

# RCX-2000 PEG USER Manual

Intel® Xeon®/Core™ i7/i5/i3 AI Computing System

Workstation-grade, NVIDIA® Tesla®/Quadro®/GeForce®/AMD Radeon™ Graphics

## Record of Revision

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# Order Information

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Part Number	Description
RCX-2330-PEG	RCX-2000, 11th Gen Intel® Processor, 1 GigE LAN, 1 2.5 GigE LAN, 6 USB 3.2 Gen 2, 4 COM, 3 SIM, 1 PCIe x16 (Gen4) Slot, 2 PCIe x4 (Gen3) Slot, 3 M.2, 32 Isolated DIO
RCX-2330R-PEG	RCX-2000, 11th Gen Intel® Processor, 1 GigE LAN, 1 2.5 GigE LAN, 6 USB 3.2 Gen 2, 4 COM, 3 SIM, 1 PCIe x16 (Gen4) Slot, 2 PCIe x4 (Gen3) Slot, 3 M.2, 32 Isolated DIO, 4 Front-access SSD Tray
RCX-2430-PEG	RCX-2000, 11th Gen Intel® Processor, 1 GigE LAN, 1 2.5 GigE LAN, 6 USB 3.2 Gen 2, 4 COM, 3 SIM, 2 PCIe x4 (Gen3) Slot, 1 PCIe x16 (Gen4) Slot, 3 M.2, 32 Isolated DIO
RCX-2430R-PEG	RCX-2000, 11th Gen Intel® Processor, 1 GigE LAN, 1 2.5 GigE LAN, 6 USB 3.2 Gen 2, 4 COM, 3 SIM, 2 PCIe x4 (Gen3) Slot, 1 PCIe x16 (Gen4) Slot, 3 M.2, 32 Isolated DIO, 4 Front-access SSD Tray
RCX-2750-PEG	RCX-2000, 11th Gen Intel® Processor, 1 GigE LAN, 1 2.5 GigE LAN, 6 USB 3.2 Gen 2, 4 COM, 3 SIM, 2 PCIe x8 (Gen4) Slot, 3 PCIe x4 (Gen3) Slot, 3 M.2, 32 Isolated DIO
RCX-2750R-PEG	RCX-2000, 11th Gen Intel® Processor, 1 GigE LAN, 1 2.5 GigE LAN, 6 USB 3.2 Gen 2, 4 COM, 3 SIM, 2 PCIe x8 (Gen4) Slot, 3 PCIe x4 (Gen3) Slot, 3 M.2, 32 Isolated DIO, 4 Front-access SSD Tray

## CPU List

Series	Model	Cores	GHz	Turbo	TDP (W)	ECC RAM
Intel® Xeon®	W-1350	6	3.3	5	80	Y
Intel® Core™	i7-11700	8	2.5	4.9	65	N/A
	i7-11700T	8	1.4	4.6	35	N/A
	i5-11500	6	2.7	4.6	65	N/A
	i5-11500T	6	1.5	3.9	35	N/A

## 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
PWS-480W-WT	480W, 24V, 90V AC to 305V AC Power Supply, Wide-Temp, IP65
PWS-600W1	600W, 24V, 90V AC to 264V AC Power Supply
PWS-600W-WT	600W, 28.8V, 90 to 305V AC Power Supply, Wide Temperature -40°C to +70°C
PWS-1000W-24V	1000W, 24V, 90V AC to 264V AC Power Supply
PWS-1500W-24V	1500W, 24V, 90V AC to 264V AC Power Supply
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	Mini PCIe 4G/GPS Module with Antenna
WiFi & Bluetooth	WiFi & Bluetooth Module with Antenna

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# 1

## GENERAL INTRODUCTION

### 1.1 Overview

Vecow RCX-2000 PEG is a workstation-grade AI Computing System. It is powered by 11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S) and integrated with NVIDIA® Tesla®/Quadro®/GeForce®/AMD Radeon™ Graphics to provide advanced computing capability and flexible expansion for ease deployment of edge AI applications including High-Speed AOI, Rolling Stock, 3D Mapping, AI Inference for Autonomous Driving, Medical Imaging and any AIoT/ Industry 4.0 applications.

Vecow RCX-2000 PEG AI Computing System is based on 11th Gen. Intel® Xeon®/Core™ i7/i5 Processor that supports 8 cores and runs with Intel® W580 chipset, delivering up to 19% CPU productivity improvement. Vecow RCX-2000 PEG supports enhanced Intel® UHD graphics featuring Intel® Iris® X<sup>e</sup> Graphics architecture and offers an excellent visual experience with up to 4K HDR. Equipped with a PCIe x16 slot that supports max 750W power for NVIDIA® or AMD graphics engine, Vecow RCX-2000 PEG provides scalability of expansion with 3 PCIe, 2 Mini PCIe, 4 M.2. In addition, Vecow RCX-2000 PEG offers a variety of interfaces including 2 GigE LAN, 6 USB, 4 COM, 3 SIM and 4 SSD tray for storage.

Vecow RCX-2000 PEG delivers a combination of ignition control, surge protection and powerful computing that not only meets the requirements of EV applications but many other industrial environments like Rolling Stock, and high-speed AOI.



## 1.2 Features

- Workstation-grade Platform : 8-core 11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S) running with Intel® W580 chipset, up to 19% CPU productivity improved 1500W power budget supports max dual 750W NVIDIA® Tesla®/Quadro®/ GeForce® or AMD Radeon™ 3-slot graphics card (RCX-2700 PEG)
- PCIe x16 Gen 4 Slot supports max 750W power for NVIDIA® or AMD 2-slot graphics card (RCX-2400 PEG)
- PCIe x16 Gen 4 Slot supports max 750W power for NVIDIA® or AMD 3-slot graphics card (RCX-2300 PEG)
- DDR4 Memory supports up to 3200MHz, optional with ECC
- Expansion : up to 2 PCIe x8 Gen4, 3 PCIe x4, 2 Mini PCIe, 1 M.2 Key E, 1 M.2 Key B
- Multiple 5G/WiFi 6/4G/LTE/GPRS/UMTS, TPM 2.0, vPRO
- DC 9V to 55V Power Input, Software Ignition Control
- Optional VHub AIoT Solution Service supports OpenVINO based AI accelerator and advanced Edge AI applications

## 1.3 Product Specification

### 1.3.1 Specifications of RCX-2330 PEG

<b>System</b>	
Processor	11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S)
Chipset	Intel® W580 Chipset
BIOS	AMI
SIO	IT8786E
Memory	4 DDR4 SO-DIMM, up to 128GB (ECC/Non-ECC)
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.1 Gen 2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD
SIM Card	3 External SIM Card Socket
<b>Expansion</b>	
Mini PCIe	2 Full-size for PCIe/USB/External SIM Card/mSATA
PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 Slot with x16 signal (Gen4)</li> <li>• 2 PCIe x16 Slot with x4 signal (Gen3)</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key E Socket (2230)</li> <li>• 1 M.2 Key B Socket (3042/3052/2280)</li> </ul>
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics P750/750 supports Intel® Iris® X <sup>e</sup> Graphics architecture
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 3 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested Graphics Card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key M Socket (2280, PCIe Gen4 x4)</li> <li>• 1 M.2 Key B Socket (2280, PCIe x2, same socket with expansion)</li> </ul>
Storage Device	<ul style="list-style-type: none"> <li>• 4 2.5" SSD/HDD Bracket (Internal)</li> <li>• 1 M.2 Key M Socket</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 12.0
LAN 2	Intel® I225IT 2.5G LAN

<b>Power</b>	
Input Voltage	9V to 55V, DC-in
Power Interface	2-pin Terminal Block : V+, V-
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	166.4mm x 208.5mm x 375.0mm (6.55" x 8.21" x 14.76")
Weight	7.8 kg (17.19 lb)
Mounting	Wallmount by mounting bracket
<b>Environment</b>	
Operating Temperature	-25°C to 60°C (-13°F to 147°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 60°C
Shock/Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.2 Specifications of RCX-2330R PEG

<b>System</b>	
Processor	11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S)
Chipset	Intel® W580 Chipset
BIOS	AMI
SIO	IT8786E
Memory	4 DDR4 SO-DIMM, up to 128GB (ECC/Non-ECC)
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.1 Gen 2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD
SIM Card	3 External SIM Card Socket
<b>Expansion</b>	
Mini PCIe	2 Full-size for PCIe/USB/External SIM Card/mSATA
PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 Slot with x16 signal (Gen4)</li> <li>• 2 PCIe x16 Slot with x4 signal (Gen3)</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key E Socket (2230)</li> <li>• 1 M.2 Key B Socket (3042/3052/2280)</li> </ul>
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics P750/750 supports Intel® Iris® X <sup>e</sup> Graphics architecture
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 3 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested Graphics Card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key M Socket (2280, PCIe Gen4 x4)</li> <li>• 1 M.2 Key B Socket (2280, PCIe x2, same socket with expansion)</li> </ul>
Storage Device	<ul style="list-style-type: none"> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> <li>• 1 M.2 Key M Socket</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 12.0
LAN 2	Intel® I225IT 2.5G LAN

<b>Power</b>	
Input Voltage	9V to 55V, DC-in
Power Interface	2-pin Terminal Block : V+, V-
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	166.4mm x 208.5mm x 375.0mm (6.55" x 8.21" x 14.76")
Weight	8.1 kg (17.85 lb)
Mounting	Wallmount by mounting bracket
<b>Environment</b>	
Operating Temperature	-25°C to 60°C (-13°F to 147°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 60°C
Shock/Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.3 Specifications of RCX-2430 PEG

<b>System</b>	
Processor	11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S)
Chipset	Intel® W580 Chipset
BIOS	AMI
SIO	IT8786E
Memory	4 DDR4 SO-DIMM, up to 128GB (ECC/Non-ECC)
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.1 Gen 2 (External)</li> <li>• 1 USB 2.0 (Internal)"</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD
SIM Card	3 External SIM Card Socket
<b>Expansion</b>	
mPCIe	2 Full-size for PCIe/USB/External SIM Card/mSATA
PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 slot with PCIe Gen 4 x16 signal</li> <li>• 2 PCIe x16 slot with PCIe Gen 3 x4 signal</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key E Socket (2230)</li> <li>• 1 M.2 Key B Socket (3042/3052/2280)"</li> </ul>
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics P750/750 supports Intel® Iris® Xe Graphics architecture
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 3 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested Graphics Card"</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key M Socket (2280, PCIe Gen4 x4)</li> <li>• 1 M.2 Key B Socket (2280, PCIe x2, same socket with expansion)"</li> </ul>
Storage Device	<ul style="list-style-type: none"> <li>• 4 2.5" SSD/HDD Bracket (Internal)</li> <li>• 1 M.2 Key M Socket"</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 12.0
LAN 2	Intel® I225IT 2.5G LAN

<b>Power</b>	
Power Input	9-55V DC-in
Power Interface	2-pin Terminal Block : V+, V
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
Smart Management	Wake on LAN
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimensions (H x W x L)	183.1mm x 208.3mm x 375.2mm (7.21"x 8.19" x 14.77)
Weight	8.3 kg(18.30 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	-25°C to 60°C (-13°F to 147°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, Non-condensing
Relative Humidity	95% @60°C
Shock/Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.4 Specifications of RCX-2430R PEG

<b>System</b>	
Processor	11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S)
Chipset	Intel® W580 Chipset
BIOS	AMI
SIO	IT8786E
Memory	4 DDR4 SO-DIMM, up to 128GB (ECC/Non-ECC)
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.1 Gen 2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD
SIM Card	3 External SIM Card Socket
<b>Expansion</b>	
Mini PCIe	2 Full-size for PCIe/USB/External SIM Card/mSATA
PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 slot with PCIe Gen 4 x16 signal</li> <li>• 2 PCIe x16 slot with PCIe Gen 3 x4 signal</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key E Socket (2230)</li> <li>• 1 M.2 Key B Socket (3042/3052/2280)</li> </ul>
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics P750/750 supports Intel® Iris® X <sup>e</sup> Graphics architecture
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 3 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested Graphics Card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key M Socket (2280, PCIe Gen4 x4)</li> <li>• 1 M.2 Key B Socket (2280, PCIe x2, same socket with expansion)</li> </ul>
Storage Device	<ul style="list-style-type: none"> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> <li>• 1 M.2 Key M Socket"</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 12.0
LAN 2	Intel® I225IT 2.5G LAN



<b>Power</b>	
Power Input	9-55V DC-in
Power Interface	2-pin Terminal Block : V+, V
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset: 1 to 255 sec./min. Per Step
Smart Management	Wake on LAN
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimensions (H x W x L)	183.1mm x 208.3mm x 375.2mm (7.21"x 8.19" x 14.77)
Weight	8.6 kg(18.96 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	-25°C to 60°C (-13°F to 147°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, Non-condensing
Relative Humidity	95% @60°C
Shock/Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.5 Specifications of RCX-2750 PEG

<b>System</b>	
Processor	11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S)
Chipset	Intel® W580 Chipset
BIOS	AMI
SIO	IT8786E
Memory	4 DDR4 SO-DIMM, up to 128GB (ECC/Non-ECC)
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.1 Gen 2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD
SIM Card	3 External SIM Card Socket
<b>Expansion</b>	
Mini PCIe	2 Full-size for PCIe/USB/External SIM Card/mSATA
PCIe	<ul style="list-style-type: none"> <li>• 2 PCIe x16 Slot with x8 signal (Gen4)</li> <li>• 3 PCIe x16 Slot with x4 signal (Gen3)</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key E Socket (2230)</li> <li>• 1 M.2 Key B Socket (3042/3052/2280)</li> </ul>
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics P750/750 supports Intel® Iris® X <sup>e</sup> Graphics architecture
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 3 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested Graphics Card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key M Socket (2280, PCIe Gen4 x4)</li> <li>• 1 M.2 Key B Socket (2280, PCIe x2, same socket with expansion)</li> </ul>
Storage Device	<ul style="list-style-type: none"> <li>• 4 2.5" SSD/HDD Bracket (Internal)</li> <li>• 1 M.2 Key M Socket</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 12.0
LAN 2	Intel® I225IT 2.5G LAN

<b>Power</b>	
Input Voltage	9V to 55V, DC-in
Power Interface	4-pin Terminal Block : V+, V+, V-, V-
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	253.9mm x 215.8mm x 375.0mm (10.00" x 8.50" x 14.76")
Weight	9.5 kg (20.94 lb)
Mounting	Wallmount by mounting bracket
<b>Environment</b>	
Operating Temperature	-25°C to 60°C (-13°F to 147°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 60°C
Shock/Vibration	<ul style="list-style-type: none"> <li>IEC 61373 : 2010</li> <li>Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.6 Specifications of RCX-2750R PEG

<b>System</b>	
Processor	11th Gen Intel® Xeon®/Core™ i7/i5 Processor (Rocket Lake-S)
Chipset	Intel® W580 Chipset
BIOS	AMI
SIO	IT8786E
Memory	4 DDR4 SO-DIMM, up to 128GB (ECC/Non-ECC)
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.1 Gen 2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD
SIM Card	3 External SIM Card Socket
<b>Expansion</b>	
Mini PCIe	2 Full-size for PCIe/USB/External SIM Card/mSATA
PCIe	<ul style="list-style-type: none"> <li>• 2 PCIe x16 Slot with x8 signal (Gen4)</li> <li>• 3 PCIe x16 Slot with x4 signal (Gen3)</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key E Socket (2230)</li> <li>• 1 M.2 Key B Socket (3042/3052/2280)</li> </ul>
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics P750/750 supports Intel® Iris® X <sup>e</sup> Graphics architecture
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 3 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested Graphics Card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key M Socket (2280, PCIe Gen4 x4)</li> <li>• 1 M.2 Key B Socket (2280, PCIe x2, same socket with expansion)</li> </ul>
Storage Device	<ul style="list-style-type: none"> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> <li>• 1 M.2 Key M Socket</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek® ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM Gigabit LAN supports iAMT 12.0
LAN 2	Intel® I225IT 2.5G LAN

<b>Power</b>	
Input Voltage	9V to 55V, DC-in
Power Interface	4-pin Terminal Block : V+, V+, V-, V-
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	253.9mm x 215.8mm x 375.0mm (10.00" x 8.50" x 14.76")
Weight	9.8 kg (21.61 lb)
Mounting	Wallmount by mounting bracket
<b>Environment</b>	
Operating Temperature	-25°C to 60°C (-13°F to 147°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 60°C
Shock/Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

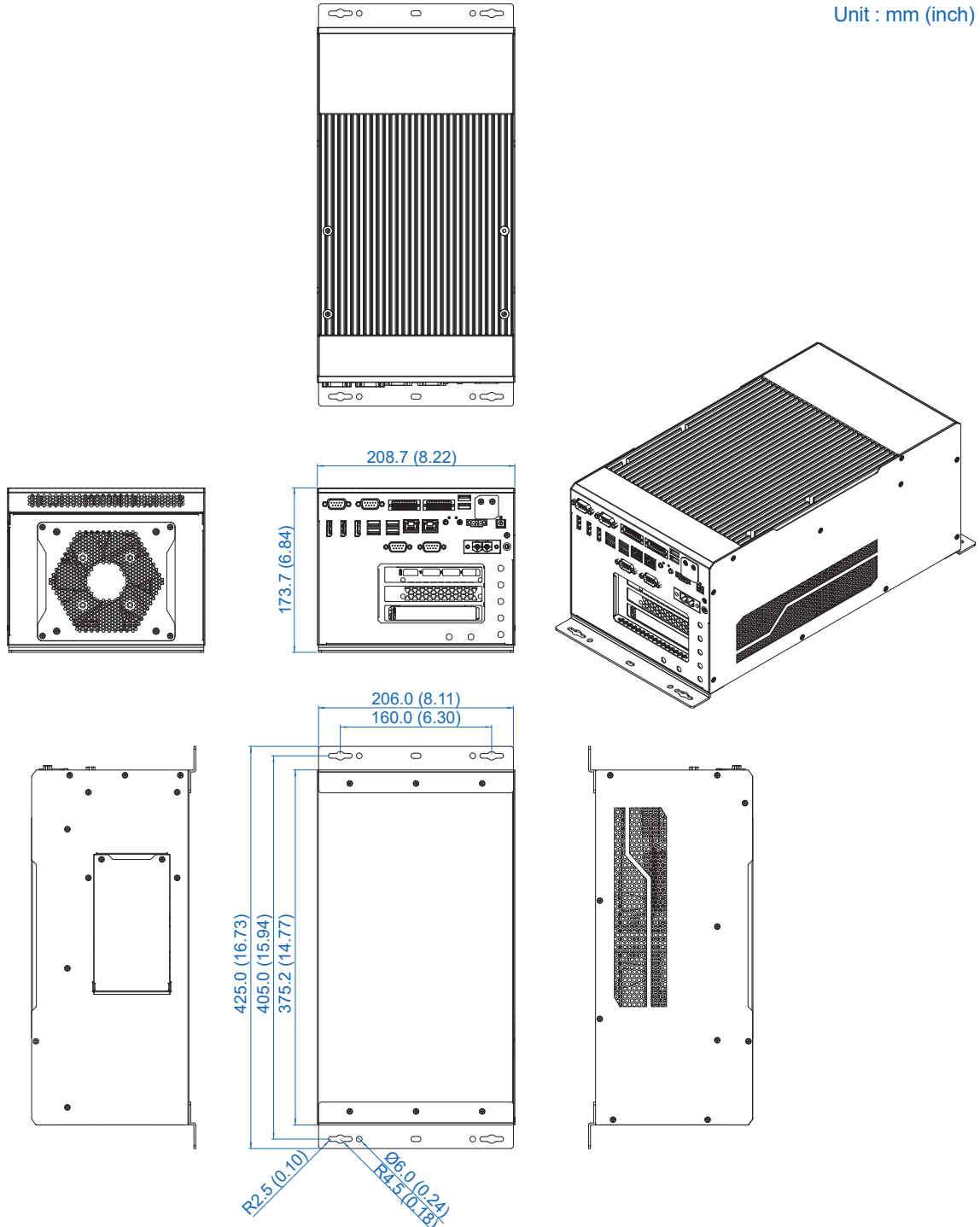
## 1.4 Supported CPU List

Series	Model	Cores	GHz	Turbo	TDP (W)	ECC RAM
Intel® Xeon®	W-1350	6	3.3	5	80	Y
Intel® Core™	i7-11700	8	2.5	4.9	65	N/A
	i7-11700T	8	1.4	4.6	35	N/A
	i5-11500	6	2.7	4.6	65	N/A
	i5-11500T	6	1.5	3.9	35	N/A

# 1.5 Mechanical Dimension

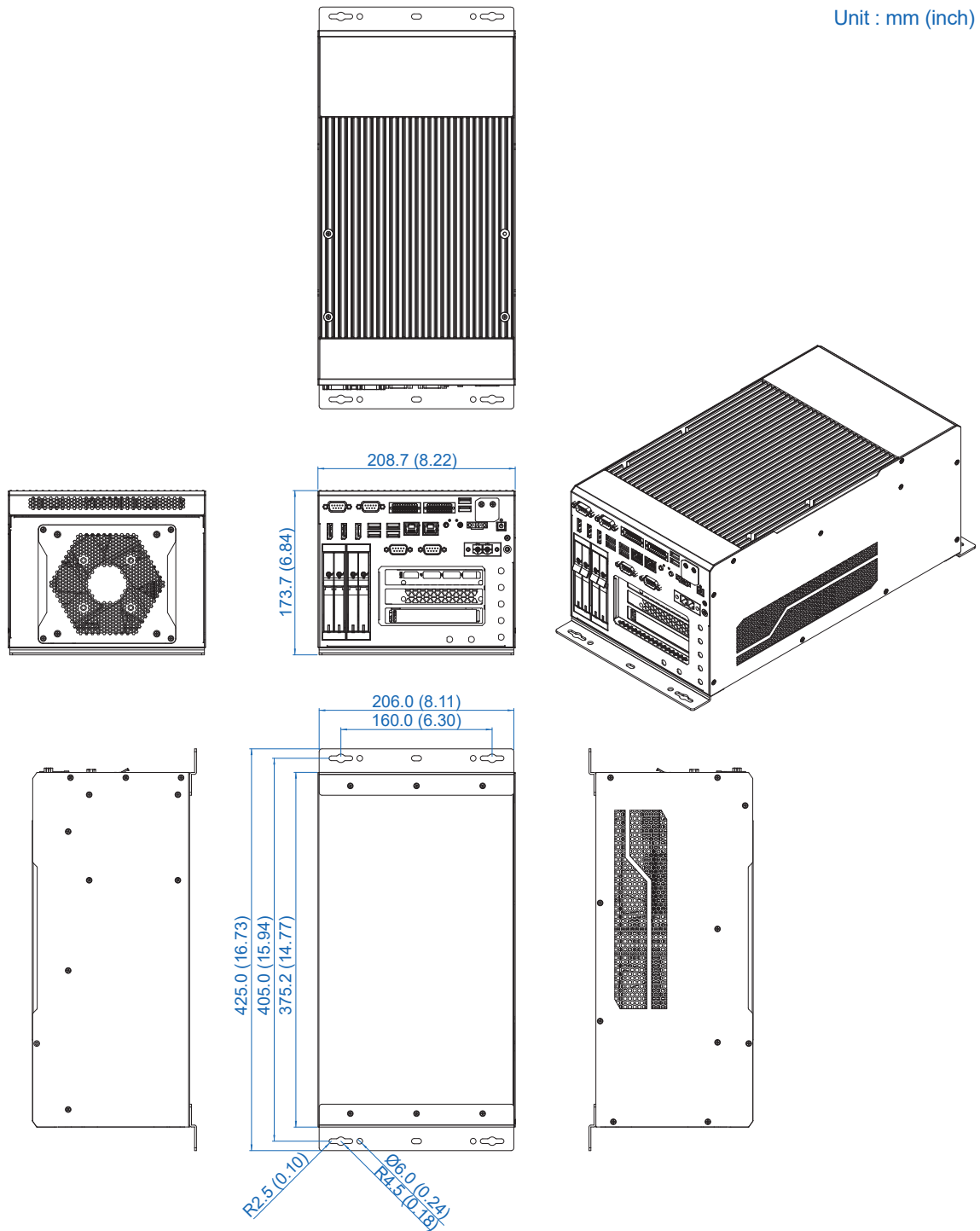
## 1.5.1 Dimensions of RCX-2330-PEG

Unit : mm (inch)



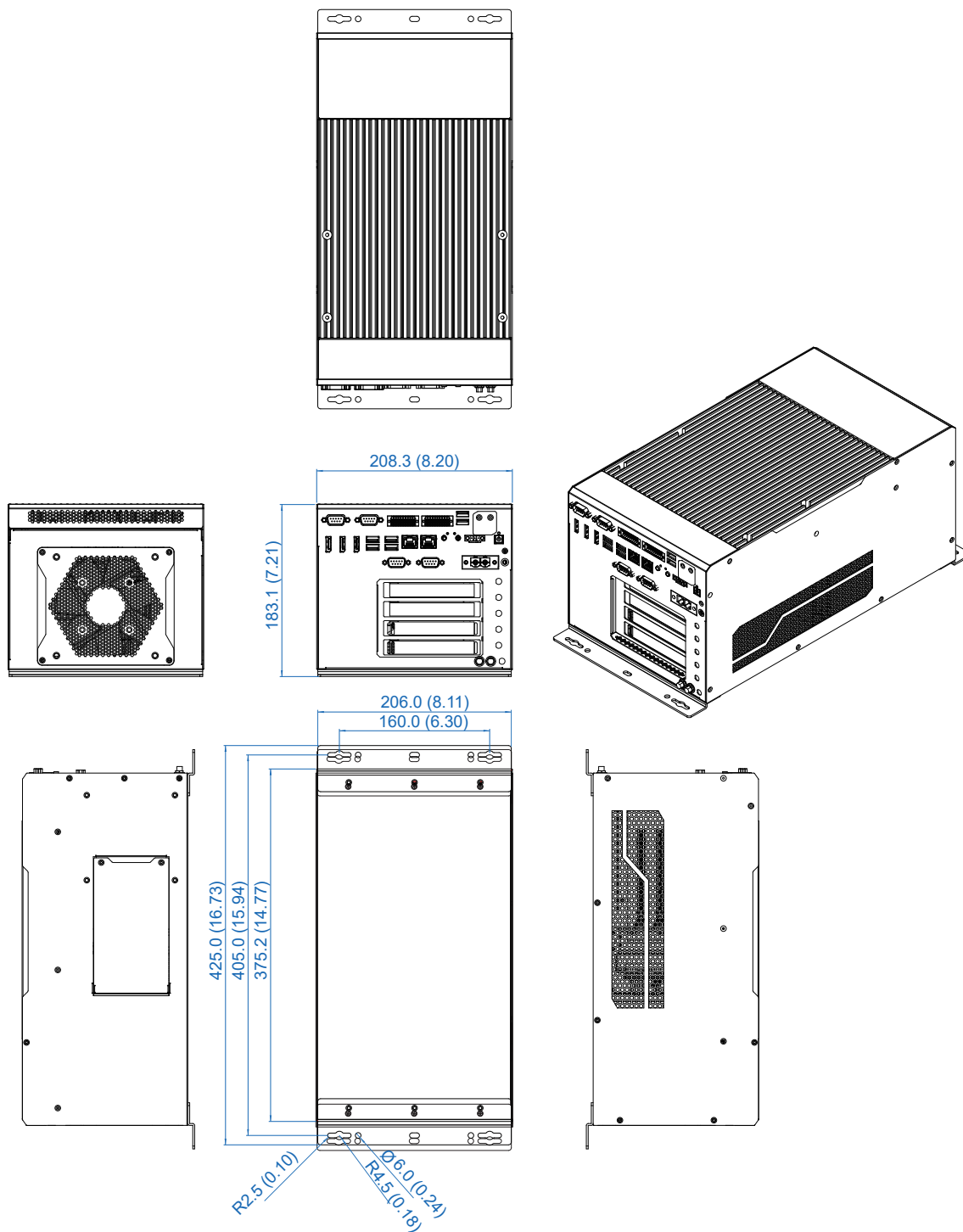
## 1.5.2 Dimensions of RCX-2330R-PEG

Unit : mm (inch)

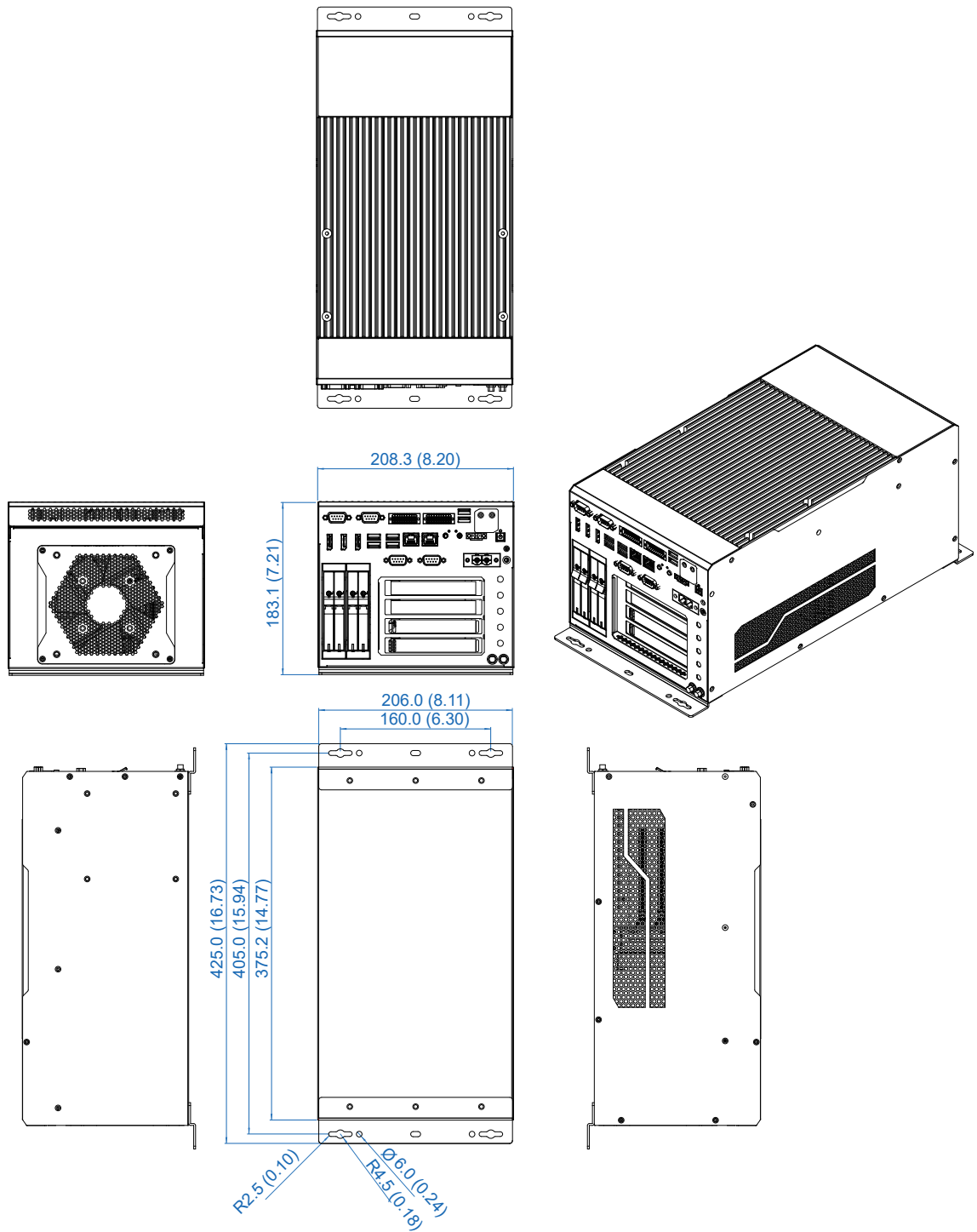




### 1.5.3 Dimensions of RCX-2430-PEG

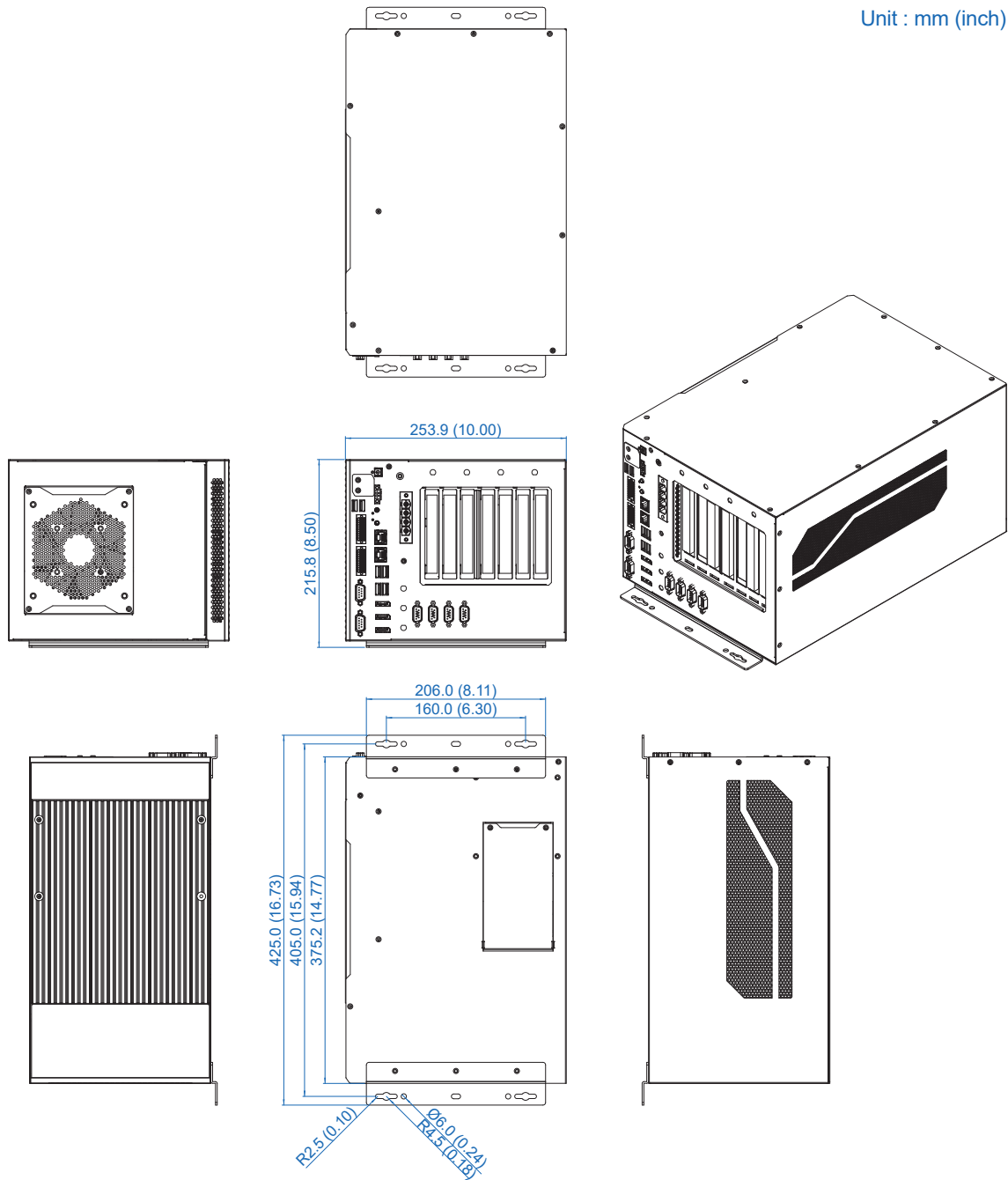


### 1.5.4 Dimensions of RCX-2430R-PEG



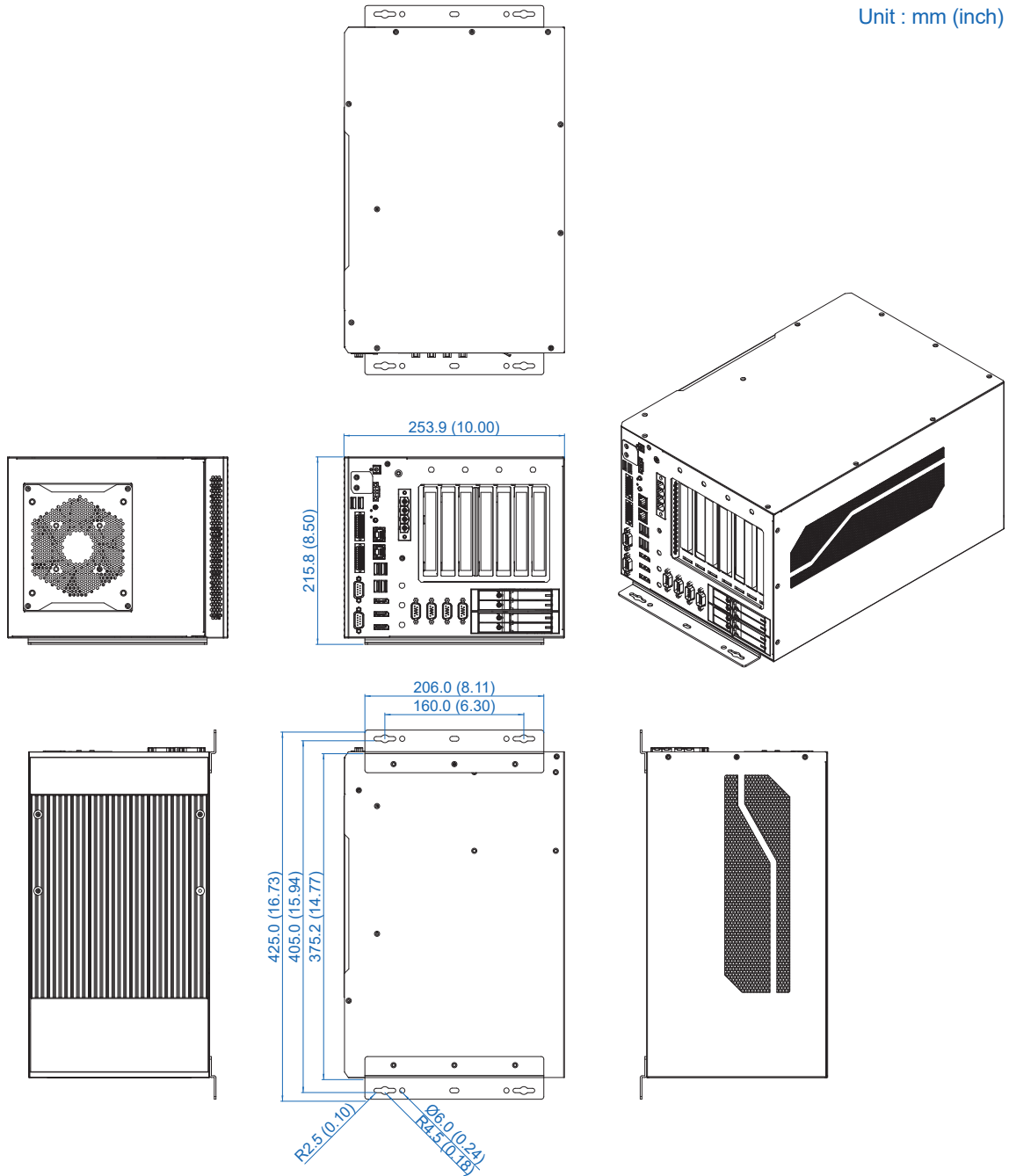
## 1.5.5 Dimensions of RCX-2750-PEG

Unit : mm (inch)



## 1.5.6 Dimensions of RCX-2750R-PEG

Unit : mm (inch)












# 2

## GETTING TO KNOW YOUR RCX-2000

### 2.1 Packing List









#### 2.1.1 RCX-2330 PEG/ RCX-2430 PEG Packing List

Item	Description	Qty
1	RCX-2000-PEG AI Computing System (According to the configuration you order, the RCX-2000 PEG series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_M2.5x6L_Ni		Mini PCIe	53-2426906-30B	2
2	F Head_M3x5L_Nylok		Wall mount	53-M004950-310	6
3	P head_M3x4L_Ni_Nylok		M.2	53-2426204-80B	3
4	F Head_M3x4L_Nylok		HDD	53-M013150-310	16
5	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
6	Terminal block 20-pin (2.54mm)		Isolated DIO/GPIO	51-2112R20-S1D	2
7	Terminal block 2-pin (10.16mm)		DC-in	51-2701R02-R1Q	1
8	Graphic Power Cable, ATX 8 pin		GPU	61-1400003-0H5	2
9	Wall mount		Wall mount	62-03P0811-000	2

## 2.1.2 RCX-2330R PEG/ RCX-2430R PEG Packing List

Item	Description	Qty
1	RCX-2000-PEG AI Computing System (According to the configuration you order, the RCX-2000 PEG series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1
2	SSD/HDD Tray Key	4

Item	Description	Outlook	Usage	P/N	Qty
1	P head_M2.5x6L_Ni		Mini PCIe	53-2426906-30B	2
2	F Head_M3x5L_Nylok		Wall mount	53-M004950-310	6
3	P head_M3x4L_Ni_Nylok		M.2	53-2426204-80B	3
4	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
5	Terminal block 20-pin (2.54mm)		Isolated DIO/GPIO	51-2112R20-S1D	2
6	Terminal block 2-pin (10.16mm)		DC-in	51-2701R02-R1Q	1
7	Graphic Power Cable, ATX 8 pin		GPU	61-1400003-0H5	2
8	Wall mount		Wall mount	62-03P0811-000	2









### 2.1.3 RCX-2750 PEG Packing List

Item	Description	Qty
1	RCX-2000-PEG AI Computing System (According to the configuration you order, the RCX-2000 PEG series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_M2.5x6L_Ni		Mini PCIe	53-2426906-30B	2
2	F Head_M3x5L_Nylok		Wall mount	53-M004950-310	6
3	P head_M3x4L_Ni_Nylok		M.2	53-2426204-80B	3
4	F Head_M3x4L_Nylok		HDD	53-M013150-310	16
5	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
6	Terminal block 20-pin (2.54mm)		Isolated DIO/GPIO	51-2112R20-S1D	2
7	Terminal block 4-pin (10.16mm)		DC-in	51-2711R04-S1Q	1
8	Graphic Power Cable, ATX 8 pin		GPU	61-1400003-0H5	4
9	Wall mount		Wall mount	62-03P0811-000	2

## 2.1.4 RCX-2750R PEG Packing List

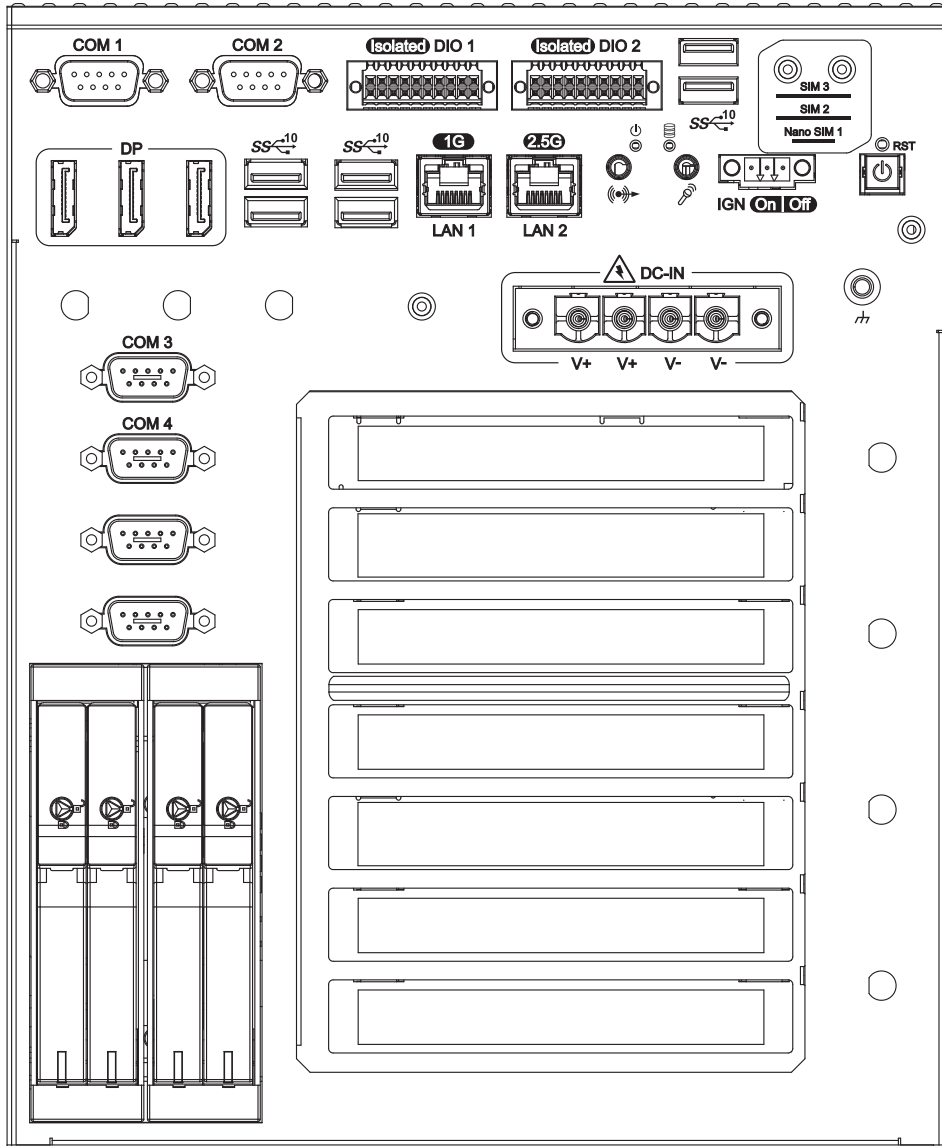
Item	Description	Qty
1	RCX-2000-PEG AI Computing System (According to the configuration you order, the RCX-2000 PEG series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1
2	SSD/HDD Tray Key	4

Item	Description	Outlook	Usage	P/N	Qty
1	P head_M2.5x6L_Ni		Mini PCIe	53-2426906-30B	2
2	F Head_M3x5L_Nylok		Wall mount	53-M004950-310	6
3	P head_M3x4L_Ni_Nylok		M.2	53-2426204-80B	3
4	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
5	Terminal block 20-pin (2.54mm)		Isolated DIO/GPIO	51-2112R20-S1D	2
6	Terminal block 4-pin (10.16mm)		DC-in	51-2711R04-S1Q	1
7	Graphic Power Cable, ATX 8 pin		GPU	61-1400003-0H5	4
8	Wall mount		Wall mount	62-03P0811-000	2

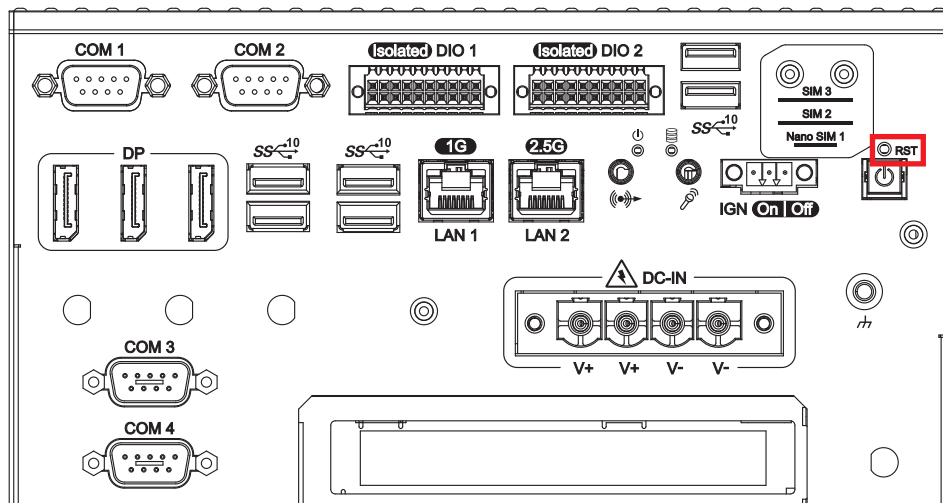


## 2.2 Front Panel I/O Functions

In Vecow's RCX-2000 PEG family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, LAN, COM Port, Isolated DIO, Display Port, and any additional storage, are placed on the front panel.

