ECX-3000 USER Manual

14th Gen Intel® Core™ i9/i7/i5/i3 Fanless Embedded System
Workstation-grade, 2.5GigE LAN, 10GigE LAN, 9V to 50V DC-in

Vecow

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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 it is not installed and used in accordance with the instruction manual, it 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 products described in this manual comply with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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Order Information

Part Number	Description
ECX-3025R	ECX-3000, 8 2.5G LAN w/4 PoE+, 1 GigE LAN, 2 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO, 2 SSD Tray
ECX-3025	ECX-3000, 8 2.5G LAN w/4 PoE+, 1 GigE LAN, 2 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO
ECX-3000-PoER	ECX-3000, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO, 2 SSD Tray
ECX-3000-PoES	ECX-3000, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO, 4 M.2 Tray
ECX-3000-PoE	ECX-3000, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO
ECX-3000-4R	ECX-3000, 3 2.5G LAN, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 GPIO, 2 SSD Tray
ECX-3000-4G	ECX-3000, 3 2.5G LAN, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 GPIO
ECX-3000-2R	ECX-3000, 1 2.5G LAN, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 GPIO, 2 SSD Tray
ECX-3000-2G	ECX-3000, 1 2.5G LAN, 1 GigE LAN, 4 COM, 2 SIM, 6 USB 3.2, 16 GPIO
ECX-3071XR	ECX-3000, 2 10G LAN, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 2 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO, 2 SSD Tray
ECX-3071X	ECX-3000, 2 10G LAN, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 2 COM, 2 SIM, 6 USB 3.2, 16 Isolated DIO

CPU List

Series	CPU	Cores	GHz	TDP (W)	ECC
Intel® Core™ (14th Gen)*	i9-14900	24	5.8	65	Y
	i7-14700	20	5.4		
	i5-14500	14	5		
	i3-14100	4	4.7		
	i9-14900T	24	5.5	35	
	i7-14700T	20	5.2		
	i5-14500T	14	4.8		
	i3-14100T	4	4.4		
Intel® Core™ (13th Gen)	i9-13900E	24	5.2	65	
	i7-13700E	16	5.1		
	i5-13500E	14	4.6		
	i3-13100E	4	4.4		
	i9-13900TE	24	5	35	
	i7-13700TE	16	4.8		
	i5-13500TE	14	4.5		
	i3-13100TE	4	4.1		
Intel® Core™ (12th Gen)	i9-12900E	16	5	65	
	i7-12700E	12	4.8		
	i5-12500E	6	4.5		
	i3-12100E	4	4.2		
	i9-12900TE	16	4.8	35	
	i7-12700TE	12	4.7		
	i5-12500TE	6	4.3		
	i3-12100TE	4	4		

* 14th Gen support PC Client use condition only.

Optional Accessories

Part Number	Description
DDR4 32G	Certified DDR4 32GB 3200MHz RAM
DDR4 16G	Certified DDR4 16GB 3200MHz RAM
DDR4 8G	Certified DDR4 8GB 3200MHz RAM
DDR4 4G	Certified DDR4 4GB 3200MHz RAM
PWA-120W1	120W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block
PWA-120WM4P1	120W, 24V, 90V AC to 264V AC Power Adapter with 4-pin Mini-DIN Connector
PWA-160W-WT	160W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block, Wide Temperature -30°C to +70°C
PWA-180W	180W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block
PWA-280W-WT	280W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block, Wide Temperature -30°C to +70°C
VESA Mount	VESA Mounting Kit
Anti-Vibration Kit	Anti-Vibration Wall Mount Bracket for ECX-3000 (Vibration : 5Grms)
DIN-RAIL	DIN Rail Kit
Rack Mount	2U Rackmount Kit
TMK2-20P-100	Terminal Block 20-pin to Terminal Block 20-pin Cable, 100cm
TMK2-20P-500	Terminal Block 20-pin to Terminal Block 20-pin Cable, 500cm
TMB-TMBK-20P	Terminal Board with One 20-pin Terminal Block Connector and DIN-Rail Mounting
M.2 Storage Module	M.2 Key M/Key B PCIe Storage Module
5G Module	5G Module with Antenna
4G Module	4G/GPS Module with Antenna
WiFi & Bluetooth	WiFi & Bluetooth Module with Antenna

Table of Contents

1

GENERAL INTRODUCTION

1.1 Overview

Vecow ECX-3000 series is a workstation-grade Fanless Embedded System. It is powered by a 24-core 14th Gen Intel® Core™ i9/i7/i5/i3 processor with up to 65W TDP CPU supported, delivering intelligent workload optimization. Support for 9V to 50V wide-range power input, an extended temperature range from -40°C to 75°C and software ignition power control make ECX-3000 a perfect solution for harsh environments.

Vecow ECX-3000 series provides a host of module options to facilitate AIoT applications. To accelerate seamless connectivity and efficient communications, the ECX-3000 Series supports a variety of LAN ports, including 2.5G PoE+, 2.5G, 10G and 1G. In response to the increasing storage demands on advanced IoT applications, the ECX-3000 Series is equipped with up to 4 front-access M.2 Tray, providing a faster, smaller and more efficient way for data-rich applications.

Vecow ECX-3000 series is designed to help accelerate the deployment of modern AIoT applications. Optional support for comprehensive high-speed functionalities that include PCIe 4.0, USB 3.2 Gen 2, 10GigE LAN, 2.5GigE LAN, and 1GigE LAN makes Vecow ECX-3000 Series the ideal solution for a wide range of AIoT applications, including Machine Vision, In-vehicle Computing, Public Security, Factory Automation, Robotic Control, AMR/AGV, and any Edge AI applications.

1.2 Features

- Workstation-grade Platform : Intel® Core™ i9/i7/i5/i3 Processor (14th gen, codename : RPL-S Refresh/RPL-S/ADL-S) running with Intel® R680E PCH supports max 65W TDP CPU
- Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture, with max 94% graphics performance and 181% GPU image classification inference performance enhanced
- 8 Independent 2.5G LAN with 4 IEEE 802.3at PoE+
- 4 Front-access M.2 SSD Tray, 6 USB 3.2 Gen 2
- DC 9V to 50V Power Input, Software Ignition Control
- Supports Intel® vPro, TCC, Time-Sensitive Networking (TSN), and TPM 2.0
- Optional VHub One-Stop AIoT Solution Service supports OpenVINO based AI accelerator and advanced Edge AI applications

1.3 Product Specification

1.3.1 Specifications of ECX-3025R

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out

Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN
PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
2.5G Ethernet	
LAN 7	Intel® I225 2.5GigE LAN
LAN 8	Intel® I225 2.5GigE LAN
LAN 9	Intel® I225 2.5GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	**35W TDP CPU :** -40°C to 70°C (-40°F to 158°F), Fanless **65W TDP CPU :** -40°C to 50°C (-40°F to 122°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.2 Specifications of ECX-3025

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
2.5G Ethernet	
LAN 7	Intel® I225 2.5GigE LAN
LAN 8	Intel® I225 2.5GigE LAN
LAN 9	Intel® I225 2.5GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	**35W TDP CPU :** -40°C to 70°C (-40°F to 158°F), Fanless **65W TDP CPU :** -40°C to 50°C (-40°F to 122°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 70°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.3 Specifications of ECX-3000-PoER

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	• 35W TDP CPU : -40°C to 75°C (-40°F to 167°F), Fanless • 65W TDP CPU : -40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.4 Specifications of ECX-3000-PoES

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 770 driven by Intel® X^e Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	4 Front-access M.2 Key M SSD Tray
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	-40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 55°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.5 Specifications of ECX-3000-PoE

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Storage Device	2 2.5" SSD/HDD Bracket (Internal)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	• 35W TDP CPU : -40°C to 75°C (-40°F to 167°F), Fanless • 65W TDP CPU : -40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.6 Specifications of ECX-3000-4R

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® X^e Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN
LAN 3	Intel® I226 2.5GigE LAN supports TSN
LAN 4	Intel® I226 2.5GigE LAN supports TSN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	• 35W TDP CPU : -40°C to 75°C (-40°F to 167°F), Fanless • 65W TDP CPU : -40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.7 Specifications of ECX-3000-4G

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 GPIO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN
LAN 3	Intel® I226 2.5GigE LAN supports TSN
LAN 4	Intel® I226 2.5GigE LAN supports TSN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	• 35W TDP CPU : -40°C to 75°C (-40°F to 167°F), Fanless • 65W TDP CPU : -40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.8 Specifications of ECX-3000-2R

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 GPIO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5” SSD/HDD Tray
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	• 35W TDP CPU : -40°C to 75°C (-40°F to 167°F), Fanless • 65W TDP CPU : -40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.9 Specifications of ECX-3000-2G

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 GPIO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	• 35W TDP CPU : -40°C to 75°C (-40°F to 167°F), Fanless • 65W TDP CPU : -40°C to 55°C (-40°F to 131°F), Fanless
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.10 Specifications of ECX-3071XR

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
10G Ethernet	
LAN 7	Intel® X710-AT2 10GigE LAN
LAN 8	Intel® X710-AT2 10GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	-25°C to 50°C (-13°F to 122°F), with Internal Fan
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 50°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.11 Specifications of ECX-3071X

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	• DDR4 3200MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485 (ESD 8KV)
USB	6 USB 3.2 (External)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
RTC Battery	Front-access RTC Battery
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/ Optional mSATA
M.2	• 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 independent displays : • 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz • 1 HDMI : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT
LAN 2	Intel® I226 2.5GigE LAN supports TSN

PoE	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226
10G Ethernet	
LAN 7	Intel® X710-AT2 10GigE LAN
LAN 8	Intel® X710-AT2 10GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	• 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260mm x 175mm x 79mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	• Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	-25°C to 50°C (-13°F to 122°F), with Internal Fan
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 50°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.4 Supported CPU List

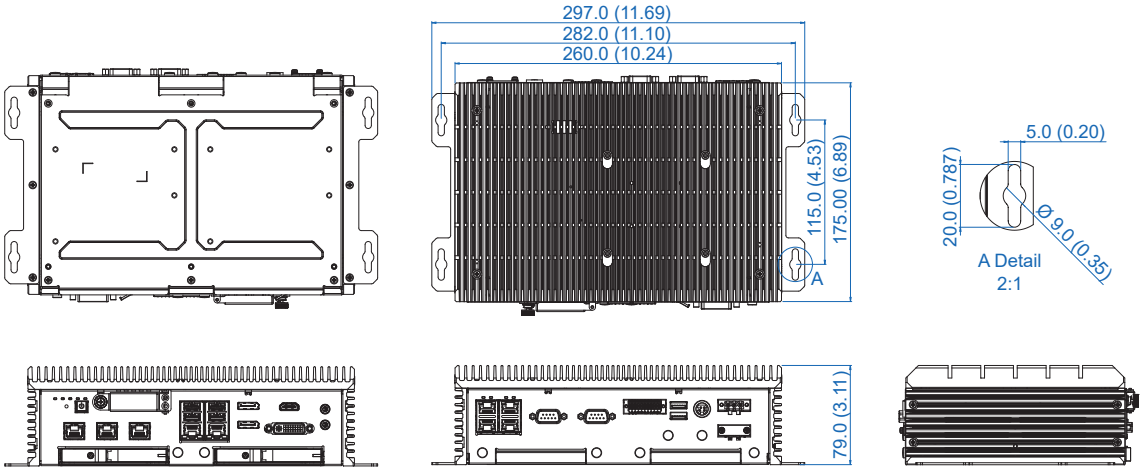
Series	CPU	Cores	GHz	TDP (W)	ECC
Intel® Core™ (14th Gen)*	i9-14900	24	5.8	65	Y
	i7-14700	20	5.4		
	i5-14500	14	5		
	i3-14100	4	4.7		
	i9-14900T	24	5.5	35	
	i7-14700T	20	5.2		
	i5-14500T	14	4.8		
	i3-14100T	4	4.4		
Intel® Core™ (13th Gen)	i9-13900E	24	5.2	65	
	i7-13700E	16	5.1		
	i5-13500E	14	4.6		
	i3-13100E	4	4.4		
	i9-13900TE	24	5	35	
	i7-13700TE	16	4.8		
	i5-13500TE	14	4.5		
	i3-13100TE	4	4.1		
Intel® Core™ (12th Gen)	i9-12900E	16	5	65	
	i7-12700E	12	4.8		
	i5-12500E	6	4.5		
	i3-12100E	4	4.2		
	i9-12900TE	16	4.8	35	
	i7-12700TE	12	4.7		
	i5-12500TE	6	4.3		
	i3-12100TE	4	4		

* 14th Gen support PC Client use condition only.

1.5 Mechanical Dimension

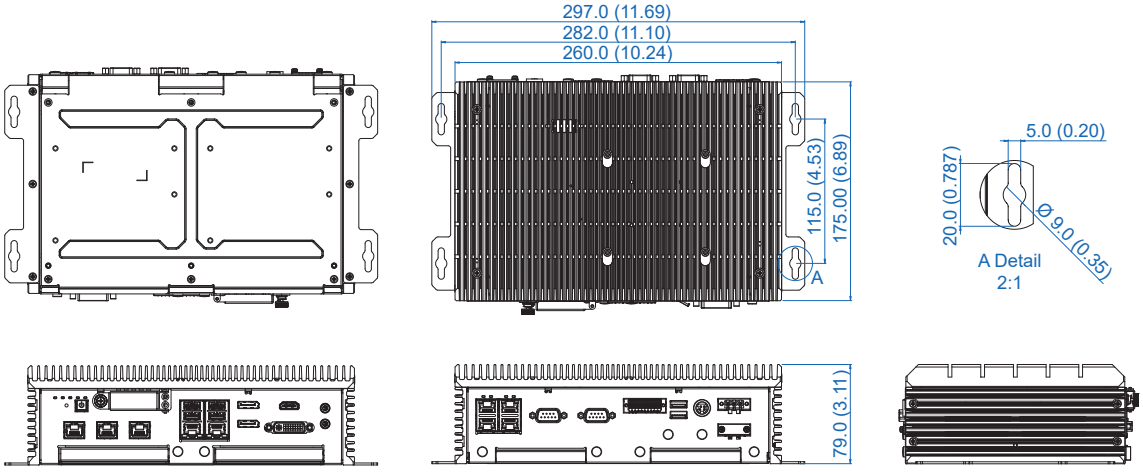
1.5.1 Dimensions of ECX-3025R

Unit : mm (inch)



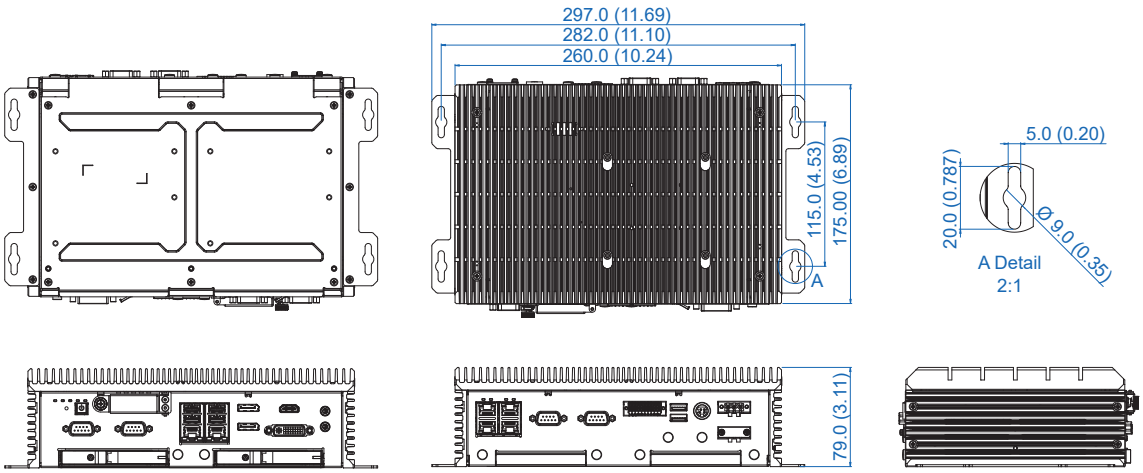
1.5.2 Dimensions of ECX-3025

Unit : mm (inch)



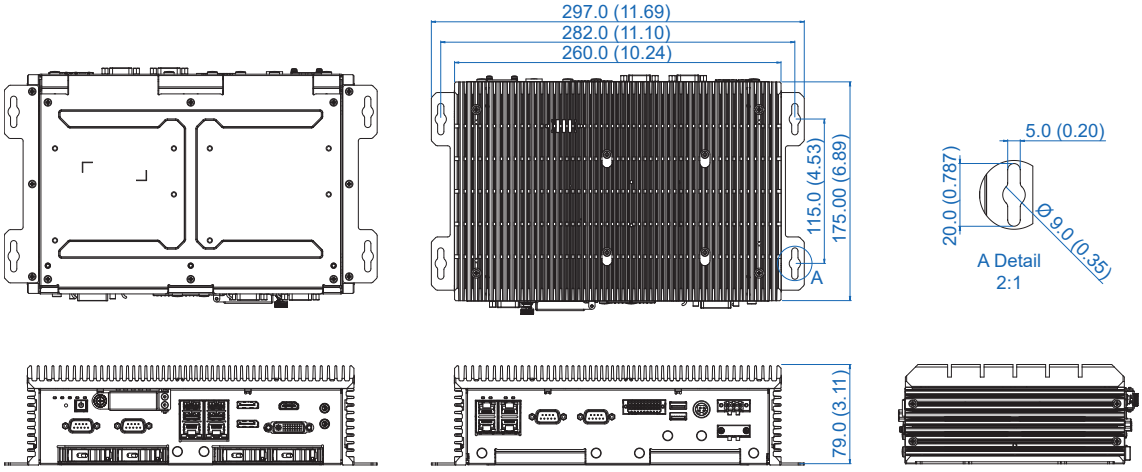
1.5.3 Dimensions of ECX-3000-PoER

Unit : mm (inch)



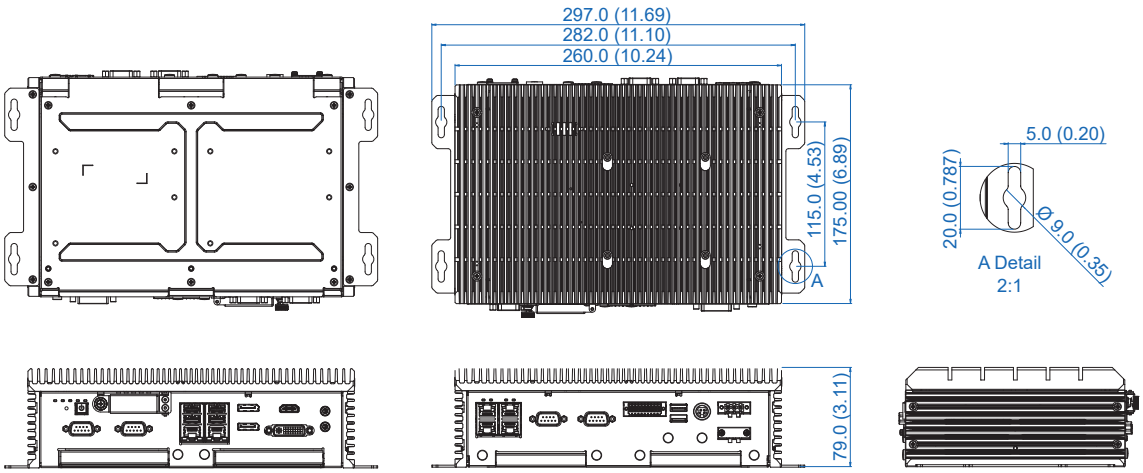
1.5.4 Dimensions of ECX-3000-PoES

Unit : mm (inch)



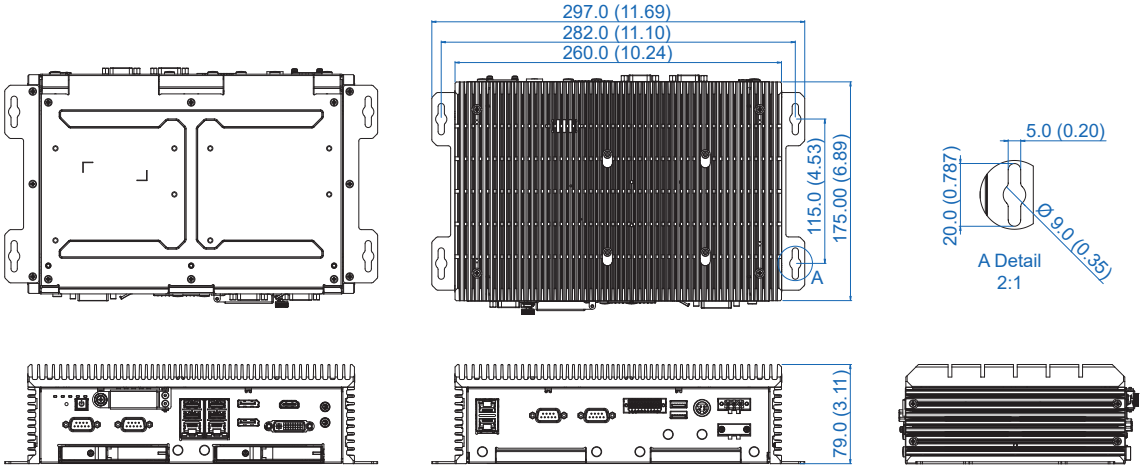
1.5.5 Dimensions of ECX-3000-PoE

Unit : mm (inch)



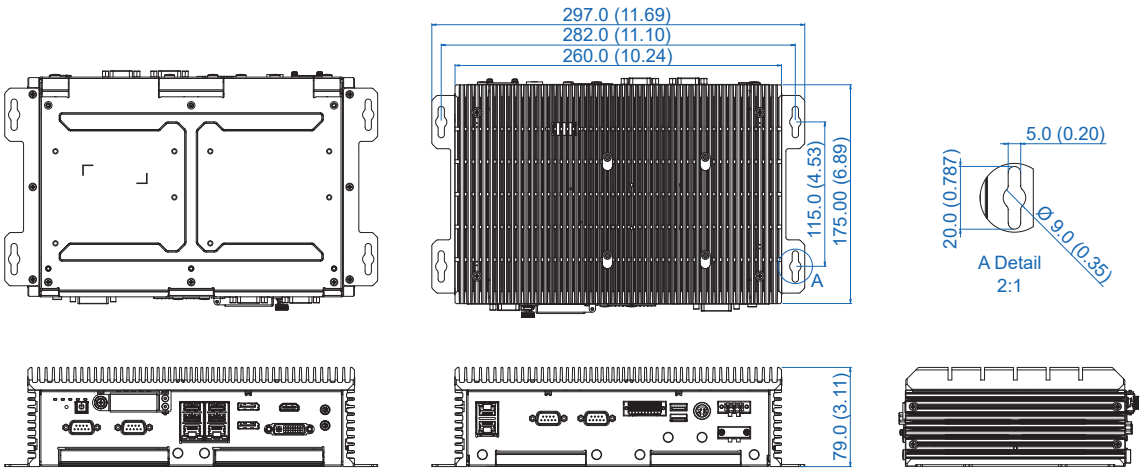
1.5.6 Dimensions of ECX-3000-4R

Unit : mm (inch)



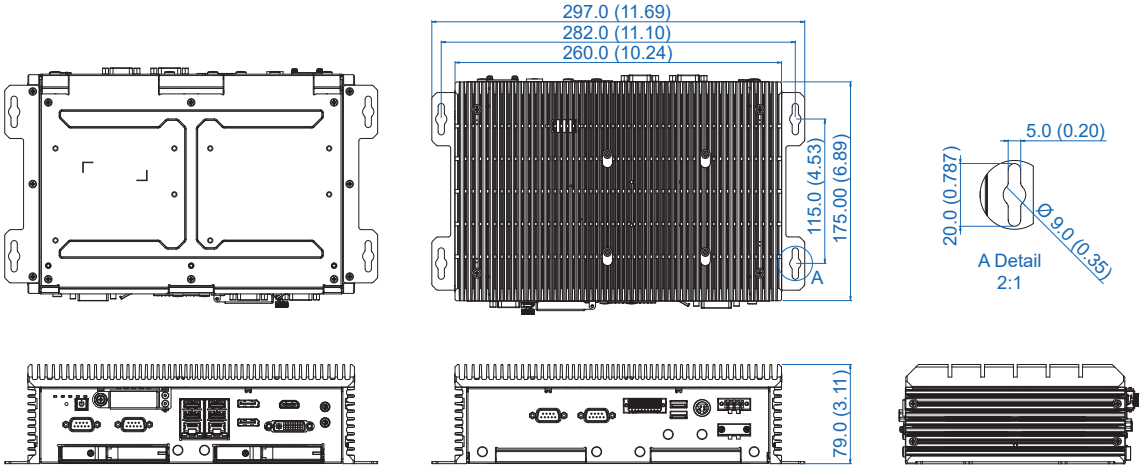
1.5.7 Dimensions of ECX-3000-4G

Unit : mm (inch)



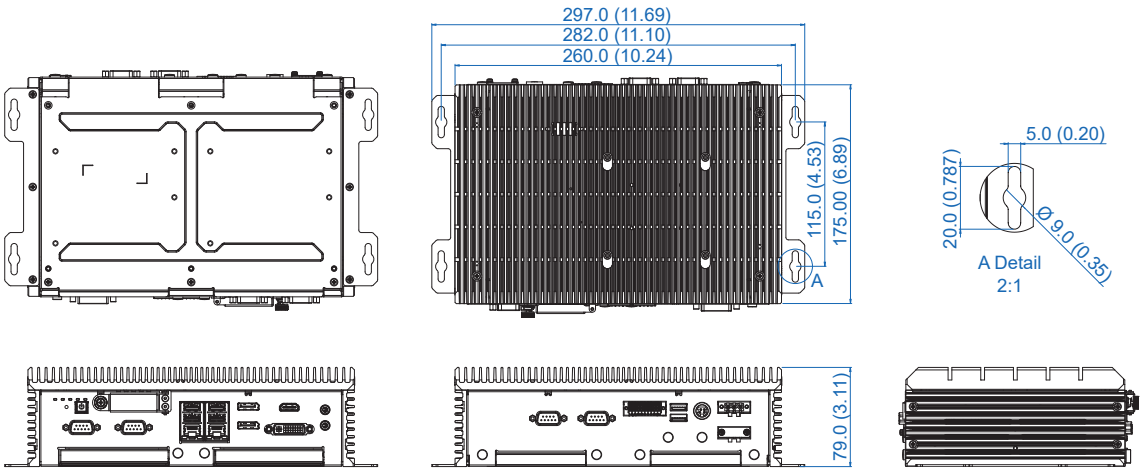
1.5.8 Dimensions of ECX-3000-2R

Unit : mm (inch)



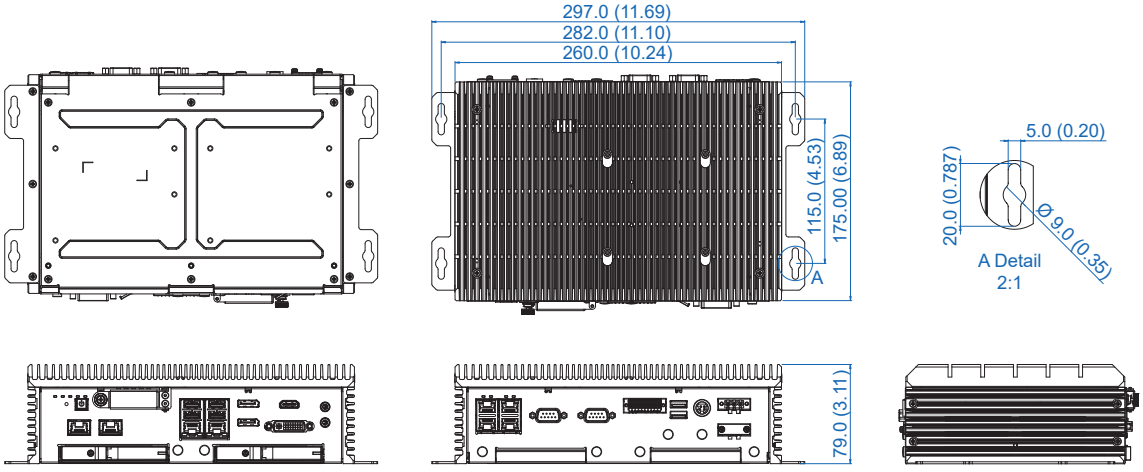
1.5.9 Dimensions of ECX-3000-2G

Unit : mm (inch)



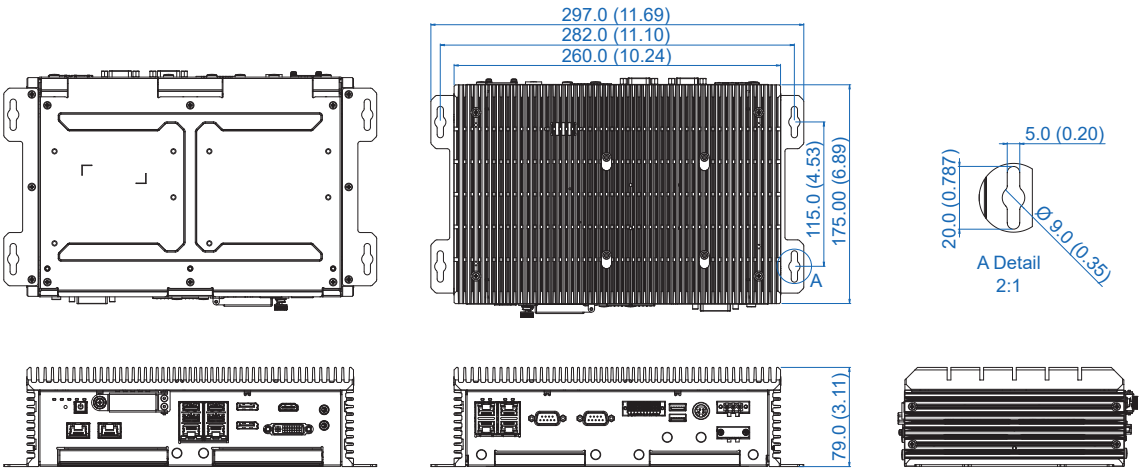
1.5.10 Dimensions of ECX-3071XR

Unit : mm (inch)



1.5.11 Dimensions of ECX-3071X

Unit : mm (inch)



2

GETTING TO KNOW YOUR ECX-3000

2.1 Packing List

2.1.1 ECX-3000-PoE/PoES/4G/2G/3025/3071X Packing List

Item	Description	Qty
1	ECX-3000 Fanless Embedded System (According to the configuration of you order, the ECX-3000 series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1
2	ECX-3000-PoE/PoES/4G/2G/3025/3071X accessory box	1

Item	Description	Outlook	Usage	P/N	Qty
1	PHILLPIS M2.5x6L,Ni		Mini PCIe module card	53-M009310-000	1
2	M3_I Head_ Phillips_L=4.0 mm_Ni _ Nylok		M.2 module card	53-M006400-010	2
3	M2x2L Ni		M.2 module card	53-M004600-000	1
4	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	6
5	M3_Flat head_Phillips _ L=4.0 mm _ Ni_Nylok		SSD/HDD	53-M006350-010	8
6	Terminal block 3-pin (5.0mm)		DC-IN/Switch	51-2411R03-S1B	2
7	Terminal block 20-pin (2.54mm)		Isolated DIO/ GPIO	51-2112R20-S1D	1
8	Bracket_Wall Mount		Wall Mount	62-03P0527-000	2

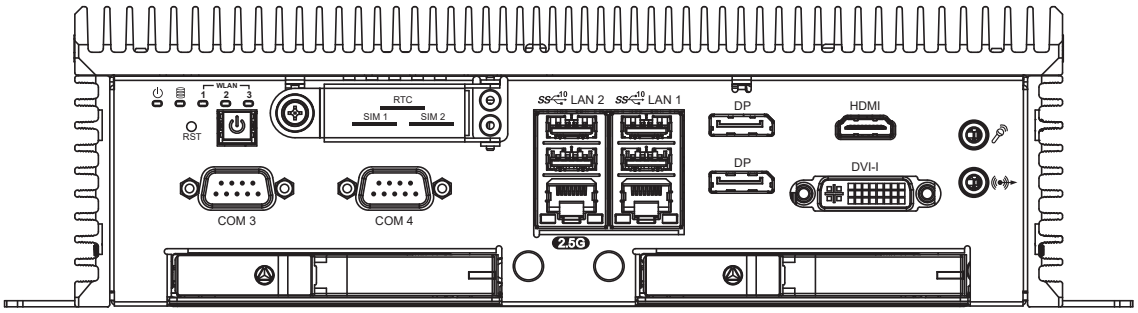
2.1.2 ECX-3000-PoER/4R/2R/3025R/3071XR Packing List

Item	Description	Qty
1	ECX-3000 Fanless Embedded System (According to the configuration of you order, the ECX-3000 series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1
2	ECX-3000-PoER/4R/2R/3025R/3071XR accessory box, which contains • SSD/HDD Tray Key	2

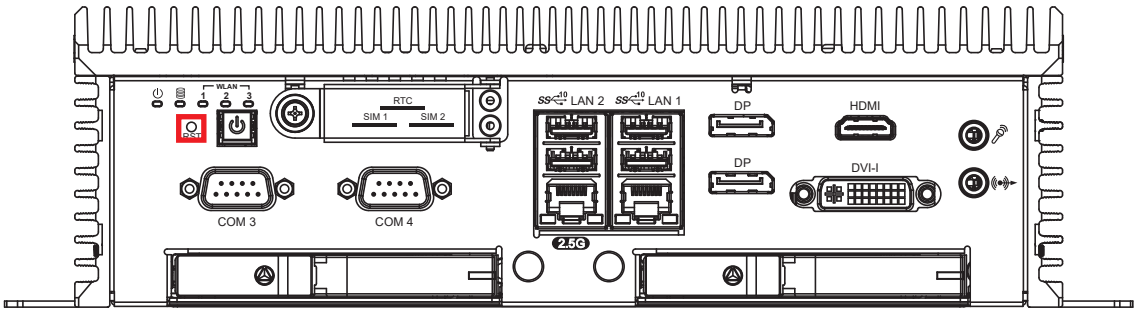
Item	Description	Outlook	Usage	P/N	Qty
1	PHILLPIS M2.5x6L,Ni		Mini PCIe module card	53-M009310-000	1
2	M3_I Head_ Phillips_L=4.0 mm_Ni _ Nylok		M.2 module card	53-M006400-010	2
3	M2x2L Ni		M.2 module card	53-M004600-000	1
4	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	6
			SSD/HDD		8
5	Terminal block 3-pin (5.0mm)		DC-IN/Switch	51-2411R03-S1B	2
6	Terminal block 20-pin (2.54mm)		Isolated DIO/ GPIO	51-2112R20-S1D	1
7	Bracket_Wall Mount		Wall Mount	62-03P0527-000	2

2.2 Front Panel I/O Functions

In Vecow ECX-3000 series family, all I/O connectors are located on front panel and rear panel. Most of the general connections to computer device, such as USB, LAN Jack, HDMI, DVI-I, Display Port and any additional storage, are placed on the front panel.

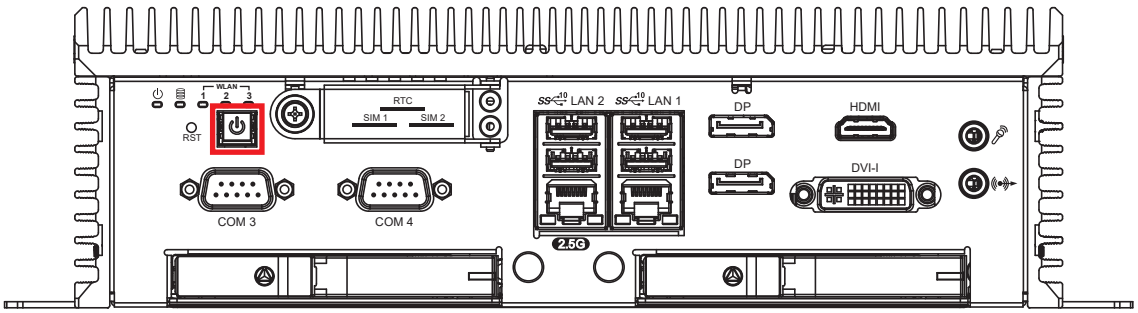


2.2.1 Reset Tact Switch



It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

2.2.2 Power Button



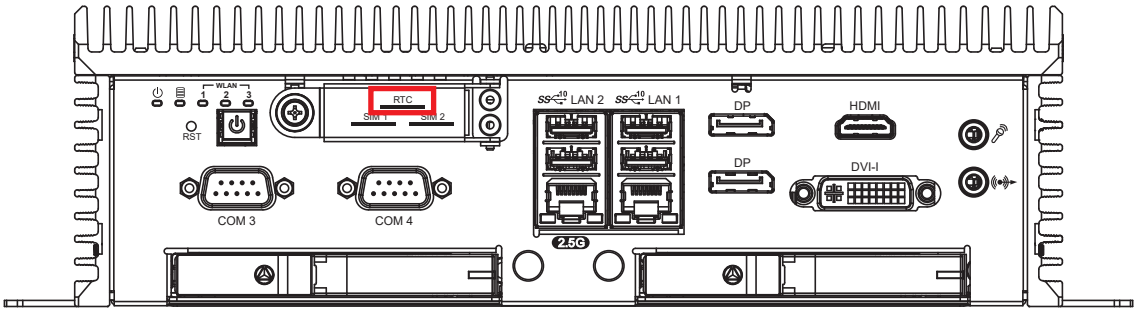
The Power Button is a non-latched switch with dual color LED indication. It indicates power status: S0, S3 and S5. More detail LED indications are listed as follows:

LED Color	Indication	System Status
Solid Blue	S0	System working
Solid Orange	S3, S5	Suspend to RAM, System off with standby power

To power on the system, press the power button and then the blue LED is lightened.To power off the system, you can either command shutdown by OS operation, or just simply press the power button.

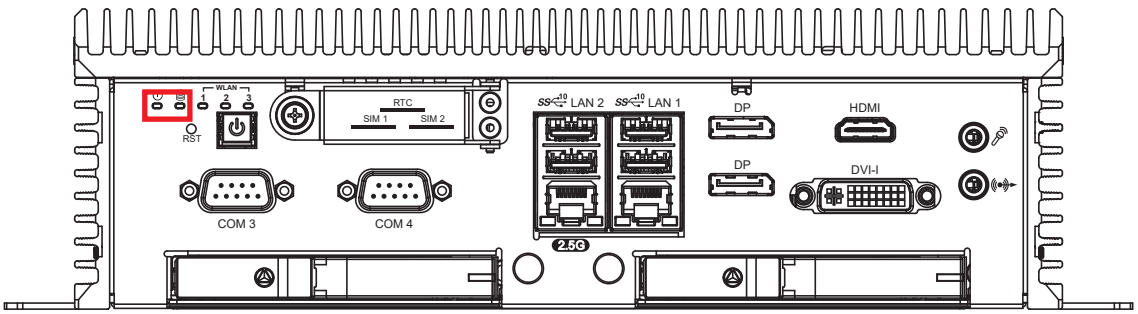
If system error, you can just press the power button for 4 seconds to shut down the machine directly.Please do note that a 4-second interval between each 2 power-on/ power-off operation is necessary in normal working status. (For example, once turning off the system, you have to wait for 4 seconds to initiate another power-on operation).

2.2.3 RTC Battery



The system's real-time clock is powered by a lithium battery. It is Equipped with Panasonic CR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

2.2.4 PWR & HDD LED Indicator

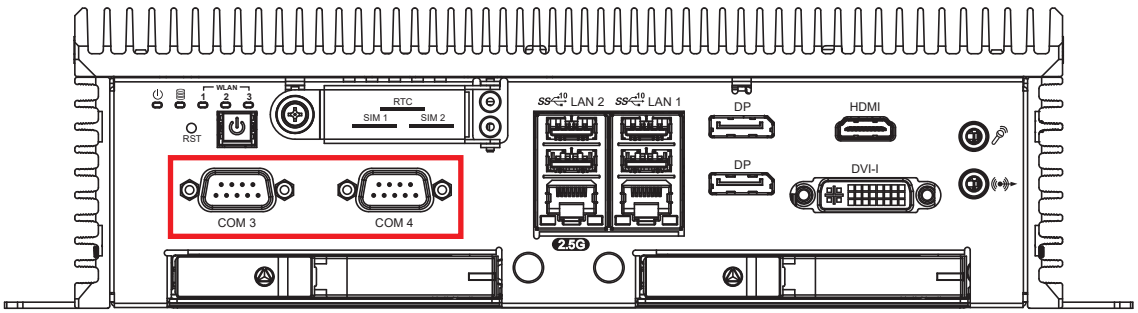


HDD LED/ Yellow : A Hard Disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

Power LED/ Green: If the LED is solid green, it indicates that the system is powered on.

LED Color	Power Status	System Status
Yellow	HDD	• On/Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/off)

2.2.5 Serial Port

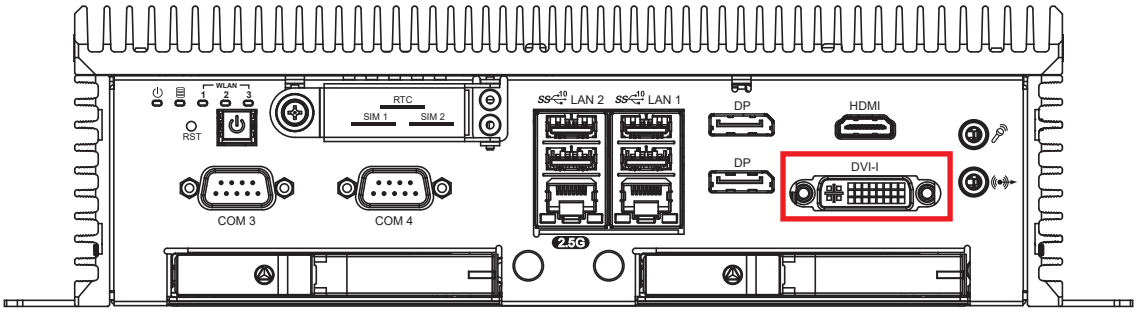


Serial port 3 to 4 (COM 3 to 4) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 3 and COM 4 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

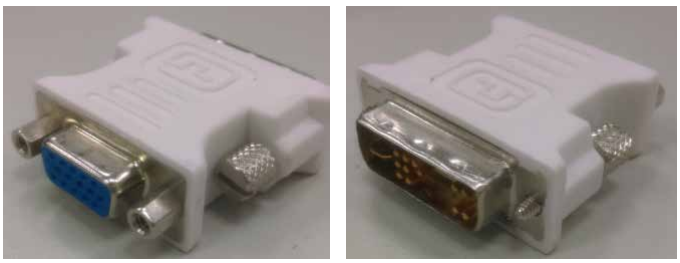
BIOS Setting	Function
COM 3 COM 4	RS-232
	RS-422 (5-wire)
	RS-485
	RS-485 w/z auto-flow control

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-485 (3-wire)
3 to 4	1	DCD	TXD-	DATA-
	2	RXD	TXD+	DATA+
	3	TXD	RXD+	----------
	4	DTR	RXD-	----------
	5	GND	GND	GND
	6	DSR	----------	----------
	7	RTS	----------	----------
	8	CTS	----------	----------
	9	RI	----------	----------

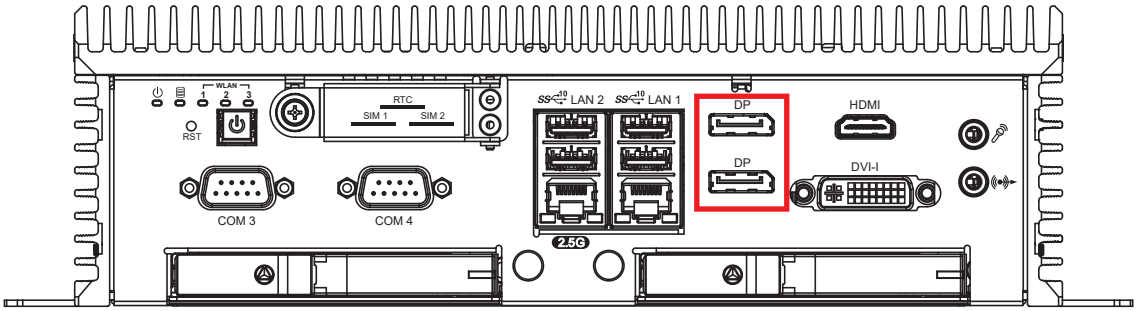
2.2.6 DVI-I Connector



- The DVI-I connector on the front panel supports both DVI and VGA display modes.
- This connector can output DVI signals. The DVI output mode supports up to 1920x1200 resolution.
- The DVI mode is automatically selected according to the display device connected.
- You will need a DVI-I cable when connecting to a display device.
- The VGA output mode supports up to 1920x1200 resolution.
- If use VGA function will need a DVII to VGA module connecting to DVI-I device.
- Below is the DVII to VGA module picture

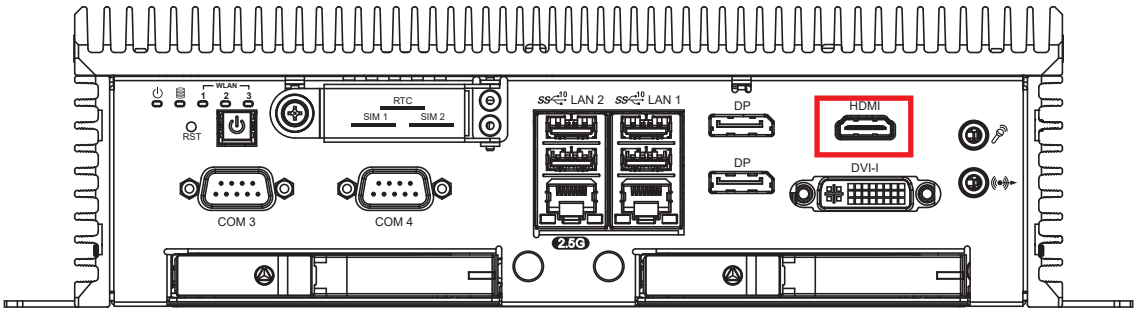


2.2.7 DisplayPort



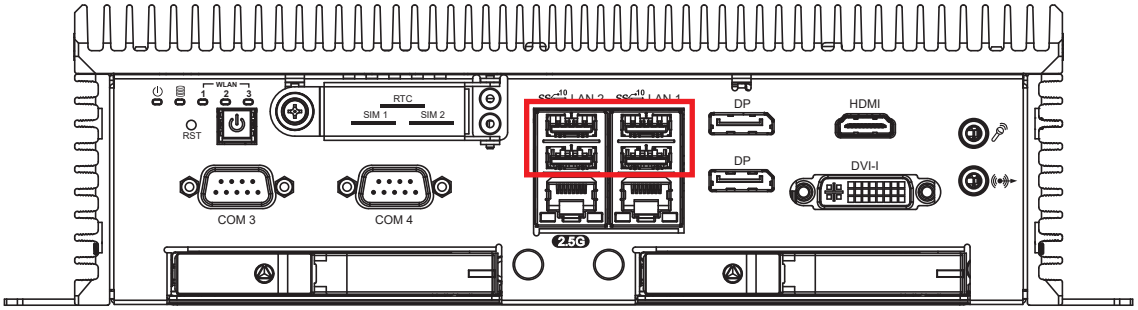
Onboard Display Port support auxiliary channel dual mode, connection supports up to 7680x4320 resolution at 60 Hz.

