Neousys Technology Inc.

POC-751VTC Series

User Manual

Revision 1.0

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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 not installed and used in accordance with the instruction manual, 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 own expense.
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Safety Precautions

- Read these instructions carefully before you install, operate, or transport the system.

- Install the system or DIN rail associated with, at a sturdy location

- Install the power socket outlet near the system where it is easily accessible

- Secure each system module(s) using its retaining screws

- Place power cords and other connection cables away from foot traffic. Do not place items over power cords and make sure they do not rest against data cables

- Shutdown, disconnect all cables from the system and ground yourself before touching internal modules

- Ensure that the correct power range is being used before powering the device

- Should a module fail, arrange for a replacement as soon as possible to minimize down-time

- If the system is not going to be used for a long time, disconnect it from mains (power socket) to avoid transient over-voltage

Service and Maintenance

- ONLY qualified personnel should service the system

- Shutdown the system, disconnect the power cord and all other connections before servicing the system

- When replacing/ installing additional components (expansion card, memory module, etc.), insert them as gently as possible while assuring proper connector engagement

ESD Precautions

- Handle add-on module, motherboard by their retention screws or the module's frame/ heat sink. Avoid touching the PCB circuit board or add-on module connector pins

- Use a grounded wrist strap and an anti-static work pad to discharge static electricity when installing or maintaining the system

- Avoid dust, debris, carpets, plastic, vinyl and 8tyrofoam in your work area.

- Do not remove any module or component from its anti-static bag before installation

About This Manual

This manual introduces and demonstrates installation procedures of Neousys POC-751VTC series systems featuring an Intel® Core™ i3-N305 processor. The manual also demonstrates the system's general installation procedures.

Revision History

Version	Date	Description
1.0	Jul. 2024	Initial release

1   Introduction

POC-751VTC is Neousys' next-generation ultra-compact in-vehicle computer with E-Mark certification for in-vehicle applications such as a mobile gateway, mobile surveillance, and passenger information system.

POC-751VTC utilizes the latest Intel® Alder Lake i3-N305 with eight CPU cores and supports up to 16GB of DDR5-4800 memory, capable of delivering up to 1.3x the CPU performance when compared to previous POC-551VTC. And with Intel's UHD Graphics supporting Open Visual Inference and Neural network Optimization (OpenVINO), users can execute deep learning and inference models for light AI applications.

The system offers four 802.3at PoE+ ports to supply 25W power to compatible connected devices such as IP cameras. Internal expansion wise, the system features two heatsink cooled mini-PCIe slots for wireless communication module installation which is essential for future intelligent vehicle applications. There are also two isolated CAN 2.0 ports that support SocketCAN in Linux for in-vehicle communications, and isolated digital I/Os for sensor and actuator control. Power input wise, it accepts wide range 8V to 35V DC input with built-in ignition power control to suit a variety of vehicle deployments.

With the combination of ignition power control, wide-range DC input, rich I/Os, and edge AI capabilities, POC-751VTC is the perfect ultra-compact solution for modern intelligent in-vehicle applications.

1.1   Specification of POC-751VTC

System Core	
System Core	
Processor	Intel® Alder Lake Core™ i3-N305 processor (8C/8T, 1.8/3.8 GHz, 15W TDP)
Graphics	Integrated Intel® HD Graphics with 32EUs
Memory	Up to 16 GB DDR5-4800 SDRAM (one SODIMM socket)
TPM	Supports TPM 2.0 (fTPM/ dTPM)
Panel I/O Interface	
Ethernet	4x Gb Ethernet ports by Intel® I350-AM4
PoE+	4x IEEE 802.3at Gigabit PoE+ ports via RJ45 connector
CAN bus	2x isolated CAN 2.0 port, supporting SocketCAN in Linux
Isolated DIO	4-CH isolated DI and 4-CH isolated DO (on motherboard) 4-CH isolated DI and 4-CH isolated DO (on MezIO)
USB	4x USB 3.2 Gen2 ports with screw-lock
Video Port	1x DP++, supporting 4096 x 2160 resolution @ 60Hz 1x HDMI1.4b, supporting 3840 x 2160 @ 30Hz
Serial Port	1x software-programmable RS-232/422/485 ports (COM1) 3x 3-wire RS-232 ports (COM2/3/4) or 1x RS-422/485 port (COM2)
Internal I/O Expansion Interface	
Mini PCI-E	2x full-size mini PCI Express socket for WiFi/ 4G/ 5G module with conduction cooled heatsink
Storage Interface	
M.2	1x M.2 2280 M key socket SATA SSD storage
Power Supply	
DC input	1x 3-pin pluggable terminal block for 8V to 35V DC input (IGN/ GND/ V+)
Ignition Control	Built-in ignition power control
Remote Ctrl. & LED output	1x3-pin pluggable terminal block for remote control and PWR LED output
Mechanical	
Dimension	176 mm (W) x 116 mm (D) x 64 mm (H)
Weight	1.7kg
Mounting	Horizontal-type wall-mount (standard)

|	Vertical-type wall-mount (optional)
Fan kit	Optional external-accessible fan kit 80mm x 80mm
Environmental	
Operating temperature	-40°C to 70°C*
Storage temperature	-40°C to 85°C
Humidity	10% to 90% , non-condensing
Vibration	EN 50155:2017/ IEC 61373, Category I, Class B - Body mounted
Shock	EN 50155:2017/ IEC 61373, Category I, Class B - Body mounted
EMC	E-Mark, EN 50121 (EN 50155 EMC) CE/FCC Class A, according to EN 55032 & EN 55035

* For sub-zero and over 60°C operating temperature, a wide temperature Solid State Disk (SSD) is required.
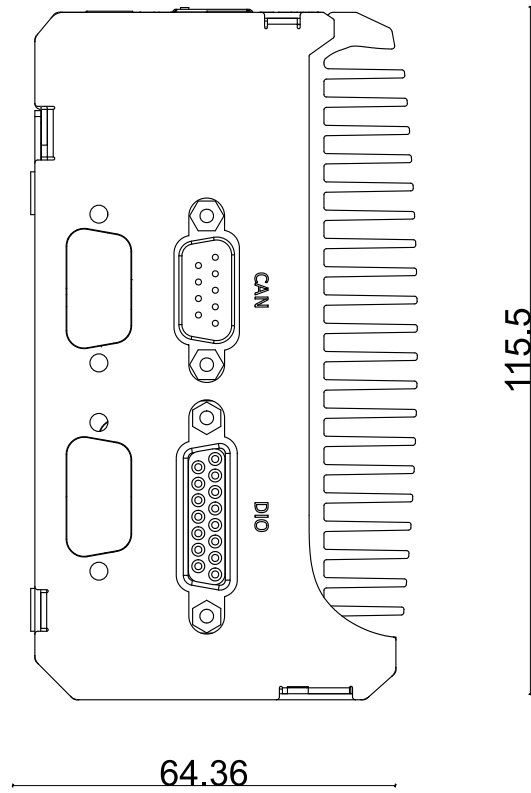
1.2   Dimension of POC-751VTC

NOTE

All measurements are in millimeters (mm).

1.2.1   Front Panel View
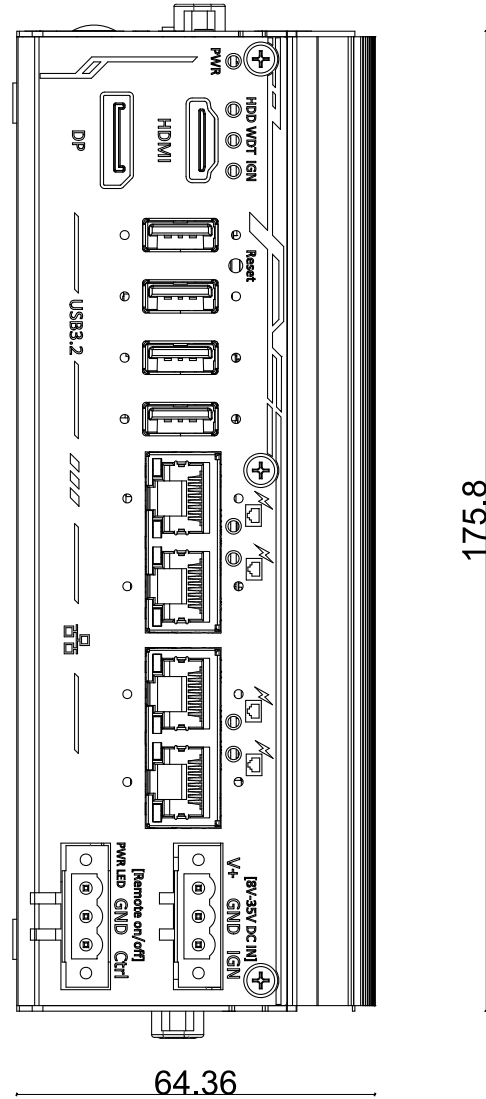
1.2.2 Reserved Panel View

115.5

64.36

1.2.3 COM Port Panel View

115.5

64.36
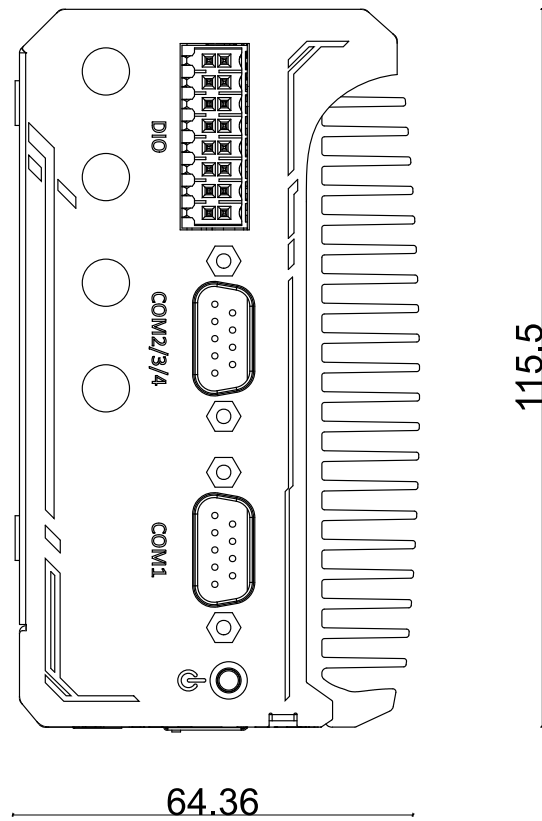
1.2.4   Bottom View
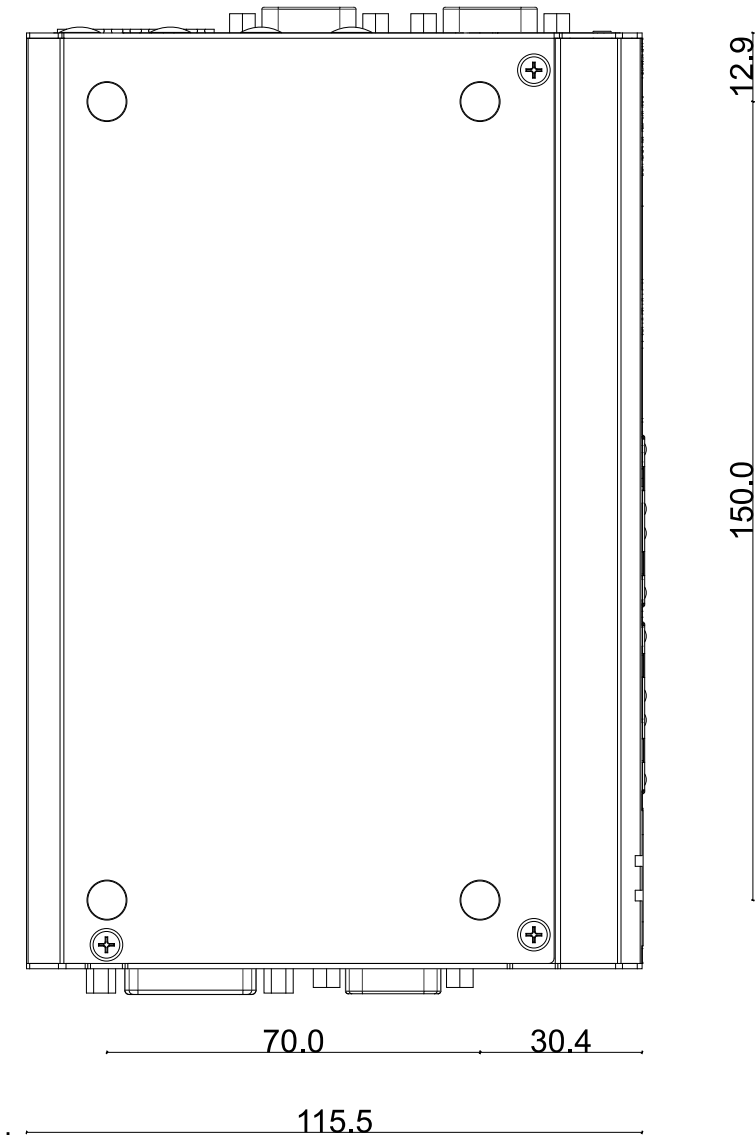
2   System Overview

Upon receiving and unpacking your POC-751VTC systems, please check immediately if the package contains all the items listed in the following table. If any item(s) are missing or damaged, please contact your local dealer or Neousys Technology.

2.1   Unpacking the System

Item	Description	Qty
1	POC-751VTC (Please verify ordered items such as CPU, RAM, HDD, etc.)	1
2	Accessory box, which contains	
	● Horizontal-type wall-mount	1
	● 3-pin power terminal block	2
	● 16-pin DIO terminal block	1
	● Screw pack	1

2.2 POC-751VTC Series Front Panel

The front panel of POC-751VTC series features four PoE+ Gigabit Ethernet ports, four USB 3.2 Gen1 ports, one HDMI, one DisplayPort, remote control and 3-pin terminal block with ignition control for DC input.
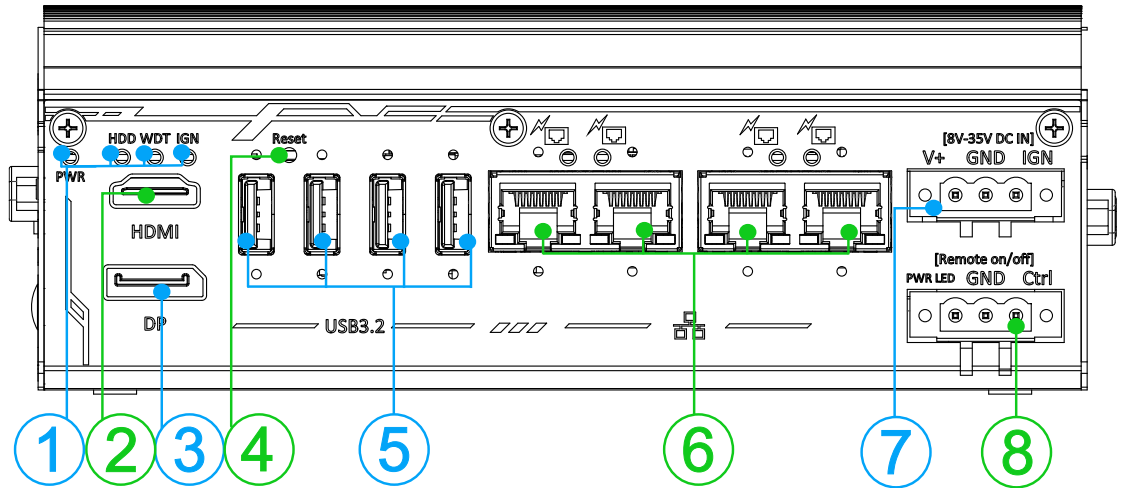
| No.	Item	Description
1	System status LED	System LEDs, Hard Disk Drive (HDD), Watchdog Timer (WDT), Ignition control (IGN).
2	HDMI	The HDMI port is a high-resolution graphics/ data port supporting up to 3840 x 2160 @ 30Hz.
3	DisplayPort	The DisplayPort is a high-resolution graphics output supporting up to 4096 x 2160 @ 60Hz.
4	Reset button	Use this button to manually reset the system.
5	USB3.2 Gen2x1 port	USB3.2 Gen 2 port (SuperSpeed+) offers up to 10Gbps, twice the bandwidth over existing SuperSpeed USB3.2 Gen. 1 connection. It is also backwards compatible with USB3.0 and USB2.0.
6	Ethernet & PoE+	4x Gb Ethernet ports by Intel® I350-AM4 with Power over Ethernet port that can provide both data and electric power to devices.
7	3-pin DC terminal block with ignition input	Compatible with DC power input from 8V - 35V. The terminal block can also be used for ignition signal input.
8	3-pin Remote on/ off control	Allows for external switch extension when the system is placed inside a cabinet.

2.2.1 System Status LED
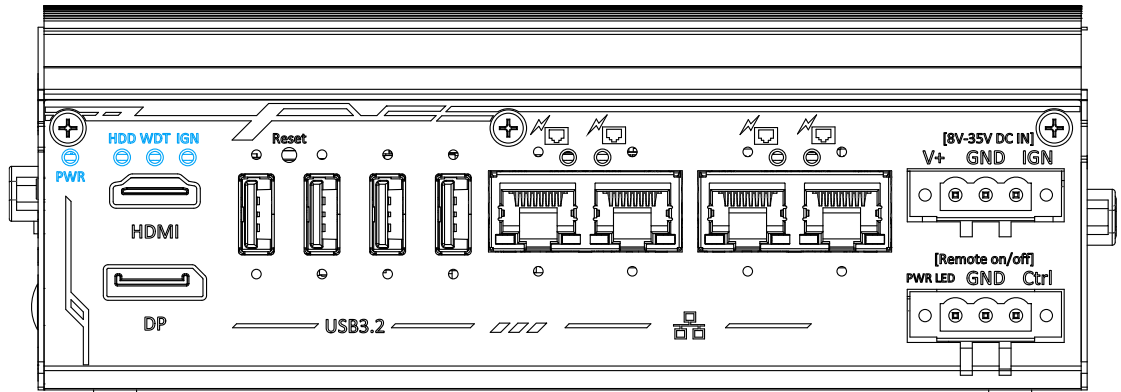
There are three LED indicators on the front panel: HDD, WDT and IGN. The descriptions of these LEDs are listed in the following table.

Indicator	Color	Description
PWR	Green	Power indictor, lit when system is on.
HDD	Red	Hard drive indicator, flashing when SATA HDD is active
WDT	Yellow	Watchdog timer indicator, flashing when watchdog timer has started
IGN	Yellow	Ignition power control, lit when IGN signal is applied.

2.2.2 HDMI
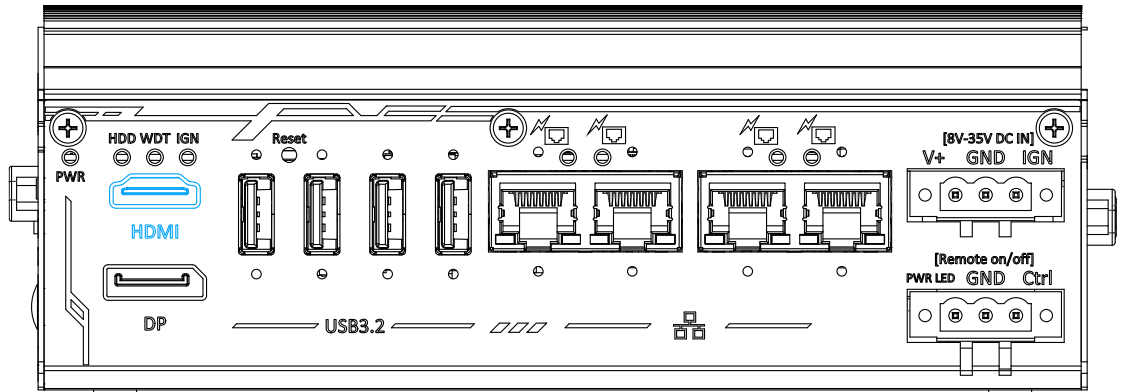
The High-Definition Multimedia Interface (HDMI) port provides uncompressed high-quality digital video and audio transmission between the system and a multimedia display device on a single cable. You can connect to other digital inputs by using a HDMI-to-DVI or HDMI-to-DP cable.

HDMI-to-DP

The system supports dual independent display outputs by connecting display devices to HDMI and DisplayPort connection. To support dual display outputs and achieve best DisplayPort output resolution in Windows, you need to install corresponding graphics drivers. Please refer to section OS Support and Driver Installation for details.

2.2.3 DisplayPort
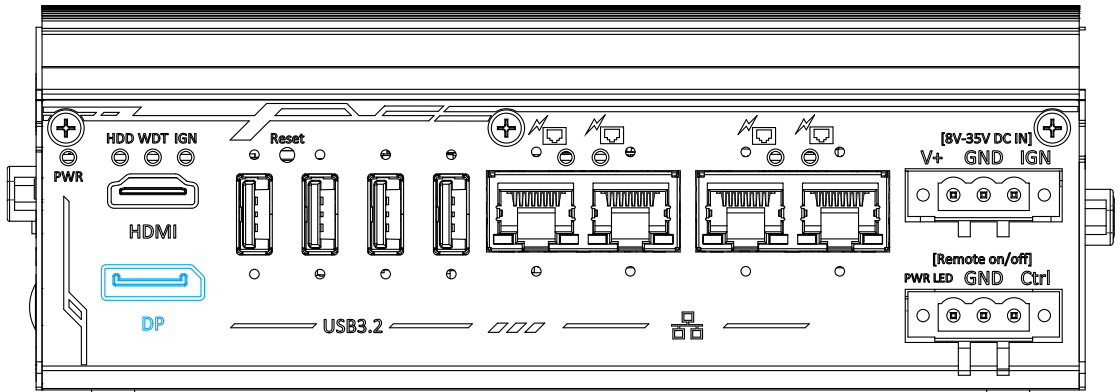
The system has a DisplayPort (DP) output which is a digital display interface that mainly connect video source and carry audio to a display device. When connecting a DP, it can deliver up to 4K UHD (4096 x 2160 @ 60Hz) in resolution. The system is designed to support passive DP adapter/ cable. You can connect to other display devices using DP-to-HDMI cable or DP-to-DVI cable.

**DP-to-HDMI**   **DP-to-DVI**

The system supports dual independent display outputs by connecting display devices to HDMI and DisplayPort connection. To support dual display outputs and achieve best DisplayPort output resolution in Windows, you need to install corresponding graphics drivers. Please refer to section OS Support and Driver Installation for details.

2.2.4 Reset Button
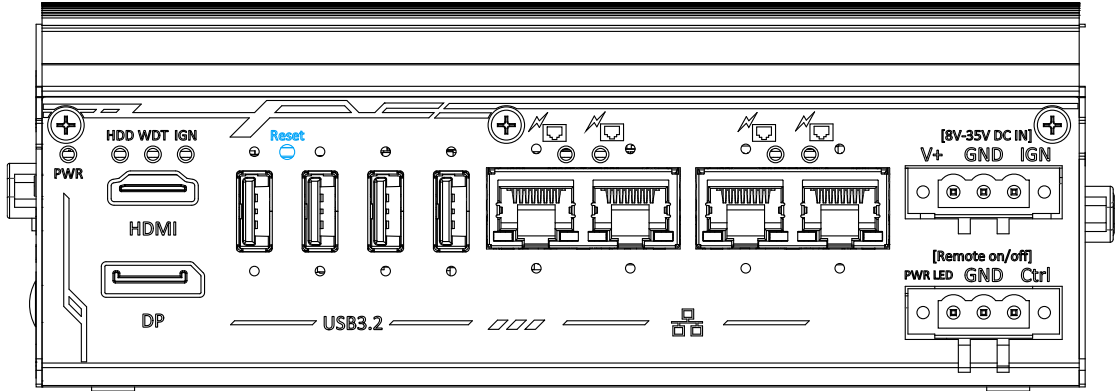
The reset button is used to manually reset the system in case of system halt or malfunction. To avoid unexpected reset, the button is purposely placed behind the panel. To reset, please use a pin-like object (eg. tip of a pen) to access the reset button

2.2.5 USB3.2 Gen2x1 Port
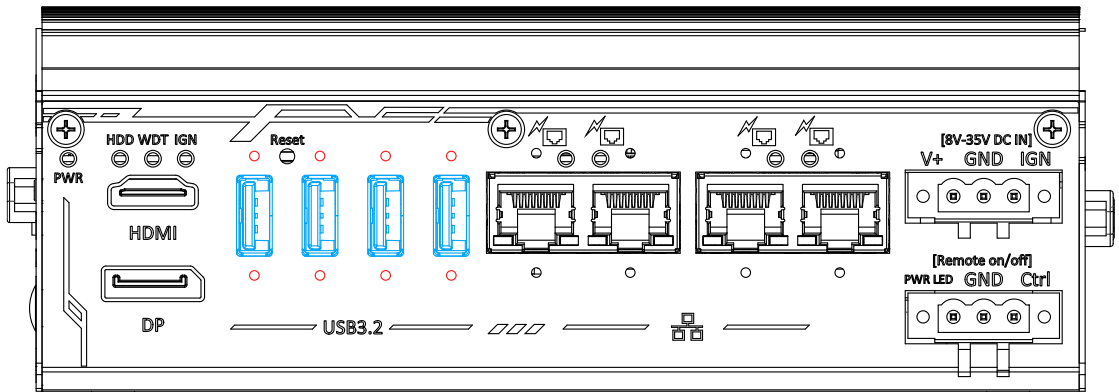
The system's USB 3.2 Gen2x1 ports (10Gbps) are implemented via native xHCI (eXtensible Host Controller Interface) controller and are backward compatible with USB3.2 Gen.1 USB 2.0, USB 1.1 and USB 1.0 devices. UFEI USB is also supported so you can use USB keyboard/ mouse in UEFI shell environment. Indicated in **red** are screw-lock holes for the corresponding USB port.

xHCI driver is supported natively in Windows 10, therefore you do not need to install the xHCI driver prior to utilizing USB functions.

