User Manual

ECU-579 Series Hardware

Intel® Xeon® Processer Scalable Family IEC-61850 Server with 4 x 1 GB LAN, 4 x SATA, 1 x M.2, 2 x hot swap power

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Acknowledgments

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For technical support services, please visit our support website at

http://www.advantech.com.cn/support/

This manual is for ECU-579 Series.

Part No.2003237260 Edition 1

Printed in China September 2020

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 at no charge during the warranty period. For out-of-warranty repairs, customers are billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you suspect that your product is defective product, 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 merchandize 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 proofof 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 packaging, and ship the package prepaid to your dealer.

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 such cases, users are required to correct the interference at their own expense.

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 you call:
   - 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

Safety Precaution - 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. The sudden rush of power when connecting a jumper or installing a card may damage sensitive electronic components.

Safety Instructions

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid or spray detergents.
4. For pluggable equipment, the power outlet socket should 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 one 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 THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE MAY GO FROM-20 TO 60 °C(-4 ~ 140 °F). THIS COULD DAMAGE THE EQUIPMENT. THE EQUIPMENT SHOULD BE IN A CONTROLLED ENVIRONMENT.
16. 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.
17. Due to the sensitive nature of the equipment it must be stored in a restricted access location, only accessible by qualified engineers.
18. When installing this equipment, ensure that the Earth cable is securely attached using a 3.5 mm screw.
19. The equipment does not include a power cord and plug. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).

DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

Contents

Chapter 1

Overview

This chapter provides an overview of the ECU-579 Series specifications.
Sections include:

- Introduction
- Hardware Specifications
- Safety Precautions
- Block Diagram
- Chassis Dimensions
- Packing List

1.1 Introduction

An upgrading implement of smart grid technologies is called for a new era motivated by the essential requirement of rugged computing platforms with faster processors and an increase in reliable storage capacity in a modern Substation Automation System. To fulfill the performance requirements that attributed to modern, distributed software applications which require fast processing, Advantech offers ECU-579 which is targeted at Advanced Server level data concentrator and protocol convertor in scenarios like substations automation, energy management and Secondary communication and control etc.

During the past years, substations are already managed under the well established SCADA OT system, and now the next step is coming for virtualization and more centralized computing to better match the requirement of the energy efficiency as well as the immediacy and flexibility to get optimized based on the spawned entire cloud as-a-service business model.

ECU-579 is certified with IEC 61850-3, the standard for the design of electrical substation automation, which provide higher reliability and stability, suitable for any Global Power & Energy automation market and defines communication between all Intelligent Electronic Devices (IED) and other related equipment from the process level (data acquisition, sensors and actuators), providing high performance and reliable functionality to meet the most critical computing applications, and supporting remote monitoring and diagnosis for the remote device connectivity to enhance maintenance efficiency.

Isolation & High Speed Communication Interface

- Comprehensive communication interface to use for Smart substation Communication server and IED Analyzer to implement Data Gateway & Protocol Conversion easily, support for variety of protocol (IEC-60870-104, DNP3.0 etc.).
- Network interface are required to respond to real-time data and collect high density network packets, handle accurately to facilitate data analysis.
- Flexible With versatile communication interface: IED Analyzer to fulfill the Data Gateway & Protocol Conversion requirement easily.

Easy to Diagnose System & Communication and Enhance Efficiency Maintenance

- Remote Diagnose and manage System to provide the high system maintenance efficiency.
- The rear IO connection and LEDs on front panel for all ports and modes, simplify the monitoring status for operation.

Fast and Easy for Configuration Customization

- Structured and functional module Internal design for easy customization and Fast assembly to fulfill the different kind of application by COTS manufacture Process.
- Customer Focused Service provide Fast response for customization development request based on this product's main hardware structure.

1.2 Hardware Specifications

1.2.1 General

- **Certification:** CE, FCC Class A, IEC61850-3, IEEE 1613
- **Dimensions (W x D x H):** 440 x 460 x 88 mm
- **Enclosure:** SECC & Aluminum
- **Mounting:** 2U 19” Rackmount
- **Power Requirements:**
  - Power 1: 100 ~ 240 V_{AC} (47 ~ 63 Hz)
  - Power 2: 100 ~ 240 V_{AC} (47 ~ 63 Hz)
- **Weight:** 11 kg
- **OS Support:** Window10, Window server 2019, Linux redhat/CentOS 7.8

1.2.2 System Hardware

- **CPU:** Intel Xeon Scalable to be selected and assembled
- **Memory:** DDR4 REG-ECC (4 GB, 8 GB, 16 GB, 32 GB) x 12 slots up to 768 GB
- **Indicators:** LEDs for Power. HDD, Programmable LEDLAN (LINK, ACT), expansion cards
- **Storage:** hot-swappable 4 x 2.5" SATA HDD (RAID0, RAID1, RAID5, RAID10) 1 x m.2 SATA
- **Display:** 1 x DB15 VGA; 2 x DVI-D

1.2.3 I/O Interface

- **Ethernet:** 4 x Giga RJ-45 ports
- **USB Ports:** 3 x USB, Rev. 3.0 compliant
- **Display:**
  - 1 X VGA, DDR4 Max 1 GB, 64 MB VRAM
  - 2 x DVI-D, Display Resolution HD (1920 x 1080) & 2K @60 Hz
- **LED Indicator:** LED for power,SATA,LAN, and programmable
- **SATA disk tray:** 4 x 2.5" hotswap SATA HDD (RAID0, RAID1, RAID5,RAID10)

1.2.4 Environment

- Humidity: 95% @ 40 °C (non-condensing)
- Operating Temperature: -20~60 °C(-4 ~ 140 °F), IEC 60068-2-2 with 100% CPU/ I/O loading, 24 hrs
- Operating Humidity: 5 ~ 95% RH (non-condensing)
- Storage Humidity: 5 ~ 95% RH (non-condensing)
- Shock Protection: IEC 68 2-27 m-SATA: 30 G half sine,11 ms
- Vibration Protection: IEC 68-2-64 (Random 1 Oct./min, 1 hr/axis.) m-SATA: 2Grms @ 5 ~ 500Hz

1.3 Function Block Diagram

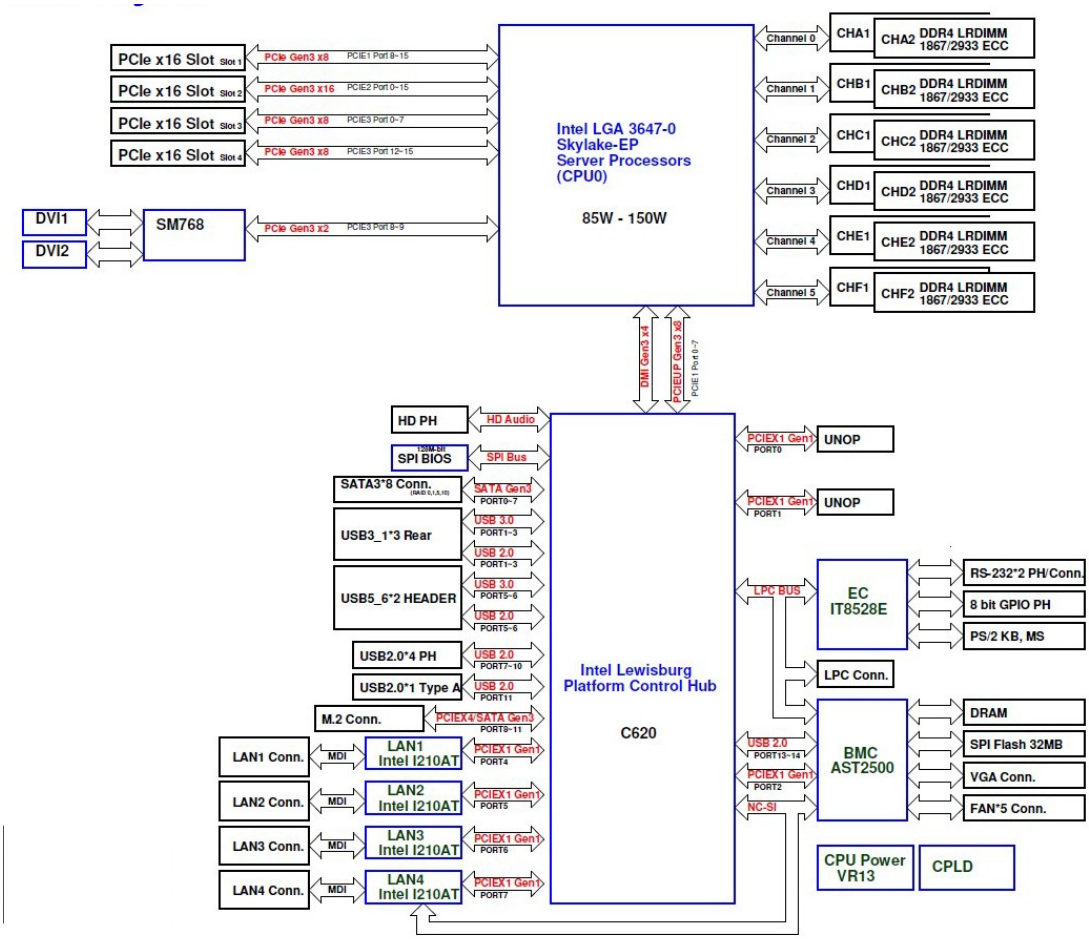


Figure 1.1 ECU-579 Series Product Function Block

1.4 Safety Precautions

The following messages inform how to make each connection. In most cases, you will simply need to connect a standard cable.

Warning! *Always disconnect the power cord from your chassis whenever you are working on it. Do not connect while the power is on. A sudden rush of power can damage sensitive electronic components. Only experienced electronics personnel should open the chassis.*

Caution! *Always ground yourself to remove any static electric charge before touching ECU-579 Series. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static shielded bag.*

Note! *If DC voltage is supplied by an external circuit, please put a protection device in the power supply input port.*

1.5 Chassis Dimensions

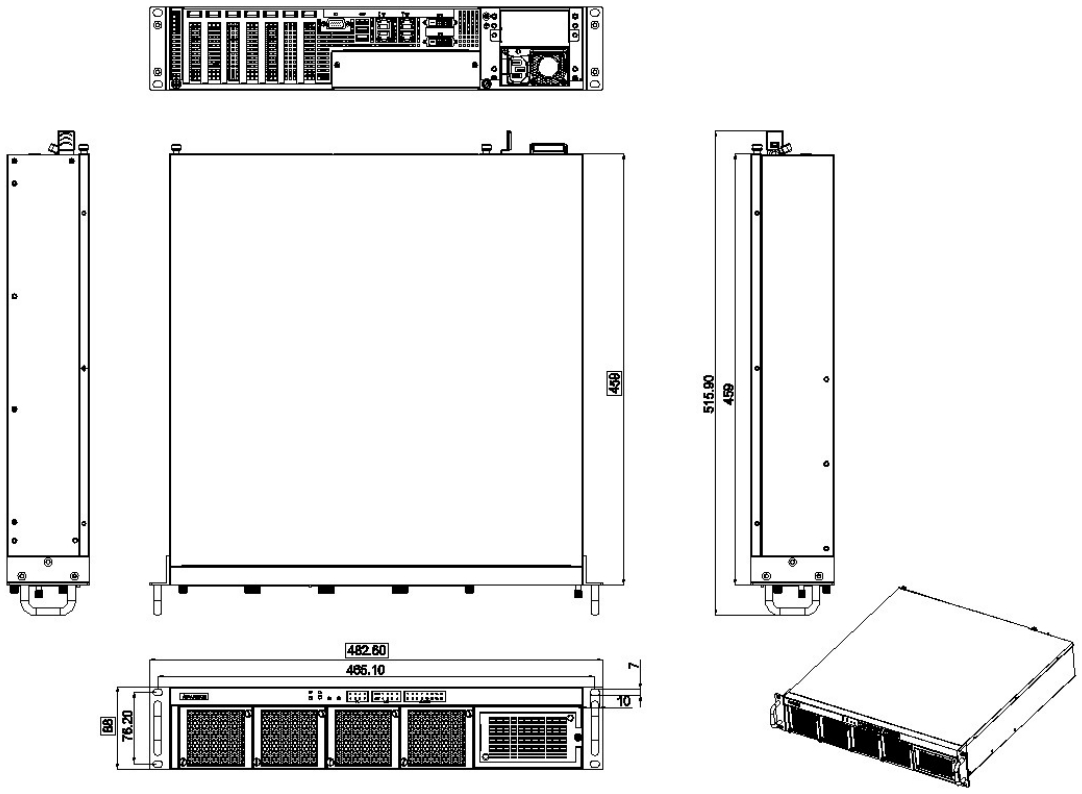


Figure 1.2 ECU-579 Chassis Dimensions

1.6 Packing List

The package of ECU-579 Series contains the following items:

