Rugged Embedded

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NEOUSYS TECHNOLOGY

Nuvo-9000 Series

Intel® BTL-S/14th/13th/12th-Gen Core™ Fanless Industrial PC with 6x 2.5GbE, USB 3.2 Type-C, Patented Cassette & MezIO® Interface

Key Features

· Supports Intel® BTL-S/14th/13th/12th-Gen Core™ 24C/ 32T 35W/ 65W CPU
· Patented Cassette for PCI/PCIe add-on card accommodation
· Rugged, -25°C to 70°C fanless operation
· Up to 5x 2.5GbE and 1x GigE ports with optional PoE+, supporting 9.5 KB jumbo frame
· 1x USB 3.2 Gen2x2 type-C and 8x USB 3.2/ 2.0 type-A ports
· Supports M.2 Gen4x4 NVMe and 2x SATA ports
· MezIO® interface for easy function expansion
· VGA/ DVI/ DP triple independent display, supporting 4K2K resolution

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R.O.C Patent No. M456527

Introduction

Nuvo-9000 series is Neousys' new rugged embedded computer based on Intel® BTL-S/14th/13th/12th-Gen platform. Benefiting from cutting-edge Intel® 7 photolithography, the latest Core™ desktop processor comes with up to 24 cores and 32 threads and presents an incredible boost of computational performance. Combining the increase of DDR5 memory bandwidth and PCIe Gen4 NVMe high-speed disk read/write, users can expect an overall system performance improvement of up to 2x when compared to previous 10th or 11th- Gen platforms.

Nuvo-9000 series inherits Neousys' patented expansion Cassette design to provide great versatility by allowing additional installation of PCIe or PCI add-on cards. There are three expansion Cassette options available for Nuvo-9000 series, the Nuvo-9000E features a single x16 Gen3 PCIe slot; Nuvo-9000DE has dual x16 PCIe slots, and Nuvo-9000P has a single PCI slot. For users who need more flexible storage, Nuvo-9000LP has a 2.5" HDD tray instead of an expansion Cassette to support a hot-swappable 2.5" HDD/SSD.

I/O functions are also comprehensively enhanced. In addition to six 2,5G and Gigabit Ethernet ports with PoE+ PSE option, Nuvo-9000 series features a USB 3.2 Gen2x2 type-C port offering 20 Gbps bandwidth for data exchange with external devices, plus another six USB 3.2 type-A ports for USB3 camera connectivity. It also has an upgraded M.2 Gen4x4 slot to support the latest NVMe SSD to boost disk read/write speed up to 7000 MB/s. For unfulfilled I/O requirements, users can utilize the expansion Cassette to add on function-specific PCIe/ PCI card, the proprietary MezIO® interface, and internal mini-PCIe/M.2 interfaces.

With its field-proven thermal design, significant CPU and I/O upgrades, and multiple expansion methods, the Neousys Nuvo-9000 series fits your need for ruggedness, performance, and versatility for a variety of applications.

Specifications

System Core

Processor		
	Supporting Intel® Core™ Series 2 P-Core Only CPU (Bartlett Lake, LGA1700 socket, 65W/ 45W TDP) - Intel® Core™ 9 273PE/ 273PTE - Intel® Core™ 7 253PE/ 253PTE - Intel® Core™ 5 223PE/ 223PTE/ 213PE/ 213PTE	Supporting Intel® Core™ Series 2 Hybrid CPU (Bartlett Lake, LGA1700 socket, 65W/ 45W TDP) - Intel® Core™ 7 251E/ 251TE - Intel® Core™ 5 221E/ 221TE/ 211E/ 211TE - Intel® Core™ 3 201E/ 201TE
	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[1] (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, 65W/ 35W 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	

Chipset	Intel® Q670E platform controller hub
Graphics	Integrated Intel® UHD Graphics 770 (32EU) / 730 (24EU)
Memory	Up to 128 GB DDR5 4800 SDRAM (two SODIMM slots)
AMT	Supports Intel® vPro/ AMT 16.0
TPM	Supports dTPM 2.0

