



»» Case Study



Enhancing Mission-Critical Battery Operations through Ruggedized Fanless Computing

How a software-driven solution company leveraged industrial computers as their hardware appliance to streamline predictive analytics for industrial battery assets at the rugged edge



The Challenge

- Battery analytics solution required hardware implementation to collect, process, and store edge data.
- Current off-the-shelf solutions proved problematic as they were unable to withstand harsh operating conditions to run predictive analytics solution.
- Current solutions were also unable to meet the required timeline for implementation due to supply chain constraints.
- Needed a compute solution that offered rich I/O and wireless connectivity at a competitive cost.



The Solution

- Turnkey, fanless mini computers from Premio replaced disparate, less-effective vendor options.
- Premio's [BCO-2000-WHL fanless mini computer](#) with 4G/LTE and comprehensive I/O kits to maximize data processing.
- Collaboration led to future-proof upgradability and hardware implantation.

The Benefit

- Rugged and embedded long-life computer unit that powers and monitors battery management solution for edge processing and data telemetry into cloud dashboard.
- Established partnership and close proximity to each other to ensure timely delivery of products.
- Team of Premio professionals that are ready and accountable since day 1: providing guidance, answers, and technical fixes.



Background

Batteries are a unique piece of technology that powers almost every type of electronics imaginable in today's world. However, many do not realize how much data batteries are capable of producing, and what that data can speak about for companies. As a central piece of hardware that drives the electrified future, understanding the health and impact that it has is crucial in managing overall product and implementing safety in many operations around the world.

Founded in 2012, the company is a leading the way in specializing in data management and analytics solutions for industrial sectors for batteries and industrial assets. With a heavy focus on battery health and intelligence, the company's software solution helps businesses optimize their operations and drive innovation through their advanced analytics.



Fanless Mini Computer

With 8th Gen Intel® Core™ Mobile-U and Celeron® Processor, 2x LAN, 4x USB 3.2

With a focus on extracting actionable insights from complex data environments, they have helped businesses optimize their operations, drive innovation, and make informed decisions. By leveraging advanced technologies such as artificial intelligence and machine learning, the intelligent cloud solution enables organizations to unlock the full potential of their battery health data and transform it into a strategic asset that improves overall health, reduce risks, and meet sustainability goals.





The Challenge

The customer faced a significant challenge in finding a unit that could meet their mission-critical requirements for ruggedization, rich I/O capabilities, and competitive pricing. Their previous solution, which involved non-rugged off-the-shelf computers from a major manufacturer, failed to withstand environmental conditions, especially high heat, when used in storage container environments housing batteries. This failure was a major pain point as it hindered the efficiency and reliability of their operations. The previous solution also failed to meet the needed timeline necessary to implement their solution.

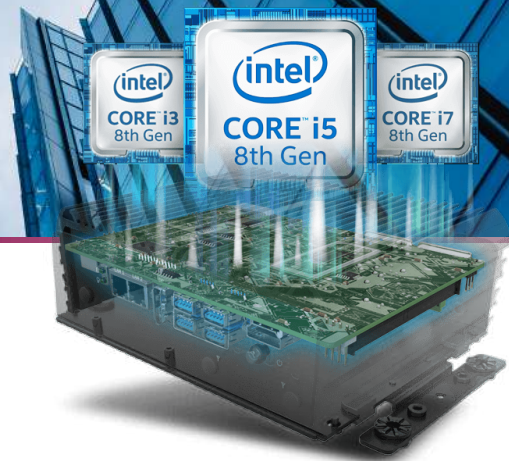
A primary area of focus for the customer is grid-scale batteries. These batteries produce tremendous amounts of data that can be captured, parametrized, analyzed, and stored. The customer developed an analytics platform that required edge telemetry collection and processing, meaning an edge device was necessary to interact with local equipment and systems to gather, process and store data as needed all before pulling and uploading to the cloud.

Their battery analytics solution involves an expansive technology stack that is designed to be secure, open and extensive for many edge data applications that are located at the rugged edge. These applications are critical for efficiently managing and optimizing battery service's entire lifecycle, ensuring that the batteries function optimally and remain reliable in various industrial applications, such as:

- Battery R&D
- Battery Hardware integration
- Grid & energy Storage Systems
- Electric Transportation
- Defense Readiness



This extensive technology stack required an absolute need for a more ruggedized industrial system, that can withstand challenging environments and capture, store, and process edge data telemetry that was being generated before it is uploaded to the cloud.



The Solution

The customer explored various Industrial PC options, but ultimately chose Premio after discovering the perfect product fit and exceptional support through Premio's website. Other options that were being considered were unable to meet the urgent near-term needs, which presented Premio with the right opportunity. Other requirements for an edge solution were small form factor, flexible processor options, fanless design, wide operating temperature, wireless connectivity options, and competitive pricing.