2.2.8 HDMI Connector



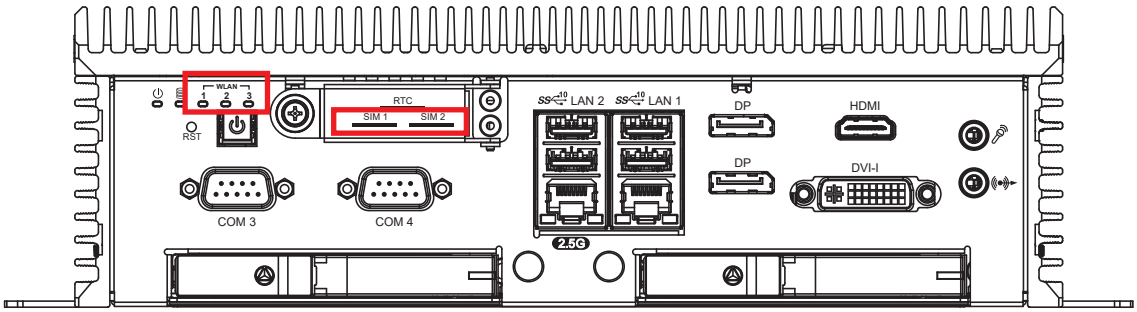
Onboard HDMI Port supports DDC channel mode. The connection supports up to 3840 x 2160 resolution at 30Hz/ 1920 x 1080 resolution at 60Hz.

2.2.9 USB 3.0



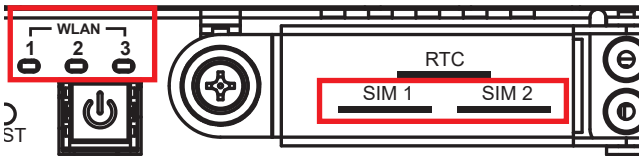
There are 4 USB 3.0 connections available supporting up to 10GB per second data rate in the front side of ECX-3000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

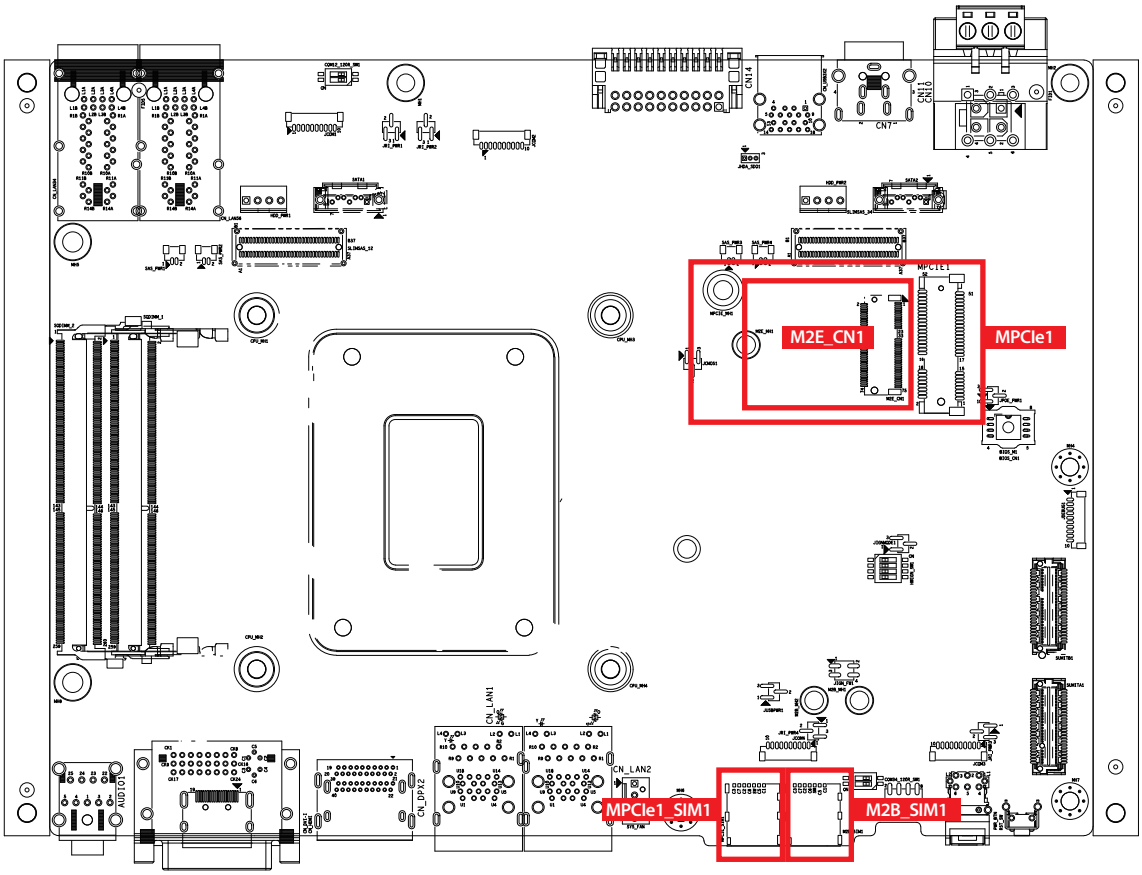
2.2.10 WLAN LED, Mini PCIe, M.2 KEY B, M.2 KEY E, Nano SIM Card Comparison

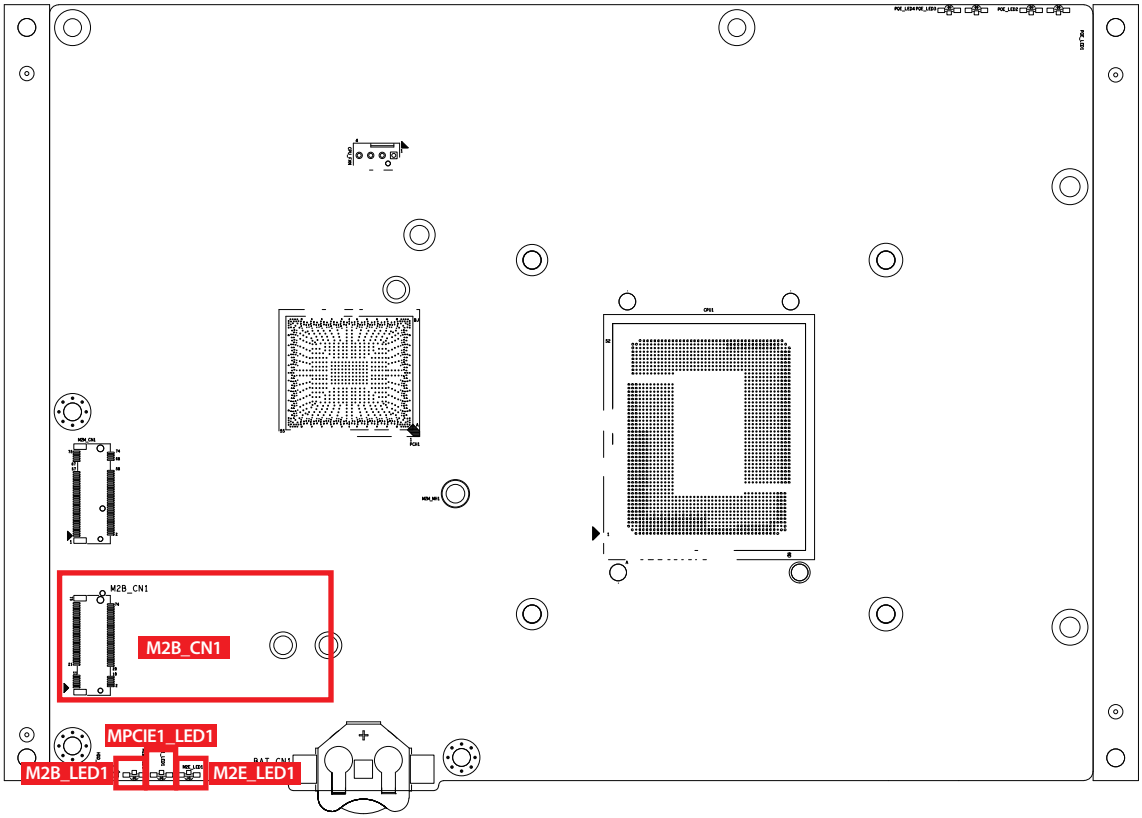


Mini PCIe Slot/M.2 KEY B/M.2 KEY E/ Nano SIM Slot/ WLAN LED Mapping Table :

Mini PCIe	SIM	LED
MPCIe1	SIM2	2
M.2 KEY B	SIM1	1
M.2 KEY E	X	3

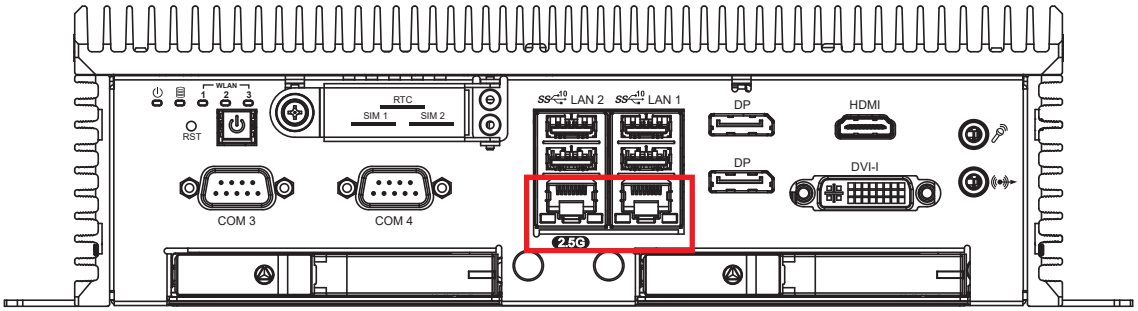






Note :
The SIM card sockets do not support hot-plug. Please make sure to unplug the system power before inserting the SIM card(s).

2.2.11 Ethernet Port



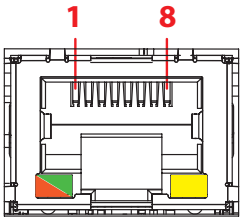
There are two 8-pin RJ-45 jacks supporting 10/100/1000/2500 Mbps Ethernet connections on the front side of ECX-3000. LAN 1 is powered by Intel® I219LM Ethernet engine, and LAN 2 is powered by Intel I226 Ethernet engine. When LAN 1 works in normal status, iAMT 11.0 function is enabled.

LAN Chip	Function	Connector
I219_LAN1	RJ-45(10/100/1000)	LAN1
I226_LAN2	RJ-45(10/100/1000/2500)	LAN2

Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows:

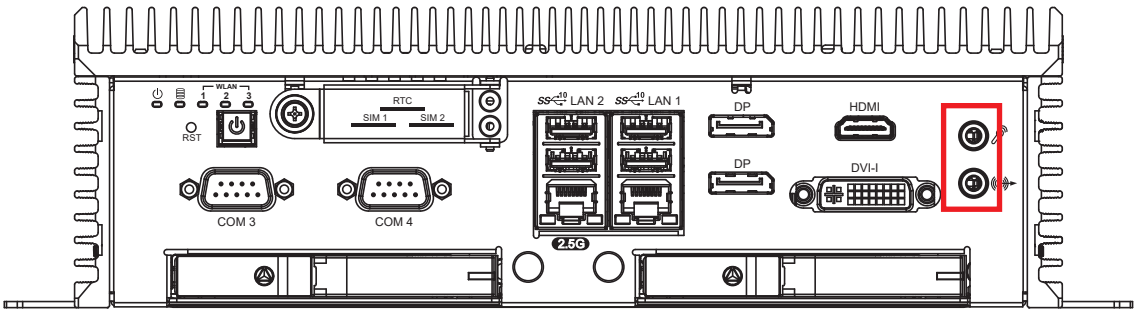
Pin Number	10/100 Mbps	1000/2500Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	------	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/ Link/ Speed status of the connection.



LAN	LED Location	LED Color	10 Mbps	100 Mbps	1000 Mbps	2500 Mbps
CN_LAN1	Left	Green/ Orange	Off	Solid Orange	Solid Green	x
	Right	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow	x
CN_LAN2	Left	Green/ Orange	Off	Off	Solid Orange	Solid Green
	Right	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow

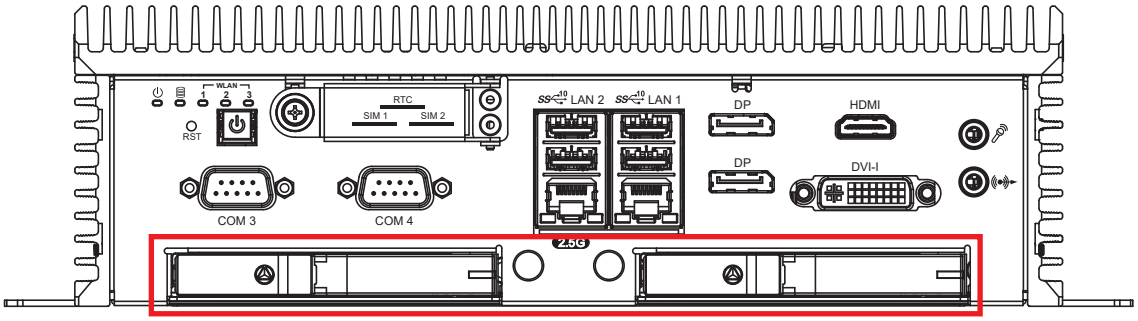
2.2.12 Audio Connector



There are 2 audio connectors, Mic-in and Line-out, in the front side of ECX-3000. Onboard Realtek ALC888 audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.

To utilize the audio function in Windows platform, you need to install corresponding drivers for both Intel Sunrise Point chipset and Realtek ALC888 codec.

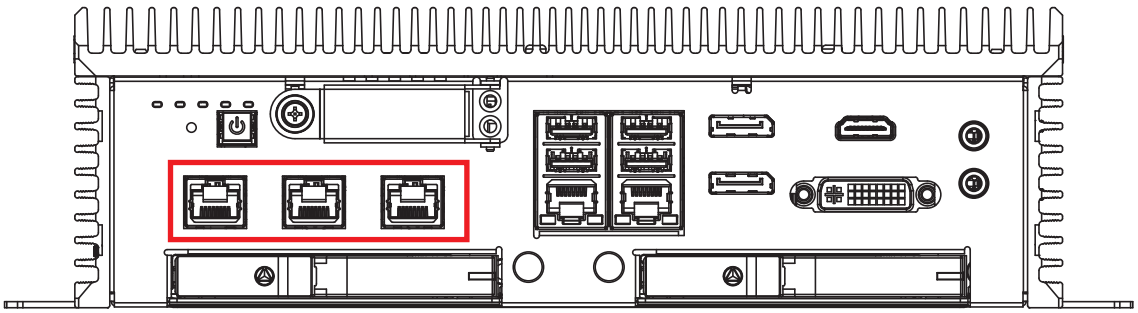
2.2.13 SSD/HDD Tray



There are 2 front-access 2.5” SSD/HDD trays in the front side of ECX-3000. Just trigger to open the SSD/HDD tray, up to 4TB is available.

2.2.14 Expansion Ethernet

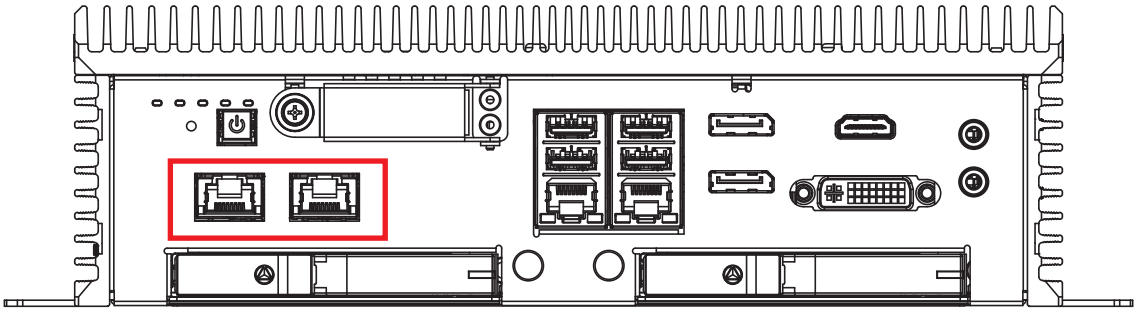
2.2.14.1 2.5G Ethernet Port (3025/3025R)



There are 3 expansion 8-pin RJ-45 jacks supporting 100/ 1000/2500 Mbps Ethernet connections in the front side. LAN 7,8,9 are powered by Intel I225.

- IEEE 802.3ab Gigabit Ethernet standard compliant
- IEEE 1588 Precision Time Protocol (PTP)
- Up to 9.7KB Jumbo Frame
- Triple independent GigE LAN Connection
- Supports Wake-on-LAN (WoL) & PXE

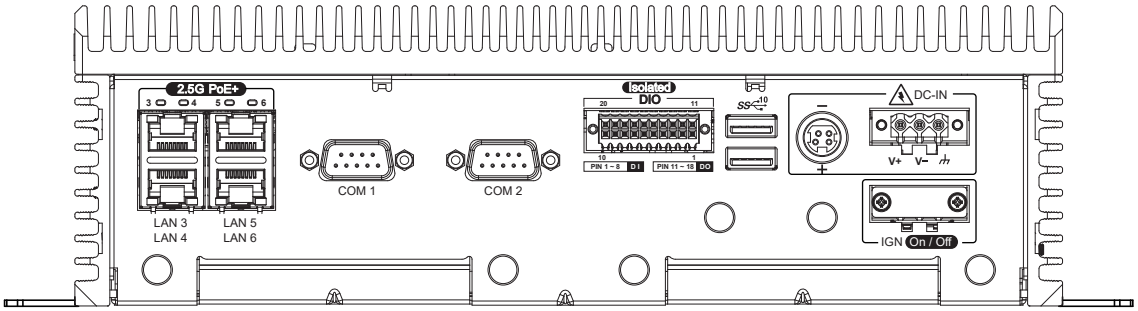
2.2.14.2 10G Ethernet Port (3071X/3071XR)



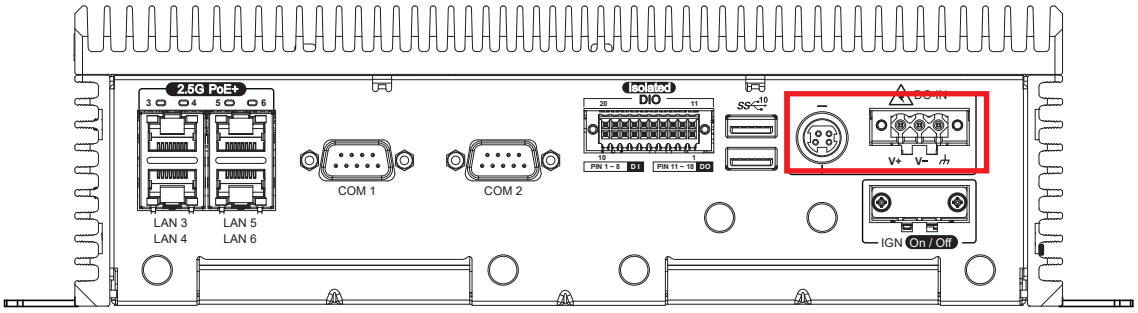
There are 2 expansion 10G ethernet LAN in the front side. These are powered by Intel X550-AT2

- Intel® X550-AT2 10GBASE-T controller supports up to 10Gbps data rate
- IEEE 802.3an Fast Ethernet standard compliant
- IEEE 1588 Precision Time Protocol (PTP)
- Up to 9728 bytes Jumbo Frame, Link Aggregation
- Supports Wake-on-LAN (WoL) & PXE
- Intel® Ethernet Power Management
- Intel® Data Direct I/O Technology
- Intel® Virtualization Technology for Connectivity (VT-c)

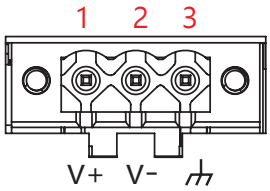
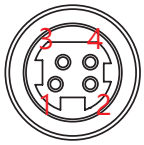
2.3 Rear Panel I/O & Functions



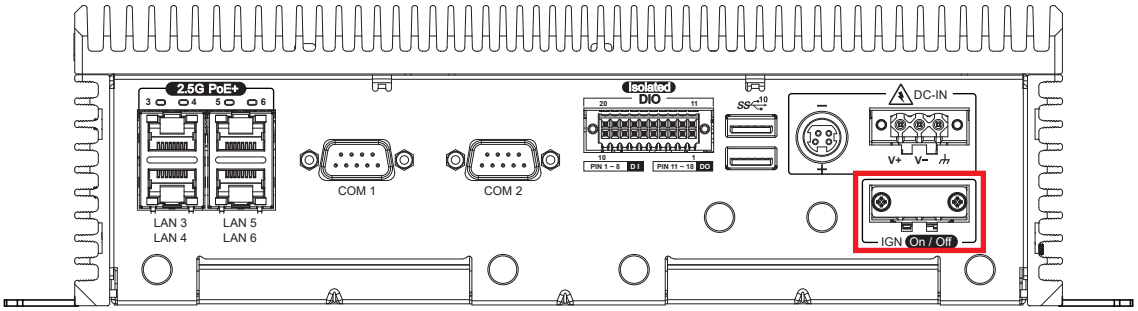
2.3.1 Power Input



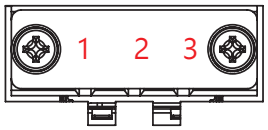
This system supports 9V to 50V DC power input by terminal block in the rear side. In normal power operation, power LED lightens in solid green.

	Pin	Definition
	1	V+
	2	V-
	3	Chassis Ground
	1	V+
	2	
	3	V-
	4	

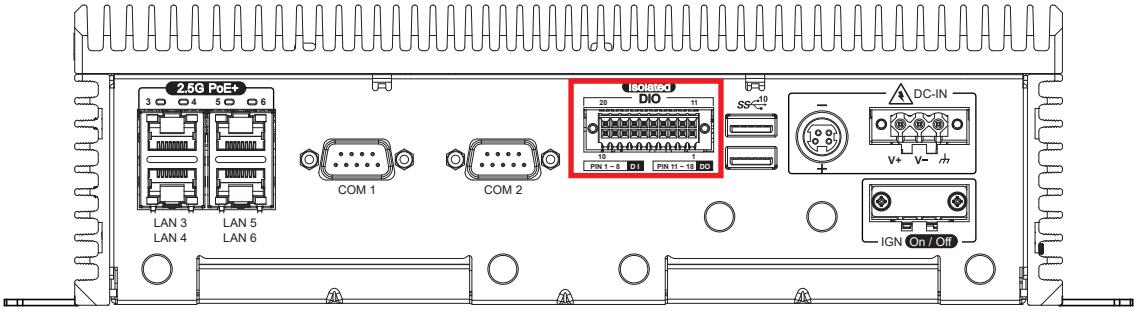
2.3.2 Remote Power On/Off Switch & IGN ITION Terminal Block



It is a 2-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function of soft power-on/ power-off (instant off or delay 4 second), and suspend mode.

	Pin	Definition
 IGN Off / On	1	Ignition
	2	SW+
	3	SW-

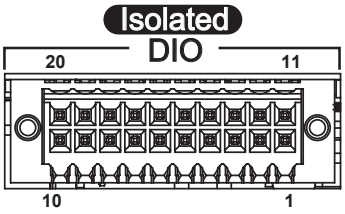
2.3.3.1 Isolated DIO



There is a 16-bit (8-bit DI, 8-bit DO) connectors in the rear side. DI/DIO support NPN(sink) and PNP(Source) mode, Each DI channel is equipped with a photocouper for isolated protection.

Each DO with isolator chip, Config by a Jumper for each DIO connector.
DO Safety-Related Certifications:

- 4242-VPK Basic Isolation per DIN V VDE V 0884-10 and DIN EN 61010-1
- 3-KVRMS Isolation for 1 minute per UL 1577
- CSA Component Acceptance Notice 5A, IEC 60950-1 and IEC 61010-1 End Equipment Standards
- GB4943.1-2011 CQC Certified

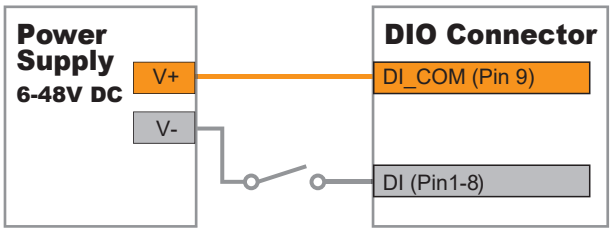


DIO Connectors pin out :

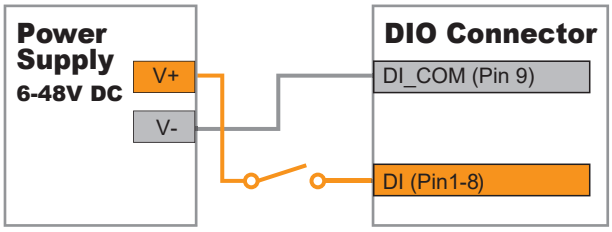
DIO	Pin No.	Definition	Function
DIO	1	INPUT 0	SIO_GPI80
	2	INPUT 1	SIO_GPI81
	3	INPUT 2	SIO_GPI82
	4	INPUT 3	SIO_GPI83
	5	INPUT 4	SIO_GPI84
	6	INPUT 5	SIO_GPI85
	7	INPUT 6	SIO_GPI86
	8	INPUT 7	SIO_GPI87
	9	DI_COM	----------
	10	DIO_GND	----------
	11	OUTPUT 0	SIO_GPO70
	12	OUTPUT 1	SIO_GPO71
	13	OUTPUT 2	SIO_GPO72
	14	OUTPUT 3	SIO_GPO73
	15	OUTPUT 4	SIO_GPO74
	16	OUTPUT 5	SIO_GPO75
	17	OUTPUT 6	SIO_GPO76
	18	OUTPUT 7	SIO_GPO77
	19	DIO_GND	----------
	20	External 6-40VDC (NPN) External 6-48VDC (PNP)	----------

DI reference circuit :

Sink Mode (NPN)

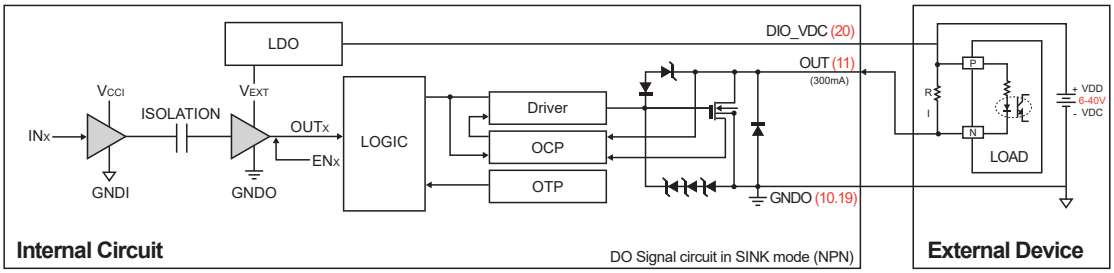


Source Mode (PNP)

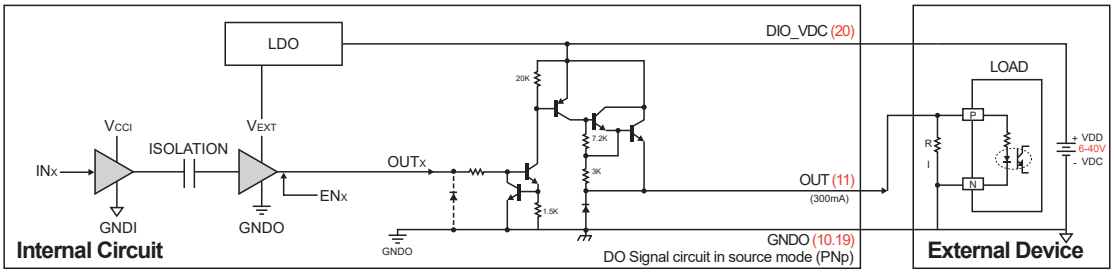


DO reference circuit :

Sink Mode (NPN, Default)



Source (PNP)



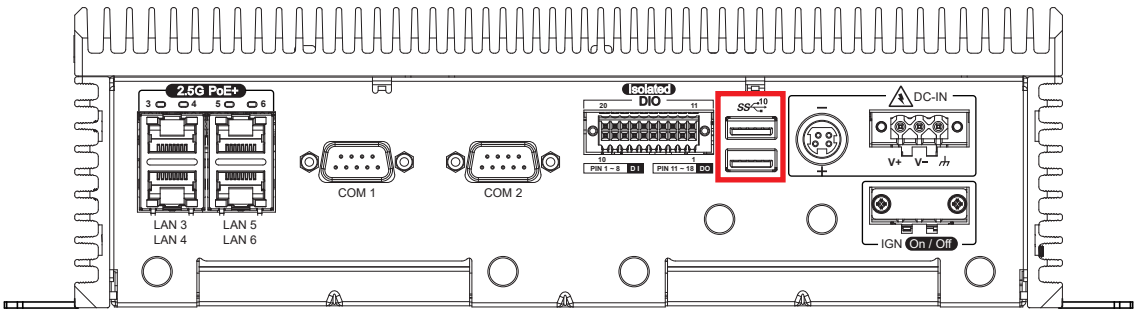
2.3.3.2 GPIO

The system offers sixteen programmable I/O. (3.3V Level)
If the GPIO is logic high, it indicates that the mapping SIO GPIO pin is logic high level.
If the GPIO is logic low, it indicates that the mapping SIO GPIO pin is logic low level.

GPIO Connectors pin assignments

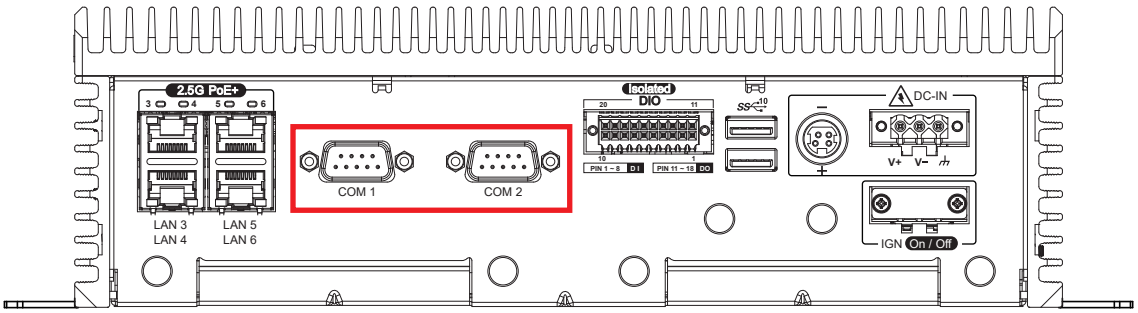
Pin No.	Mapping to SIO GPIO Function	Pin No.	Mapping to SIO GPIO Function
1	SIO_GPI80	11	SIO_GPO70
2	SIO_GPI81	12	SIO_GPO71
3	SIO_GPI82	13	SIO_GPO72
4	SIO_GPI83	14	SIO_GPO73
5	SIO_GPI84	15	SIO_GPO74
6	SIO_GPI85	16	SIO_GPO75
7	SIO_GPI86	17	SIO_GPO76
8	SIO_GPI87	18	SIO_GPO77
9	----------	19	GND
10	GND	20	----------

2.3.4 USB Port



There are 2 USB 3.0 connections available supporting up to 10GB per second data rate in the rear side of ECX-3000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.3.5 Serial Port



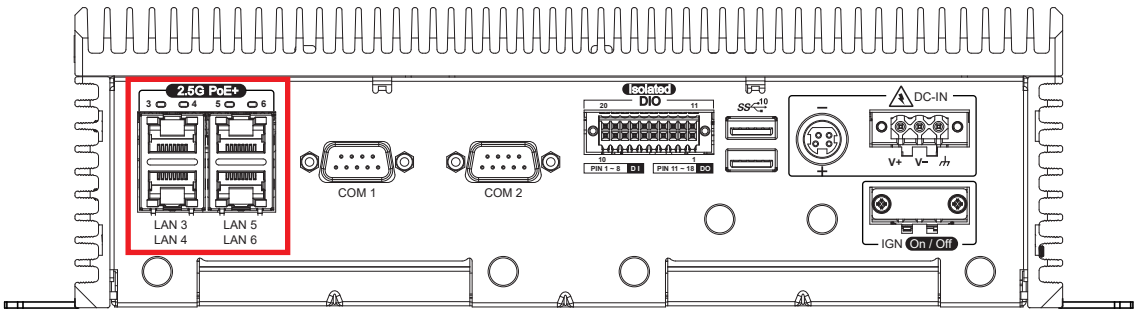
Serial port 1 to 2 (COM 1 to 2) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 and COM 2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

BIOS Setting	Function
COM 1 COM 2	RS-232
	RS-422 (5-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the following table :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-485 (3-wire)
1 to 2	1	DCD	TXD-	DATA-
	2	RXD	TXD+	DATA+
	3	TXD	RXD+	----------
	4	DTR	RXD-	----------
	5	GND	GND	GND
	6	DSR	----------	----------
	7	RTS	----------	----------
	8	CTS	----------	----------
	9	RI	----------	----------

2.3.6 PoE Ports

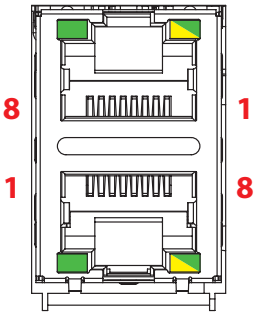


There are 4 RJ45 connectors in the rear side of ECX-3000. It supports IEEE 802.3at (PoE+) Power over Ethernet (PoE) connection delivering up to 37W/54V per port and 1000BASE-T gigabit data signals over standard Ethernet Cat 5/Cat 6 cable.
Each PoE connection is powered by Intel® I226 2.5Gigabit Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization. Only when PoE port starts to supply power to power devices, the dedicated LED will be lightened.
PS. Suggest to use PoE function when power input is over 24V.
The pin-outs of LAN 3 and LAN 6 are listed as follows :

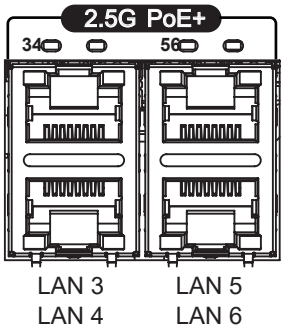
Pin No.	10/100 Mbps	1000/2500 Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	------	MDI3_N

Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.
The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000/2500 Mbps Ethernet network; The left LED will keep twinkling/ off when Ethernet data packets are being transmitted/ received.

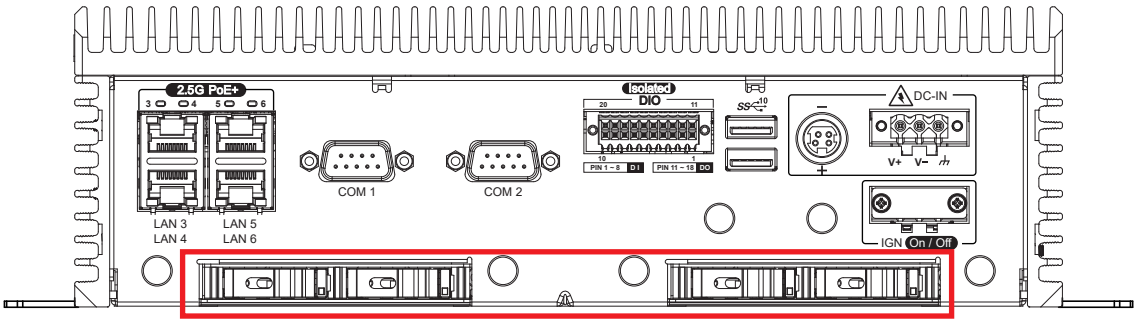
LED Location	LED Color	10/100M Mbps	1000 Mbps	2.5 Gbps
Right	Green/ Yellow	Off	Solid Yellow	Solid Green
Left	Green	Twinkling Green	Twinkling Green	Twinkling Green



POE Power output LED	Color	LAN Chip	LAN Port
3	Solid Green	LAN3-I226	LAN3
4	Solid Green	LAN4-I226	LAN4
5	Solid Green	LAN5-I226	LAN5
6	Solid Green	LAN6-I225	LAN6



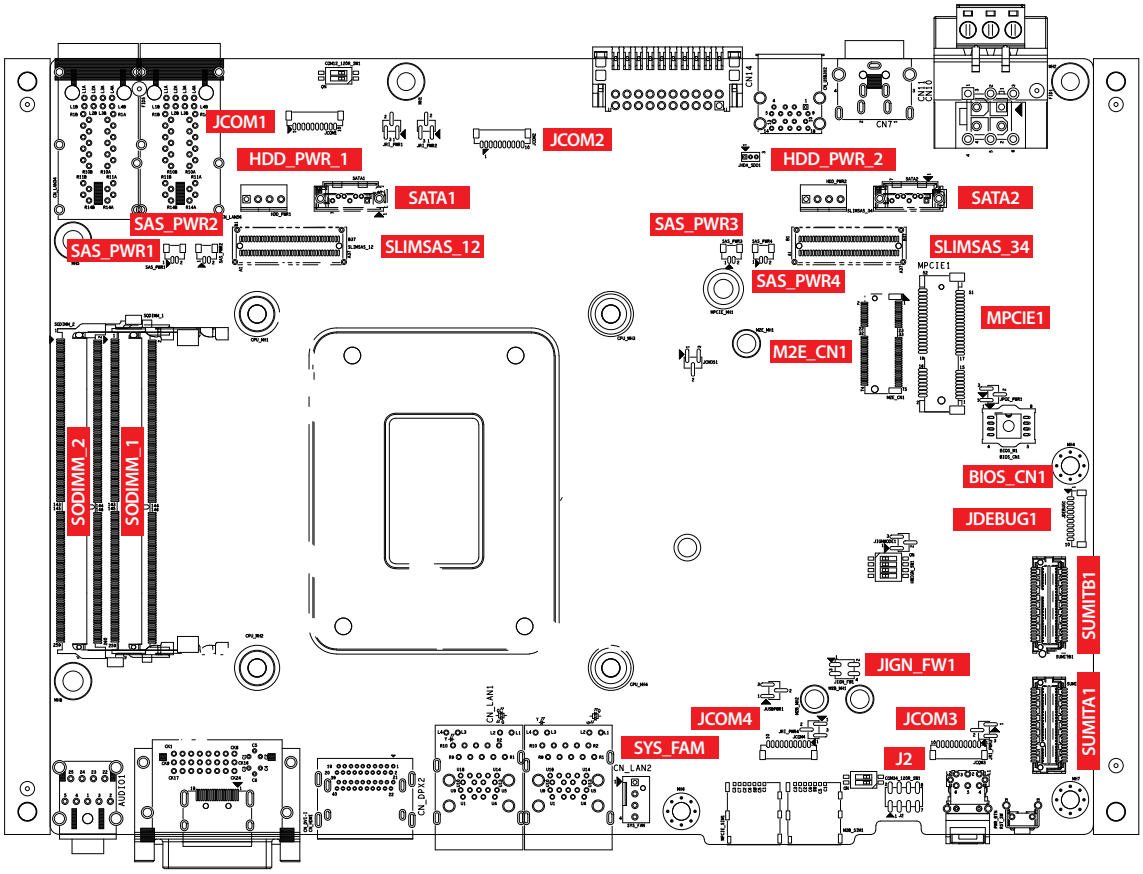
2.3.7 M.2 Key M SSD Tray



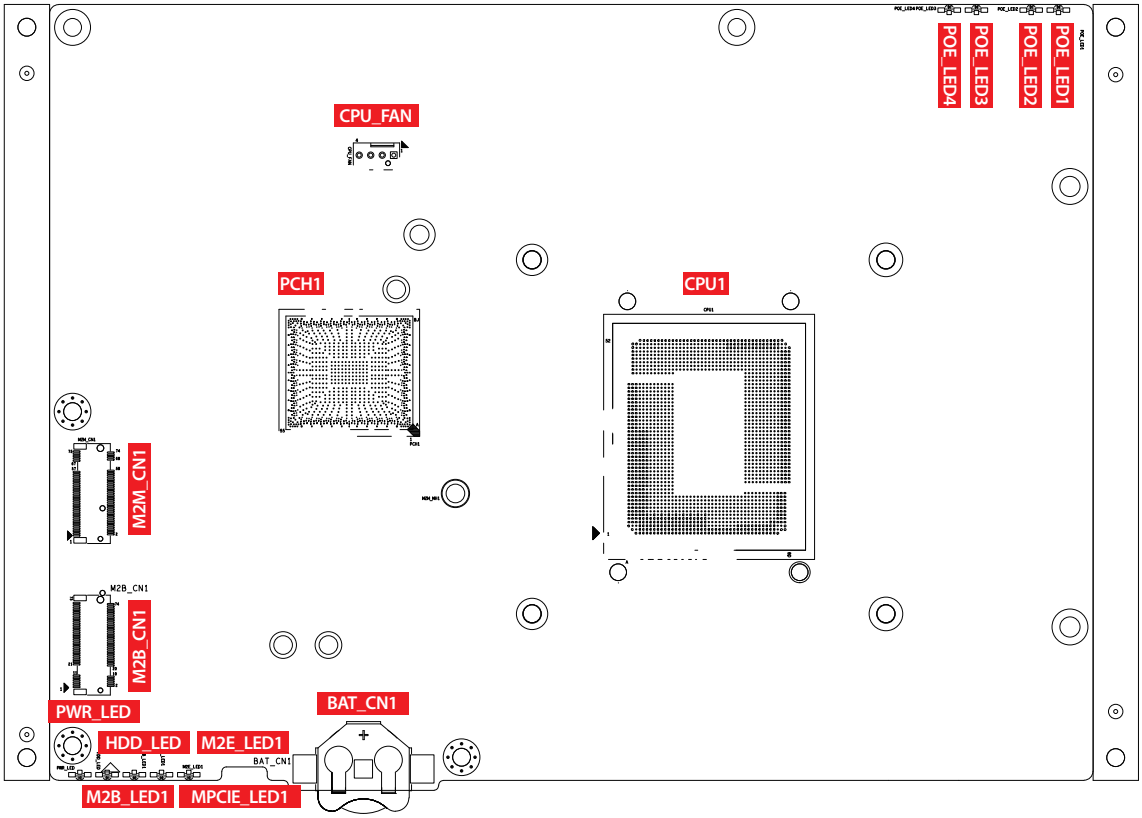
4 Front-access M.2 Key M SSD Tray.(only Support PCIE)

2.4 Main Board Expansion Connectors

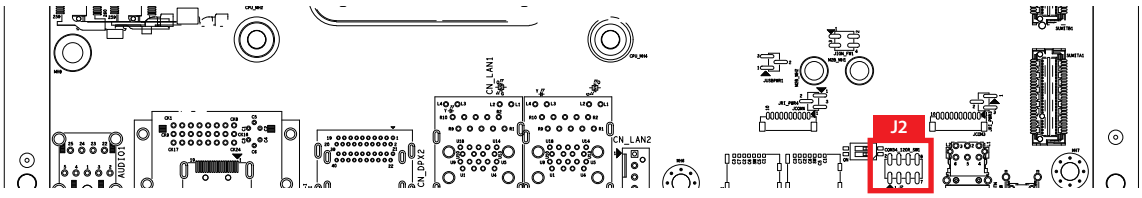
2.4.1 Top View (Component Side) of ECX-3000 Main Board With Connector Location



2.4.2 BOTTOM View of ECX-3000 Main Board with Connector Location

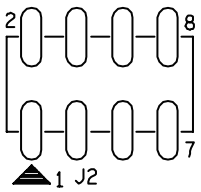


2.4.3 J2: Miscellaneous Pin Header



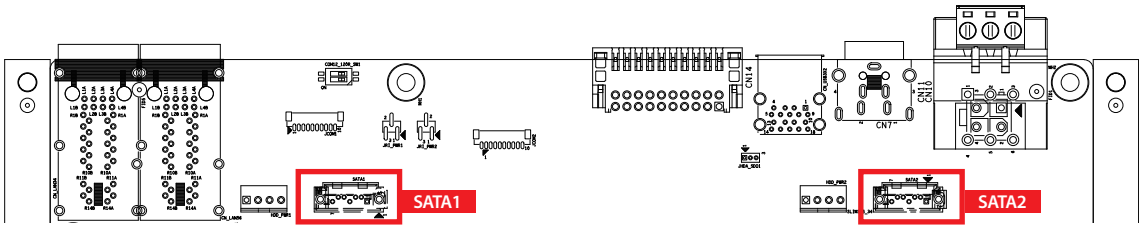
2.0mm 2x4p header

This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already can be accessed by front panel and top panel. The pin-outs of Miscellaneous port are listed in following table:

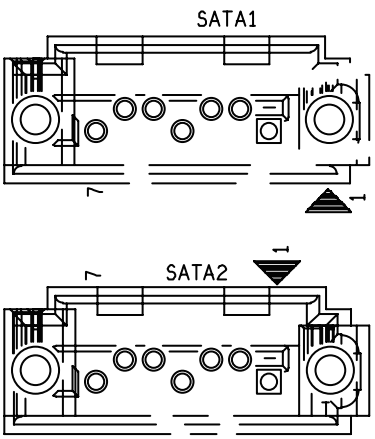


Group	Pin No.	Description
HDD LED	1	HDD_LED_P
	3	HDD_LED_N
RESET BUTTON	5	FP_RST_BTN_N
	7	Ground
POWER LED	2	PWR_LED_P
	4	PWR_LED_N
POWER BUTTON	6	FP_PWR_BTN_IN
	8	Ground

2.4.4 SATA1,SATA2 : SATA III Connector

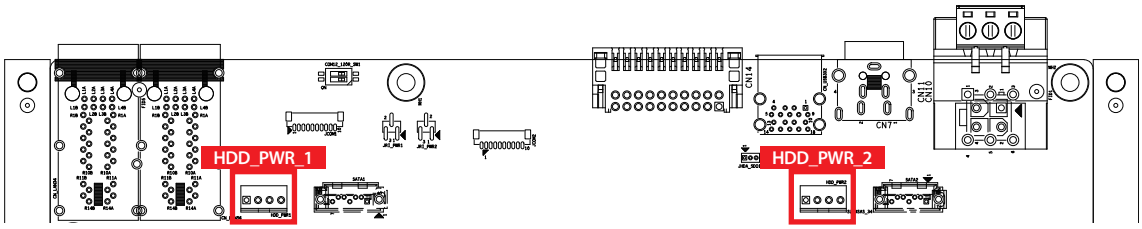


There are 2 onboard high performance Serial ATA III (SATA III) on ECX-3000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 and SATA2 are listed in the following table :

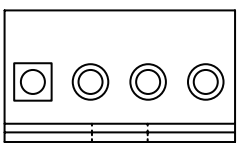


Pin Number	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

2.4.5 HDD_PWR_J1, HDD_PWR_J2 : SATA Power Connector

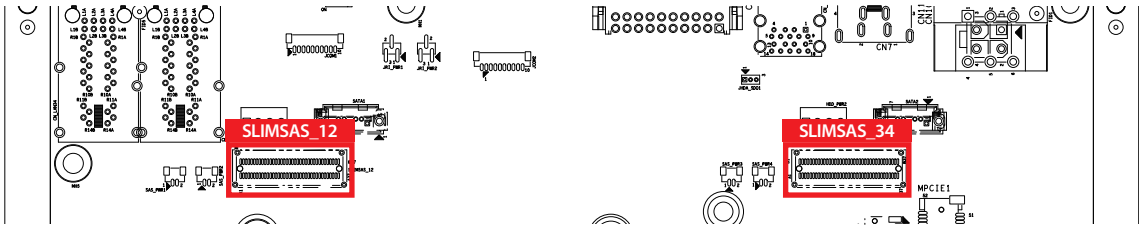


There are 2 onboard high performance Serial ATA III (SATA III) on ECX-3000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 and SATA2 are listed in the following table :



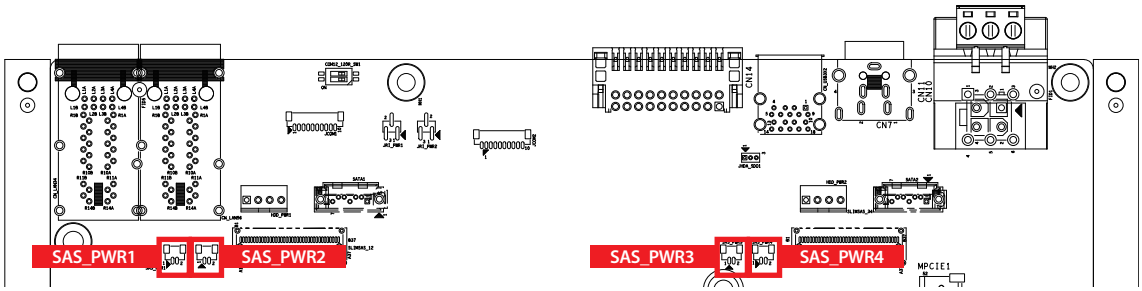
Pin Number	Definition
1	+12V
2	GND
3	GND
4	+5V

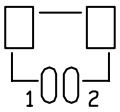
2.4.6 SLIMSAS_12, SLIMSAS_34 : M2D Board PCIE cable connector



ECX-3000 support front access M.2 tray via cable to connect to ECX-3000 M2D Board.

