Neousys Technology Inc.

POC-465AWP Series

User Manual

Revision 1.2

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Legal Information

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Neousys Technology Inc. may modify, update or upgrade the software, firmware or any accompanying user documentation without any prior notice. Neousys Technology Inc. will provide access to these new software, firmware or documentation releases from download sections of our website or through our service partners.

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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 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.

CE

The product(s) described in this manual complies 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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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

- By means of a power cord connected to a socket-outlet with earthing connection

- This product is intended to be supplied by a Listed Power Adapter or DC power source, rated 8-35Vdc, 16A, Tma 70 degree C and 5000m altitude during operation. If further assistance is required, please contact Neousys Technology

- 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 styrofoam 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-465AWP series systems.

Revision History

Version	Date	Description
1.0	Sep. 2023	Initial release
1.1	Nov. 2023	Updated recommended screw torque force when reinstalling enclosure panel.
1.2	Aug. 2025	Updated ignition power control's low battery detection specifications

1   Introduction

POC-465AWP is a new segment of Neousys fanless computers featuring an IP66 rating based on Intel® Elkhart Lake Atom. The acronym AWP stands for Affordability, Waterproof, and Protection. In short, the POC-465AWP is designed to solve your everyday environmental challenges. With IP66 waterproof protection in a stainless steel and aluminum chassis, the air-tight system prevents internal PCBA corrosion in high salinity or humidity situations. Secondly, the hermetic enclosure can be deployed into grimy or dusty air-polluted environments such as a farm or mining site without being affected. The system also features -25°C to 70°C wide operating temperature capability and an efficient heat dissipation design to minimize thermal throttling.
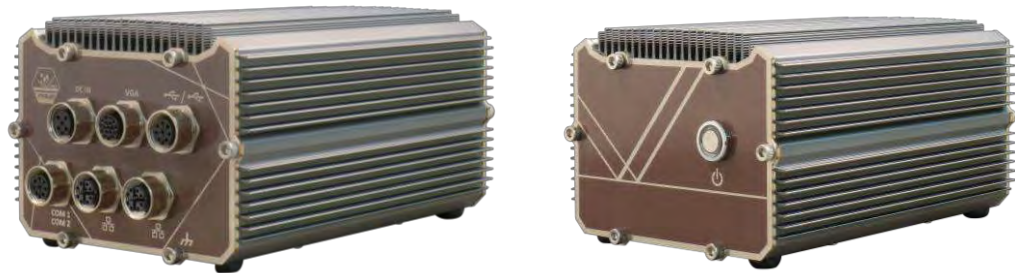
Connection-wise, POC-465AWP comes with M12 connectors to ensure connection in demanding, shock, and vibration environments. The system has two 2.5G Ethernet ports, one isolated RS-232, and one isolated RS-422/485. The isolated design protects the motherboard from voltage spikes that may damage internal components. It also has a VGA, two USB2.0, an M.2 M key to support SATA SSD, and a mini-PCIe for wireless WiFi/ LTE, CAN bus, etc.

Combining IP66, M12 and great thermal design, POC-465AWP is reliable and highly tolerant to challenging conditions to fulfill versatile applications. Its ultra-compact size fits easily into confined spaces, and its waterproof capability makes it suitable for outdoor applications like wildfire detection, unmanned vehicle; or harsh environments like food / beverage manufacturing and pharmaceutical processing. The IP66 rating is an additional function that can enhance a product's value and quality, and such is the case with Neousys' POC-465AWP

1.1 Specification of POC-465AWP

System Core	
Processor	Intel® Elkhart Lake Atom® x6425E quad-core 2.0GHz/3.0GHz 12W processor
Graphics	Integrated Intel® UHD Graphics
Memory	Up to 32 GB DDR4-3200 SDRAM by one SODIMM socket
TPM	Supports TPM 2.0 (fTPM/ dTPM)
Panel I/O Interface	
Ethernet	2x 2.5GBASE-T Ethernet ports by Intel® I226-IT via M12 X-coded, 8-pin connector
Video Port	1x VGA connector, supporting 1920 x 1200 resolution, via M12 A-coded, 17-pin connector
Serial Port	1x isolated RS-232 port (COM1) and 1x isolated RS-422/ 485 ports (COM2) via M12 A-coded, 8-pin connector
USB 2.0	2x USB 2.0 ports via M12 A-coded, 8-pin connector
Storage Interface	
M.2 M key	1x M.2 2280 M key socket for SATA SSD
Internal Expansion Bus	
mini-PCIe	1x full-size mini-PCIe Express socket with internal micro SIM socket
Power Supply	
DC Input	8-35V DC input with ignition power control input via M12 A-coded, 5-pin connector
Mechanical	
Dimension	106 mm (W) x 159.7 mm (D) x 79 mm (H)
Weight	1.45kg
Mounting	Wall-mount (optional)
Environmental	
Operating Temperature	-25°C to 70°C */**
Storage Temperature	-40°C to 85°C */**
Humidity	10%~90% , non-condensing
Vibration	Operating, MIL-STD-810G, Method 514.6, Category 4
Shock	Operating, MIL-STD-810G, Method 516.6, Procedure I, Table 516.6-II
EMC	CE/FCC Class A, according to EN 55032 & EN 55035

* For wide temperature use condition, a wide temperature/industrial M.2 M key SATA SSD module is required.
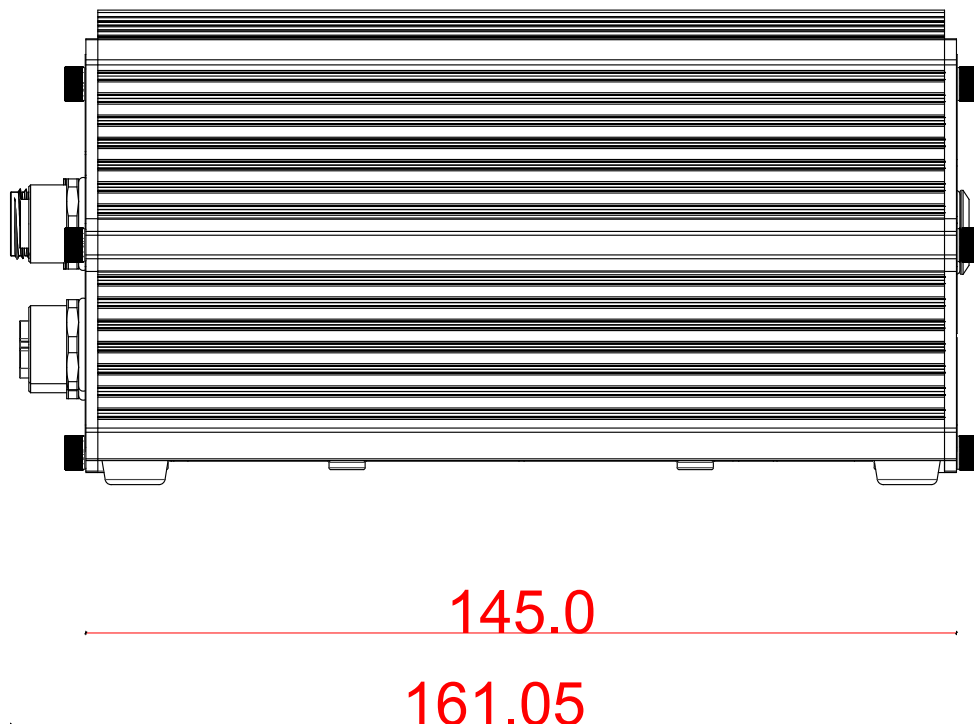
** For full function use condition (mini-PCIe and M.2 are all adopted), the operating temperature may be constrained by mini-PCIe and M.2 modules. Please contact Neousys Technology.

1.2 Dimension

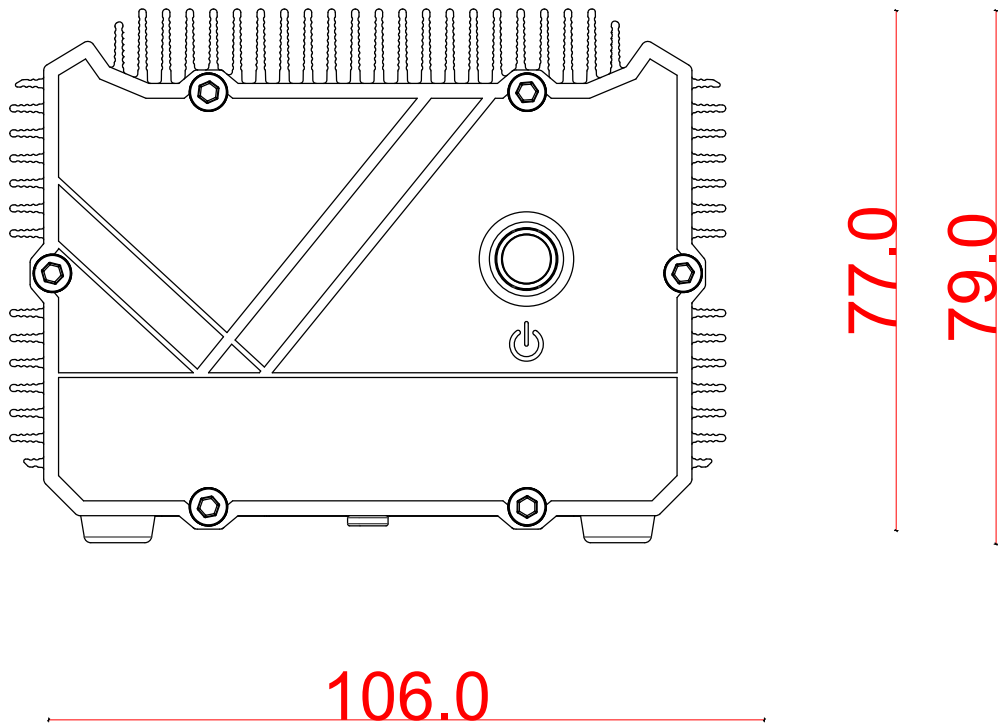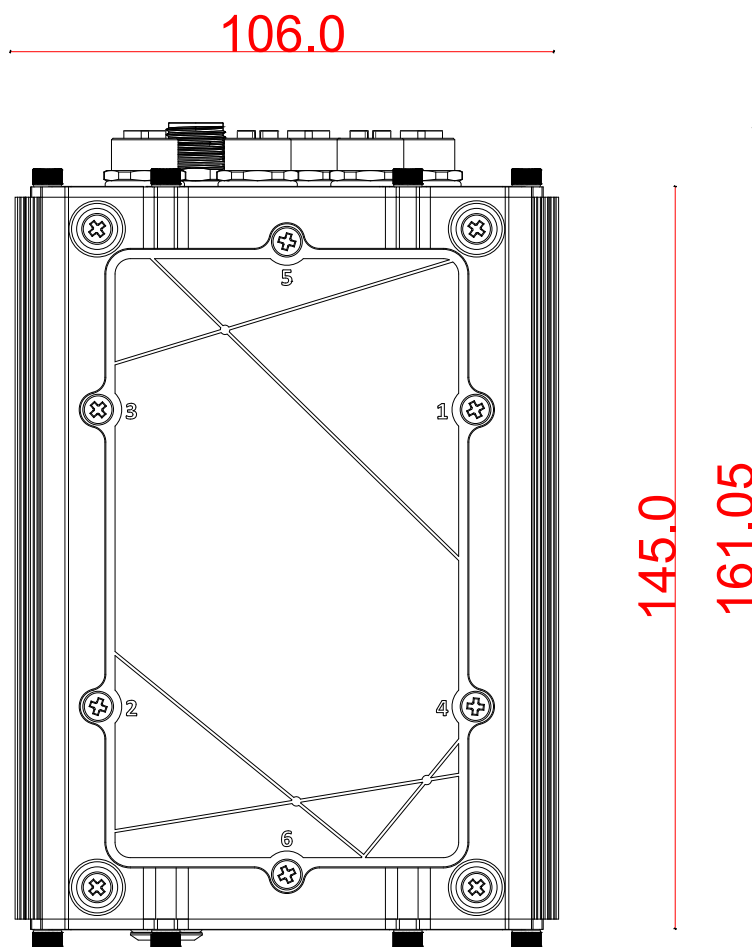### 1.2.1 I/O Panel View
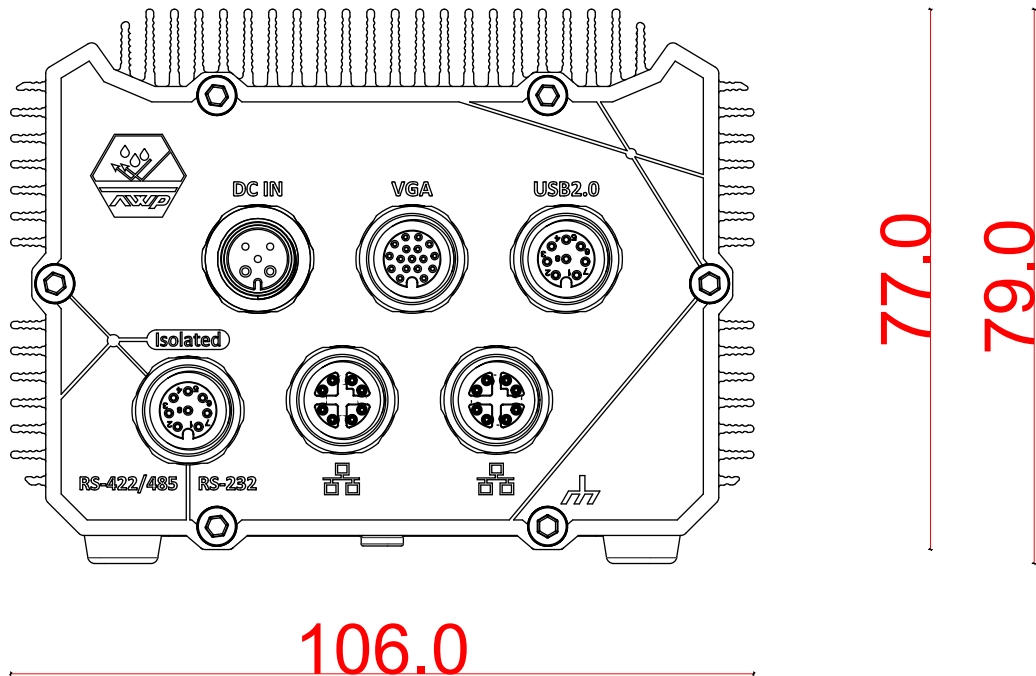
1.2.2 Side View

