ECX-4000 USER Manual

Intel® Core™ Ultra 200S Series Processors Embedded System
Workstation-grade, 2.5GigE LAN, 10GigE LAN, 9V to 50V DC-in

Vecow

1.2.0 Edition 20260630

Record of Revision

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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

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Order Information

Part Number	Description
ECX-4025R	ECX-4000, 8 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO, 2 SSD Tray
ECX-4025	ECX-4000, 8 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO
ECX-4000-PoER	ECX-4000, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO, 2 SSD Tray
ECX-4000-PoE	ECX-4000, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO
ECX-4000-6R	ECX-4000, 5 2.5G LAN, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO, 2 SSD Tray
ECX-4000-6G	ECX-4000, 5 2.5G LAN, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO
ECX-4000-2R	ECX-4000, 1 2.5G LAN, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 GPIO, 2 SSD Tray
ECX-4000-2G	ECX-4000, 1 2.5G LAN, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 GPIO
ECX-4071R	ECX-4000, 2 10G SFP+, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO, 2 SSD Tray
ECX-4071	ECX-4000, 2 10G SFP+, 5 2.5G LAN w/4 PoE+, 1 GigE LAN, 4 COM, 6 USB 3.2 Gen2, 16 Isolated DIO

CPU List

Processor Brand	CPU P/N	Cores	GHz*	TDP (W)
Intel® Core™ Ultra	9 285	24	2.5	65
	7 265	20	2.4	
	5 245	14	3.5	
	9 285T	24	1.4	35
	7 265T	20	1.5	
	5 245T	14	2.2	

Optional Accessories

Part Number	Description
DDR5 48G	Certified DDR5 48GB RAM
DDR5 32G	Certified DDR5 32GB RAM
DDR5 16G	Certified DDR5 16GB RAM
DDR5 8G	Certified DDR5 8GB RAM
PWA-120W1	120W, 24V, AC 90V-264V Power Adapter
PWA-160W-WT	160W, 24V, AC 85V-264V Power Adaptor, Wide Temperature -30°C to +70°C
PWA-180W	180W, 24V, AC 90V-132V/180V-264V Power Adapter
PWA-280W-WT	280W, 24V, AC 85V-264V Power Adaptor, Wide Temperature -30°C to +70°C *Recommended when enable turbo mode (35W CPU)
PWA-330W	330W, 24V, AC 90V-264V Power Adapter *Recommended when enable turbo mode (65W CPU)
VESA Mount	VESA Mounting Kit
DIN-RAIL	DIN Rail and VESA Mounting 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 Storage Module
5G Module	5G Module with Antenna
4G Module	4G/GPS Module with Antenna
WiFi & Bluetooth	WiFi & Bluetooth Module with Antenna

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GENERAL INTRODUCTION

1.1 Overview

The Vecow ECX-4000 series is a workstation-grade fanless embedded system powered by Intel® Core™ Ultra 9 285/7 265/5 245 processors. It leverages the latest advanced hybrid architecture, combining Performance cores (P-cores) and Efficiency cores (E-cores) for a total of up to 24 cores. The system features a dedicated Neural Processing Unit (NPU) optimized for efficient AI workloads and the X^e LPG graphics architecture, delivering up to 36 TOPS and twice the graphics performance of its predecessors.

The ECX-4000 series offers comprehensive connectivity options essential for modern edge deployments. It supports high-speed DDR5 6400 CSODIMM memory and features up to six LAN ports with four PoE^+. Additional connectivity includes six USB 3.2 Gen 2 ports, two external SIM card sockets, three M.2 sockets, and two optional SUMIT slots for flexible expansion.

Designed for reliable operation in demanding environments, the ECX-4000 series incorporates a 9V to 50V redundant power input and advanced software-based ignition power control, ensuring seamless performance for mission-critical edge workloads. It is ideally suited for applications in in-vehicle computing, intelligent logistics, smart cities, public security, and more.

1.2 Features

- Intel® Core™ Ultra 200S Series processor (Arrow Lake) running with Intel® W880 PCH features accelerated hybrid computing performance, up to 24 cores
- Intel® Integrated NPU and X^e LPG Graphics Architecture optimize system workload and AI Acceleration, delivering up to 36 TOPS
- 2 DDR5 6400MHz Memory supports up to 96GB, optional with ECC
- 2 10G SFP+, 8 2.5GigE LAN with 4 PoE^+, 1 GigE LAN
- 6 USB 3.2 Gen 2, 16 Isolated DIO, 4 COM RS-232/422/485
- 2 front-access 2.5" SSD Tray, optional M.2 SSD Tray
- Expansion : 2 M.2 Key B, 1 Key E, SUMIT A, B
- Wireless connection : 5G/WiFi 7/BT/4G/LTE/GPRS/UMTS
- DC 9V to 50V Redundant Power Input, Software Ignition Control
- Supports Intel® vPro, TSN, TCC, and TPM 2.0
- Optional VHub AIoT Solution Service supports OpenVINO™ Toolkit for Edge AI applications

1.3 Product Specification

1.3.1 Specifications of ECX-4025R

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by front access SSD/HDD tray, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

PoE	
LAN 3	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 4	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 5	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 6	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
2.5G Ethernet	
LAN 7	Intel® I226 2.5GigE LAN
LAN 8	Intel® I226 2.5GigE LAN
LAN 9	Intel® I226 2.5GigE LAN
Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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 airflow)	-40°C to 70°C (-40°F to 158°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, ICES, EN50155, EN50121-3-2

1.3.2 Specifications of ECX-4025

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by internal bracket, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

PoE	
LAN 3	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 4	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 5	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 6	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
2.5G Ethernet	
LAN 7	Intel® I226 2.5GigE LAN
LAN 8	Intel® I226 2.5GigE LAN
LAN 9	Intel® I226 2.5GigE LAN
Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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 70°C (-40°F to 158°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, ICES, EN50155, EN50121-3-2

1.3.3 Specifications of ECX-4000-PoER

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by front access SSD/HDD tray, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

PoE	
LAN 3	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 4	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 5	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 6	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.4 Specifications of ECX-4000-PoE

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® X^e LPG Graphics architecture, up to 4X^e Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by internal bracket, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

PoE	
LAN 3	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 4	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 5	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 6	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.5 Specifications of ECX-4000-6R

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by front access SSD/HDD tray, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN
LAN 3	Intel® I226IT 2.5GigE
LAN 4	Intel® I226IT 2.5GigE
LAN 5	Intel® I226IT 2.5GigE
LAN 6	Intel® I226IT 2.5GigE

Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.6 Specifications of ECX-4000-6G

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by internal bracket, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE
LAN 4	Intel® I226IT 2.5GigE
LAN 5	Intel® I226IT 2.5GigE
LAN 6	Intel® I226IT 2.5GigE

Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.7 Specifications of ECX-4000-2R

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
GPIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by front access SSD/HDD tray, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.8 Specifications of ECX-4000-2G

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
GPIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
SUMIT	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by internal bracket, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.9 Specifications of ECX-4071R

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by front access SSD/HDD tray, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

PoE	
LAN 3	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 4	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 5	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 6	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
10G SFP+	
LAN 7	Intel® X710-BM2 supports IEEE 802.3 10GBASE-T SFP+
LAN 8	Intel® X710-BM2 supports IEEE 802.3 10GBASE-T SFP+
Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

1.3.10 Specifications of ECX-4071

System	
Processor	Intel® Core™ Ultra 200S Series Processors, 65W/35W, max 24-core (Arrow Lake-S)
Chipset	Intel® W880 Chipset
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 6400MHz CSODIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485
USB	6 USB 3.2 Gen 2
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 External SIM Card Socket
Expansion	
M.2	• 2 M.2 Key B Socket (3042/3052/2280, PCIe x2/USB 3, default/SATA) • 1 M.2 Key E Socket (2230, PCIe x2/USB2)
Graphics	
Graphics Processor	Intel® Xe LPG Graphics architecture, up to 4Xe Graphics Engines
Interface	• 2 DisplayPort : Up to 7680 x 4320 @60Hz • 1 HDMI 2.0 : Up to 3840 x 2160 @60Hz • 1 DVI-I : Up to 1920 x 1080 @60Hz
Storage	
SATA	2 SATA III (6Gbps) by internal bracket, support software RAID 0, 1
M.2	• 1 M.2 Key M Socket (2280, PCIe x4) • 2 Front-access M.2 Socket (2280, PCIe x4, Optional)
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® I226IT 2.5GigE LAN supports TSN

PoE	
LAN 3	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 4	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 5	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
LAN 6	Intel® I226IT 2.5GigE IEEE 802.3at (25.5W/48V) PoE+
10G SFP+	
LAN 7	Intel® X710-BM2 supports IEEE 802.3 10GBASE-T SFP+
LAN 8	Intel® X710-BM2 supports IEEE 802.3 10GBASE-T SFP+
Power	
Input Voltage	DC 9V to 50V, Redundant Power Input
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block
Others	
TPM	Infineon SLB9672 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 11, 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, ICES, EN50155, EN50121-3-2

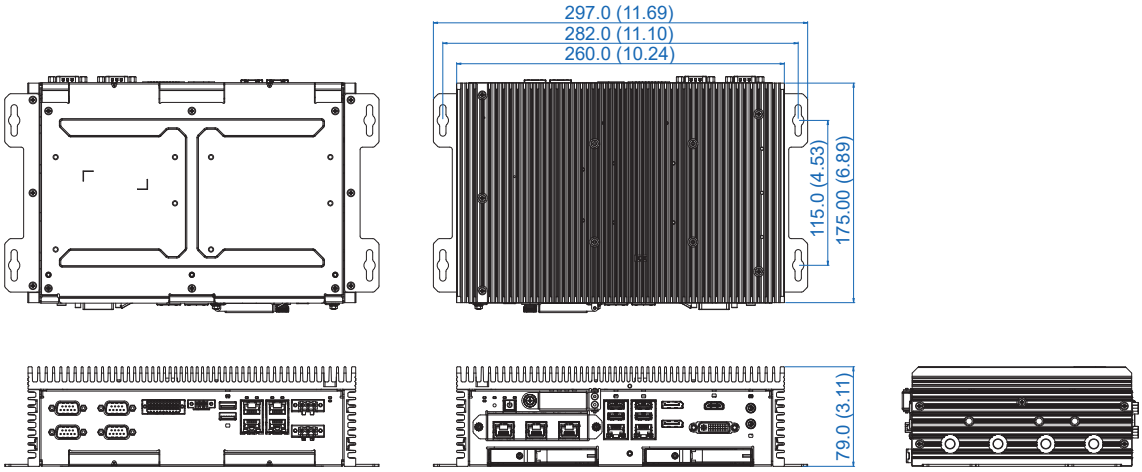
1.4 Supported CPU List

Processor Brand	CPU P/N	Cores	GHz*	TDP (W)
Intel® Core™ Ultra	9 285	24	2.5	65
	7 265	20	2.4	
	5 245	14	3.5	
	9 285T	24	1.4	35
	7 265T	20	1.5	
	5 245T	14	2.2	

1.5 Mechanical Dimension

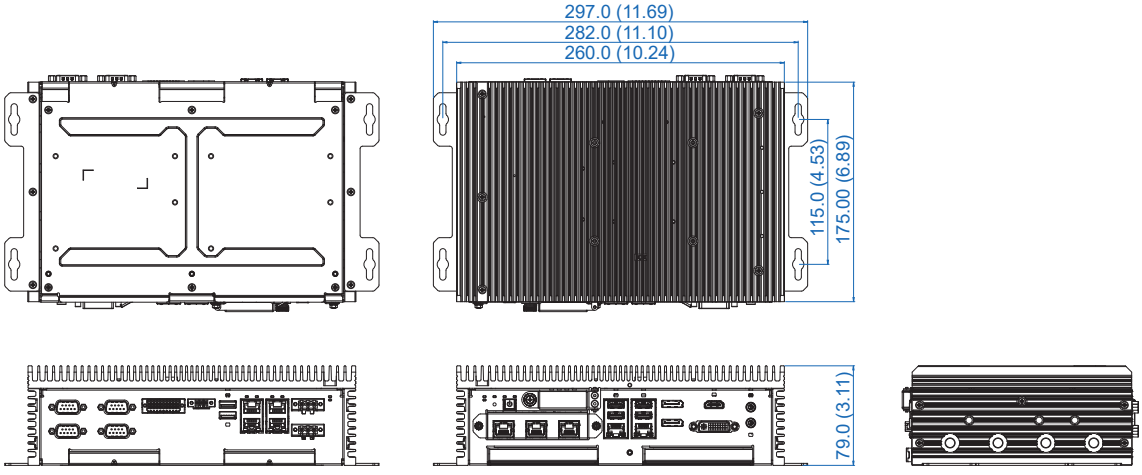
1.5.1 Dimensions of ECX-4025R

Unit : mm (inch)



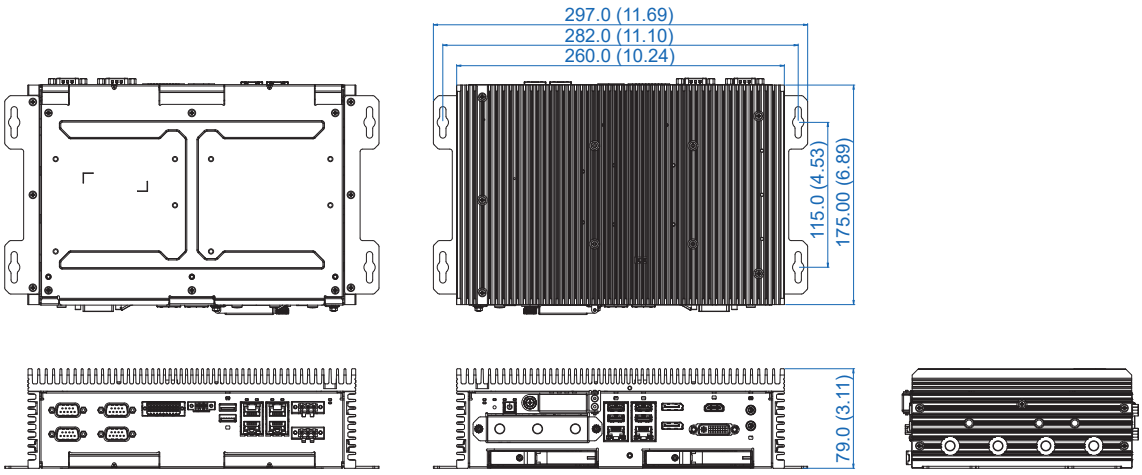
1.5.2 Dimensions of ECX-4025

Unit : mm (inch)



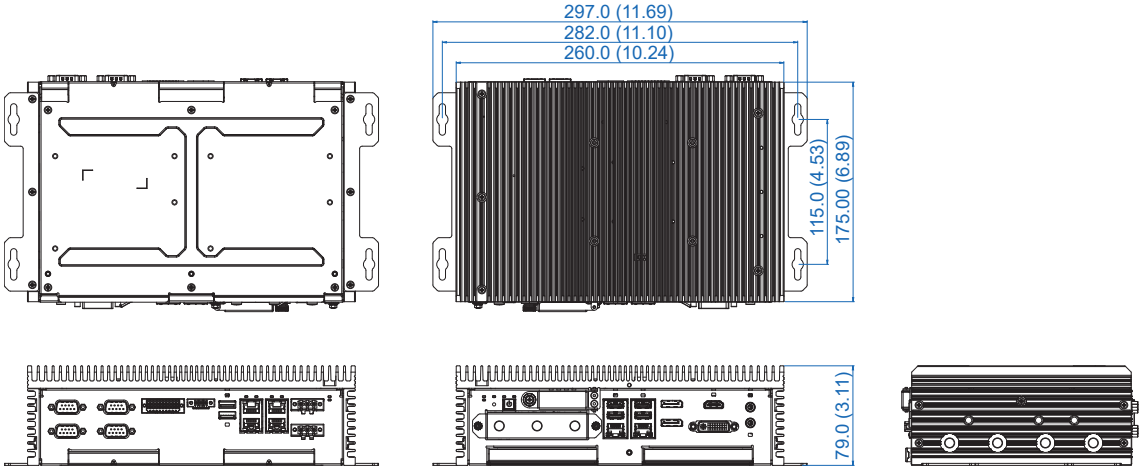
1.5.3 Dimensions of ECX-4000-PoER

Unit : mm (inch)



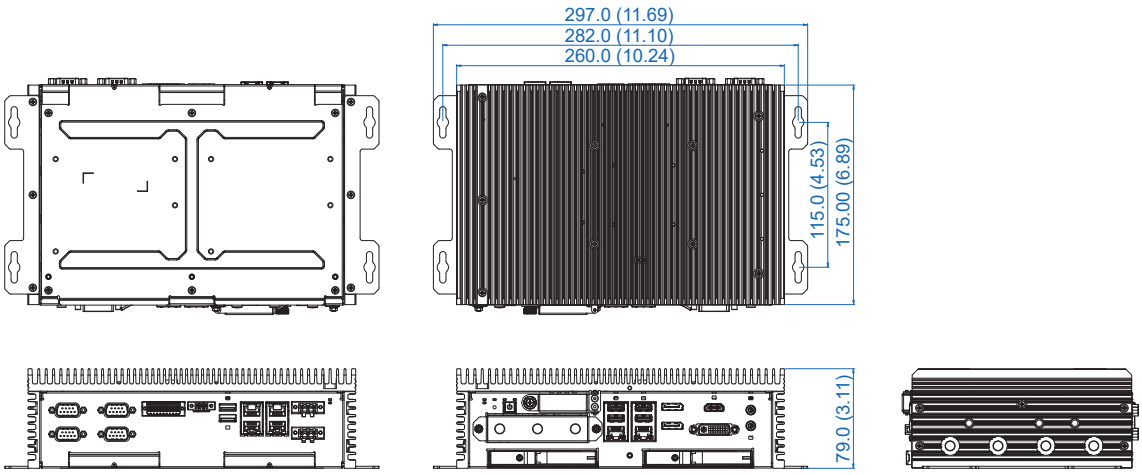
1.5.4 Dimensions of ECX-4000-PoE

Unit : mm (inch)



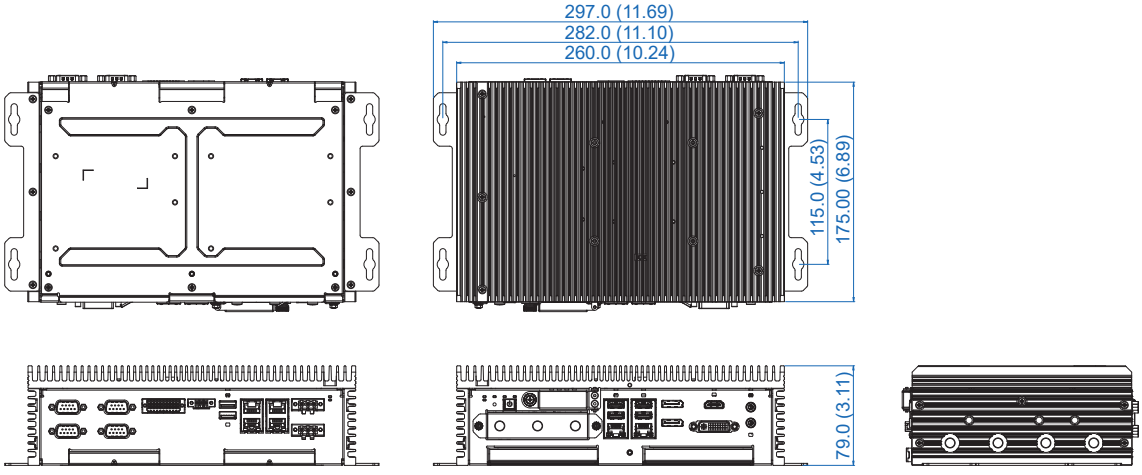
1.5.5 Dimensions of ECX-4000-6R

Unit : mm (inch)



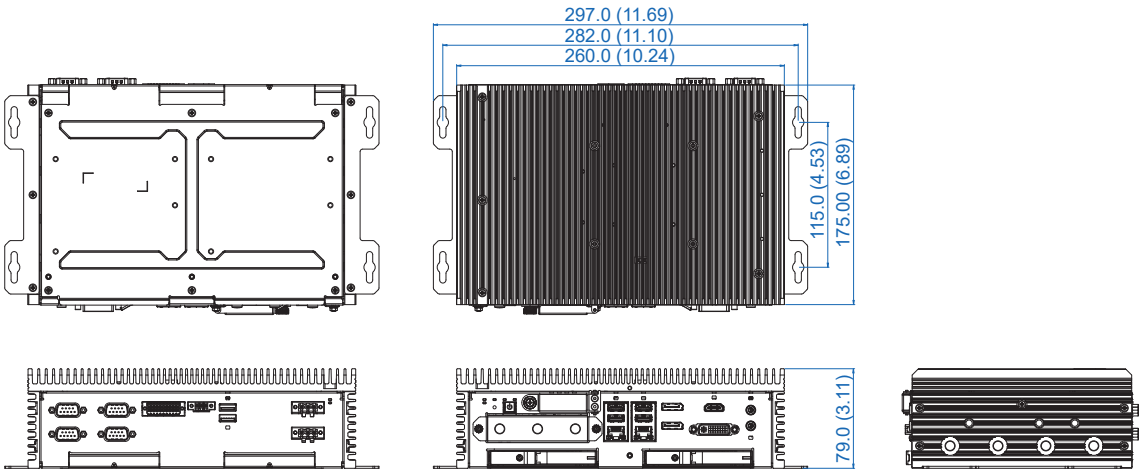
1.5.6 Dimensions of ECX-4000-6G

Unit : mm (inch)



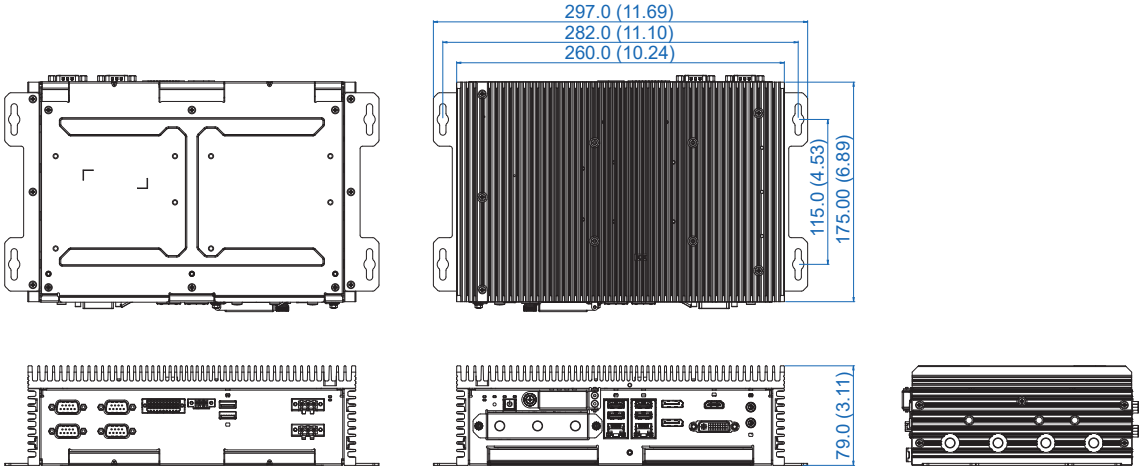
1.5.7 Dimensions of ECX-4000-2R

Unit : mm (inch)



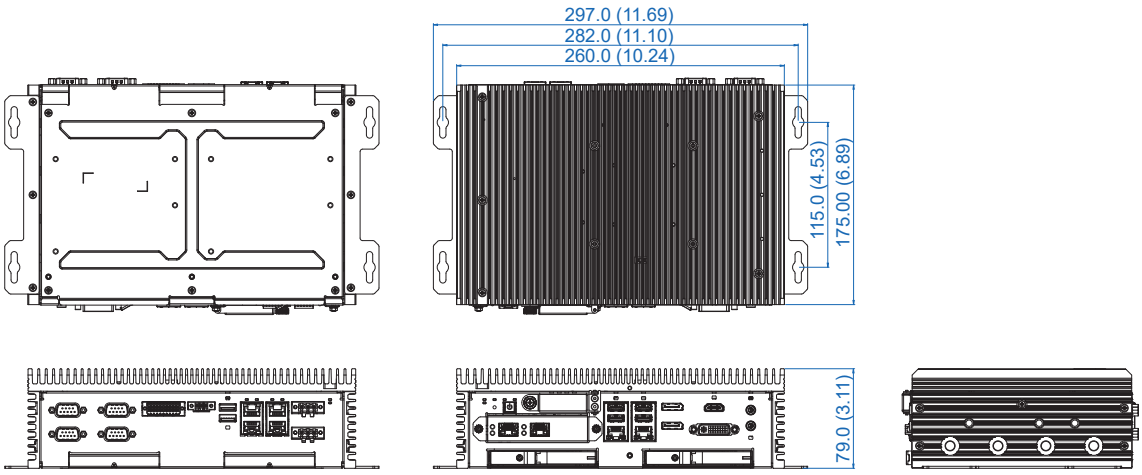
1.5.8 Dimensions of ECX-4000-2G

Unit : mm (inch)



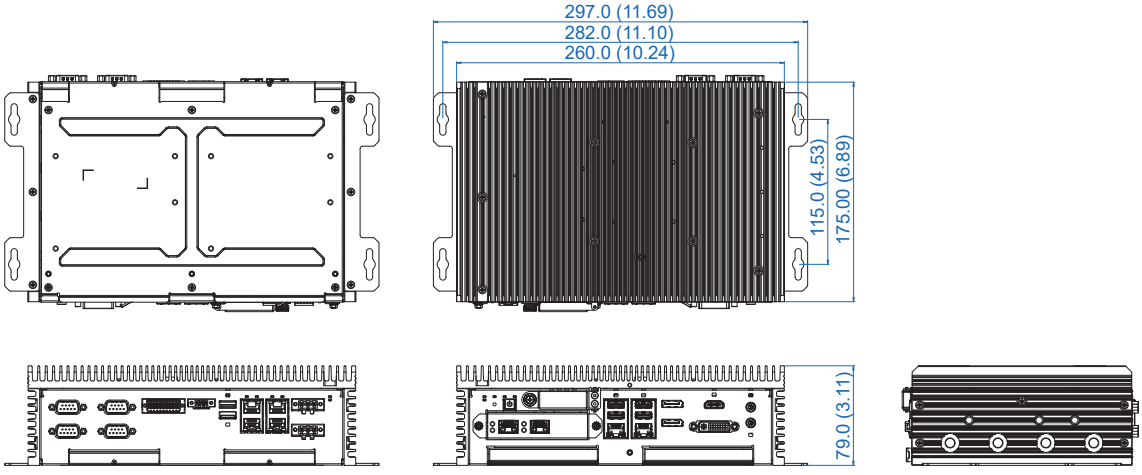
1.5.9 Dimensions of ECX-4071R

Unit : mm (inch)



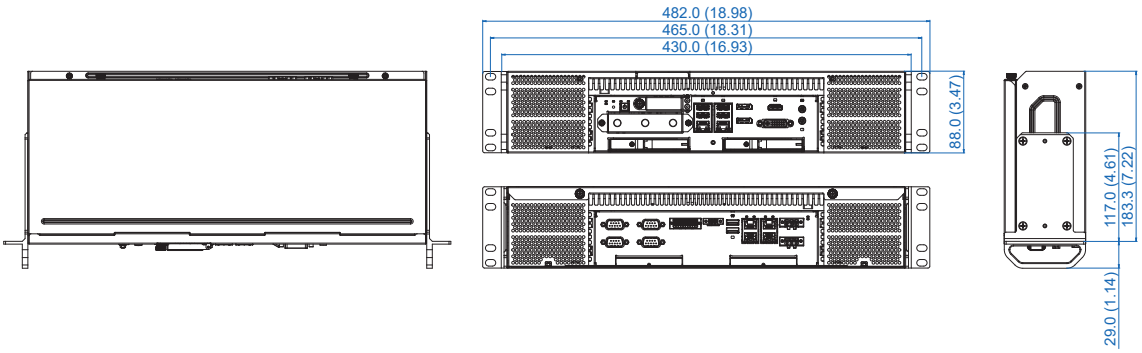
1.5.10 Dimensions of ECX-4071

Unit : mm (inch)



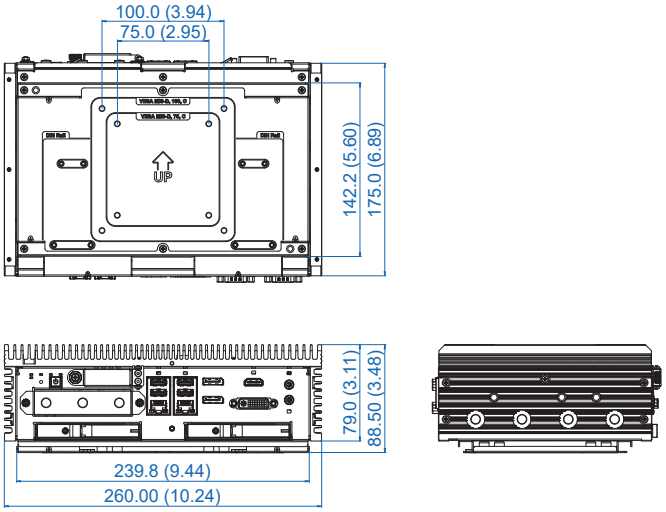
1.5.11 Dimensions of Rack Mount Enclosure(Optional)

Unit : mm (inch)



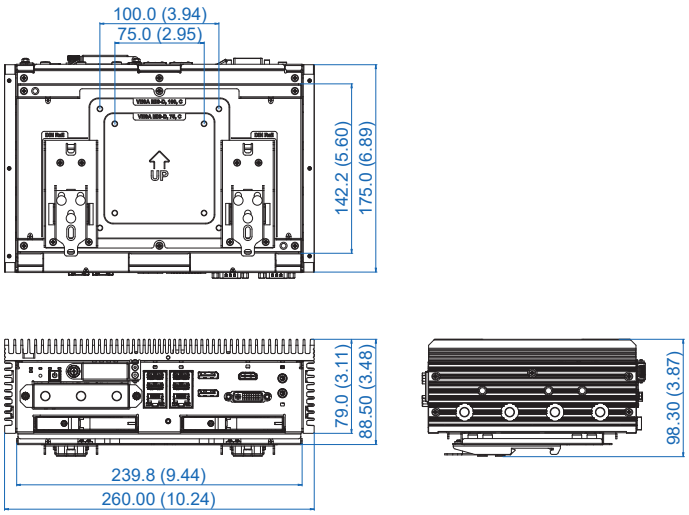
1.5.12 Dimensions of VESA Mount Bracket(Optional)

Unit : mm (inch)



1.5.13 Dimensions of DIN Rail Bracket(Optional)

Unit : mm (inch)



2

GETTING TO KNOW YOUR ECX-4000

2.1 Packing List

2.1.1 ECX-4000-PoE/6G/2G/4025/4071 Packing List

Item	Description	Qty
1	ECX-4000 Fanless Embedded System (According to the configuration of you order, the ECX-4000 series may contain SSD/HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1
2	ECX-4000-PoE/6G/2G/4025/4071 accessory box, which contains	1

Item	Description	Picture	Use for	P/N	Qty
1	Hex. standoff_M3_ L=2.45 mm_L1=2.0 mm_L2=3.8 mm_ Nylok		M.2 Key B & M	53-M005582-014	3
2	M3_I Head_Phillips_ L=4.0 mm_Ni _Nylok		M.2 module card	53-M006400-010	4
3	M2_I Head_Phillips_ L=2.0 mm_Ni		M.2 Key B & M	53-M004600-000	3
4	M3_Flat head_ Phillips_L=5.0 mm_ 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	51-2411R03-S1B	2
7	Terminal block 3-pin (3.5mm)		Remote SW/IGN	51-2211R03-S1A	1
8	Terminal block 20-pin (2.54mm)		Isolated DIO/GPIO	51-2112R20-S1D	1
9	Wall mount bracket		Wall mount	62-04P0527-C0A	2
10	Thermally conductive compound		CPU	53-4036342-203	1
11	Rubber Foot		Stand	53-7030042-303	4
12	M3_Pan head_ Phillips_L=5.0 mm_ Ni_Nylok		Rubber foot	53-M007110-010	4

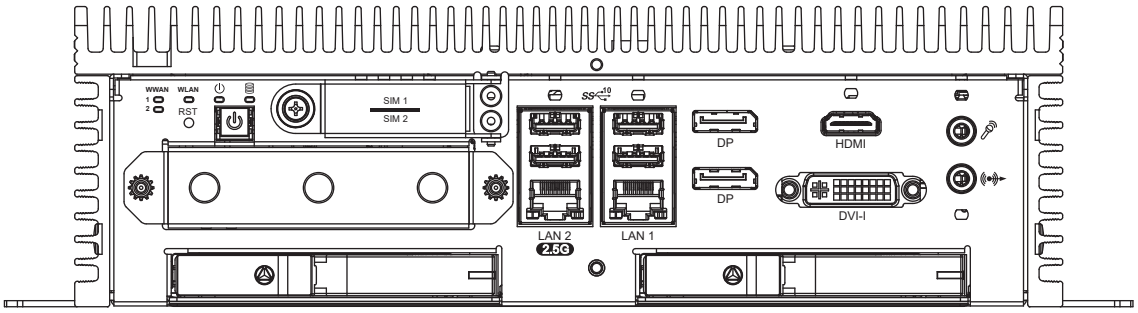
2.1.2 ECX-4000-PoER/6R/2R/4025R/4071R Packing List

Item	Description	Qty
1	ECX-4000 Fanless Embedded System (According to the configuration of you order, the ECX-4000 series may contain SSD/HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1
2	ECX-4000-PoER/6R/2R/4025R/4071R accessory box, which contains	1

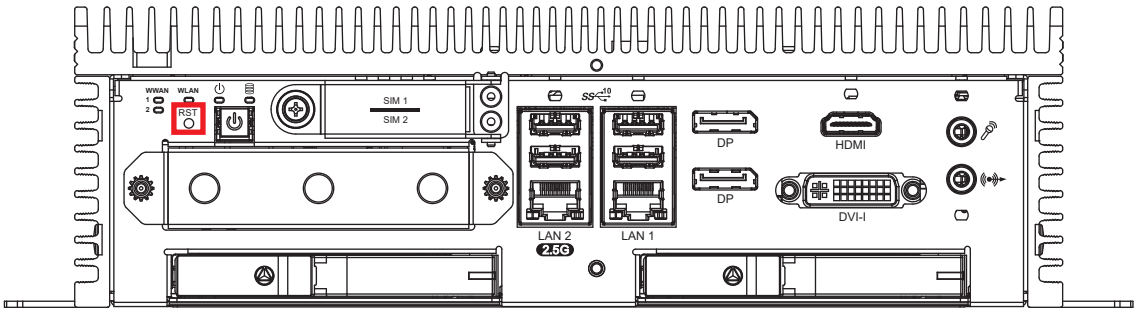
Item	Description	Picture	Use for	P/N	Qty
1	Hex. standoff_M3_ L=2.45 mm_L1=2.0 mm_L2=3.8 mm_ Nylok		M.2 Key B & M	53-M005582-014	3
2	M3_I Head_Phillips_ L=4.0 mm_Ni _Nylok		M.2 module card	53-M006400-010	4
3	M2_I Head_Phillips_ L=2.0 mm_Ni		M.2 Key B & M	53-M004600-000	3
4	M3_Flat head_ Phillips_L=5.0 mm_ Black_Nylok		Wall mount bracket	53-M004950-310	6
5	Terminal block 3-pin (5.0mm)		DC-IN	51-2411R03-S1B	2
6	Terminal block 20-pin (2.54mm)		Isolated DIO/GPIO	51-2112R20-S1D	1
7	Terminal block 3-pin (3.5mm)		Remote SW/IGN	51-2211R03-S1A	1
8	Wall mount bracket		Wall mount	62-04P0527-C0A	2
9	Thermally conductive com-pound		CPU	53-4036342-203	1
10	Rubber foot		Stand	53-7030042-303	4
11	M3_Pan head_ Phillips_L=5.0 mm_ Ni_Nylok		Rubber foot	53-M007110-010	4
12	SSD Tray Key		SSD Tray	N/A	2

2.2 Front Panel I/O Functions

In Vecow ECX-4000 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.

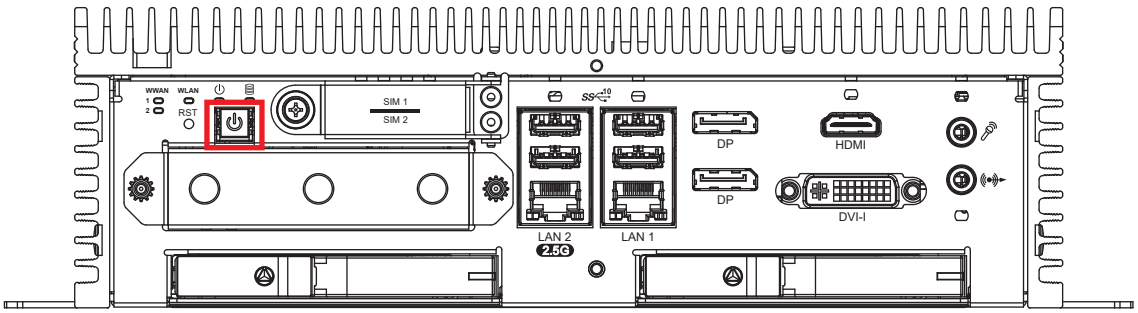


2.2.1 Reset Tact Switch



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



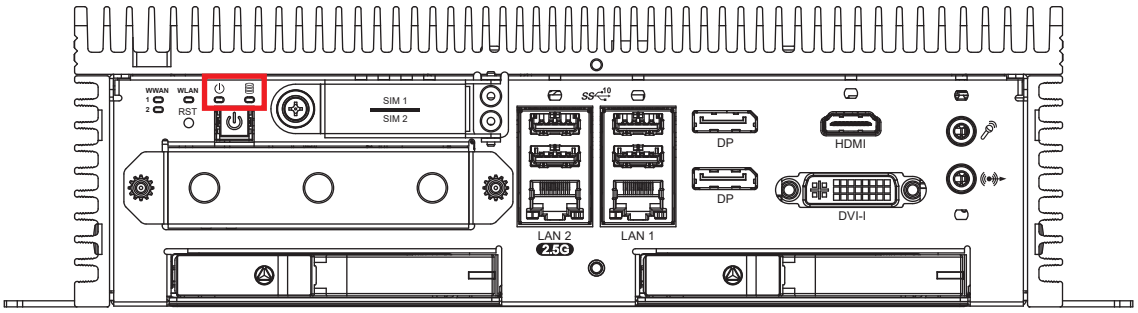
The Power Button is a non-latched switch with dual color LED indication.
It indicates power status : S0, S3 and S5. More detail LED indications are listed as follows :

LED Color	Power Status	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 PWR & HDD LED Indicator

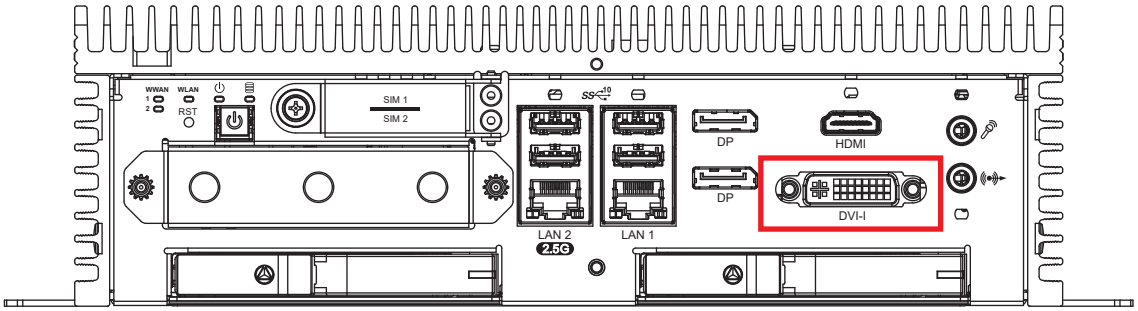


HDD LED/ Yellow : A Hard Disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

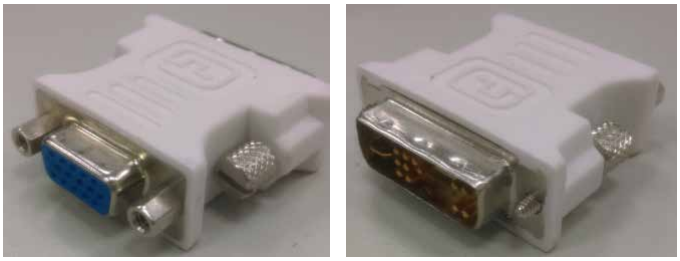
Power LED/ Green : If the LED is solid green, it indicates that the system is powered on.

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

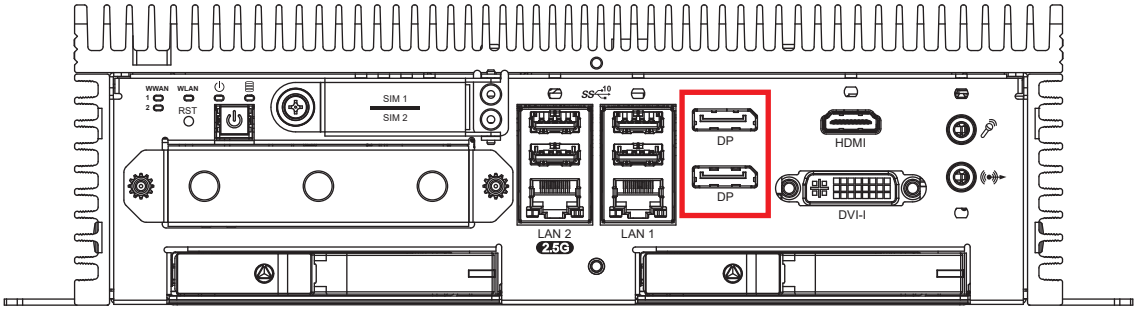
2.2.4 DVI-I Connector



- 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

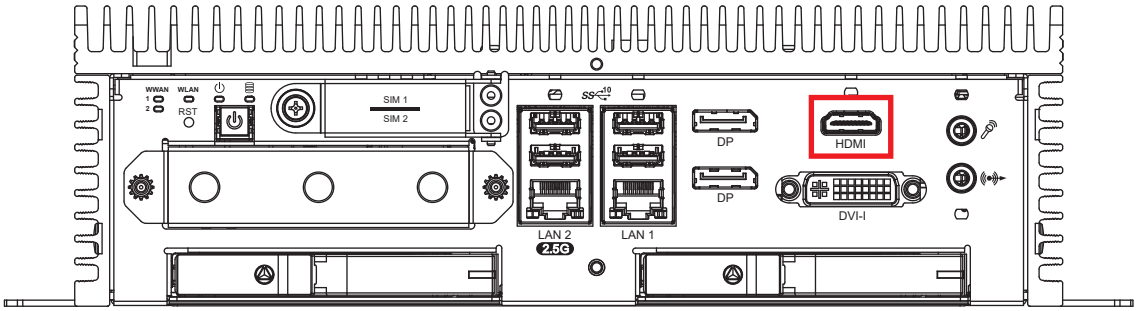


2.2.5 DisplayPort



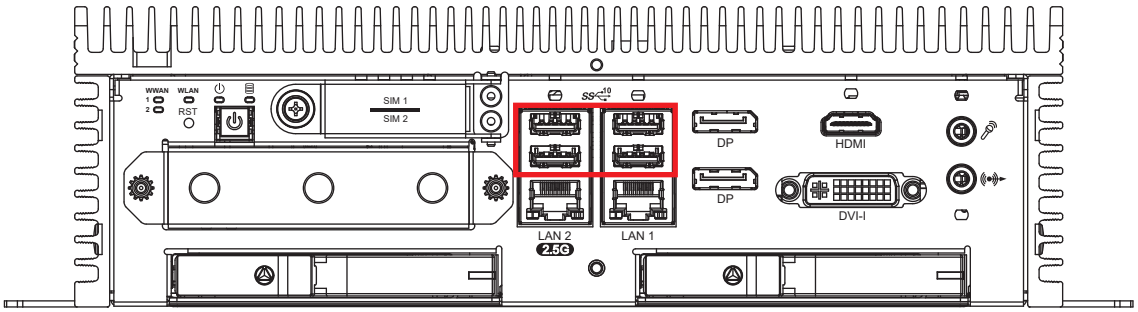
Onboard Display Port support auxiliary channel dual mode, connection supports up to 5120x3200 resolution at 60 Hz.

