

ECX-2000 USER

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

Manual

Record of Revision

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Order Information

Part Number	Description
ECX-2025R	ECX-2000, 3 2.5 GigE LAN, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, Fanless
ECX-2025FR	ECX-2000, 3 2.5 GigE LAN, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink
ECX-2025	ECX-2000, 3 2.5 GigE LAN, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, Fanless
ECX-2025F	ECX-2000, 3 2.5 GigE LAN, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink
ECX-2000-PoER	ECX-2000, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, Fanless
ECX-2000F-PoER	ECX-2000, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink
ECX-2000-PoE	ECX-2000, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, Fanless
ECX-2000F-PoE	ECX-2000, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink
ECX-2000-6FR	ECX-2000, 6 GigE LAN with 2 SFP, 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, Fanless
ECX-2000F-6FR	ECX-2000, 6 GigE LAN with 2 SFP, 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, with Fan Sink
ECX-2000-6F	ECX-2000, 6 GigE LAN with 2 SFP, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, Fanless
ECX-2000F-6F	ECX-2000, 6 GigE LAN with 2 SFP, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, with Fan Sink
ECX-2000-4R	ECX-2000, 4 GigE LAN, 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, Fanless
ECX-2000F-4R	ECX-2000, 4 GigE LAN, 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, with Fan Sink
ECX-2000-4G	ECX-2000, 4 GigE LAN, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, Fanless
ECX-2000F-4G	ECX-2000, 4 GigE LAN, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, with Fan Sink

Part Number	Description
ECX-2000-2R	ECX-2000, 2 GigE LAN, 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, Fanless
ECX-2000F-2R	ECX-2000, 2 GigE LAN, 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, with Fan Sink
ECX-2000-2G	ECX-2000, 2 GigE LAN, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, Fanless
ECX-2000F-2G	ECX-2000, 2 GigE LAN, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 GPIO, with Fan Sink
ECX-2055R	ECX-2000, 2 10G RJ45, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Internal Fan
ECX-2055FR	ECX-2000, 2 10G RJ45, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink and Internal Fan
ECX-2055	ECX-2000, 2 10G RJ45, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Internal Fan
ECX-2055F	ECX-2000, 2 10G RJ45, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink and Internal Fan
ECX-2071R	ECX-2000, 2 10G SFP+, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, Fanless
ECX-2071FR	ECX-2000, 2 10G SFP+, 6 GigE LAN with 4 PoE ⁺ , 2 SSD Tray, 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink
ECX-2071	ECX-2000, 2 10G SFP+, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, Fanless
ECX-2071F	ECX-2000, 2 10G SFP+, 6 GigE LAN with 4 PoE ⁺ , 4 COM, 2 Nano SIM, 6 USB 3.2, 16 Isolated DIO, with Fan Sink

CPU List

Series	CPU	Cores	GHz	TDP (W)	CPU	Cores	GHz	TDP (W)	ECC RAM
Intel® Xeon®	W-1290E	10	4.8	95	W-1290TE	10	4.5	35	Yes
	W-1270E	8	4.8	80	W-1270TE	8	4.4	35	Yes
	W-1250E	6	4.7	80	W-1250TE	6	3.8	35	Yes
Intel® Core™	i9-10900E	10	4.7	65	i9-10900TE	10	4.5	35	NA
	i7-10700E	8	4.5	65	i7-10700TE	8	4.4	35	NA
	i5-10500E	6	4.2	65	i5-10500TE	6	3.7	35	NA
	i3-10100E	4	3.8	65	i3-10100TE	4	3.6	35	Yes

Optional Accessories

Part Number	Description
DDR4 32G	Certified DDR4 32GB 3200MHz RAM
DDR4 16G	Certified DDR4 16GB 3200MHz RAM
DDR4 8G	Certified DDR4 8GB 3200MHz RAM
DDR4 4G	Certified DDR4 4GB 3200MHz RAM
PWA-160W-WT	160W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block, Wide Temperature -30°C to +70°C
PWA-180W	180W, 24V, 90V AC to 132V AC/ 180V AC to 264V AC Power Adapter with 3-pin Terminal Block, 0°C to +40°C
PWA-280W-WT	280W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block, Wide Temperature -30°C to +70°C
VESA Mount	VESA Mounting Kit
Anti-Vibration Kit	Anti-Vibration Wall Mount Bracket for ECX-2000 (Vibration : 5Grms)
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/Key B PCIe Storage Module
5G Module	5G Module with Antenna
4G Module	4G/GPS Module with Antenna
WiFi & Bluetooth	WiFi & Bluetooth Module with Antenna

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1

GENERAL INTRODUCTION

1.1 Overview

Vecow ECX-2000 Series is a workstation-grade compact integrated Fanless Embedded System. Featuring 10-core 10th Gen Intel® Xeon®/Core™ i9/i7/i5/i3 processor with Intel® W480E Chipset and CPU support up to 95W TDP, Vecow ECX-2000 Series reinvents itself from the inside out because it is optimized for modern computer vision applications at the edge including Machine Vision, Factory Automation, Intelligent Vending, Intelligent Transportation System (ITS), Robotic Control, AMR/AVG, Deep Learning, and any Artificial Intelligent oriented AIoT or Industry 4.0 applications.

Vecow ECX-2000 Series offers fully featured I/O, including USB 3.2, up to 9 GigE LAN with multiple configurations such as 10G LAN/2.5G LAN/10G SFP+/1G Ethernet configurations, making it ideally suited for Machine Vision, ITS and AMR/AGV applications. For flexible system expansion, ECX-2000 Series is outfitted with Mini PCIe, M.2 and SUMIT A, B and enables mobile communication connectivity through SIM Sockets. By integrating interfaces including multi-port GigE LAN with 4 IEEE 802.3at PoE+, expansions configurations like M.2, Mini PCIe, 2 front-access trays, 2 SIM sockets, and 1 SD card, ECX-2000 Series delivers flexible options to scale functionality. In addition, the ECX-2000 series adopts the latest 2.5G Ethernet networking technology for high performance-driven industrial embedded fanless system, to meet the system throughput requirements of large amounts of image data transmission for edge computing.

With new generation workstation-grade performance, leading integrations, rugged reliability and smarter system maintenance, Vecow ECX-2000 Series is your smarter choice for modern computer vision applications.

1.2 Features

- Workstation-grade Platform : 10-core 10th Gen Intel® Xeon®/Core™ i9/i7/i5/i3 Processor (CML-S) running with Intel® W480E chipset supports max 95W TDP CPU
- DDR4 2933MHz Memory supports up to 64GB, optional with ECC
- 9V to 50V wide range DC Power Input with 80V Surge Protection
- Fanless, -40°C to 75°C Operating Temperature
- 9 Independent GigE LAN with 4 IEEE 802.3at PoE⁺
- Nano SIM Sockets for 5G/WiFi 6/4G/3G/LTE/GPRS/UMTS
- Expansion : 1 M.2 Key B, 1 M.2 Key E, 1 Mini PCIe, optional SUMIT A, B
- 6-port USB 3.2 supports up to 10Gbps data transfer
- Front Access : 2 2.5" SSD Tray, 2 Nano SIM Socket, 1 Micro SD Card
- Supports Configurable Software Ignition Power Control and TPM 2.0
- Optimized user-friendly design for easier system maintenance
- Supports multiple Ethernet Configuration options such as : 10G LAN/2.5G LAN/10G SFP+/1G SFP
- Optional VHub One-Stop AIoT Solution Service supports OpenVINO based AI accelerator and advanced Edge AI applications

1.3 Product Specification

1.3.1 Specifications of ECX-2025R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
2.5G Ethernet	
LAN 7	Intel [®] I225 2.5GigE LAN
LAN 8	Intel [®] I225 2.5GigE LAN
LAN 9	Intel [®] I225 2.5GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.2 Specifications of ECX-2025FR

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
2.5G Ethernet	
LAN 7	Intel [®] I225 2.5GigE LAN
LAN 8	Intel [®] I225 2.5GigE LAN
LAN 9	Intel [®] I225 2.5GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.3 Specifications of ECX-2025

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
2.5G Ethernet	
LAN 7	Intel [®] I225 2.5GigE LAN
LAN 8	Intel [®] I225 2.5GigE LAN
LAN 9	Intel [®] I225 2.5GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.4 Specifications of ECX-2025F

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
2.5G Ethernet	
LAN 7	Intel [®] I225 2.5GigE LAN
LAN 8	Intel [®] I225 2.5GigE LAN
LAN 9	Intel [®] I225 2.5GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 70°C (-40°F to 158°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.5 Specifications of ECX-2000-PoER

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.6 Specifications of ECX-2000F-PoER

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.7 Specifications of ECX-2000-PoE

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.8 Specifications of ECX-2000F-PoE

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.9 Specifications of ECX-2000-6FR

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

SFP	
LAN 5	1000BASE SFP by Intel® I350
LAN 6	1000BASE SFP by Intel® I350
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.10 Specifications of ECX-2000F-6FR

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

SFP	
LAN 5	1000BASE SFP by Intel® I350
LAN 6	1000BASE SFP by Intel® I350
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.11 Specifications of ECX-2000-6F

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

SFP	
LAN 5	1000BASE SFP by Intel® I350
LAN 6	1000BASE SFP by Intel® I350
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.12 Specifications of ECX-2000F-6F

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

SFP	
LAN 5	1000BASE SFP by Intel® I350
LAN 6	1000BASE SFP by Intel® I350
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.13 Specifications of ECX-2000-4R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.14 Specifications of ECX-2000F-4R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.15 Specifications of ECX-2000-4G

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.16 Specifications of ECX-2000F-4G

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
LAN 3	Intel® I210 GigE LAN
LAN 4	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.17 Specifications of ECX-2000-2R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.18 Specifications of ECX-2000F-2R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.19 Specifications of ECX-2000-2G

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.20 Specifications of ECX-2000F-2G

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
SUMIT A, B	2 SUMIT Slot (Optional)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W TDP CPU : -40°C to 75°C (-40°F to 167°F) 65W TDP CPU : -40°C to 55°C (-40°F to 131°F) 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.21 Specifications of ECX-2055R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X550-AT2 10GigE LAN
LAN 8	Intel [®] X550-AT2 10GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.22 Specifications of ECX-2055FR

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X550-AT2 10GigE LAN
LAN 8	Intel [®] X550-AT2 10GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W, 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.23 Specifications of ECX-2055

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X550-AT2 10GigE LAN
LAN 8	Intel [®] X550-AT2 10GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.24 Specifications of ECX-2055F

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X550-AT2 10GigE LAN
LAN 8	Intel [®] X550-AT2 10GigE LAN
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W, 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.25 Specifications of ECX-2071R

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
LAN 8	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.26 Specifications of ECX-2071FR

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 Front-access 2.5" SSD/HDD Tray
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
LAN 8	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W, 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.27 Specifications of ECX-2071

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
LAN 8	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.28 Specifications of ECX-2071F

System	
Processor	Intel® 10th Generation Xeon®/Core™ i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2933MHz (ECC/Non-ECC) • Up to 64GB • 2 260-pin SO-DIMM Socket
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> • 6 USB 3.2 (External) • 1 USB 2.0 (Internal)
Isolated DIO	16 Isolated DIO : 8 DI, 8 DO
LED	Power, HDD, PoE, Wireless
SIM Card	2 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	1 Full-size Mini PCIe Socket for PCIe/USB/SIM Card/Optional mSATA
M.2	<ul style="list-style-type: none"> • 1 M.2 Key B Socket (3042/3052) • 1 M.2 Key E Socket (2230, supports CNVi)
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	<ul style="list-style-type: none"> • DVI-I : Up to 1920 x 1200 @ 60Hz • DVI-D : Up to 1920 x 1080 @ 60Hz • DisplayPort : Up to 4096 x 2304 @ 60Hz
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
mSATA	1 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	<ul style="list-style-type: none"> • 1 Micro SD Card, Push-in/Push-out Ejector • 2 2.5" SSD/HDD Bracket (Internal)
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

PoE	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE ⁺ by Intel [®] I210
10G Ethernet	
LAN 7	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
LAN 8	Intel [®] X710-BM2 10G SFP+ LAN supports IEEE 802.3 10GBASE-T SFP+
Power	
Input Voltage	9V to 50V, DC-in
Power Interface	<ul style="list-style-type: none"> • 3-pin Terminal Block : V+, V-, Frame Ground • 4-pin Mini-DIN
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
Others	
TPM	Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L x H)	260.0mm x 175.0mm x 79.0mm (10.24" x 6.89" x 3.11")
Weight	3.8 kg (8.38 lb)
Mounting	<ul style="list-style-type: none"> • Wallmount by mounting bracket • DIN Rail Mount (Optional) • 2U Rackmount (Optional)
Environment	
Operating Temperature	35W, 65W, 80W, 95W TDP CPU : -40°C to 55°C (-40°F to 131°F)
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	<ul style="list-style-type: none"> • IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	<ul style="list-style-type: none"> • IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC, EN50155, EN50121-3-2

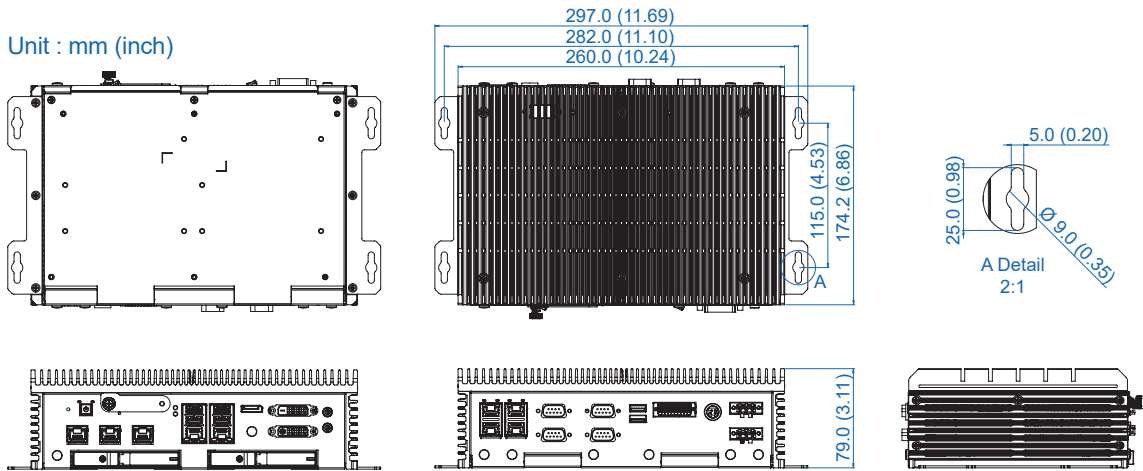
1.4 Supported CPU List

Series	CPU	Cores	TDP	Cache	Max. Frequency	ECC Memory
Intel® Xeon®	W-1290E	10	95W	20M	Up to 4.8GHz	Y
	W-1290TE	10	35W	20M	Up to 4.5GHz	Y
	W-1270E	8	80W	16M	Up to 4.8GHz	Y
	W-1270TE	8	35W	16M	Up to 4.4GHz	Y
	W-1250E	6	80W	12M	Up to 4.7GHz	Y
	W-1250TE	6	35W	12M	Up to 3.8GHz	Y
Intel® Core™	i9-10900E	10	65W	20M	Up to 4.7GHz	NA
	i9-10900TE	10	35W	20M	Up to 4.5GHz	NA
	i7-10700E	8	65W	16M	Up to 4.5GHz	NA
	i7-10700TE	8	35W	16M	Up to 4.4GHz	NA
	i5-10500E	6	65W	12M	Up to 4.2GHz	NA
	i5-10500TE	6	35W	12M	Up to 3.7GHz	NA
	i3-10100E	4	65W	6M	Up to 3.8GHz	Y
	i3-10100TE	4	35W	6M	Up to 3.6GHz	Y

1.5 Mechanical Dimension

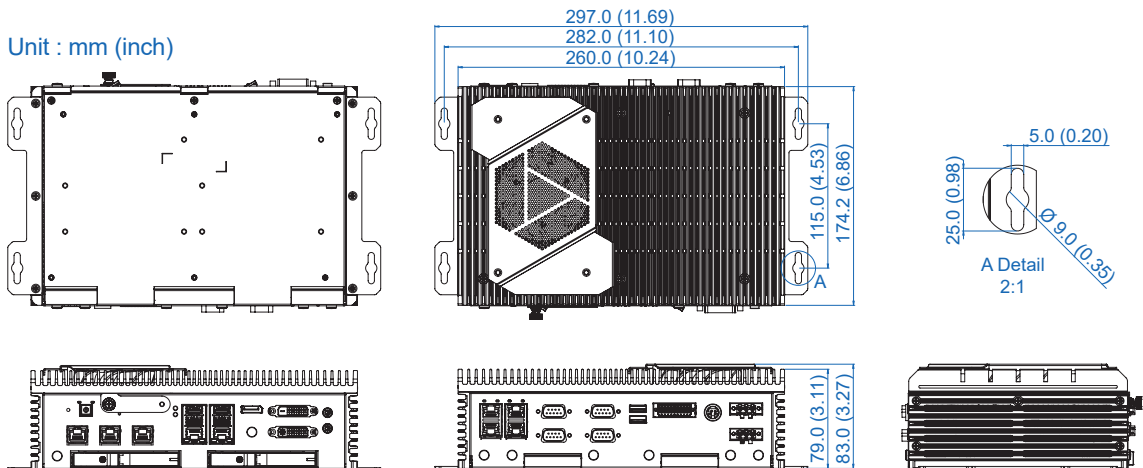
1.5.1 Dimensions of ECX-2025R

Unit : mm (inch)



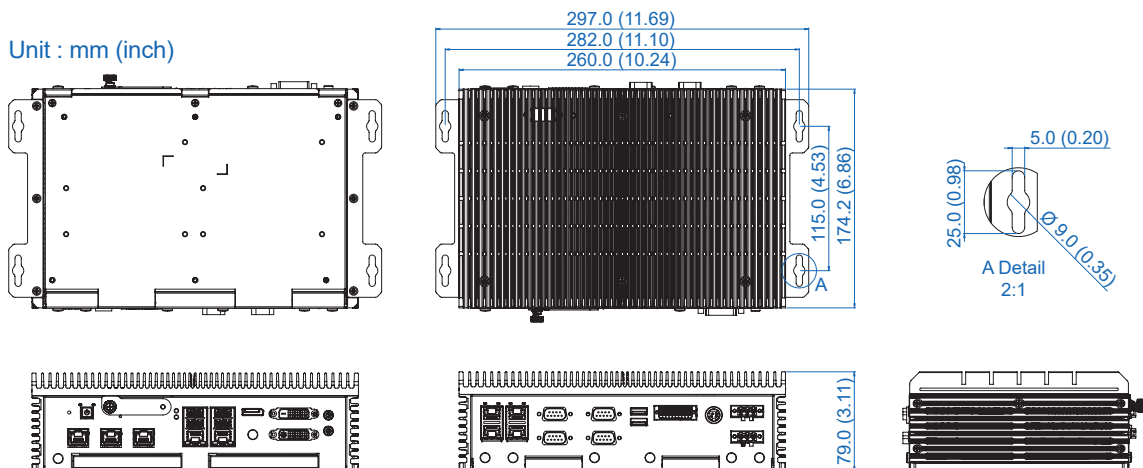
1.5.2 Dimensions of ECX-2025FR

Unit : mm (inch)



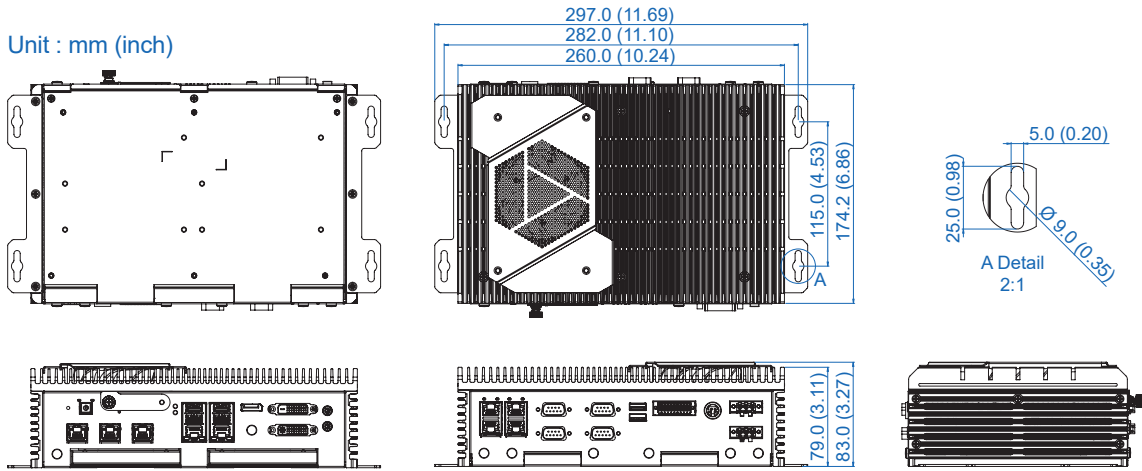
1.5.3 Dimensions of ECX-2025

Unit : mm (inch)



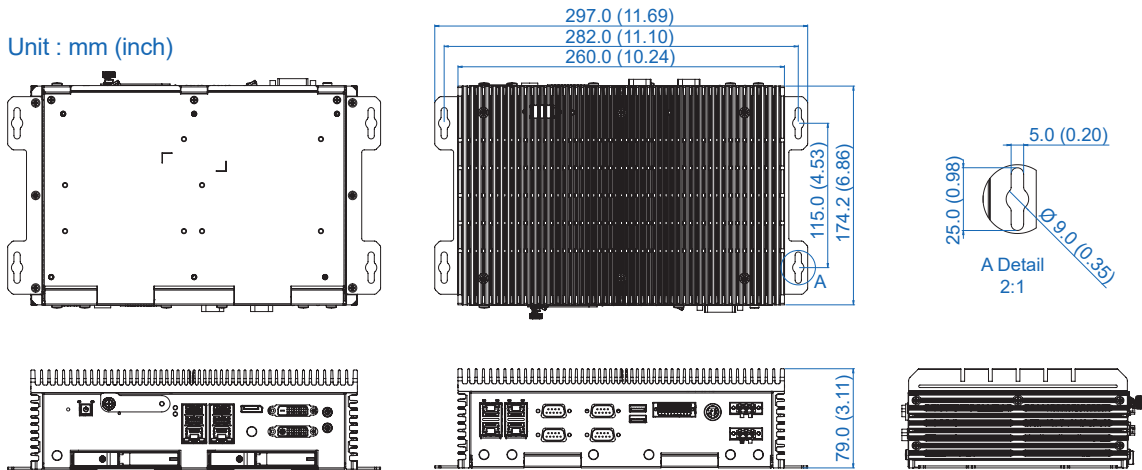
1.5.4 Dimensions of ECX-2025F

Unit : mm (inch)



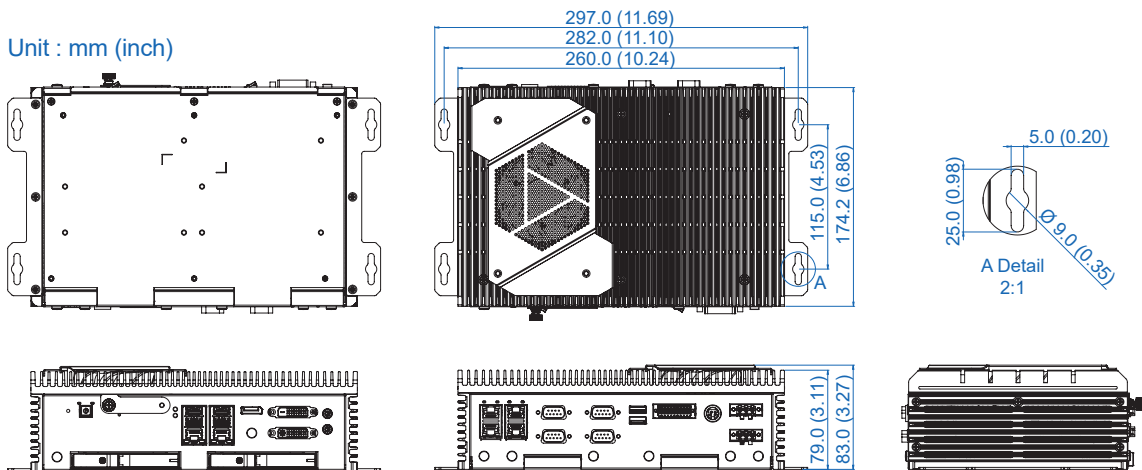
1.5.5 Dimensions of ECX-2000-PoER

Unit : mm (inch)



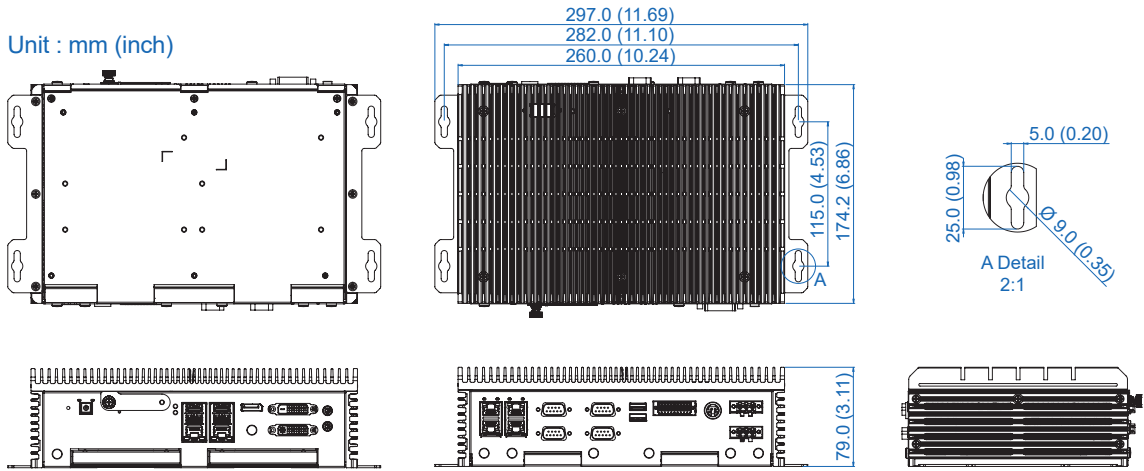
1.5.6 Dimensions of ECX-2000F-PoER

Unit : mm (inch)



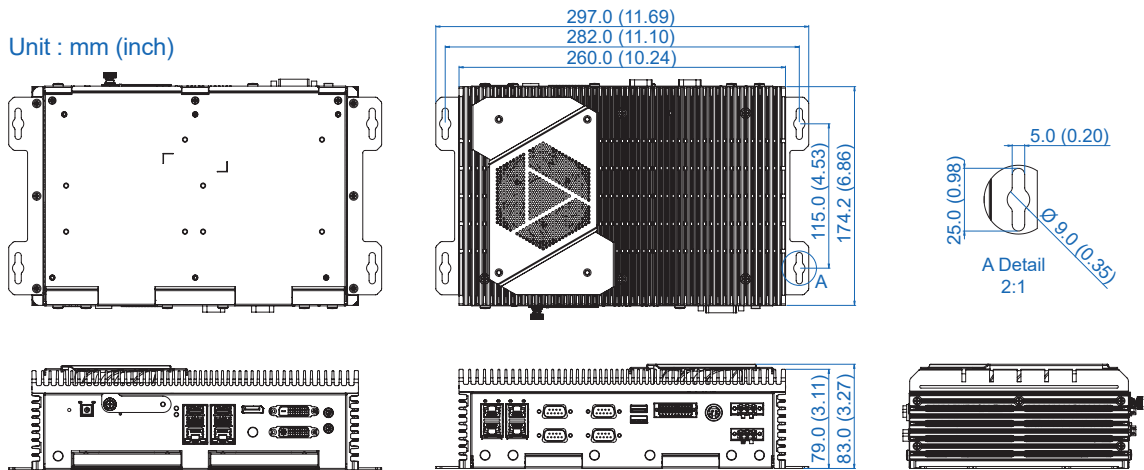
1.5.7 Dimensions of ECX-2000-PoE

Unit : mm (inch)



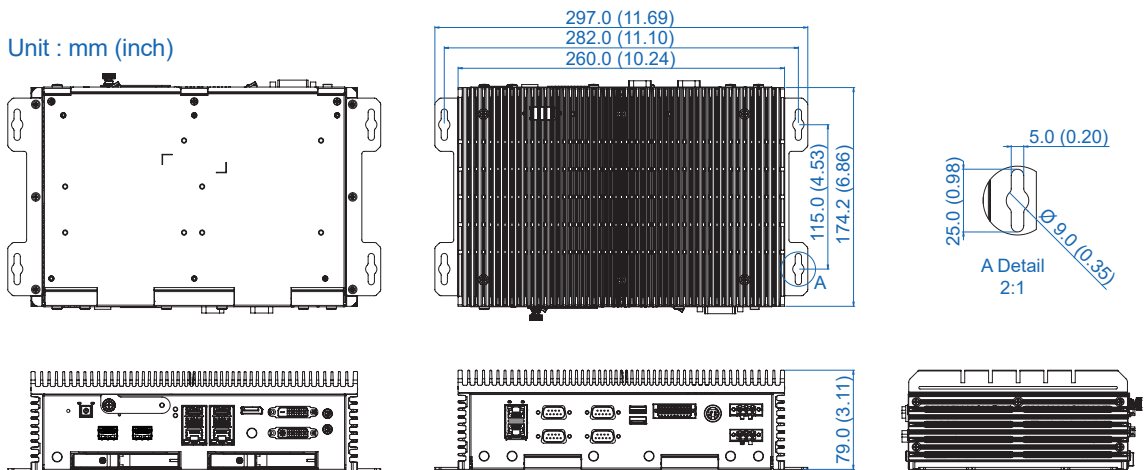
1.5.8 Dimensions of ECX-2000F-PoE

Unit : mm (inch)



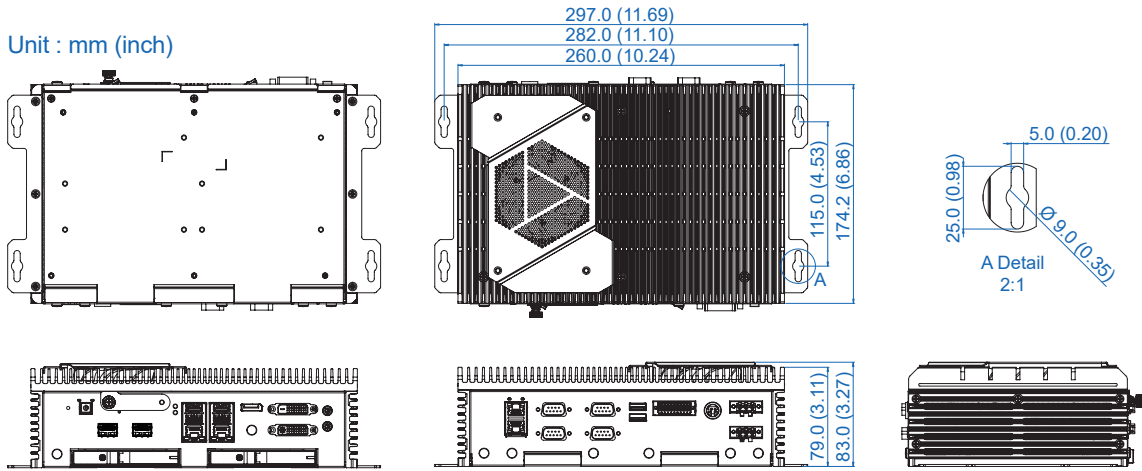
1.5.9 Dimensions of ECX-2000-6FR

Unit : mm (inch)



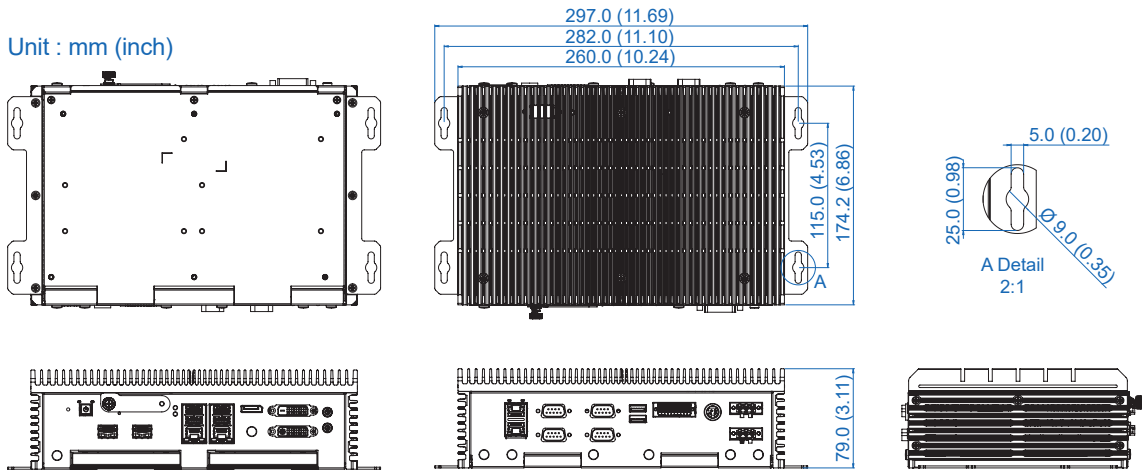
1.5.10 Dimensions of ECX-2000F-6FR

Unit : mm (inch)



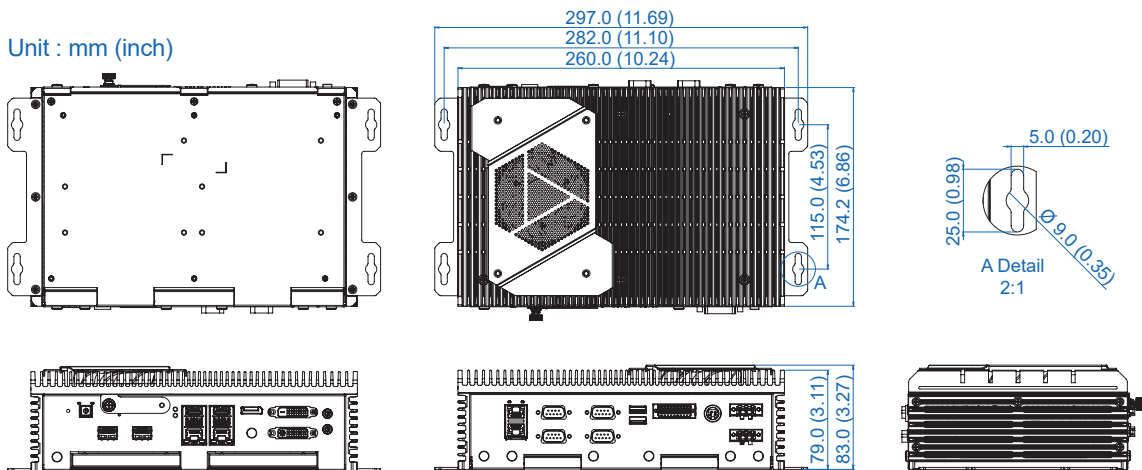
1.5.11 Dimensions of ECX-2000-6F

Unit : mm (inch)



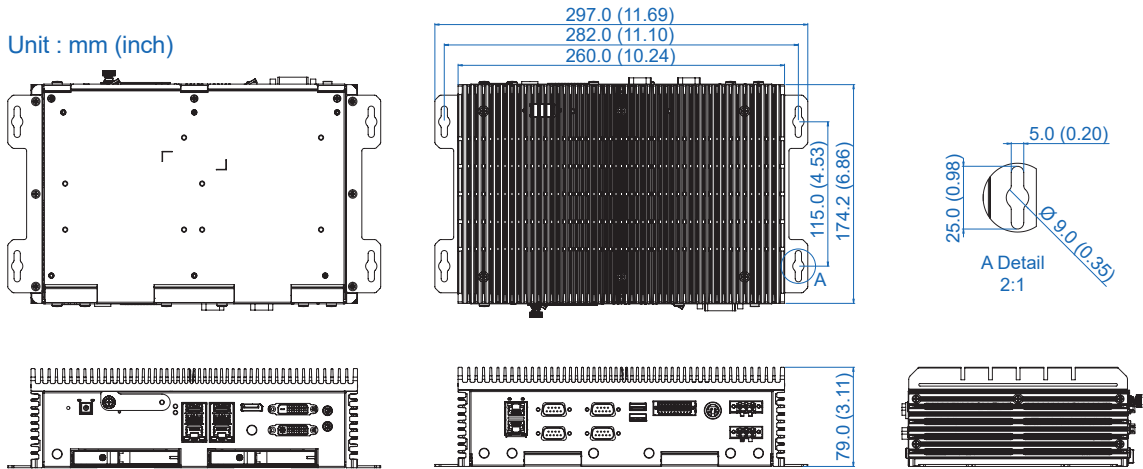
1.5.12 Dimensions of ECX-2000F-6F

Unit : mm (inch)



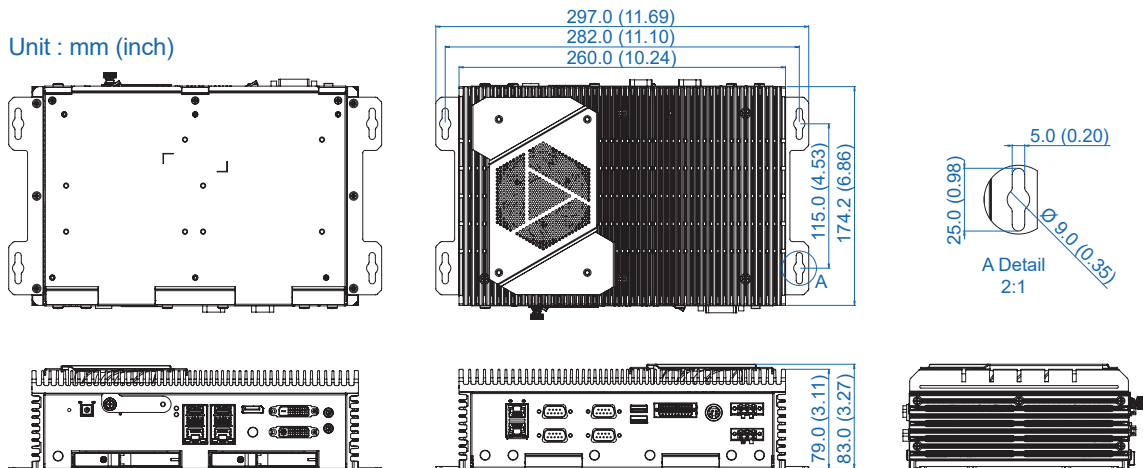
1.5.13 Dimensions of ECX-2000-4R

Unit : mm (inch)



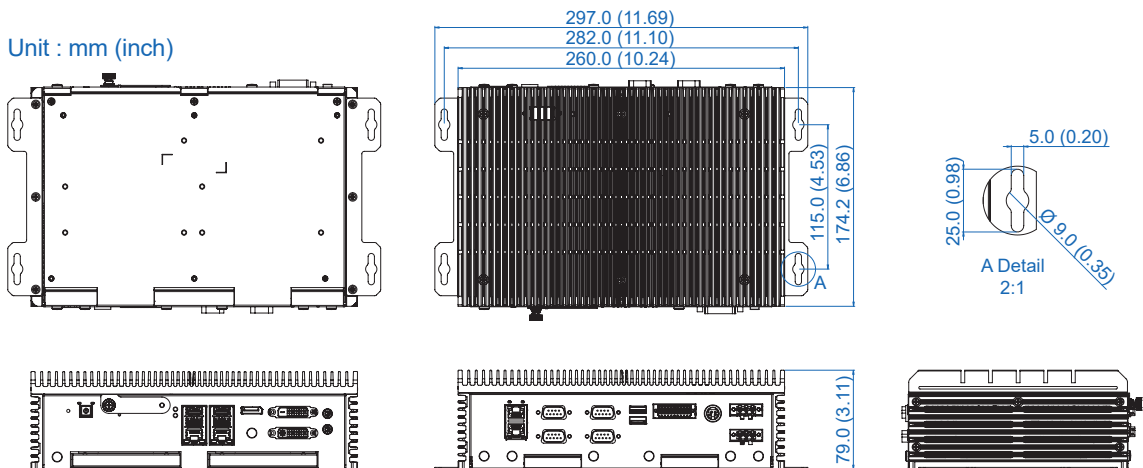
1.5.14 Dimensions of ECX-2000F-4R

Unit : mm (inch)



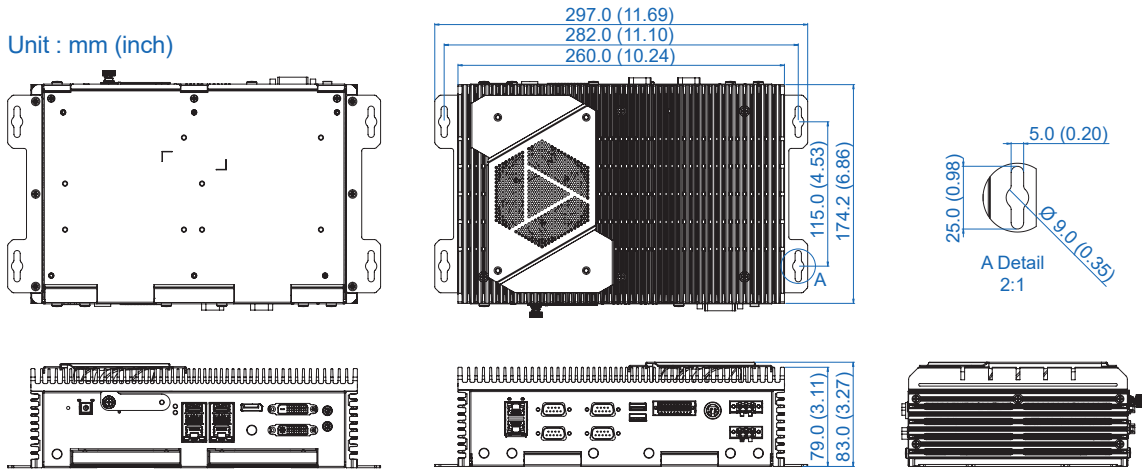
1.5.15 Dimensions of ECX-2000-4G

Unit : mm (inch)



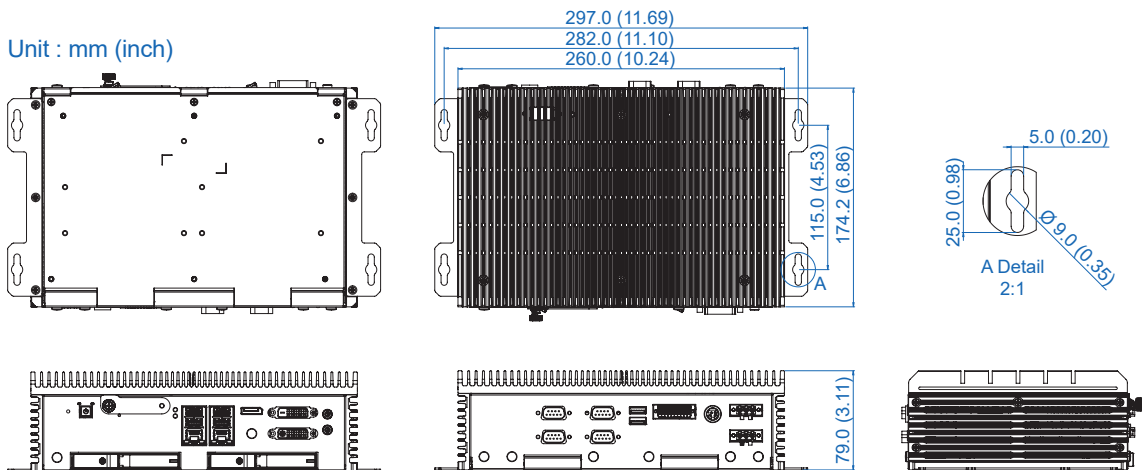
1.5.16 Dimensions of ECX-2000F-4G

Unit : mm (inch)



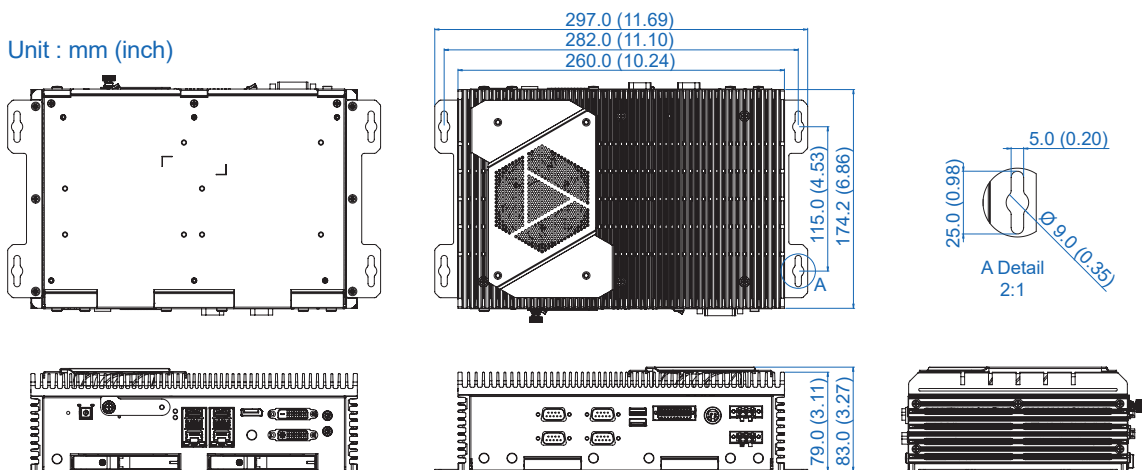
1.5.17 Dimensions of ECX-2000-2R

Unit : mm (inch)



