Industrial IT Extended Automation System 800xA
High integrity automation solutions for continuous productivity improvements
You’re under more pressure than ever before to run your operation profitably – to achieve greater results with fewer resources. In the past, optimizing process control defined excellent performance. However, with changing market demands requiring faster turnarounds, greater customization, smaller lot sizes, and lower overall cost, production gains through process control improvements are not enough to guarantee success.

In today’s fast paced global economy, competitive advantages result when a company can tap into its assets’ unused productivity safely and effectively to meet changing demands. With the Industrial IT Extended Automation System 800xA, ABB provides you with the technology and solutions needed to achieve a sustainable competitive advantage by enabling your plant to perform smarter, safer, and better at substantial cost savings.

Have you achieved operational excellence?
Operational excellence results when continuous improvement strategies, in conjunction with real-time feedback and analysis tools, maximize production or safety asset availability, optimize quality, and ensure predictable and appropriate plant performance. You face daily operational issues: How quickly do you react not only to process upsets, but changes in demand or product mix? Is the right information available to the right people in a usable format, or must they search several different systems to gather the data? Are you overspending on preventive maintenance? Are you constantly reacting to equipment failures rather than proactively identifying poor performers? Does your end product consistently meet quality standards? At ABB, our tools...
provide more than a one-time improvement in performance, but continue to meet the challenges you’re faced with on a daily basis. With System 800xA, the result is ongoing improvement in your overall productivity and profitability, ultimately leading you to operational excellence.

Setting the gold standard of automation
Industrial IT System 800xA extends the reach of traditional automation systems — beyond control of the process — to achieve the productivity gains necessary to succeed in today’s business markets.

For the first time, this scope is accessible from a single user interface that is configured to present information and provide interaction in a context appropriate to all user disciplines.

Extended Automation objects created within the engineering environment provide a foundation for the efficient development, deployment, reuse, and continuous improvement of production and safety applications with predictability unattainable from other automation solutions.

Protecting your investments
System 800xA is the latest installment on ABB’s 20+ year commitment to our DCS users. Our pledge of Evolution through Enhancement ensures that future advances in systems technologies will enhance rather than compromise your current investments. With System 800xA, you have the ability to extend the automation reach of your present system to enjoy new levels of productivity. The 800xA system provides the flexibility to implement the functions you require today and the agility to add others as needs evolve. Where others promote “rip and replace” migration strategies, we deliver true system evolution, allowing you to build on your strong DCS foundation.

Compounding value throughout the enterprise
System 800xA’s unique operating environment allows you to incorporate ‘best in class’ products, applications and services from the world’s largest automation supplier. Built on the Industrial IT Aspect Object™ technology platform and industry specific expertise, ABB’s automation portfolio provides the seamless link between process, safety, and business management to deliver knowledge based solutions.
Personalizing your view—Integrate your operation for increased productivity

Knowledge is the most precious commodity in business today. Are your operators performing non-routine work processes consistently? Does your maintenance department know what equipment performance is degrading, and why? Do your engineers know what process loops are underperforming, and why? Do your managers know where production losses are occurring, and why? With data originating from a variety of devices and systems, the plant is teeming with information. The challenge, however, is having the information available in the proper context at the right time, in the right form, and to the right people.

Informed decisions through personalized workplaces

The growing deployment of peripheral applications related to productivity improvement vastly increases the amount of data available to improve productivity in the plant, utility, or mill. Yet, without the proper context, plant personnel can be exposed to information overload.

Unique to System 800xA is its ability to gather information from multiple plant sources and transform it into relevant information for a diverse set of users such as maintenance technicians, process engineers, production managers, or plant operators. For example, operators require an environment to allow them to run a plant in a safe way and produce products in required quantity and quality. Operations managers require an environment to let them know what is the return on investment, risk, uptime, and production and maintenance costs at any given time. Engineers need an environment that will allow them to implement a specification change into their running plant in shortest time with lowest cost at the lowest risk. Maintenance and service personnel need information to ensure maximum availability of plants and applications.
Fully integrated system improves plant productivity
Removing the barriers of traditional distributed control systems, System 800xA supports the platform, application, and professional service needs of total plant management and control.

System 800xA dramatically improves plant-wide productivity through the following powerful, integrated core functions:

Operations
Process Portal, the industry’s most intuitive system interface, provides a consistent method for accessing enterprise-wide data and for interacting with multiple applications from any connected workstation in the plant or office.

Engineering
Integrated engineering environment efficiently supports the complete lifecycle of the automation project, from planning, through configuration and library management, to commissioning and operation to minimize system ownership costs.