1.2.3 Power Button Panel View

77.0

79.0

106.0

1.2.4 Bottom View

106.0

145.0

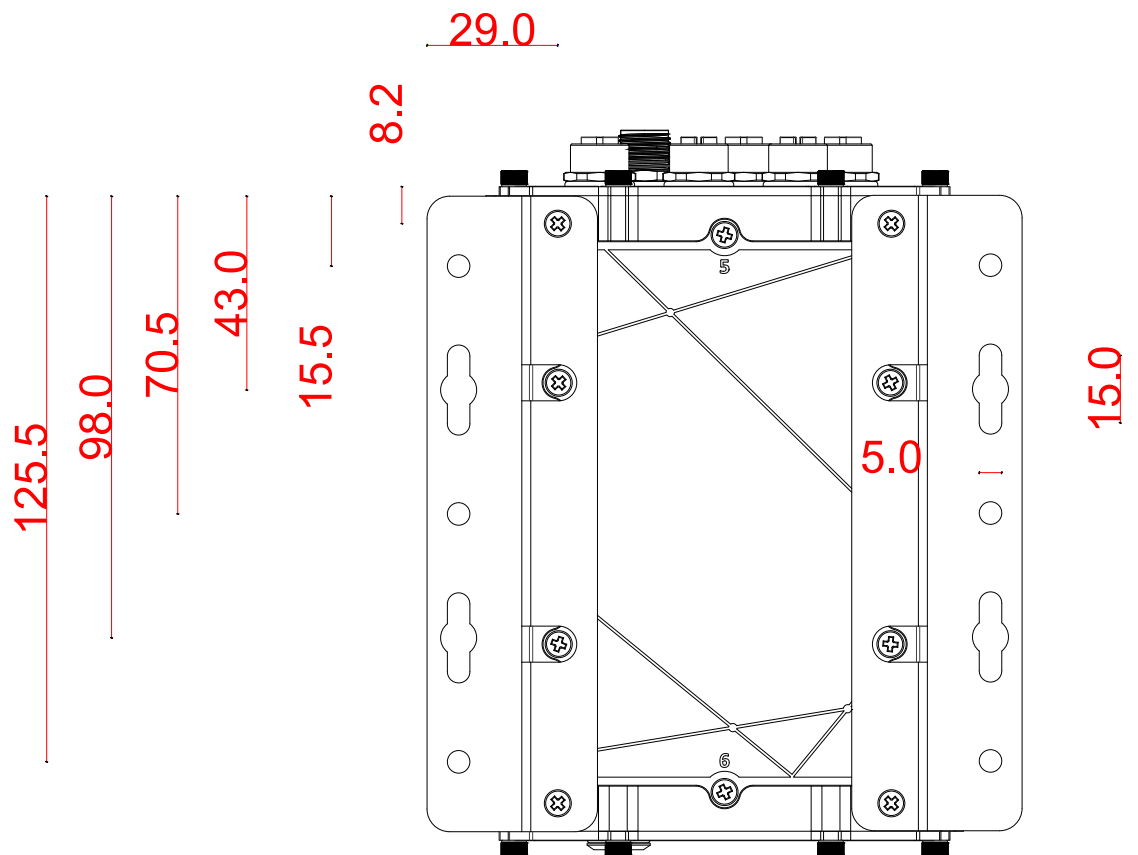161.05

1.2.5 Wall Mount Bracket Dimensions (Optional)

The system comes with an optional wall mount bracket.

2 System Overview

Upon receiving and unpacking your POC-465AWP series, 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-465AWP ultra-compact fanless computer (Please verify additionally purchased accessories such as memory module, M.2 SSD, TPU, etc.)	1

Optional M12 Cable Kit

Item	Description	Qty
1	A5 DCIN cable, 180cm	1
2	A17 VGA cable, 180cm	1
3	A8 COM port cable, 180cm	1
4	A8 USB cable, 180cm	1
5	X8 LAN cable, 100cm	2

2.2 POC-465AWP Series Front Panel

The IO panel of POC-465AWP features M12 connectors that include an isolated COM, DC input, VGA, Gigabit Ethernet, and USB2.0 ports.
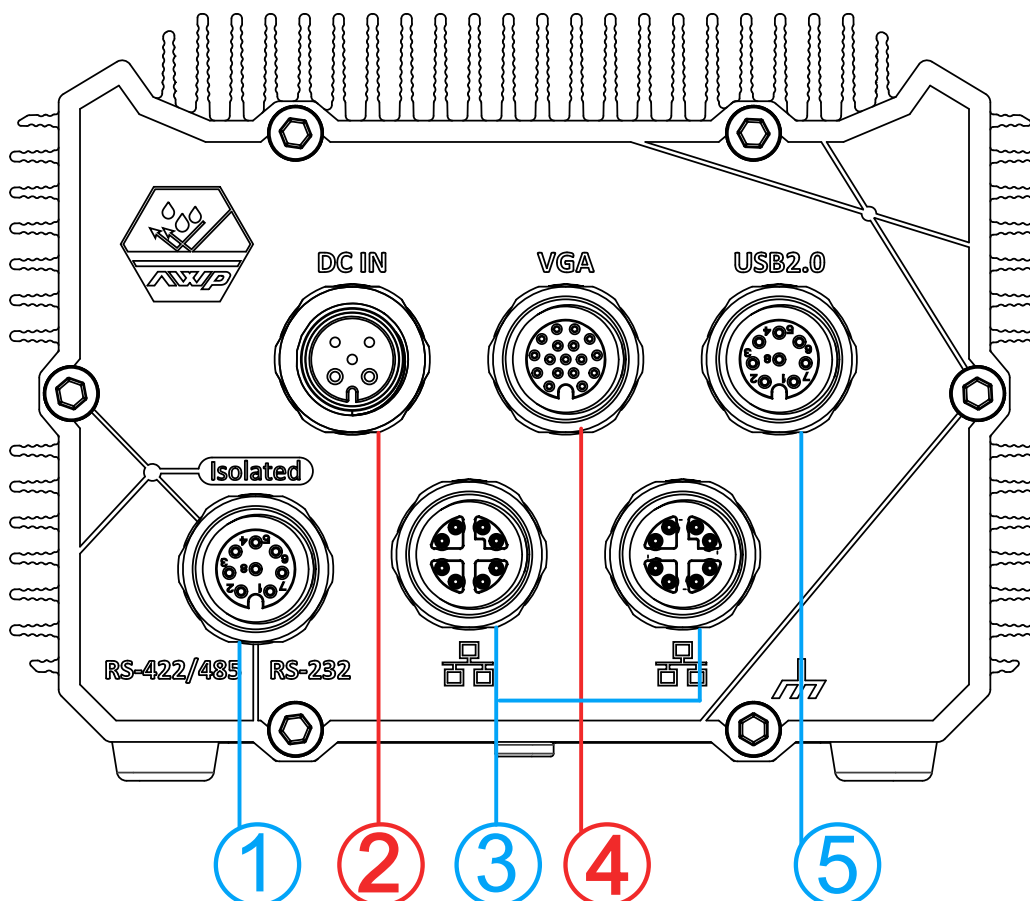
No.	Connector	Description
1	M12 A-coded Isolated COM	COM 1 is isolated RS-232 port with 15 kV ESD protection COM 2 is RS422/485 port with 15 kV ESD protection
2	M12 A-coded DC-in	8V to 35V DC input
3	M12 X-coded 2.5Gb Ethernet	The Ethernet port offers up to 2.5Gb/s transfer bandwidth
4	M12 A-coded VGA	VGA output supports resolution up to 1920x1200@60Hz
5	M12 A-coded USB 2.0	The USB 2.0 ports offer up to 480Mbit/s bandwidth and are backward compatible with USB 1.1/ 1.0.

2.2.1 M12 A-coded Isolated COM Port
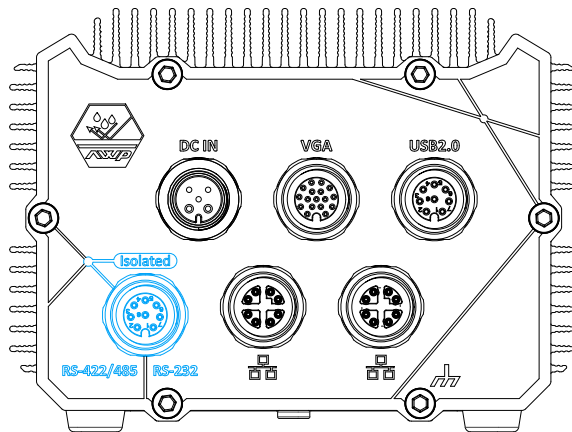
The system provides two isolated COM ports via an M12 A-coded connector for communicating with external devices. COM 1 port is a 3-wire RS-232 specifications and provide up to 115200 bps baud rate while COM2 port is RS-422/485 specifications.

Connector Pin Definition
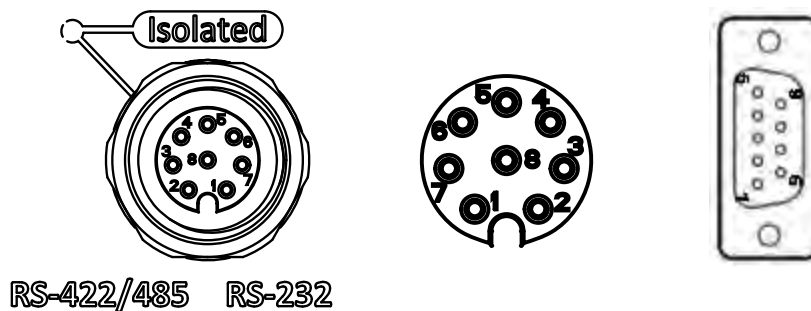
RS-422/485   RS-232

M12 Panel side		M12 Cable end	COM cable	Signal
Signal	**M12 panel pin**	**M12 cable pin**	**COM pin**	
RXD1	1	1	2	COM1
TXD1	6	6	3	
GND	7	7	5	
TXPS	2	2	2	COM2
TXN2	3	3	8	
RXP2	4	4	3	
RXN2	5	5	4	
GND	8	8	5	

2.2.2 M12 A-coded DC-in Port
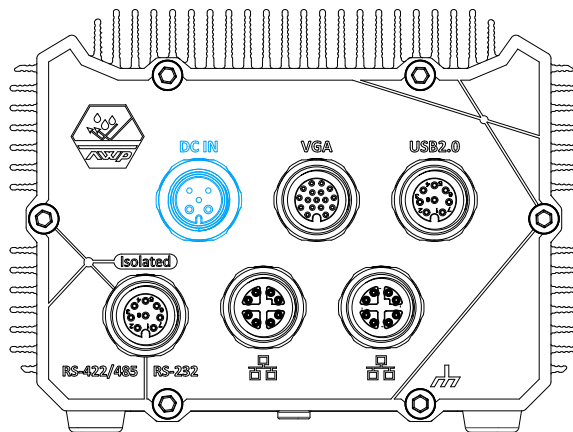
The system accepts a wide range of DC power input from 8V to 35V via a M12 A-coded connector. The M12 A-coded connectors offer COTS availability and ultra-rugged connection reliability when wiring DC power.

⚠ **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.

Connector Pin Definition
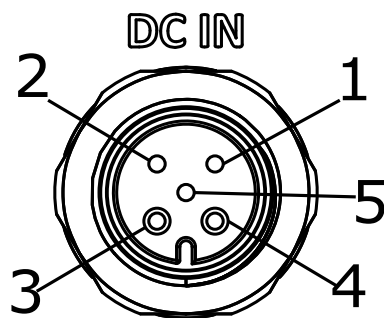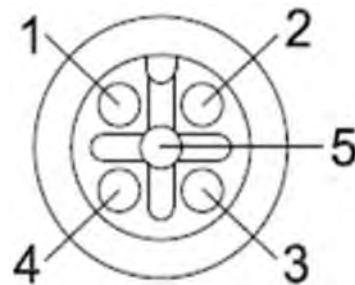
| Panel side | Cable connector end |

Signal	M12 panel side	M12 cable connector end	Euro PIN (cable side)	Wire color
IGN	2	2	IGN	(yellow)
V+	1	1	V+	(red)
V+	4	4		(red)
GND	3	3	GND	(black)
GND	5	5		(black)

2.2.3 M12 X-coded 2.5Gb Ethernet Port
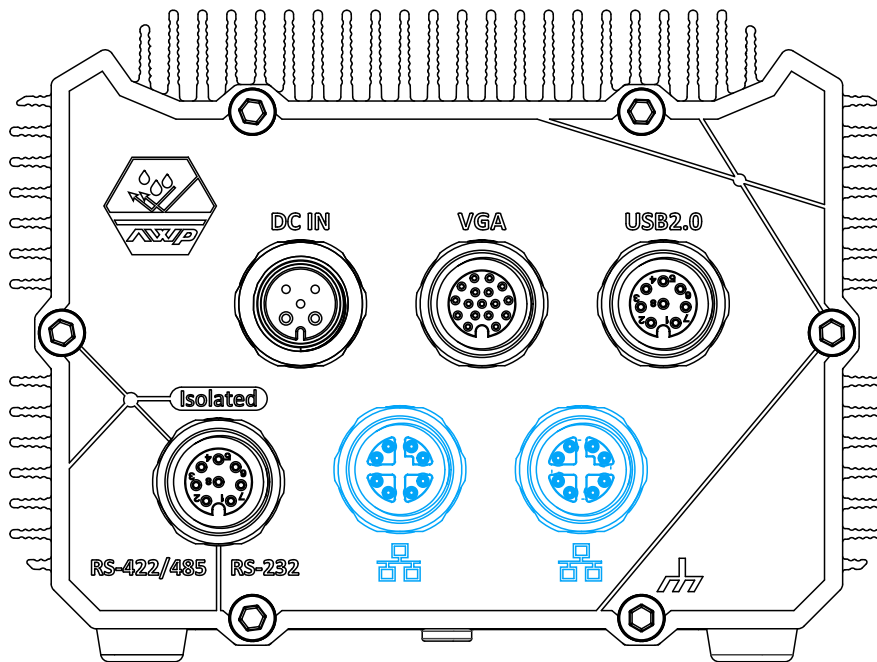
The system offers 2.5Gb Ethernet ports using Intel® I226-IT controller via an M12 X-coded, 8-pin connector.

