One Vision
MicroSCADA X

Faster learning resulting in increased safety of people and assets.

- Savings through efficient electrical energy management
- Utmost reliability and availability
- Easy to use, anywhere and anytime
- Scale up and expand
Unified

A user centric product designed from the core for a modern and adaptive experience. MicroSCADA X allows you to take full control of your operations and systems with intuitive navigation and data handling within a single user interface.

Simplified

With MicroSCADA X, we aimed to deliver a product solution that gives you full control and simplifies interaction with your power networks.

Available

The browser based user interface provides seamless access from the control room to mobile devices. This system availability enables faster and more accurate utilization of system data as well as faster reaction to situations in the network.

Secure

From its initial conceptual design until its final deployment, MicroSCADA X supports the latest international cyber security standards to keep your networks, primary equipment, periodic operations and people safe and secure.
Managing your plant’s power distribution
7 reasons to choose MicroSCADA X

Designed and optimized for managing electrical power systems, MicroSCADA X offers industrial plants an ideal solution to meet today’s ever-growing challenges with regard to rising costs, better productivity, higher energy efficiency and sustainability. Having a dedicated system for the task has definite advantages. Here are some of the highlights in brief.

1. Electrical energy management functionality
   The electrical energy management functionality gives you full and continuous control of the power distribution to secure an uninterrupted power supply and distribution. It saves you from unscheduled downtime in your production processes and keeps them up and running.

2. Electrical energy system information management
   Right timing and proactiveness are musts in running an electrical energy network. MicroSCADA X’s electrical energy system information management produces correct and relevant information, for example, about the state of the components and energy use patterns. It also schedules electricity consumption for off-peak hours and the plant’s own generation for peak hours, when the price of purchased electricity is at its highest. All these lead to cost savings.

3. Asset management support
   MicroSCADA X integrates versatile asset management support, enabling you to proactively extend the lifecycle of the power distribution network and its components. Its load forecasting function helps you optimize your energy production, purchasing and selling, as well as electrical network configuration. Other asset management benefits include improved energy efficiency through lower reactive power flow and remote support provided by ABB.

4. High reliability and availability
   High reliability and availability are written all over MicroSCADA X. It can be delivered pre-installed in the factory in a robust and compact industrial computer that withstands even the harshest and most demanding environments or it can be deployed in virtualized environments to make administration even easier. The redundant architecture boosts system availability further.

5. Seamless integration
   MicroSCADA X enables seamless integration with other systems through a wide range of protocols and interfaces. It allows you to easily connect and interface with devices, systems and additional applications according to your needs.

6. Scalable and expandable
   The modular solution is scalable and expandable, in order to meet your future needs. Existing systems can be reused in upgrades and extensions. An existing MicroSCADA X system can be easily upgraded to the latest version of MicroSCADA X.

7. Easy to use
   MicroSCADA X is easy to use, anywhere, at any time, thanks to standard user interface technology. A familiar user environment ensures safe and error-free operation. The system can be accessed from local and remote workplaces and also from mobile devices.
Savings through efficient electrical energy management

Electrical energy is a significant raw material in many process industries. It can account for up to one-third of a plant’s variable costs, thus making up a big part of the total cost of the end product. The continuously rising electrical energy price provides yet another good reason to improve energy efficiency through better control of the electrical process.

Complete control and coordination
MicroSCADA X plays an important role in various power management applications, such as reactive power control, load shedding and emergency load shedding. It coordinates and sends commands to the connected IEDs (Intelligent electronic devices) to adjust the parameter settings under disturbance situations or to optimize the electrical system behavior. It also enables you to monitor power losses and identify their causes.

Switch order management the intelligent way
The switch order management function supports planning, simulation, execution and reporting of scheduled maintenance outage operations. The intelligent algorithms automatically optimize the switching sequence to minimize the affected production process.

Through its operation planning functionality, MicroSCADA X allows both automatic and manual switch orders, for instance, to open and close switching devices in the distribution network. You can create switch order documents with user-defined actions based on company-specific templates. The switching planning takes the technical constraints of the electrical network into account, such as voltage drop, disconnector breaking capacity and load level for each feeder. Furthermore, it eliminates damage to the primary equipment and the electrical network during maintenance outages by ensuring correct relay protection operation at all times.

Energy metering shows consumption
Protection and control IEDs offer energy metering functionality. Additionally, separate energy meters installed in the process can measure energy consumption. The data is stored in the MicroSCADA X database, allowing you to optimize the production process and make it more energy efficient.

