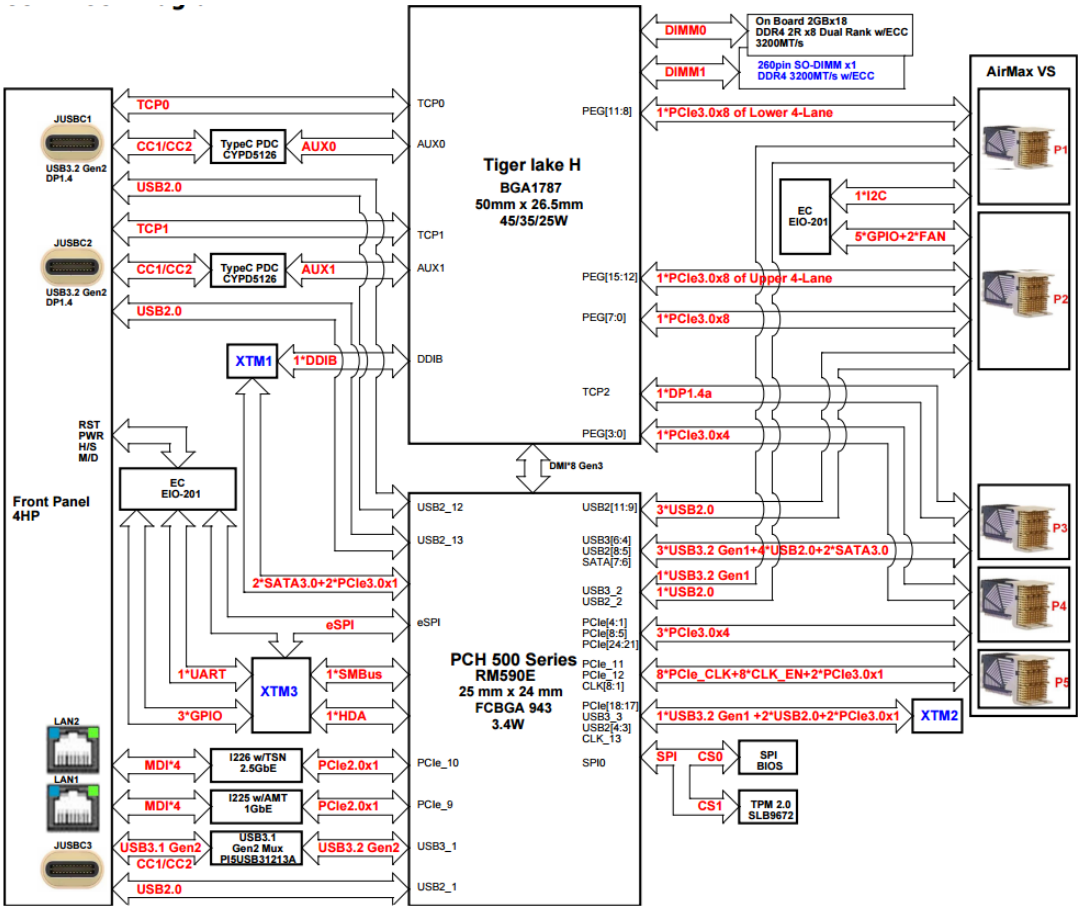


Figure 1.4 MIC-330V2 Block Diagram

1.4 Switches

1.4.1 Switch

There is 1 switch on M-2 board, then you can switch 2x GbE between 2x M12 to 8HP front and 2x GbE signals to P6, Please find details in below table 1.5:

Table 1.5: SW1 Setting Definitions		
Status	**Function**	**Note**
On/On	GbE function to LAN1/LAN2 M12	[default]
Off/Off	GbE function to P6 (ETH1/ETH2)	

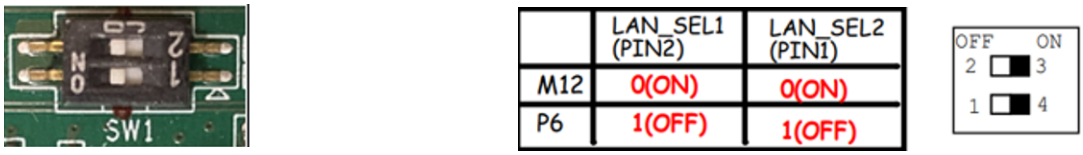


Figure 1.5 SW1 functions definition

Note! *The SKU that MIC-330V2 with M-2 board will be realized by customer's request, if you want, please contact with your local sales.*

1.5 Connectors Definitions

1.5.1 MIC-330V2 Series with M-1 IO Functions

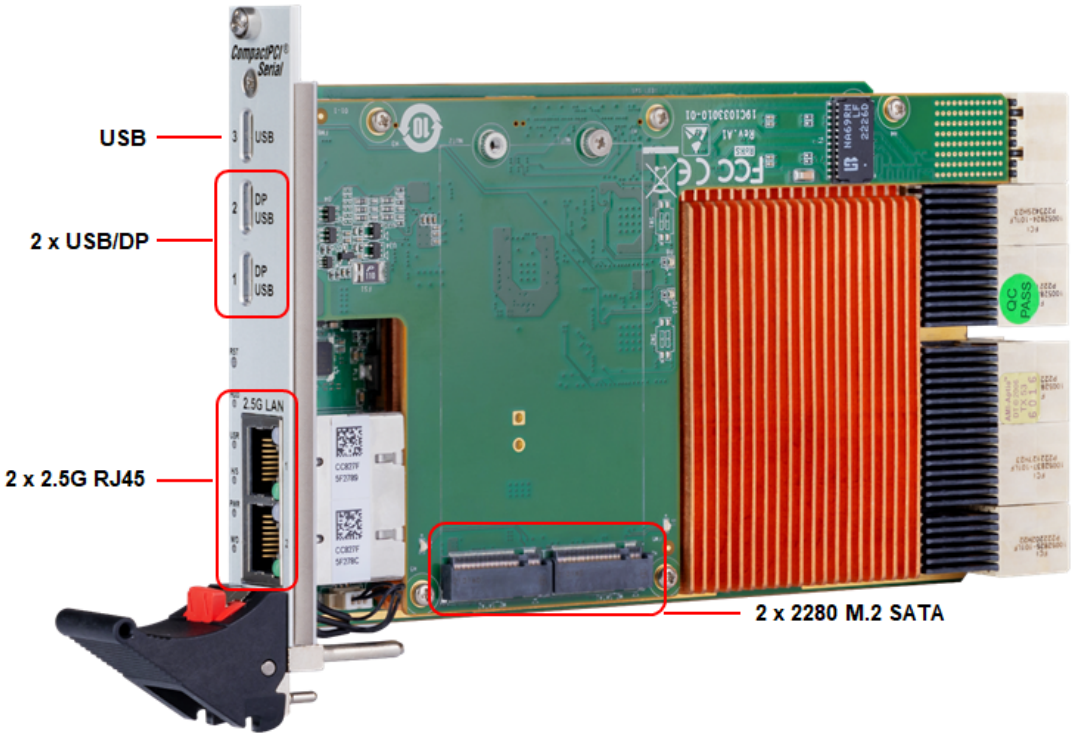


Figure 1.6 MIC-330V2 series with M-1 IO functions

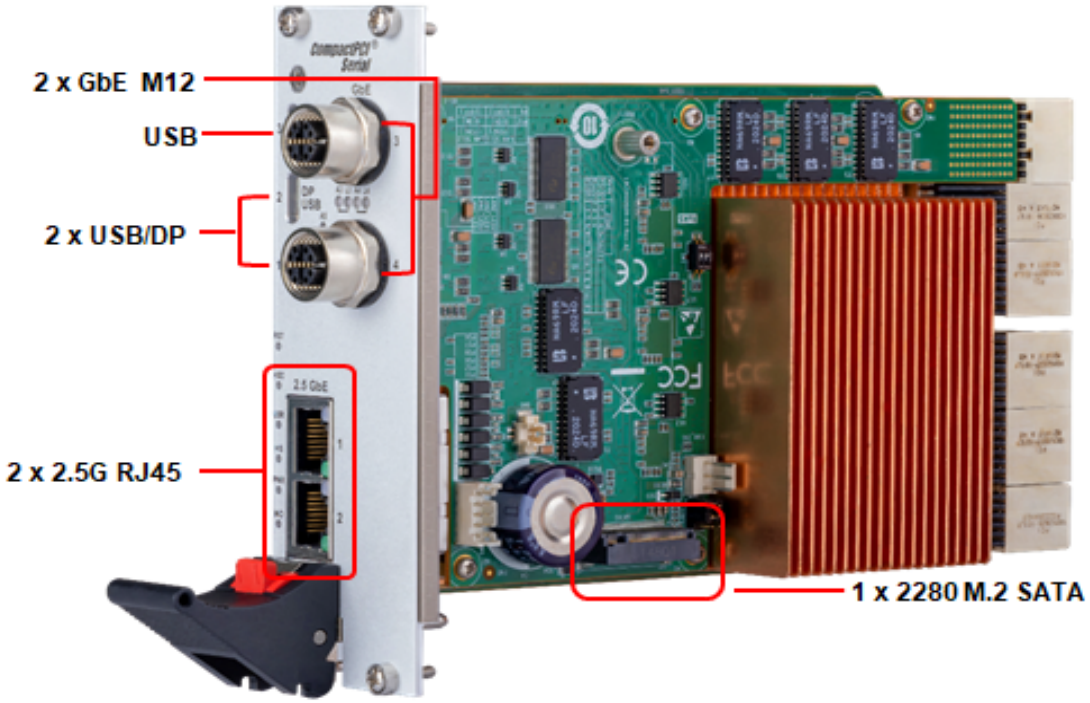


Figure 1.7 MIC-330V2 with M-2 IO Functions

1.6 Safety Precautions

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electric shock, always disconnect the power from your CompactPCI chassis before you work on it. Don't touch any components on the CPU board or other boards while the CompactPCI chassis is powered.
- Disconnect power before making any configuration changes. The sudden rush of power as you connect a jumper or install a board may damage sensitive electronic components.
- Always ground yourself to remove any static charge before you touch your CPU board. Be particularly careful not to touch the chip connectors.
- Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to static electric discharges and fields. Keep the board in its antistatic packaging when it is not installed in the chassis, and place it on a static dissipative mat when you are working with it. Wear a grounding wrist strap for continuous protection.