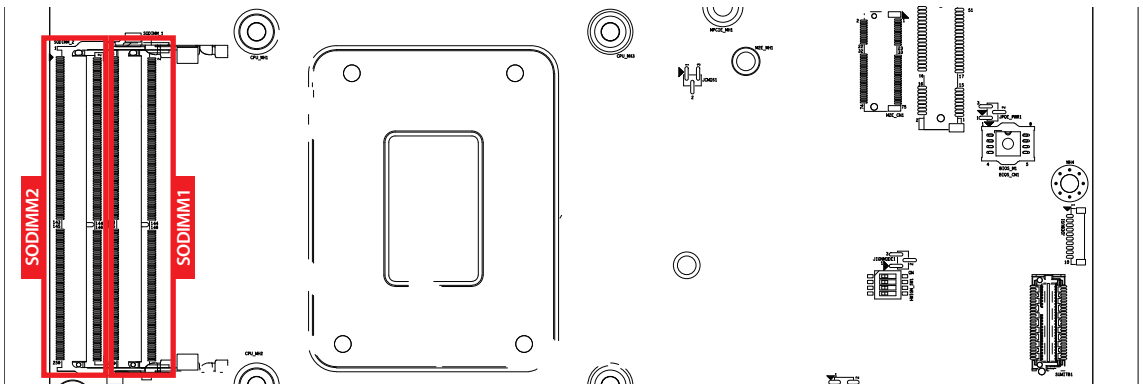
2.4.7 SAS_PWR1, SAS_PWR2, SAS_PWR3, SAS_PWR4 : M2D Board Power cable Connector





Pin Number	Definition
1	+12V(Max.2A)
2	GND

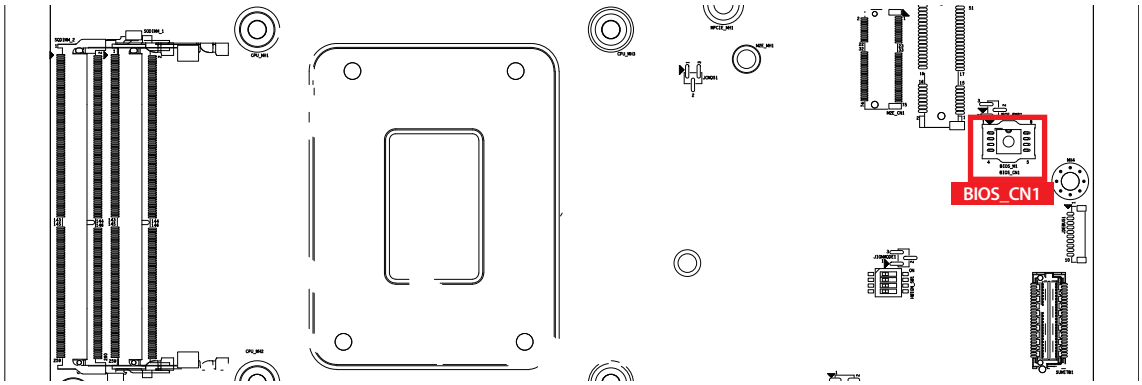
2.4.8 SODIMM_1, SODIMM_2: DDR4 Slot



There are 2 DDR4 channel onboard, support DDR4 3200, max 64GB Each channel 32GB

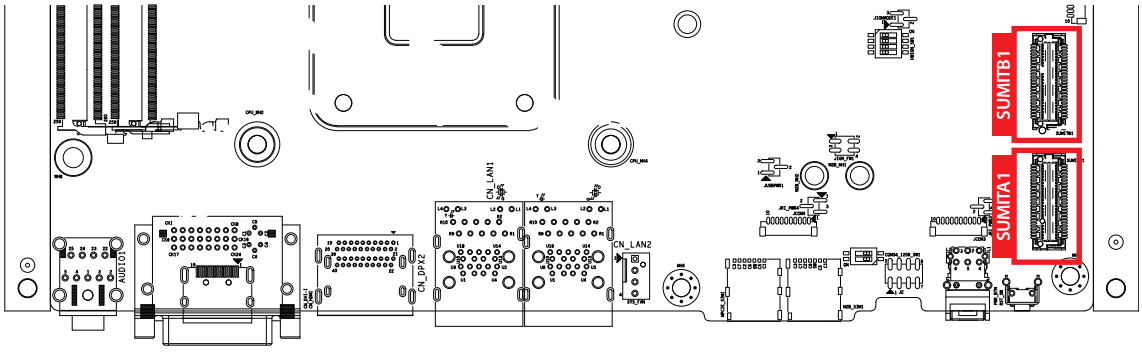
Slot	Description
SODIMM_1	DDR4 Channel A
SODIMM_2	DDR4 Channel B

2.4.9 BIOS_CN1 : BIOS Socket

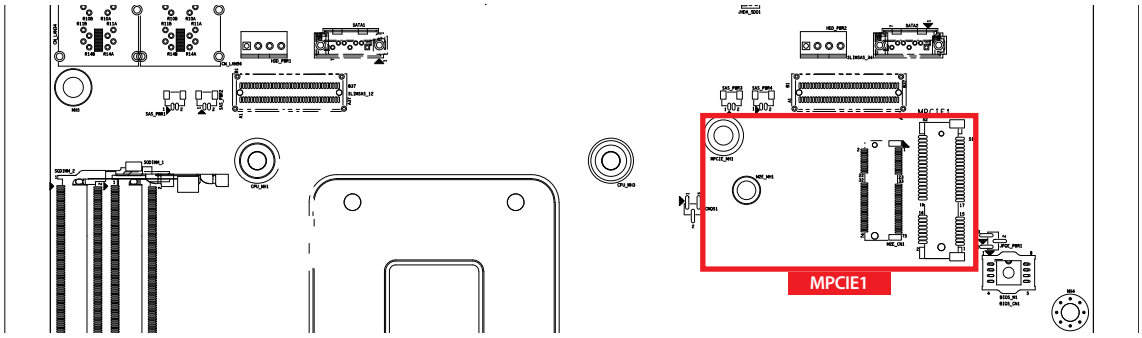


If the BIOS needs to be changed, please contact the Vecow RMA service team.

2.4.10 SUMITA1, SUMITB1



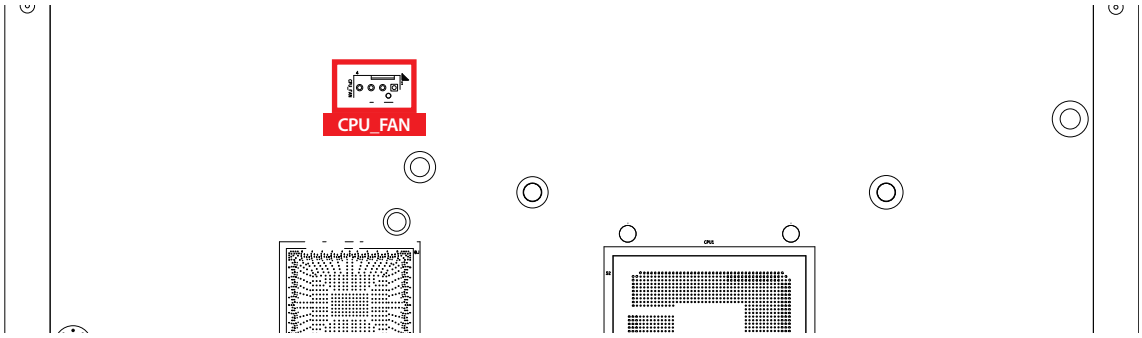
2.4.11 MPCIE1 : Mini PCIe



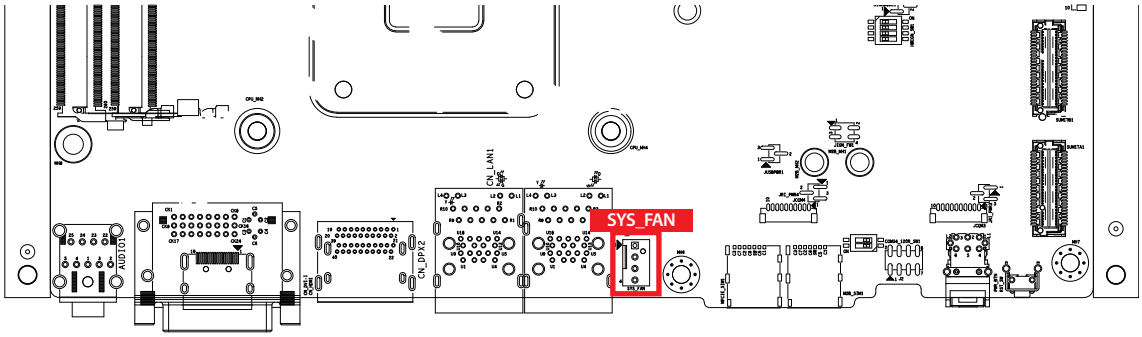
The pin assignments of MPCIe 1 ted in the following table :

Pin Number	Signal Name	Pin Number	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	GND	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

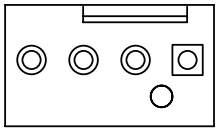
2.4.12 CPU_FAN,SYS_FAN : FAN Header



Fan power connector supports for additional thermal requirements. The pin assignments of CPU_FAN/SYS_FAN are listed in the following table.

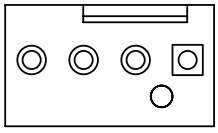


CPU_FAN1



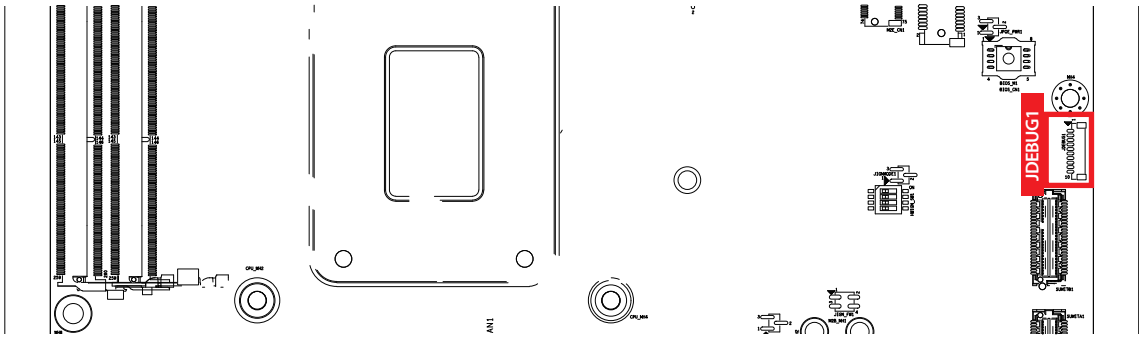
Pin No.	Definition
1	GND
2	+12V (2A max)
3	Fan speed sensor
4	Fan PWM

SYS_FAN2



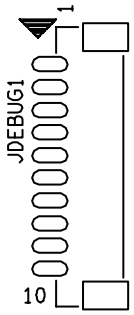
Pin No.	Definition
1	GND
2	+12V (2A max)
3	Fan speed sensor
4	Fan PWM

2.4.13 JDEBUG1 : ESPI Port 80 Header

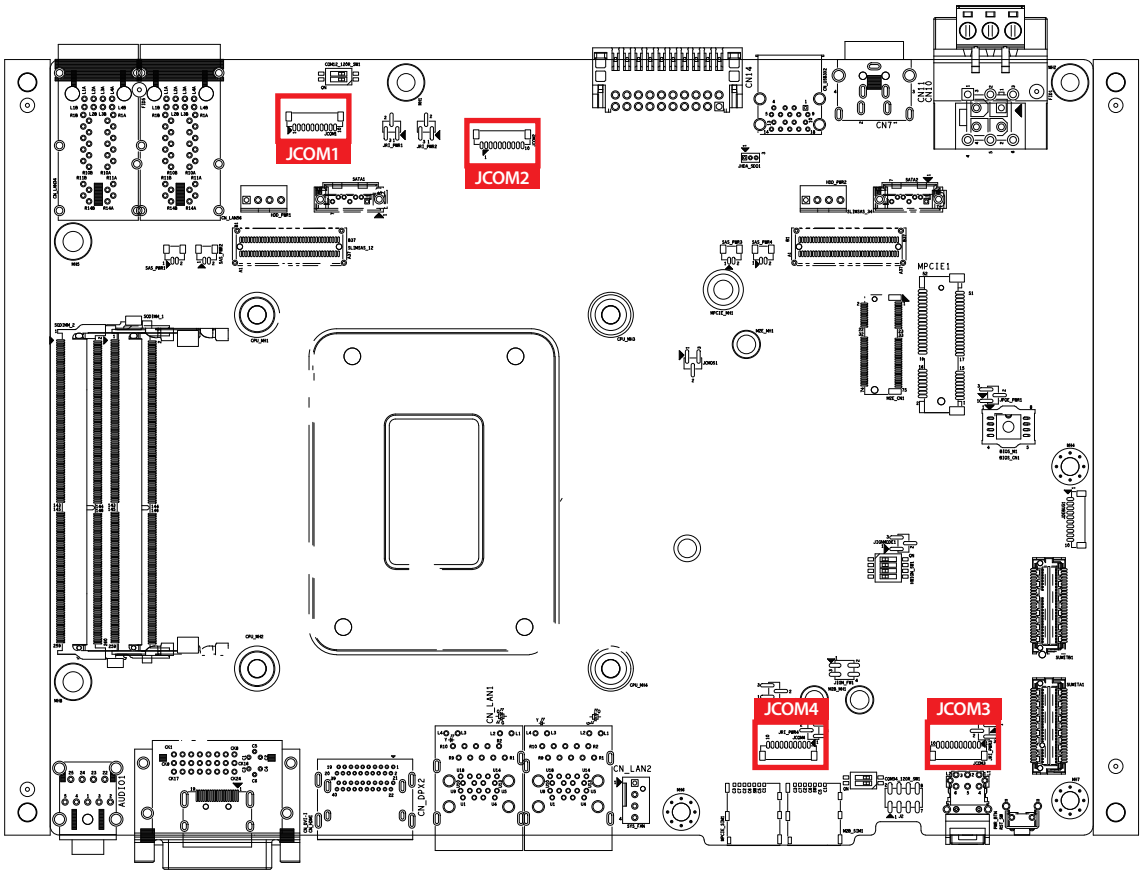


The pin assignments of MPCIe 1 ted in the following table :

Pin No.	Description
1	+V3.3S
2	Port 80_ESPI_CS#
3	Port 80_ESPI_IO0
4	Port 80_ESPI_IO1
5	Port 80_ESPI_IO2
6	Port 80_ESPI_IO3
7	GND
8	Port 80_ESPI_CLK
9	RST 80_ESPI_RST#
10	GND

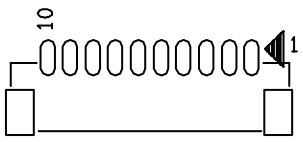


2.4.14 JCOM1,JCOM2,JCOM3,JCOM4 : Serial Port cable Connector

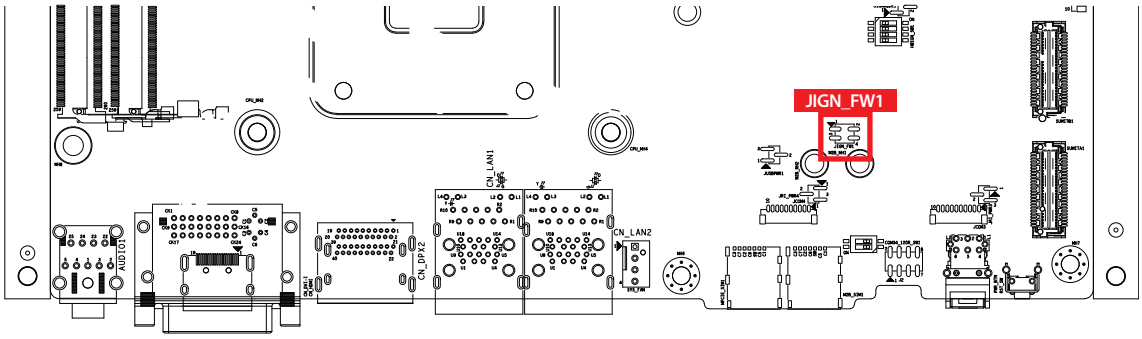


Location	Description
JCOM1	COM1
JCOM2	COM2
JCOM3	COM3
JCOM4	COM4

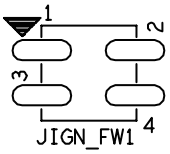
Pin No.	Function
1	NC
2	GND
3	RI
4	DTR
5	CTS
6	TXD
7	RTS
8	RXD
9	DSR
10	DCD



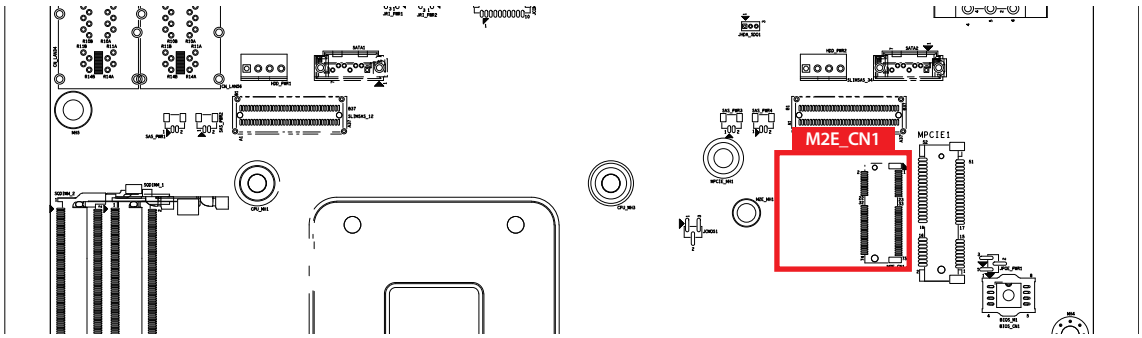
2.4.15 JIGN_FW1 : IGNITION FW Programming Header



Pin No.	Description
1	GND
2	MCU_RST#
3	+V3.3_MCU
4	MCU_PRG

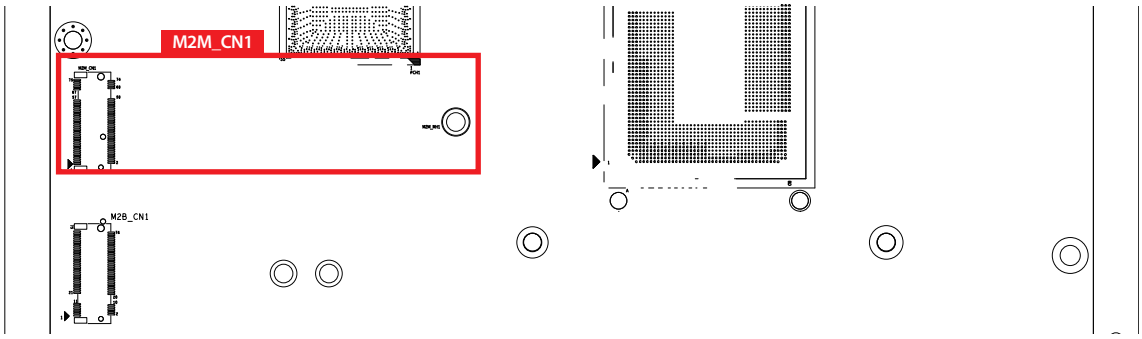


2.4.16 M2E_CN1 : USB2.0/2x PCIex1



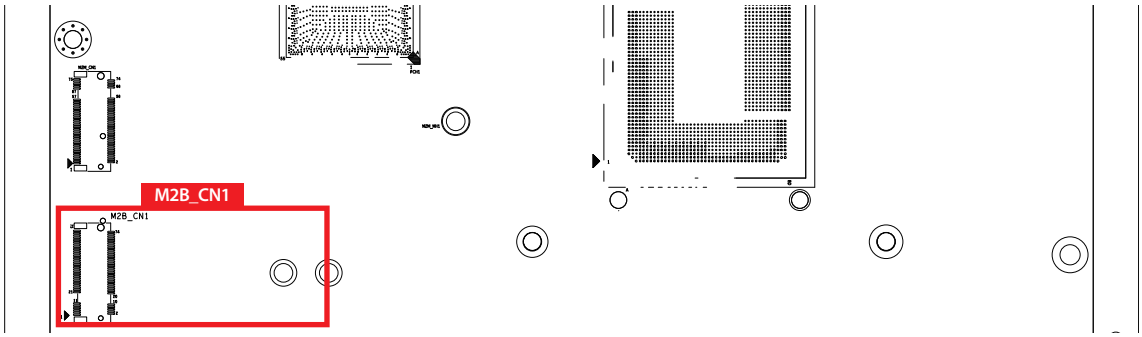
M.2 key E connector is suitable for applications that use wireless connectivity including Wi-Fi,Bluetooth, NFC of GNSS. Module card types include 2230.

2.4.17 M.2 KEY M: PCIe x4



M.2 key M connector is suitable for applications that use Host I/Fs supported by either PCIe Module card types include 2280 (Only Support PCIE)

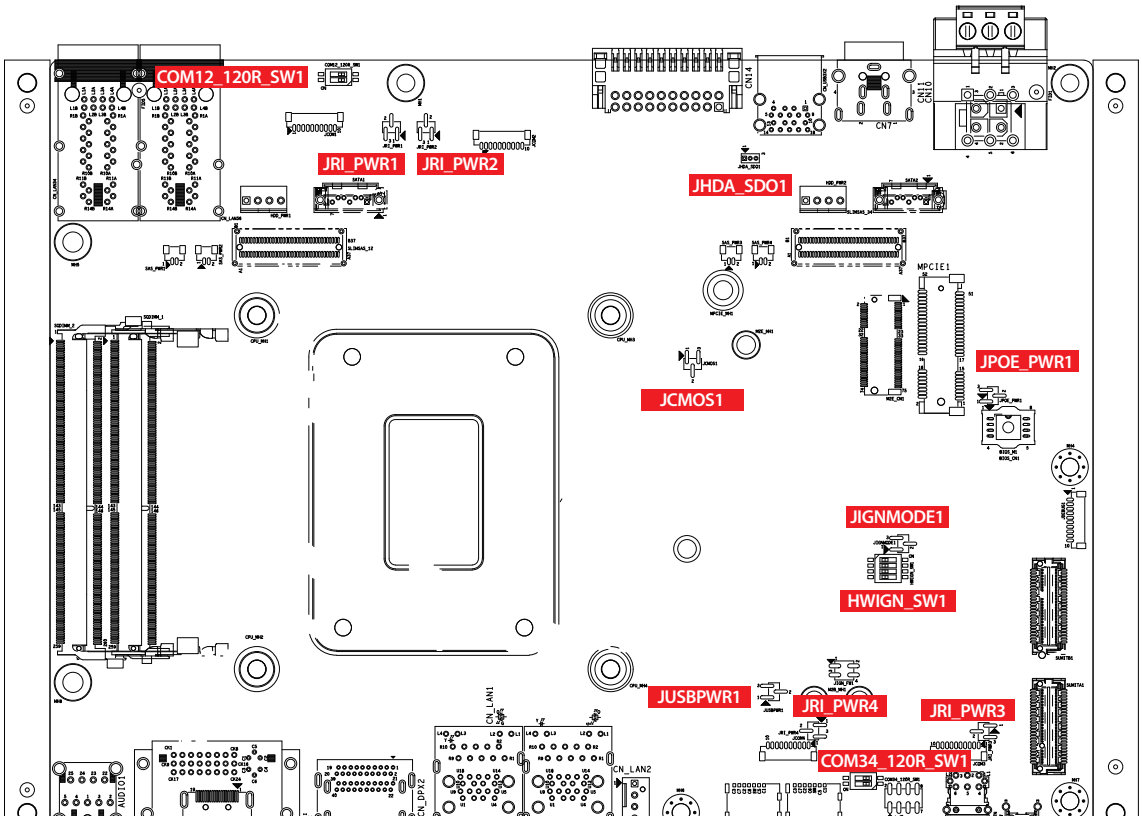
2.4.18 M.2 KEY B : USB3.0/USB2.0 Support(default) , SATA(BIOS option)



Module card types include 3042,3052.

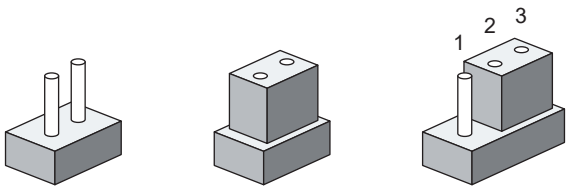
2.5 Main Board Jumper Settings

2.5.1 Board top view of the system main board with jumper and DIP switch



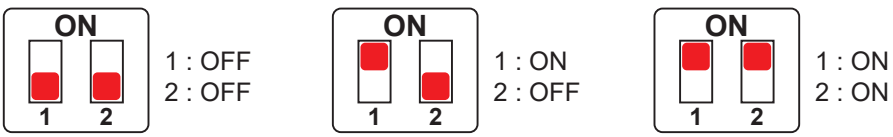
The figure below is the top view of the system main board which is the main board. It shows the location of the jumpers and the switches.

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.

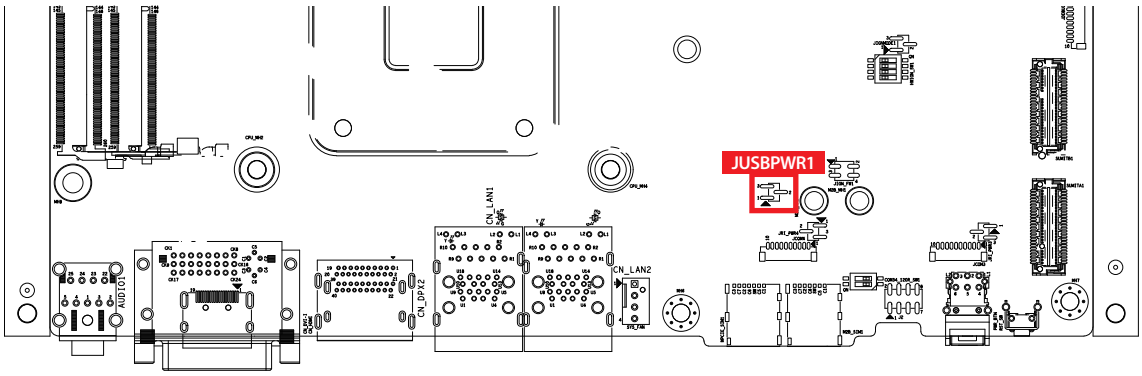


Open Closed Closed 2-3

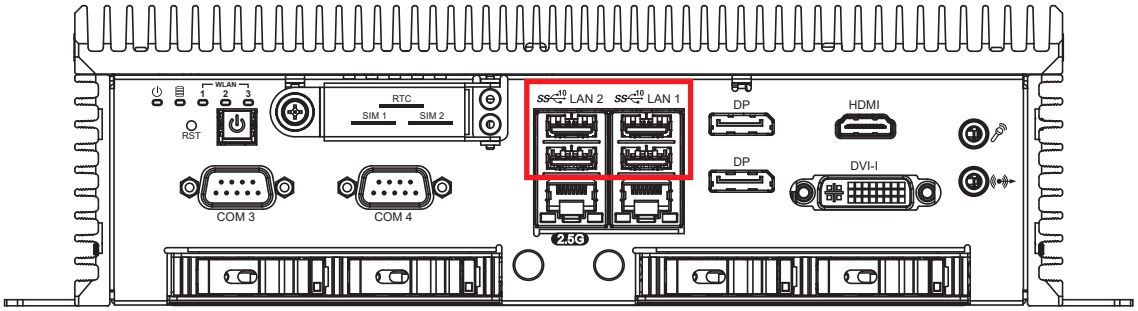
You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.



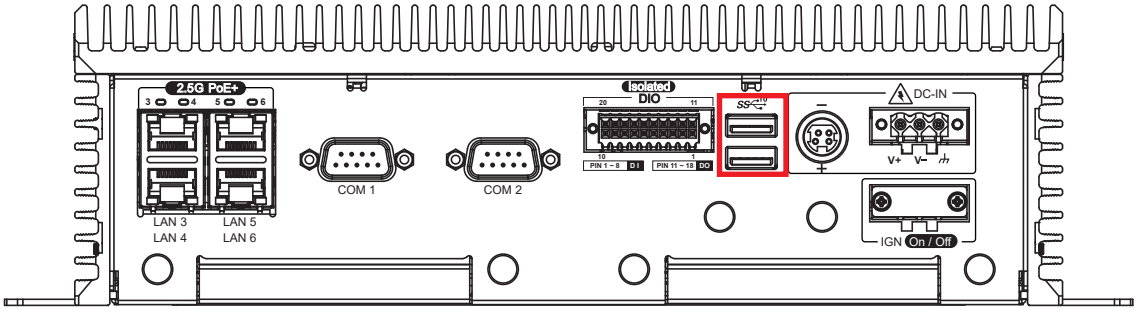
2.5.2 JUSBPWR1 : USB Wake Up

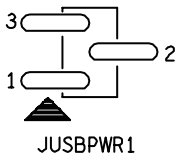


Front Plane View

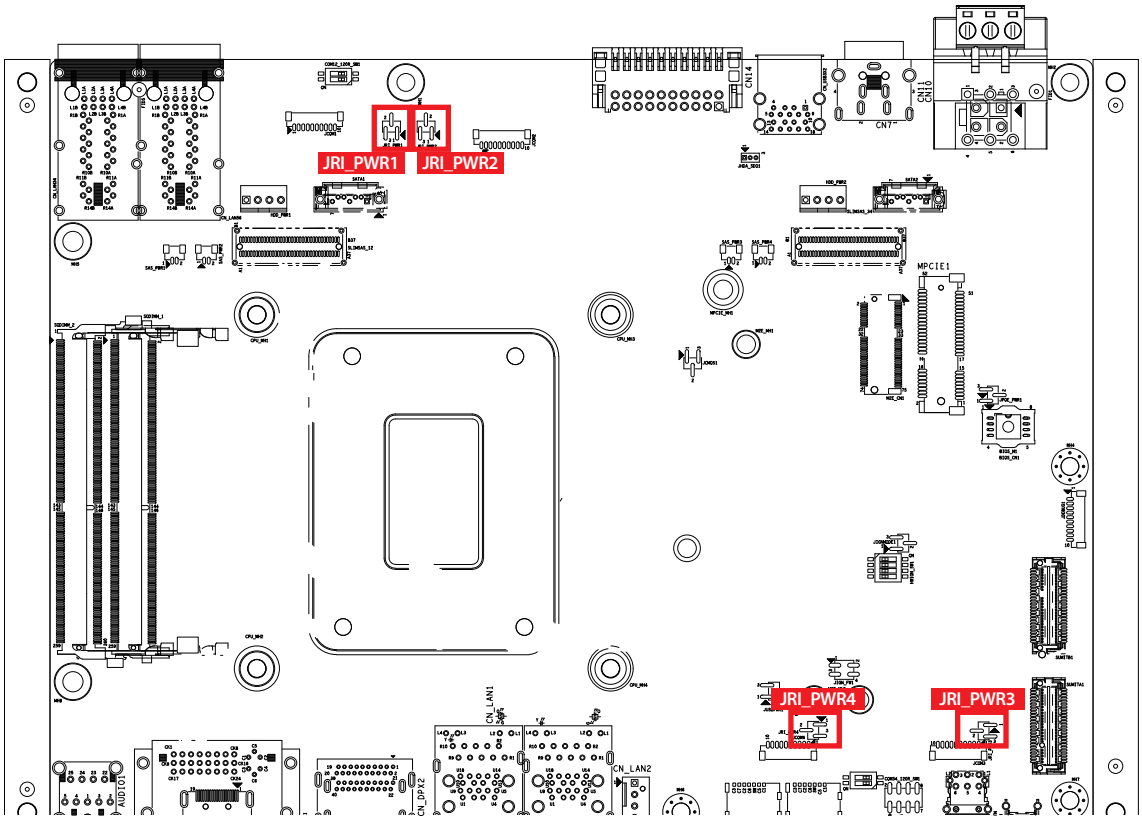


Rear Plane View

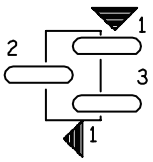


Location	Description	Function	
JSBPWR1	2 - 3	Non Wake Up support	
	1 - 2	Supported Wake Up(Default)	

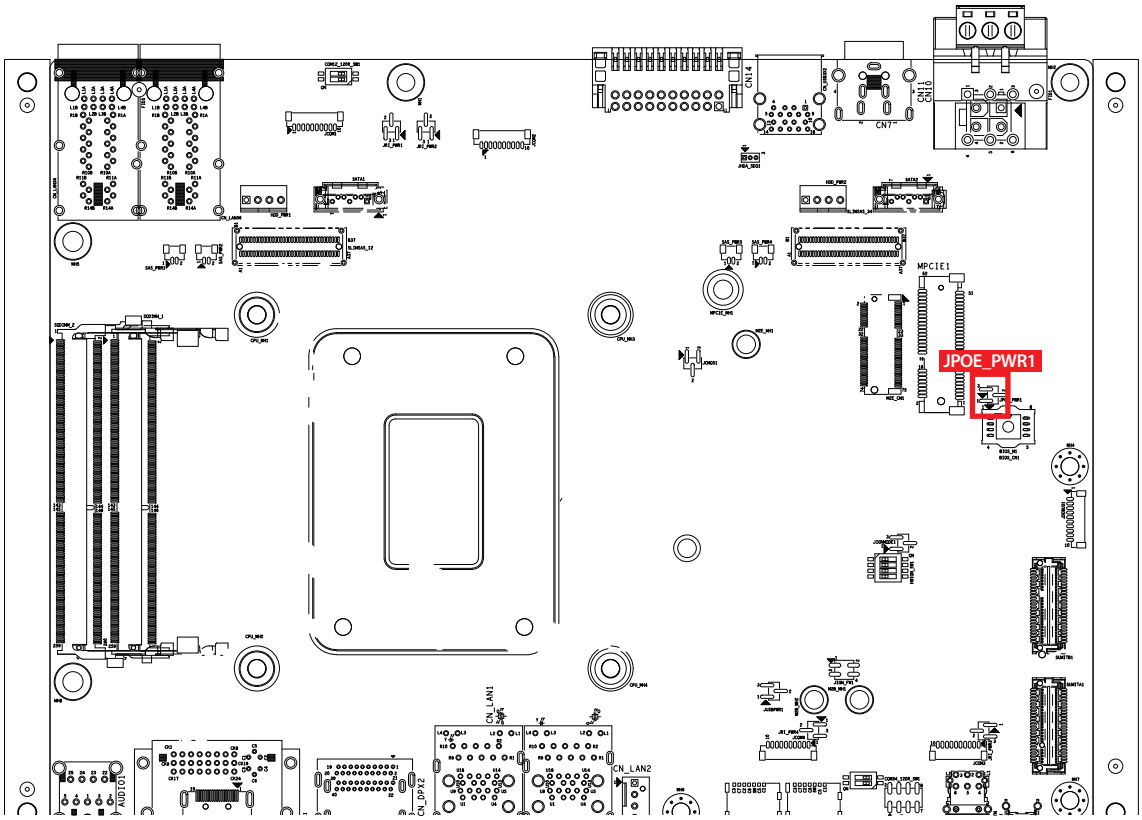
2.5.3 JRI_PWR1,JRI_PWR2, JRI_PWR3, JRI_PWR4 : COM Port RI pin Select

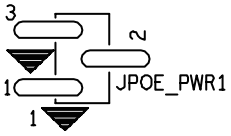


Location	Pin Number	Description	COM Port
JRI_PWR1	1 - 2	+12V (0.5A max.)	COM1
	2 - 3	RI(Default)	
JRI_PWR2	1 - 2	+12V (0.5A max.)	COM2
	2 - 3	RI(Default)	
JRI_PWR3	1 - 2	+12V (0.5A max.)	COM3
	2 - 3	RI(Default)	
JRI_PWR4	1 - 2	+12V (0.5A max.)	COM4
	2 - 3	RI(Default)	

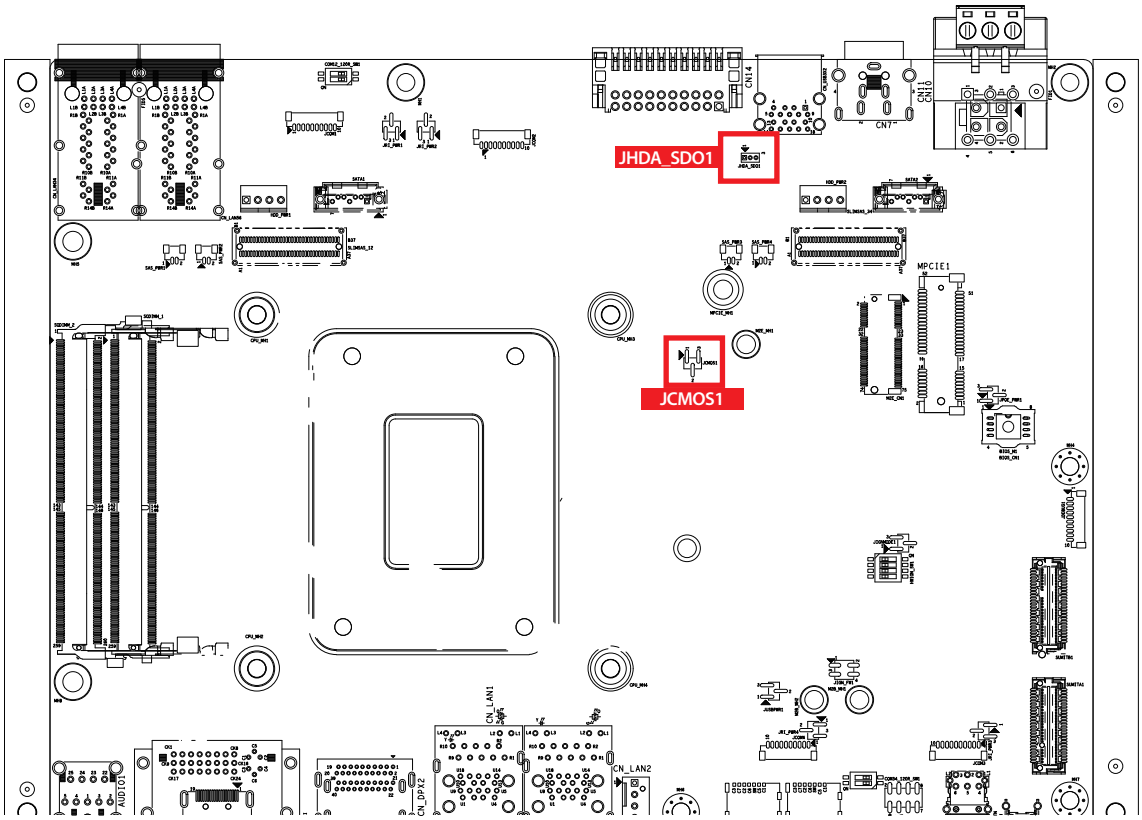


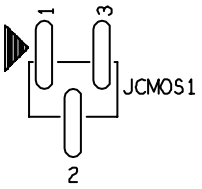
2.5.4 JPOE_PWR1 : PoE Power ON Select



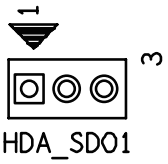
Location	Description	Function	
JPOE_ PWR1	1 - 2	PoE power on at standby power ready	
	2 - 3	PoE power on after system power on(Default)	
	No Jumper	Disable PoE power	

2.5.5 JCMOS1, JHDA_SDO1 : CMOS & ME Flash



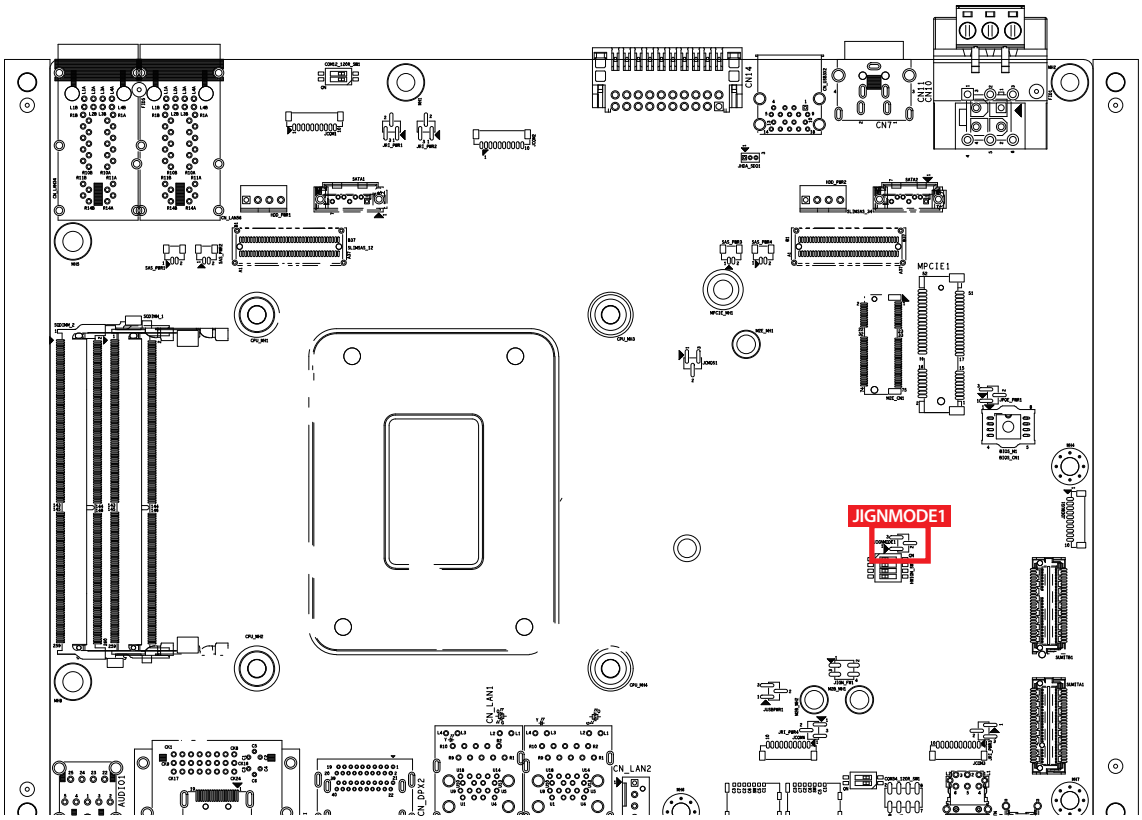


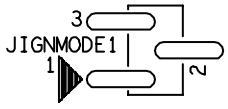
Jumper	Setting	Function
JCMOS1	1 - 2	*Normal (Default)
	2 - 3	Clear CMOS



