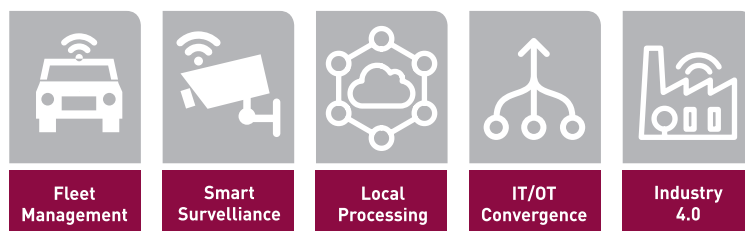# Rugged Edge Computers

The industrial world has gone under significant technological changes in the past decades through a digitalization of all its operations. The integration of computers into traditional processes have accelerated innovation to help automate and optimize industries for efficient growth. In order to continue increased productivity and performance, new advents of complex smart sensors, artificial intelligence, big data, and advanced robotics combined with improved data communication is paving the way for a new industrial era.

This type of computing closer to where data is being generated from sensors, devices and machines is termed edge computing and it is rapidly introducing new application workloads by lending smart processing power to previously simplistic system functions. Edge computers are able to gather and analyze specific sensor data from production lines, robots, vehicles and any other system in order to infer valuable insights for strategic business decisions.

By accessing data with edge computers, applications such as predictive maintenance for fleet management, manufacturing, railway, and natural resource industrials offer massive cost savings and prevents unplanned stops. Another benefit is the reduction of costly network bandwidth by incorporating edge computers for local processing instead of sending streams of data to a cloud database. The advantage of local processing not only helps on cost savings but also enables low latency response times for real-time computing capability. This is essential in machine autonomy innovation, where camera systems, LiDAR and smart sensors are used to guide autonomous robots or vehicles. Without real-time processing and reaction times, machine autonomy would not be reliable enough.

Edge computers offer new application opportunities for IoT technology proliferation, but in order for them to function safely out in the field whether it be in an industrial factory, underground mining operation or any transport vehicle, then edge computers need to be ruggedized for harsh usage conditions. This is why Premio Rugged Edge Computers are validated to sustain wide operating temperatures of -40° to 70°C, wide voltage inputs between 9 to 50VDC and high shock and vibration levels of 50G and 5Grms. The rugged qualities of Premio edge computers provide system reliability for integration in industrial applications needing real-time data processing for strategic and actionable insights.

KEY APPLICATIONS:

| Fleet Management | Smart Survelliance | Local Processing | IT/OT Convergence | Industry 4.0 |

KEY PREMIO BENEFITS:

MOBILITY AND REMOTE DEPLOYMENT

Rugged edge computers feature CAN Bus network protocol support for in-vehicle integration. By tapping into the sensor networks of vehicles, data can be gathered and analyzed for valuable and actionable insights. In addition, rugged edge computers are built with power ignition management to properly source power from a vehicle's ignition system.

WIRELESS CONNECTIVITY

With support for cellular 4G LTE network connectivity and GPS/GNSS, edge computers benefit from added location tracking data information and access to a wider network of connected devices through its wireless WAN. Machine-to-machine communication is a vital part of the growing IoT movement and rugged edge computers are the key aspect in processing the data generated from connected sensors and devices for functionality.

RUGGED DESIGN AND SECURITY

Purpose-built and designed to be implemented in harsh usage environments, rugged edge computers provide protection measures against external elements including wide operating temperatures of -40° to 70°C, wide voltage input ranges of 9 to 50VDC and high shock and vibration resistance of 50G and 5Grms. In addition to rugged reliability, Premio edge computers offer integrated TPM 2.0 for cryptographic security against intrusion.

I/O PORTS AND EXPANDABILITY

Premio's rugged edge computers offer a wide variety of I/O port options. This includes GPIO/DIO for control over sensors, COM serial ports for legacy industrial systems, USBs for modern high speed devices, LAN/PoE for IP cameras and PCI/PCIe expansion for additional peripheral devices.
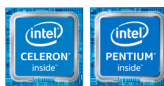
PERFORMANCE ACCELERATORS

Featuring the latest computing performance from Intel processors, Premio's rugged edge computers utilize high power efficiency through low TDP CPUs. The improvements of processing power have enabled smaller devices to output better application performance. This allows edge computers to locally analyze data without having to rely on a cloud data center thus providing real-time actions with low latency.