Having relevant and correct information at the right time is the key to carrying out the right actions in your electrical energy network. MicroSCADA X’s information management functionality offers many advanced tools for the demanding task.

Reports tailored to your needs
MicroSCADA X provides extensive facilities for reporting active and reactive power to summarize the electrical energy consumption and the energy efficiency of the production process. Developed for managing information within electrical energy systems, MicroSCADA X provides correct and relevant information to the plant’s operational management in all situations.

Additional analysis tools are available for evaluating the energy use patterns of all processes and thus identifying areas for improvement. The tools enable major cost savings in all industries, and especially in very energy-intensive processes.

Opportunities for cost reduction are greatest when both electricity consumption and prices vary over time, which is common in the process industries and in an open electricity market environment. The analysis tools clearly indicate the cost of electricity and provide support to schedule electricity consumption for off-peak hours. They enable coordination of electricity purchases and sales with the plant’s own generation capacity, scheduling this generation for peak hours to provide additional cost savings.

Monitoring reveals the condition of components
The intelligent protection and control IEDs provide valuable information about the condition of components, such as transformers, and the whole electrical system. The data is presented for the user and maintenance personnel via the MicroSCADA X user interface. For instance, transformer temperatures can be directly shown on the process display together with other related values such as power, cost, etc.

Faults easily analyzed and managed
Easy access to an event list and disturbance information allows you to analyze different types of faults. Advanced event logging and analysis, including filtering, will help you find exactly the information you need, for instance, to optimize the selectivity scheme of your protection equipment. With accurate time synchronization and time-tagging of events in the protection and control IEDs, MicroSCADA X creates a strong basis for accurate disturbance analysis. You can utilize this data for analyzing the process behavior and taking corrective measures in the primary equipment. In electrical energy systems, MicroSCADA X allows you to directly access parameter settings and efficiently handle disturbance information.

The dynamic busbar coloring function provides you with quick access to information for instance about the powered, un-powered and earthed parts of the busbar as well as voltage drops. Also, alarming objects are visualized. The busbar coloring combined with object control simulation of MicroSCADA X ensures safe and correct operation of your primary equipment.
Take the best possible care of your assets

A system featuring versatile asset management support enables you to extend the lifecycle of your power distribution network and its components. It all adds up to lower maintenance costs and allows you to make the most of your assets.

Asset management for the whole life cycle
MicroSCADA X integrates versatile asset management support during the whole network life cycle. It collects and receives relevant data from protection and control IEDs as well as detailed maintenance and component data, which is stored in the realtime database. All the reports and data can be used when planning maintenance activities and component replacements—also proactively.

More energy efficiency through less reactive power
One way to improve energy efficiency is to reduce the reactive power flow in the power distribution system. Electrical utilities often apply expensive sanctions if the agreed limits concerning reactive power are not followed, for example, if a plant feeds reactive power to the distribution system of the supplying power utility, or uses more power than has been agreed upon.

MicroSCADA X’s reactive power control functionality monitors and keeps the reactive power flow within pre-defined limits in a selected point in the plant distribution network.

Measurement reports present currents, voltages, and active and reactive power in both numerical and graphical formats as, for instance, five-minute or hourly average values. However, with MicroSCADA X, it is possible to design special applications for even better power control. Such applications let you set boundaries for the permitted amount of reactive power while MicroSCADA X continuously monitors the levels, allowing you to take necessary actions in time.

Remote support also available
If you need support running the MicroSCADA X system, ABB specialists can access it through a remote connection and provide you with help in analyzing the network behavior. The remote connection is always set up based on your security requirements and keeping cyber security in mind.

The remote support service also allows you to more flexibly organize maintenance operations.

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The network planning functionality helps you plan future electrical power system expansions. You can utilize your existing assets in the optimum way and make investments according to the technical requirements of the whole planning period to minimize the cost of investment and costs from power losses. When power network construction according to the selected plan has started, the network model can be moved to the real-time database of your electrical power distribution system. You can also start with the network database for off-line network planning and add an on-line electrical power distribution system later using your existing network database.

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Time to buy or sell electrical energy?
MicroSCADA X’s load forecasting function helps you optimize your energy production, purchasing and selling, as well as electrical network configuration. Knowing power production and consumption in real time makes it possible to control the plantwide energy demand and achieve a balance between production and consumption. Additionally, the network reconfiguration function helps you find the optimum state of the electrical network to minimize production losses.