Able to meet the immediate availability for the customers, Premio introduced the [BCO-2000 series, a fanless industrial mini computer](#), designed to meet all the specified requirements listed by the customer. The BCO-2000 proved to be an ideal fit as a hardware solution due to its small form factor, robust performance, rugged industrial grade design, and reliable 4G/LTE connectivity, all while maintaining a competitive price point.



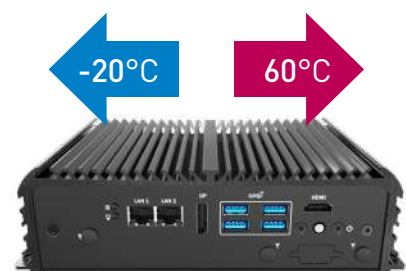
Ultra-Compact Size



Wireless Connectivity for Remote Deployments

Equipped with a powerful Intel Core I5 Processor, the BCO-2000 ensured that the customer's analytics software ran smoothly and efficiently. This empowered users to gain valuable insights in real-time, allowing for enhanced quality and accuracy of data. Most importantly, the BCO-2000 series allowed for the integration of 4G/LTE connectivity, giving the customer the ability to remotely monitor and manage their battery health operations in real-time. Premio also highlighted the future possibility of integrating 5G connectivity. With 5G's lower latency and faster speeds, the customer's operations would benefit from even more advanced and seamless data transfer for its edge computing solution.

Premio's BCO-2000 is also built with a robust ruggedized industrial design that tackles the challenges of deployment at the edge, where harsh environmental conditions can be detrimental to computers. With a wide operating temperature range of -20°C to 60°C , the BCO-2000 can withstand the high heat conditions where many solutions were being implemented.

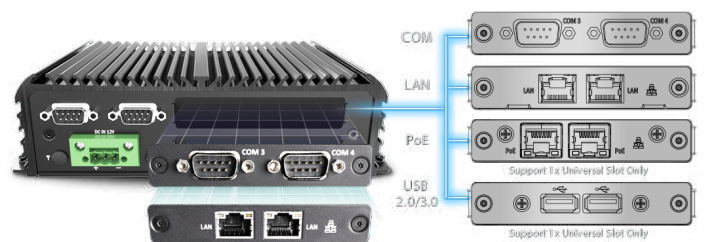


Operating Temperature



The Benefit

PPremio's tailored solution effectively addressed the primary challenge of finding a ruggedized computer with rich I/O options and competitive pricing. By adopting Premio's ruggedized computer with 4G LTE connectivity, the customer significantly enhanced their mission-critical operations. The inclusion of 4G LTE connectivity enabled seamless wireless connectivity to efficiently manage their batteries and maintain constant communication with remote sites, streamlining operating and ensuring seamless data transfer. In addition, the ruggedization of the unit ensured reliable performance in demanding environments, where extreme temperatures and other challenging conditions were prevalent. As technology continues to advance, the prospect of integrating 5G connectivity presents an exciting opportunity to further optimize their operations and stay at the forefront of innovation.



In tackling the challenges of finding a reliable, ruggedized unit, the customer found a perfect partner in Premio. Through this collaboration, it demonstrated the significance of selecting the right technology partner. Premio's tailored solution not only resolved the immediate pain points but also laid the foundation for future advancements, setting a promising precedent for future partnerships and potential for continuous growth.



Premio's Manufacturing Facility in Los Angeles, California.

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WE DESIGN,
MANUFACTURE, AND
SERVICE CUSTOMERS
AROUND THE WORLD



BCO-2000 SERIES



	Basic Fanless System ideal for space-constrained applications					
Model	BCO-2000					
CPU Onboard	Support 8 th Gen. Intel® WL-UE Processor (15W TDP) Intel® Core™ i5-8365UE Processor 6M Cache, up to 4.10 GHz Intel® Celeron® Processor 4305UE 2M Cache, 2.00 GHz					
Memory	1x 260-Pin DDR4 2400MHz SO-DIMM, up to 32GB					
Graphic Output	1x DisplayPort, 1x HDMI (Optional)					
LAN	2x RJ45 GbE (Support Wake-on-LAN and PXE)					
Storage	1x mSATA (shared by 1x Mini PCIe) & 1x Internal 2.5" SATA HDD Bay					
Internal Expansion Slot	2x Full-size Mini-PCIe (1x shared with mSATA)					
Power	AT/ATX 12V Select, 3-pin Terminal Block					
Audio	Line-out / Mic-in Phone Jack					
Certification	UL, CE, FCC Class A					
Operating Temperature	-20°C to 60°C					
Dimensions (WxDxH)	140 x 192 x 61 mm					
Weight	1.4 kg					
Universal Expansion Slot	2					
Expansion (Option)	2x LAN	2x PoE (Support 1x Universal Slot Only)	2x COM	4x COM	2x USB 2.0 (Support 1x Universal Slot Only)	2x USB 3.0 (Support 1x Universal Slot Only)