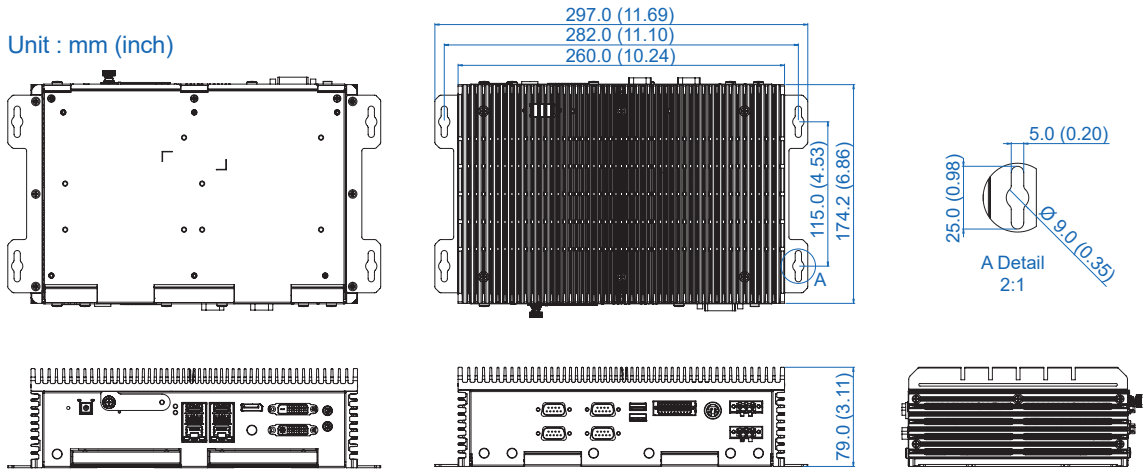
1.5.18 Dimensions of ECX-2000F-2R

Unit : mm (inch)



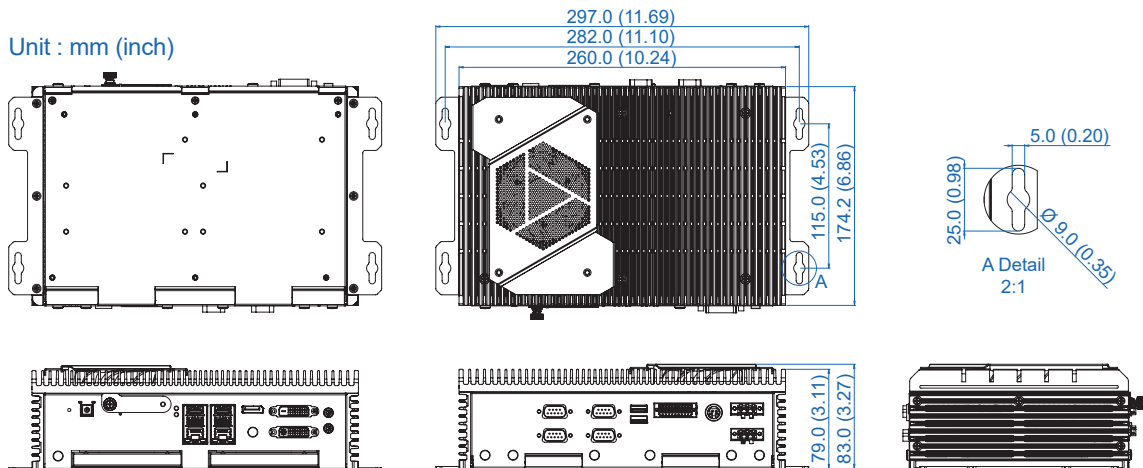
1.5.19 Dimensions of ECX-2000-2G

Unit : mm (inch)



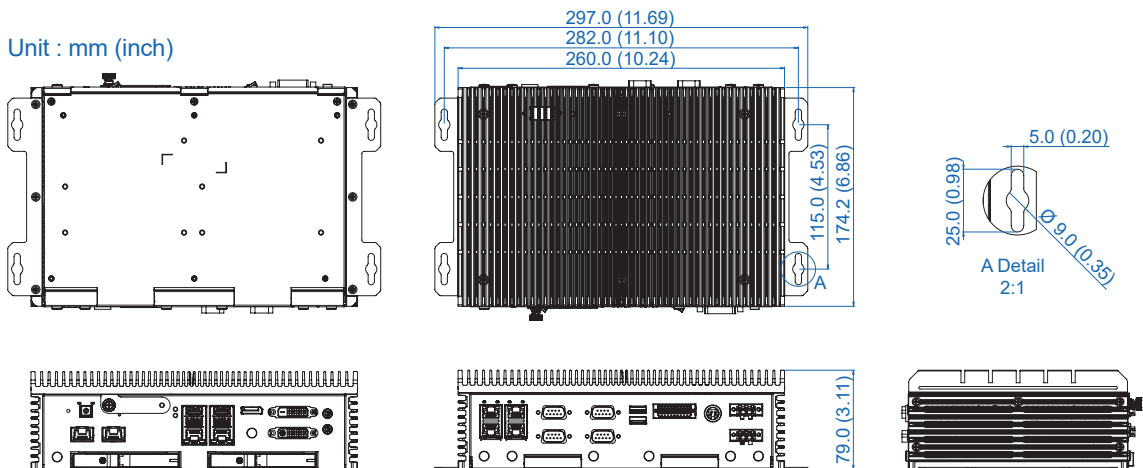
1.5.20 Dimensions of ECX-2000F-2G

Unit : mm (inch)



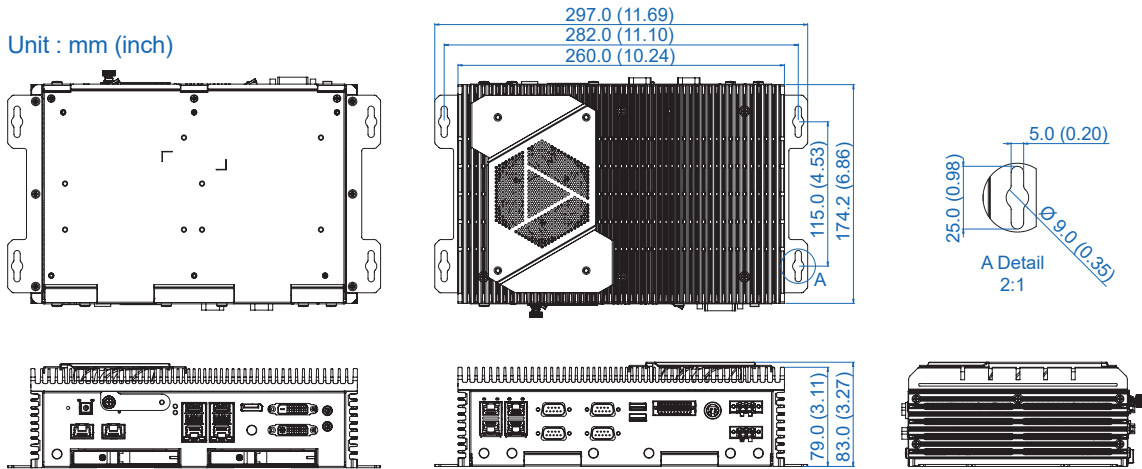
1.5.21 Dimensions of ECX-2055R

Unit : mm (inch)



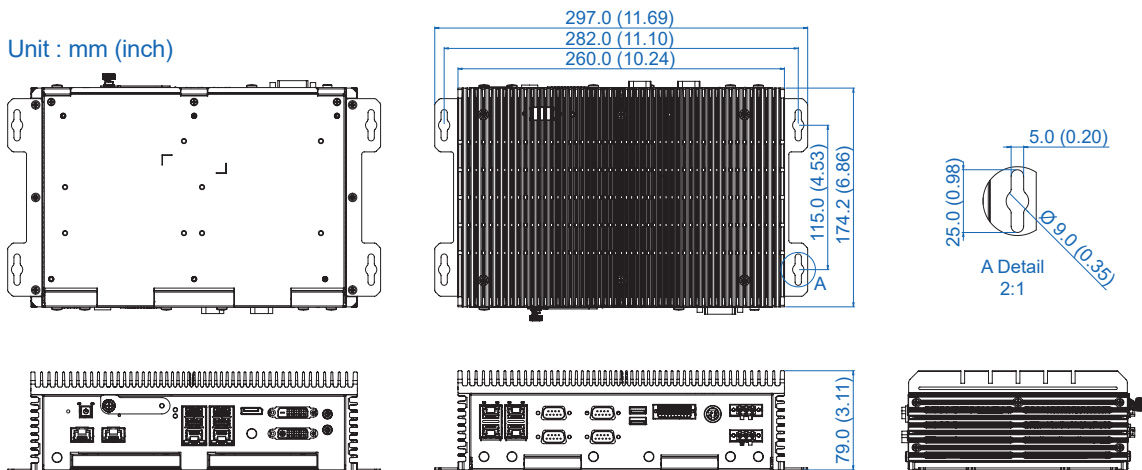
1.5.22 Dimensions of ECX-2055FR

Unit : mm (inch)



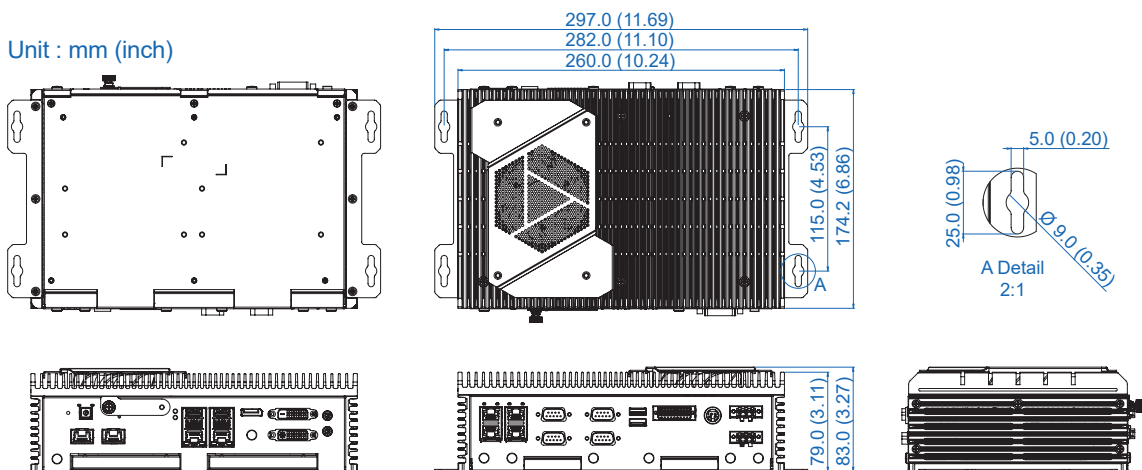
1.5.23 Dimensions of ECX-2055

Unit : mm (inch)



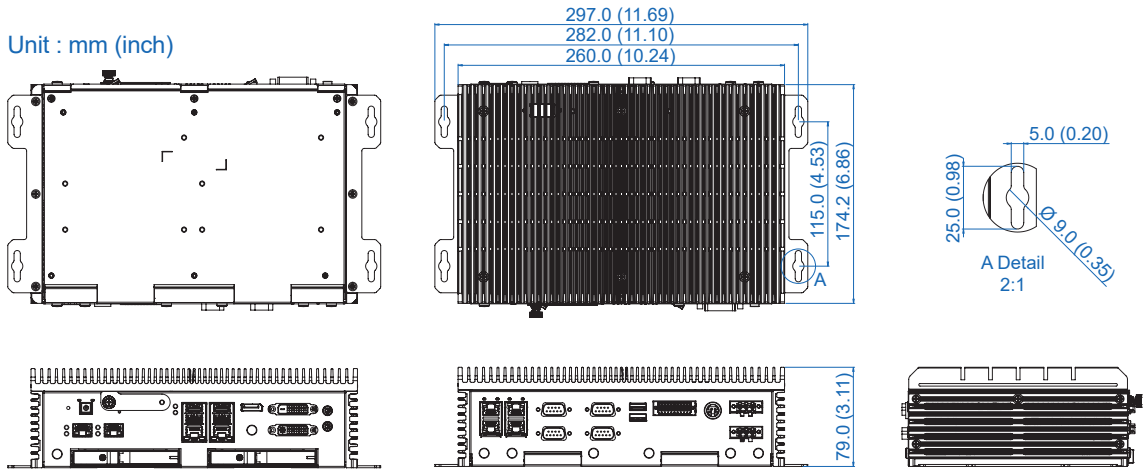
1.5.24 Dimensions of ECX-2055F

Unit : mm (inch)



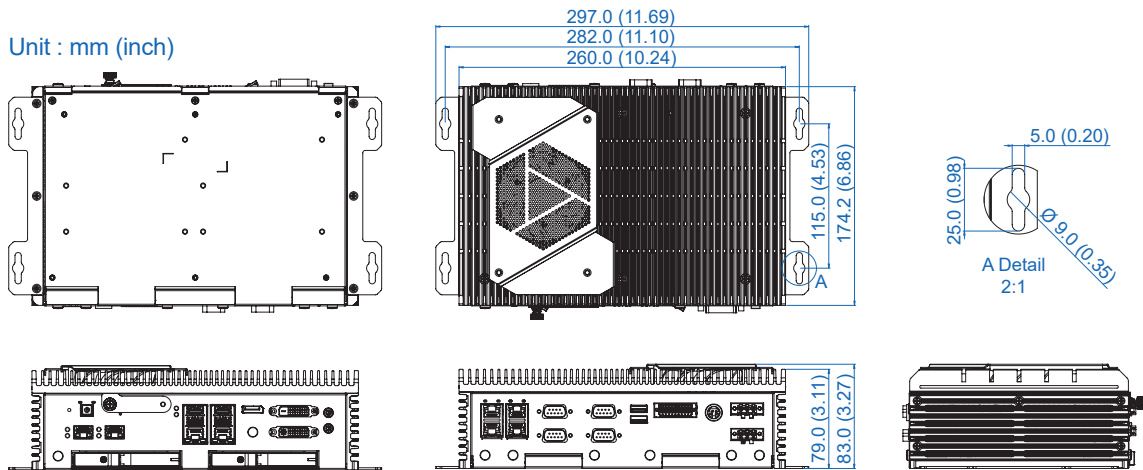
1.5.25 Dimensions of ECX-2071R

Unit : mm (inch)



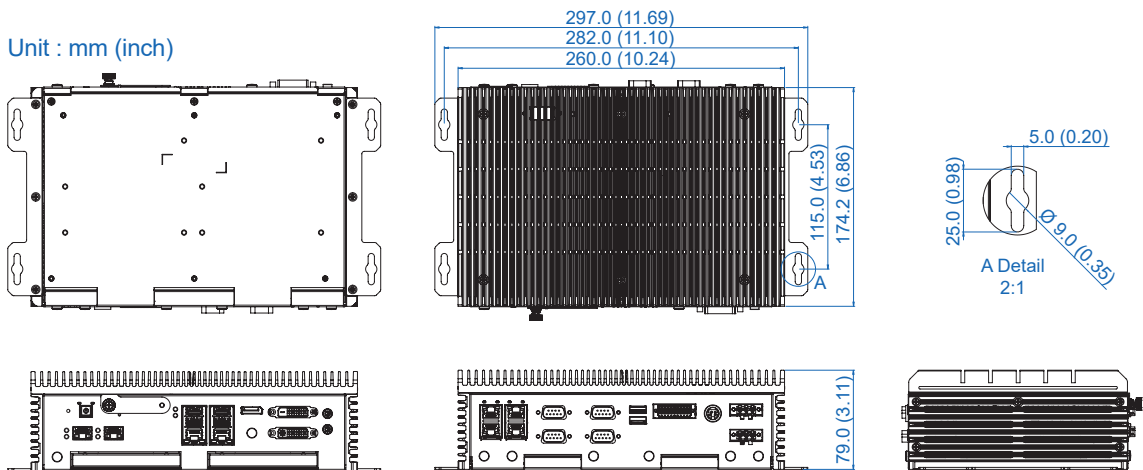
1.5.26 Dimensions of ECX-2071FR

Unit : mm (inch)



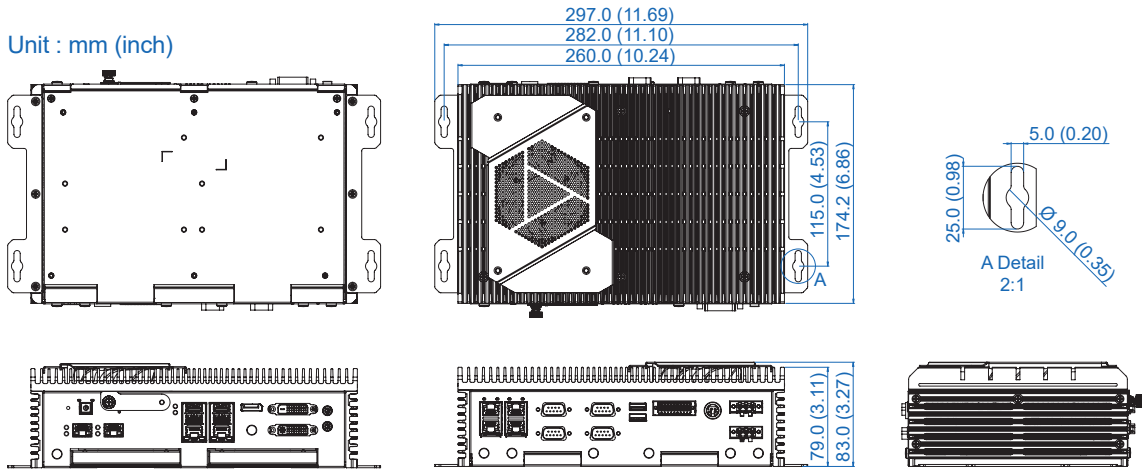
1.5.27 Dimensions of ECX-2071

Unit : mm (inch)



1.5.28 Dimensions of ECX-2071F

Unit : mm (inch)









2

GETTING TO KNOW YOUR ECX-2000

2.1 Packing List







2.1.1 ECX-2000-PoE/6F/4G/2G/2025/2055/2071 Packing List

Item	Description	Qty
1	ECX-2000 Fanless Embedded System (According to the configuration of you order, the ECX-2000 series may contain SSD/HDD and DDR4 SODIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	PHILLPIS M2.5x6L,Ni		Mini PCIe module card	53-2426906-30B	1
2	M3x4 Ni		M.2 module card	53-M006400-010	3
3	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	6
			SSD/HDD		8
4	Terminal block 3-pin (5.0mm)		DC-IN/Switch	51-2411R03-S1B	2
5	Terminal block 20-pin (2.54mm)		Isolated DIO/ GPIO	51-2112R20-S1D	1
6	Bracket_Wall Mount		Wall Mount	62-03P0527-000	2

2.1.2 ECX-2000-PoER/6FR/4R/2R/2025R/2055R/2071R Packing List

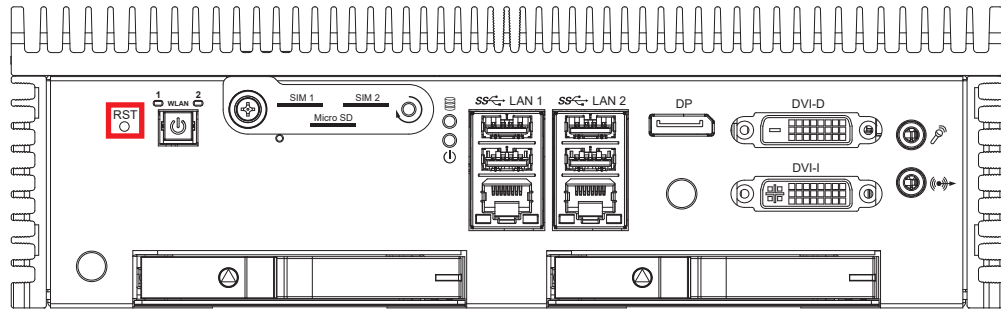
Item	Description	Qty
1	ECX-2000 Fanless Embedded System (According to the configuration of you order, the ECX-2000 series may contain SSD/HDD and DDR4 SODIMM. Please verify these items if necessary.)	1
2	SSD/HDD Tray Key	2

Item	Description	Outlook	Usage	P/N	Qty
1	PHILLPIS M2.5x6L,Ni		Mini PCIe module card	53-2426906-30B	1
2	M3x4 Ni		M.2 module card	53-M006400-010	3
3	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	6
4	Terminal block 3-pin (5.0mm)		DC-IN/Switch	51-2411R03-S1B	2
5	Terminal block 20-pin (2.54mm)		Isolated DIO/ GPIO	51-2112R20-S1D	1
6	Bracket_Wall Mount		Wall Mount	62-03P0527-000	2

2.2 Front Panel I/O Functions

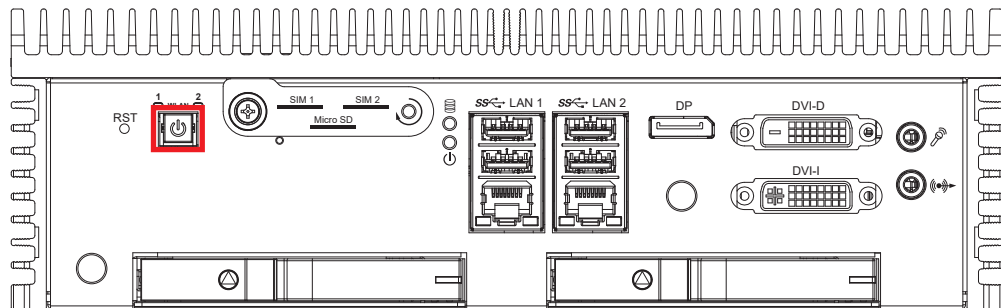
In Vecow ECX-2000 series family, all I/O connectors are located on front panel and rear panel. Most of the general connections to computer device, such as USB, LAN Jack, Display, DVI-D, Display Port and any additional storage, are placed on the front panel.

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 :

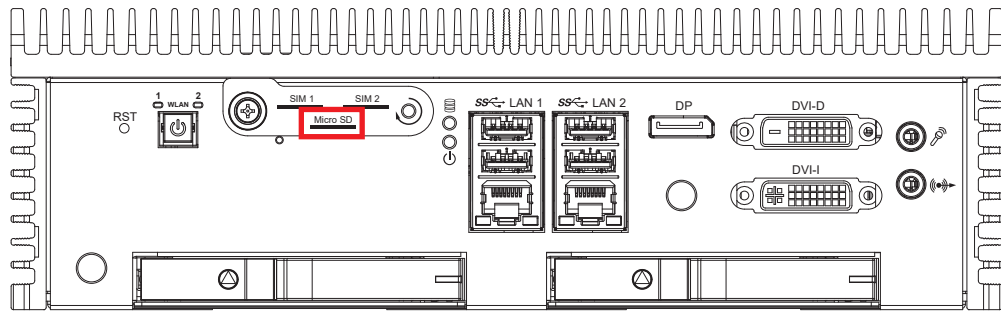
LED Color	Power Status	System Status
Solid Blue	S0	System working
Solid Orange	S3, S5	Suspend to RAM, System off with standby power

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 Micro SD Card



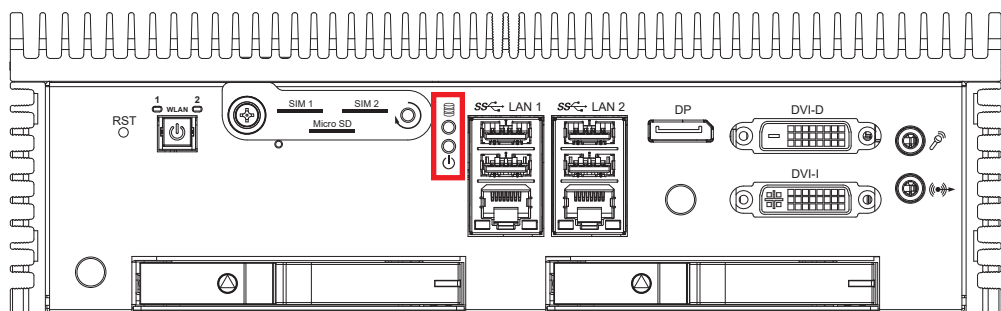
There is a Micro SD card socket on the front panel.

The Micro SD card socket does not support boot OS from SD.

The pinouts of Micro SD port are listed as follows :

Pin No.	Description	Pin No.	Description
1	SD_DATA2	2	SD_DATA3
3	SD_CMD	4	SD_PWR (+V3.3)
5	SD_CLK	6	GND
7	SD_DATA0	8	SD_DATA1
9	SD_WP	10	SD_DET#

2.2.4 PWR & HDD LED Indicator

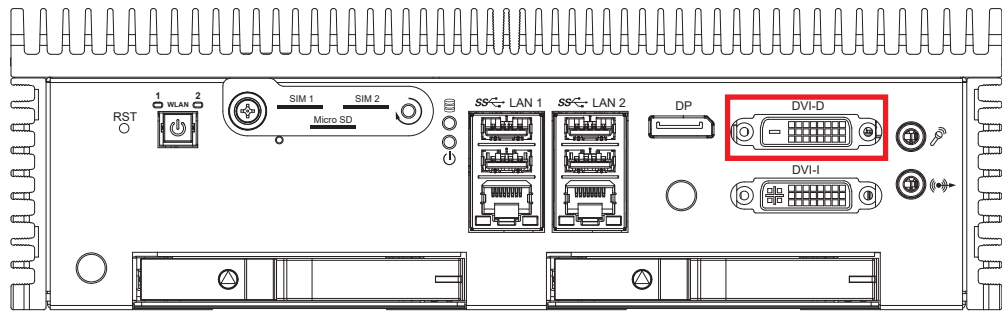


HDD LED/Yellow : A Hard Disk/M.2 KEY M LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

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

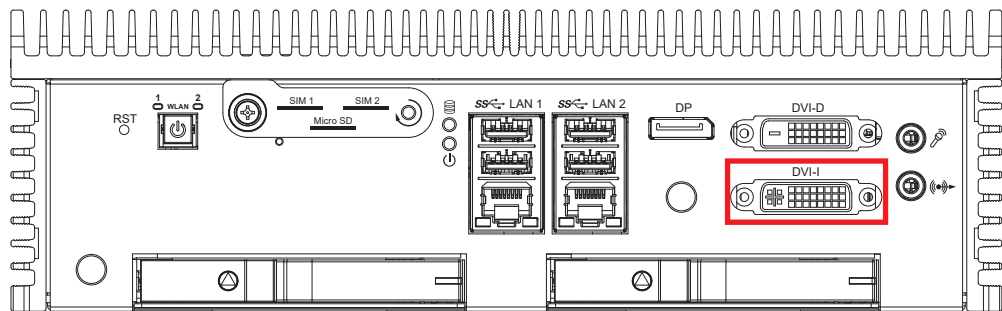
LED Color	Indication	System Status
Yellow	HDD/M.2 KEY M	<ul style="list-style-type: none"> • On/Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/off)

2.2.5 DVI-D Connector



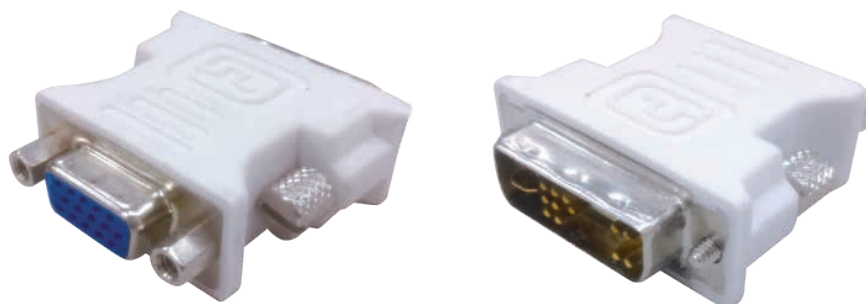
The DVI-D connector on the front panel supports DVI display. This connector can output DVI signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

2.2.6 DVI-I Connector

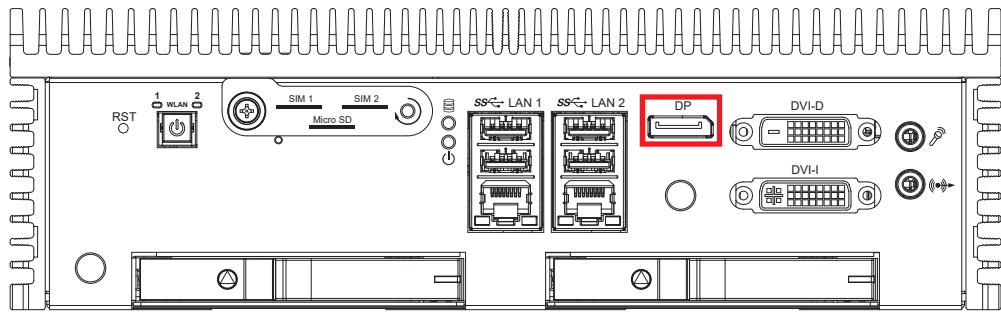


The DVI-I connector on the front panel supports both DVI and VGA display modes. This connector can output DVI or VGA signals. The DVI output mode supports up to 1920x1200 resolution. The DVI mode is automatically selected according to the display device connected. You will need a DVI-I cable when connecting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

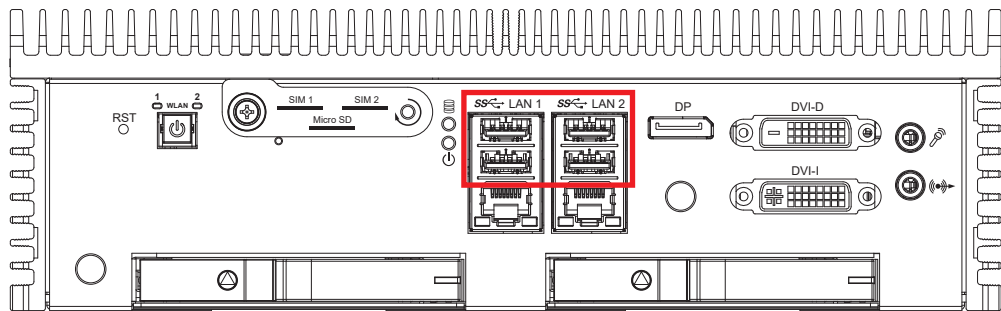


2.2.7 DisplayPort



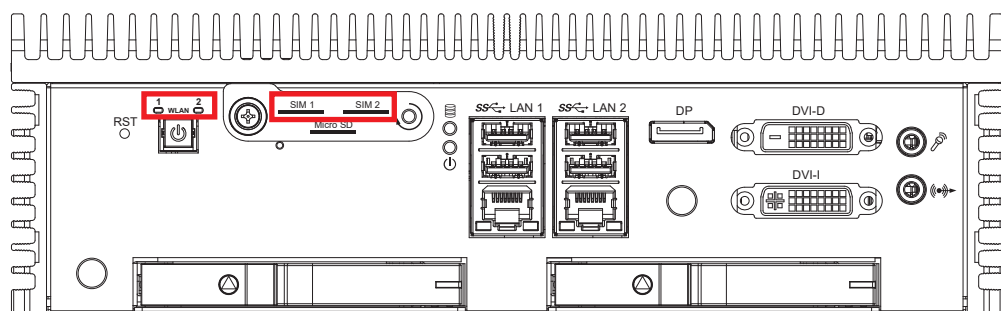
Onboard Display Port support auxiliary channel dual mode, connection supports up to 4096x2304 resolution at 60Hz.

2.2.8 USB 3.0



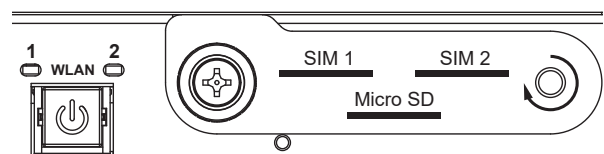
There are 4 USB 3.0 connections available supporting up to 5GB per second data rate in the front side of ECX-2000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

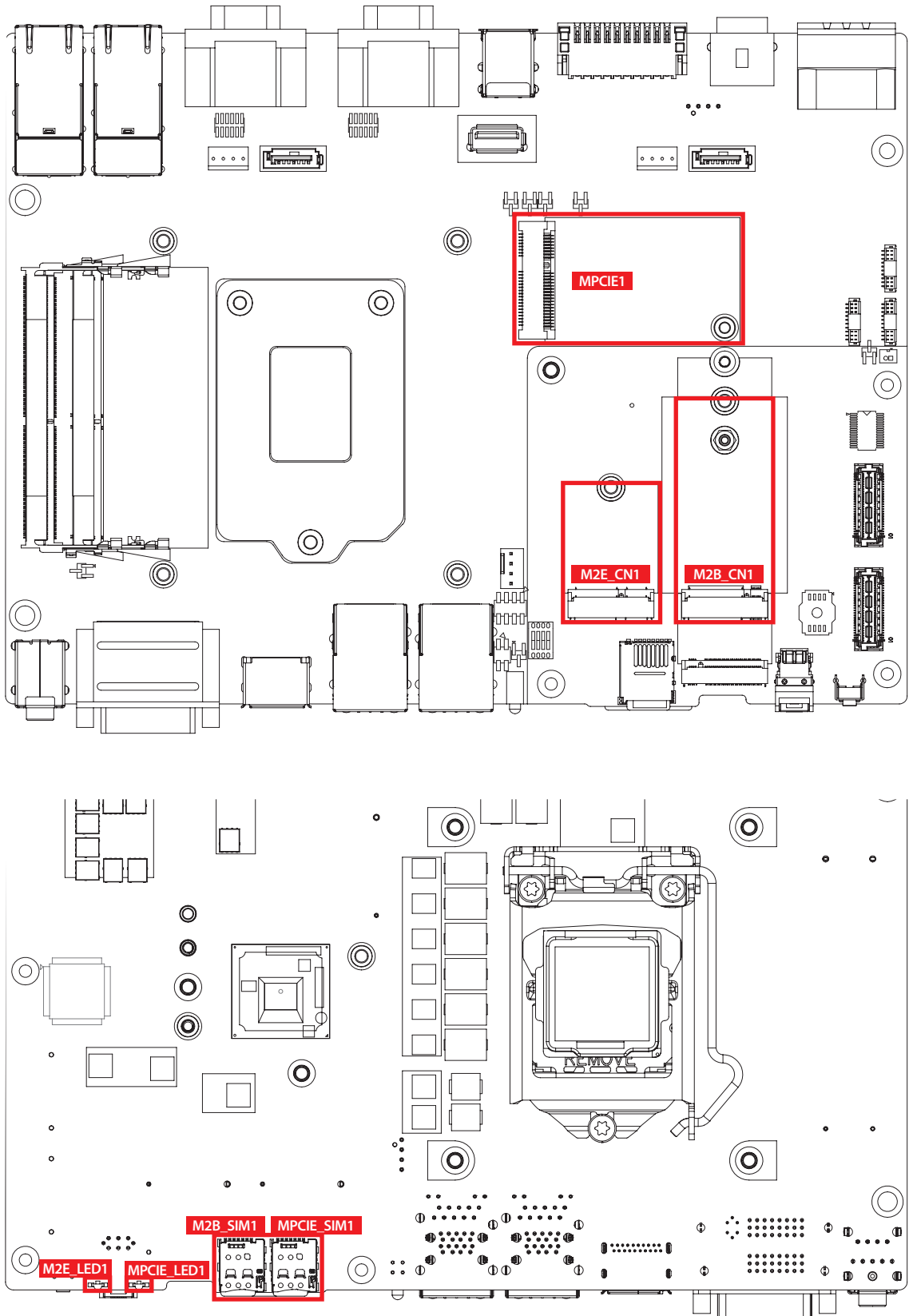
2.2.9 WLAN LED, Mini PCIe, M.2 KEY B, M.2 KEY E, Nano SIM Card Comparison



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

Mini PCIe	SIM	LED
MPCle1	SIM2	2
M.2 KEY B	SIM1	X
M.2 KEY E	X	1

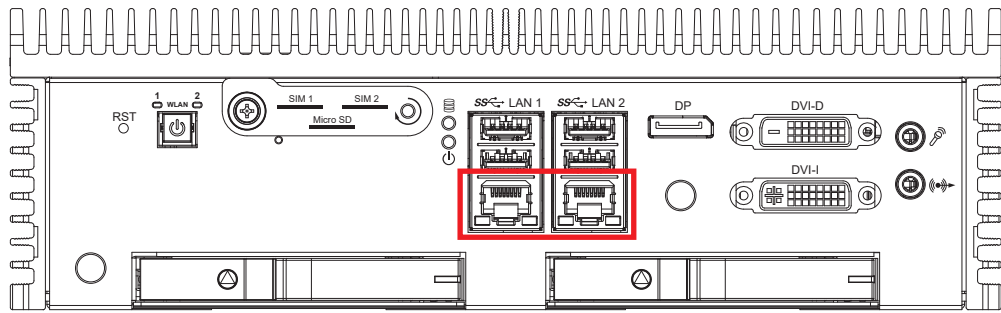




Note :

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

2.2.10 Ethernet Port



There are 2 8-pin RJ-45 jacks supporting 10/100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel® i219 Ethernet Phy; LAN 2 is powered by Intel® I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, iAMT 14.0 function is enabled.

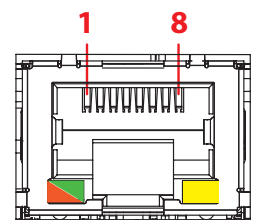
Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows :

Pin No.	10/100 Mbps	1000Mbps
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

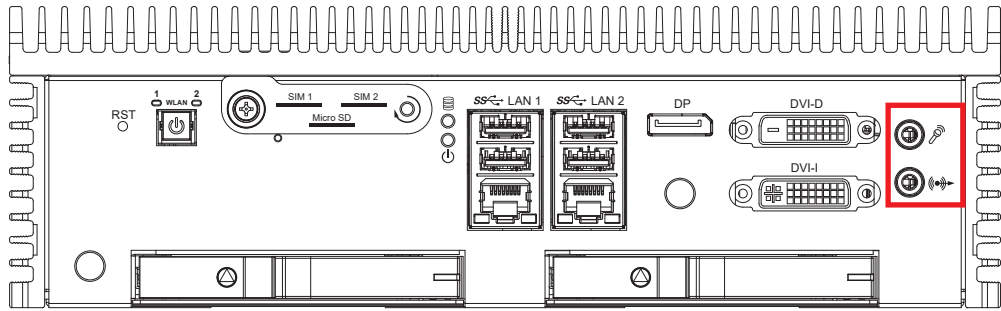
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/off when Ethernet data packets are being transmitted/received.

LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Left	Green/ Orange	Off	Solid Green	Solid Orange
Right	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow



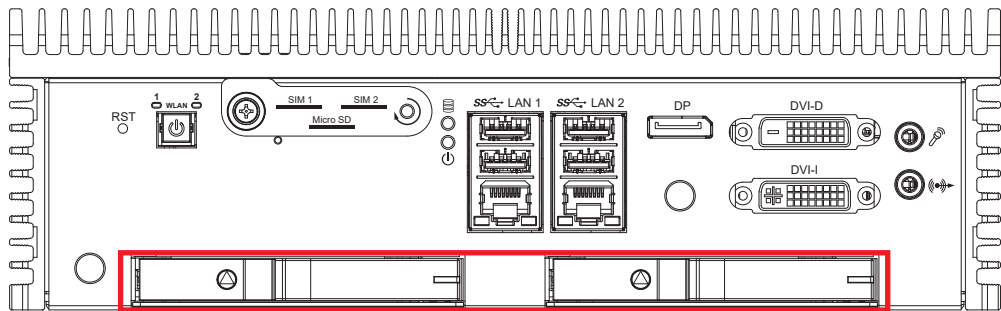
2.2.11 Audio Connector



There are 2 audio connectors, Mic-in and Line-out, in the front side of ECX-2000. Onboard Realtek ALC888S-VD 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 ALC888S-VD codec.

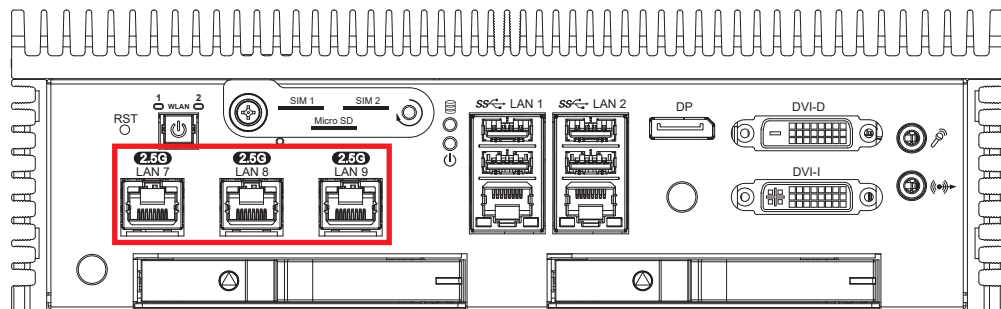
2.2.12 SSD/HDD Tray



There are 2 front-access 2.5" SSD/HDD trays in the front side of ECX-2000. Just trigger to open the SSD/HDD tray, up to 4TB is available.

2.2.13 Expansion Ethernet

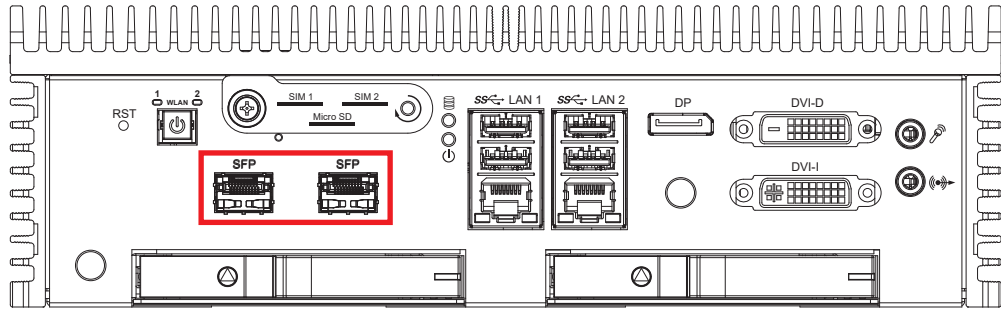
2.2.13.1 2.5G Ethernet Port (2025/2025R)



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

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

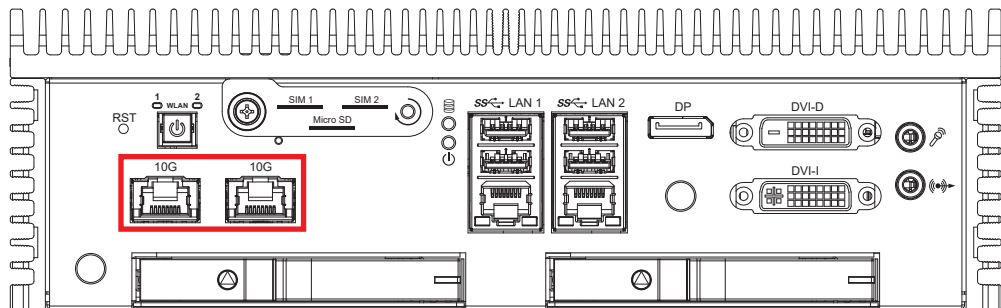
2.2.13.2 1G Fiber Port (6FR/6F)



There are 2 expansion SFP Fiber LAN in the front side. These are powered by Intel® I350.

- Intel® I350 Gigabit Ethernet Controller supports 1Gbps data rate
- IEEE 802.3 Fast Ethernet over optical fiber standard compliant
- IEEE 1588 Precision Time Protocol (PTP)
- Up to 9.5KB Jumbo Frame
- Dual 100BASE-FX fiber ports
- Supports Wake-on-LAN (WoL) & PXE

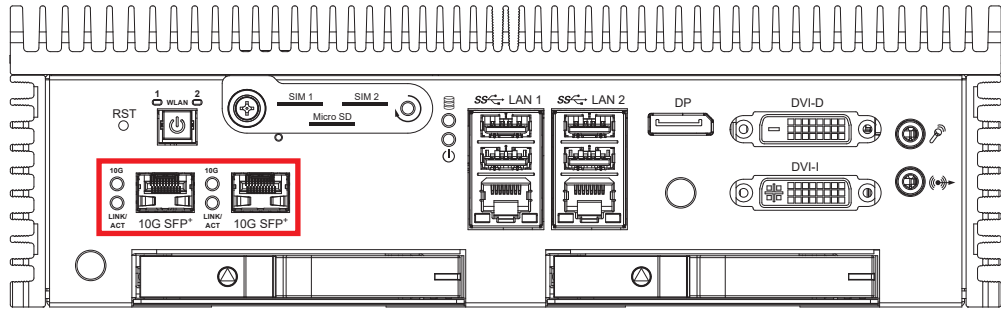
2.2.13.3 10G Ethernet Port (2055R/2055)



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)

2.2.13.4 10G Fiber Port (2071R/2071)

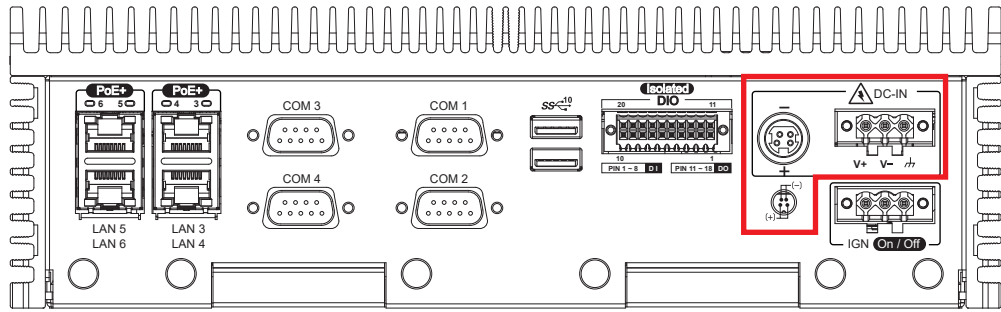


There are 2 expansion 10G fiber in the front side. These are powered by Intel® X710-BM2.

