Neousys Technology Inc.

Nuvo-10000 Series

Quick Introduction Guide

Revision 1.0

Table of Contents

Legal Information

All Neousys Technology Inc. products shall be subject to the latest Standard Warranty Policy

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.

Before installing any software, applications or components provided by a third party, customer should ensure that they are compatible and interoperable with Neousys Technology Inc. product by checking in advance with Neousys Technology Inc.. Customer is solely responsible for ensuring the compatibility and interoperability of the third party's products. Customer is further solely responsible for ensuring its systems, software, and data are adequately backed up as a precaution against possible failures, alternation, or loss.

For questions in regards to hardware/ software compatibility, customers should contact Neousys Technology Inc. sales representative or technical support.

To the extent permitted by applicable laws, Neousys Technology Inc. shall NOT be responsible for any interoperability or compatibility issues that may arise when (1) products, software, or options not certified and supported; (2) configurations not certified and supported are used; (3) parts intended for one system is installed in another system of different make or model.

Contact Information

Headquarters (Taipei, Taiwan)	**Neousys Technology Inc.** 15F, No.868-3, Zhongzheng Rd., Zhonghe Dist., New Taipei City, 23586, Taiwan Tel: +886-2-2223-6182 Fax: +886-2-2223-6183 Email, Website
Americas (Illinois, USA)	**Neousys Technology America Inc.** 3384 Commercial Avenue, Northbrook, IL 60062, USA Tel: +1-847-656-3298Email, Website
China	**Neousys Technology (China) Ltd.** Room 612, Building 32, Guiping Road 6100, Shanghai Tel: +86-2161155366Email, Website

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.

Copyright Notice

Disclaimer

This manual is intended to be used as an informative guide only and is subject to change without prior notice. It does not represent commitment from Neousys Technology Inc. Neousys Technology Inc. shall not be liable for any direct, indirect, special, incidental, or consequential damages arising from the use of the product or documentation, nor for any infringement on third party rights.

Patents and Trademarks

Neousys, the Neousys logo, Expansion Cassette, MezIO™ are registered patents and trademarks of Neousys Technology, Inc.

Windows is a registered trademark of Microsoft Corporation.

Intel®, Core™ are registered trademarks of Intel Corporation

NVIDIA® is a registered trademark of NVIDIA Corporation

All other names, brands, products or services are trademarks or registered trademarks of their respective owners.

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 styrofoam in your work area.
- Do not remove any module or component from its anti-static bag before installation

About This Guide

This quick introduction guide introduces Neousys Nuvo-10000 series' basic I/Os. The system features support for an Intel® 13th/ 12th Gen Core™ CPU processor with up to 7 slot expandability. The system is also capable of supporting one 125W NVIDIA® graphics card for modern AI applications.

Revision History

Version	Date	Description
1.0	Mar. 2024	Initial release

1 Introduction

Nuvo-10000 series is the ideal choice to replace your bulky rack-mount or wall-mount IPC systems. The system offers up to seven PCIe/ PCI slots in its compact chassis to deliver the same level of expandability as off-the-shelf 4U 19" IPCs. Users can install a wide variety of AIO, DIO, communication, image capture and motion control cards for versatile applications.

Leveraging Intel® 14th/ 13th/ 12th-Gen Alder Lake Core™ i desktop processors with Q670 chipset, Nuvo-10000 series delivers exceptional computing power over traditional IPCs in a comparatively compact size with a competitive price. It features eight USB 3.2 ports with screw-lock mechanism for USB3 cameras. There is one GbE, one 2.5 GbE, 5 COM ports, and accommodates two 2.5" HDDs/ SSDs with the addition of an internal SATA port for a third HDD/SSD. The system can also support a 115W NVIDIA® GPU to offer significant AI computing power for modern deep-learning applications.

Driven by the increasing demand for industrial IoT, vision inspection and machine automation, Nuvo-10000 series is a flexible all-around rugged solution that can satisfy various industrial applications. With an assortment of I/O ports and flexible 7-slot PCIe/ PCI expandability, Nuvo-10000 series is geared for the fifth industrial revolution.

1.1 Product Specifications

1.1.1 Nuvo-10003 Specifications

System Core	
Processor	Supporting Intel® 14th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-14900/ i9-14900T - Intel® Core™ i7-14700/ i7-14700T - Intel® Core™ i5-14500/ i5-14400/ i5-14500T - Intel® Core™ i3-14100/ i3-14100T Supporting Intel® 13th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-13900E/ i9-13900TE - Intel® Core™ i7-13700E/ i7-13700TE - Intel® Core™ i5-13500E/ i5-13400E/ i5-13500TE - Intel® Core™ i3-13100E/ i3-13100TE Supporting Intel® 12th-Gen Core™ CPU (LGA1700 socket, 35W/ 65W TDP) - Intel® Core™ i9-12900E/ i9-12900TE - Intel® Core™ i7-12700E/ i7-12700TE - Intel® Core™ i5-12500E/ i5-12500TE - Intel® Core™ i3-12100E/ i3-12100TE - Intel® Pentium® G7400E/ G7400TE - Intel® Celeron® G6900E/ G6900TE
Chipset	Intel® Q670E platform controller hub
Graphics	Integrated Intel® UHD Graphics 770 (32EU)/ 730 (24EU)
Memory	Up to 64 GB DDR5 4800 SDRAM (two SODIMM slots)
AMT	Supports Intel vPro/ AMT 16.0
TPM	Supports dTPM2.0
I/O Interface	
Ethernet	1x 2.5G Ethernet port by I226-IT 1x Gigabit Ethernet port by I219-LM
Video port	1x HDMI 1.4b, supporting 3840 × 2160 resolution 1x DisplayPort, supporting 4096 x 2304 resolution
Serial Port	2x software-programmable RS-232/422/485 ports (COM1/ COM2) 3x 3-wire RS-232 ports (COM3/ COM4/ COM5)
USB3.2	4x USB 3.2 Gen2 (10 Gbps) ports

	4x USB 3.2 Gen2 (5 Gbps) ports
USB2.0	1x USB 2.0 port with Type-A connector (internal)
Audio	1x 3.5mm jack for mic-in and speaker-out
Storage Interface	
SATA	2x SATA ports for internal 2.5” HDD/ SSD installation
M.2	1x M.2 2280 SATA interface
Expansion Bus	
PCI Express	1x PCIe x16 slot @ Gen3, 16-lanes 2x PCIe x8 slot @ Gen3, 4-lanes
mini PCIe	2x full-size mini PCI Express socket
Power Supply	
DC Input	1x 3-pin pluggable terminal block for 12V to 35V DC input
Remote Ctrl. & LED Output	1x 10-pin (2x5) wafer connector for remote on/off control and status LED output
Max. power consumption	For reference only, actual consumption may vary depending on configuration. With i7-12700 (65W mode): 141.4W (Max.) @ 24V With i7-12700 (65W mode): 146.4W (Max.) @ 48V With i7-12700TE (35W mode): 106.6W (Max.) @ 24V With i7-12700TE (35W mode): 111.8W (Max.) @ 48V With i5-12400 (35W mode): 105.1W (Max.) @ 24V With i5-12400 (35W mode): 110.9W (Max.) @ 48V With i5-12400 (65W mode): 120.5W (Max.) @ 24V With i5-12400 (65W mode): 126.2W (Max.) @ 48V
Mechanical	
Dimension	157.1(W) x 280(D) x 188.3(H) mm (Nuvo-10003)
Weight	4.2kg
Mounting	Wall-mount (standard)
Environmental	
Operating temperature	-25°C ~ 60°C
Storage temperature	-40°C ~85°C
Humidity	10%~90%, non-condensing
Vibration	Operating, MIL-STD-810H, Method 514.6, Category 4
Shock	Operating, MIL-STD-810H, Method 516.6, Procedure I, Table 516.6-II
EMC	CE/ FCC Class A, according to EN 55032 & EN 55035

1.1.2 Nuvo-10007 Specifications

System Core	
Processor	Supporting Intel® 14th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-14900/ i9-14900T - Intel® Core™ i7-14700/ i7-14700T - Intel® Core™ i5-14500/ i5-14400/ i5-14500T - Intel® Core™ i3-14100/ i3-14100T Supporting Intel® 13th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-13900E/ i9-13900TE - Intel® Core™ i7-13700E/ i7-13700TE - Intel® Core™ i5-13500E/ i5-13400E/ i5-13500TE - Intel® Core™ i3-13100E/ i3-13100TE Supporting Intel® 12th-Gen Core™ CPU (LGA1700 socket, 35W/ 65W TDP) - Intel® Core™ i9-12900E/ i9-12900TE - Intel® Core™ i7-12700E/ i7-12700TE - Intel® Core™ i5-12500E/ i5-12500TE - Intel® Core™ i3-12100E/ i3-12100TE - Intel® Pentium® G7400E/ G7400TE - Intel® Celeron® G6900E/ G6900TE
Chipset	Intel® Q670E platform controller hub
Graphics	Integrated Intel® UHD Graphics 770 (32EU)/ 730 (24EU)
Memory	Up to 64 GB DDR5 4800 SDRAM (two SODIMM slots)
AMT	Supports Intel vPro/ AMT 16.0
TPM	Supports dTPM 2.0
I/O Interface	
Ethernet	1x 2.5G Ethernet port by I226-IT 1x Gigabit Ethernet port by I219-LM
Video port	1x HDMI 1.4b, supporting 3840 × 2160 resolution 1x DisplayPort, supporting 4096 x 2304 resolution
Serial Port	2x software-programmable RS-232/422/485 ports (COM1/ COM2) 3x 3-wire RS-232 ports (COM3/ COM4/ COM5)
USB3.2	4x USB 3.2 Gen2 (10 Gbps) ports 4x USB 3.2 Gen2 (5 Gbps) ports

USB2.0	1x USB 2.0 port with Type-A connector (internal)
Audio	1x 3.5mm jack for mic-in and speaker-out
Storage Interface	
SATA	2x SATA ports for internal 2.5” HDD/ SSD installation
M.2	1x M.2 2280 SATA interface
Expansion Bus	
PCI Express	2x PCIe x16 slot @ Gen3, 8-lanes 3x PCIe x8 slot @ Gen3, 4-lanes 2x PCIe x4 slot @ Gen3, 2-lanes
mini PCIe	2x full-size mini PCI Express socket
Power Supply	
DC Input	1x 3-pin pluggable terminal block for 12V to 35V DC input
Remote Ctrl. & LED Output	1x 10-pin (2x5) wafer connector for remote on/off control and status LED output
Max. power consumption	For reference only, actual consumption may vary depending on configuration. With i7-12700 (65W mode): 141.4W (Max.) @ 24V With i7-12700 (65W mode): 146.4W (Max.) @ 48V With i7-12700TE (35W mode): 106.6W (Max.) @ 24V With i7-12700TE (35W mode): 111.8W (Max.) @ 48V With i5-12400 (35W mode): 105.1W (Max.) @ 24V With i5-12400 (35W mode): 110.9W (Max.) @ 48V With i5-12400 (65W mode): 120.5W (Max.) @ 24V With i5-12400 (65W mode): 126.2W (Max.) @ 48V
Mechanical	
Dimension	240.7(W) x 280(D) x 188.3(H) mm
Weight	5.2kg
Mounting	Wall-mount (standard)
Environmental	
Operating temperature	-25°C ~ 60°C
Storage temperature	-40°C ~85°C
Humidity	10%~90%, non-condensing
Vibration	Operating, MIL-STD-810H, Method 514.6, Category 4
Shock	Operating, MIL-STD-810H, Method 516.6, Procedure I, Table 516.6-II
EMC	CE/ FCC Class A, according to EN 55032 & EN 55035