2.2.6 IEEE 802.3at Power over Ethernet Port
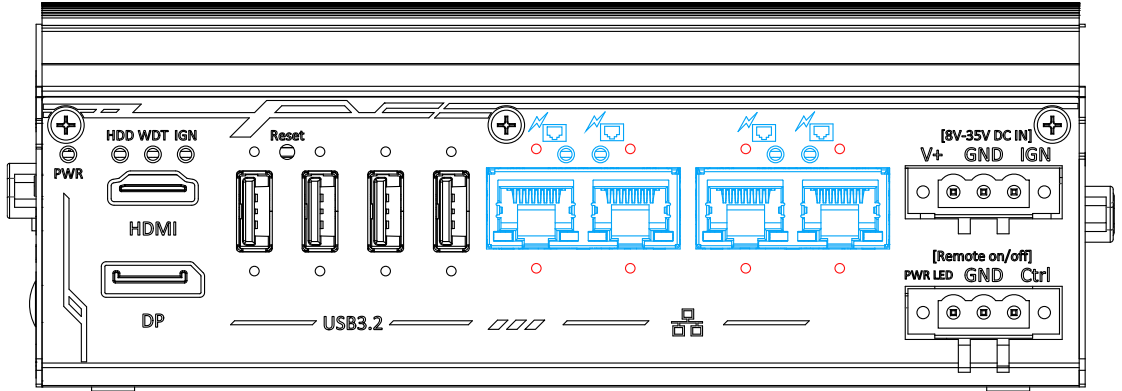
The system offers four Gb Ethernet ports via Intel® I350-AM4 and is backward compatible with 100/ 10Mb connection speeds.

The Gigabit Power over Ethernet (PoE) port can supply power and data on a standard CAT-5/CAT-6 Ethernet cable. Acting as a PSE (Power Sourcing Equipment), compliant with IEEE 802.3at, each port delivers up to 25W to a Powered Device (PD). PoE automatically detects and determine if the connected device is PoE PD or not before supplying power, making it compatible with standard Ethernet devices as well. Indicated in **red** is a screw-lock hole for the corresponding Ethernet port.

Active/Link LED (Right)

LED Color	Status	Description
Green	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED (Left)

LED Color	Status	Description
Green or Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000 Mbps

2.2.7 3-pin Terminal Block for DC Input with Ignition Power Control
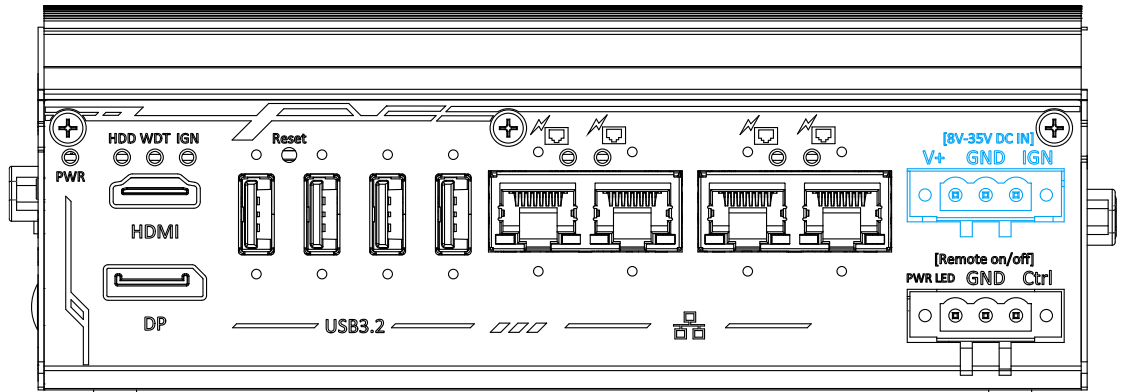
The system accepts a wide range of DC power input from 8V to 35V via a 3-pin pluggable terminal block, which is fit for field usage where DC power is usually provided. The screw clamping mechanism on the terminal block offers connection reliability when wiring DC power.

In addition to DC power input, this terminal block can also accepts an ignition signal input (IGN).

> ⚠ **WARNING**
>
> *Please make sure the voltage of DC power is correct before you connect it to the system. Supplying a voltage over 35V will damage the system.*

2.2.8   3-pin Remote On/ Off
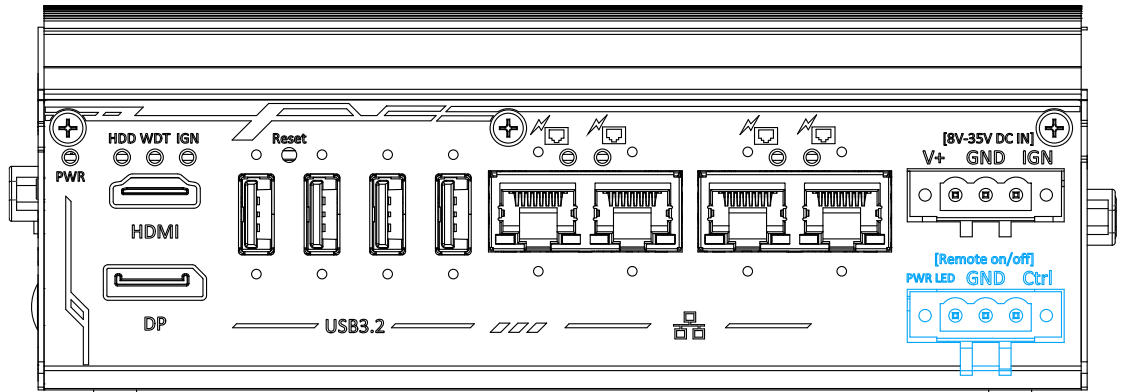
The "Remote On/ Off" 3-pin connection allows for external switch extension. It is useful when the system is placed in a cabinet or a not easily accessed location. You may connect an external remote with an external status LED indicator (15mA) by connecting to PWR LED and GND.

2.3 DIO/ COM Port Panel

The COM port panel of POC-751VTC series features additional I/O functions, such as digital input/ output, COM ports, and reserved antenna openings for SMA antenna installation. In addition, the power button can also be located on this panel.
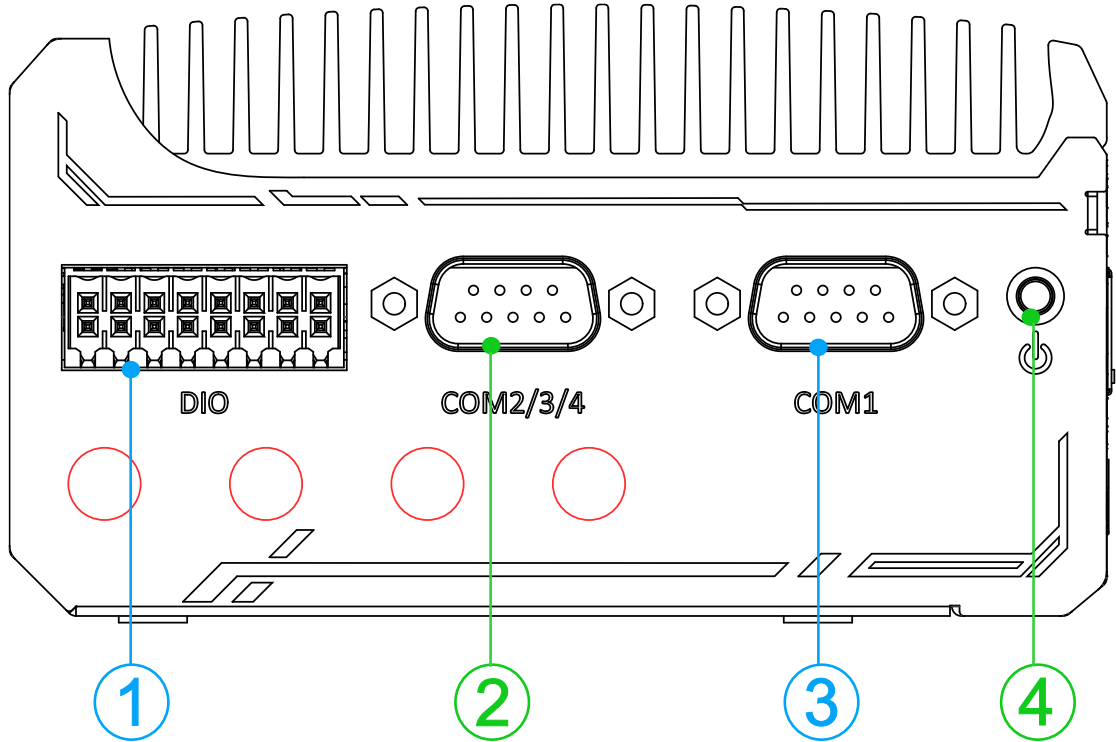
No.	Item	Description
1	Digital I/O	4 channel isolated digital input 4 channel isolated digital output
2	COM port 2/ 3/ 4	**Can be configured as:** **COM2**: single RS-422/ 485 port **COM2/ COM3/ COM4**: three 3-wire RS-232 ports
3	COM port 1	Software programmable RS-232/ 422/ 485 port.
4	Power button	Use this button to turn on or shutdown the system.
	◯	Opening reserved for SMA antenna installation.

2.3.1 Digital Input/ Output
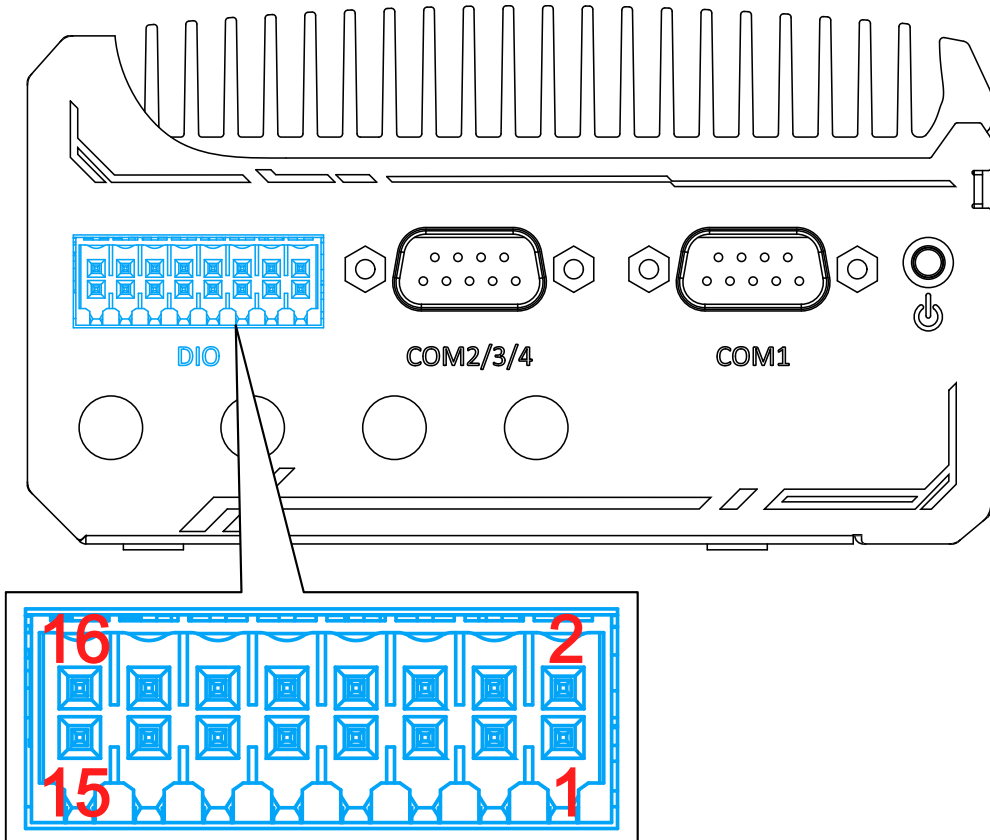
The system provides 4x isolated digital input channels and 4x isolated digital output channels. The DIO functions support polling mode I/O access and DI change-of-state interrupt. Please refer to Watchdog Timer & Isolated DIO for information on wiring and programming the isolated DIO channels.

Pin#	Pin Definition	Pin#	Pin Definition
1	ISO_DI0_CN	9	ISO_DO0_CN
2	IGND0	10	EOGND
3	ISO_DI1_CN	11	ISO_DO1_CN
4	IGND1	12	EOGND
5	ISO_DI2_CN	13	ISO_DO2_CN
6	IGND2	14	EOGND
7	ISO_DI3_CN	15	ISO_DO3_CN
8	IGND3	16	VDD

*When using DO0 ~ DO3, DOGND is the ground should be used.

Wiring for DIO

The digital input function is implemented using a photo-coupler with an internally series-connected 1kΩ resistor. You need to provide a voltage to specify the logic high/low state. The input voltage for logic high is 5~24V, and the input voltage for logic low is 0~1.5V.
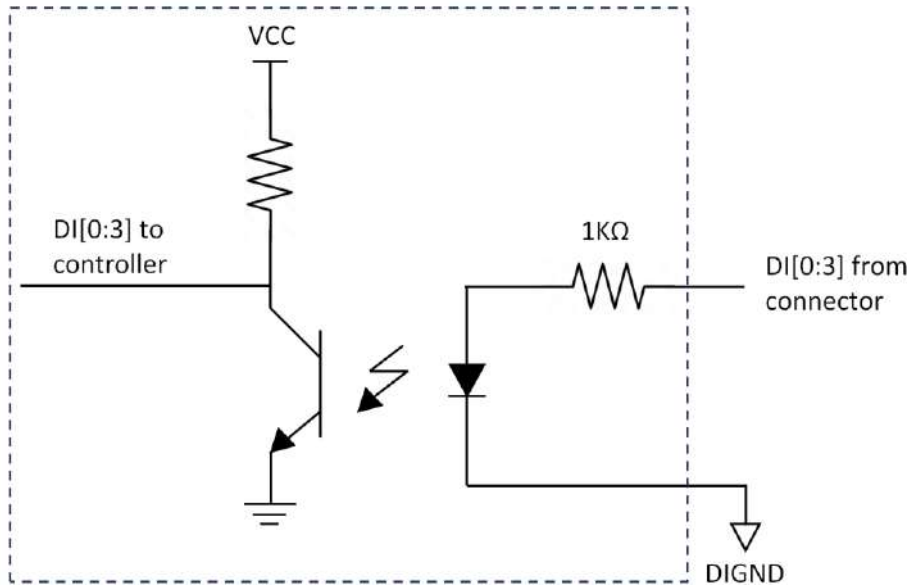
The digital output function is implemented using Power MOSFET + Analog Device iCoupler® component. The DO channels are configured as NO (normally-open) configuration. When you turn on the system, all DO channels have a deterministic state of logic 0 (circuit disconnected from GND return). When logic 1 is specified, MOSFET is activated and GND return path is established. The digital output function on the system supports sinking current connection. The following diagrams are the suggested wiring for DO:
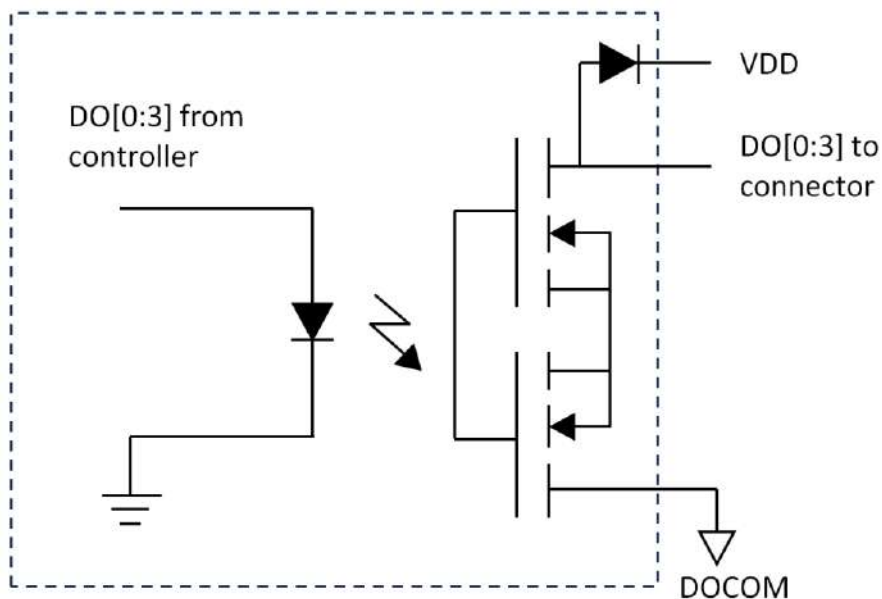
2.3.2 COM 1 Port
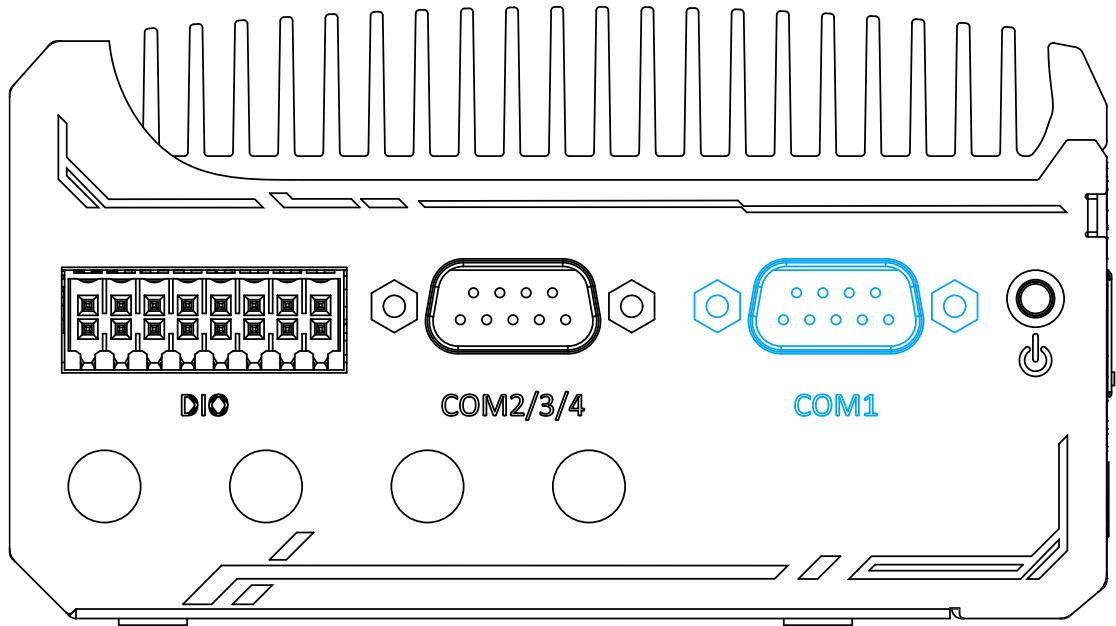
Implemented using industrial-grade ITE8786 Super IO chip (-40 to 85°C) and provide up to 921600 bps baud rate, COM1 is a software-configurable RS-232/422/485 port via 9-pin D-Sub male connector. The operation mode, slew rate and termination of COM1 can be set in BIOS setup utility. The following table describes the pin definition of COM ports.
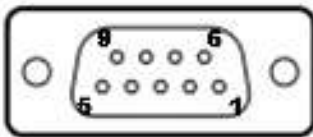
	COM1		
Pin#	RS-232 Mode	RS-422 Mode	RS-485 Mode (Two-wire 485)
1	DCD		
2	RX	422 TXD+	485 TXD+/RXD+
3	TX	422 RXD+	
4	DTR	422 RXD-	
5	GND	GND	GND
6	DSR		
7	RTS		
8	CTS	422 TXD-	485 TXD-/RXD-
9	RI		

2.3.3 COM Port (COM2/ COM3/ COM4)

Implemented using industrial-grade ITE8786 Super IO chip (-40 to 85°C) and provide up to 921600 bps baud rate, the D-Sub male connector (COM2/ 3/ 4) can be configured in the BIOS as 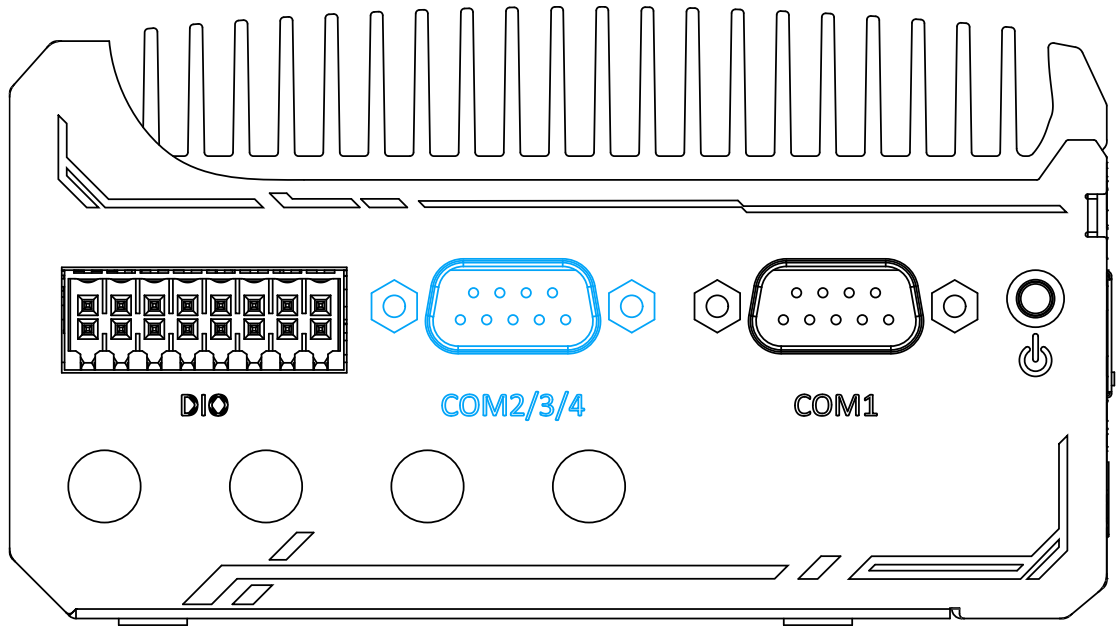single RS-422/ 485 port (COM2) or three 3-wire RS-232 ports (COM2/COM3/COM4). Please refer to COM2/ 3/ 4 Port Configuration for configuring operation mode. An optional 1-to-3 Y-cable is available to connect three RS-232 devices.
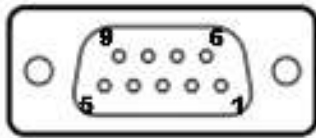
COM2/ 3/ 4 Pin

1-to-3 Y-cable

The following table describes the pin definition of the COM port

	3-port RS-232 COM2/ 3/ 4				Single port RS-422/ 485 COM2		
Pin#	COM2	COM3	COM4	Pin#	RS-422	RS-485
1				1		
2	RX			2	TxD+	TxD+/ RxD+
3	TX			3	RxD+	
4		TX		4	RxD-	
5	GND	GND	GND	5	GND	GND
6		RX		6		
7			TX	7		
8			RX	8	TxD-	TxD-/ RxD-
9				9		
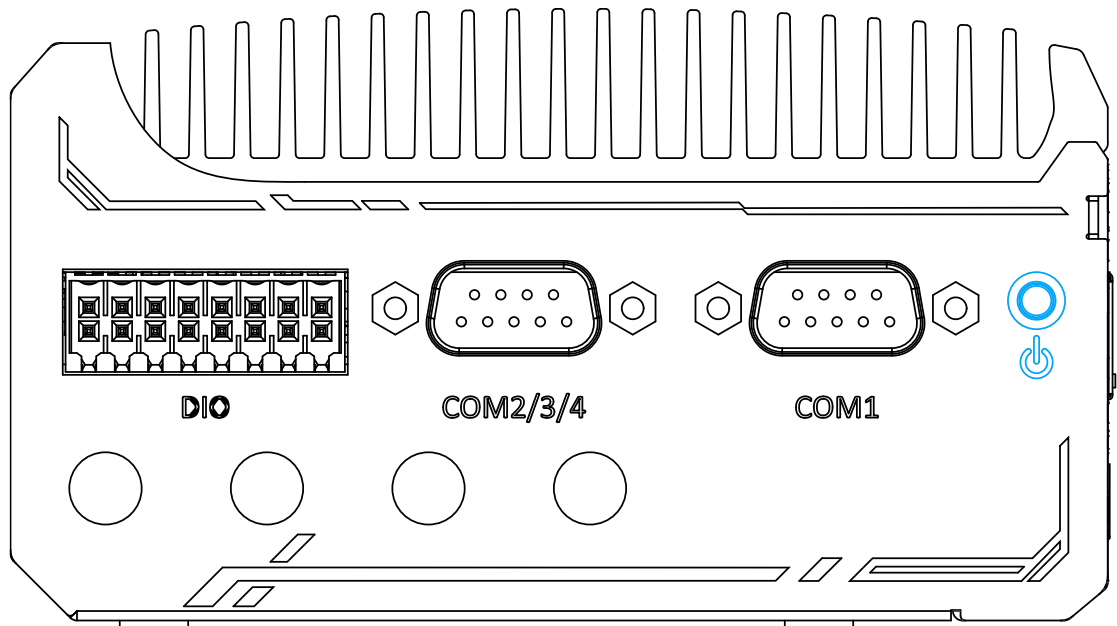
2.3.4 Power Button

The power button is a non-latched switch for ATX mode on/off operation. Press to turn on the system, PWR LED should light up and to turn off, you can either issue a shutdown command in the OS, or just press the power button. In case of system halts, you can press and hold the power button for 5 seconds to force-shutdown the system. Please note that there is a 5 seconds interval between two on/off operations (i.e. once turning off the system, you will need to wait for 5 seconds to initiate another power-on operation).

2.3.5 SMA Antenna Opening
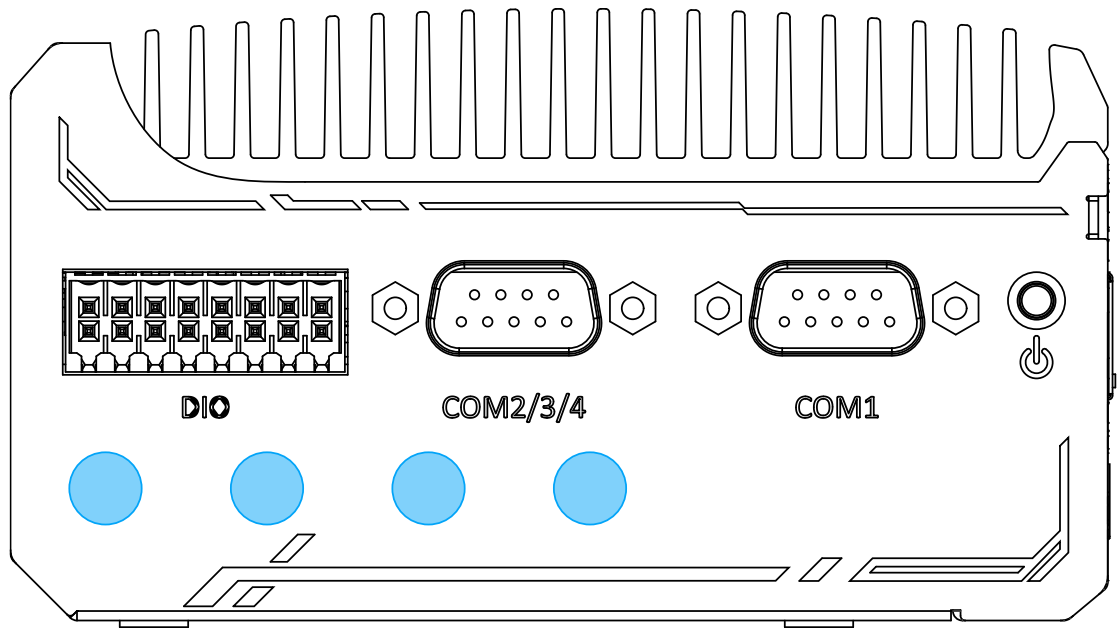
The system offers SMA antenna openings reserved for SMA antenna installations.
Users can take advantage of the openings when installing mini-PCIe module for
wireless communication reception such as 5G, 4G, GNSS or WiFi.

