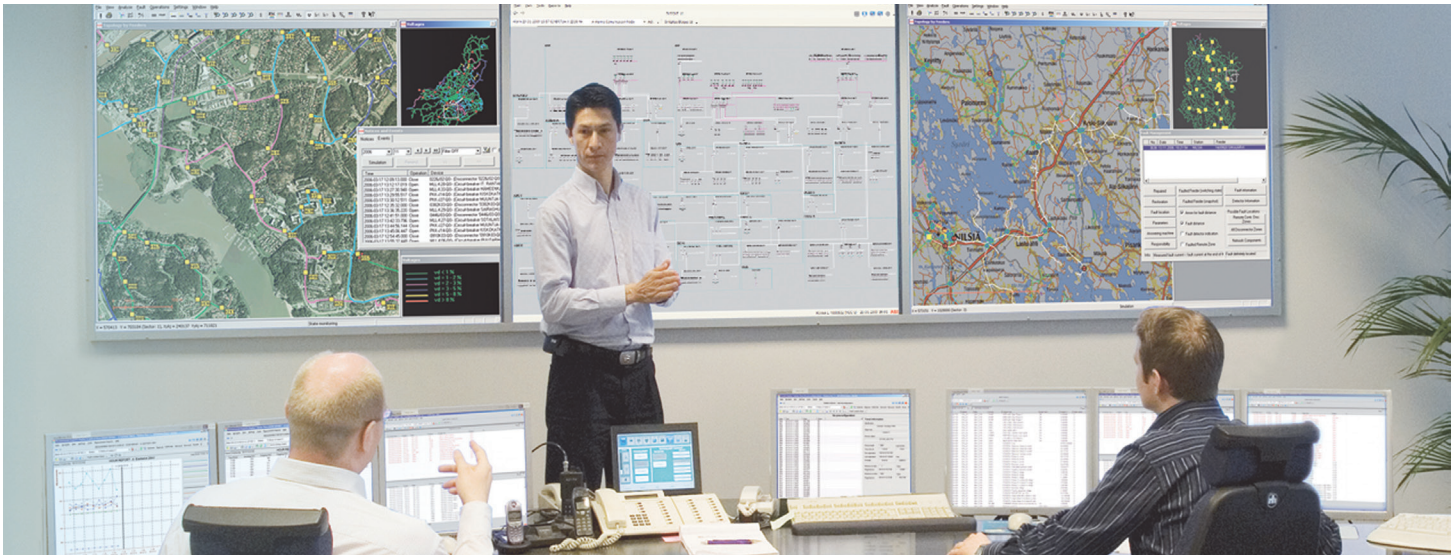


ABB North America

Substation Automation Systems
Innovative solutions for reliable and optimized power delivery

Power and productivity
for a better world™

Substation Automation Systems



Advanced substation automation, protection and control solutions provide the real time performance required to meet today's grid reliability demands, industrial productivity imperatives and energy efficiency objectives

Enhancing or upgrading existing protection and control schemes with state-of-the-art substation automation solutions is an important requirement in an overall process optimization strategy. Deploying advanced technologies, leveraging interoperability, designing a system to meet your needs now - with the ability to migrate to higher level systems as your business demands - are all essential to a successful substation automation implementation.

Utilities and industries across the world are facing increased pressure to deliver reliable, high-quality power supplies at affordable rates and with minimum environmental impact. The need to optimize energy flow in the power system and make the best use of existing resources is increasing. ABB is committed to delivering reliable, flexible solutions, using the most effective technologies to ensure customers achieve maximum efficiency, availability and reliability.

ABB can help you develop a sustainable migration strategy for a step-wise retrofit or ensure successful execution of a whole system upgrade project. Whether system design and engineering, protection and control panels, drop-in control houses, project management, procurement, installation or testing and commissioning, we can improve your operations and help you maximize your return on investment.