- ECU-579 Product
- Accessory box (Screw, Jumper, 1 x Start up manual)
- 1 x warranty card (D)
- 1 x ROHS LIST

Chapter 2

Hardware Specification

This chapter shows,
Sections include:

- Overview
- Front Elements (LED, FAN, SATA Slots)
- Power Input
- Ethernet Interface (On board)
- Display Interface
- USB
- Expansion Functions
- Storage (SATA, M.2)
- Processors
- Memory
- TPM
- Platform Features Description
- Available Accessories

2.1 Overview

2.1.1 ECU-4784 LED and Interface position

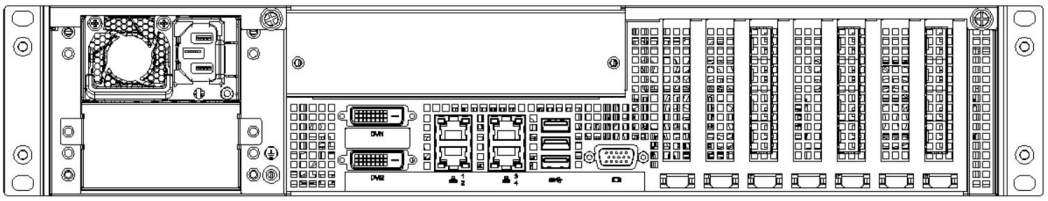


Figure 2.1 ECU-579 Front Panel

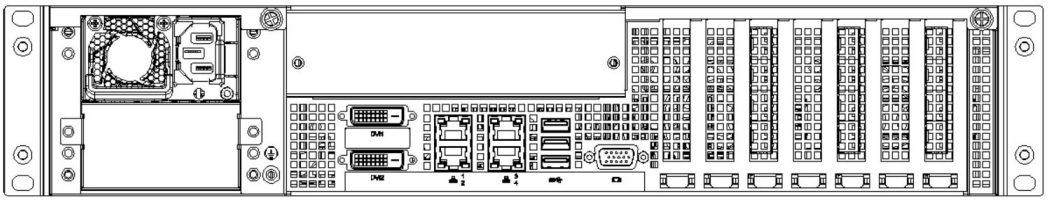
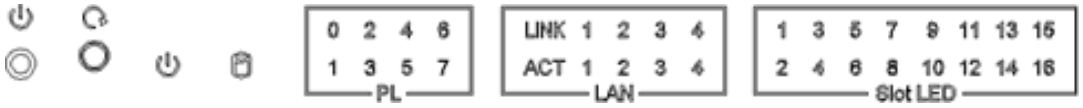


Figure 2.2 ECU-579 Rear Panel

2.2 Front Elements

2.2.1 LED Indicators

The LEDs in the front panel can be divided into 4 groups.



2.2.1.1 System Status Indicators

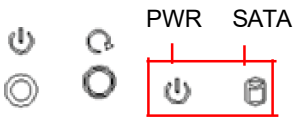


Table 2.1: Definition of System Status Indicators

LED	Status	Description
PWR	Green	System power1 or 2 is on
	Off	System power1 and 2 is off
SATA	Green	Data is transmitting
	Off	No data is transmitting

2.2.1.2 LAN Status Indicators

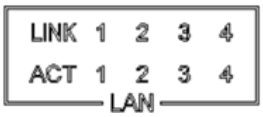
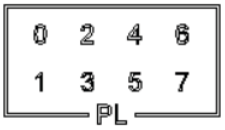


Table 2.2: Definition of System Status Indicators

Item	LED	Status	Description
1	LAN/LINK (Port 1~4)	Green	1 Gbps network link
		Orange	100 Mbps network link
		Off	10 Mbps network link or invalid network link
2	LAN/ACT (Port 1~4)	Green	Ethernet date being received/ transmitted
		Off	Invalid network link

2.2.1.3 Programmable LED



The ECU-579 Series products provide 8 programmable indicating LEDs, which are convenient for users to control the Programmable LED state (green, off) using API programming, it can be used to indicate and edit this machines operating status, a detailed explanation of the API programming.

Table 2.3: Programmable LED Status Indicators

LED	Status	Description
PL (0 ~ 7)	Green	Customers can, according to their needs, define the Programmable LED state
	Off	

There are up to 8 LEDs (LED0~LED7) and could control and monitor the status (On / Off), The Advantech Programmable LED Driver provides examples on how to use the ECU-579's Programmable LED and offering reference for users to develop their own applications. You can modify these sample applications to meet your requirements.

2.2.1.4 Slot LED

The Slot LED defined differently according to the corresponding expansion card, here we take the LED definition of UNOP-1514RE/PE as example to show how it is defined, and other LED definition according to the description of the relevant expansion card, manual accordingly.

Below picture showing the LED number definition for UNOP-1514RE/PE:

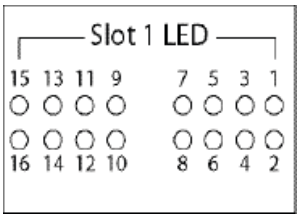


Table 2.4: Ex. UNOP-1524PE/RE LED Status Indicators

LED No.	LAN Status	LED Status	Description
1	LAN 1 Active	White (Blink)	Data being received/transmitted
		Off	No data being received/transmitted
2	LAN 1 Link	White	10 Mbps/100 Mbps/1 Gbps network link
		Off	Invalid network link
3	LAN 2 Active	White (Blink)	Data being received/transmitted
		Off	No data being received/transmitted
4	LAN 2 Link	White	10 Mbps/100 Mbps/1 Gbps network link
		Off	Invalid network link
5	LAN 3 Active	White (Blink)	Data being received/transmitted
		Off	No data being received
6	LAN 3 Link	White	10 Mbps/100 Mbps/1 Gbps network link
		Off	Invalid network link
7	LAN 4 Active	White (Blink)	Data being received/transmitted
		Off	No data being received/transmitted
8	LAN 4 Link	White	10 Mbps/100 Mbps/1 Gbps network link
		Off	Invalid network link
9-16	N/A	-	-

2.2.2 Fan Modules

The ECU-579 has four fan modules at the front and three of them are hot-swappable. Each of the fan modules carries a high performance fans for optimized air flow. Each fan module is secured by two thumb screws.

We have the unique patent design to ensure no loss of fan volume, even if one of the fan module broken.

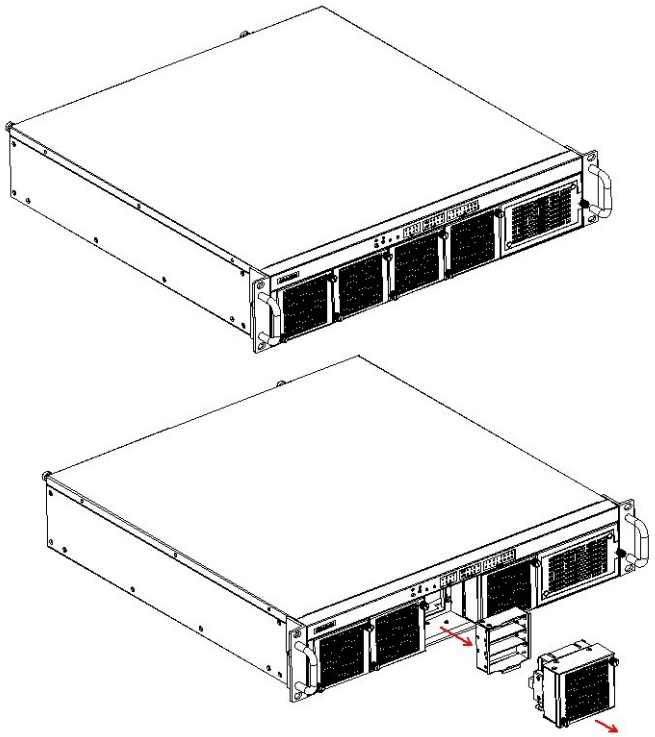


Figure 2.3 Remove the Fan module

2.2.3 Disk Bay

ECU-579 supports four hot swappable 2.5” HDDs/SSDs at the front.

Follow the steps below to install a HDD:

1. Remove the baffle on the right of the front panel, and drag out the disk tray.

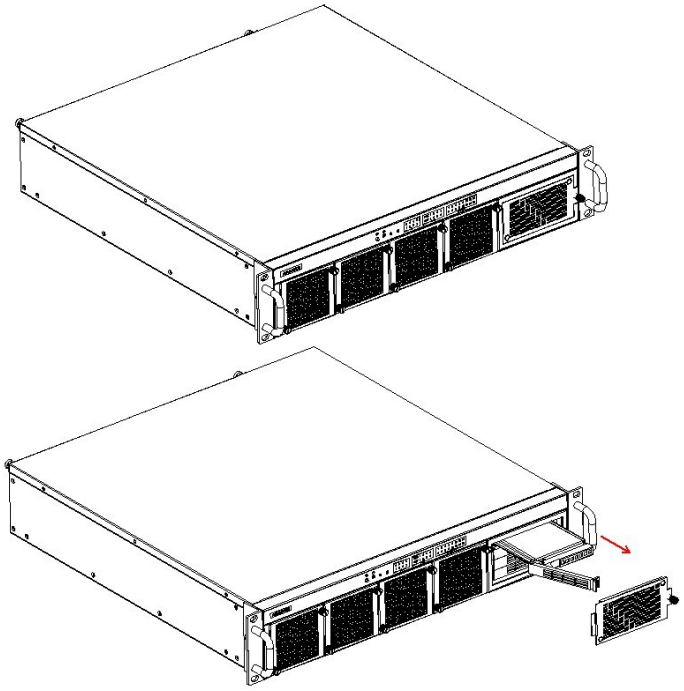


Figure 2.4 Remove the SATA baffle

2. Fix the SATA disk on to the tray and pull it back into the disk bay, and put on the baffle in front of the SATA bay.

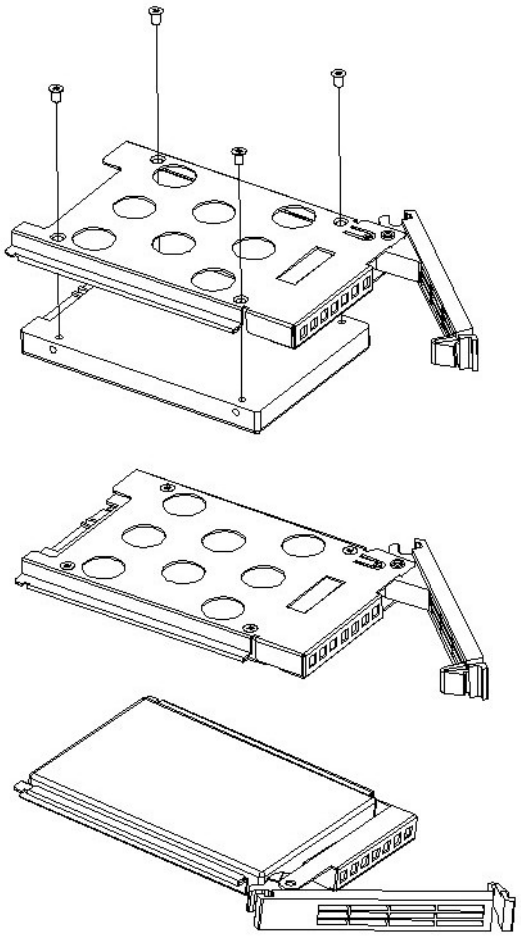


Figure 2.5 Fix the SATA disk onto the disk tray

2.3 Power Input

The ECU-579 Series products support redundant power input supporting both AC and DC.