1.1.3 Nuvo-10034 Specifications

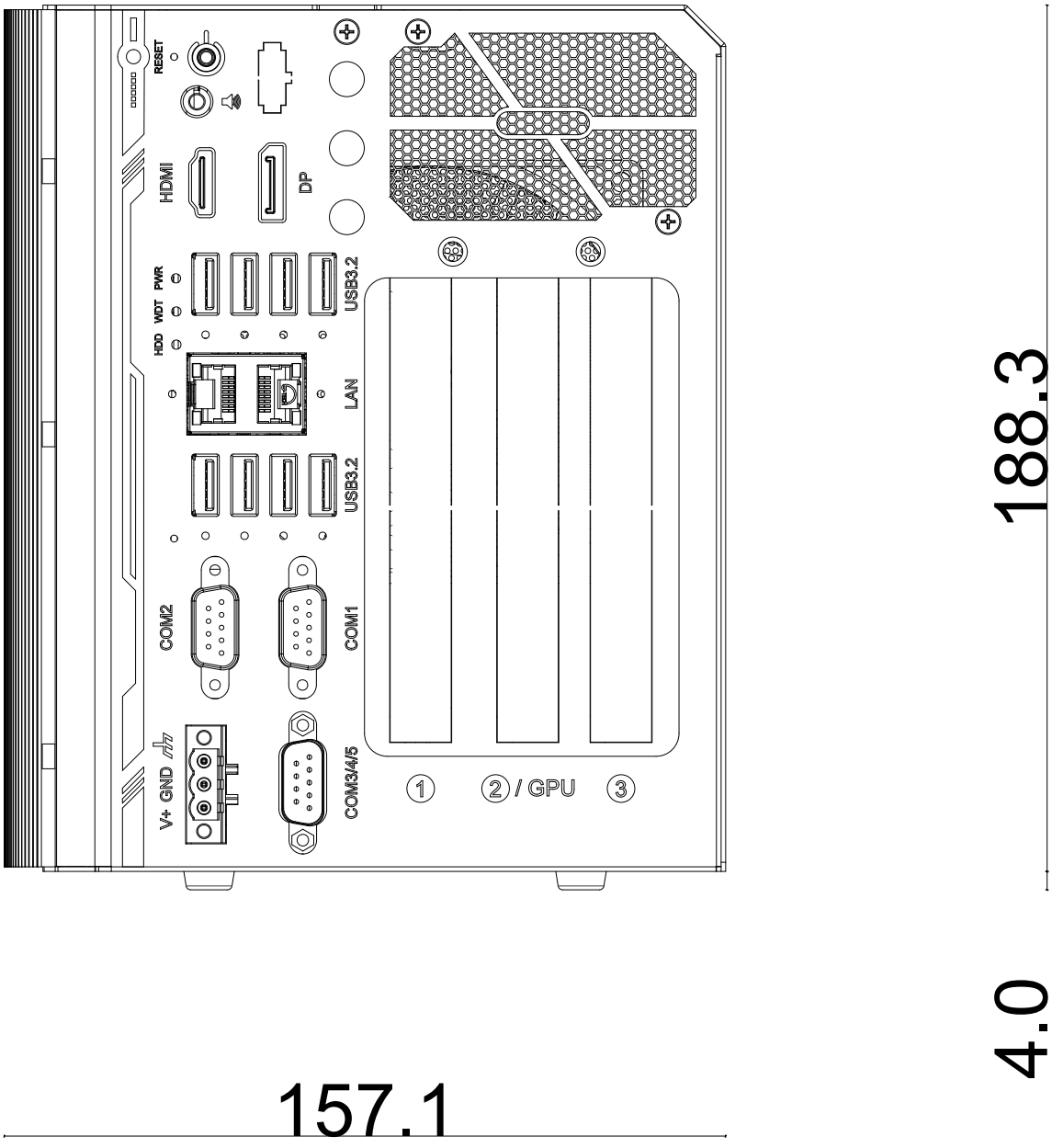
System Core	
Processor	Supporting Intel® 14th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-14900/ i9-14900T - Intel® Core™ i7-14700/ i7-14700T - Intel® Core™ i5-14500/ i5-14400/ i5-14500T - Intel® Core™ i3-14100/ i3-14100T Supporting Intel® 13th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-13900E/ i9-13900TE - Intel® Core™ i7-13700E/ i7-13700TE - Intel® Core™ i5-13500E/ i5-13400E/ i5-13500TE - Intel® Core™ i3-13100E/ i3-13100TE Supporting Intel® 12th-Gen Core™ CPU (LGA1700 socket, 35W/ 65W TDP) - Intel® Core™ i9-12900E/ i9-12900TE - Intel® Core™ i7-12700E/ i7-12700TE - Intel® Core™ i5-12500E/ i5-12500TE - Intel® Core™ i3-12100E/ i3-12100TE - Intel® Pentium® G7400E/ G7400TE - Intel® Celeron® G6900E/ G6900TE
Chipset	Intel® Q670E platform controller hub
Graphics	Integrated Intel® UHD Graphics 770 (32EU)/ 730 (24EU)
Memory	Up to 64 GB DDR5 4800 SDRAM (two SODIMM slots)
AMT	Supports Intel vPro/ AMT 16.0
TPM	Supports dTPM 2.0
I/O Interface	
Ethernet	1x 2.5G Ethernet port by I226-IT 1x Gigabit Ethernet port by I219-LM
Video port	1x HDMI 1.4b, supporting 3840 × 2160 resolution 1x DisplayPort, supporting 4096 x 2304 resolution
Serial Port	2x software-programmable RS-232/422/485 ports (COM1/ COM2) 3x 3-wire RS-232 ports (COM3/ COM4/ COM5)
USB3.2	4x USB 3.2 Gen2 (10 Gbps) ports 4x USB 3.2 Gen2 (5 Gbps) ports

USB2.0	1x USB 2.0 port with Type-A connector (internal)
Audio	1x 3.5mm jack for mic-in and speaker-out
Storage Interface	
SATA	2x SATA ports for internal 2.5” HDD/ SSD installation
M.2	1x M.2 2280 SATA interface
Expansion Bus	
PCI Express	2x PCIe x16 slot @ Gen3, 8-lanes 2x PCIe x8 slot @ Gen3, 4-lanes
mini PCIe	2x full-size mini PCI Express socket
Power Supply	
DC Input	1x 3-pin pluggable terminal block for 12V to 35V DC input
Remote Ctrl. & LED Output	1x 10-pin (2x5) wafer connector for remote on/off control and status LED output
Max. power consumption	For reference only, actual consumption may vary depending on configuration. With i7-12700 (65W mode): 141.4W (Max.) @ 24V With i7-12700 (65W mode): 146.4W (Max.) @ 48V With i7-12700TE (35W mode): 106.6W (Max.) @ 24V With i7-12700TE (35W mode): 111.8W (Max.) @ 48V With i5-12400 (35W mode): 105.1W (Max.) @ 24V With i5-12400 (35W mode): 110.9W (Max.) @ 48V With i5-12400 (65W mode): 120.5W (Max.) @ 24V With i5-12400 (65W mode): 126.2W (Max.) @ 48V
Mechanical	
Dimension	240.7(W) x 280(D) x 188.3(H) mm
Weight	5.2kg
Mounting	Wall-mount (standard)
Environmental	
Operating temperature	-25°C ~ 60°C
Storage temperature	-40°C ~85°C
Humidity	10%~90%, non-condensing
Vibration	Operating, MIL-STD-810H, Method 514.6, Category 4
Shock	Operating, MIL-STD-810H, Method 516.6, Procedure I, Table 516.6-II
EMC	CE/ FCC Class A, according to EN 55032 & EN 55035

