



VCO-6131E-4M2 AI Edge Inference Computer

Compute, Storage, Connectivity, Ruggedness: Ingredients for Inference

Industry 4.0 is driving the need for improved intelligence at the rugged edge. Several business and service sectors are reaping benefits that localized inference analysis lends to their operations and procedures. By allowing edge compute technology to independently process and reflexively respond to situational data, keener insights are gleaned, latency is avoided, and network demands are reduced.

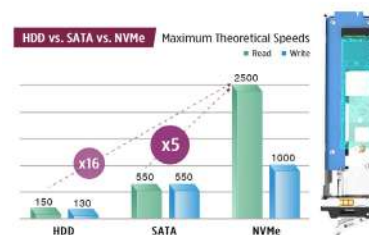
Premio has joined a blend of next generation processing and storage technologies with the latest IoT connectivity features for a solution designed from the ground up to deliver holistic inference analysis at the rugged edge. The VCO-6131E-4M2 incorporates advanced performance Intel® 9th Gen processors, rich GPU support and scalable, hot-swappable NVMe capacity into versatile hardware designed to withstand edge deployments in volatile, unsparing industrious settings.

Inference Analysis at the Rugged Edge

The VCO-6131E-4M2 supports powerful GPUs, processing volumes of complex data to drive AI functions. The AI Edge Inference Computer is deployed in either controlled or dynamic environments to capture data to train neural networks. The computers process countless inputs to prompt the neural network to arrive at the desired result. The neural network is exhaustively adjusted until it displays a cognitive understanding

of the input to accurately perform the process independent of human involvement.

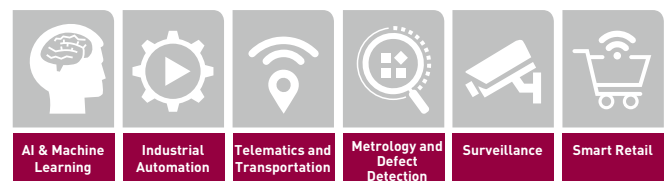
Once a neural network is trained, its refined algorithms are deployed at the rugged edge to conduct inference analysis. The speed and accuracy of a properly informed algorithm greatly exceed those of human counterparts. Industrial and critical infrastructure sectors are awakening to the fresh insights and optimization potential for safer, more resource- and cost-efficient automation.



The VCO-6131E-4M2's rapid NVMe storage and high-speed I/O expandability drive efficient data collection and processing for training neural networks, quickly

offloading essential data to cloud archives for more advanced IoT management. Powerful GPU expandability applies the informed algorithms toward inference analysis tasks at key edge network positions in real-time. Ruggedized hardware architecture safeguards the AI Edge Inference Computer in harsh environments, while seamless connectivity ensures reliable communication from remote and mobile settings.

Key Applications





Computing for the Evolving Edge

8th/9th Gen Intel® Processor and Q370 chipset

The VCO-6131E-4M2 leverages rich performance enhancements supplied by 8th / 9th Gen. Intel® CFL-R S Processors and Q370 chipset support. The Intel® technology enables up to 16-way multi-tasking through hyperthreading its maximum eight cores. The processor supports DDR4 RAM for up to 64 GB of memory and 2666 MT/s transfer speeds, while UHD graphics offer rich visual output for many applications using optical data.

The socket design is combined with Intel®'s Q370 chipset to deliver augmented peripheral performance for low-latency edge responsiveness. Gigabit wireless speeds, PCIe 3.0 lanes, SATA ports and rapid USB 3.2 Gen 2 grant the VCO-6131E-4M2 exceptional I/O integration options for transmitting data to and from the device.

Dedicated GPU Support

The 8th/9th Gen Intel® Core™ Processor provides a mix of processing power for a variety of workloads at the edge. This AI Edge Inference Computer offers multi-level processing and real-time intelligence by balancing workloads between CPU and GPU performance cores. The front sided PCIe expansion slots for the inference computer can be populated with GPU performance accelerators up to 250W in a Full-Length, Full Height form factor. Graphics accelerators like GPUs allow intelligent devices to run machine learning algorithms for inference analysis of data from a variety of IoT sensors.

High-Speed Storage Primed for Edge Intelligence

NVMe

Four removable trays allow quick, hot swappable loading of NVMe storage media. NVMe enables datacenter-equivalent read/write speeds at the edge. With a transfer capacity around 8GB/s for

all four drives, VCO-6131E-4M2 efficiently feeds integrated CPUs and GPUs volumes of data for complex applications. Rapid data speeds enable more reflexive inference analysis at the edge.

NVMe. Informing the Rugged Edge.

Several optimized technologies have converged to promote real-time, in-depth responsiveness at the edge. Multi-core CPUs and advanced GPUs stand ready to perform numerous parallel processes, while 5G, 10GbE and speedier I/O technologies wait to receive and offload volumes of rich data. Solid state drive (SSD) storage offers a vastly quicker and structurally more rugged data repository than its hard disk drive (HDD) cousin. The main hindrance to immediate intelligence at the edge, however, has been the chosen storage technology's inability to efficiently read and write data beyond the limitations inherent in the connective architecture. This is where NVMe carries the day over more traditional data transfer protocols in legacy products

NVMe, or Non-Volatile Memory Express, is an SSD protocol conceived with focused efficiency in mind. As an SSD, it relies on semiconductor chips without moving parts to store and access data. NVMe's delivery system, however, is via direct contact with PCIe 3.0 lanes. This streamlined interface alleviates data bottlenecks that can occur with other SSD technologies.

