



Simplifying Co-located Solar and BESS Integration

Empowering Grid Stability via Standardized, Secure Infrastructure

Region: United Kingdom

MOXA Product



DA-820E Series

- 13th Gen Intel® Core™ processor
- IEC 61850-3, IEEE 1613, and IEC 60255 compliant power-automation computers
- Security options such as TPM 2.0, UEFI Secure Boot and physical security



DRP-C100 Series

- DIN-rail mountable fanless computers
- -30 to 60°C operating temperature range
- DNV, CID2, ATEX, and IECEx certified



EDS-4008 Series

- IEC 62443-4-2 Security Level 2 certified
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches) , and RSTP/STP for network redundancy
- Supports IEEE 802.3bt PoE; up to 90 W output per port



MGate MB3270-G2 Series

- Supports high-performing and low-latency agent mode to actively poll Modbus devices and cache data
- Supports proprietary Modbus and Modbus extensions for various devices and Auto Device Routing for easy configuration
- Compliance with IEC 62443-4-2 Security Level 2 requirements



ioLogik E1200 Series

- Supports RESTful APIs for IIoT applications
- Simplifies I/O management with MXIO library for Windows and Linux
- Wide operating temperature models available for -40 to 75°C (-40 to 167°F) temperature range

Background

As the United Kingdom accelerates its net-zero transition and reduces reliance on imported energy, renewable energy assets are expected to deliver not only clean generation but also grid-scale energy stability. While solar power is a key pillar of decarbonization, its inherent intermittency limits its ability to provide steady, average output and dispatchable power on its own.

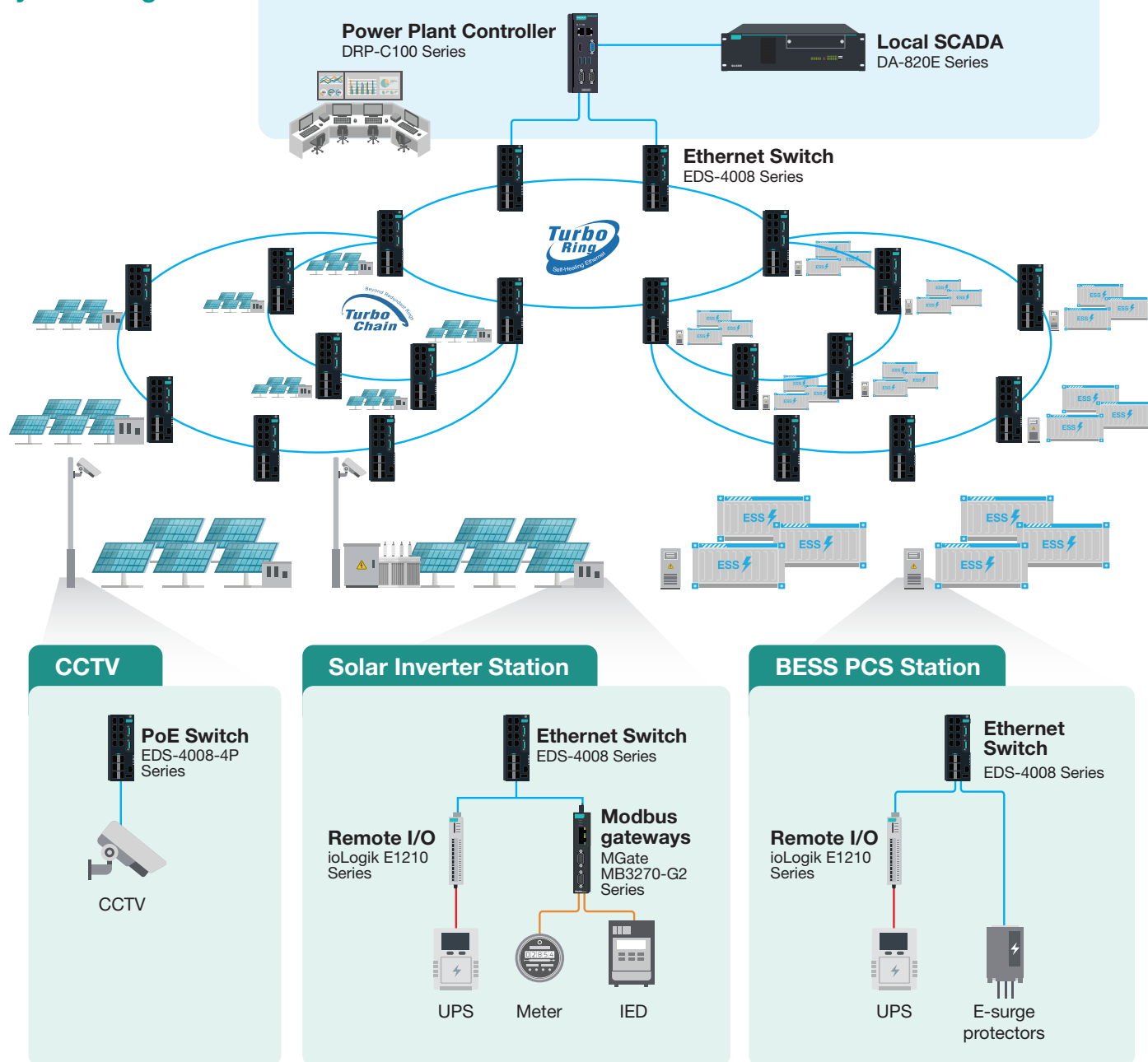
To address this challenge, a leading UK-based developer—with end-to-end expertise ranging from system design to long-term O&M—has adopted co-located solar and BESS as its core scaling strategies. By integrating energy storage, the developer transforms intermittent assets into stable infrastructure capable of supporting the local grid via a ‘local generation, local consumption’ model. The flagship site in Eastern England alone generates 20,000 MWh annually, enough to power 5,000 households.