Connector Pin Definition
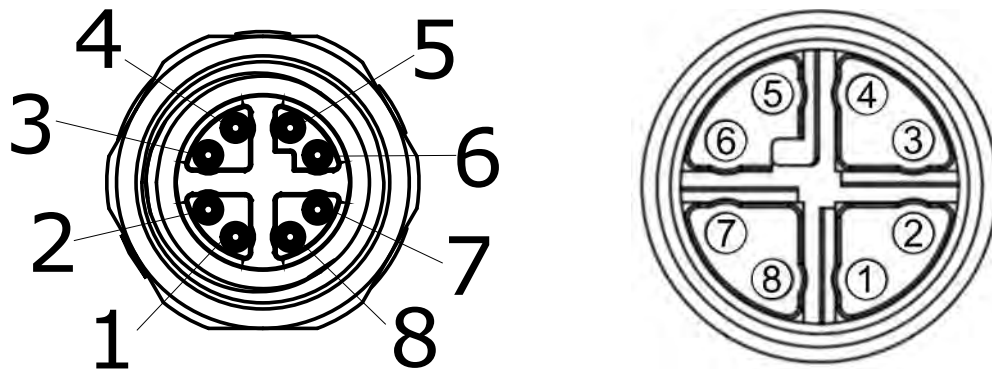
Signal	M12 panel side	M12 cable connector end	Wire color	
LAN P0	1	1		
LAN N0	2	2		
LAN P1	3	3		
LAN N1	4	4		
LAN P3	5	5		
LAN N3	6	6		
LAN N2	7	7		
LAN P2	8	8		

2.2.4   M12 A-coded VGA Port
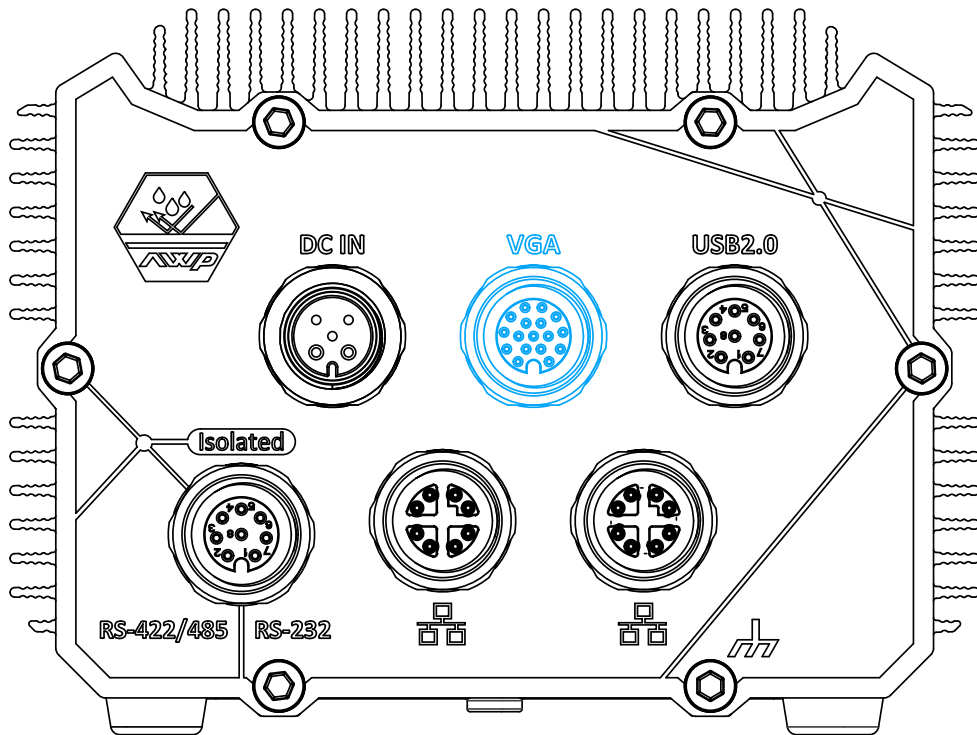
VGA connector is the most common video display connection. The VGA output supports up to 1920x1200@60Hz resolution. To support VGA display output and achieve best VGA output resolution in Windows, you need to install corresponding graphics drivers. Please refer to section OS Support and Driver Installation for details.

VGA Connector Pin Definition

Panel side   **Cable connector end**
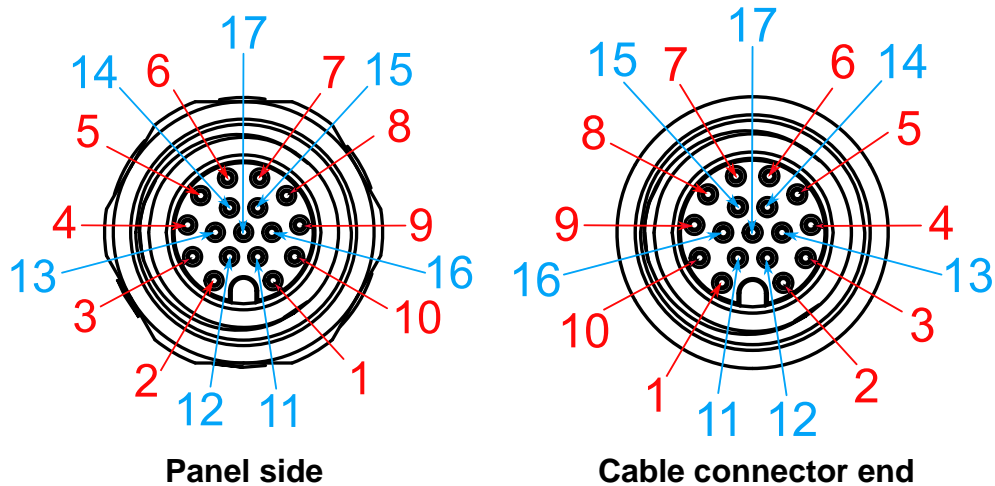
Signal	M12 panel side	M12 cable connector end	Wire color	
Red	1	1		
GREEN	9	9		
BLUE	7	7		
GND	6	6		
GND	8	8		
GND	10	10		
GND	12	12		
GND	13	13		
GND	14	14		
GND	11	11		
GND	16	16		
GND	15	15		
P5V_VGA	17	17		
VGA_SDA	5	5		
HSYNC_CN	3	3		
VSYNC_CN	2	2		
VGA_SCL	4	4		

NOTE

Please make sure your VGA cable includes SDA and SCL (DDC clock and data) signals for correct communication with monitor to get resolution/timing information. A cable without SDA/ SCL can cause blank screen on your VGA monitor due to incorrect resolution/timing output.

2.2.5 M12 A-coded USB 2.0 Port
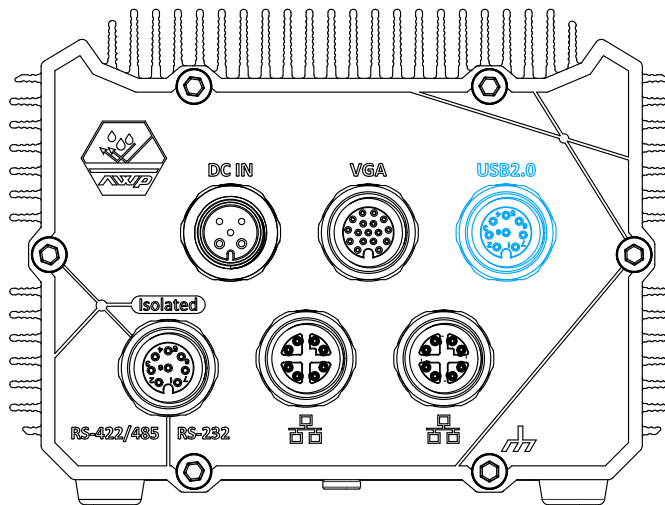
The USB2.0 ports are implemented via native xHCI (eXtensible Host Controller Interface) and are backward compatible with USB 1.1 and USB 1.0 devices. UEFI USB support is also provided so you can use USB keyboard/ mouse in UEFI shell environment.

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

Connector Pin Definition

	Panel side	Cable connector end	
Signal	M12 panel side	M12 cable connector end	Wire color
D1+	1	1	🟢
D1-	2	2	
VCC_USB	3	3	🔴
GND	4	4	⬛
GND	5	5	⬛
VCC_USB	6	6	🔴
D2-	7	7	
D2+	8	8	🟢

2.3   POC-465AWP Power Button
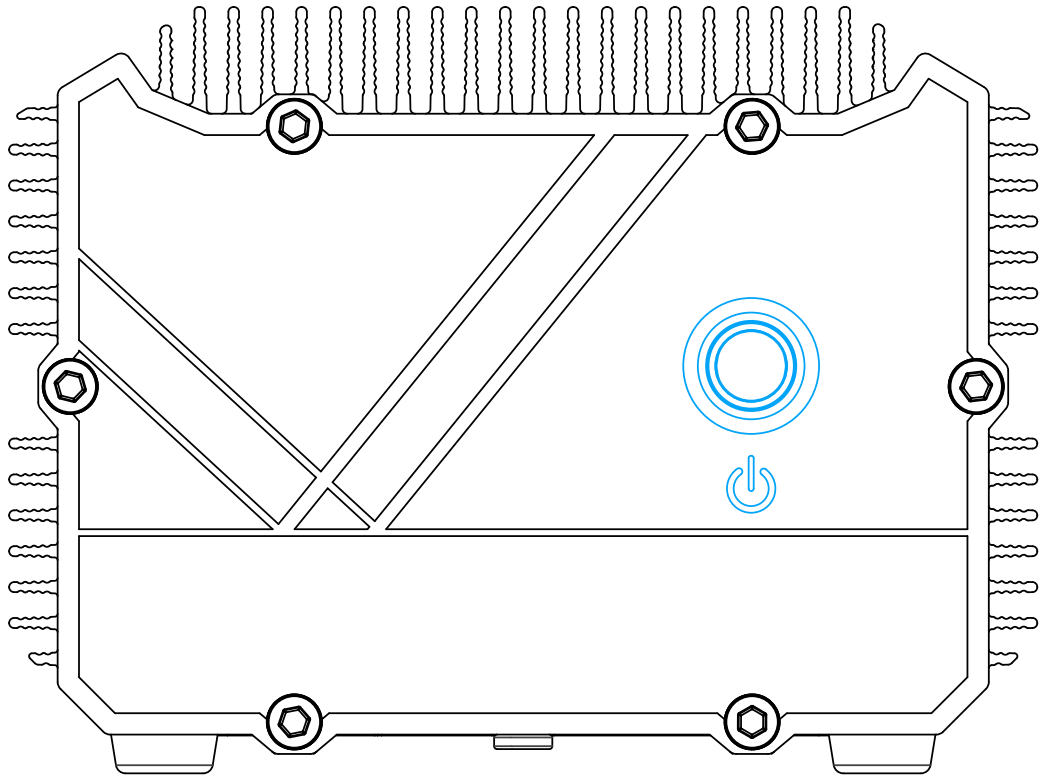
The power button is a non-latched switch for ATX mode on/off operation. Press to turn on the system, PWR LED should light up and to turn off, you can either issue a shutdown command in the OS, or just press the power button. In case of system halts, you can press and hold the power button for 5 seconds 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).

2.4 POC-465AWP Series Internal I/O

The system's internal I/O connectors consist of a M.2 2280 M key SATA interface slot, and a full size mini-PCIe slot coupled with a micro SIM soket.

2.4.1 M.2 2280 M Key Slot (SATA Signal Only)

The system has an M.2 2280 slot (SATA signal only) for you to install an M.2 SATA SSD for faster access over traditional hard disk drives.

📝 **NOTE**

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

M.2 2280 M Key Pin Definition
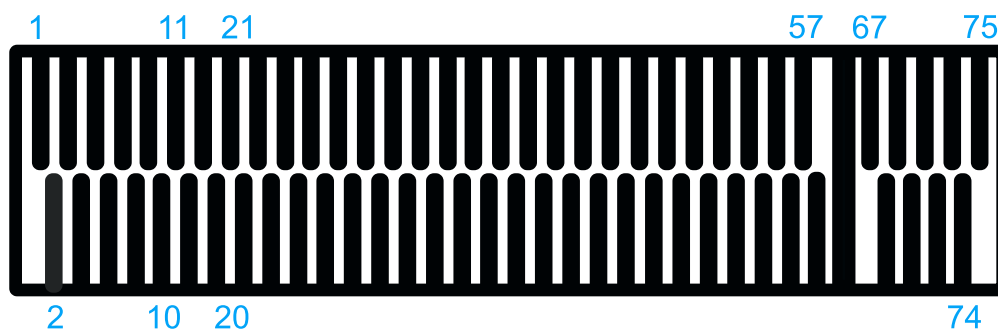
Pin #	Signal	Pin #	Signal
1	GND	2	+3V3
3	GND	4	+3V3
5		6	-
7		8	-
9	GND	10	DAS/DSS_N
11		12	+3V3
13		14	+3V3
15	GND	16	+3V3
17		18	+3V3
19		20	-
21	GND	22	-
23		24	-
25		26	-
27	GND	28	-
29		30	-
31		32	-
33	GND	34	-
35		36	DEVSLP
37		38	-
39	GND	40	-
41	SATA-B+	42	-
43	SATA-B-	44	-
45	GND	46	-
47	SATA-A-	48	-
49	SATA-A+	50	PERST N
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		

