

BayWa r.e. Streamlines Edge Integration for Their Power Plants

N3uron Platform Improves Efficiency and Reduces Costs

BayWa r.e. is a leading global company in the renewable energy industry, with expertise in developing, servicing, wholesaling, and providing energy solutions. With over 20 years of experience, BayWa r.e. has the capability to deliver renewable energy projects around the world to boost the transition to a carbon-neutral world.

In the Americas, BayWa r.e. Operation Services LLC, launched in 2021 a new Remote Operational Control Centre (ROCC) based in California, providing around the clock coverage for its solar, wind and battery storage projects in the U.S. and Mexico. The ROCC performs a number of critical operations, including performance monitoring, downtime categorization reporting, generation forecasting, and more.

BayWa r.e. needed a standardized, flexible edge solution that allowed them to integrate all the remote assets into their central SCADA system, which was Ignition. They chose N3uron by N3uron Connectivity Systems, an industrial platform for building fully customized solutions in the Industrial Internet of Things (IIoT), DataOps, human-machine interface (HMI) and SCADA.

BayWa r.e. has effectively implemented N3uron across eighteen plants and plans to further expanding this innovative solution to new sites. Leveraging N3uron's capabilities, BayWa r.e. has been able to significantly cut down on integration costs. By adopting open standards such as MQTT Sparkplug, they have ensured secure and seamless data exchange between their facilities and the ROCC. This strategic move has not only streamlined their operations but also enhanced efficiency across the company.



Redesigning BayWa r.e.'s Edge Integration Solution

With the rapid expansion of their renewable energy projects in America, BayWa r.e. faced the challenge to efficiently integrate all of their remote assets into their central SCADA system. The goal was to speed up customer integration and reduce costs, with the main challenges being the amount of sites and compatibility with Ignition, their control center SCADA system.

Trent Derr, OT Engineering Manager at BayWa r.e., was tasked with redesigning the company's existing edge integration solution. *"Early into my appointment at BayWa r.e. Operation Services, we identified a costly and inefficient SCADA onboarding solution",* recalls Derr. *"Redesigning the existing edge integration solution was top priority to speed up customer integration and reduce costs."*

In addition to the initial hurdles of site quantity and Ignition compatibility, BayWa r.e. encountered other obstacles in their quest for an efficient SCADA onboarding solution. One such obstacle was the limited computing resources at some facilities. This meant that any new edge integration solution would need to be lean and efficient, capable of running smoothly even on systems with constrained hardware resources. *"N3uron's lightweight and Sparkplug B support were key in getting through these challenges",* said Derr.

“Many other SCADA products are not as well-designed for edge solutions. They are over engineered, not user-friendly, or require significant computing resources”, explains Derr. “N3uron performs the best at the edge in all three of those categories”.

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- Trent Derr,
OT Engineering Manager at BayWa r.e

Moreover, the new solution would have to meet several key requirements. First and foremost, it needed to allow for a seamless, quick deployment and configuration. This would enable BayWa r.e. to quickly and easily set up the system across their numerous sites, thereby accelerating new plants integration.

The solution also needed to be scalable. With BayWa r.e.’s renewable energy projects expanding at a rapid pace, the edge integration solution had to be ready to grow with the company and handle an increasing number of sites.

Security was also a paramount concern. The solution had to ensure the integrity and confidentiality of data as it was transmitted from remote assets to the central SCADA system. Baywa r.e.’s infrastructure meets the NERC-CIP standards, which are stringent regulations designed to secure the assets required for operating North America’s bulk electric system. This compliance signifies robust cybersecurity measures to protect their systems and data, including defenses against cyber threats and capabilities to detect and respond to potential security incidents.

N3uron has given Baywa r.e. exactly what it required. *“N3uron was the optimal edge SCADA solution for standardizing, simplifying, and reducing costs of our integration package”,* said Derr. *“N3uron has been deployed internally as part of the BayWa r.e. Operation Services core infrastructure to integrate all of our customer-owned facilities into our SCADA and DAS systems”.*

Unique Features and Capabilities

Trent Derr explains the reasons why BayWa r.e. chose N3uron over other competing products: *“The*

affordable cost, user-friendly interface, installer flexibility, and wide-ranging capability for data integration and aggregation”.

Baywa r.e. opted for open standard tools to ensure a future-proof architecture that would prevent vendor lock-in. They chose the MQTT protocol to transfer large amounts of data more efficiently. In particular, they utilized Sparkplug B, an open-source software specification that defines how to use MQTT in a mission-critical, real-time environment.

N3uron connects and exchanges data with all the systems and devices at the power plants and publishes this data via MQTT. It transforms the tags and their properties into the Sparkplug MQTT Topic and Payload format, making it 100% self-discoverable and easy to consume by any Sparkplug-enabled applications, such as Ignition. According to Derr, *“N3uron’s Sparkplug B support enabled seamless integration with Ignition using a plug-and-play architecture”.*

“So far, the project has involved 18 N3uron Nodes, with 10,000 tags per node, and 4 to 5 modules per site”, said Derr. N3uron is a modular platform, that provides a wide range of modules which can be stacked to deploy fully customized applications. *“The modules typically used were Modbus Client, DNP Client, Historian, Derived Tags and of course Sparkplug Client”.*

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Impact on BayWa r.e.’s Success

The results of the project have been impressive. Trent Derr shares how N3uron has impacted BayWa r.e.: *“We were able to reduce our integration costs by roughly \$50K per site by drastically reducing software costs, reducing server hardware costs, and eliminating outside SCADA vendor support.”*

“N3uron has been a game-changer for us,” Derr says. *“It has allowed us to streamline our edge integration*

solution and reduce costs while maintaining high levels of performance and reliability”.

Baywa r.e. plans to continue expanding the project and incorporating new features along the way “While the bulk of the project was completed in 2022, we’re continually onboarding new sites”, Derr concludes. The company is also considering a possible further use of the N3uron REST API Server and SQL Client modules for remote management and database injection.

In conclusion, the story of BayWa r.e.’s journey with N3uron is a testament to innovation. N3uron’s innovative edge integration solution empowered BayWa r.e. to drive efficiency, reduce costs, and maintain its commitment to a sustainable, carbon-neutral future.