Table 2.5: Power Input

Item	AC/DC	Volt. Range	Power Rating	Installation
	AC	100-240 V_{AC}	0.7 A 50-60 Hz	Plug in
	DC	100-240 V_{DC}	0.7 A	

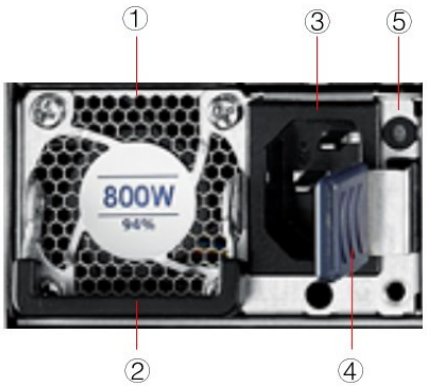


Figure 2.6 Power installation position

Table 2.6: PSU Details

Item	Element	Description
1	Fan	PSU fan and air outlet area
2	Handle	Handle for extraction / insertion
3	Power Connector	Power connector
4	Lock	Lock for locking /unlocking the module. Pull left to unlock.
5	LED	Red LED indicating a failure or degradation when lit

Table 2.7: PSU LED Status Information

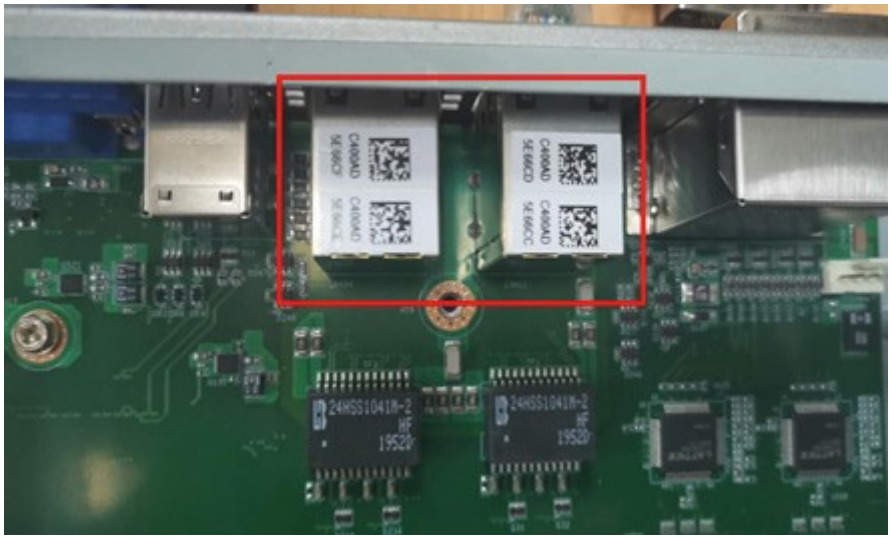
Power supply condition	Power supply LED
Output ON and OK	Green
No AC power to all PSU	OFF
AC present/only standby output on	1 Hz Flashing Green (0.5s: OFF, 0.5s: Green)
AC cord unplugged or AC power lost; with a second power supply in parallel still with AC input power.	Amber
Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan.	1 Hz Blink Amber (0.5s: OFF, 0.5s: Amber)
Power supply critical event causing a shutdown; failure, OCP, OVP, Fan Fail	Amber
Smart Redundant state	0.33 Hz Blink Green (1s: OFF, 2s: Green)
Power supply FW update mode	2 Hz Blink Green (0.25s: OFF, 0.25s: Green)

2.4 Ethernet Interface

The ECU-579 Series products are equipped with Intel 4 x Giga LAN, LAN1 port is shared with IPMI function.

2.4.1 MAC address

You can identify MAC addresses according to the labels placed on ethernet connector like below picture.



2.5 Display Interface

ECU-579 is figured with dual DVI connector and one VGA connector. You can set up the display trough BIOS.

Note! *The "onboard device" is the option for VGA output, the "PCIE device" is the option for DVI output.*

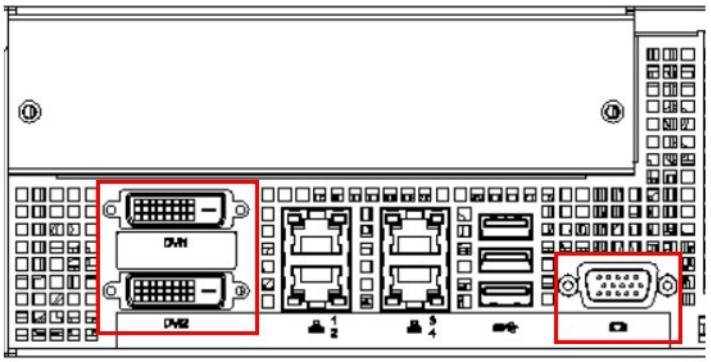


Figure 2.7 Display position

When it is the first time getting started with a bare sever, the operation system needs to be installed. UEFI is the default mode in the bare machine, and VGA is the default display for BIOS.

Below illustration about display precaution needs your attention.

Caution! *If you choose UEFI mode, both VGA and DVI could be used to display BIOS output.*

After the Windows operation system, you can use both VGA and DVI for display output (need to install "DVI SM687 driver").

If it is Linux system installed, VGA can be used as display output but DVI output needs to be tested since it will meet unstable output with variable Linux OS version.

Caution! *If you choose Legacy mode then VGA or DVI could be used to display BIOS output.*

If you install window OS then both VGA and DVI could be used to display output (need to install "DVI SM687 driver").

If you install Linux OS, VGA can be used as display output but DVI output needs to be tested since it will meet unstable output with variable Linux OS version.

2.6 USB Ports

ECU-579 are equipped with 4 USB 3.0 connector on the rear panel with transmission rates of up to 480 Mbps 5 Gbps (USB 3.0) and fuse protection are supported. The USB interface can be disabled in the system BIOS setup.

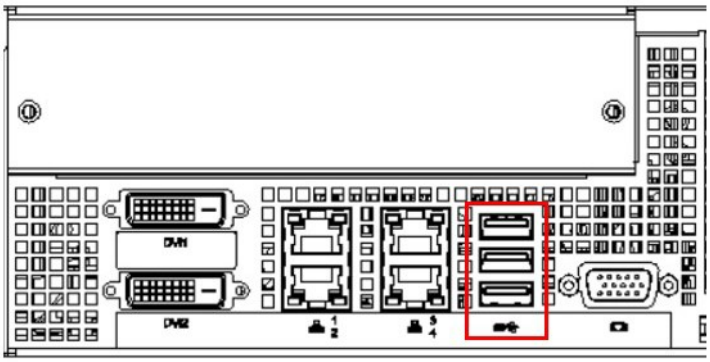


Figure 2.8 USB Ports Position

2.7 Expansion Slots

2.7.1 Expansion PCI/PCIE Slot

2.7.1.1 Expansion PCI/PCIE Slot illustration

The ECU-579 supports 1 standard Domain I/O Expansions (each supports 1PCIe and 2 PCI devices) which supports up to 2 PCI devices and 1 PCIe device. You could also install the expansion of other functions of the PCI & PCIe interface to meet customer's demand.

The ECU-579 Series offers 2 expansion slots for modularized domain I/O plug-incards. Through the interface card, the ECU-579 Series can also use standard PCI cards, PCIe cards, mini-PCI cards as well as the PCI-104 card. Due to the ECU-579 Series being an embedded system, the power providing for the expansion slot is limited.

The maximum power support for each slot is:

5 V @ 2 A

3.3 V @ 1.5 A

12 V @ 0.25 A

And totally support maximum 25 W (at 50 °C condition) for all slots. Before you configure all the module and plug-in card, please note not to exceed the power limit.

2.7.1.2 Expansion PCI/PCIE card list

Below is the expansion card list compatible for ECU-579 for reference:

Table 2.8: Expansion PCI/PCIE card list

ECU Standard PN	Description
ECU-P1618D-AE	8-port RS-232/422/485 serial port card
ECU-P1628D-AE	8-port isolated RS-232/422/485 serial port card
ECU-P1524PE-GAE	2-port SFP Gigabit Ethernet Card with HSR/PRP
ECU-P1761A-AE	4-ch Digital input 4-ch relay output card with IRIG-B
UNOP-1624D-AE	4-port Iso.RS-232/422/485&IRIG-B card
UNOP-1514C-AE	4-port Fiber Optic LAN card
UNOP-1514PE-AE	4-port SFP LAN Gigabit card
UNOP-1514RE-AE	4-port RJ45 LAN Gigabit card
UNOP-1000I-BE	PCI & Mini-PCI Expansion card
UNOP-1000J-BE	PCI-104 & Mini-PCIe Expansion card
UNOP-1000K-AE	PCIe Expansion card
UNOP-1901-AE	HDD Expansion kit
ECU-P1528RE-AE	8-port RJ45 LAN Gigabit card
ECU-P1528PE-AE	8-port SFP LAN Gigabit card

2.7.2 PCIE Expansion Cards

2.7.2.1 PCIE Expansion Card illustration

The ECU-579 supports 4 low profile PCIE card and the size limitation showing as below picture.

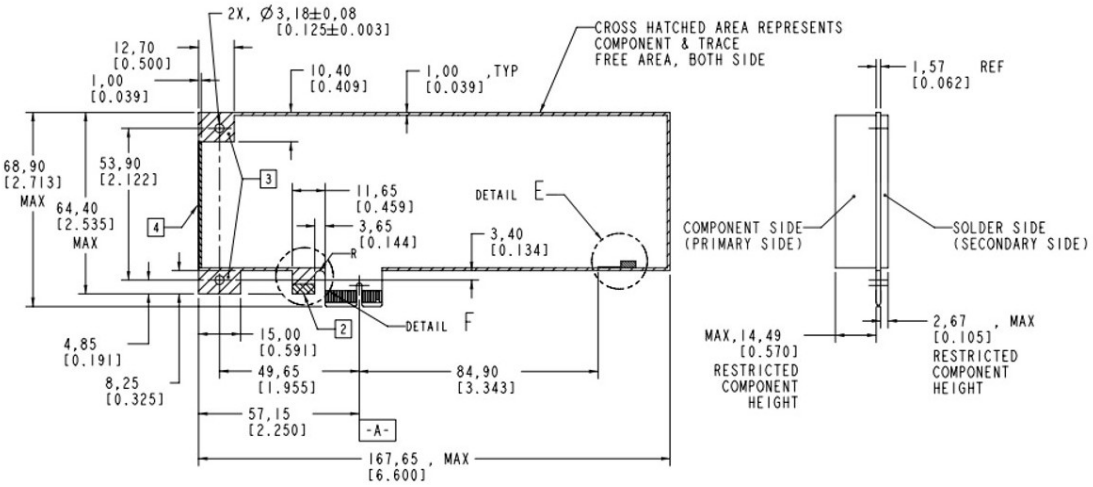


Figure 2.9 PCIE card dimension limitation

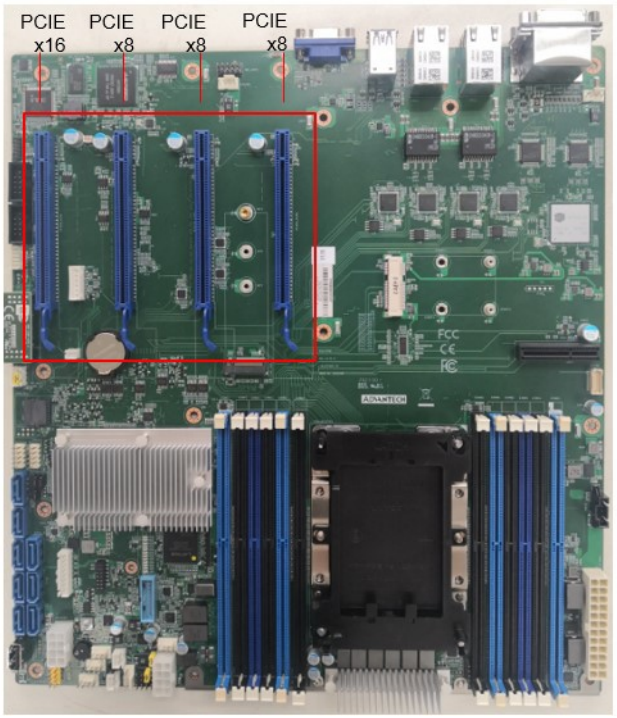


Figure 2.10 PCIE card position on main board

2.7.2.2 PCIE Expansion Card list

The tested PCIE Expansion listed as following:

Part Number	Description
PCIE-1130PS-00A1E	Quad Port Copper Gigabit Ethernet PCI Express Server Adapter with Intel® I350 (Advantech Form Factor)
PCIE-2130NP-00A1E	Quad Port Fiber Gigabit Ethernet PCI Express Server Adapter with Intel® I350
PCIE-2230NP-00A1E	Quad Port Fiber 10GbE Ethernet PCI Express Server Adapter with Intel® XL710-BM1
PCIE-2220NP-00A1E	Dual Port Fiber 10GbE Ethernet PCI Express Server Adapter with Intel® 82599ES

2.8 Storage (SATA, M.2)

2.8.1 SATA Disk

ECU-579 provides 4 slots for 2.5” SATA disks which supports RAID 0, 1, 5, 10.

