# NRU-220S/ NRU-222S

NVIDIA® Jetson AGX Orin™ AI NVR for Intelligent Video Analytics


## Key Features

- **Powered by NVIDIA® Jetson AGX Orin™ SoM bundled with JetPack 5.1.1**
- **Rugged -25°C to 70°C fanless operation (No throttling at 65°C with 64GB AGX Orin MAXN Mode)**
- **2x 2.5 Gigabit Ethernet + 4x IEEE 802.3at Gigabit PoE+ ports**
- **2x front-accessible 2.5" SSD trays**
- **1x M.2 2280 M key socket for NVMe SSD**
- **2x mini-PCIe sockets for WiFi/ GNSS/ NVMe/ CAN modules**
- **1x 3042/ 3052 M.2 B key socket for 4G/5G mobile communication**
- **1x isolated RS-485 and 2x RS232 ports**
- **8V to 48V wide-range DC input with built-in ignition power control**

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## Introduction

NRU-220S series is a one-stop AI NVR real-time inference and video transcoder powered by NVIDIA® Jetson AGX Orin. Its fanless design and wide-temperature operation capability makes it ideal for stationary or mobile deployment applications.

Powered by NVIDIA® Jetson AGX Orin™ 32GB/ 64GB system-on-module (SOM), it comprises an Ampere GPU with up to 2048 CUDA cores, 64 Tensor cores, 2x NVDLA 2.0 Engines that offer a total of 275 sparse TOPS (INT8) AI inference and video transcoding capability of up to twenty-two 1080P video streams simultaneously.

NRU-220S offers four 802.3at PoE+ ports sharing 1 Gigabit bandwidth; each port can supply up to 25.5W of power to IP cameras. The additional two 2.5GbE ports is ideal for surveillance applications requiring more IP camera connections, or higher bandwidth connections to the backend. In addition to 64GB eMMC on the Orin module and an M.2 2280 NVMe socket for fast SSD read/write, NRU-220S is equipped with two front-accessible 2.5" SSD trays for storage expansion. It also has two mini-PCIe sockets for CAN/ COM/ WiFi modules and one M.2 B key socket for 4G LTE/5G NR mobile communications.

In addition to the above mentioned connectivity, the system also includes a wide range of NVIDIA AI tools, and modern deep learning frameworks. NRU-220S brings real-time video inference to the edge for surveillance, predictive maintenance, and intelligent transportation system (ITS) applications. Furthermore, with Neousys' unique damping bracket design, ignition power control, and 8-48V wide-range DC power input, NRU-220S is also ideal for in-vehicle deployment. Last but not least, NRU-220S comes with a derivative model, NRU-222S, incorporating M12 connectors for applications in shock and vibration environments that require extreme rugged connections, such as for agriculture, construction, and mining machinery.

NRU-220S series is Neousys' response to edge AI performance demands in a compact form factor with fanless wide-temperature operation.

## Specifications

| | NRU-220S | NRU-222S |
|---|---|---|
| **System Core** | | |
| Processor | Supporting NVIDIA® Jetson AGX Orin™ System-on-Module (SOM), comprising NVIDIA® Ampere GPU and Arm Cortex-A78AE CPU | |
| Memory | 32GB/ 64GB LPDDR5 (AGX Orin 32GB/ 64GB) @ 3200 MHz on SOM | |
| eMMC | 64GB eMMC 5.1 on SOM | |
| **Panel I/O Interface** | | |
| Ethernet Port | 6x RJ45 with screw-lock | 6x M12 X-coded 8-pin |
| | Port 1, Port 2: 2.5 Gigabit Ethernet ports by Intel® I225<br>Port 3 ~ Port 6: Gigabit ports, share 1 Gbps total bandwidth | |
| PoE Capability | IEEE 802.3at PoE+ PSE for Port 3 ~ Port 6, 100W total power budget | |
| USB | 1x USB 3.2 Gen2 port<br>2x USB 2.0 ports<br>1x USB Type C (Debug Only) | |
| Video Port | 1x DisplayPort, supporting 3840x2160 at 60Hz | |
| Serial Port | 1x Isolated RS-485 port and 2x RS-232 ports | |
| CAN bus | 2x CAN 2.0 ports | |
| Isolated DIO | 4-CH isolated DI and 4-CH isolated DO | |
| **Internal I/O Interface** | | |
| Mini PCI Express | 1x full-size mini PCI Express socket (PCIe + USB 2.0) for WiFi 6 or CAN<br>1x full-size mini PCI Express socket (USB 2.0) for GNSS or 4G LTE | |
| M.2 | 1x M.2 3042/3052 B key (USB 3.1 Gen 1 + USB 2.0)<br>for LTE/5G module with dual micro SIM support | |
| **Storage** | | |
| SATA HDD | 2x front-accessible 2.5" 7mm SSD | |
| M.2 NVMe | 1x M.2 2280 M key NVMe socket (PCIe Gen4x4) for NVMe SSD | |

