Symphony Plus
S+ Operations
All information, in one place, presented for swift and prompt action. It’s time to sit down and take total control.
Operator effectiveness is fundamental to a plant’s performance. However, with fewer plant operators, a generational shift in the operator workforce, and increasing complexity of plant operations, it is becoming ever more challenging. Symphony™ Plus, with its intuitive, easy-to-use human machine interface (HMI), leads operators to greater awareness, faster response and better decisions.

S+ Operations is designed for high performance in every aspect involved: human machine interface, integrated operations, seamless life cycle management, information management, alarm management, security, process optimization, and with flexible, scalable fault-tolerant design.

**Designed for high performance**
S+ Operations provides operators with distraction-free state-of-the-art process information and access.

**Integrated operations**
S+ Operations seamlessly integrates all plant devices and systems.

**Seamless life cycle management**
S+ Operations allows for seamless and incremental integration of new products, technology and functionality without the time and expense of re-engineering and retraining.

**Information management**
S+ Operations transforms data into meaningful information and presents it in intuitive user-specific desktop displays for real-time business decisions.

**Alarm management**
S+ Operations’ superior integrated alarm management system includes the industry’s leading EEMUA 191-compliant alarm management analysis system.

**Security**
S+ Operations provides users with a secure and reliable operations environment with built-in security features.

**Process optimization**
S+ Operations combined with OPTIMAX® optimization applications improves overall plant productivity.

**Flexible, scalable fault-tolerant design**
S+ Operations’ unique system architecture is easily adapted to any power or water application.
S+ Operations
Improving operator effectiveness

**Designed for high performance**
S+ Operations provides operators with detailed well-arranged process overview displays. Direct access navigation leads to information-rich control faceplates, superior trending capabilities in accordance with VDI/VDE 3699 Part 4, EEMUA 191-based alarms, and various reports.

State-of-the-art graphics with intuitive control faceplates provide for well-arranged and detailed displays of any control point in the plant. Favorite places, history lists, short cuts and hot buttons facilitate quick and easy navigation through the power or water facility. Workplace layouts are adjusted and optimized according to the user’s needs and preferences. These workplaces are optimized to individual preference and access rights based on user log-in. Windows management functions, such as safe areas, pinning and stacking, prioritize the presentation of important material.

Direct and seamless cross-navigation between operation displays and engineering documentation provides users with the ability to easily troubleshoot any control loop or process area.

S+ Operations’ reports are easily adaptable to the specific requirements of a plant, including customized reports using Microsoft Excel.

S+ Operations gives even the most complex installation and process the operational simplicity needed for the efficient administration of the plant. This is the way that every modern industrial process deserves to be controlled – with such speed, simplicity and proficiency to defy the multi-layered complexity of the events taking place and the equipment controlling them. There is no better way to boost operational excellence.

**S+ Operations provides operators with distraction-free state-of-the-art process information and access**
- State-of-the-art graphics
- Intuitive, information-rich control faceplates
- Operational simplicity
- Distraction-free display
- Personalized workplaces
- Strong reporting functionality
- Easy configuration
- Superior trending capabilities according to VDI/VDE 3699 Part 4
- EEMUA 191 and ISA SP 18.2 alarm and events
**Symphony Plus**

**S+ Operations**

Protecting previous investments

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**Seamless life cycle management**

ABB’s goal is to help its customers improve operational performance, and at the same time get as much value out of their existing investment as possible.

S+ Operations provides for easy and seamless upgrades to the latest software. Installation of S+ Operations workstation upgrades can be performed online and in parallel operation with the existing HMIs. Additionally, the existing console database and graphics can be directly reused in S+ Operations. This allows for the continued use of the existing knowledge base without retraining, and avoids production loss during the upgrade process.

ABB’s software management program, Automation Sentinel, is one of the most efficient ways to get the most value out of installed ABB control system investments. It protects past, present and future automation investments. This innovative software management program helps users keep their automation software current and provides them with an incremental and cost-effective evolution path to the latest S+ Operations software.

**S+ Operations allows for seamless and incremental integration of new products, technology and functionality without the time and expense of re-engineering and retraining:**

− Manages life cycle costs
− Upgrades according to own timetable
− Preserves process graphics and operator knowledge

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**Integration**

S+ Operations provides a broad view of the plant by integrating data from all plant areas and systems, including turbine control, electrical balance of plant and remote SCADA systems. Through its open architecture, S+ Operations flawlessly consolidates and rationalizes plant data to improve operator response to changing conditions, resulting in increased plant safety and uptime.

