Soluciones Aplicaciones Edge AI y AIoT

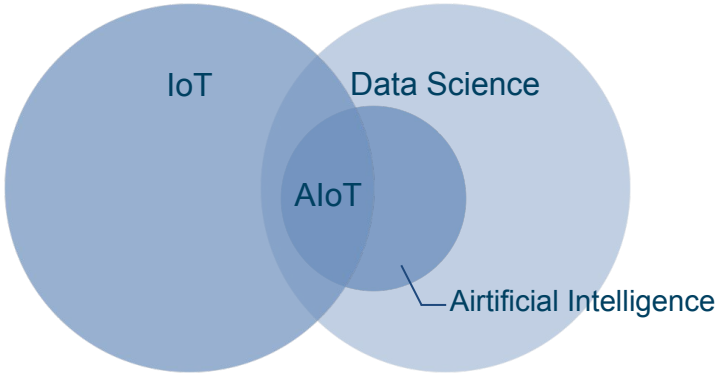
Carlos González (FAE)

Helping Innovation

- **Introducción Sistemas Inteligentes:**
- **Soluciones AIoT:**
  - **Soluciones Edge AI:**
    - Sistemas *Edge AI*
    - Sistemas *Machine Vision*
    - Plataformas *Edge AI*
    - Sistemas **NVIDIA Jetson**
  - **Comunicaciones para AIoT:**
    - Soluciones 5G y 4G
- **Q&A**

IoT, Big Data, AI

- **IoT:**
  - Red de sensores que recogen información para almacenarla y analizarla
- **Big Data:**
  - Procesos para revelar tendencias, patrones o correlaciones ocultas
- **Airtificial Intelligence (AI):**
  - Una máquina (artificial) imita las funciones cognitivas (inteligencia) de los humanos.
    - Entender los datos
    - Nuevos algoritmos para resolver problemas complejos sin que el programador los programe



AI + IoT = **AIoT**

- Sistemas inteligentes y conectados con capacidad de tomar decisiones por ellos mismos, analizar los resultados de estas decisiones y mejorarlos con el tiempo

AIoT

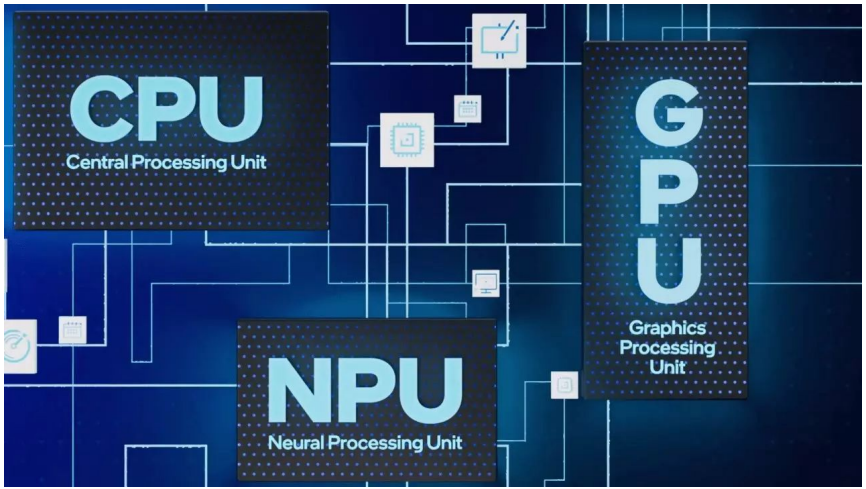
- **Cloud AI:**
  - Con el avance de las aplicaciones de la Inteligencia Artificial y su crecimiento, la computación en la nube se convirtió en una parte central de la evolución de la IA

- **Edge AI:**
  - Sistema que utiliza algoritmos de Machine Learning para procesar datos generados por un dispositivo de hardware **a nivel local**
    - Reduce los costes y los tiempos de latencia (Aplicaciones en tiempo real)
    - Aumenta el nivel de seguridad. Los datos son procesados sin necesidad de la nube
    - Reducción en los costes del servicio de internet al reducir drásticamente los datos a enviar
    - Menor mantenimiento especializado. Tecnología autónoma que muestra los datos para su monitorización

CPU vs GPU vs NPU

CPU: Procesa tareas generales del sistema.

Rendimiento en **GHz** (frecuencia) y **Cores/Threads** (núcleos e hilos)

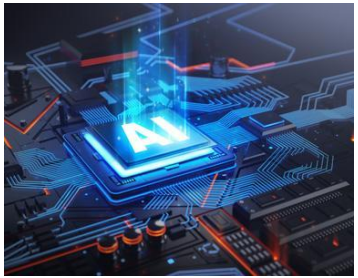


GPU: Acelera gráficos y cálculos paralelos.

Medido en **TFLOPS** (operaciones de coma flotante por segundo) y **VRAM** (memoria gráfica)

NPU: Unidad especializada diseñado para ejecutar eficientemente tareas de inteligencia artificial (**IA**) y aprendizaje automático (**ML**). Se enfoca en operaciones intensivas como **redes neuronales**, **acelerando cálculos de matriz** y **reduciendo el consumo energético** en comparación con CPU o GPU. Evaluado en **TOPS** (trillones de operaciones por segundo).