Safety
A complete, scalable IEC 61508 and IEC 61511 compliant SIS (Safety Instrumented System) that spans the entire safety loop, including SIL rated field devices, I/O modules, controllers, and field actuators. Powerful system functions as well as operator and engineering tools reduce plant risk through management of the human factor.

Information Management
Powerful information management software collects, stores, retrieves and presents historical, process and business data to enhance the usefulness of data from all operations.

Production Management
Production management and optimization increased productivity tools provide the agility, speed, and control needed to respond to increasing production demands by modeling, executing, and tracking information associated with material and control flow across the plant.

Asset Optimization
Asset optimization software exploits the wealth of plant resident information to assess and report equipment conditions in real-time to reduce costly corrective and preventive maintenance and optimize maintenance and calibration workflows.

Control and I/O
Comprehensive suite of standards-based hardware and software meets the needs of total plant control. Controllers are complimented with a full line of industrial I/O interfaces to meet all plant environments.

Device Management
System 800xA integration of intelligent field devices via all fieldbus standards lowers lifecycle costs through significant cost savings in the design, implementation, and operation of field equipment.

Extended functionality doesn’t necessarily mean “large.” System 800xA provides you the flexibility to start small by implementing the functions you require today, and the ability to add others as your needs dictate.
Reducing time to decision and action

The 800xA Extended Automation System delivers the exact information – filtering out the noise – to facilitate consistent, sound business decisions and provides the environment to optimize the associated response.

The enabling technology for this data access, storage, and management is ABB’s patented Aspect Object framework. Aspect Objects relate all of your plant data, the Aspects, to specific plant assets, the Objects.

The headache of locating information spread between different people, locations, computers, and applications is over. Contextual navigation presents the entire production facility in a consistent, easy to view fashion. This allows a single window environment to include smart field devices, asset optimization functions, information management, batch management, safety systems, and MES (Manufacturing Execution Systems) applications.

In other systems, data is presented without user context. This means that every user must evaluate and understand the same sea of data, and then root out the decision criteria before taking action. With 800xA Process Portal, each user’s login defines the type and class of information required for timely and informed decision-making. Thus, System 800xA delivers much more than an operator console; Process Portal provides an intelligent and focused presentation, enabling rapid response.

Optimal reaction requires real-time knowledge that an upset has occurred, or will occur. Process Portal provides notification through its audible and visual alarm and event presentation.

Remote personnel are notified of critical events via mobile telephones, e-mail accounts, and pagers by 800xA’s SMS (Short Messaging Service) and e-mail messaging service. Using GSM (Global System for Mobile communications) mobile phone technology, System 800xA allows remote acknowledgement of notification.
Comprehensive operator functionality for reliable control
System 800xA provides a complete set of operator functions that include realistic process graphics with standard faceplates, superior trending capabilities, intelligent alarm and event handling, production reporting and remote messaging. Complete functionality simplifies and streamlines operator interaction for more reliable control.

Integrated data for informed decision-making
Information from ABB applications, other automation systems or even business systems is readily integrated into the 800xA system on common displays. This single window provides users a much broader view of the facility and better information from which to make quicker, more informed decisions.

Intuitive and flexible context-sensitive navigation for fast information access
Quick access with familiar web browser tools to displays and information is provided. Favorite places, history lists, short cuts and hot buttons provide navigation through a process production facility quickly and accurately. Use of the right mouse button provides access to additional details such as photos, operator instructions and maintenance information.

Personalized workplaces for focused information access
Workplace layouts are adjusted and optimized to users' preferences and needs with individualized menus, toolbar contents and display locations. Windows management functions such as safe areas, pinning and stacking priorities minimize operation errors by prioritizing the presentation of important material.
Reducing risk through high integrity automation

Today, companies require tighter integration among safety and control applications. The industry is calling for SIS solutions that are cost effective through integration with control systems, less frequent proof-testing, and scalable architectures. The 800xA HI (High Integrity) system satisfies these objectives by providing a functional building block approach for system design to meet every system application need.

Embedded safety and control
The 800xA system architecture offers the flexibility of hosting both safety and process critical control applications in the same controller. The AC 800M HI controller is supported by common engineering tools, human system interface, historian, audit trail, asset and device management applications, and instruments; thereby improving the overall integrity and reliability of Basic Process Control Systems (BPCS) and Safety Instrumented Systems (SiS) operations. Such an environment offers safe, instant, interaction between applications; leading to a host of benefits, from easier handling, through better technical solutions, to lower costs.

Meets industry standards
800xA HI systems are delivered and supported in accordance with the strictest current standards. Among others, System 800xA HI complies with IEC 61508, IEC 61511, EN 954, NFPA 85 and NFPA 72 standards.