2.4.2 mini-PCIe Slot with micro SIM Socket

The system has a mini-PCIe slot coupled with a micro SIM socket.
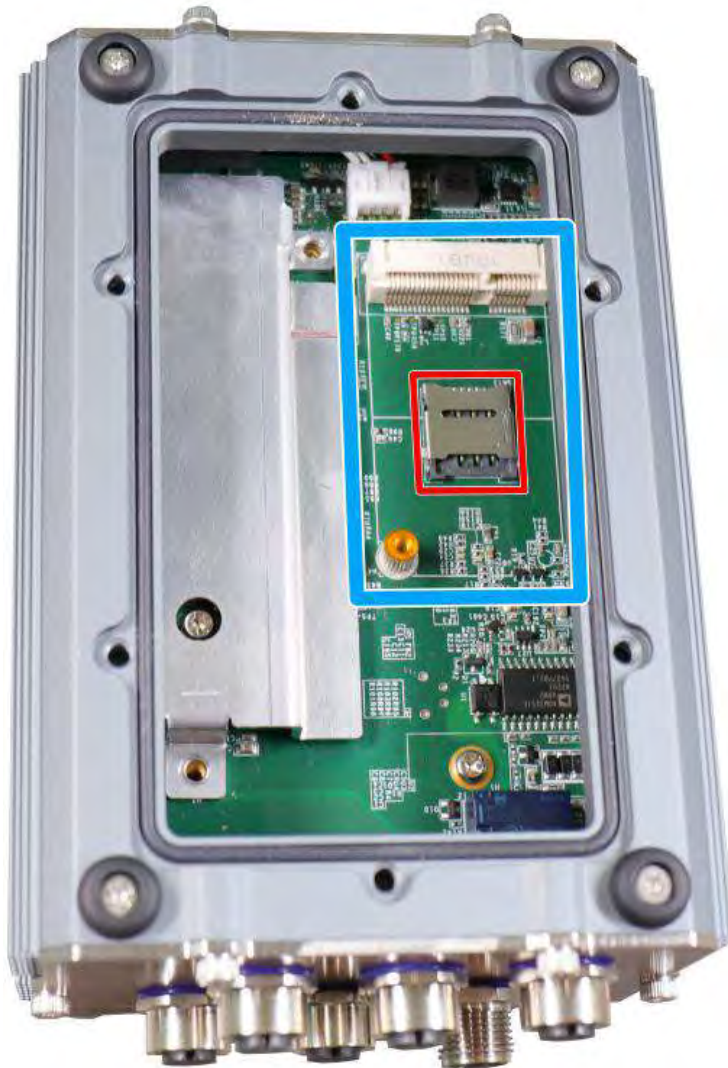
The system provides a mini-PCIe socket (indicated in **blue**) that is in compliance with mini-PCIe specification rev. 1.2. This mini-PCIe socket is designed with SIM card (slot indicated in **red**) support. With a SIM card installed, your system can access the internet via your network provider's 5G/ 4G network.

Due to waterproof IP66 rating, for SMA antenna installation, please contact Neousys Technology or your authorized dealer for compatible enclosure panel.

mini-PCIe socket definition
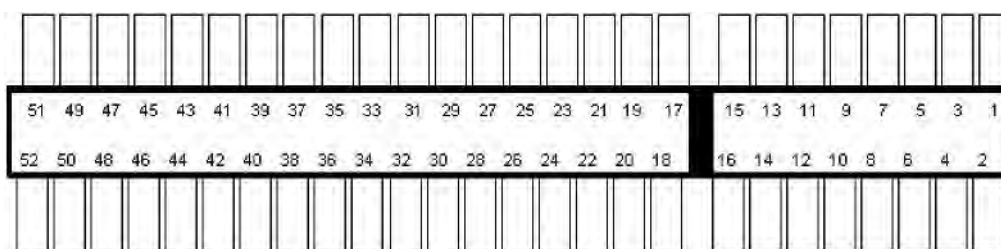
Pin	Signal (mPCIe)	Pin #	Signal (mPCIe)
1	WAKE#	2	+3.3Vaux
3	-	4	GND
5	-	6	+1.5V
7	CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DATA
11	REFCLK-	12	UIM_CLK
13	REFCLK+	14	UIM_RESET
15	GND	16	UIM_VPP
Mechanical Key			
17	Reserved* (UIM_C8)	18	GND
19	Reserved* (UIM_C4)	20	W_DISABLE#
21	GND	22	PERST#
23	PERn0	24	3.3V
25	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	3.3V	40	GND
41	3.3V	42	-
43	GND	44	-
45	Reserved	46	-
47	Reserved	48	+1.5V
49	Reserved	50	GND
51	Reserved	52	3.3V

⚠ **WARNING**

Some off-the-shelf mini-PCIe modules are not compliant to standard mini-PCIe interface. They use 1.8V I/O signals instead of standard 3.3V I/O and may cause signal conflict. Please consult with Neousys for compatibility when in doubt! Installing an incompatible 4G module may damage the system or the module itself may be damaged.

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 the system has powered off, all cables and antennae (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 necessary components such as memory module, M.2 modules or MezIO^{TM} module, you need to disassemble the POC-465AWP system enclosure:

1.　To disassemble POC-465AWP, turn the system upside down and place it on a secured flat surface. Unfasten the screws in the following order.
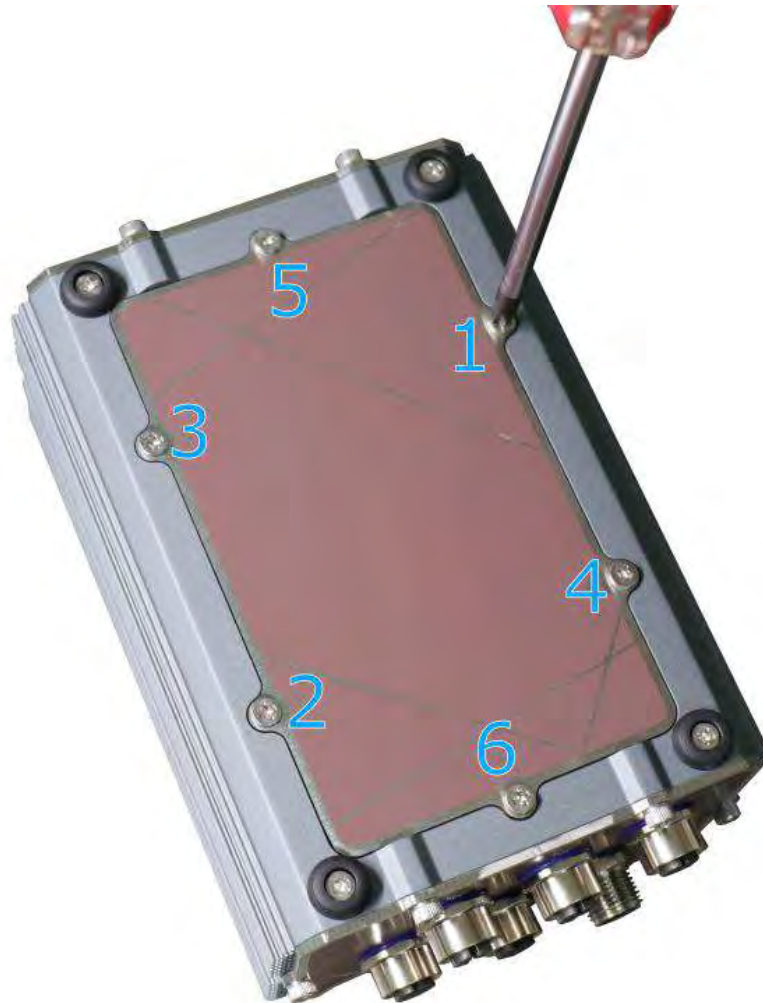
2. Gently open the bottom panel.
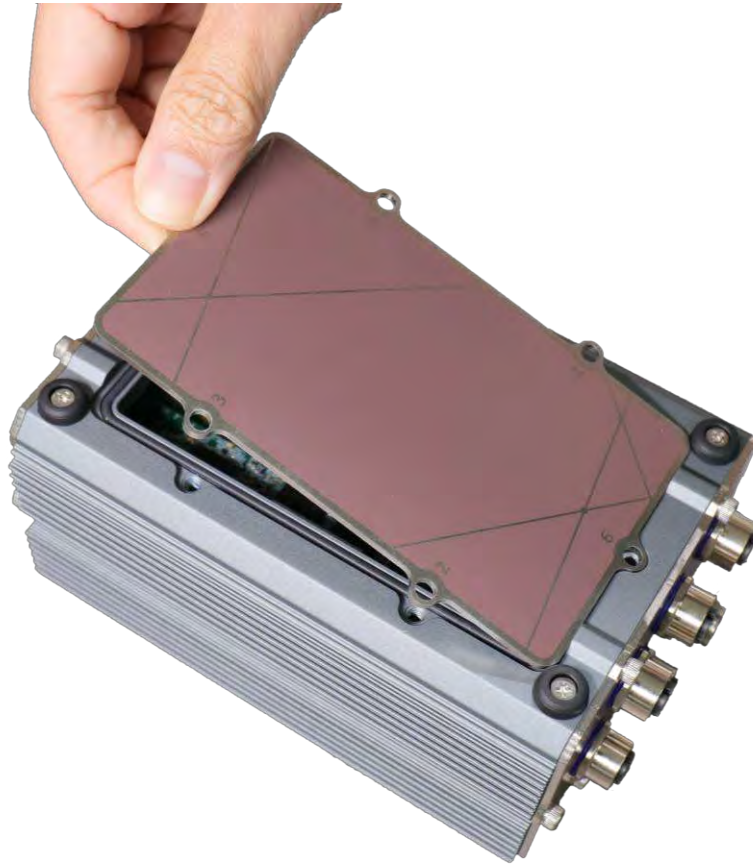
3. Accessible user expansion slots after removing the bottom panel.

3.2   Installing Internal Components

3.2.1   M.2 2280 M Key Module Installation

There is one M.2 2280 M key module expansion slot for POC-465AWP system. Please follow the procedures below to install the memory module.

1.   Disassemble the system enclosure

2.   The M.2 2280 M key slot can be located once the enclosure has been removed.

3. To install the M.2 M key module, you must remove the heatsink first by removing the screws indicated.

4. Remove the M.2 module's heatink.

5. Insert the M.2 M key module on a 45 degree angle.

6. Secure the module by fastening the screw.

7. Remove the protective film off the thernal pad and reinstall the M.2 module's heatsink to complete the installation.

📝 **NOTE**

Please make sure the O-ring is seated properly in the groove to ensure the system's IP66 functionality.

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8. Reinstall the system enclosure.

3.2.2   mini-PCIe Module & SIM Card Installation

There is a mini-PCIe slot and micro SIM card socket for POC-465AWP system.
Please follow the procedures below for installation.

1. Disassemble the system enclosure.

2. The mini-PCIe slot and micro SIM card socket can be located once the enclosure
    has been removed.
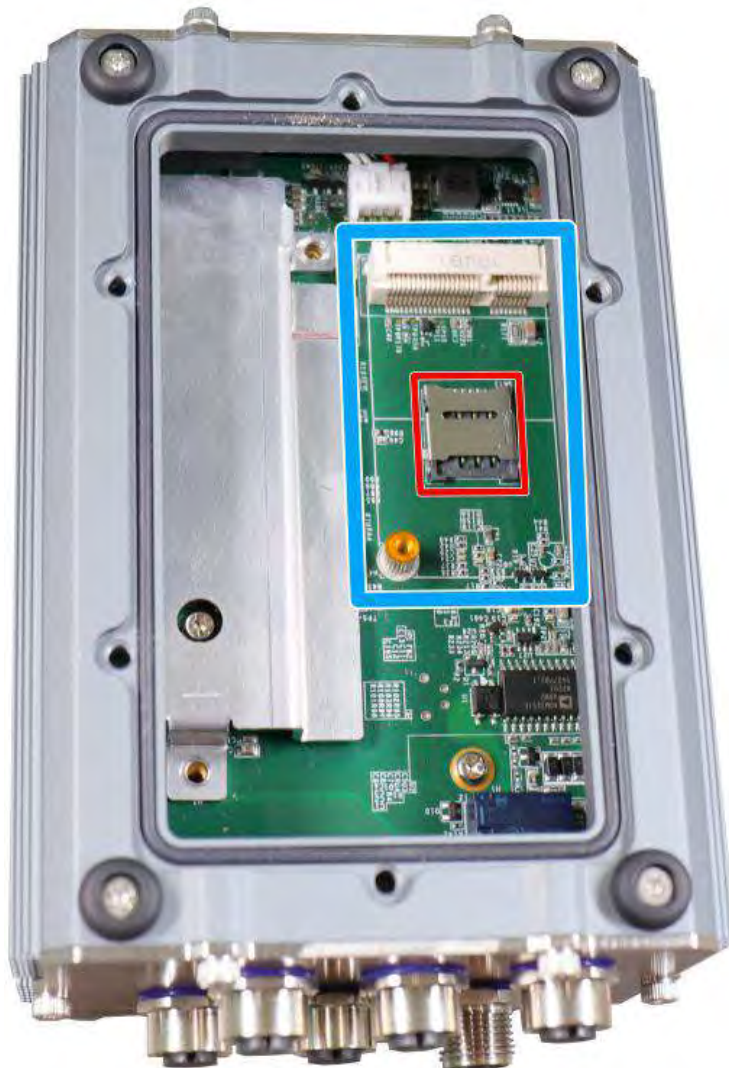
3. Before installing the mini-PCIe module, please install the SIM card first. To install a SIM card, slide the SIM bracket in the direction indicated and lift the bracket.
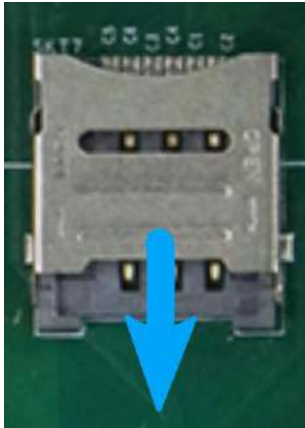
Slide to unlock the bracket   Lift the bracket

4. Place the SIM card into the socket, place the bracket over the SIM card, gently press and slide the bracket in the direction shown to secure the SIM card.