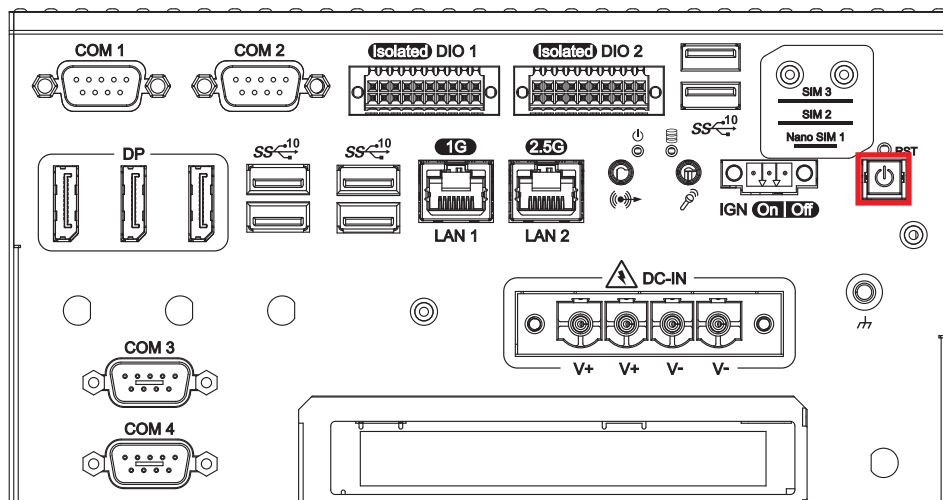


## 2.2.1 Reset Tact Switch



The item circled red is a hardware reset switch. Use this switch to reset the system without powering off the RCX-2000. Press and hold the reset switch for a few seconds, then reset will be enabled.

## 2.2.2 Power Button



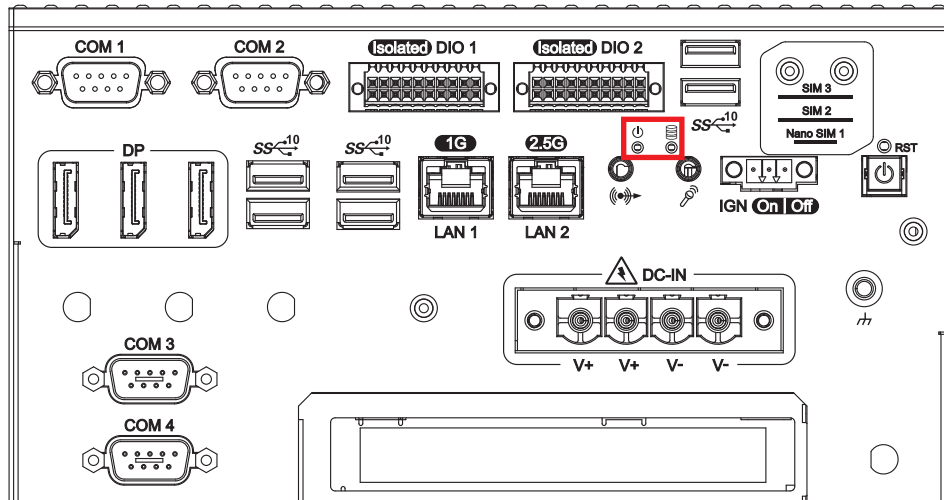
The power button is a non-latched switch with dual color LED indication. It indicates power statuses : S0, S3 and S5. More details on the LED indications are listed in the following chart :

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 RCX-2000, press the power button which will light the blue LED. To power off RCX-2000, you can either command shutdown by OS operation or simply press the power button. If system error appears, press and hold the power button for four seconds to shut down the machine directly.

Please do note that a four-second interval between each two power-on/power-off operation is necessary in normal working status. (For example, once turning off the system, you have to wait for four seconds to initiate another power-on operation).

## 2.2.3 PWR & HDD LED Indicator

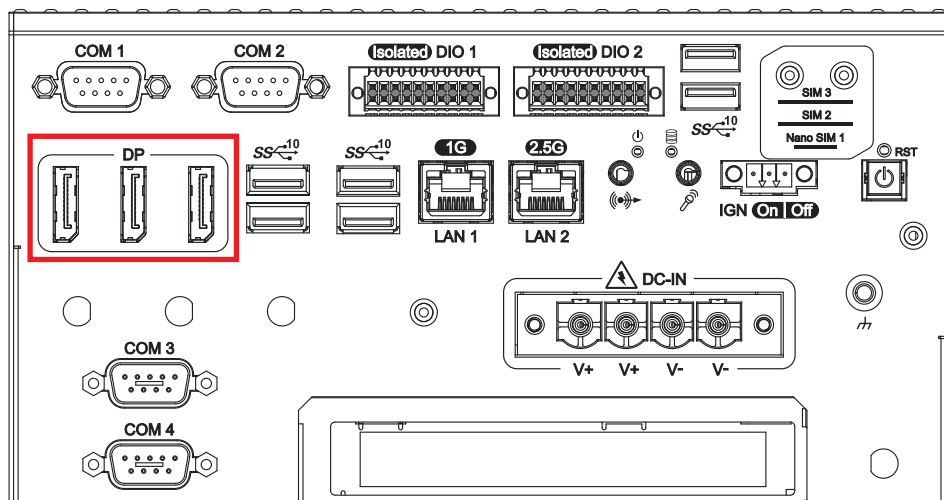


**Yellow-HDD LED :** A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

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

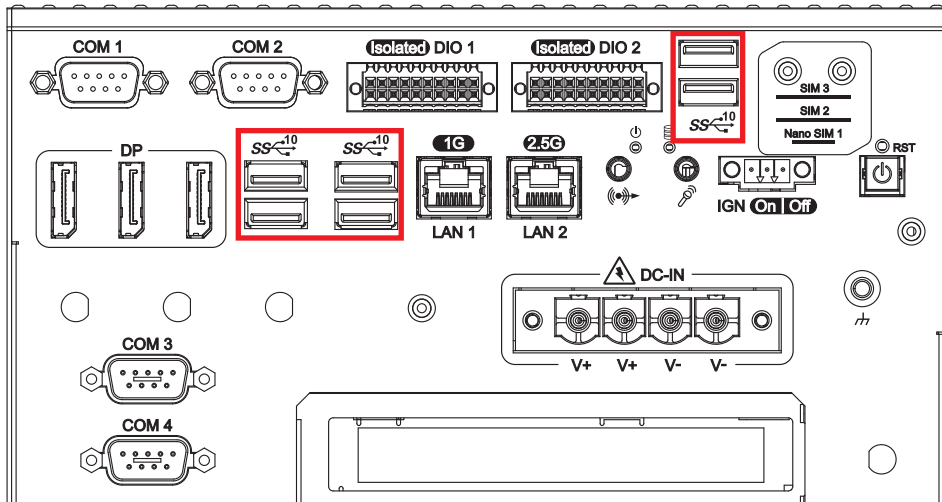
LED Color	Indication	System Status
Yellow	HDD	<ul style="list-style-type: none"> <li>On/Off : Storage status, function or not.</li> <li>Twinkling : Data transferring.</li> </ul>
Green	Power	System power status (on/off)

## 2.2.4 Display Port



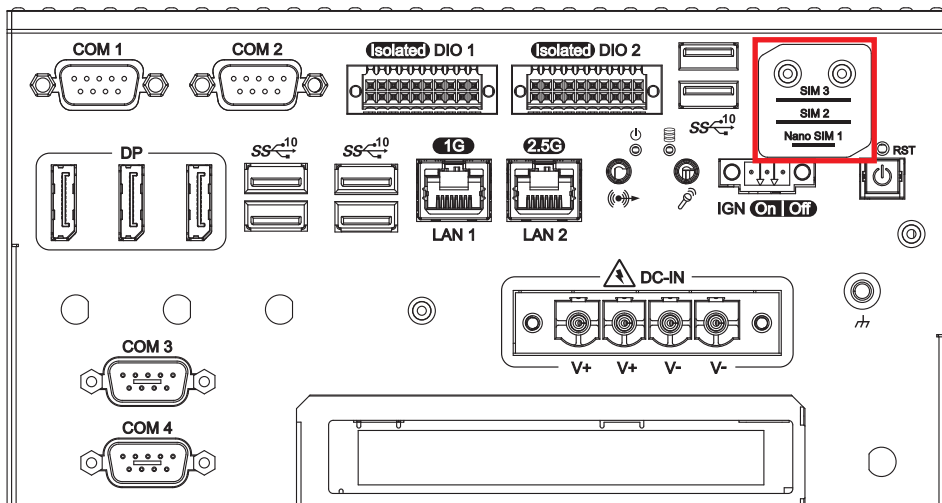
Onboard Display Port support auxiliary channel dual mode, connection supports up to 4096 x 2304 resolution at 60Hz.

## 2.2.5 USB 3.2

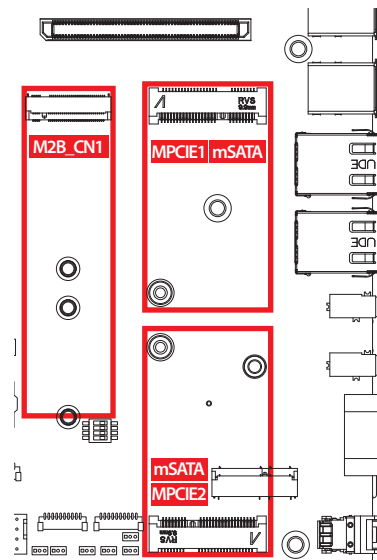


There are 6 USB 3.2 Gen2 Type A connections available supporting up to 10GB per second data rate in the front side of RCX-2000 PEG. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

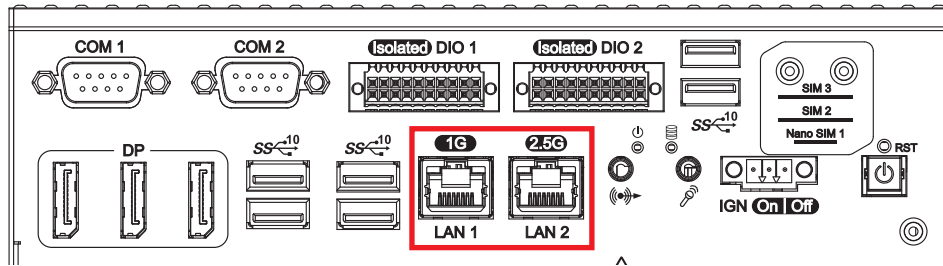
## 2.2.6 SIM 3, SIM 2, Nano SIM 1



Slot	SIM
MPCIE2	SIM3
MPCIE1	SIM2
M2B_CN1	Nano SIM1



## 2.2.7 10/100/1000/2500 Mbps Ethernet Port



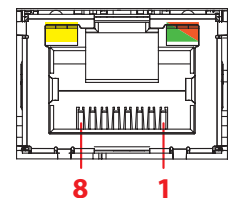
There are two 8-pin RJ-45 jacks supporting 10/100/1000/2500 Mbps Ethernet connections on the front side of RCX-2000. LAN 1 is powered by Intel I219LM Ethernet engine, and LAN 2 is powered by Intel I225 Ethernet engine. When LAN 1 works in normal status, iAMT 11.0 function is enabled.

LAN Chip	Function	Connector
I219_LAN1	RJ-45(10/100/1000)	LAN1
I225_LAN2	RJ-45(10/100/1000/2500)	LAN2

Using suitable RJ-45 cable, you can connect the RCX-2000 system to a computer or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both LAN 1 and LAN 2 support "Wake" on LAN and pre-boot functions. The pinouts of LAN 1 and LAN 2 are listed in the following chart :

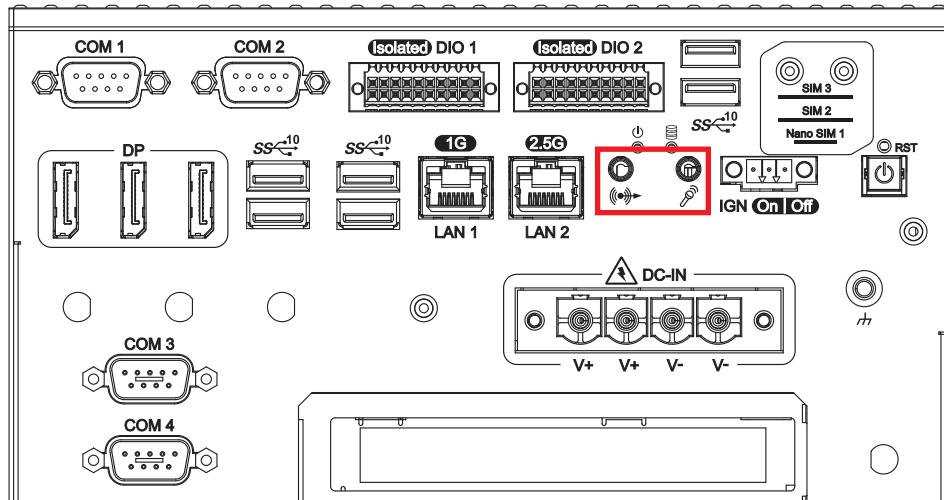
Pin No.	10/100 Mbps	1000Mbps	2500Mbps
1	E_TX+	MDI0_P	MDI0_P
2	E_TX-	MDI0_N	MDI0_N
3	E_RX+	MDI1_P	MDI1_P
4	-----	MDI2_P	MDI2_P
5	-----	MDI2_N	MDI2_N
6	E_RX-	MDI1_N	MDI1_N
7	-----	MDI3_P	MDI3_P
8	-----	MDI3_N	MDI3_N

Each LAN port is supported by a standard RJ-45 connector with LED indicators to present active/link/speed statuses of the connection.



LAN	LED Location	LED Color	10Mbps	100Mbps	1000Mbps	2500Mbps
LAN1_CN1	Right	Green/Orange	Off	Solid Orange	Solid Green	x
	Left	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow	x
LAN2_CN1	Right	Green/Orange	Off	Off	Solid Orange	Solid Green
	Left	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow

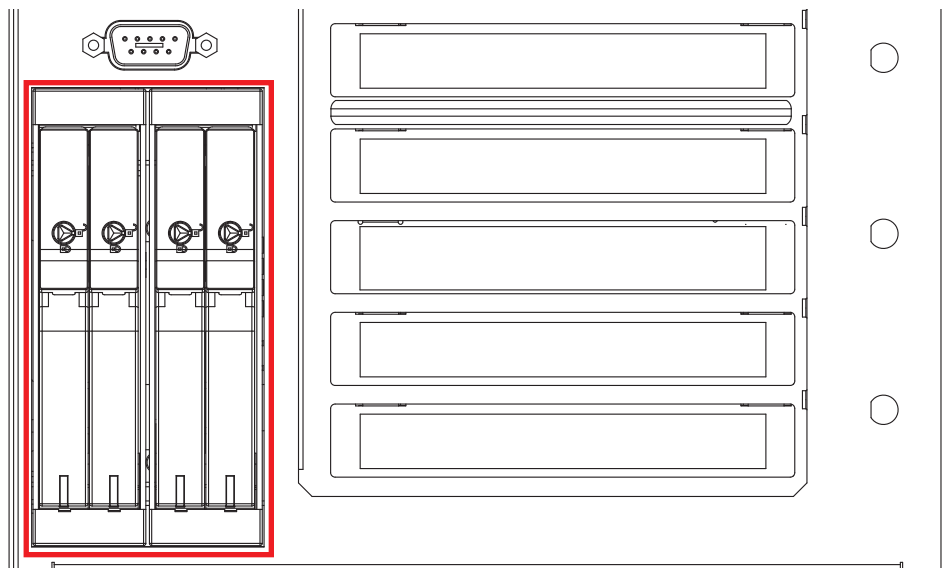
## 2.2.8 Audio Connector



There are two audio connectors, mic-in and line-out, on the front side of RCX-2000. Onboard Realtek ALC888 audio codec supports 5.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.

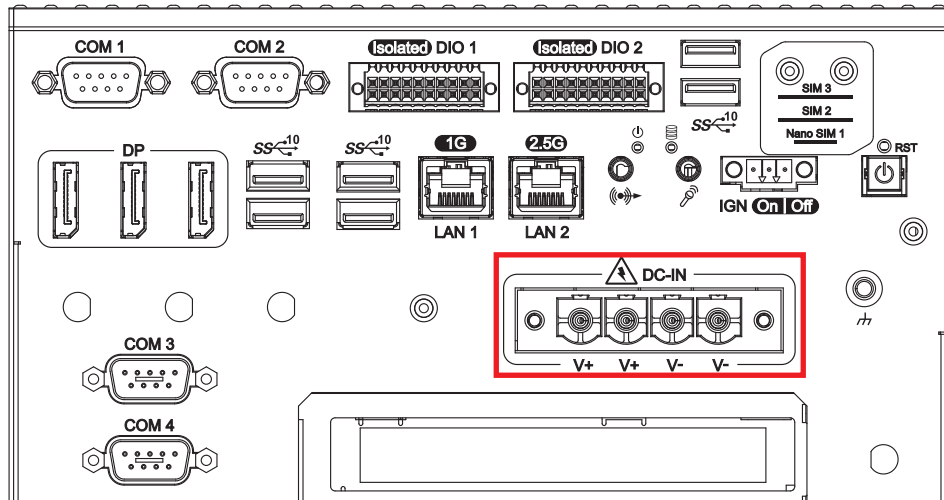
To utilize the audio function on the Windows platform, you need to install corresponding drivers for both Intel W580 chipset and Realtek ALC888 codec. Please refer to chapter four for more details on driver installation.

## 2.2.9 Front-access SSD/HDD Tray



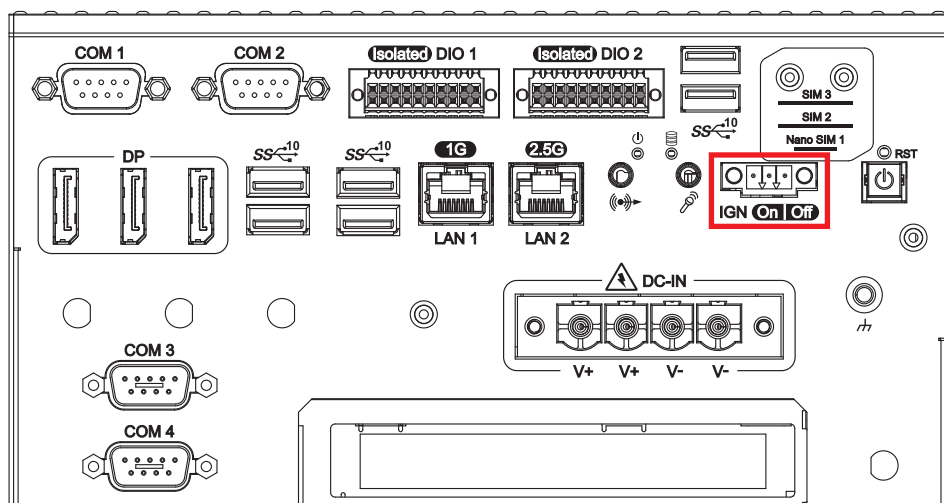
There are four front-access 2.5" SSD/HDD trays on the front side of RCX-2000. Press the trigger to open the SSD/HDD tray which has up to 8TB available.

## 2.2.10 Power Terminal Block



RCX-2000 supports 9V to 55V DC power input.

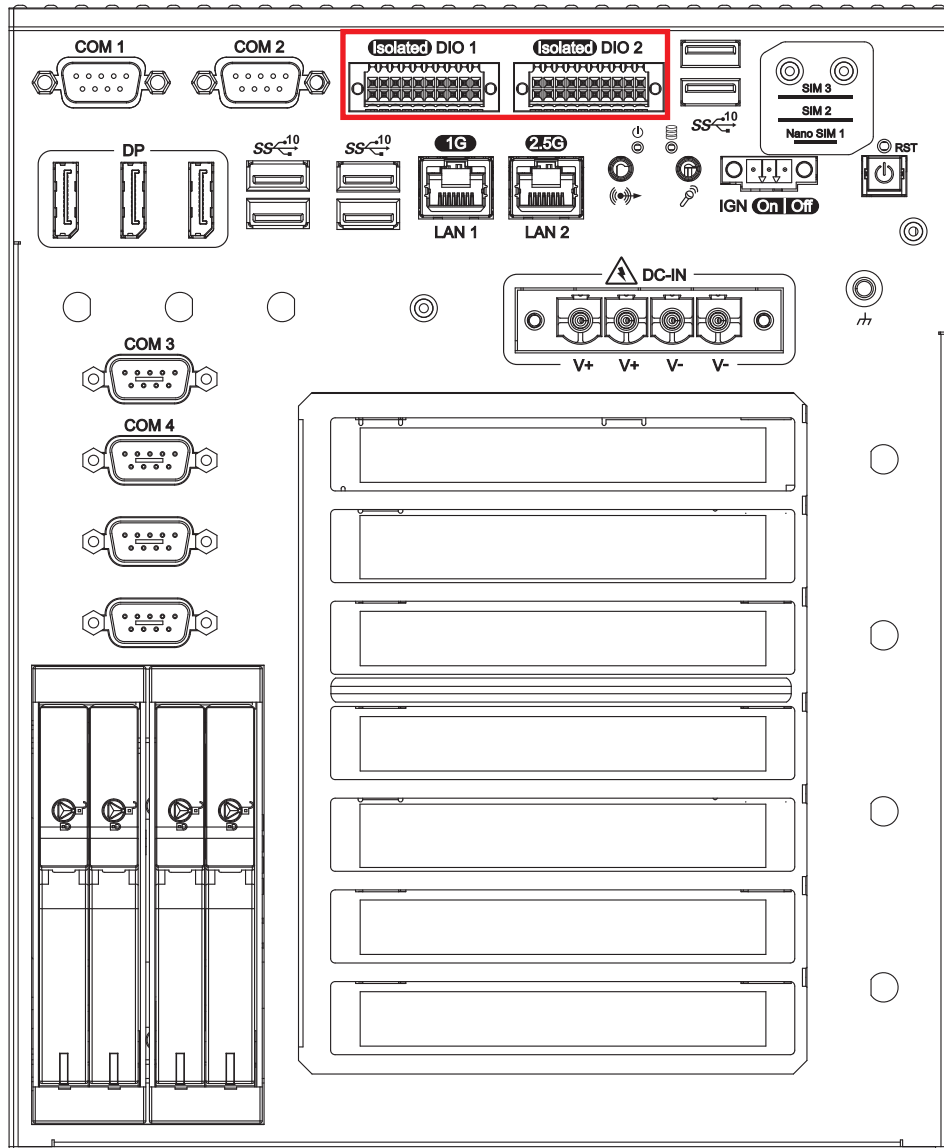
## 2.2.11 Remote Power On/Off Switch



It is a 2-pin power-on/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 on soft power-on/power-off (instant off or delay four seconds), and suspend mode.

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

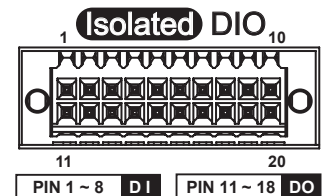
## 2.2.12 Isolated DIO



There is a 16-bit (8-bit DI, 8-bit DO) connectors in the front side. DI/DIO support NPN (sink) and PNP (Source) mode, Each DI channel is equipped with a photocoupler for isolated protection. Each DO with isolator chip, Config by a Jumper for each DIO connector.

DO Safety-Related Certifications :

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





DIO1 Connectors pin out :

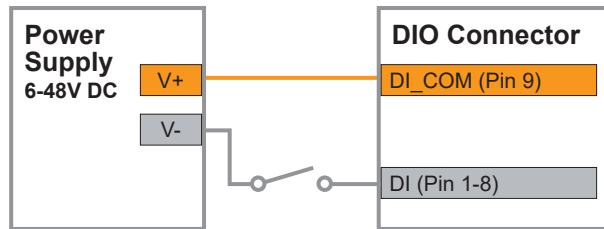
Pin No.	Definition	Mapping to SIO GPIO Function
1	INPUT 0	SIO_GPI80
2	INPUT 1	SIO_GPI81
3	INPUT 2	SIO_GPI82
4	INPUT 3	SIO_GPI83
5	INPUT 4	SIO_GPI84
6	INPUT 5	SIO_GPI85
7	INPUT 6	SIO_GPI86
8	INPUT 7	SIO_GPI87
9	+VDI_COM1	
10	GND_ISO_DIO1	
11	OUTPUT 0	SIO_GPO70
12	OUTPUT 1	SIO_GPO71
13	OUTPUT 2	SIO_GPO72
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	GND_ISO_DIO1	
20	External 6-40VDC (NPN) External 6-48VDC (PNP)	

DIO2 Connectors pin out :

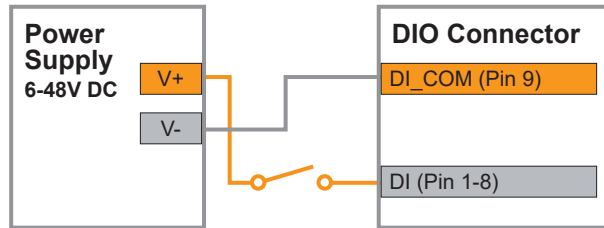
Pin No.	Definition	Mapping to SIO GPIO Function
1	INPUT 8	SIO_GPI0
2	INPUT 9	SIO_GPI1
3	INPUT 10	SIO_GPI2
4	INPUT 11	SIO_GPI3
5	INPUT 12	SIO_GPI4
6	INPUT 13	SIO_GPI5
7	INPUT 14	SIO_GPI6
8	INPUT 15	SIO_GPI7
9	+VDI_COM2	
10	GND_ISO_DIO2	
11	OUTPUT 8	SIO_GPO0
12	OUTPUT 9	SIO_GPO1
13	OUTPUT 10	SIO_GPO2
14	OUTPUT 11	SIO_GPO3
15	OUTPUT 12	SIO_GPO4
16	OUTPUT 13	SIO_GPO5
17	OUTPUT 14	SIO_GPO6
18	OUTPUT 15	SIO_GPO7
19	GND_ISO_DIO2	
20	External 6-40VDC (NPN) External 6-48VDC (PNP)	

DI reference circuit :

Sink Mode (NPN)

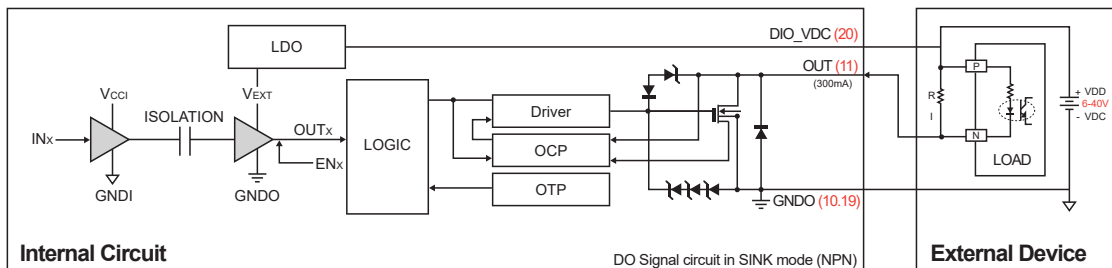


Source Mode (PNP)

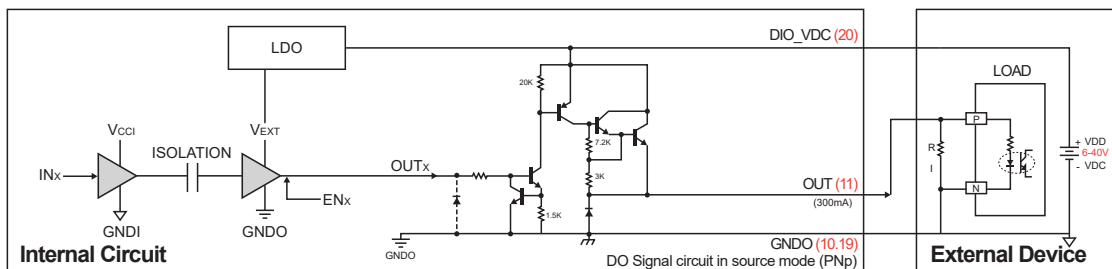


DO reference circuit :

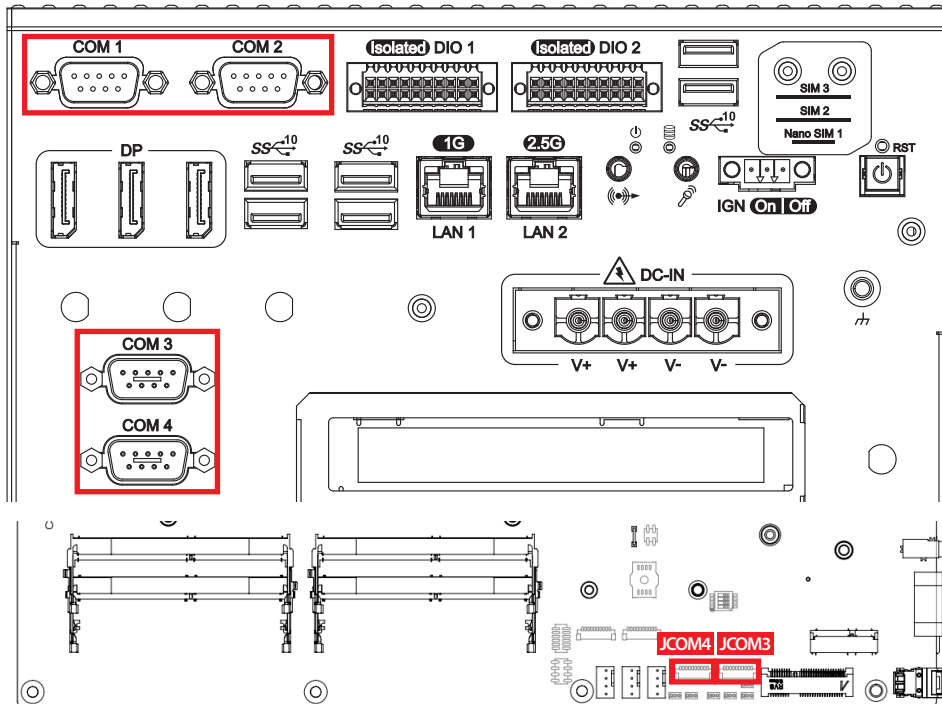
Sink Mode (NPN, Default)



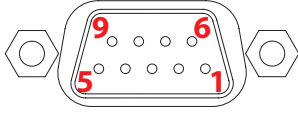
Source (PNP)



## 2.2.13 Serial Port COM



Serial port can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition is RS-232, but if you want to change to RS-422 or RS-485, you can find the settings in BIOS.

