RCX-3000 PEG USER Manual

14th Gen Intel® Core™ i9/i7/i5/i3 AI Computing System
Workstation-grade, Expandable, Dual NVIDIA/AMD Full-length Graphics, 2.5G LAN

Vecow

4.00 Edition 20240717

Record of Revision

Version	Date	Page	Description	Remark
1.00	2024/02/22	All	Official Release	
1.10	2024/04/01	All	Update	
2.00	2024/05/28	v, 1-9	Update	
3.00	2024/07/09	All	Update	
4.00	2024/07/17	4, 6	Update	

Disclaimer

This manual is released by Vecow Co., Ltd. for reference purpose only. All product offerings and specifications are subject to change without prior notice. Vecow Co., Ltd. is under no legal commitment to the details of this document. Vecow shall not be liable for direct, indirect, special, incidental, or consequential damages arising out of the use of this document, the products, or any third party infringements, which may result from such use.

Declaration of Conformity

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE

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

Copyright and Trademarks

Order Information

Part Number	Description
RCX-3750-PEG	RCX-3750-PEG, Intel 13th Gen Core i9/ i7/ i5/ i3 Processor , 2 2.5G RJ45 LAN, 1 OOB LAN, 2 PCIe x 8, 3 PCIe x 4 Slot, 4 USB 3.2 Type A, 1 USB 3.2 Gen2 x2 Type C(5V/3A), 4 COM, 3 SIM, 4 DP, 3 M.2 sockets, 2 Front-access SSD Tray, 2 Front-access M.2 Tray(by PCIe x4), DC-IN 16-50V.
RCX-3750-APEG	RCX-3750-PEG, Intel 13th Gen Core i9/ i7/ i5/ i3 Processor , 2 2.5G RJ45 LAN, 1 OOB LAN, 2 PCIe x 8, 3 PCIe x 4 Slot, 4 USB 3.2 Type A, 1 USB 3.2 Gen2 x2 Type C(5V/3A), 4 COM, 3 SIM, 4 DP, 3 M.2 sockets, 2 Front-access SSD Tray, 2 Front-access M.2 Tray(by PCIe x4), AC-IN 90-240V.
RCX-3430-PEG	RCX-3430-PEG, Intel 13th Gen Core i9/ i7/ i5/ i3 Processor , 2 2.5G RJ45 LAN, 1 OOB LAN, 1 PCIe x 16, 2 PCIe x 4 Slot, 4 USB 3.2 Type A, 1 USB 3.2 Gen2 x2 Type C(5V/3A), 4 COM, 3 SIM, 4 DP, 3 M.2 sockets, 2 Front-access SSD Tray, 2 Front-access M.2 Tray(by PCIe x4), DC-IN 16-50V.

Optional Accessories

Part Number	Description
DDR5 48G	Certified DDR5 48GB 5600MHz RAM
DDR5 32G	Certified DDR5 32GB 4800/5600MHz RAM
DDR5 24G	Certified DDR5 24GB 5600MHz RAM
DDR5 16G	Certified DDR5 16GB 4800/5600MHz RAM
DDR5 8G	Certified DDR5 8GB 4800/5600MHz RAM
PWS-1000W-24V	1000W, 24V, 90V AC to 264V AC Power Supply
PWS-1500W-24V	1500W, 24V, 90V AC to 264V AC Power Supply
PWS-3000W-24V	3000W, 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
Rackmount kit	Rackmount Kit for RCX-3000

CPU List

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

* 14th Gen support PC Client use condition only.

Table of Contents

1

GENERAL INTRODUCTION

1.1 Overview

The Vecow RCX-3000 PEG is a workstation-grade AI Computing System. It is powered by 14th Gen Intel® Core™ i9/i7/i5/i3 Processor, running with Intel® R680E PCH with 65W TDP CPU. The RCX-3000 PEG elevates embedded computing capability, blending exceptional performance and improving power efficiency for advanced AI and inferencing applications, including AOI, Autonomous Robotics, Vehicle Computing, Deep Learning, and various Edge AI applications.

The RCX-3000 PEG supports a wide range of I/O and expansion options, including 2 2.5G LAN, 4 USB ports, 2 2.5" SSD Trays, 2 M.2 SSD Trays, 4 COM ports, 32 Isolated DIO and 3 SIM card sockets. To enhance functionality and flexibility, the RCX-3000 PEG is equipped with up to 7 PCIe expansion slots, allowing for maximum 1800W power budget for discrete graphics cards.

For industrial deployments, it features an operating temperature range from -25°C to 45°C, as well as flexible power input options, including DC 16V to 50V and AC 90V to 220V. Furthermore, the RCX-3000 PEG supports OOB (Out-Of-Band) remote device management functions, providing comprehensive monitoring, control, and updating capabilities for devices at the edge. This feature brings robust disaster recovery services to the Edge AI applications.

1.2 Features

- Workstation-grade Platform : Intel® Core™ i9/i7/i5/i3 Processor (14th gen, codename : RPL-S Refresh/RPL-S/ADL-S) running with Intel® R680E PCH supports max 65W TDP CPU
- Max 1800W power budget supports dual 900W NVIDIA® or AMD 2-slot full-length graphics card
- Flexible Power Input Design with Software Ignition Control : DC 16V to 50V or AC 220V
- Up to 7 Slot PCIe expansions with PCIe 4.0 x16/PCIe 4.0 x8 and PCIe x4 signals
- 2 Front-access M.2 and 2 2.5" SSD Tray, multiple 5G/WiFi/4G/LTE/GPRS/UMTS
- 4 DisplayPort up to 4K resolution, USB 3.2 Gen 2x2 Type C with a max speed of 20Gbps data transfer supported, 2 Independent 2.5G LAN with Intel® TSN
- Support remote devices Out-Of-Band management functions powered by Allxon

1.3 Product Specification

1.3.1 Specifications of RCX-3750 PEG

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	4 DDR5 UDIMM, up to 192GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	• 4 USB 3.2 Gen 2 Type A • 1 USB 3.2 Gen 2x2 Type C (5V/3A)
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, OOB
SIM Card	3 External SIM Card Sockets
Expansion	
Mini PCIe	1 Mini PCIe Socket for PCIe/USB/SIM Card
PCIe	• 2 PCIe x16 Slot with PCIe 4.0 x8 Signal • 3 PCIe x16 Slot with PCIe x4 Signal
M.2	• 2 M.2 Key B Socket (2280/3042/3052, PCIe x2/USB3(Default)/USB2) • 1 M.2 Key E Socket (2230, PCIe x1/USB)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 Independent displays : 4 DisplayPort, up to 4096 x 2304 @60Hz
Storage	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	2 Front-access M.2 Key M SSD Tray (2280, PCIe x4)
Storage Device	• 2 Front-access 2.5" SSD/HDD Tray • 2 Internal Bracket 2.5" SSD/HDD
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I226 2.5GigE LAN supports TSN
LAN 2	Intel® I226 2.5GigE LAN supports TSN

Power	
Input Voltage	16V to 50V, 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
Out-of-Band Management	
MCU	Nuvoton NUC980
Interface	OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector
Remote Management	Support Remote Power ON/OFF, Reset and Power Cycling
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10/11, Linux
Mechanical	
Dimension (W x D x H)	254mm x 269mm x 398mm (10.00"x 10.59"x 15.67")
Weight	10.2 kg (22.5lb)
Mounting	• Wallmount by mounting bracket • Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	-25°C to 45°C (-13°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% @45°C
Shock/Vibration	• IEC 61373 : 2010 • Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.2 Specifications of RCX-3750 APEG

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	4 DDR5 UDIMM, up to 192GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	• 4 USB 3.2 Gen 2 Type A • 1 USB 3.2 Gen 2x2 Type C (5V/3A)
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, OOB
SIM Card	3 External SIM Card Sockets
Expansion	
Mini PCIe	1 Mini PCIe Socket for PCIe/USB/SIM Card
PCIe	• 2 PCIe x16 Slot with PCIe 4.0 x8 Signal • 3 PCIe x16 Slot with PCIe x4 Signal
M.2	• 2 M.2 Key B Socket (2280/3042/3052, PCIe x2/USB3(Default)/USB2) • 1 M.2 Key E Socket (2230, PCIe x1/USB)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 Independent displays : 4 DisplayPort, up to 4096 x 2304 @60Hz
Storage	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	2 Front-access M.2 Key M SSD Tray (2280, PCIe x4)
Storage Device	• 2 Front-access 2.5" SSD/HDD Tray • 2 Internal Bracket 2.5" SSD/HDD
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I226 2.5GigE LAN supports TSN
LAN 2	Intel® I226 2.5GigE LAN supports TSN

Power	
Input Voltage	AC 90V to 240V (2000W @220V for dual discrete graphics card operation)
Power Interface	3-pin C14-type AC Plug
Ignition Control	16-mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Out-of-Band Management	
MCU	Nuvoton NUC980
Interface	OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector
Remote Management	Support Remote Power ON/OFF, Reset and Power Cycling
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10/11, Linux
Mechanical	
Dimension (W x D x H)	254mm x 269mm x 398mm (10.00"x 10.59"x 15.67")
Weight	10.2 kg (22.5lb)
Mounting	• Wallmount by mounting bracket • Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	-25°C to 45°C (-13°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% @45°C
Shock/Vibration	• IEC 61373 : 2010 • Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests
EMC	CE, FCC, EN50155, EN50121-3-2

1.3.3 Specifications of RCX-3430 PEG

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	4 DDR5 UDIMM, up to 192GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	• 4 USB 3.2 Gen 2 Type A • 1 USB 3.2 Gen 2x2 Type C (5V/3A)
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, OOB
SIM Card	3 External SIM Card Sockets
Expansion	
mPCIe	1 Mini PCIe Socket for PCIe/USB/SIM Card
PCIe	• 1 PCIe x16 Slot with PCIe 4.0 x16 Signal • 2 PCIe x16 Slot with PCIe x4 Signal
M.2	• 2 M.2 Key B Socket (2280/3042/3052, PCIe x2/USB3(Default)/USB2) • 1 M.2 Key E Socket (2230, PCIe x1/USB)
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® Xe Architecture
Interface	4 Independent displays : 4 DisplayPort, up to 4096 x 2304 @60Hz
Storage	
SATA	4 SATA III (6Gbps) support software RAID 0, 1, 5, 10
M.2	2 Front-access M.2 Key M SSD Tray (2280, PCIe x4)
Storage Device	• 2 Front-access 2.5" SSD/HDD Tray • 2 Internal Bracket 2.5" SSD/HDD
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Ethernet	
LAN 1	Intel® I226 2.5GigE LAN supports TSN
LAN 2	Intel® I226 2.5GigE LAN supports TSN

Power	
Power Input	16V to 50V, 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
Out-of-Band Management	
MCU	Nuvoton NUC980
Interface	OOB LAN, 10/100Mb Ethernet LAN, RJ45 Connector
Remote Management	Support Remote Power ON/OFF, Reset and Power Cycling
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10/11, Linux
Mechanical	
Dimensions (H x W x L)	206mm x 269mm x 398mm (8.11"x 10.59"x 15.67")
Weight	8.6 kg (18.96lb)
Mounting	• Wallmount by mounting bracket • Rackmount (Optional)
Environment	
Operating Temperature (with air flow)	-25°C to 45°C (-13°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% Humidity, non-condensing
Relative Humidity	95% @45°C
Shock/Vibration	• IEC 61373 : 2010 • Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests
EMC	CE, FCC, EN50155, EN50121-3-2

1.4 Supported CPU List

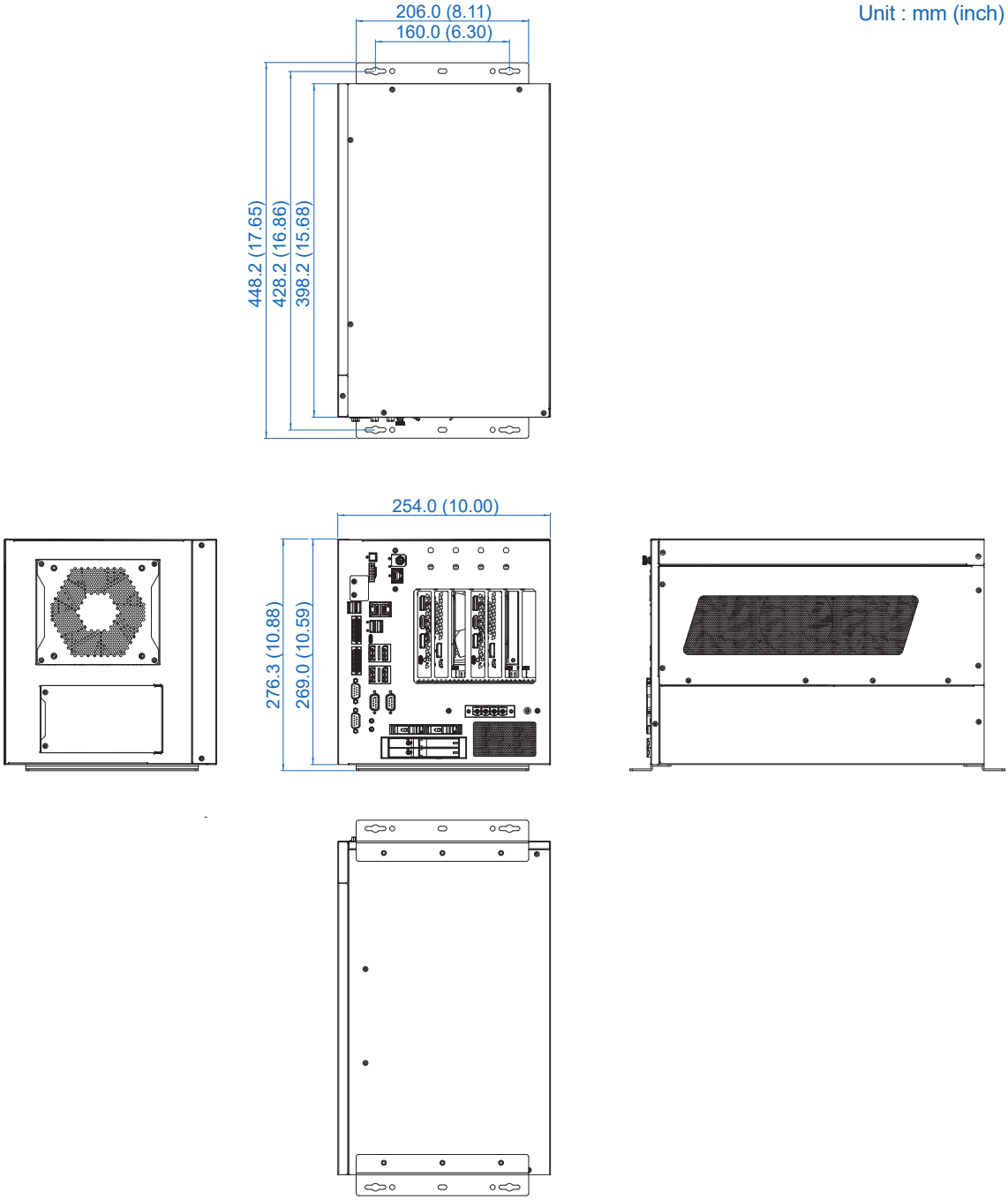
Series	CPU	Cores	GHz	TDP (W)	ECC
Intel® Core™ (14th Gen)*	i9-14900	24	5.8	65	Y
	i7-14700	20	5.4		
	i5-14500	14	5		
	i3-14100	4	4.7		
	i9-14900T	24	5.5	35	
	i7-14700T	20	5.2		
	i5-14500T	14	4.8		
	i3-14100T	4	4.4		
Intel® Core™ (13th Gen)	i9-13900E	24	5.2	65	
	i7-13700E	16	5.1		
	i5-13500E	14	4.6		
	i3-13100E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

* 14th Gen support PC Client use condition only.

1.5 Mechanical Dimension

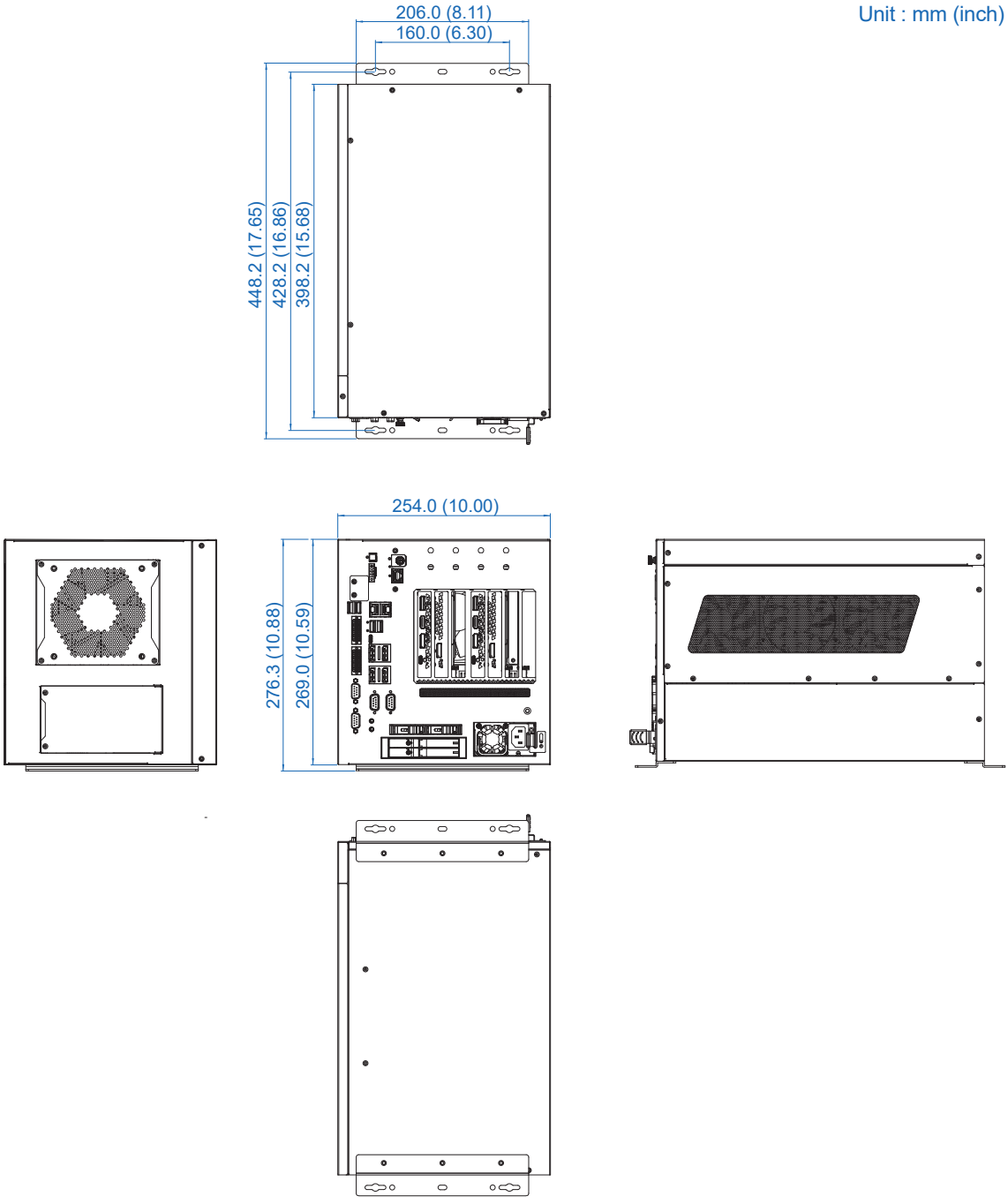
1.5.1 Dimensions of RCX-3750 PEG

Unit : mm (inch)

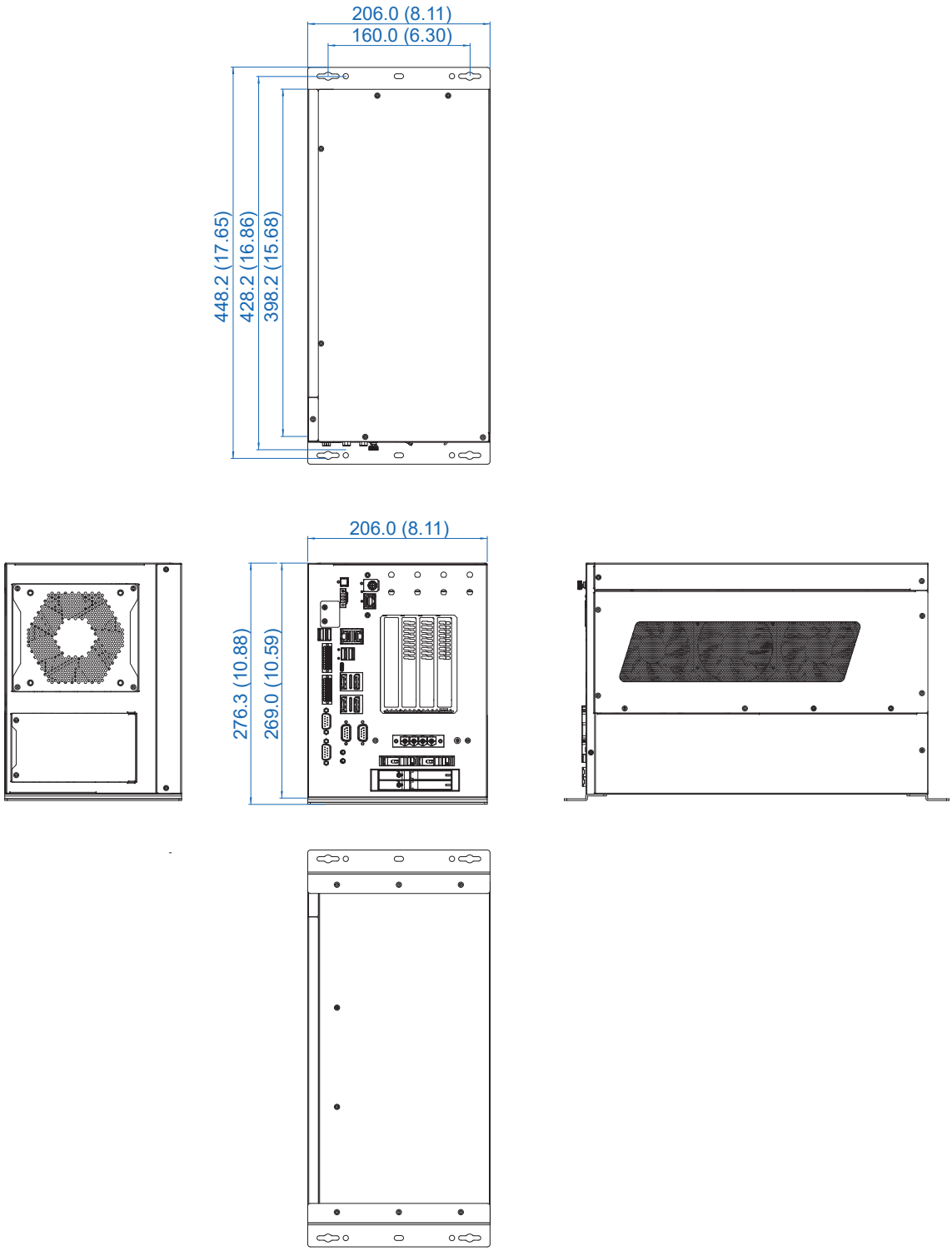


1.5.2 Dimensions of RCX-3750 APEG

Unit : mm (inch)



1.5.3 Dimensions of RCX-3430 PEG



2

GETTING TO KNOW YOUR RCX-3000 PEG

2.1 Packing List

2.1.1 RCX-3750 PEG Packing List

Item	Description	Qty
1	RCX-3750-PEG AI Computing System (According to the configuration you order, the RCX-3000 PEG series may contain SSD/HDD and DDR5 U-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	1
2	F Head_#6-32*6L_Nylok		Wall mount	53-I000350-311	6
3	P head_M3x6L_Ni_Nylok		M.2	53-2426206-80B	3
4	F Head_M3x4L_Nylok		HDD	53-M013150-310	8
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	Key		SSD/HDD tray	N/A	1

2.1.2 RCX-3750 APEG Packing List

Item	Description	Qty
1	RCX-3750-APEG AI Computing System (According to the configuration you order, the RCX-3000 PEG series may contain SSD/HDD and DDR5 U-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	1
2	F Head_#6-32*6L_Nylok		Wall mount	53-I000350-311	6
3	P head_M3x6L_Ni_Nylok		M.2	53-2426206-80B	3
4	F Head_M3x4L_Nylok		HDD	53-M013150-310	8
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	Graphic Power Cable, ATX 8 pin		GPU	61-1400003-0H5	4
8	Key		SSD/HDD tray	N/A	1

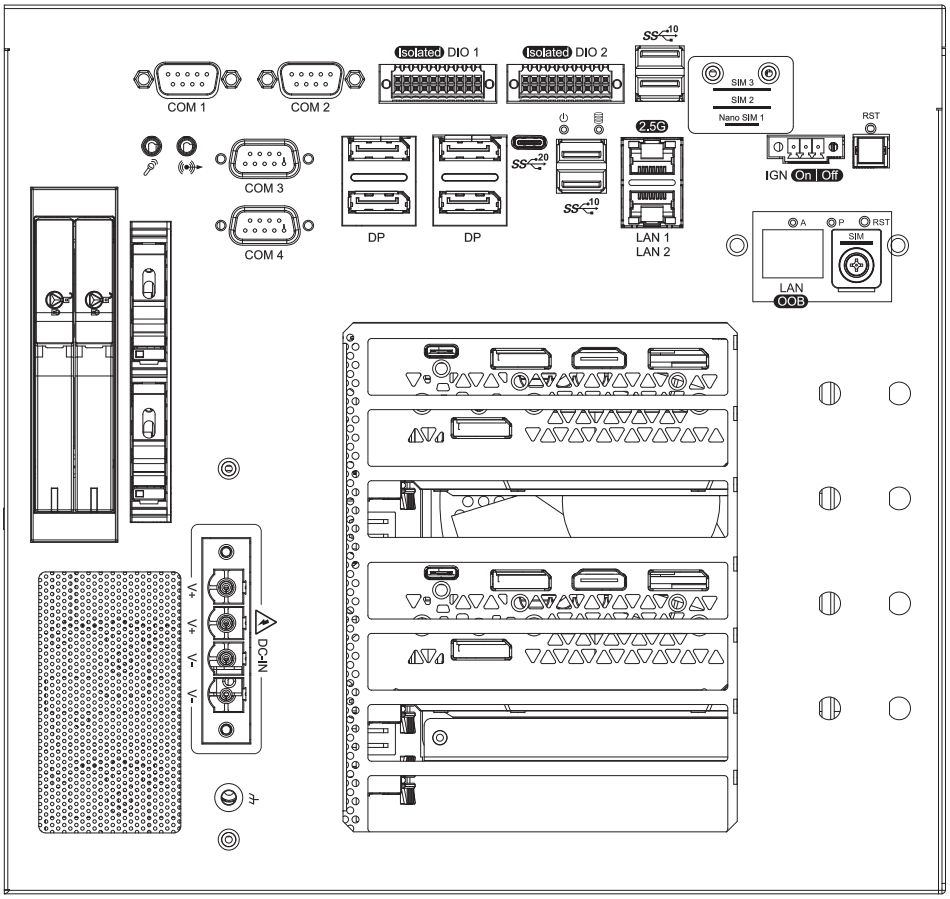
2.1.3 RCX-3430 PEG Packing List

Item	Description	Qty
1	RCX-3430-PEG AI Computing System (According to the configuration you order, the RCX-3000 PEG series may contain SSD/HDD and DDR5 U-DIMM. Please verify these items if necessary.)	1

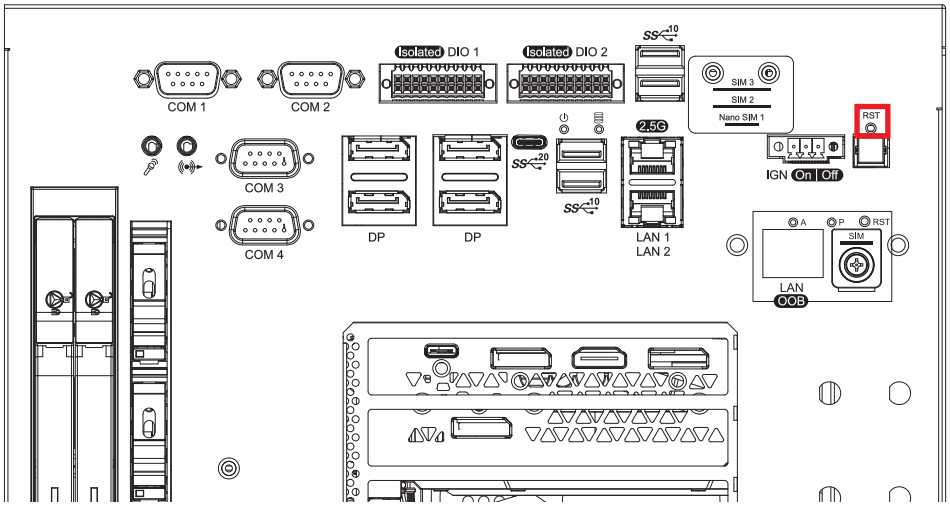
Item	Description	Outlook	Usage	P/N	Qty
1	P head_M2.5x6L_Ni		Mini PCIe	53-2426906-30B	1
2	F Head_#6-32*6L_Nylok		Wall mount	53-I000350-311	6
3	P head_M3x6L_Ni_Nylok		M.2	53-2426206-80B	3
4	F Head_M3x4L_Nylok		HDD	53-M013150-310	8
5	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
6	Terminal block 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	2
9	Key		SSD/HDD tray	N/A	1

2.2 Front Panel I/O Functions

In Vecow's RCX-3000 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, SIM, OOB, LAN, COM Port, Isolated DIO , Display Port, and any additional storage, are placed on the front panel.

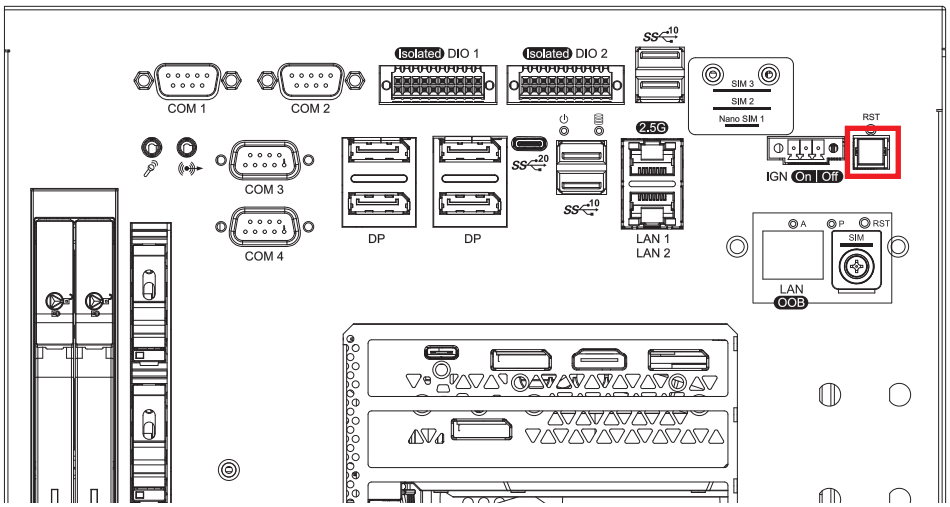


2.2.1 Reset Tact Switch



The item circled red is a hardware reset switch. Use this switch to reset the system without powering off the RCX-3000. Press and hold the reset switch for a few seconds, then reset will be enabled.

2.2.2 Power Button



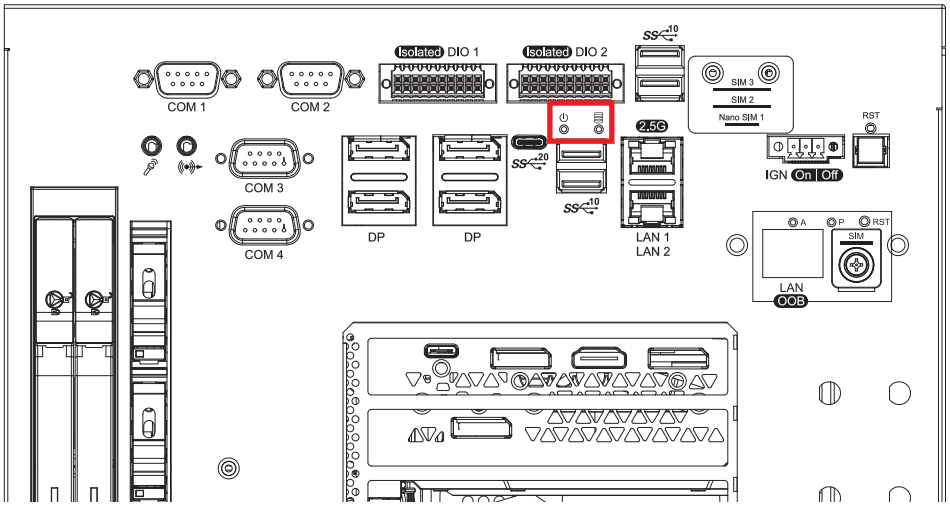
The power button is a non-latched switch with dual color LED indication. It indicates power statuses : S0, S3 and S5. More details on the LED indications are listed in the following chart :

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-3000, press the power button which will light the blue LED.
To power off RCX-3000, 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

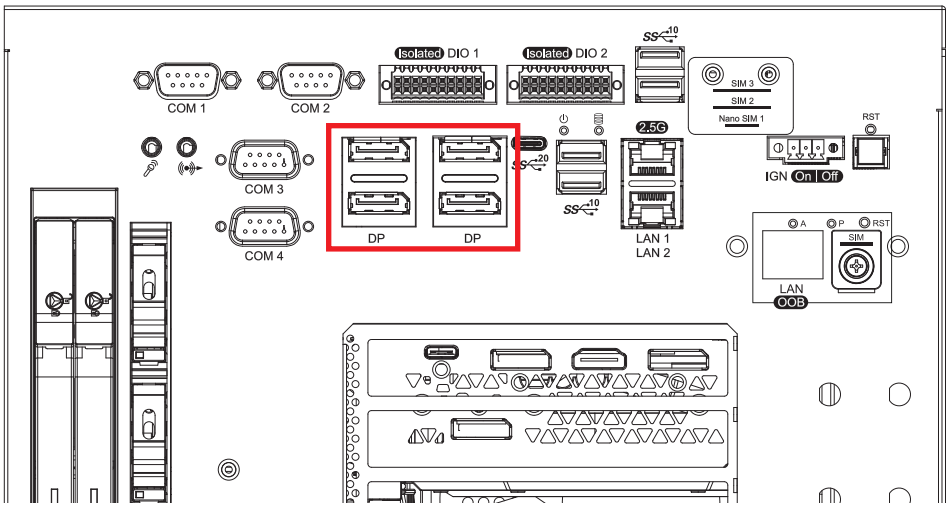


Yellow-HDD LED : A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

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

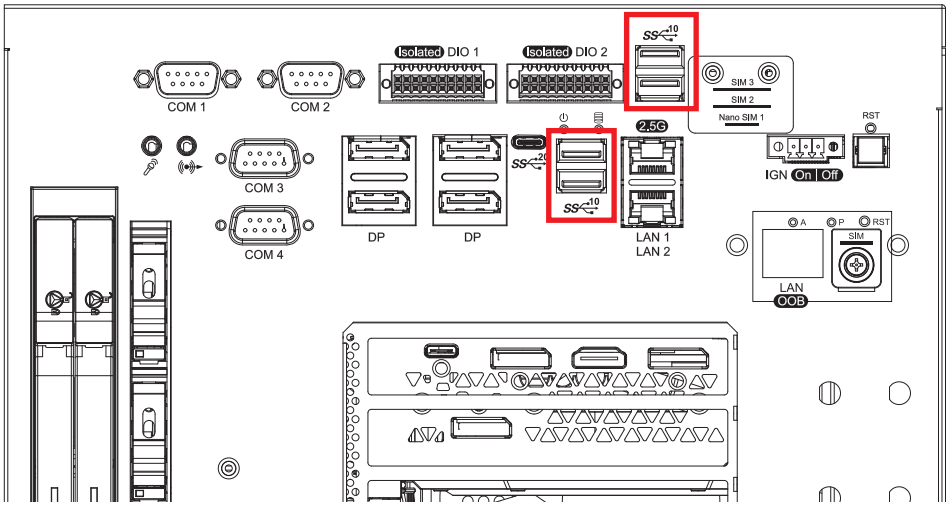
LED Color	Indication	System Status
Yellow	HDD	• On/Off : Storage status, function or not. • Twinkling : Data transferring.
Green	Power	System power status (on/off)

2.2.4 Display Port



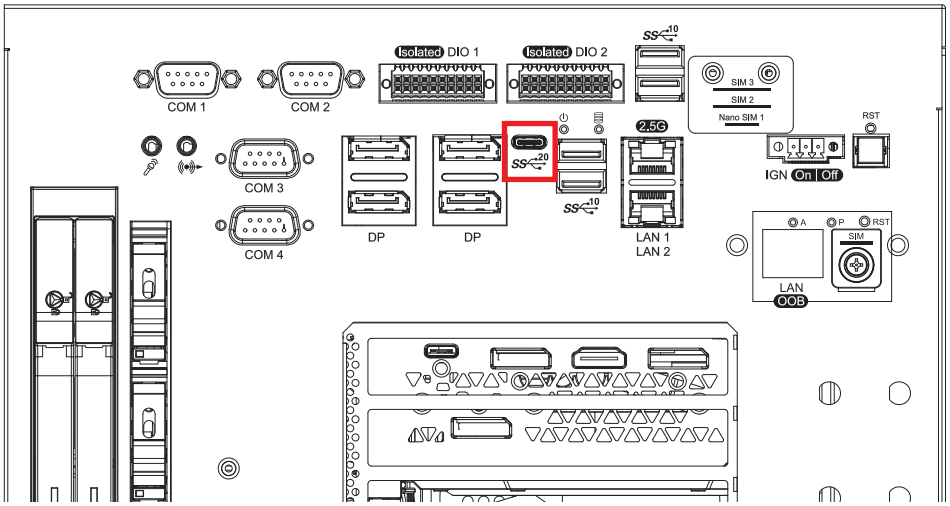
Onboard Display Port support auxiliary channel dual mode, connection supports up to 5120x3200 resolution at 60 Hz.

2.2.5 USB Type-A Connector



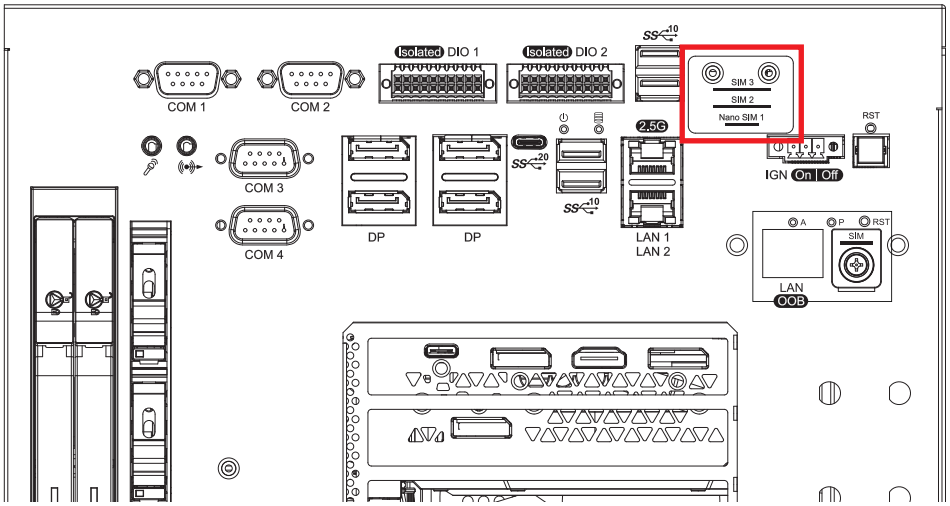
There are 4 USB 3.2 Gen2 Type A connections available supporting up to 10GB per second data rate in the front side of RCX-3000 PEG . It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.6 USB Type-C Connector

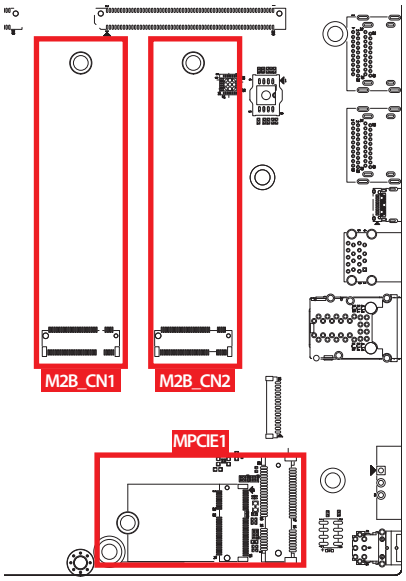


USB Type-C connector support up to 20GB per second data rate in the front side of RCX-3000 series.

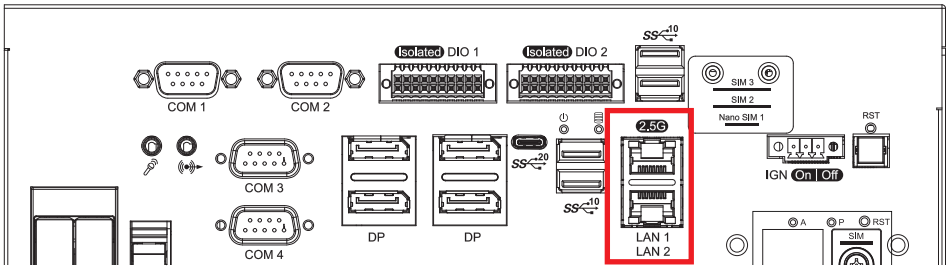
2.2.7 SIM 3, SIM 2, Nano SIM 1



Slot	SIM
MPCIE1	SIM3
M2B_CN1	SIM2
M2B_CN2	Nano SIM1



2.2.8 10/100/1000/2500 Mbps Ethernet Port



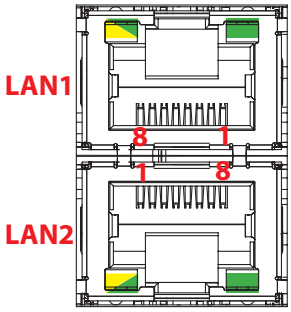
There are two 8-pin RJ-45 jacks supporting 10/100/1000/2500 Mbps Ethernet connections on the front side of RCX-3000. LAN1, LAN 2 is powered by Intel I226 Ethernet engine.

LAN Chip	Function	Connector
I226_LAN1	RJ-45(10/100/1000/2500)	LAN1
I226_LAN2	RJ-45(10/100/1000/2500)	LAN2

Using suitable RJ-45 cable, you can connect the RCX-3000 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 functions. The pinouts of LAN 1 and LAN 2 are listed in the following chart:

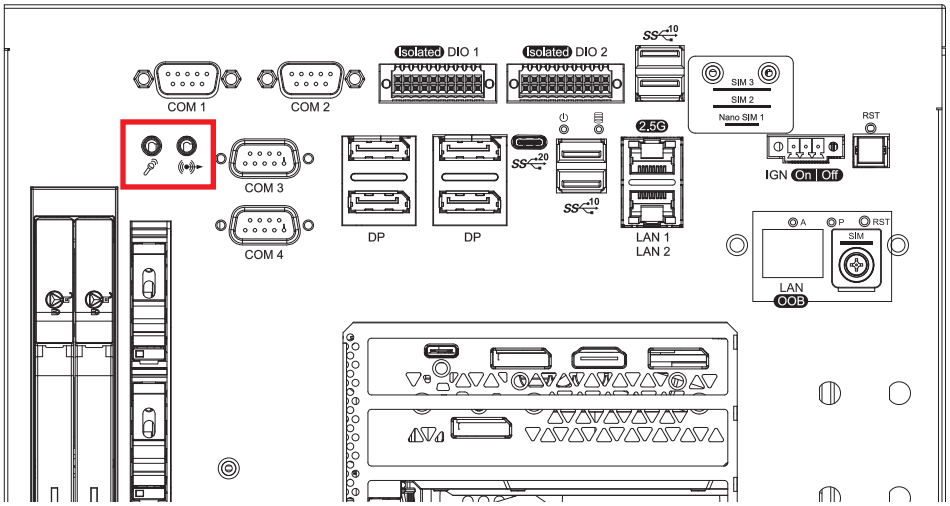
Pin No.	10/100 Mbps	1000Mbps	2500Mbps
1	E_TX+	MDI0_P	MDI0_P
2	E_TX-	MDI0_N	MDI0_N
3	E_RX+	MDI1_P	MDI1_P
4	----	MDI2_P	MDI2_P
5	-----	MDI2_N	MDI2_N
6	E_RX-	MDI1_N	MDI1_N
7	-----	MDI3_P	MDI3_P
8	------	MDI3_N	MDI3_N

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



LED Location	LED Color	10/100Mbps	1000Mbps	2500Mbps
Right	Green	Twinkling Green	Twinkling Green	Twinkling Green
Left	Green/Yellow	Off	Solid Yellow	Solid Green

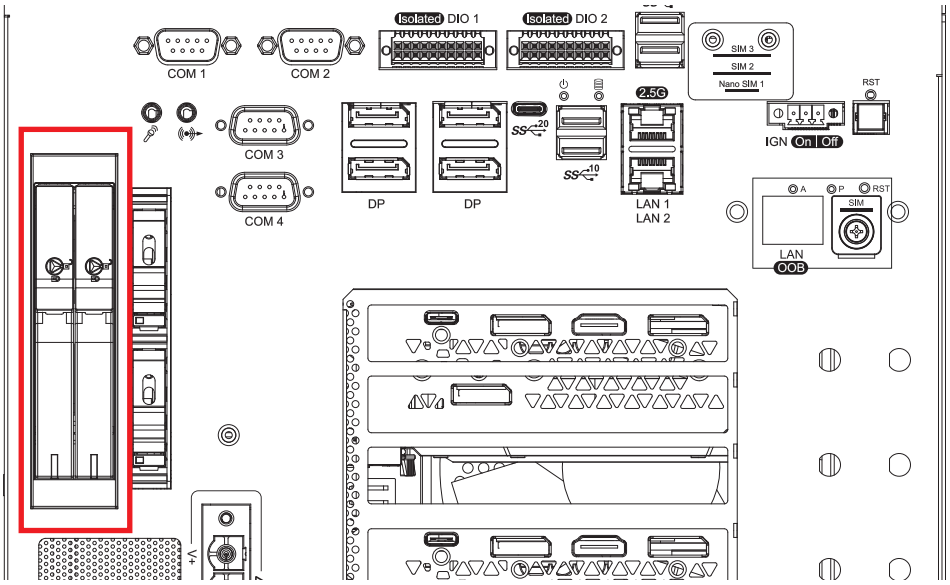
2.2.9 Audio Connector



There are two audio connectors, mic-in and line-out, on the front side of RCX-3000. Onboard Realtek ALC888 audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.

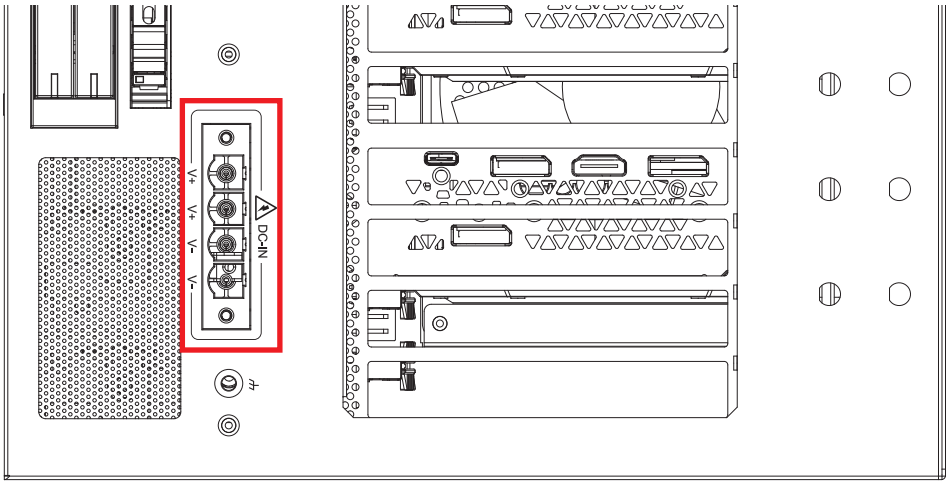
To utilize the audio function on the Windows platform, you need to install corresponding drivers for both Intel R680E chipset and Realtek ALC888 codec. Please refer to chapter four for more details on driver installation.

2.2.10 Front-access SSD/HDD Tray



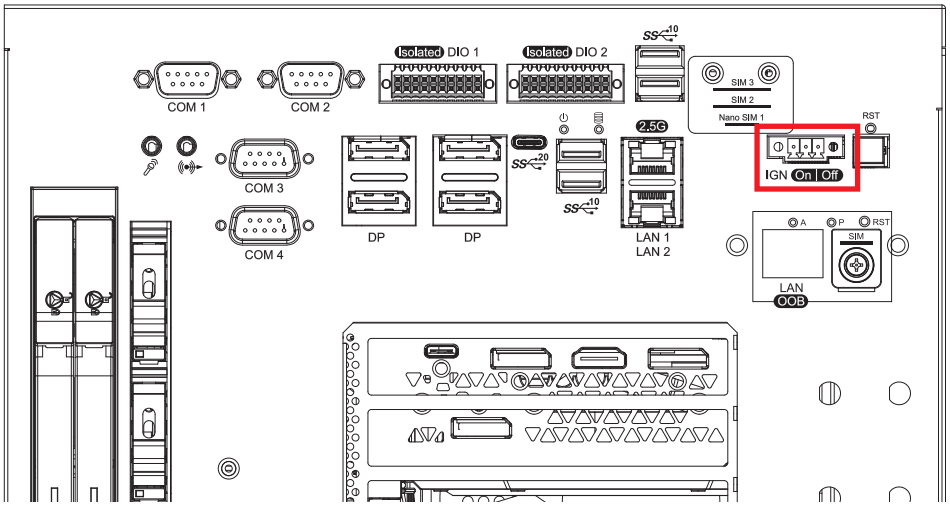
There are two front-access 2.5” SSD/HDD trays on the front side of RCX-3000. Press the trigger to open the SSD/HDD tray which has up to 8TB available.

2.2.11 Power Terminal Block



RCX-3000 supports 16V to 50V DC power input.

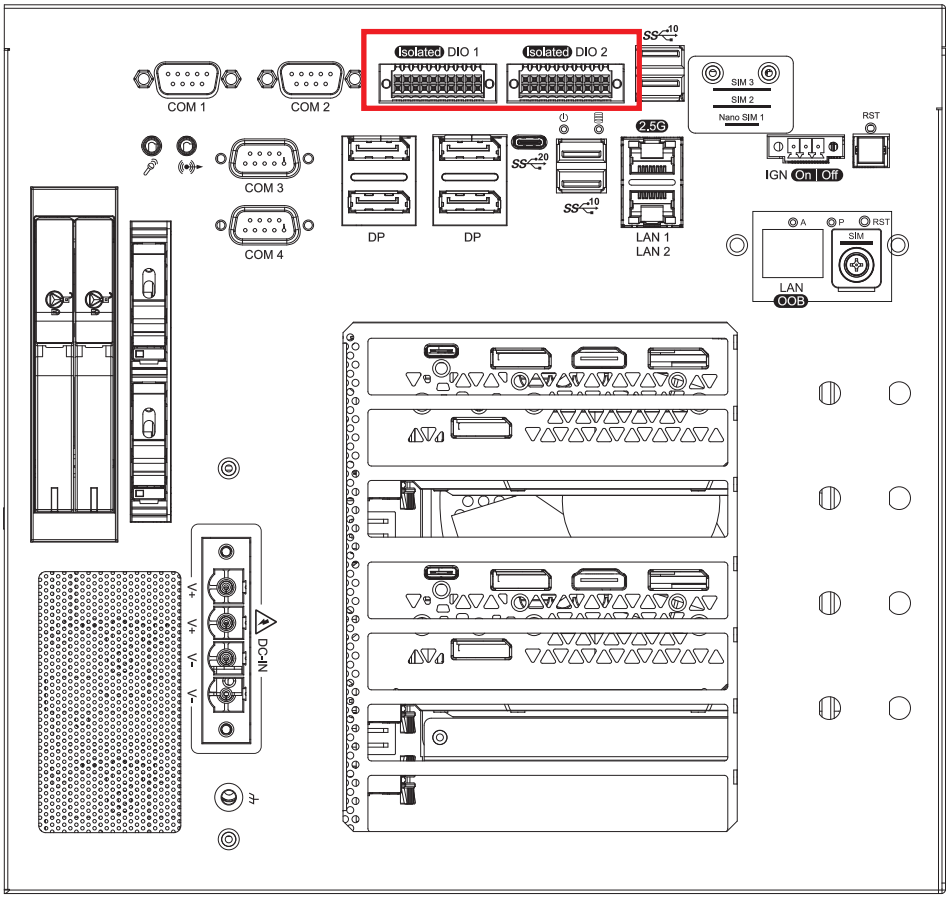
2.2.12 Remote Power On/Off Switch



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-

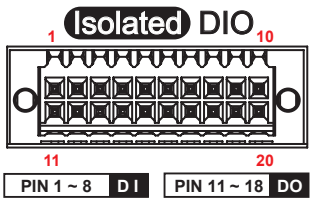
2.2.13 Isolated DIO



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 photocouper for isolated protection. Each DO with isolator chip, Config by a Jumper for each DIO connector.

DO Safety-Related Certifications :

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



DIO1 Connectors pin out :

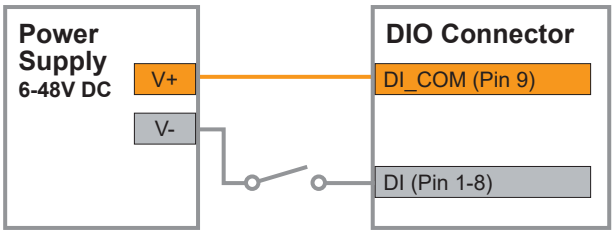
Pin No.	Definition	Mapping to SIO GPIO Function
1	INPUT 0	SIO_GPI80
2	INPUT 1	SIO_GPI81
3	INPUT 2	SIO_GPI82
4	INPUT 3	SIO_GPI83
5	INPUT 4	SIO_GPI84
6	INPUT 5	SIO_GPI85
7	INPUT 6	SIO_GPI86
8	INPUT 7	SIO_GPI87
9	+VDI_COM1	
10	GND_ISO_DIO1	
11	OUTPUT 0	SIO_GPO70
12	OUTPUT 1	SIO_GPO71
13	OUTPUT 2	SIO_GPO72
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 :

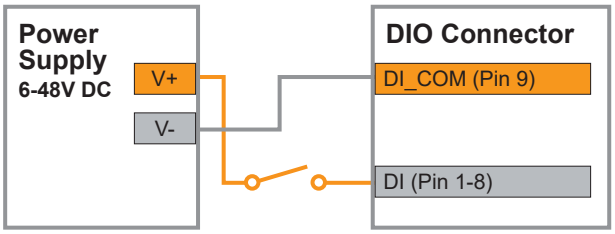
Pin No.	Definition	Mapping to SIO GPIO Function
1	INPUT 8	SIO_GPI0
2	INPUT 9	SIO_GPI1
3	INPUT 10	SIO_GPI2
4	INPUT 11	SIO_GPI3
5	INPUT 12	SIO_GPI4
6	INPUT 13	SIO_GPI5
7	INPUT 14	SIO_GPI6
8	INPUT 15	SIO_GPI7
9	+VDI_COM2	
10	GND_ISO_DIO2	
11	OUTPUT 8	SIO_GPO0
12	OUTPUT 9	SIO_GPO1
13	OUTPUT 10	SIO_GPO2
14	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)

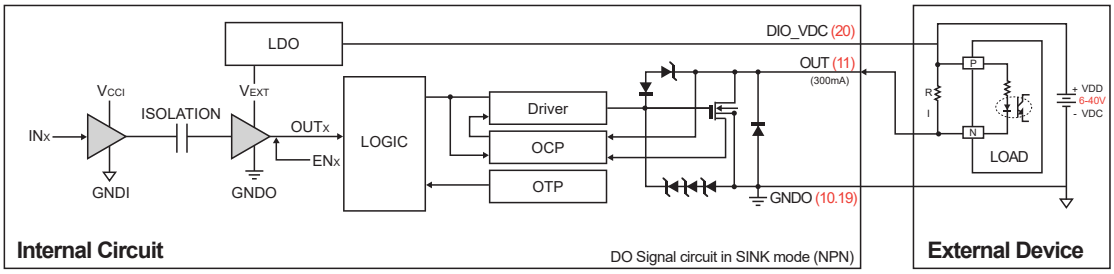


Source Mode (PNP)

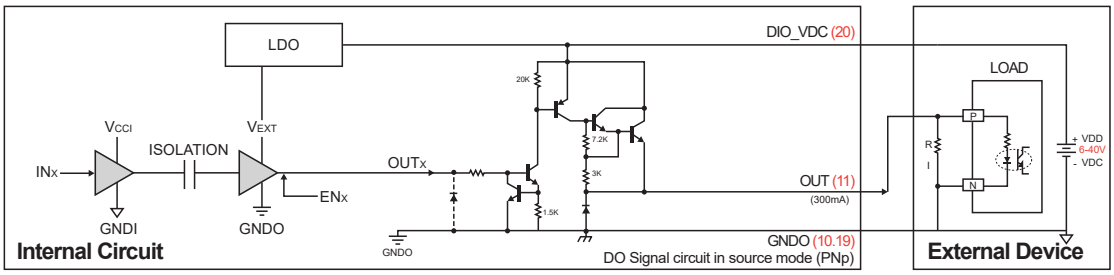


DO reference circuit :

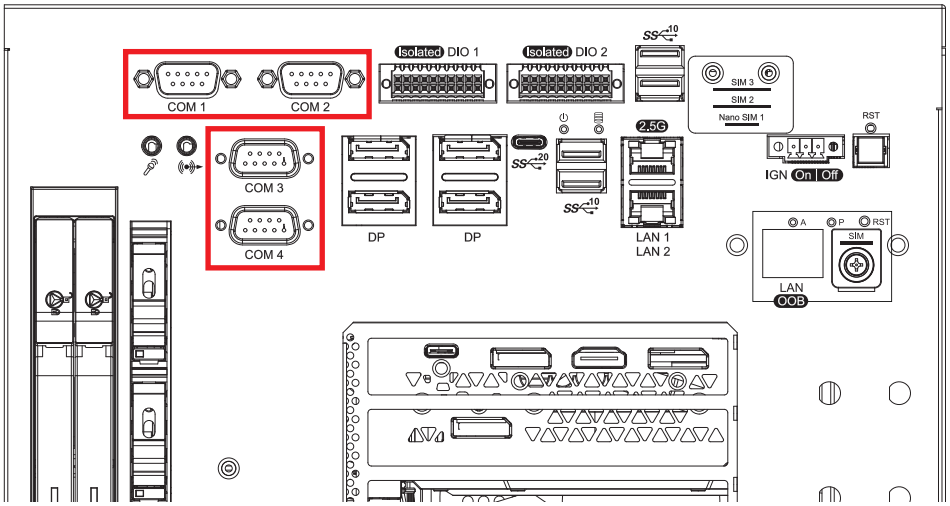
Sink Mode (NPN, Default)



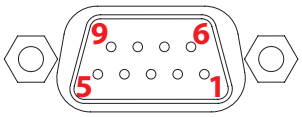
Source (PNP)



2.2.14 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.

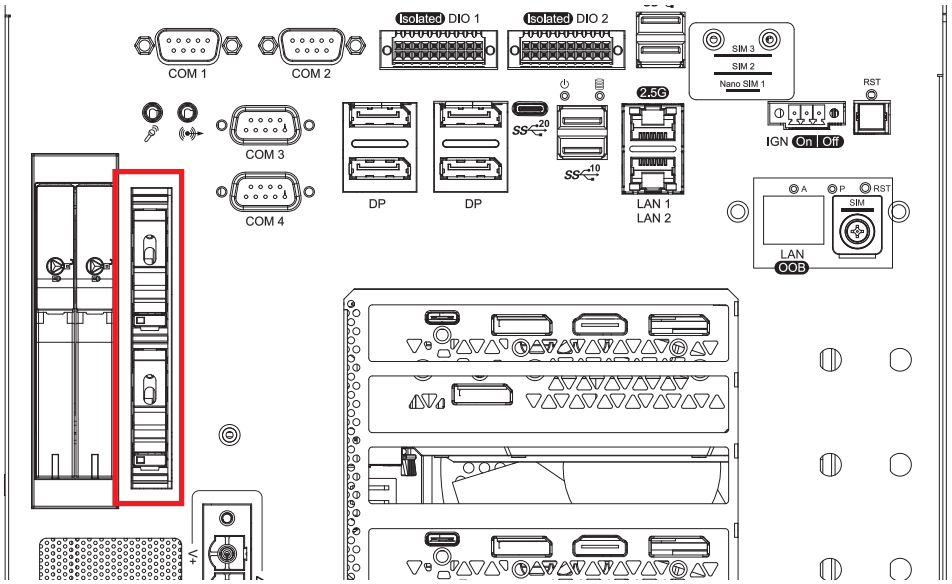


BIOS Setting	Function
COM 1 COM 2 COM 3 COM 4	RS-232
	RS-422 (5-wire)
	RS-485
	RS-485 w/z auto-flow control

The pin assignments are listed in the table as follows :

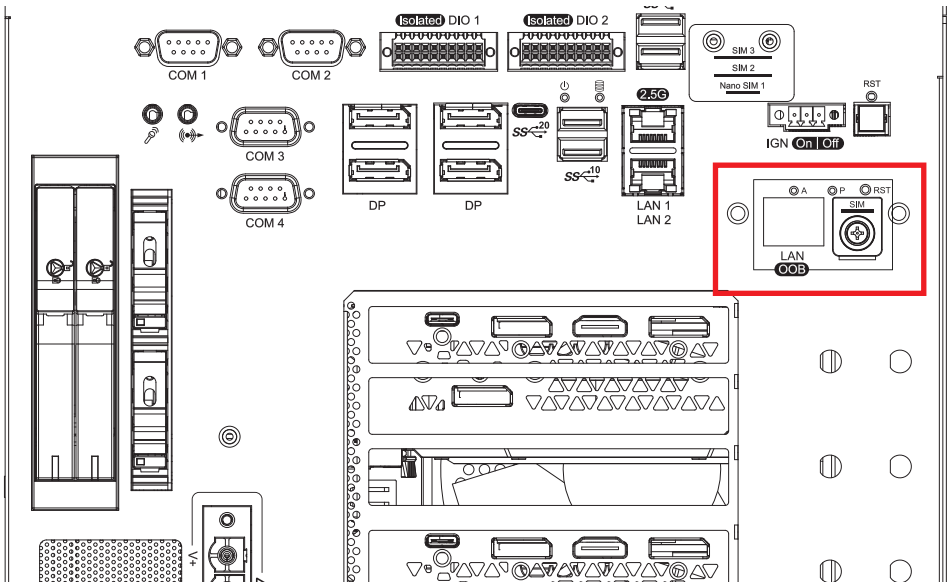
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-485 (3-wire)
1, 2 3, 4	1	DCD	TXD-	DATA-
	2	RXD	TXD+	DATA+
	3	TXD	RXD+	----------
	4	DTR	RXD-	----------
	5	GND	GND	GND
	6	DSR	----------	----------
	7	RTS	----------	----------
	8	CTS	----------	----------
	9	RI	----------	----------

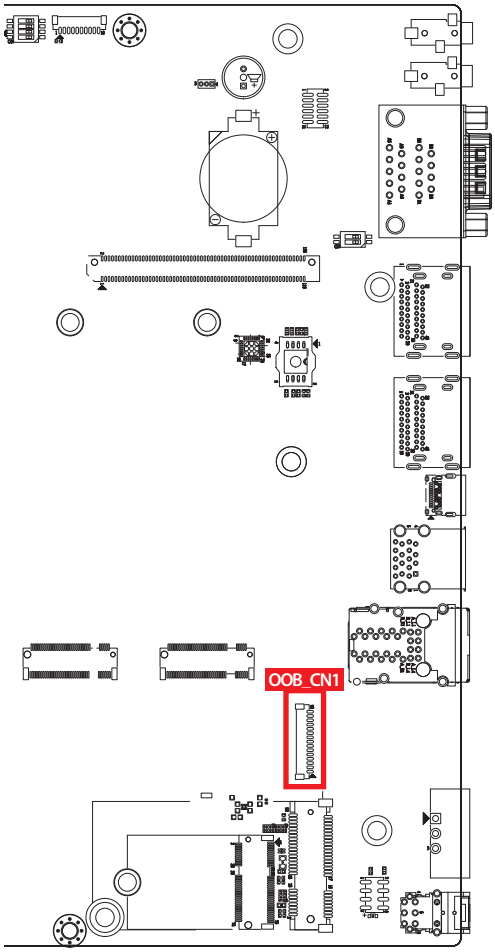
2.2.15 M.2 Key M SSD Tray



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

2.2.16 OOB Connector : Remote control ON/OFF/Reset.





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

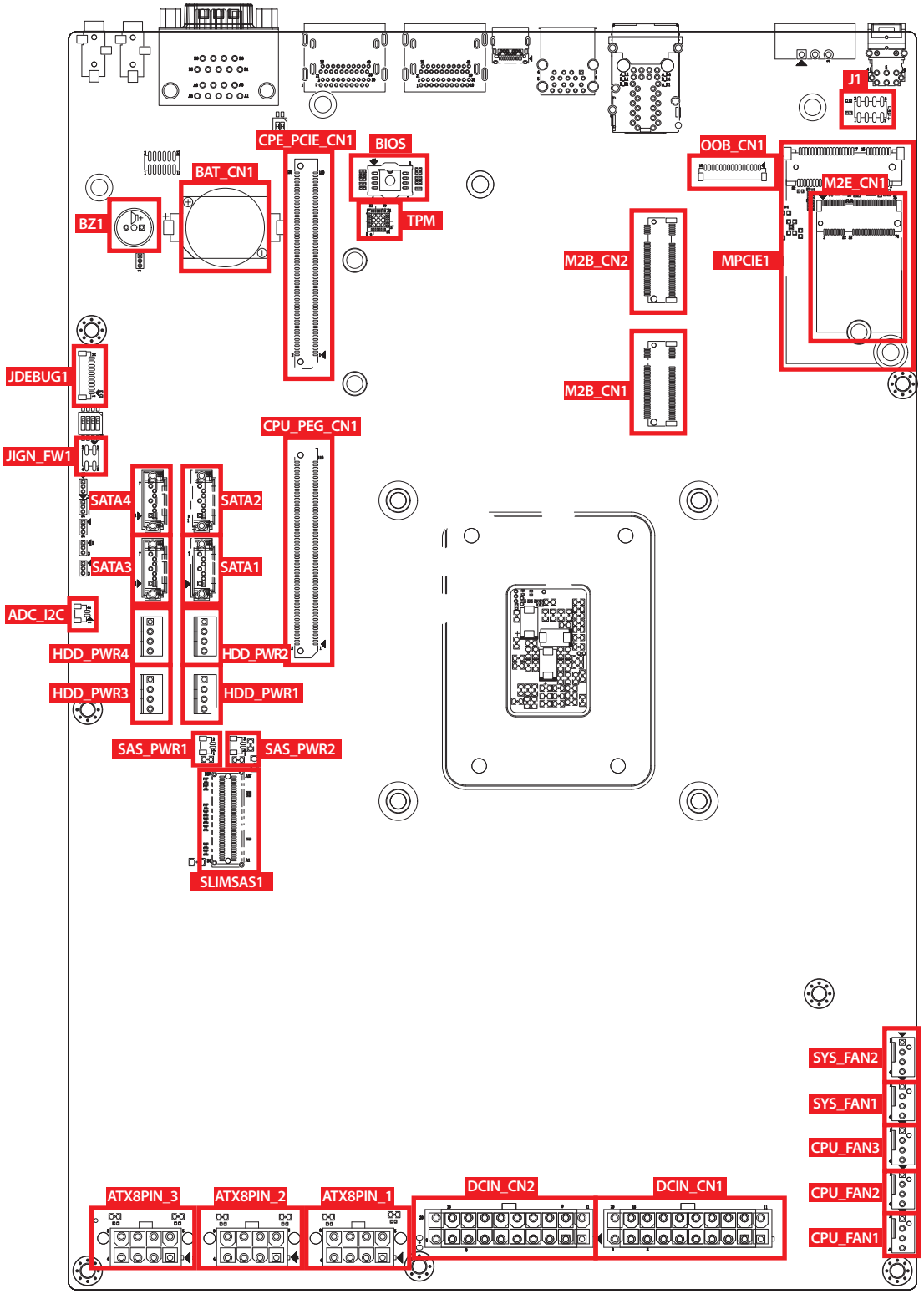
The LED indicator can instantly judge the power status(P) of OOB Enabler and the connection status(A) of OOB Enabler and Allxon Portal.

If both LEDs are on, it means OOB Enabler is running and the connection to Allxon Cloud is stable. The OOB network port is used for OOB out-of-band control.

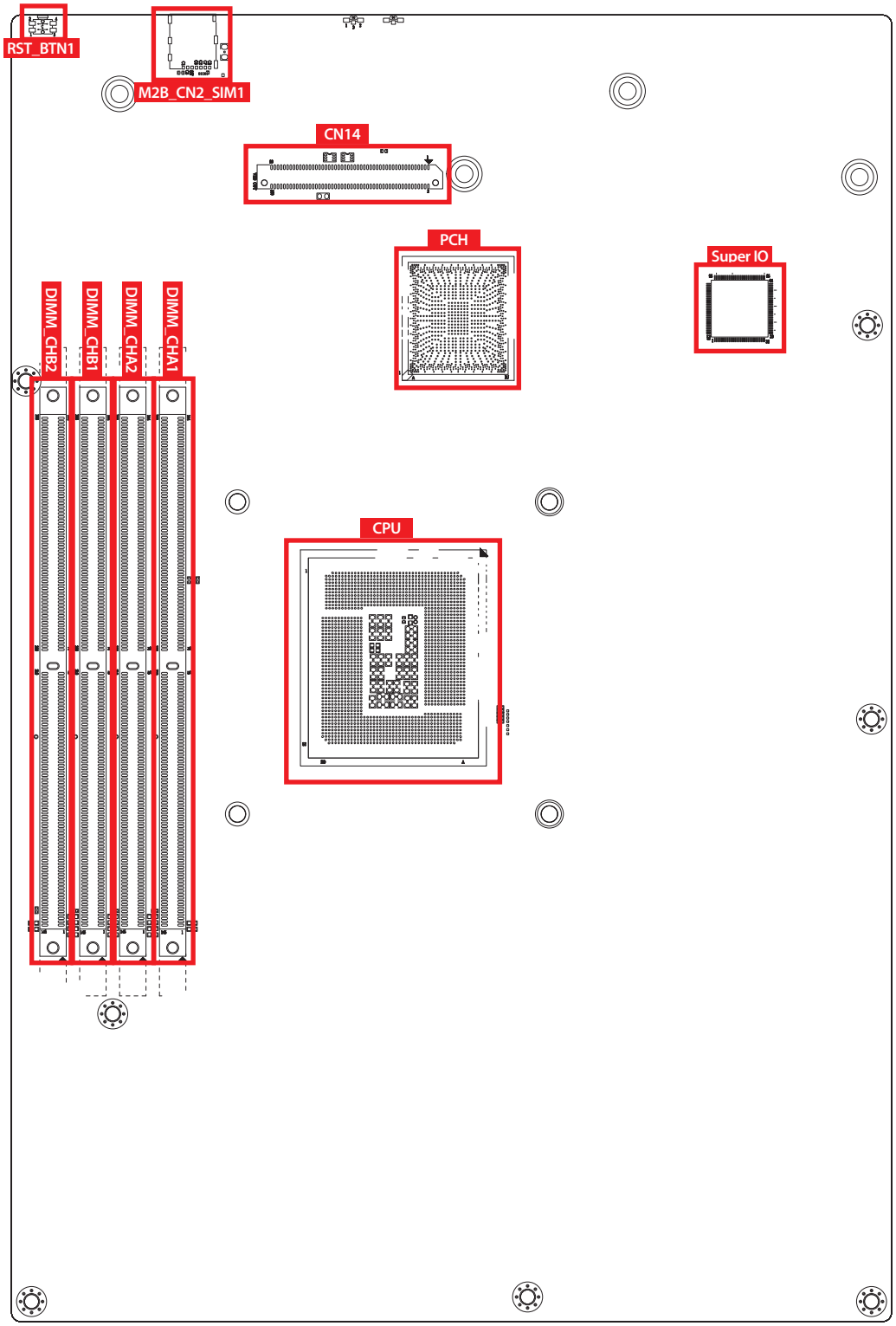
The SIM card holder is used for OOB 4G network cards. This function is optional. For detailed instructions, please refer to the OOB chapter.

2.3 Main Board Expansion Connectors

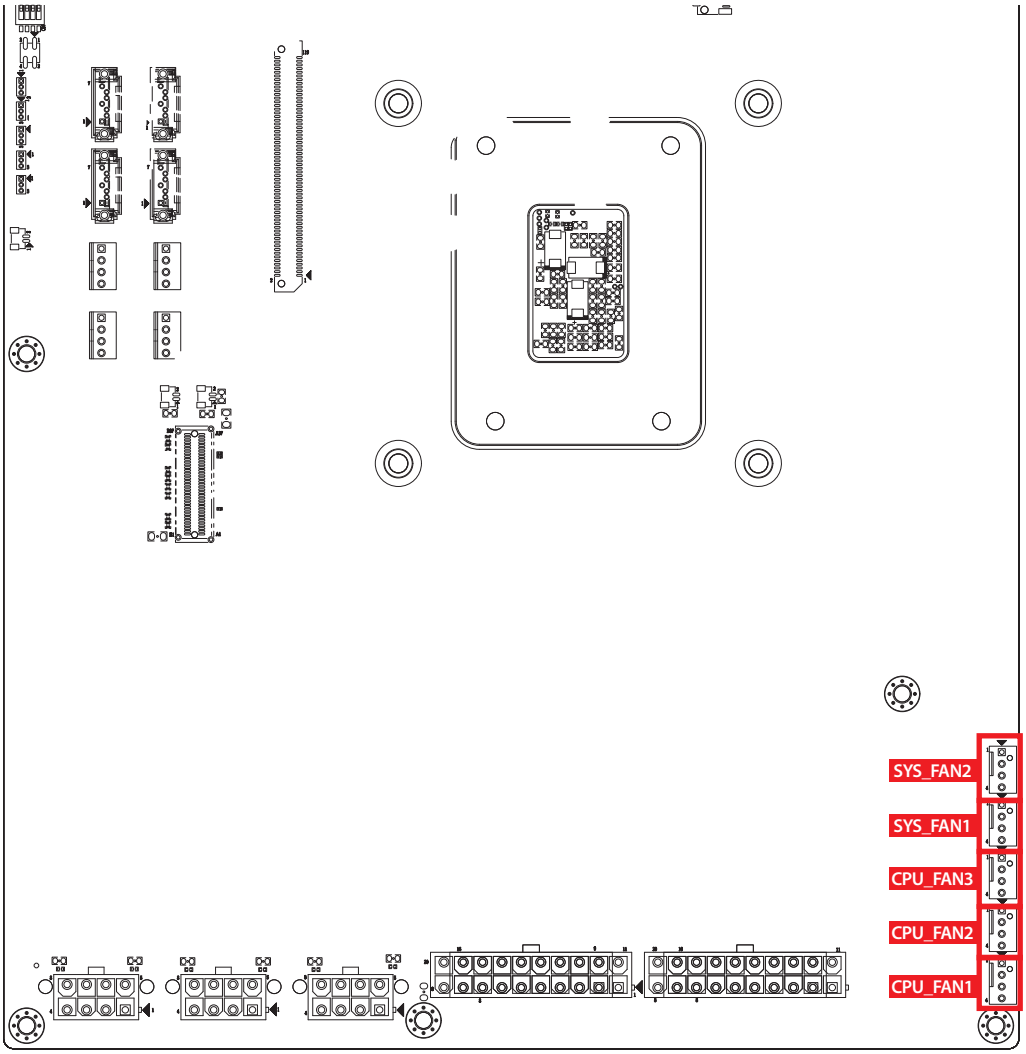
2.3.1 Front View of RCX-3000 PEG Main Board With Connector Location



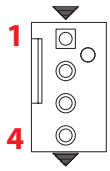
2.3.2 Rear View of RCX-3000 Main Board With Connector Location



2.3.3 CPU_FAN1, CPU_FAN2, CPU_FAN3, SYS_FAN1, SYS_FAN2

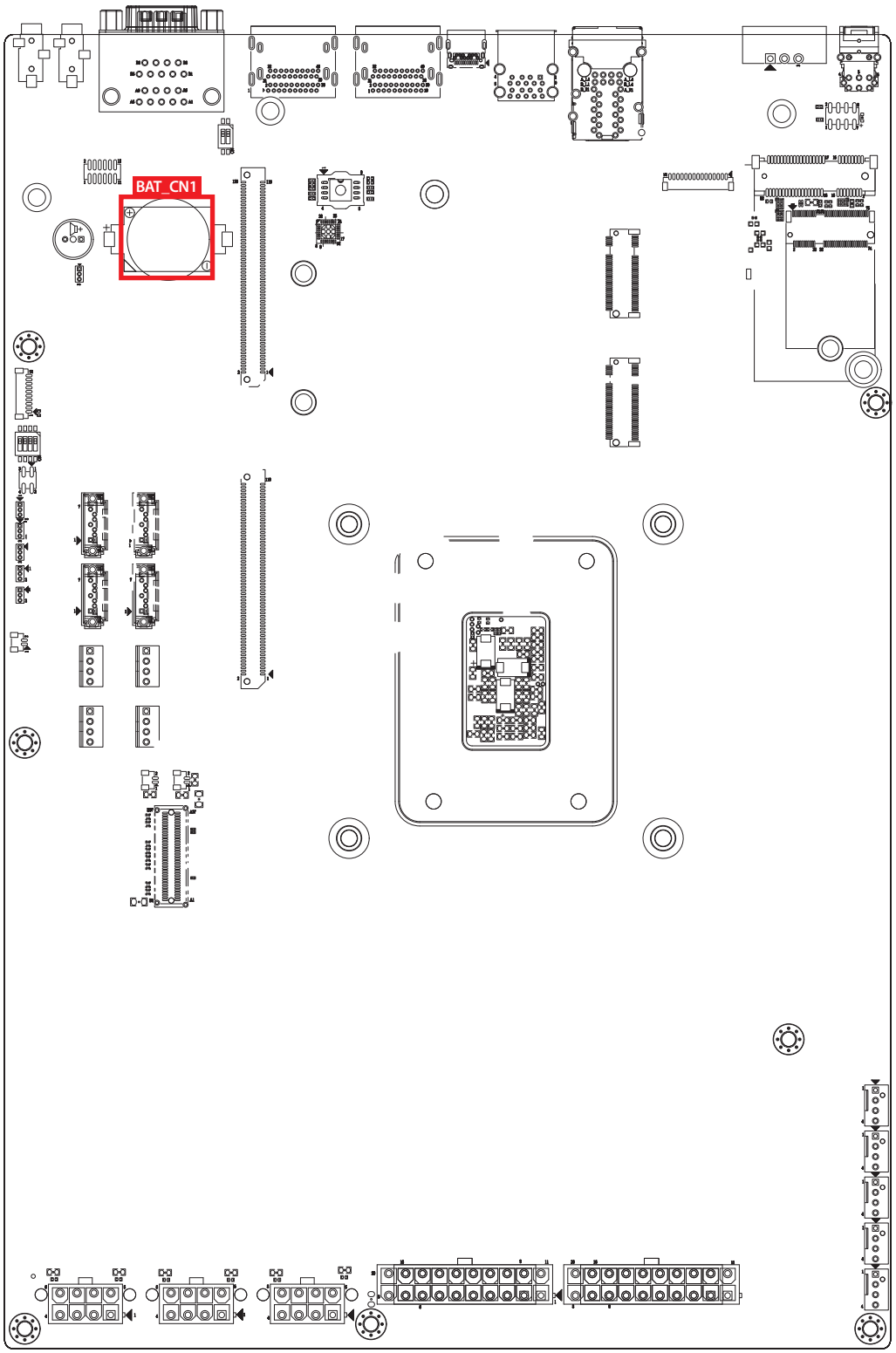


The fan power connector is for additional thermal requirements. The pin assignments of CPU_FAN1 , CPU_FAN2, CPU_FAN3 , SYS_FAN1 , SYS_FAN2 are listed in the following table:



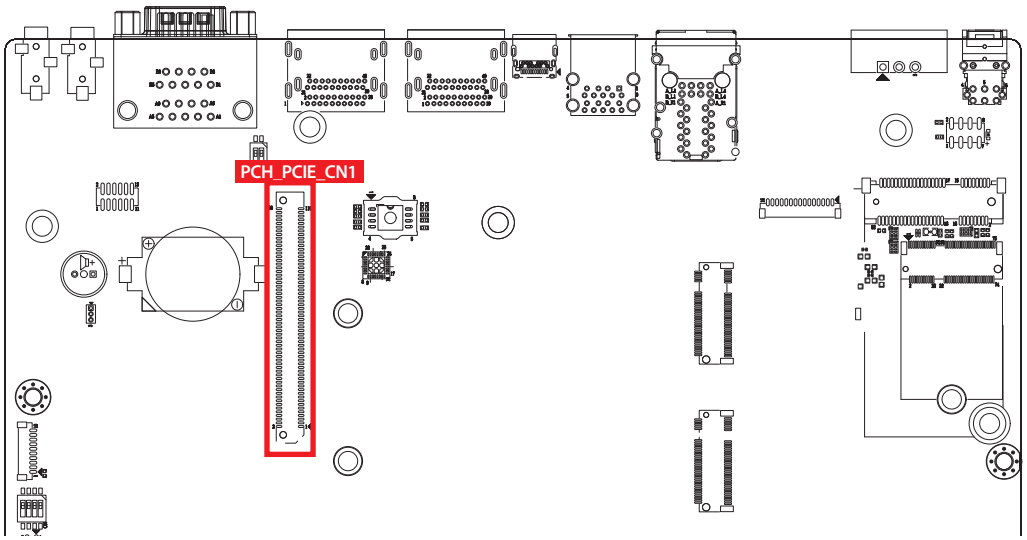
	CPU_FAN1, SYS_FAN1		CPU_FAN2, CPU_FAN3,SYS_FAN2	
	Pin No.	Description	Pin No.	Description
	1	GND	1	GND
	2	+12V (up to 2A)	2	+12V (up to 2A)
	3	Fan speed sensor	3	NC
	4	Fan PWM	4	Fan PWM

2.3.4 BAT_CN1 : Battery

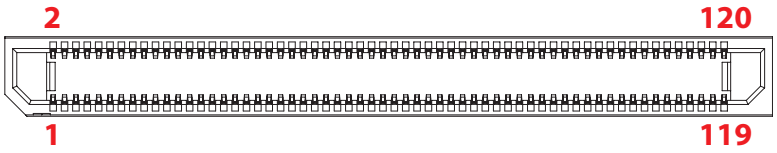


The RCX-3000's real-time clock is powered by a lithium battery. It is equipped with Panasonic CR2032 220mAh lithium battery. It is recommended that you do not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.

2.3.5 PCH_PCIE_CN1 : Board to Board Conn. (PCH)



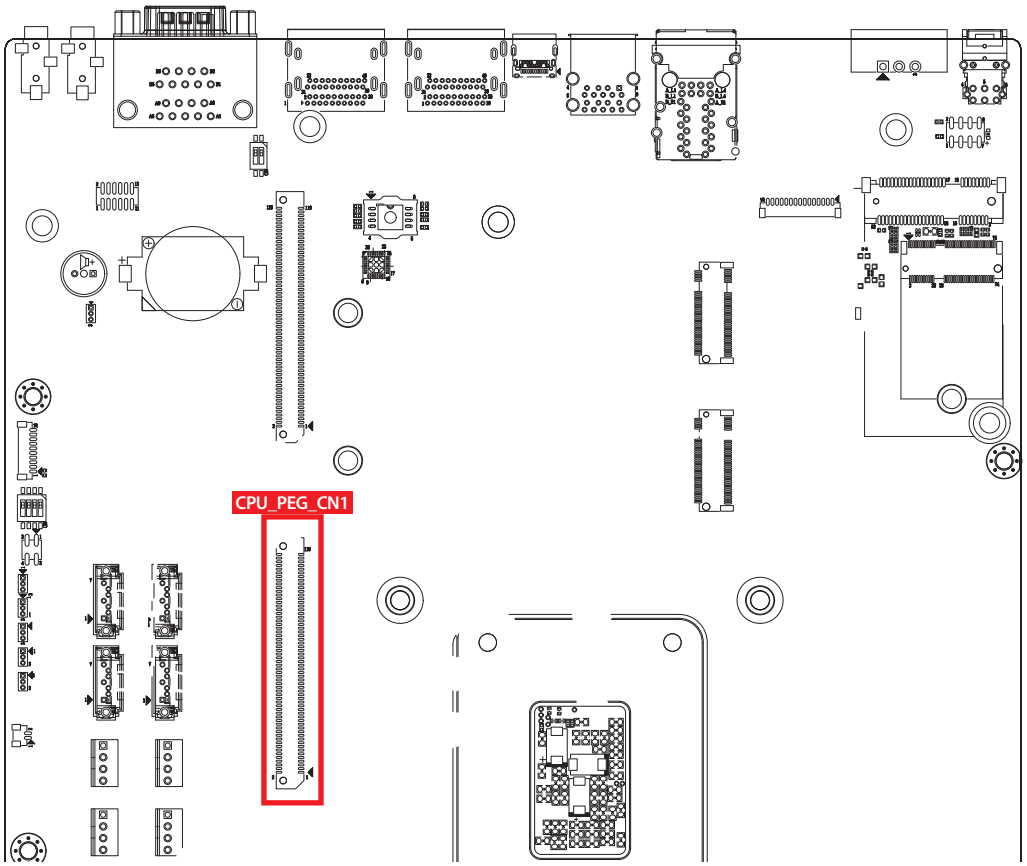
The pin assignments of PCH_PCIE_CN1 are listed in the following table :



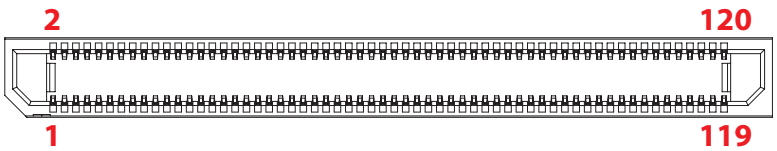
Pin No.	Function	Pin No.	Function
1	GND	2	GND
3	CLK100M_CPU_3_N	4	CLK100M_CPU_2_N
5	CLK100M_CPU_3_P	6	CLK100M_CPU_2_P
7	GND	8	GND
9	CLK100M_CPU_1_N	10	PCIE24_RX_N
11	CLK100M_CPU_1_P	12	PCIE24_RX_P
13	GND	14	GND
15	PCIE24_TX_N	16	PCIE23_RX_N
17	PCIE24_TX_P	18	PCIE23_RX_P
19	GND	20	GND
21	PCIE23_TX_N	22	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 Conn. (CPU)



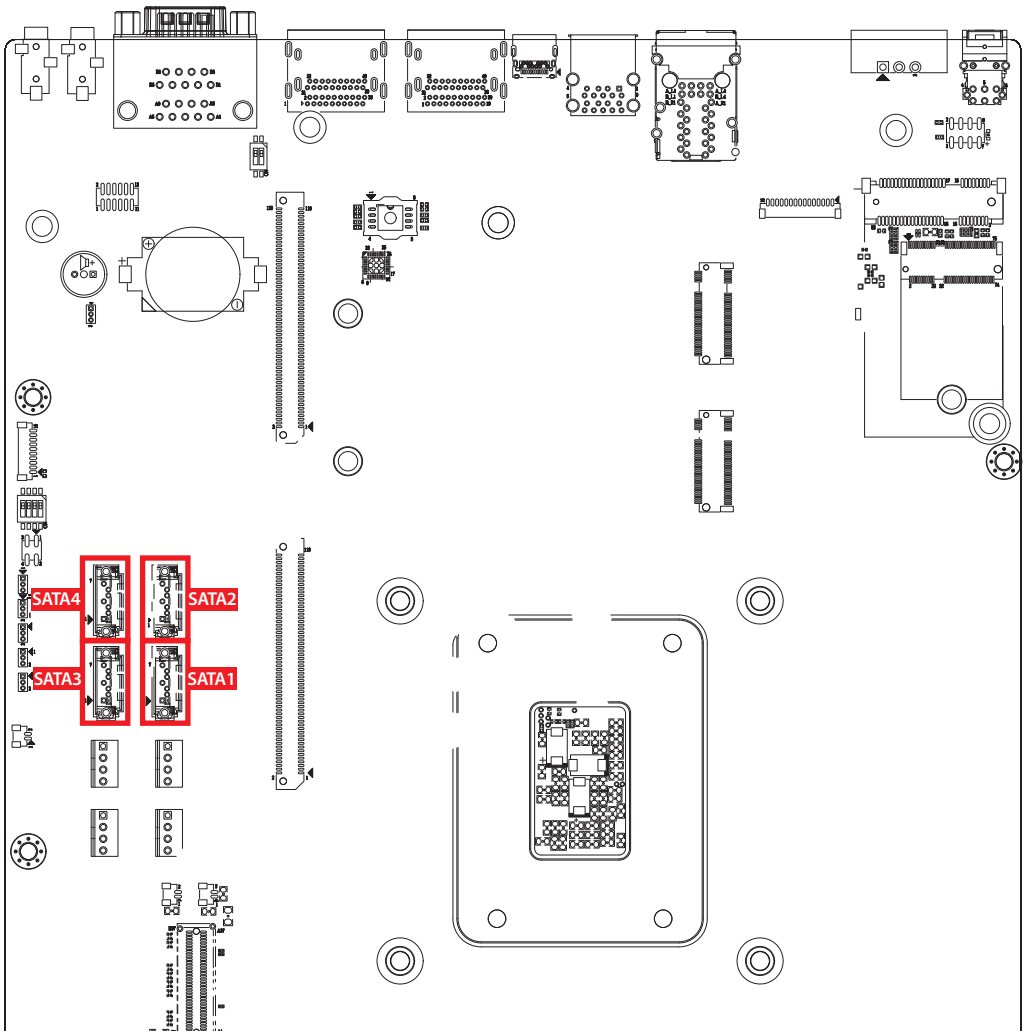
The pin assignments of CPU_PEG_CN1 are listed in the following table :



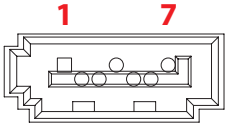
Pin No.	Function	Pin No.	Function
1	+V12S	2	+V12S
3	+V12S	4	+V12S
5	+V12S	6	+V12S
7	+V12S	8	+V12S
9	+V12S	10	+V12S
11	GND	12	GND
13	GND	14	GND
15	GND	16	GND
17	GND	18	GND
19	GND	20	GND
21	PEG_RX_DN_15	22	PEG_TX_DN_15
23	PEG_RX_DP_15	24	PEG_TX_DP_15
25	GND	26	GND
27	PEG_RX_DN_14	28	PEG_TX_DN_14
29	PEG_RX_DP_14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

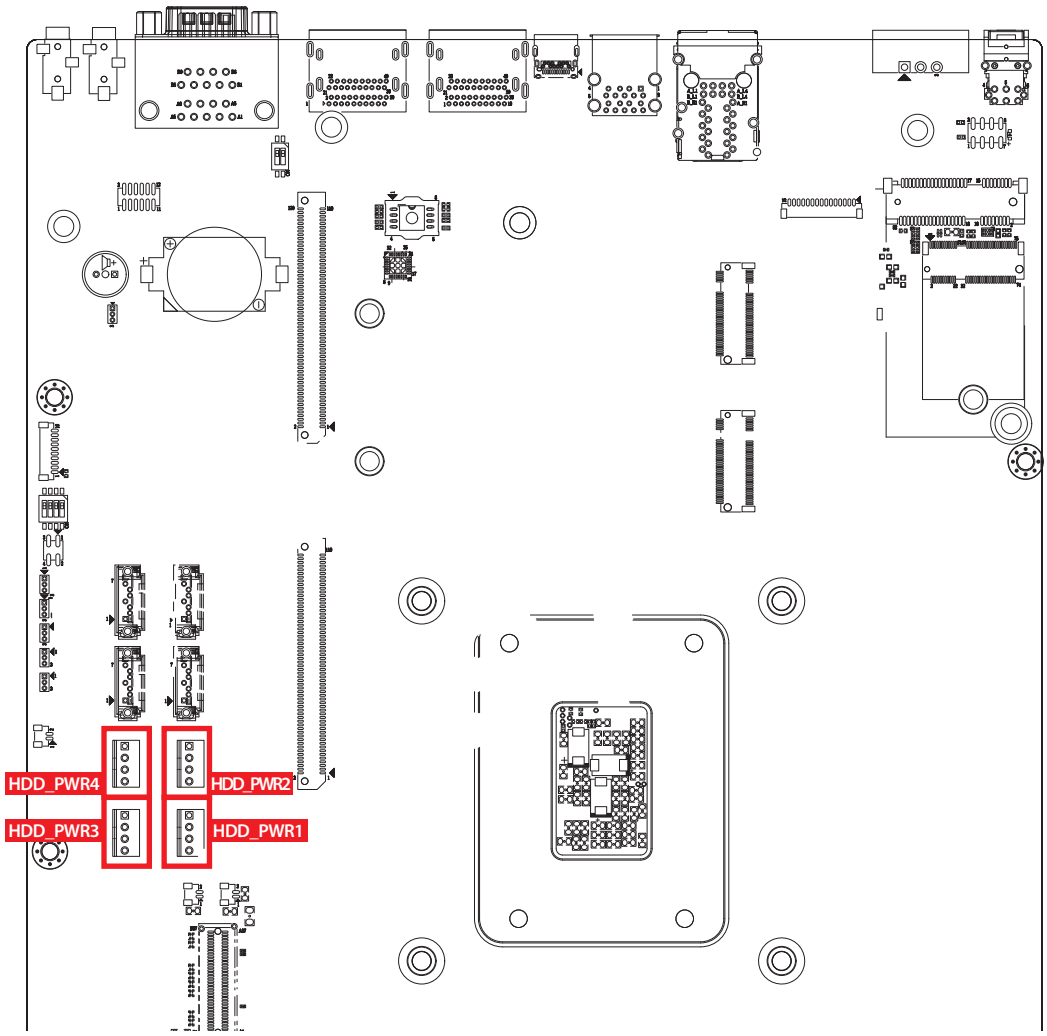


There are four onboard high performance Serial ATA III's (SATA III) on RCX-3000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1, SATA2, SATA3, and SATA4 are listed in the following table:

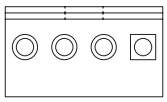


Pin No.	Definition	Pin No.	Definition
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

2.3.8 HDD_PWR1, HDD_PWR2, HDD_PWR3, HDD_PWR4 : SATA Power Connector

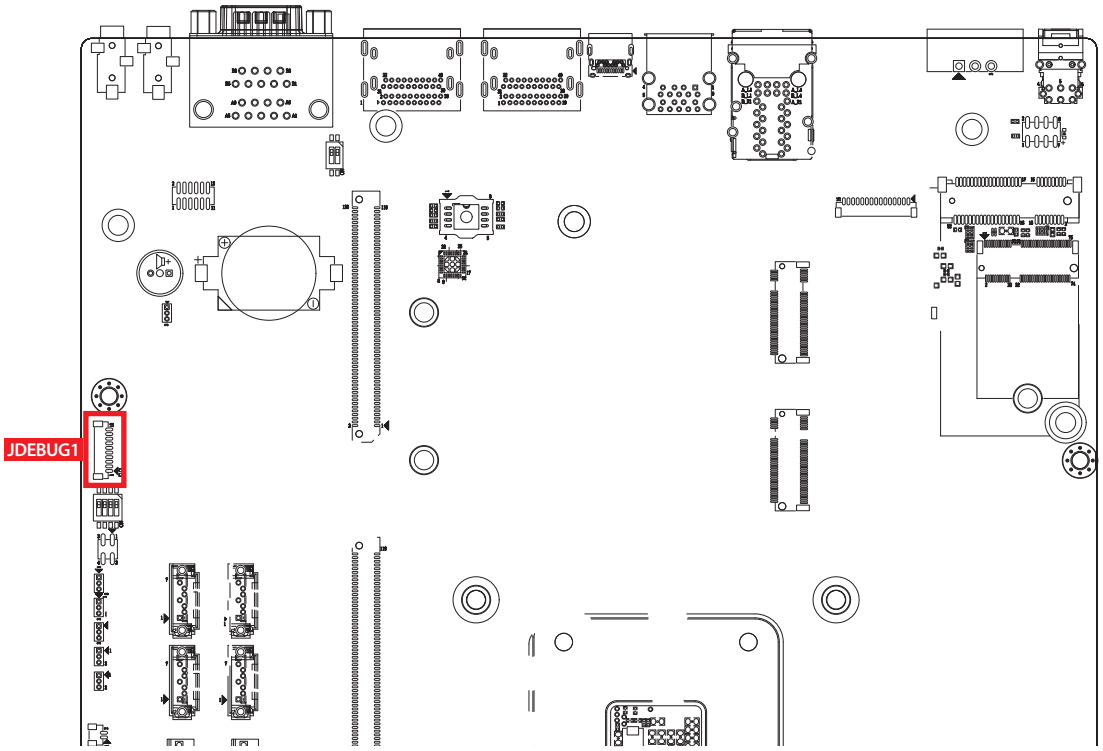


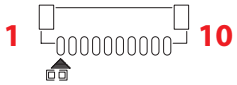
The RCX-3000 is also equipped with two SATA power connectors. It supports 5V (Up to 3A) and 12V (Up to 3A) currents to the hard drive or SSD. The pin assignments of HDD_PWR1 , HDD_PWR2 , HDD_PWR3 , HDD_PWR4 are listed in the following table:



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

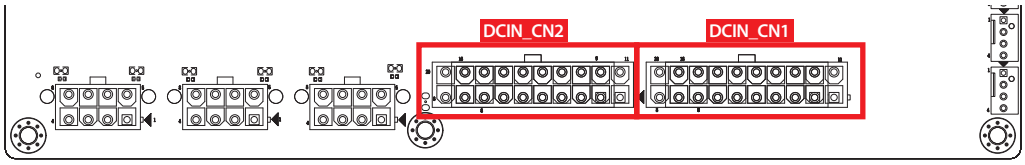
2.3.9 JDEBUG1 : ESPI Port 80 Debug Port

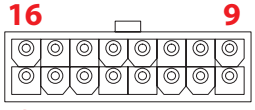




Pin No.	Definition	Pin No.	Definition
1	+V3.3S	2	Port 80_ESPI_CS#
3	Port 80_ESPI_IO0	4	Port 80_ESPI_IO1
5	Port 80_ESPI_IO2	6	Port 80_ESPI_IO3
7	GND	8	Port 80_ESPI_CLK
9	Port 80_ESPI_RST#	10	GND

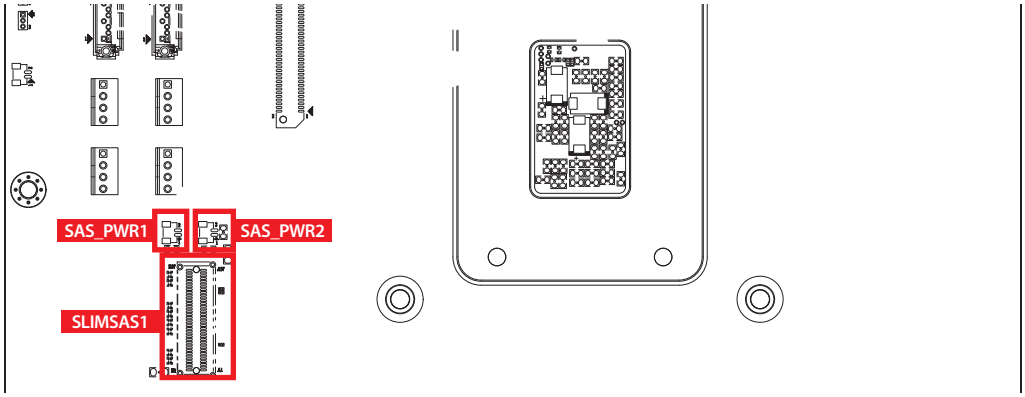
2.3.10 DCIN_CN1,DCIN_CN2 : DC input Connector(12V Only)



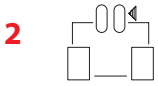


Pin No.	Definition	Pin No.	Definition
1	V-	9	V-
2	V-	10	V-
3	V-	11	V-
4	V-	12	V-
5	V+	13	V+
6	V+	14	V+
7	V+	15	V+
8	V+	16	V+

2.3.11 SAS_PWR1,2,SLIMSAS1 : Expansion M.2 Key Mx2 Slot(ECX-3000-M2D)

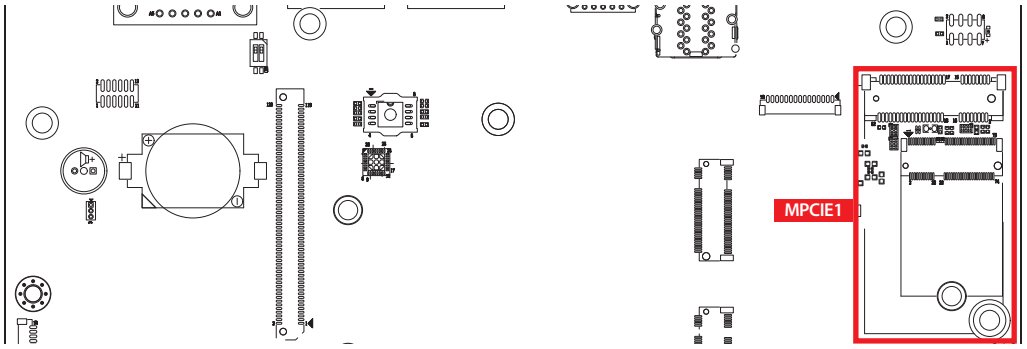


Location	PCIE
SLIMSAS1	CPU PCIEx4
	PCH PCIEx4

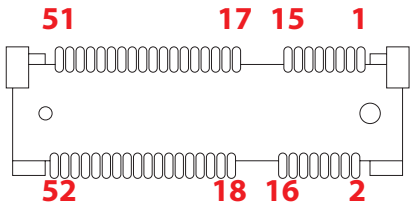


Location	Pin No.	Definition
SAS_PWR1,2	1	12V
	2	GND

2.3.12 MPCIE1 : Mini PCIe (PCIE Only)



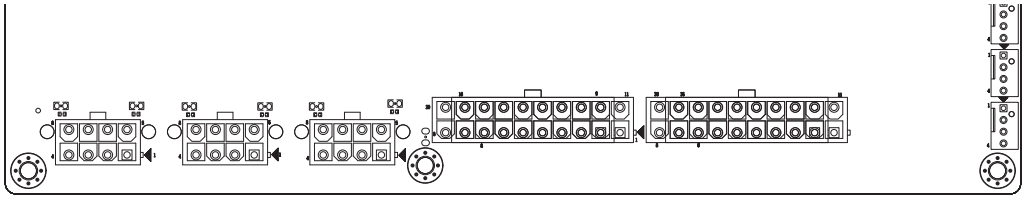
The pin assignments of MPCIE1 are listed in the following table:



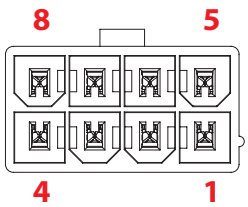
Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+V3.3A
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved
43	Reserved	44	Reserved
41	+V3.3A	42	Reserved
39	+V3.3A	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	Reserved
29	GND	30	Reserved
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+V3.3A
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND

Mechanical Key			
15	GND	16	UIM_VPP_2
13	REFCLK+	14	UIM_RESET_2
11	REFCLK-	12	UIM_CLK_2
9	GND	10	UIM_DATA_2
7	CLKREQ#	8	UIM_PWR_2
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	+V3.3A

2.3.13 ATX8PIN_1,ATX8PIN_2, ATX8PIN_3 : 8Pin ATX Power Connector

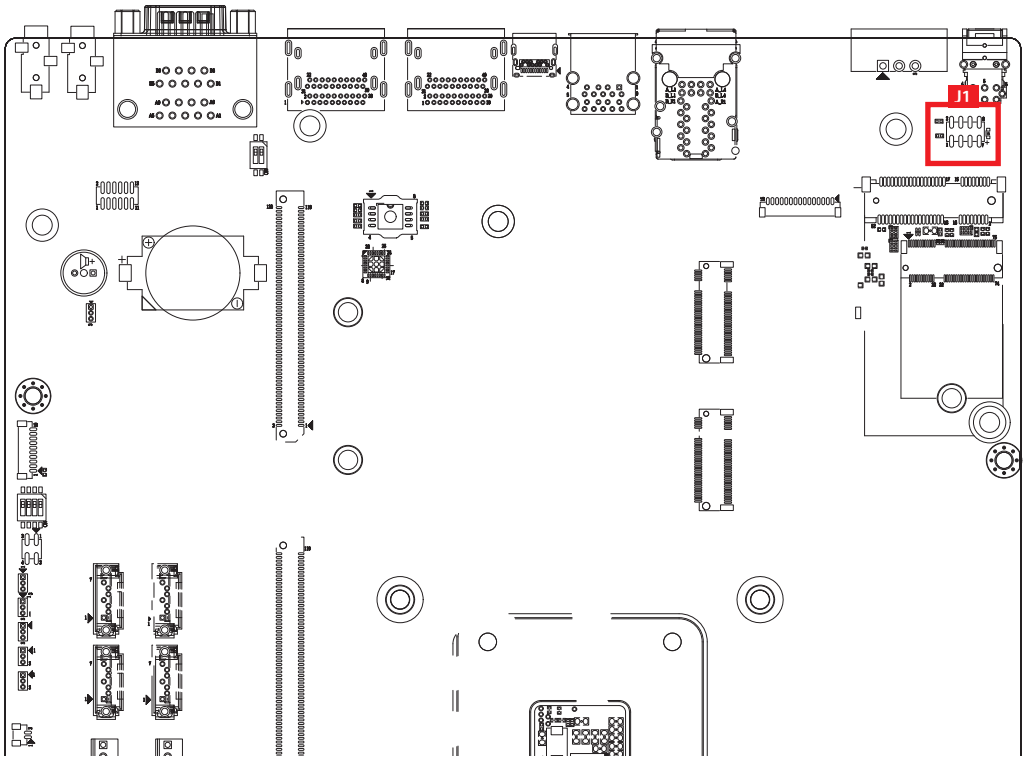


RCX-3000 +V12S total max 750W.
The pin assignments of ATX8PIN_1, ATX8PIN_2, ATX8PIN_3 are listed in the following table :



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

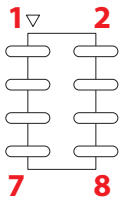
2.3.14 J1 : Miscellaneous Pin Header



2.0mm 2x4p header

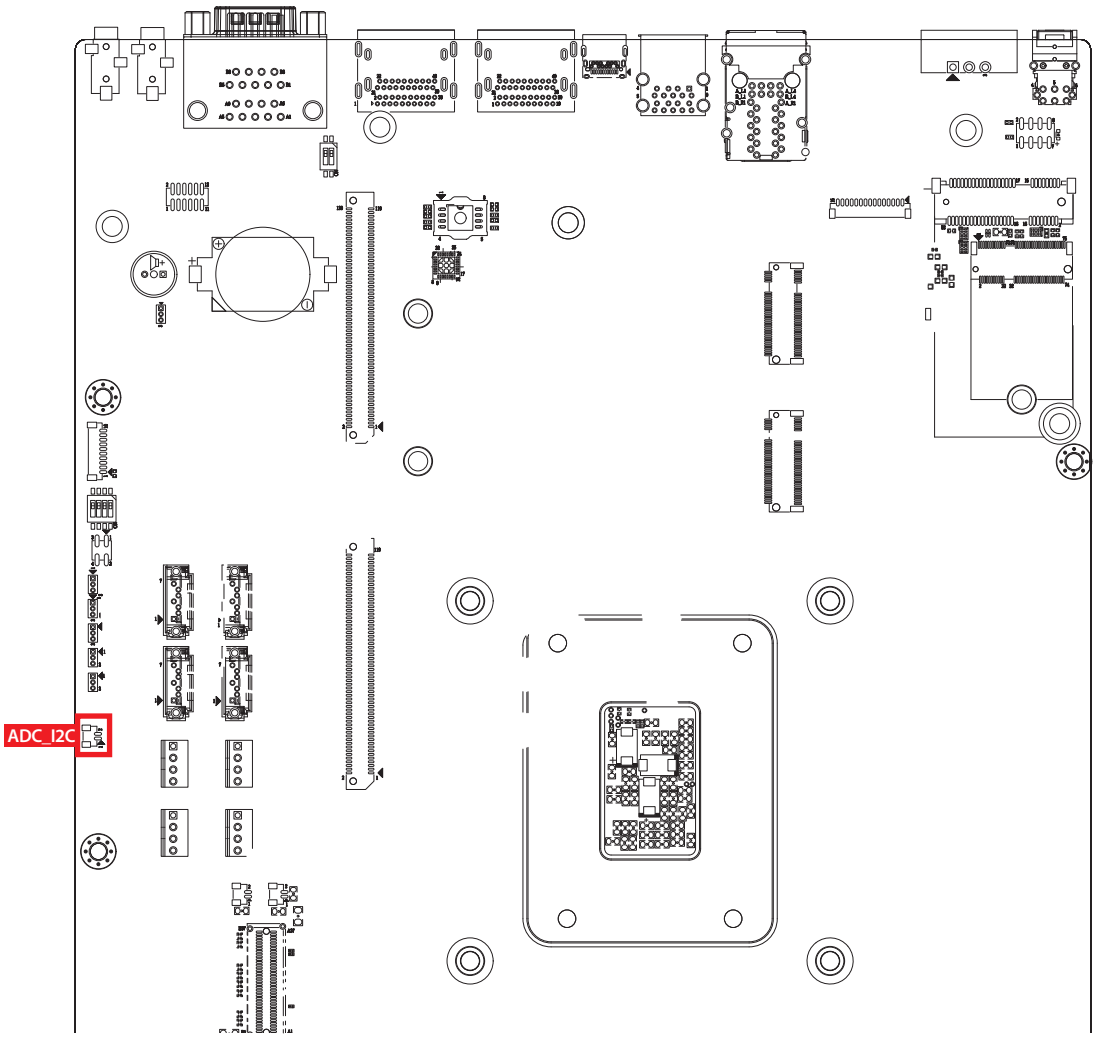
This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button.

The pin assignments of J1 are listed in the following table:

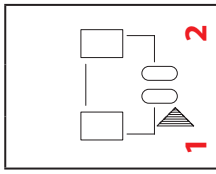


Group	Pin No.	Description
HDD LED	1	HDD_LED_P
	3	HDD_LED_N
RESET BUTTON	5	FP_RST_BTN_N
	7	Ground
POWER LED	2	PWR_LED_P
	4	PWR_LED_N
POWER BUTTON	6	FP_PWR_BTN_IN
	8	Ground

2.3.15 ADC_I2C : MCU I2C

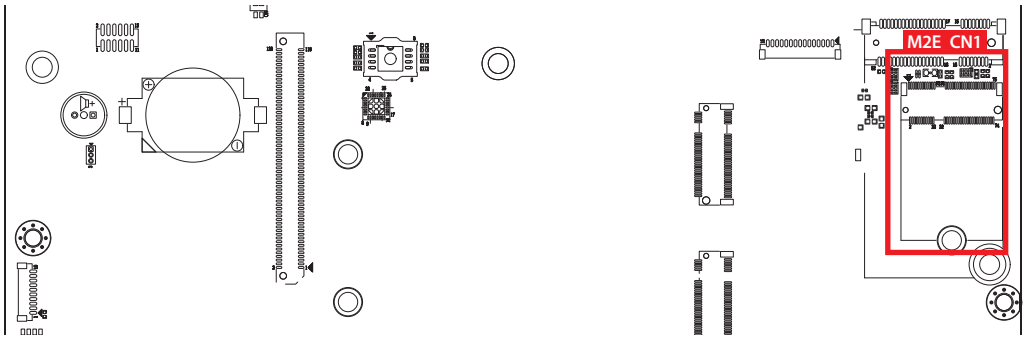


Sense input Voltage and Current I2C header.
For GPC-1000-DCB and RCX-3000-ACB Board.

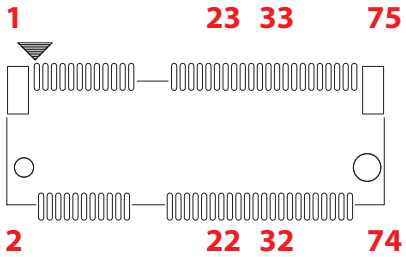


Group	Pin No.	Description
HDD LED	1	I2C0_SDA_MCU
	2	I2C0_SCL_MCU

2.3.16 M2E_CN1 : M.2 KEY E USB2, PCIex1 support



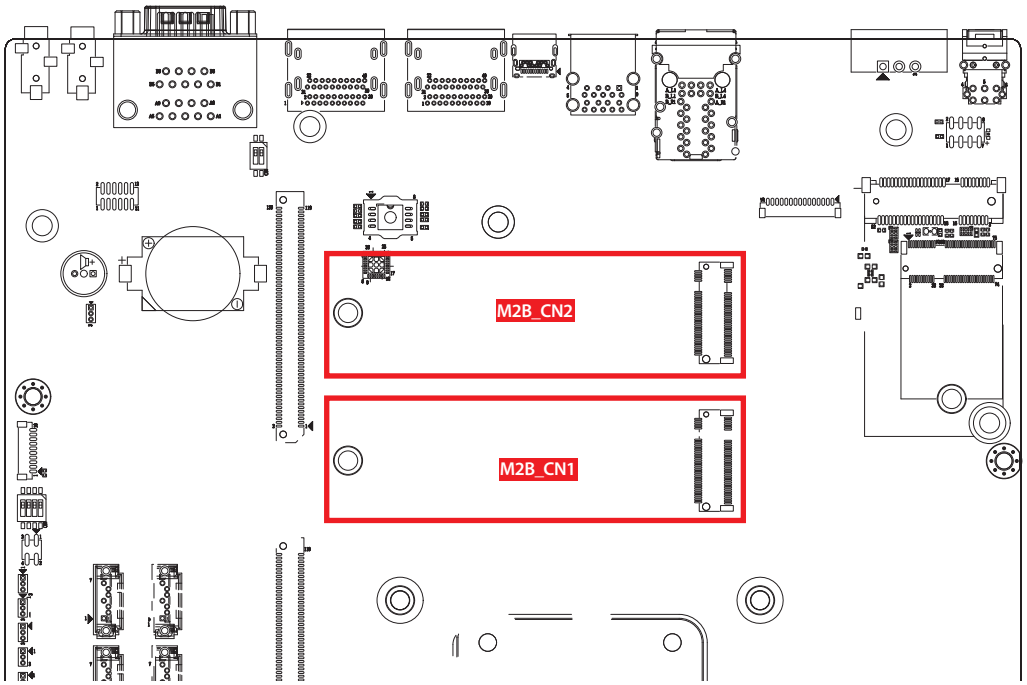
M.2 key E connector is suitable for applications that use wireless connectivity including Wi-Fi,Bluetooth, NFC of GNSS. Module card types include 2230
Pin Out :



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

43	PCIE_RX_N0	42	NC
41	PCIE_RX_P0	40	NC
39	GND	38	NC
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 M2B_CN1, M2B_CN2 : M.2 KEY B USB3,USB2,PCIe Support

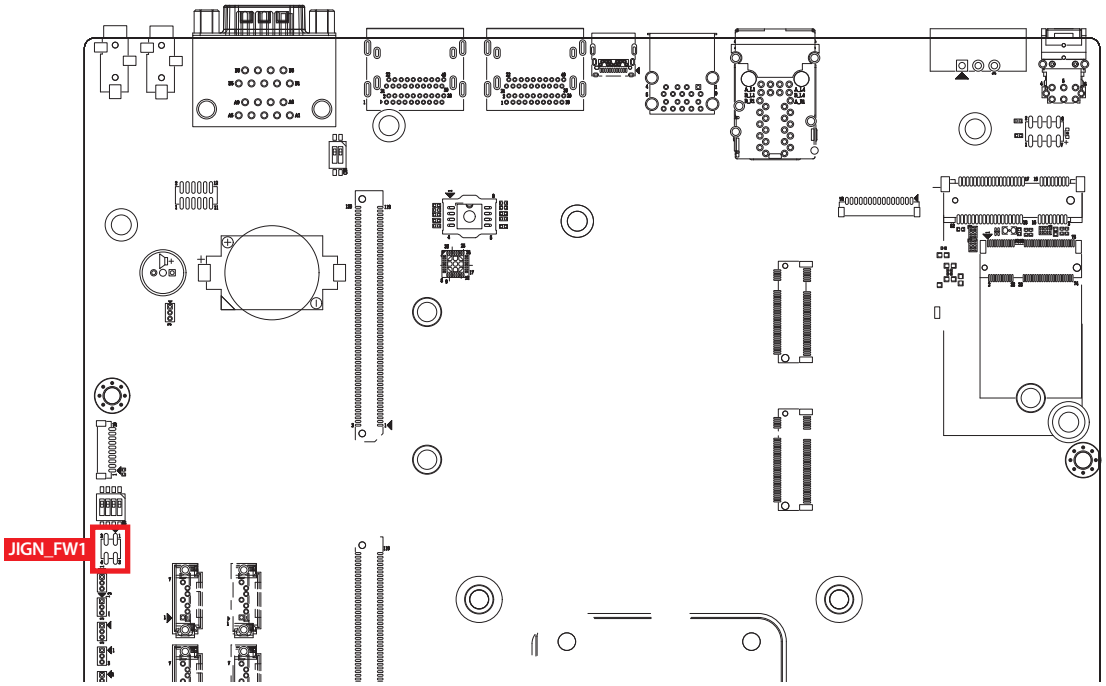


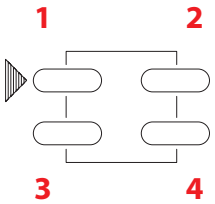
USB3.0/USB2.0 Support(Default) , PCIex2(BIOS control)
Module card types include 3042,3052,2280.
Pin Out :

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

Pin No.	Signal Name	Pin No.	Signal Name
61	NC	60	NC
59	NC	58	NC
57	GND	56	NC
55	PCIE_100M_CLK_P	54	PCIE_WAKE#
53	PCIE_100M_CLK_N	52	PCIE_CLK_REQ
51	GND	50	PLTRST#
49	(default) USB_TX_1P,PCIe_TX_1P	48	NC
47	(default) USB_TX_1N, PCIe_ TX_1N	46	NC
45	GND	44	NC
43	(default) USB_RX_1P, PCIe_RX_1P	42	NC
41	(default) USB_RX_1N, PCIe_RX_1N	40	NC
39	GND	38	DEVSLP
37	(default) USB_TX_2P, PCIe_TX_2P	36	UIM_PWR
35	(default) USB_TX_2N, PCIe_ TX_2N	34	UIM_DATA
33	GND	32	UIM_CLK
31	(default) USB_RX_2P, PCIe_RX_2P	30	UIM_RESET
29	(default) USB_RX_2N, PCIe_RX_2N	28	NC
27	GND	26	NC
25	NC	24	NC
23	NC	22	NC
21	NC	20	NC
Mechanical Key			
11	GND		
9	USB-	10	LED1#
7	USB+	8	NC
5	GND	6	FULL_CARD_PWR_OFF
3	GND	4	+V3.3A
1	NC	2	+V3.3A

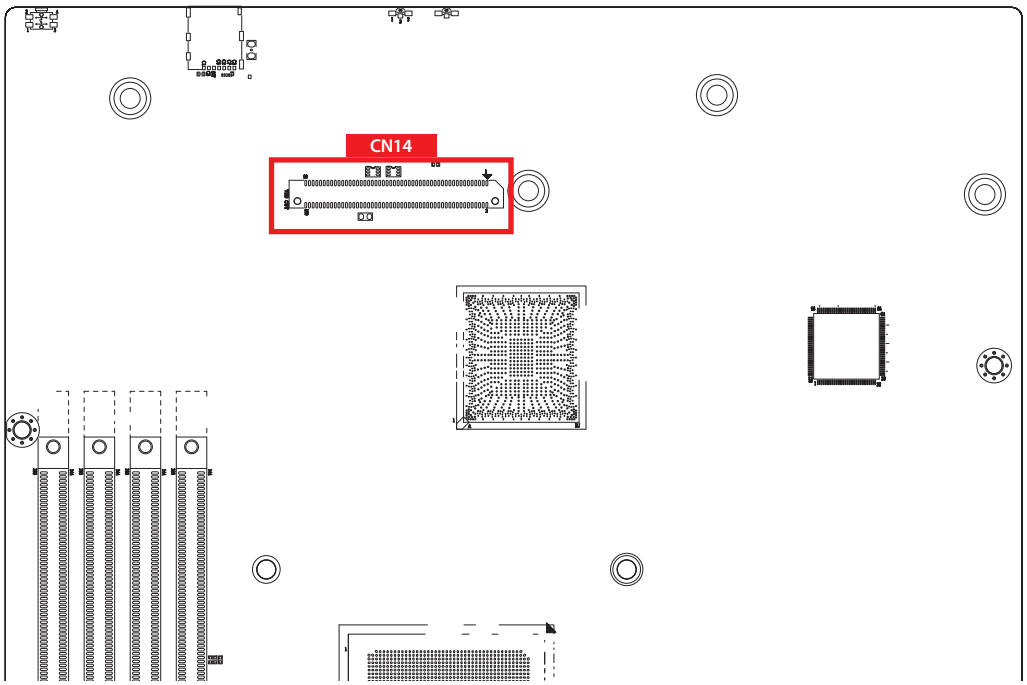
2.3.18 JIGN_FW1 : IGNITION FW Programming Header



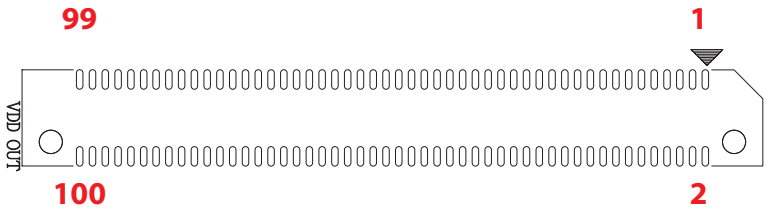


Pin No.	Description
1	GND
2	MCU_RST#
3	+V3.3_MCU
4	MCU_PRG

2.3.19 CN14 : IO Board Connector



The pin assignments of CN14 are listed in the following table:

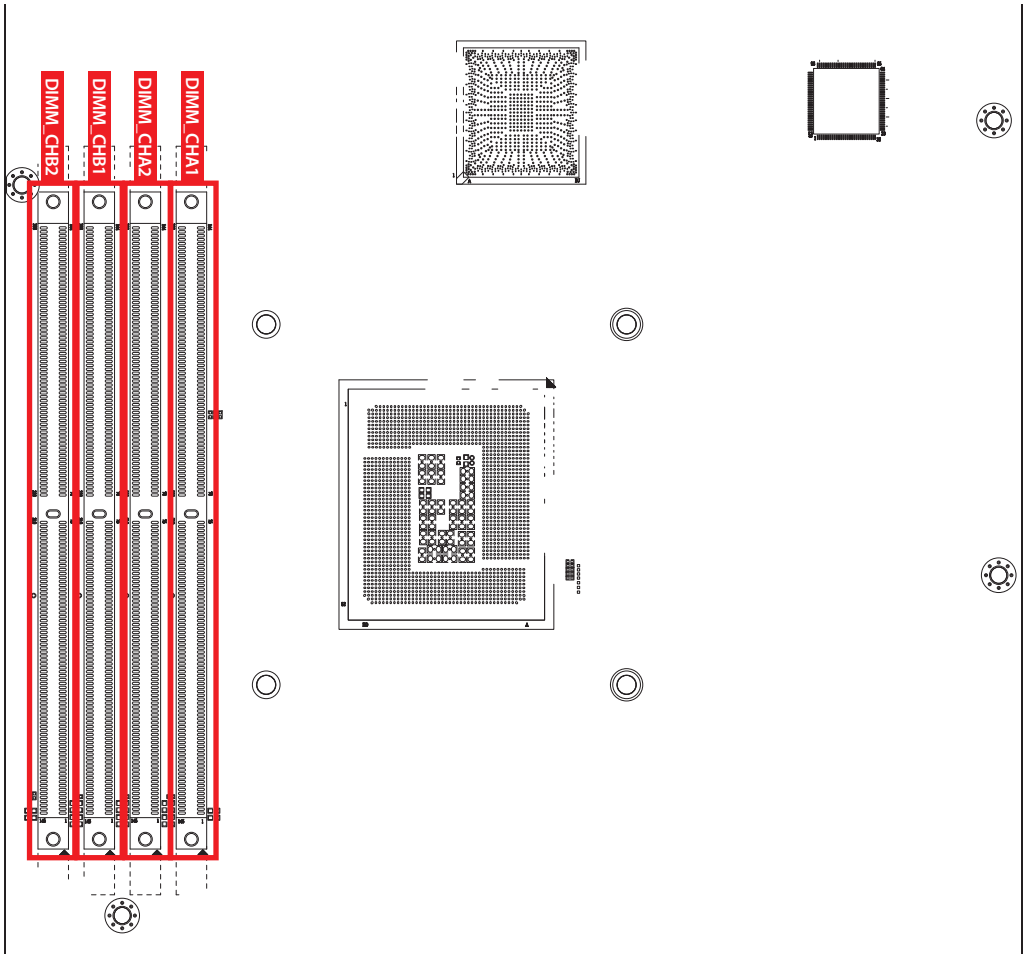


Pin No.	Signal Name	Pin No.	Signal Name
1	UIM_PWR_1	2	UIM_PWR_2
3	UIM_DATA_1	4	UIM_DATA_2
5	UIM_CLK_1	6	UIM_CLK_2
7	UIM_RESET_1	8	UIM_RESET_2
9	UIM_VPP_1	10	UIM_VPP_2
11	SIO_GPI80	12	DIO2_GPI0
13	SIO_GPI81	14	DIO2_GPI1
15	SIO_GPI82	16	DIO2_GPI2
17	SIO_GPI83	18	DIO2_GPI3
19	SIO_GPI84	20	DIO2_GPI4

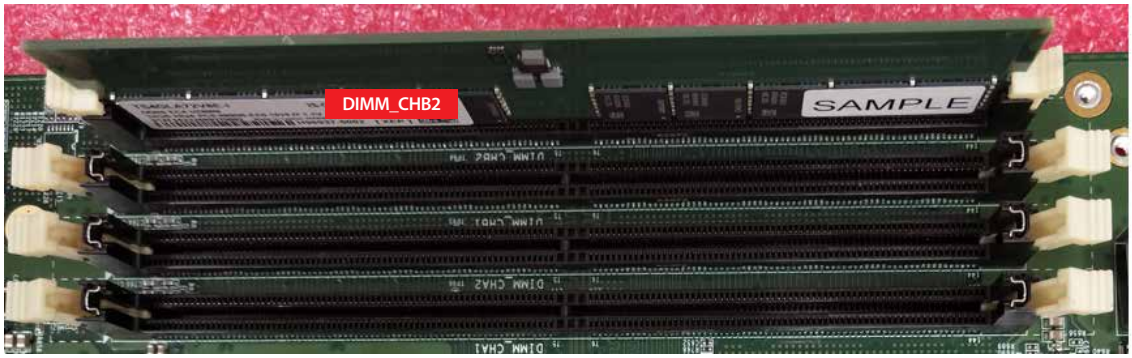
21	SIO_GPI85	22	DIO2_GPI5
23	SIO_GPI86	24	DIO2_GPI6
25	SIO_GPI87	26	DIO2_GPI7
27	SIO_GPO70	28	DIO2_GPO0
29	SIO_GPO71	30	DIO2_GPO1
31	SIO_GPO72	32	DIO2_GPO2
33	SIO_GPO73	34	DIO2_GPO3
35	SIO_GPO74	36	DIO2_GPO4
37	SIO_GPO75	38	DIO2_GPO5
39	SIO_GPO76	40	DIO2_GPO6
41	SIO_GPO77	42	DIO2_GPO7
43	GND	44	GND
45	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
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

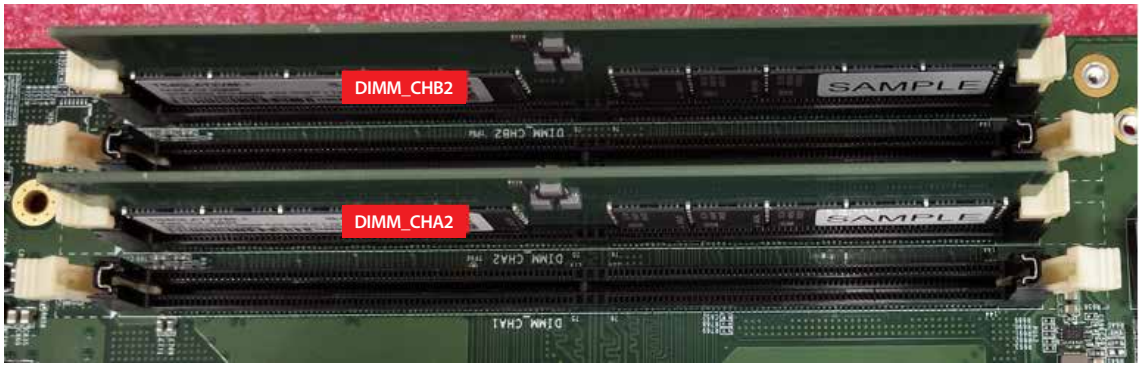
71	+V3.3S	72	+V3.3S
73	GND	74	GND
75	SIO_GP60	76	SIO_GP47
77	SIO_GP61	78	SIO_GP62
79	GND	80	GND
81	USB3_PCH_RXN1	82	USB3_PCH_RXN2
83	USB3_PCH_RXP1	84	USB3_PCH_RXP2
85	GND	86	GND
87	USB3_PCH_TXN1	88	USB3_PCH_TXN2
89	USB3_PCH_TXP1	90	USB3_PCH_TXP2
91	GND	92	GND
93	USB_P1_DP	94	USB_P2_DP
95	USB_P1_DN	96	USB_P2_DN
97	+V5A	98	+V5A
99	+V5A	100	+V5A

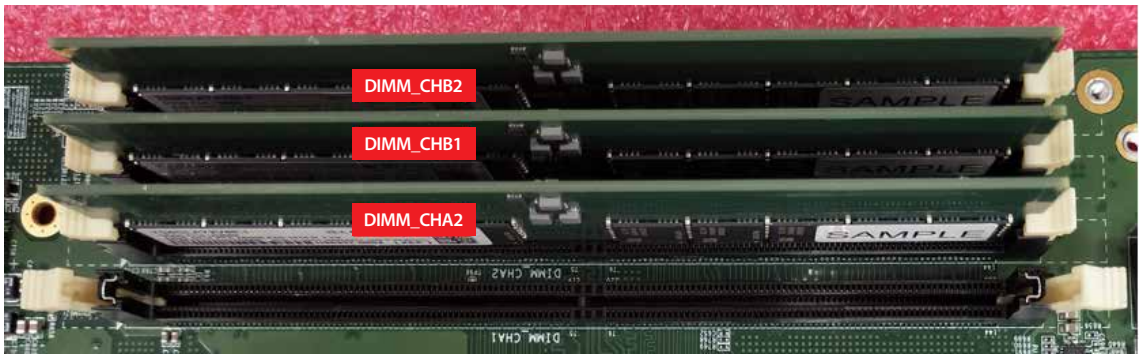
2.3.20 DIMM_CHA1, DIMM_CHA2, DIMM_CHB1, DIMM_CHB2 : DDR5 U-DIMM slot

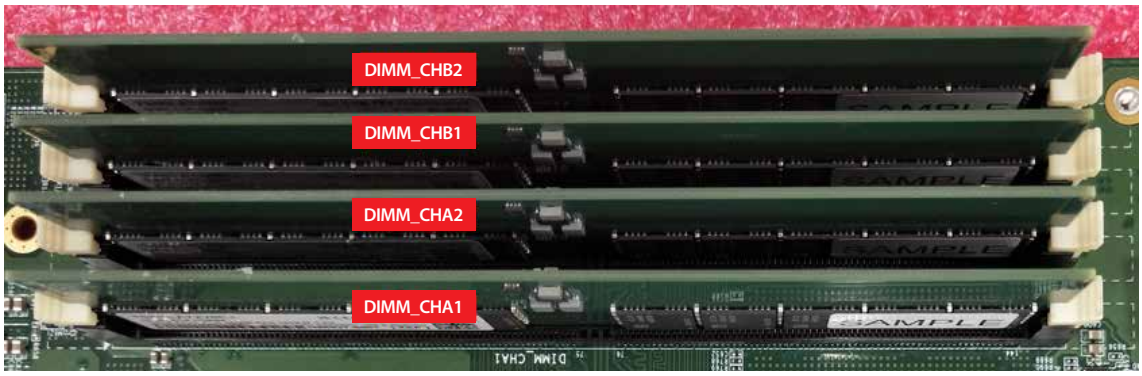


4 DDR4 U-DIMM, up to 128GB.





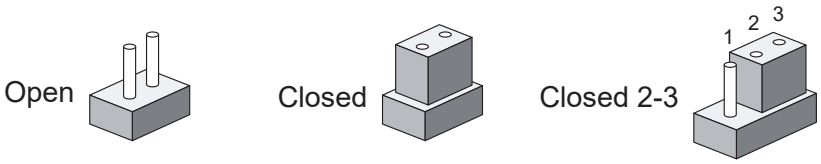




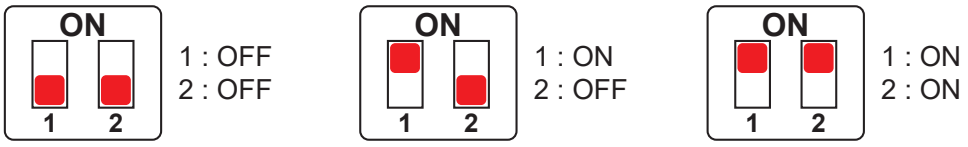
SODIMM Quantity	Location
1	DIMM_CHB2
2	DIMM_CHB2 , DIMM_CHA2
3	DIMM_CHB1, DIMM_CHB2 , DIMM_CHA2
4	DIMM_CHB1, DIMM_CHB2 , DIMM_CHA1, DIMM_CHA2

2.4 Main Board Jumper Settings

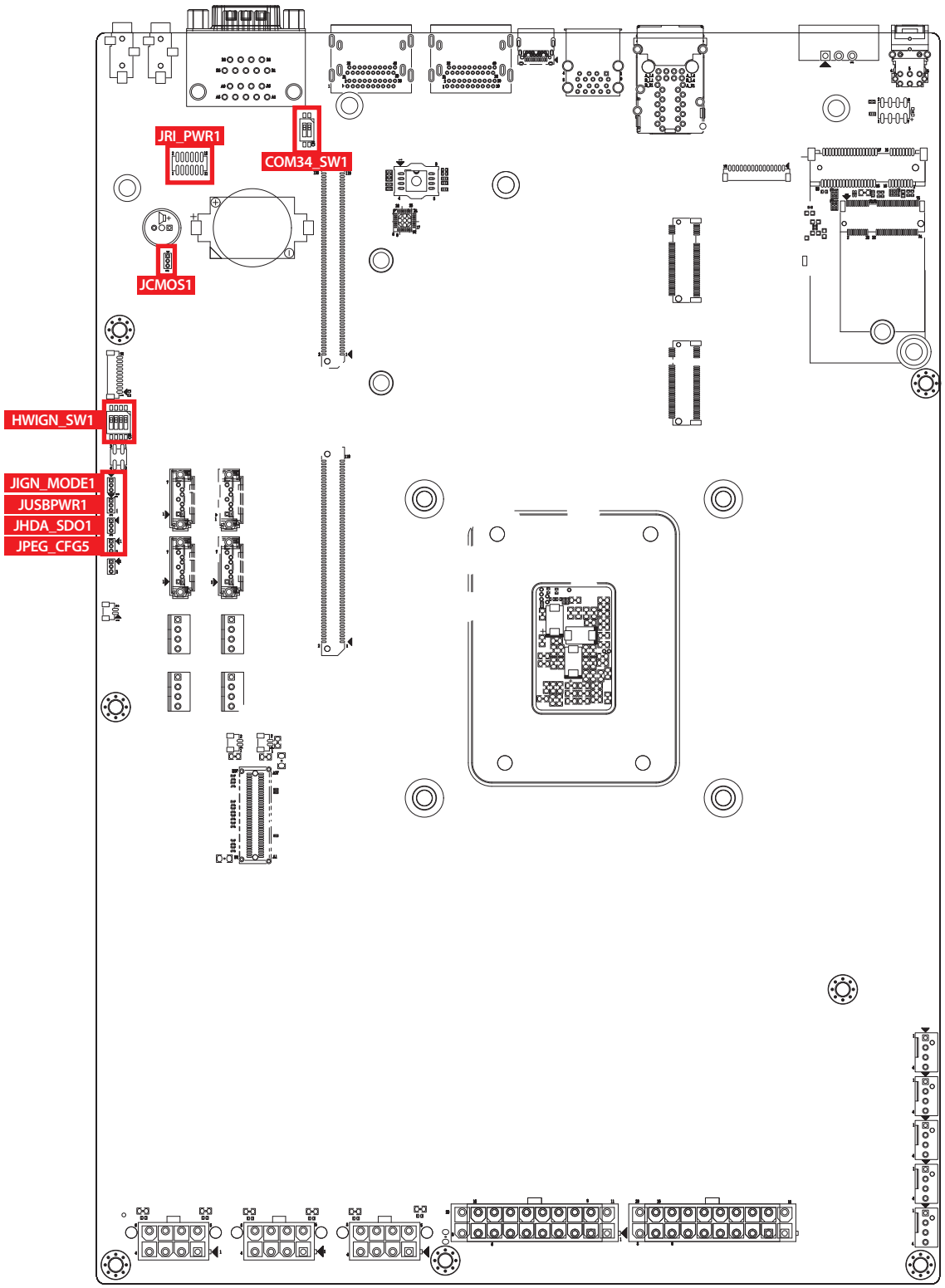
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper,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



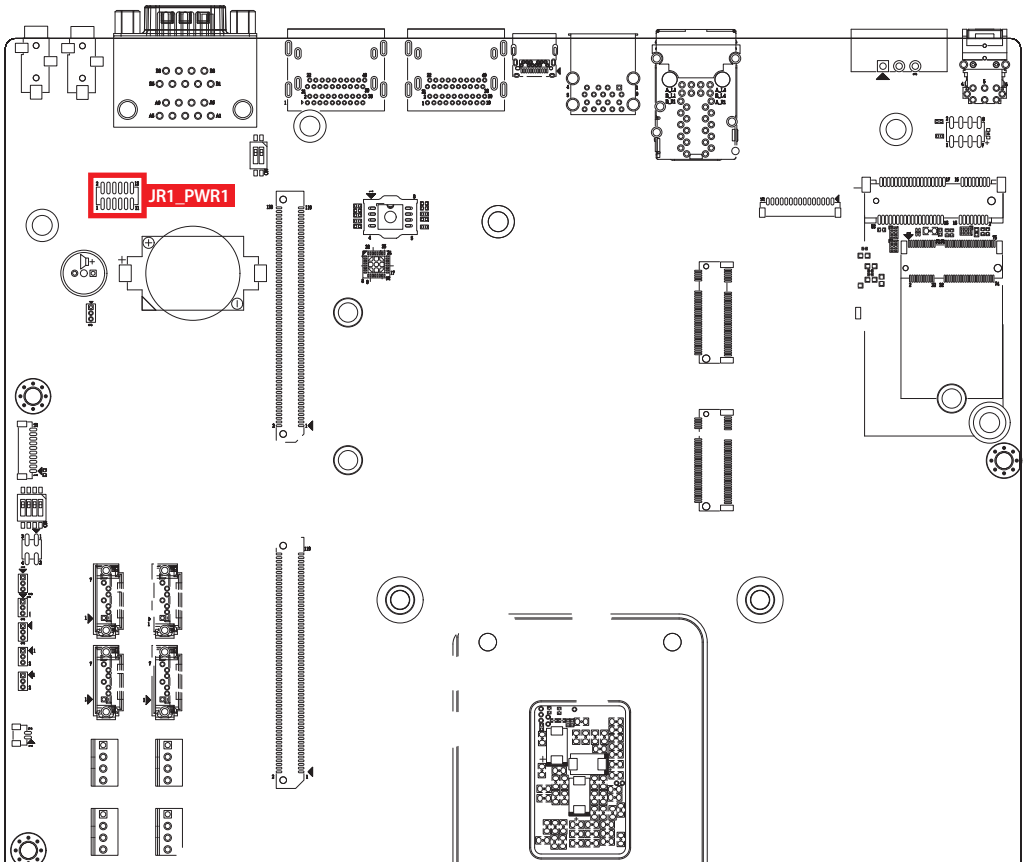
You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.

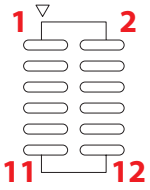


2.4.1 Front View of RCX-3000 Main Board With Ju mper Location



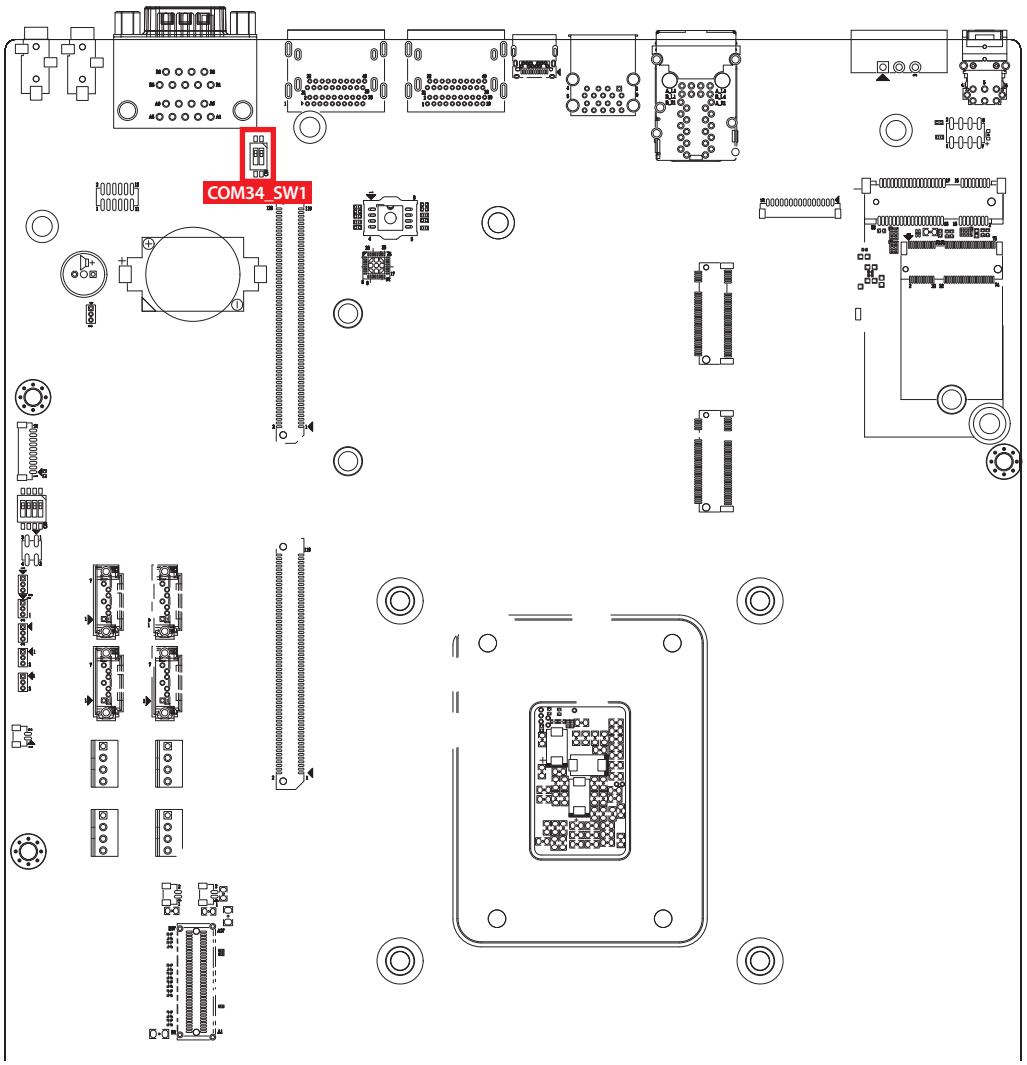
2.4.2 JRI_PWR1 : COM3, COM4 RI Pin Function





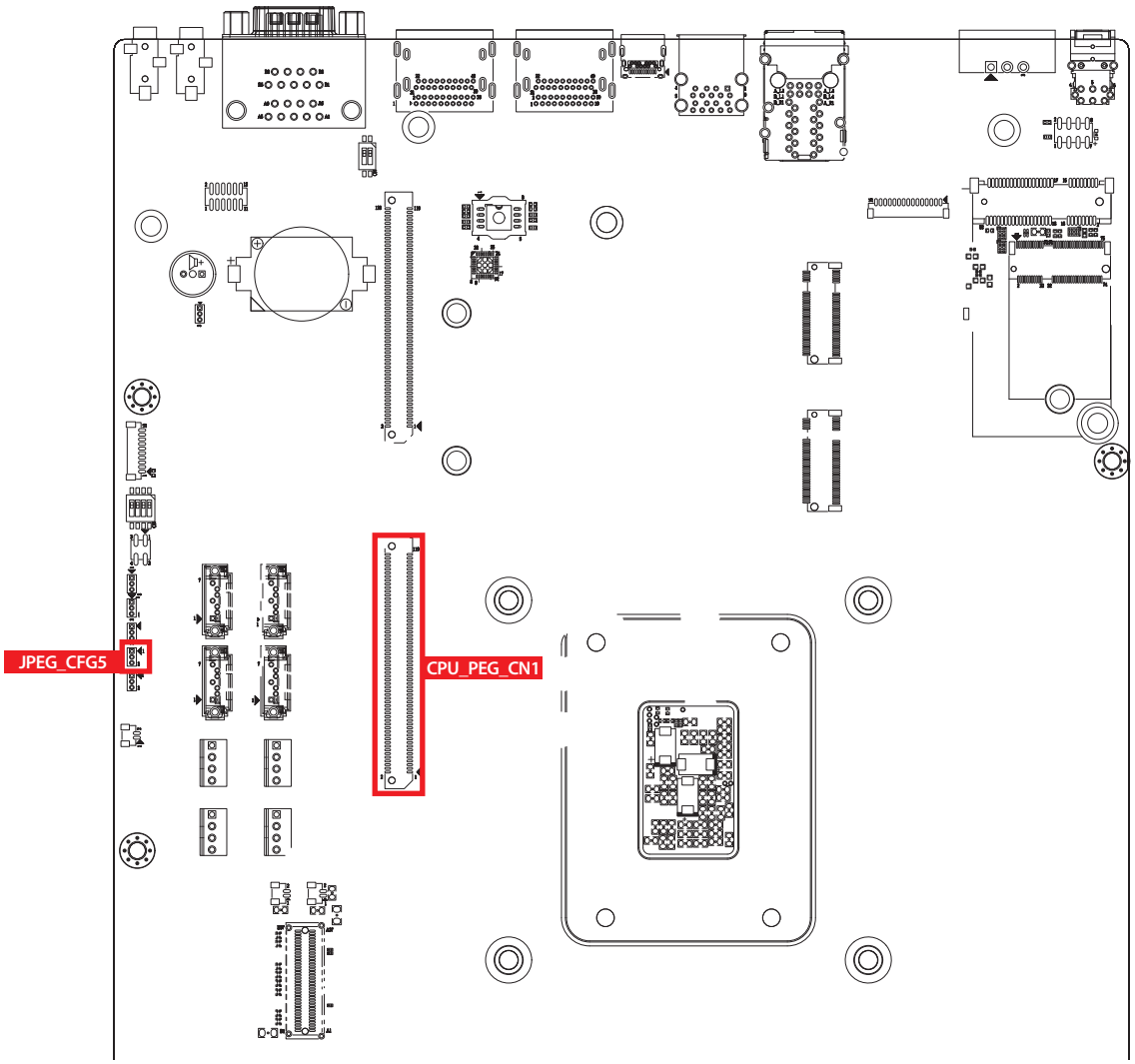
Group	Setting	Description
COM3	1 - 2	+5V (1A max.)
	3 - 4	+12V (0.5A max.)
	5 - 6	RI (Default)
COM4	7 - 8	+5V (1A max.)
	9 - 10	+12V (0.5A max.)
	11 - 12	RI (Default)

2.4.3 COM34_SW1 : RS-485/422 RECEIVER TERMINATION RESISTANCE



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

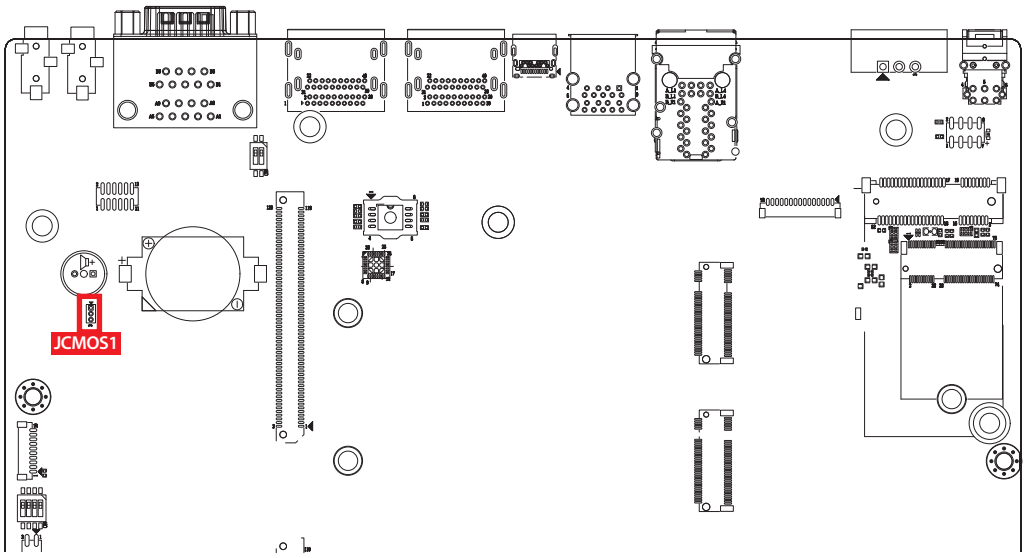
2.4.4 JPEG_CFG5 : CPU PEG (CPU_PEG_CN1) Configuration



CPU PEG (CPU_PEG_CN1) configuration table as follows:

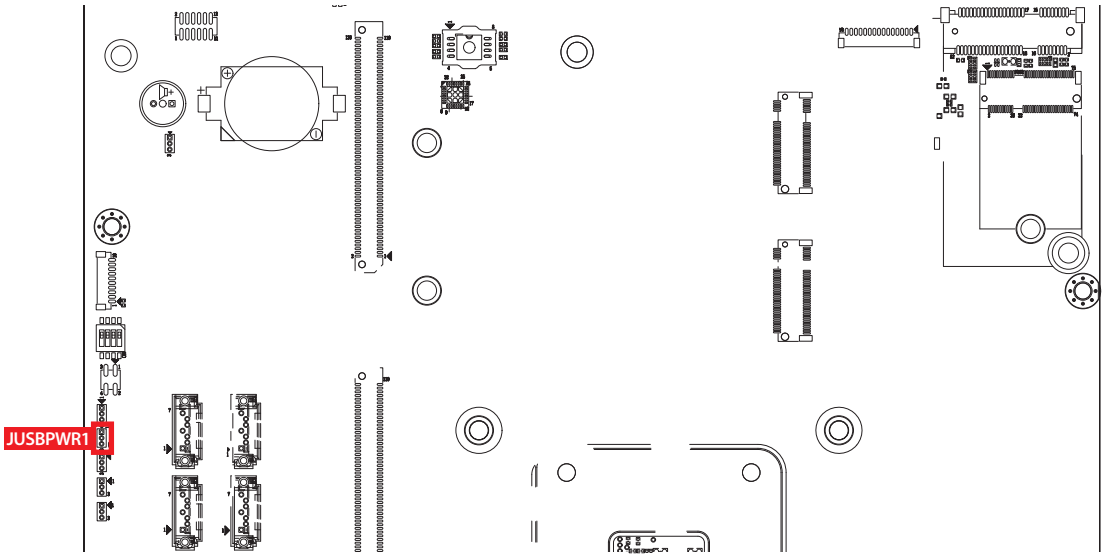
	Riser Card	PCIe Configuration	JPEG_CFG5
1 3	RCX-2750-BP	2 x 8	(2-3)
	RCX-2330-BP RCX-2430-BP	1 x16(Default)	(1-2)

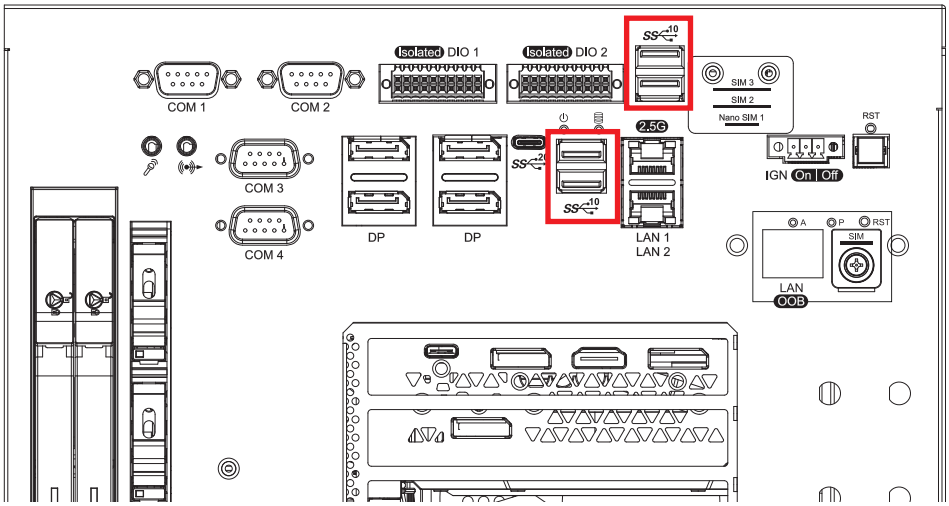
2.4.5 JCMOS1 : Clear CMOS



	Setting	Description
 3 1	1-2	Normal (Default)
	2-3	Clear CMOS

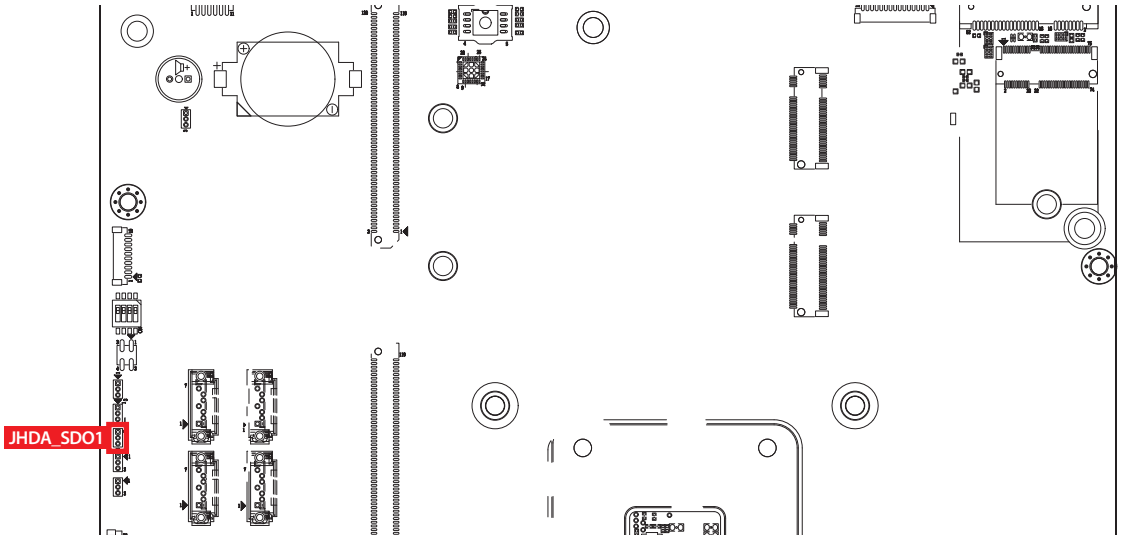
2.4.6 JUSBPWR1 : USB Wake Up





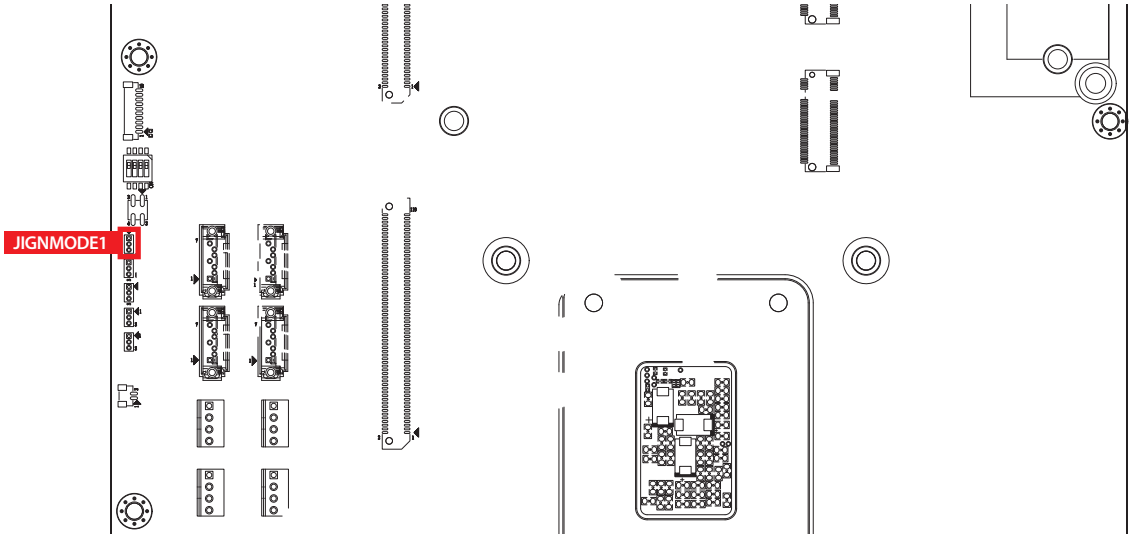
Setting	Definition
(1-2)	USB 3.0 and USB 2.0 Wake Up Enable (Default)
(2-3)	USB 3.0 and USB 2.0 Wake Up Disable

2.4.7 JHDA_SDO1



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

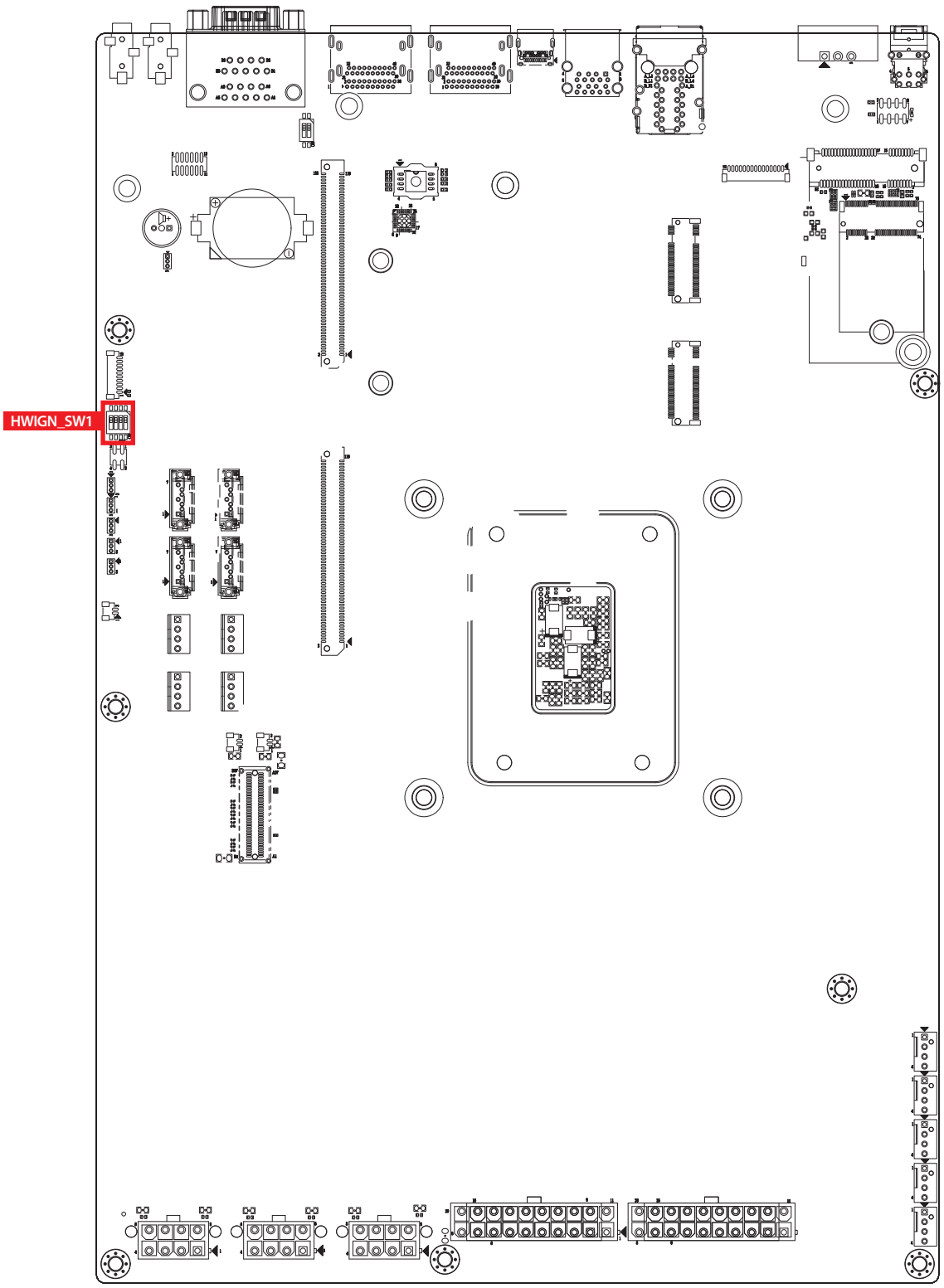
2.4.8 JIGNMODE1 : IGN Mode



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

2.5 Ignition Control

2.5.1 IGN_SW1 : Ignition Control (HW)

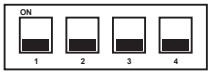
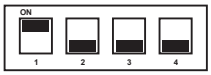
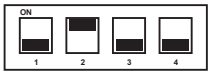
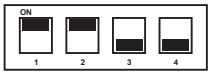
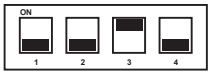
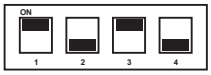
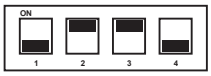
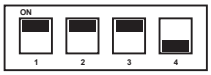
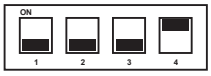
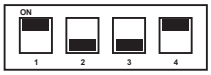
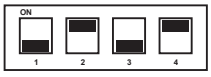
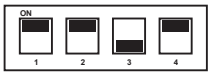
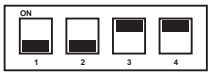
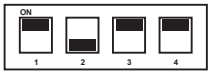
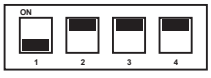
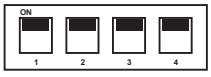


The RCX-3000 PEG provide ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay period.

2.5.2 Adjust Ignition Control Modes

The RCX-3000 PEG provide sixteen modes of different power on/off delay periodsadjustable via rotary switch. The default rotary switch is set to 0 in ATX/ AT power mode.

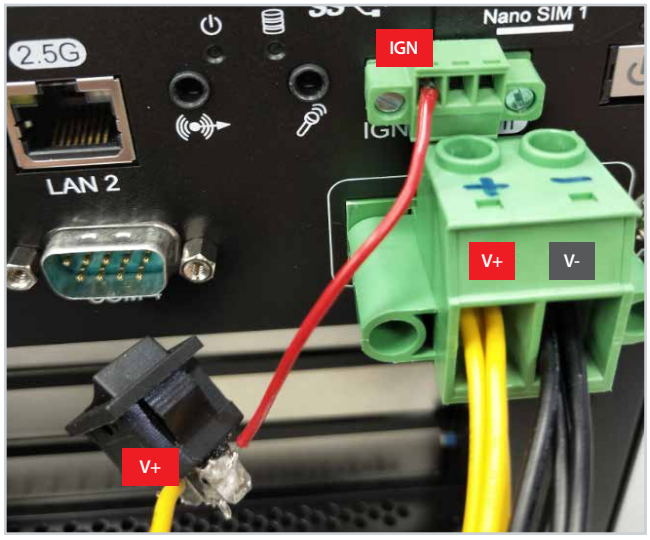
The modes are listed in the following table :

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

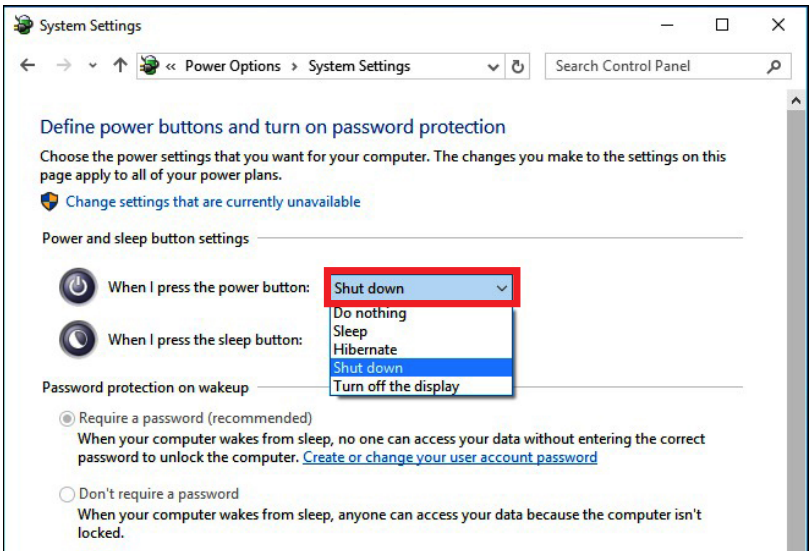
To activate ignition control, you need to provide IGN signal via the 3-pin plugable terminal block located on the front panel. Please use the following pictures to find the general wiring configuration.

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-3000 supports 16V to 50V wide range DC power input in ATX/AT mode.
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.

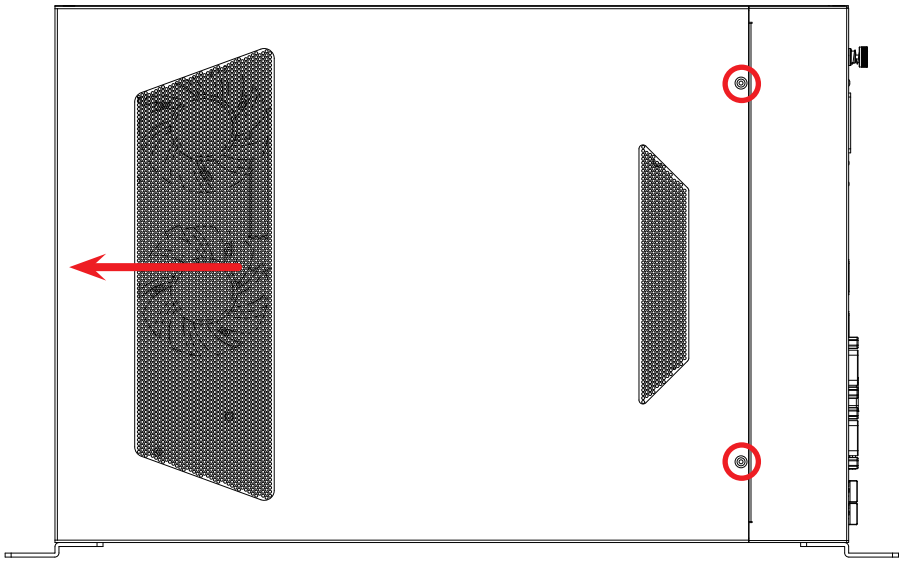
3

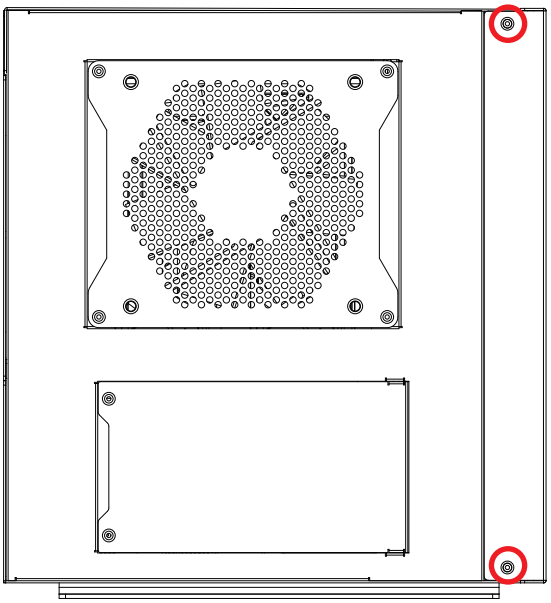
SYSTEM SETUP

3.1 How to open your RCX-3000 PEG

3.1.1 RCX-3000 PEG Series

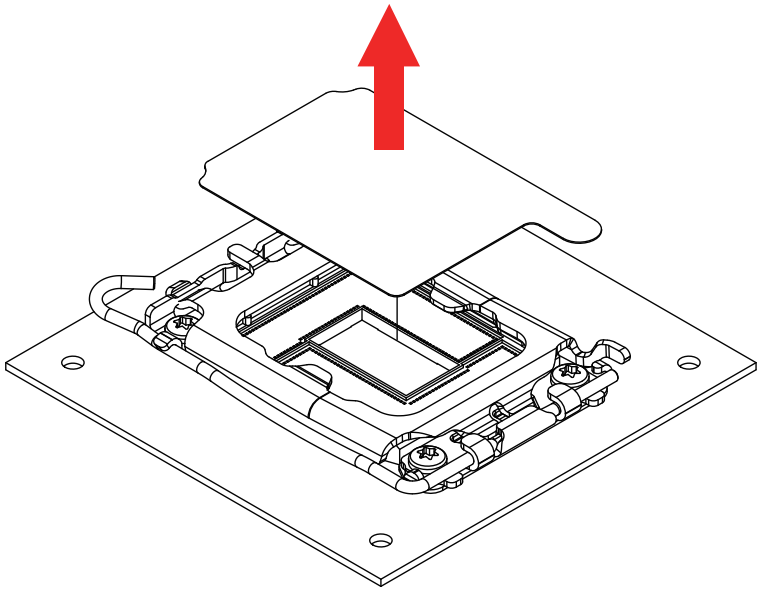
Remove the screws indicated and separate the Cover from the enclosure.



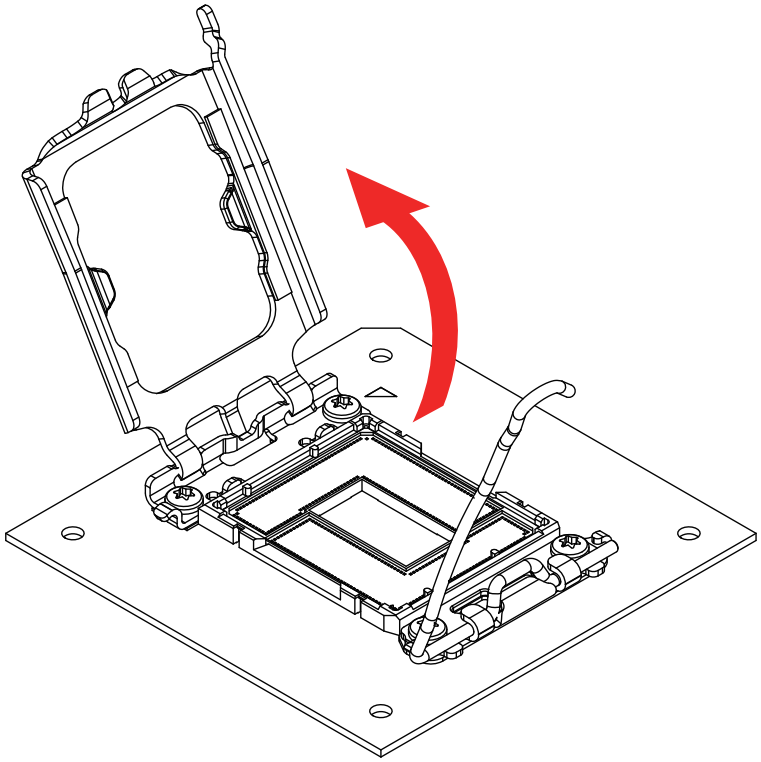


3.2 Installing CPU

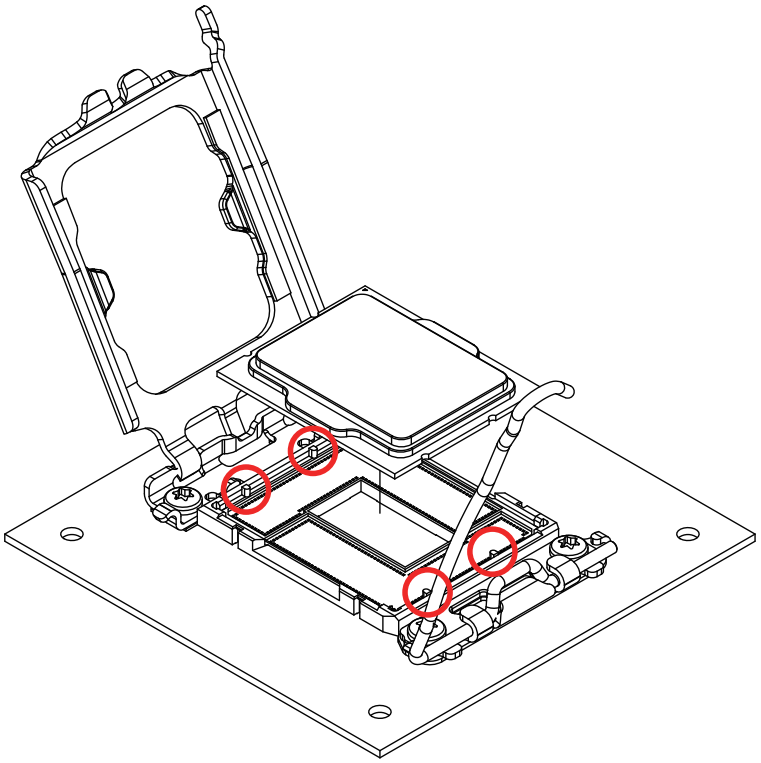
Step 1 Remove CPU mylar



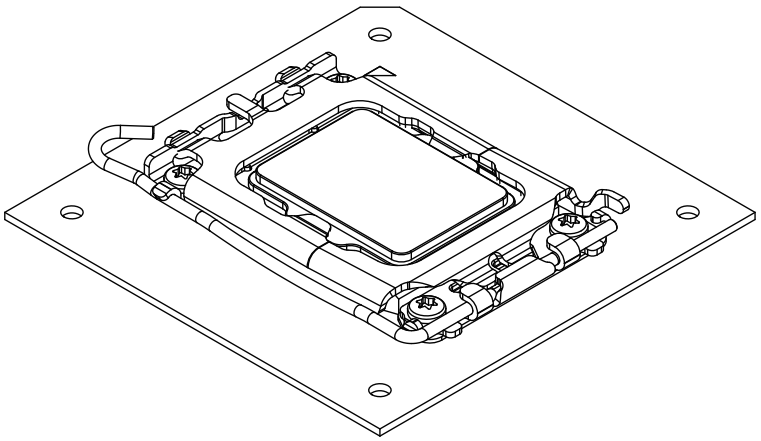
Step 2 Open CPU independent loading mechanism (ILM)



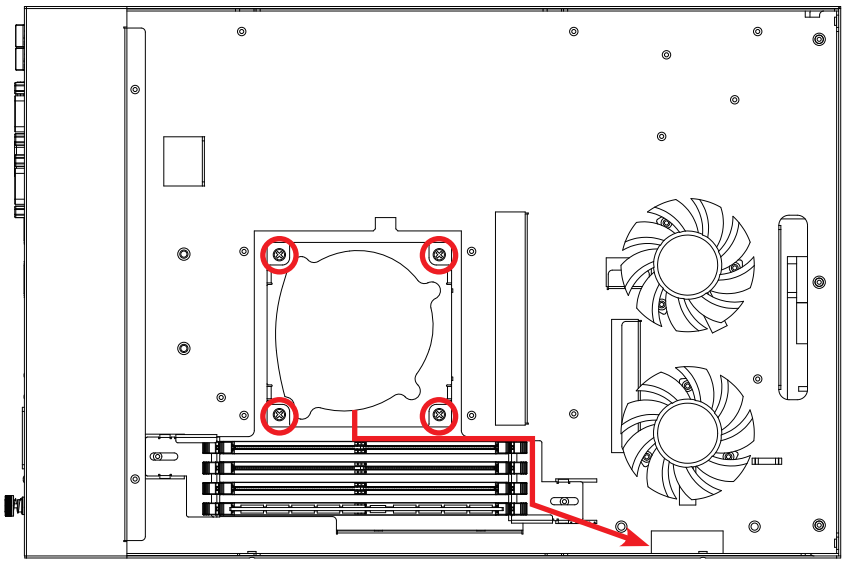
Step 3 Install CPU. (Be careful CPU pin)



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

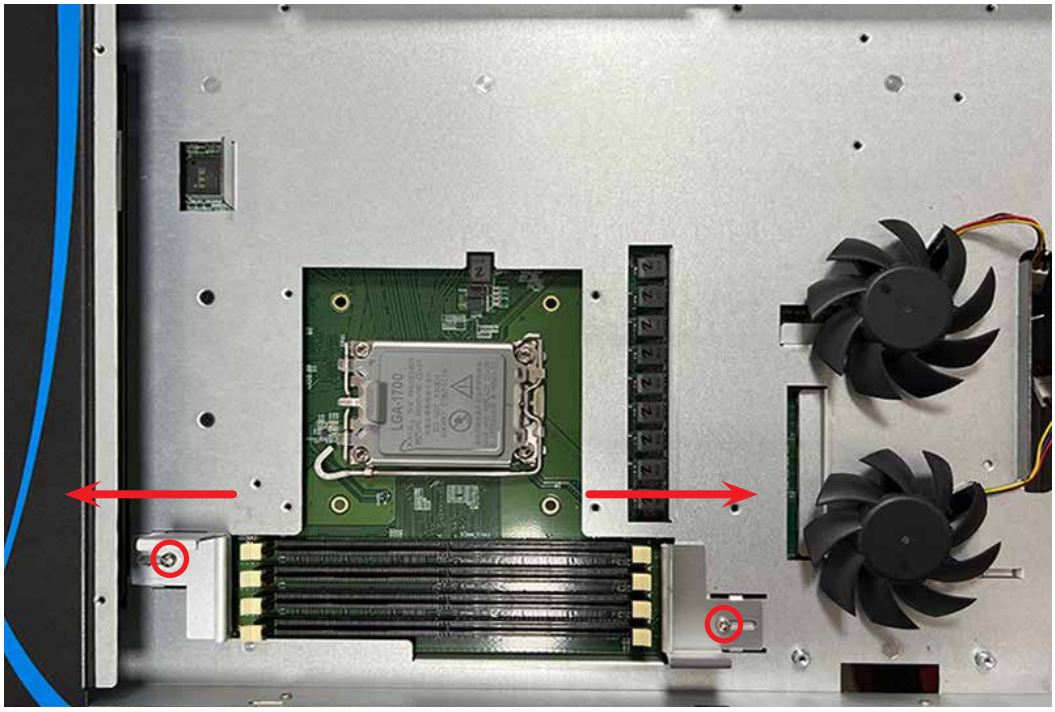


Step 5 Install the cooler and tighten the four screws
Connect the fan wires following the red line indications

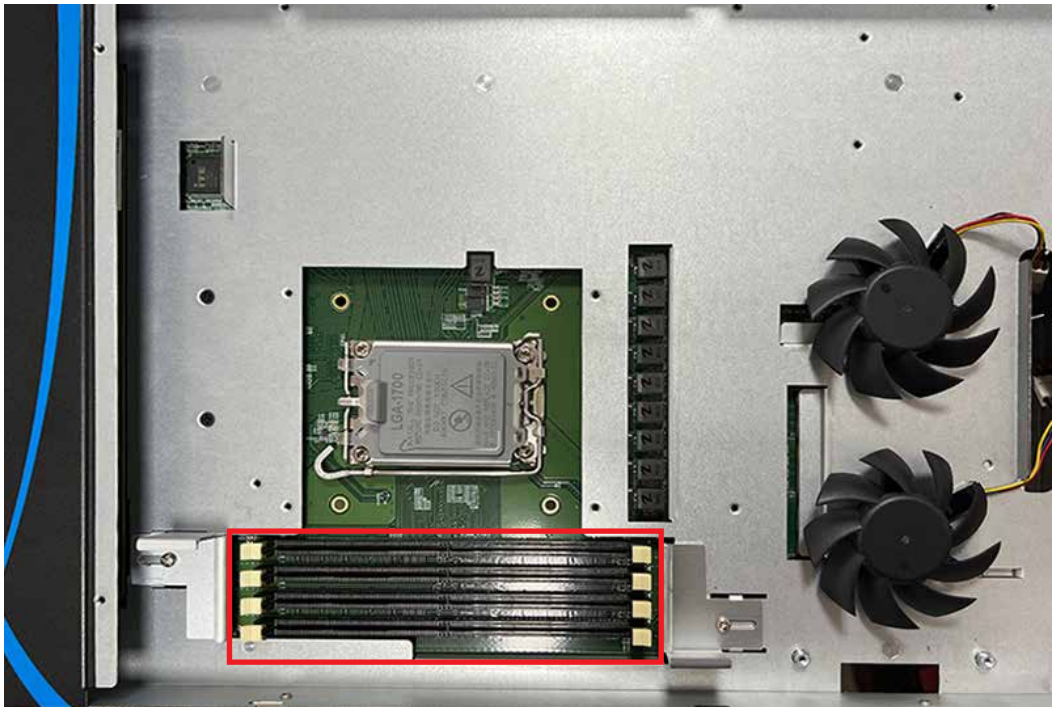


3.3 Installing DDR5 UDIMM Modules

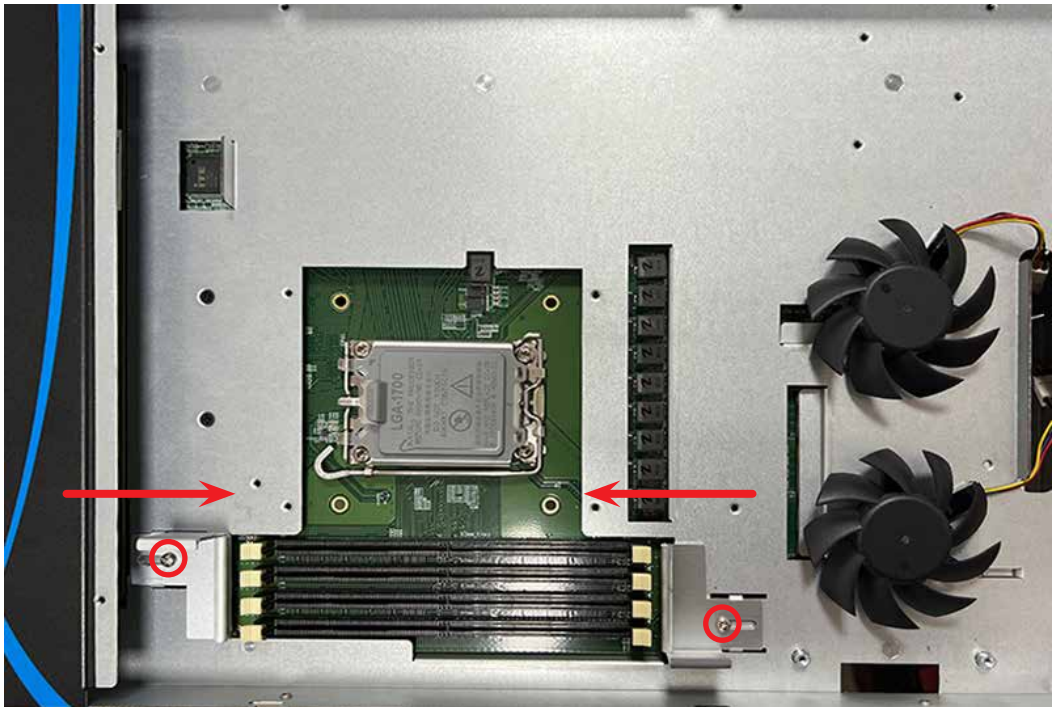
Step 1 Loosen the two M3 flat head screws and slide the metal plate to the left and right.



Step 2 Install UDIMM.

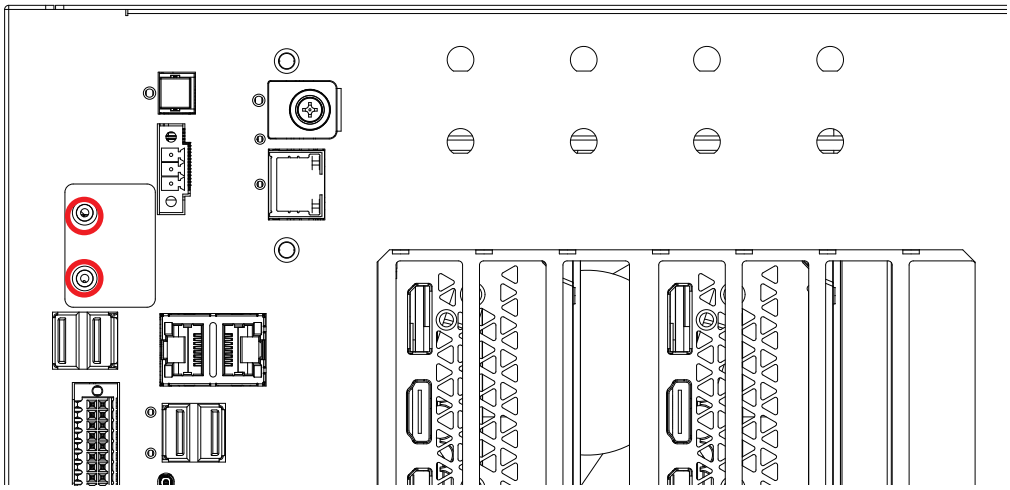


Step 3 Push the metal plate inwards and tighten the two M3 flat head screws.

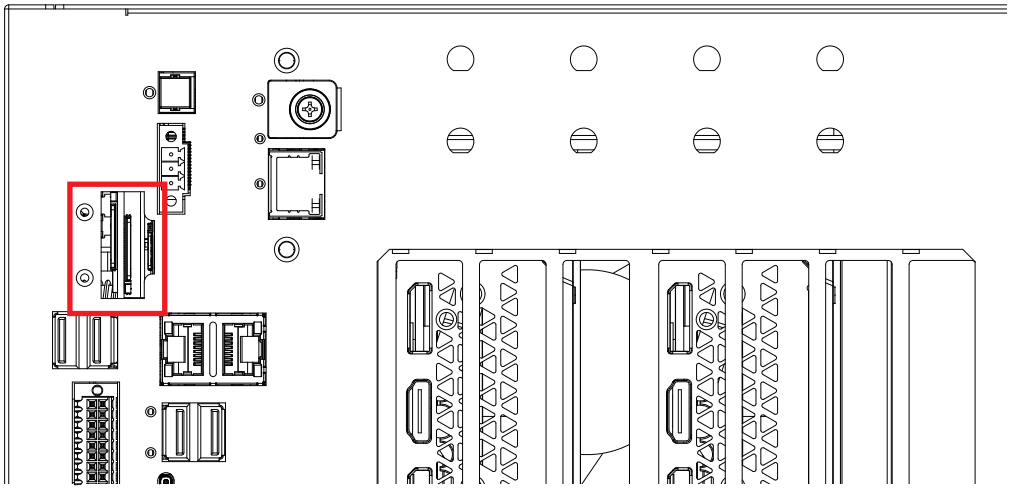


3.4 Installing SIM Card

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

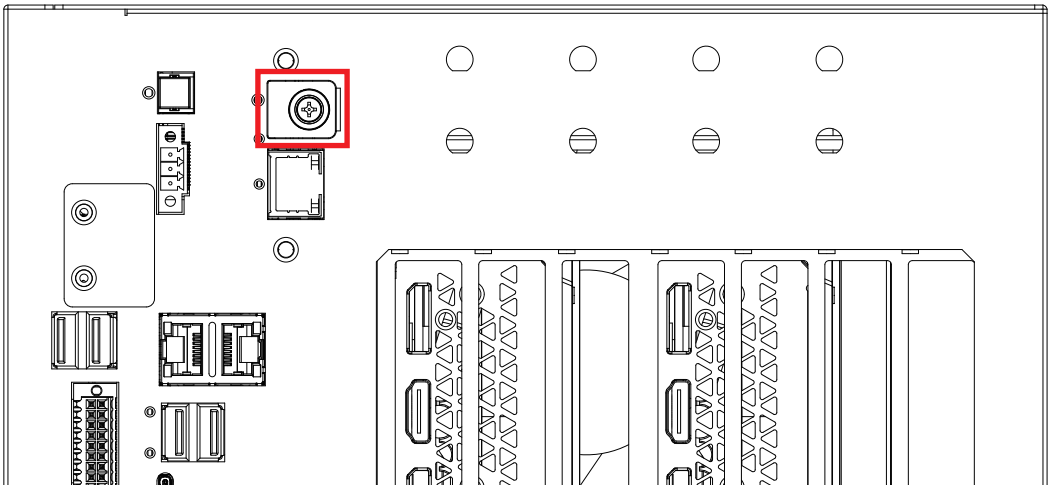


Step 2 Install SIM card in the marked red area.

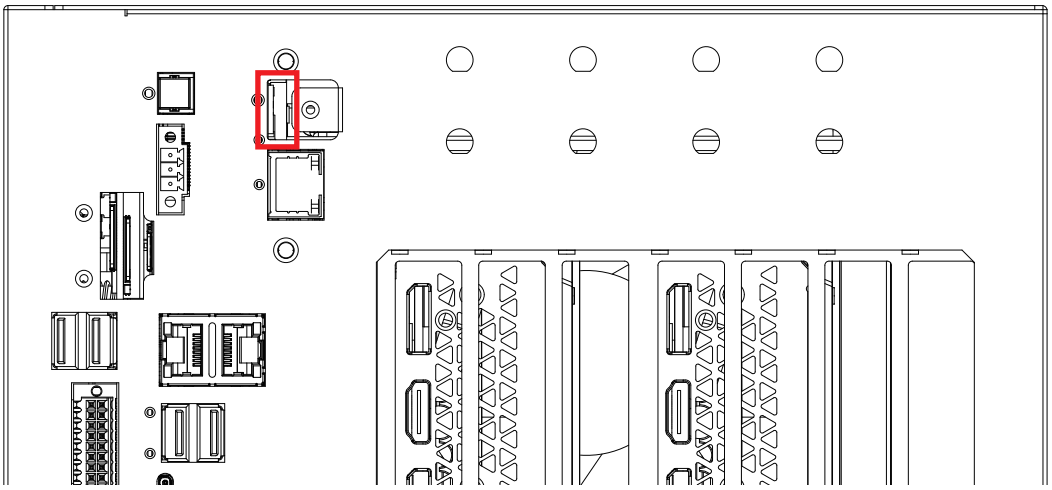


3.4.1 Installing OOB SIM Card

Step 1 Remove the OOB SIM card cover.



Step 2 Install SIM card.

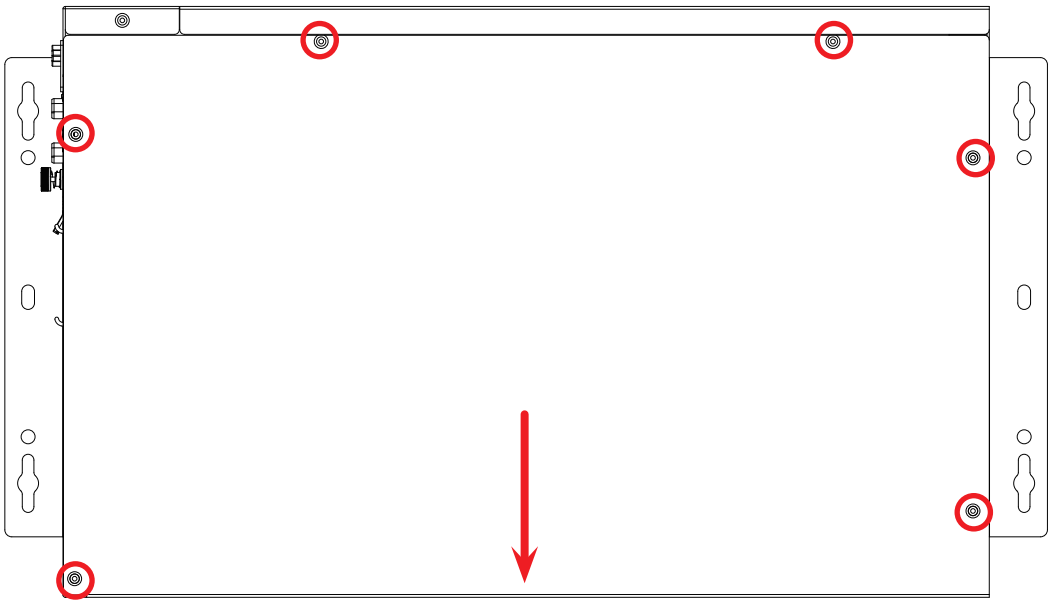


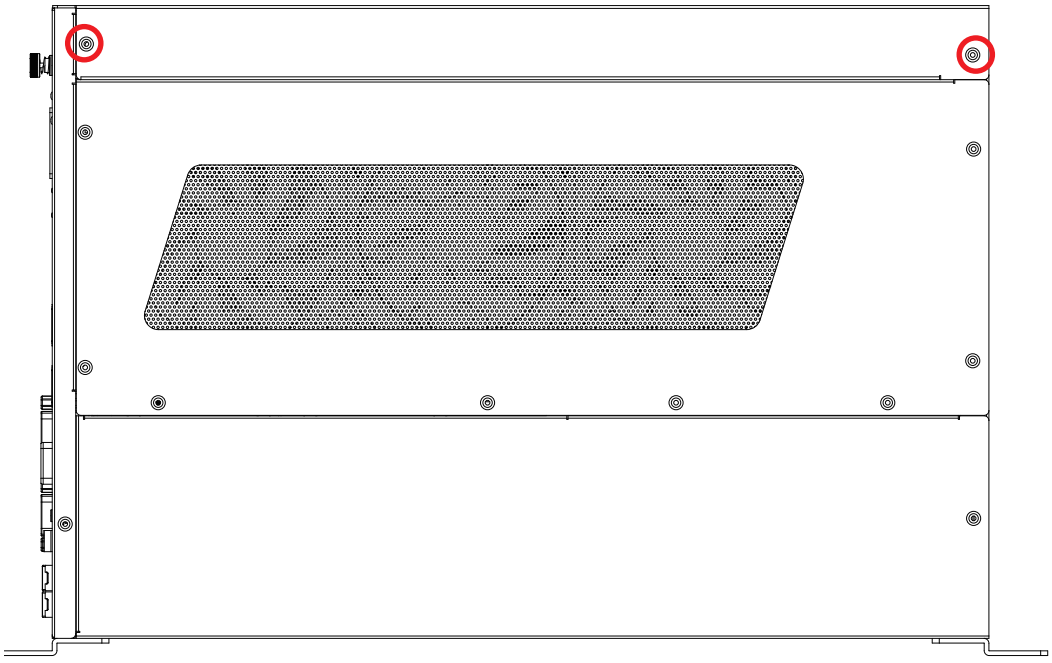
3.5 Installing PCIe Card

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

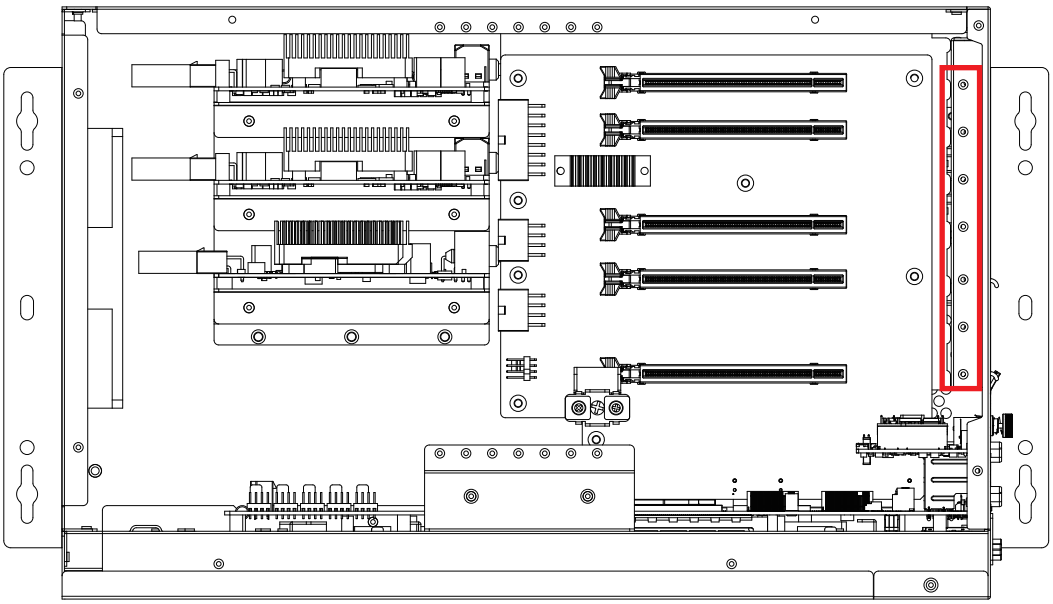
(*Based on the position of power connectors and the card sink/case design, not all expansion card within the maximum dimension can fit in to the system. Please consult the Vecow support team for confirmation.)

Step 1 Remove 8 M3 flat head screws and remove the top cover.



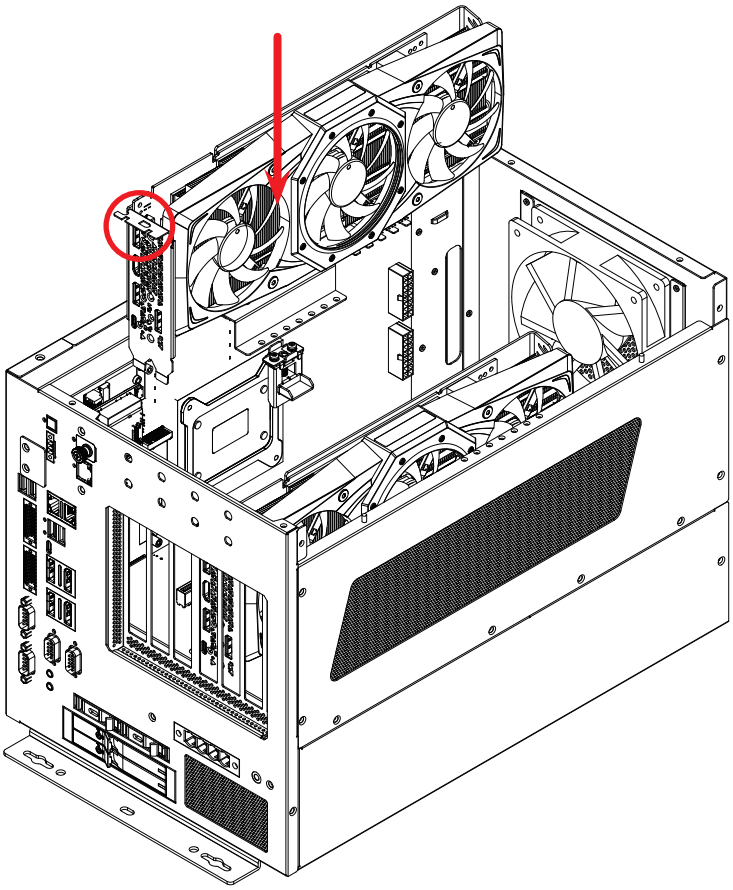


Step 2 Remove M3x5L screws and PCI bracket.



Notice: For RCX-3000 Series, please press the clip before removing the card.

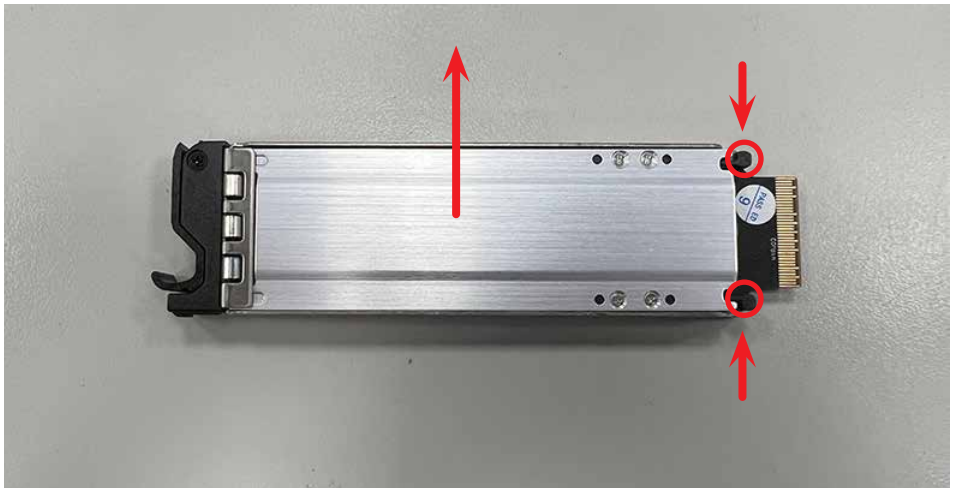
Step 2 Install the PCIE card and tighten the M3x5L screws.



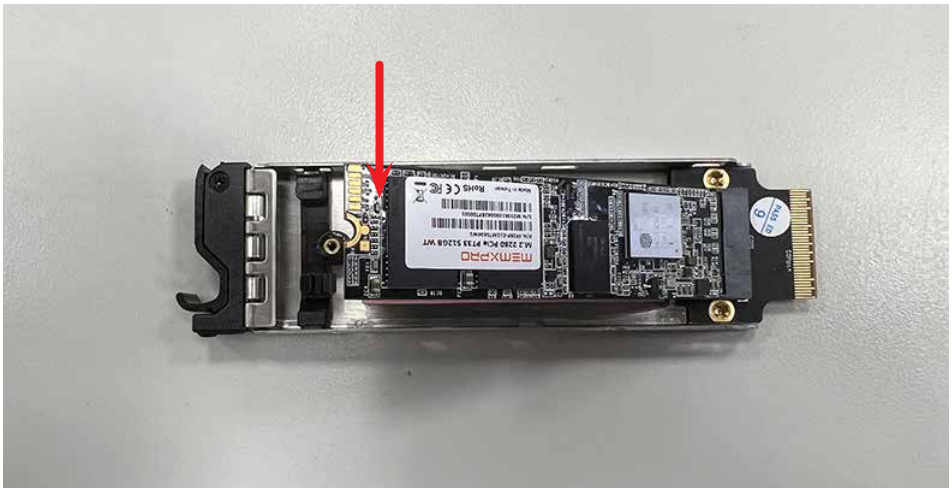
3.6 Installing HDD/SSD & M.2

Step 1 To remove the M.2 module.

Step 2 Press the switches on both sides, lift, and remove the top cover.

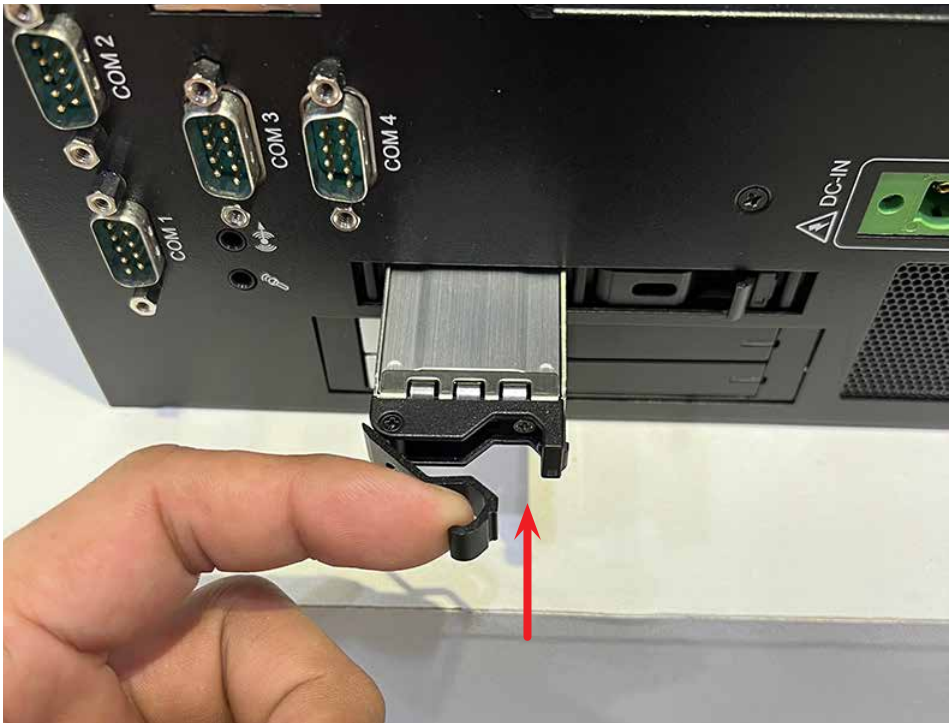


Step 2 Install M.2.

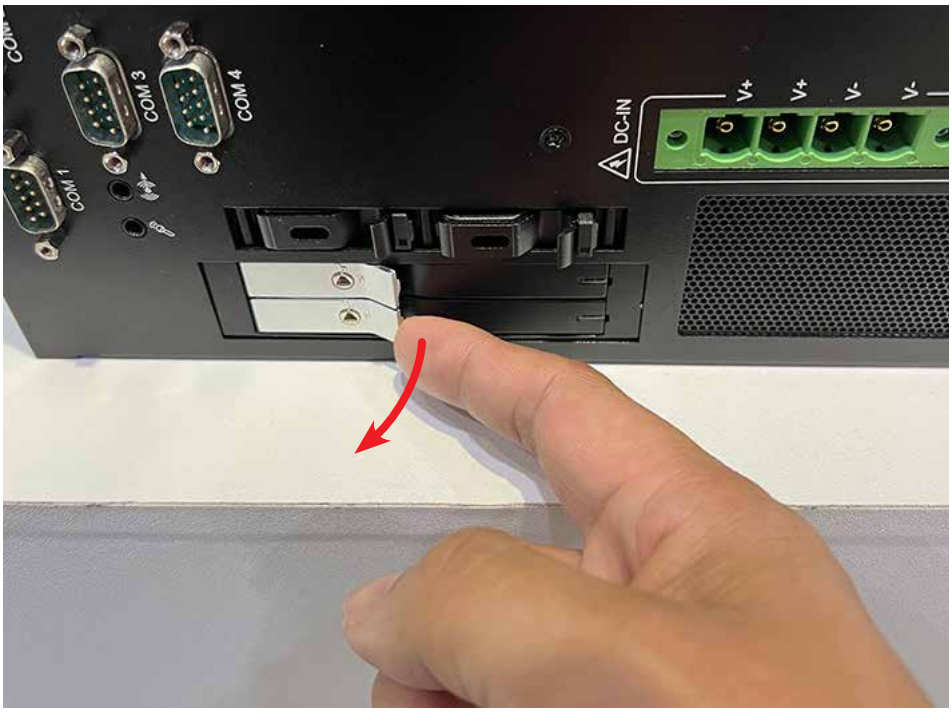


Step 4 Cover the top.

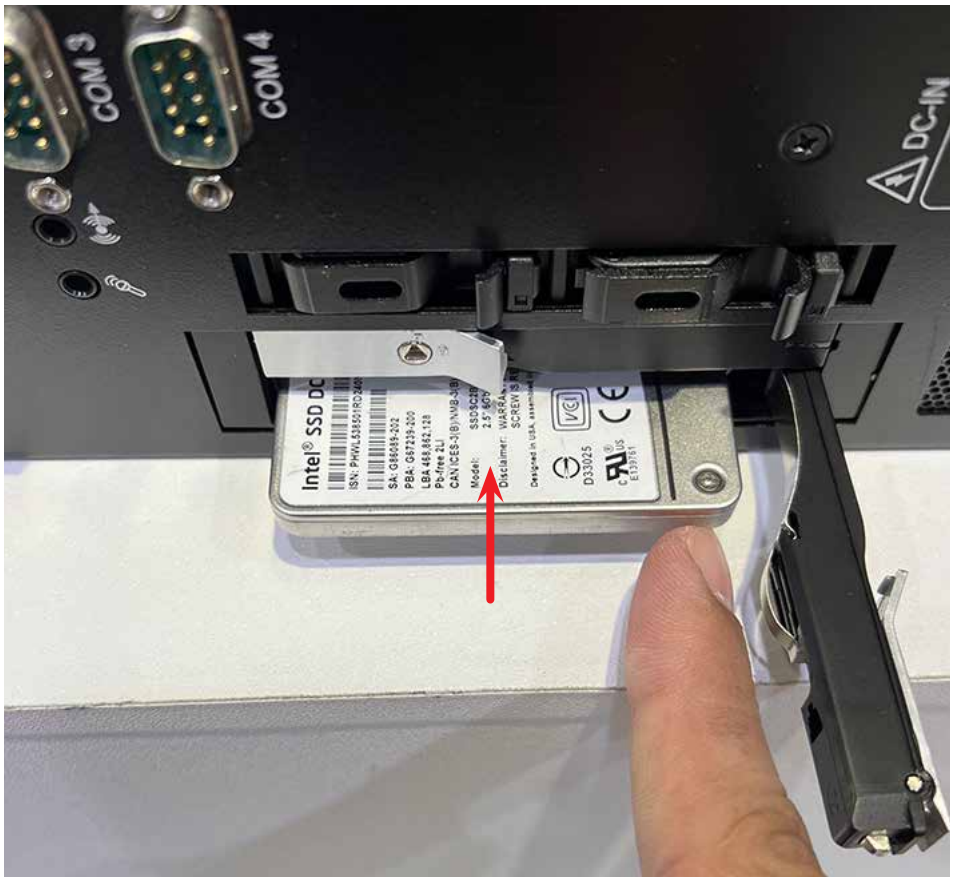
Step 5 Install the M.2 module.

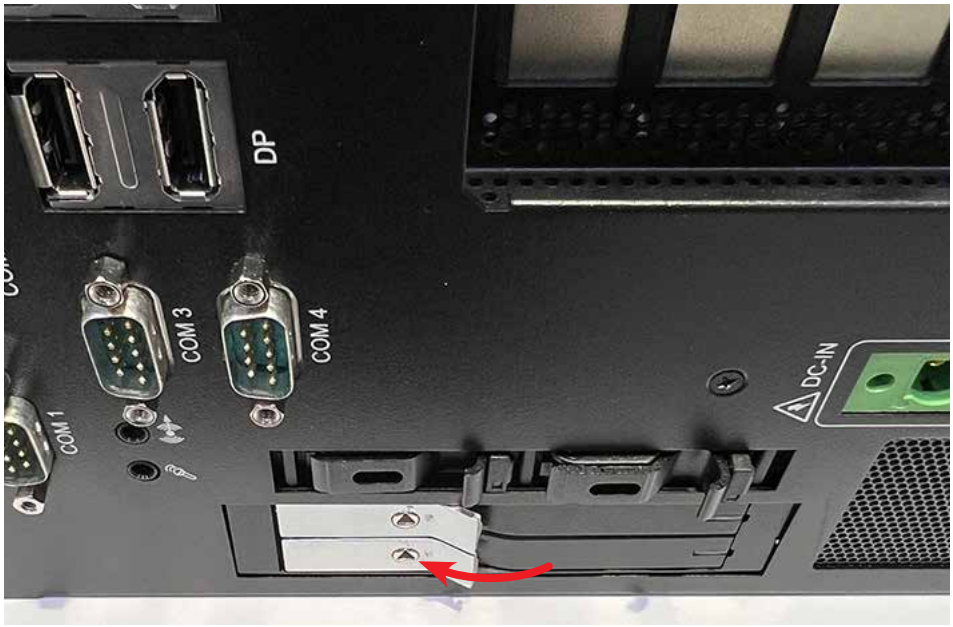


Step 6 Open the cover of the SSD.



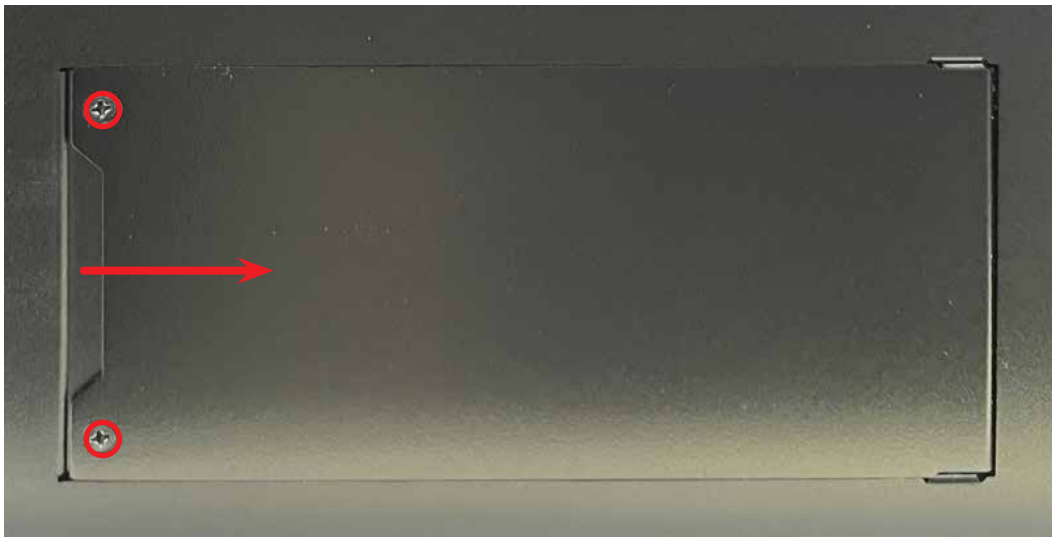
Step 7 Install the SSD and cover the casing.



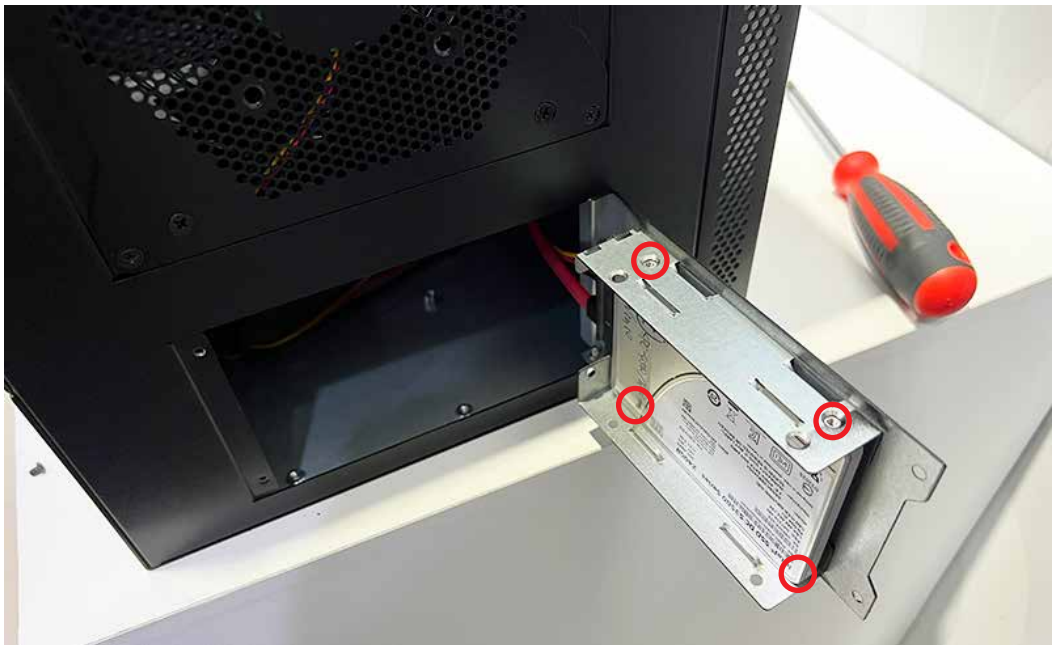


3.6.1 Internal SSD/HDD for RCX-3700/3400 PEG Series

Step 1 Remove the two M3 flat-head screws to open the cover.

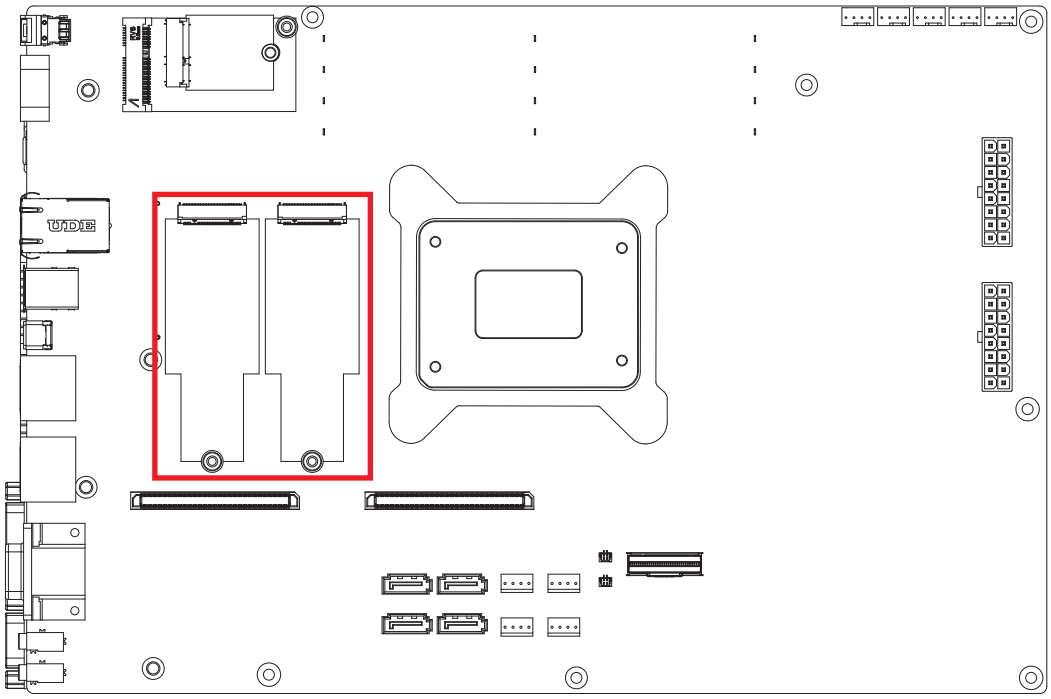


Step 2 Lock in place with four M3 flat-head screws to secure the SSD.

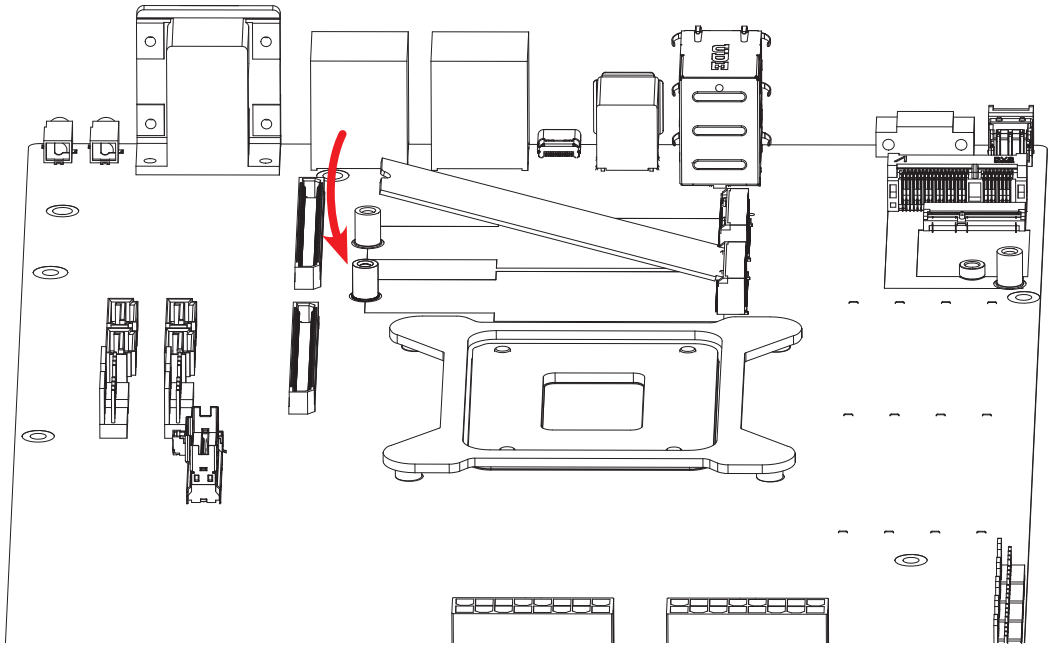


3.7 Installing M.2

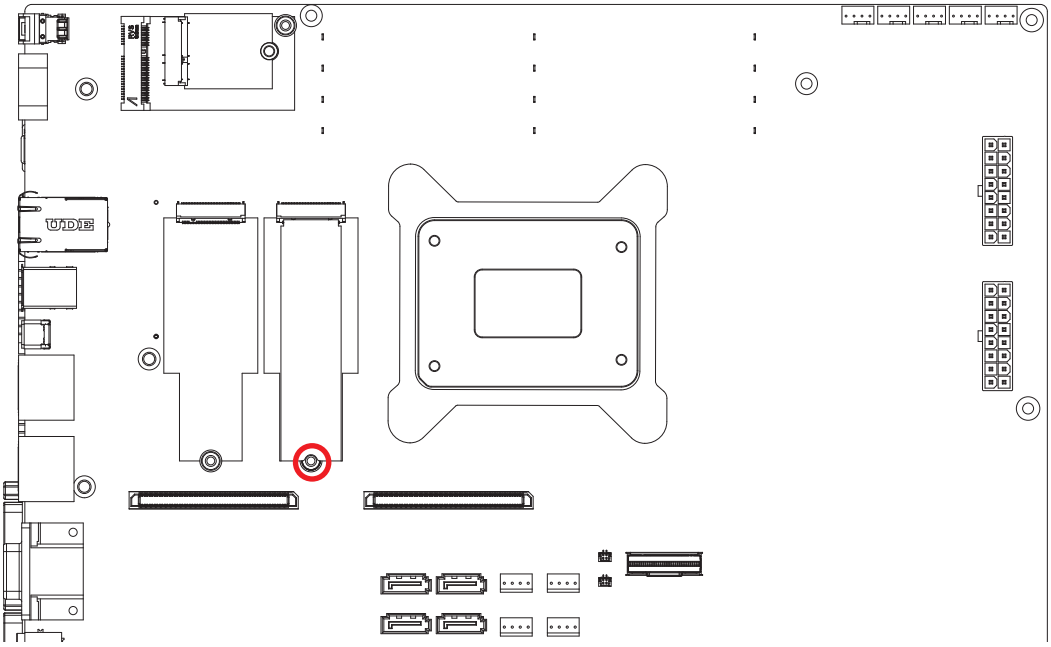
Step 1 The red box indicates the location of the M.2.



Step 2 Install M.2.

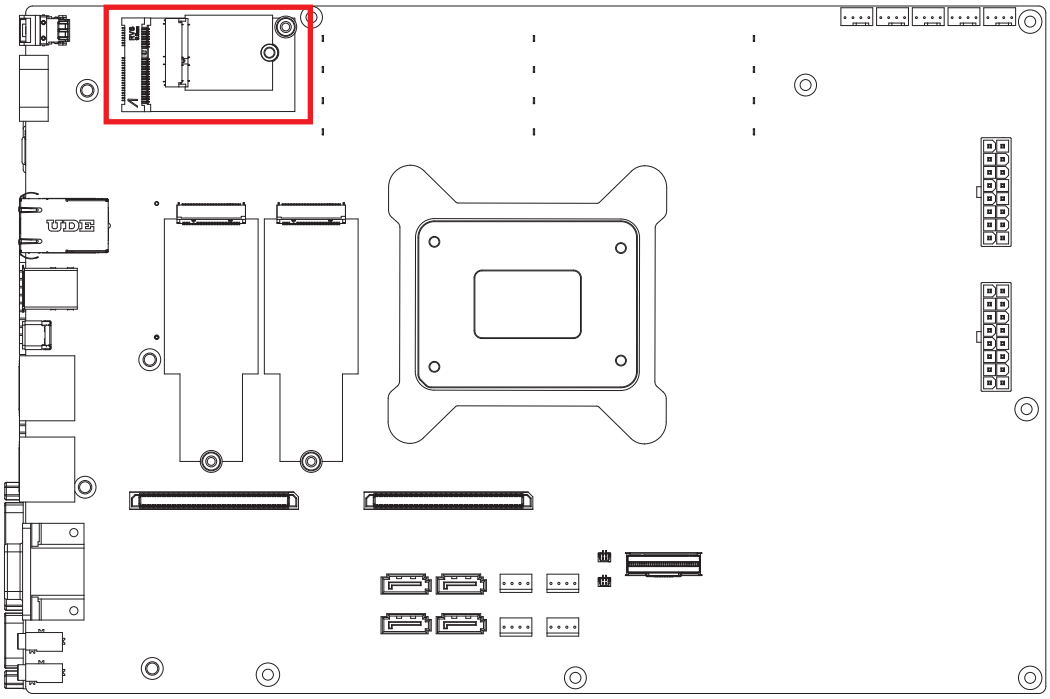


Step 3 Secure using screws.

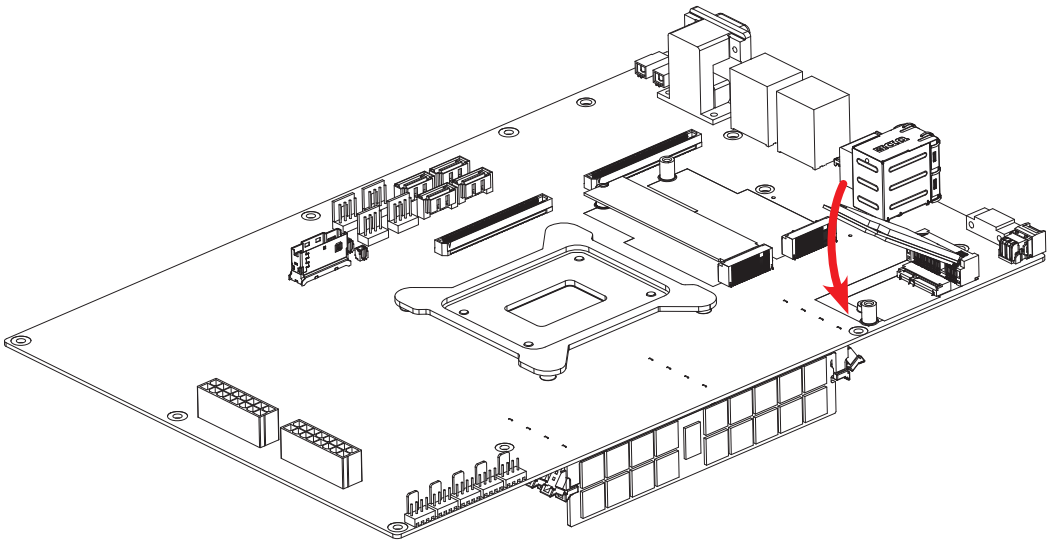


3.8 Installing MiniPCIe Card

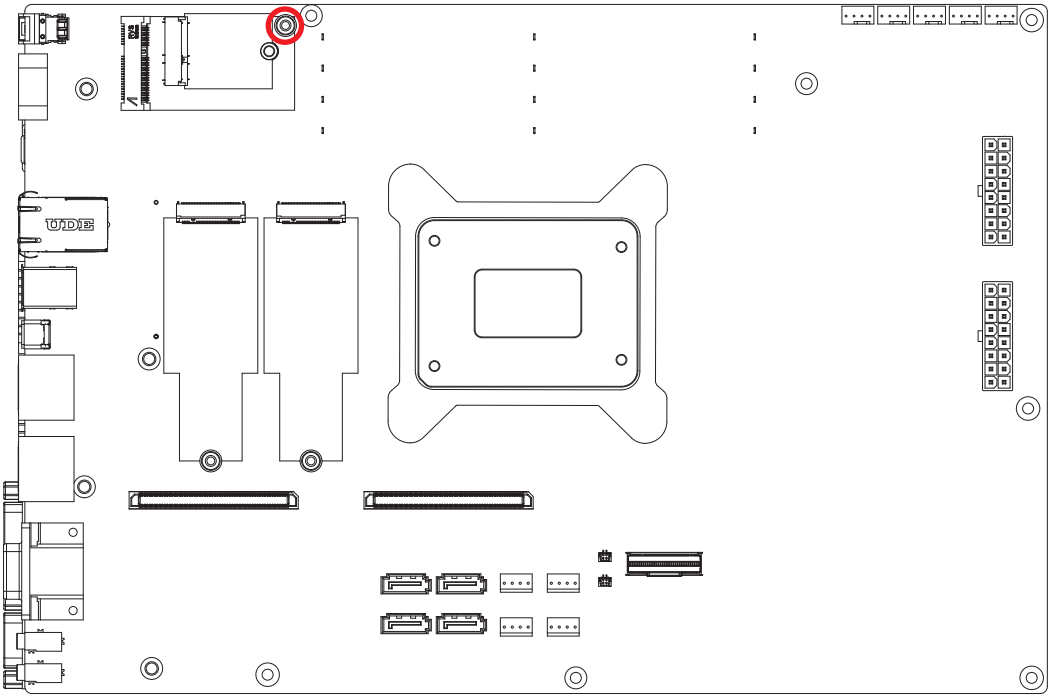
Step 1 The red box indicates the MiniPCIe slot location.



Step 2 Install the MiniPCIe card.

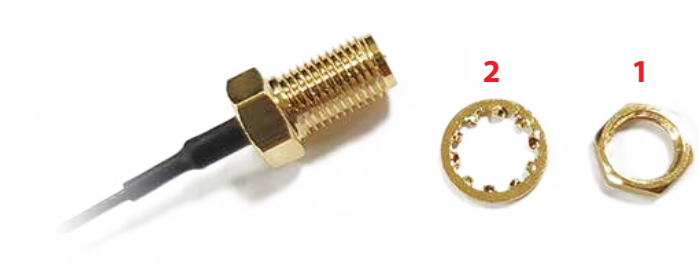


Step 3 Secure using M2.5 screws.

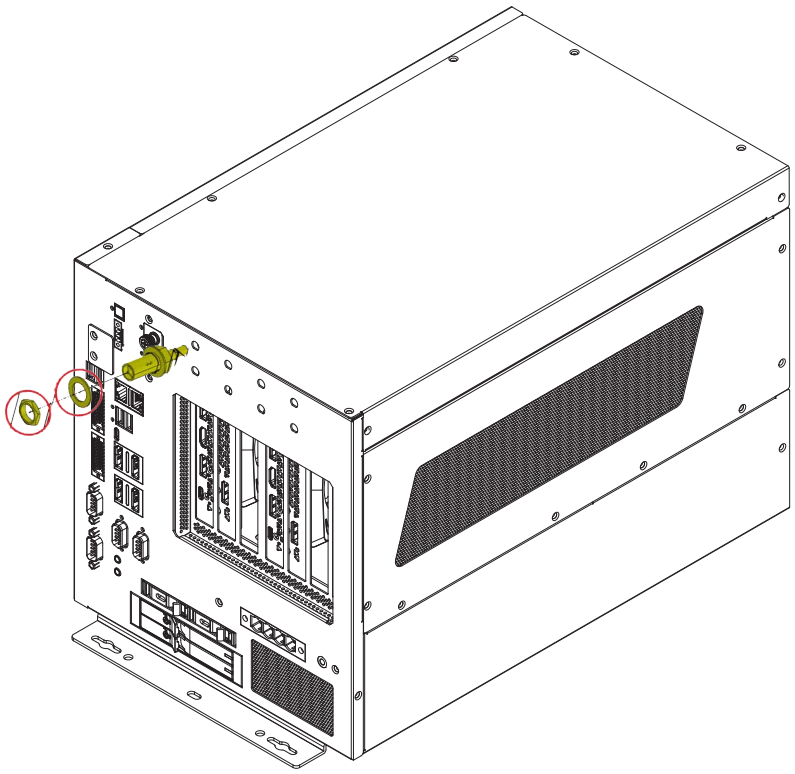


3.9 Installing Antenna Cable

Step 1 Check antenna parts (cable and washers).



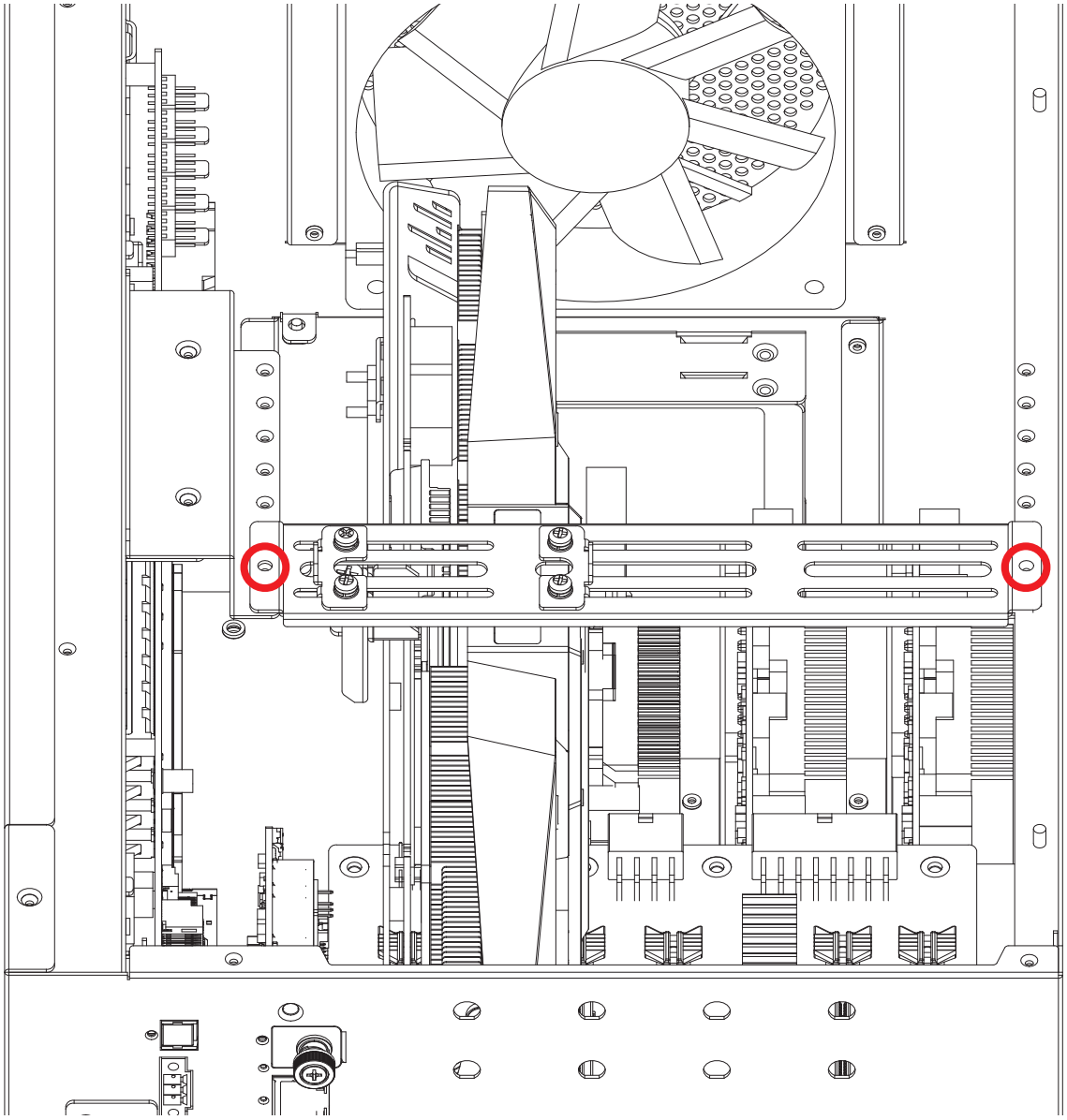
Step 2 Install the antenna.



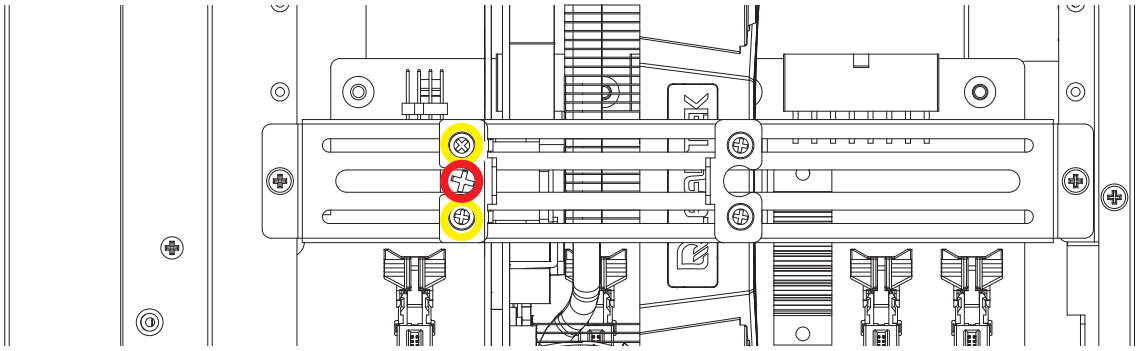
3.10 Installing Hold-down Kit

Step 1 Loosen the two M3 x 4L screws with F heads and adjust them to the desired clamping

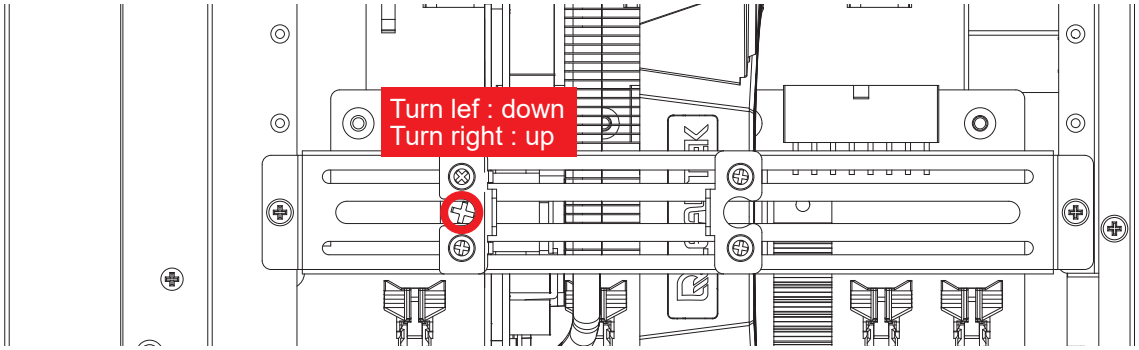
Hold-down Kit

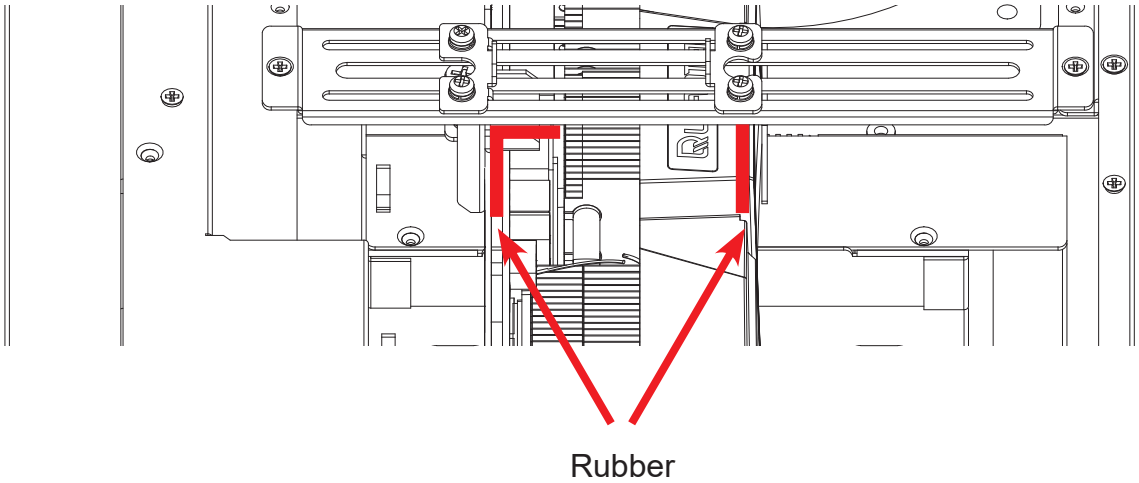


Step 2 Adjust the plate left or right to fix the card and then fasten two screws on the marked yellow area.



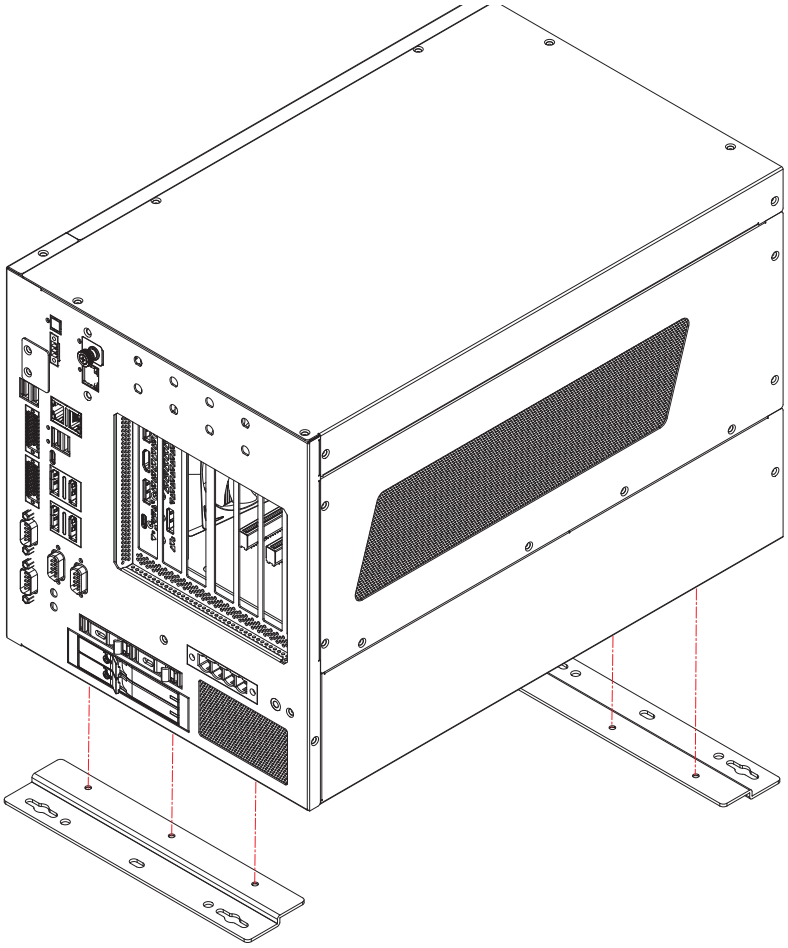
Step 3 Turn the screw (circle in red) left or right with Phillips screwdriver to adjust the pad up and down.





3.11 Mounting Your RCX-3000 PEG

Install the wall mount using six #6-32 flat-head screws.



4

BIOS SETUP

4.1 Entering BIOS Setup

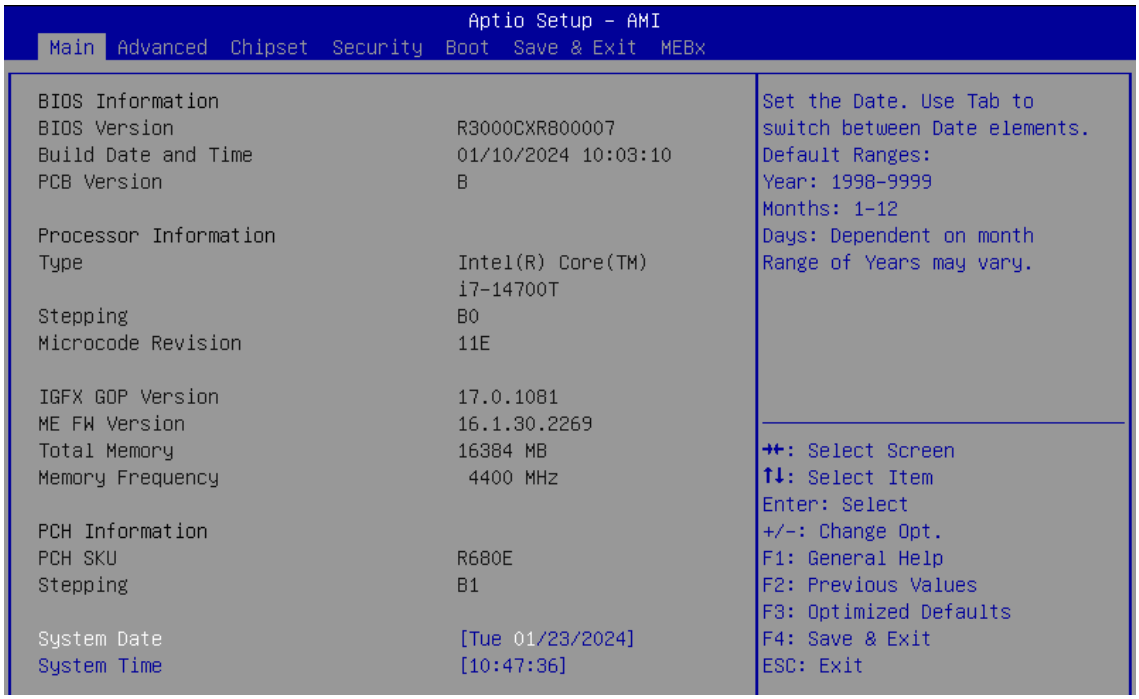


Figure 4-1 : Entering Setup Screen

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

4.2 Main Menu

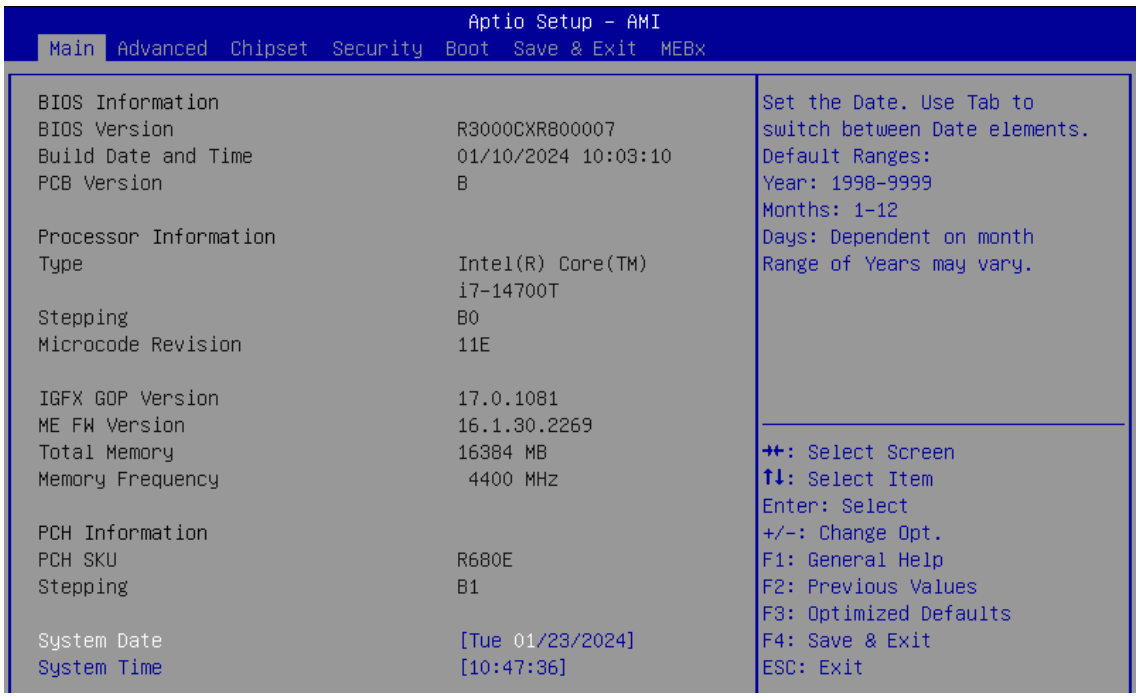


Figure 4-2 : BIOS Main Menu

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

System Date

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

System Time

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

4.3 Advanced Menu

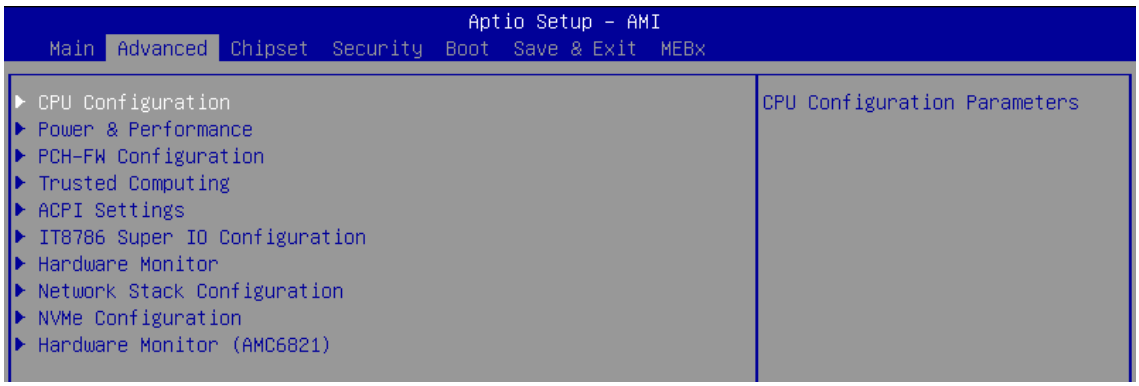


Figure 4-3 : BIOS Advanced Menu

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

4.3.1 CPU Configuration

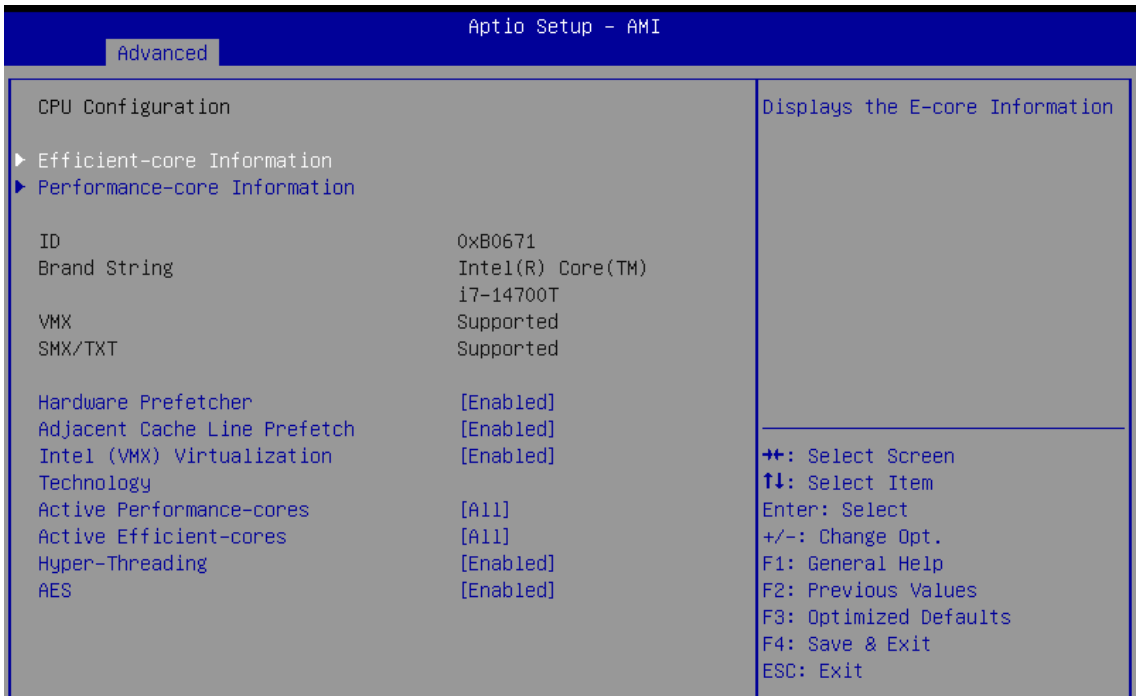


Figure 4-3-1 : CPU Configuration

Efficient-core Information
Displays the E-core Information.
Performance-core Information
Displays the P-core Information.
Hardware Prefetcher
To turn on/off the MLC streamer prefetcher.
Adjacent Cache Line Prefetch
To turn on/off prefetching of adjacent cache lines.

Intel (VMX) Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores
Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Active Efficient-cores
Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
Hyper-Threading
Enable or Disable Hyper-Threading Technology.
AES
Enable/Disable AES (Advanced Encryption Standard).

4.3.2 Power & Performance

Figure 4-3-2 : Power & Performance

4.3.2.1 CPU – Power Management Control

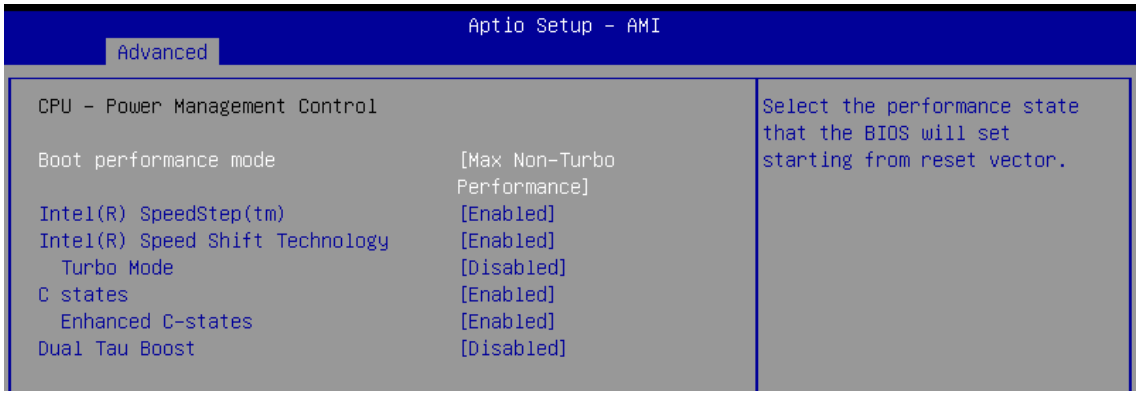


Figure 4-3-2-1 : CPU – Power Management Control

Boot performance mode
Select the performance state that the BIOS will set 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.

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.

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

4.3.3 PCH-HW Configuration

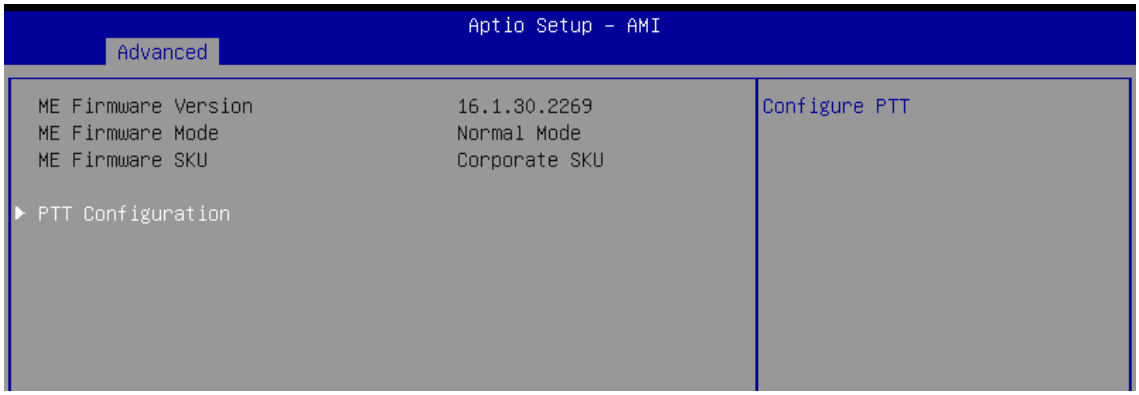


Figure 4-3-3 : PCH-HW Configuration

PTT Configuration
Configure PTT.

4.3.3.1 PTT Configuration

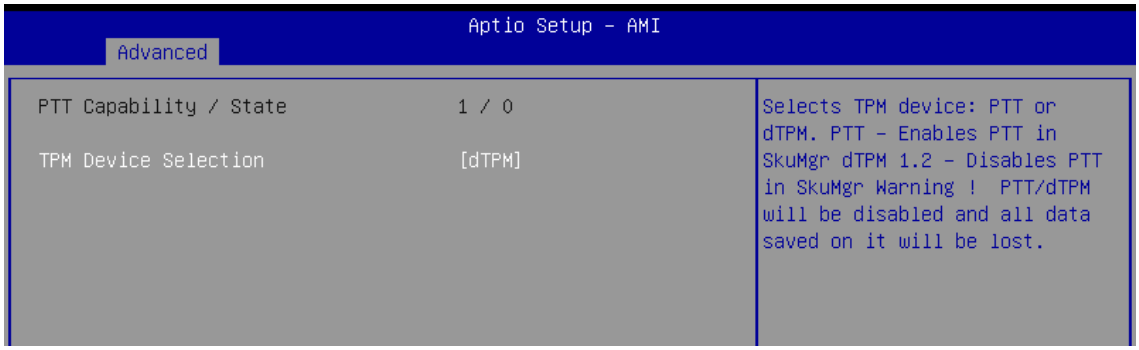


Figure 4-3-3-1 : PTT Configuration

PTT Capability / State

Platform Trust Technology Capability / Enablement State.

TPM Device Selection

Selects TPM device: PTT or discrete TPM.

PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT is SkuMgr Warning! PTT/dTPM will be disabled and all data saved on it will be lost.

4.3.4 Trusted Computing

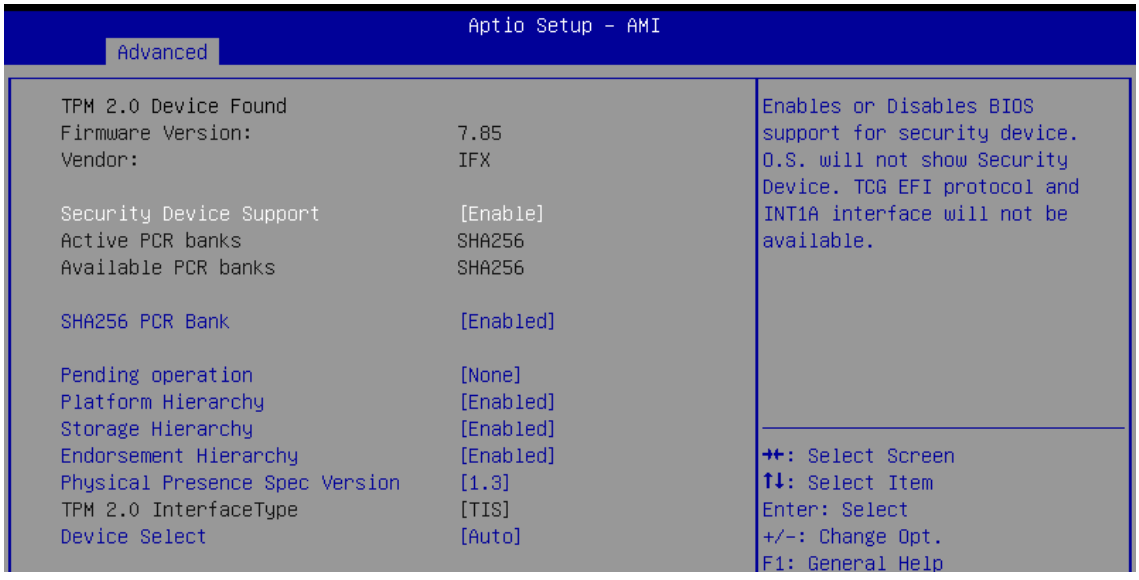


Figure 4-3-4 : Trusted Computing

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

4.3.5 ACPI Settings

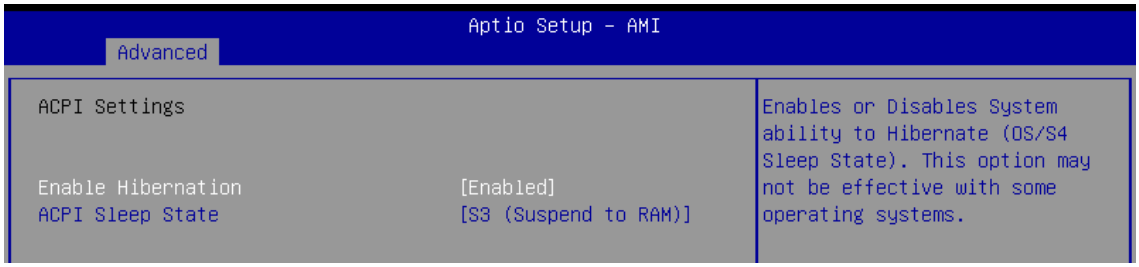


Figure 4-3-5 : ACPI Settings

Enable Hibernation

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

ACPI Sleep State

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

4.3.6 IT8786 Super IO Configuration

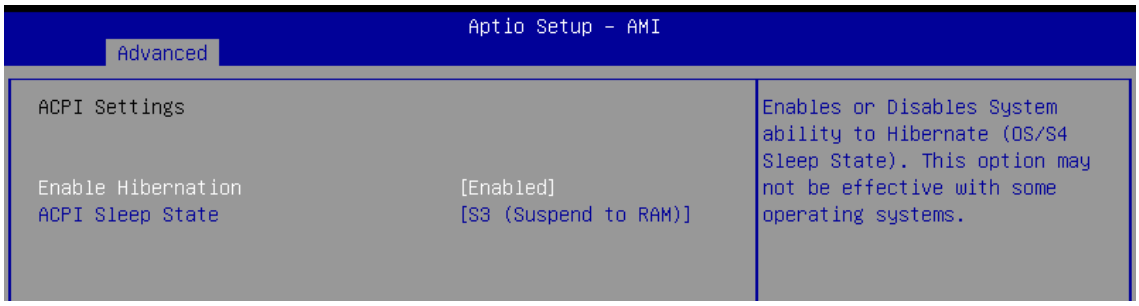


Figure 4-3-6 : IT8786 Super IO Configuration

4.3.6.1 Serial Port X Configuration

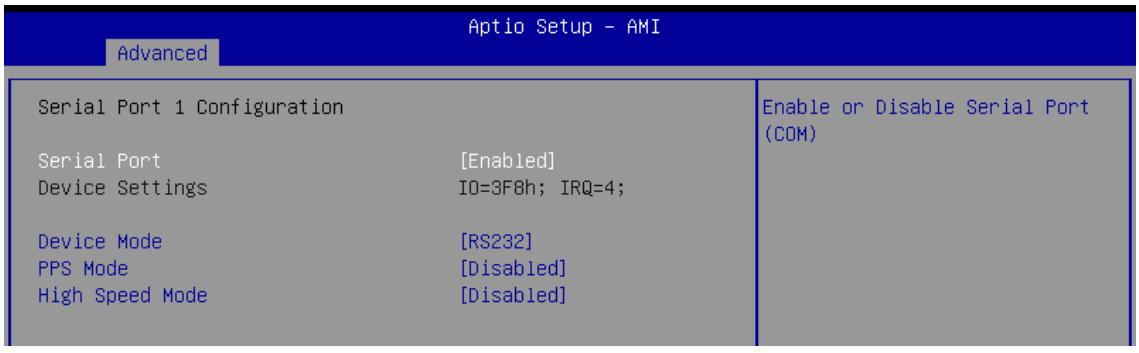


Figure 4-3-6-1 : Serial Port X Configuration

Serial Port

Enable or Disable Serial Port (COM).

Device Mode

Select Device Mode.

PPS Mode

Enable or Disable PPS.

High Speed Mode

Enable or disable High Speed Serial Port.

Note: A device driver is required on OS for high speed serial port function. (High Speed Serial Port is Port 1 only)

4.3.7 Hardware Monitor

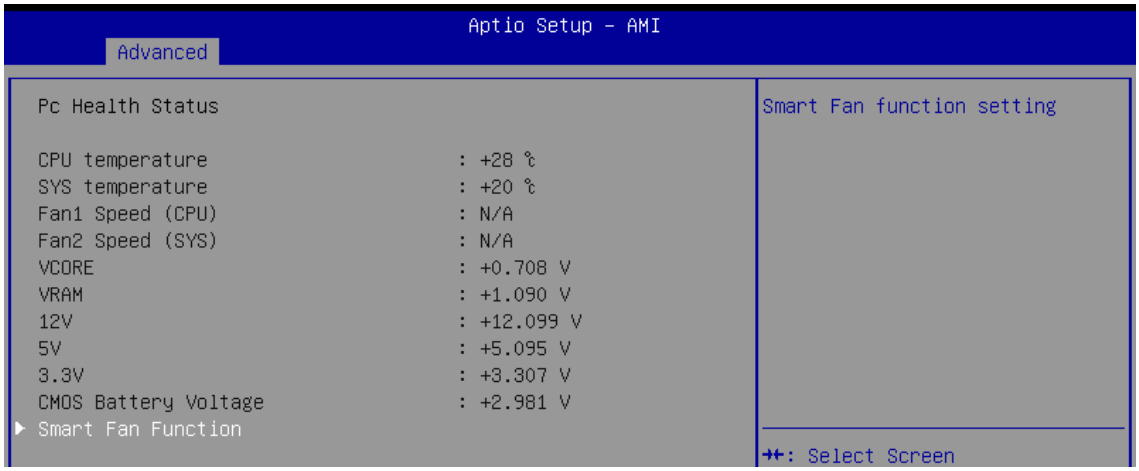


Figure 4-3-7 : Hardware Monitor

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

4.3.7.1 Smart Fan Function

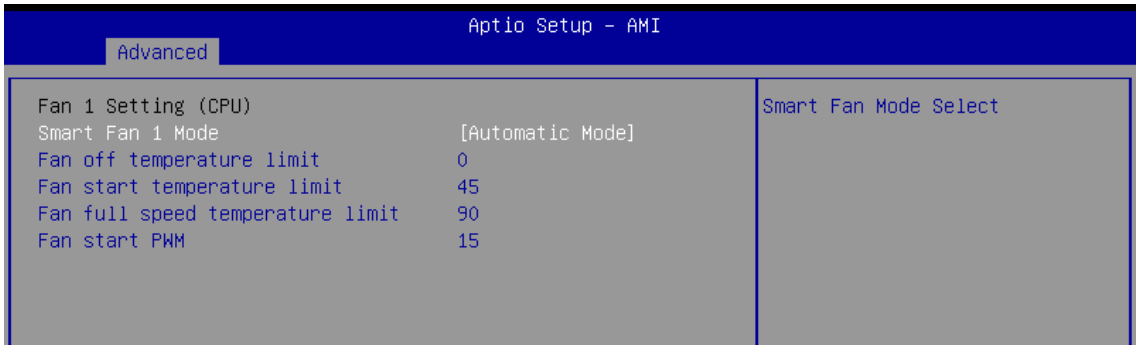


Figure 4-3-7-1 : Smart Fan Function

Smart Fan X Mode
Smart Fan Mode Select.
Fan off temperature limit
Fan will off when temperature lower than this limit.
Fan start temperature limit
Fan will work when temperature higher than this limit.
Fan full speed temperature limit
Fan will full speed when temperature higher than this limit.
Fan start PWM
Fan will start with this PWM value.

4.3.8 Network Stack Configuration

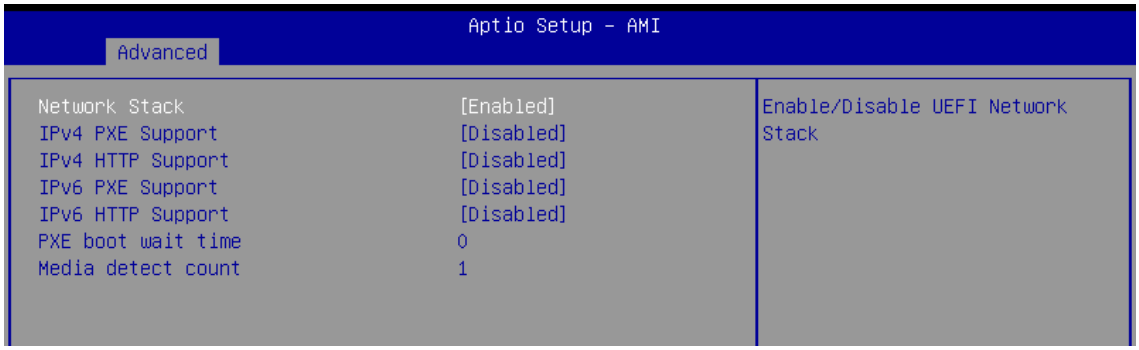


Figure 4-3-8 : Network Stack Configuration

Network Stack
Enable/Disable UEFI Network Stack.

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

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

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

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

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

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

4.3.9 NVMe Configuration

Figure 4-3-9 : NVMe Configuration

Display NVMe controller and Drive information.

4.3.10 Hardware Monitor (AMC6821)

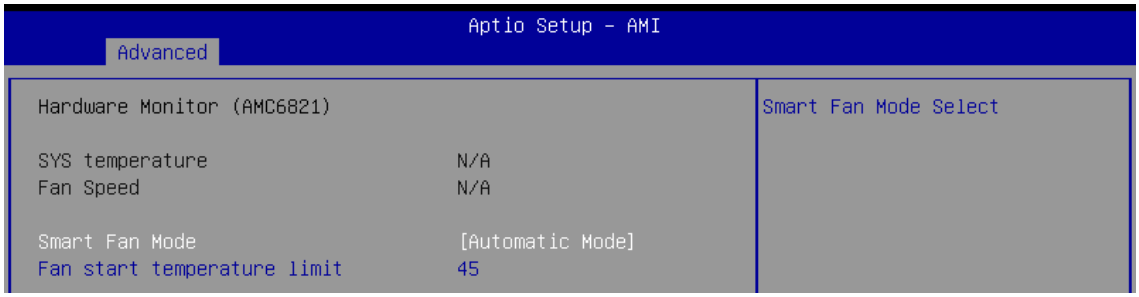


Figure 4-3-10 : Hardware Monitor (AMC6821)

Smart Fan Mode
Smart Fan Mode Select (Software Mode / Automatic Mode).
Manual Duty Cycle Setting
Fan will work with this Manual Duty Cycle Value. Rang 0~255.
Fan start temperature limit
Fan will work when temperature higher than this limit. Rang 0~124.
Fan Full Speed Temperature = Fan Start Temperature Limit + 100 / 3.14(Slope).

4.4 Chipset Menu

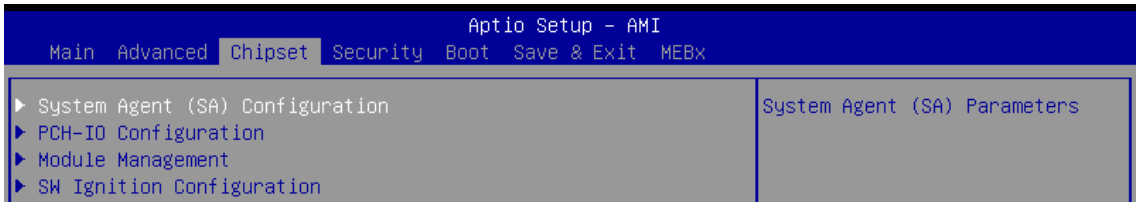


Figure 4-4 : BIOS Chipset Menu

Select Chipset tab to enter chipset BIOS setup options, such as System Agent (SA) Configuration, PCH-IO Configuration, and SW Ignition Configuration.

4.4.1 System Agent (SA) Configuration

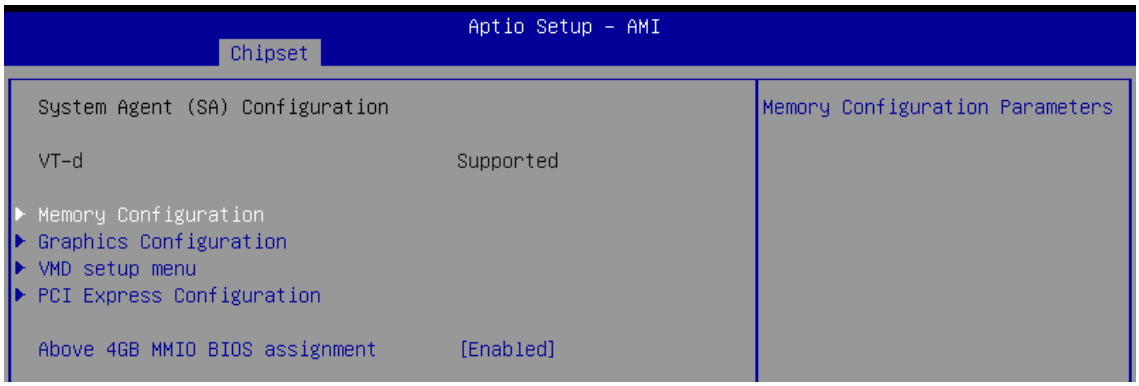


Figure 4-4-1 : System Agent (SA) Configuration

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

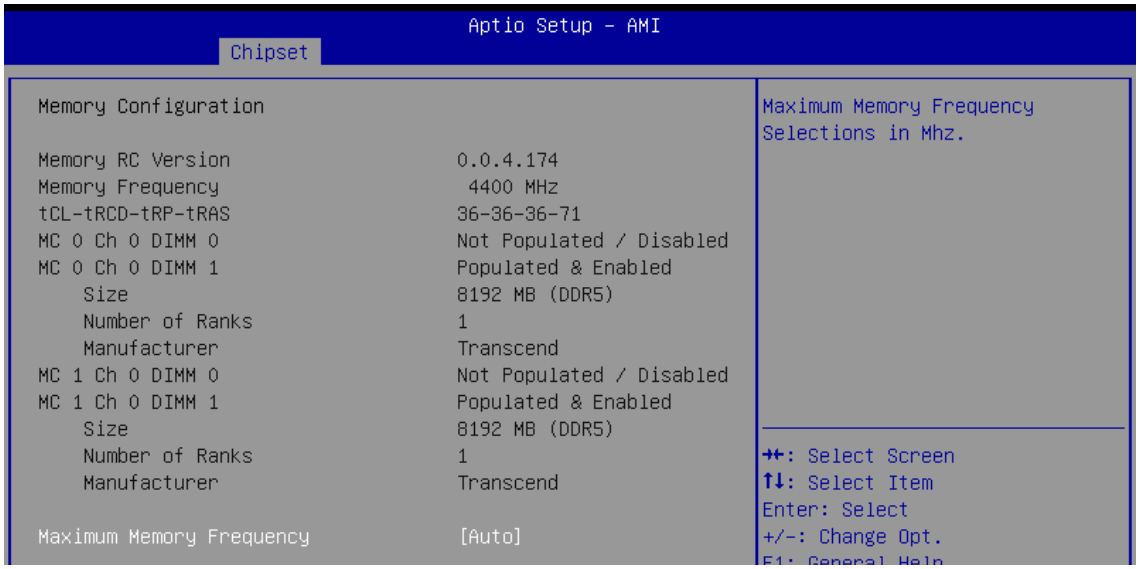


Figure 4-4-1-1 : Memory Configuration

Displays memory information.

Maximum Memory Frequency

Maximum Memory Frequency Selections in Mhz.

4.4.1.2 Graphics Configuration

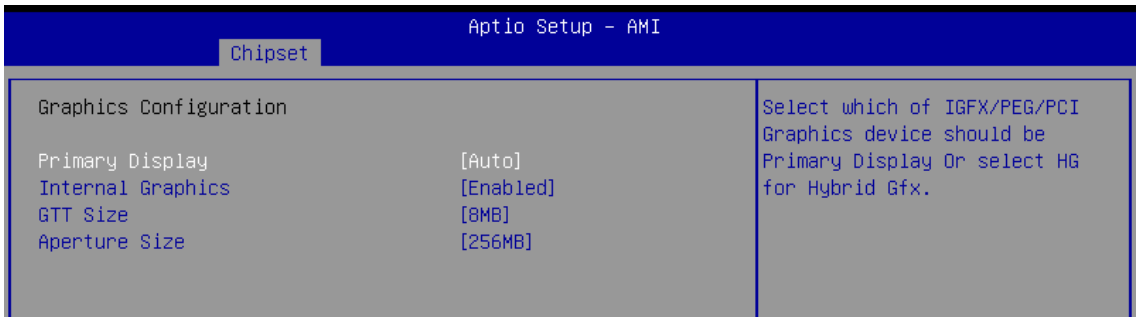


Figure 4-4-1-2 : Graphics Configuration

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display.

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.

4.4.1.3 VMD setup menu

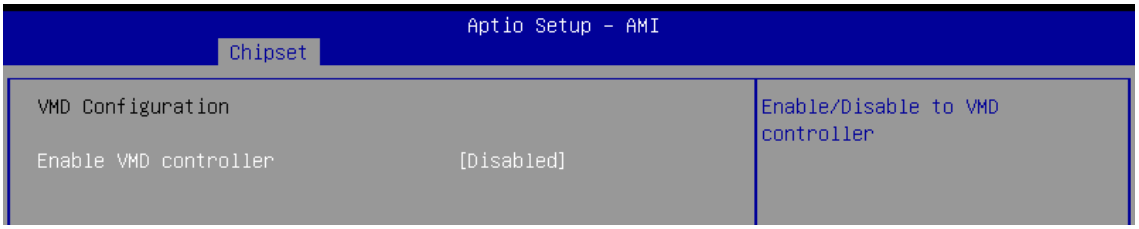
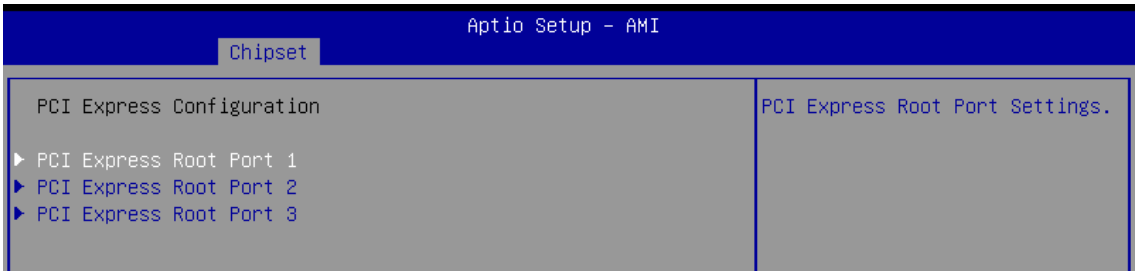


Figure 4-4-1-3 : VMD setup menu

Enable VMD controller
Enable/Disable to VMD controller.

4.4.1.4 PCI Express



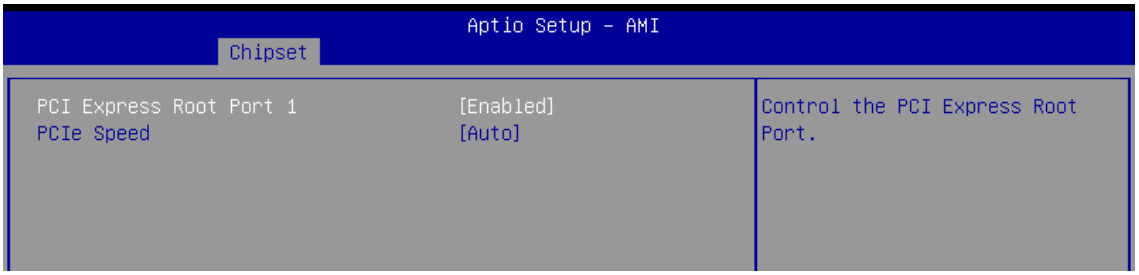


Figure 4-4-1-4 : PCI Express

PCI Express Root Port
Control the PCI Express Root Port.
PCIe Speed
Configure PCIe Speed.

4.4.2 PCH-IO Configuration

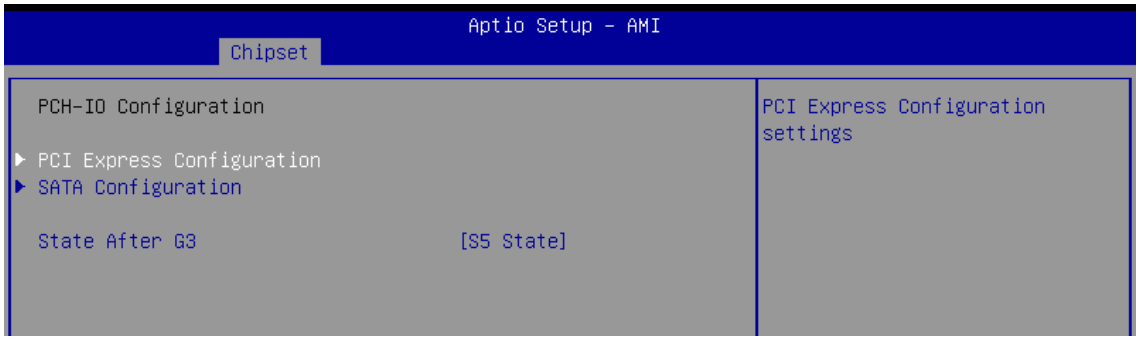
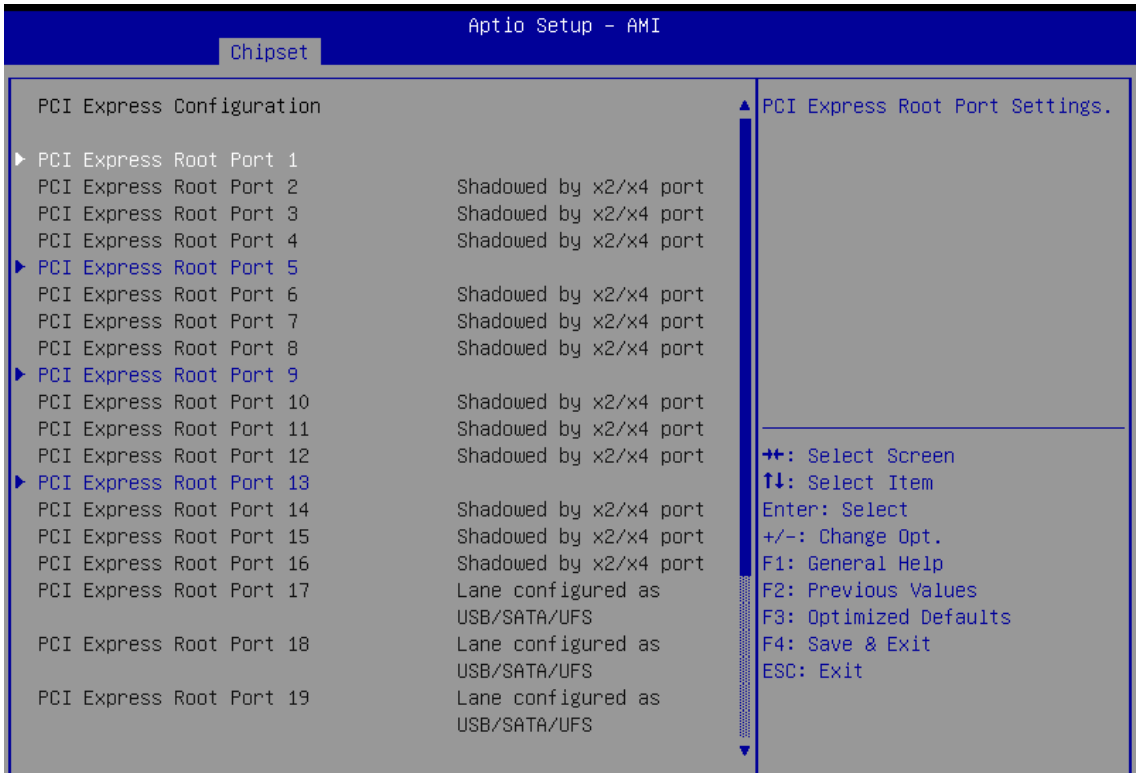


Figure 4-4-2 : PCH-IO Configuration

PCI Express Configuration
PCI Express Configuration settings.
SATA Configuration
SATA Device Options Settings.
State After G3
Specify what state to go to when power is re-applied after a power failure (G3 state).
S0 State : Always turn-on the system when power source plugged-in.
S5 State : Always turn-off the system when power source plugged-in.

4.4.2.1 PCI Express Configuration



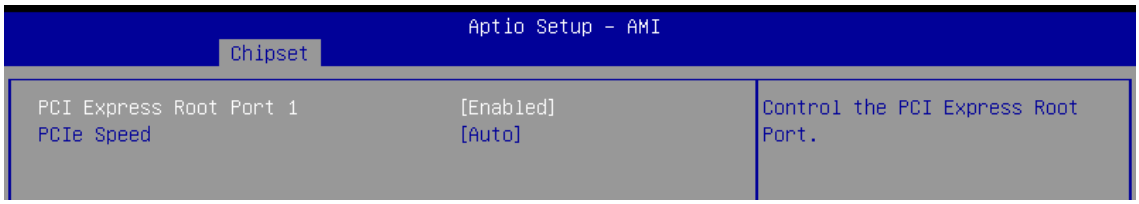


Figure 4-4-2-1 : PCI Express Configuration

PCI Express Root Port
Control the PCI Express Root Port.
PCIe Speed
Configure PCIe Speed.

4.4.2.2 SATA Configuration

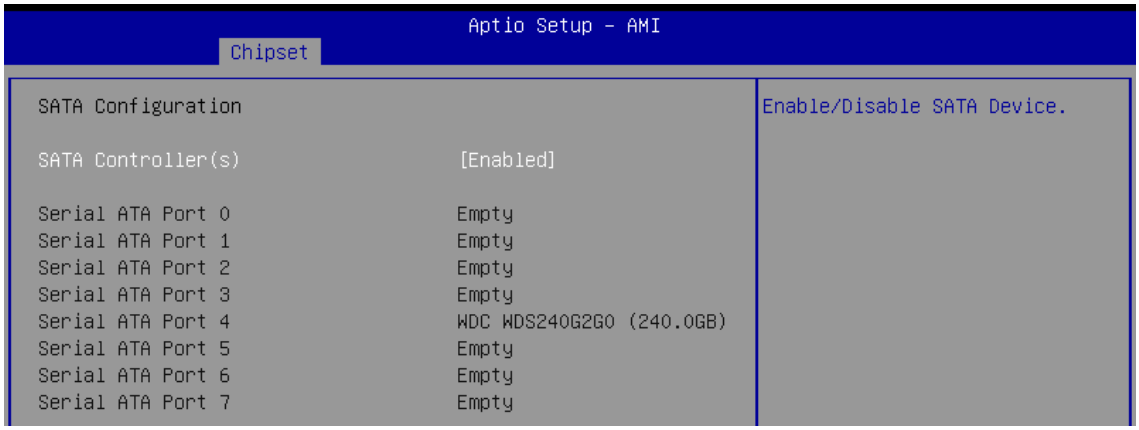


Figure 4-4-2-2 : SATA Configuration

SATA Controller(s)
Enable / Disable SATA Device.

4.4.3 Module Management

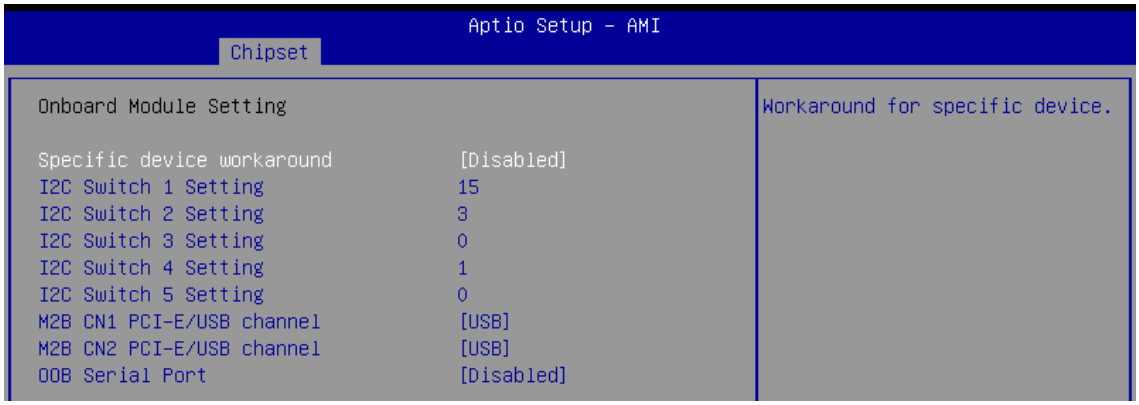


Figure 4-4-3 : Module Management

Specific device workaround
Workaround for specific device.(Boot delay / Warm reset / Cold reset).
I2C Switch Setting
Bit 0~3 for Channel 0~3, 1 to enable, 0 to disable.
For example:
For channel 0, 2 & 3 enter 13 (1101b).

Switch IC	Channel	Device
I2C Switch 1	Channel 0	No Device
	Channel 1	No Device
	Channel 2	No Device
	Channel 3	No Device
I2C Switch 2	Channel 0	Ignition
	Channel 1	TYPE C
	Channel 2	OOB module
	Channel 3	PoE (Reserve)
I2C Switch 3	Channel 0	MPCIE
	Channel 1	M.2 KEY-E
	Channel 2	No Device
	Channel 3	No Device

RCX-2330-BP / RCX-2430-BP

Switch IC	Channel	Device
I2C Switch 5	Channel 0	CPU_PEG_SLOT1
	Channel 1	PCH_PCIe_SLOT1
	Channel 2	PCH_PCIe_SLOT2
	Channel 3	No Device

RCX-2750-BP

Switch IC	Channel	Device
I2C Switch 4	Channel 0	AMC6821
	Channel 1	CPU_PEG_SLOT1
	Channel 2	PCH_PCIe_SLOT3
	Channel 3	No Device
I2C Switch 5	Channel 0	CPU_PEG_SLOT2
	Channel 1	PCH_PCIe_SLOT1
	Channel 2	PCH_PCIe_SLOT2
	Channel 3	No Device

M2B CN1 PCI-E/USB channel
Select M2B CN1 PCI-E/USB channel selection.
M2B CN2 PCI-E/USB channel
Select M2B CN2 PCI-E/USB channel selection.
OOB Serial Port
Enable or Disable Serial Port (COM)

4.4.4 SW Ignition Configuration

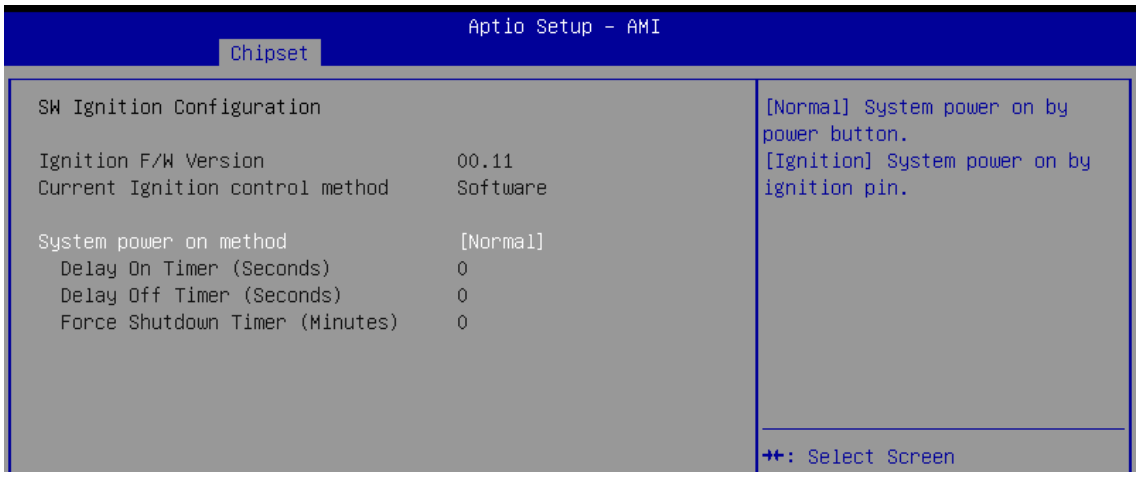


Figure 4-4-4 : SW Ignition Configuration

System power on method
[Normal] System power on by power button.
[Ignition] System power on by ignition pin.
Delay On Timer (Seconds)
The delay time after user trigger ignition on signal (Seconds).
Delay Off Timer (Seconds)
The delay time after user trigger ignition off signal (Seconds)..
Force Shutdown Timer (Minutes)
Used to force cut off system power when OS unable gracefully shutdown system successfully.

4.5 Security Menu

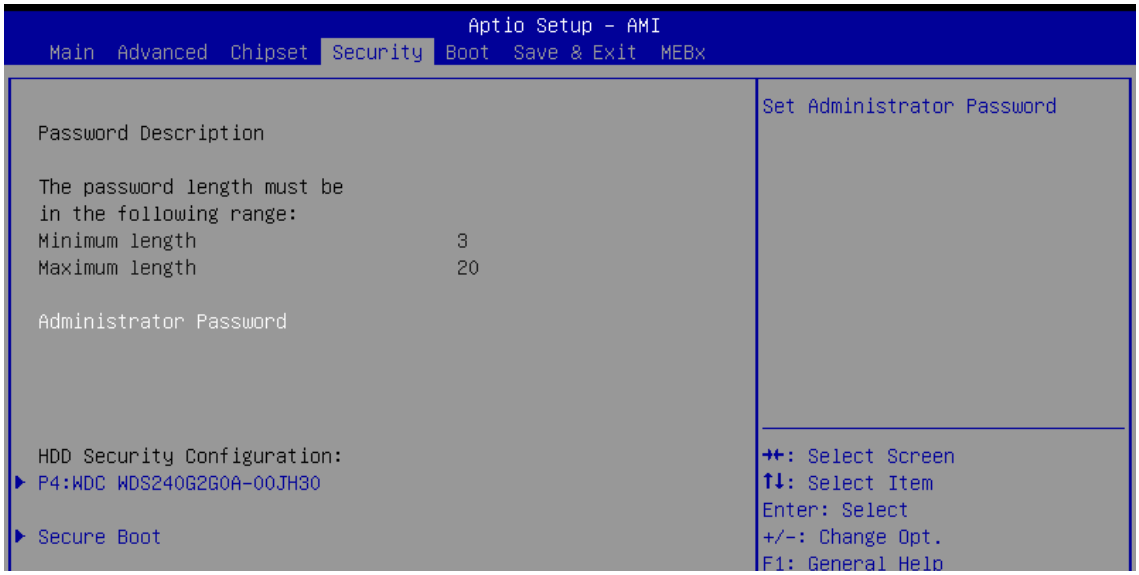


Figure 4-5 : BIOS Security Menu

Administrator Password

Set administrator password.

4.5.1 HDD Security Configuration

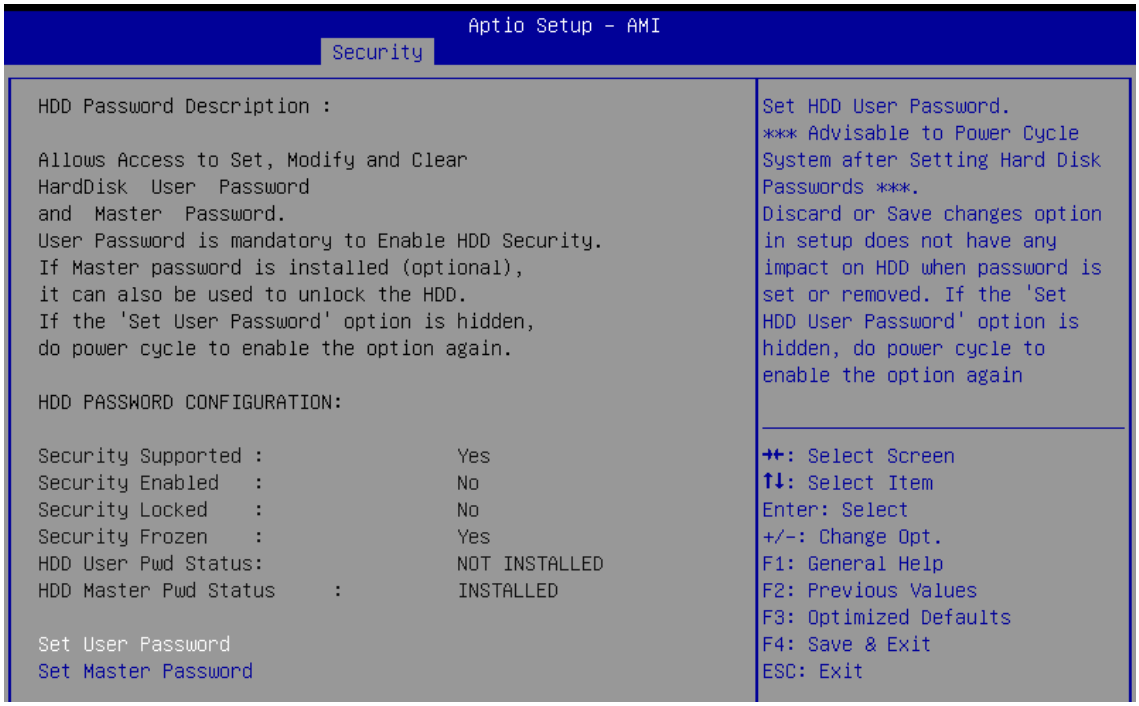


Figure 4-5-1 : HDD Security Configuration

Set User Password

Set HDD User Password.

*** Advisable to Power Cycle System after Setting Hard Disk Passwords ***.

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

Set Master Password

Set Master Password.

4.5.2 Secure Boot

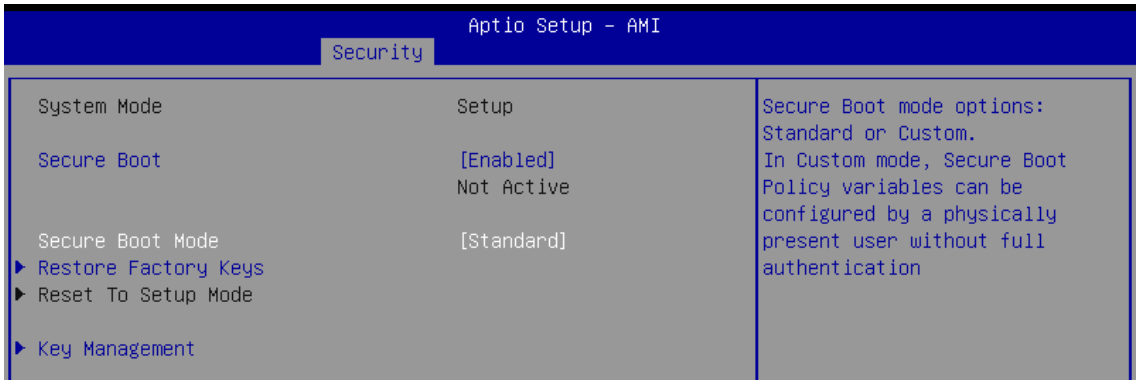


Figure 4-5-2 : Secure Boot

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 variable authentication.

4.6 Boot Menu

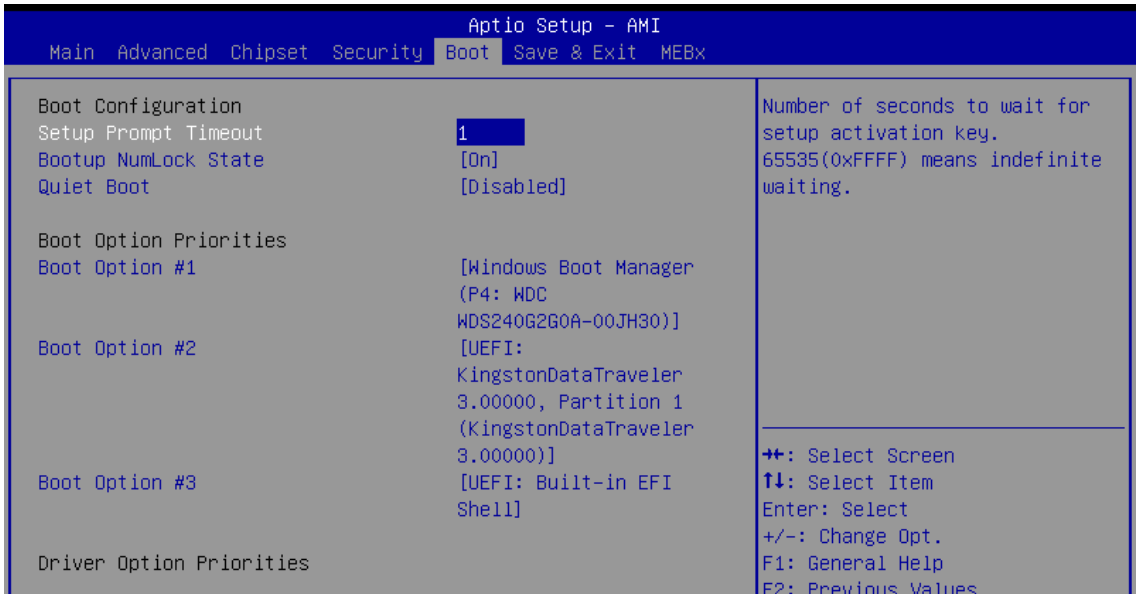


Figure 4-6 : BIOS Boot Menu

Setup Prompt Timeout

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

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Boot Option Priorities

Sets the system boot order.

4.7 Save & Exit

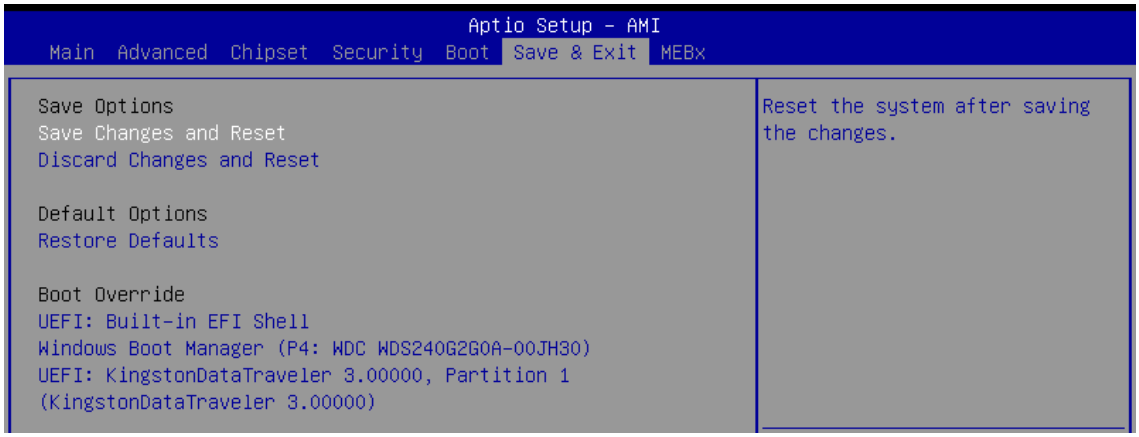


Figure 4-7 : BIOS Save and Exit Menu

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Restore Defaults

Restore/Load Default values for all the setup options.

A

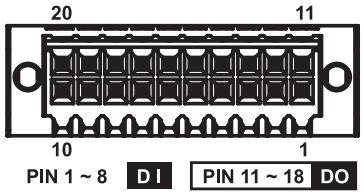
APPENDIX A : Isolated DIO Guide

A.1 Function Description

The RCX-3000 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 :

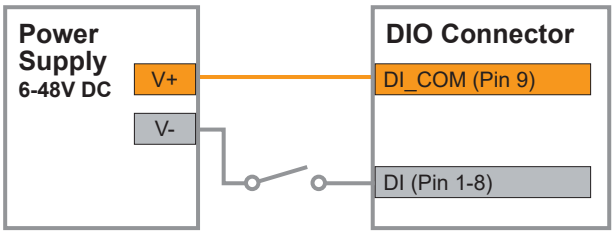


Pin No.	Isolated DIO	Non-Isolated DIO Definition	Pin No.	Isolated DIO Definition	Non-Isolated DIO Definition
1	DI 0	DIO 0	11	DO 0	DIO 8
2	DI 1	DIO 1	12	DO 1	DIO 9
3	DI 2	DIO 2	13	DO 2	DIO 10
4	DI 3	DIO 3	14	DO 3	DIO 11
5	DI 4	DIO 4	15	DO 4	DIO 12
6	DI 5	DIO 5	16	DO 5	DIO 13
7	DI 6	DIO 6	17	DO 6	DIO 14
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

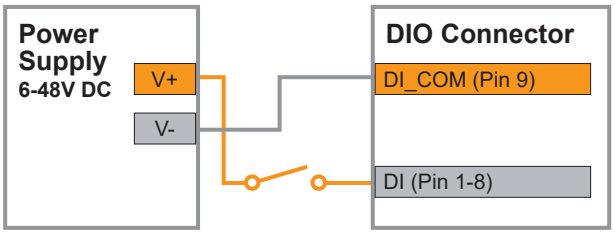
A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode
(NPN)

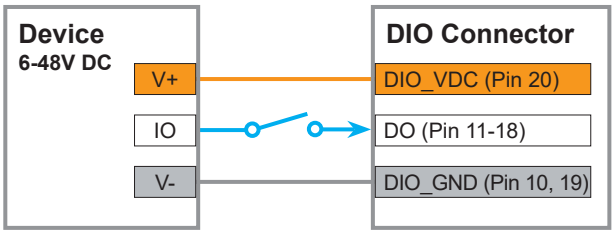


Source Mode
(PNP)

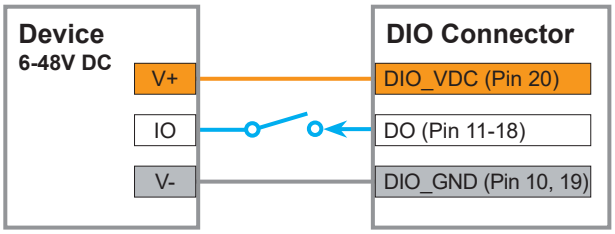


DO reference circuit :

Sink Mode
(NPN, Default)



Source Mode
(PNP)

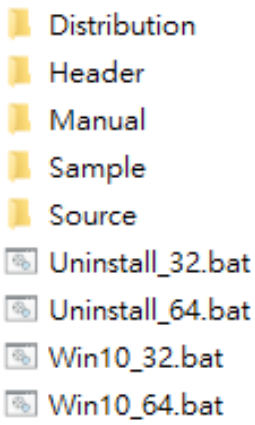


A.3 Software Package Contain

- Distribution folder include x32 and x64 versions, use batch file for installation.
  There are included as fallowed :
    Win10_32.bat, and Win10_64.bat :
      Installation for driver, and
    Uninstall_32.bat, and Uninstall_64.bat :
      Uninstallation for driver
  Run batch file as Administrator.

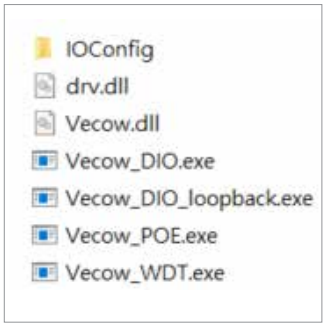
Make sure Windows version before installation.

- Header folder include head file for software developer or System Integration.
- Manual folder include API description.
- Sample folder include sample program, driver library, and API library for Windows/Linux
- Source folder include sample program source code that compile on Visual Studio 2008/Ubuntu18.04.

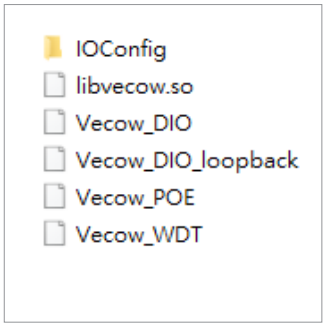


A.4 Sample

Execute demo tool.



Windows



Linux

Sample, as shown below :

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

Choose IO : (1/2)
```

Vecow_DIO

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

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

Vecow_DIO_loopback

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

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

Vecow_WDT

B

APPENDIX B : Software Functions

B.1 Driver API Guide

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

BOOL initial_SIO(BYTE Isolate_Type, BYTE DIO_NPN)
Initial machine for IO and watch dogtimer.
Isolate_Type : DIO type.
1 : Isolated DIO;
0 : Non-Isolated DIO(GPIO).
DIO_NPN : DI/DO type.
1 : PNP (Source) mode for European rule;
0 : NPN (Sink) mode for Japanese rule.
Return :
TRUE (1) : Success.
FALSE (0) : Fail (Driver not exists, or version is too old, or machine not match).

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

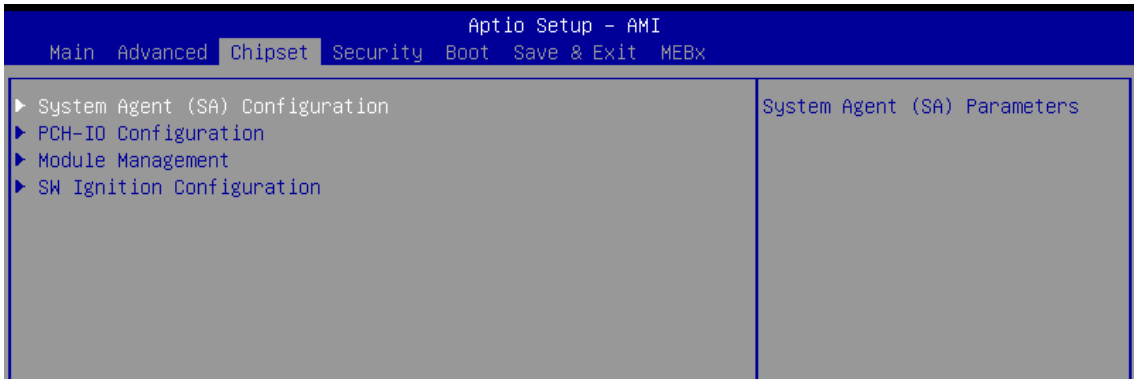
APPENDIX C : RAID Functions

C.1.1 VMD Mode for RAID

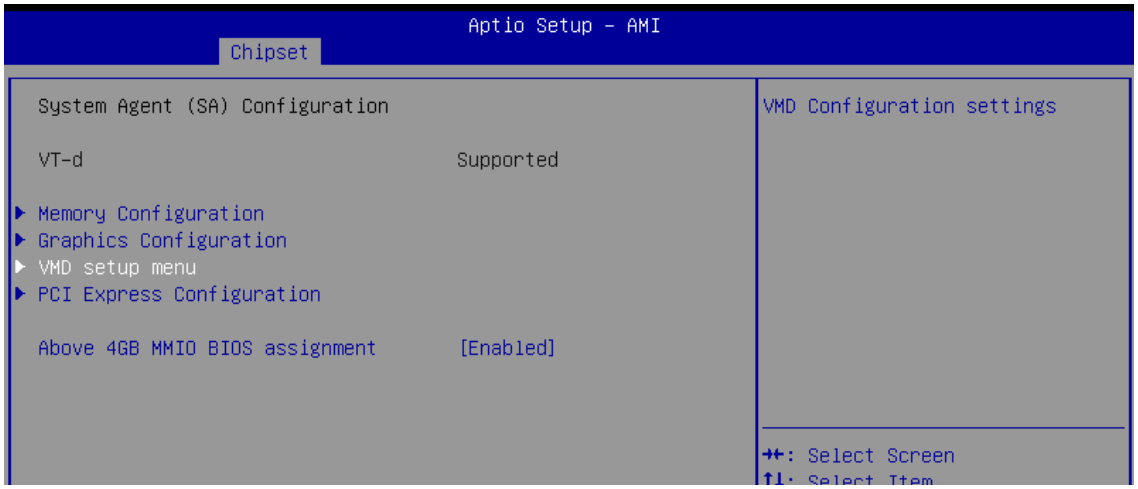
Please set Enable VMD controller as Enabled on BIOS menu.

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

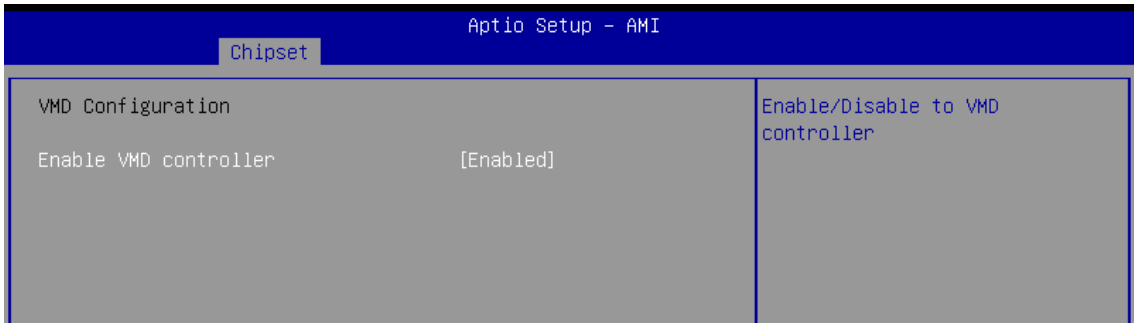
1. Select System Agent (SA) Configuration.



2. Select VMD setup menu.

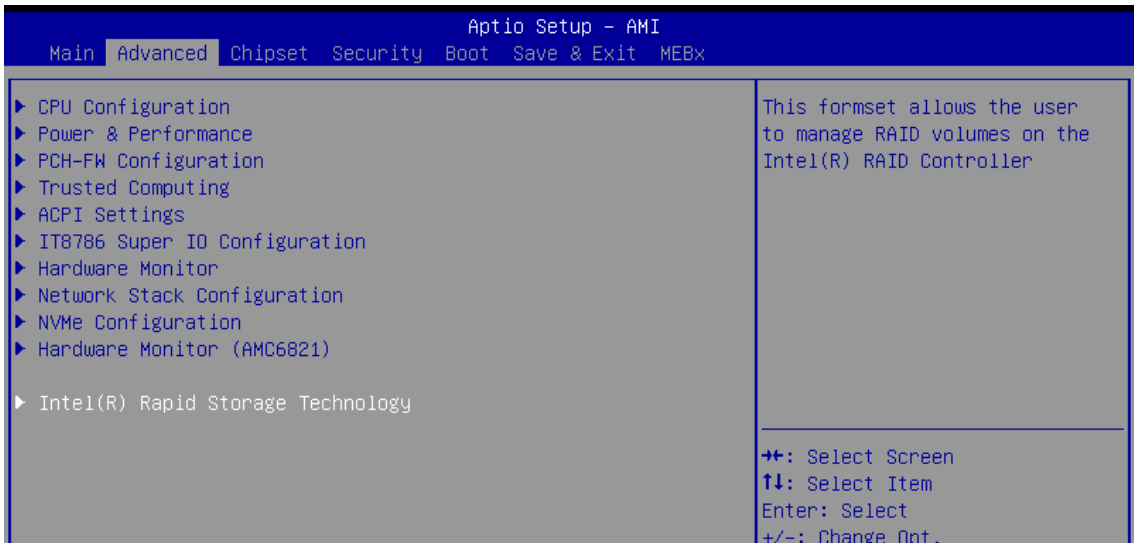


3. Enabled VMD controller. Then Save Changes and Reset.

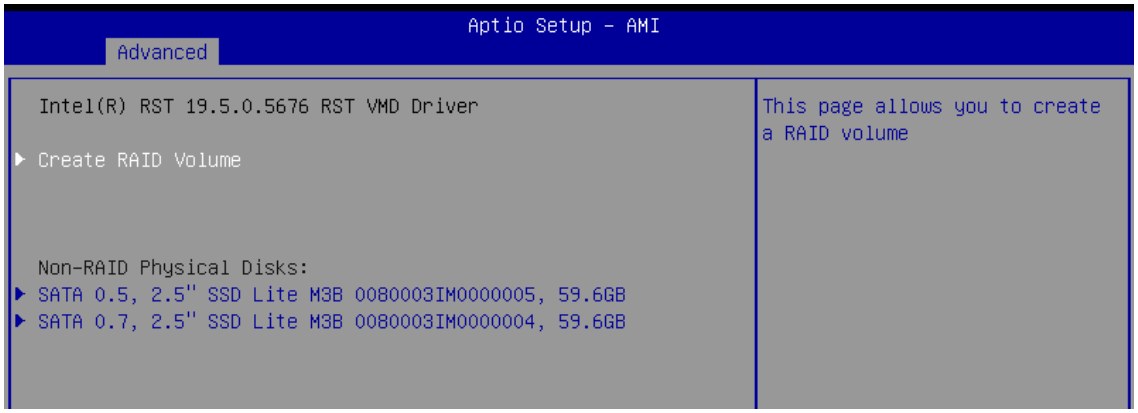


C.1.2 UEFI Mode for RAID

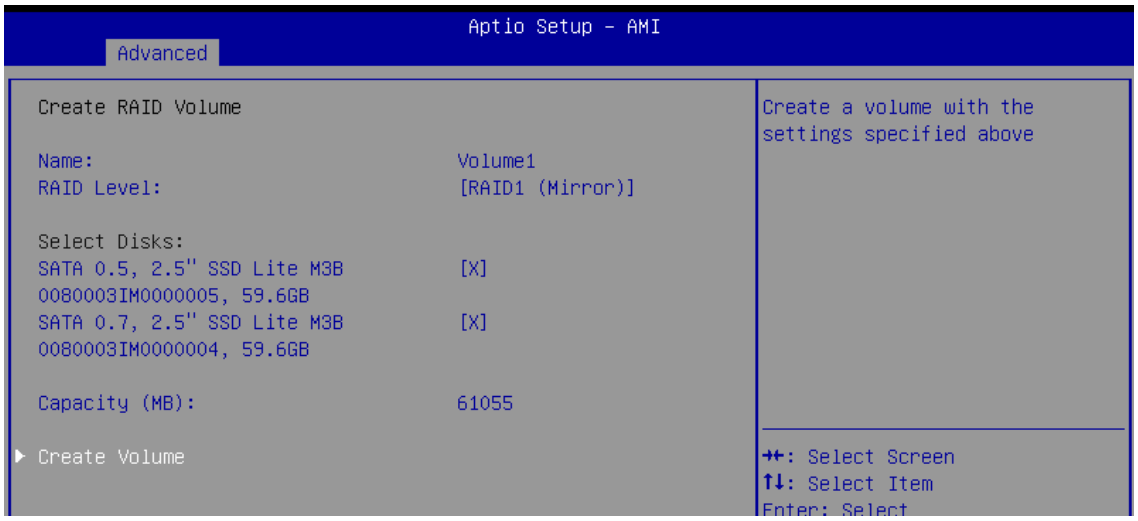
1. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.
Advanced → Intel(R) Rapid Storage Technology



2. Select Create RAID Volume on BIOS menu.
This system is featured 2 M.2 Key M for NVMe SSD, and 4 SATA slots for HDD.
Please note. Storage device M.2 and SATA cannot be mixed to create a RAID Volume.



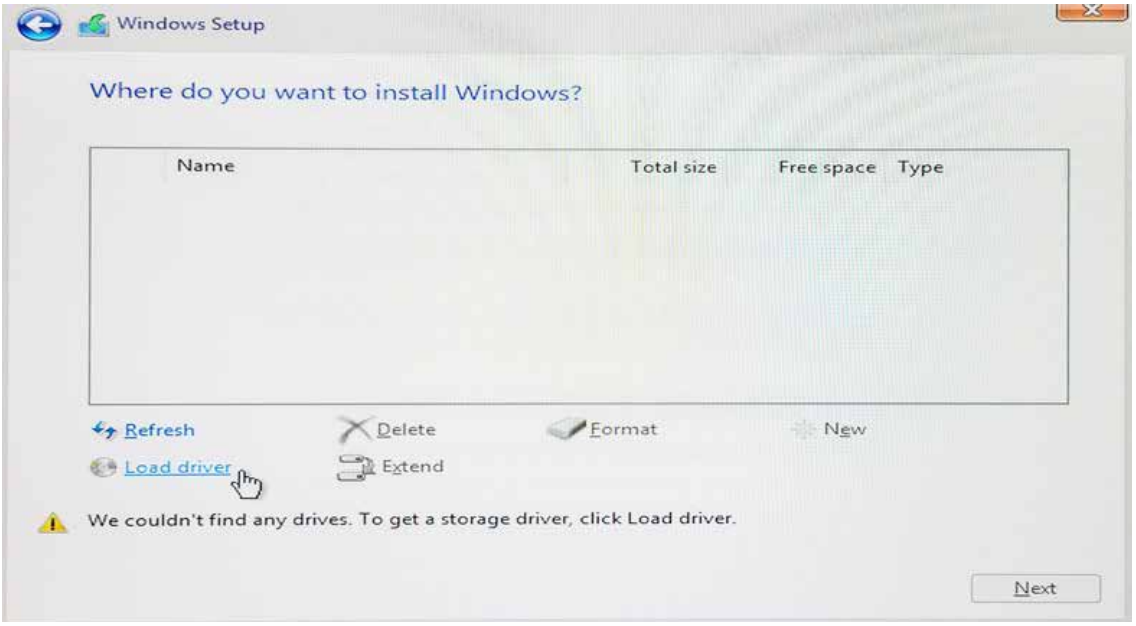
3. Select disks to create RAID Volume, then Save Changes and Reset to install OS.



C.2 OS Installation

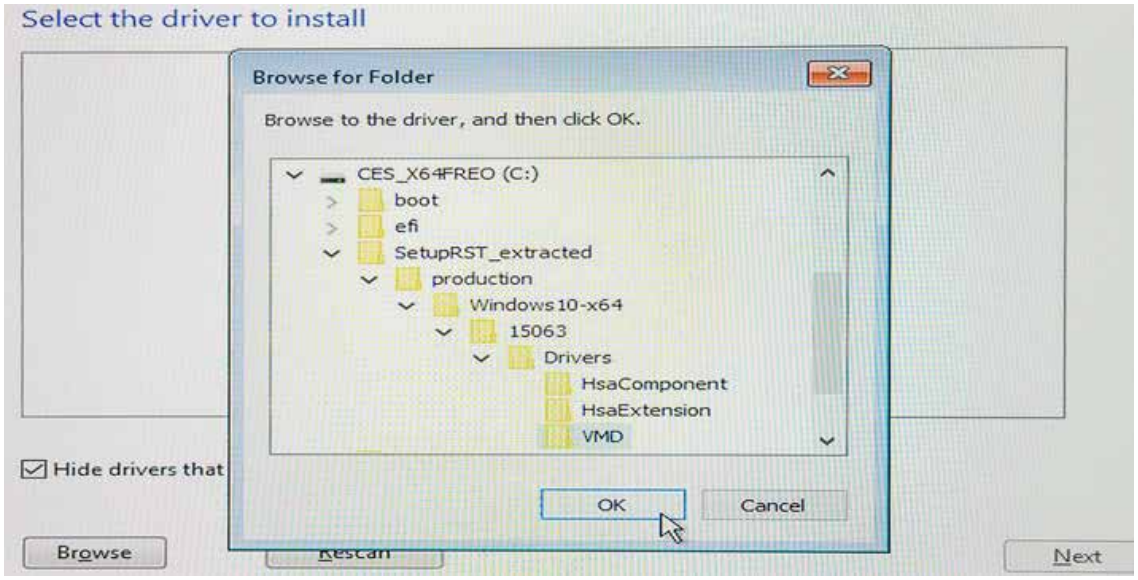
This system is featured 2 M.2 Key M for NVMe SSD, and 4 SATA slots for HDD. We used SATA HDD for Windows 10 OS installation as an example.

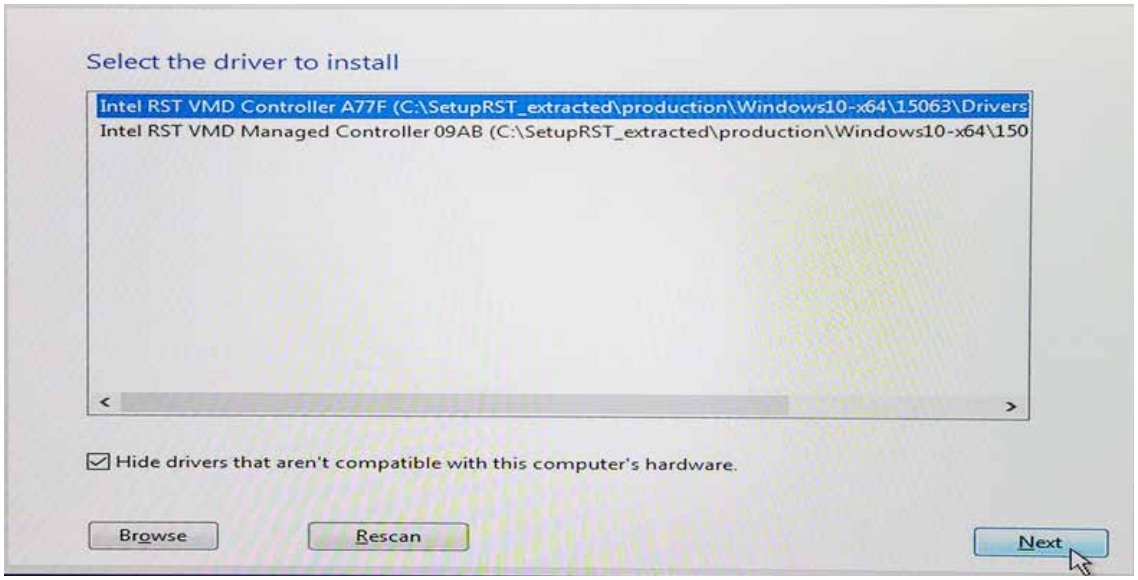
Please note. After Enabled VMD controller needs to load the IRST driver first before it can read the hard disk.



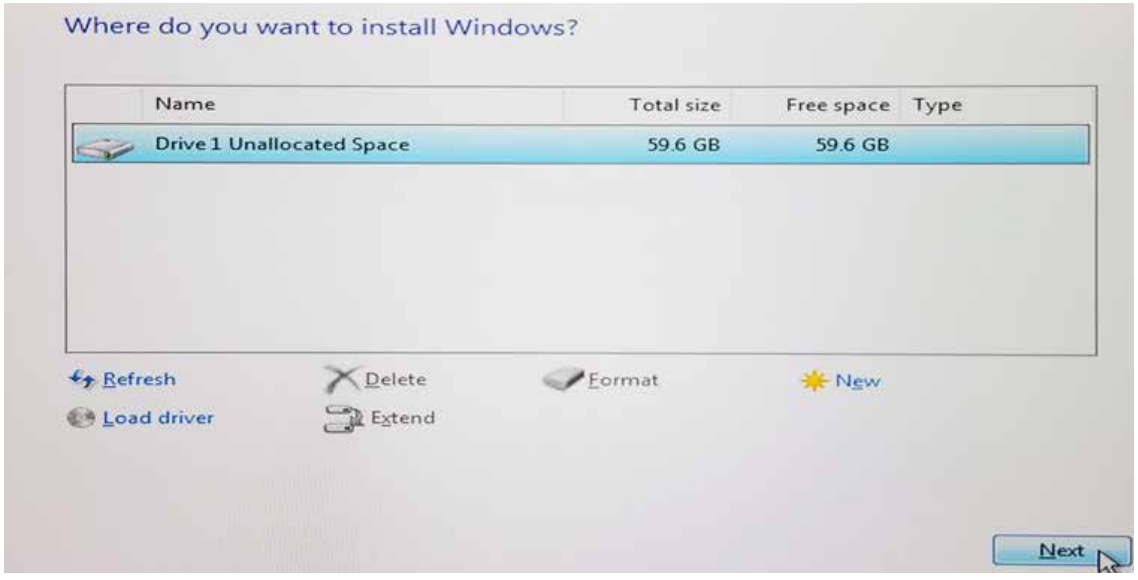
You can find the latest information and software directly from Intel's website.
http://www.intel.com/p/en_US/support/highlights/chpsts/imsm
Download driver "SetupRST.exe" and decompress it.
You can refer to Intel official teaching.
https://www.intel.com/content/www/us/en/support/articles/000094664/technologies/intel-rapid-storage-technology-intel-rst.html
Open Windows PowerShell or CMD and navigate to the location of the SetupRST.exe file.

Enter the following command to extract:
./SetupRST.exe -extractdrivers SetupRST_extracted.
After extraction, a "SetupRST_extracted " folder will be created, then put the folder on the USB drive used for installing Windows.
Loading driver and install it when installing Windows.





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



C.3 To Install All Device Drivers of the System

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

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

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

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

Install "SetupRST.exe"

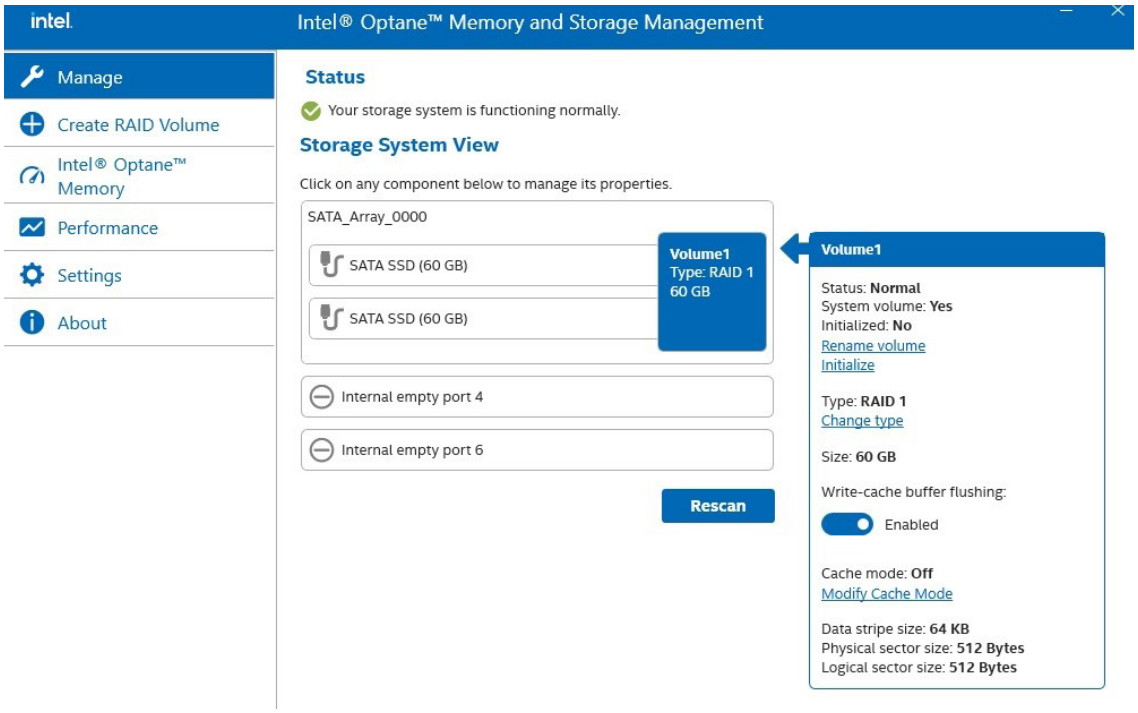
The RAID environment has been done when you completed the steps above.
At this point, the basic RAID Volume setup steps have concluded.

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

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

You can find it at Microsoft Store.
https://apps.microsoft.com/detail/9MZNG5HZWZ1T?activetab=pivot%3Aoverviewtab&hl=en-us&gl=US

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

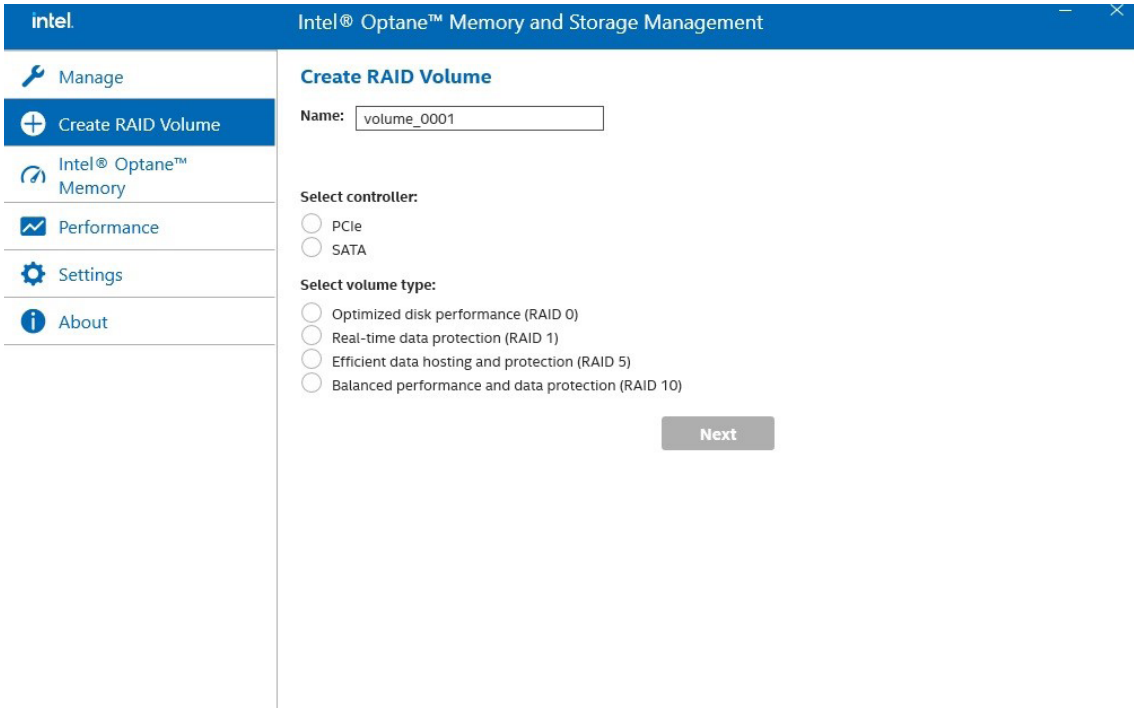


C.6 To Insert SATA HDD for RAID

Please note, you can use additional two SATA ports for SATA HDD, except for mSATA slot. And storage device M.2 and SATA cannot be mixed to create a RAID Volume.

C.7 To Create RAID Volume on "Intel® Optane™ Memory and Storage Management" Software

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



D

APPENDIX D : Setting up Allxon OOB

1. Setting up Allxon OOB

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

1.1 Enable Allxon INB & OOB Services

1.1.1 Install Allxon Agent on Device

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

Refer to the following webpage for detailed instructions:
Install Allxon Agent via Command Prompt

1.1.2 Pairing Edge Device to Allxon Portal

- Get Device Pairing Code

Refer to the following webpage for detailed instructions:
Get Device Pairing Code

- Get Add Your Device on Allxon Portal

Refer to the following webpage for detailed instructions:
Add Your Device on Allxon Portal

1.1.3 Enable OOB Enabler on Device

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

Refer to the webpage for detailed instructions:
Enable Out-Of-Band Management on Device

1.2 Allxon swiftDR for Power Cycling

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

Refer to the webpage for detailed instructions:
Allxon swiftDR for Power Cycling

2. Troubleshooting Your OOB Enabler

2.1 Network Connectivity Requirements

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

APPENDIX E : Power Consumption

Testing Board	RCX-3000
RAM	32GB * 4
USB-1	USB Micsoft Wired Keyboard 600
USB-2	USB Mouse HP G1K28AA
USB-3	USB Flash Transecnd 3.0 8GB
USB-4	USB Flash Transecnd 3.0 8GB
SATA 0	Transcend SATA SSD420 128GB
SATA 1	Seagate HDD 500GB
LAN2 (i226-IT)	2.5 Gbps
LAN2 (i226-IT)	2.5 Gbps
Graphics output	DP
Power plan	Balance(Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program-1	BurnInTest

E.1 Intel® Core™ i9-13900TE (36M Cache, up to 5.00 GHz)

Power on and boot to Win 10 64-bit (without turbo boost technology)

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
i9-13900TE	16V	0.403A	06.45W	0.488A	07.81W	1.370A	21.92W
i9-13900TE	24V	0.296A	07.10W	0.348A	08.36W	0.940A	22.56W
i9-13900TE	36V	0.255A	09.16W	0.290A	10.44W	0.693A	24.95W
i9-13900TE	50V	0.236A	11.82W	0.265A	13.23W	0.542A	27.08W

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
i9-13900TE	16V	3.095A	49.52W	3.459A	55.34W
i9-13900TE	24V	2.036A	48.86W	2.241A	53.78W
i9-13900TE	36V	1.417A	51.01W	1.567A	56.41W
i9-13900TE	50V	1.069A	53.45W	1.215A	60.77W

Power on and boot to Win 10 64-bit (with turbo boost technology)

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
i9-13900TE	16V	0.368A	05.88W	0.454A	07.26W	1.329A	21.26W
i9-13900TE	24V	0.296A	07.11W	0.351A	08.43W	0.902A	21.64W
i9-13900TE	36V	0.259A	09.33W	0.291A	10.48W	0.646A	23.25W
i9-13900TE	50V	0.237A	11.86W	0.269A	13.45W	0.525A	26.24W

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
i9-13900TE	16V	4.141A	66.26W	4.273A	68.37W
i9-13900TE	24V	2.609A	62.62W	2.753A	66.07W
i9-13900TE	36V	1.812A	65.23W	1.885A	67.86W
i9-13900TE	50V	1.322A	66.10W	1.384A	69.20W

E.2 Intel® Core™ i7-13700E (30M Cache, up to 5.10 GHz)

Power on and boot to Win 10 64-bit (without turbo boost technology)

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
i7-13700E	16V	0.369A	05.90W	0.441A	07.06W	1.366A	21.86W
i7-13700E	24V	0.294A	07.06W	0.344A	08.24W	0.947A	22.72W
i7-13700E	36V	0.251A	09.02W	0.292A	10.53W	0.650A	23.38W
i7-13700E	50V	0.247A	12.34W	0.271A	13.53W	0.531A	26.56W

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
i7-13700E	16V	3.517A	56.27W	4.064A	65.02W
i7-13700E	24V	2.367A	56.80W	2.721A	65.30W
i7-13700E	36V	1.598A	57.53W	1.860A	66.96W
i7-13700E	50V	1.256A	62.80W	1.294A	64.70W

Power on and boot to Win 10 64-bit (with turbo boost technology)

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
i7-13700E	16V	0.368A	05.89W	0.443A	07.09W	1.277A	20.43W
i7-13700E	24V	0.294A	07.05W	0.342A	08.21W	0.934A	22.42W
i7-13700E	36V	0.260A	09.36W	0.292A	10.52W	0.666A	23.98W
i7-13700E	50V	0.238A	11.92W	0.260A	13.02W	0.524A	26.19W

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
i7-13700E	16V	6.200A	99.20W	6.246A	99.94W
i7-13700E	24V	4.248A	101.95W	4.181A	100.35W
i7-13700E	36V	2.878A	103.61W	2.833A	101.99W
i7-13700E	50V	2.145A	107.25W	2.160A	107.98W

E.3 Intel® Core™ i9-13900TE with One RTX 4090 Graphics Card

Power on and boot to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit) Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	16V	0.391A	06.26W	0.456A	07.30W
i9-13900TE	24V	0.296A	07.10W	0.345A	08.28W
i9-13900TE	36V	0.249A	08.96W	0.283A	10.19W
i9-13900TE	50V	0.229A	11.45W	0.252A	12.60W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	16V	3.012A	48.19W	26.176A	418.82W
i9-13900TE	24V	2.360A	56.64W	17.856A	428.54W
i9-13900TE	36V	1.554A	55.94W	12.103A	435.71W
i9-13900TE	50V	1.125A	56.25W	8.830A	441.50W

Power on and boot to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit) Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	16V	0.384A	06.14W	0.457A	07.31W
i9-13900TE	24V	0.297A	07.13W	0.349A	08.38W
i9-13900TE	36V	0.251A	09.04W	0.282A	10.15W
i9-13900TE	50V	0.230A	11.50W	0.255A	12.75W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	16V	3.034A	48.54W	28.358A	453.73W
i9-13900TE	24V	2.165A	51.96W	19.553A	469.27W
i9-13900TE	36V	1.495A	53.82W	13.351A	480.64W
i9-13900TE	50V	1.238A	61.90W	9.642A	482.10W

E.4 Intel® Core™ i7-13700E with One RTX 4090 Graphics

Power on and boot to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit) Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	16V	0.370A	05.92W	0.444A	07.10W
i7-13700E	24V	0.293A	07.03W	0.343A	08.23W
i7-13700E	36V	0.257A	09.25W	0.290A	10.44W
i7-13700E	50V	0.249A	12.45W	0.273A	13.65W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	16V	3.165A	50.64W	25.642A	410.27W
i7-13700E	24V	2.093A	50.23W	17.063A	409.50W
i7-13700E	36V	1.523A	54.83W	11.825A	425.70W
i7-13700E	50V	1.252A	62.60W	8.653A	432.65W

Power on and boot to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit) Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	16V	0.368A	05.89W	0.443A	07.09W
i7-13700E	24V	0.294A	07.06W	0.341A	08.18W
i7-13700E	36V	0.255A	09.18W	0.288A	10.37W
i7-13700E	50V	0.231A	11.55W	0.255A	12.75W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	16V	3.185A	50.96W	26.530A	424.48W
i7-13700E	24V	2.124A	50.98W	17.878A	429.07W
i7-13700E	36V	1.505A	54.18W	12.335A	444.06W
i7-13700E	50V	1.159A	57.95W	9.021A	451.05W

E.5 Intel® Core™ i9-13900TE with Two RTX 4090 Graphics Card

Power on and boot to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit) Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	24V	0.365A	08.76W	0.400A	09.60W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	24V	3.125A	75.00W	34.598A	830.34W

Power on and boot to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit) Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	24V	0.366A	08.78W	0.397A	09.53W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i9-13900TE	24V	3.390A	81.36W	35.685A	856.44W

E.6 Intel® Core™ i7-13700E with Two RTX 4090 Graphics Card

Power on and boot to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)	
				Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	24V	0.375A	09.00W	0.398A	09.55W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	24V	3.453A	82.87W	36.280A	870.72W

Power on and boot to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)	
				Sleep Mode	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	24V	0.362A	08.69W	0.373A	08.95W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		idle status CPU usage less 3%		Run 100% CPU usage with FurMark	
		Max Current	Max Consumption	Max Current	Max Consumption
i7-13700E	24V	3.040A	72.96W	38.280A	918.72W

E.7 Intel® Core™ i9-13900TE with One RTX 4090 Graphics Card

AC Switching Power Supply to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i9-13900TE	AC110V	10.61W	12.21W
i9-13900TE	AC220V	09.67W	11.40W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i9-13900TE	AC110V	64.11W	432.76W
i9-13900TE	AC220V	61.74W	428.71W

AC Switching Power Supply to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i9-13900TE	AC110V	10.43W	12.12W
i9-13900TE	AC220V	09.65W	11.65W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i9-13900TE	AC110V	67.74W	451.52W
i9-13900TE	AC220V	62.04W	447.29W

E.8 Intel® Core™ i7-13700E One RTX 4090 Graphics Card

AC Switching Power Supply to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i7-13700E	AC110V	10.33W	12.45W
i7-13700E	AC220V	09.42W	11.63W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i7-13700E	AC110V	63.35W	446.62W
i7-13700E	AC220V	62.44W	443.90W

AC Switching Power Supply to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i7-13700E	AC110V	10.34W	12.30W
i7-13700E	AC220V	09.62W	11.30W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i7-13700E	AC110V	64.32W	492.24W
i7-13700E	AC220V	63.78W	482.25W

E.9 Intel® Core™ i9-13900TE Two RTX 4090 Graphics Card

AC Switching Power Supply to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i9-13900TE	AC110V	10.57W	12.35W
i9-13900TE	AC220V	09.31W	11.21W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i9-13900TE	AC110V	85.12W	746.32W
i9-13900TE	AC220V	86.81W	736.52W

AC Switching Power Supply to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i9-13900TE	AC110V	10.52W	12.38W
i9-13900TE	AC220V	9.40W	11.45W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i9-13900TE	AC110V	94.25W	765.78W
i9-13900TE	AC220V	86.72W	752.68W

E.10 Intel® Core™ i7-13700E Two RTX 4090 Graphics Card

AC Switching Power Supply to Win 10 64-bit (without turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i7-13700E	AC110V	10.54W	12.51W
i7-13700E	AC220V	09.52W	11.37W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i7-13700E	AC110V	88.68W	772.14W
i7-13700E	AC220V	86.48W	757.38W

AC Switching Power Supply to Win 10 64-bit (with turbo boost technology)

CPU	Power Input	Standby Mode	Power on and boot to Win 10 (64-bit)
			Sleep Mode
		Max Consumption	Max Consumption
i7-13700E	AC110V	10.50W	12.42W
i7-13700E	AC220V	09.51W	11.64W

CPU	Power Input	Power on and boot to Win10 (64-bit)	
		idle status CPU usage less 3%	Run 100% CPU usage with FurMark
		Max Consumption	Max Consumption
i7-13700E	AC110V	88.58W	812.45W
i7-13700E	AC220V	88.18W	800..23W

APPENDIX F : Supported Memory and Storage List

F.1 Supported Memory List

Testing Board	RCX-3000
Memory Test	MemTest86 V10.2
BurnInTest	V10.2

F.2 Tset Item

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

F.3 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
TEAMGROUP 48G DDR5 5600 U-DIMM	TE48GFLXV2TH CT	25ºC
		25ºC
Innodisk 32G DDR4 4800 U-DIMM	M5U0-BGS2KCVP-H03	25ºC
		25ºC
Kingston 32G DDR4 4800 U-DIMM	KVR48U40BD8-32	25ºC
		25ºC

F.4 Supported ECC Memory List

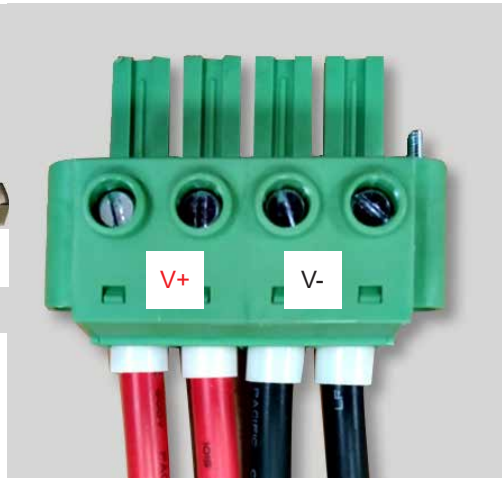
Brand	Info	Test Temp. (Celsius)
Kingston 32G DDR4 4800 U-DIMM	KSM48E40BD8KM-32HM	25ºC
		25ºC
TRANSCEND 16G DDR4 4800 U-DIMM	TS2GLA72V8E	25ºC
		25ºC

F.5 Supported Storage Device List

Type	Brand	Model	Capacity
SATA HDD	Seagate	SDC001	500GB
SATA SSD	Apacer	AS340X	120GB
	SMART	FDMP8960GTCXA111	960GB
	MEMXPRO	M3A MI3MA1212802WN	128GB
	Transcend	TS128GSSD420K	128GB
		TS128GSSD230S	128GB
	Kingston	SHFS37A	240GB
	Innodisk	2.5” SATA SSD 3TE4 DES25-A28M41BW1DC-H03	128GB
		2.5”SATA SSD 3TG2-P DGS25-64GD81BC1QC	64GB
M.2 PCIe SSD	Toshiba	KXG50ZNV512G	512GB
	Kingston	SA2000MB	250GB
	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
		980 EVO PRO MZ-V8P250BW	250GB
	Intel	760P SSDPEKKW128G8	128GB
	SMART	FDMP8960GTCXA111	960GB

APPENDIX G : How to Install Power Supply

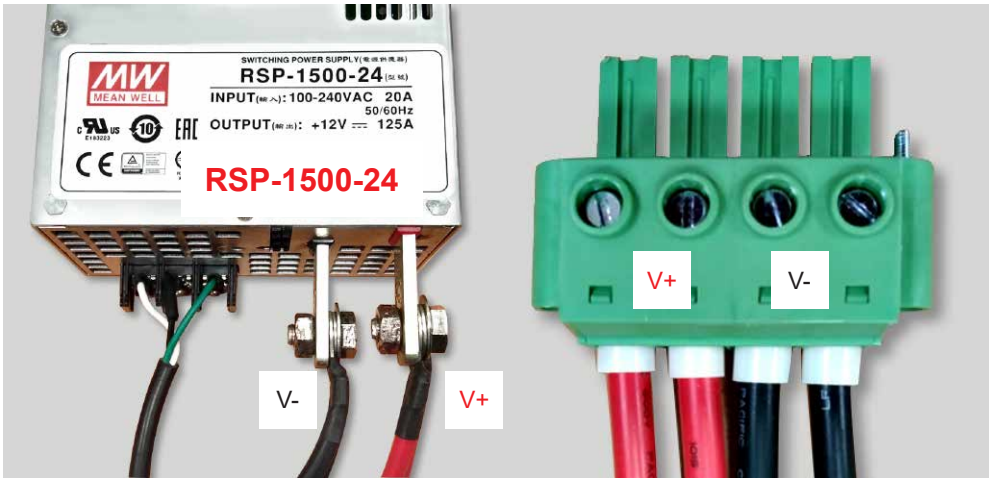
G.1 RSP-3000-24 Power Supply



GREEN ····· ⏚
BLACK ····· AC/L
WHITE ····· AC/N

G.2 RSP-1500-24 Power Supply

RCX-2700 PEG Series



APPENDIX H : Debug Beep Sound Code

Beeps	Description
1	Invalid password
1	Memory install twice
2	Recovery started
3	DXEIPL PPI or DXE Core is not found
4	Memory not installed
4	Recovery failed
4	S3 Resume failed
4	Some of the Architectural Protocols are not available
6	Flash update is failed
7	Platform cannot be reset because reset PPI is not available
7	Platform cannot be reset because reset protocol is not available
8	Platform PCI resource requirements cannot be met

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

Vecow

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