Place in socket   Slide to secure SIM and bracket

5. With the SIM card in place, install the mini-PCIe card by inserting it at a 45 degree angle, and secure it with a screw.
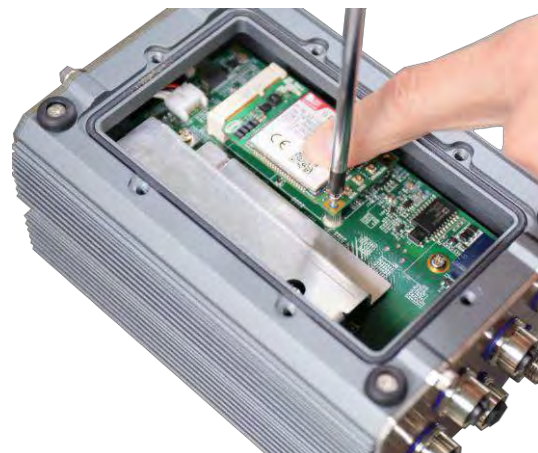
Insert at 45 degree angle   Secure with a screw

6. Reinstall the system enclosure.

3.3   Installing the System Enclosure

1.   With the system upside
      down, position on a
      secured flat surface, place
   the bottom panel onto the
      enclosure.

📝 **NOTE**

Please make sure the O-ring is seated properly in the groove to ensure the system's IP66 functionality.

---

2.   Secure the screws on the panel
      in the following order to
      complete installing the system
      enclosure.

📝 **NOTE**

Please secure the screws using 5.5Kgf-cm2 of torque force.

3.4 Wall Mount Installation (Optional Accessory)

The optional wall mount bracket allows the system to be mounted horizontally. Please refer to the following installation procedure to install the wall mount.

1. To install the optional wall mount bracket, you need to remove the rubber stands (indicated in **blue**) at the bottom of the system. Remove the rubber stands by removing the screws (indicated in **red**).
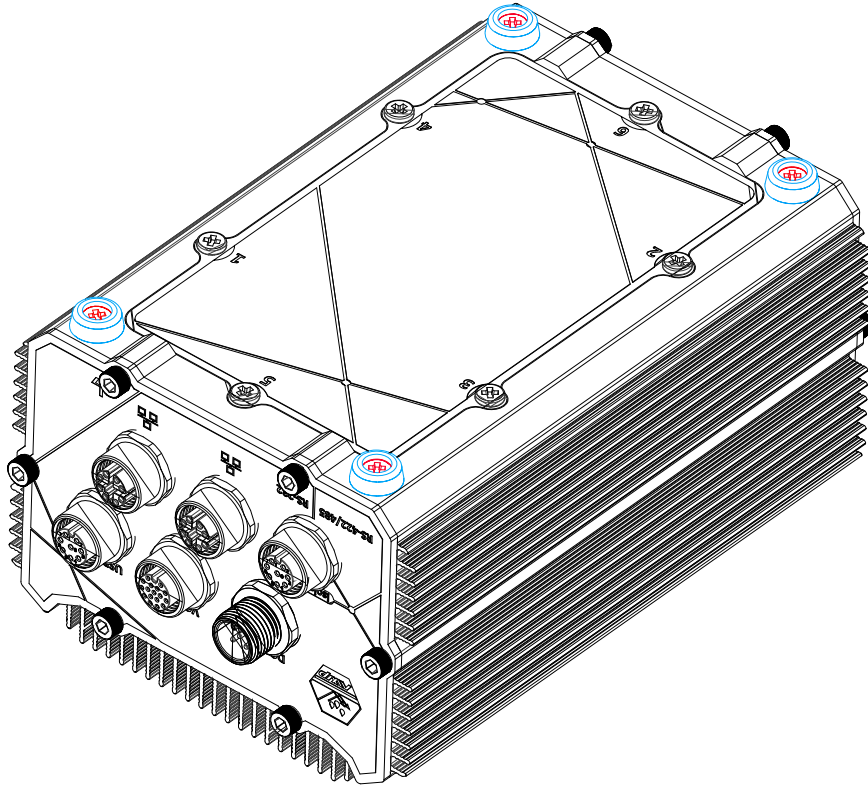
2. Secure the two wall mount brackets (indicated in **blue**) to the bottom of the system enclosure using the M4 screws (indicated in **red**) provided.

2-Wall Mount Brackets
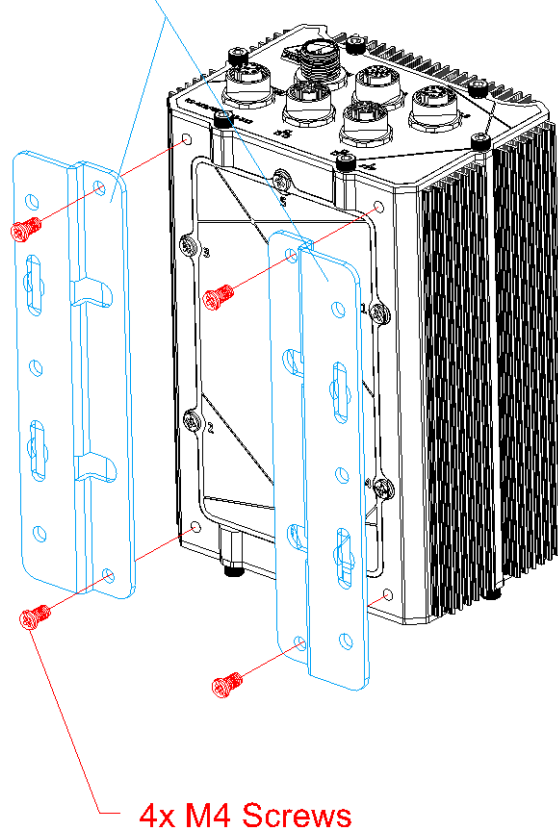
4x M4 Screws

3. Dimension illustration of the installed wall mount bracket for your reference.

3.5 Powering On the System

There are five methods to power on the system

- Pressing the power button

- Sending a LAN packet via Ethernet (Wake-on-LAN)

- Using the ignition signal input

We will describe the processes and actions involved for the first four methods in this section and the ignition signal input method will be described in section 3.7.

3.5.1 Powering On Using the Power Button
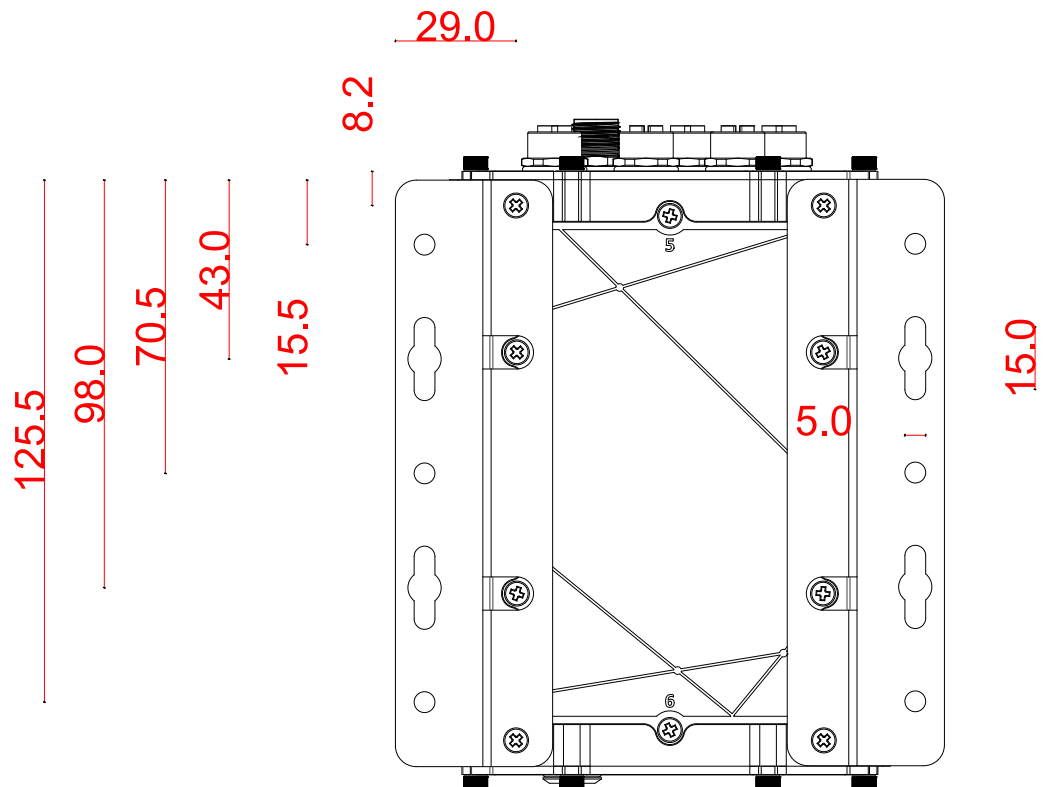
This is the simplest way to turn on your system. The power button on the front panel is a non-latched switch and behaves as the ATX-mode on/off control. With DC power connected, pushing the power button will turn on the system and the PWR LED indicator will light up. Pushing the button when system is 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.
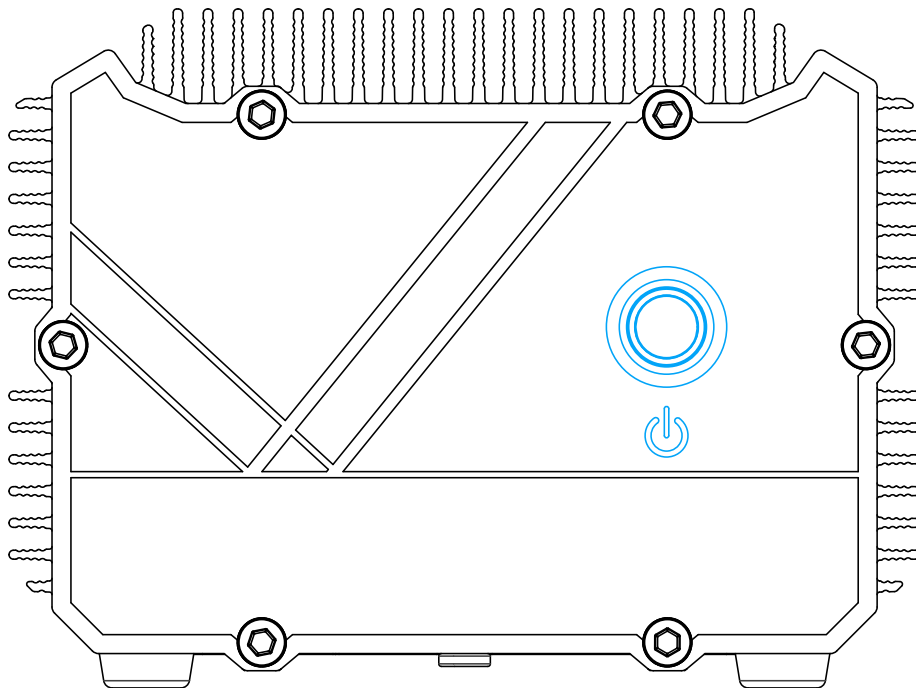
3.5.2 Powering On Using Wake-on-LAN

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 port #1 shown below.
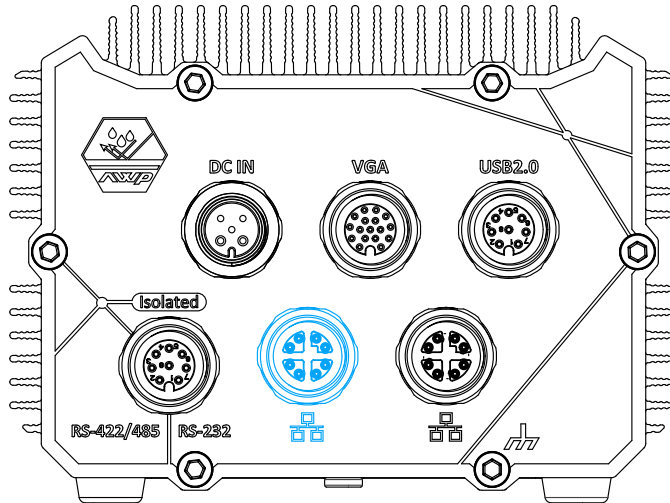
To enable WOL function and power on your system, please follow the steps below.

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

2. Go to the **[Power]**>**[Wake On LAN]** and set it to **[Enabled]**.

3. Press F10 to "**Save changes and exit BIOS**" and allow the system boot into the operating system.

4. Once booted into the Windows system, press "**Windows key + E**", right-click on "**Network**>**Properties**>**Change adapter settings**". Locate and double-click on the adapter Intel® I226 Gigabit Network Connection, click on **Configure.**

5. Click on the **Power Management** tab and check the following options. Click on OK when done
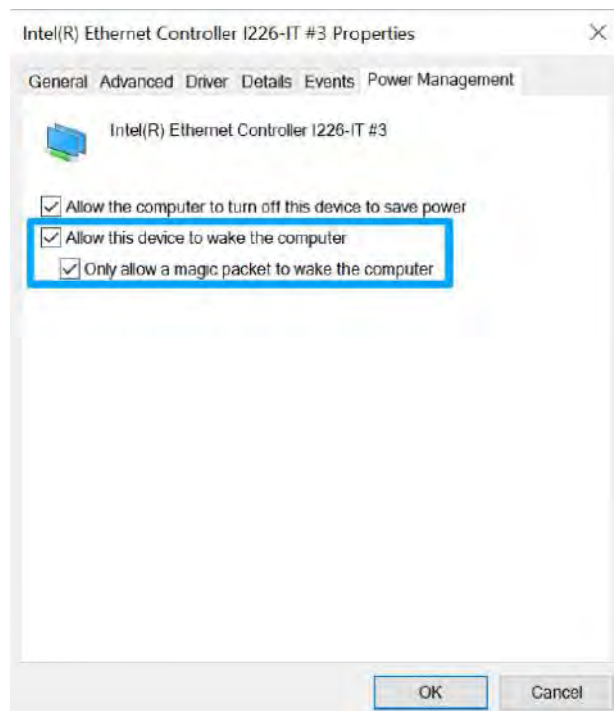
- **Wake on Magic Packet**

  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.

3.6 Ignition Power Control

The ignition power control module for in-vehicle applications is a 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. In this section, we'll illustrate the principle of ignition power control and operation modes.

