⚠ Warning

- Only qualified service personnel should install and service this product to avoid injury.
- Observe all ESD procedures during installation to avoid damaging the equipment.
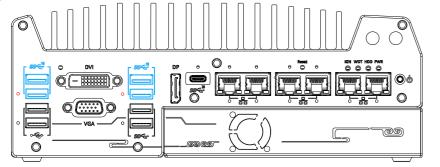
❶ Preparing tools

Unpack the equipment and make sure the following tools are available and delivered contents are correct.

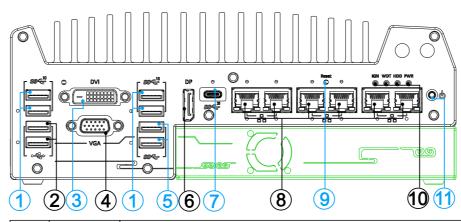1-1. User-provided tools
- Anti-static wrist wrap

1-2. Packing List

Item	Description	Quantity
01	Nuvo-9000 system	1
02	Drivers & utilities disc	1
03	CPU bracket	1
04	Wall-mount bracket	2
05	Foot pad	4
06	3-pin pluggable terminal block	2
07	2.5" HDD/SSD thermal pad (if HDD not installed)	1
08	Rubber spacer (barebone system only)	4
09	Screw pack	1

❷ Overview - Front Panel

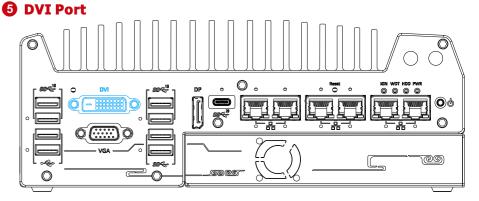| No.	Item	Description
1	USB3.2 Gen2x1 port	USB3.1 Gen 2 port (SuperSpeed+) offers up to 10Gbps, twice the bandwidth over existing SuperSpeed USB3.1 Gen. 1 connection. It is also backwards compatible with USB3.0 and USB2.0
2	USB2.0 port	The USB 2.0 ports offer up to 480Mbit/s bandwidth and are backward compatible with USB 1.1/ 1.0.
3	DVI port	DVI-D output supports resolution up to 1920x1200@60Hz and is compatible with other digital connections via an adapter.
4	VGA port	VGA output supports resolution up to 1920x1200@60Hz
5	USB3.1 Gen1x1 port	USB3.1 Gen 1 offers up to 5Gbps of data-throughput performance
6	DisplayPort	Support display resolutions up to 7680 x 4320 @ 60Hz. Compatible with HDMI/ DVI via respective adapter/ cable (resolution may vary).
7	USB3.2 Gen2x2 Type-C port	The USB 3.2 Gen2x2 type-C port offers up to 20Gbps of bandwidth connectivity for fast data exchange with external devices
8	PoE+ GbE port	1x 2.5GbE by I225 and 1x GbE by I219 (Nuvo-9002E/ P/ DE) with screw-lock 5x 2.5GbE by I225 and 1x GbE by I219 (Nuvo-9006E/ P/ DE) with screw-lock
9	Reset button	Use this button to manually reset the system.
10	LED indicators	From left to right, the LEDs are IGN (ignition control), WDT (watchdog timer), HDD (hard disk drive) and PWR (system power).
11	Power button	Use this button to turn on or shutdown the system.
Area in Green	Cassette module	The cassette module offers a separate compartment to manage thermal conditions and reduce installation complications of an add-on card.

❸ 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. UEFI 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.
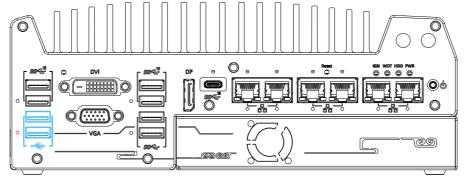
❹ USB2.0 Port

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. Indicated in red is a screw-lock hole for the corresponding USB port.

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

❺ DVI Port

DVI-D transmits graphics data in digital format and therefore can deliver better image quality at high resolution. The DVI connector on the front panel can either output DVI signals or other digital signals (via an adapter/ cable) depending on the display device connected. It supports resolutions up to 1920x1200@60Hz.
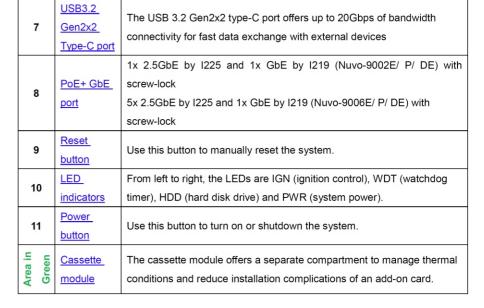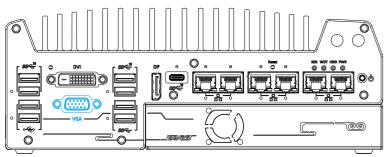
The system supports triple independent display outputs by connecting display devices to VGA, DVI and DisplayPort connection. To support multiple display outputs and achieve best DVI output resolution in Windows, you need to install corresponding graphics driver.
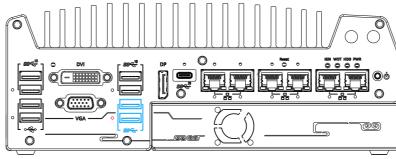
❻ VGA Port

