Rugged Embedded Computer

DS-1500 Series

User Manual

Rugged Embedded Computer

Intel® Arrow Lake-S Core™ Ultra 200S Series Processors, High Performance and PCIe Expandable Rugged Embedded Computer, Supporting up to 2x PCI/PCIe Expansion Cards

Version: V1.04

Contents

Preface

Revision

Revision	Description	Date
1.00	First Released	2025/11/25
1.01	Added 2P5GLAN, 10GXM12LAN	2025/12/08
1.02	Added UL Certification	2025/12/17
1.03	Added Antenna Cutout Universal Bracket (UB1032)	2026/01/05
1.04	Added CMI-CAN01	2026/04/28

Copyright Notice

Acknowledgement

Disclaimer

This manual is intended to be used as a practical and informative guide only and is subject to change without notice. It does not represent a commitment on the part of Cincoze. This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

Declaration of Conformity

FCC

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 which case the user will be required to correct the interference at his own expense.

CE

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

UL

A product that carries the "UL Listed" approval mark means that the product has been tested by UL to nationally recognized Safety Standards and has been found to be free from reasonably foreseeable risk of fire, electric shock and related hazards.

Product Warranty Statement

Warranty

Cincoze products are warranted by Cincoze Co., Ltd. to be free from defect in materials and workmanship for 2 years from the date of purchase by the original purchaser. During the warranty period, we shall, at our option, either repair or replace any product that proves to be defective under normal operation. Defects, malfunctions, or failures of the warranted product caused by damage resulting from natural disasters (such as by lightening, flood, earthquake, etc.), environmental and atmospheric disturbances, other external forces such as power line disturbances, plugging the board in under power, or incorrect cabling, and damage caused by misuse, abuse, and unauthorized alteration or repair, and the product in question is either software, or an expendable item (such as a fuse, battery, etc.), are not warranted.

RMA

Before sending your product in, you will need to fill in Cincoze RMA Request Form and obtain a RMA number from us. Our staff is available at any time to provide you with the most friendly and immediate service.

- **RMA Instruction**
  - Customers must fill in Cincoze Return Merchandise Authorization (RMA) Request Form and obtain an RMA number prior to returning a defective product to Cincoze for service.
  - Customers must collect all the information about the problems encountered and note anything abnormal and describe the problems on the "Cincoze Service Form" for the RMA number apply process.
  - Charges may be incurred for certain repairs. Cincoze will charge for repairs to products whose warranty period has expired. Cincoze will also charge for repairs to

products if the damage resulted from acts of God, environmental or atmospheric disturbances, or other external forces through misuse, abuse, or unauthorized alteration or repair. If charges will be incurred for a repair, Cincoze lists all charges, and will wait for customer's approval before performing the repair.

- Customers agree to ensure the product or assume the risk of loss or damage during transit, to prepay shipping charges, and to use the original shipping container or equivalent.
- Customers can be sent back the faulty products with or without accessories (manuals, cable, etc.) and any components from the system. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, Cincoze is not responsible for the devices/parts.
- Repaired items will be shipped along with a "Repair Report" detailing the findings and actions taken.

Limitation of Liability

Cincoze' liability arising out of the manufacture, sale, or supplying of the product and its use, whether based on warranty, contract, negligence, product liability, or otherwise, shall not exceed the original selling price of the product. The remedies provided herein are the customer's sole and exclusive remedies. In no event shall Cincoze be liable for direct, indirect, special or consequential damages whether based on contract of any other legal theory.

Technical Support and Assistance

1. Visit the Cincoze website at www.cincoze.com where you can find the latest information about the product.
2. Contact your distributor or our technical support team or sales representative 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

Conventions Used in this Manual

WARNING (AVERTIR)

This indication alerts operators to an operation that, if not strictly observed, may result in severe injury.

(Cette indication avertit les opérateurs d'une opération qui, si elle n'est pas strictement observée, peut entraîner des blessures graves.)

CAUTION (ATTENTION)

This indication alerts operators to an operation that, if not strictly observed, may result in safety hazards to personnel or damage to equipment.
(Cette indication avertit les opérateurs d'une opération qui, si elle n'est pas strictement observée, peut entraîner des risques pour la sécurité du personnel ou des dommages à l'équipement.)

NOTE (NOTE)

This indication provides additional information to complete a task easily.
(Cette indication fournit des informations supplémentaires pour effectuer facilement une tâche.)

Safety Precautions

Before installing and using this device, please note the following precautions.

1. Read these safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Disconnect this equipment from any AC outlet before cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
9. Position the power cord so that people cannot step on it. 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 by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
    If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's

manual.

- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

14. CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.
    ATTENTION: Risque d'explosion si la batterie est remplacée par un type incorrect. Mettre au rebus les batteries usagées selon les instructions.
15. Equipment intended only for use in a RESTRICTED ACCESS AREA.
16. Output of the external power source shall comply with ES1, PS3 requirements, output rating between 9-48 VDC, with minimum rated maximum ambient temperature 60°C, and has to be evaluated according to UL/IEC/EN 60950-1 and/or UL/IEC/EN 62368-1. If you need further assistance, please contact Cincoze for further information.
17. Ensure to connect the power cord of the power adapter to a socket-outlet with an earth connection.
18. Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

Package Checklist

Item	Description	Q'ty
1	Embedded System	1
2	Heatsink Pack	1
3	Wall Mount Kit	1
4	Screw Pack	1
5	Power Terminal Block Connector	1
6	Remote Function Terminal Block Connector	2
7	Fan Terminal Block Connector	1
8	M.2 Key B Type 3052 to 3042 Adapter Bracket	3

Note: Notify your sales representative if any of the above items are missing or damaged.

Ordering Information

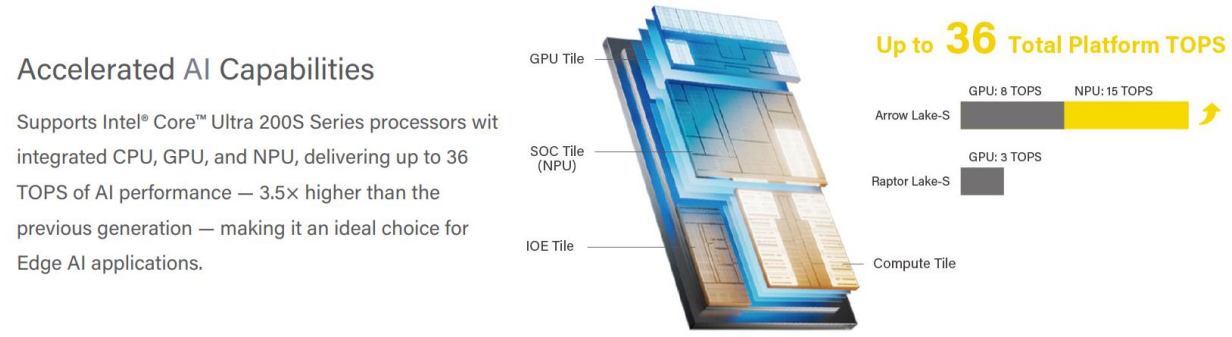
Model No.	Product Description
DS-1500-R10	Intel® Arrow Lake-S Core™ Ultra 200S Series Processors, High Performance and PCIe Expandable Rugged Embedded Computer
DS-1501-R10	Intel® Arrow Lake-S Core™ Ultra 200S Series Processors, High Performance and PCIe Expandable Rugged Embedded Computer, Supporting 1x PCI/PCIe Expansion Card
DS-1502-R10	Intel® Arrow Lake-S Core™ Ultra 200S Series Processors, High Performance and PCIe Expandable Rugged Embedded Computer, Supporting 2x PCI/PCIe Expansion Cards

Chapter 1
Product Introduction

1.1. Overview

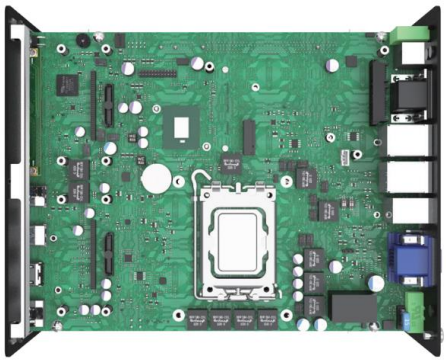
The DS-1500 series is a high-performance, expandable, rugged embedded computer, supporting modular I/O expansion and up to two PCI/PCIe slots. It has international certifications for stable and reliable performance in harsh environments, making it perfect for smart manufacturing, rail, and more.

- Intel® Arrow Lake-S Core™ Ultra 200S Series (Max 65 W TDP)
- 2 x DDR5 SO-DIMM/CSODIMM Sockets, Up to 6400MHz, 96GB
- 2x PCI/PCIe expansion slots, Up to 130W Expansion
- Optional CMI modules for I/O Expansion
- Optional CFM modules for Hardware TPM, Ignition Sensing & PoE
- Wide operating temperature -40°C to 60°C



Rich and Expandable I/O

Native I/O and modular I/O expansion, providing high-speed transmission (10 GbE LAN, USB 3.2), industrial I/O (COM, DIO, PS/2), display outputs, and M.2 Key B/M/E slots for wireless communication modules or NVMe SSDs.

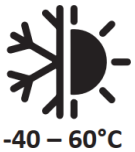


PCI/PCIe with Patented PCIe Card Retainer

Supports up to 2× PCI/PCIe expansion slots (DS-1502) for I/O, image capture, data acquisition, and motion control cards, or a single 130 W GPU card (111 × 235 mm). The patented adjustable card retainer secures expansion cards in high-vibration environments, ensuring long-term stable operation.

Rugged and Reliable

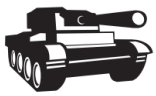
Industrial-grade protections include wide temperature (-40°C to 60°C) and wide voltage (9–48 VDC) support; overvoltage, overcurrent, and ESD protection. Meets US military shock and vibration standard (MIL-STD-810H), as well as rail EMC (EN 50121-3-2) and fire protection (EN 45545-2) standards.



-40 – 60°C
-40 – 140°F

9 - 48VDC

EN 50121-3-2
EN 45545-2



MIL-STD-810H

1.2. Specifications

Model Name	DS-1500	DS-1501	DS-1502
System			
Processor	• Arrow Lake-S Ultra 200S Series CPU: - Intel® Core™ Ultra 9 285 24 Cores Up to 5.6 GHz, TDP 65W - Intel® Core™ Ultra 9 285T 24 Cores Up to 5.4 GHz, TDP 35W - Intel® Core™ Ultra 7 265 20 Cores Up to 5.3 GHz, TDP 65W - Intel® Core™ Ultra 7 265T 20 Cores Up to 5.3 GHz, TDP 35W - Intel® Core™ Ultra 5 245 14 Cores Up to 5.1 GHz, TDP 65W - Intel® Core™ Ultra 5 245T 14 Cores Up to 5.1 GHz, TDP 35W - Intel® Core™ Ultra 5 225 10 Cores Up to 4.9 GHz, TDP 65W - Intel® Core™ Ultra 5 225T 10 Cores Up to 4.9 GHz, TDP 35W		
Chipset	• Intel W880 Chipset		
Memory	• 2x DDR5 SO-DIMM/CSODIMM Sockets, Support Un-buffered and ECC Type - Ultra 9 / 7: Supports 6400MHz, 96GB. • - Ultra 5: Supports Up to 5600 MHz, 96GB.		
BIOS	• AMI BIOS		
Graphics			
Graphics Engine	• Integrated Intel® Xe LPG Graphics		
Maximum Display Output	• Supports Quad Independent Display		
VGA	• 1x VGA Connector: 1920 x 1200@60Hz		
DP	• 2x DP Connector: 4096 x 2304@60Hz - Support cable switch HDMI 4096 x 2160@30Hz * Verified maximum resolution: 3840 x 2160@60Hz		
HDMI	• 1x HDMI Connector: 4096 x 2160@30Hz * Verified maximum resolution: 3840 x 2160@30Hz		
Audio			
Audio Codec	• Realtek® ALC888, High Definition Audio		
Line-out	• 1x Line-out, Phone Jack 3.5mm		
Mic-in	• 1x Mic-in, Phone Jack 3.5mm		
I/O			
LAN	• 1x 2.5 GbE LAN, RJ45 - GbE1: Intel® I225 • 1x GbE LAN, RJ45 - GbE2: Intel® I219		
COM	• 2x RS-232/422/485 with Auto Flow Control (Supports 5V/12V), DB9		
USB	• 2x 10Gbps USB 3.2 Gen2x1, Type A		

	• 4x 5Gbps USB 3.2 Gen1x1, Type A • 2x 480Mbps USB 2.0, Type A		
PS/2	• 1x PS/2, 6 Pin Mini-DIN Female Connector		
Storage			
2.5” SSD/HDD	• 1x 2.5” Front Accessible SATA HDD/SSD Bay (SATA3.0) • 1x 2.5” Internal SATA HDD/SSD Bay (SATA3.0)		
M.2 Key B Socket	• 1x M.2 Key B Type 3042/3052 Socket (PCIe Gen 4x2 / USB3.2 Gen2x1 / SATA 3.0), Support 5G / GNSS / Storage / Add-on Card Expansion • 2x M.2 Key B Type 3042/3052 Socket (PCIe Gen 3x2 / SATA 3.0), Support GNSS / Storage / Add-on Card Expansion		
M.2 Key M Socket	• 1x M.2 Key M Type 2280 Socket (PCIe Gen3 x4 / SATA 3.0), Support Storage / Add-on Card Expansion		
Expansion			
PCI Express		• 1 x PCI/PCIe Expansion Slot with Optional Riser Card * Supports maximum dimensions of add-on card (L x H): 235 x 124mm * Supports GPU card up to 75W	• 2x PCI/PCIe Expansion Slot with Optional Riser Card * Supports maximum dimensions of add-on card (L x H): 235 x 124mm * Supports GPU card up to 130W
SIM Socket	• 2x SIM Socket		
CMI (Combined Multiple I/O) Interface	• 2x High Speed CMI Interface for optional CMI Module Expansion • 2x Low Speed CMI Interface for optional CMI Module Expansion		
CFM (Control Function Module) Interface	• 1x CFM IGN Interface for optional CFM-IGN Module Expansion • 1x CFM-TPM Interface for optional CFM-TPM Module Expansion		
Other Function			
RAID	• Support RAID 0/1/5/10		
External FAN Connector	• 1x External FAN Connector, 4-pin Terminal Block (Support Smart Fan by BIOS)		
Power Ignition Sensing	• Support Power Ignition Sensing Function with Delay Time Management and Selectable 12V/24V (With Optional CFM Module)		
TPM	• Support Discrete TPM2.0 (with Optional CFM Module)		
Clear CMOS Switch	• 1x Clear CMOS Switch		
Reset Button	• 1x Reset Button		
Instant Reboot	• Support 0.2sec Instant Reboot Technology		
Watchdog Timer	• Software Programmable Supports 256 Levels System Reset		
Antenna Holes	• 2		
Power			

Power Button	• 1x ATX Power On/Off Button		
Power Mode Switch	• 1x AT/ATX Mode Switch		
Power Input	• 9 - 48VDC, 3-pin Terminal Block		
Remote Power On/Off	• 1x Remote Power On/Off, 2-pin Terminal Block		
Remote Power LED	• 1x Remote Power LED, 2-pin Terminal Block		
Max. Power Consumption	• 35W CPU: 163W • 65W CPU: 262.8W - Test conducted with CPU, 1x RAM, and 1x storage - 100% load during burn-in testing.		
Inrush Current (Peak)	• 35W CPU: 5.812 A@24V • 65W CPU: 5.983 A@24V		
Physical			
Dimensions (W x D x H)	• 227 x 261 x 88 mm	• 227 x 261 x 108 mm	• 227 x 261 x 128 mm
Weight Information	• 4.9 KG	• 5.3 KG	• 5.7 KG
Mechanical Construction	• Extruded Aluminum with Heavy Duty Metal		
Mounting	• Wall Mount		
Physical Design	• Fanless Design • Cableless Design • Jumper-less Design • Unibody Design		
Reliability & Protection			
Reverse Power Input Protection	• Yes		
Over Voltage Protection	• Protection Range: 51-58V • Protection Type: shut down operating voltage, re-power on at the present level to recover		
Over Current Protection	• 15A		
CMOS Battery Backup	• SuperCap Integrated for CMOS Battery Maintenance-free Operation		
MTBF	• 307,224 Hours - Database: Telcordia SR-332 Issue3, Method 1, Case 3		
Operating System			
Windows	• Windows®11, Windows®10		
Linux	• Ubuntu 24.04		

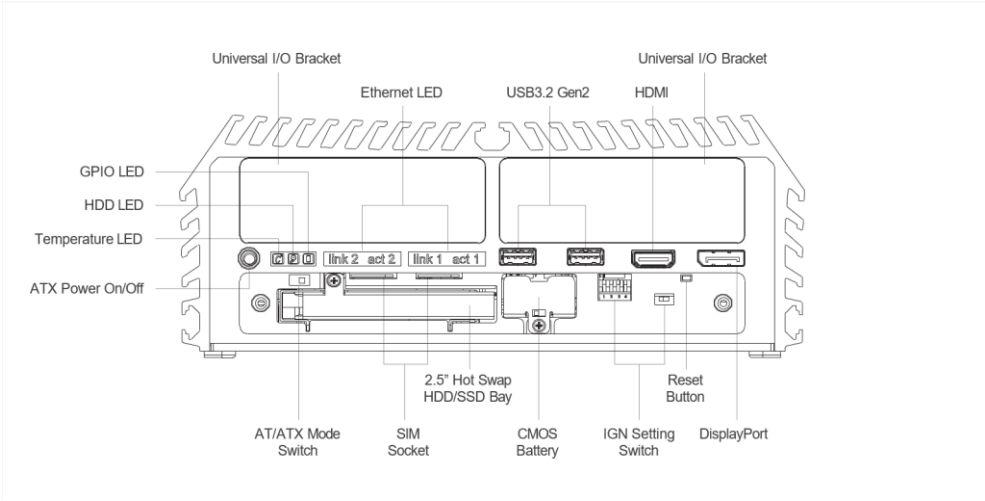
Environment	
Operating Temperature	• 35W TDP Processor: -40°C to 60°C (-40°F to 140°F) • 65W TDP Processor: -40°C to 50°C (-40°F to 122°F) With External Fan Kit - With extended temperature peripherals; Ambient with air flow - According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14
Storage Temperature	• -40°C to 85°C (-40°F to 185°F)
Relative Humidity	• 95%@60°C (non-Condensing)
Shock	• MIL-STD-810H
Vibration	• MIL-STD-810H
EMC	• CE, UKCA, FCC, ICES-003 Class A
EMI	• CISPR 32 Conducted & Radiated: Class A • EN/BS EN 50121-3-2 Conducted & Radiated: Class A • EN/BS EN IEC 61000-3-2 Harmonic current emissions: Class A • EN/BS EN61000-3-3 Voltage fluctuations & flicker • FCC 47 CFR Part 15B, ICES-003 Conducted & Radiated: Class A
EMS	• EN/IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV • EN/IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 20 V/m • EN/IEC 61000-4-4 EFT: AC Power: 2 kV; Signal: 2 kV • EN/IEC 61000-4-5 Surges: AC Power: 2 kV • EN/IEC 61000-4-6 CS: 10V • EN/IEC 61000-4-8 PFMF: 50 Hz, 1A/m • EN/IEC 61000-4-11 Voltage Dips & Voltage Interruptions: 0.5 cycles at 50 Hz
Railway	• EMC: - EN 50155: 2021 Clause 4.4.6, 13.4.9 - EN 50121-1: 2017 - EN 50121-3-2: 2016 + A1: 2019
Fire Protection	• EN 45545-2
Safety	• UL, cUL, CB, IEC, EN 62368-1

** Product Specifications and features are for reference only and are subject to change without prior notice. For more information, please refer to the latest product datasheet from Cincoze's website.*

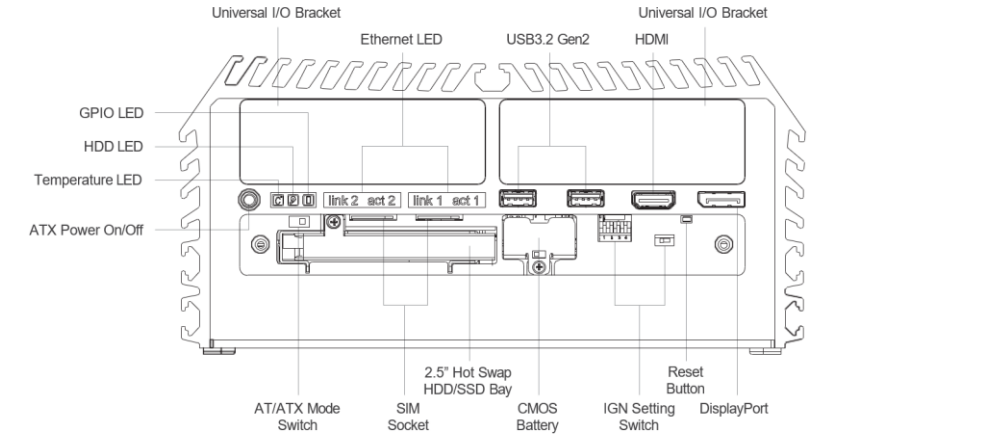
1.3. External Layout

1.3.1. Front

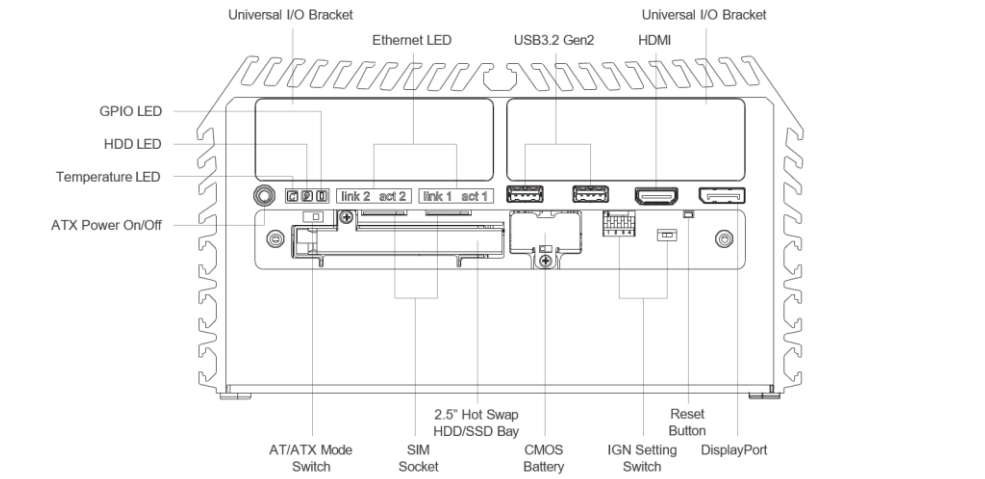
DS-1500



DS-1501

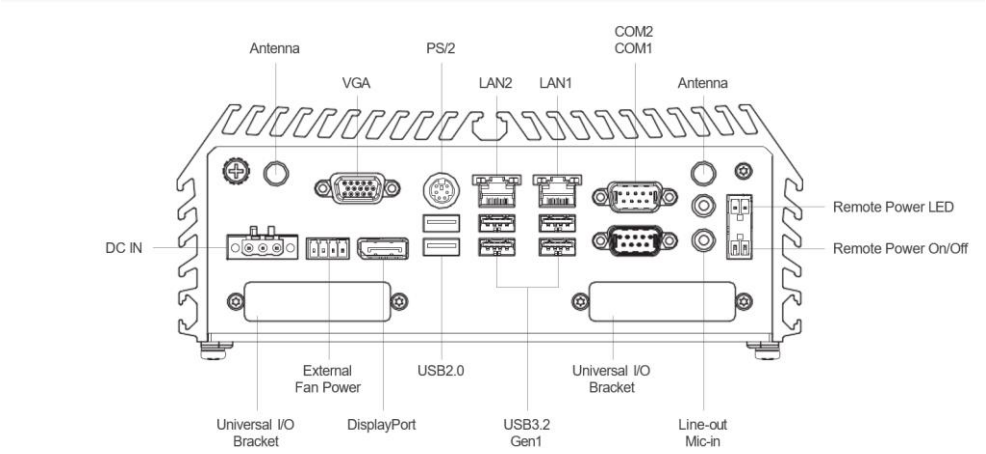


DS-1502



1.3.2. Rear

DS-1500



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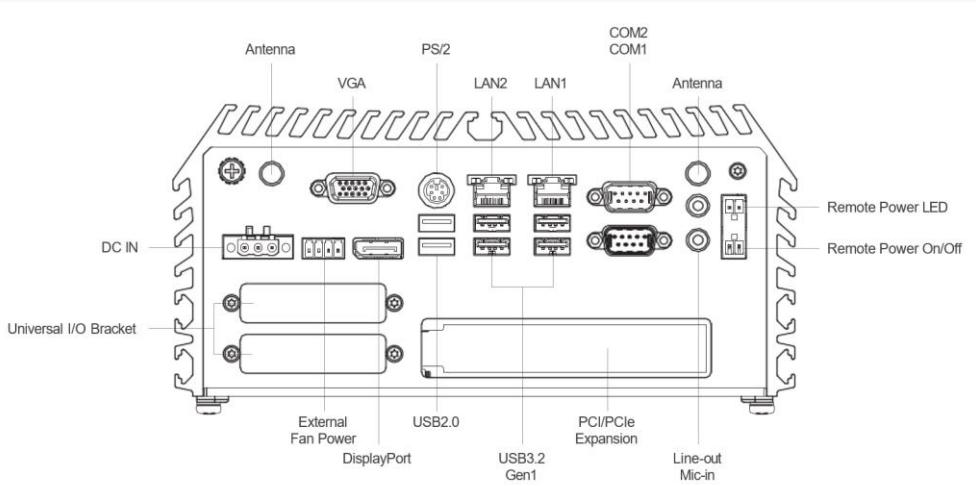

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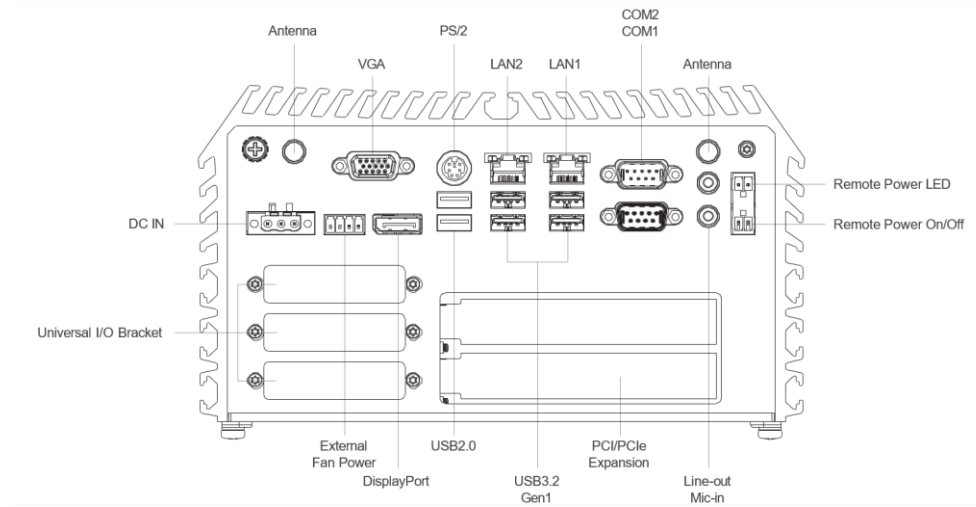
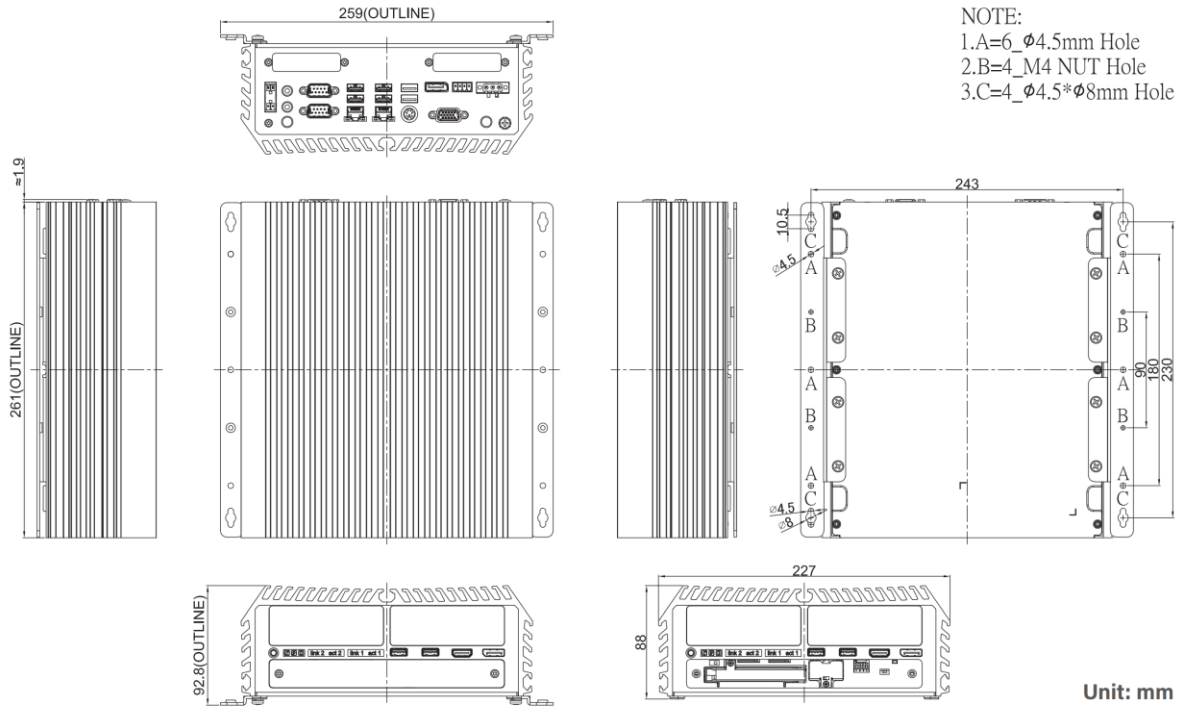


1.4. Dimensions

DS-1500



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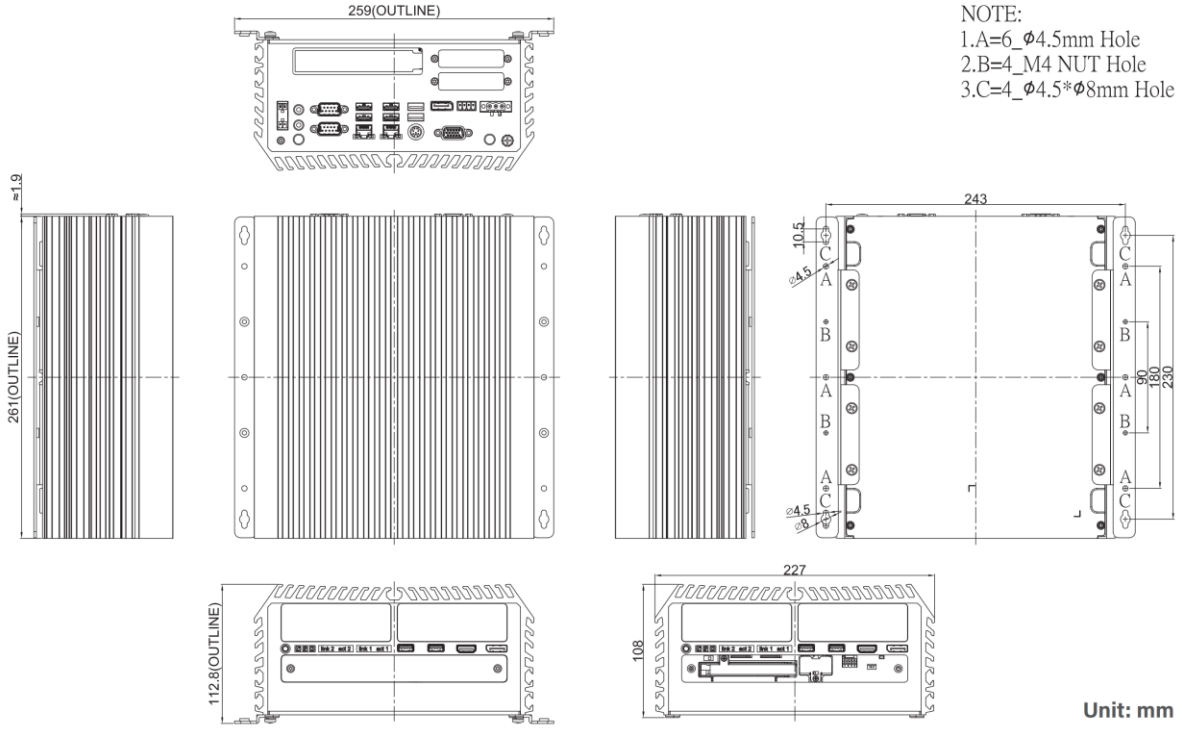
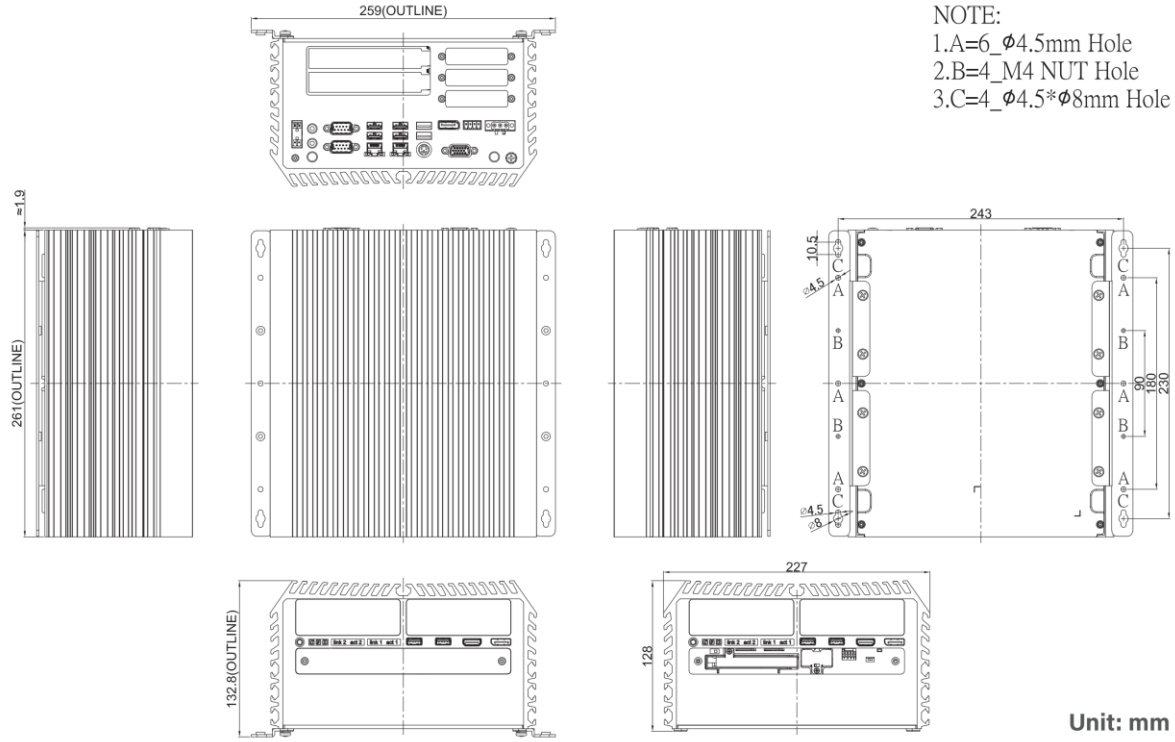


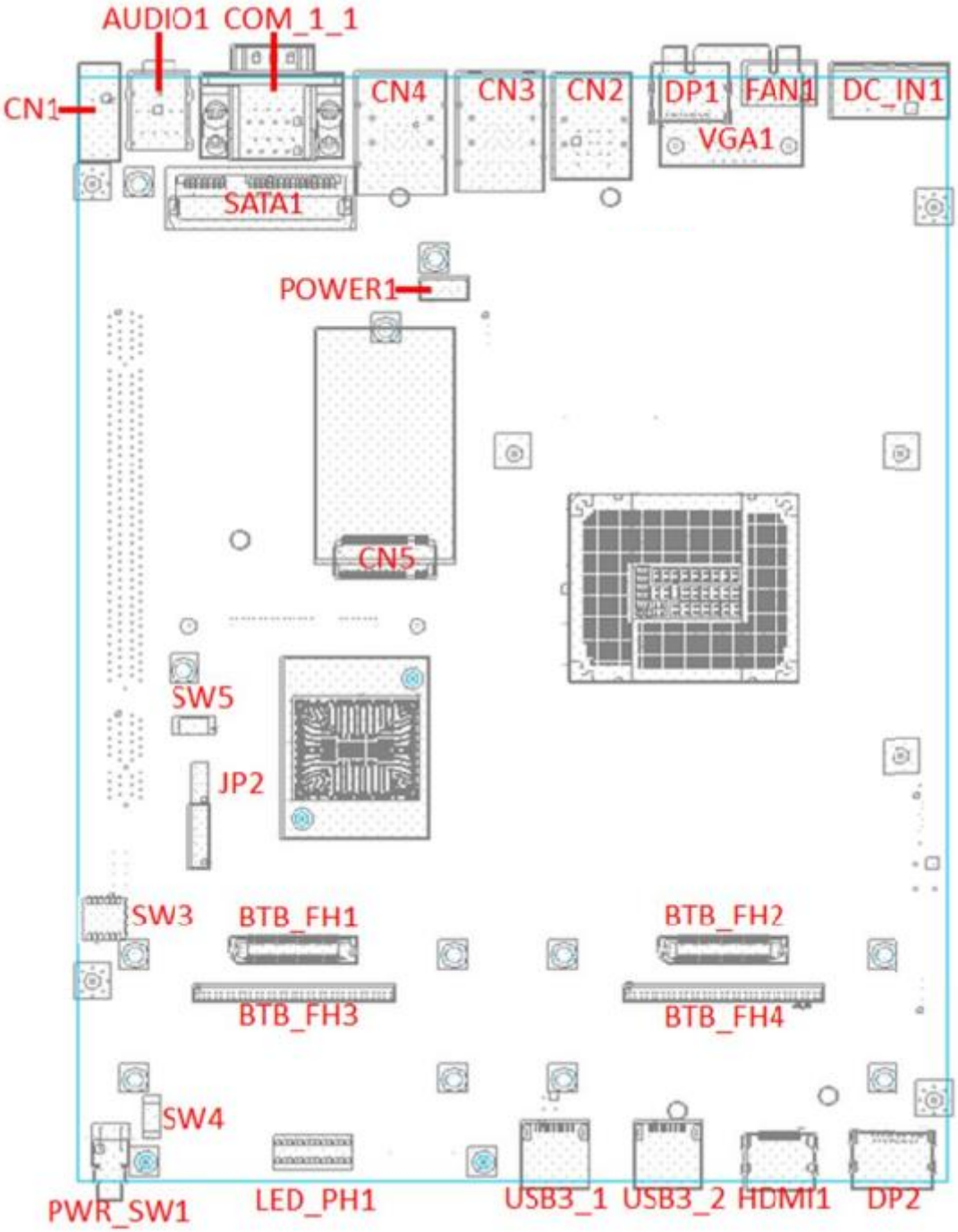
DS-1502


259(OUTLINE)
NOTE:
1.A=6_Φ4.5mm Hole
2.B=4_M4 NUT Hole
3.C=4_Φ4.5*Φ8mm Hole
≈1.9
261(OUTLINE)
243
10.5
Φ4.5
90
180
230
132.8(OUTLINE)
227
128
Unit: mm