2.8.2 M.2 Storage

The M.2 2280 connector supports both SATA and PCIe SSD devices for higher read/ write speeds.

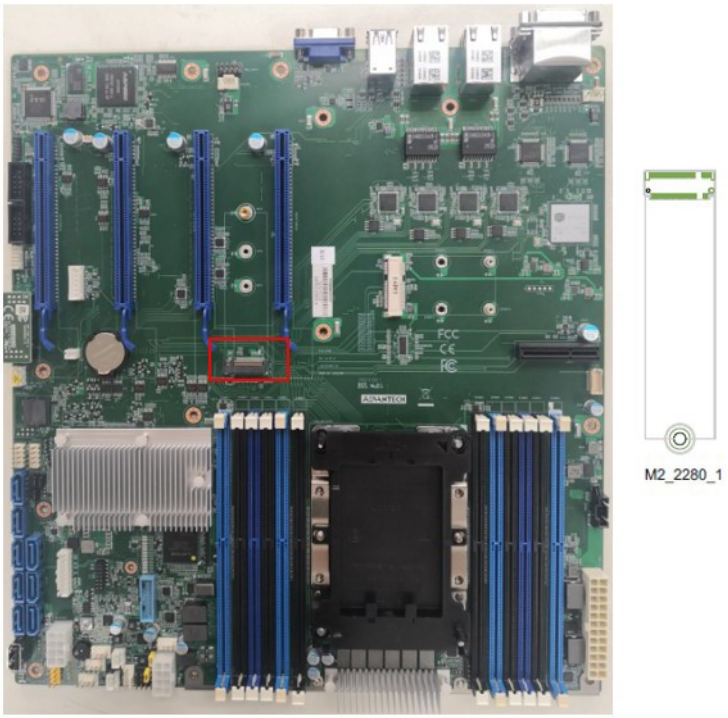


Figure 2.11 M.2 connector position on main board

2.9 Processors

2.9.1 Compatible Intel Xeon Scalable Series CPU

ECU-579 is equipped with two CPU sockets to support Intel Xeon Platinum/Gold/Silver/Bronze Scalable Family series up to 28-core processors.

Table 2.9: Tested Intel Xeon Scalable Series CPU List

Test item	Description								Result	Remark
CPU family	sSpec.	Core Stepping	Power	Number of Processor Cores	Intel UPI	HT	Shared Last level Cache	Package Type		
Intel Xeon Silver 4109T CPU @2.00 GHz	QN0F	U-0	70 W	8	9.6 GT/s	Y	11 MB	LGA3647	PASS	
Intel Xeon Gold 5119T CPU @1.90 GHz	QN11	M-0	85 W	14	10.4 GT/s	Y	19.25 MB	LGA3647	PASS	
Intel Xeon Gold 5120T CPU @2.20 GHz	QMXL	M-0	105 W	14	10.4 GT/s	Y	19.25 MB	LGA3647	PASS	
Intel Xeon Gold 6208U CPU @2.90 GHz	SRGZD	8-1	150 W	16	NA	Y	22 MB	LGA3647	PASS	

2.10 Memory

ECU-579 has 12 of 288-pin memory slots for DDR4 2133/2400/2666 MHz memory modules with maximum capacity of 1.5 TB (Maximum 64 GB for each IMM). ECU-579 supports registered DIMM memory modules.

2.10.1 Configurations with Single CPU

A total of 12 DDR4 DIMMs are supported on the ECU-579 equally spread over the two processor sockets with a capacity up to 768GB memory.

The following table indicates recommended DIMM configurations with a single processor, based on the guideline, you may adjust your memory configuration according to your PCIe expansion card configuration.

The table below summarizes the supported DIMM configurations.

Table 2.10: DIMM Configurations with Single CPU

Quantity of memory installed												
CPU0	1	2	3	4	5	6	7	8	9	10	11	12	CPU1
DIMMA1	v	v	v	v		v		v				v	DIMMG1
DIMMA2								v				v	DIMMG2
DIMMB1		v	v	v		v		v				v	DIMMH1
DIMMB2								v				v	DIMMH2
DIMMC1			v			v						v	DIMMI1
DIMMC2												v	DIMMI2
DIMMD1				v		v		v				v	DIMMJ1
DIMMD2								v				v	DIMMJ2
DIMME1				v		v		v				v	DIMMK1
DIMME2								v				v	DIMMK2
DIMMF1						v						v	DIMML1
DIMMF2												v	DIMML2

2.10.2 Validated memory

Advantech has tested a list of RAM for your reference, and these are verified compatible with ECU-579 under our test.

Table 2.11: DIMM Configurations with Single CPU

Test item	Description						Result	Remark
Brand	**Size**	**Speed**	**Type**	**ECC**	**2DPC Speed**	**Vendor PN**	**PASS**	
Advantech	8 G	2400	DDR4	Y	2400	AQD-D4U8GR24-HE	PASS	
Advantech	8 G	2400	DDR4	Y	2400	SQR-RD4N8G2K4SZBBB	PASS	
Advantech	16 G	2400	DDR4	Y	2400	AQD-D4U16R24-HE	PASS	
Advantech	32 G	2400	DDR4	Y	2400	SQR-RD4M-32G2K4SRB	PASS	
Advantech	8 G	2666	DDR4	Y	2400	AQD-D4U8GR26-SE	PASS	
Advantech	8 G	2666	DDR4	Y	2400	AQD-D4U8GR26-HE	PASS	
Advantech	16 G	2666	DDR4	Y	2400	AQD-D4U16R26-HE	PASS	
Advantech	8 G	2666	DDR4	Y	2400	TS1GHR72V6B	PASS	
Advantech	4 G	2666	DDR4	Y	2400	XECU-D4U4GR26-SGTR	PASS	

2.11 TPM

The ECU-579 supports Trusted Platform Module (TPM 2.0) technology, TPM is designed to provide hardware-based, security-related functions. A TPM is a microchip designed to provide basic security-related functions, primarily involving encryption keys. The TPM is usually installed on the motherboard of a computer, and communicates with the rest of the system using a hardware bus.

The Trusted Platform Module (TPM) is the root-of-trust in a given platform (such as on desktop computers). If built into a computer that runs an operating system that is aware of this chip, it can check the system integrity and authenticate third-party users who would like to access the security features, while remaining under complete control of its primary user. Therefore, privacy and confidentiality are assured.

2.12 Platform Features Description

2.12.1 BIOS

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of your computer. The Setup program uses a number of menus for making changes and turning the special features on or off. This chapter describes the basic navigation of the ECU-579 setup screens.

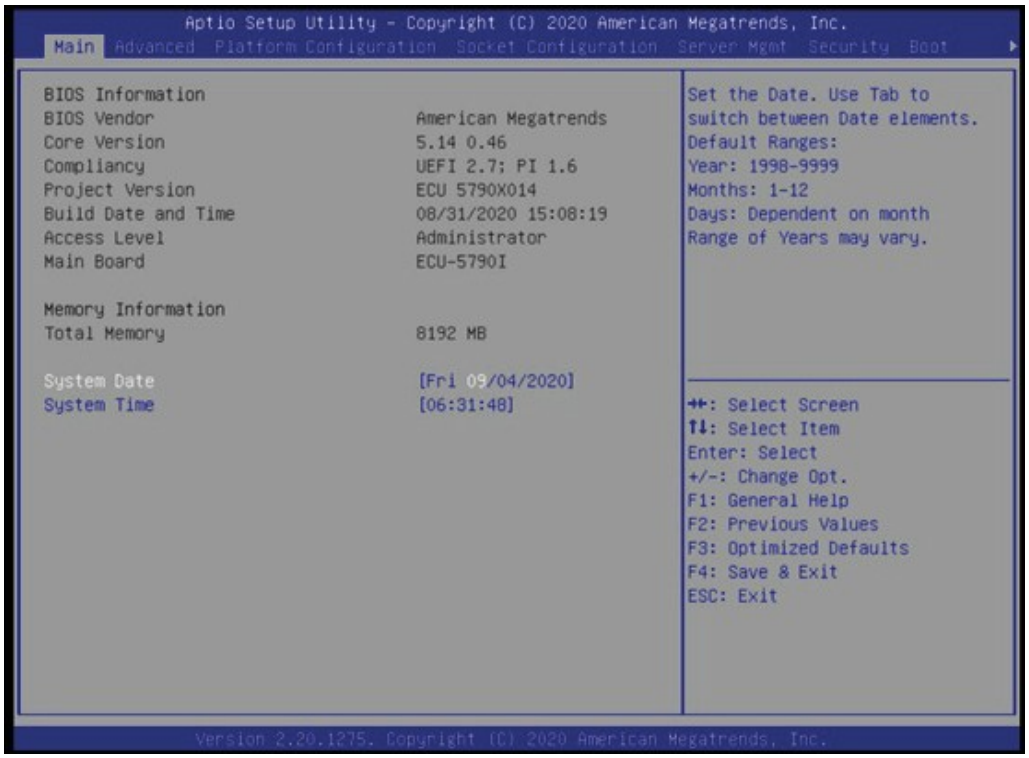


Figure 2.12 BIOS Interface

ECU-579's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed up CMOS so it retains the Setup information when the power is turned off.

Note! *The BIOS setup screens shown in this chapter are for reference only, they may not exactly match what you see on your display.*

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

2.12.2 Watchdog

2.12.2.1 Watchdog timer overview

The watchdog timer is built in to the EC controller IT8528E. It provides the following functions for user programming can be enabled and disabled by user's program Timer, which can be set from 1 to 255 seconds Generates an interrupt or reset signal if the software fails to reset the timer before time-out.

To get the driver and test user case of Window and Linux operation system, you can visit official website of Advantech under ECU-579 product page to download the driver with the test sample in it.

2.12.3 IPMI

ECU-579 is equipped with ASPEED 2500 BMC chip (Part Number: 9691B250000) and supports IPMI 2.0 (Intelligent Platform Management Interface 2.0) via sharing LAN port.

LAN1 can be applied with the IPMI function that allows remote control management.High reliability and outstanding performance makes ECU-579 the ideal platform for industrial server/networking applications.

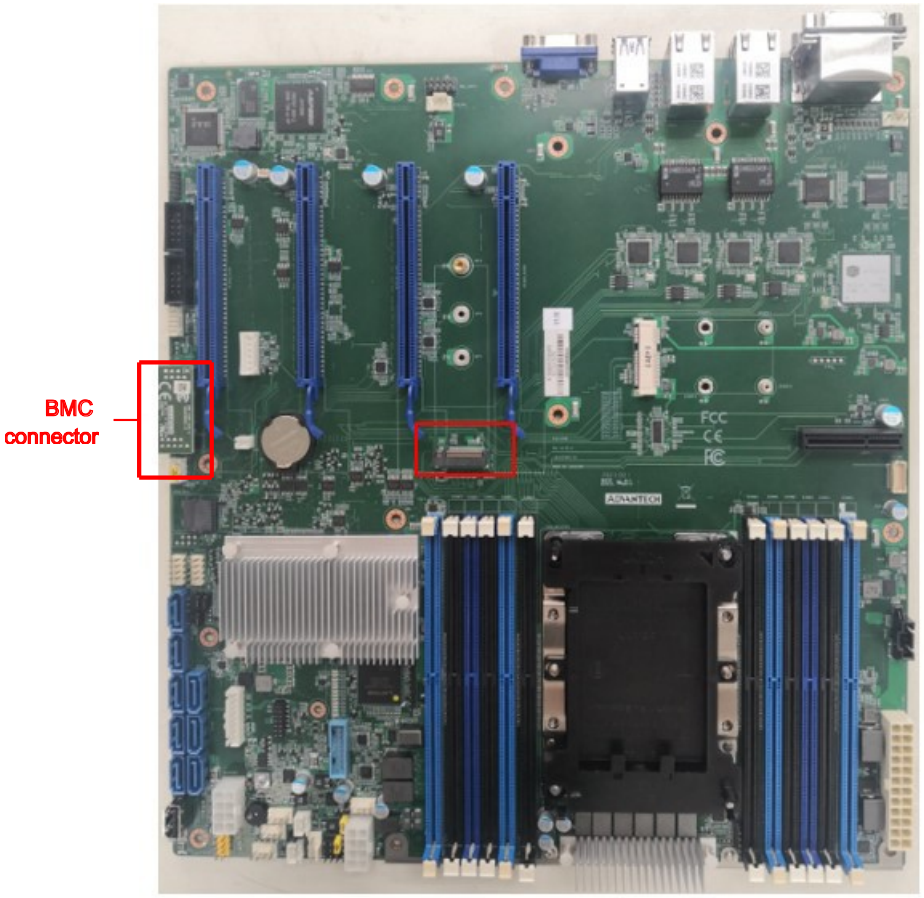


Figure 2.13 BMC Position

To enable IPMI function, you need to set up in BIOS. Firstly, enter the IP of the ECU-579 LAN1 you are using or use DHCP mode to get the IP address automatically. Then enter the IP address to initial the IPMI network interface to start remote control. More function instruction, pls refer to the introduction file of Intel IPMI document.