1.7 Installation Steps

The MIC-330V2 contains electro-statically sensitive devices. Please discharge your clothing before touching the assembly. Do not touch components or connector pins. We recommend that you perform assembly at an anti-static workbench.

1.8 Battery Replacement

The battery model number is CR2032, 3V, 210 mAh battery. Replacement batteries may be purchased from Advantech. When ordering the battery, please contact your local sales office to check availability.

Advantech PN:1760000018, 3V/220mA BBBCR2032B for M-1 board

Advantech PN:1750129010, 3V/220mA with WIRE CR2032M1S8-LF for M-2 board

1.9 Software Support

Windows 10, Windows 11,Linux, Ubuntu 22.04, VxWorks 7.0 have been fully tested on the MIC-330V2. Please contact representative for details on support for other operating systems.

Chapter 2

AMI BIOS Setup

This chapter describes how to configure the AMI BIOS.

2.1 Introduction

The AMI BIOS has been customized and integrated into many industrial and embedded motherboards for decades. This section describes the BIOS. which has been specifically adapted for the MIC-330V2. With the AMI UEFI BIOS Setup Utility, you can modify BIOS settings and control the special features of the MIC-330V2. The Setup program uses a number of menus for making changes and turning its special features on or off. This chapter describes the basic navigation of the MIC-330V2 setup screens.

Figure 2.1 Setup Program Initial Screen

2.2 BIOS Setup

The MIC-330V2 Series system has AMI BIOS built in, with a BIOS SETUP utility that allows users to configure required settings or to activate certain system features.

The BIOS SETUP saves the configuration in the NVRAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power. when CMOS battery is removed or the clear jumper is set, all user's settings will be restored the BIOS default settings.

Table 2.1: Control Keys

< → > < ← >	Select Screen
< ↑ > < ↓ >	Select item
<Enter>	Select
<+/->	Change Option
<F1>	General help, for Setup Sub Menu
<F2>	Previous values
<F3>	Optimized defaults
<F4>	Save & exit
<Esc>	Exit

2.3 Entering Setup

Turn on the computer, and there should be a POST (Power-On Self Test) screen that shows the CPU information. When pressing <DEL> or <F2>, you will immediately be allowed to enter Setup.

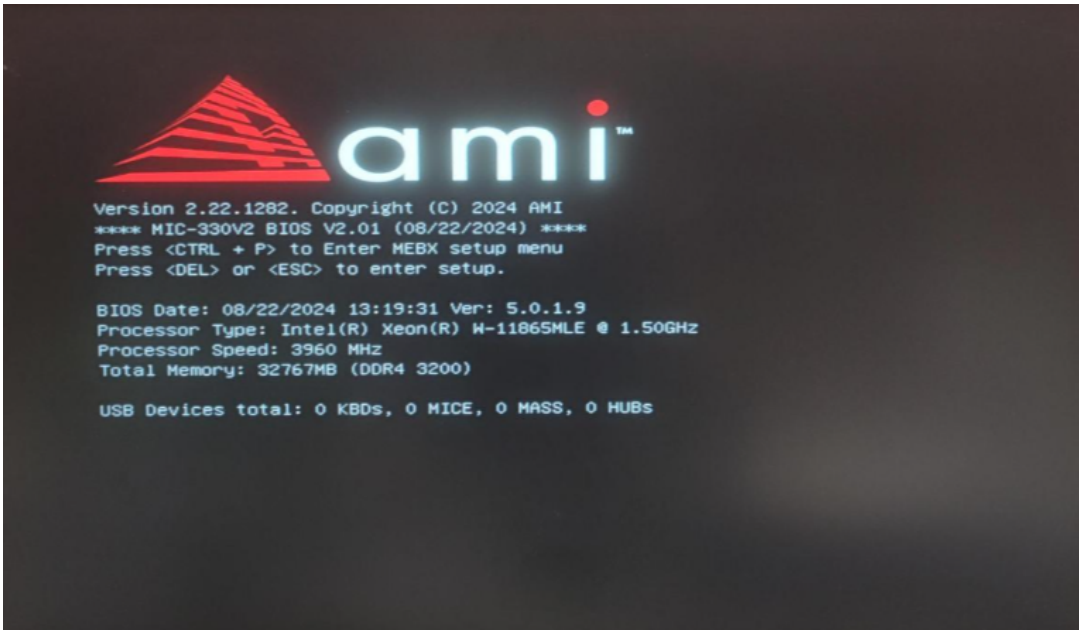


Figure 2.2 Setup Screen

2.3.1 Main Setup

When you first enter the BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. The main BIOS setup screen is shown below.

Figure 2.3 Main Setup Screen

The main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. The right frame displays the keyboard shortcuts. Above the keyboard shortcuts, there is an area reserved for a text message. When one option in the left frame is selected, it is highlighted in white. At the same time, the text message in the right frame always shows the further annotation.

- **System Time/System Date**
  Use this option to change the system time and date. Highlight System Time or System Date using the <↑><↓> keys. Input new values through the keyboard. Press the <↑><↓> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

2.3.2 Advanced BIOS Features Setup

Select the Advanced tab from the MIC-330V2 setup screen to enter the Advanced BIOS Setup screen. You can click one of the items in the left frame of the screen, such as serial console, to go to the sub menu of the selected item. You can display an platform option by highlighting it using the <↑><↓> keys. All the platform BIOS Setup options are described in this section. The platform BIOS Setup screen is shown below. The sub menus are described on the following pages.

Figure 2.4 Platform BIOS Features Setup Screen

2.3.2.1 CPU Configuration

Figure 2.5 Serial Console Setting

CPU configuration Settings

- **Intel (VMX) Virtualization Technology**
  When enabled, a VMM can utilize the additional hardware capabilities provided by vanderpool Technology.
- **Active Processor Cores**
  Number of cores to enable in each processor package.
- **Hyper-Threading**
  Enabled or disabled Hyper-Threading Technology.
- **AES**
  Enable/disable AES (Advanced Encryption Standard)
- **Intel Trusted Execution Technology**
  Enables utilization of additional hardware capabilities provided by Intel (R) Trusted Execution Technology. Changes require a full power cycle to take effect.

2.3.2.2 Power and Performance

Figure 2.6 Power and Performance

- **CPU—Power Management Control**
  Select the performance state that the BIOS will set starting from reset vector, you can set power Limit 1, Power Limit 2, Power Limit 4 here.

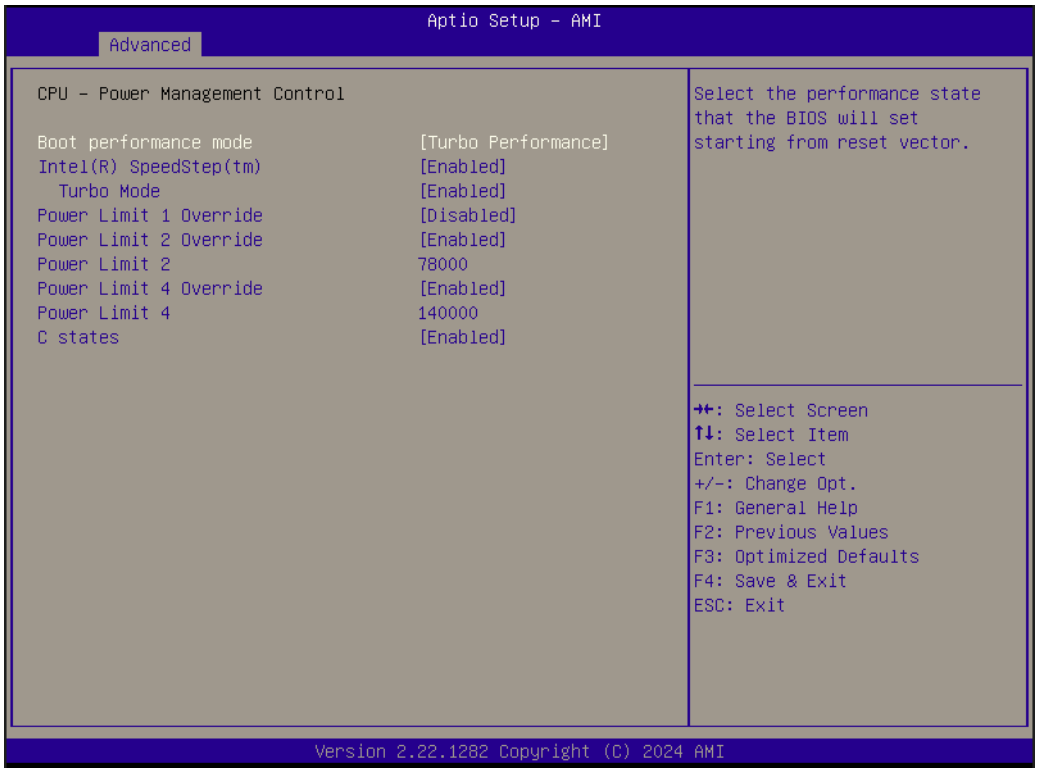


Figure 2.7 CPU Power Management Control

- **GT—Power Management Control**
  Check to enable render standby support.