2.2.6 HDMI Connector



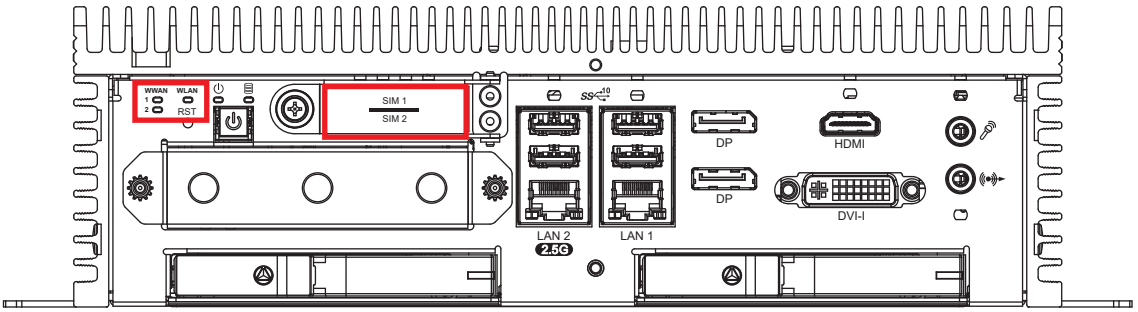
Onboard HDMI Port supports DDC channel mode. The connection supports up to 3840 x 2160 resolution at 60Hz.

2.2.7 USB 3.0



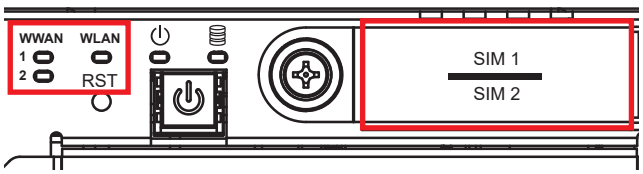
There are 4 USB 3.0 connections available supporting up to 10GB per second data rate in the front side of ECX-4000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

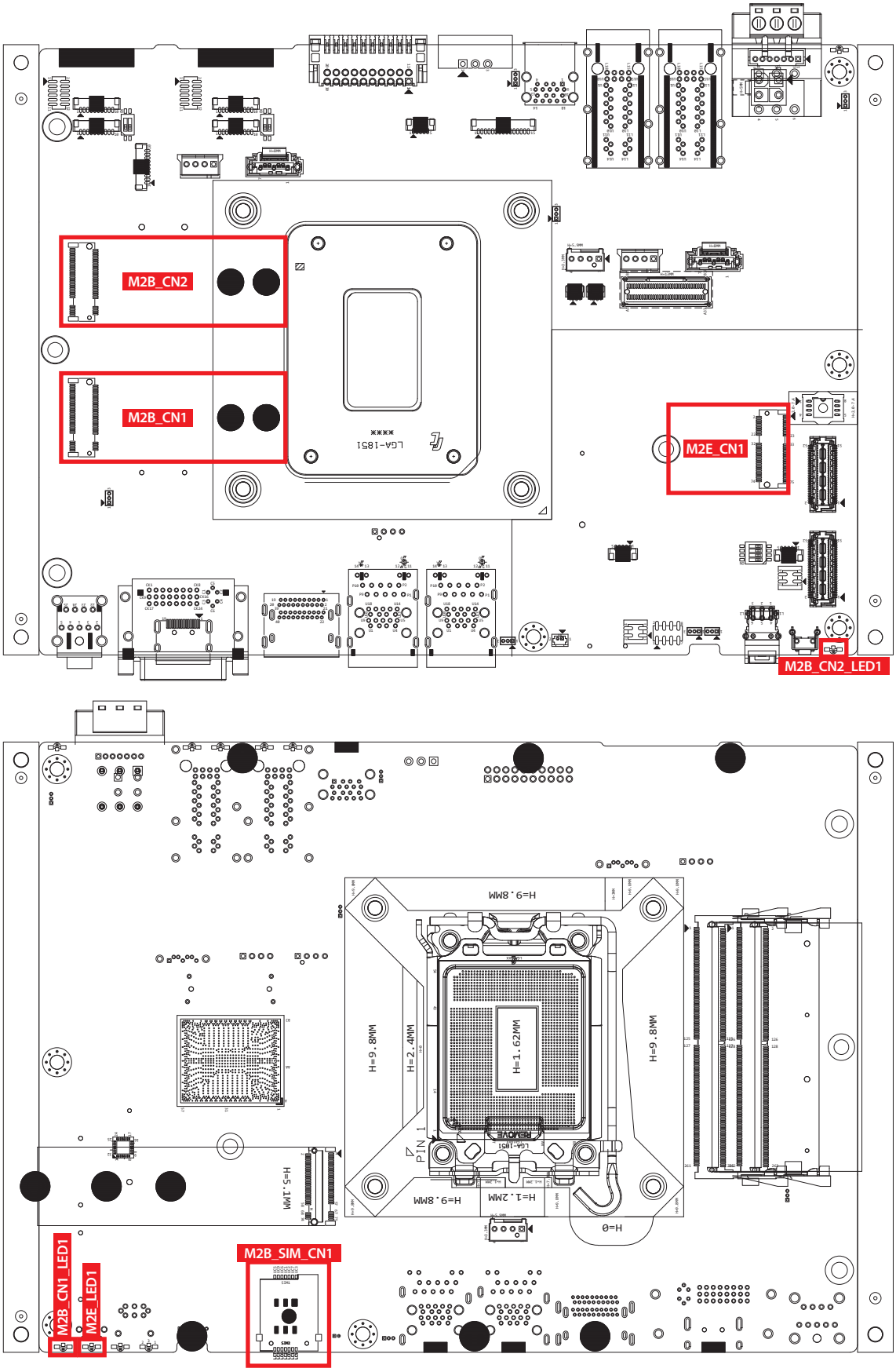
2.2.8 WLAN LED, M.2 KEY B,M.2 KEY E, Nano SIM Card Comparison



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

Slot	SIM	LED
M2B_CN1	SIM1	WWAN1
M2B_CN2	SIM2	WWAN2
M2E_CN1	X	WLAN

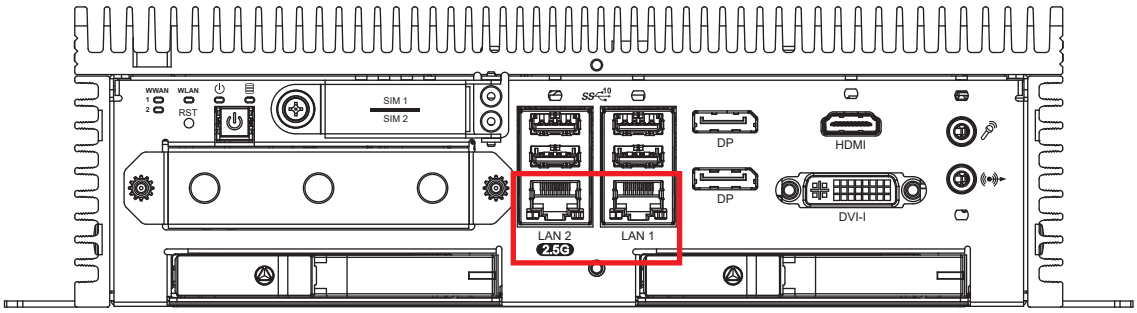




Note :

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

2.2.9 Ethernet Port



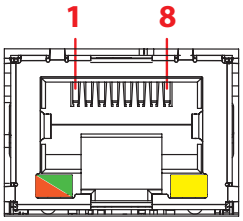
There are two 8-pin RJ-45 jacks supporting 10/100/1000/2500 Mbps Ethernet connections on the front side of ECX-4000. LAN 1 is powered by Intel® I219LM Ethernet engine, and LAN 2 is powered by Intel I226 Ethernet engine. When LAN 1 works in normal status, iAMT 11.0 function is enabled.

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 :

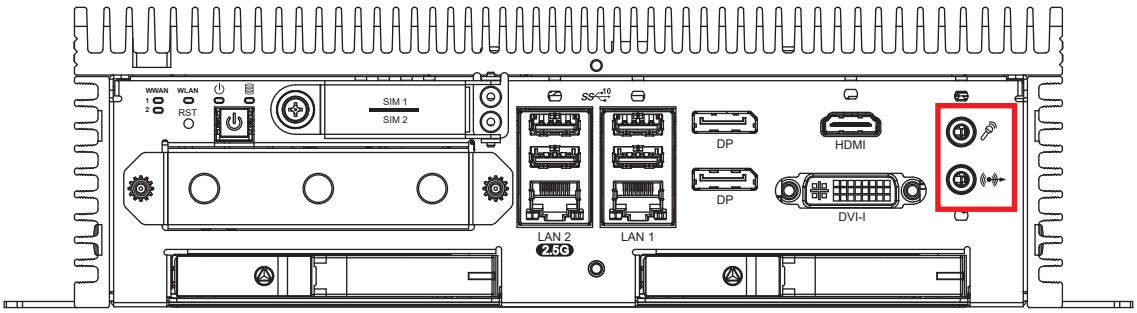
Pin No.	10/100 Mbps	1000/2500Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	------	MDI3_N

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

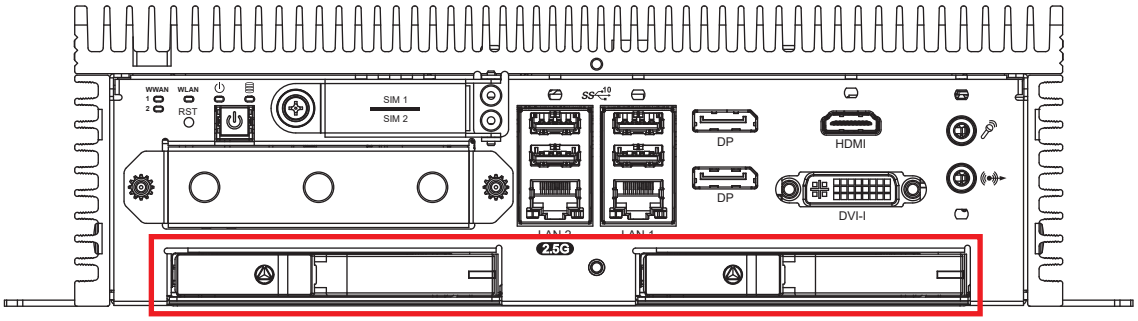
2.2.10 Audio Connector



Here are 2 audio connectors, Mic-in and Line-out, in the front side of ECX-4000. 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.

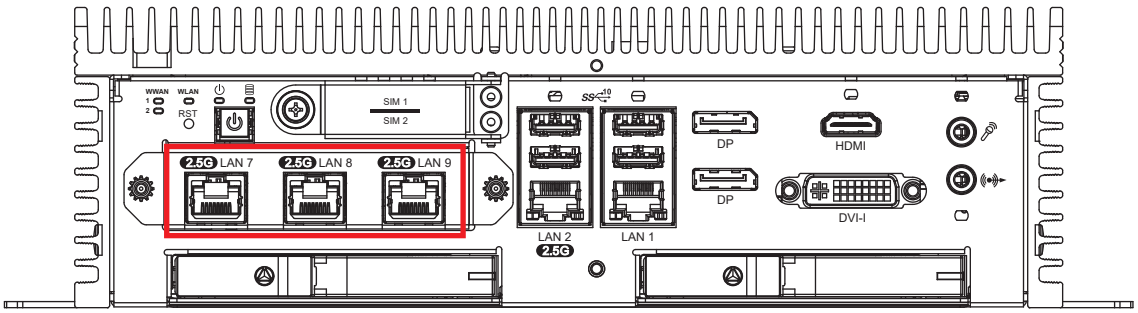
2.2.11 SSD/HDD Tray



There are 2 front-access 2.5” SSD/HDD trays in the front side of ECX-4000. Just trigger to open the SSD/HDD tray.

2.2.12 Expansion Ethernet

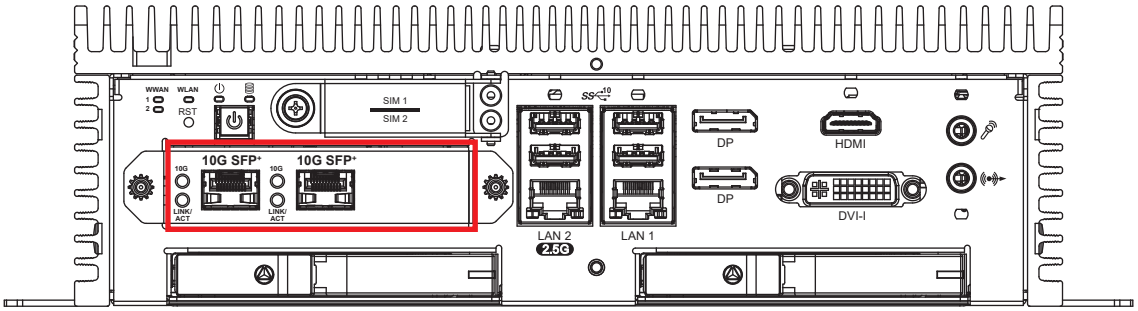
2.2.12.1 2.5G Ethernet Port (4025/4025R)



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 I226.

- 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

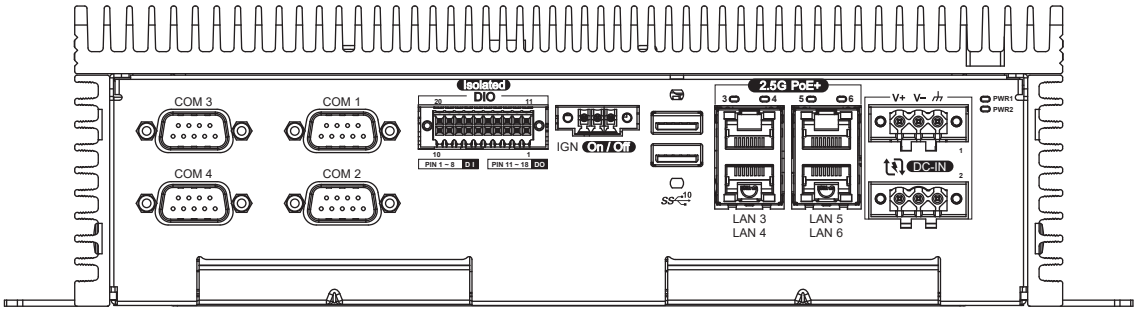
2.2.12.2 10G Ethernet Port (4071X/4071XR)



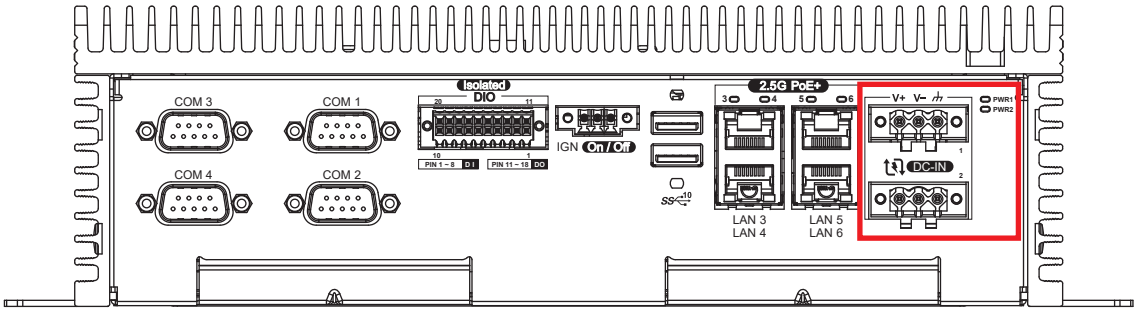
There are 2 expansion 10G ethernet LAN in the front side. These are powered by Intel X550-AT2

- 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)

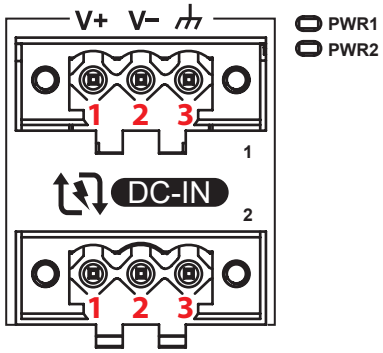
2.3 Rear Panel I/O & Functions



2.3.1 Power Input

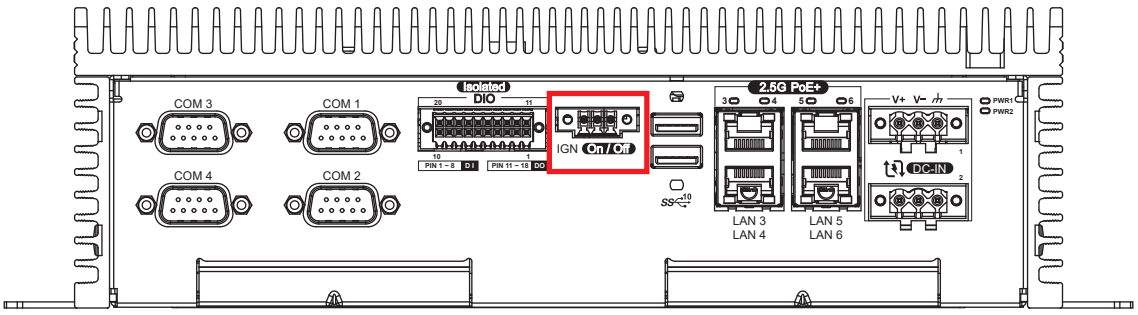


This system supports 9V to 50V DC power input by terminal block in the rear side.
In normal power operation, power LED lightens in solid green.

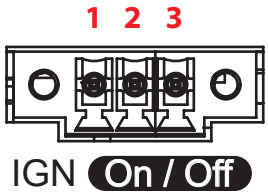


Pin	Definition
1	V+
2	V-
3	Chassis Ground

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

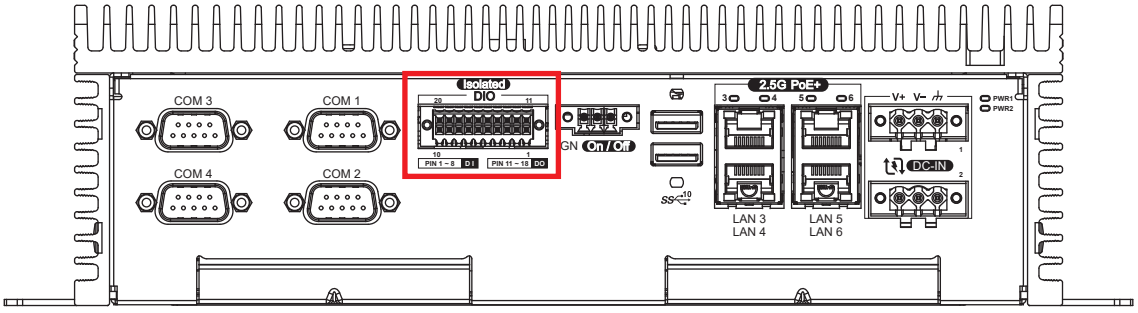


It is a 2-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function of soft power-on/ power-off (instant off or delay 4 second), and suspend mode.



Pin	Definition
1	Ignition
2	SW+
3	SW-

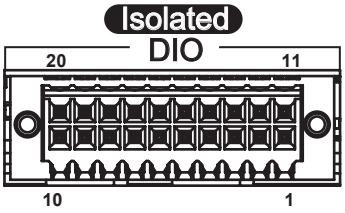
2.3.3.1 Isolated DIO



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

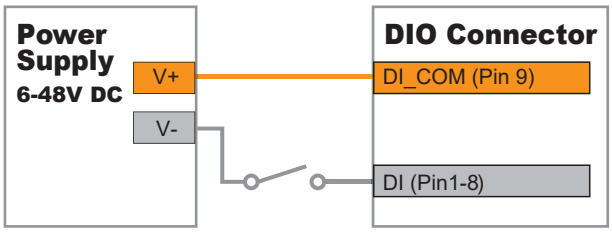


DIO Connectors pin out :

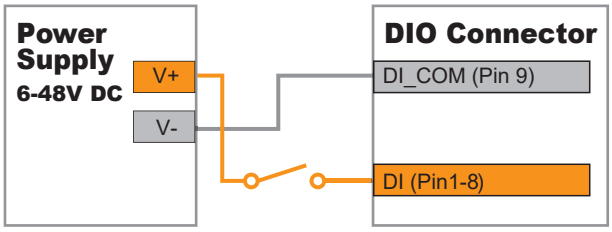
Pin No.	Definition	Mapping to SIO GPIO Function
1	INPUT 0	SIO_GPI80
2	INPUT 1	SIO_GPI81
3	INPUT 2	SIO_GPI82
4	INPUT 3	SIO_GPI83
5	INPUT 4	SIO_GPI84
6	INPUT 5	SIO_GPI85
7	INPUT 6	SIO_GPI86
8	INPUT 7	SIO_GPI87
9	DI_COM	----------
10	DIO_GND	----------
11	OUTPUT 0	SIO_GPO70
12	OUTPUT 1	SIO_GPO71
13	OUTPUT 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)

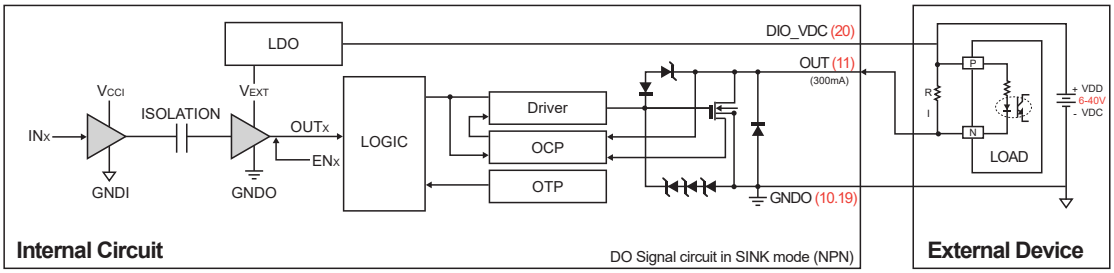


Source Mode (PNP)

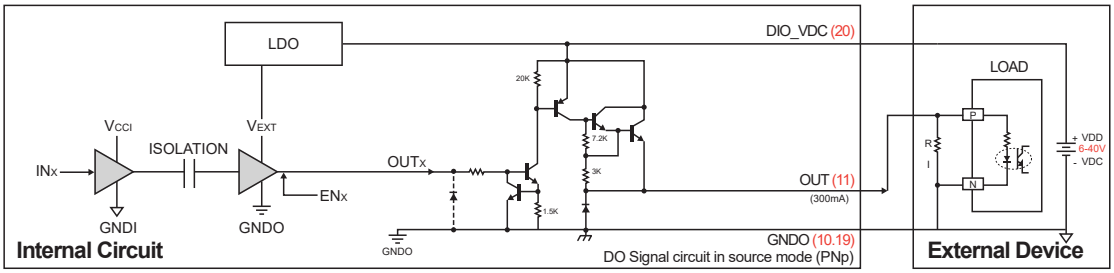


DO reference circuit :

Sink Mode (NPN, Default)



Source (PNP)



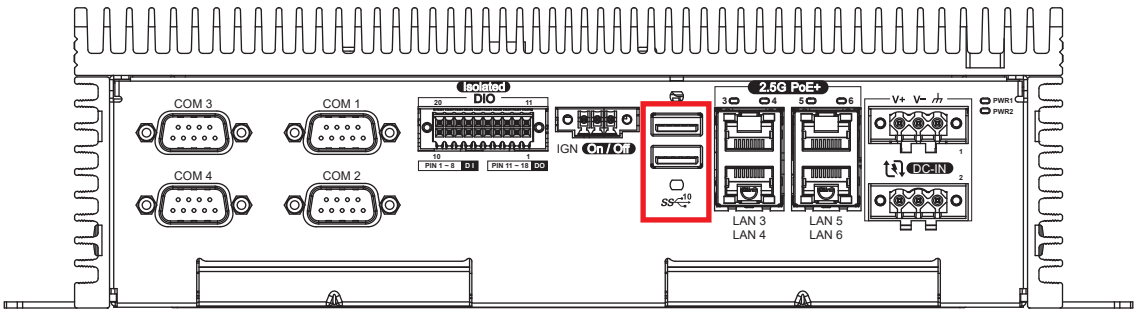
2.3.3.2 GPIO

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

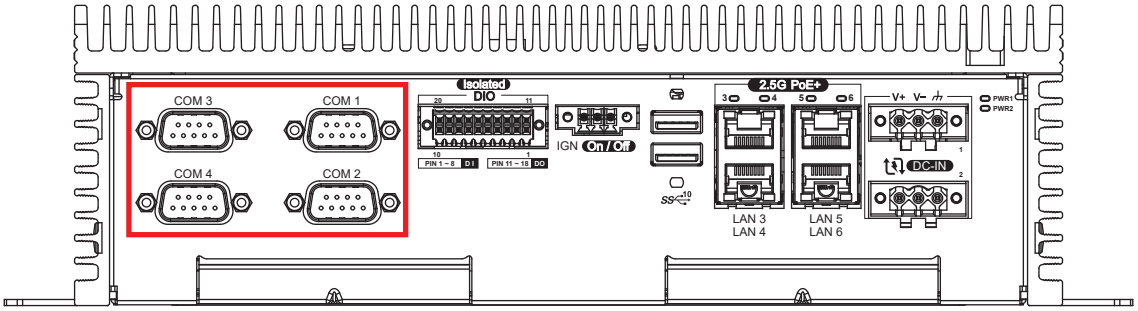
Pin No.	Mapping to SIO GPIO Function	Pin No.	Mapping to SIO GPIO Function
1	SIO_GPI80	11	SIO_GPO70
2	SIO_GPI81	12	SIO_GPO71
3	SIO_GPI82	13	SIO_GPO72
4	SIO_GPI83	14	SIO_GPO73
5	SIO_GPI84	15	SIO_GPO74
6	SIO_GPI85	16	SIO_GPO75
7	SIO_GPI86	17	SIO_GPO76
8	SIO_GPI87	18	SIO_GPO77
9	----------	19	----------
10	----------	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-4000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

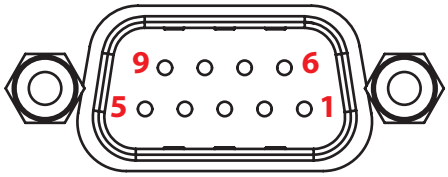
2.3.5 Serial Port



Serial port 1 to 4 (COM 1 to 4) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1,2,3,4 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

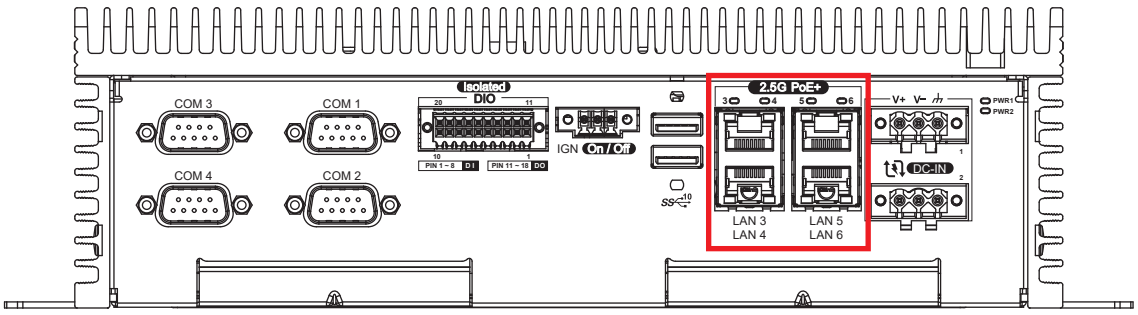
BIOS Setting	Function
COM 1 to 4	RS-232
	RS-422 (5-wire)
	RS-485 (3-wire)

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 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	----------	----------

2.3.6 PoE Ports



There are 4 RJ45 connectors in the rear side of ECX-4000. It supports IEEE 802.3at (PoE^{+}) Power over Ethernet (PoE) connection delivering up to 25.5W/54V per port and 2500BASE-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.

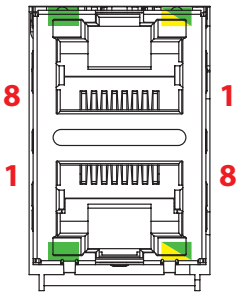
The pin-outs of LAN 3 and LAN 6 are listed as follows :

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

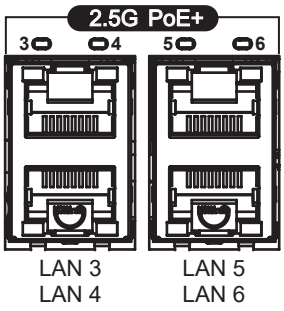
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

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 Loca-tion	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

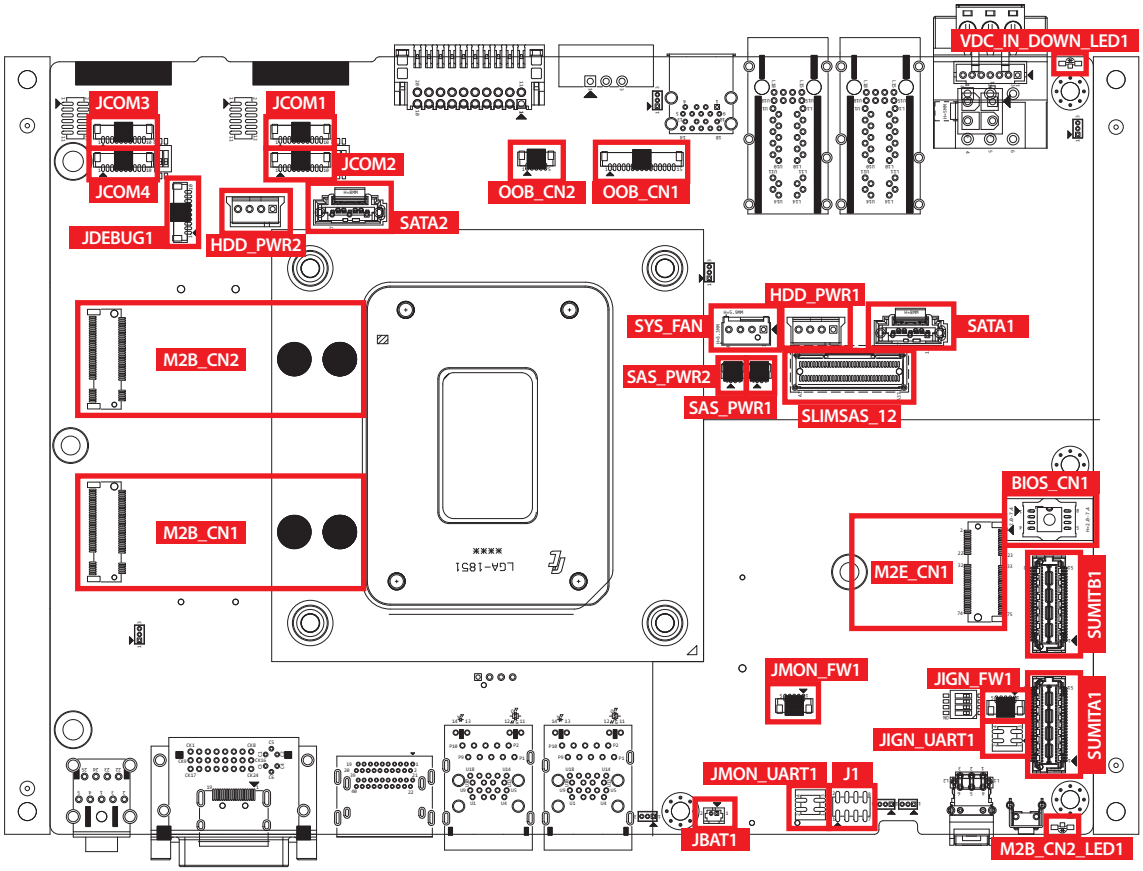


POE Power output LED	Color	LAN Chip	LAN Port
3	Solid Green	LAN3-I226	LAN3
4	Solid Green	LAN4-I226	LAN4
5	Solid Green	LAN5-I226	LAN5
6	Solid Green	LAN6-I226	LAN6

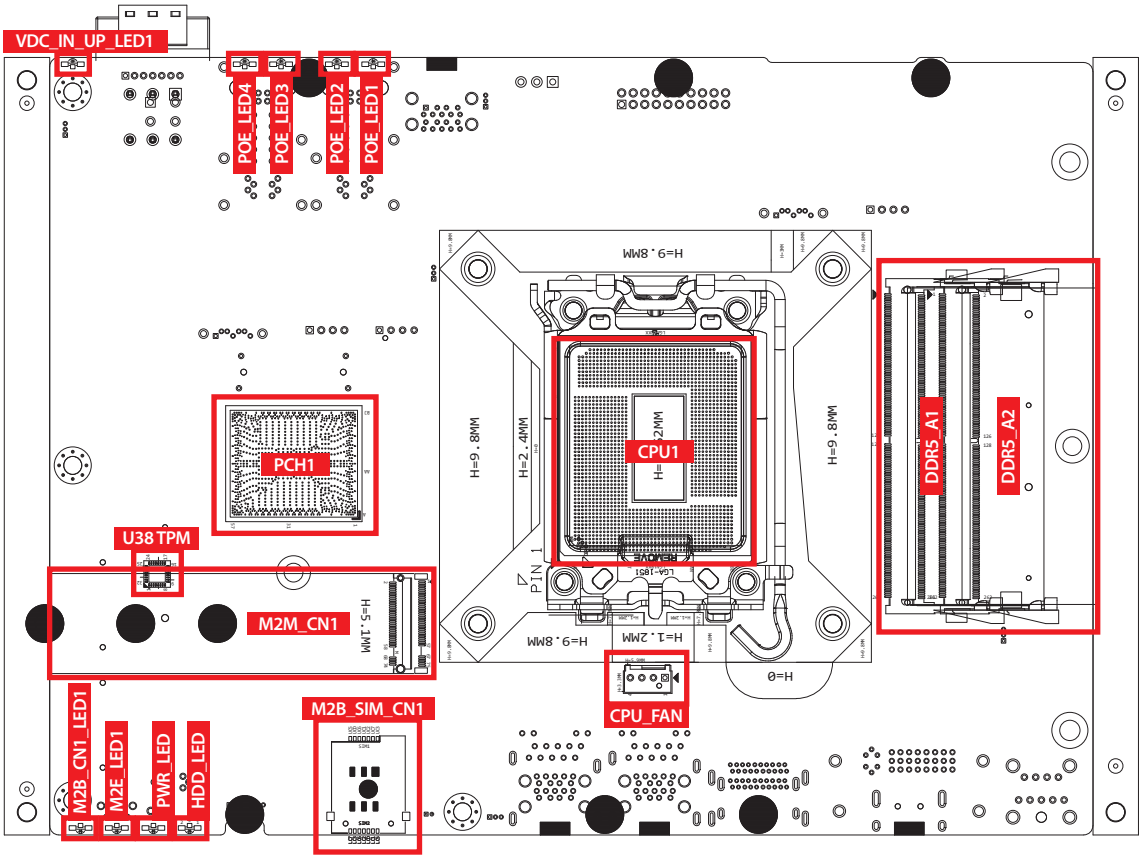


2.4 Main Board Expansion Connectors

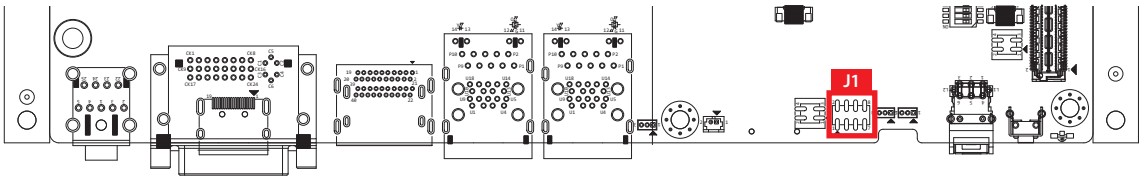
2.4.1 Top View (Component Side) of ECX-4000 Main Board With Connector Location



2.4.2 Bottom View (Solder Side) of ECX-4000 Main Board With Connector Location

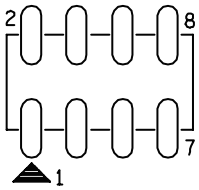


2.4.3 J1 : Miscellaneous Pin Header



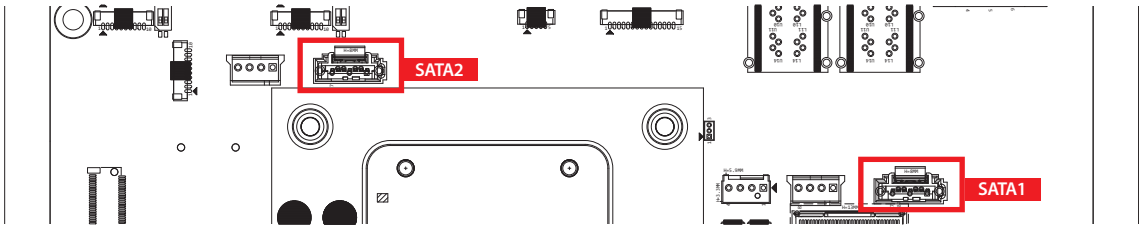
2.0mm 2x4p header

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 :

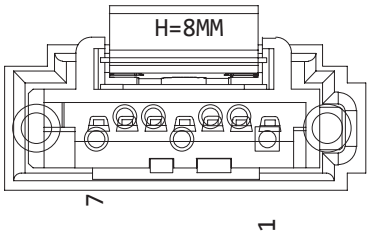


Group	Pin No.	Description
HDD LED	1	HDD_LED_P
	3	HDD_LED_N
RESET BUTTON	5	FP_RST_BTN_N
	7	Ground
POWER LED	2	PWR_LED_P
	4	PWR_LED_N
POWER BUTTON	6	FP_PWR_BTN_IN
	8	Ground

2.4.4 SATA1,SATA2 : SATA III Connector

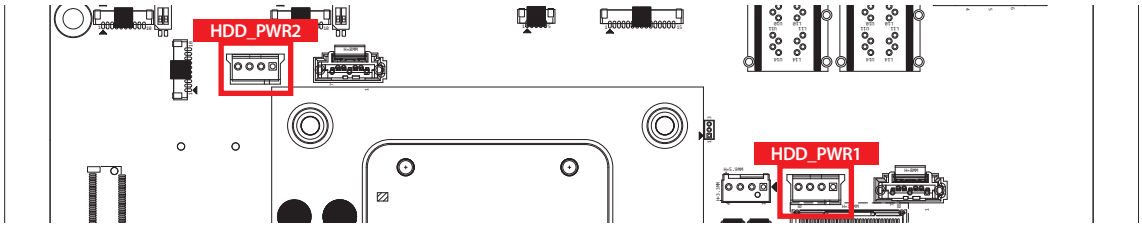


There are 2 onboard high performance Serial ATA III (SATA III) on ECX-4000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 and SATA2 are listed in the following table :

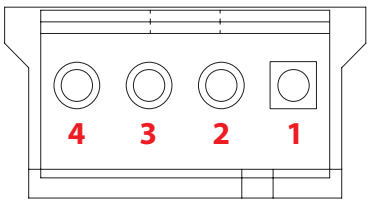


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

2.4.5 HDD_PWR1, HDD_PWR2 : SATA Power Connector

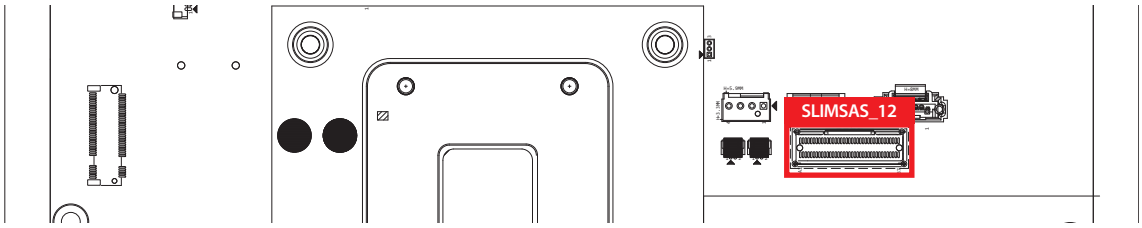


The ECX-4000 also equip with a SATA power connector. The one port supports 5V (Up to 3A) and 12V (Up to 3A) current to the hard drive or SSD. The pin assignments of HDD_PWR1,HDD_PWR2 are listed in the following table :



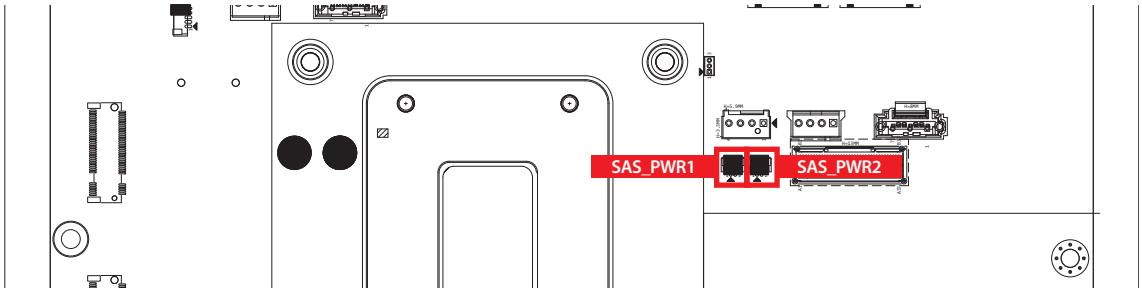
Pin No.	Definition
1	+12V
2	GND
3	GND
4	+5V

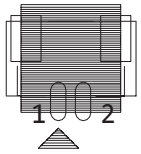
2.4.6 SLIMSAS_12 : M2D Board PCIE cable connector



ECX-4000 support front access M.2 tray via cable to connect to ECX-3000 M2D Board.