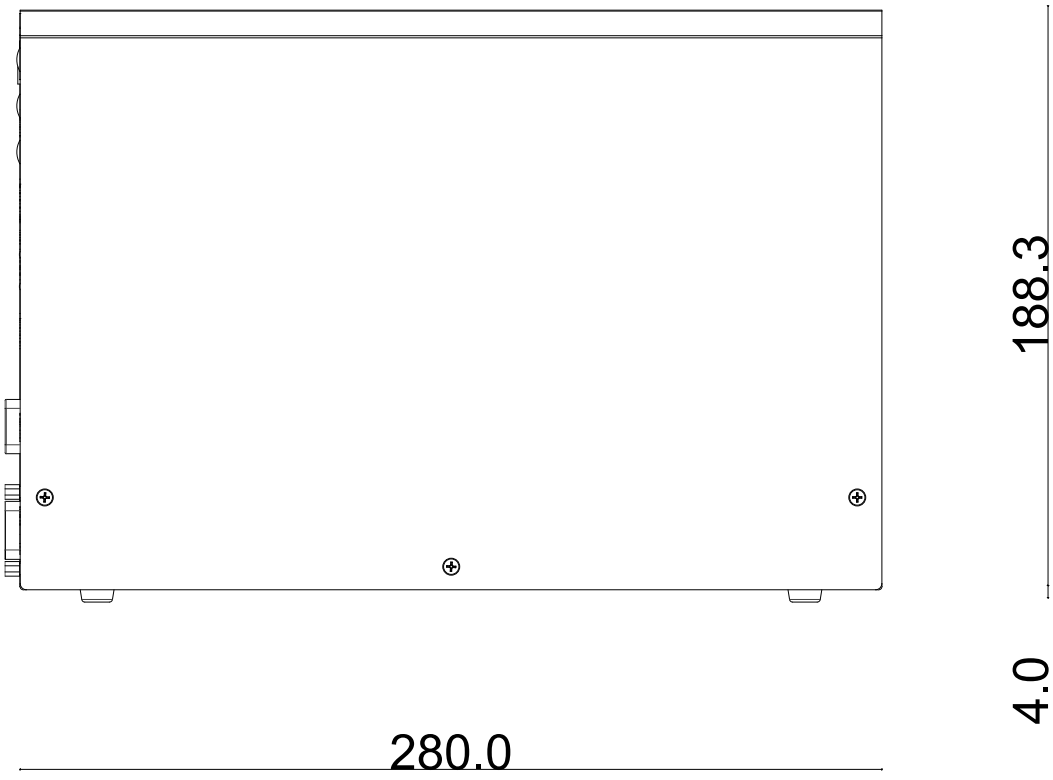
1.2 Nuvo-10003 Dimensions

> NOTE
>
> *All measurements are in millimeters (mm).*

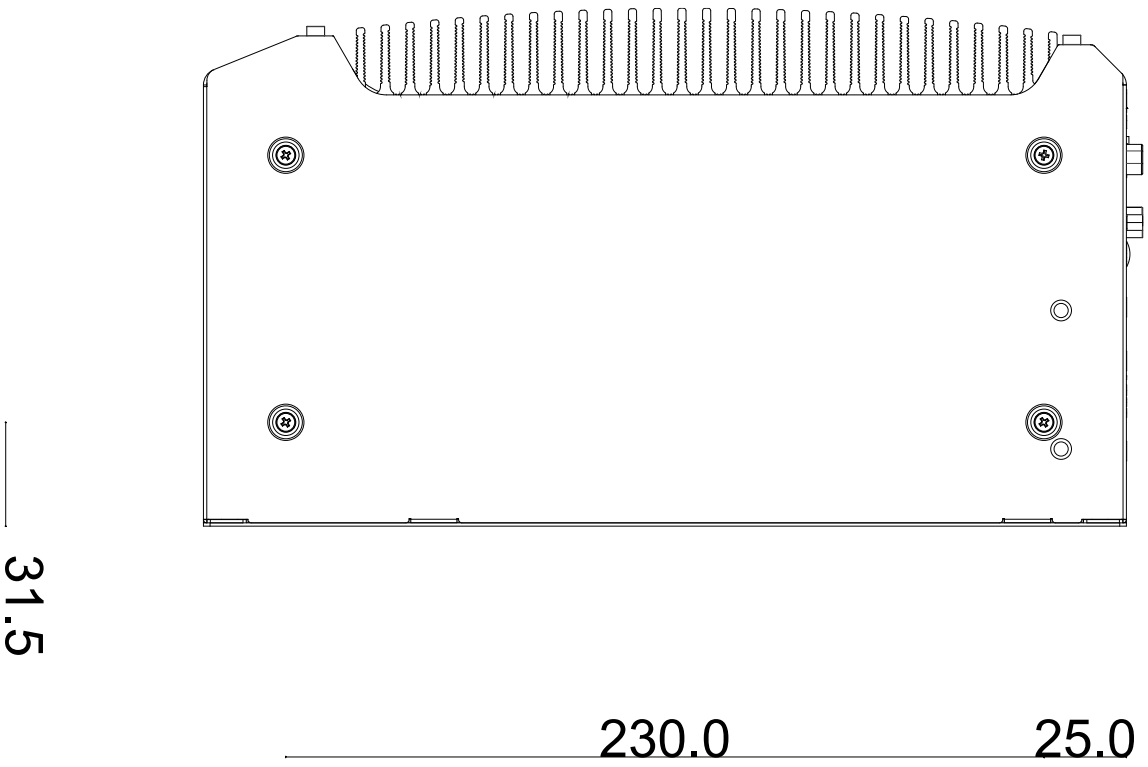
1.2.1 Nuvo-10003 I/O Panel View



1.2.2 Nuvo-10003 Side View



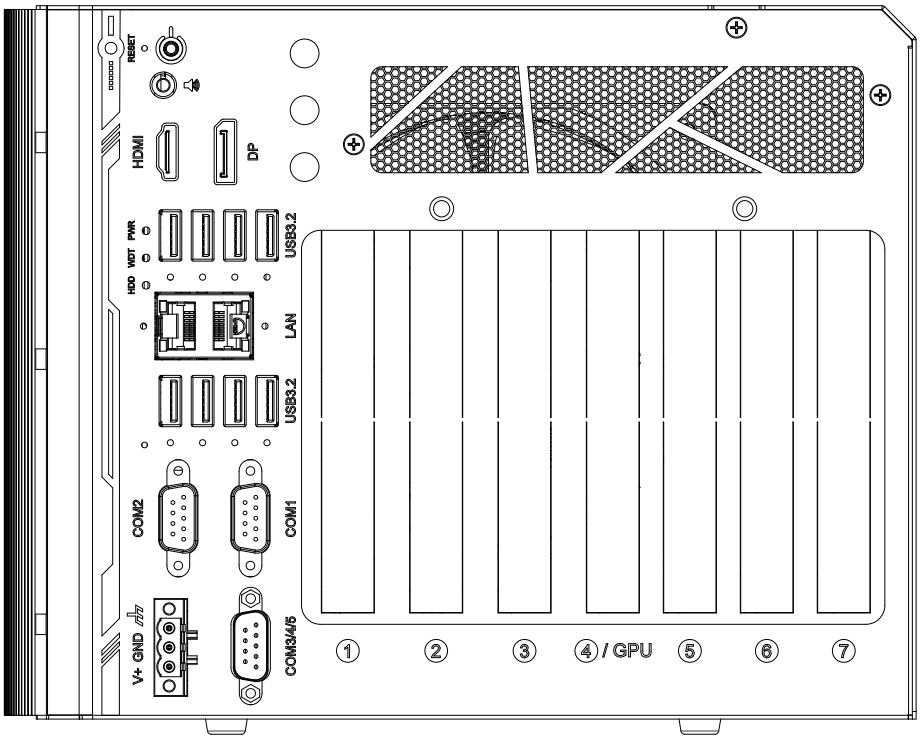
1.2.3 Nuvo-10003 Bottom View



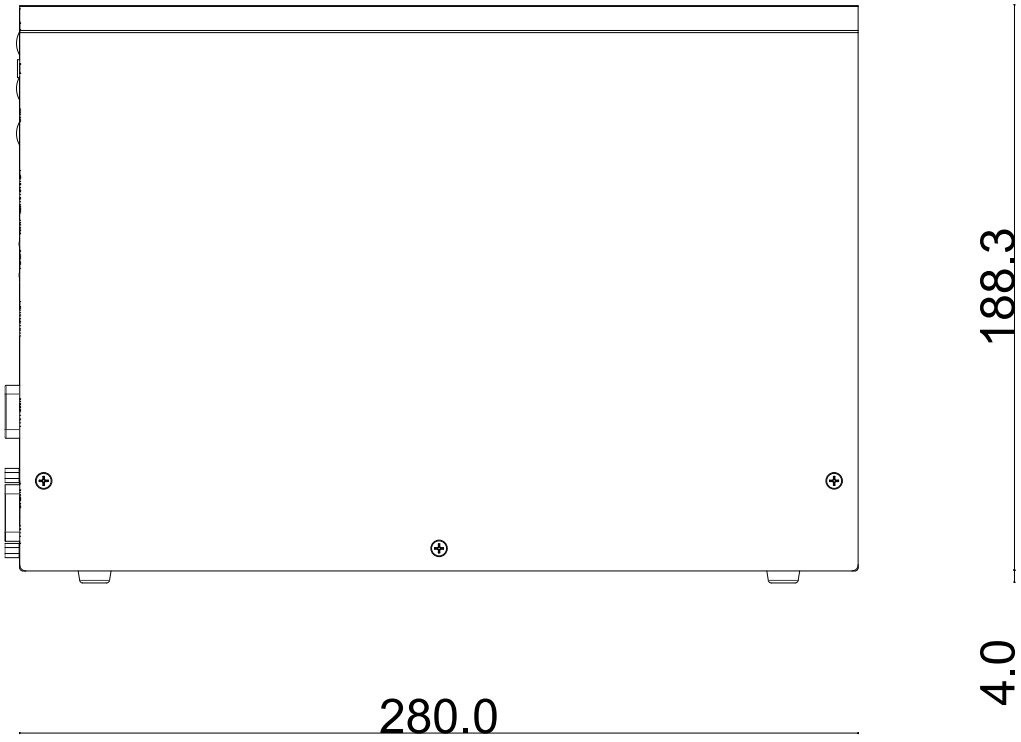
1.3 Nuvo-10007/ 10034 Dimension

> NOTE
>
> *Nuvo-10007/ 10034 systems share the same external dimensions.*
>
> *All measurements are in millimeters (mm).*

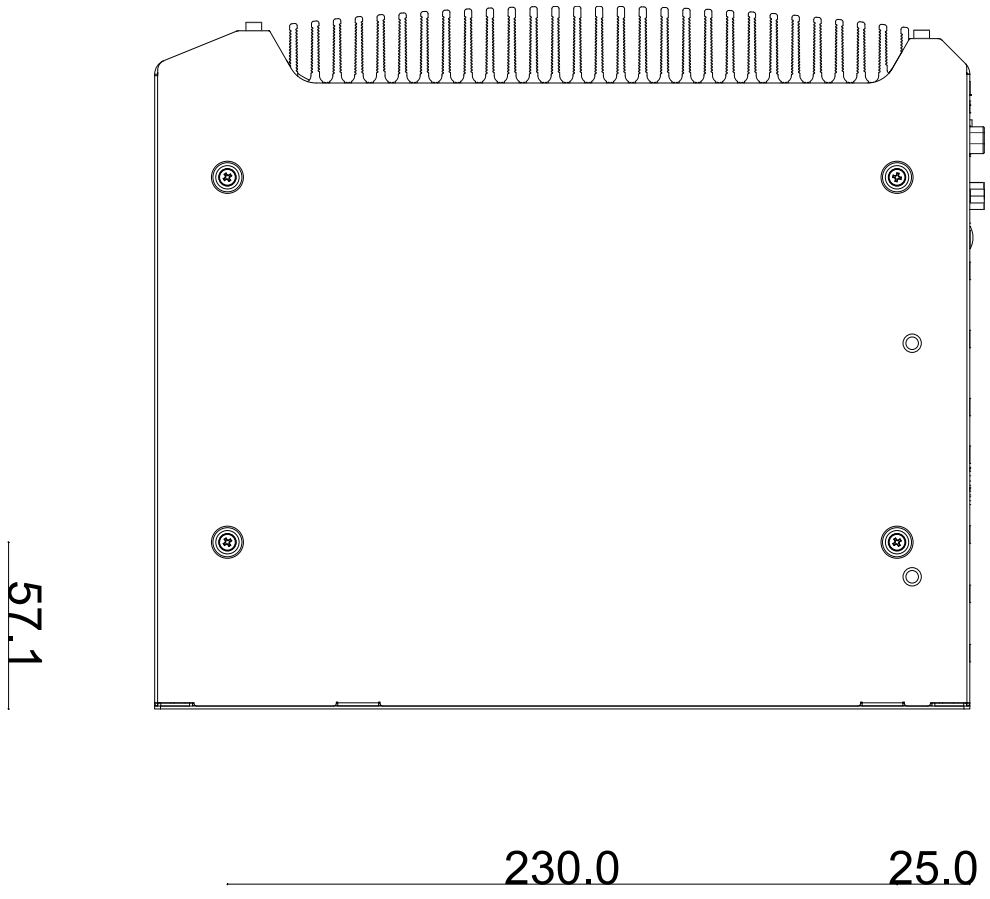
1.3.1 Nuvo-10007/ 10034 I/O Panel View



1.3.2 Nuvo-10007/ 10034 Side View



1.3.3 Nuvo-10007/ 10034 Bottom View



2 Overview

Upon receiving and unpacking your Nuvo-10000 system, 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 Nuvo-10000 Packing List

System / Pack	Nuvo-10000 series	Qty
1	Nuvo-10000 series system (If you ordered CPU/ RAM/ HDD, please verify these items)	1
2	Accessory box, which contains ● CPU bracket ● Wall-mount bracket ● 3-pin power terminal block ● Screw pack	 1 2 1 1

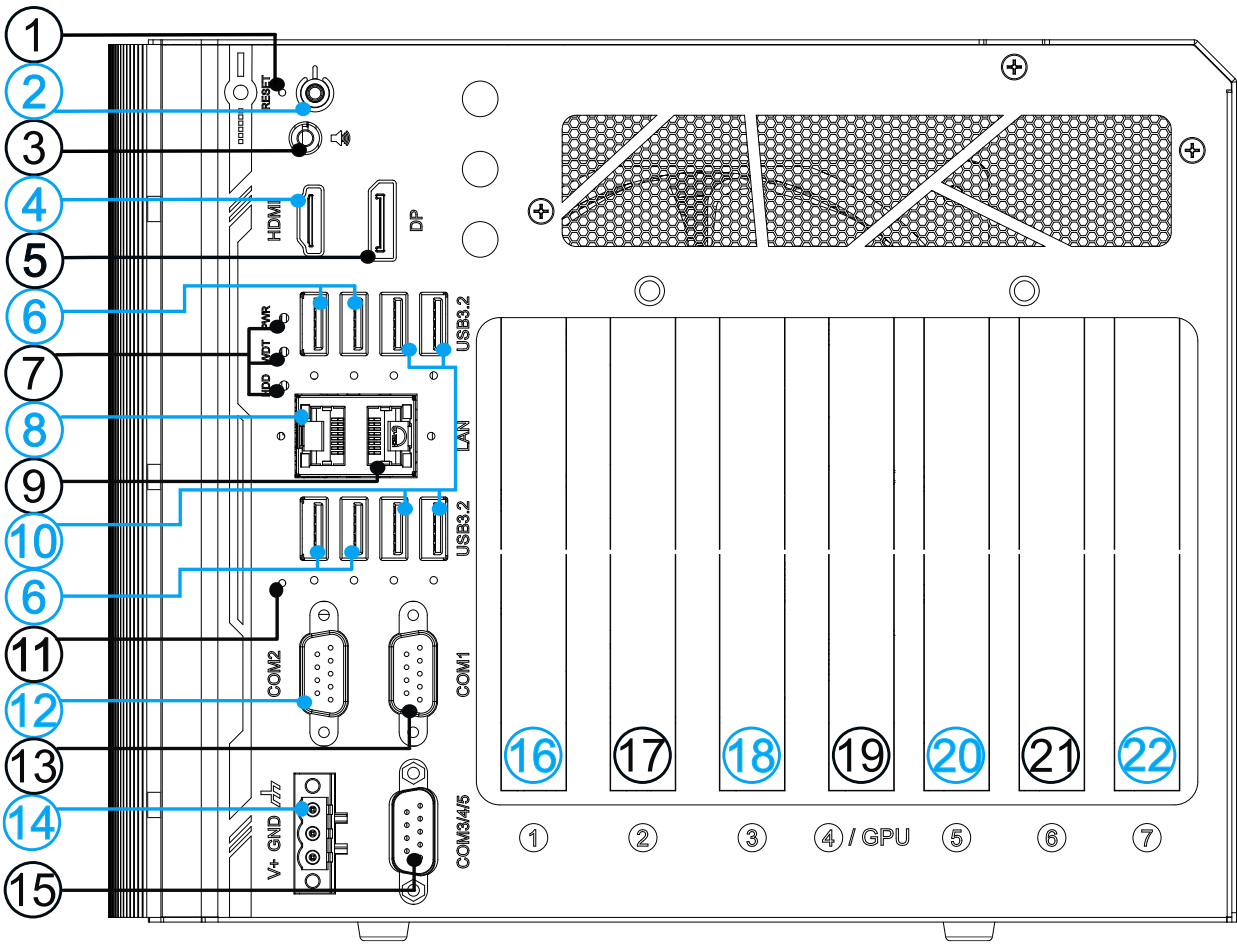
2.2 Nuvo-10000 Series I/O Panel

NOTE

Nuvo-10000 series systems share the same I/O connections and differ only in their number of PCIe and PCI slots. For demonstration purposes, an illustration matching Nuvo-10007/ 10034 will be used in the following sections.