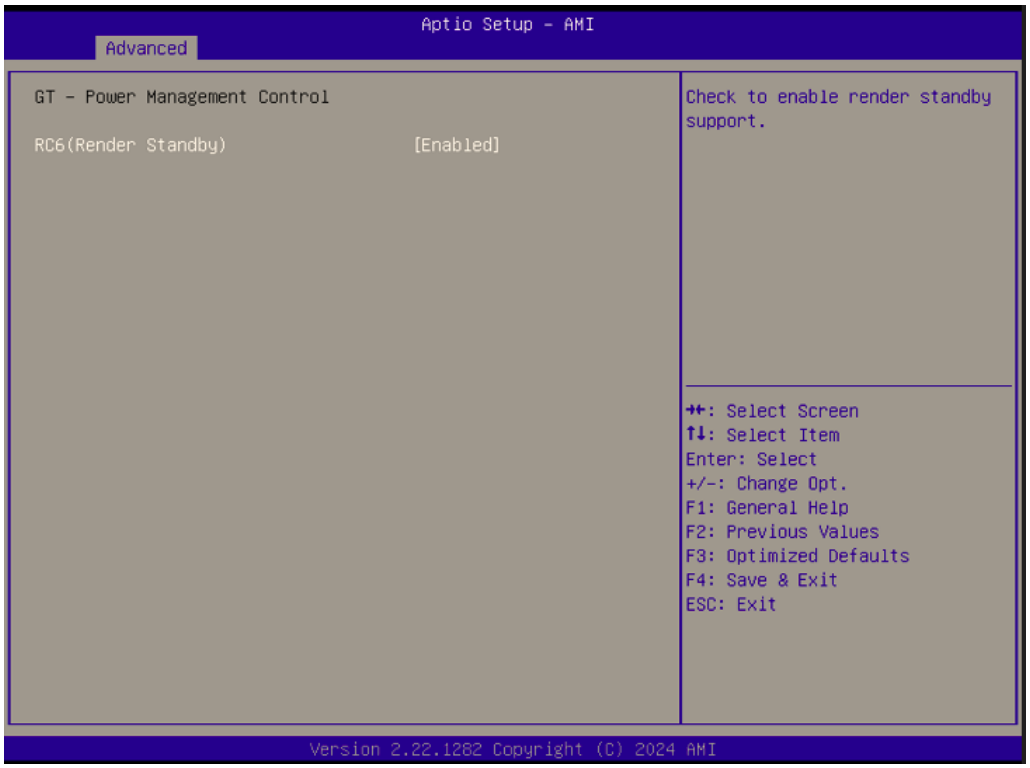


Figure 2.8 GT Power Management Control

2.3.2.3 ME FW configuration

You can see ME FW version here, and configure Management Engine Technology Parameters.

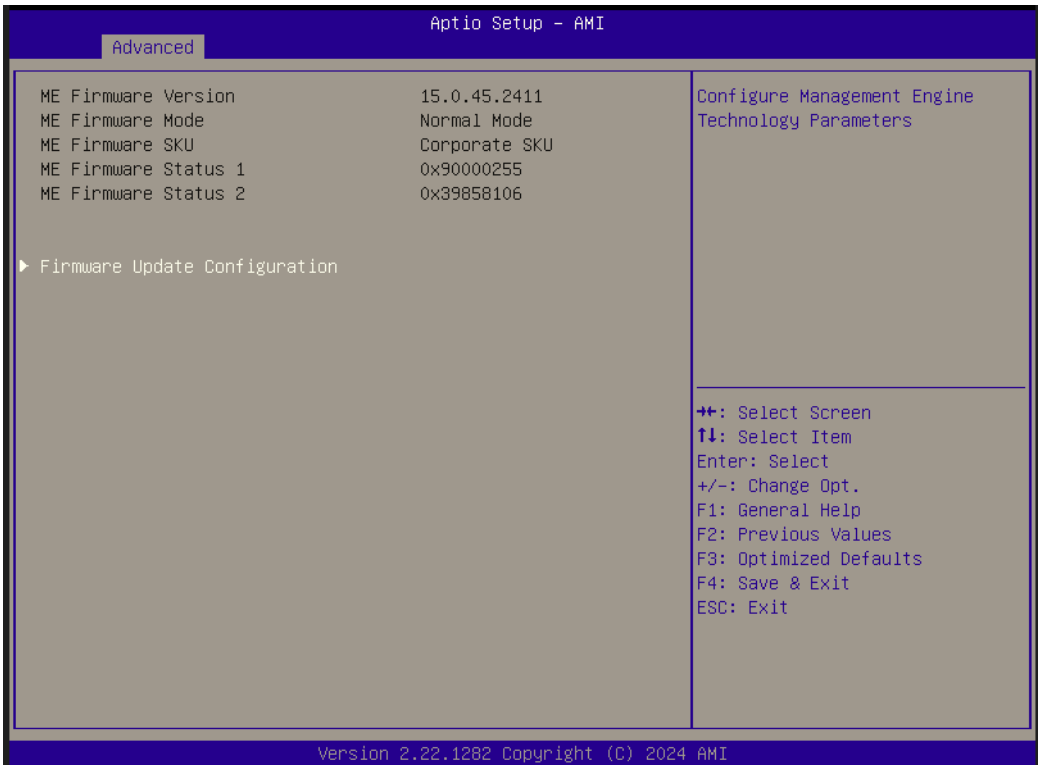


Figure 2.9 ME FW Image

2.3.2.4 Trusted Computing

You can see TPM 2.0 FW here, enables or disables BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.

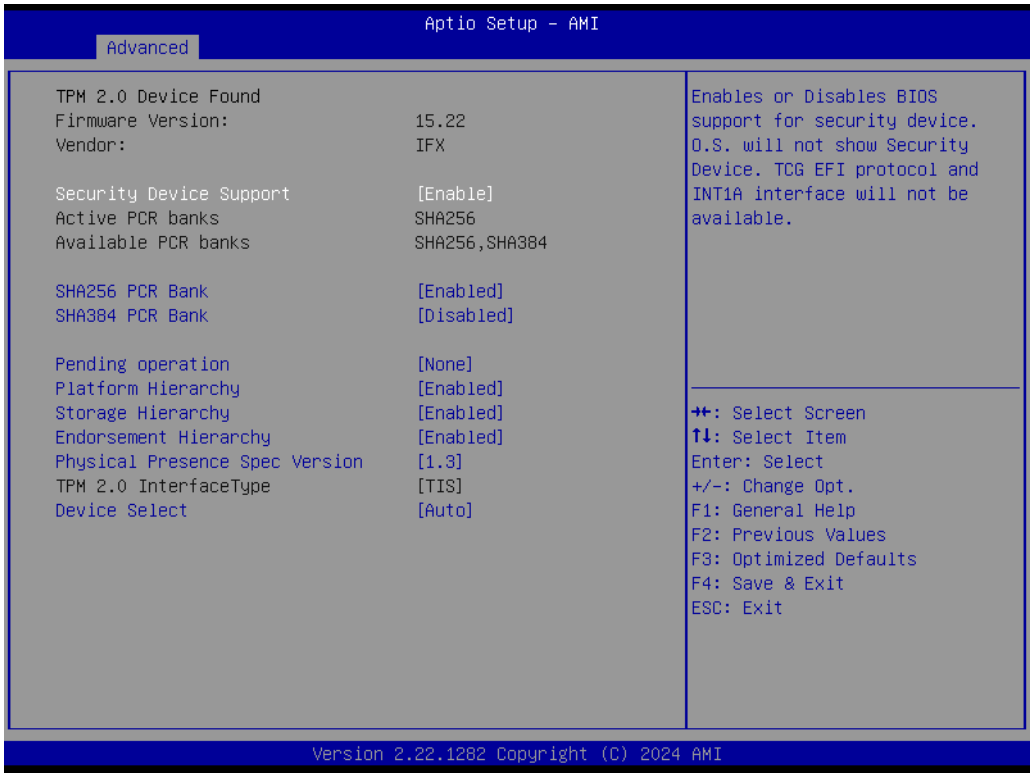


Figure 2.10 Trusted Computing

2.3.2.5 ACPI Settings

Enables or disables BIOS ACPI Auto Configuration.

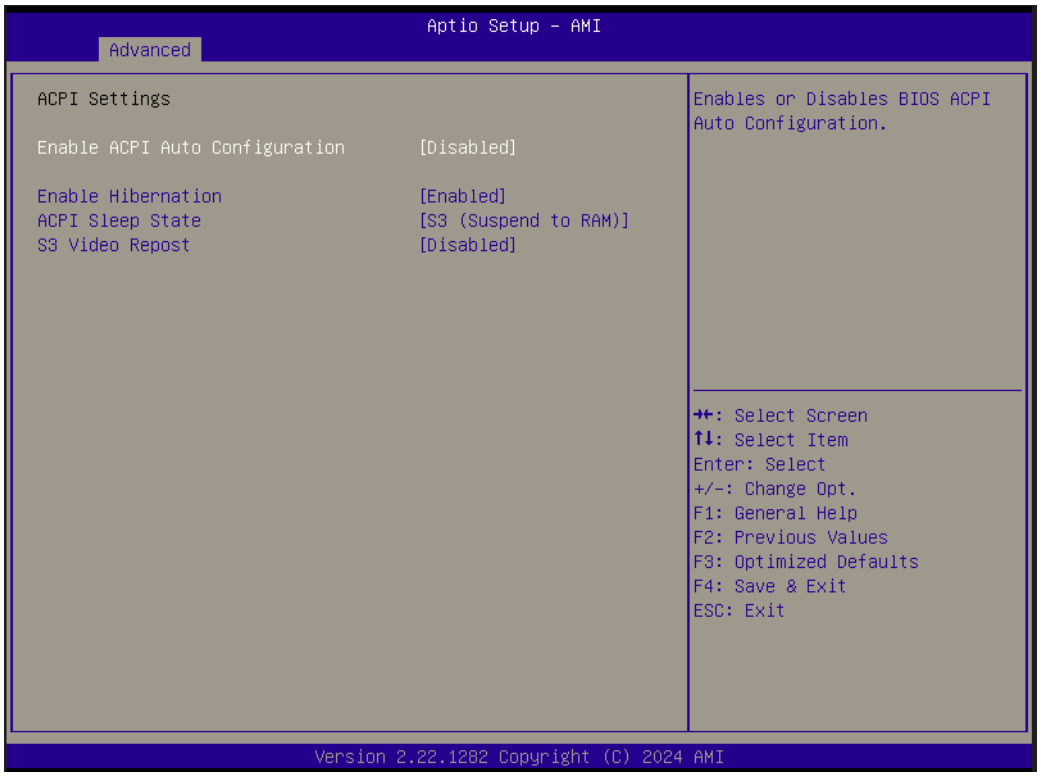


Figure 2.11 ACPI Setting

2.3.2.6 Embedded Controller

You can find the Embedded Controller FW here, and enter into monitor hardware option to check CPU temperature, voltage status and so on.