I/O Interface

Ethernet Port[2]	1x 2.5G Ethernet by I226-IT/ I225-IT and 1x Gigabit Ethernet by I219-LM (Nuvo-9002E/ P/ DE/ LP) with screw-lock 5x 2.5G Ethernet by I226-IT/ I225-IT and 1x Gigabit Ethernet by I219-LM (Nuvo-9006E/ P/ DE/ LP) with screw-lock
PoE+	Optional IEEE 802.3at PoE+ PSE for Port 3 ~ Port 6 (2.5GbE) 100 W total power budget
USB 3.2	1x USB 3.2 Gen2x2 (20 Gbps) port in type-C connector with screw-lock 4x USB 3.2 Gen2x1 (10 Gbps) ports in type-A connectors 2x USB 3.2 Gen1x1 (5 Gbps) ports in type-A connectors
USB 2.0	2x USB 2.0 ports
Video Port (Integrated Graphics)	1x VGA, supporting 1920 x 1200 resolution 1x DVI-D, supporting 1920 x 1200 resolution 1x DisplayPort, supporting 4096 x 2304 resolution
Serial Port	2x software-programmable RS-232/ 422/ 485 ports (COM1/ COM2) 2x RS-232 ports (COM3/ COM4)
Audio	1x 3.5 mm jack for mic-in and speaker-out

Storage Interface

SATA HDD	2x internal SATA port for 2.5" HDD/ SSD installation, supporting RAID 0/ 1(Nuvo-9000E/ 9000P/ 9000DE) 1x hot-swappable 2.5" HDD tray (7mm HDD/ SSD) and 1x internal 2.5" SATA port, supporting RAID 0/ 1 (Nuvo-9000LP)
M.2 NVMe	1x M.2 2280 M key NVMe socket (PCIe Gen4x4) for NVMe SSD

Internal Expansion Bus

PCI/PCI Express	1x PCIe x16 slot@Gen3, 8-lanes PCIe signals in Cassette (Nuvo-9002E/ 9006E) 2x PCIe x16 slots@Gen3, 8-lanes PCIe signals in Cassette (Nuvo-9002DE/ 9006DE) 1x PCI slot in Cassette (Nuvo-9002P/ 9006P)
Mini PCI Express	1x full-size mini PCI Express socket
M.2	1x M.2 2242/3052 B key socket with SIM slot for M.2 5G/ 4G module
Expandable I/O	1x MezIO® expansion port for Neousys MezIO® modules

Power Supply

DC Input	1x 3-pin pluggable terminal block for 8 to 48V DC input 1x 3-pin pluggable terminal block for 24V DC input (UL series)
Remote Ctrl. & LED Output	1x 3-pin pluggable terminal block for remote control and PWR LED output (Ctrl_In/ GND/ LED_Out)

Mechanical

Dimension	240 mm (W) x 225 mm (D) x 90 mm (H) (Nuvo-9000E/ P series) 240 mm (W) x 225 mm (D) x 110.5 mm (H) (Nuvo-9000DE series) 240 mm (W) x 225 mm (D) x 79 mm (H) (Nuvo-9000LP series)
Weight	3.58 kg (Nuvo-9000E/ P series)/ 3.89 kg (Nuvo-9000DE series) 3.36 kg (Nuvo-9000LP series)
Mounting	Wall-mount (standard) or DIN-rail mount (optional)