Nuvo-10000 series I/O Panel

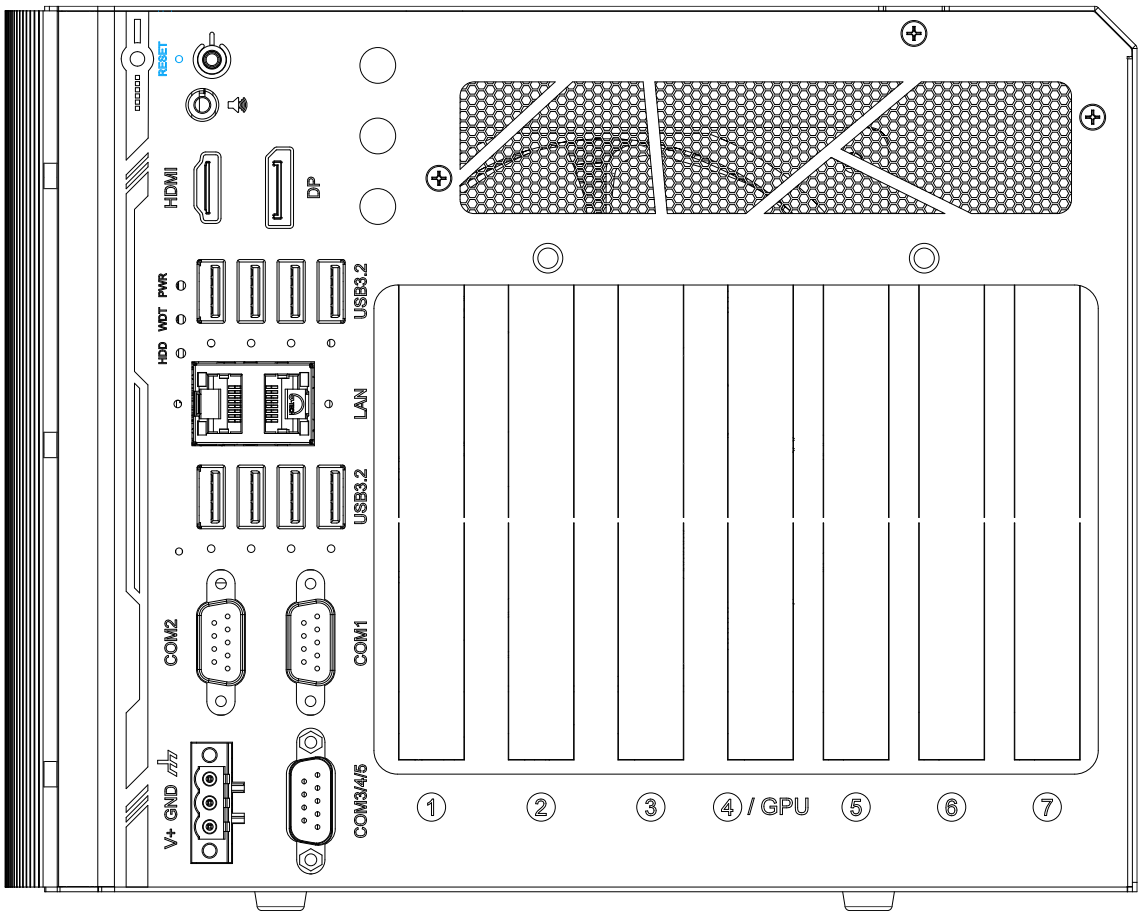
The Nuvo-10000 I/O panel features HDMI, DisplayPort, USB3.2 Gen2/ Gen1, 2.5Gb Ethernet and COM ports.



No.	Item	Description
1	Reset button	Use this button to manually reset the system.
2	Power Button	Use this button to turn on or shutdown the system.
3	3.5mm Speaker/ Headphone Output Jack	The 4-pole 3.5mm jack accepts microphone voice input and headphone speaker sound output.

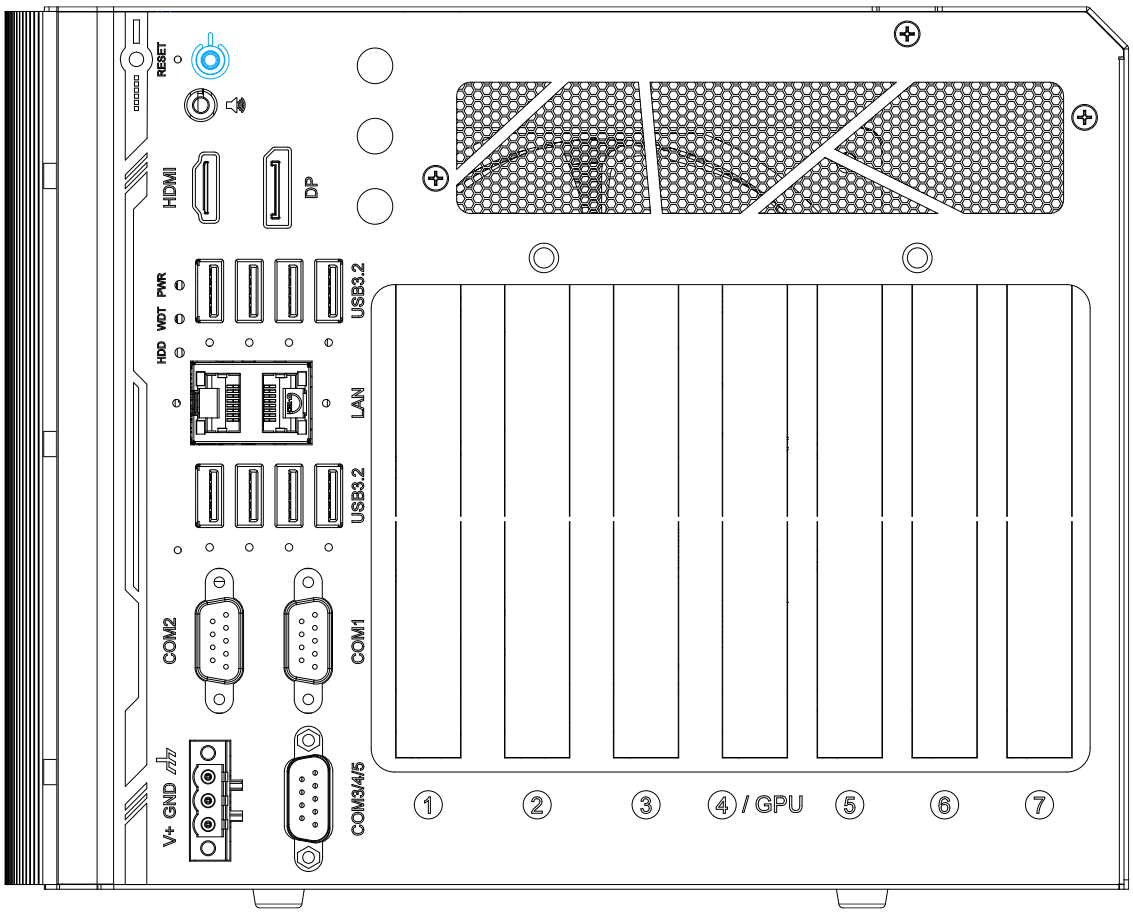
4	HDMI port	The HDMI port is a high-resolution graphics/ data port supporting up to 3840 x 2160 @ 30Hz.
5	DisplayPort	Support display resolutions up to 4096 x 2304. Compatible with HDMI/ DVI via respective adapter/ cable (resolution may vary).
6	USB3.2 Gen2x1 port	The ports offer up to 10 Gbps of data-throughput performance
7	LED indicator	From top to bottom, the LEDs are PWR (system power), WDT (watchdog timer), HDD (hard disk drive).
8	Gb Ethernet port	Gigabit Ethernet port by Intel® I219-LM
9	2.5Gb Ethernet port	2.5Gb Ethernet port by Intel® I226-IT
10	USB 3.1 Gen1 port	USB3.1 Gen 1 offers up to 5Gbps of data-throughput performance
11	Clear CMOS button	Use this button to clear the system CMOS.
12	COM 2 port	COM 2 port is a software-selectable RS-232/ 422/ 485 port. The operation mode can be set in BIOS.
13	COM 1 port	COM 1 port is a software-selectable RS-232/ 422/ 485 port. The operation mode can be set in BIOS.
14	3-pin terminal block	The system accepts 12-35V DC power input.
15	COM port 3/ 4/ 5	COM3, COM4 and COM5 are 3-wire RS-232 ports that share a single DB9 connector.
16	Expansion slot	PCIe x8 Gen3 4-lanes
17	Expansion slot	PCIe x8 Gen3 4-lanes (Nuvo-10007/ Nuvo-10034) PCIe x16 Gen3 16-lanes (Nuvo-10003)
18	Expansion slot	PCIe x16 Gen3 8-lanes (Nuvo-10007/ Nuvo-10034) PCIe x8 Gen3 4-lanes (Nuvo-10003)
19	Expansion slot	PCIe x16 Gen3 8-lanes (Nuvo-10007/ Nuvo-10034)
20	Expansion slot	PCIe x8 Gen3 4-lanes (Nuvo-10007) PCI 33MHz/ 32-bit 5V (Nuvo-10034)
21	Expansion slot	PCIe x4 Gen3 2-lanes (Nuvo-10007) PCI 33MHz/ 32-bit 5V (Nuvo-10034)
22	Expansion slot	PCIe x4 Gen3 2-lanes (Nuvo-10007) PCI 33MHz/ 32-bit 5V (Nuvo-10034)