During process startup, maintenance, and testing, inhibiting of specific safety functions is performed through Process Portal standard operator dialogs.

ABB safety expertise
ABB has more than 30 years of experience in designing, implementing, and maintaining fault-tolerant, programmable, safety systems for oil and gas, petrochemicals, fine chemicals, and power generation applications. Through System 800xA’s common operations, engineering, and information environment for BPCS and SiS, ABB provides safety solutions that are easily scalable from a few loops to complete safety systems.

Secure firewalls
Although integrated within a common environment, System 800xA’s extensive diagnostics and certified firewall mechanisms eliminate common-cause failures of control and safety circuits. Access management mechanisms embedded within the 800xA controller environment include: Access Control to applications, Confirm Operation, and Force Control. With these embedded firewalls in place, safety and process applications can freely exchange signals and data without the
With more than 30 years of experience in designing, implementing, and maintaining safety systems, ABB provides a wide range of field proven applications, including:
- Fire & Gas systems
- Emergency and Process shutdown (ESD and PSD)
- Interlock systems
- Burner Management and Boiler Protection (BMS)
- Critical Control
- High Pressure Protection Systems (HIPPS)
- Pipeline Protection systems (PPS)

need for external, complex interface hardware, software and mirroring of data.

Flexible and scalable SIS design
System 800xA offers a complete SIS (Safety Instrumented System) solution, complying with the IEC 61508 and IEC 61511 standards and covering not only the “logic solver” but the entire safety loop, consisting of SIL rated field instruments, controllers and I/O modules, valve positioners, and actuators. Highly scalable, System 800xA SIS solutions provide you the flexibility to match specific safety functions with your actual plant needs.

800xA High Integrity controllers and I/O are highly modular, offering many interconnection options and making them suitable for all safety and business critical process automation applications, from small to large, from single to redundant. Redundant solution for CPU and I/O will increase the availability.

Safety integrity monitoring
Using 800xA Asset Optimization and 800xA Information Management features, the need for off-line proof-testing is dramatically reduced. Actual events in daily operation are monitored, analyzed, and used in the functional verification and documentation of safety instrumented function integrity.

Total safety lifecycle management
System 800xA’s object-oriented engineering environment with SIL compliant function libraries efficiently supports the entire safety system lifecycle from planning, through design and library management, to commissioning and support. System 800xA’s engineering environment includes safeguards against non-SIL compliant configurations. Once identified as a safety application, the engineering system will automatically limit user configuration choices and will prevent download if SIL requirements are not met.

SIL compliant application solutions
System 800xA includes a comprehensive library of standard reusable components that include extended automation entities such as faceplates, graphic elements, trends, document links, and alarm and events. In addition, ABB provides a broad family of industry specific libraries that contain pre-configured Control Modules, Function Blocks, and graphic elements. These pre-tested proven libraries significantly reduce the time required to engineer, test, and maintain control applications, while minimizing project risks.
Continuous productivity improvements and increased profitability are the driving forces behind the selection of today’s automation systems. Traditionally, production facilities maintained many controller subsystems; each meeting specific plant needs.

However, to succeed in today’s changing business environment, you need a controller possessing multi-functional capabilities, adaptability to changing requirements, openness, availability, programmability and maintainability.

**Installed base compatibility**
System 800xA builds upon the leading brands and technologies that have made ABB number one in automation systems installed base. This includes control and I/O compatibility for most installed systems from ABB, Bailey, Hartmann & Braun, Taylor, Fischer and Porter, and Alfa Laval Automation. The result: maximum leverage from installed components as you evolve to new functionality!

**Scalable, cost effective, fault tolerant design**
800xA systems deliver powerful and versatile scalable solutions. Redundant controller, communications, I/O, and power options provide the highest level of availability in the industry. Equally effective for small hybrid systems and large, integrated safety and automation applications, System 800xA’s scalable, cost effective design contributes to higher return on assets by improving production control and safety, maximizing process availability, and minimizing maintenance.

**Diverse software functionality to meet all needs**
Controllers feature an extensive software library of pre-defined and user-defined control and safety SIL compliant elements. These functions provide the power to easily design complex control or safety strategies to fit any application including continuous, sequential, batch, and advanced control.

**Open architecture reduces lifecycle costs**
Designed from the ground up to leverage the power of industry standard fieldbuses and open communication protocols, ABB’s open architecture allows for the easy integration of a wide variety of devices and systems. System 800xA provides for total plant data integration while reducing overall system support costs.

