



## Fanless Mini PC for Industrial Edge IoT

### RCO-1000-EHL Series with Intel® Atom® x6425E Processor (Elkhart Lake)

More than ever, the amount of data generated at the industrial edge is at its highest and continues to grow rapidly. With the explosion of smart sensors and IIoT devices, there is large-volume demand for a new type of industrial-grade hardware to accommodate a diverse set of requirements for work consolidation at the rugged edge. Numerous enterprises are investing in processing data-driven AI algorithms at the source of data generation rather than in a data center. Processing data remotely introduces latency and is unreliable in mission-critical applications. As a result, enterprises can gain a competitive advantage by gathering data and implementing AI/machine learning next to the data source.

Edge AI enables enterprises to quickly analyze valuable insights while delivering more efficient and reliable operations, especially for latency-sensitive or mission-critical IIoT applications. In order to achieve this level of computing, hardware manufacturers need to overcome the harsh environmental challenges at the rugged edge, including extreme temperature, shock, vibration, limited space, and remote location. Premio addresses these challenges by introducing the latest fanless mini computer, the RCO-1000-EHL Series.

The RCO-1000-EHL Series is an industrial grade, fanless mini computer powered by Intel® Atom® x6425E that delivers unmatched durability and edge computing performance, specifically for industrial IoT applications.

#### Key Markets and Applications



Industrial  
Automation



Robotics  
and Motion  
Control



Intelligent  
Gateways



Kiosk  
and Retail



Remote  
Monitoring



Fleet  
Management



Smart  
Agriculture



## Built Ready for Industrial Edge IoT

The RCO-1000-EHL Series supports Intel® Atom® x6425E Series (also known as Elkhart Lake) and is Intel's first enhanced platform for IIoT as a response to meet the demands of intelligent IIoT at the edge. With heavier workloads, harsher environments, and more complex data to analyze, integrating Intel® Atom® x6425E into the RCO-1000-EHL provides considerable performance improvements by leveraging its SoC design with a 10nm compute die and 14nm PCH in a single chipset.



### RCO-1000-EHL Supported Processor:

- Intel Atom® x6425E (Embedded Series)

Processor	Cores	Max TDP	CPU High Frequency Mode	CPU Burst (Turbo) Mode	Graphics High Frequency Mode	Graphics Burst (Turbo) Mode	Intel® UHD Graphic
Intel Atom® x6425E	4	12W	2.0 GHz	3.0 GHz	500 MHz	750 MHz	32 EUs

## RCO-1000-EHL Generational Performance Boost

<b>Up to 60%</b> Performance Increase (over RCO-1000-J1900)	<b>10nm</b> Efficient Power 12W TDP	<b>Up to 4x</b> Memory Boost (DDR4 32GB) (over RCO-1000-J1900)
<b>Up to 2.3x</b> Faster Single & Multi Thread (over Intel® Bay Trail J1900)	<b>Up to 5x</b> Faster Graphics with Intel® UHD Graphics	<b>15 Years</b> IOTG Product Lifecycle Support



### Up to 60% Overall Performance Boost

The latest RCO-1000-EHL Series delivers up to a 60% increase in overall performance over the previous generation RCO-1000-J1900 Series. However, despite the enhanced processing power, the RCO-1000-EHL remains extremely power efficient with a minimal TDP of 12W in a 10nm lithography, essential for low-power IIoT solutions.



### Up to 2.3x Single & Multi Thread Boost

To provide next-generation compute performance, the Intel® Atom® Elkhart Lake x6425E delivers up to 2.3x increase in a single thread and multi-thread performance over its the previous Intel® Bay Trail J1900 processor. Faster thread performances are critical for optimizing complex software applications.



### Up to 5x Graphics Performance Boost

With integrated Intel® UHD Graphics, the Intel® Atom® Elkhart Lake x6425E has improved up to 5x in graphics performance over the previous Intel® Bay Trail® J1900 SoC. The x6425E can handle more data-intensive calculations and operate up to 400 GFLOPS on an FP32 (Single Precision) data type compared to the J1900 with only 41 GFLOPS. This enables the RCO-1000-EHL to support 4K 60fps resolution and up to three independent displays for various high-resolution multimedia applications at the edge.



### Up to 4x More RAM with DDR4 Memory

Intel® Elkhart Lake offers significant memory improvements over the previous 8GB RAM from RCO-1000-J1900, supporting up to 32GB memory for even greater computing edge AI and IIoT performance. In addition, the x6425E Series now supports DDR4 memory with 4x Quad Channel connectivity compared to J1900 with DDR3 and 2x Dual Memory Channel for even faster performance.



### Embedded 15 Years Lifecycle

All of the robust IoT features that Intel® Elkhart Lake offers are covered within Intel® IoT Group (IOTG) long-lifecycle product availability. The 15-year product lifecycle provides the customer with fifteen years of IOTG hardware and software technical support, a great value proposition for long-term industrial applications.