Through integration of traditionally isolated plant devices and systems, S+ Operations extends the reach of the automation system to all plant areas. S+ Operations integrates perfectly with Symphony Plus controllers, but can also be used with other ABB control families as well as third-party standard interfaces. The result is a simplified view of the entire plant.

Traditionally disparate plant systems and device data are easily accessed. The resident information is used by control strategies and higher level applications to produce tighter, more reliable process control solutions.

The open architecture design reduces life cycle costs by simplifying the task of integrating plant systems and devices. Additionally, the useful life is extended as the open architecture allows the easy integration of new off-the-shelf applications and products.

**S+ Operations seamlessly integrates all plant devices and systems**

− Total plant automation
− Perfect integration of heterogeneous systems
− Open architecture

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**System architecture overview**

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**S+ Operations**

*Simple and flexible system architecture*

**Scalable fault-tolerant design**
S+ Operations’ unique system architecture provides flexible and scalable configurations for small, medium and large applications.

S+ Operations provides server-less as well as server-based solutions. This flexibility makes adapting to evolving needs an easy step. With all existing data remaining untouched, the switchover to the extended system is easy and virtually seamless. The expense of becoming accustomed to the ‘new’ system is minimal: operator panels and well-established workflows remain the same.

For server-based applications, the architecture can be expanded over multiple levels in a hierarchical structure; fitting perfectly to SCADA requirements of geographically distributed applications. For instance, consider a photovoltaic solar power plant whose coordinated control of thousands of solar panels over several square kilometers requires remote data collection from trackers, meteorological stations, inverters, string boxes, transformation centers, and substations. S+ Operations does this effectively through a hierarchical architecture based on front-end and concentration servers. Front-end servers are used for data acquisition, while concentration servers are used to store and forward data to remote operation centers using firewall-friendly TCP/IP protocols. Multi-redundancy at all levels prevents data loss, while preserving full functionality and performance.

As a windows-based, web-enabled HMI, S+ Operations provides its information integration and user navigation within a standard Microsoft Windows™ environment. Remote client options include a pure thin client based on Internet Explorer.

**S+ Operations unique system architecture easily adapts to any power and water application**
- Server-less architecture
- Server-based architecture
- Easy migration
- Perfect integration with heterogeneous systems
- Easy configuration and scalability
- Real-time database
- Multi-master architecture
- Hierarchical architecture
- SCADA architecture
- Segregated or combined architecture
- Every desired level of redundancy possible
Implementing and maintaining a secure and reliable control environment with minimal effort and time is a challenging mission faced by all plant operators and personnel today. ABB actively participates on several major control system security standards committees including FERC, NERC, ISA, IEC and ISO. These committees provide security guidance in the form of system documentation and guidelines for every phase of the product and project development process. With this in mind, Symphony Plus has been designed with inherent security features in all core functional areas, including S+ Operations, to protect the integrity and reliability of system operations.

Based on the IEC 62351-8 security standard, S+ Operations defines rights and roles for a user or user groups with very fine granularity. Sophisticated authorization and access control provide a tight guard against unwanted activities.

The log-over function enables a fast and temporary switch between users in a running workplace, and the built-in configuration change management allows easy comparison and the virtually risk-free deployment of different configurations. The system also maintains an audit trail of changes made to process settings as well as configuration changes.

S+ Operations provides comprehensive diagnostic displays to present the health of the process and control system. In addition, system hardening is easily deployed to protect servers, workstations and supported network equipment.

Total and selective ‘backup and restores’ are possible through the system administration features. System nodes are replaced easily by deploying all original software and configuration data to the new replacement node.

ABB evaluates security updates from third-party software such as Microsoft, McAfee and Adobe with respect to relevance to and compatibility with Symphony Plus. All relevant updates are validated within seven days.

ABB fully understands the importance of cyber security and its responsibility in advancing the security of industrial automation and control systems. As our customers invest in new ABB technologies, they can rely on system solutions where reliability and security have the highest priority.

S+ Operations provides users with a secure and reliable operations environment with built-in security features

- User authentication
- Role-based access control
- Event logging/audit trails
- Backup/restore
- Hardened hosts
- Host firewall configuration
- Antivirus
- Network zones
- Security patch validation

Username
Password
Log on
Information management

Information is a key asset in business today. To achieve a sustainable competitive advantage, utilities must be able to adapt quickly to change. Reduced time to decision and action is critical to improving quality and productivity. The timely collection, transformation and distribution of reliable information is a significant issue.