Detección de Incendios

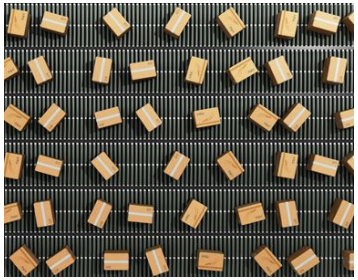


GPU Edge Computing

Gestión de Identidad

Mantenimiento Predictivo

Autonomous Mobile Robot (AMR)



Automatización de Almacenes

Soluciones AIoT

AXIOMTEK

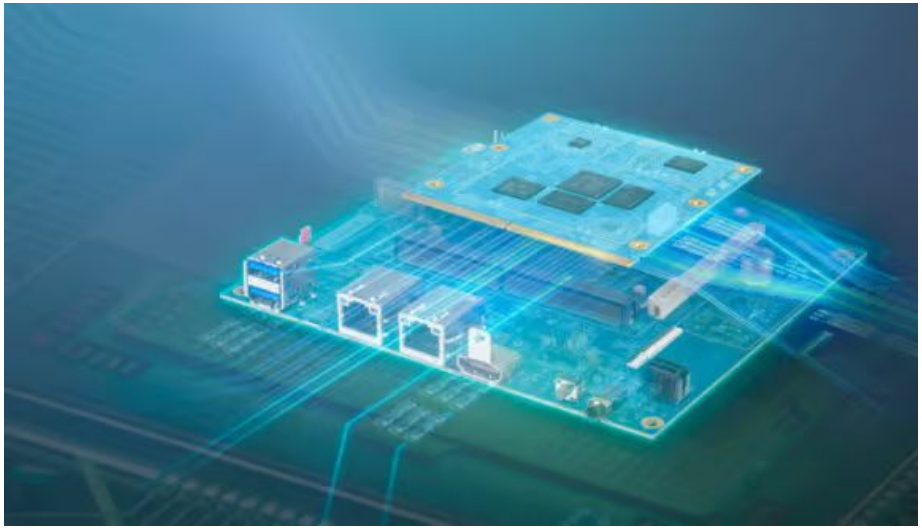
Fundada en 1990, Axiomtek es una empresa líder en diseño y fabricación de ordenadores industriales y sistemas embebidos. Desde sus inicios, Axiomtek ha conseguido reconocimiento mundial por sus diseños innovadores y una excelente satisfacción del cliente.

Como fabricante líder industrial, Axiomtek se dedica a la producción de soluciones de última generación que apoyan a los usuarios en el logro de sus objetivos.

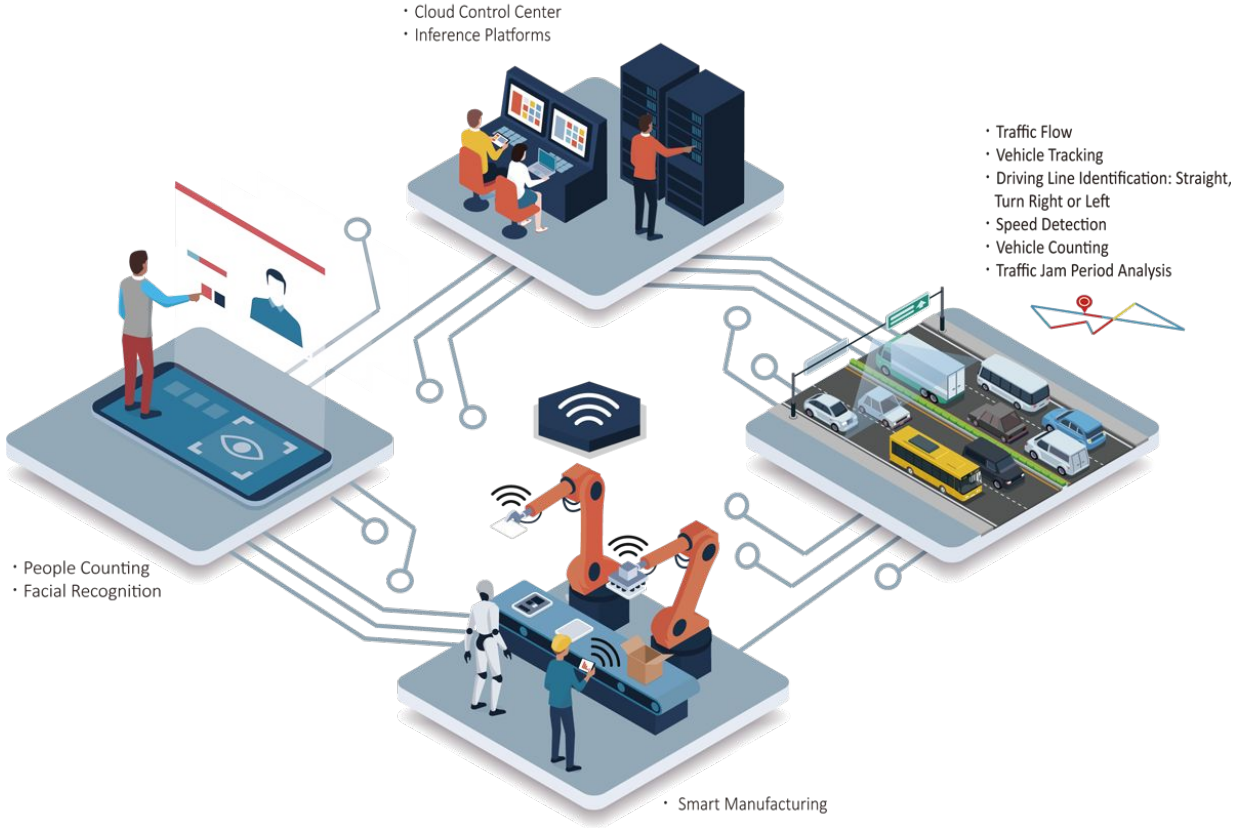
Sus líneas de producto incluyen la placas embebidas, sistemas en módulos, ordenadores en placas, sistemas embebidos, gateways, paneles PCs táctiles, soluciones médicas, industriales y para señalización digital.

VIA Technologies, Inc., con sede en Taiwán, es un líder mundial en la conexión de empresas con tecnología avanzada de Inteligencia Artificial, IoT y Visión Artificial a través de soluciones inteligentes innovadoras para aplicaciones de transporte, industria, ciudades inteligentes y centros de datos.

VIA proporciona el hardware, el software y los componentes básicos para crear sistemas y dispositivos integrados innovadores.