**Flexible I/O options**
ABB I/O, available for local and remote mounting, provides a wide variety of input/output and signal conditioning capability, ranging from standard analog and digital to HART, FOUNDATION Fieldbus H1/HSE, and PROFIBUS PA/DP protocol devices. Intrinsically safe I/O, SIL rated I/O, and modular packaging options allow for System 800xA to be installed anywhere in the plant.

### 800xA supported controllers

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With the largest installed base of traditional DCS in the world, ABB has designed the 800xA system to allow for implementation with its entire line of control and I/O products.

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Control and I/O for entire plant needs
Embracing the principles of open, real-time networking, System 800xA provides a scalable solution that spans and integrates loop, unit, area, plant, and interplant controls. From providing a secure foundation with robust, but flexible, base level regulatory and sequence control to higher level management and advanced control functions that include safety controls, production management, maintenance management, information management, and network management solutions, System 800xA meets the application needs of a wide variety of industries.

System 800xA provides you with a secure, reliable, control environment with minimum effort through built-in security features such as access control, user authentication, and audit trail capability.

ABB enhances secure system operations by actively participating on security standards committees, conducting threat-modeling studies, and incorporating “safe design” practices into product development.

Based upon the Aspect Object technology and a common set of hardware, System 800xA seamlessly integrates traditionally isolated DCS and Safety systems. SIS realization is achieved by either utilizing individual controllers or through dedicated applications within the same controller. With this embedded control and safety architecture, System 800xA reduces costs significantly; achieving the objectives of both systems... maximum plant availability at minimum risk!
Engineering for maximum performance

System 800xA helps you engineer for maximum performance with:
- A fully integrated engineering environment for development and reuse of intellectual assets
- A single source of truth for all data within the automation system
- A comprehensive set of libraries to streamline the engineering workflow

System 800xA provides a visual environment for easy design and deployment of automation strategies, process visualization displays, information management, asset optimization, and field device integration. The flexible, distributed engineering environment allows project data to be accessed, created and modified simultaneously by different users.

Total asset lifecycle engineering
Opportunities to drive operational performance improvement begin early in the project lifecycle where key asset information is being created in core process design systems. For example, by using System 800xA's process engineering tool integration for INtools®, not only can automation system structure, functionality, and graphics be created directly from
the INtools design, but operational changes such as ranges, units, and settings, can be continually reflected back to the INtools application. With this unique feature, engineering savings of 40% and operational savings of 20% are achievable from reduced as-built cycles and by automatically maintaining design synchronization.

**Graphical function design**

800xA Engineering graphical function design features enable your engineers to be “engineers” instead of “programmers.” The graphical design of automation strategies facilitates easier engineering of your applications. Because design is function oriented, you can develop strategies without specifying controller and I/O physical allocations. Additionally, System 800xA’s on-line monitoring and tuning features support you during commissioning and continuous improvement.

**Process visualization**

Interactive process operation graphics can easily be customized through the use of the comprehensive library of pre-defined elements and symbols. In addition, bitmaps, photos, and third party graphical elements can be supported.

**Device management**

Device management for HART, FOUNDATION Fieldbus, and PROFIBUS intelligent devices provides the tools to engineer device integration from topology on down to the field elements, including device parameterization, application planning, commissioning, and detailed diagnostics.

**Bulk data management**

The ability to efficiently manage large amounts of data is crucial to the engineering of any automation system. Using Microsoft Excel® and Excel add-ins, 800xA Engineering bulk data management features allow for the automatic importation and assignment of external data such as signal lists, tag names, or documents. In addition, you can export system data at any time to support data validation and modification.

**Reusable solutions**

Companies ensure maximum consistency, reliability, and availability of plant asset production by using “Best Practices” solutions. System 800xA allows standard solutions to be quickly reproduced and deployed.

Most focus their reuse solutions at the process control strategy and implementation levels. With System 800xA, your solution standards incorporate extended automation entities such as faceplates, graphic elements, trends, document links, CMMS data views, field device diagnostics, and asset monitors. Standards are defined at any level across the entire plant, loop, machine, line, unit, and area.

As needs change, your standards will change. System 800xA allows you to improve them. And with automatic update of all deployed instances, you can immediately improve the performance of your plant.

**Change management**

Needed to meet regulatory compliance, 800xA Engineering change management features record and track system configuration changes to project libraries, instantiated solutions, and runtime and off-line data. System 800xA audit trail and electronic signatures are key features that specifically fulfill FDA 21 CFR part 11 requirements.

