

Case Study

Integrating Tecogen Energy Systems with SkySpark Analytics BMS

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Overview

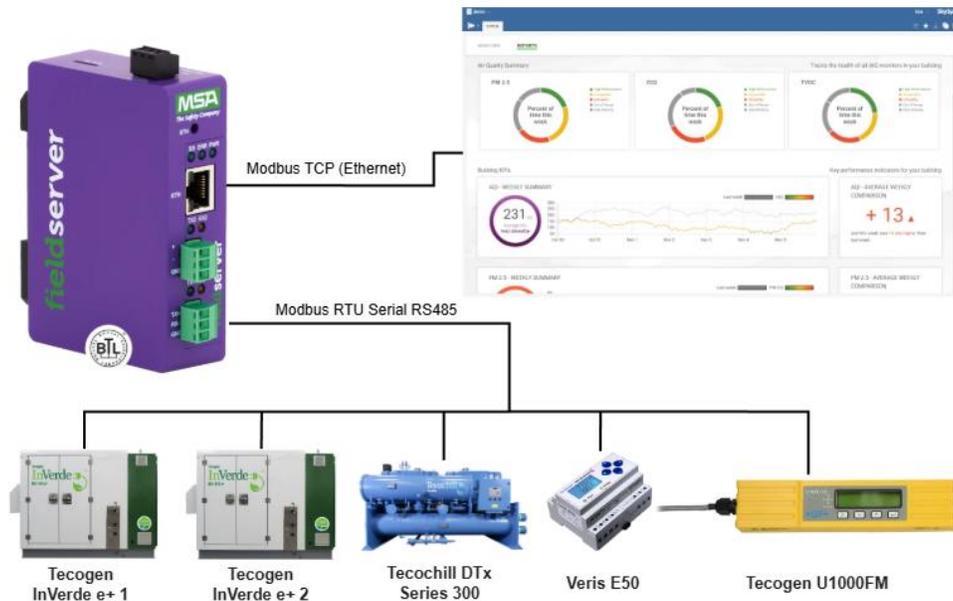
DSM Engineering Associates required a reliable method to integrate on-site Tecogen InVerde e+ cogeneration units, a Tecogen U1000FM ultrasonic flow meter, Veris E50 electrical energy meters, and a Tecochill DTx Series 300 water-cooled chiller at a high-occupancy hotel in New York City into a SkySpark analytics platform. The installed equipment communicated using Modbus RTU, while the analytics environment required Modbus TCP for real-time monitoring and energy analysis.

A Chipkin QuickServer Modbus RTU to Modbus TCP gateway was deployed to bridge the two systems without modifying or replacing any field equipment. The solution delivered stable, validated, and normalized data into the analytics platform, enabling accurate energy visibility and supporting long-term operational optimization.



Customer Goals and Challenges

Our client was tasked with improving energy visibility and performance analytics for a high-occupancy hotel in New York City. The goal was to deliver reliable, real-time operational data from on-site energy systems into a SkySpark analytics environment to support monitoring, analysis, and long-term optimization. See Network Diagram below.



The primary challenge was that the installed Tecogen cogeneration, chiller, and metering equipment communicated exclusively using Modbus RTU, while the analytics platform required Modbus TCP. Replacing or modifying live equipment was not an option, and the solution needed to integrate cleanly with existing systems already operating in the facility.

Additional technical challenges included:

- Integrating into an active Modbus RTU network without disrupting live operations
- Supporting a multi-master RS-485 architecture
- Ensuring accurate register mapping, scaling, and data normalization
- Delivering stable, trustworthy data suitable for analytics and decision-making

The solution needed to be reliable, non-intrusive, and scalable, meeting both immediate project requirements and long-term operational goals.

Chipkin's approach to the solution

Chipkin approached the integration by first validating the existing Modbus RTU environment to ensure the new gateway could be introduced without impacting live systems. Serial communication parameters—including baud rate, parity, and stop bits—were verified to align with the installed Tecogen equipment and existing Modbus masters.

Because the RS-485 network already supported multiple masters, Chipkin implemented a Modbus-compliant RS-485 splitter to maintain protocol integrity and prevent bus contention. Polling strategies were optimized to minimize network load, and only required registers were mapped to reduce unnecessary traffic.

All data points were carefully validated, scaled, and normalized within the gateway before being exposed as Modbus TCP to the SkySpark environment. This ensured that values were accurate, stable, and immediately usable for analytics and energy performance evaluation.

By combining protocol expertise with practical field engineering, Chipkin delivered a robust, non-intrusive integration that met both immediate project needs and long-term operational requirements.

Results and Key Takeaway

The completed integration delivered reliable, real-time access to operational data from Tecogen cogeneration, chiller, and metering systems into the SkySpark analytics environment. Data was validated, normalized, and consistently available without disrupting existing equipment or live operations.

As a result, the client gained improved visibility into energy production, cooling performance, and consumption across the facility. This enabled more accurate analytics, reduced reliance on manual data collection, and supported better-informed operational decisions for a mission-critical hospitality site.

Key outcomes

- Stable delivery of normalized Modbus TCP data to SkySpark
- Accurate, analytics-ready energy and performance data
- Improved operational insight without equipment replacement
- Reduced integration risk through a proven, non-intrusive architecture
- A scalable solution supporting future optimization initiatives