

Nuvo-9000 Series

Fanless Rugged Embedded Computer with Intel® 13th/12th Gen. Core™ CPU

BRESSNER
A ONE STOP SYSTEMS COMPANY

Features

- Intel® 13th/12th Gen. Core™ 35W/ 65W CPU
- DDR5 4,800 SDRAM SODIMM, up to 64GB
- Intel® Q670E chipset
- MeziO® interface for easy feature expansion
- Operating temperature: -25 ° ~ 70 °C



Nuvo-9000 – Rugged embedded computer with massive computing power

Nuvo-9000 series is a new rugged embedded computer based on Intel® 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.

Flexibility through expansion-options and a variety of interfaces

Nuvo-9000 series inherits a 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 Nuvo-9000 series fits your need for ruggedness, performance, and versatility for a variety of applications.



Nuvo-9000 Series

Fanless Rugged Embedded Computer with Intel® 13th/12th Gen. Core™ CPU

| Specifications | Nuvo-9000 Series |
|------------------------------|--|
| SYSTEM | |
| CPU | 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 Support 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) |
| RAM | Up to 64GB DDR5 4.800 SDRAM (two SODIMM slots) |
| Storage | 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) 1x M.2 2280 M key NVMe socket (PCIe Gen4x4) for NVMe SSD |
| AMT | Supports Intel® vPro/ AMT 16.0 |
| TPM | Supports TPM 2.0 |
| Expansion | 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) 1x full-size mini PCI Express socket 1x M.2 2242/3052 B key socket with SIM slot for M.2 5G/ 4G module 1x MezzIO® expansion port for Neosys MezzIO® modules |
| INTERFACE | |
| Ethernet** | 1x 2.5G Ethernet by I225-IT and 1x Gigabit Ethernet by I219-LM (Nuvo-9002E/ P/ DE/ LP) with screw-lock 5x 2.5G Ethernet by I225-IT and 1x Gigabit Ethernet by I219-LM (Nuvo-9006E/ P/ DE/ LP) with screw-lock Optional IEEE 802.3at PoE+ PSE for Port 3 ~ Port 6 100 W total power budget |
| USB | 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 Gen 1x1 (5 Gbps) ports in type-A connectors 2x USB 2.0 ports |
| COM | COM 1/2: 2x software-programmable RS-232/ 422/ 485 ports COM 3/4: 2x RS-232 ports |
| Video | 1x VGA, supporting 1920 x 1200 resolution 1x DVI-D, supporting 1920 x 1200 resolution 1x DisplayPort, supporting 4096 x 2304 resolution |
| Audio | 1x 3.5 mm jack for mic-in and speaker-out |
| Power | 1x 3-pin pluggable terminal block |
| ENVIRONMENTAL | |
| Cooling | Fanless |
| Power Supply | 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 Control & LED | 1x 3-pin pluggable terminal block for remote control and PWR LED output |
| Operating Temperature | With 35W CPU: -25° ~ 70°C *** With 65W CPU: -25° ~ 70°C ****/***** (configured as 35W TDP) -25° ~ 50°C ****/***** (configured as 65W TDP) |
| Storage Temperature | -40° ~ 85°C |
| Vibration / Shock Resistance | Vibration: MIL-STD-810H, Method 514.8, Category 4 Shock: MIL-STD-810H, Method 516.8, Procedure I |
| Humidity | 10 ~ 90% , non-condensing |
| Dimensions | Nuvo-9000E/ P Series: 240 (W) x 255 (D) x 90 (H) mm Nuvo-9000DE Series: 240 (W) x 255 (D) x 110.5 (H) mm Nuvo-9000LP Series: 240 (W) x 255 (D) x 79 (H) mm |
| Weight | Nuvo-9000E/ P Series: 3.58 kg Nuvo-9000DE Series: 3.89 kg Nuvo-9000LP Series: 3.36 kg |
| Mounting | Wall-mount (standard) or DIN-rail mount (optional) |
| Certifications | CE/FCC Class A, according to EN 55032 & EN 55035 Safety: UL 62368-1, IEC62368-1 (UL series only) |

* A BIOS update may be required for the system to recognize 13th-Gen processors. Please contact Neosys Technology for more information.

** Due to I225-IT specification limitation, for systems running 2.5G Ethernet link speeds, please limit the operating temperature to 60°C.