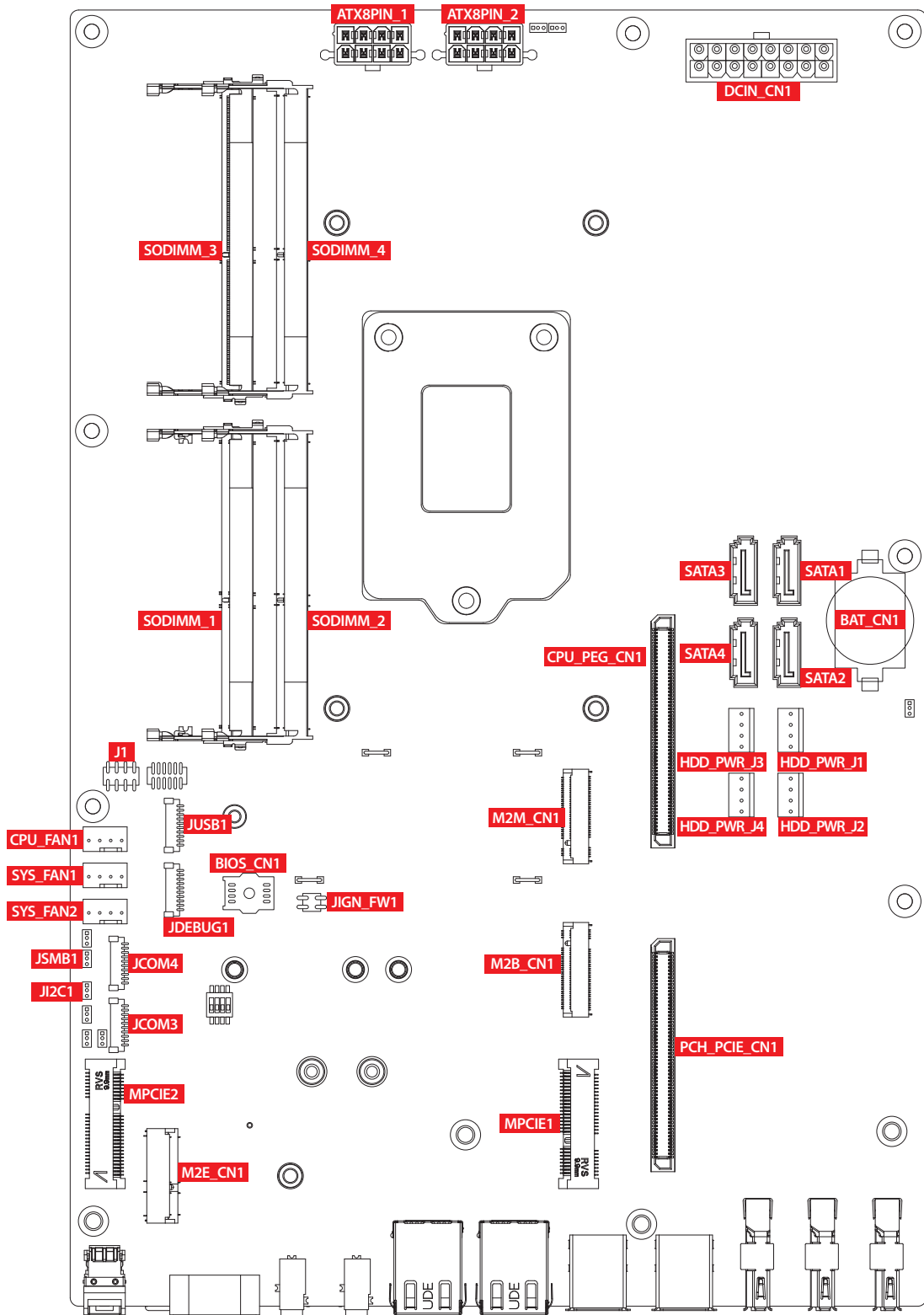
	BIOS Setting	Function
	COM 1 COM 2 COM 3 COM 4	
		RS-422 (5-wire)
		RS-422 (9-wire)
		RS-485
		RS-485 w/z auto-flow control

The pin assignments are listed in the table as follows :

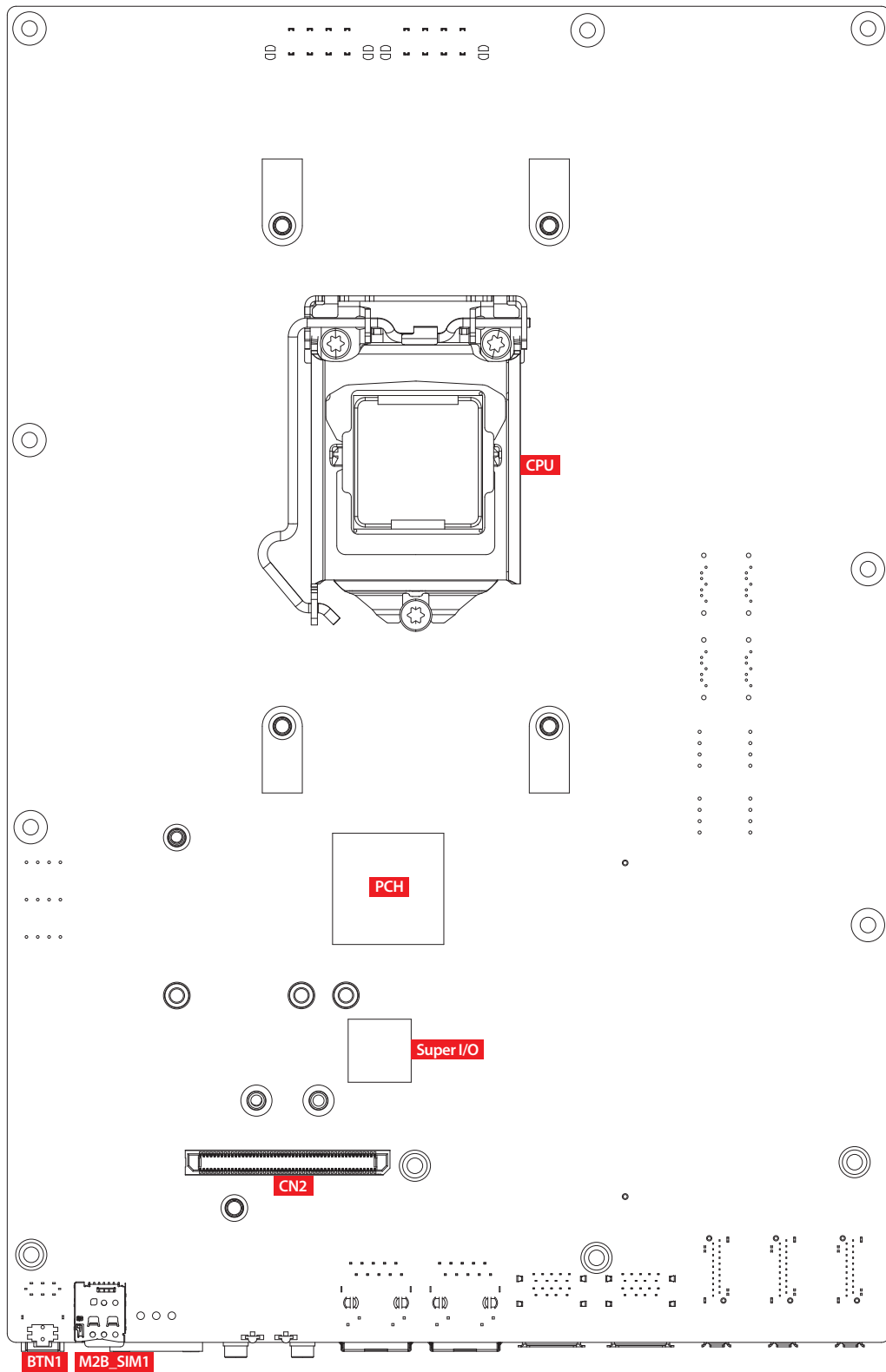
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1, 2 3, 4	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----

## 2.3 Main Board Expansion Connectors

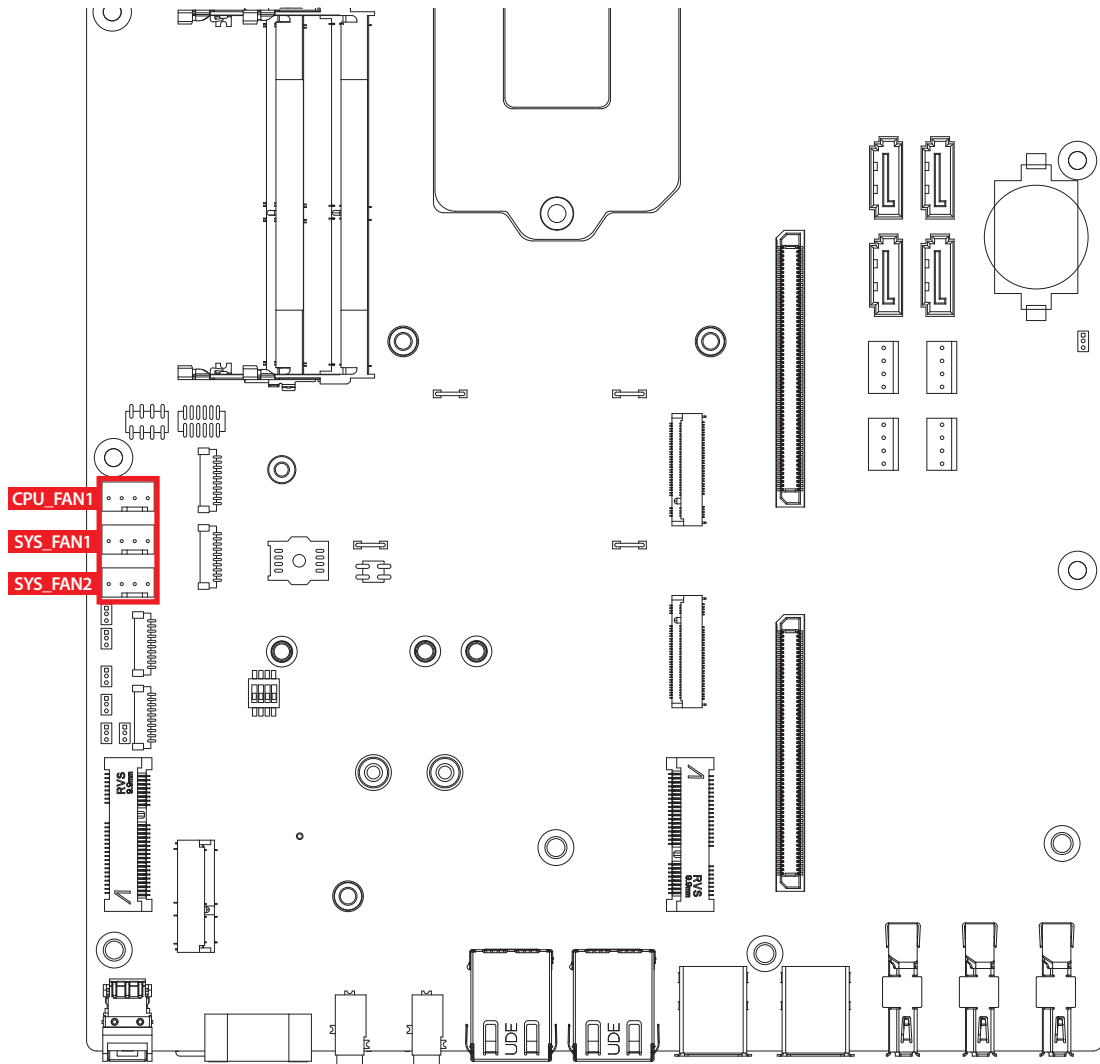
### 2.3.1 Front View of RCX-2000 PEG Main Board With Connector Location



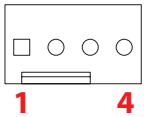
### 2.3.2 Rear View of RCX-2000 Main Board With Connector Location



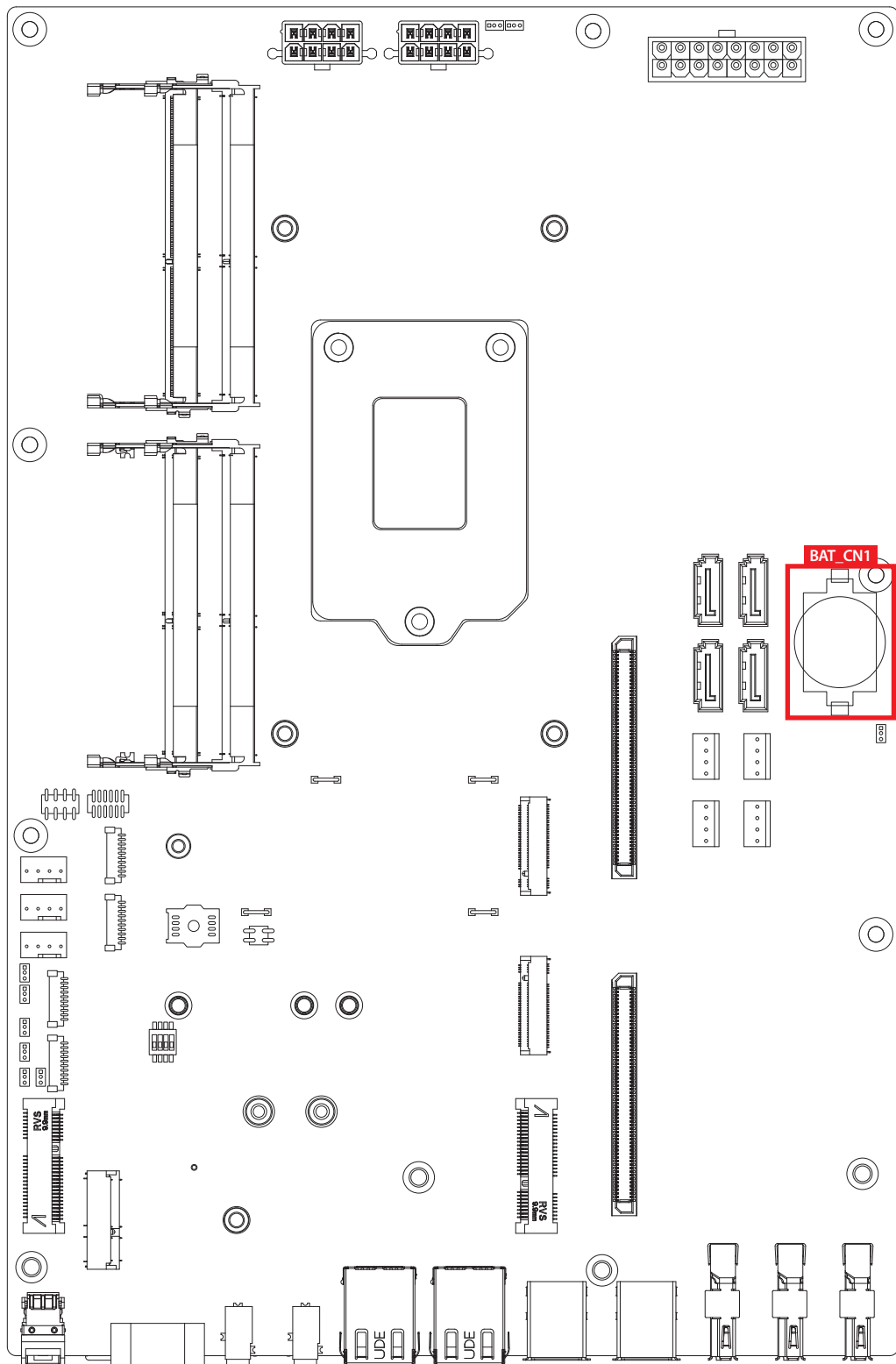
### 2.3.3 CPU\_FAN1, SYS\_FAN1, SYS\_FAN2



The fan power connector is for additional thermal requirements. The pin assignments of CPU\_FAN1, SYS\_FAN1, SYS\_FAN2 are listed in the following table :

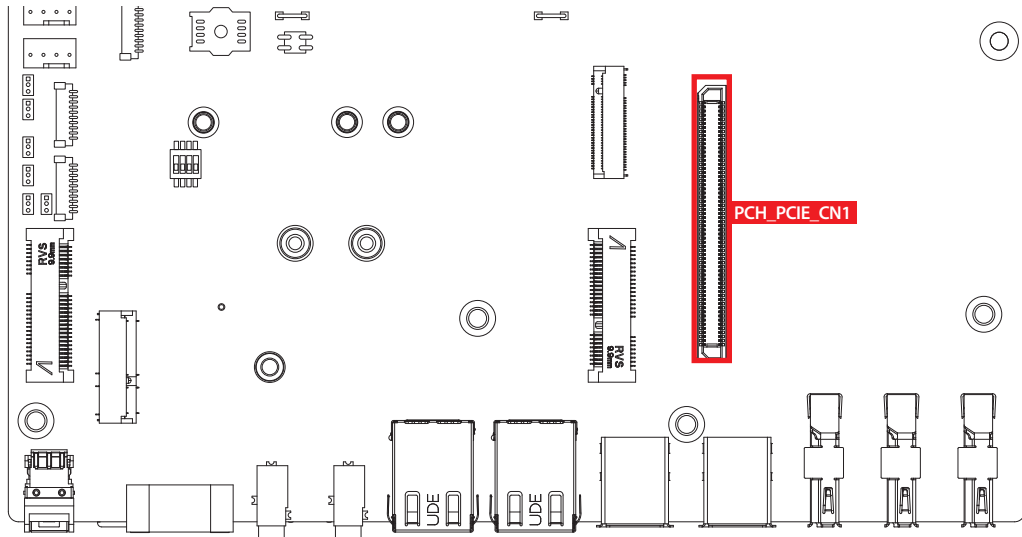
	CPU_FAN1		SYS_FAN1, SYS_FAN2	
	Pin No.	Description	Pin No.	Description
	1	GND	1	GND
	2	+12V (up to 1A)	2	+12V (up to 1A)
	3	Fan speed sensor	3	Fan speed sensor
	4	Fan PWM	4	Fan PWM

### 2.3.4 BAT\_CN1 : Battery



The RCX-2000's real-time clock is powered by a lithium battery. It is equipped with Panasonic CR2032 220mAh lithium battery. It is recommended that you do not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

### 2.3.5 PCH\_PCIE\_CN1 : Board to Board Conn. (PCH)



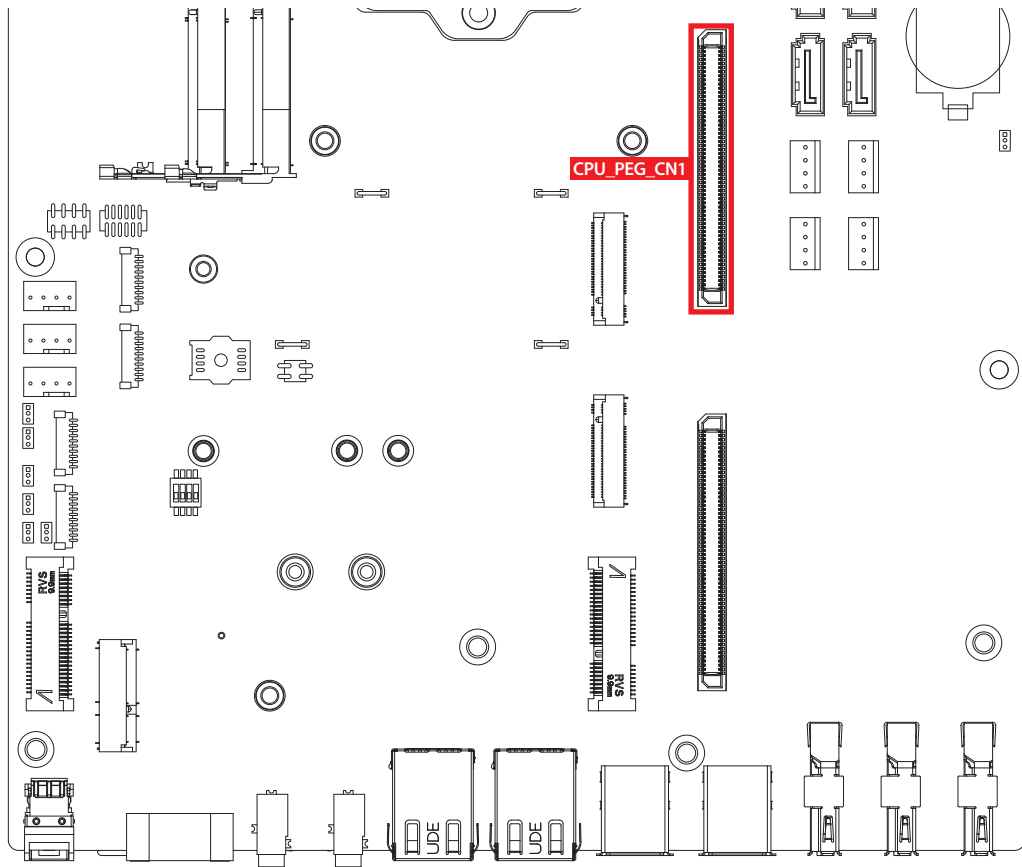
The pin assignments of PCH\_PCIE\_CN1 are listed in the following table :

Pin No.	Function	Pin No.	Function
1	GND	2	GND
3	CLK100M_CPU_3_N	4	CLK100M_CPU_2_N
5	CLK100M_CPU_3_P	6	CLK100M_CPU_2_P
7	GND	8	GND
9	CLK100M_CPU_1_N	10	PCIE24_RX_N
11	CLK100M_CPU_1_P	12	PCIE24_RX_P
13	GND	14	GND
15	PCIE24_TX_N	16	PCIE23_RX_N
17	PCIE24_TX_P	18	PCIE23_RX_P
19	GND	20	GND
21	PCIE23_TX_N	22	PCIE22_RX_N
23	PCIE23_TX_P	24	PCIE22_RX_P
25	GND	26	GND
27	PCIE22_TX_N	28	PCIE21_RX_N
29	PCIE22_TX_P	30	PCIE21_RX_P
31	GND	32	GND
33	PCIE21_TX_N	34	PCIE12_RX_N
35	PCIE21_TX_P	36	PCIE12_RX_P
37	GND	38	GND
39	CLK100M_PCH_3_N	40	PCIE11_RX_N



Pin No.	Function	Pin No.	Function
41	CLK100M_PCH_3_P	42	PCIE11_RX_P
43	GND	44	GND
45	PCIE12_TX_N	46	PCIE10_RX_N
47	PCIE12_TX_P	48	PCIE10_RX_P
49	GND	50	GND
51	PCIE11_TX_N	52	PCIE9_RX_N
53	PCIE11_TX_P	54	PCIE9_RX_P
55	GND	56	GND
57	PCIE10_TX_N	58	PCIE8_RX_N
59	PCIE10_TX_P	60	PCIE8_RX_P
61	GND	62	GND
63	PCIE9_TX_N	64	PCIE7_RX_N
65	PCIE9_TX_P	66	PCIE7_RX_P
67	GND	68	GND
69	CLK100M_PCH_2_N	70	PCIE6_RX_N
71	CLK100M_PCH_2_P	72	PCIE6_RX_P
73	GND	74	GND
75	PCIE8_TX_N	76	PCIE5_RX_N
77	PCIE8_TX_P	78	PCIE5_RX_P
79	GND	80	GND
81	PCIE7_TX_N	82	CLK100M_PCH_1_N
83	PCIE7_TX_P	84	CLK100M_PCH_1_P
85	GND	86	GND
87	PCIE6_TX_N	88	+V3.3A
89	PCIE6_TX_P	90	+V3.3A
91	GND	92	+V3.3A
93	PCIE5_TX_N	94	+V3.3S
95	PCIE5_TX_P	96	+V3.3S
97	GND	98	+V3.3S
99	GND	100	+V3.3S
101	GND	102	+V3.3S
103	GND	104	+V3.3S
105	GND	106	+V3.3S
107	GND	108	+V3.3S
109	GND	110	+V3.3S
111	GND	112	+V3.3S
113	GND	114	+V3.3S
115	GND	116	+V3.3S
117	GND	118	+V3.3S
119	GND	120	+V3.3S

### 2.3.6 CPU\_PEG\_CN1 : Board to Board Connectotr (CPU)

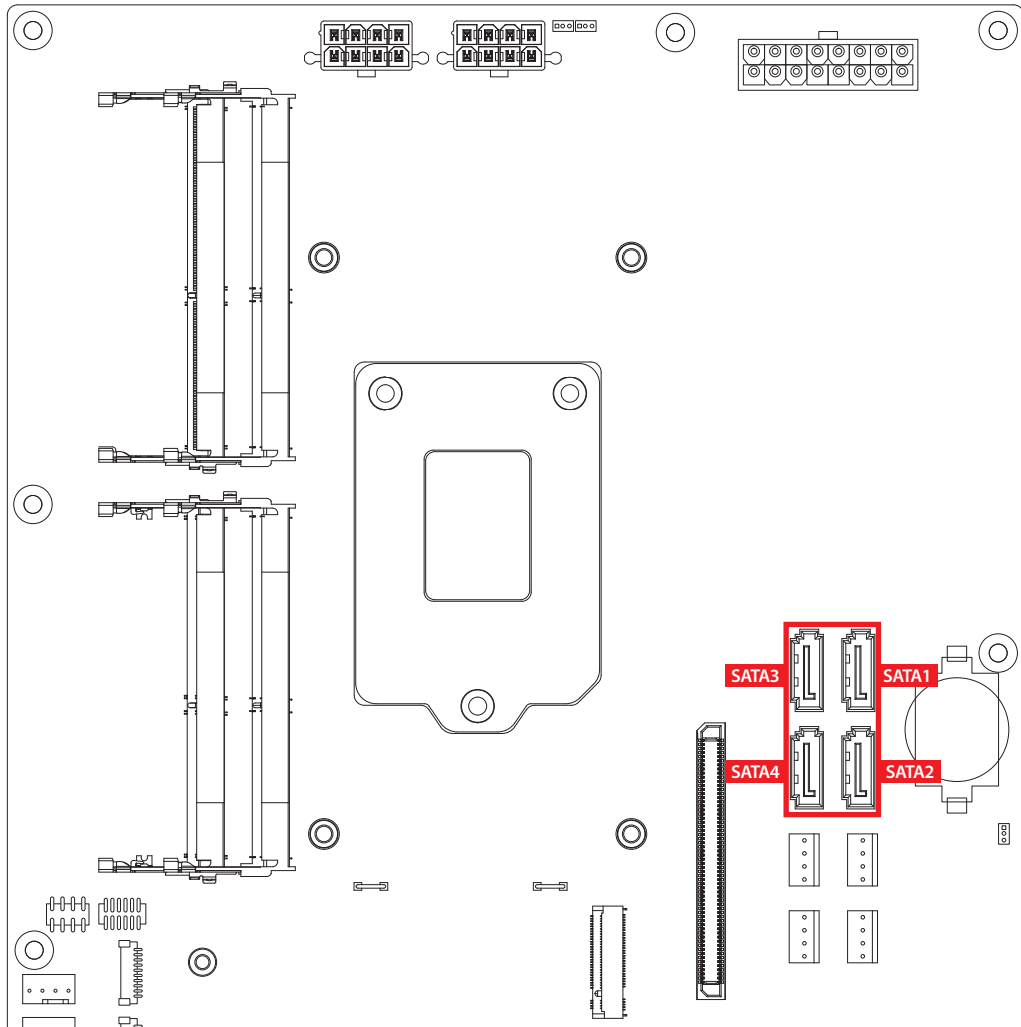


The pin assignments of CPU\_PEG\_CN1 are listed in the following table :

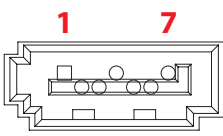
Pin No.	Function	Pin No.	Function
1	+V12S	2	+V12S
3	+V12S	4	+V12S
5	+V12S	6	+V12S
7	+V12S	8	+V12S
9	+V12S	10	+V12S
11	GND	12	GND
13	GND	14	GND
15	GND	16	GND
17	GND	18	GND
19	GND	20	GND
21	PEG_RX_DN_15	22	PEG_TX_DN_15
23	PEG_RX_DP_15	24	PEG_TX_DP_15
25	GND	26	GND
27	PEG_RX_DN_14	28	PEG_TX_DN_14
29	PEG_RX_DP_14	30	PEG_TX_DP_14
31	GND	32	GND

Pin No.	Function	Pin No.	Function
33	PEG_RX_DN_13	34	PEG_TX_DN_13
35	PEG_RX_DP_13	36	PEG_TX_DP_13
37	GND	38	GND
39	PEG_RX_DN_12	40	PEG_TX_DN_12
41	PEG_RX_DP_12	42	PEG_TX_DP_12
43	GND	44	GND
45	PEG_RX_DN_11	46	PEG_TX_DN_11
47	PEG_RX_DP_11	48	PEG_TX_DP_11
49	GND	50	GND
51	PEG_RX_DN_10	52	PEG_TX_DN_10
53	PEG_RX_DP_10	54	PEG_TX_DP_10
55	GND	56	GND
57	PEG_RX_DN_9	58	PEG_TX_DN_9
59	PEG_RX_DP_9	60	PEG_TX_DP_9
61	GND	62	GND
63	PEG_RX_DN_8	64	PEG_TX_DN_8
65	PEG_RX_DP_8	66	PEG_TX_DP_8
67	GND	68	GND
69	PEG_RX_DN_7	70	PEG_TX_DN_7
71	PEG_RX_DP_7	72	PEG_TX_DP_7
73	GND	74	GND
75	PEG_RX_DN_6	76	PEG_TX_DN_6
77	PEG_RX_DP_6	78	PEG_TX_DP_6
79	GND	80	GND
81	PEG_RX_DN_5	82	PEG_TX_DN_5
83	PEG_RX_DP_5	84	PEG_TX_DP_5
85	GND	86	GND
87	PEG_RX_DN_4	88	PEG_TX_DN_4
89	PEG_RX_DP_4	90	PEG_TX_DP_4
91	GND	92	GND
93	PEG_RX_DN_3	94	PEG_TX_DN_3
95	PEG_RX_DP_3	96	PEG_TX_DP_3
97	GND	98	GND
99	PEG_RX_DN_2	100	PEG_TX_DN_2
101	PEG_RX_DP_2	102	PEG_TX_DP_2
103	GND	104	GND
105	PEG_RX_DN_1	106	PEG_TX_DN_1
107	PEG_RX_DP_1	108	PEG_TX_DP_1
109	GND	110	GND
111	PEG_RX_DN_0	112	PEG_TX_DN_0
113	PEG_RX_DP_0	114	PEG_TX_DP_0
115	GND	116	GND
117	SMB_PCH_SMBCLK	118	PCIE_WAKE#
119	SMB_PCH_SMBDATA	120	PLTRST_PEG#

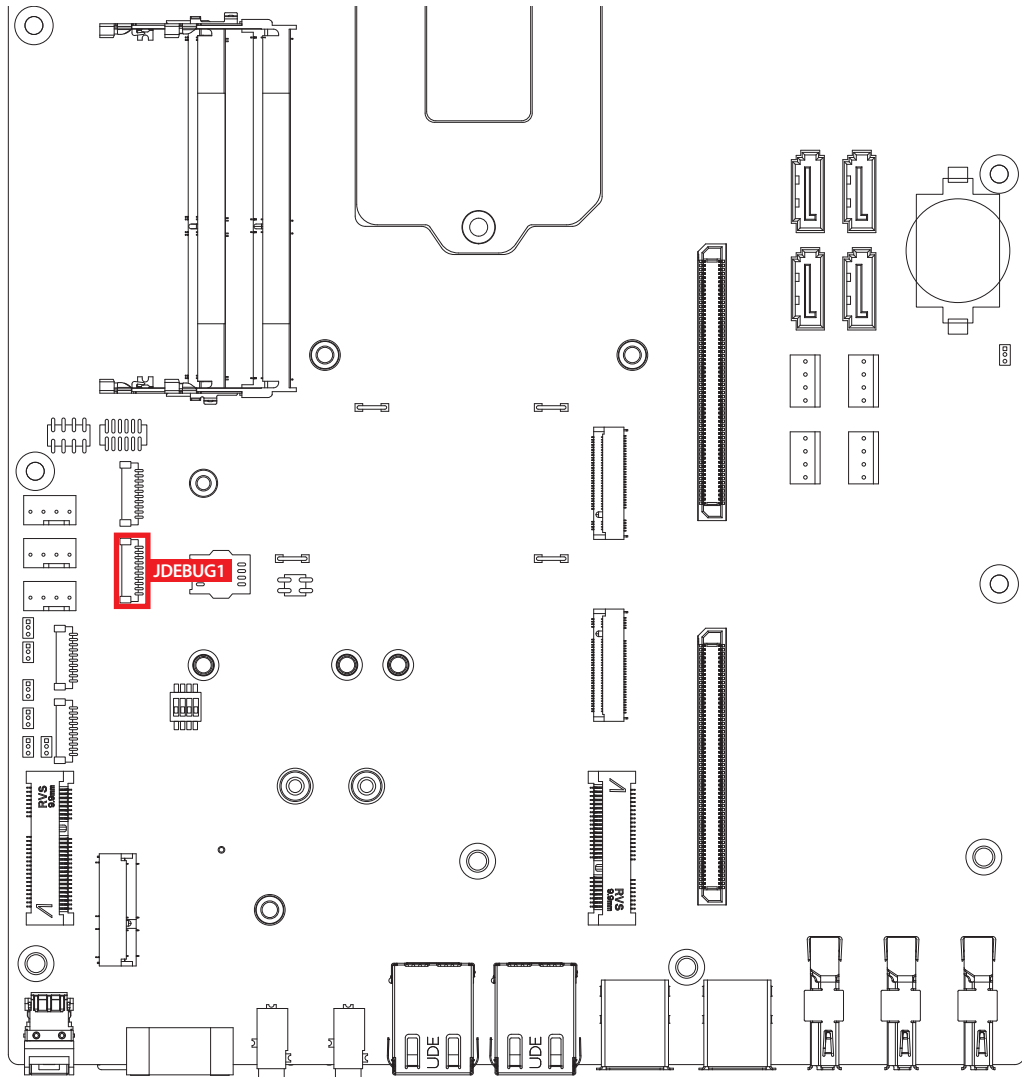
### 2.3.7 SATA1, SATA2, SATA3, SATA4 : SATA III Connector



There are four onboard high performance Serial ATA III's (SATA III) on RCX-2000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1, SATA2, SATA3, and SATA4 are listed in the following table :

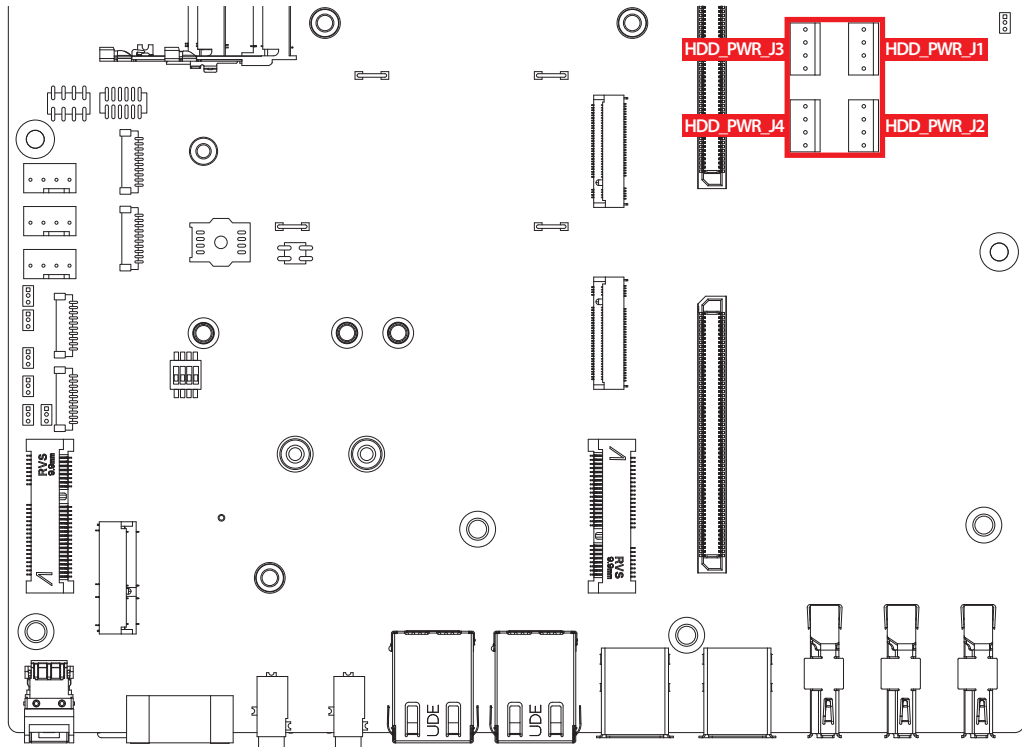
	Pin No.	Definition	Pin No.	Definition
	1	GND	2	TXP
	3	TXN	4	GND
	5	RXN	6	RXP
	7	GND		

### 2.3.8 JDEBUG1 : ESPI Port 80 Debug Port

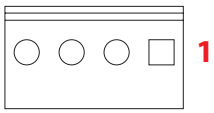


	Pin No.	Definition	Pin No.	Definition
	1	+V3.3A	2	Port 80_ESPI_CS#
	3	Port 80_ESPI_IO0	4	Port 80_ESPI_IO1
	5	Port 80_ESPI_IO2	6	Port 80_ESPI_IO3
	7	GND	8	Port 80_ESPI_CLK
	9	Port 80_ESPI_RST#	10	GND

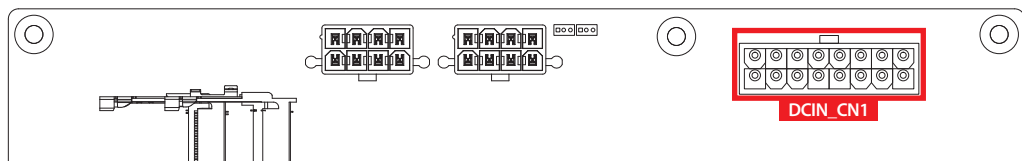
### 2.3.9 HDD\_PWR\_J1, HDD\_PWR\_J2, HDD\_PWR\_J3, HDD\_PWR\_J4 : SATA Power Connector

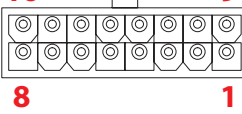


The RCX-2000 is also equipped with two SATA power connectors. It supports 5V (Up to 2A) and 12V (Up to 2A) currents to the hard drive or SSD. The pin assignments of HDD\_PWR\_J1, HDD\_PWR\_J2, HDD\_PWR\_J3, HDD\_PWR\_J4 are listed in the following table :

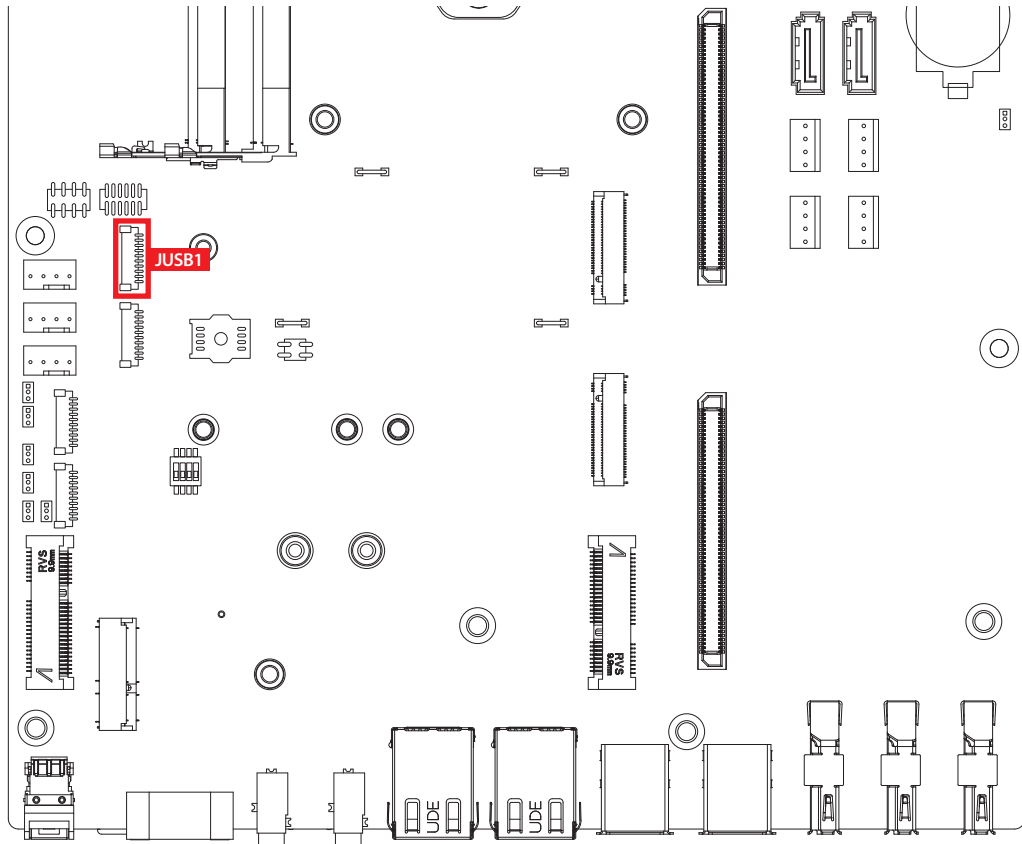
	Pin No.	Definition	Pin No.	Definition
	1	+12V	2	GND
	3	GND	4	+5V

### 2.3.10 DCIN\_CN1 : DC input Connector (9~55V)



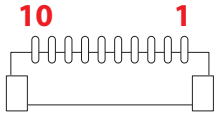
	Pin No.	Definition	Pin No.	Definition
	1	V-	9	V-
	2	V-	10	V-
	3	V-	11	V-
	4	V-	12	V-
	5	V+	13	V+
	6	V+	14	V+
	7	V+	15	V+
	8	V+	16	V+

### 2.3.11 JUSB1 : Internal Dual Port USB 2.0 Header

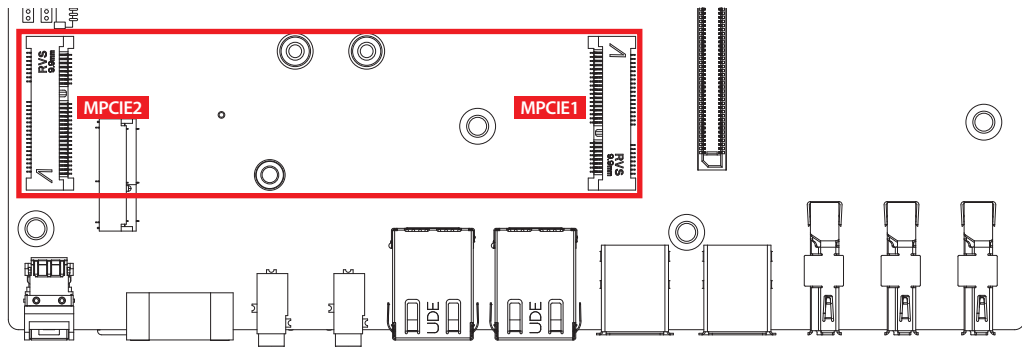


The RCX-2000 main board provides up to two expansion USB ports using plug-and-play for Dongle Key or LCD touch panel. The USB interface supports 480Mbps transfer rate which complies with high speed USB specification Rev. 2.0 and are fuse protected. The USB interface is accessed through one 1x10-pin JST 1.0mm connector. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 1x10-pin connector on one end and a USB connector on the other.

The pin assignments of JUSB1 are listed in the following table :

	Pin No.	Definition	Pin No.	Definition
		1	+V5A	2
	3	+V5A	4	USB_D_9N
	5	USB_D_9P	6	USB_D_12N
	7	USB_D_12P	8	GND
	9	GND	10	GND

### 2.3.12 MPCIE1, MPCIE2 : Mini PCIe, mSATA



Both mSATA and mini PCIe share the same form factor and similar electrical pinout assignments on their connectors. There was no clear mechanism to distinguish if an mSATA drive or a Mini PCIe device is plugged into the socket until recently that SATA I/O issued an ECN change (ECN #045) to redefine pin-43 on mSATA connector as "no connect" instead of "return current path" (or GND).

When an mSATA drive is inserted, its pin-43 is "no connect", and the respective pin on the socket is being pulled-up to logic 1. When a mini PCIe device is inserted, its pin-43 forces the respective pin on the socket to ground, or logic 0.

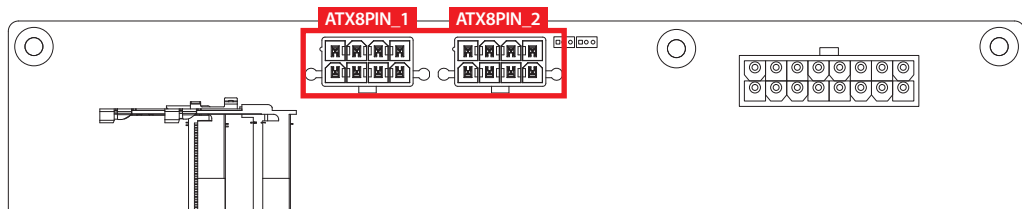
The pin assignments of MPCIE1, MPCIE2 are listed in the following table :

Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+V3.3A
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	Status	44	Reserved
41	+V3.3A	42	Reserved
39	+V3.3A	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



Pin No.	Signal Name	Pin No.	Signal Name
23	PERn0	24	+V3.3A
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	Reserved
13	REFCLK+	14	Reserved
11	REFCLK-	12	Reserved
9	GND	10	Reserved
7	CLKREQ#	8	Reserved
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	+V3.3A

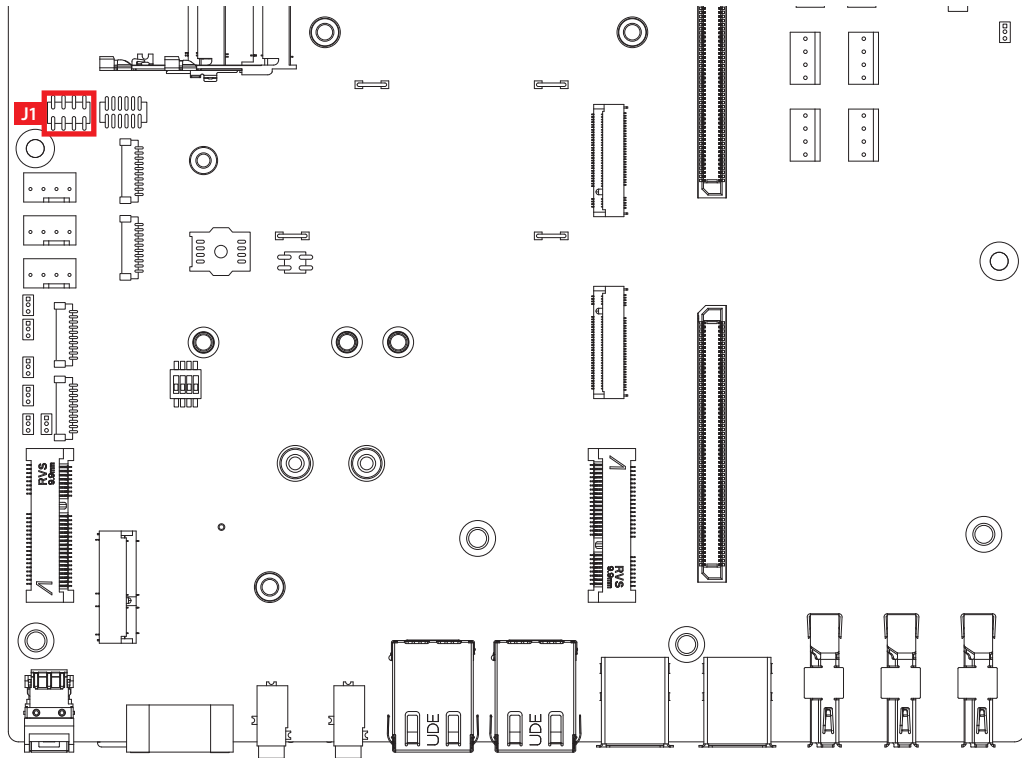
### 2.3.13 ATX8PIN\_1, ATX8PIN\_2 : 8Pin ATX Power Connector (Total Max 432W)



The pin assignments of ATX8PIN\_1, ATX8PIN\_2 are listed in the following table :

	Pin No.	Signal Name	Pin No.	Signal Name
	1	GND	5	+V12S
	2	GND	6	+V12S
	3	GND	7	+V12S
	4	GND	8	+V12S

### 2.3.14 J1 : Miscellaneous Pin Header



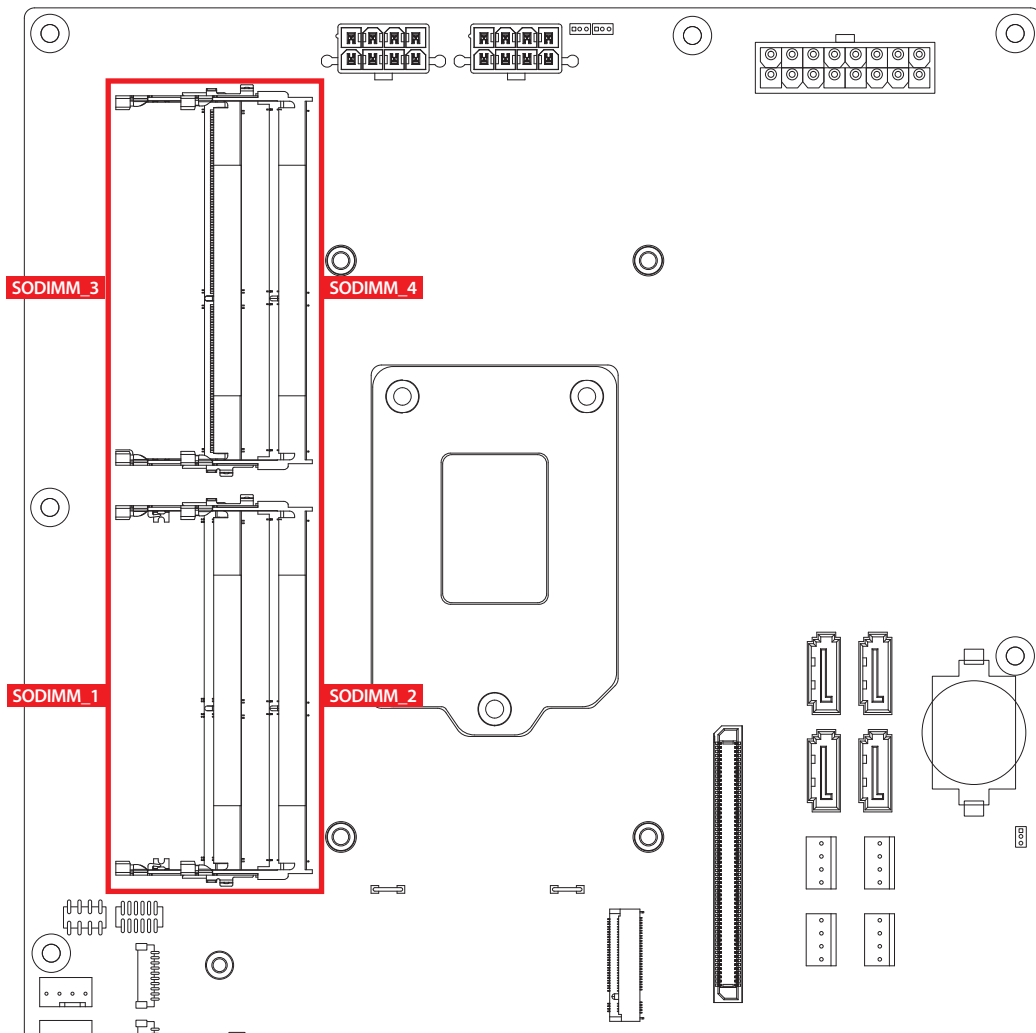
#### 2.0mm 2x4p header

This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button.