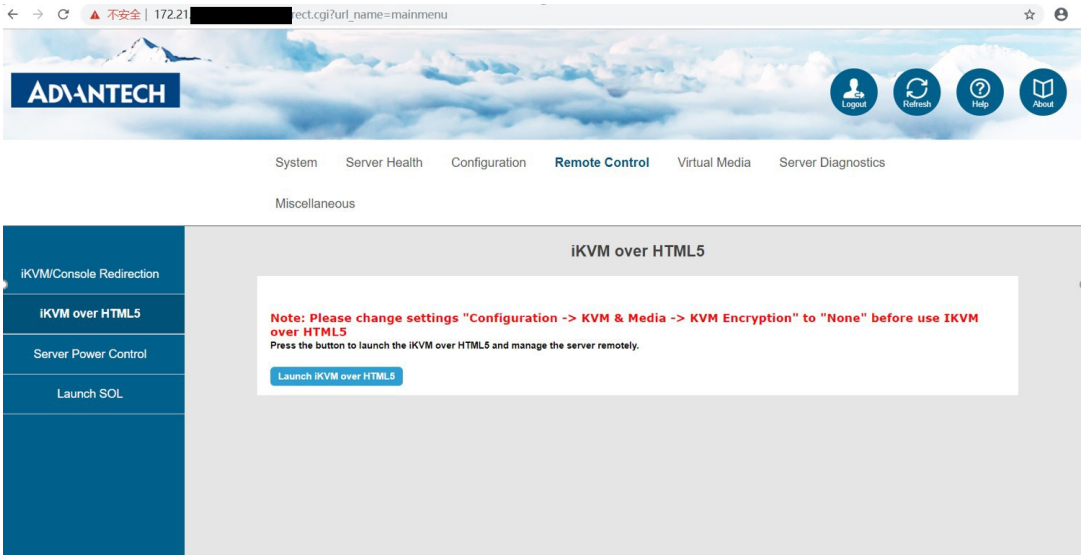


Figure 2.14 IPMI interface

Note! *If you need to remote operate BIOS, only VGA display mode support this function.*

2.13 Available Accessories

2.13.1 Spare Parts

The following spare parts are available for ordering.

Table 2.12: Spare Parts

Order Part Number	Description
XECU-FSP800-20FN	Power module

Chapter 3

Initial Setup and Configuration

Sections include:

- **Jumper Indication**
- **BIOS Setup and System Assignments**
- **Installing Components (CPU, RAM, SATA, PCIE card)**
- **Replacing components**

3.1 Jumper Indication

ECU-579 has 7 jumpers in case you need to implement relevant functions.

Table 3.1: Jumper list

Jumper position name	Function
PSON1	AX mode: 1-2 short/ ATX mode: 2-3 short (default)
JTHR_SEL1	Thermal sensor on board (default): 1-2 short/ External: 2-3 short
JWDT1	Watchdog Enable: 1-2 short (default)/Disable: 2-3 short
JCMOS1	CMOS Clear Normal: 1-2 short (default)/Clear CMOS: 2-3 short

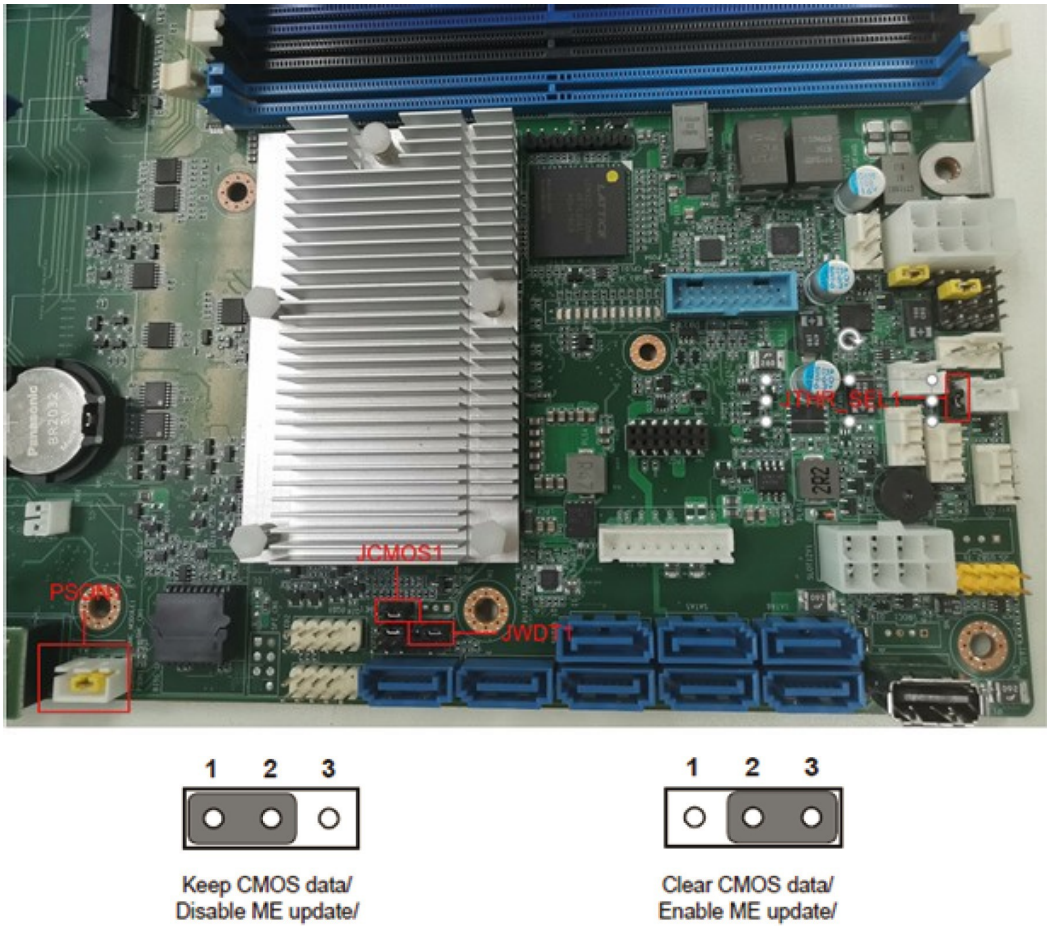


Figure 3.1 ECU-579 Jumper position indication

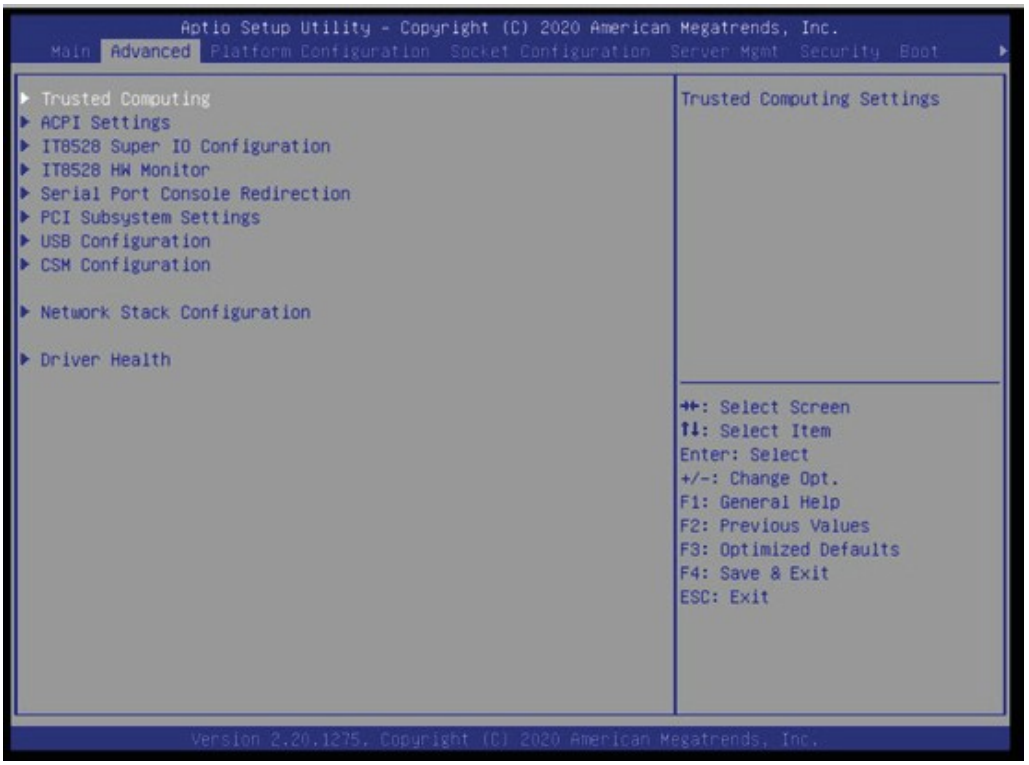
3.2 BIOS Setup and System Assignments

3.2.1 System Date / System Time

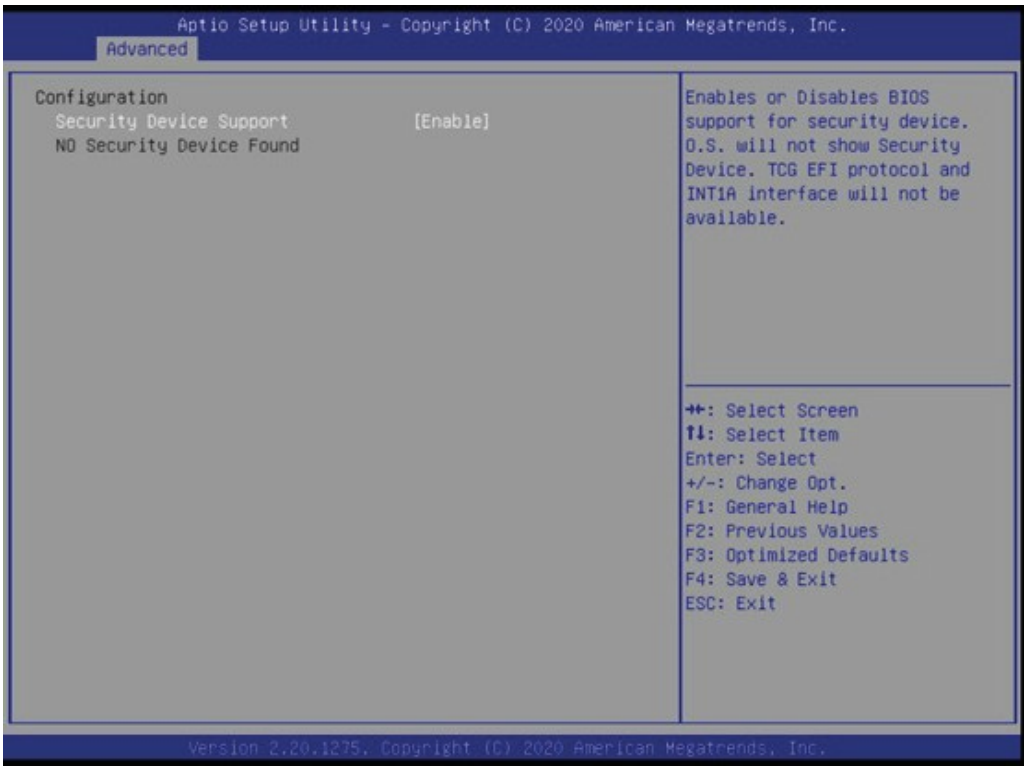
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the ASMB-935 setup screen to enter the Advanced BIOS setup screen. You can select any of the items in the left frame of the screen, such as CPU configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens are shown below. The sub menus are described on the following pages.