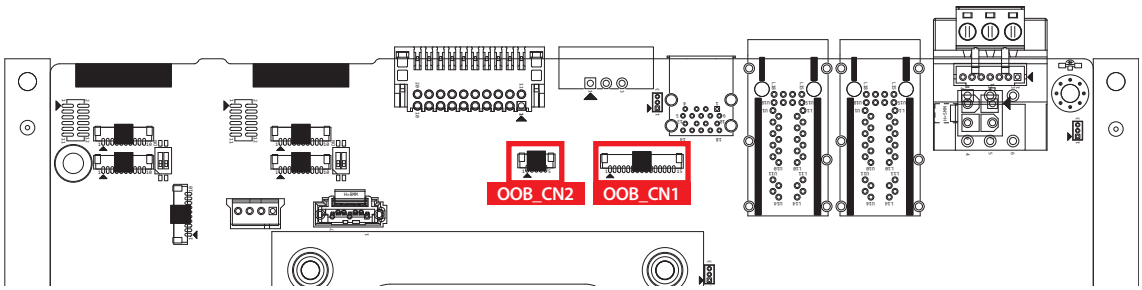
2.4.7 SAS_PWR1, SAS_PWR2 : M2D Board Power cable Connector





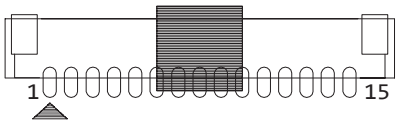
Pin No.	Definition
1	+12V(Max.2A)
2	GND

2.4.8 OOB_CN1,OOB_CN2 : For OOB Module

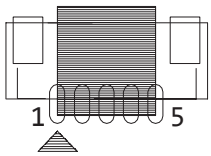


The LED indicator can instantly judge the power status(P) of OOB Enabler and the connection status(A) of OOB Enabler and Allxon Portal.
If both LEDs are on, it means OOB Enabler is running and the connection to Allxon Cloud is stable. The OOB network port is used for OOB out-of-band control.

The SIM card holder is used for OOB 4G network cards. This function is optional. For detailed instructions, please refer to the OOB chapter.

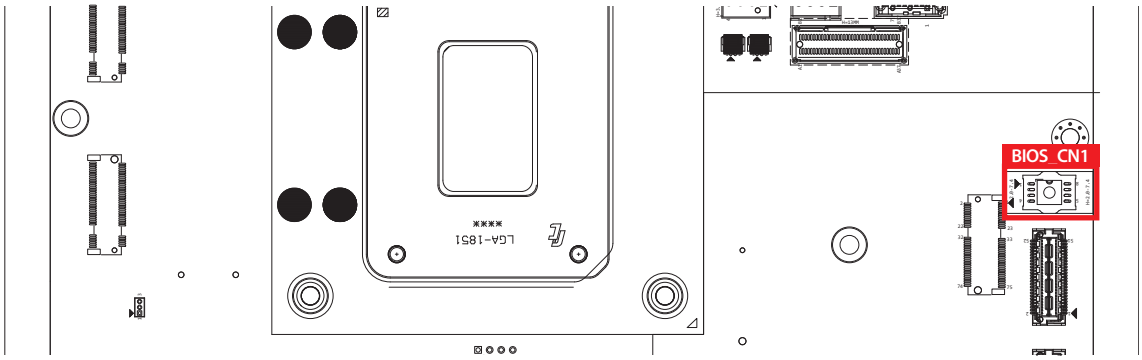


Location	Pin No.	Definition
OOB_CN1	1	5V
	2	5V
	3	GND
	4	NC
	5	NC
	6	GND
	7	UART_RX
	8	UART_TX
	9	GND
	10	NC
	11	NC
	12	GND
	13	PSW_NU
	14	OOB_RSTBTN#
	15	PWR_ONOFF_DET



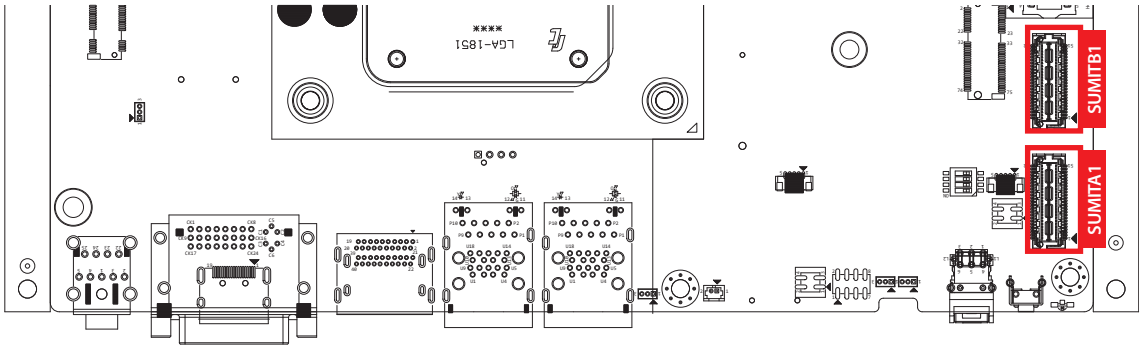
Location	Pin No.	Definition
OOB_CN2	1	NC
	2	NC
	3	GND
	4	BIOS_UART0_TXD_R
	5	BIOS_UART0_RXD_R

2.4.9 BIOS_CN1 : BIOS Socket



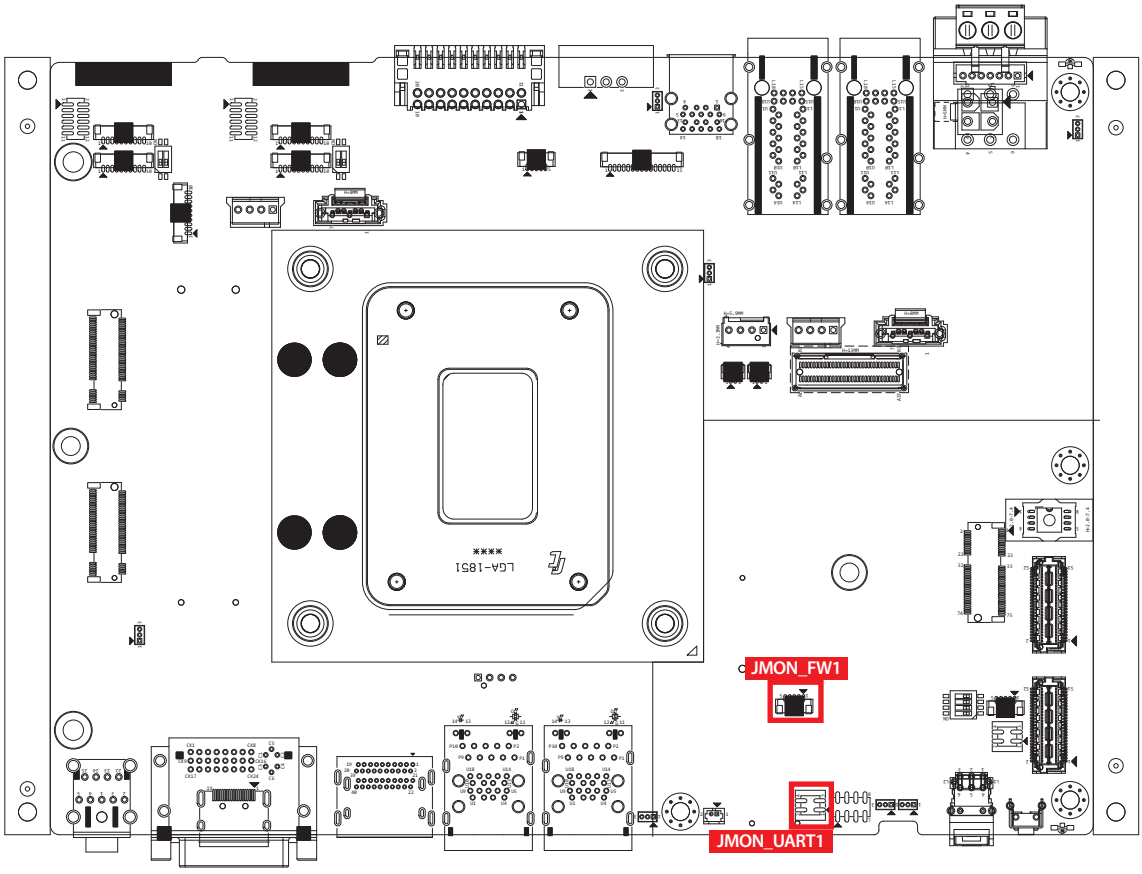
If the BIOS needs to be changed, please contact the Vecow RMA service team.

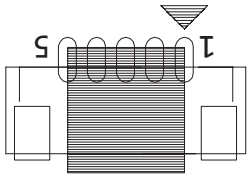
2.4.10 SUMITA1, SUMITB1



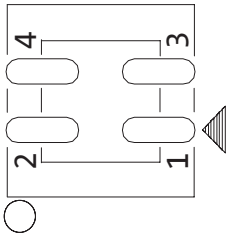
This system have standard SUMIT A and SUMIT B for SUMIT type add on cards.

2.4.11 JMON_FW1,JMON_UART1 : HW Monitor MCU update FW and debug header



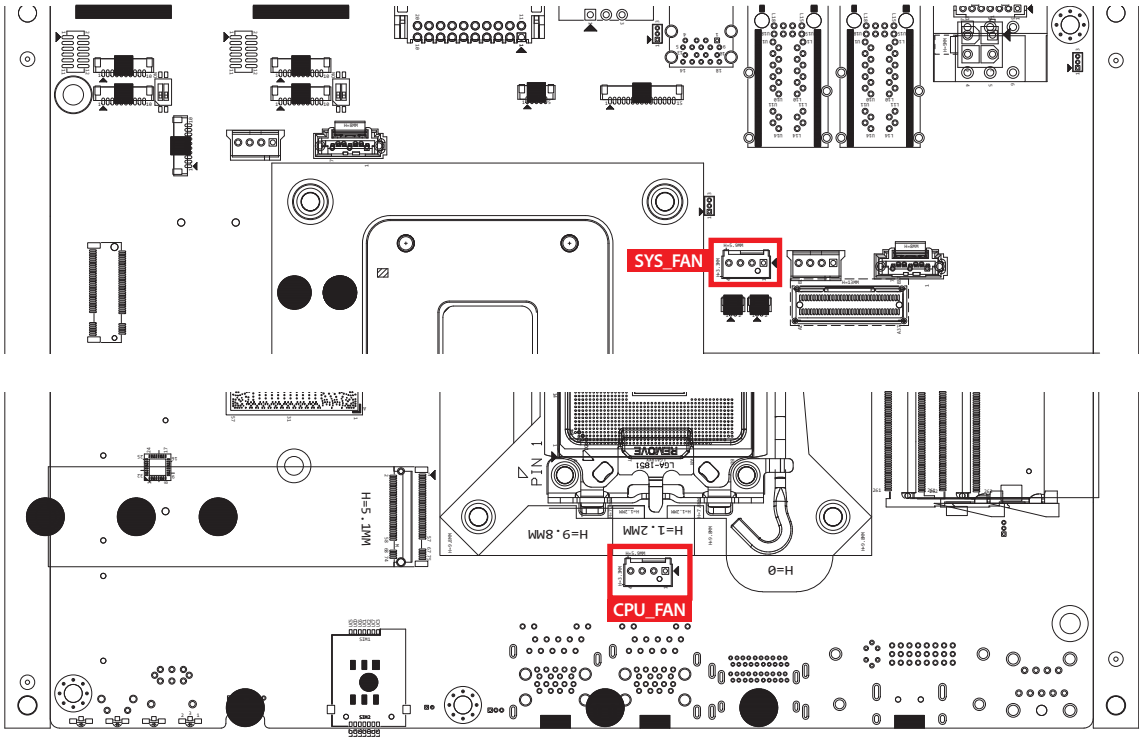


Location	Pin No.	Definition
JMON_ FW1	1	3.3V
	2	DATA
	3	CLK
	4	RST#
	5	GND

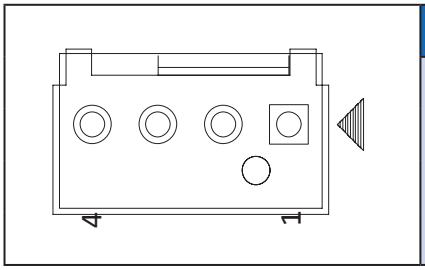


Location	Pin No.	Definition
JMON_ UART1	1	GND
	2	UART_TX
	3	3.3V
	4	UART_RX

2.4.12 CPU_FAN,SYS_FAN : FAN Header

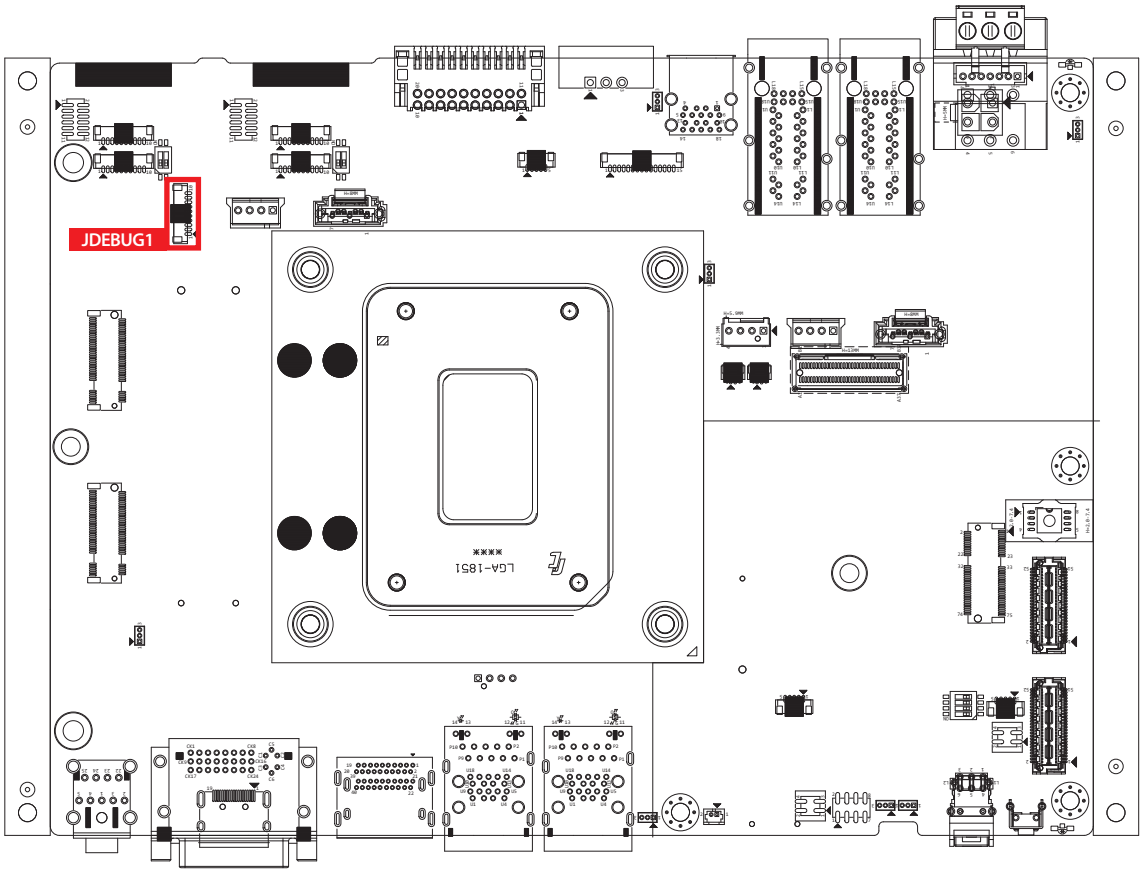


Fan power connector supports for additional thermal requirements.
The pin assignments of CPU_FAN/SYS_FAN are listed in the following table.



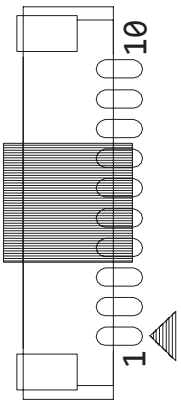
Location	Pin No.	Function
CPU_FAN SYS_FAN	1	GND
	2	+12V (2A max)
	3	Fan speed sensor
	4	Fan PWM

2.4.13 JDEBUG1 : ESPI Port 80 Header

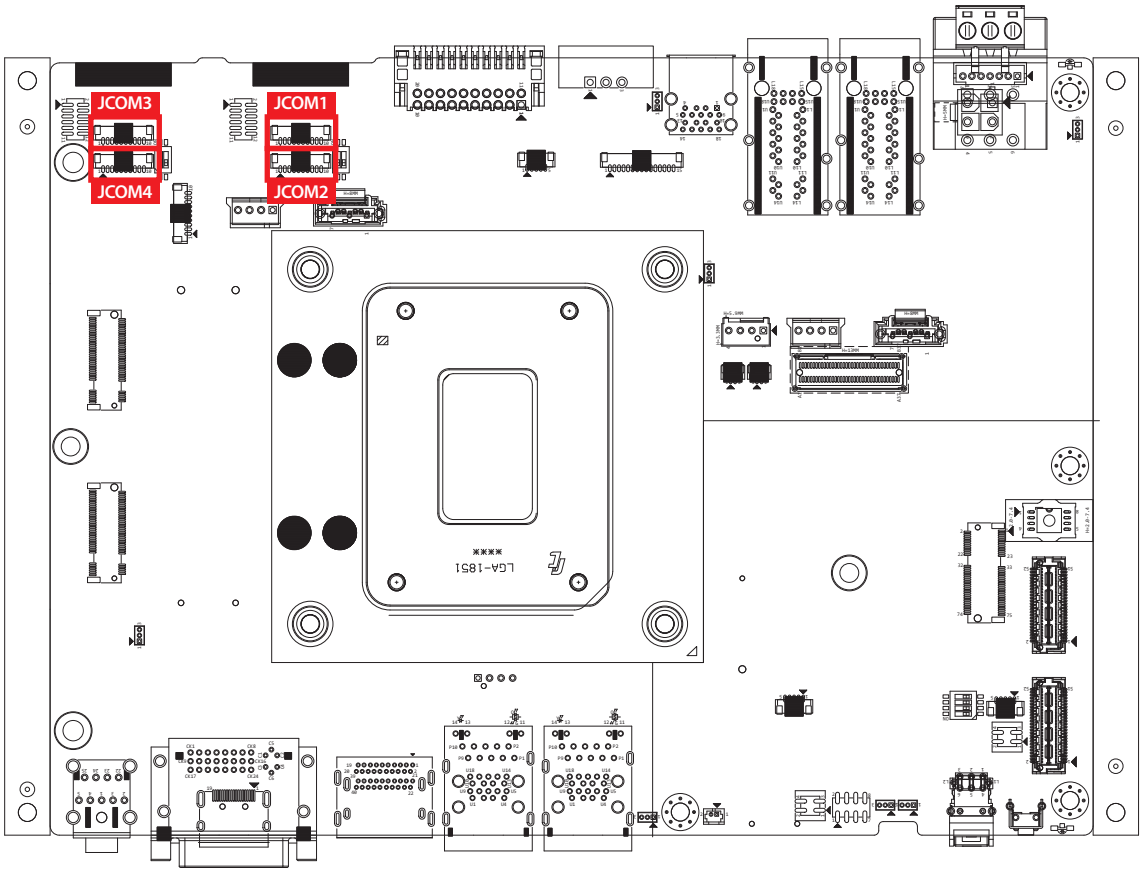


The system's provide a ESPI Port 80 Header for Debug Card.

Pin No.	Function
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

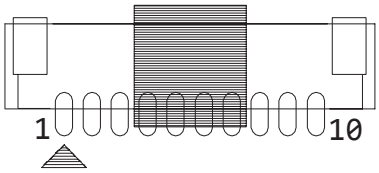


2.4.14 JCOM1,JCOM2,JCOM3,JCOM4 : Serial Port cable Connector

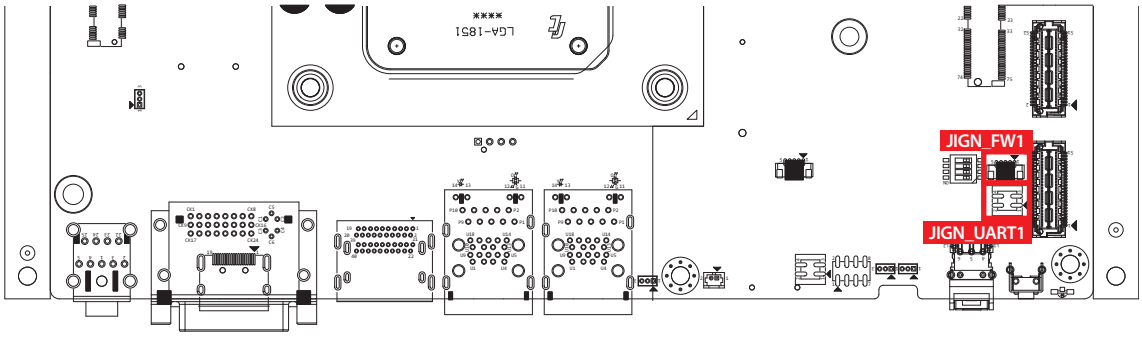


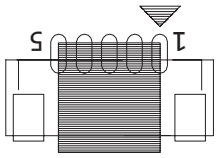
Location	Description
JCOM1	COM1
JCOM2	COM2
JCOM3	COM3
JCOM4	COM4

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

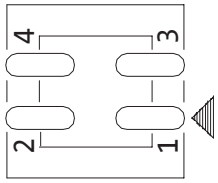


2.4.15 JIGN_FW1,JIGN_UART1 : IGNITION FW Programming Header



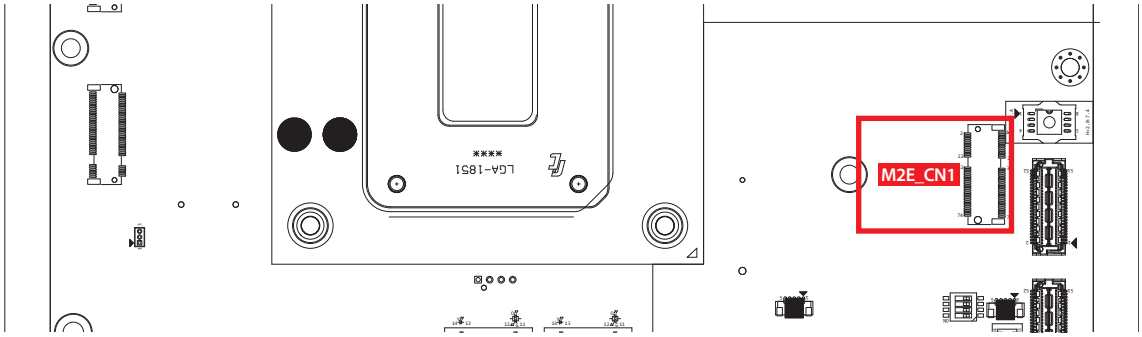


Location	Pin No.	Definition
JIGN_FW1	1	3.3V
	2	DATA
	3	CLK
	4	RST#
	5	GND



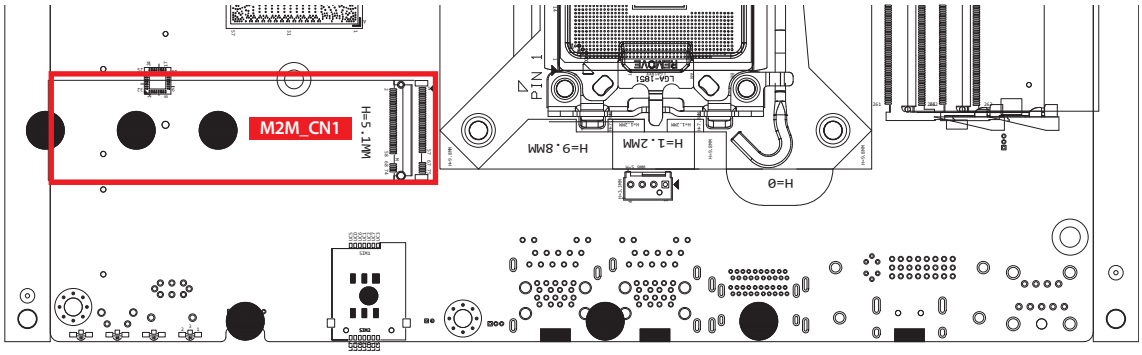
Location	Pin No.	Definition
JIGN_UART1	1	GND
	2	UART_TX
	3	3.3V
	4	UART_RX

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.

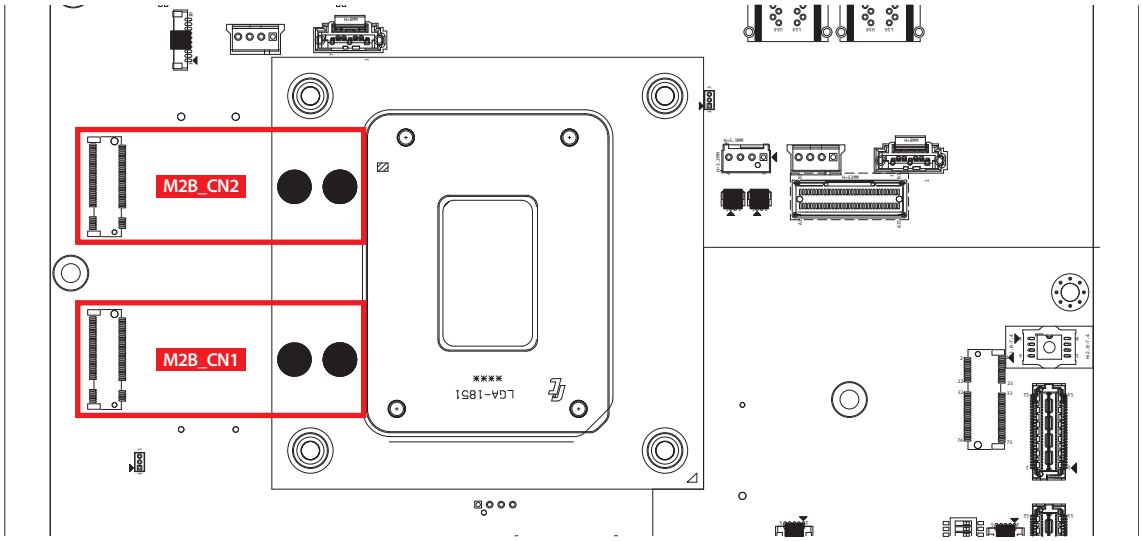
2.4.17 M.2 KEY M : PCIe x4



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)

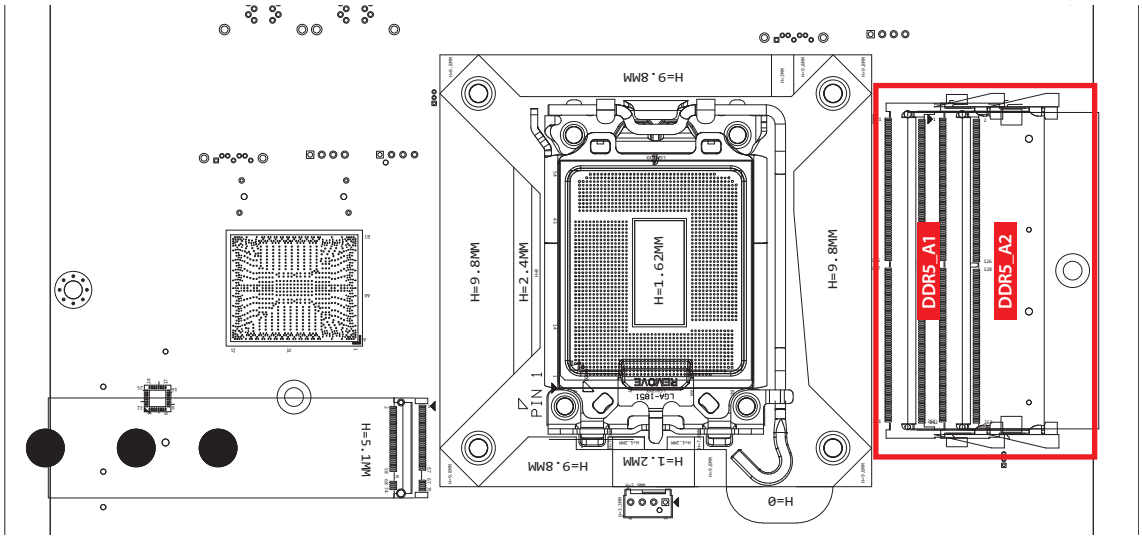
2.4.18 M2B_CN1,M2B_CN2 : M.2 Key B SLOT

USB3.0/USB2.0+SATA Support(default) ; PCIEx2(BIOS Control)

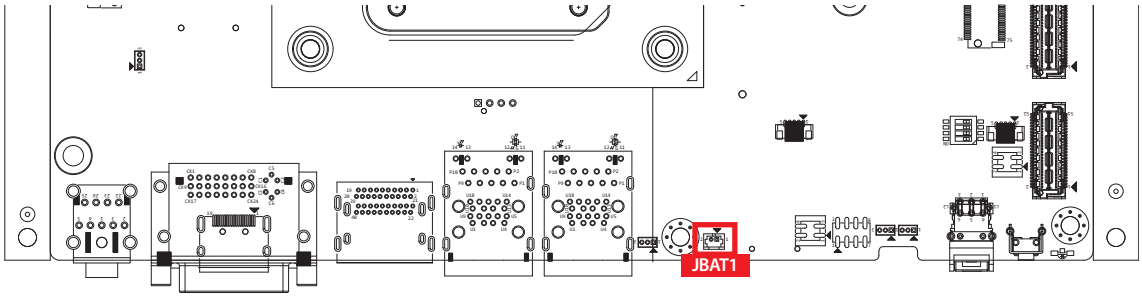


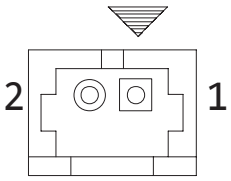
Module card types include 3042,3052,2280.

2.4.19 DDR5_A1,DDR5_A2 : DDR5 SO-DIMM up to 96GB



2.4.20 JBAT1 : Battery



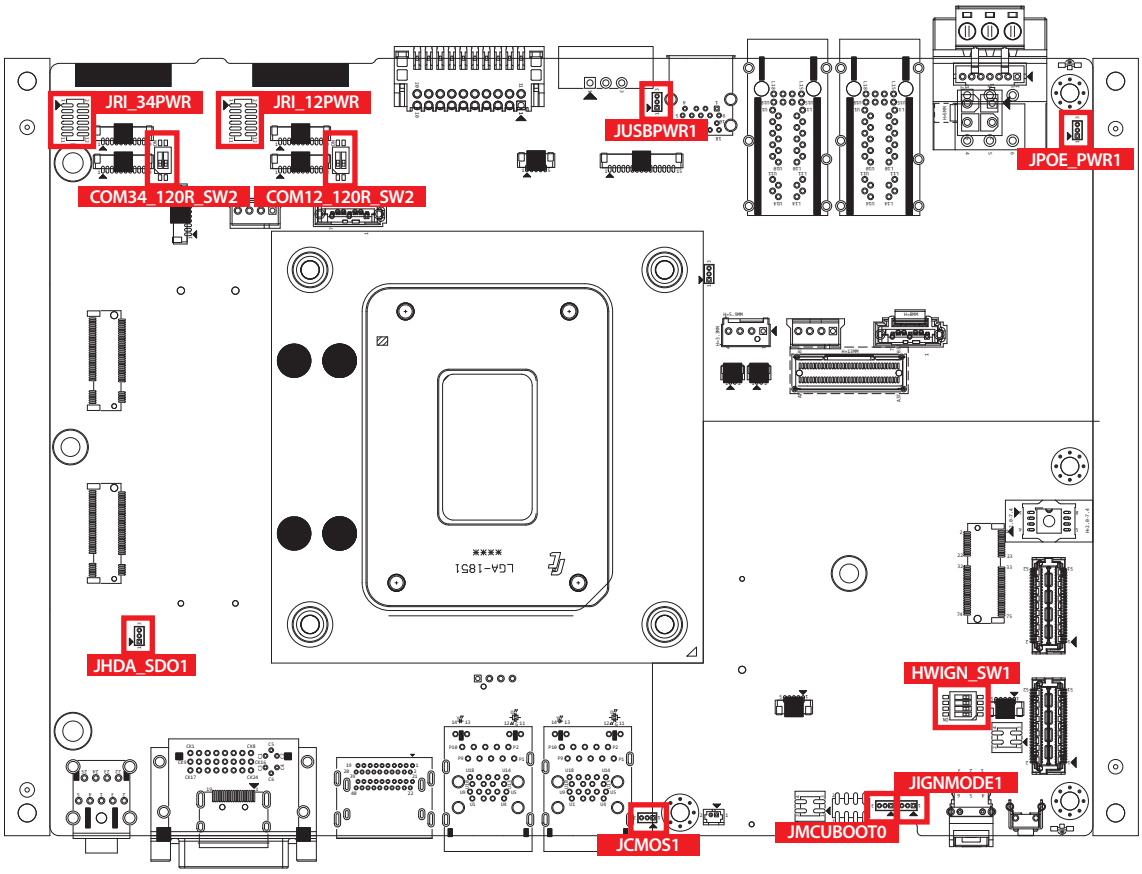


Location	Pin No.	Definition
JBAT1	1	3V
	2	GND

The ECX-4000 real-time clock is powered by a lithium battery. It is equipped with Panasonic CR2032 220mAh lithium battery. It is recommended that you do not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

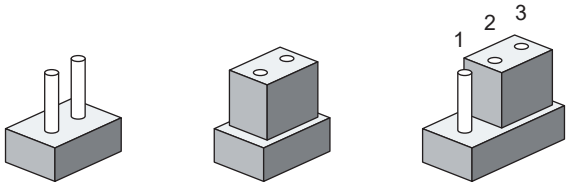
2.5 Main Board Jumper Settings

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



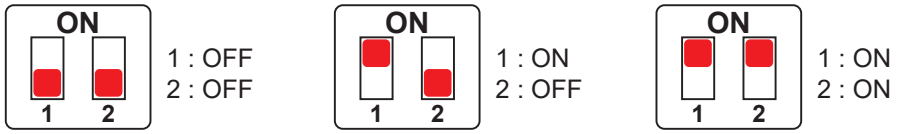
The figure below is the top view of the system main board which is the main board. It shows the location of the jumpers and the switches.

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.

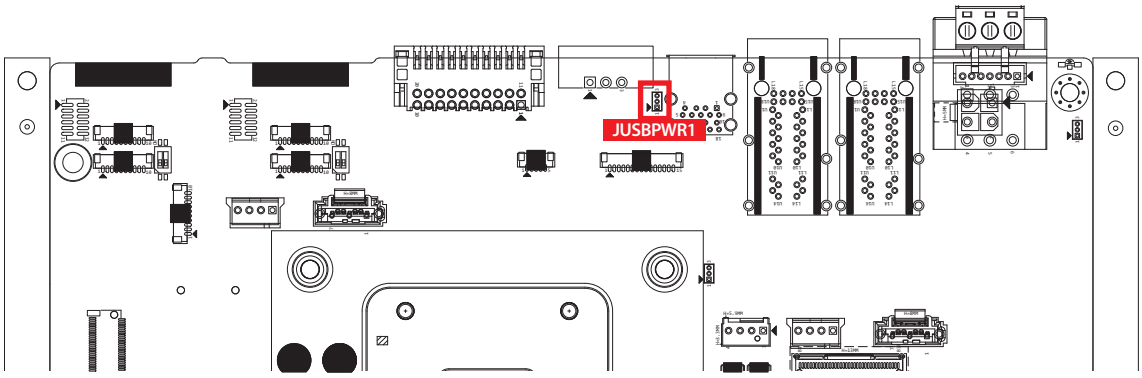


Open Closed Closed 2-3

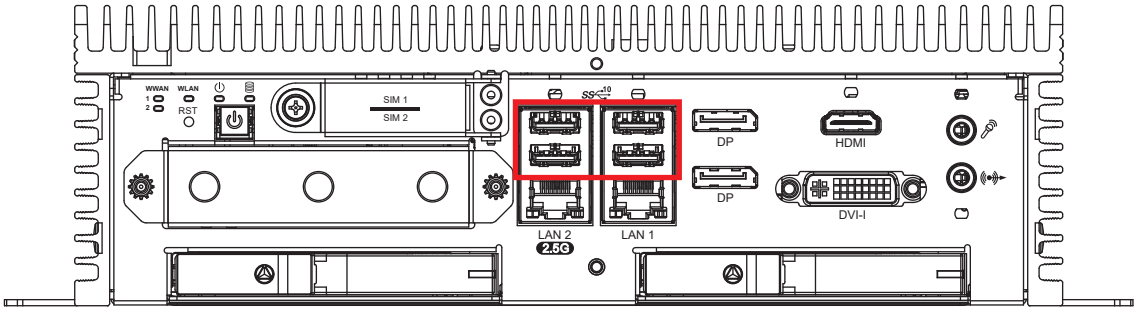
You may configure your card to match the needs of your application by DIP switch. As below show the deep switch on and off.



