NRU-52S+/ NRU-52S

Rugged NVIDIA® Jetson Orin™ NX/ Xavier™ NX Edge AI Computer with 4x PoE++ Ports for Intelligent Video Analytics

Preliminary

Key Features

- **Powered by NVIDIA® Jetson Orin™ NX or Xavier™ NX SOM bundled with JetPack 5.1.1**
- **Rugged -25°C to 70°C fanless operation**
- **4x IEEE 802.3bt PoE++ GbE ports with screw-lock**
- **2x mini-PCIe sockets for WIFI/GNSS/NVMe/CAN modules**
- **1x M.2 3042/3052 B key socket for 4G/5G mobile communication**
- **1x hardware configurable RS232/RS422/RS485 port**
- **8V to 35V wide-range DC input with built-in ignition power control**
- **MIL-STD-810G and EN 50155 EMC certified**

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Introduction

NRU-52S series is a rugged, wide temperature, fanless edge AI computer delivering up to 100 TOPS for AI-based video analytics applications requiring H.264/H.265 video decoding and real-time inference. Power by an NVIDIA® Jetson Orin™ NX/ Xavier™ NX system on module (SoM), it comprises of NVIDIA® Ampere GPUs (Orin NX), CUDA cores, Tensor cores, and NVDLA (NVIDIA® Deep Learning Accelerator).

Benefiting from the power-efficiency of NVIDIA® Jetson Orin™ NX, which consumes only 25W of power, NRU-52S+ can decode up to 18 streams of 1080p video at 30 FPS, and also offer 100 TOPS inference performance. The high AI performance per watt makes NRU-52S+ ideal for applications with a limited power source, such as in a robot, vehicle, or rolling stock. Also, with Neousys' industrial-grade thermal design, NRU-52S+ is ideal for edge deployments that require fanless wide temperature operations, such as at roadside, wayside, construction site, agriculture, or in a dusty factory.

NRU-52S+ offers four IEEE 802.3bt PoE++ ports, each port can supply up to 90W to IP cameras or PTZ speed dome cameras for AI-based detection, tracking, and recognition applications. NRU-52S+ also offers flexible expansions with two mPCIe sockets for NVMe storage, WIFI, GNSS, or V2X module; one M.2 B key for 4G LTE or 5G NR module with dedicated passive thermal design, and a total of five antenna holes for mobile broadband. It also has one hardware configurable RS232/RS422/RS485, 1x GPS PPS input, 3-CH isolated DI, and 4-CH isolated DO for communication with external devices.

By integrating PoE++ connectivity, 100 TOPS inference performance, a vast of NVIDIA AI JetPack toolkits, NRU-52S+ can enable more possibilities for real-time video analytics such as autonomous machines, security alerts, law enforcement, and V2X applications. With its -25°C to 70°C fanless operation, wide-range DC input, ignition control, and 4G/ 5G connectivity, NRU-52S+ is not only for indoor/ stationary installations but also ideal for harsh edge deployments.

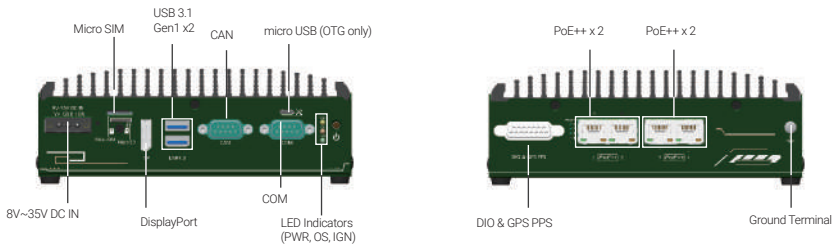
Specifications

	NRU-52S+-JON8/ NRU-52S+-JON16	NRU-52S-NX8/ NRU-52S-NX16
System Core		
Processor	NVIDIA® Jetson Orin™ NX system-on-module (SOM), comprising NVIDIA® Ampere GPU and ARM Cortex CPU	NVIDIA® Jetson Xavier™ NX system-on-module (SOM), comprising NVIDIA® Volta GPU and Carmel CPU
Memory	8GB/ 16GB LPDDR5 @ 3200 MHz on SOM	8GB/ 16GB LPDDR4x (Xavier NX 8GB/ 16GB) @ 1600/ 1866 MHz on SOM
eMMC	N/A	16GB eMMC 5.1 on SOM
Panel I/O Interface		
Ethernet Port	4x Gigabit ports with screw-lock, share 1 Gbps total bandwidth	
PoE Capability	In compliant with IEEE 802.3bt PoE++ Type 3 and Type 4 PSE, maximum 90W output on single PoE++ port Compatible with 802.3at (PoE+) and 802.3af (PoE) PD	
USB	2x USB 3.1 Gen1 ports (total 5 Gbps shared with M.2 B key) 1x micro USB (OTG)	
Video Port	1x DisplayPort, supporting 3840x2160 at 60Hz	
Serial Port	1x hardware configurable RS-232/ 422/ 485 port	
CAN Bus	1x isolated CAN 2.0 port	
Isolated DIO	1x GPS PPS input, 3-CH isolated DI and 4-CH isolated DO	
Ground Terminal	1x M4 ground terminal for chassis ESD shielding	