2.4　CAN bus and DIO Port Panel

The CAN bus/ DIO panel features a CAN bus port that supports CAN2.0A/ CAN2.0B up to 1Mbps and 4x isolated digital input channels/ 4x isolated digital output channels.
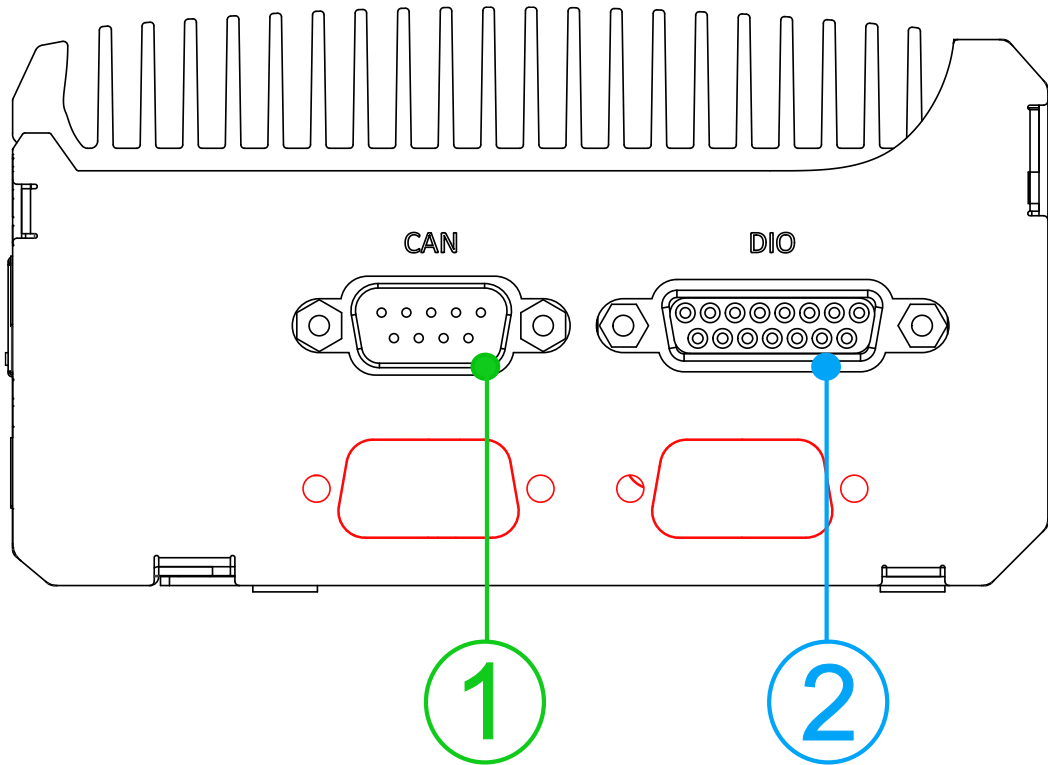
No.	Item	Description
1	CAN bus port	The CAN bus port allows the system to communicate with other in-vehicle CAN device(s).
2	DIO port	The DIO port provides 4x isolated digital input and 4x isolate output channels
		Reserved DB9 port opening

2.4.1 CAN bus Port
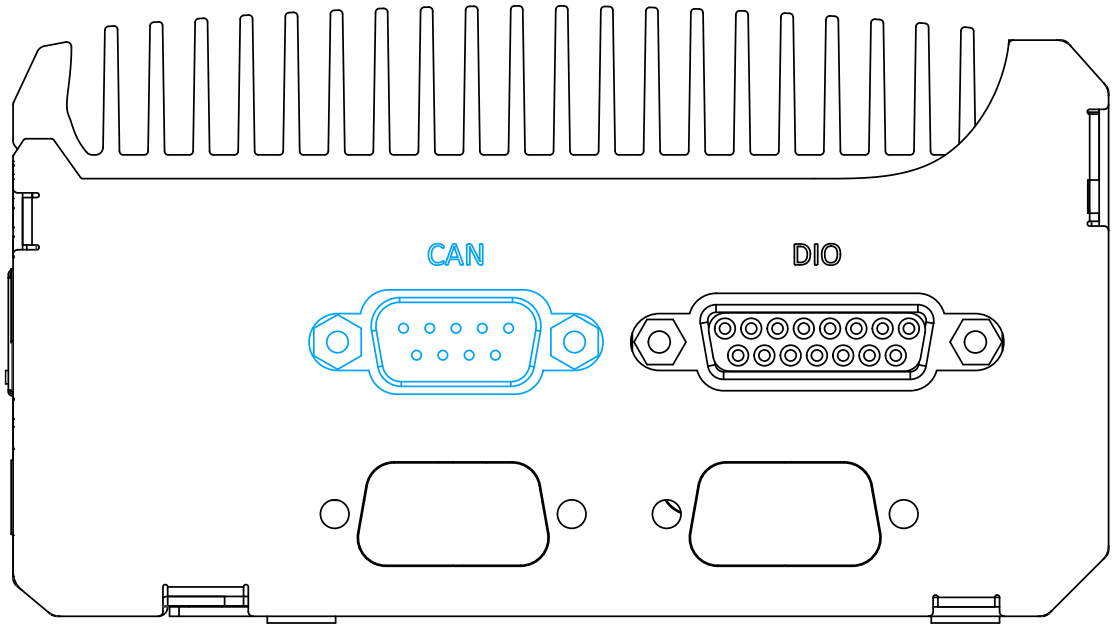
CAN bus is a robust industrial bus with a pair of differential signals and is commonly used in various industrial and in-vehicles applications. The system is equipped with a CAN bus DB9 port that is compatible with both industrial and in-vehicle applications. The CAN bus port supports CAN2.0A and CAN2.0B up to 1Mbps.
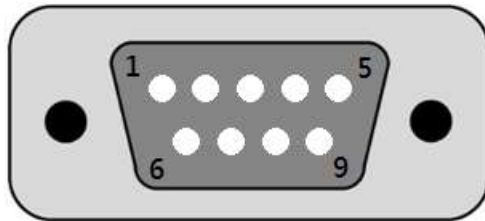
Pin No.	Definition	I/O	Description
1	-	-	Reserved pin. Keep unconnected
2	CAN1_L	I/O	CAN Bus1 Low-level voltage
3	-	-	Reserved pin. Keep unconnected
4	CAN2_L	I/O	CAN Bus2 Low-level voltage
5	-	-	Reserved pin. Keep unconnected
6	CAN1_GND	-	CAN bus1 ground
7	CAN1_H	I/O	CAN Bus1 high-level voltage
8	CAN2_H	I/O	CAN Bus2 high-level voltage
9	CAN2_GND	-	CAN bus2 ground

2.4.2 Digital Input/ Output
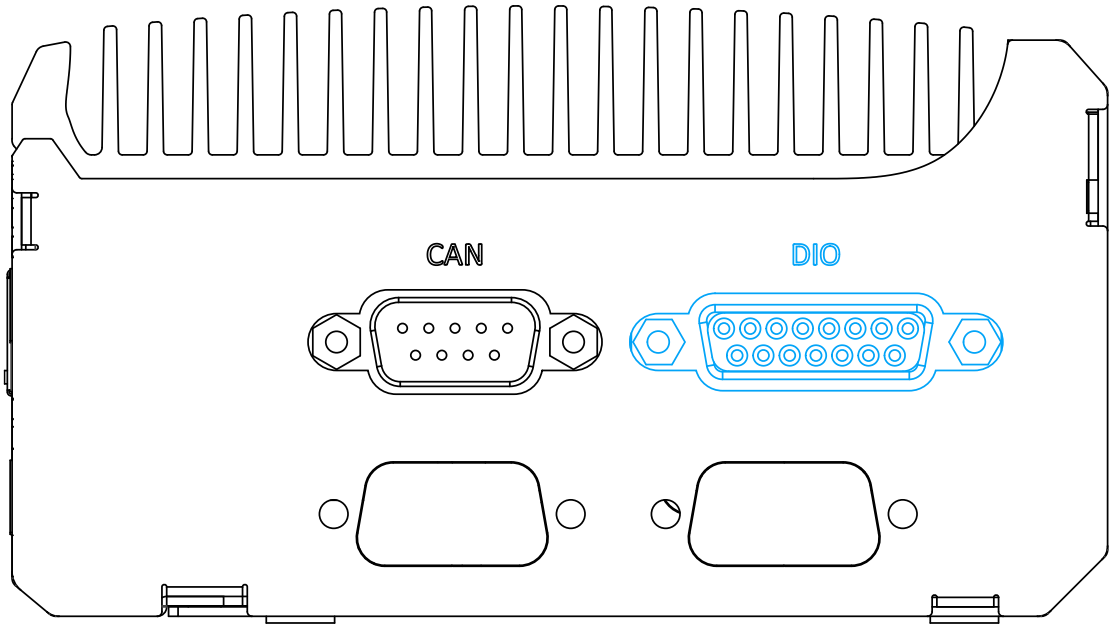
The system provides 4x isolated digital input channels and 4x isolated digital output channels. The DIO functions support polling mode I/O access and DI change-of-state interrupt. Please refer to Watchdog Timer & Isolated DIO for information on wiring and programming the isolated DIO channels.
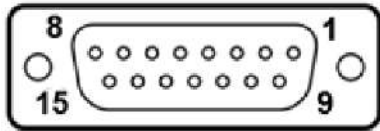
Pin#	Pin Definition	Pin#	Pin Definition
1	VDD	9	ISO_DO0_CN
2	ISO_DO1_CN	10	DO0_COM
3	DO1_COM	11	ISO_DO2_CN
4	ISO_DO3_CN	12	DO2_COM
5	DO3_COM	13	ISO_DI0_CN
6	ISO_DI1_CN	14	DI_GND
7	DI_GND	15	ISO_DI2_CN
8	ISO_DI3_CN		

2.5 CMOS Reset Button
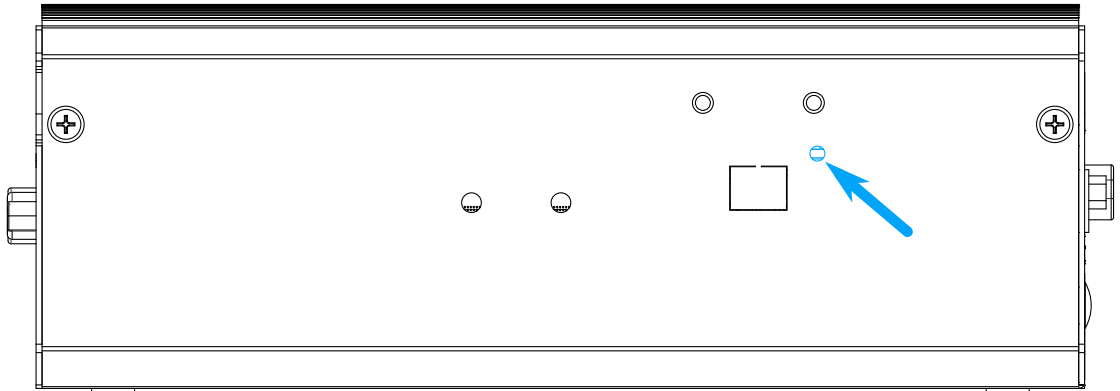
Positioned on the rear panel (opposite the IO panel), indicated by the **blue arrow**, the CMOS Reset button is used to manually reset the motherboard BIOS in case of system halt or malfunction. To avoid unexpected operation, it is purposely placed behind the panel. To reset, please use the tip of a pen, press and hold for at least 5 seconds to reset the BIOS.

> **NOTE**
>
> The CMOS button will only reset the BIOS settings. The ignition power control's MCU is not a part of the BIOS and therefore its settings will **NOT** be affected when your press the CMOS button of your system.
>
> Should you clear the CMOS and you wish to reconfigure the IGN power-on delay setting also, please do the refer to the following steps:
>
> 1. Set the _ignition power control switch_ to 0 (ATX mode) or 1 (AT mode).
>
> 2. Turn the system on, press F2 to access the BIOS
>
> 3. Press F9 to load default settings.
>
> 4. Go to ignition power control settings **([Power] > [Ignition Power Control])**.
>
> 5. Set the _ignition power control switch_ back to the F position.
>
> 6. Press F10 to Save & Exit when done.
>
> For ignition power control settings, please refer to the _relevant section_.

2.6 Internal I/O

The system's internal I/O connectors consist of n mini-PCIe slot with SIM slot, an M.2 slot for NVMe SSD, SO-DIMM socket, slot and a MezIO™ port for application-oriented expansion purposes.

2.6.1 Full-size mini-PCIe Slot and SIM Socket
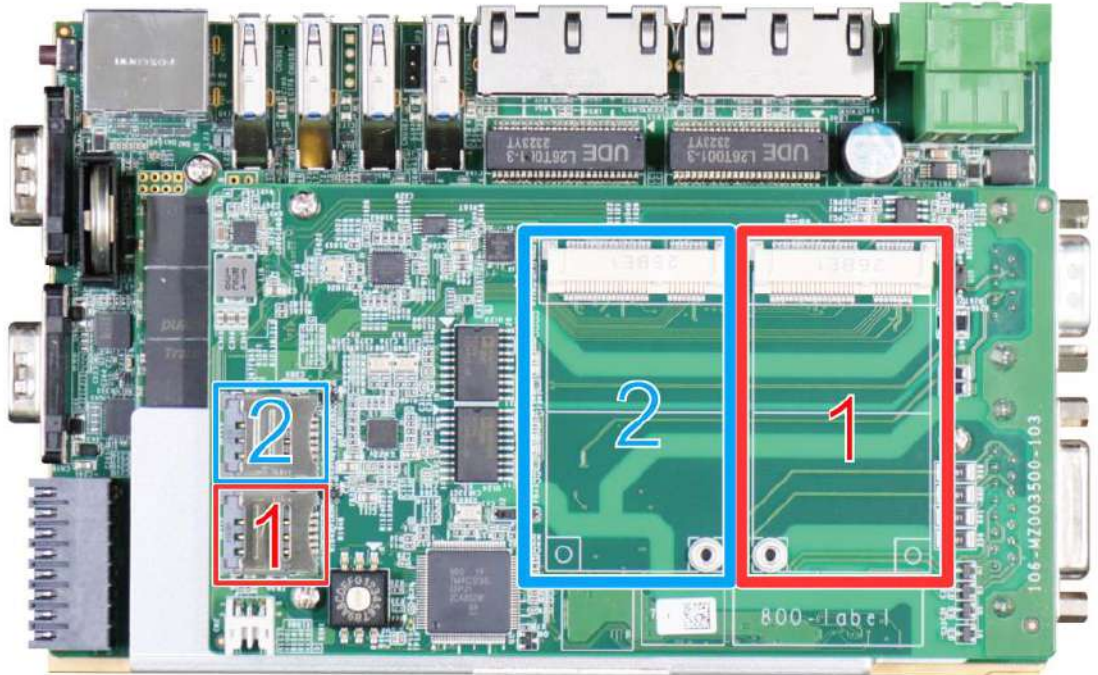
The system provides two full-size mini-PCIe socket each with a dedicated SIM card slot (in corresponding colors). With a SIM card installed, your system can access the internet via your network provider's 5G/ 4G network. If you are installing Neousys' mPCIe to M.2 adapter card, please use the SIM slot on the adapter card.

For wireless (WiFi/ 5G/ 4G) communication, there are SMA antenna openings on system side panels.
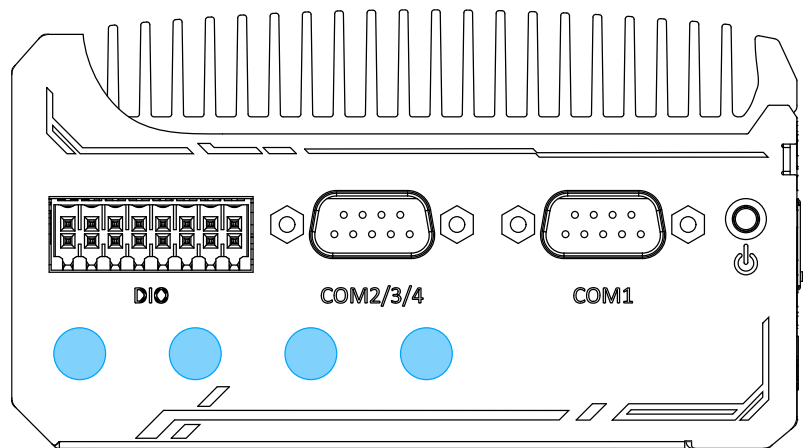
DIO/ COM port panel antenna openings

mini-PCIe Pin Definition
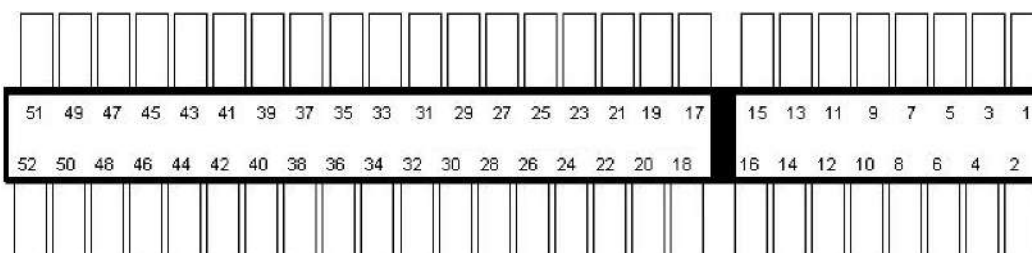
Pin #	Signal	Pin #	Signal
1	WAKE#	2	+3.3Vaux
3	COEX1	4	GND
5	COEX2	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
Mechanical Key			
17	Reserved* (UIM_C8)	18	GND
19	Reserved* (UIM_C4)	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	+3.3Vaux
25	PERp0	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PETn0	32	SMB_DATA
33	PETp0	34	GND
35	GND	36	USB_D-
37	GND	38	USB_D+
39	+3.3Vaux	40	GND
41	+3.3Vaux	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	Reserved	46	LED_WPAN#
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	+3.3Vaux

⚠ **WARNING**

Some off-the-shelf mini-PCIe 4G modules use 1.8V I/O signals instead of 3.3V I/O and may cause signal interference. Installing an incompatible 4G module may damage the system or the module itself may be damaged. Please consult with Neousys when in doubt!

2.6.2 M.2 2280 (M Key) Slot for SSD
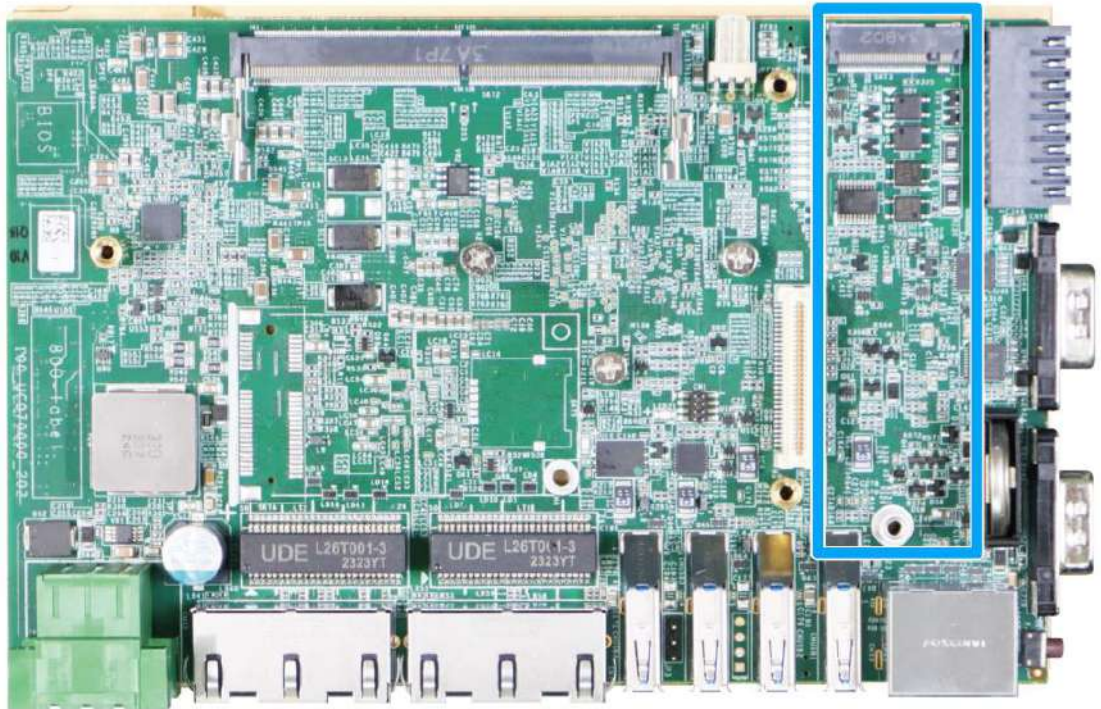
The system has an M key M.2 2280 slot supporting SATA signal only SSD storage. Users can install an SSD for improved disk read/ write performance over mechanical hard drives or 2.5" SSDs.

📝 **NOTE**

The M.2 slot is only compatible with SATA signal M.2 SSD only.

M.2 (M Key) Slot Pin Definition
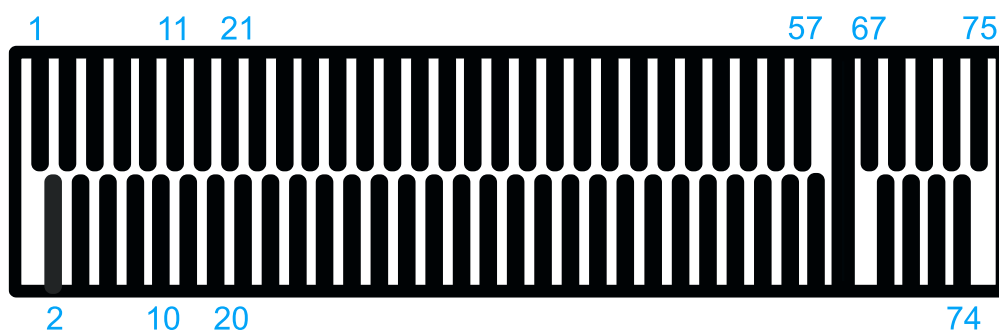
Pin #	Signal	Pin #	Signal
1	GND	2	+3V3
3	GND	4	+3V3
5		6	-
7		8	-
9	GND	10	-
11		12	+3V3
13		14	+3V3
15	GND	16	+3V3
17		18	+3V3
19		20	-
21	GND	22	-
23		24	-
25		26	-
27	GND	28	-
29		30	-
31		32	-
33	GND	34	-
35		36	-
37		38	-
39	GND	40	-
41	SATA-B+	42	-
43	SATA-B-	44	-
45	GND	46	-
47	SATA-A-	48	-
49	SATA-A+	50	-
51	GND	52	-
53		54	-
55		56	-
57	GND	58	-
Mechanical Key			
67	-	68	SUSCLK
69	PEDET	70	+3V3
71	GND	72	+3V3
73	GND	74	+3V3
75	GND		

2.6.3   SO-DIMM Socket
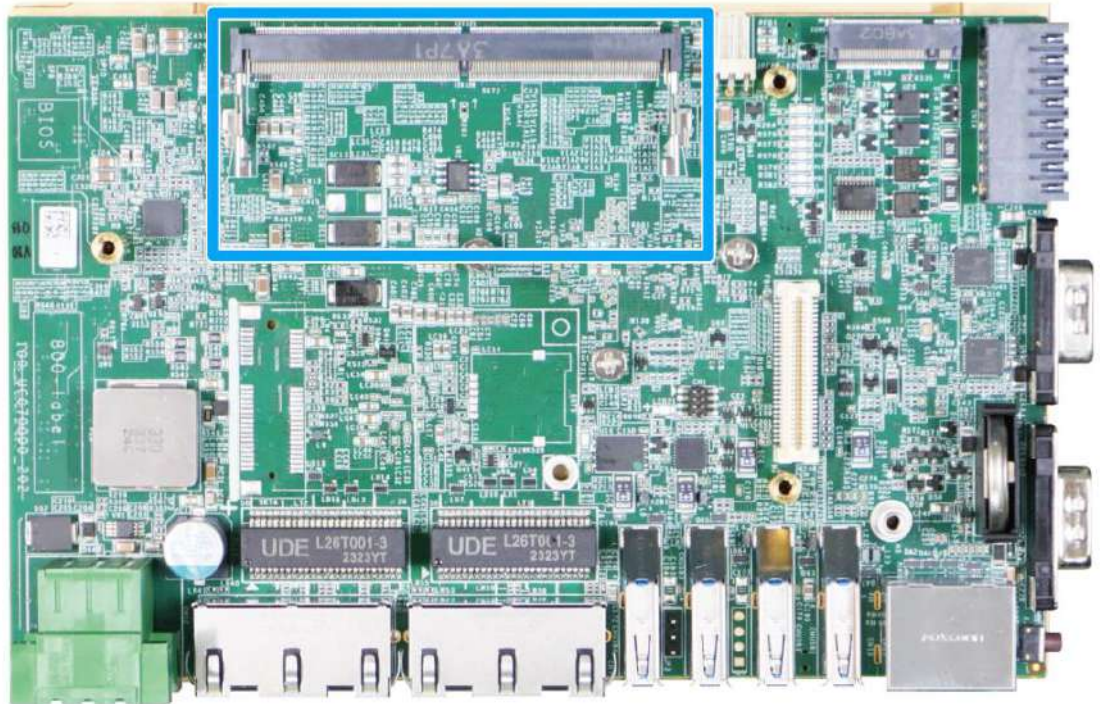
The system supports one SO-DIMM socket for installing DDR5-4800 memory module up to 16GB in capacity.