Sistemas Edge AI

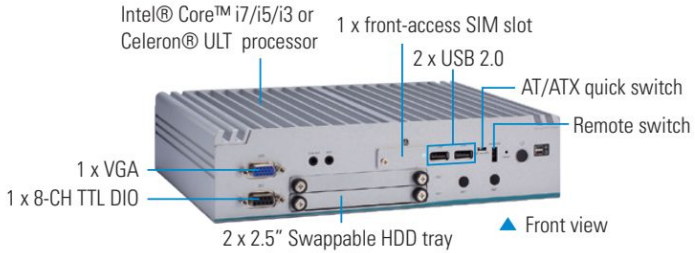

• Cloud Control Center
• Inference Platforms
• Traffic Flow
• Vehicle Tracking
• Driving Line Identification: Straight, Turn Right or Left
• Speed Detection
• Vehicle Counting
• Traffic Jam Period Analysis
• People Counting
• Facial Recognition
• Smart Manufacturing

Light Edge AI

The embedded system that utilizes trained model can detect PPE and monitors breach of danger zone.

eBOX630-528-FL

Fanless Embedded System with 8th Gen Intel® Core™ i7/i5/i3 or Celeron® ULT Processor, 2 HDMI, 1 VGA, 3 GbE LAN, 6 USB, Dual PCI Express Mini Card Slots, and 9 to 36 VDC



Features

- 8th gen Intel® Core™ i7/i5/i3 or Celeron® ULT processor (Whiskey Lake-U)
- Dual-channel DDR4 2400 SO-DIMM for up to 64GB of memory
- Supports 2 HDMI, VGA, 3 GbE LAN, 4 COM, and 6 USB
- Trusted platform module (TPM 2.0 onboard)
- Fanless -40°C to +70°C* operating temperature
- 9 to 36 VDC wide range DC power input
- Hailo-8™ AI acceleration modules compatible**

** -40°C to +70°C operating temp. at 0.7 m/s air flow*
*** 0°C to +50°C operating temp. with Hailo-8™ AI acceleration module*

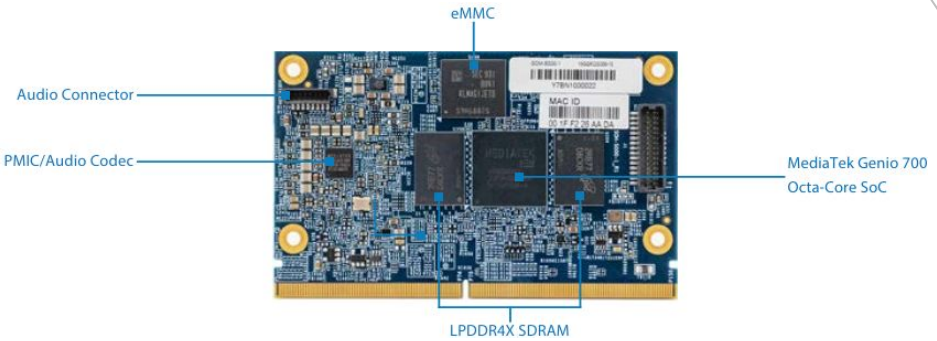
IP40 | Fanless | DDR4 | 9 - 36 VDC | TripleView | USB 3.1 | Hailo-8

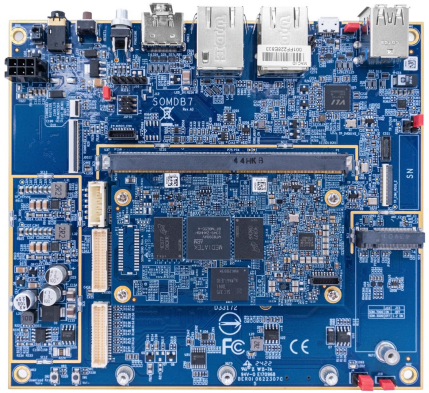
VIA SOM-5000

Fanless low-power platform for Edge AI applications with MediaTek Genio 700 OctaCore processor

Features

- High-performance MediaTek Genio 700 Octa-Core SoC
- Powerful and efficient MediaTek Deep Learning Accelerator (MDLA) 3.0 and Cadence® Tensilica® Vision P6 NPU supporting up to 4 TOPS
- 4K hardware accelerated H.265/H.264 video processing
- Dual display and dual MIPI CSI-2 camera support
- Optional 4G LTE mobile broadband support with onboard M.2 and SIM card slots