Substation automation benefits

Advanced functionality within intelligent electronic devices (IEDs) and developments in communication technologies and architectures provide greater insight and control than ever before. Among the many benefits of an advanced substation automation system, you can achieve:

- Cost reductions in operations, maintenance and service
- Higher productivity and availability of assets
- Improved reliability, reduced outage times and enhanced service capabilities
- Enterprise-wide data integration for efficient power system management, better decision making and information support to smart grid solutions
- Prolonged equipment service life
- Improved support for operations, maintenance and protection engineers
- Sustainable investments into future-proof and interoperable systems
- System openness for hardware and functional extensions
- Reduced station wiring

End-to-end, risk-free project implementation

Close collaboration ensures we understand the unique challenges and priorities for each project. Comprehensive domain expertise enables us to develop the right strategy to achieve automation objectives efficiently and with minimum service disruption. With a dedicated engineering team averaging more than 20 years in substation automation, protection and control, the North America substation automation systems group has considerable technical credentials and extensive practical experience. Couple this with certified project management professionals and a team of field-based project engineers, and our ability to deliver worry-free turnkey next generation substation automation solutions to the market - on time and within budget - is second to none.

Our capabilities

Scalable migration strategies

Scalable solutions supporting DNP3.0, Modbus and IEC 61850 ensure an open and future-proof migration strategy for step-wise implementation. Effective migration strategies must also consider varying life cycles of equipment and allow for selective refurbishment of components to meet operational and financial needs. A sustainable strategy ensures smooth transition to new technologies and provides you with the system openness needed for hardware and functional extension as well as connectivity to other systems within the “smart grid” or simply within your own enterprise.

Design and engineering

Consultation is essential to developing the optimal specification for a cost-effective solution that considers all operational, maintenance and asset management requirements. Our highly skilled protection and systems engineers are regularly trained on state of the art technology as well as tools supporting both ABB and non-ABB hardware. This training and technical proficiency ensures that you receive the best multi-vendor and multi-generation system integration in order to fully exploit the capabilities of the deployed devices, and provides best-in-class engineering for reuse and extension. Our design deliverables are compatible with a variety of CAD systems, are highly flexible and are adaptable to different engineering drafting systems.

Quality control and quality assurance

ABB is ISO 9001 certified, assuring a high level of quality at all levels of the process. Routine tests are conducted on all hardware, software and delivered systems to ensure the highest quality project delivery. Additionally, our systems verification center validates IEC 61850 compliance when required, enabling seamless future migration of your systems.

Project management

Delivering projects on time and within budget is critical to your success, and ours. Our project managers apply established and proven project management methodologies and best practices to deliver the most efficient and timely project implementation.

Procurement

As a global supplier of power products and systems, we have direct access to the most technologically advanced hardware and software. In the case of 3rd party equipment, as a global buyer we have standing agreements with all major suppliers and our supply management strategies ensure we enjoy the fastest delivery and competitive prices in accordance with the highest quality standards

Installation and site supervision

You can have confidence knowing that the team involved with the design, engineering and systems verification of your project will be on-site to supervise the installation. Their in-depth knowledge of your requirements and understanding of your solution ensures timely and accurate installation and compliance with a pre-agreed site acceptance test (SAT) plan. We’re right by your side throughout the process.

Testing and commissioning

Following installation, ABB system engineers supervise the commissioning process in accordance with the accepted SAT plan, ensuring the system is taken into service efficiently.

Post-installation service and training

We offer varying levels of post installation support. From simple support line access to complex multi-year post-delivery support agreements typical of larger projects, there is a service option to fit your needs.

Engineered substation automation solutions from ABB





Substation Automation (SA) and small SCADA systems

There are more than 500 ABB engineered SA and small SCADA solutions operating in the U.S. today

– SA systems integrating ABB and non ABB IEDs provide a human interface to the process for control, monitoring and logging of events. These systems support varying system architectures and data buses. Further, they provide cyber security compliant communication with other control systems over OPC or other open protocols.

– Small SCADA systems access IEDs and RTUs from a number of distribution substations or a small or medium sized electrical network through radio, fiber-optic or other communication pathways to provide distribution automation functionality. Advanced distribution management features such as load control, demand management and GIS overlay are also available with a small SCADA system.