The pin assignments of J1 are listed in the 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

### 2.3.15 SODIMM\_1, SODIMM\_2, SODIMM\_3, SODIMM\_4



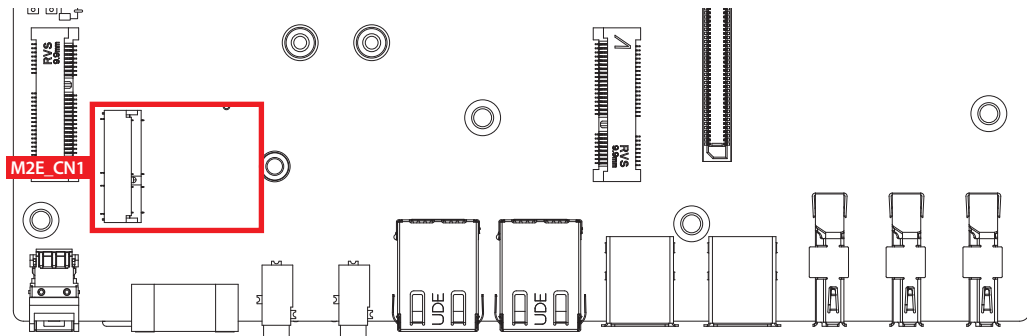
4 DDR4 SO-DIMM, up to 128GB.





SODIMM Quantity	Location
1	SODIMM_3
2	SODIMM_3, SODIMM_1
3	SODIMM_3, SODIMM_4, SODIMM_1
4	SODIMM_3, SODIMM_4, SODIMM_1, SODIMM_2

### 2.3.16 M2E\_CN1 : M.2 KEY E USB2, PCIe2 Support



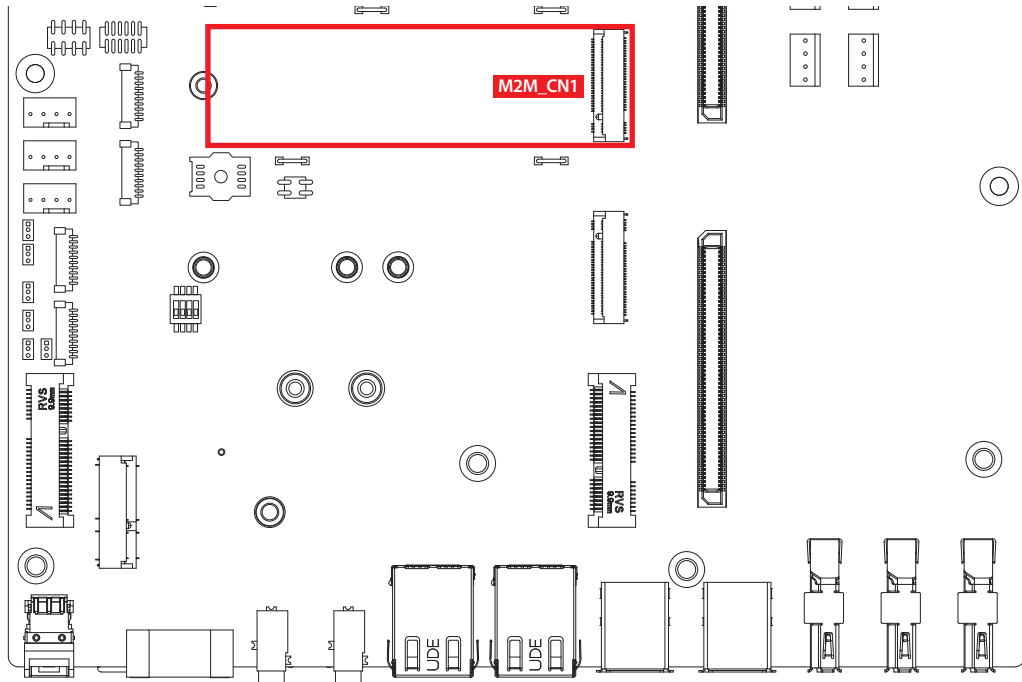
M.2 key E connector is suitable for applications that use wireless connectivity including Wi-Fi, Bluetooth, NFC or GNSS. Module card types include 2230.

Pin Out :

Pin No.	Signal Name	Pin No.	Signal Name
75	GND	74	+V3.3A
73	PCIE_100M_CLK__N1	72	+V3.3A
71	PCIE_100M_CLK__P1	70	NC
69	GND	68	PCIE_CLK_REQ1#
67	PCIE_RX_N1	66	NC
65	PCIE_RX_P1	64	NC
63	GND	62	SMB_ALERT#
61	PCIE_TX_N1	60	SMB_CLK
59	PCIE_TX_P1	58	SMB_DATA
57	GND	56	NC
55	PCIE_WAKE#	54	NC
53	PCIE_CLK_REQ0#	52	PLTRST#
51	GND	50	SUS_CLK
49	PCIE_100M_CLK__N0	48	NC
47	PCIE_100M_CLK__P0	46	NC
45	GND	44	NC

Pin No.	Signal Name	Pin No.	Signal Name
43	PCIE_RX_N0	42	CL_CLK
41	PCIE_RX_P0	40	CL_DATA
39	GND	38	CL_RST_N
37	PCIE_TX_N0	36	NC
35	PCIE_TX_P0	34	NC
33	GND	32	NC
Mechanical Key			
23	NC		
21	NC	22	NC
19	NC	20	NC
17	NC	18	GND
15	NC	16	NC
13	NC	14	NC
11	NC	12	NC
9	NC	10	NC
7	GND	8	NC
5	USB-	6	LED1#
3	USB+	4	+V3.3A
1	GND	2	+V3.3A

### 2.3.17 M2M\_CN1 : M.2 KEY M PCIe x4 Support



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

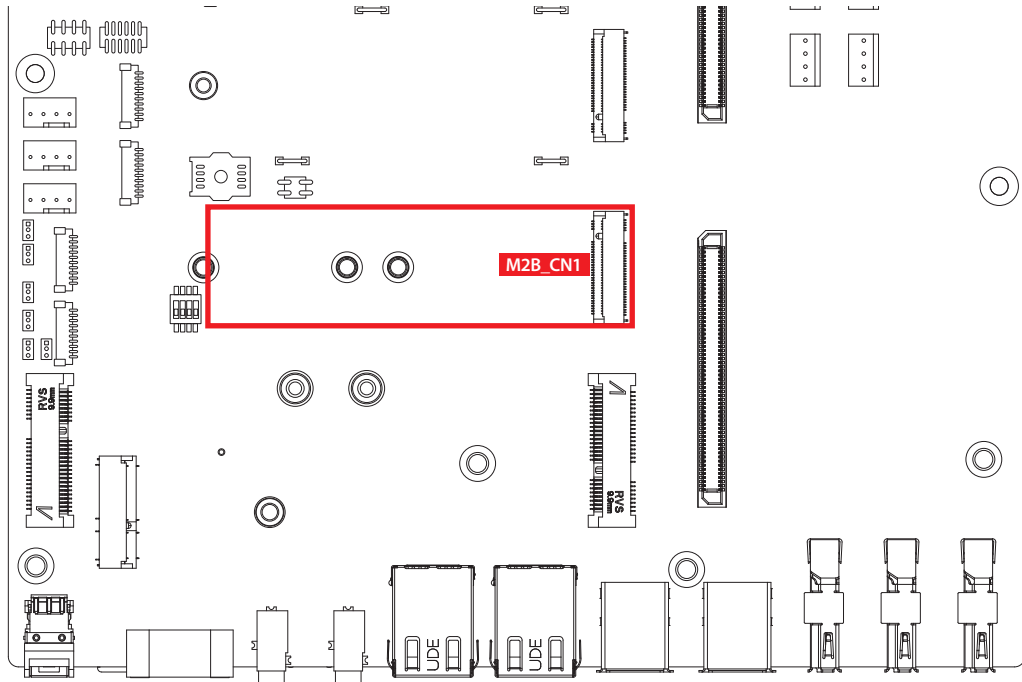
Pin Out :

Pin No.	Signal Name	Pin No.	Signal Name
75	GND		
73	GND	74	+V3.3S
71	GND	72	+V3.3S
69	NC	70	+V3.3S
67	GND	68	NC
<b>Mechanical Key</b>			
57	GND	58	NC
55	CLK100M_KEYM_P	56	NC
53	CLK100M_KEYM_N	54	PCIE_WAKE#

Pin No.	Signal Name	Pin No.	Signal Name
51	GND	52	CK_REQ9_N
49	PCIE_PEG60_TXP0	50	PLTRST#_MPCIE
47	PCIE_PEG60_TXN0	48	NC
45	GND	46	NC
43	PCIE_PEG60_RXP0	44	NC
41	PCIE_PEG60_RXN0	42	NC
39	GND	40	NC
37	PCIE_PEG60_TXP1	38	DEVSLP
35	PCIE_PEG60_TXN1	36	NC
33	GND	34	NC
31	PCIE_PEG60_RXP1	32	NC
29	PCIE_PEG60_RXN1	30	NC
27	GND	28	NC
25	PCIE_PEG60_TXP2	26	NC
23	PCIE_PEG60_TXN2	24	NC
21	GND	22	NC
19	PCIE_PEG60_RXP2	20	NC
17	PCIE_PEG60_RXN2	18	+V3.3S
15	GND	16	+V3.3S
13	PCIE_PEG60_TXP3	14	+V3.3S
11	PCIE_PEG60_TXN3	12	+V3.3S
9	GND	10	M2M_SATA_LED#
7	PCIE_PEG60_RXP3	8	NC
5	PCIE_PEG60_RXN3	6	NC
3	GND	4	+V3.3S
1	GND	2	+V3.3S

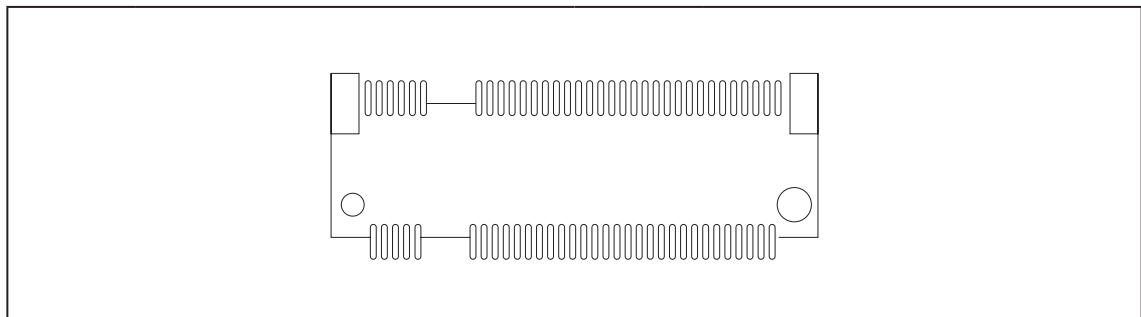


### 2.3.18 M2B\_CN1 : M.2 KEY B USB3, USB2, PCIe Support



USB 3.0/USB 2.0 Support (Default) , PCIe x2 (BIOS option)  
 Module card types include 3042, 3052, 2280.

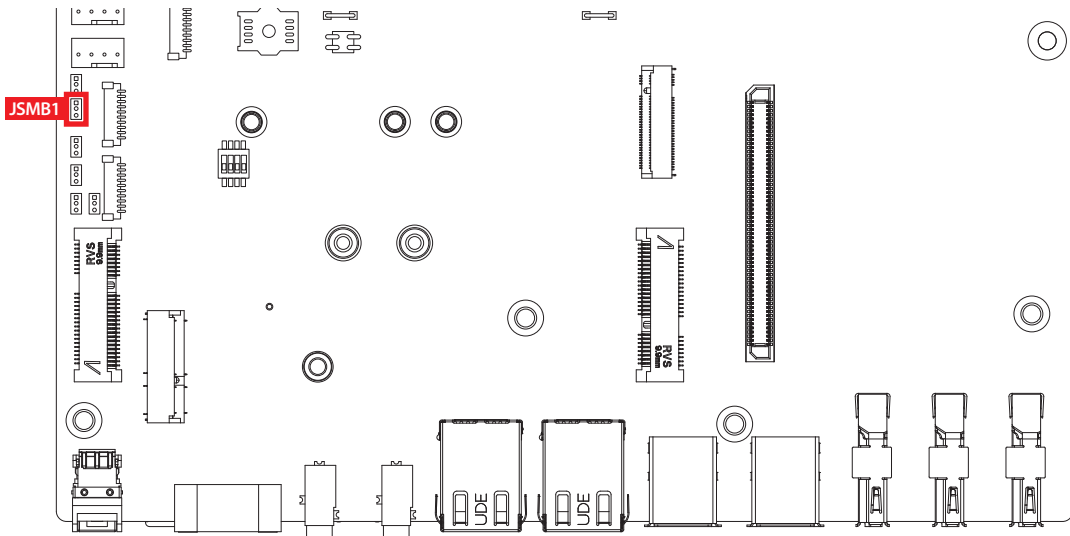
Pin Out :



Pin No.	Signal Name	Pin No.	Signal Name
75	NC	74	+V3.3A
73	GND	72	+V3.3A
71	GND	70	+V3.3A
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

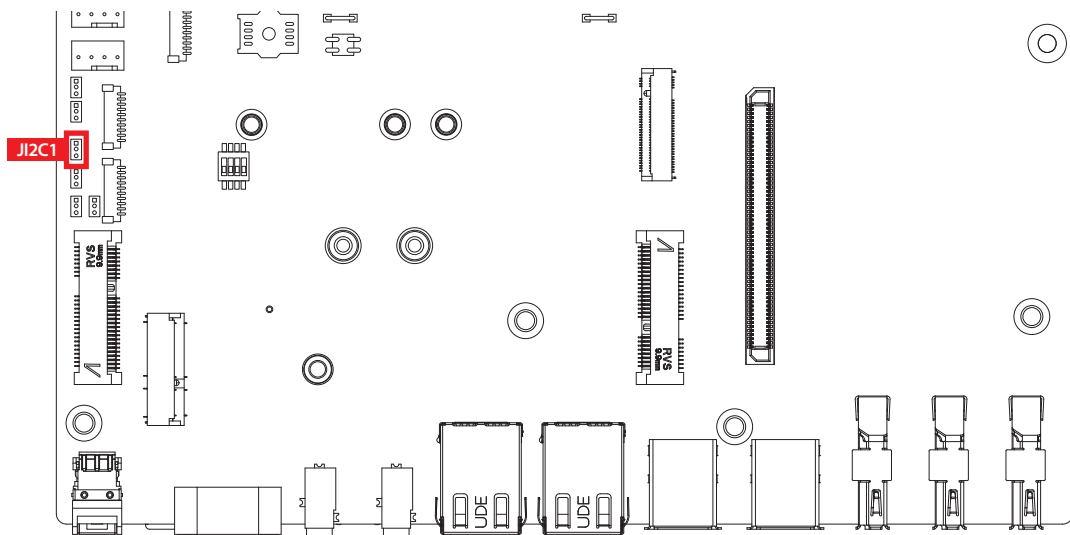
Pin No.	Signal Name	Pin No.	Signal Name
55	PCIE_100M_CLK_P	54	PCIE_WAKE#
53	PCIE_100M_CLK_N	52	PCIE_CLK_REQ
51	GND	50	PLTRST#
49	(default) USB_TX_1P, PCle_TX_1P	48	NC
47	(default) USB_TX_1N, PCle_TX_1N	46	NC
45	GND	44	NC
43	(default) USB_RX_1P, PCle_RX_1P	42	NC
41	(default) USB_RX_1N, PCle_RX_1N	40	NC
39	GND	38	DEVSLP
37	(default) USB_TX_2P, PCle_TX_2P	36	UIM_PWR
35	(default) USB_TX_2N, PCle_TX_2N	34	UIM_DATA
33	GND	32	UIM_CLK
31	(default) USB_RX_2P, PCle_RX_2P	30	UIM_RESET
29	(default) USB_RX_2N, PCle_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	NC
5	GND	6	FULL_CARD_PWR_OFF
3	GND	4	+V3.3A
1	NC	2	+V3.3A

### 2.3.19 JSMB1 : SMBUS Header



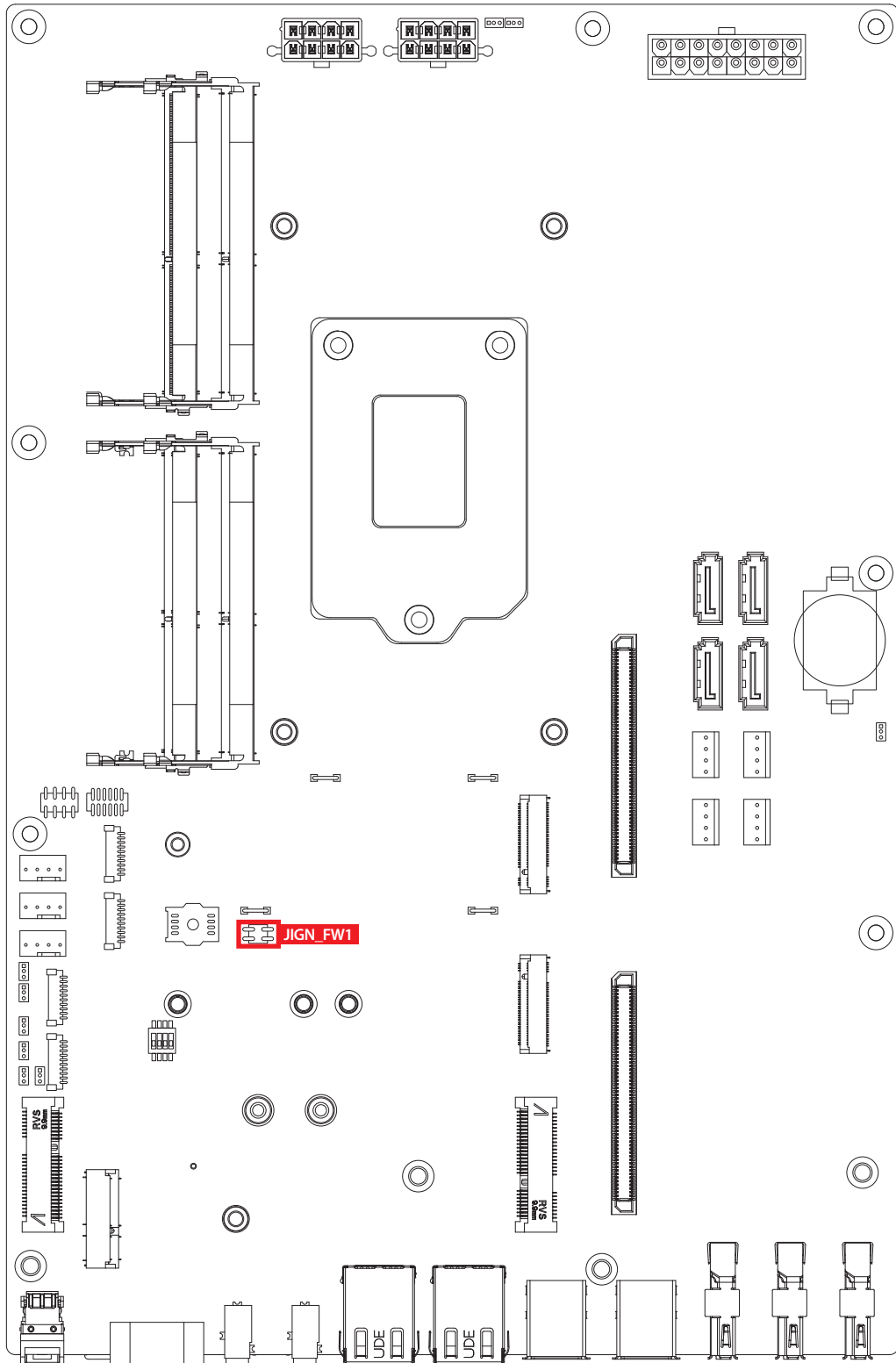
	Pin No.	Definition
	1	SMBUS_CLK
	2	SMBUS_DATA
	3	GND

### 2.3.20 JI2C1 : I2C Header



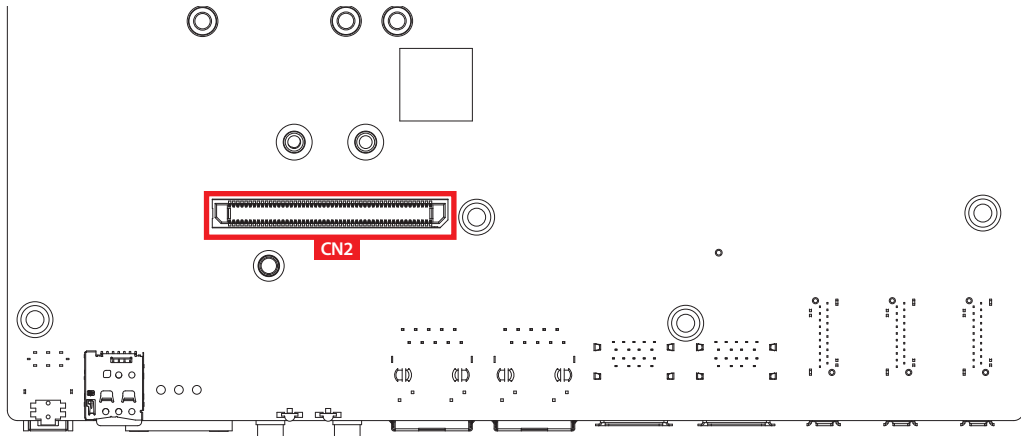
	Pin No.	Definition
	1	I2C_CLK
	2	I2C_DATA
	3	GND

### 2.3.21 JIGN\_FW1 : IGNITION FW Programming Header



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

### 2.3.22 CN2 : IO Board Connector



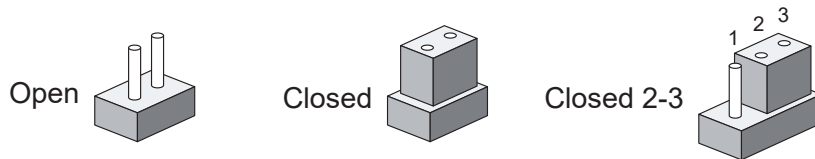
The pin assignments of CN2 are listed in the following table :

Pin No.	Function	Pin No.	Function
1	UIM_PWR_1	2	UIM_PWR_2
3	UIM_DATA_1	4	UIM_DATA_2
5	UIM_CLK_1	6	UIM_CLK_2
7	UIM_RESET_1	8	UIM_RESET_2
9	UIM_VPP_1	10	UIM_VPP_2
11	SIO_GPI80	12	DIO2_GPI0
13	SIO_GPI81	14	DIO2_GPI1
15	SIO_GPI82	16	DIO2_GPI2
17	SIO_GPI83	18	DIO2_GPI3
19	SIO_GPI84	20	DIO2_GPI4
21	SIO_GPI85	22	DIO2_GPI5
23	SIO_GPI86	24	DIO2_GPI6
25	SIO_GPI87	26	DIO2_GPI7
27	SIO_GPO70	28	DIO2_GPO0
29	SIO_GPO71	30	DIO2_GPO1
31	SIO_GPO72	32	DIO2_GPO2
33	SIO_GPO73	34	DIO2_GPO3

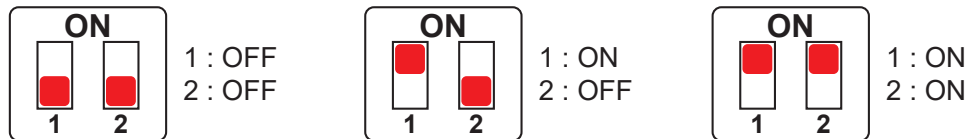
Pin No.	Function	Pin No.	Function
35	SIO_GPO74	36	DIO2_GPO4
37	SIO_GPO75	38	DIO2_GPO5
39	SIO_GPO76	40	DIO2_GPO6
41	SIO_GPO77	42	DIO2_GPO7
43	GND	44	GND
45	UART3_DCD#	46	UART4_DCD#
47	UART3_RXD	48	UART4_RXD
49	UART3_TXD	50	UART4_TXD
51	UART3_DTR#	52	UART4_DTR#
53	UART3_DSR#	54	UART4_DSR#
55	UART3_RTS#	56	UART4_RTS#
57	UART3_CTS#	58	UART4_CTS#
59	UART3_RI#	60	UART4_RI#
61	UART3_MODE0	62	UART4_MODE0
63	UART3_MODE1	64	UART4_MODE1
65	UART3_MODE2	66	UART4_MODE2
67	SP338E_TERM_COM3	68	SP338E_TERM_COM4
69	+V3.3S	70	+V3.3S
71	+V3.3S	72	+V3.3S
73	GND	74	GND
75	SIO_GP60	76	SIO_GP47
77	SIO_GP61	78	SIO_GP62
79	GND	80	GND
81	USB3_PCH_RXN1	82	USB3_PCH_RXN2
83	USB3_PCH_RXP1	84	USB3_PCH_RXP2
85	GND	86	GND
87	USB3_PCH_TXN1	88	USB3_PCH_TXN2
89	USB3_PCH_TXP1	90	USB3_PCH_TXP2
91	GND	92	GND
93	USB_P1_DP	94	USB_P2_DP
95	USB_P1_DN	96	USB_P2_DN
97	+V5A	98	+V5A
99	+V5A	100	+V5A

## 2.4 Main Board Jumper Settings

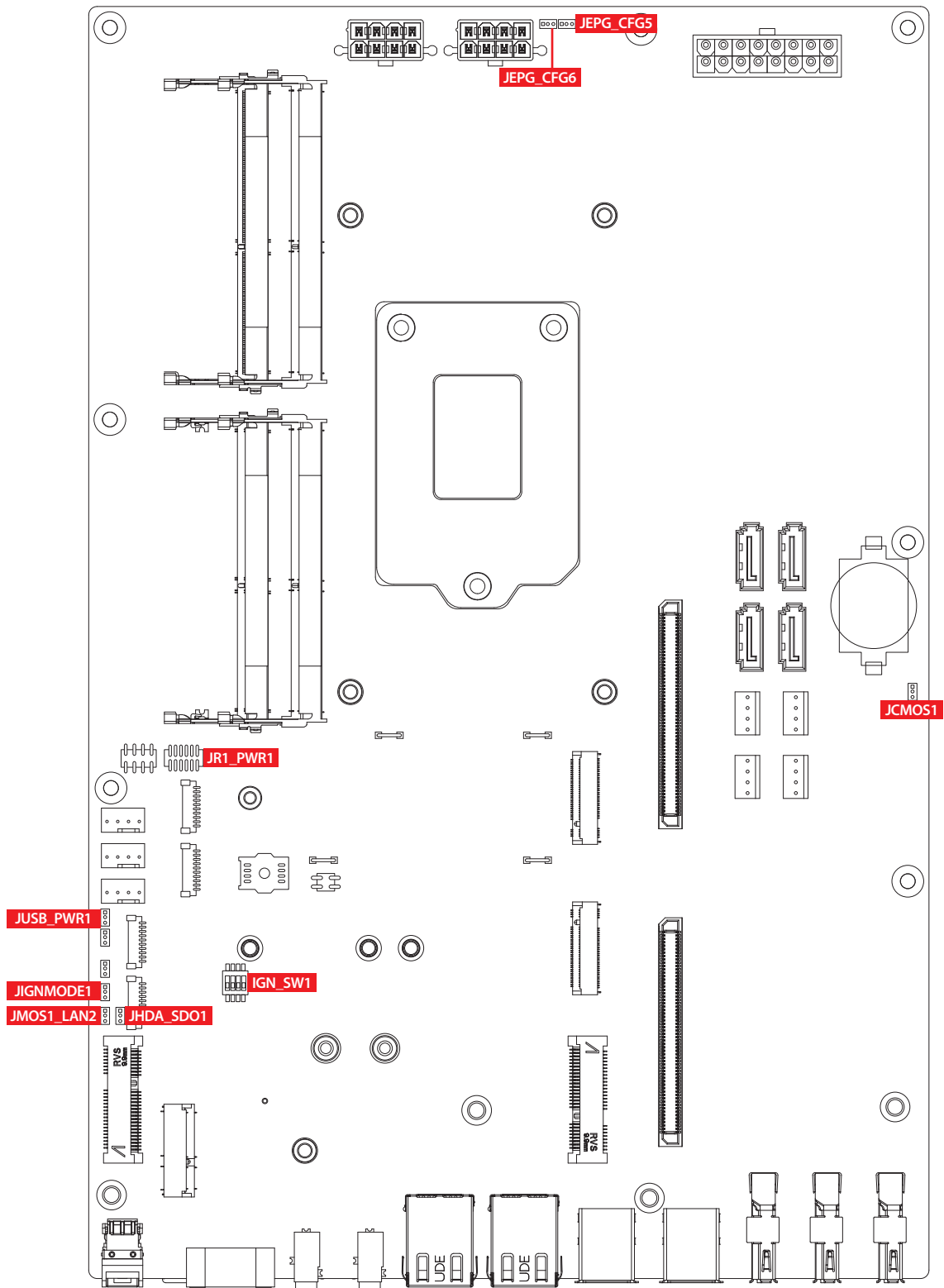
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper,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

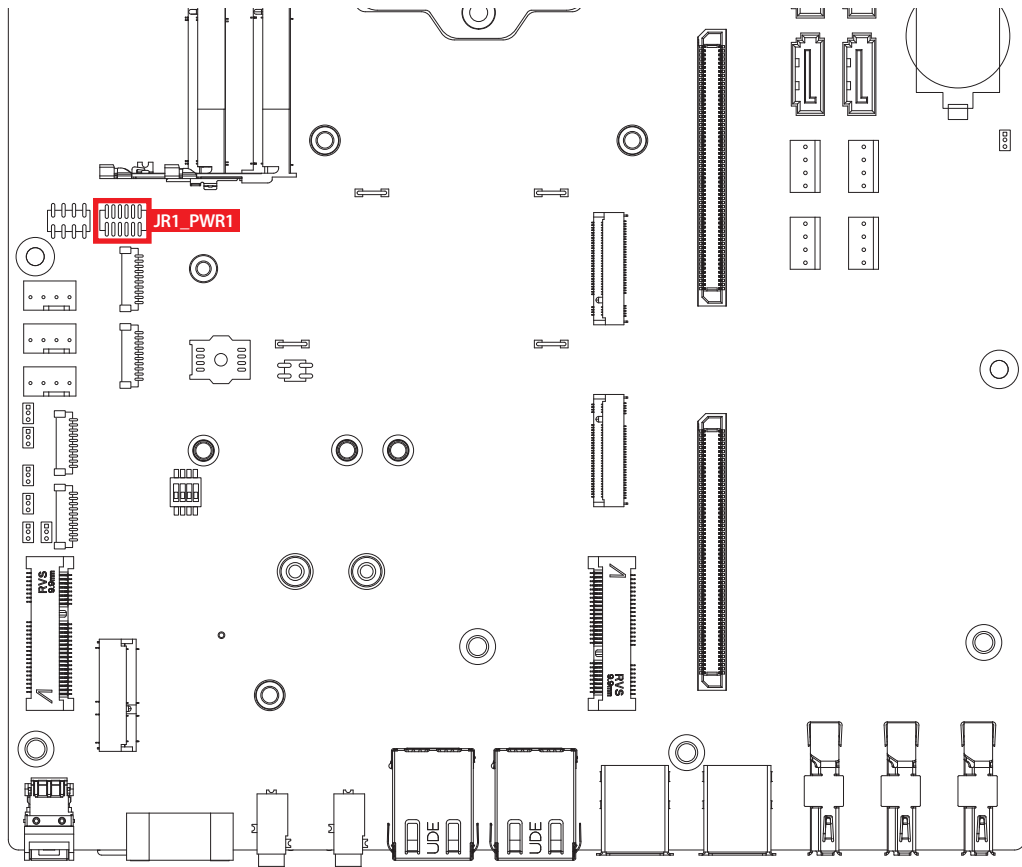


## 2.4.1 Front View of RCX-2000 Main Board With Jumper Location



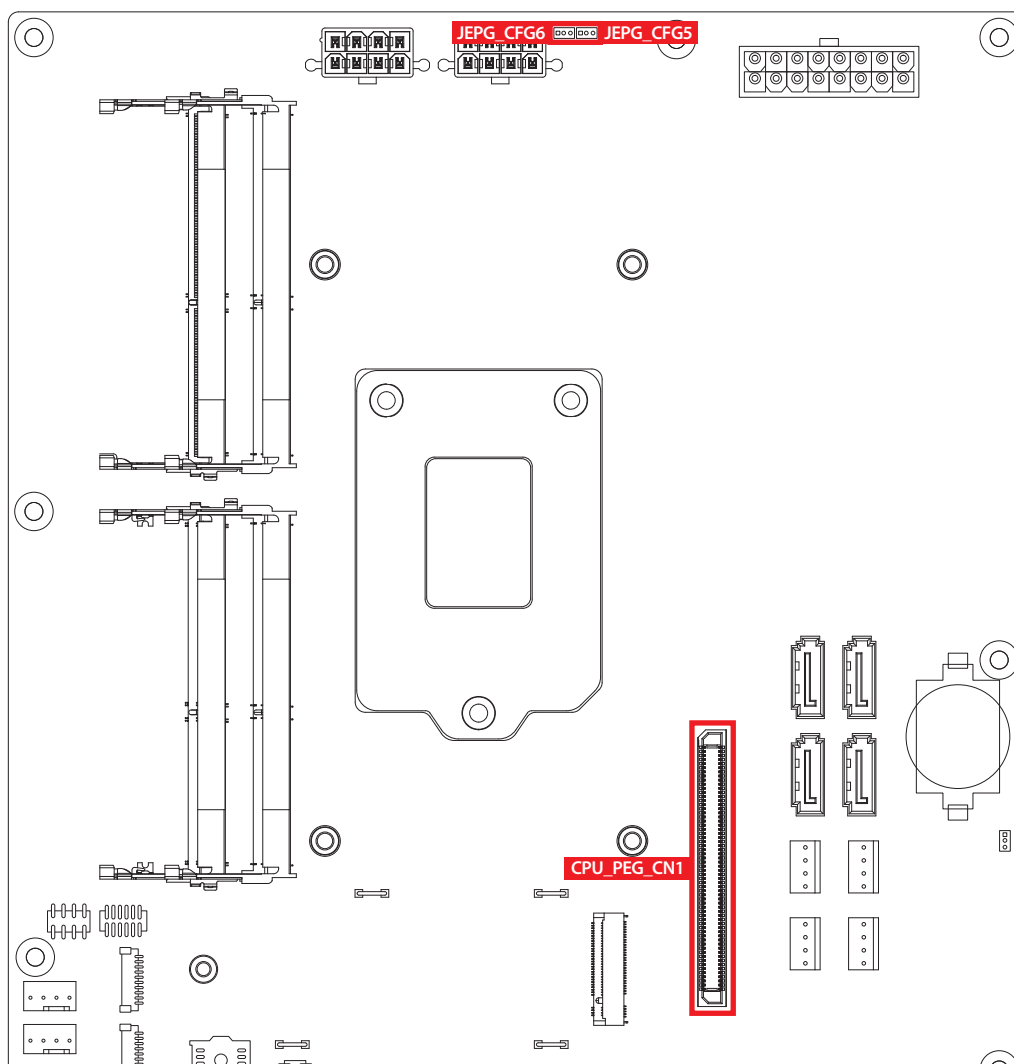






## 2.4.2 JRI\_PWR1 : COM3, COM4 RI Pin Function



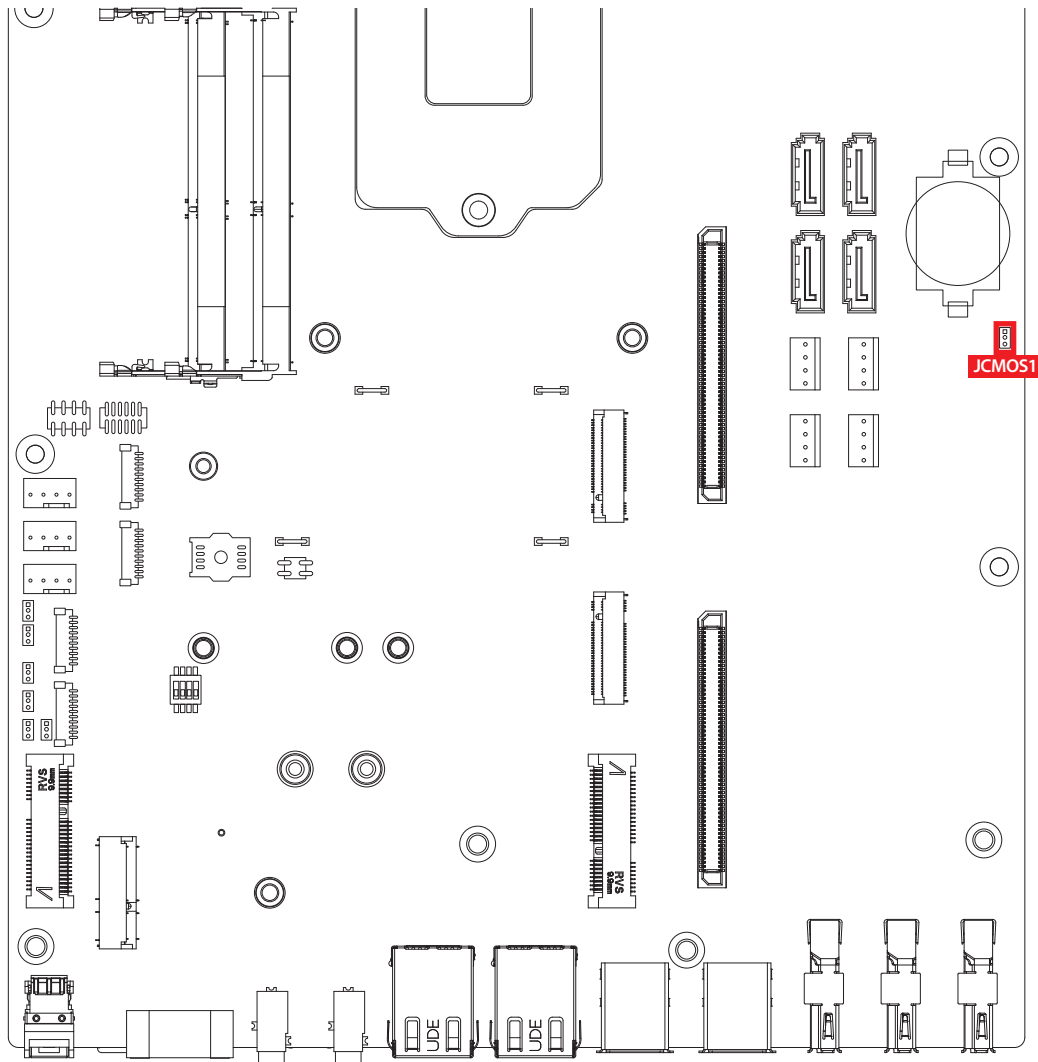
	Group	Setting	Description
	COM3	1 - 2	+5V (1A max.)
		3 - 4	+12V (0.5A max.)
		5 - 6	RI (Default)
	COM4	7 - 8	+5V (1A max.)
		9 - 10	+12V (0.5A max.)
		11 - 12	RI (Default)