NVMe's theoretical data read speeds of 2,500 MB/s are practically quintuple those of SATA. SATA, the other predominant SSD protocol, boasts write speeds of about half NVMe's, topping around 550 MB/s. As far as HDD competition, NVMe delivers 16 times the read speed.

By deploying a rapid-fire storage media and setting a clear path for its transmission to PC components, NVMe provides the operative immediacy that responsive edge intelligence demands. Applications leveraging inference analysis can access stored algorithms and mission-critical data at speeds exceeding human cognition.



Connecting from the Rugged Edge

Steady Wireless Connectivity

The VCO-6131E-4M2 enables seamless wireless connectivity for remote and mobile edge deployments. Wi-Fi 6 and Bluetooth 5 technologies reliably connect to sensors and network systems through a wireless IoT enterprise. Dual SIM sockets provide continuous 4G/LTE cellular connectivity at remote or mobile edge deployments. The VCO-6131E-4M2 is also 5G-ready through a modular add-in card, providing edge deployments vastly greater cellular speeds and more granular network slicing options.

10GbE I/O Ready

The AI Edge Inference Computer supports two 10GbE ports through its add-on daughterboard. The high-speed connections enable low-latency data transmission for advanced industrial inference analysis applications leveraging faster network speeds like 10GbE.

LAN/PoE Options

The VCO-6131E-4M2 may be configured with up to eight additional LAN ports for standard IoT network connectivity. PoE ports are also available to supply electricity to power-constrained peripheral devices like cameras and IoT sensors.

Built Rugged. Built Ready.

Wide Operating Temperature

The VCO-6131E-4M2's wide -25 to 60° C operating temperature accommodates a vast range of challenging thermal conditions. Blistering steel foundries and ice-encrusted arctic minesites can easily dispatch the AI Edge Inference Computer for deep data inference analyses at the rugged edge.

Wide Voltage Input

A 9 to 48VDC input latitude accepts a wide range of available power voltages and provides a level of surge mitigation. The AI Edge Inference Computer supports AT/ATX power modes according to deployment requirements.

Hot-Swappable Blower

The AI Edge Inference Computer delivers cooling where it counts. Integrated blower fans neutralize temperature spikes stemming from heat generating GPU and NVMe usage. However, complex computing may continue throughout maintenance with the VCO-6131E-4M2's hot-swappable blower fan. The rugged cooling fans can be easily removed for cleaning or replacement as often as the rugged environment demands.

Shock and Vibration Tolerance (30G shock / 3 Grms Vibration)

The VCO-6131E-4M2 is hardened to withstand environmental impacts and vibrations characteristic of the rugged edge. The AI Edge Inference Computer can be safely deployed in vehicles to instantly collect and process torrents of sensor data to train neural networks, leverage telematics for intelligent fleet management or perform predictive analytics to alert of impending traffic hazards. Heavy industrial sectors can dispatch the VCO-6131E-4M2 to rough, volatile settings to conduct inference analysis on visual and situational input. Metrological applications, quality inspections and predictive maintenance algorithms make the AI Edge Inference Computer an indispensable rugged utility for business optimization.

Power Ignition Management

Intelligent transportation deployments can harness the power of inference analytics safely through the VCO-6131E-4M2's power ignition management feature. The AI Edge Inference Computer safely powers down after engine shutoff following a predetermined interval. The feature ensures applications close properly and data is neither lost nor corrupted.

TPM 2.0 Security

An integrated trusted platform module applies TPM 2.0 standards to safeguard the VCO-6131E-4M2. The microprocessor's root keys enable password protection, device authentication and future-ready cybersecurity. The TPM defends the device, data and transmissions against malicious actors.

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NEW

VCO SERIES

VCO-6131E-4M2



Processor	Support 8 th / 9 th Gen. Intel® CFL-R S Processor (LGA 1151, 65W/35W TDP)
Memory	2x 260-Pin DDR4 2400/2666MHz SODIMM. Max. up to 64GB (Un-buffered and Non-ECC)
Display	Triple Independent Display by 1x DVI-I and 2x DisplayPort
Storage	2x Internal 2.5" SATA HDD Bay (support H=15mm) 2x Removable 2.5" SATA HDD Bay 1x mSATA (Shared by 1x Mini PCI Express) 1x M.2 (M Key, NVMe PCIe x4, 2280) 1x M.2 (E Key, PCIe x2, USB 2.0, 2230) 4x M.2 PCIe x2, 2280 (hot-swappable) 2x Internal SIM socket
Internal Expansion Slot	2x Full-size Mini PCIe (1x shared by 1x mSATA), 1x PCIe x16 slot for GPU card(x8) & 4 M.2(x8)
I/O	4x RS-232/422/485 (w/ 2x internal), 4x USB 3.2 Gen 2 (10Gbps), 8 in / 8 out (Isolated), 2x Intel® GbE supporting Wake-on-LAN and PXE
Power	9 to 48VDC Wide Range Power Input Supporting AT/ATX Mode
Operating Temp.	-25°C to 60°C