However, as hybrid energy sites expand across remote and unstaffed locations, the challenge shifts to managing complex assets over a 10-year life cycle. Ensuring mission-critical stability requires more than just hardware; it demands a cyber-resilient architecture designed to prevent security breaches that could threaten the regional energy security. To achieve this, the developer worked with Moxa’s team of experts to co-design a standardized, secure communication backbone that ensures seamless interoperability and operational efficiency for the next decade.

Project Requirement

- **Portfolio Scalability:** A standardized replicable blueprint to support the rapid expansion of multiple hybrid sites across various regions.
- **Subsystem Integration:** Seamless data exchange between PV inverters, BESS containers, and CCTV systems to ensure real-time grid response.
- **Remote Management:** Highly available communication backbone to provide real-time visibility for unstaffed, geographically dispersed locations.
- **Industrial Cybersecurity:** Secure-by-design networking compliant with IEC 62443 to mitigate risks to regional energy security.
- **Operational Longevity:** Industrial-grade hardware capable of sustaining stable operations for over a decade in harsh outdoor environments.

System Diagram



Why Moxa

- **One-Stop Integration for Rapid Scaling:** Moxa provides a comprehensive hardware and software stack—edge connectivity and protocol gateways to secure industrial networking. This one-stop approach facilitates the creation of a replicable template, accelerating deployment across multi-site portfolios while ensuring high operational performance as the capacity expands.
- **Operational Excellence and Lower TCO:** High-reliability networking and advanced remote management significantly reduce the frequency of on-site maintenance visits (truck rolls), directly lowering long-term OPEX for remote assets.
- **Regulatory Compliance and Grid Security:** By providing IEC 62443-4-2 Security Level 2 compliant components, Moxa delivers a verifiable trust foundation that simplifies grid compliance and protects critical infrastructure from evolving cyber threats.
- **Expert Consultancy as a Strategic Backing:** Moxa and its specialized technical partners act as a unified support team, providing consultative system design to ensure seamless interoperability between subsystems. This collaborative expert backing eliminates technical silos and mitigates integration risks to ensure stable, long-term project success.