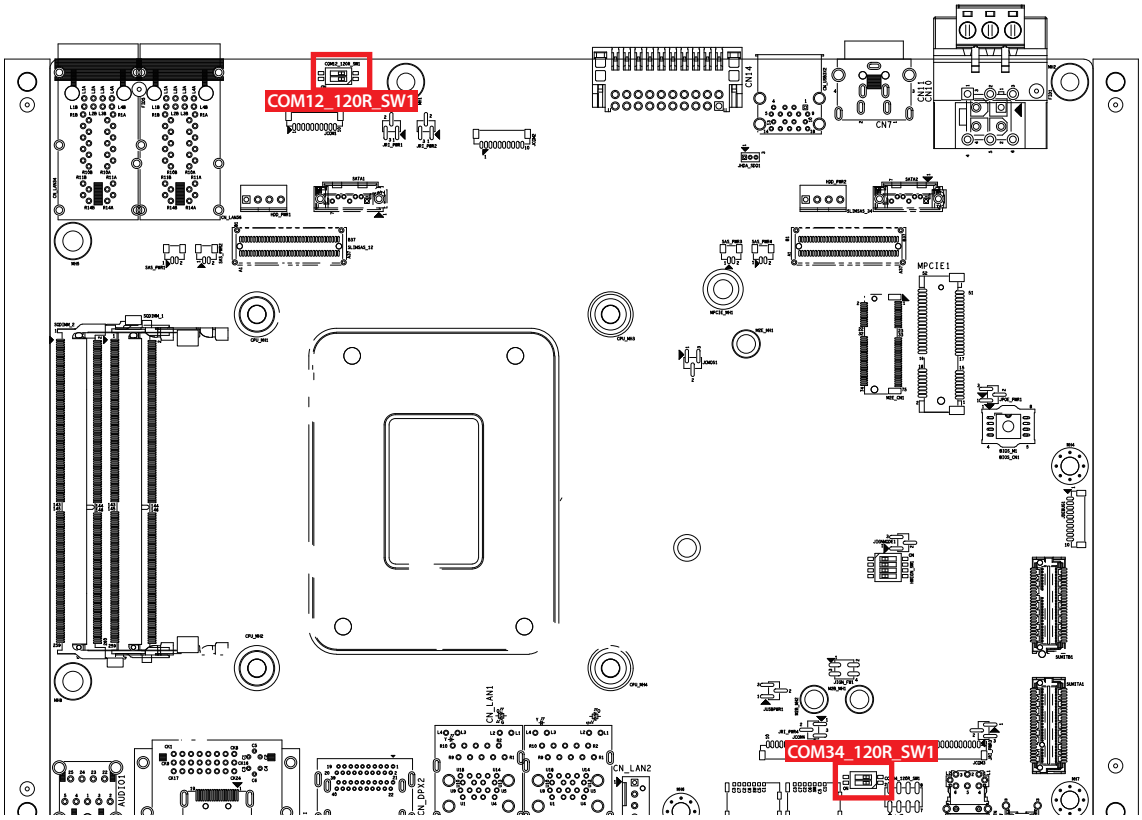
Jumper	Setting	Function
JHDA_ SDO1	1 - 2	Enable security measures defined in the Flash Descriptor. (Default)
	2 - 3	Disable Flash Descriptor Security (Flash ME)

2.5.6 JIGNMODE1 : IGNITION MODE



Location	Description	Function	
JIGNMODE1	1 - 2	H/W mode	
	2 - 3	S/W mode(default)	

2.5.7 COM12_120R_SW1,COM34_120R_SW1 : RS-485/422 RECEIVER TERMINATION RESISTANCE



JP2	Setting	Function	Port
COM12_120R_SW1	1(ON)	DCD / RXD Termination 120R enable	COM1
	1(OFF)	DCD / RXD Termination 120R Disable(default)	
	2(ON)	DCD / RXD Termination 120R enable	COM2
	2(OFF)	DCD / RXD Termination 120R Disable(default)	
COM34_120R_SW1	1(ON)	DCD / RXD Termination 120R enable	COM1
	1(OFF)	DCD / RXD Termination 120R Disable(default)	
	2(ON)	DCD / RXD Termination 120R enable	COM2
	2(OFF)	DCD / RXD Termination 120R Disable(default)	

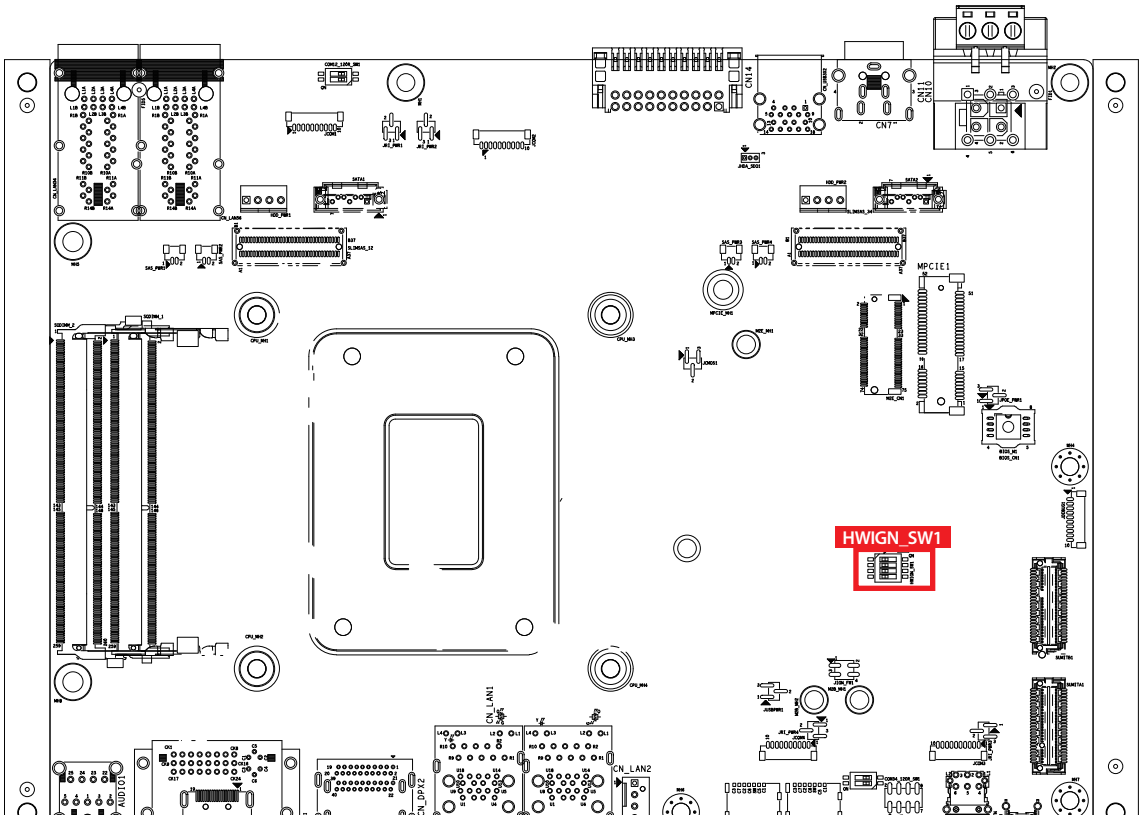
2.6 Ignition Control

ECX-3000 series provides ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay period.

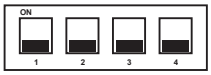
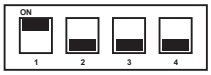
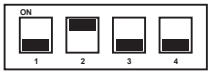
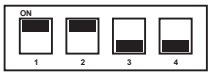
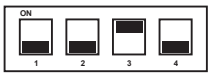
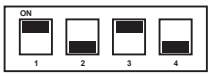
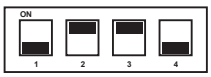
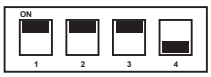
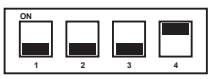
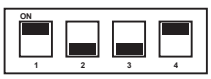
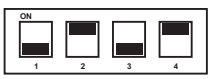
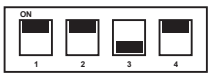
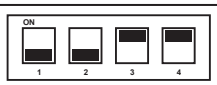
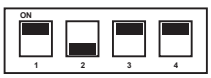
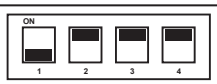
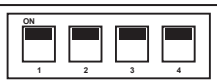
2.6.1 Adjust Ignition Control Modes

ECX-3000 series provides 16 modes of different power on/off delay periods adjustable via HWIGN_SW1 switch. The default rotary switch is set to 0 in ATX/ AT power mode.

HWIGN_SW1 : Ignition Control



The modes are listed in below table :

DIP Switch Position	Power on delay	Power off delay	Switch Position
0	ATX/AT mode (Default)		
1	No delay	No delay	
2	No delay	5 seconds	
3	No delay	10 seconds	
4	No delay	30 seconds	
5	No delay	60 seconds	
6	5 seconds	10 seconds	
7	5 seconds	30 seconds	
8	5 seconds	60 seconds	
9	5 seconds	90 seconds	
A	5 seconds	120 seconds	
B	10 seconds	10 seconds	
C	10 seconds	30 seconds	
D	10 seconds	60 seconds	
E	10 seconds	90 seconds	
F	10 seconds	120 seconds	

2.6.2 Ignition Control Wiring

To activate ignition control, you need to provide IGN signal via the 3-pin pluggable terminal block locates in the back panel. Please find below the general wiring configuration.

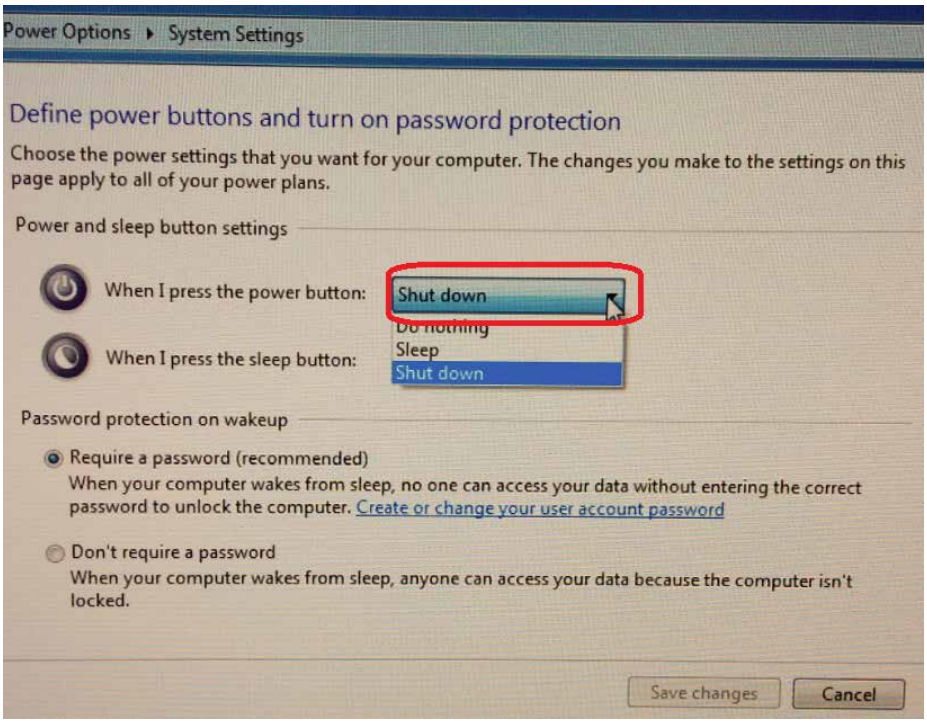
Pin No.	Definition
1	Ignition (IGN)
2	SW+
3	SW-

For testing purpose, you can refer to the picture blow to simulate ignition signal input controlled by a latching switch.

Note :

1. DC power source and IGN share the same ground.
2. ECX-3000 supports 9V to 50V wide range DC power input in ATX/AT mode. In Ignition mode, the input voltage is fixed to 12V/24V for car battery scenario.
3. For proper ignition control, the power button setting should be “Power Down” mode.

In Windows for example, you need to set “When I press the power button” to Shut down.



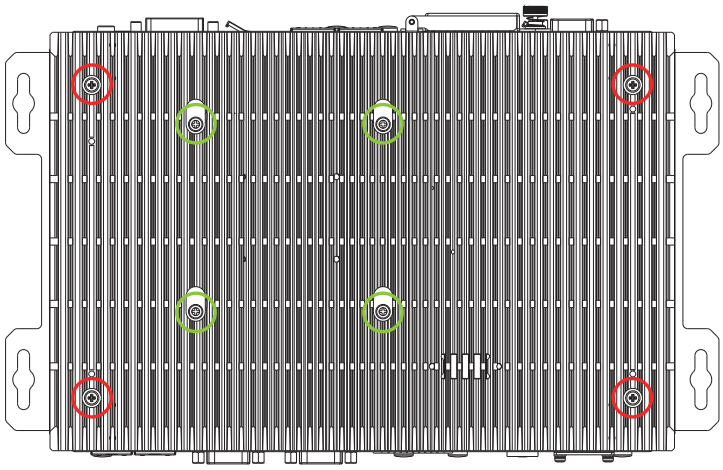
3

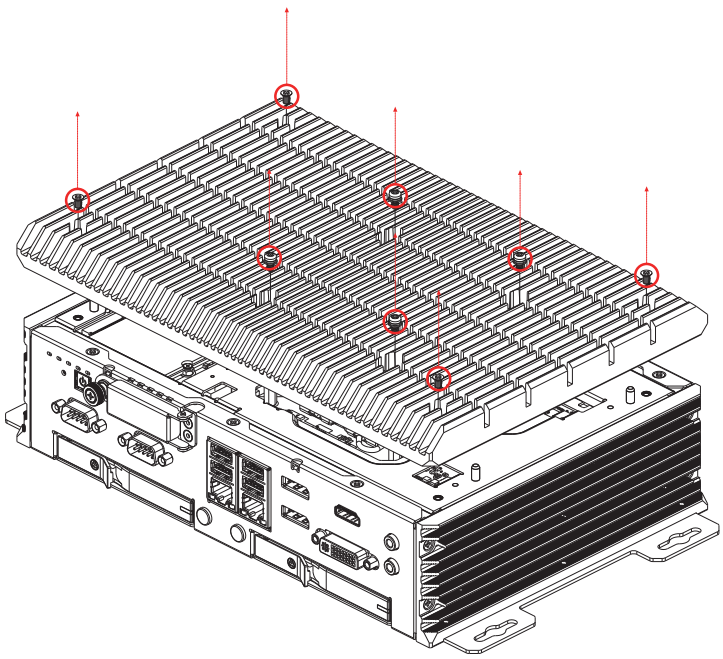
SYSTEM SETUP

3.1 How to Open Your ECX-3000

3.1.1 ECX-3025R / ECX-3025 / ECX-3000-PoER / ECX-3000-PoES / ECX- 3000-PoE / ECX-3000-4R / ECX-3000-4G / ECX-3000-2R / ECX-3000-2G / ECX-3071XR / ECX-3071X

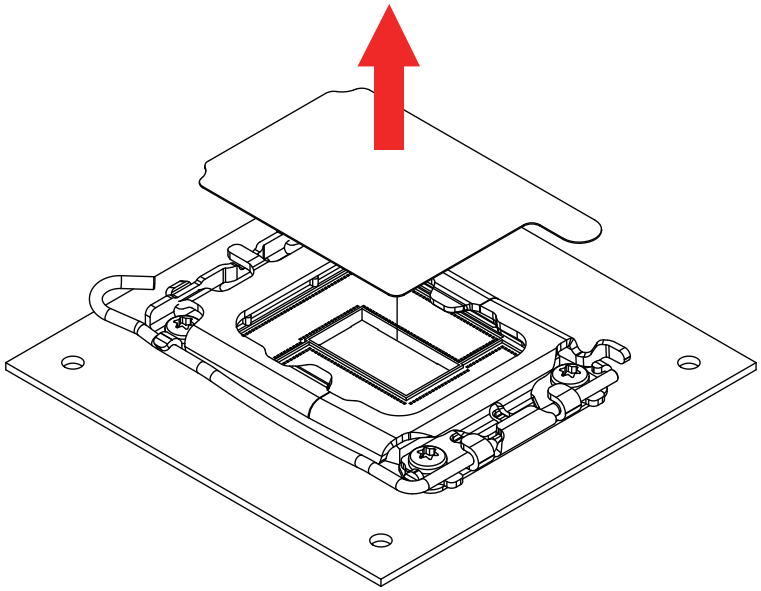
Step 1 Remove four flat head M3x5L screws and four pan head SFW M3x6L screws, and take out heat sink



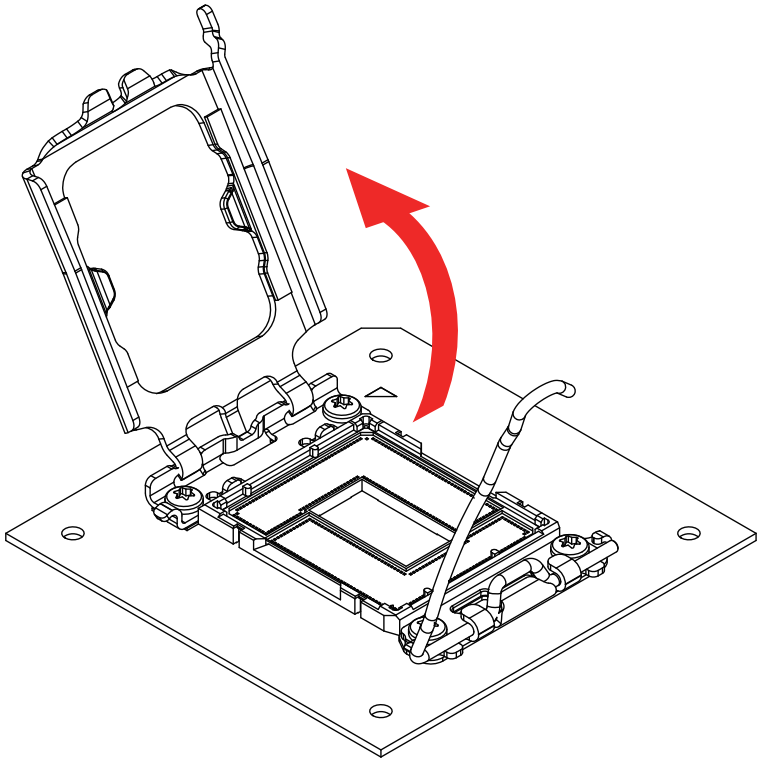


3.2 Installing CPU

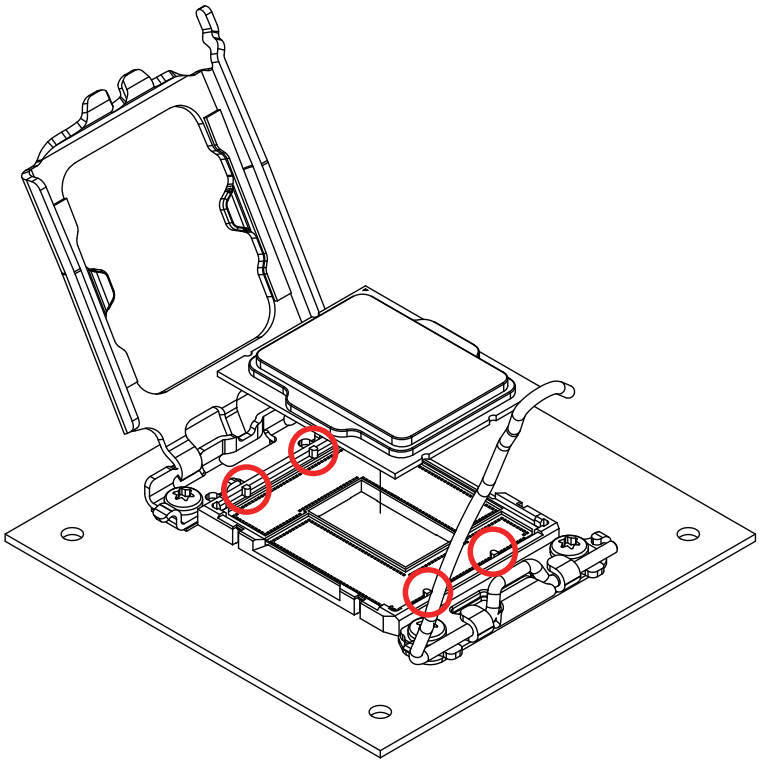
Step 1 Remove CPU mylar



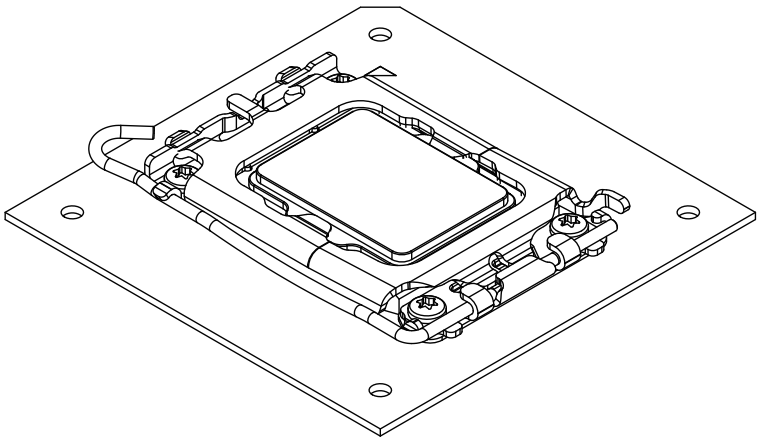
Step 2 Open CPU independent loading mechanism (ILM)



Step 3 Install CPU. (Be careful CPU pin)

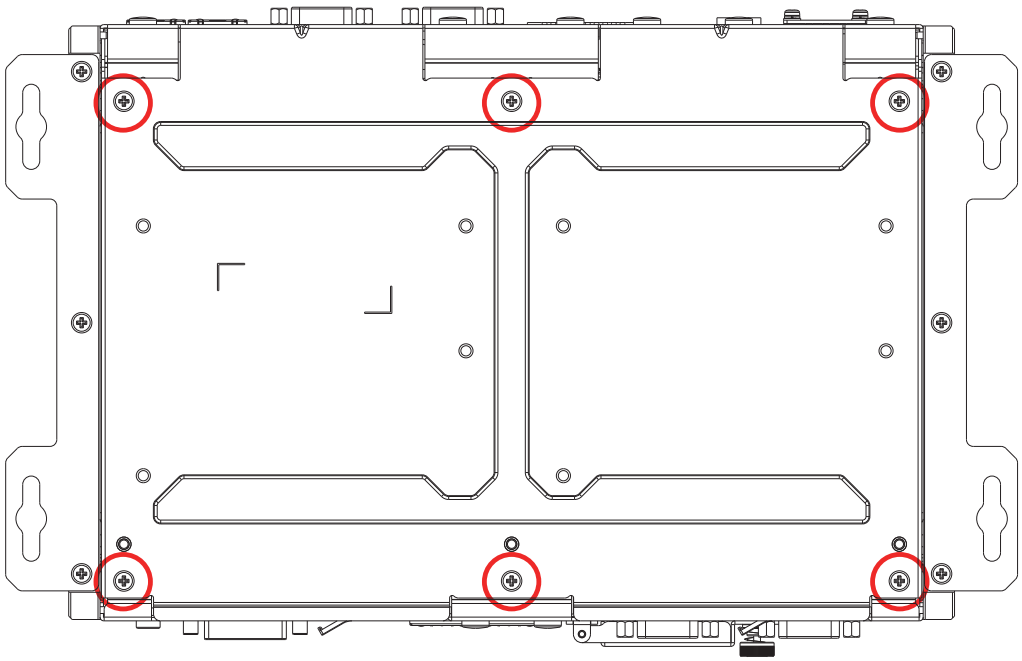


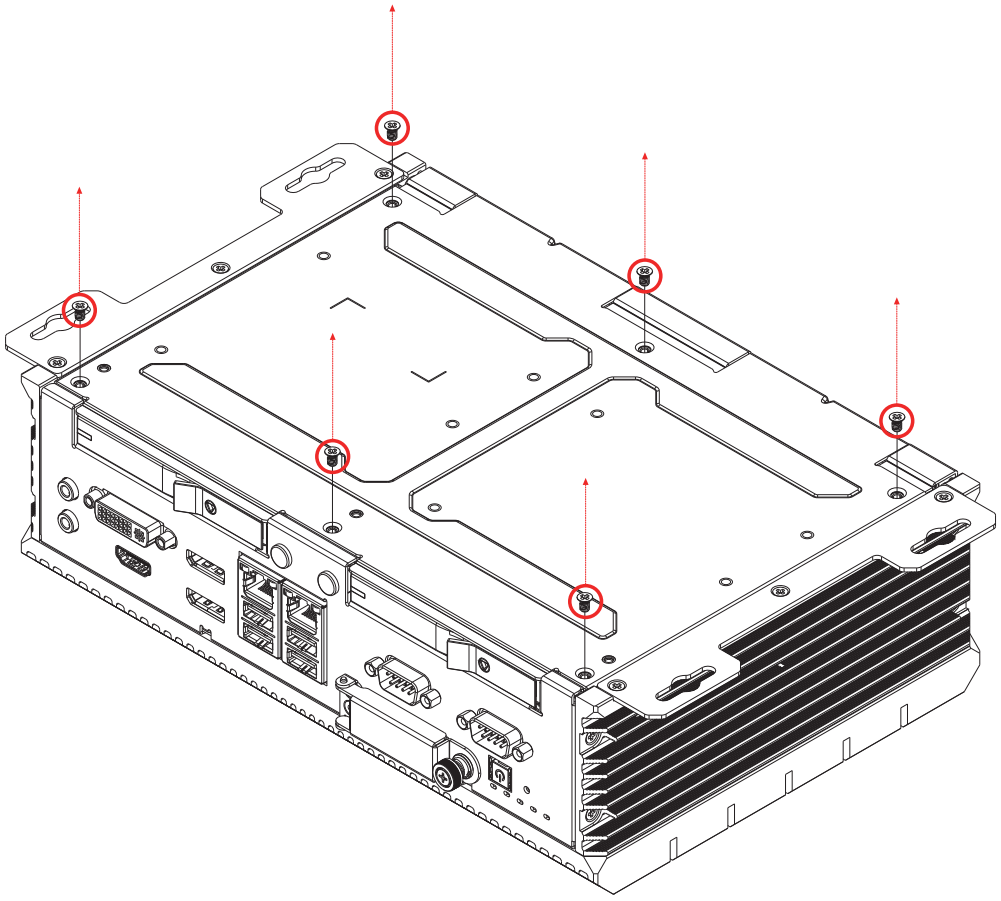
Step 4 Close CPU independent loading Mechanism (ILM) and finish



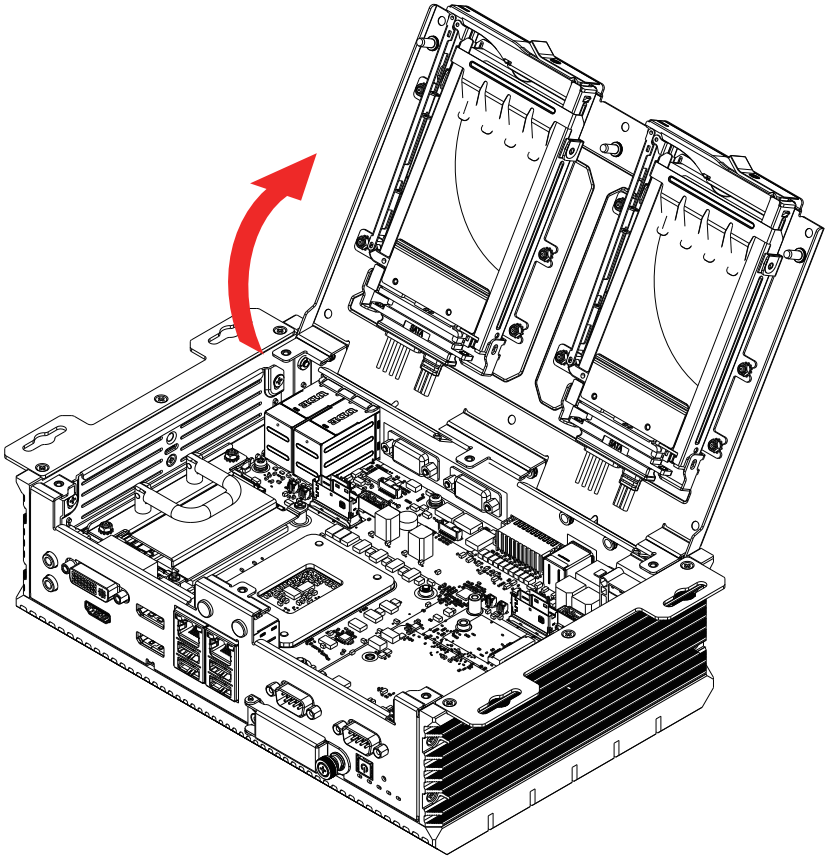
3.3 Installing DDR4 SO-DIMM Modules

Step 1 Remove six flat head M3x5L screws

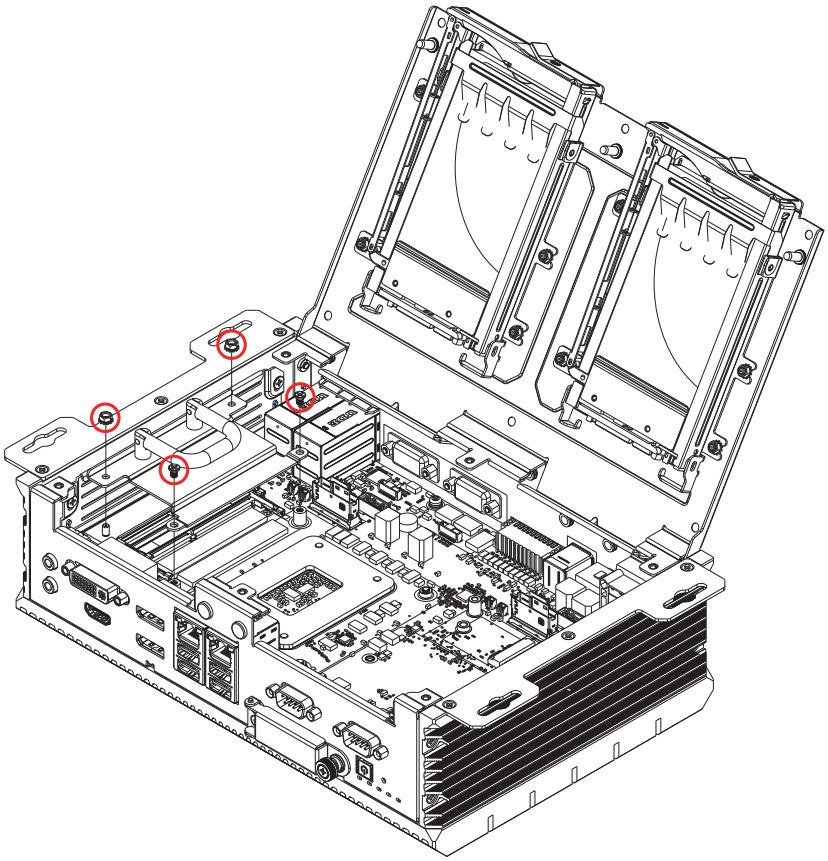




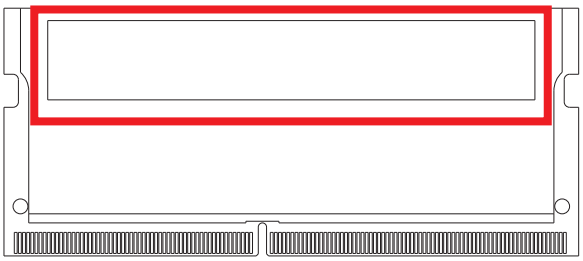
Step 2 Open bottom cover



Step 3 Remove two hexagon M3 nuts and two I head M3x4L screws



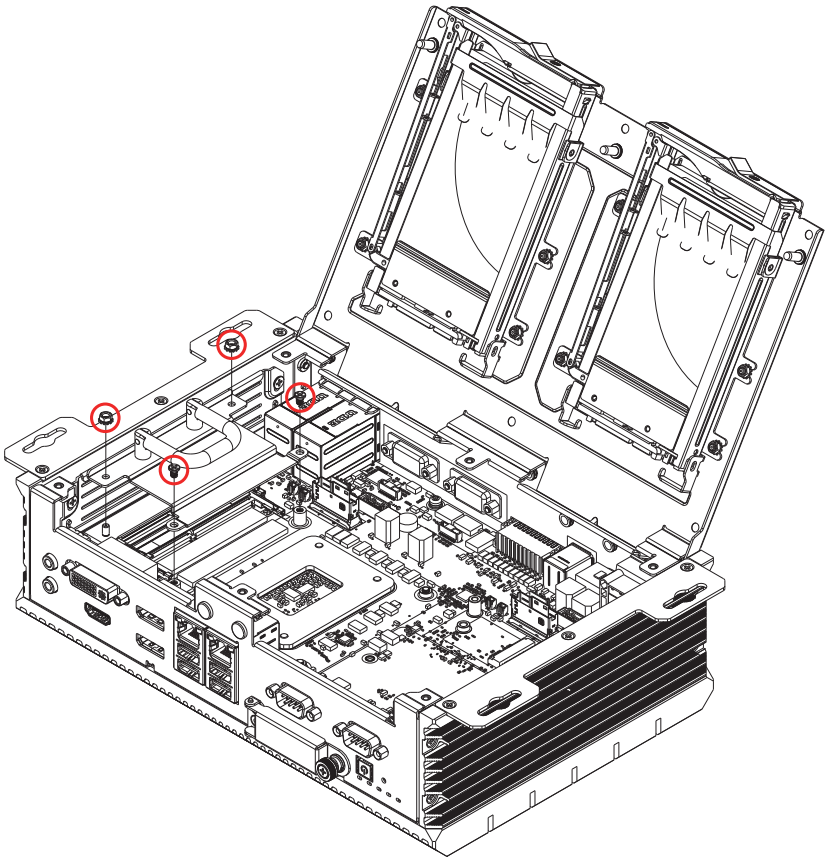
Step 4 Paste thermal pad on bottom side of Memory (Only SODIMM_2)



Step 5 Install DDR4 RAM module into SO-DIMM socket

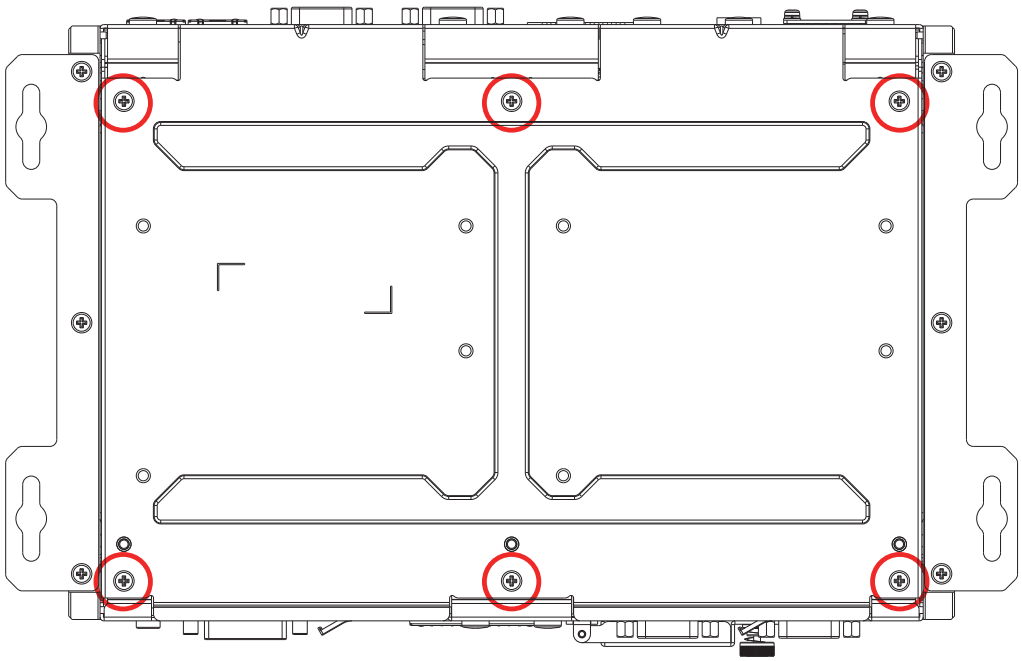
Step 6 Make sure RAM module is locked by the memory slot

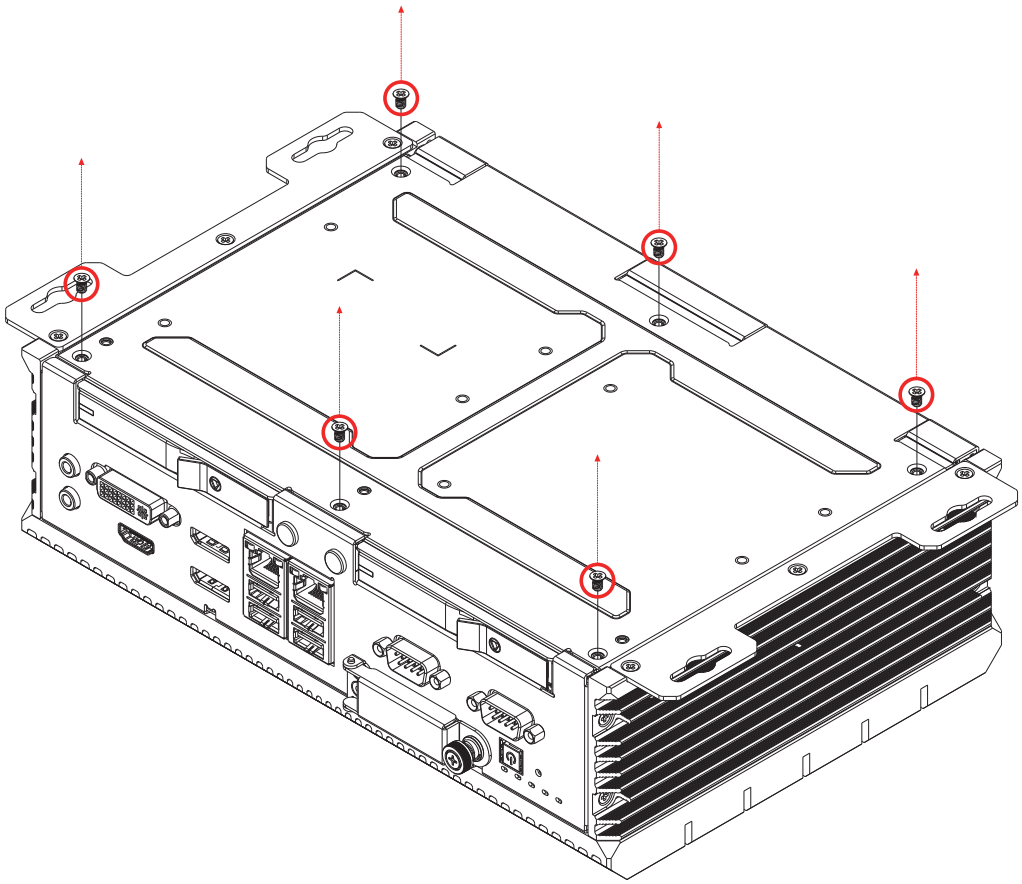
Step 7 Use two hexagon M3 nuts and two I head M3x4L screws, Fasten memory heat spreader



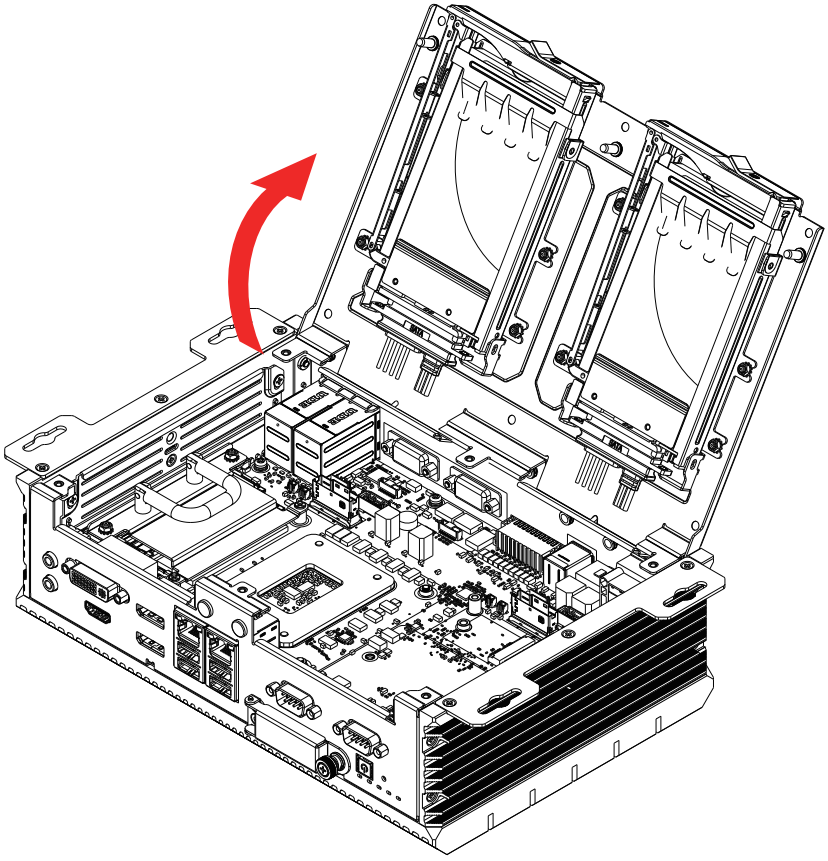
3.4 Installing Mini PCIe Card

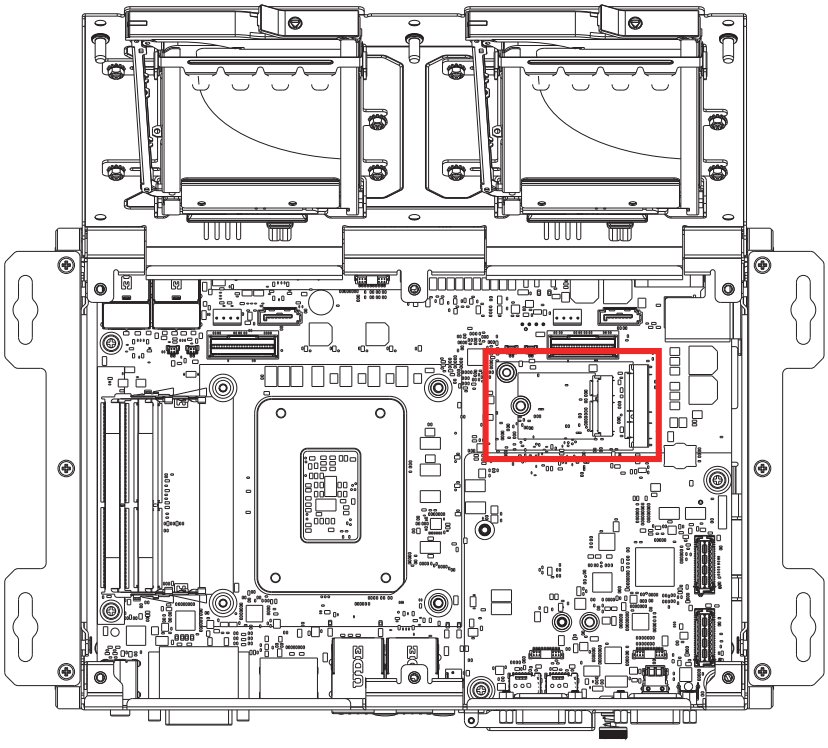
Step 1 Remove six flat head M3x5L screws