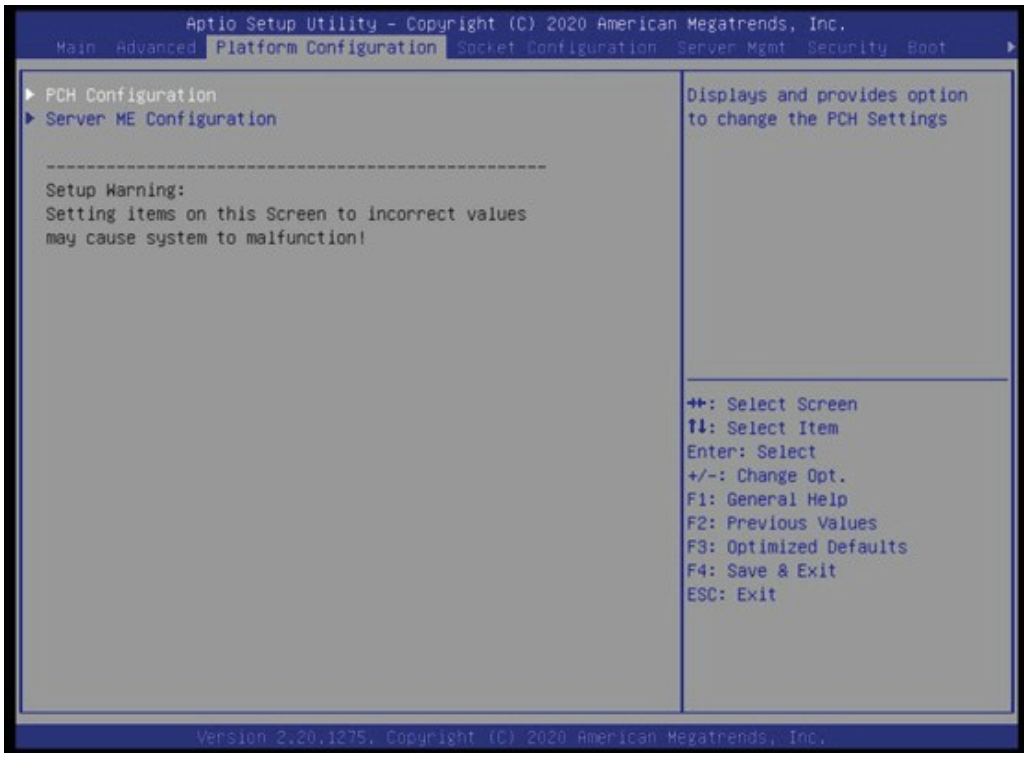
3.2.3 Trusted computing



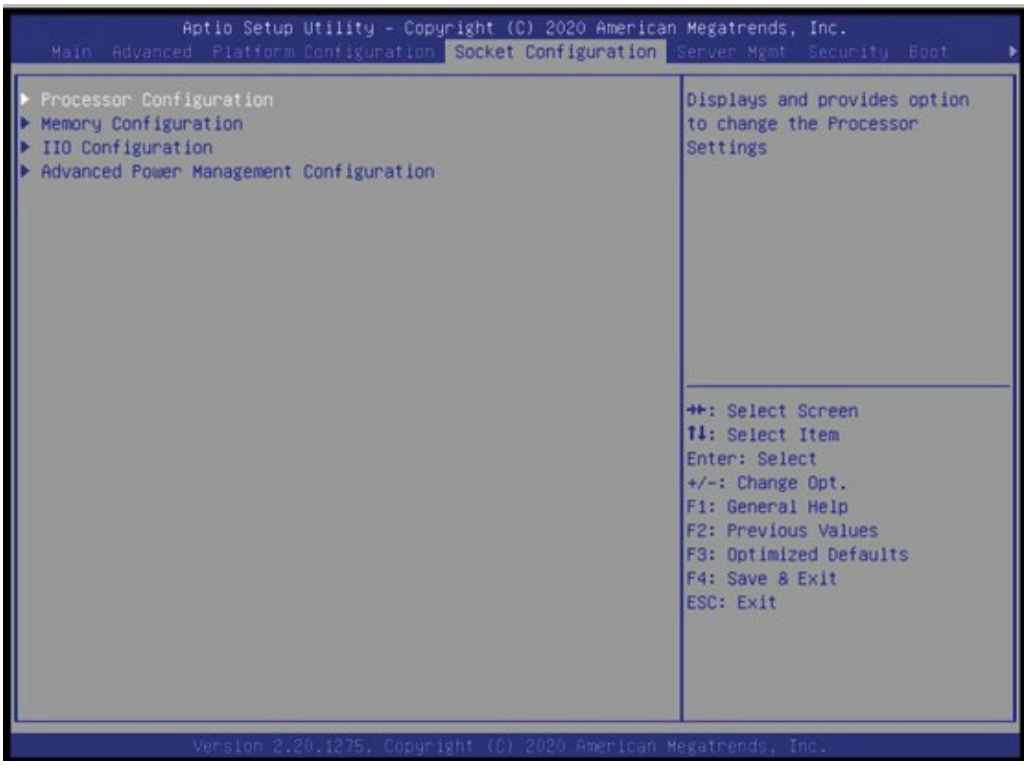
- **Security Device Support**
  Enables or disables BIOS support for security devices.

ECU-579 is equipped with Advantech's LPC TPM 2.0 module to enable trusted computing function.

3.2.4 Platform Configuration

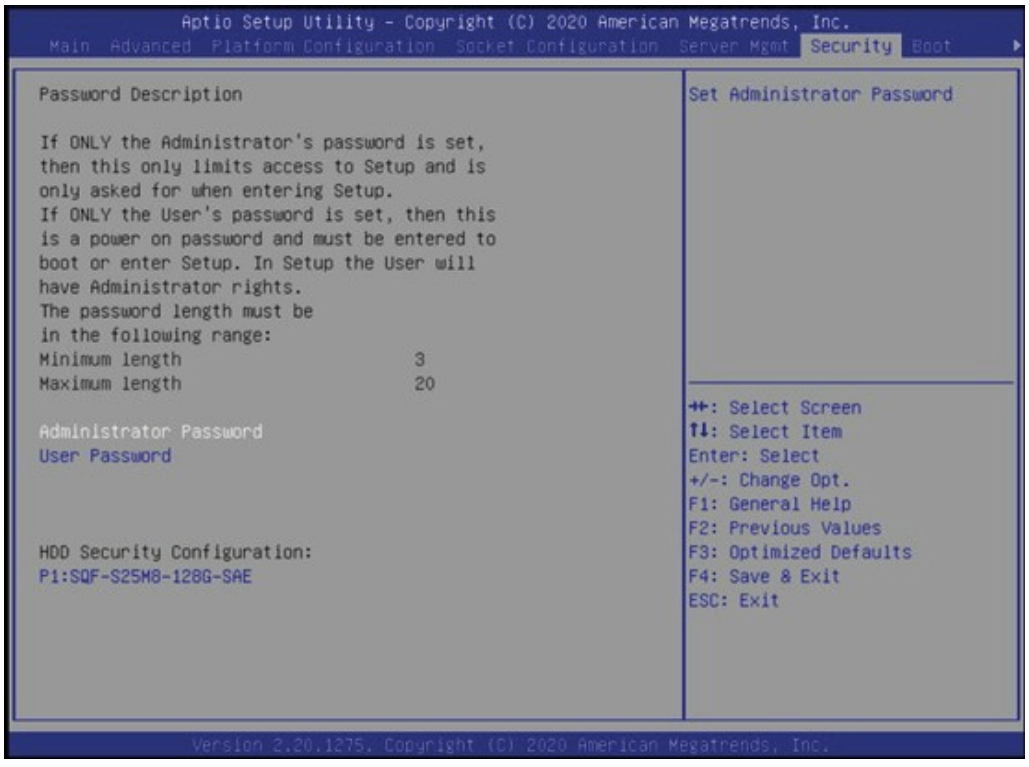


3.2.5 Socket Configuration

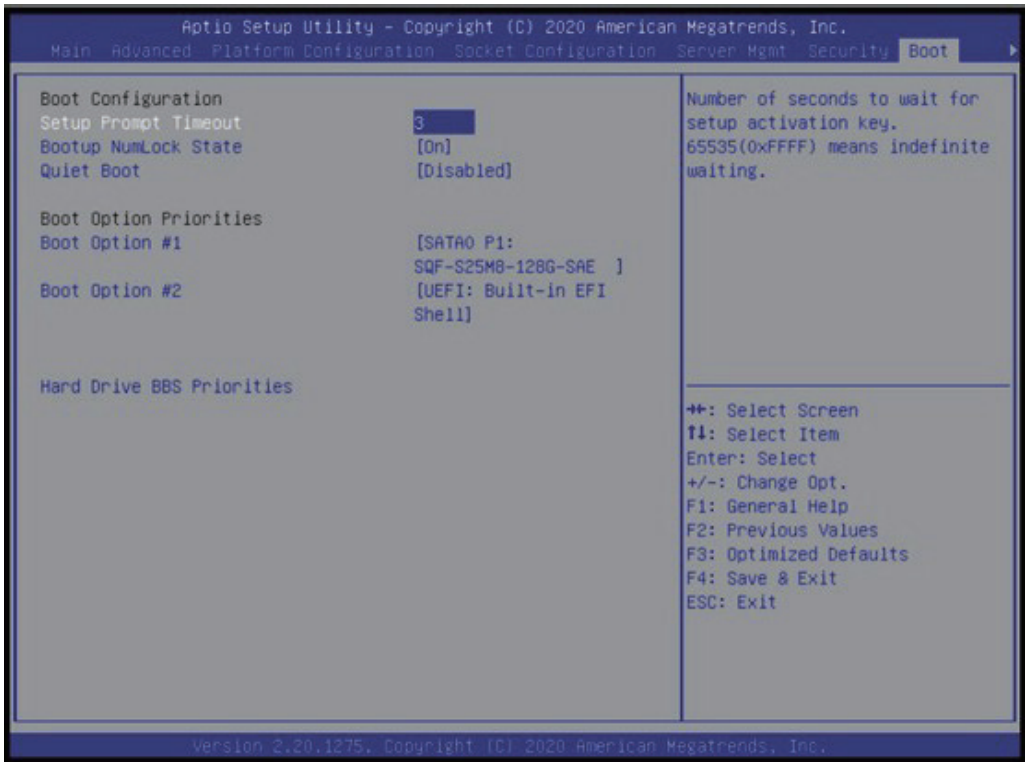


3.2.6 Server Management

3.2.7 Security



3.2.8 Boot Options



3.3 Installing Components

When you are going to start with ECU-579, the basic components like CPU and RAM are necessary to be installed first.

In this chapter, we will show indication as pictures to guide the steps of installing the components could be used.

Firstly, you need to open the chassis by unscrewed the points as below picture showing.

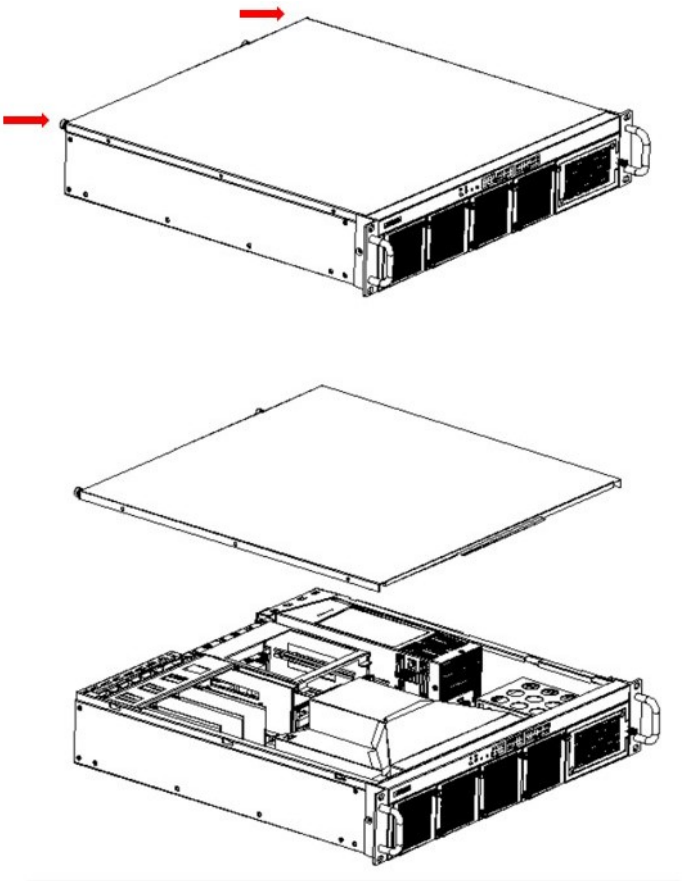


Figure 3.2 Open the Chassis

3.3.1 Installing CPU

To install the CPU, you need to take of the wind scooper and unscrew the cooling fin.