Easy and flexible data access is essential for all operational and business decisions. All users, including operators, managers, engineers and maintenance supervisors, have unique requirements and viewing preferences for information. S+ Operations’ integrated information management provides support at every organizational level to improve efficiency and profitability.

S+ Operations removes barriers and transforms data into meaningful information, presenting it to all users in easy to understand user-specific formats.

In order to enable each user to work as efficiently as possible, S+ Operations has been designed to provide maximum flexibility and easy utilization.

S+ Operations provides the possibility to view real-time data and historical information simultaneously in one display. The practical advantages are seen when looking at trend curve values: users step through information over time without having to move from a real-time system to a separate historian.

Additionally, data is accessed from multiple history servers and other systems and combined in comprehensive displays - aggregating analog as well as digital trend data.
S+ Operations is based on ABB’s long and extensive experience in the power generation and water industries. It has been designed to simplify plant management procedures by presenting all important information from anywhere in the enterprise on cross-site and cross-plant information platforms.

It provides the ability to collect and securely store business and process data from all plant sources. This data is then analyzed and transformed into useful information and presented to the users to improve efficiency and profitability.

Desktop displays give managers concise, enterprise-wide information in familiar Microsoft® Office formats, without having to leave their desks. A discrete tag ticker, continuously showing key performance indicators (KPI), can be supplemented with a trend display when more information is required. While operator displays provide information in the control system environment, these displays are able to seamlessly present both real-time and historical trend data as well as alarms and events.

Sophisticated reporting functions draw on all current and historical process information that is retrievable from S+ Operations and other information systems. Reports are easily configurable to the specific needs of a plant, including customized reports.

S+ Operations includes ready-made templates for:
- Instantaneous value reports
- Sequence of events (SOE) reports
- Alarm messages, status messages, operator interventions
- Filtering by priority, plant area, etc
- Operation reports (shift, daily, monthly and yearly)
- Status reports (plant snapshots)
- Trip reports
- Maintenance reports

S+ Operations transforms data into meaningful information and presents it in intuitive user-specific desktop displays for real-time business decisions
- Seamless view of real-time and historical data
- Historical data from all plant sources
- Sophisticated presentation module
- Perfectly integrated into operator station
- Direct and quick access of historical information and real-time data
- Real-time database with millisecond resolution
- Clearly arranged event history display with integrated trend data graphics
- Data display via full clients and Web clients
- Discrete tag ticker for KPIs
High-quality alarm system

**Alarm management**
A high-quality alarm system is an essential tool for operators to run a plant safely and efficiently. But in many plants, modern devices and systems generate all types of alarms too easily, which unfortunately leads to a flood of alarms and overwhelms the operators’ cognitive capabilities.

Alarm rates that are constantly too high distract operators, decrease vigilance, lower awareness and overload the operator’s short-term memory.

S+ Operations’ advanced alarm management system provides all the necessary instruments for efficient and stringent alarm management. The EEMUA 191 and ISA SP 18.2-compliant alarm analysis tools help users to categorize occurring alarms, while the integrated alarm management system keeps operators focused and undistracted, allowing them to act with confidence. Clear and instantly available alarm-related information extends the possibilities to respond swiftly and correctly, which helps avoid costly downtime.

S+ Operations improves the operators’ capability to detect and respond to abnormal situations. For example, S+ Operations supports the implementation of high-performance alarm management strategies with features such as alarm grouping, filtering, inhibiting, shelving, and suppressing.

S+ Operations’ alarm management functions lead to alarm statistical analysis and advanced alarm reports. System management of alarms includes priorities and groups, in which groups are organized and viewed in hierarchical structures. S+ Operations supports remote alarming through standardized server and client communication.

**S+ Operations’ superior integrated alarm management system includes the industry’s leading EEMUA 191 and ISA SP 18.2-based alarm analysis system**
- Advanced alarm management analysis
- EEMUA 191 and ISA SP 18.2-compliant alarm analysis
- Alarm grouping, filtering, inhibiting, shelving, and suppressing
- Alarm statistical analysis and reports
- Remote alarming
**S+ Operations**

**Process and asset optimization**

**Performance monitoring**

There is strong pressure on today's businesses to maintain a high level of productivity. This requires a clear asset management and maintenance strategy to increase asset availability and performance, while maximizing operations and maintenance effectiveness. The key to reducing these costs is knowing what needs maintenance and, just as important, what does not.

