

### Features and Benefits

- **Secure Historic Data Storage and Access:** Data availability is increased by fault tolerant and distributed configurations. Data integrity is protected by user access restrictions and offline storage.
- **Accessible Archive Services:** Electronic records access are secure and reliable using approved offline management archiving functions.
- **Integrated Administration and Configuration:** Inherent system configuration and administration provides a single information repository and single point change management eliminating duplicate engineering effort.
- **Intuitive Presentation:** Desktop displays give managers concise information in familiar office formats. Operator displays provide historical information in the control system environment.
- **Flexible Report Generation and Distribution:** A wide variety of reporting requirements are supported in familiar formats. Versatile scheduling options provide automatic triggers for key actions.
- **Comprehensive Production Records:** All batch recipe and execution data, inventory transactions, quality management actions, and manual operations of the manufacturing process are recorded. No need to manually aggregate multiple data sources to compile the complete production record.
- **Sophisticated Data Transformation:** User defined data structures and calculations provide powerful, reusable algorithms in addition to external application data support.



### Integrating Information for Improved Visibility

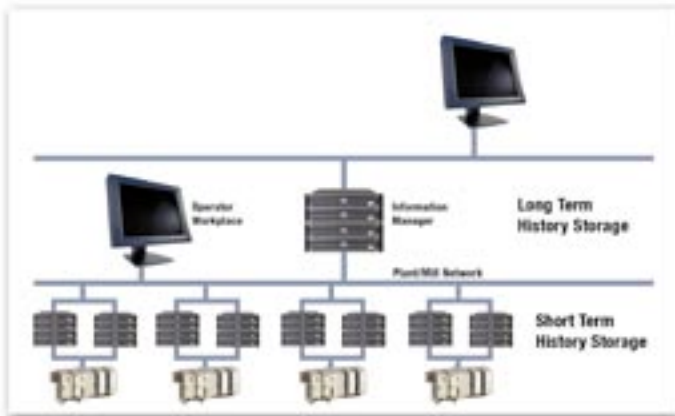
Information is a key asset of all businesses. To achieve a sustainable competitive advantage, manufacturing and process businesses must be able to adapt quickly to change. Reduced time to decision and action is critical for improving quality and productivity. This makes the timely collection, transformation and distribution of reliable information a significant issue. In today's business environment, one of the barriers to increased productivity is aggregating data from a myriad of disparate sources, transforming it into meaningful information, and presenting it to operations, maintenance, engineering, and management in the context most meaningful to them.

Information Management functions include historical, process and business data that are collected from available sources and stored securely. The data is transformed into meaningful information, which is presented to each decision maker in a manner that is easy to understand. This provides support at every level in the organization to improve efficiency and profitability.

## Overview

800xA Information Management, as described within this Overview Document, provides intelligent data access functions and views to assist all levels of personnel in making quick, informed decisions, taking the appropriate action, and thereby improving performance.

History Servers are logically linked together at a site, and across an enterprise, to provide a common historical data environment. This allows seamless data retrieval from all points within the system. Moreover, Information Management functionality can be applied to a single ABB control system, or across multiple control systems from multiple vendors.



**Figure 1.** Seamless data access independent of location

Information from all applications in the extended automation system is readily available in a variety of straightforward views and reports, which can be customized by operators, engineers, maintenance personnel and managers to utilize precisely the information they need to run their business better. Tight integration also means that data - both real-time and historical - can be accessed and retrieved from anywhere in the system regardless of where it originated or is stored. This makes it possible for each user to document activities and review past events specific to their responsibilities. They can view, analyze and use the information they require precisely where and when it is needed, so that the time it takes to make important decisions can be reduced.

ABB's Information Management functions are embedded in System 800xA and use the inherent system engineering, configuration and administration capabilities. They are unique in their flexibility and provide solutions in a variety of industries. The storage, transformation and presentation functions fall into nine categories:

- Information storage
- Configuration and administration
- Information presentation
- Reporting
- Regulatory agency compliance support
- Comprehensive Production Records
- Scheduling
- Security
- Data transformation

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## Information Storage

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### Architecture Options

When information is viewed, analyzed and acted upon, its source must be reliable and secure. System 800xA functions provide both secure storage configurations and a variety of common and specialty data structures. Users can be confident that their decisions are based upon reliable information.