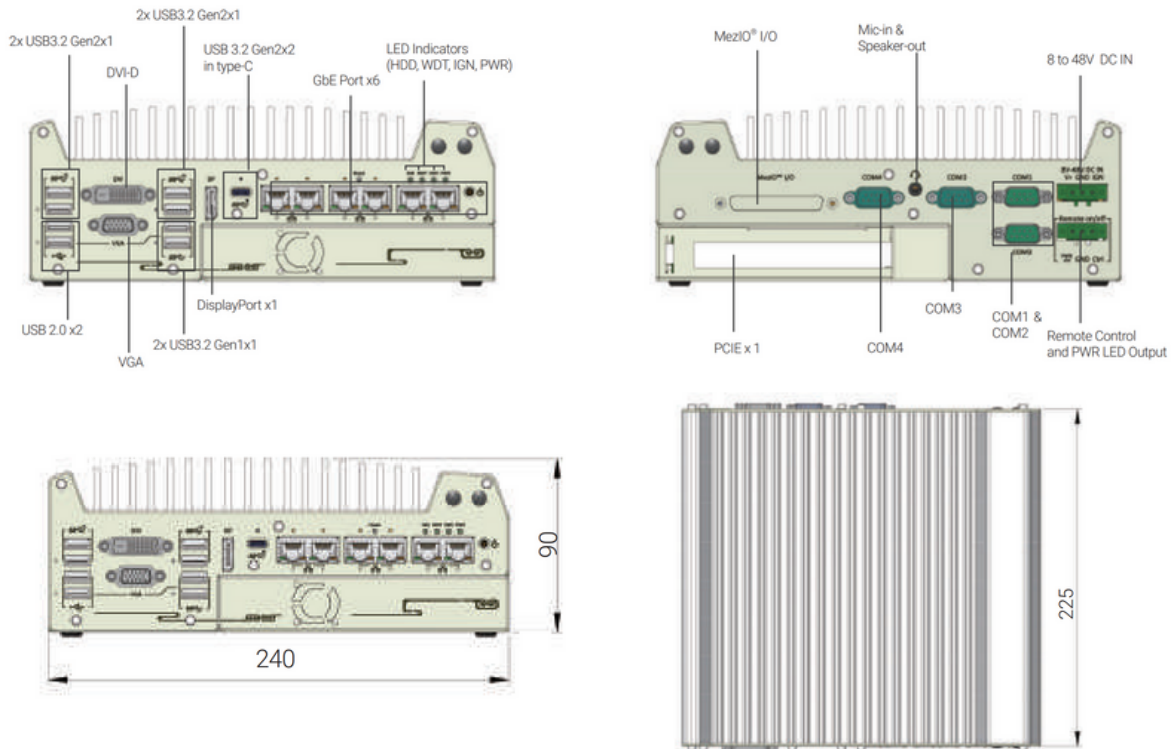
*** For sub-zero operating temperature, a wide temperature HDD or Solid State Disk (SSD) is required.

**** 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.

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Nuvo-9000E/P



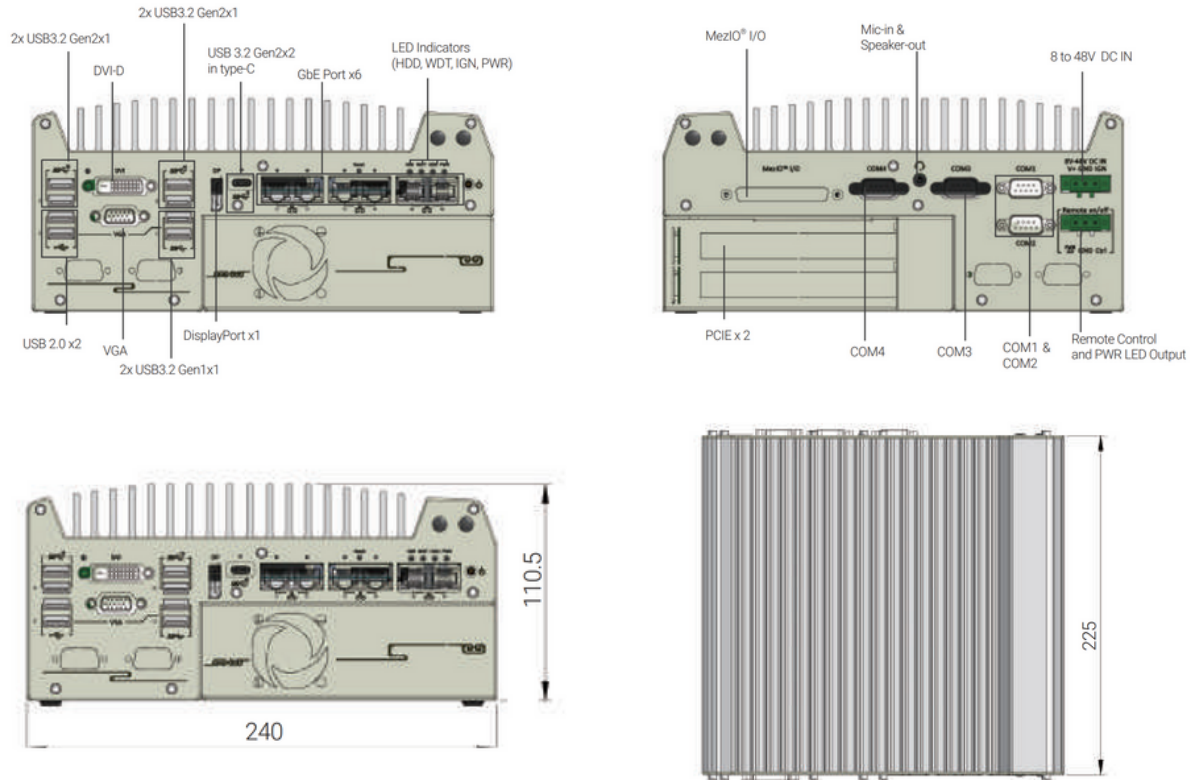
| Model No. | Description |
|---------------|--|
| Nuvo-9002E | Intel® 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCIe Cassette & MeziO® Interface |
| Nuvo-9002P | Intel® 13th/12th-Gen Core™ Rugged Embedded Computer with 2x 2.5GbE/ GbE, USB 3.2 Type-C, single-slot PCI Cassette & MeziO® Interface |
| Nuvo-9006E | Intel® 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® 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® 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® 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® 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® 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 | Neosys' 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 |