2.6.4 Ignition Power Control Switch
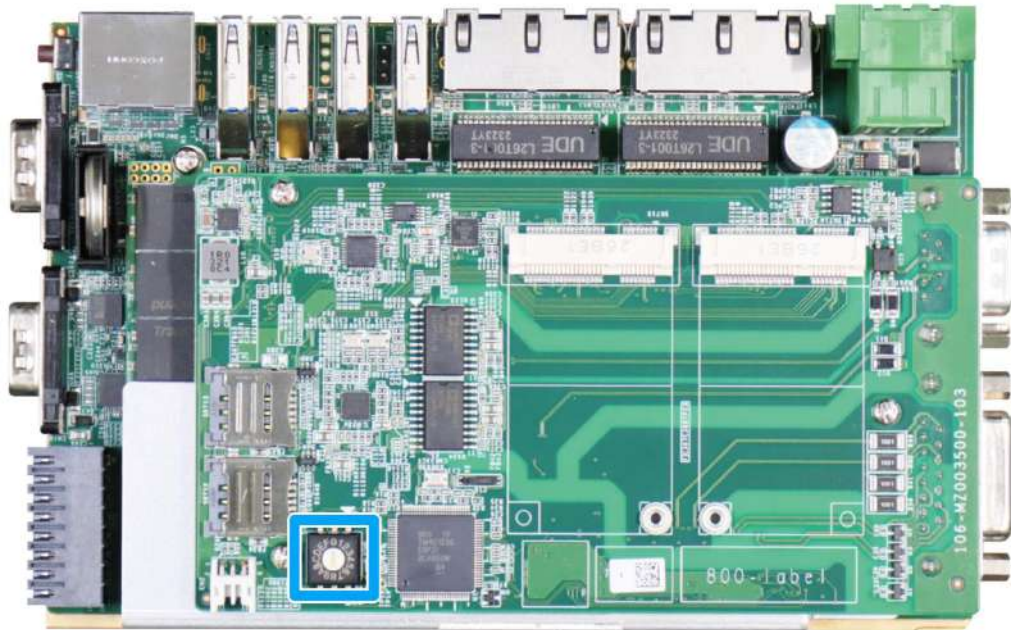
The ignition power control module for in-vehicle applications is an MCU-based implementation that monitors the ignition signal and reacts to turn on/off the system according to predefined on/off delay. For details, please refer to the section "Ignition Power Control"

3 System Installation

Before disassembling the system enclosure and installing components and modules, please make sure you have done the following:

- It is recommended that only qualified service personnel should install and service this product to avoid injury or damage to the system.
- Please observe all ESD procedures at all times to avoid damaging the equipment.
- Before disassembling your system, please make sure you have the module/ component you wish to install at hand and have all the necessary tools.
- Before disassembling your system, please make sure the system has powered off, all cables and antenna (power, video, data, etc.) are disconnected.
- Place the system on a flat and sturdy surface (remove from mounts or out of server cabinets) before proceeding with the installation/ replacement procedure.

3.1 Disassembling the System Enclosure

To install internal components such as M.2 SSD, memory module, or mini-PCIe module, you need to disassemble the system enclosure. Please refer to the following procedures:

1. Remove the screws indicated on the front I/O panel.

2. Remove the three (3) screws at the bottom.

3. Remove the two (2) screws on the rear panel.

4. Remove the four (4) hex bolt screws on the DIO/ COM port panel.

5. Separate the bottom panel from the system.

6. Remove the screw indicated.

7. Separate the DIO/ CAN bus port panel from the system.

8. Remove the screw indicated and remove the I/O panel.

Remove the screw   **Remove the I/O panel**

9. Remove the screws securing the MezIO module, and gently lift and separate the MezIO module from the system.
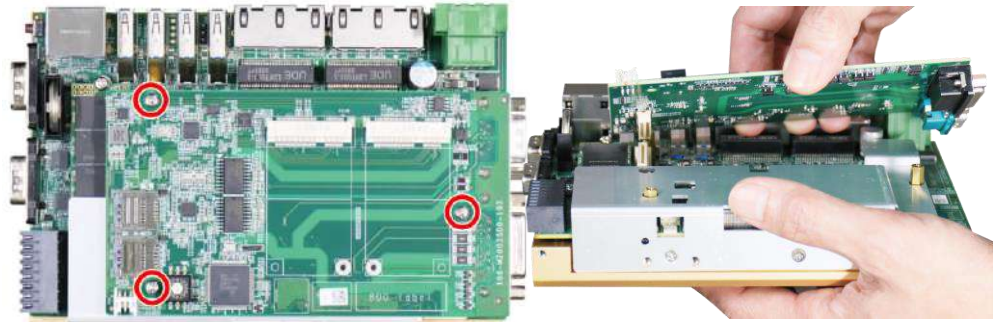
Remove screws securing MezIO module   **Separate MezIO module from system**

10. Unscrew the two (2) screws to remove the DRAM/ M.2 heat spreader.
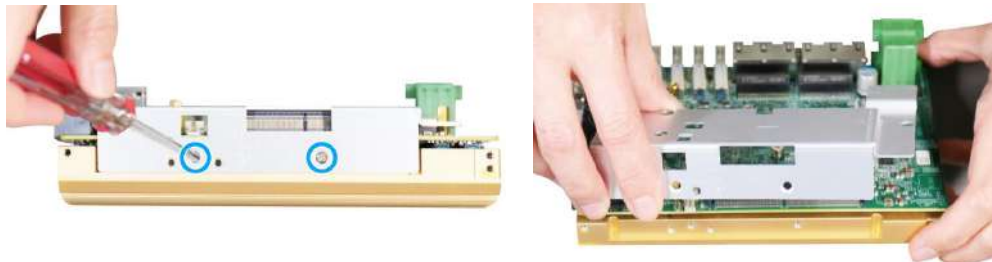
Remove the screws securing heat spreader   **Separate the heat spreader from system**

11. With external panels and DRAM/ M.2 heat spreader removed, you are ready to install internal components.

12. Reinstall the enclosure when done.

3.2 Installing Internal Components

3.2.1 DDR5 SO-DIMM Installation

There is one SO-DIMM memory slot on the motherboard. Please follow the procedures below to install the memory module.

1. Disassemble the system enclosure.

2. Locate the SO-DIMM slot on the motherboard shown once the enclosure and heat spreader have been removed.
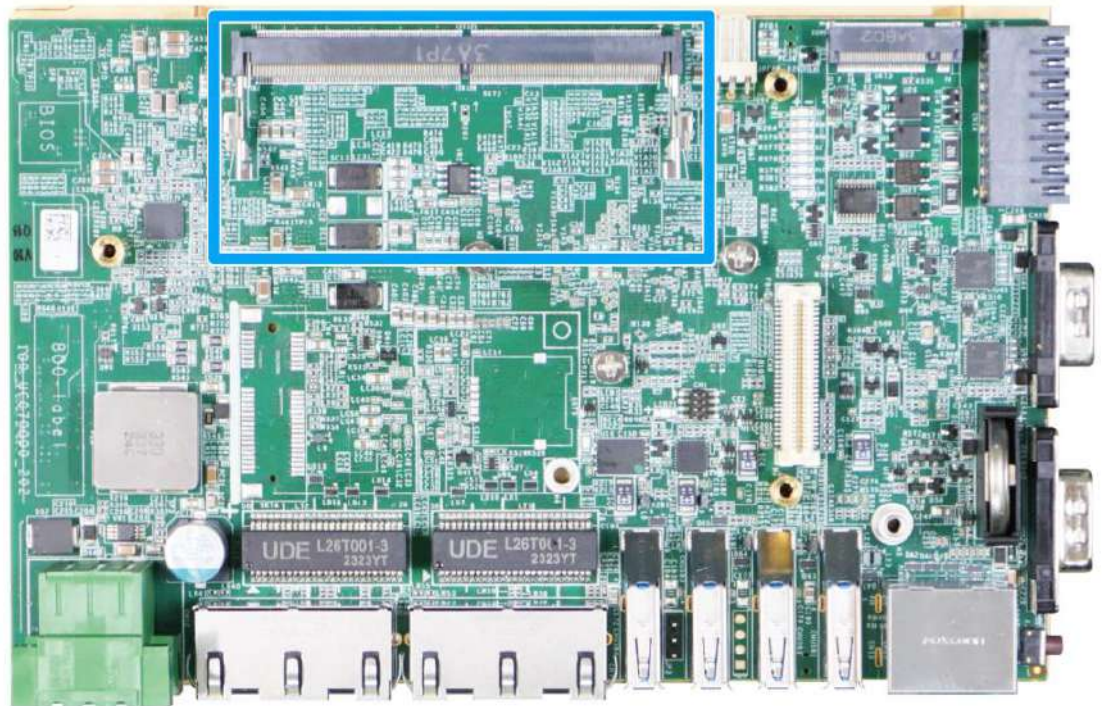
3. **To install**, insert the gold finger end of the SO-DIMM on a 45 degree angle into the slot and gently push the SO-DIMM down until it is clipped-in.
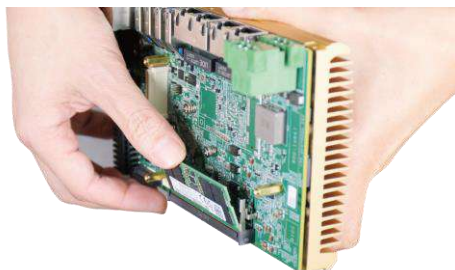
45 degree angle insert   **Push until it is clipped-in**

4. Remove the protection film on the thermal pad.
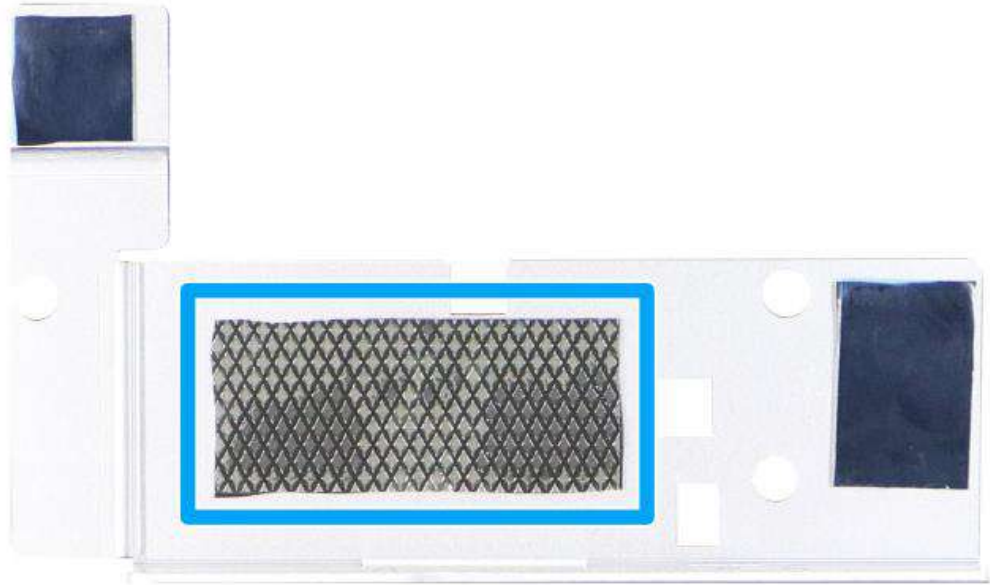
5. Secure the DRAM/ M.2 heatsink spreader onto the side of the system heatsink.
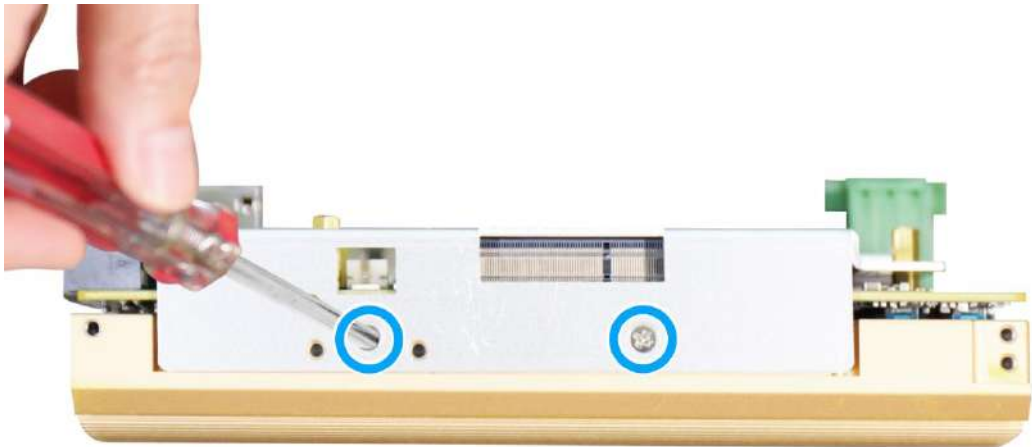
6. Reinstall the enclosure when done.

3.2.2 M.2 2880 M Key SSD Installation

There is one M.2 2280 M Key slot for you to install an SSD. Please follow the procedures below to install the M.2 SSD module.

1. Disassemble the system enclosure.

2. Located the M.2 2280 M Key slot once the system enclosure and heat spreader have been removed.
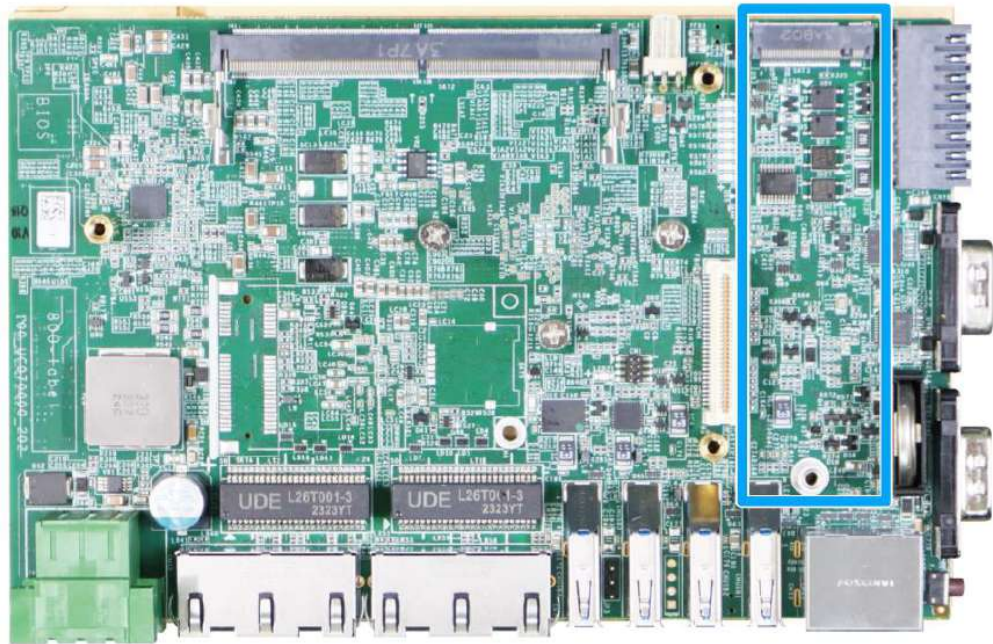
3. Insert the M.2 SSD into the slot on a 45° angle.
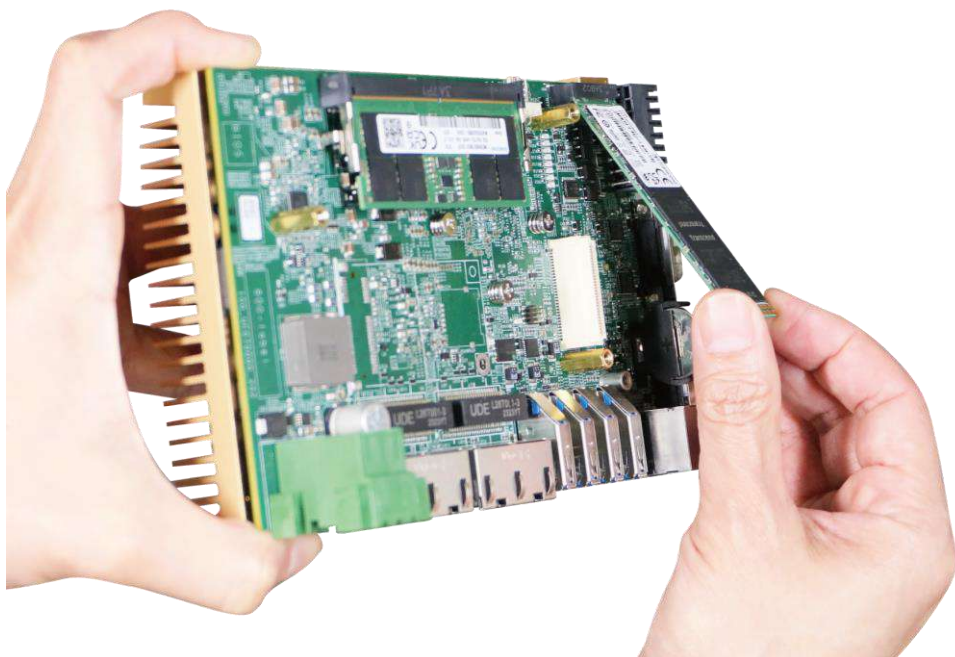
4. Gently push it towards the motherboard and secure the SSD with the supplied screw.
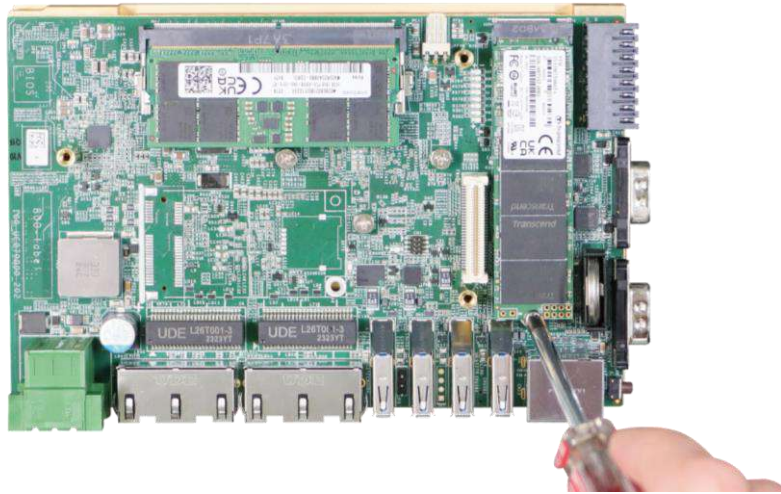
5. Once you have installed the SSD, you need to reinstall the heat spreader but before you do so, please make sure the protective film on the thermal pad has been removed.
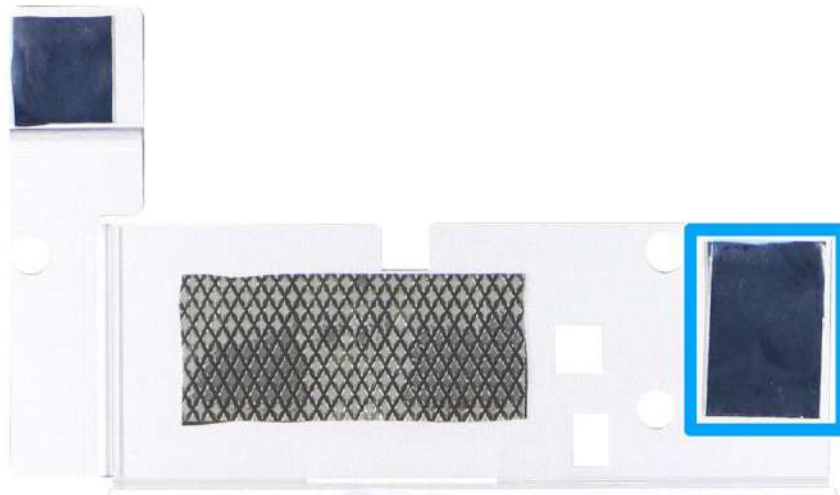
6. Secure the heat spreader by securing the two screws (indicated in red).
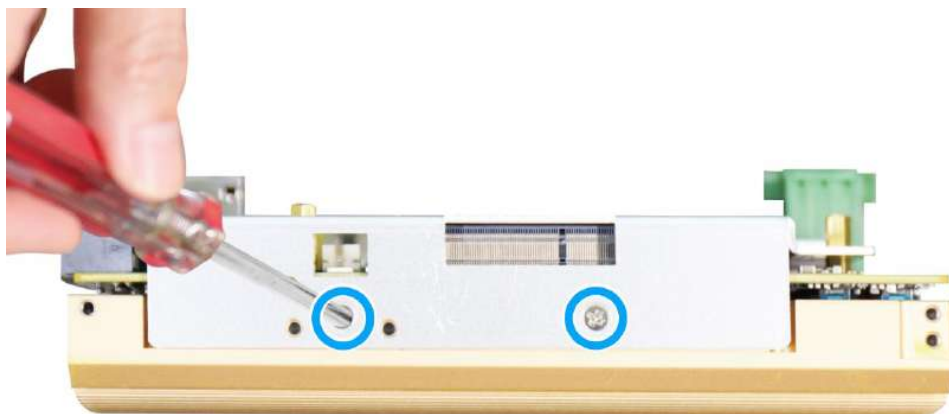
7. Reinstall the enclosure when done.

3.2.3 mini-PCIe Module, SIM Card and Antenna Installation

The mini-PCIe and SIM slots are on the MezIO™ module. Please follow the procedures below to install the mini-PCIe module and SIM card, as well as the antenna for wireless communication.

1. Disassemble the system enclosure.

2. The mini-PCIe and SIM slots are shown in the illustration below.
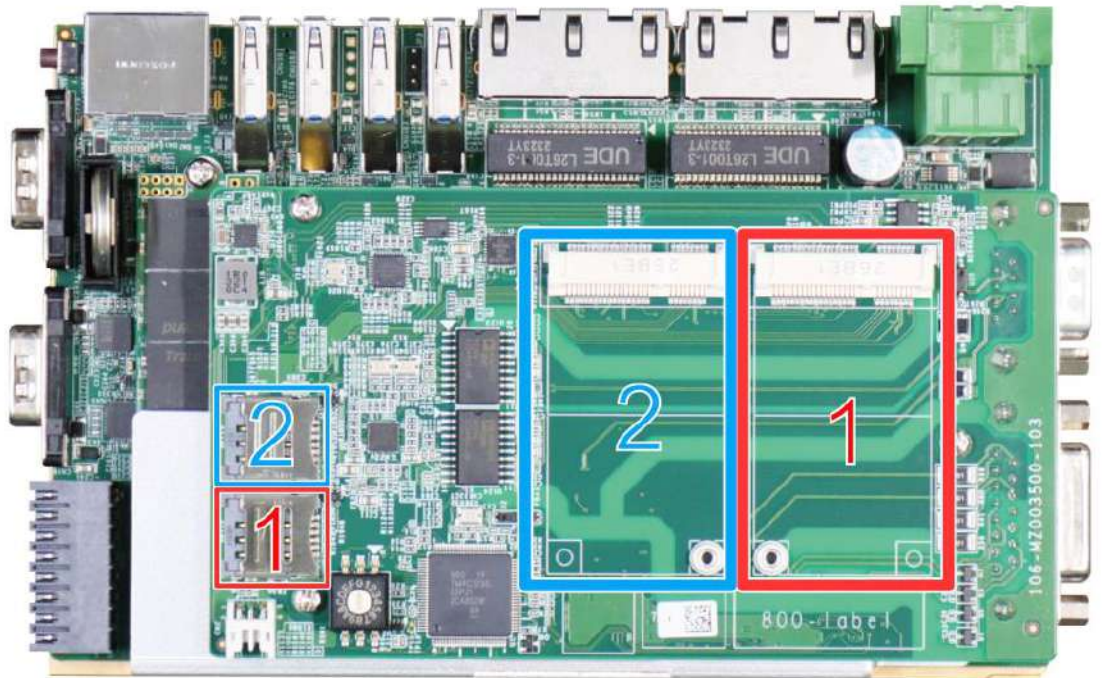
3. If you are installing a 5G/ 4G wireless module that requires a SIM, please install the SIM card first. Otherwise go to the next step. Push the SIM slot holder in the direction shown and flip open the holder to place the SIM into the slot.
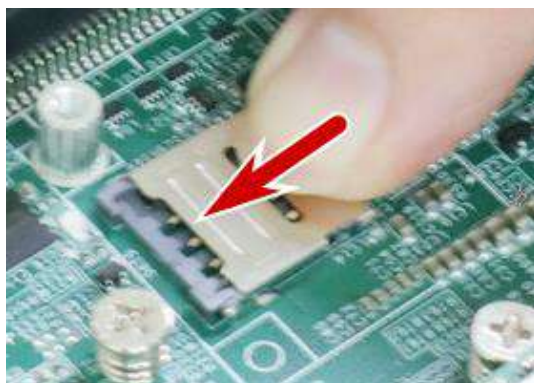
Push the SIM holder in the direction shown   Flip open the holder and place SIM