An open distributed architecture supports storage of data in more than one place for added reliability.

- **Consolidated data storage** functions collect data from multiple history servers and store it in a single location. This provides a common history repository for viewing and reporting.
- **Dual history servers** provide an additional level of fault tolerance by storing the same data in two different servers.

Data can be saved off-line for long-term storage. Archiving functions support the copying of data to various archive media for extended data storage and security. Media supported includes Magnetic Optical (MO) media, CD, DVD, and hard disk (either local or remote).

### Storage Options

**Raw Data Storage:** Hierarchical structures provide efficient configurations for storage. The highest resolution data can be stored for a short time span, while hierarchical logs can store progressively lower resolution data for longer time spans. This configuration uses less storage space, enabling the user to store data over longer periods.

**Standard Algorithms:** Within a log hierarchy, an algorithm can be performed before the data is stored. A single value is stored that represents a larger time span of values. Standard algorithms include maximum, minimum, average, sum, and sum of squares values for a specified time interval.

**Data Compression:** If process variables have little or no changes over time, the user can choose to compress the data to conserve disk space. However, certain applications require the raw uncompressed data for application or documentation purposes.

**Data types supported:** In addition to the standard process control data types, a wide variety of data storage types are supported.

The types of data that may be stored include:

- Process values
- User-defined softpoints
- Asynchronous values for data entered manually or written to by external applications
- Finished Report outputs
- Event data including Audit Trail

**Production data:** Often when a product is being manufactured, the information relationships are not time-based and cannot be pre-configured or anticipated. Production Data Logs (PDL) have built-in provisions for the organization, storage and retrieval of this type of information. PDL organizes critical process data such as operator interventions, alarm and events, equipment usage and task start/stop and duration times.

PDL provides special data structures for storing logically organized production data typically used for batch production records.

Messages (including alarms and events) from standard control loop processing, operator control functions, control applications, batch programming or user-defined applications are supported in PDL. The messages, process and production information are automatically associated with each other.

PDL data is stored in a relational database and is accessible by standard SQL queries. The information is available to Crystal Reports, and other network-based report packages, and applications such as Microsoft Access and Excel. Excel Data Access supports form-driven requests to PDL data for easy information retrieval. Information from PDL is used as the data source for batch-to-batch displays and for standard batch reports.

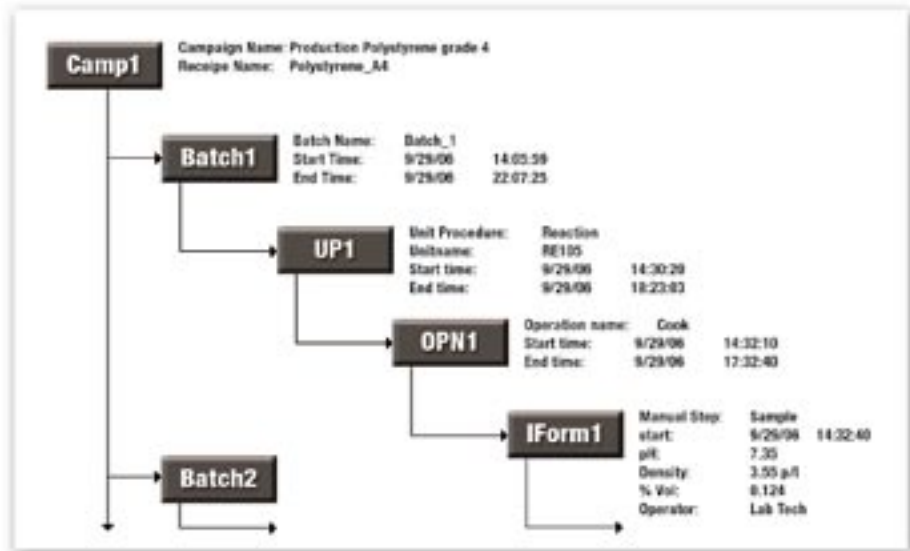


Figure 2. Batch Production Record

## Configuration and Administration

The 800xA system's Information Management functions are a collection of embedded historian, data transformation and information presentation features. These use the inherent system engineering, configuration and administration features. This provides benefits both in terms of initial set-up and life cycle cost, and consistency.