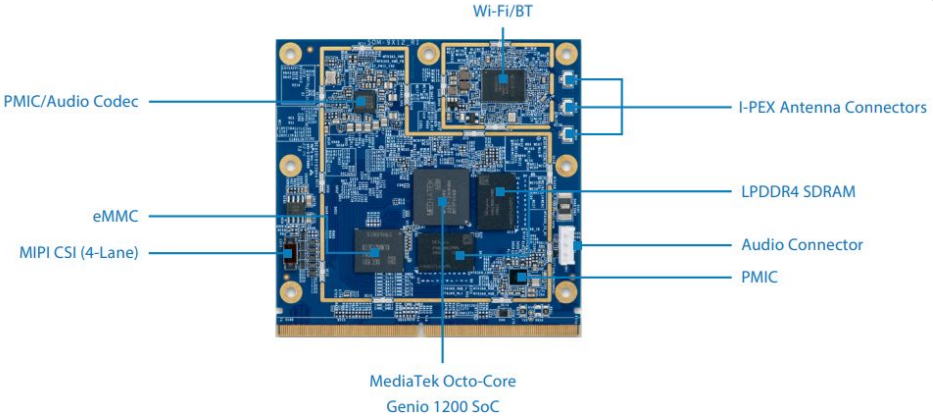


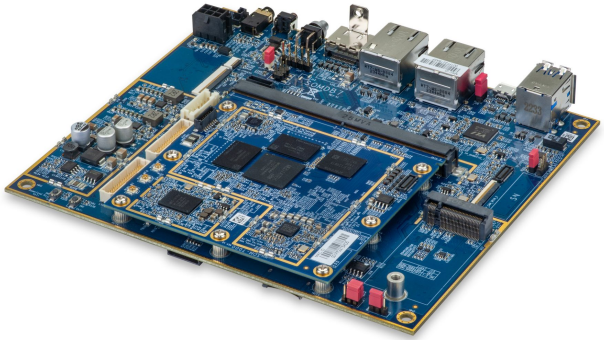
VIA SOM-7000

Fanless low-power Edge AI platform with MediaTek Genio 1200 OctaCore processor

Features

- High-performance MediaTek Genio 1200 Octa-Core SoC
- Powerful and efficient MediaTek Deep Learning Accelerators 2.0 and Cadence® Tensilica® Vision P6 NPUs supporting up to 4.8 TOPS
- Dual-band Wi-Fi 6
- 4K hardware accelerated H.265/H.264 video processing
- Dual display and dual MIPI CSI-2 camera support





Advanced Edge AI

The modular autonomous vehicle system can gather real-time data and analytics to improve driving safety.

RTX 3090 GPU & AX92321 Frame Grabber

Camers

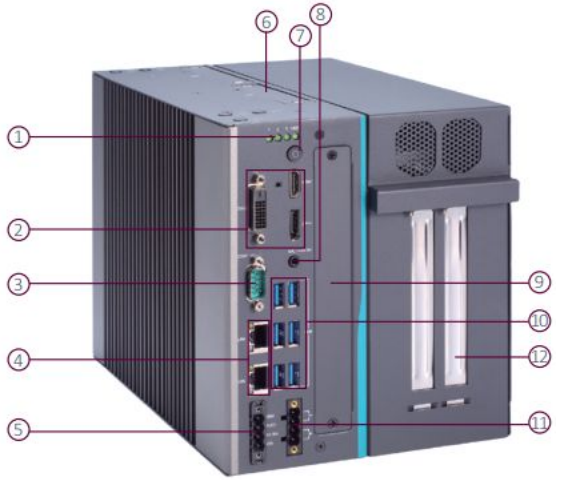
Dual LiDar

IPC962A

2-slot Industrial System with LGA1700 Socket 14th/13th/12th Gen Intel® Core™ i9/i7/i5/i3 or Celeron® Processor, Intel® H610E/Q670E, Front-access I/O, and 2 PCIe & PCI Slots

Features

- Intelligent power management: Ignition and USB power on/off control
- Optional extension system I/O module
- Optional 5G network (Q670E)
- Supports Intel® RAID (Q670E)
- EN 61000-6-2 certified



1. 1 x HDD/SSD access LED & 3 x user's LED
2. DVI-D, DisplayPort++, HDMI
3. RS-232/422/485
4. 2 x LAN
5. 4-pin terminal block for ignition control, remote power and remote LED
6. 2 x HDD/SSD bay
7. Switch for power on/off with LED
8. Mic-in & Line-out
9. Extension system I/O module
   (1) AX93511
   (2) AX93512
   (3) AX93516
   (4) AX93519
   (5) MIO160
   (6) Blank I/O cover
10. 6 x USB
11. 4-pin terminal block for DC input
12. Expansion interface
    (1) EIO121
    (2) EIO122

High-Performance AI Computing

The high-performance GPU workstation renews the AI model to continually optimize the procedure.

Optimized Model

GPU Cards

iHPC300

intel. XEON

NVIDIA.

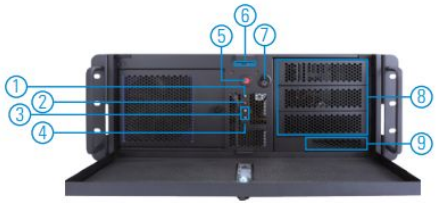
iHPC300

4U Rackmount GPU Workstation with 3rd Generation Intel® Xeon® Scalable Processors, and Multiple Accelerator Cards

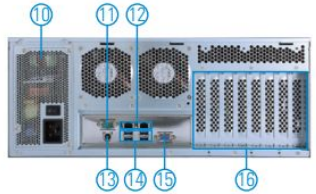
▲ Side view

Features

- LGA4189 socket 3rd gen Intel® Xeon® Scalable processors, up to 270W, 40 cores
- 6 DDR4-3200 R-DIMM un-bufferrd non-ECC/ECC memory, up to 384GB
- PCIe x16 and 3 PCIe x8 in support of up to 6 accelerator cards
- Supports M.2 Key M 2280
- TPM 2.0 supported (optional)



▲ Front view



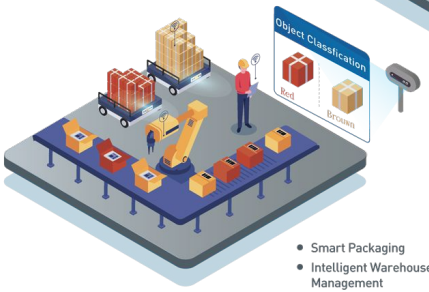
▲ Rear view

1. Power LED
2. HDD LED
3. LAN activity LED
4. Programmable LED
5. System reset
6. 2 x USB 3.1 Gen1
7. Power switch
8. 3 x 5.25" HDD drive bay
9. 1 x 3.5" HDD drive bay
10. 1200W or 2000W power supply
11. COM port
12. 2 x LAN
13. PS/2 Combo Port
14. 4 x USB 3.1 Gen1
15. VGA
16. Expansion slots

Machine Vision

- Security and Surveillance
- Personal Protection Equipment Detection
- Access Control

- Automated Optical Inspection (AOI)
- Human Machine Interface
- AMR - Robotic Control System
- Quality Control



