

Surveillance/ Video Analytics



# NRU-52S+/ NRU-52S

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

## Preliminary



CE FC

### 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 Neosys' 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/<br>NRU-52S+-JON16                                                                                                                           | NRU-52S-NX8/<br>NRU-52S-NX16                                                                  |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>System Core</b>         |                                                                                                                                                            |                                                                                               |
| 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                                                                          |
| Bundled JetPack Version    | JetPack 5.1.1                                                                                                                                              | JetPack 4.6.1                                                                                 |
| <b>Panel I/O Interface</b> |                                                                                                                                                            |                                                                                               |
| 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<br>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)<br>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/<br>NRU-52S+-JON16 |                                                                                                                                                                                                          | NRU-52S-NX8/<br>NRU-52S-NX16                                                                                                                                                  |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Internal I/O Interface           |                                                                                                                                                                                                          |                                                                                                                                                                               |
| Mini PCI Express                 | <b>With Orin NX</b><br>1x full-size mini PCI Express socket (PCIe + USB 2.0) for M.2 M 2242 NVMe with adapter for storage<br>1x full-size mini PCI Express socket (PCIe + USB 2.0) for GNSS, V2X, or CAN | <b>With Xavier NX</b><br>1x full-size mini PCI Express socket (PCIe + USB 2.0) for WiFi, NVMe storage<br>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)<br>-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<br>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.

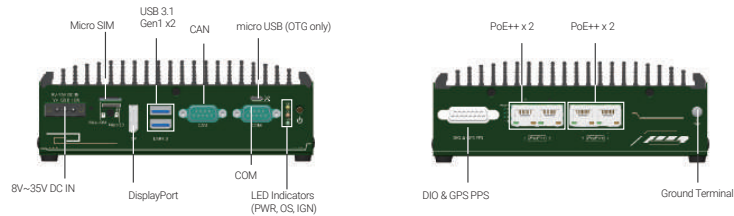
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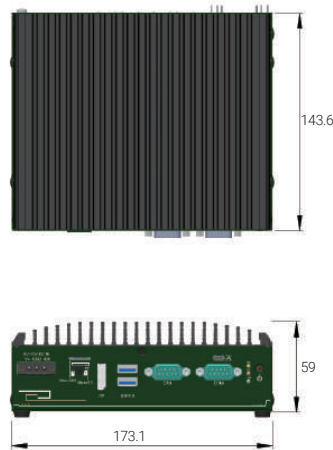
NRU-52S+/ NRU-52S



### 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 |

All specifications and photos are subject to change without prior notice

## Assured Systems

Assured Systems is a leading technology company with over 1,500 regular clients in 80 countries, deploying over 85,000 systems to a diverse customer base in 12 years of business. We offer high-quality and innovative rugged computing, display, networking and data collection solutions to the embedded, industrial, and digital-out-of-home market sectors.

### US

[sales@assured-systems.com](mailto:sales@assured-systems.com)

Sales: +1 347 719 4508

Support: +1 347 719 4508

1309 Coffeen Ave  
Ste 1200  
Sheridan  
WY 82801  
USA

### EMEA

[sales@assured-systems.com](mailto:sales@assured-systems.com)

Sales: +44 (0)1785 879 050

Support: +44 (0)1785 879 050

Unit A5 Douglas Park  
Stone Business Park  
Stone  
ST15 0YJ  
United Kingdom

VAT Number: 120 9546 28

Business Registration Number: 07699660