GPU Computing

Nuvo-9166GC Series

Ruggedized Edge AI Inference Computer supporting NVIDIA® L4 GPU and Intel® 13th/12th-Gen Core™ processor with dual PCIe slots

Key Features

- **Supports NVIDIA® L4 GPU and one additional PCIe card**
- **Supports Intel® 13th/12th-Gen Core™ up to 16C/ 24T 35W/ 65W**
- **Dedicated heat dissipation for -25°C to 60°C wide-temperature operation**
- **5x 2.5GbE and 1x GbE with optional PoE+ (ports 3~6)**
- **1x USB 3.2 Gen2x2 type-C and 6x USB 3.2 type-A ports**
- **M.2 2280 M key socket (Gen4x4) supporting NVMe SSD**
- **Accommodates two 2.5" SATA HDD/ SSD with RAID 0/ 1 support**
- **MezIO™ interface for add-on expansion**

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**R.O.C Patent No. M534371/ M456527*

Introduction

Nuvo-9166GC is a rugged, wide-temperature, Edge AI Inference Computer that delivers excellent CPU and GPU performance by leveraging Intel® 13th/12th-Gen platform and NVIDIA® L4. Thanks to its high-performance density and flexible camera expansion, Nuvo-9166GC is ideal for multi-camera applications requiring real time responses, e.g., AI inspection, robotic guidance, and autonomous machines.

Supporting an Intel® Core™ CPU up to 24 cores/ 32 threads, Nuvo-9166GC provides up to nearly twice the performance when compared to 11th/ 10th Gen platforms. The system also supports NVIDIA® L4, a data center grade GPU powered by NVIDIA® Ada Lovelace architecture for energy-efficient AI acceleration applications, it offers up to 30.3 TFLOPS in FP32 or 485 TOPS in INT8 to set new benchmarks for industrial edge AI computing.

Nuvo-9166GC has a proven thermal design to guarantee reliable system operation from -25°C to 60°C. It features a passive-cooling design for the CPU and DDR5 memory module. There is also a segregated and patented Cassette module with an air tunnel to continuously guide cool airflow through the passive heat sink of NVIDIA® L4, guranteeing optimum performance. Camera connectivity wise, Nuvo-9166GC has six GbE ports and six USB3 ports, and with MezIO® expansion and an additional PCIe slot, Nuvo-9166GC can support up to fourteen industrial GigE cameras or eighteen industrial USB3 cameras. To help store all the data from the multiple cameras is an M.2 2280 Gen4x4 slot supporting an NVMe SSD to offer up to 7000 MB/s extreme read/write speeds and two 2.5" SATA HDD/SSD slots to further expand storage capacity.

By integrating rugged construction, wide operating temperature, server grade AI inference performance, powerful hybrid CPU, and camera expansion capability, Nuvo-9166GC is the perfect Edge AI Inference Computer for versatile AI applications.

Specifications

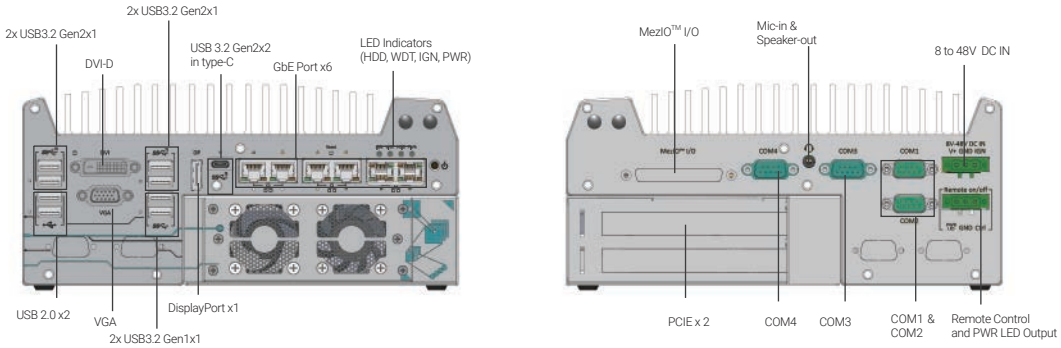
System Core		
Processor	Supporting Intel® 13th-Gen Core™ CPU (LGA1700 socket, 65W/ 35W TDP) - Intel® Core™ i9-13900E/ i9-13900TE - Intel® Core™ i7-13700E/ i7-13700TE - Intel® Core™ i5-13500E/ i5-13400E/ i5-13500TE - Intel® Core™ i3-13100E/ i3-13100TE	Support Intel® 12th-Gen Core™ CPU (LGA1700 socket, 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)	
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	5x 2.5G Ethernet by I225-IT and 1x Gigabit Ethernet by I219-LM with screw-lock	
PoE+	Optional IEEE 802.3at PoE+ PSE for Port 3 ~ Port 6. 100W 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 connector, supporting 1920 x 1200 resolution 1x DVI-D connector, supporting 1920 x 1200 resolution 1x DisplayPort connector, 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	
M.2	1x M.2 2280 M key socket (PCIe Gen4 x4) for NVMe SSD	