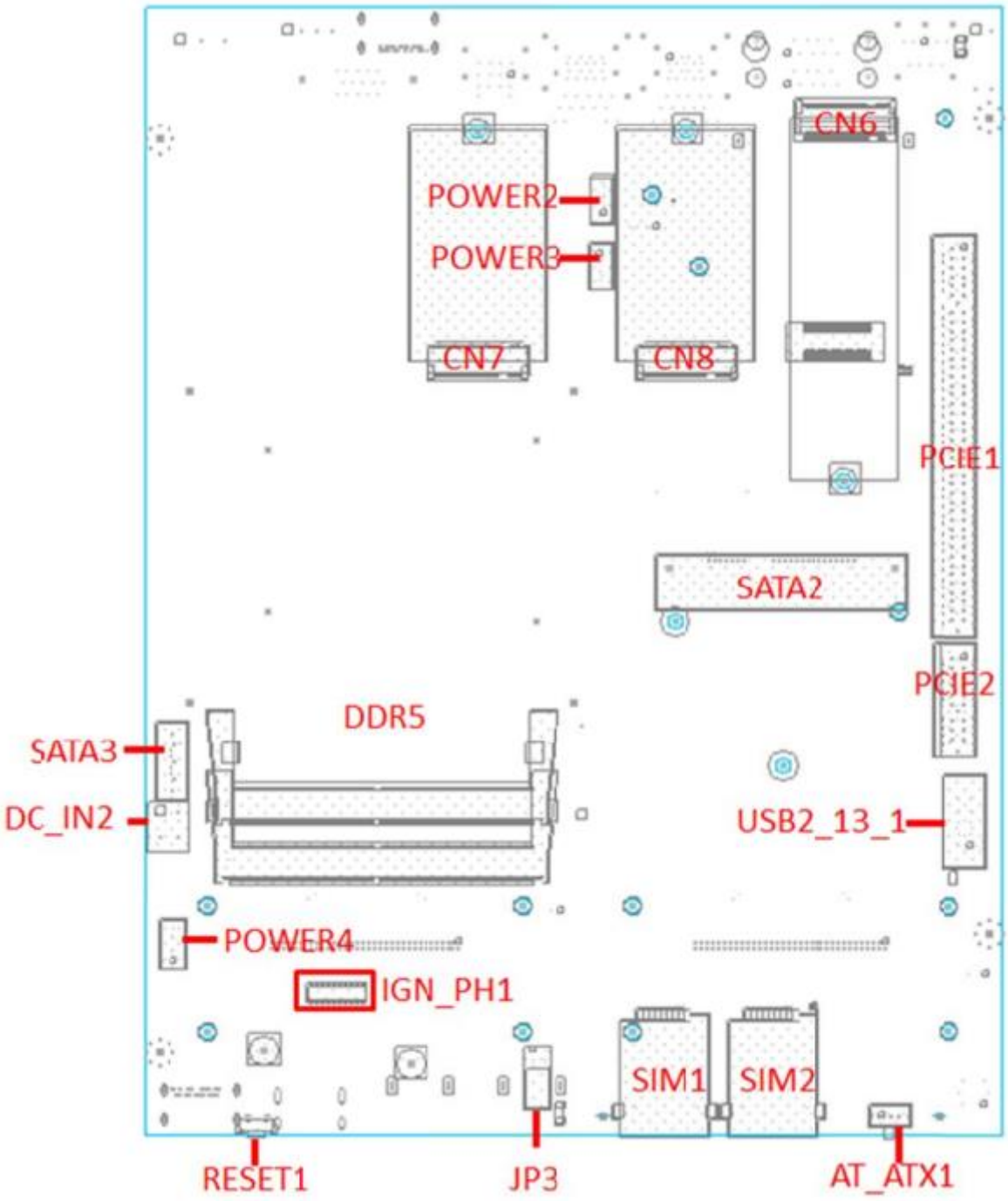
Chapter 2
Introduction to Switches and Connectors

2.1. Location of Switches and Connectors

2.1.1. Top View



2.1.2. Bottom View



2.2. Switches and Connectors Definition

List of Switch & Connector

Connector	Definition
DC_IN1	3-pin DC 9-48V Power Input with Power Ignition Connector
DP1, DP2	DisplayPort Connector
VGA1	VGA Connector
HDMI1	HDMI Connector
FAN1	External PWM Fan Connector
CN2	PS/2 and USB2.0 Ports
CN3	LAN2 (I225IT) and USB3.0 Ports
CN4	LAN1 (I219LM) and USB3.0 Ports
COM_1_1	COM1 /COM2, RS232 / RS422 / RS485 Connector
AUDIO1	Audio Jack / MIC_IN / LINE_OUT
CN1	Remote Power On/Off + Remote Power LED Connector
SATA1,2	22-pin SATA Connector
SATA3	7-pin SATA Connector
Power 1~4	+5V/+12V Power Connector
CN5,	M.2 Key B Type 3052 Connector (Support PCIE/SATA/USB3)
CN7, CN8	M.2 Key B Type 3052 Connector (Support PCIE/SATA)
CN6	M.2 Key M Type 2280 Connector (Support PCIE/SATA)
SW3	SATA DOM / COM1 / COM2 Power Select
SW4	Super CAP/ Engineering use
SW5	PCIE Configuration
BTB_FH1, BTB_FH2	PSE LAN Port Board to Board Connector
BTB_FH3, BTB_FH4	DIO or COM Port Board to Board Connector
USB3_1, USB3_2	USB 3.1 Gen2 Ports
PWR_SW1	Power button with power on LED
LED_PH1	LED board connector for IGN Temperature, HDD, GPIO, LAN2, LAN1 LED
PCIE1	PCI-Express X16 Socket
PCIE2	PCI-Express X1 Socket /FAN
USB2_13_1	Internal USB 2.0 Ports
DDR5	DDR5 SODIMM Socket
IGN_PH1	IGN Board to Board connector

SIM1, SIM2	SIM Card Socket
AT_ATX1	AT / ATX Power Mode Switch
RESET1	Reset button
DC_IN2	4-pin DC 9-48V Out Power Connector
JP2	BIOS SPI interface, TPM (Optional)
JP3	RTC Battery board to board connector

2.3. Definition of Switches

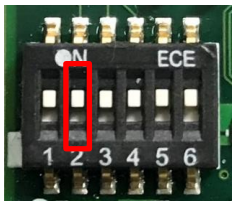
PWR_SW1: Power button with power on LED

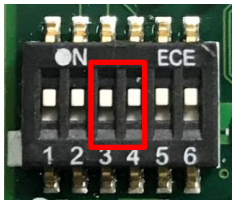
Switch	Definition
Push	Power System

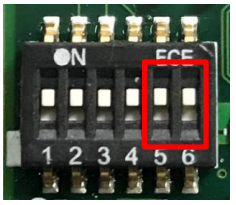
LED Type	LED Status	Status
Power LED	Blue	Power off (S4/S5)
	Green	Power on (S0)
	Blinking Blue & Green	Stand by (S3)

SW3: SATA DOM / COM1 / COM2 Power Select

Location	Function		DIP1	DIP2
SW3	SATA DOM	Disable	N/A	ON (Default)
		Enable		OFF
Location	**Function**		**DIP3**	**DIP4**
SW3	COM1	RI	ON (Default)	ON (Default)
		5V	ON	OFF
		12V	OFF	OFF
Location	**Function**		**DIP5**	**DIP6**
SW3	COM2	RI	ON (Default)	ON (Default)
		5V	ON	OFF
		12V	OFF	OFF







SW4: Super CAP/ Engineering use

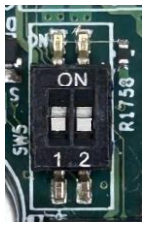
Location	Function		DIP1	DIP2
SW4	Super CAP	Enabled	ON (Default)	ON (Default)
		Disabled	OFF	

ON

OFF

SW5: PCIE Configuration

Location	Function		DIP1	DIP2
SW5	PCIE1	X8,X4,X4	ON	ON
		X8,X8	ON	OFF
		Reserved	OFF	ON
		X16	OFF(Default)	OFF(Default)



ON

OFF

RESET1: Reset Button

Switch	Definition
Push	Reset System

AT_ATX1: AT / ATX Power Mode Switch

Switch	Definition
Left	AT Power Mode
Right	ATX Power Mode (Default)

JP3: RTC Battery board to board connector

Clear BIOS Switch

Pin	Definition
1-2 (Left)	Normal Status (Default)
2-3 (Right)	Clear BIOS

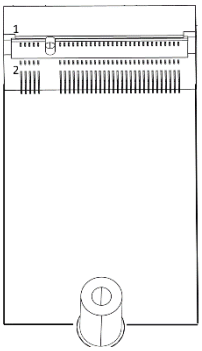
WARNING
(AVERTIR)

After performing Clear CMOS, the system will take several minutes to start. This is normal. During this process, the system will POST three times, and the system's Power LED will alternate between green and blue lights.

(Après avoir effectué Clear CMOS, le système prendra plusieurs minutes pour démarrer. Cela est normal. Pendant ce processus, le système effectuera trois fois le POST, et la LED d'alimentation du système alternera entre les lumières verte et bleue.)

2.4. Definition of Connectors

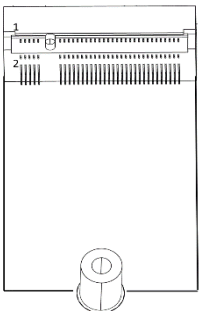
CN5 : M.2 Key B Type 3052 Connector (Support PCIE/SATA/USB3)



Pin No.	PIN Name	Pin No.	Pin name
1	CFG3	2	+3.3V
3	GND	4	+3.3V
5	GND	6	NC
7	USB2_D+	8	NC
9	USB2_D-	10	LED#1
11	GND	12	Key
13	Key	14	Key
15	Key	16	Key
17	Key	18	Key
19	Key	20	NC
21	CFG0	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PERN1	30	USIM1_RST
31	PERP1	32	USIM1_CLK
33	GND	34	USIM1_DATA
35	PETN1	36	USIM1_PWR
37	PETP1	38	DEVSLP
39	GND	40	SIM2_DET
41	PERN0/SATA_RXP	42	USIM2_DATA
43	PERP0/SATA_RXN	44	USIM2_CLK
45	GND	46	USIM2_RST
47	PETN0/SATA_TXN	48	USIM2_PWR
49	PETP0/SATA_TXP	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKN	54	WAKE#
55	REFCLKP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	SIM1_DET

67	RESET2#	68	SUSCLK
69	CFG1	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	CFG2		

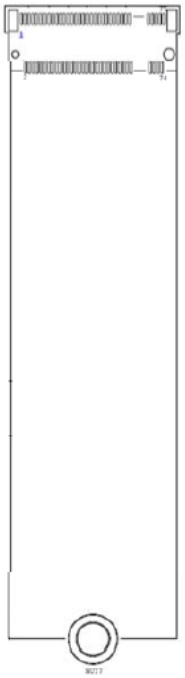
CN7, CN8 : M.2 Key B Type 3052 Connector (Support PCIE/SATA)



Pin No.	PIN Name	Pin No.	Pin name
1	CFG3	2	+3.3V
3	GND	4	+3.3V
5	GND	6	NC
7	USB2_D+	8	NC
9	USB2_D-	10	LED#1
11	GND	12	Key
13	Key	14	Key
15	Key	16	Key
17	Key	18	Key
19	Key	20	NC
21	CFG0	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	PERN1	30	NC
31	PERP1	32	NC
33	GND	34	NC
35	PETN1	36	NC
37	PETP1	38	DEVSLP
39	GND	40	NC
41	PERN0/SATA_RXP	42	NC
43	PERP0/SATA_RXN	44	NC
45	GND	46	NC
47	PETN0/SATA_TXN	48	NC
49	PETP0/SATA_TXP	50	PERST#
51	GND	52	CLKREQ#
53	REFCLKN	54	WAKE#
55	REFCLKP	56	NC
57	GND	58	NC
59	NC	60	NC

61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	RESET2#	68	SUSCLK
69	CFG1	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	CFG2		

CN6 : M.2 Key M Type 2280 Connector (Support PCIE/SATA)



Pin No.	PIN Name	Pin No.	Pin name
1	CFG3	2	+3.3V
3	GND	4	+3.3V
5	PERN3	6	NC
7	PERP3	8	NC
9	GND	10	LED
11	PETN3	12	+3.3V
13	PETP3	14	+3.3V
15	GND	16	+3.3V
17	PERN2	18	+3.3V
19	PERP2	20	NC
21	CFG0	22	NC
23	PETN2	24	NC
25	PETP2	26	NC
27	GND	28	NC
29	PERN1	30	NC
31	PERP1	32	NC
33	GND	34	NC
35	PETN1	36	NC
37	PETP1	38	DEVSLP
39	GND	40	SMB_CLK
41	PERN0/SATARP0	42	SMD_DATA
43	PERP0/SATARN0-	44	ALERT#
45	GND	46	NC
47	PETN0/SATATN0	48	NC
49	PETP0/SATATP0	50	RESET#
51	GND	52	NC
53	REFCLKN	54	PEWAKE#

55	REFCLKP	56	NC
57	GND	58	NC
59	Key	60	Key
61	Key	62	Key
63	Key	64	Key
65	Key	66	Key
67	NC	68	SUSCLK
69	PEDET	70	+3.3V
71	GND	72	+3.3V
73	GND	74	+3.3V
75	CFG2	76	NC

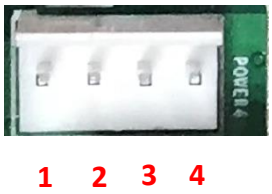
POWER1~4: +5V/+12V Power Output Connector

Power1~3 Connector Type: 1X4 4-pin Wafer, 2.0 mm pitch

Pin	Definition
1	+5V
2	GND
3	GND
4	+12V

Power 4 Connector Type: 1X4 4-pin Wafer, 2.54mm pitch

Pin	Definition
1	+5V
2	GND
3	GND
4	+12V

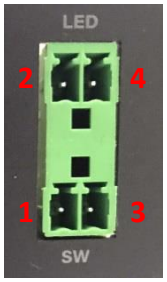


CN1：Remote Power On/Off + Remote Power LED Connector

Remote Power LED connector can connect an external LED indicator up to 10mA @ 3.3V.

Connector Type: Terminal Block 2X2 4-pin, 3.5mm pitch

Pin	Definition
1	PWR_SW
2	LED
3	GND
4	GND



WARNING (AVERTIR)

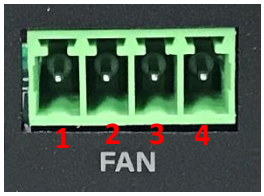
Do not apply power to this connector! This port is used to connect a SWITCH!

(Ne mettez pas sous tension ce connecteur! Ce port est utilisé pour connecter un SWITCH!)

FAN1: External PWM Fan Connector

Connector Type: Terminal Block 1X4 4-pin, 3.5mm pitch

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



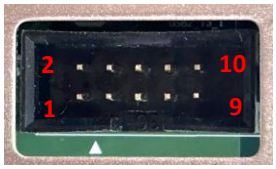
SATA3: 7-pin SATA/SATA DOM Connector

Pin	Definition	Pin	Definition
1	GND	5	B-
2	A+	6	B+
3	A-	7	+5V
4	GND		

USB2_13_1: Internal USB 2.0 Ports

Connector Type: Box Header, 2x5 10-pin, 2.54mm pitch

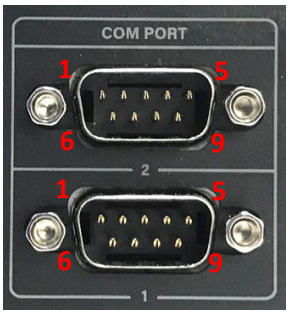
Pin	Definition	Pin	Definition
1	VBUS (+5V)	6	USB2_P1_DP
2	VBUS (+5V)	7	GND
3	USB2_P0_DN	8	GND
4	USB2_P1_DN	9	CGND
5	USB2_P0_DP	10	CGND



COM_1_1: COM1 /COM2, RS232 / RS422 / RS485 Connector

Connector Type: 9-pin D-Sub

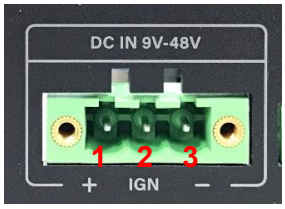
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD	TX-	DATA -
2	RXD	TX+	DATA +
3	TXD	RX+	
4	DTR	RX-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		



DC_IN1: 3-pin DC 9-48V Power Input with Power Ignition Connector

Connector Type: Terminal Block 1x3 3-pin, 5.0mm pitch

Pin	Definition
1	+9-48VIN
2	Ignition (IGN)
3	GND



CAUTION (ATTENTION)

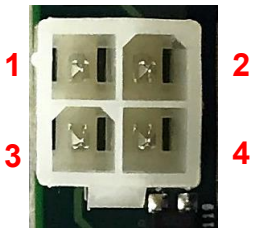
Please disconnect the power source before mounting the DC power cables or connecting the DC power connector to system.

(Veuillez débrancher la source d'alimentation avant de monter les câbles d'alimentation CC ou de connecter le connecteur d'alimentation CC au système.)

DC_IN2: 4-pin DC 9-48V Out Power Connector

Connector Type: 2x2 4-pin, 4.2mm pitch

Pin	Definition
1	GND
2	GND
3	+9-48VIN
4	+9-48VIN



WARNING (AVERTIR)

Before using this connector, make sure that the PIN3 & PIN4 voltage meets the power requirements of the device.

(Avant d'utiliser ce connecteur, assurez-vous que la tension PIN3 et PIN4 répond aux exigences d'alimentation de l'appareil.)

LED_PH1: LED board connector for IGN Temperature, HDD, GPIO, LAN2, LAN1 LED

TEMP HDD GPIO LAN2 Link LAN2 Act LAN1 Link LAN1 Act

LED Type	Status	LED Color
TEMP LED	System Temp ≤ 65°C	Green
	65°C < System Temp ≤ 70°C	Blue
	70°C < System Temp ≤ 75°C	Red
	75°C < System Temp	Blinking Red
HDD LED	No activity	No light
	SATA/M.2 SSD data activity	Yellow
GPIO LED	No activity	No light

	GPIO activity	Green
LAN2 Link LED	2.5Gbps Network Link	Green
	1Gbps Network Link	Orange
	100Mbps Network Link	No light
LAN2 Act LED	Link and data activity	Blinking Yellow
	Link but no activity	Steady Yellow
	No Link	No light
LAN1 Link LED	1Gbps Network Link	Green
	100Mbps Network Link	Orange
	10Mbps Network Link	No light
LAN1 Act LED	Link and data Activity	Blinking Yellow
	Link but no Activity	Steady Yellow
	No Link	No light

NOTE (NOTE)

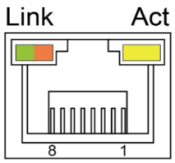
The TEMP LED is only available when IGN module is installed.

(La LED TEMP n'est disponible que lorsque le module IGN est installé.)

CN3: LAN2 (I225IT) and USB3.0 Ports

LAN2 LED Status Definition

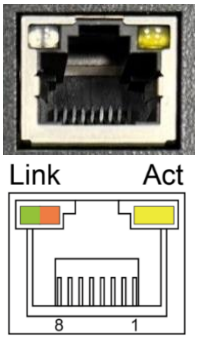
Link Speed LED Status	Definition
Steady Green	2.5 Gbps Network Link
Steady Orange	1 Gbps Network Link
Off	100 Mbps/ 10 Mbps Network Link
Link Act LED Status	**Definition**
Blinking Yellow	Link and Data Activity
Steady Yellow	Link but No Activity
Off	No Link



CN4: LAN1 (I219LM) and USB3.0 Ports

LAN 1 LED Status Definition

Link Speed LED Status	Definition
Steady Green	1 Gbps Network Link
Steady Orange	100 Mbps Network Link
Off	10 Mbps Network Link
Link Act LED Status	**Definition**
Blinking Yellow	Link and Data Activity
Steady Yellow	Link but No Activity
Off	No Link

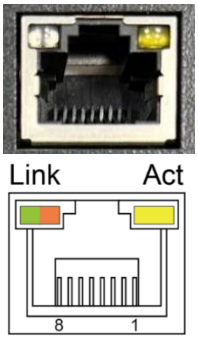


2.5. Optional Module: Definition of Switches and Connectors

2.5.1. CMI-2P5GLAN03

LAN (I225) LED Status Definition

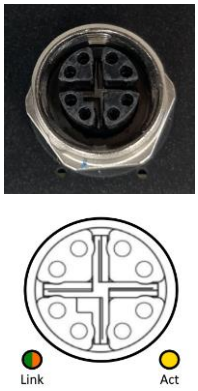
Link Speed LED Status	Definition
Steady Green	2.5 Gbps Network Link
Steady Orange	1 Gbps Network Link
Off	100 Mbps Network Link
Off	10 Mbps Network Link
Link Act LED Status	**Definition**
Blinking Yellow	Link and Data Activity
Steady Yellow	Link but No Activity



2.5.2. CMI-10GXM12LAN03

LAN (X550) LED Status Definition

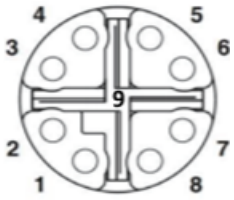
Link Speed LED Status	Definition
Steady Green	10 Gbps Network Link
Steady Orange	1 Gbps Network Link
Off	100 Mbps Network Link
Link Act LED Status	**Definition**
Blinking Yellow	Link and Data Activity
Steady Yellow	Link but No Activity



LAN Port Pin Definitions

Connector Type: M12 X coded 8pin connector

Pin	Definition	Pin	Definition
1	MDX0+	2	MDX0-
3	MDX1+	4	MDX1-
5	MDX3+	6	MDX3-
7	MDX2-	8	MDX2+
9	GND		

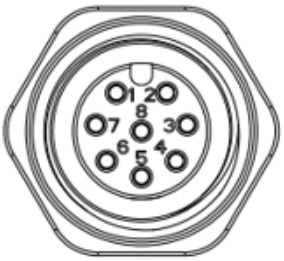


2.5.3. CMI-M12LAN01

LAN Port Pin Definitions

Connector Type: M12 A coded 8pin connector

Pin	Definition	Pin	Definition
1	2_LAN1_0+	2	2_LAN1_0-
3	2_LAN1_1+	4	2_LAN1_2+
5	2_LAN1_2-	6	2_LAN1_1-
7	2_LAN1_3+	8	2_LAN1_3-

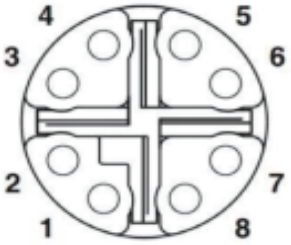


2.5.4. CMI-XM12LAN01

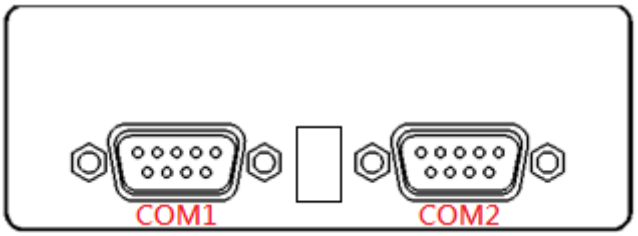
LAN Port Pin Definitions

Connector Type: M12 X coded 8pin connector

Pin	Definition	Pin	Definition
1	D1+	2	D1-
3	D2+	4	D2-
5	D4+	6	D4-
7	D3-	8	D3+



2.5.5. CMI-CAN01



COM1 and COM2 (on the module) : CAN BUS Connector

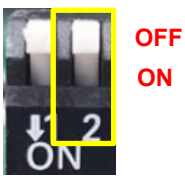
Connector Type: 9-pin D-Sub

Pin	CAN BUS1 Definition	CAN BUS2 Definition
1	N.C	N.C
2	CAN1L	CAN2L
3	GND	GND
4	N.C	N.C
5	N.C	N.C
6	GND	GND
7	CAN1H	CAN2H
8	N.C	N.C
9	N.C	N.C

SW1: COM1/COM2 120Ω Terminating Resistor Select

Location	Function		DIP1	DIP2
SW1 on CMI-CAN Module	COM1	Enabled	OFF (Default)	OFF (Default)
		Disabled	ON	ON

Location	Function		DIP1	DIP2
SW1 on CMI-CAN Module	COM2	Enabled	OFF (Default)	OFF (Default)
		Disabled	ON	ON

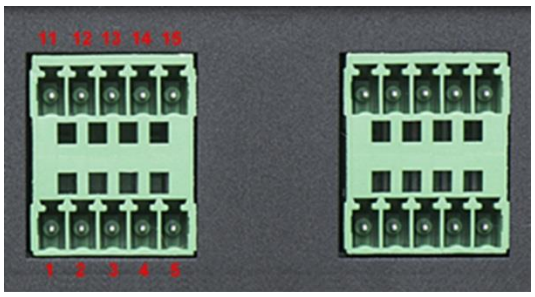


2.5.6. CMI-DIO02

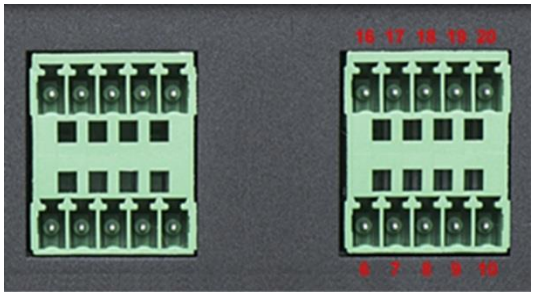
DIO1: Digital Input / Output Connector

Connector Type: Terminal Block 2X5 10-pin, 3.5mm pitch

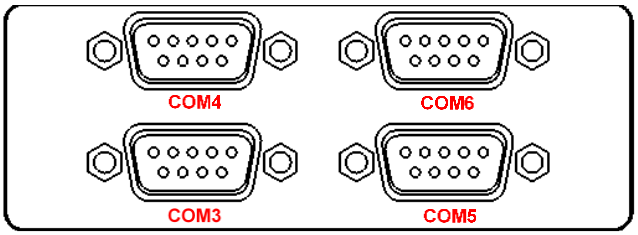
Pin	Definition	Pin	Definition
1	DI1	11	DO1
2	DI2	12	DO2
3	DI3	13	DO3
4	DI4	14	DO4
5	XCOM+ (DC INPUT)	15	XCOM- (GND)



Pin	Definition	Pin	Definition
6	DI5	16	DO5
7	DI6	17	DO6
8	DI7	18	DO7
9	DI8	19	DO8
10	2XCOM+ (DC INPUT)	20	2XCOM- (GND)



2.5.7. CMI-COM02



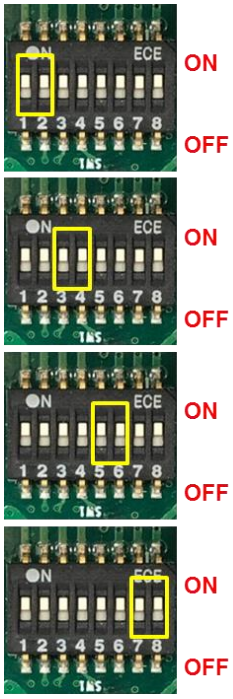
COM3~COM6：RS232 / RS422 / RS485 Connector

Connector Type: 9-pin D-Sub

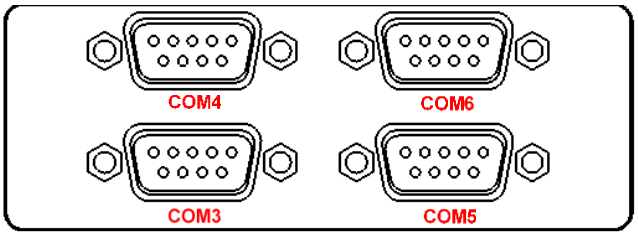
Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD	TX-	DATA -
2	RXD	TX+	DATA +
3	TXD	RX+	
4	DTR	RX-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		

SW1 on CMI-COM02 Module：COM3~COM6 Power Select

Location	Function		DIP1	DIP2
SW1	COM6	0V(RI)	ON (Default)	ON (Default)
		5V	ON	OFF
		12V	OFF	OFF
Location	**Function**		**DIP3**	**DIP4**
SW1	COM5	0V(RI)	ON (Default)	ON (Default)
		5V	ON	OFF
		12V	OFF	OFF
Location	**Function**		**DIP5**	**DIP6**
SW1	COM4	0V(RI)	ON (Default)	ON (Default)
		5V	ON	OFF
		12V	OFF	OFF
Location	**Function**		**DIP7**	**DIP8**
SW1	COM3	0V(RI)	ON (Default)	ON (Default)
		5V	ON	OFF
		12V	OFF	OFF



2.5.8. CMI-ICOM01



COM3~COM6：RS232 / RS422 / RS485 Connector

Connector Type: 9-pin D-Sub

Pin	RS232 Definition	RS422 / 485 Full Duplex Definition	RS485 Half Duplex Definition
1	DCD	TX-	DATA -
2	RXD	TX+	DATA +
3	TXD	RX+	
4	DTR	RX-	
5	GND		
6	DSR		
7	RTS		
8	CTS		
9	RI		

NOTE (NOTE)

COM3/4/5/6 are isolated COM, each pin5 (GND) is independent.

(COM3/4/5/6 sont des COM isolés, chaque pin5 (GND) est indépendant.)

2.5.9. CFM-IGN101

SW2：IGN Module Timing Setting Switch

Set shutdown delay timer when ACC is turned off

Pin 1	Pin 2	Pin 3	Pin 4	Definition
ON (IGN Enabled) / OFF (IGN Disabled)	ON	ON	ON	0 second
	ON	ON	OFF	1 minute
	ON	OFF	ON	5 minutes
	ON	OFF	OFF	10 minutes
	OFF	ON	ON	30 minutes
	OFF	ON	OFF	1 hour
	OFF	OFF	ON	2 hours
	OFF	OFF	OFF	Reserved (0 second)

Default setting of Pin1 to Pin4 is OFF / OFF / OFF / OFF.

24V_12V_1：IGN Module Voltage Mode Setting Switch

12V / 24V Car Battery Switch

Switch	Definition
Left	12V Car Battery Input
Right	24V Car Battery Input (Default)

Chapter 3
System Setup

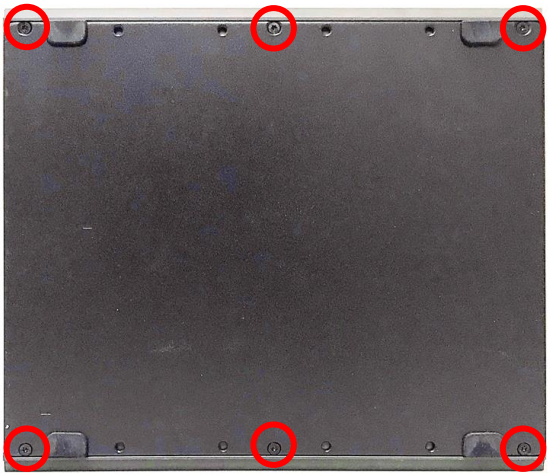
3.1. Removing Top Cover

WARNING (AVERTIR)

To prevent electrical shock or system damage, the power must be turned off and the unit must be disconnected from all power sources before removing the top cover.
(Pour éviter tout choc électrique ou dommage au système, l'alimentation doit être coupée et l'appareil déconnecté de toutes les sources d'alimentation avant de retirer le capot supérieur.)

All steps in Chapter 3 are demonstrated using the DS-1502 as an example.

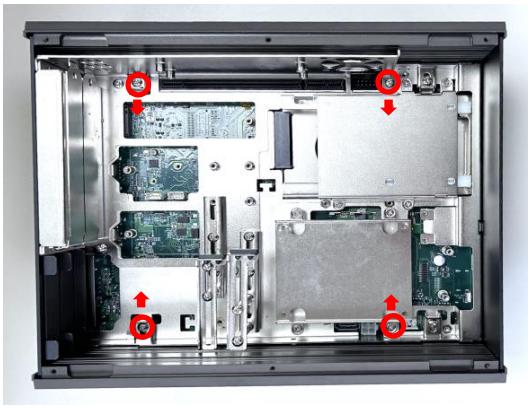
Step 1. Flip the unit upside down and remove the 6 screws on the bottom cover.



Step 2. Remove the bottom cover from the chassis.

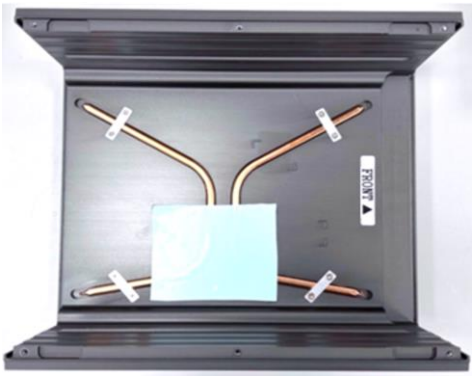
Step 3. Remove the two screws from the rear bezel as shown below and set them aside.

Step 4. Loosen but do not remove the 4 screws indicated below, then pull the 4 latches as indicated below.



Step 5. Lift up the unit vertically by holding the front and rear panels.

Step 6. Flip the system upright and set it to the side.



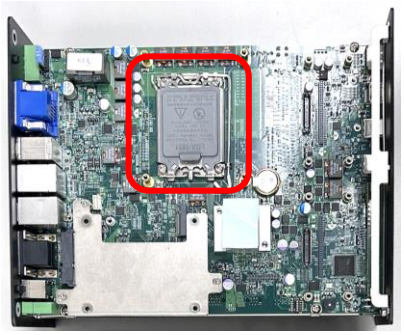
3.2. Installing CPU

WARNING (AVERTIR)

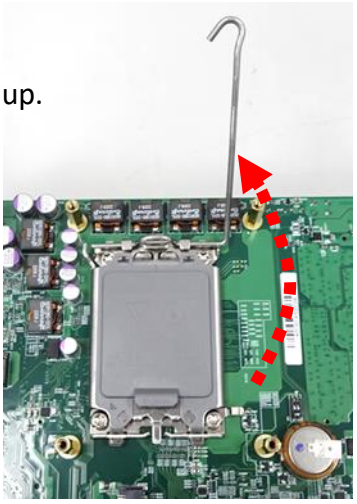
After replacing the CPU, please perform a Clear CMOS before powering on. According to Intel documentation (Clear CMOS after Hardware Configuration Change, Document Number: 337986-001), if you do not perform a Clear CMOS, the BIOS will apply settings from the old CPU to the new CPU, which may cause performance issues or startup failures. Therefore, Cincoze performs a Clear CMOS procedure before shipping. When customers power on the system for the first time, it will take several minutes to start. This is normal. During this process, the system will POST three times, and the Power LED will alternate between green and blue lights.

(Après avoir remplacé le CPU, veuillez effectuer un Clear CMOS avant de mettre sous tension. Selon la documentation Intel (Clear CMOS after Hardware Configuration Change, Document Number: 337986-001), si vous n'effectuez pas un Clear CMOS, le BIOS appliquera les paramètres de l'ancien CPU au nouveau CPU, ce qui peut entraîner des problèmes de performance ou des échecs de démarrage. Par conséquent, Cincoze effectue une procédure de Clear CMOS avant l'expédition. Lorsque les clients mettent le système sous tension pour la première fois, il faudra plusieurs minutes pour démarrer. Cela est normal. Pendant ce processus, le système effectuera trois fois le POST et la LED d'alimentation alternera entre les lumières verte et bleue.)

Step 1. Locate the CPU socket.



Step 2. Press the lever down and to the side, then up.



Step 3. Lift up the holder.

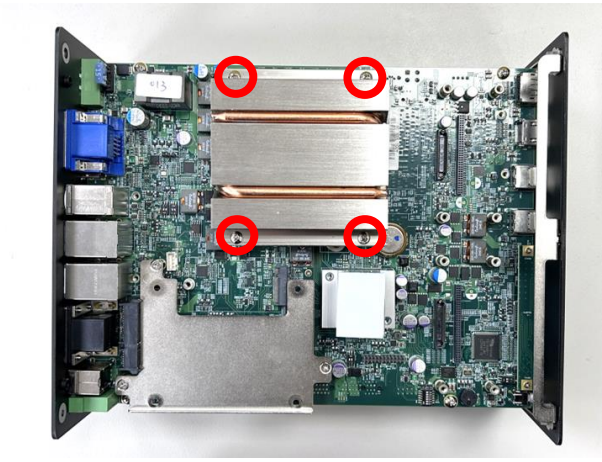
Step 4. Align the CPU with the fool-proof protrusions on the socket and gently seat the CPU.