3.6.1 Principles of Ignition Power Control

The basic concept of ignition power control module is to control the timing correlation between ignition signal and system power status. A typical timing correlation is described in following diagram.
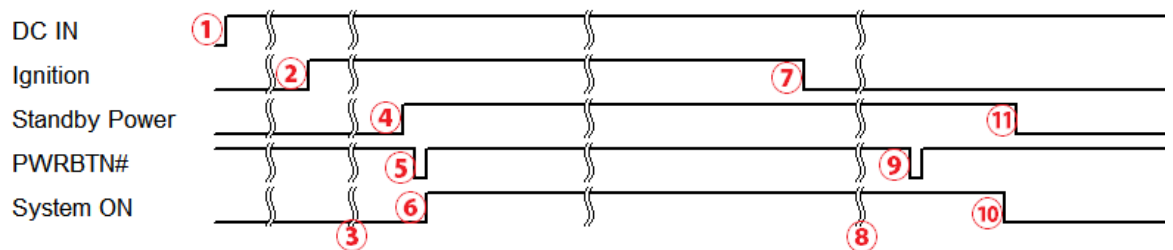
1. When DC power is supplied to the system, MCU starts to periodically detect ignition signal. Note that only MCU is working at this moment and the overall power consumption is less than 2 mW.

2. Ignition signal is active (both 12VDC and 24VDC ignition signals are accepted).

3. MCU starts to count a pre-defined power-on delay.

4. Once power-on delay expired, MCU turns on necessary standby power for the system (3.3VSB & 5VSB).

5. A PWRBTN# pulse is then issued to turn on the system (equivalent to one pressing the power button on the front panel).

6. The system is booting and becomes operational.

7. After a period of time, the ignition signal becomes inactive.

8. MCU starts to count a pre-defined power-off delay.

9. Once power-off delay expired, another PWRBTN# pulse is issued to perform a soft-off for the system (ex. a normal shutdown process for Windows system).

10. The system is completely shut down.

11. As MCU detects system is off, it turns off the standby power for the system, and operates in low power mode again (< 2mW power consumption).

3.6.2 Additional Features of Ignition Power Control

In addition to the typical timing correlation, the ignition power control module offers additional features to provide additional reliability for in-vehicle applications.

- **Low battery detection**

  The ignition power control module continuously monitors the voltage of DC input when the system is operational. If input voltage is less than 11V (for 12VDC input) or less than 22V (for 24VDC input) over a 60-second duration, it will shut down the system automatically.

- **Guarded power-on/ power-off delay duration**

  If ignition signal goes inactive during the power-on delay duration, the ignition power control module will cancel the power-on delay process and go back to idle status. Likewise if ignition signal goes active during the power-off delay duration, the ignition power control module will cancel the power-off delay process and keep the system running.

- **System hard-off**

  In some cases, system may fail to shutdown via a soft-off operation due to system/ application halts. The ignition power control module offers a mechanism called "hard-off" to handle this unexpected condition. By detecting the system status, it can determine whether the system is shutting down normally. If not, the ignition power control module will force cut-off the system power 10 minutes after the power-off delay duration.

- **Smart off-delay**

  The ignition power control module offers two modes (mode 6 & mode 7) which have very long power-off delay duration for applications require additional off-line time to process after the vehicle has stopped. In these two modes, the ignition power control module will automatically detect the system status during the power-off delay duration. If the system has shutdown (by the application software) prior to power-off delay expiring, it will cut off the system power immediately to prevent further battery consumption.

3.6.3　Wiring Ignition Signal
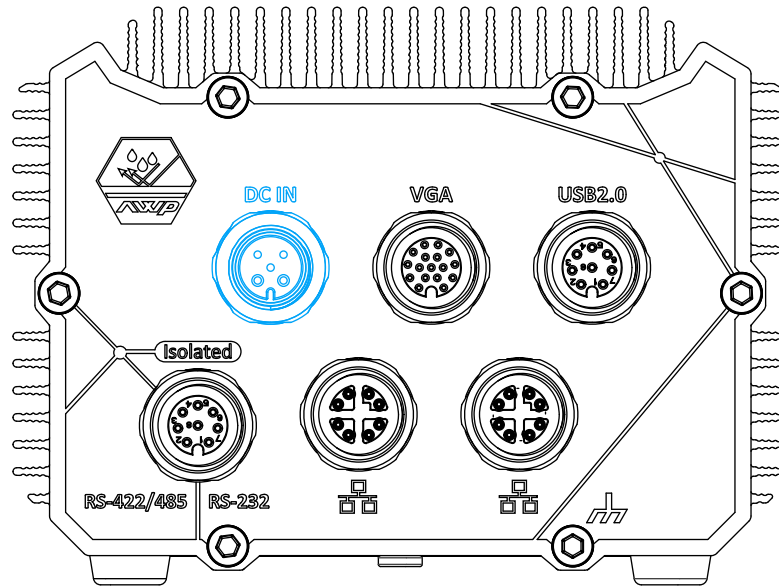
To have ignition power control for in-vehicle usage, you need to supply IGN signal to the system. The IGN input is located on the Pin 2 of the M12 A-coded connector (shared with DC power input). For in-vehicle ignition control wiring, please do the following:

1.　Connect car Battery+ line (12V for sedan, 24V for bus/truck) to V+.

2.　Connect car Batter-/ GND line to GND.

3.　Connect ACC line to IGN.

> ⚠ **WARNING**
>
> *Please make sure your DC power source and IGN signal share the same ground. IGN input accepts 8~35VDC. Supply a voltage higher than 35VDC may damage the system.*

3.6.4 Configure your Windows system

When applying ignition power control to your system, please make sure you've configured your Windows system to initiate a shutdown process when pressing the power button. By default, Windows 10 goes to sleep (S3) mode when power button is pressed. As sleep (S3) is not a complete shutdown behavior, the ignition control function does not recognize the finish of a normal shut down process and thus users will encounter a system hard-off (power cut-off after 10 minutes). Please configure "When I press the power button" to "Shut down" in your Windows system settings.
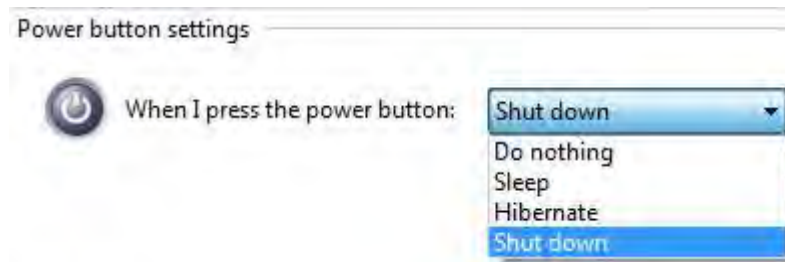
4 BIOS Settings

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-465AWP Series Setup Utility                        Rev. 5.0
 Main Advanced  Security  Power  Boot  Exit

 BIOS Version                 POC46A01.Build230725      This is the help for the hour, minute,
 Release Date                 07/25/2023                second field. Valid range is from 0 to
                                                        23, 0 to 59, 0 to 59. INCREASE/REDUCE :
 Processor Type               Intel Atom(R) x6425E Processor @ 2.00GHz   +/-.
 System Bus Speed             100 MHz
 System Memory Speed          2133 MHz
 Cache RAM                    1536 KB
 Total Memory                 8192 MB

 System Time                  [22:08:46]
 System Date                  [08/02/2023]


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

4.1 COM Port Configuration

The system's COM1 port supports RS-232. 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&2 operating mode:

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

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

3. You can Enable/ Disable COM1 or select COM2 to **[Set COM2 as]** option to the desired mode.

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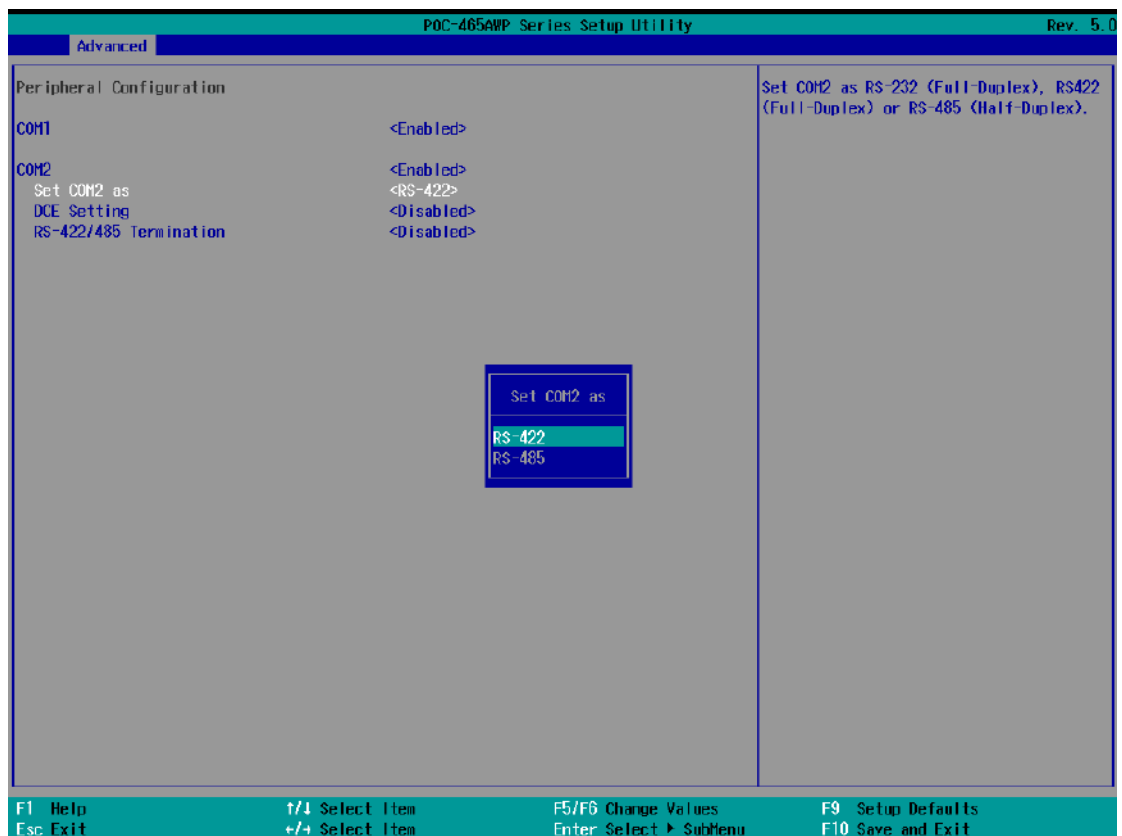
4.1.1 TPM Availability

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. As TPM 2.0 requires 64-bit Windows 10 with UEFI boot mode, it is enabled in BIOS by default.


To enable TPM 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".

4.2 C-States

C-States is a power-saving technique implemented in modern Intel processors. It shuts down the clock signals and power for idle logic units inside the CPU to save the energy consumed. The trade-off, however, is a longer latency for CPU to wake up and be 100% operational. Depending on your application, you can configure these options to have higher performance (disable "C-States") or lower power-consumption (enable "C-States").

To set C-States and Enhanced C-States:

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

2. Go to **[Power]** → **[CPU Configuration]** →**[CPU Power Management]**

3. Enable/disable the **[C-States]** option according to your application.

4. Once set, press **F10** to save setting and exit.
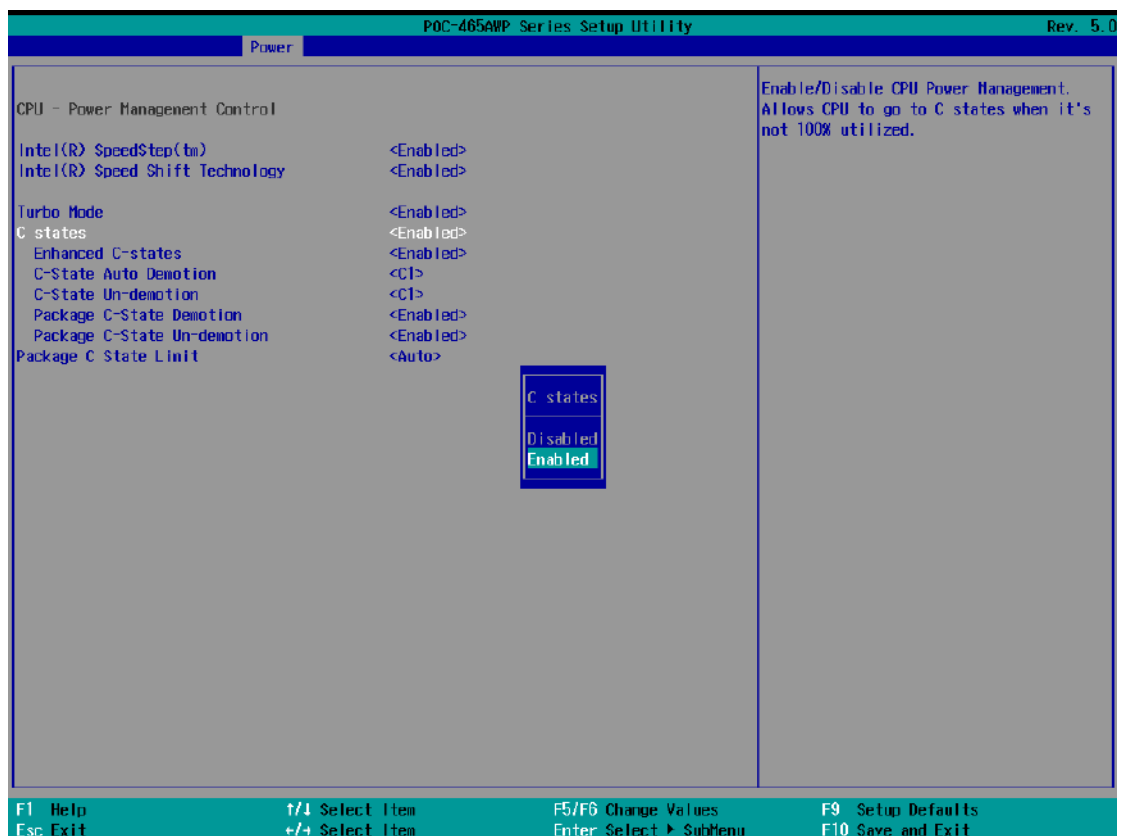
4.3 Wake-on-LAN

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.

