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ELECTRIFICATION & AUTOMATION

Coexistence of SCADA and grid transparency – two Siemens solutions seamlessly combined SCADA and Electrification X

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SCADA systems are the „steering wheel“ of the grid – built for real-time control.

In addition, Electrification X acts as the “digital co-pilot”: providing additional data and insights to enhance current and future SCADA functionalities, while enabling intelligent add-on modules and optimized navigation tools to operate the grid of tomorrow with greater foresight and efficiency.

Challenge

Energy management is confronted with several central challenges. Companies must cope with volatile energy prices while simultaneously integrating renewable energy sources. At the same time, they need to comply with stringent regulatory requirements, such as ISO 50001, and ensure sufficient transparency through digitalization. In addition, many organizations face limited internal resources and rely on outdated, legacy infrastructure. Energy management is often not prioritized at the top management level, which further hinders progress. This situation is compounded by fragmented, department-specific data silos, particularly within SCADA systems.

Siemens offers a combined, proven and safe paths for utilities – depending on regulatory, operational, and digital maturity:

- **SCADA Grid Control System**
- **Electrification X**



SCADA is necessary for protection and operation

... like **brakes** and a **steering wheel**



IoT simplifies operation and maintenance

... like **driver assistance systems** and **error management systems**



SCADA Grid Control System

- Is a classic system for monitoring and controlling energy grids (electricity, gas, water, district heating).
- The focus is on centralized grid and operational management for utilities, grid operators, and industry.
- Strengths: Proven, mission-critical control, TSO/DSO- and Industry & Infrastructure-aligned processes access only for physically & logically protected user groups (control room), highly flexible through IEC interfaces.
- SCADA system stays on-premise.



Electrification X

- Is a cloud-based SaaS IoT suite (part of the Siemens Xcelerator Portfolio), designed as a cloud-native and multi-tenant offering.
- Analytics, visibility, and new use cases move to cloud – transparency due to monitoring, autonomous management of assets, analysis and AI-support (new upcoming features will keep the software up to date).
- It serves digital transformation and helps customers to manage their energy grids, increase uptime and improve reliability, asset utilization, cybersecurity, and energy efficiency to reach sustainability goals and manage microgrids.
- Offers modular, scalable feature sets for asset management, grid fault monitoring, microgrid monitoring, EV load management, distribution grid management, OT cybersecurity asset management.
- Unlock the value of protected grid data for cross-departmental use, while maintaining the highest level of security.
- SaaS includes standardized services such as regular updates, new features, maintenance of the application and underlying server infrastructure, high system availability, and APIs for seamless integration with other systems.
- Strengths: transparency (find blind spots), flexibility (reduced congestion), efficiency (lower OPEX), resilience (faster fault resolution), scalability (easy rollout).

Main features in comparison

Category	SCADA grid control system	Electrification X
Technical platform	On-premise (Server/Client)	Cloud (IoT SaaS, Siemens Xcelerator)
Grid Network Management	✓ SCADA	Uses grid control data as an optional input for analytics (read-only)
Asset Management	-----	✓ Asset Management provides operational and asset data, health index based on condition monitoring (temperature, humidity, partial discharge, circuit breaker), predictive maintenance for medium-voltage assets
Load Management for Grids	Focuses on MV load mgmt with DMS	Distribution Grid Management offers station monitoring, analysis of load profiles and bottlenecks, autonomous feeder management for load shedding (for MV and LV)
EV Load Management	-----	✓ with feature set Load Management: monitoring and control of charging infrastructure, set points for load shedding with dynamic load management (for stations and EV chargers)
DER Load Management	Spectrum Power 5 supports DER-aware load management, but it is not a full DER Management System (DERMS)	✓ With feature set Power Ressource Management: monitoring and control for renewables like PV inverters, wind farms, BESS, generators and overall microgrids
Predictive maintenance	-----	✓ Data-driven, AI/analytics-based
OT Cybersecurity & Asset Management	-----	✓ OT Companion offers comprehensive OT inventory, vulnerability monitoring (vendor-agnostic), workflow and baseline management to simplify NIS2/NERC compliance and patch management
Network Fault Management	Handles real-time fault management	✓ Network Fault Management gives immediate remote access to fault records/logs/settings in substations and overhead line networks, helping to localize and clear faults faster
Sustainability/ Energy Management	-----	✓ Sustainability/Energy Management provides 24/7 energy, cost, emissions KPIs; energy benchmarking; eSankey diagrams; target-setting and project tracking, and customizable reports to accelerate decarbonization, identify saving potential
Cybersecurity	Secure by on-premise level system design	✓ Multi-tenant, cloud-based security, and much more – ISO 27001, CSA Trusted Cloud Provider, STAR Level 1, cybersecurity aligned with NIS-2 regulation (for critical infrastructure), IEC 62443-2-4, IEC 62443-3-3
Integration in IT/OT	About interfaces, IEC standards	✓ APIs, harmonization IoT/OT asset data collection in the field based on IEC 61850, Modbus TCP, SNMP, MQTT (depending on the feature set) via SICAM GridEdge, ISMS conform, encrypted communication with TLS (transport layer security) and X.509 certificates and own certification authority (CA)
Usability	Engineering & Control Focus, Control Technology	✓ Intuitive user-friendly UI, fine-grained access control possible

Electrification X does not replace SCADA – it extends it!