Environmental

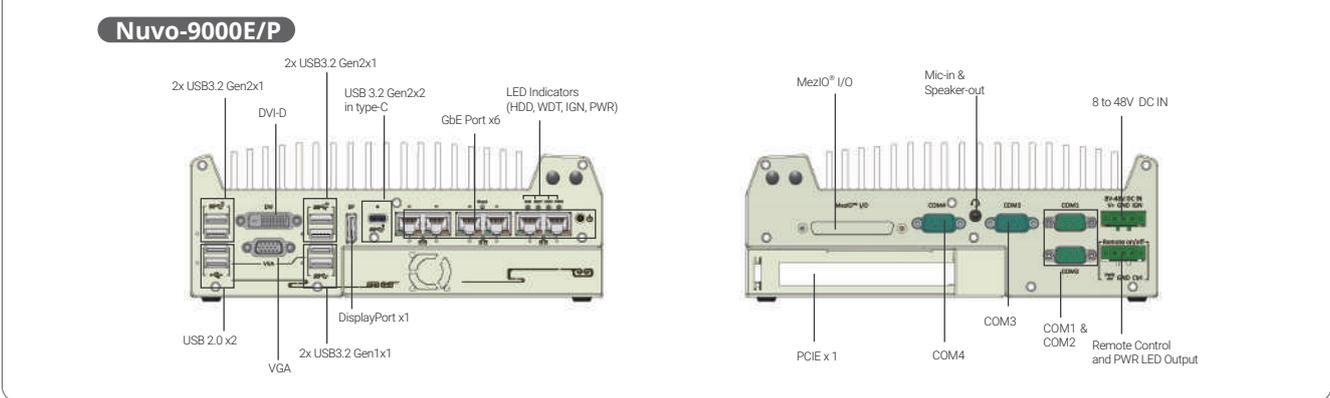|	
Operating Temperature	**with 35W CPU** -25°C ~ 70°C [3] **with 65W CPU** -25°C ~ 70°C [3/[4] (configured as 35W TDP) -25°C ~ 50°C [3/[4] (configured as 65W TDP)
Storage Temperature	-40°C ~ 85°C
Humidity	10%~90% , non-condensing
Vibration	MIL-STD-810H, Method 514.8, Category 4
Shock	MIL-STD-810H, Method 516.8, Procedure I
EMC	CE/FCC Class A, according to EN 55032 & EN 55035
Safety	UL 62368-1, IEC62368-1 (UL series only)

[1] A BIOS update may be required for the system to recognize 13th-Gen processors. Please contact Neousys Technology for more information.
[2] Due to I225-IT specification limitation, for systems running 2.5G Ethernet link speeds, please limit the operating temperature to 60°C.
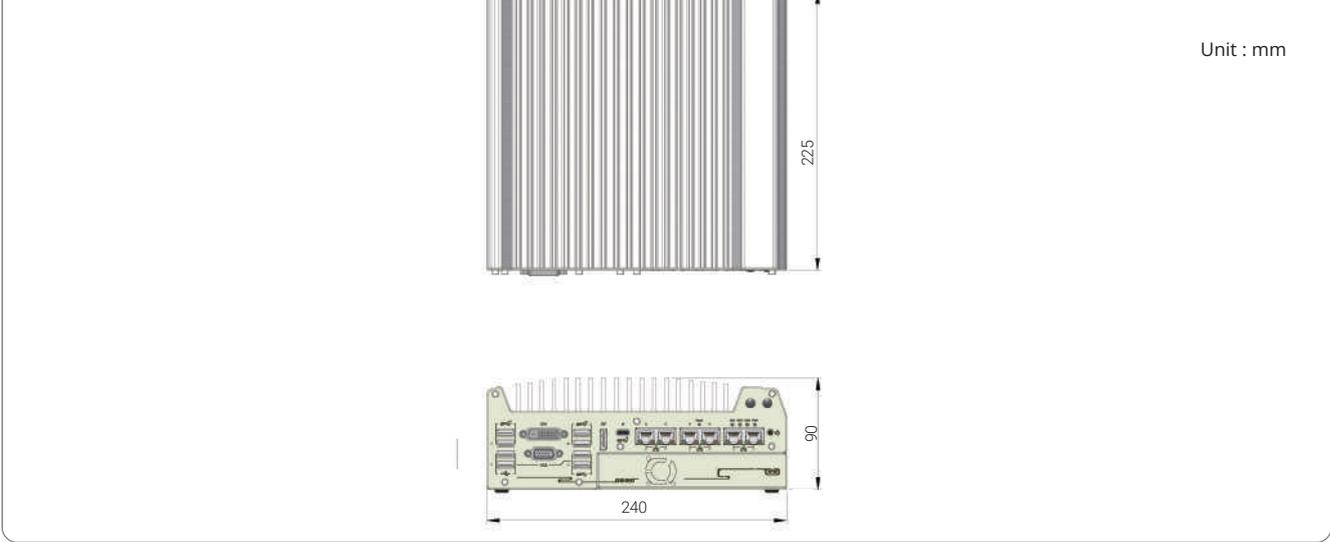[3] For sub-zero operating temperature, a wide temperature HDD or Solid State Disk (SSD) is required.
[4] For CPU operating at 65W mode, the highest operating temperature shall be limited to 50°C and thermal throttling may occur when sustained full-loading applied. Users can configure CPU power in BIOS to allow higher operating temperature.