Nuvo-9000 Series

Fanless Rugged Embedded Computer with Intel® 13th/12th Gen. Core™ CPU

Nuvo-9000DE



| Model No. | Description |
|----------------|--|
| Nuvo-9002DE | Intel® 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® 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® 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® 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 | Neusys' 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) |

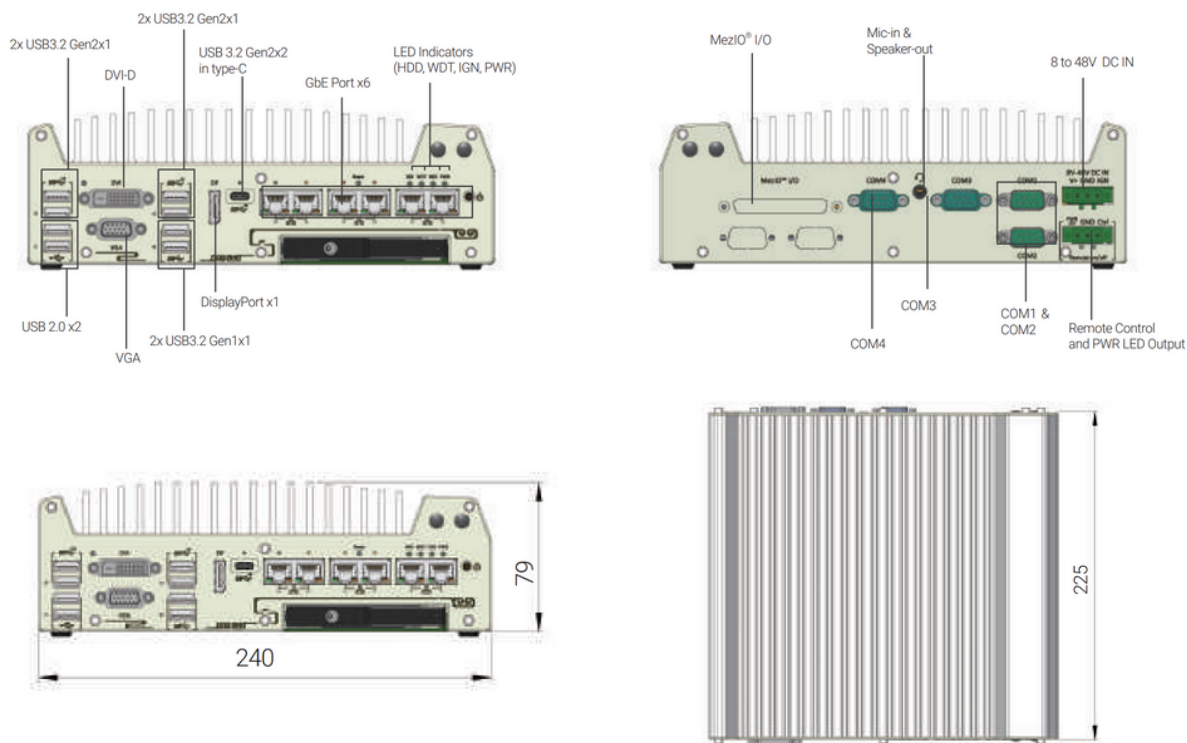
MeziO® Modules

| | | | |
|--------------------|---|----------------------|---|
| 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 |

Nuvo-9000 Series

Fanless Rugged Embedded Computer with Intel® 13th/12th Gen. Core™ CPU

Nuvo-9000LP



| Model No. | Description |
|----------------|---|
| Nuvo-9002LP | Intel® 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® 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® 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® 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 | Neosys' 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 |