Distributed SCADA systems for industrial plants (MV and HV substations)

Electrical substation automation systems covering the electrical network of a large industrial plant includes features such as load shedding, load sharing, IEC 61850 based IED integration and communication with plant DCS.

Remote Terminal Units (RTUs), Gateways and local HMIs

These devices, or subsystems, concentrate data using a variety of substation hardened hardware. Upstream communication is achieved with industry accepted open protocols that support secure long distance communication.

ABB offers complete remote terminal unit packages with the requisite cubicles, binary input and output units, GPS time synchronization modules and various types of communication modules providing a discrete wired or a modern gateway solution capable of passing information and control signals back and forth to the remote control center. Various protocols including IEC 61850 are supported and the systems are provided with optional web based HMIs and PLC logic capability to handle complex applications.

Vendor-neutral IED integration into SA systems

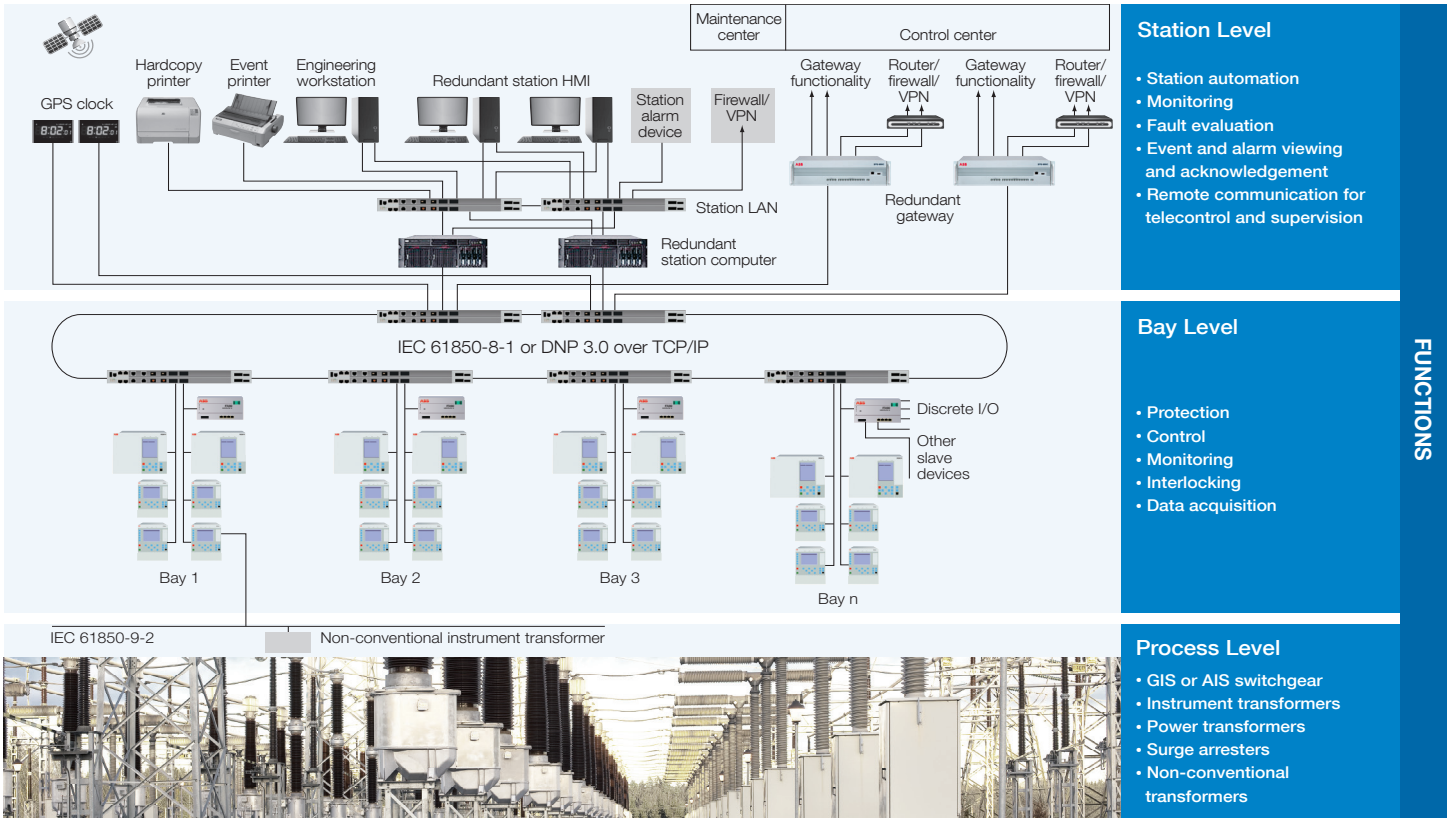
ABB has extensive experience delivering SA systems using customer specified IEDs and data buses. Many references attest to our skill in integrating these third party devices with hierarchical ABB systems to provide customers real value in using the extracted information from the specified IEDs.