Step 5. Press down on the holder. The CPU socket cover will detach automatically. Set the cover aside for future use

Step 6. Press the lever back to its original place to lock the CPU.

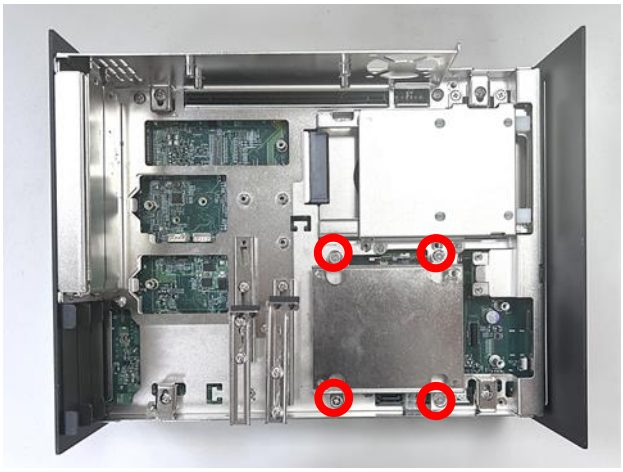
Step 7. Make sure that the CPU is clean, and apply thermal paste onto the center of the CPU's surface as shown below. For more information about thermal paste application, refer to the support article on Intel's official website.

Step 8. Align the mounting holes on CPU heatsink with the standoffs and secure the heatsink with the 4 screws provided as indicated.

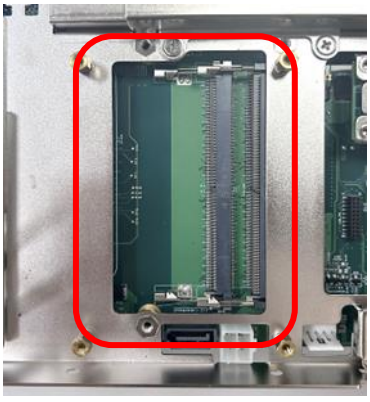


3.3. Installing SO-DIMM

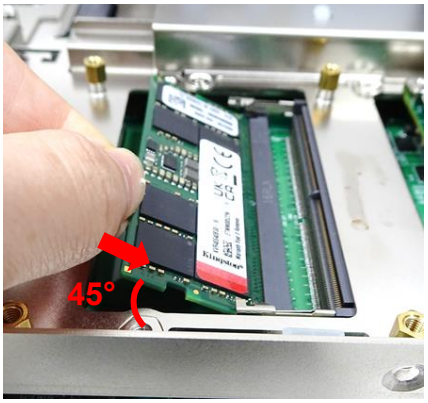
Step 1. Flip the system upside down. Remove the 4 screws indicated below and remove the HDD bracket.



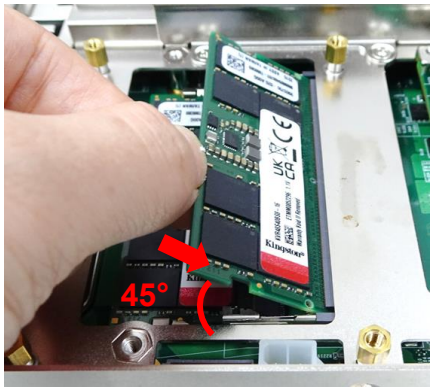
Step 2. Locate two SO-DIMM sockets at the bottom.



Step 3. Insert a SO-DIMM module at a 45-degree angle until it is firmly seated in the socket.



Lower socket



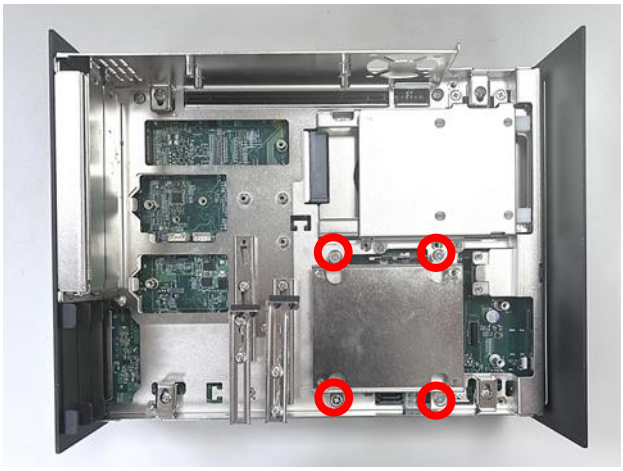
Upper socket

Step 4. Press down on the module until the retaining clips snap back in place.

Lower socket

Upper socket

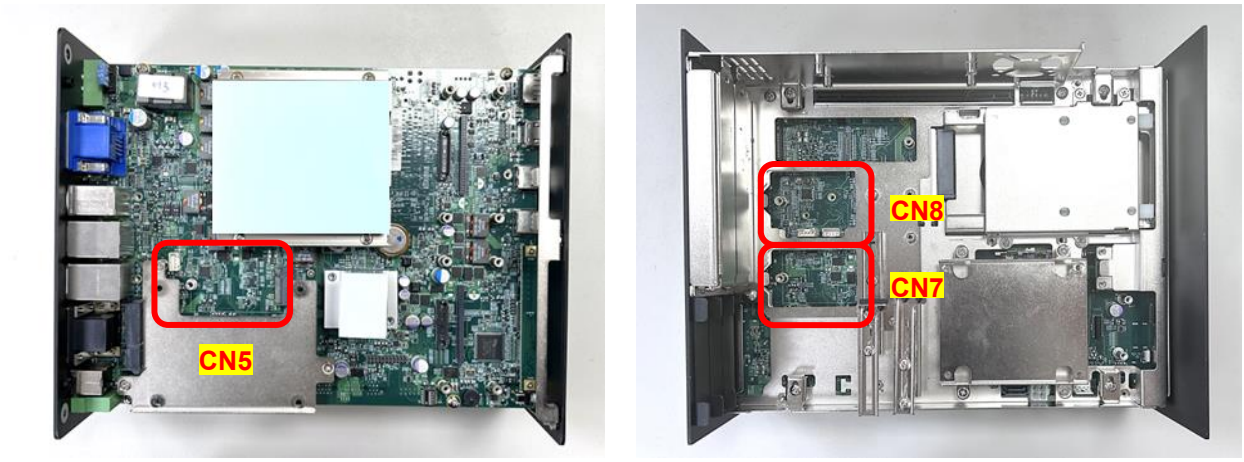
Step 5. Place the HDD bracket back into place and secure it with 4 screws as indicated below.



3.4. Installing M.2 Key B Module

3.4.1. M.2 Key B type 3052 Module

Step 1. Locate the M.2 Key B type 3052 connector (CN5) on the top side or the M.2 Key B type 3052 connector (CN7 or CN8) on the bottom side of the system motherboard. CN5 is used as the example here.



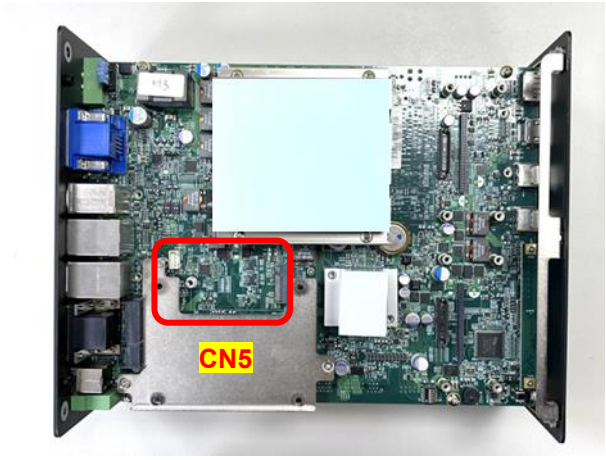
Step 2. Insert the M.2 Key B type 3052 module at a 45-degree angle until it is firmly seated in the socket.

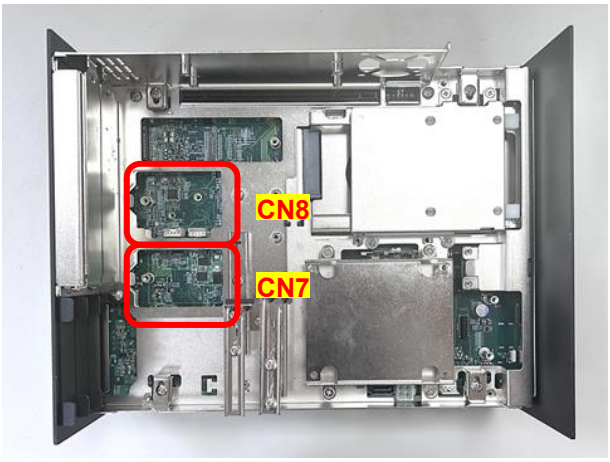
Step 3. Press down on the module and secure it with a screw.

3.4.2. M.2 Key B type 3042/2242 Module

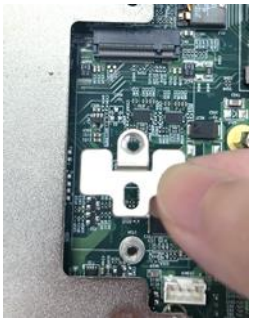
This section uses an M.2 Key B 2242 module as an example for installation.

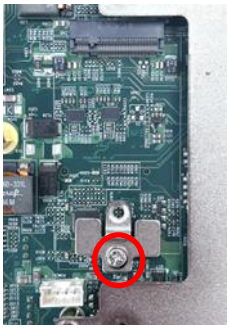
Step 1. Locate the M.2 Key B type 3052 connector (CN5) on the top side or the M.2 Key B type 3052 connector (CN7 or CN8) on the bottom side of the system motherboard. CN5 is used as the example here.





Step 2. Align the M.2 Key B Type 3052 to 3042 Adapter Bracket (included in the Package) with the corresponding screw hole. Secure the bracket in place and fasten the screw (M3x4L, included in the Screw Pack).





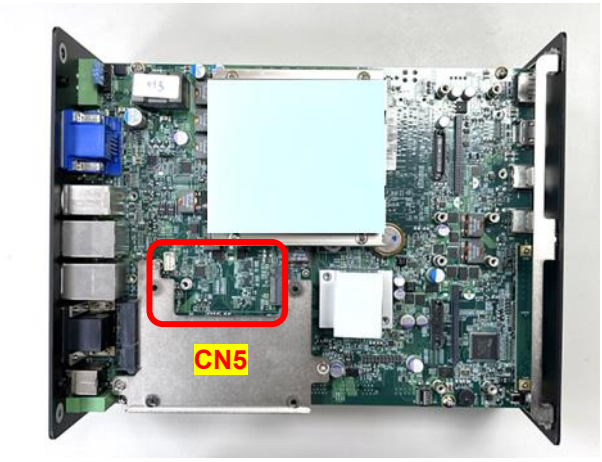
Step 3. Insert the M.2 Key B module at a 45-degree angle until it is firmly seated in the socket.

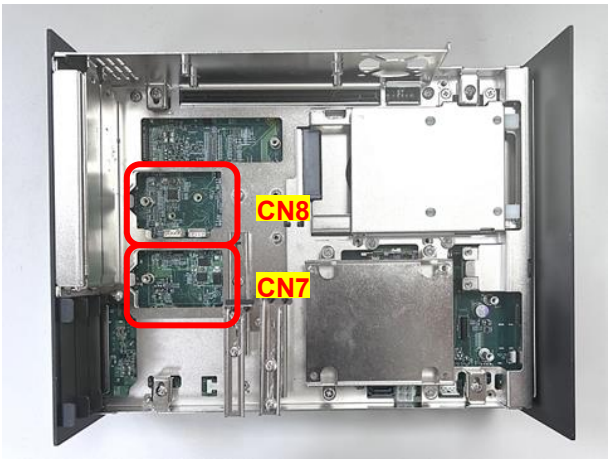
Step 4. Press down on the module and secure it with a screw.

3.4.3. M.2 Key E type 2230 Module

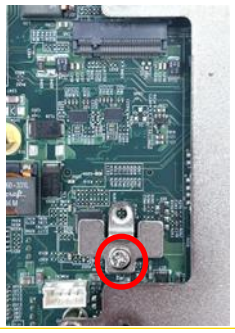
This section covers the installation of an M.2 Key E type 2230 adapter card. For this section, you'll need to purchase our M.2 Key B Type 2242 to M.2 Key E Type 2230 Adapter Card (Model: AC-BE01-R10). This optional accessory allows the use of M.2 Key E type 2230 cards with the DS-1500 system.

Step 1. Locate the M.2 Key B type 3052 connector (CN5) on the top side or the M.2 Key B type 3052 connector (CN7 or CN8) on the bottom side of the system motherboard. CN5 is used as the example here.

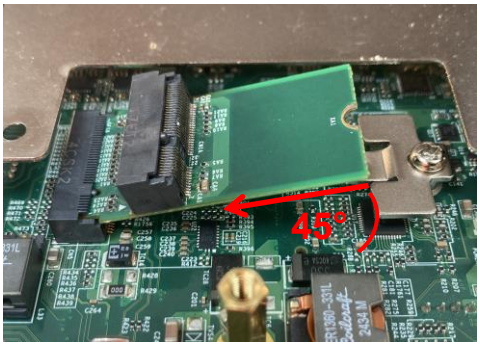




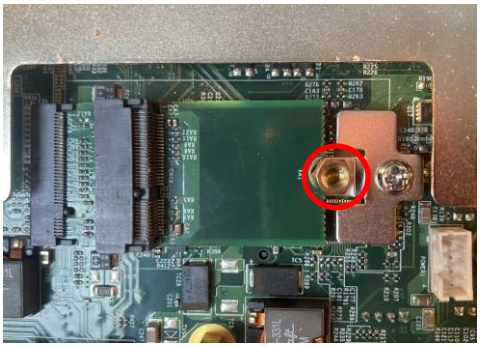
Step 2. Align the M.2 Key B Type 3052 to 3042 Adapter Bracket (included in the Package) with the corresponding screw hole. Secure the bracket in place and fasten the screw (M3x4L, included in the Screw Pack).



Step 3. Insert the M.2 Key B to M.2 Key E adapter card at a 45-degree angle until it is firmly seated in the socket.

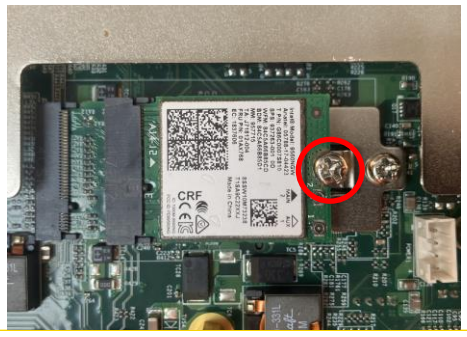


Step 4. Press down on the module and secure it with a standoff.



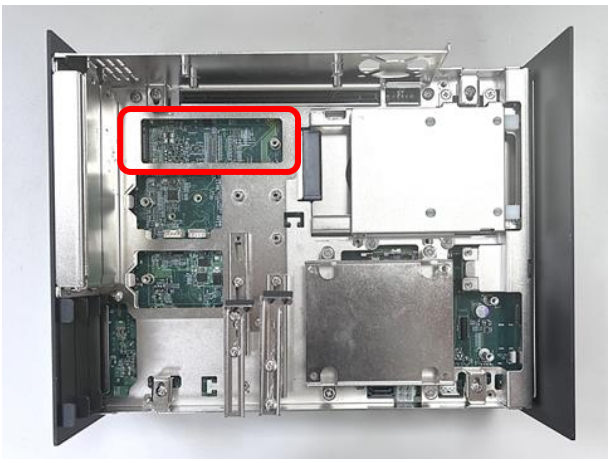
Step 5. Insert the M.2 Key E module at a 45-degree angle until it is firmly seated in the socket.

Step 4. Press down on the module and secure it with a screw.

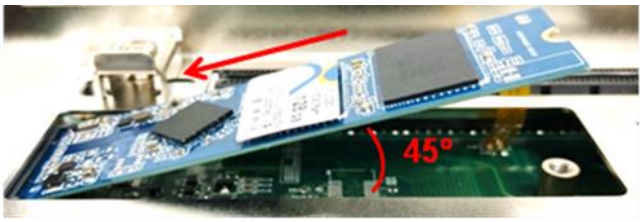


3.5. Installing M.2 Key M Module

Step 1. Flip the system upside down and locate the M.2 Key M slot (CN6).



Step 2. Insert the M.2 Key M module at a 45-degree angle until it is firmly seated in the socket.



Step 3. Press down on the module and secure it with a screw.

3.6. Installing Antenna

Step 1. Remove the antenna covers on the rear panel indicated below.

Step 2. Slot the antenna jacks through their respective cutouts.

Step 3. Thread the washer and the nut onto the antenna jack until they sit flush against the rear panel.

Step 4. Assemble the antenna and antenna jack.

Step 5. Attach the RF connector cable to the Wireless card to complete installation.

3.7. Installing Antenna Cutout Universal Bracket (Rear)

An optional Universal Bracket (Model No. UB0331) features two antenna cutouts. This bracket allows users to mount antennas in the designated cutouts. For Antenna installation details, refer to the previous chapter (3.6).

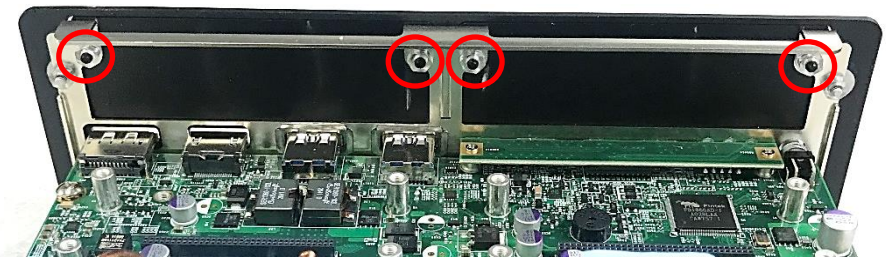
Step 1. Remove the two screws from any bracket on the system's rear panel (the top bracket is used as an example here).

Step 2. Attach the I/O bracket to the system as indicated below, and secure it with screws. For guidance on antenna installation, please refer to the previous chapter (3.6).

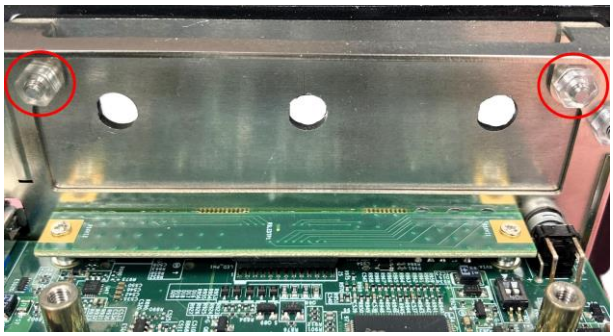
3.8. Installing Antenna Cutout Universal Bracket (Front)

An optional Universal Bracket (Model No. UB1032) features three antenna cutouts. This bracket allows users to mount antennas in the designated cutouts. For Antenna installation details, refer to chapter 3.6.

Step 1. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.

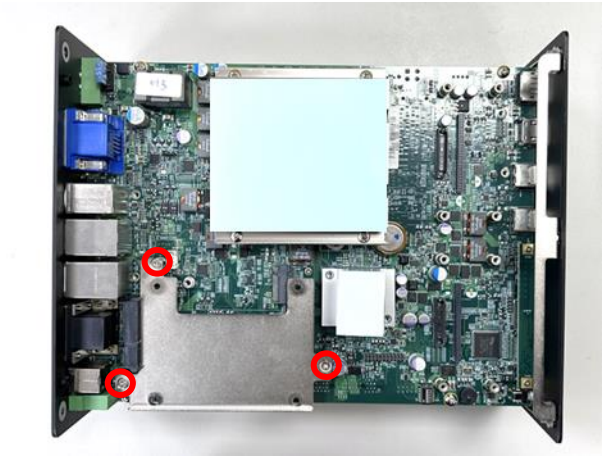


Step 2. Install the UB and secure it in place with two hex nuts as indicated below.

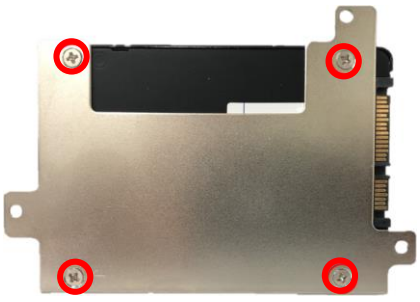


3.9. Installing SATA Hard Drive on Top Side

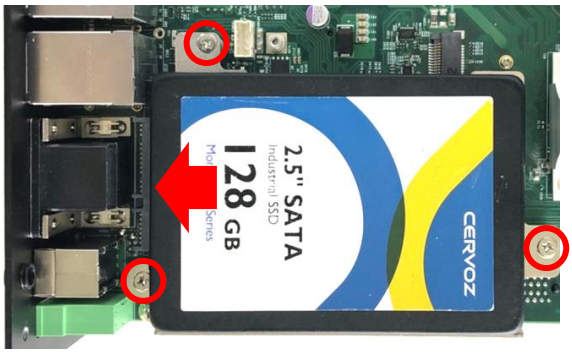
Step 1. Remove the 3 screws on the HDD bracket and remove the bracket.



Step 2. Set the HDD upside down, with the four bottom screws facing up. Place the HDD bracket over the HDD and secure it with 4 screws.



Step 3. Flip the HDD assembly upright and insert the drive into the SATA socket. Secure the bracket to the motherboard with 3 screws.



3.10. Installing Riser Card

The applicable riser cards for the DS-1500 series are listed in the following table. Please kindly note that this installation guide is intended only for the DS-1501 and DS-1502 models.

Item	Model No.	Description	Compatible Model
1	RC-E16-01	Riser Card with 1 x PCIex16 Slot	DS-1501
2	RC-PI-01	Riser Card with 1 x PCI Slot	DS-1501
3	RC-E8E8-R10	Riser Card with 2 x PCIex8 Slots	DS-1502
4	RC-E16E1-01	Riser Card with 1 x PCIex16 and 1 x PCIex1 slot, supports add-on cards up to 75W.	DS-1502
5	RC-E16PI-01	Riser Card with 1 x PCIex16 and 1 x PCI slot	DS-1502
6	RC-PIPI-01	Riser Card with 2 x PCI Slots	DS-1502
7	RC-E16E1-02	Riser Card with 1 x PCIex16 and 1 x PCIex1 slot with an auxiliary power connector, supports add-on cards up to 130W.	DS-1502

Refer to Section 3.9.1 for installation instructions for items 1 to 6, and section 3.9.2 for item 7.

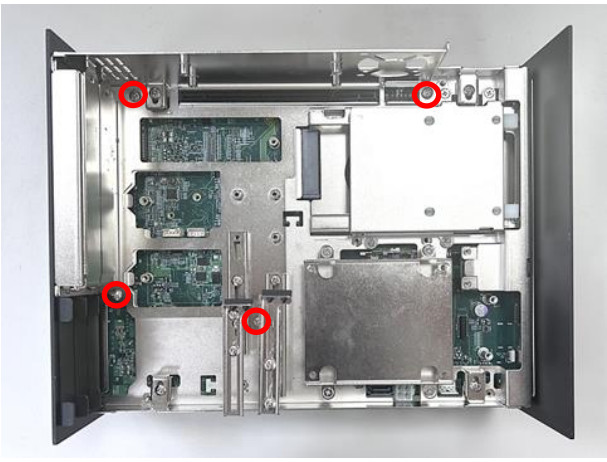
3.10.1. Method 1

Please note that this section uses Riser Card Model No. RC-E8E8-R10 as an example for installation.

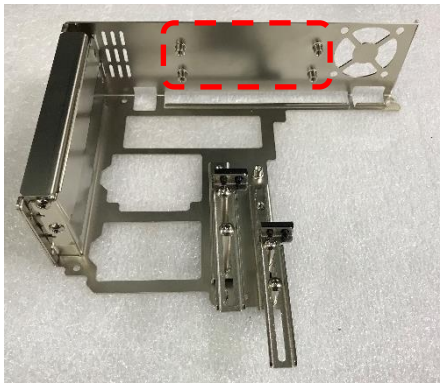
Step 1. Prepare the Riser Card.

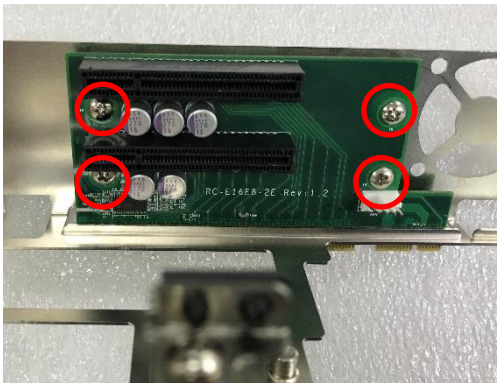
Riser Card (Model No. RC-E8E8-R10)

Step 1. Remove the 4 screws to remove the extension bracket.

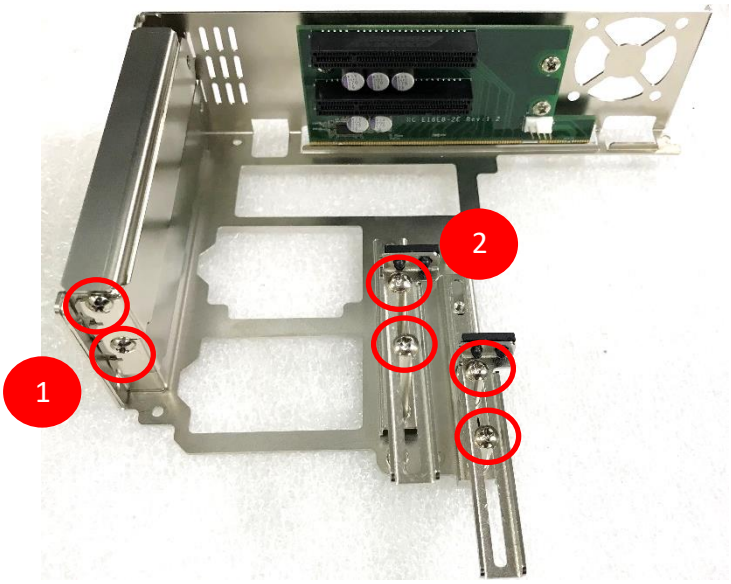


Step 2. Secure the riser card to the extension bracket with 4 screws as indicated below.

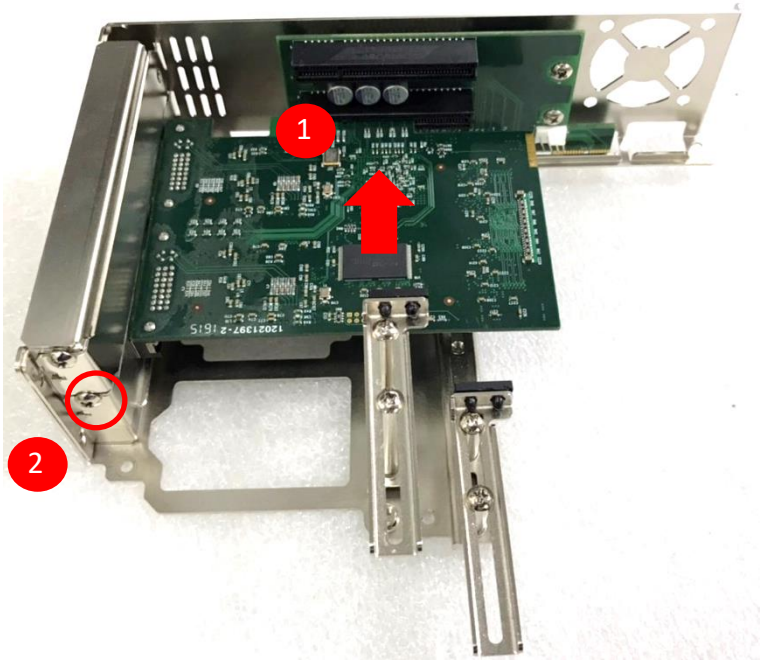




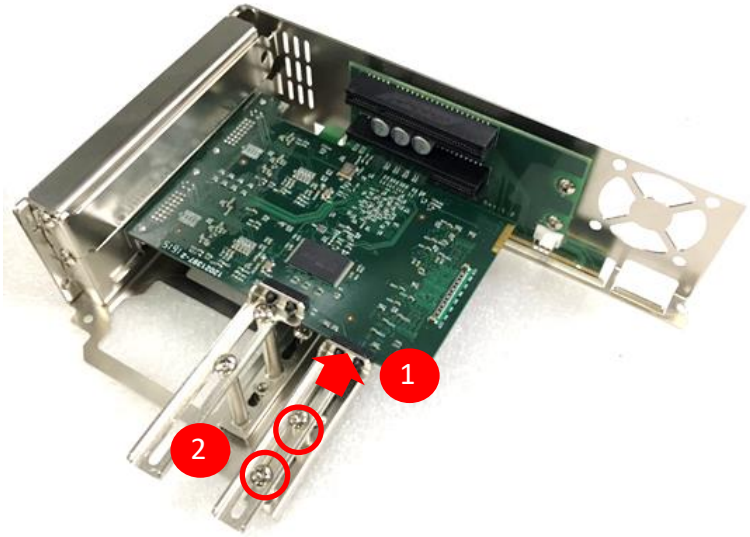
Step 3. (1) Remove the screws to remove as many PCI(e) slot covers as necessary. (2) Loosen but do not remove the four screws indicated below.



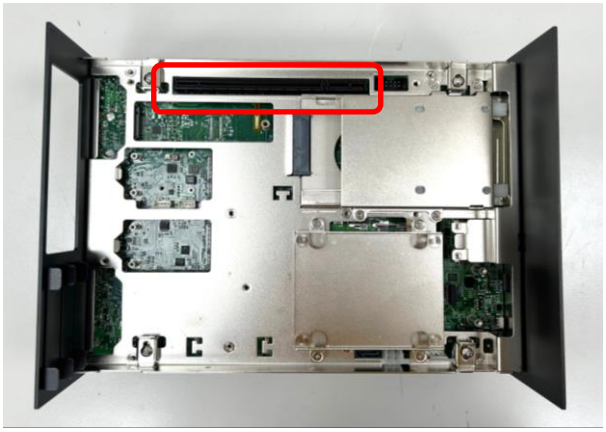
Step 4. (1) Insert a PCI(e) card into the slot. (2) Secure the card to the bracket with a screw.



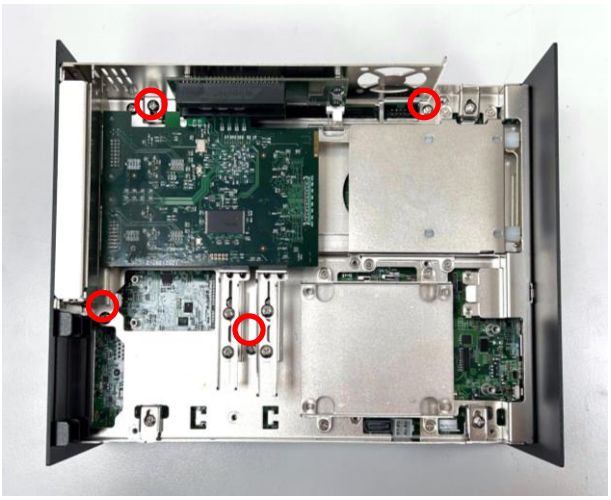
Step 5. (1) Push the card retainer forward until it grips the PCB of the card. (2) Secure the card retainer with two screws.

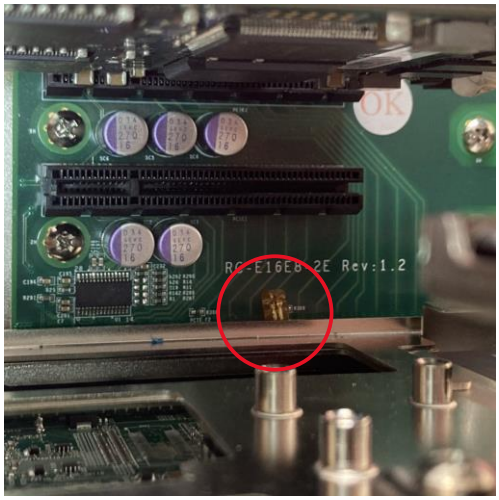


Step 6. Locate the riser card slot on the bottom side of the system.



Step 7. Install the assembled expansion bracket into the system and secure it with 4 screws as indicated below. Loosen the latches (see Section 3.1, step 4) if necessary for ease of installation. Ensure the bracket or the riser card does not crush the thermistor.





WARNING (AVERTIR)

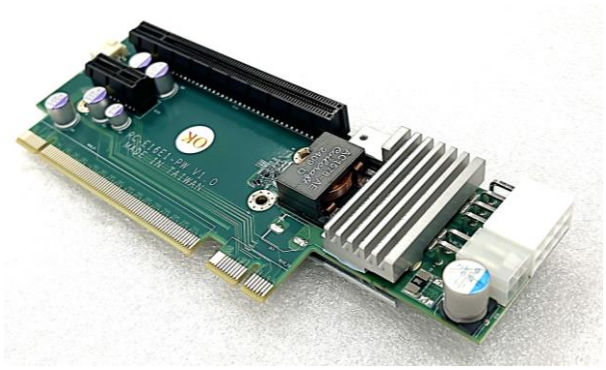
Ensure the bracket or the riser card does not crush the thermistor. Failure to follow this step may damage the sensor.

(S'assurer que le support ou la carte d'extension ne comprime pas la thermistance. Le non-respect de cette étape peut endommager le capteur.)

3.10.2. Method 2

Please note that this section uses Riser Card Model No. RC-E16E1-02 as an example for installation.

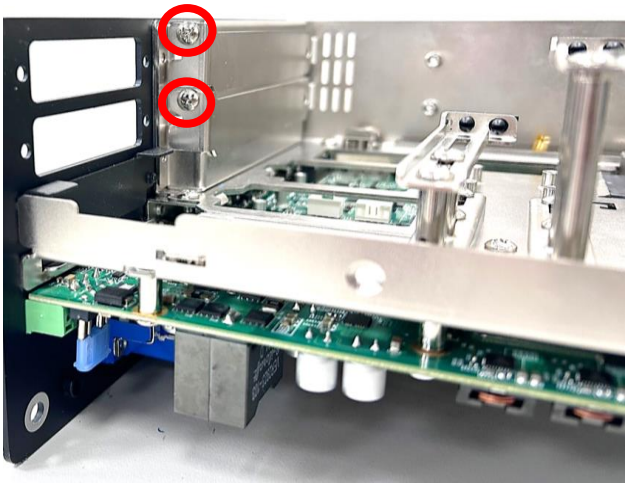
Step 1. Prepare the Riser Card.

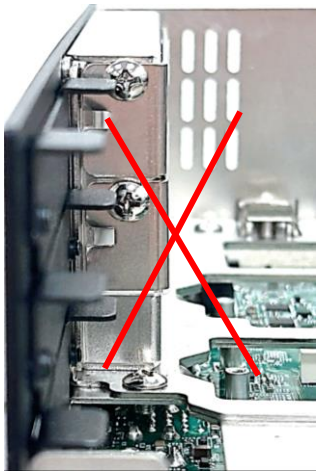


Riser Card (Model No. RC-E16E1-02)

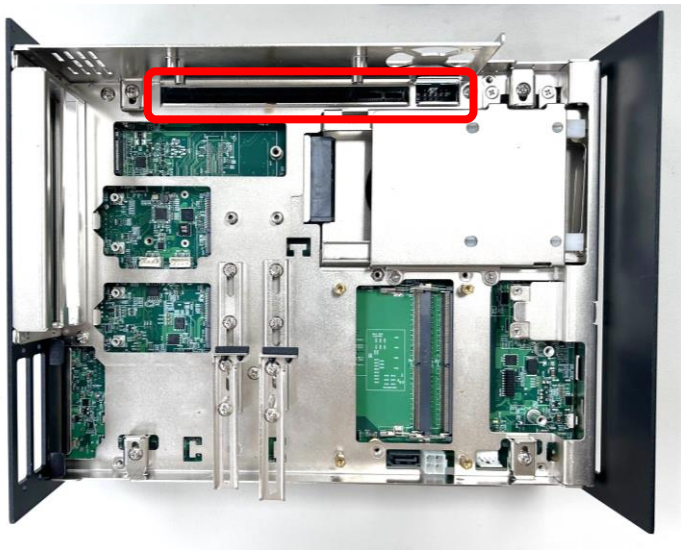
Step 2. Remove the screws securing the expansion covers, then remove the covers as well.

Step 3. Remove the screws securing the PCI(e) slot covers, then remove the covers themselves. If the expansion covers were not removed in Step 2, it will be difficult to access the screws here (see bottom right). Therefore, please ensure Step 2 is completed first.

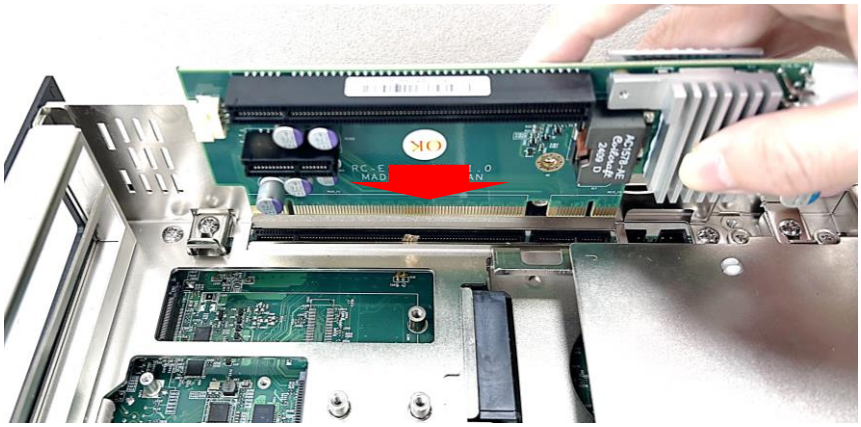




Step 4. Identify the riser card slot on the bottom side of the system.