**Integrated documentation and diagnostics**

System 800xA’s integrated engineering environment provides the ability to associate documentation with related equipment and applications. Using dynamic documents, you can quickly navigate to the displays required for action. Documents based on Microsoft Excel, Word®, or AutoCAD® can be enhanced with live process values for easier diagnos
Information is a key asset of all businesses. To achieve a sustainable competitive advantage, manufacturing and process businesses must be able to adapt quickly to change.

Reduced time to decision and action is critical for improving quality and productivity. This makes the timely collection, manipulation and distribution of reliable information a significant issue. In today’s business environment, electronic data needs to be presented as information to operations, engineering and management in the context most meaningful to them.

Information management functions are inherent to System 800xA. Historical, process and business data is collected from disparate sources and stored securely. The data is transformed into meaningful information, which is presented in a manner that is easy to understand. This provides important support at every level to improve efficiency and profitability.

Intuitive presentation
Desktop displays give managers concise, enterprise-wide information in familiar office formats without them having to leave their desks. A discrete tag ticker continuously showing key performance indicators (KPIs) can be supplemented with a trend display when more information is required. Operator displays provide information in the control system environment. These are able to seamlessly present both real-time and historic trend data as well as alarm and events.

From the control room to the plant floor, users have access to data in a flexible variety of formats that enable agile responses by key decision makers.

Automated actions
Versatile scheduling options, which provide automatic triggers for key actions, support all plant personnel with both standard procedures and exception handling. Examples include support for root cause analysis with event triggered pre- and post-event logging, improving quality and asset availability by using calculations and event triggering to provide predictive alarms, as well as time scheduled reports.
inconsistencies between multiple databases and the need to duplicate engineering effort.

Flexible report generation and distribution
A wide variety of reporting requirements are supported in familiar, simple to use formats. Not only can these fulfill plant and regulatory agency documentation requirements, but they also act as powerful tools for decision making and planning for improved performance.

Comprehensive batch production records
All batch recipe and execution data, inventory transactions, quality management actions, and manual operations of the manufacturing process are recorded. There is no need to aggregate multiple data sources to compile the complete production record. This makes it very easy to display and/or report any information from a specific batch, or from the entire campaign.

Sophisticated data transformation
User defined data structures and calculations provide powerful, reusable algorithms and applications. These can be used to transform raw data into information, such as KPIs or material properties, as well as to offer sophisticated control support. The data structures can also be used to integrate external application data into the system.

Secure historical data storage and access
Fault tolerant and distributed data configurations provide dependable data availability. The information is also protected by user access restrictions and off-line storage. Users can be confident that electronic record keeping requirements are being met and that their decisions are based upon reliable information.

Integrated administration and configuration
The embedded historian uses the inherent system configuration and administration. This allows single point change management and eliminates the risk of
ABBB takes a unified approach to asset management, offering a vast, unmatched portfolio of solutions. This portfolio is constantly being enhanced – for the latest information, please contact your ABB representative or visit us at www.abb.com.

800xA Asset Optimization (AO) is the cornerstone of ABB's asset management portfolio. AO provides real-time asset monitoring, notification and maintenance workflow optimization of automation and plant equipment, plant infrastructure, field devices, IT assets and production processes. AO is unique in that it brings together in one user interface, all information resident in different, traditionally disparate, automation and monitoring systems to provide a composite view of the health and performance of an asset. Transparently maintaining all the richness of information, advantages and capabilities of each specialized system, AO eliminates the need for the user to switch between several systems, workplaces, application environments and navigation schemes.

AO features are provided as extensions to Process Portal. While this solution functions as fully integrated capabilities of ABB's System 800xA, it is also available as a stand-alone solution.

In general, 800xA Asset Optimization features can be categorized into two user beneficial areas:

- Increased asset availability and performance (including asset condition monitoring and reporting)
- Optimized Operations and Maintenance effectiveness (including Computerized Maintenance Management System (CMMS) and Device Management System (DMS) Calibration Integration)

ABB's Asset Optimization (AO) includes software that monitors asset performance. While retrieving data from and interacting with multiple data servers (real-time data servers, OPC® servers, etc.), asset monitors use real-time plant information to detect health and performance conditions, assist in problem diagnosis and to offer correction recommendations.

AO includes a base set of asset monitors that vary in complexity from those that simply identify status changes in an intelligent device or identify high, low, or deviation limit conditions in the control system, to those that utilize advanced process equipment condition monitoring applications. When a performance condition is detected, the asset monitor issues an Asset Condition Document (ACD) and notifies the system.

ACDs contain all information necessary to describe an asset condition. This information may be used to generate a work order for maintenance purposes. Asset monitors can
exist in any part of the plant hierarchy, such as the device, loop, equipment, process, plant or enterprise. They can be written for higher-level assets (parents) that are themselves composed of many subassets (children). In addition, System 800xA pre-configured asset monitor types are available for assignment to assets of all levels.