4. Flip the holder back onto the SIM card and push in the direction shown to lock-in the SIM card into the slot.

5. To install the mini-PCIe module, insert the module's gold fingers on a 45 degree angle into the socket, gently press the module down and secure it with a screw.
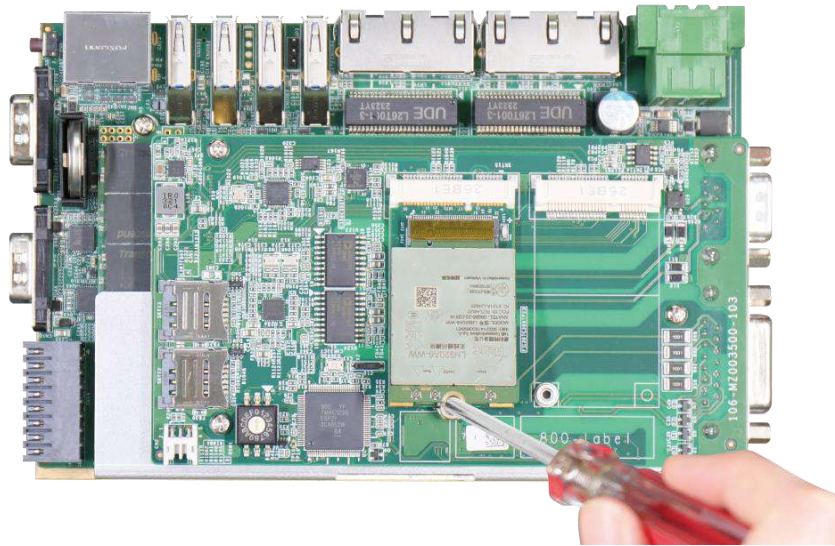
6. Clip-on mini-PCIe module's antenna (please refer to the module's user manual on antenna cable connection).
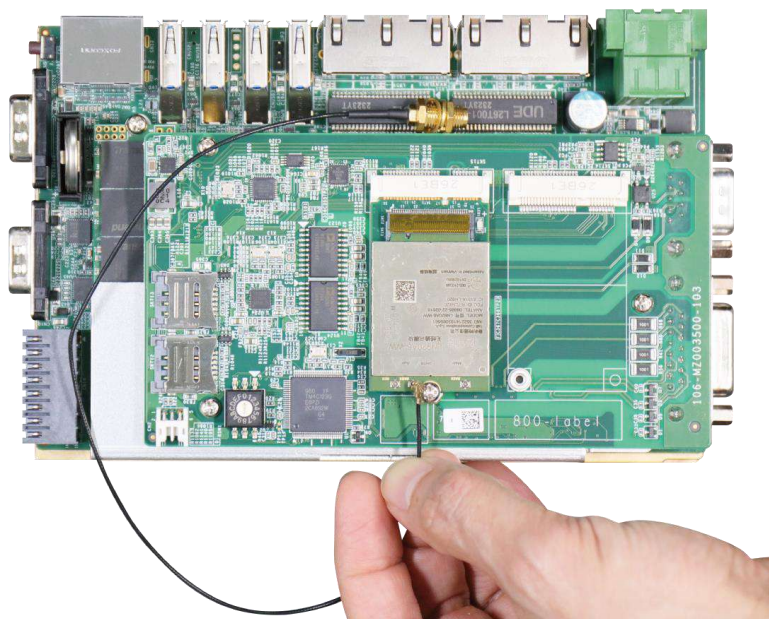
7. Remove the protective film from the thermal pad.
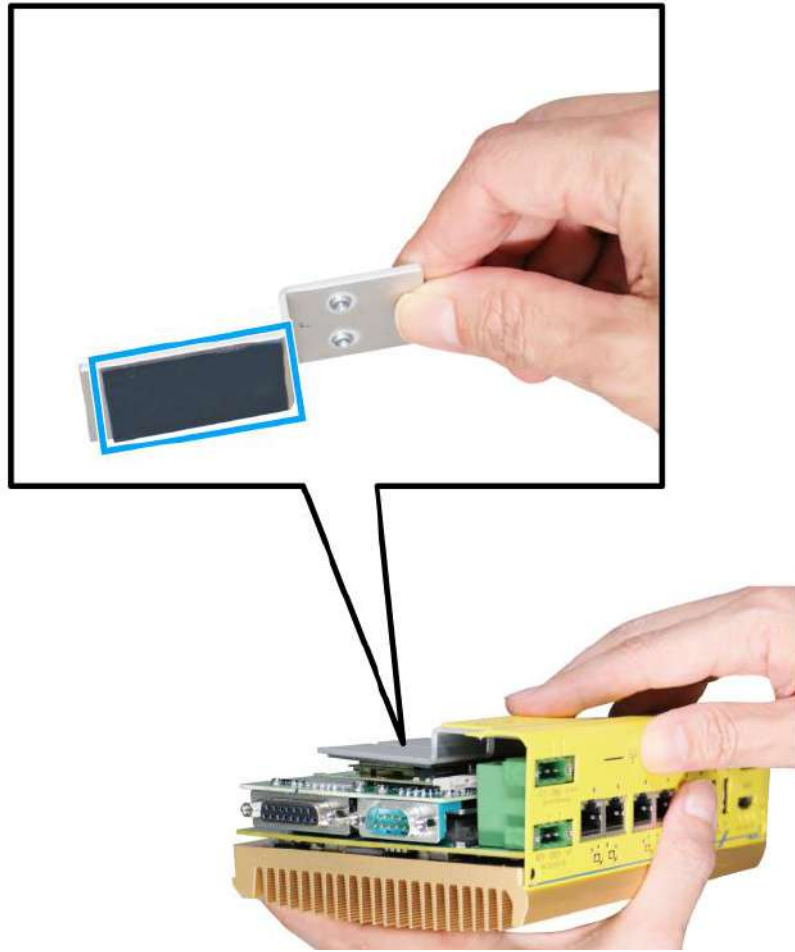
8. Remove one of the antenna covers from the enclosure.
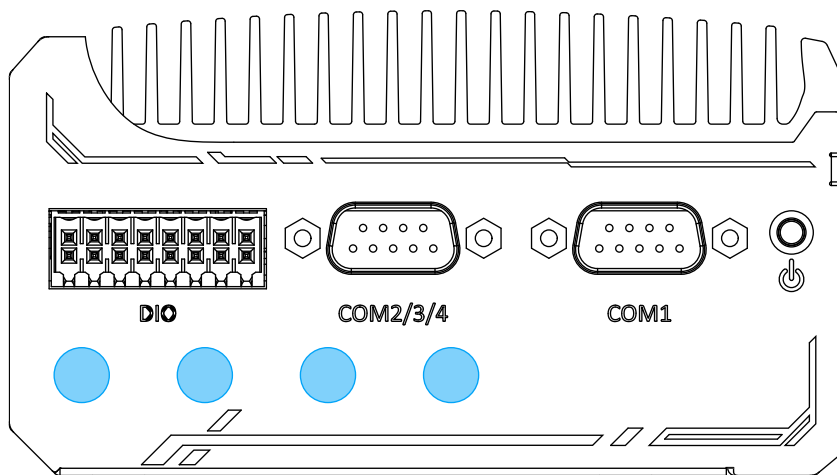
9. Secure the SMA antenna connector, reinstall the enclosure and attach the external SMA antenna.
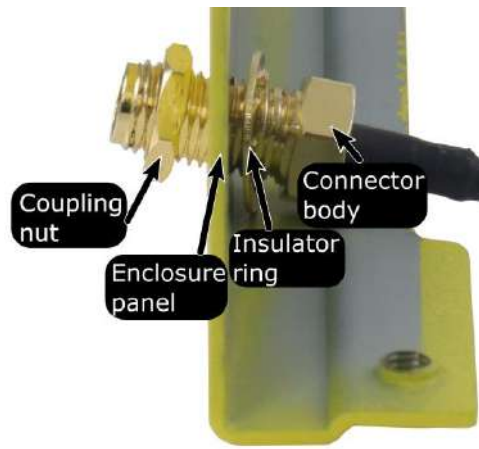
Securing antenna connection   **Attach external antenna**

10. Repeat steps 3 to 8 if you wish to install another mini-PCIe module.

11. Reinstall the enclosure when done.

3.2.4 mini-PCIe to M.2 Adapter Card Installation (Optional)

Neousys Technology has optional mini-PCIe to M.2 expansion adapter cards. Please consult your sales representative for details should you have the need to install M.2 modules.
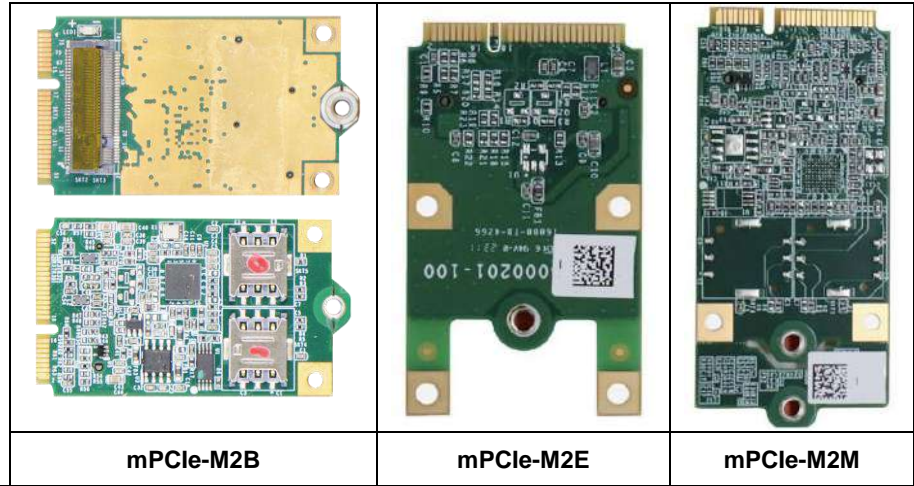
	mPCIe-M2B	mPCIe-M2E	mPCIe-M2M
Form Factor			
Function	M.2 3042/3052 B key module on mPCIe slot	M.2 2230 E key module on mPCIe slot	M.2 2242 M key NVMe on mPCIe slot
Host Interface			
Interface	PCIe (Gen2) USB 2.0	PCIe USB 2.0	PCIe
Module Interface			
Interface	USB3.0 USB2.0	PCIe	PCIe
Output Connector			
M.2	M.2 B Key	M.2 E Key	M.2 M Key
Mechanical			
Dimension (With removable PCB)	64.3 x 30 x 5 mm	51.0 x 30 x 5 mm	64.3 x 30 x 5 mm
Dimension (Without removable PCB)	54.3 x 30 x 5 mm	42.6 x 30 x 5 mm	54.3 x 30 x 5 mm
Environmental			
Operating Temperature	-25°C to 70°C	-25°C to 70°C	-25°C to 70°C

If you are installing a 5G/ 4G M.2 module, please install the SIM card onto the adapter first before securing the module onto the adapter.

1. Insert the SIM card into the slot. You may use open-source freeware that communicates with Serial ports, such as PuTTY, to designate the SIM card you would like to use.
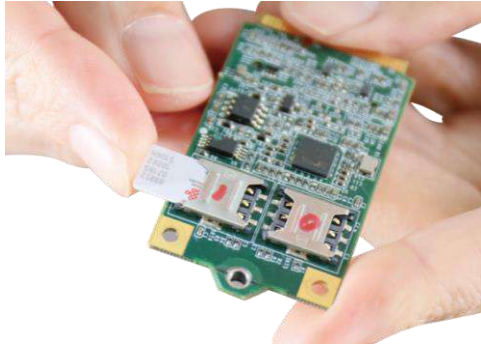
2. Insert the adapter into the mini-PCIe slot on a 45 degree angle and secure with a screw.
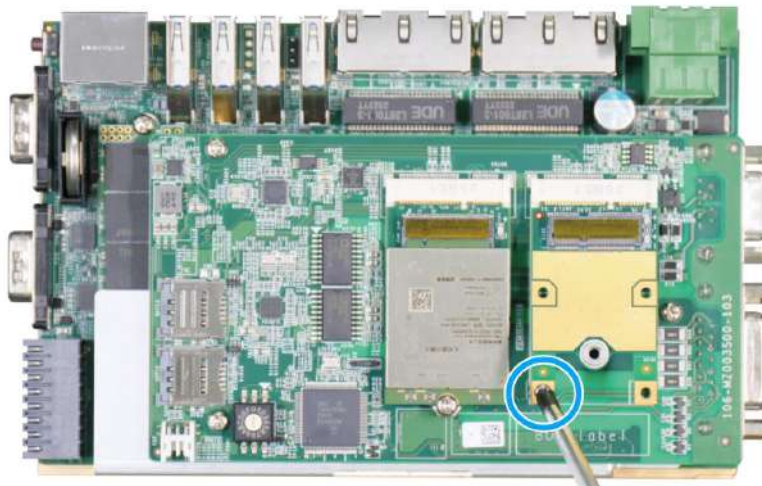
3. Insert the M.2 module on a 45 degree angle onto the adapter and secure with a screw.
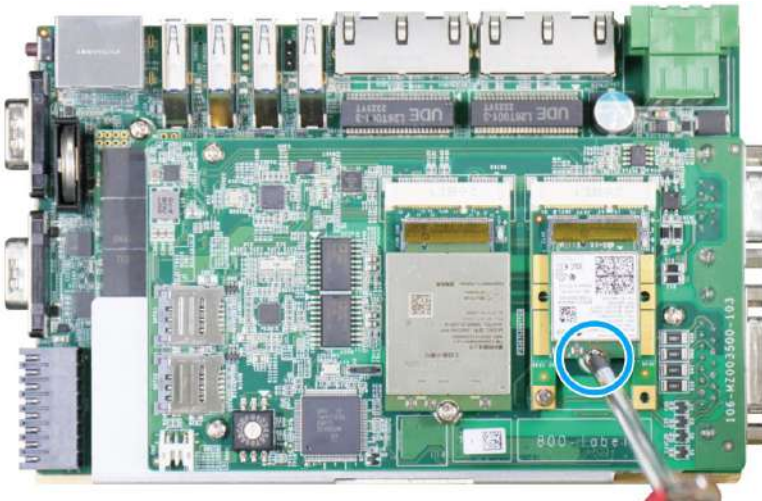
4. Please refer to the module's user manual on antenna cable connection.

5. Remove the protection film on the thermal pad.
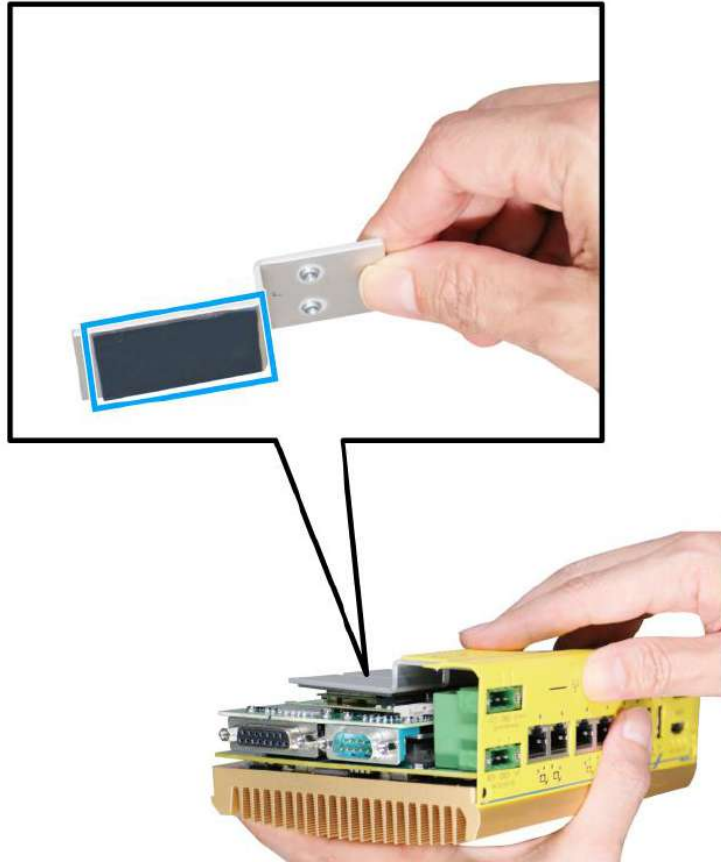
6. Reinstall the enclosure when done.

3.3   Installing the System Enclosure

1. Install the DRAM/ SSD heatsink and secure with screws indicated.
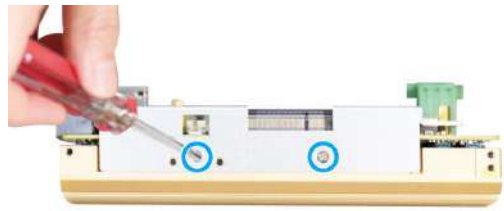
Install heatsink   **Secure heatsink with screws**

2. Align and lower the MezIO module onto the motherboard while matching the three copper stands, and secure with screws indicated.
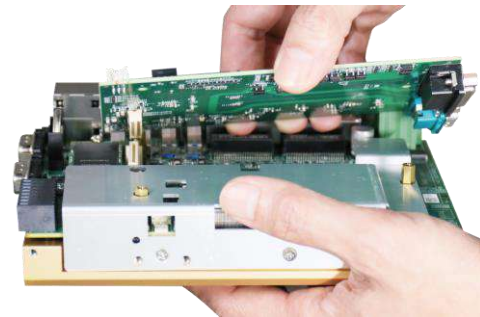
Lower MezIO module onto copper stands   **Secure MezIO module with screws**
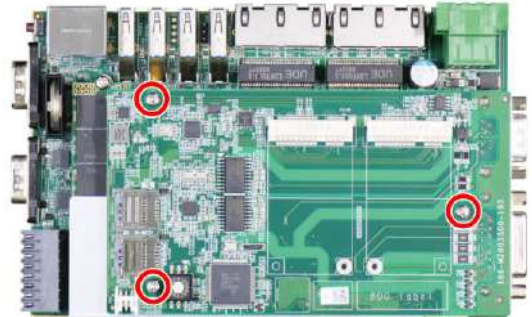
3. Install the front I/O panel and secure with screw indicated.
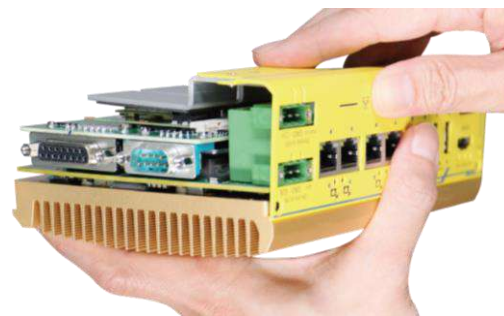
Install I/O panel   **Secure with screw**

4. Install the DIO/ CAN bus panel and secure with screw indicated.

Install panel   **Secure with screw**

5. Install the bottom/ COM port panel.

6. Secure the hex bolt screws on the DIO/ COM port panel.

7. Secure the two screws on the rear.

8.   Secure the screws at the bottom of the enclosure.

9.   Secure the screws on the front I/O panel to complete the enclosure installation process.
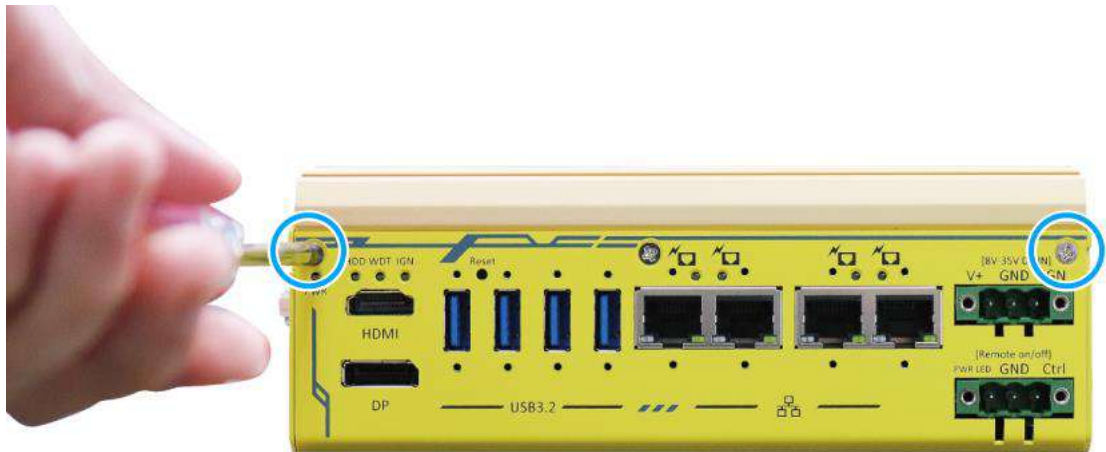
3.4 Wall Mount Installation

3.4.1 Horizontal Wall Mount Installation

The horizontal wall mount bracket allows the system to be mounted horizontally.

Please refer to the following installation procedure:

1. Remove the rubber stands to access the M4 tapping (indicated in **green**).
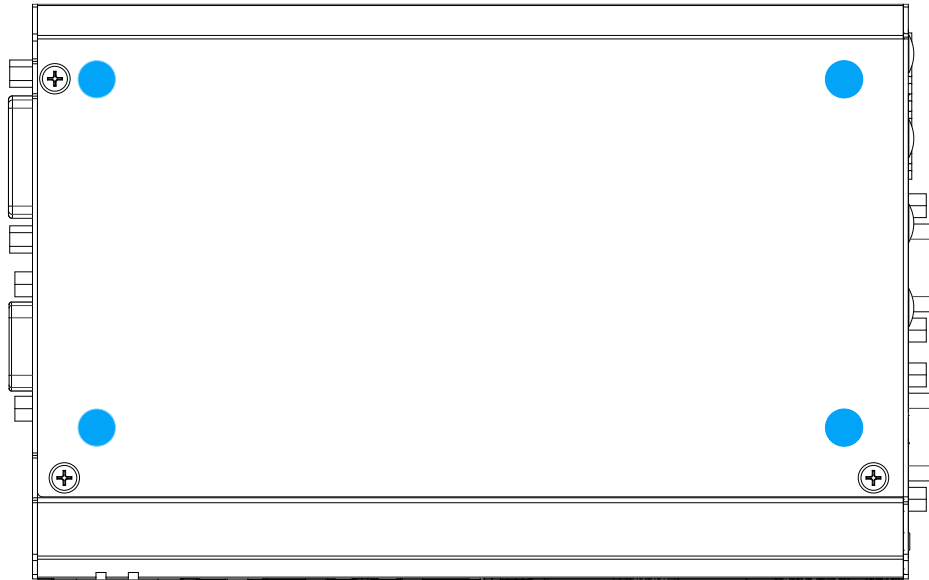
2. To install, secure the wall mount bracket (indicated in **red**) to the bottom of the system enclosure using the M4 screws (indicated in **blue**) provided.
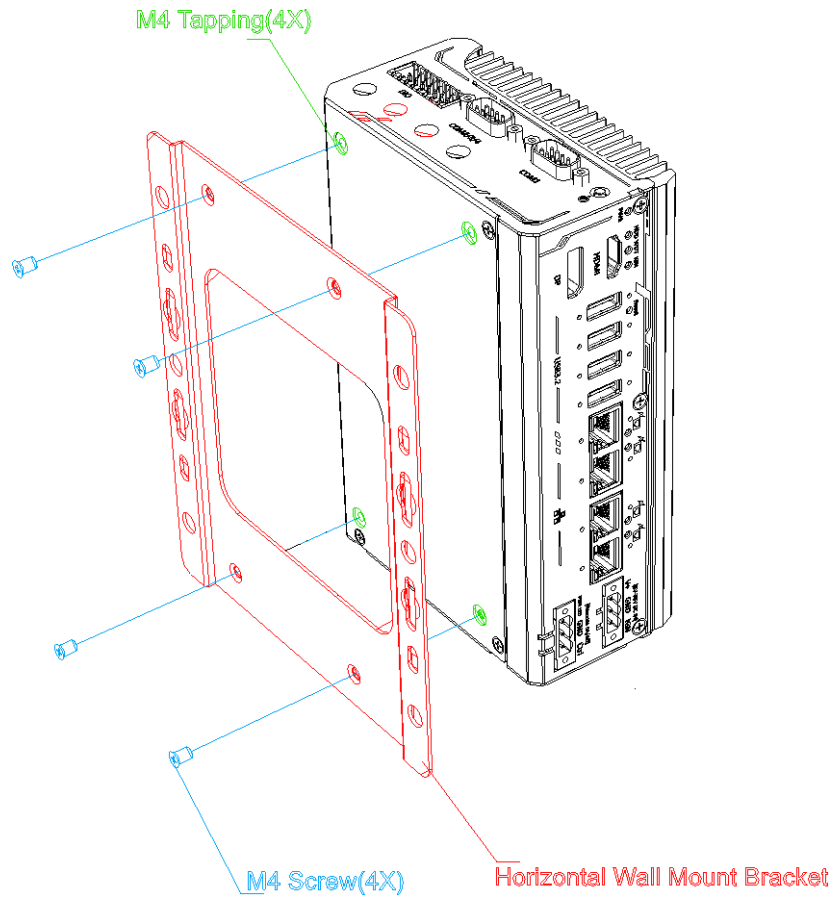
3. Dimension illustration of the installed horizontal wall mount bracket for your reference.