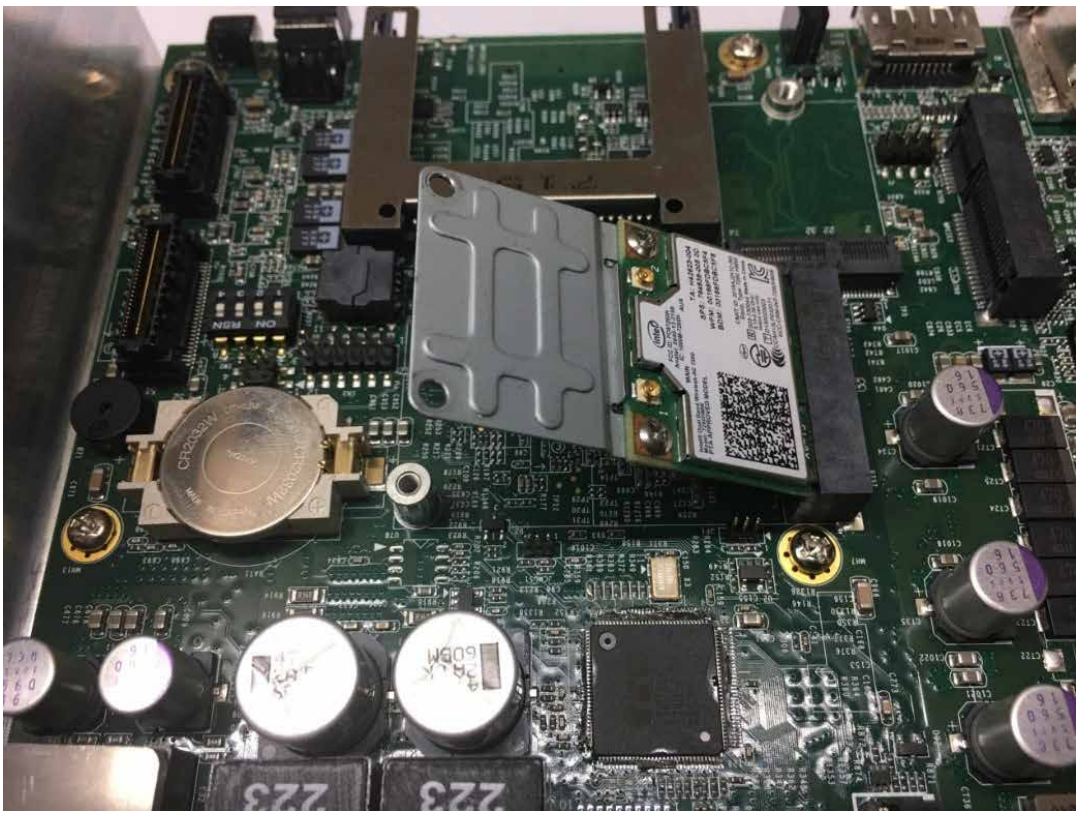


Step 2 Open bottom cover

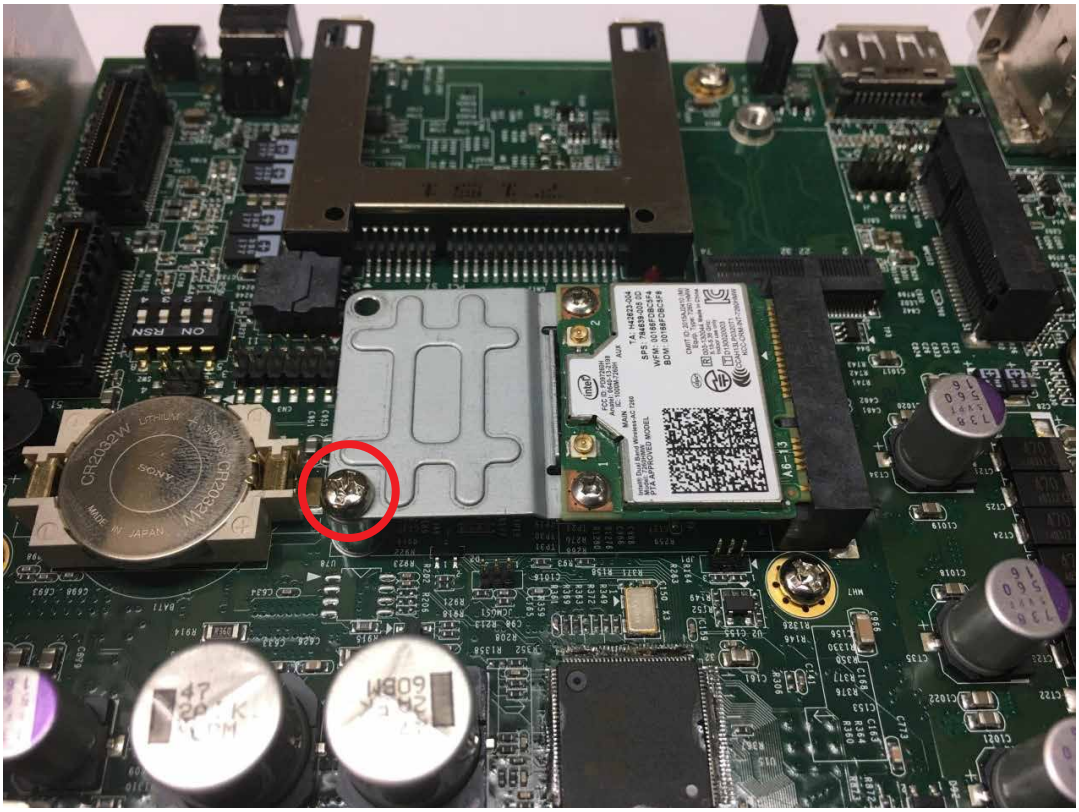




Step 3 Install mini PCIe card into slot

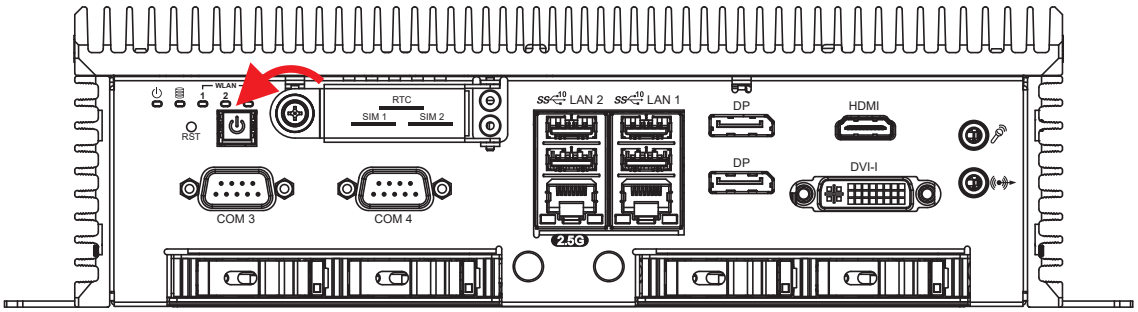


Step 4 Fasten pan head SFW M2.5x6L screw

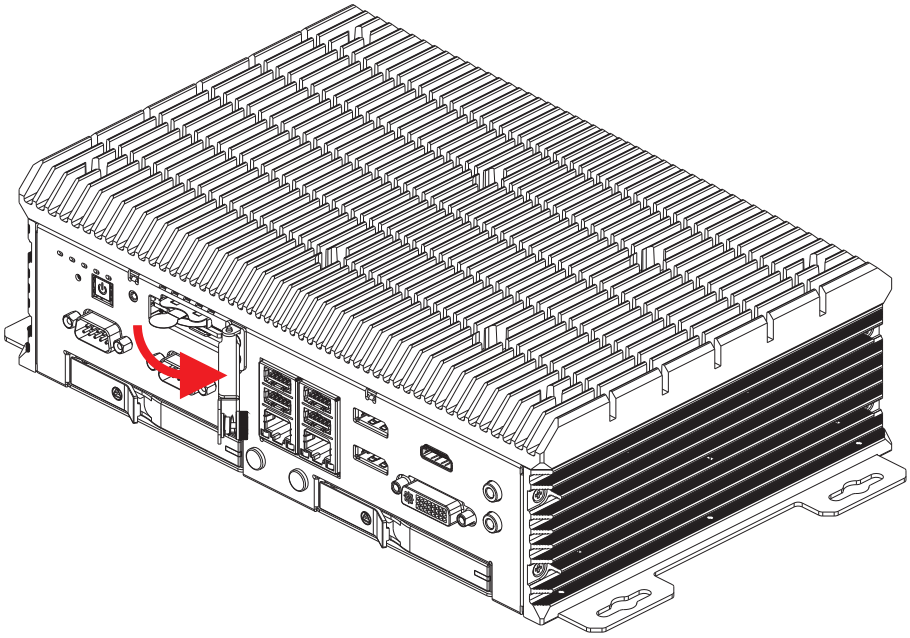


3.5 Installing Nano SIM Card

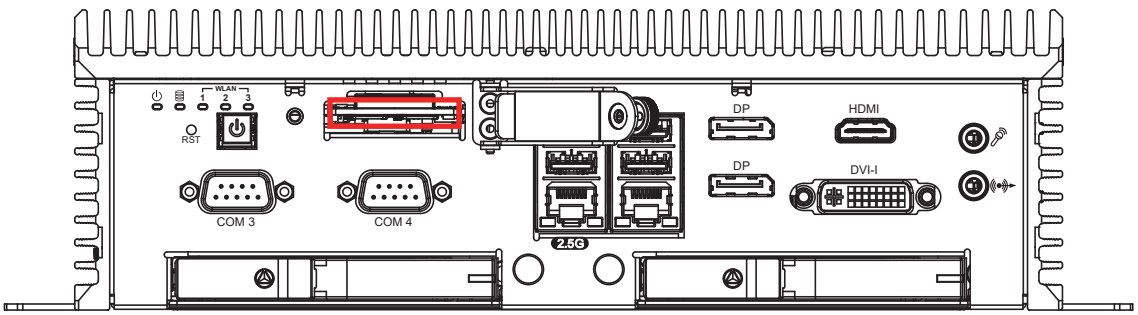
Step 1 Release captive panel screw



Step 2 Install SIM card in the marked red area.

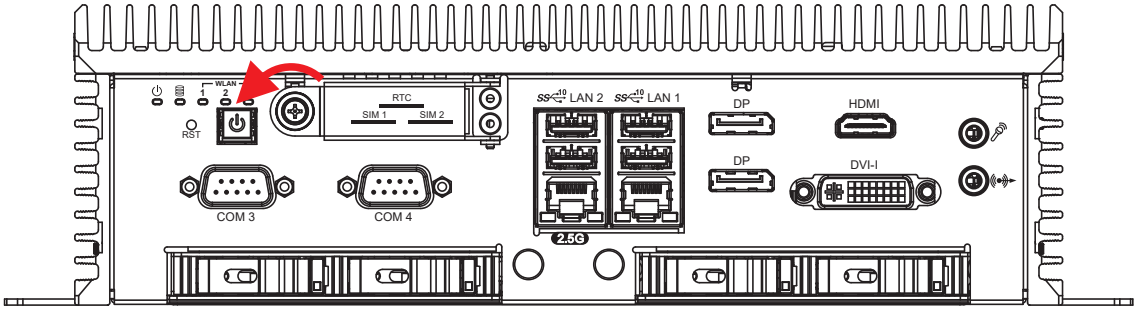


Step 3 Insert nano SIM card and push to lock

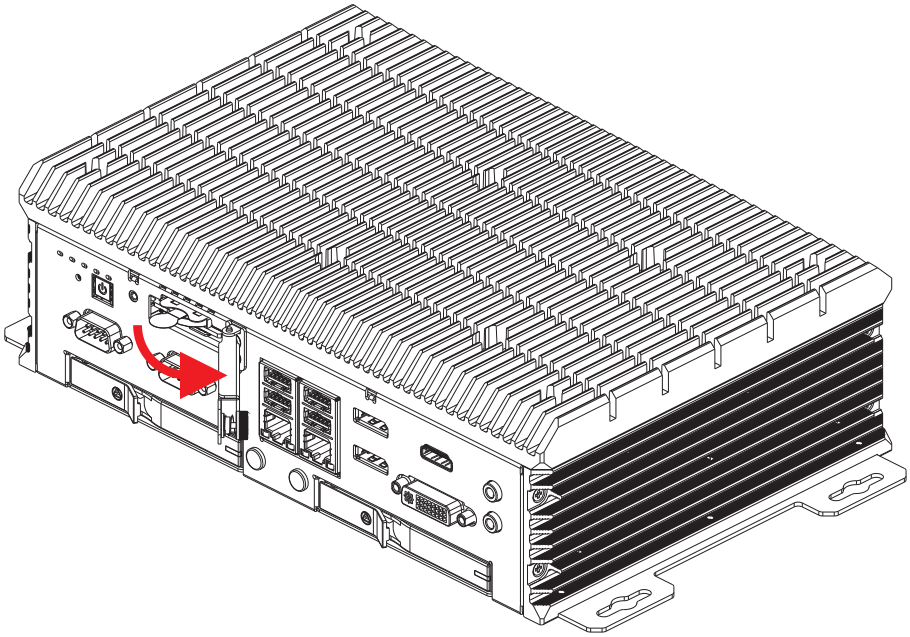


3.6 Installing Removable RTC Battery

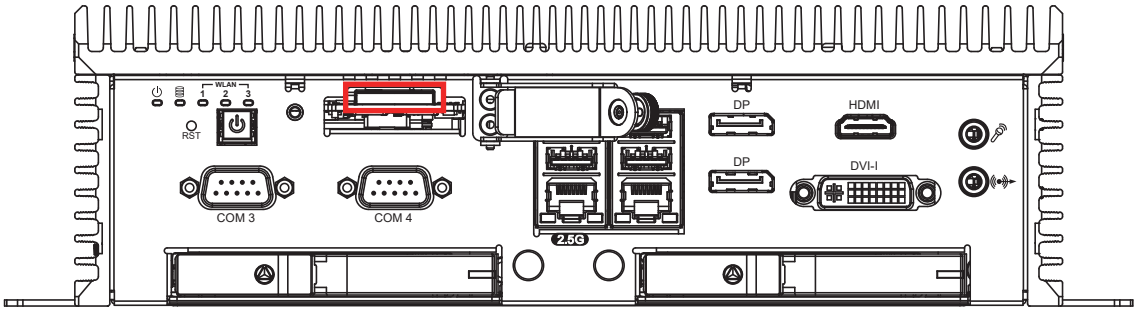
Step 1 Release captive panel screw.



Step 2 Install SIM card in the marked red area.



Step 3 Insert removable RTC battery

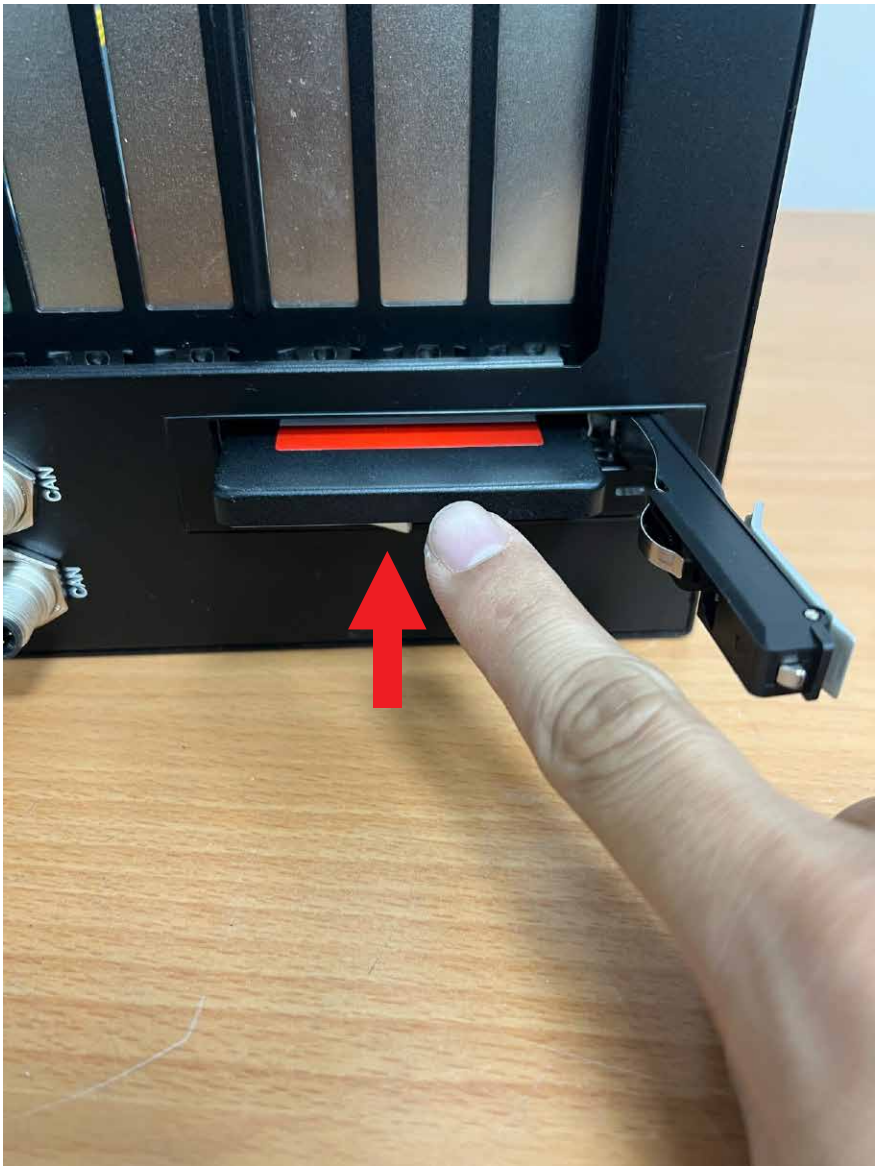


3.7 Installing SSD/HHD

3.7.1 ECX-3000-R series

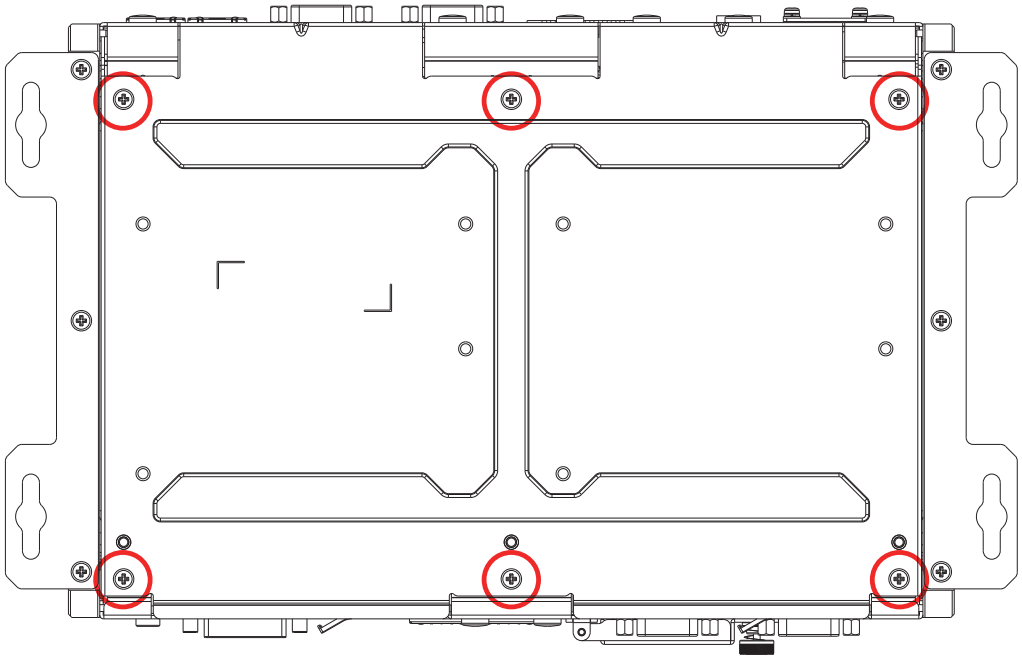
Step 1 Open SSD/HDD Door

Step 2 Insert 2.5” SSD/HDD into the tray.

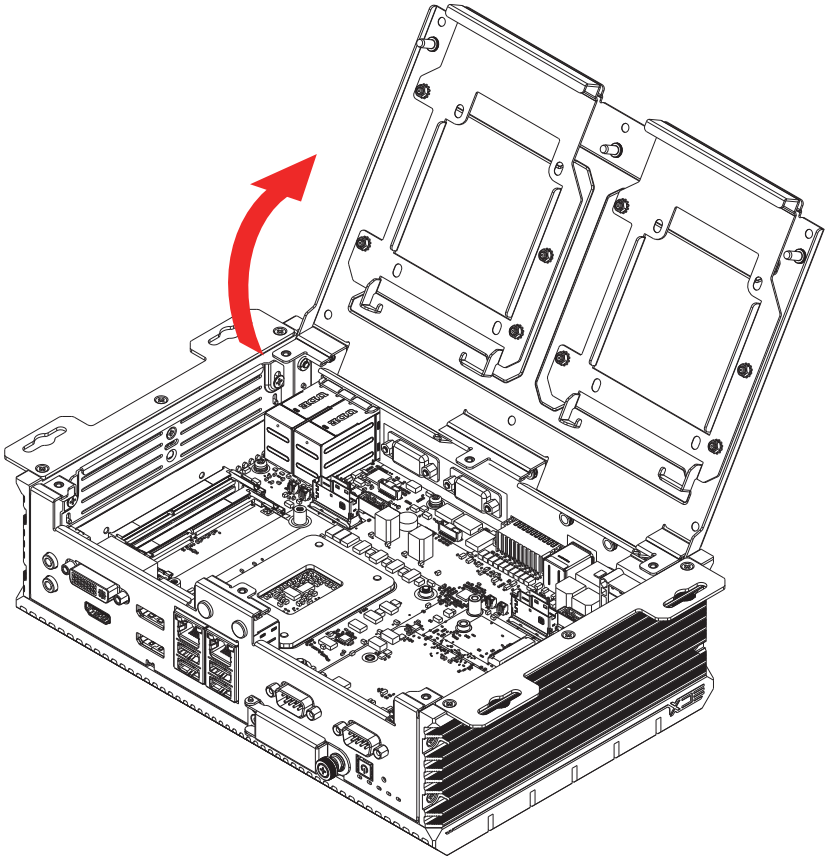


3.7.2 ECX-3000-G series series

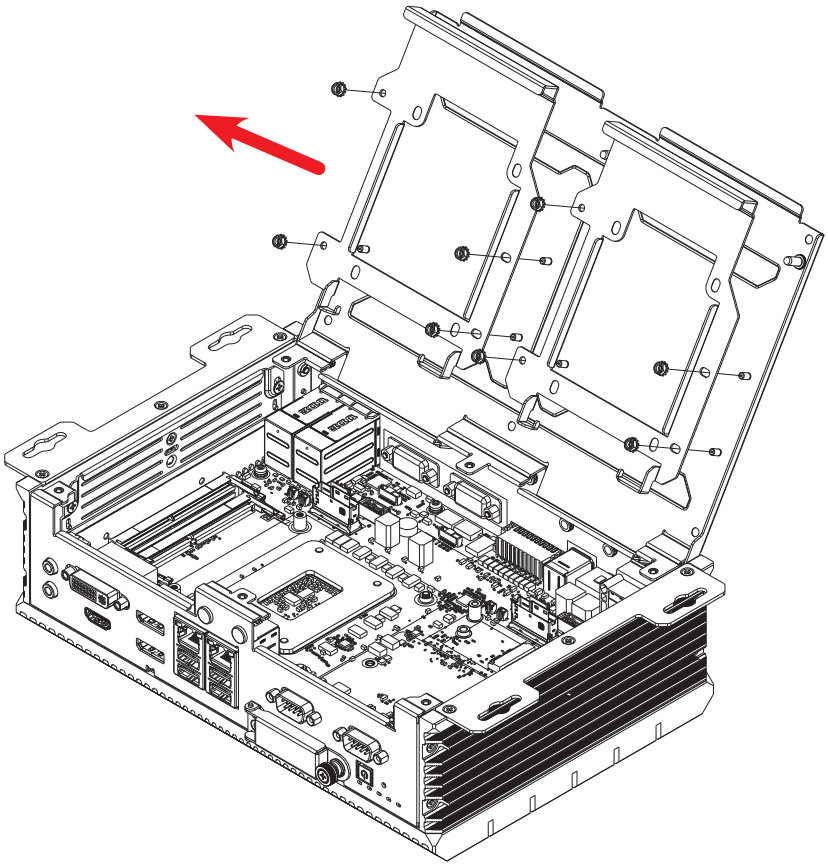
Step 1 Remove six flat head M3x5L screws.



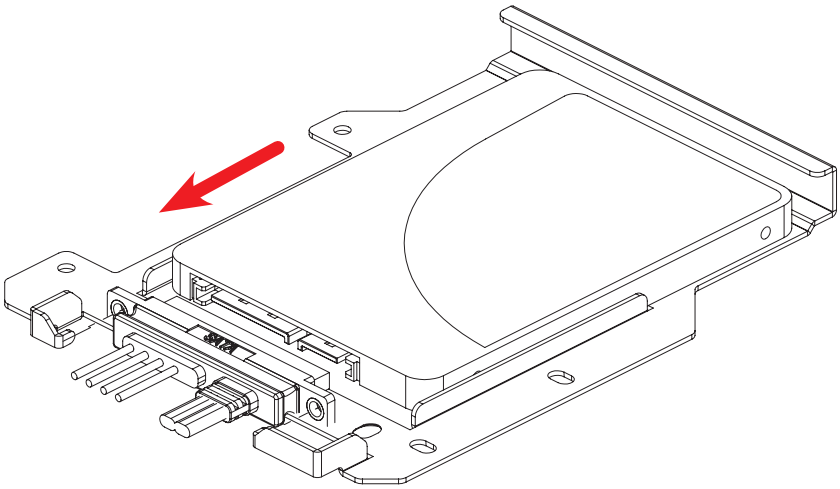
Step 2 Open bottom cover



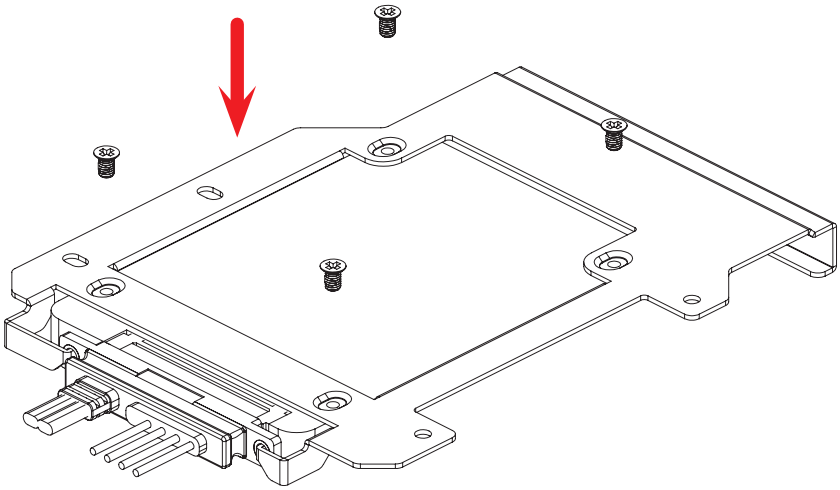
Step 3 Remove eight hexagon M3 nuts



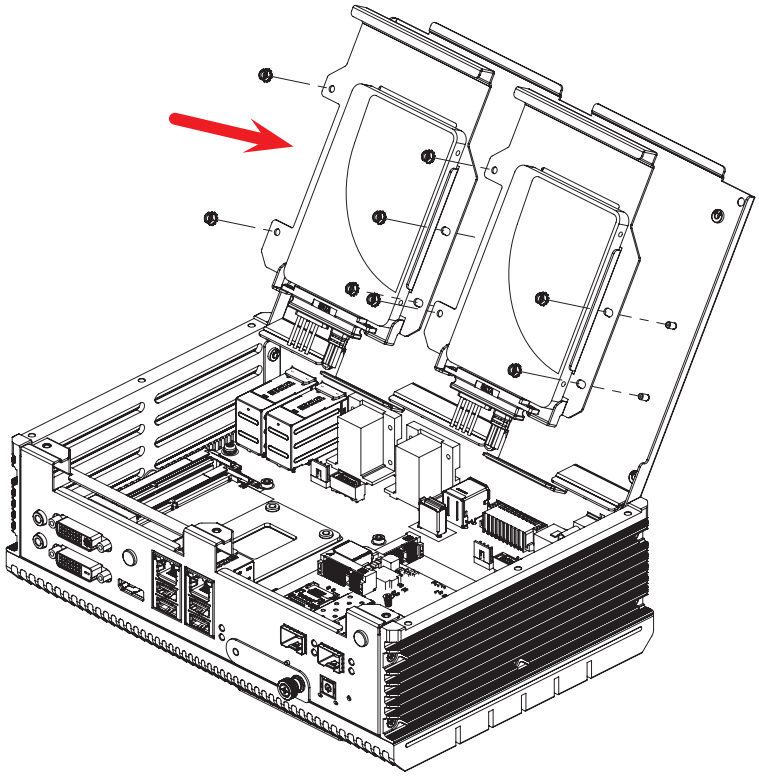
Step 4 Install SSD/HDD & SATA 22P cable into SSD/HDD bracket



Step 5 Use four flat head M3x4L screws and fasten SSD/HDD

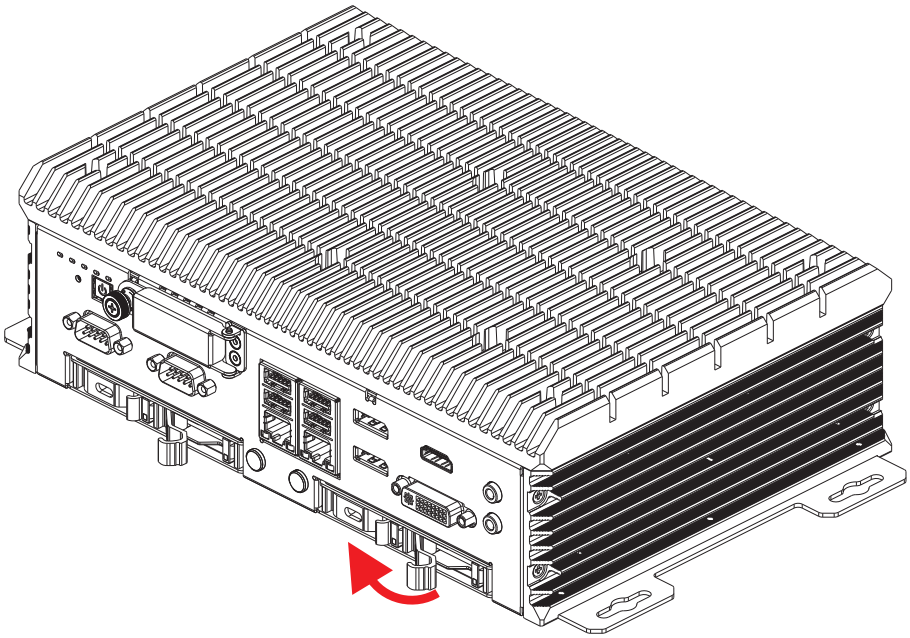


Step 6 Use eight Hexagon M3 Nuts and fasten bracket SSD/HDD

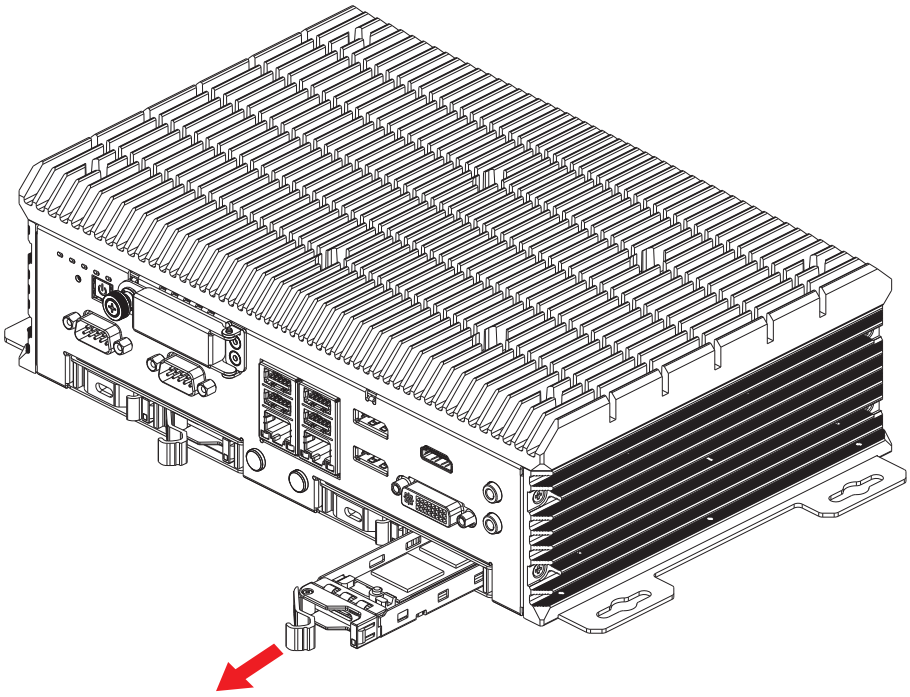


3.7.3 ECS-3000-S

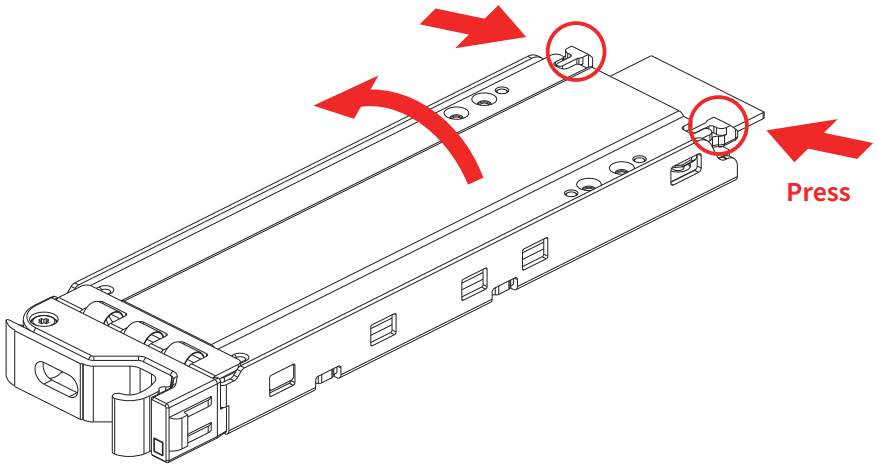
Step 1 Open front door of M.2 tray



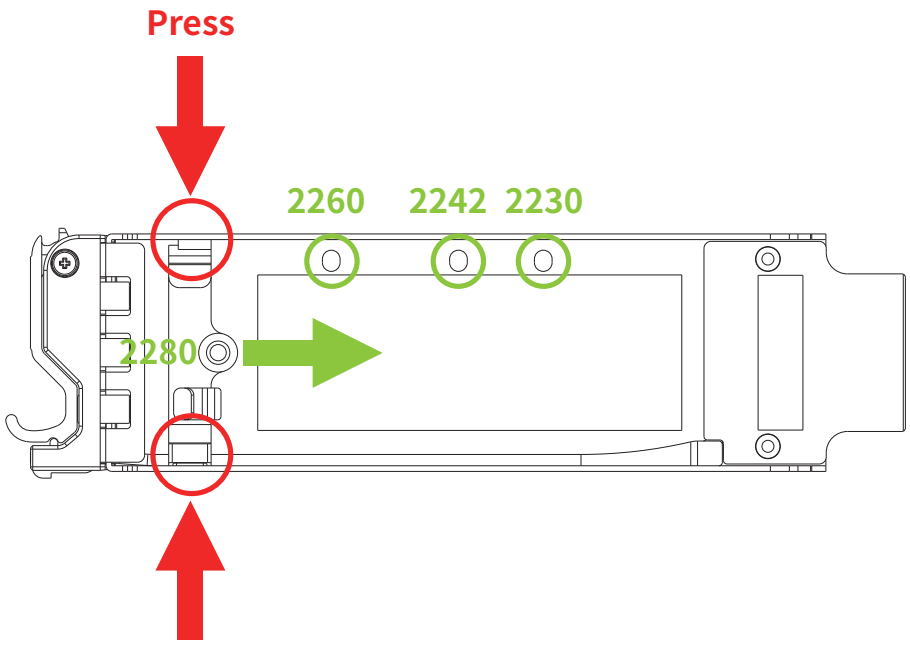
Step 2 Draw out M.2 tray



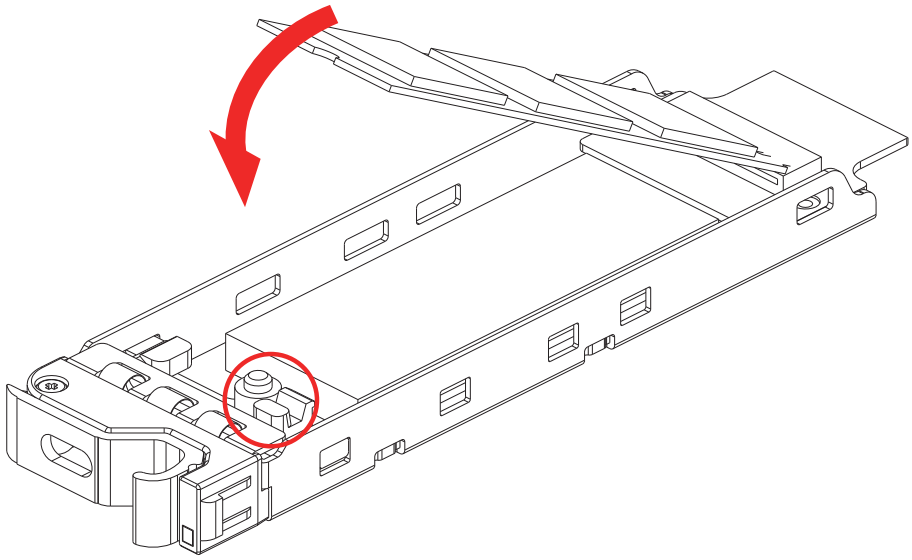
Step 3 Open top cover of M.2 tray



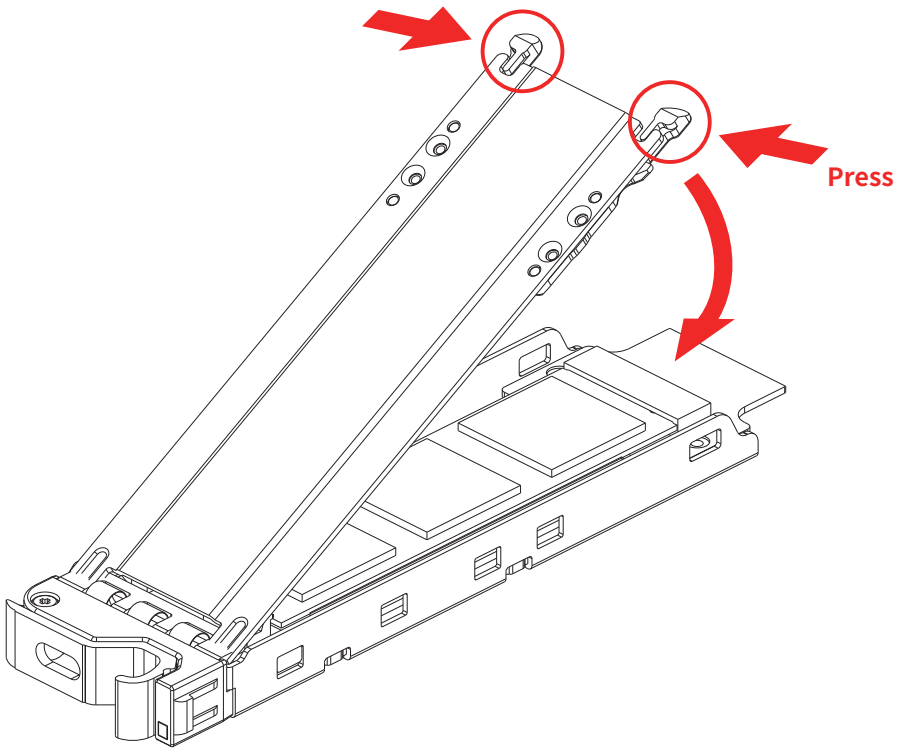
Step 4 If install 2230/2242/2260 M.2 module card, Press the latch of spacer support, and move to the position of 2230/2242/2260



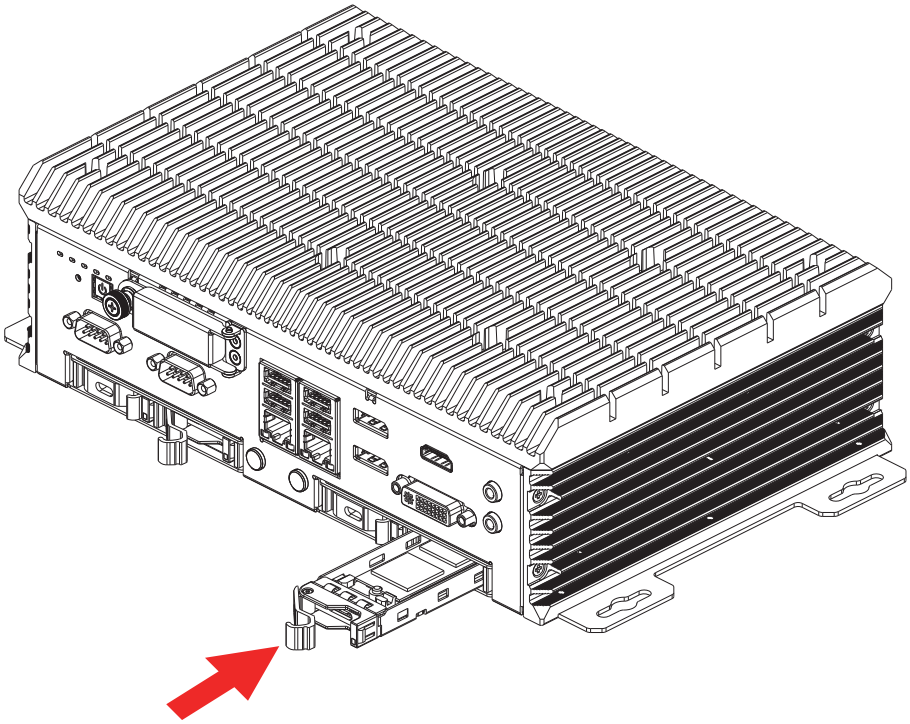
Step 5 Install M.2 module card



Step 6 Install top cover of M.2 tray



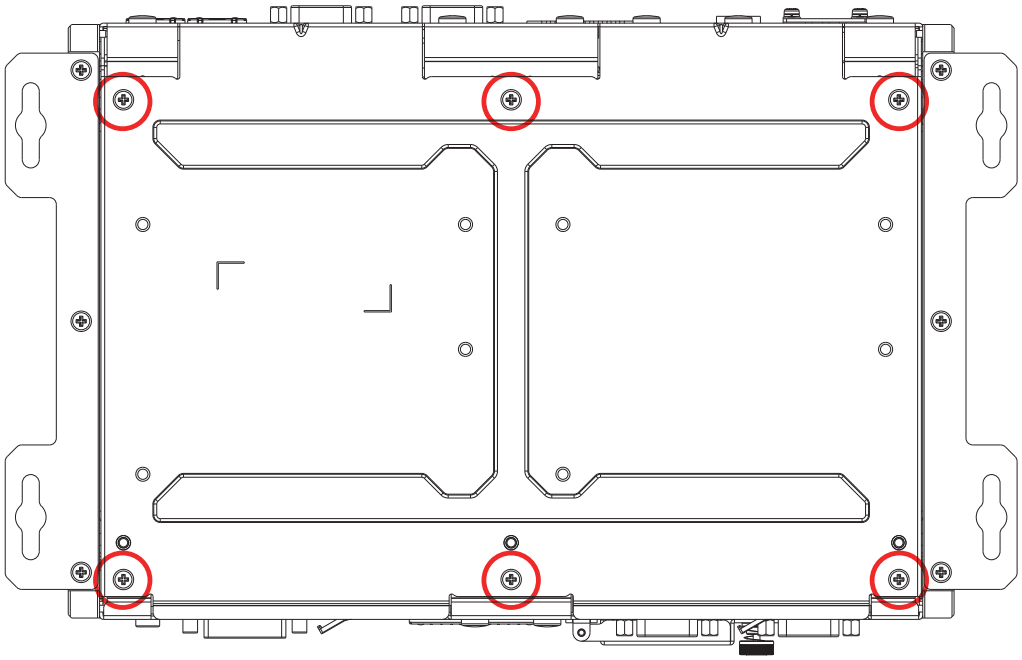
Step 7 Install M.2 tray

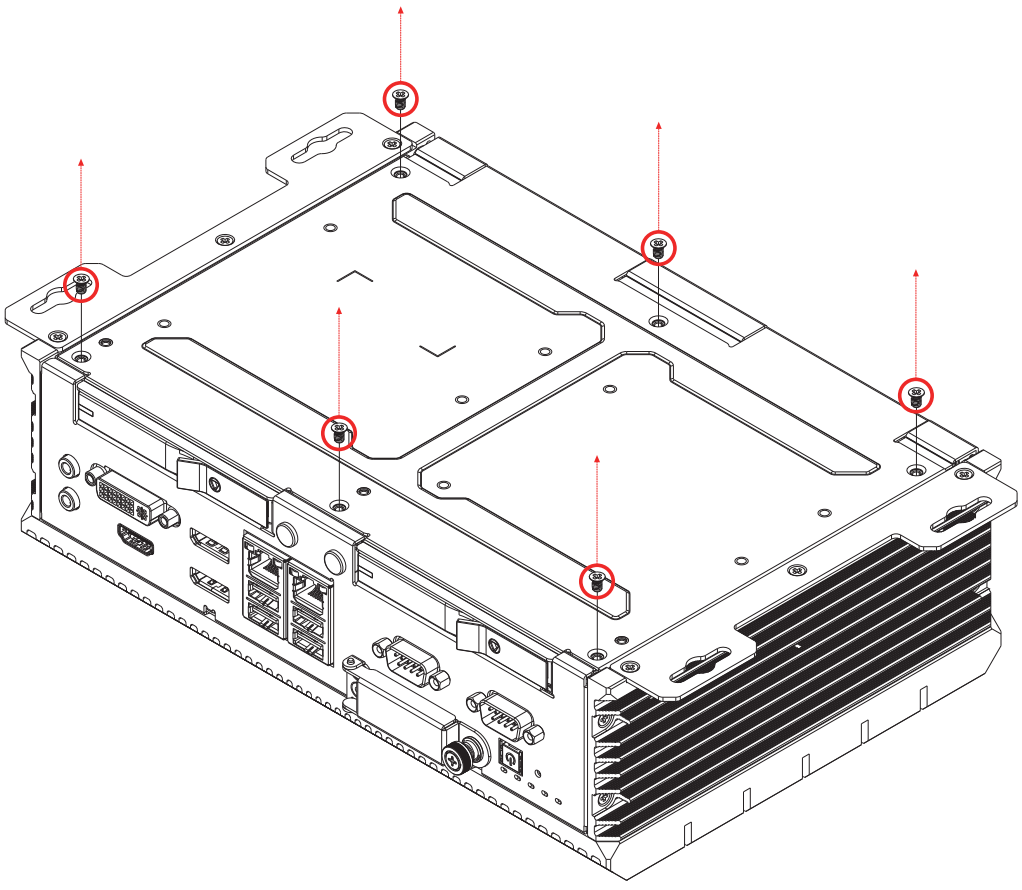


3.8 Installing M.2

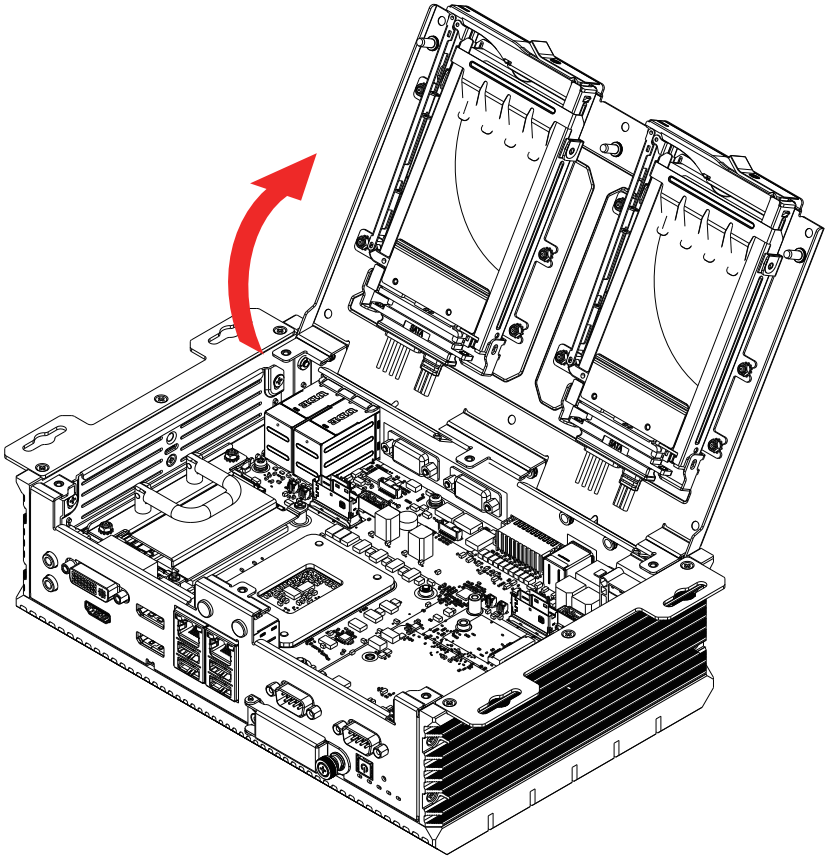
3.8.1 M.2 Key E 2230

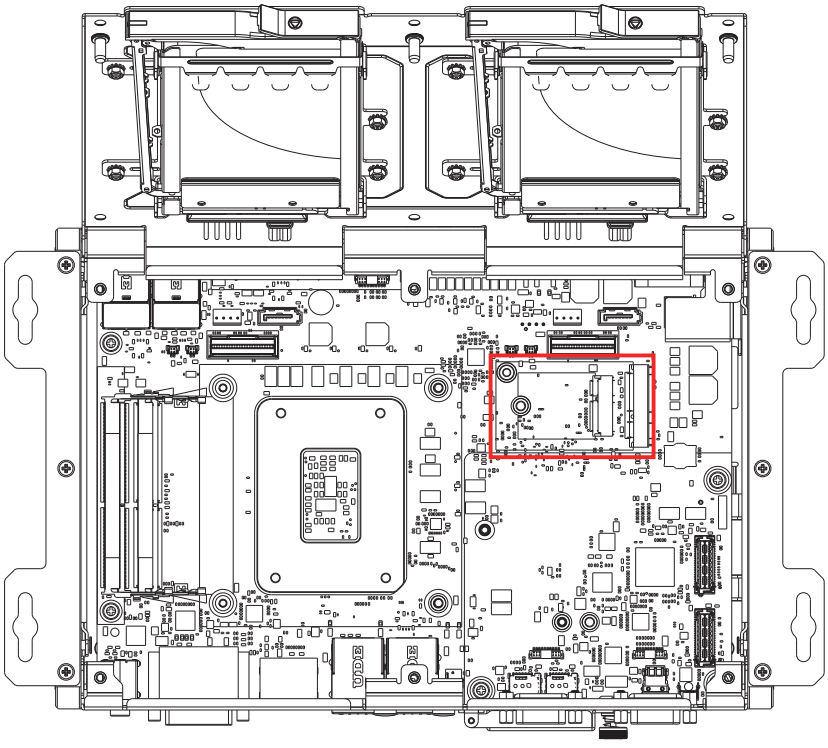
Step 1 Remove six flat head M3x5L screws