- Intel® X710-BM2 Dual Port 10Gigabit Ethernet Controller supports up to 10Gbps data rate
- IEEE 802.3 Fast Ethernet over optical fiber 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
- -25°C to 55°C Operating Temperature

2.3 Rear Panel I/O & Functions

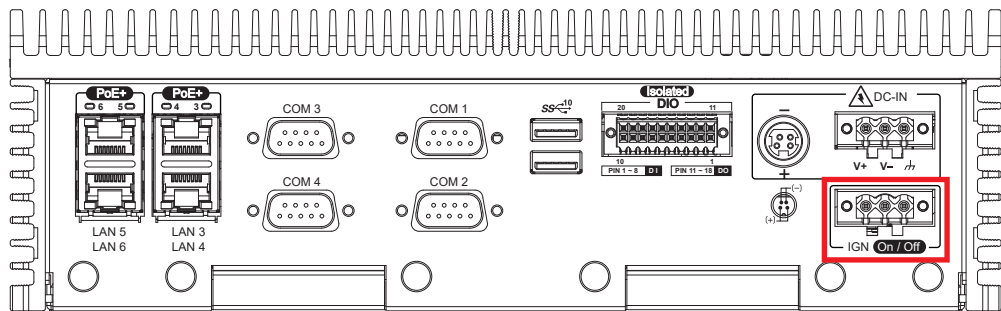
2.3.1 Power Terminal Block



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. Supports up to 80V surge protection.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Chassis Ground		

2.3.2 Remote Power On/Off Switch & IGNITION Terminal Block

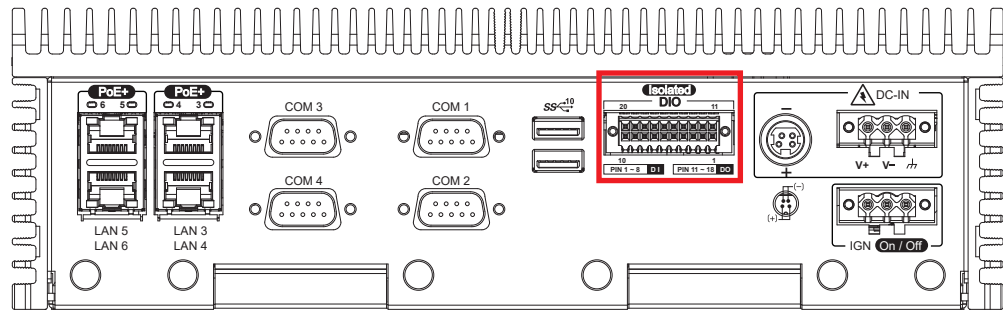


It is a 2-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function of soft power-on/power-off (instant off or delay 4 second), and suspend mode.

Pin No.	Definition	Pin No.	Definition
1	Ignition	2	SW+
3	SW-		

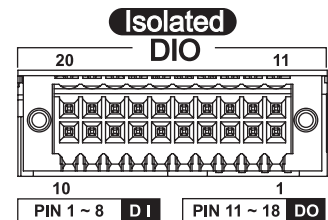
2.3.3 Isolated DIO/GPIO

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.

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

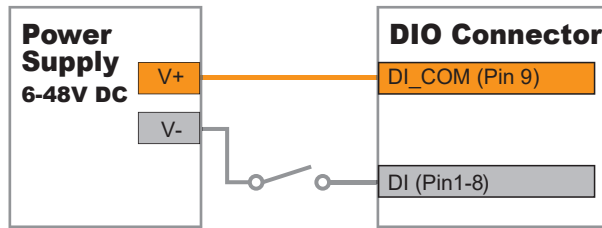


DIO Connectors pin out :

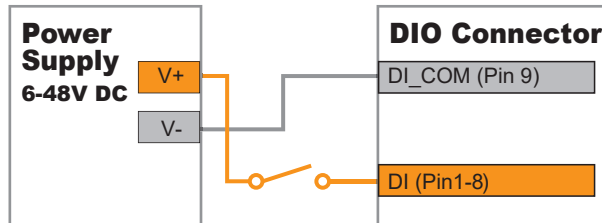
DIO	Pin No.	Definition	Function
DIO	1	INPUT 0	SIO_GPI80
	2	INPUT 1	SIO_GPI81
	3	INPUT 2	SIO_GPI82
	4	INPUT 3	SIO_GPI83
	5	INPUT 4	SIO_GPI84
	6	INPUT 5	SIO_GPI85
	7	INPUT 6	SIO_GPI86
	8	INPUT 7	SIO_GPI87
	9	DI_COM	-----
	10	DIO_GND	-----
	11	OUTPUT 0	SIO_GPO70
	12	OUTPUT 1	SIO_GPO71
	13	OUTPUT 2	SIO_GPO72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

DI reference circuit :

Sink Mode (NPN)

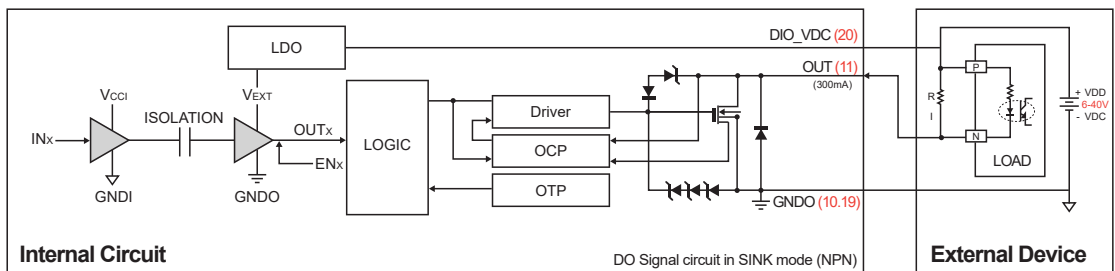


Source Mode (PNP)

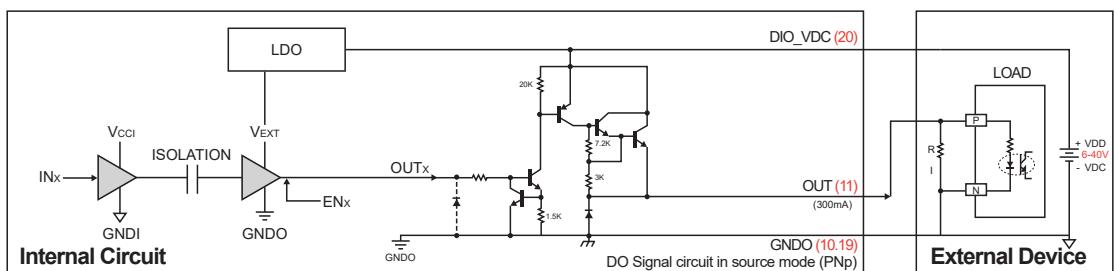


DO reference circuit :

Sink Mode (NPN, Default)



Source (PNP)



2.3.3.2 GPIO

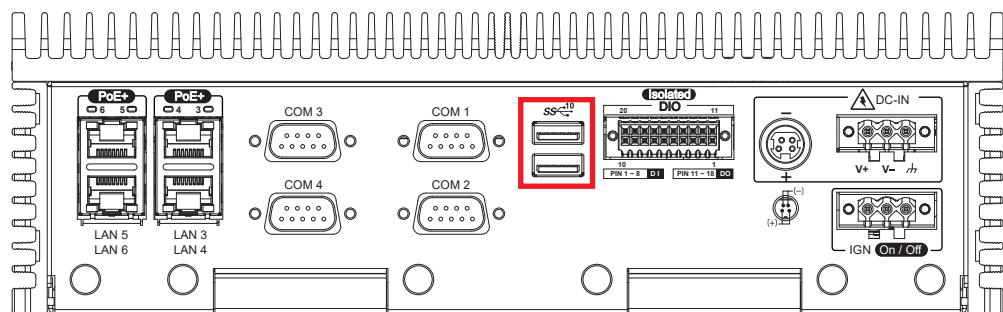
The system offers sixteen programmable I/O. (3.3V Level)

If the GPIO is logic high, it indicates that the mapping SIO GPIO pin is logic high level.
If the GPIO is logic low, it indicates that the mapping SIO GPIO pin is logic low level.

GPIO Connectors pin assignments

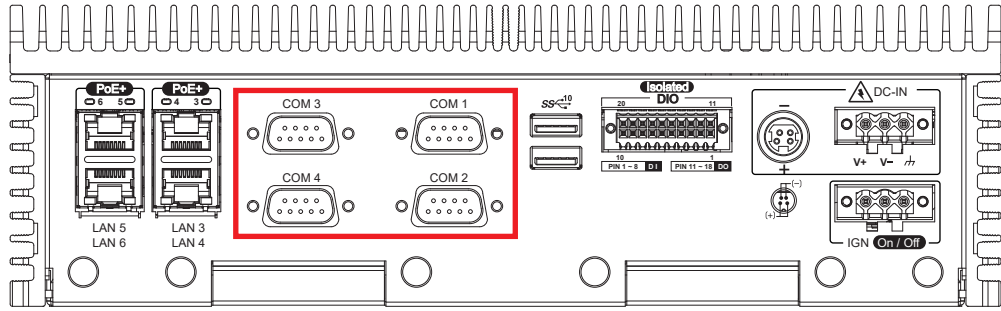
Pin No.	Definition	Pin No.	Definition
1	SIO_GPI80	11	SIO_GPO70
2	SIO_GPI81	12	SIO_GPO71
3	SIO_GPI82	13	SIO_GPO72
4	SIO_GPI83	14	SIO_GPO73
5	SIO_GPI84	15	SIO_GPO74
6	SIO_GPI85	16	SIO_GPO75
7	SIO_GPI86	17	SIO_GPO76
8	SIO_GPI87	18	SIO_GPO77
9	-----	19	GND
10	GND	20	-----

2.3.4 USB Port



There are 2 USB 3.0 connections available supporting up to 10GB per second data rate in the rear side of ECX-2000. 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



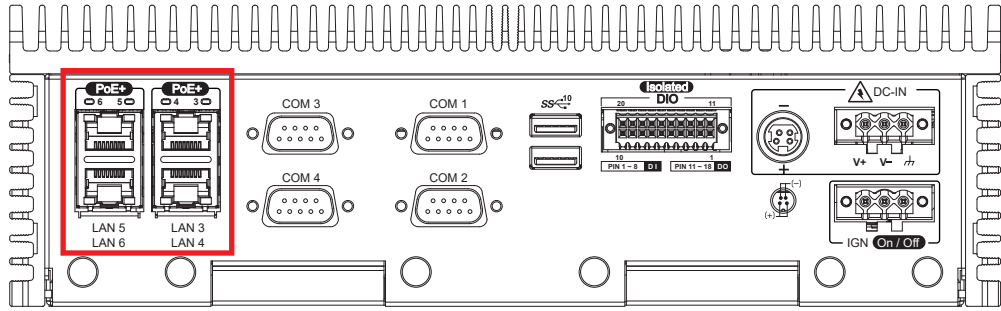
Serial port 1 to 4 (COM 1 to 4) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 and COM 2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

BIOS Setting	Function
COM 1	RS-232
COM 2	RS-422 (5-wire)
COM 3	RS-422 (9-wire)
COM 4	RS-485
COM 4	RS-485 w/z auto-flow control

The pin assignments are listed in the following table :

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

2.3.6 PoE Ports



There are 4 RJ45 connectors in the rear side of ECX-2000. It supports IEEE 802.3at (PoE+) Power over Ethernet (PoE) connection delivering up to 37W/54V per port and 1000BASE-T gigabit data signals over standard Ethernet Cat 5/Cat 6 cable.

Each PoE connection is powered by Intel® I210 Gigabit 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 12V.

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

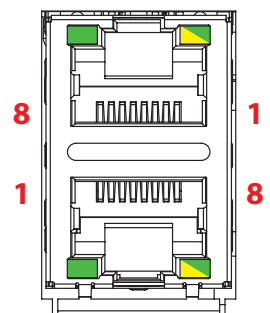
Pin No.	10/100 Mbps	1000Mbps	PoE
1	E_TX+	MDI0_P	PoE+
2	E_TX-	MDI0_N	PoE+
3	E_RX+	MDI1_P	PoE-
4	----	MDI2_P	----
5	----	MDI2_N	----
6	E_RX-	MDI1_N	PoE-
7	----	MDI3_P	----
8	-----	MDI3_N	----

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 100Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/off when Ethernet data packets are being transmitted/received.

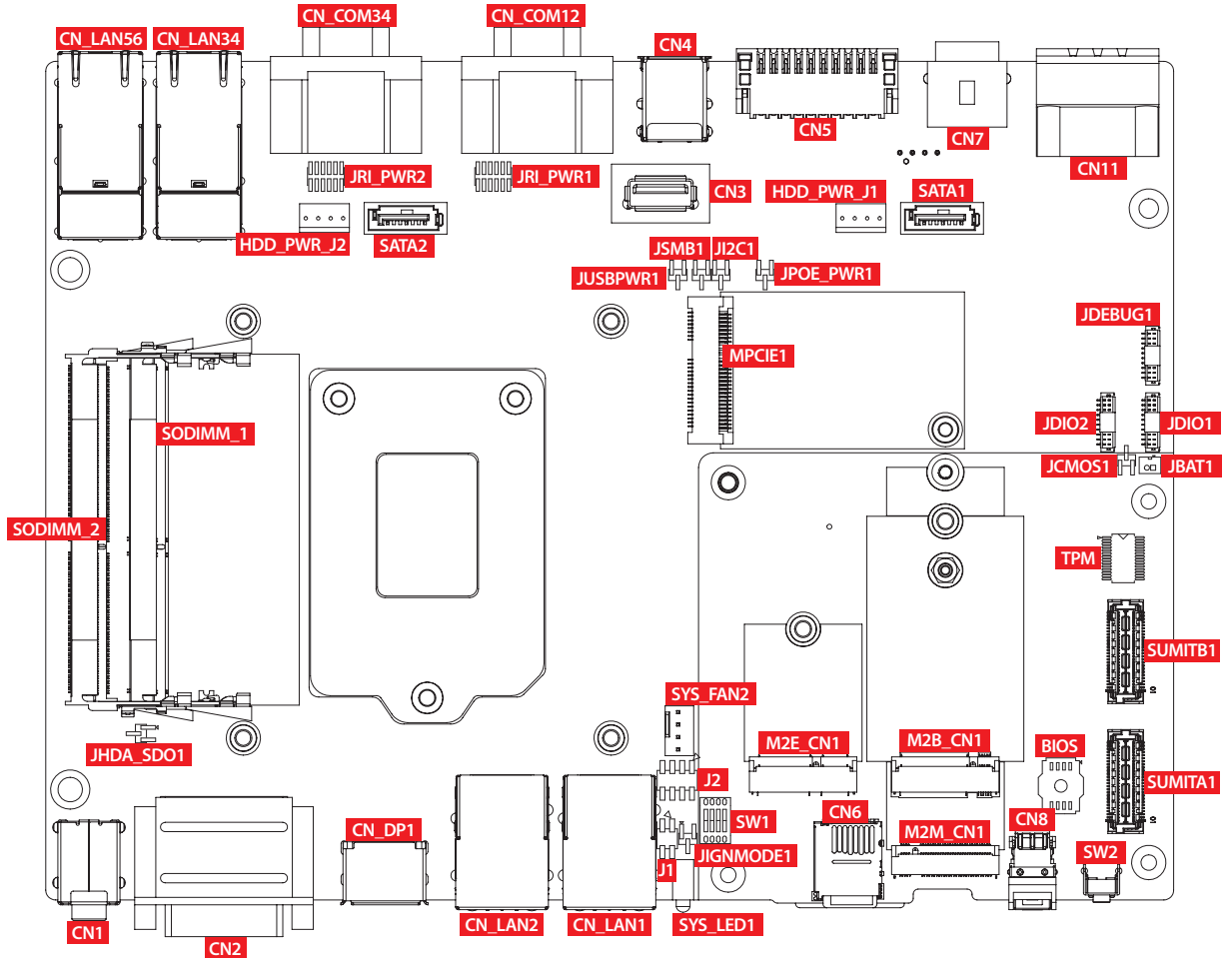
LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Right	Green/ Yellow	Off	Solid Green	Solid Yellow
Left	Green	Twinkling Green	Twinkling Green	Twinkling Green

POE LED	LED Color	POE Status
LED 3 - 6	Solid Green	POE ON

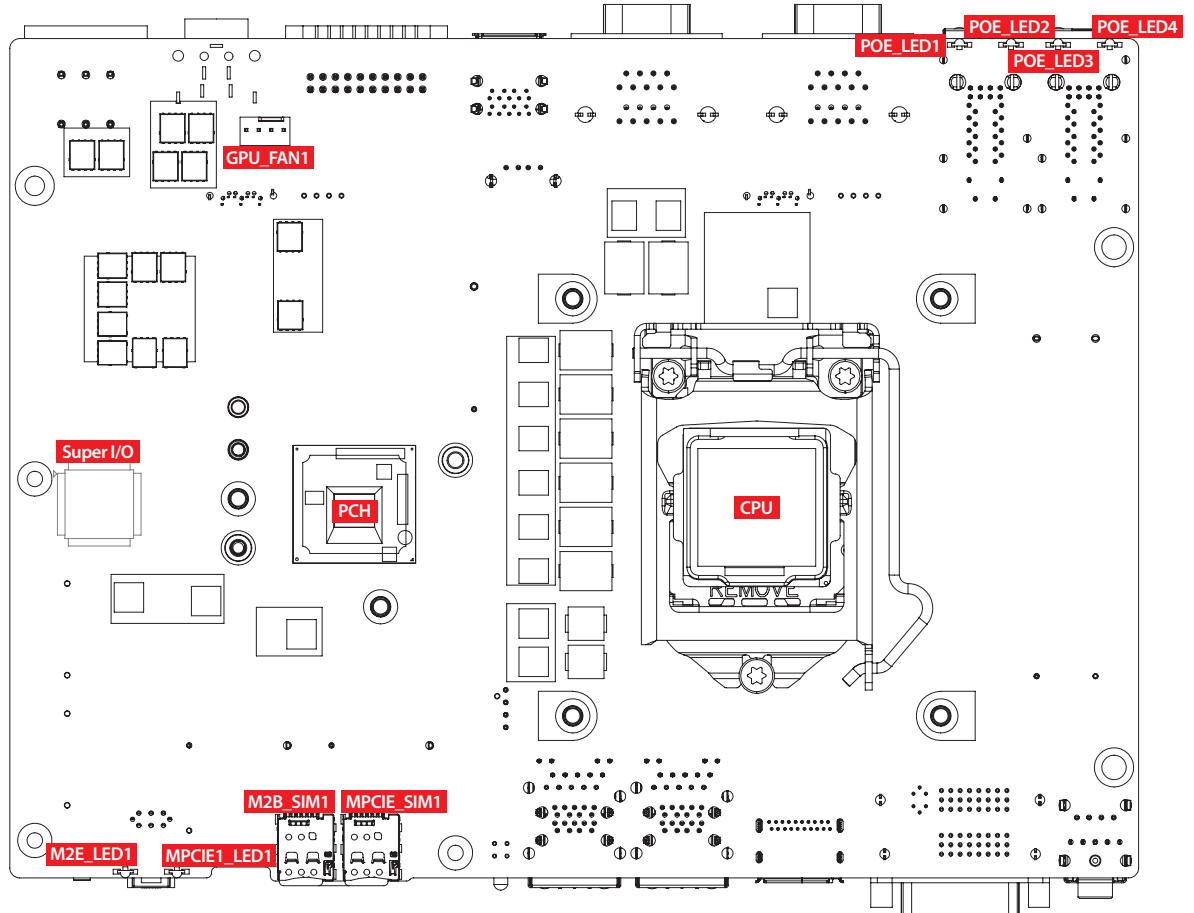


2.4 Main Board Expansion Connectors

2.4.1 Top View (Component Side) of ECX-2000 Main Board With Connector Location



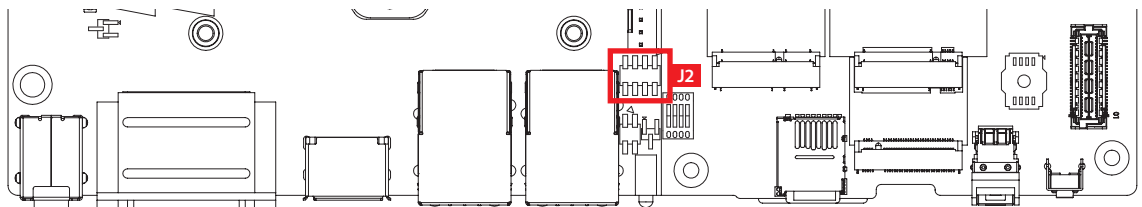
2.4.2 Bottom View (Solder Side) of ECX-2000 Main Board With Connector Location



2.4.3 J2 : Miscellaneous Pin Header

2.0mm 2x4p header

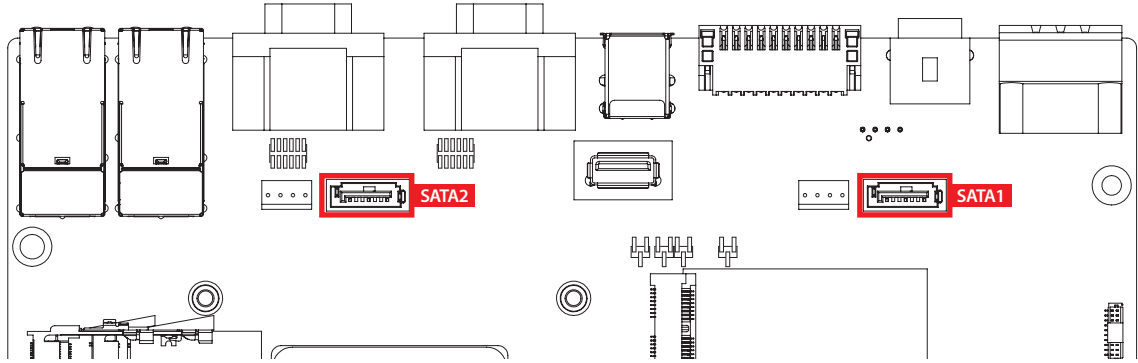
This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already can be accessed by front panel and top panel. The pin-outs of Miscellaneous port are listed in following table :



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

2.4.4 SATA1, SATA2 : SATA III Connector

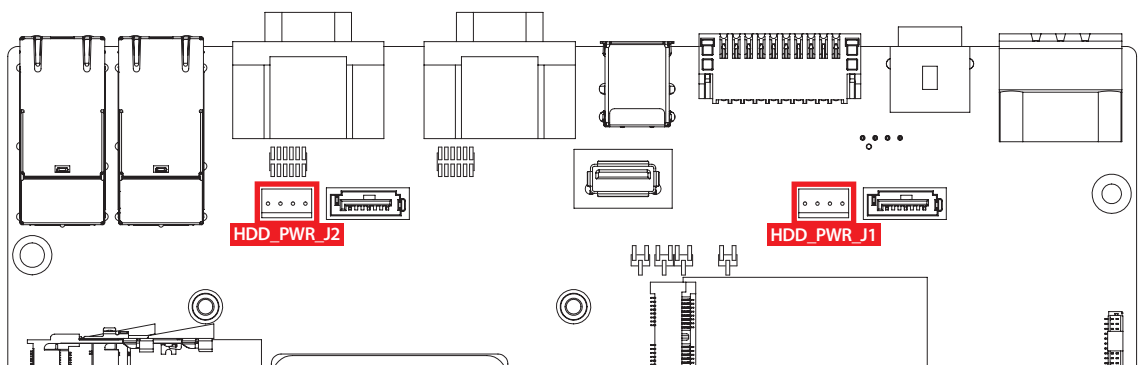
There are 2 onboard high performance Serial ATA III (SATA III) on ECX-2000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 and SATA2 are listed in the following table :



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

2.4.5 HDD_PWR_J1, HDD_PWR_J2 : SATA Power Connector

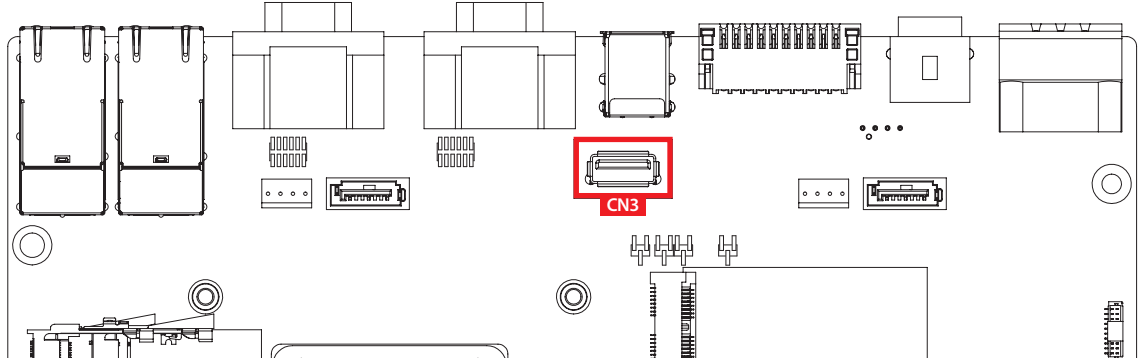
The ECX-2000 also equip with a SATA power connector. The one port supports 5V (Up to 2.5A) and 12V (Up to 2.5A) current to the hard drive or SSD. The pin assignments of HDD_PWR_J1 are listed in the following table :



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

2.4.6 CN3 : Internal USB

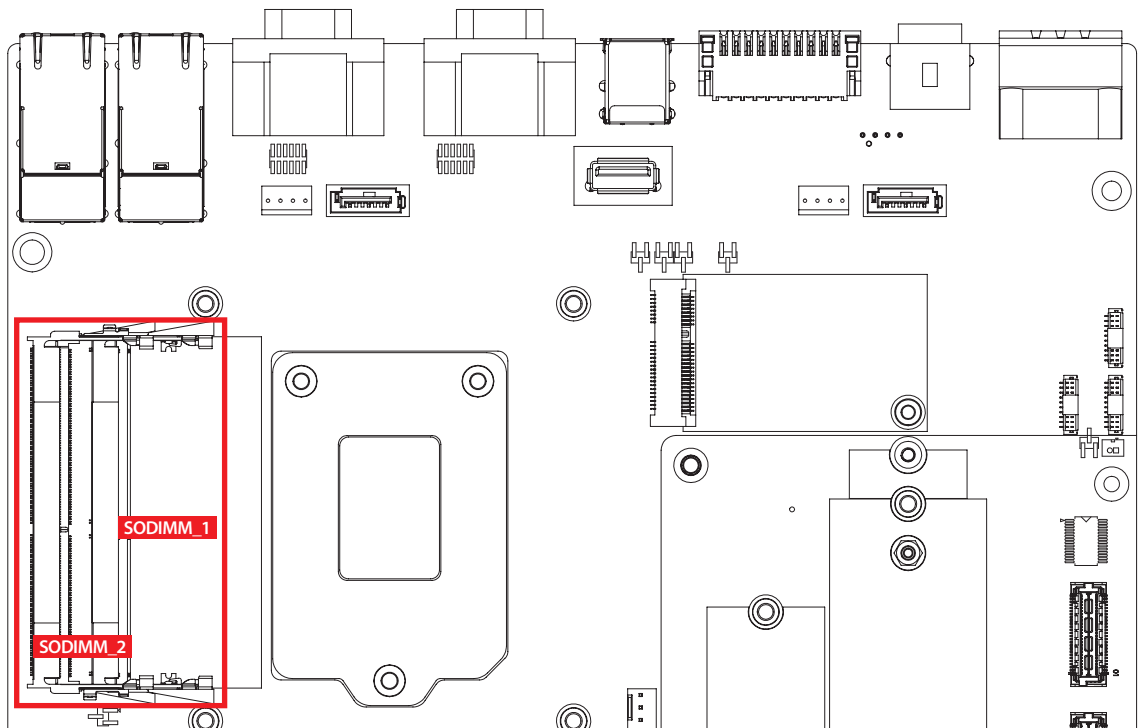
The USB 2.0 connections available supporting up to 480Mbps. It also compliant with the requirements of high speed (HS), full speed (FS) and low speed (LS). The pin assignments of CN3 are listed in the following table :



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

2.4.7 SODIMM_1, SODIMM_2 : DDR4 Slot

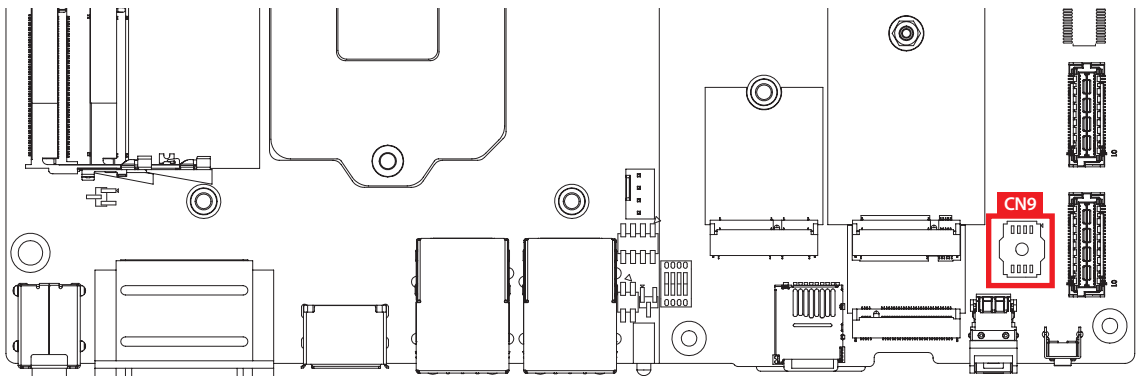
There are 2 DDR4 channel onboard, support DDR4 2933, max 64GB Each channel 32GB.



Slot	Description
SODIMM_1	DDR4 Channel A
SODIMM_2	DDR4 Channel B

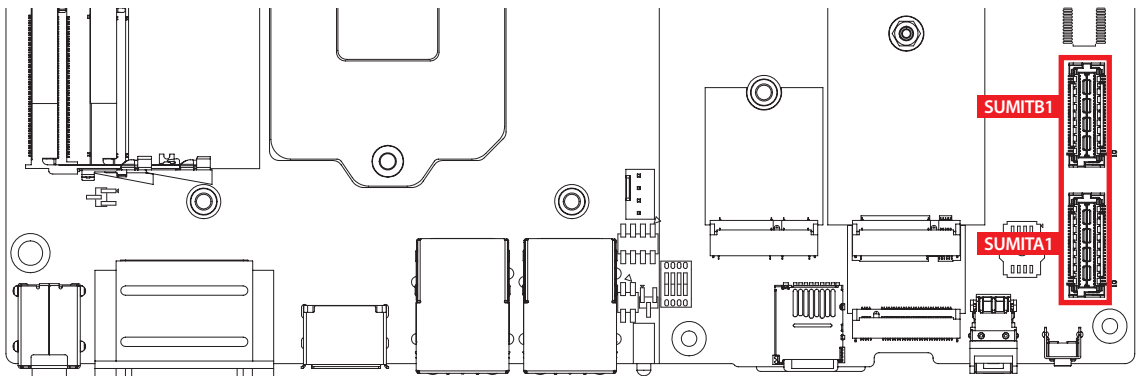
2.4.8 CN9 : BIOS Socket

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



2.4.9 SUMIT A, SUMIT B

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



SUMIT A Pin Out :

Pin No.	Function	Pin No.	Function
1	+5V_AUX	2	+12V
3	+3.3V	4	SMB_DATA
5	+3.3V	6	XMB_CLK
7	Reserved	8	Reserved
9	Reserved	10	SPI_MISO
11	USB_OC#	12	SPI_MOSI
13	Reserved	14	SPI_CLK
15	+5V	16	SPI_CS10
17	USB_3+	18	SPI_CS1#
19	USB_3-	20	Reserved
21	+5V	22	LPC_DRQ1#
23	USB_2+	24	LPC_AD0
25	USB_2-	26	LPC_AD1

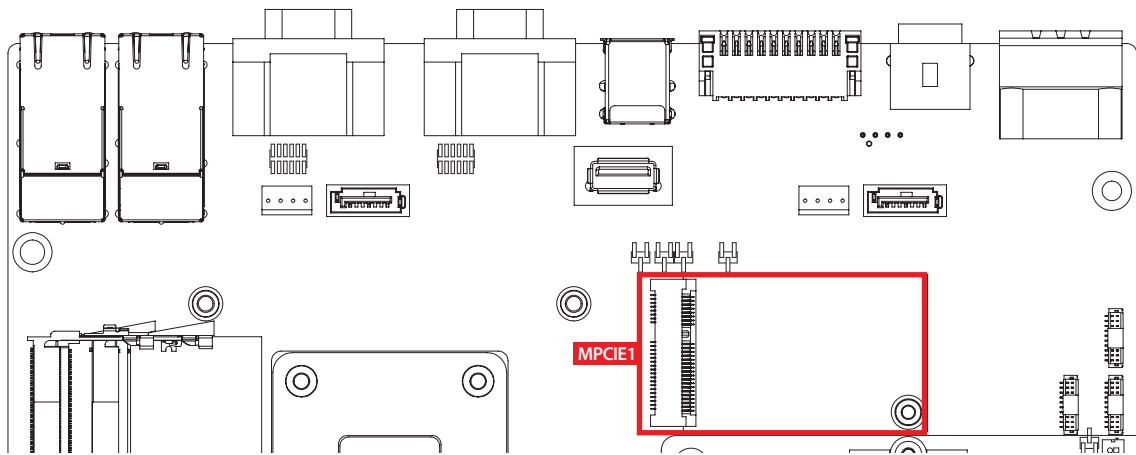
Pin No.	Function	Pin No.	Function
27	+5V	28	LPC_AD2
29	USB_1+	30	LPC_AD3
31	USB_1-	32	LPC_FRAME#
33	+5V	34	SERIRQ#
35	USB_0+	36	Reserved
37	USB_0-	38	CLK_33MHz
39	GND	40	GND
41	A_PET_P0	42	A_PER_P0
43	A_PET_N0	44	A_PER_N0
45	GND	46	APRSNT#/A_PE_CLKREQ#
47	PERST#	48	A_CLKP
49	WAKE#	50	A_CLKN
51	+5V	52	GND

SUMIT B Pin Out :

Pin No.	Function	Pin No.	Function
1	GND	2	GND
3	B_PET_P0	4	B_PER_P0
5	B_PET_N0	6	B_PER_N0
7	GND	8	GND
9	C_CLKP	10	B_CLKP
11	C_CLKN	12	B_CLKN
13	CPRSNT#/C_PE_CLKREQ#	14	GND
15	C_PET_P0	16	C_PER_P0
17	C_PET_N0	18	C_PER_N0
19	GND	20	GND
21	C_PET_P1	22	C_PER_P1
23	C_PET_N1	24	C_PER_N1
25	GND	26	GND
27	C_PET_P2	28	C_PER_P2
29	C_PET_N2	30	C_PER_N2
31	GND	32	GND
33	C_PET_P3	34	C_PER_P3
35	C_PET_N3	36	C_PER_N3
37	GND	38	GND
39	PERST#	40	WAKE#
41	Reserved	42	Reserved
43	+5V	44	Reserved
45	+5V	46	+3.3V
47	+5V	48	+3.3V
49	+5V	50	+3.3V
51	+5V	52	+5V_AUX

2.4.10 Mini PCIe : MPCle1

Standard full length mini PCIe slot

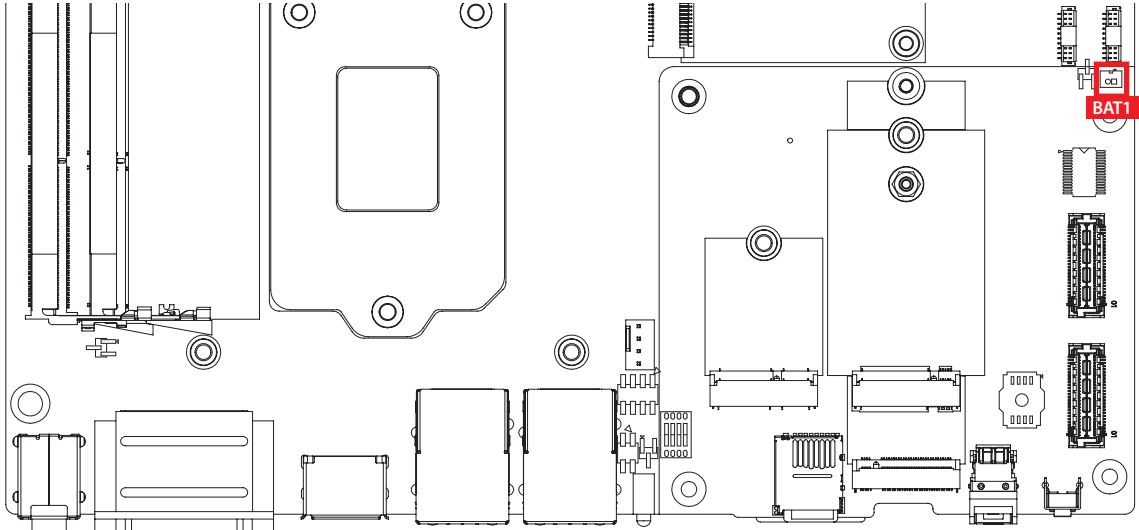


The pin assignments of MPCle 1 ted in the following table :

Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	GND	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

2.4.11 JBAT1 : RTC Battery

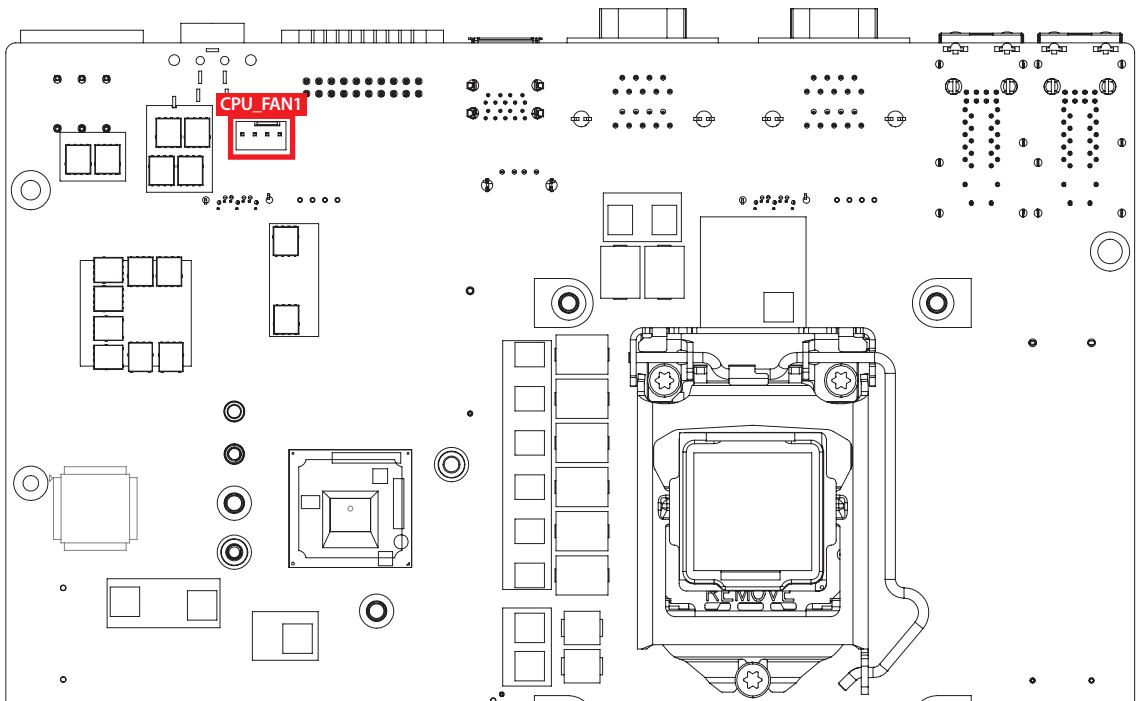
The system's real-time clock is powered by a lithium battery. It is Equipped with Panasonic CR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

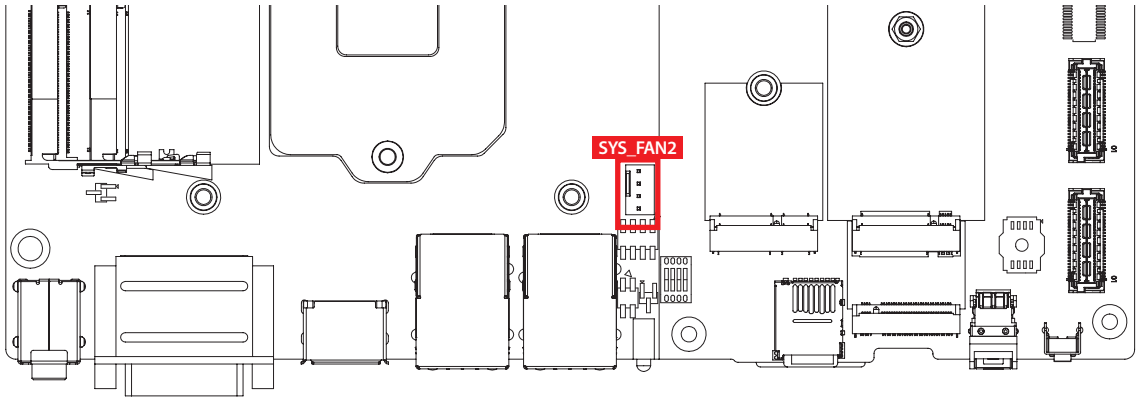


Pin No.	Description
1	BAT-
2	BAT+

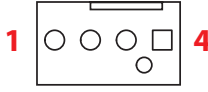
2.4.12 CPU_FAN1, SYS_FAN2 : FAN Header

Fan power connector supports for additional thermal requirements. The pin assignments of CPU_FAN1/SYS_FAN2 are listed in the following table.