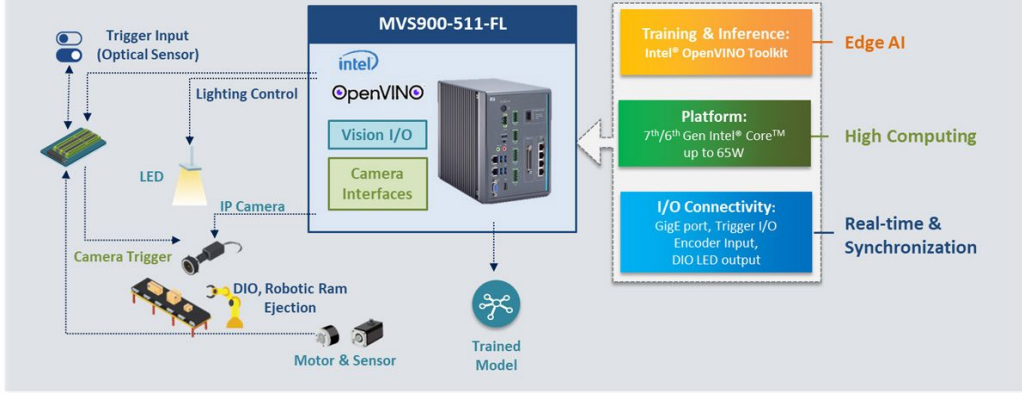
- Smart Packaging
- Intelligent Warehouse Management
- Smart Logistics

Partnership on AI Deployment

OpenVINO TensorFlow NVDIA JetPack

Intel® Edge Software Hub for Industrial

All-in-One Machine Vision Solution for AIoT/Factory Automation

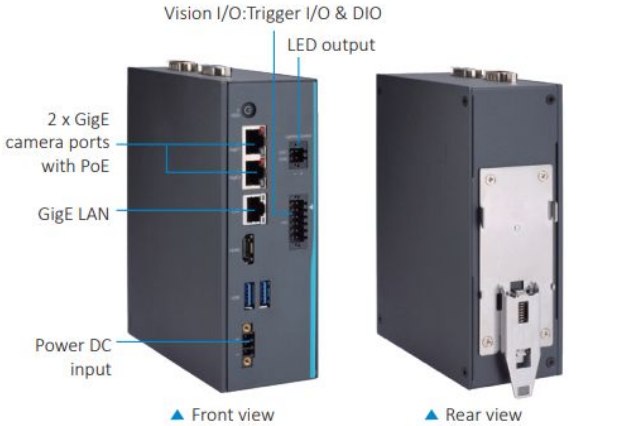


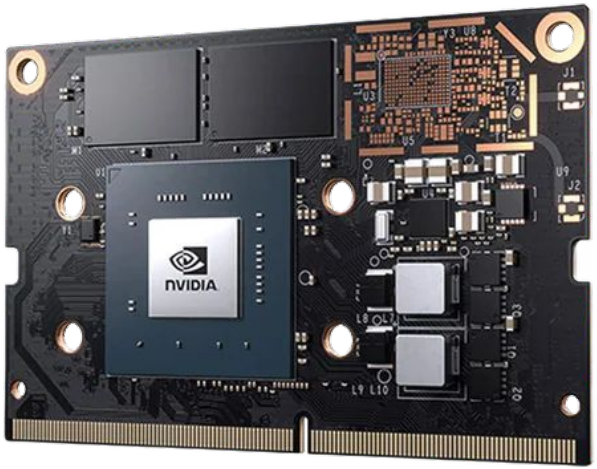
MVS100-323-FL

Mini Vision System with Intel Atom® x5-E3940 Processor, Vision I/O, 2-CH PoE, and 2-CH LED Output

Features

- Integrated real-time vision I/O
  - 2-CH trigger input
  - 2-CH trigger output
  - 2-CH LED lighting control
  - 4-CH isolated DIO
- Supports camera interfaces
  - 2 IEEE802.3af GbE LAN ports (PoE)
- Power input: 24 VDC
- -10°C to +55°C operating temperature range
- Supports TPM 2.0 function





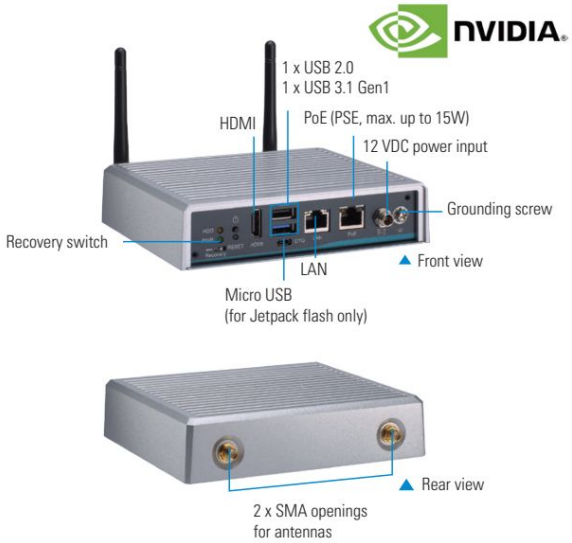
NVIDIA Jetson

NVIDIA Jetson

	Jetson Nano	Jetson TX2	Jetson Xavier NX	Jetson AGX Xavier	Jetson Orin Nano	Jetson Orin NX	Jetson AGX Orin
Rendimiento	0.47 TFLOPS	1.33 TFLOPS	21 TOPS	32 TOPS	20–40 TOPS	70–100 TOPS	200–275 TOPS
GPU	128 núcleos Maxwell	256 núcleos Pascal	384 núcleos Volta + 48 Tensor Cores	512 núcleos Volta + 64 Tensor Cores	Hasta 1024 núcleos Ampere + 16 Tensor Cores	1024 núcleos Ampere + 32 Tensor Cores	Hasta 2048 núcleos Ampere + 64 Tensor Cores
CPU	Quad-core Cortex-A57	Dual-core Denver 2 + Quad-core Cortex-A57	6-core Carmel ARMv8.2	8-core Carmel ARMv8.2	6-core Cortex-A78AE	Hasta 8-core Cortex-A78AE	Hasta 12-core Cortex-A78AE
Memoria	4 GB	8 GB	8 GB	32–64 GB	4–8 GB	8–16 GB	32–64 GB
Consumo de Energía	5–10 W	7.5–15 W	10–20 W	10–30 W	7–15 W	10–25 W	15–60 W