### Configuration

From the design phase through the implementation of a project, savings are realized and inconsistencies are eliminated through efficient engineering. One historical solution and database is used for both process control and information management; therefore, there is no duplication of the engineering effort. Information Management configurations are properties of objects that already exist in the control system definition. There is no need to maintain two distinct databases.

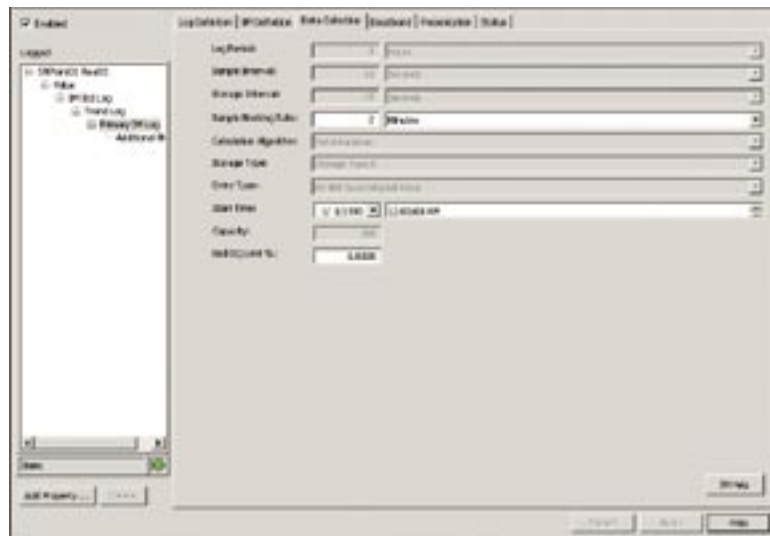


Figure 3. History Log Configuration

### Administration

Security settings, user authority definitions, status monitoring and back-up functions are system-wide functions integral to the 800xA system.

### Maintenance

Having a single point of change for system maintenance means that there is no risk of inconsistencies between multiple databases and no need to duplicate engineering effort. Changes to properties made in the control system database such as ranges, alarm limits, etc. are automatically propagated to the historical tag configuration, since it is simply an extension of the control system tag configuration. This saves the user from having to remember to modify a second tag database configuration in an identical manner. That helps lower overall system administration costs, as there is no need to administer a separate Production Information Management System (PIMS).

## Information Presentation

Easy, flexible data access is essential. Every user, be they operators, managers, engineers, maintenance supervisors, etc. has unique requirements for the information they require and how they would like to view it. In order to enable each user to work as productively as possible, the Information Management functions have been designed with flexibility and ease of use in mind.

Industrial IT 800xA Information Management functions provide:

- For operators or other users at their Process Portal workplaces:
  - Trend displays
  - The ability to integrate historical data along with other data sources into a single display
  - The ability to look at all real-time and historical data via Microsoft Excel reports
  - Displays of historical events with flexible filtering
  
- For all others at their desks:
  - Web-based viewing of information
  - Desktop trend displays
  - Desktop tag ticker display
  - The ability to look at all real-time and historical data via Microsoft Excel reports
  - Remote desktop clients for custom displays

Seamless views of real time and historical information are provided throughout the system. The practical advantage of this can be seen when looking at values in trend curves; users can step through information over time without having to move from a real-time system to a separate historian. Additionally, data can come from multiple History Servers and other systems, and be combined on comprehensive displays.

### Operator Trend Displays

800xA Process Portal users can see all real-time and historical data using the standard operator trend displays. See the 800xA Operations Overview document for more details.