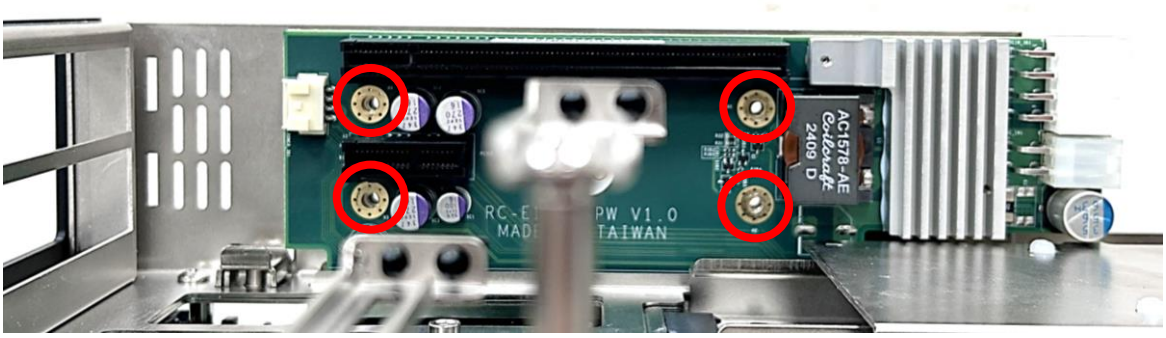
Step 5. Ensure the contacts of the riser card are properly aligned with the slot, then insert the riser card vertically into place. Ensure the riser card does not crush the thermistor.



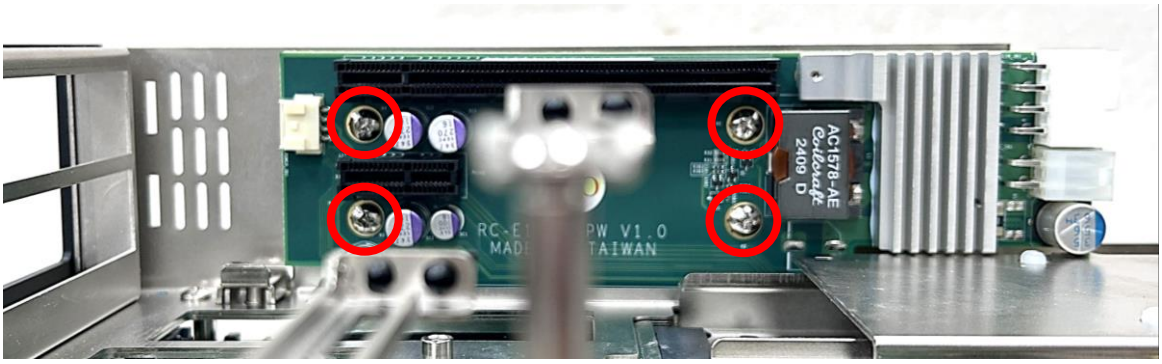
WARNING (AVERTIR)

Ensure the riser card does not crush the thermistor. Failure to follow this step may damage the sensor.
(S'assurer que la carte d'extension ne comprime pas la thermistance. Le non-respect de cette étape peut endommager le capteur.)

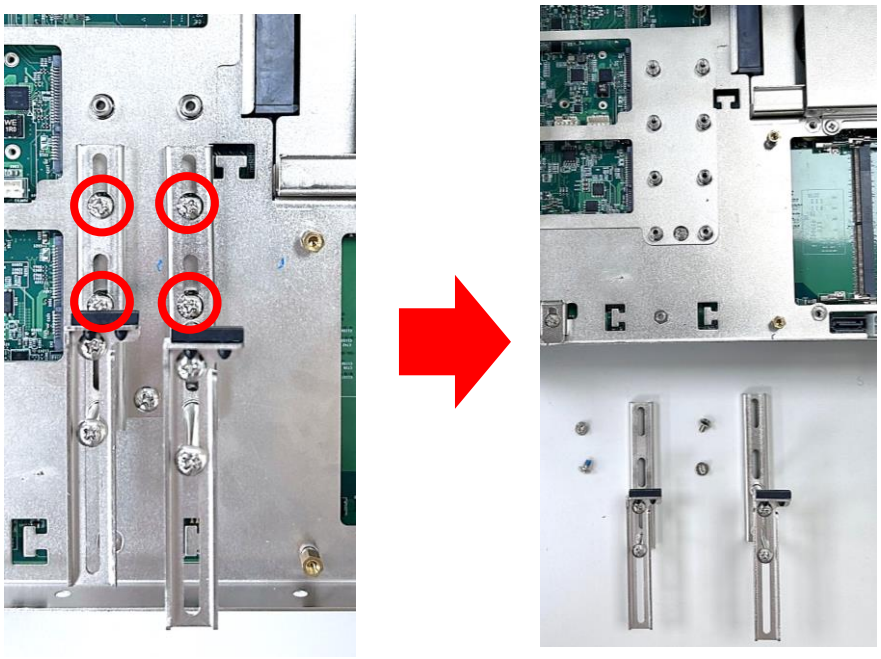
Step 6. Ensure the screw holes are properly aligned.



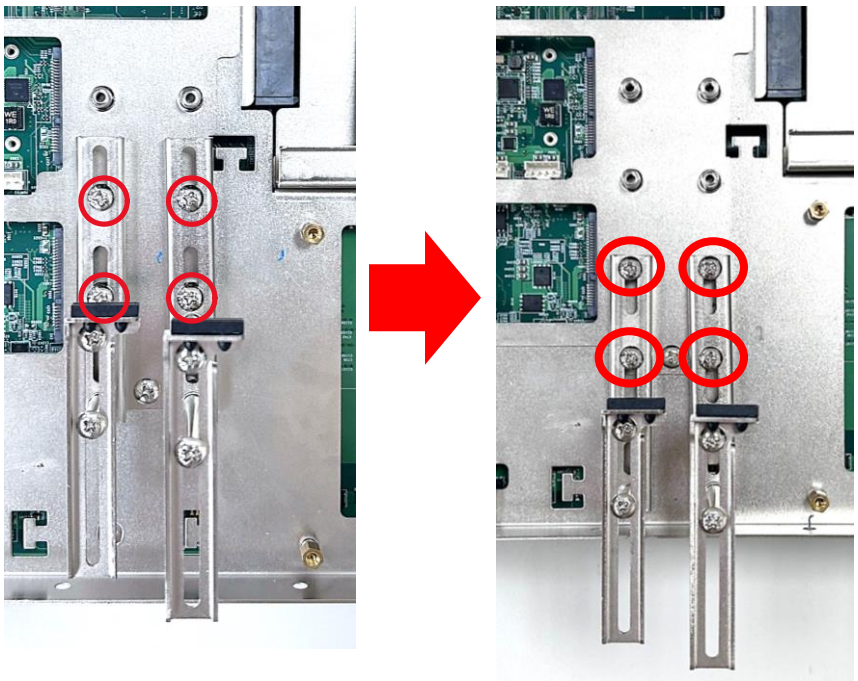
Step 7. Secure the riser card to the system with 4 screws (M3x5L).



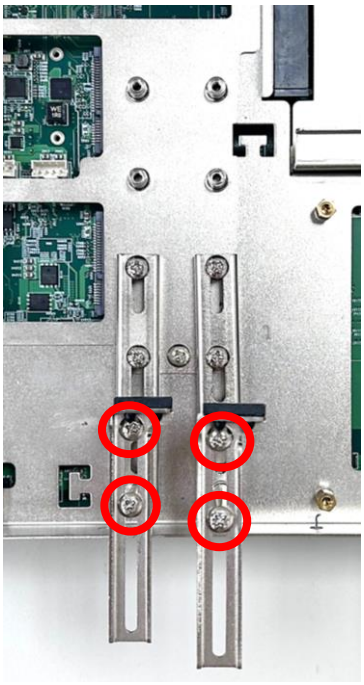
Step 8. Adjust the position of the card retainer stands according to the size of the PCIe card. In this example, the largest card size supported by the DS-1502 is used (235mm x 124mm). If the size of your card does not require repositioning, Step 8 and Step 9 may be skipped.
Remove the four screws indicated below to remove the card retainer stands.



Step 9. Align the card retainer stands with the suitable screw holes, then secure the card retainers as indicated below.

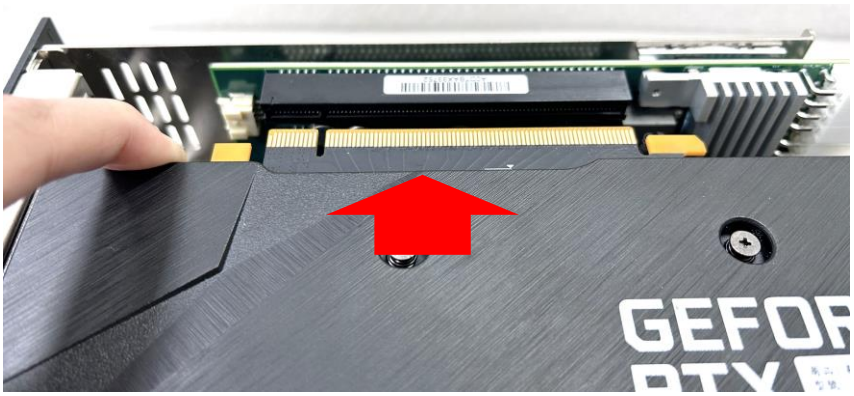


Step 10. Loosen but do not remove the card retainer screws indicated below.



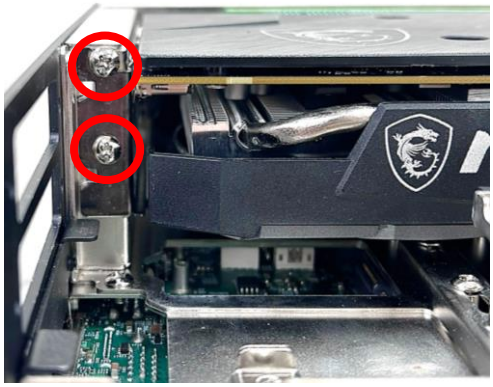
Step 11. Identify the PCIe card slots on the riser card. The example here uses the PCIe x16 slot.

Step 12. Ensure the contacts of the PCIe card are properly aligned with the slot, then insert the card.



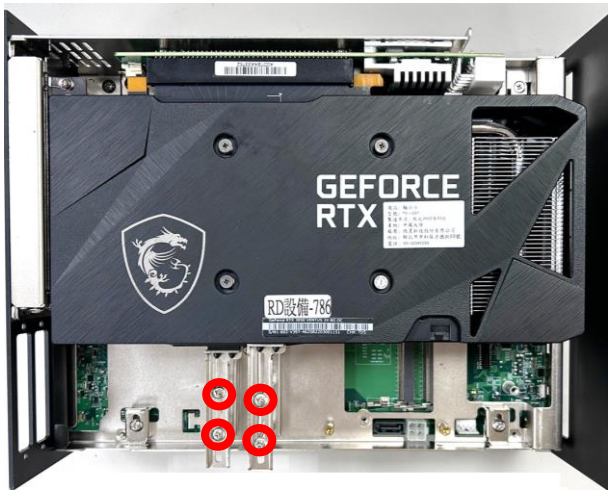
Step 13. Ensure that the metal tabs of the card are slotted into the holes.

Step 14. Secure the card to the bracket with screws.

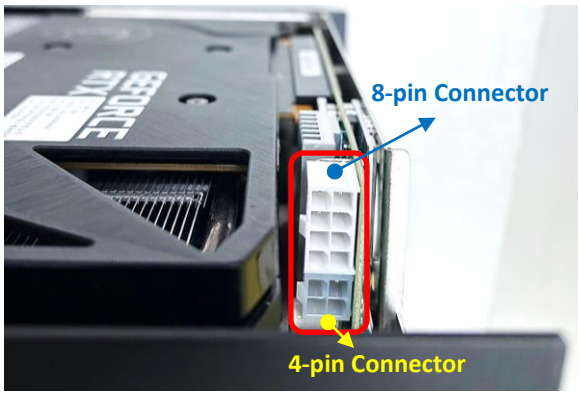


Step 15. Push the appropriate card retainer forward until it grips the PCB of the card (see insert below). In this example, it is the top card retainer. Next, push the second card retainer forward until it rests firmly against the side of the card.

Step 16. Secure the card retainers with the 4 screws indicated below.

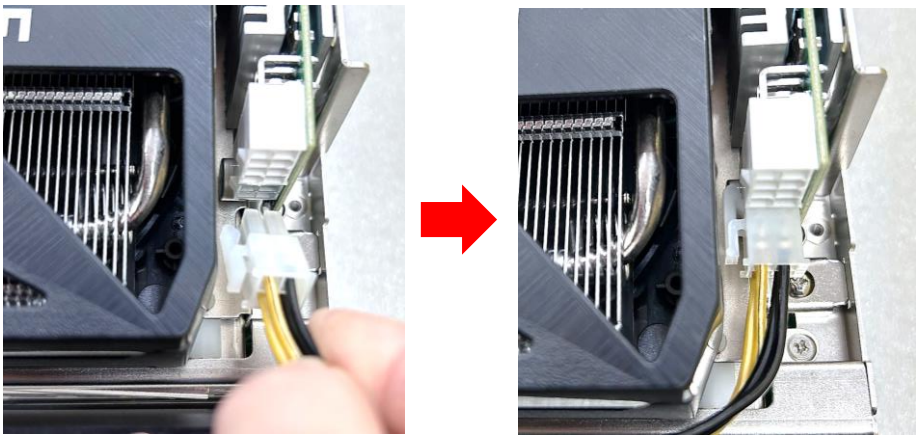


Step 17. Locate the power connectors on the riser card. The 8-pin Connector is for the PCIe card, and the 4-pin Connector is for the DC_IN2 on the system motherboard.

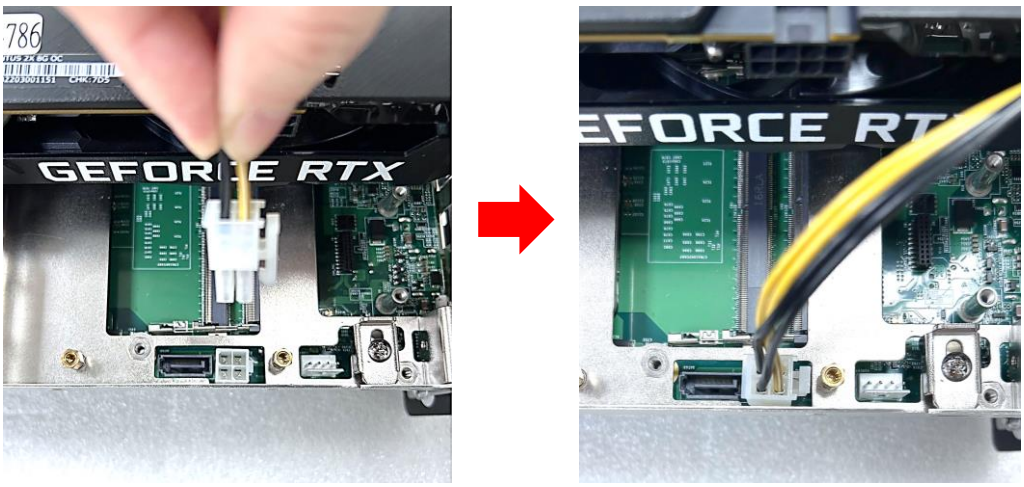


Step 18. Prepare the 4-to-4-pin power cord. (Included in the Riser Card Package)

Step 19. Properly align the 4-pin power cord with the 4-pin connector on the riser card and plug it in.



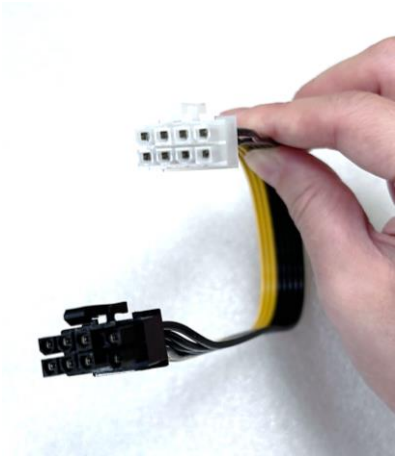
Step 20. Properly align the 4-pin power cord with the DC_IN2 connector on the motherboard and plug it in.



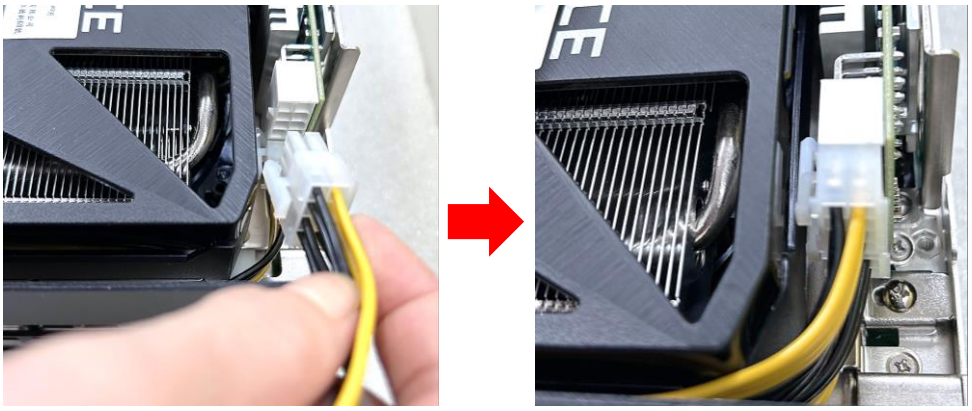
NOTE (NOTE)

The 4-pin power cord must be plugged in correctly for the RC-E16E1-02 Riser Card to function properly.
(Le câble d'alimentation à 4 broches doit être branché correctement pour que la carte d'extension RC-E16E1-02 Riser Card fonctionne correctement.)

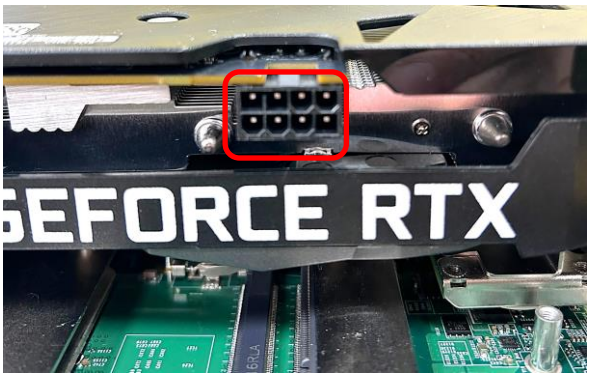
Step 21. Prepare the 8-to-8-pin power cord. (Included in the Riser Card Package)



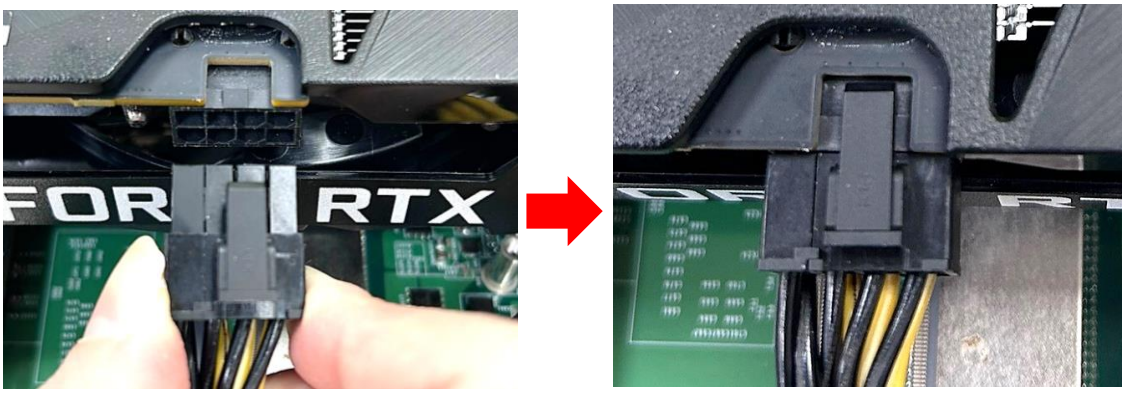
Step 22. Properly align the 8-pin power cord with the 8-pin connector on the riser card and plug it in.



Step 23. Locate the power connector on the PCIe card.

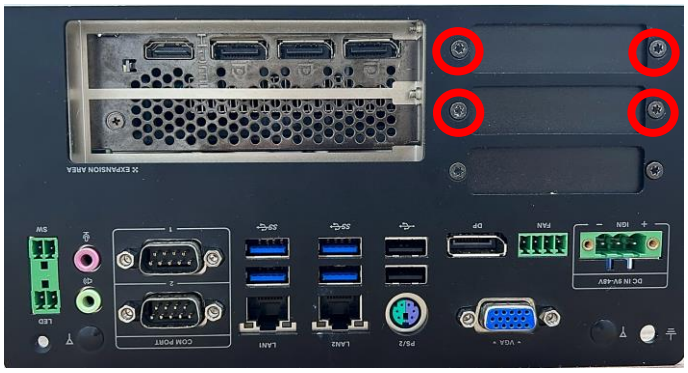


Step 24. Properly align the 8-pin power cord with the connector and plug it into the PCIe card.



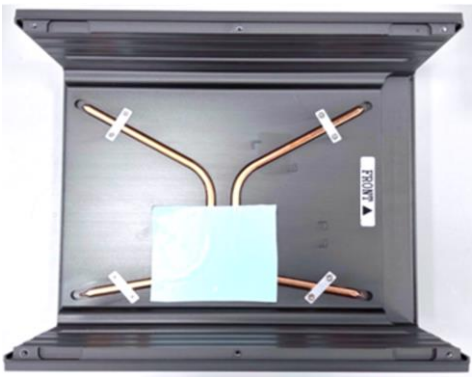
Step 25. Perform cable management as shown in the picture below.

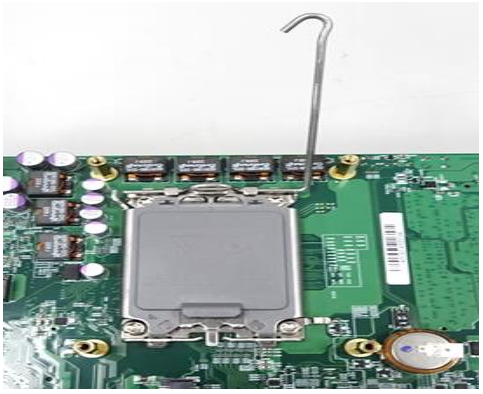
Step 26. Reinstall the expansion covers and secure them with screws as indicated below.



3.11. Assembling Top Cover

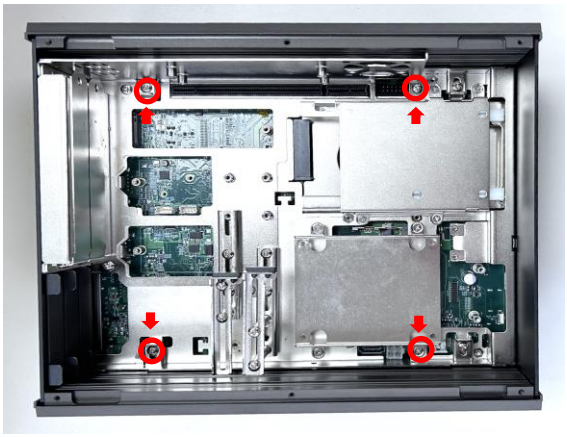
Step 1. Set the top cover upside down. Ensure that the top cover and the system chassis are aligned (e.g., front with front).





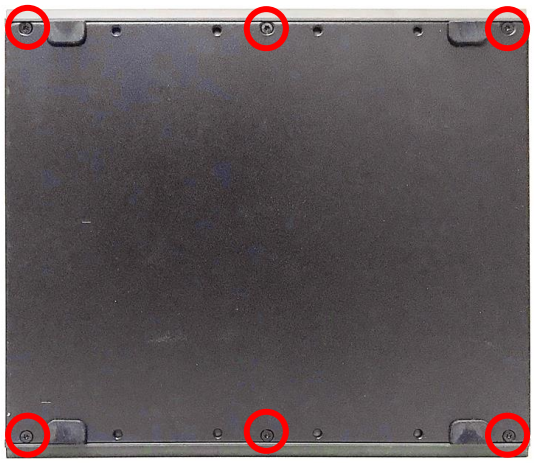
Step 2. Flip the system chassis upside down and align the front and rear panels with the grooves in the top cover. Lower the system chassis onto the top cover.

Step 3. Push the 4 latches as indicated below, then secure the screws.



Step 4. Secure the two screws on the rear panel.

Step 5. Align the grooves of the bottom cover with the front and rear panels, then secure it with 6 screws.



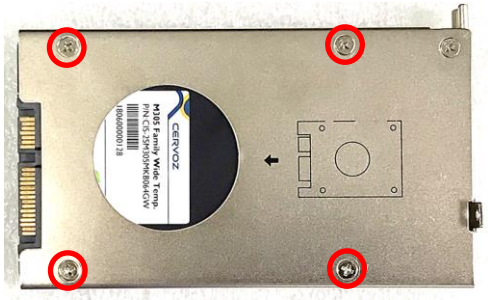
3.12. Installing SATA Hard Drives in the Front Panel

Step 1. Loosen the two screws to remove the cover plate of the maintenance zone.

Step 2. Remove the screw indicated below to unlock the HDD bay cover bracket.

Step 3. Pull the rotating arm to the right and pull the HDD bracket out of the system.

Step 4. Set the HDD upside down with the four bottom mount screw holes facing up. Place the HDD bracket over the HDD, ensuring the direction of the HDD is correct. Secure the HDD to the HDD bracket with four screws as indicated below.



Step 5. Align the HDD bracket with the entrance of the HDD bay. Insert the HDD bracket and push it until the HDD connector is fully inserted into the SATA slot.

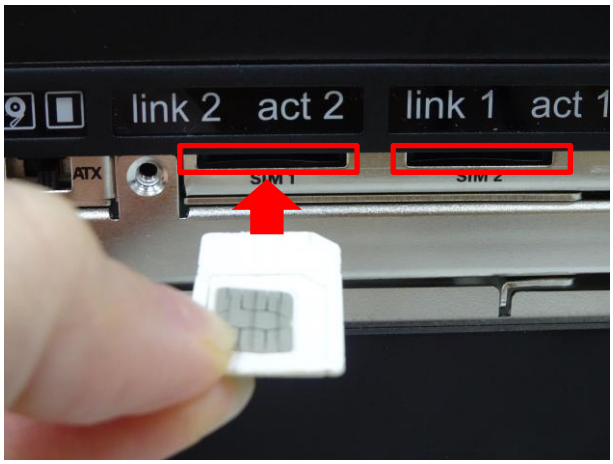
Step 6. Place the rotating arm back in place and secure it with a screw.

Step 7. Reinstall the maintenance zone cover plate and secure it with two screws.

3.13. Installing SIM Card

Step 1. Loosen the two screws to remove the cover plate of the maintenance zone.

Step 2. Locate the SIM card slots and insert a SIM card with the gold contacts facing up (see below). When both slots have SIM cards, the network connection will prioritize SIM1.



Step 3. Reinstall the maintenance zone cover plate and secure it with two screws.

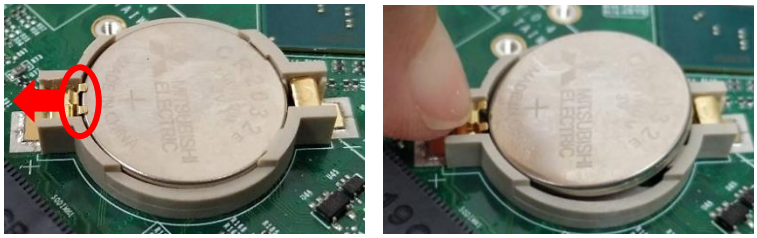
3.14. Replacing CMOS Battery

Step 1. Loosen the two screws to remove the cover plate of maintenance zone.

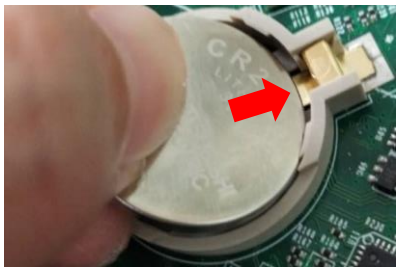
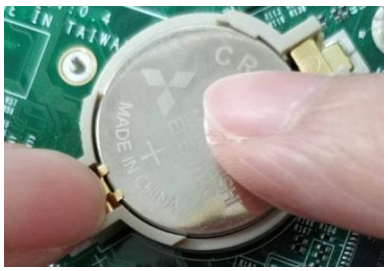
Step 2. Locate the removable CMOS Battery and remove the screw.

Step 3. Pull out the CMOS battery bracket. A tweezer may be helpful for this step.

Step 4. Remove the battery by pressing the metal tab backwards as indicated.



Step 5. Pay attention to the direction of “+” and “– “signs on the battery. Push the battery into the slot from the "-" side and pull the metal tab backward to firmly seat the battery in the holder.

Step 6. Insert the battery bracket firmly.

Step 7. Secure the bracket with a screw.

Step 8. Reinstall the maintenance zone cover plate and secure it with two screws.

3.15. Installing Wall Mount

The DS-1500 series supports wall mounting when used with the optional wall mount kit.

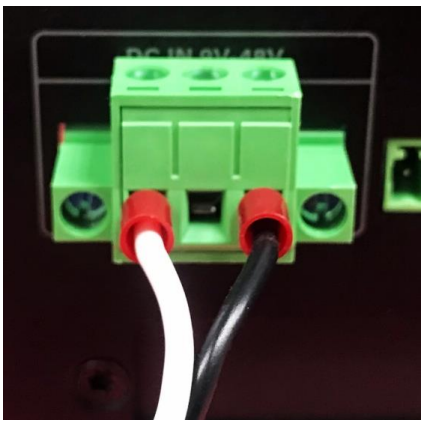
Step 1. Secure the wall mount brackets to the bottom of the system using the 8 screws (M5x6L) provided with the kit.

Step 2. Secure the system to the wall by using the bracket mounting holes.

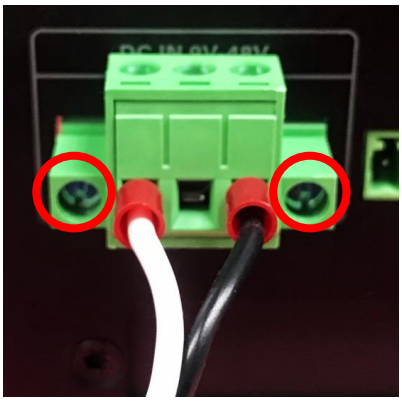
3.16. Connecting to the Power Supply

Step 1. Locate the DC_IN1 power connector.

Step 1. Align the V- wire with the V- port and the V+ wire with the V+ port, then connect the power supply to the DC_IN connector.



Step 2. Secure the Phoenix connector to the system with two screws.



WARNING (AVERTIR)

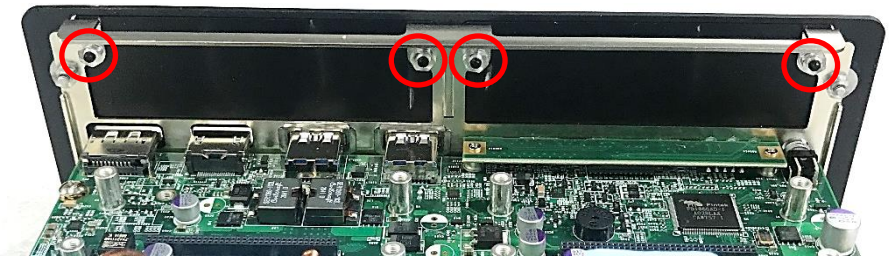
To avoid power-related issues, use a new power supply and ensure the screws are properly tightened.

(Pour éviter les problèmes liés à l'alimentation électrique, utilisez une nouvelle source d'alimentation et assurez-vous que les vis sont bien serrées.)

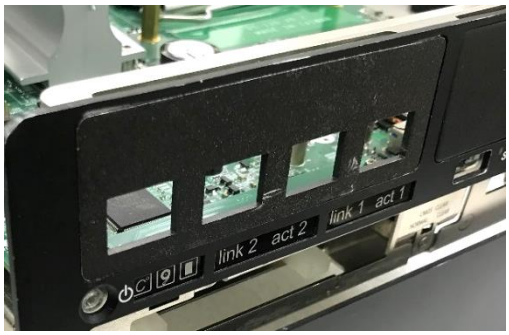
3.17. Installing CMI Modules

3.17.1. CMI-LAN01/UB1012

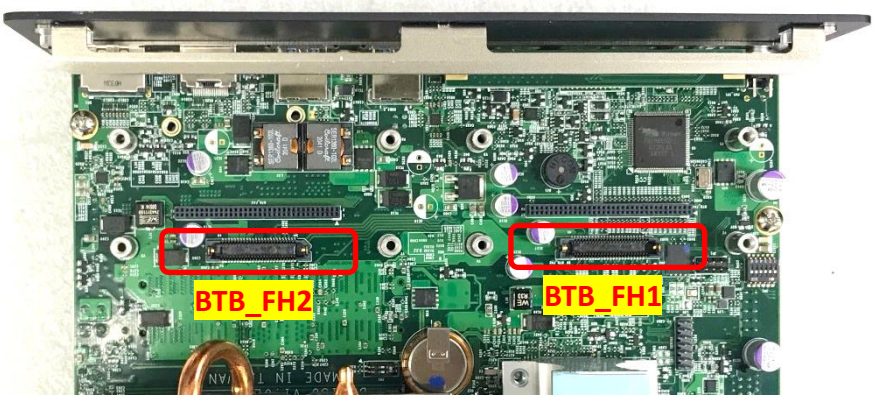
Step 1. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.



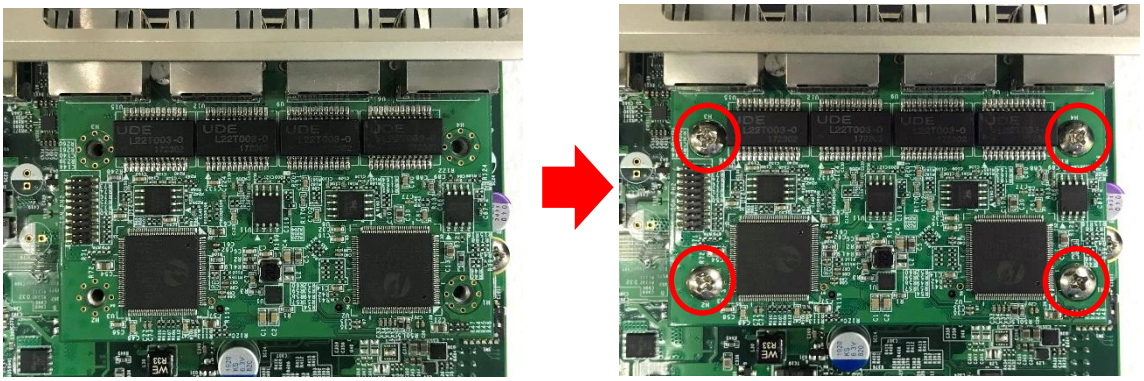
Step 2. Install the CMI-LAN bracket and fasten the two hex nuts as indicated to secure it to the system.



Step 3. Locate the BTB connector on the top side of the motherboard. In this example, BTB_FH1 will be used.

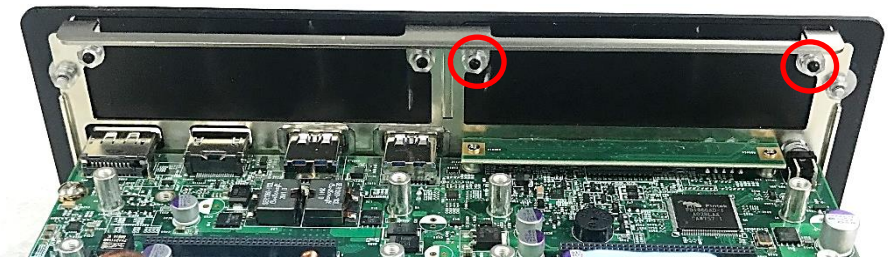


Step 4. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 4 screws as indicated below.

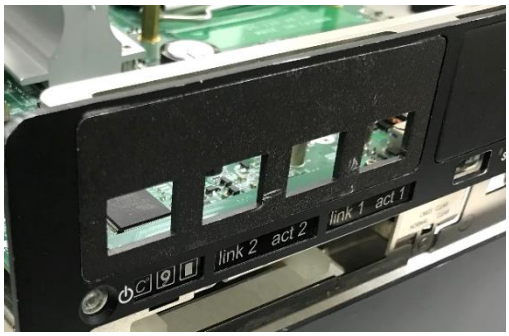


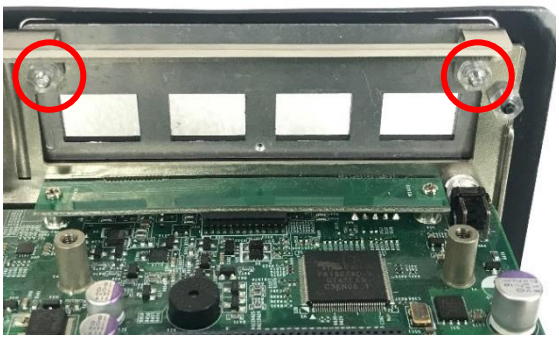
3.17.2. CMI-2P5GLAN03/UB1012

Step 1. From the rear of the front panel, remove two hex nuts on the right side and remove the corresponding cover plate (see below).

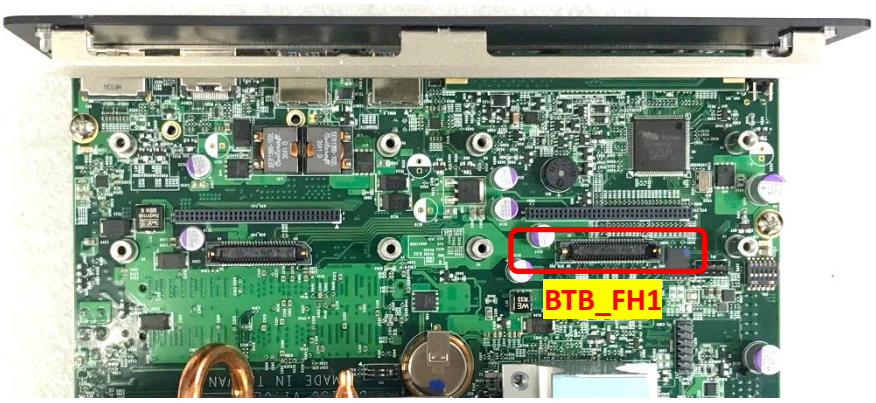


Step 2. Install the CMI-LAN bracket and fasten the two hex nuts as indicated to secure it to the system.