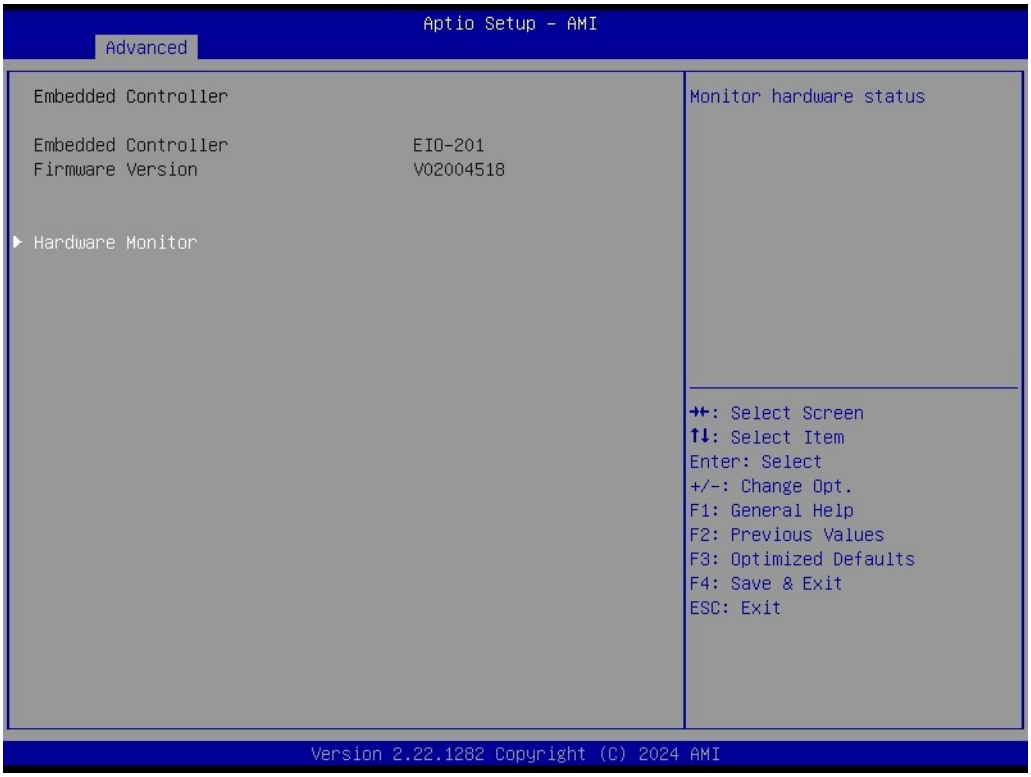


Figure 2.12 Embedded Controller

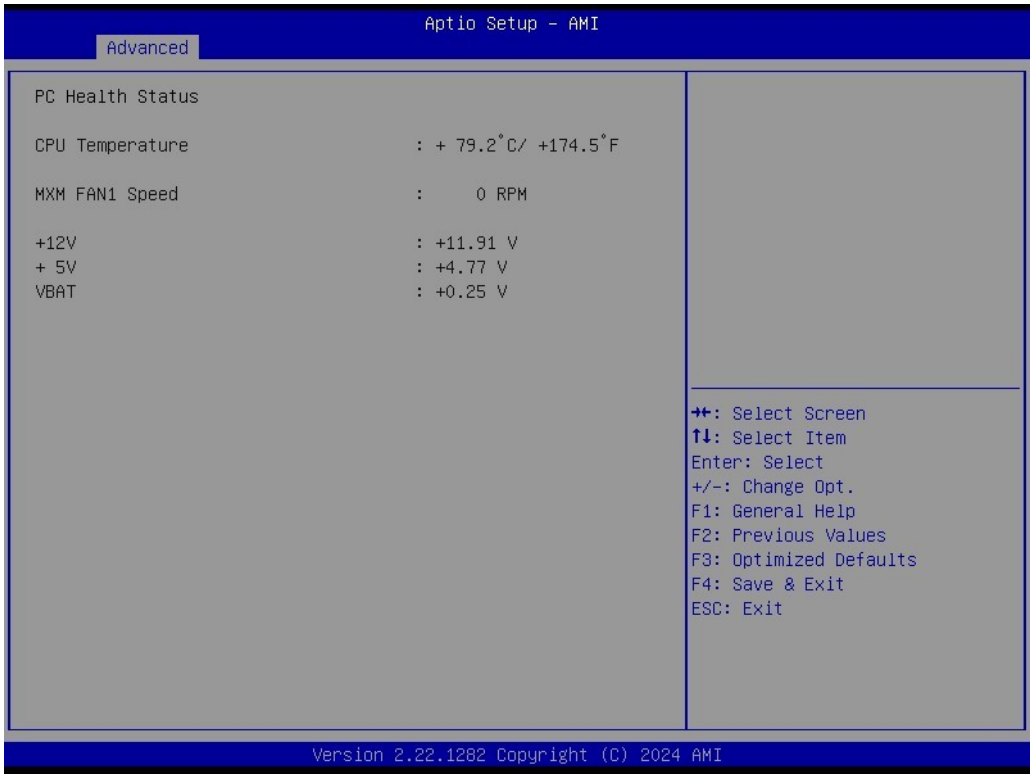


Figure 2.13 Hardware Monitor

2.3.2.7 Serial Port Console Redirection

This item allows users to enable or disable console redirection or Microsoft Windows Emergency Management Services (EMS).

For MIC-330V2 SKUs, console port is disabled.

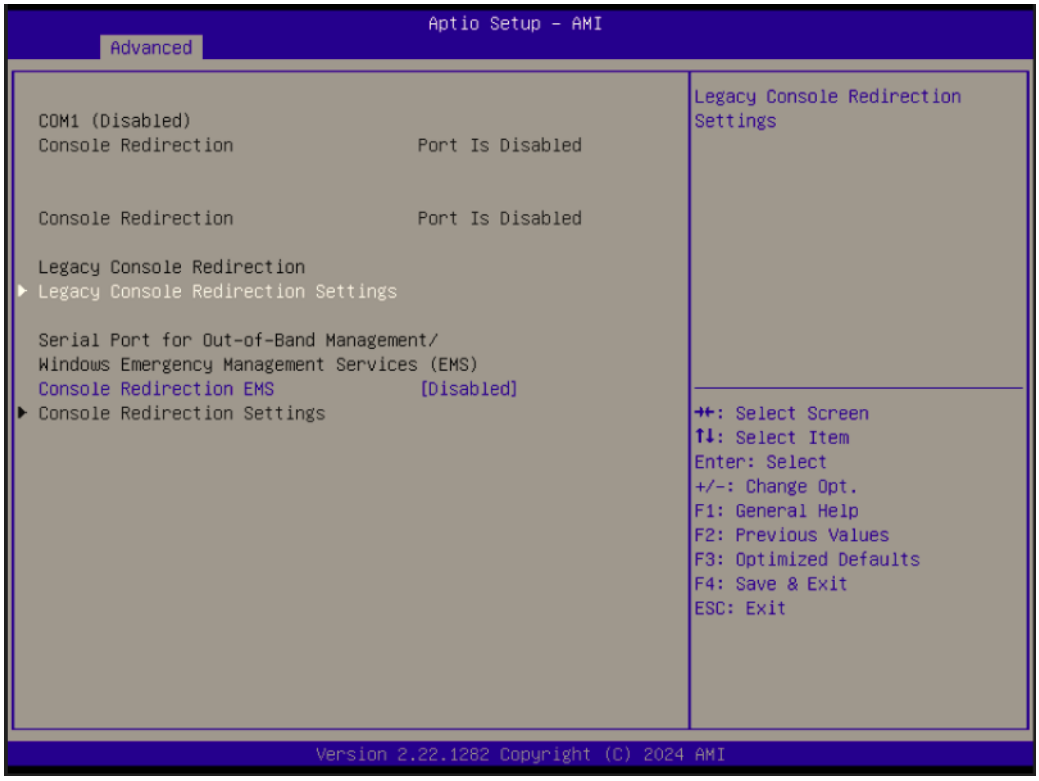


Figure 2.14 Serial Console Setting

2.3.2.8 USB Configuration

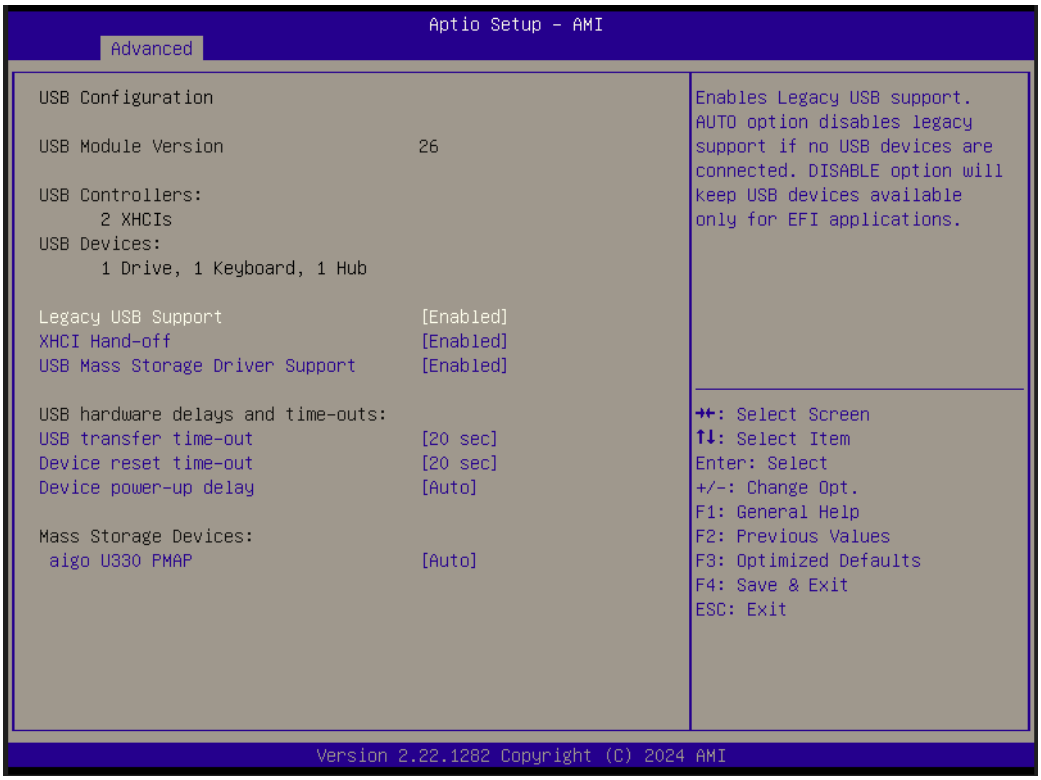


Figure 2.15 USB Configuration

USB configuration setting

- **Legacy USB support**
  Enables Legacy USB Support, AUTO option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.
- **XHCI Hand-off**
  This is a workaround for OS without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
- **USB Mass Storage Driver support**
  Enable/disable USB Mass Storage Driver support

2.3.2.9 Network Stack Configuration

Figure 2.16 Network Stack Configuration

This option can enable/disable UEFI Network stack.