	NRU-52S+-JON8/ NRU-52S+-JON16	NRU-52S-NX8/ NRU-52S-NX16
Internal I/O Interface		
Mini PCI Express	**With Orin NX** 1x full-size mini PCI Express socket (PCIe + USB 2.0) for M.2 M 2242 NVMe with adapter for storage 1x full-size mini PCI Express socket (PCIe + USB 2.0) for GNSS, V2X, or CAN	**With Xavier NX** 1x full-size mini PCI Express socket (PCIe + USB 2.0) for WiFi, NVMe storage 1x full-size mini PCI Express socket (USB 2.0) for GNSS, V2X, or CAN
M.2	1x M.2 3042/ 3052 B key (USB 3.1 Gen 1 + USB 2.0) for 4G/5G module with dual SIM support (1x front-accessible, 1x internal)	
Power Supply		
DC Input	1x 3-pin pluggable terminal block for 8V to 35V DC input and ignition power control (V+/ GND/ IGN)	
Mechanical		
Dimension	173 mm (W) x 144 mm (D) x 60 mm (H)	
Weight	1.4kg	
Mounting	Wall-mount bracket (optional)	
Environmental		
Operating Temperature	-25°C ~ 70°C with passive cooling (15W TDP mode with 50W PoE++ power supply) -25°C ~ 70°C with optional fan kit (15W TDP mode with 144W PoE++ power supply)	
Storage Temperature	-40°C to 85°C	
Humidity	10% to 90%, non-condensing	
Vibration	Operating, MIL-STD-810G, Method 514.7, Category 4	
Shock	Operating, MIL-STD-810G, Method 516.7, Procedure I	
EMC	CE/FCC Class A, according to EN 55032 & EN 55035 EN 50121-3 (EN 50155:2017, Clause 13.4.8)	

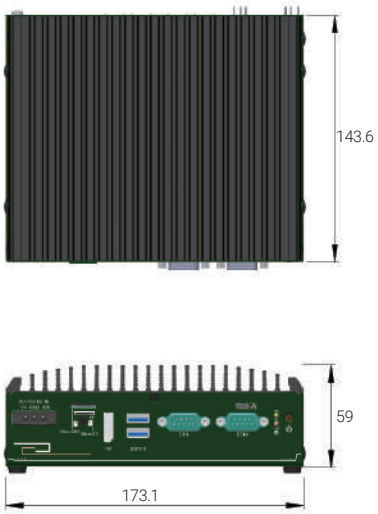
• For sub-zero and over 60°C operating temperature, a wide temperature SD card / NVMe is required.

Appearance



Dimensions

Unit : mm



Ordering Information

Model No.	Product Description
NRU-52S+-JON8	Rugged NVIDIA® Jetson Orin™ NX(8GB) Edge AI Computer with 4x PoE++ Ports for Intelligent Video Analytics with 120GB M.2 2242 M NVMe
NRU-52S+-JON16	Rugged NVIDIA® Jetson Orin™ NX(16GB) Edge AI Computer with 4x PoE++ Ports for Intelligent Video Analytics with 120GB M.2 2242 M NVMe
NRU-52S-NX8	Rugged NVIDIA® Jetson Xavier™ NX(8GB) Edge AI Computer with 4x PoE++ Ports for Intelligent Video Analytics
NRU-52S-NX16	Rugged NVIDIA® Jetson Xavier™ NX(16GB) Edge AI Computer with 4x PoE++ Ports for Intelligent Video Analytics

Optional Accessories

PA-160W-OW	160W AC-DC power adapter, 20V/8A; 18AWG/120cm; cord end terminals for terminal block, operating temperature : -30 to 70°C.
PA-120W-OW	120W AC/DC power adapter, 20V/6A; 18AWG/120cm; cord end terminals for terminal block, operating temperature : -30 to 70°C.
Wmkit-NRU-50	Wall mounting kit for NRU-50 series, including wall mounting brackets and screws
AccsyBx-FAN-NRU-50	Fan kit for NRU-50 series, including 92x92mm fan, fan frame, fan cable cover, and screws
Tpkit-NRU-50	3 pcs of 30x30x2 mm thermal pad for mPCIe modules with the max component height between 1.3 mm and 2.4 mm, and M.2 B key modules with the max component height between 0.7 mm and 2.0 mm