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Case Study

SCADA and PLC Integration for District Energy Infrastructure



A large mixed use urban development required a resilient and scalable control and monitoring system for its electrical substations and district energy infrastructure. The requirements covered private wire electrical distribution, low temperature hot water district heating, chilled water district cooling and central plant facilities. The solution needed to integrate seamlessly with an existing supervisory control environment while supporting future expansion and ongoing development phases.

Project highlights

- End to end delivery of a multi site PLC and SCADA system for district energy and private wire electrical distribution
- Deployment of a resilient fibre optic ring network supporting segregated control and metering communications
- Integration of electrical substations, district heating and cooling assets within a unified supervisory platform
- Implementation of standardised modular control panels with local HMI for consistent operation and maintenance
- Real time monitoring, alarms and historical trending enabling accurate energy reporting and asset visibility
- Scalable architecture designed to support phased expansion across a large mixed use development

Scope of delivery

The project delivery included detailed design, manufacture, installation and commissioning of PLC control panels and remote telemetry units. Multiple electrical substations and plant rooms were equipped with new control panels, local HMIs, instrumentation and metering gateways. A major fibre optic ring network was deployed to host segregated SCADA and automated meter reading networks, alongside full systems testing, documentation and operator training.

Key challenges

The main challenges were integrating new infrastructure into a live SCADA environment without disruption, coordinating a large number of interfaces and communication protocols, managing late stage design changes and approved scope variations, maintaining consistent time synchronisation and data integrity across multiple distributed sites to support reliable event recording and energy reporting, and maintaining consistent quality and cybersecurity standards across multiple locations.

Technical solution

A modular and standardised architecture was implemented using Siemens PLCs and local touch screen HMIs. Control panels were connected via a fibre optic backbone with segregated networks for control and metering data. The system was fully integrated with a central SCADA platform providing alarms, trending and historical data, alongside secure user access and role based permissions. GPS based time synchronisation ensured accurate system wide event recording and alignment across all assets.

Outcome and benefits

The project was successfully commissioned and delivered a robust multi site SCADA PLC system.

The solution improved visibility and control of electrical and district energy assets, enabled accurate energy monitoring, reduced the need for manual intervention, and provided a scalable platform capable of supporting future development phases.

The system improves operational visibility across multiple sites, supports proactive maintenance and reduces reliance on manual intervention. It provides accurate and consistent energy data, enabling more effective performance monitoring and long term operational optimisation.

Speak to one of our **experts**



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