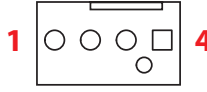


CPU_FAN1



Pin No.	Definition
1	GND
2	+12V (1.5A max)
3	Fan speed sensor
4	Fan PWM

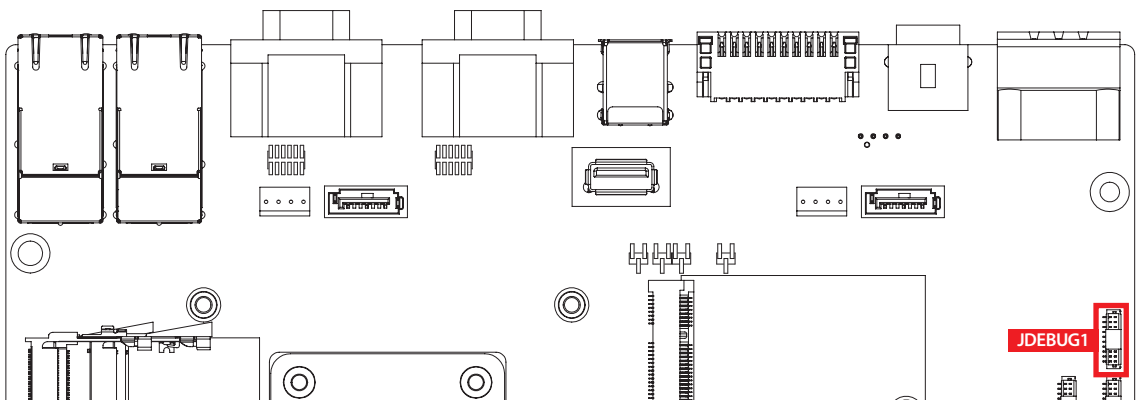
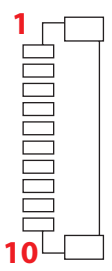
SYS_FAN2



Pin No.	Definition
1	GND
2	+12V (1.5A max)
3	NC
4	Fan ctrl

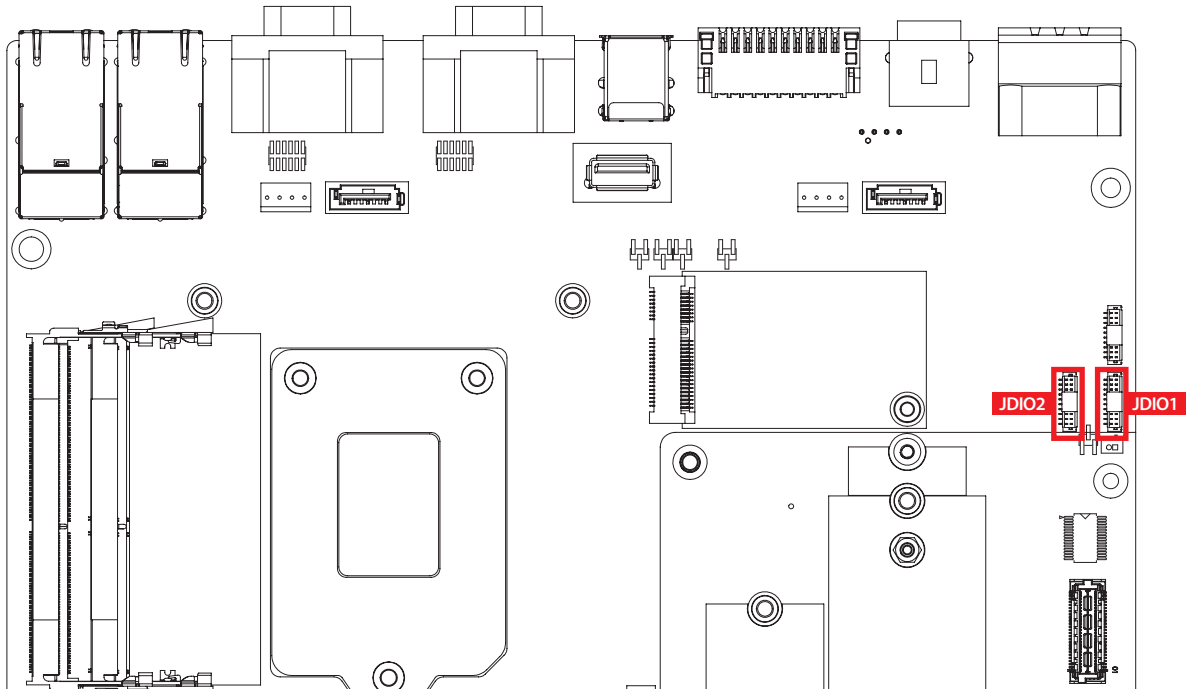
2.4.13 JDEBUG1 : LPC Port 80 Header

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

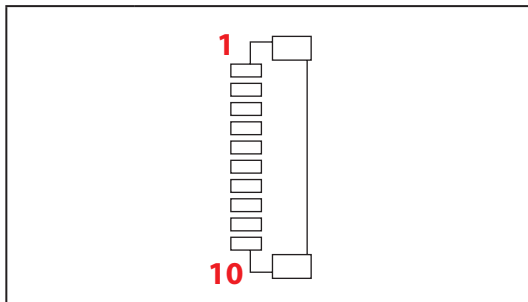



Pin No.	Definition	Pin No.	Definition
1	+3.3V	2	SERIRQ
3	LAD0	4	LAD1
5	LAD2	6	LAD3
7	FRAME#	8	24M_CLK
9	PLTRST#	10	GND

2.4.14 JDIO1, JDIO2 : 8bit-in 8bit-out GPIO Header (only support 3.3V)

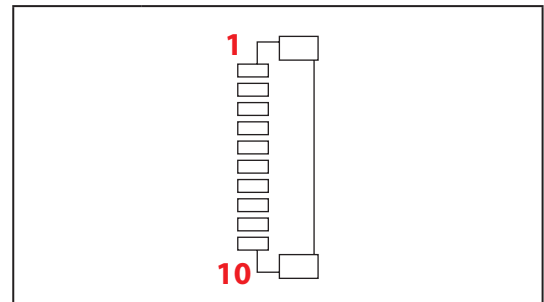


JDIO1 (8bit-in) :



Pin No.	Description
1	GPI_0
2	GPI_1
3	GPI_2
4	GPI_3
5	GPI_4
6	GPI_5
7	GPI_6
8	GPI_7
9	+V3.3_AUX
10	GND

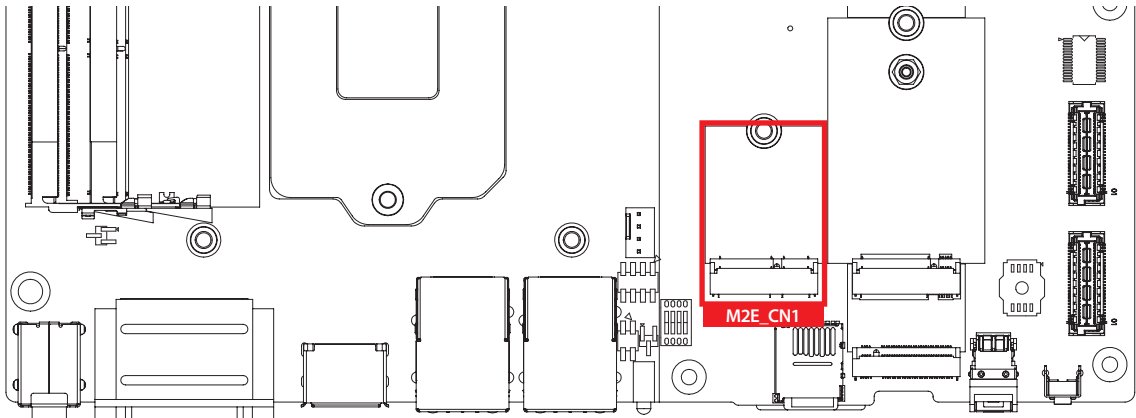
JDIO2 (8bit-out) :



Pin No.	Description
1	GPO_0
2	GPO_1
3	GPO_2
4	GPO_3
5	GPO_4
6	GPO_5
7	GPO_6
8	GPO_7
9	+V3.3_AUX
10	GND

2.4.15 M.2 KEY E : USB 2.0/PCIex1+ Intel CNVI support

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

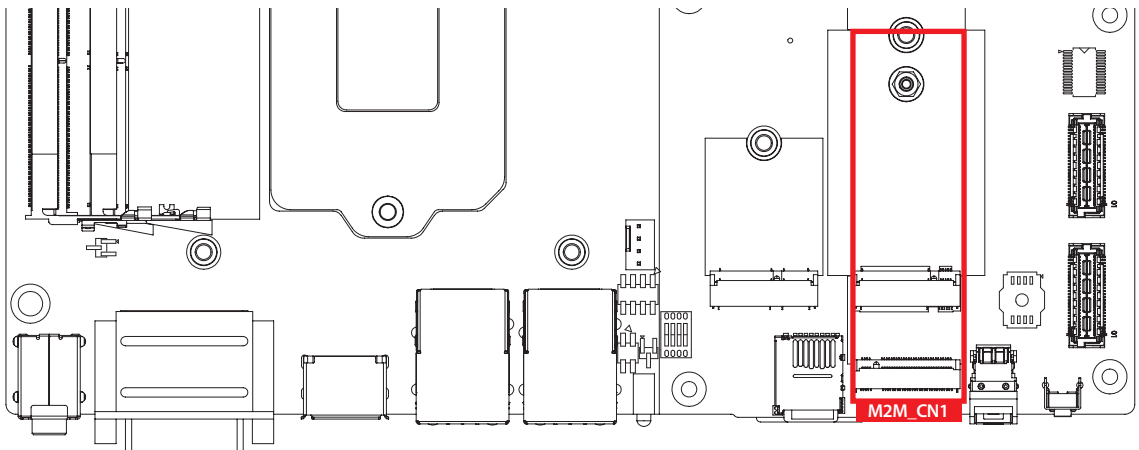


Pin No.	Signal Name	Pin No.	Signal Name
75	GND	74	+V3.3_AUX
73	CNVI_WT_CLK_P	72	+V3.3_AUX
71	CNVI_WT_CLK_N	70	NC
69	GND	68	PCIE_CLK_REQ1#
67	CNVI_WT_D0_P	66	NC
65	CNVI_WT_D0_N	64	M2E_REFCLK
63	GND	62	SMB_ALERT#
61	CNVI_WT_D1_P	60	SMB_CLK
59	CNVI_WT_D1_N	58	SMB_DATA
57	GND	56	M2E_WLAN_DISABLE
55	PCIE_WAKE#	54	M2E_BT_DISABLE
53	PCIE_CLK_REQ0#	52	PLTRST#
51	GND	50	SUS_CLK
49	PCIE_100M_CLK_N	48	CNVI_MFUART2_RXD
47	PCIE_100M_CLK_P	46	CNVI_MFUART2_TXD
45	GND	44	CNVI_BLANKING
43	PCIE_RX_N	42	CL_CLK
41	PCIE_RX_P	40	CL_DATA
39	GND	38	CL_RST_N
37	PCIE_TX_N	36	CNVI_BRI_DT
35	PCIE_TX_P	34	CNVI_RGI_RSP
33	GND	32	CNVI_RGI_DT
Mechanical Key			

Pin No.	Signal Name	Pin No.	Signal Name
23	CNVI_WR_CLK_P		
21	CNVI_WR_CLK_N	22	CNVI_BRI_RSP
19	GND	20	UART_WAKE#
17	CNVI_WR_D0_P	18	GND
15	CNVI_WR_D0_N	16	LED2#
13	GND	14	PCM_BT_OUT
11	CNVI_WR_D1_P	12	PCM_BT_IN
9	CNVI_WR_D1_N	10	PCM_BT_RST
7	GND	8	PCM_BT_CLK
5	USB-	6	LED1#
3	USB+	4	+V3.3_AUX
1	GND	2	+V3.3_AUX

2.4.16 M.2 KEY M : PCIe x4/SATA Support

M.2 key M connector is suitable for applications that use Host I/Fs supported by either PCIe or SATA, or Solid State Storage Devices (SSD). Module card types include 2280.

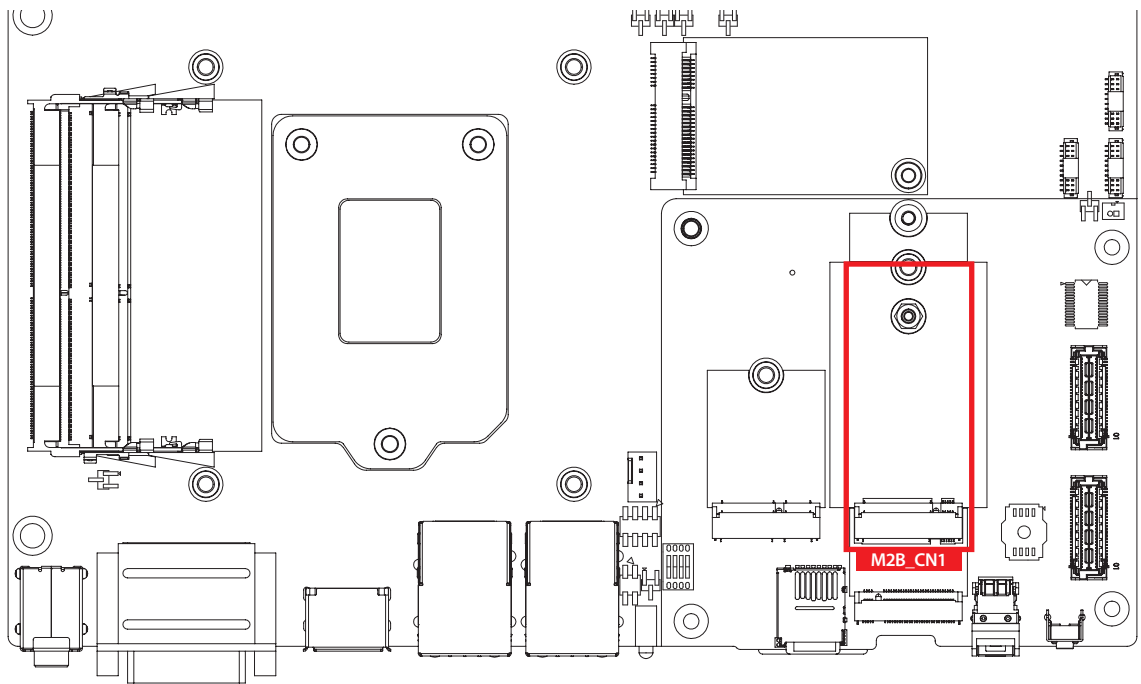


Pin No.	Signal Name	Pin No.	Signal Name
74	3.3V	75	GND
72	3.3V	73	GND
70	3.3V	71	GND
68	SCUSCLK (3.2KHz)(O)(0/3.3V)	69	PEDET (NC-PCIe/GND-SATA)
	Connector Key	67	N/C
	Connector Key		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key

Pin No.	Signal Name	Pin No.	Signal Name
58	N/C		Connector Key
56	N/C	57	GND
54	PEWAKE# (I/O)(O)(0/3.3V) or N/C	55	REFCLKp
52	CLKREQ# (I/O)(O)(0/3.3V) or N/C	53	REFCLKn
50	PERST# (I/O)(O)(0/3.3V) or N/C	51	GND
48	N/C	49	PETp0/SATA-A+
46	N/C	47	PETn0/SATA-A-
44	N/C	45	GND
42	N/C	43	PERp0/SATA-B-
40	N/C	41	PERp0/SATA-B+
38	DEVSLP (O)	39	GND
36	N/C	37	PETp1
34	N/C	35	PETn1
32	N/C	33	GND
30	N/C	31	PERp1
28	N/C	29	PERn1
26	N/C	27	GND
24	N/C	25	PETp2
22	N/C	23	PETn2
20	N/C	21	GND
18	3.3V	19	PERp2
16	3.3V	17	PERn2
14	3.3V	15	GND
12	3.3V	13	PETp3
10	DAS/DDS# (I/O)/LED1# (I) (0/3.3V)	11	PETn3
8	N/C	9	GND
6	N/C	7	PERp3
4	3.3V	5	PERn3
2	3.3V	3	GND
		1	GND

2.4.17 M.2 KEY B : USB 3.0/USB 2.0 Support (default), PCIe2 (BIOS option)

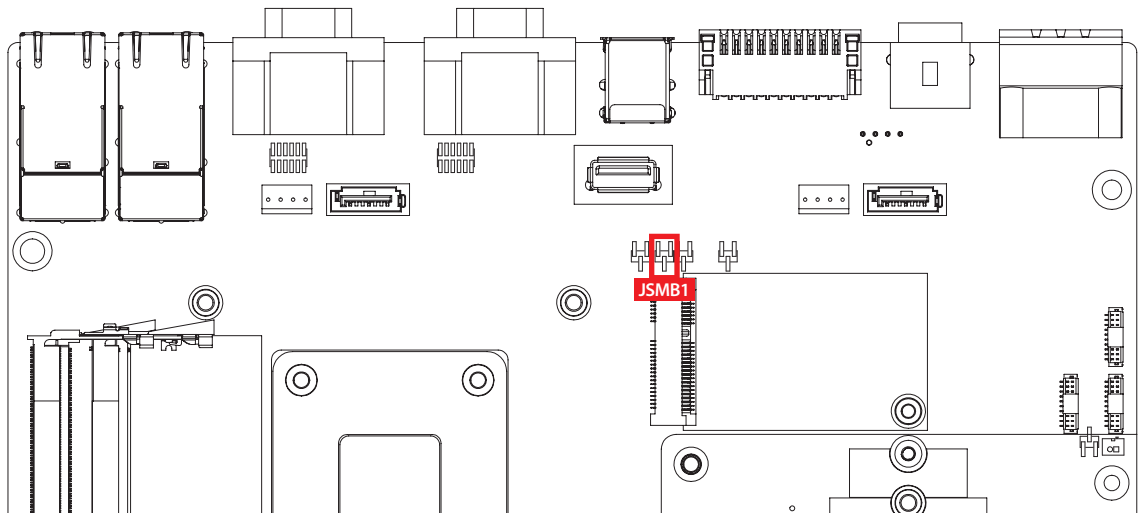
Module card types include 3042,3052.



Pin No.	Signal Name	Pin No.	Signal Name
75	NC	74	+V3.3_AUX
73	GND	72	+V3.3_AUX
71	GND	70	+V3.3_AUX
69	NC	68	NC
67	NC	66	SIM_DETECT
65	NC	64	NC
63	NC	62	NC
61	NC	60	NC
59	NC	58	NC
57	GND	56	NC
55	PCIE_100M_CLK_P	54	PCIE_WAKE#
53	PCIE_100M_CLK_N	52	PCIE_CLK_REQ
51	GND	50	PLTRST#
49	(default)USB_TX_1P, PCIe_TX_1P	48	NC

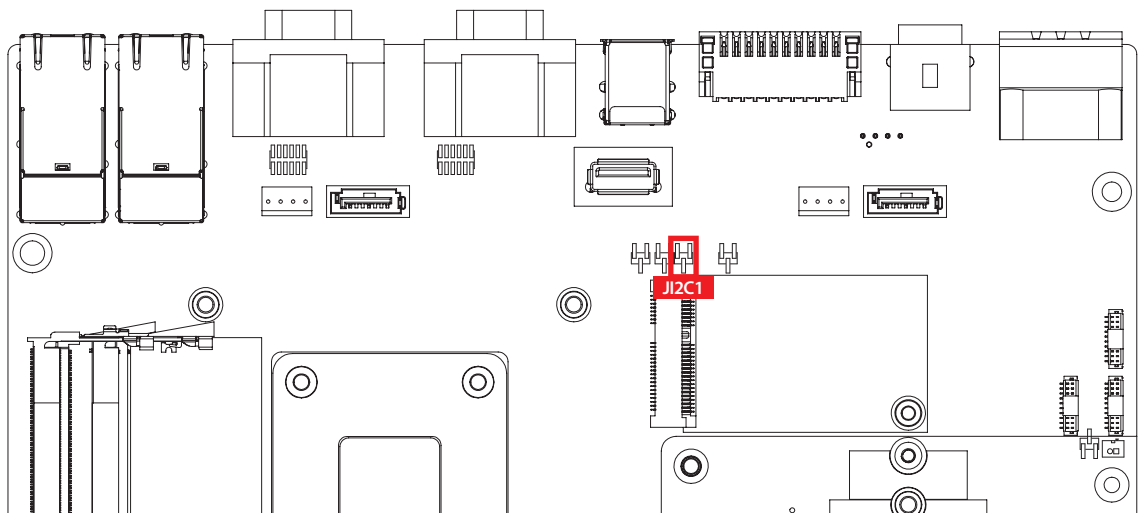
Pin No.	Signal Name	Pin No.	Signal Name
47	(default)USB_TX_1N, PCIe_TX_1N	46	NC
45	GND	44	NC
43	(default)USB_RX_1P, PCIe_RX_1P	42	NC
41	(default)USB_RX_1N, PCIe_RX_1N	40	NC
39	GND	38	DEVSLP
37	(default)USB_TX_2P, PCIe_TX_2P	36	UIM_PWR
35	(default)USB_TX_2N, PCIe_TX_2N	34	UIM_DATA
33	GND	32	UIM_CLK
31	(default)USB_RX_2P, PCIe_RX_2P	30	UIM_RESET
29	(default)USB_RX_2N, PCIe_RX_2N	28	NC
27	GND	26	NC
25	NC	24	NC
23	NC	22	NC
21	NC	20	NC
Mechanical Key			
11	GND		
9	USB-	10	LED1#
7	USB+	8	W_DISABLE#
5	GND	6	FULL_CARD_PWR_OFF
3	GND	4	+V3.3_AUX
1	NC	2	+V3.3_AUX

2.4.18 JSMB1 : MBUS Header



	Pin No.	Function
	1	SMB_CLK
	2	SMB_DAT
	3	GND

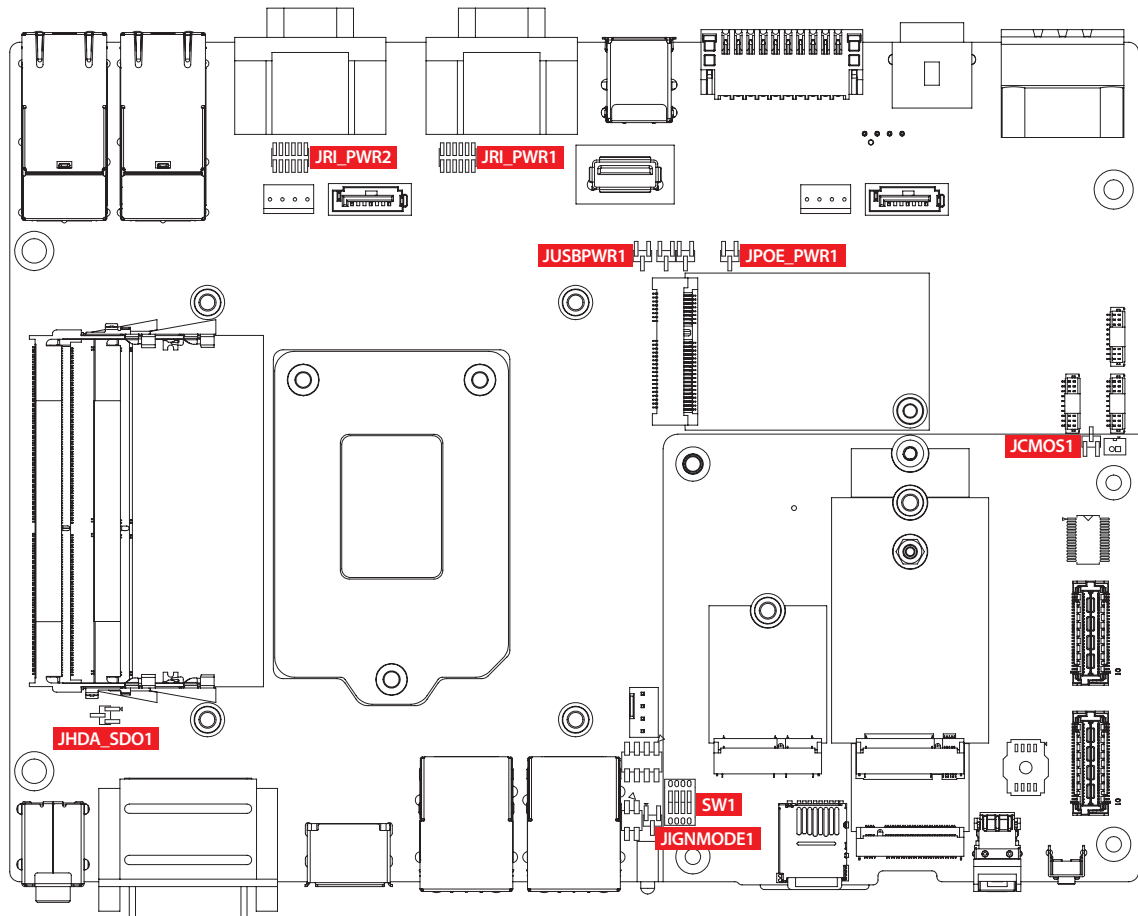
2.4.19 JI2C1 : I2C Header



	Pin No.	Function
	1	I2C_CLK
	2	I2C_DAT
	3	GND

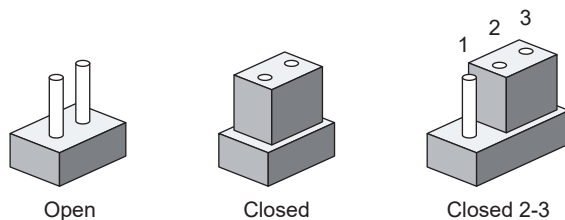
2.5 Main Board Jumper Settings

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

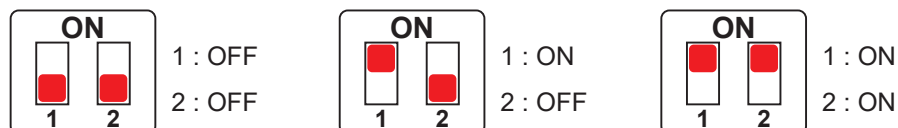


The figure below is the top view of the system main board. It shows the location of the jumpers and the switches.

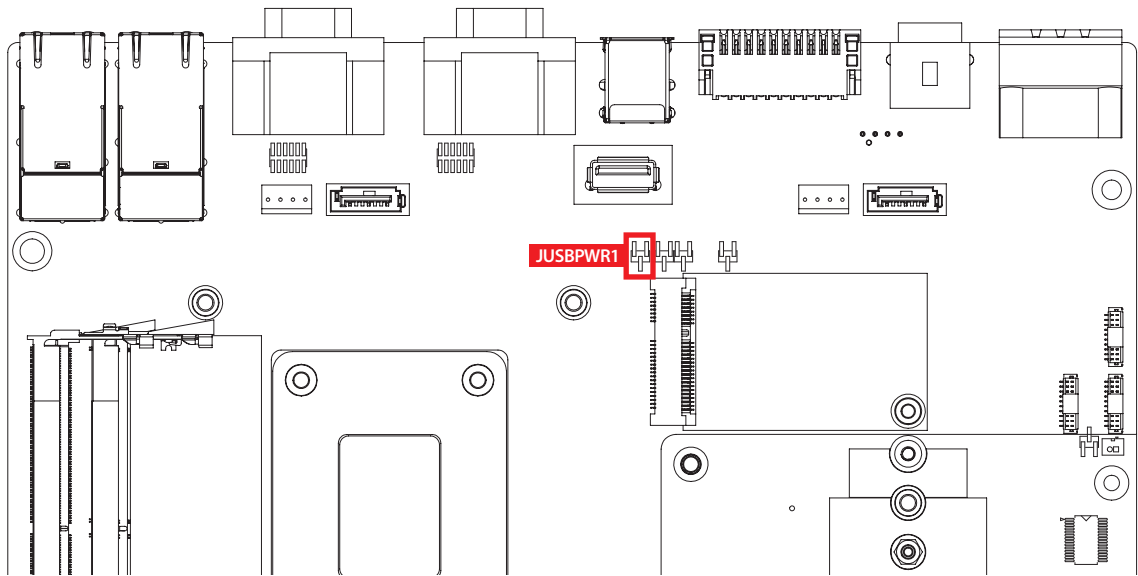
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, 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.



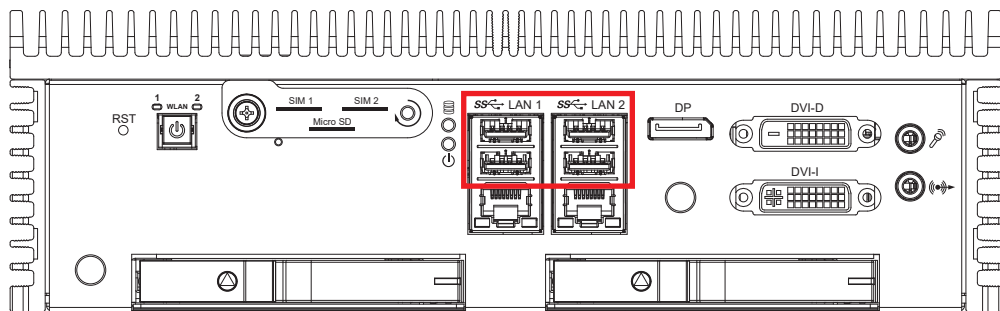
You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.



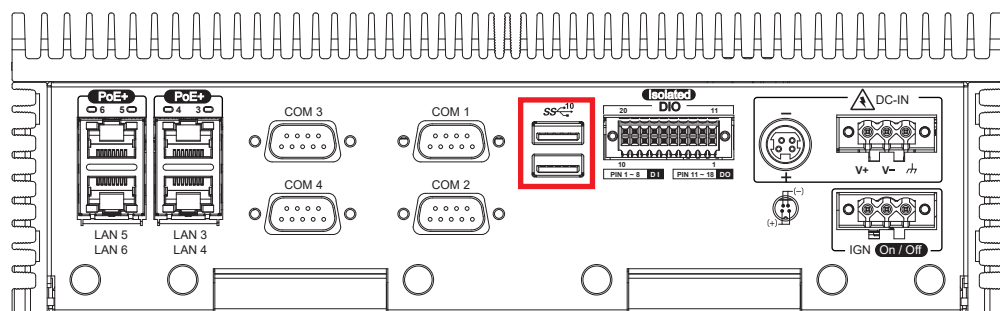
2.5.2 JUSBPWR1 : USB Wake Up



Front Plane View

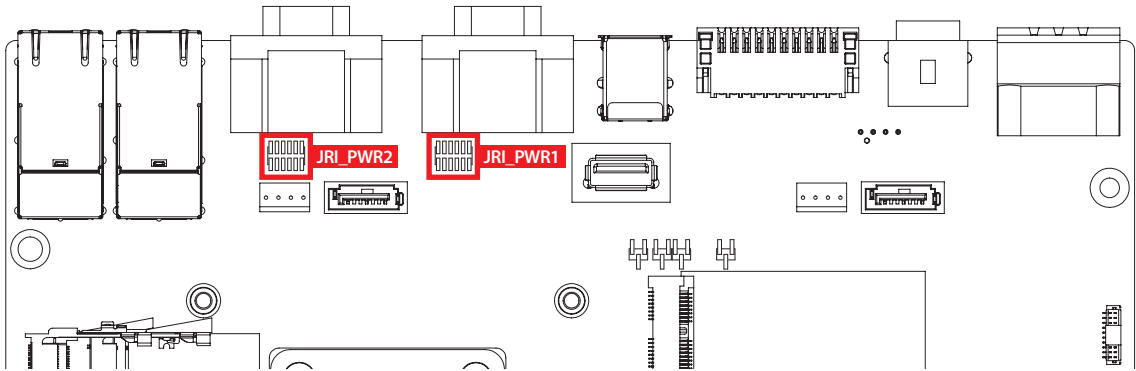


Rear Plane View



Jumper	Setting	Function
JSBPWR1	2:3	Non Wake Up support
JSBPWR1	1:2	Supported Wake Up (Default)

2.5.3 JRI_PWR1, JRI_PWR2 : COM Port RI pin Select



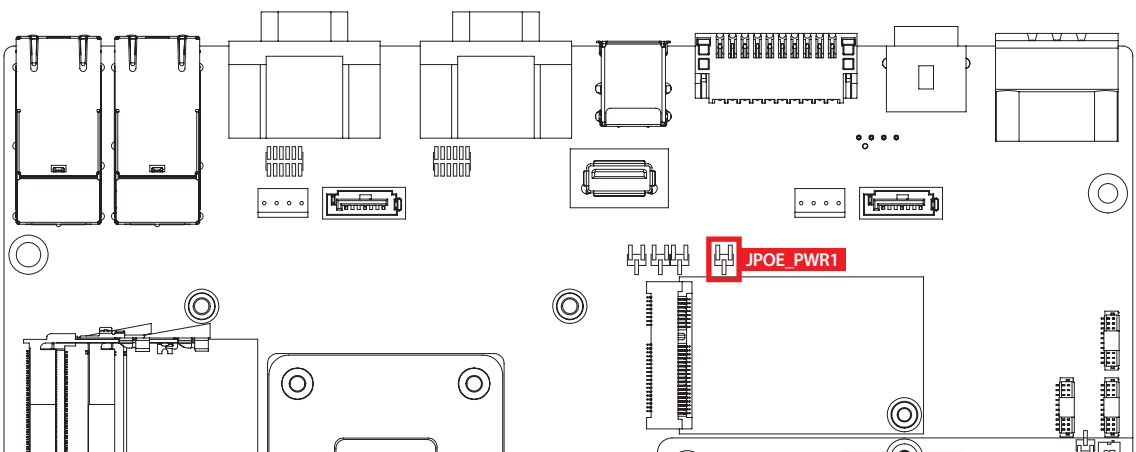
JRI_PWR1

Pin No.	Description	COM Port
1 - 2	+5V (1A max.)	COM1
3 - 4	+12V (0.5A max.)	
5 - 6	RI (Default)	
7 - 8	+5V (1A max.)	COM2
9 - 10	+12V (0.5A max.)	
11 - 12	RI (Default)	

JRI_PWR2

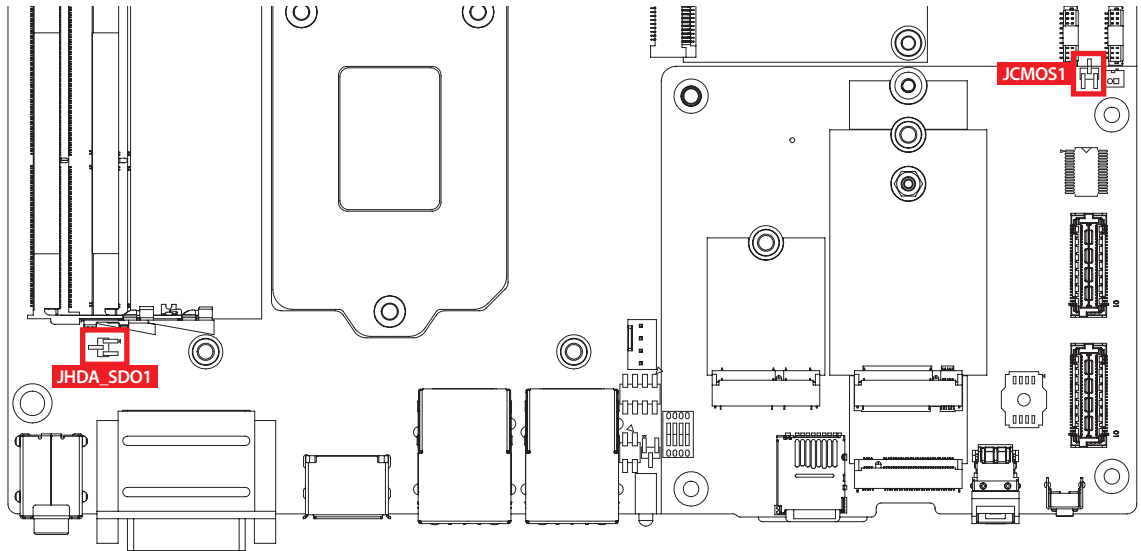
Pin No.	Description	COM Port
1 - 2	+5V (1A max.)	COM3
3 - 4	+12V (0.5A max.)	
5 - 6	RI (Default)	
7 - 8	+5V (1A max.)	COM4
9 - 10	+12V (0.5A max.)	
11 - 12	RI (Default)	

2.5.4 JPOE_PWR1 : PoE Power ON Select

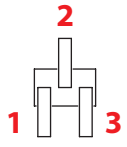


Setting	Function
1 - 2	PoE power on at standby power ready
2 - 3	PoE power on after system power on (Default)
No Jumper	Disable PoE power

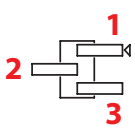
2.5.5 JCMOS1, JHDA_SDO1 : CMOS & ME Flash



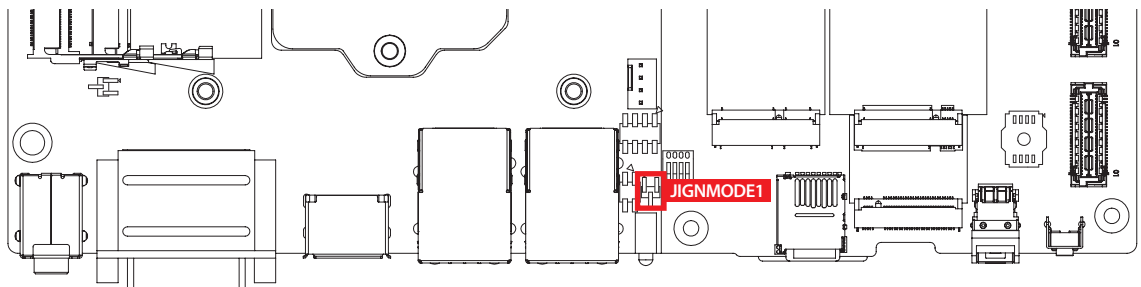
JCMOS1 :

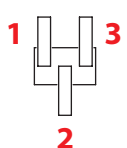
	Setting	Function
		1 - 2
	2 - 3	Clear CMOS

JHDA_SDO1 :

	Setting	Function
		1 - 2
	2 - 3	Disable Flash Descriptor Security (Flash ME)

2.5.6 JIGNMODE1 : IGNITION Mode



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

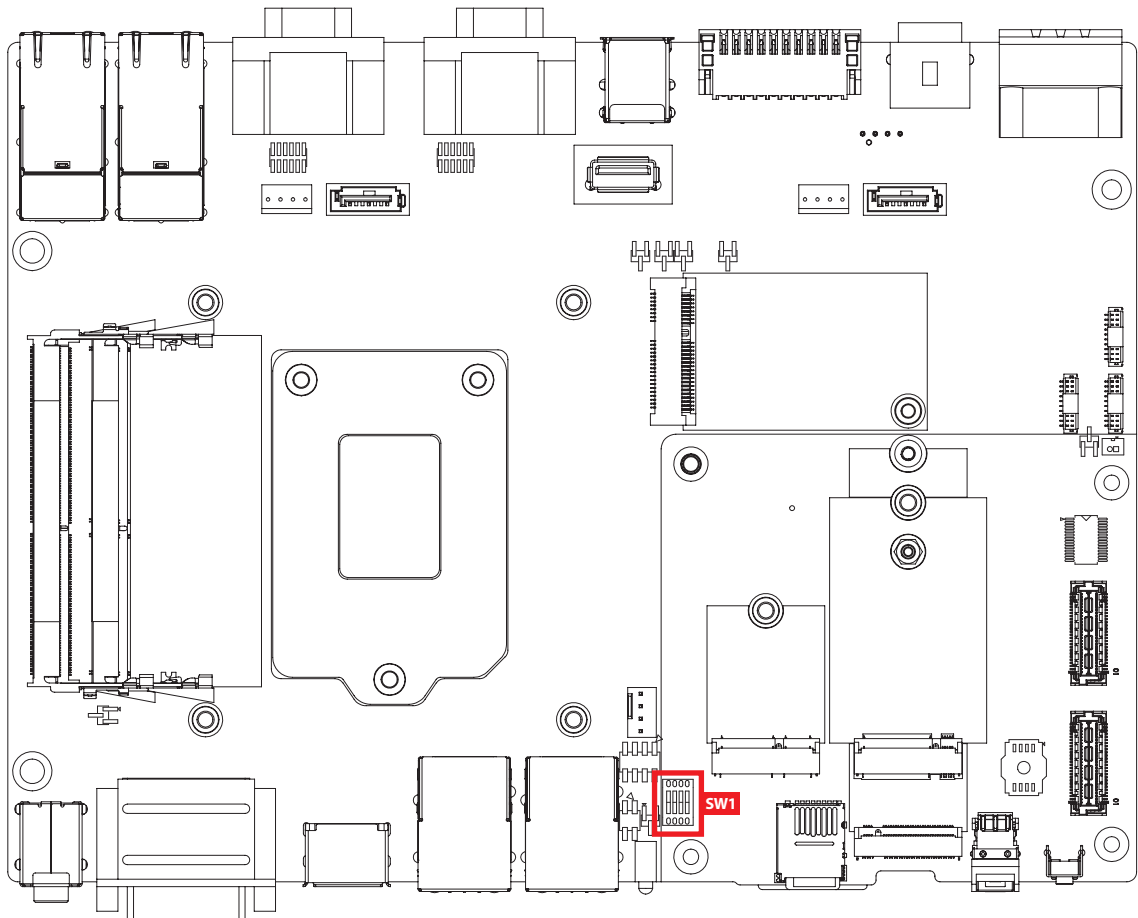
2.6 Ignition Control

ECX-2000 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.

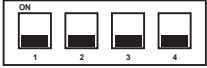

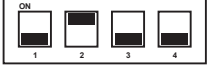
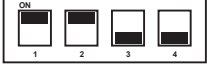
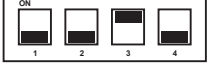
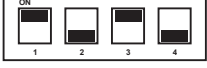
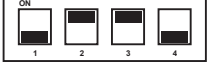
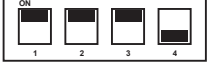

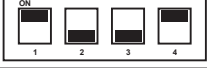
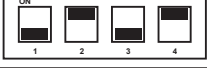
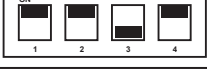
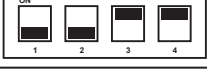
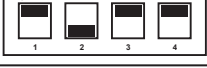
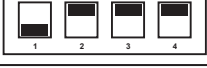
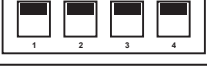
2.6.1 Adjust Ignition Control Modes

ECX-2000 series provides 16 modes of different power on/off delay periods adjustable via SW1 switch. The default switch is set to 0 in ATX/AT power mode.

SW1 : Ignition Control



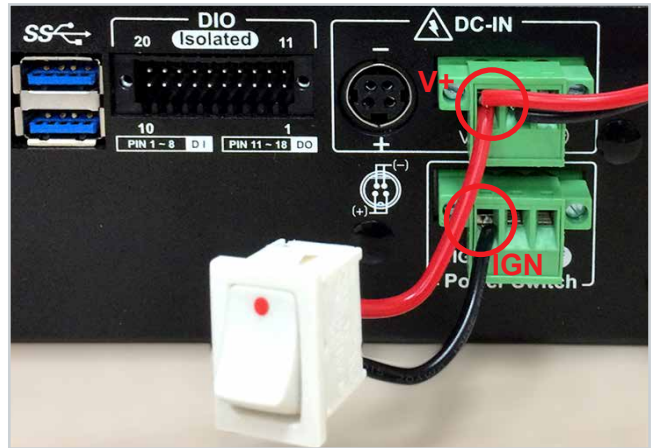
The modes are listed in below table :

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

2.6.2 Ignition Control Wiring

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

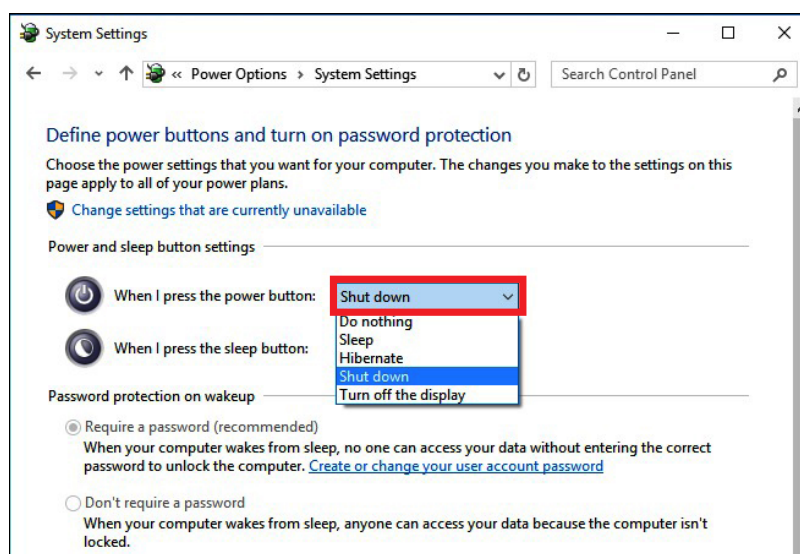
Pin No.	Definition
1	Ignition (IGN)
2	SW+
3	SW-



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-2000 supports 9V to 50V wide range DC power input in ATX/AT mode. In Ignition mode, the input voltage such as the wide voltage operating range of the system is 9V to 50V DC.
3. For proper ignition control, the power button setting should be "Power Down" mode.