Field Device asset monitors for HART®, Foundation Fieldbus™ and PROFIBUS devices are available as part of the respective Device Libraries provided with System 800xA Device Management. These asset monitors can be generic or device-specific. The proper asset monitor is automatically assigned to individual plant devices.

ABB’s Asset Management Portfolio goes beyond Smart Instruments. We have asset monitors for all process areas including:

- **Plant Equipment**
  - Rotating Equipment
  - DCS Controllers
  - IT Assets
  - Heat Exchanger Asset Monitor
  - Control Loop Asset Monitor
  - Drives Monitor
  - Propulsion Condition Management System
  - Compressor/Pump Curves Asset Monitor

- **Plant Electrical Equipment**
  - Drives
  - Transformers
  - Low Voltage Circuit Breakers
  - Universal Motor Controller (UMC22)
  - MNSiS Asset Monitor

ABB’s AO technology combines information from multiple OPC sources into a single asset monitor, including: types of condition monitoring, current condition, historical data access and alarm and event database. It enables users to seamlessly integrate third-party condition based monitoring systems (CMMS) into 800xA Asset Optimization with our External Status Asset Monitor. This provides a single view of multiple maintenance systems, lower engineering costs, simplified maintenance, patented technology and the ability to create custom asset monitors with an Excel based tool.

Additionally, ABB creates custom asset monitors using ABB’s Asset Optimization Software Development Kit. For the latest list of integrated devices and their corresponding asset monitors, please contact your ABB representative.

Benefits of 800xA Asset Optimization (AO) include:
- **Complete Asset Optimization**
- A single interface for operations, maintenance, engineering and management to optimize asset availability and utilization
- **Reduced Time to Repair through Optimized Work Processes**
  - Integration of disparate Computerized Maintenance Management Systems (CMMS), DMS Calibration Systems, Dynamic Overall Equipment Effectiveness (OEE) Tools and control systems streamlines work flow between operations and maintenance to reduce downtime
- **Automatic Monitoring of Maintenance Conditions**
  - Real-time monitoring and alarming of asset Key Performance Indicators (KPIs) facilitate fast, reliable implementation of corrective actions
  - Plant-Wide Adoption of Predictive and Proactive Maintenance Strategies
  - AO collects, aggregates and analyzes real-time plant asset information to provide advanced warning of degrading performance and impending failure, a critical component of any Reliability Centered Maintenance (RCM) strategy
- **Consistent Reporting of Plant Asset Health**
  - Visualization of current health conditions with analysis features provides the ability to drill down to the root cause of failure
- **Regulatory Compliance**
Unveiling your hidden plant with real-time production intelligence

Plants can waste up to 40 percent of their process production capacity through equipment downtime, process bottlenecks, and quality issues. These undetected losses comprise a company’s “hidden plant” productivity opportunities.

System 800xA’s Real-Time Production Intelligence (Real-TPI) application software is designed to tap into these hidden productivity treasures by determining the true performance of the factory and identify ways to improve it. This established solution has delivered excellent results to manufacturers in a wide variety of industries. Real-TPI can be utilized with cpmPlus, ABB’s Collaborative Production Management solution. It is now available as a functional extension of System 800xA.

Real-time performance measurement
Real-TPI is a specialized software application developed for plant engineers and production managers for use in determining the on-line OEE (Overall Equipment Effectiveness) of production equipment and processes. By automatically collecting machine data in real-time, Real-TPI is able to record, analyze, and present the individual machine and combined process availability, performance, and product quality factors that determine overall production efficiency. The resulting information is invaluable for removing process bottlenecks, thereby improving overall manufacturing throughput and product quality.

Data provided in asset context
Real-TPI stores all necessary context data for every event, allowing meaningful analysis and identification of the weakest link in the production line. Real-TPI calculates and updates the OEE values and other Key Performance Indicators on-line for the selected period and machines.

Analysis and reporting
Real-TPI software harnesses the analytical power of three industry standard production evaluation processes: OEE, RCA (Root Cause Analysis), and TPM (Total Productive Maintenance). When OEE indicates poor performance, RCA is utilized to determine what the problem is and where it is located so that corrective action can be taken. TPM is a process to adjust production equipment procedures with the goal of improving efficiency.

Real-TPI standard analysis and report displays include Chronograms, OEE Displays, Pareto Charts, Waterfall Diagrams, Penalty Charts, and Production Reports.
While control systems automate large sections of most plants, human error remains a critical contributor to most accidents. Safety risks, along with unplanned shutdowns and start-up times after outages, can be reduced with use of Industrial IT Training Simulator (ITS) solutions.

