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NRU-52S Series

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

Key Features

- **Powered by NVIDIA® Jetson Xavier™ NX SOM bundled with JetPack 4.6.1**
- **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 3042/3052 M.2 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 certified**

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Introduction

NRU-52S is a rugged, wide temperature, fanless edge AI computer delivering 21 TOPS for AI-based video analytics applications requiring H.264/H.265 video decoding and real-time inference. Powered by NVIDIA® Jetson Xavier™ NX system on module (SOM), it comprises a 6-core ARM CPU and NVIDIA® Volta GPU with 384 CUDA cores, 48 Tensor cores, and 2 NVDLA (NVIDIA® deep learning accelerator).

Benefiting from the power-efficiency of NVIDIA® Jetson Xavier™ NX, which consumes only 15W of power, NRU-52S can decode up to 32 streams of 1080p video at 30 FPS, and also offer 21 TOPS inference performance. The low power consumption 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, 1 GPS PPS input, 3-CH isolated DI, and 4-CH isolated DO for communication with external devices.

By integrating PoE++ connectivity, 21 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.

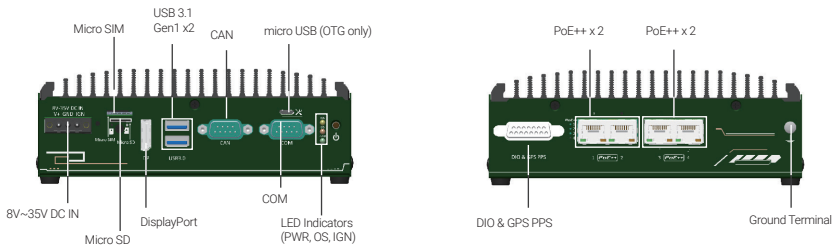
Specifications

System Core	
Processor	NVIDIA® Jetson Xavier™ NX system-on-module (SOM), comprising NVIDIA® Volta GPU and Carmel CPU
Memory	8GB/ 16GB LPDDR4x (Xavier NX 8GB/ 16GB) @ 1600/ 1866 MHz on SOM (15W/ 20W TDP mode)
eMMC	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)
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
Micro SD	1x front-accessible microSD card slot
Ground Terminal	1x M4 ground terminal for chassis ESD shielding
Internal I/O Interface	
Mini PCI Express	2x full-size mini PCI Express socket (PCIe + USB 2.0) for WIFI, GNSS, NVMe storage, V2X, or CAN modules
M.2	1x 3042/3052 M.2 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	1.4 kg
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 ~ 85°C
Humidity	10% ~ 90%, non-condensing
Vibration	Operating, MIL-STD-810G, Method 514.7, Category 4 (pending)
Shock	Operating, MIL-STD-810G, Method 516.7, Procedure I (pending)
EMC	CE/FCC Class A, according to EN 55032 & EN 55035 (pending) EN 50121-3 (EN 50155:2017, Clause 13.4.8) (pending)

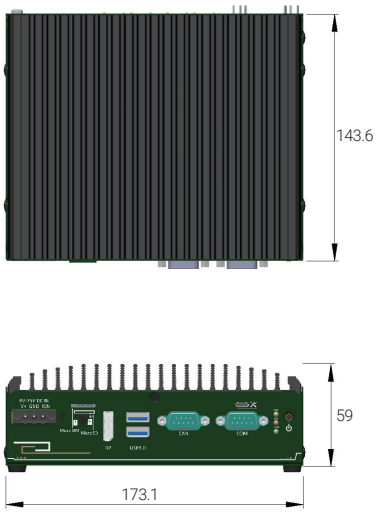
** For sub-zero and over 60°C operating temperature, a wide temperature HDD or Solid State Disk (SSD) is required.*

Appearance



Dimensions

Unit : mm



Ordering Information

Model No.	Product Description
NRU-52S-8GB	Rugged NVIDIA® Jetson Xavier™ NX (8GB) Edge AI Computer with 4x PoE++ Ports for Intelligent Video Analytics
NRU-52S-16GB	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.
Risr-M2M-mPCIe	NGFF M.2 2242 key M to mini-PCIe adapter
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