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.
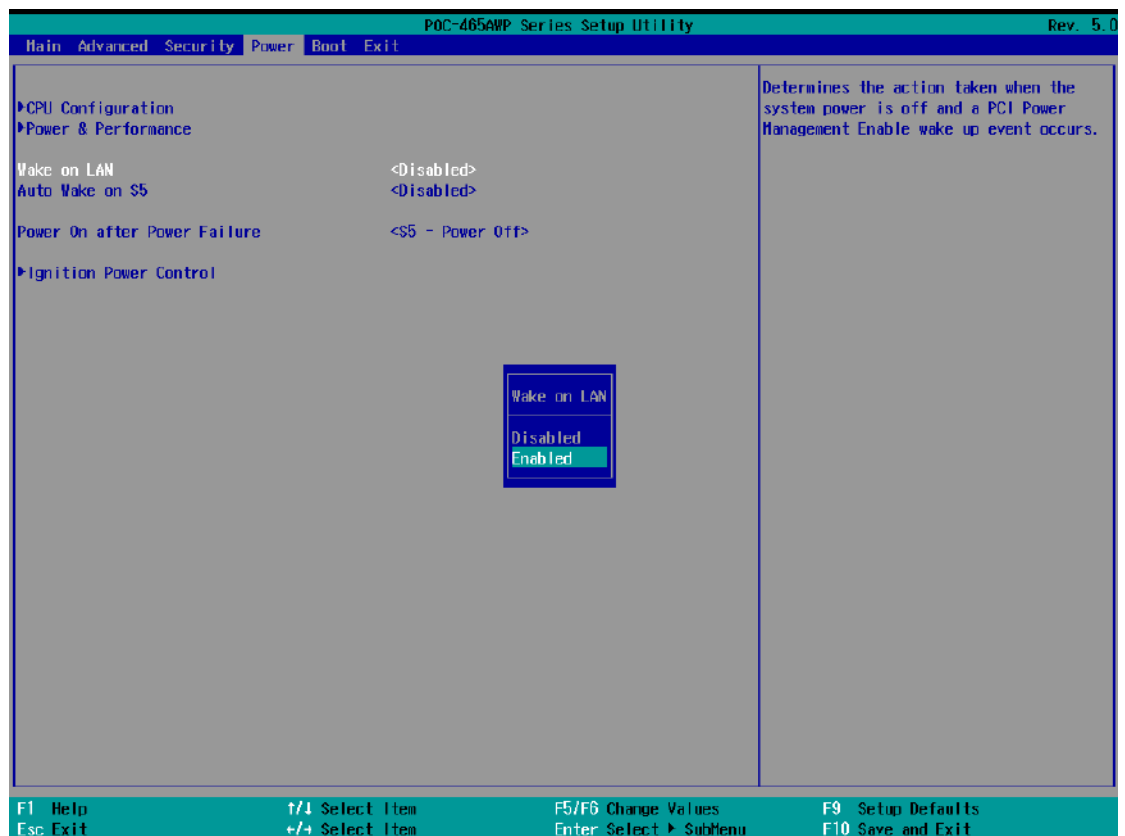
4.4 Power On after Power Failure

This option defines the system's behavior when DC power is supplied.

Value	Description
S0 – Power On	System is powered on when DC power is supplied.
S5 – Power Off	System is kept in off state when DC power is supplied.
Last State	The system reverts to its state before the power failure.

When you want to use the AT-mode remote on/off control function, you have to set this option to "S0 – Power On". Please refer to this section for instructions of using AT-mode remote on/off control function.

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]**.

3. Set the **[Power On after Power Failure]** option to the desired setting.

4. Once set, press **F10** to save setting and exit.
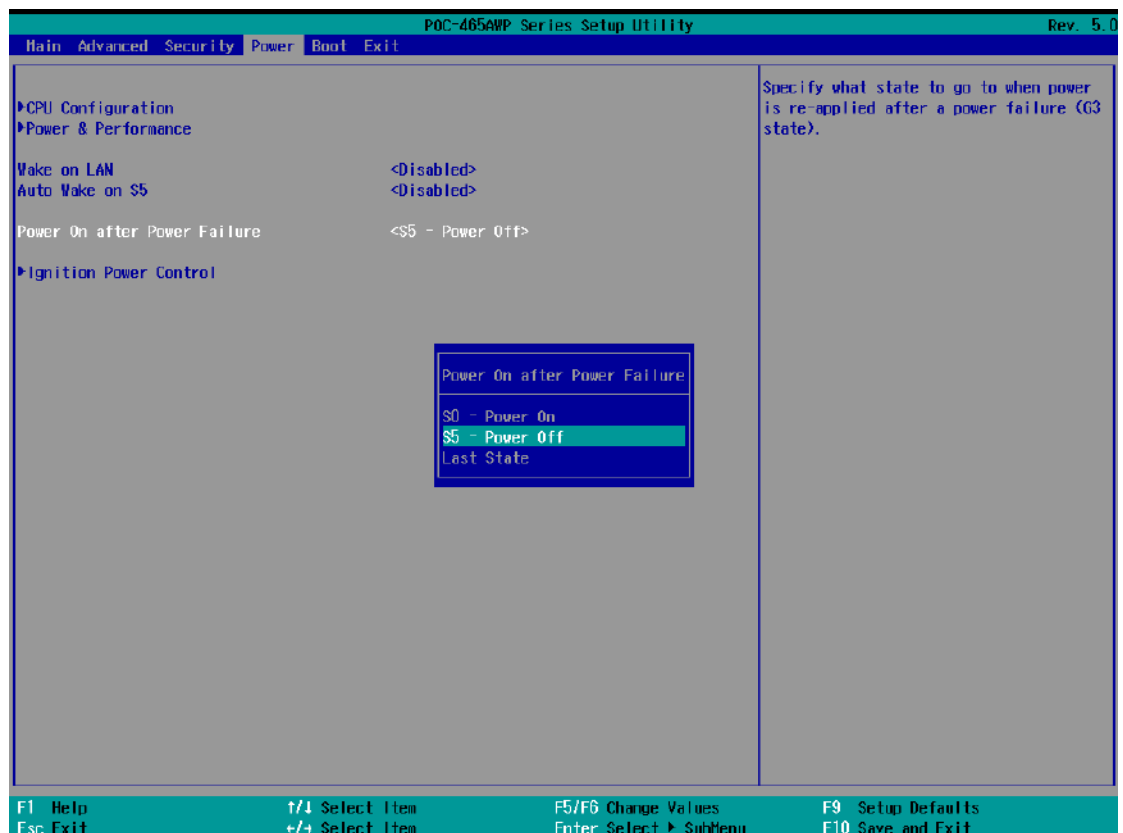
4.5　Ignition Power Control

The system feature ignition power control. It 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 smart off delay, low battery threshold, system hard-off, etc. The ignition control settings can are configured in the BIOS, and to do so, please refer to the following instructions:

> **NOTE**
>
> *The ignition settings will not reset when you flash the BIOS. To reset the ignition settings, please Load Default Settings, press F10 to Save and Exit, and press the power button to turn the system to complete the reset procedure.*

To configure the ignition power control 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.　To configure ignition power control settings, set operation mode to **[IGN]**, and press Enter to enable other ignition power control settings for configuration.
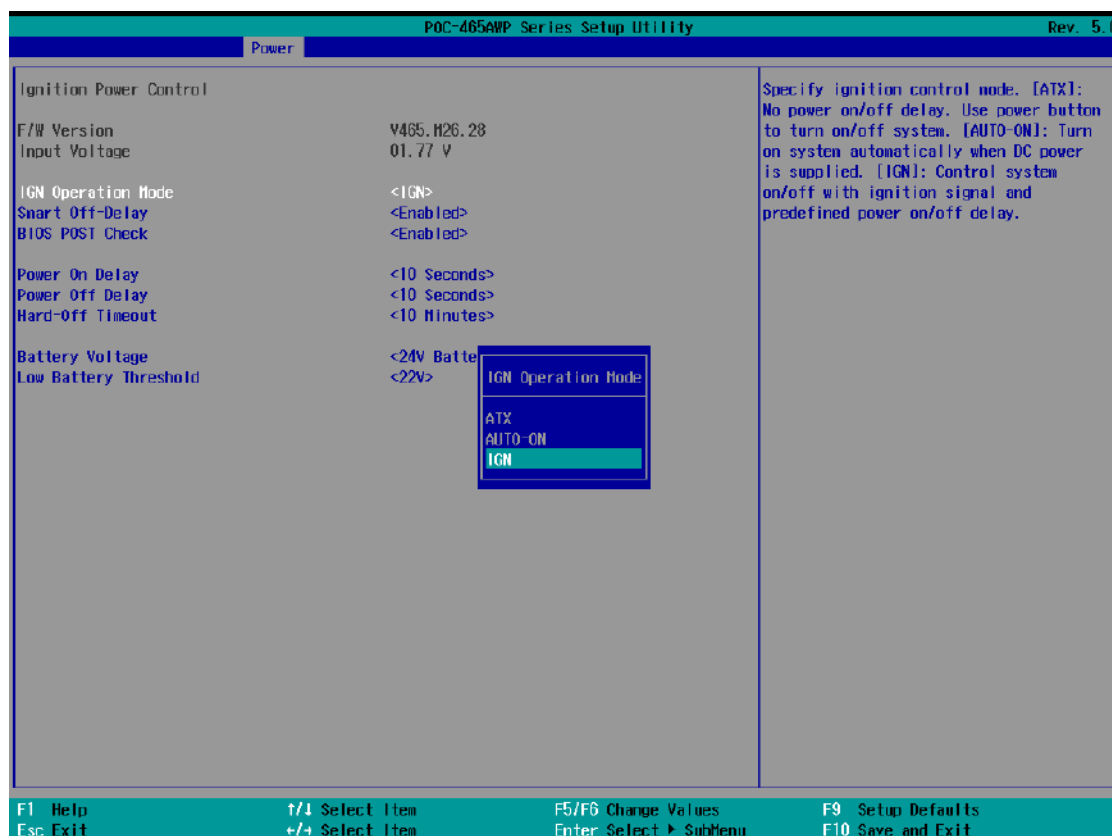
4. For example, highlight **[Power On Delay]** and press Enter to bring up time delay configuration options.
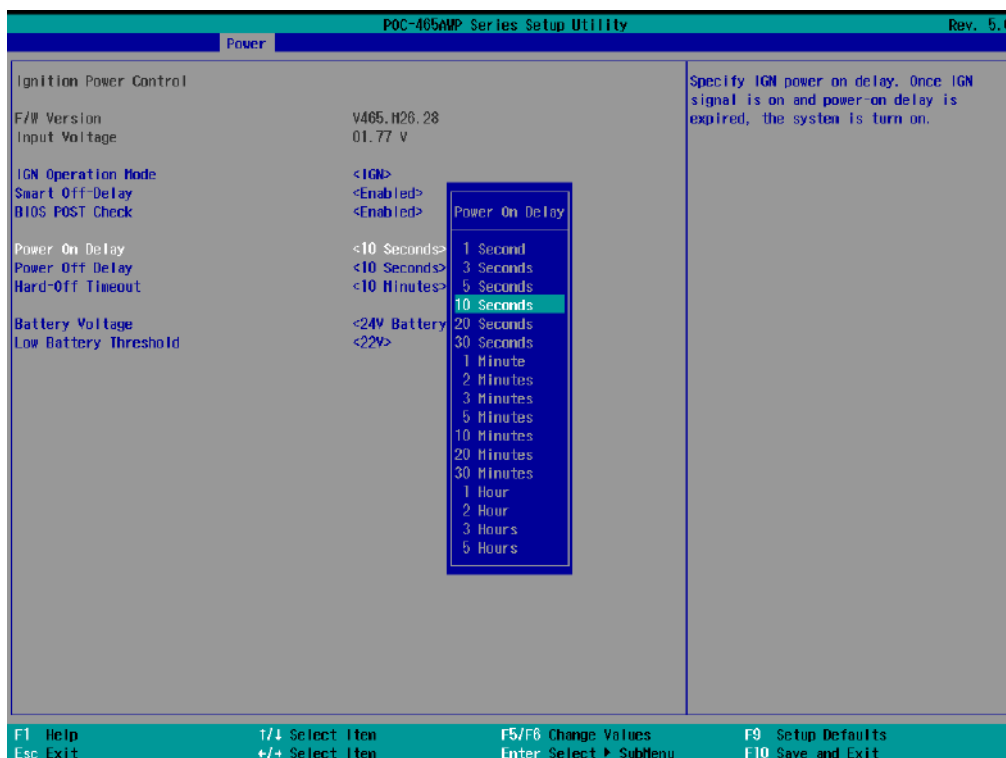
5. You may also set the input battery voltage to correspond to the voltage supplied by your vehicle by highlighting **[Battery Voltage]**, and press Enter to bring up the options **[12v or 24v Battery]**.
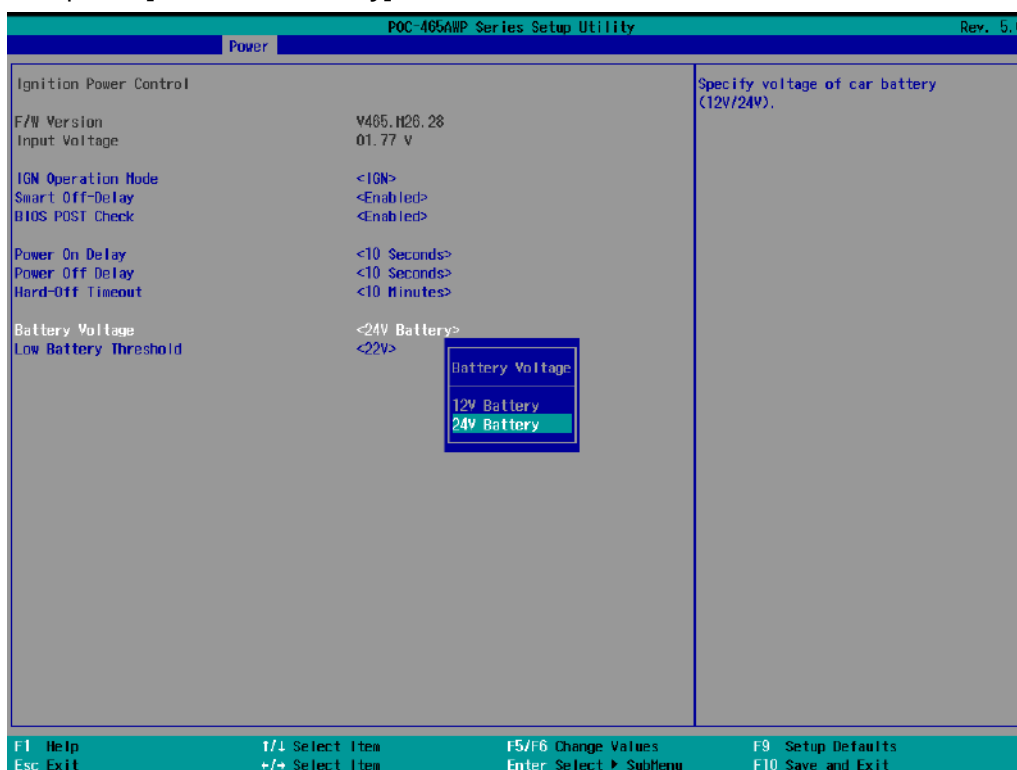

6. Press F10 to "Exit Saving Changes".

55

4.6   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.