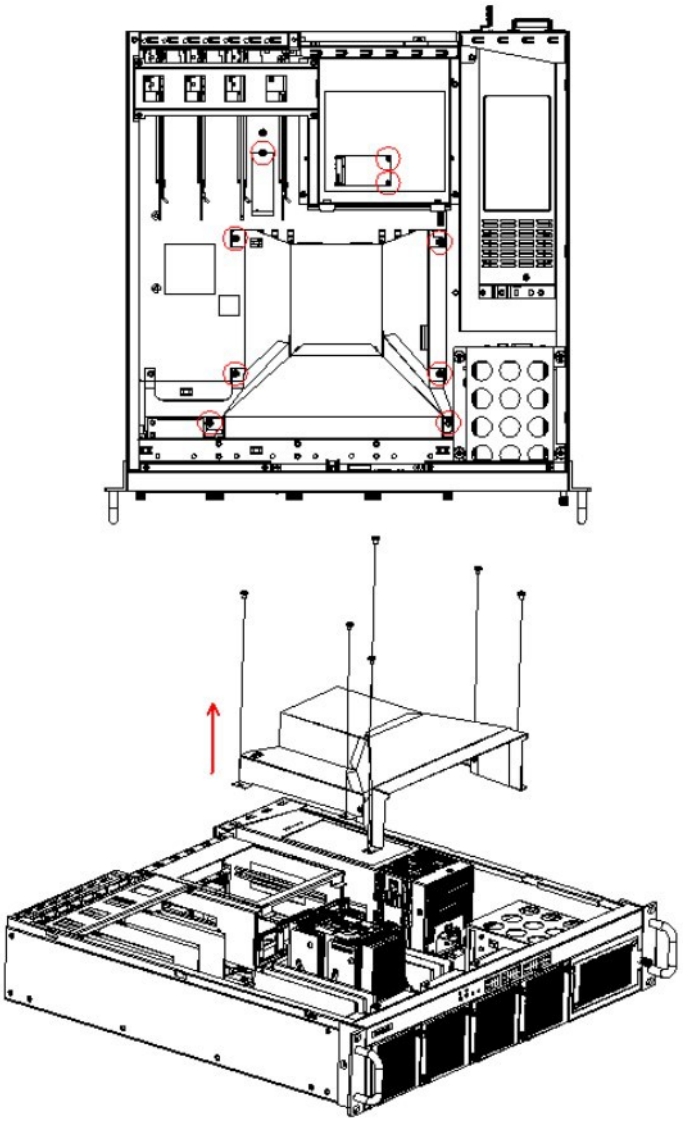


Figure 3.3 Take off the wind scooper

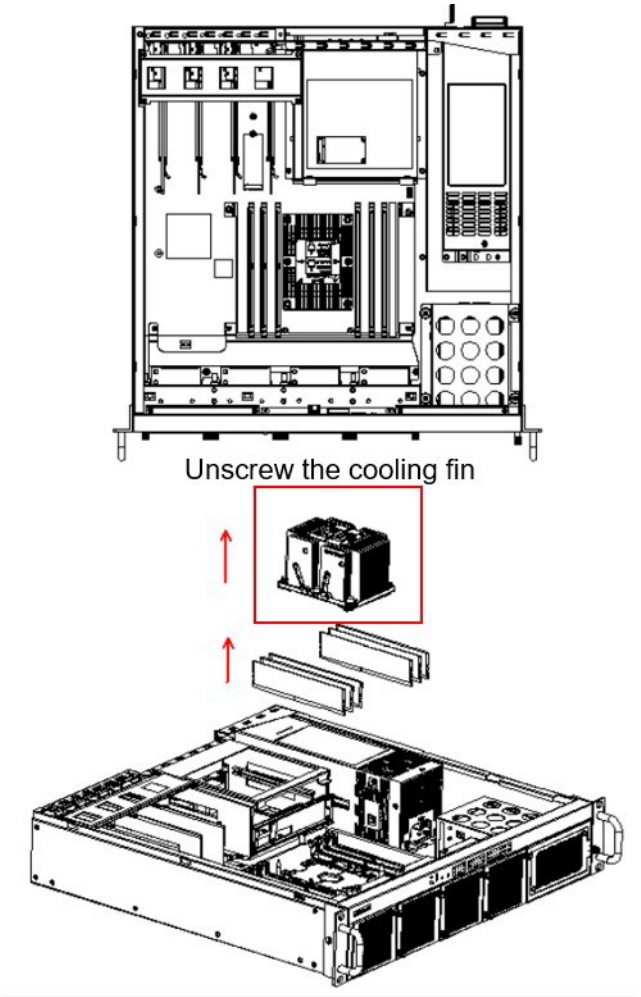


Figure 3.4 Take off the cooling fin

Pay attention to the direction of CPU consistent with the CPU bracket and the cooling fin, and install the CPU into the CPU bracket to get it fixed with the cooling fin, then stall back to the Main PCB board.

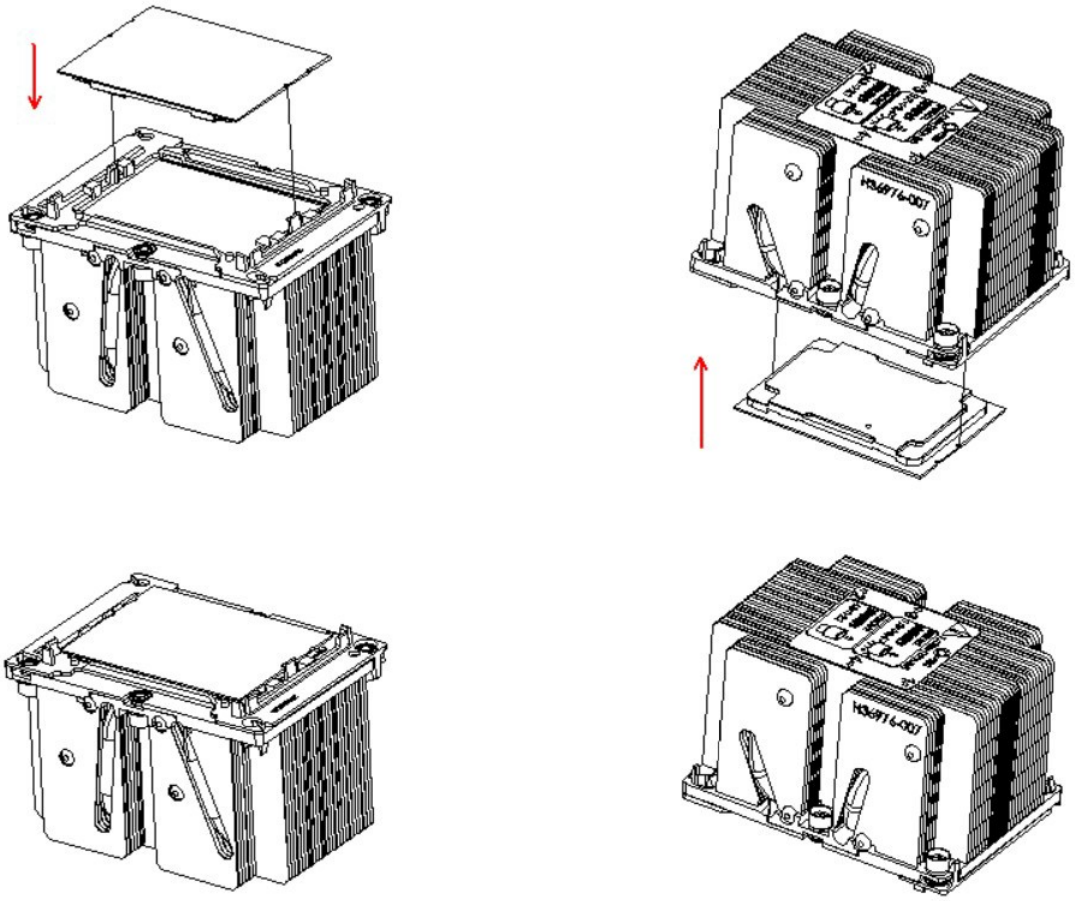


Figure 3.5 Fix CPU into bracket

3.3.2 Installing RAM

Memory performance is affected by different DIMM configurations. To reach optimal memory interleaving, be sure to install identical DIMM types with the same size, speed, and number of ranks on those memory slots corresponding to the correct processor.

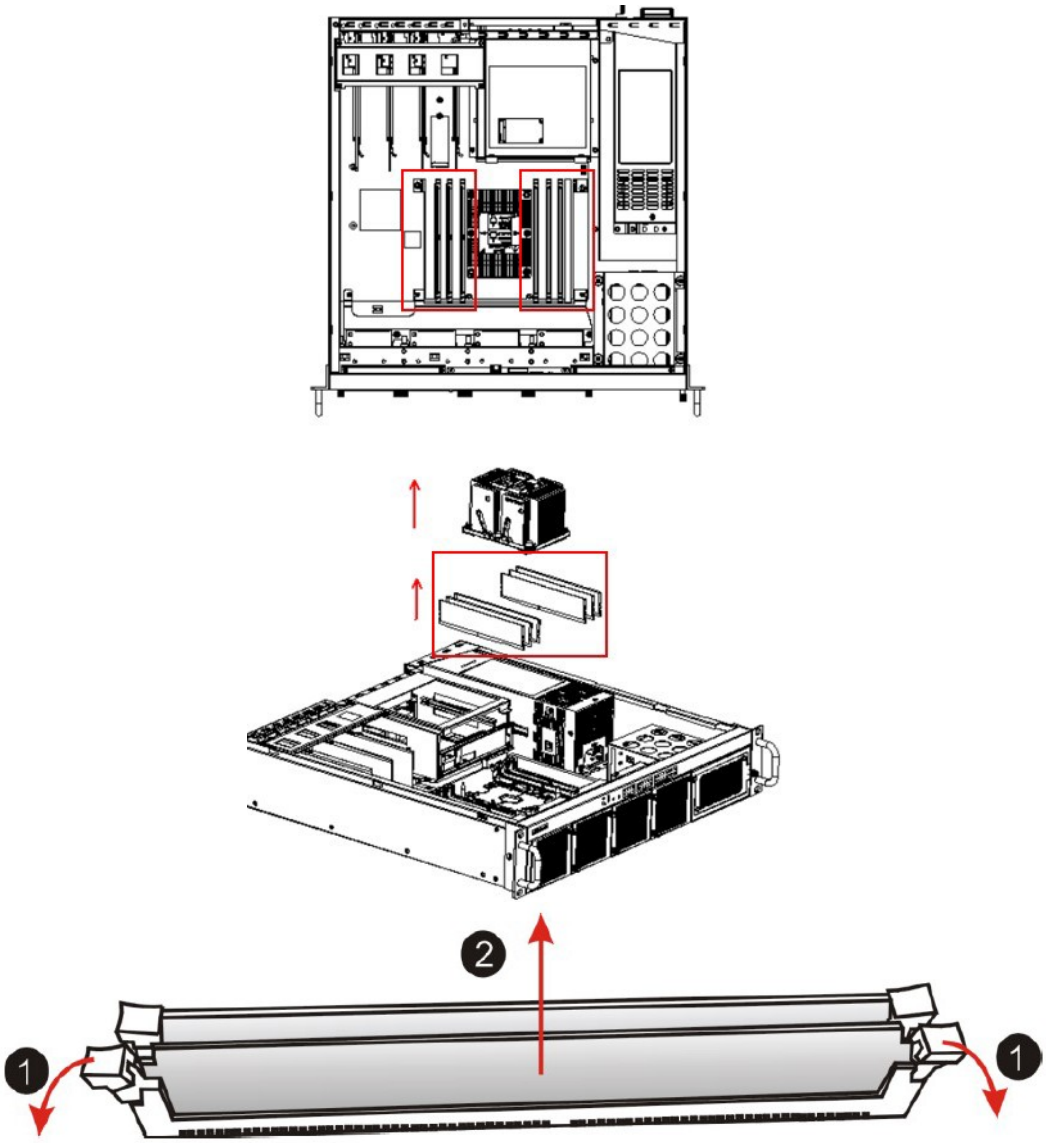


Figure 3.6 RAM installation position

Note! *If only one slide installed into the slot,it should be in the BLUE slot,and the memory slides are better to installed symmetrically.*

To replace a DIMM module, basically extract the DIMM module by pushing the DIMM socket latches outward. As the latches flip completely open, the DIMM module will be automatically extracted from the socket. Pull the DIMM module out vertically.