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

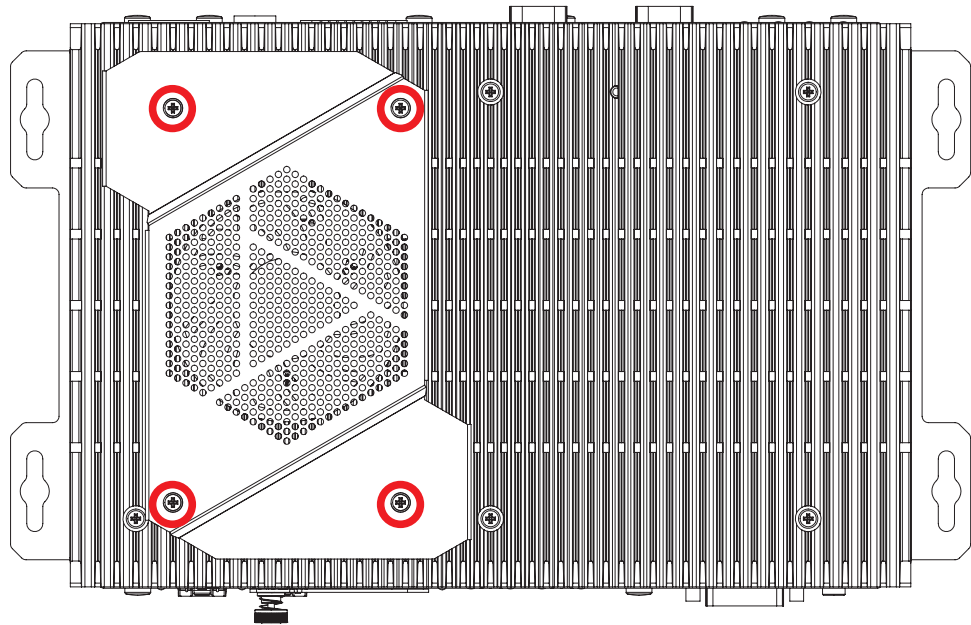
3

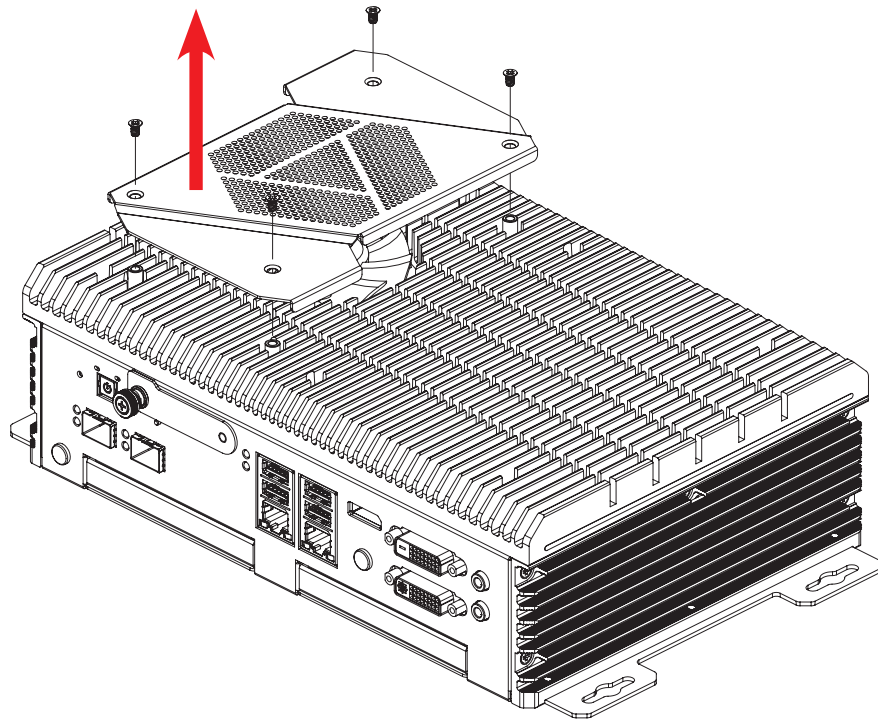
SYSTEM SETUP

3.1 How to Open Your ECX-2000

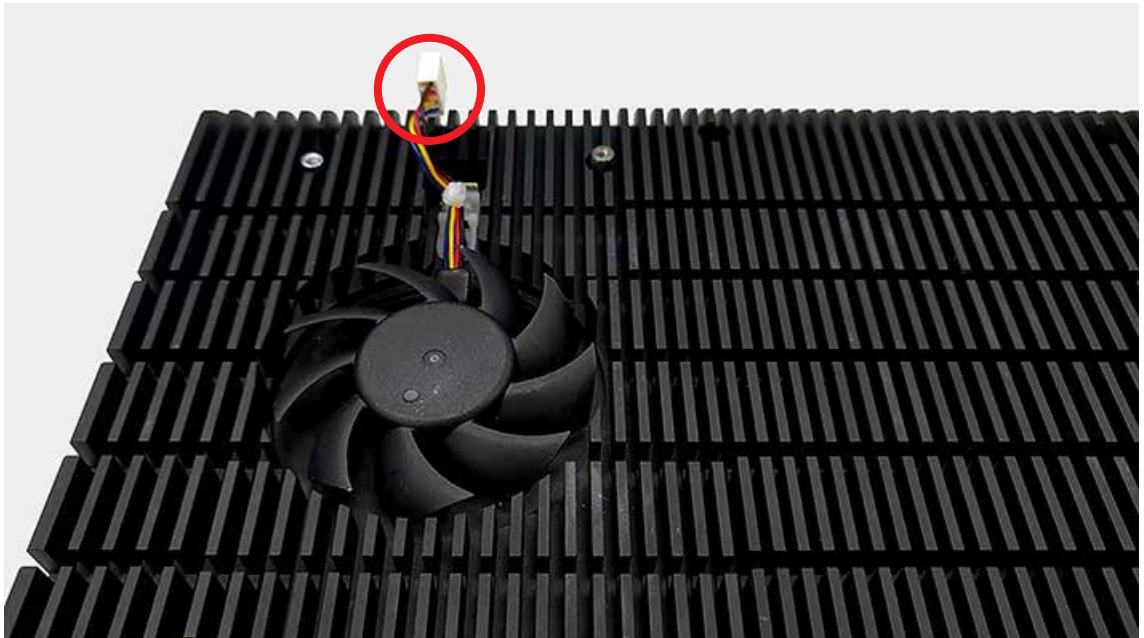
3.1.1 ECX-2025FR/ECX-2025F/ECX-2000F-PoER/ECX-2000F-PoE/
ECX-2000F-6FR/ECX-2000F-6F/ECX-2000F-4R/ECX-2000F-4G/
ECX-2000F-2R/ECX-2000F-2G/ECX-2055FR/ECX-2055F/
ECX-2071FR/ECX-2071F

Step 1 Remove four flat head M3x5L screws and take out cover fan.

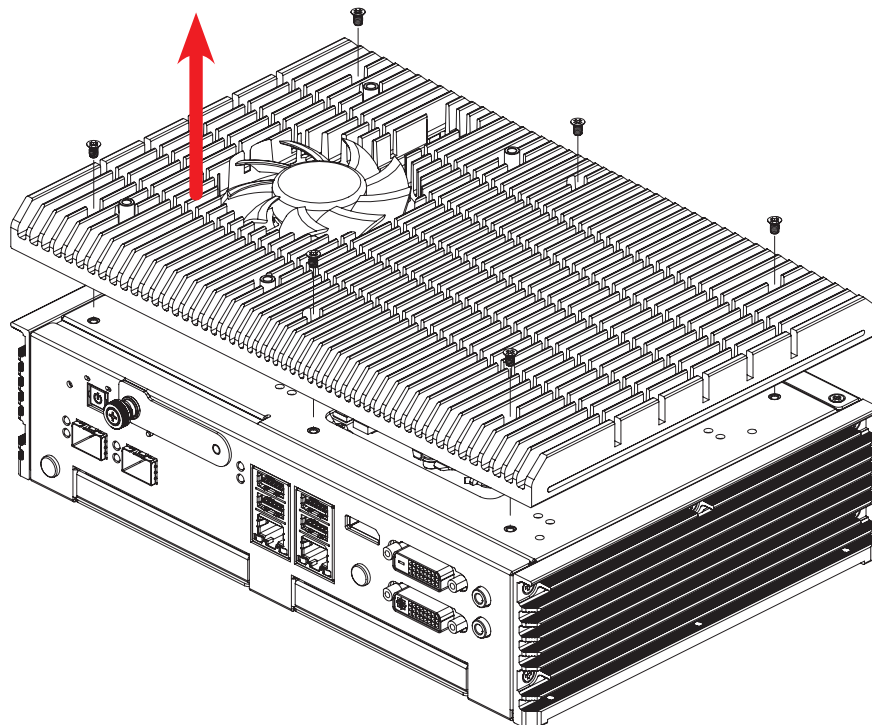
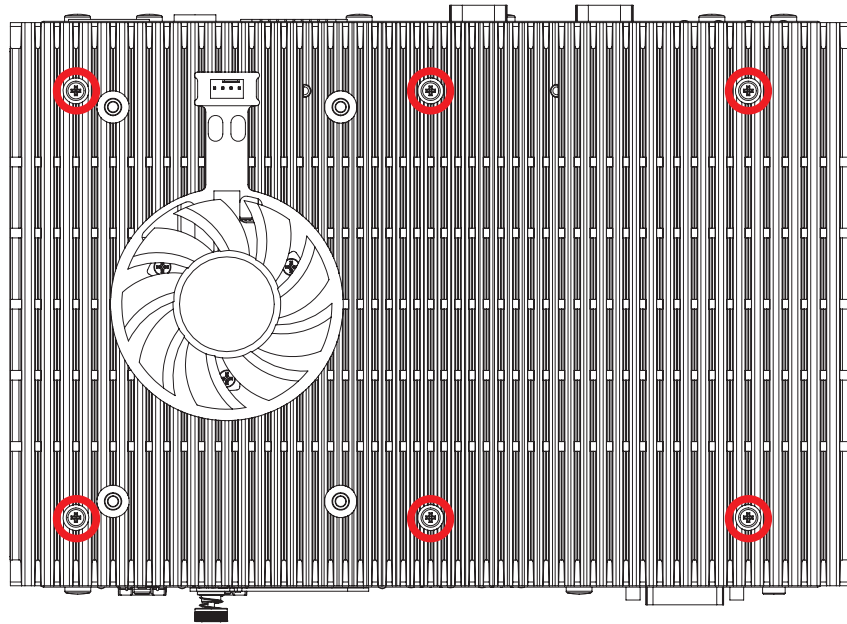




Step 2 Remove plug fan.

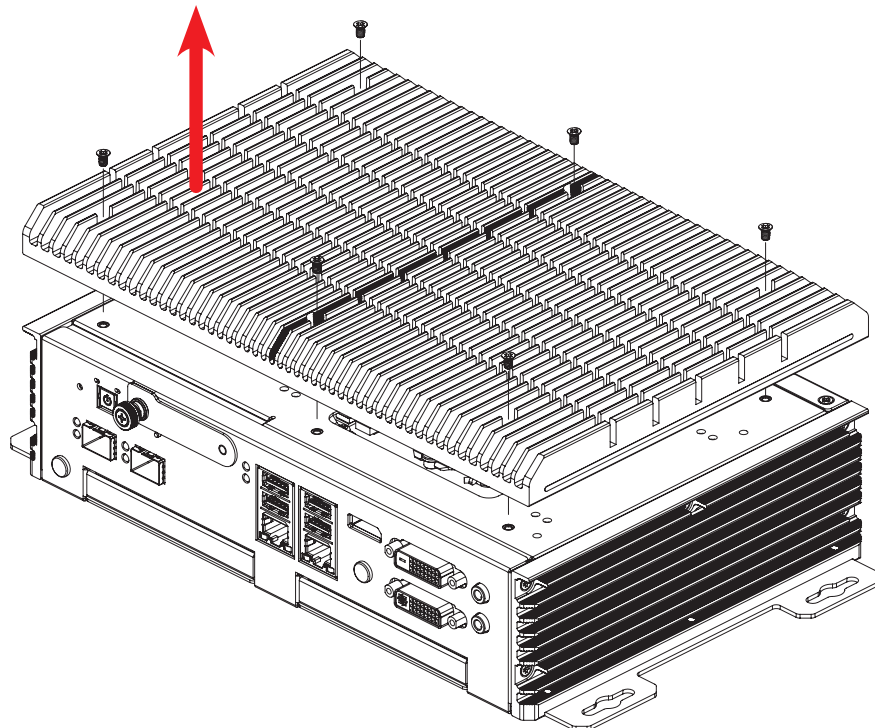
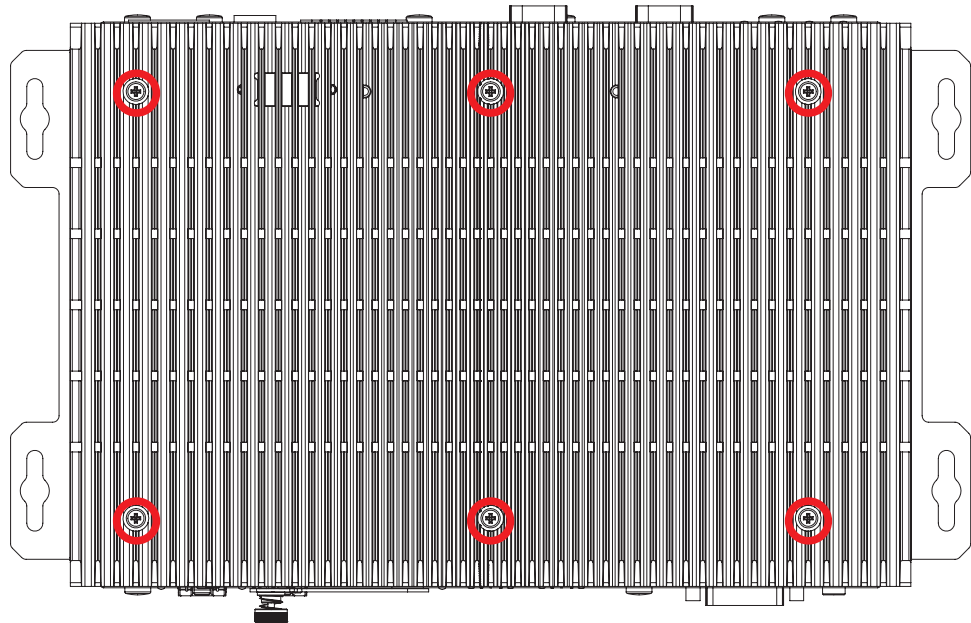


Step 3 Remove six flat head M3x5L screws and take out cooler.



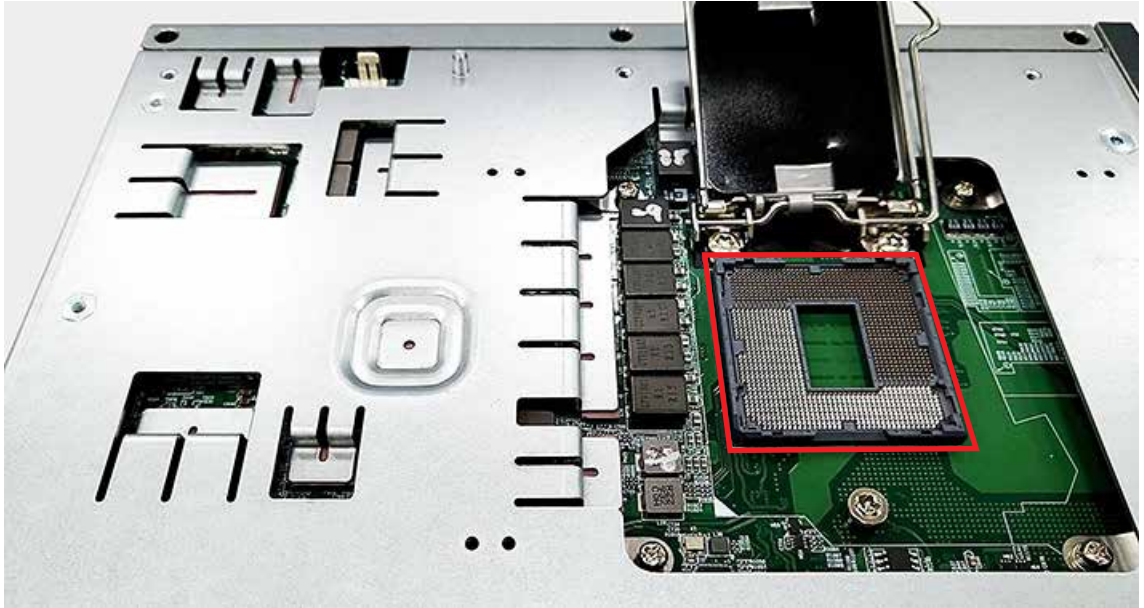
3.1.2 ECX-2025R/ECX-2025/ECX-2000-PoER/ECX-2000-PoE/ ECX-2000-6FR/ECX-2000-6F/ECX-2000-4R/ECX-2000-4G/ ECX-2000-2R/ECX-2000-2G/ECX-2055R/ECX-2055/ ECX-2071R/ECX-2071

Step 1 Remove six Flat head M3x5L screws and Take out Heat Sink.

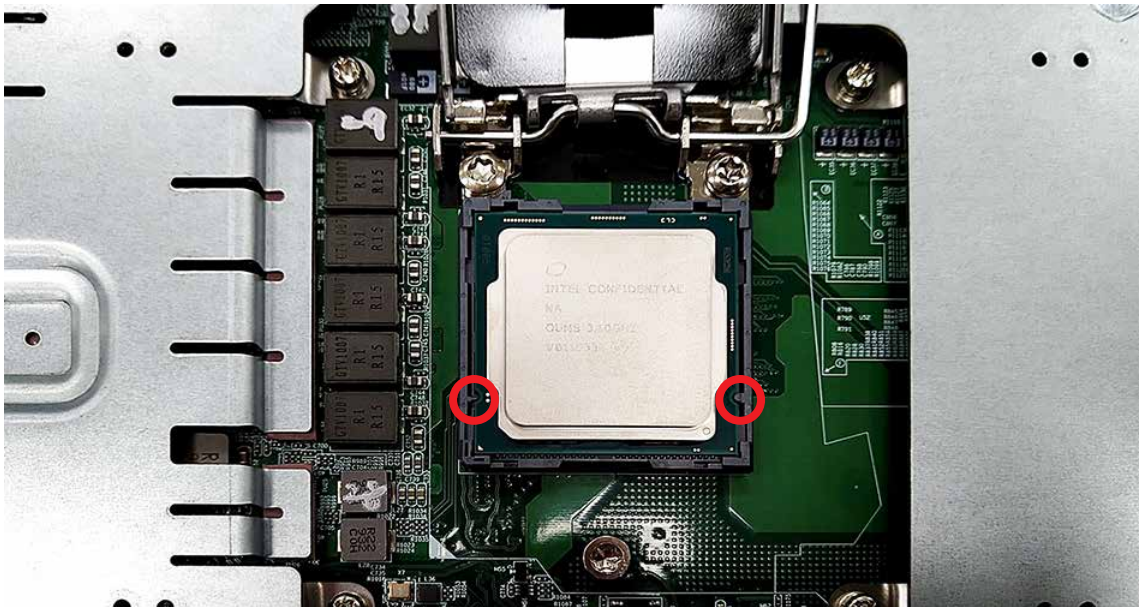


3.2 Installing CPU

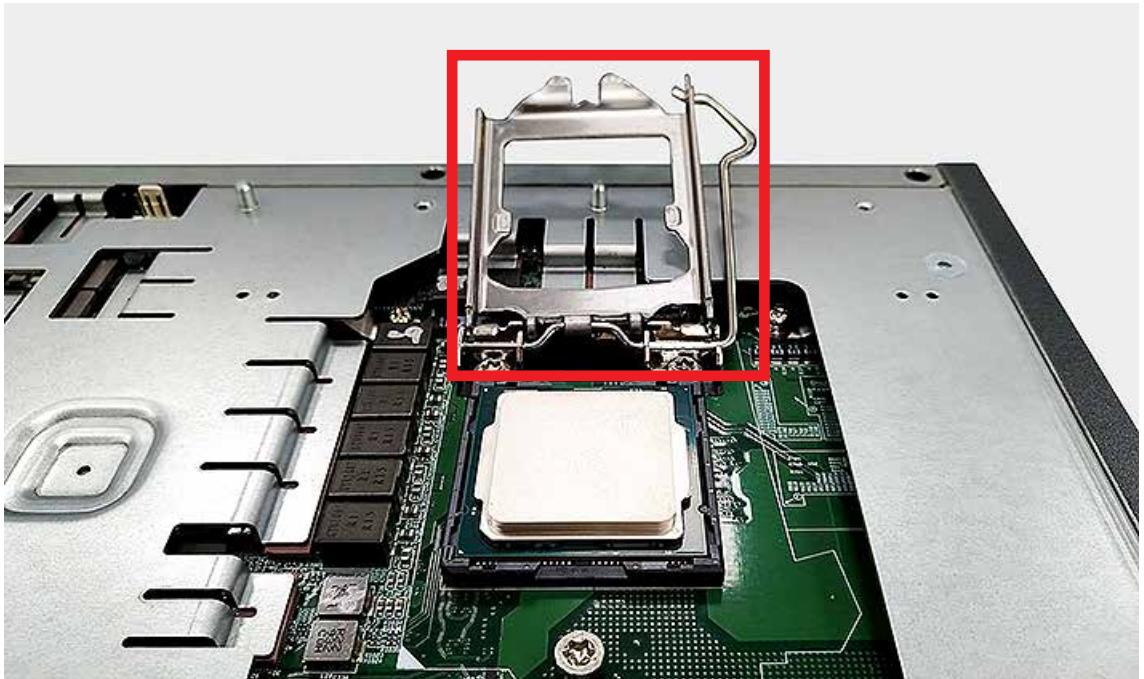
Step 1 Open CPU Independent Loading Mechanism (ILM)



Step 2 Install CPU. (Be careful CPU pin)



Step 3 Remove the mylar.

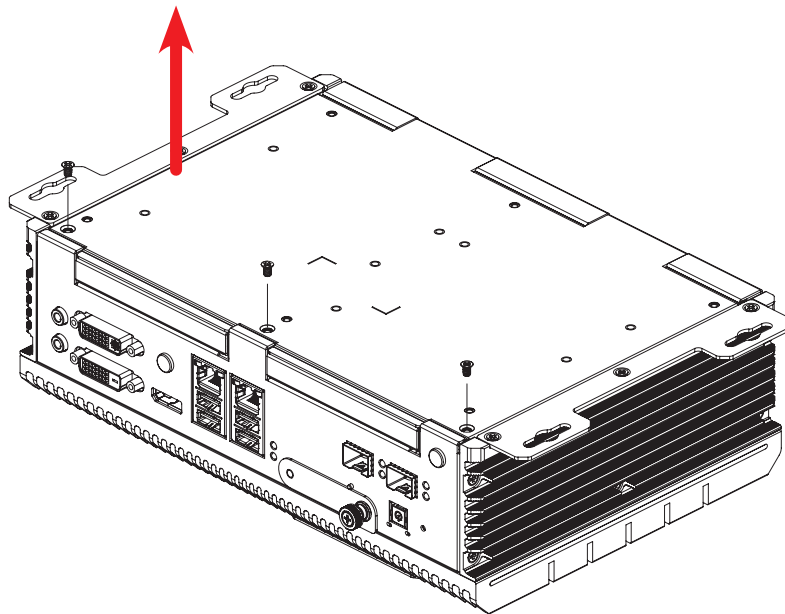
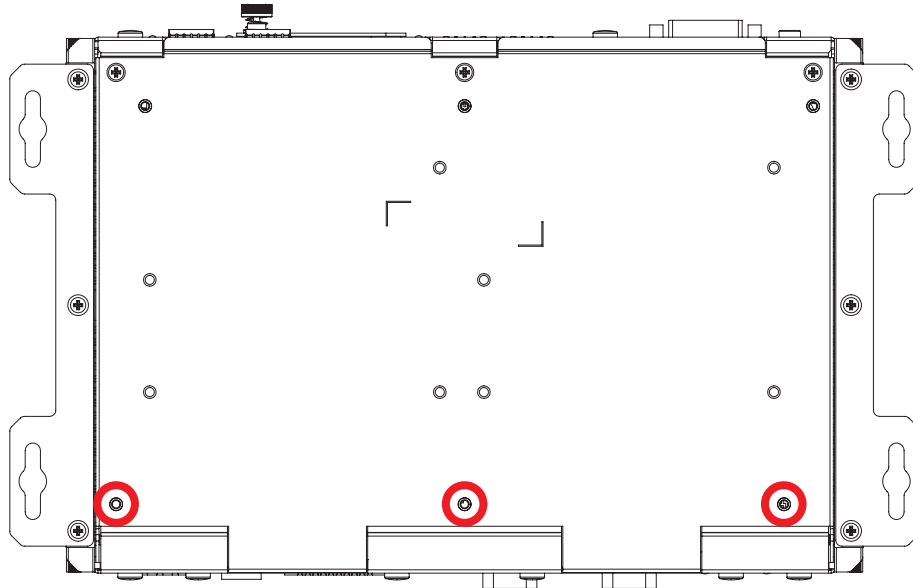


Step 4 Close CPU Independent Loading Mechanism (ILM) and finish.

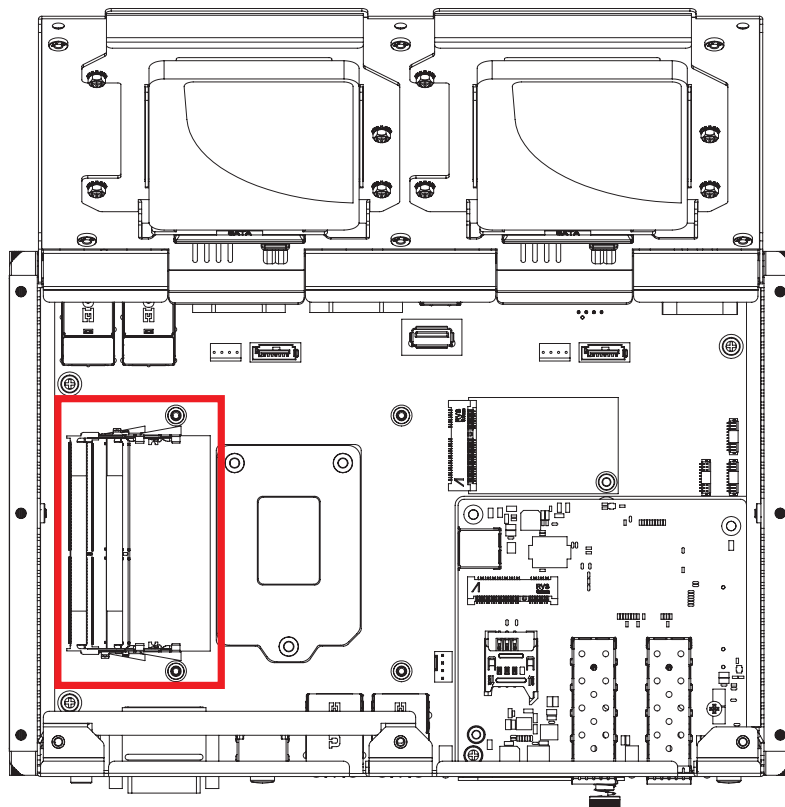
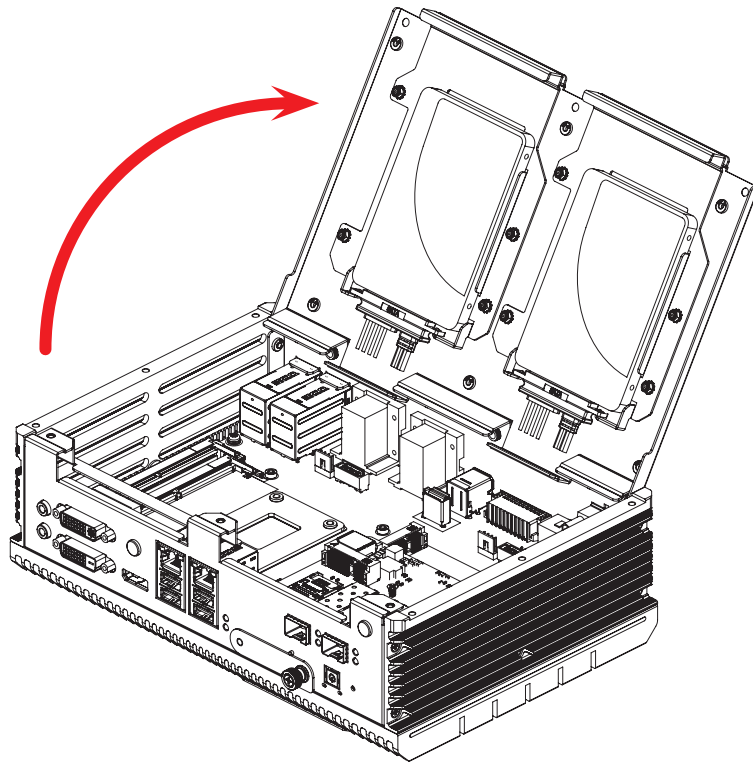


3.3 Installing DDR4 SO-DIMM Modules

Step 1 Remove three flat head M3x5L screws.



Step 2 Open Cover_Bottom.



Step 3 Install DDR4 RAM module into SO-DIMM socket.

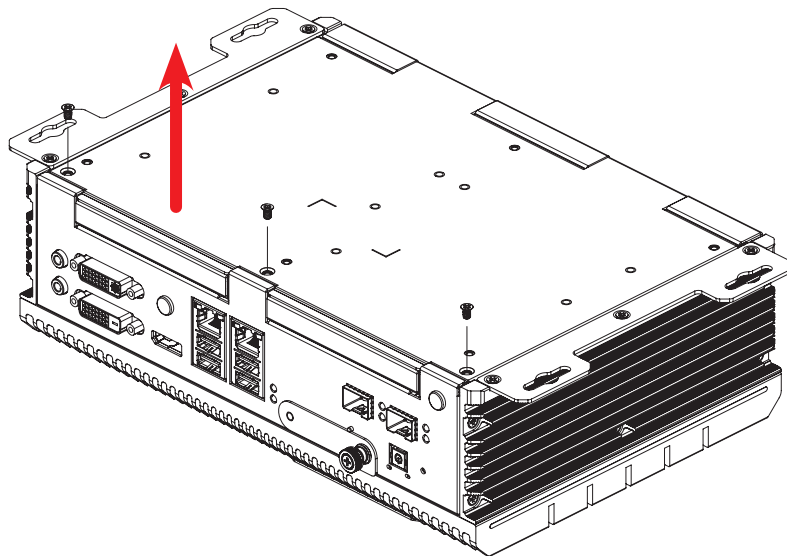
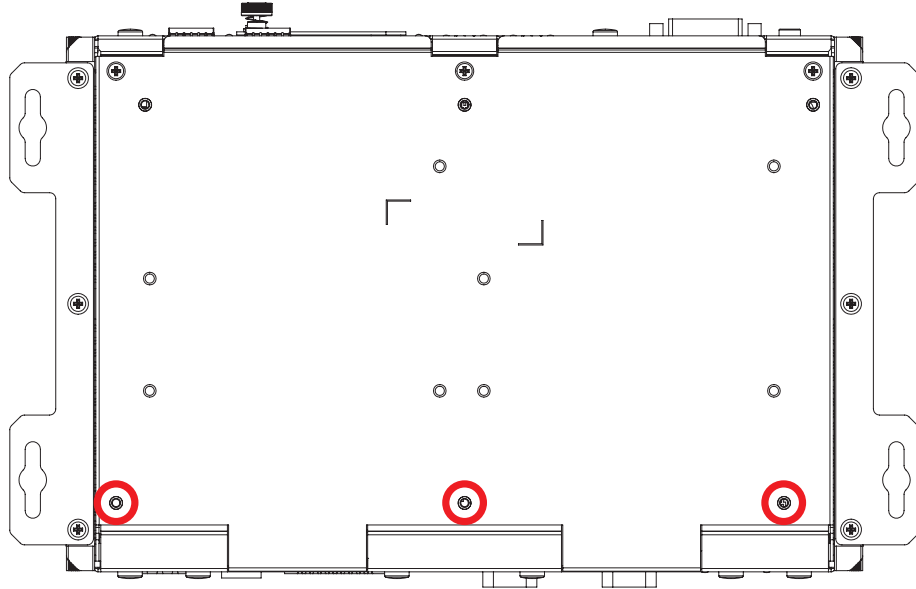


Step 4 Install DDR4 RAM module into SO-DIMM socket.

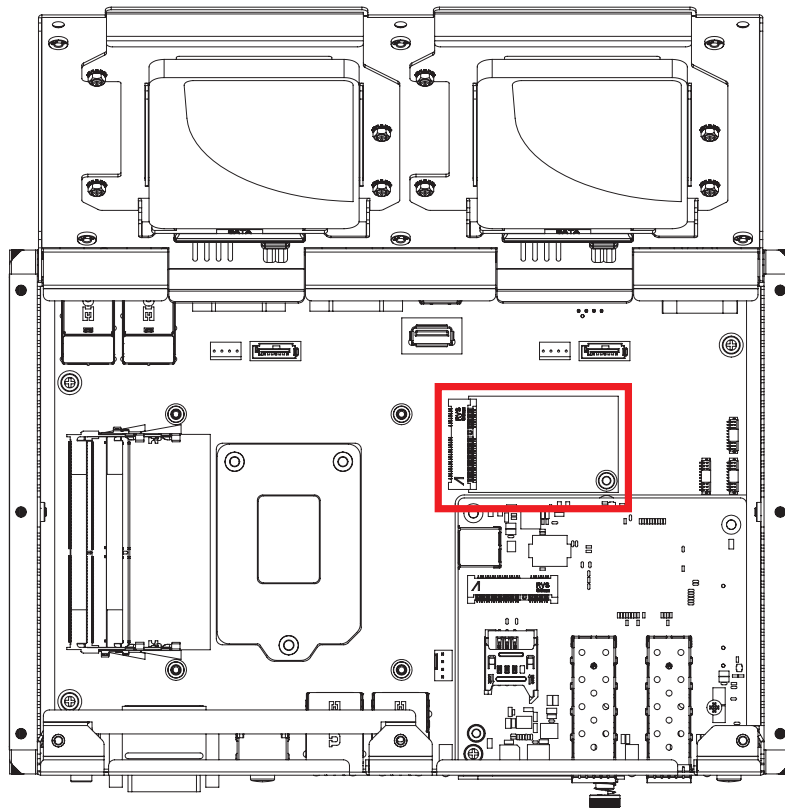
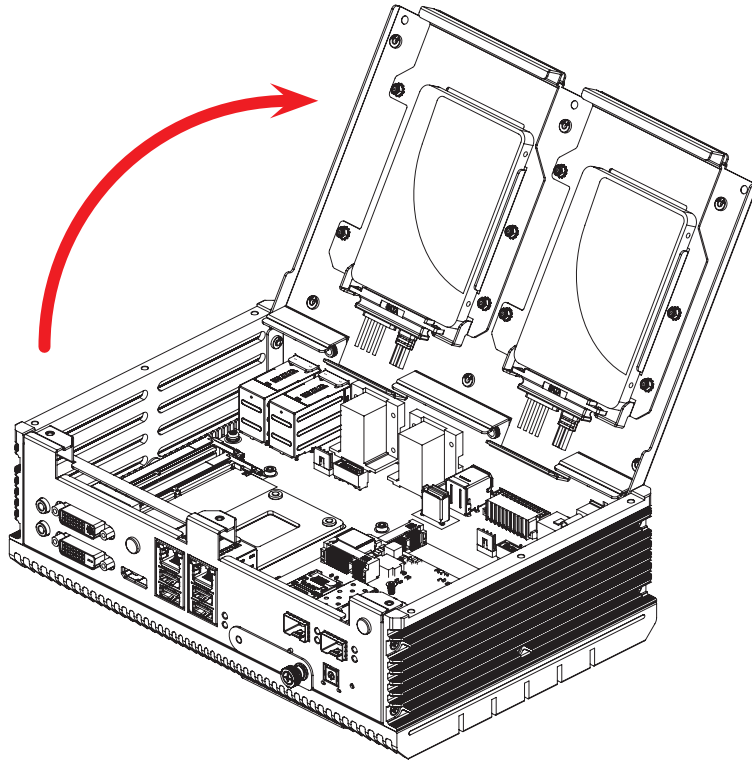


3.4 Installing Mini PCIe Card

Step 1 Remove three flat head M3x5L screws.



Step 2 Open cover bottom.



Step 3 Install mini PCIe card into slot.

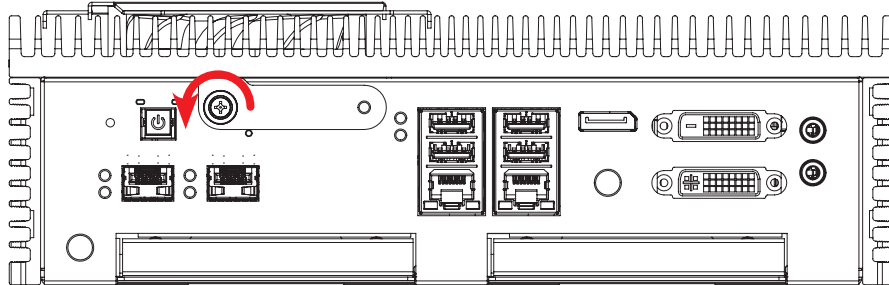


Step 4 Fasten one PHILLIPS M2.5 screw.

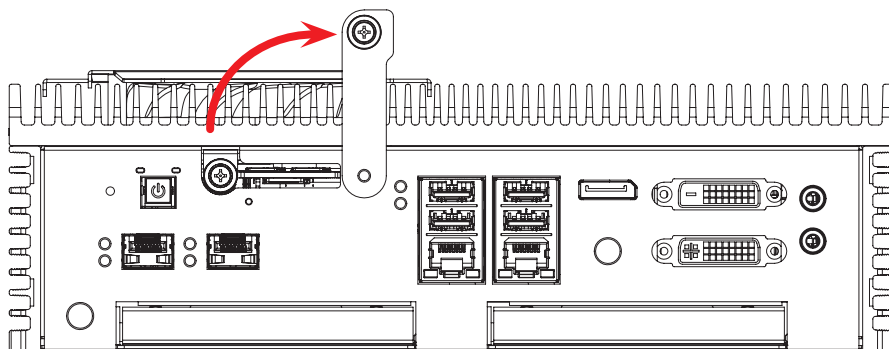


3.5 Installing Nano SIM Card

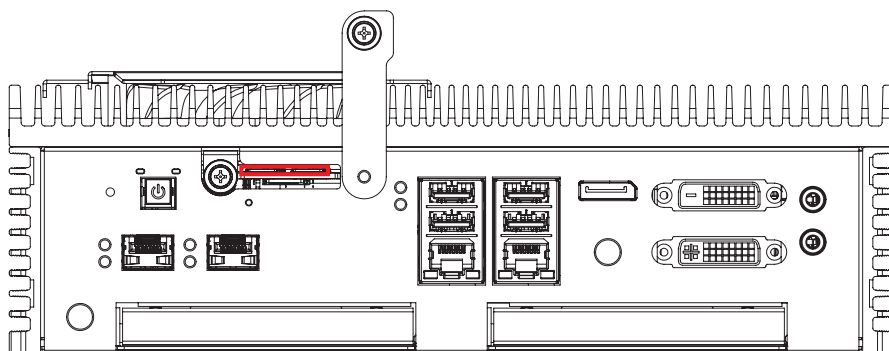
Step 1 Release captive panel screw.



Step 2 Rotate cover card and open.

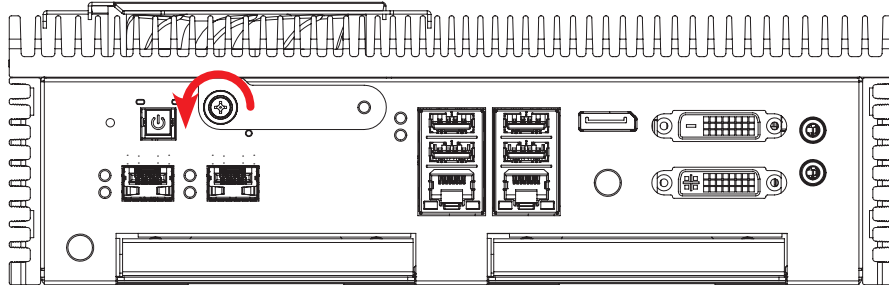


Step 3 Insert Nano SIM card and push to lock.

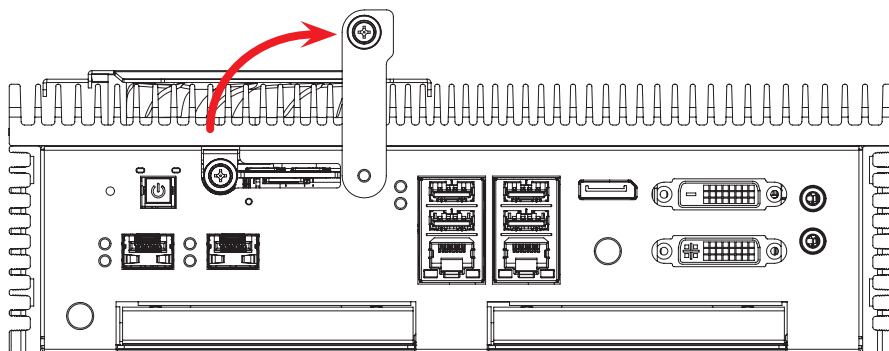


3.6 Installing Micro SD Card

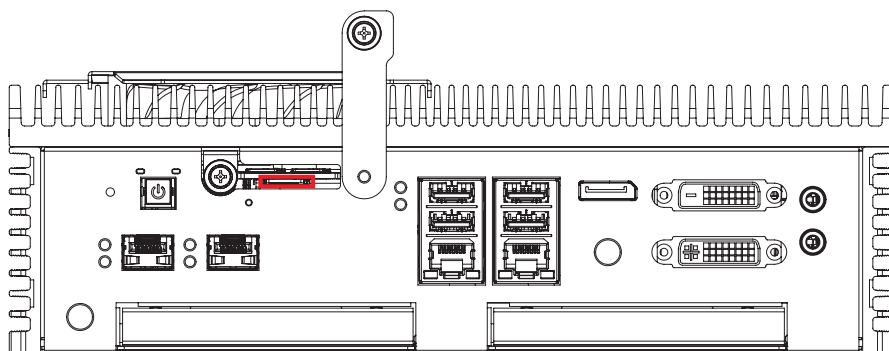
Step 1 Release captive panel screw.



Step 2 Rotate cover card and open.



Step 3 Insert Micro SD card and push to lock.



3.7 Installing SSD/HDD

3.7.1 ECX-2000-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.

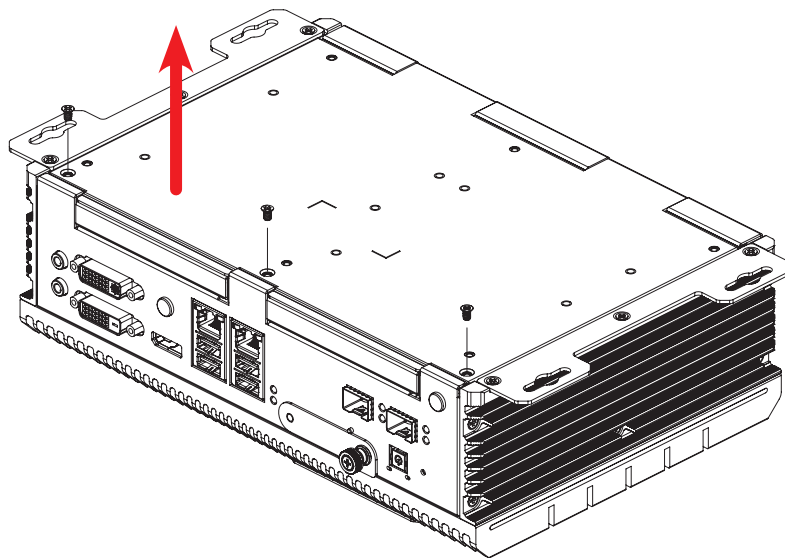
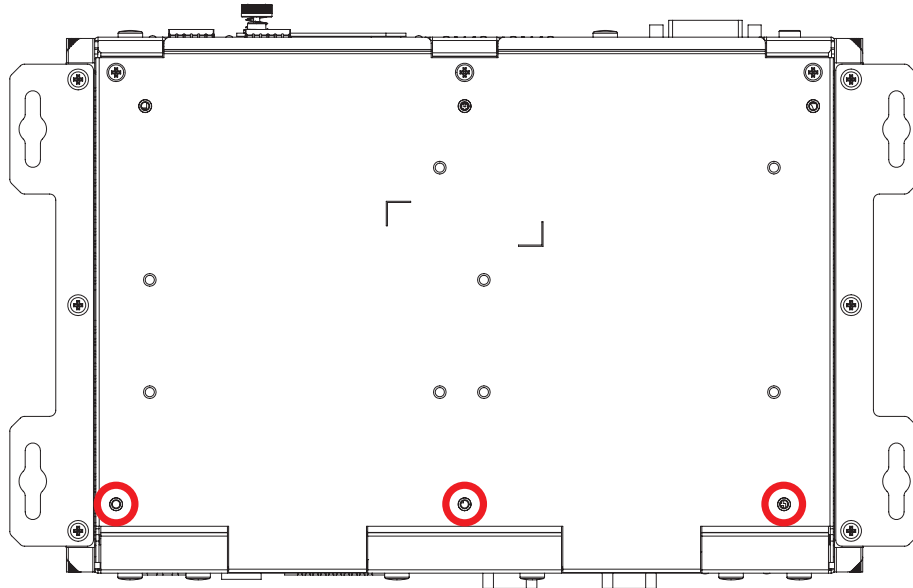


Step 4 Lock the SSD/HDD tray with key.