## 2.4.3 JPEG\_CFG5, JPEG\_CFG6 : CPU PEG (CPU\_PEG\_CN1) Configuration



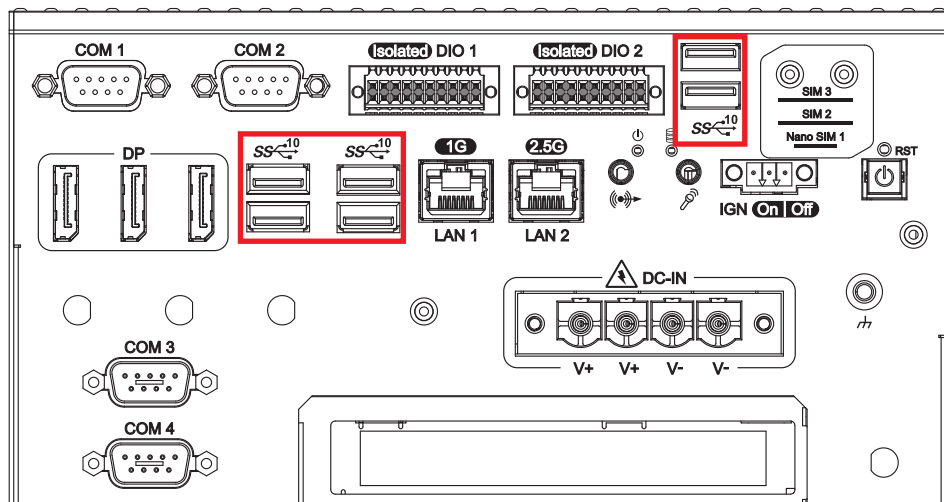
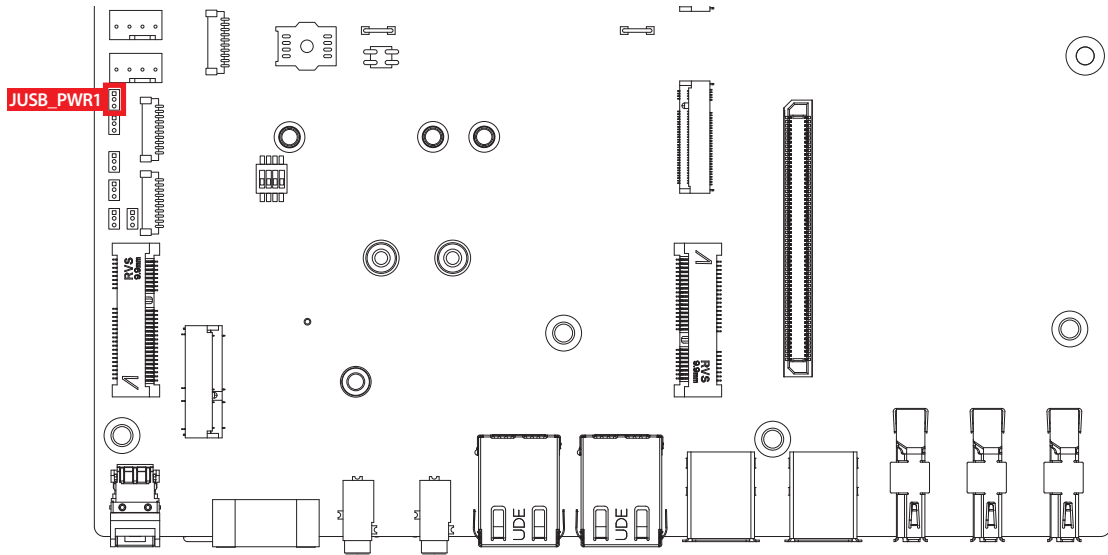
	Riser Card	PCIe Configuration	JPEG_CFG5	JPEG_CFG6
<b>1</b>  <b>3</b>   		1 x8, 2 x4	(2-3)	(2-3)
	RCX-2750-BP	2 x 8	(2-3)	(1-2)
	RCX-2330-BP	1 x16(Default)	(1-2)	(1-2)

## 2.4.4 JCMOS1 : Clear CMOS



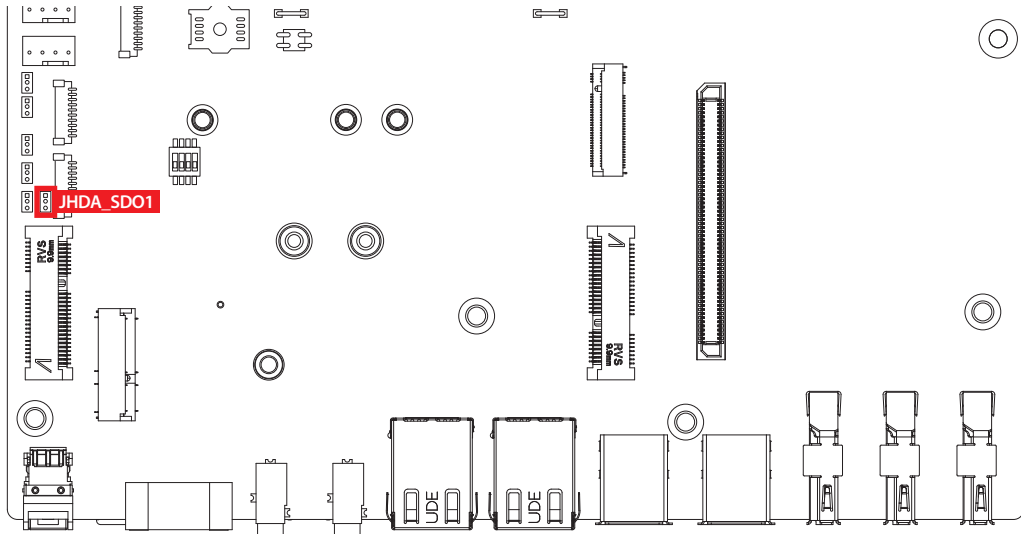
	Setting	Description
<b>1</b>  <b>3</b> 	1-2	Normal (Default)
	2-3	Clear CMOS

## 2.4.5 JUSB.PWR1 Pin Header : USB Wake Up



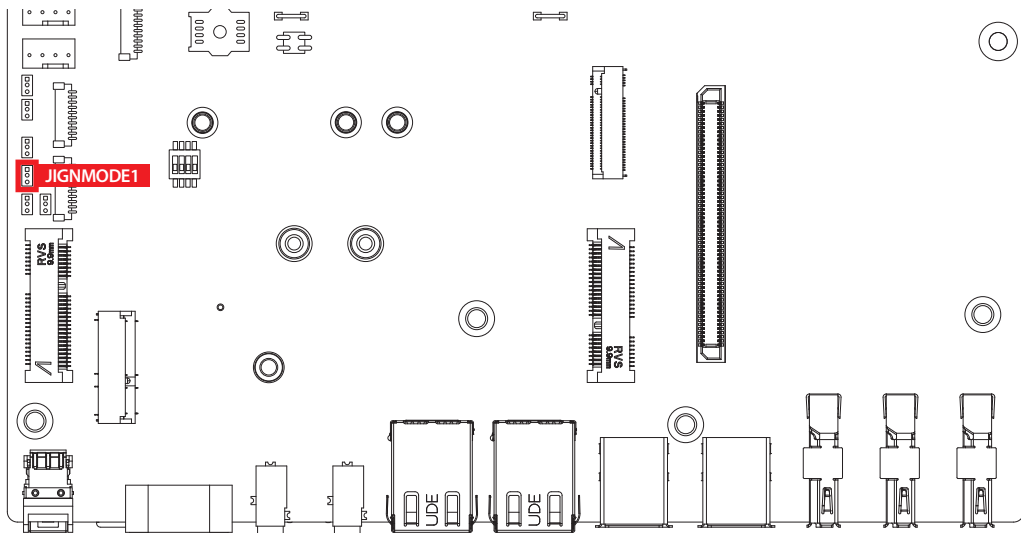
Setting	Definition
(1-2)	USB 3.0 and USB 2.0 Wake Up Enable (Default)
(2-3)	USB 3.0 and USB 2.0 Wake Up Disable

## 2.4.6 JHDA\_SDO1



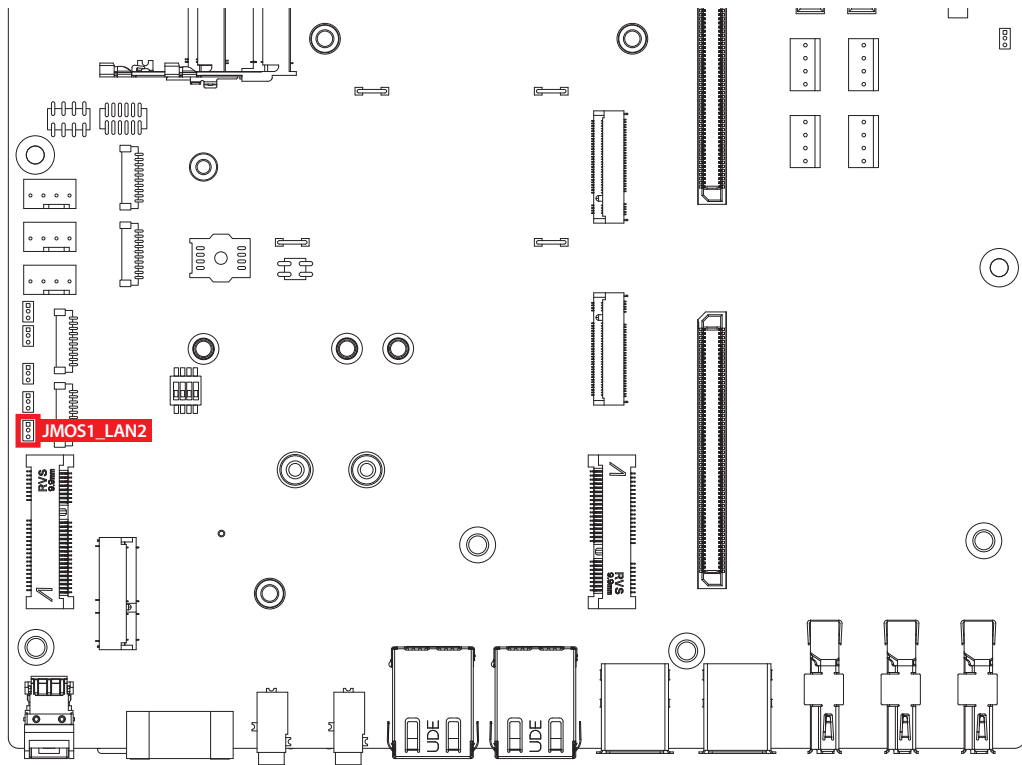
		Setting	Description
		1 - 2	Enable security measures defined in the Flash Descriptor. (Default)
		2 - 3	Disable Flash Descriptor Security (Flash ME)

## 2.4.7 JIGNMODE1 : IGN Mode



		Setting	Function
		1 - 2	HW Mode
		2 - 3	SW Mode (Default)

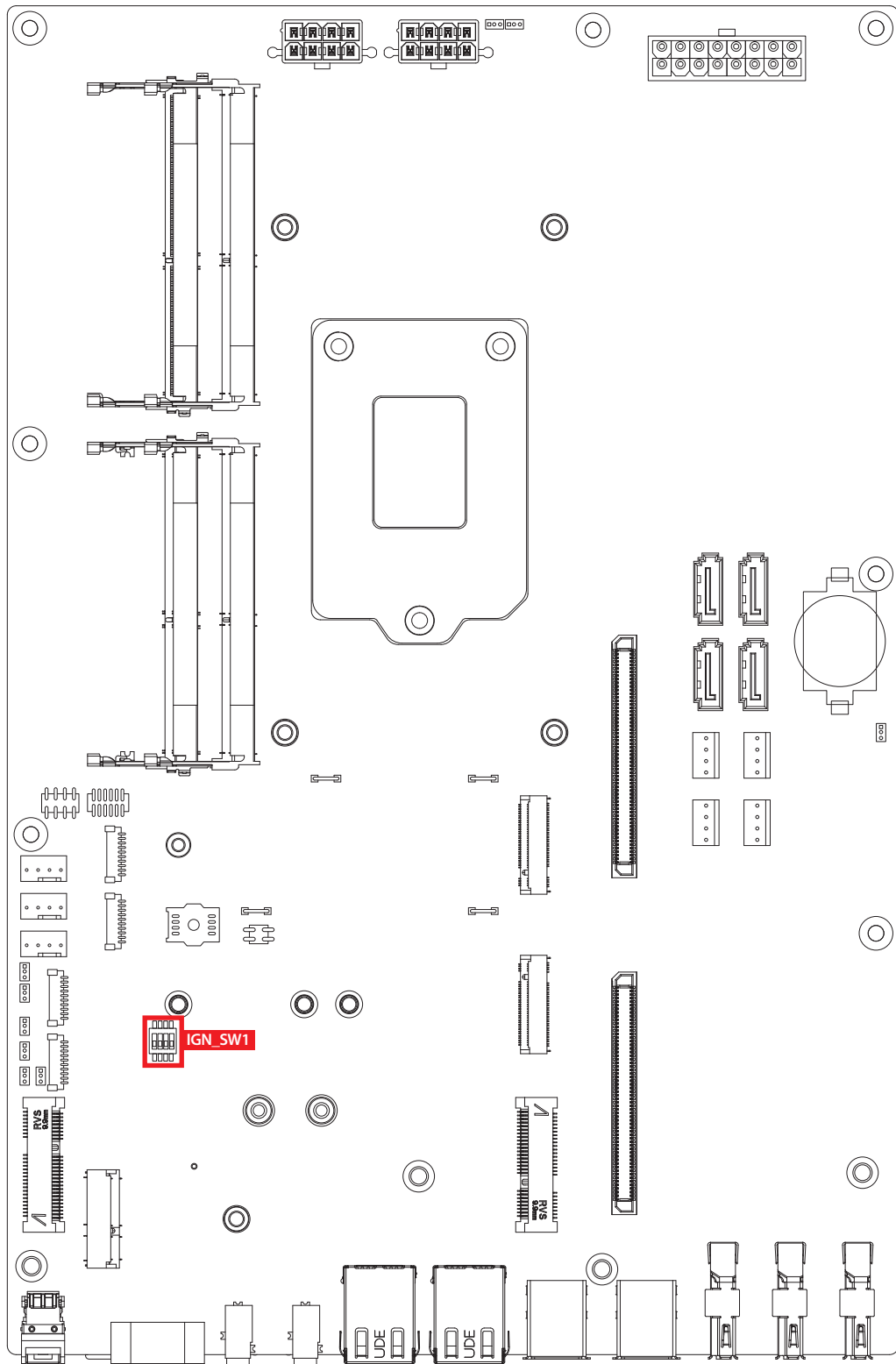
## 2.4.8 JMOSI\_LAN2



	Setting	Function
<div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">1</div> <input type="checkbox"/> </div>	1-2	enable flash security (Default)
<div style="display: flex; align-items: center;"> <div style="margin-right: 5px;">3</div> <input type="checkbox"/> </div>	2-3	disable flash security

## 2.5 Ignition Control

### 2.5.1 IGN\_SW1 : Ignition Control (HW)

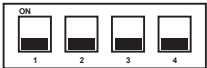
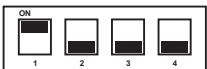






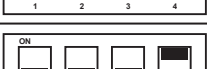









The RCX-2000 PEG provide ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay period.

## 2.5.2 Adjust Ignition Control Modes

The RCX-2000 PEG provide sixteen modes of different power on/off delay periods adjustable via rotary switch. The default rotary switch is set to 0 in ATX/AT power mode.

The modes are listed in the following 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	

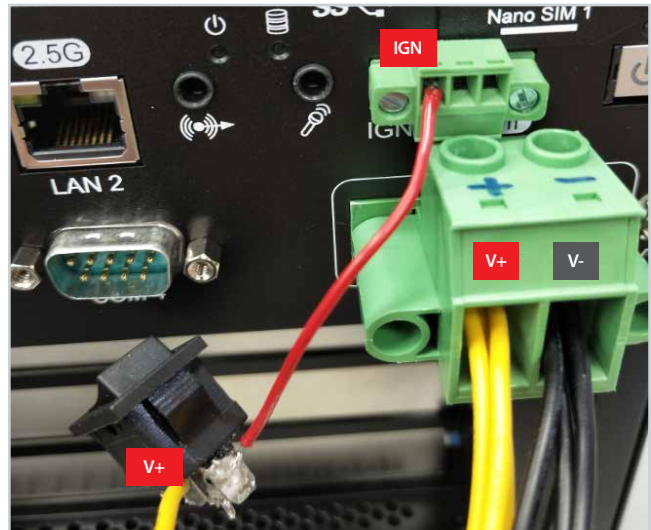


## 2.5.3 Ignition Control Wiring

To activate ignition control, you need to provide IGN signal via the 3-pin pluggable terminal block located on the front panel. Please use the following pictures to find the general wiring configuration.



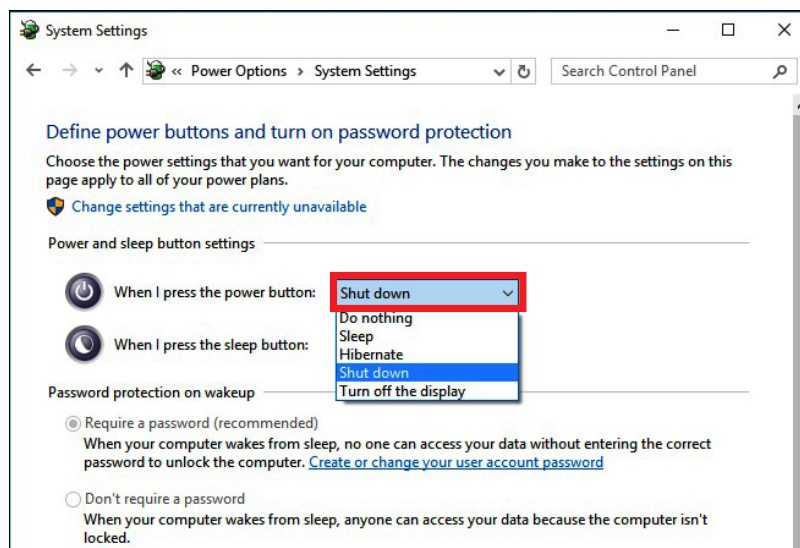
Pin No.	Definition
1	Ignition
2	SW+
3	SW-



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. RCX-2000 supports 9V to 55V wide range DC power input in ATX/AT mode. In Ignition mode, the input voltage is fixed to 12V/24V for car battery scenario.
3. For proper ignition control, the power button setting should be "Power Down" mode.



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

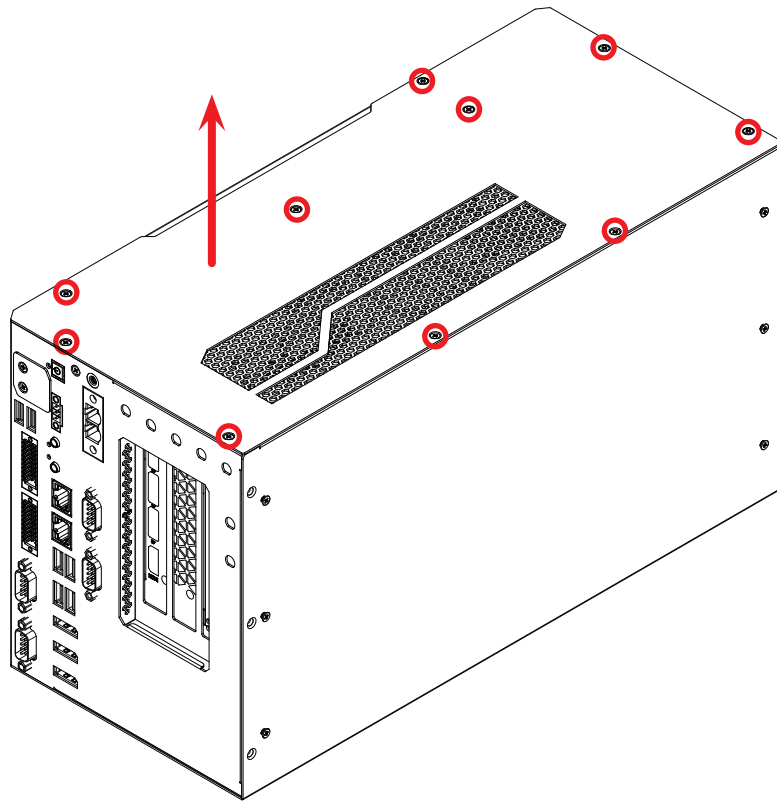
# 3

## SYSTEM SETUP

### 3.1 How to open your RCX-2000

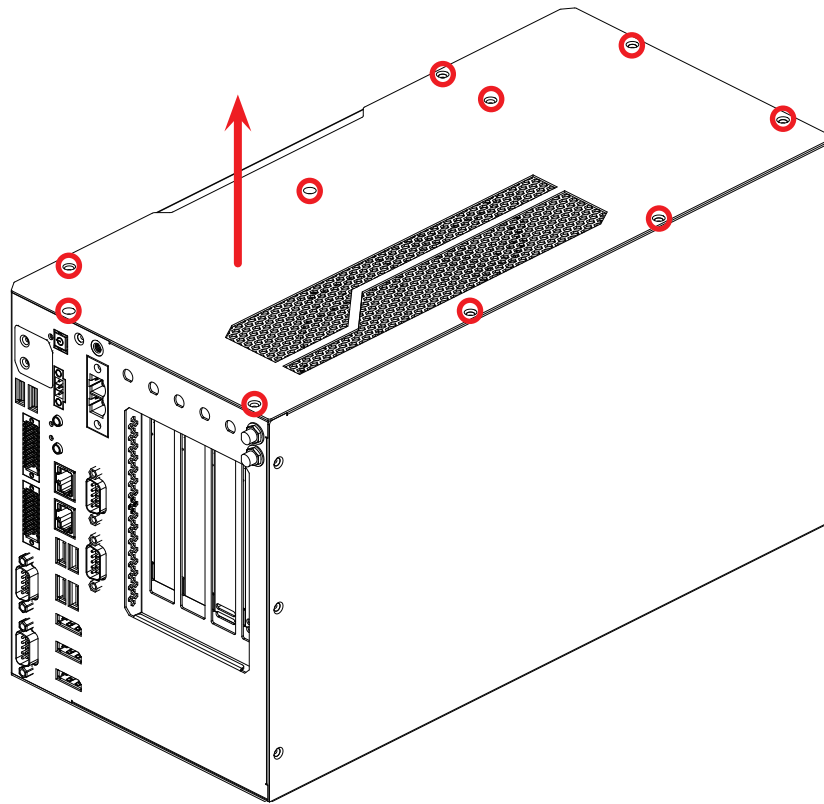
#### 3.1.1 RCX-2330-PEG/RCX-2330R-PEG

Remove the screws indicated and separate the Cover from the enclosure.



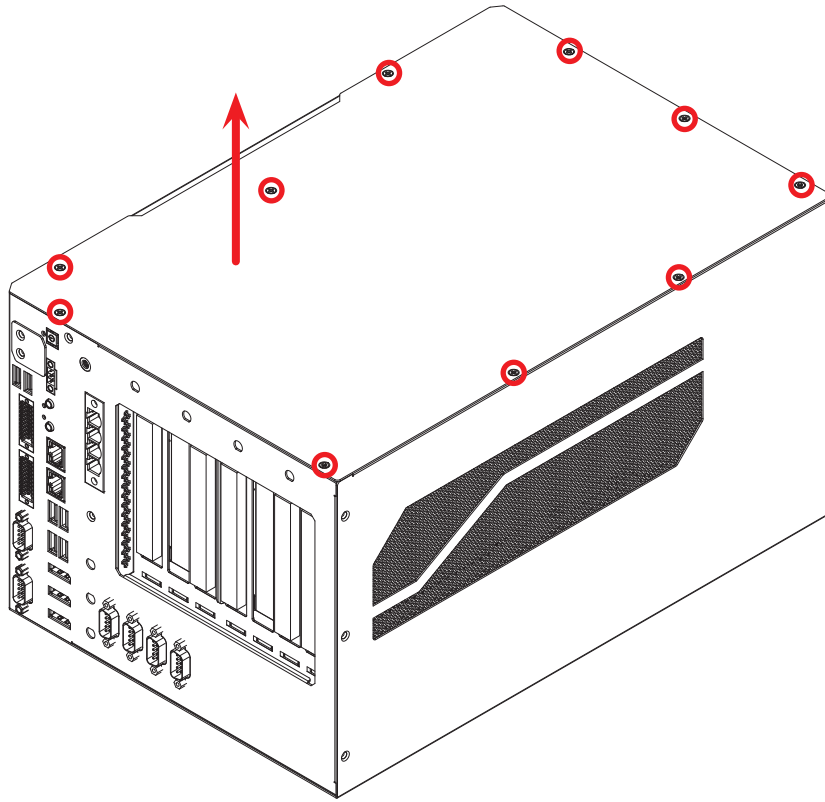
### 3.1.2 RCX-2430-PEG/RCX-2430R-PEG

Remove the screws indicated and separate the Cover from the enclosure.



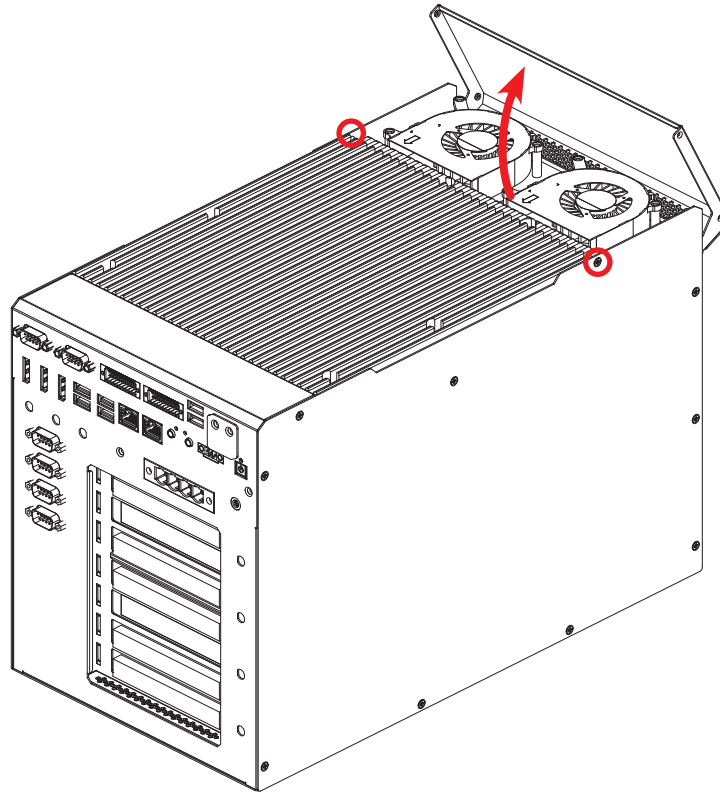
### 3.1.3 RCX-2750-PEG/RCX-2750R-PEG

Remove the screws indicated and separate the Cover from the enclosure.

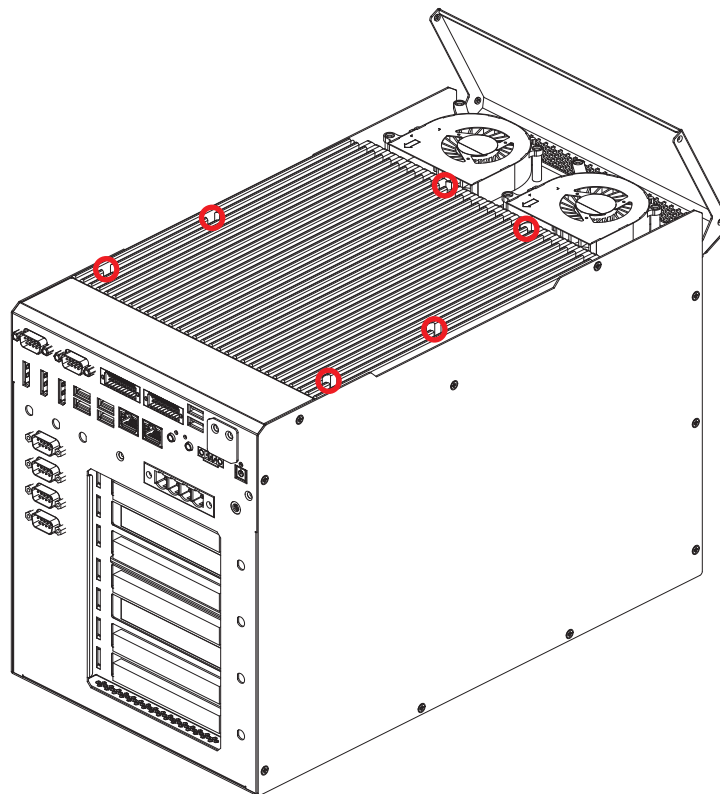


## 3.2 Installing CPU

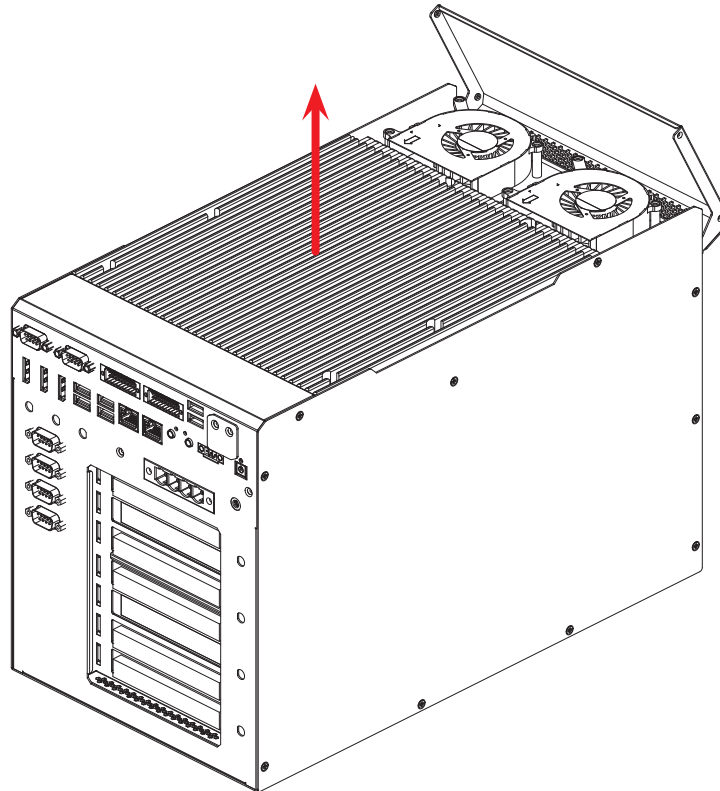
**Step 1** Remove the screws indicated and open Cover from fan kit.



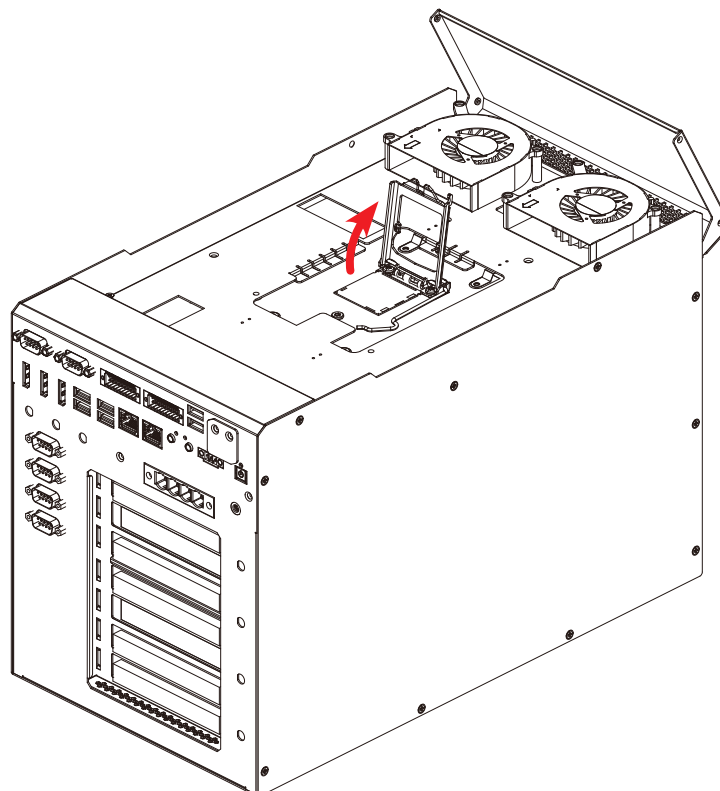
**Step 2** Remove the screws from heat sink.



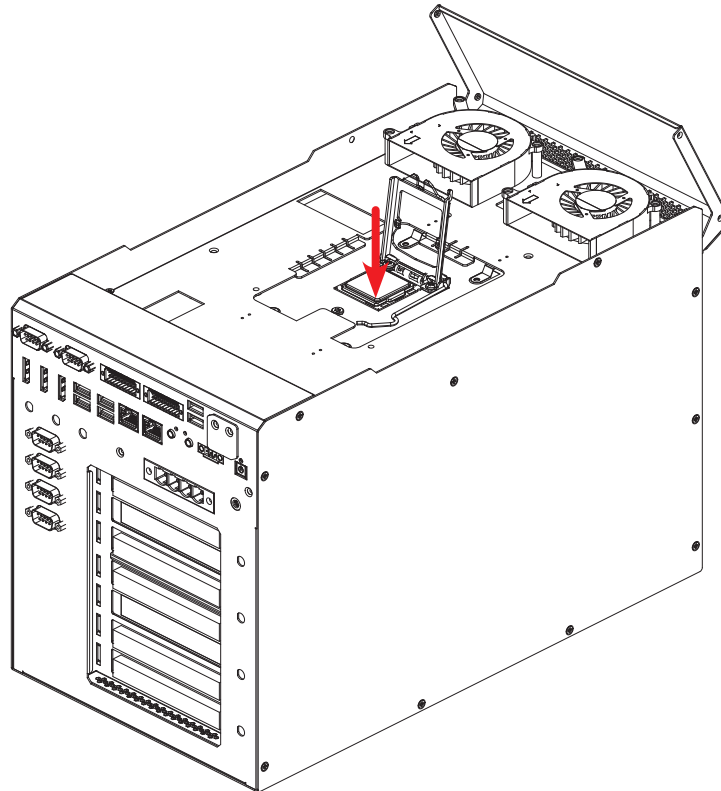
**Step 3** Separate the heat sink from the enclosure.



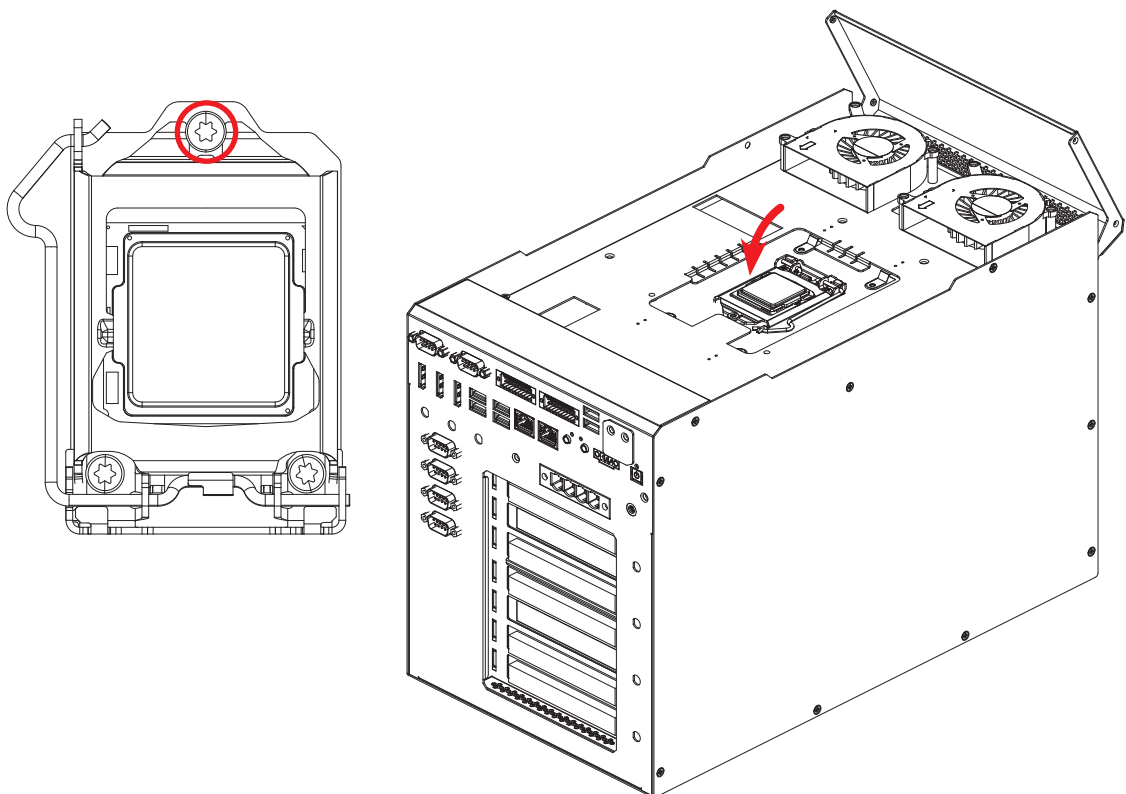
**Step 4** Open CPU independent Loading Mechanism (ILM).



**Step 5** Remove the mylar and Installing CPU.

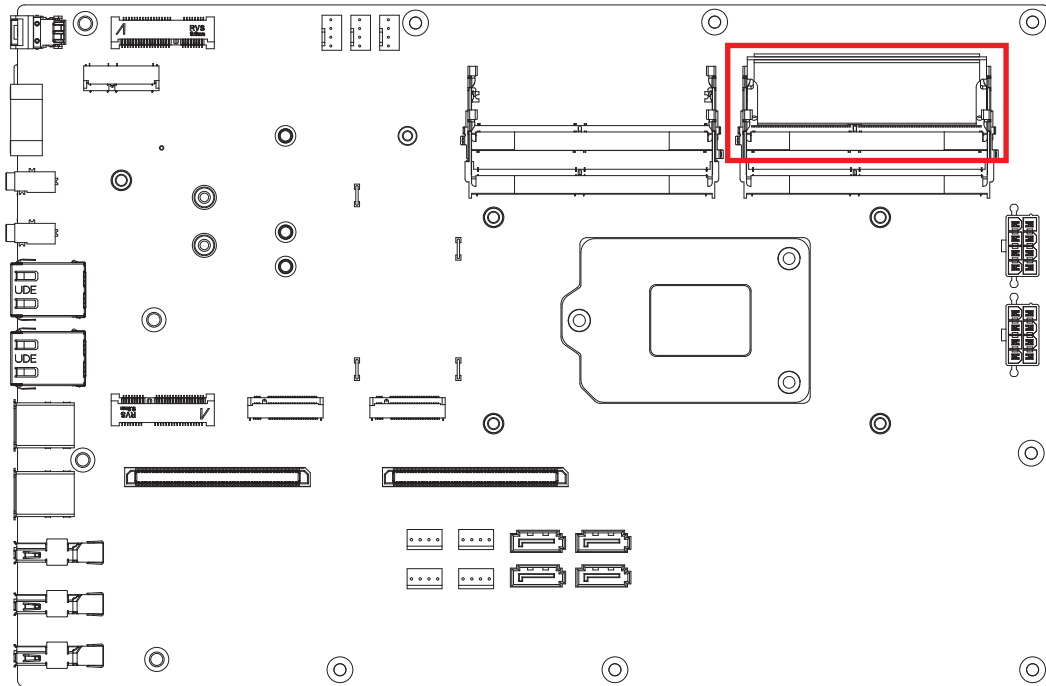


**Step 7** Check CPU and CPU slot lock pin, Close CPU Independent Loading Mechanism (ILM) and finish.

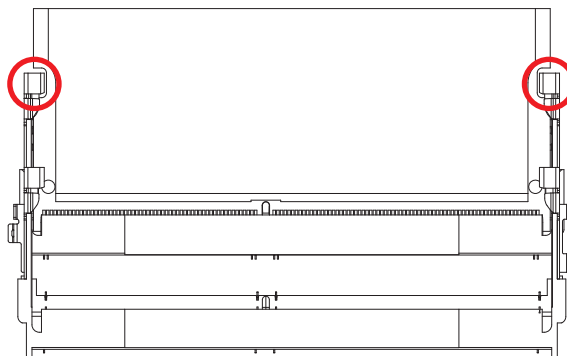


### 3.3 Installing DDR4 SO-DIMM Modules

**Step 1** Install DDR4 RAM module into SO-DIMM slot.



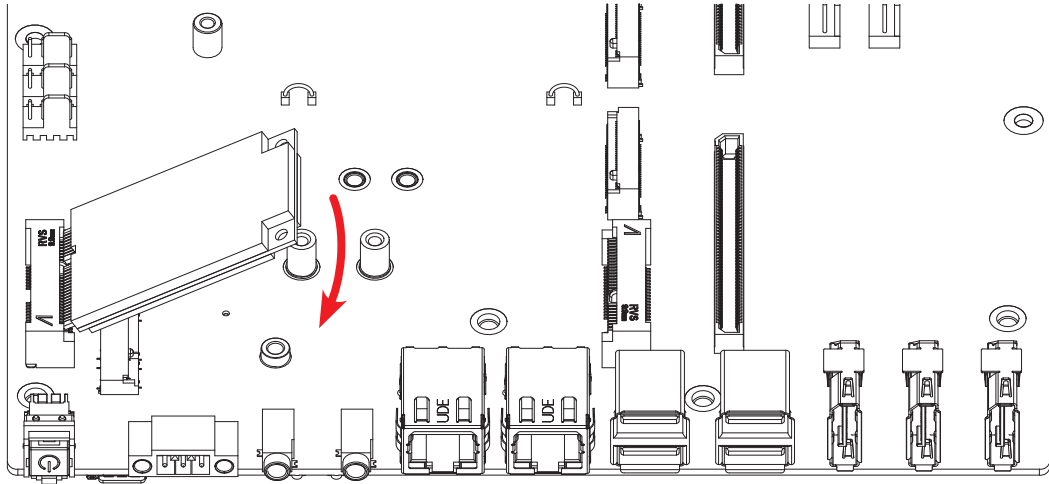
**Step 2** Make sure the RAM module is locked by the memory slots (red).