| | NRU-220S | NRU-222S |
|---|---|---|
| **Power Supply** | | |
| DC Input | 1x 3-pin pluggable terminal block for 8V to 48V DC input and ignition power control (IGN/ GND/ V+) | 1x M12 A-coded 5-pin for 8V to 48V DC input and ignition power control (IGN/ GND/ V+)* |
| **Mechanical** | | |
| System LED | PWR: System carrier board power status<br>OS: Jetson OS boot status<br>IGN: Ignition power signal | |
| Dimension | 230 mm (W) x 173 mm (D) x 66 mm (H) | |
| Weight | 2.6 kg (excluding the damping bracket) | |
| Mounting | Wall-mount with the damping bracket | |
| **Environmental** | | |
| Operating Temperature | -25°C ~ 70°C with passive cooling (30W TDP mode) ** | |
| Storage Temperature | -40°C ~ 85°C | |
| Humidity | 10% ~ 90%, non-condensing | |
| Vibration | Operating, MIL-STD-810H, Method 514.8, Category 4 | IEC61373:2010, Category 1, Class B Body Mounted (part of EN 50155) |
| Shock | Operating, MIL-STD-810H, Method 516.8, Procedure I | IEC61373:2010, Category 1, Class B Body Mounted (part of EN 50155) |
| EMC | CE/ FCC Class A, according to EN 55032 & EN 55035<br>EN 50121-3 (EN 50155:2017, Clause 13.4.8) | CE/ FCC Class A, according to EN 55032 & EN 55035<br>EN 50121-3 (EN 50155:2017, Clause 13.4.8) |

** Due to the M12 DC input current limit, the allowable DC input range of the NRU-222S varies based on the system load: System load under 60W, the required DC input range is 8V to 48V*
*System load between 60W to 160W, the required DC input range is 20V to 48V*
*** For sub-zero and over 60°C operating temperature, a wide temperature HDD or Solid State Disk (SSD) is required.*

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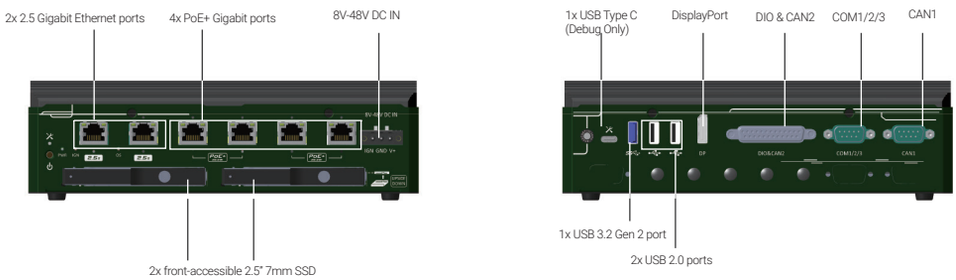
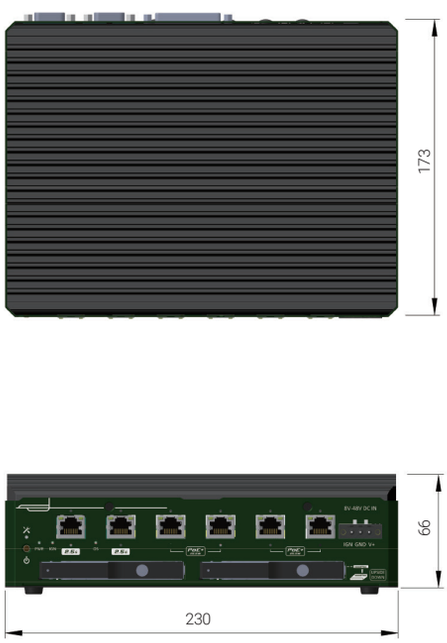
## Appearance