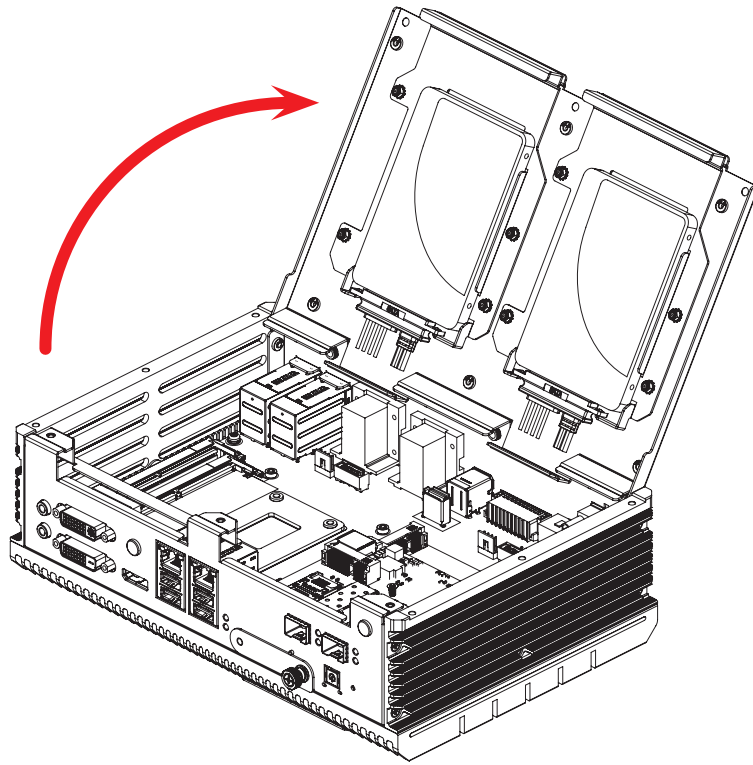


3.7.2 ECX-2000 Series

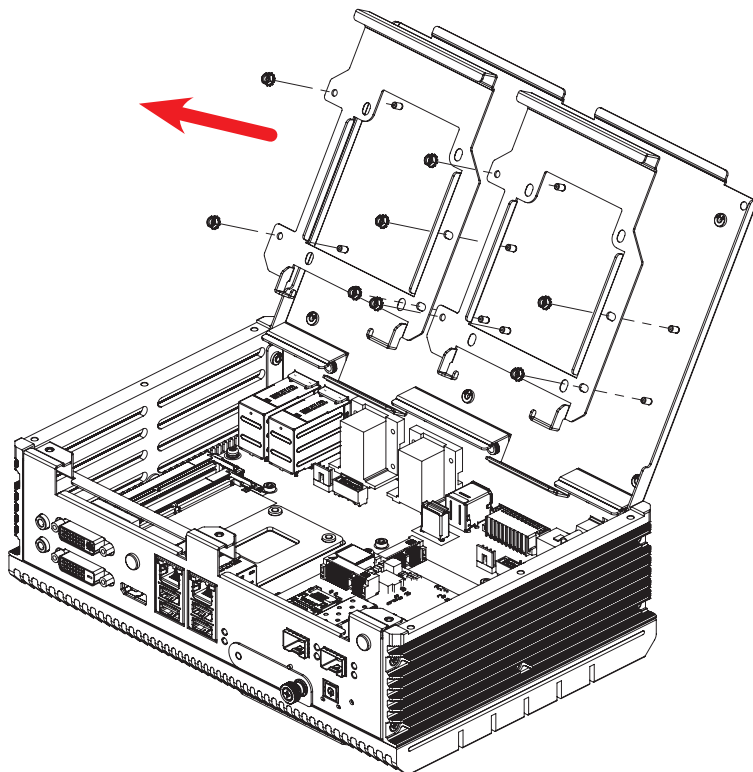
Step 1 Remove three flat head M3x5L screws.



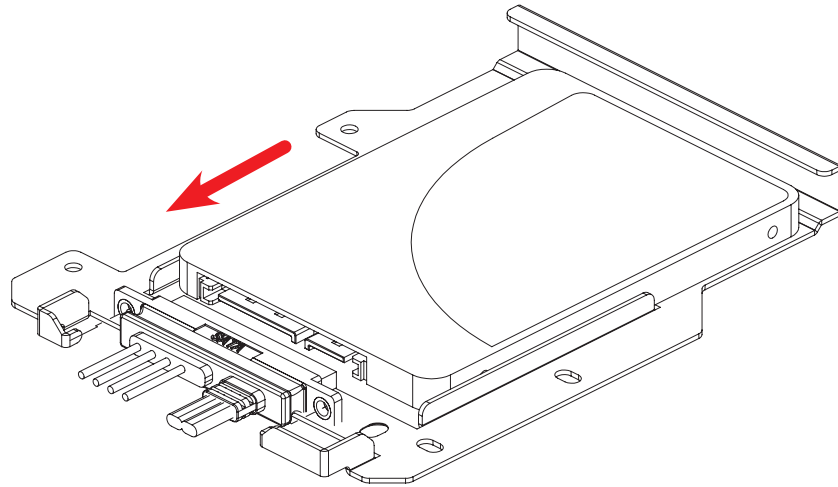
Step 2 Open cover bottom.



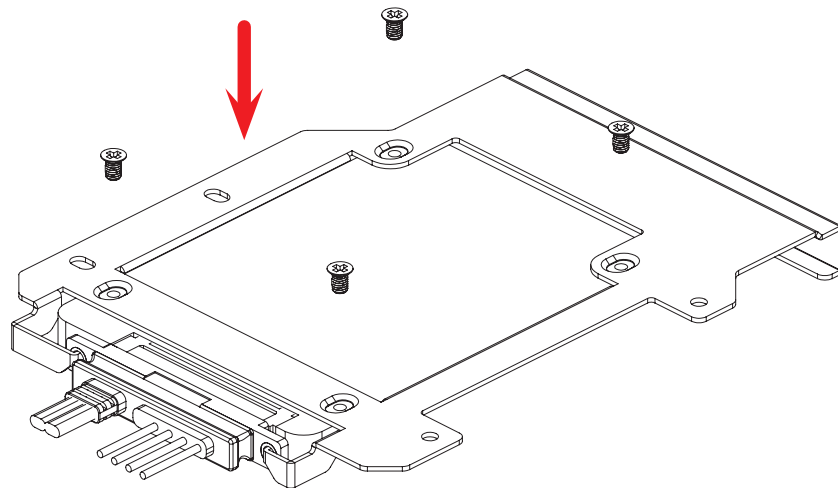
Step 3 Remove eight Hexagon M3 Nuts.



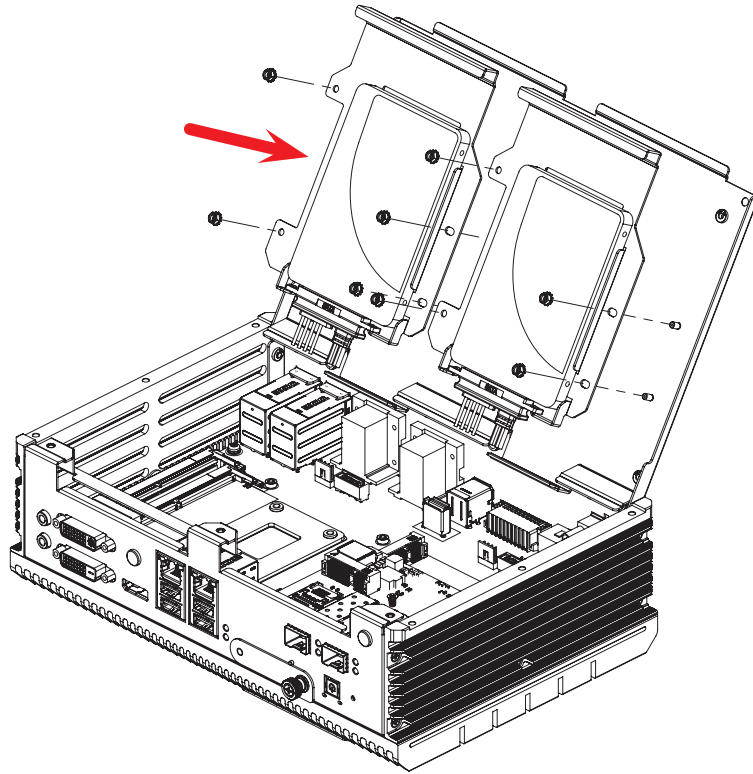
Step 4 Install SSD/HDD & SATA 22P cable into bracket SSD/HDD.



Step 5 Use four flat head M3x5L screws and fasten SSD/HDD.

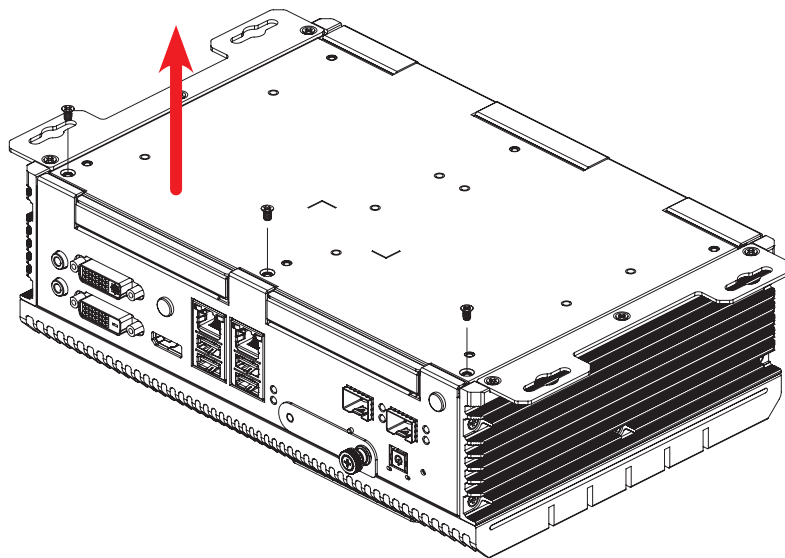
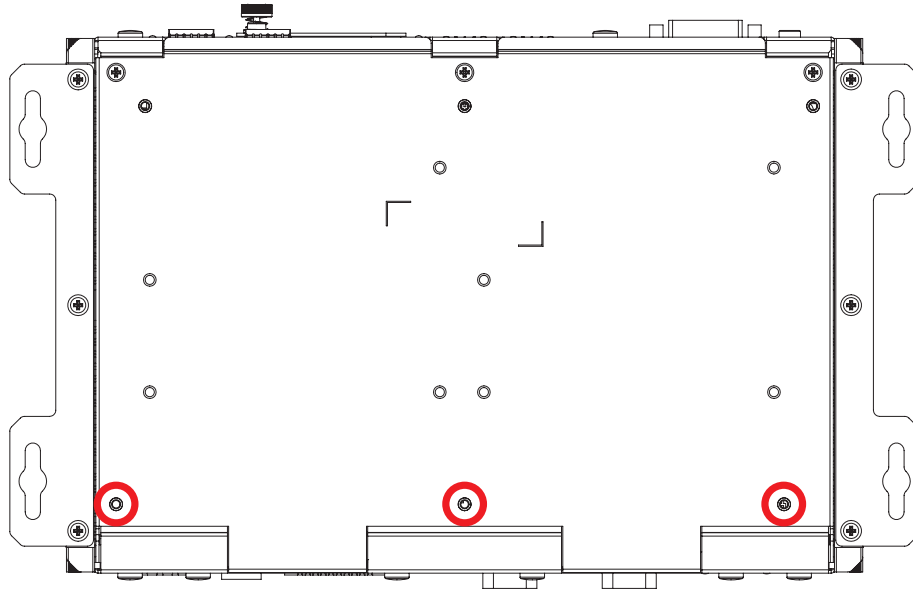


Step 6 Use eight Hexagon M3 Nuts and fasten bracket SSD/HDD

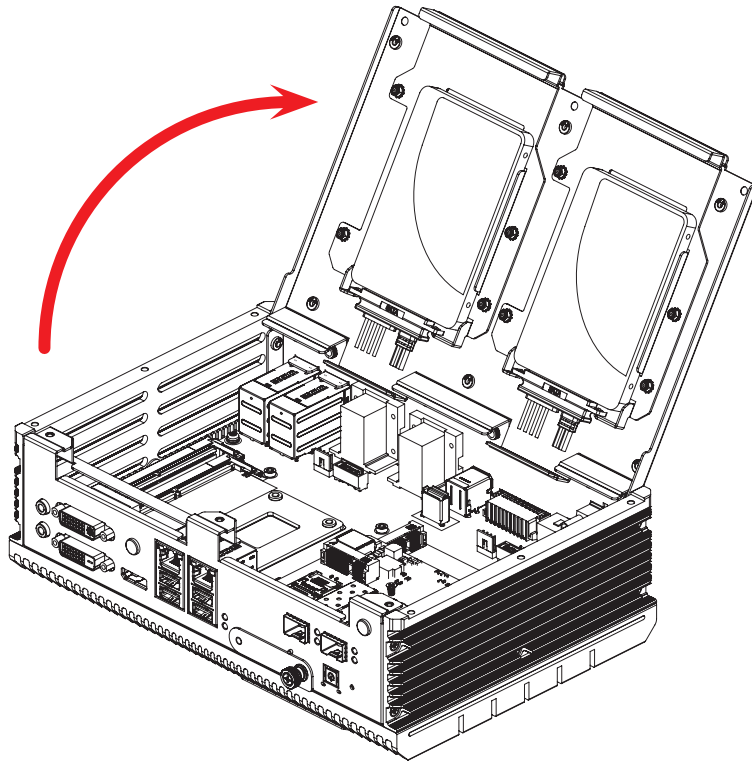


3.8 Installing M.2

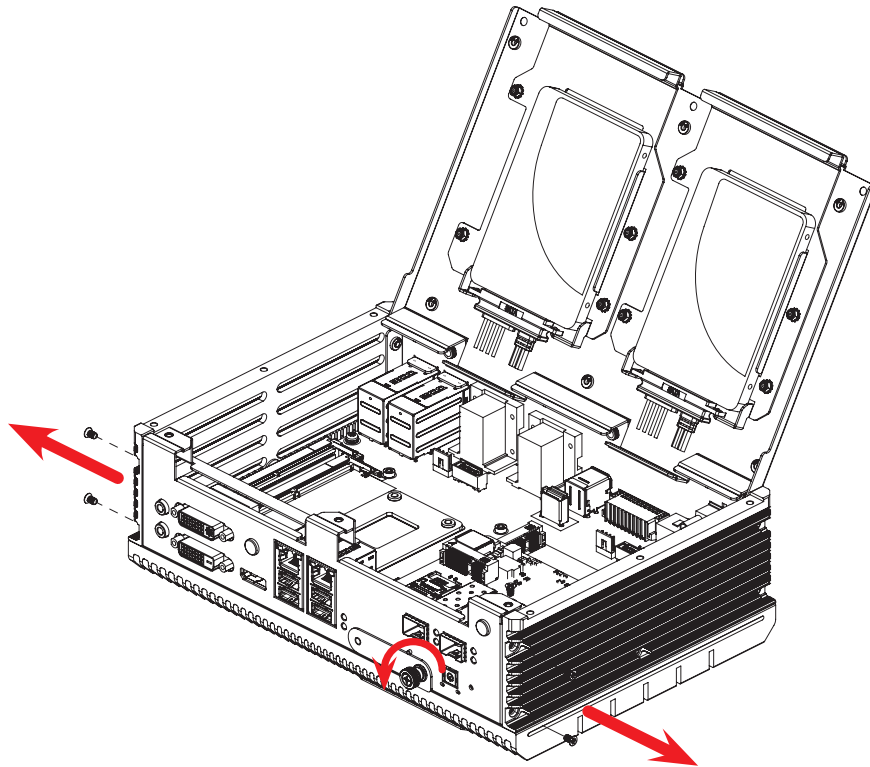
Step 1 Remove three flat head M3x5L screws.



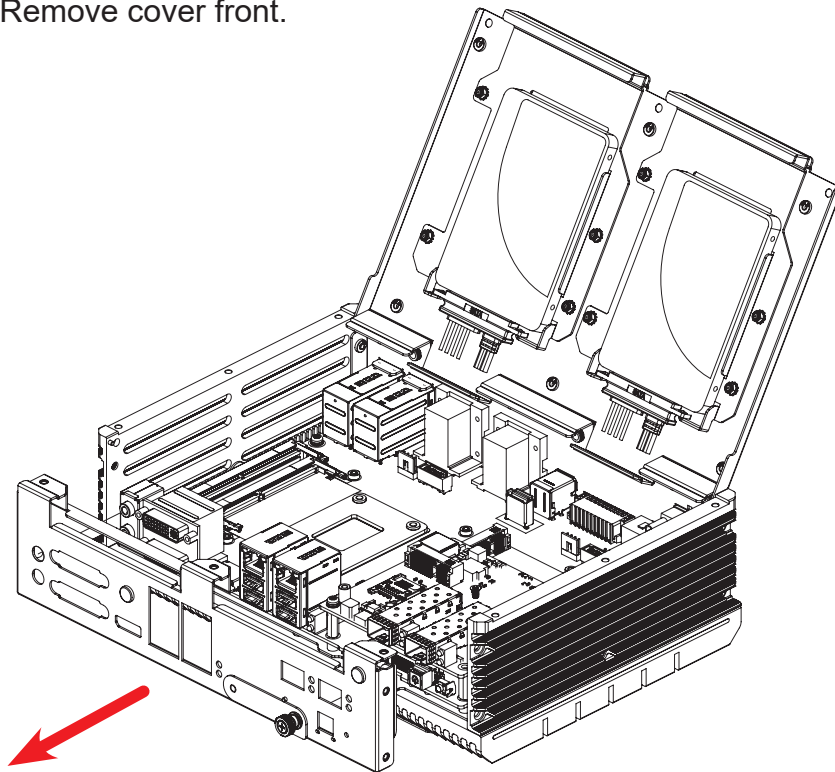
Step 2 Open Cover_Bottom.



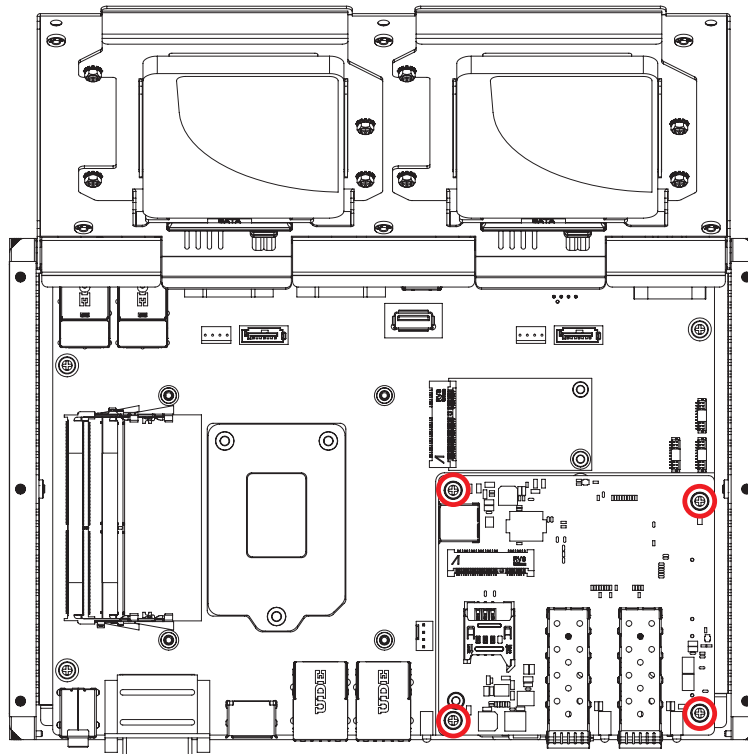
Step 3 Remove four flat head M3x5L screws and release captive panel screw.

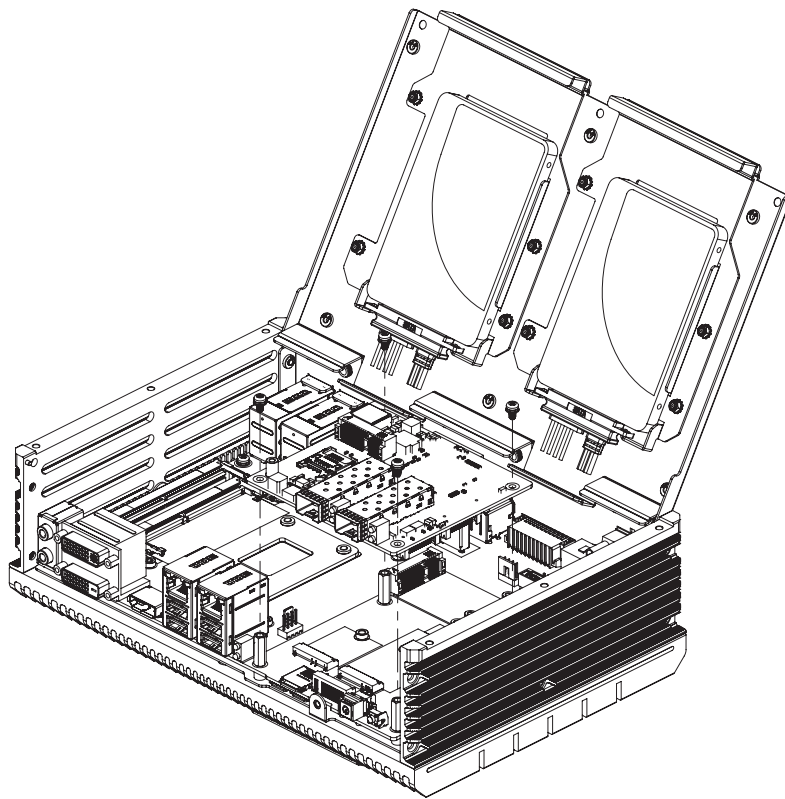


Step 4 Remove cover front.

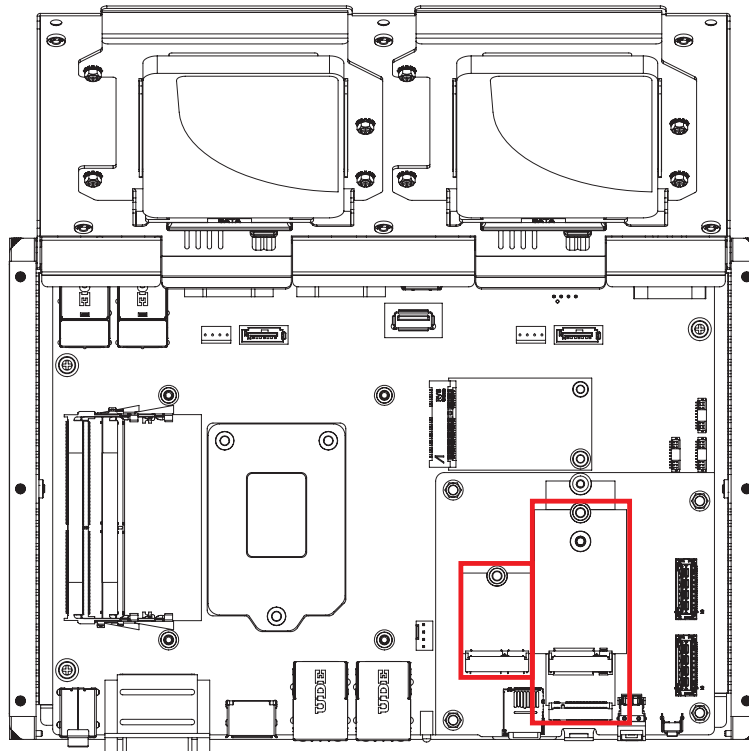


Step 5 Remove four pan head M3x6L screws and take out SUMIT Industry Standard Module.





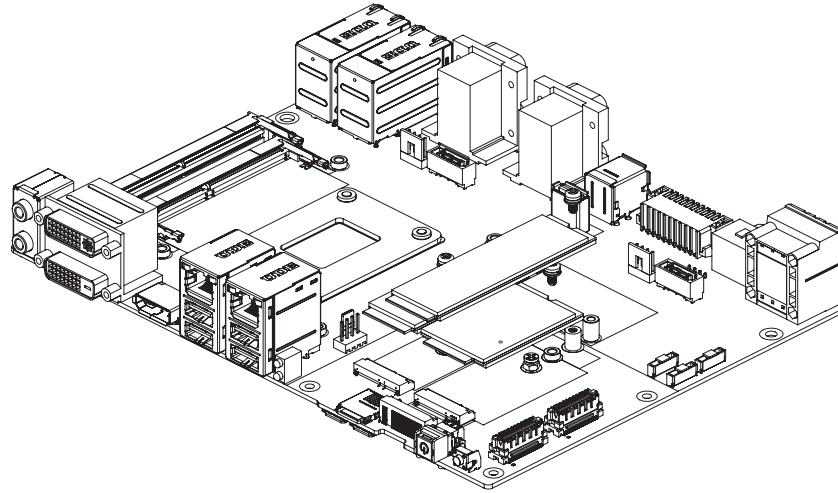
Step 6 The position of M.2 (NGFF) connector.



Step 7 Key E 2230, Key B 3052, Key M 2280

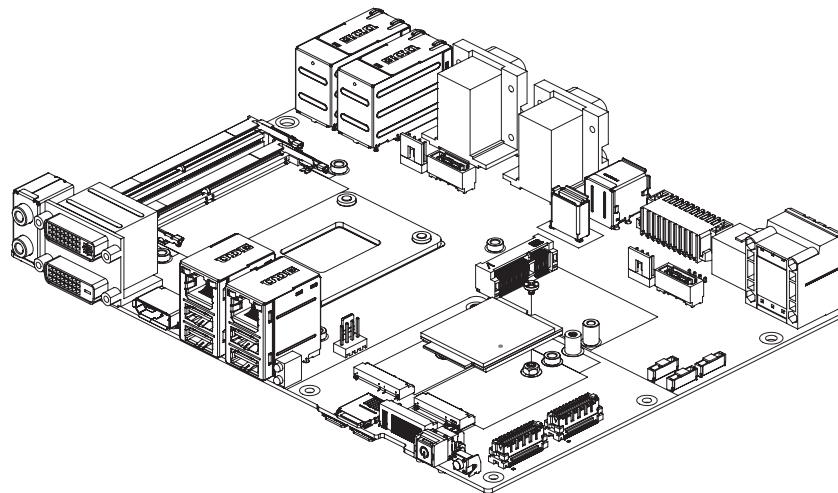
Install M.2 into slot and fasten one pan head M3 screw.

For Key B 3052, remove the Key B 3042 hex M3 standoff before installation.



Key B 3042

Install M.2 into slot and fasten one pan head M2 screw.

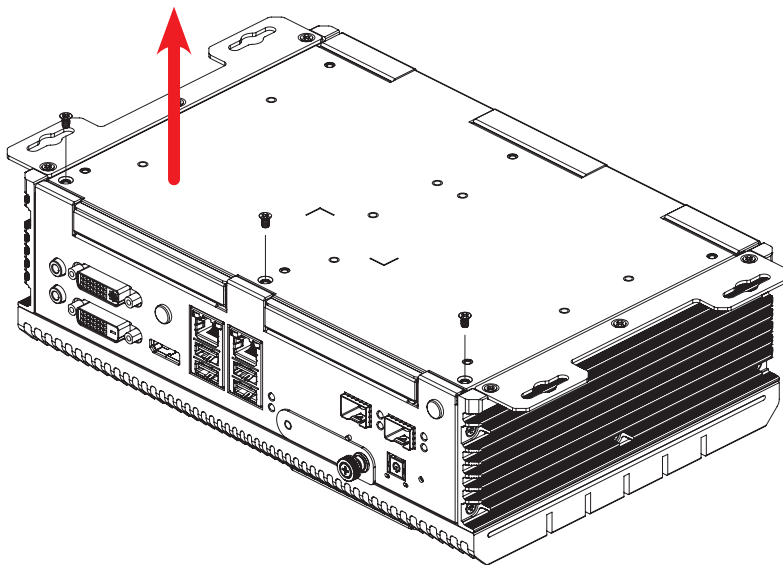
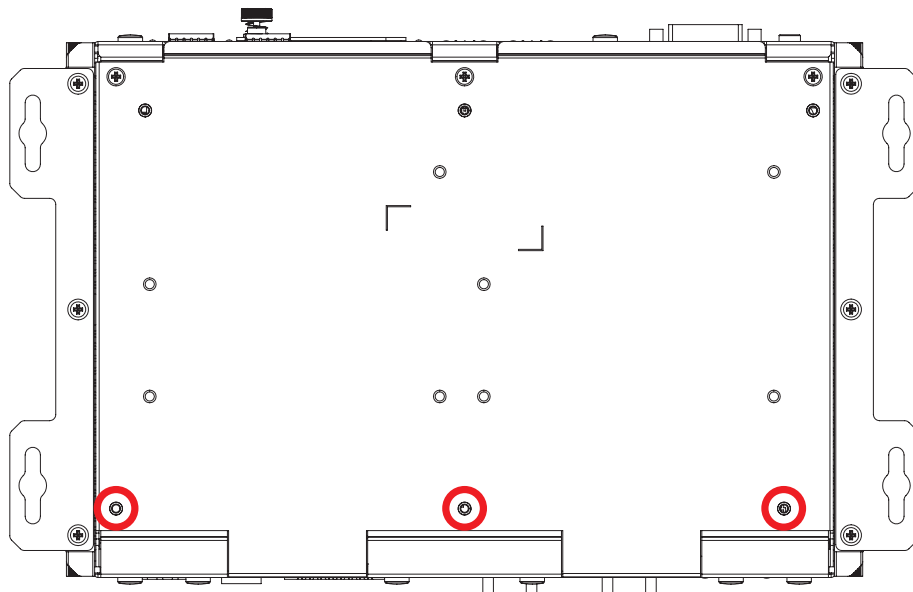


3.9 Installing Antenna Cable

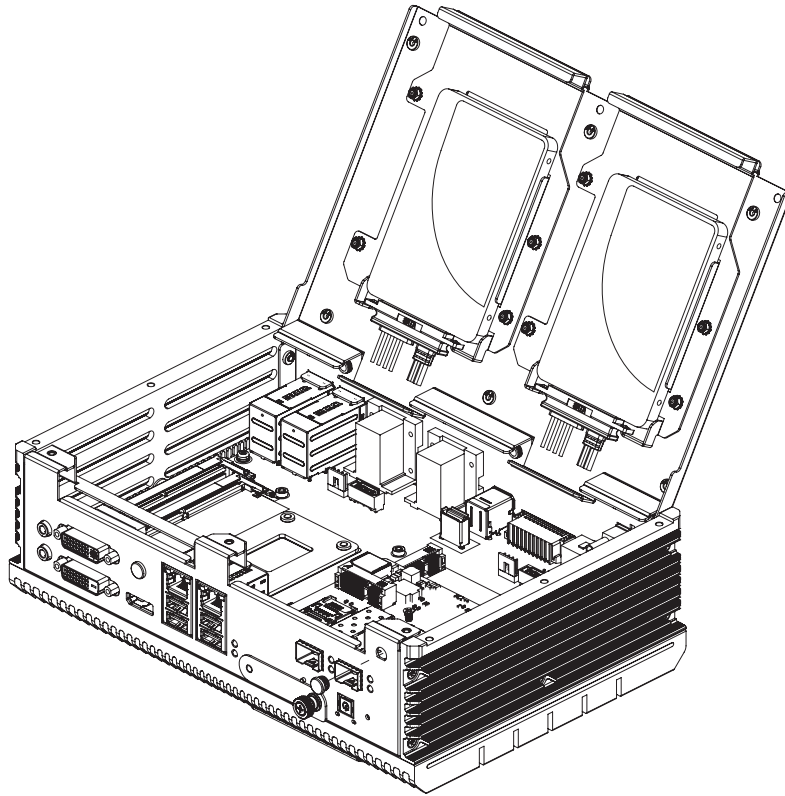
Step 1 Check antenna cable and washer.



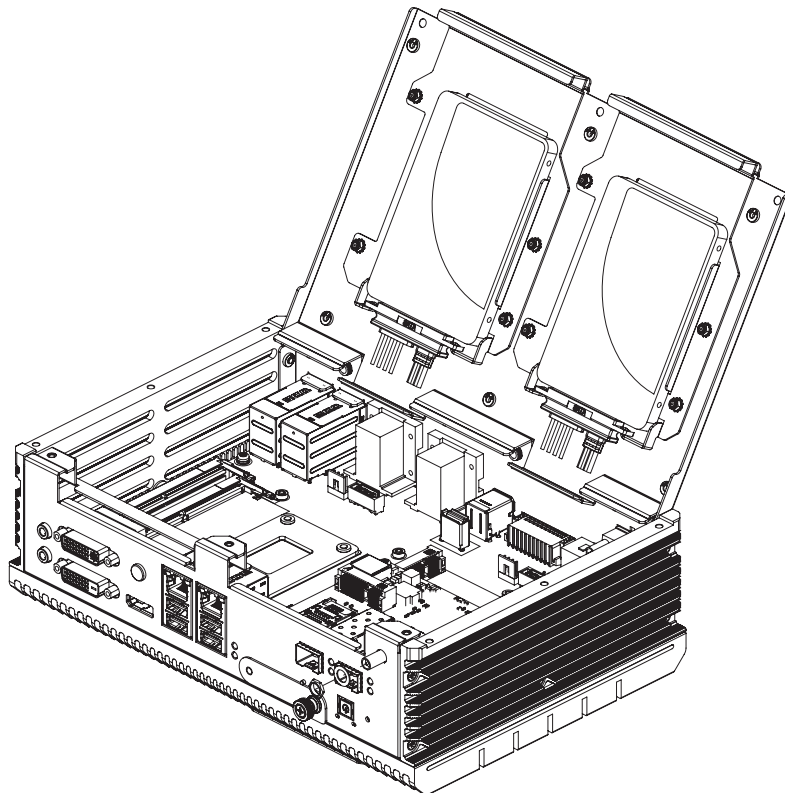
Step 2 Remove three flat head M3x5L screws.



Step 3 Remove hole plug.



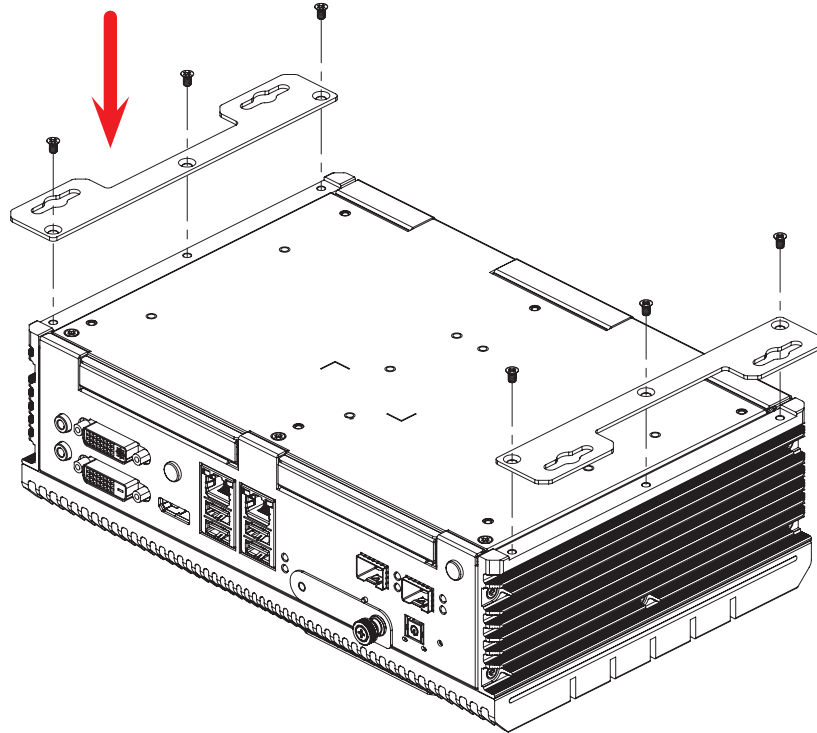
Step 4 Install SMA cable and fasten washer and nut.



3.10 Mount Your ECX-2000

3.10.1 Wall Mount

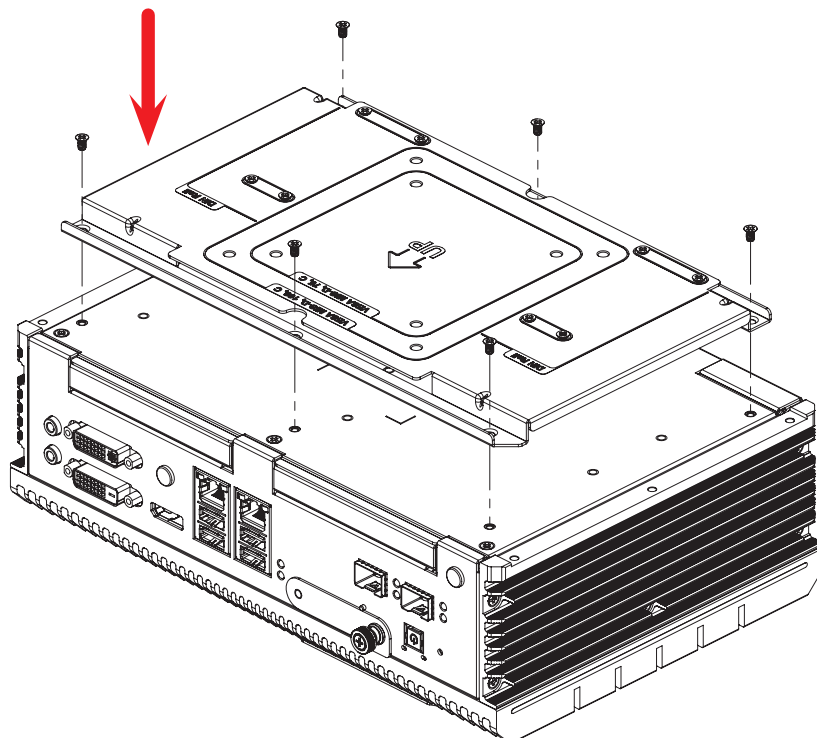
Fasten six flat head M3x5L screws.



3.10.2 VESA Mount

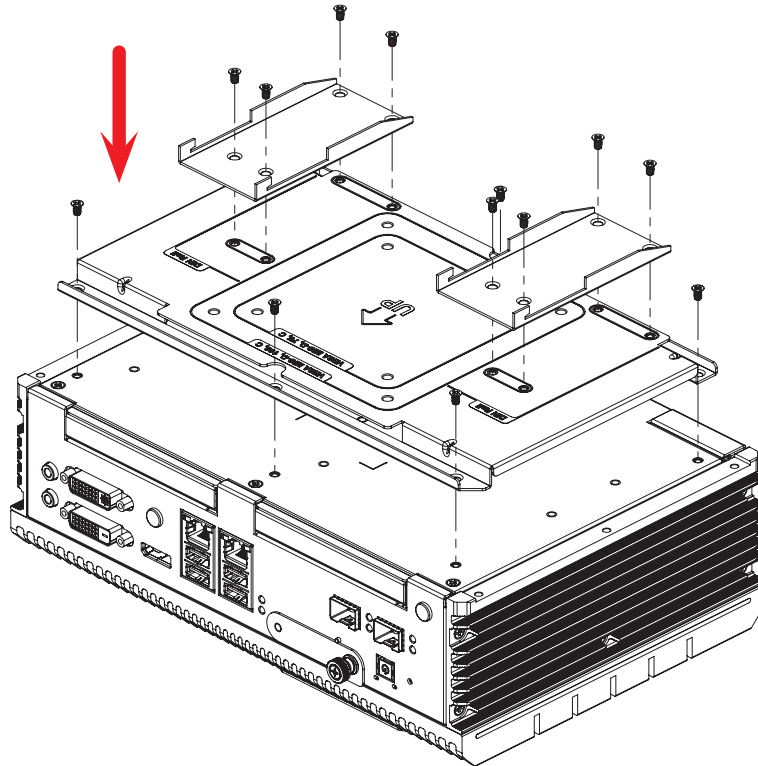
Fasten six flat head M3x5L screws

VESA 75 x 75/100 x 100 mm

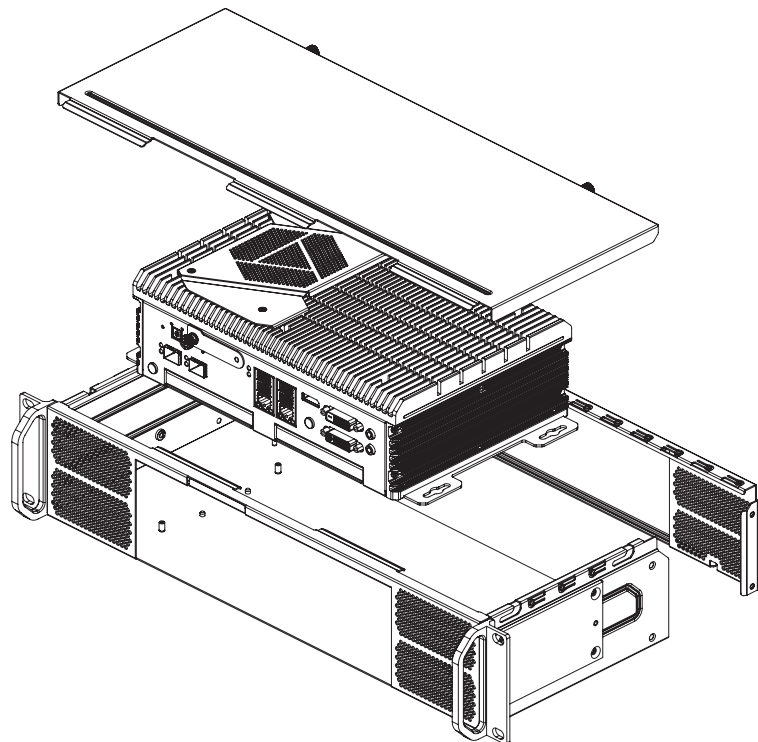


3.10.3 DIN Rail Mount

Fasten fourteen flat head M3x5L screws.



3.10.4 2U Rack Mount



4

BIOS SETUP

4.1 Entering BIOS Setup

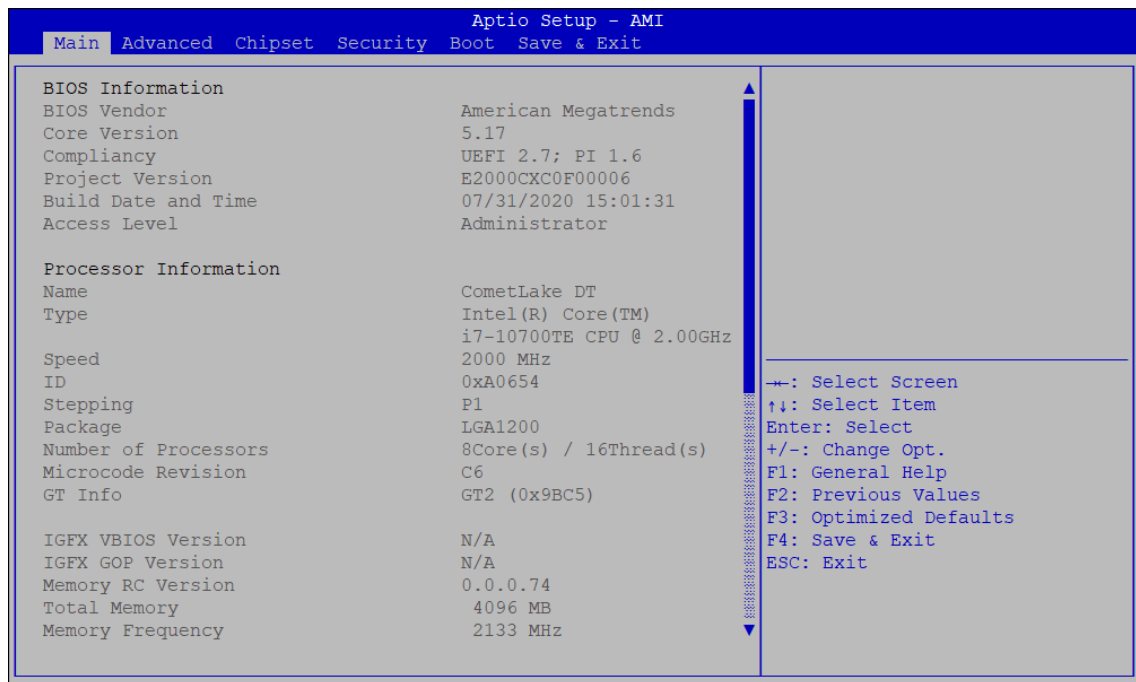


Figure 4-1 : Entering Setup Screen

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

4.2 Main

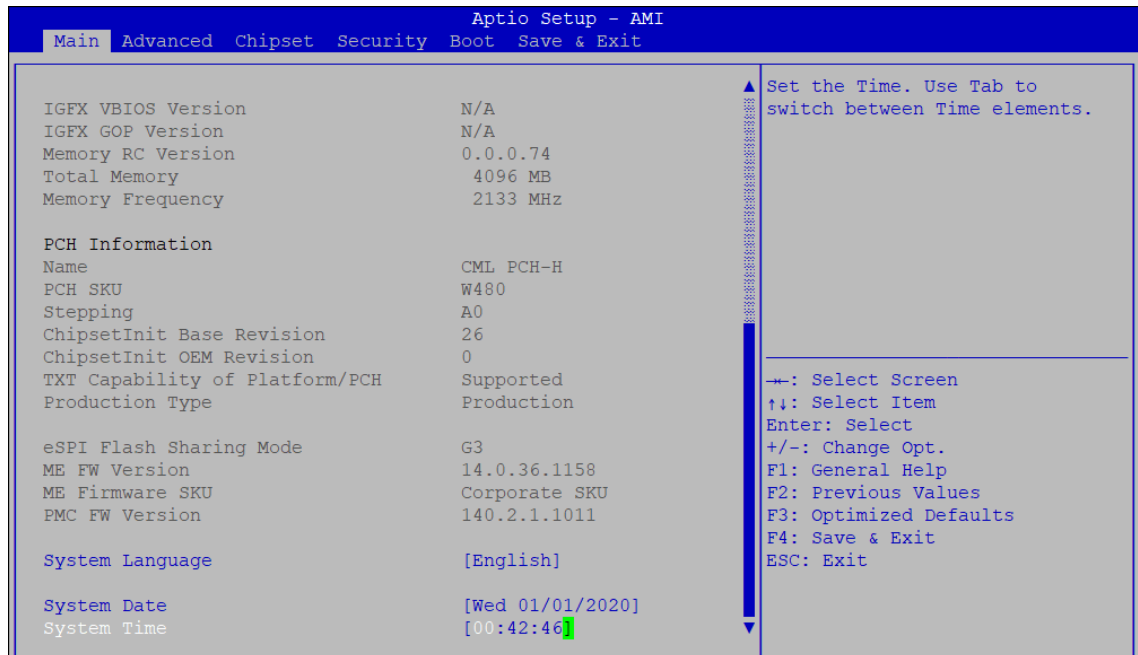


Figure 4-2 : BIOS Main Menu

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.