Figure 4. Operator Trend Display

## Event Viewer

The Process Portal Alarm and Event viewer provides access to all alarms and events in the system. From the viewer, lists can be defined for History events. The view allows filtering based upon various categories of events. In addition to predefined default event views, it is also possible to configure a view based upon a user defined filtered list.

Event Time	Category	Message/Description	Priority	Initial	Severity	Status
2011-10-20 01:34:00.000	AlarmEvent_Security	Operation as object RockControl Network Unit	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_Security	Operation as object RockControl Network Unit	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_Security	Operation as object RockControl Network Unit	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_Security	Operation as object RockControl Network Unit	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_AssessDirectory	Aspect 'Runtime Properties' modified	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_AssessDirectory	Aspect 'Runtime Properties' modified	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_AssessDirectory	Aspect 'Runtime Properties' modified	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_AssessDirectory	Aspect 'Runtime Properties' modified	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Activate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Activate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Deactivate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Deactivate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_Acknowledge	Alarm on object H-0000 acknowledged	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Activate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Deactivate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_Acknowledge	Alarm on object H-0000 acknowledged	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Activate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Activate_Cond F = 1	High	NO	High	Suppressed
2011-10-20 01:34:00.000	AlarmEvent_OperationAction	InPhaseSet_Activate_Cond F = 1	High	NO	High	Suppressed

Figure 5. Alarm and Event Viewer

## Excel Data Access

As an additional capability ad hoc displays can be added using Excel. Excel Data Access (previously called Data Direct) provides a set of ABB Add-ins for Microsoft Excel to enable operators and other personnel to run queries for data, or create and execute standard reports on demand, within a familiar office environment. These Add-ins provide access to process variables, historical values, messages, events and production data. Subject to user authority, it is also possible to input data (for example, lab data), to update data (for example setpoints), and to modify values that are already stored.

Object Name	Calculation	Log Time Stamp	Value	Data Quality
SoftPac/SoftPac/Center/Counter/CountValueHistory2NW	Any	10.22.2004 14:12:29	26 OK	
		10.22.2004 14:13:41	31 OK	

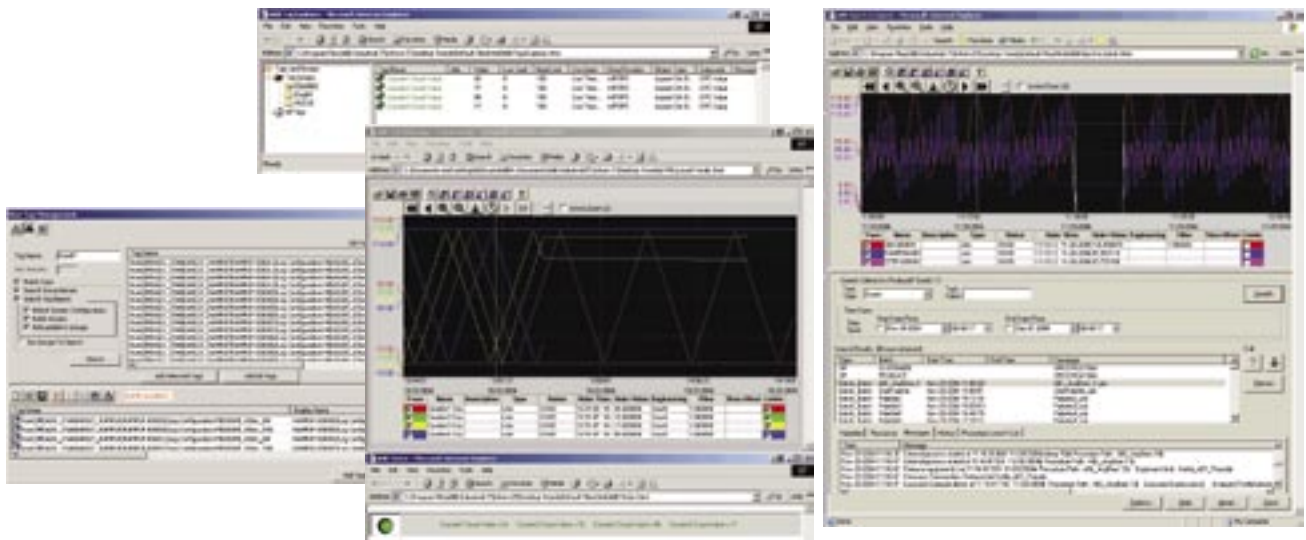
The dialog box 'Historical Values' is open, showing a tree view of objects under 'Control System'. The 'Related Variables' section is also visible, with fields for 'Start Date', 'End Date', 'Start Time', and 'End Time'.