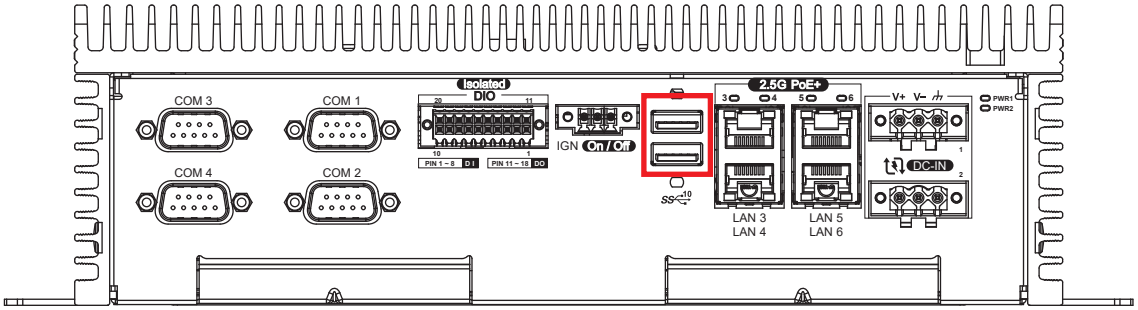
2.5.2 JUSBPWR1 : USB Wake Up

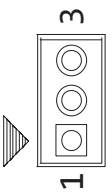


Front Plane View

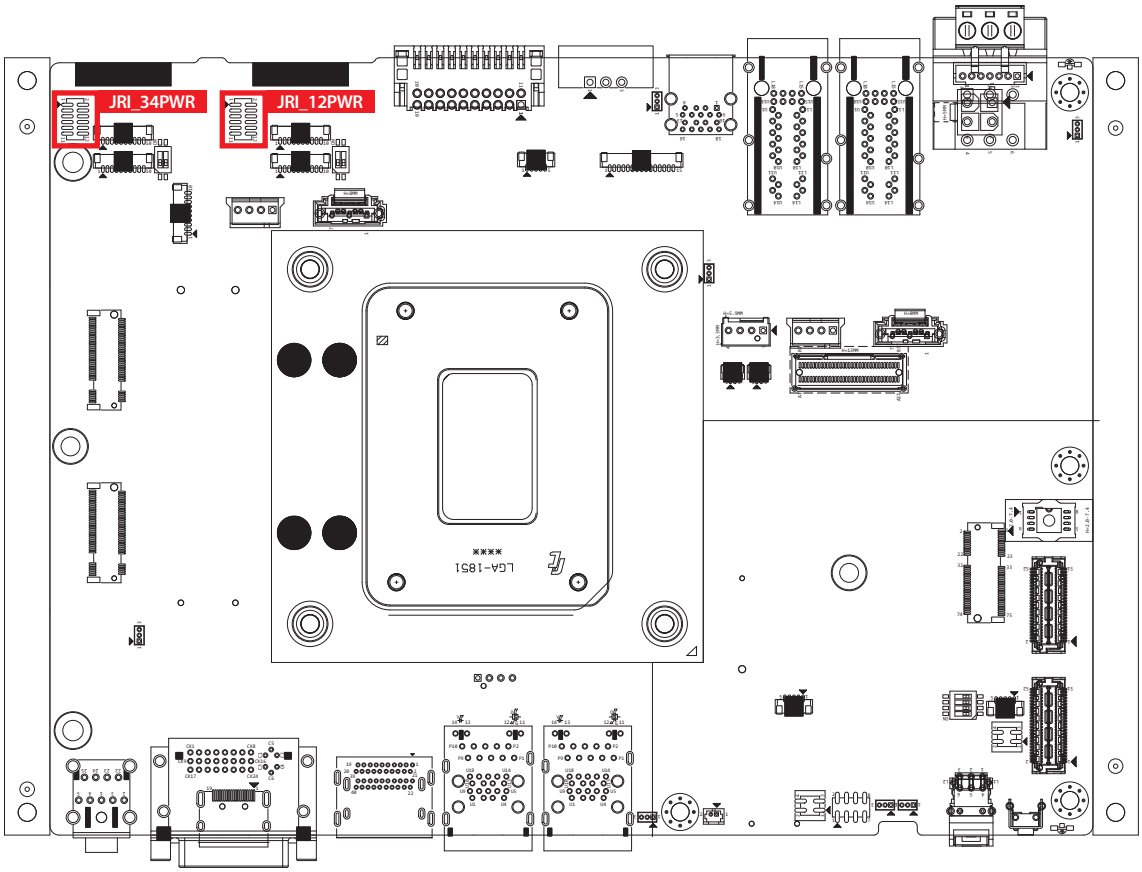


Rear Plane View

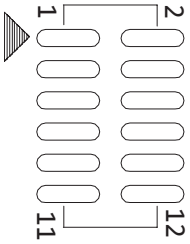


Location	Setting	Function	
JUSBPWR1	2 - 3	Non Wake Up support	
	1 - 2	Supported Wake Up(Default)	

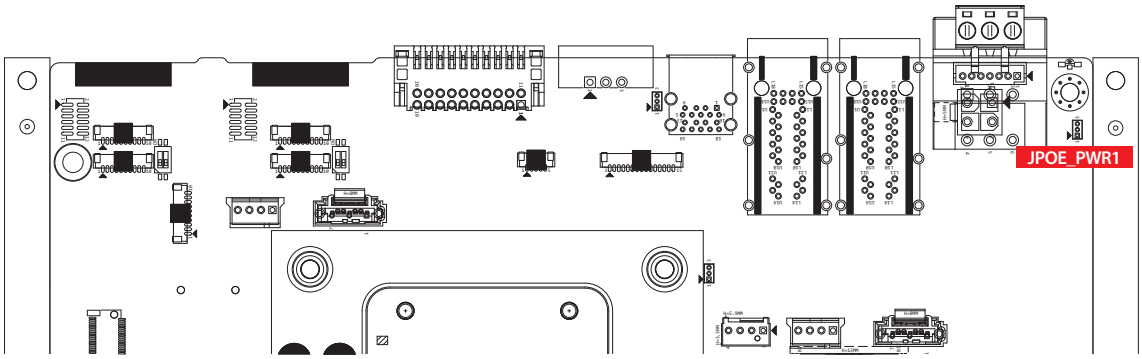
2.5.3 RI_12PWR, JRI_34PWR : COM Port RI pin Select

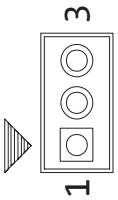


Location	Pin No.	Description	COM Port
JRI_12PWR	(1-2)	5V	COM1
	(3-4)	12V	
	(5-6)Default	RI	
	(7-8)	5V	COM2
	(9-10)	12V	
	(11-12) Default	RI	
JRI_34PWR	(1-2)	5V	COM3
	(3-4)	12V	
	(5-6)Default	RI	
	(7-8)	5V	COM4
	(9-10)	12V	
	(11-12) Default	RI	

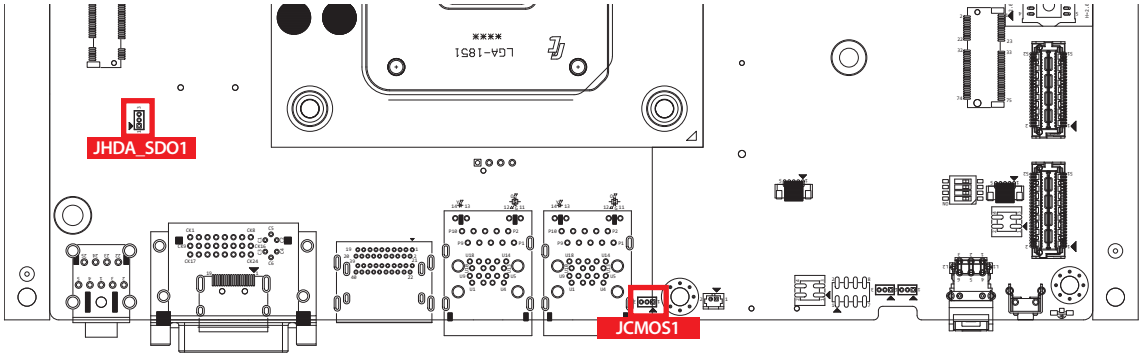


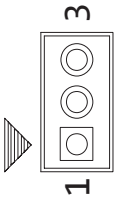
2.5.4 JPOE_PWR1 : PoE Power ON Select



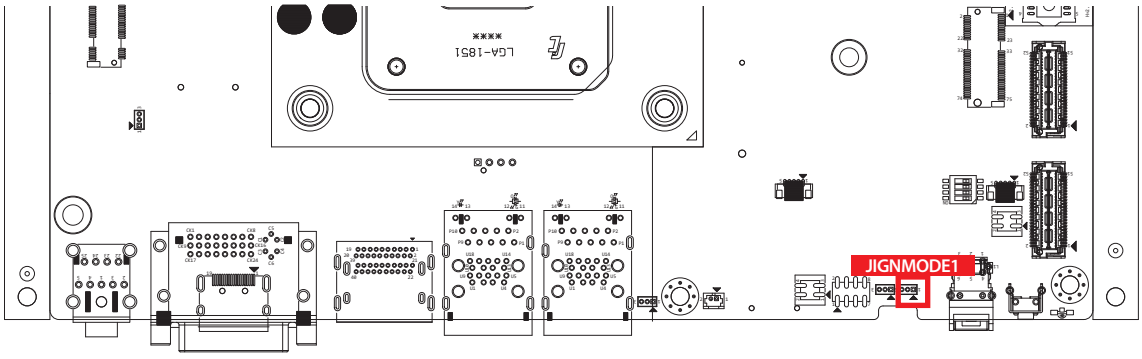
Location	Setting	Function	
JPOE_ PWR1	1 - 2	PoE power on at standby power ready	
	2 - 3	PoE power on after system power on(Default)	
	No Jumper	Disable PoE power	

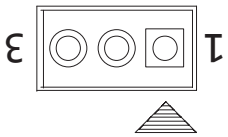
2.5.5 JCMOS1, JHDA_SDO1 : CMOS & ME Flash



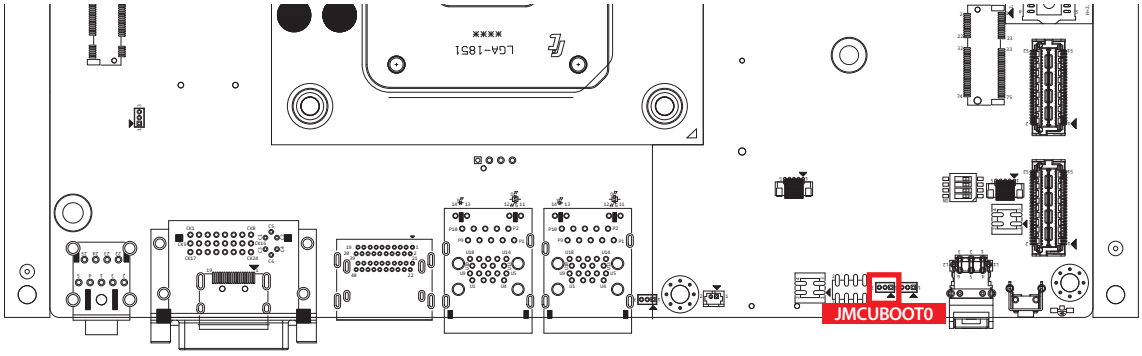
Jumper	Setting	Function	
JCMOS1	1 - 2	*Normal (Default)	
	2 - 3	Clear CMOS	
JHDA_ SDO1	1 - 2	Enable security measures defined in the Flash Descriptor. (Default)	
	2 - 3	Disable Flash Descriptor Security (Flash ME)	

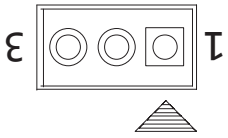
2.5.6 JIGNMODE1 : IGNITION mode



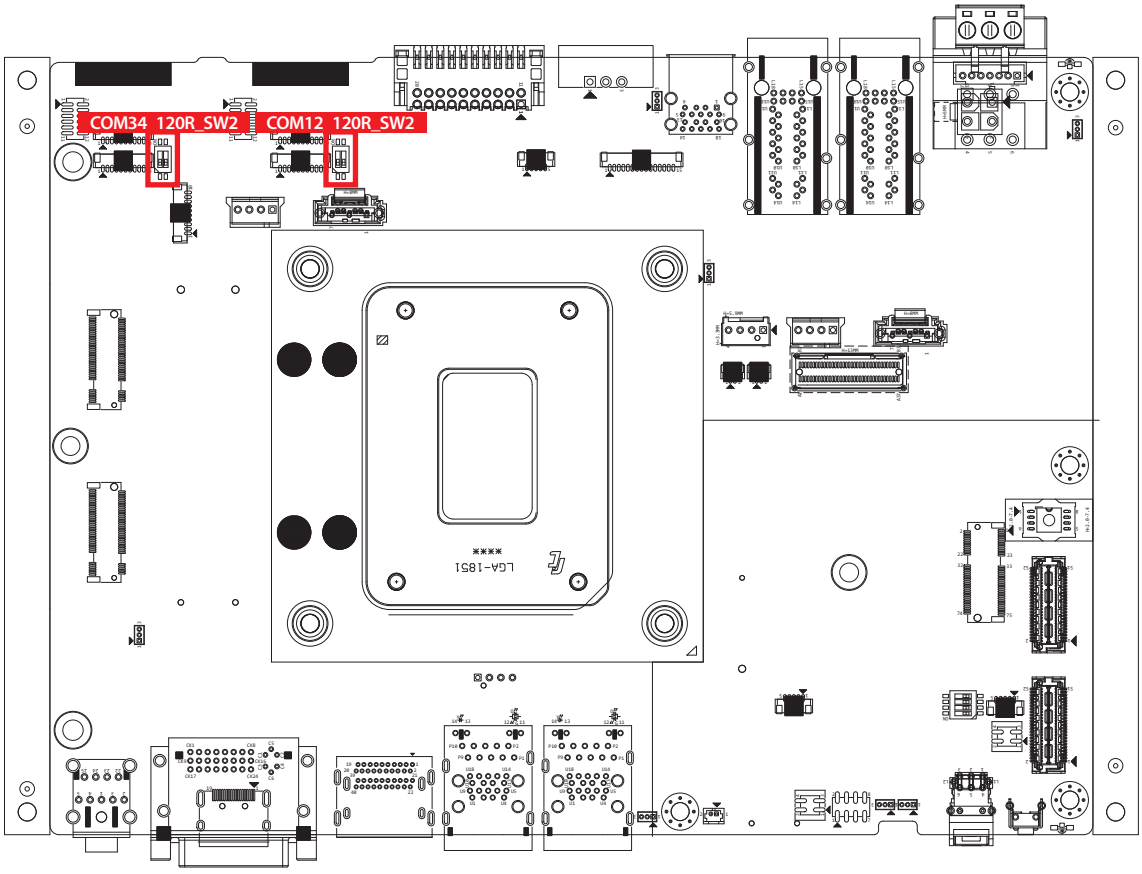
Jumper	Setting	Function	
JIGNMODE1	1 - 2	H/W mode	
	2 - 3	S/W mode(default)	

2.5.7 JMCUBOOT0 : IGN MCU Boot mode



Jumper	Setting	Function	
JMCUBOOT0	1 - 2	System memory	
	2 - 3	Main Flash memory(default)	

2.5.8 COM12_120R_SW2,COM34_120R_SW2 : RS-485/422 RECEIVER TERMINATION RESISTANCE



Location	Setting	Function	Port
COM12_120R_SW2	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_SW2	1(ON)	DCD / RXD Termination 120R enable	COM3
	1(OFF)	DCD / RXD Termination 120R Disable(default)	
	2(ON)	DCD / RXD Termination 120R enable	COM4
	2(OFF)	DCD / RXD Termination 120R Disable(default)	

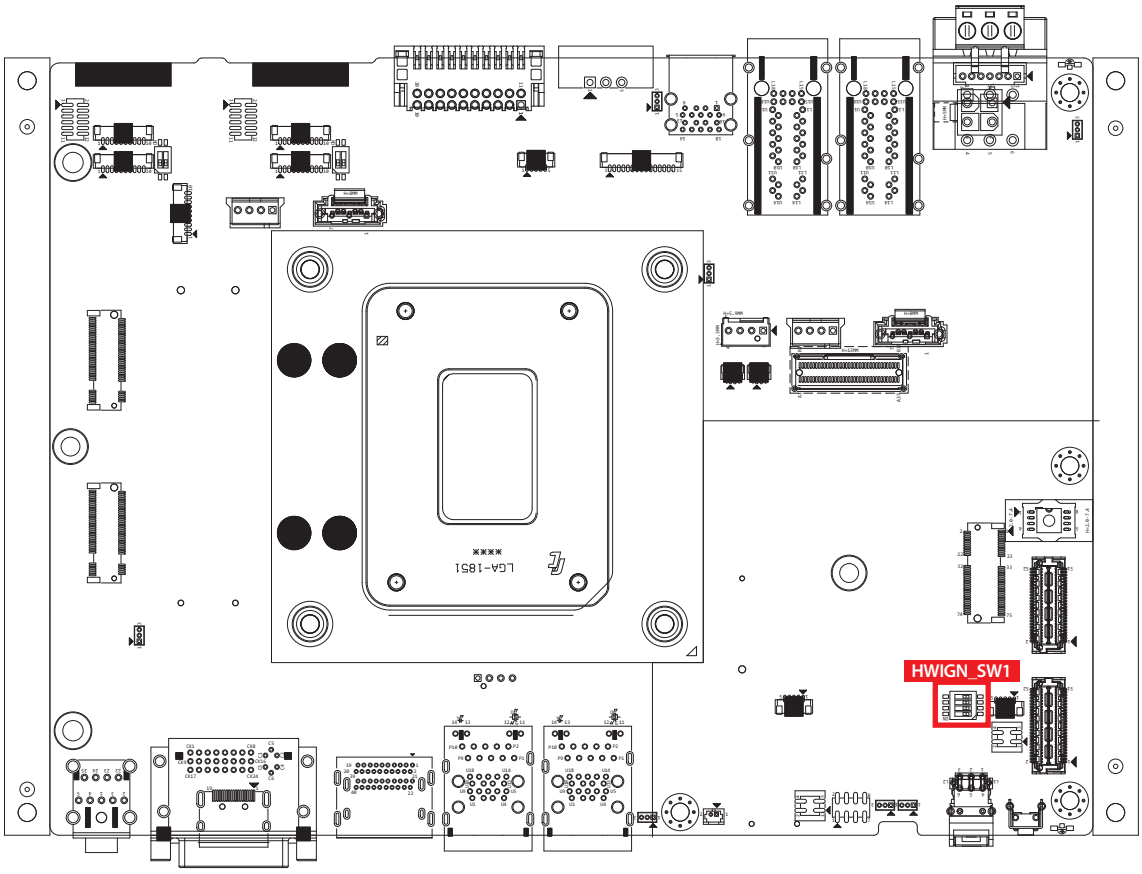
2.6 Ignition Control

ECX-4000 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.

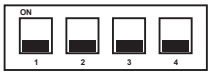
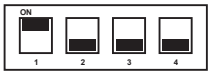
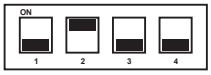
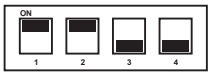
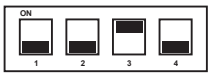
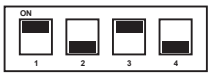
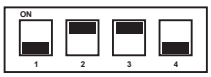
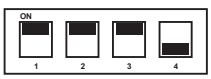
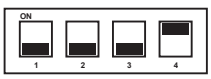
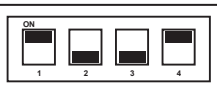
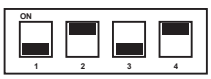
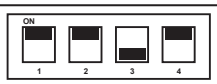
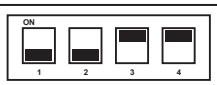
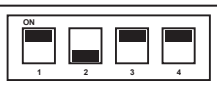
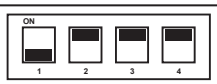
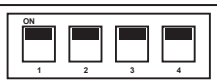
2.6.1 Adjust Ignition Control Modes

ECX-4000 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



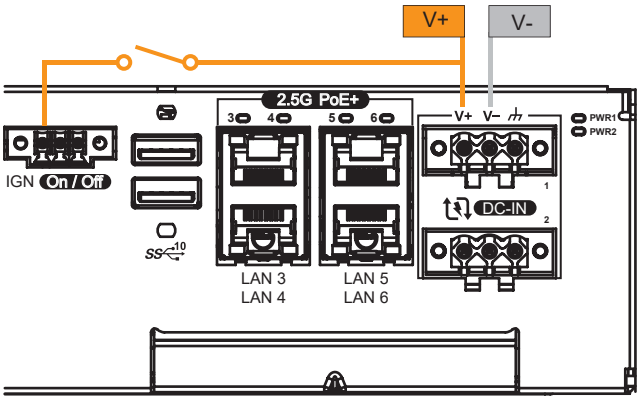
The modes are listed in below table :

Deep 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-

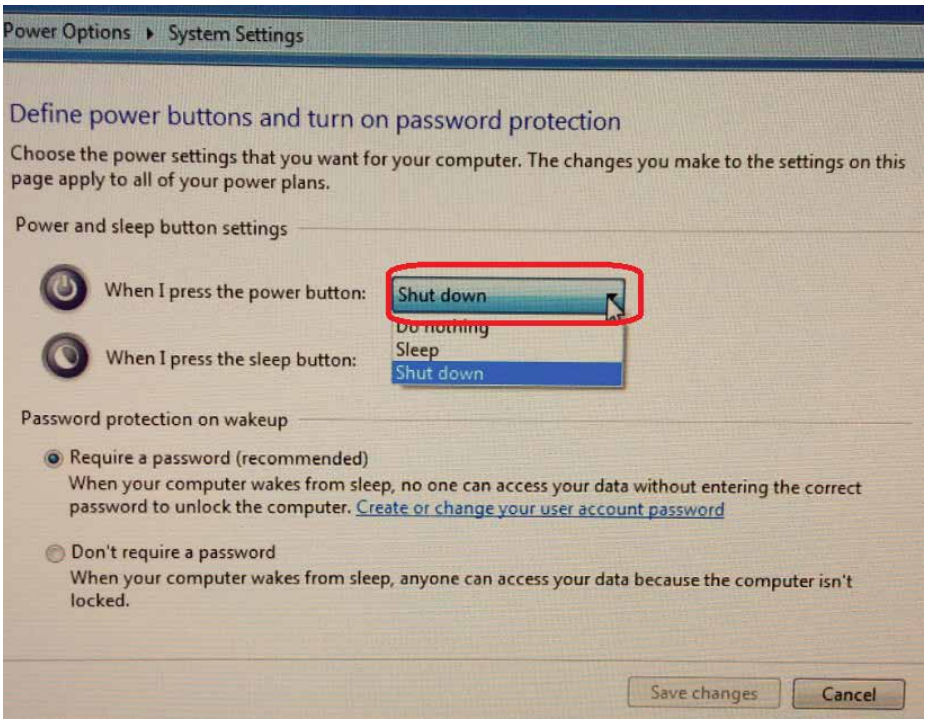


For testing purpose, you can refer to the picture blow to simulate ignition signal input controlled by a latching switch.

Note :

1. DC power source and IGN share the same ground.
2. ECX-4000 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.

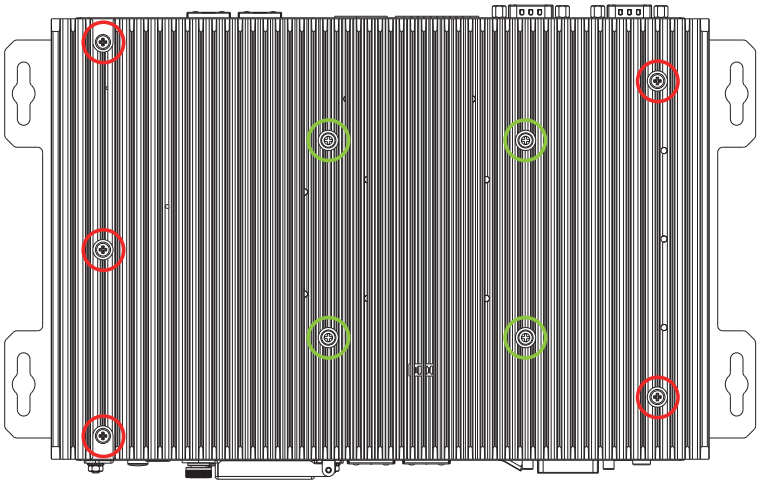


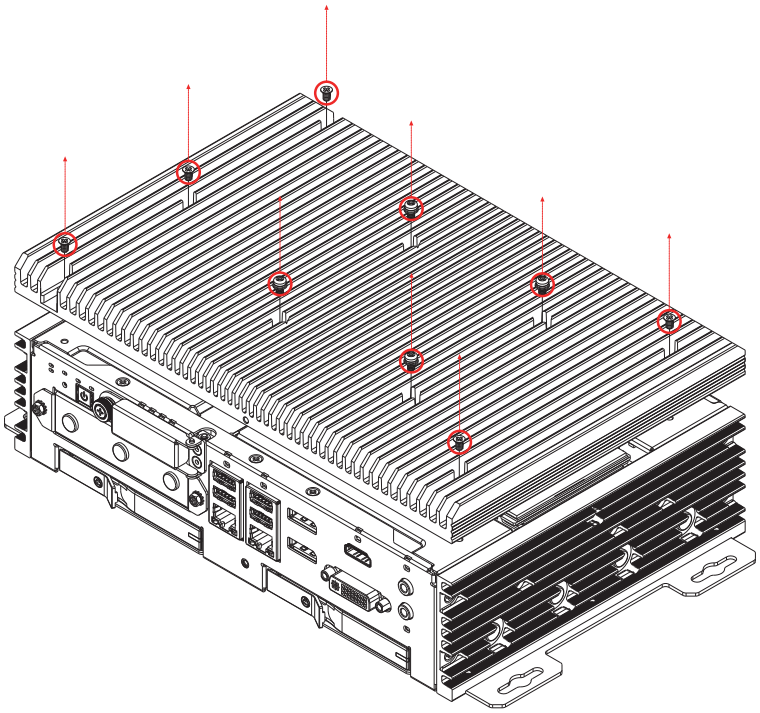
3

SYSTEM SETUP

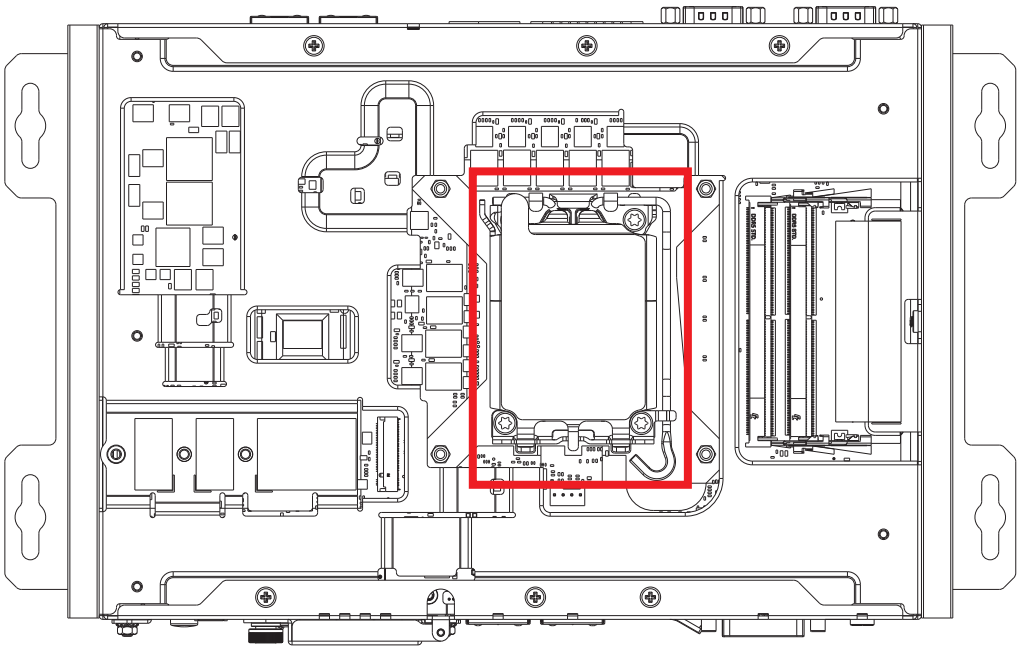
3.1 Installing CPU

Step 1 Remove five flat head M3x5L screws and four pan head SFW M3x6L screws

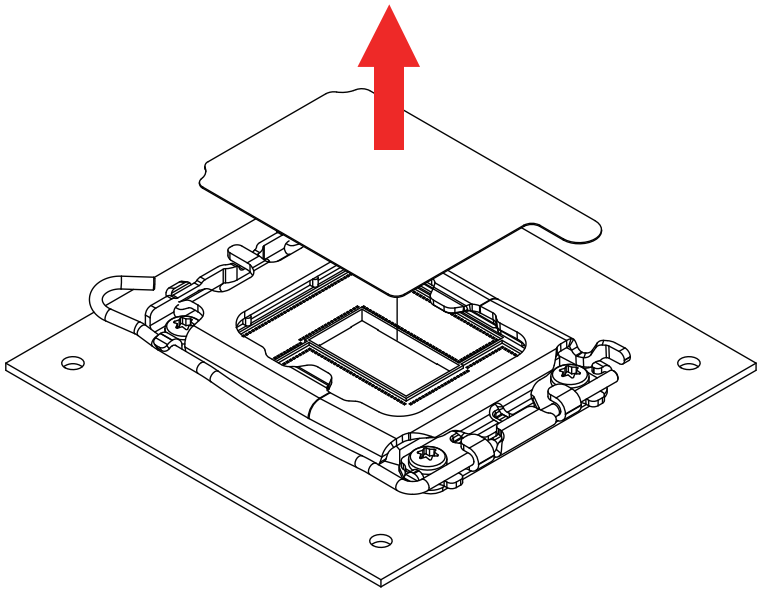




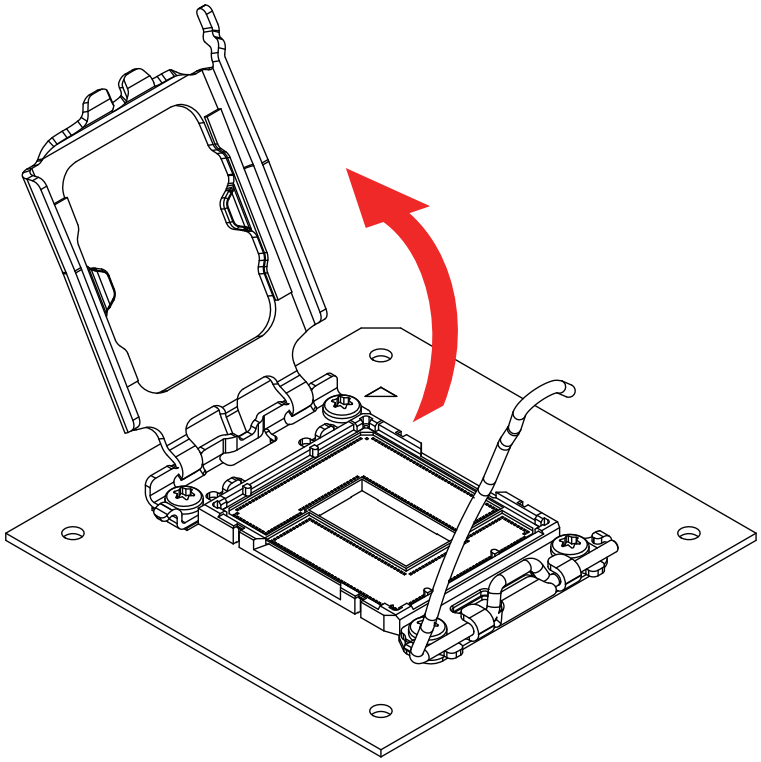
Step 2 Take out heat sink.



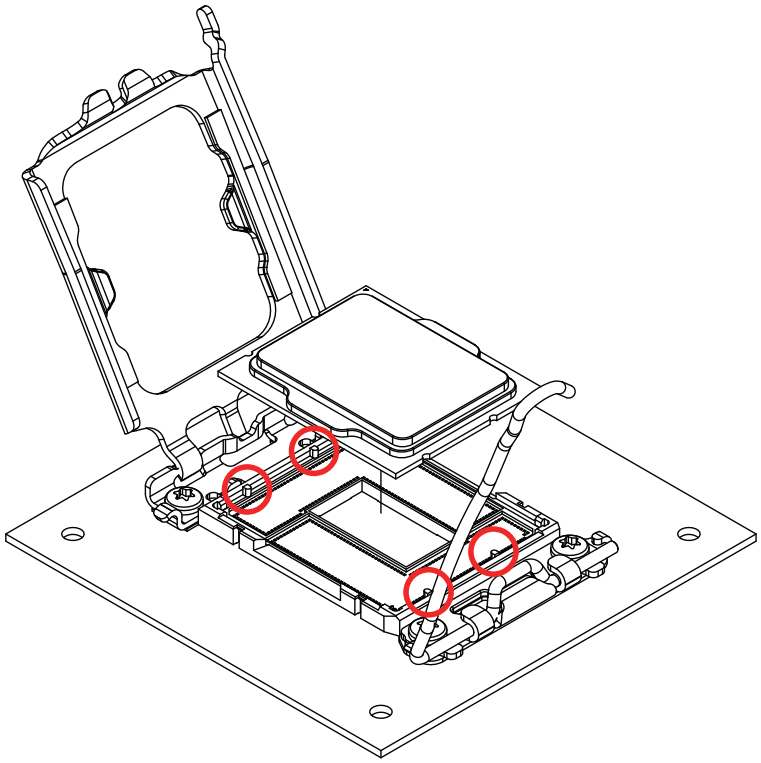
Step 3 Remove CPU mylar



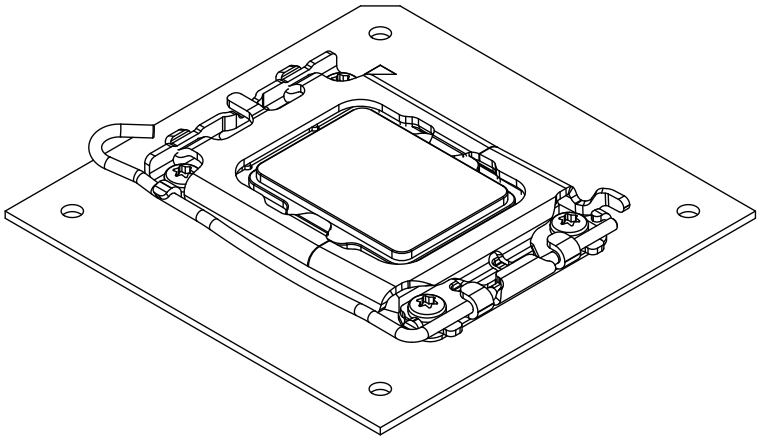
Step 4 Open CPU independent loading mechanism (ILM)



Step 5 Install CPU. (Be careful CPU pin)

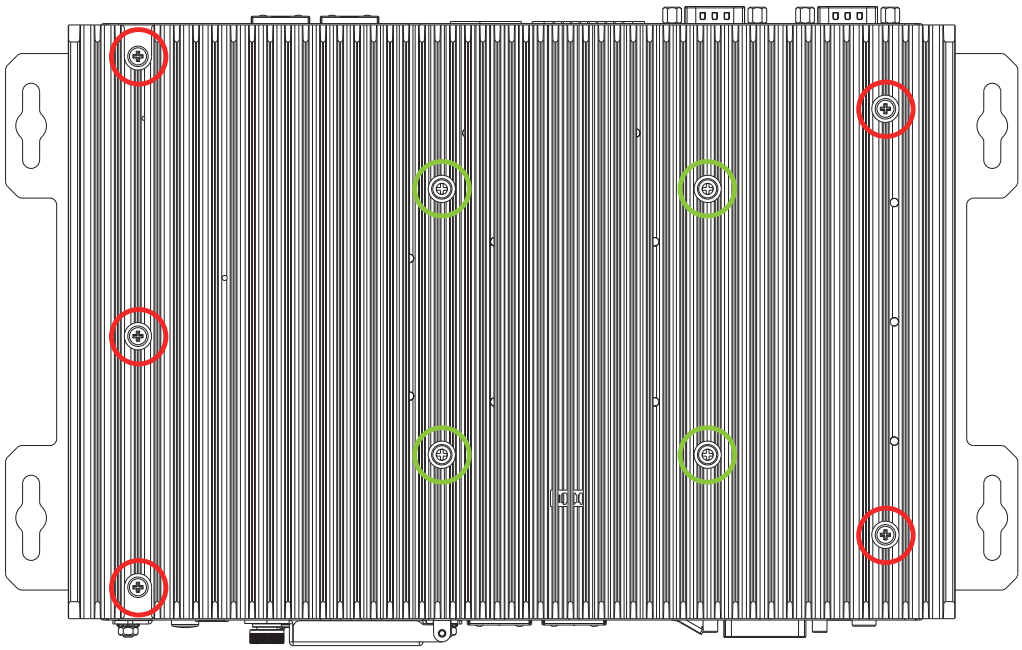


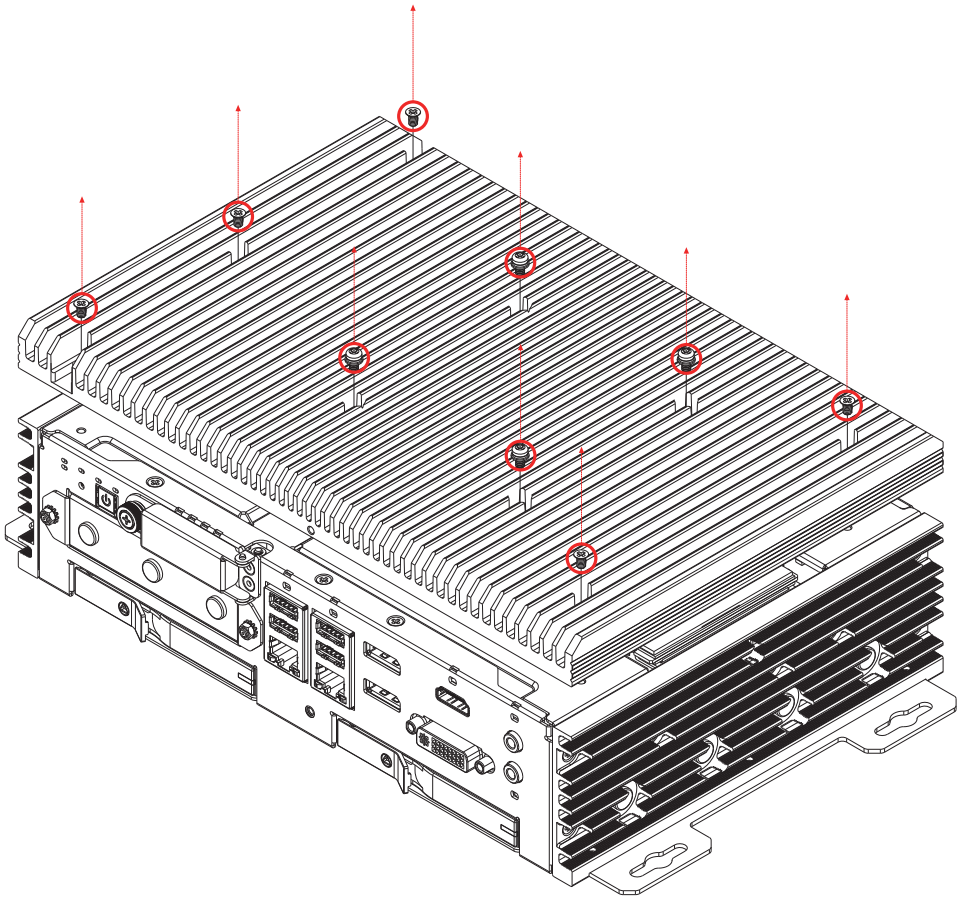
Step 6 Close CPU independent loading Mechanism (ILM) and finish



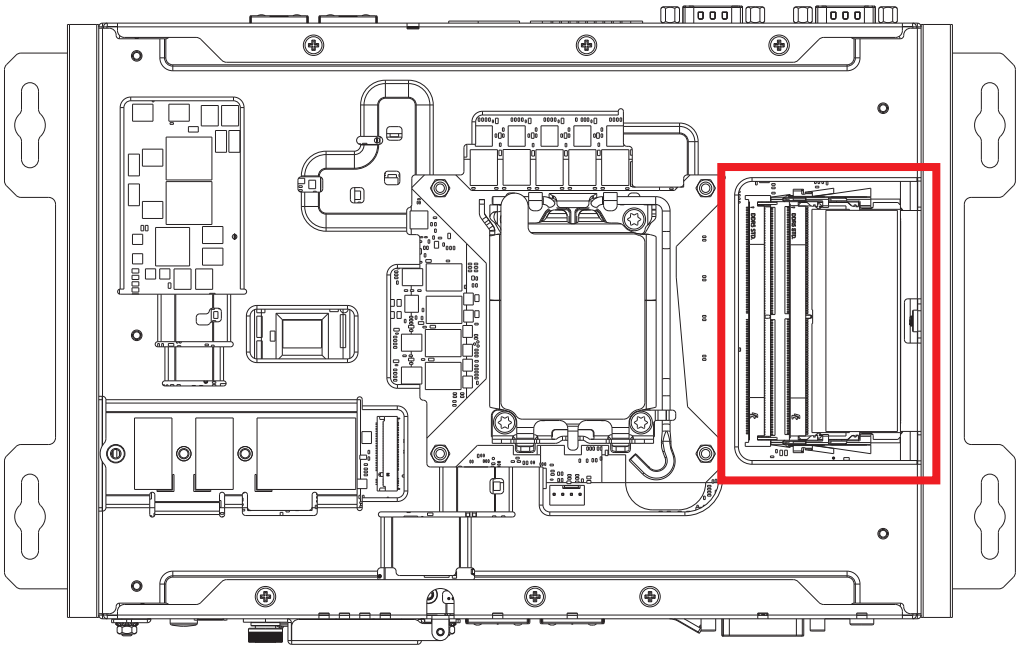
3.2 Installing DDR5 SO-DIMM Modules

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

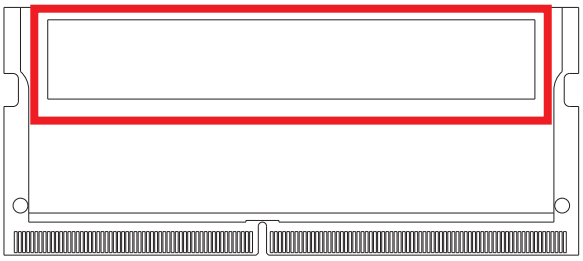




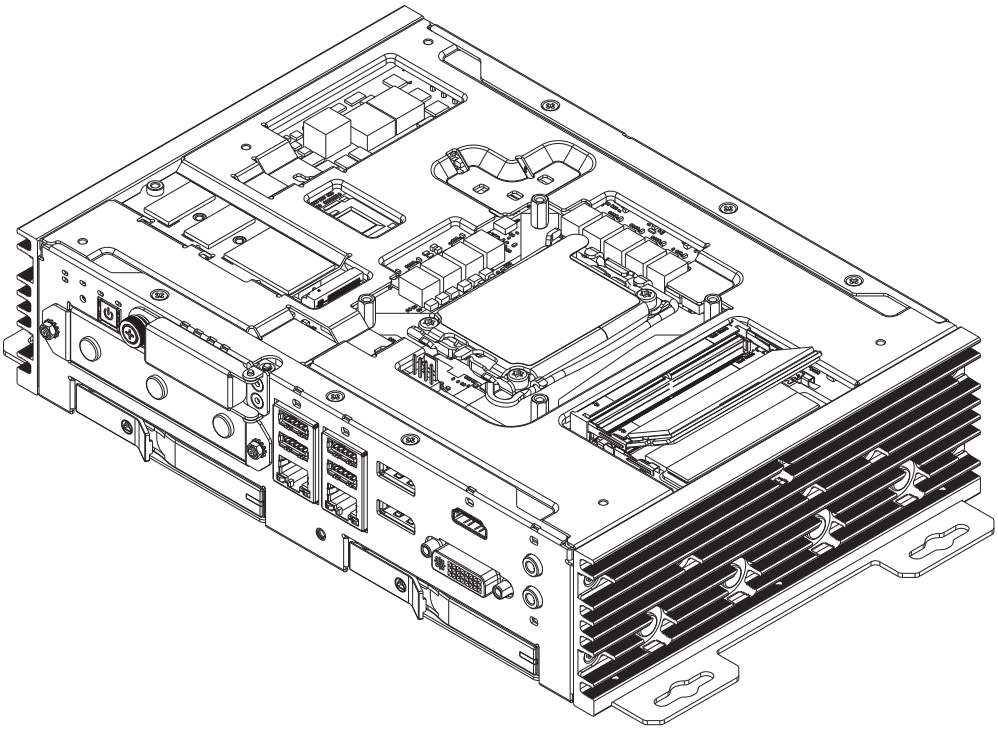
Step 2 Take out heat sink.