2.3.2.10 NVMe Configuration

Figure 2.17 NVMe Configuration

This item shows NVMe storage Configuration.

2.3.3 Chipset Setting

Enter the chipset tab from the BIOS setup screen. Users can select any item in the left frame of the screen to go to the sub menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys.

Figure 2.18 Chipset Configuration

2.3.3.1 System Agent (SA) Configuration

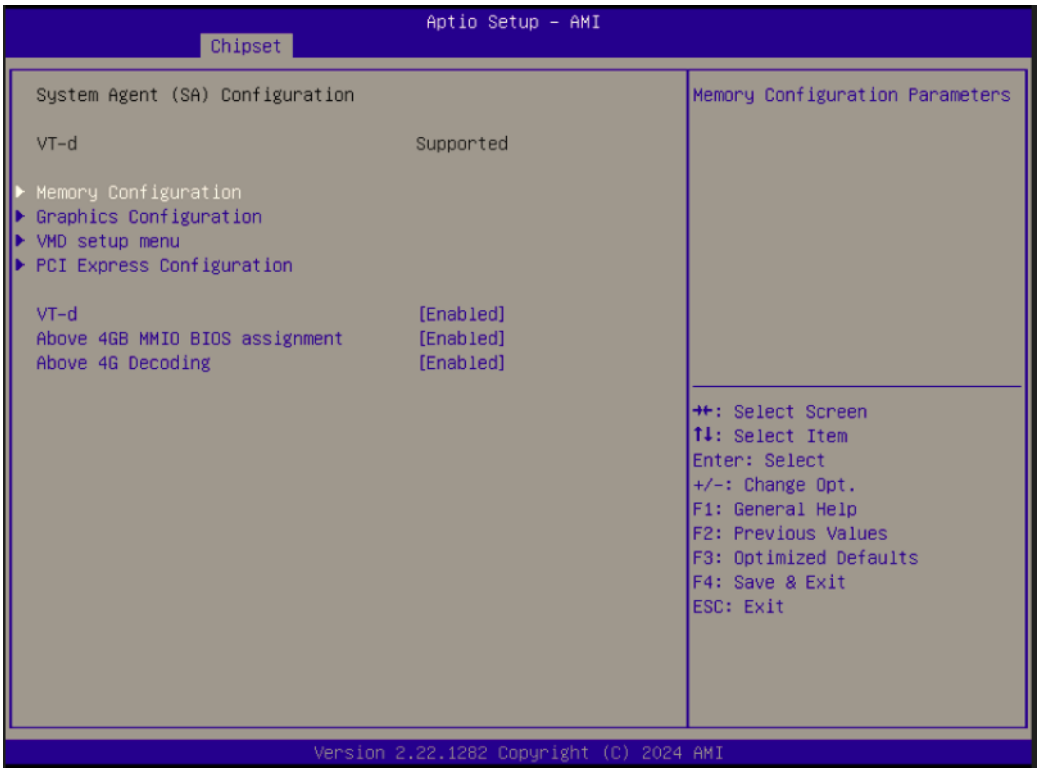


Figure 2.19 System Agent(SA) Configuration

Intel VT-d supported

- **Above 4GB MMIO BIOS Assignment Enabled**
  Enable/disable above 4GB Memory Mapped IO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.
- **Above 4GB Decoding Enabled**
  Globally enables or disables 64-bit capable devices to be decoded in above 4g address space (only if system supports 64-bit PCI decoding).

Memory Configuration

Figure 2.20 Memory Configuration

The option shows the memory configuration parameters, including memory size, memory frequency, etc., for Max TOLUD. This means dynamic assignment will adjust TOLUD automatically based on the largest MMIO length of the installed graphics controller.

Graphics Configuration

Figure 2.21 Graphics Configuration

This option displays the graphics configuration. You can select the parameters for the internal graphics device.

Please note that on the MIC-330V2, the "Skip Scanning of External Gfx Card" option is disabled, which means the system will scan for an external Gfx card on PEG and PCH PCIe ports.

VMD setup

Figure 2.22 VMD Configuration

This option enables/disables the VMD controller.

PCI Express Configuration from CPU

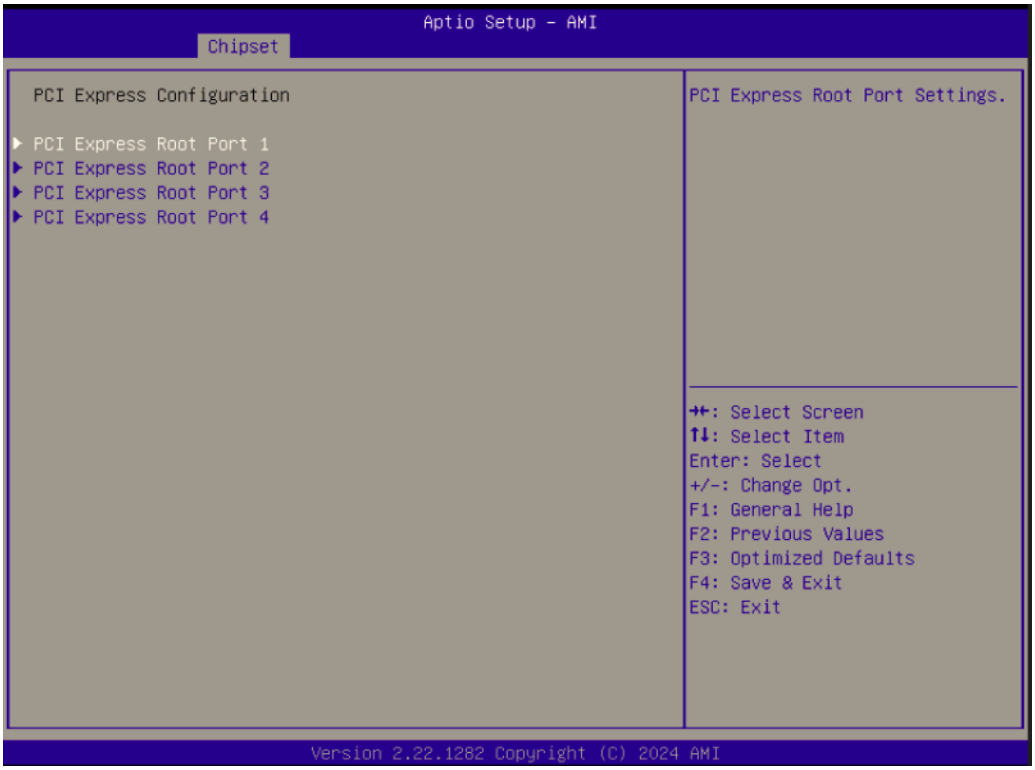


Figure 2.23 PCI Express Configuration from CPU

There are a total of four PCI Express root ports from the CP, and you can enable or disable each root port after selecting it. Take PCI Express Root Port 1, for example:

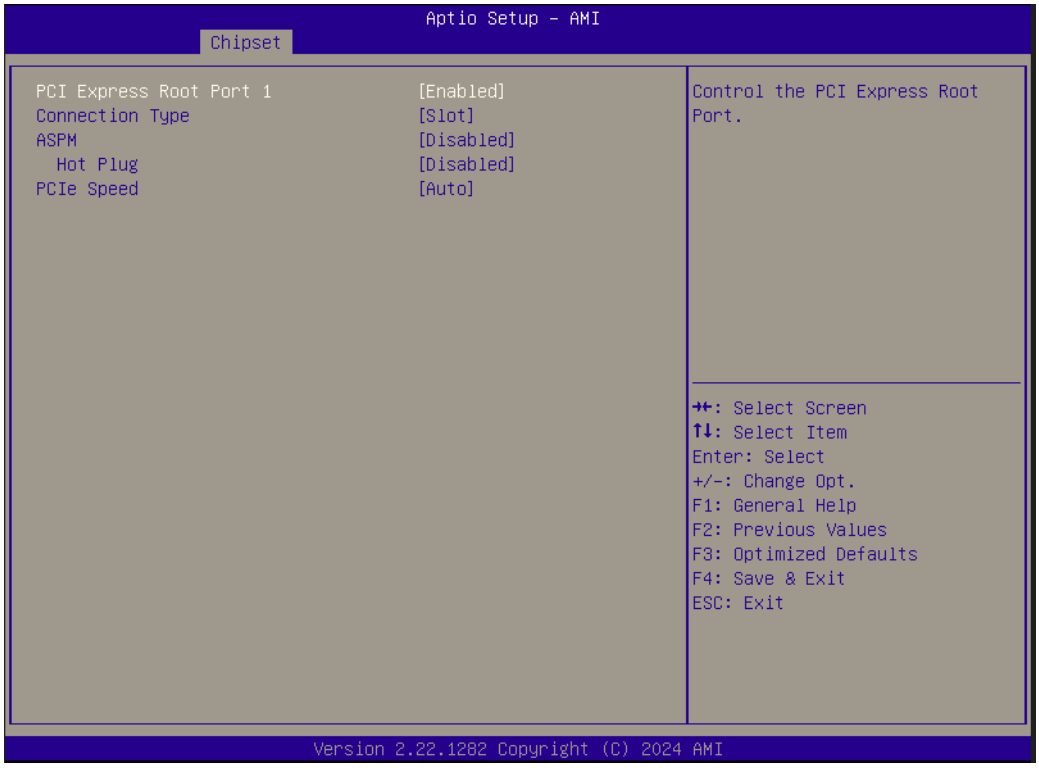


Figure 2.24 PCI Express Configuration (CPU)

You can enable/disable each PCI Express root port, to control the PCI Express root port.