S+ Operations combined with S+ Optimization's OPTIMAX® suite improves overall plant productivity and lowers maintenance costs by monitoring short-term and long-term degradation of plant equipment. Within S+ Operations, performance summary displays and detailed plant component displays are only one-click away and alert personnel how current operating conditions affect overall performance. The OPTIMAX suite includes specialized performance monitoring packages for the boiler, turbine, and related equipment in the power plant, RO (reverse osmosis) membranes in desalination plants, and water leakage detection in water infrastructure networks.

**Streamlined maintenance**

Asset performance alarms alert operators to degrading performance, while S+ Operations’ integration with maintenance management systems (CMMS), such as SAP PM, allows for easy communication and navigation to asset-specific maintenance activities. Through S+ Operations, operators can easily create and submit new work orders or review status of existing work orders maintained in the CMMS system.

Additionally, S+ Operations provides alternatives to “paper” shift logs with its Shiftbook and electronic shift log options. Using these functions, shift changes are automatically noted in the operator shift log with open work actions passed on to the next shift “To Do” list (covers all shifts).

All together, these features reduce the plant’s maintenance costs by moving toward condition-based maintenance and streamlining operation and maintenance work interactions.

**Plant optimization**

Optimizing asset performance requires information that is accurate, timely and actionable. Having this information leads to better decisions: whether to buy or sell power or fuel, to start or stop a unit, to replace equipment, or to perform preventive maintenance.

ABB provides a suite of plant optimization solutions that enable power and water plants to run at maximum efficiency while balancing the trade-off between revenues, life cycle costs and emissions. ABB’s OPTIMAX suite consists of decision-support tools that continuously assess plant conditions and provide root cause analysis in case of deviations. OPTIMAX advanced process control (APC) solutions reduce emissions by optimizing combustion, shortening boiler startup times and improving coordinated boiler-turbine control and unit frequency response.

S+ Operations combined with OPTIMAX suite improves overall plant productivity

- Direct access to real-time and historical data
- Perfect integration with maintenance management systems
- Facilitates proactive and predictive maintenance
- Streamlines work processes

17 Maintenance is the largest controllable cost in business today

18 Water infrastructure performance displays
Electrical system integration

Electrical integration allows industrial and utility processes to be run at a higher level of availability and energy efficiency, and provides for a reduction of operational and investment costs.

A large step forward in terms of simplifying the integration of electrical systems has been taken with the introduction of the IEC 61850 standard.

S+ Operations provides native MMS communication with IEC 61850 IEDs in order to acquire and display typical measurements relevant to the electrical integration: three phase current, voltage and all protection values.

Direct native communication within S+ Operations represents an easy and fast solution that reduces the cost of the application and makes S+ Operations an integrated IEC 61850 device.

Moreover, S+ Operations allows full control of the electrical structures, modelling the most relevant power system applications. Our offering includes all relevant bay models such as transformer, generator, incoming, measuring, outgoing, busbar, variable speed drive and motor bay.

Electrical data and bay models have their own graphic representation on S+ Operations HMI, providing high level integration functions that enable the operator to:
- Create the proper links between electrical and process objects
- Support complete navigation from process to electrical views
- Group electrical data in the faceplate of the bay to which they belong
- Represent electrical equipment (circuit breakers, switches, etc.) in terms of the complete set of signals and conditions acquired via IEC 61850

S+ Operations provides electrical and process operators with an ergonomic environment that offers process graphics in line with the users’ expectations, and which enables them to explore different aspects of the application either during normal plant operations or fault diagnosis.

S+ Operations is an integrated IEC 61850 device
- Complete view and control of electrical integration devices
- System architecture that increases the efficiency of plant engineering and operation
- Comprehensive visualization of the production processes
- Maximized production results and quality
Integrated geographical information system
To meet the needs of distributed automation and improve the performance of wide area applications like photovoltaic plants, hydropower stations, wind farms, and water distribution networks, S+ Operations offers an integrated geographical information system (GIS) for easy and immediate access to all site assets, both local and remote.