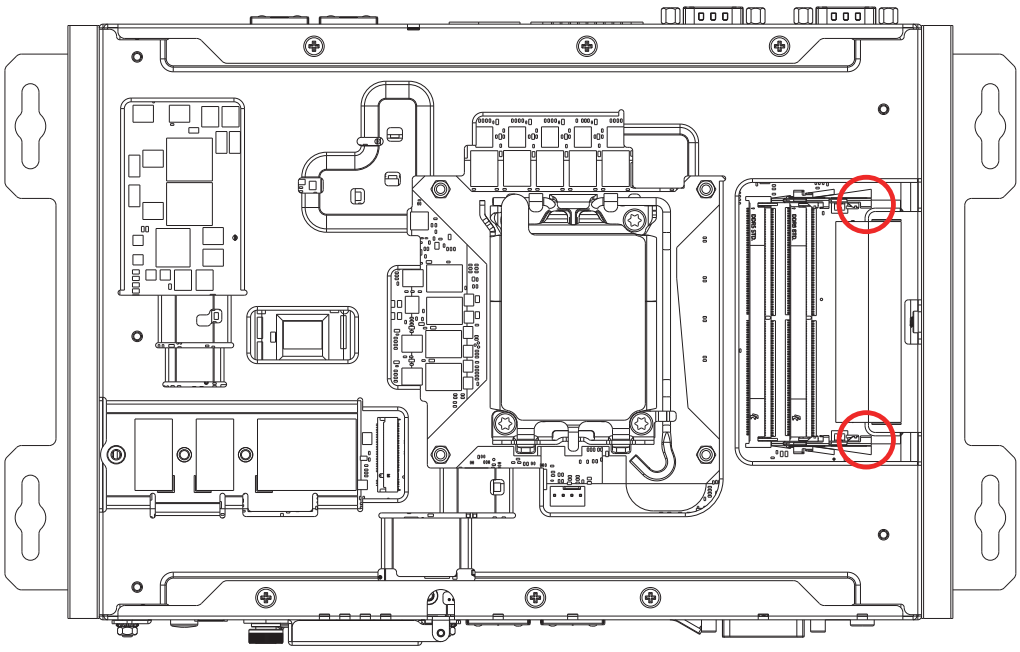
Step 3 Paste thermal pad on bottom side of Memory (Only SODIMM_2)



Step 4 Install SO-DIMM module into SO-DIMM socket



Step 5 Make sure SO-DIMM module is locked by the memory slot

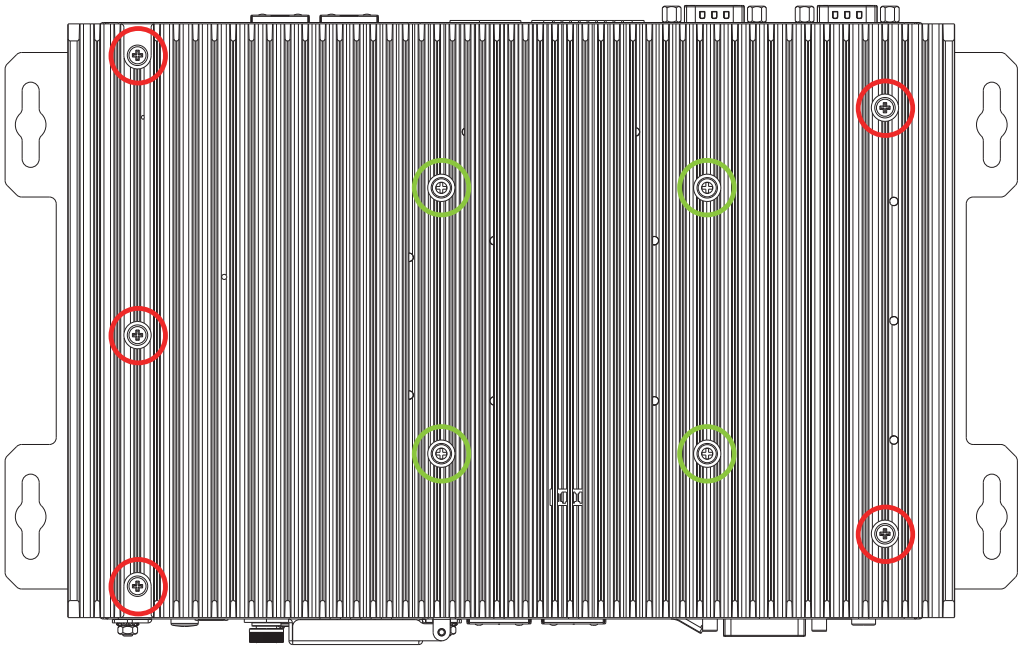


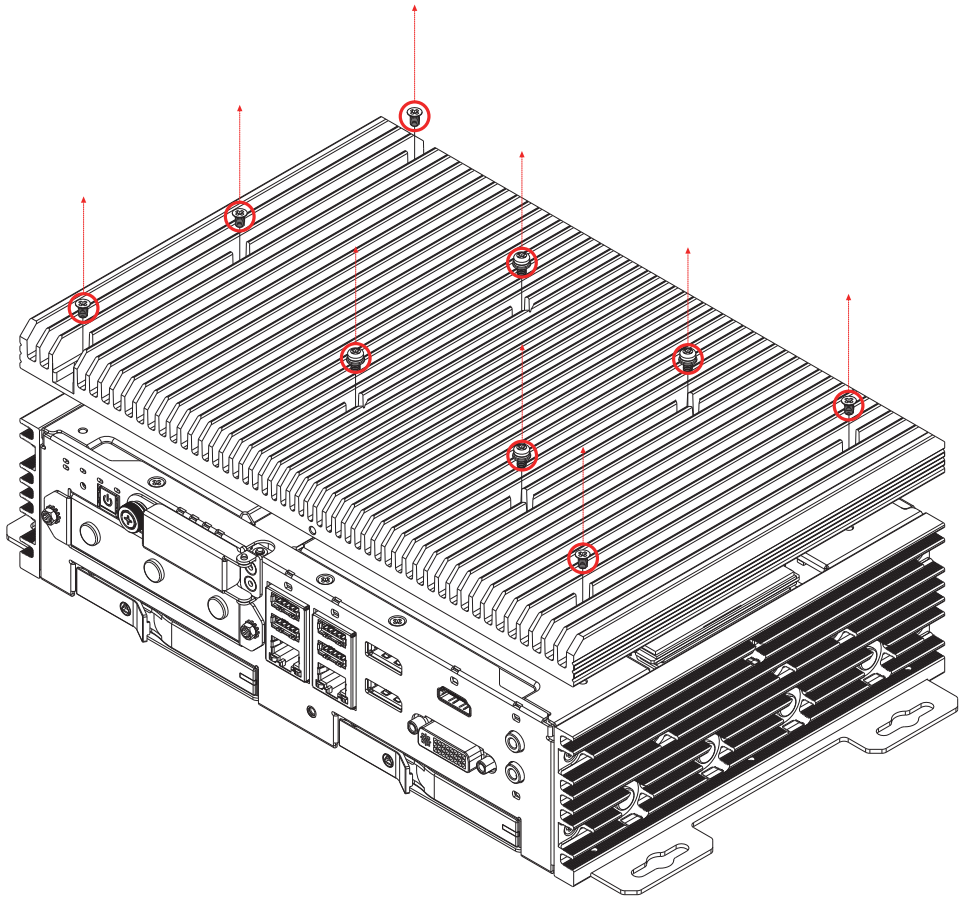
P.S The current thermal pad design is for 3.7 mm thickness of SO-DIMM module. For other thicknesses of SO-DIMM module, The thermal pad need to be confirmed, or redesigned.

3.3 Installing M.2

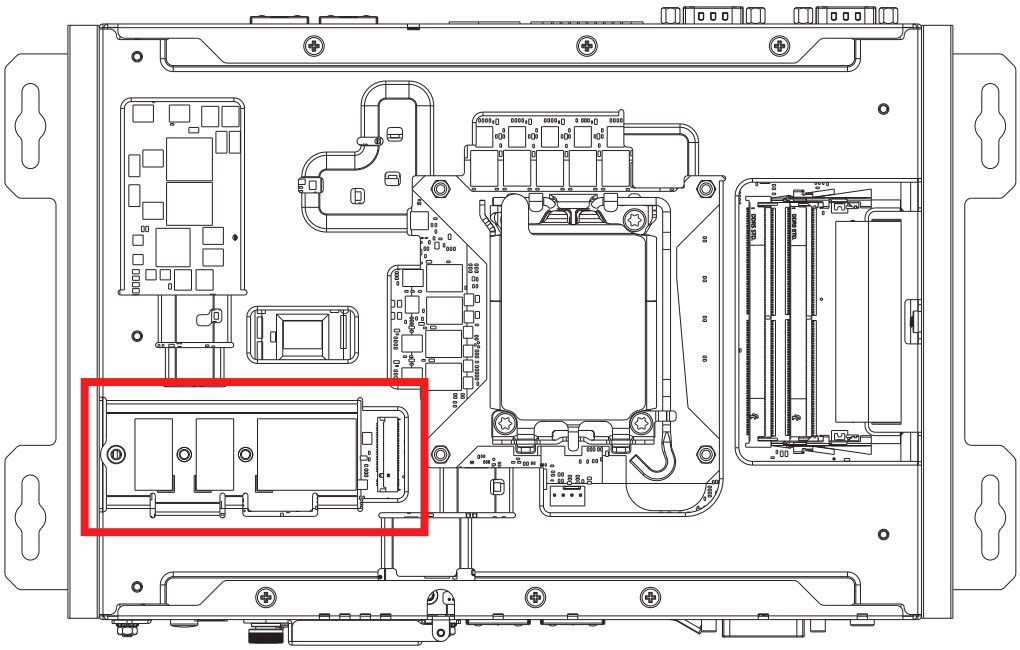
3.3.1 M.2 Key M

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





Step 2 Take out heat sink.

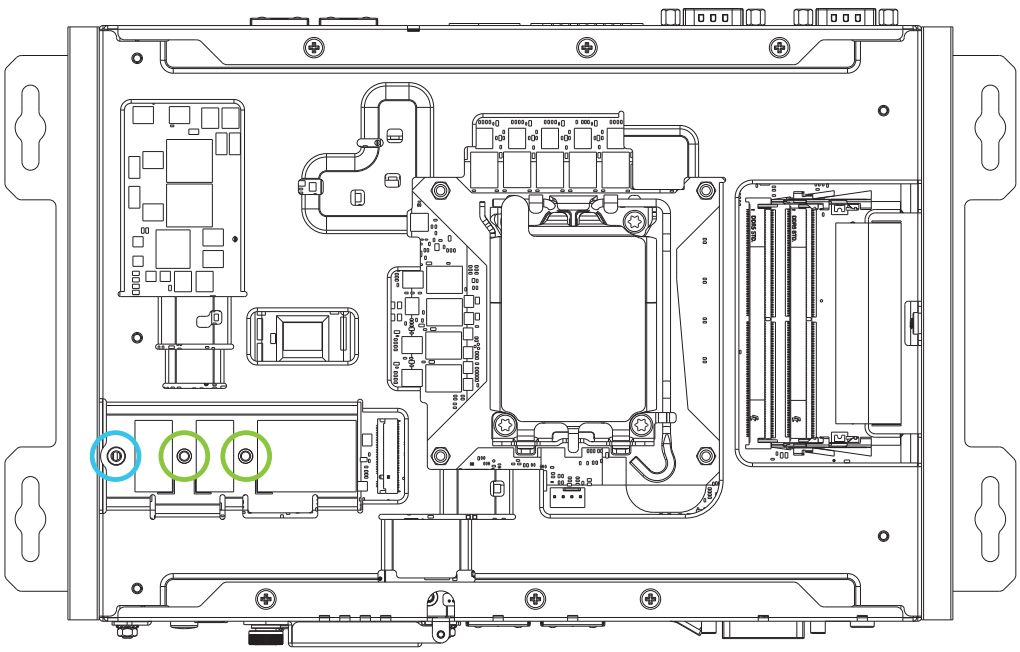


Step 3

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

2260 : Install hexagon M3 standoff on the position of 2260, module card, and fasten I head M2x2L screw

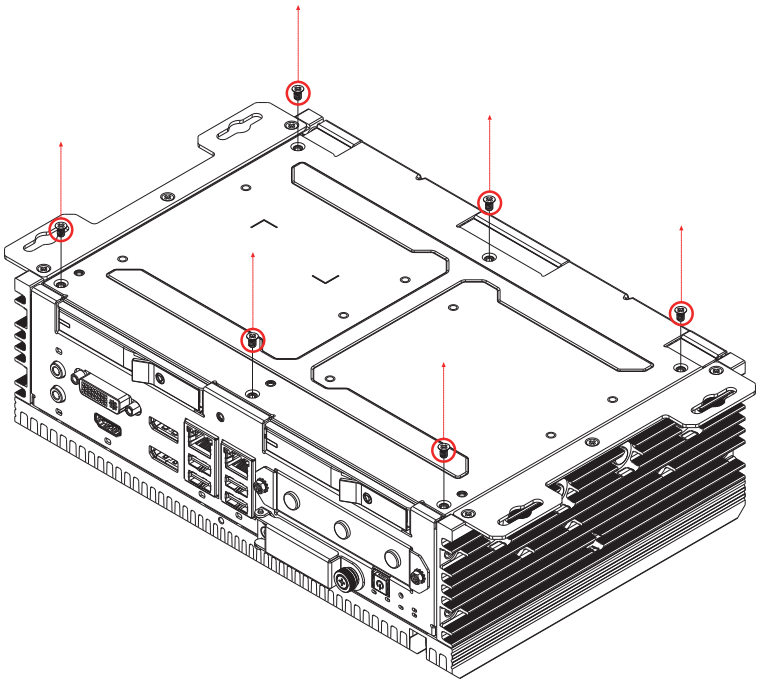
2242 : Install hexagon M3 standoff on the position of 2242, and install M.2 module card, and fasten I head M2x2L screw.



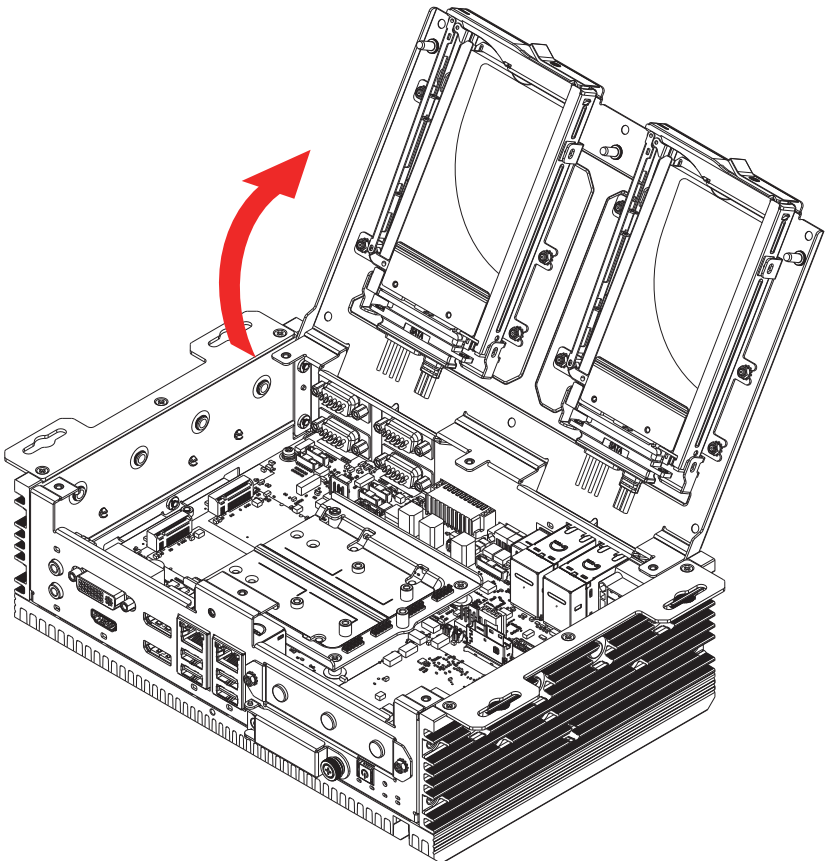
P.S The current thermal pad design is for D1, D2, D3, and D5. For other lables(S1, S2, S3, and D4) of module card, The thermal pad need to be confirmed, or redesigned.

3.3.2 M.2 Key B

Step 1 Remove six flat head M3x5L screws.



Step 2 Open bottom cover.

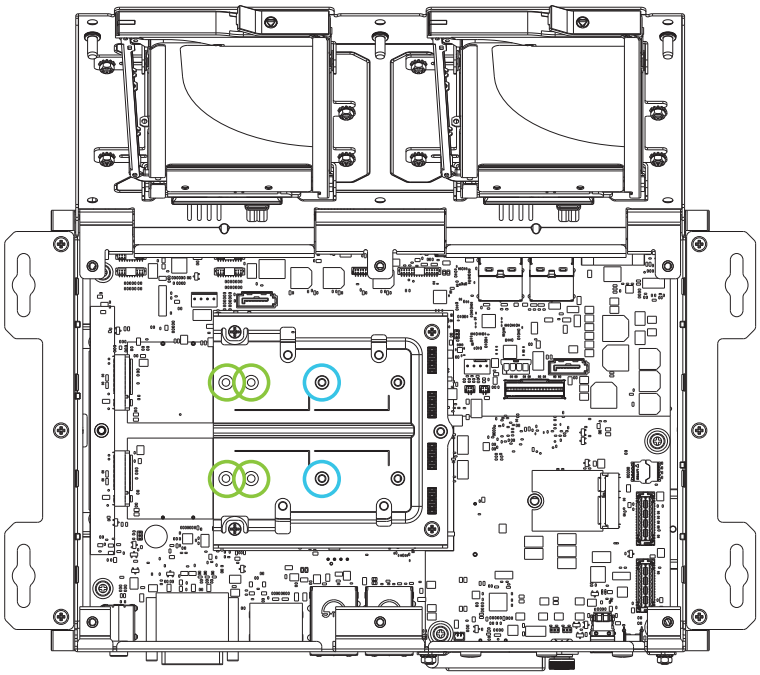


Step 3

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

3052 : Install hexagon M3 standoff on the position of 3052, and install M.2 module card, and fasten I head M2x2L screw.

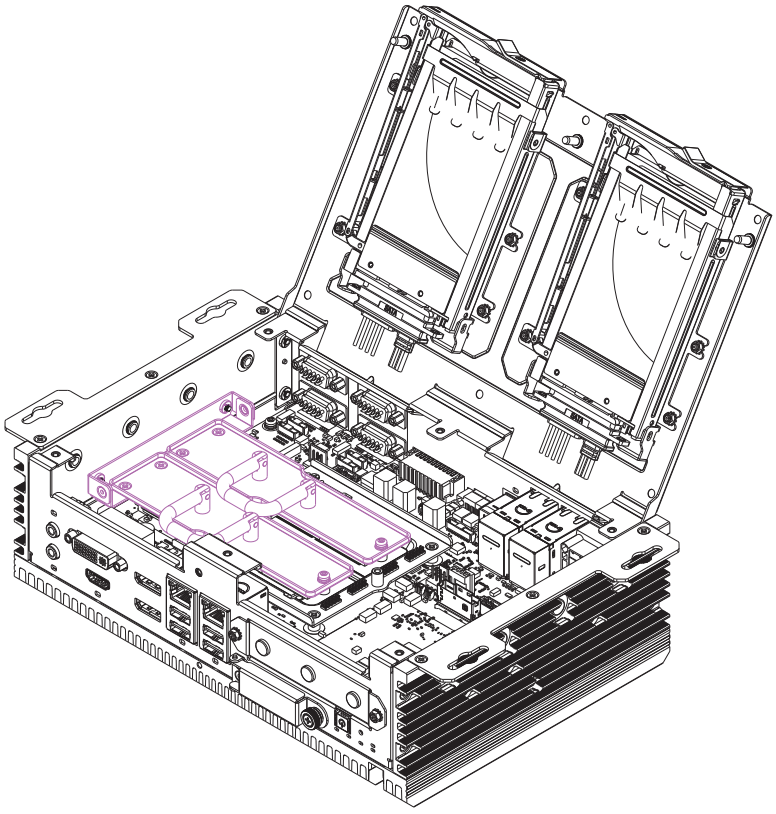
3042 : Install hexagon M3 standoff on the position of 3042, and install M.2 module card, and fasten I head M2x2L screw.



2260 : Optional

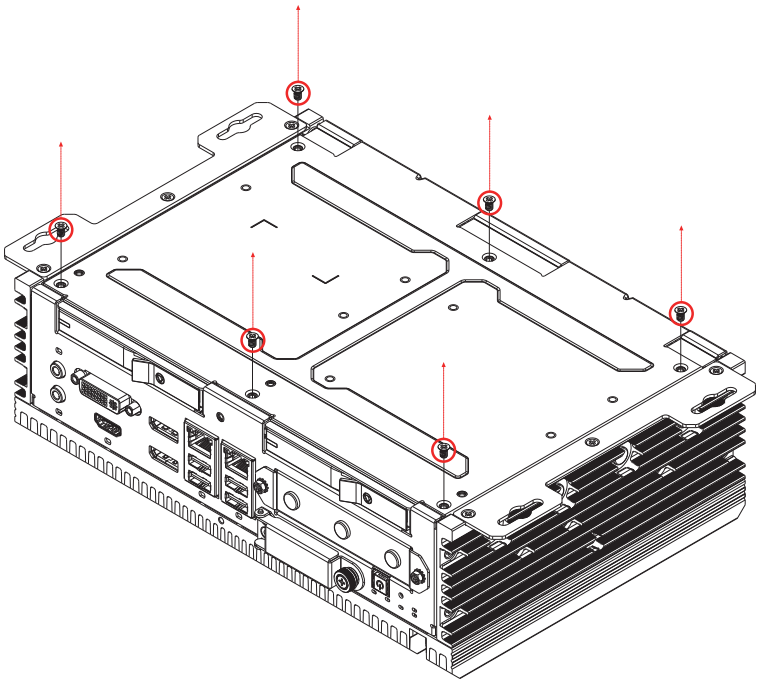
22110 : Optional

Thermal kit : Optional

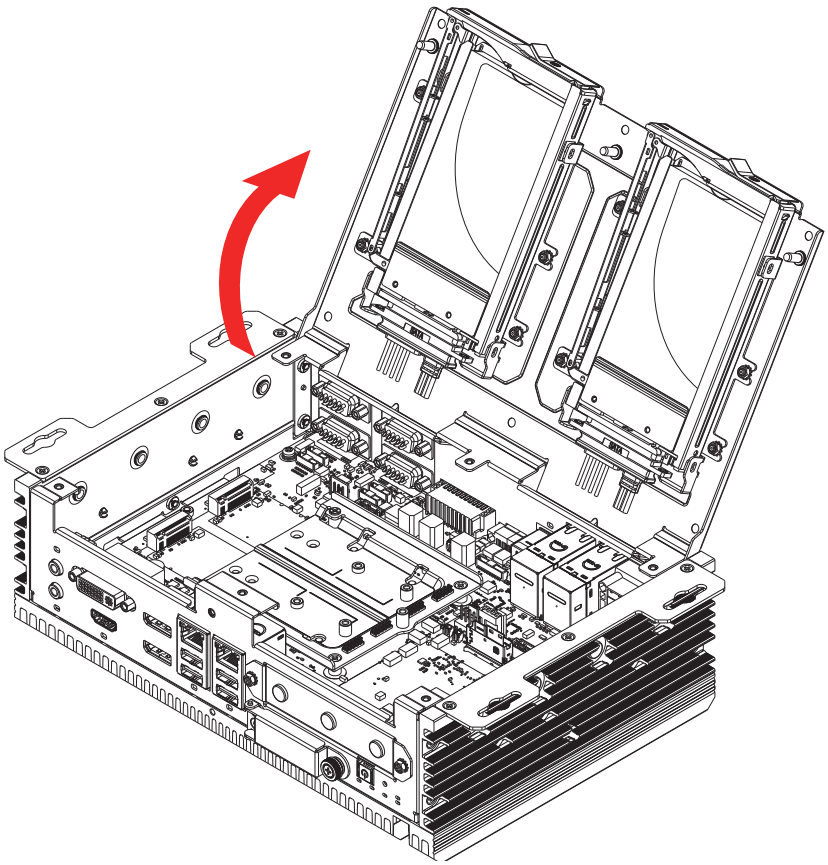


3.3.3 M.2 Key E

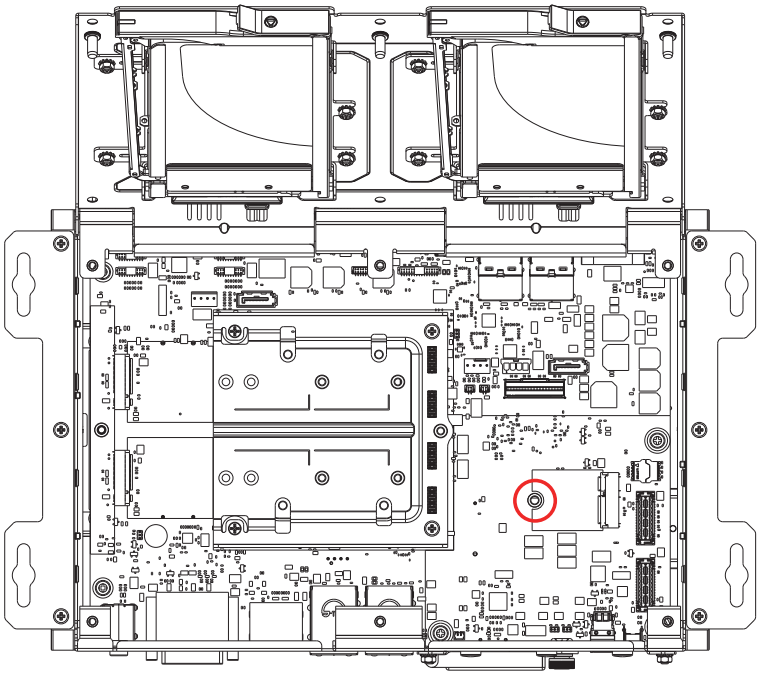
Step 1 Remove six flat head M3x5L screws.



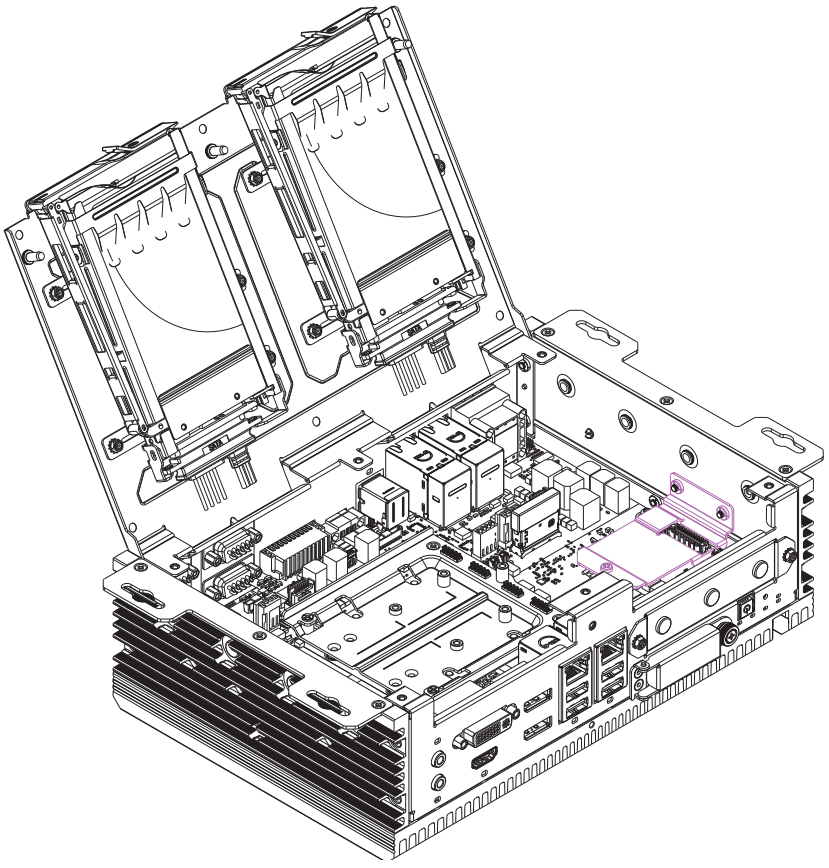
Step 2 Open bottom cover.



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



Thermal kit : Optional



3.4 Installing SSD/HDD/M.2(Optional)

3.4.1 ECX-4000-R series

Step 1 Use the trigger and open SSD/HDD tray.



Step 2 Open front door of SSD/HDD tray.



Step 3 Install 2.5" SSD/HDD into the tray and close.

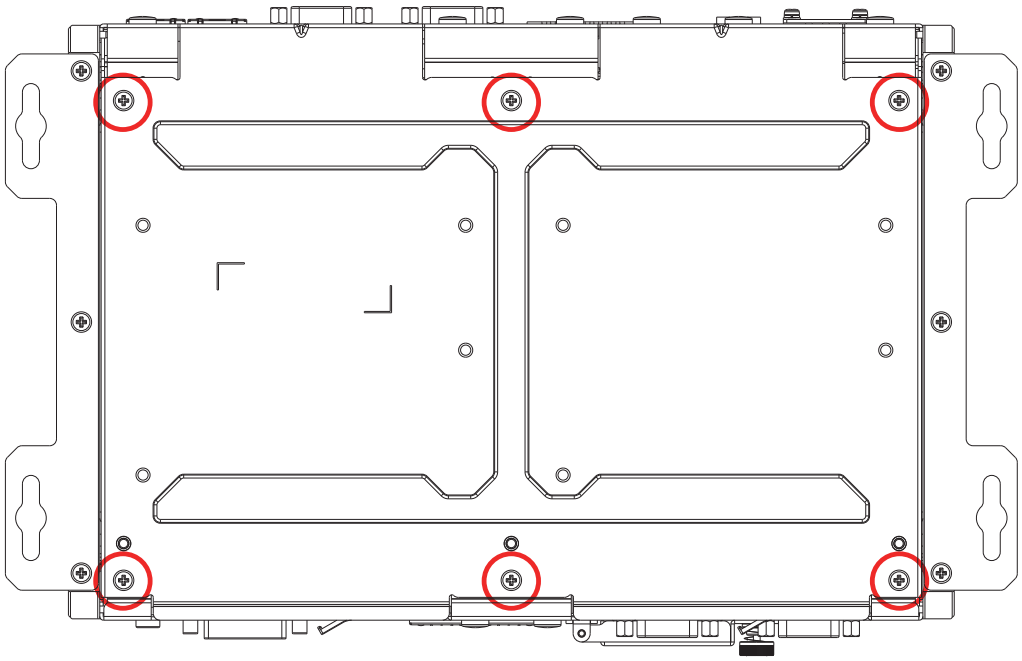


Step 4 Lock the SSD/HDD tray with key.

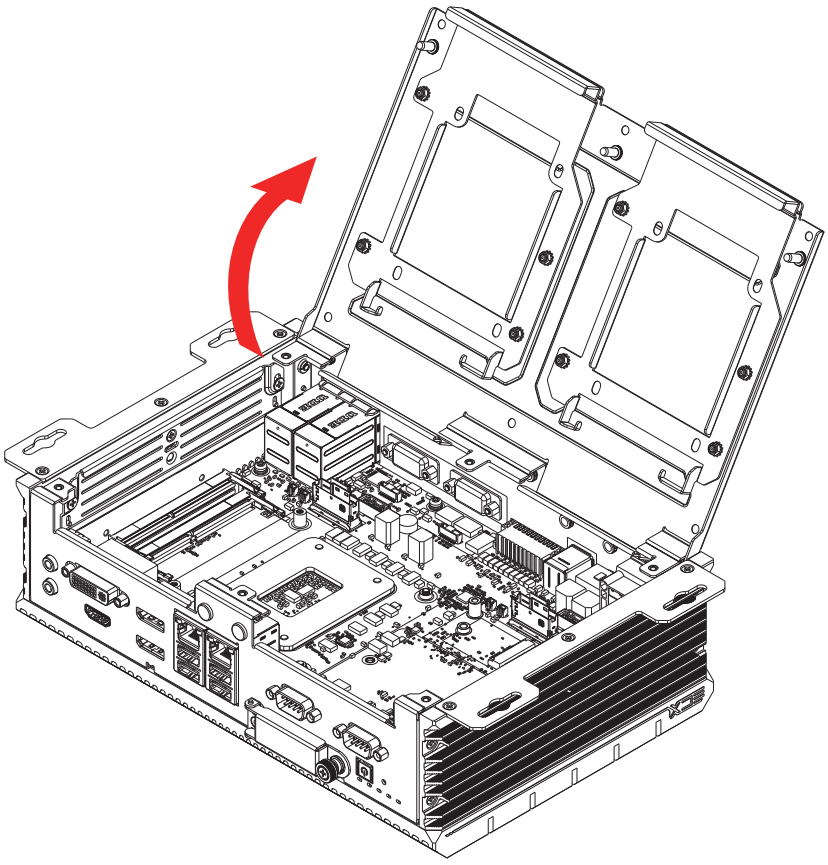


3.4.2 ECX-4000-G series

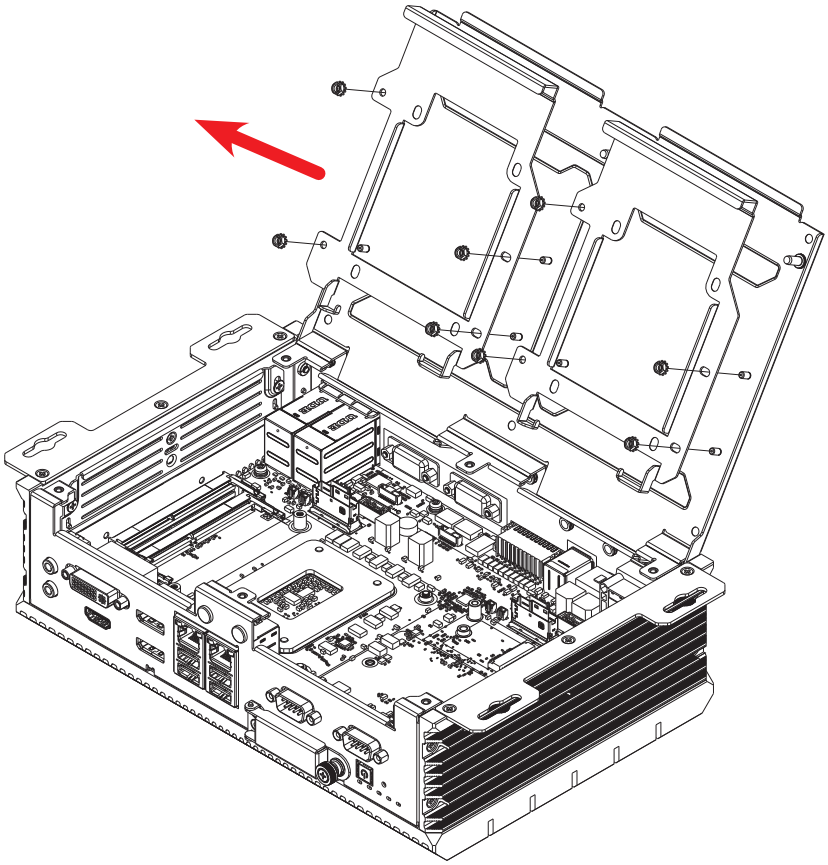
Step 1 Remove six flat head M3x5L screws.



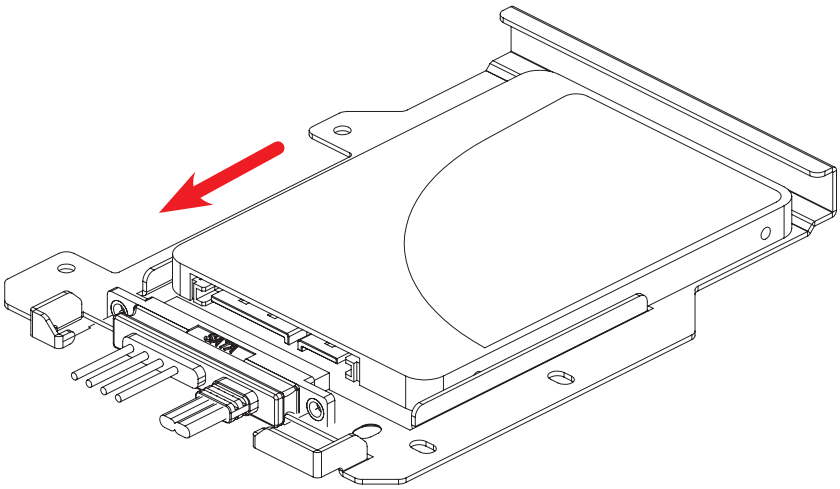
Step 2 Open bottom cover



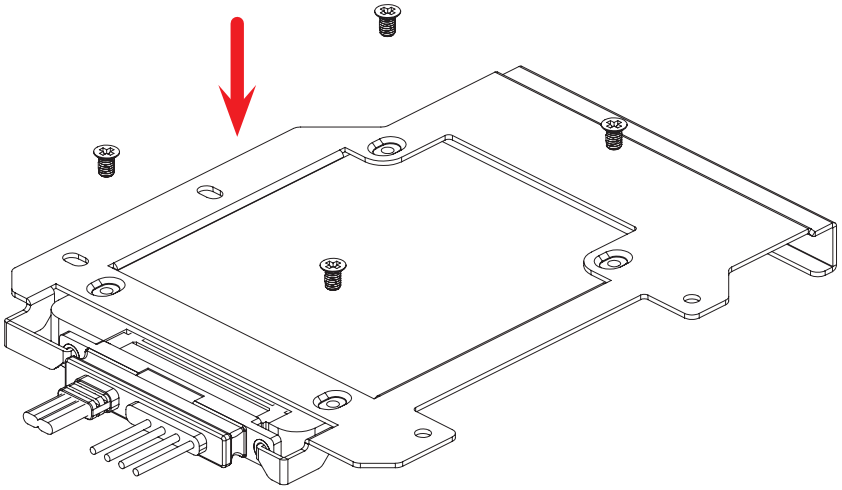
Step 3 Remove eight hexagon M3 nuts



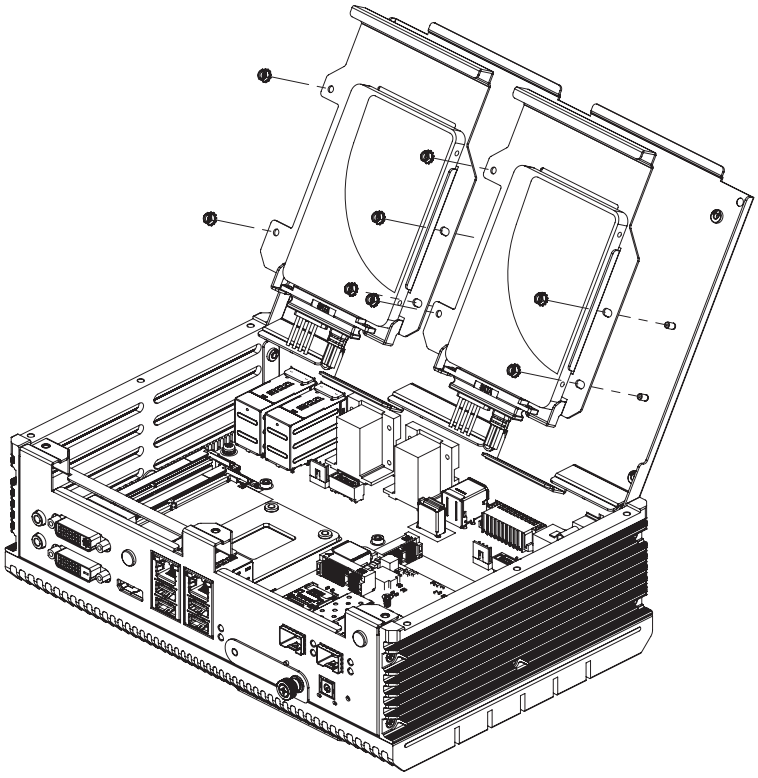
Step 4 Install SSD/HDD & SATA 22P cable into SSD/HDD bracket