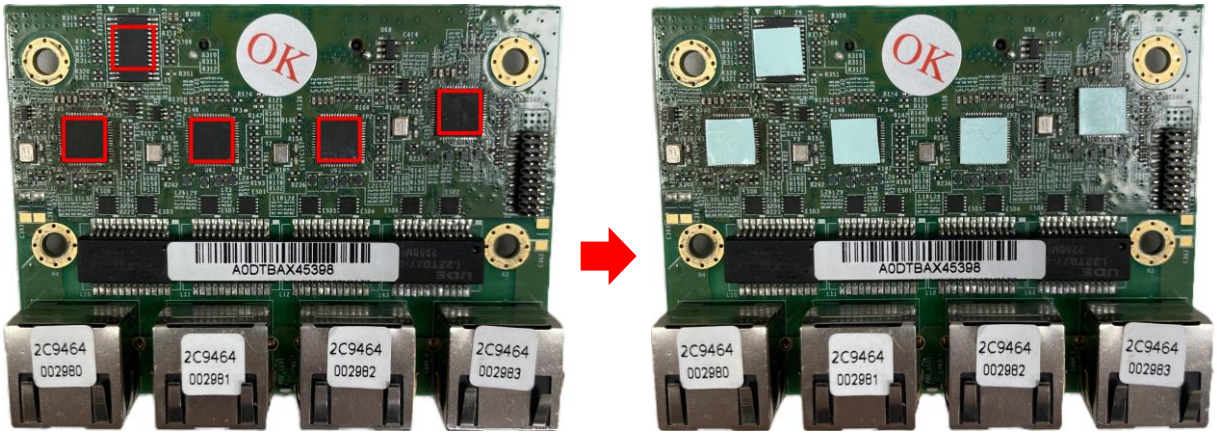




Step 3. Locate the BTB_FH1 connector on the top side of the motherboard. Only this connector supports the CMI-2P5GLAN module.



Step 4. Locate the 5 chips on the CMI-2P5GLAN module indicated by the red squares below. Carefully apply thermal pads to each chip.



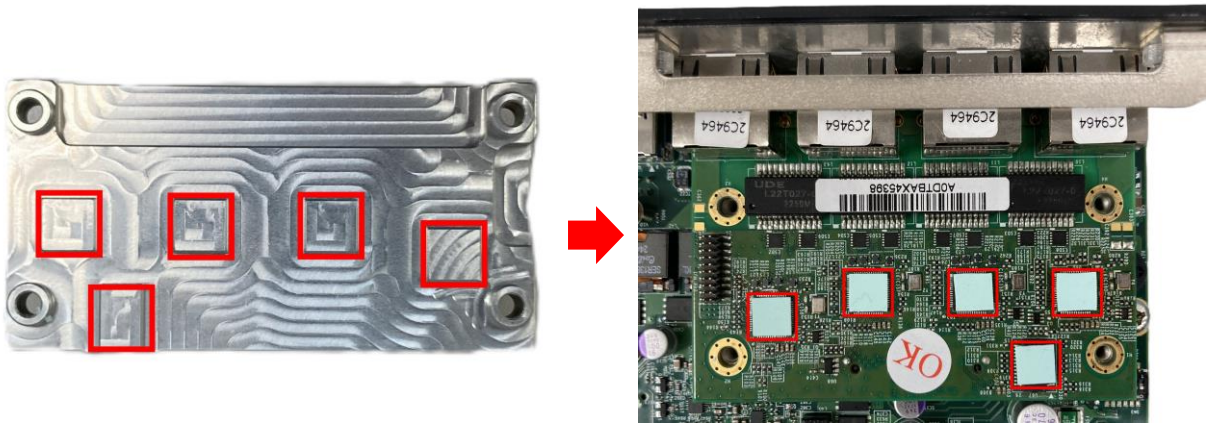
Step 5. Align the CMI module with the BTB connector and gently insert the module onto the motherboard.

CAUTION (ATTENTION)

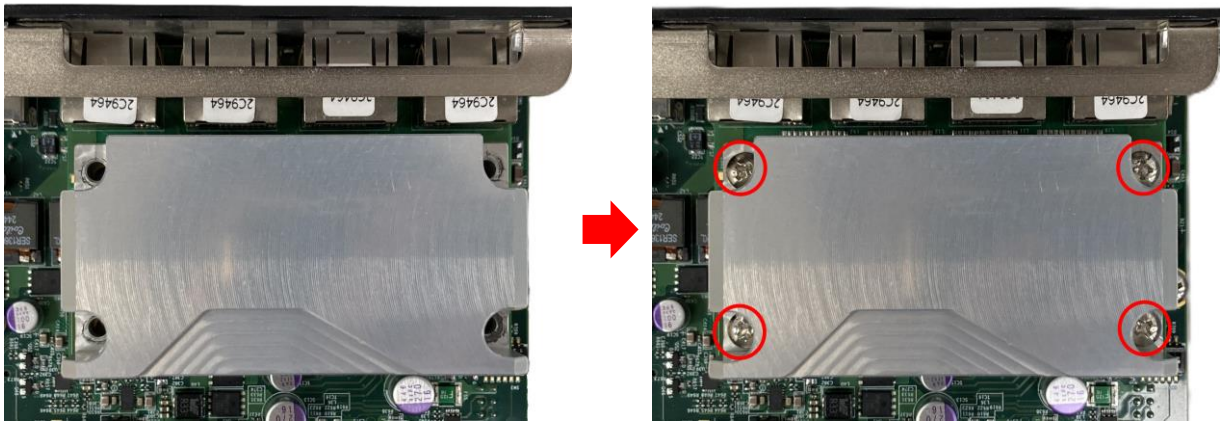
Before installing the heatsink (in the next step), please make sure the protective films on both sides of the thermal pad have been removed!

(Avant d'installer le dissipateur thermique (à l'étape suivante), veuillez vous assurer que les films protecteurs des deux côtés du tampon thermique ont été retirés !)

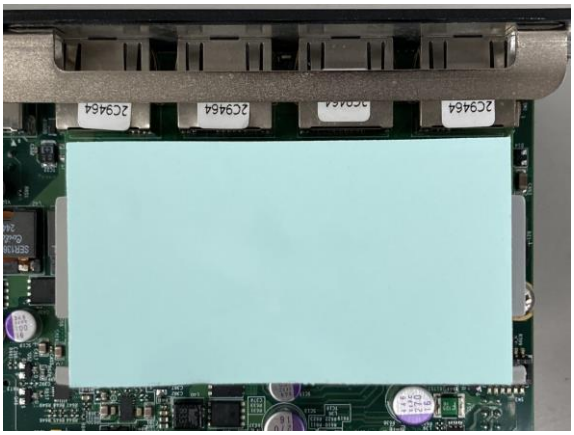
Step 6. Align the heatsink protrusions with the chip pads on the CMI module and place it onto the module.



Step 7. Secure the CMI module to the motherboard using 4 screws as indicated below.



Step 8. Carefully apply a thermal pad to the heatsink.



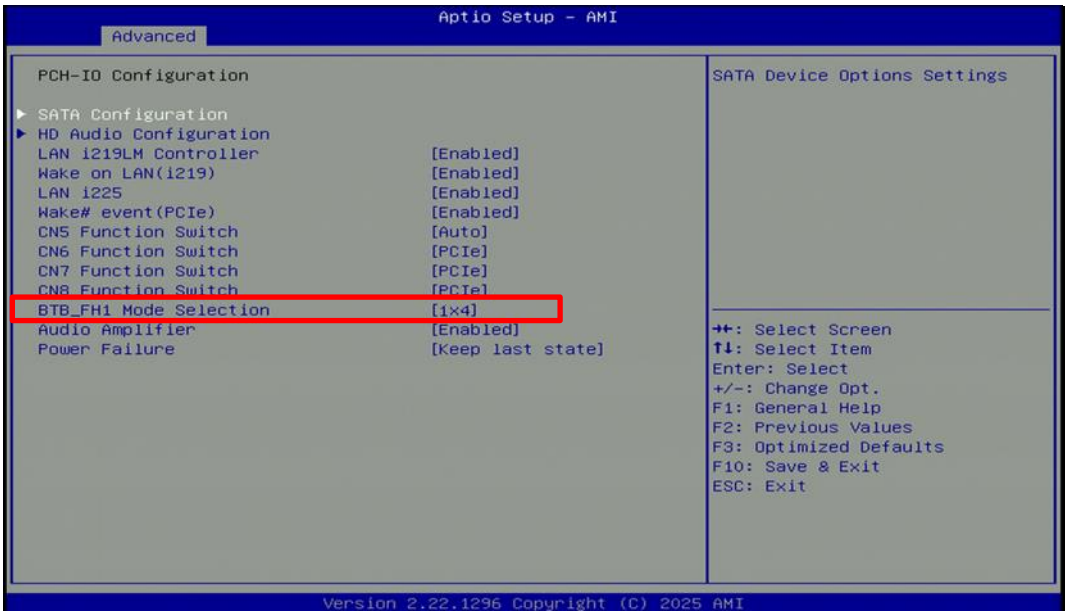
CAUTION (ATTENTION)

Before assembling the system, please make sure the protective films on both sides of the thermal pad have been removed!

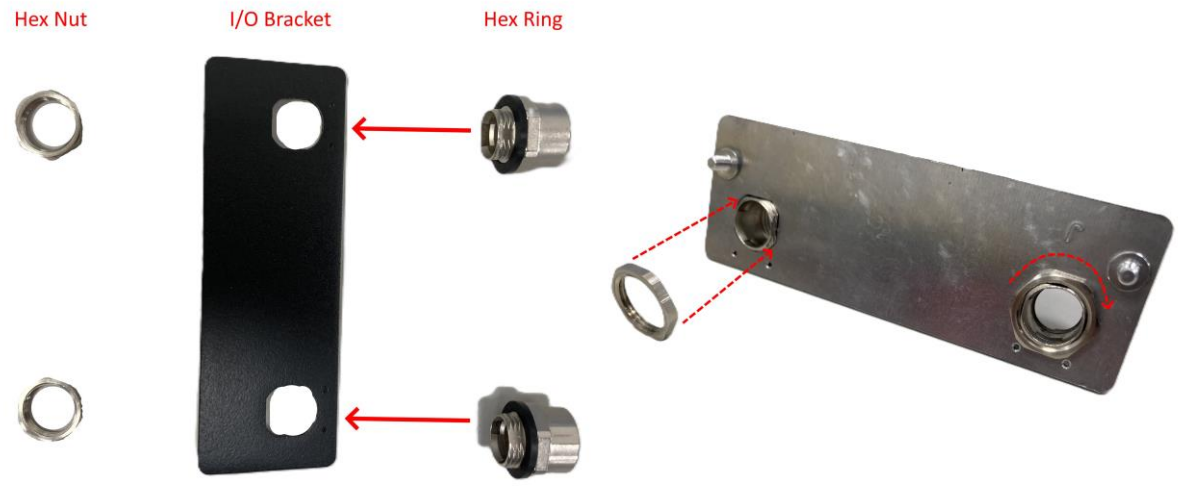
(Avant d'assembler le système, veuillez vous assurer que les films protecteurs des deux côtés du pad thermique ont été retirés !)

3.17.3. CMI-10GXM12LAN03/UB1037

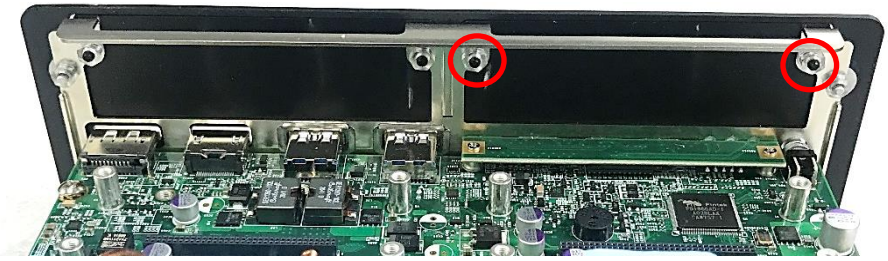
A BIOS setting must be configured before this module can be installed. After entering BIOS, navigate to **Advanced** > **PCH-IO**, then change the **BTB_FH1 Mode Selection** setting from **4x1** (default) to **1x4**.



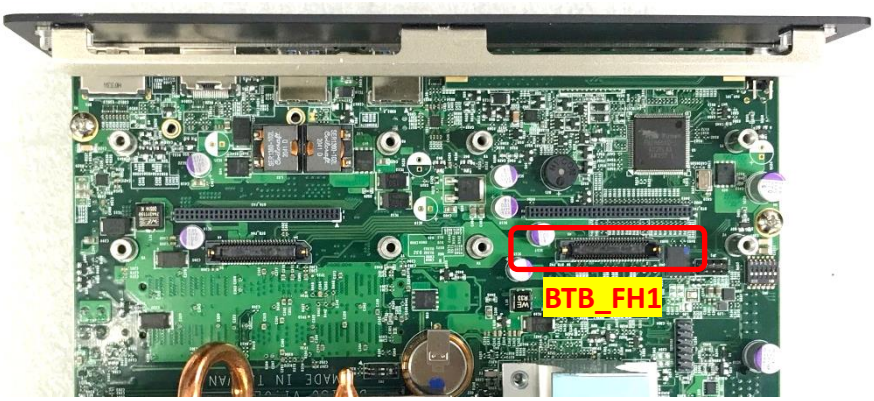
Step 1. Assemble the 10GXM12LAN bracket as indicated below: slot the hex rings through the XM12 I/O bracket and secure them from the inside with the hex nuts.



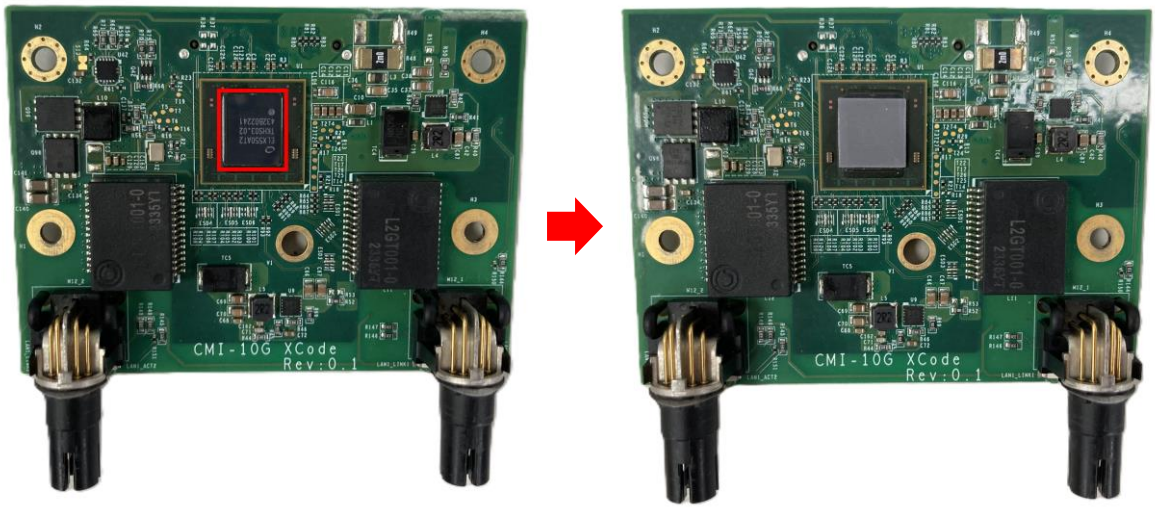
Step 2. From the rear of the front panel, remove two hex nuts on the right side and remove the corresponding cover plate (see below).



Step 3. Locate the BTB_FH1 connector on the top side of the motherboard. Only this connector supports the 10GXM12LAN module.



Step 4. Locate the chip on the 10GXM12LAN module indicated by the red square below. Carefully apply a thermal pad to the chip.

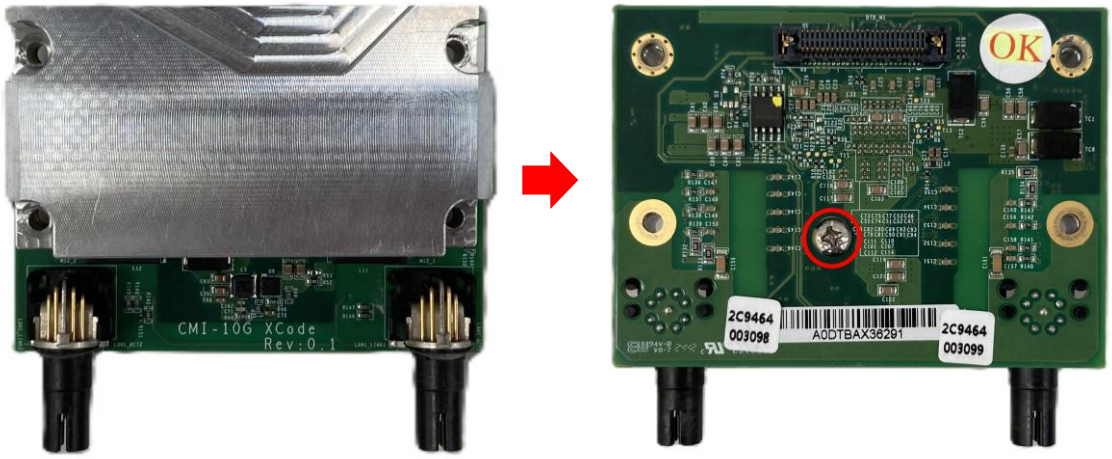


CAUTION (ATTENTION)

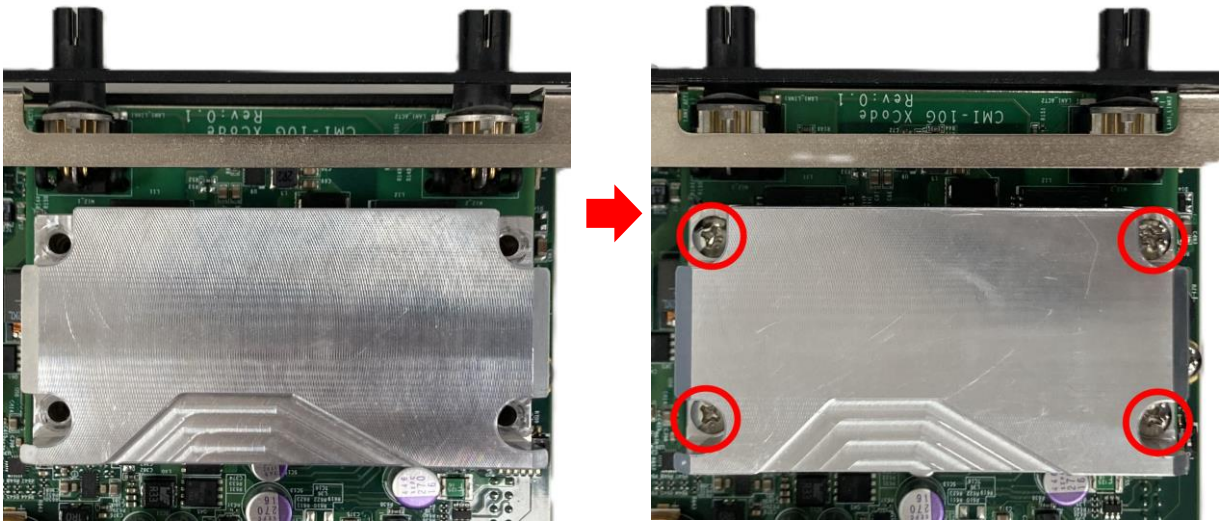
Before installing the heatsink (in the next step), please make sure the protective films on both sides of the thermal pad have been removed!

(Avant d'installer le dissipateur thermique (à l'étape suivante), veuillez vous assurer que les films protecteurs des deux côtés du tampon thermique ont été retirés !)

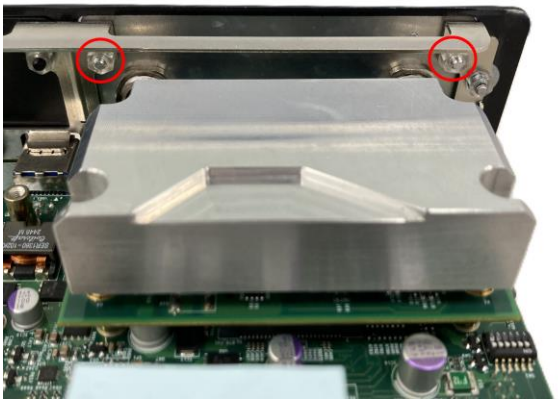
Step 5. Install the heatsink and flip the module over. Secure the heatsink with a screw as indicated.



Step 6. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 4 screws as indicated below.



Step 7. Install the 10GXM12LAN bracket and fasten the two hex nuts as indicated to secure it to the system.



Step 8. Carefully apply a thermal pad to the heatsink.

CAUTION (ATTENTION)

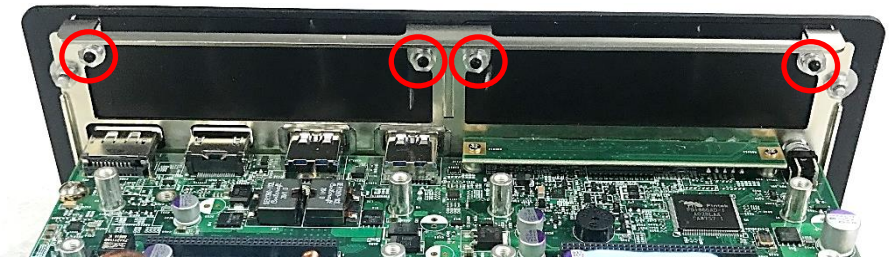
Before assembling the system, please make sure the protective films on both sides of the thermal pad have been removed!

(Avant d'assembler le système, veuillez vous assurer que les films protecteurs des deux côtés du pad thermique ont été retirés !)

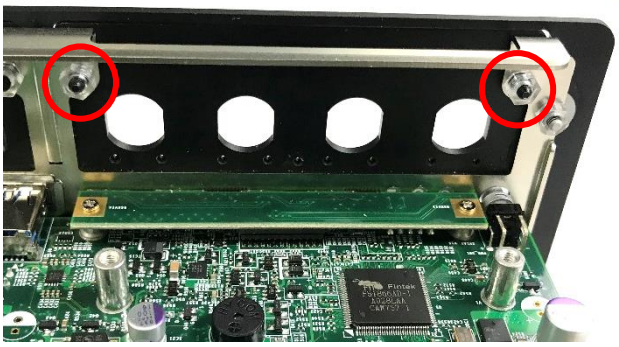
Step 9. Insert the rubber rings into the XM12LAN ports. Tweezers are recommended.

3.17.4. CMI-M12LAN01/UB1010

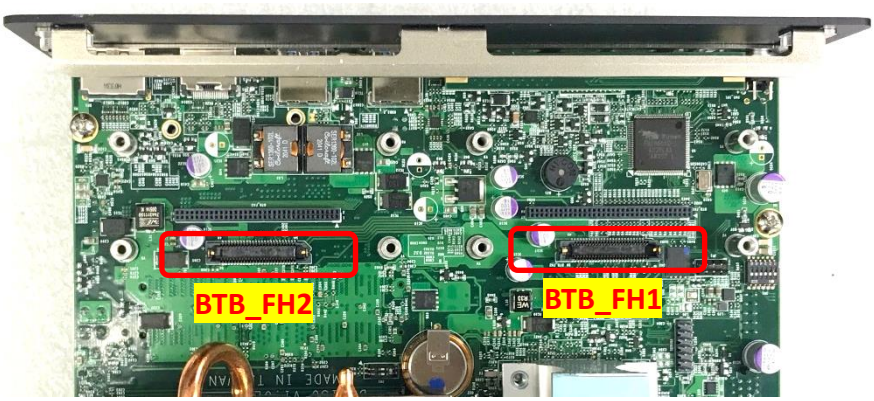
Step 1. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.



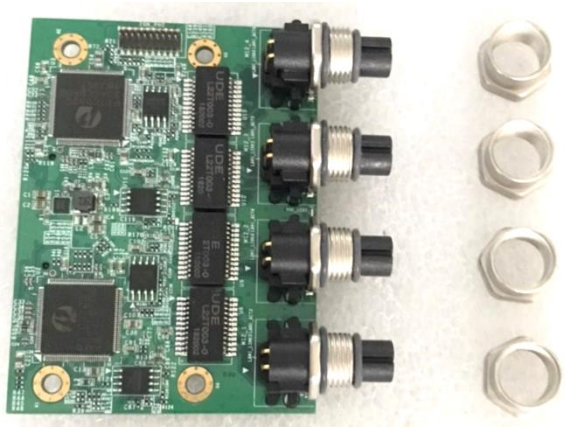
Step 2. Install the CMI-M12LAN bracket and fasten the two hex nuts as indicated to secure it to the system.



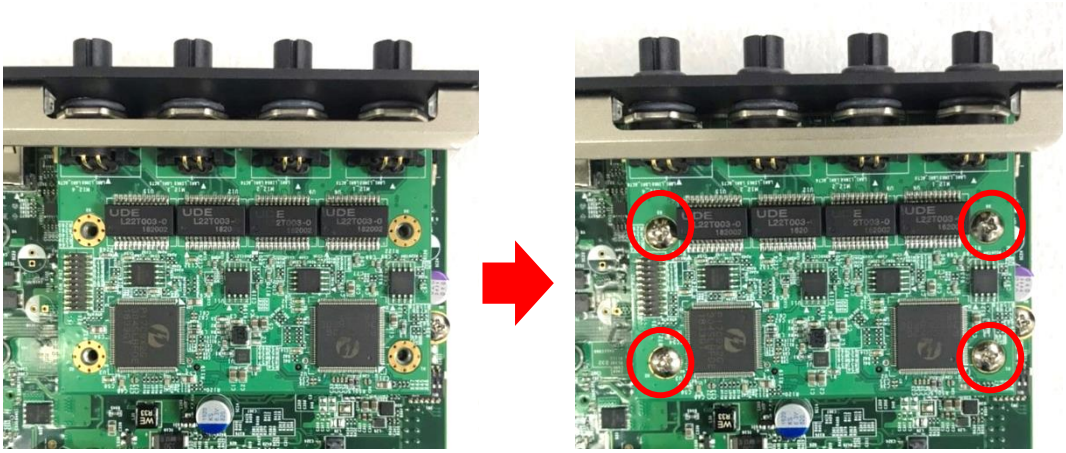
Step 3. Locate the BTB connector on the top side of the motherboard. In this example, BTB_FH1 will be used.



Step 4. Remove the four hex rings from the CMI-M12LAN module.



Step 5. Slot the CMI-M12LAN ports through the holes on the bracket. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 4 screws as indicated below.

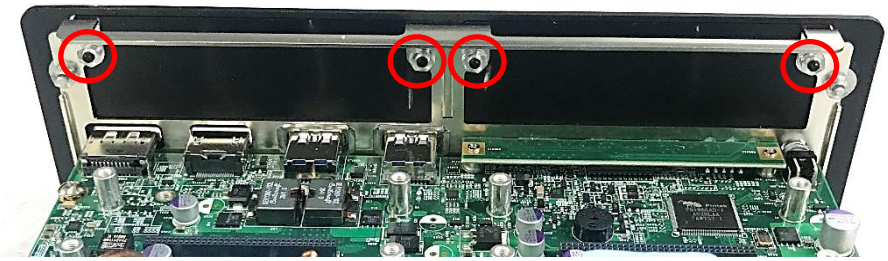


Step 6. Thread the four hex rings onto the CMI-M12LAN module.

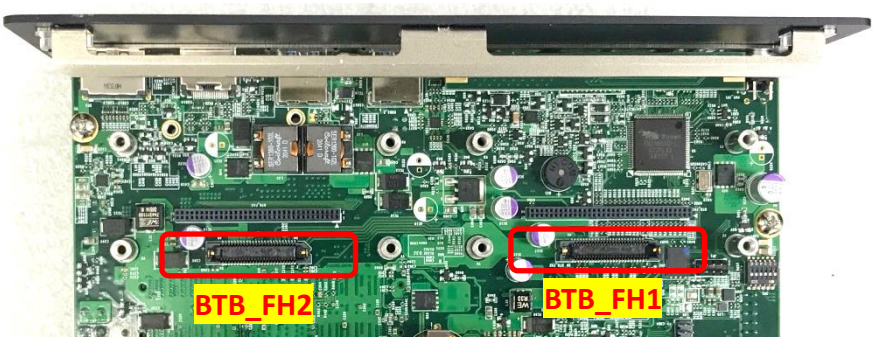
3.17.5. CMI-XM12LAN01/UB1030

Step 1. Assemble the XM12LAN bracket as indicated below: slot the hex rings through the M12 I/O bracket and secure them from the inside with the hex nuts.

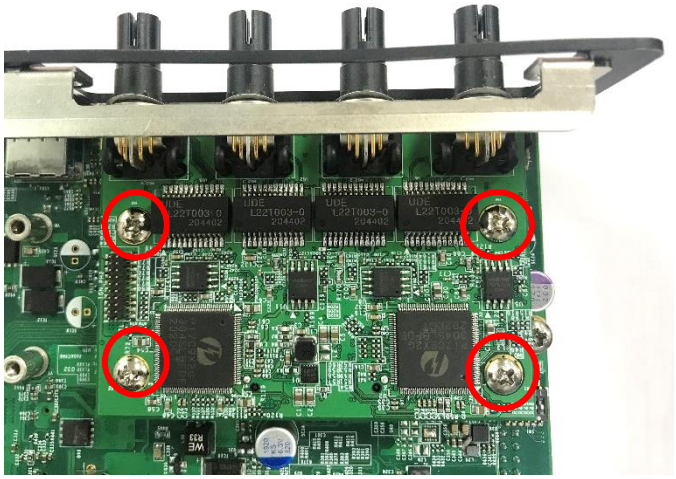
Step 2. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.



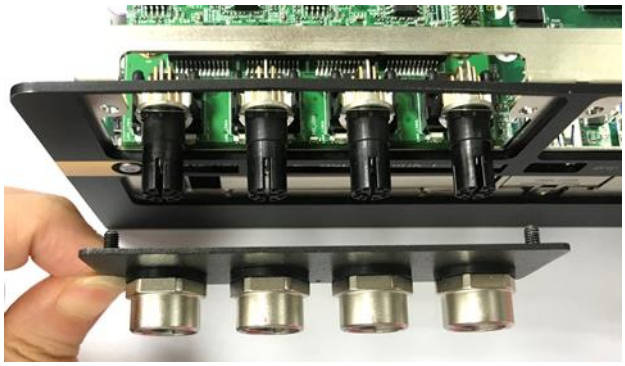
Step 3. Locate the BTB connector on the top side of the motherboard. In this example, BTB_FH1 will be used.

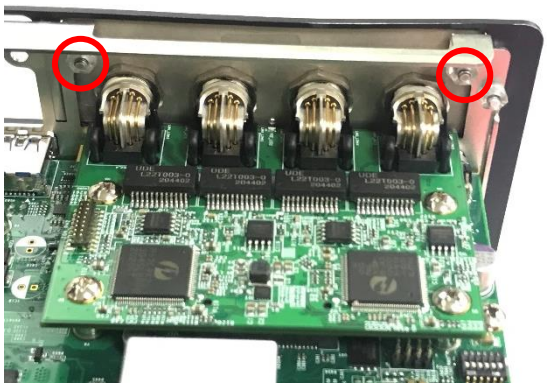


Step 4. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 4 screws as indicated below.

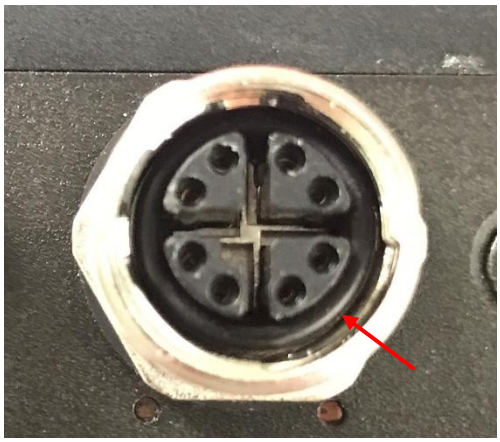


Step 5. Install the assembled XM12LAN bracket and fasten the hex nuts to secure it to the system.



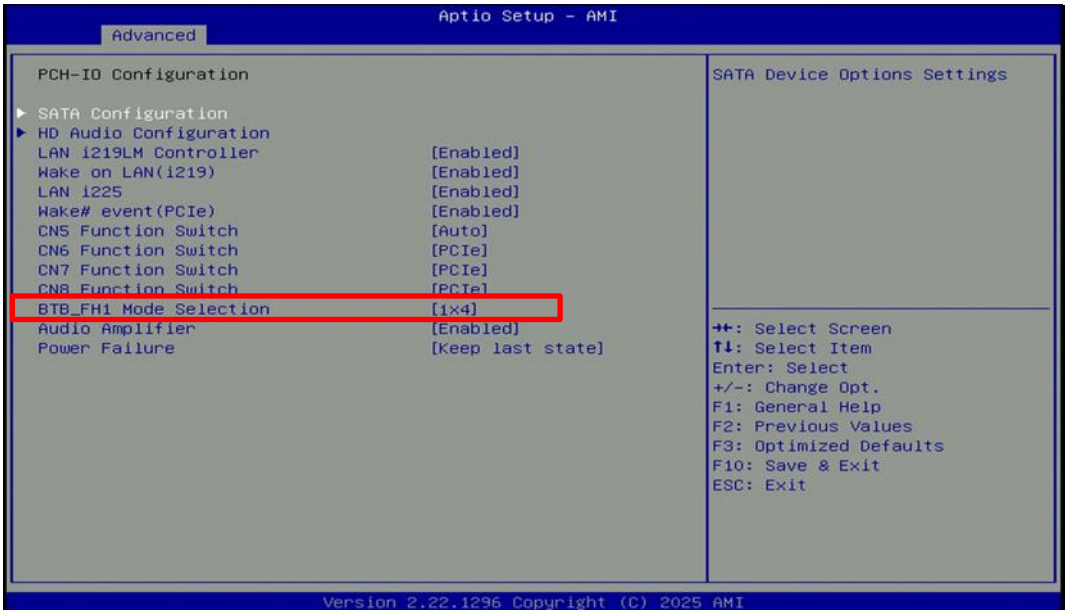


Step 6. Insert the rubber rings into the XM12LAN ports.

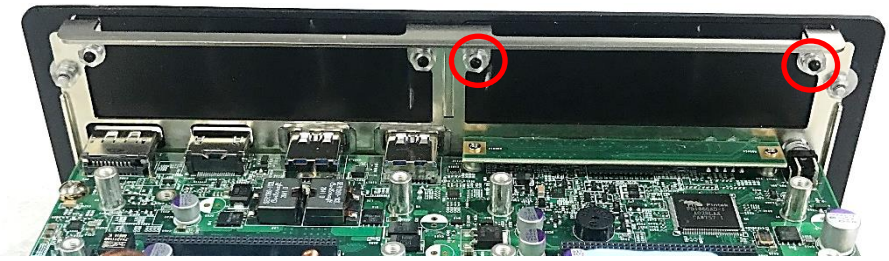


3.17.6. CMI-10GLAN03/UB1028

A BIOS setting must be configured before this module can be installed. After entering BIOS, navigate to **Advanced** > **PCH-IO**, then change the **BTB_FH1 Mode Selection** setting from **4x1** (default) to **1x4**.

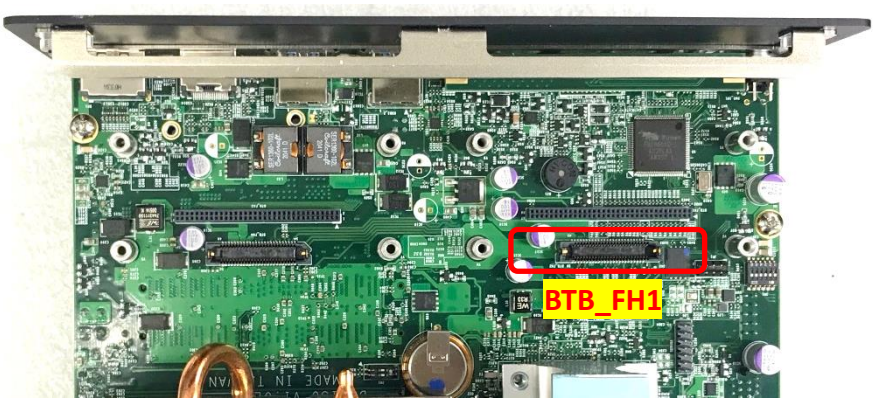


Step 1. From the rear of the front panel, remove two hex nuts on the right side and remove the corresponding cover plate (see below).

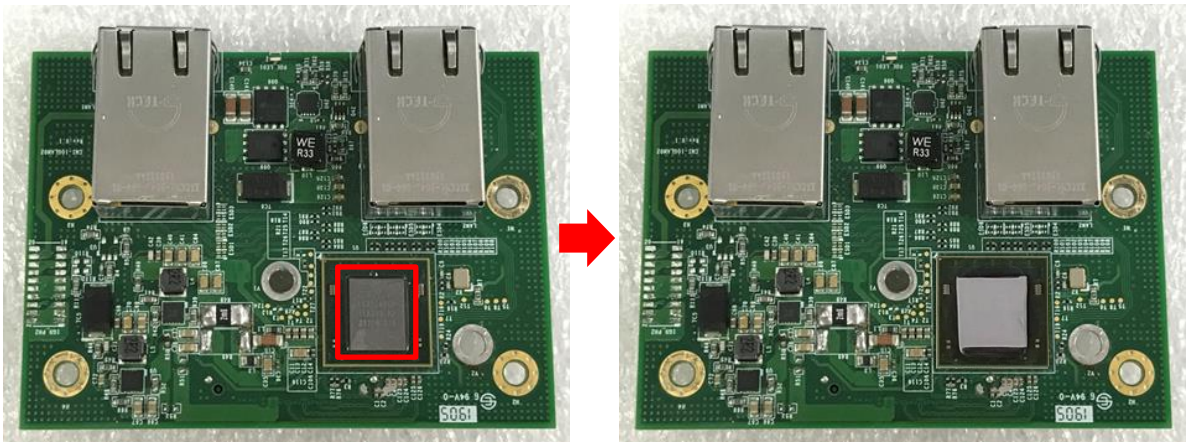


Step 2. Install the CMI-10GLAN bracket and fasten the two hex nuts as indicated to secure it to the system.