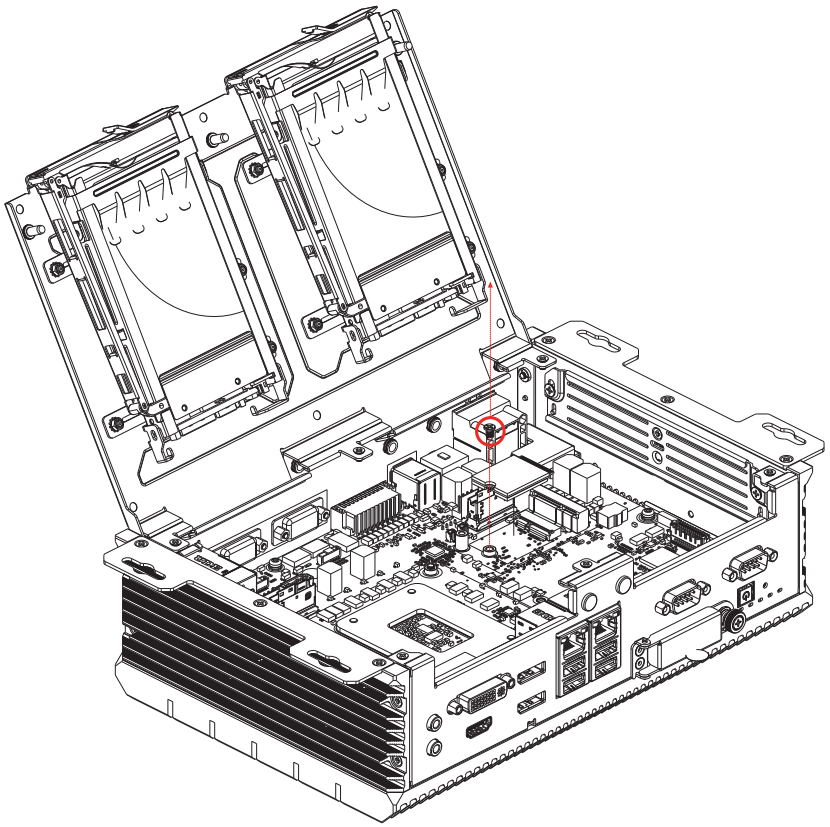


Step 2 Open bottom cover



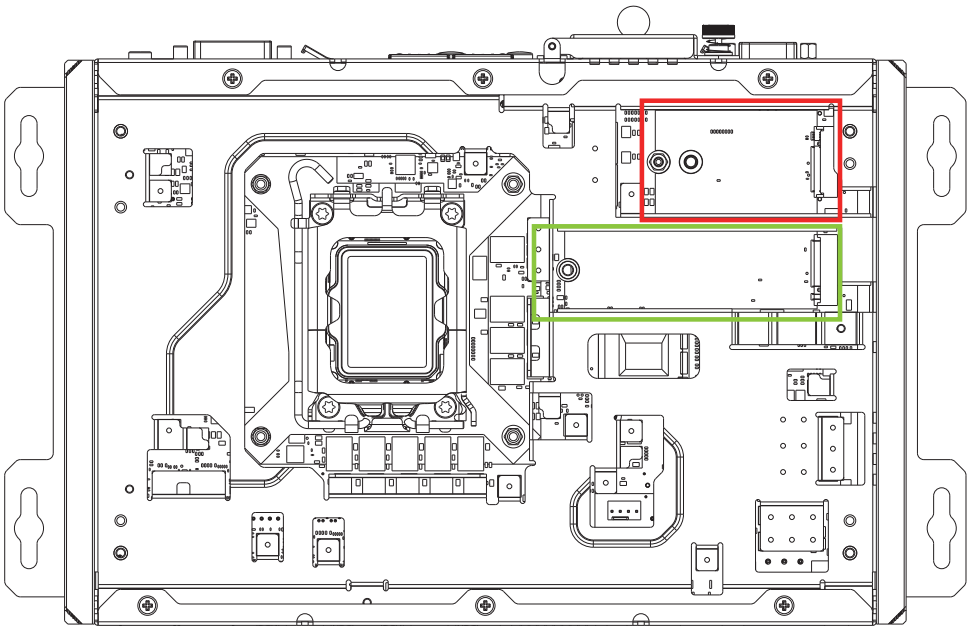


Step 3 Install M.2 module card into slot and fasten I head M3x4L screw



3.8.2 M.2 Key B 3042/3052 & Key M 2280

Step 1 Remove heat sink/cooler

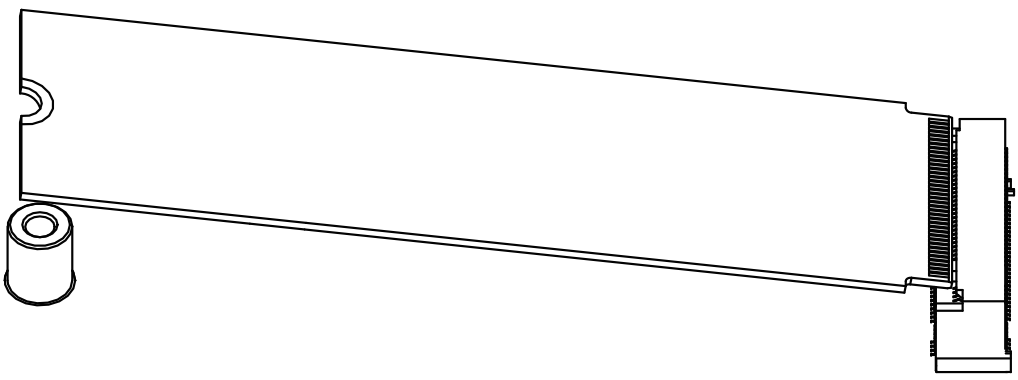


Step 2

M.2 Key B 3042
Install M.2 Key B 3042 module card into slot and fasten I head M2x2L screw

M.2 Key B 3052
Remove hexagon M3 standoff on the position of Key B 3042, Install M.2 Key B 3052 module card and fasten I head M2x2L screw

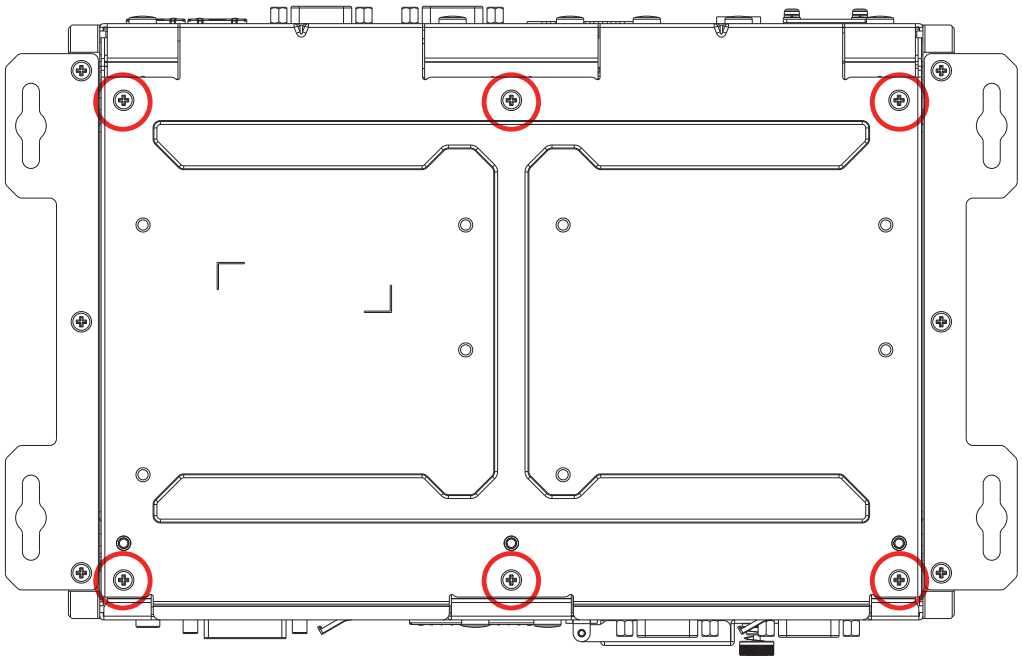
M.2 Key M 2280
Install M.2 Key M 2280 module card into slot and fasten I head M3x4L screw

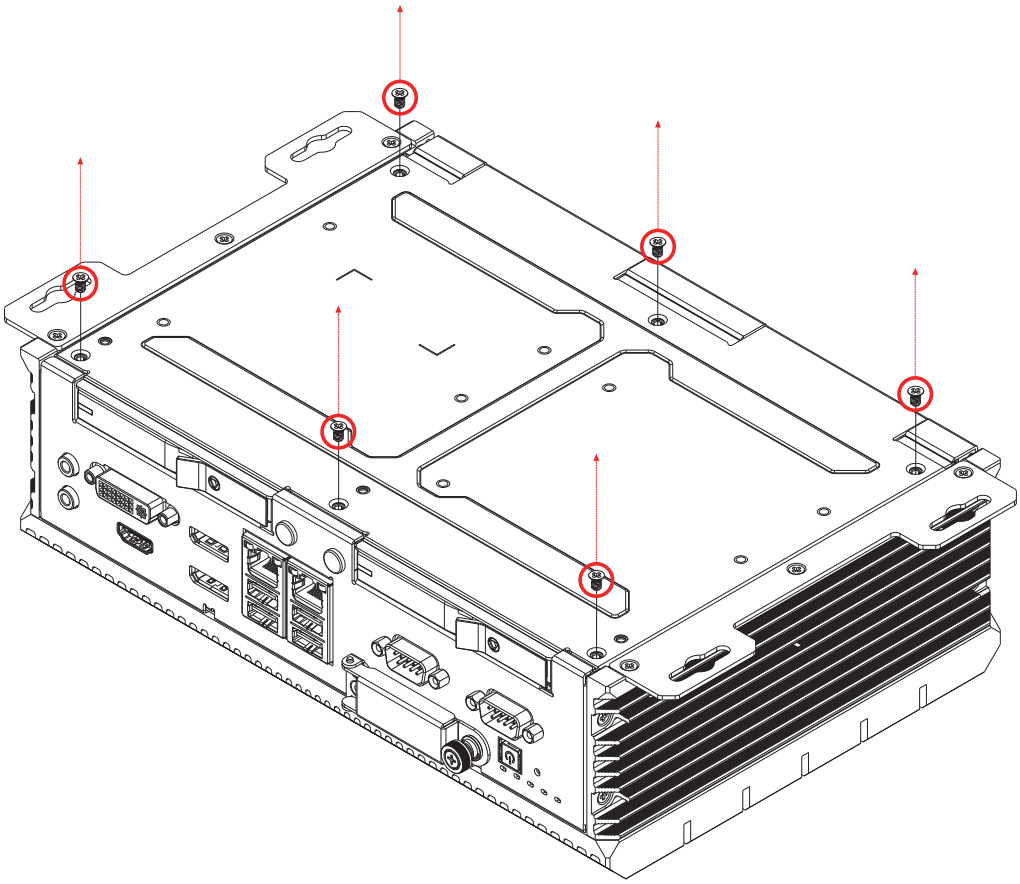


3.9 Installing Antenna Cable

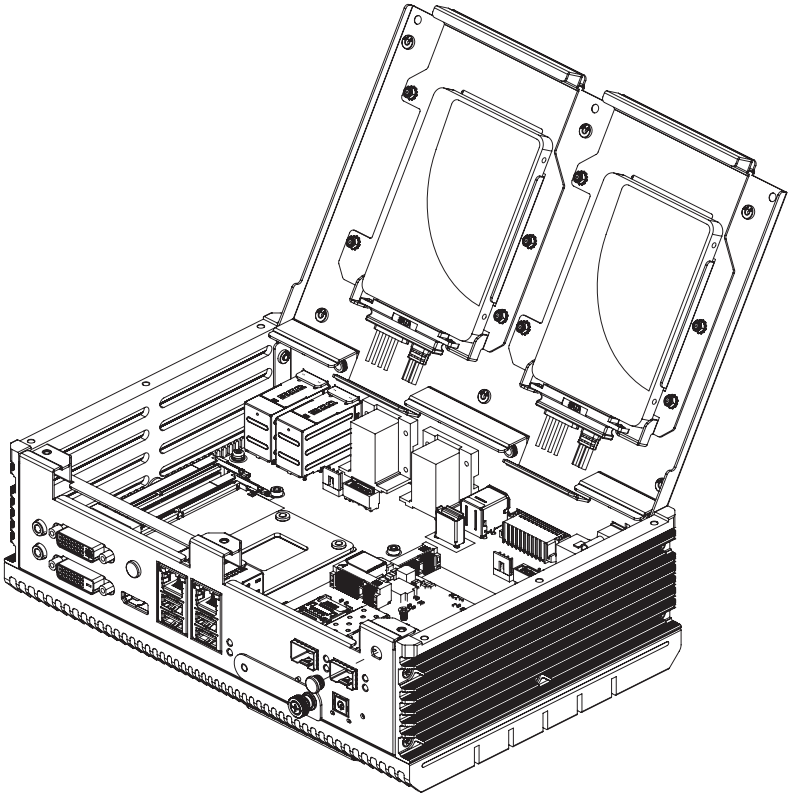
Step 1 Check antenna parts (cable and washers).

Step 2 Remove six flat head M3x5L screws

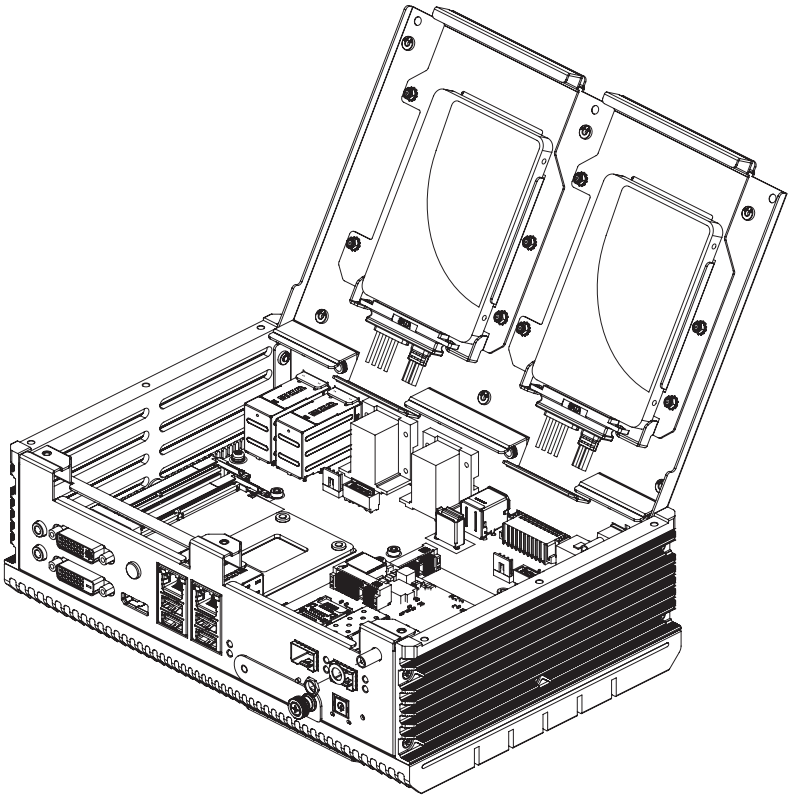




Step 3 Remove hole plug.



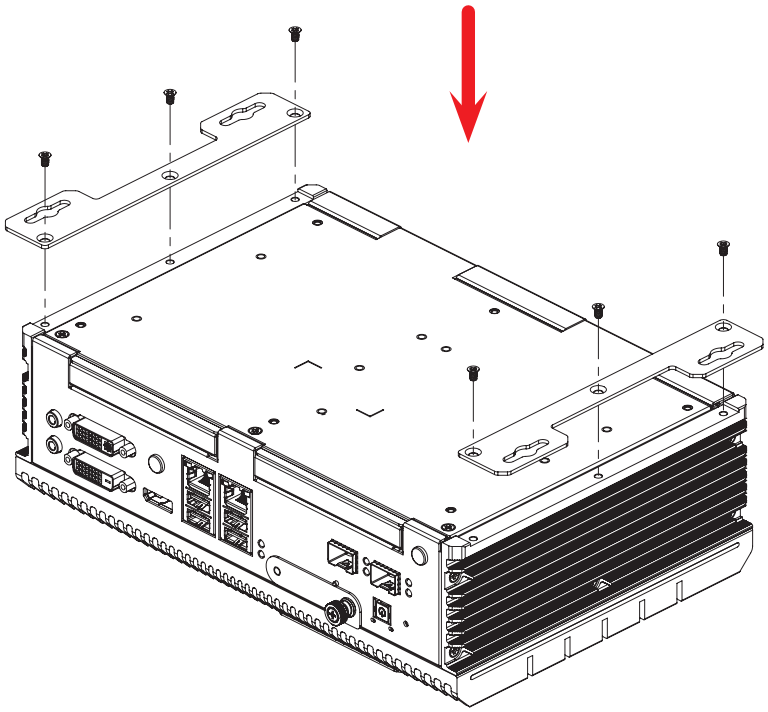
Step 4 Install SMA cable and fasten washer and nut.



3.10 Mount Your ECX-3000

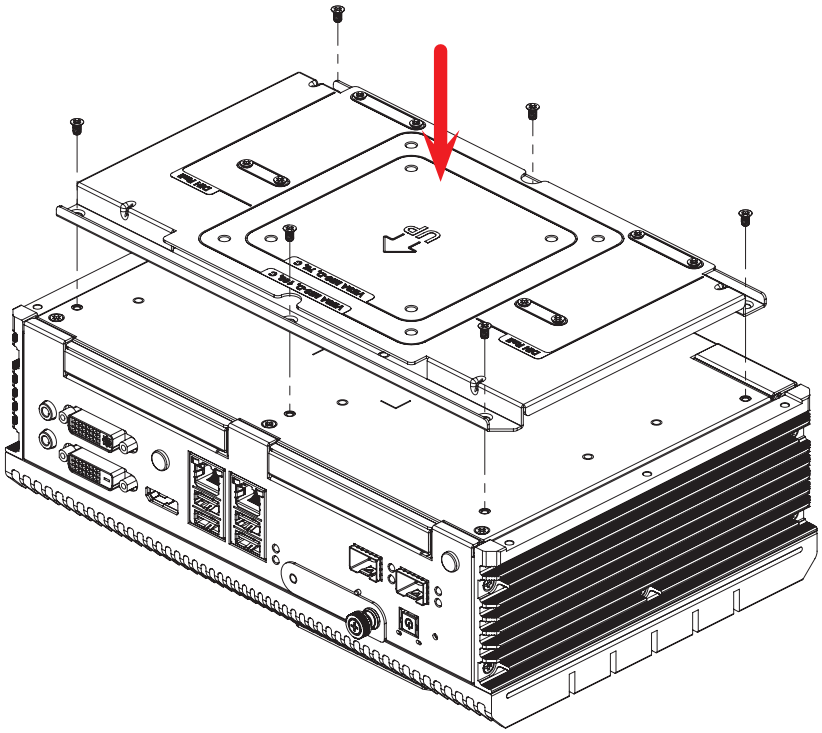
3.10.1 Wall Mount

Fasten six flat head M3x5L screws.



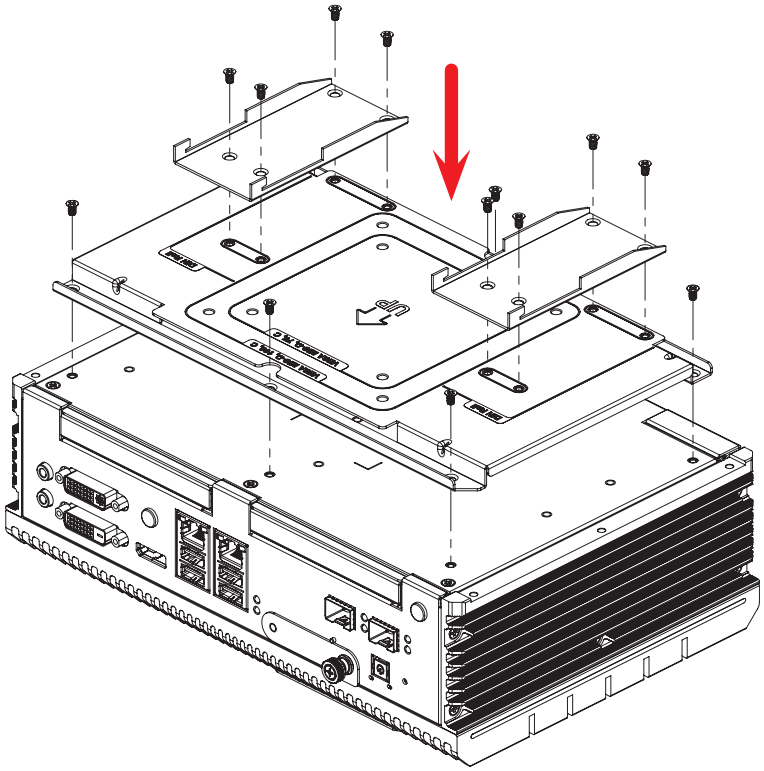
3.10.2 VESA Mount

Fasten six flat head M3x5L screws
VESA 75 x 75/100 x 100 mm

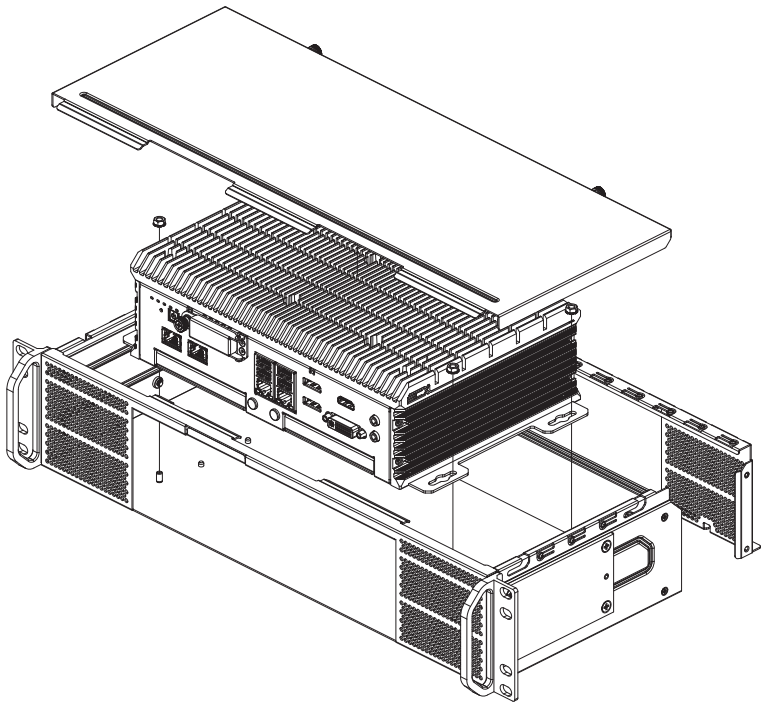


3.10.3 DIN Rail Mount

Fasten fourteen flat head M3x5L screws.

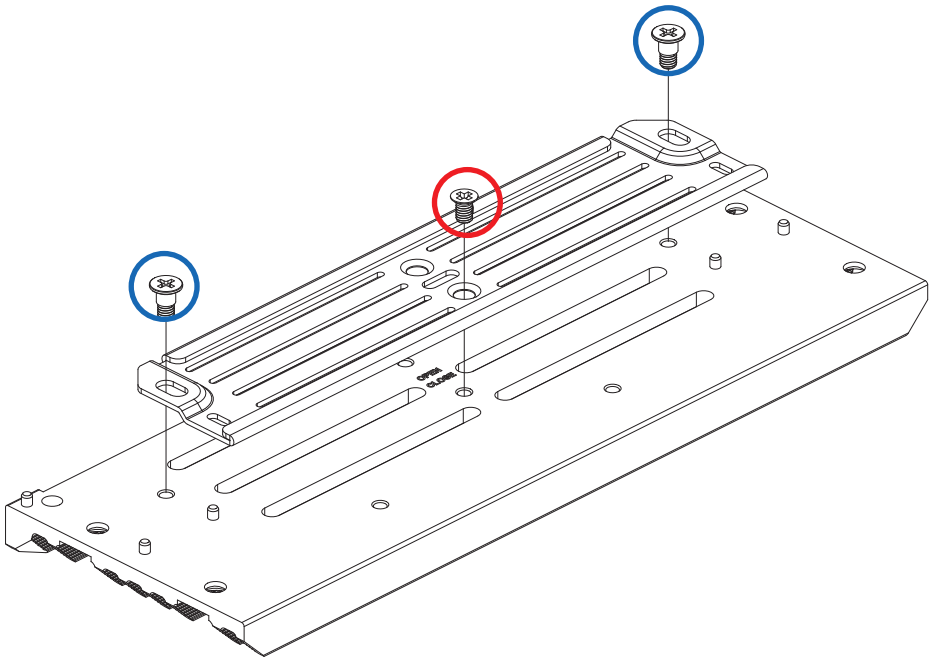


3.10.4 2U Rack Mount

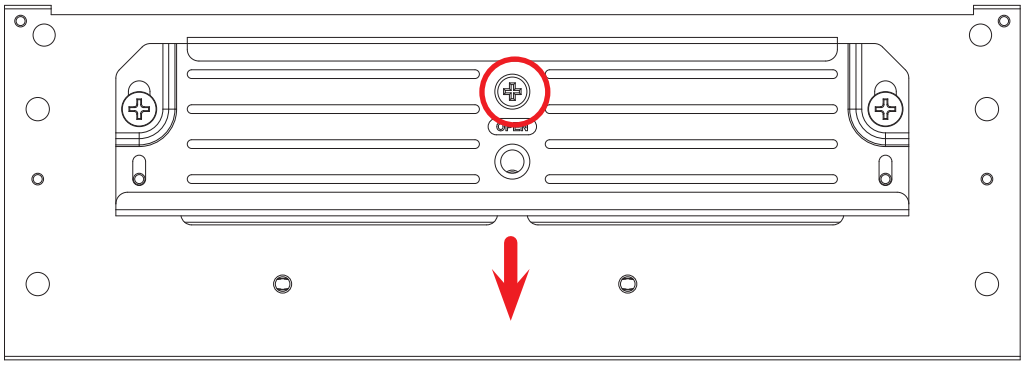


3.11 Blocking side heatsink air vent of ECX-3000

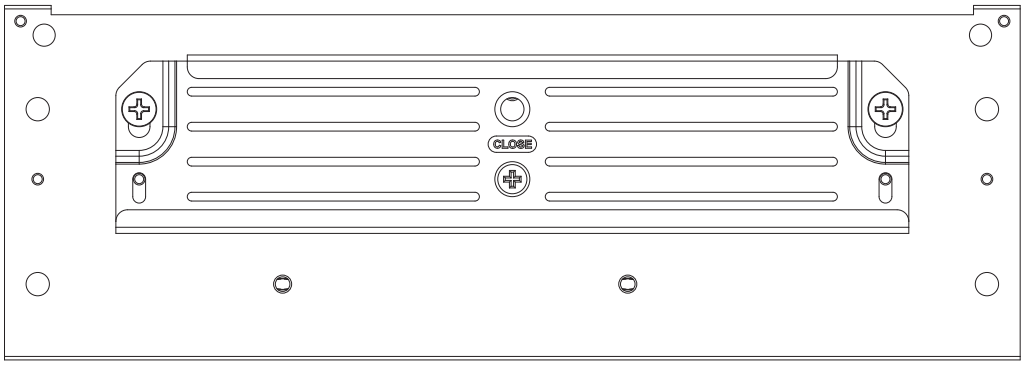
Step 1 Fasten 1 flat head M3x5L screws in the middle and 2 M3 I Head Screw at both sides of the heatsink side cover.



Step 2 Loosen the screw and slide the cover downward.



Step 3 Finished.



4

BIOS SETUP

4.1 BIOS Setup

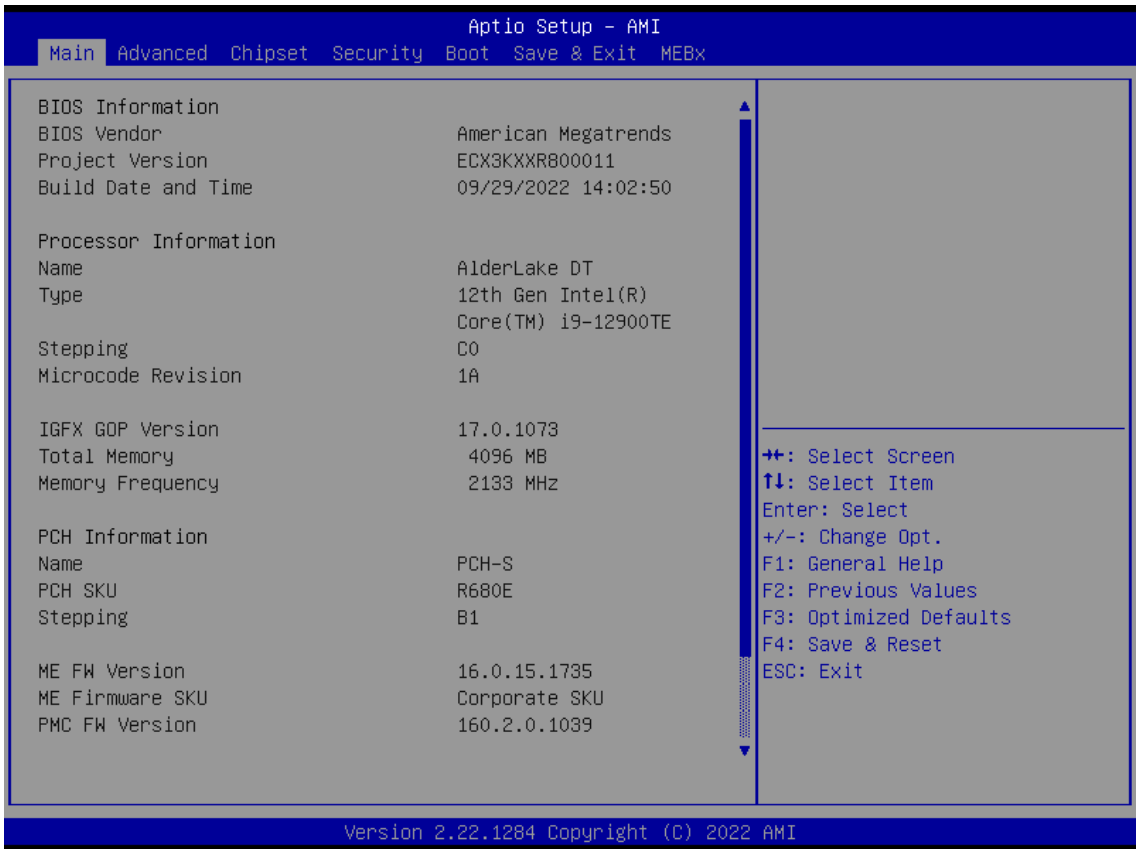


Figure 4-1 : Entering Setup Screen

BIOS provides an interface for users to check and change system configuration. The BIOS setup program is accessed by pressing the <Del> key when POST display output is shown.

4.2 Main Menu

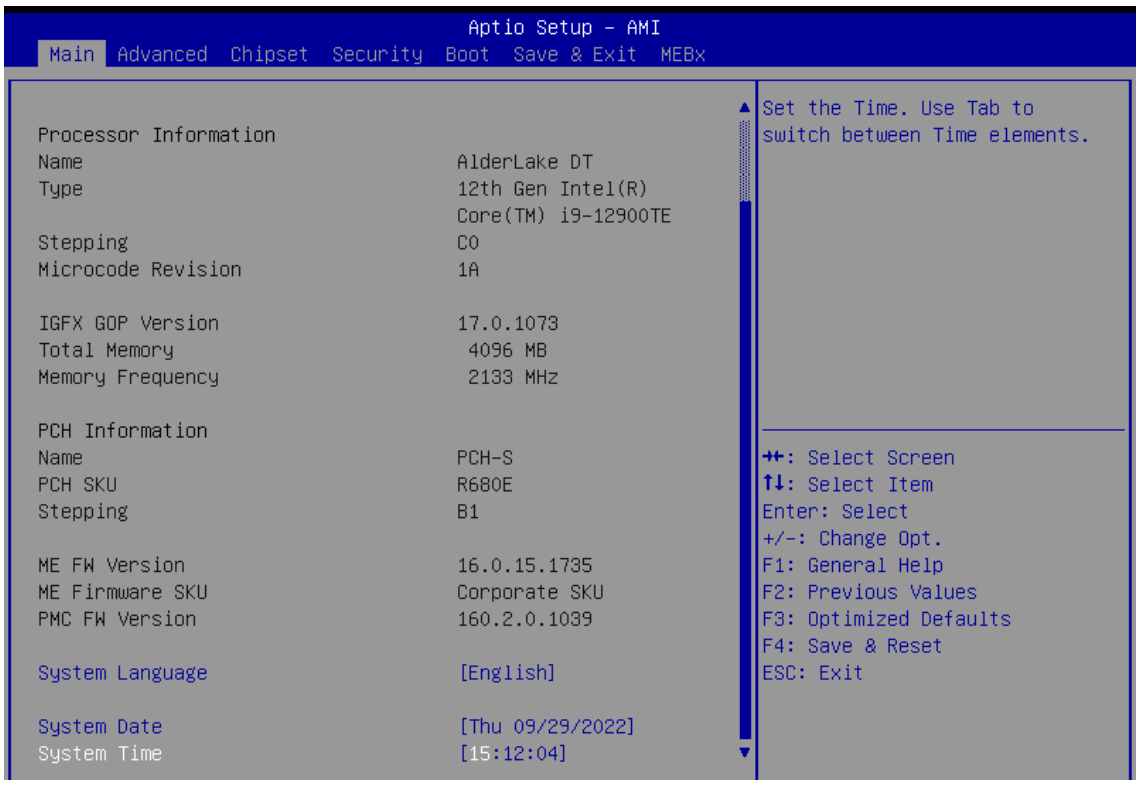


Figure 4-2 : BIOS Main Menu

The main menu displays BIOS version and system information. There are two options on the main menu, system date and system time.

System Date

Set the date. Use Tab to switch between date elements.

System Time

Set the time. Use Tab to switch between time elements.

4.3 Advanced Functions

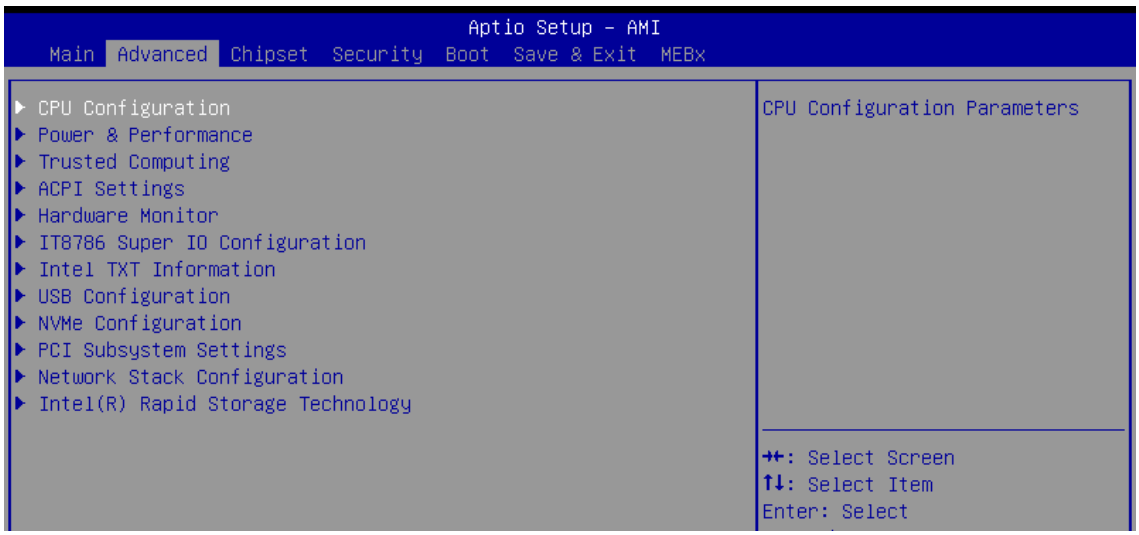


Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, SATA configuration, and USB configuration.

4.3.1 CPU Configuration

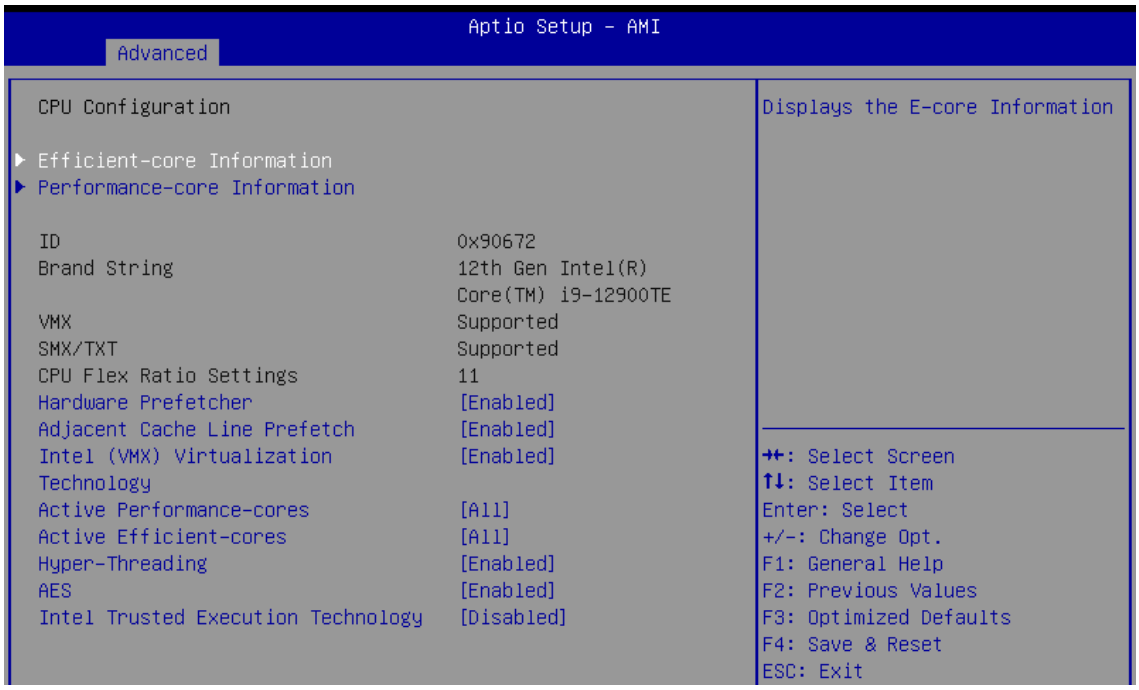


Figure 4-3-1 : CPU Configuration

Hardware Prefetcher
To turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch
To turn on/off prefetching of adjacent cache lines.

Intel (VMX) Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Performance-cores
Number of P-cores to enable in each processor package.

Active Efficient-cores
Number of E-cores to enable in each processor package.

Hyper-threading
Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per core is enabled.

AES
Enable/disable CPU Advanced Encryption Standard instructions.

Intel Trusted Execution Technology
Enables utilization of additional hardware capabilities provided by Intel ® Trusted Execution Technology. Changes require a full power cycle to take effect.

4.3.1.1 Efficient-core Information

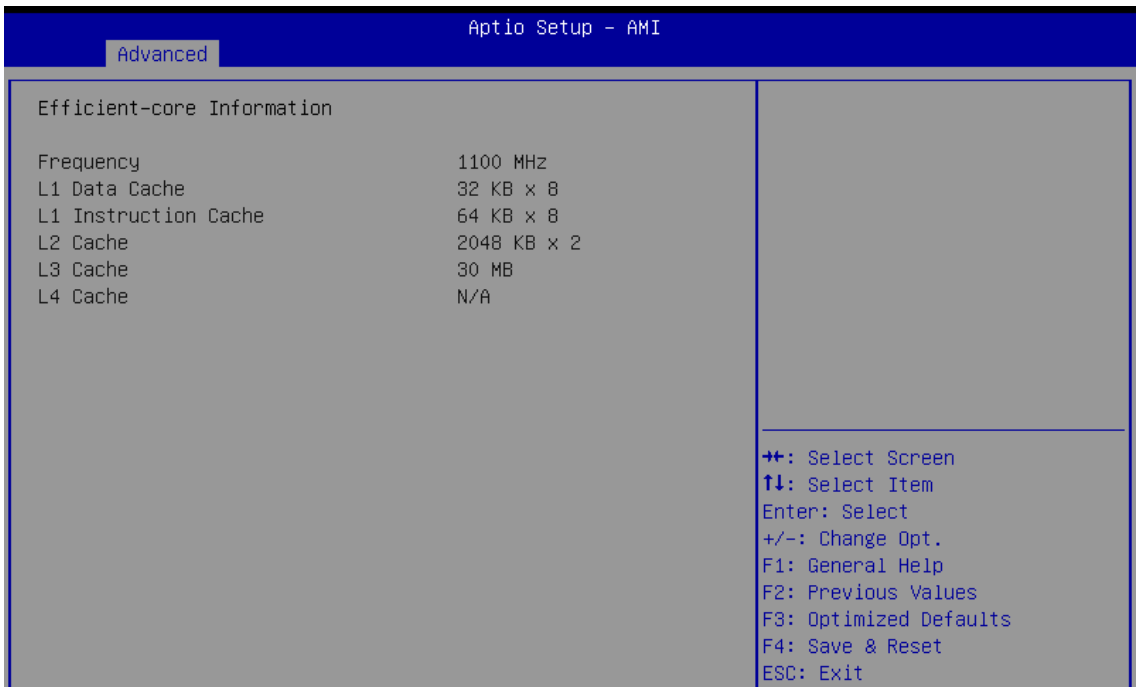


Figure 4-3-1-1 : Efficient-core Information

Displays Efficient-core Information.

4.3.1.2 Performance-core Information

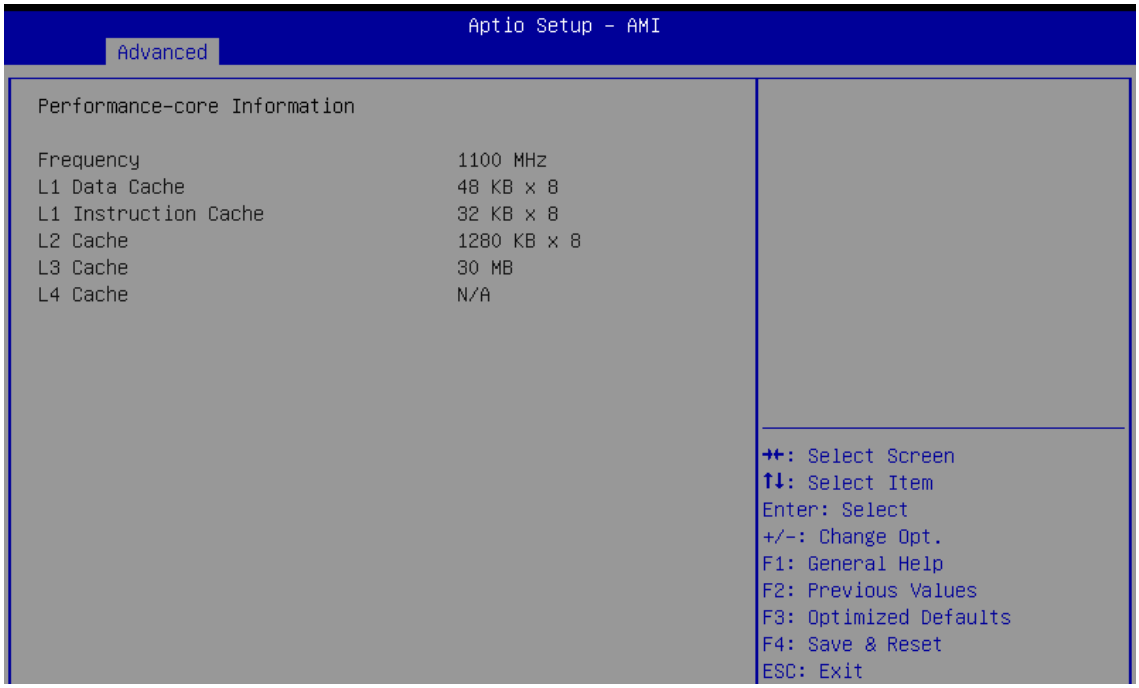


Figure 4-3-1-2: Performance-core Information

Displays Performance-core Information.