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Utmost reliability and availability
Uninterrupted primary process and dependable operational safety

Providing full and continuous control over the network, MicroSCADA X ensures uninterrupted power supply and distribution. It all results in an uninterrupted primary process and dependable operational safety.

Safety comes first
MicroSCADA X prevents simultaneous operations of primary electrical equipment. It reserves the device (circuit breaker) and verifies whether the selected object (circuit breaker or contactor) can be operated before executing the Open or Close command. Additionally, switchgear inter-locking schemes prevent dangerous operations that might otherwise damage the electrical equipment. Only authorized operators can modify the interlocking schemes.

Using MicroSCADA X minimizes the risk of personnel injuries when performing control actions of primary equipment, such as circuit breakers. MicroSCADA X also prevents operation of primary equipment during maintenance, thus ensuring safety. Notification of ongoing maintenance work can be shown on the system displays and in the control dialog to inform operators accordingly. Remote operation keeps the operator away from possible hazards related to chemicals, heat, dust, noise, moisture, moving parts, etc.

Redundancy ensures availability
Constant system availability is vital. MicroSCADA X supports redundant architecture to enhance availability and increase system reliability. It can work in a redundant mode with two separate servers, one hosting the main application and the other hosting the back-up application. All data is simultaneously updated in both servers. If the main server fails, the back-up one will take over. This redundancy concept can be also applied in distributed and hierarchical systems to ensure redundancy at all levels from communication front-ends to all upper-level servers.

System availability can be further enhanced through redundancy in communication. MicroSCADA X supports redundant communication according to the Parallel Redundancy Protocol (PRP) as defined in the IEC 62439 standard. Using redundant communication improves the fault tolerance and reliability of the communication system. It also enables maintenance of the system during operation.

Advanced system self-supervision
System self-supervision enables the system to always ensure correct information for safe and fast operation. In addition to process data, it facilitates status information about the system, system components and connected process devices (protection and control IEDs, PLCs, etc.), as well as the communication network status. The modular structure and multiple parallel processes in MicroSCADA X ensure that the parts vital to the system are available even if there are failures in other applications.
Cyber security
A large number of cyber security features that protect systems from abuse or vandalism are built into the MicroSCADA X portfolio. Features include, for example:

- User authentication
- Flexible user authorization
- Session expiration
- Communication encryption
- Event logging
- Reporting

MicroSCADA X-based systems can also be equipped with industry-standard malware and intrusion protection solutions, like virus protection and application whitelisting. Cyber security is considered during the whole lifecycle of products starting from the requirements and development phases and throughout the operation phase. New cyber security features are designed to meet and exceed requirements from standards such as IEC 62351, IEEE 1686 and NERC-CIP.

MicroSCADA X meets the stringent security needs of industrial control systems and, at the same time, permits information to be shared between departments and individuals within the company. All users of the system have their own profile that specifies access rights and various user-specific preferences. This ensures that all operations are made with the proper knowledge and authority and that the user interface supports the task in question. Modern security technologies, such as commercial firewalls, ensure continuous system security and prohibit malicious attacks and unauthorized access.

Unique and flexible system architecture capability
A MicroSCADA X-based system can be built in a distributed and hierarchical architecture to form independent sub-systems which further improve availability. This solution also improves reliability as the system can be designed according to various performance and capacity needs.

For example, communication front-ends can be installed in dedicated servers, separated from the main servers. The hierarchical architecture is based on a process data mirroring function that mirrors process data from one system to another. The process data is mirrored between different control center levels and servers without any need for additional signal mapping.

Support for a wide range of communication protocols
In process industries, there is often a need for dedicated systems for process automation and managing power distribution. These two systems must work independently from each other with their dedicated tasks, and yet they need to be tightly and seamlessly integrated to share data such as alarms and events. MicroSCADA X allows you to easily connect and interface with devices, systems and additional applications according to your needs. The system supports an extensive range of standard and de facto standard communication protocols designed both for remote communication with process interface units, such as protection and control IEDs and gateways, and for inter-center communication. Most of the supported communication protocols are available both in master and slave modes.

Open to integration
MicroSCADA X’s powerful interfaces enable efficient integration and mapping of any process data to parallel systems. You can, for instance, easily integrate process automation systems, 3rd party systems and legacy systems through an OPC interface and still operate the network efficiently and safely. For a different kind of reporting, MicroSCADA X offers also SQL export of any data from the database to, for example, Excel or your own reporting tools.