System protection schemes

These special protection schemes are a combination of many IEDs, fast and secure device communication and localized control options. Such schemes require optimized implementation of customer specific logics, inputs from a variety of sources and redundancy, resulting in even higher reliability in most cases.

Drop in control houses

A growing trend in substation control and protection is a pre-fabricated drop in control house. These drop in control houses are factory tested, installed and commissioned much faster providing a shorter project time line, much higher reliability and a single point of contact for all parts of the control house.



IEC 61850 architecture

IEC 61850 system architectures

ABB is an active participant in the development of IEC 61850 and has been a pioneer in its implementation with hundreds of successful implementation references worldwide. ABB provides products, systems and tools to integrate ABB's advanced IEDs, as well as other third party compliant IEDs, to provide a state of the art IEC 61850 architecture.

Synchronizing panels and high speed bus transfer schemes

Typically supplied for large and medium sized generation plants (both new plants and as a retrofit to aging power plants), these systems provide secure, automatic and manual synchronizing options for generators. High speed bus transfer systems ensure surge free transfer of incoming power to large inertia motors in power plants and assure mechanical shaft protection.

Conventional control and relay panels

Provided both for new stations as well as retrofit, these panels house relays, control and monitoring equipment in enclosures. Devices are mounted, wired and tested to approved designs. Enclosures meet various NEMA/IP requirements and are dead front, duplex, open rack or rack mounted/swing frame type designs. ABB can offer its own standard panel designs or work on customer specified options.

Wide area measurement solutions

To ensure system stability in a heavily loaded system, all or most installed components should remain in service and the right actions must be taken quickly in the event the system has not recovered after a serious event. ABB has developed highly accurate technology working in close collaboration with knowledgeable customers and subject matter experts at a number of universities. This technology was developed with ABB's expertise and by utilizing a decade of experience in applying microprocessors for relaying and control. The technology covers both phasor measurement units (PMUs) as well as systems including data concentration and application software.

Markets served

Our successful implementation of thousands of substation automation projects has given us the knowledge, experience and competence to deliver state-of-the-art solutions to energy producers, transmitters, distributors and consumers alike.

Areas of specialization:
– Power plants
– Electrical grids
– Industry
– Wind
– Solar
– Hydro








Leadership, innovation and experience - our commitment to you

The ABB Group of companies operates in around 100 countries and employs about 130,000 people. We are a global leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. Technology is foundational for ABB and R&D fuels our innovation. With seven research centers, 6,000 scientists and 70 university collaborations across the world, we are working to develop unique technologies and solutions that make our customers more competitive.

This global experience and resource depth enables ABB to help North America customers define and create a system architecture that delivers the key components of a modern electrical system appropriate for their unique operational needs and economic constraints. We deliver advanced protection and automation schemes faster with solutions engineering and testing throughput using an error-free, optimized and documented process. This results in lower life cycle costs, provides customers various lifetime support options and guarantees our engineering team stays ahead of the technology curve in both implementation and reliability.

Contact us

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