

Warning

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

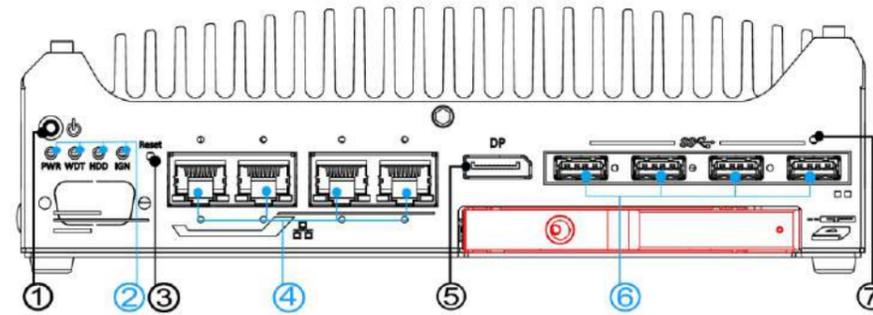
1 Preparing tools

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

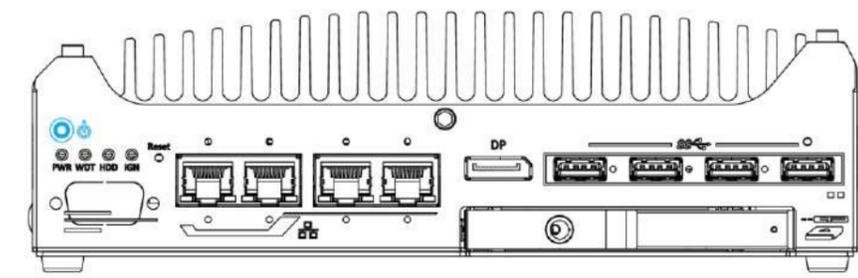
Item	Description	Quantity
01	Nuvo-9531 system	1
02	CPU bracket	1
03	Wall-mount bracket	2
04	Drivers & utilities disc	1
05	3-pin pluggable terminal block	1
06	Screw pack	1

2 Overview - Front Panel



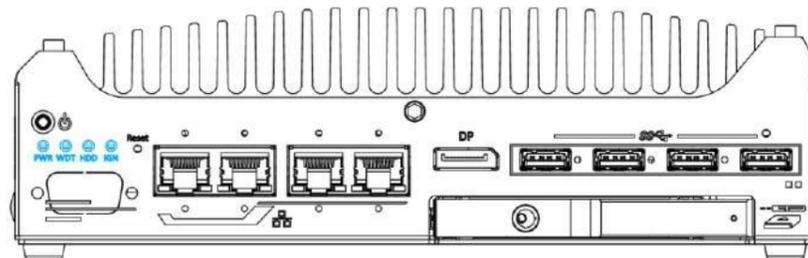
No.	Item	Description
1	Power Button	Use this button to turn on or shutdown the system.
2	System status LEDs	Four system LEDs, power (PWR), watchdog timer (WDT), hard disk drive (HDD) and ignition (IGN).
3	Reset button	Use this button to manually reset the system.
4	2.5G Ethernet Port (optional PoE+)	The 2.5G Ethernet ports support 10/ 100/ 1000/ 2500 Mbps network connections with optional PoE+.
5	DisplayPort	Support display resolutions up to 4096 x 2304. Compatible with HDMI/ DVI via respective adapter cable (resolution may vary).
6	USB3.2 Gen1 Ports	USB 3.2 Gen1 port supports up to 5 Gbit/s data transfer bandwidth.
7	CMOS Reset Button	Use this button to manually reset the CMOS.
	Area in red	2.5" HDD/ SSD hot swappable tray

3 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).

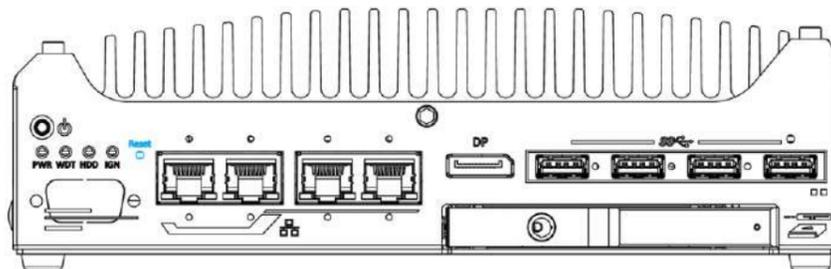
4 System Status LED



There are four LED indicators on the I/O panel: PWR (power), WDT (Watchdog timer), HDD (hard disk drive), IGN (ignition power control, an optional feature). The descriptions of these four LED are listed in the following table.