AIE100-903-FL

Fanless Edge AI System with NVIDIA® Jetson Nano™, HDMI, GbE LAN, GbE PoE, and 2 USB



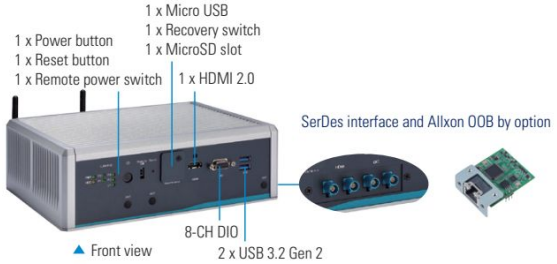
Features

- NVIDIA® Jetson Nano™ with Maxwell™ GPU architecture with 128 NVIDIA CUDA® cores
- High AI computing performance for GPU-accelerated processing
- Ideal for edge AI smart city applications
- Optional IP42 cover kit for semi-outdoor applications
- Supports one 15W GbE PoE for camera
- Wide operating temperature from -30°C to +60°C
- JetPack supported

NVIDIA® Jetson Nano™ will be available until 2025*
The official end of life notice will be sent at least 8 months before the last shipment.

AIE900-XNX

Fanless Edge AI System with NVIDIA® Jetson Xavier™ NX, 1 HDMI, 1 GbE LAN, 4 GbE PoE, 8-CH DI/DO, and 2 COM/CAN for 5G and AMR Applications



Features

- NVIDIA® Jetson Xavier™ NX with 384-core NVIDIA Volta™ GPU
- 1 M.2 Key B slot for 5G
- Wide power input range of 9 to 36 VDC (ignition by option)
- Supports four PoE for GigE cameras and LiDAR connectivity
- -30°C to +60°C operating temperature range
- Supports device management and optional out-of-band service powered by AIIxon
- Optional SerDes FPD-LINK III

NVIDIA® Jetson Xavier™ NX will be available until 2026*
The official end of life notice will be sent at least 8 months before the last shipment.

AIE800-904-FL

Rugged IP67-rated Fanless Edge AI System with NVIDIA® Jetson Xavier™ NX, 1 HDMI, 1 GbE PoE, 1 USB and 100 to 240 VAC Power Input (9 to 36 VDC disponible)

Features

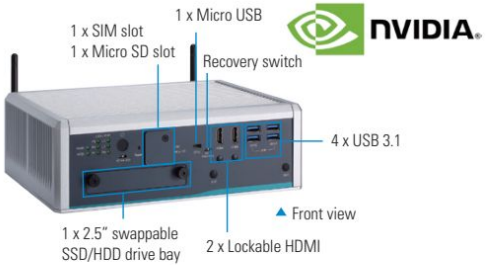
- IP67-rated design, specifically for outdoor environments
- NVIDIA® Jetson Xavier™ NX with Volta™ GPU architecture with 384 NVIDIA CUDA® cores
- High AI computing performance for GPU accelerated processing
- -30°C to +50°C operating temperature range
- 100 to 240 VAC wide range power input with 10kV surge protection
- 4 N-jack antenna openings with water proof design
- Features M12 lockable I/Os
- 1 IEEE 802.3at GbE PoE (30W)

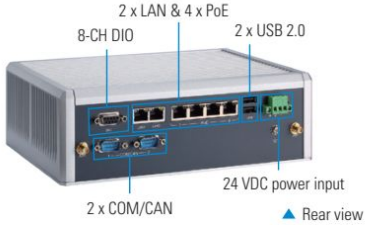
NVIDIA® Jetson Xavier™ NX available through to 2026*
The official end of life notice will be sent for at least 8 months before the last shipment.

IP67 | Fanless | DDR4 | 100 - 240 VAC | PoE | NVIDIA Xavier NX | Allxon DMS

AIE900-902-FL

Fanless Edge AI System with NVIDIA® Jetson AGX Xavier™, 2 HDMI, 2 GbE LAN, 4 GbE PoE, 6 USB, 2 COM or 2 CAN, and 8-CH DI/DO





Features

- NVIDIA® Jetson AGX Xavier™ with 512-core Volta GPU with 64 Tensor cores GPU
- High AI computing performance for GPU-accelerated processing
- Ideal for intelligent edge applications, AGV, AMR, and computer vision
- Supports M.2 NVMe PCIe x4 SSD slot
- Wide operating temperature from -30°C to +50°C
- Supports JetPack

NVIDIA® Jetson AGX Xavier™ will be available until 2025
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NVIDIA Jetson