## Workload Consolidation at The Rugged Edge

- **High-Speed I/O:**  
4K Displays and 10Gbps USB Ports
- **Scalable Custom I/O:**  
DP/HDMI/DIO/USB/COM
- M.2 AI Module for Machine Inferencing
- **Wireless Technologies:**  
5G/4G/Wi-Fi 6/Bluetooth 5
- On-Board Embedded CAN Bus Protocol and I/O
- Power Ignition Module (Optional)
- **Discrete Hardware Security:** TPM 2.0

### High-Speed I/O Ports and Expansions

The base model of the RCO-1000-EHL now supports 1x 2.5Gb Ethernet, 3x USB 3.2 Gen 2 (10Gbps), 2x COM (RS-232/422/485), and up to 3x True 4K independent displays, delivering high-speed edge performance for more demanding IIoT applications. Moreover, the RCO-1000-EHL allows internal storage and accelerator expansions through its 1x M.2 B-Key (2242/3042/3052), 1x Full-Size mPCIe (with mSATA), and 1x 2.5" SATA SSD/HDD Bay, providing the ultimate package for next-gen IIoT solutions.



### Scalable and Customizable I/O

One of the advantages of the RCO-1000-EHL Series is its customizable and scalable universal I/O brackets through Premio's proprietary 50x-pin PCIe 3.0 pins design. The system can be configured with up to 4x USB, 4x COM, 1x DIO (4-in, 4-out), and even a 1x 4K DP/HDMI port. The scalable universal I/O brackets allow the RCO-1000-EHL Series to support more I/O ports than most of the competitors in the market, a true competitive advantage at the rugged edge.

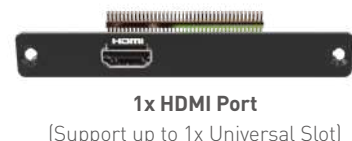


Stackable I/O daughterboards through 50x-pin PCIe 3.0 for scalable designs.

### Universal I/O Configurations

#### Scalable I/O Advantages:

- Fast Delivery Time to Market
- Lower BOM
- Flexible and Scalable
- Long Product Lifecycle
- Quick Maintenance/Upgrades





## AI Inference at the Rugged Edge

The RCO-1000-EHL empowers AI intelligence at the rugged edge by featuring the Hailo-8™ M.2 module. The Hailo-8™ AI processor is an AI accelerator that delivers data center-class performance to execute deep learning inferencing in real-time while maintaining low power consumption in a compact M.2 form factor. With 26 tera-operations per second (TOPS), the Hailo-8™ M.2 module delivers real-time, low latency, and high-efficiency AI inferencing for the RCO-1000-EHL Series, making the RCO-1000-EHL Series a superior industrial solution for edge AI solutions.

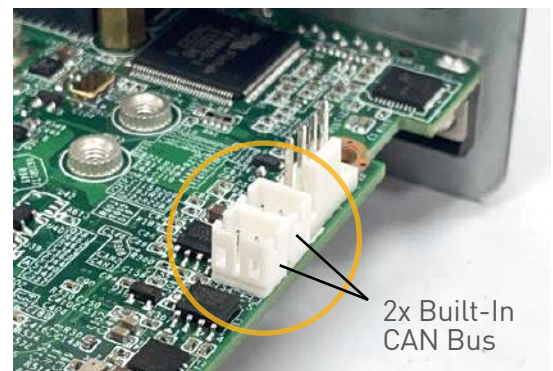


## Robust Wireless Technology for Remote IoT

Industrial edge IoT applications often require deployments in mobile or remote locations. The RCO-1000-EHL Series' robust wireless technologies enable seamless wireless connectivity for mobile and remote IIoT solutions. The system features a Dual-SIM socket, providing 4G/LTE and even 5G cellular connectivity through a modular add-in card. The 5G module also supports the Global Navigation Satellite System (GNSS) and eSIM features for autonomous geo-spatial positioning and cellular redundancy. In addition, the RCO-1000-EHL also supports Wi-Fi 6 and Bluetooth 5 to connect to various wireless sensors and IoT devices.

## Embedded CAN Bus for In-Vehicle Communication

The on-board embedded CAN bus (Controller Area Network) allows the RCO-1000-EHL to communicate directly with other machines and network devices, reducing the need for a host computer and simplifying cable routing. With a two-channel, two-pin Can Bus I/O and protocol built-in to the RCO-1000-EHL's motherboard, the system can leverage vehicle telematics data and provide real-time in-vehicle analytics. Most fanless mini PCs in the market don't have a built-in CAN bus. However, the built-in CAN bus provides the RCO-1000-EHL Series with a fully robust, efficient, and flexible feature for harsh environment applications.