MicroSCADA X SYS600C is the ideal automation solution for all harsh environments in both transmission and distribution substations. As a robust industry grade computer, it has no internal moving or otherwise vulnerable parts and therefore MicroSCADA X SYS600C has a long and guaranteed lifetime. In a robust and compact package it offers proven MicroSCADA X functionality for real-time monitoring and control of primary and secondary equipment.

MicroSCADA X SYS600C software has high scalability and modern architecture enabling easy integration to other systems. Copy and paste function makes it easy to expand the application. This way, the MicroSCADA X SYS600C ensures efficient engineering and system integration. You can enjoy its ease of use as a communication gateway, as a control system HMI or communication server in both industrial control and electrical utility applications.

Pre-configured from the factory.
Delivered from the factory with tested and pre-installed software and a product specific hardening, containing an order-specific configuration. MicroSCADA X SYS600C requires only minimal engineering before installation and commissioning.

Maximum robustness
Guaranteeing long meantime between failures.

Extensive connectivity
Designed with legacy and future connectivity in mind.

Fault tolerant
High availability through critical component reassurance.

Capacity
Simple integration with high capacity.

Designed for critical applications, where reliability is essential
Constant control—anywhere, anytime.
Network planning and diagnosis
the simple way

Advanced simulation and planning tools make it possible to analyze
the state of the network, optimize its usage and achieve savings
in maintenance costs.

A fast and visual overview of the network
MicroSCADA X provides you with a fast overview
of the network with all its lines, switches,
transformers, motors, substations, etc. with the
zooming, panning and de-cluttering functions. It
analyzes the network connectivity and shows the
network status with dynamic line coloring. It
colors looped networks including, for example,
generator feeds, de-energized parts, feeding
main transformers or feeders. Also, there is
upstream and downstream tracing for current
direction analysis.

Analyses reveal bottlenecks and problems
MicroSCADA X includes network analysis
algorithms that work in both radial and meshed
networks, and support distributed generation in
medium and low voltage networks. Network
analysis enables you to check the network state
and find out the location of possible bottlenecks
or problem areas. It includes load flow calculation
in real time with the possibility to use measured
real-time values for motors and generators.

In addition, simulated network switching states
or planned network changes can be used to
analyze fault situations or make worst-case analyses.

Motors in the start-up state and the status of
capacitors can be included in the studies. The
results shown include numerical data for line
sections and network coloring, including loading
rates for cables and transformers.

1-, 2- and 3-phase short circuit currents can be
calculated, and network and switchgear short
circuit capacity can be checked with short circuit
calculations. Also, operation of the protection
scheme in any network situation can be checked.
This includes checks on detection ability, short
circuit capacity and protection selectivity.

Network reinforcement planning made easy
The network planning tool enables you to easily
plan network changes and compare alternatives
regarding technical acceptability, cost of losses
and investment costs for new equipment. The
created alternatives can be stored in the
database to be reanalyzed or fine-tuned.

Each plan includes costs of investment and losses
from the entire study period in net present value
(NPV), a material report, network reliability
indices (SAIDI and SAIFI) (or T-SAIDI and T-SAIFI)
as well as an estimated reliability cost.

Easy to use, anywhere,
at any time

MicroSCADA X features standard user interface technology, making
operation easy, safe and error-free.

A familiar user environment
The user interface and user interaction methods
are based on de facto standard technology and
solutions known from today’s web enabled world.
A familiar environment promotes safe, error-free
and intuitive operations.

Tested for maximum usability
Visual comfort is further enhanced by the
intuitive and consistent operator workplace. This
makes it easy to master the overall harmony of
the various information displays in your Interface,
and get familiar with the system quickly.
Integration of operational descriptions and
instructions in the process display together with
real-time process information adds to efficient
and safe system operation. You can easily
translate your application into your preferred
language using translation tools, and,
furthermore, the system can be operated in
several languages simultaneously.

The user interface has been tested in usability
laboratories and at customer sites in order to
ensure maximum usability. In this way the user
interface supports the user in his tasks and
allows the user to perform the task with high
efficiency and effectiveness.

Accessible regardless of time or place
The system can be accessed from local and
remote workplaces and also from mobile devices
enabling system access regardless of time and
place. This provides high flexibility for operators.