	Jetson Nano	Jetson TX2	Jetson Xavier NX	Jetson AGX Xavier	Jetson Orin Nano	Jetson Orin NX	Jetson AGX Orin
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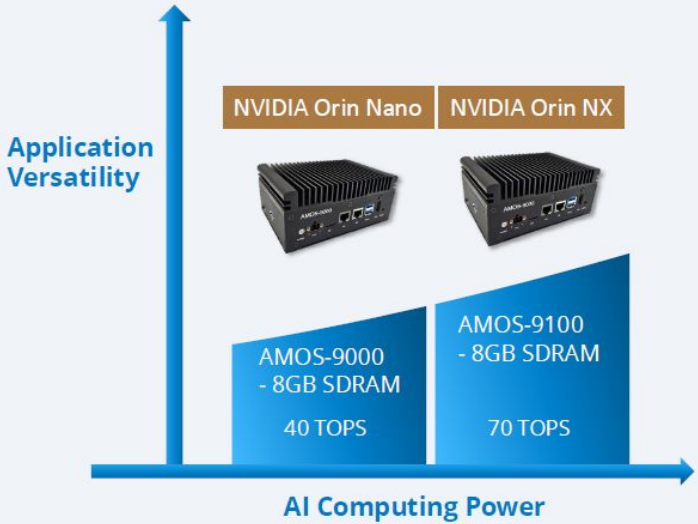
CPU	Quad-core Cortex-A57	Dual-core Denver 2 + Quad-core Cortex-A57	6-core Carmel ARMv8.2	8-core Carmel ARMv8.2	6-core Cortex-A78AE	Hasta 8-core Cortex-A78AE	Hasta 12-core Cortex-A78AE
Memoria	4 GB	8 GB	8 GB	32–64 GB	4–8 GB	8–16 GB	32–64 GB
Consumo de Energía	5–10 W	7.5–15 W	10–20 W	10–30 W	7–15 W	10–25 W	15–60 W

Jetson Orin Nano (8GB)

- 40 TOPS
- Power Consumption: 7-15 W
- 3 x Expansion M.2 slot for SSD storage, Wi-Fi, 5G/LTE
- 2 x Robust I/O RS485/422/232
- DI/DO advanced connectivity
- 12 ~ 24V power range (9~36V manufacture option)
- Linux Jetpack 5.1/6.0

Jetson Orin NX (8GB)

- 70 TOPS
- Power Consumption: 10-25 W
- POE, LoRa Wireless (manufacture option)
- 3 x Expansion M.2 slot for SSD storage, Wi-Fi, 5G/LTE
- 2 x Robust I/O RS485/422/232
- DI/DO advanced connectivity
- 12 ~ 24V power range (9~36V manufacture option)
- Linux Jetpack 5.1/6.0



AMOS-9000/9100


Smoke & Firewatch
Factory security


Crane Equipment
Safety Guard


Interactive Service
Robotics


Industrial
Automation


Hazard Safety
Guard


Mobile Robot

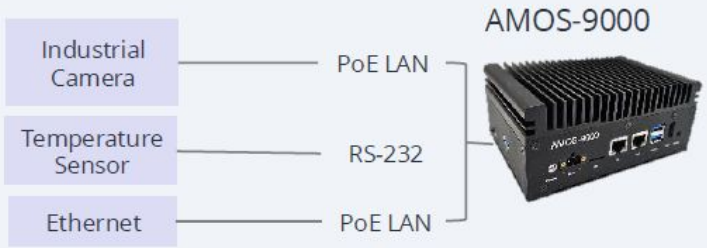

AMR / AGV

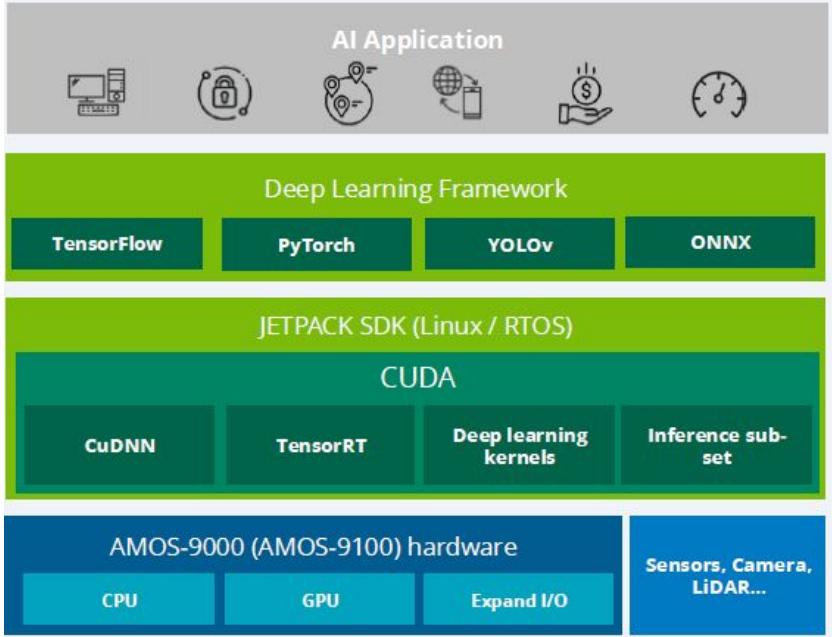

Mobile Forklift

- High-performance AI edge computing computer system
- Advanced AI obstacle prediction and motion control. Equipped with multiple input and output interfaces, it connects cameras, LiDAR, ultrasonic sensors, and control panels, enabling quick processing and execution of continuous operations.
- Terminal equipment LoRa and other secondary positioning technologies to achieve precise obstacle avoidance and movement.

Robot Arm	PoE LAN
LiDAR	PoE LAN
Touch Panel	HDMI + USB
Ultrasonic	USB
Motor	RS-232
LoRa	PCIe
3D camera	USB