Appearance

Nuvo-9000E/P

2x USB3.2 Gen2x1
2x USB3.2 Gen2x1
DVI-D
USB 3.2 Gen2x2 in type-C
GbE Port x6
LED Indicators (HDD, WDT, IGN, PWR)
USB 2.0 x2
VGA
2x USB3.2 Gen1x1
DisplayPort x1

MezIO® I/O
Mic-in & Speaker-out
8 to 48V DC IN
PCIE x 1
COM4
COM3
COM1 & COM2
Remote Control and PWR LED Output

Dimensions

Unit : mm

225

90

240

Ordering Information

Model No.	Product Description
Nuvo-9002E	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCIe Cassette & MezIO® Interface
Nuvo-9002P	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCI Cassette & MezIO® Interface
Nuvo-9006E	Intel® BTL-S/ 14th/ 13th/12th -Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCIe Cassette & MezIO® Interface
Nuvo-9006P	Intel® BTL-S/ 14th/ 13th/12th -Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCI Cassette & MezIO® Interface
Nuvo-9002E-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCIe Cassette, MezIO® Interface & UL certified
Nuvo-9002P-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCI Cassette, MezIO® Interface & UL certified
Nuvo-9006E-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCIe Cassette, MezIO® Interface & UL certified
Nuvo-9006P-UL	Intel® BTL-S/14th/ 13th/12th -Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCI Cassette, MezIO® Interface & UL certified
PoE+ Option	Option of 802.3at PoE+ PSE for 2.5GbE port 3 ~ port 6

Optional Accessories

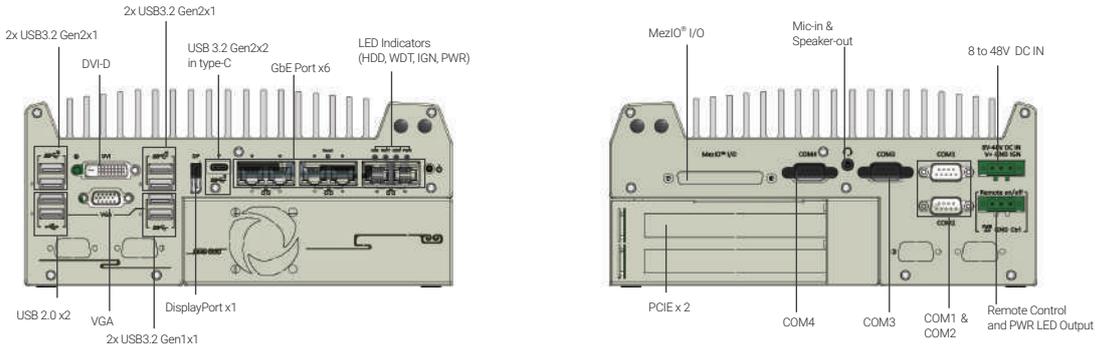|	
DINRAIL-O	DIN-rail mount assembly for Nuvo-9000 series
Dmpbr-Nuvo5000_7000	Neousys' patented damping brackets assembly for Nuvo-9000 Series
Fankit-25	Fan assembly for 1-slot Cassette, 25x25x10 mm
PA-160W-OW	160W AC-DC power adapter 20V/8A; 18AWG/120cm; cord end terminals for terminal block, operating temperature: -30°C to 70°C. (recommended for 35W CPU)
PA-280W-ET2	280W AC/DC power adapter 24V/ 11.67A ; 16AWG/ 100cm; cord end terminals for terminal block, operating temperature : -30°C to 60°C. (recommended for 65W CPU or 35W CPU with PoE+ option)