COMPLETE LINE OF EMBEDDED SYSTEM SOLUTIONS ALSO AVAILABLE:

Rugged Edge Computers
In-Vehicle Computers
Machine Vision Computers
Rugged Industrial Computers
Fanless Mini PC Computers
Industrial Touch Displays and Panel PCs

RCO Series		RCO-3200	RCO-3211	RCO-3222
Processors		Intel® Celeron® Processor J1900, Quad Core, 2MB Cache, 2.0 GHz	Intel® Pentium® Processor N4200, Quad Core, 2MB Cache, 1.1 GHz, up to 2.5 GHz	
Memory		1x DDR3L 1066/1333MHz SODIMM	1x DDR3L 1866MHz SODIMM, Max. up to 8GB	
Storage Bays		1x Internal 2.5" SATA HDD Bay 1x mSATA (shared by 1x Mini PCIe)	1x Internal 2.5" SATA HDD Bay ; 1x Removable 2.5 SATA HDD Bay 1x mSATA (shared by 1x Mini PCIe & 1x SATA) ; 1x CFast (shared by 1x mSATA & 1x SATA)	
SIM Sockets		2x external SIM sockets		
Power Ignition Sensing		Power Ignition Management		
TPM 2.0		N/A	Yes	
GPIO / DIO		N/A	8 in / 8 out Isolated	
USB		1 x USB 3.0 , 3x USB 2.0	2 x USB 3.0 , 2x USB 2.0	
Universal I/O Slot		1x Universal I/O Bracket	2x Universal I/O Bracket (By mini PCIe interface)	3x Universal I/O Bracket (By mini PCIe interface)	3x Universal I/O Bracket (By mini PCIe interface)
Expansion Slots		2x Full Size Mini PCIe	2x Full Size Mini PCIe	2x Full Size Mini PCIe RCO-3211E: 1x PCIe x4 RCO-3211P: 1xPCI	2x Full Size Mini PCIe RCO-3222EE: 2x PCIe x4 RCO-3222PP: 2x PCI
COM/Serial		2x RS-232/422/485	2x RS-232/422/485 4x RS-232/422/485 (internal)	2x RS-232/422/485 4x RS-232/422/485 (internal)	2x RS-232/422/485 4x RS-232/422/485 (internal)
LAN / PoE M12		N/A	2x LAN RCO-3200-4L: 4 LAN ,RCO-3200-4L-M12: 4 LAN M12 RCO-3200-4P: 4 PoE, RCO-3200-4P-M12: 4 PoE M12 RCO-3200-8L: 8 LAN, RCO-3200-8L-M12: 8 LAN M12 RCO-3200-8P: 8 PoE, RCO-3200-8P-M12: 8 PoE M12	2x LAN RCO-3211x-4L: 4 LAN RCO-3211x-4P: 4 PoE RCO-3211x-4L-M12: 4 LAN M12 RCO-3211x-4P-M12: 4 PoE M12	2x LAN RCO-3222x-4L: 4 LAN RCO-3222x-4P: 4 PoE RCO-3222x-4L-M12: 4 LAN M12 RCO-3222x-4P-M12: 4 PoE M12

RCO Series		RCO-3400	RCO-3411	RCO-3422
Processors		7th Gen Intel® Core™ i5-7300U Processor, Dual Core, 3MB Cache, 2.6 GHz, up to 3.5 GHz 7th Gen Intel® Core™ i3-7100U Processor, Dual Core, 3MB Cache, 2.4 GHz		
Memory		1x DDR4 1866/2133MHz SODIMM, Max. up to 16GB		
Storage Bays		1x Internal 2.5 SATA HDD Bay ; 1x Removable 2.5 SATA HDD Bay 1x mSATA (shared by 1x Mini PCIe) ; 1x CFast (shared by 1x mSATA)		
SIM Sockets		2x external SIM sockets		
Power Ignition Sensing				
TPM 2.0		Yes		
GPIO / DIO		8 in / 8 out Isolated		
USB		4 x USB 3.0 Rear, 2x USB 2.0 Front		
D-sub Cutout		3x D-sub RCO-3400-4x: 1x D-sub	4x D-sub RCO-3411-4x: 2x D-sub	6x D-sub RCO-3422x-4x: 4x D-sub
Expansion Slots		2x Full Size Mini PCIe	2x Full Size Mini PCIe RCO-3411E: 1x PCIe x4 RCO-3411P: 1xPCI	2x Full Size Mini PCIe RCO-3422EE: 2x PCIe x4 RCO-3422PP: 2x PCI
COM/Serial		2x RS-232/422/485, 3x RS-232/422/485 (internal)RCO-3400-4x: 2x RS-232/422/485, 1x RS-232/422/485 (internal)	2x RS-232/422/485, 3x RS-232/422/485 (internal)RCO-3411x-4x: 2x RS-232/422/485, 1x RS-232/422/485 (internal)	2x RS-232/422/485, 3x RS-232/422/485 (internal) RCO-3422x-4x: 2x RS-232/422/485, 1x RS-232/422/485 (internal)
LAN / PoE M12		2x LAN RCO-3400-4L: 4 LAN RCO-3400-4P: 4 PoE RCO-3400-4L-M12: 4 LAN M12 RCO-3400-4P-M12: 4 PoE M12	2x LAN RCO-3411x-4L: 4 LAN RCO-3411x-4P: 4 PoE RCO-3411x-4L-M12: 4 LAN M12 RCO-3411x-4P-M12: 4 PoE M12	2x LAN RCO-3422x-4L: 4 LAN RCO-3422x-4P: 4 PoE RCO-3422x-4L-M12: 4 LAN M12 RCO-3422x-4P-M12: 4 PoE M12