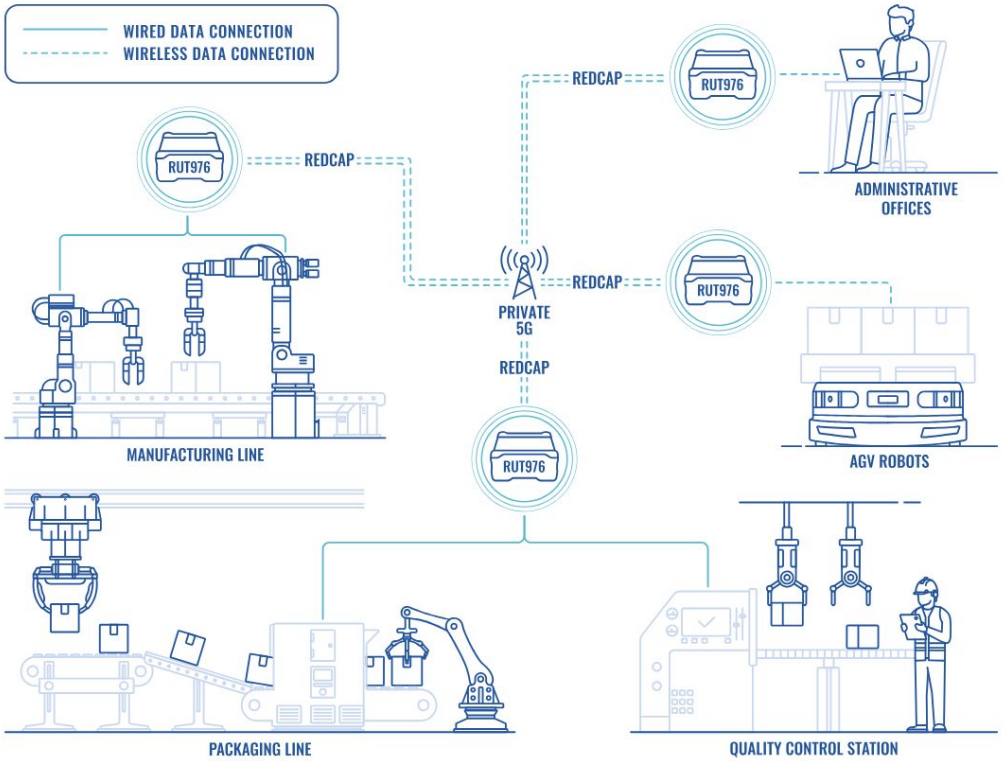
- PoE GbE LAN ports for camera interfaces allows simplified power over ethernet connection for factory cable routing, easy relocation, minimizes the risk of electrical hazards
- Precise and powerful solution detects potentially hazardous smoke emissions by analyzing images taken using an industrial camera.





- **Edge AI Application**
  leverage NVIDIA's comprehensive AI packages to streamline software requirements, focus on developing unique Edge AI applications that add market value to edge solutions
- **TensorRT**
  For optimized deep learning models, particularly useful for vision and inference tasks on NVIDIA hardware
- **TensorFlow**
  Compatible with a range of models in computer vision, natural language processing, and other AI applications
- **ONNX Runtime**
  Provides cross-platform capabilities and is compatible with models trained on various frameworks, enabling versatile deployment options for deep learning

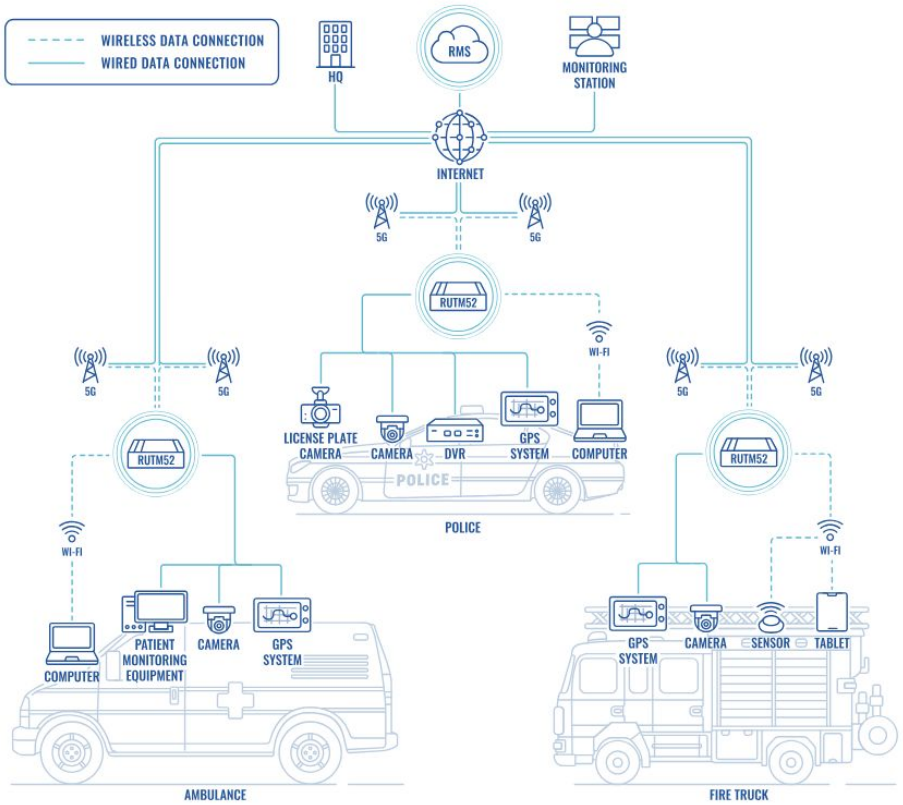
Conectividad 5G y 4G



RUT976

Router REDCAP 5G

- REDCAP 5G Baja latencia, alta capacidad y precios asequibles
- Compatible con versiones anteriores de 4G LTE Cat 4
- Dual SIM
- Ethernet, RS232, RS485, y múltiples entradas y salidas
- Con conmutación automática por error, WAN de respaldo y otros escenarios de conmutación



RUTM52

Router 5G Dual

- Modem 5G Dual. Hasta el doble de velocidad celular y conexión permanente
- DOBLE SIM Y eSIM
- SA Y NSA
- Compatible con versiones anteriores de 4G (LTE Cat 20)
- Con conmutación automática por error, WAN de respaldo y otros escenarios de conmutación

RUT956

ROUTER CELULAR INDUSTRIAL

- 4G LTE (Cat 4), 3G, 2G
- DOBLE SIM
- Ethernet, serie (RS232, RS485) y múltiples entradas/salidas
- GNSS, Modbus TCP, RTU
- HTTP(S), MQTT, Azure MQTT, Kinesis
- Teltonika Remote Management System (RMS)

Muchas gracias