2.2.1 Reset Button



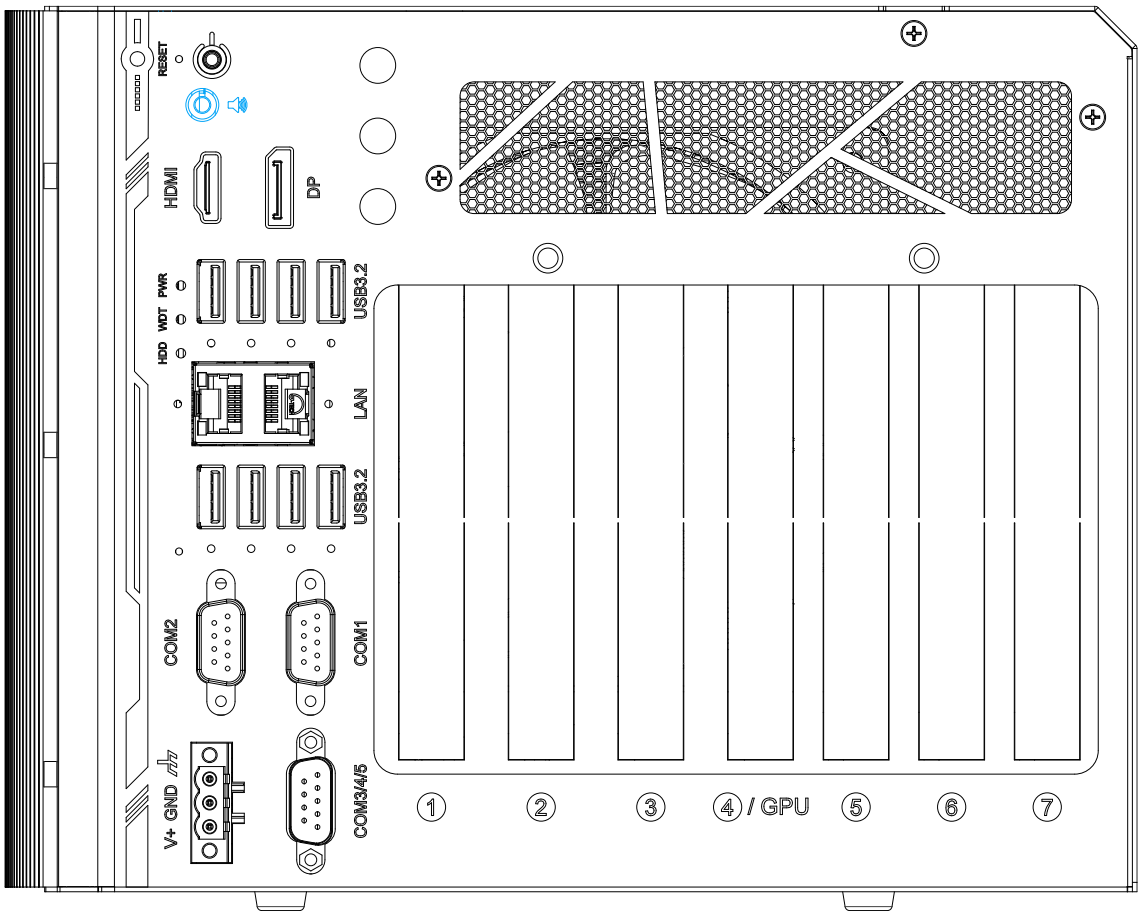
The reset button is used to manually reset the system in case of system halt or malfunction. To avoid unexpected reset, the button is purposely placed behind the panel. To reset, please use a pin-like object (eg. tip of a pen) to access the reset button.

2.2.2 Power Button



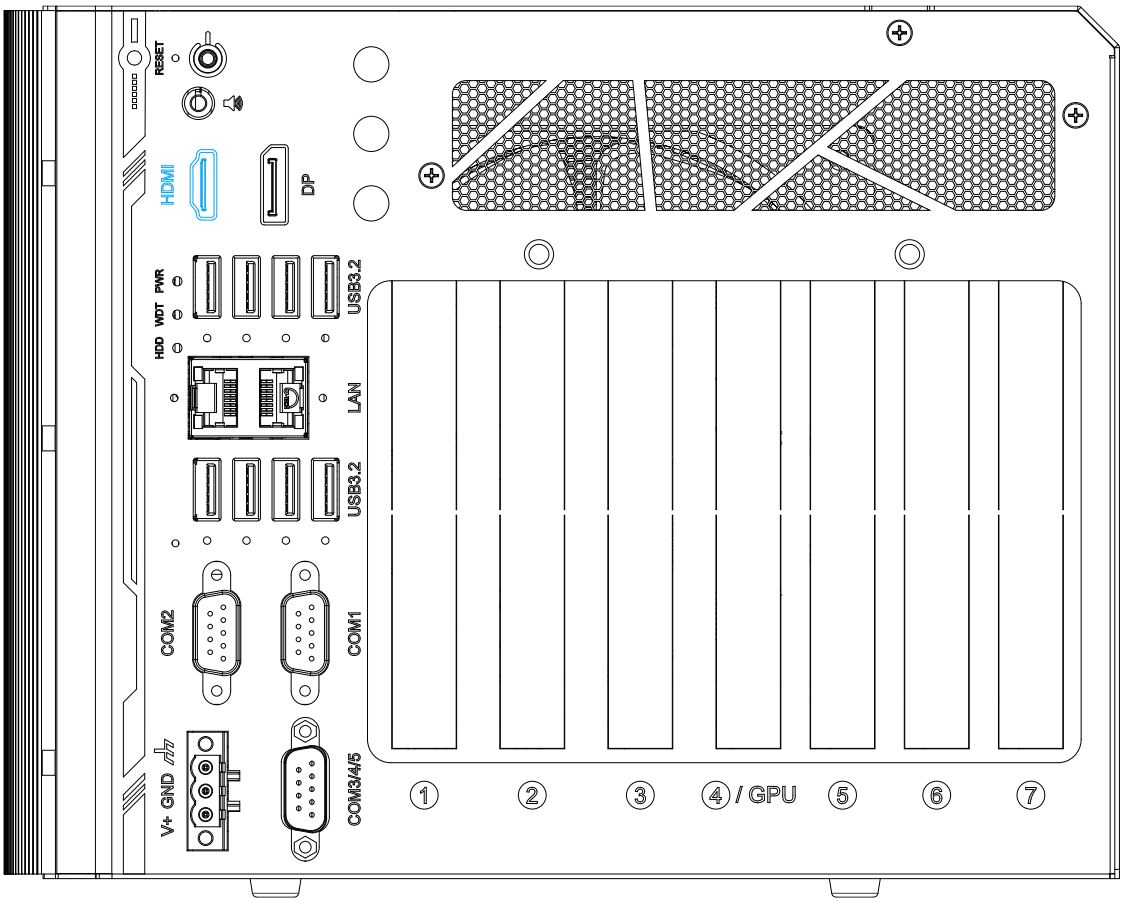
The power button is a non-latched switch for ATX mode on/off operation. To turn on the system, press the power button and the PWR LED should light-up green. To turn off the system, issuing a shutdown command in OS is preferred, or you can simply press the power button. To force shutdown when the system 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).

2.2.3 3.5mm Speaker/ Headphone Output Jack



The system audio function uses high definition audio codec. 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 for both Intel® Q670 chipset and audio device drivers.

2.2.4 HDMI Port

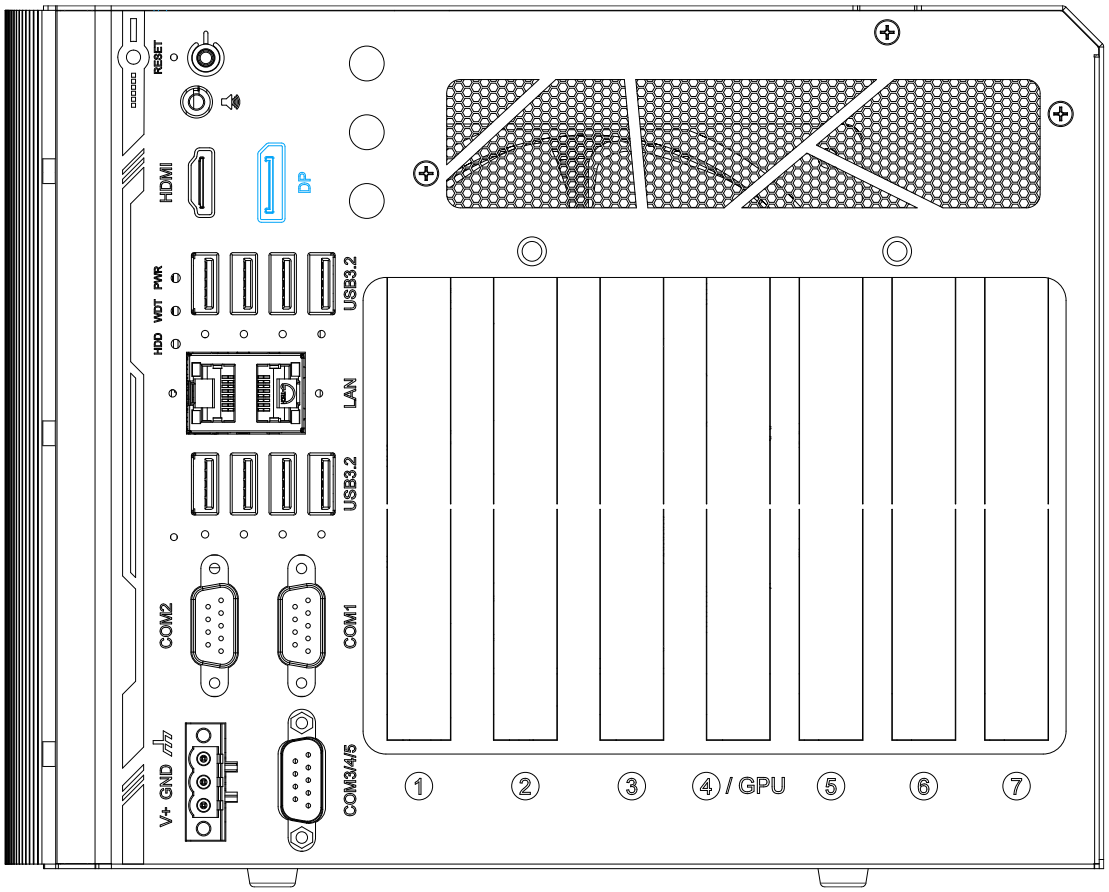


The High-Definition Multimedia Interface (HDMI) port provides uncompressed high-quality digital video and audio transmission between the system and a multimedia display device on a single cable. You can connect to other digital inputs by using a HDMI-to-DVI or HDMI-to-DP cable.

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.

HDMI-to-DP

2.2.5 DisplayPort



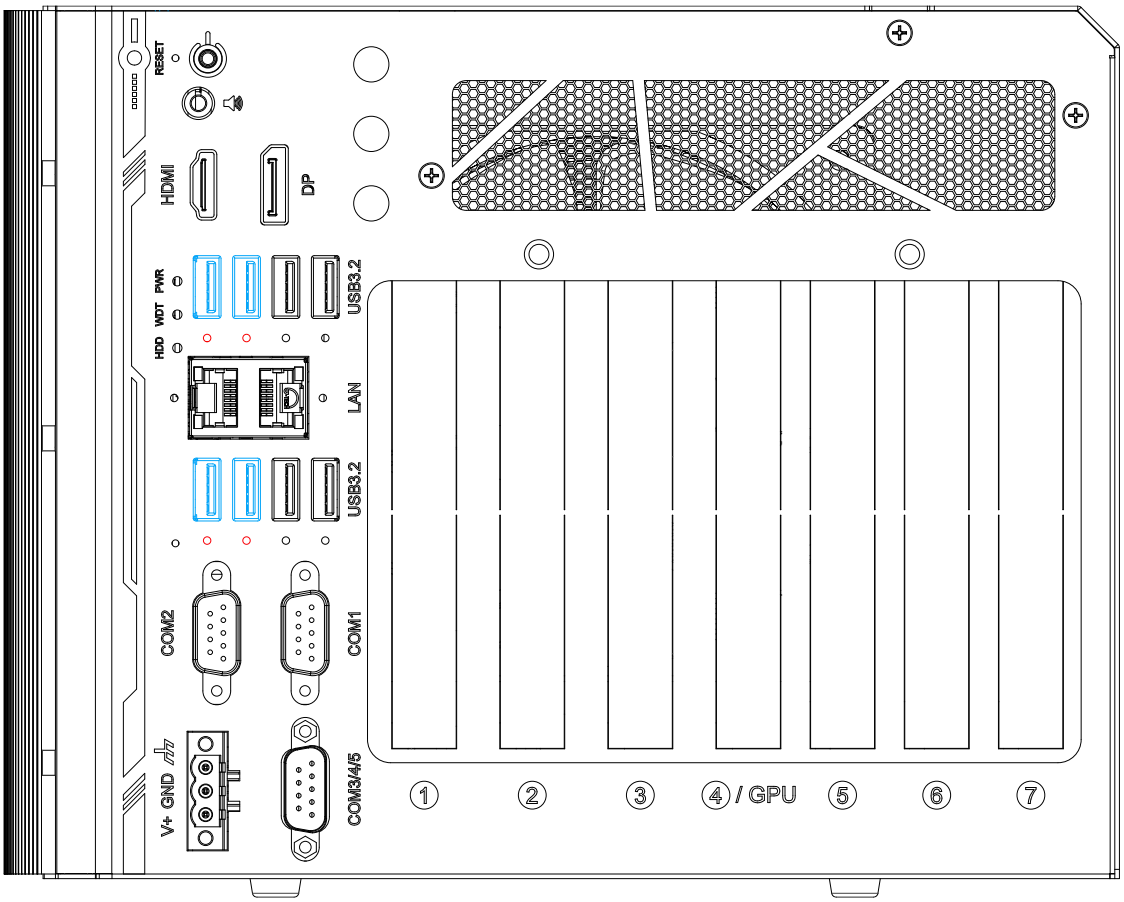
The DisplayPort (DP) output is a digital display interface that mainly connect video source and carry audio to a display device. When connecting a DP, it can deliver up to 4K UHD (4096 x 2304) in resolution. The system is designed to support passive DP adapter/ cable. You can connect to other display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

