NRU-110V Series

NVIDIA® Jetson AGX Xavier™ Edge AI Platform Supporting 8x GMSL Automotive Cameras and 10GbE Ethernet

Key Features

- **Powered by NVIDIA® Jetson AGX Xavier™ SOM bundled with JetPack 4.4**
- **Support 8x GMSL automotive cameras via FAKRA Z connectors**
- **1x 10GBASE-T 10G Ethernet port**
- **1x M.2 2280 M key socket for NVMe SSD**
- **1x mini PCIe socket for WiFi/4G module**
- **1x isolated CAN bus port and 1x RS232 port with flow control**
- **1x GPS PPS input, 3-CH isolated DI and 4-CH isolated DO**
- **8V to 35V wide-range DC input with built-in ignition power control**

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Introduction

The NRU-110V series is a Jetson AGX Xavier™ computer supporting GMSL cameras that can act as a camera sensor hub for autonomous driving, a control unit for autonomous mobile robots (AMR), or a video transcoding unit for teleoperation of unmanned ground vehicles. It is a turnkey solution with on-board GMSL deserializers for eight synchronized automotive GMSL camera inputs and a pre-installed board support package (BSP) with drivers for selected cameras.

The support of GMSL cameras equips NRU-110V with powerful vision capability. Taking advantage of automotive cameras featuring IP67 waterproof characteristic, high dynamic range (>120dB HDR), auto white balance (AWB), and LED flickering mitigation (LFM), NRU-110V can obtain high-quality images regardless of lighting conditions, from bright sunny days to overcast weather and pitch-black nights. More than that, it not only has a unique synchronization mechanism capable of simultaneously acquiring images from eight GMSL cameras within microseconds channel-to-channel skew, but also accepts GPS PPS signal to align image data with other sensors, such as LIDAR or cameras on other systems.

NRU-110V further integrates various I/O interfaces to interact with different sensors on autonomous machines. It has a 10Gb Ethernet to stream raw images in real-time to another powerful GPU computer performing perception, a CAN bus interface for in-vehicle communication, or connect an inertial measurement unit (IMU) to localize and determine orientation and position. Additionally, NRU-110V offers RS-232 plus dedicated GPS PPS input for connecting an external GPS module, M.2 NVMe slot for storage extension, mini-PCIe for WiFi/ 4G module connectivity, and isolated DIO for generic controls.

Combining eight GMSL automotive camera support, significant TFLOPS inference performance, multiple sensor interfaces, and 10GbE data transmission, the NRU-110V is a rugged edge AI computer connected to a variety of sensors to fulfill perception and planning on the same platform. It is ideal for AI-based vision applications that require continuous interactions with surroundings, such as UGV, AMR, ADAS, intelligent V2X, etc.