5.2

10.0

15.0

40.0

84.0

130.0

175.8

132.0

145.5
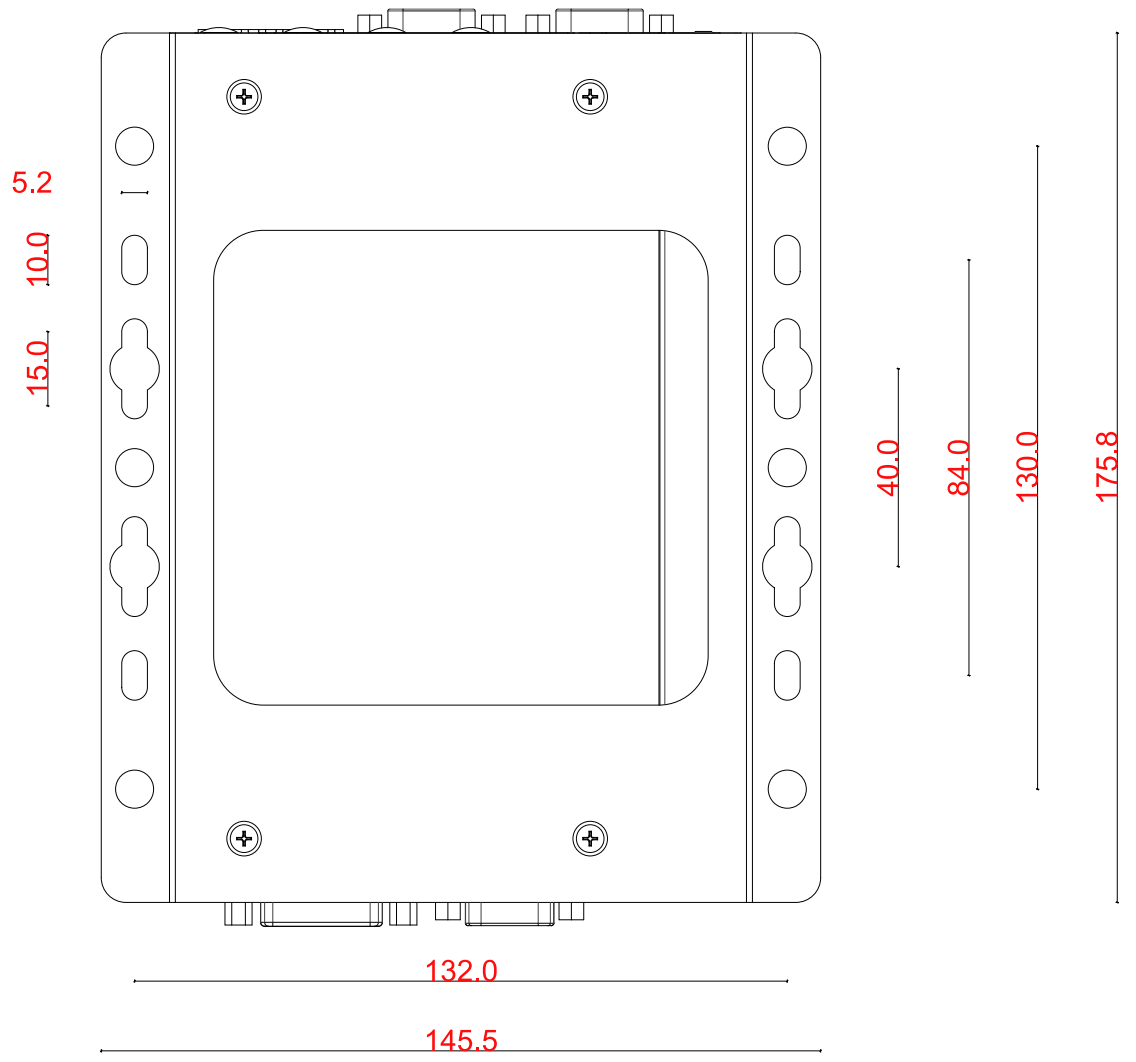
3.4.2 Vertical Wall Mount Bracket (optional)

1. To install, secure the vertical wall mount bracket (indicated in **red**) to the rear panel of the system using the M4 screws provided (**indicated in blue**).
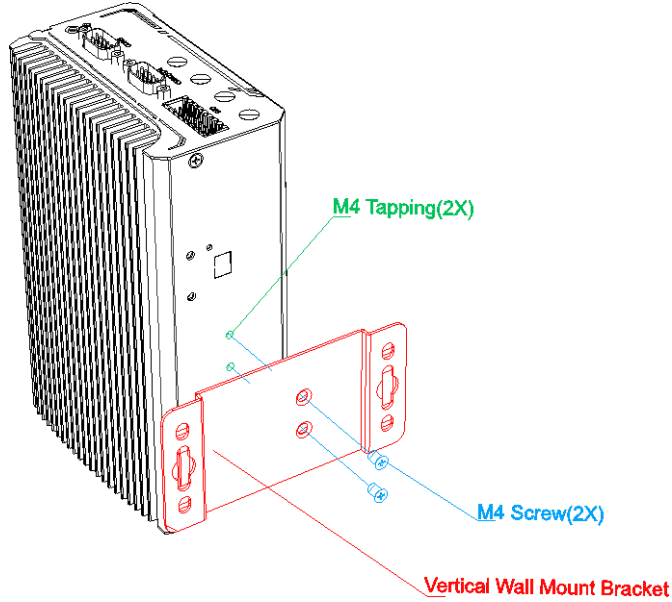
2. Dimension illustration of the install vertical wall mount bracket for you reference.
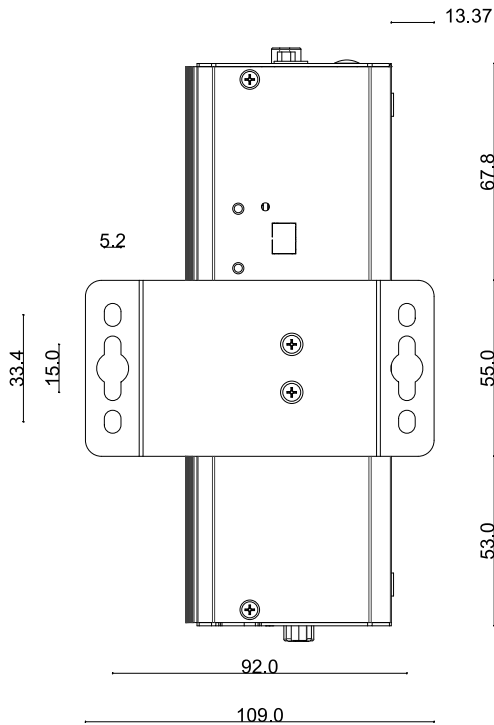
3.5 Powering On the System

There are several methods to power on the system

- Pressing the power button
- Via an external non-latched switch
- Sending a LAN packet via Ethernet (Wake-on-LAN)
- Via Power Ignition Control

3.5.1 Powering On Using the Power Button

This is the simplest way to turn on your system. The power button on the side panel is a non-latched switch and behaves as the ATX-mode on/off control. With DC power connected, pushing the power button will turn on the system and the PWR LED indicator will light up. Pushing the button when system is on will turn off the system. If your operating system supports ATX power mode (i.e. Microsoft Windows or Linux), pushing the power button while the system is in operation will result in a pre-defined system behavior, such as shutdown or hibernation.
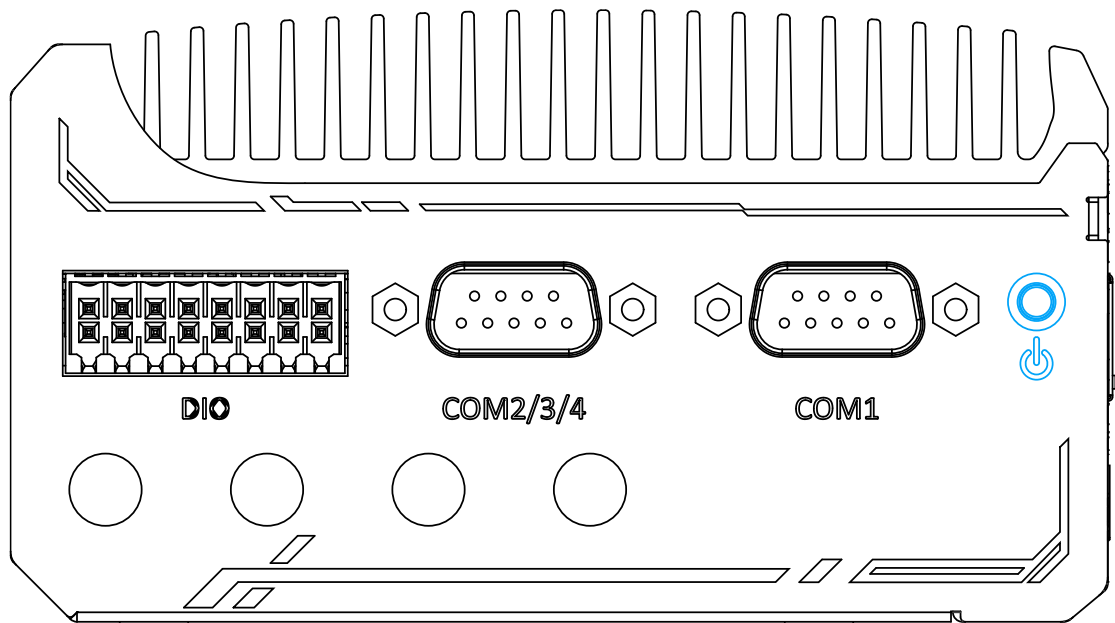
3.5.2 Powering On Using An External Non-Latched Switch

If your application demands the system to be placed inside a cabinet, you may use an external non-latched switch to power on/ off the system. The system provides a 3-pin "Remote On/ Off" plug for connecting a non-latched switch and acts as the ATX-mode power on/off control switch. The external non-latched switch acts exactly the same as the power button on the side panel. To setup and power on/ off the system using an external non-latched switch (ATX-mode), please follow the steps described below.

1.   Acquire a non-latched switch with 3-pin plug.

2.   Connect the non-latched switch to the Remote On/ Off plug.
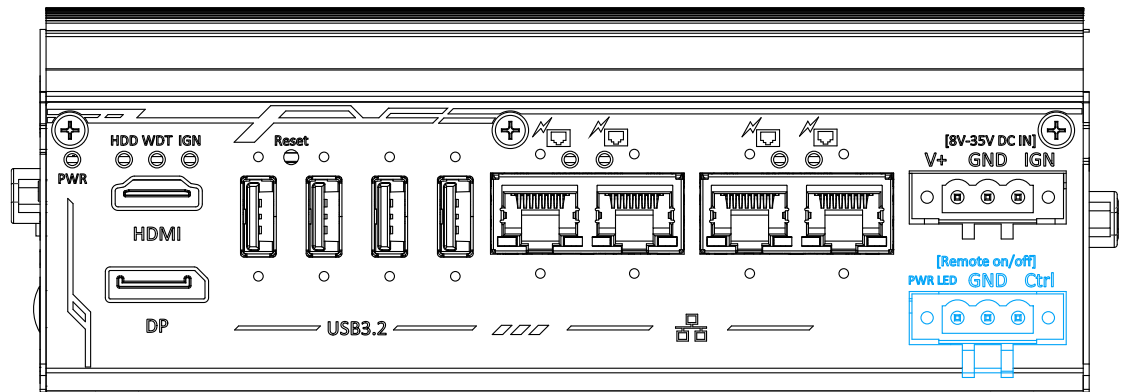
3.   With DC power connected, pushing the power button will turn on the system and the PWR LED indicator will light up. Pushing the button when system is on will turn off the system. If your operating system supports ATX power mode (i.e. Microsoft Windows or Linux), pushing the power button while the system is in operation will result in a pre-defined system behavior, such as shutdown or hibernation.

3.5.3 Powering On Using Wake-on-LAN

Wake-on-LAN (WOL) is a mechanism to wake up a computer system from a S3 (standby), S4 (Hibernate) or S5 (system off with standby power) state via issuing Subnet Directed Broadcasts (SDB) or a magic packet. The system implements the Wake-on-LAN function for the GbE ports highlighted in blue, shown below.
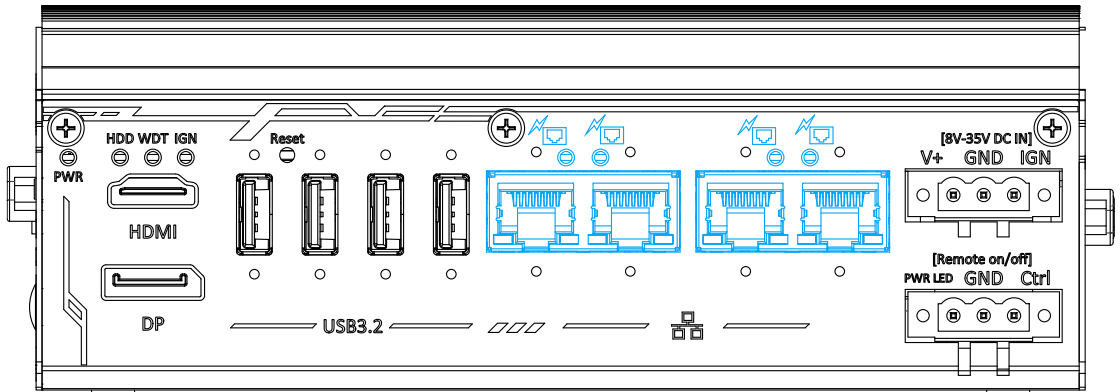
To enable WOL function and power on your system, please follow the steps below.

1. Press F2 when the system boots up to enter BIOS.
2. Enter the **[Power]** menu. And configure the **[Wake On LAN]** option as **[Enabled]**. Please refer to the Wake-on-LAN section.
3. In Windows systems, identify the Local Area Connection of the corresponding Gigabit Controller and click the **Configure** button.
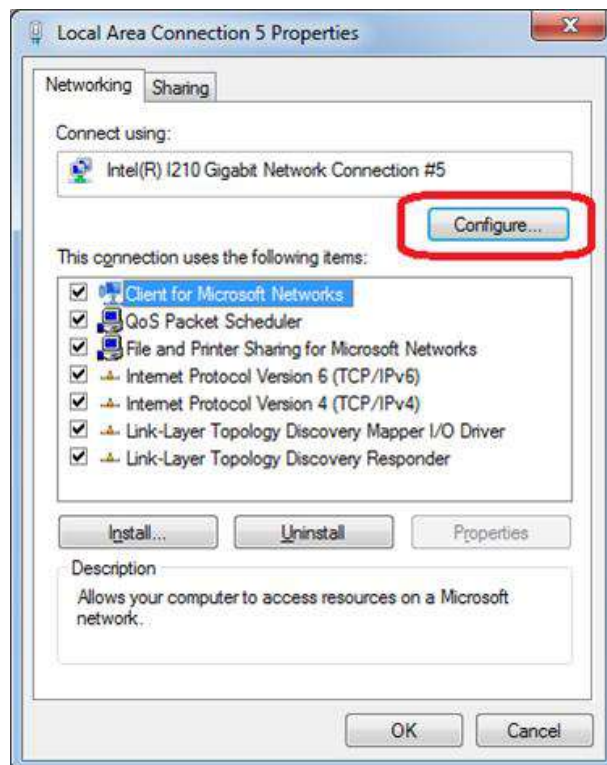
4. Click the **Power Management** tag, and check the following two options accordingly
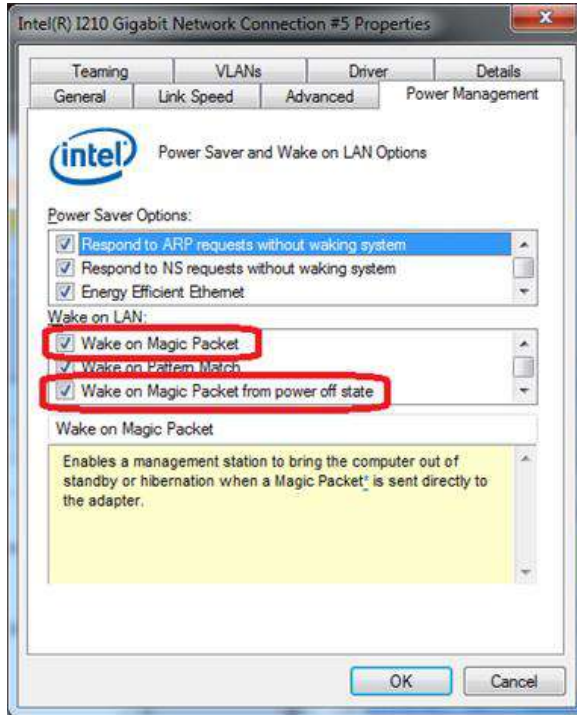
- **Wake on Magic Packet**

  The system can wake from S3 or S4 state when receiving a magic packet. The magic packet is a broadcast frame containing anywhere within its payload 6 bytes of all 255 (FF FF FF FF FF FF in hexadecimal), followed by sixteen repetitions of the target computer's 48-bit MAC address.

  For example, NIC's 48-bit MAC Address is 78h D0h 04h 0Ah 0Bh 0Ch

  DESTINATION SOURCE MISC

  FF FF FF FF FF FF

  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

  78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

78 D0 04 0A 0B 0C 78 D0 04 0A 0B 0C

MISC   CRC

There are some free tools available on Internet that can be used to send a magic packet. Please refer to the following link to understand more about Magic Packet.

http://en.wikipedia.org/wiki/Wake-on-LAN

● **Wake on Magic Packet from power off state**

When checking this option, the system can wake from S5 (system off with standby power) state when receiving a magic packet.

4 BIOS Settings

The system is shipped with factory-default BIOS settings optimized for best performance and compatibility. In this section, we'll illustrate some BIOS settings you may need to set or change prior to operating system installation. Please always make sure you understand the effect of change before you proceed with any changes. If you are unsure of the function you are changing, it is recommended to change one setting at a time to see its effect(s).

```
                         POC-751VTC Series Setup Utility                    Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

 InsydeH2O Version              POC75D01              This is the help for the hour, minute,
 UEFI Version                   2.80                  second field. Valid range is from 0 to
 Product Name                   POC-751VTC Series     23, 0 to 59, 0 to 59. INCREASE/REDUCE :
 Build Date                     04/18/2024            +/-.

 Processor Type                 Intel(R) Core(TM) i3-N305
 System Bus Speed               100 MHz
 System Memory Speed            4800 MT/s
 Cache RAM                      4096 KB
 Total Memory                   16384 MB
 Memory Controller 0 - DDR5     16384 MB

 System Time                    [08:19:40]
 System Date                    [05/08/2024]

 F1  Help            ↑/↓ Select Item       F5/F6 Change Values        F9  Setup Defaults
 Esc Exit            ←/→ Select Item       Enter Select ▶ SubMenu     F10 Save and Exit
```

✎ NOTE

Not all BIOS settings will be discussed in this section. If a particular setting/ function you are after requires specific BIOS settings but is not discussed in this section, please contact Neousys Technical Support staff.

4.1 COM1 Port Configuration

The system's COM1 port support RS-232 (full-duplex), RS-422 (full-duplex) and RS-485 (half-duplex) mode. You can set the COM1 operating mode via BIOS settings. The option in the BIOS setting called "*Slew Rate*" defines how sharp the rising/falling edge is for the output signal of COM1. For long-distance RS-422/485 transmission, you may set the "*Slew Rate*" option as "High" to improve signal quality. For RS-422/485 communication, the "*RS-422/485 Termination*" option determines whether to enable/disable internal termination of RS-422/485 transceiver according to your wiring configuration (e.g. with or without external termination).
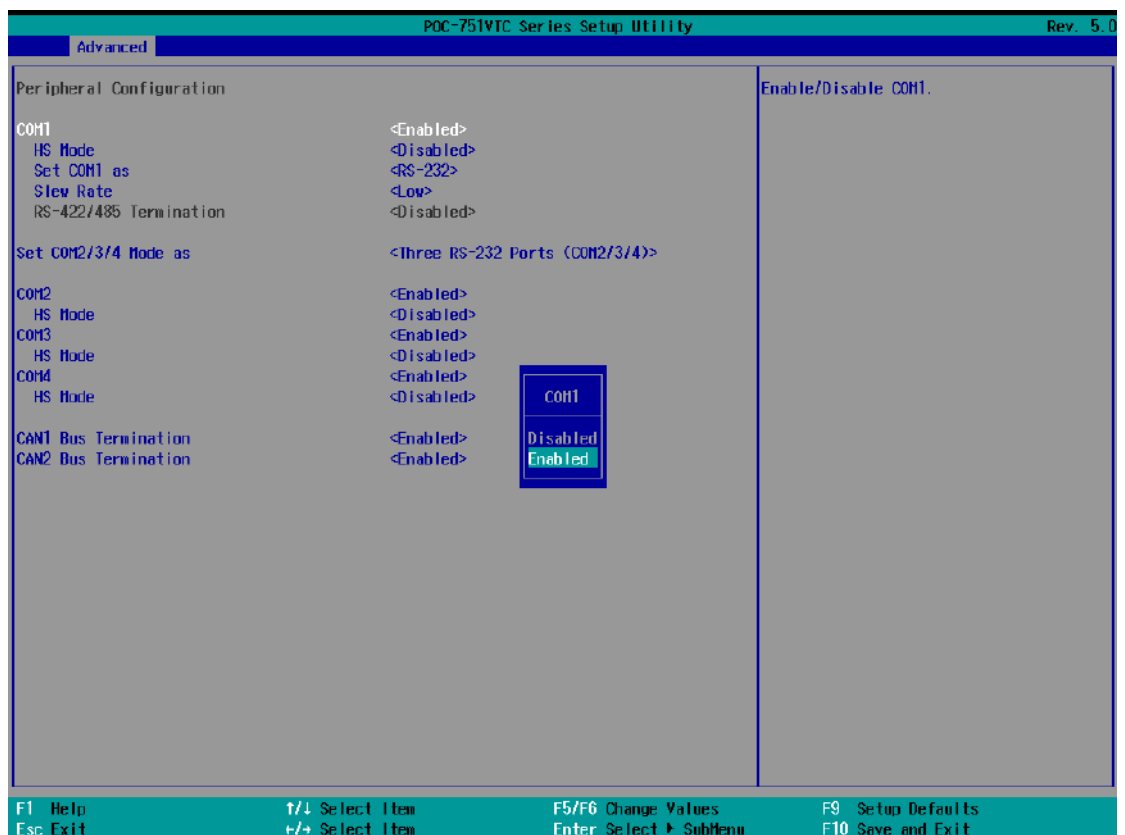
To set COM1 operating mode:

1. Press **F2** when the system boots up to enter the BIOS setup utility.
2. Go to **[Advanced]** → **[Peripheral Configuration]**.
3. Set the **[Set COM1 Mode as]** option to the desired mode.
4. Once set, press **F10** to save setting and exit.

4.2 COM 2/ 3/ 4 Port Configuration

The system's COM 2/ 3/ 4 ports support RS-232 (full-duplex). When set to

RS-422/485 mode, it will only act as COM2 port only.
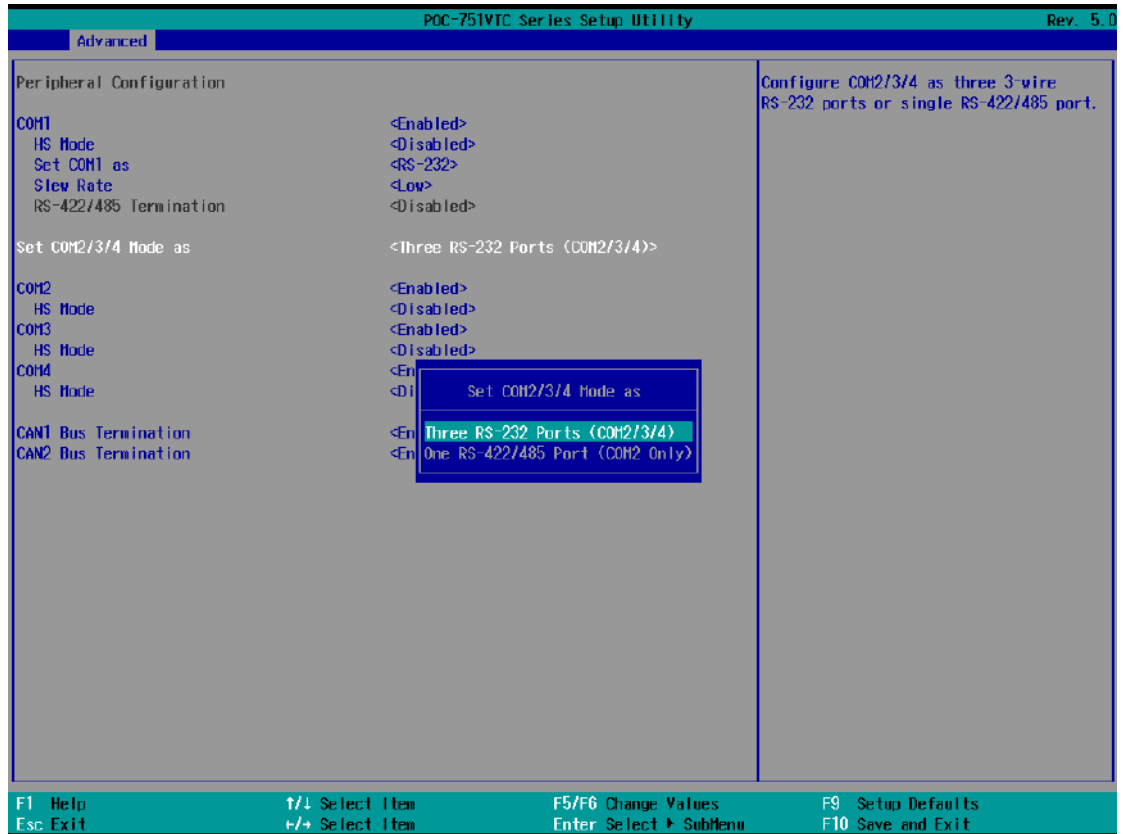
To enable COM/ 3/ 4 operating mode:

1. Press **F2** when the system boots up to enter the BIOS setup utility.

2. Go to **[Advanced]** → **[Peripheral Configuration]**.

3. Highlight the COM port (3 or 4) and set it to <Enabled> .

4. Once set, press **F10** to save setting and exit.

4.3   COM Port High Speed Mode

The high speed mode of each COM port effectively allows for the port's baud rate generator to operate at 8x the speed with an effective baud rate of 921,600 bps (115,200 x 8). Please refer to the following instructions on how to enable the high speed mode for your COM port (COM1 used as an example).

To set COM port high speed mode:

1.   Press **F2** when the system boots up to enter the BIOS setup utility.

2.   Go to **[Advanced] > [Peripheral Configuration]**.

3.   Enable or set the **[Set COM1 Mode as]** option to the desired mode.

4.   Highlight **[HS Mode]** and press ENTER to bring up options, highlight **[Enable]** and press ENTER.

5.   Once set, press **F10** to save setting and exit.

4.4 TPM Availability

Trusted Platform Module (TPM) is a hardware-based cryptoprocessor to secure hardware by integrating cryptographic keys into devices. The system is designed with on-board TPM 2.0 module. It is enabled in the BIOS by default.