Step 3. Locate the BTB_FH1 connector on the top side of the motherboard. Only this connector supports the CMI-10GLAN module.



Step 4. Locate the chip on the CMI-10GLAN module indicated by the red square below. Carefully apply a thermal pad to the chip.

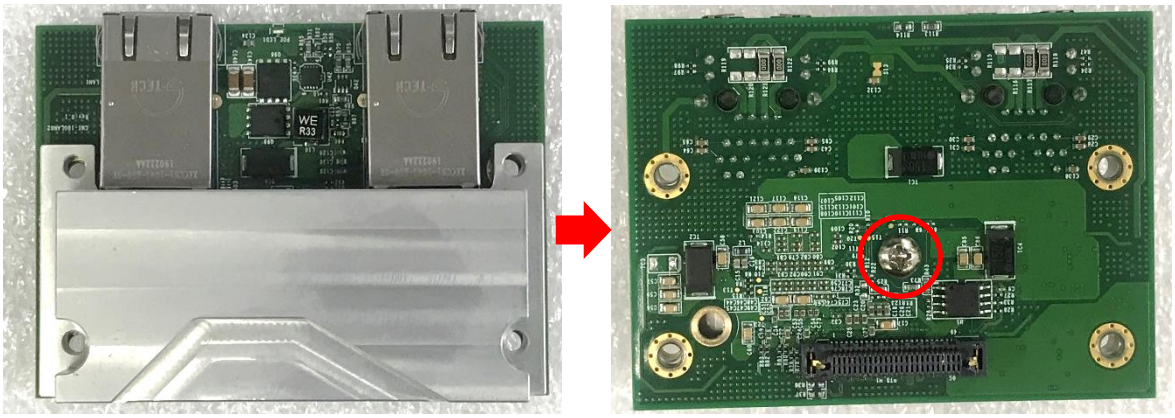


CAUTION (ATTENTION)

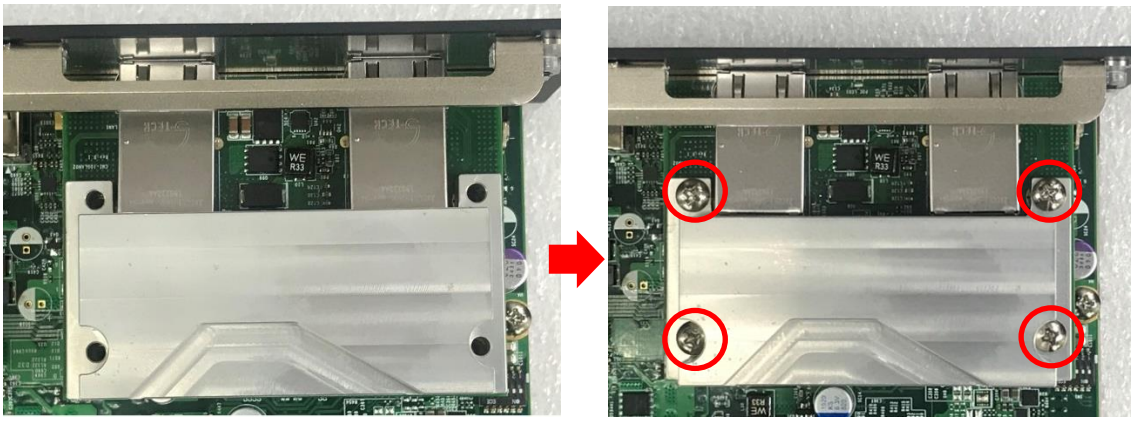
Before installing the heatsink (in the next step), please make sure the protective films on both sides of the thermal pad have been removed!

(Avant d'installer le dissipateur thermique (à l'étape suivante), veuillez vous assurer que les films protecteurs des deux côtés du tampon thermique ont été retirés !)

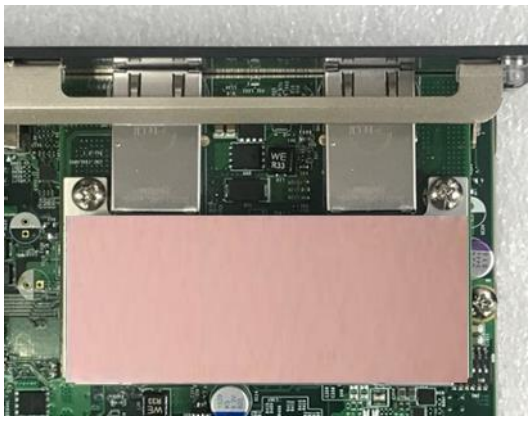
Step 5. Install the heatsink and flip the module over. Secure the heatsink with a screw as indicated.



Step 6. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 4 screws as indicated below.



Step 7. Carefully apply a thermal pad to the heatsink.



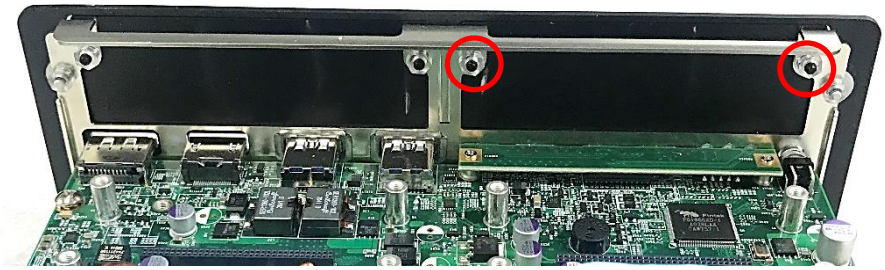
CAUTION
(ATTENTION)

Before assembling the system, please make sure the protective films on both sides of the thermal pad have been removed!

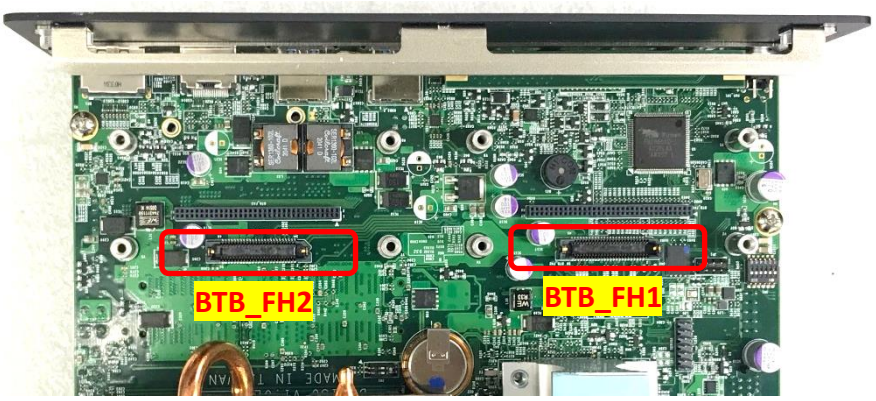
(Avant d'assembler le système, veuillez vous assurer que les films protecteurs des deux côtés du pad thermique ont été retirés !)

3.17.7. CMI-CAN01/UB1038

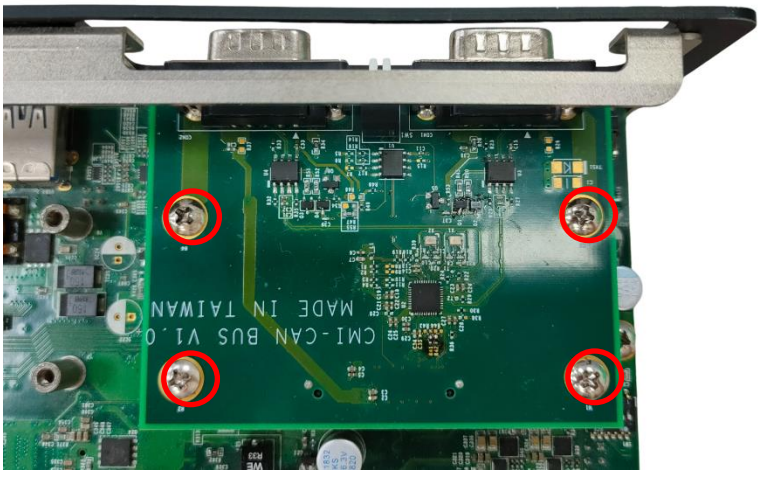
Step 1. Loosen the 2 hex nuts from back side of front bezel. Remove the front bezel.



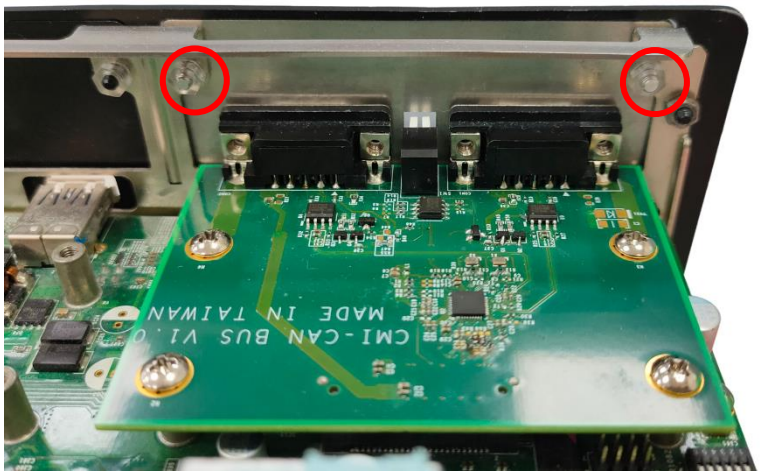
Step 2. Locate the connector(s) of CMI-CAN module on top side of system.



Step 3. Insert the CMI module vertically into the female connector on system's mainboard until it's connected firmly and fasten 4 screws to fix it.



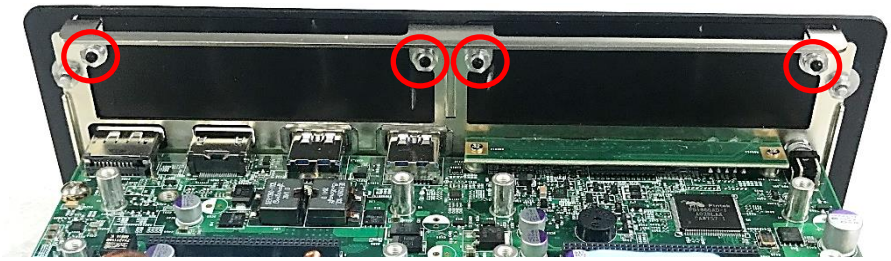
Step 4. Fasten the 2 hex nuts from the back side of front bezel.



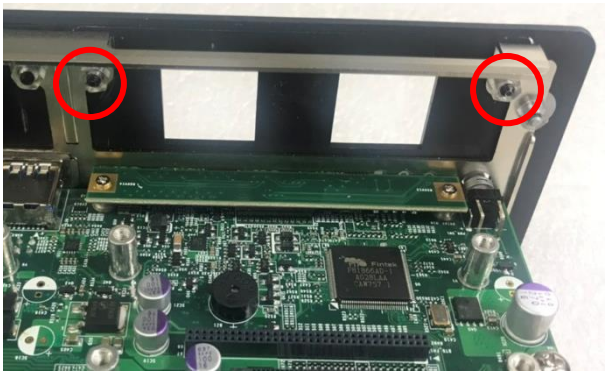
Step 5. Fasten 4 D-Sub jack screws to secure it.

3.17.8. CMI-DIO02/UB1018

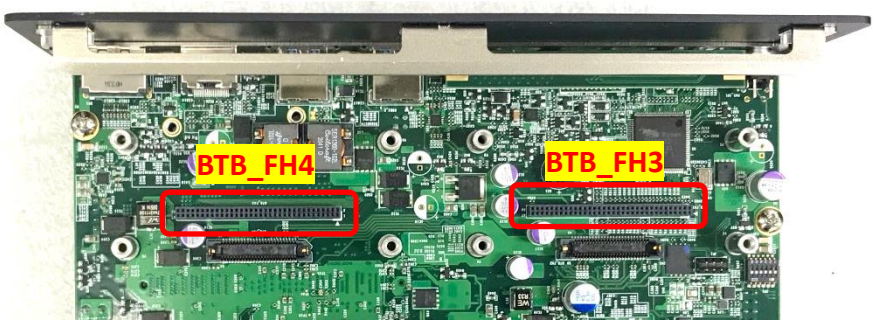
Step 1. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.



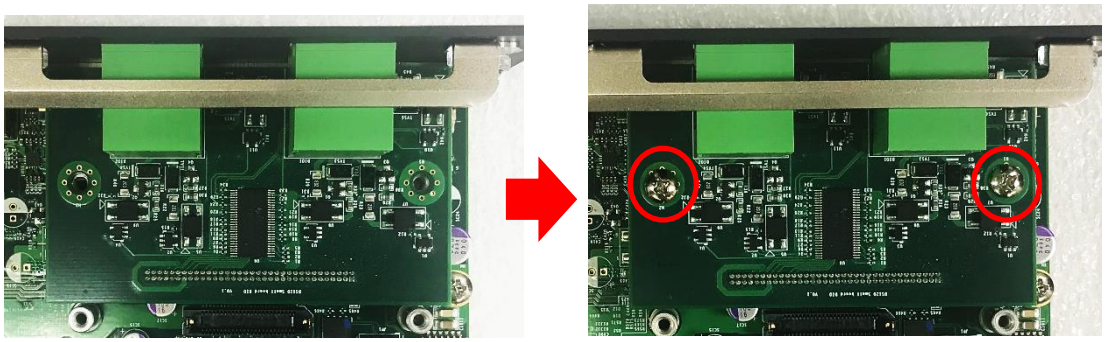
Step 2. Install the CMI-DIO bracket and fasten the two hex nuts as indicated to secure it to the system.



Step 3. Locate the BTB connector on the top side of the motherboard. In this example, BTB_FH3 will be used.

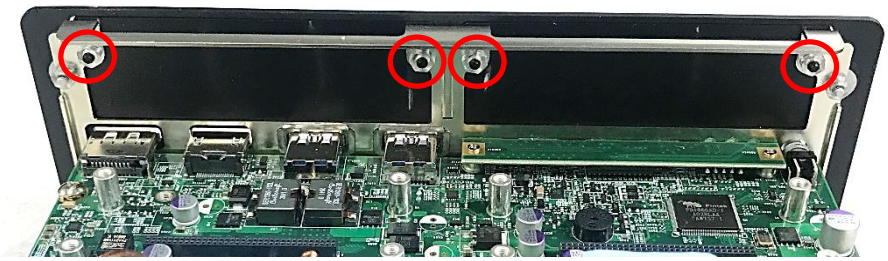


Step 4. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 2 screws as indicated below.

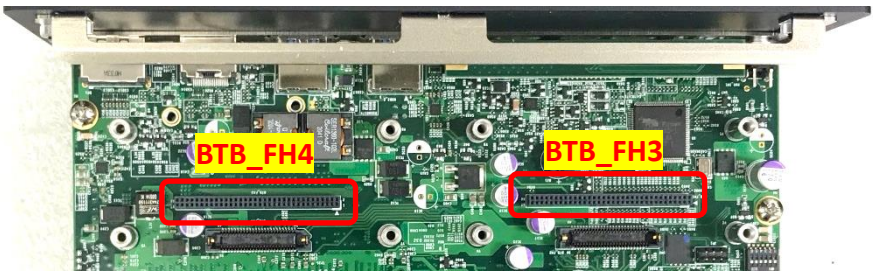


3.17.9. CMI-COM02/UB1004

Step 1. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.



Step 2. Locate the BTB connector on the top side of the motherboard. In this example, BTB_FH3 will be used.

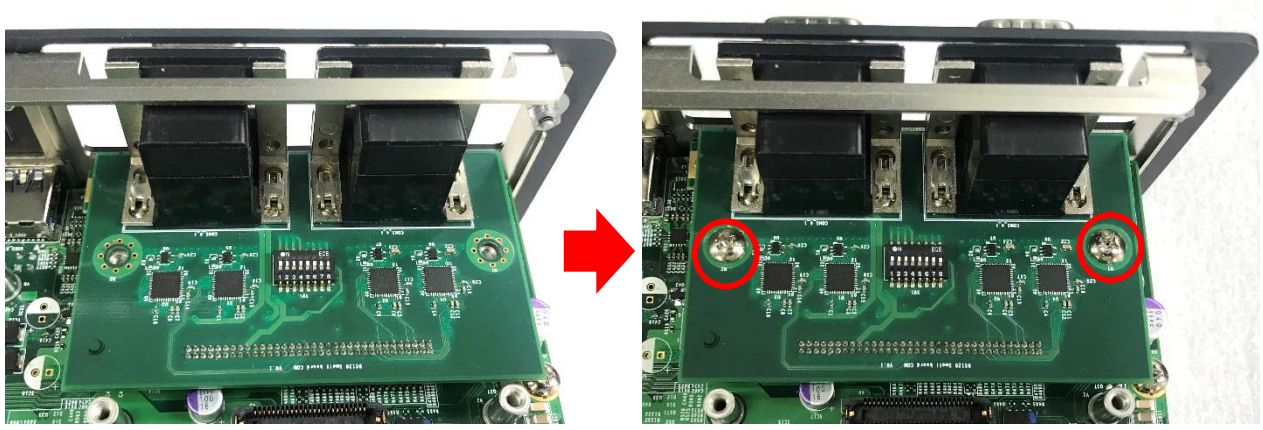


NOTE (NOTE)

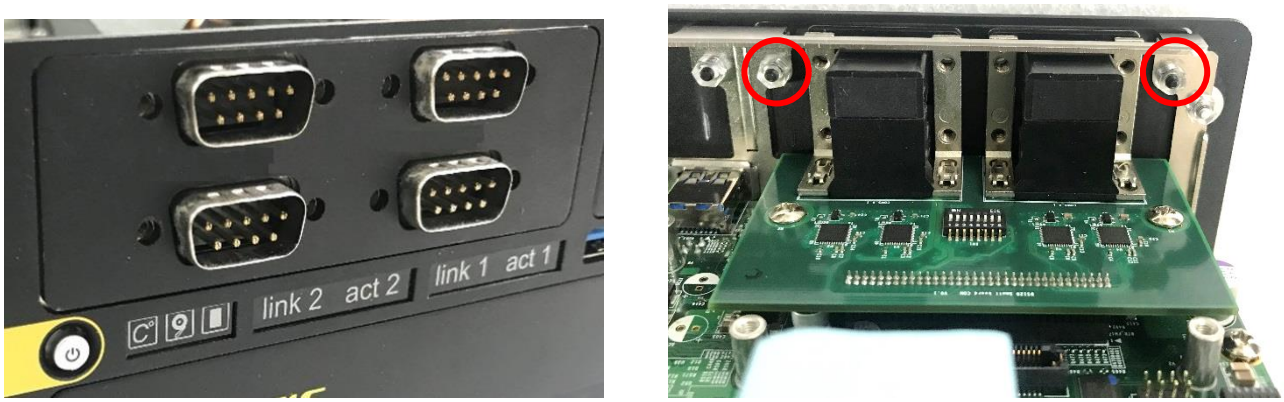
The DS-1500 series supports up to one CMI-COM module at a time.

(La série DS-1500 prend en charge un seul module CMI-COM à la fois.)

Step 3. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 2 screws as indicated below.



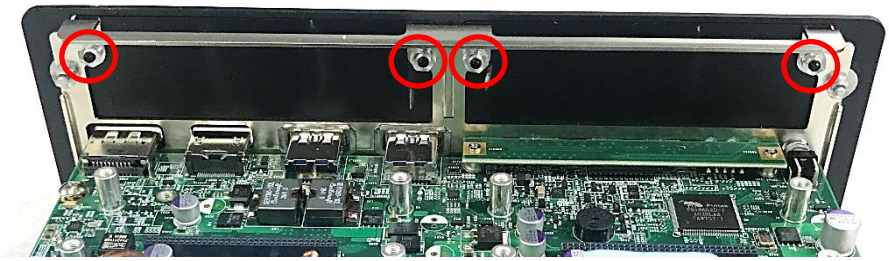
Step 4. Install the CMI-DIO bracket and fasten the two hex nuts as indicated to secure it to the system.



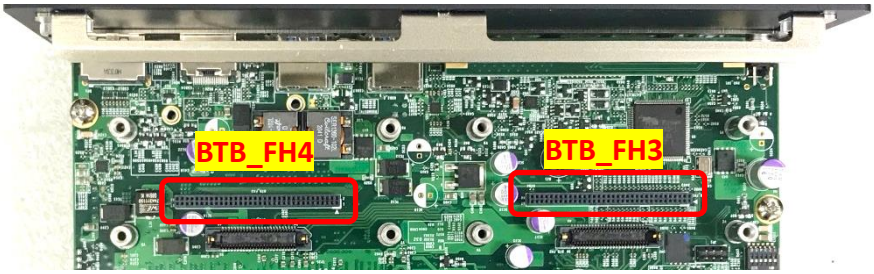
Step 5. Fasten the 8 D-Sub jackscrews to secure the bracket to the module.

3.17.10. CMI-ICOM01/UB1004

Step 1. From the rear of the front panel, remove two hex nuts on either the left or the right side and remove the corresponding cover plate (see below). The cover plate on the right is used as the example here.



Step 2. Locate the BTB connector on the top side of the motherboard. In this example, BTB_FH3 will be used.

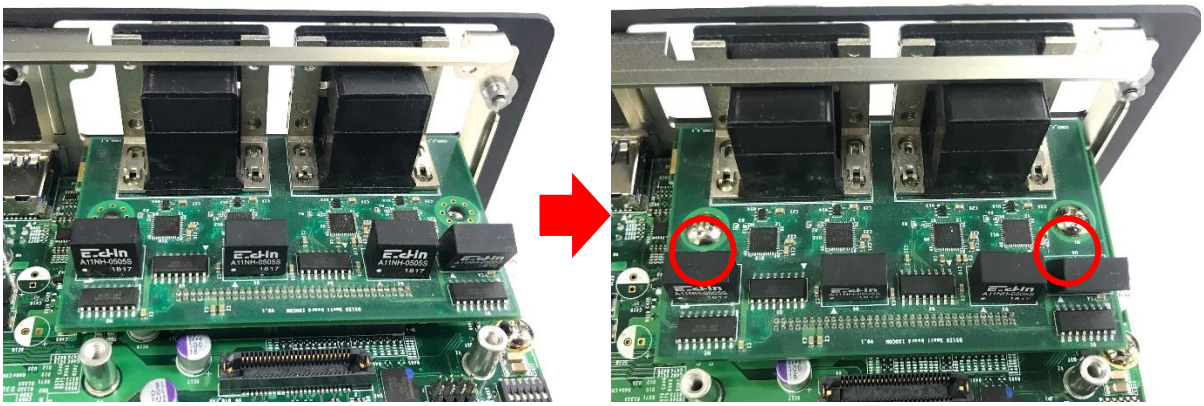


NOTE (NOTE)

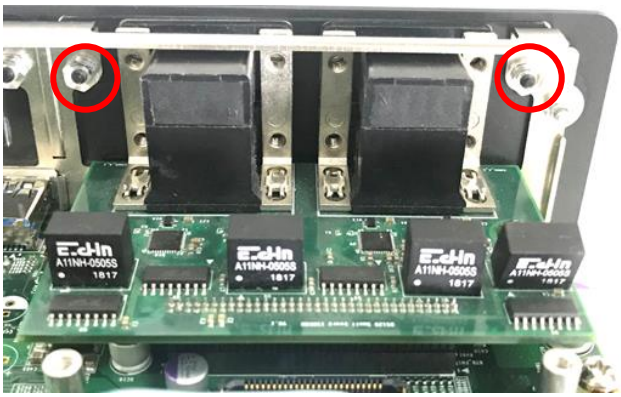
The DS-1500 series supports up to one CMI-ICOM module at a time.

(La série DS-1500 prend en charge un seul module CMI-ICOM à la fois.)

Step 3. Align the CMI module with the BTB connector and gently insert the module onto the motherboard. Secure the module to the motherboard using 2 screws as indicated below.



Step 4. Install the CMI-ICOM bracket and fasten the two hex nuts as indicated to secure it to the system.



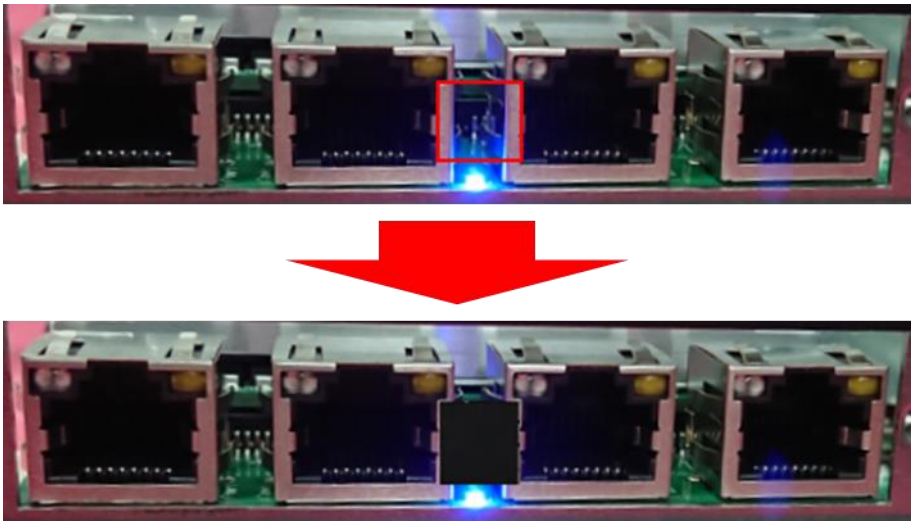
Step 5. Fasten the 8 D-Sub jackscrews to secure the bracket to the module.

3.18. Installing CFM Modules

3.18.1. CFM-PoE03 Module

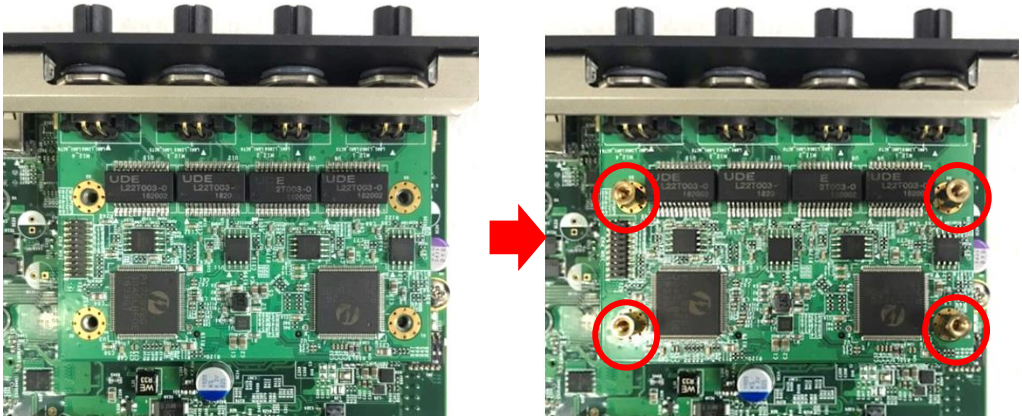
The CFM-PoE03 module can be installed on the CMI-LAN, CMI-M12LAN, or CMI-XM12LAN modules. When using the CMI-LAN01-R12 module, shading tape must be applied to the area indicated by the red box. Do not block the PoE LED.

This step can be skipped when using the CMI-M12LAN01-R12 module.



This section uses the CMI-M12LAN module as an example. Please follow the installation steps 1 to 4 in section 3.16.2 in advance.

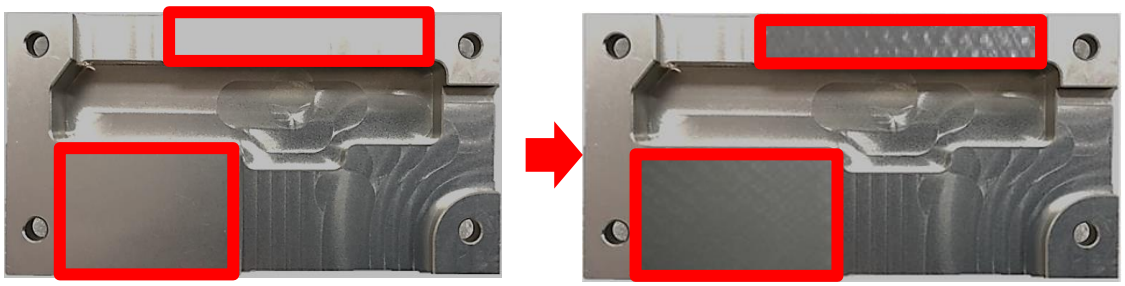
Step 1. Fasten four copper standoffs onto the CMI-M12LAN module.



Step 2. Insert the CFM-PoE3 module onto the CMI-M12LAN module until it rests on top of the standoffs.

Step 3. Apply a thermal pad to the coil of the CFM-PoE03 module indicated below. Ensure the protective films on both sides have been removed before continuing.

Step 4. Flip the CFM-PoE03 heatsink upside down and locate the two areas indicated by the red rectangles. Carefully apply thermal pads to these two areas.

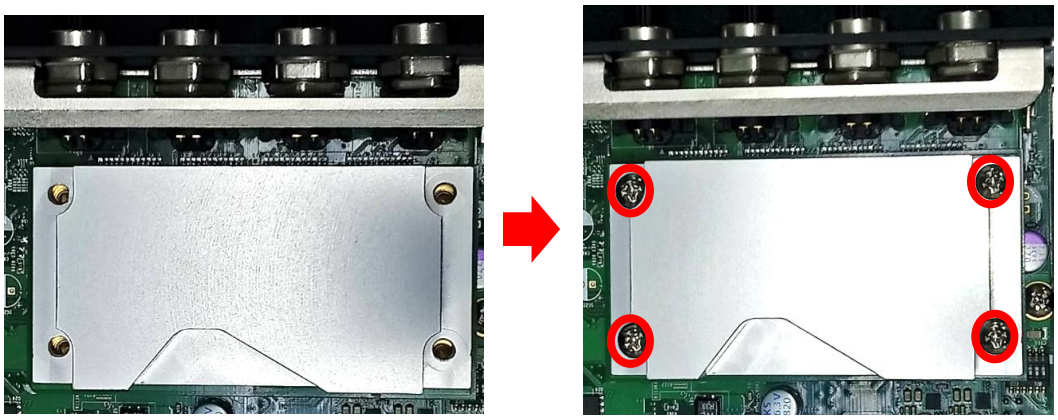


CAUTION
(ATTENTION)

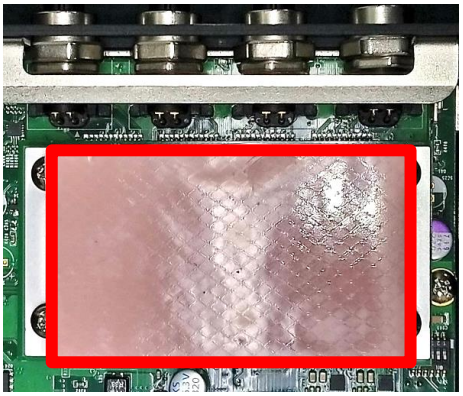
Before installing the heatsink (in the next step), please make sure the protective film on the thermal pads have been removed!

(Avant d'installer le dissipateur thermique (à l'étape suivante), veuillez vous assurer que le film protecteur sur les tampons thermiques a été retiré !)

Step 5. Install the heatsink onto the CFM-PoE03 module and secure it to the CMI module with 4 screws as indicated below.



Step 6. Carefully apply a thermal pad to the heatsink, then continue with step 6 in section 3.16.2.



CAUTION (ATTENTION)

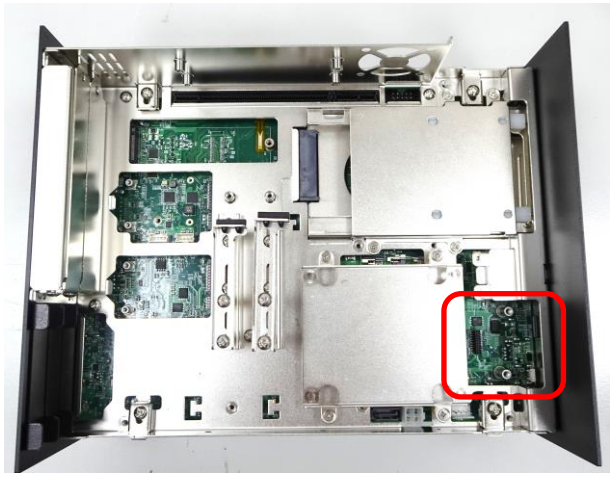
Before assembling the system, please make sure the protective films on both sides of the thermal pad have been removed!

(Avant d'assembler le système, veuillez vous assurer que les films protecteurs des deux côtés du tampon thermique ont été retirés !)

Once installation is complete, the PoE LED on the LAN module will like up blue after the system powers on (see below).

3.18.2. CFM-IGN101 Module

Step 1. Locate the IGN_PH1 connector on the bottom side of the system.

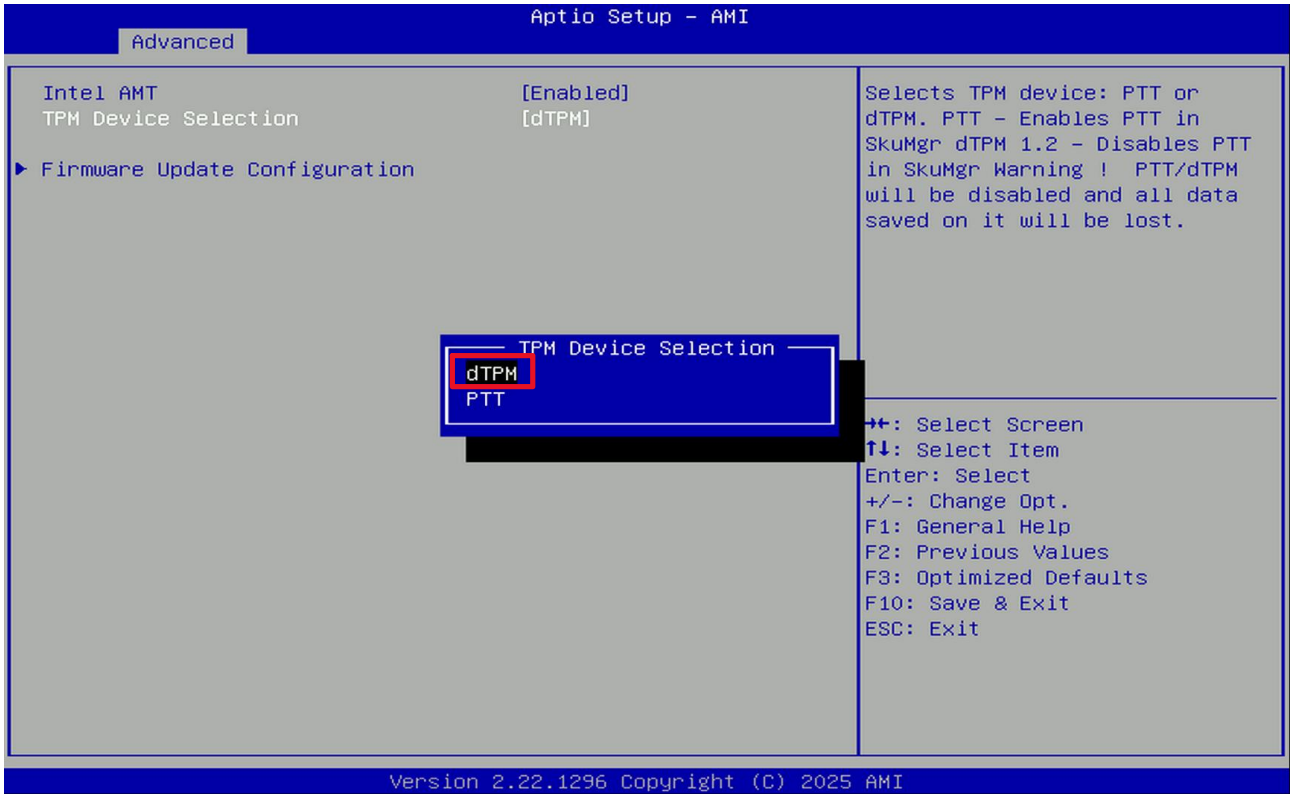


Step 2. Insert the IGN module vertically into the female connector on the system motherboard. Ensure all the pins are connected properly.

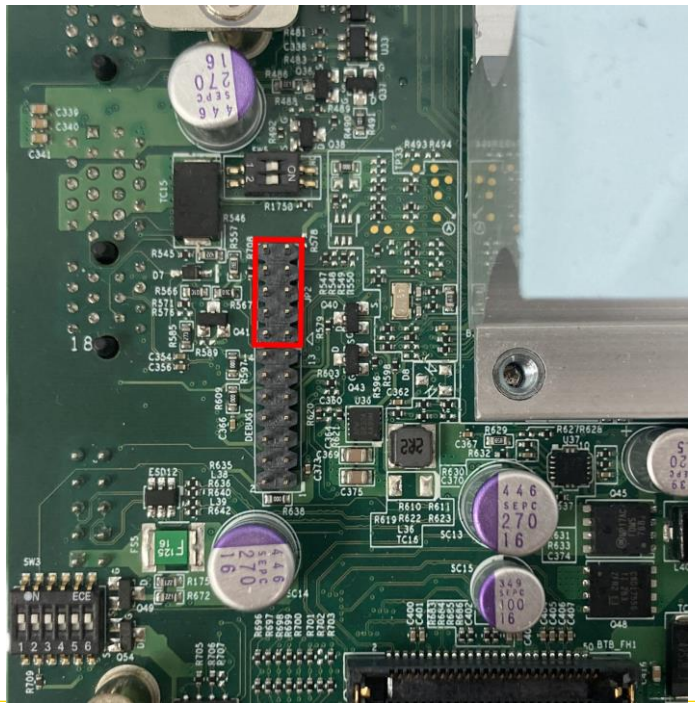
Step 3. Secure the IGN board to the system with 2 screws.