### NRU-220S




## Dimensions

Unit : mm




## Ordering Information

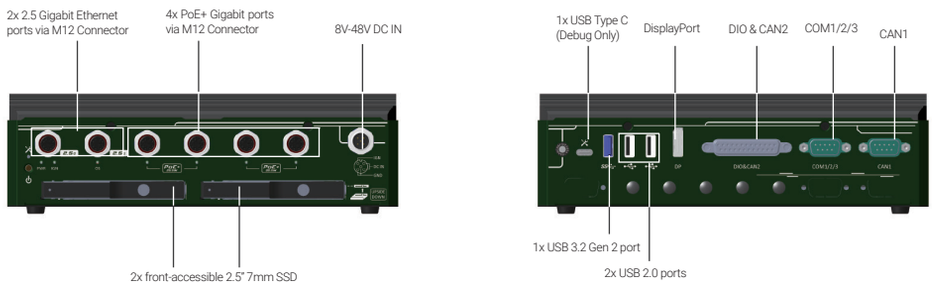
| Model No. | Product Description |
|---|---|
| NRU-220S-JAO32 | NVIDIA® Jetson AGX Orin™ (32GB) AI NVR for Intelligent Video Analytics with RJ45 Ethernet |
| NRU-220S-JAO64 | NVIDIA® Jetson AGX Orin™ (64GB) AI NVR for Intelligent Video Analytics with RJ45 Ethernet |

## 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. |
| AccsyBx-FAN-NRU-100 | Fan kit with 92mm x 92mm fan for NRU-220S series |

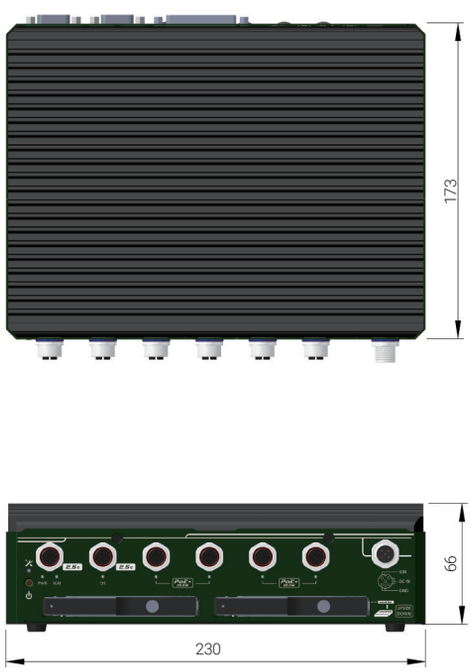
## Appearance

### NRU-222S




## Dimensions

Unit : mm




## Ordering Information

| Model No. | Product Description |
|---|---|
| NRU-222S-JAO32 | NVIDIA® Jetson AGX Orin™ (32GB) AI NVR for Intelligent Video Analytics with M12 Ethernet |
| NRU-222S-JAO64 | NVIDIA® Jetson AGX Orin™ (64GB) AI NVR for Intelligent Video Analytics with M12 Ethernet |

## 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. |
| AccsyBx-FAN-NRU-100 | Fan kit with 92mm x 92mm fan for NRU-220S series |

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