To enable TMP availability:

1. When system boots up, press F2 to enter BIOS setup utility.

2. Go to **[Security] > [TPM Availability]**, press ENTER to bring up Options, Available/ Hidden.

3. Highlight your selection, press Enter and press F10 to "Exit Saving Changes".

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4.5 Power over Ethernet (PoE)

The Power over Ethernet (PoE) setting in the BIOS allows you to enable/ disable the PoE function of the designated port upon system boot up.
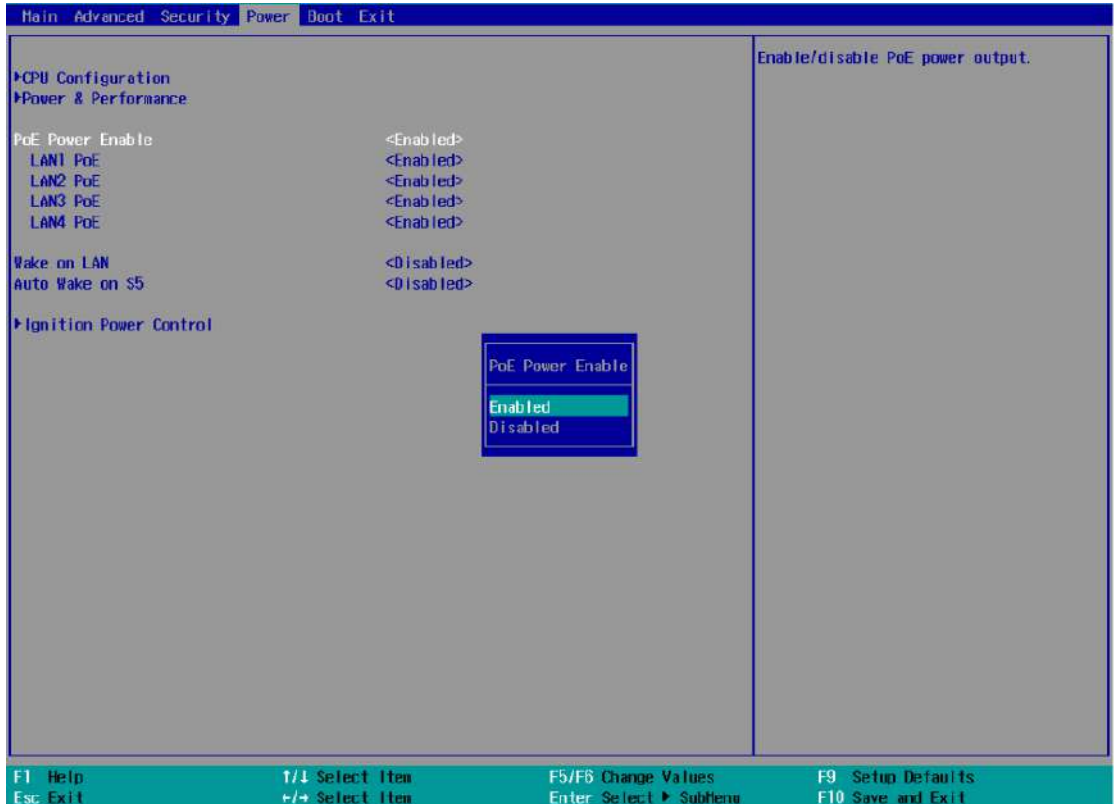
To enable/ disable Power over Ethernet settings:

1. Press **F2** when the system boots up to enter the BIOS setup utility.

2. Go to **[Power]** → **[PoE Enable]**

3. Use the up/ down arrow to highlight and select between Enabled/ Disabled, press Enter to make your selection.

4. When Enabled, you may set each LAN port's PoE function by selecting Enabled/ Disabled using the arrow key, press Enter to make your selection.
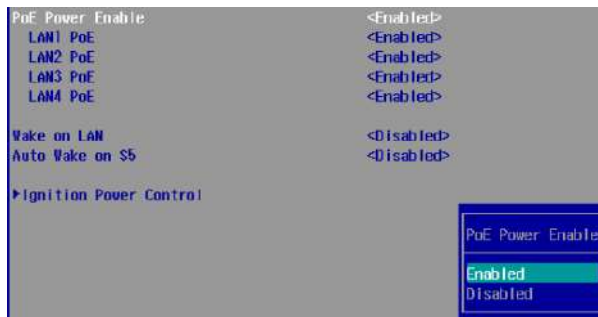
Enable/ Disable LAN PoE function   **Corresponding LAN ports**
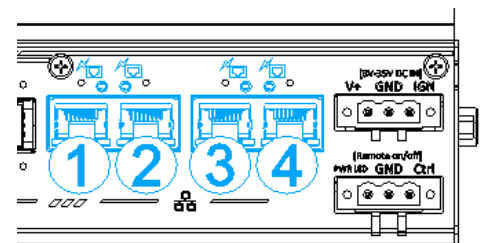
5. Once set, press F10 to save setting and exit.

4.6   Wake-on-LAN

Wake-on-LAN (WOL) is a mechanism which allows you to turn on your system via Ethernet connection. To utilize Wake-on-LAN function, you have to enable this option first in BIOS settings. Please refer to Powering on via Wake-on-LAN function.

```
                              POC-751VTC Series Setup Utility                            Rev. 5.0
 Main  Advanced  Security  Power  Boot  Exit

 ▶CPU Configuration                                        Determines the action taken when the
 ▶Power & Performance                                      system power is off and a Wake-on-LAN
                                                           event occurs on any of GbE port.
 PoE Power Enable                     <Enabled>
    LAN1 PoE                          <Enabled>
    LAN2 PoE                          <Enabled>
    LAN3 PoE                          <Enabled>
    LAN4 PoE                          <Enabled>

 Wake on LAN                          <Disabled>
 Auto Wake on S5                      <Disabled>

 ▶Ignition Power Control
                                            ┌──────────────┐
                                            │ Wake on LAN  │
                                            ├──────────────┤
                                            │ Disabled     │
                                            │ Enabled      │
                                            └──────────────┘




 F1  Help              ↑/↓ Select Item      F5/F6 Change Values      F9  Setup Defaults
 Esc Exit              ←/→ Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

To enable/ disable "Wake on LAN" option:

1. Press **F2** when the system boots up to enter the BIOS setup utility.

2. Go to **[Power]**.

3. You may enable/disable the **[Wake on LAN]** option.

4. Once set, press **F10** to save setting and exit.

4.7   C-States

Intel processors utilize C-States to regulate the power-draw and operating frequency of each core. By enabling this function, it allows BIOS to reduce the operating frequency, power-draw, or both of the idle processor core for the system to operate more efficiently. Please refer to the steps below to enable processor C-States.

To set "Power On after Power Failure" option:

1.   Press **F2** when the system boots up to enter the BIOS setup utility.

2.   Go to **[Power] > [Power & Performance]** and press ENTER.
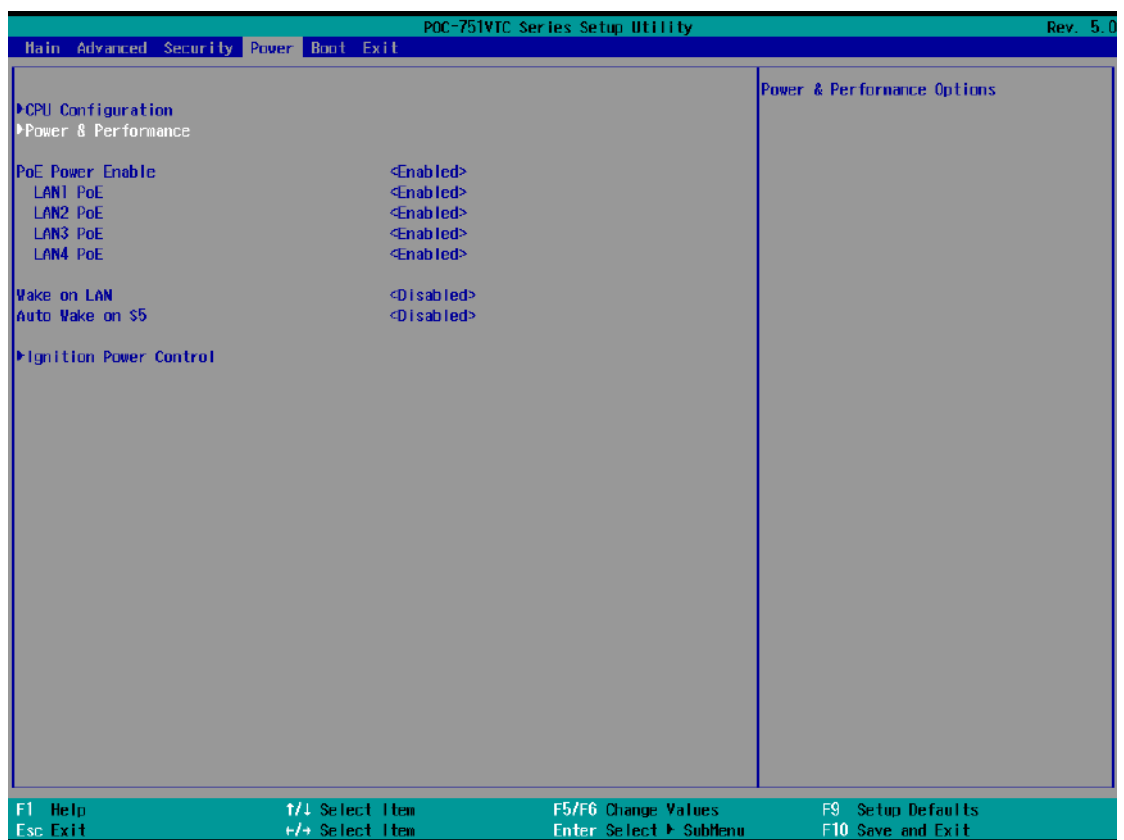
3. Highlight "**C states**" and press ENTER, set to "**Enabled**" and press ENTER.

4. Press F10 to "**Save and Exit**".
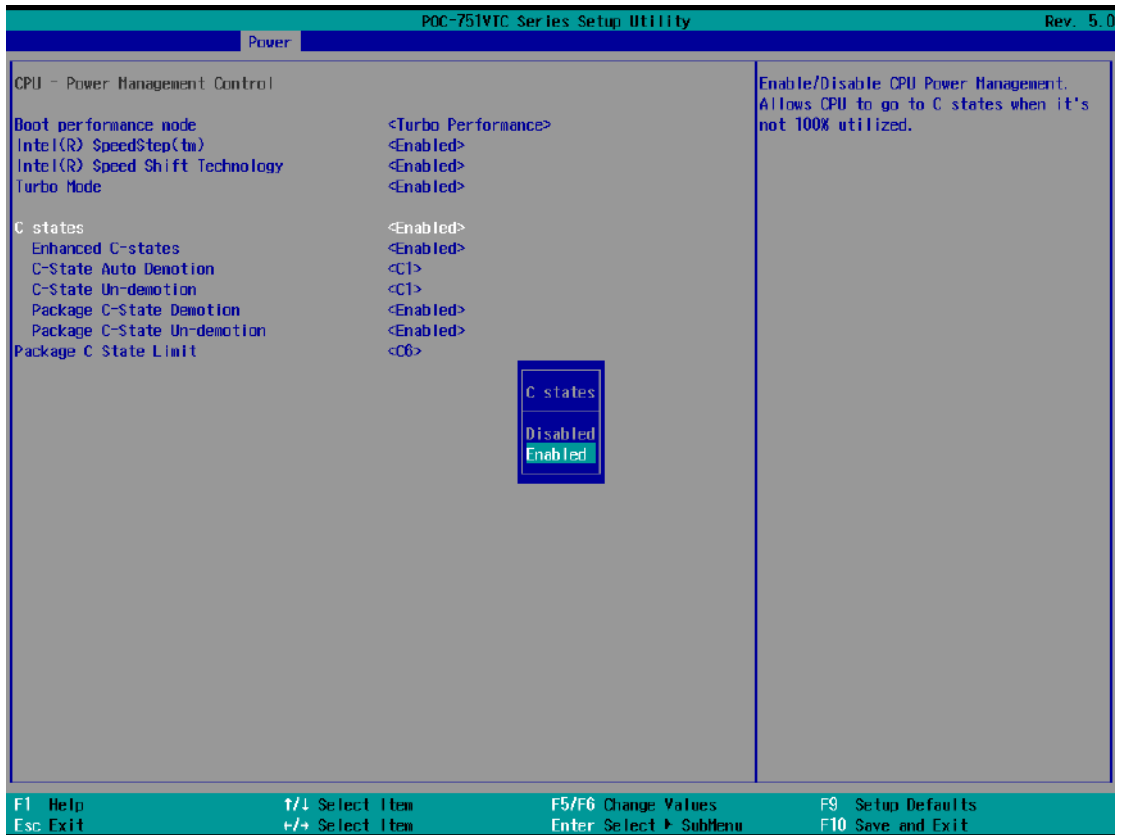
4.8   Auto Wake on S5

When the system is set to operate in S5 state, the user can specify a time to turn on
the system, daily or monthly.
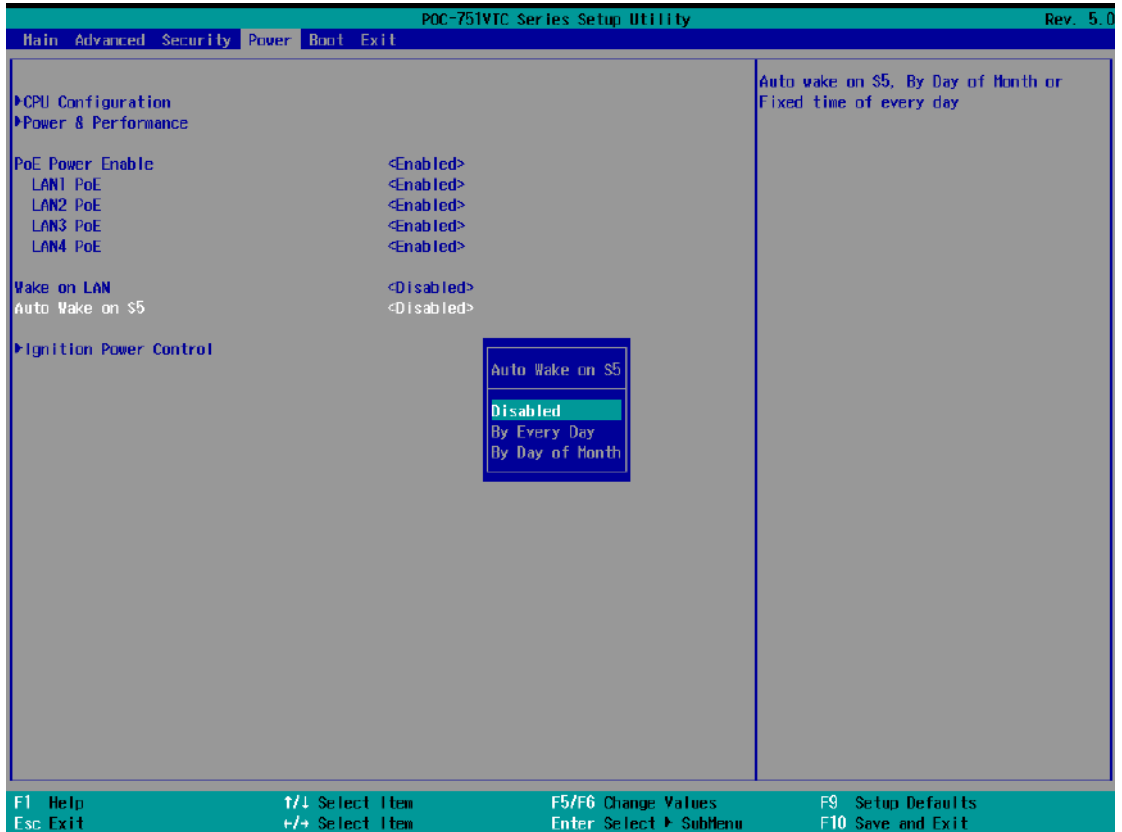
Value	Option	Description
Auto Wake on S5	Disabled	The system does not turn on when operating in state S5.
	By Every Day	The system turns on each day when operating in state S5. Specify the time of day.
	By Day of Month	The system turns on each month when operating in state S5. Specify the day and time.

Go to **[Power]** > **[Auto Wake on S5]**, highlight your selection, press ENTER and
press F10 to "Exit Saving Changes".

4.9   Ignition Power Control

> ✎ *NOTE*
>
> *The ignition power control's MCU is not a part of the BIOS and therefore its settings will **NOT** be affected when your press the CMOS button of your system.*
>
> *Should you clear the CMOS and you wish to reconfigure the IGN power-on delay setting also, please do the refer to the following steps:*
>
> *1. Set the ignition power control switch to 0 (ATX mode) or 1 (AT mode).*
>
> *2. Turn the system on, press F2 to access the BIOS.*
>
> *3. Press F9 to load default settings before accessing the ignition power control settings.*
>
> *4. Once reconfigured, please set the ignition power control switch back to the F position.*

The system ignition power control is set via its BIOS. The ignition power control module for in-vehicle applications is an MCU-based implementation that monitors the ignition signal and reacts to turn on/off the system according to predefined on/off delay. Its built-in algorithm supports other features such as ultra-low power standby, battery-low protection, system hard-off, etc.
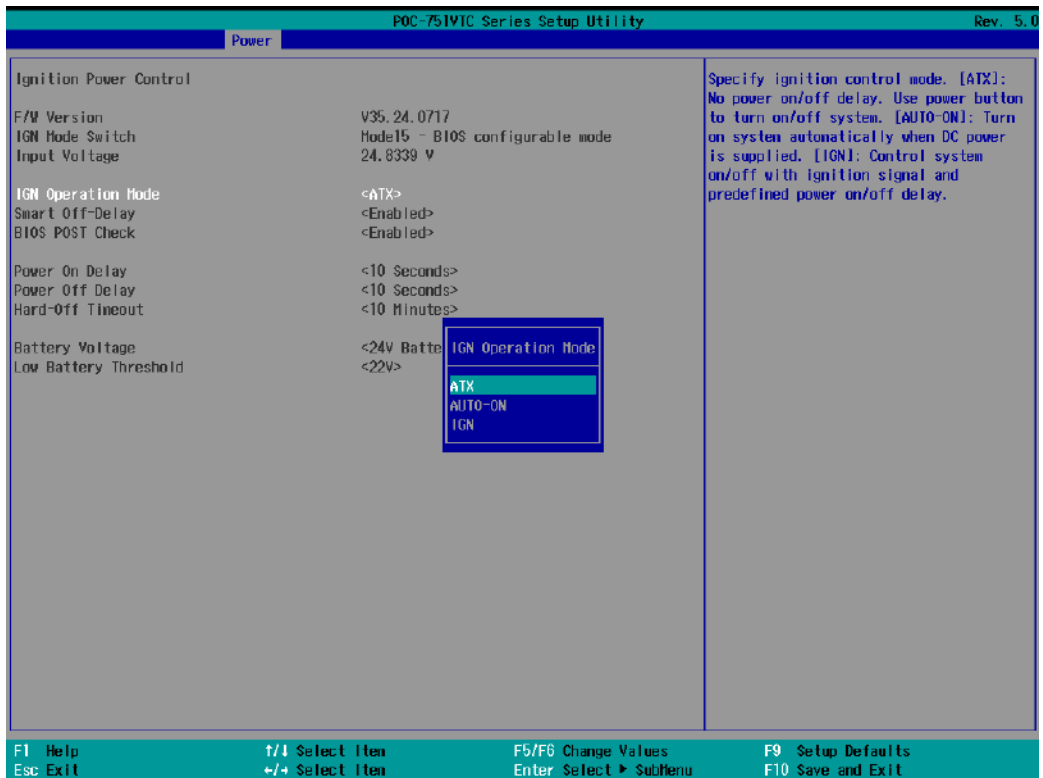
To set IGN settings:

1. Press F2 when the system boots up to enter the BIOS setup utility.

2. Go to **[Power] > [Ignition Power Control]** and press ENTER.

3. Highlight **[IGN Operation Mode]** and select the setting you desire

Setting	Description
[ATX]	The power button turns on/ off the system without delay.
[Auto-on]	The system powers on automatically when DC power is supplied
[IGN]	User set power on/ off delay settings.

4. The ignition power on delay has the following predefined settings.
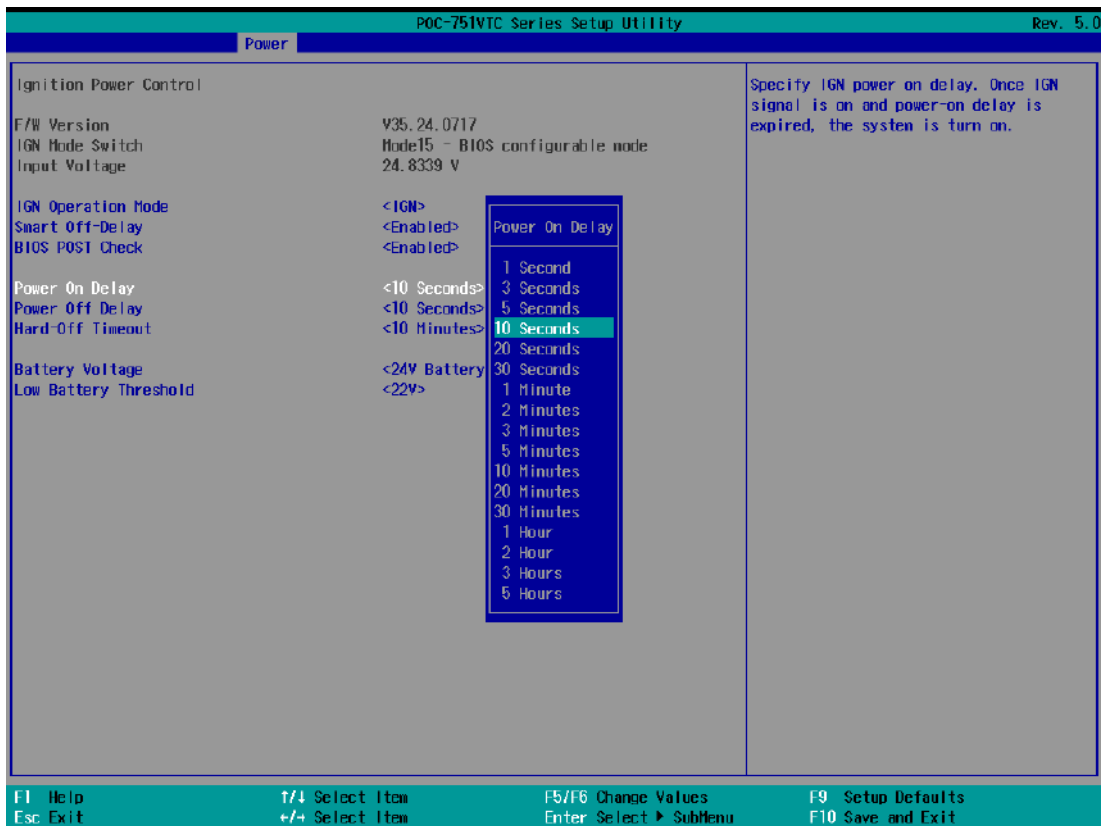
5. The ignition power off delay has the following predefined settings.
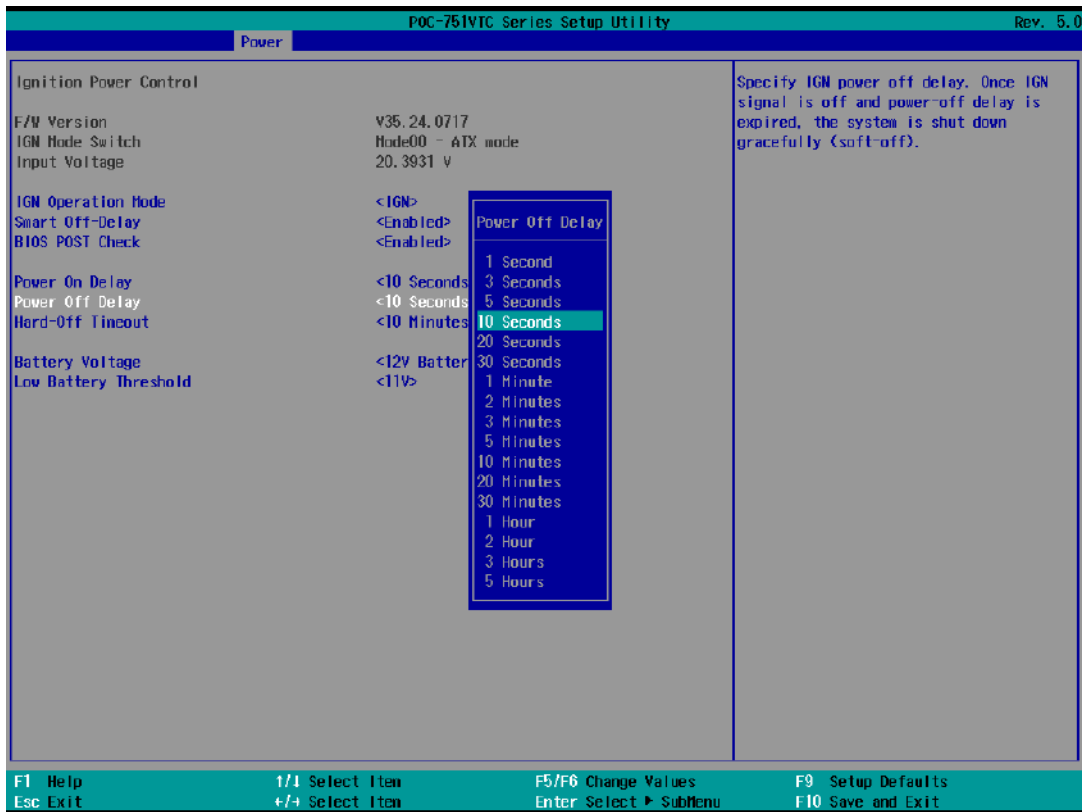
6. You can also set the battery supplied voltage to suit your vehicle type.
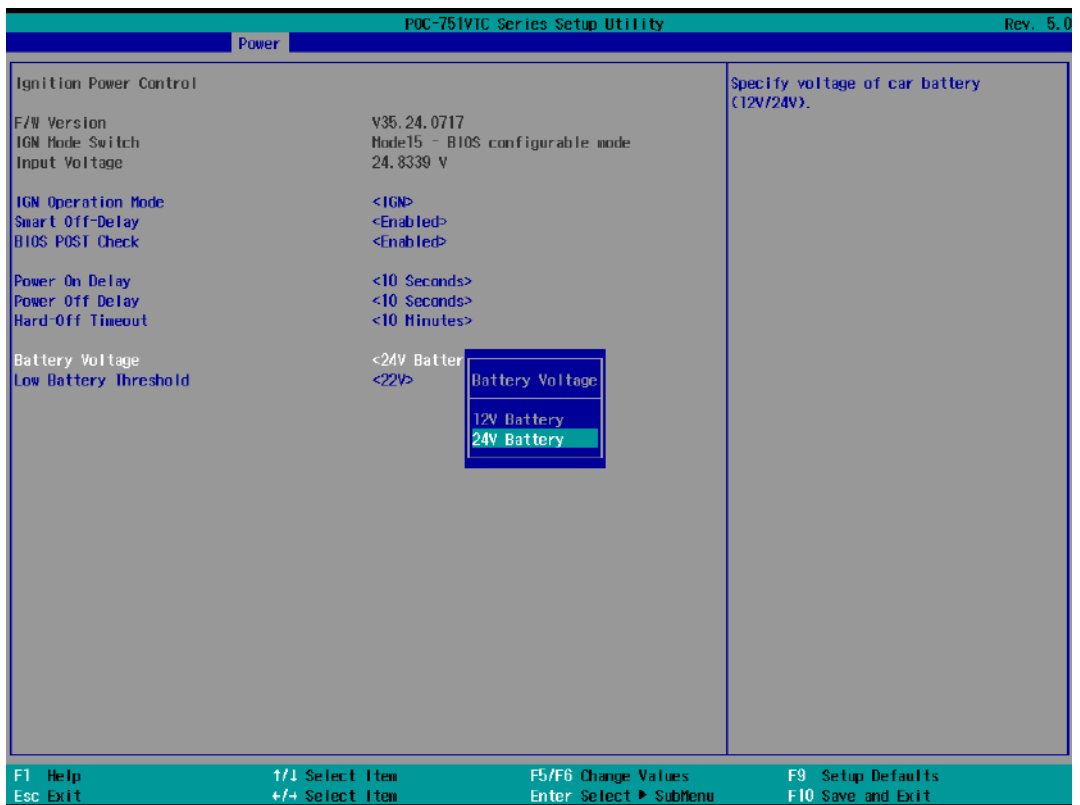
7.   A low battery threshold can also be set.
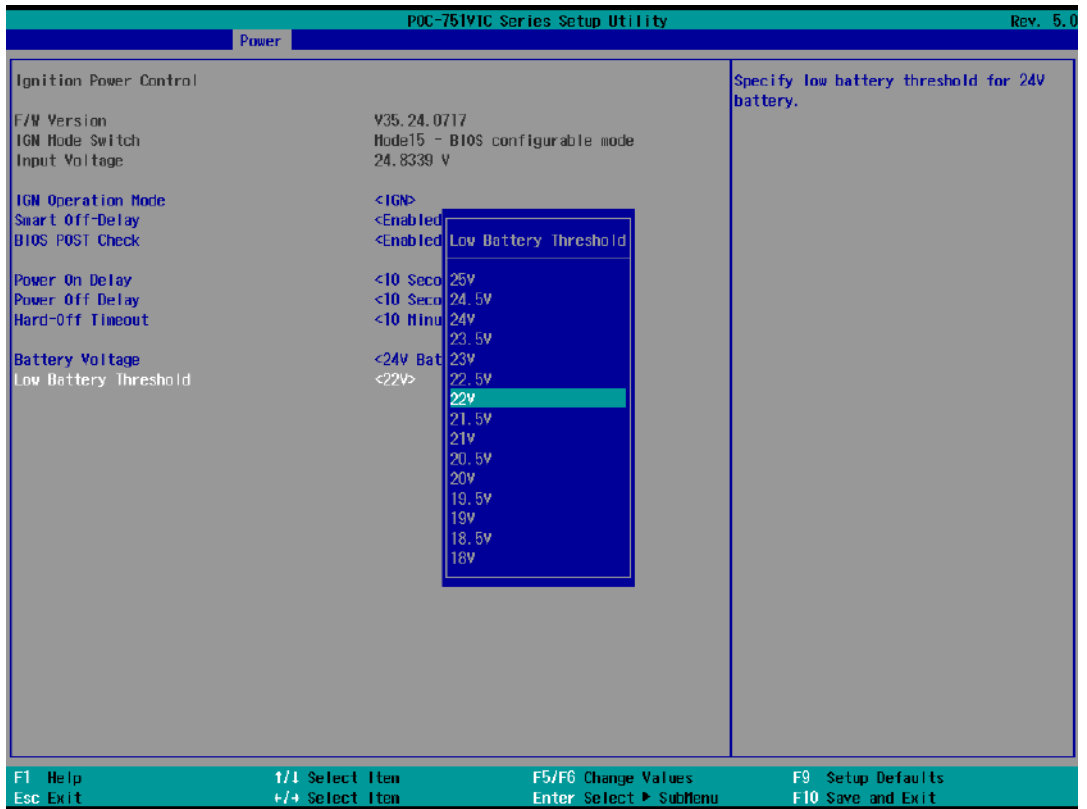
4.10 Boot Menu

The Boot menu in BIOS allows you to specify the system's boot characteristics by
setting bootable device components (boot media) and method. Or, you may press
F12 upon system start up and select a device you wish boot from.
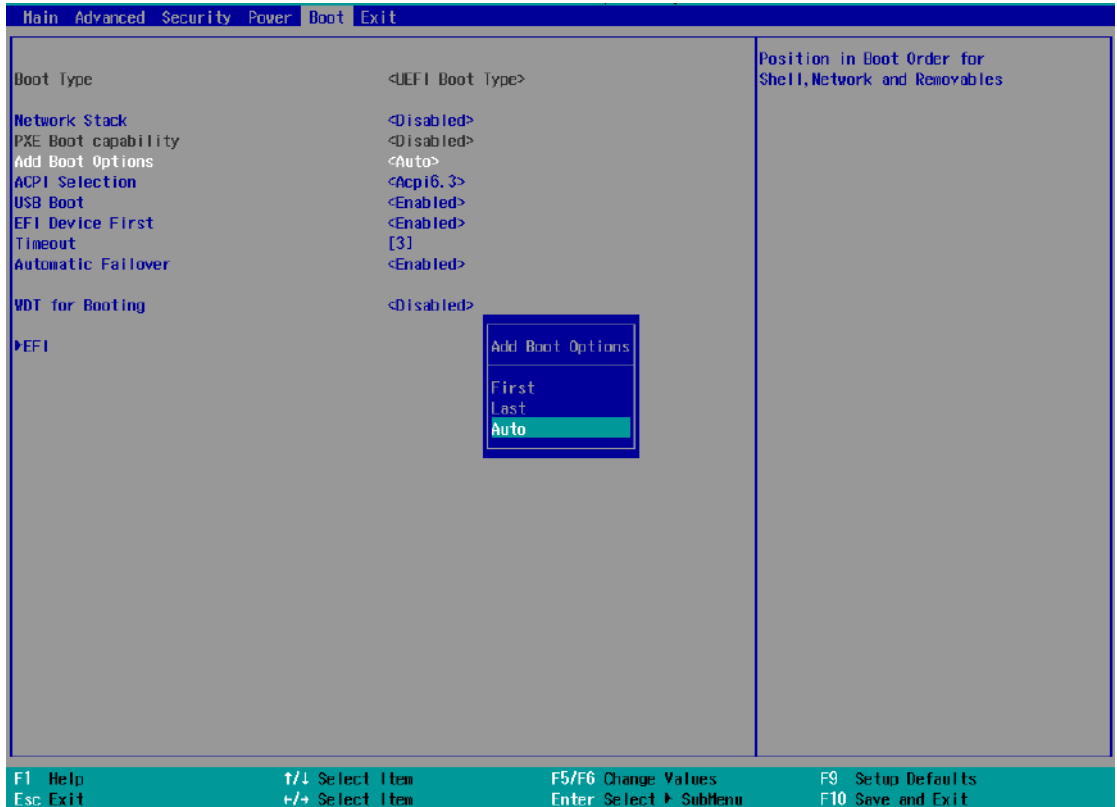
Value	Option	Description
Boot Type	UEFI Boot Type	Only UEFI boot media listed are approved as boot media.
Quick Boot	Enabled	The system starts up faster because BIOS skips various hardware function tests
	Disabled	The system starts up slower because BIOS goes through various hardware functions tests
Network Stack	Enabled	The system is available for network access using UEFI.
	Disabled	The system is not available for network access using UEFI.
PXE Boot capability	Enabled	By enabling this function, it allows the computer to load an operating system over a network connection.
	Disabled	

Add Boot Options	First	Newly detected boot media are placed at the top of the boot order.
	Last	Newly detected boot media are placed at the bottom of the boot order.
	Auto	Newly detected boot media order will be automatically detected and placed in boot order.
ACPI Selection	4.0/ 5.0/ 6.0/ 6.1/ 6.3	Advanced Configuration and Power Interface allows the operating system to control system power management
USB Boot	Enabled	Allow boot from bootable USB devices.
	Disabled	Does not allow boot from bootable USB devices
EFI Device First	Enabled	Set to boot bootable EFI media first.
	Disabled	Will not boot bootable EFI media first.
Timeout	1, 2, 3, etc (in seconds)	Boot delay time in seconds to give the user time to activate the hotkey to access the BIOS
Automatic Failover	Enabled	Automatically checks for the next bootable device when the set default device fails.
	Disabled	Will only boot from the designated device.
WDT for booting	Disabled, 1, 3, 5, 10 (minutes)	WDT ensures a successful system boot by specifying a timeout value

4.11 Position New Boot Device

The "Add Boot Options" allow you to determine whether a newly added device (eg. USB flash disk) is to boot as the first device to boot or the last in the boot sequence.