2.3.3.2 PCH-IO Configuration

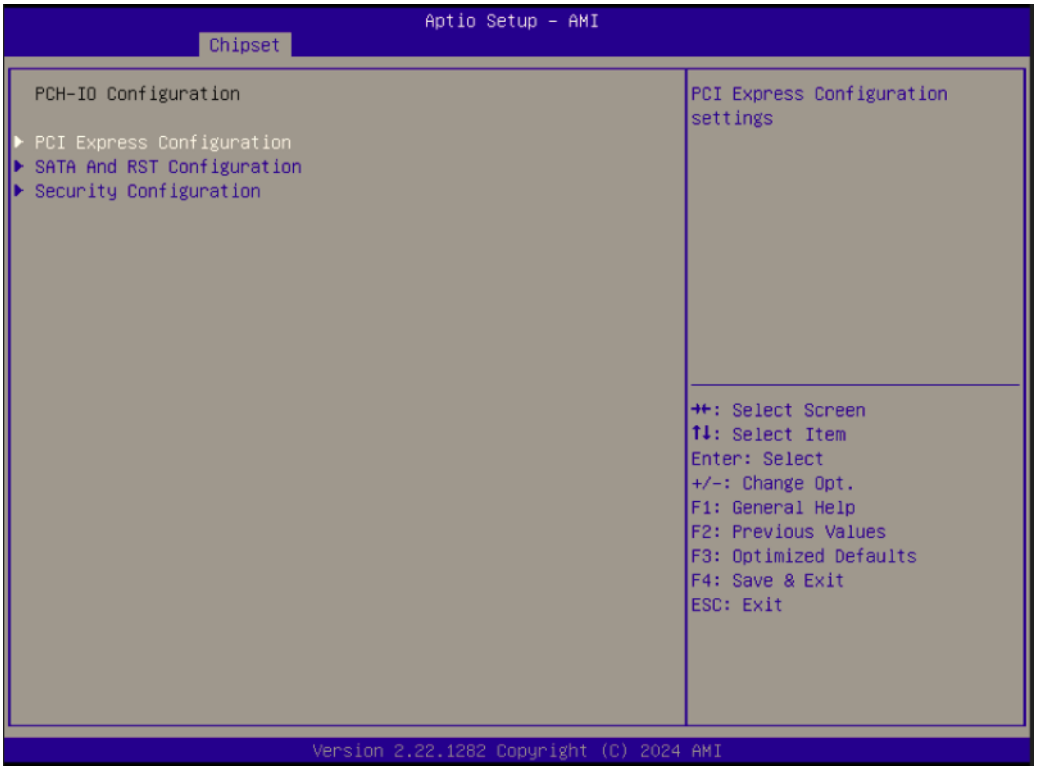


Figure 2.25 PCH-IO Configuration

- **PCI Express (from PCH) Configuration**

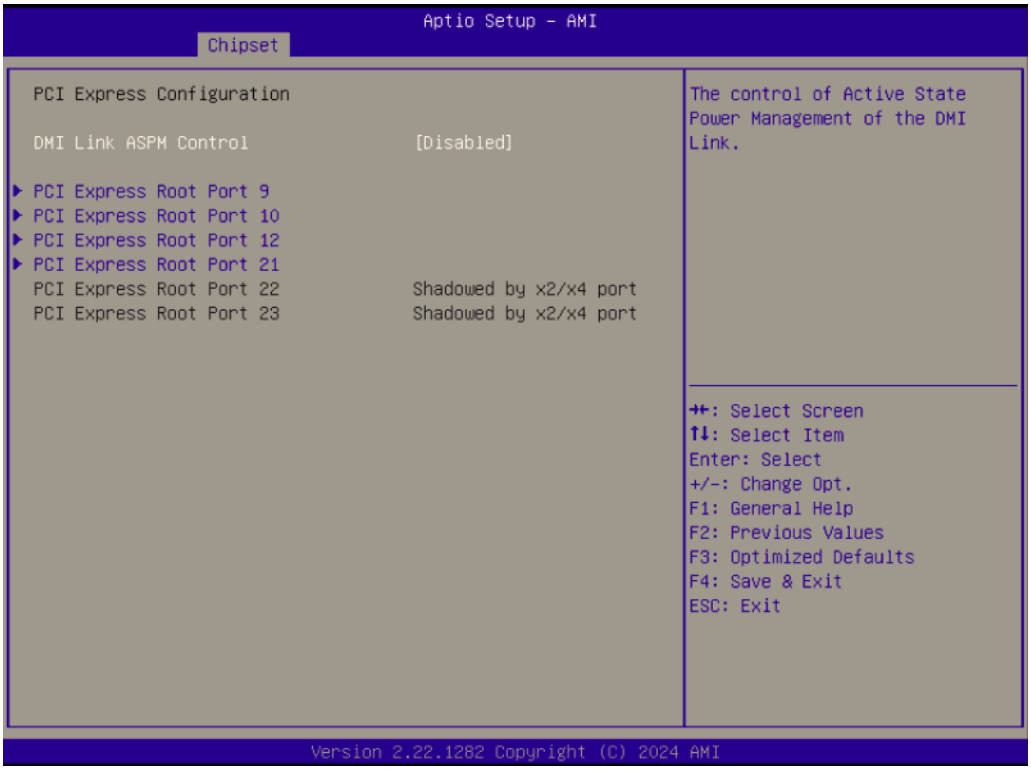


Figure 2.26 PCI Express Configuration (PCH)

There are four PCI Express root ports from the PCH that can be configured, and you can enable or disable each root port after entering its option.

SATA Configuration

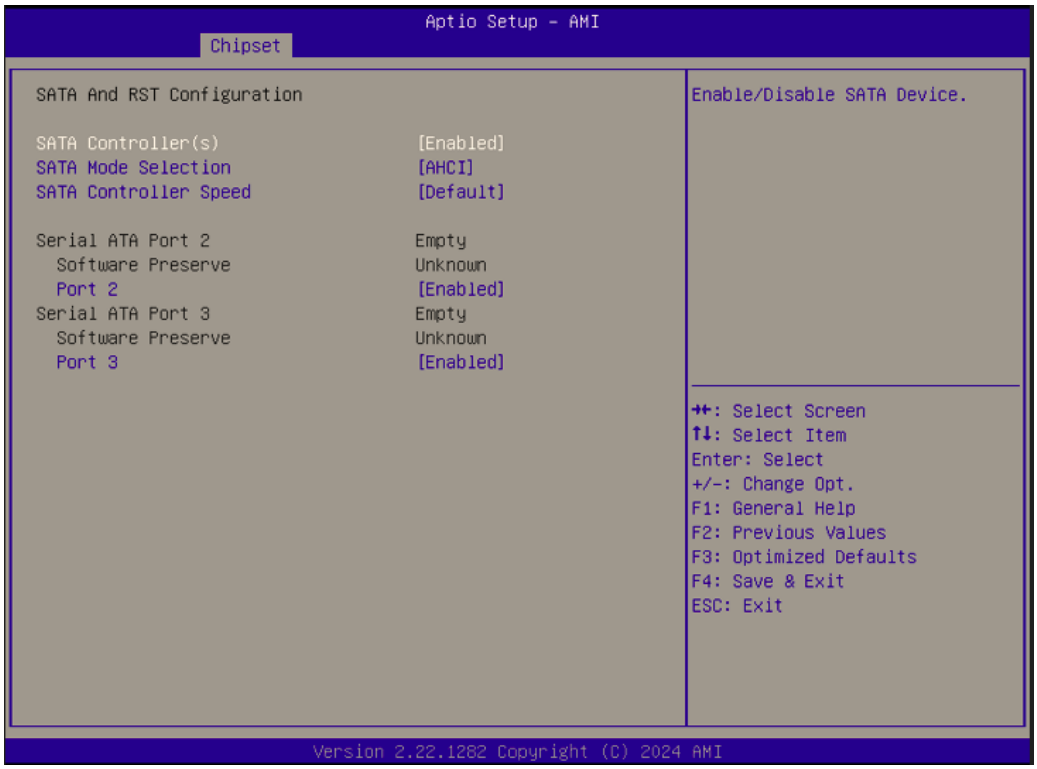


Figure 2.27 SATA Configuration

This option enables/disables a SATA Device.

Security Configuration

Figure 2.28 Security Configuration

This option enables or disables the PCH BIOS lock feature. It must be enabled to ensure SMM protection of the flash memory.

2.3.4 Security

Figure 2.29 Security Settings

- **Administrator Password**
  Set Administrator Password.
- **User Password**
  Set User Password.

2.3.5 Boot

Enter the Boot tab from the BIOS setup screen. Users can select any item in the left frame of the screen to go to the sub menu for that item. Users can display a Boot Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section. The Setup screens are shown below. The sub menus are described on the following pages.