System Time

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

4.3 Advanced

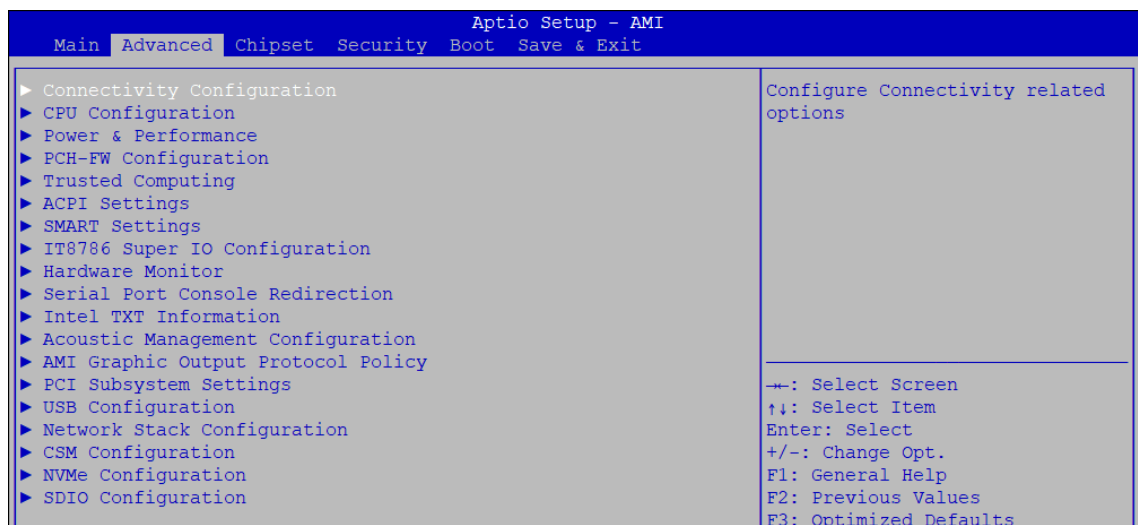


Figure 4-3 : BIOS Advanced Menu

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

4.3.1 CPU Configuration

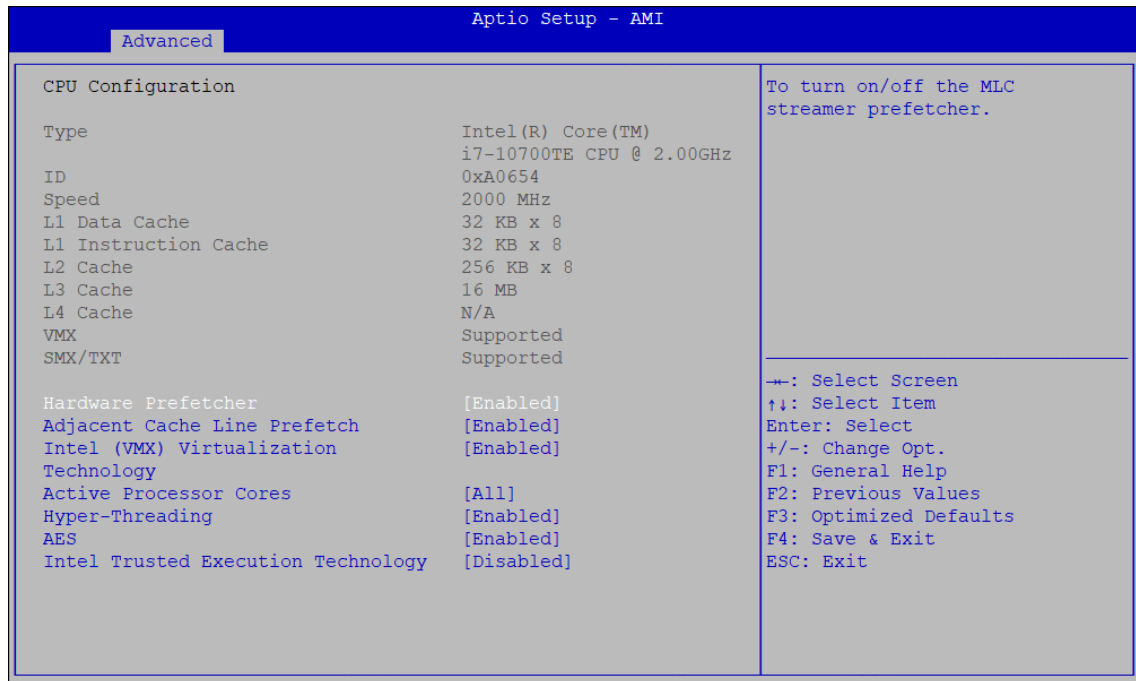


Figure 4-3-1 : CPU Configuration

Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

Intel (VMX) Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Processor Cores

Number of cores to enable in each processor package.

Hyper-threading

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

AES

Enable/disable CPU Advanced Encryption Standard instructions.

Intel Trusted Execution Technology

Enables utilization of additional hardware capabilities provided by Intel® Trusted Execution Technology.

Changes require a full power cycle to take effect.

4.3.2 Power & Performance

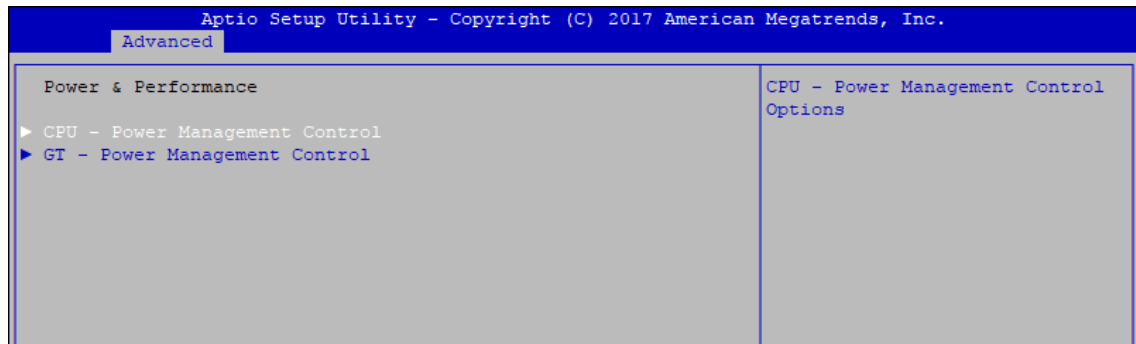


Figure 4-3-2 : Power & Performance

4.3.2.1 CPU – Power Management Control

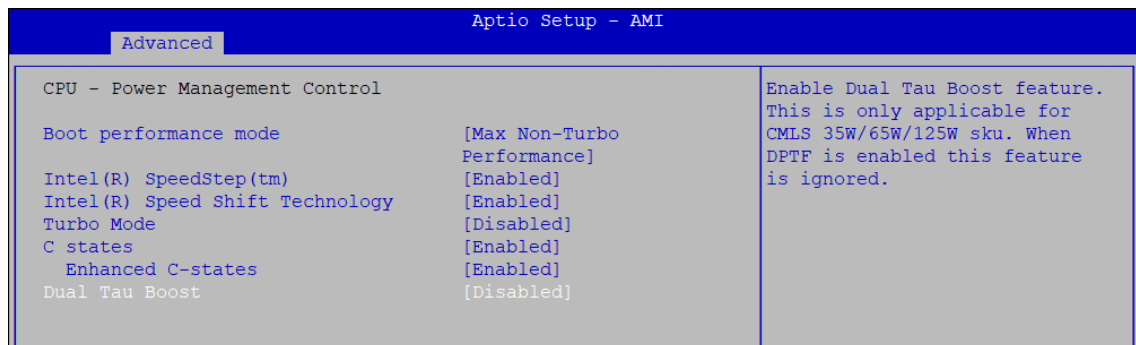


Figure 4-3-2-1 : CPU – Power Management Control

Boot performance mode

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

Intel(R) SpeedStep(tm)

Allows more than two frequency ranges to be supported.

Intel(R) Speed shift Technology

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

Turbo Mode

Turbo Mode.

C states

Enable or disable CPU C states.

Enhanced C-states

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

Dual Tau Boost

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

4.3.2.2 GT – Power Management Control

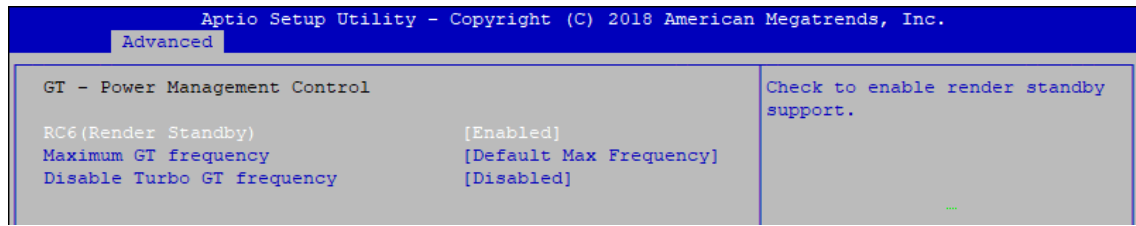


Figure 4-3-2-2 : GT – Power Management Control

RC6(Render Standby)

Check to enable render standby support.

Maximum GT frequency

Maximum GT frequency limited by the user. Choose between 350MHz (RPN) and 1150MHz (RP0). Value beyond the range will be clopped to min/max supported by SKU

Disable Turbo GT frequency

Check to enable render standby support.

4.3.3 PCH-FW Configuration

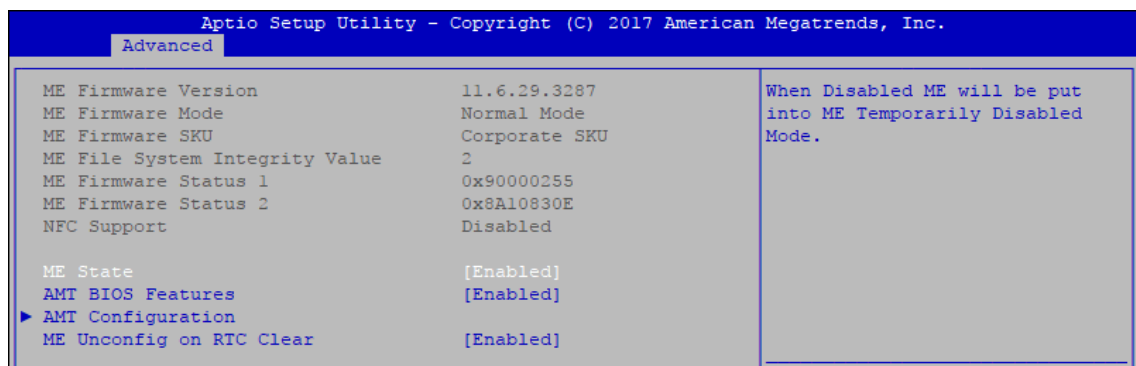


Figure 4-3-3 : PCH-FW Settings

ME State

Set ME to Soft temporarily disabled.

AMT BIOS Features

When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.

AMT Configuration

Configure Intel® Active Management Technology Parameters.

ME Unconfig on RTC Clear State

Disabling this option will cause ME not to unconfigure on RTC clear.

4.3.4 Trusted Computing

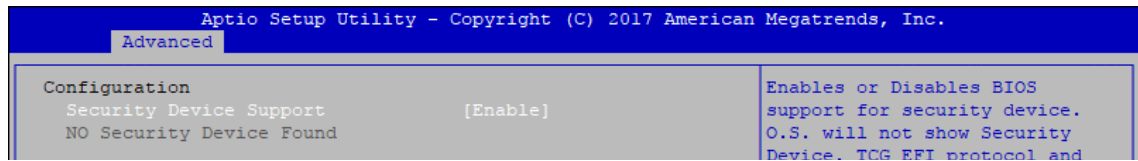


Figure 4-3-4 : Trusted Computing

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

4.3.5 ACPI Settings

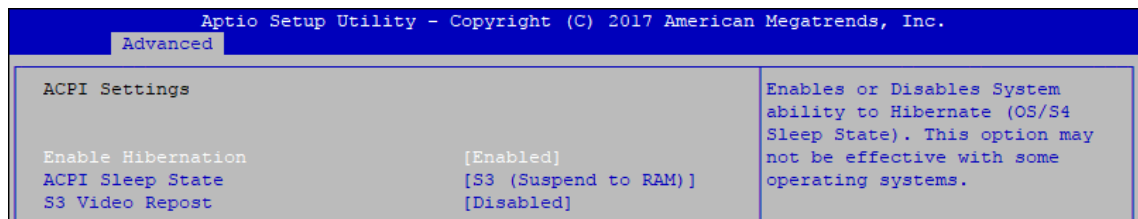


Figure 4-3-5 : ACPI Settings

Enable Hibernation

Enables or disables system's ability to hibernate (OS/S4 sleep state). This option may not be effective with some OS.

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S3 Video Repost

Enables or disables S3 video repost.

4.3.6 SMART Settings

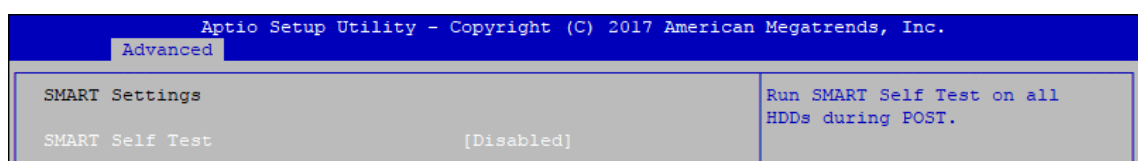


Figure 4-3-6 : SMART Settings

SMART Self Test

Run SMART self test on all HDDs during POST.

4.3.7 IT8786 Super IO Configuration

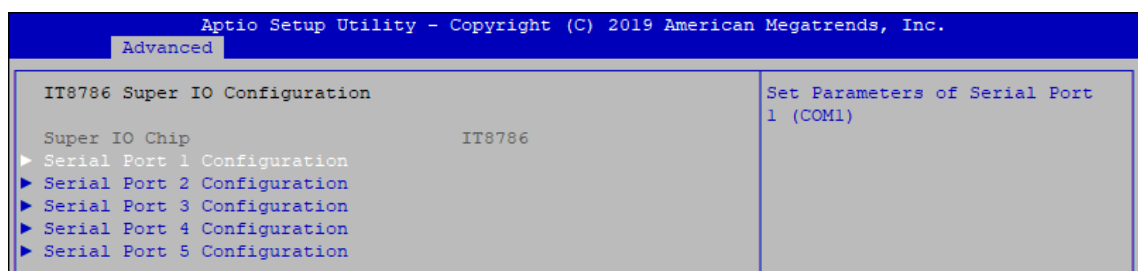


Figure 4-3-7 : IT8786 Super IO Settings

4.3.7.1 Serial Port X Configuration

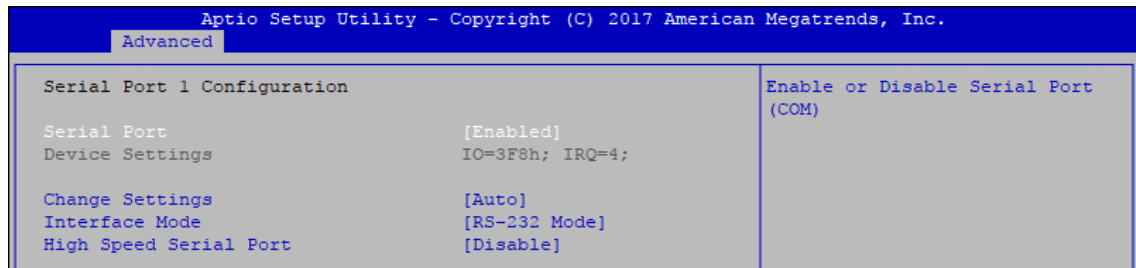


Figure 4-3-7-1 : Serial Port X Configuration

Serial Port 1 to port 4 Configuration

Options for Serial Port 1 to Serial Port 4.

Entering the corresponding Port option then end user can change the settings such as I/O resource and UART mode (High Speed Serial Port is Port 1 only).

4.3.8 Hardware Monitor

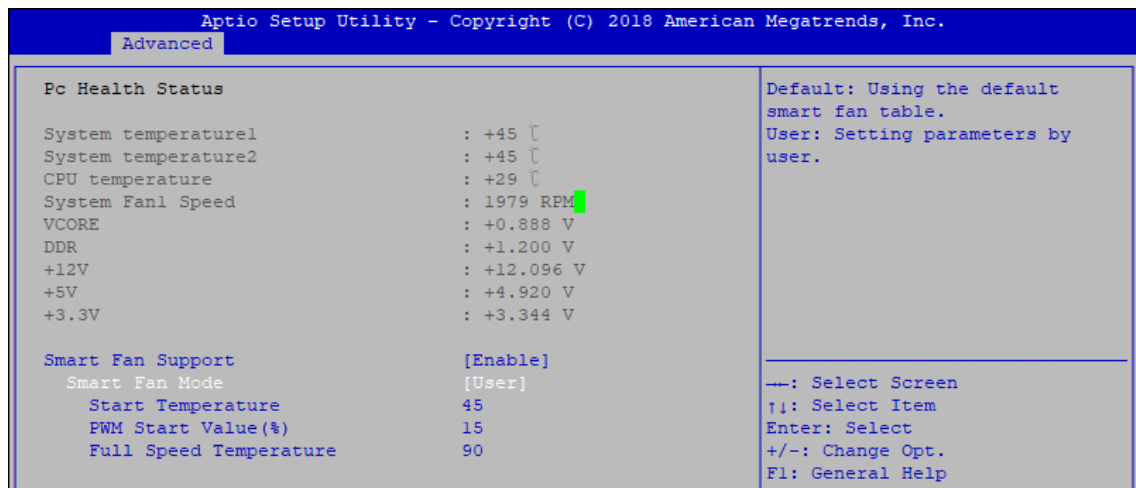


Figure 4-3-8 : Hardware Monitor Settings

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

Smart Fan Support

Smart Fan Support. Work with Full Speed if "Smart Fan Support" is Disabled.

Smart Fan Mode

Default : Using the default smart fan table.

User : Setting parameters by user..

Start Temperature

Temperature Limit value of Fan Start (Degree C).

(Range : 10~80)

PWM Start Value (%)

Default PWM Value of Fan.

(Range : 15%~100%)

Full Speed Temperature

Temperature Limit value of Fan Full Speed (Degree C)..

(Range : 50~90)

4.3.9 Serial Port Console Redirection

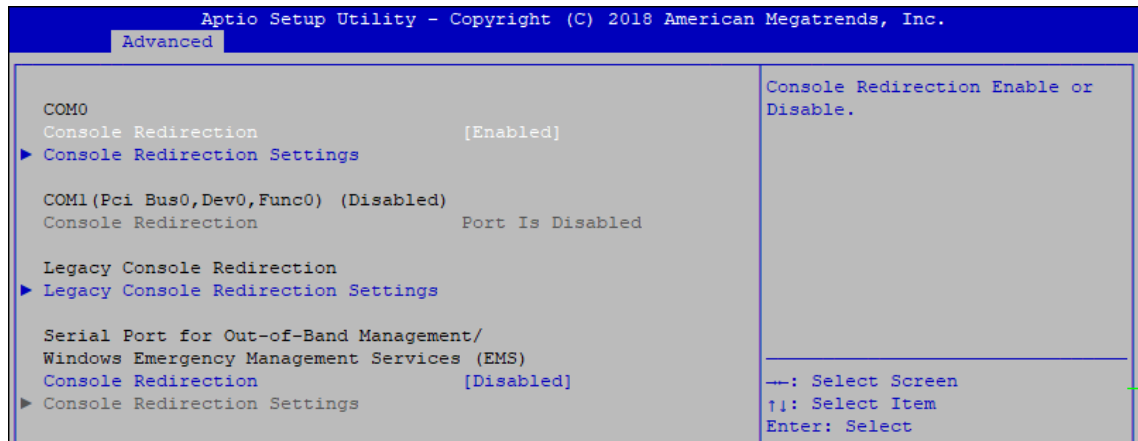


Figure 4-3-9 : Serial Port Console Redirection Settings

Console Redirection

Console redirection enable or disable.

Console Redirection Settings

These settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Legacy Console Redirection

Legacy Console Redirection Settings.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

Console redirection enable or disable.

4.3.10 Intel TXT Information

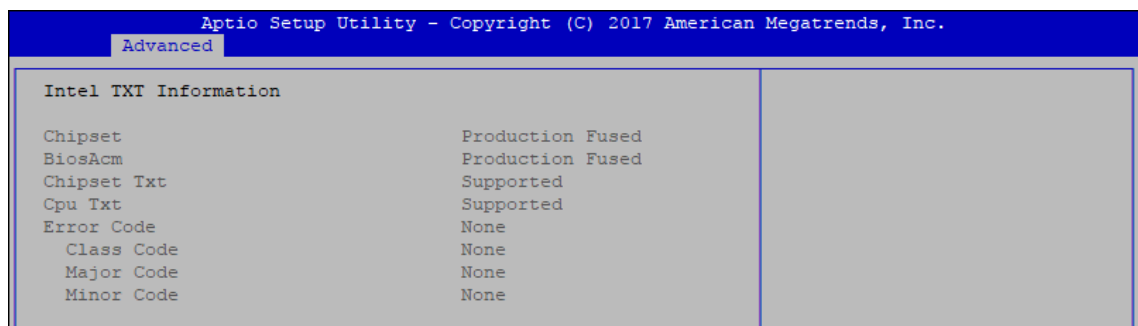


Figure 4-3-10 : Intel TXT Information

Display Intel TXT information.

4.3.11 Acoustic Management Configuration

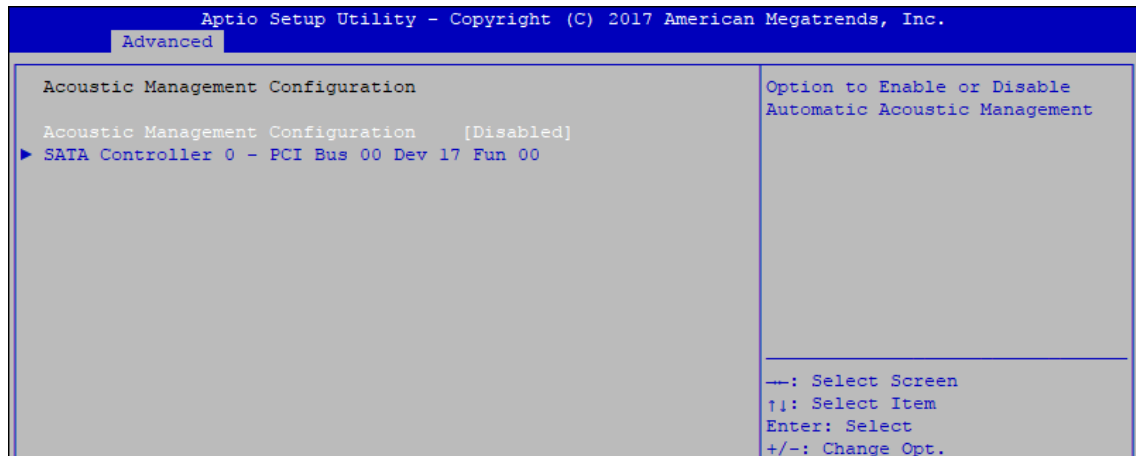


Figure 4-3-11 : Acoustic Management Settings

Acoustic Management Configuration

Option to enable or disable automatic acoustic management.

4.3.12 PCI Subsystem Setting

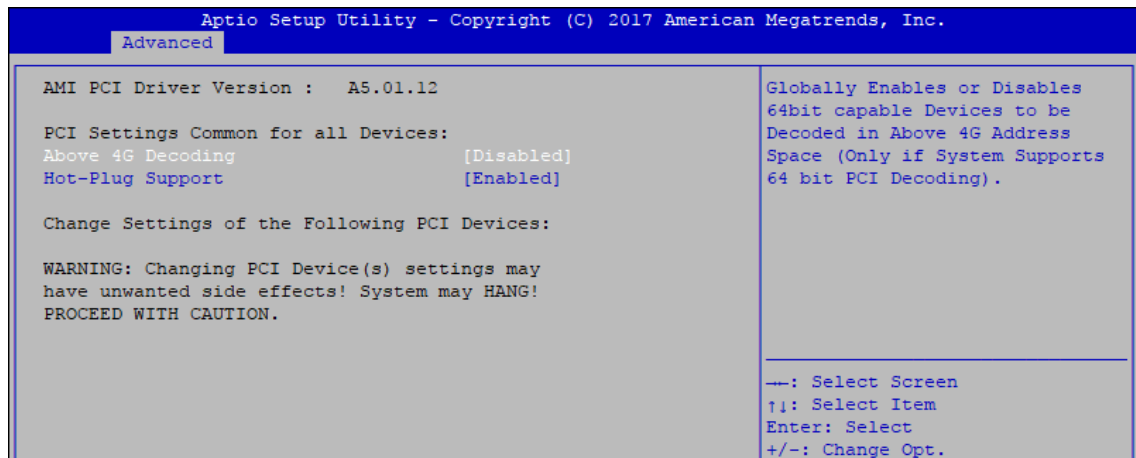


Figure 4-3-12 : PCI Subsystem Settings

Above 4G Decoding

Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports bot PCI Decoding)

Hot-Plug Support

Globally Enables or Disables Hot-Plug support for the entire System. If system has Hot-Plug Capable Slots and this option set to Enabled, it provides a Setup screen for selecting PCI resource padding for Hot-Plug.

4.3.13 Network Stack Configuration

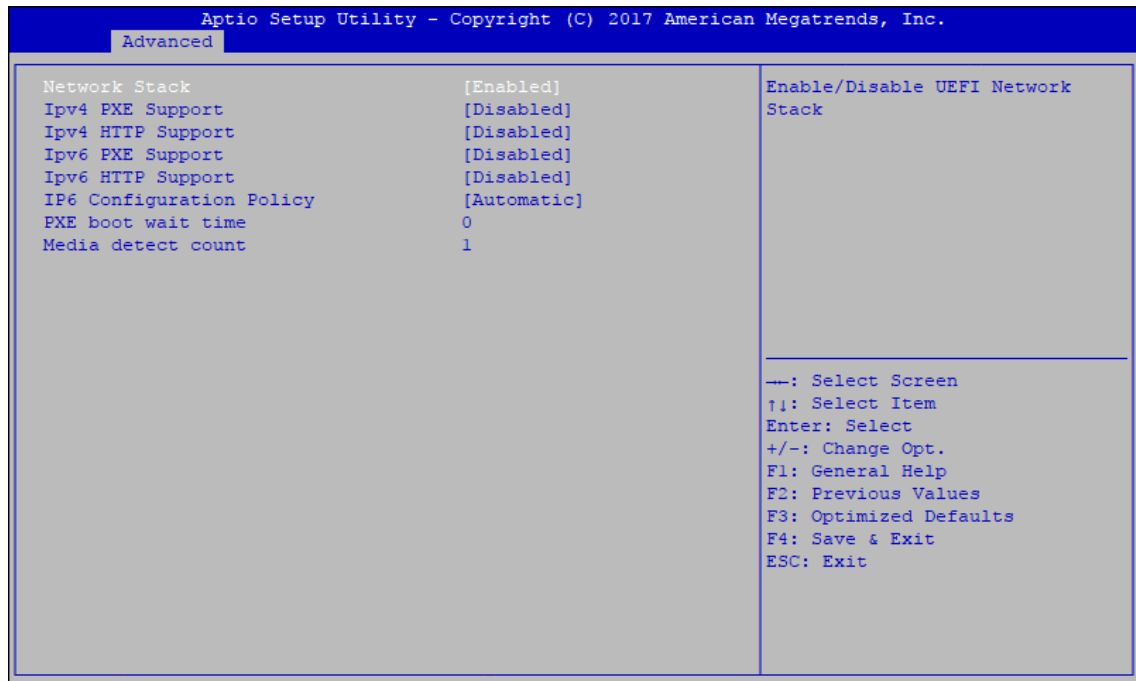


Figure 4-3-13 : Network Stack Settings

Network Stack

Enable/Disable UEFI Network Stack

Ipv4 PXE Support

Enable/Disable IPv4 PXE boot support.

Ipv4 HTTP Support

Enable/Disable IPv4 HTTP boot support.

Ipv6 PXE Support

Enable/Disable IPv6 PXE boot support.

Ipv6 HTTP Support

Enable/Disable IPv6 HTTP boot support.

IP6 Configuration Policy

Set IP6 Configuration Policy.

PXE boot wait time

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

Media detect count

Number of times presence of media will be checked.

4.3.14 NVMe Configuration

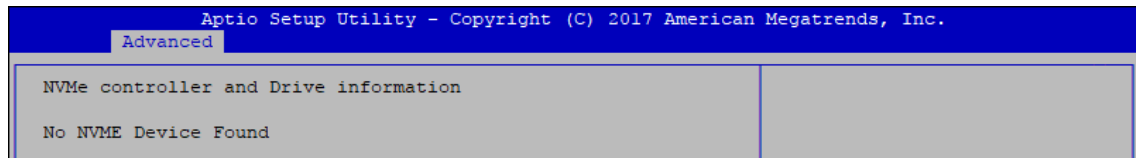


Figure 4-3-15 : NVMe Settings

Display NVMe controller and Drive information.

4.3.15 USB Configuration

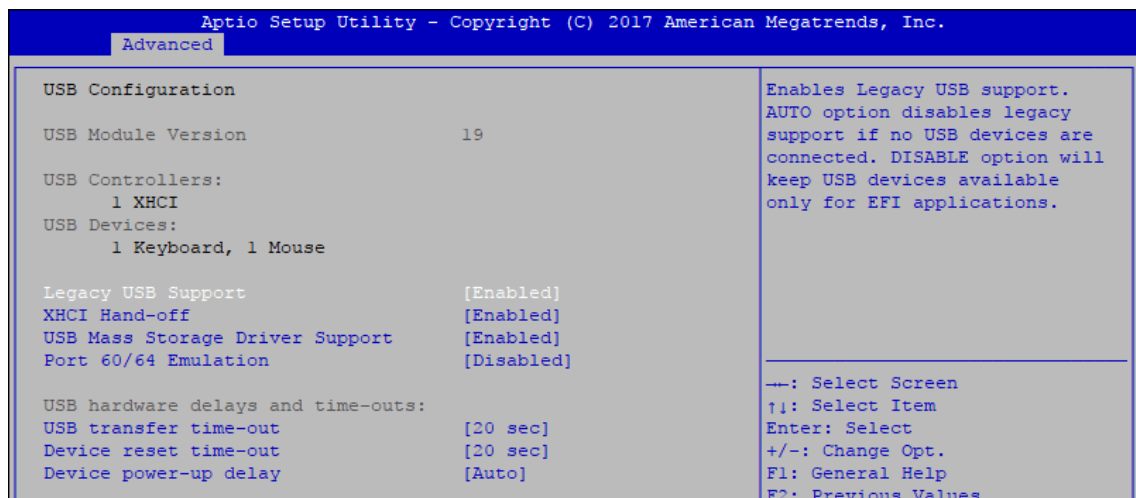


Figure 4-3-16 : USB Settings

Legacy USB Support

Enables Legacy USB support.

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

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

XHCI Hand-off

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

USB Mass Storage Driver Support

Enable/disable USB mass storage driver support.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB transfer time-out

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

Device reset time-out

USB mass storage device start unit command time-out.

Device power-up delay

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

4.3.16 Connectivity Configuration

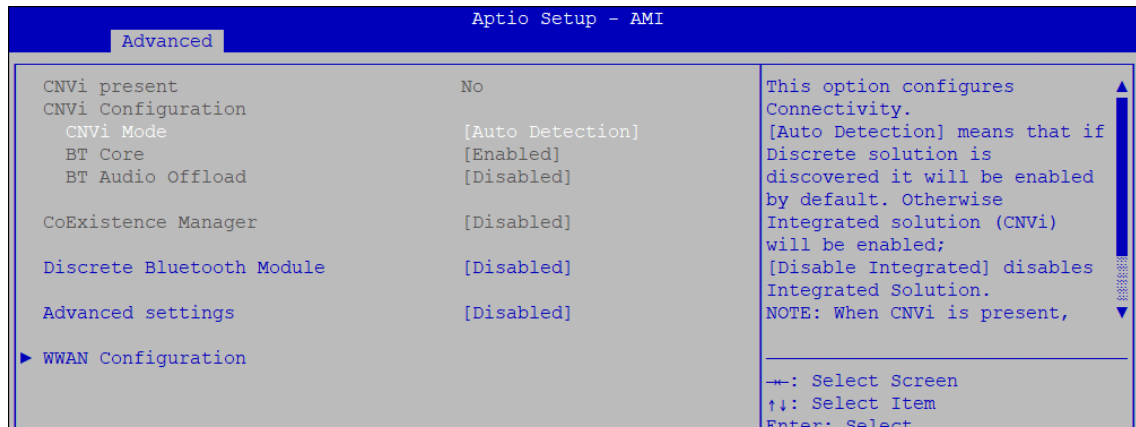


Figure 4-3-17 : Connectivity Settings

CNVi present

[Yes] means CNVi is the active Connectivity Solution,
[No] means CNVi was not discovered.

CNVi Mode

This option configures Connectivity.

[Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled;
[Disable Integrated] disables Integrated Solution.

NOTE : When CNVi is present, the GPIO pins that are used for radio interface cannot be assigned to the other native function.

BT Core

This is an option intended to Enable/Disable BT Core in CNVi

BT Audio Offload

This is an option to Enable/Disable BT Audio Offload which enables audio input from BT device in HFP format to the audio DSP and enables power efficient audio output to BT device via A2DP format.

This feature only support with Intel(R) Wireless-AX 22560

CoExistence Manager

CoEx Manager mitigates radio coexistence issues between Intel WWAN (modem) and Intel WLAN (WiFi/BT).

This should be enabled only if both WWAN and WLAN solutions are based on Intel components

Discrete Bluetooth Module

Seriallo UART0 needs to be enabled to select BT Module

Advanced settings

Configure ACPI objects for wireless devices

WWAN Configuration

Configure WWAN related options

4.3.17 SDIO Configuration

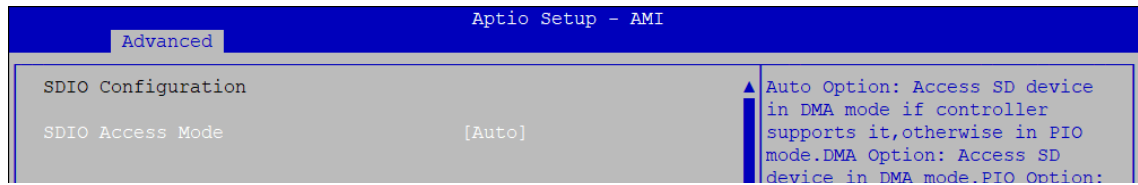


Figure 4-3-18 : SDIO Settings

SDIO Access Mode

[Auto] : Access SD device in DMA mode if controller supports it, otherwise in PIO mode.

[DMA] : Access SD device in DMA mode.

[PIO] : Access SD device in PIO mode.

4.4 Chipset

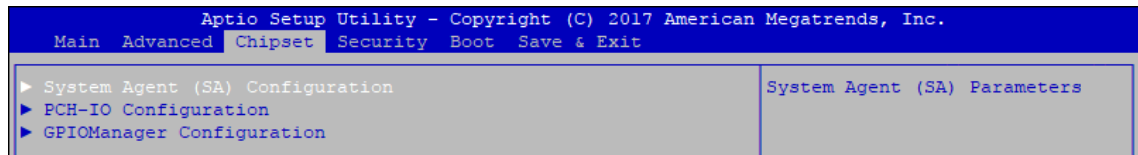


Figure 4-4 : BIOS Chipset Menu

System Agent (SA) Configuration

System Agent (SA) parameters.

PCH-IO Configuration

PCH parameters.

GPIOManager Configuration

GPIOManager Configuration.

4.4.1 System Agent (SA) Configuration

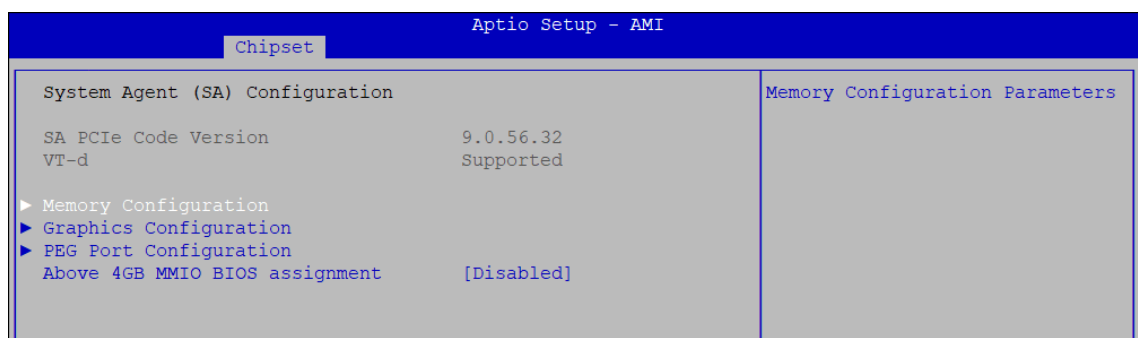


Figure 4-4-1 : System Agent Settings

VT-d

VT-d capability.

Above 4GB MMIO BIOS assignment

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

4.4.1.1 Memory Configuration

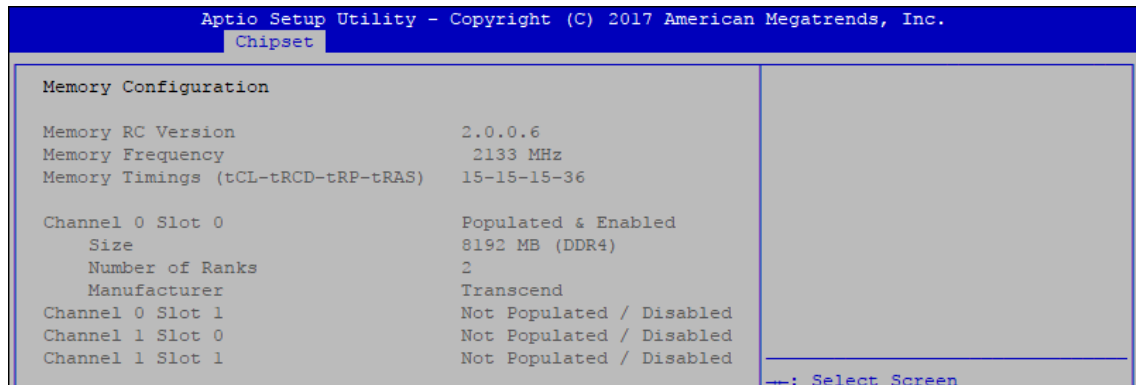


Figure 4-4-1-1 : Memory Configuration

Displays memory information.

4.4.1.2 Graphics Configuration

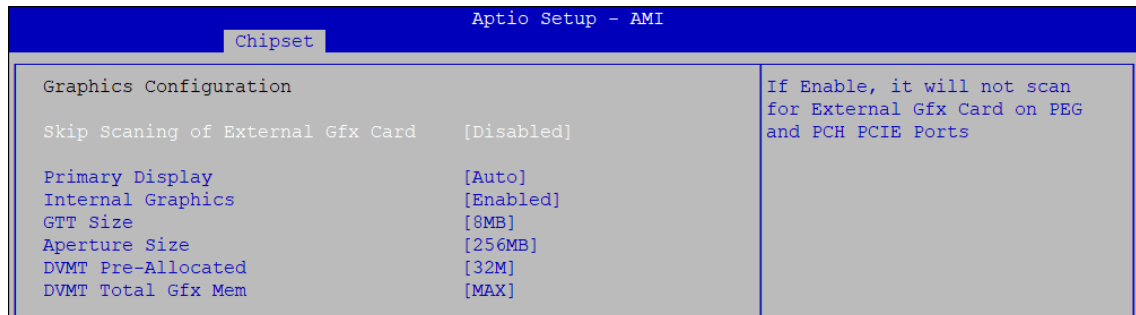


Figure 4-4-1-2 : Graphics Settings

Skip Scanning of External Gfx Card

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

Primary Display

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

Internal graphics

Keep IGFX enabled based on the setup options.

GTT Size

Select the GTT Size.

Aperture Size

Select the Aperture Size.

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

DVMT Pre-Allocated

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

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

4.4.1.3 PEG Port Configuration

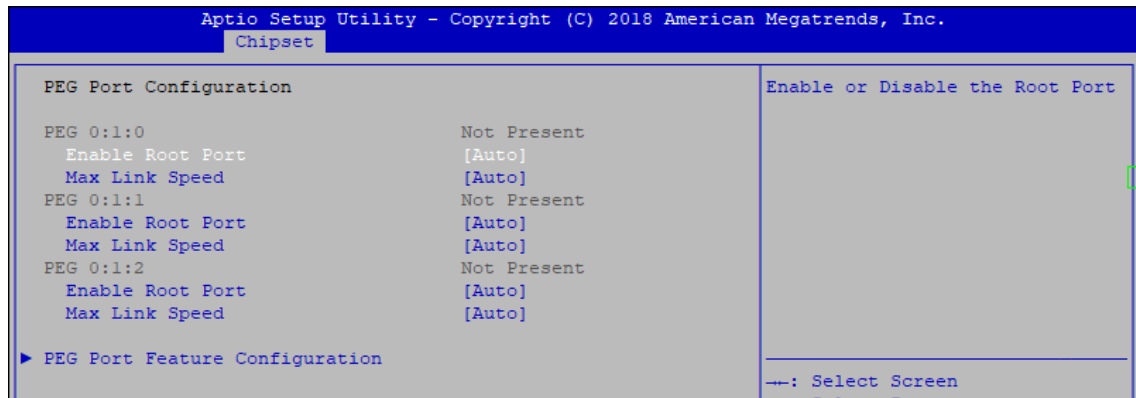


Figure 4-4-1-3 : PEG Port Configuration

PEG port options for PCIe device.

4.4.2 PCH-IO Configuration

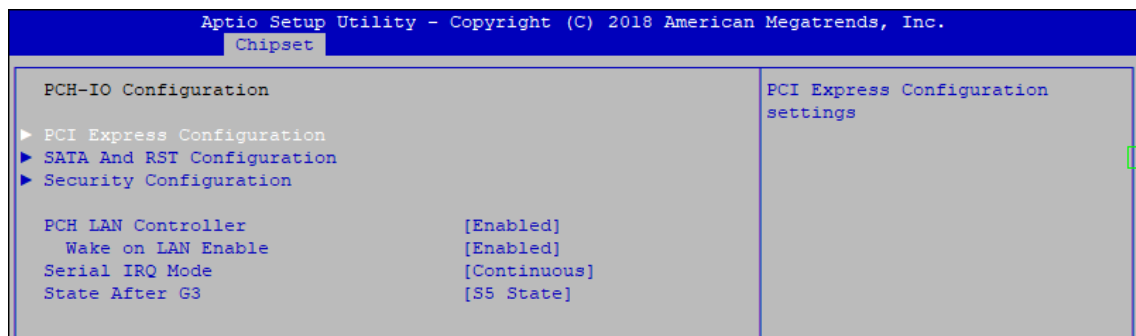


Figure 4-4-2 : PCH-IO Settings

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The wake On LAN cannot be disabled if ME is on at Sx state.)

Serial IRQ Mode

Configure serial IRQ mode.

State After G3

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

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

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

4.4.2.1 PCI Express Configuration of PCH-IO

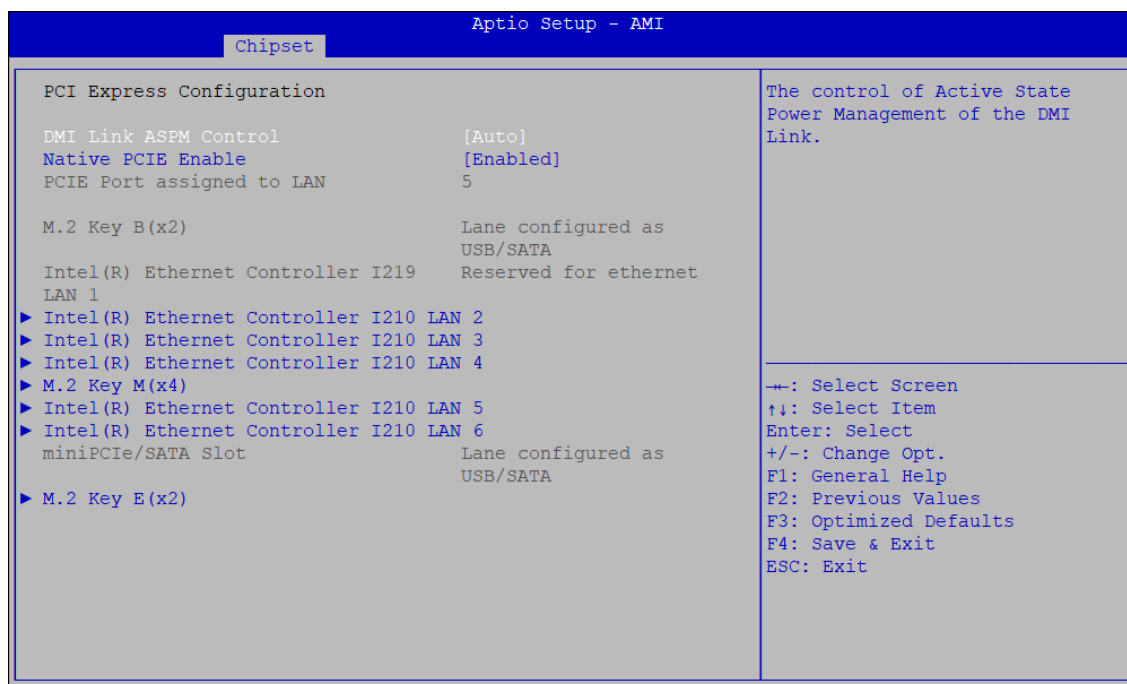


Figure 4-4-2-1 : PCH-IO Settings

DMI Link ASPM Control

Enable/Disable the control of Active State Power Management on SA side of the DMI Link.