S+ Operations’ integrated GIS features enable the user to surf and navigate over a map of the entire plant or network. S+ Operations’ preconfigured GIS layers allow for the interactive panning, zooming, and de-cluttering of spatial information. Seamless association with its DCS objects such as tags, alarms, graphics, etc. allow for simple “one click” navigation between the GIS and DCS environments. Thus, by zooming in on a specific module or unit of the process, the user can readily obtain real-time and historic data on that particular asset. This reduces the time required for spatial investigations and improves the overall supervision, operation, and management of the process by providing faster and easier access to the operating values of each asset, regardless of its location.

The GIS features are an inherent extension of the S+ Operations HMI. It does not require additional 3rd party GIS software nor is it bound to any specific geo-map vendor, thus offering affordable GIS visualization for small applications such as SCADA applications. Engineering is simplified through the use of preconfigured GIS layers and symbols.

Utilities that have an installed GIS system to manage their decentralized and geographically distributed infrastructure can reuse their existing data within ABB’s S+ Operations’ GIS. A clear data separation strategy based on an extendable data model eliminates the risk of interfering with a user’s existing GIS infrastructure. However, custom integration scenarios are also possible. To comply with the stringent security requirements in the control room, S+ Operations’ GIS offers a fully offline GIS solution (without any need for Internet access) and can work with the user’s own background maps (street maps, satellite imagery, etc.). Additionally, S+ Operations’ GIS solution also fully supports background maps from popular providers such as Google Maps™ and Microsoft Bing™ Maps as well as a combination of locally hosted and internet-based geo-data layers and maps. The offered flexibility makes S+ Operations’ GIS an ideal choice for large and small installations.

S+ Operations integrated GIS leads to faster and better informed operator decisions
– Visualization of geographical information from GIS in the operational environment
– Cross navigation between S+ Operations’ alarms and tags and GIS objects
– Combine temporal and spatial representation of data in GIS
– Pre-configured GIS spatial layers
**S+ Operations**

Simple, scalable, seamless and secure

S+ Operations is designed to provide users with the most advanced, the most efficient and - at the same time - the most simple operations system on the market.

Outstanding flexibility, scalability and reliability are provided by S+ Operations’ unique system architecture. Integration of all plant assets and evolution from the installed HMI is easy and seamless.

S+ Operations’ information management features provide detailed and clearly arranged displays of all plant data, including real-time information and historical data. Detailed and intuitive trend displays and flexible reports present pertinent, easy to understand information to all levels of the organization.

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<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Simple and flexible system architecture/structure</td>
<td>Low investment and low maintenance costs</td>
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<tr>
<td>Large-scale networks possible</td>
<td>Expandable when needs evolve</td>
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<td>Flexible - for single and multi-system facilities</td>
<td>Adapts to any requirement - even the most demanding</td>
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<tr>
<td>Server-less and server-based installations possible</td>
<td>Adapts to any requirement</td>
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<td>Miscellaneous data from multiple servers seamlessly integrated in one display</td>
<td>Saves time, effort and human resources</td>
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<td>Any requested redundancy possible</td>
<td>Provides the maximum system stability and reliability</td>
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<tr>
<td>Easy modification and expansion of configurations</td>
<td>Protects existing assets as the business evolves</td>
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Detailed and clearly arranged faceplates and displays simplify operator interaction for more reliable control. The advanced alarm management tool, including an EMMUA191-compliant alarm management analysis system, leads to greater awareness, faster response and better decisions.

S+ Operations’ embedded security features ensure complete system integrity. Optimization tools are only one click away. OPTIMAX optimization application suite is easily integrated for superior plant efficiency.

S+ Operations satisfies customers by combining excellent technical features with outstanding economic benefits. All in all, S+ Operations drives effective operations with complete plant information and sustains profitable growth by transforming data into actionable business decisions.

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<th>Features</th>
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<tr>
<td>Active (real-time) data and historical information fully integrated in the information management system</td>
<td>Provides quick, easy and seamless access to all stored data from a single system</td>
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<td>Short-time historical data stored at every workstation</td>
<td>Enables a quick overview of the evolution of situations; gives the time and opportunity for correct decision-making</td>
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<td>Dedicated historical data servers</td>
<td>Guarantees data consistency under all circumstances</td>
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<td>Detailed human machine interface</td>
<td>Delivers intuitive, clearly arranged workplaces and direct access to all details</td>
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<td>Utilizes Web standards</td>
<td>Allows utilization of standard software and hardware</td>
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<tr>
<td>Perfect basis for ABB optimization tools</td>
<td>Facilitates proactive and predictive maintenance</td>
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