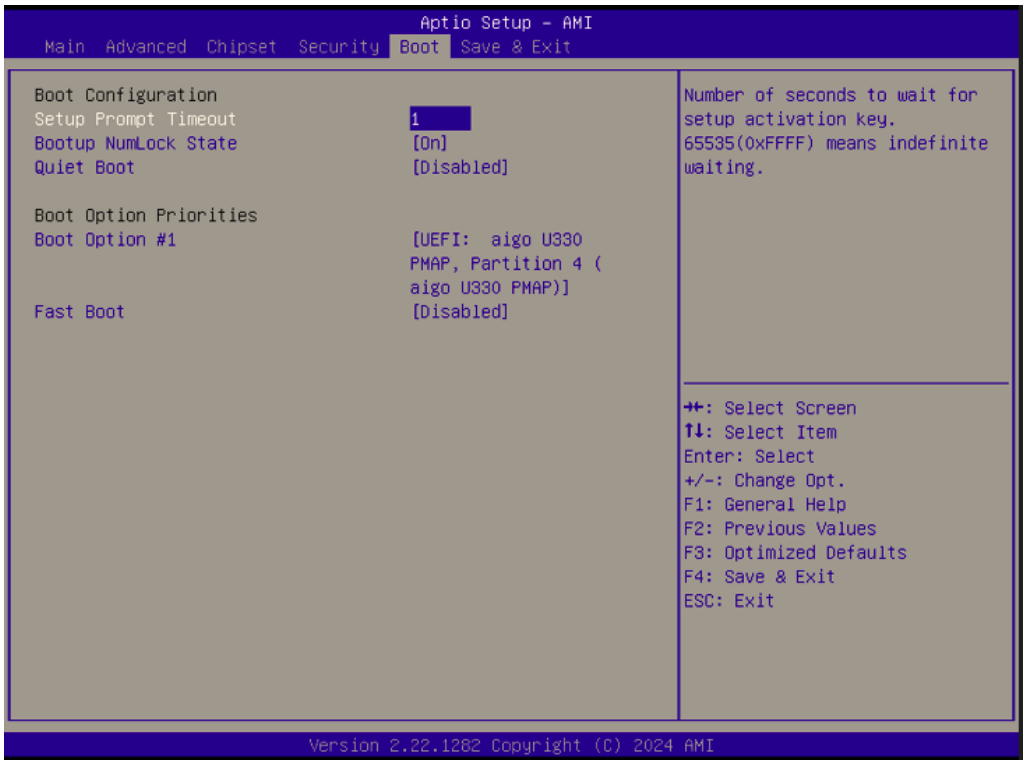


Figure 2.30 Boot Configuration

Boot Configuration Settings

- **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key.
  65535 (0xFFFF) means indefinite waiting.
- **Boot up NumLock State**
  Select the keyboard NumLock state. If set to "ON," NumLock will remain enabled after booting. If set to "OFF," NumLock will remain disabled after booting.
- **Quiet Boot**
  Enable or disable Quiet Boot option. If this option is set to Disabled, the BIOS display normal POST messages. If enabled, an OEM Logo is shown instead of POST messages.
- **Boot Option**
  Boot Option #1
  Boot Option #2
  The option shows the boot priority of devices.
- **Fast Boot**
  Enables/disables boot with initialization of a minimal set of devices required to launch the active boot option. This has no effect for BBS boot options.

2.3.6 Save & Exit

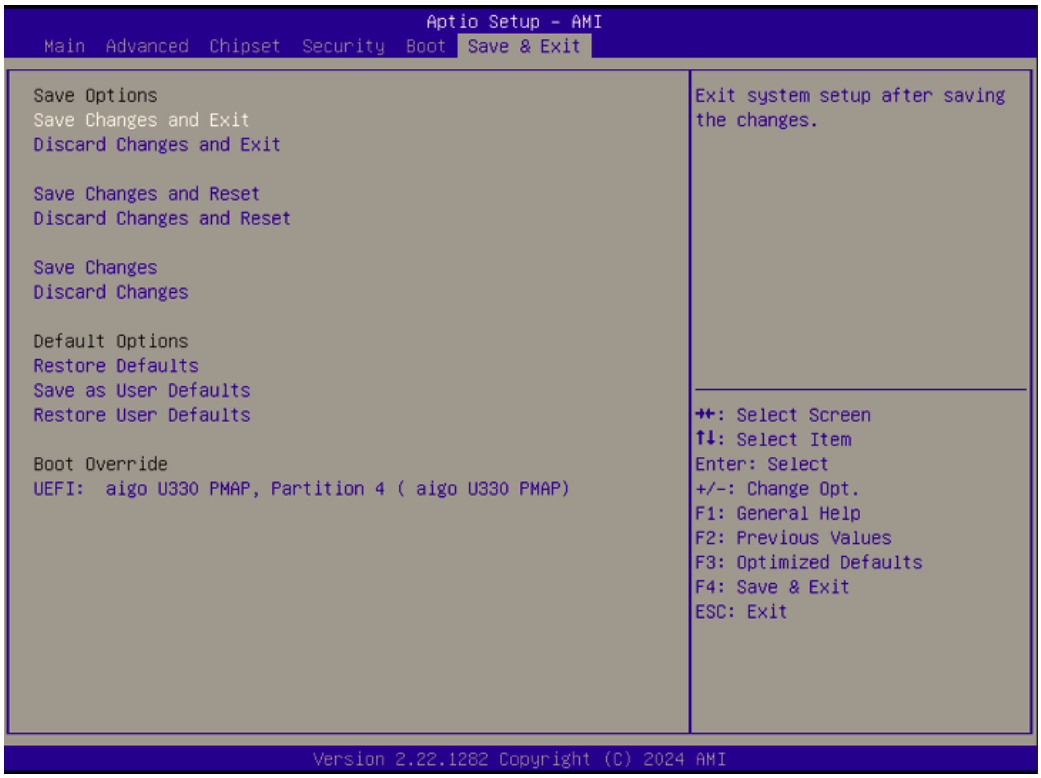


Figure 2.31 Save & Exit

- **Save Changes and Exit**
  When users have completed system configuration, select this option to save changes, exit BIOS setup menu and reboot the computer to take effect of all system configuration parameters.
  – Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
  – Select Ok or cancel.
- **Discard Changes and Exit**
  Select this option to quit Setup without making any permanent changes to the system configuration.
  – Select Discard Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
  – Select Ok to discard changes and exit. Discard Changes: Select Discard Changes from the Exit menu and press <Enter>.
- **Save changes and reset**
  Reset the system after saving the changes.
- **Discard changes and reset**
  Reset system setup without saving any changes.
- **Save changes**
  Save Changes done so far to any of the setup options.
- **Discard changes**
  Discard Changes done so far to any of the setup options.
- **Restore Default**
  The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system perfor-

mance, but may not work best for all computer applications. In particular, do not use the Defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.

- **Save as User Default**
  Save the all current settings as a user default.
- **Restore User Default**
  Restore all settings to user default values.
- **Boot Override**
  This option shows the boot device for you to choose.

Appendix A

Pin Assignments

This appendix describes pin assignments.

A.1 P1~P5 Connector Pin Definitions

Table A.1: P1~P5 Connector Pin Definitions (1)						
Pin	**A**	**B**	**C**	**D**	**E**	**F**
5-06	5_PE_CLKE#	5_PE_CLK+	5_PE_CLK-	6_PE_CLKE#	6_PE_CLK+	6_PE_CLK-
5-05	1_PE_CLK+	1_PE_CLK-	1_PE_CLKE#	2_PE_CLK+	2_PE_CLK-	2_PE_CLKE#
5-04	GND	NC	NC	GND	NC	NC
5-03	8_PE_Tx00+	8_PE_Tx00-	GND	8_PE_Rx00+	8_PE_Rx00-	GND
5-02	GND	NC	NC	GND	NC	NC
5-01	7_PE_Tx00+	7_PE_Tx00-	GND	7_PE_Rx00+	7_PE_Rx00-	GND
4-08	GND	6_PE_Tx02+	6_PE_Tx02-	GND	6_PE_Rx02+	6_PE_Rx02-
4-07	6_PE_Tx00+	6_PE_Tx00-	GND	6_PE_Rx00+	6_PE_Rx00-	GND
4-06	GND	5_PE_Tx02+	5_PE_Tx02-	GND	5_PE_Rx02+	5_PE_Rx02-
4-05	5_PE_Tx00+	5_PE_Tx00-	GND	5_PE_Rx00+	5_PE_Rx00-	GND
4-04	GND	4_PE_Tx02+	4_PE_Tx02-	GND	4_PE_Rx02+	4_PE_Rx02-
4-03	4_PE_Tx00+	4_PE_Tx00-	GND	4_PE_Rx00+	4_PE_Rx00-	GND
4-02	GND	3_PE_Tx02+	3_PE_Tx02-	GND	3_PE_Rx02+	3_PE_Rx02-
4-01	3_PE_Tx00+	3_PE_Tx00-	GND	3_PE_Rx00+	3_PE_Rx00-	GND
3-08	GND	7_SATA_Tx+	7_SATA_Tx-	GND	7_SATA_Rx+	7_SATA_Rx-
3-07	NC	NC	GND	NC	NC	GND
3-06	GND	NC	NC	GND	TCP2_TXRX-_N0 (rsvd)	TCP2_TXRX-_P0 (rsvd)
3-05	DDI3_HPD (rsvd)	NC	GND	TCP2_AUX- (rsvd)	TCP2_AUX+ (rsvd)	GND
3-04	GND	NC	NC	GND	NC	NC
3-03	4_USB3_Tx+	4_USB3_Tx-	GND	4_USB3_Rx+	4_USB3_Rx-	GND
3-02	GND	2_USB3_Tx+	2_USB3_Tx-	GND	2_USB3_Rx+	2_USB3_Rx-
3-01	5_USB2+	5_USB2-	GND	6_USB2+	6_USB2-	GND
2-08	GND	GPIO (rsvd)	GPIO (rsvd)	GND	2_USB2+	2_USB2-
2-07	GPIO (rsvd)	GPIO (rsvd)	GND	GPIO (rsvd)	NC	GND
2-06	GND	2_PE_Tx06+	2_PE_Tx06-	GND	2_PE_Rx06+	2_PE_Rx06-
2-05	2_PE_Tx04+	2_PE_Tx04-	GND	2_PE_Rx04+	2_PE_Rx04-	GND
2-04	GND	2_PE_Tx02+	2_PE_Tx02-	GND	2_PE_Rx02+	2_PE_Rx02-
2-03	2_PE_Tx00+	2_PE_Tx00-	GND	2_PE_Rx00+	2_PE_Rx00-	GND
2-02	GND	1_PE_Tx06+	1_PE_Tx06-	GND	1_PE_Rx06+	1_PE_Rx06-
2-01	1_PE_Tx04+	1_PE_Tx04-	GND	1_PE_Rx04+	1_PE_Rx04-	GND
1-06	GND	1_PE_TX02+	1_PE_TX02-	GND	1_PE_RX02+	1_PE_RX02-
1-05	1_PE_TX00+	1_PE_TX00-	GND	1_PE_RX00+	1_PE_RX00-	GND
1-04	GND	1_USB2+	1_USB2-	GND	NC	NC
1-03	1_USB3_TX+	1_USB3_TX-	PWRBTN#	1_USB3_RX+	1_USB3_RX-	PWR_FAIL# (rsvd)
1-02	GND	I2C_SCL	I2C_SDA	GND	PS_ON#	RST#
1-01	+12V	STANDBY	GND	+12V	+12V	GND

Note! *1. NC: No Connection*

2. #: Active Low

3. DP port on P3 reserved for RIO DP connector and 5 GPIO on P2 for special purpose, not standard CPCI-Serial pin Definition.