MezIO® Modules

MezIO®-C180	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-232 ports	**MezIO®-V20-EP**	MezIO® module with ignition power control function for in-vehicle application
MezIO®-C181	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-422/ 485 ports	**MezIO®-U4**	MezIO® module with 4x USB 3.1 ports
MezIO®-D220	MezIO® module with 8-CH isolated digital input and 8-CH isolated digital output	**MezIO®-G4**	MezIO® module with 4x GigE ports
MezIO®-D230	MezIO® module with 16-CH isolated digital input and 16-CH isolated digital output	**MezIO®-G4P**	MezIO® module with 4x IEEE 802.3at PoE+ ports *Only Nuvo-9006E/P-PoE support MezIO-G4P*

All specifications and photos are subject to change without prior notice

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Nuvo-9000 Series

Appearance

Nuvo-9000DE

2x USB3.2 Gen2x1
DVI-D
2x USB3.2 Gen2x1
USB 3.2 Gen2x2 in type-C
GbE Port x6
LED Indicators (HDD, WDT, IGN, PWR)
USB 2.0 x2
VGA
DisplayPort x1
2x USB3.2 Gen1x1

MezIO® I/O
Mic-in & Speaker-out
8 to 48V DC IN
PCIE x 2
COM4
COM3
COM1 & COM2
Remote Control and PWR LED Output

Dimensions

Unit : mm

225
110.5
240
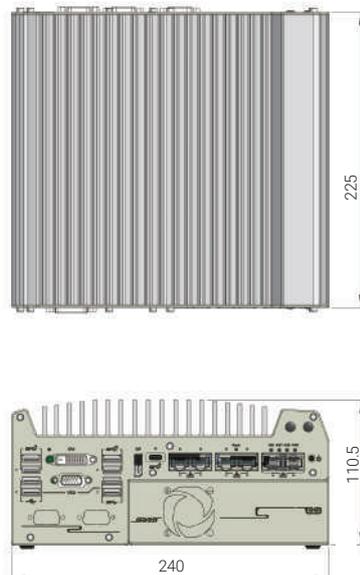
Ordering Information

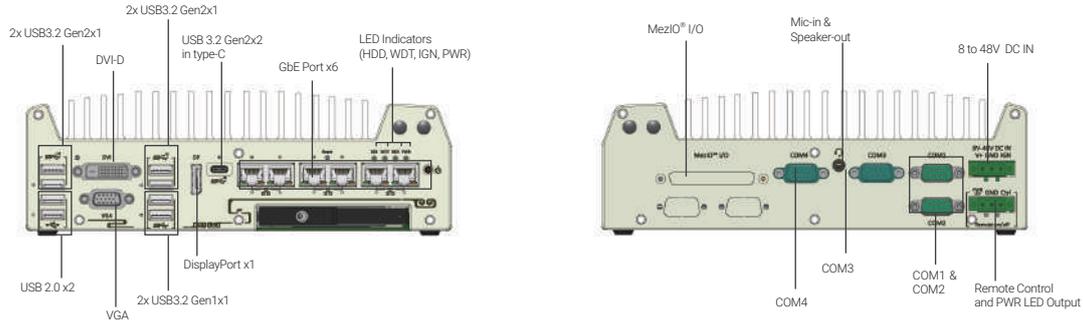| Model No.	Product Description
Nuvo-9002DE	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, dual-slot PCIe Cassette & MezIO® Interface
Nuvo-9006DE	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, dual-slot PCIe Cassette & MezIO® Interface
Nuvo-9002DE-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, dual-slot PCIe Cassette, MezIO® Interface & UL certified
Nuvo-9006DE-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, dual-slot PCIe Cassette, MezIO® Interface & UL certified
PoE+ Option	Option of 802.3at PoE+ PSE for 2.5GbE port 3 ~ port 6