DP-to-HDMI

DP-to-DVI

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. Please refer to section OS Support and Driver Installation for details.

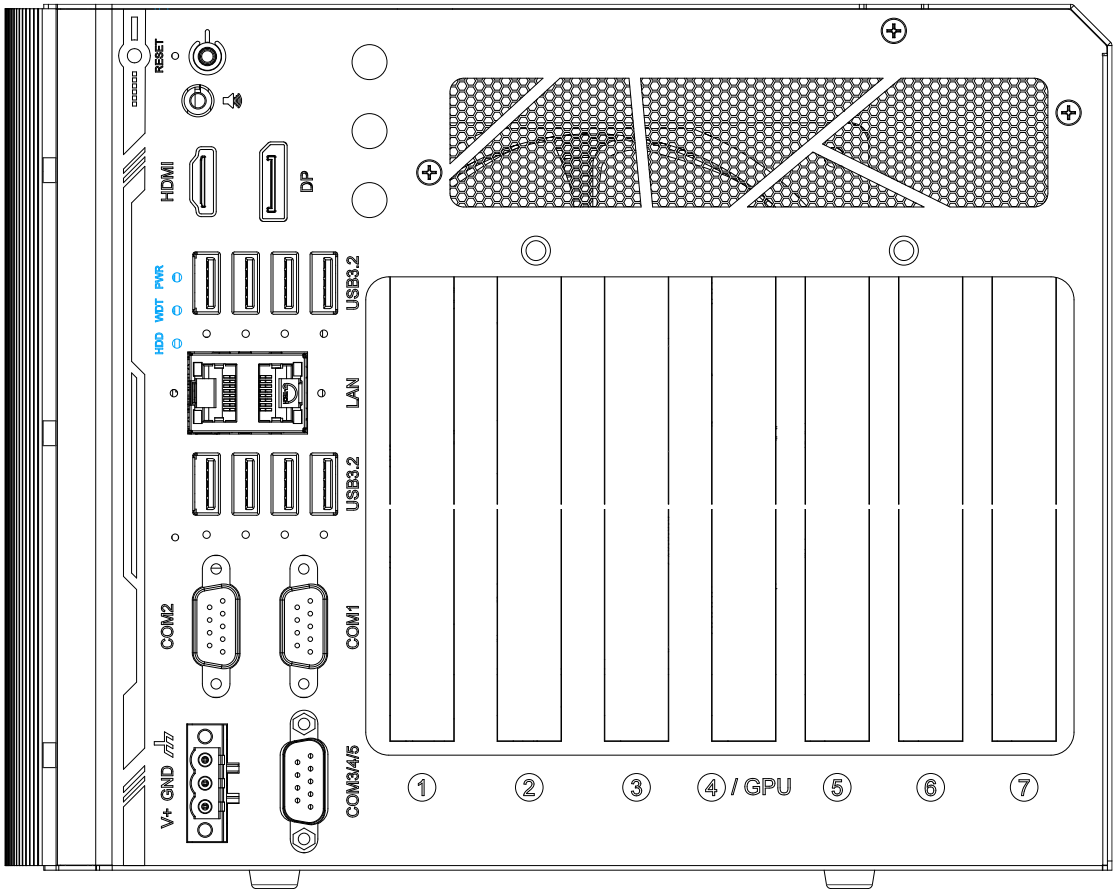
2.2.6 USB3.2 Gen2x1



The system's USB 3.2 Gen2x1 ports (10Gbps) feature panel screw fix hole (indicated in **red**), and are implemented via native xHCI (eXtensible Host Controller Interface) controller. They are backward compatible with USB3.2 Gen.1 USB 2.0, USB 1.1 and USB 1.0 devices. Legacy USB is also supported so you can use USB keyboard/mouse in DOS environment.

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

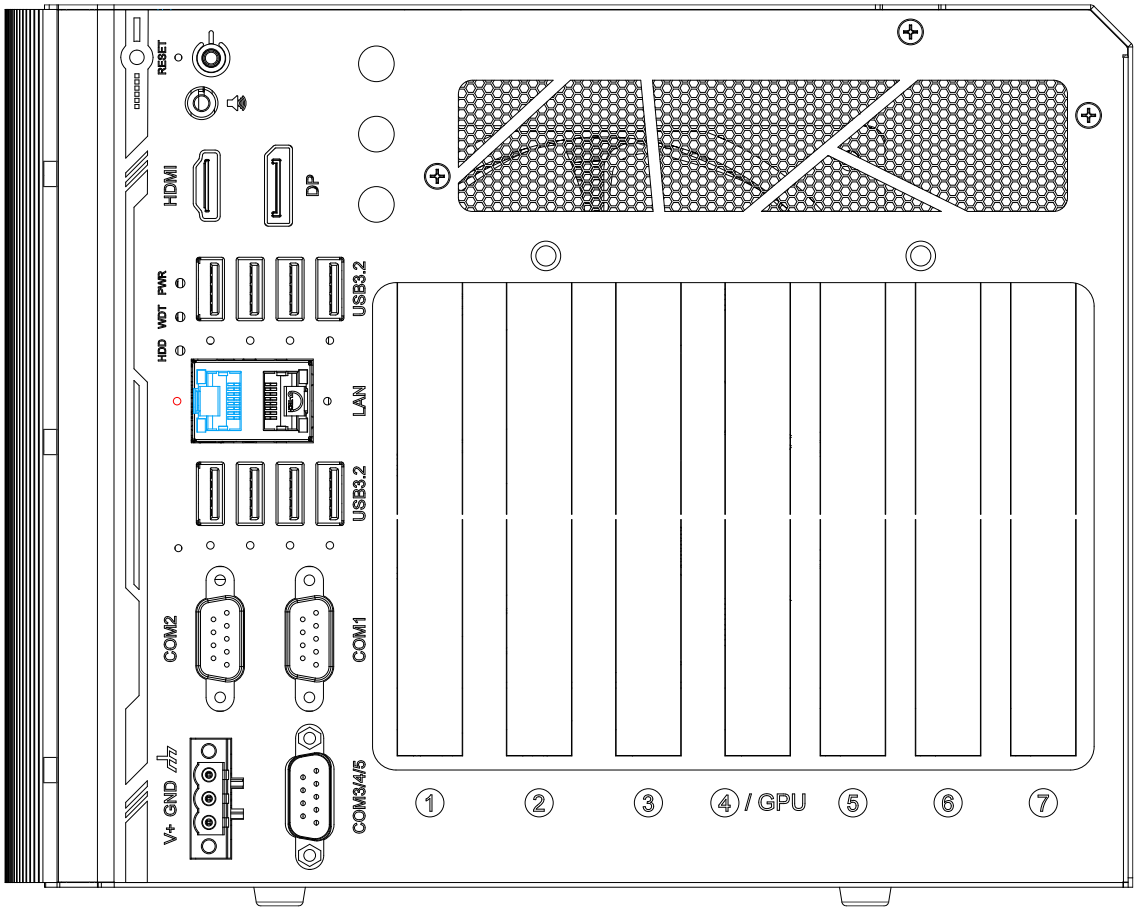
2.2.7 LED Indicators



There are three LED indicators on the I/O panel. From top to bottom, they are power (PWR), Watchdog timer (WDT) and hard disk drive activity (HDD). The descriptions of these three LEDs are listed in the following table.

Indicator	Color	Description
PWR	Green	Power indictor, lid when system is on.
WDT	Yellow	Watchdog timer LED, flashing when WDT is active.
HDD	Red	Hard drive indicator, flashing when hard disk drive is active.

2.2.8 Gigabit Ethernet Port



The system has a GbE port featuring panel screw fix hole (indicated in **red**), and it supports Wake-on-LAN functions. The GbE port is implemented with Intel® I219-LM controller with one dedicated PCI Express link for maximum performance. When the Ethernet connection is established, the LED indicators on the RJ45 connector represents the following connection statuses:

Active/Link LED

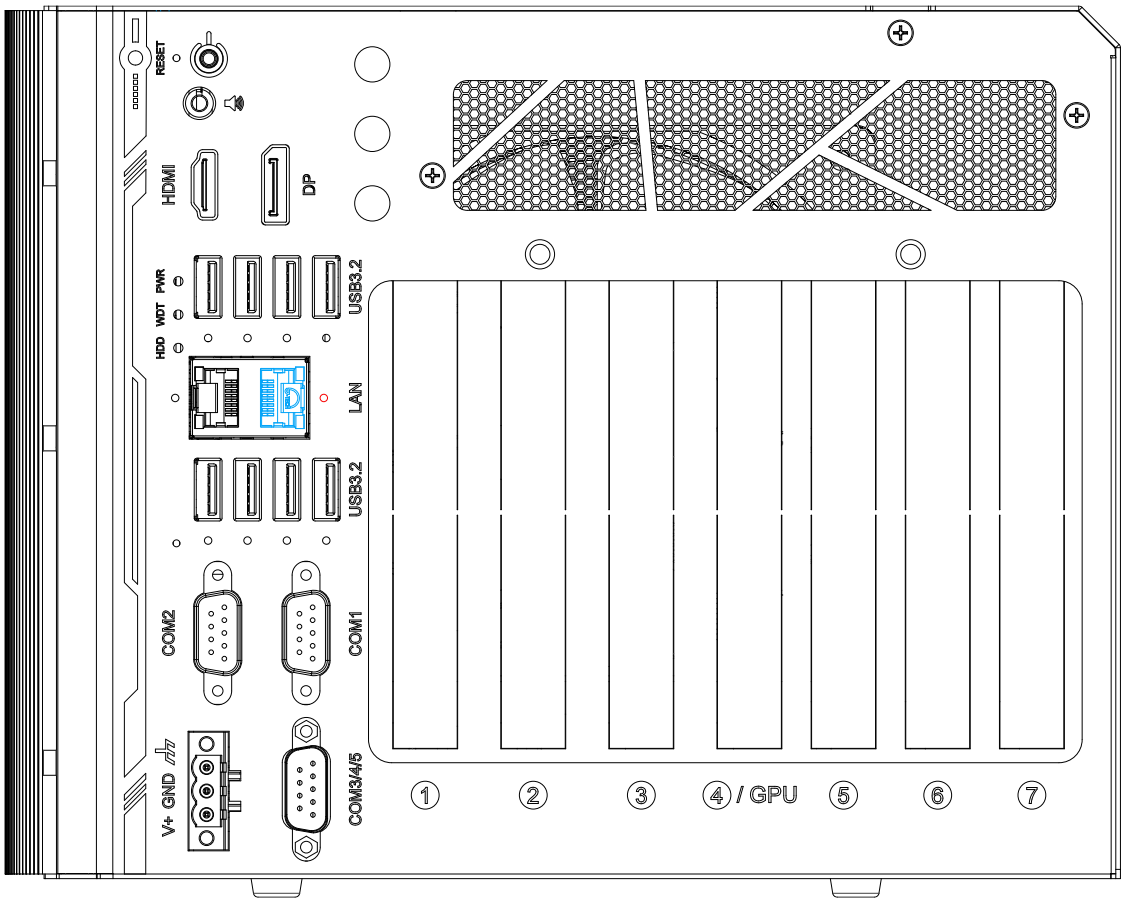
LED Color	Status	Description
Green	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

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

Drivers must be installed to utilize the GbE port in Windows environment.