3.18.3. CFM-TPM01 Module

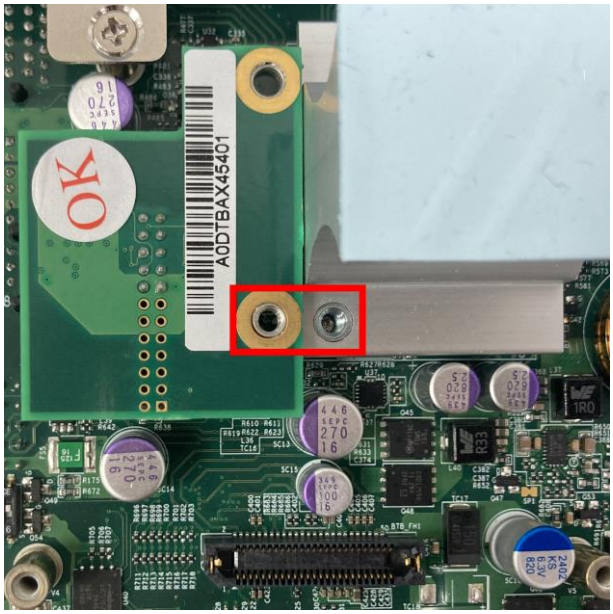
A BIOS setting must be configured before this module can be installed. Press [Del] to enter BIOS, then navigate to **Advanced** > **PCH-FW > TPM Device Selection** and change the setting from **PTT** (default) to **dTPM**.



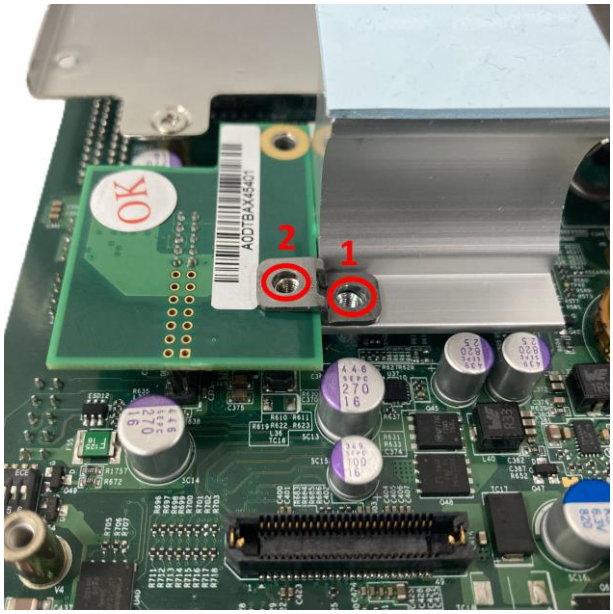
Step 1. Disconnect the system from power. Locate the JP2 connector next to the PCH heatsink on the top side of the motherboard.



Step 2. Insert the TPM module vertically into the connector. Make sure the bottom screw hole is aligned with the screw hole on the PCH heatsink.



Step 3. Place the S-shaped bracket onto PCH and the TPM, and gently secure it to the PCH heatsink, then to the TPM.

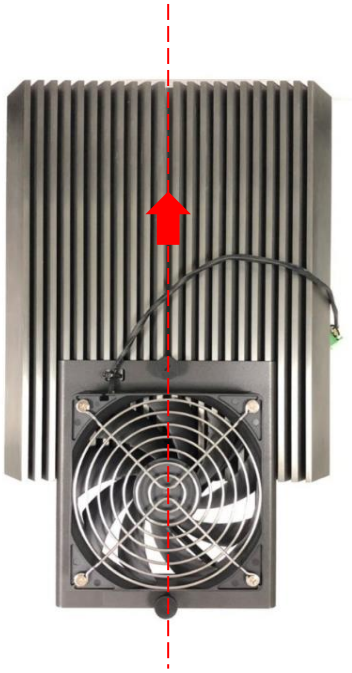


3.19. Installing External FAN

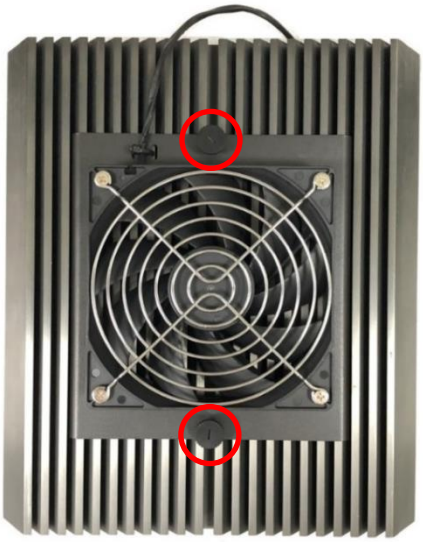
Model No.	Product Description
FAN-EX101	External Fan with 4pin Terminal Block Plug, Mounting Bracket. Support Smart Fan Function

Step 1. Prepare an external fan. Loosen but do not remove the 2 screws on the mounting bracket.

Step 2. Slide the nuts of the mount bracket screws into the middle groove of the top cover as indicated below.



Step 3. Move the fan to the center of the top cover and tighten the 2 screws to secure it as indicated below.

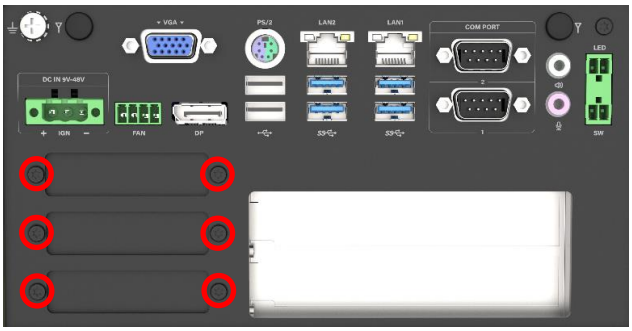


Step 4. Plug in the fan cable to the external fan connector at the rear panel.

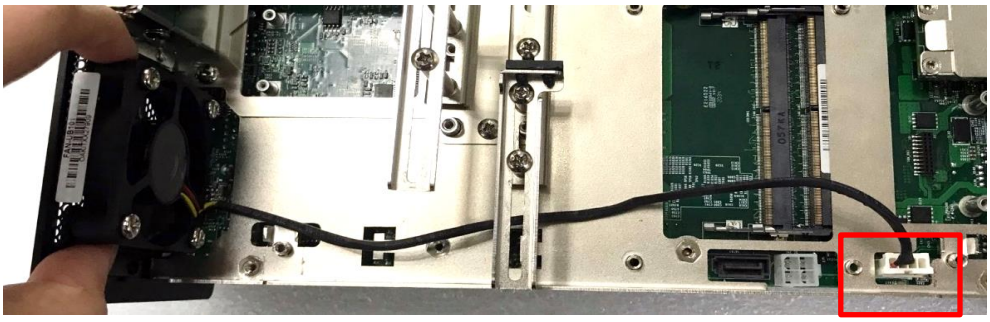
3.20. Installing Internal FAN (For DS-1502 only)

Model No.	Product Description
FAN-UB100	Exhaling Fan with 4pin Connector, Universal Bracket
FAN-UB101	Inhaling Fan with 4pin Connector, Universal Bracket

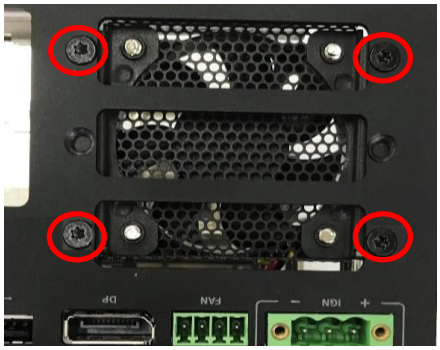
Step 1. Remove the 6 screws indicated below to detach all three expansion covers from the rear panel.



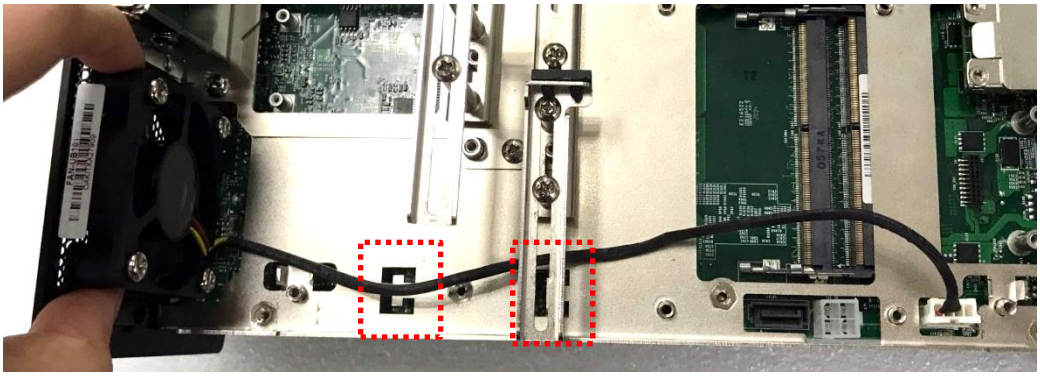
Step 2. Connect the fan connector to the fan header (POWER4).



Step 3. Secure the fan to the rear panel with 4 screws as indicated.



Step 4. Perform cable management. The dotted rectangular areas indicated below can be used to anchor cable ties.



Chapter 4
BIOS Setup

4.1. BIOS Introduction

The BIOS (Basic Input/ Output System) is a program stored on the motherboard's flash memory. When the computer is powered on, the BIOS will activate. The BIOS first runs an auto-diagnostic test called POST (Power On Self-Test), which detects and configures all hardware.

BIOS Setup

Setup can be accessed by pressing <Del> immediately after powering on the computer while the startup message is shown on the screen. If the message disappears before you can enter your keyboard input, you can restart the system to try again by pressing <Ctrl> + <Alt> + <Del> simultaneously.

Control Keys	
<←> <→>	Move to select screen
<↑> <↓>	Move to select item
<Esc>	Quit the BIOS Setup
<Enter>	Select item
<Page Up/+>	Increases the numeric value or makes changes
<Page Down/->	Decreases the numeric value or makes changes
<Tab>	Select setup fields
<F1>	General help
<F2>	Previous value
<F3>	Load Optimized defaults
<F10>	Save configuration and Exit

Main Menu

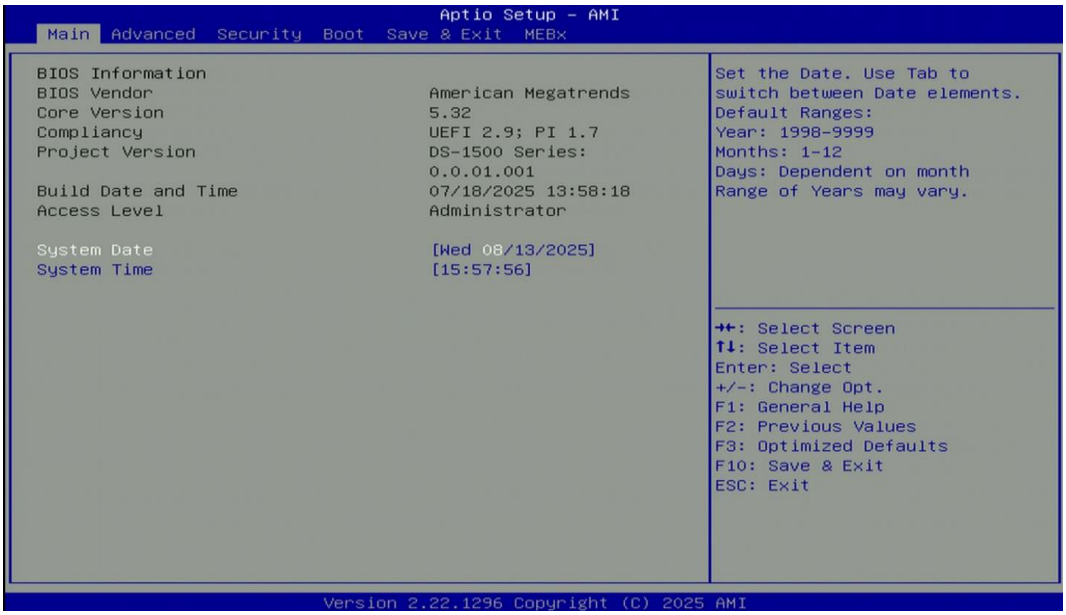
The main menu lists the setup functions you can change. You can use the arrow keys (↑↓) to select different items and fields. The description of the highlighted function is displayed at the bottom of the screen.

Sub-Menu

If a right pointer symbol is present to the left of a particular field, this field contains a sub-menu. A sub-menu contains additional options for a given field. You can use the arrow keys (↑↓) to highlight the field and press <Enter> to enter the sub-menu. Once inside, you can use the same keys to enter values and move from field to field. If you want to exit the sub-menu, press <Esc>.

4.2. Main Setup

After pressing <Del> to enter BIOS, the Main Menu will appear on the screen (see below). This manual is based on BIOS 0.0.01.001.



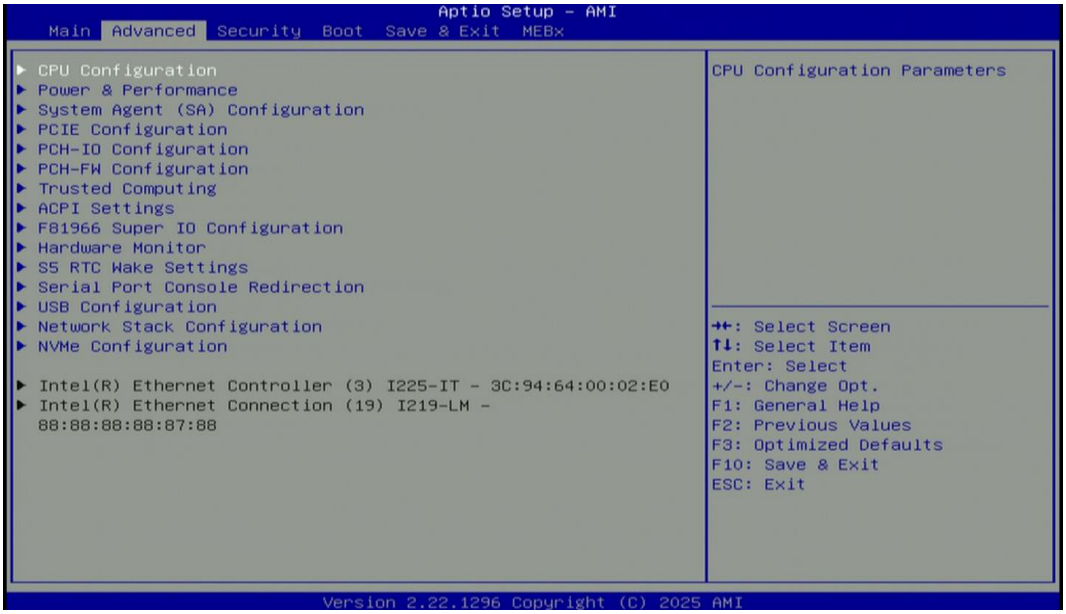
■ System Date

Set the date. Please use <Tab> to switch between date elements.

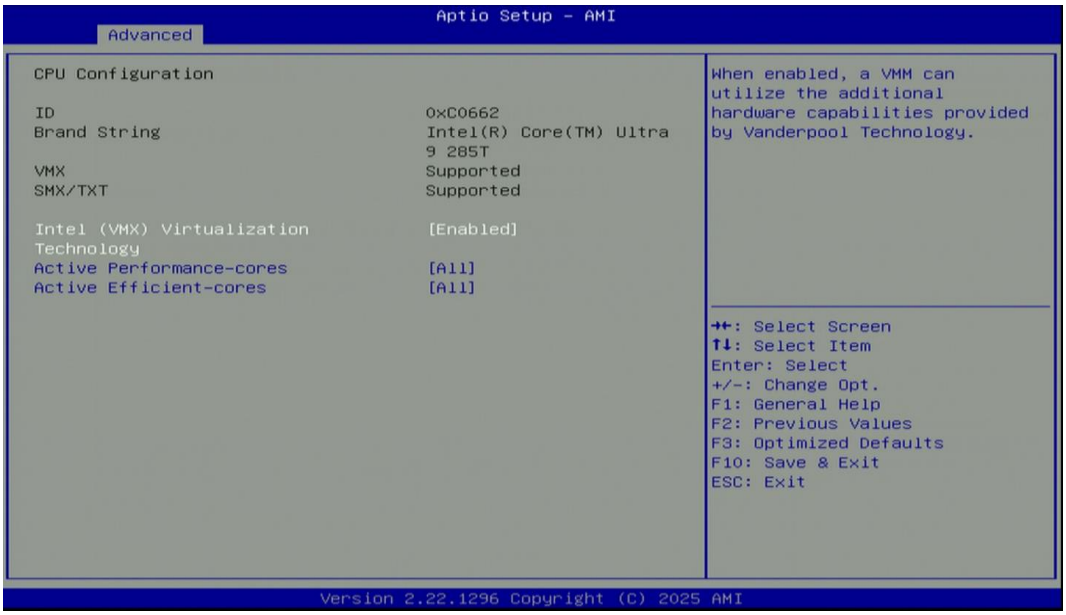
■ System Time

Set the time. Please use <Tab> to switch between time elements.

4.3. Advanced Setup



4.3.1. CPU Configuration



■ Intel (VMX) Virtualization Technology [Enabled]

Enables or disables Intel® Virtualization Technology. Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems.

■ Active Performance-cores [All]

Allows users to choose the number of active performance cores. The options may change depending on the installed CPU.

Configuration options: [1] [2] [3] [4] [5] [6] [7] [All]

■ Active Efficient-cores [All]

Allows users to choose the number of active efficient cores. The options may change depending on the installed CPU.

Configuration options: [0] [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [All]

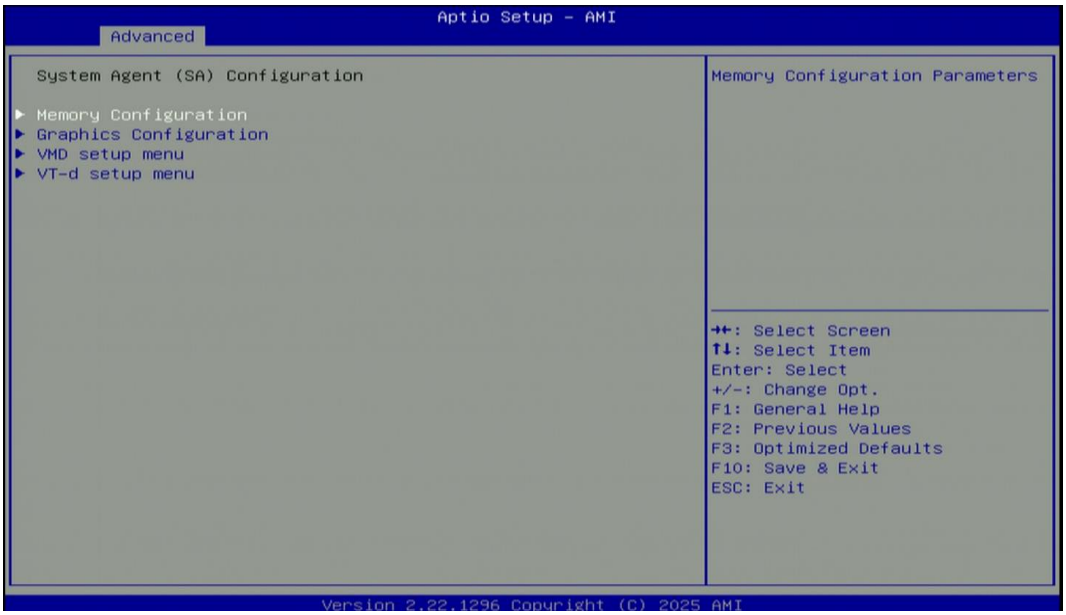
4.3.2. Power & Performance

■ SKU Power Config [Auto]

Allows users to choose the upper limit of CPU power.

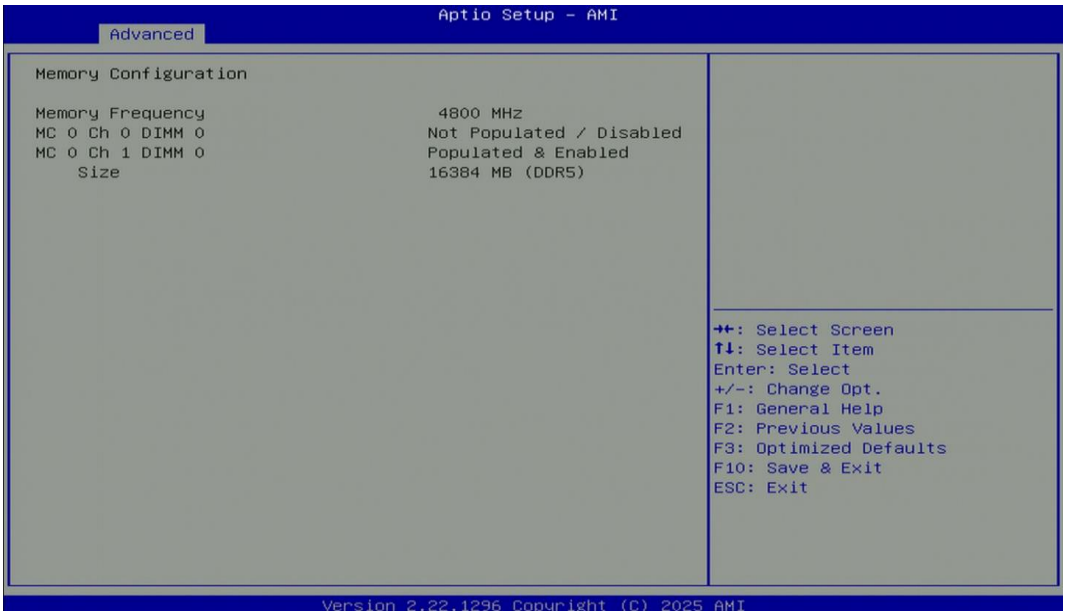
Configuration options: [Auto] [35W]

4.3.3. System Agent (SA) Configuration



■ Memory Configuration

This item displays details of the memory installed in the system.



■ Graphics Configuration

❑ **Primary Display [Auto]**

Allows users to select which graphics device should be the primary display, or select SG for switchable graphics.

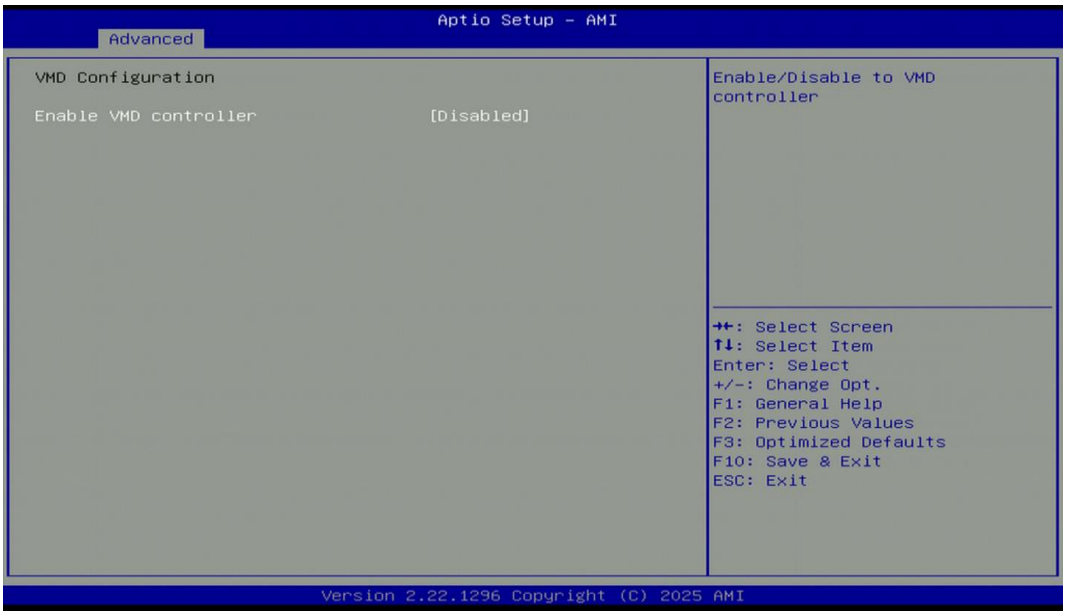
Configuration options: [Auto] [IGFX]

❑ **Internal Graphics [Auto]**

This item allows users to enable or disable Internal Graphics.

Configuration options: [Auto] [Disabled] [Enabled]

■ VMD setup menu



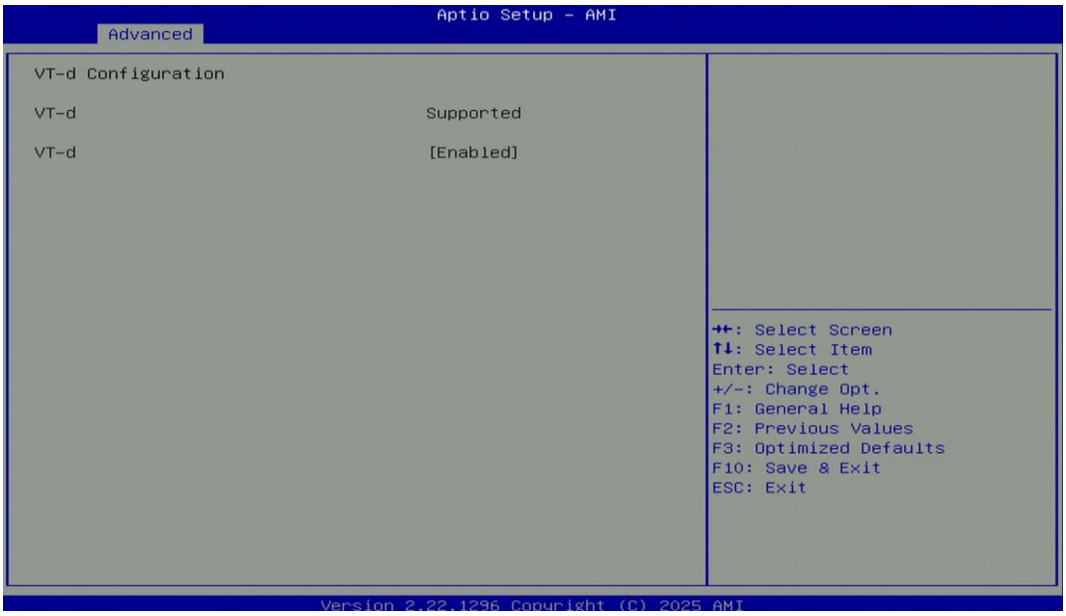
❑ Enable VMD controller [Disabled]

Allows users to enable or disable the VMD Controller.

Configuration options: [Disabled] [Enabled]

Enabling this function allows the system to support RAID and enables the Intel® Rapid Storage Technology (RST) sub-menu.

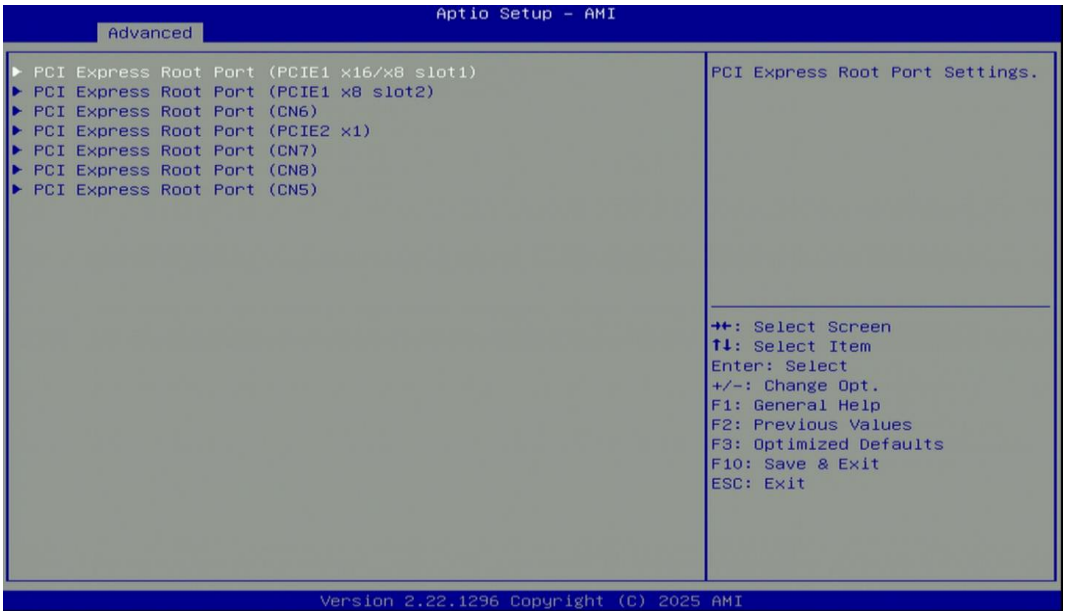
■ VT-d setup menu



❑ VT-d [Enabled]

This item allows users to enable Intel® Virtualization Technology for Directed I/O (VT-d) function.

4.3.4. PCIE Configuration



- **PCI Express Root Port (PCIE1 x16/x8 slot1)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

    Allows you to select PCI Express interface speed.

    Configuration options: [Auto] [Gen1] [Gen2] [Gen3].
- **PCI Express Root Port (PCIE1 x8 slot2)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

    Allows you to select PCI Express interface speed.

    Configuration options: [Auto] [Gen1] [Gen2] [Gen3].
- **PCI Express Root Port (CN6)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

    Allows you to select PCI Express interface speed.

    Configuration options: [Auto] [Gen1] [Gen2] [Gen3].
- **PCI Express Root Port (PCIE2 x1)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

    Allows you to select PCI Express interface speed.

    Configuration options: [Auto] [Gen1] [Gen2] [Gen3].

- **PCI Express Root Port (CN7)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

    Allows you to select PCI Express interface speed.

    Configuration options: [Auto] [Gen1] [Gen2] [Gen3].
- **PCI Express Root Port (CN8)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

    Allows you to select PCI Express interface speed.

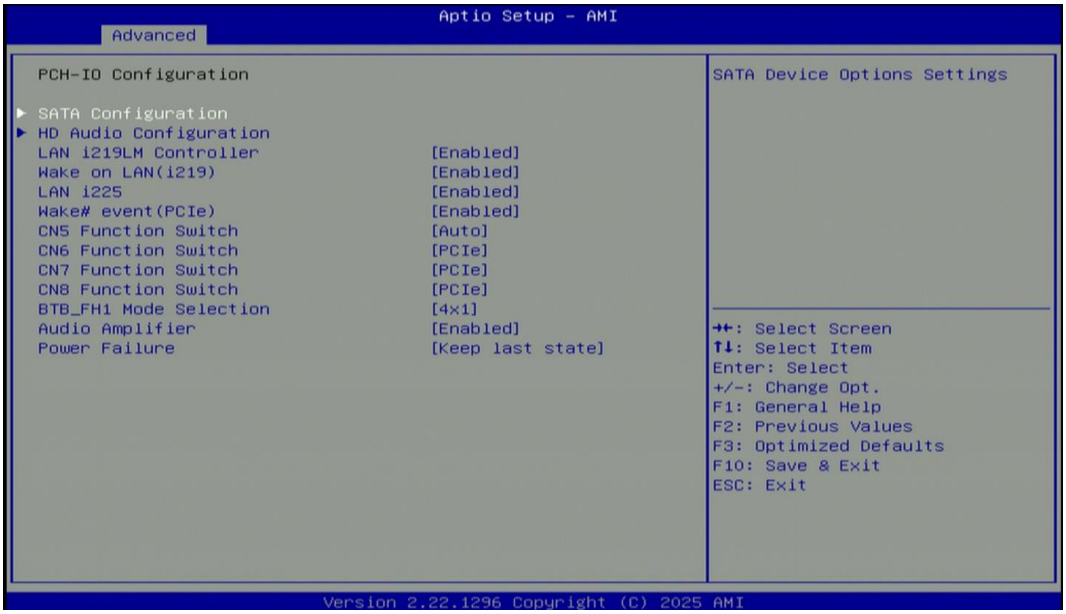
    Configuration options: [Auto] [Gen1] [Gen2] [Gen3].
- **PCI Express Root Port (CN5)**
  - **PCI Express Root Port [Enabled]**

    Allows you to enable or disable the PCI Express Port.
  - **PCIe Speed [Auto]**

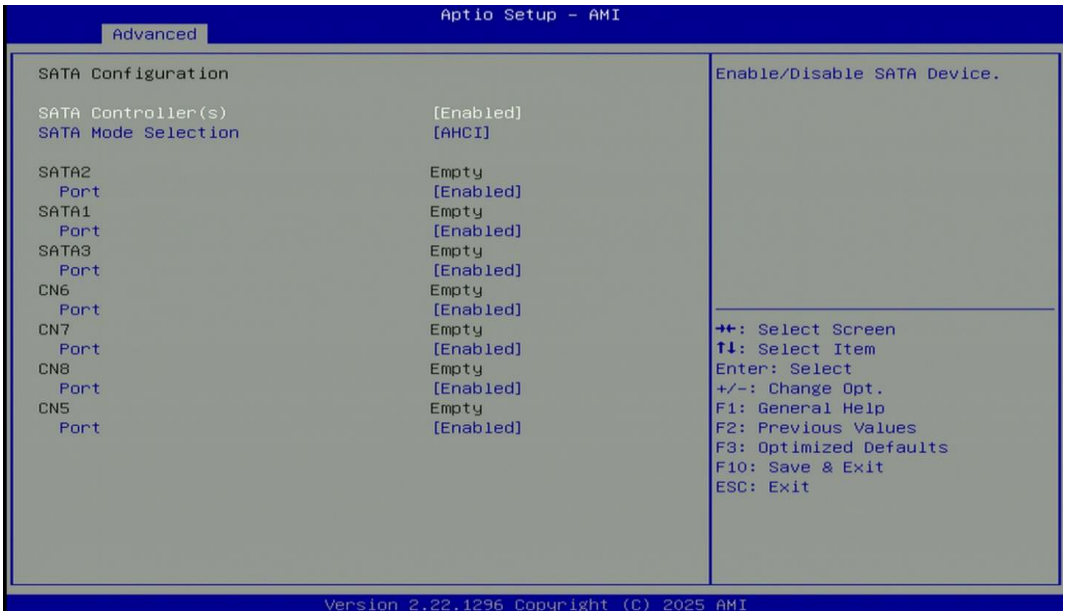
    Allows you to select PCI Express interface speed.

    Configuration options: [Auto] [Gen1] [Gen2] [Gen3] [Gen4].

4.3.5. PCH-IO Configuration



■ SATA Configuration



■ SATA Controller(s) [Enabled]

Enables or disables Serial ATA controller.

■ SATA Mode Selection [AHCI]

This item only allows users to choose [AHCI] mode.

- ❑ **SATA2**

  Port [Enabled]

  Enables or disables SATA2.

- ❑ **SATA1**

  Port [Enabled]

  Enables or disables SATA1.

- ❑ **SATA3**

  Port [Enabled]

  Enables or disables SATA3.

- ❑ **CN6**

  Port [Enabled]

  Enables or disables CN6.

- ❑ **CN7**

  Port [Enabled]

  Enables or disables CN7.

- ❑ **CN8**

  Port [Enabled]

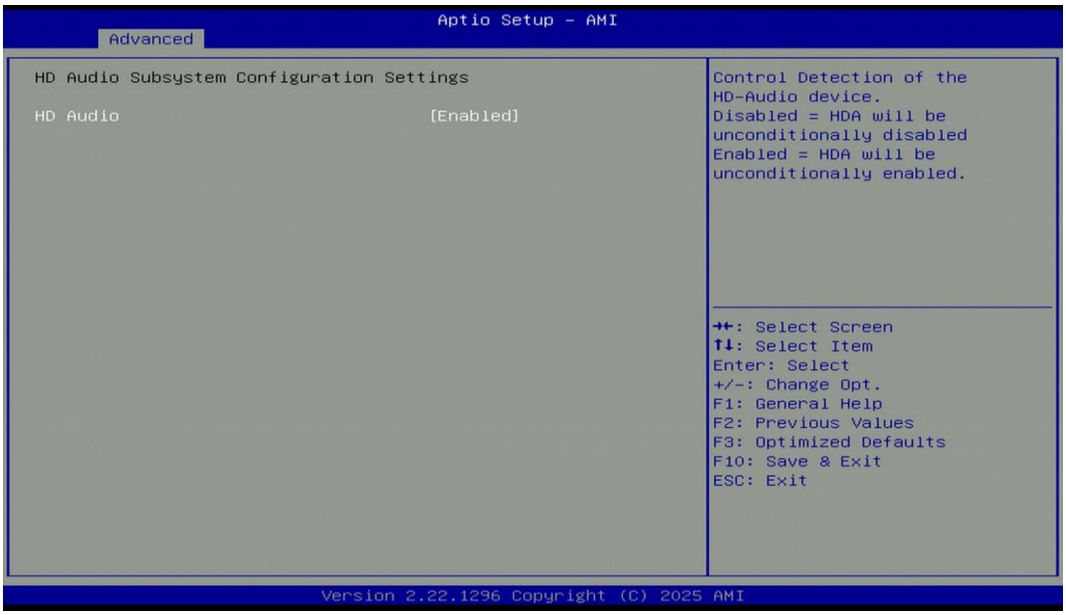
  Enables or disables CN8.

- ❑ **CN5**

  Port [Enabled]

  Enables or disables CN5.