Native PCIE Enable

PCI Express Native Support Enable/Disable.

PCI Express device settings

Bios options for PCI Express device setting.

4.4.2.2 SATA and RST Configuration

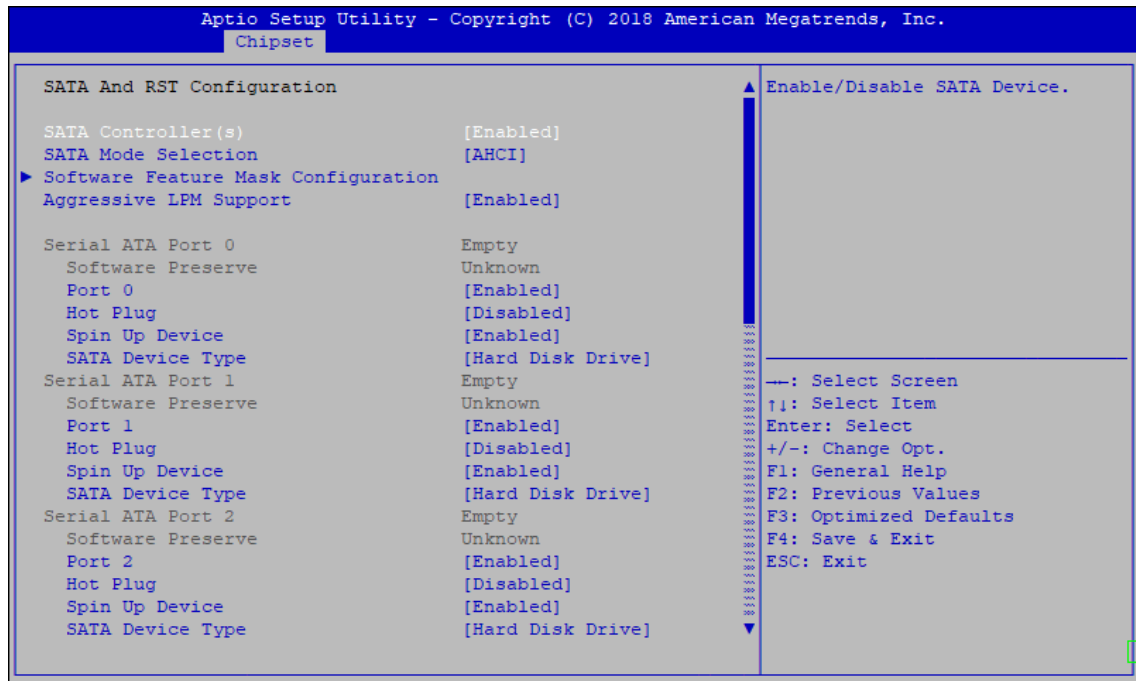


Figure 4-4-2-2 : SATA and RST Settings

SATA Controller(s)

Enable or disable SATA Device.

SATA Mode Selection

Determines how SATA controller(s) operate.

Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.

Aggressive LPM Support

Enable PCH to aggressively enter link power state.

Options for each SATA port

Port n

Enable or disable SATA Port.

Hot Plug

Designated this port as Hot Pluggable.

Spin Up Device

On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

SATA Device Type

Identifies that the SATA port is connected to solid state drive or hard disk drive.

4.4.2.3 Security Configuration

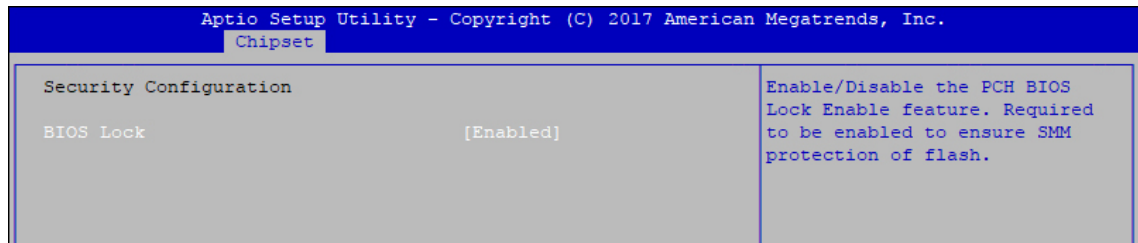


Figure 4-4-2-3 : Security Settings

BIOS Lock

Enable/disable the PCH BIOS Lock Enable (BLE bit) feature.

4.4.3 GPIOManager Control

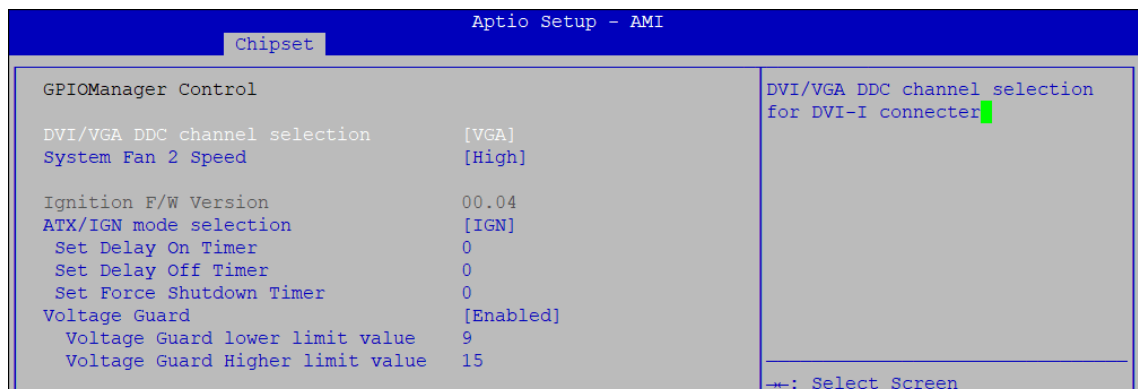


Figure 4-4-3 : GPIOManager Settings

DVI/VGA DDC channel selection

DVI/VGA DDC channel selection for DVI-I connector

System Fan 2 Speed

System Fan 2 Speed control (SYS_FAN2)

Ignition F/W Version

Indicate current ignition f/w version

Current Ignition control method

[Hardware] Ignition mode control by hardware switch.

[Software] Ignition mode control by software

System power on method

[Normal] System power on by power button

[Ignition] System power on by ignition pin

Delay On Timer (Second)

The delay times after user trigger ignition on signal

Delay Off Timer (Second)

The delay times after user trigger ignition off signal

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

4.5 Security

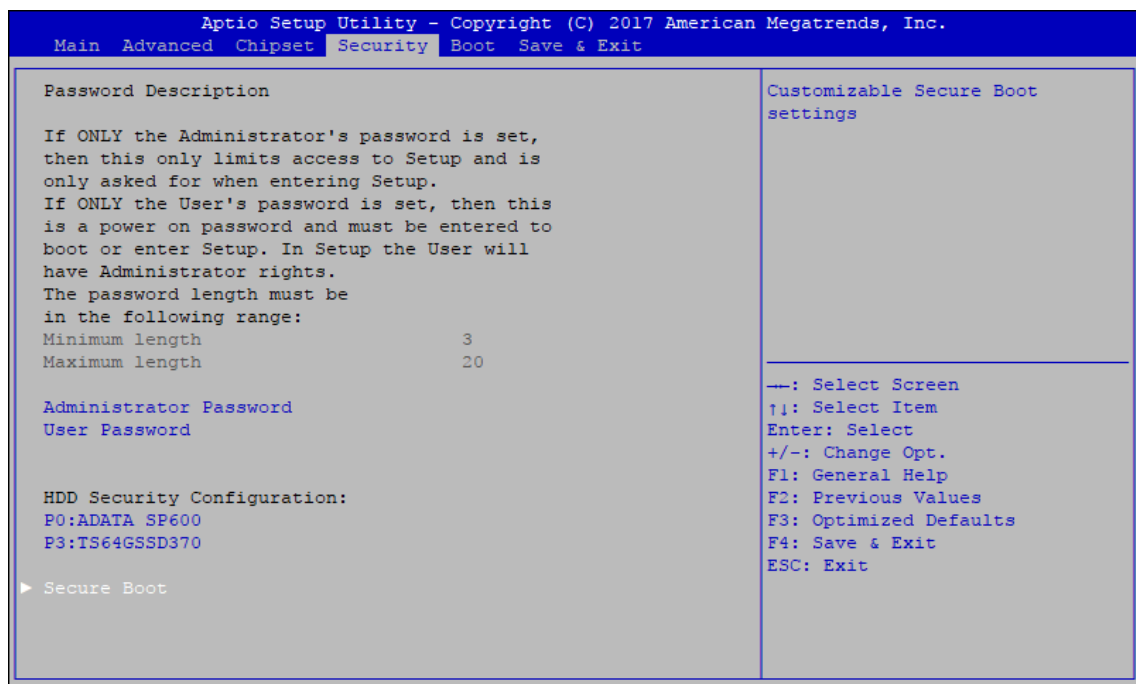


Figure 4-5 : BIOS Security Menu

Administrator Password

Set administrator password.

User Password

Set user password.

Secure Boot

Customizable Secure Boot Settings.

4.5.1 HDD Security Configuration

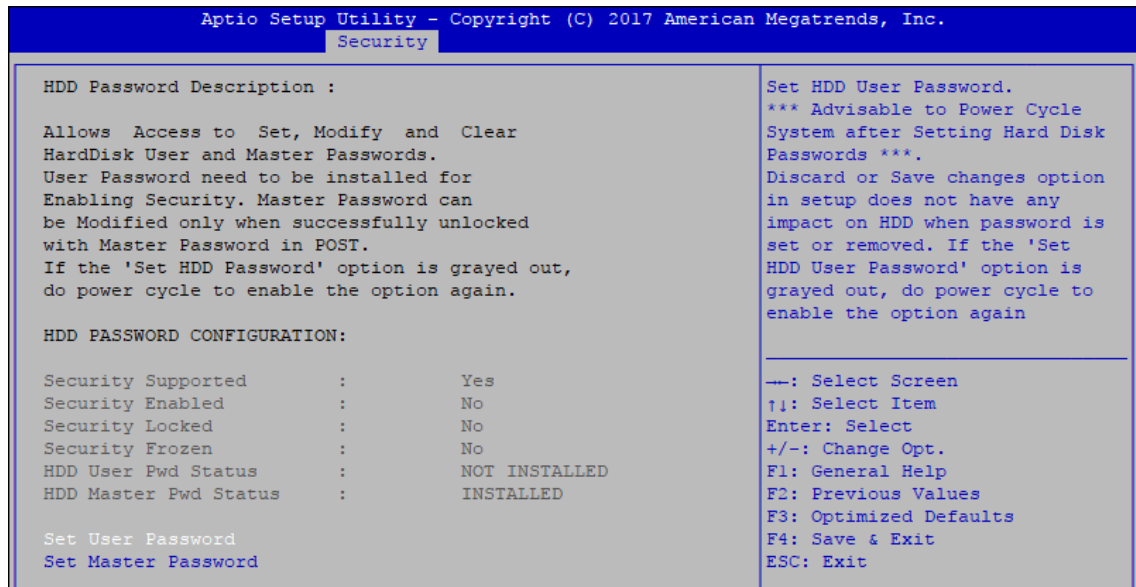


Figure 4-5-1 : HDD Security Settings

Set User Password

Set HDD user password.

*** Advisable to power cycle system after setting hard disk passwords ***

Discard or save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is gray, do power cycle to enable the option again.

4.5.2 Security Boot

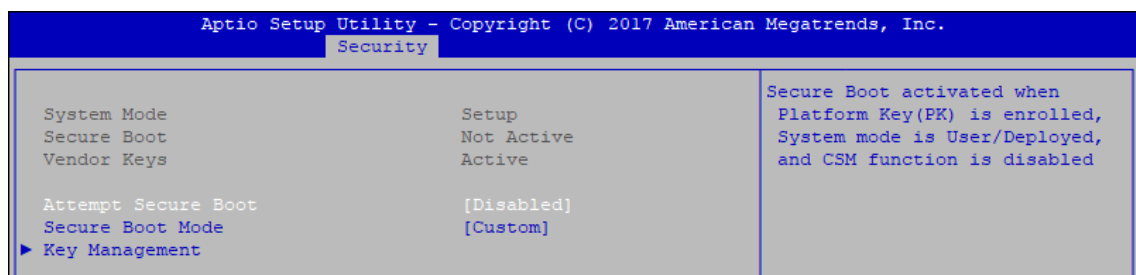


Figure 4-5-2 : Security Boot Settings

Attempt Secure Boot

Secure Boot activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.

Secure Boot Mode

Secure Boot mode selector Standard/Custom.

In custom mode Secure Boot Variables can be configured without authentication

Key Management

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

4.6 Boot

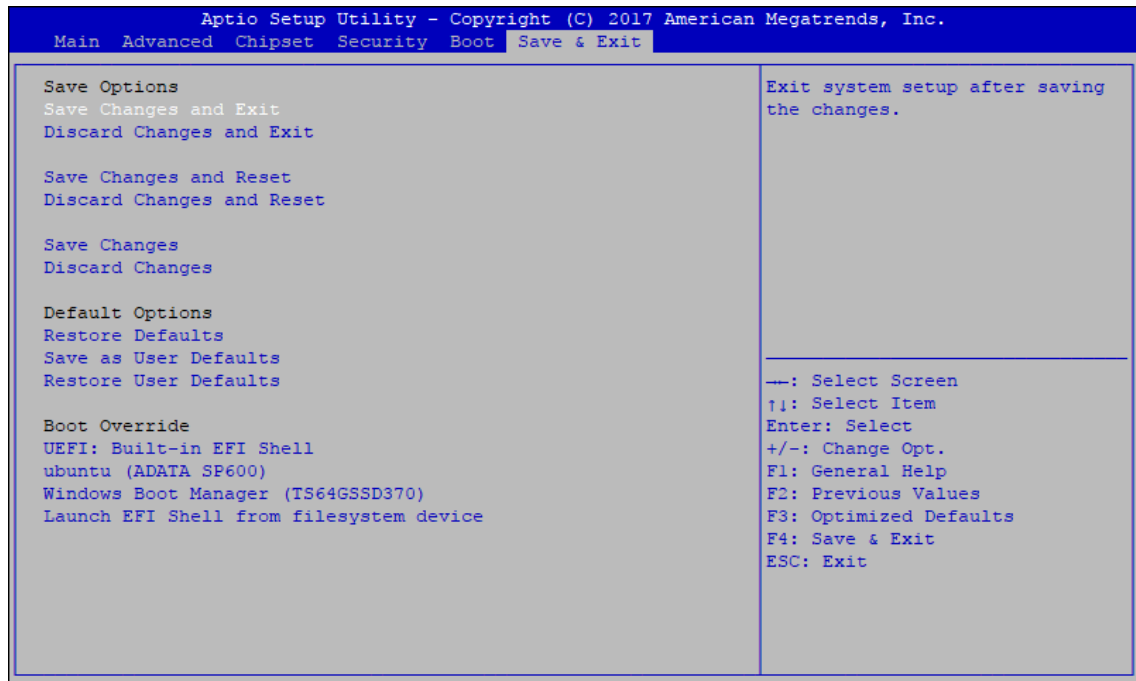


Figure 4-6 : BIOS Boot Menu

Setup Prompt Timeout

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

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Boot Option

Sets the system boot order.

New Boot Option Policy

Controls the placement of newly detected UEFI boot options.

Hard Drive BBS Priorities

Set the order of the Legacy devices in this group.

4.7 Save & Exit

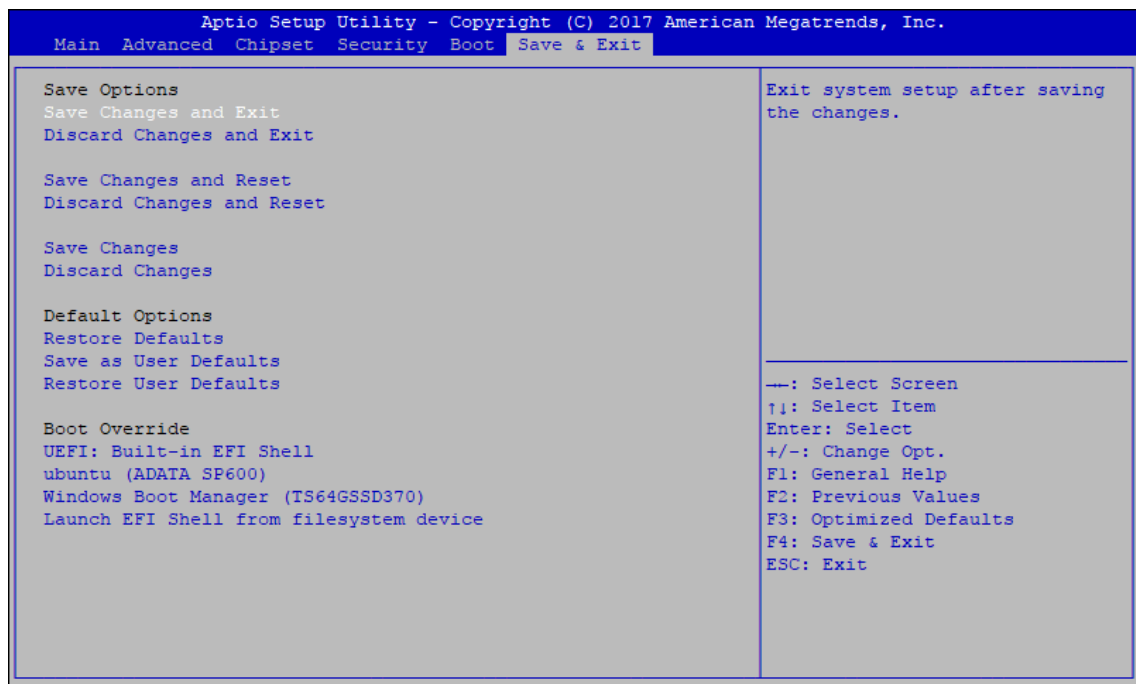


Figure 4-7 : BIOS Save and Exit Menu

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.

Default Options

Restore Defaults

Restore/Load Default values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options

A

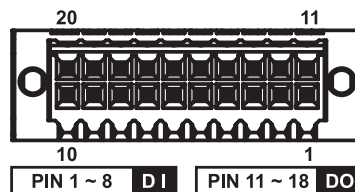
APPENDIX A : Isolated DIO Guide

A.1 Function Description

The ECX-2000 offers a 16-bit DIO (Isolated/Non-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.

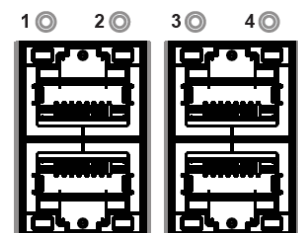
DIO definition is shown below :



Pin No.	DIO Definition	GPIO Definition	Pin No.	DIO Definition	GPIO Definition
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	GND
10	DIO_GND	GND	20	External VDC	NC

POE definition is shown below :

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



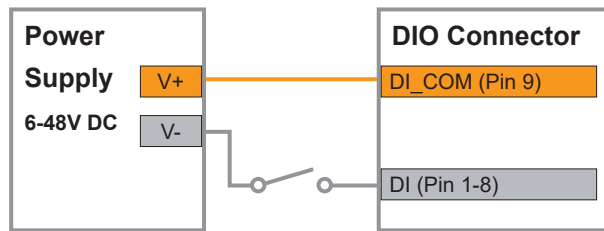
Do NOT use these functions in below :

1. PE-2000 : DIO1 (ID = 0), POE
2. PE-3000 : POE (ID = 0)
3. UE-1000 : USB (ID = 0)

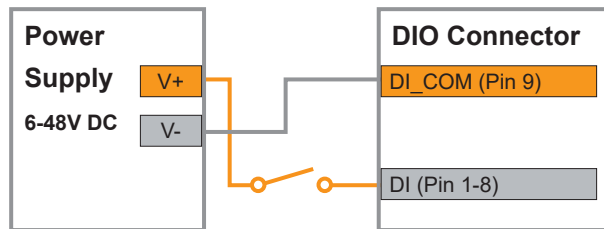
A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode
(NPN)

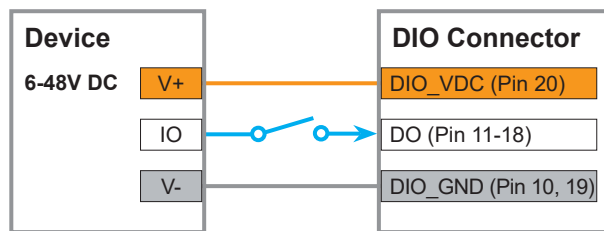


Source Mode
(PNP)

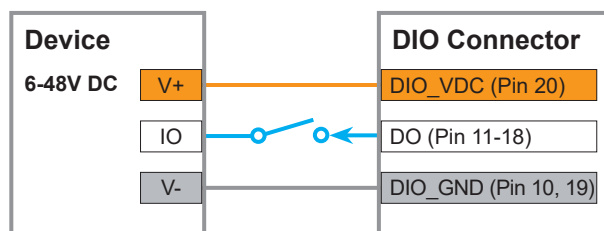


DO reference circuit :

Sink Mode
(NPN, Default)



Source Mode
(PNP)



A.3 Software Package Contain

Distribution folder include x32 and x64 versions, use batch file for installation.

There are included as followed :

Win10_32.bat, and Win10_64.bat :

Installation for driver, and

Uninstall_32.bat, and Uninstall_64.bat :

Uninstallation for driver

Run batch file as Administrator.

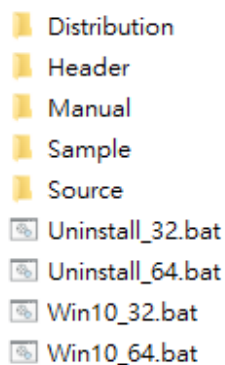
Make sure Windows version before installation.

Header folder include head file for software developer or System Integration.

Manual folder include API description.

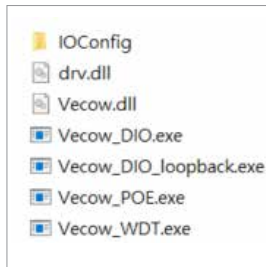
Sample folder include sample program, driver library, and API library for Windows/Linux

Source folder include sample program source code that compile on Visual Studio 2008/ubuntu16.04.

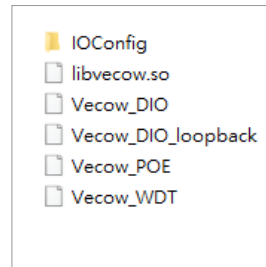


A.4 Sample

Execute demo tool.



Windows



Linux

Sample, as shown below :

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

Choose IO : (1/2)
```

Vecow_DIO

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

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

Vecow_DIO_loopback

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

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

Vecow_POE

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

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

Vecow_WDT

B

APPENDIX B : Software Functions

B.1 Driver API Guide

In Header folder, Vecow.h and VecowLinux.h contain usable 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).

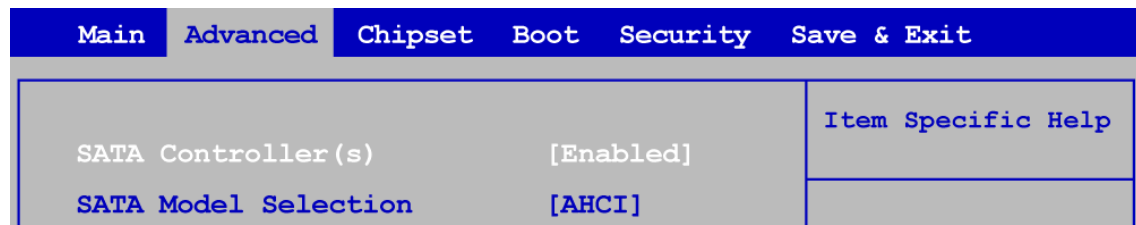
C

APPENDIX C : RAID Functions

C.1.1 SATA Mode for RAID

Please select SATA Device to RAID mode on BIOS menu.

Advanced → SATA Configuration → SATA Mode Selection → Intel RST Premium



C.1.2 UEFI Mode for RAID

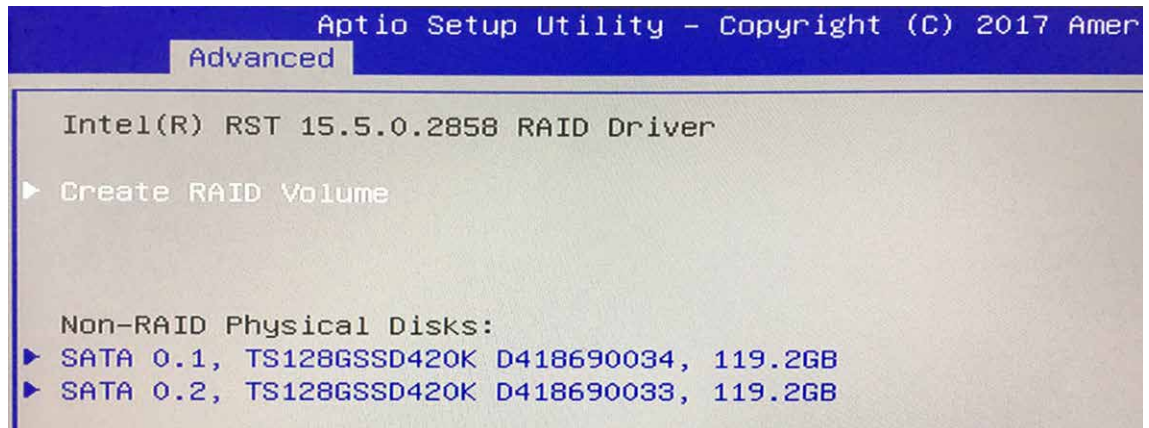
1. Please select SATA device to RAID mode on BIOS menu.

Advanced → SATA Configuration → SATA Mode Selection → Intel RST Premium
→ Save Changes and Reset.

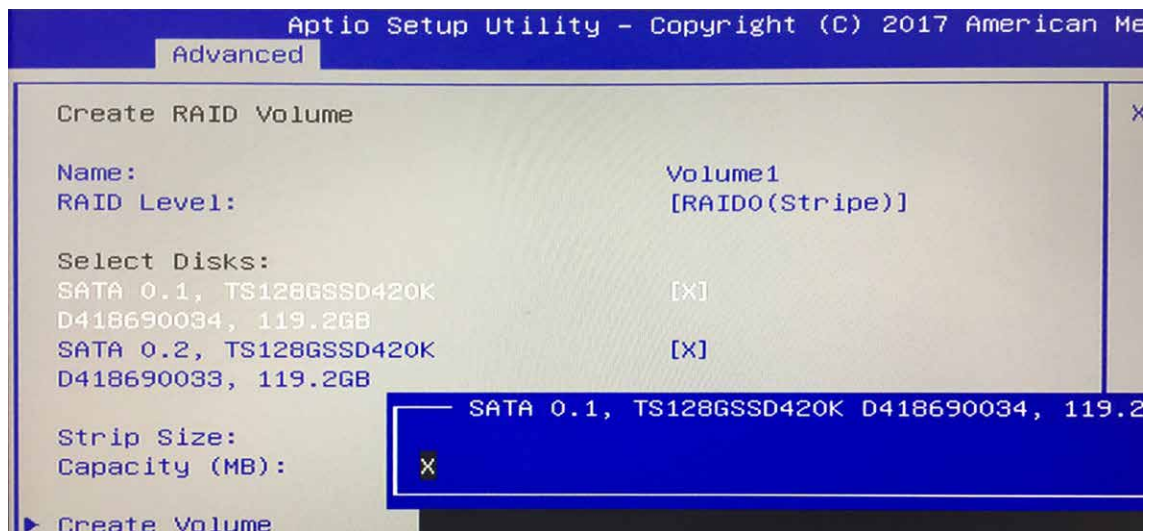
2. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.



3. Select Create RAID Volume on BIOS menu.



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



C.2 OS Installation

The system is featured with one M.2 key M for NVME, one mSATA slot, and including two internal SATA.

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

C.3 To Install All Device Drivers of the System

The instructions are as follows :

1. Install Chipset driver
2. Install Network driver
3. Install ME driver (if available)
4. Install Audio driver
5. Install VGA driver

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

You can get the latest information and the software directly from Intel website.

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

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

C.5 To Insert SATA HDD for RAID 1

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

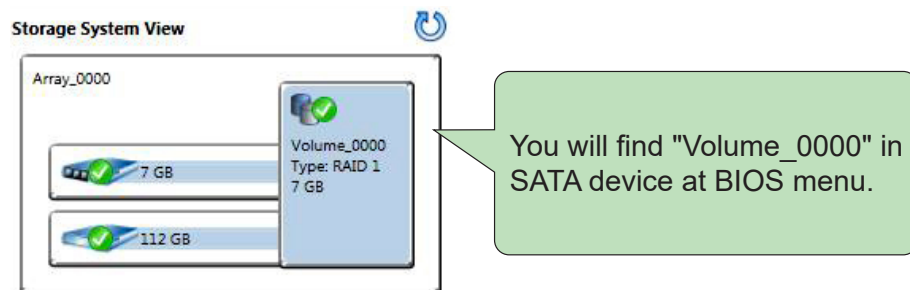
C.6 To Create RAID Volume on "Rapid Storage Technology" Software

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

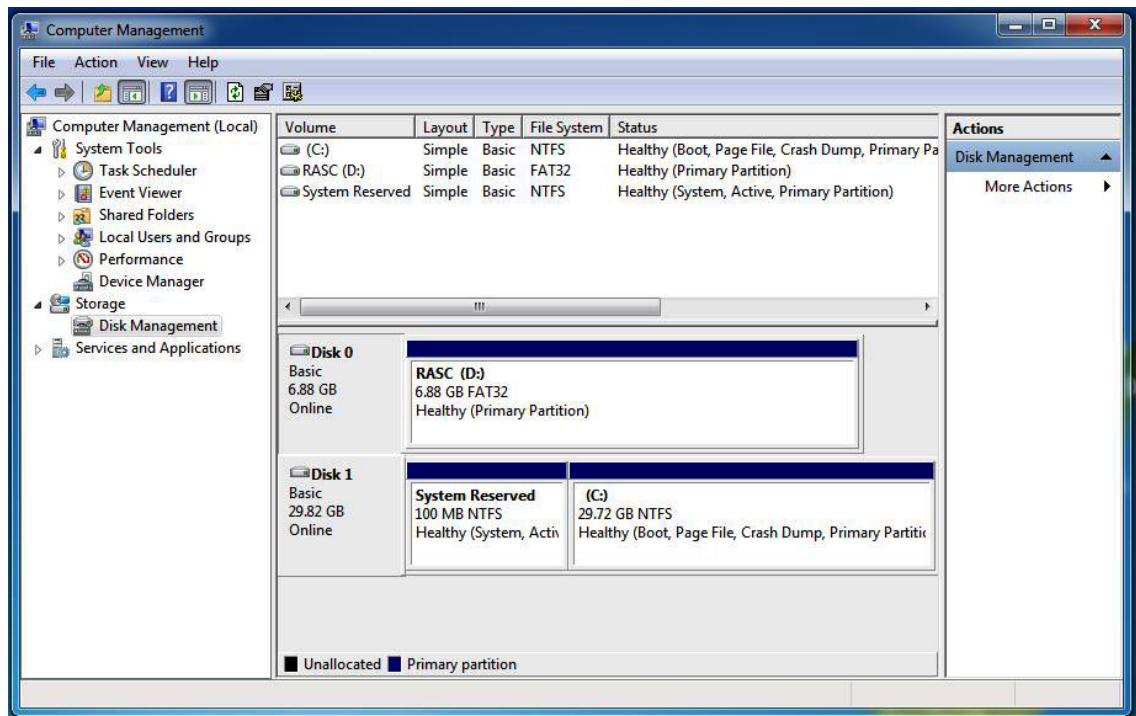


C.7 Disk Management : Partition the Disk

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

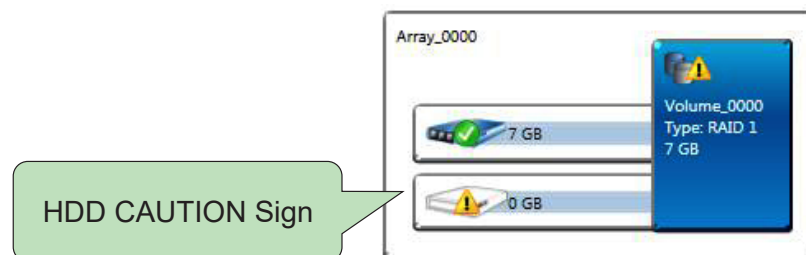


To start disk management tool, select "initialize disk".
 Then add "Logical Device" for Windows access.



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

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



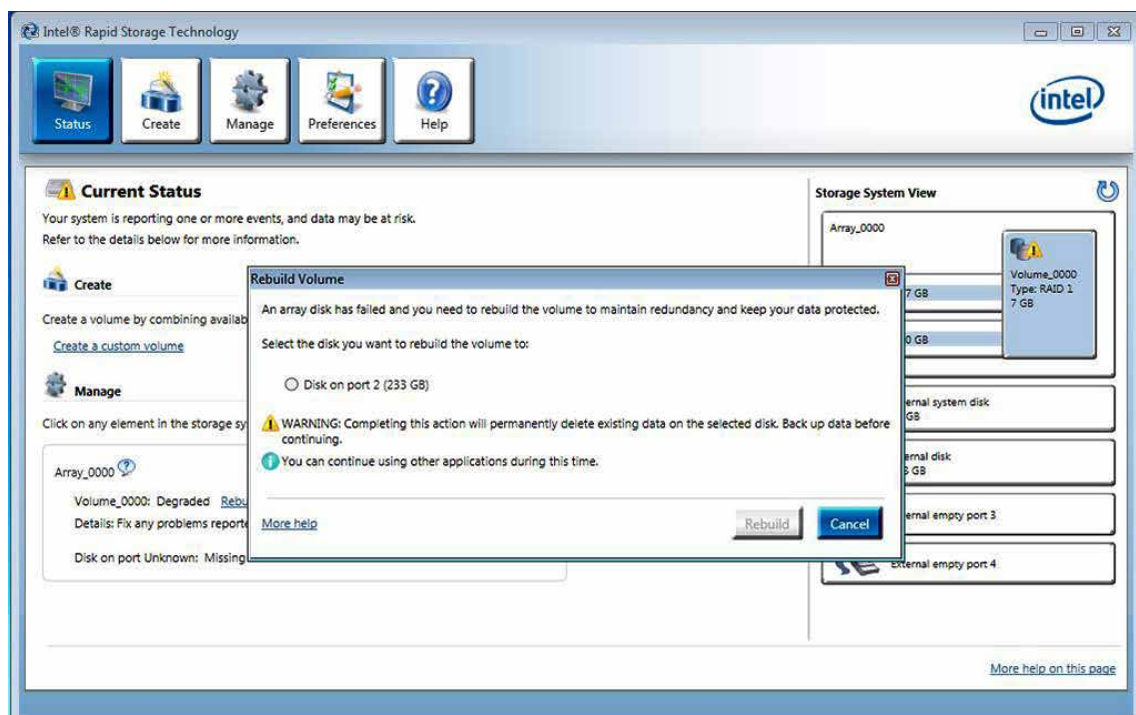
C.9 Recovery and Auto Rebuild When Use the **SAME** RAID HDD



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

A warning will pop-up to ask you if the disk is not a member of the original RAID volume.

If you press "Rebuild", it will replace the broken SATA HDD to the last SATA HDD of RAID volume.



D

APPENDIX D : Power Consumption

Testing Board	ECX-2000
RAM	16GB * 2
USB-1	USB 3.0 Flash Drive
USB-2	USB 3.0 Flash Drive
USB-3	USB 3.0 Flash Drive
USB-4	USB 3.0 Flash Drive
USB-5	USB Mouse HP G1K28AA
USB-6	USB Keyboard AOPEN CMS-730
SATA 0	Innodisk 3MG2-P DGS25-64GD81BC1QC 64GB
SATA 1	FORESEE S903S256G 256GB
Graphics Output	DVI
Power Plan	Balance (Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program	BurnInTest

D.1 Intel® Core™ i7-10700TE 2.00GHz (16M Cache, 4.40GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i7-10700TE	9V	0.423A	03.81W	0.579A	05.21W	1.874A	16.87W
Core™ i7-10700TE	12V	0.314A	03.77W	0.437A	05.24W	1.341A	16.09W
Core™ i7-10700TE	24V	0.201A	04.82W	0.276A	06.62W	0.720A	17.28W
Core™ i7-10700TE	50V	0.149A	07.45W	0.199A	09.95W	0.404A	20.20W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Core™ i7-10700TE	9V	4.139A	37.25W	4.372A	39.35W
Core™ i7-10700TE	12V	3.090A	37.08W	3.232A	38.78W
Core™ i7-10700TE	24V	1.595A	38.28W	1.689A	40.54W
Core™ i7-10700TE	50V	0.826A	41.30W	0.869A	43.45W

D.2 Intel® Core™ i5-10500E 3.10GHz (12M Cache, 4.20GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-10500E	9V	0.423A	03.81W	0.579A	05.21W	1.787A	16.08W
Core™ i5-10500E	12V	0.315A	03.78W	0.439A	05.27W	1.343A	16.12W
Core™ i5-10500E	24V	0.203A	04.87W	0.277A	06.65W	0.717A	17.21W
Core™ i5-10500E	50V	0.150A	07.50W	0.200A	10.00W	0.412A	20.60W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-10500E	9V	5.133A	46.20W	5.431A	48.88W
Core™ i5-10500E	12V	3.900A	46.80W	3.996A	47.95W
Core™ i5-10500E	24V	2.015A	48.36W	2.020A	48.48W
Core™ i5-10500E	50V	1.020A	51.00W	1.064A	53.20W

D.3 Intel® Xeon® W-1270E 3.40GHz (16M Cache, up to 4.80GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1270E	9V	0.423A	03.81W	0.579A	05.21W	1.901A	17.11W
Xeon® W-1270E	12V	0.314A	03.77W	0.438A	05.26W	1.366A	16.39W
Xeon® W-1270E	24V	0.201A	04.82W	0.276A	06.62W	0.770A	18.48W
Xeon® W-1270E	50V	0.149A	07.45W	0.199A	09.95W	0.410A	20.50W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1270E	9V	7.913A	71.22W	8.075A	72.68W
Xeon® W-1270E	12V	5.552A	66.62W	5.769A	69.23W
Xeon® W-1270E	24V	2.877A	69.05W	2.894A	69.46W
Xeon® W-1270E	50V	1.409A	70.45W	1.460A	73.00W

D.4 Intel® Xeon® W-1290E 3.50GHz (20M Cache, up to 4.80GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1290E	9V	0.425A	03.83W	0.580A	05.22W	1.770A	15.93W
Xeon® W-1290E	12V	0.314A	03.77W	0.437A	05.24W	1.359A	16.31W
Xeon® W-1290E	24V	0.203A	04.87W	0.277A	06.65W	0.744A	17.86W
Xeon® W-1290E	50V	0.150A	07.50W	0.199A	09.95W	0.419A	20.95W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1290E	9V	8.815A	79.34W	8.987A	80.88W
Xeon® W-1290E	12V	6.568A	78.82W	6.602A	79.22W
Xeon® W-1290E	24V	3.306A	79.34W	3.355A	80.52W
Xeon® W-1290E	50V	1.619A	80.95W	1.695A	84.75W

E

APPENDIX E : Supported Memory & Storage List

E.1 Test Item

Testing Board	ECX-2000
Memory Test	MemTest86 V8.4
BurnInTest	BurnInTest Pro V8.1 (build 1025)

Channel	Memory Test	Burn-in Test	Flash BIOS	Remove Battery	Sleep	Hibernate	Reboot	CPU-Z
*2	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
*1 (SODIMM_1)	PASS	PASS	N/A	N/A	PASS	PASS	PASS	PASS
*1 (SODIMM_2)	PASS	PASS	N/A	N/A	PASS	PASS	PASS	PASS

E.2 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
MEMXPRO 16GB DDR4-2666 SODIMM	D4S-AG26H1G8W2	25°C
UD info 32GB DDR4-2666 SODIMM	UD4S26EBGSLC-A	25°C
Innodisk 16GB DDR4-2933 SODIMM	M4S0-AGS1O5UN-H03	25°C
Innodisk 16GB DDR4-2933 SODIMM	M4S0-AGS1OCUN-H03	25°C
SL LINK 8GB DDR4-3200 SODIMM	J4AGSH1G8TMEC	25°C
SL LINK 16GB DDR4-3200 SODIMM	J4AGSH1G8TMFC	25°C
UD info 16GB DDR4-3200 SODIMM	UD4S32GAGSJC-C	25°C
Innodisk 16GB DDR4-3200 SODIMM	M4S0-AGS1OCEM-H03	25°C
Innodisk 16GB DDR4-3200 SODIMM	M4S0-AGS1O5EM-H03	25°C
MEMXPRO 32GB DDR4-3200 SODIMM	D4S-BG32M2G8W1	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4S0-BGS2OCEM-H03	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4S0-BGS2O5EM-H03	25°C

E.3 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
KINGSTON 16GB DDR4-2666 SODIMM	KSM26SED8/16ME	25°C
SL LINK 8GB DDR4-3200 SODIMM	J48GDH1G8TMJC	25°C
SMART 32GB DDR4-3200 SODIMM	ST4097SO420825SA	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4D0-BGS2QCEM-H03	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4D0-BGS2Q5EM-H03	25°C

E.4 Supported Storage Device List

Type	Brand	Model	Capacity
Micro SD	Innodisk	3ME2 EA3TFM-064G	64GB
	Innodisk	3ME2 ES3TFW-064G	64GB
	UD info	uSD-08UD	128GB
SATA HDD	TOSHIBA	MQ01ABF050	500GB
	TOSHIBA	MQ01ABD050	500GB
	HGST	Z5K500-500 HTS545050A7E680	500GB
mSATA SSD	Intel	Intel-310 SSDMAEMC080G2	80GB
	Kingston	SUV500MS	120GB
SATA SSD	Kingston	SUV500/120G	120GB
	Intel	540s SSDSC2KW120H6	120GB
	Intel	E 5400s SSDSC2KR120H6	120GB
	FORESEE	S903S128G	128GB
	WD	GREEN WDS240G2G0A	240GB
	SAMSUNG	860 EVO MZ-76E250	250GB
	FORESEE	S903S256G	256GB
	LITE-ON	K8-L1256	256GB
	LITE-ON	K8-L1512	512GB
M.2 SATA SSD	SANDISK	X400 SD8SN8U-128G-1002	128GB
	MEMXPRO	M.2 2280 SATA PM31 256GB ST FP28S-B5GTMS464C1	256GB
	MEMXPRO	M.2 2280 SATA PM31 512GB WT FP28S-E1GTMS464W1	512GB
	MEMXPRO	M.2 2280 SATA PT31 512GB WT FP28S-E1GMTS594W1	512GB
	Innodisk	M.2 (S80) 3TE7 DEM28-01TDK1ECAQF-H03	1TB

Type	Brand	Model	Capacity
M.2 SATA SSD	Innodisk	M.2 (S80) 3TE7 DEM28-01TDK1EWAQF-H03	1TB
	Exascend	SI3 EXSAM1K0019C2N8I00	1920GB
	Exascend	SC3 EXSAM1K002TV3N8C00	2TB
M.2 PCIe SSD	INTEL	760P SSDPEKKW128G8	128GB
	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
	FORESEE	FSGPMMC-256G	256GB
	SMART	M1400v (C-temp) SVM2PHA480GMT51	480GB
	TOSHIBA	KXG50ZNV512G	512GB
	DSL	M.2 PCIe SSD DMD8TT01TB3E8DC1	1TB
	Innodisk	M.2 (P80) 3TE2 DEM28-01TM61ECAQF-H03	1TB
	Innodisk	M.2 (P80) 3TE6 DEM28-01TDD1ECAQF-H03	1TB
	Exascend	PE3 EXP3M4D0019V2N8C0E	1920GB
	Innodisk	M.2 (P80) 3TG3-P DGM28-02TDA1ECBEH-H03	2TB

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



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

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