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

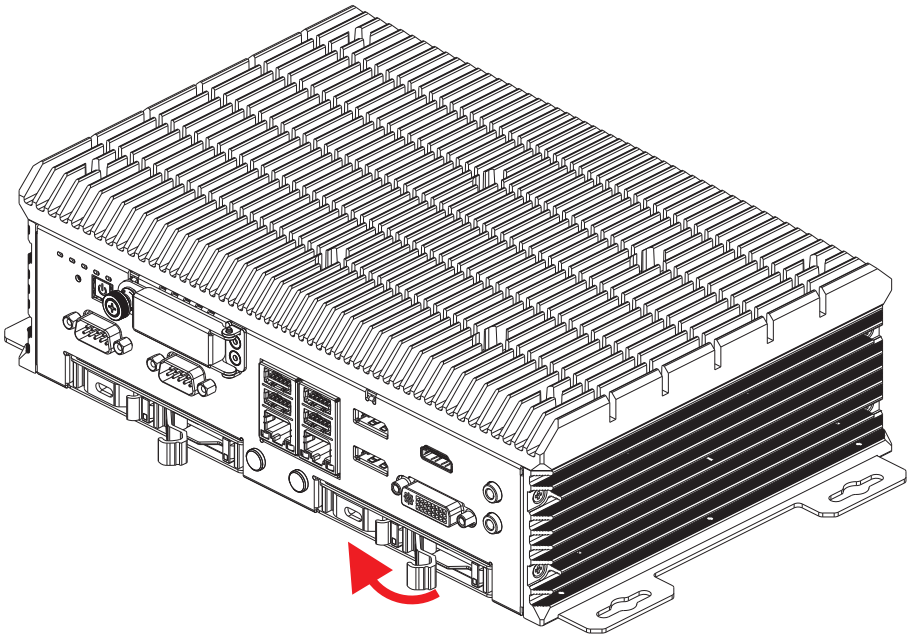


Step 6 Use eight Hexagon M3 Nuts and fasten bracket SSD/HDD

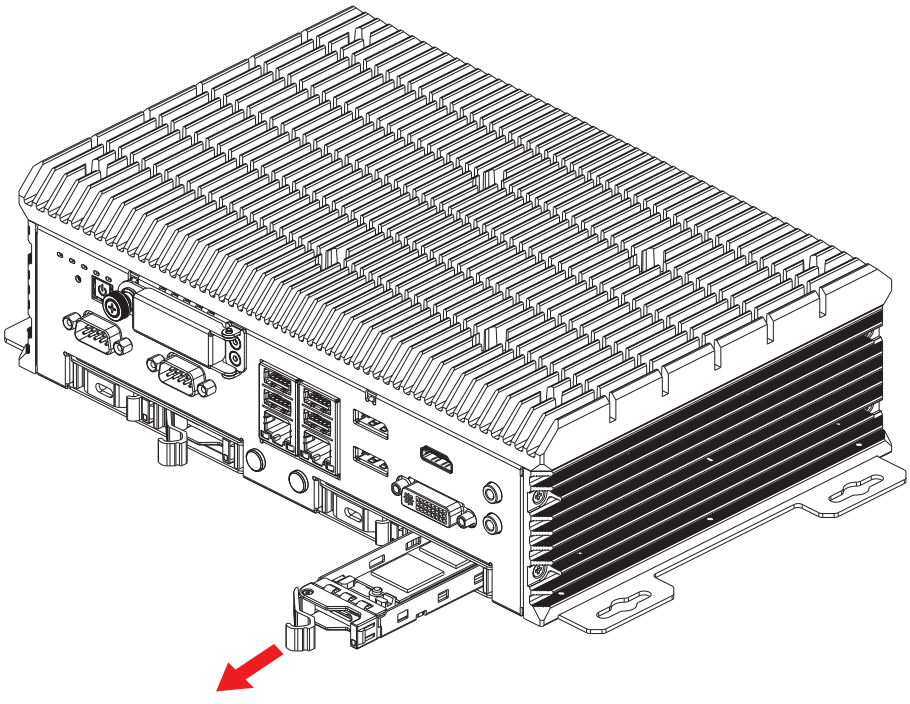


3.4.3 ECX-4000-S series(Optional)

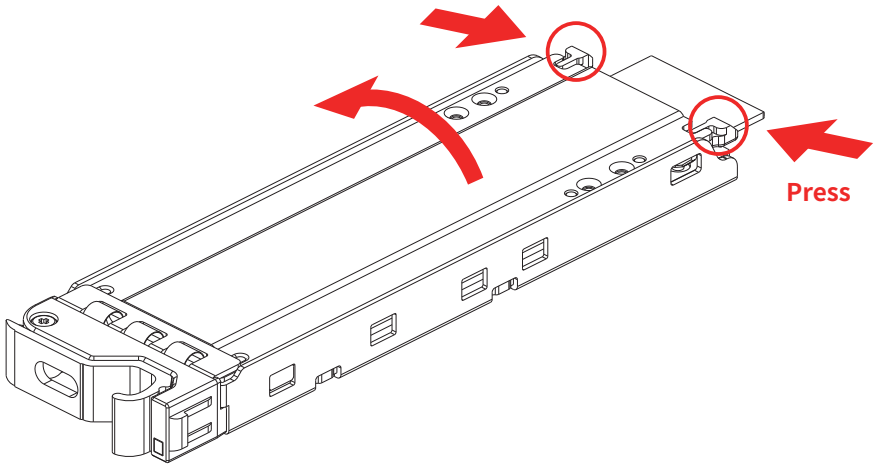
Step 1 Open front door of M.2 tray



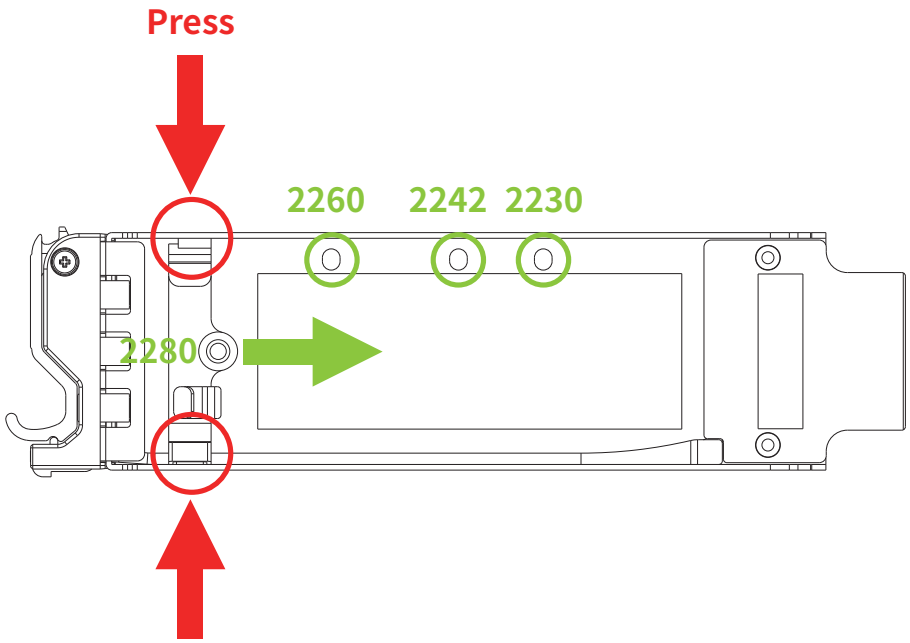
Step 2 Draw out M.2 tray



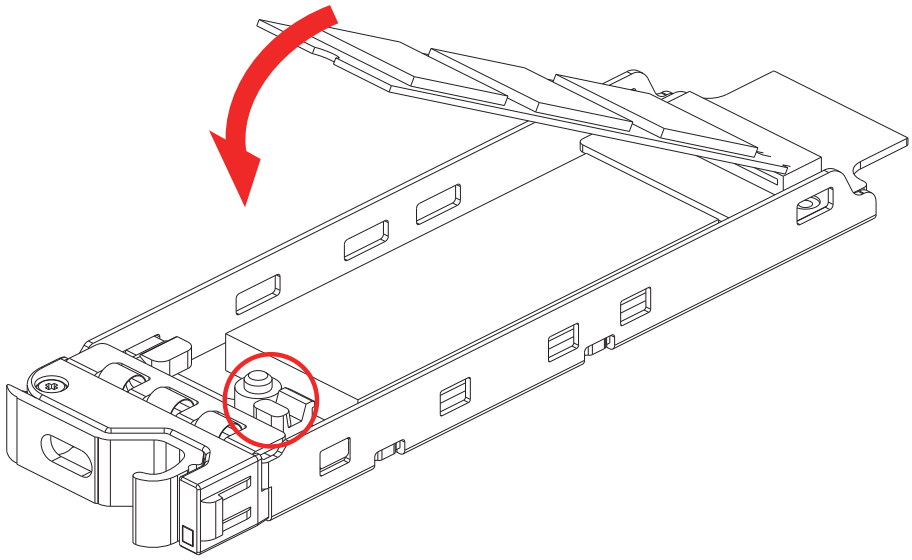
Step 3 Open top cover of M.2 tray



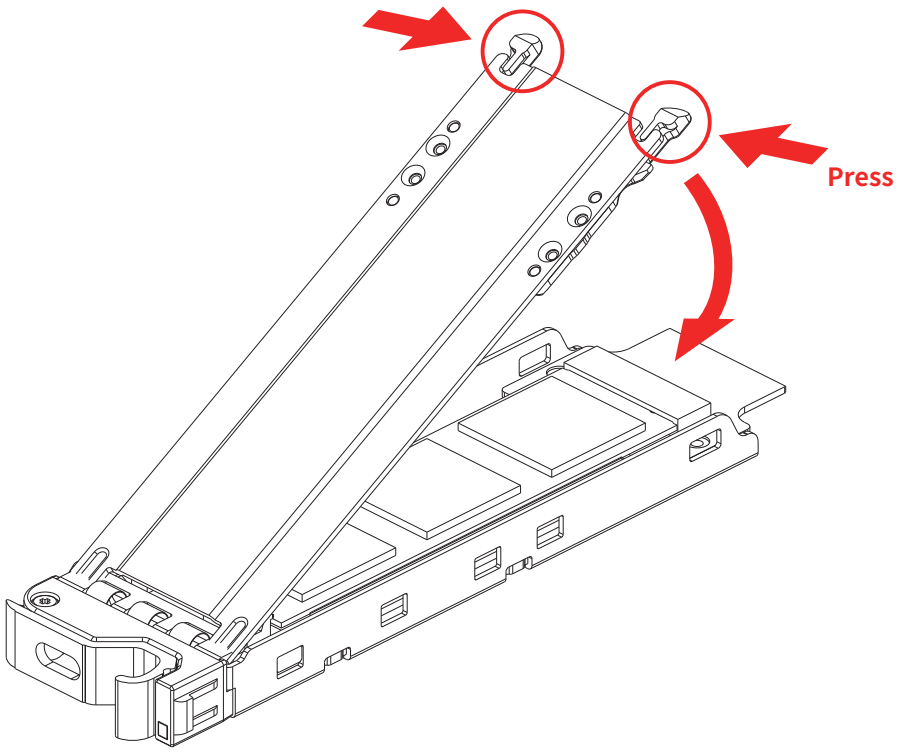
Step 4 If install 2230/2242/2260 M.2 module card, Press the latch of spacer support, and move to the position of 2230/2242/2260



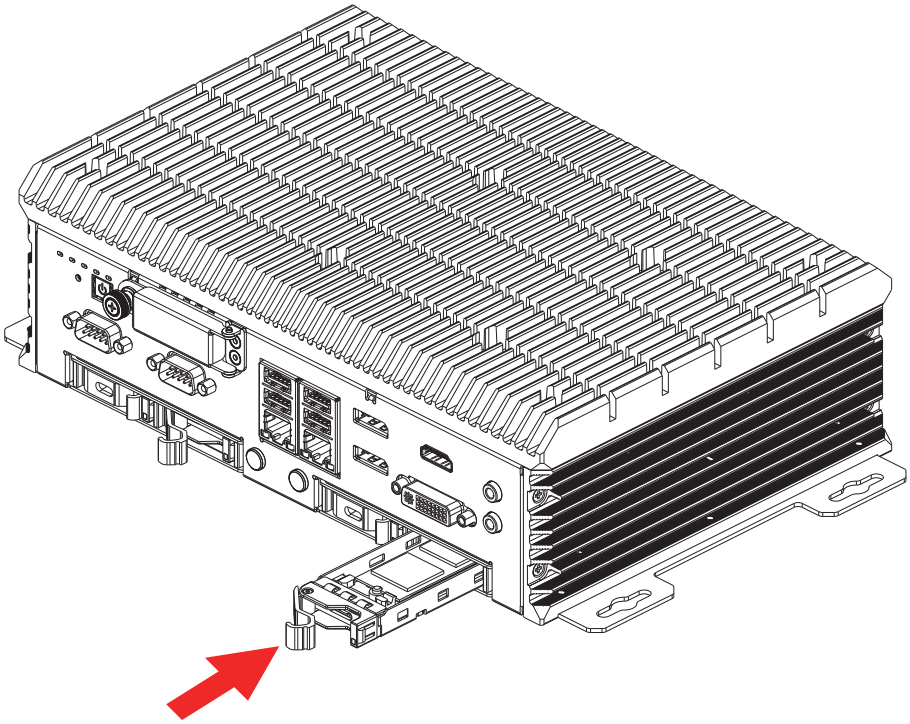
Step 5 Install M.2 module card



Step 6 Install top cover of M.2 tray

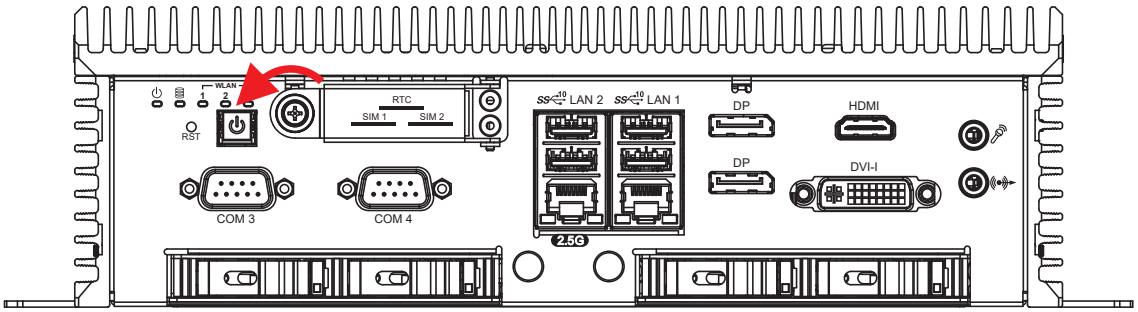


Step 7 Install M.2 tray

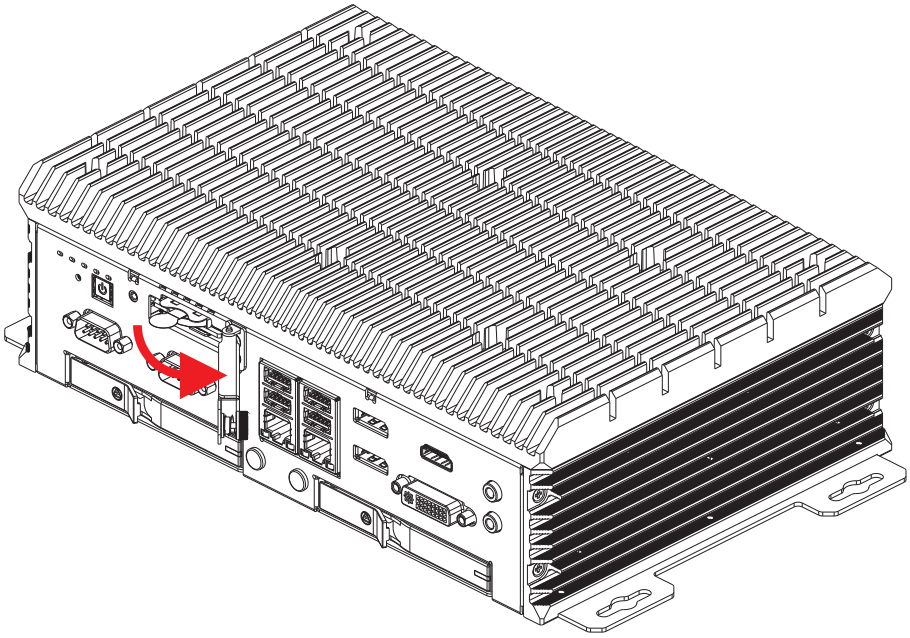


3.5 Installing Nano SIM Card

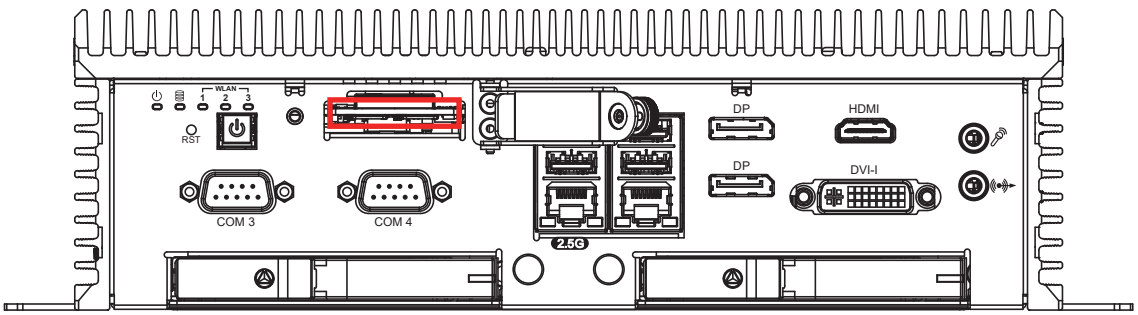
Step 1 Release captive panel screw



Step 2 Install SIM card in the marked red area.

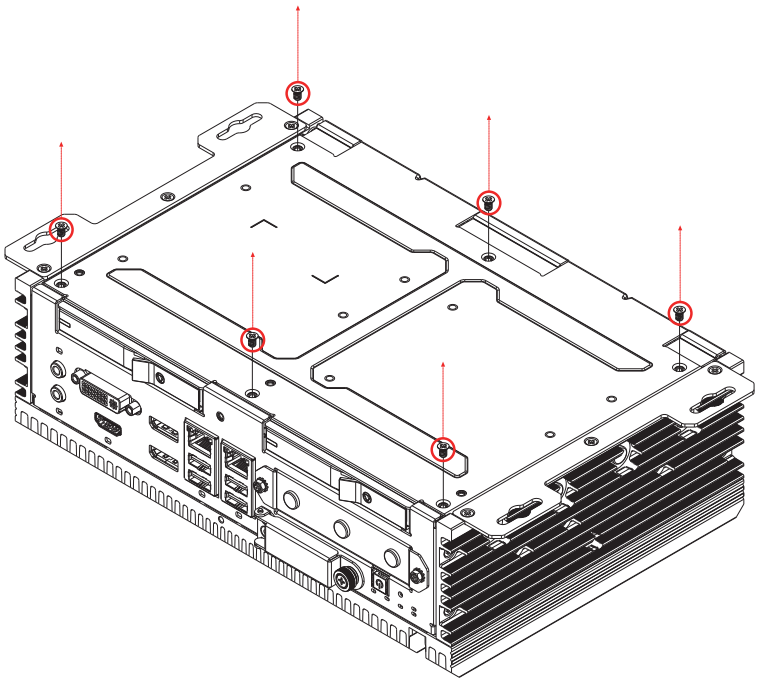


Step 3 Insert nano SIM card and push to lock

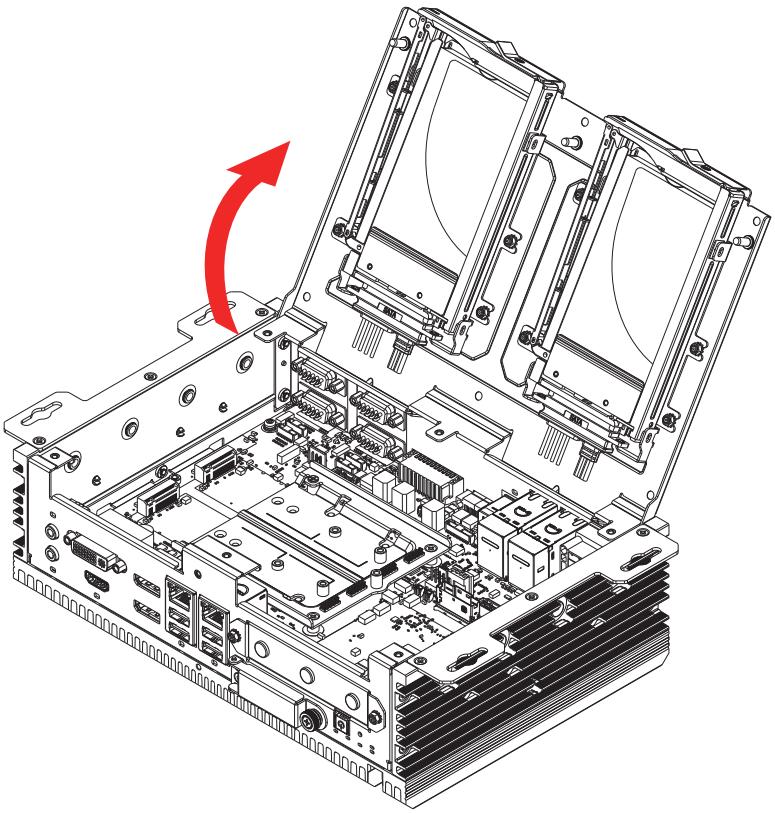


3.6 Installing Antenna Cable

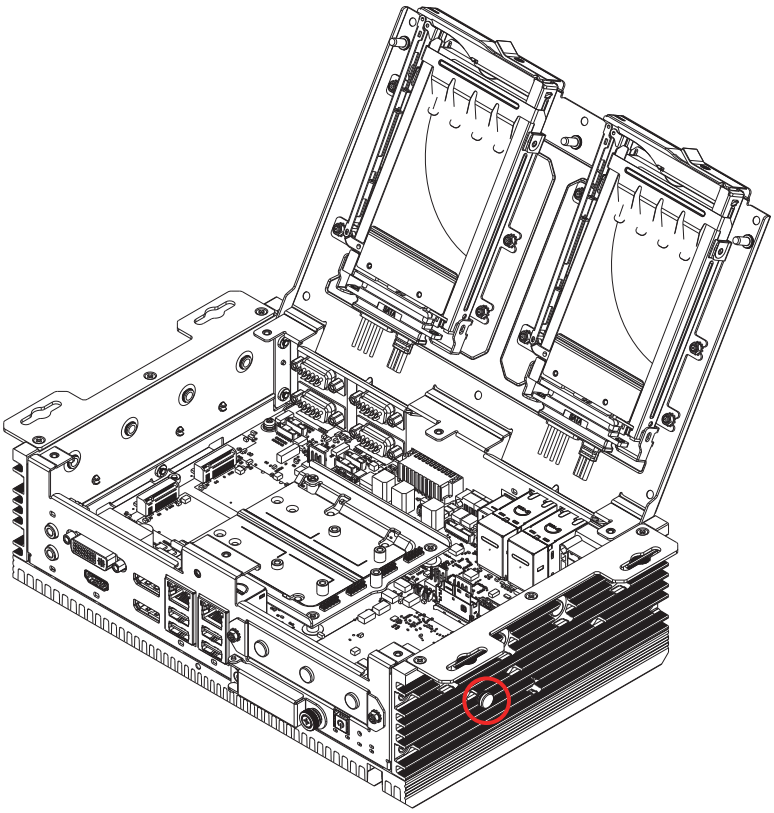
Step 1 Remove six flat head M3x5L screws.



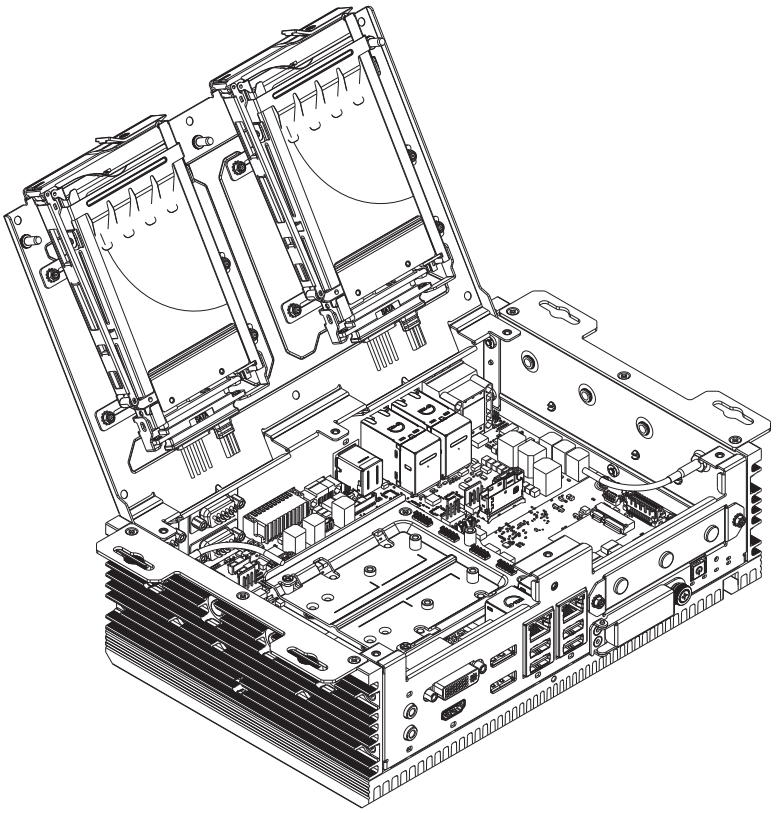
Step 2 Open bottom cover.



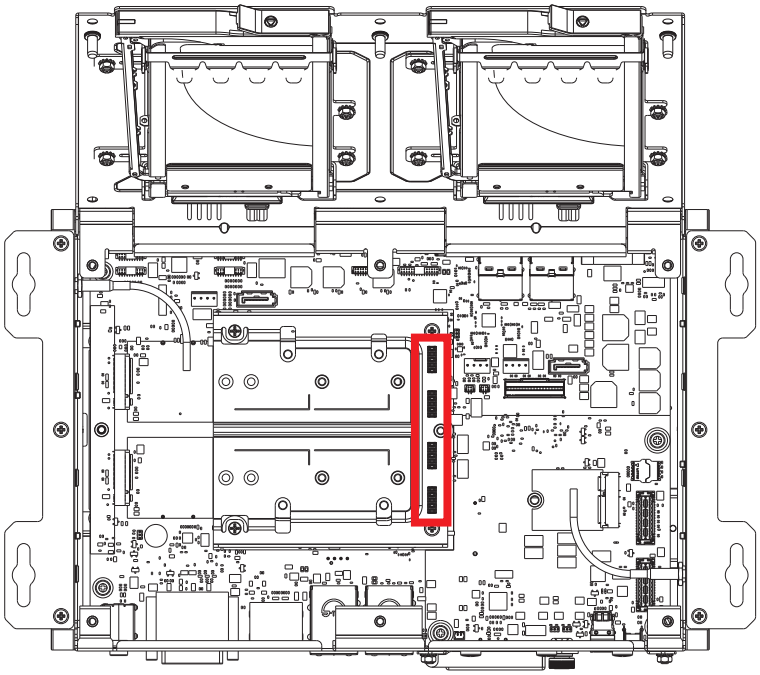
Step 3 Remove hole plug.



Step 4 Install SMA cable, and fasten washer and nut.

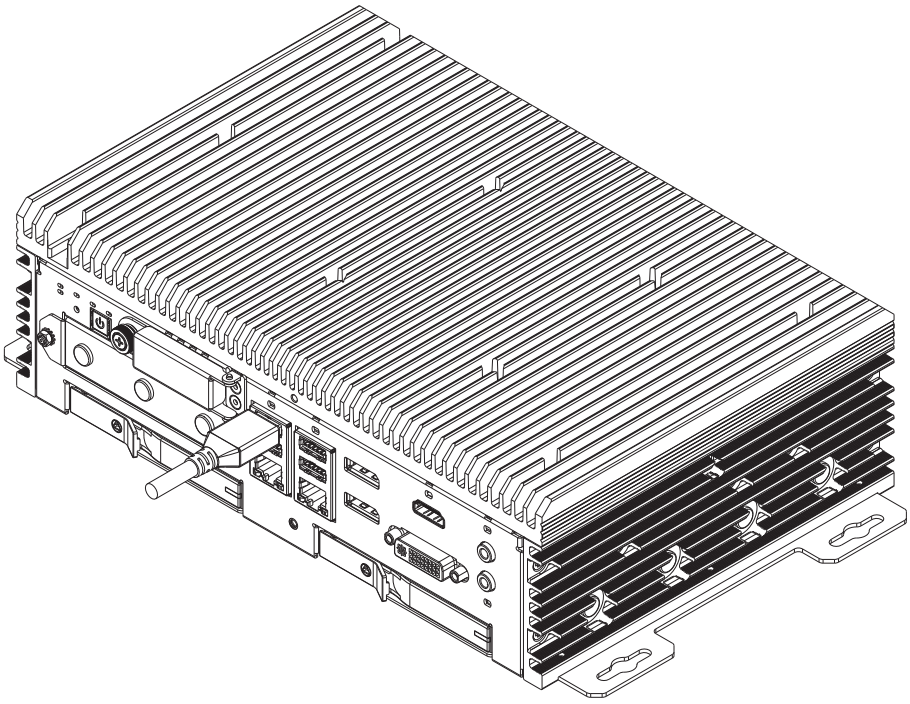


Step 5 Insert wire into the wire mount.

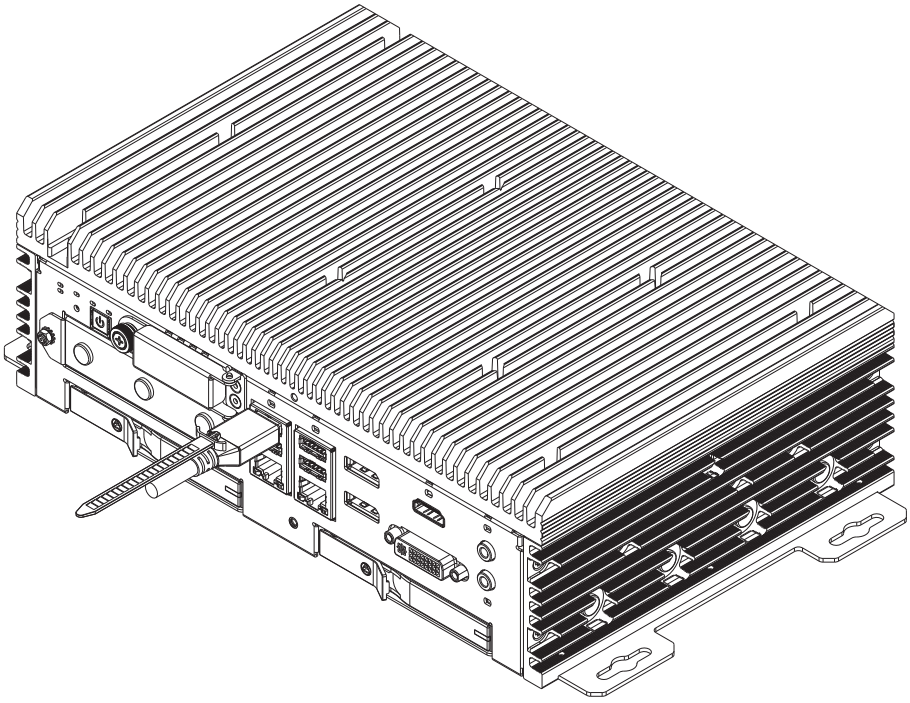


3.7 Installing Cable Tie & Cable Mounting(Optional)

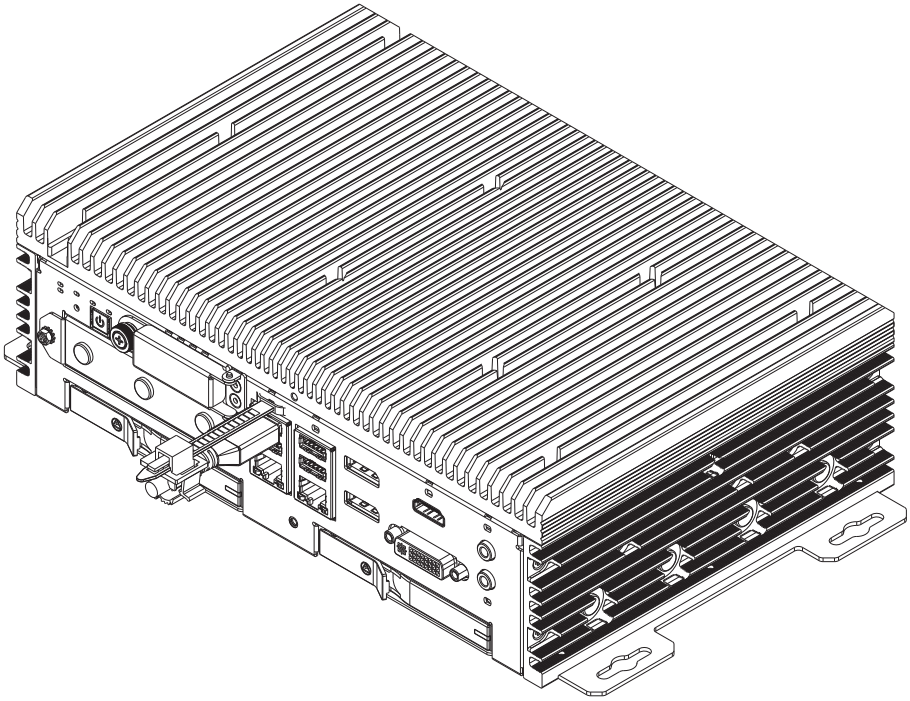
Step 1 Insert cable into the connector first.



Step 2 Insert cable tie into the mounting hole.



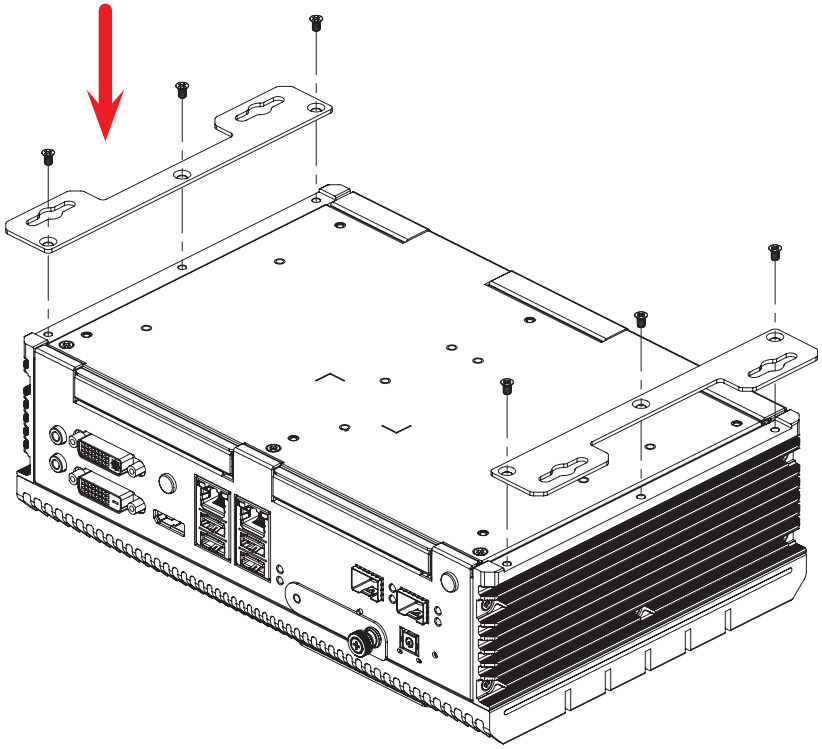
Step 3 Insert cable mounting, and tighten the wire.



3.8 Mount Your ECX-4000

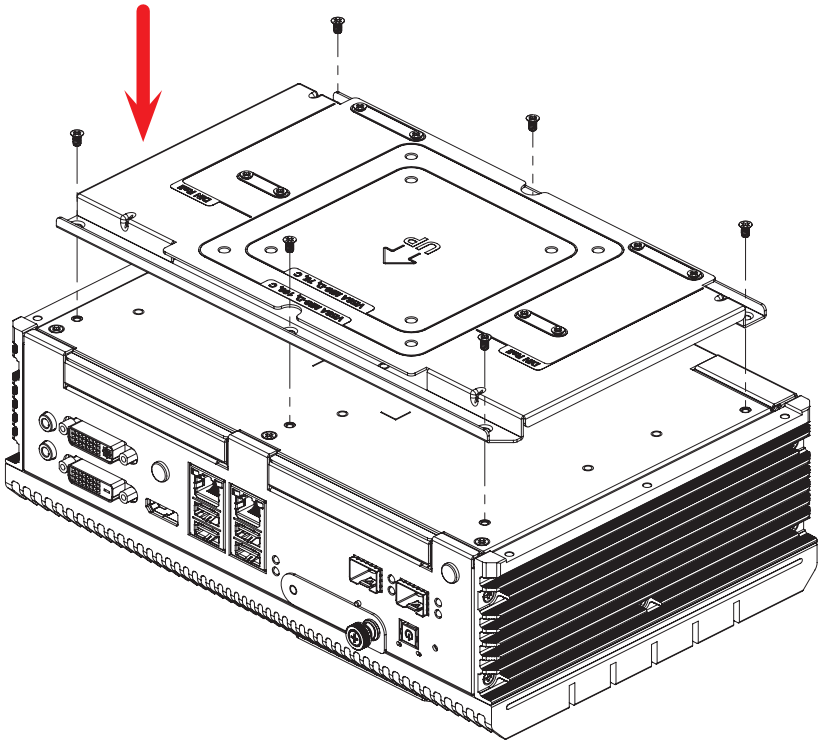
3.8.1 Wall Mount

Fasten six flat head M3x5L screws.



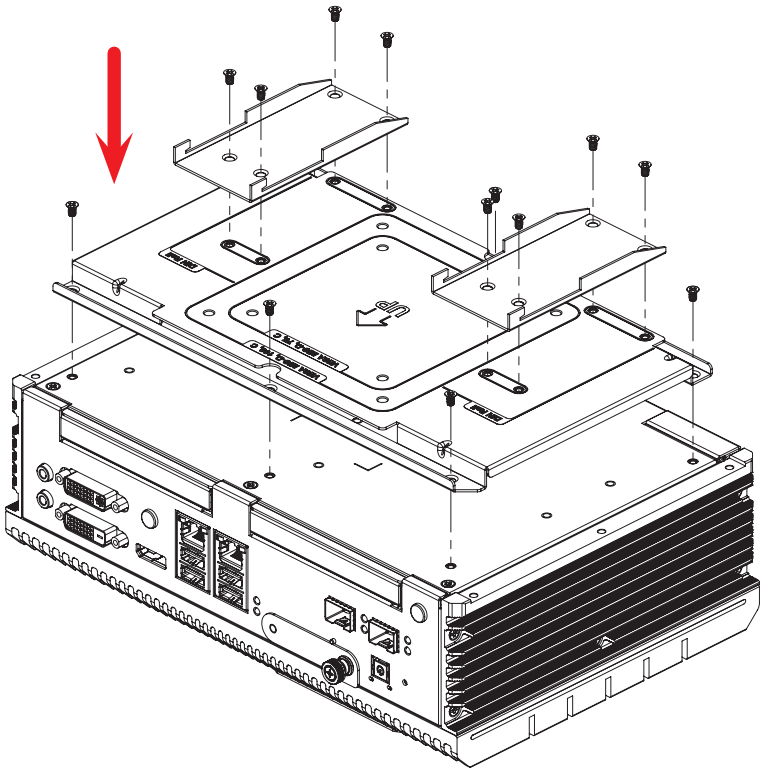
3.8.2 VESA mount(Optional)

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



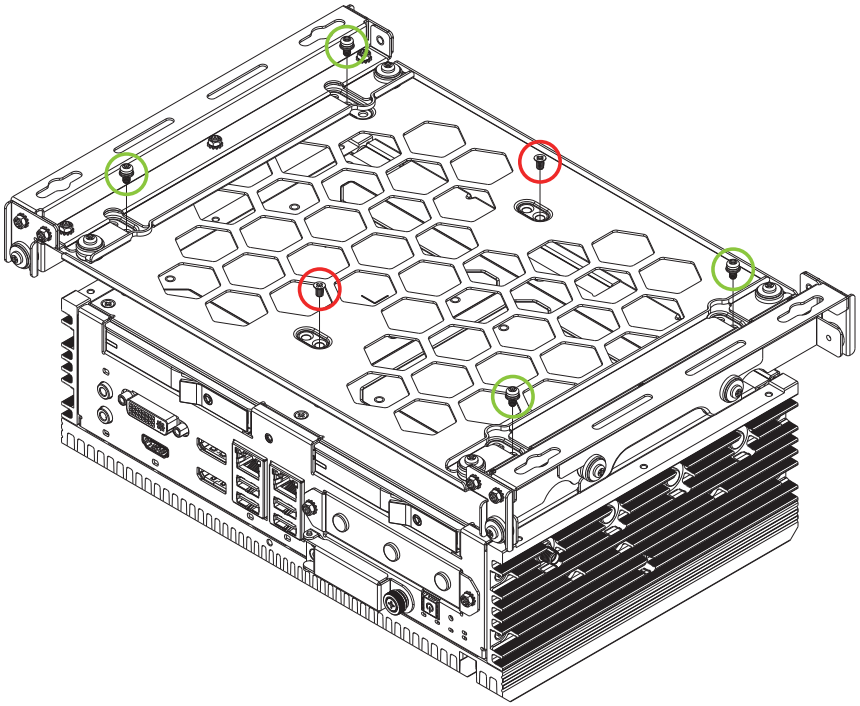
3.8.3 Din rail mount(Optional)

Fasten fourteen flat head M3x5L screws.

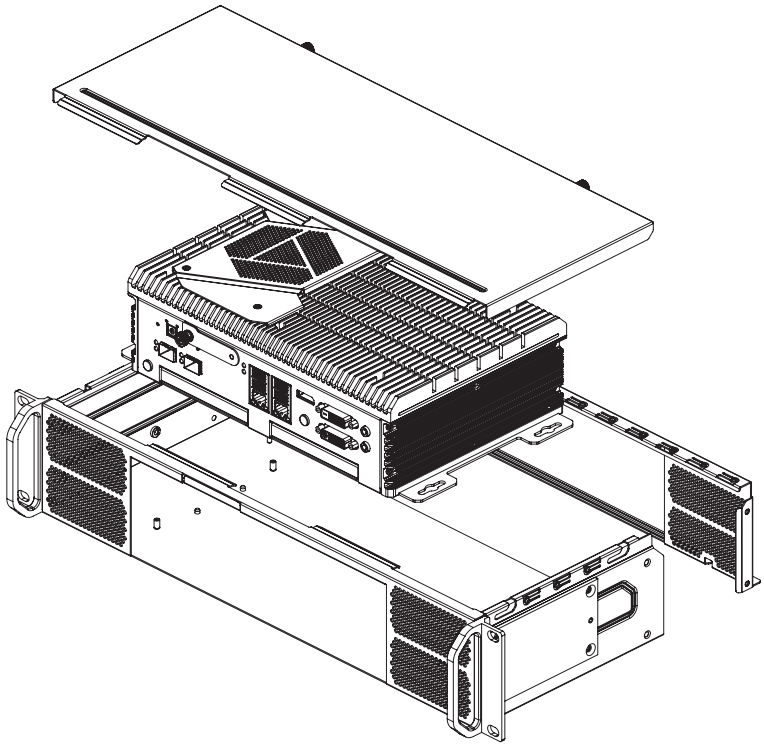


3.8.4 Anti-Vibration kit(Optional)

Fasten two flat head M3x5L screws and four pan head SFW M3x6L screws.



3.8.5 Rack Mount Enclosure(Optional)



4

BIOS SETUP

4.1 BIOS Setup

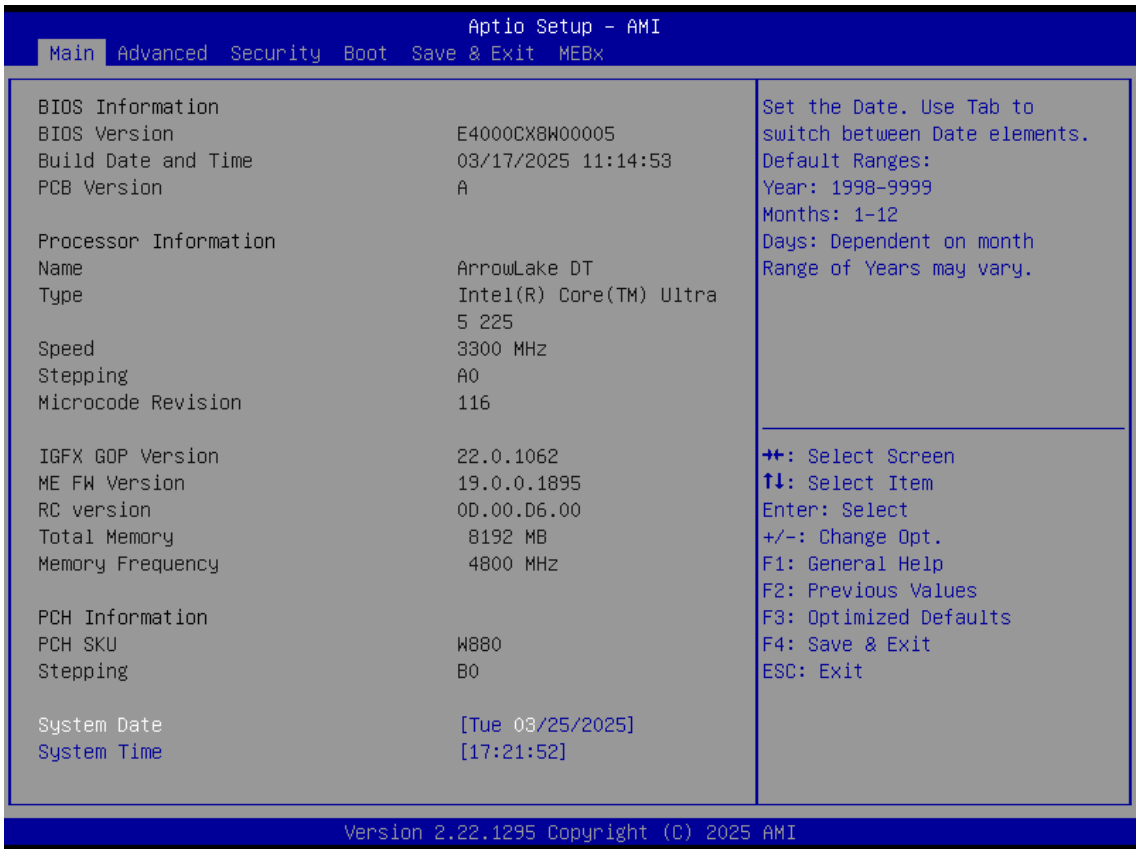


Figure 4-1 : Entering BIOS Setup

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

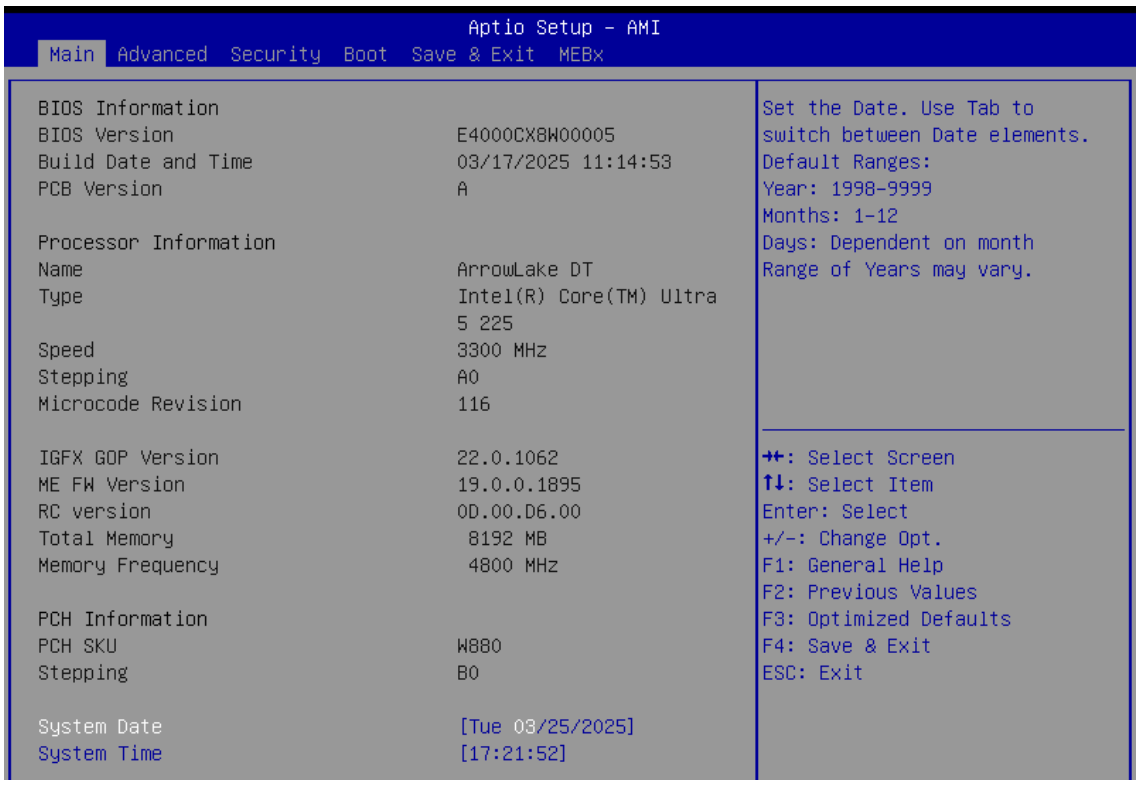


Figure 4-2 : Main Menu

The main menu displays BIOS version and system information. There are two options on Main menu.