4.3.2 Power & Performance

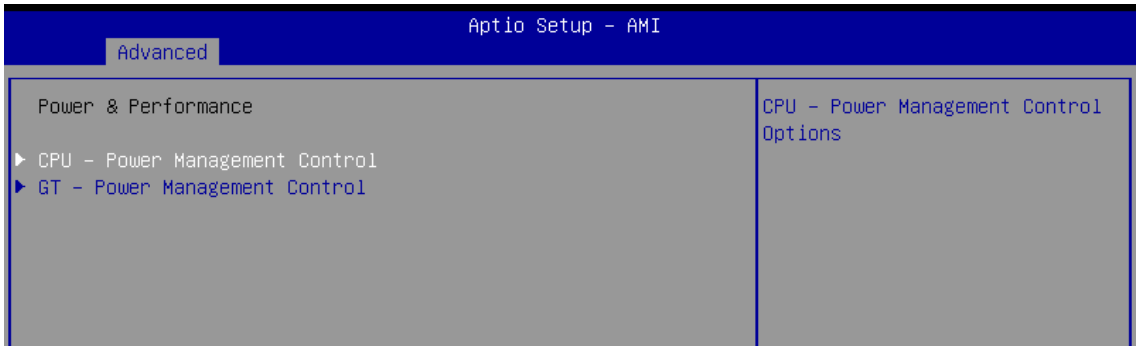


Figure 4-3-2 : Power & Performance

4.3.2.1 CPU – Power Management Control

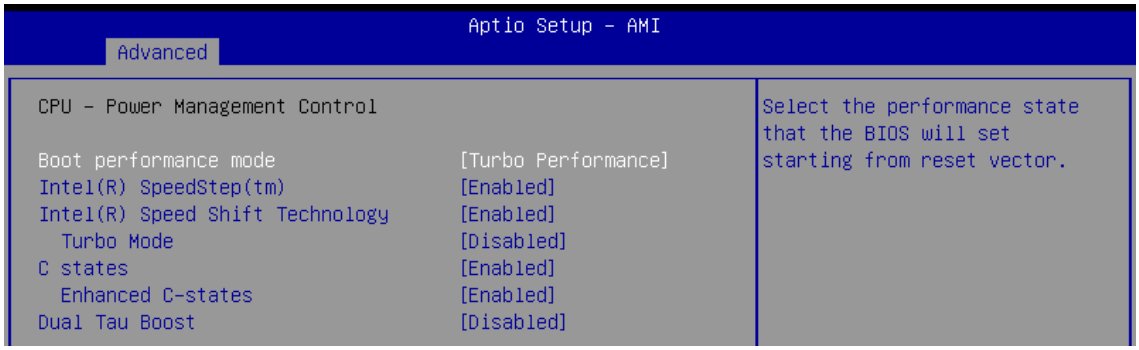


Figure 4-3-2-1 : CPU – Power Management Control

Boot performance mode
Select the performance state that the BIOS will set before OS handoff.

Intel(R) SpeedStep(tm)
Select the performance state that the BIOS will set before OS handoff.

Intel(R) Speed shift Technology
Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPCv2 interface to allow for hardware controlled P-states.

Turbo Mode
Turbo Mode.

C states
Enable or disable CPU C states.

Enhanced C-states
Enable/disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

Dual Tau Boost
Enable Dual Tau Boost feature. This is only applicable for Desktop 35W/65W/125W sku. When DPTF is enabled this feature is ignored.

4.3.2.2 GT – Power Management Control

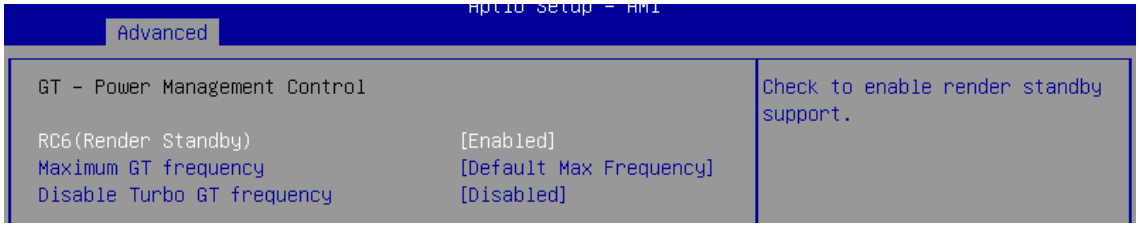


Figure 4-3-2-2 : GT – Power Management Control

RC6(Render Standby)
Check to enable render standby support.

Maximum GT frequency
Maximum GT frequency limited by the user. Choose between 100MHz (RPN) and 1200MHz (RP0). Value beyond the range will be clopped to min/max supported by SKU.

Disable Turbo GT frequency
Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited.

4.3.3 PCH-FW Configuration

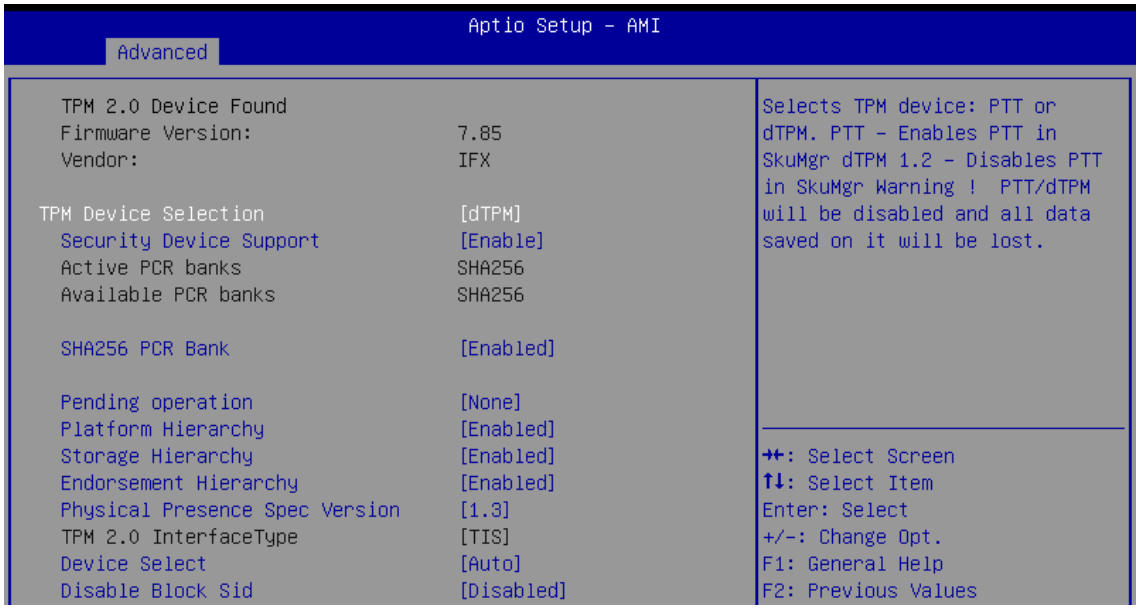


Figure 4 3-3: Trusted Computing

TPM Device Selection
Selects TPM device: PTT or discrete TPM.

Security Device Support
Enables or Disables BIOS support for security device. O.S. will not show Security Device.

SHA256 PCR Bank
Enable or Disable SHA256 PCR Bank.

Pending operation
SSchedule an Operation for the Security Device.

Platform Hierarchy
Enable or Disable Platform Hierarchy.

Storage Hierarchy
Enable or Disable Storage Hierarchy.

Endorsement Hierarch
Enable or Disable Endorsement Hierarchy.

Physical Presence Spec Version
Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.

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

Disable Block Sid
Override to allow SID authentication in TCG Storage device.

4.3.4 ACPI Settings

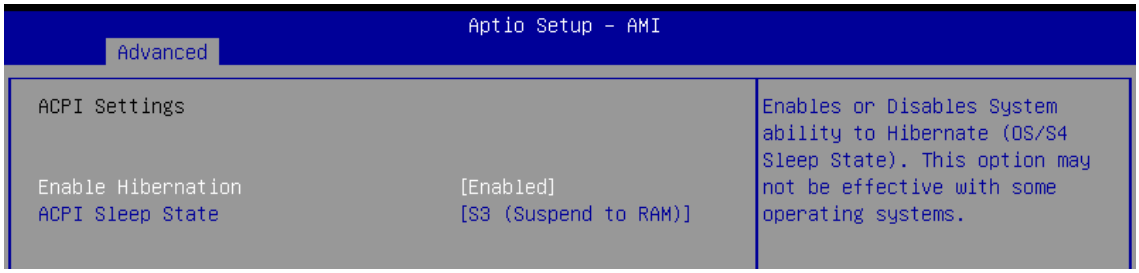


Figure 4-3-4 : ACPI Settings

Enable Hibernation
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.

ACPI Sleep State
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

4.3.5 Hardware Monitor

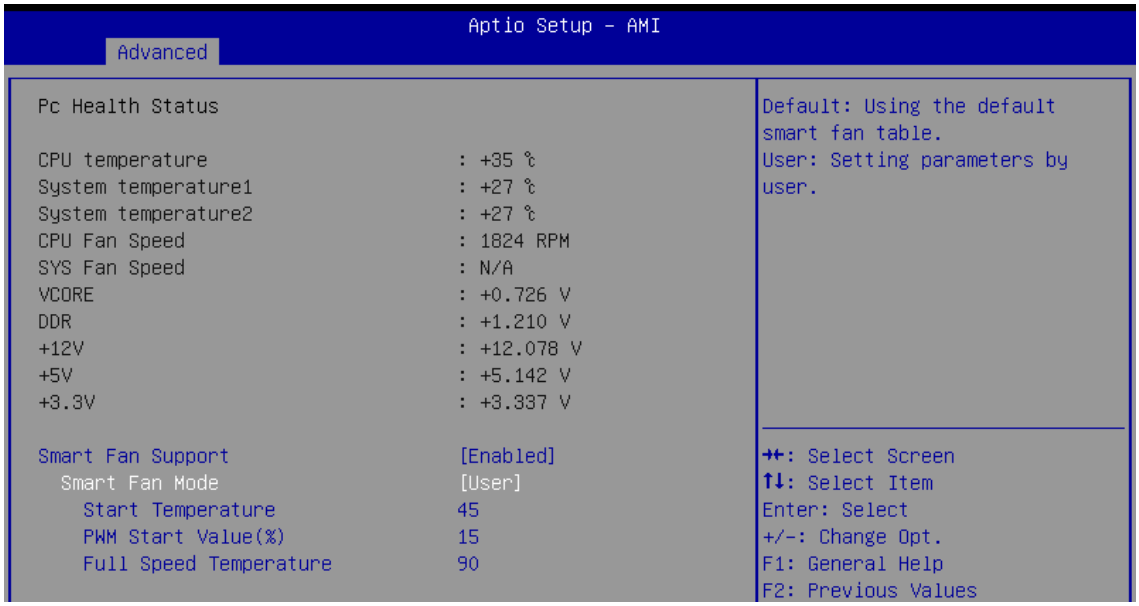


Figure 4-3-5: Hardware Monitor Settings

The IT8786 SIO features an enhanced hardware monitor providing thermal, fan speed, and system voltages' status monitoring.

Smart Fan Support
Smart Fan Support. Work with Full Speed if “Smart Fan Support” is Disabled.

Smart Fan Mode
Default: Using the default smart fan table.

User: Setting parameters by user..

Start Temperature
Temperature Limit value of Fan Start (Degree C).
(Range:10~80)

PWM Start Value (%)
Default PWM Value of Fan.
(Range:15%~100%)

Full Speed Temperature
Temperature Limit value of Fan Full Speed (Degree C)..
(Range:50~90)

4.3.6 IT8786 Super IO Configuration

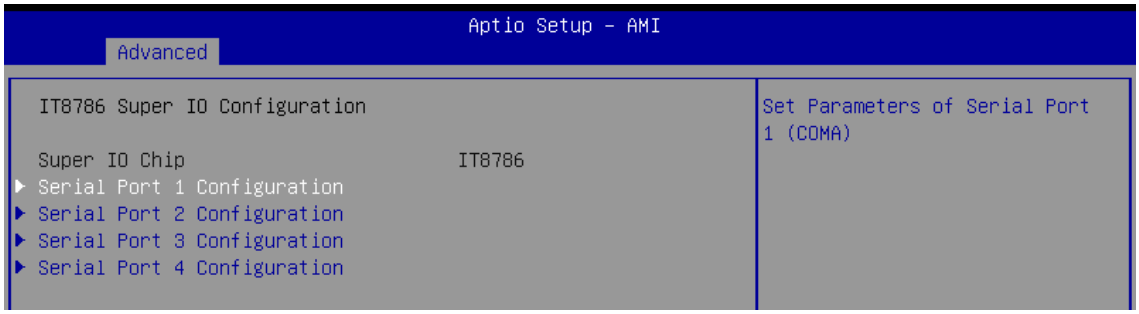


Figure 4-3-6: IT8786 Super IO Settings

4.3.6.1 Serial Port X Configuration

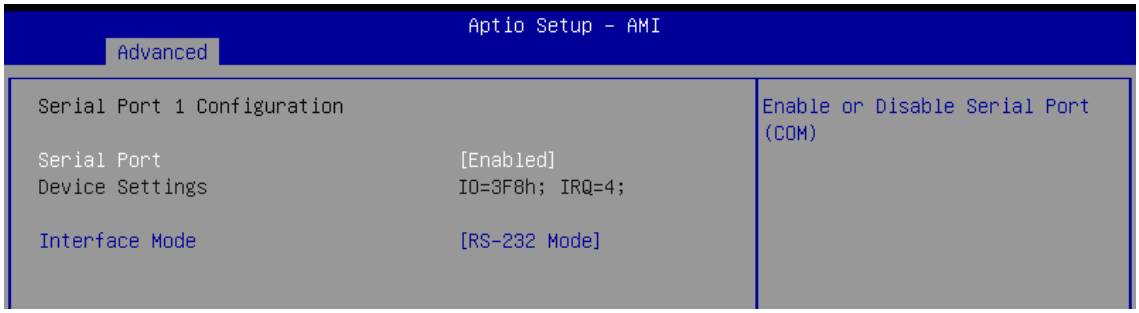


Figure 4-3-6-1: Serial Port X Configuration

Serial Port 1 to port 4 Configuration

Options for Serial Port 1 to Serial Port 4.

Entering the corresponding Port option then end user can change the settings such as I/O resource and UART mode.

4.3.7 Intel TXT Information

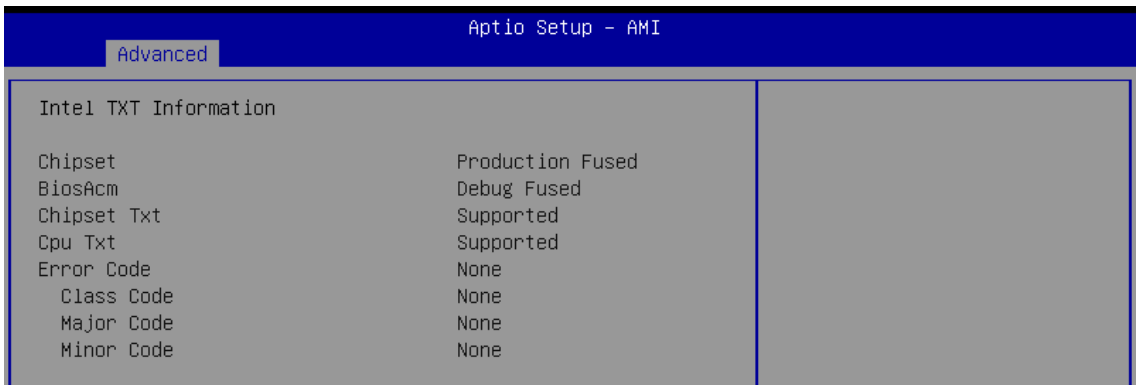


Figure 4-3-7: Intel TXT Information

Display Intel TXT information.

4.3.8 USB Configuration

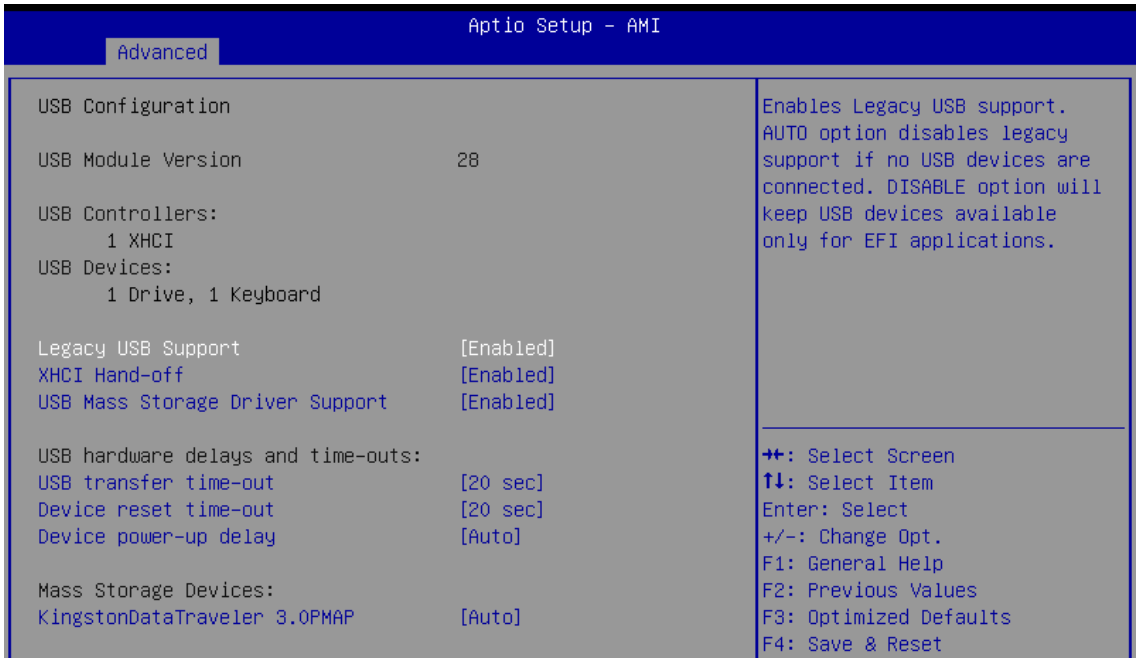


Figure 4-3-8: USB Settings

Legacy USB Support
Enables Legacy USB support.

AUTO option disables Legacy support if no USB devices are connected.

DISABLE option will keep USB devices available only for EFI applications.

XHCI Hand-off
This is a workaround for OS-es without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

USB Mass Storage Driver Support
Enable/disable USB mass storage driver support.

USB transfer time-out
The time-out value for control, bulk, and interrupt transfers.

Device reset time-out
USB mass storage device start unit command time-out.

Device power-up delay
Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value, for a root port it is 100 ms, for a hub port the delay is taken from the hub descriptor.

Mass Storage Devices:
Mass storage device emulation type.

4.3.9 NVMe Configuration

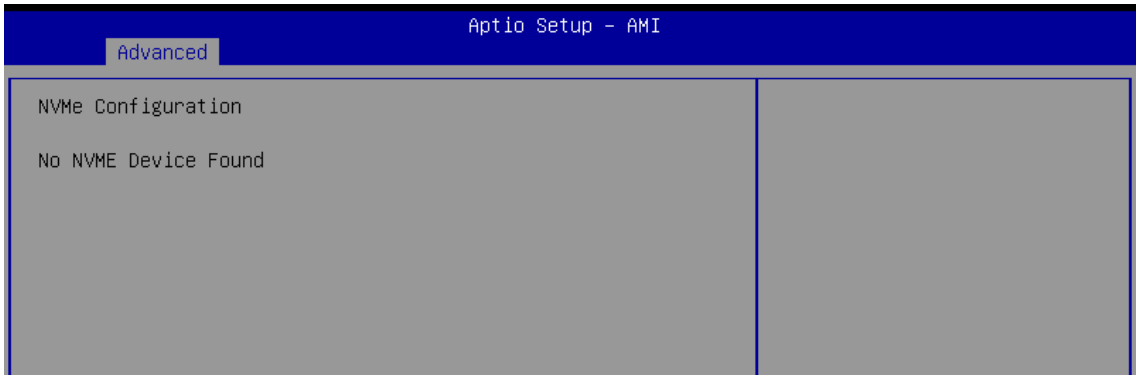


Figure 4-3-9: NVMe Settings

Display NVMe controller and Drive information.

4.3.10 PCI Subsystem Setting

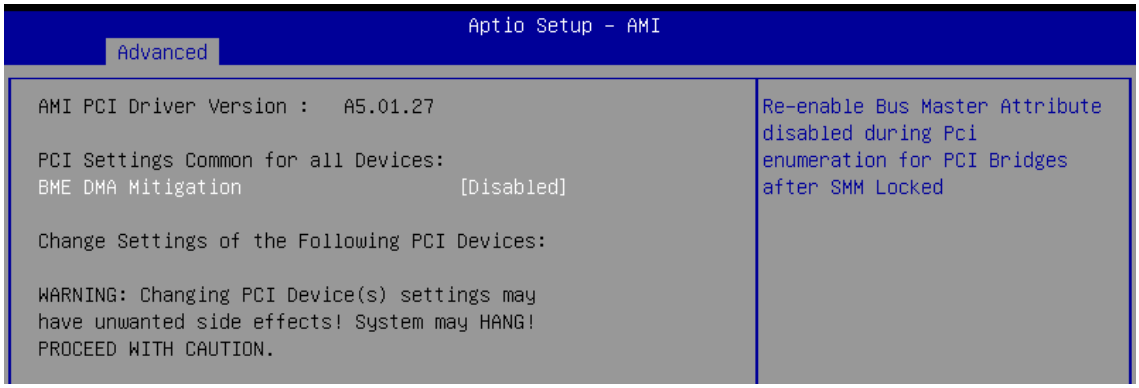


Figure 4-3-10: PCI Subsystem Settings

BME DMA Mitigation

Re-enable Bus Master Attribute disabled during Pci enumeration for PCI Bridges after SMM Locked.

4.3.11 Network Stack Configuration

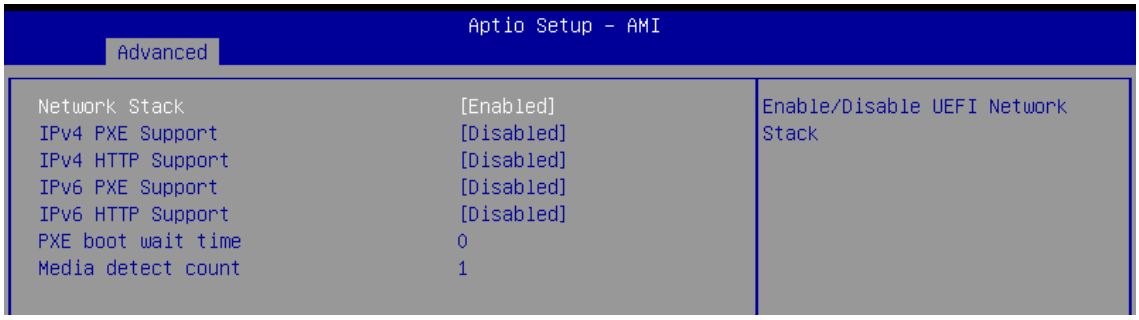


Figure 4-3-11: Network Stack Settings

Network Stack
Enable/Disable UEFI Network Stack

Ipv4 PXE Support
Enable/Disable IPv4 PXE boot support.

Ipv4 HTTP Support
Enable/Disable IPv4 HTTP boot support.

Ipv6 PXE Support
Enable/Disable IPv6 PXE boot support.

Ipv6 HTTP Support
Enable/Disable IPv6 HTTP boot support.

PXE boot wait time
Wait time to press ESC key to abort the PXE boot.

Media detect count
Number of times presence of media will be checked.

4.3.12 Intel(R) Rapid Storage Technology

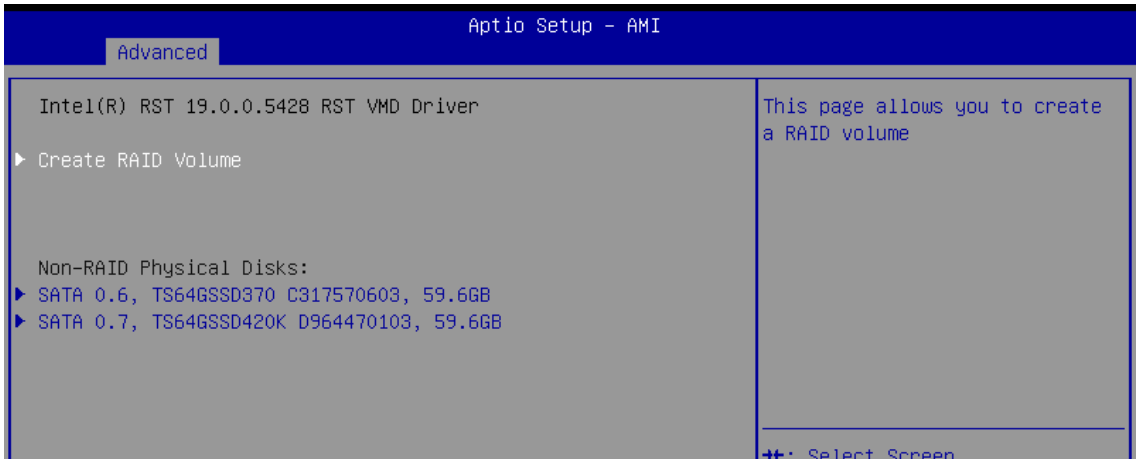


Figure 4-3-12: Intel(R) Rapid Storage Technology

Creating RAID Volume

This page allows you to create a RAID volume.
Display RAID controller and Drive information.

4.4 Chipset Functions

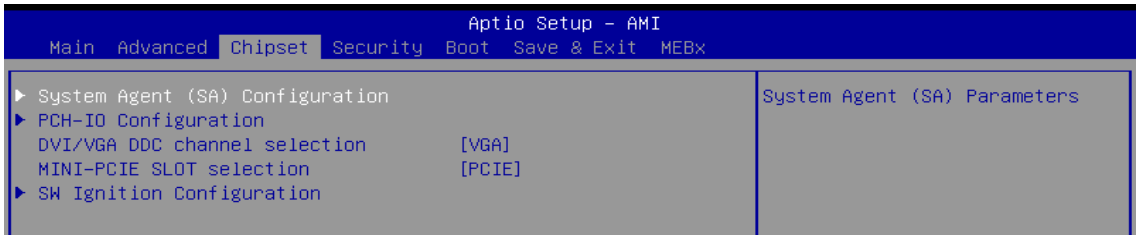


Figure 4-4 : BIOS Chipset Menu

System Agent (SA) Configuration
System Agent (SA) parameters.

PCH-IO Configuration
PCH parameters.

DVI/VGA DDC channel selection
Config GPIO status select DVI or VGA.

MINI-PCIE SLOT selection
MINI-PCIE SLOT selection PCIE or SATA.

SW Ignition Configuration
SW Ignition Configuration, setting Delay Timer and value of Voltage limit.

4.4.1 System Agent (SA) Configuration

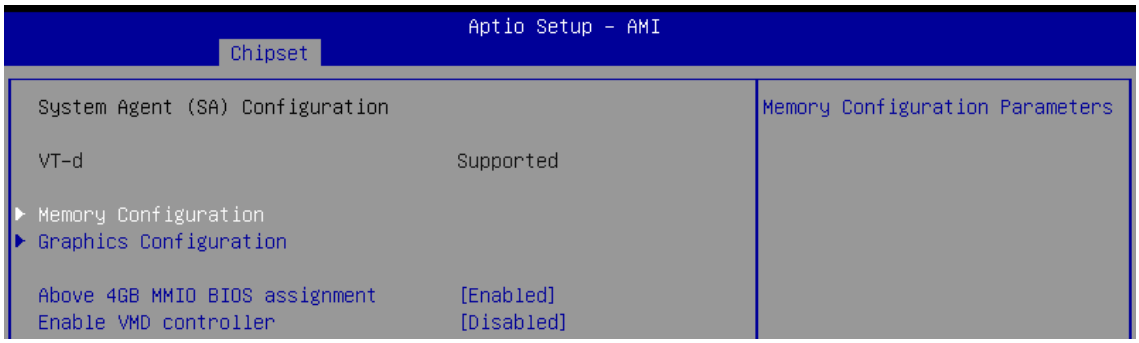


Figure 4-4-1: System Agent Settings

VT-d
VT-d capability.

Memory Configuration
Memory Configuration Parameters.

Graphics Configuration
Graphics Configuration page.

Above 4GB MMIO BIOS assignment
Enable/disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when aperture size is set to 2048MB.

Enable VMD controller
Enable/Disable to VMD controller.

4.4.1.1 Memory Configuration

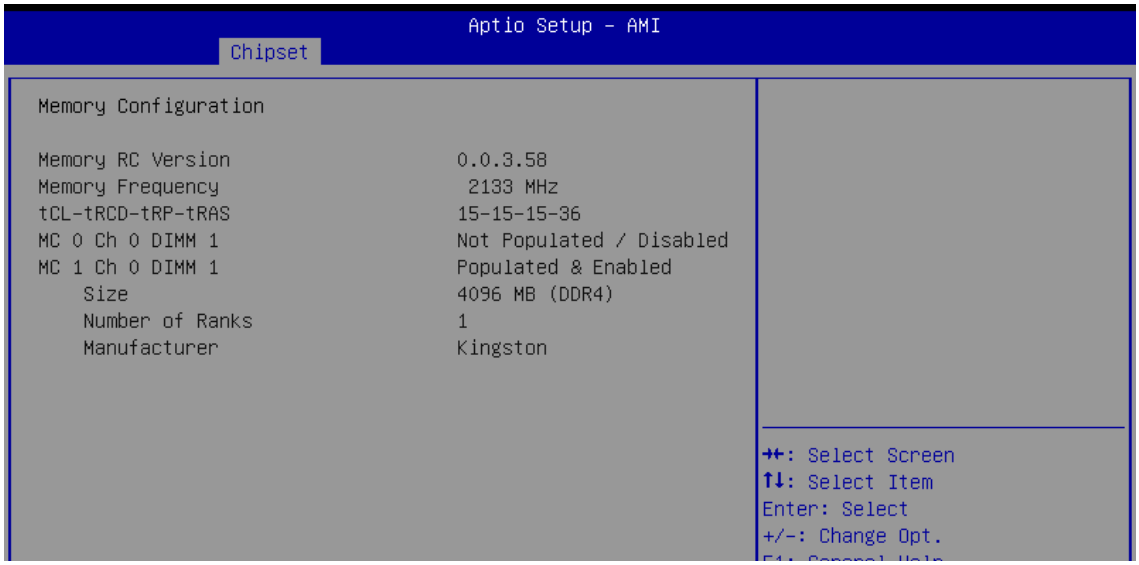


Figure 4-4-1-1: Memory Information

Displays memory information.

4.4.1.2 Graphics Configuration

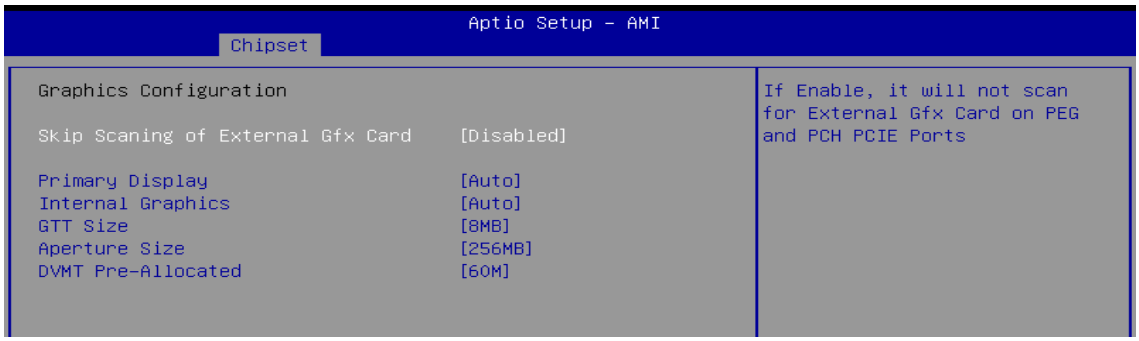


Figure 4-4-1-2 : Graphics Configuration

Skip Scanning of External Gfx Card
If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.

Primary Display
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.

External Gfx Card Primary Display Configuration
External Gfx Card Primary Display Configuration.

Internal graphics
Keep IGFX enabled based on the setup options.

GTT Size
Select the GTT Size.

Aperture Size
Select the Aperture Size.
Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

4.4.2 PCH-IO Configuration

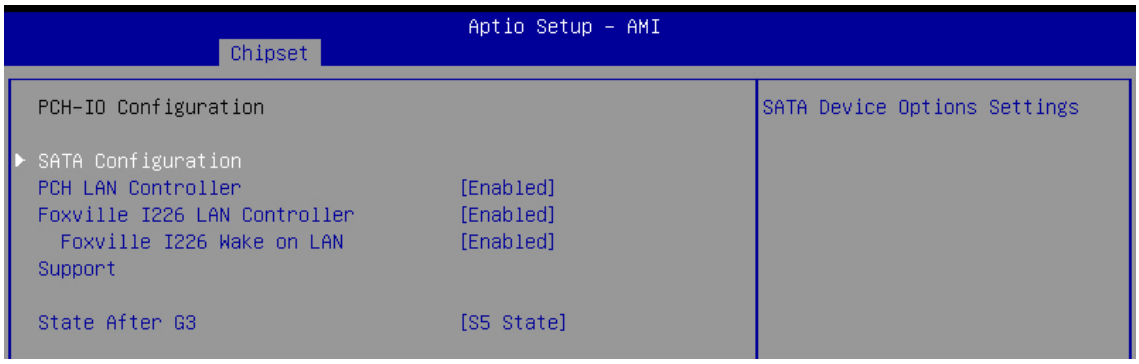


Figure 4-4-2 : PCH-IO Configuration

SATA Configuration
SATA Device Options Settings.

PCH LAN Controller
Enable or Disable onboard NIC.

Foxville I226 LAN Controller
Enable or Disable Foxville I226 LAN Controller.

Foxville I226 Wake on LAN Support
Enable or Disable Foxville I226 Wake on LAN Support.

State After G3
Specify what state to go to when power is re-applied after a power failure (G3 state).

S0 State: Always turn-on the system when power source plugged-in.

S5 State: Always turn-off the system when power source plugged-in.

4.4.2.1 SATA Configuration

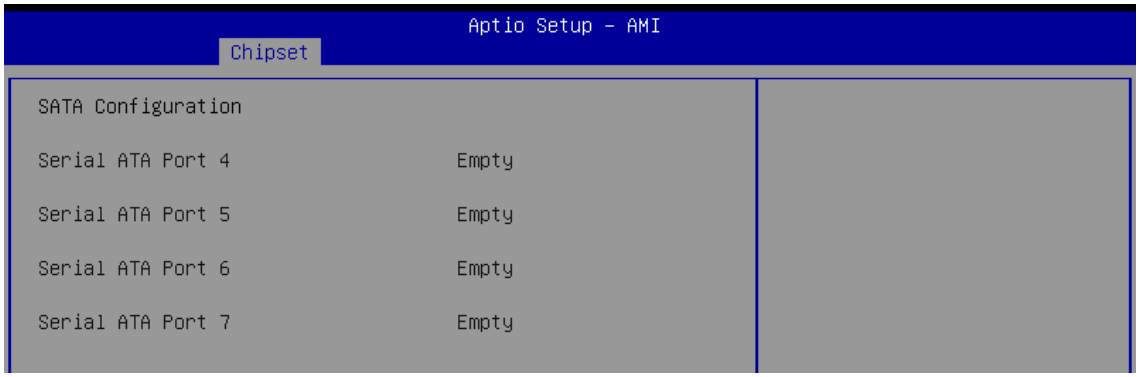


Figure 4-4-2-1: SATA Configuration

Displays SATA device information.

4.4.3 SW Ignition Configuration

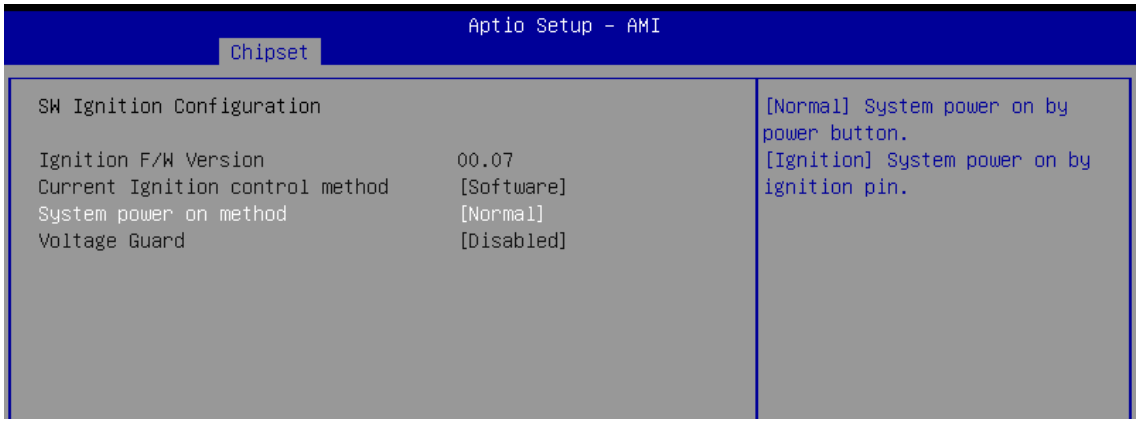


Figure 4-4-3: SW Ignition Configuration

System power on method

Normal:System power on by power button.

Ignition:System power on by ignition pin.

4.5 Security Function

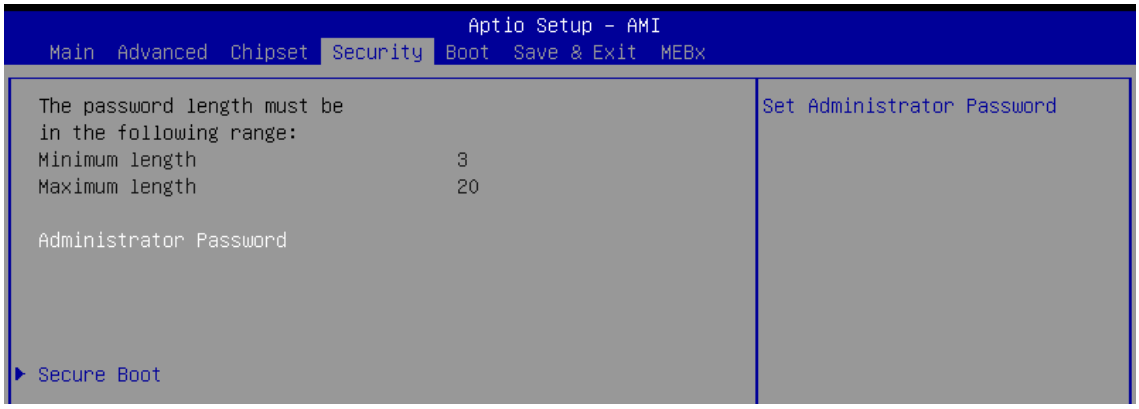


Figure 4-5 : BIOS Security Menu

Administrator Password
Set administrator password.

Secure Boot
Customizable Secure Boot Settings.

4.5.1 Security Boot

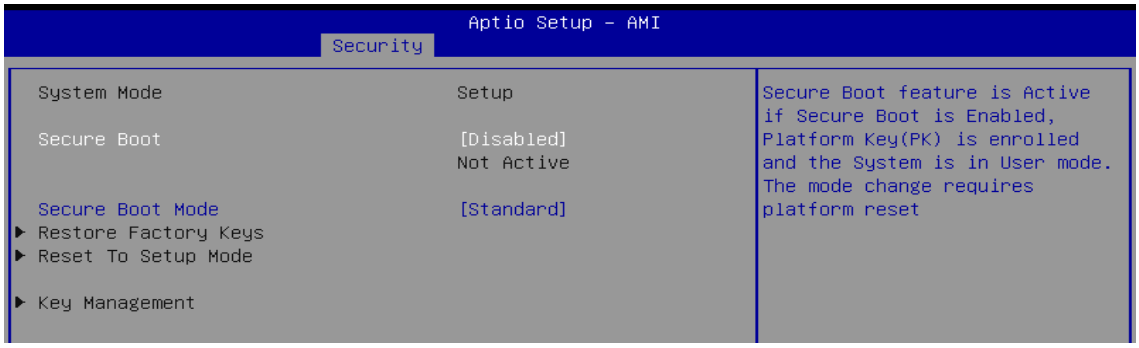


Figure 4-5-1 Security Boot Settings

Secure Boot
Secure Boot feature is Active if Secure Boot is Enabled.

Secure Boot Mode
Secure Boot mode selector Standard/Custom.

In custom mode Secure Boot Variables can be configured without authentication.

Restore Factory Keys
Force System to User Mode.

Reset To Setup Mode
Delete all Secure Boot key databases from NVRAM.

Key Management
Enables expert users to modify Secure boot policy variables without full authentication

4.6 Boot Function

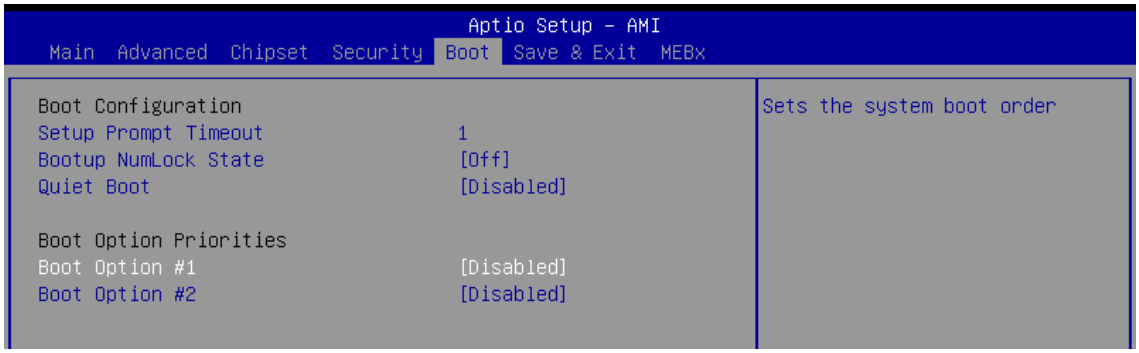


Figure 4-6: BIOS Boot Menu

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Boot Option

Sets the system boot order.

4.7 Save & Exit

Figure 4-7: Bios Save and Exit Menu

Save Changes Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Restore Defaults

Restore/Load Default values for all the setup options.

4.8 MEBx

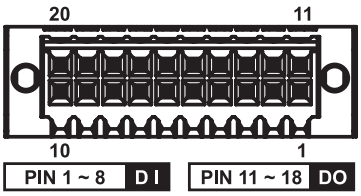
Figure 4-8: BIOS Boot Menu

The MEBx Login page , configuration AMT BIOS features.

APPENDIX A : Isolated DIO Guide

A.1 Function Description

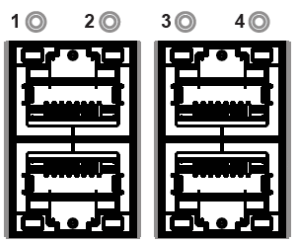
The ECX-3000 offers a 16-bit DIO (Isolated) 20-pin terminal block connector, a watchdog timer, and a 4-port POE.
Isolated DIO pins are fixed by Hardware design that cannot change in/out direction in runtime process.
DIO definition is shown below:



Pin No.	Isolated DIO	Pin No.	Isolated DIO
1	DI 0	11	DO 0
2	DI 1	12	DO 1
3	DI 2	13	DO 2
4	DI 3	14	DO 3
5	DI 4	15	DO 4
6	DI 5	16	DO 5
7	DI 6	17	DO 6
8	DI 7	18	DO 7
9	DI COM	19	GND
10	GND	20	External VDC

POE definition is shown below :

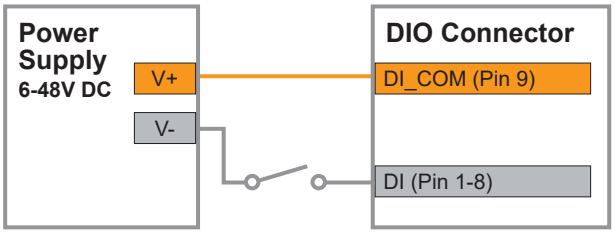
Port No.	Definition	Port No.	Definition
1	POE 0	3	POE 2
2	POE 1	4	POE 3



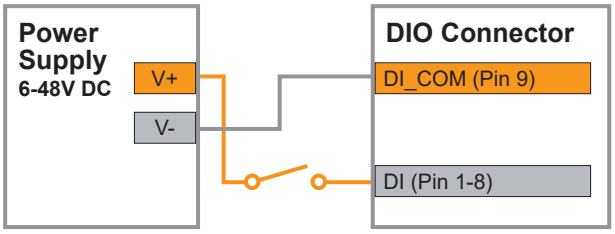
A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode
(NPN)

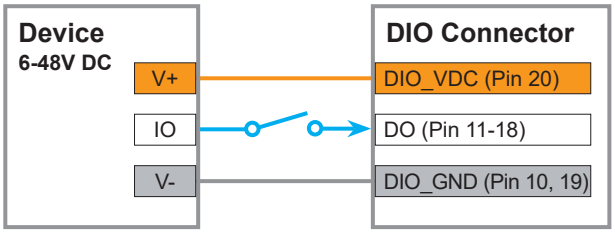


Source Mode
(PNP)

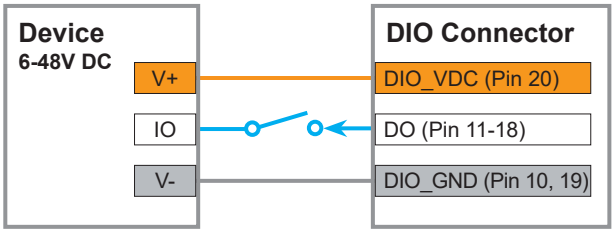


DO reference circuit :

Sink Mode
(NPN, Default)

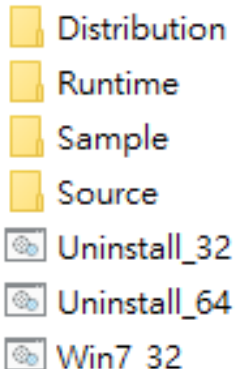


Source Mode
(PNP)



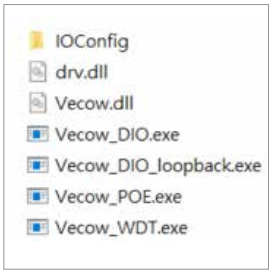
A.3 Software Package Contain

Distribution folder include x32 and x64 versions, use batch file for installation.
There are included as followed :
Win10_32.bat, and Win10_64.bat :
Installation for driver, and
Uninstall_32.bat, and Uninstall_64.bat :
Uninstallation for driver
Run batch file as Administrator.
Make sure Windows version before installation.
Header folder include head file for software developer or
System Integration.
Manual folder include API description.
Sample folder include sample program, driver library, and API library for Windows/ Linux
Source folder include sample program source code that compile on Visual Studio 2008/ubuntu16.04.