It could be 12 slides as max memory modules to be install into ECU-579 with 6 slides at each side of cooling fin.

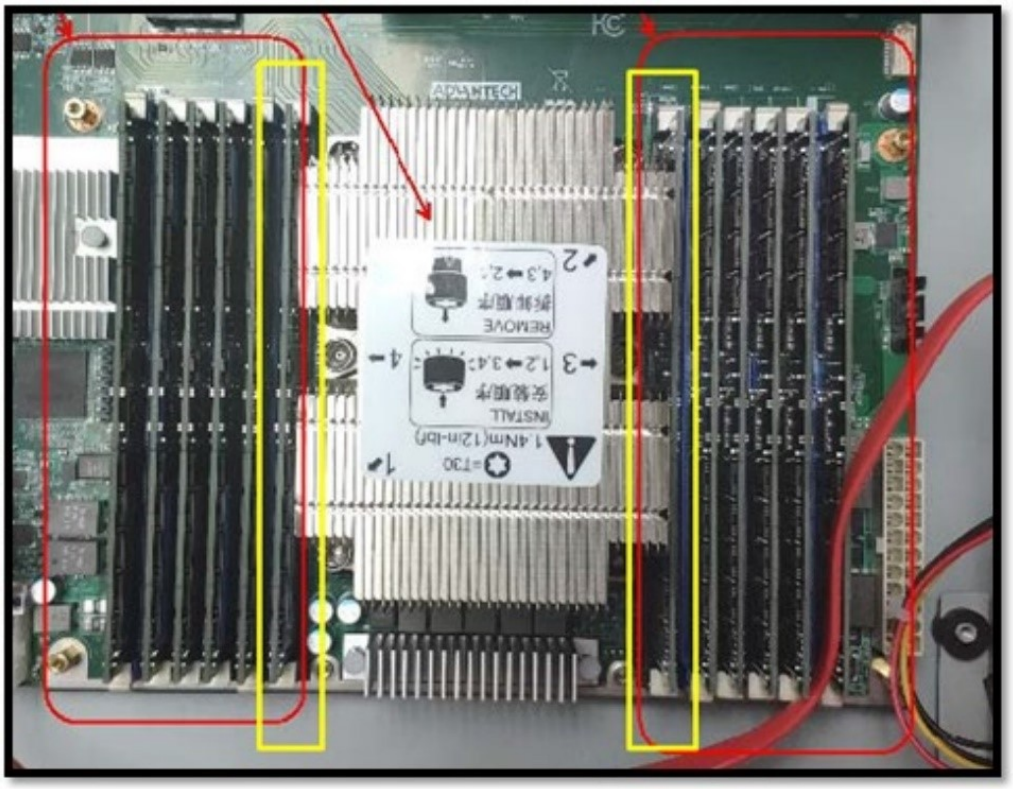


Figure 3.7 Memory installed with full quantity

3.3.3 Installing storage disk like SATA and M.2

Remove the baffle first as the picture showing below, and pull out the disk tray.

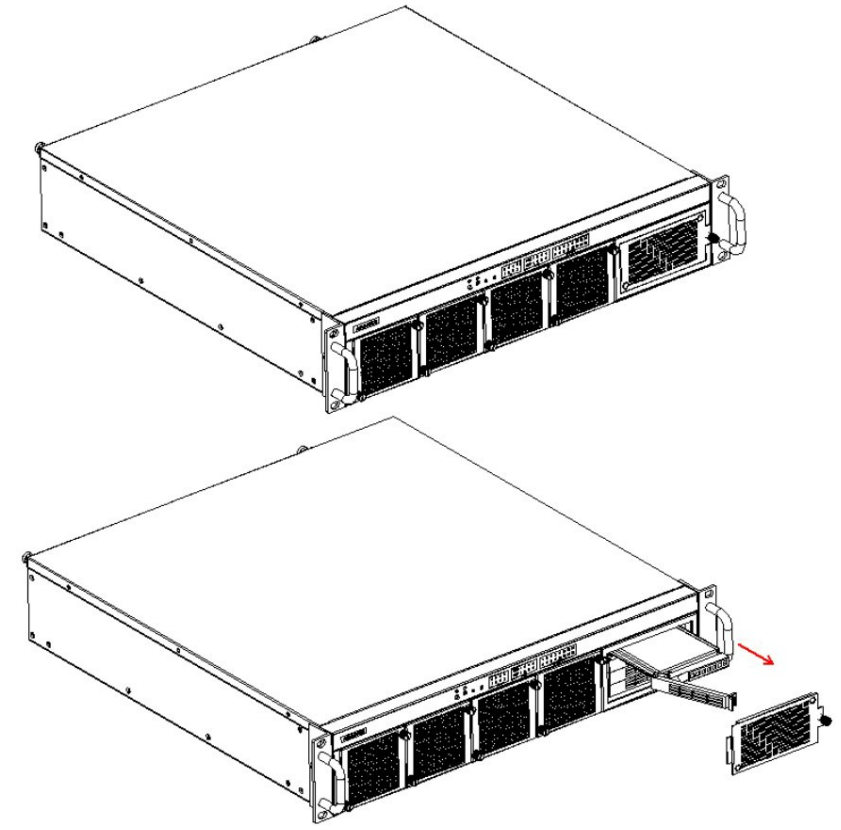


Figure 3.8 Remove the HDD baffle

Use the screws in the accessory box to fix the hard disk onto the tray, and push into the disk drawer. We have 4 disk drawers in total for 4 hard disks at most.

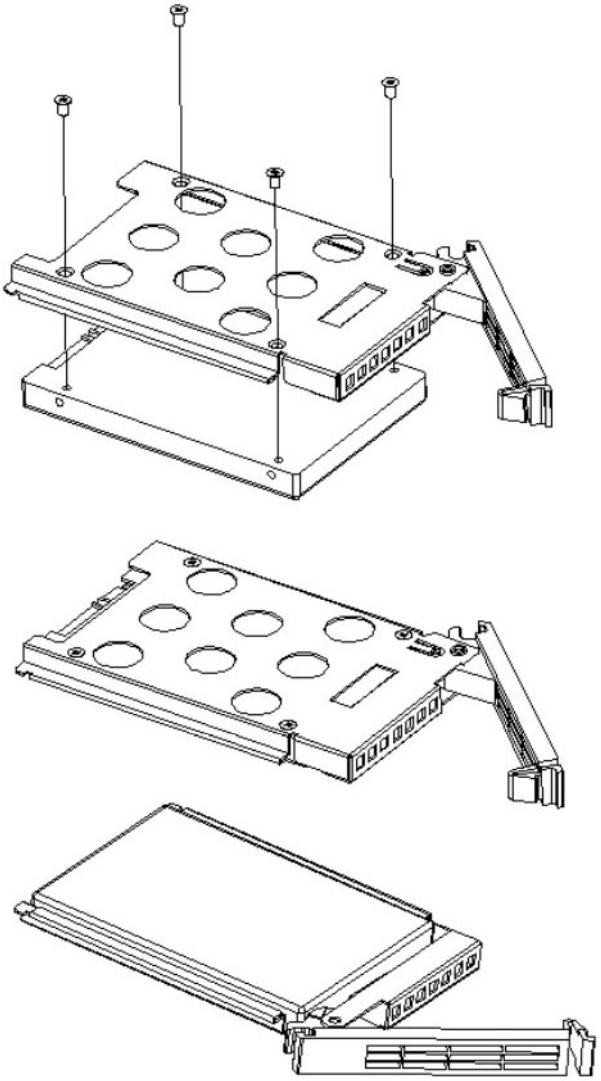


Figure 3.9 Fix the hard disk

You may add one M.2 hard disk at below position.

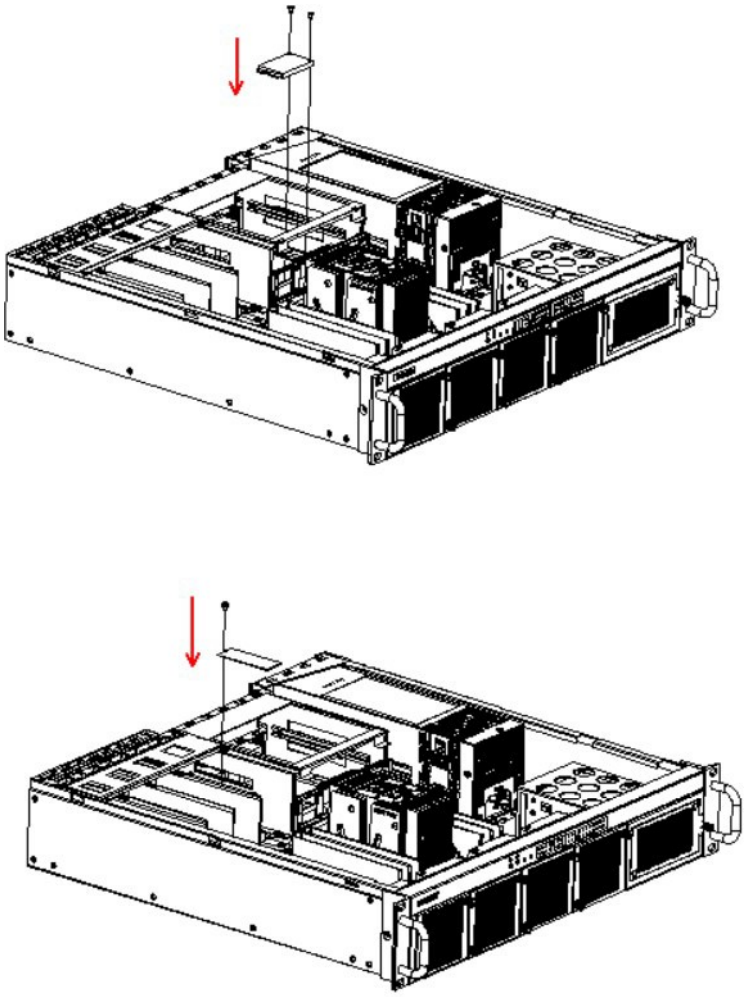


Figure 3.10 Install M.2 disk position

3.3.4 Installing PCI/PCIE card

You can install one PCI/PCIE card without opening the chassis on the back of panel at below position after remove the baffle. You can find the expansion card list in chapter 2.7.1.

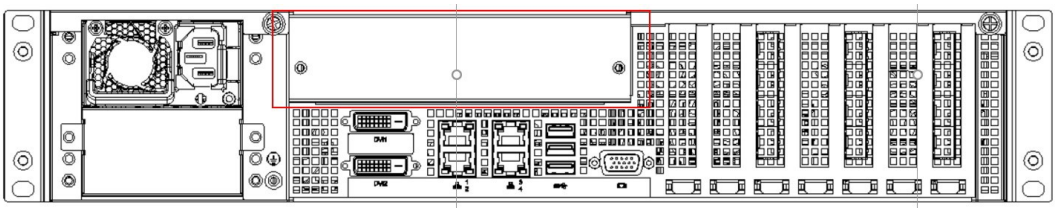


Figure 3.11 Install PCI/PCIE card position

3.3.5 Installing low profile PCIE card

You can install at most 4 low profile PCIE card at below position.

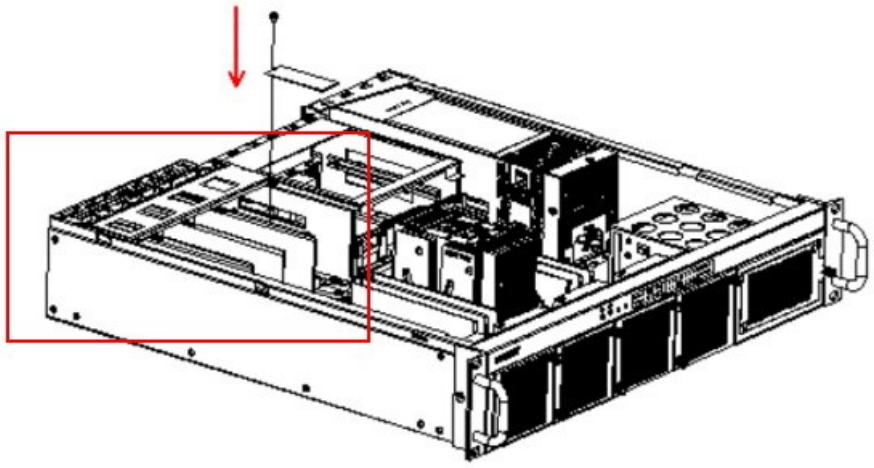


Figure 3.12 Install low profile PCIE card position

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Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.