Figure 6. Excel Data Access

## Desktop Displays

Internet and intranet access is supported by web-based technology. Custom displays such as Desktop Trend and Ticker, Batch to Batch displays, Desktop Tag Explorer, PDL, and Event and SQL Browsers are available as ActiveX controls and can be accessed from an Internet Explorer Desktop. Displays can also be called up at a Process Portal Workplace.

The Desktop Trends provide trend and associated information in a web browser. The display shows graphical traces for up to eight values and can seamlessly present data from both the real-time trend buffer and historical data logs. The trend supports a full range of scrolling and zooming features, including a unique feature called Active Zoom. This provides zooming into a section of the trend while maintaining the overall scope.



**Figure 7.** Desktop data presentation tools

The Ticker Display shows a repeating stream of real-time data for selected tags, similar to a stock market ticker. Colors can be used to show the value status, for example alarm or bad data quality. Points can be dragged and dropped from the ticker to the trend display for analysis.

The Production Data Log (PDL) Browser provides access to production data from Batch and Manufacturing Management or other such structured applications. In the case of a batch process, all information is structured and associated with the Batch ID number. This makes it possible to easily display and use all information concerned with any particular batch.

The Batch to Batch Display includes both a trend display and PDL data browser all in one display. This provides a visual association between a graphical trend and resources, variables and messages.

The Event Browser provides a view of all messages including Audit Trail messages. Filtering is available to make analysis easier. The SQL Browser provides the ability to run ad hoc SQL queries. Queries can be saved and reopened for future viewing.

Through remote Display Clients the user can create custom graphics such as process mimic displays or status overviews, and view them from their desktop. A wide range of display elements are available for creating these displays such as bar charts, pie

charts, edit boxes and gauges as well as traditional process elements like pumps, motors and vessels. Displays can be viewed in a web browser or other container that supports navigation.

A display can include data from any part of the system including real-time and historical values. Displays can also write data to the History server if the user has the appropriate authority.

Intuitive desktop tag and trend search tool provides the ability to configure once and use in multiple applications and desktops.

## Reporting

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Manufacturing environments dictate a wide variety of reporting requirements. Typical reporting requirements include:

- Production status reports for managers
- Compliance reports for regulatory agencies such as EPA
- Detailed production for FDA validation
- Status reports for operations
- Ad hoc reports

Within System 800xA, real-time data, historical values, lab data, batch information and event information can be incorporated into reports created in Microsoft Excel, Crystal Reports or another report package that uses ODBC or OLE DB data access.

Reports can be accessed by and distributed to those that need them in the appropriate format and media so that the process and plant history is effectively documented. This eliminates the need to fumble through diverse formats and media.

Operators can view reports from their Process Portal workplaces by simply browsing report archives via the Plant Explorer. Other personnel can create reports at their desktops with familiar applications to extract relevant information from the automation system, as they need it. Reports are also viewable via a web browser.

Reports can be automatically generated and sent to multiple output destinations:

- Printers
- Email distribution lists
- Historical storage
- Local or network disk storage
- Plant explorer structure

Report archive management is provided and it is possible to specify the maximum number of stored reports. In a regulated environment or when otherwise required, electronic signatures and version control may be applied to reports.

The following report templates are supplied with the system:

- Trip (pre-trip and post-trip values)
- Trend (hourly, shift, daily, monthly)
- Event
- Snapshot
- Batch Report (Batch Audit events, Batch Manager events, Batch Comment events, Batch Equipment, Batch events, Batch Procedures, Batch Process events, