VCM-1000 USER Manual

14th Gen Intel® Core™ i9/i7/i5/i3 Compact Embedded System
6 GigE LAN w/4 PoE+, 12 USB, DC 24V, -25°C to 75°C Operation Temp.

Vecow

3.0.0 Edition 20240709

Record of Revision

Version	Date	Page	Description	Remark
1.00	2023/07/03	All	Official Release	
1.10	2023/08/22	34, 36	Update	
2.00	2024/05/28	v, 1, 2, 3, 5, 7, 9	Update	
3.00	2024/07/09	All	Update	

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Declaration of Conformity

FCC

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

CE

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

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Order Information

Part Number	Description
VCM-1000	VCM-1000, 2 GigE LAN, 2 COM, 4 USB 3.2, 1 SSD Bracket, Fanless
VCM-1000F	VCM-1000F, 2 GigE LAN, 2 COM, 4 USB 3.2, 1 SSD Bracket, Fan
VCM-1100F	VCM-1100F, 6 GigE LAN w/4 PoE+, 2 COM, 8 USB 3.2, 28 Isolated DIO, 2 SSD Bracket, Fan

CPU List

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

* 14th Gen support PC Client use condition only.

Optional Accessories

Part Number	Description
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
PWA-120W1	120W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block
PWA-160W-WT	160W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block, Wide Temperature -30°C to +70°C
PWA-180W	180W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block
VESA Mount	VESA Mounting Kit
DIN-RAIL Kit	DIN Rail Kit and VESA Mounting Kit
M.2 Storage Module	M.2 Key M Storage Module
4G Module	4G/GPS Module with Antenna
WiFi & Bluetooth	WiFi & Bluetooth Module with Antenna

Table of Contents

1

GENERAL INTRODUCTION

1.1 Overview

Vecow VCM-1000 Series is a high-performance embedded system powered by a 24-core 14th Gen Intel® Core™ i9/i7/i5/i3 processor. It supports up to 65W TDP CPU, and DDR5 memory up to 96GB, delivering exceptional performance and scalability.

To facilitate seamless connectivity and efficient communications, the VCM-1000 Series offers a wide range of I/O interfaces, including 6 independent GigE LAN ports with 4 IEEE 802.3at PoE+, 2 COM ports, and support for up to 12 USB 3.2 connections. Additionally, to meet the growing storage demands of advanced IoT applications, the VCM-1000 Series is equipped with 2 2.5" SSD/HDD slots and 1 M.2 Key M socket. This configuration provides a faster, smaller, and more efficient solution for data-rich applications.

Vecow VCM-1000 is designed to help accelerate the deployment of modern AIoT applications. It is compact, with a 2U half-rack design, supports software ignition control, TPM 2.0, and allows for a wide range of operating temperatures from -25°C to 75°C, making it ideal for demanding workloads such as digital factories, public security, mobile robots, and any Edge AI applications.

1.2 Features

- 24-core 14th Gen Intel® Core™ i9/i7/i5/i3 Processor running with Intel® H610E PCH
- 2 DDR5 5200MHz SO-DIMM, up to 96GB Memory
- 6 Independent GigE LAN with 4 IEEE 802.3at PoE+
- 12 USB, 2 COM RS-232/422/485, 28 Isolated DIO
- WiFi/4G/3G/LTE/GPRS/UMTS, M.2 Key E, M.2 Key B
- Software Ignition Control, TPM 2.0, Intel® TCC
- Compact 2U half-rack design, -25°C to 75°C wide range operating temperature
- Optional VHub AIoT Solution Service supports OpenVINO based AI accelerator and advanced Edge AI application

1.3 Product Specification

1.3.1 Specifications of VCM-1000

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • Intel® 13th Generation Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • Intel® 12th Generation Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® H610E
BIOS	AMI
SIO	IT8786E
Memory	• 2 DDR5 5200MHz (Non-ECC) • Up to 96GB • 2 262-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485
USB	4 USB 3.2 (External), 4 USB 2.0 (External), 2 USB 2.0 (Internal)
LED	Power, HDD, PoE, Wireless
SIM Card	1 SIM Card Socket (Internal)
Expansion	
M.2	• 1 M.2 Key B Socket (2280/3052/3042, PCIe, SATA, USB 2) • 1 M.2 Key E Socket (2230, PCIe)
Graphics	
Graphics Processor	Intel® UHD Graphics 770 driven by Intel® Xe Architecture
Interface	• 1 VGA : Up to 1920 x 1200 @60Hz • 1 DVI-D : Up to 1920 x 1200 @60Hz
Storage	
SATA	1 SATA III (6Gbps)
M.2	1 M.2 Key M Socket (2280/22110, PCIe x2, SATA)
Storage Device	1 2.5" SSD/HDD Bracket (Internal)
Ethernet	
LAN 1	Intel® I219LM GigE LAN
LAN 2	Intel® I210 GigE LAN
Power	
Input Voltage	24V DC-in (±5%)
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN

Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 11, Windows 10, Linux
Mechanical	
Dimension (W x L x H)	200mm x 200mm x 55mm (7.87" x 7.87" x 2.16")
Weight	2.5kg (5.51 lb)
Mounting	• Wallmount by mounting bracket • VESA Mount (Optional) • DIN Rail Mounting (Optional)
Environment	
Operating Temperature (with air flow)	• 35W CPU Fanless : -25°C to 60°C (-13°F to 140°F) • 65W CPU Fanless : -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% at 60°C
Shock	• IEC 60068-2-27 • SSD : 50G @ wallmount, Half-sine, 11ms
Vibration	• IEC 60068-2-64 • SSD : 5Grms, 5Hz to 500Hz, 3 Axis
EMC	CE, FCC

1.3.2 Specifications of VCM-1000F

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • Intel® 13th Generation Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • Intel® 12th Generation Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® H610E
BIOS	AMI
SIO	IT8786E
Memory	• 2 DDR5 5200MHz (Non-ECC) • Up to 96GB • 2 262-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485
USB	4 USB 3.2 (External), 4 USB 2.0 (External), 2 USB 2.0 (Internal)
LED	Power, HDD, PoE, Wireless
SIM Card	1 SIM Card Socket (Internal)
Expansion	
M.2	• 1 M.2 Key B Socket (2280/3052/3042, PCIe, SATA, USB 2) • 1 M.2 Key E Socket (2230, PCIe)
Graphics	
Graphics Processor	Intel® UHD Graphics 770 driven by Intel® Xe Architecture
Interface	• 1 VGA : Up to 1920 x 1200 @60Hz • 1 DVI-D : Up to 1920 x 1200 @60Hz
Storage	
SATA	1 SATA III (6Gbps)
M.2	1 M.2 Key M Socket (2280/22110, PCIe x2, SATA)
Storage Device	1 2.5" SSD/HDD Bracket (Internal)
Ethernet	
LAN 1	Intel® I219LM GigE LAN
LAN 2	Intel® I210 GigE LAN
Power	
Input Voltage	24V DC-in (±5%)
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN

Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 11, Windows 10, Linux
Mechanical	
Dimension (W x L x H)	200mm x 200mm x 55mm (7.87" x 7.87" x 2.16")
Weight	2.5kg (5.51 lb)
Mounting	• Wallmount by mounting bracket • VESA Mount (Optional) • DIN Rail Mounting (Optional)
Environment	
Operating Temperature (with air flow)	• 35W CPU with Fan : -25°C to 75°C (-13°F to 167°F) • 65W CPU with Fan : -25°C to 60°C (-13°F to 140°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock/ Vibration	• IEC 61373 : 2010 • Railway Applications : Rolling Stock Equipment, Shock and Vibration Test
EMC	CE, FCC

1.3.3 Specifications of VCM-1100F

System	
Processor	• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh) • Intel® 13th Generation Core™ i9/i7/i5/i3 Processor (Raptor Lake-S) • Intel® 12th Generation Core™ i9/i7/i5/i3 Processor (Alder Lake-S)
Chipset	Intel® H610E
BIOS	AMI
SIO	IT8786E
Memory	• 2 DDR5 5200MHz (Non-ECC) • Up to 96GB • 2 262-pin SO-DIMM Socket
I/O Interface	
Serial	2 COM RS-232/422/485
USB	8 USB 3.2 (External), 4 USB 2.0 (External), 2 USB 2.0 (Internal)
Isolated DIO	28 Isolated DIO : 24 DO, 4 DI
LED	Power, HDD, PoE, Wireless
SIM Card	1 SIM Card Socket (Internal)
Expansion	
M.2	• 1 M.2 Key B Socket (2280/3052/3042, PCIe, SATA, USB 2) • 1 M.2 Key E Socket (2230, PCIe)
Graphics	
Graphics Processor	Intel® UHD Graphics 770 driven by Intel® X^e Architecture
Interface	• 1 VGA : Up to 1920 x 1200 @60Hz • 1 DVI-D : Up to 1920 x 1200 @60Hz
Storage	
SATA	2 SATA III (6Gbps)
M.2	1 M.2 Key M Socket (2280/22110, PCIe x2, SATA)
Storage Device	2 2.5" SSD/HDD Bracket (Internal)
Ethernet	
LAN 1	Intel® I219LM GigE LAN
LAN 2	Intel® I210 GigE LAN
Ethernet	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350

Power	
Input Voltage	24V DC-in (±5%)
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Others	
TPM	Infineon SLB9670 supports TPM 2.0, SPI Interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 11, Windows 10, Linux
Mechanical	
Dimension (W x L x H)	200mm x 200mm x 67mm (7.87" x 7.87" x 2.63")
Weight	2.8kg (6.18 lb)
Mounting	• Wallmount by mounting bracket • VESA Mount (Optional) • DIN Rail Mounting (Optional)
Environment	
Operating Temperature (with air flow)	• 35W CPU with Fan : -25°C to 75°C (-13°F to 167°F) • 65W CPU with Fan : -25°C to 60°C (-13°F to 140°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock/ Vibration	• IEC 61373 : 2010 • Railway Applicatioans : Rolling Stock Equipment, Shock and Vibration Test
EMC	CE, FCC

1.4 Supported CPU List

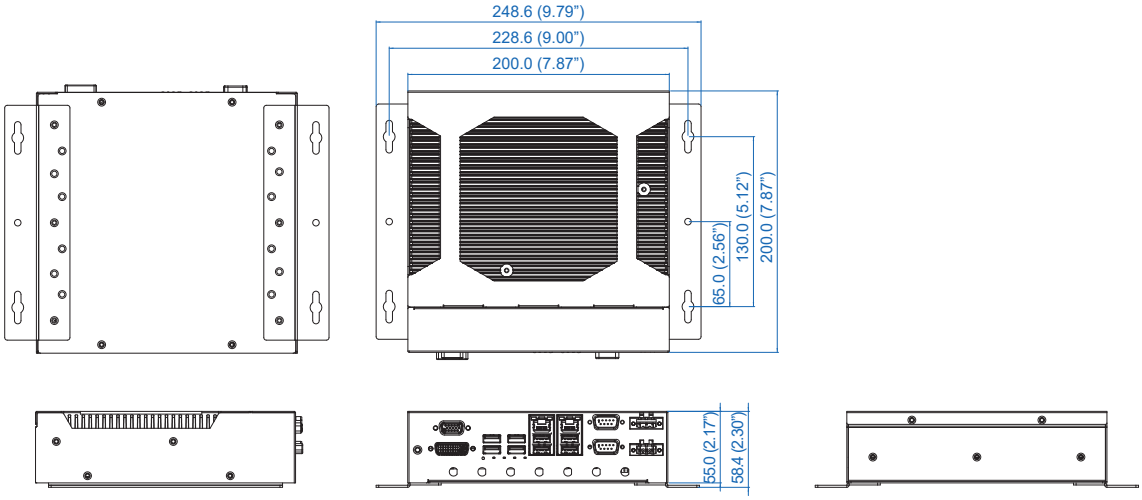
Series	CPU	Cores	GHz	TDP (W)	ECC
Intel® Core™ (14th Gen)*	i9-14900	24	5.8	65	Y
	i7-14700	20	5.4		
	i5-14500	14	5		
	i3-14100	4	4.7		
	i9-14900T	24	5.5	35	
	i7-14700T	20	5.2		
	i5-14500T	14	4.8		
	i3-14100T	4	4.4		
Intel® Core™ (13th Gen)	i9-13900E	24	5.2	65	
	i7-13700E	16	5.1		
	i5-13500E	14	4.6		
	i3-13100E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

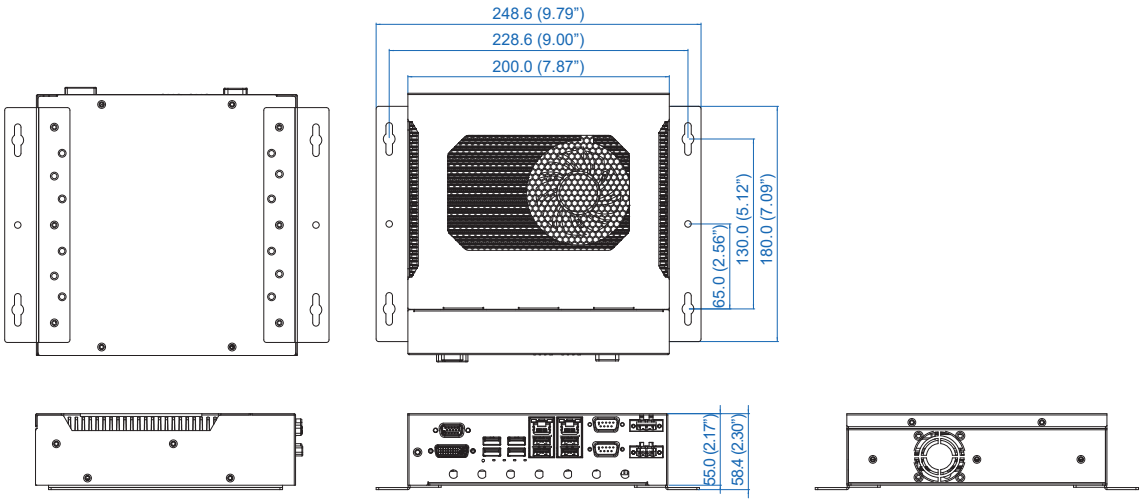
1.5.1 Dimensions of VCM-1000

Unit : mm (inch)



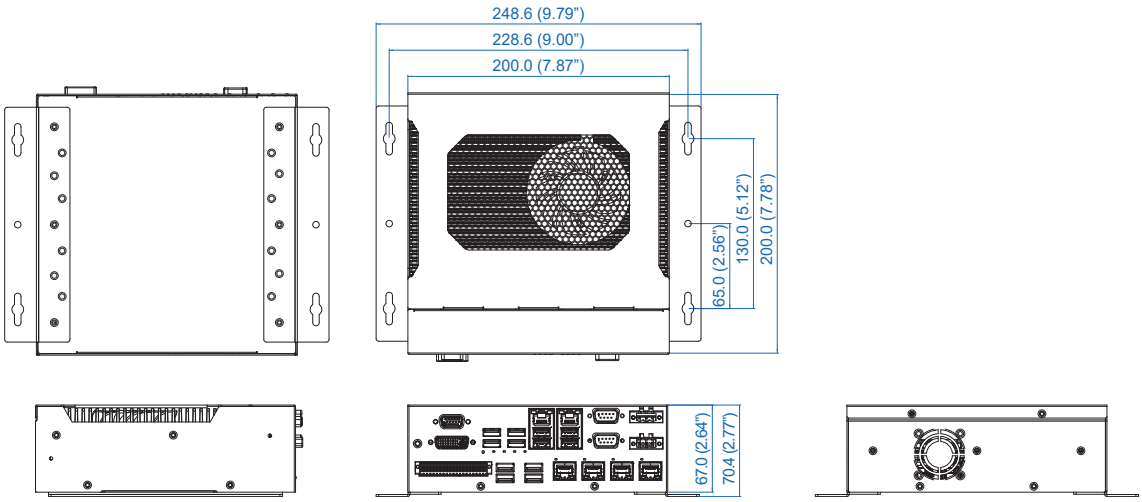
1.5.2 Dimensions of VCM-1000F

Unit : mm (inch)



1.5.3 Dimensions of VCM-1100F

Unit : mm (inch)



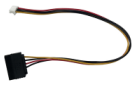
2

GETTING TO KNOW YOUR VCM-1000

2.1 Packing List

2.1.1 VCM-1000/VCM-1000F

Item	Description	Qty
1	VCM-1000 Compact Embedded System (According to the configuration of you order, the VCM-1000 series may contain SSD/ HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1
2	VCM-1000/VCM-1000F accessory box, which contains:	1

Item	Description	Outlook	Usage	P/N	Qty
1	Terminal block 3-pin (5.0mm)		DC-IN/IGN	51-2411R03-S1B	2
2	PHILLPIS M3x4L, Ni+Ny		M.2	53-2426204-80B	5
3	Flat M3x4L		SSD/HDD	53-2466204-30B	8
4	Flat #6-32x6L, Black+Ny		Wall mount bracket	53-I000350-311	8
5	Wall mount bracket VCM-1000		Wall Mount bracket	62-03P1187-01A	2
6	M.2 Key B 52 to 80		M.2 Key B 3052 extender bracket	62-03P0997-30A	1
7	M.2 Key M 80 to 110		M.2 Key M 2280 extender bracket	62-03P1212-30A	1
8	SATA Data Cable		SATA Data Cable	61-13I0707-0DA	1
9	SATA Power Cable		SATA Power Cable	61-13P0415-08A	1

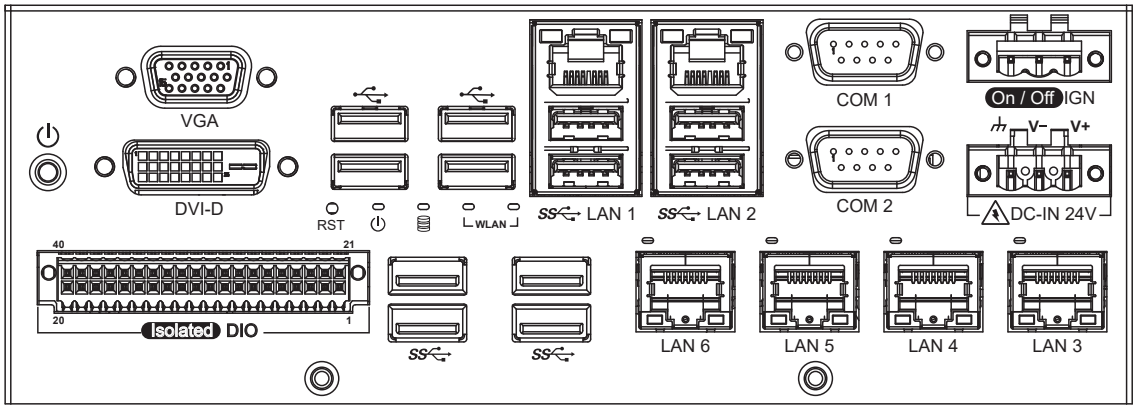
2.1.2 VCM-1100F

Item	Description	Qty
1	VCM-1100F Compact Embedded System (According to the configuration of you order, the VCM-1000 series may contain SSD/ HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1
2	VCM-1100F accessory box, which contains:	1

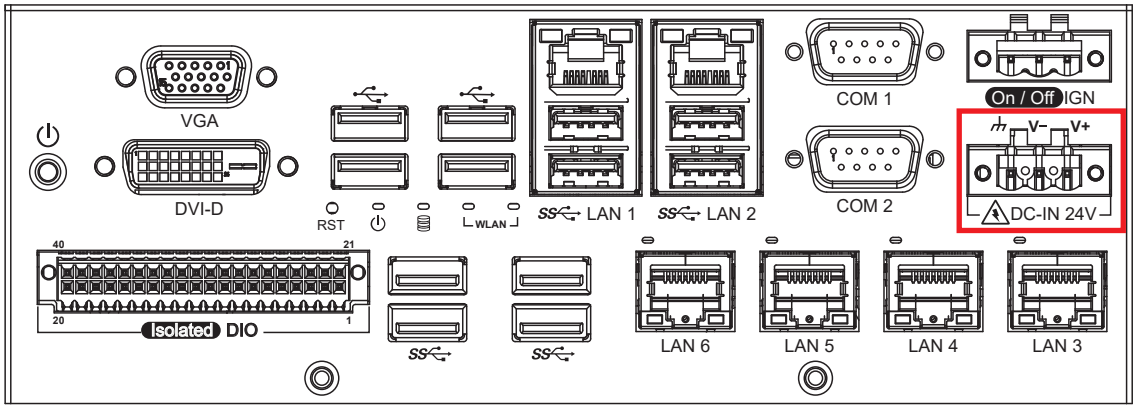
Item	Description	Outlook	Usage	P/N	Qty
1	Terminal block 3-pin (5.0mm)		DC-IN/IGN	51-2411R03-S1B	2
2	PHILLPIS M3x4L, Ni+Ny		M.2	53-2426204-80B	5
3	Flat M3x4L		SSD/HDD	53-2466204-30B	8
4	Flat #6-32x6L, Black+Ny		Wall mount bracket	53-I000350-311	8
5	Wall mount bracket VCM-1000		Wall Mount bracket	62-03P1187-01A	2
6	M.2 Key B 52 to 80		M.2 Key B 3052 extender bracket	62-03P0997-30A	1
7	M.2 Key M 80 to 110		M.2 Key M 2280 extender bracket	62-03P1212-30A	1
8	SATA Data Cable		SATA Data Cable	61-13I0707-0DA	2
9	SATA Power Cable		SATA Power Cable	61-13P0415-08A	2
10	Terminal Block 2x20P 2.54mm		Isolated DIO	51-2112R40-S1D	1

2.2 Front Panel I/O Functions

In Vecow VCM-1000 series family, all I/O connectors are located on front panel. Most of the general connections to computer device, such as USB, LAN Jack, VGA, DVI-D, DIO Port and Serial ports, are placed on the front panel.



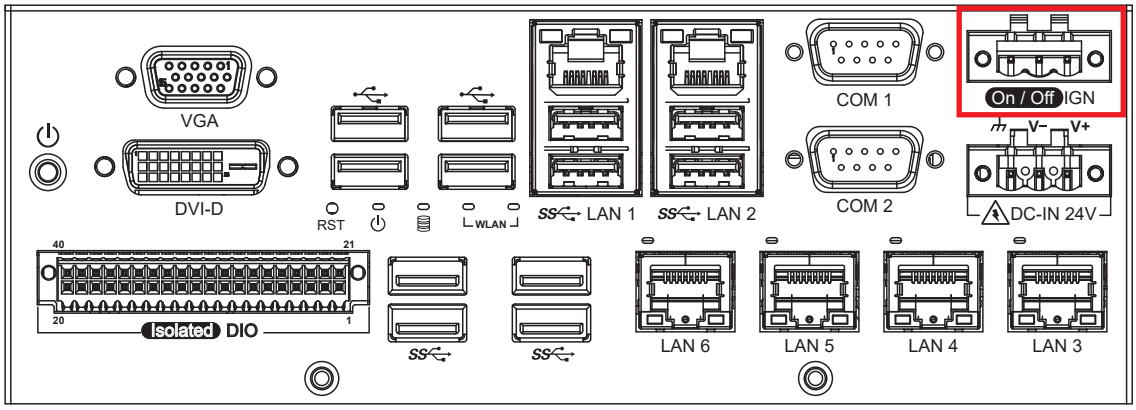
2.2.1 Power Input



This system supports 24V DC power input by terminal block in the front side. In normal power operation, power LED lightens in solid green.

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

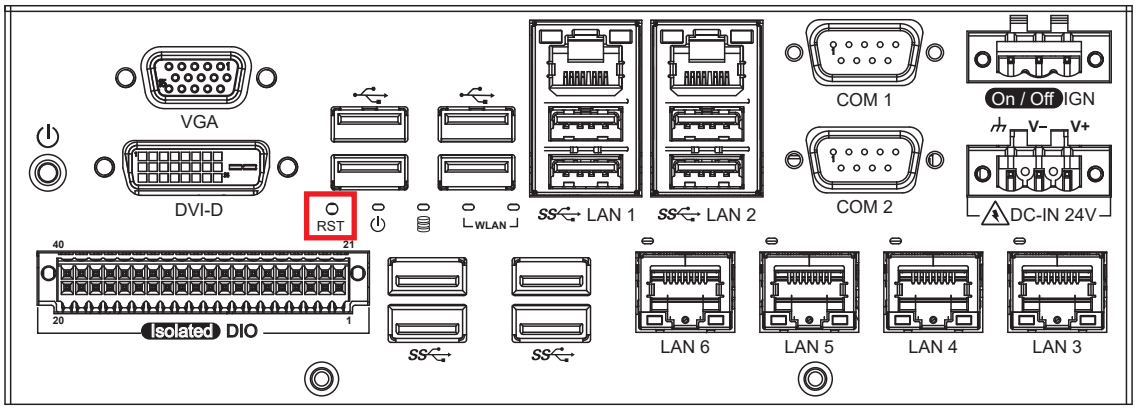
2.2.2 Remote Power On/Off Switch & IGN ITION Terminal Block



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

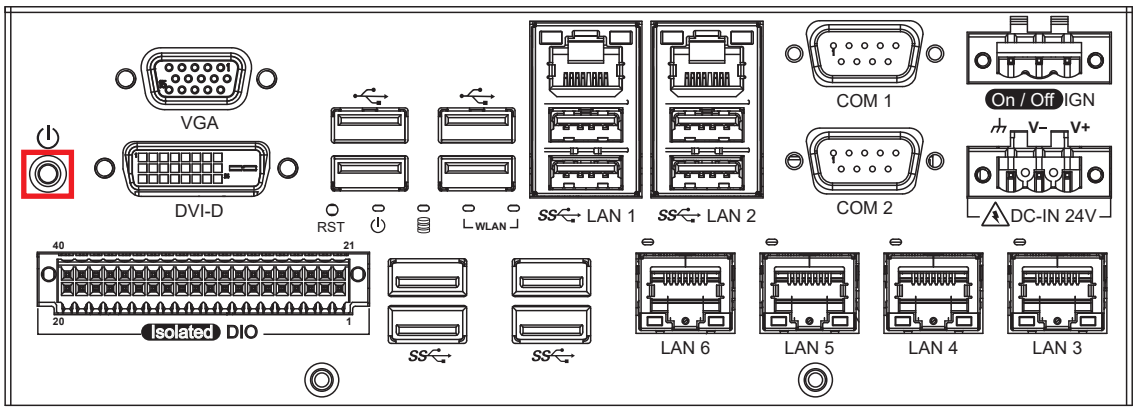
Pin No.	Definition	Pin No.	Definition
1	Ignition	2	SW+
3	SW-		-

2.2.3 Reset Tact Switch



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

2.2.4 Power Button



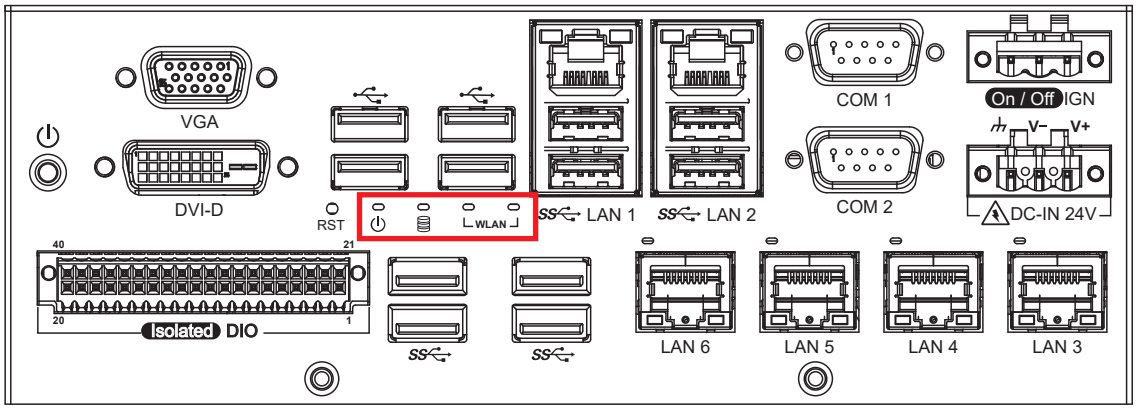
To power on the system, press the power button and then the Green LED is lightened.

To power off the system, you can either command shutdown by OS operation, or just simply press the power button.

If system error, you can just press the power button for 4 seconds to shut down the machine directly.

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

2.2.5 PWR & HDD LED Indicator



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

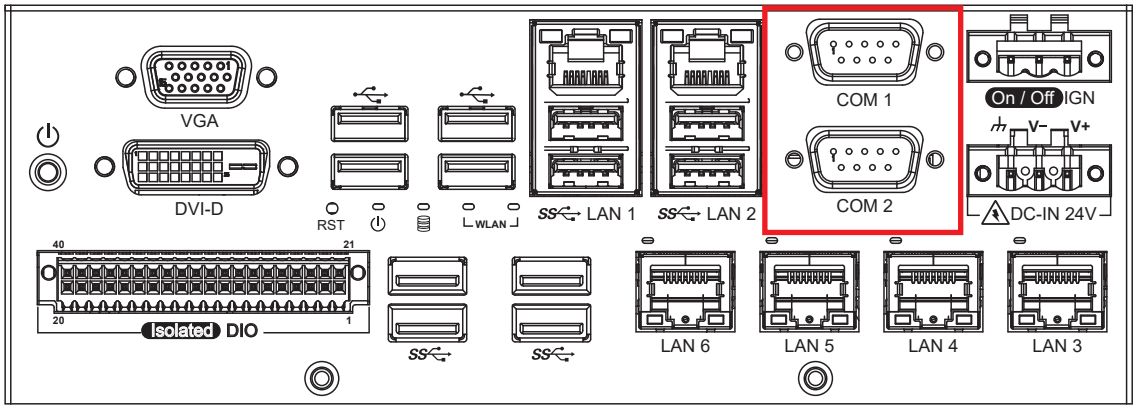
Yellow-HDD LED: A hard disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities are in progress.

Green- WLAN LED: If the LED is solid green, it indicates that the device on M2 key-E Socket is working.

Green-WLAN LED: If the LED is solid green, it indicates that the device on M2 key-B Socket is working.

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

2.2.6 Serial Port

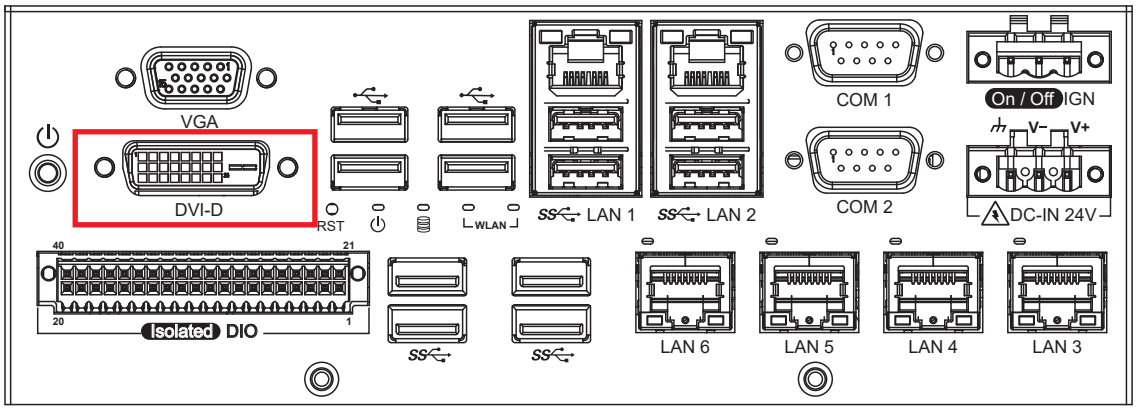


Serial port 1 to 2 (COM1 to 2) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM1 and COM2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

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

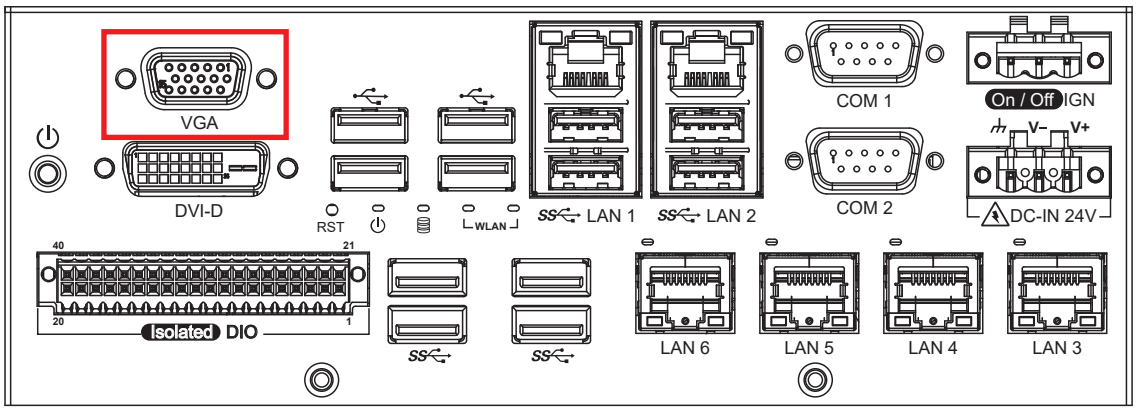
Serial Port	Pin No.	RS-232	RS-422(5-wire)	RS-485(3-wire)
1 to 2	1	DCD	TXD-	DATA-
	2	RXD	TXD+	DATA+
	3	TXD	RXD+	----------
	4	DTR	RXD-	----------
	5	GND	GND	GND
	6	DSR	----------	----------
	7	RTS	----------	----------
	8	CTS	----------	----------
	9	RI	----------	----------

2.2.7 DVI-I Connector

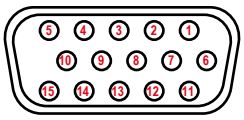


The DVI-D connector on the front panel supports DVI display. This connector can either output DVI signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will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

2.2.8 VGA Connector

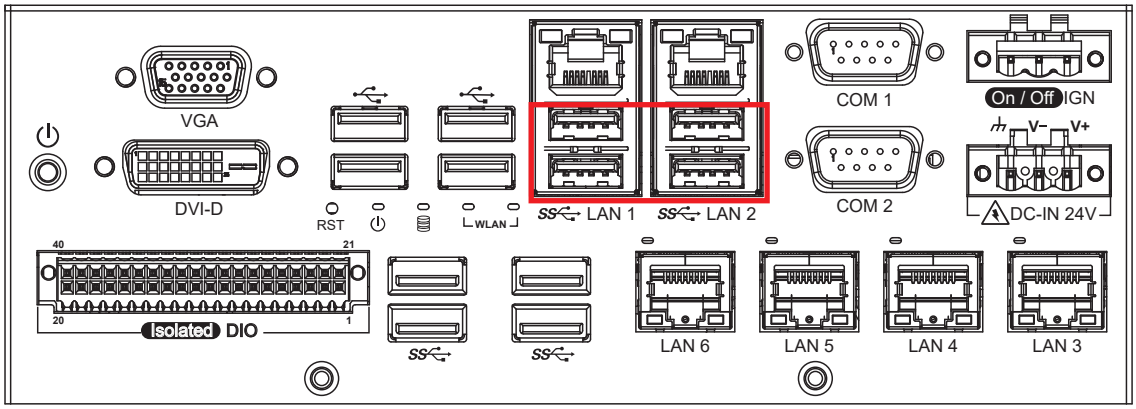


The VCM-1000 series comes with a DB15 female connector on the front panel to connect a VGA monitor. To ensure that the monitor image remains clear, be sure to tighten the monitor cable after connecting it to the VCM-1000. The VGA output mode supports up to 1920x1200 resolutions. The pin assignments of the VGA connector are shown below.



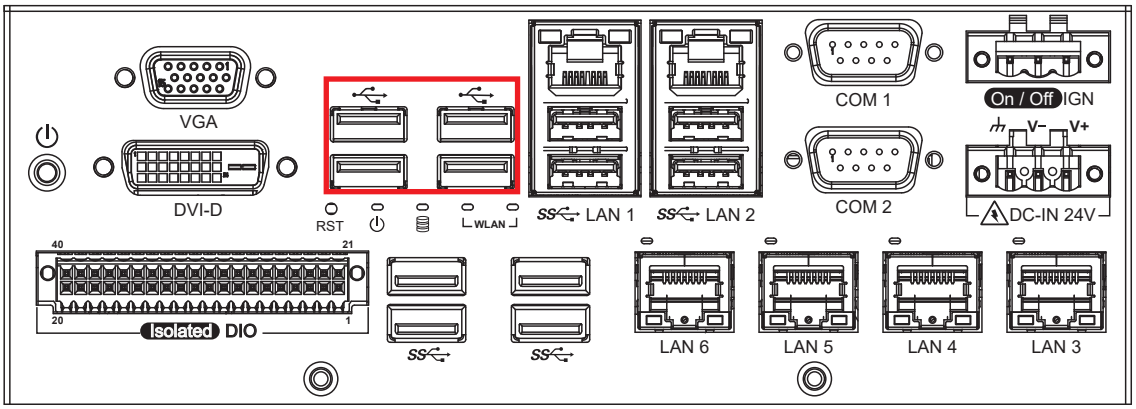
Pin No.	Definition	Pin No.	Definition
1	Red Color Signal	2	Green Color Signal
3	Blue Color Signal	4	NC
5	Ground	6	Red return
7	Green return	8	Blue return
9	VCC	10	Ground
11	NC	12	DDC-DATA
13	H-Sync.	14	V-Sync.
15	DDC-CLK		-

2.2.9 USB 3.2



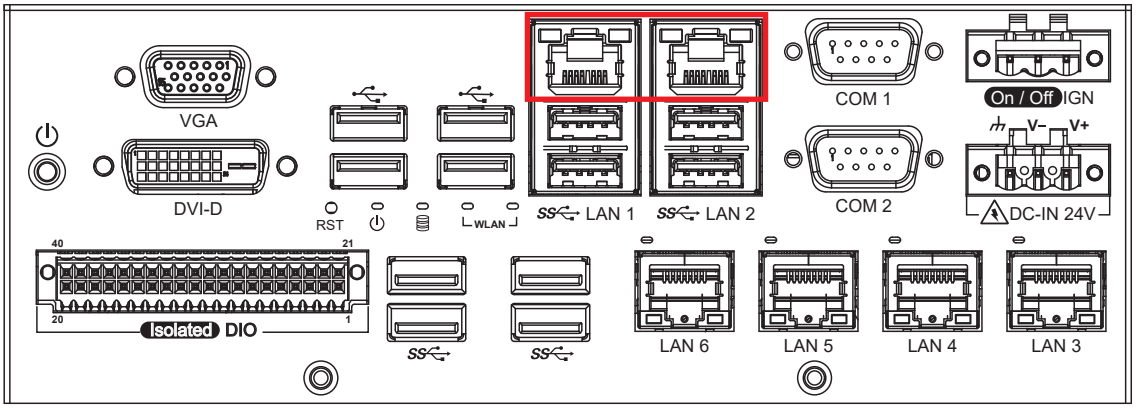
There are 4 USB 3.2 connections available supporting up to 5Gbps/10Gbps per second data rate in the front side of VCM-1000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.10 USB2.0



There are 4 USB 2.0 ports available supporting up to 480Mbps per second data rate in the front side of VCM-1000. They are also compliant with the requirements of high speed (HS), full speed (FS) and low speed (LS).

2.2.11 Ethernet Port



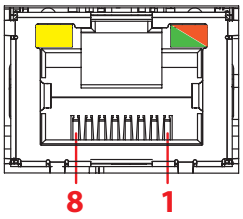
There are two 8-pin RJ-45 jacks supporting 10/100/1000 Mbps Ethernet connections on the front side of VCM-1000. LAN1 is powered by Intel® I219LM Ethernet engine, and LAN2 is powered by Intel I210-IT Ethernet engine.

LAN Chip	Function	Connector
I219_LAN1	RJ-45(10/100/1000)	LAN1
I210_LAN2	RJ-45(10/100/1000)	LAN2

Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN1 and LAN2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN1 and LAN2 are listed as follows:

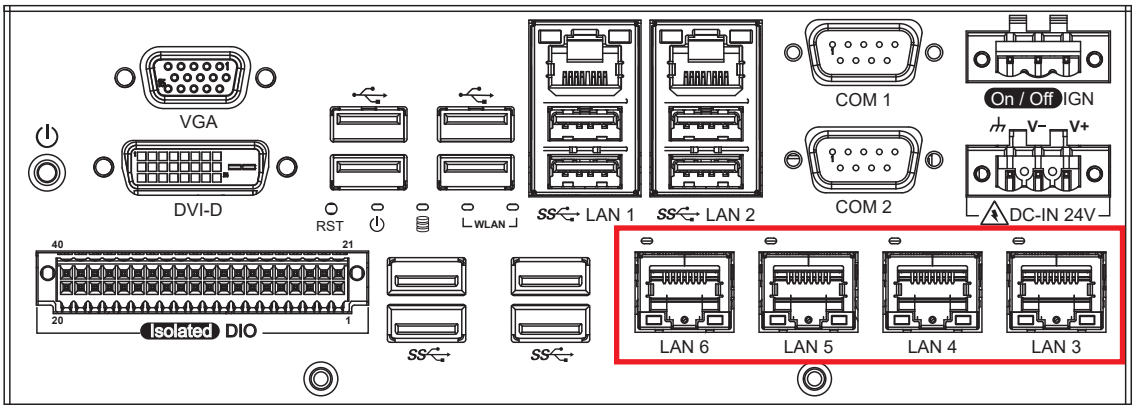
Pin No.	10/100 Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	------	MDI3_N

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



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

2.2.12 PoE Ports (VCM-1100F)



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

Each PoE connection is powered by Intel® I350 Gigabit Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization. Only when PoE port starts to supply power to power devices, the dedicated LED will be lightened.

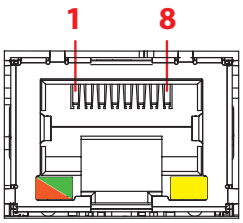
PS. Suggest to use PoE function when power input is over 24V.

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

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

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

The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/off when Ethernet data packets are being transmitted/received.
The pin-outs of LAN 3 and LAN 6 are listed as follows:

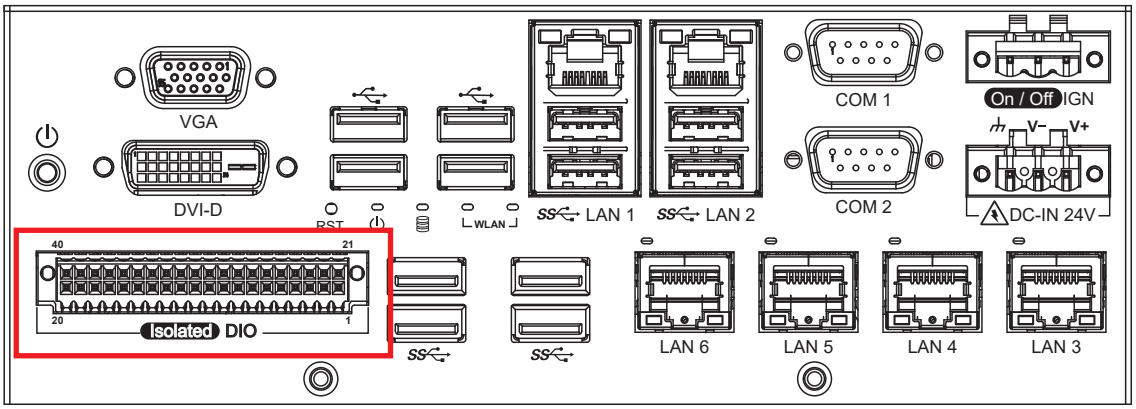


LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Right	Green/ Orange	Off	Solid Green	Solid Orange
Left	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow

POE LED	LED Color	POE Status
LED 1 - 4	Solid Green	POE ON

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

2.2.13 Isolated DIO/GPIO (VCM-1100F)



There is a 28-bit (4-bit DI, 24-bit DO) connectors in the rear side. DI/DIO support NPN (sink) and PNP (Source) mode, Each DI channel is equipped with a photocoupler for isolated protection. Each DO with isolator chip, Config by a Jumper for each DIO connector. DO Safety-Related Certifications:

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

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

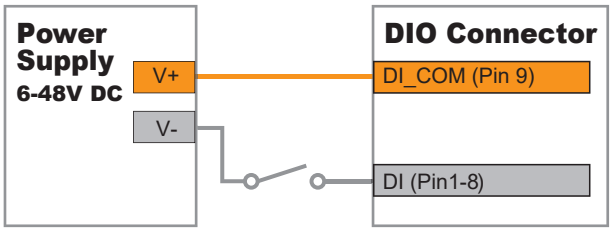
DIO Connectors pin out :

DIO	Pin No.	Definition	Function
DIO	1	GND	-
	2	EXT_OUT16	SIO_GPO90
	3	EXT_OUT17	SIO_GPO91
	4	EXT_OUT18	SIO_GPO92
	5	EXT_OUT19	SIO_GPO93
	6	EXT_OUT20	SIO_GPO94
	7	EXT_OUT21	SIO_GPO95
	8	EXT_OUT22	SIO_GPO96
	9	EXT_OUT23	SIO_GPO97
	10	GND	-
	11	EXT_IN0	SIO_GPI63
	12	EXT_IN1	SIO_GPI64
	13	EXT_IN2	SIO_GPI65
	14	EXT_IN3	SIO_GPI66
	15	GND	-
	16	EXT_GP60 (Reserve)	SIO_GP60
	17	EXT_GP61 (Reserve)	SIO_GP61
	18	+VDI_COM	-
	19	GND	-
	20	+VDIO_EXT	-
	21	GND	-
	22	EXT_OUT0	SIO_GPO70
	23	EXT_OUT1	SIO_GPO71
	24	EXT_OUT2	SIO_GPO72
	25	EXT_OUT3	SIO_GPO73
	26	EXT_OUT4	SIO_GPO74
	27	EXT_OUT5	SIO_GPO75
	28	EXT_OUT6	SIO_GPO76
	29	EXT_OUT7	SIO_GPO77
	30	GND	-
	31	EXT_OUT8	SIO_GPO80
	32	EXT_OUT9	SIO_GPO81
	33	EXT_OUT10	SIO_GPO82
	34	EXT_OUT11	SIO_GPO83
	35	EXT_OUT12	SIO_GPO84
	36	EXT_OUT13	SIO_GPO85
	37	EXT_OUT14	SIO_GPO86
	38	EXT_OUT15	SIO_GPO87
	39	GND	-
	40	+VDIO_EXT	-

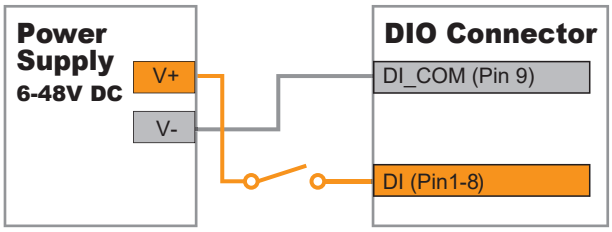
Notice: +VDIO_EXT is external 6-40VDC (NPN) or external 6-48VDC(PNP).

DI reference circuit :

Sink Mode (NPN)

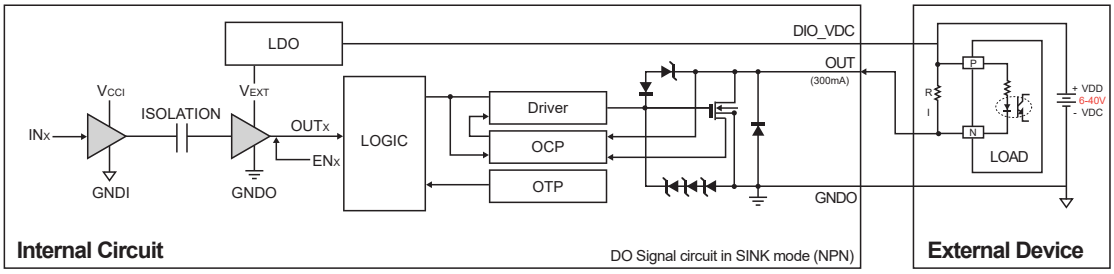


Source Mode (PNP)

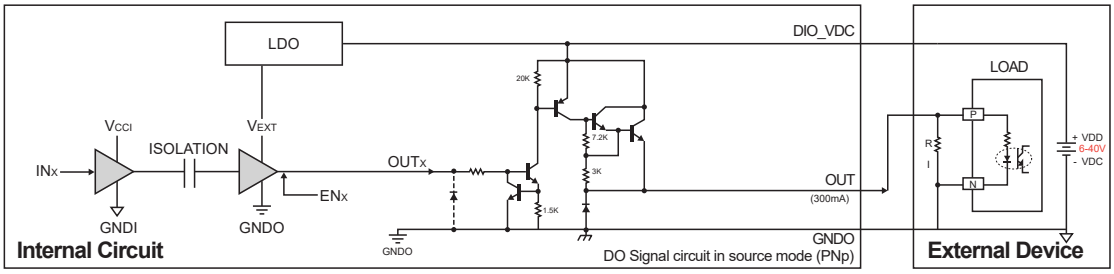


DO reference circuit :

Sink Mode (NPN, Default)



Source (PNP)



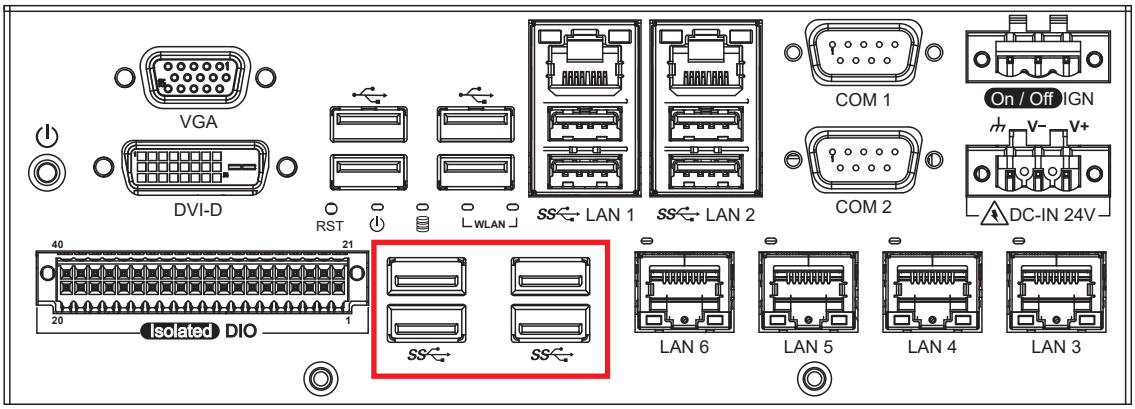
2.2.14 GPIO (VCM-1100) Option

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

GPIO Connectors pin assignments

Pin No.	Mapping to SIO GPIO Function	Pin No.	Mapping to SIO GPIO Function
1	GND	21	GND
2	SIO_GPO90	22	SIO_GPO70
3	SIO_GPO91	23	SIO_GPO71
4	SIO_GPO92	24	SIO_GPO72
5	SIO_GPO93	25	SIO_GPO73
6	SIO_GPO94	26	SIO_GPO74
7	SIO_GPO95	27	SIO_GPO75
8	SIO_GPO96	28	SIO_GPO76
9	SIO_GPO97	29	SIO_GPO77
10	GND	30	GND
11	SIO_GPI63	31	SIO_GPO80
12	SIO_GPI64	32	SIO_GPO81
13	SIO_GPI65	33	SIO_GPO82
14	SIO_GPI66	34	SIO_GPO83
15	GND	35	SIO_GPO84
16	SIO_GP60 (Reserve)	36	SIO_GPO85
17	SIO_GP61 (Reserve)	37	SIO_GPO86
18	------	38	SIO_GPO87
19	GND	39	GND
20	------	40	------

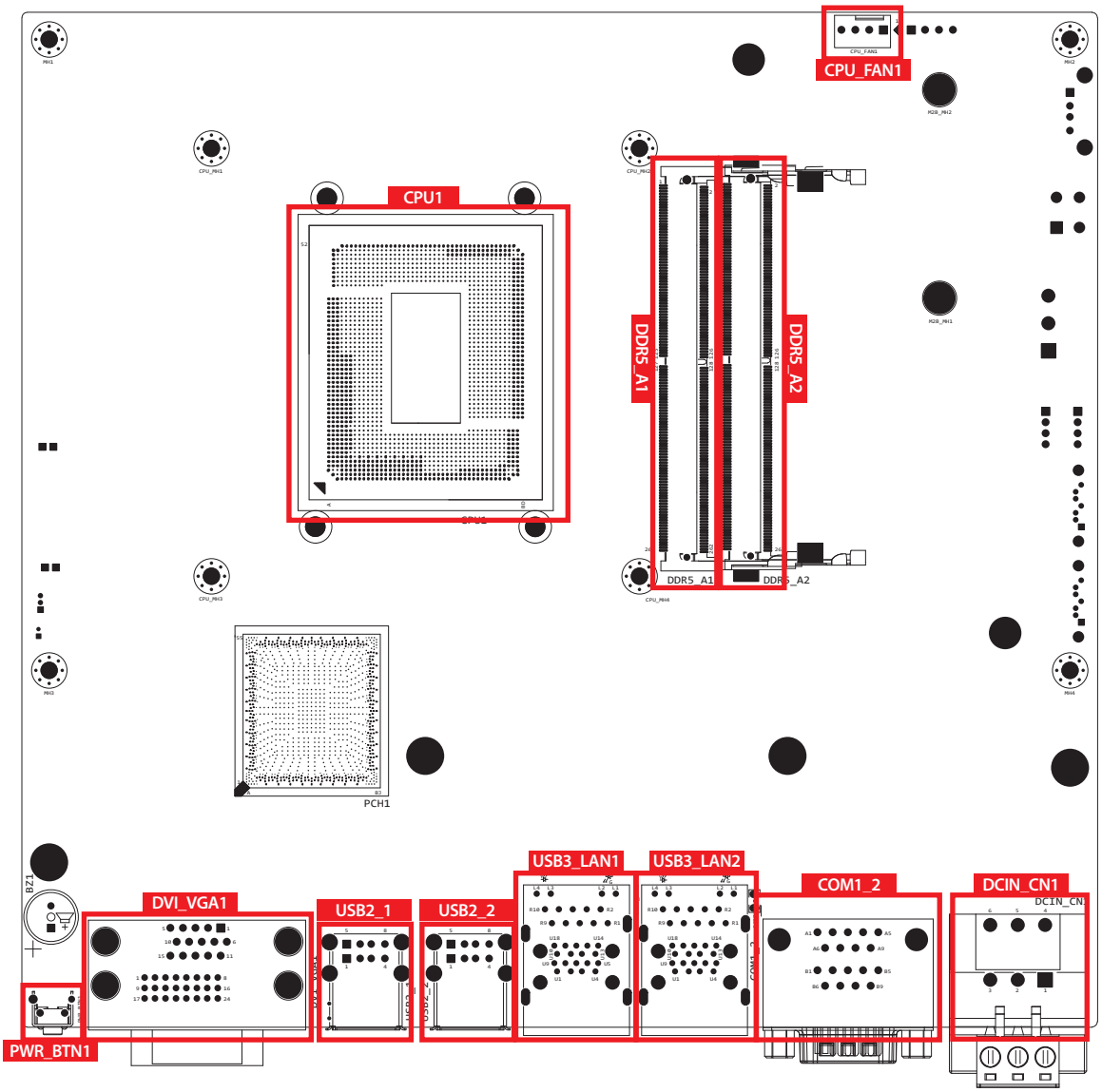
2.2.15 USB 3.2 (VCM-1100F)



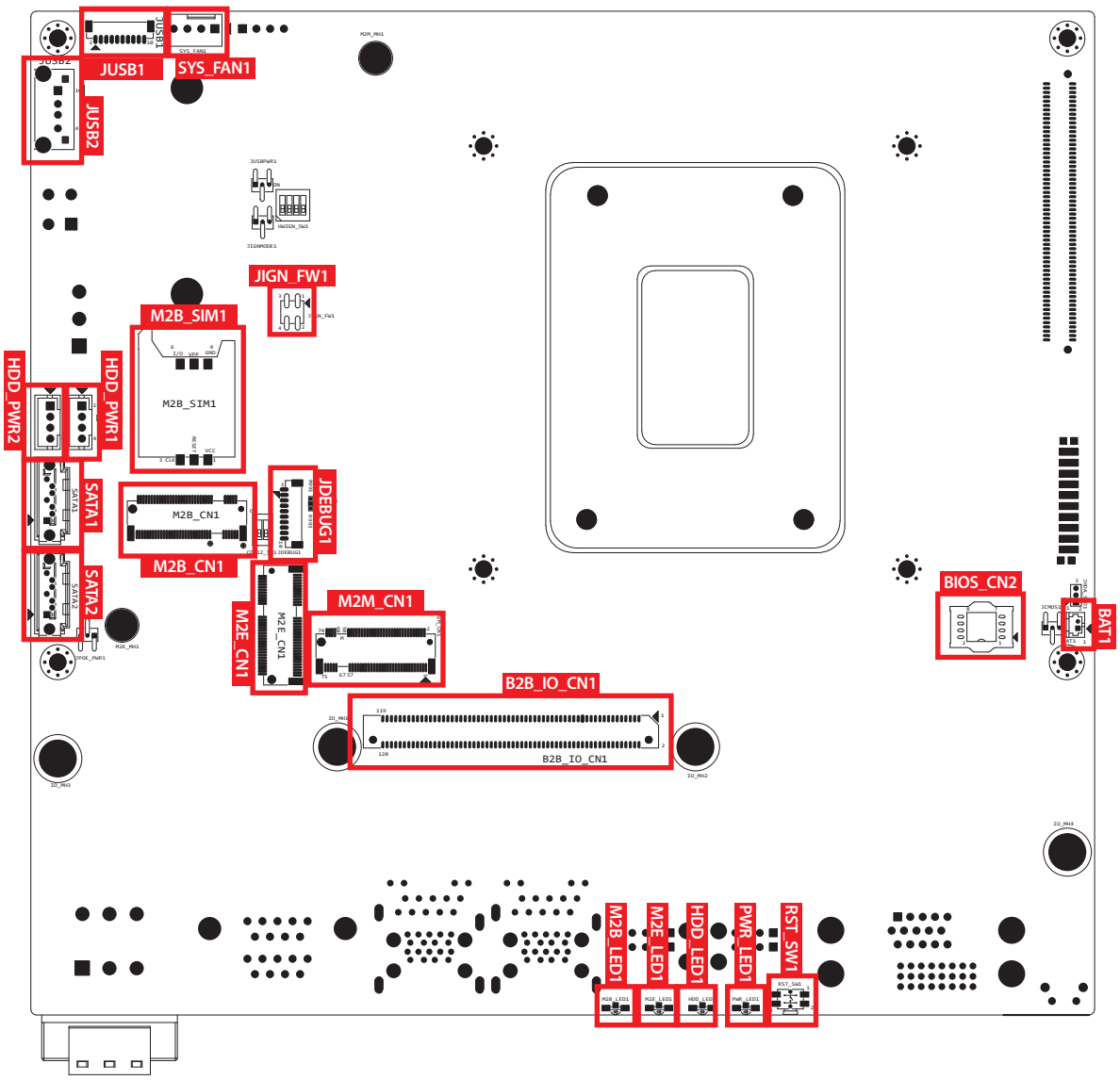
There are 4 USB 3.2 connections available supporting up to 5Gbps per second data rate in the front side of VCM-1000. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.3 Main Board Expansion Connectors

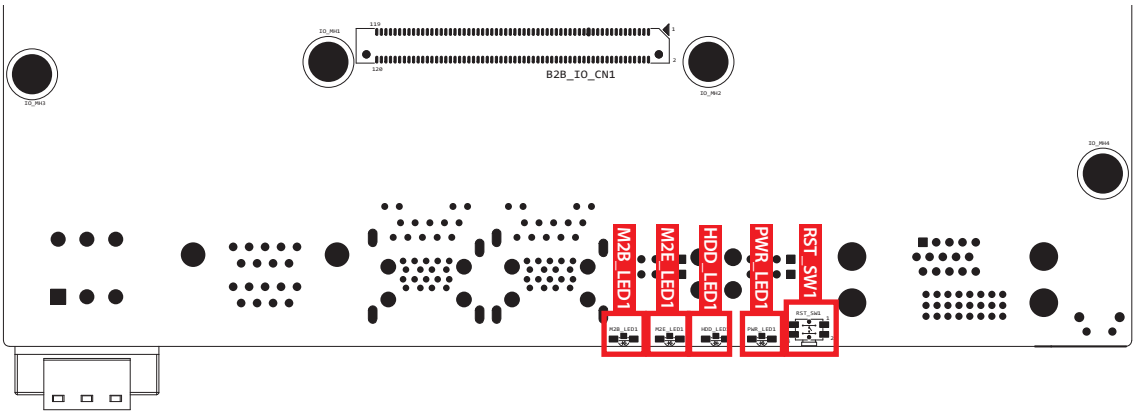
2.3.1 Top View (Component Side) of VCM-1000 Main Board With Connector Location



2.3.2 Bottom View (Solder Side) of VCM-1000 Main Board With Connector Location

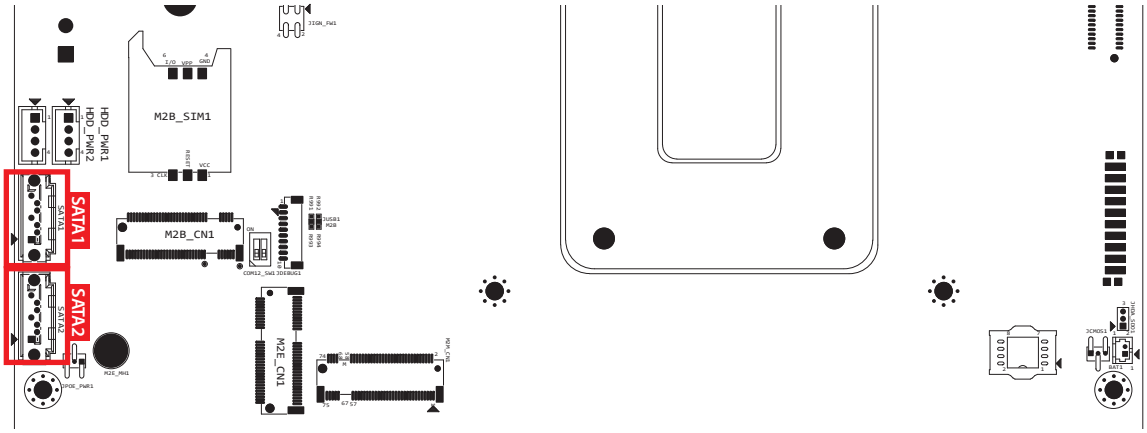


2.3.3 RST_SW1, PWR_LED1, HDD_LED1, M2E_LED1, M2B_LED1

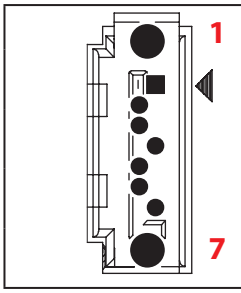


Reset button, power LED indicator, hard drive LED indicator, M.2 E key Wifi LED indicator and M.2 B key LED indicator, which already can be accessed by front panel.

2.3.4 SATA1, SATA2 : SATA III Connector

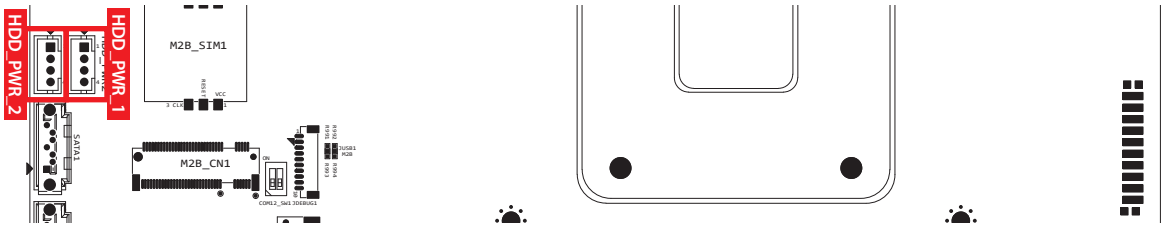


There are 2 onboard high performance Serial ATA III (SATA III) on VCM-1000. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 and SATA2 are listed in the following table :

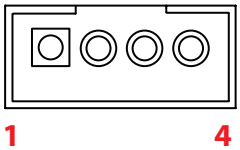


Pin No.	Definition	Pin No.	Definition
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		-

2.3.5 HDD_PWR1, HDD_PWR2 : SATA Power Connector

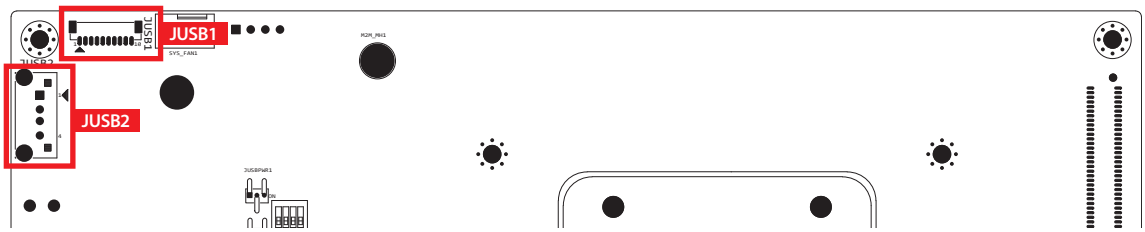


The vcm-1000 also equip with a SATA power connector. The one port supports 5V (Up to 2A) and 12V (Up to 2A) current to the hard drive or SSD. The pin assignments of HDD_PWR1, HDD_PWR2 are listed in the following table:



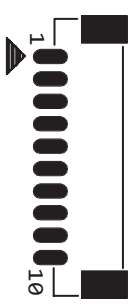
Pin Number	Definition
1	+12V (2A max)
2	GND
3	GND
4	+5V (2A max)

2.3.6 JUSB1, JUSB2: Internal USB 2.0 Connector

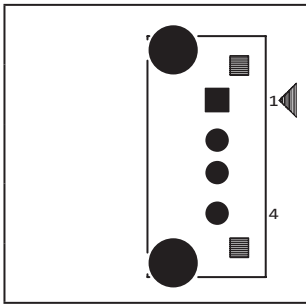


The VCM-1000 main board provides maxima two expansion USB ports. The USB interface supports 480Mbps transfer rate which comply with high speed USB specification Rev. 2.0. The JUSB1 interface is accessed through one 10-pin JST 1.0mm connector(selection option). You will need an adapter cable if you use a standard USB connector. The adapter cable has a 10-pin connector on one end and a USB connector on the other.

The pin assignments of JUSB1 and JUSB2 are listed in the following table:

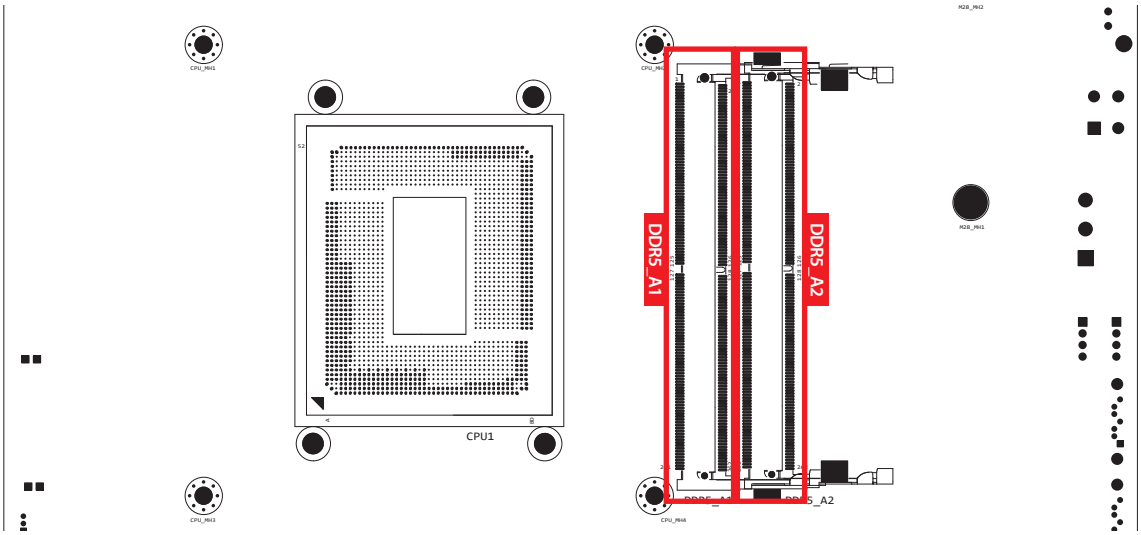


Pin No.	Definition	Pin No.	Definition
1	USB_VCC	2	USB_VCC
3	USB_VCC	4	USB_D_14N
5	USB_D_14P	6	NC
7	NC	8	GND
9	GND	10	GND



Pin Number	Definition
1	USB_VCC
2	USB_D_9N
3	USB_D_9P
4	GND

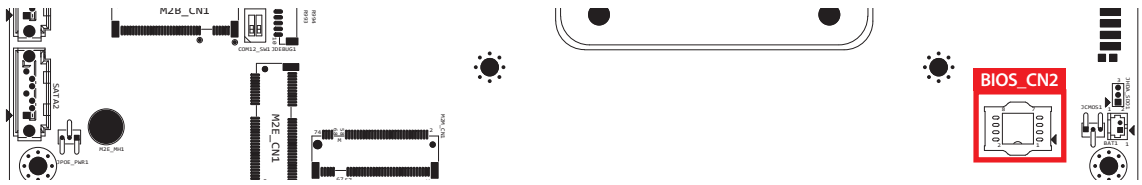
2.3.7 DDR5_A1, DDR5_A2: DDR5 Slot



There are 2 DDR5 channel onboard, support DDR5 4800, max 64GB, each channel 32GB.

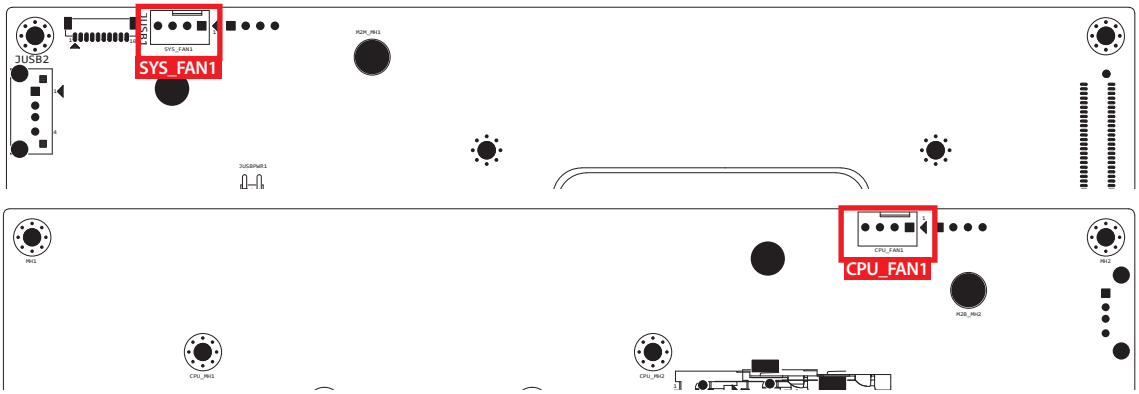
Slot	Description
DDR5_A1	DDR5 Channel A
DDR5_A2	DDR5 Channel B

2.3.8 BIOS_CN1 : BIOS Socket



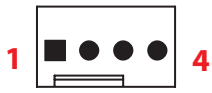
If the BIOS needs to be changed, please contact the Vecow RMA service team.

2.3.9 CPU_FAN, SYS_FAN : FAN Header



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

CPU_FAN1

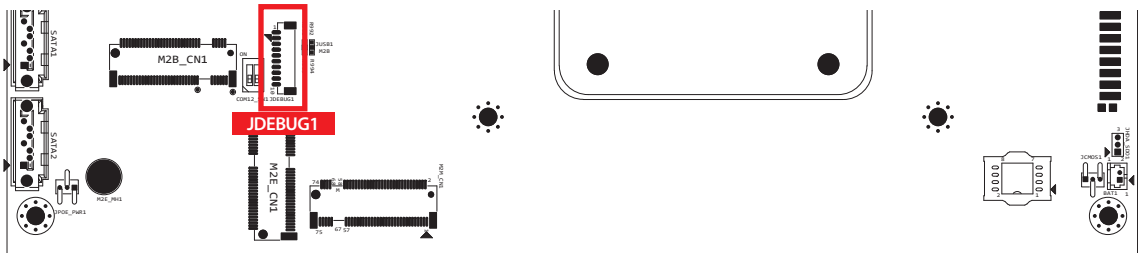


Pin No.	Definition
1	GND
2	+12V (2A max)
3	Fan speed sensor
4	Fan PWM

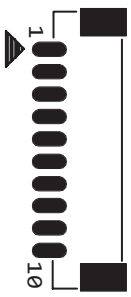
SYS_FAN1

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

2.3.10 JDEBUG1 : ESPI Port 80 Header

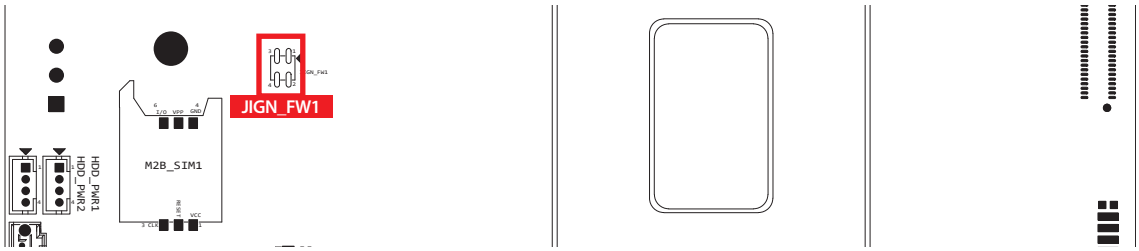


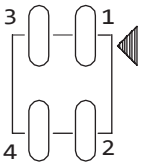
The system's provide a ESPI Port 80 Header for Debug Card.



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	RST 80_ESPI_RST#	10	GND

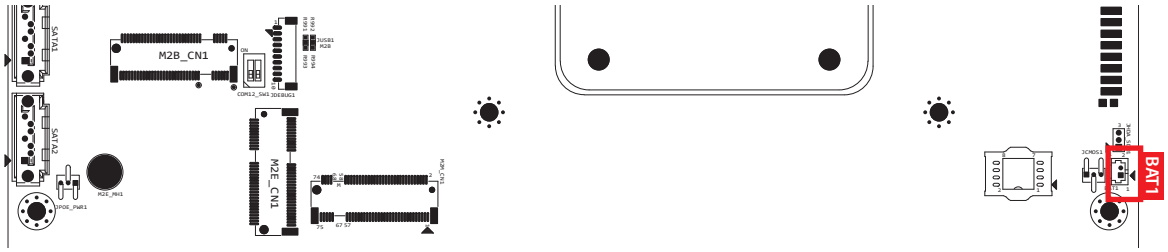
2.3.11 JIGN_FW1 : IGNITION FW Programming Header



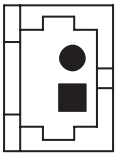


Pin Number	Definition
1	GND
2	MCU_RST#
3	+V3.3_MCU
4	MCU_PRG

2.3.12 BAT1: RTC Battery

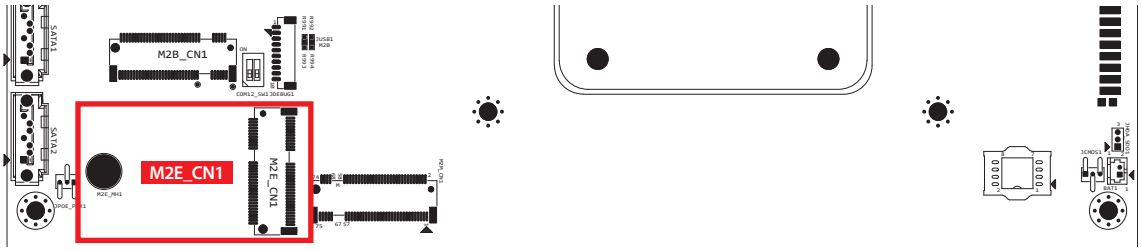


The VCM-1000's real-time clock is powered by a lithium battery. It is equipped with Panasonic BR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own, but if the battery needs to be changed, please contact the Vecow RMA service team.



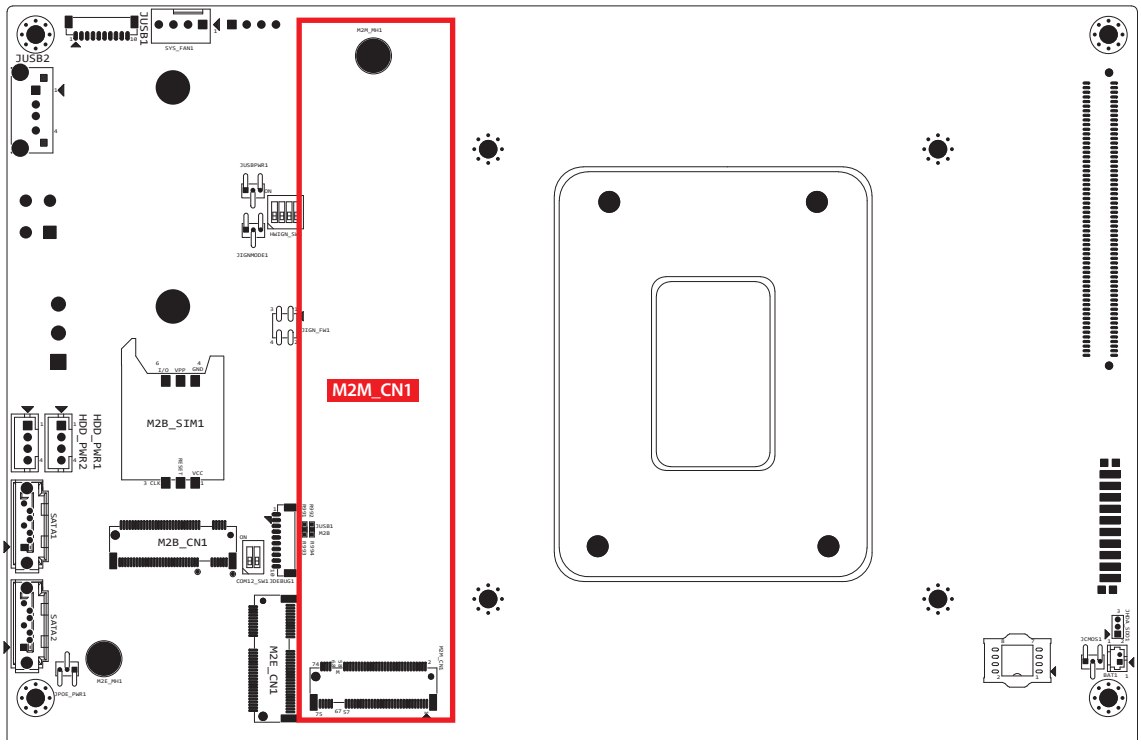
Pin Number	Definition
1	+3V_BAT
2	GND

2.3.13 M2E_CN1 : PCIe x1



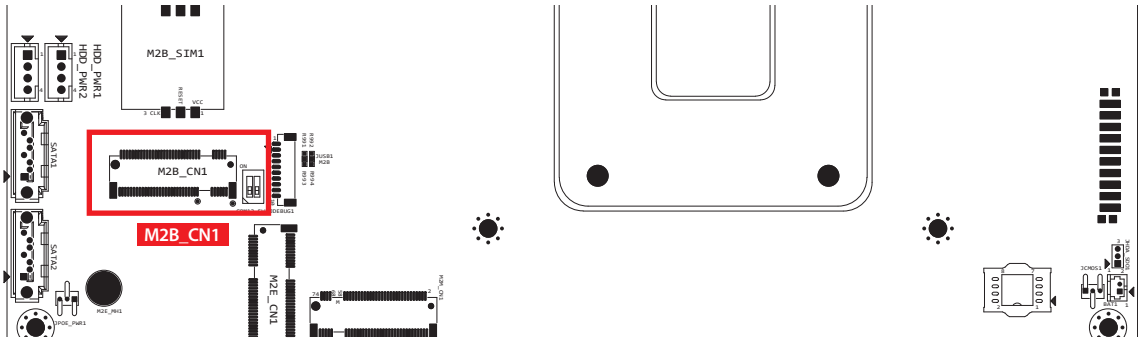
M.2 key E connector is suitable for applications that use wireless connectivity including Wi-Fi,Bluetooth, NFC of GNSS. Module card types include 2230.

2.3.14 MEM_CN1 : PCIe x2, SATA



M.2 key M connector is suitable for applications that use Host I/Fs supported by either PCIe Module card , and NVMe or SATA SSD that types include 22110 (2280 with iron sheet).

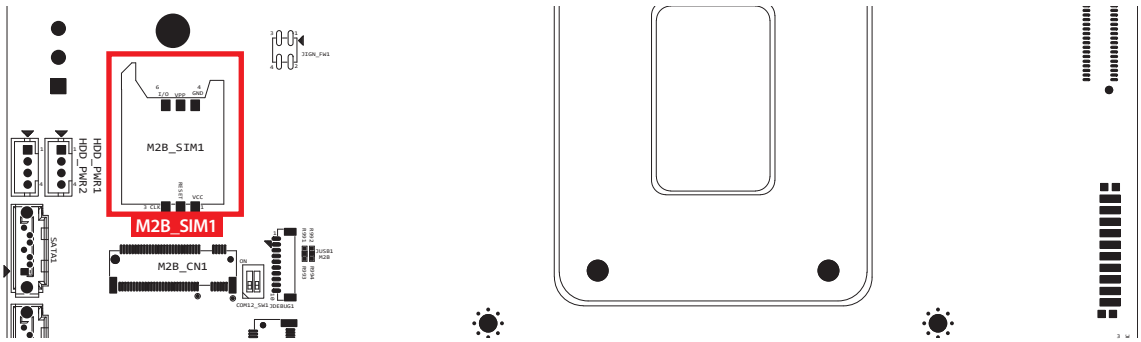
2.3.15 M.2 KEY B: PCIe x1, USB2.0 co-lay default , SATA (BIOS option)



M.2 key B connector is suitable for applications that use wireless connectivity including LTE/5G module, and NVMe SSD (BW : PCIe x1) that types include 2280/3042/3052.

Remind: The default BIOS setting is M.2 Key B for PCIe. If wanting to use SATA SSD (SATAIII), an optional BIOS is required.

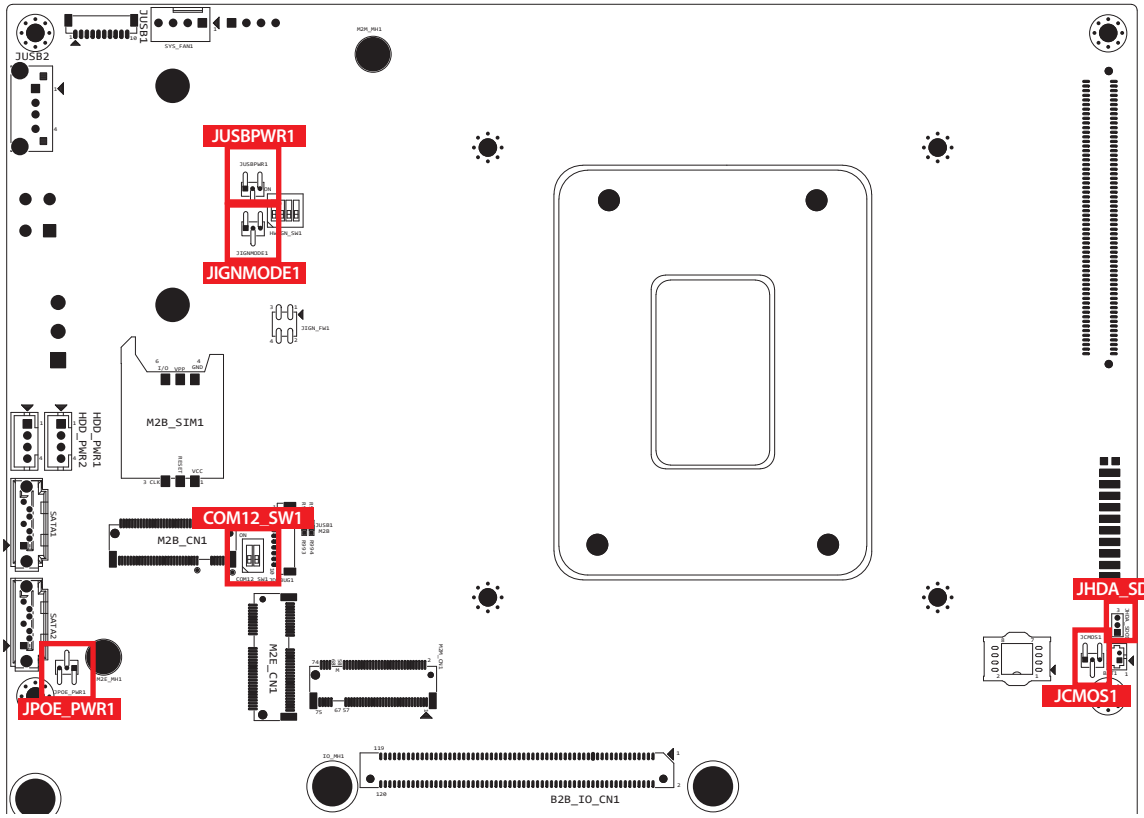
2.3.16 M2B_SIM1 : Mini SIM Card Socket for M.2 key B Slot



The Mini SIM card socket is support locked type. Please make sure to unplug the system power before inserting the Mini SIM card.

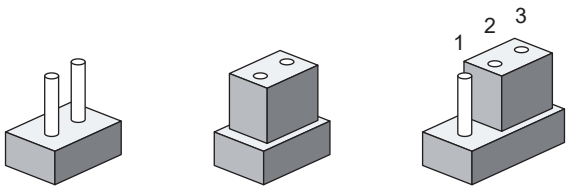
2.4 Main Board Jumper Settings

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



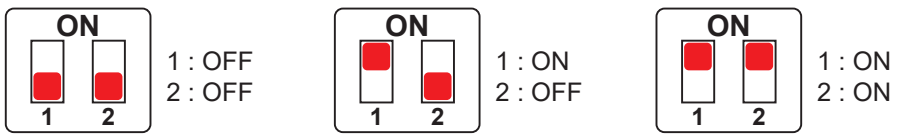
The figure below is the top view of the system main board which is the main board. It shows the location of the jumpers and the switches.

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

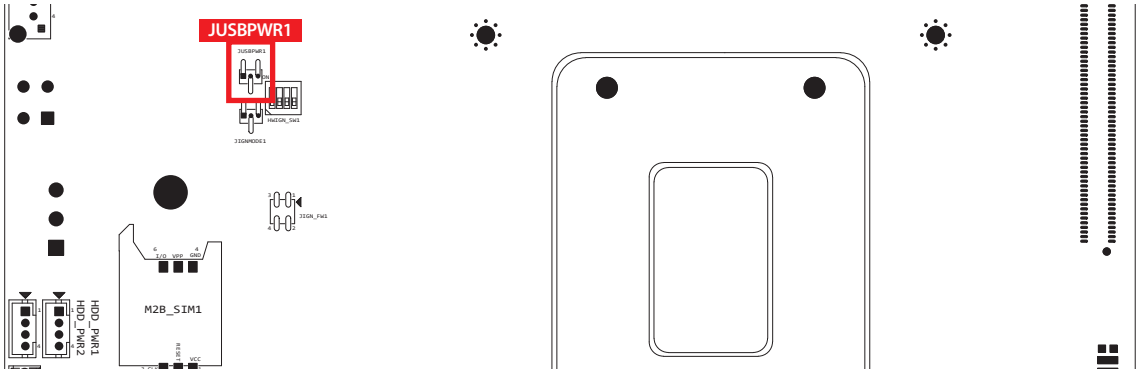


Open Closed Closed 2-3

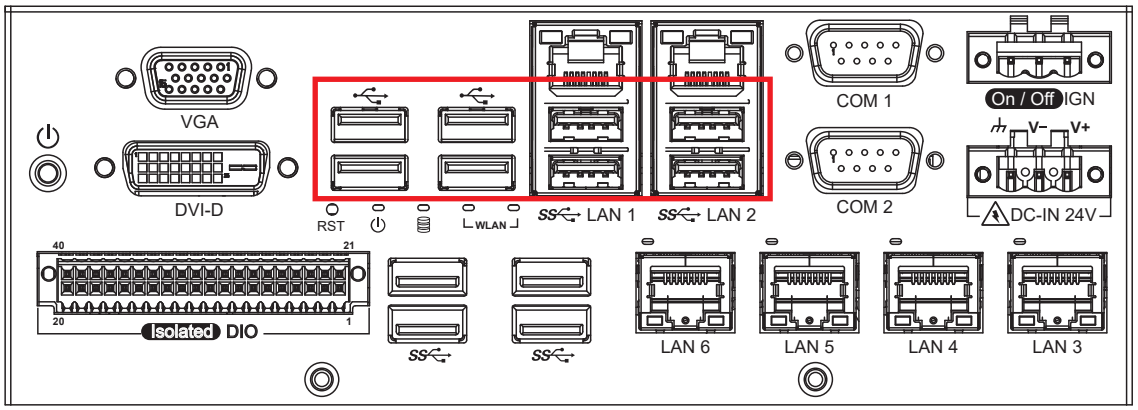
You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.

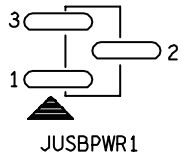


2.4.2 JUSBPWR1 : USB Wake Up

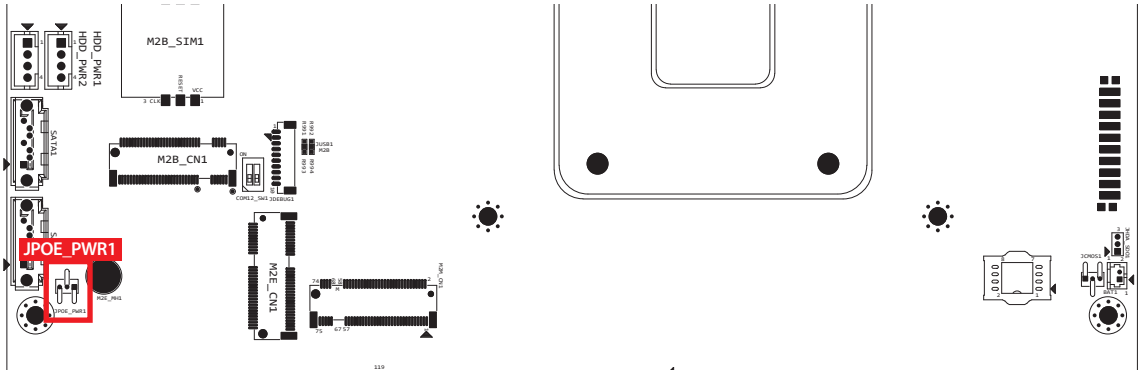


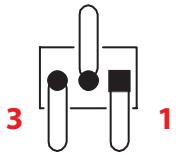
Front Plane View



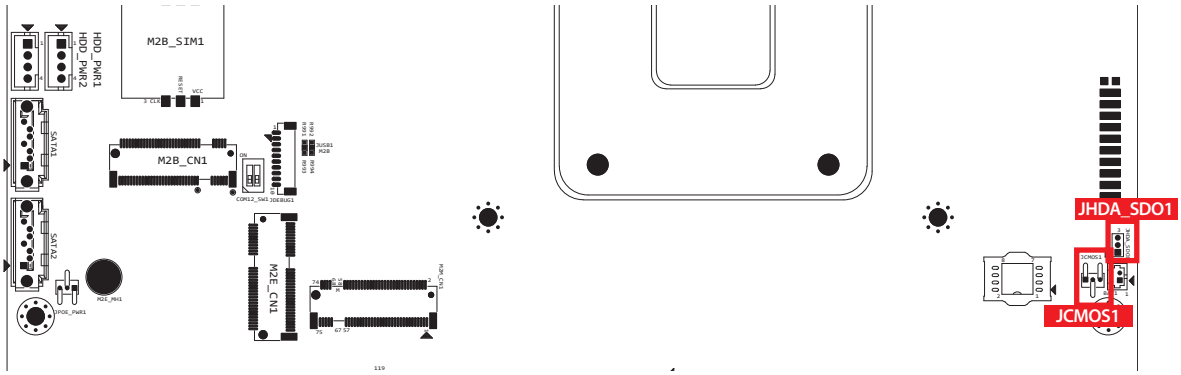
Location	Description	Function	
JSBPWR1	1-2	Supported Wake Up(Default)	
	2-3	Non Wake Up support	

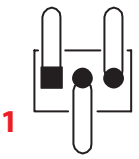
2.4.3 JPOE_PWR1 : PoE Power ON Select



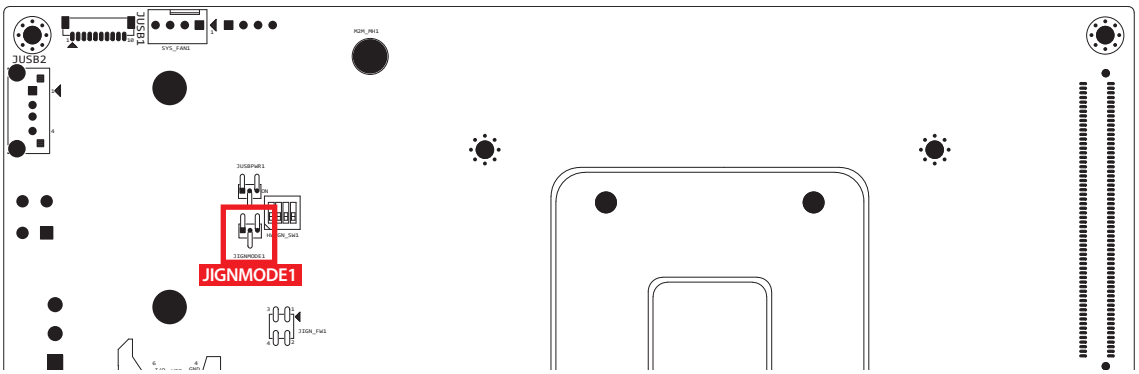
Location	Setting	Function	
JPOE_ PWR1	1-2	PoE power on at standby power ready	
	2-3	PoE power on after system power on(Default)	
	No Jumper	Disable PoE power	

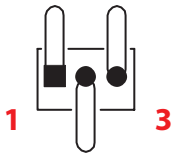
2.4.4 JCMOS1, JHDA_SDO1 : CMOS & ME Flash



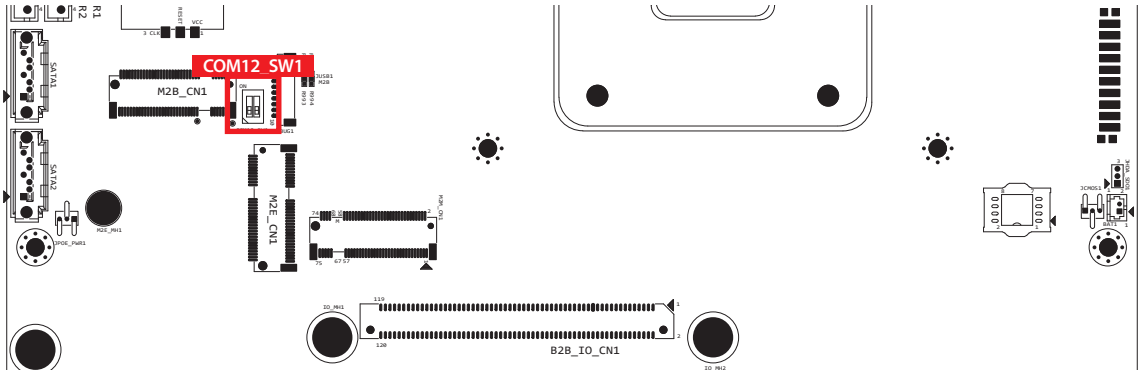
Location	Description	Function	
JCMOS1	1 - 2	Normal (Default)	
	2 - 3	Clear CMOS	
JHDA_ SDO1	1-2	Enable security measures defined in the Flash Descriptor. (Default)	
	2-3	Disable Flash Descriptor Security (Flash ME)	

2.4.5 JIGNMODE1 : IGNITION mode



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

2.4.6 COM12_SW1: RS-485/422 RECEIVER TERMINATION RESISTANCE



Location	Ports	Setting	Function
COM12_ SW1	COM1	1(ON)	DCD / RXD Termination 120R Enable
		1(OFF)	DCD / RXD Termination 120R Disable(default)
	COM2	2(ON)	DCD / RXD Termination 120R Enable
		2(OFF)	DCD / RXD Termination 120R Disable(default)

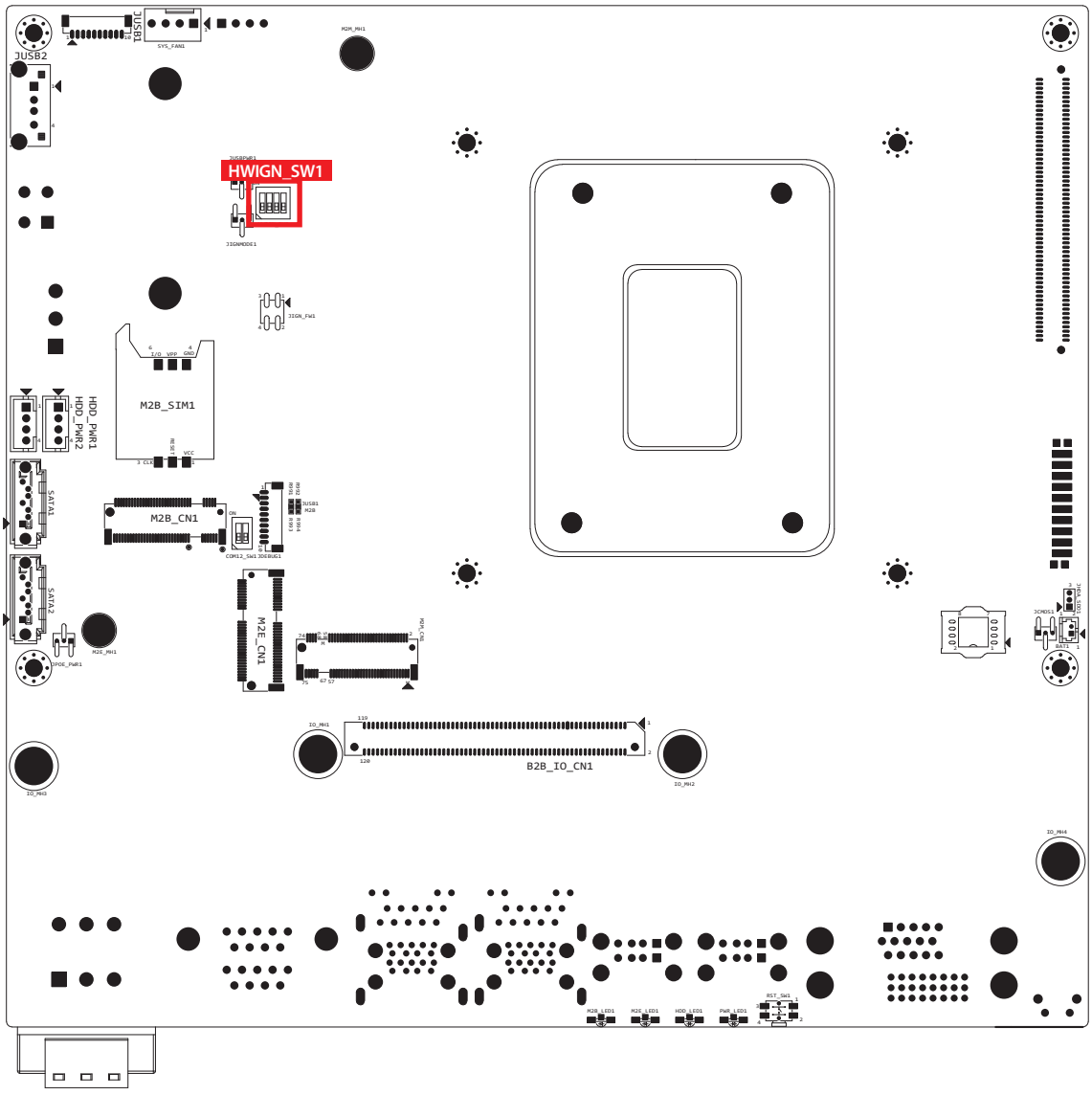
2.5 Ignition Control

VCM-1000 series provides ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay period.

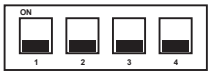
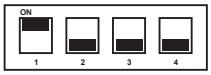
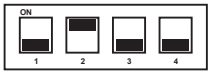
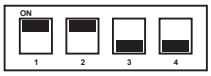
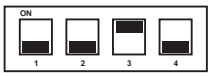
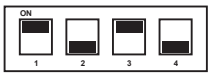
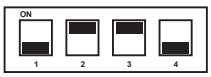
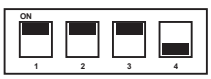
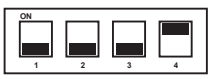
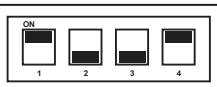
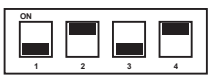
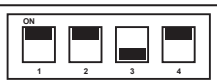
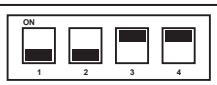
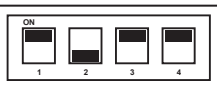
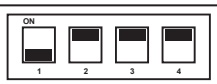
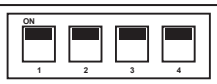
2.5.1 Adjust Ignition Control Modes

VCM-1000 series provides 16 modes of different power on/off delay periods adjustable via HWIGN_SW1 switch. The default rotary switch is set to 0 in ATX/AT power mode.

HWIGN_SW1 : Ignition Control



The modes are listed in below table :

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

2.6.2 Ignition Control Wiring

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

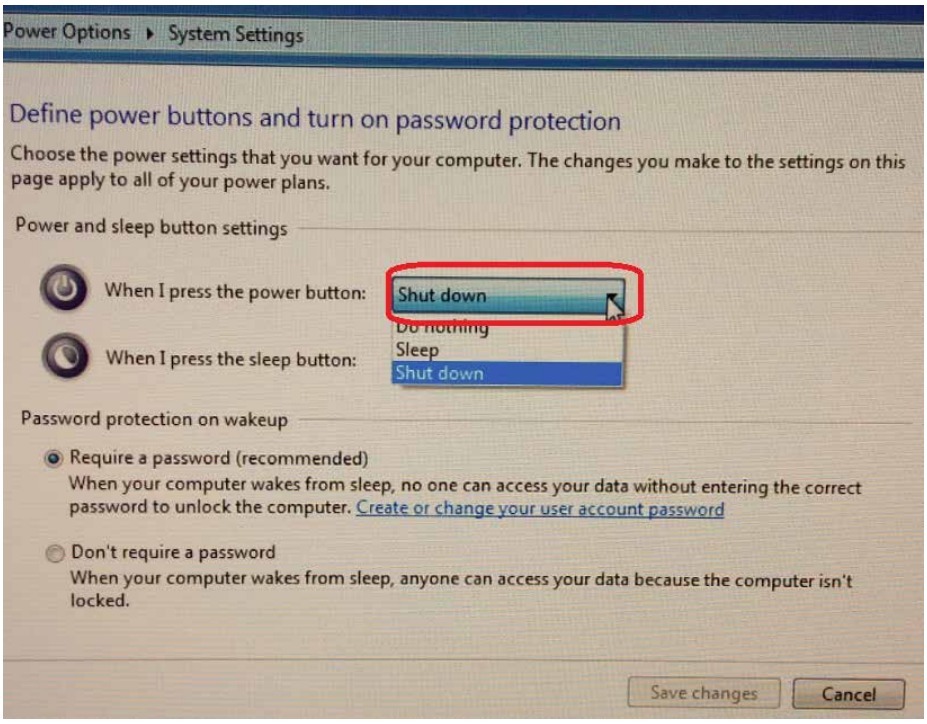
Pin No.	Definition
1	Ignition (IGN)
2	SW+
3	SW-

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

Note :

1. DC power source and IGN share the same ground.
2. VCM-1000 supports 24V DC power input in ATX/AT mode. In Ignition mode, the input voltage is fixed to 12V/24V for car battery scenario.
3. For proper ignition control, the power button setting should be “Power Down” mode.

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



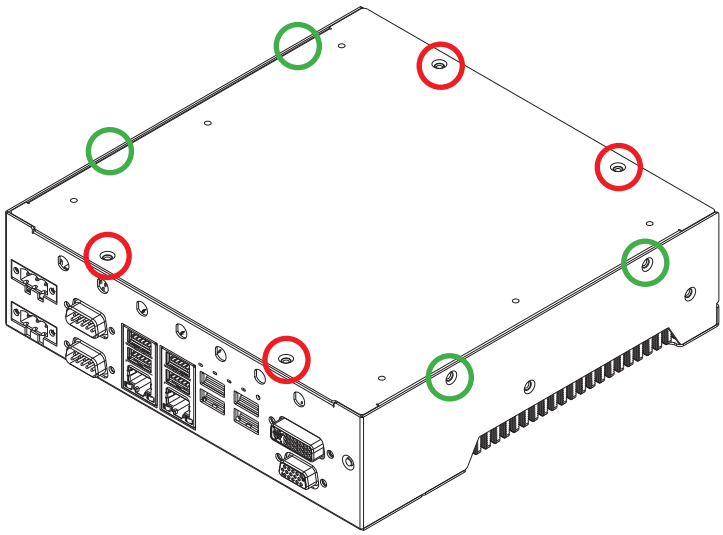
3

SYSTEM SETUP

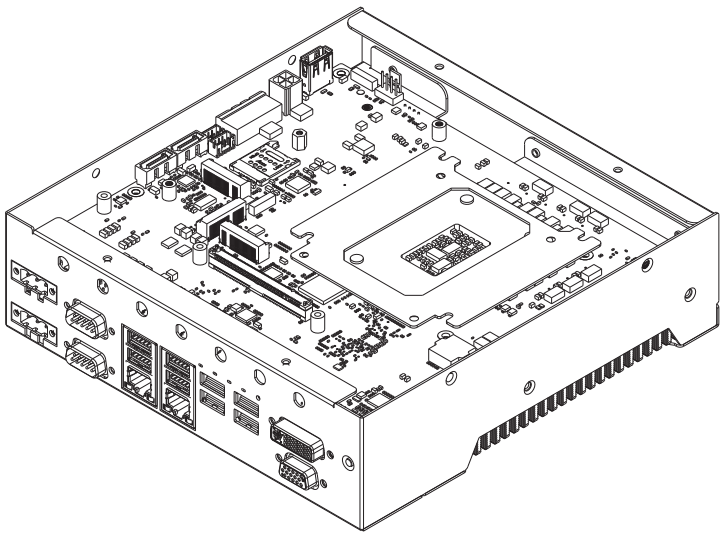
3.1 How to Open Your VCM-1000

3.1.1 VCM-1000 / VCM-1000F

Step 1 Remove bottom side four flat head M3x4L screws and both side four flat head M3x4L screws, and take out bottom cover.

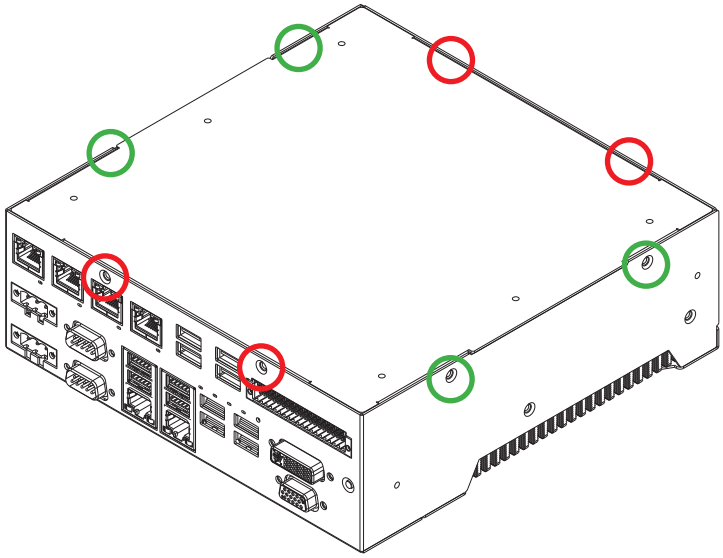


Step 2 After take out bottom cover.

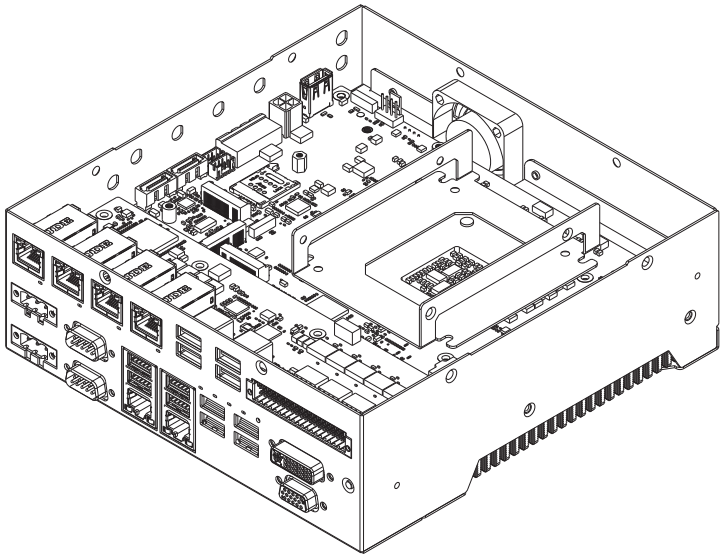


3.1.2 VCM-1100F

Step 1 Remove front and rear four flat head M3x4L screws and both side four flat head M3x4L screws, and take out bottom cover.



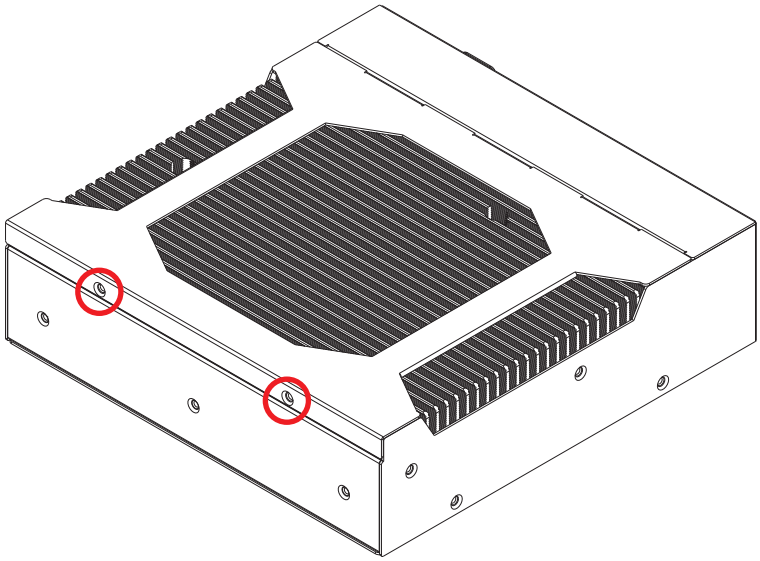
Step 2 After take out bottom cover.



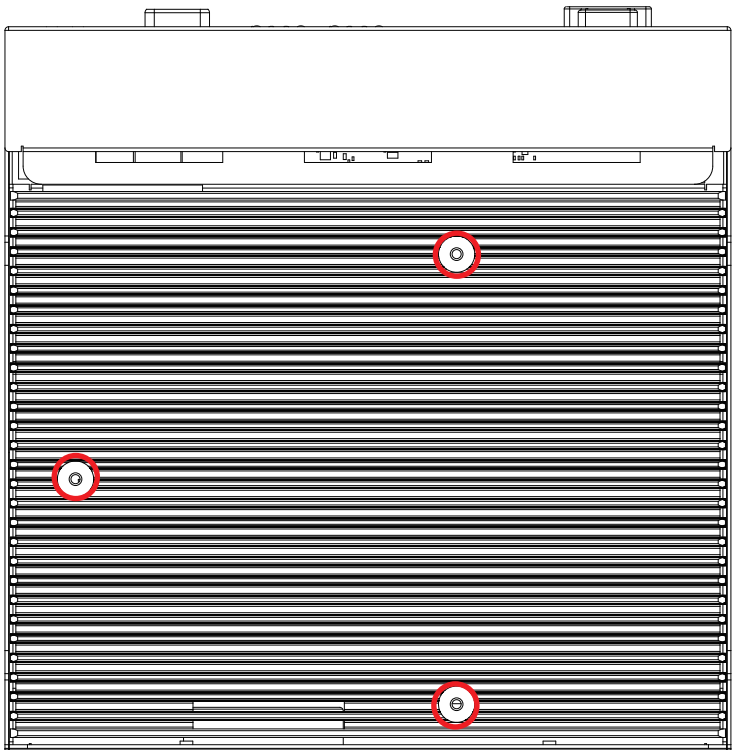
3.2 Installing CPU

3.2.1 VCM-1000

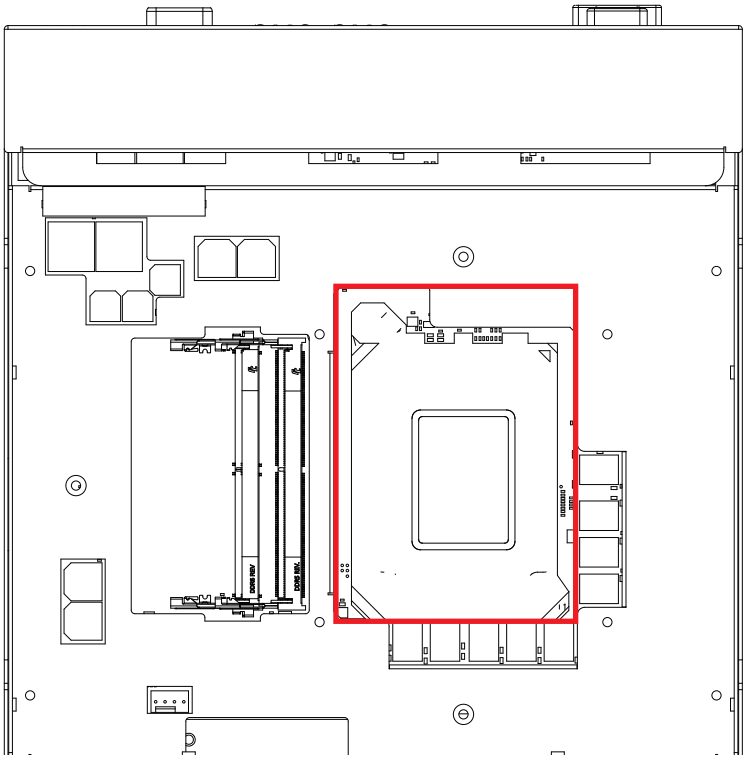
Step 1 Remove two pan head M3x4L screws, and take out sink cover.



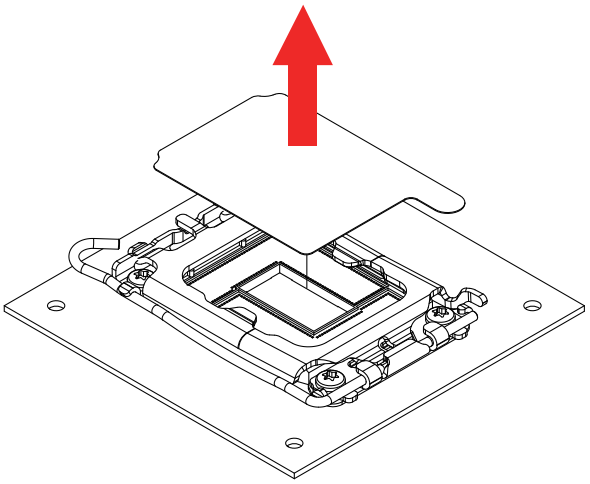
Step 2 Remove three I head M3x6L screws, and take out heat sink.



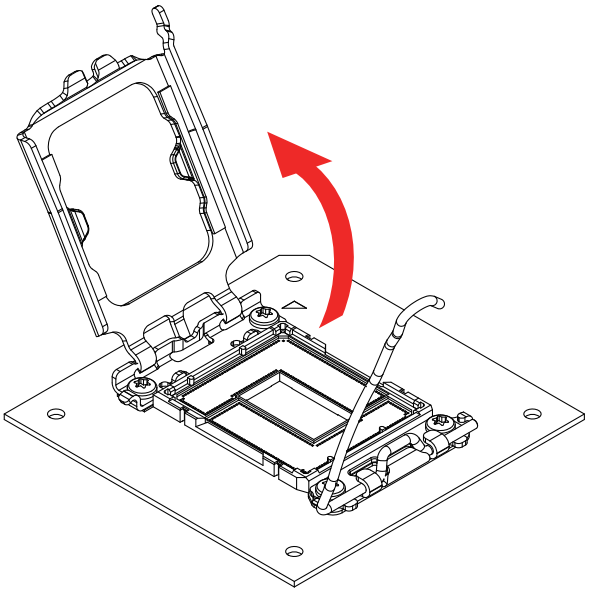
Step 3 CPU slot.



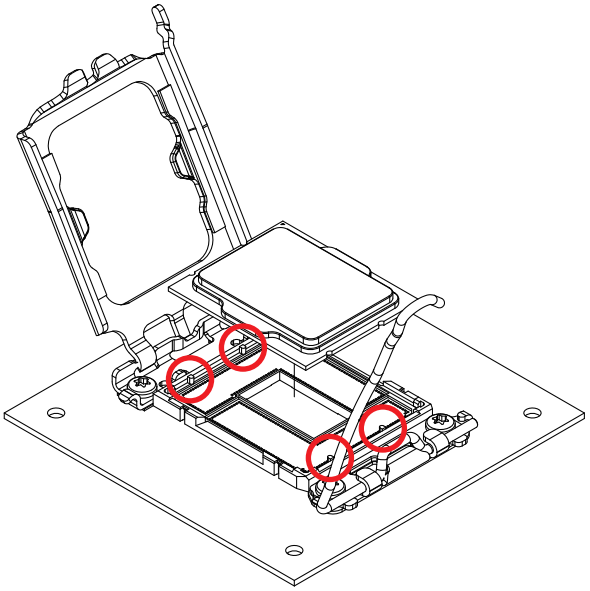
Step 4 Remove CPU mylar.



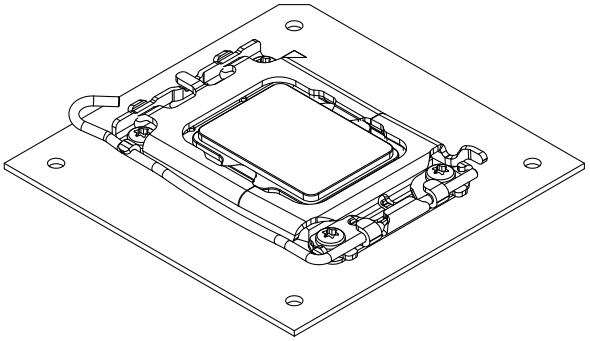
Step 5 Open CPU independent loading mechanism (ILM)



Step 6 Install CPU. (Be careful CPU pin).

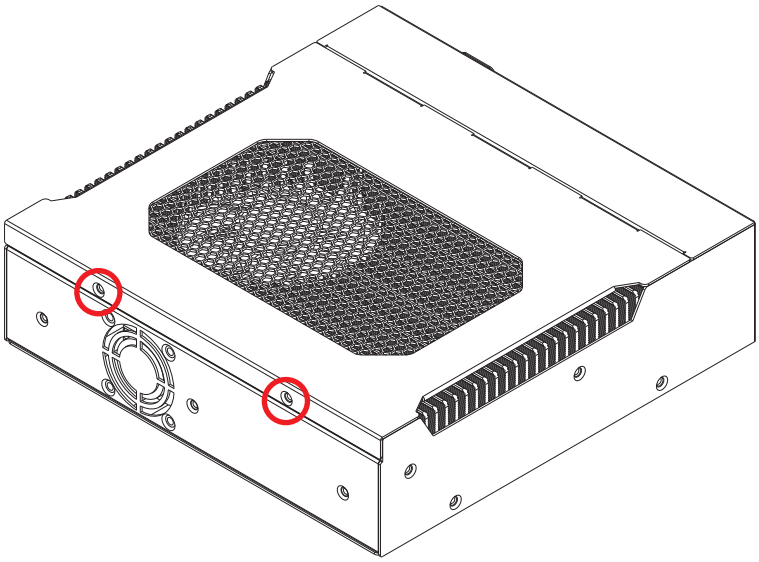


Step 7 Close CPU independent loading Mechanism (ILM) and finish.

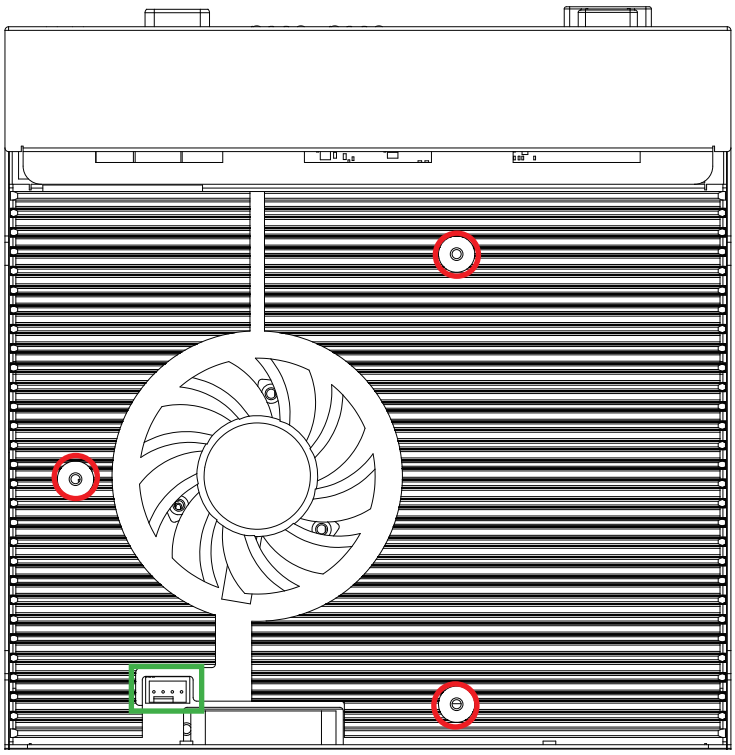


3.2.2 VCM-1000F/VCM-1100F

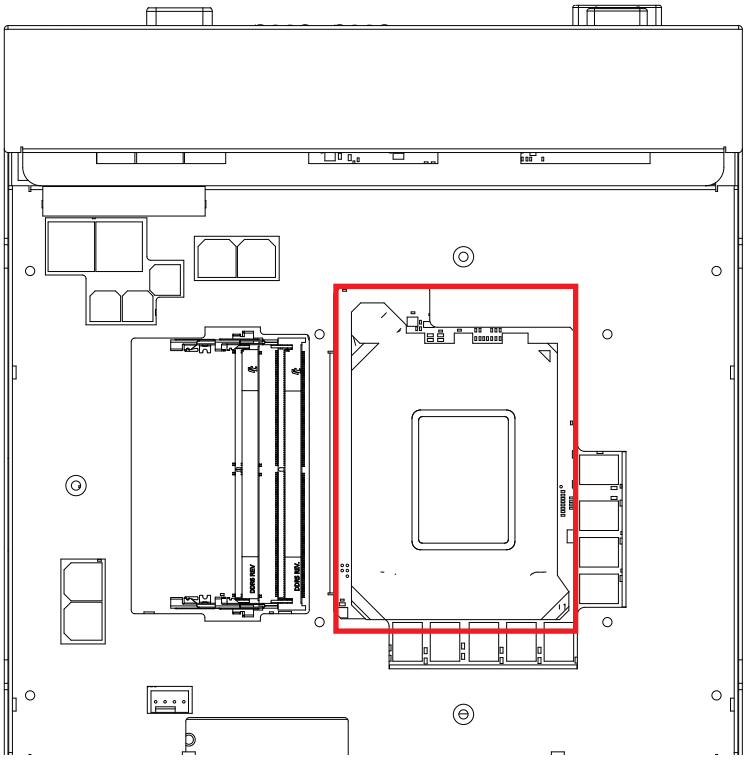
Step 1 Remove two pan head M3x4L screws, and take out fan cover.



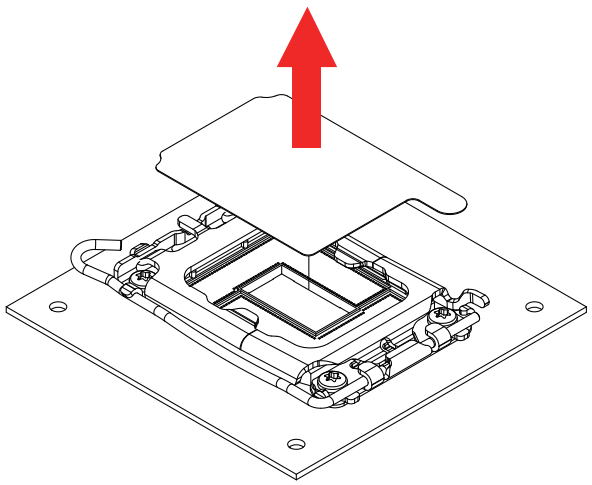
Step 2 Remove three I head M3x6L screws, fan header and take out heat sink.



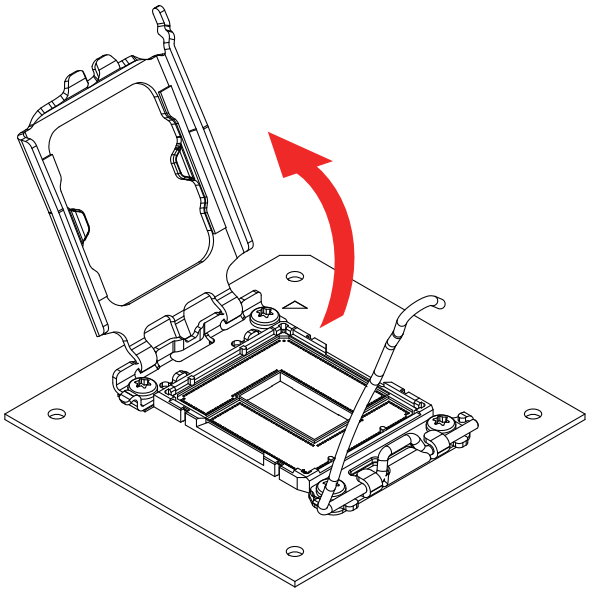
Step 3 CPU slot.



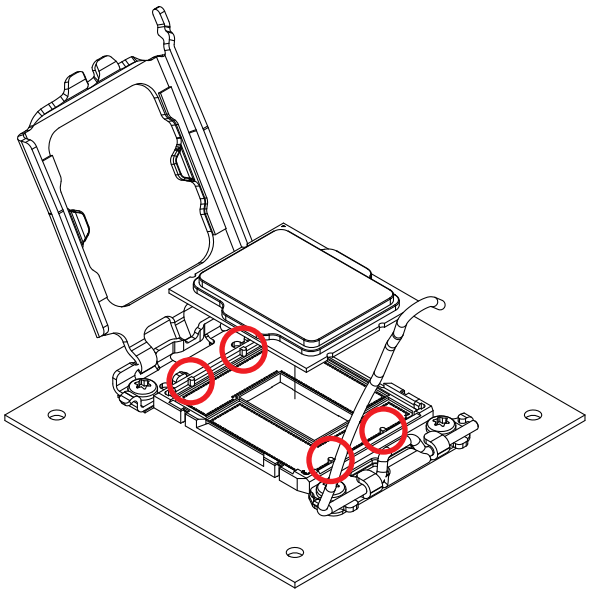
Step 4 Remove CPU mylar.



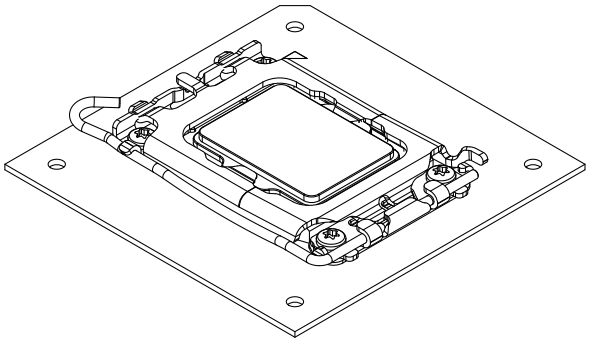
Step 5 Open CPU independent loading mechanism (ILM)



Step 6 Install CPU. (Be careful CPU pin).

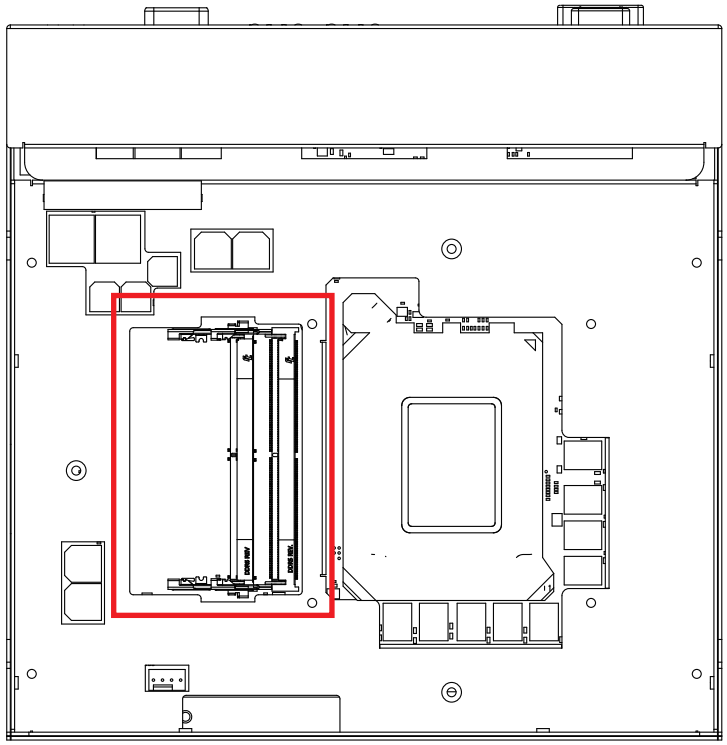


Step 7 Close CPU independent loading Mechanism (ILM) and finish.



3.3 Installing DDR5 SO-DIMM Modules

Step 1 DDR5 SO-DIMM slot.

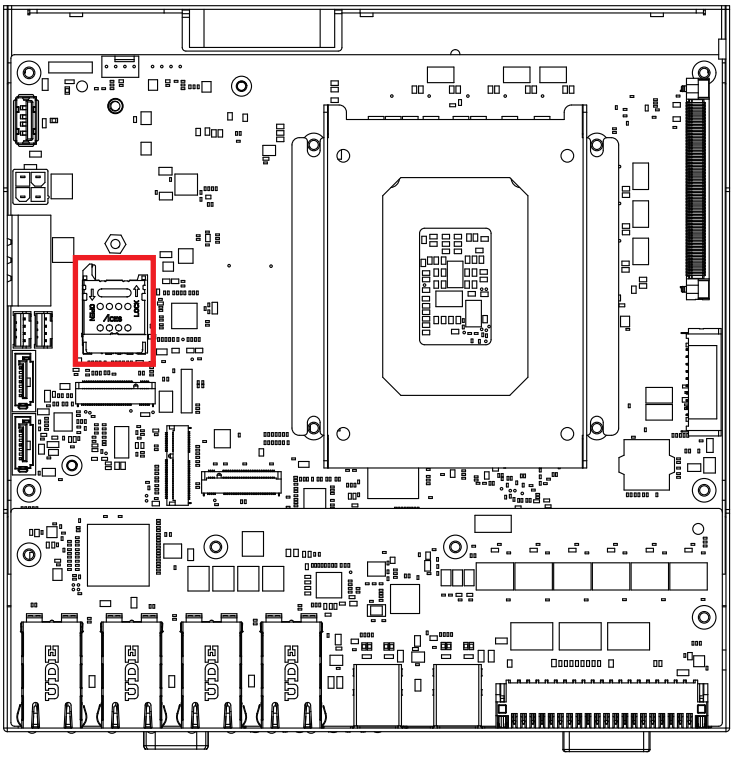


Step 2 Install DDR5 RAM module into SO-DIMM socket.

Step 3 Make sure RAM module is locked by the memory slot.

3.4 Installing Mini PCIe Card

Step 1 SIM slot.



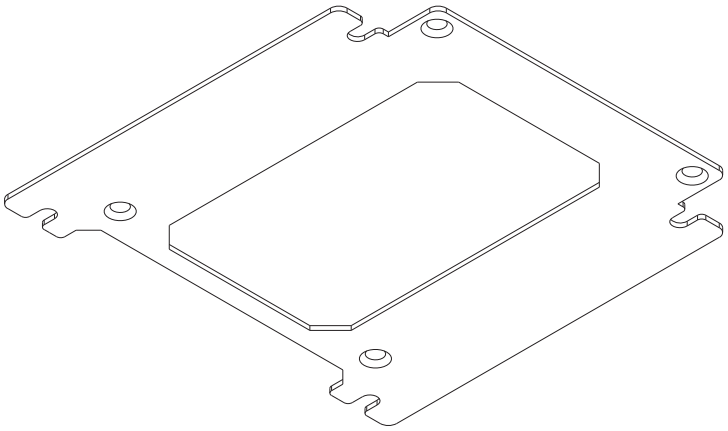
Step 2 Push SIM card slot cover open and install SIM card.

Step 3 Close the cover.

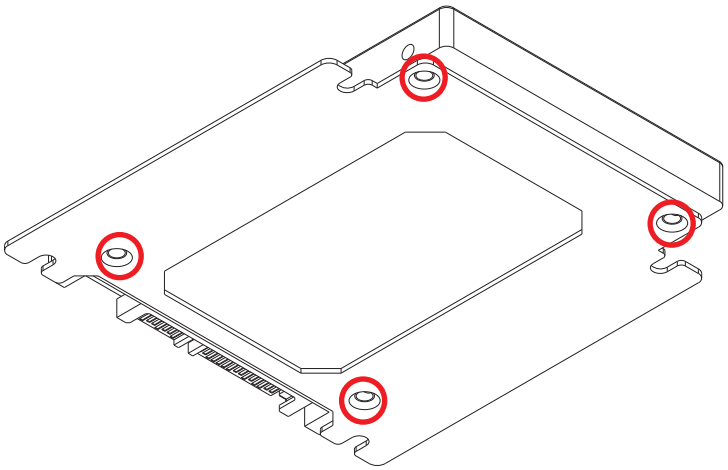
3.5 Installing SSD/HDD

3.5.1 VCM-1000/VCM-1000F

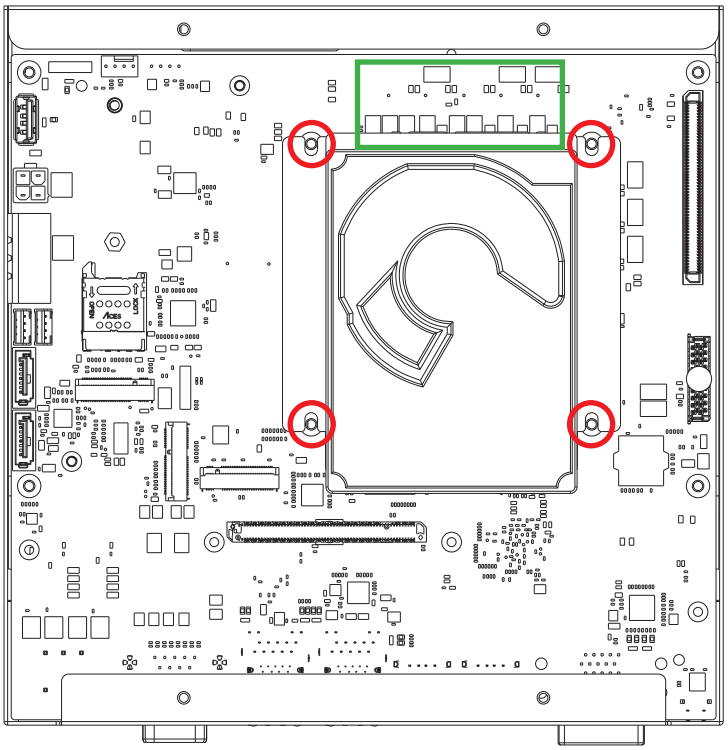
Step 1 SSD/HDD bracket for VCM-1000/VCM-1000F.



Step 2 Put SSD/HDD into bracket and fasten four flat head M3x4L screws.

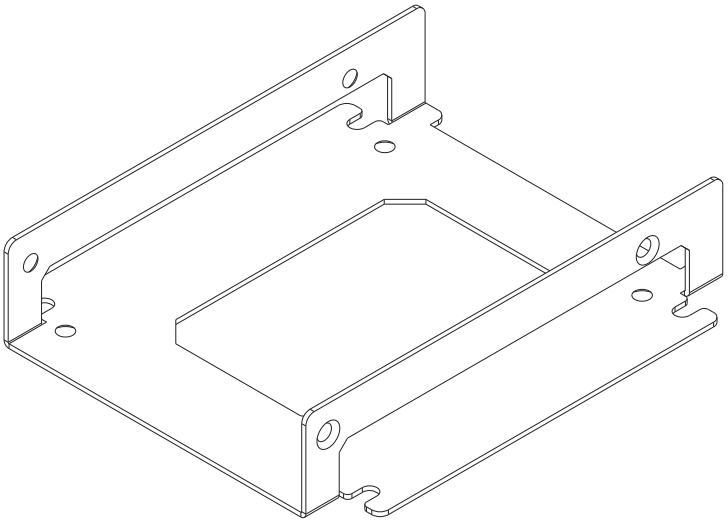


Step 3 Connector SATA data, SATA power cable to SSD/HDD and fasten four pan head M3x4L screws.

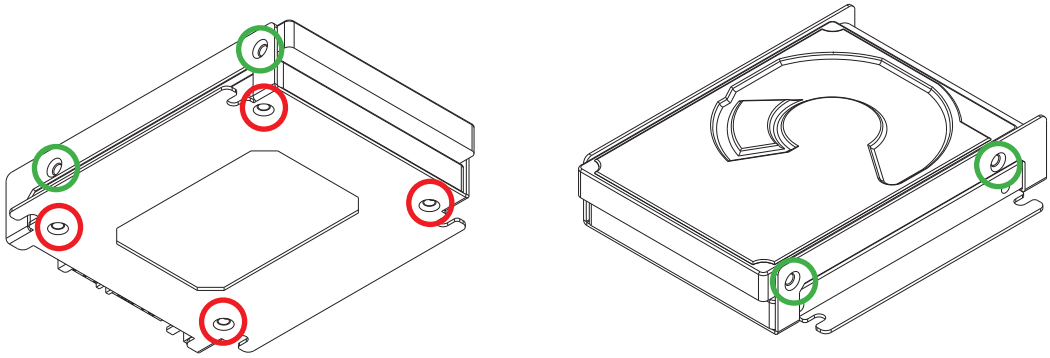


3.5.2 VCM-1100F

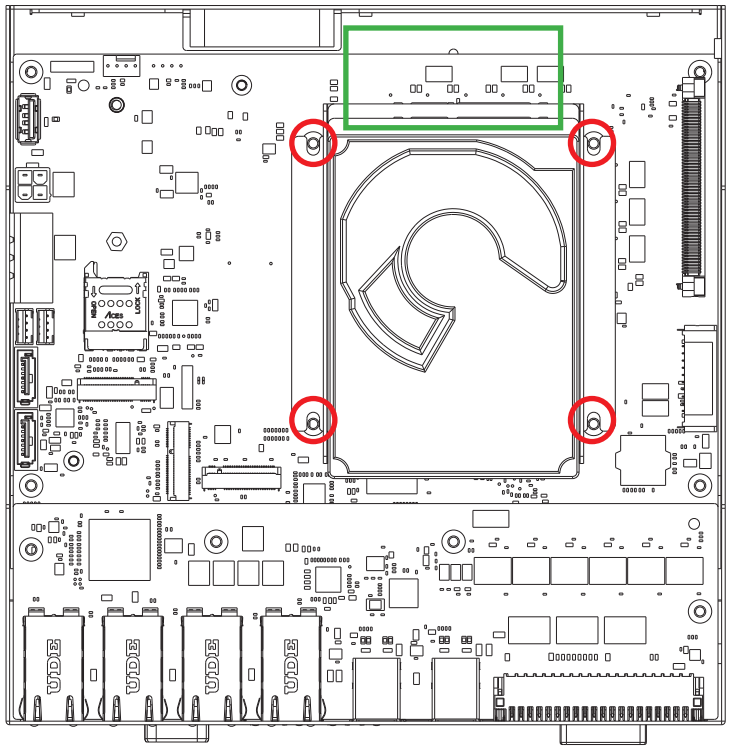
Step 1 SSD/HDD bracket for VCM-1100F.



Step 2 Put SSD/HDD into bracket and fasten eithgt flat head M3x4L screws. (Four on the bottom, four on the side.)



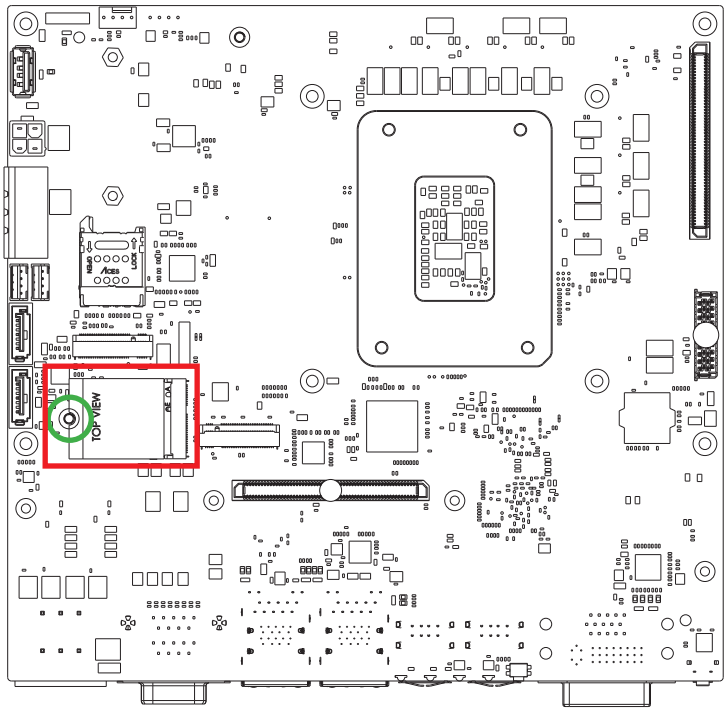
Step 3 Connector SATA data, SATA power cable to SSD/HDD and fasten four pan head M3x4L screws.



3.6 Installing M.2

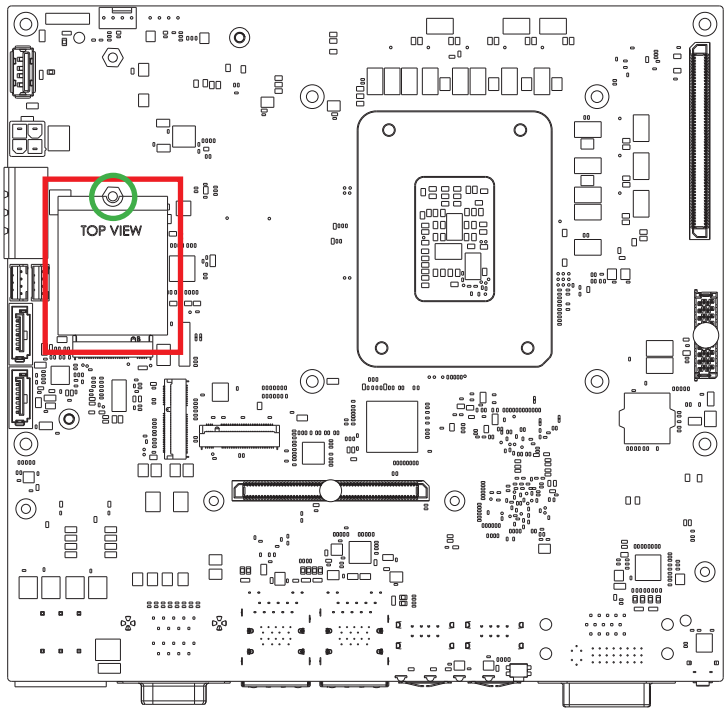
3.6.1 M.2 Key E 2230

Install M.2 Key E 2230 into slot and fasten one pan head M3x4L screw.



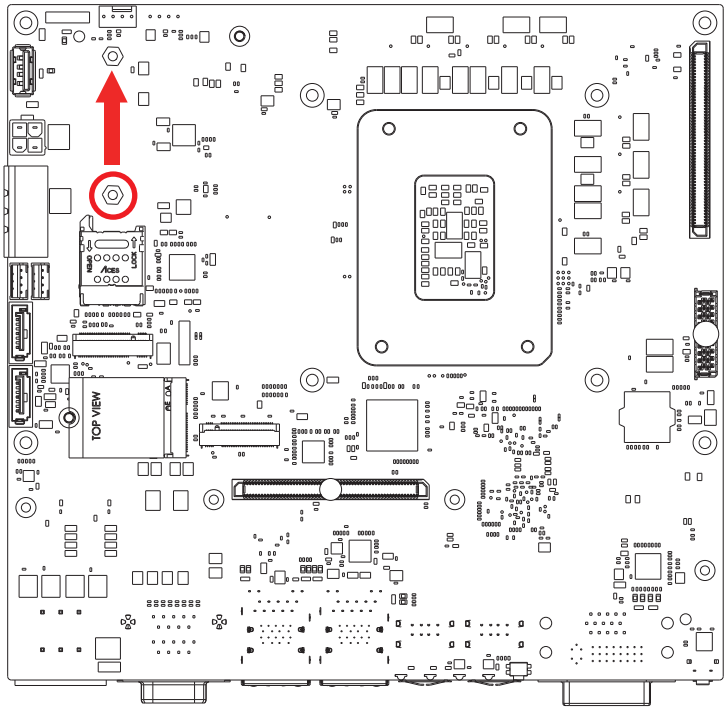
3.6.2 M.2 Key B 2242/3042

Install M.2 Key B 2242/3042 into slot and fasten one pan head M3x4L screw.

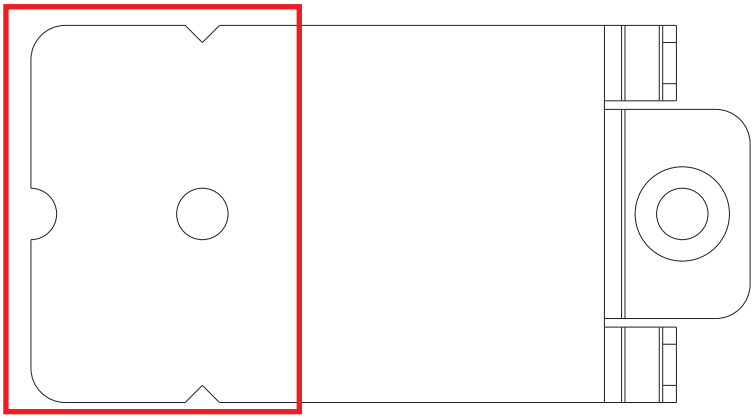


3.6.3 M.2 Key B 3052

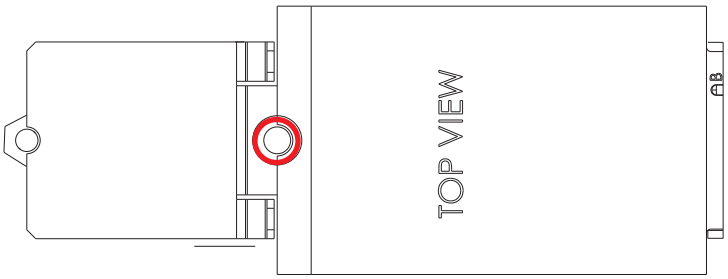
Step 1 Change the stud position.



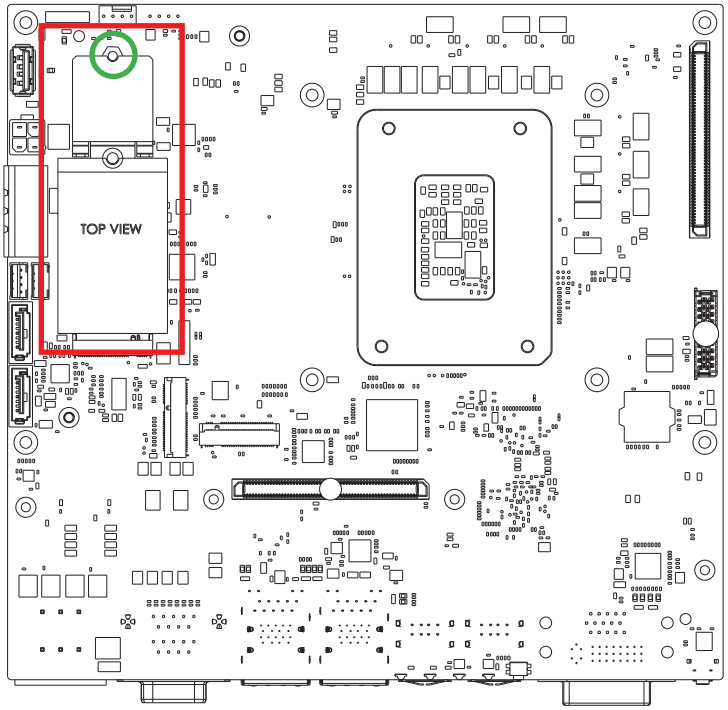
Step 2 M.2 extender bracket to 2280 slot. (Brack off excess size.)



Step 3 Install M.2 key b 3052 module on extender bracket and fasten one pan head M3x4L screw.

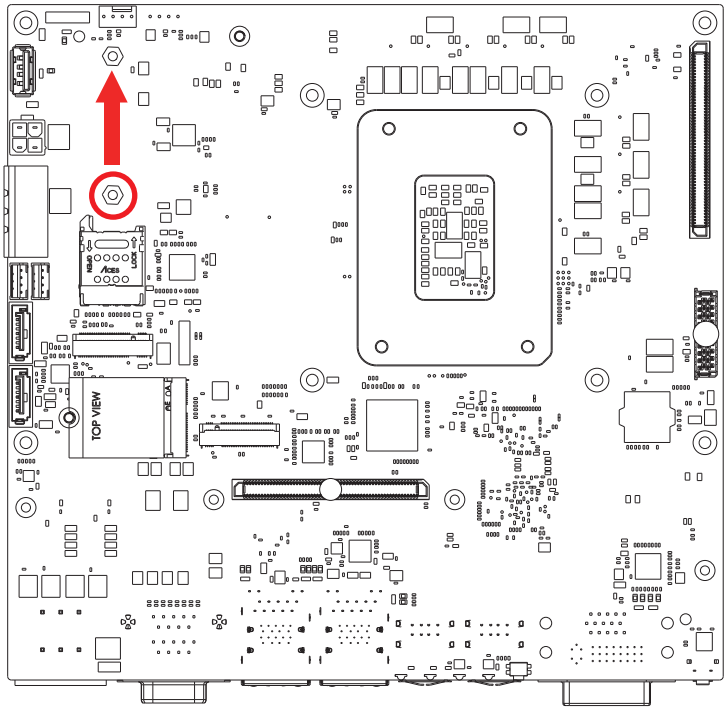


Step 4 Install M.2 Key B 3052 with extender bracket into slot and fasten one pan head M3x4L screw.

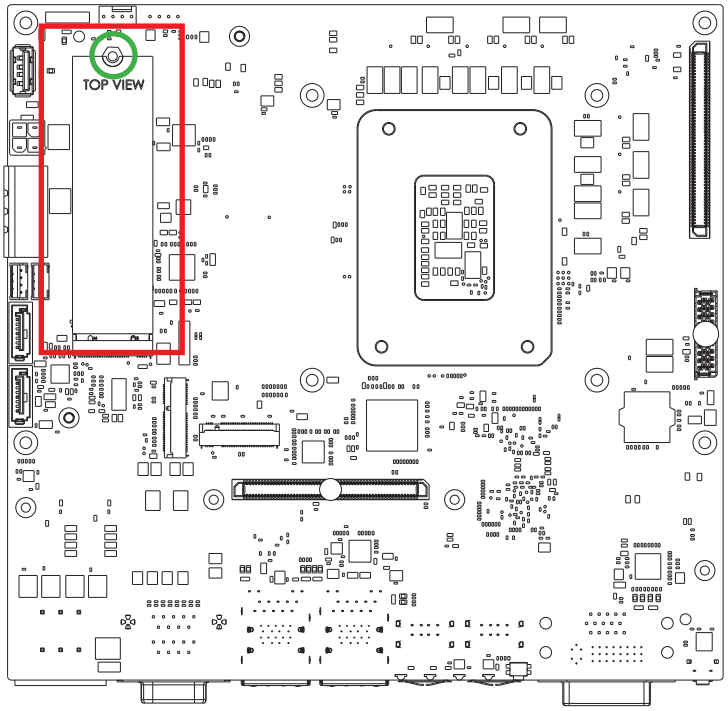


3.6.4 M.2 Key B 2280

Step 1 Change the stud position.

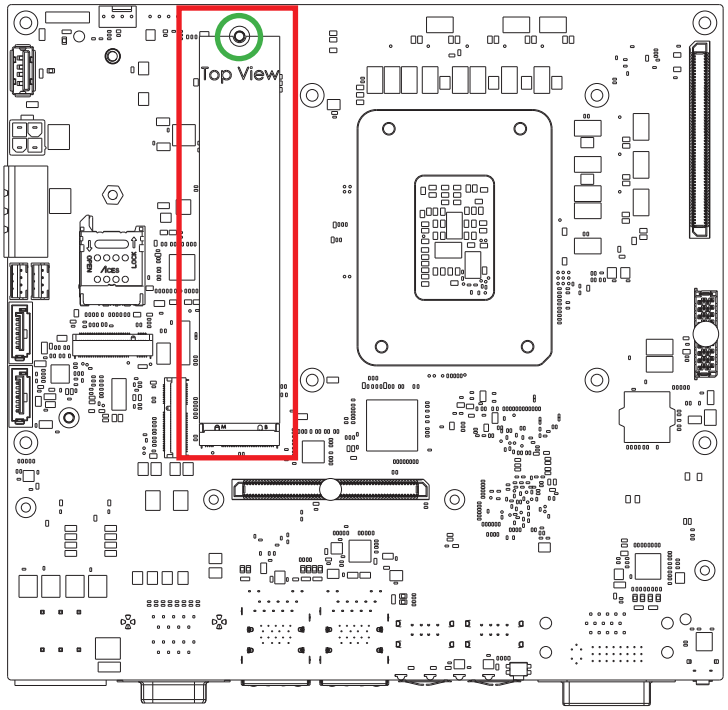


Step 2 Install M.2 Key B 2280 into slot and fasten one pan head M3x4L screw.



3.6.5 M.2 Key M 22110

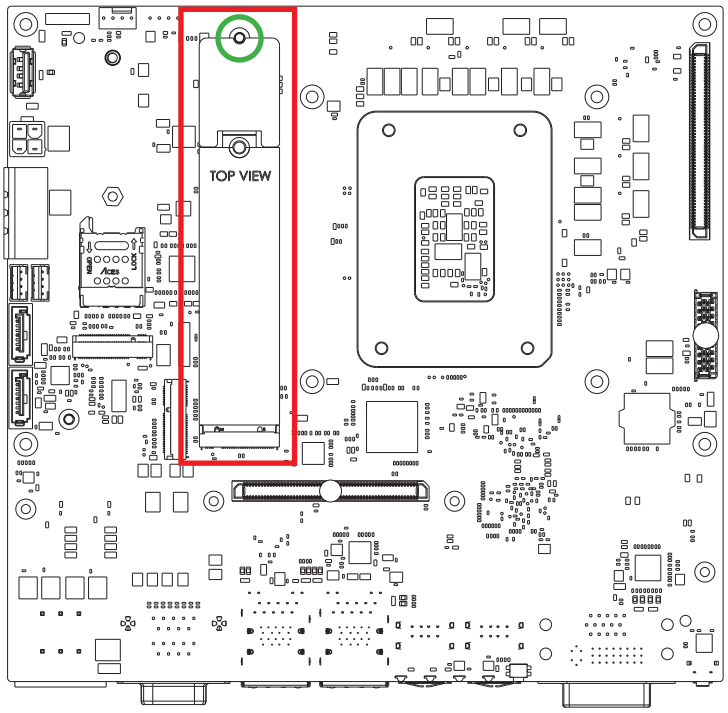
Step 1 Install M.2 Key B 22110 into slot and fasten one pan head M3x4L screw.



3.6.6 M.2 Key M 2280

Step 1 Install M.2 key M 2280 module on extender bracket and fasten one pan head M3x4L screw.

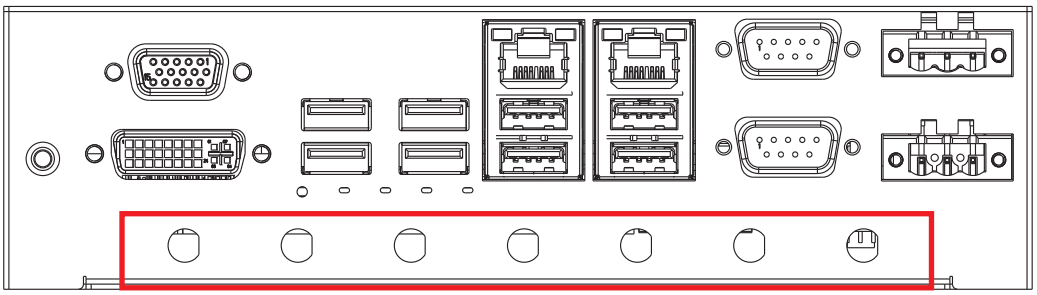
Step 2 Install M.2 Key B 2280 with extender bracket into slot and fasten one pan head M3x4L screw..



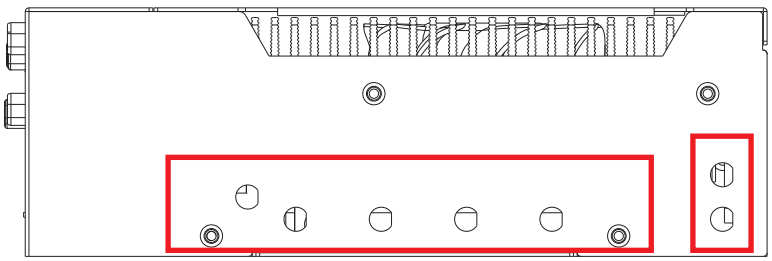
3.7 Installing Antenna Cable

Step 1 Remove the rubber corks on the panel.

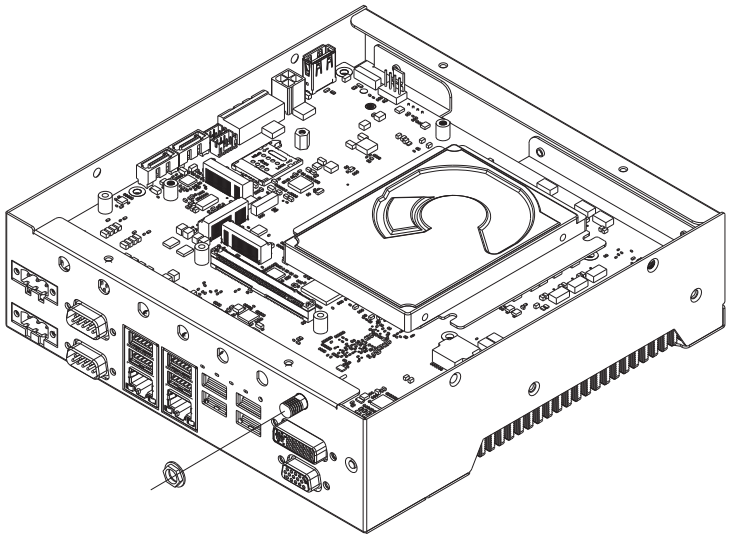
VCM-1000/VCM-1000F



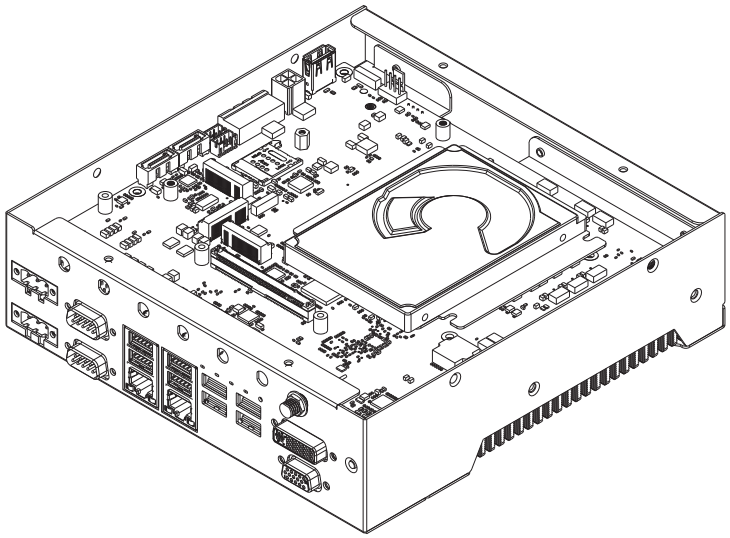
VCM-1100F



Step 2 Put antenna cable connector into the hole on panel.



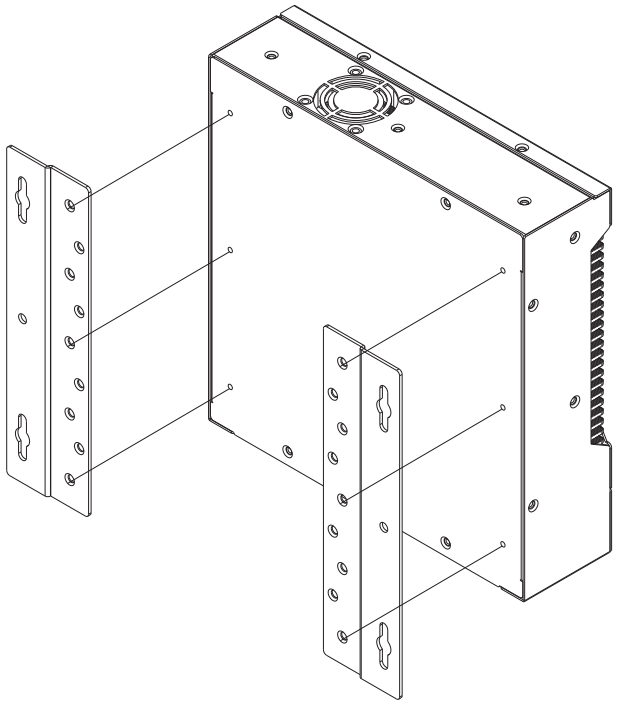
Step 3 Fasten washer on the antenna cable connector.



3.8 Mount Your VCM-1000

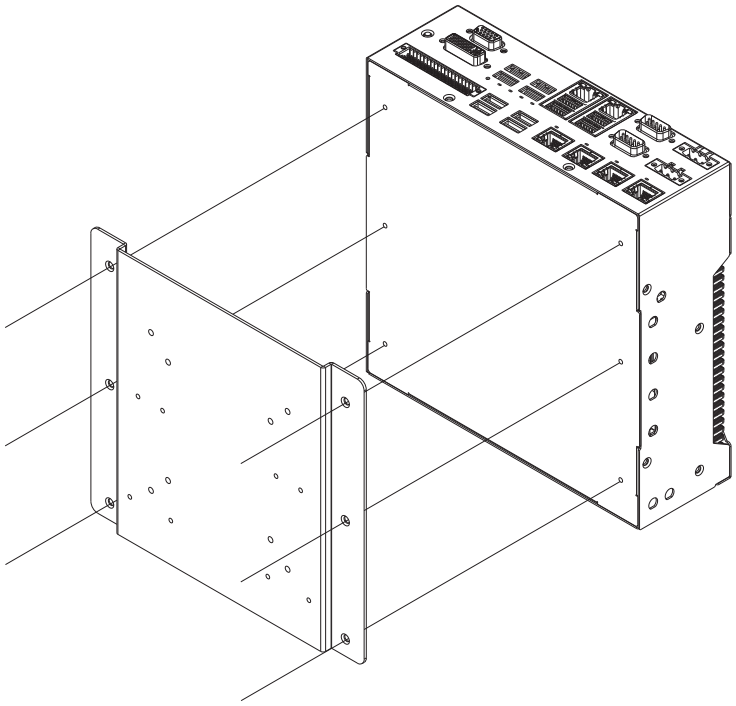
3.8.1 Wall mount

Fasten six flat head #6-32x6L screws.



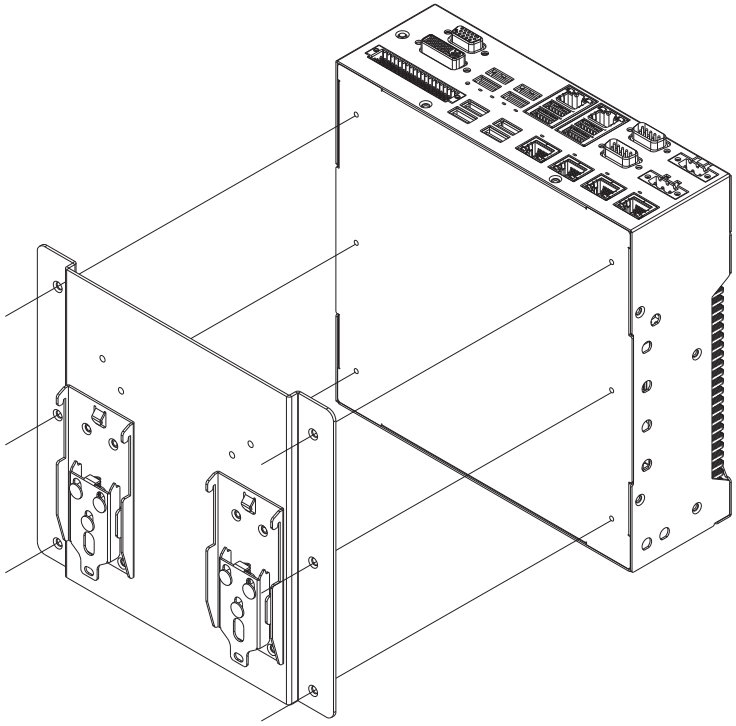
3.8.2 VESA mount

Fasten six flat head #6-32x6L screws.



3.8.3 Din rail mount

Fasten six flat head #6-32x6L screws.



4

BIOS SETUP

4.1 BIOS Setup

Figure 4-1 : Entering Setup Screen

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

4.2 Main Menu

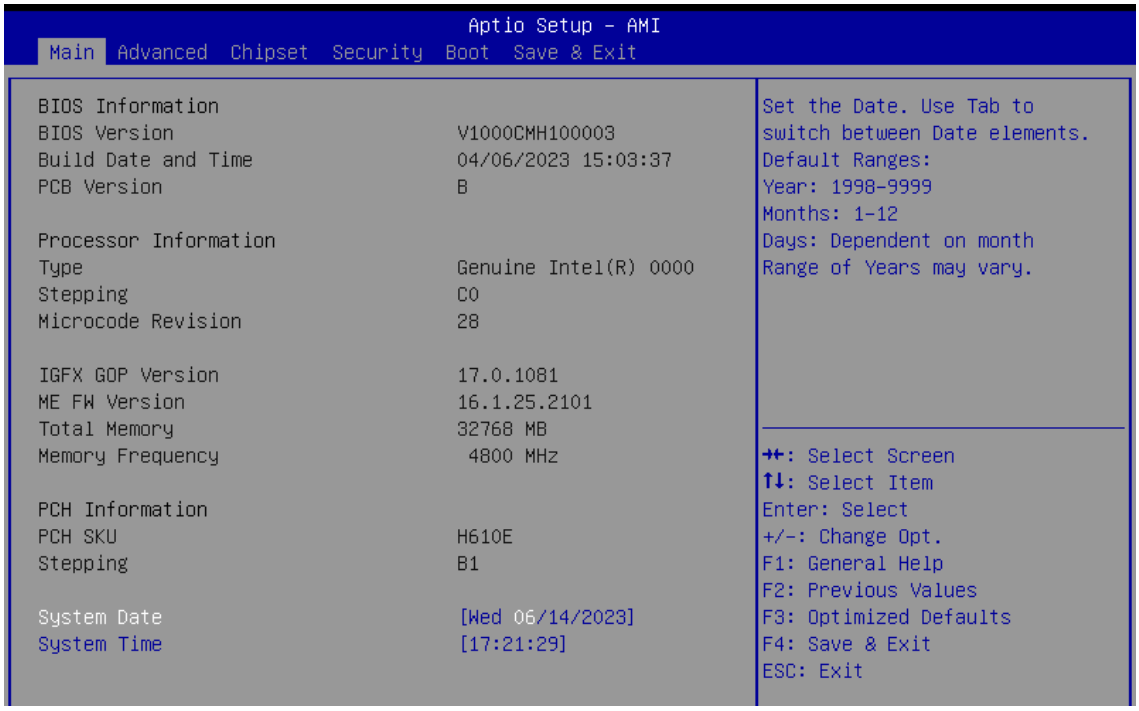


Figure 4-2 : BIOS Main Menu

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

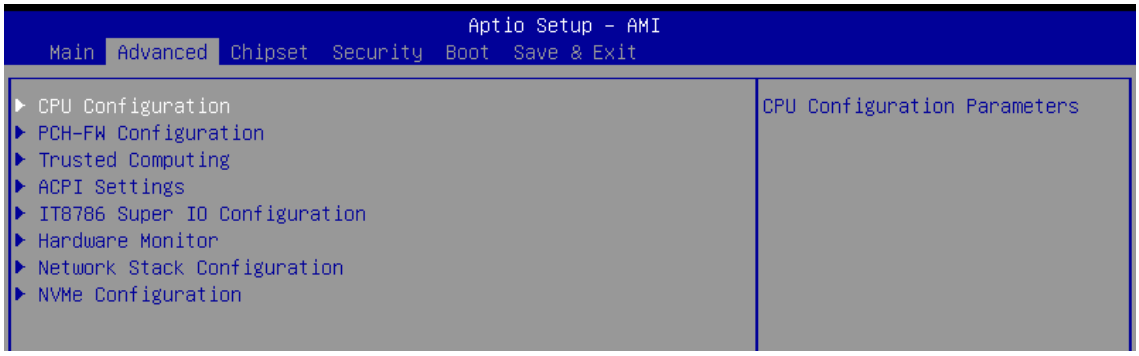


Figure 4-3 : BIOS Advanced Menu

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

4.3.1 CPU Configuration

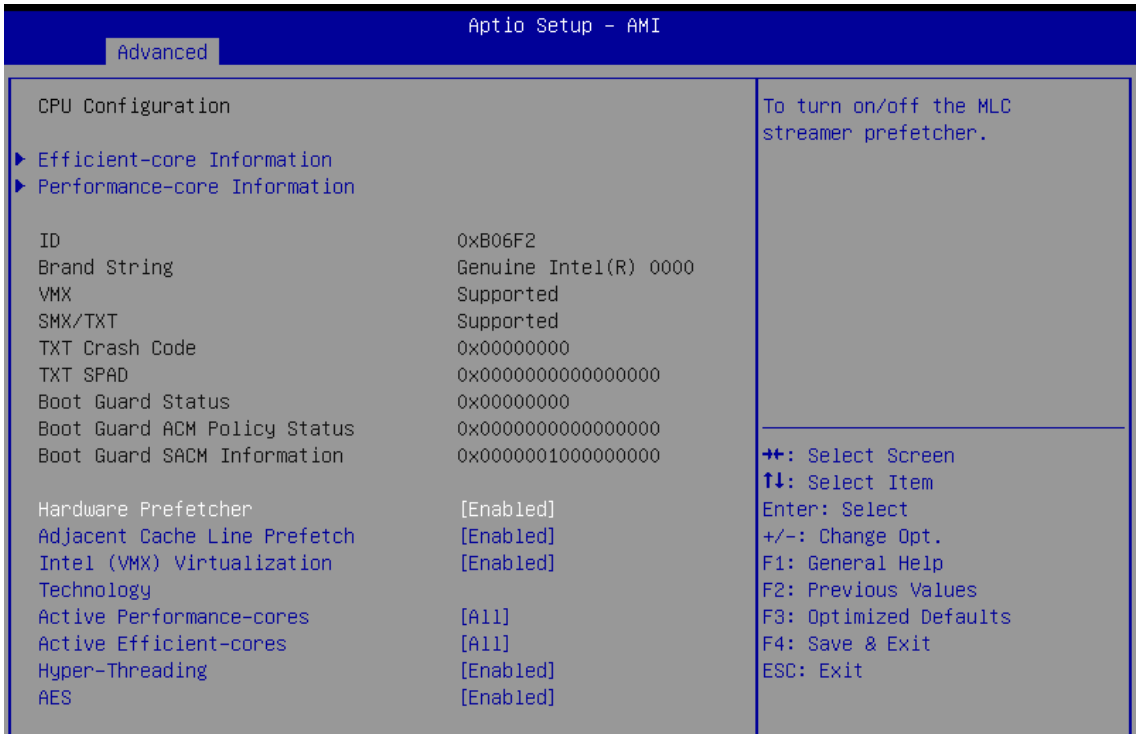


Figure 4-3-1 : CPU Configuration

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 PCH-FW Configuration

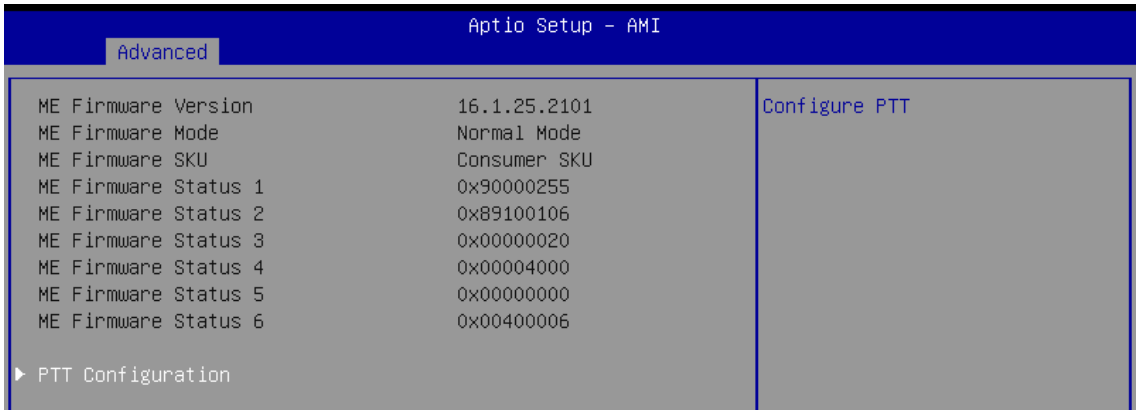


Figure 4 3-2: PCH-FW Configuration

PTT Configuration
Configure PTT.

4.3.2.1 PTT Configuration

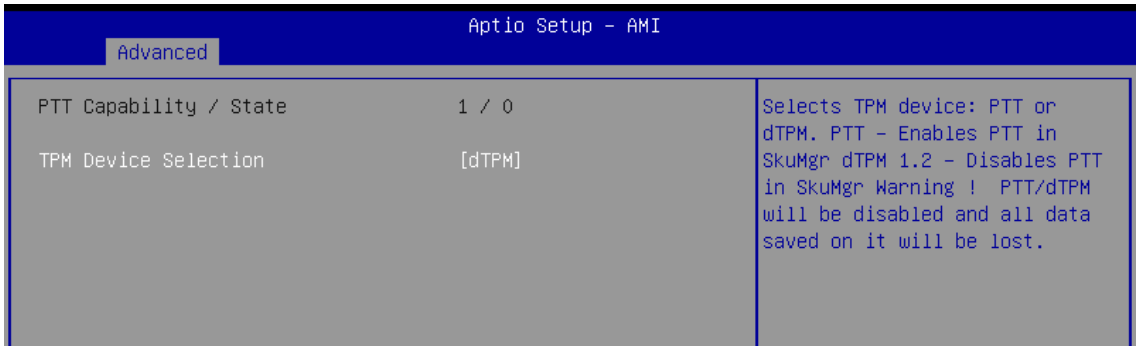


Figure 4 3-2-1: PTT Configuration

TPM Device Selection

Selects TPM device: PTT or dTPM. 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.

4.3.3 Trusted Computing

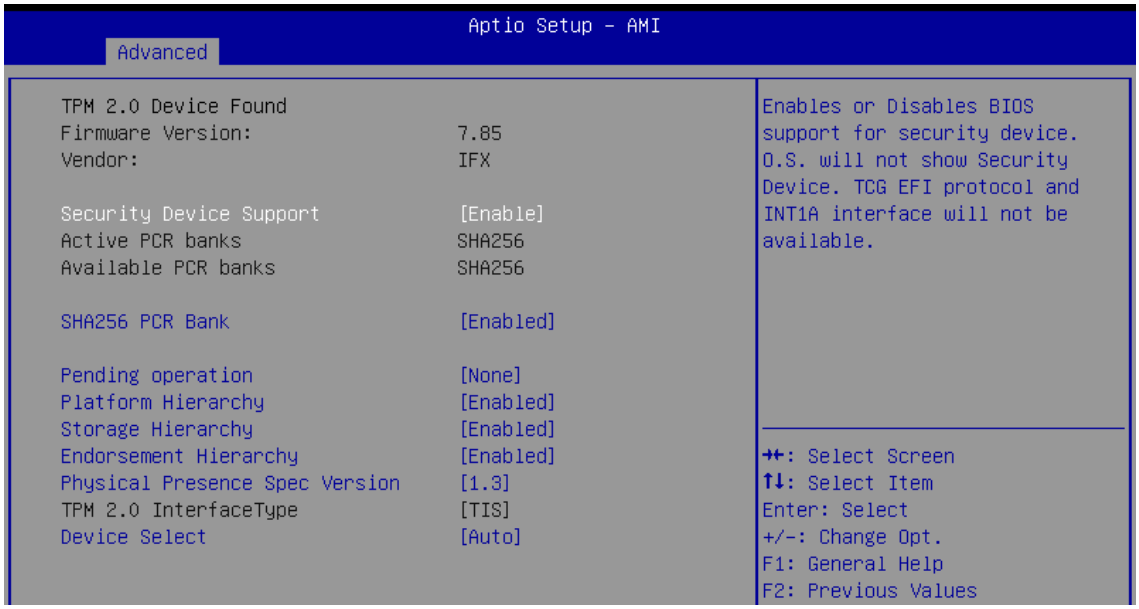


Figure 4 3-3: Trusted Computing

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

4.3.4 ACPI Settings

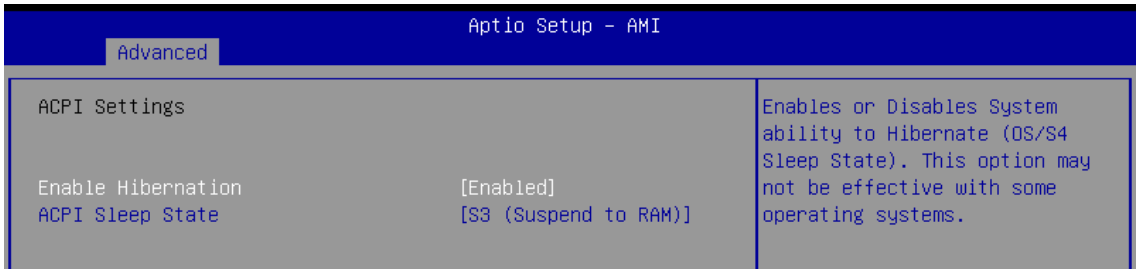


Figure 4-3-4 : ACPI Settings

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

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

4.3.5 IT8786 Super IO Configuration

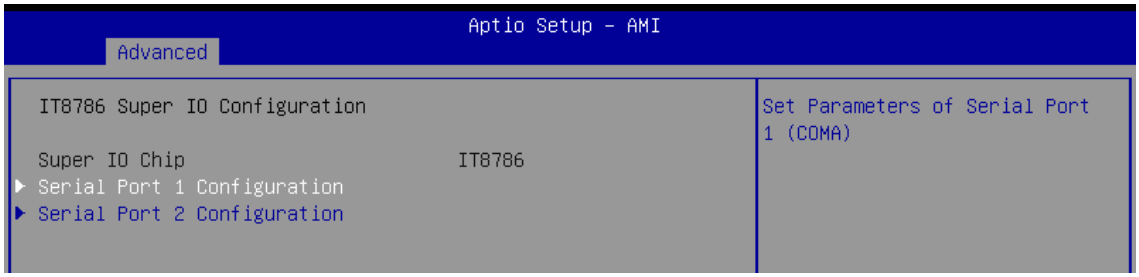


Figure 4 3-5: IT8786 Super IO Configuration

4.3.5.1 Serial Port X Configuration

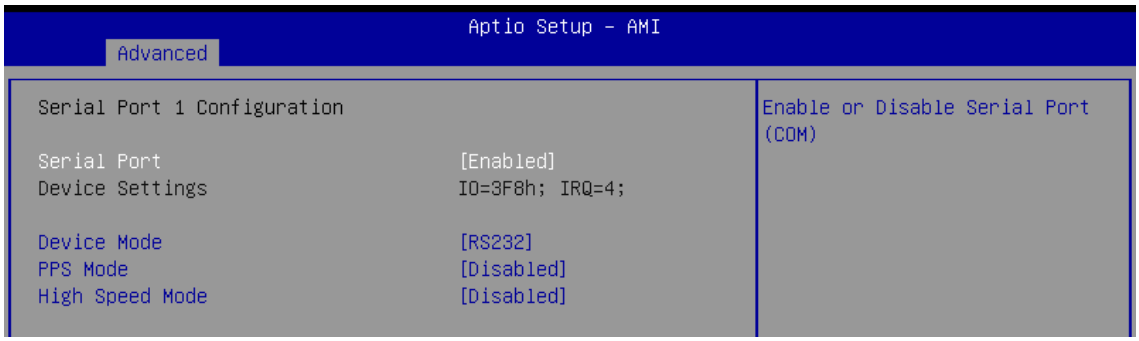


Figure 4-3-5-1: Serial Port X Configuration

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 Serial Port High Speed. (Serial Port 1 only).

4.3.6 Hardware Monitor

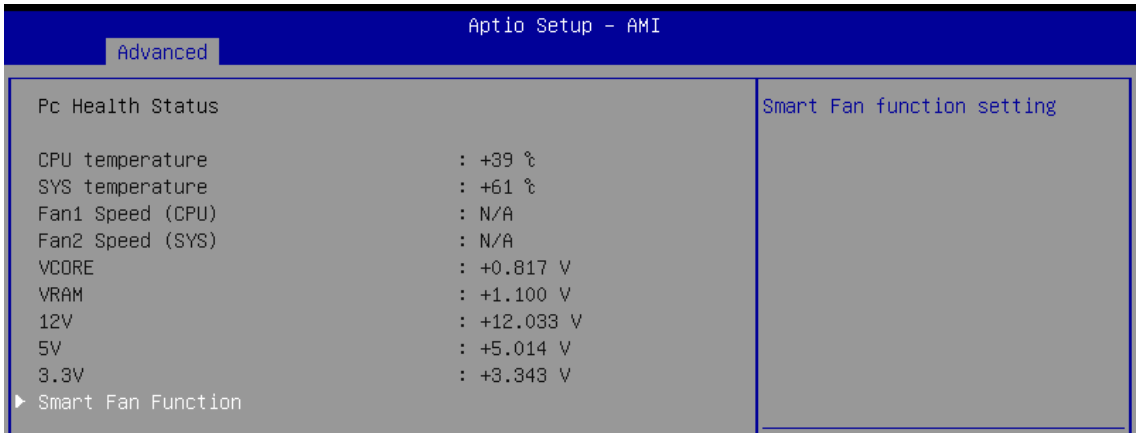


Figure 4-3-6: Hardware Monitor

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

4.3.6.1 Smart Fan Function

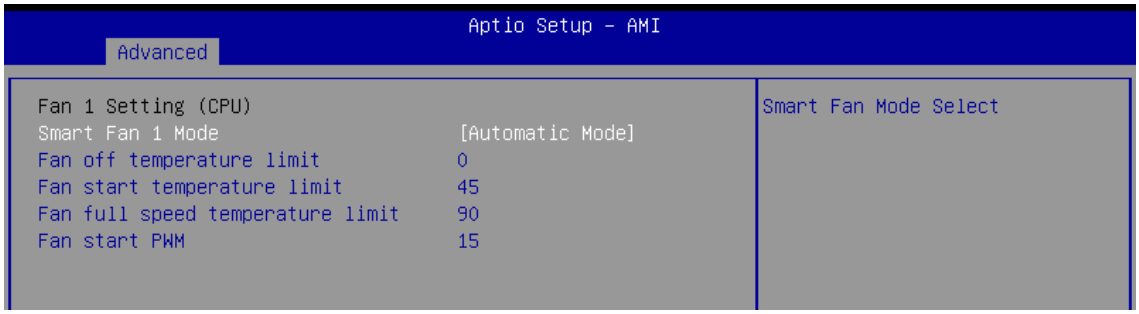


Figure 4-3-6-1: Smart Fan Function

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.

Manual PWM Setting
Fan will work with this Manual PWM Value.

4.3.7 Network Stack Configuration

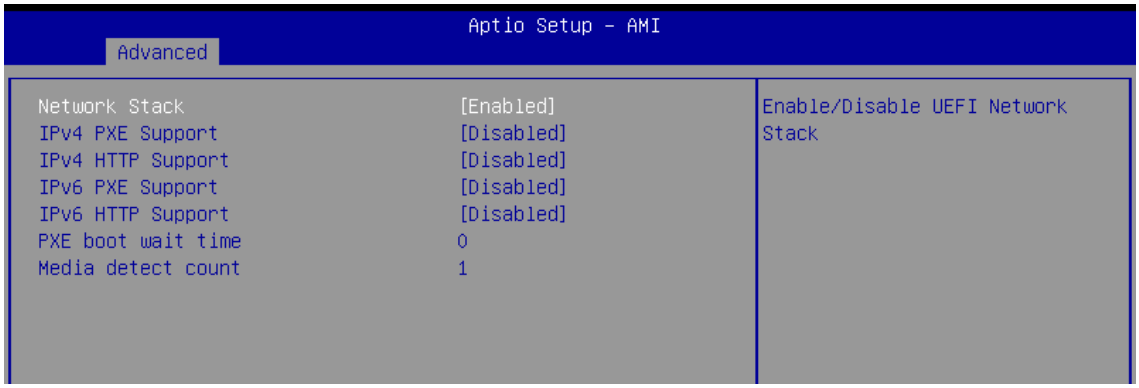


Figure 4-3-7: Network Stack Configuration

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.

4.3.8 NVMe Configuration

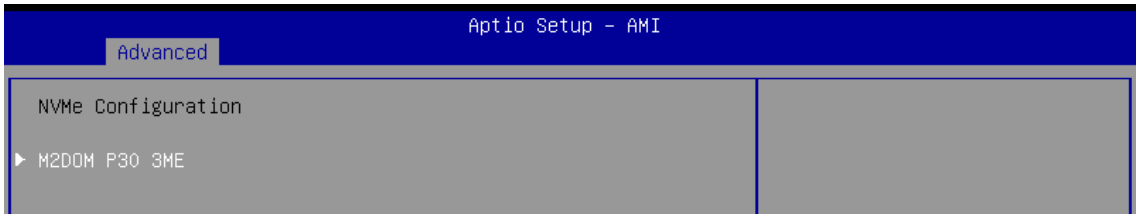


Figure 4-3-8: NVMe Configuration

Display NVMe controller and Drive information.

4.4 Chipset Functions

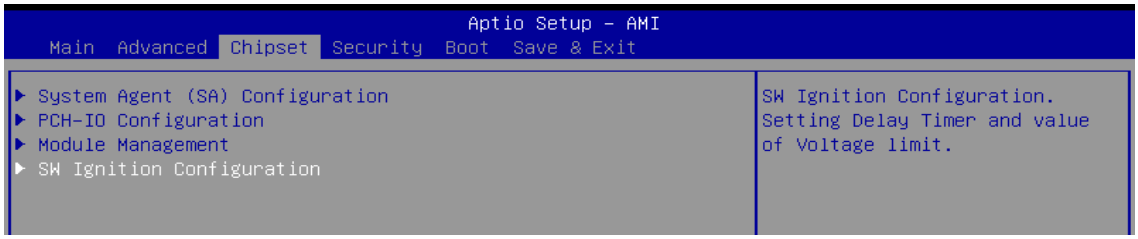


Figure 4-4: BIOS Chipset Menu

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

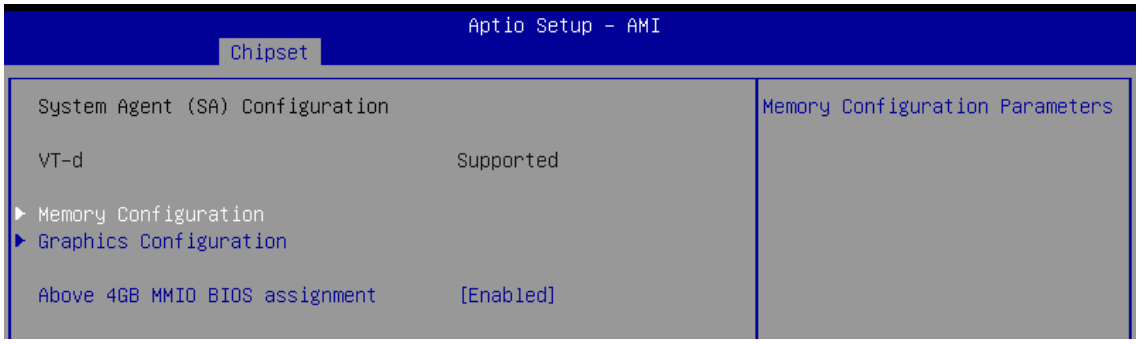


Figure 4-4-1: System Agent (SA) Configuration

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

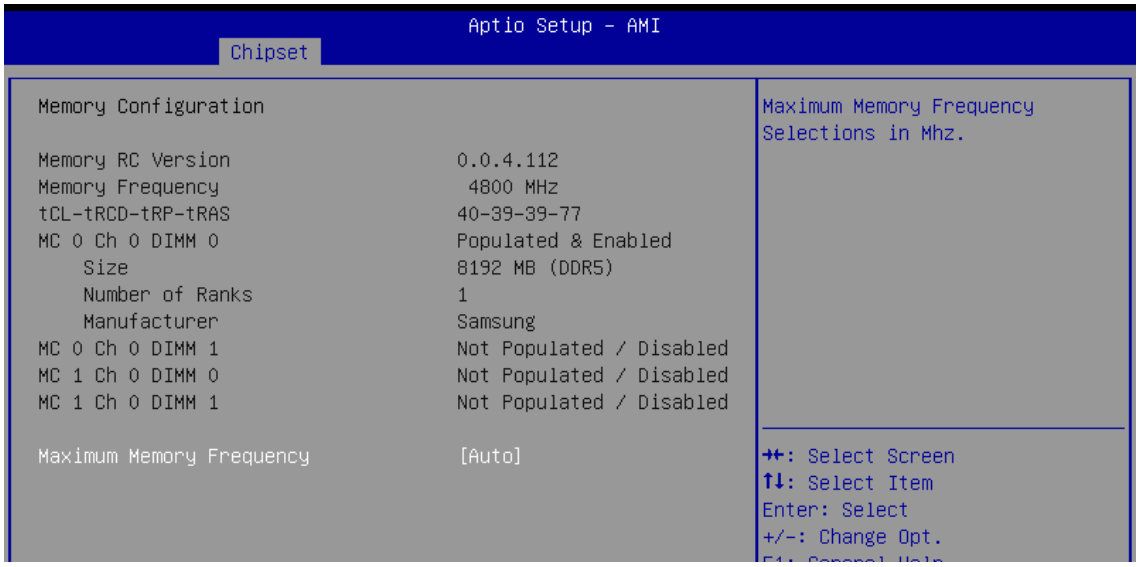


Figure 4-4-1-1: Memory Information

Maximum Memory Frequency
Maximum Memory Frequency Selections in Mhz.

4.4.1.2 Graphics Configuration

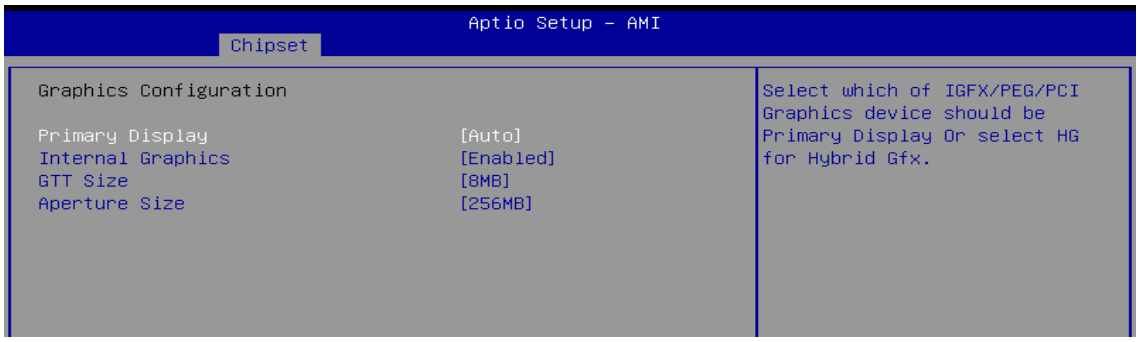


Figure 4-4-1-2 : Graphics Configuration

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

Internal Graphics
Keep IGFX enabled based on the setup options.

GTT Size
Select the GTT Size.

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

4.4.2 PCH-IO Configuration

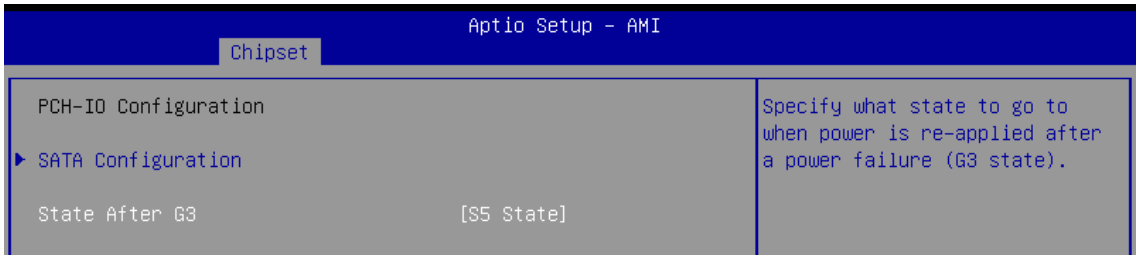


Figure 4-4-2 : PCH-IO Configuration

State After G3

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

4.4.2.1 SATA Configuration

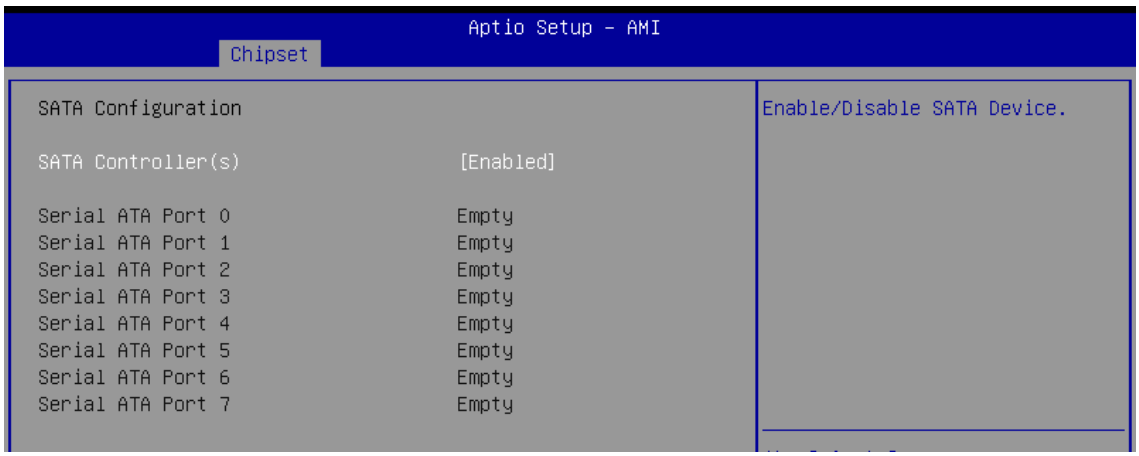


Figure 4-4-2-1: SATA Configuration

SATA Controller(s)

Enable/Disable SATA Device.

4.4.3 Module Management

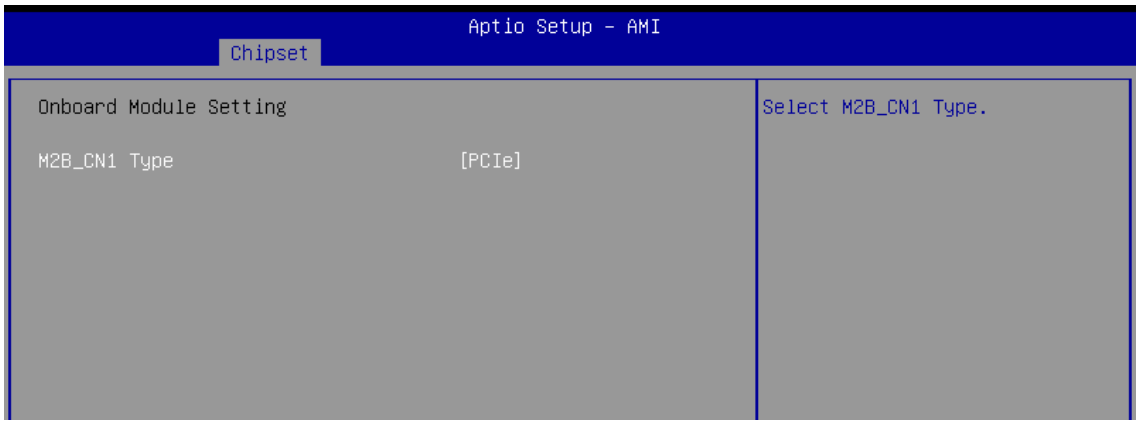


Figure 4-4-3: Module Management

M2B_CN1 Type

Select M2B_CN1 Type.

4.4.4 SW Ignition Configuration

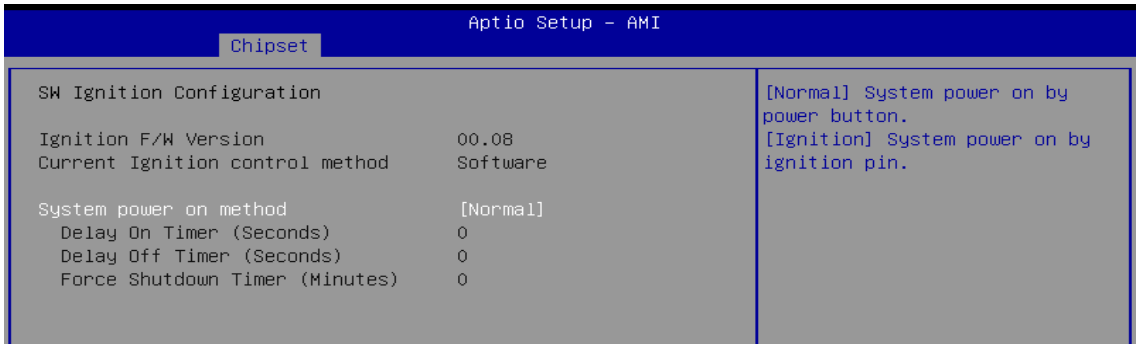


Figure 4-4-4: SW Ignition Configuration

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 Function

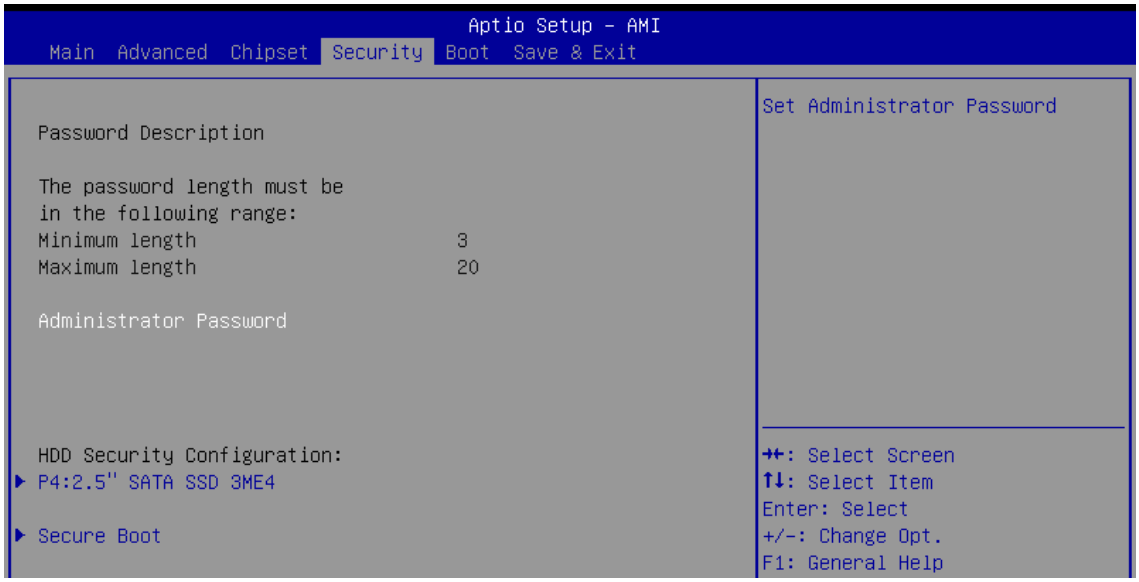


Figure 4-5 : BIOS Security Menu

Administrator Password
Set Administrator Password.

4.5.1 HDD Security Configuration

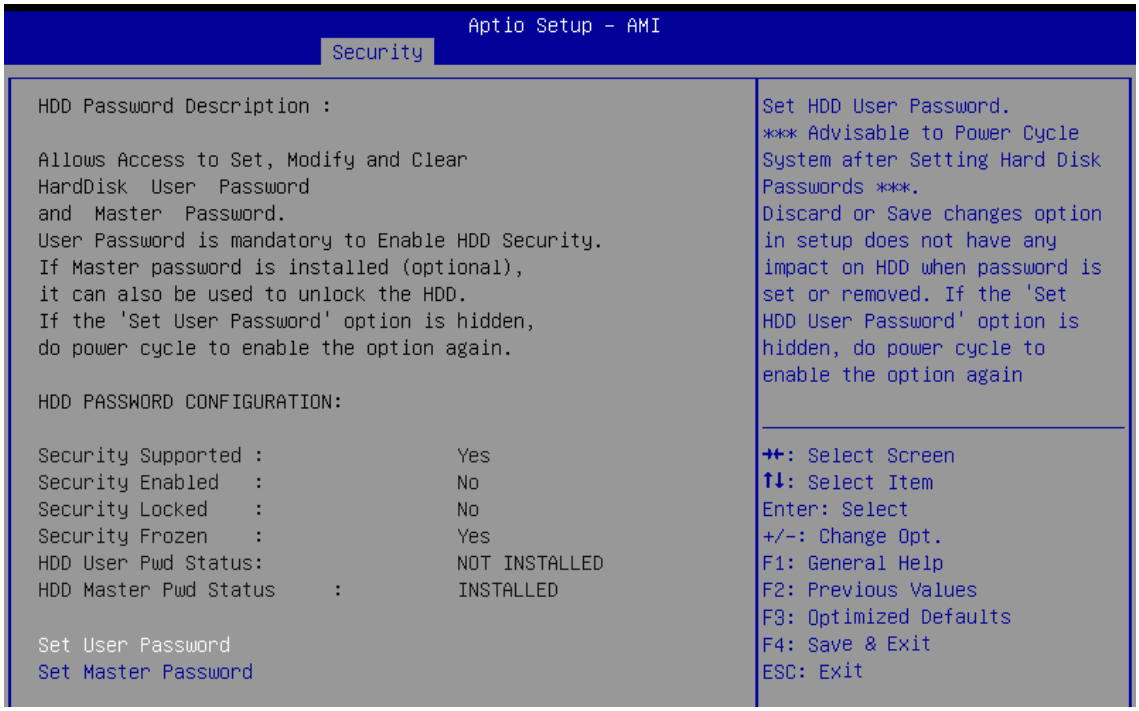


Figure 4-5-1: HDD Security Configuration

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

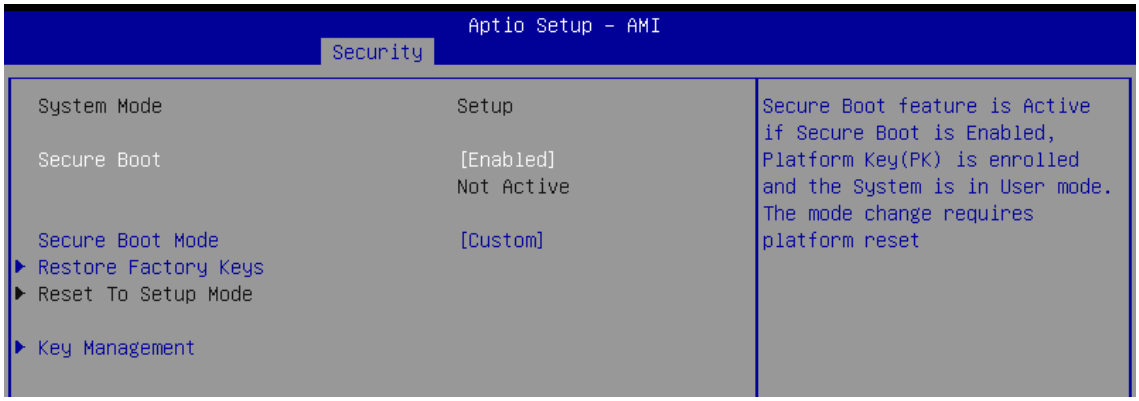


Figure 4-5-2: Secure Boot

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 Function

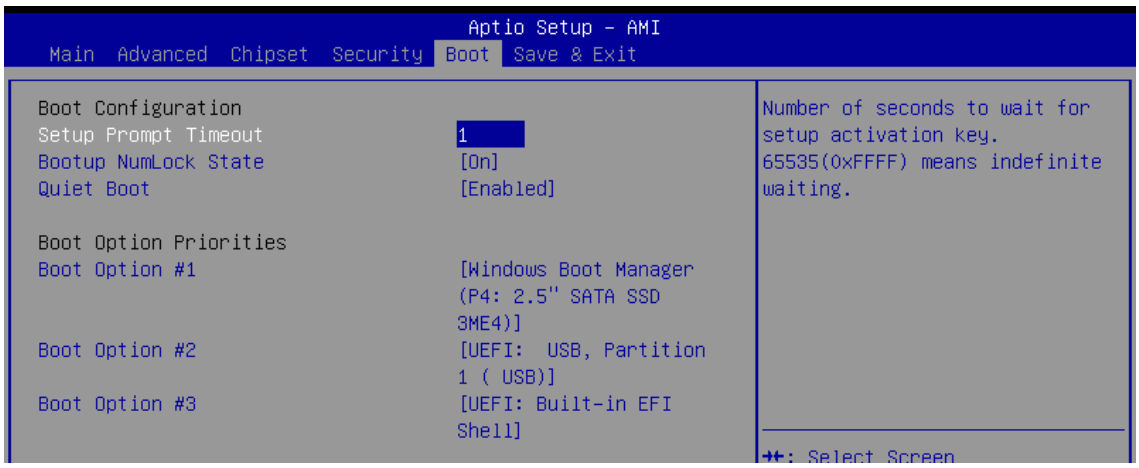


Figure 4-6: BIOS Boot Menu

Setup Prompt Timeout

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

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Boot Option Priorities

Sets the system boot order.

4.7 Save & Exit

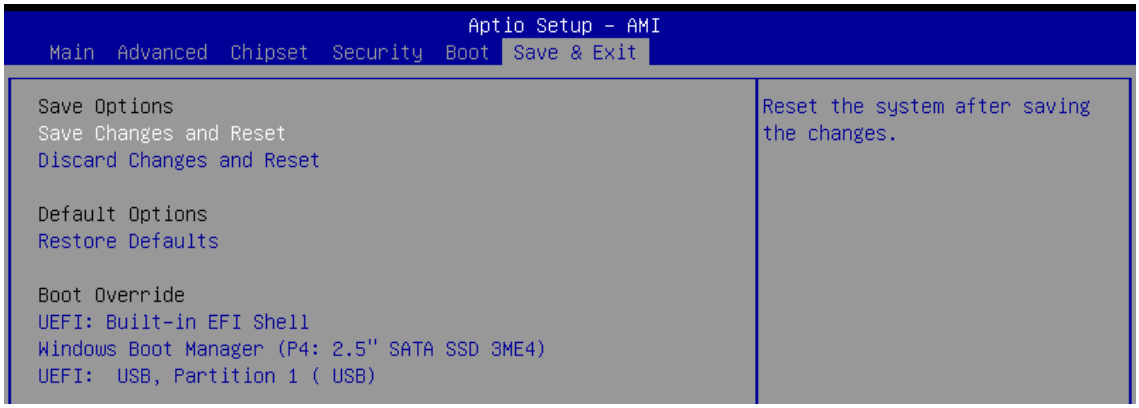


Figure 4-7: Bios Save and Exit Menu

Save Changes Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

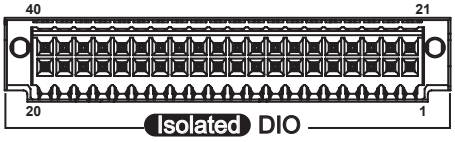
Restore Defaults

Restore/Load Default values for all the setup options.

APPENDIX A : Isolated DIO Guide

A.1 Function Description

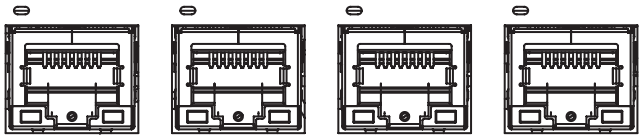
The VCM-1000 offers a 24bit DO/ 4bit DI (Isolated) 40-pin terminal block connector, a watchdog timer, and a 4-port POE.
Isolated DIO pins are fixed by Hardware design that cannot change in/out direction in runtime process.
DIO definition is shown below:



Pin No.	Isolated DIO	Pin No.	Isolated DIO
1	GND	21	GND
2	SIO_GPO90	22	SIO_GPO70
3	SIO_GPO91	23	SIO_GPO71
4	SIO_GPO92	24	SIO_GPO72
5	SIO_GPO93	25	SIO_GPO73
6	SIO_GPO94	26	SIO_GPO74
7	SIO_GPO95	27	SIO_GPO75
8	SIO_GPO96	28	SIO_GPO76
9	SIO_GPO97	29	SIO_GPO77
10	GND	30	GND
11	SIO_GPI63	31	SIO_GPO80
12	SIO_GPI64	32	SIO_GPO81
13	SIO_GPI65	33	SIO_GPO82
14	SIO_GPI66	34	SIO_GPO83

15	GND	35	SIO_GPO84
16	SIO_GP60 (Reserve)	36	SIO_GPO85
17	SIO_GP61 (Reserve)	37	SIO_GPO86
18	------	38	SIO_GPO87
19	GND	39	GND
20	------	40	------

POE definition is shown below :

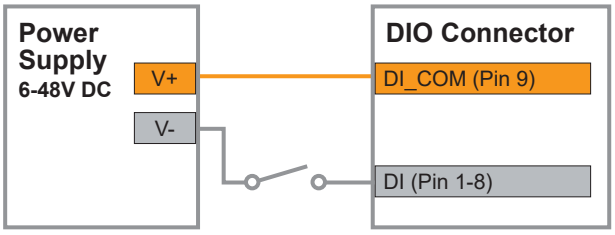


Port No.	Definition	Port No.	Definition
3	POE 1	5	POE 3
4	POE 2	6	POE 4

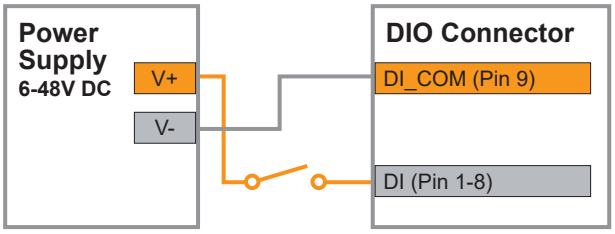
A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode (NPN)

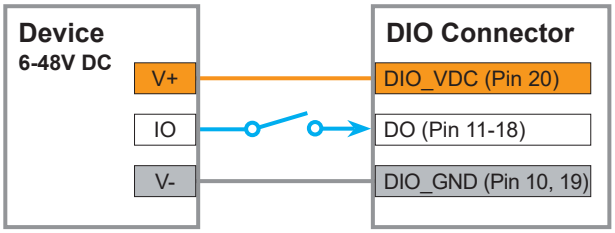


Source Mode (PNP)

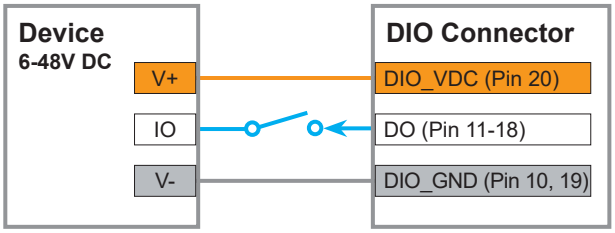


DO reference circuit :

Sink Mode (NPN, Default)



Source Mode (PNP)



A.3 Software Package Contain

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

There are included as followed :

Win10_32.bat, and Win10_64.bat :

Installation for driver, and

Uninstall_32.bat, and Uninstall_64.bat :

Uninstallation for driver

Run batch file as Administrator.

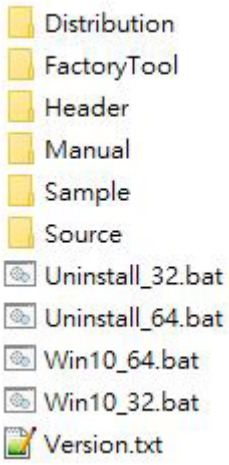
Make sure Windows version before installation.

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

Manual folder include API description.

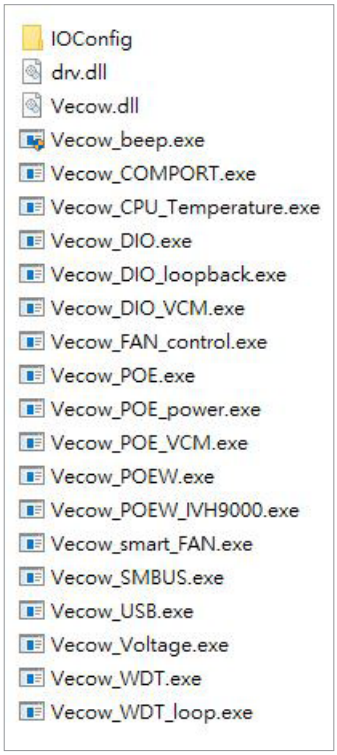
Sample folder include sample program, driver library, and API library for Windows/Linux

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

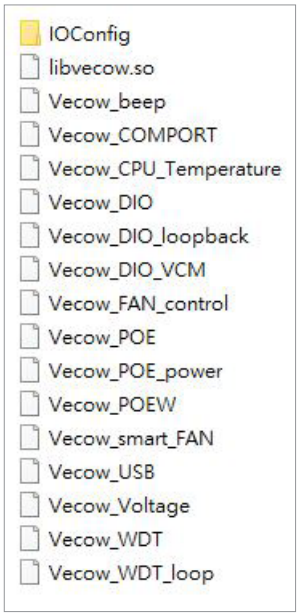


A.4 Sample

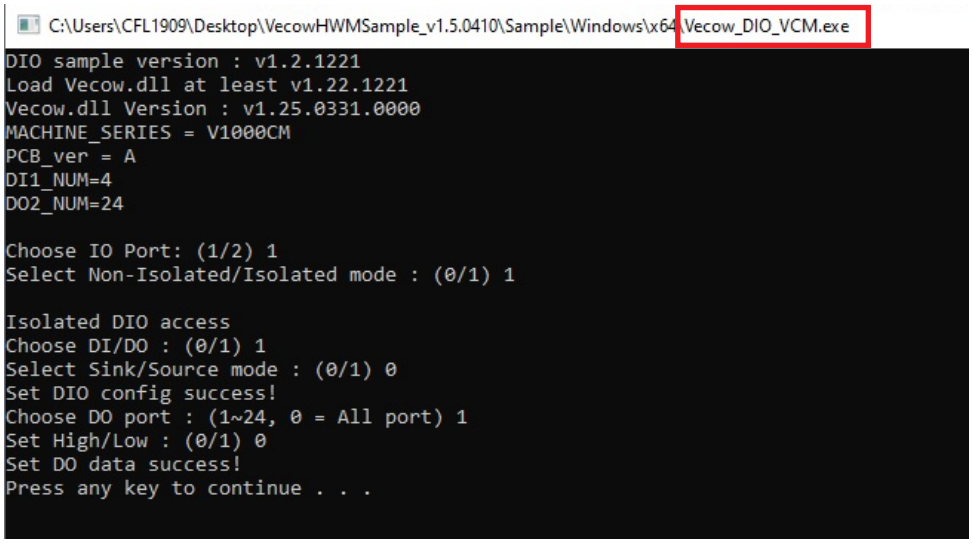
Execute demo tool.



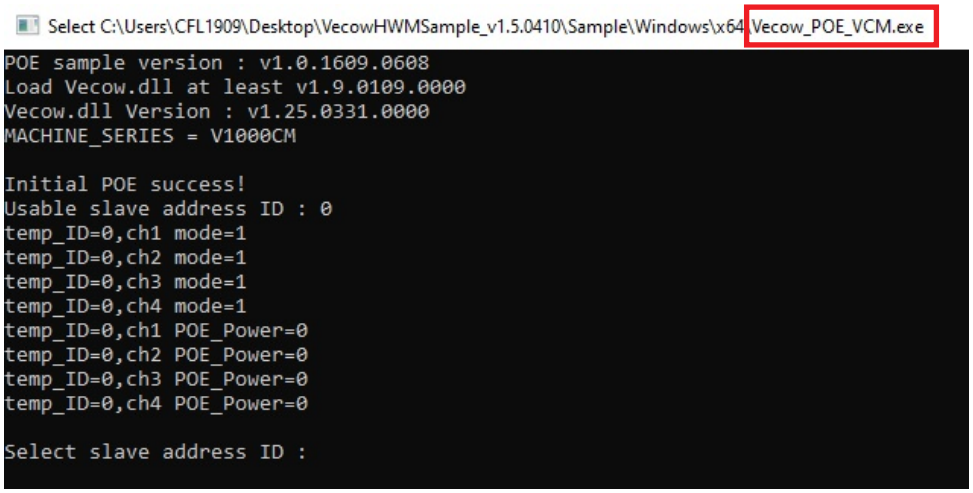
Windows



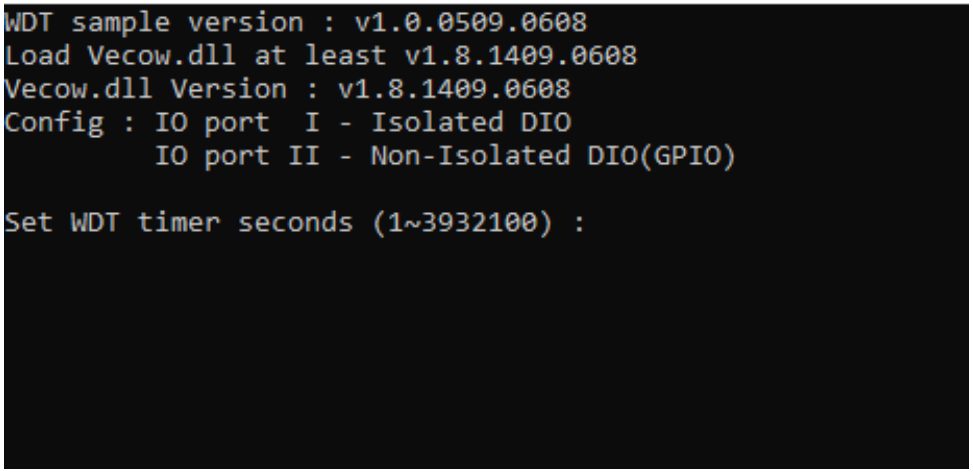
Linux



Vecow_DIO_VCM



Vecow_POE_VCM



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_other(BYTE *Iso, BYTE *DI_mode, BYTE *DO_mode, DWORD *Mask)

Get DIO configuration (by variable)

Isolate_Type : DIO type.

1 : Isolated DIO;

0: Non-Isolated DIO(GPIO).

DI_mode ([3:0]) : 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 ([23:0]): DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0: NPN (Sink) mode for Japanese rule.

Mask ([27:0]) : 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_other(BYTE Iso, BYTE DI_mode, BYTE DO_mode, DWORD Mask)

Set DIO configuration.

Isolate_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DI_mode ([3:0]) : 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 ([23:0]) : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([27:0]) : 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_other(DWORD *DO_data, DWORD *DI_data)

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

DI ([3:0]) : Input state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

DO ([23:0]) : 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_other(DWORD DO_data)

Set isolated DIO output(DO).

DO ([23:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

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

1 : High;

0 : Low.

BOOL get_WDT(DWORD *WDT)

Get watchdog timer setup.

WDT : watchdog timer setup.

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

Return :

TRUE (1) : Success.

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

BOOL set_WDT(DWORD WDT)

Set watchdog timer setup.

WDT : watchdog timer setup.

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

Return :

TRUE (1) : Success.

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

BOOL cancel_WDT()

Cancel watchdog timer.

Return :

TRUE (1) : Success.

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

BOOL initial_POE(BYTE Scan, BYTE ID)

Initial POE.

Scan : POEID scan type

2 : Auto scan;

1 : Manual setup.

ID : POE ID by manual setting.

Range : 0~15.

Return :

TRUE (1) : Success.

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

BOOL get_POE_configuration_ip804(BYTE ID, BYTE *Auto, BYTE *Mask)

Get POE configuration (by variable).

ID : POE ID.

Range : 0~15.

Auto ([3:0]) : Auto mode, pin setting by hexadecimal bitmask.

1 : Auto;

0 : Manual.

Mask ([3:0]) : DC Enable/Disable, pin setting by hexadecimal bitmask.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or out of range error, or call by pointer error, or hardware problem)

BOOL set_POE_configuration_ip804(BYTE ID, BYTE Auto, BYTE Mask)

Set POE configuration (by variable).

ID : POE ID.

Range : 0~15.

Auto ([3:0]) : Auto mode, pin setting by hexadecimal bitmask.

1 : Auto;

0 : Manual.

Mask ([3:0]): DC Enable/Disable, pin setting by hexadecimal bitmask.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or out of range error, or hardware problem).

BOOL get_POE_ip804(BYTE ID, BYTE *POE)

Get POE state.

ID : POE ID.

Range : 0~15.

POE ([3:0]) : POE state, pin setting by hexadecimal bitmask.

1 : On;

0 : Off.

Return :

TRUE (1) : Success.

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

APPENDIX C : Power Consumption (VCM-1100)

Testing Board :	VCM-1100
RAM	32GB * 2
USB-1 : (USB 2.0)	USB Micsoft Wired Keyboard 600
USB-2 : (USB 2.0)	USB Mouse HP G1K28AA
USB-3 : (USB 2.0)	USB Flash Kingston 2.0 32GB
USB-4 : (USB 2.0)	USB Flash Kingston 2.0 16GB
USB-5 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-6 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-7 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-8 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-9 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-10 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-11 : (USB 3.0)	USB Flash Kingston 3.0 16GB
USB-12 : (USB 3.0)	USB Flash ADATA 3.0 8GB
SATA 0	Innodisk DGS25-64GD81BC1QC 64GB
SATA 1	Transcend TS128GSSD230S 128GB
LAN 1 (i219-V)	1.0 Gbps
LAN 2 (i210)	1.0 Gbps
LAN 3 (i350)	1.0 Gbps
LAN 4 (i350)	1.0 Gbps
LAN 5 (i350)	1.0 Gbps
LAN 6 (i350)	1.0 Gbps
Graphics Output	DVI
Power Plan	Balance (Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program	BurnInTest

C.1 Intel® Core™ i9-13900E 1.80 GHz (36M Cache, up to 5.20 GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i9-13900E	24V	0.360A	08.64W	0.426A	10.23W	1.716A	41.19W

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
Intel® Core™ i9-13900E	24V	2.439A	58.53W	3.462A	83.09W

C.2 Intel® Core™ i7-13700TE 1.10 GHz (30M Cache, up to 4.80 GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i7-13700TE	24V	0.353A	08.48W	0.420A	10.08W	1.085A	26.03W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i7-13700TE	24V	1.888A	45.32W	2.233A	53.58W

D

APPENDIX D : Power Consumption (VCM-1000)

Testing Board :	VCM-1000
RAM	32GB * 2
USB-1 : (USB 2.0)	USB Micsoft Wired Keyboard 600
USB-2 : (USB 2.0)	USB Mouse HP G1K28AA
USB-3 : (USB 2.0)	USB Flash Kingston 2.0 32GB
USB-4 : (USB 2.0)	USB Flash Kingston 2.0 16GB
USB-5 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-6 : (USB 3.0)	USB Flash Kingston 3.0 32GB
USB-7 : (USB 3.0)	USB Flash Kingston 3.0 16GB
USB-8 : (USB 3.0)	USB Flash ADATA 3.0 8GB
SATA 0	Innodisk DGS25-64GD81BC1QC 64GB
SATA 1	Transcend TS128GSSD230S 128GB
LAN 1 (i219-V)	1.0 Gbps
LAN 2 (i210)	1.0 Gbps
Graphics Output	DVI
Power Plan	Balance (Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program	BurnInTest

D.1 Intel® Core™ i9-13900E 1.80 GHz (36M Cache, up to 5.20 GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i9-13900E	24V	0.312A	07.48W	0.377A	09.06W	0.856A	20.55W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i9-13900E	24V	2.085A	50.04W	3.218A	77.24W

D.2 Intel® Core™ i7-13700TE 1.10 GHz (30M Cache, up to 4.80 GHz)

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

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i7-13700TE	24V	0.318A	07.64W	0.389A	09.34W	0.851A	20.43W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core™ i7-13700TE	24V	1.557A	37.37W	2.105A	50.51W

APPENDIX E : Supported Memory & Storage List

E.1 Supported Memory List

Testing Board :	VCM-1000
Memory Test	MemTest86 V9.4
BurnIn Test	BurnInTest Pro V8.1

Test Item

Channel	Memory test	BurnIn test	Flash BIOS	Remove Battery
*2	PASS	PASS	PASS	PASS
*1(DIMM 1)	PASS	PASS	N/A	PASS
*1(DIMM 2)	PASS	PASS	N/A	PASS

E.2 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
TEAMGROUP 48G DDR5 5600 SO-DIMM	TE48GFSXV2TH	25ºC
SMART 32G DDR5 4800 SO-DIMM	SR4G6SO5285-SB	25ºC
SLLINK 32G DDR5 4800 SO-DIMM	J5BGSH2G8A4FC	25ºC

E.3 Supported Storage Device List

Type	Brand	Model	Capacity
SATA HDD	Seagate	SDC001	500GB
SATA SSD	SMART	FDMP8960GTCXA111	960GB
	Transcend	TS128GSSD230S	128GB
	Kingston	SA400S37/120G	128GB
	Apacer	AP120GAS340XC	120GB
	Innodisk	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
	SMART	FDMP8960GTCXA111	960GB

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

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