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

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

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

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

10.   Once set, press **F10** to save setting and exit.
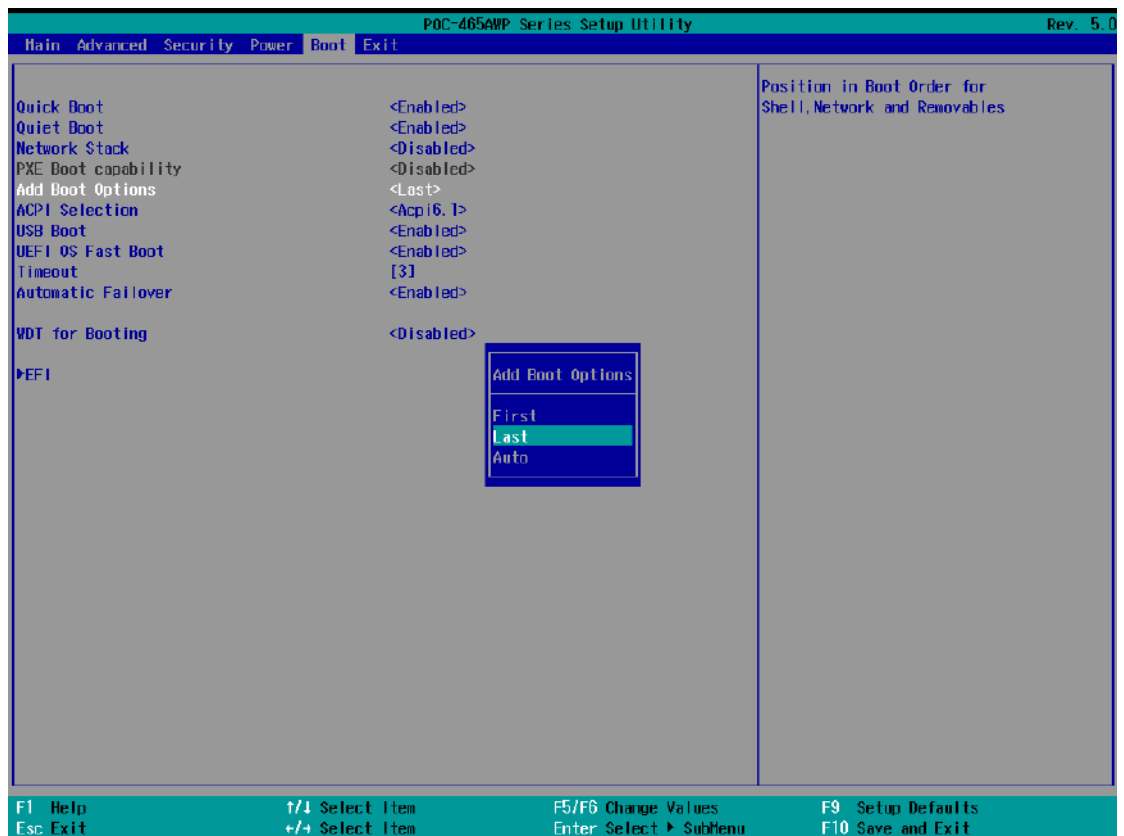
4.7 Watchdog Timer

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.
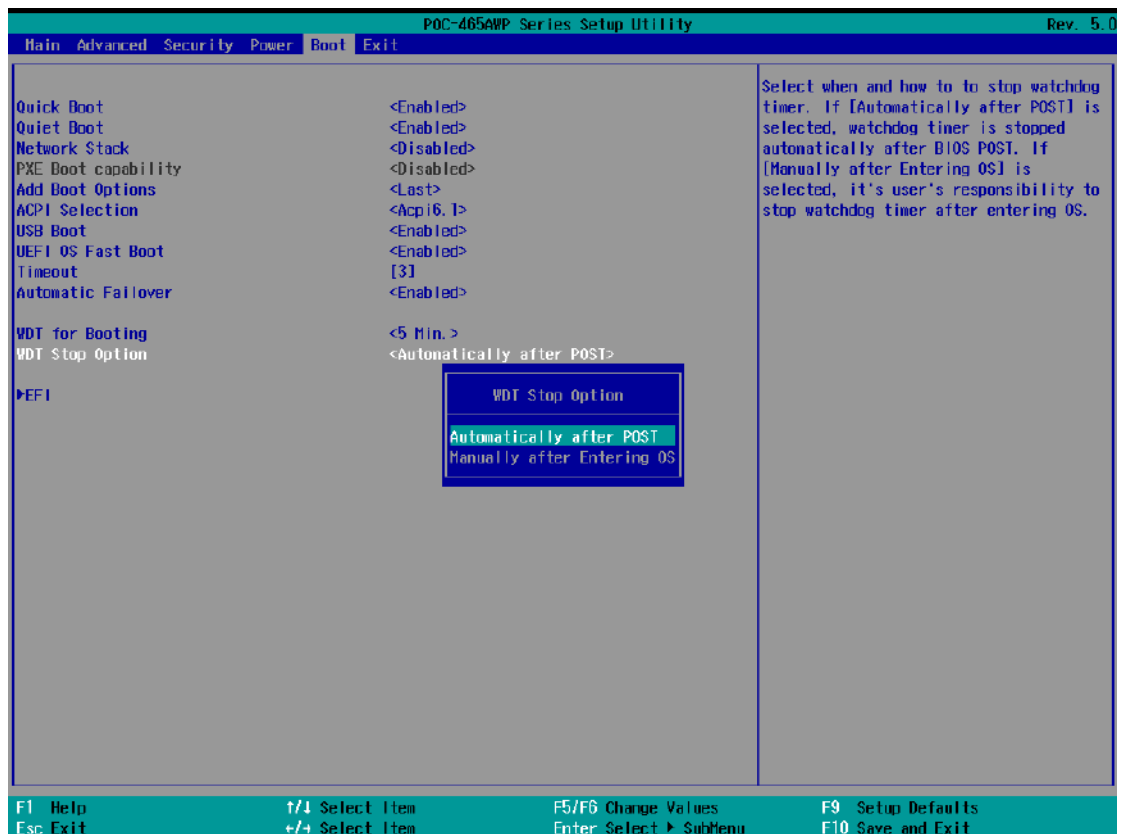
5   OS Support and Driver Installation

5.1   Operating System Compatibility

Due to Intel's policy, POC-465AWP series only provide driver support for the following Windows operating systems. For Linux support, please use Linux kernel versions no later than 5.15. The following list contains the operating systems which have been tested in Neousys Technology Inc.

- Microsoft Windows 10 Enterprise LTSC 2021 64-bit

- Microsoft Windows 11 IoT Enterprise 22H2 64-bit

- Ubuntu 20.04.5 LTS, 22.04 LTS, 22.04.1 LTS or other distribution with kernel version ≥ 5.15 *

NOTE

For Linux system, user may need to manually compile and install the driver for Intel graphics or I226 controller if the driver is not embedded in kernel. You can visit Intel website for further information.

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.

5.2.1   Install Drivers Automatically

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 note that you must install WDT_DIO_Setup_v2.3.1.9 or later versions.

Please refer to this link to download WDT_DIO.

Appendix A Using WDT & DIO

The watchdog timer (WDT) function to ensure 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.
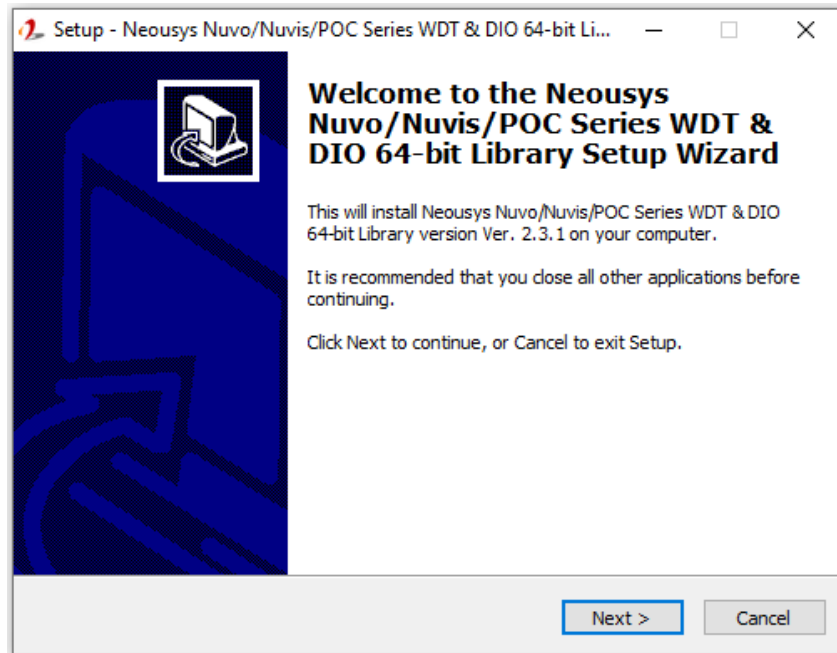
Installing WDT_DIO Library

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.

- For Windows 10 64-bit OS with 64-bit application (x64 mode), please install WDT_DIO_Setup_v2.3.1.9 (x64).exe or later version.

- For Windows 10 64-bit OS with 32-bit application (WOW64 mode), please install WDT_DIO_Setup_v2.3.1.9 (wow64).exe or later version.
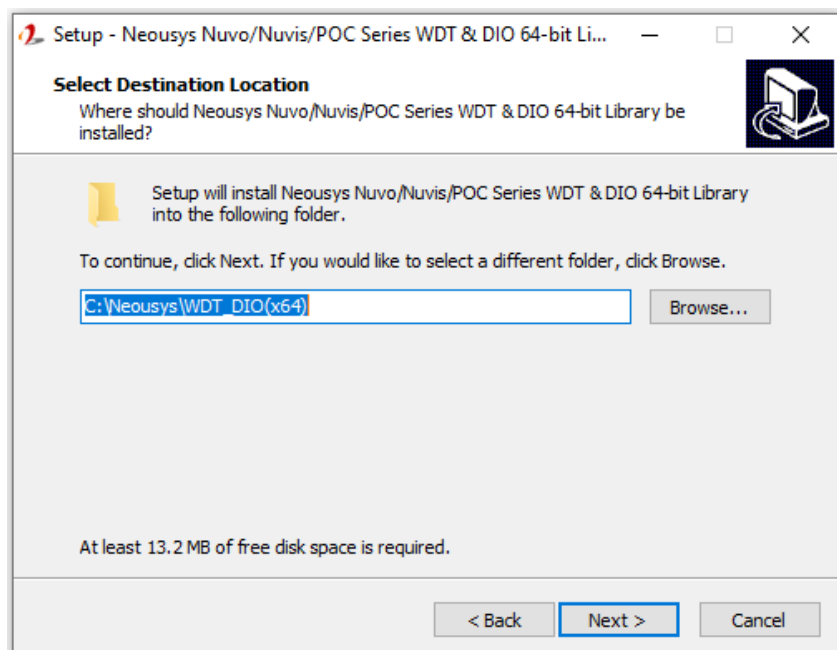
WDT and DIO Library Installation

To setup WDT & DIO Library, please follow instructions below.

1. Execute **WDT_DIO_Setup.2.3.1.9.exe**. and the following dialog appears.

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.
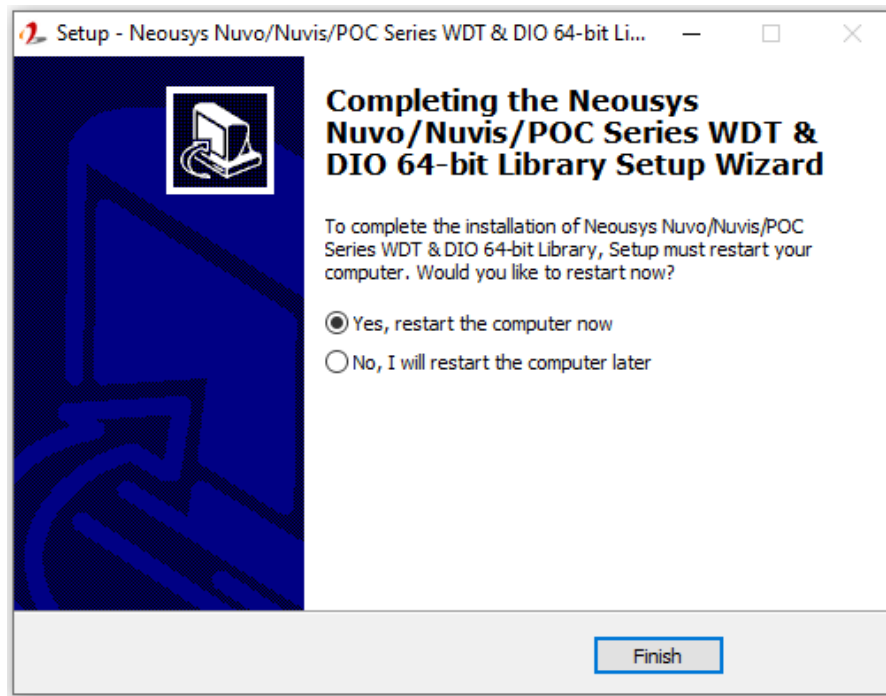
4. When programming your WDT or DIO program, the related files are located in

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()