Learn to manage your system in any situation
ABB’s versatile standard course offering and fully
customized training programs enable your
engineers and operators to fully utilize the
MicroSCADA X system. The training courses
include extensive hands-on sessions and well-
documented exercises. As a result, your personnel
will be well prepared both for handling the system
in daily operation, as well as for managing any
type of disturbance situation.
Scale up and expand according to your needs

MicroSCADA X is easy to expand and upgrade according to the changing needs in the plant. Existing systems can be reused, which makes upgrades and extensions easy and efficient.

High system scalability
The MicroSCADA X system is highly scalable, and the same software can be used for low-end single systems up to fully fledged distributed monitoring and control systems. This means that your system server, databases, workstations and communication frontends can be installed either in single or multiple computers.

Expandable with new functions on-line
Thanks to its modular structure, MicroSCADA X can be expanded with new functionalities as new requirements for electrical power distribution evolve. MicroSCADA X is open to system extensions, so additional data points and switching devices can easily be integrated into your existing system at any time without adding new software. Extensions can be executed on-line which will save time and money when expanding the system.

Easy upgrade to a new version
MicroSCADA X features complete backwards compatibility. Therefore any existing system can be easily upgraded to the latest version. This is possible due to the clear separation of the MicroSCADA X software from your system-specific application data. In an upgrade, all the system-specific data and the application can be fully re-used without re-engineering. This means that your existing application will run as it is in the new product version. The re-use of the data minimizes the need for tests, which significantly shortens the engineering and commissioning time.

Power distribution monitoring
Process displays with network coloring, zooming, panning and decluttering
- Geographical network presentation with background maps
- Versatile navigation capabilities
- Dynamic diagrams for detailed network views
- Event, alarm and blocking lists
- Trends
- Extensive reporting facilities
- e.g. measurement, outage and energy reports
- Availability statistics and indices, such as SAIFF (system average interruption frequency index)
- CAIFI (customer average interruption frequency index)
- SAIIDI (system average interruption duration index)
- CAIDI (customer average interruption duration index)
- Historian for high-performance data logging, refinement, analysis and reporting
- Power-quality monitoring
- Language support including several simultaneous operator-specific languages

Fault management
Uploading and analysis of disturbance record files
- Manual/automatic fault isolation and restoration
- Network modeling and connectivity analysis including manually controlled switches, line cuts and temporary earthings
- Network topology and tracing functions (upstream and downstream) with switch state simulations
- Quick and accurate fault location based on fault distance calculation and/or fault indicator data
- Outage reporting and statistics for fault and maintenance outages and reconns.
- Efficient reconfiguration support for minimizing power losses.

Network analysis and operational planning
- Rapid network analysis
- Real-time load flow calculation based on measured or estimated values for motors and generators
- 3-, 3- and 3-phase fault current calculation
- Protection analysis including selectivity calculation
- Motor start-up analysis
- Accurate state estimation and load forecasting for network monitoring, operations planning and contingency analysis
- Advanced operation planning for scheduled outages
- Simulation of switching actions, fault situations and historical events
- Setting of relay parameters

Network planning and documentation
- Versatile network data management and analysis for asset management
- Creating and comparing alternative plans
- Technical constraints (e.g. line overloads and voltage drops)
- Cost of losses
- Investment cost
- Technical analysis
- Reliability indices
- Reliability cost

System platform and architecture
- System supervision
- High performance and availability
- Process data mirroring for hierarchical systems
- Redundant hot standby system capability
- Solutions from compact to distributed system design
- Remote workstations – also web-based
- Standard PC hardware and Microsoft Windows® operating systems

Cyber security
- To answer to requirements from IEC 62351, IEEE 1688, NERC-CIP and more
- User authentication, authorization and session expiration based on roles
- Event logging and reporting
- Communication encryption such as DNP 3.0 Secure Authentication, VPN
- Malware and intrusion protection
- Product hardening, patch management and incident handling processes

Communication and interfaces
- Solution libraries for efficient integration with protection and control IEDs
- Slave protocols: IEC 60870-5-101/104, DNP 3.0 TCP/serial, Modbus RTU, RP710/L, ADLP180, F4F, etc.
- Ethernet redundancy according to IEC 62439/PRP
- Open interfaces: OPC, DDE, Application programming interfaces for application and communication extensions
- Integration with Office applications
- Web services/XML
- Data concentration and signal grouping
- GPS time synchronization