4. "rsvd" represents reserved function, not ready now.

Table A.2: P1~P5 Connector Pin Definitions (2)						
Pin	**G**	**H**	**I**	**J**	**K**	**L**
5-06	7_PE_CLKE#	7_PE_CLK+	7_PE_CLK-	8_PE_CLKE#	8_PE_CLK+	8_PE_CLK-
5-05	3_PE_CLK+	3_PE_CLK-	3_PE_CLKE#	4_PE_CLK+	4_PE_CLK-	4_PE_CLKE#
5-04	GND	NC	NC	GND	NC	NC
5-03	NC	NC	GND	NC	NC	GND
5-02	GND	NC	NC	GND	NC	NC
5-01	NC	NC	GND	NC	NC	GND
4-08	GND	6_PE_Tx03+	6_PE_Tx03-	GND	6_PE_Rx03+	6_PE_Rx03-
4-07	6_PE_Tx01+	6_PE_Tx01-	GND	6_PE_Rx01+	6_PE_Rx01-	GND
4-06	GND	5_PE_Tx03+	5_PE_Tx03-	GND	5_PE_Rx03+	5_PE_Rx03-
4-05	5_PE_Tx01+	5_PE_Tx01-	GND	5_PE_Rx01+	5_PE_Rx01-	GND
4-04	GND	4_PE_Tx03+	4_PE_Tx03-	GND	4_PE_Rx03+	4_PE_Rx03-
4-03	4_PE_Tx01+	4_PE_Tx01-	GND	4_PE_Rx01+	4_PE_Rx01-	GND
4-02	GND	3_PE_Tx03+	3_PE_Tx03-	GND	3_PE_Rx03+	3_PE_Rx03-
4-01	3_PE_Tx01+	3_PE_Tx01-	GND	3_PE_Rx01+	3_PE_Rx01-	GND
3-08	GND	8_SATA_Tx+	8_SATA_Tx-	GND	8_SATA_Rx+	8_SATA_Rx-
3-07	NC	NC	GND	NC	NC	GND
3-06	GND	NC	NC	GND	NC	NC
3-05	NC	NC	GND	TCP2_TXRX-_N1 (rsvd)	TCP2_TXRX-_P1 (rsvd)	GND
3-04	GND	TCP2_TX_N0 (rsvd)	TCP2_TX_P0 (rsvd)	GND	TCP2_TX_N1 (rsvd)	TCP2_TX_P1 (rsvd)
3-03	NC	NC	GND	NC	NC	GND
3-02	GND	3_USB3_Tx+	3_USB3_Tx-	GND	3_USB3_Tx+	3_USB3_Tx-
3-01	7_USB2+	7_USB2-	GND	8_USB2+	8_USB2-	GND
2-08	GND	3_USB2+	3_USB2-	NC	4_USB2+	4_USB2-
2-07	FAN_TACH (rsvd)	FAN_TACH (rsvd)	GND	FAN_PWM (rsvd)	FAN_PWM (rsvd)	GND
2-06	GND	2_PE_Tx07+	2_PE_Tx07-	GND	2_PE_Rx07+	2_PE_Rx07-
2-05	2_PE_Tx05+	2_PE_Tx05-	GND	2_PE_Rx05+	2_PE_Rx05-	GND
2-04	GND	2_PE_Tx03+	2_PE_Tx03-	GND	2_PE_Rx03+	2_PE_Rx03-
2-03	2_PE_Tx01+	2_PE_Tx01-	GND	2_PE_Rx01+	2_PE_Rx01-	GND
2-02	GND	1_PE_Tx07+	1_PE_Tx07-	GND	1_PE_Rx07+	1_PE_Rx07-
2-01	1_PE_Tx05+	1_PE_Tx05-	GND	1_PE_Rx05+	1_PE_Rx05-	GND
1-06	GND	1_PE_TX03+	1_PE_TX03-	GND	1_PE_RX03+	1_PE_RX03-
1-05	1_PE_TX01+	1_PE_TX01-	GND	1_PE_RX01+	1_PE_RX01-	GND
1-04	GND	NC	NC	GND	NC	NC
1-03	SATA_SD3 (rsvd)	SATA_SDO (rsvd)	GND/GA2	SATA_SCL (rsvd)	SATA_SL (rsvd)	GND/GA3
1-02	GND	PRST# (rsvd)	WAKE_IN# (n.a.)	GND	NC	SYSEN#
1-01	+12V	+12V	GND	+12V	+12V	GND

Note! *1. NC: No Connection*

2. #: Active Low

3. DP port on P3 reserved for RIO DP connector for special purpose, not standard CPCI-Serial pin Definition

4. "rsvd" represents reserved function, not ready now

5. "n.a" represents not available

A.2 P6 Connector Pin Definitions on M-1/M-2 Board

Table A.3: P6 Connector Pin Definitions on M-1/M-2 Board

	Pin	A	B	C	D	E	F
P6 Mazzanine side card-2	6-08	GND	NC	NC	GND	NC	NC
	6-07	NC	NC	GND	NC	NC	GND
	6-06	GND	NC	NC	GND	NC	NC
	6-05	NC	NC	GND	NC	NC	GND
	6-04	GND	4_ETH_A+	4_ETH_A-	GND	4_ETH_B+	4_ETH_B-
	6-03	3_ETH_A+	3_ETH_A-	GND	3_ETH_B+	3_ETH_B-	GND
	6-02	GND	2_ETH_A+	2_ETH_A-	GND	2_ETH_B+	2_ETH_B-
	6-01	1_ETH_A+	1_ETH_A-	GND	1_ETH_B+	1_ETH_B-	GND
P6 Mazzanine side card-1	6-08	GND	NC	NC	GND	NC	NC
	6-07	NC	NC	GND	NC	NC	GND
	6-06	GND	NC	NC	GND	NC	NC
	6-05	NC	NC	GND	NC	NC	GND
	6-04	GND	NC	NC	GND	NC	NC
	6-03	NC	NC	GND	NC	NC	GND
	6-02	GND	2_ETH_A+	2_ETH_A-	GND	2_ETH_B+	2_ETH_B-
	6-01	1_ETH_A+	1_ETH_A-	GND	1_ETH_B+	1_ETH_B-	GND
	Pin	**G**	**H**	**I**	**J**	**K**	**L**
P6 Mazzanine side card-2	6-08	GND	NC	NC	GND	NC	NC
	6-07	NC	NC	GND	NC	NC	GND
	6-06	GND	NC	NC	GND	NC	NC
	6-05	NC	NC	GND	NC	NC	GND
	6-04	GND	4_ETH_C+	4_ETH_C-	GND	4_ETH_D+	4_ETH_D-
	6-03	3_ETH_C+	3_ETH_C-	GND	3_ETH_D+	3_ETH_D-	GND
	6-02	GND	2_ETH_C+	2_ETH_C-	GND	2_ETH_D+	2_ETH_D-
	6-01	1_ETH_C+	1_ETH_C-	GND	1_ETH_D+	1_ETH_D-	GND
P6 Mazzanine side card-1	6-08	GND	NC	NC	GND	NC	NC
	6-07	NC	NC	GND	NC	NC	GND
	6-06	GND	NC	NC	GND	NC	NC
	6-05	NA	NC	GND	NC	NC	GND
	6-04	GND	NC	NC	GND	NC	NC
	6-03	NA	NC	GND	NC	NC	GND
	6-02	GND	2_ETH_C+	2_ETH_C-	GND	2_ETH_D+	2_ETH_D-
	6-01	1_ETH_C+	1_ETH_C-	GND	1_ETH_D+	1_ETH_D-	GND

Note!

1. NC: No Connection.

2. #: Active Low.

3. Ethernet port 1/2 on Mezzanine side card-2 are switchable between front I/O and P6, and default are Switched to front I/O.

Appendix B

Embedded Controller

This appendix describe EC configuration.

B.1 Features

- **Power Sequence**
- **Hardware Monitor:**
  - Voltage: Including +12V_HOT, +V5, VBAT status, will show in BIOS setup menu;
  - Thermal: CPU temperature will show in BIOS setup menu;
  - FAN Speed: reserved, will customize by customer request.
- **LED:**
  - 80 port LED
  - USR (USER_LED)
    Default: Green on
  - PWR (PWROK_LED)
    ◊ On: Handle Switch on and power good
    ◊ Flash: Handle Switch off and power good
    ◊ Off: Power not ready
  - H/S (BLUE_LED)
    ◊ On: System boot on
    ◊ Off: System shutdown
  - M/D (Drone Mode)
    ◊ On: Peripheral slot
    ◊ Off: motherboard slot
- **Button/Switch:**
  - Handle Switch: System boot on/system boot off by OS power button behavior
  - RST_BT1: reset system
- **Watchdog:**
  - Reset
  - Power Cycle
  - IRQ
- Fan/SMBus/Thermal protect/UART/GPIO reserved, will customized by customer request.

Appendix C

Glossary

Table C.1: Glossary	
ACPI	Advanced Configuration and Power Interface
API	Application Programming Interface
BIOS	Basic Input/Output System
CPU	Central Processing Unit
CPCI	CompactPCI
DDR4	Double Data Rate 4
ECC	Error Checking and Correction
FCBGA	Flip Chip BGA
Flash	Flash memory
FPGA	Field Programmable Gate Array
FRU	Field Replaceable Unit
GbE	Gigabit Ethernet
GPIO	General Purpose Input/Output
HDD	Hard Disk Drive
HW	HardWare
I/O	Input/Output
IC	Integrated Circuit
I2C	Inter Integrated Circuit
LPC	Low Pin Count
MAC	Medium Access Control
PCI	Peripheral Component Interconnect
PCIe	Peripheral Component Interconnect Express
RIO	Rear Input/Output
RS-232	Recommended Standard 232
RTC	Real Time Clock
RTM	Rear Transition Module
SATA	Serial Advanced Technology Attachment
SEL	System Event Log
SPD	Serial Presence Detect
SPI	Serial Peripheral Interface
SW	SoftWare
UART	Universal Asynchronus Receiver Transmitter
USB	Universal Serial Bus

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