Powering AI Embedded and Functional Safety Applications

NVIDIA® Jetson AGX Xavier™ Industrial delivers the highest performance for AI embedded industrial and functional safety applications in a power-efficient, rugged system-on-module. It’s form-factor and pin-compatible with Jetson AGX Xavier, and has up to 20X the performance and 4X the memory of NVIDIA® Jetson™ TX2i. This lets you bring the latest AI models to your most demanding use cases.

Extended temperature, shock, and vibration specifications—plus new functional safety capabilities—make this Jetson module ideal for industrial-grade AI products. The module also includes hardware-verified secure boot, hardware-accelerated cryptography, support for encrypted storage and memory, and other security features to protect customer software.

NVIDIA JetPack™ SDK includes libraries, samples, and tools to accelerate the entire AI pipeline, and pretrained models from the NGC™ catalog are performance-optimized and ready to be fine-tuned with customer datasets. Support for cloud-native technologies enables seamless model and software updates throughout the module’s 10-year operating lifetime.

The Jetson Safety Extension Package is available on request, with supporting software and documentation for customers who want to create IEC 61508 compliant products. A Safety design guide is also available with recommendations, guidelines, and ISO-13849 Cat. 2/3 PLd architecture examples as point of reference for customer safety designs.

Ease of development and speed of deployment—combined with form-factor, performance, and power advantage—make Jetson AGX Xavier Industrial the ideal rugged and safety-ready AI product platform.

Key Features

**Module**
- 512-core NVIDIA Volta™ GPU with 64 Tensor cores
- 2x NVDLA
- 8-core NVIDIA Carmel Arm®v8.2 64-bit CPU
- 32GB 256-bit LPDDR4x (ECC Support)
- 64GB eMMC 5.1
- 2x 7-way VLIW vision accelerator processor

**Power**
- Voltage input 5V, 9V~20V
- Module Power: 20W - 40W

**Environment**
- Operating temperature: -40°C to 85°C measured on the TTP surface
- Storage temperature: -40°C to 85°C
- Non-operational humidity: 95% RH, -10°C to 65°C
- Operational vibration: 5G RMS 10 to 500Hz, 3-axis, FCT (random/sinusoidal)
- Non-operational vibration: 3G RMS 10 to 1000Hz, 3-axis, FCT (random)
- Operational shock: 50G, half sine, 11ms
- Non-operational shock:140G, half sine, 2ms
# NVIDIA Jetson AGX Xavier Industrial

## Technical Specifications

### AI Performance
- 30 TOPS (INT8)

### GPU
- NVIDIA Volta architecture with 512 NVIDIA® CUDA® cores and 64 Tensor cores

### Max GPU Freq
- 1.21 GHz

### CPU
- 8-core NVIDIA Carmel Arm®v8.2 64-bit CPU
- 8MB L2 + 4MB L3

### CPU Max Freq
- 2.03 GHz

### DL Accelerator
- 2x NVDLA

### Vision Accelerator
- 2x 7-Way VLIW vision processor

### Safety Cluster Engine
- 2x ARM® Cortex®-R5 in lockstep

### Memory
- 32GB 256-bit LPDDR4x (ECC Support)
- 136.5 GB/s

### Storage
- 64GB eMMC 5.1

### Power
- 20W | 40W

### PCIe
- 1 x8 + 1 x4 + 1 x2 + 2 x1
- (PCIe Gen4, Root port and Endpoint)

### CSI Camera
- Up to 6 cameras (36 via virtual channels)
- 16 lanes MIPI CSI-2
- D-PHY 1.2 (up to 40Gbps) | C-PHY 1.1 (up to 62Gbps)

### Video Encode
- 2x4K60 | 6x4K30 | 12x1080p60 | 24x1080p30 (H.265&H.264)
- 1x4K60 | 2x4K30 | 6x1080p60 | 14x1080p30 (VP9)

### Video Decode
- 2x8K30 | 4x4K60 | 8x4K30 | 18x1080p60 | 36x1080p30 (H.265)
- 2x4K60 | 6x4K30 | 12x1080p60 | 24x1080p30 (H.264&VP9)

### Display
- 3 multi-mode DP 1.4/eDP 1.4/HDMI 2.0 a/b

### Networking
- 10/100/1000 Base-T Ethernet

### USB
- 3x USB 3.1 and 4x USB 2.0

### Other IOs
- 5xUART/3xSPI/3xI2S/5xI2C/2xCAN/DMIC & DSPK/GPIOs

### Mechanical
- 100mm x 87mm
- 699-pin connector
- Integrated Thermal Transfer Plate