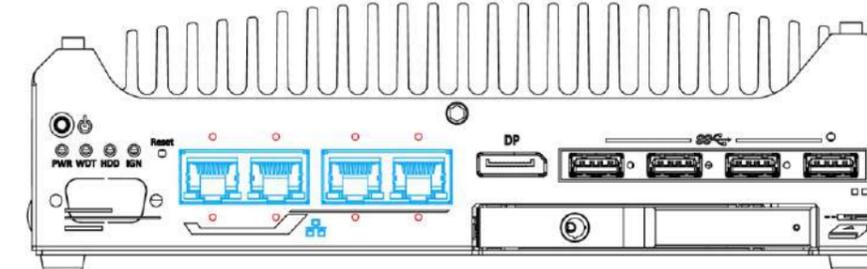
Indicator	Color	Description
PWR	Green	Power indicator, lighted-up when system is on.
WDT	Yellow	Watchdog timer LED, flashing when watchdog timer is started.
HDD	Red	Hard drive indicator, flashing when hard drive is active.
IGN	Green	An optional feature. Ignition signal indicator, lid when IGN is high (12V/ 24V).

5 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.

6 2.5G Ethernet Port (Optional PoE+)



The system offers four 2.5Gb Ethernet ports using Intel® I226 controller, and each port each come with screw-lock mechanism (indicated in red). When plugged in and connected via the Ethernet cable, the LEDs on the RJ45 connector indicate connection status and speed.

The optional Power over Ethernet (PoE) supplies 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). The system has a total 100W power budget. PoE ports can automatically detect and determine if the connected device requires power or not, so it is compatible with standard Ethernet devices as well.

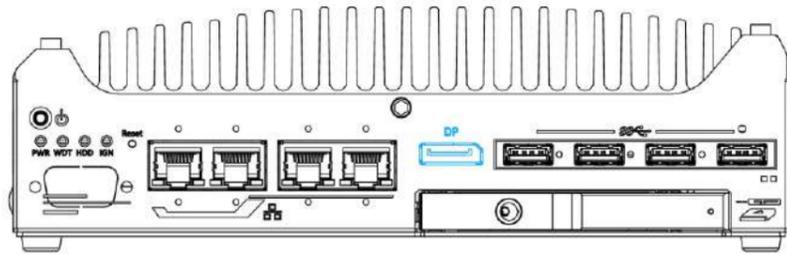
Active/Link LED

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

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

7 DisplayPort

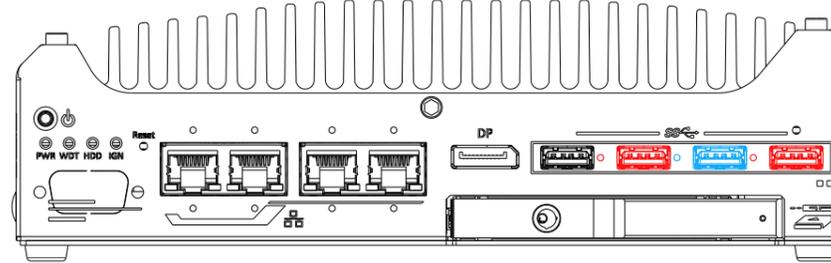


The system has a DisplayPort (DP) output which is a digital display interfaces that mainly connect video source and carry audio to a display device. When connecting a DP, it can deliver up to 4K UHD (4096 x 2304) in resolution. The system is designed to support passive DP adapter/ cable. You can connect to other display devices using DP-to-HDMI cable or DP-to-DVI cable.



With the VGA output on the rear panel, the system supports dual independent display outputs. To support dual display outputs and achieve best VGA/ DisplayPort output resolution in Windows, you need to install corresponding graphics drivers.