```
Main  Advanced  Security  Power  Boot  Exit

                                                      Position in Boot Order for
Boot Type                      <UEFI Boot Type>       Shell,Network and Removables

Network Stack                  <Disabled>
PXE Boot capability            <Disabled>
Add Boot Options               <Auto>
ACPI Selection                 <Acpi6.3>
USB Boot                       <Enabled>
EFI Device First               <Enabled>
Timeout                        [3]
Automatic Failover             <Enabled>

WDT for Booting                <Disabled>

▶EFI                                        Add Boot Options

                                            First
                                            Last
                                            Auto

F1  Help               ↑/↓ Select Item    F5/F6 Change Values      F9  Setup Defaults
Esc Exit               ←/→ Select Item    Enter Select ▶ SubMenu   F10 Save and Exit
```

To set the newly-installed boot device as the first or last boot device:

8. Press **F2** when the system boots up to enter the BIOS setup utility.

9. Go to **[Boot] > [Add Boot Options]** menu.

10. Select **[First]** or **[Last]** for your newly-added boot device and press Enter.

11. Once set, press **F10** to save setting and exit.

4.12 Watchdog Timer

The watchdog timer secures the boot process by means of a timer. Once the timer expires, a reset command is issued to initiate another booting process. There are two options in BIOS menu, "*Automatically after POST*" and "*Manually after Entering OS*". When "*Automatically after POST*" is selected, the BIOS automatically stops the watchdog timer after POST (Power-On Self Test) OK. When "*Manually after Entering OS*" is selected, the user must stop the watchdog timer once booted into the OS. This guarantees the system can always boot into the OS, otherwise another booting process will be initiated. For information about programming watchdog timer, please refer to **Appendix A Using WDT & DIO**.

To set the watchdog timer for boot in BIOS:

1. Press **F2** when the system boots up to enter the BIOS setup utility.

2. Go to **[Boot]** menu.

3. Disable or select timeout value for **[WDT for Booting]** option.

4. Once you set a timeout value, the **[WDT Stop Option]** option appears. You can select either *"Automatically after POST"* or *"Manually after Entering OS"*.

5. Once set, press **F10** to save setting and exit.

5 OS Support and Driver Installation

5.1 Operating System Compatibility

The system supports most operating system developed for Intel® x86 architecture. The following list contains the operating systems which have been tested by Neousys Technology.

- Microsoft Window 10 LTSC 2021 (x64)
- Microsoft Windows 11 IoT Enterprise 22H2 64-bit
- Ubuntu 20.04.2 LTS or other distribution with kernel version ≥ 5.19 */**

NOTE

For other Linux OS, Linux kernel should upgrade to 5.19

*For Linux system, user may need to manually compile and install the driver for Intel graphics or Ethernet controller if the driver is not embedded in kernel. You can visit Intel website for further information.

**For distributions, graphics driver may not be completely implemented in its kernel. You may encounter restrictions when using these features, such as multiple independent displays. For optimum operation, it is the users' responsibility to manually check for new drivers and upgrades!

Neousys may remove or update operating system compatibility without prior notice. Please contact us if your operating system of choice is not on the list.

5.2 Driver Installation

The system drivers are available online, please click on this link to download the drivers.

5.3 Driver Installation for Watchdog Time Control

Neousys provides a driver package which contain function APIs for Watchdog Timer control function. You should install the driver package (WDT_DIO_Setup.exe) in prior to use these functions. Please download the latest version of WDT_DIO_Setup.exe to ensure compatibility.

Please refer to this link to download WDT_DIO.

Appendix A Using WDT & DIO

The watchdog timer (WDT) function ensures reliable system operation. The WDT is a hardware mechanism to reset the system if the watchdog timer is expired. Users can start the WDT and keeping resetting the timer to make sure the system or program is running. Otherwise, the system shall be reset.

In this section, we'll illustrate how to use the function library provided by Neousys to program the WDT functions. Currently, WDT driver library supports Windows 10 x64 and WOW64 platform. For other OS support, please contact Neousys Technology for further information.

Installing WDT_DIO Library

The WDT_DIO function library is delivered in the form of a setup package named **WDT_DIO_Setup.exe**. In prior to program WDT, you should execute the setup program and install the WDT library. Please use the following WDT_DIO_Setup packages according to your operating systems and application.

NOTE

Please download from Neousys website and install the latest WDT_DIO_Setup.exe file.

WDT and DIO Library Installation

WDT_DIO_Setup.2.4.0.0.exe will be used as an example to demonstrate WDT & DIO Library installation setup process. Please refer to the instructions below.

1. Execute **WDT_DIO_Setup.2.4.0.0.exe**.
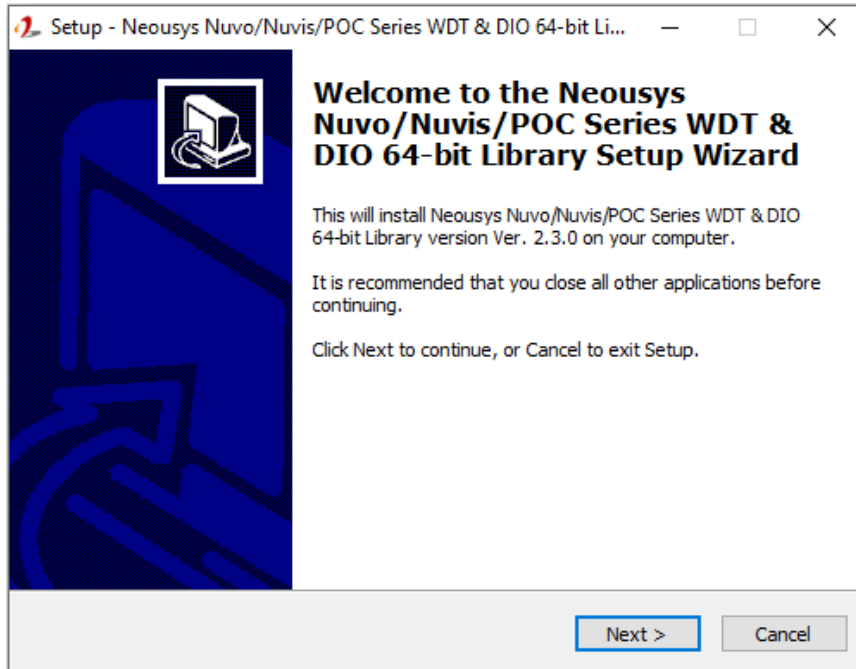
2. Click "Next >" and specify the directory of installing related files. The default directory is *C:\Neousys\WDT_DIO*.
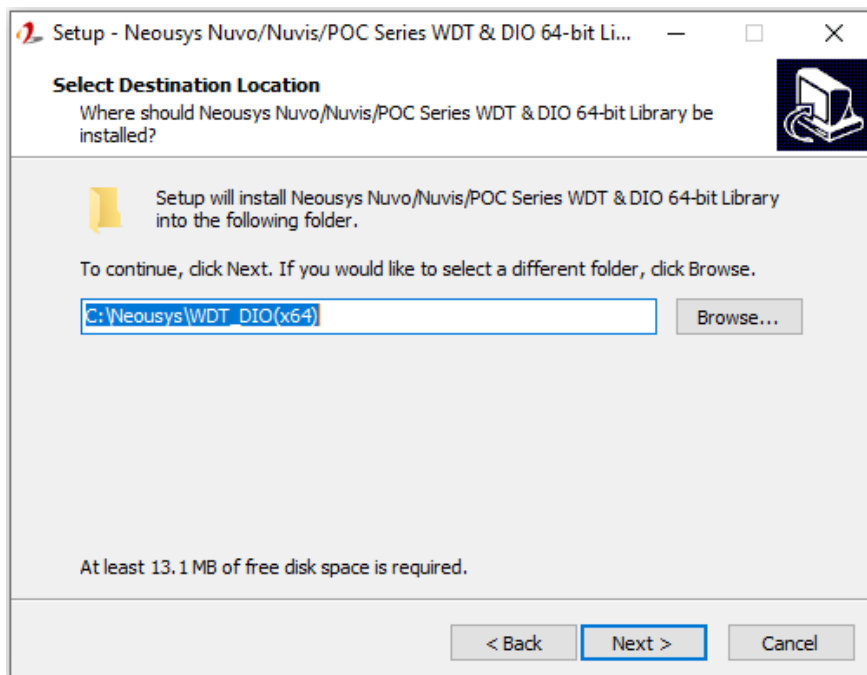
3. Once the installation has finished, a dialog will appear to prompt you to reboot the system. The WDT & DIO library will take effect after the system has rebooted.
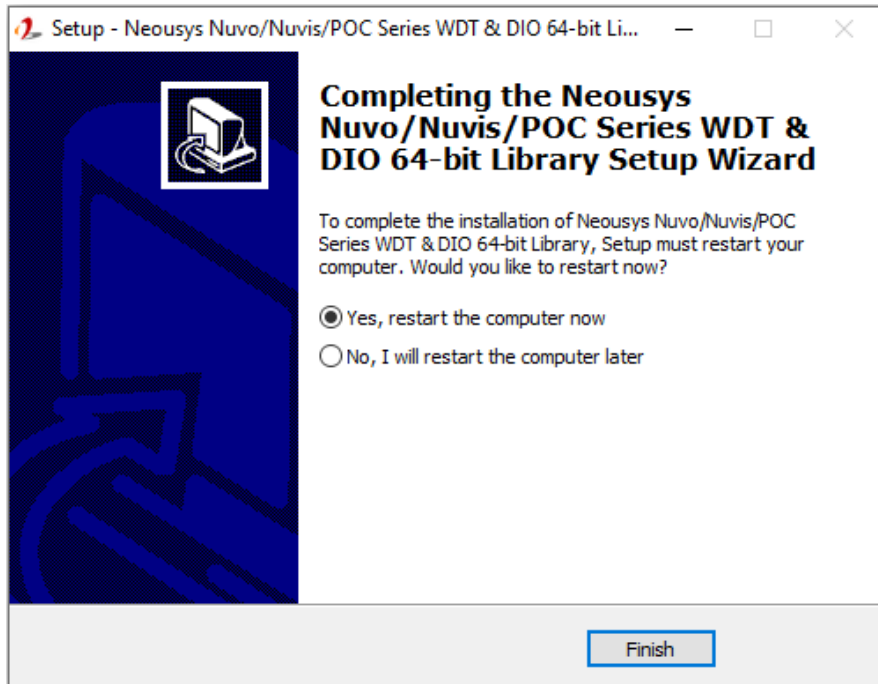
4. When programming your WDT or DIO program, the related files are located in

Header File:	\Include
Library File:	\Lib
Function Reference:	\Manual
Sample Code:	\Sample\WDT_Demo (Demo for Watchdog Timer) \Sample\DIO_Demo (Demo for isolated DIO Control) \Sample\COS_Demo (Demo for change-of-state DI)

WDT Function Reference

InitWDT

Syntax	BOOL InitWDT(void);
Description:	Initialize the WDT function. You should always invoke InitWDT() before set or start watchdog timer.
Parameter	None
Return Value	**TRUE:** Successfully initialized **FALSE:** Failed to initialize
Usage	BOOL bRet = InitWDT()

SetWDT

Syntax	BOOL SetWDT(WORD tick, BYTE unit);
Description	Set timeout value and unit for watchdog timer. When InitWDT() is invoked, a default timeout value of 255 seconds is assigned.
Parameter	*tick* 　　WORD value (1 ~ 65535) to indicate timeout ticks. *unit* 　　BYTE value (0 or 1) to indicate unit of timeout ticks. 　　0 : unit is minute 　　1: unit is second
Return Value	If value of unit is correct (0 or 1), this function returns TRUE, otherwise FALSE.

Usage	WORD tick=255;
	BYTE unit=1; //unit is second.
	BOOL bRet = SetWDT(tick, unit); //timeout value is 255 seconds

StartWDT

Syntax	BOOL StartWDT(void);
Description	Starts WDT countdown. Once started, the WDT LED indicator will begin blinking. If ResetWDT() or StopWDT is not invoked before WDT countdowns to 0, the WDT expires and the system resets.
Parameter	None
Return Value	If the timeout value is given in correct format (WDT started), this function returns TRUE, otherwise FALSE
Usage	BOOL bRet = StartWDT()

ResetWDT

Syntax	BOOL ResetWDT(void);
Description	Reset the timeout value to the value given by SetWDT().If ResetWDT() or StopWDT is not invoked before WDT countdowns to 0, the WDT expires and the system resets.
Parameter	None
Return Value	Always returns TRUE
Usage	BOOL bRet = ResetWDT()

StopWDT

Syntax	BOOL StopWDT(void);
Description	Stops the countdown of WDT. When WDT has stopped, the WDT LED indicator stops blinking.
Parameter	None
Return Value	Always returns TRUE
Usage	BOOL bRet = StopWDT()

DIO Functions

InitDIO

Syntax	BOOL InitDIO(void);
Description	Initialize the DIO function. You should always invoke InitDIO() before write/read any DIO port/channel.
Parameter	None
Return Value	Returns TRUE if initialization successes, FALSE if initialization failed.
Usage	BOOL bRet = InitWDT()

DIReadLine

Syntax	BOOL DIReadLine(BYTE ch);
Description	Read a single channel of isolated digital input.
Parameter	*ch* BYTE value specifies the DI channel to be read. C*h* should be a value of 0 ~ 7.
Return Value	The status (TRUE or FALSE) of the specified DI channel.

Usage	BYTE ch=3; //DI channel #3
	
	BOOL DIChValue = DIReadLine(ch); //read DI channel #3

DIReadPort

Syntax	WORD DIReadPort(void);
Description	Read the entire isolated digital input port (8 channels).
Parameter	None
Return Value	A WORD value (0~255) indicates the status of DI port (8 DI channels).
Usage	WORD DIPortValue = DIReadPort ();

DOWriteLine

Syntax	void DOWriteLine(BYTE ch, BOOL value);
Description	Write a single channel of isolated digital output.
Parameter	*ch* BYTE value specifies the DO channel to be written. C*h* should be a value of 0 ~ 7. *value* BOOL value (TRUE or FALSE) specifies the status of DO channel.
Return Value	None

Usage	BYTE ch=3; //DI channel #3
	BOOL DOChValue=TRUE;
	
	DOWriteLine(ch, DOChValue); //write DO channel #3 as TRUE

DOWritePort

|	
Syntax	void DOWritePort(WORD value);
Description	Write the entire isolated digital output port (8 channels).
Parameter	*value* WORD value specifies the status of the DO port. V*alue* should be a value of 0~255.
Return Value	None
Usage	WORD DOPortValue=0XFF; //11111111b DOWritePort(DOPortValue); //write DO port as 11111111b

Appendix B PoE On/ Off Control

The system offers four 802.3at PoE+ ports with a unique feature to allow users manually turn on or off the power supply of each PoE port. This can be function can be useful in power device (PD) fault-recovery or power reset.

The function APIs are encapsulated in Neousys WDT_DIO driver package. Please follow the instructions in Appendix A Watchdog Timer & Isolated DIO to install the driver package prior to programming PoE on/off control function

PoE On/ Off Control Function Reference

GetStatusPoEPort

Syntax	BYTE GetStatusPoEPort (Byte port);
Description	Get current on/off status of designated PoE port.
Parameter	*port* BYTE value specifies the index of PoE port. Please refer to the following illustration, *port* should be a value of 1 ~ 4.
Return Value	BYTE value indicating PoE on/off status 0 if port is disabled (off) 1 if port is enabled (on)
Usage	BYTE bEnabled = GetStatusPoEPort (1); //Get on/off status of PoE Port#1
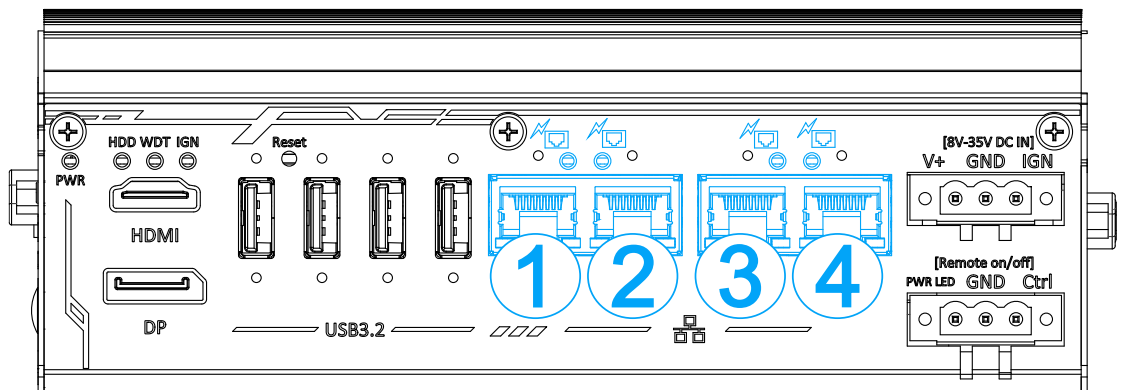
EnablePoEPort

Syntax	BOOL EnablePoEPort (BYTE port);
Description	Turn on PoE power of designated PoE port.
Parameter	*port* BYTE value specifies the index of PoE port. Please refer to the following illustration, *port* should be a value of 1 ~ 4
Return Value	**TRUE** if enabled success **FALSE** if fail to enable.
Usage	BOOL bRet = EnablePoEPort (1); //Turn on PoE Port#1
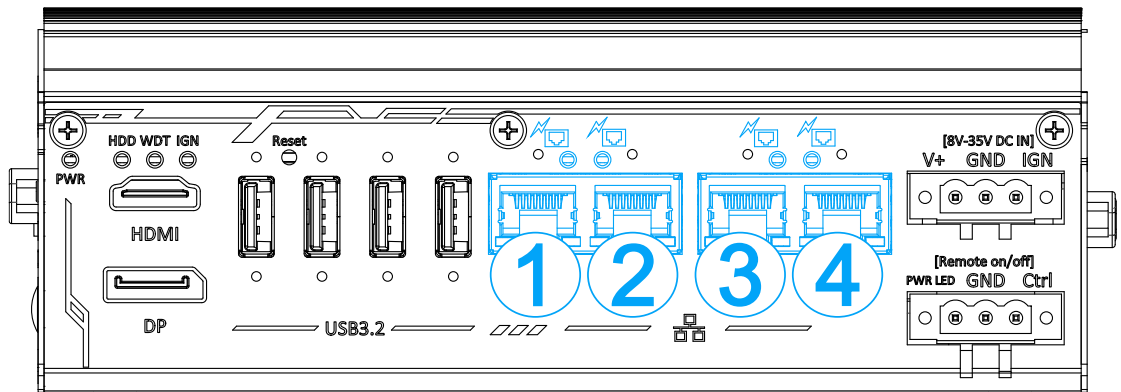
DisablePoEPort

Syntax	BOOL DisablePoEPort (BYTE port);
Description	Turn off PoE power of designated PoE port
Parameter	*port* BYTE value specifies the index of PoE port. Please refer to the following illustration, *port* should be a value of 1 ~ 4
Return Value	**TRUE** if disabled success **FALSE** if fail to disable
Usage	BOOL bRet = DisablePoEPort (1); //Turn off PoE Port#1