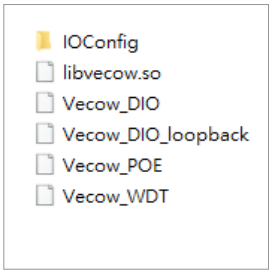


A.4 Sample

Execute demo tool.



Windows



Linux

Sample, as shown below :

```
DIO sample version : v1.0.0609.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port  I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Choose IO : (1/2)
```

Vecow_DIO

```
DIO loopback sample version : v1.0.1509.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port  I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

How many IO temp_port : (1/2)
```

Vecow_DIO_loopback

```
POE sample version : v1.0.1609.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608

Initial POE success!
Usable slave address ID : 0
Select slave address ID :
```

Vecow_POE

```
WDT sample version : v1.0.0509.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port  I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Set WDT timer seconds (1~3932100) :
```

Vecow_WDT

B

APPENDIX B : Software Functions

B.1 Driver API Guide

In Header folder, Vecow.h and VecowLinux.h contain usabled API for Windows/Linux.

BOOL initial_SIO(BYTE Isolate_Type, BYTE DIO_NPN)

Initial machine for IO and watch dogtimer.

Isolate_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DIO_NPN : DI/DO type.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Driver not exists, or version is too old, or machine not match).

BOOL get_IO1_configuration(BYTE *Iso, BYTE *DI_mode, BYTE *DO_mode, WORD *Mask)

Get DIO configuration (by variable)

Isolate_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DI_mode ([7:0]) : DI type, pin setting by hexadecimal bitmask only for Isolated DIO.

0xFF : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

DO_mode : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask only for Non-Isolated DIO (GPIO).

1 : Output;

0 : Input

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem).

BOOL set_IO1_configuration(BYTE Iso, BYTE DI_mode, BYTE DO_mode, WORD Mask)

Set DIO configuration.

Isolate_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DI_mode ([7:0]) : DI type, pin setting by hexadecimal bitmask only for Isolated DIO.

0xFF : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

DO_mode : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask only for Non-Isolated DIO(GPIO).

1 : Output;

0 : Input

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

BOOL get_DIO1(BYTE *DO_data, BYTE *DI_data)

Get isolated DIO output(DO) and input (DI).

DI ([7:0]) : Input state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

DO ([7:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

BOOL set_DIO1(BYTE DO_data)

Set isolated DIO output(DO).

DO ([7:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

BOOL get_GPIO1(WORD *GPIO_data)

Get GPIO.

GPIO_data ([15:0]) : GPIO state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

BOOL set_GPIO1(WORD GPIO_data)

Set GPIO.

GPIO_data ([15:0]) : GPIO state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

BOOL get_WDT(DWORD *WDT)

Get watchdog timer setup.

WDT : watchdog timer setup.

Unit : second (Range : 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec)).

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem).

BOOL set_WDT(DWORD WDT)

Set watchdog timer setup.

WDT : watchdog timer setup.

Unit : second (Range : 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec)).

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or setup 0, or hardware problem).

BOOL cancel_WDT()

Cancel watchdog timer.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error or hardware problem).

BOOL initial_POE(BYTE Scan, BYTE ID)

Initial POE.

Scan : POEID scan type

2 : Auto scan;

1 : Manual setup.

ID : POE ID by manual setting.

Range : 0~15.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Driver not exists, or version is too old, or out of range error).

BOOL get_POE_configuration(BYTE ID, BYTE *Auto, BYTE *Mask)

Get POE configuration (by variable).

ID : POE ID.

Range : 0~15.

Auto ([3:0]) : Auto mode, pin setting by hexadecimal bitmask.
1 : Auto;
0 : Manual.
Mask ([3:0]) : DC Enable/Disable, pin setting by hexadecimal bitmask.
1 : Enable;
0 : Disable.
Return :
TRUE (1) : Success.
FALSE (0) : Fail (Initial error, or out of range error, or call by pointer error, or hardware problem)

BOOL set_POE_configuration(BYTE ID, BYTE Auto, BYTE Mask)
Set POE configuration (by variable).
ID : POE ID.
Range : 0~15.
Auto ([3:0]) : Auto mode, pin setting by hexadecimal bitmask.
1 : Auto;
0 : Manual.
Mask ([3:0]): DC Enable/Disable, pin setting by hexadecimal bitmask.
1 : Enable;
0 : Disable.
Return :
TRUE (1) : Success.
FALSE (0) : Fail (Initial error, or out of range error, or hardware problem).

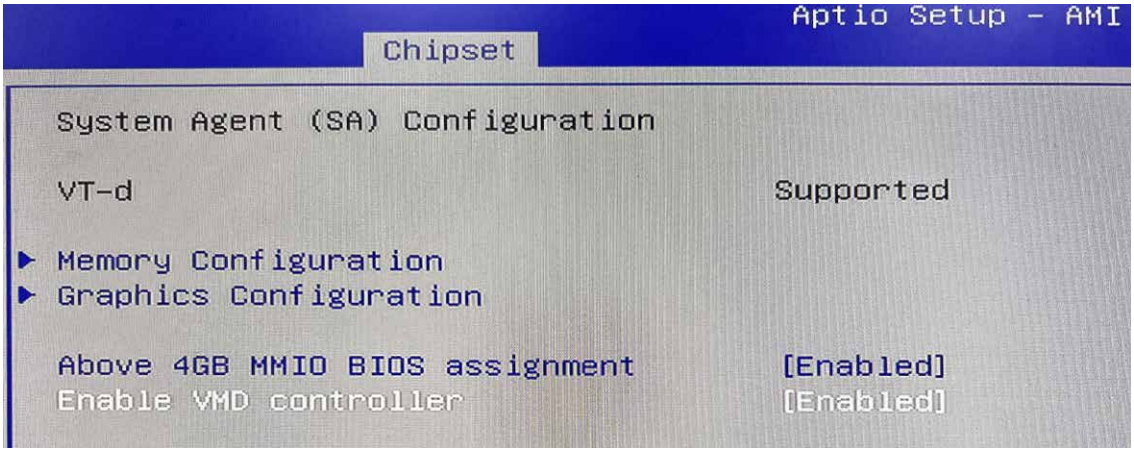
BOOL get_POE(BYTE ID, BYTE *POE)
Get POE state.
ID : POE ID.
Range : 0~15.
POE ([3:0]) : POE state, pin setting by hexadecimal bitmask.
1 : On;
0 : Off.
Return :
TRUE (1) : Success.
FALSE (0) : Fail (Initial error, or out of range error, or call by pointer error, or hardware problem).

BOOL set_POE(BYTE ID, BYTE POE)
Set POE state.
A. ID : POE ID.
Range : 0~15.
B. POE ([3:0]) : POE state, pin setting by hexadecimal bitmask.
1 : On;
0 : Off.
Return :
TRUE (1) : Success.
FALSE (0) : Fail (Initial error, or out of range error, or hardware problem).

APPENDIX C : RAID Functions

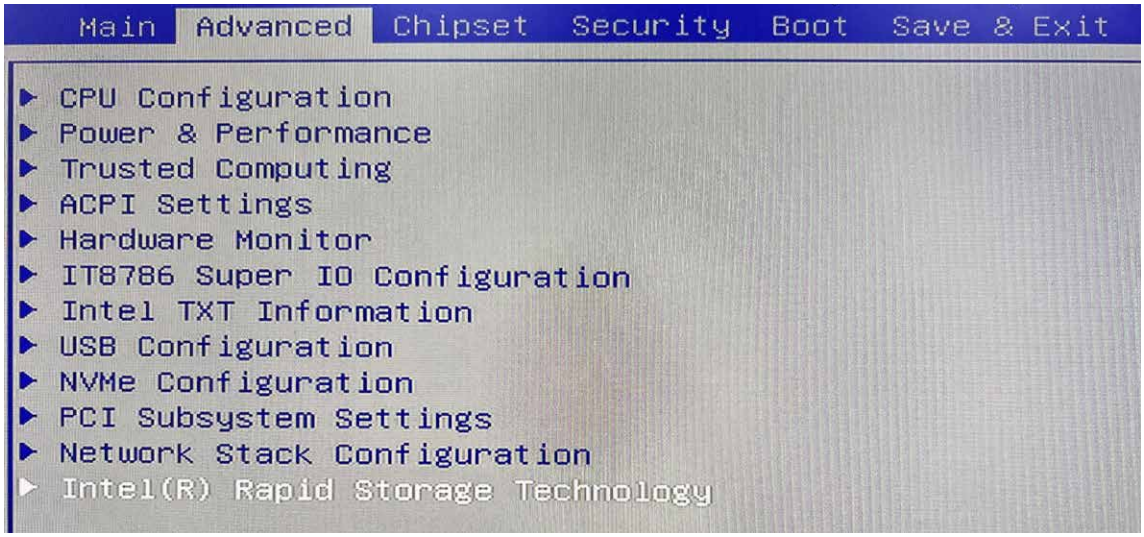
C.1.1 VMD Controller for RAID

Please set Enable VMD controller as Enabled on BIOS menu.
Chipset → System Agent (SA) Configuration → Enable VMD controller → Enabled → Save Changes and Reset.

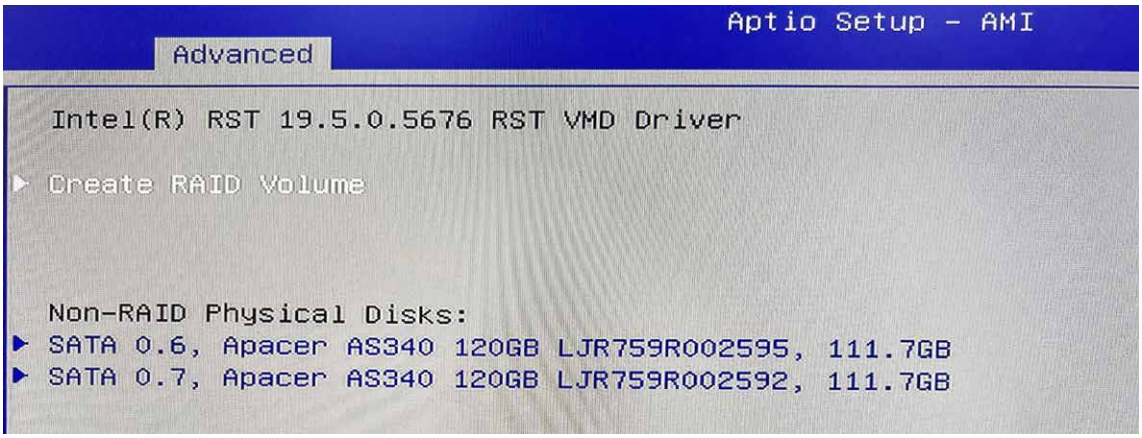


C.1.2 UEFI Mode for RAID

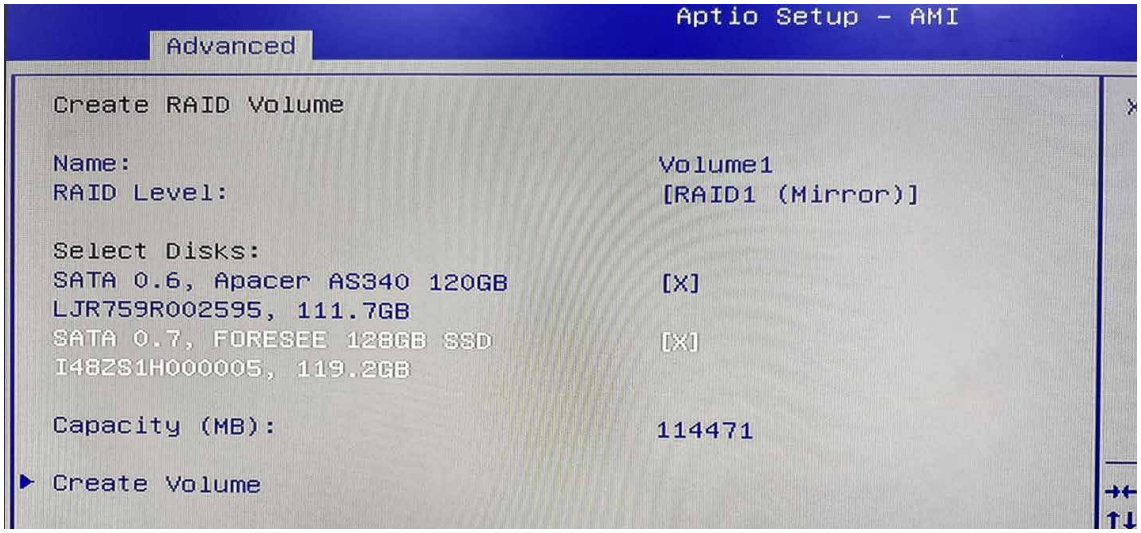
1. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.
Advanced → Intel(R) Rapid Storage Technology



2. Select Create RAID Volume on BIOS menu.



3. Select disks to create RAID Volume then Save Changes and Reset to install OS with EFI mode.



C.2 OS Installation

The system is featured with one M.2 key M for NVME, one mSATA slot, and including two internal SATA.
We used SATA for Windows 10 OS installation as an example.

Note:
ECX-3100 PEG, ECX-3200 PEG, ECX-3200MX PEG are equipped with 2 SATA.
ECX-3400 PEG, ECX-3600 PEG, ECX-3800 PEG are equipped with 4 SATA.

C.3 To Install All Device Drivers of the System

The instructions are as follows :
1. Install Chipset driver
2. Install Network driver
3. Install ME driver (if available)
4. Install Audio driver
5. Install VGA driver

C.4 To Install"Intel Rapid Storage Technology" Software

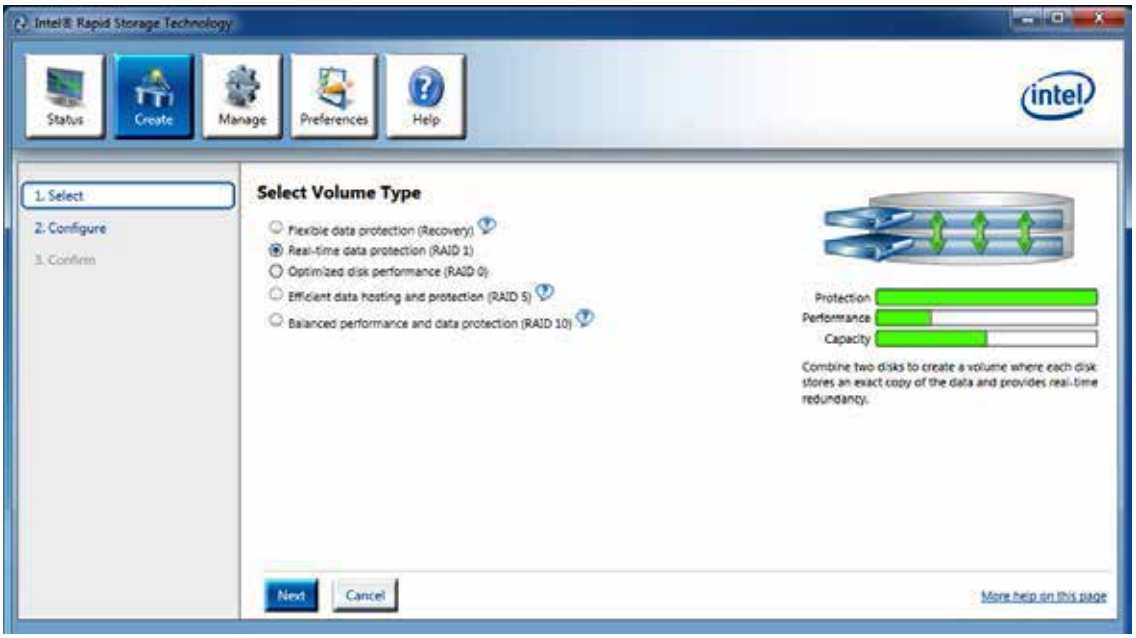
You can find the latest information and software directly from Intel's website.
http://www.intel.com/p/en_US/support/highlights/chpsts/imsm
The RAID environment has been done if you completed the steps above.

C.5 To Insert SATA HDD for RAID 1

Please note, you can use two SATA ports for SATA HDD, except for mSATA slot.

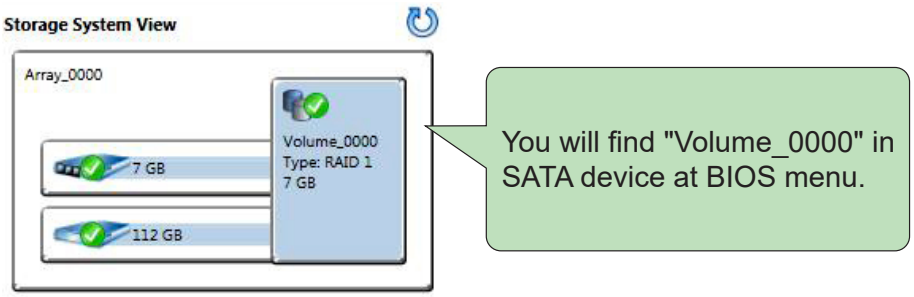
C.6 To Create RAID Volume on "Rapid Storage Technology" Software

ECX-3000 is featured with two SATA HDD's for RAID volume, so there are two options to choose on this page. Let's take RAID 1 as an example, select "RAID 1".

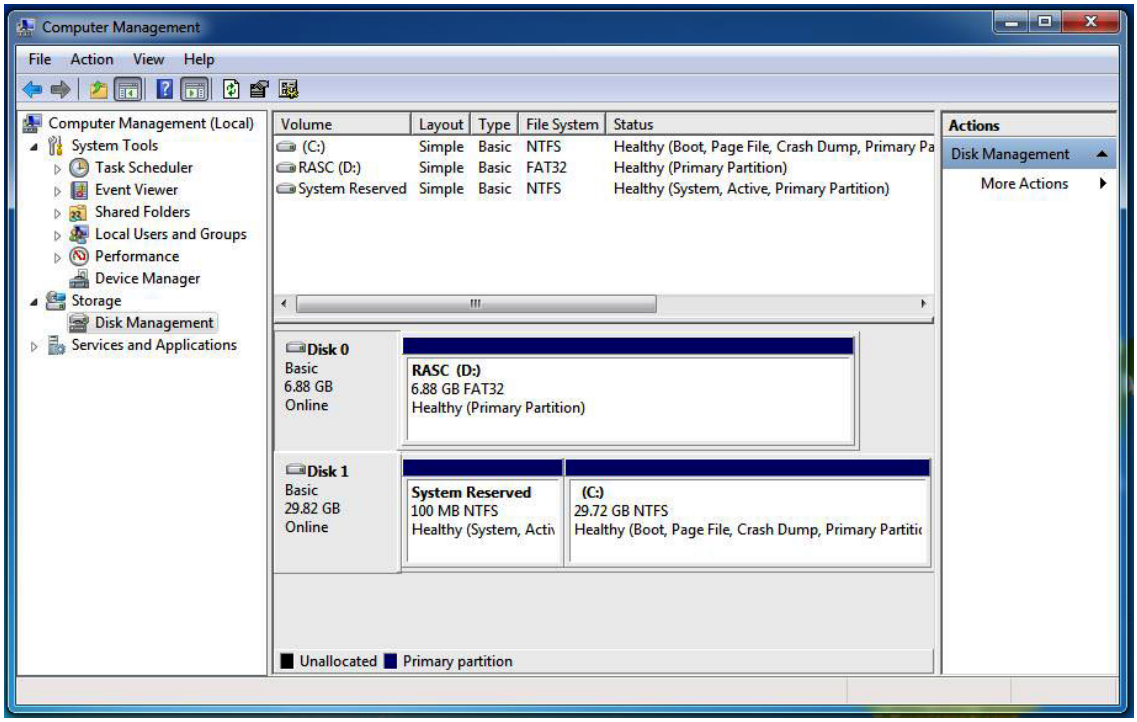


C.7 Disk Management : Partition the Disk

After RAID 1 volume is created, you can see the figure of SATA device allocation.

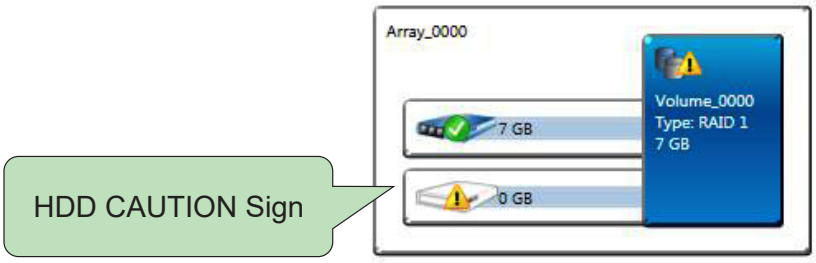


To start disk management tool, select "initialize disk".
Then add "Logical Device" for Windows access.

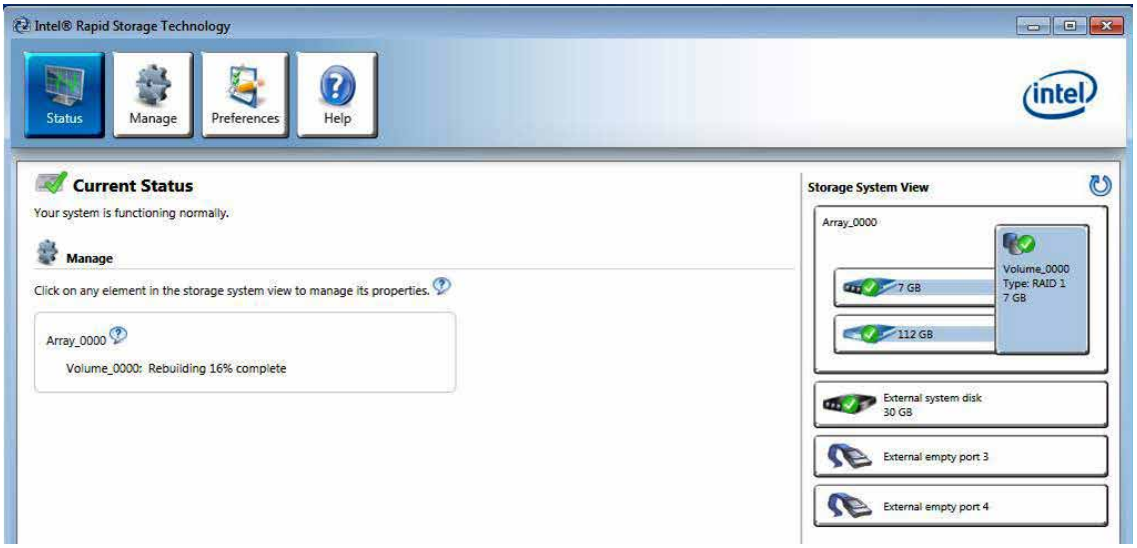


C.8 If One SATA HDD on RAID Volume is Out-of-use

After RAID 1 volume is created, you can see the figure of SATA device allocation.

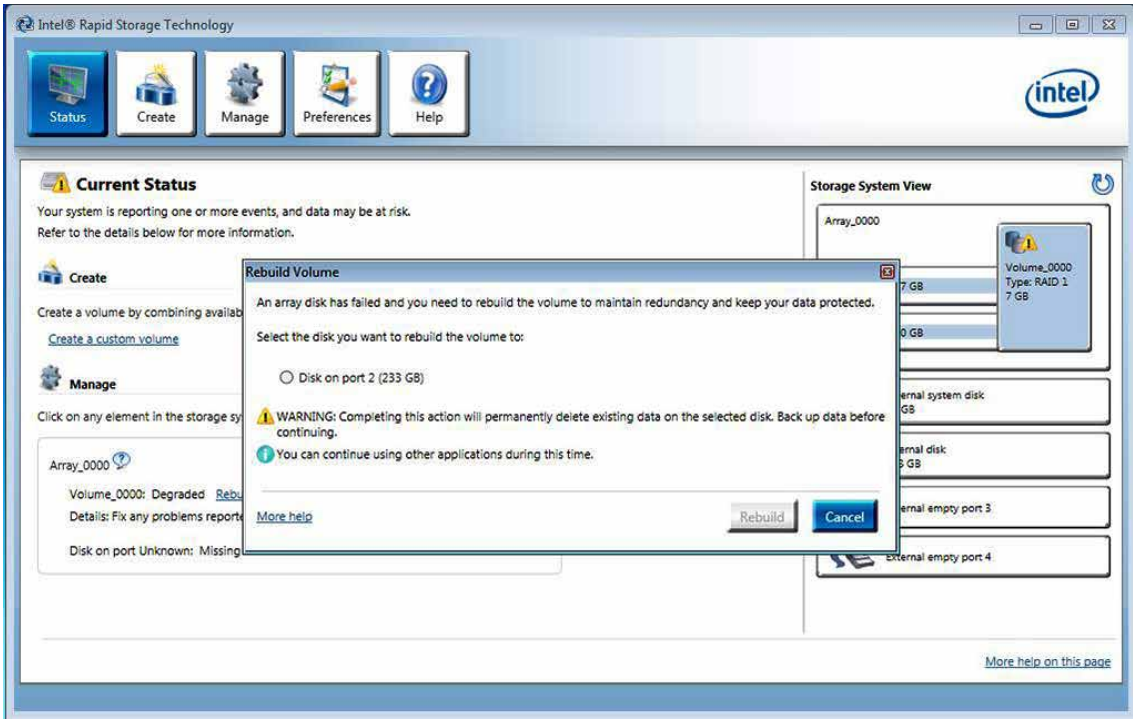


C.9 Recovery and Auto Rebuild When Use the SAME RAID HDD



C.10 Recovery and Auto Rebuild When Use DIFFERENT RAID HDD

A warning will pop-up to ask you if the disk is not a member of the original RAID volume.
If you press "Rebuild", it will replace the broken SATA HDD to the last SATA HDD of RAID volume.



D

APPENDIX D : Power Consumption

Testing Board :	ECX-3000
RAM :	32GB * 2
USB-1 :	USB Mouse ACER MOAMUOA
USB-2 :	USB Keyboard Logitech G-100 GameingKeyboard
SATA :	Apacer AS340X 120GB SSD
Graphics output :	DVI
Power plan :	Balance(Windows10 Power plan)
Power Source :	Chroma 62006P-100-25
Test Program :	BurnInTest

D.1 Intel® Core i7-12700TE 1.40 GHz (25M Cache, up to 4.60 GHz)

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core i7-12700TE	9V	0.388A	03.49W	0.492A	04.43W	2.327A	20.94W
Intel® Core i7-12700TE	12V	0.284A	03.41W	0.396A	04.75W	1.850A	22.20W
Intel® Core i7-12700TE	24V	0.230A	05.52W	0.298A	07.15W	0.950A	22.80W
Intel® Core i7-12700TE	50V	0.192A	09.60W	0.241A	12.05W	0.554A	27.70W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core i7-12700TE	9V	5.504A	49.54W	7.753A	69.78W
Intel® Core i7-12700TE	12V	4.168A	50.02W	5.482A	65.78W
Intel® Core i7-12700TE	24V	2.151A	51.62W	2.923A	70.15W
Intel® Core i7-12700TE	50V	1.101A	55.05W	1.464A	73.20W

D.2 Intel® Core i9-12900E 2.30 GHz (30M Cache, up to 5.00 GHz)

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core i9-12900E	9V	0.374A	03.37W	0.507A	04.56W	2.570A	23.13W
Intel® Core i9-12900E	12V	0.284A	03.41W	0.383A	04.60W	1.872A	22.46W
Intel® Core i9-12900E	24V	0.230A	05.52W	0.304A	07.30W	1.052A	25.25W
Intel® Core i9-12900E	50V	0.192A	09.60W	0.239A	11.95W	0.574A	28.70W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core i9-12900E	9V	8.932A	80.39W	8.956A	80.60W
Intel® Core i9-12900E	12V	6.831A	81.97W	7.201A	86.41W
Intel® Core i9-12900E	24V	3.416A	81.98W	3.485A	83.64W
Intel® Core i9-12900E	50V	1.680A	84.00W	1.723A	86.15W

APPENDIX E : Supported Memory & Storage List

E.1 Supported Memory List

Testing Board :	ECX-3000
Memory Test	MemTest86 V10 Build 1000

Test Item

Channel	Memory Test	Sleep	Hibernate	Reboot	OS internal info
(SODIMM_1+ SODIMM_2)	PASS	PASS	PASS	PASS	PASS

E.2 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
Transcend 16GB DDR4-2133 SODIMM	TS0CASGSB0000	25ºC
Innodisk 16GB DDR4-2133 SODIMM	M4S0-AGS1O5RG-H03	25ºC
SLLINK 16GB DDR4-2666 SODIMM	J4AGSH1G8QHFC	25ºC
MEMXPRO 16GB DDR4-2666 SODIMM	D4S-AG26H1G8W2	25ºC
Innodisk 16GB DDR4-3200 SODIMM	M4S0-AGS1O5EM-H031	25ºC
SMART 16GB DDR4-3200 SODIMM	ST2046SO410825-SE	25ºC
SLLINK 32GB DDR4-3200 SODIMM	J4BGSH2G8TMFC	25ºC

E.3 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
Innodisk 16GB DDR4-3200 SODIMM	M4D0-AGS1Q5EM-H031	25ºC
SLLINK 32GB DDR4-3200 SODIMM	J4BGDH2G8TMKC	25ºC

E.4 Supported Storage Device List

Type	Brand	Model	Capacity
SATA HDD	TOSHIBA	MQ01ABF050	500GB
	TOSHIBA	MQ01ABD050	500GB
	HGST	Z5K500-500 HTS545050A7E680	500GB
mSATA SSD	Kingston	SUV500MS	120GB

Type	Brand	Model	Capacity
SATA SSD	innodisk	3MG2-P DGS25-64GD81BC1QC	64GB
	Patriot Burst	BURST	120GB
	Apacer	AS340X	120GB
	Kingston	SA400S37/120G	120GB
	Kingston	SHFS37A/240G	240GB
	SAMSUNG	860 EVO MZ-76E250	250GB
	MEMXPRO	ET30	256GB
	MEMXPRO	PT31	256GB
	FORESEE	S903S256G	256GB
	LITE-ON	K8-L1256	256GB
	SMART	AFABF3096000043	960GB
M.2 SATA SSD	MEMXPRO	M.2 2280 SATA PM31 512GB WT FP28S-E1GTMS464W1	512GB
	MEMXPRO	M.2 2280 SATA PT31 512GB WT FP28S-E1GMTS594W1	512GB
M.2 PCIe SSD	INTEL	760P SSDPEKKW128G8	128GB
	Transcend	TS128GMTE110S	128GB
	Kingston	R8U-SNS8154P3/128GJ	128GB
	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
	SAMSUNG	980 PRO MZ-V8P250	250GB
	PNY	CS1031	256GB
	TOSHIBA	KXG50ZNV512G	512GB
	SMART	CP3000	960GB
	innodisk	4TG2-P	4TB

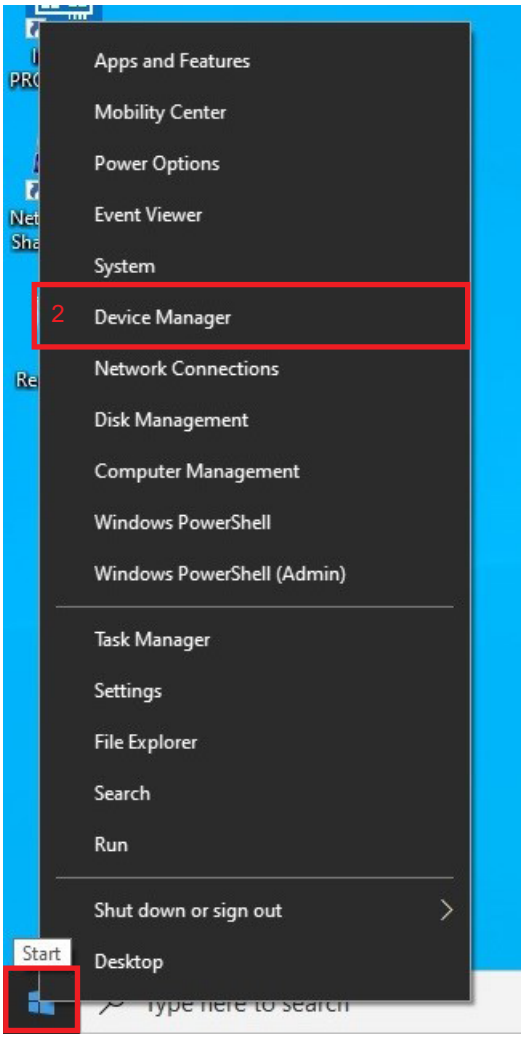
** If more help is needed, please contact Vecow Technical Support.**

APPENDIX F : I219 LAN Driver setting

In order for the system to work stably, please follow the settings below

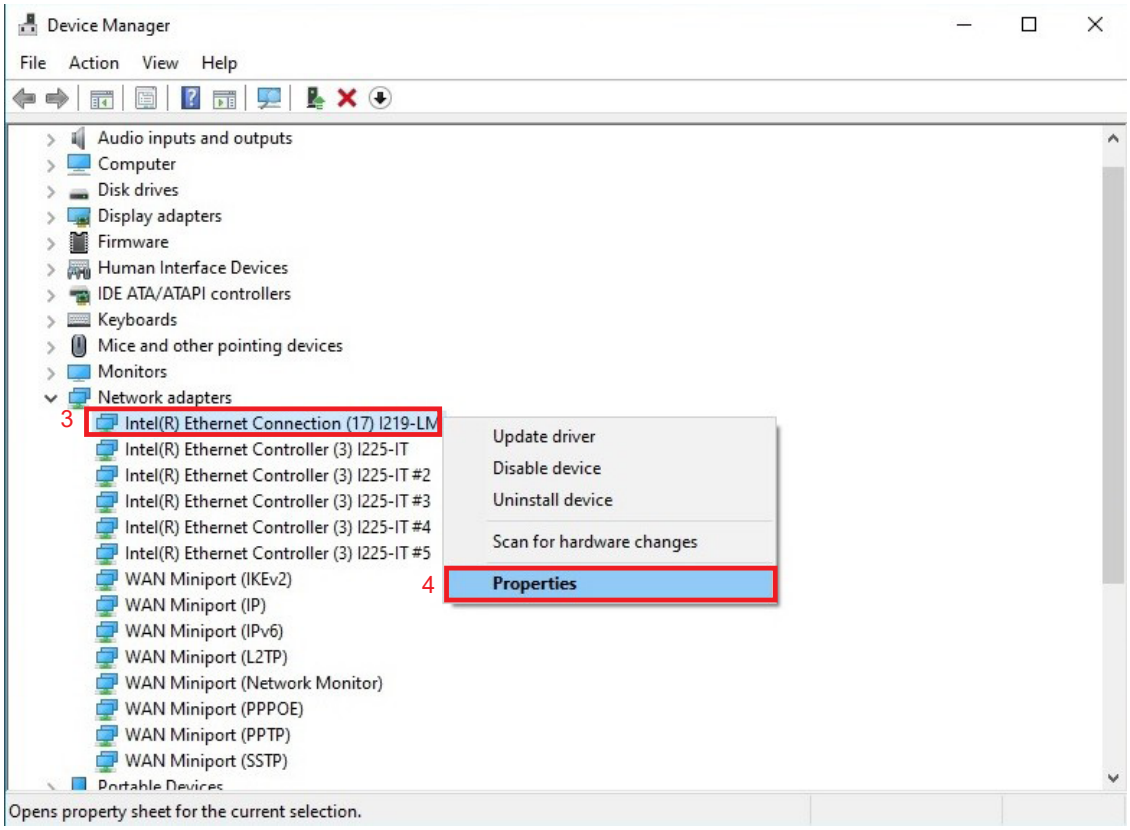
1. Right-click start.

2. Select Device Manage.



3. Right-click Intel(R) Connection (17)I219-LM.

4. Select Properties.

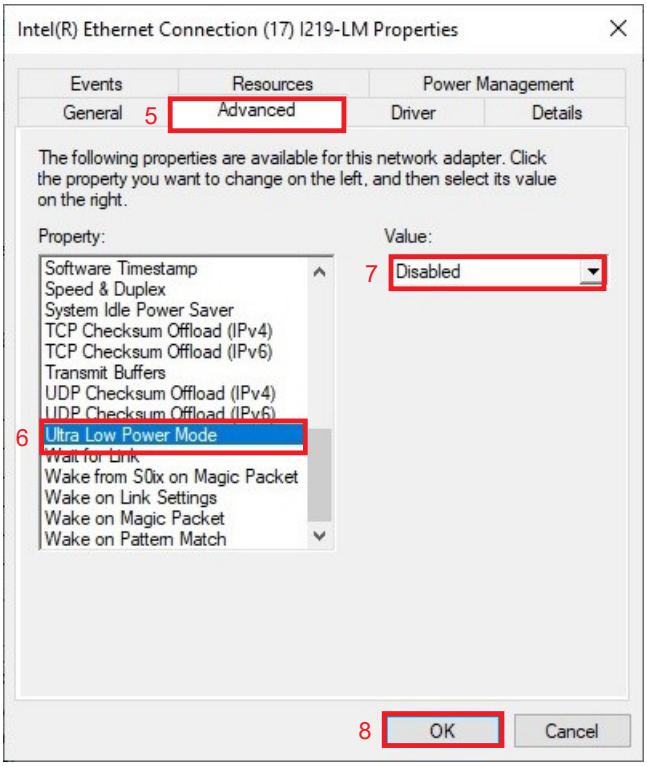


5. Select Advanced.

6. Select Ultra Low Power Mode.

7. Select Disabled

8. OK

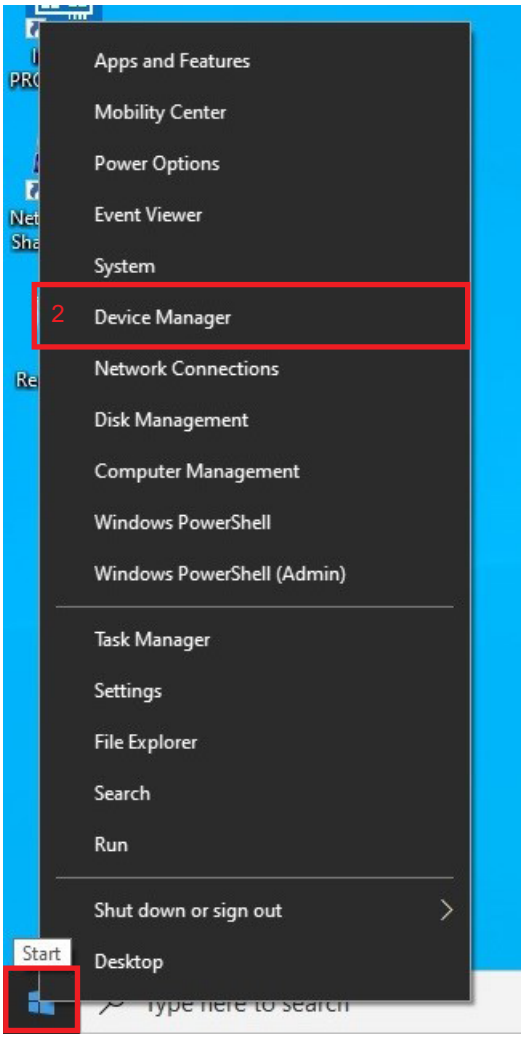


APPENDIX G : UMX-100 Solution

In order for the system to work stably, please follow the settings below

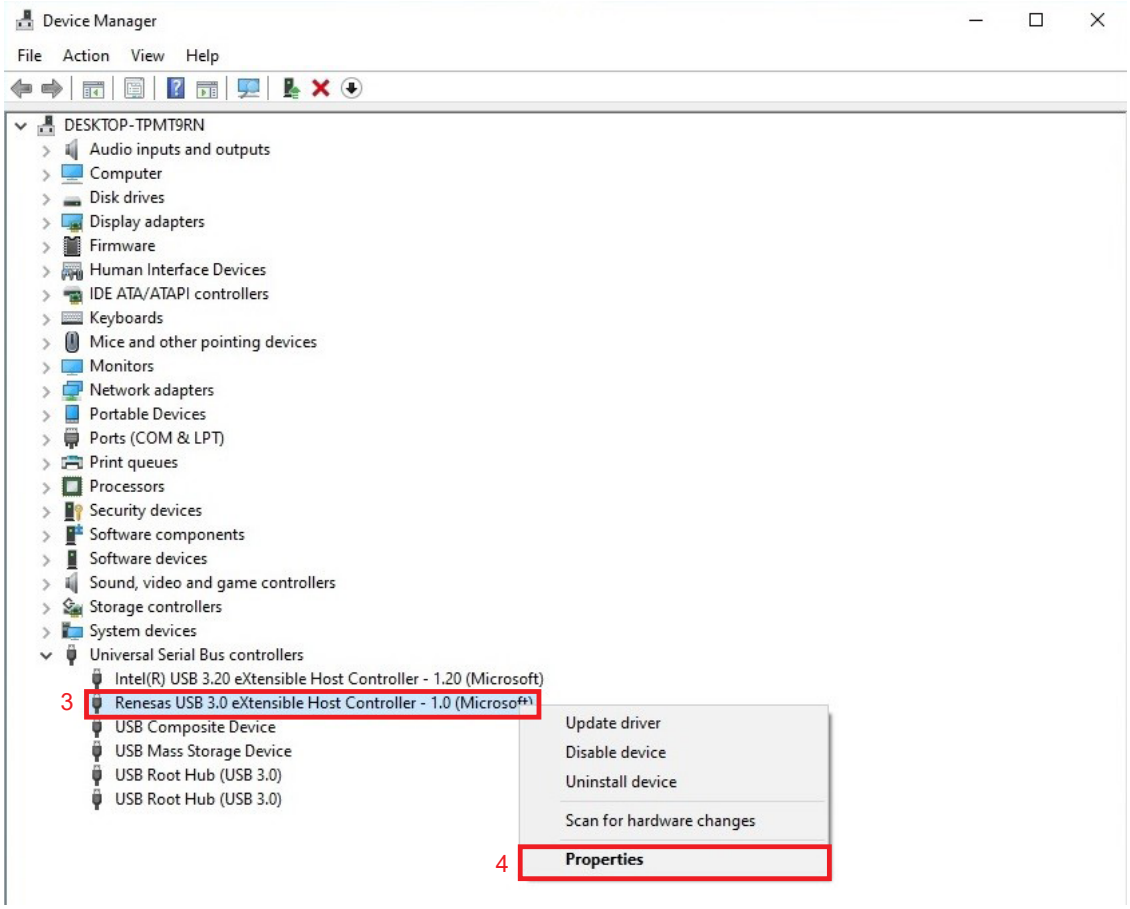
1. Right-click start.

2. Select Device Manage.



3. Right-click the device(Renesas USB3.0 eXtensible Host Controller - 1.0(Microsoft).

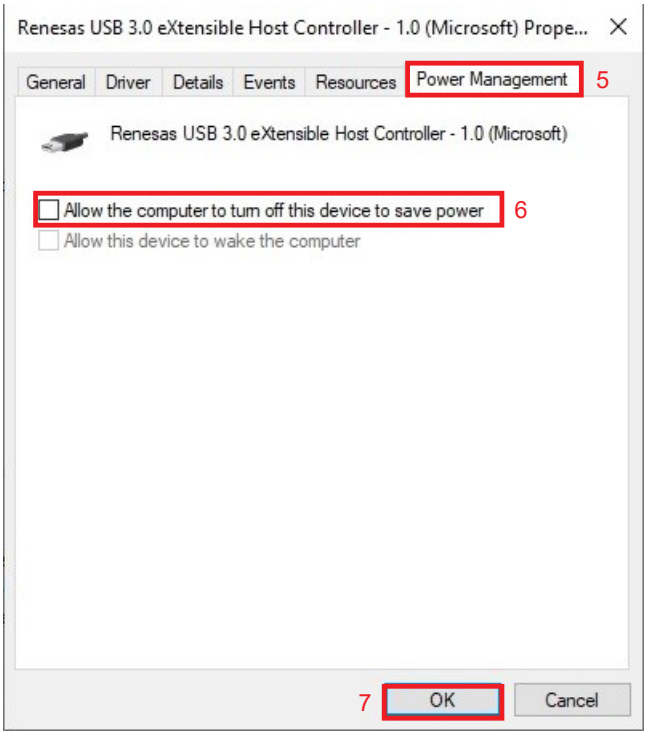
4. Select Properties.



5. Select Power Management.

6. Uncheck (Allow the computer to turn off this device to save power).

7. OK.



8. Restart the computer.

9. Make sure if (Allow the computer to turn off this device to save power) is uncheck.

Vecow

For further support information, please visit www.vecow.com