Expansion Bus	
PCI Express	2x PCIe x16 slot@Gen3, 8-lanes PCIe signal in Cassette for installing NVIDIA® L4 GPU and one additional PCIe card
Mini PCI Express	1x full-size mini PCI Express socket
M.2	1x M.2 3042/3052 B key socket with SIM slot for M.2 4G/ 5G 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 [1]
Remote Ctrl. & LED Output	1x 3-pin pluggable terminal block for remote control and PWR LED output
Mechanical	
Dimension	240 mm (W) x 225 mm (D) x 110.5 mm (H)
Weight	4.0kg
Mounting	Wall-mount (standard) or damping bracket (optional)
Environmental	
Operating Temperature	**With 35W CPU and 130W GPU** -25°C to 60°C [2][3] **With 65W CPU and 130W GPU** -25°C to 60°C[2][3] (configured as 35W TDP) -25°C to 50°C[2][3] (configured as 65W TDP)
Storage Temperature	-40°C to 85°C
Humidity	10% to 90% , non-condensing
Vibration	MIL-STD-810H, Method 514.8, Category 4 (with optional damping bracket)
Shock	MIL-STD-810H, Method 516.8, Procedure I (with optional damping bracket)
EMC	CE/FCC Class A, according to EN 55032 & EN 55035

[1] The system is designed to tolerant 8V to 48V voltage fluctuation. The minimal nominal voltage is required with different system configuration. For system with CPU and L4 GPU, 12V or above nominal DC voltage is recommended. For system with CPU, L4 GPU and additional PoE+ PD and/or high-watt PCIe card, 24V or above nominal DC voltage is recommended.
[2] For sub-zero operating temperature, a wide temperature HDD or Solid State Disk (SSD) is required.
[3] 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.

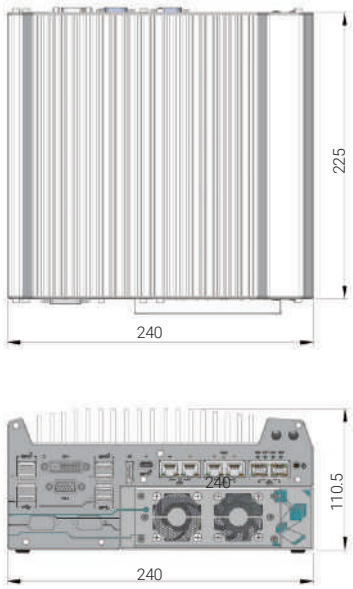
Last updated: 7 - Jun 2023

Appearance



Dimensions

Unit : mm



Ordering Information

Model No.	Product Description
Nuvo-9166GC	Ruggedized Edge AI Inference Computer supporting NVIDIA® L4 GPU and Intel® 13th/12th-Gen Core™ processor with dual PCIe slots
PoE+ Option	Option of 802.3at PoE + PSE for 2.5GbE port 3 ~ port 6

Optional Accessories

Dmpbr-Nuvo9160	Neousys' patented damping brackets assembly for Nuvo-9166GC
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.
PA-600W-ENC	600W AC/DC power adapter 24V/25A; cord end terminals for terminal block, operating temperature : -20°C to 70°C.
MezIO® Modules	
MezIO®-C180	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-232 ports
MezIO®-C181	MezIO® module with 4x RS-232/ 422/ 485 ports and 4x RS-422/ 485 ports
MezIO®-D220	MezIO® module with 8-CH isolated digital input and 8-CH isolated digital output
MezIO®-D230	MezIO® module with 16-CH isolated digital input and 16-CH isolated digital output
MezIO®-V20-EP	MezIO® module with ignition power control function for in-vehicle application
MezIO®-U4	MezIO® module with 4x USB 3.1 ports
MezIO®-G4	MezIO® module with 4x GigE ports
MezIO®-G4P	MezIO® module with 4x IEEE 802.3at PoE+ ports

Only Nuvo-9006DE-PoE support MezIO-G4P