System Date

Set the Date. Use Tab to switch between Date elements.
Default Ranges :
Year : 1998-9999
Months : 1-12
Days : Dependent on month Range of Years may vary

System Time

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

4.3 Advanced

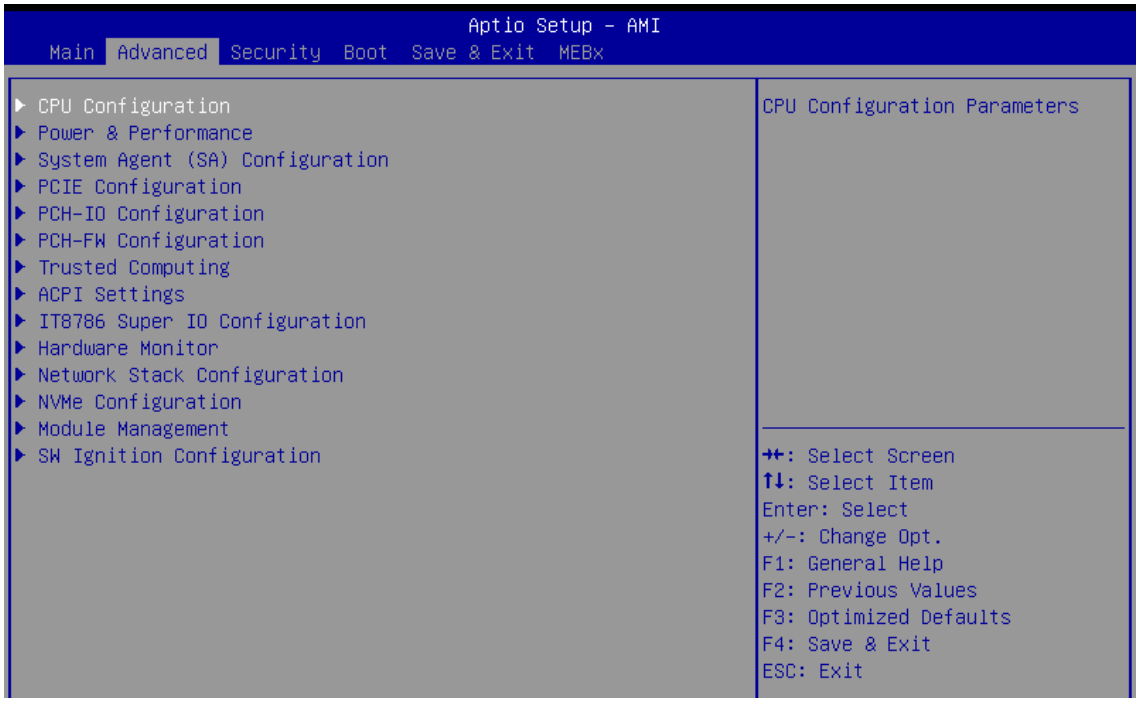


Figure 4-3 : Advanced Menu

Select advanced tab to enter advanced BIOS setup options such as CPU configuration, ACPI settings, and Super IO configuration.

4.3.1 CPU Configuration

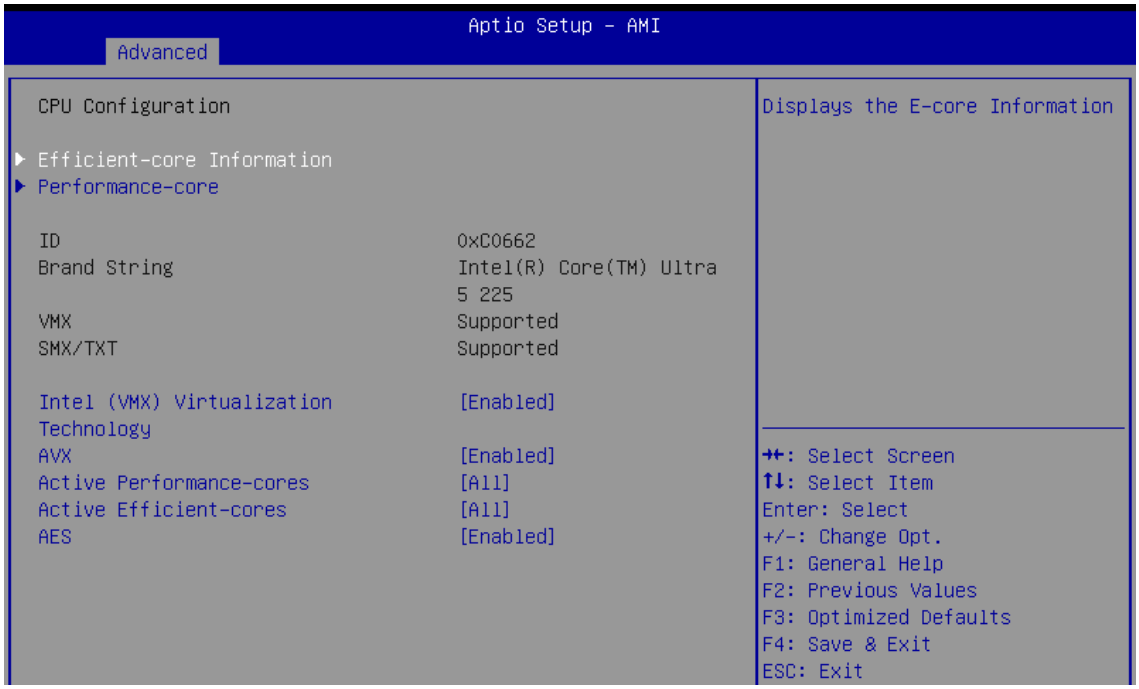


Figure 4-3-1 : CPU Configuration

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

AVX
Enable/Disable the AVX and AVX2 Instructions

Active Performance-cores
Number of P-cores to enable in each processor package. Note: Number of Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

Active Efficient-cores
Number of E-cores to enable in each processor package. Note: Number of Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

AES
Enable/Disable AES (Advanced Encryption Standard)

4.3.2 CPU - Power Management Control

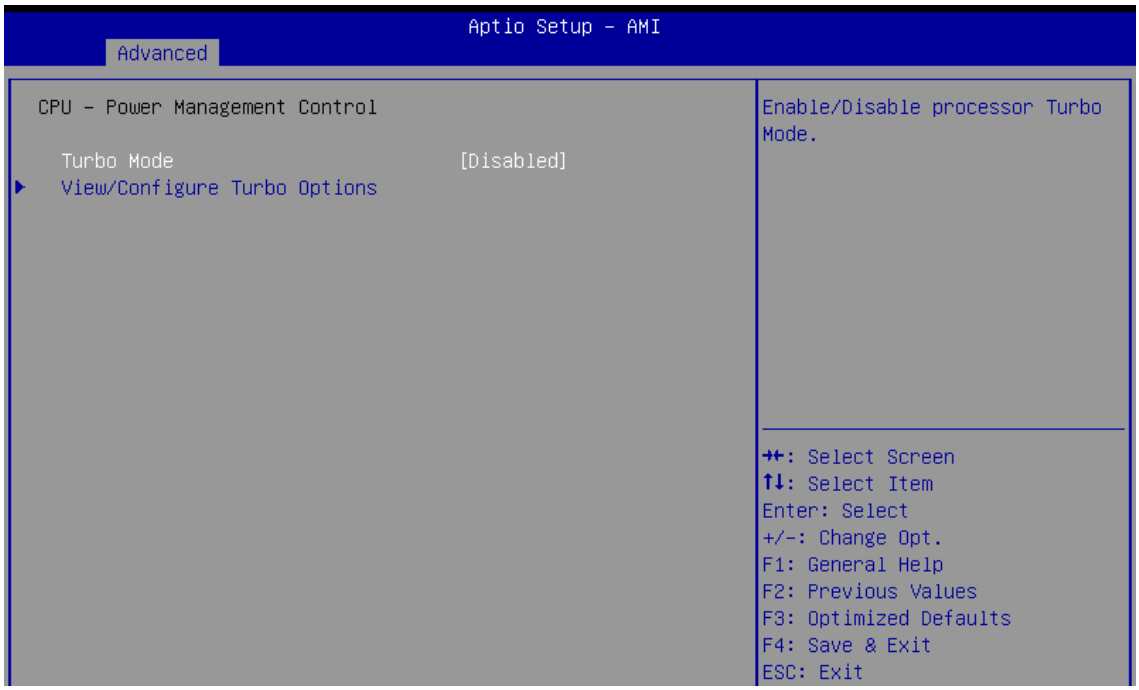


Figure 4 3-2 : CPU - Power Management Control

Turbo Mode
Enable/Disable processor Turbo Mode.

View/Configure Turbo Options
View/Configure Turbo Options

4.3.3 Memory Configuration

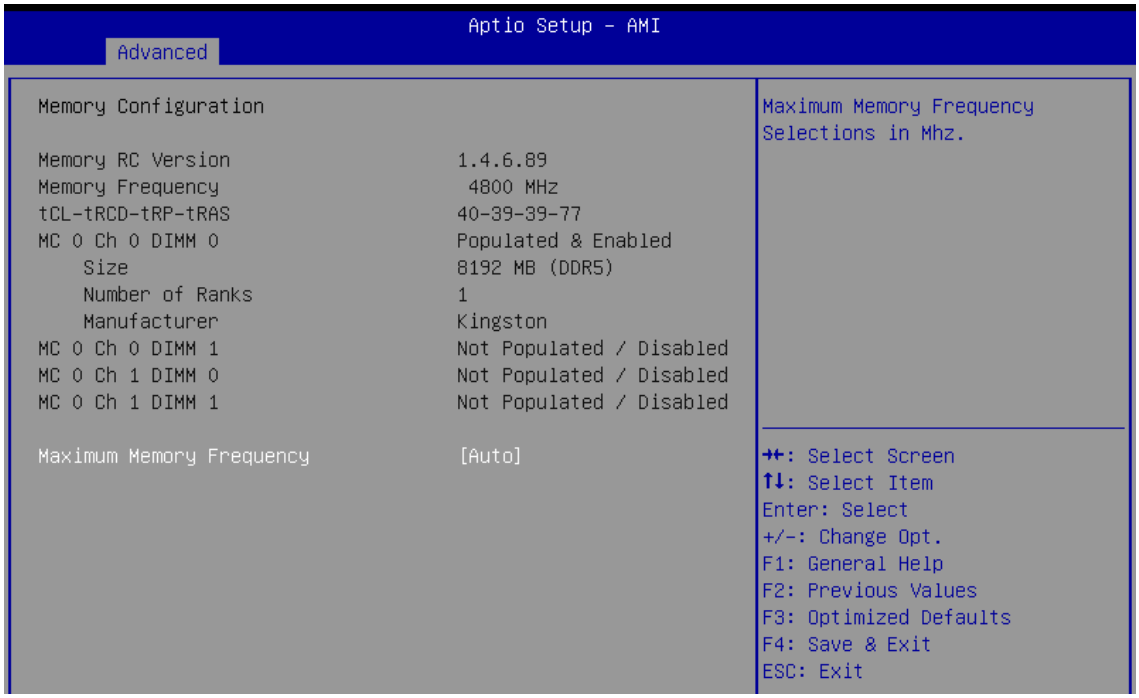


Figure 4 3-3 : Memory Configuration

Maximum Memory Frequency

Maximum Memory Frequency Selections in Mhz.

4.3.4 Graphics Configuration

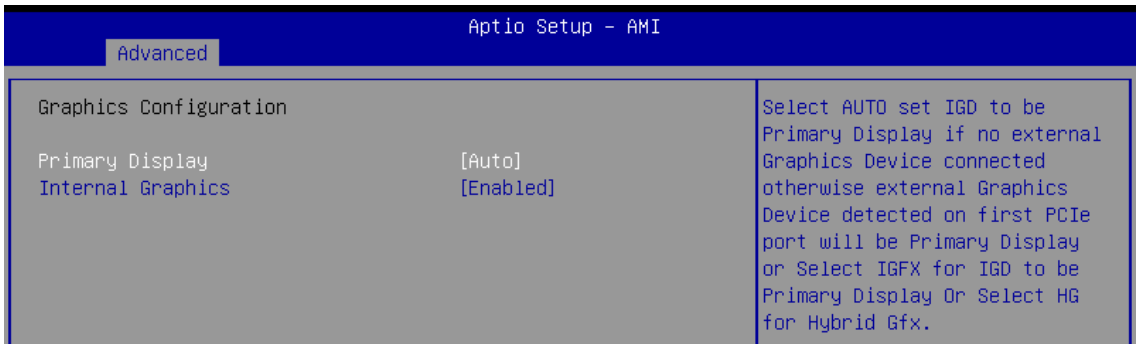


Figure 4-3-4 : Graphics Configuration

Primary Display

Select AUTO set IGD to be Primary Display if no external Graphics Device connected otherwise external Graphics Device detected on first PCIe port will be Primary Display or Select IGFX for IGD to be Primary Display Or Select HG for Hybrid Gfx.

Internal Graphics

Keep IGFX enabled based on the setup options.

4.3.5 VMD Configuration

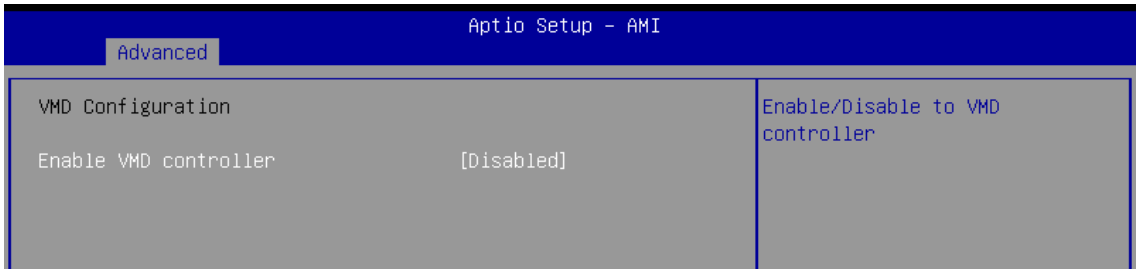


Figure 4-3-5 : VMD Configuration

Enable VMD controller
Enable/Disable to VMD controller.

4.3.6 PCIE Configuration

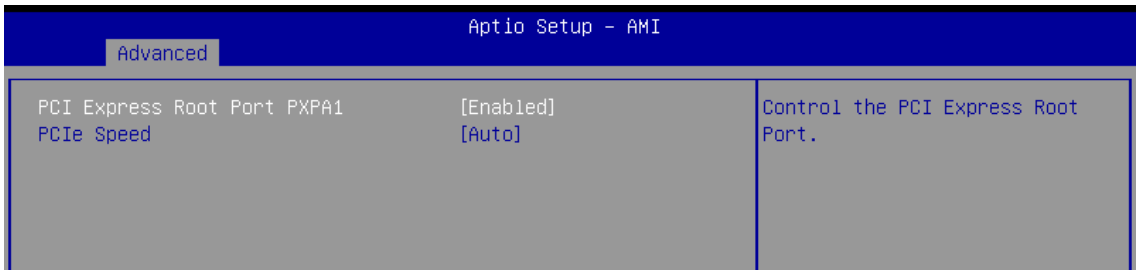


Figure 4-3-6 : PCIE Configuration

PCI Express Root Port X
Control the PCI Express Root Port.

PCIe Speed
Configure PCIe Speed.

4.3.7 PCH-IO Configuration

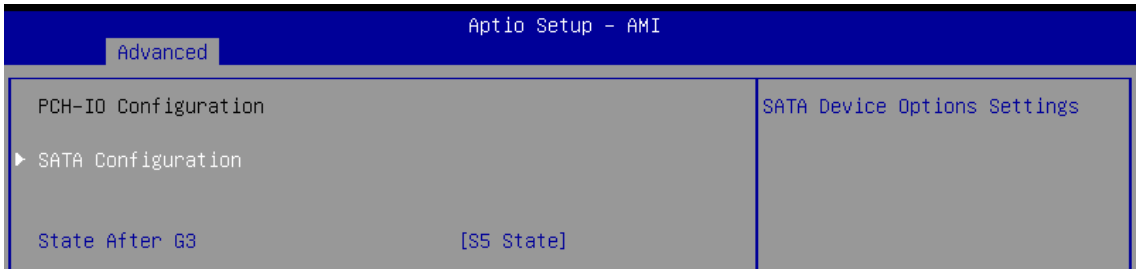


Figure 4-3-7 : PCH-IO Configuration

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

4.3.8 SATA Configuration

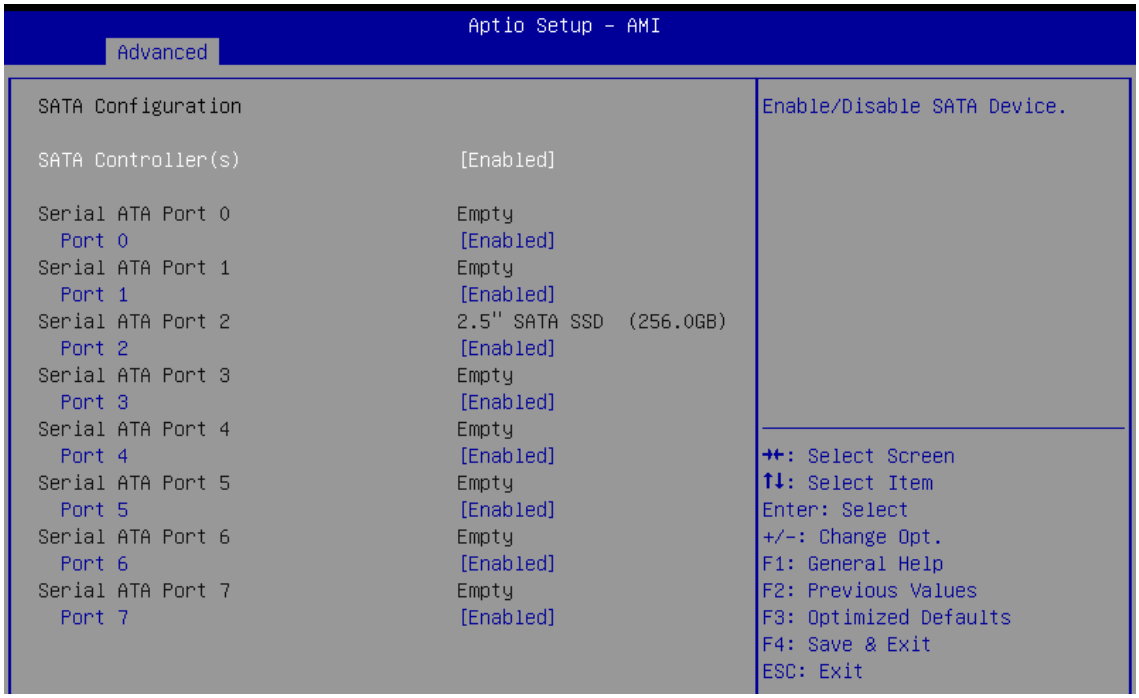


Figure 4-3-8 : SATA Configuration

SATA Controller(s)
Enable/Disable SATA Device.

Port X
Enable or Disable SATA Port.

4.3.9 PCH-FW Configuration

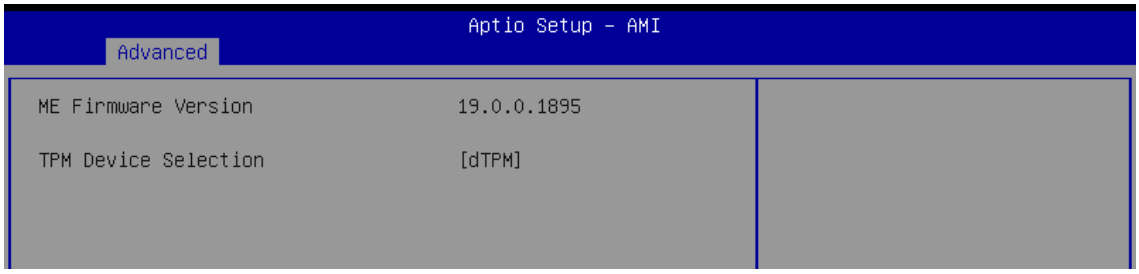


Figure 4-3-9 : PCH-FW Configuration

TPM Device Selection
Selects TPM device : PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.

4.3.10 Trusted Computing

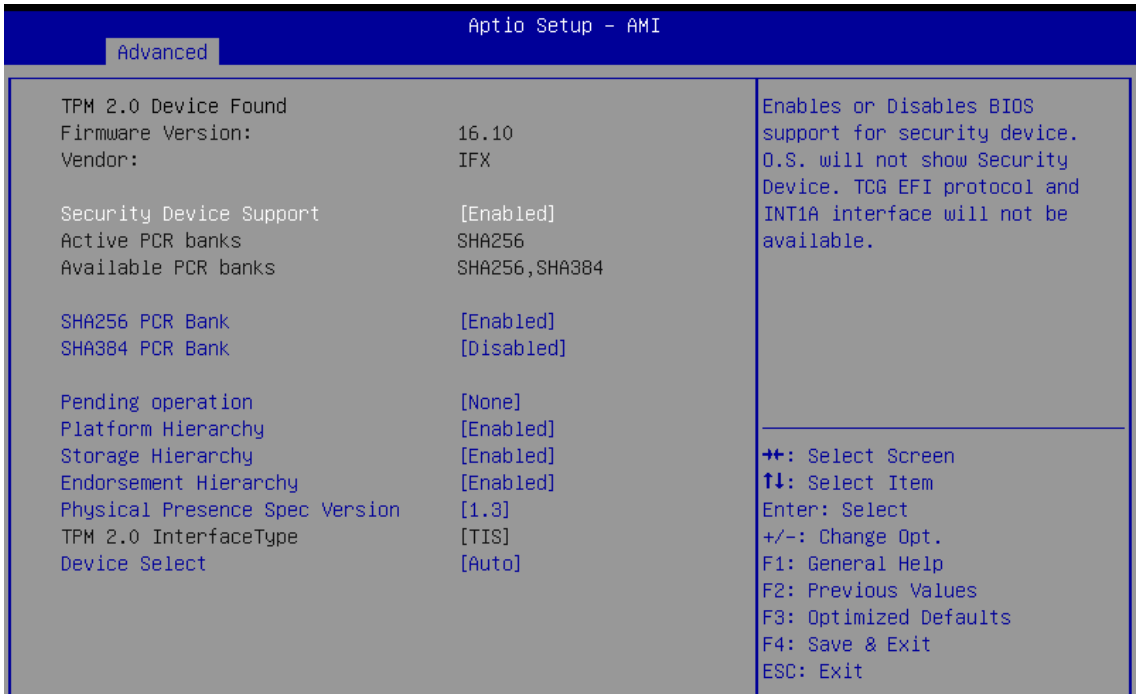


Figure 4-3-10 : Trusted Computing

Control the TPM device status and display related information if TPM chip is present.

4.3.11 ACPI Settings

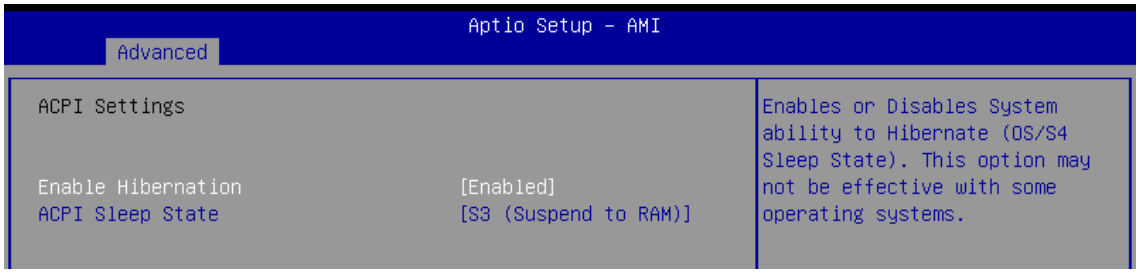


Figure 4-3-11 : ACPI Settings

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.

4.3.12 Super IO Configuration

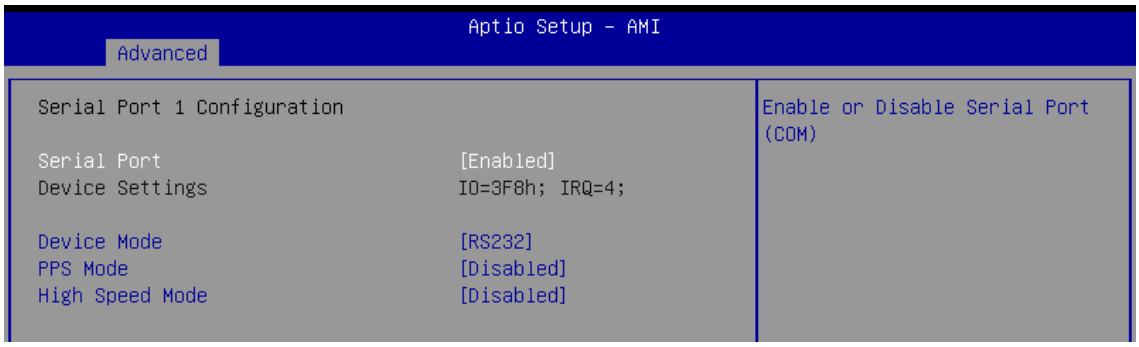


Figure 4-3-12 : Super IO Configuration

Serial Port
Enable or Disable Serial Port (COM).

Device Mode
Select Device Mode.

PPS Mode
Enable or Disable PPS.

High Speed Mode (Only Serial Port 1)
Enable or Disable Serial Port High Speed.

4.3.13 Hardware Monitor

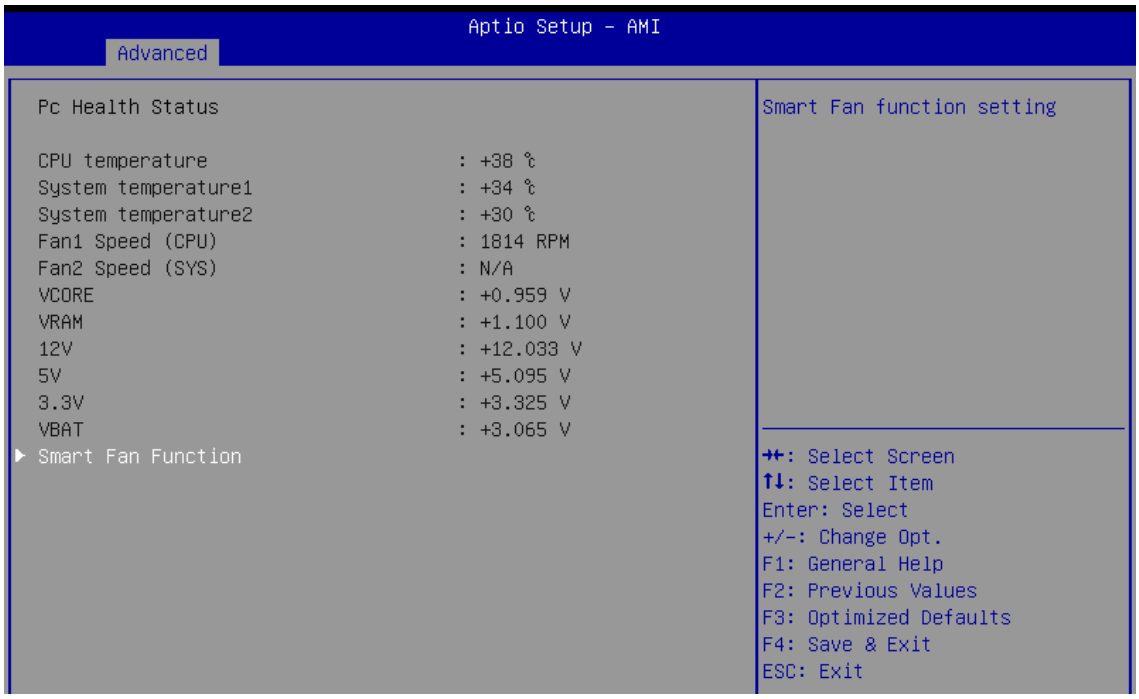


Figure 4-3-13 : Hardware Monitor

Smart Fan Function
Smart Fan function setting.

4.3.14 Network Stack Configuration

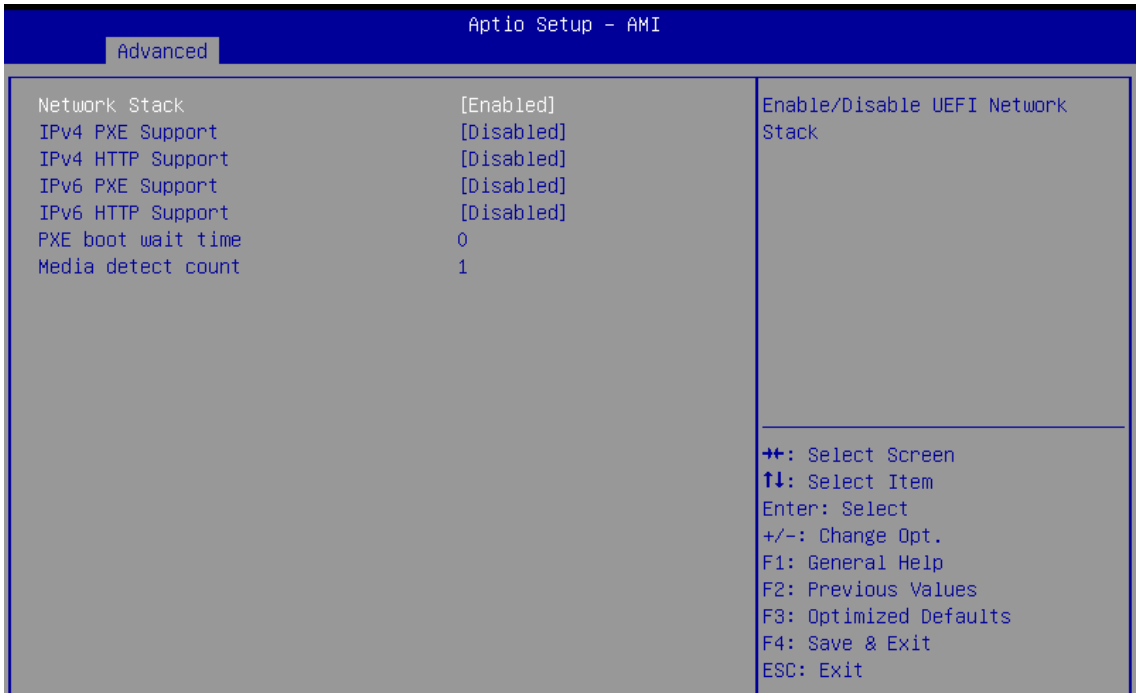


Figure 4-3-14 : Network Stack Configuration

Network Stack
Enable/Disable UEFI Network Stack.

IPv4 PXE Support
Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

IPv4 HTTP Support
Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.

IPv6 PXE Support
Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

IPv6 HTTP Support
Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

PXE boot wait time
Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

Media detect count
Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

4.3.15 NVMe Configuration

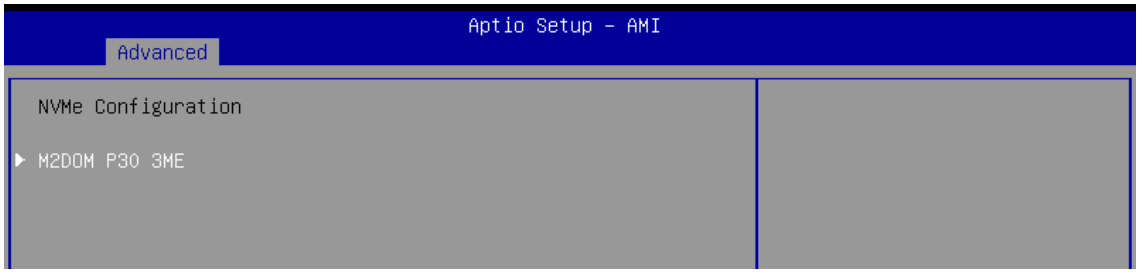


Figure 4-3-15 : NVMe Configuration

Display NVMe controller and Drive information.

4.3.16 Module Management

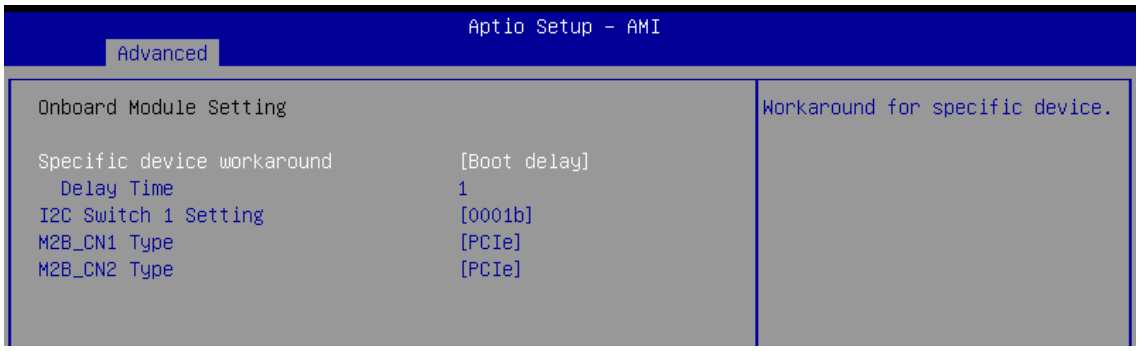


Figure 4-3-16 : Module Management

Specific device workaround
Workaround for specific device.

Delay Time
Workaround Delay Time 0~255 (second).

I2C Switch X Setting
I2C Switch Setting. Bit 0~3 for Channel 0~3. 1 to enable, 0 to disable.
For example: 0101b for channel 0 & 2.

Switch IC	Channel	Device
I2C Switch 1	0	UPS
	1	M.2 KEY-E
	2	SUMIT-A
	3	M.2 KEY-M

M2B_CN1 Type
Select M2B Type.

M2B_CN2 Type
Select M2B Type.

4.3.17 SW Ignition Configuration

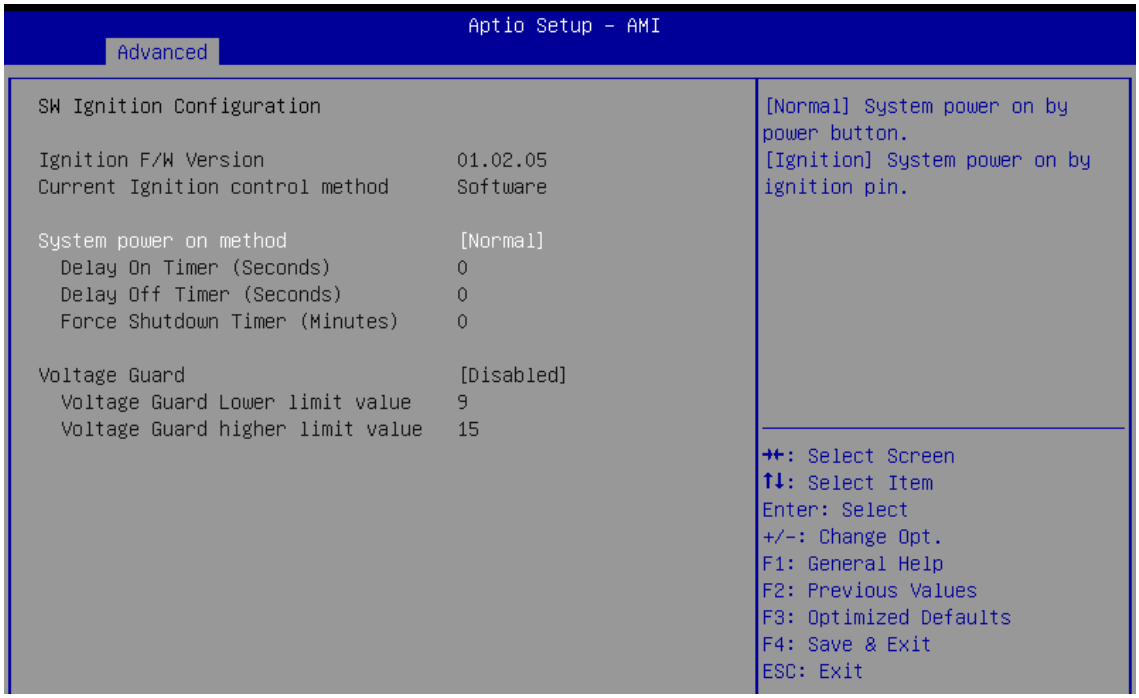


Figure 4-3-17 : SW Ignition Configuration

System power on method
[Normal] System power on by power button.
[Ignition] System power on by ignition pin.

Delay On Timer (Seconds)
The delay time after user trigger ignition on signal (Seconds).

Delay Off Timer (Seconds)
The delay time after user trigger ignition off signal (Seconds).

Force Shutdown Timer (Minutes)
Used to force cut off system power when OS unable gracefully shutdown system successfully.

Voltage Guard
Voltage Guard enable or disable, only effect on Ignition mode.

Voltage Guard Lower limit value
Voltage Guard lower limit value setting. Range : 9v ~ 40v.

Voltage Guard higher limit value
Voltage Guard Higher limit value setting. Range : 15v ~ 55v.

4.4 Security

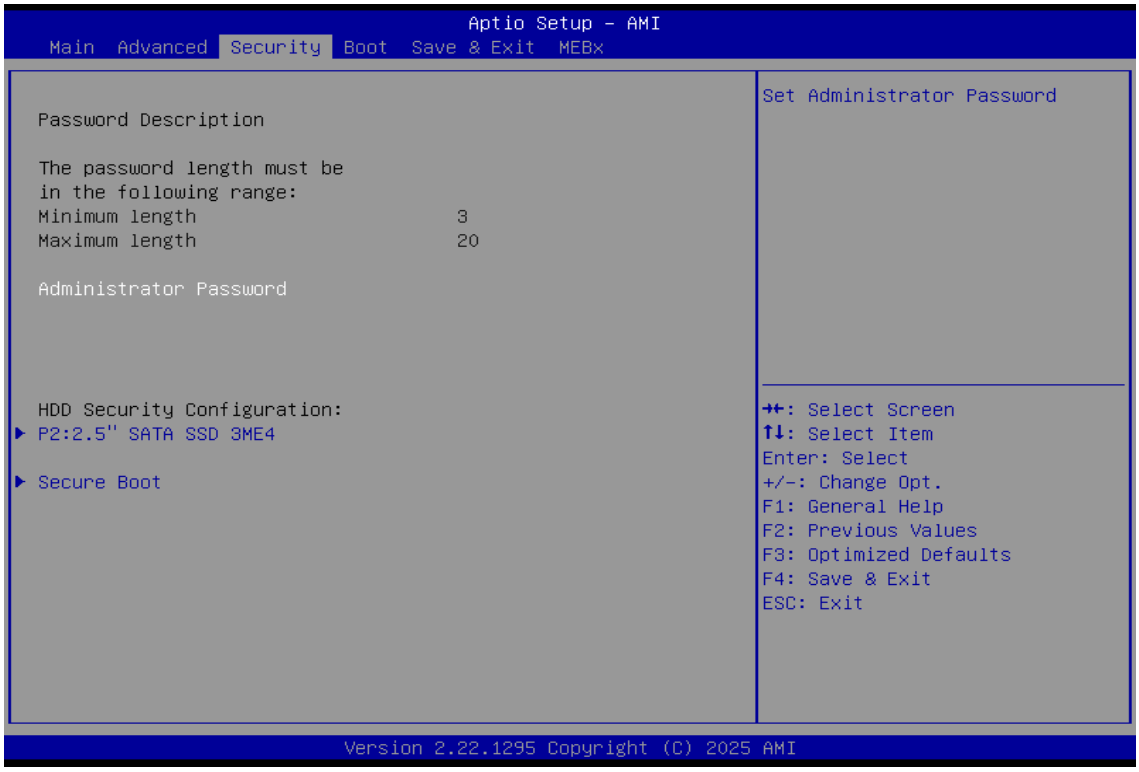


Figure 4-4 : Security Menu

Administrator Password
Set administrator password.

HDD Security Configuration
HDD Security Configuration for selected drive.

Secure Boot
Secure Boot configuration.