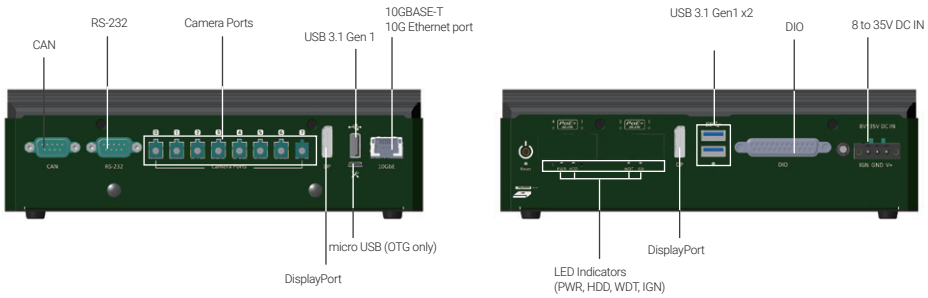
Specifications

System Core	
Processor	Supporting NVIDIA® Jetson AGX Xavier™ system-on-module, comprising of NVIDIA® Volta GPU and Carmel CPU
Memory	32GB LPDDR4x @ 2133 MHz on SOM
eMMC	32GB eMMC 5.1 on SOM
I/O Interface	
GMSL Camera	8x GMSL FAKRA Z connector, supporting 8x 1280x720 @ 30 FPS camera input
Ethernet port	1x 10GBASE-T 10G Ethernet port by Intel® X550-AT controller
CAN bus	1x isolated CAN bus 2.0 port
Isolated DIO	1x GPS PPS input. 3-CH isolated DI and 4-CH isolated DO
USB	3x USB 3.1 Gen1 (5 Gbps) ports
Video Port	2x DisplayPort, supporting 3840x2160 at 60Hz
Serial Port	1x RS-232 port with flow control
Storage Interface	
M.2 NVMe	1x M.2 2280 M key socket (PCIe Gen3 x2) for NVMe SSD
Internal Expansion Bus	
Mini PCI Express	1x full-size mini PCI Express socket with internal SIM socket

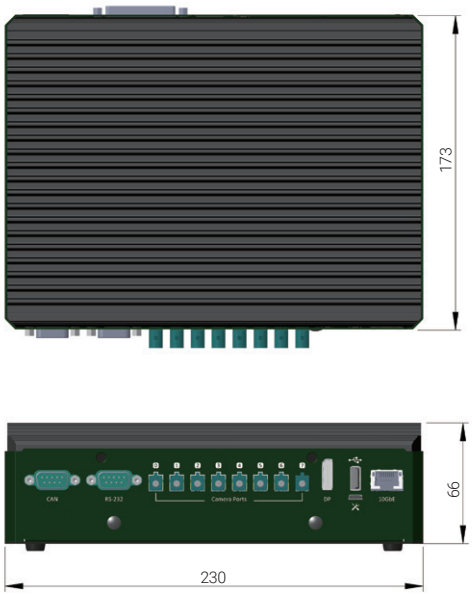
Power Supply	
DC Input	1x 3-pin pluggable terminal block for 8V to 35V DC input (IGN/ GND/ V+)
Mechanical	
Dimension	230 mm (W) x 173 mm (D) x 66 mm (H)
Weight	2.7 kg (excluding damping bracket)
Mounting	Neousys' patented damping bracket (standard)
Environmental	
Operating Temperature	-25°C to 50°C with passive cooling (MAX TDP mode) * -25°C to 70°C with passive cooling (30W TDP mode) * -25°C to 70°C with optional fan kit (all modes) *
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

*Note: * For sub-zero and over 60°C operating temperature, a wide temperature Solid State Disk (SSD) is required. NRU-110V is shipped with 30W TDP mode*

Appearance



Dimensions



Unit : mm

Ordering Information

Model No.	Product Description
NRU-110V	NVIDIA® Jetson AGX Xavier™ edge AI platform supporting 8x GMSL automotive cameras and 10G Ethernet
NRU-110V-F	NVIDIA® Jetson AGX Xavier™ edge AI platform supporting 8x GMSL automotive cameras and 10G Ethernet with fan kit

Optional Accessories

PA-120W-OW	120W AC/DC power adapter, 20V/6A; 18AWG/120cm; cord end terminals for terminal block, operating temperature : -30 to 70°C.
Fan kit	Fan kit with 92mm x 92mm fan for NRU-110V series
AC-AR0147-H40	On Semi AR0147 CMOS sensor camera; 1280x720 @30fps; LFM; HFOV 41, IP67; male FAKRA connector
AC-AR0147-H60	On Semi AR0147 CMOS sensor camera; 1280x720 @30fps; LFM; HFOV 59, IP67; male FAKRA connector
AC-AR0147-H120	On Semi AR0147 CMOS sensor camera; 1280x720 @30fps; LFM; HFOV 125, IP67; male FAKRA connector
AC-AR0147-H190	On Semi AR0147 CMOS sensor camera; 1280x720 @30fps; LFM; HFOV 197, IP67; male FAKRA connector
FK-FF-CABLE-7M	7M FAKRA cable for cameras with male FAKRA connector; The waterproof end is black
FK-FF-CABLE-15M	15M FAKRA cable for cameras with male FAKRA connector; The waterproof end with heat shrink tube

*Note: * Combined use of different FOV with the same CMOS sensor is verified on NRU series. Combined use of different FOV with varying CMOS sensors is not guaranteed. Please consult Neousys for feasibility.*