**Lifecycle simulator**
Industrial IT Training Simulators are an integral part of a cost-effective, comprehensive program for all phases of the plant lifecycle. By combining operator and maintenance training, control logic development, testing and validation, operator validation, and plant optimization studies into one system, you can maximize the value of your simulator system.

**Leveraging intellectual investments**
ABB simulation solutions build directly from your running plant system investments. By using the same operator displays, control logic, and execution environment as System 800xA, skills are 100% transferable. This also means that as the plant system evolves, so does the simulator; assuring longer simulator life and lower lifecycle costs.

**Scalable process models**
In a simulator system, a process model simulates the process I/O. With ABB simulator solutions, process models ranging from low-end models through control logic to high fidelity third party models can work closely with the simulator to provide the desired level of process response.

**Runtime simulator functions**
Operation of the simulator is performed via the instructor’s station, where the instructor can initiate specific simulator functions including: freeze and resume of control execution, save and load process conditions, set process speed, and simulate process malfunctions.

**Easy configuration and maintenance**
Typically, only portions of the running plant are included in a simulator’s scope. The Transformation Tool is used for defining the parts of the plant that will be simulated. Automated transfer of control definitions from plant controllers makes the simulator system easy to maintain. Re-transformation after plant modifications supports reuse of transfer configurations in earlier project phases.
Improving batch production profitability, consistency, and traceability

800xA Batch Management provides unsurpassed functionality in recipe management, batch and procedural control, safety, and security. It provides you the agility and control to respond to increasing production demands in real-time. By helping you to reduce lifecycle costs and production downtime, 800xA Batch Management enables you to achieve and sustain a competitive advantage in the marketplace.

Flexible recipe management
System 800xA employs a single, system-wide equipment model. Units, equipment modules, and all other resources are all configured within the same model. This makes adding or “cloning” a new process unit as simple as copy and paste. System 800xA is the only system that can use the new unit without having to modify existing recipes.

Unique on-line recipe editing capability provides unmatched flexibility during batch execution. Without stopping the batch, you can modify parameters, sequence, and equipment assignments. All changes made to running control recipes are automatically saved in the batch production record.

Exception procedures
Anyone can run a batch to a pre-configured recipe under normal conditions. Only System 800xA provides exception procedures that extend beyond the procedure model of ISA88. These procedures provide the ability to configure error handling logic within the recipe, which greatly simplifies logic configuration for handling production specific abnormal conditions.

Resource management and scheduling
Resource management and scheduling flexible equipment management supports network, multi-path and single path equipment configurations. 800xA Batch Management reserves and allocates equipment and other resources at run-time based on batch priority.

Scheduling control recipes is made easy based upon master recipe procedures and batch-specific formulation data. You can select equipment at either schedule time or dynamically allocate it at run-time.

Eliminate shift inconsistencies
Some batch processes require operators to make manual parameter adjustments based upon processing conditions, environmental conditions or raw material quantity. 800xA Batch Management provides an easy-to-use expression builder for the definition of recipe parameters that must be dynamically adjusted based upon current run-time conditions. This enables the performance of your process as if your best operators were on the job 24/7!

Reduce scrap and off-spec material
In many cases, operator or supervisor intervention in a batch process means aborting the batch recipe procedure and manually completing the batch. 800xA Batch Management provides the tools to allow user intervention to make the necessary adjustments and continue the processing of the batch through the control recipe procedure. An operator or supervisor can easily re-route the batch path to another allowable unit if the originally selected unit is not available or out-of-service.
Cost Effective Evolution

ABB has been a pioneer and leader in the design and deployment of batch automation systems on a worldwide basis. ABB has a twenty-five year heritage in the design of batch automation system products and solutions for the fine chemical, food, beverage and pharmaceutical markets. 800xA Batch Management, like all functional areas within System 800xA, has been designed to support the stepwise evolution of your existing process control system. ABB makes it possible to introduce System 800xA and 800xA Batch Management without the costly replacement of controllers or time-consuming effort of reconfiguring the control strategy.

Unique on-line recipe editing capability provides unmatched flexibility during batch execution. Without stopping the batch, you can modify parameters, sequence, and equipment assignments. All changes made to running control recipes are automatically saved in the batch production record.

Regulatory compliance support

For manufacturing processes subject to licensing by regulatory bodies such as FDA, MHRA, and TGA, System 800xA provides the tools you need to achieve compliance. Security, audit trail, change management, electronic signature, automated reporting, archival and retrieval are integral to all operations and system applications. 800xA Batch Management enforces the production sequences necessary to consistently manufacture on-spec product.

