



Case Study

Driving the Internet of Energy with the Darveen DBC-3200 Industrial IoT Gateway

As the global energy landscape rapidly evolves, the need for intelligent, flexible, and resilient infrastructure grows stronger. Everyone deserves access to sustainable energy. A Central European energy system solution provider and smart grid operator is committed to delivering renewable energy solutions for all. With the maturation of IT and Industrial IoT (IIoT) technologies, the concept of virtual power plants—essentially a distributed "Internet of Energy"—has become a practical reality. From utility-scale power plants and rooftop solar panels to battery storage and electric vehicles, virtual power plants can collect energy from virtually any source or device. Surplus electricity can even be sold back to the grid. But managing all of these distributed energy assets securely and efficiently is a complex challenge, which is where the Internet of Energy (IoE) comes into play.

What is the Internet of Energy (IoE)?

The IoE connects the entire energy infrastructure, from generation to transmission, using data from interconnected energy assets to determine the most efficient energy delivery paths. It enables predictive

energy management, reducing maintenance and operational costs while improving reliability across the grid.

The Internet of Energy (IoE) requires reliable industrial-grade computing solutions capable of integrating diverse energy assets, collecting real-time data, and enabling smarter energy management and analytics. Darveen's [DBC-3200 DIN-Rail IPC](#) has emerged as a powerful Industrial IoT gateway platform rising to meet these demands with unmatched adaptability and reliability.

Challenge: Bridging Energy Assets to Intelligent Networks

The Central European energy system solution provider faced complex challenges in securely connecting distributed energy resources—such as solar panels, wind turbines, smart meters, and battery storage—to centralized control and cloud systems. They require an industrial edge gateway that can operate reliably in harsh industrial environments and support local processing for real-time insights and automated control.

Solution: The Darveen DBC-3200 as a Resilient Industrial IoT Gateway

The Darveen [DBC-3200](#) addresses these challenges via its rugged design and feature-rich connectivity. Powered by Intel® Celeron® and Core™ processors, it delivers efficient processing with low thermal output, suitable for continuous edge operations. Its compact DIN-rail mount form factor enables easy deployment in electrical cabinets.

Key capabilities include:

- Flexible CPU options offer Intel® Celeron® to Core™ i3/i5/i7 processors, letting users optimize performance and cost for different site needs.
- Fanless design with a compact form factor of 176 × 120 × 60 mm, allowing easy installation in narrow, enclosed cabinets for data control and monitoring at the edge.
- Extensive industrial I/O ports including 4x COM, 6x USB, dual gigabit LAN, and a SIM card slot for flexible sensor integration and data connection.
- DIN-rail mounting enables fast, space-saving installation in control cabinets for organized, efficient setups.
- Mini PCIe and M.2 slots support wireless connectivity options like Wi-Fi, cellular, Bluetooth, and GNSS to connect remote or mobile energy assets.
- Wide power input range (9-36V DC) and operating temperature tolerance (-10 to 60°C)

ensure uninterrupted operation in demanding environments.

- Robust security through BIOS-level TPM support and software watchdogs enhances resilience against cyber threats.

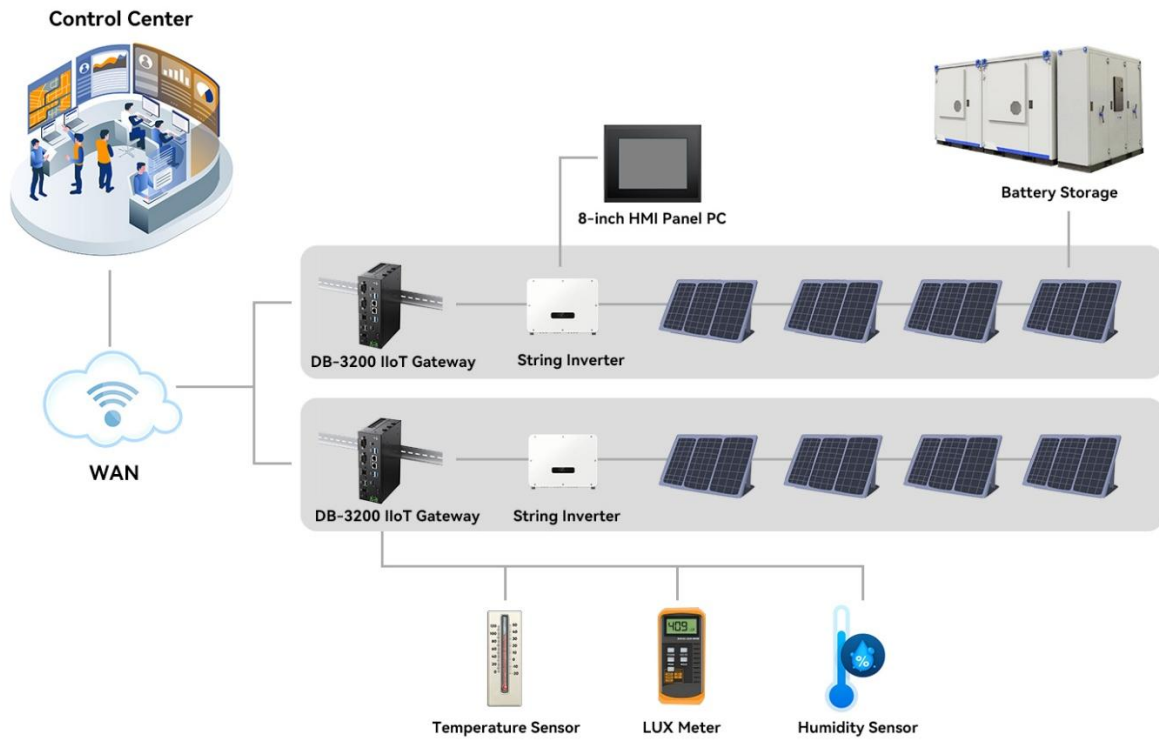
Impact: Enabling Smarter Energy Management and Grid Stability

Deployed as an Industrial IoT gateway in a significant energy project, the DBC-3200 enabled seamless data acquisition from diverse field equipment and local preprocessing to filter and aggregate data before sending to the central energy management system. This edge computing approach reduced network load, minimized latency for control actions, and improved overall system responsiveness.

The rugged design guaranteed continuous uptime under fluctuating environmental conditions, while the device's comprehensive industrial connectivity met diverse communication needs across solar inverters, battery controllers, and smart meters. Operators gained real-time visibility and control over distributed assets, enabling predictive maintenance and optimized energy distribution that improved grid reliability and reduced operational costs.

A Reliable Platform for Internet of Energy Innovation

The Darveen [DBC-3200](#) stands as a cornerstone solution for energy companies striving to harness the full potential of the Internet of Energy—transforming traditional grids into intelligent, adaptive, and sustainable energy ecosystems.



About Darveen

Established in 2007, Darveen is dedicated to developing rugged industrial computing solutions tailored to the diverse needs of vertical industries. Our product portfolio includes vehicle mount computers, industrial panel PCs, industrial displays, embedded box computers, and rugged tablets. With nearly two decades of experience in product design and manufacturing, Darveen's solutions are widely adopted in smart ports, warehousing and logistics, and heavy-duty vehicle applications. Riding the Industry 4.0 wave, Darveen is expanding its reach into edge computing, smart manufacturing, industrial automation, healthcare, and marine sectors.

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