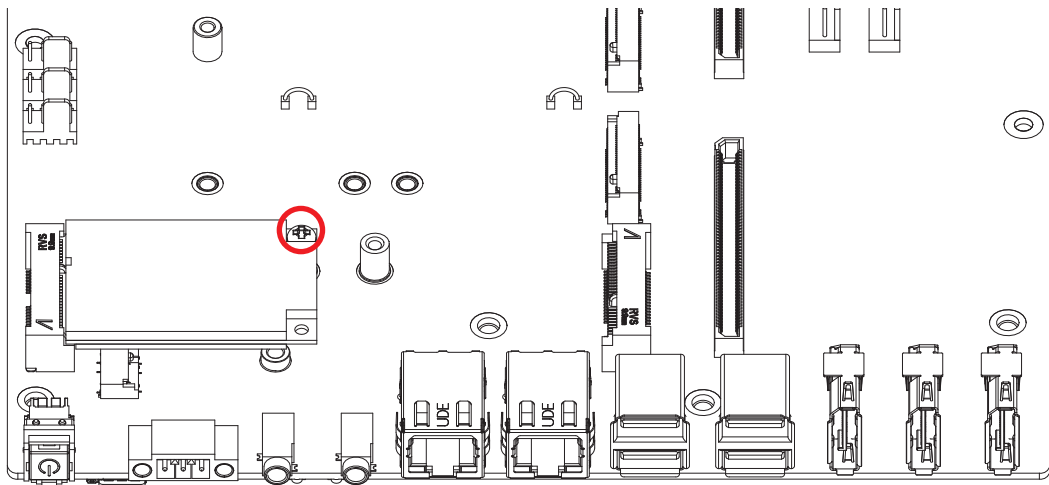


### 3.4 Installing Mini PCIe Card

**Step 1** Install Mini PCIe card into the Mini PCIe slot.

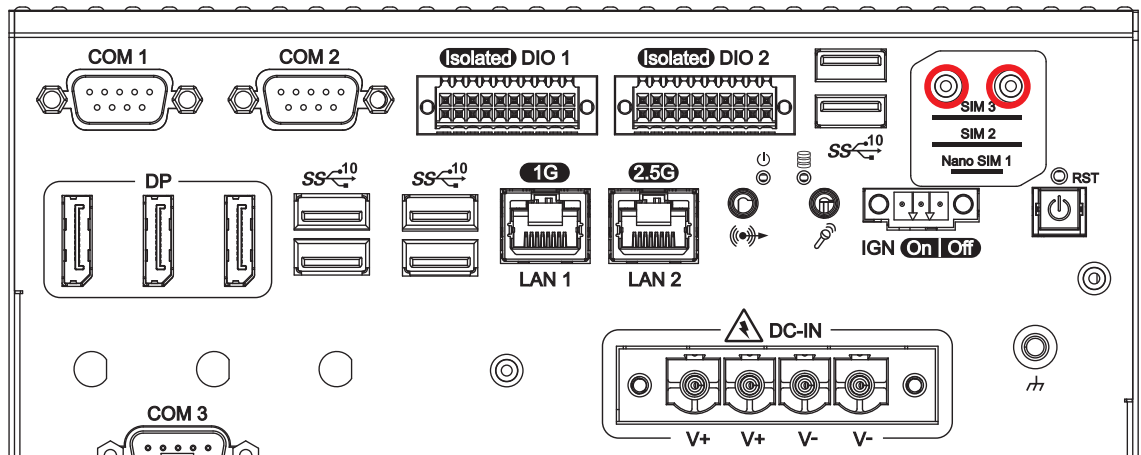


**Step 2** Fasten one M2.5 screws.

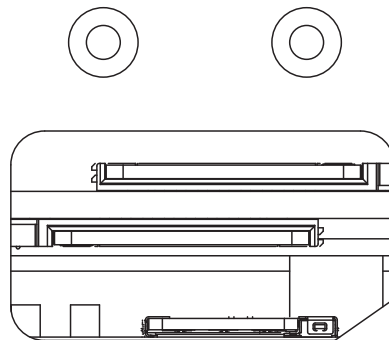


### 3.5 Installing SIM Card

**Step 1** Remove SIM cover (Remove M3 x 4L screws).



**Step 2** Install SIM card in the marked red area.

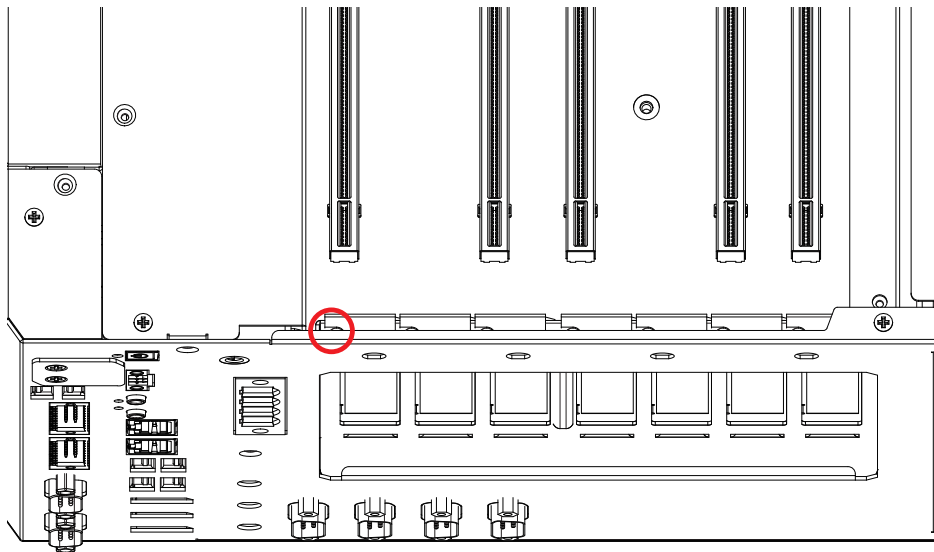


## 3.6 Installing PCI/PCIe Card

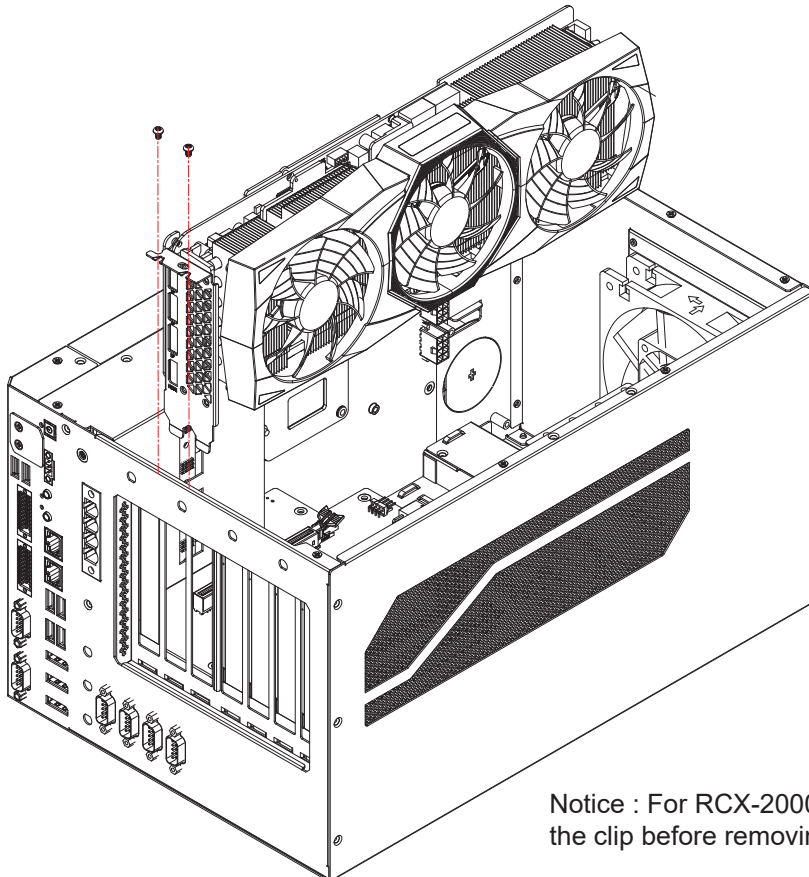
System designs will support 111.15 mm standard height, 320 mm maximum length (without the I/O bracket & power cable) expansion cards.

(\*Based on the position of power connectors and the card sink/case design, not all expansion card within the maximum dimension can fit in to the system. Please consult the Vecow support team for confirmation.)

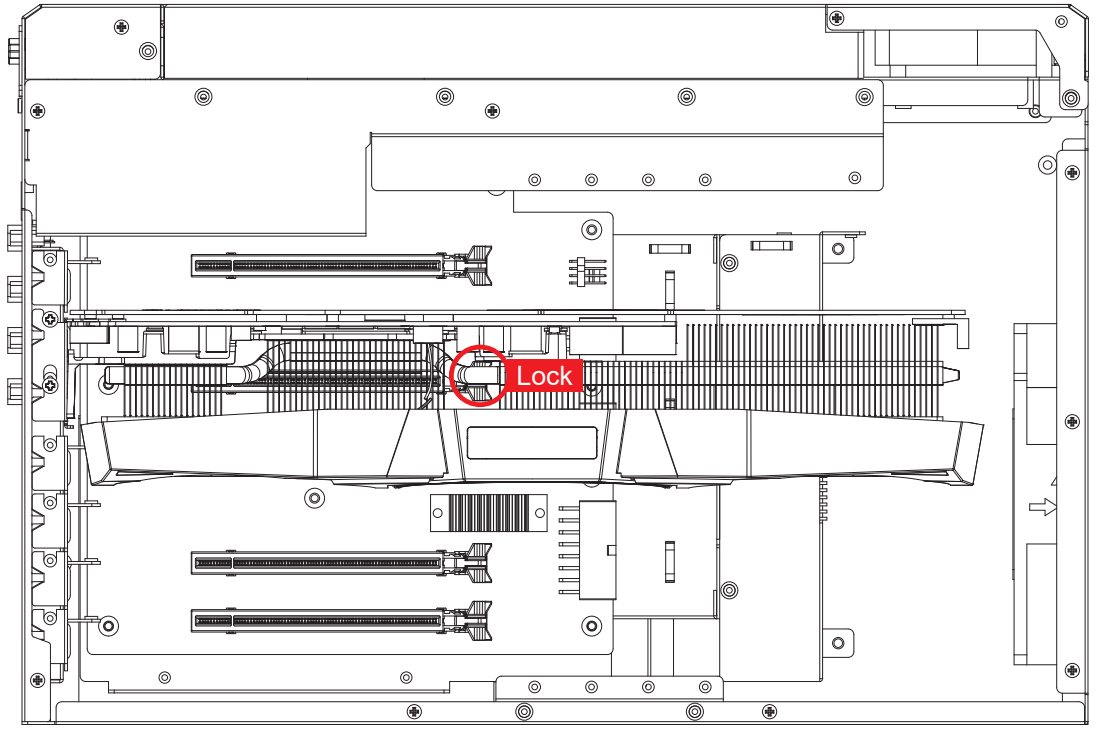
**Step 1** Remove M3x5L screws and PCI bracket.



**Step 2** Install the PCI/PCIe Card and lock it in place, Fasten one M3x5L screws.



Notice : For RCX-2000 Series, please press the clip before removing the card.



## 3.7 Installing SSD/HDD

The 2.5" hard drive works with both 9.5mm and 7mm drives.

### 3.7.1 External SSD/HDD for RCX-2300R/2700R PEG Series

**Step 1** Open SSD/HDD Door



**Step 2** Insert 2.5" SSD/HDD into the tray.



**Step 3** Push back and close the SSD/HDD tray.



**Step 4** Lock the SSD/HDD tray with the key.



### 3.7.2 Internal SSD/HDD for RCX-2300/2700 PEG Series

**Step 1** Remove M3 x 5L screws.



**Step 2** Open the HDD door and Insert 2.5" SSD/HDD into the tray.

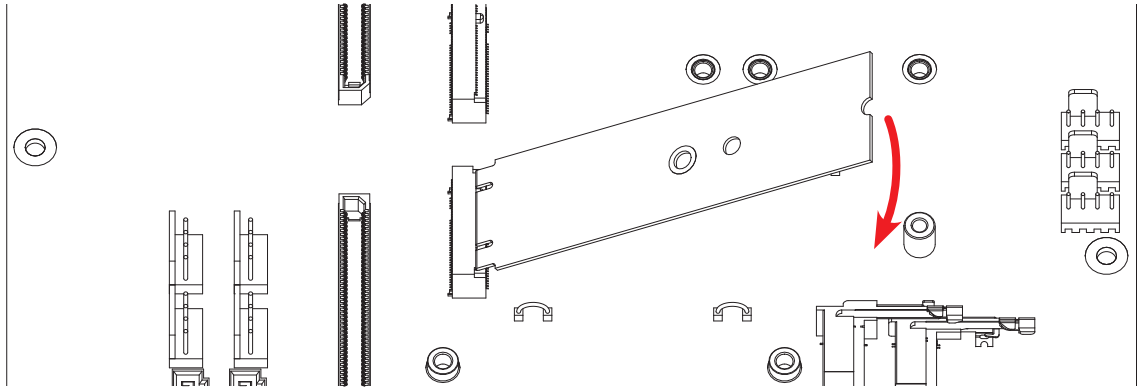


**Step 3** Fasten four F Head M3x4L screws (1 set).

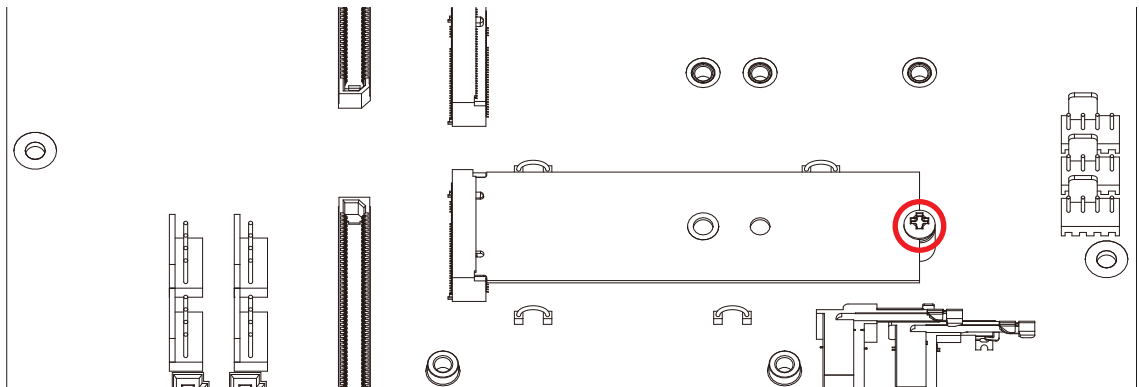


### 3.7.3 Installing M.2

**Step 1** Install M.2 card into the slot.



**Step 2** Fasten one M3 screw.

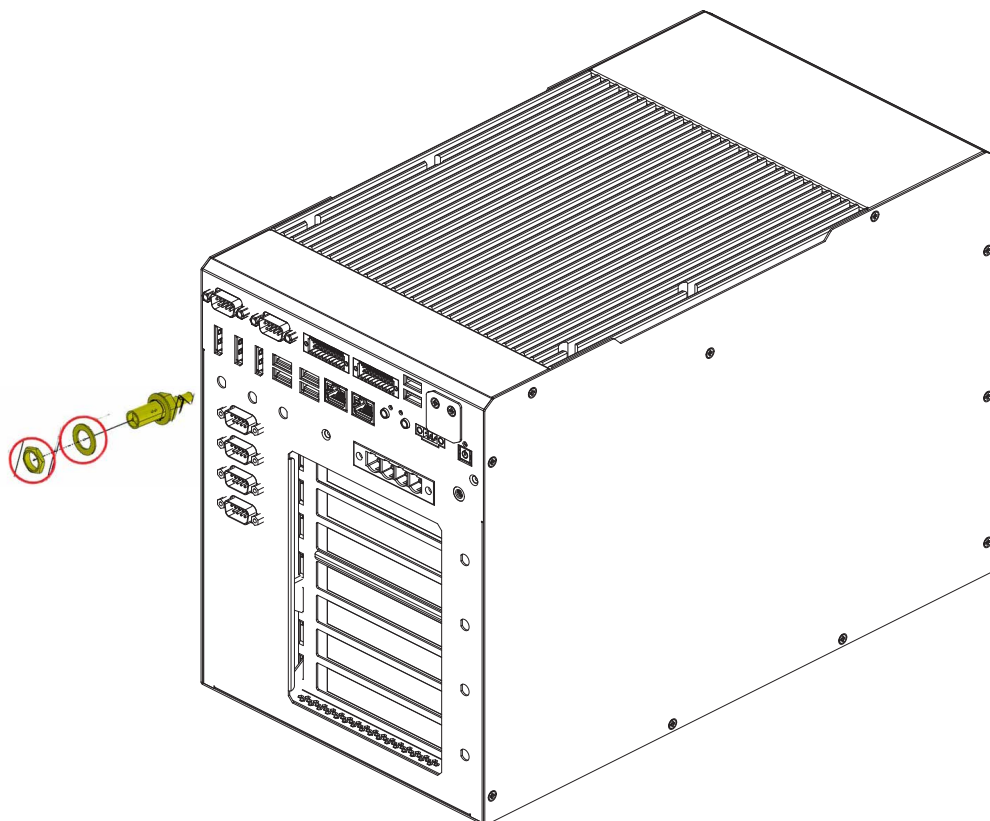


## 3.8 Installing Antenna Cable

**Step 1** Check antenna parts (cable and washers).



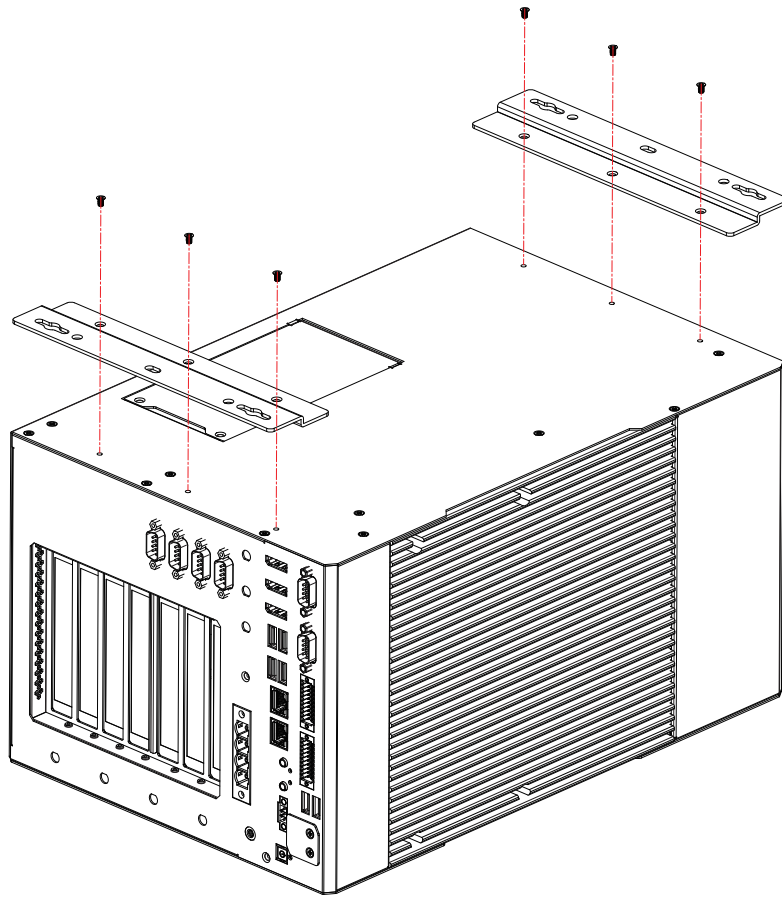
**Step 3** Fasten washer 1, washer 2, and on Antenna cable connector.





### 3.9 Mounting Your RCX-2000 PEG

Install wall mount to RCX-2000 bottom, Install six F head M3x5L screws.

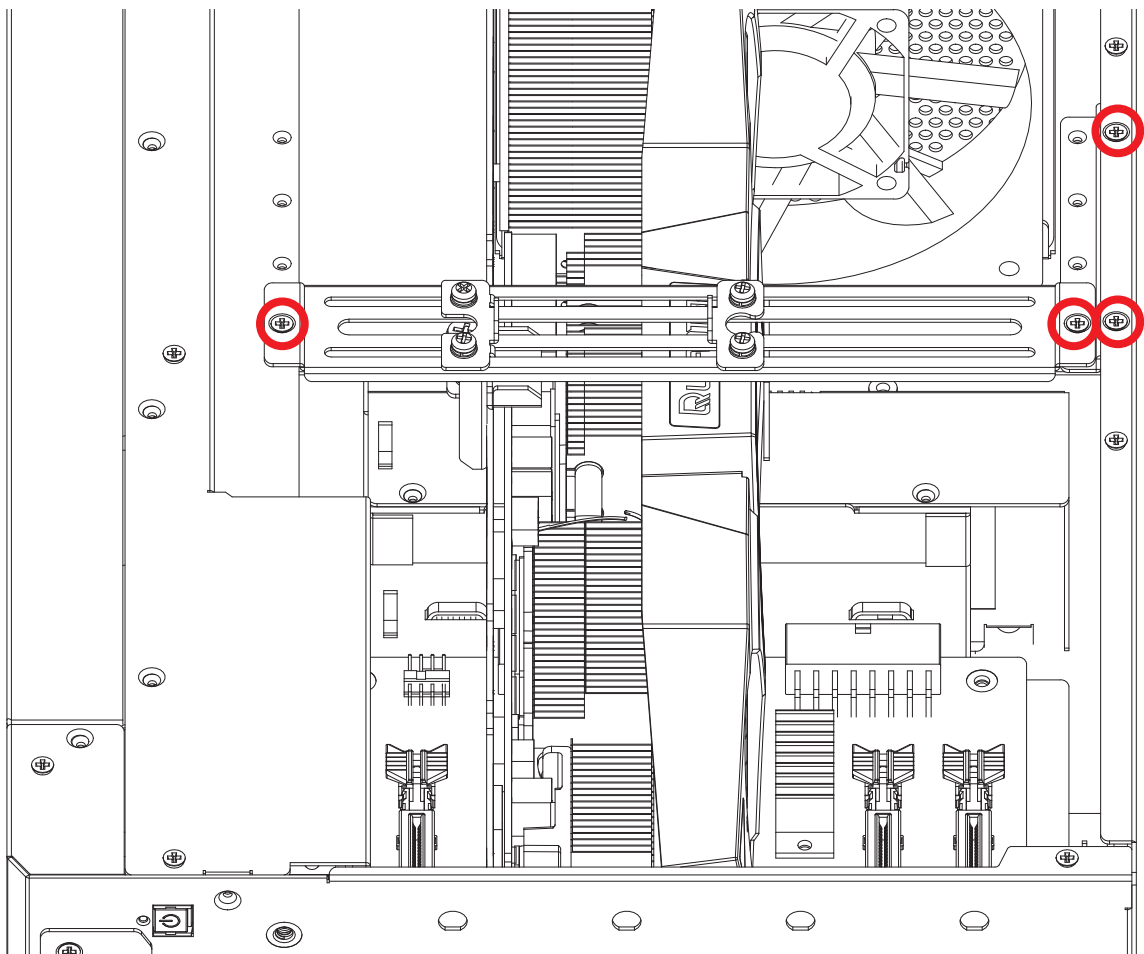


### 3.10 Installing Hold-down Kit

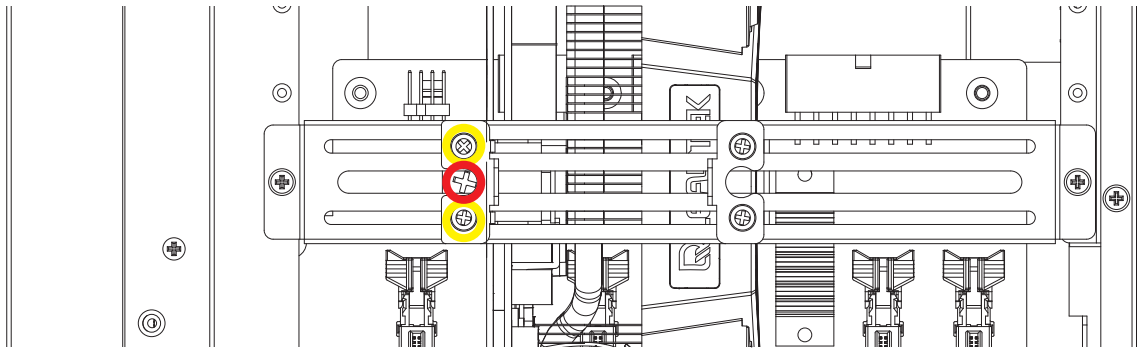
Step 1 Fasten four F head M3 x 4L Screws.



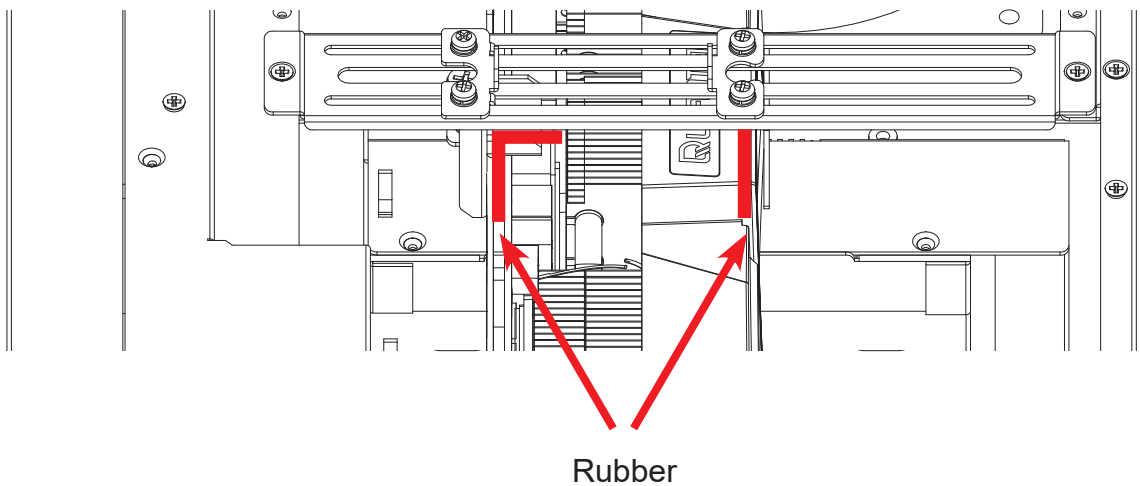
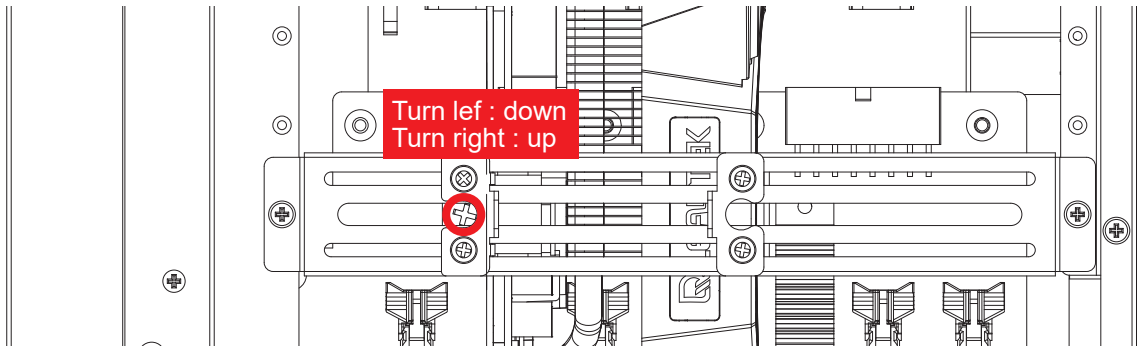
Hold-down Kit



**Step 2** Adjust the plate left or right to fix the card and then fasten two screws on the marked yellow area.



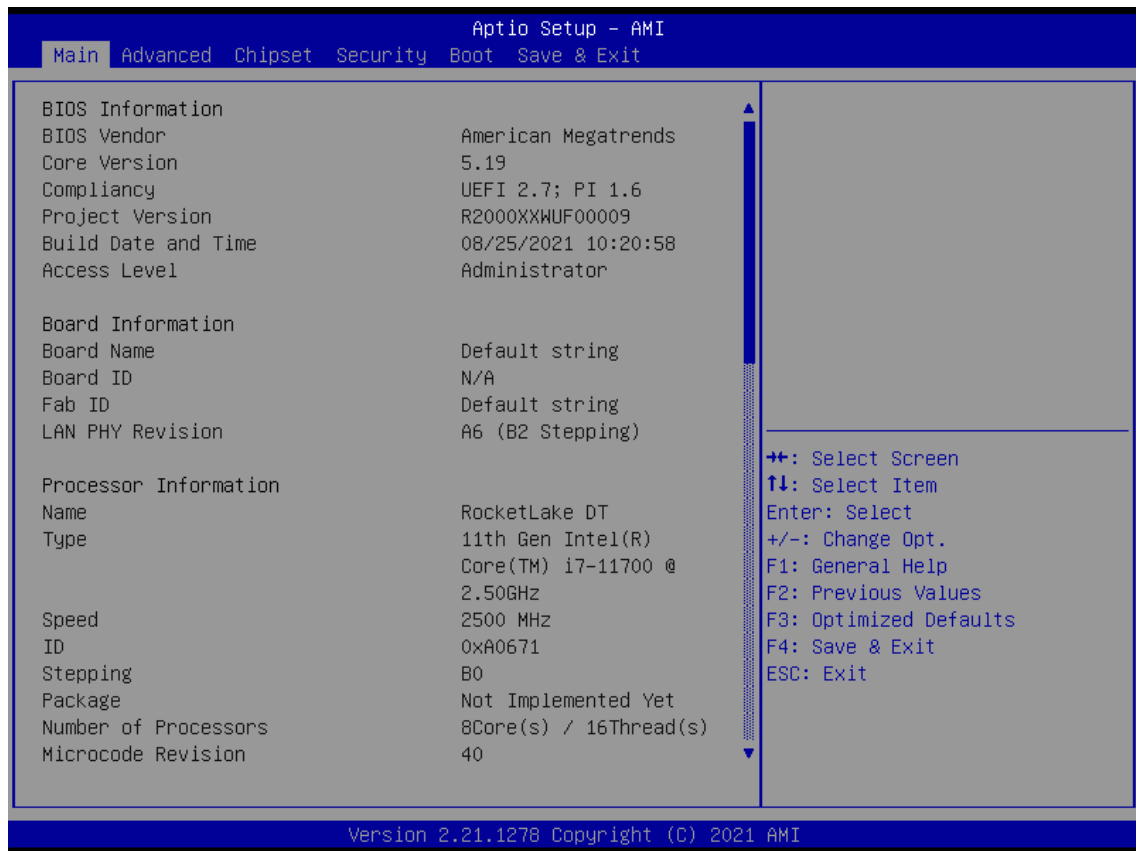
**Step 3** Turn the screw (circle in red) left or right with Phillips screwdriver to adjust the pad up and down.



# 4

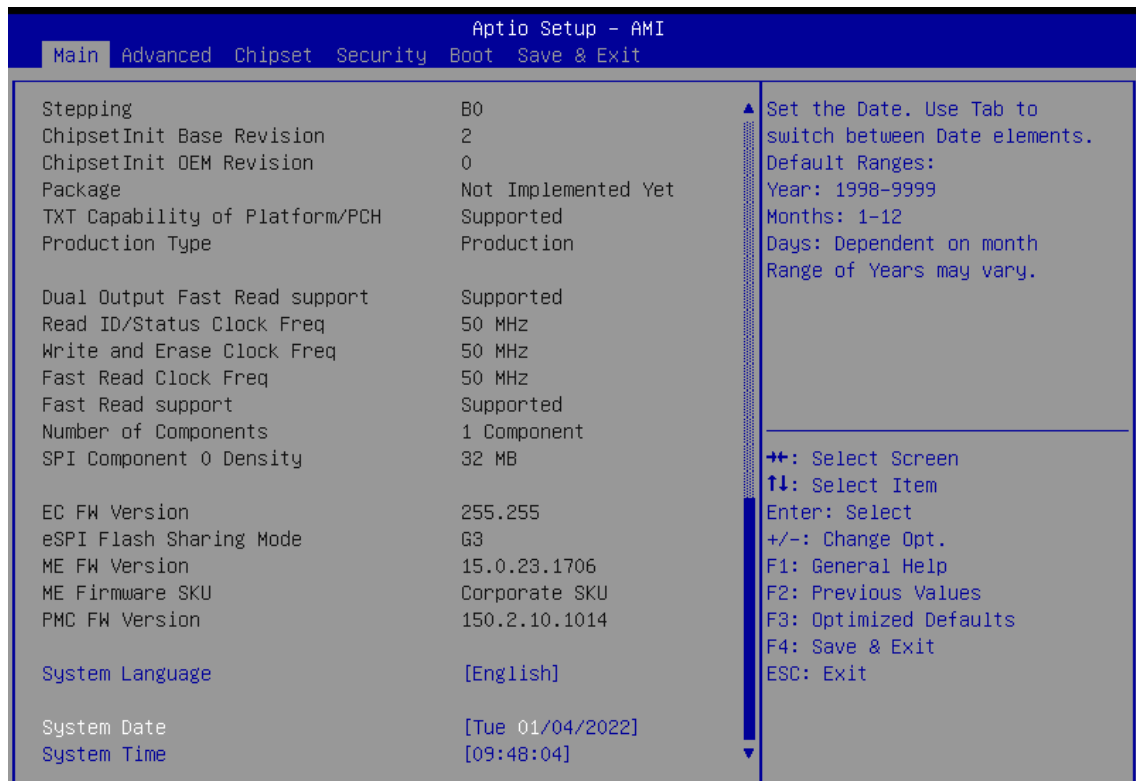
## BIOS SETUP

### 4.1 Entering BIOS Setup



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

## 4.2 Main Menu



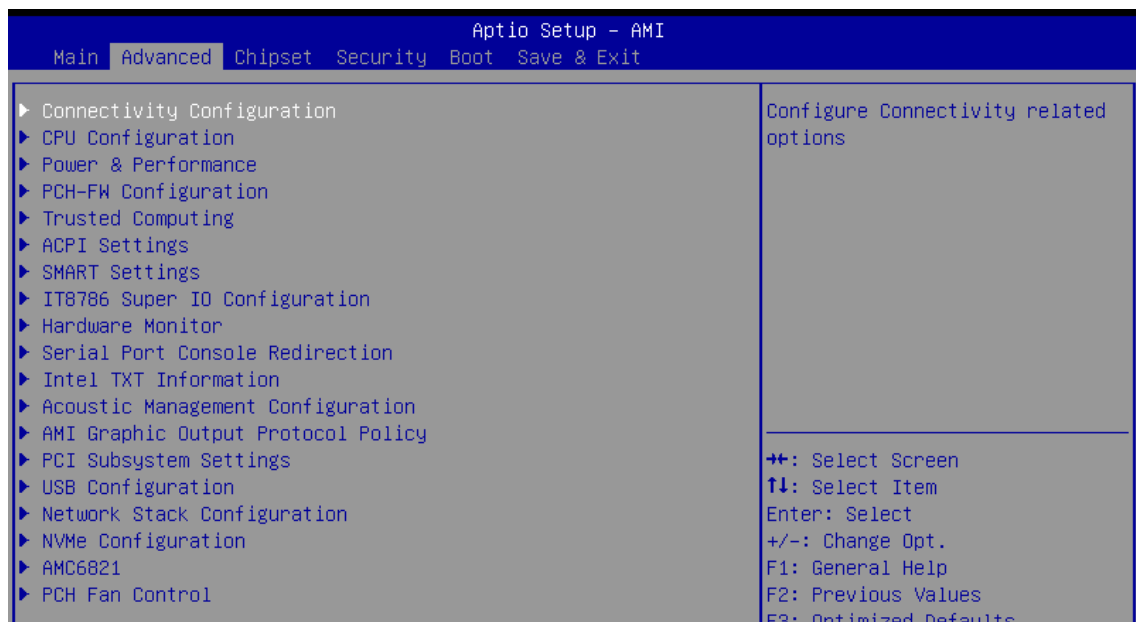
### System Date

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

### System Time

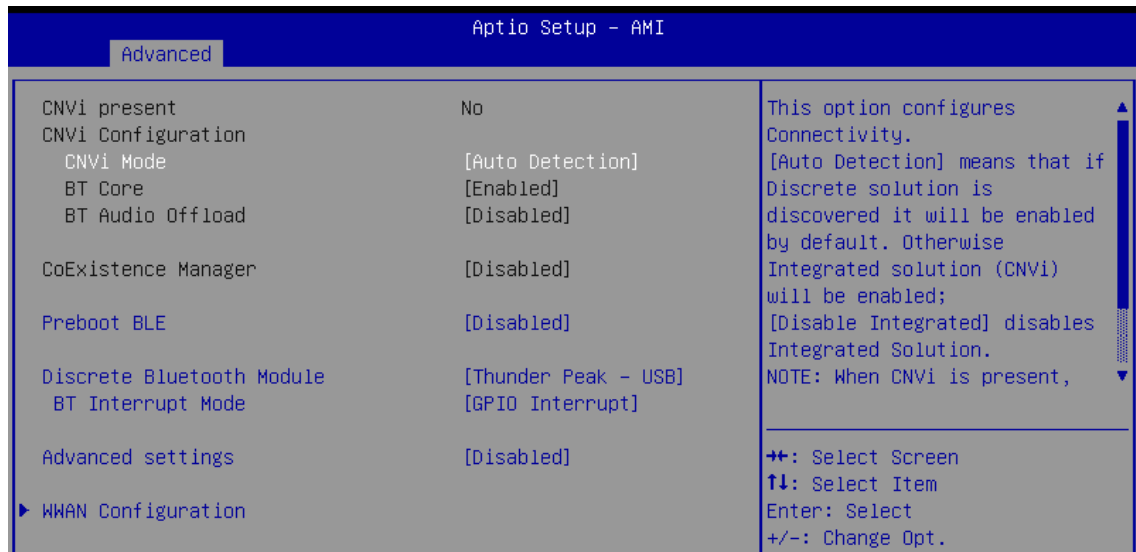
Set the time. Use <Tab> to switch between time elements.

## 4.3 Advanced Functions



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

### 4.3.1 Connectivity Configuration



#### 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

#### Preboot BLE

This will be used to enable Preboot Bluetooth function.

#### Discrete Bluetooth Module

Seriallo UART0 needs to be enabled to select BT Module.

#### BT Interrupt Mode

Selects routing of interrupt from BT Module.

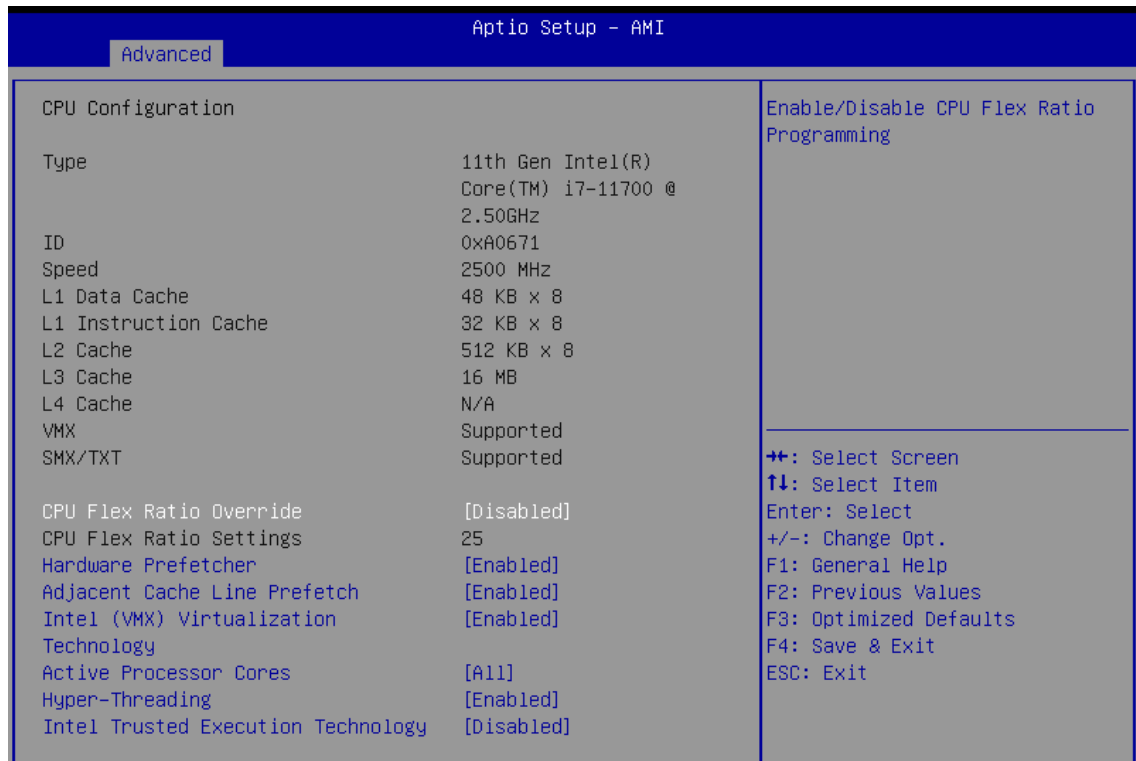
#### Advanced settings

Configure ACPI objects for wireless devices.

#### WWAN Configuration

Configure WWAN related options.

## 4.3.2 CPU Configuration



### CPU Flex Ratio Override

Enable/Disable CPU Flex Ratio Programming.

### CPU Flex Ratio Settings

This value must be between Max Efficiency Ratio (LFM) and Maximum non-turbo ratio set by Hardware (HFM).

### 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

Enable or Disable Hyper-Threading Technology.

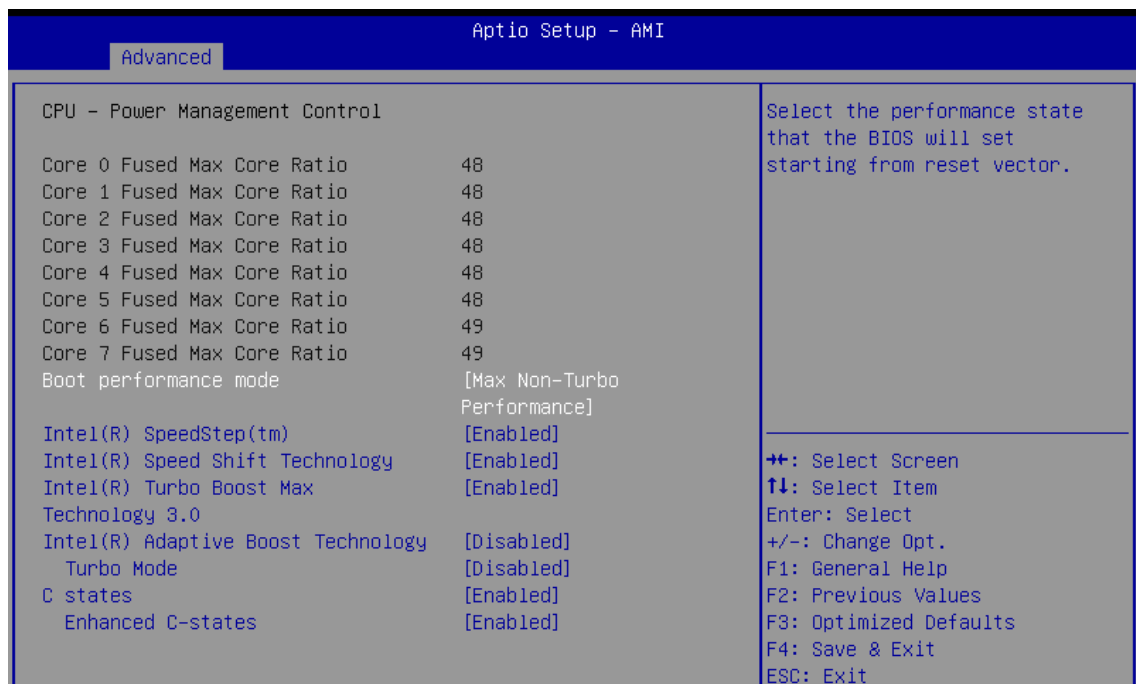
### Intel Trusted Execution Technology

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

### 4.3.3 Power & Performance



#### 4.3.3.1 CPU - Power Management Control



#### Boot performance mode

Select the performance state that the BIOS will set starting from reset vector.

#### Intel(R) SpeedStep(tm)

Allows more than two frequency ranges to be supported.

#### Intel(R) Speed Shift Technology

Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

#### Intel(R) Turbo Boost Max Technology 3.0

Enable/Disable Intel(R) Turbo Boost Max Technology 3.0 support. Disabling will report the maximum ratio of the slowest core in \_CPC object.

#### Intel(R) Adaptive Boost Technology

Enable/Disable IABT to improve performance by allowing higher multi-core turbo frequencies.



### Turbo Mode

Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.

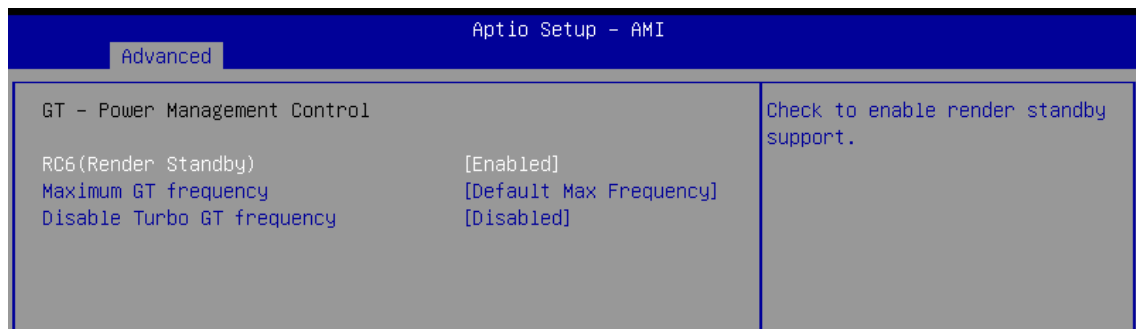
### C states

Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

### Enhanced C-states

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

## 4.3.3.2 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 XXX MHz (RPN) and XXX MHz (RP0). Value beyond the range will be clipped to min/max supported by SKU. (XXX depend on CPU)

### Disable Turbo GT frequency

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

### 4.3.4 PCH-FW Configuration

Aptio Setup - AMI		
Advanced		
ME Firmware Version	15.0.23.1706	Configure Intel(R) Active Management Technology Parameters
ME Firmware Mode	Normal Mode	
ME Firmware SKU	Corporate SKU	
ME Firmware Status 1	0x90000255	
ME Firmware Status 2	0x30858106	
ME State	[Enabled]	
AMT BIOS Features	[Enabled]	
▶ AMT Configuration		
ME Unconfig on RTC Clear	[Enabled]	

#### ME State

When Disabled ME will be put into ME Temporarily Disabled Mode.

#### AMT BIOS Features

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

Note : This option does not disable Manageability Features in FW.

#### AMT Configuration

Configure Intel(R) Active Management Technology Parameters.

#### ME Unconfig on RTC Clear

When Disabled ME will not be unconfigured on RTC Clear.

### 4.3.5 Trusted Computing

Aptio Setup - AMI		
Advanced		
TPM 2.0 Device Found		Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Firmware Version:	7.85	
Vendor:	IFX	
Security Device Support	[Enable]	
Active PCR banks	SHA256	
Available PCR banks	SHA-1,SHA256	
SHA-1 PCR Bank	[Disabled]	
SHA256 PCR Bank	[Enabled]	
Pending operation	[None]	
Platform Hierarchy	[Enabled]	
Storage Hierarchy	[Enabled]	
Endorsement Hierarchy	[Enabled]	
TPM 2.0 UEFI Spec Version	[TCG_2]	
Physical Presence Spec Version	[1.3]	
TPM 2.0 InterfaceType	[TIS]	
Device Select	[Auto]	

⇐⇐: Select Screen  
 ⇕: Select Item  
 Enter: Select  
 +/-: Change Opt.  
 F1: General Help  
 F2: Previous Values  
 F3: Optimized Defaults

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

### 4.3.6 ACPI Settings

Aptio Setup - AMI		
Advanced		
ACPI Settings		Enables or Disables BIOS ACPI Auto Configuration.
Enable ACPI Auto Configuration	[Disabled]	
Enable Hibernation	[Enabled]	
ACPI Sleep State	[S3 (Suspend to RAM)]	
S3 Video Repost	[Disabled]	

#### Enable ACPI Auto Configuration

Enables or Disables BIOS ACPI Auto Configuration.

#### Enable Hibernation

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

#### ACPI Sleep State

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

#### S3 Video Repost

Enable or Disable S3 Video Repost.

### 4.3.7 SMART Settings

Aptio Setup - AMI		
Advanced		
SMART Settings		Run SMART Self Test on all HDDs during POST.
SMART Self Test	[Disabled]	

#### SMART Self Test

Run SMART Self Test on all HDDs during POST.

### 4.3.8 IT8786 Super IO Configuration

Aptio Setup - AMI		
Advanced		
IT8786 Super IO Configuration		Set Parameters of Serial Port 1 (COMA)
Super IO Chip	IT8786	
▶ Serial Port 1 Configuration		
▶ Serial Port 2 Configuration		
▶ Serial Port 3 Configuration		
▶ Serial Port 4 Configuration		

Display Serial Port X Configuration.

### 4.3.8.1 Serial Port X Configuration

Aptio Setup - AMI		
Advanced		
Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
Change Settings	[Auto]	
Interface Mode	[RS-422 Mode]	
RS-422 Mode	[5-Wire]	
RS422/485 Termination mode	[Disabled]	

#### Serial Port

Enable or Disable Serial Port (COM).

#### Change Settings

Select an optimal settings for Super IO Device

#### Interface Mode

Serial Port Mode Selection; RS-232; RS-422; RS-485; Loop Back;

#### RS-422 Mode

Select an optimal setting for RS-422 mode.

#### RS422/485 Termination mode

Enable or disable 120 ohm Termination Resistance for RXD+/RXD- signal.

### 4.3.9 Hardware Monitor

Aptio Setup - AMI		
Advanced		
Pc Health Status		Smart Fan Support. Work with Full Speed if "Smart Fan Support" is Disabled.
System temperature1	: +30 %	
System temperature2	: +32 %	
CPU temperature	: +29 %	
CPU Fan1 Speed	: N/A	
VCORE	: +0.858 V	
DDR	: +1.199 V	
+12V	: +12.210 V	
+5V	: +5.005 V	
+3.3V	: +3.337 V	
Smart Fan Support	[Enabled]	
Smart Fan Mode	[User]	
Start Temperature	45	++: Select Screen
PWM Start Value(%)	15	↑↓: Select Item
Full Speed Temperature	90	Enter: Select
		+/-: Change Opt.
		F1: General Help

#### 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

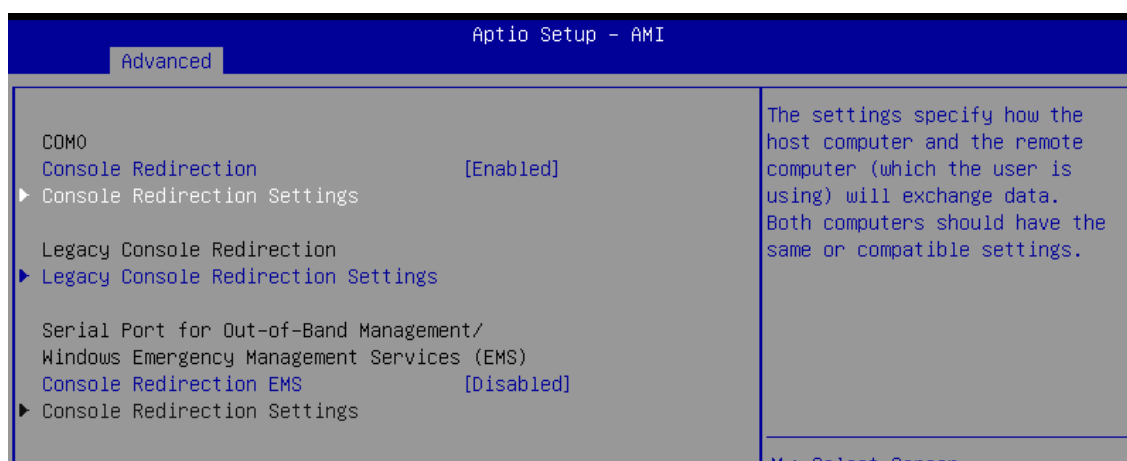
### PWM Start Value(%)

Default PWM value of Fan. (15-100%)

### Full Speed Temperature

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

## 4.3.10 Serial Port Console Redirection



### Console Redirection

Console Redirection Enable or Disable.

### Console Redirection Settings

The 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.

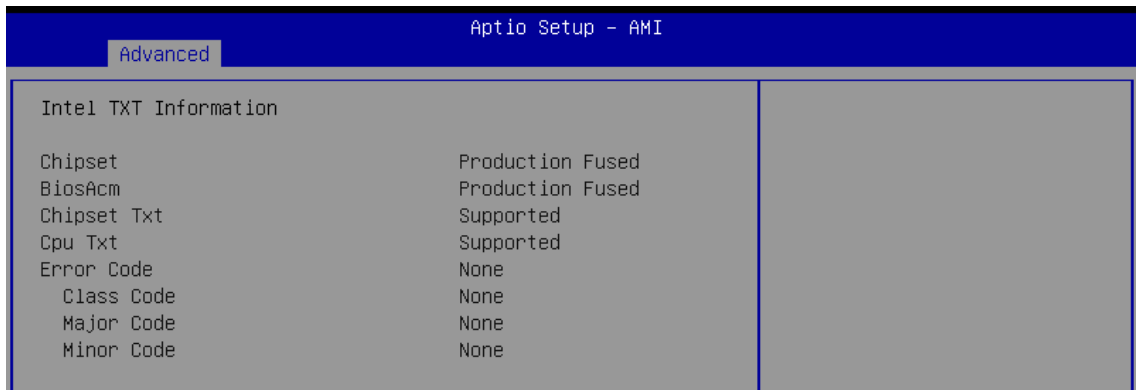
### Console Redirection EMS

Console Redirection Enable or Disable.

### Console Redirection Settings

The 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.

### 4.3.11 Intel TXT Information



Display Intel TXT information.

### 4.3.12 Acoustic Management Configuration



#### Acoustic Management Configuration

Option to Enable or Disable Automatic Acoustic Management.

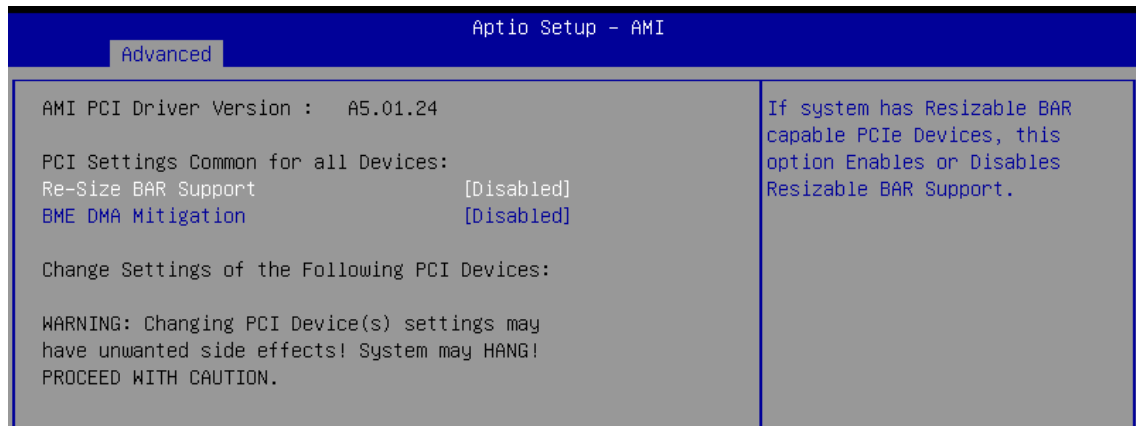
### 4.3.13 AMI Graphic Output Protocol Policy



#### Output Select

Output Interface.

### 4.3.14 PCI Subsystem Settings



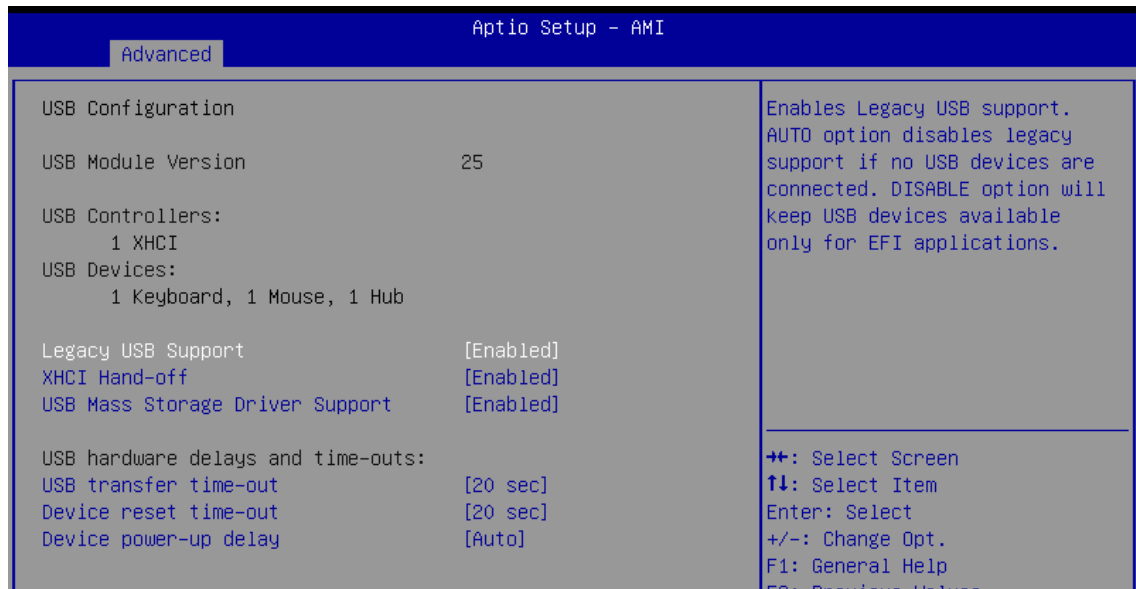
#### Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support.

#### BME DMA Mitigation

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

### 4.3.15 USB Configuration



#### 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 Oses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

## USB Mass Storage Device Configuration

Enable/Disable USB Mass Storage Driver Support.

### USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

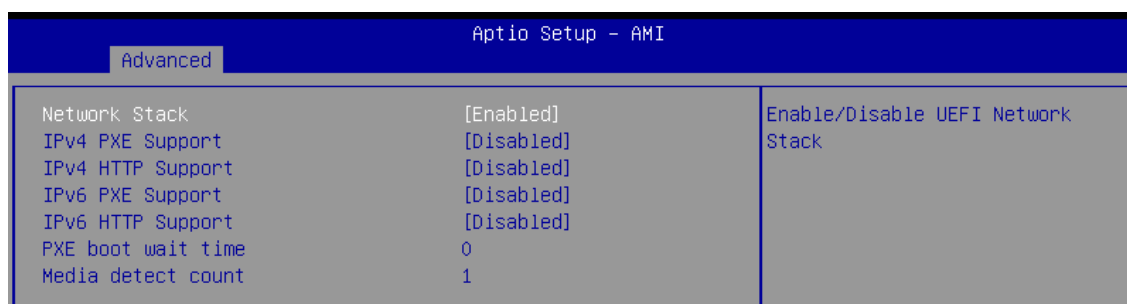
### Device reset time-out

USB mass storage device Start Unit command time-out.

### Device power-up delay

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

## 4.3.16 Network Stack Configuration



Aptio Setup - AMI		
Advanced		
Network Stack	[Enabled]	Enable/Disable UEFI Network Stack
IPv4 PXE Support	[Disabled]	
IPv4 HTTP Support	[Disabled]	
IPv6 PXE Support	[Disabled]	
IPv6 HTTP Support	[Disabled]	
PXE boot wait time	0	
Media detect count	1	

### Network Stack

Enable/Disable UEFI Network Stack

### IPv4 PXE Support

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

### IPv4 HTTP Support

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

### IPv6 PXE Support

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

### IPv6 HTTP Support

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

### PXE boot wait time

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

### Media detect count

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

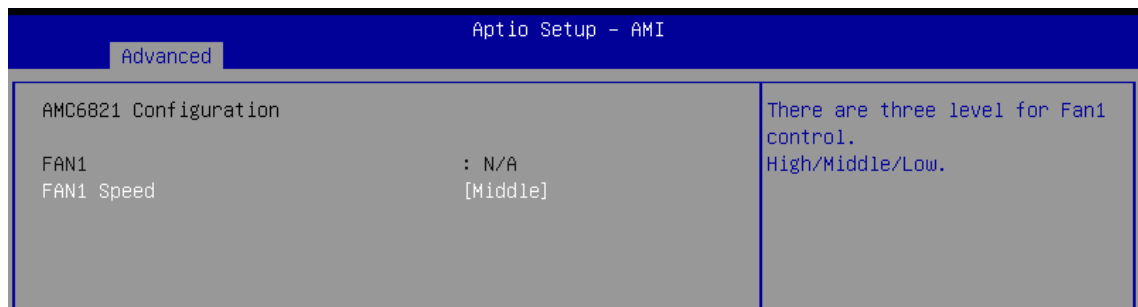


### 4.3.17 NVMe Configuration



Display NVMe controller and Drive information.

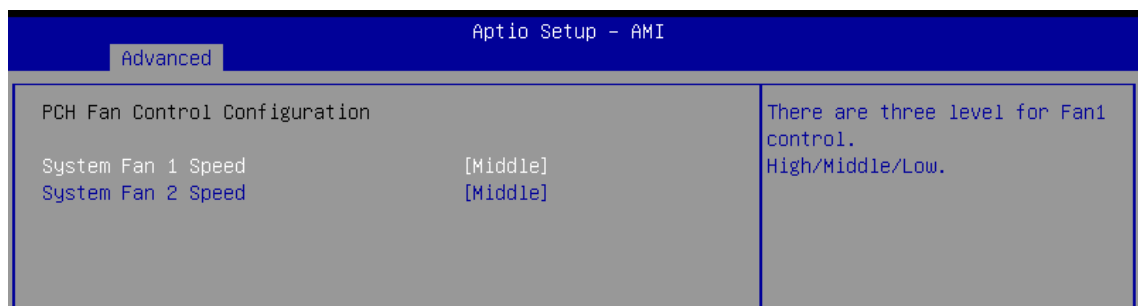
### 4.3.18 AMC6821



#### FAN1 Speed

There are three level for Fan1 control. High/Middle/Low.

### 4.3.19 PCH Fan Control



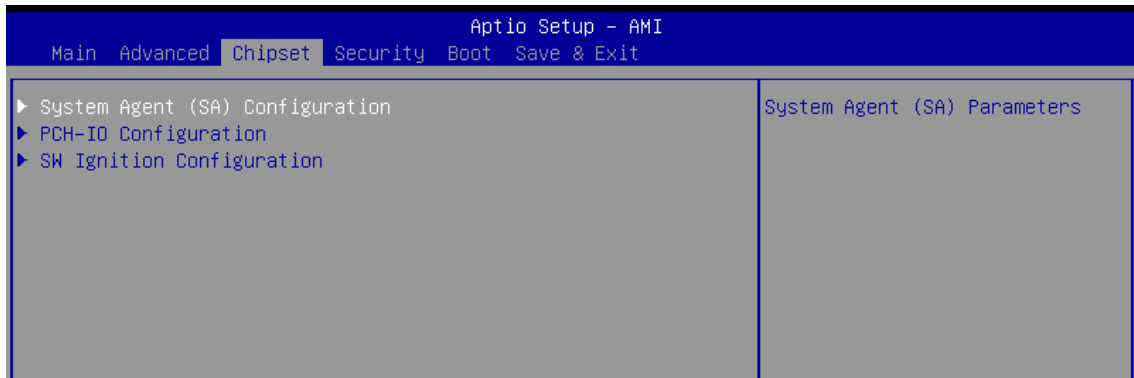
#### System Fan 1 Speed

There are three level for Fan1 control. High/Middle/Low.

#### System Fan 2 Speed

There are three level for Fan2 control. High/Middle/Low.

## 4.4 Chipset Functions



### System Agent (SA) Configuration

System Agent (SA) Parameters.

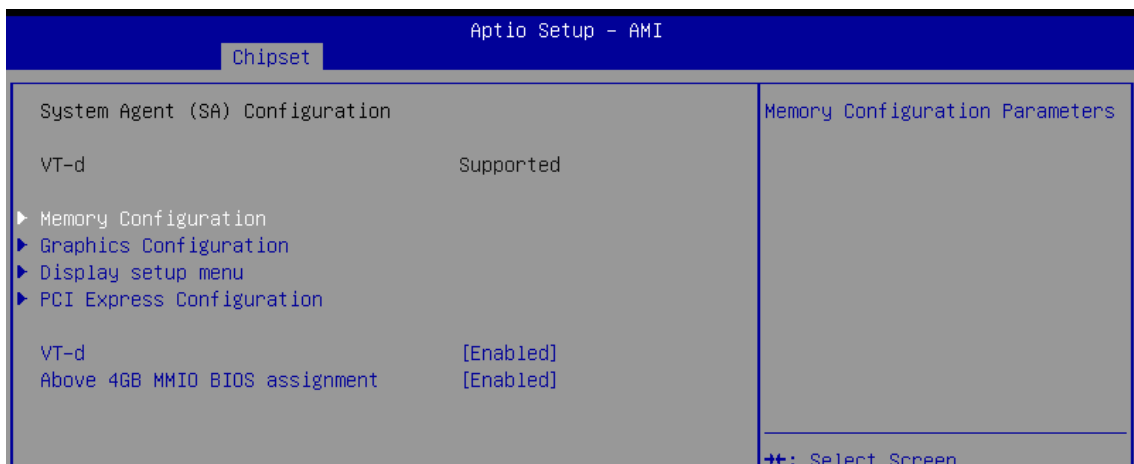
### PCH-IO Configuration

PCH Parameters.

### SW Ignition Configuration

SW Ignition Configuration. Setting Delay Timer and value of Voltage limit.

### 4.4.1 System Agent (SA) Configuration



### VT-d

VT-d capability.

### Above 4GB MMIO BIOS assignment

Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.

### 4.4.1.1 Memory Configuration

Chipset		Aptio Setup - AMI
Memory Configuration		Maximum Memory Frequency in Mhz. Must divide by 133 or 100 according to the refclk. In Gear2 must divide by 266 or 200. Lowest Gear2 speed is 2133
Memory RC Version	0.4.97.116	
Memory Frequency	2400 MHz	
Memory Timings (tCL-tRCD-tRP-tRAS)	17-17-17-39	
Channel 0 Slot 0	Populated & Enabled	
Size	8192 MB (DDR4)	
Number of Ranks	1	
Manufacturer	Kingston	
Channel 0 Slot 1	Not Populated / Disabled	
Channel 1 Slot 0	Not Populated / Disabled	
Channel 1 Slot 1	Not Populated / Disabled	
Maximum Memory Frequency	[2400]	↔: Select Screen
DDR Speed Control	[Manual]	↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help

#### Maximum Memory Frequency

Maximum Memory Frequency in Mhz. Must divide by 133 or 100 according to the refclk. In Gear2 must divide by 266 or 200. Lowest Gear2 speed is 2133.

#### DDR Speed Control

DDR Frequency and Gear1/Gear2 control for all SAGV points.

### 4.4.1.2 Graphics Configuration

Chipset		Aptio Setup - AMI
Graphics Configuration		If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports
Skip Scanning of External Gfx Card	[Disabled]	
Primary Display	[Auto]	
Internal Graphics	[Enabled]	
GTT Size	[8MB]	
Aperture Size	[256MB]	
DVMT Pre-Allocated	[60M]	
DVMT Total Gfx Mem	[MAX]	

#### 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 HG for Hybrid 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.

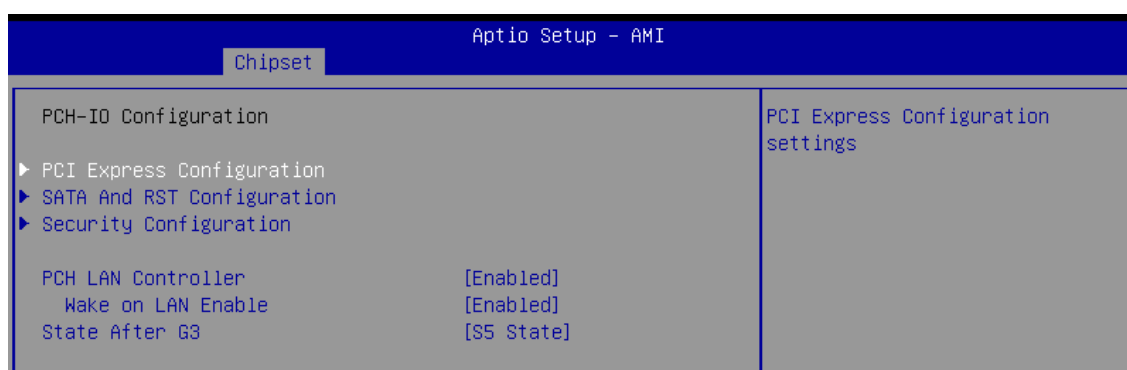
## 4.4.1.3 PCI Express Configuration



### PCI Express Device Configuration

PCI Express Root Port Settings.

## 4.4.2 PCH-IO Configuration



### PCH LAN Controller

Enable/Disable onboard NIC.

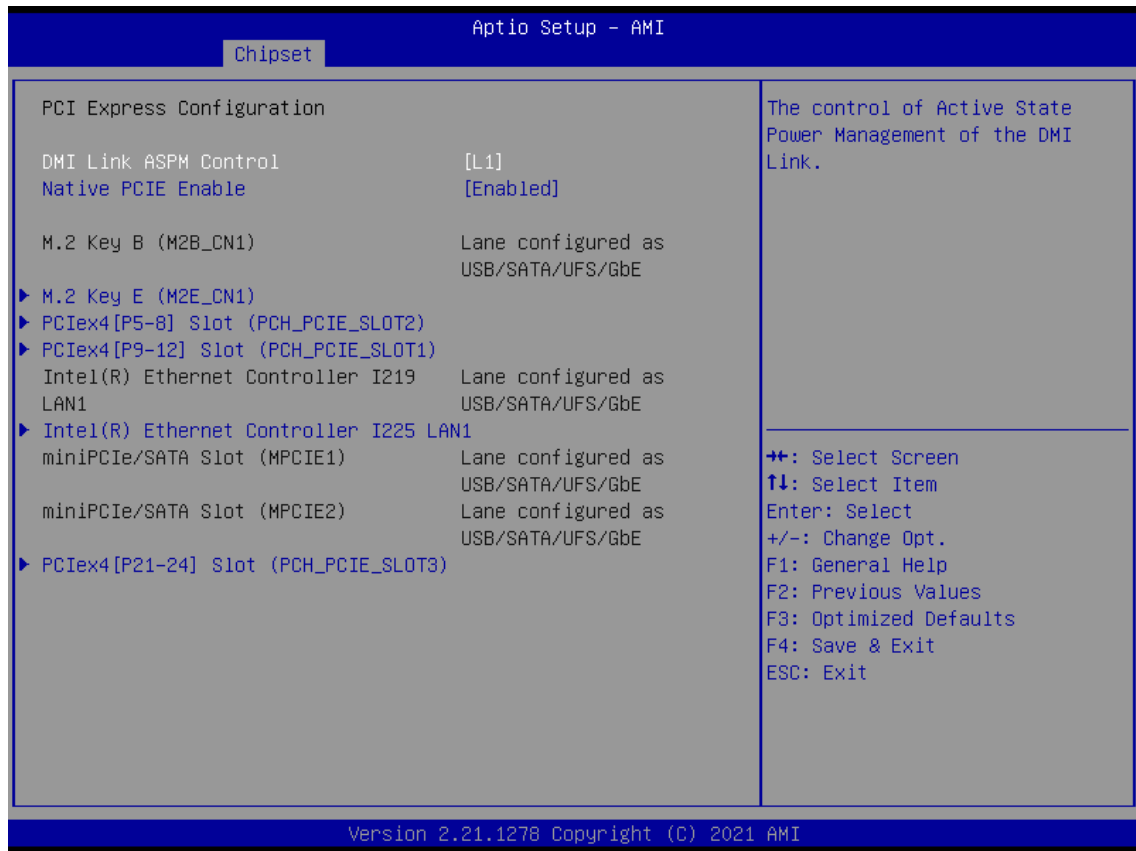
### Wake on LAN Enable

Enable/Disable integrated LAN to wake the system.

### State After G3

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

## 4.4.2.1 PCI Express Configuration



### DMI Link ASPM Control

The control of Active State Power Management of the DMI Link.

### Native PCIE Enable

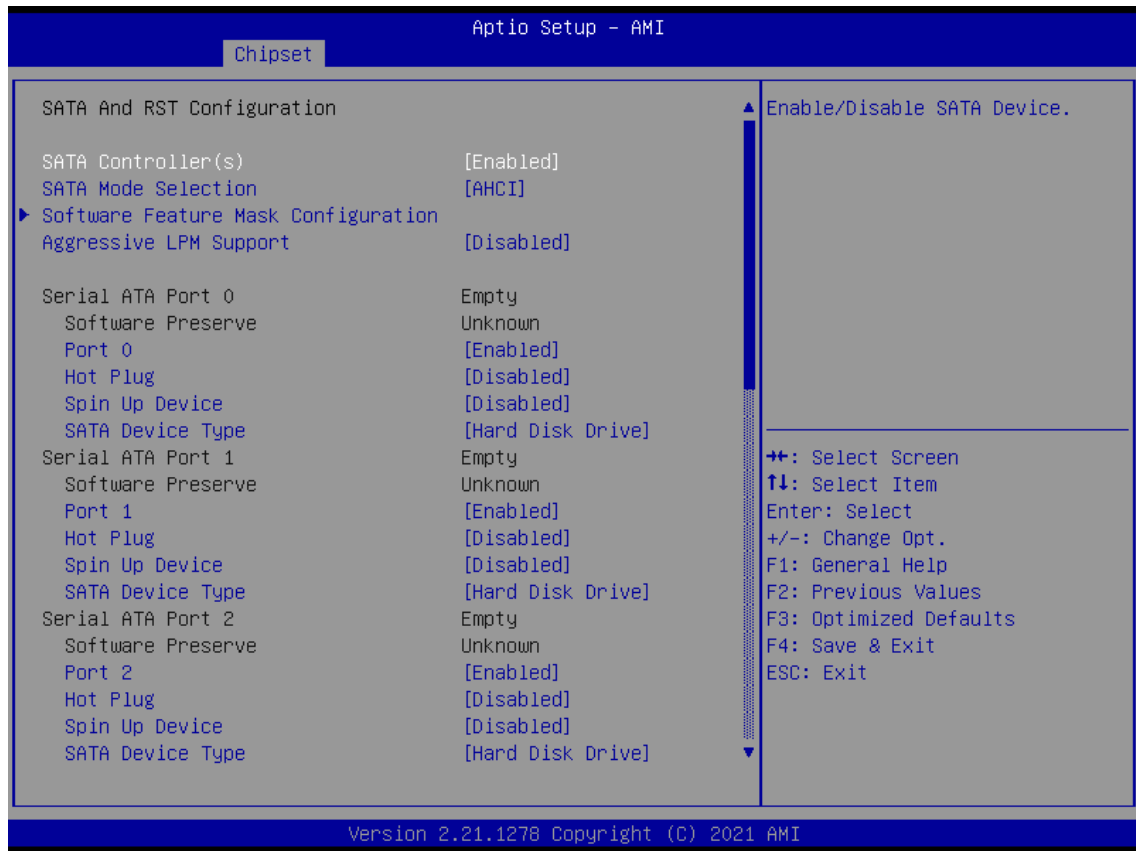
Bit - PCIe Native \* control

- 0 - ~ Hot Plug
- 1 - SHPC Native Hot Plug control
- 2 - ~ Power Management Events
- 3 - PCIe Advanced Error Reporting control
- 4 - PCIe Capability Structure control
- 5 - Latency Tolerance Reporting control

### PCI Express Device Configuration

PCI Express Root Port Settings.

## 4.4.2.2 SATA And RST Configuration



### SATA Controller(s)

Enable/Disable SATA Device.

### SATA Mode Selection

Determines how SATA controller(s) operate.

### Software Feature Mask Configuration

RST Legacy OROM/RST UEFI driver will refer to the SWFM configuration to enable/disable the storage features.

### Aggressive LPM Support

Enable PCH to aggressively enter link power state.

### Port X

Enable or Disable SATA Port.

### Hot Plug

Designates this port as Hot Pluggable.

### Spin Up Device

If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

### SATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

### 4.4.2.3 Security Configuration

Aptio Setup - AMI		
Chipset		
Security Configuration		Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM
RTC Memory Lock	[Enabled]	
BIOS Lock	[Enabled]	
Force unlock on all GPIO pads	[Disabled]	

#### RTC Memory Lock

Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM.

#### BIOS Lock

Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.

#### Force unlock on all GPIO pads

If Enabled BIOS will force all GPIO pads to be in unlocked state.

## 4.5 Security Functions

Aptio Setup - AMI	
Main Advanced Chipset Security Boot Save & Exit	
Password Description	Set Administrator Password
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length 3 Maximum length 20	
Administrator Password User Password	
▶ Secure Boot	
	++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults

#### Administrator Password

Set Administrator Password.

#### User Password

Set User Password.

## 4.5.1 Secure Boot



### Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset.

### Secure Boot Mode

Secure Boot mode options : Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

### Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

### Reset To Setup Mode

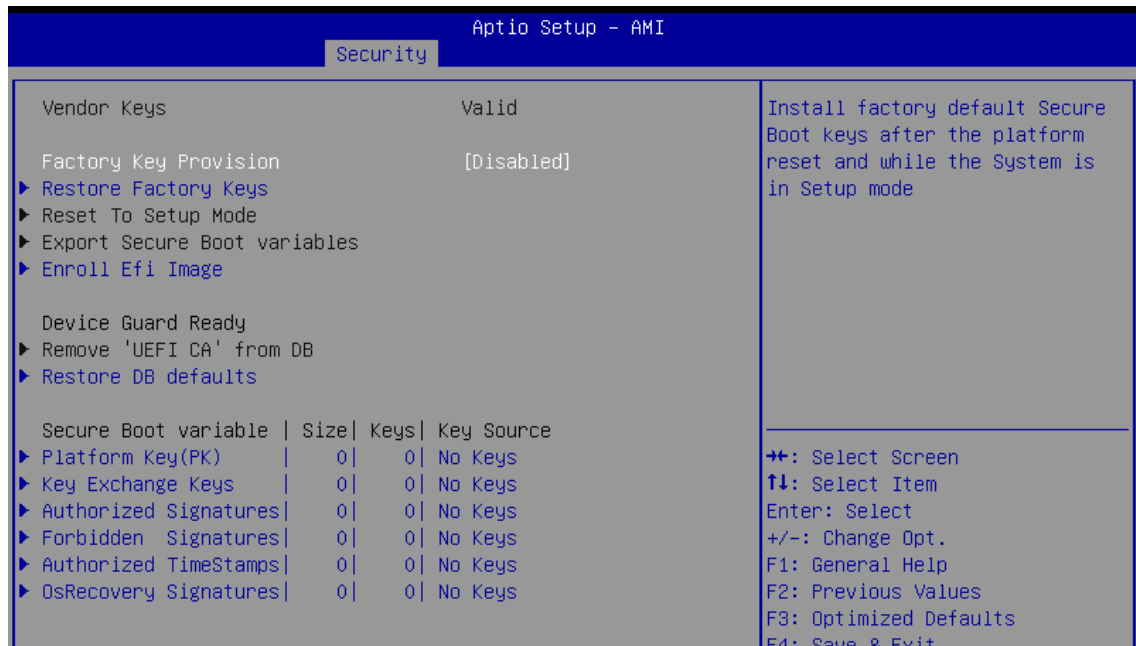
Delete all Secure Boot key databases from NVRAM.

### Key Management

Enables expert users to modify Secure Boot Policy variables without full authentication.



### 4.5.1.1 Key Management



#### Factory Key Provision

Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

#### Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

#### Reset To Setup Mode

Delete all Secure Boot key databases from NVRAM.

#### Export Secure Boot variables

Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

#### Enroll Efi Image

Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

#### Remove 'UEFI CA' from DB

Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db).

#### Restore DB defaults

Restore DB variable to factory defaults.

#### Platform Key(PK)

#### Key Exchange Keys

#### Authorized Signatures

#### Forbidden Signatures

#### Authorized TimeStamps

## OsRecovery Signatures

Enroll Factory Defaults or load certificates from a file :

1.Public Key Certificate :

- a) EFI\_SIGNATURE\_LIST
- b) EFI\_CERT\_X509 (DER)
- c) EFI\_CERT\_RSA2048 (bin)
- d) EFI\_CERT\_SHAXXX

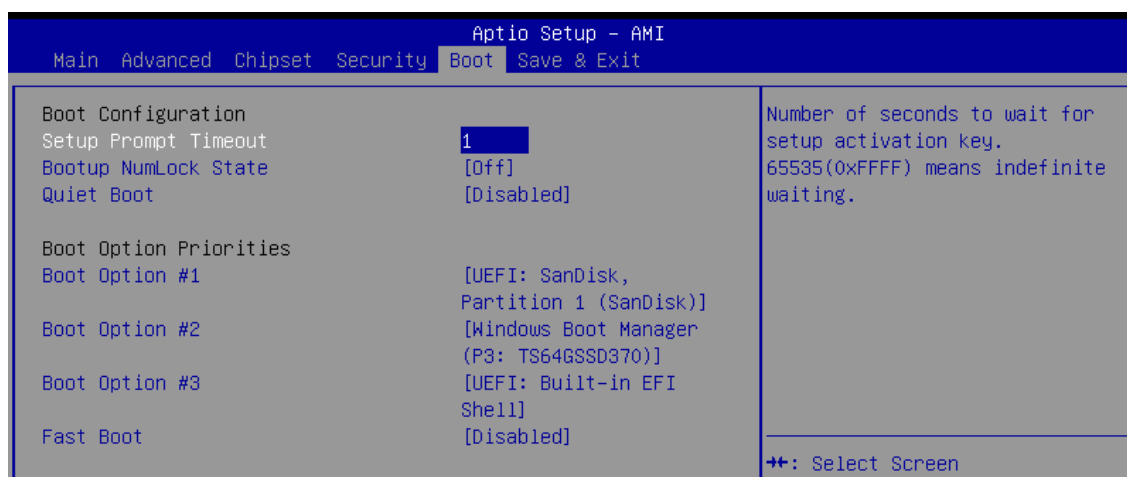
2.Authenticated UEFI Variable

3.EFI PE/COFF Image (SHA256)

Key Source :

Factory, External, Mixed

## 4.6 Boot Functions



### 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.

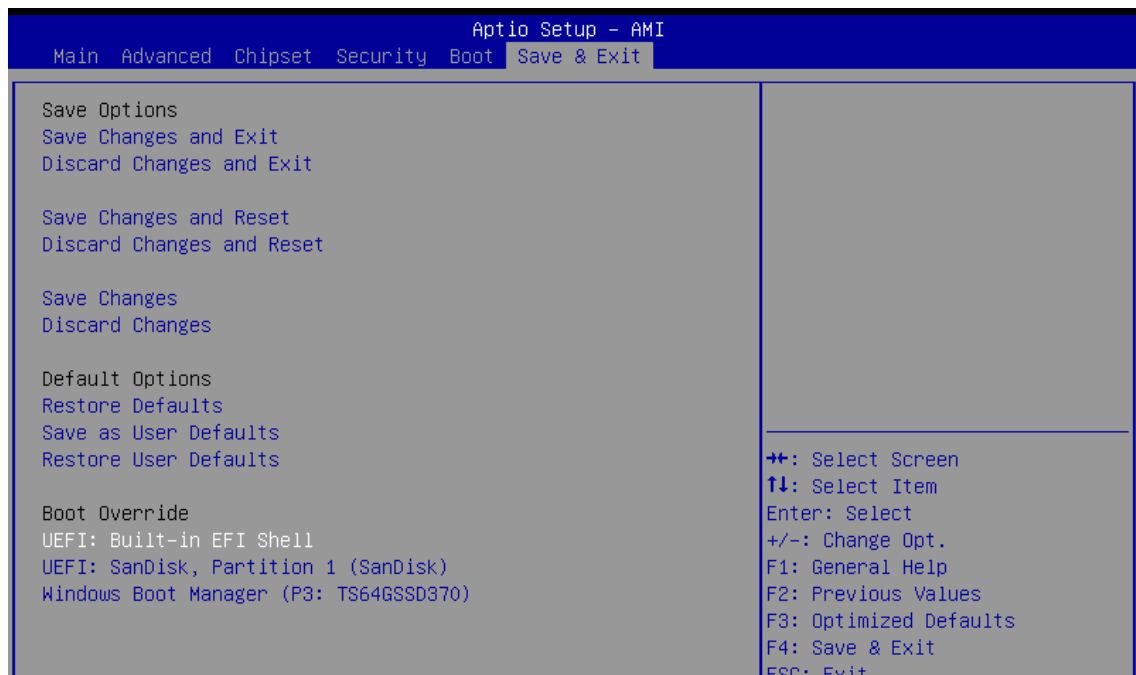
### Boot Option # X

Sets the system boot order.

### Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

## 4.7 Save & Exit



### 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.

### 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

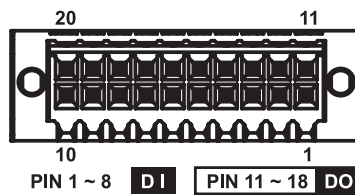
## APPENDIX A : Isolated DIO Guide

### A.1 Function Description

The RCX-2000 offers two 16-bit Isolated DIO 20-pin terminal block connector, a watchdog timer.

Isolated DIO pins are fix by Hardware design that cannot change in/out direction in runtime process.

DIO definition is shown below :

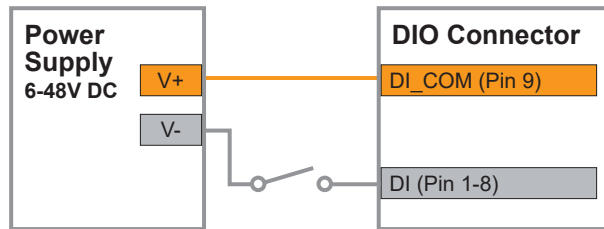


Pin No.	Isolated DIO	Non-Isolated DIO Definition	Pin No.	Isolated DIO Definition	Non-Isolated DIO Definition
1	DI 0	DIO 0	11	DO 0	DIO 8
2	DI 1	DIO 1	12	DO 1	DIO 9
3	DI 2	DIO 2	13	DO 2	DIO 10
4	DI 3	DIO 3	14	DO 3	DIO 11
5	DI 4	DIO 4	15	DO 4	DIO 12
6	DI 5	DIO 5	16	DO 5	DIO 13
7	DI 6	DIO 6	17	DO 6	DIO 14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

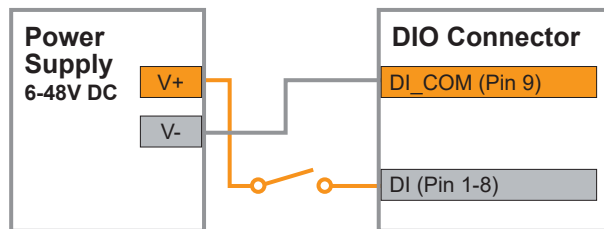
## A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode  
(NPN)

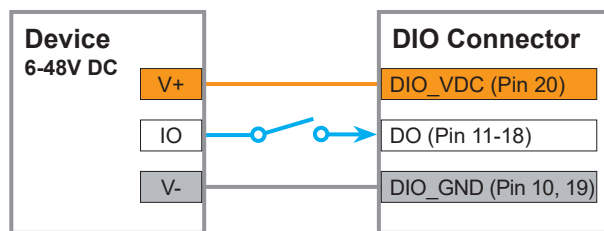


Source Mode  
(PNP)

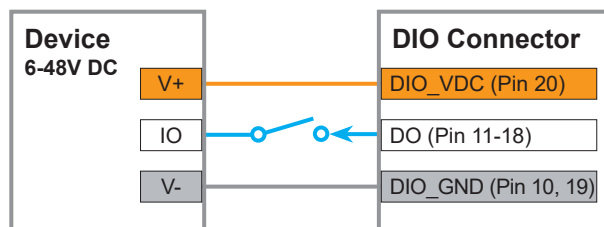


DO reference circuit :

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/Ubuntu18.04.


 Distribution


 Header


 Manual


 Sample

 Source

 Uninstall\_32.bat

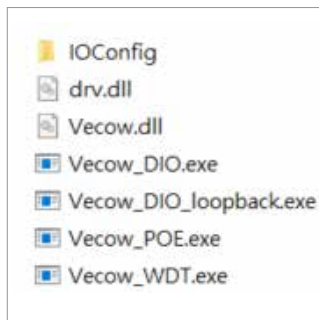
 Uninstall\_64.bat

 Win10\_32.bat

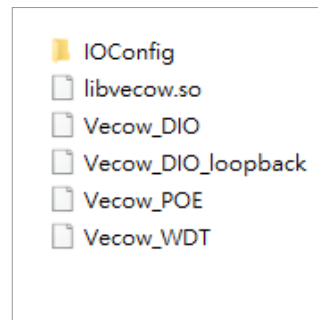
 Win10\_64.bat

## 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

```
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)**

#### **BOOL get\_IO2\_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)**

**BOOL set\_IO2\_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)**

**BOOL get\_DIO2(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).

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

**BOOL set\_DIO1(BYTE DO\_data)**

**BOOL set\_DIO2(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).

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

**BOOL config\_COMPORT(BYTE \*PORT\_NUM)**

Set COMPORT configuration.

A. PORT\_NUM : Usable COMPORT number.

Range : 1~6.

Return :

TRUE (1) : Success.

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

**BOOL set\_COMPORT\_mode(BYTE port, BYTE mode, BYTE term)**

Set COMPORT mode.

B. port : which port set.

Range : 1~6.

C. mode : Usable COMPORT number.

0 : RS232 mode;

1 : RS422-5Wire mode.

2 : RS422-9Wire mode;

4 : RS485 mode.

4 : Loopback mode.

D. term : Termination enable for RS422/RS485 mode.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

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

**BOOL get\_COMPORT\_mode(BYTE port, BYTE \*mode, BYTE term)**

Get COMPORT mode.

E. port : which port get.

Range : 1~6.

F. mode : Usable COMPORT number.

0 : RS232 mode;

1 : RS422-5Wire mode.

2 : RS422-9Wire mode;

4 : RS485 mode.

4 : Loopback mode.

G. term : Termination enable for RS422/RS485 mode.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

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

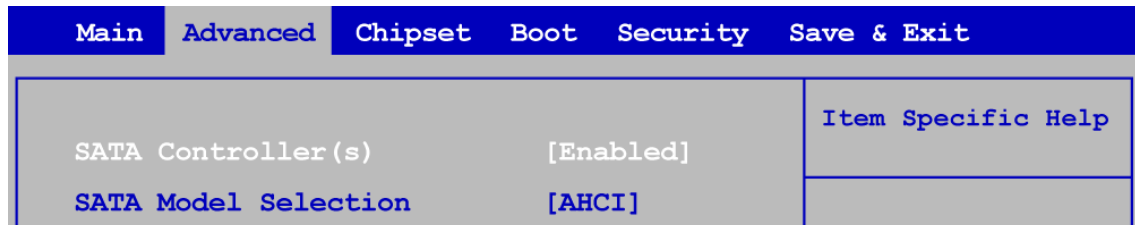
# C

## 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 → RAID (Skylake platform)/Intel RST Premium (Kaby Lake/Coffee Lake platform)

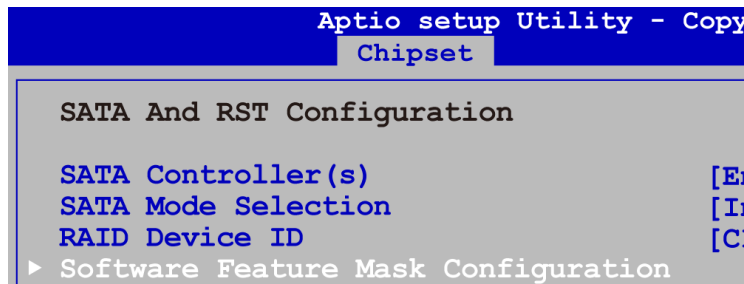


### C.1.2 UEFI Mode for RAID

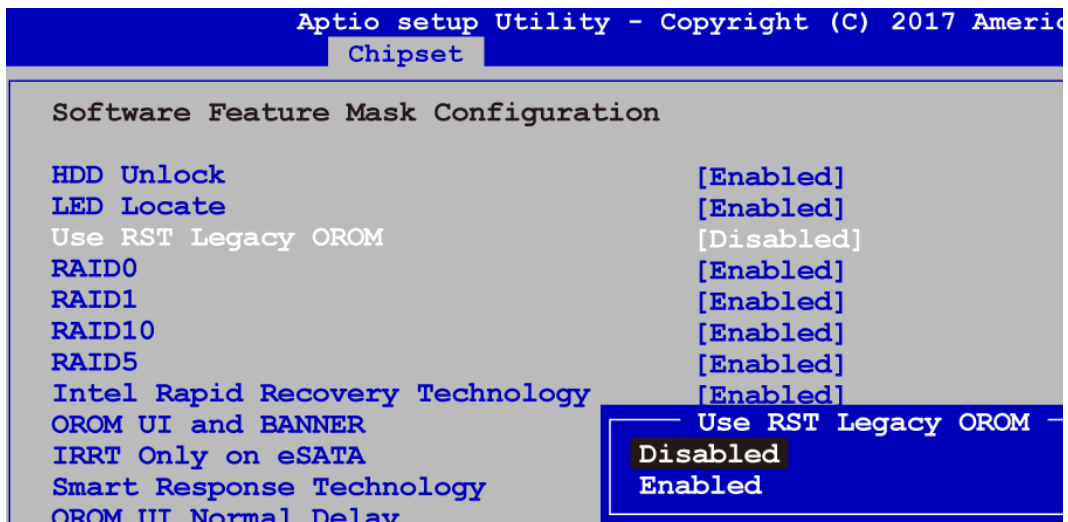
1. Please select SATA device to RAID mode on BIOS menu.

Advanced → SATA Configuration → SATA Mode Selection → RAID (Skylake platform)/Intel RST Premium (Kaby Lake/Coffee Lake platform)

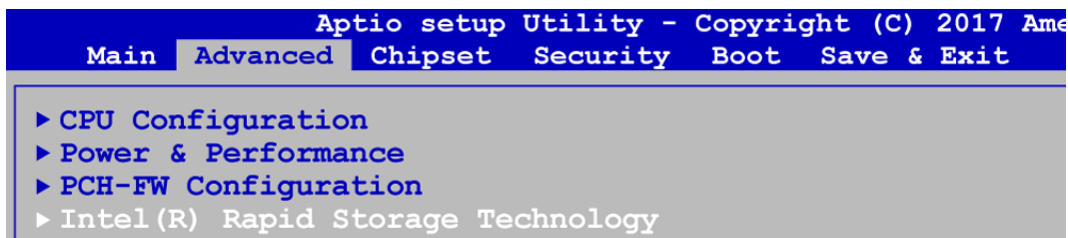
2. Please select Software Feature Mask Configuration on BIOS menu.



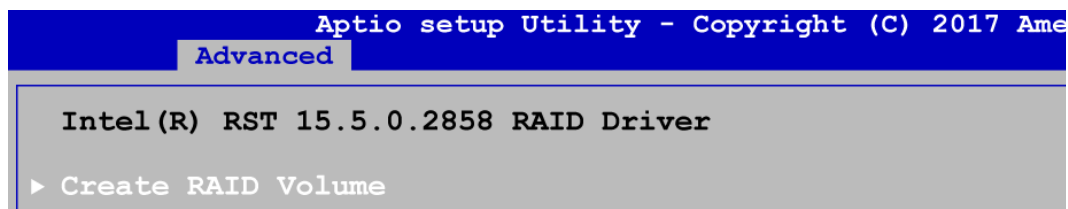
3. Use RST Legacy OROM → Disabled → Save Changes and Reset.



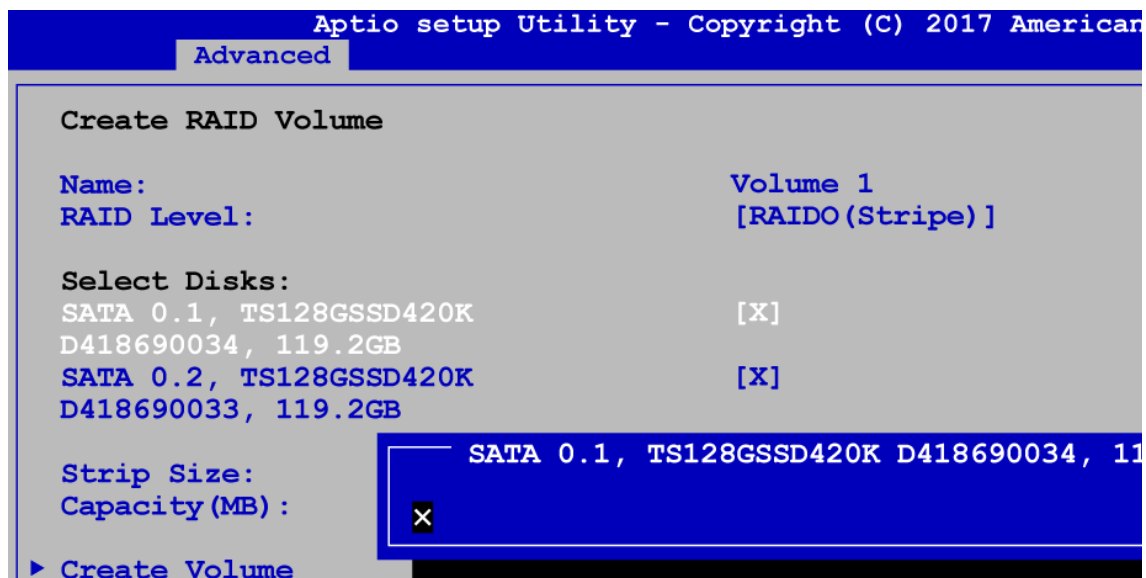
4. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.



5. Select Create RAID Volume on BIOS menu.



6. 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 six SATA, including four internal SATA, one mSATA and one CFast.

You can select one of the SATA ports for OS installation.

We used CFast card 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/imsm](http://www.intel.com/p/en_US/support/highlights/chpsts/imsm)

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

## C.5 To Insert SATA HDD for RAID 1

Please note, you can use four SATA ports for SATA HDD, except for the CFast port and mSATA slot.

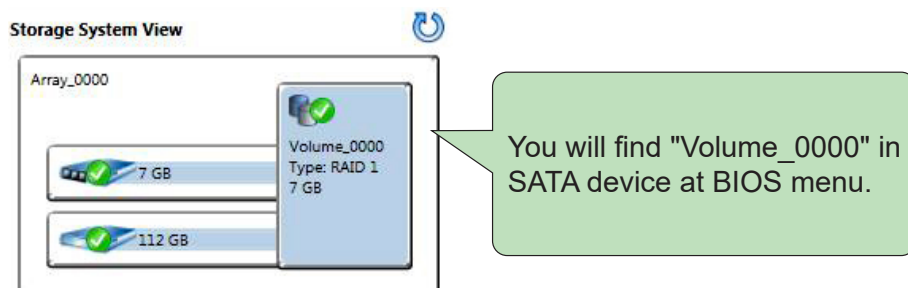
## C.6 To Create RAID Volume on "Rapid Storage Technology" Software

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



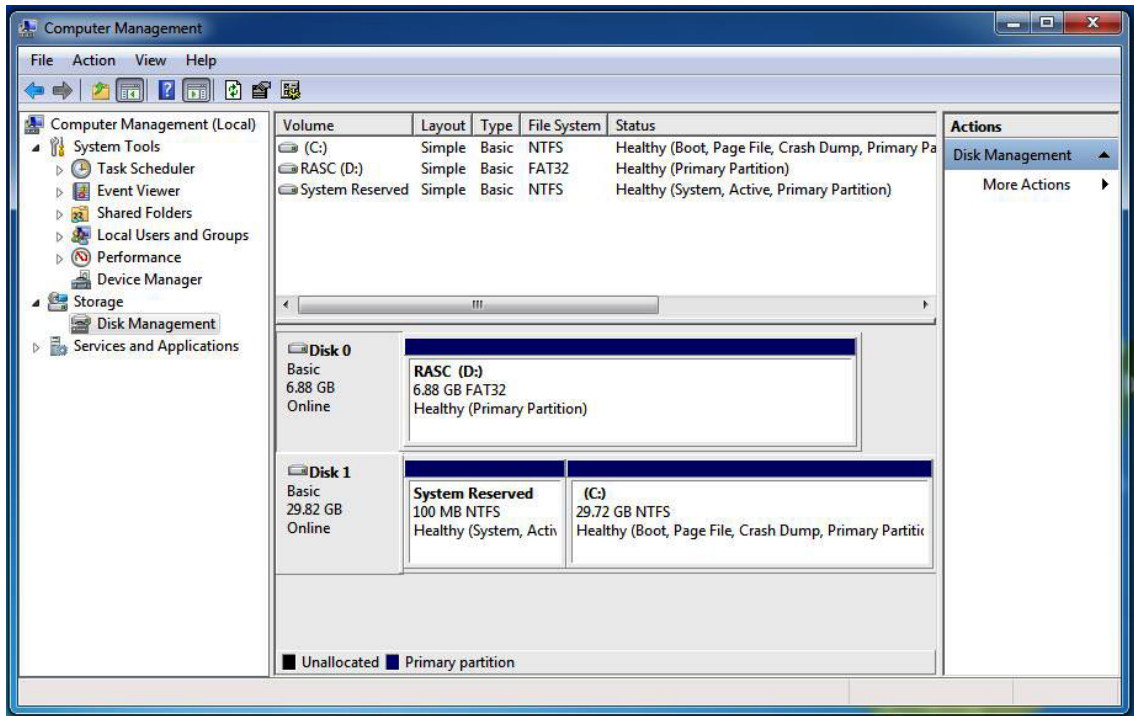
## C.7 Disk Management : Partition the Disk

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



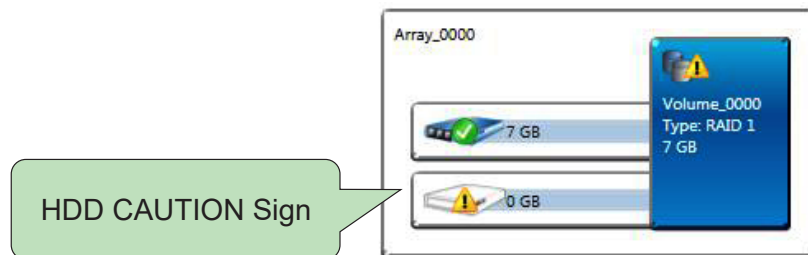
To start disk management tool, select "initialize disk".

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.





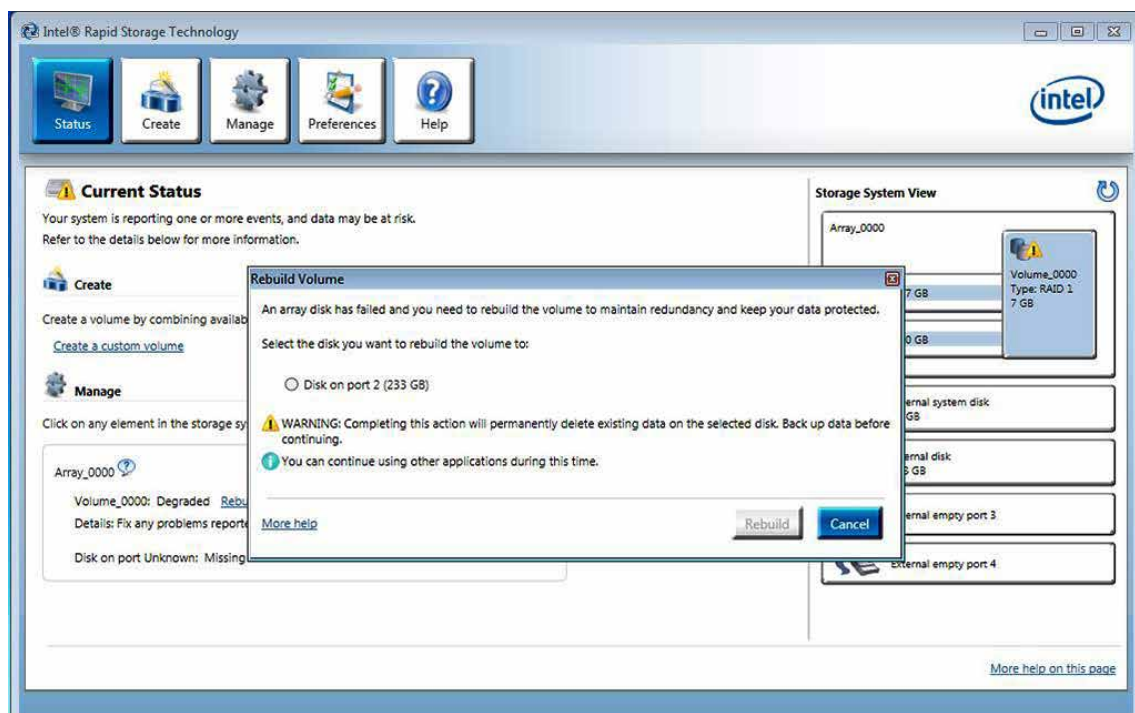
## C.9 Recovery and Auto Re-build When Use the **SAME** RAID HDD



## C.10 Recovery and Auto Re-build When Use **DIFFERENT** RAID HDD

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

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



# D

## APPENDIX D : Power Consumption

Testing Board	RCX-2000
RAM	32GB * 4
USB-1	USB Microsoft Wired Keyboard 600
USB-2	USB Mouse HP G1K28AA
USB-3	USB Flash Transcend 3.0 8GB
USB-4	USB Flash Transcend 3.0 8GB
USB-5	USB Flash Kingston 3.0 16GB
USB-6	USB Flash Kingston 3.0 32GB
SATA 0	Transcend SATA SSD420 128GB
SATA 1	Seagate HDD 500GB
LAN1 (i219)	1.0 Gbps
LAN2 (i225-IT)	2.5 Gbps
Graphics Output	DP
Power Plan	Balance (Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program-1	BurnInTest
Test Program-2	FurMark

## D.1 Intel® Core™ i5-11500 (12M Cache, up to 4.60GHz)

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

CPU	Power Input	Power on and boot to Win 10 (64-bit)					
		Standby Mode		Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-11500	9V	0.330A	02.97W	0.632A	05.69W	2.821A	25.39W
Core™ i5-11500	12V	0.272A	03.26W	0.472A	05.66W	2.640A	31.68W
Core™ i5-11500	24V	0.184A	04.42W	0.289A	06.94W	1.340A	32.16W
i5-11500	36V	0.139A	04.99W	0.252A	09.06W	0.830A	29.88W
Core™ i5-11500	55V	0.113A	06.22W	0.165A	09.08W	0.643A	35.34W

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™ i5-11500	9V	5.957A	53.61W	7.117A	64.05W
Core™ i5-11500	12V	4.638A	55.66W	5.530A	66.36W
Core™ i5-11500	24V	2.345A	56.28W	2.713A	65.11W
Core™ i5-11500	36V	1.620A	58.32W	1.950A	70.20W
Core™ i5-11500	55V	1.124A	61.82W	1.300A	71.50W

## D.2 Intel® Core™ i7-11700 (16M Cache, up to 4.90GHz)

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

CPU	Power Input	Power on and boot to Win 10 (64-bit)					
		Standby Mode		Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i7-11700	9V	0.330A	02.97W	0.684A	06.15W	2.836A	25.52W
Core™ i7-11700	12V	0.275A	03.29W	0.581A	06.97W	2.710A	32.52W
Core™ i7-11700	24V	0.185A	04.44W	0.288A	06.91W	1.220A	29.28W
Core™ i7-11700	36V	0.139A	05.00W	0.241A	08.68W	0.890A	32.04W
Core™ i7-11700	55V	0.114A	06.29W	0.186A	10.23W	0.618A	33.99W

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™ i7-11700	9V	6.215A	55.94W	7.126A	64.13W
Core™ i7-11700	12V	5.051A	60.61W	6.090A	73.08W
Core™ i7-11700	24V	2.660A	63.84W	3.097A	74.33W
Core™ i7-11700	36V	1.717A	61.81W	2.052A	73.87W
Core™ i7-11700	55V	1.257A	69.14W	1.380A	75.90W

## D.3 Intel® Xeon® W-1350 (12M Cache, up to 5.00GHz)

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

CPU	Power Input	Power on and boot to Win 10 (64-bit)					
		Standby Mode		Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1350	9V	0.316A	02.97W	0.896A	08.43W	3.713A	34.90W
Xeon® W-1350	12V	0.275A	03.30W	0.790A	09.48W	3.120A	37.44W
Xeon® W-1350	24V	0.187A	04.49W	0.353A	08.47W	1.427A	34.25W
Xeon® W-1350	36V	0.139A	05.02W	0.336A	12.08W	1.086A	39.10W
Xeon® W-1350	55V	0.114A	06.24W	0.186A	10.23W	0.704A	38.72W

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-1350	9V	9.453A	88.86W	11.545A	108.52W
Xeon® W-1350	12V	7.233A	86.80W	8.507A	102.08W
Xeon® W-1350	24V	3.485A	83.64W	4.110A	98.64W
Xeon® W-1350	36V	2.639A	95.00W	3.165A	113.94W
Xeon® W-1350	55V	1.661A	91.35W	1.809A	99.50W

## D.4 Intel® Core™ i9-11900K (16M Cache, up to 5.30GHz)

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

CPU	Power Input	Power on and boot to Win 10 (64-bit)					
		Standby Mode		Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i9-11900K	9V	0.329A	02.99W	0.475A	04.32W	4.223A	38.43W
Core™ i9-11900K	12V	0.306A	03.67W	0.535A	06.41W	3.462A	41.54W
Core™ i9-11900K	24V	0.185A	04.44W	0.321A	07.71W	1.725A	41.40W
Core™ i9-11900K	36V	0.139A	05.00W	0.249A	08.95W	1.144A	41.18W
Core™ i9-11900K	55V	0.114A	06.27W	0.219A	12.05W	0.812A	44.68W

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™ i9-11900K	9V	11.936A	108.62W	13.070A	118.94W
Core™ i9-11900K	12V	10.156A	121.87W	10.943A	131.32W
Core™ i9-11900K	24V	4.983A	119.60W	5.719A	137.26W
Core™ i9-11900K	36V	3.227A	116.17W	3.786A	136.30W
Core™ i9-11900K	55V	2.077A	114.24W	2.364A	130.02W

## D.5 Intel® Core™ i7-11700 Add One RTX 3090 Graphics Card

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™ i7-11700	12V	0.272A	03.26W	0.557A	06.68W	3.653A	43.84W
Core™ i7-11700	24V	0.186A	04.46W	0.340A	08.16W	2.139A	51.34W
Core™ i7-11700	36V	0.139A	05.00W	0.246A	08.86W	1.385A	49.86W
Core™ i7-11700	55V	0.116A	06.38W	0.184A	10.12W	0.985A	54.18W

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™ i7-11700	12V	8.168A	98.02W	35.657A	427.88W
Core™ i7-11700	24V	4.125A	99.00W	17.423A	418.15W
Core™ i7-11700	36V	2.783A	100.19W	11.957A	430.45W
Core™ i7-11700	55V	1.925A	105.88W	8.026A	441.42W

## D.6 Intel® Core™ i7-11700 Add Two RTX 3090 Graphics Card

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™ i7-11700	12V	0.283A	03.40W	0.568A	06.82W	4.529A	54.35W
Core™ i7-11700	24V	0.183A	04.39W	0.342A	08.21W	2.305A	55.32W
Core™ i7-11700	36V	0.139A	05.00W	0.249A	08.96W	1.824A	65.66W
Core™ i7-11700	55V	0.116A	06.38W	0.184A	10.12W	1.125A	61.88W

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™ i7-11700	12V	9.325A	111.90W	73.620A	883.44W
Core™ i7-11700	24V	4.765A	114.36W	32.298A	775.15W
Core™ i7-11700	36V	3.235A	116.46W	21.521A	774.76W
Core™ i7-11700	55V	2.358A	129.69W	15.258A	839.19W



# E

## APPENDIX E : Supported Memory & Storage List

### E.1 Supported Memory List

Testing Board	RCX-2000
Memory Test	MemTest86 V8.2
BurnInTest	V8.1

### E.2 Tset Item

Channel	Memtest	Bunin	Flash BIOS	Remove Battery
*2 (Socket 1; Socket 2)	PASS	PASS	PASS	PASS
*2 (Socket 3; Socket 4)	PASS	PASS	PASS	PASS
*1 (Socket 1)	PASS	PASS	N/A	PASS
*1 (Socket 2)	N/A	N/A	N/A	N/A
*1 (Socket 3)	PASS	PASS	N/A	PASS
*1 (Socket 4)	N/A	N/A	N/A	N/A

### E.3 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
Innodisk 32G DDR4 3200 SO-DIMM	M4S0-BGS20CEM-H03	25°C
		25°C
Innodisk 16G DDR4 3200 SO-DIMM	M4S0-AGS105EM-H03	25°C
		25°C
Innodisk 4G DDR4 3200 SO-DIMM	M4S0-4GSXZ5EM-H03	25°C
		25°C
SLINK 32GB DDR4 3200 SO-DIMM	J4BGSH2G8TMFC	25°C
		25°C
Kingston 32GB DDR4 3200 SO-DIMM	KVR32S2208/32	25°C
		25°C
Kingston 16GB DDR4 3200 SO-DIMM	KVR32S2208/16	25°C
		25°C
MEMXPRO 16GB DDR4 3200 SO-DIMM	D4S-AG32M2G8CA	25°C
		25°C
MEMXPRO 16GB DDR4 2666 SO-DIMM	D4S-AG26H1G8W2	25°C
		25°C
SLINK 16GB DDR4 2666 SO-DIMM	J4AGSH1G8QHFC	25°C
		25°C
SLINK 32GB DDR4 2666 SO-DIMM	J4BGSS2G8QHXI	25°C
		25°C
Kingston 4GB DDR4 2666 SO-DIMM	KVR26S19S6/4	25°C
		25°C
Kingston 8GB DDR4 2666 SO-DIMM	KVR26S19S8/8	25°C
		25°C
Kingston 16GB DDR4 2666 SO-DIMM	KVR26S19D8/16	25°C
		25°C

## E.4 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
SLINK 32G DDR4 3200 SO-DIMM	J4BGDH2G8TMKC	25°C
		25°C
Innodisk 4G DDR4 2666 SO-DIMM	M4D0-4GSSPCIK-H03	25°C
		25°C
Innodisk 8G DDR4 2666 SO-DIMM	M4D0-8GS1P5IK-H03	25°C
		25°C
Innodisk 16G DDR4 2666 SO-DIMM	M4D0-AGS1Q5SJ-H03	25°C
		25°C
Innodisk 16G DDR4 2666 SO-DIMM	M4D0-AGS1Q5IK-H03	25°C
		25°C
Innodisk 16G DDR4 2666 SO-DIMM	M4D0-AGS1QCIC-H03	25°C
		25°C
SLINK 32G DDR4 2666 SO-DIMM	J4BGDS2G8QHKC	25°C
		25°C
SLINK 32G DDR4 2666 SO-DIMM	J4BGDS2G8QHKI	25°C
		25°C
SLINK 16G DDR4 2666 SO-DIMM	J4AGDH1G8QHKC	25°C
		25°C
SLINK 8G DDR4 2666 SO-DIMM	J48GDH1G8QHJC	25°C
		25°C
Innodisk 4G DDR4 2400 SO-DIMM	M4D0-4GSSPCSJ-H03	25°C
		25°C
Innodisk 4G DDR4 2400 SO-DIMM	M4D0-4GSSP5IK-H03	25°C
		25°C

## E.5 Support Up to 3200MHz

- 2 DDR support up to 3200MHz
- Memory install in Socket 1, Socket 3 and Socket 1&3 Only

Brand	Info	Test Temp. (Celsius)
SLLINK DDR4 3200 32GB SODIMM	J4BGSH2G8TMFC	25°C
SMART DDR4 3200 16GB SODIMM	STI2046SO410825-SE	25°C
SMART DDR4 3200 8GB SODIMM	STI1026SO410825-SE	25°C

## E.6 Supported Storage Device List

Type	Brand	Model	Capacity
mSATA	Transcend	mSATA TS64GMSA370	64GB
	Intel	Intel-310 SSDMAEMC080G2	80GB
	Innodisk	DEMSR-32GD06SW2QC	32GB
SATA SSD	Intel	SSD E5400s SSDSC2KR120H6	120GB
		SSD 540s SSDSC2KW120H6	120GB
	Innodisk	3MG2-P DGS25-64GD81BC1QC	64GB
	MEMXPRO	M3A MI3MA1212802WN	128GB
	LITE-ON	K8-L1512	512GB
		K8-L1256	256GB
	Transcend	TS128GSSD420K	128GB
		SSD370 TS64GSSD370I	64GB
	Kingston	SUV400S37	120GB
	FORESEE	S903S128G	128GB
		S903S256G	256GB
	ADATA	ISSS332-128GM	128GB
		ISSS332-256GM	256GB
M.2 SSD (PCIe)	ADATA	IM2P33F8-128GD	128GB
		IM2P33F8-256GD	128GB
	Toshiba	KXG50ZNV512G	512GB
	Phison	ESMP256GTB3C2-E12	256GB
	FORESEE	FSGMMC-256G	256GB
	Kingston	SA2000MB	500GB
	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
		980 EVO PRO MZ-V8P250BW	250GB
	Intel	760P SSDPEKKW128G8	128GB
	Innodisk	M.2 (P80) 3TE6 DEM28-01TDD1ECAQF-H03	1TB
		M.2 (P80) 3TG3-P DGM28-02TDA1ECBEH-H03	2TB

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

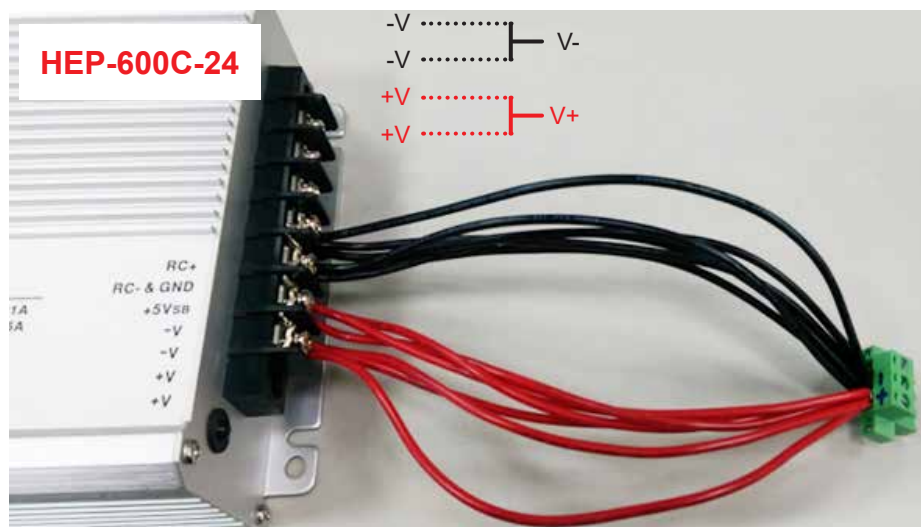
# F

## APPENDIX F : How to Install Power Supply

### F.1.1 HEP-600-24 Adapter AC Cable



### F.1.2 HEP-600-24 Adapter DC Cable

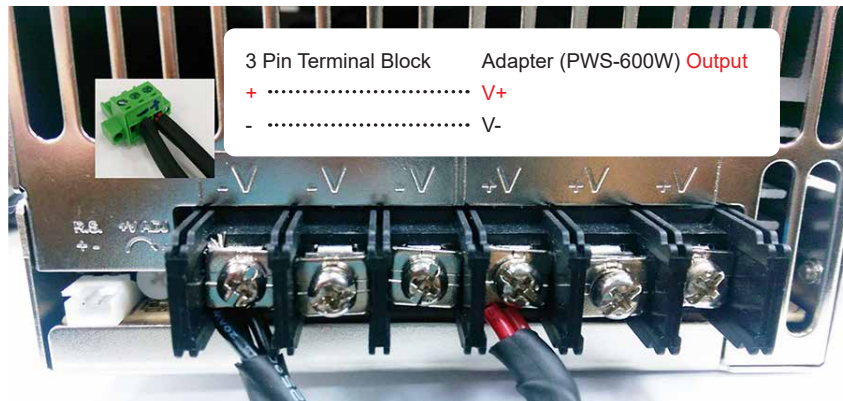


## F.2.1 PWS-600W Adapter AC Cable



Adapter (PWS-600W) <b>Input</b>	AC Power Cord
L .....	BLACK
N .....	WHITE
⊥ .....	GREEN

## F.2.2 PWS-600W Adapter DC Cable



## F.3.1 PWS-480W Adapter AC Cable

Adapter (PWS-480W-WT) <b>Input</b>	AC Power Cord
BROWN .....	BLACK
GREEN/YELLOW .....	GREEN
BLUE .....	WHITE

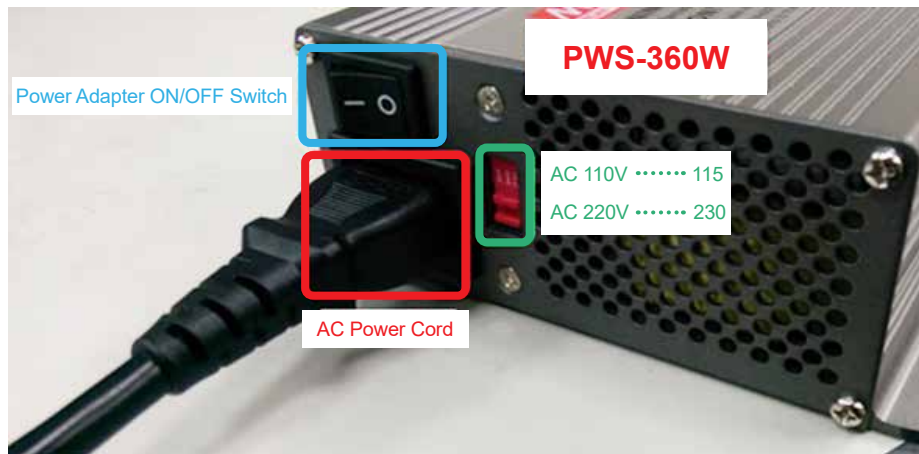


## F.3.2 PWS-480W Adapter DC Cable

3 Pin Terminal Block	Adapter (PWS-480W-WT) <b>Output</b>
+ .....	BROWNx2
- .....	BLUEx2



## F.4.1 PWS-360W Adapter AC Cable



## F.4.2 PWS-360W Adapter AC Cable



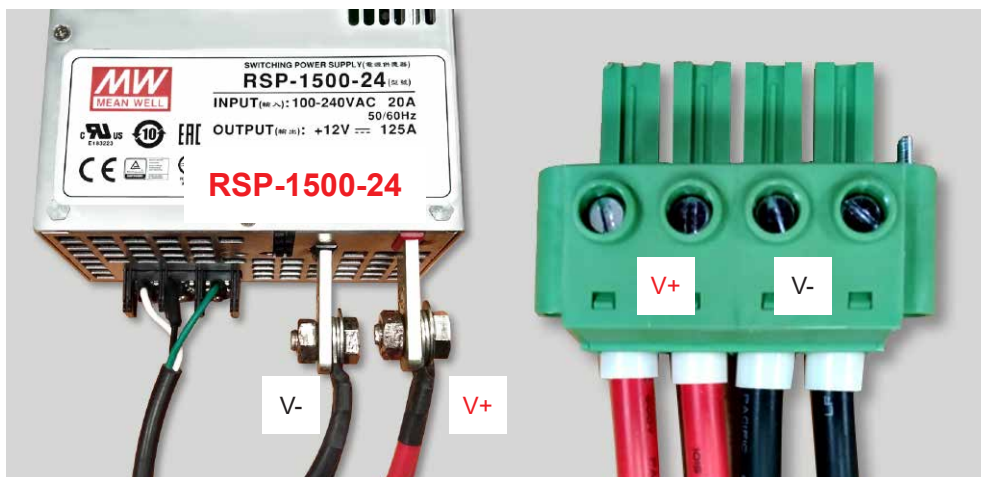


## F.5.1 RSP-1500-12 Adapter AC Cable

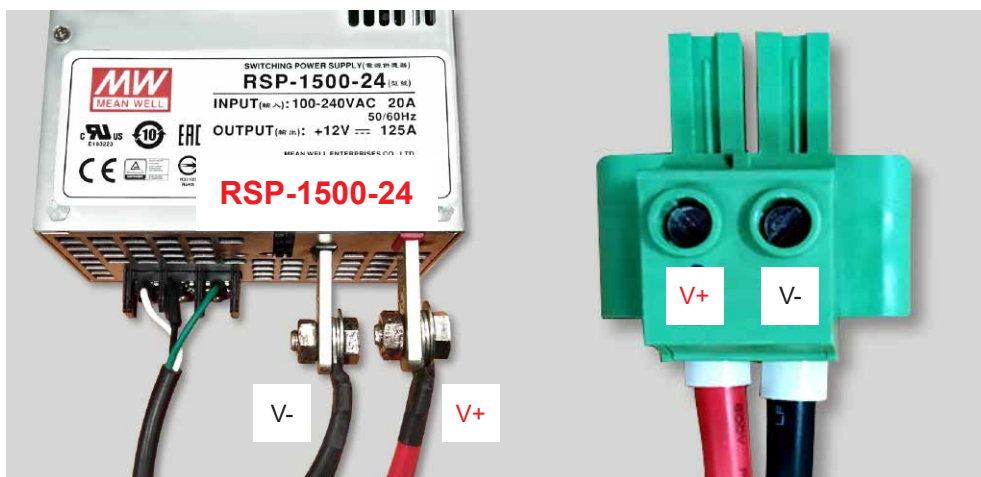


## F.5.2 RSP-1500-24 Adapter DC Cable

RCX-2700 PEG Series



RCX-2300/2400 PEG Series



\*\* If more help is needed, please contact Vecow technical support.



For further support information, please visit [www.vecow.com](http://www.vecow.com)

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