■ HD Audio Configuration



❑ **HD Audio [Enabled]**

Allows you to select HD Audio options.

[Enabled]: HD Audio device is unconditionally enabled.

[Disabled]: HD Audio device is unconditionally disabled.

■ LAN i219LM Controller [Enabled]

Enables or disables i219LM LAN Controller.

■ Wake On LAN (i219) [Enabled]

Enables or disables integrated LAN i219LM Wake on LAN function.

■ LAN i225 [Enabled]

Enables or disables I225 LAN Controller.

■ Wake# event (PCIe) [Enabled]

Enables or disables integrated LAN i210 Wake on LAN function.

■ CN5 Function Switch [Auto]

Allows users to select [Auto], [SSD-SATA], [SSD-PCIe], [WWAN-PCIe], [WWAN-USB3] for CN5 connector.

■ CN6 Function Switch [PCIe]

Allows users to select [PCIe] or [SATA] for CN6 connector.

■ CN7 Function Switch [PCIe]

Allows users to select [PCIe] or [SATA] for CN7 connector.

■ CN8 Function Switch [PCIe]

Allows users to select [PCIe] or [SATA] for CN8 connector.

■ BTB_FH1 Mode Selection [4x1]

Allows users to select [4x1] or [1x4] for BTB_FH1 Mode.

■ Audio Amplifier [Enabled]

Enables or disables Audio Amplifier Function.

■ Power Failure [Keep last state]

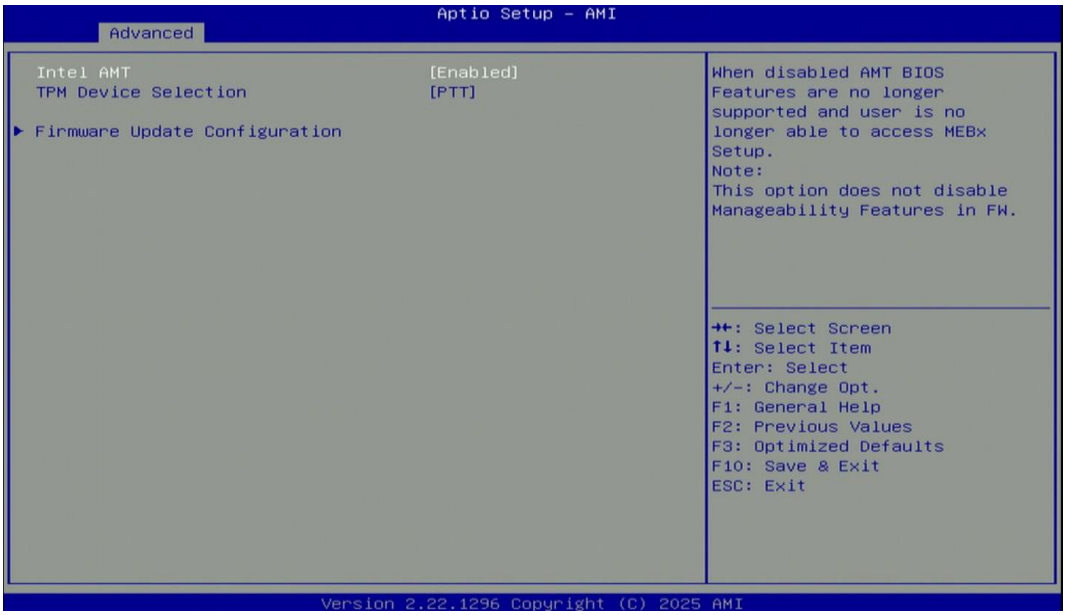
Allows you to specify which power state the system will enter when power is resumed after a power failure (G3 state).

[Always on]: Enters power on state.

[Always off]: Enters power off state.

[Keep last state]: Enters the last power state before a power failure.

4.3.6. PCH-FW Configuration



■ Intel AMT [Enabled]

Allows users to enable or disable Intel® Active Management Technology BIOS execution.

■ TPM Device Selection [PTT]

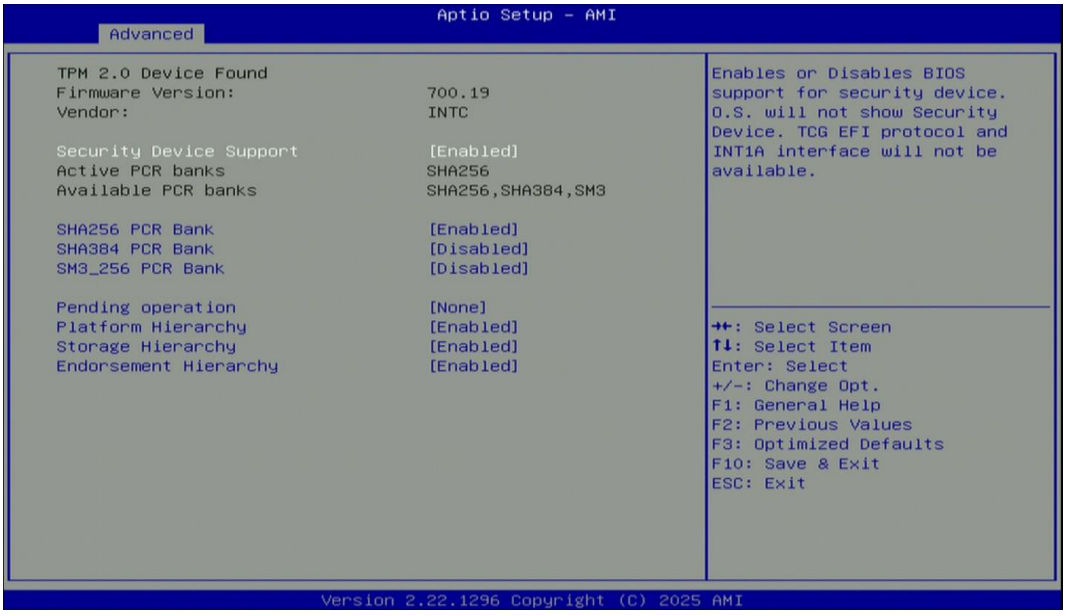
Allows users to select [PTT] or [dTPM] for TPM Device.

■ Firmware Update Configuration

❑ ME FW Image Re-Flash [Disabled]

Allows users to enable or disable the ME firmware image re-flash function.

4.3.7. Trusted Computing



■ Security Device Support [Enable]

Allow users to enable or disable Security Device Support function.

■ SHA256 PCR Bank [Enabled]

Enables or disables SHA256 PCR Bank function.

■ SHA384 PCR Bank [Disabled]

Enables or disables SHA384 PCR Bank function.

■ SHA3_256 PCR Bank [Disabled]

Enables or disables SHA3_256 PCR Bank function.

■ Pending Operation [None]

Allows users to select which mode Pending Operation will operate.

Configuration options: [None] [TPM Clear]

■ Platform Hierarchy [Enabled]

Enables or disables Platform Hierarchy function.

■ Storage Hierarchy [Enabled]

Enables or disables Storage Hierarchy function.

■ Endorsement Hierarchy [Enabled]

Enables or disables Endorsement Hierarchy function.

4.3.8. ACPI Settings

This item allows users to configure ACPI settings.

■ Enable Hibernation [Enabled]

Enables or disables system hibernation (OS S4 sleep state).

■ ACPI Sleep State [S3 (Suspend to RAM)]

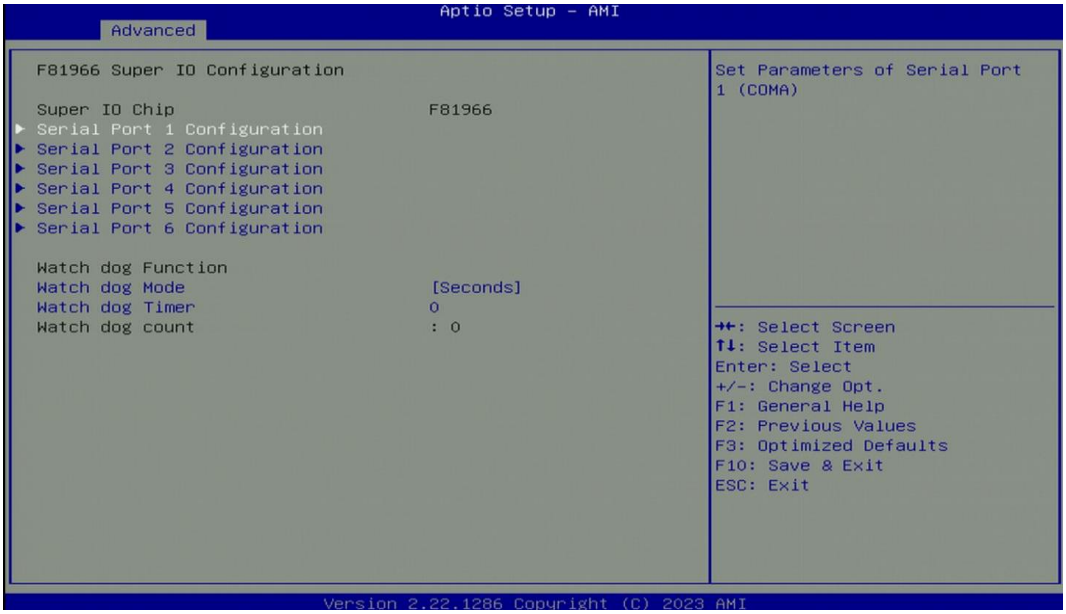
Allows users to select the highest Advanced Configuration Power Interface® (ACPI) sleep state that the system will enter when the suspend button is pressed.

[Suspend Disabled]: Disables entering suspend state.

[S3 (suspend to RAM)]: Enables suspend to RAM state.

4.3.9. F81966 Super IO Configuration

The screen allows users to select options for the Super IO configuration and change the value of selected options.



■ Serial Port 1~6 Configuration

- ❑ **Serial Port [Enabled]**

  This item allows users to enable or disable the serial port.

- ❑ **Change Settings [Auto]**

  This item allows users to change the address & IRQ settings of the specified serial port.

❑ **Serial Port Mode [RS232]**

This item allows users to select Serial Port Mode.

Configuration options: [RS232] [RS422/RS485 Full Duplex] [RS485 Half Duplex]

■ **Watch Dog [Disabled]**

Enables or disables Watch dog function.

■ **Watch Dog Mode [Sec]**

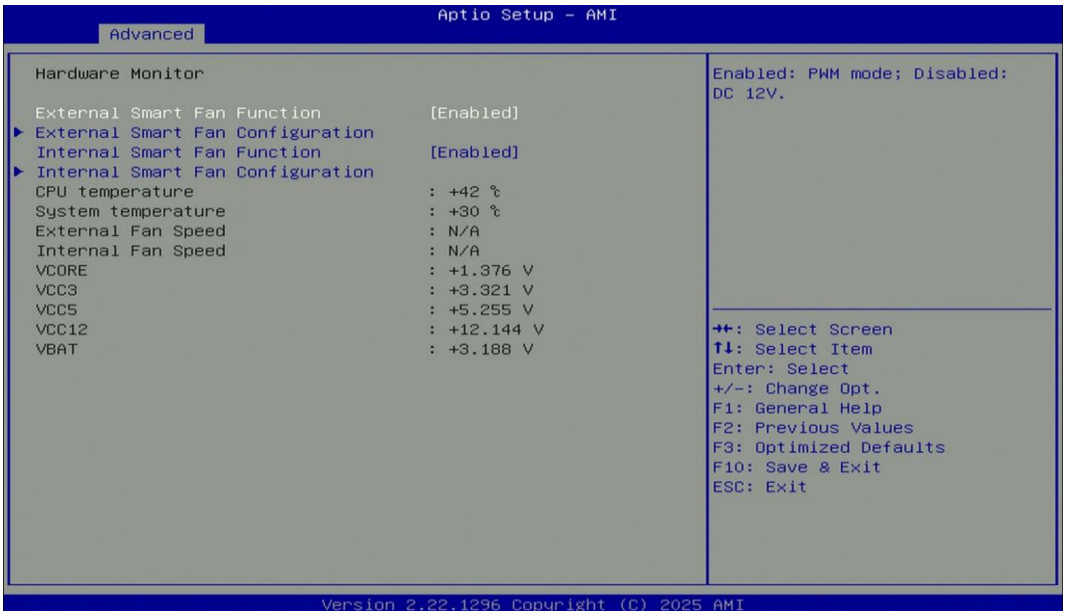
Changes the Watch dog mode. Select [Sec] or [Min].

■ **Watch Dog Timer [0]**

The user can set a value in the range of 0 to 255.

4.3.10. Hardware Monitor

These items display the current status of all monitored hardware devices/ components, such as voltages and temperatures.



■ **External Smart Fan Function [Enabled]**

Enables or disables external smart fan function.

■ **External Smart Fan Configuration**

Allows users to set external smart fan parameters.

■ **Internal Smart Fan Function [Enabled]**

Enables or disables internal smart fan function.

■ **Internal Smart Fan Configuration**

Allows users to set internal smart fan parameters.

4.3.11. S5 RTC Wake Settings

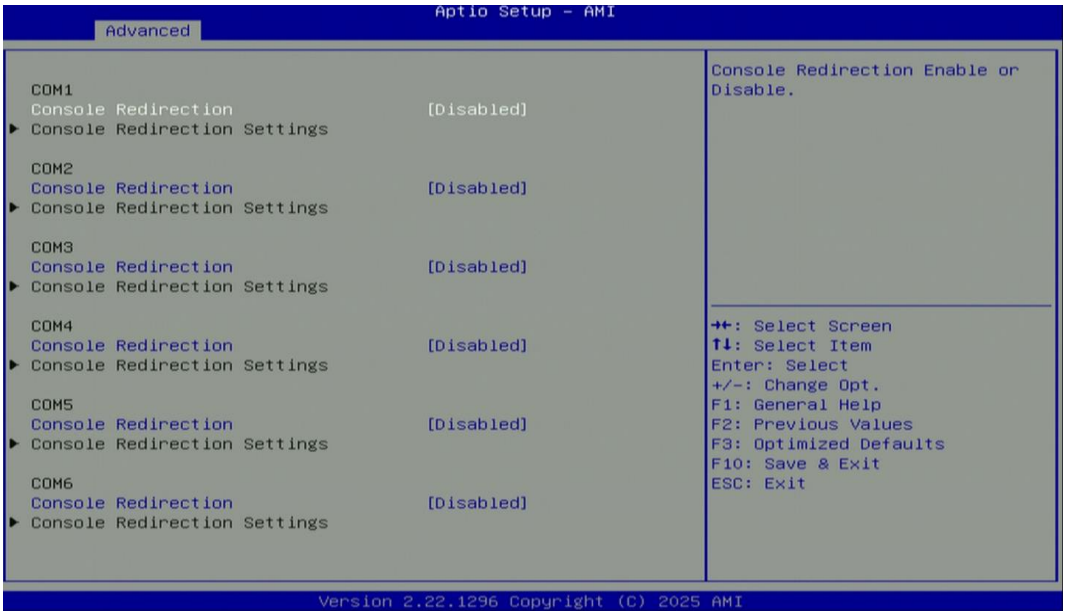
■ Wake System from S5 [Disabled]

This item allows users to wake the system from S5 state.

[Fixed Time]: Set a specified time (HH:MM:SS) to wake the system.

[Dynamic Time]: Set a countdown time to wake the system.

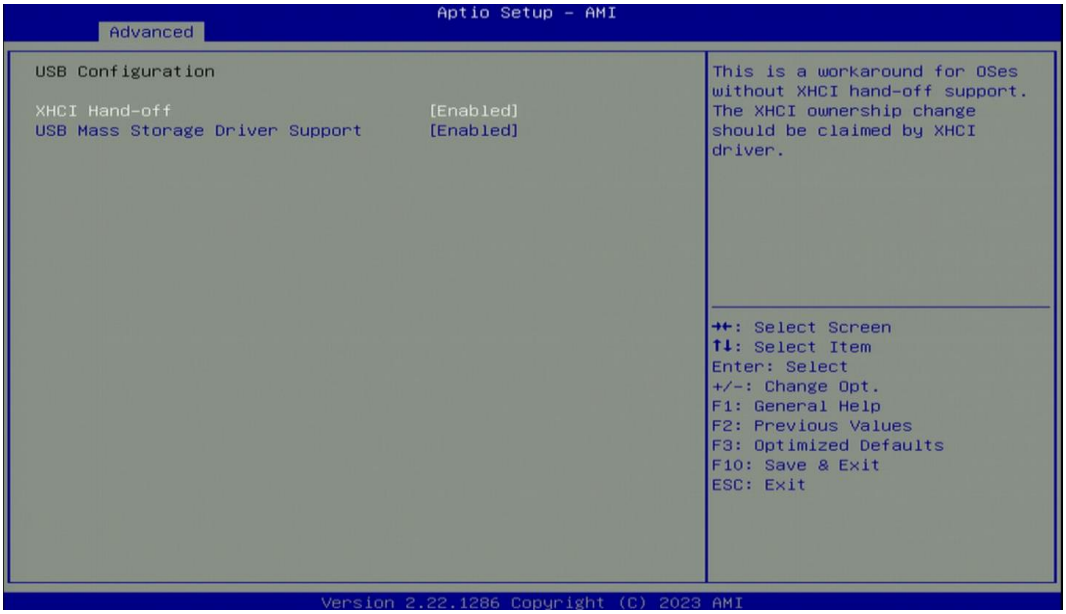
4.3.12. Serial Port Console Redirection



■ **Console Redirection [Disabled]**

These items allow users to enable or disable COM1, COM2, COM3, COM4, COM5, COM6 console redirection function.

4.3.13. USB Configuration



■ **XHCI Hand-off [Enabled]**

This item allows users to enable or disable XHCI (USB3.2) hand-off function.

■ **USB Mass Storage Driver Support [Enabled]**

Enables or disables support for USB mass storage devices.

4.3.14. Network Stack Configuration

■ **Network Stack [Disabled]**

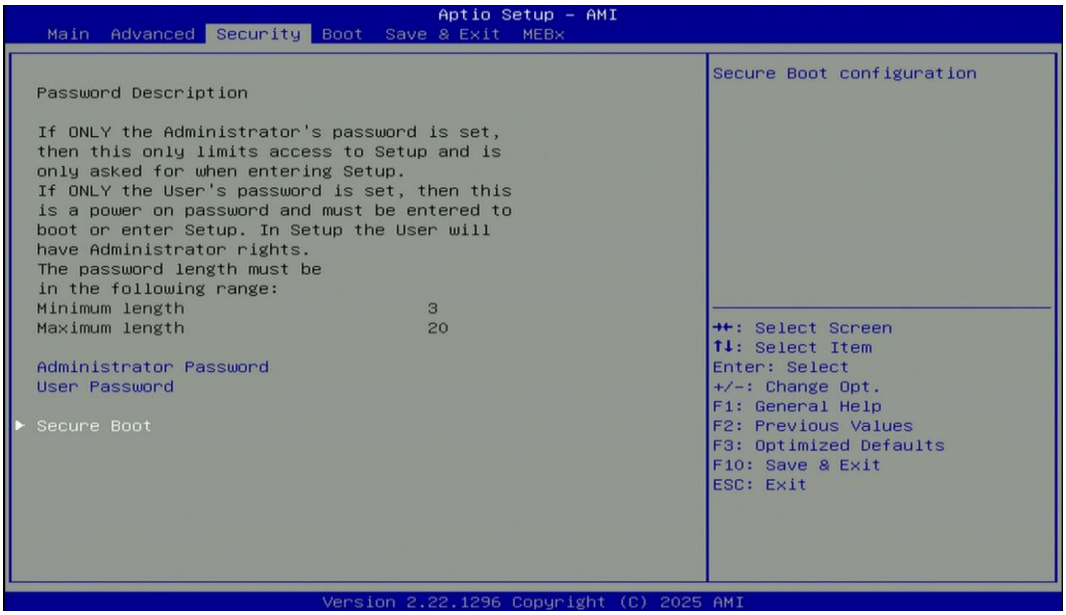
Enables or disables UEFI Network Stack.

4.3.15. NVMe Configuration

The screen allows users to select options for the NVMe configuration and change the value of the selected option. These settings appear only if an NVMe Device is detected.

4.4. Security Setup

This section allows users to configure BIOS security settings. To remove a password, select the password, then leave the field blank and press <Enter>.



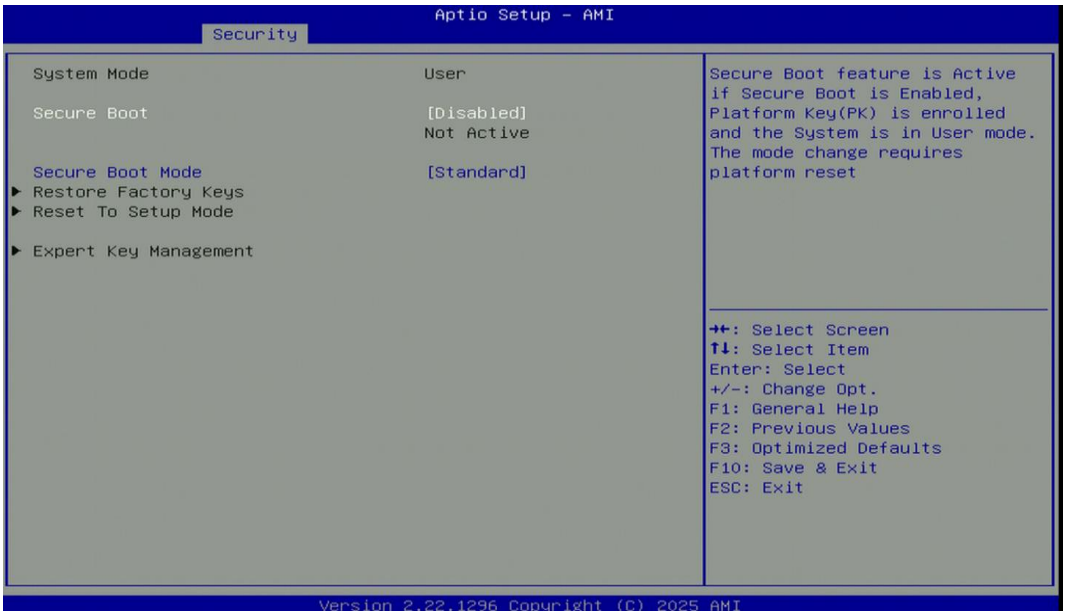
■ Administrator Password

Administrator Password controls access to the BIOS Setup utility.

■ User Password

User Password controls access to the system at boot and to the BIOS Setup utility.

■ Security Boot



- **Secure Boot [Disabled]**

  Enable or disable Secure Boot function.

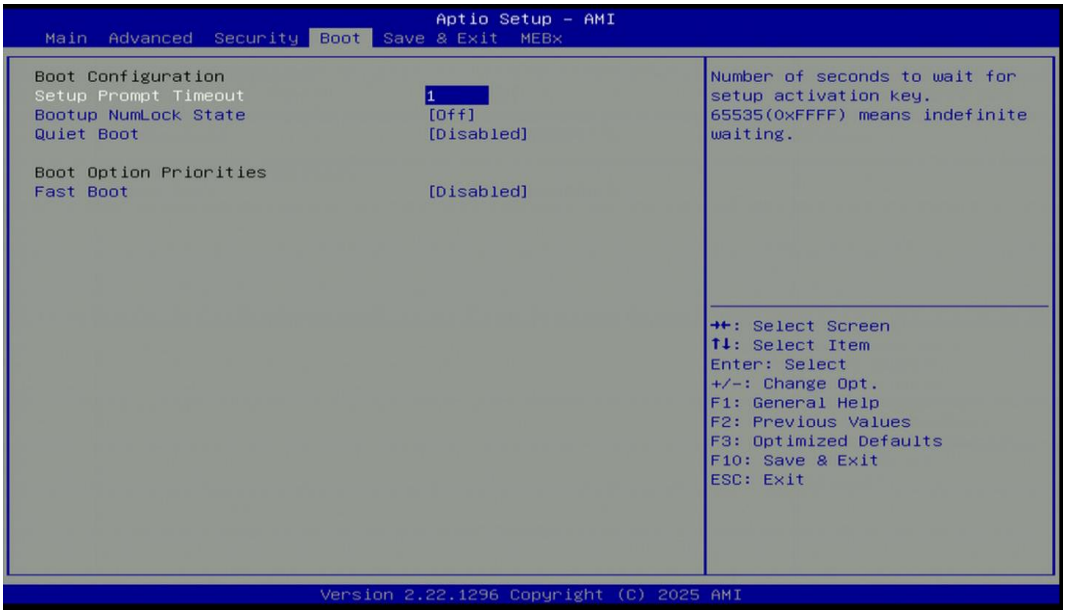
- **Secure Boot Mode [Standard]**

  Allows you to select Secure Boot Mode.

  Configuration options: [Standard] [Custom].

4.5. Boot Setup

This section allows you to configure Boot settings.



■ Setup Prompt Timeout [1]

Use this item to set the number of seconds (1 to 65535) to wait for setup activation key.

■ Bootup NumLock State [Off]

Allows users to select the power-on state for keyboard NumLock.

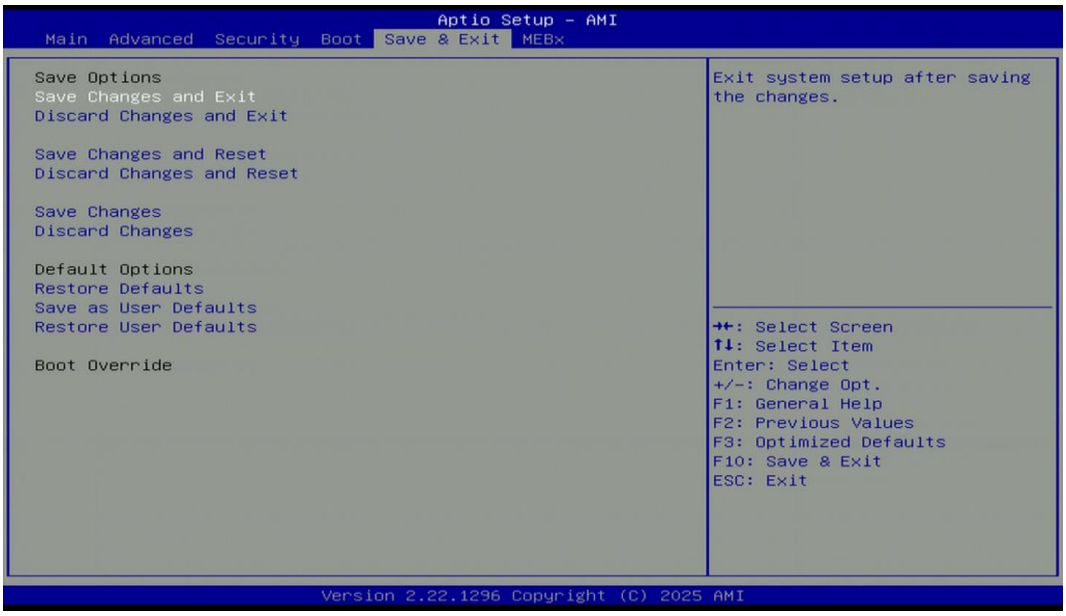
■ Quiet Boot [Disabled]

Allows users to enable or disable Quiet Boot function.

■ Fast Boot [Disabled]

Allows users to enable or disable Fast Boot function.

4.6. Save & Exit



■ Save Changes and Exit

This item allows users to exit system setup after saving changes.

■ Discard Changes and Exit

This item allows users to exit system setup without saving changes.

■ Save Changes and Reset

This item allows users to reset the system after saving changes.

■ Discard Changes and Reset

This item allows users to reset system setup without saving any changes.

■ Save Changes

This item allows users to save changes done so far to any of the setup options.

■ Discard Changes

This item allows users to discard changes done so far to any of the setup options.

■ Restore Defaults

This item allows users to restore/ load default values for all the options.

■ Save as User Defaults

This item allows users to save the changes done so far as user defaults.

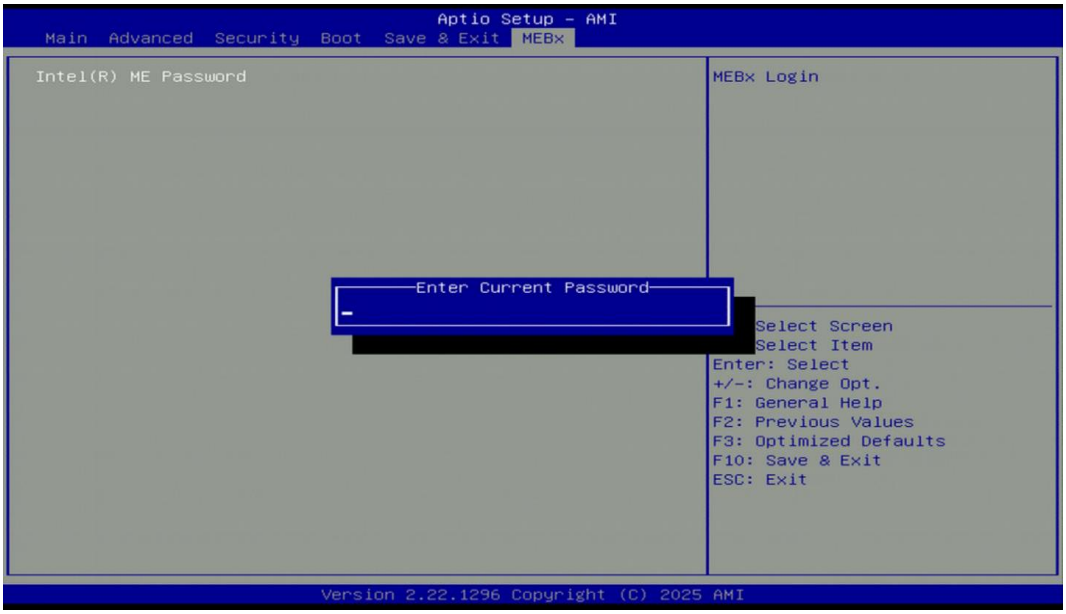
■ Restore User Defaults

This item allows users to restore the user defaults to all the options.

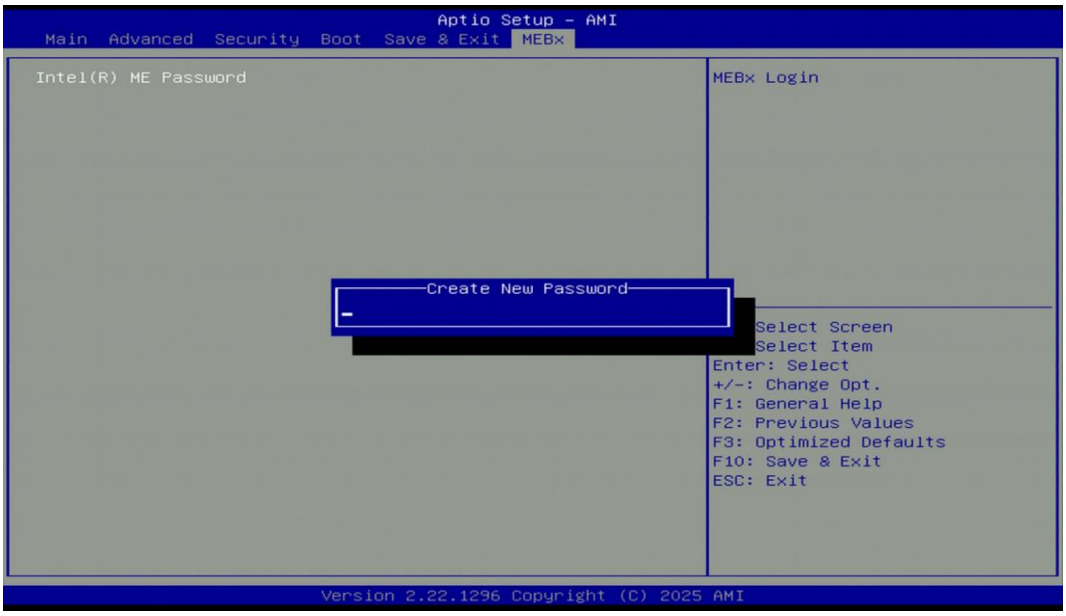
4.7. MEBx

This page is for ME function setting. Press the <Del> key to enter the BIOS menu, then use the arrow keys to navigate to the MEBx page.

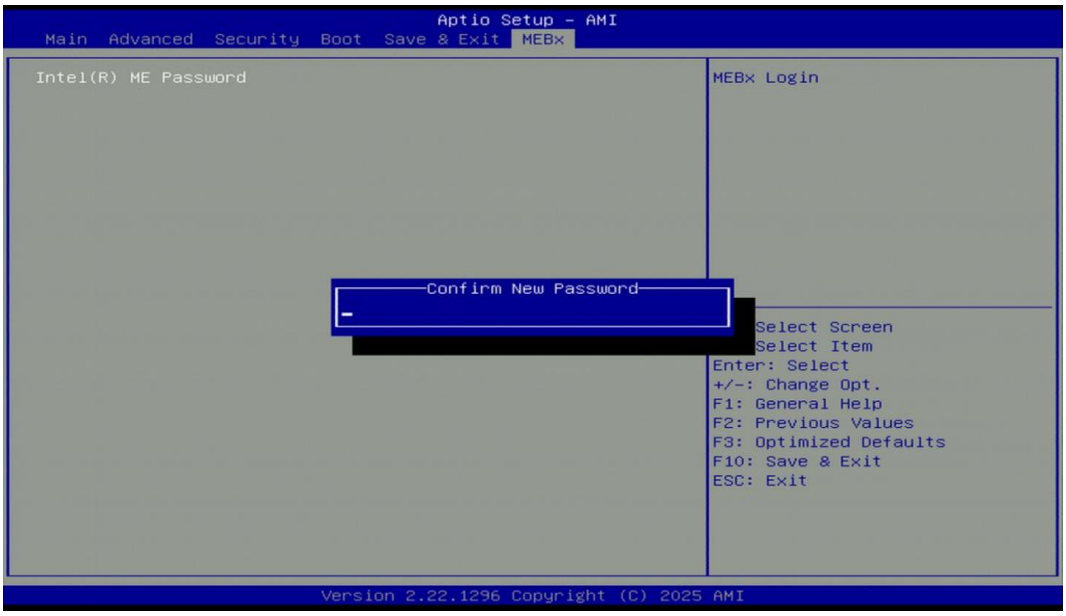
Press enter key to enter the default password "admin".



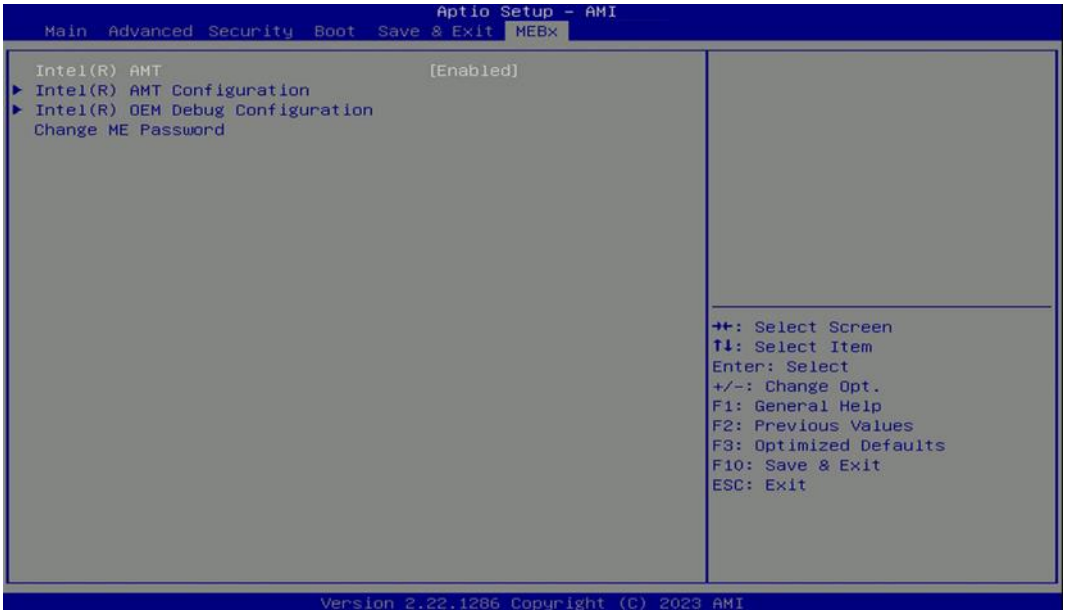
Create a new password using 8 characters including uppercase and lowercase letters, numbers, and special symbols.



Enter the password again.



This reveals the MEBx function settings.



Chapter 5
Product Application

5.1. Where can I download drivers?

Drivers for the DS-1500 Series can be downloaded from the CINCOZE website.

5.2. Where can I find technical documents?

The following documents are the most relevant technical references for the DS-1500 Series. All documents can be accessed via the CINCOZE Partner Zone:

- **Application Notes**: Navigate to *Home > Partner Zone > Technical Support > Application Notes*.
- **Configure & Installation**: Navigate to *Home > Partner Zone > Technical Support > Configure & Installation*.
- **Other Product Information**: Navigate to *Home > Partner Zone > Product Center > Product Information > Rugged Embedded Computers > High Performance & PCIe Expandable (DS Series) > DS-1500 Series*.

Catalog	Document Tile
Application Notes	DIO Application Guide
	DIO Technical Guide
	Instant Reboot Application Guide
	WDT Application Guide
	WDT Technical Guide
Configure & Installation	AT ATX Function Manual
	BIOS Administrator User Password Function Manual
	Clear CMOS Function Manual
	COM Function Manual
	CSM Function Manual
	Digital I/O Function Manual
	How to import Secure Boot Key?
	How to restore Windows image with Clonezilla?
	How to set TPM function under Windows?
	How to stop automatic driver update in Windows SOP
	How to Update BIOS and ME under UEFI shell?
	How to Update BIOS under UEFI shell?
	How to Update BIOS under Windows?
	IGN Module User Manual
	Intel AMT with KVM Remote Control
	POE Module User Manual
	PXE Function Manual
	RAID Function Manual

	Remote Switch Function Manual
	Wake On LAN Function Manual
	WDT Function Manual