8 USB3.2 Gen1 Port

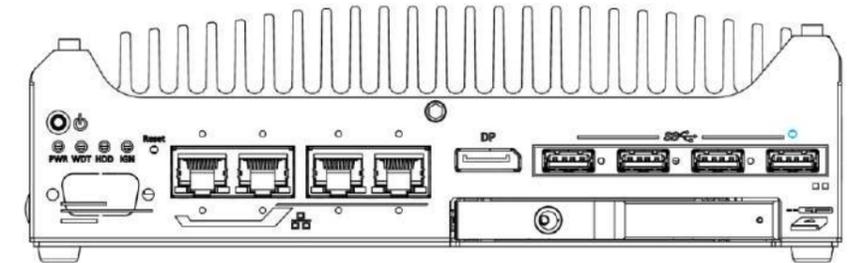


The system offers four USB 3.2 Gen1 (SuperSpeed USB) ports on its front panel with screw-lock mechanism. They are backward compatible with USB 2.0, USB 1.1 and USB 1.0 devices. UEFI USB is also supported so you can use USB keyboard/ mouse in UEFI shell environment. USB 3.2 Gen1 driver is supported natively in Windows 10. The screw-lock mechanism is available on the three ports indicated in blue and red, and due to the width of the screw-lock connector, only the USB ports indicated in red can be connected simultaneously when using the screw-lock mechanism.

Note

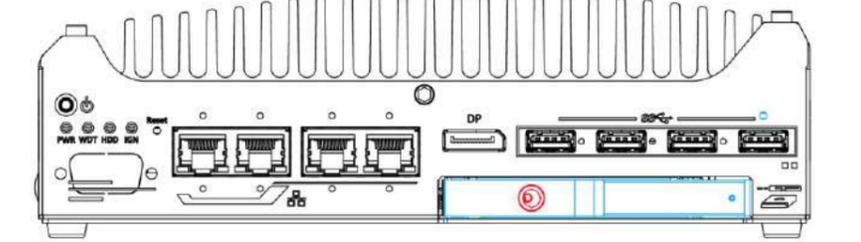
Depending on the design of your screw-lock USB connector, the CMOS reset button may be obstructed if the USB port below is connected.

9 CMOS Reset Button



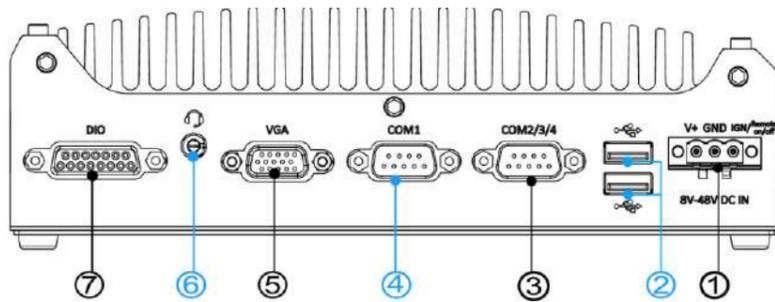
The CMOS Reset button is used to manually reset the motherboard BIOS in case of system halt or malfunction. To avoid unexpected operation, it is purposely placed behind the panel. To reset, please use the tip of a pen, press and hold for at least 5 seconds to reset the BIOS.

10 2.5" HDD/ SSD Hot-swappable Tray



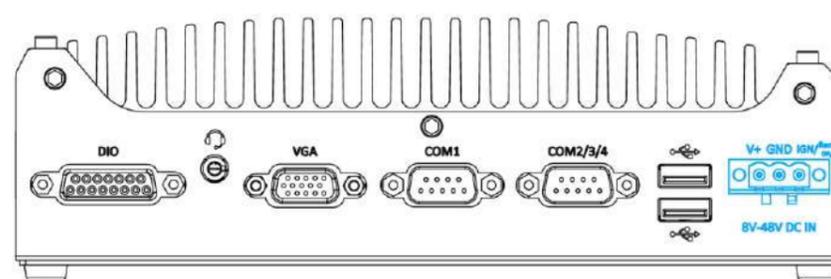
The system features an external hot-swappable 2.5" hot-swappable tray that supports a 7mm 2.5" HDD/ SSD. Designed for easy access, the HDD tray is secured by a lock (indicated in red).