PAT – Process Analytical Technology

Industrial IT eXtended PAT (xPAT) is a single, scalable, integrated PAT solution that can be integrated with an 800xA system based process automation strategy or used as a stand-alone solution. xPAT enables quality by design (QbD) and real-time product release. Models link analytical sources together. xPAT maintains methods and manages collection and storage of analyzer data which is used for monitoring, analysis and closed loop control - with ABB or third-party control systems. Faster time to market is assured for xPAT users; due to better process understanding, as well as reduced risk and exceptions.

Business System Connectivity

Some organizations have supply chain management solutions, enterprise resource planning (ERP) systems or schedule optimization software packages that drive the dispatching of shop-floor manufacturing requirements. 800xA Batch Management includes a web-services based interface function to facilitate the bi-directional transfer of data between 800xA Batch Management and these applications.
Project Execution services

Complementing System 800xA and over 100 years of automation expertise are software, application, and service professionals worldwide that are focused on delivering productivity and profits to you. Our industry-focused experts provide solutions for customers in Chemical and Petrochemical, Life Sciences, Pulp and Paper, Manufacturing, Utilities, and other industries. Through our dedicated teams, ABB is committed to providing you with solutions that will improve your productivity.

From advanced control and process optimization applications to dynamic simulation and training, ABB delivers a foundation for advanced control techniques in real-time. Backed by industry specific experience and know-how, System 800xA advanced control applications ensure that your facility will operate more efficiently, profitably, and competitively.

ABB’s application engineers have the expertise to solve every possible automation problem. Working side-by-side with control room operators, they have implemented advanced process control and optimization using applications and products from around the world.

Their practical experience is backed by ABB’s research into control theory, information technology, mathematics and statistics. ABB delivers world-class technology from our own R&D and from our software partners, using best-in-class tools to improve an integrated application package, for a small-scale single-unit or a large-scale multi-unit facility.
Total lifecycle support

**ABB Services**
ABB is one of the world’s largest automation companies with an extensive, global installed base of control, motion and robotic products and systems. Our portfolio of services – from spare parts to consulting, optimization, and outsourcing services – ensures maximum return on your ABB automation equipment investment. Our automation service offerings include:

- **Support & Remote Services**
  - Remote Asset Monitoring
  - Web-Based Support
  - Telephone Technical Support

- **Evolution & Retrofit Services**
  - Evolution Planning
  - Evolution Implementation
  - Standard Evolution Packages
  - System Software Lifecycle Management

- **Training Services**
  - Product Programs
  - Process Programs
  - Custom Courseware
  - Coaching
  - Training Assessments

- **Reliability Engineering & Consulting**
  - Energy Efficiency
  - Process Safety
  - Reliability & Maintenance

With more than 10,000 service professionals worldwide, we get the job done, when it’s needed, where it’s needed.

Automation Sentinel is ABB’s control system software lifecycle support program.
This program provides the best overall return-on-investment for past, present and future control system software investments. It also assists in actively managing your software lifecycle costs by providing:

- Enhanced support for installed control system software
- Optimized system performance because software is kept up-to-date
- A flexible path forward to newer system software technology products

**Maintenance & Field Services**
- Installation & Commissioning
- Predictive, Preventive and Corrective
- Service Contract Agreements

**Optimization Services**
- Process Optimization
- Asset Optimization

**Spare Parts & Repair Services**
- Parts
- Emergency Parts
- Test & Inspection
- Repair & Refurbishment
- Online Parts & Repair
- Parts Inventory Management

Asset and Process Optimization Services utilize proven, improvement methodology, special tools, and knowledge of systems and processes to diagnosis, implement, and sustain performance improvement, which lowers cost and increases the productivity of installed systems and assets.

Reliability Engineering & Consulting experts deliver worldwide experience to ensure reach full potential of productivity and energy efficiency is achieved in a sustainable manner. ABB’s broad suite of maintenance and reliability services assures equipment will start-up, operate and shut down without failures or cutbacks.

Lifecycle Services include a comprehensive selection of services to maximize productivity, minimize lifecycle costs and extend the useful life of installed equipment. These include remote services, application engineering, equipment evolution and upgrade programs, on-site corrective and preventive maintenance, subscription services, maintenance, spare parts and repair, technical support, and training.

Customized service contracts provide asset management strategies using assessments completed by expert resources working together with site personnel.

- Improving equipment productivity
- Minimizing costs throughout the equipment life
- Extending the useful equipment life

**IT**
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