VGA connector is the most common video display connection. The VGA output supports up to 1920x1200@60Hz resolution. The system supports triple independent display outputs by connecting display devices to VGA, DVI and DisplayPort connection. To support multiple display outputs and achieve best VGA output resolution in Windows, you need to install corresponding graphics drivers.
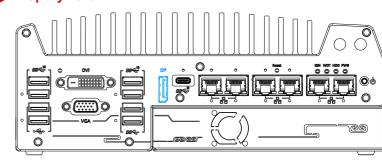
Note

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.

❼ USB3.2 Gen1x1 Port

The system's USB 3.2 Gen1x1 ports (5Gbps) are implemented via native xHCI (eXtensible Host Controller Interface) controller and are backward compatible with USB 2.0, USB 1.1 and USB 1.0 devices. UEFI USB is also supported so you can use USB keyboard/mouse in UEFI shell environment. Indicated in red is a screw-lock hole 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.
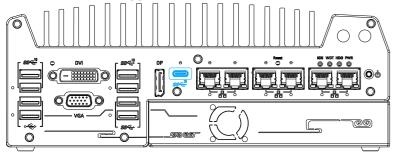
❽ DisplayPort

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 connected to a DP, it can deliver up to 8K UHD (7680 x 4320 @ 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.

The system supports triple independent display outputs by connecting display devices to VGA, DVI and DisplayPort connection. To support multiple display outputs and achieve best DisplayPort output resolution in Windows, you need to install corresponding graphics drivers.
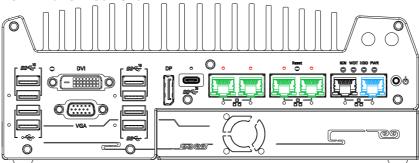
❾ USB3.2 Gen2x2 Type-C Port

The system's USB 3.2 Gen2x2 type-C port offers up to 20Gbps of data transfer bandwidth, and is implemented via the native xHCI (eXtensible Host Controller Interface) controller. The port is backward compatible with USB3.2 Gen.1 USB 2.0, USB 1.1 and USB 1.0 devices via a USB hub (not included) to connect to external devices.
xHCI driver is supported natively in Windows 10, therefore you do not need to install the xHCI driver prior to utilizing USB functions.

❿ PoE+ Ethernet Port

The ports marked in green/ black are Power over Ethernet (PoE) ports implemented with Intel I225-IT 2.5G Ethernet controller, and marked in blue is implemented using Intel® I219-LM controller that supports Wake-on-LAN and is also compatible with Intel® AMT (Active Management Technology) to support advanced features such as remote SOL desktop and remote on/ off control. The four PoE+ ports feature panel screw fix holes (indicated in red) for a firm and secure connection.
The PoE ports supply electrical power and data on a standard CAT-5/CAT-6 Ethernet cable. Acting as a PoE PSE (Power Sourcing Equipment), compliant with IEEE 802.3at, each PoE port delivers up to 25W to a Powered Device (PD), and the system has a total 100W power PoE budget.
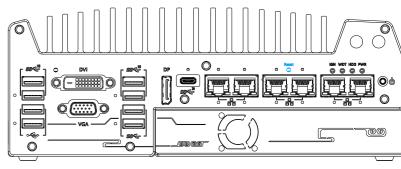
Active/Link LED (Right)

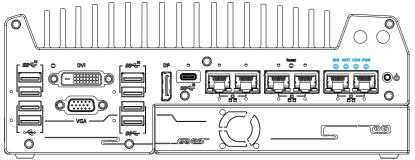| LED Color	Status	Description
Orange	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED (Left)

LED Color	Status	Description
Green or Orange	Off	10 Mbps
	Green	100 Mbps
	Orange	1000/ 2500 Mbps

⓫ 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.
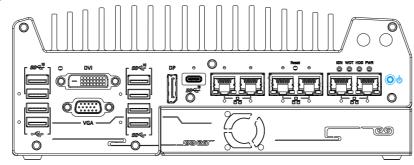
⑫ Status LED Indicator

There are four LED indicators on the I/O panel: IGN, WDT, HDD and PWR. The descriptions of these four LED are listed in the following table.
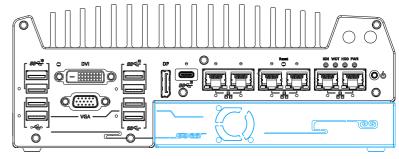
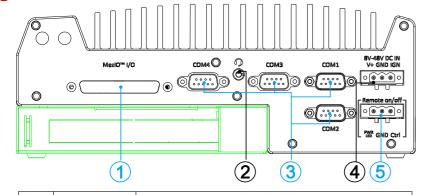| Indicator	Color	Description
IGN	Yellow	Ignition signal indicator, lid when IGN is high (12V/ 24V).
WDT	Yellow	Watchdog timer LED, flashing when WDT is active.
HDD	Red	Hard drive indicator, flashing when hard disk drive is active.
PWR	Green	Power indictor, lid when system is on.