2.2.9 2.5G Ethernet Port



The systems has a 2.5Gb Ethernet port featuring panel screw fix hole (indicated in **red**).

The port has one dedicated PCI Express link for maximum network performance. Please refer to the table below for LED connection statuses.

Active/Link LED

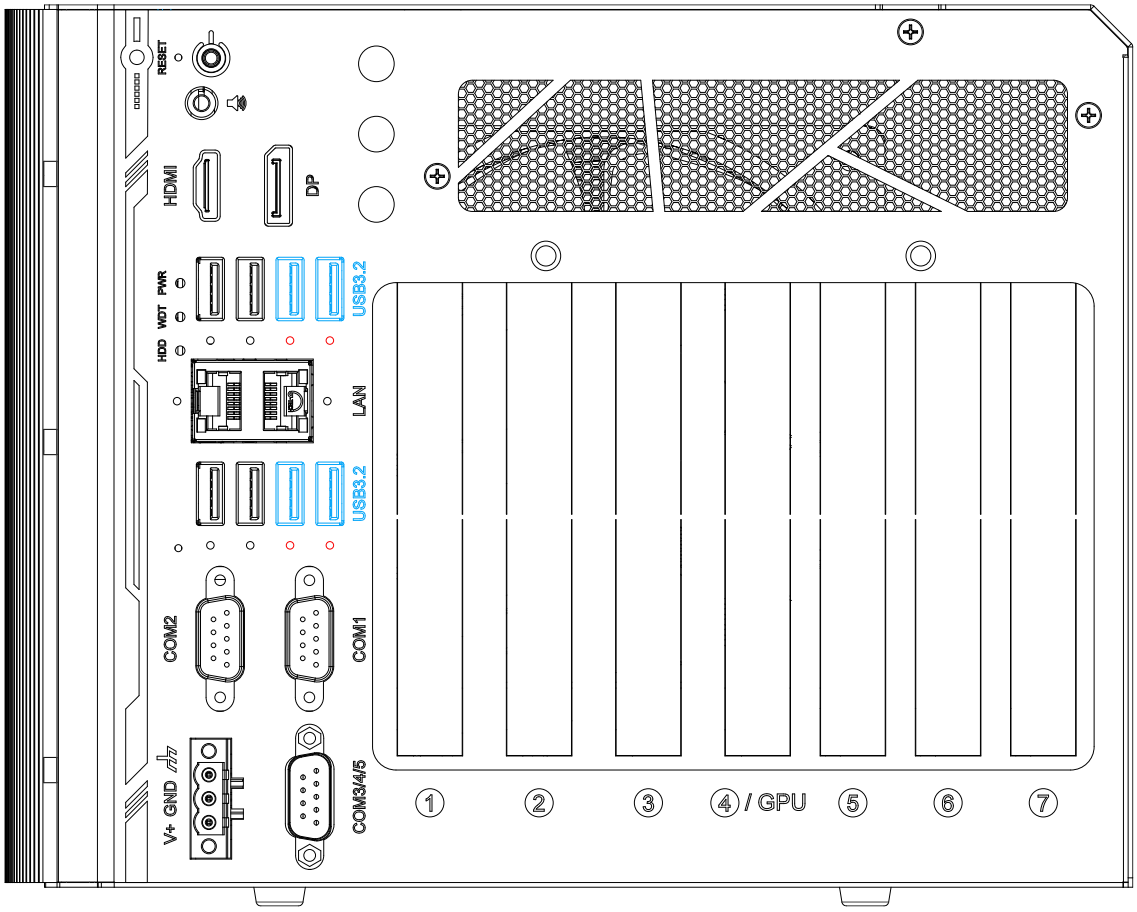
LED Color	Status	Description
Orange	Off	Ethernet port is disconnected
	On	Ethernet port is connected and no data transmission
	Flashing	Ethernet port is connected and data is transmitting/receiving

Speed LED

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

To utilize the Ethernet port in Windows, you need to install corresponding driver for the Ethernet controller.

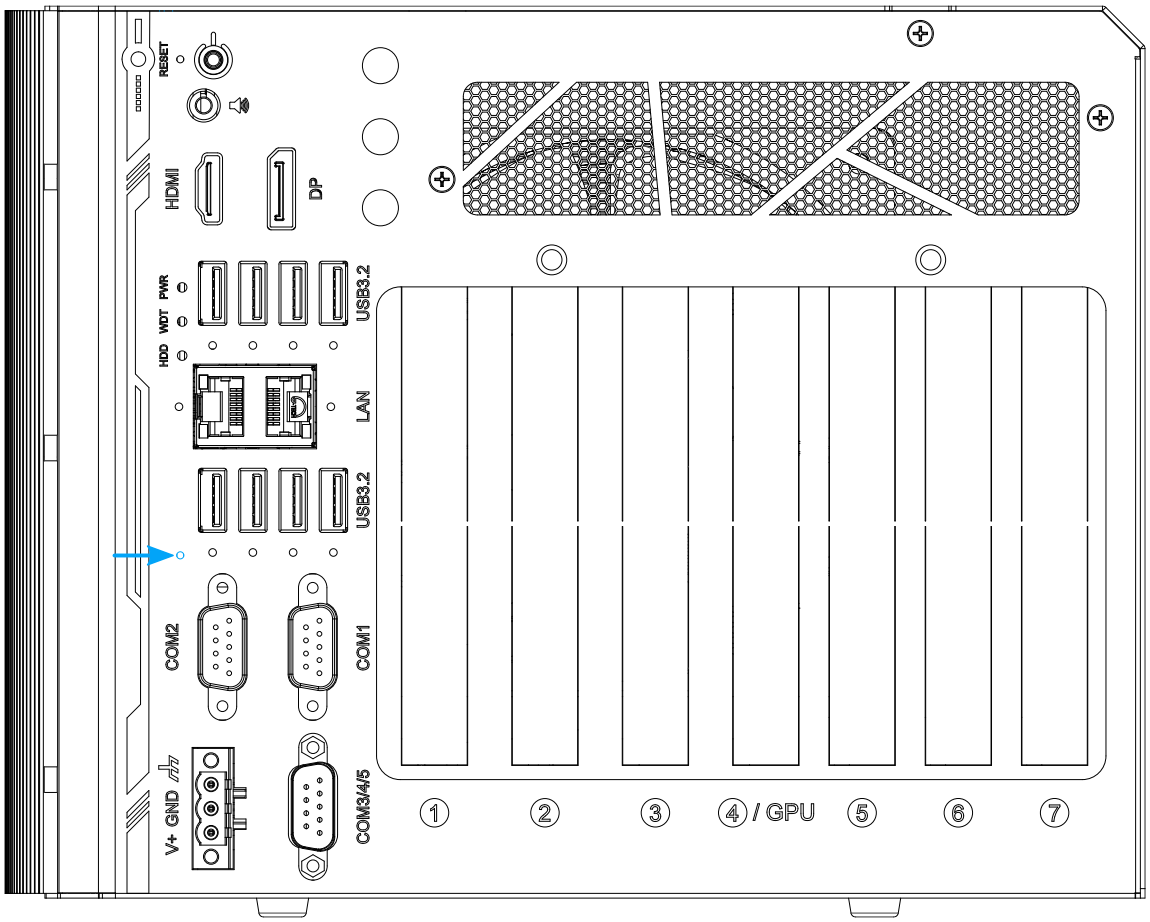
2.2.10 USB3.2 Gen1x1 Port



The system's USB 3.2 Gen1x1 ports (5Gbps) feature panel screw fix hole (indicated in **red**), and are implemented via native xHCI (eXtensible Host Controller Interface) controller. They are backward compatible with USB 2.0, USB 1.1 and USB 1.0 devices.

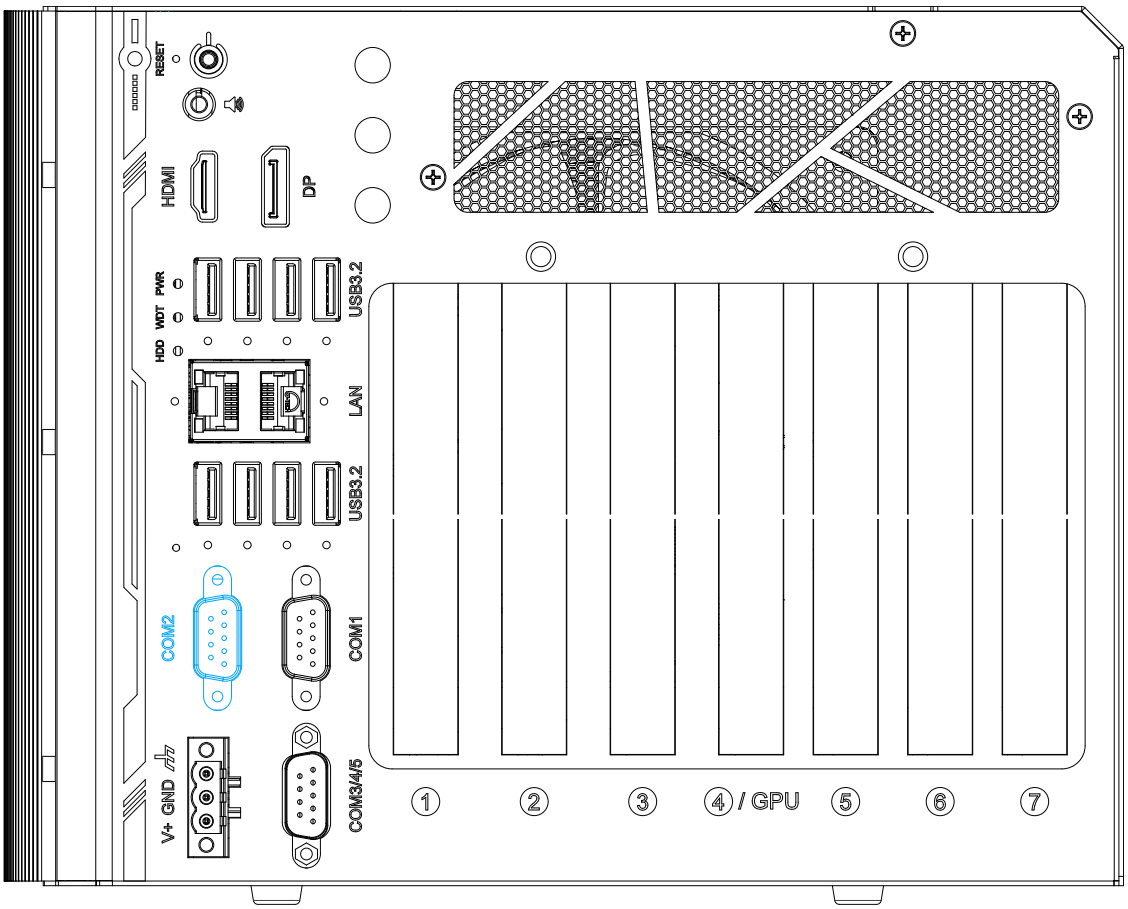
Legacy USB is also supported so you can use USB keyboard/mouse in DOS environment. xHCI driver is supported natively in Windows 10, therefore you do not need to install xHCI driver in prior to utilize USB functions.