4.5 Boot

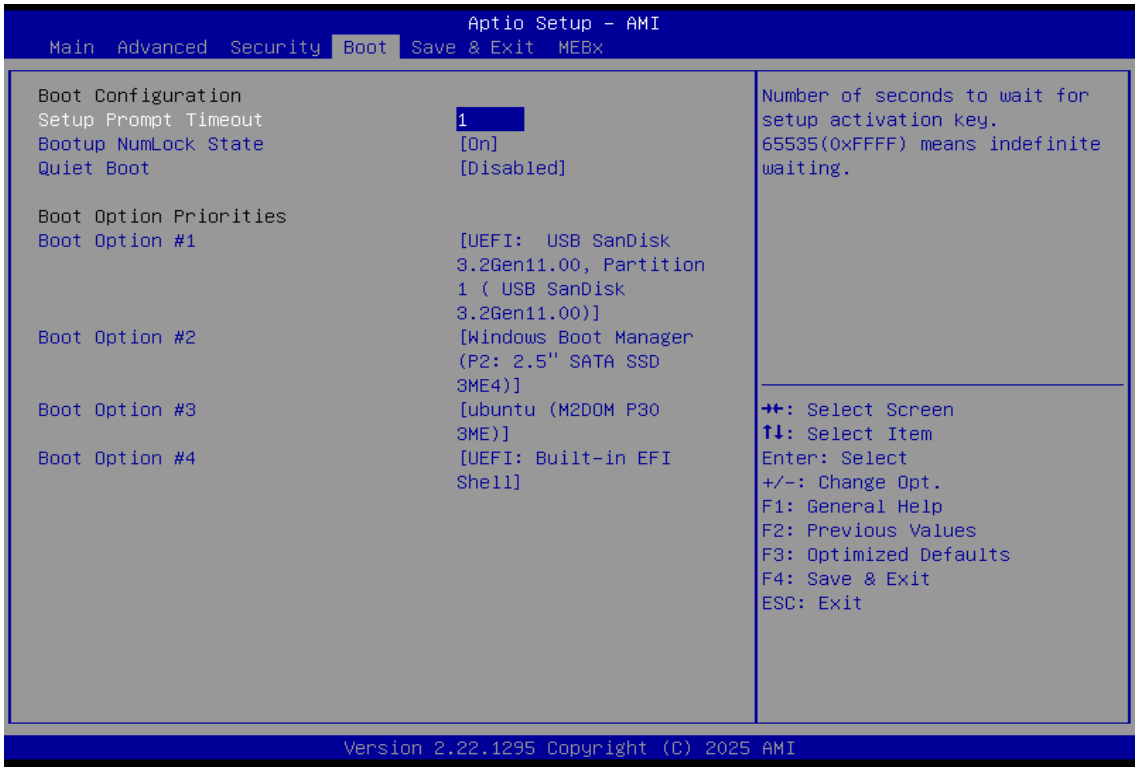


Figure 4-5 : Boot Menu

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 Priorities
Sets the system boot order.

4.6 Save & Exit

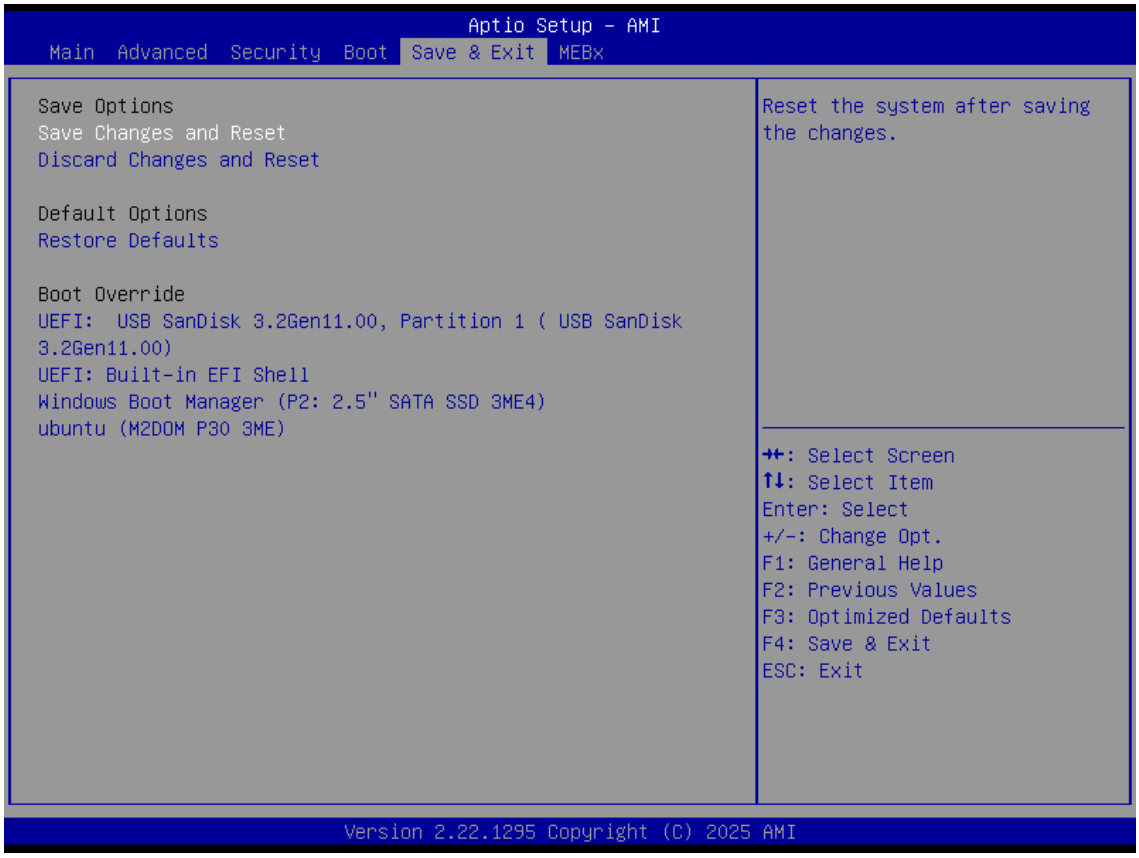


Figure 4-6: Save & Exit Menu

Save Changes and 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.

A

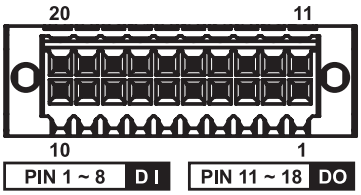
APPENDIX A : Isolated DIO Guide & Watchdog Function

A.1 Function Description

The ECX-4000 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.

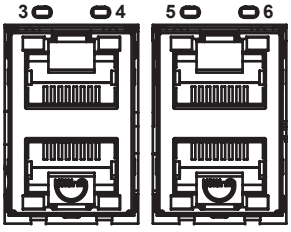
DIO definition is shown below :



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

POE definition is shown below :

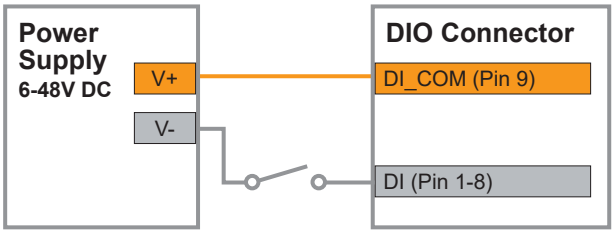
Port No.	Definition	Port No.	Definition
3	POE 0	5	POE 2
4	POE 1	6	POE 3



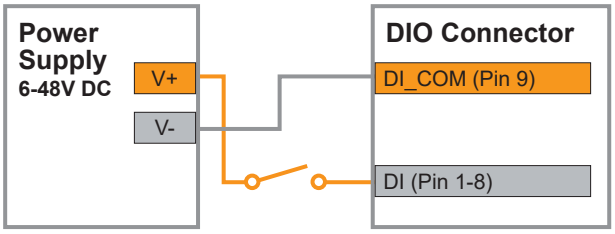
A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode (NPN)

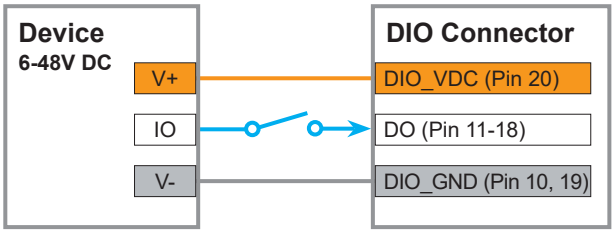


Source Mode (PNP)

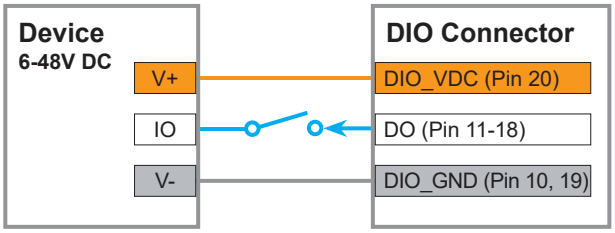


DO reference circuit :

Sink Mode (NPN, Default)

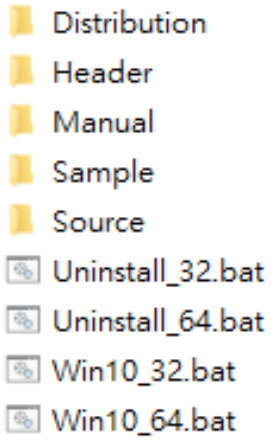


Source Mode (PNP)



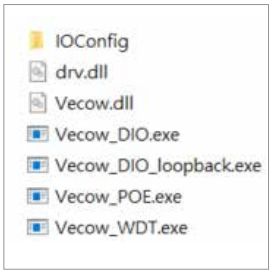
A.3 Software Package Contain

Distribution folder include x32 and x64 versions, use the batch file for driver installation.
There are included as fallowed :
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.

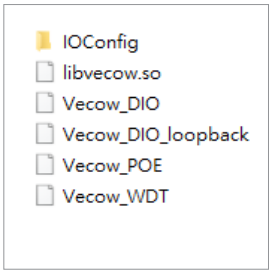


A.4 Sample

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).

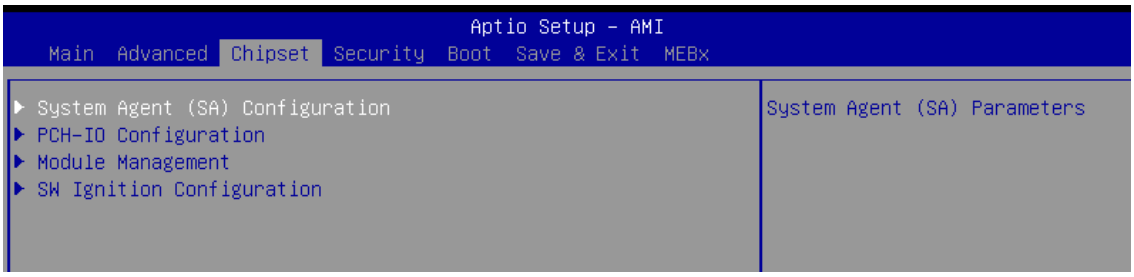
APPENDIX C : RAID Installation Guide

C.1.1 VMD Controller for RAID

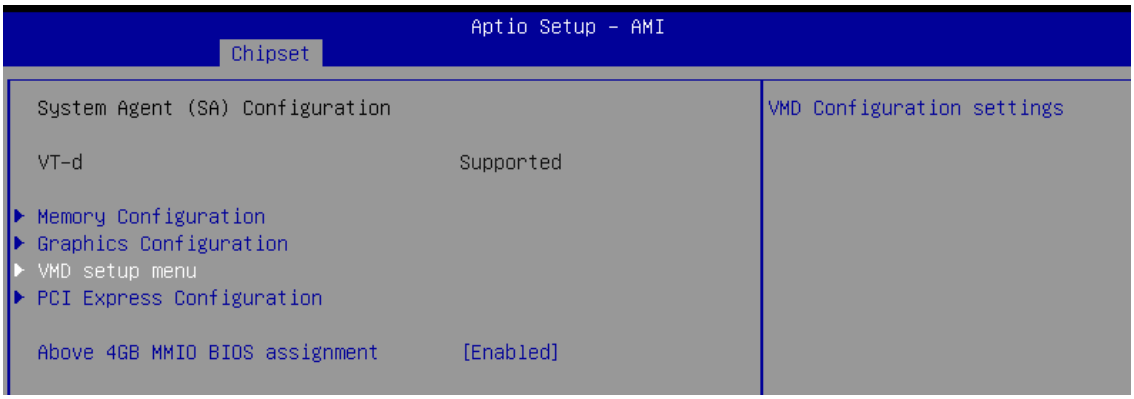
Please set Enable VMD controller as Enabled on BIOS menu.

Chipset → System Agent (SA) Configuration → VMD setup menu→
Enable VMD controller → Enabled → Save Changes and Reset.

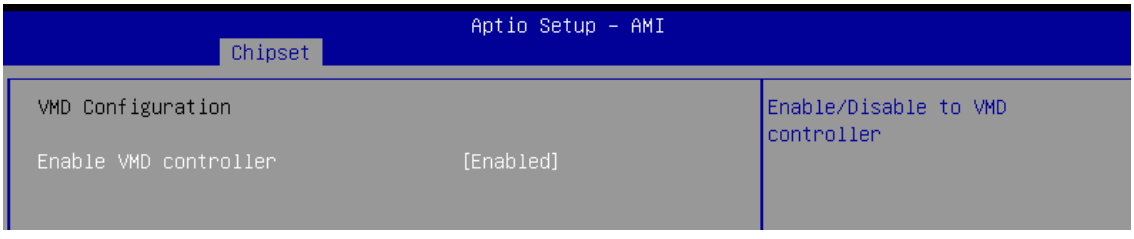
1. Select System Agent (SA) Configuration.



2. Select VMD setup menu.

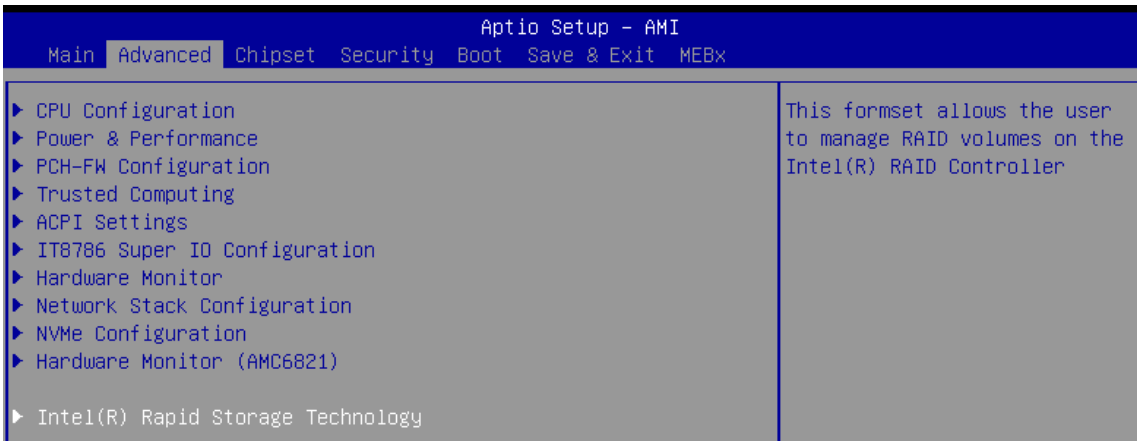


3. Enabled VMD controller. Then Save Changes and Reset.

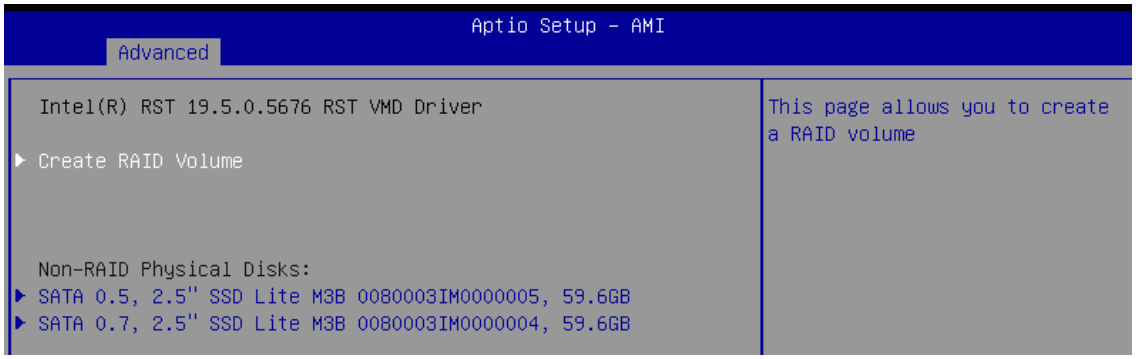


C.1.2 UEFI Mode for RAID

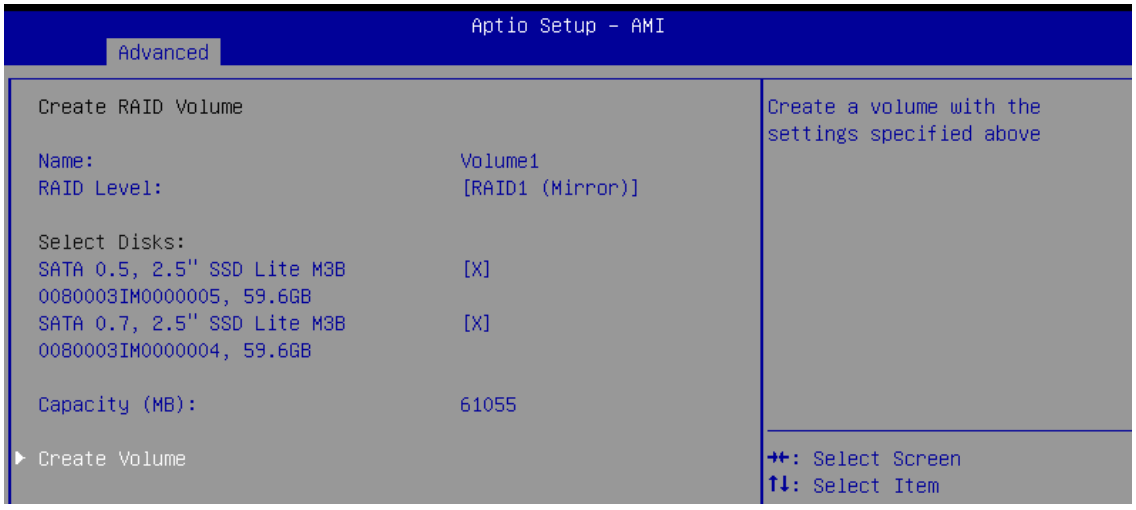
1. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.
Advanced → Intel(R) Rapid Storage Technology



2. Select Create RAID Volume on BIOS menu.
This system is featured 2 M.2 Key B for NVMe SSD, and 2 SATA slots for 2.5” HDD.
Please note. Storage device M.2 and SATA cannot be mixed to create a RAID Volume.



3. Select disks to create RAID Volume, then Save Changes and Reset to install OS.



C.2 OS Installation

This system is featured 2 M.2 Key B for NVMe SSD, and 2 SATA slots for 2.5” HDD.

We used 2.5” SATA HDD for Windows 10 OS installation as an example.

Please note. After Enabled VMD controller needs to load the IRST driver first before it can read the hard disk.



You can find the latest information and software directly from Intel’s website.

http://www.intel.com/p/en_US/support/highlights/chpsts/imsm

Download driver "SetupRST.exe" and decompress it.

You can refer to Intel official teaching.

https://www.intel.com/content/www/us/en/support/articles/000094664/technologies/intel-rapid-storage-technology-intel-rst.html

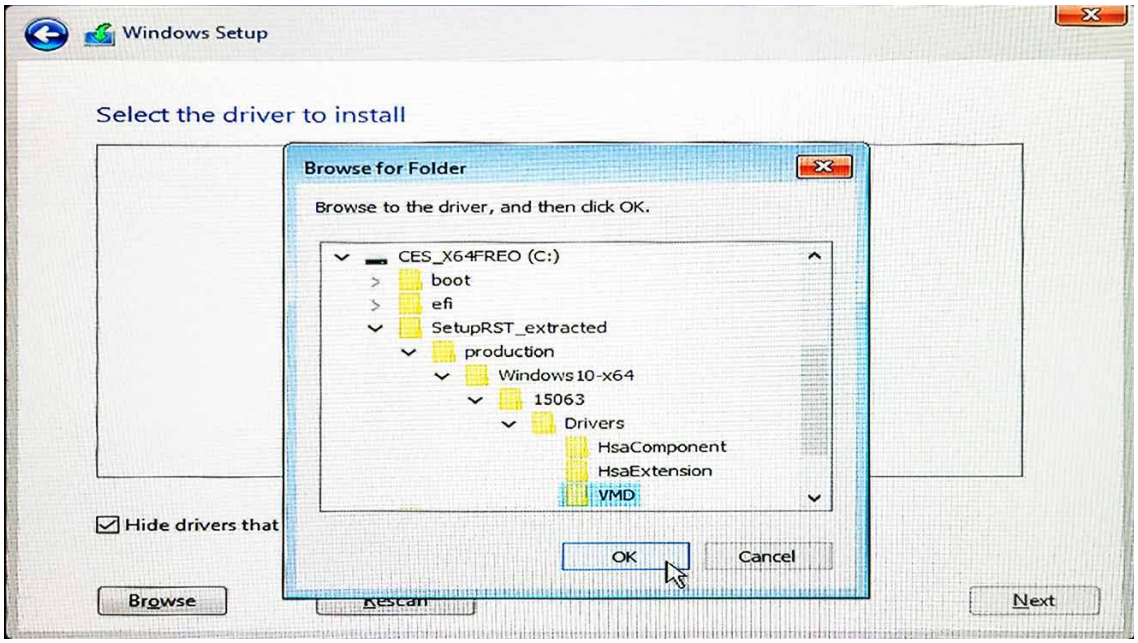
Open Windows PowerShell or CMD and navigate to the location of the SetupRST.exe file.

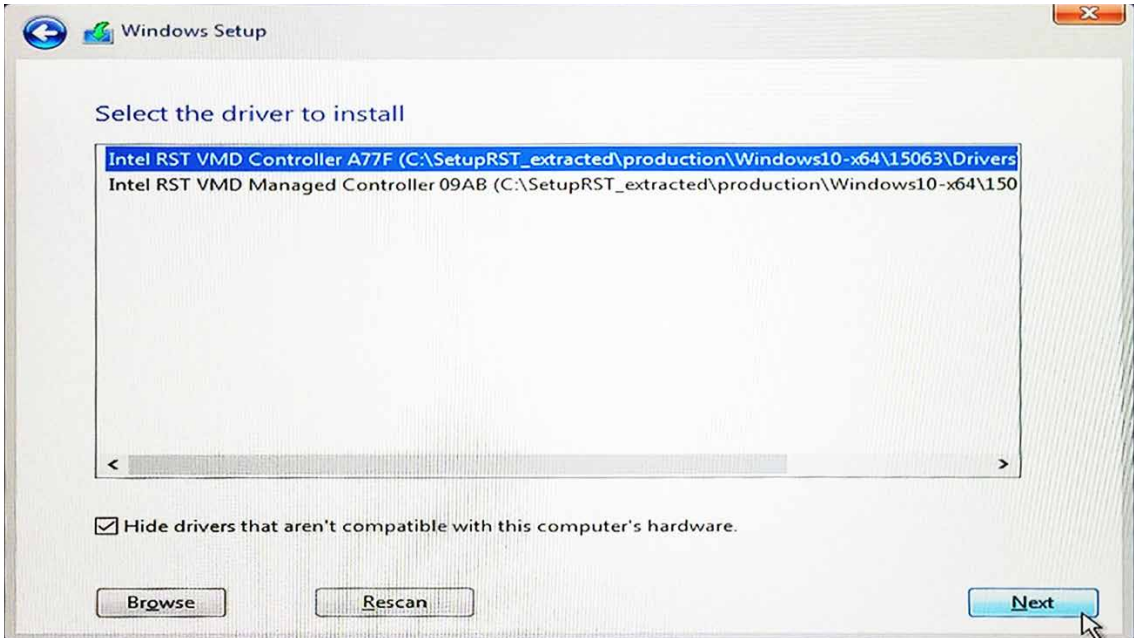
Enter the following command to extract :

./SetupRST.exe -extractdrivers SetupRST_extracted.

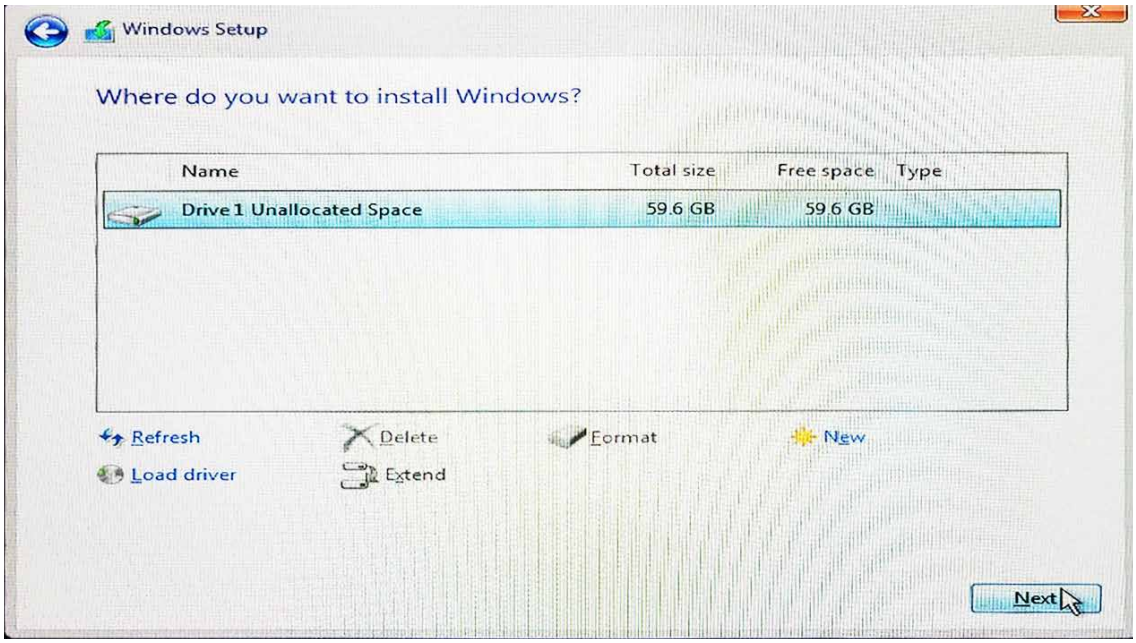
After extraction, a "SetupRST_extracted " folder will be created, then put the folder on the USB drive used for installing Windows.

Loading driver and install it when installing Windows.





Then you can select the hard drive and install the OS.



C.3 To Install All Device Drivers of the System

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

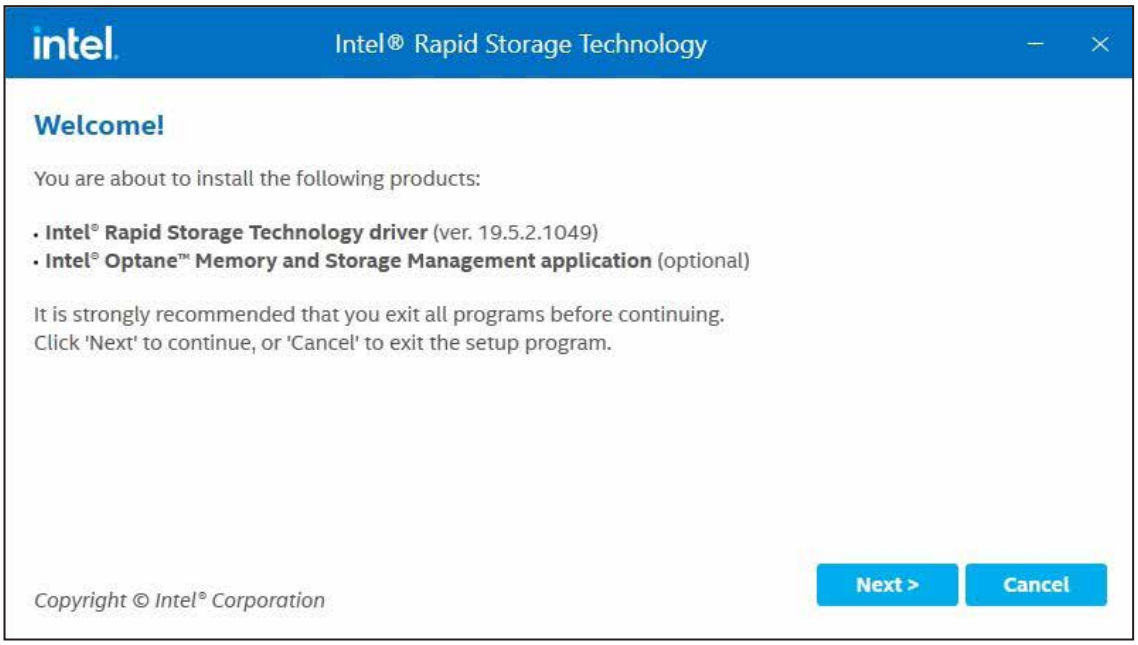
C.4 To Install "Intel Rapid Storage Technology" driver

You can get the software from driver CD.

Also, you can find the latest information and software directly from Intel's website.

http://www.intel.com/p/en_US/support/highlights/chpsts/imsm

Install "SetupRST.exe"



The RAID environment has been done when you completed the steps above.

At this point, the basic RAID Volume setup steps have concluded.

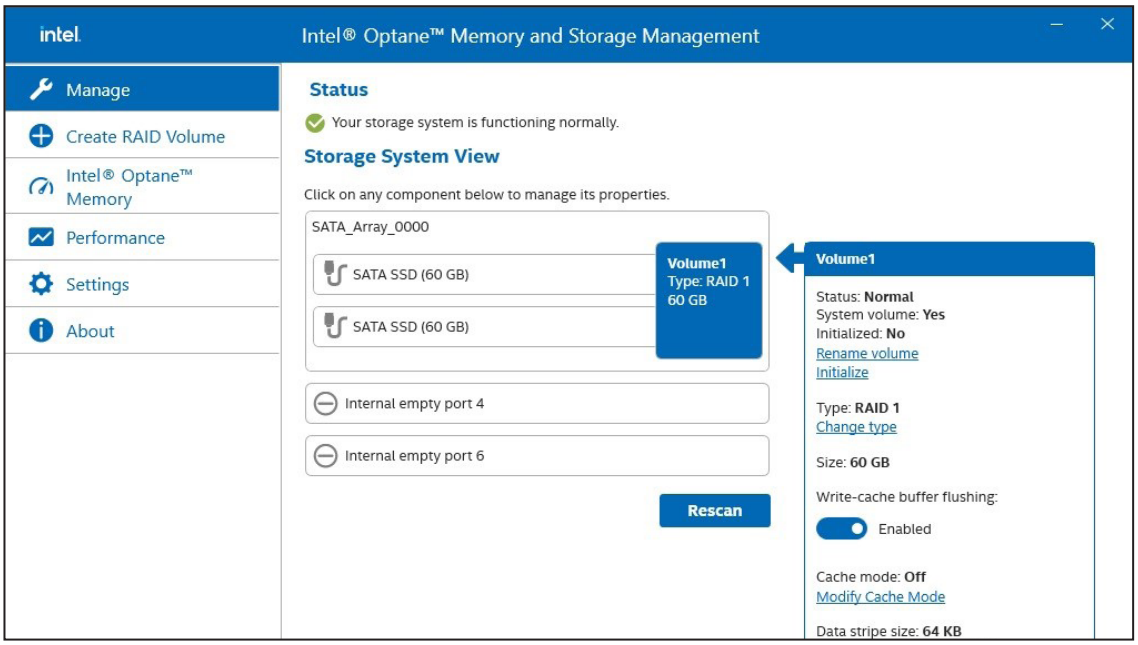
C.5 Manage RAID Volume on "Intel® Optane™ Memory and Storage Management" Software

You can download "Intel® Optane™ Memory and Storage Management" to manage and create RAID Volumes

You can find it at Microsoft Store.

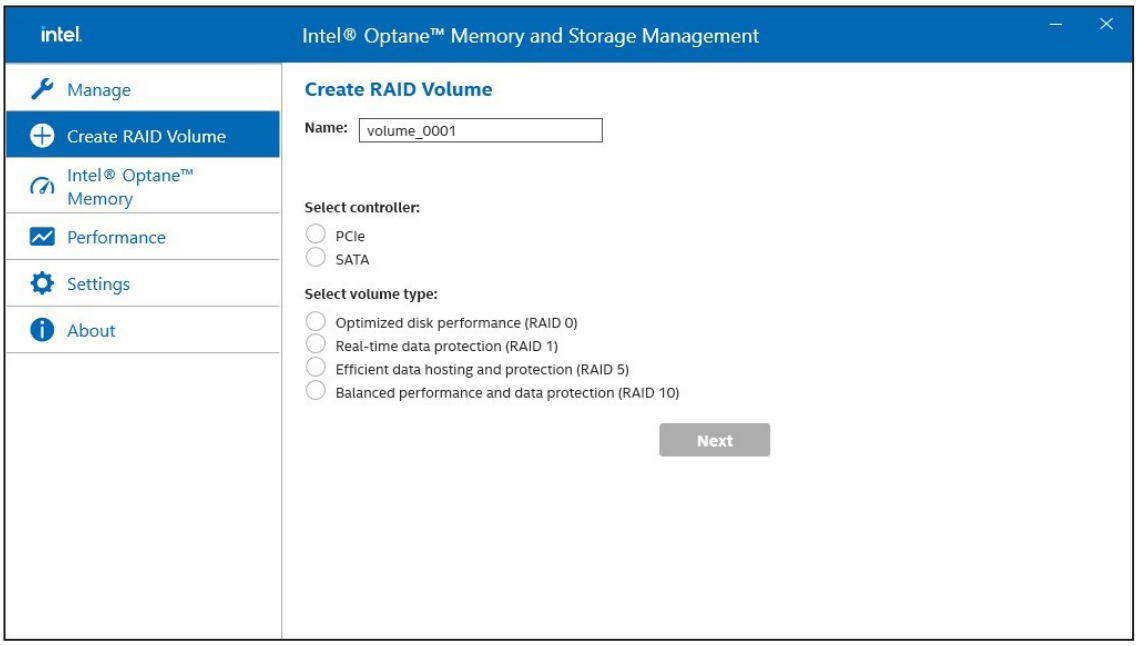
https://apps.microsoft.com/detail/9MZNG5HZWZ1T?activetab=pivot%3Aoverviewtab&hl=en-us&gl=US

After installation, the created RAID Volume will be displayed here.



C.6 To Create RAID Volume on "Intel® Optane™ Memory and Storage Management" Software

You can connect additional storage devices to build RAID Volumes, and use "Intel® Optane™ Memory and Storage Management" Software for management.



D

APPENDIX D : Power Consumption

Testing Board :	ECX-4000
RAM :	32GB * 2
USB-1 :	USB logitech Keyboard K120
USB-2 :	USB logitech Mouse K120
SATA :	Transcend TS128GSSD420K 128GB SSD
Graphics output :	HDMI
Power plan :	Balance(Windows11 Power plan)
Power Source :	Chroma 62006P-100-25
Test Program :	BurnInTest 10.2

D.1 Intel® Ultra 9 285 2.50 GHz (36M Cache, up to 5.60 GHz)

Power on and boot to Win 11 (64-bit)

CPU	Input Power	Standby Mode		Power on and boot to Win 11 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Ultra 9 285	9V	0.735A	06.61W	0.833A	07.49W	2.784A	25.18W
Intel® Ultra 9 285	12V	0.555A	06.65W	0.632A	07.57W	2.114A	25.36W
Intel® Ultra 9 285	24V	0.350A	08.41W	0.384A	09.23W	1.121A	26.90W
Intel® Ultra 9 285	50V	0.241A	12.07W	0.258A	12.89W	0.615A	30.75W

CPU	Input Power	Power on and boot to Win11 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Ultra 9 285	9V	7.489A	67.40W	8.185A	73.66W
Intel® Ultra 9 285	12V	5.873A	70.47W	6.329A	75.94W
Intel® Ultra 9 285	24V	2.982A	71.62W	3.257A	78.16W
Intel® Ultra 9 285	50V	1.460A	73.00W	1.664A	83.20W

D.2 Intel® Ultra 9 285T 1.40 GHz (36M Cache, up to 5.40 GHz)

Power on and boot to Win 11 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 11 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Ultra 9 285T	9V	0.727A	06.43W	0.812A	07.30W	2.713A	24.41W
Intel® Ultra 9 285T	12V	0.551A	06.61W	0.618A	07.39W	2.159A	25.90W
Intel® Ultra 9 285T	24V	0.344A	08.27W	0.378A	09.05W	1.088A	26.15W
Intel® Ultra 9 285T	50V	0.236A	11.82W	0.254A	12.71W	0.566A	28.30W

CPU	Power Input	Power on and boot to Win11 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Ultra 9 285T	9V	6.704A	60.35W	7.243A	65.24W
Intel® Ultra 9 285T	12V	5.126A	61.51W	5.763A	69.21W
Intel® Ultra 9 285T	24V	2.620A	62.98W	2.940A	70.64W
Intel® Ultra 9 285T	50V	1.322A	66.10W	1.504A	75.20W

APPENDIX E : Supported Memory & Storage List

E.1 Supported Memory List

Testing Board :	ECX-4000
Memory Test	MemTest86 V11.1 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 8GB DDR5-5600 SODIMM	TS1GSA64V6G	25ºC
Innodisk 32GB DDR5-5600 SODIMM	M5S0-BGG20CZQ	25ºC
Transcend 32GB DDR5-6400 SODIMM	TS4GSA64V4E3	25ºC

E.3 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
Innodisk 16GB DDR5-5600 SODIMM	M5D0-AGS2PCZQ	25ºC
Transcend 32GB DDR5-5600 SODIMM	TS4GSA72V6E	25ºC
Kingston 16GB DDR5-5600 SODIMM	9965802-021.A00G	25ºC
Team Group 48GB DDR5-5600 SODIMM	TE48GFSEV2TH-V	25ºC
Innodisk 16GB DDR5-4800 SODIMM	M5D0-AGS2PCVP-H03	25ºC
Transcend 16GB DDR5-4800 SODIMM	TS2GSA72V8E	25ºC

E.4 Supported Storage Device List

Type	Brand	Model	Capacity
SATA SSD	Innodisk	DES25-C12DK1KCCQL-H03	512GB
	Innodisk	DES25-C12DK1KWCQF-H03	128GB
	Transcend	TS128GSSD420K	128GB
M.2 SATA SSD	Innodisk	DEM28-C12DK1KCAQL-H03	512GB
	Smart	FDM28256GTCYC282	256GB
M.2 PCIe SSD	Innodisk	4TG2-P	512GB
	Transcend	TS512GMTE720T	512GB
	Transcend	TS512GMTE460T	512GB
	Innodisk	DEM28-C12DD1KCCQF-H03	512GB
	Crucial	T700	1TB

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

APPENDIX F : Setting up Allxon OOB

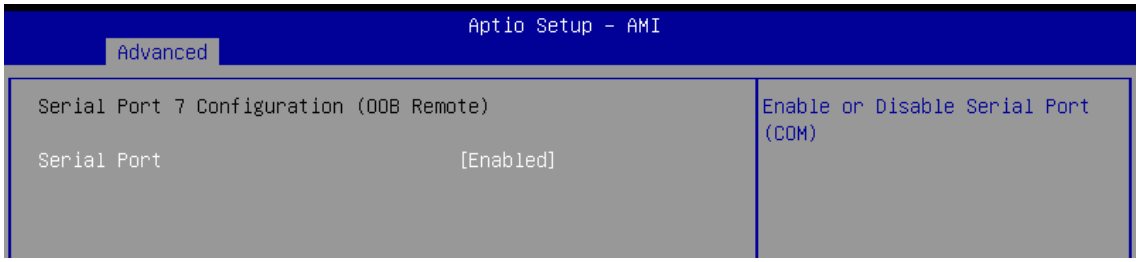
F.1 Setting up Allxon OOB

This section will guide you step-by-step on how to enable and activate OOB Management Services. If you need to use both services (Allxon INB and OOB features), please follow the steps below.

F.1.1 BIOS Setting before using Allxon on system

1.1.1 Enable Allxon OOB Remote Management

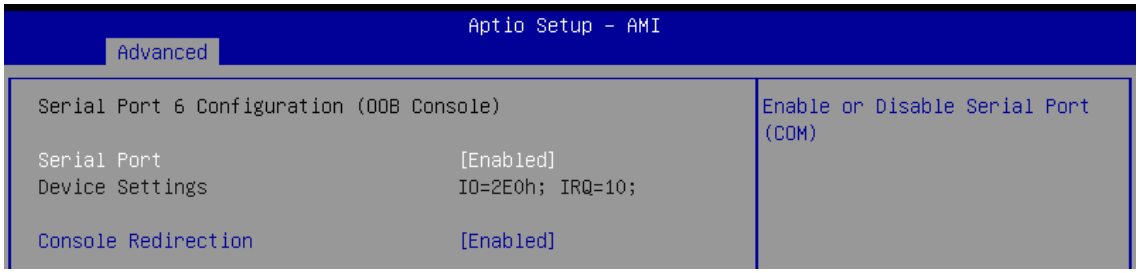
Step 1 Set Serial Port 7 Configuration (OOB Remote) : [Enabled]



1.1.2 Enable Allxon Remote Console

Step 1 Set Serial Port 6 Configuration (OOB Console) : [Enabled]

Step 2 Set Console Redirection : [Enabled]



F.1.2 Enable Allxon INB & OOB Services

1.2.1 Install Allxon Agent on Device

Users can easily initiate the Allxon Agent installation process from their desktop using selected devices from Allxon's hardware partners.

Refer to the following webpage for detailed instructions :

Install Allxon Agent via Command Prompt

1.2.2 Pairing Edge Device to Allxon Portal

Get Device Pairing Code

Refer to the following webpage for detailed instructions :

Get Device Pairing Code

Get Add Your Device on Allxon Portal

Refer to the following webpage for detailed instructions :

Add Your Device on Allxon Portal

1.2.3 Enable OOB Enabler on Device

After you have paired and added your device onto Allxon Portal, you will now have the option to also link the OOB Enabler to Allxon Portal.

Refer to the webpage for detailed instructions :

Enable Out-Of-Band Management on Device

F.1.3 Allxon swiftDR for Power Cycling

Allxon swiftDR Series is a powerful Out-Of-Band remote device management solution to empower disaster recovery. This section details Allxon swiftDR for Power Cycling on Allxon Portal, to introduce Allxon's power-related OOB features.

Refer to the webpage for detailed instructions :

Allxon swiftDR for Power Cycling

F.2 Troubleshooting Your OOB Enabler

F.2.1 Network Connectivity Requirements

To get the best out of Allxon Services, ensure you are connected to a stable Internet connection. If your organization restricts Internet communications with the network using a firewall or proxy device, refer to the following webpage for detailed Information :

Allxon Service Port/Protocol and Whitelist Information

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

Vecow

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

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