11 Overview - Rear Panel



No.	Item	Description
1	3-pin Terminal Block DC Input (Optional Ignition Power Control)	Compatible with DC power input from 8~48V, the terminal block is also used for ignition signal input.
2	USB2.0 Ports	The USB 2.0 ports are backward with USB 1.1 / 1.0.
3	COM2/3/4 Port	Can be configured as: COM2: single RS-422/ 485 port COM2/ COM3/ COM4: three 3-wire RS-232 ports
4	COM1 Port	Software programmable RS-232/ 422/ 485 port.
5	VGA Port	VGA output supports resolution up to 1920x1200@60Hz
6	4-Pole 3.5mm Microphone-in/ Speaker-out Jack	The 4-pole 3.5mm jack accepts microphone voice input and headphone speaker sound output.
7	DIO Port	The port provides four DI and four DO via DB15 female connector

12 3-pin Terminal Block for DC, Remote ON/ Off, and Optional Ignition Power Control



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.

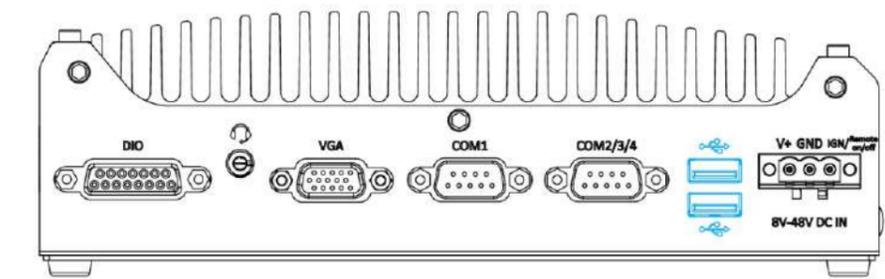
The Remote On/ Off connection allows for external switch extension. It is useful when the system is placed in a cabinet or a not easily accessed location.

In addition to DC power input and Remote On/ Off, this terminal block can also accept optional ignition signal input (IGN) 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.

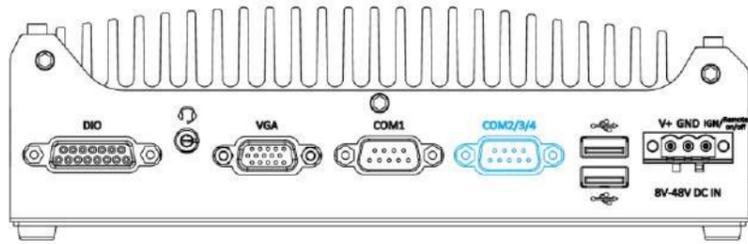
13 USB2.0 Port



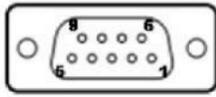
The USB2.0 ports are implemented via native xHCI (eXtensible Host Controller Interface) in the Intel 600 chipset and are backward compatible with USB 1.1 and USB 1.0 devices. UEFI USB support is also provided so you can use USB keyboard/ mouse in UEFI shell environment.

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

14 COM2/3/4 Port



The port provides up to 921600 bps baud rate, it can be configured in the BIOS as single RS-422/ 485 port (COM2) or three 3-wire RS-232 ports (COM2/ 3/ 4). An optional 1-to-3 Y-cable is available to connect three RS-232 devices.