⑬ Power Button

The power button is a non-latched switch for ATX mode on/off operation. To turn on the system, press the power button and the PWR LED should light-up green. To turn off the system, issuing a shutdown command in OS is preferred, or you can simply press the power button. To force shutdown when the system freezes, press and hold the power button for 5 seconds. Please note that there is a 5-second interval between on/off operations (i.e. once the system is turned off, there is a 5-second wait before you can power-on the system).
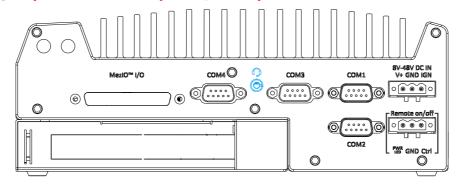
⑭ Cassette Module

Neousys' patented expansion Cassette (R.O.C. Patent No. M456527) provides a separated compartment to accommodate an add-on card. It effectively manages thermal conditions of both the system and the add-on card. The modular concept brought by Cassette module also reduces the complexity of installing and replacing an add-on card in the fanless controller.
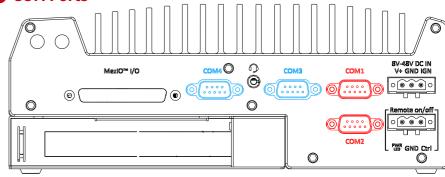
⑮ Rear Panel IO

No.	Item	Description
1	MezIO™ I/O	Reserved for MezIO™ I/O connector. Connector may vary depending on your choice of MezIO™.
2	4-Pole 3.5mm headphone/ microphone jack	The 4-pole 3.5mm jack accepts microphone voice input and headphone speaker sound output.
3	COM ports 1-4	The four COM ports offer communication with external devices.
4	3-pin terminal block (DC/ ignition input)	Compatible with DC power input from 8-48V, the terminal block is also used for ignition signal input.
5	3-pin remote on/ off control	Allows for external switch extension when the system is placed inside a cabinet.
Area in green	Cassette module	The cassette module offers a separate compartment to manage thermal conditions and reduce installation complications of an add-on card.

⑯ 4-pole 3.5mm Headphone/ Microphone Jack

The system audio function uses high definition audio. There is a female 4-pole audio jack for headphone (speaker) output and microphone input. The HD audio codec is natively supported in Windows 10 and Windows 11 and no additional drivers are required to enable audio functions on Nuvo-9000 series.
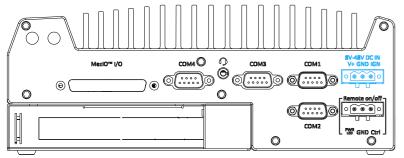
⑰ COM Ports

The system provides four COM ports to communicate with external devices. The COM ports are implemented using industrial-grade ITE8786 Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate. COM1 and COM2 (in red) are software-configurable RS-232/ 422/ 485 ports. COM3 and COM4 (in blue) are standard 9-wire RS-232 ports. The operation mode of COM1 and COM2 can be set in BIOS setup utility. The following table describes the pin definition of COM ports.

Pin#	COM1 & COM2			COM3 & COM4
	RS-232 Mode	RS-422 Mode	RS-485 Mode (Two-wire 485)	RS-232 Mode
1	DCD			DCD
2	RX	422 TXD+	485 TXD+/RXD+	RX
3	TX	422 RXD+		TX
4	DTR	422 RXD-		DTR
5	GND	GND	GND	GND
6	DSR			DSR
7	RTS			RTS
8	CTS	422 TXD-	485 TXD-/RXD-	CTS
9	RI			RI

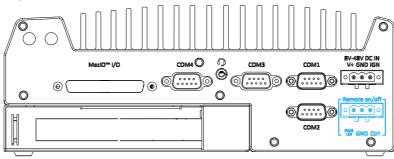## ⓲ 3-pin Terminal Block for DC and Ignition Input

The system accepts a wide range of DC power input from 8 to 48V 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 accept ignition signal input (IGN) when ignition control module (eg. MezIO-V20) is installed for in-vehicle applications.

Warning

Please make sure the voltage of DC power is correct before you connect it to the system. Supplying a voltage over 48V will damage the system.

⓳ 3-pin Remote On/ Off

The "Remote On/ Off" 3-pin connection allows for the connection of an external non-latched switch to turn on/ off the system. It is useful when the system is placed in a cabinet or a not easily accessed location. You may connect an external status LED (20mA) indicator by connecting to PWR LED and GND.