2.2.11 Clear CMOS Button

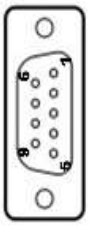


Indicated by the **blue arrow**, the CMOS Reset button is used to manually reset the motherboard BIOS in case of system halt or malfunction. To avoid unexpected operation, it is purposely placed behind the panel. To reset, please use the tip of a pen, press and hold for at least 5 seconds to reset the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

2.2.12 COM2 Port



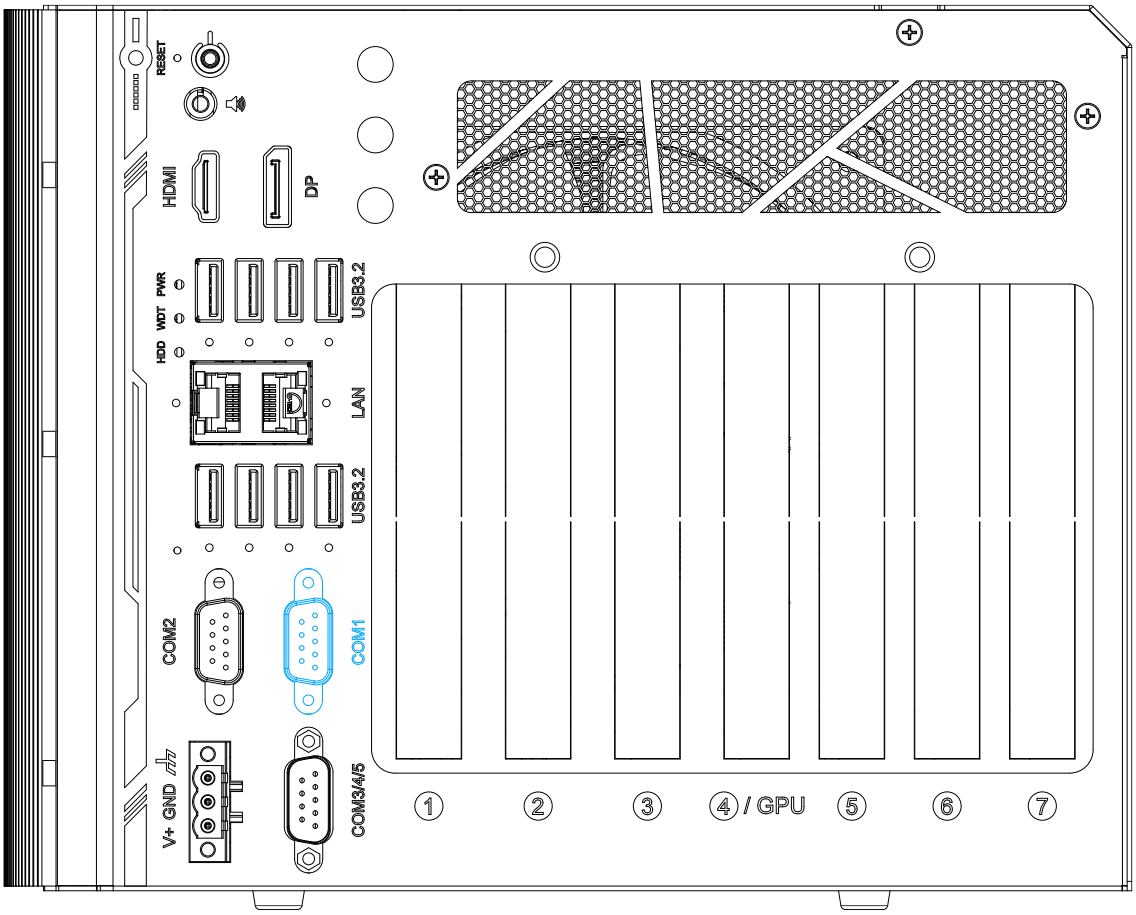
The COM port is implemented using industrial-grade ITE8786 Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate. It is a software-configurable RS-232/422/485 port. The operation mode of can be set in BIOS setup utility. The following table describes the pin definition of the COM port.



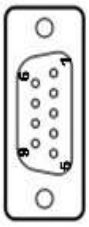
COM Port Pin Definition

	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		

2.2.13 COM1 Port



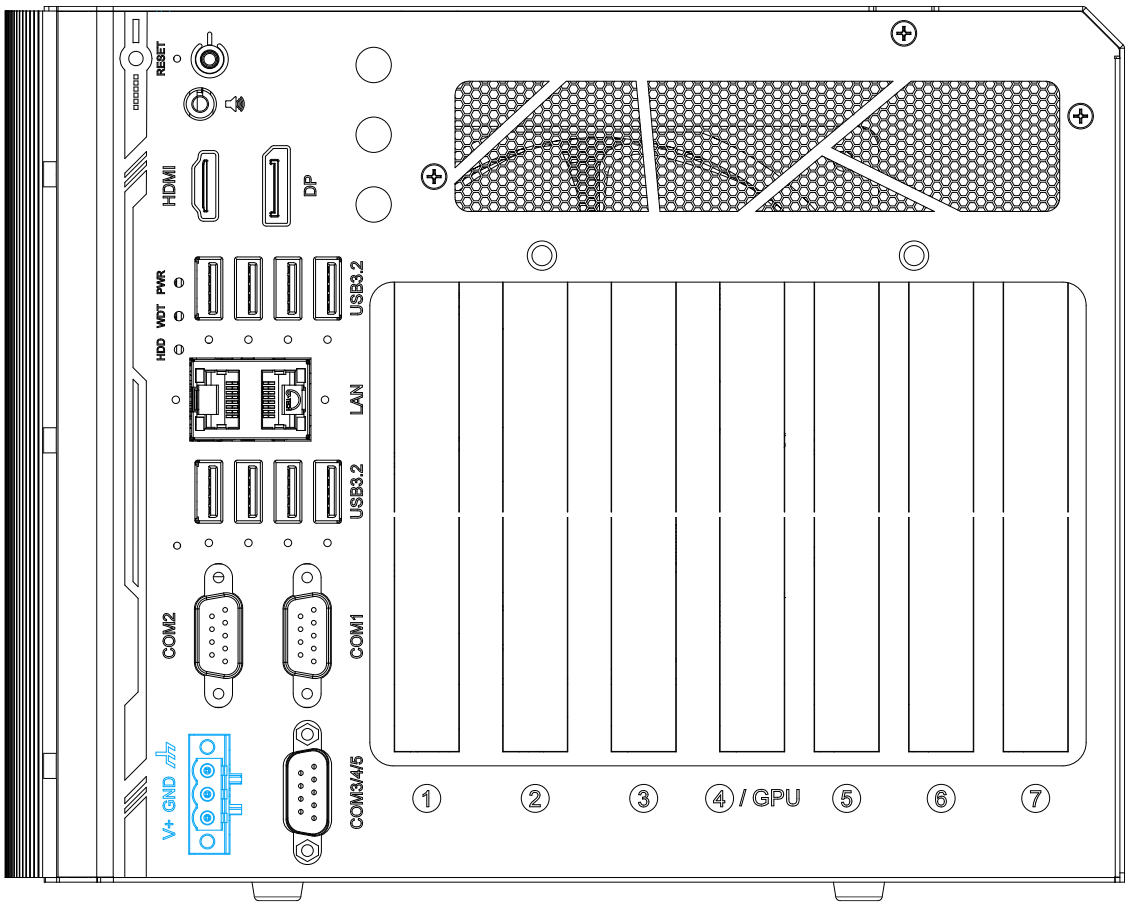
The COM1 port is implemented using industrial-grade ITE8786 Super IO chip (-40 to 85°C) and provide up to 115200 bps baud rate. It is a software-configurable RS-232/422/485 port. The operation mode of can be set in BIOS setup utility. The following table describes the pin definition of the COM port.



COM Port Pin Definition

	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		

2.2.14 3-pin Terminal Block for DC Input



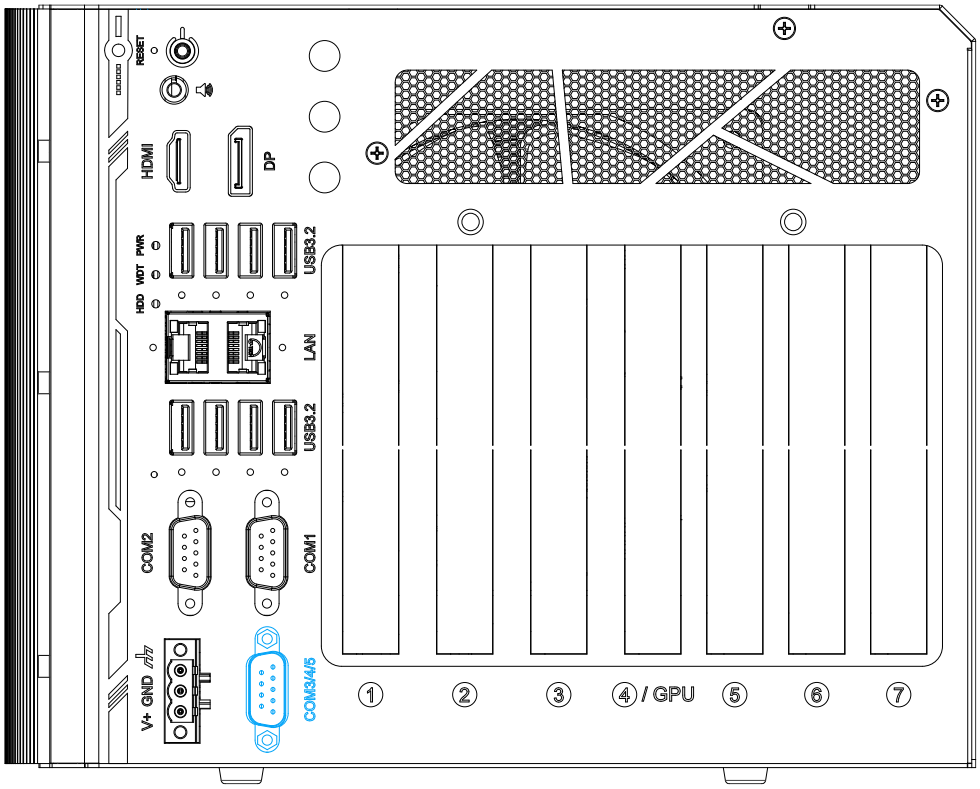
The system accepts a wide range of DC power input from 12 to 35V via 3-pin pluggable terminal block, which is fit for field usage where DC power is provided. And the screw clamping connection of the terminal block gives a very reliable way of wiring DC power.

Symbol	Description
⏚	Chassis ground (connected to the earth ground)
GND	Negative polarity (ground) of DC input
V+	Positive polarity of DC input

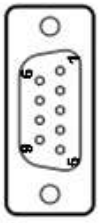
WARNING

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.

2.2.15 COM3/ 4/ 5 Port



COM3, COM4 and COM5 are 3-wire RS-232 ports share single DB9 connector. You can directly connect this to one external device with 3-wire RS-232 interface, or use an optional 1-to-3 Y-cable to have three DB9 connectors for more devices. The following table describes the pin definition of the DB9 connector as well as the Y-cable.



	COM3/ 4/ 5 DB9		
Pin#	COM3	COM4	COM5
1			
2	RX		
3	TX		
4		TX	
5	GND	GND	GND
6		RX	
7			TX
8			RX
9			

	Y-Cable DB9
Pin#	COM3 (A)
1	
2	RX
3	TX
4	
5	GND
6	
7	
8	
9	