## Power Ignition Management

The RCO-1000-EHL Series has an optional power ignition module for ignition sensing and management. Power ignition management is a configurable component that sets a predetermined time interval for the RCO-1000-EHL to boot or shutdown. This system is programmable with six different configurations on how the computer should behave when the engine turns On/Off. Compatible for both 12V and 24V systems, this feature ensures that applications are saved and closed properly, avoiding data loss and corruption.



## Discrete Hardware Security with TPM 2.0

Providing hardware-level data security is crucial for edge IoT applications. The RCO-1000-EHL has a discrete TPM 2.0 chip that safely encrypts essential data. In addition, the integrated trust platform module's root keys enable password protection, device authentication, and future-ready cybersecurity, defending the device's data and transmission against malicious attacks.

## Ultra-Compact. Ultra-Rugged.

 <b>Ultra-Compact</b> Palm-Sized Form Factor	 <b>Fanless</b> Passive Cooling	 <b>Rugged</b> Industrial-Grade Materials
 <b>-40°C to 70°C</b> (Intel Embedded Series) Extreme Temperature	 <b>50G   5Grms</b> Shock & Vibration Resistance	 <b>Flexible</b> VESA/Wall Mount/ Side Mount/Din-Rail



## Ultra-Small Form Factor with Hardened Fanless Design

The ultra-compact form factor of the RCO-1000-EHL base model measures in at (WxDxH) 150mm x 105mm x 49mm for base model, one of the smallest industrial fanless mini computers on the market. This mini size is achieved thanks to its fanless design that utilizes passive cooling instead of using air cooling fans. Furthermore, the system implements ultra-conductive materials such as aluminum and copper heat pipes as its heatsinks for optimal heat dissipation. Moreover, the computer's chassis is built and designed to protect the internal component while also working as a giant heatsink made of extruded aluminum and heavy metal.

Everything combined from fanless technology, scalable I/O ports, and various features built-in features on the motherboard level allows the RCO-1000-EHL Series to be the leader for powerful, industrial-grade mini computers on the market with around 30% smaller size compared to the industry average.



## Robust Industrial Performance

The RCO-1000-EHL Series is tested and validated to its limit at Premio's in-house testing lab for best-in-class industrial durability. It has the durability to withstand extreme industrial environments while maintaining reliable performance at the rugged edge.

- Wide Temperature Range: -40°C to 70°C (Intel Embedded Series)
- 50G Shock & 5Grms Vibration (MIL-STD-810G Compliance)
- Wide Voltage Input: 9VDC-36VDC Input
- Over Current & Over Voltage Protection



## Flexible Mounting

Deploy the RCO-1000-EHL anywhere through its flexible mounting options. The RCO-1000-EHL supports various mounting configurations, including side mount, VESA mount, wall mount, and an optional DIN-Rail mount. The ultra-rugged design, ultra-compact form factor, and flexible mounting options enable the latest RCO-1000-EHL Series to be ready for industrial IoT deployments anywhere.



Wall Mount



VESA Mount



Side Mount



DIN-Rail Mount

WE DESIGN,  
MANUFACTURE, AND  
SERVICE CUSTOMERS  
AROUND THE WORLD



NEW

## RCO-1000-EHL SERIES



**RCO-1000-EHL-10**



**RCO-1000-EHL-20**



**RCO-1000-EHL-30**

	With 1x Universal Expansion Slot	With 3x Universal Expansion Slots	With 5x Universal Expansion Slots
Processor	Supports 11 <sup>th</sup> Gen Intel® Atom® Processors X Series (Elkhart Lake) Intel® Embedded Series: Intel® Atom® Processor x6425E, Quad Core, 1.5 MB Cache, 1.8 GHz, 12W TDP		
Memory	1x 260-Pin DDR4 2400/2667/3200MT/s SODIMM. Max. up to 32GB		
Display	Dual Display, 2x DisplayPort 1.4, DP++ (4096 x 2160@60Hz)		
Storage	1x M.2 (B Key, 2242/3042/3052, PCIe 1 + USB 3.2 Gen2, Support 4G/5G Module) 1x mSATA (shared by 1x Mini PCI Express) 2x External SIM socket 1x Internal 2.5" SATA HDD Bay (support H=9.5 mm)		
Internal Expansion Slot	1x Full-size Mini PCIe		
I/O	3x USB 3.2 Gen 2 (10 Gbps) 1x USB 2.0, 2x RS-232/422/485, 2x RJ45 (2.5 & 1 GbE)		
Power	9 to 36 VDC, AT/ATX Select, 3-pin Terminal Block		
Operating Temperature	0°C to 60°C (Supported by Intel® PC Client Series), -40°C to 70°C (Supported by Intel® Embedded Series)		
Certification	UL Certification, CE, FCC Class A		
Dimensions (W x D x H)	150 x 105 x 49 mm	150 x 105 x 66 mm	150 x 105 x 83 mm