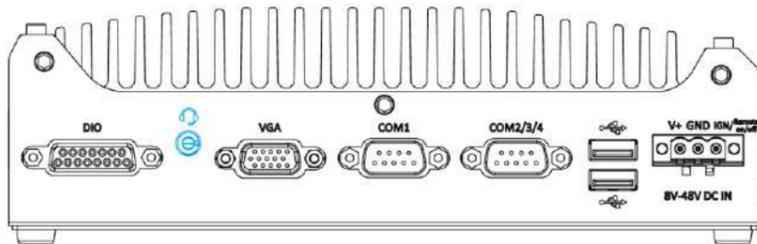
COM2/ 3/ 4 Pin

1-to-3 Y-cable

The following table describes the pin definition of the COM port

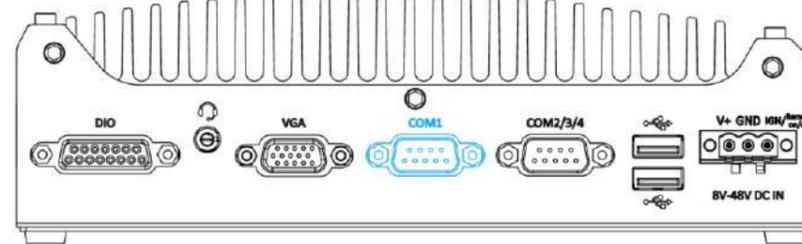
3-port RS-232 COM2/ 3/ 4				Single port RS-422/ 485 COM2		
Pin#	COM2	COM3	COM4	Pin#	RS-422	RS-485
1				1		
2	RX			2	TxD+	TxD+/ RxD+
3	TX			3	RxD+	
4		TX		4	RxD-	
5	GND	GND	GND	5	GND	GND
6		RX		6		
7			TX	7		
8			RX	8	TxD-	TxD-/ RxD-
9				9		

17 4-Pole 3.5mm Microphone-in/ Speaker-out Jack

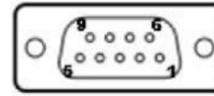


There is a female 4-pole audio jack for headphone (speaker) output and microphone input. To utilize the audio function in Windows, you need to install corresponding drivers.

15 COM1 Port



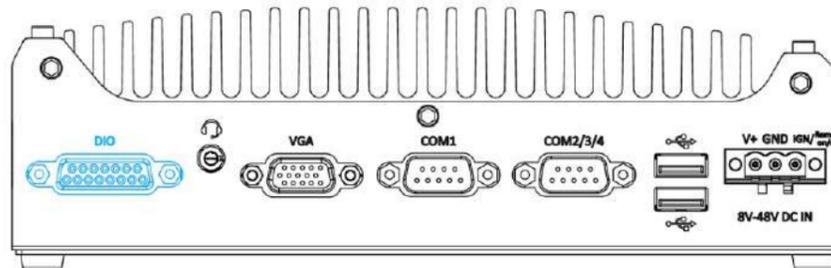
The port provides up to 921600 bps baud rate, it is a software-configurable RS-232/422/485 port via 9-pin D-Sub male connector. The operation mode, slew rate and termination of COM1 can be set in BIOS setup utility. The following table describes the pin definition of COM ports.



Pin#	COM1		
	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		

18 DIO Port

The digital input (DI) and digital output (DO) function provides four digital input and four digital output on the rear panel of the system via DB15 female connector.



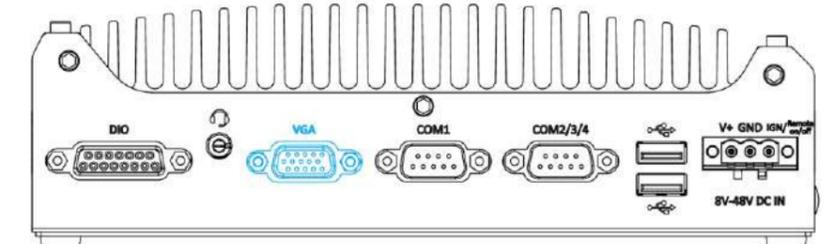
Isolated Digital Input

No. of Channel	4-CH Isolated Digital Input Channels
Logic Level	Logic High: 5 to 24V Logic Low: 0 to 1.5V
Isolated Voltage	2500 Vrms
Input Resistance	1kΩ
Operation Mode	Polling

Isolated Digital Output

No. of Channel	4-CH Isolated Digital Output Channels
Sink Current (per channel)	500 mA
Isolated Voltage	1500 Vrms
Operation Mode	Polling

16 VGA Port

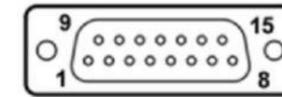


VGA connector is the most common video display connection. The VGA output supports up to 1920x1200@60Hz resolution.

With the DisplayPort on the front panel, the system supports dual independent display outputs. To support dual display outputs and achieve best VGA/ DisplayPort 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.



Pin Definition

Pin#	Pin Definition	Pin#	Pin Definition
1	DI_0	9	DI_GND
2	DI_1	10	DI_2
3	DI_GND	11	DI_3
4	DO_GND	12	DO_GND
5	DO_0	13	DO_2
6	DO_1	14	DO_3
7	DO_GND	15	-
8	VDD		

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