Optional Accessories

DINRAIL-O	DIN-rail mount assembly for Nuvo-9000 series
Dmpbr-Nuvo5000_7000	Neousys' patented damping brackets assembly for Nuvo-9000 Series
PA-160W-OW	160W AC-DC power adapter 20V/8A; 18AWG/120cm; cord end terminals for terminal block, operating temperature: -30°C to 70°C. (recommended for 35W CPU)
PA-280W-ET2	280W AC/DC power adapter 24V/ 11.67A ; 16AWG/ 100cm; cord end terminals for terminal block, operating temperature : -30°C to 60°C. (recommended for 65W CPU or 35W CPU with PoE+ option)

MezIO® Modules

|			
MezIO®-C180	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-232 ports	MezIO®-V20-EP	MezIO® module with ignition power control function for in-vehicle application
MezIO®-C181	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-422/ 485 ports	MezIO®-U4	MezIO® module with 4x USB 3.1 ports
MezIO®-D220	MezIO® module with 8-CH isolated digital input and 8-CH isolated digital output	MezIO®-G4	MezIO® module with 4x GigE ports
MezIO®-D230	MezIO® module with 16-CH isolated digital input and 16-CH isolated digital output	MezIO®-G4P	MezIO® module with 4x IEEE 802.3at PoE+ ports *Only Nuvo-9006DE-PoE support MezIO-G4P*

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Appearance

Nuvo-9000LP

Dimensions

Unit : mm
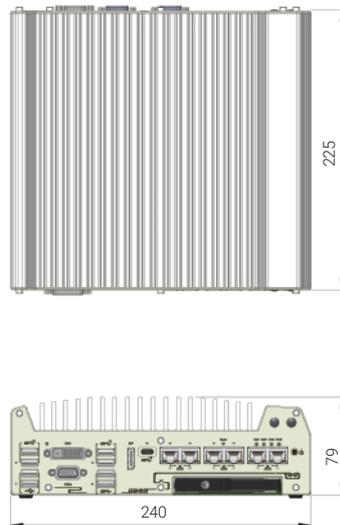
Ordering Information

Model No.	Product Description
Nuvo-9002LP	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, MezIO® Interface & 2.5" HDD tray
Nuvo-9006LP	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, MezIO® Interface & 2.5" HDD tray
Nuvo-9002LP-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, MezIO® Interface, 2.5" HDD tray & UL certified
Nuvo-9006LP-UL	Intel® BTL-S/ 14th/ 13th/12th-Gen Core™ Rugged Embedded Computer with 6x 2.5GbE/ GbE, USB 3.2 Type-C, MezIO® Interface, 2.5" HDD tray & UL certified
PoE+ Option	Option of 802.3at PoE+ PSE for 2.5GbE port 3 ~ port 6

Optional Accessories

DINRAIL-O	DIN-rail mount assembly for Nuvo-9000 series
Dmpbr-Nuvo5000_7000	Neousys' patented damping brackets assembly for Nuvo-9000 Series
PA-160W-OW	160W AC-DC power adapter 20V/8A; 18AWG/120cm; cord end terminals for terminal block, operating temperature: -30°C to 70°C. (recommended for 35W CPU)
PA-280W-ET2	280W AC/DC power adapter 24V/ 11.67A ; 16AWG/ 100cm; cord end terminals for terminal block, operating temperature : -30°C to 60°C. (recommended for 65W CPU or 35W CPU with PoE+ option)

MezIO® Modules

MezIO®-C180	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-232 ports	**MezIO®-V20**	MezIO® module with 16-mode ignition power control and 1x mini-PCIe socket for in-vehicle usage
MezIO®-C181	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-422/ 485 ports	**MezIO®-U4**	MezIO® module with 4x USB 3.1 ports
MezIO®-D220	MezIO® module with 8-CH isolated digital input and 8-CH isolated digital output	**MezIO®-G4**	MezIO® module with 4x GigE ports
MezIO®-D230	MezIO® module with 16-CH isolated digital input and 16-CH isolated digital output	**MezIO®-G4P**	MezIO® module with 4x IEEE 802.3at PoE+ ports *Only Nuvo-9006LP-PoE support MezIO-G4P*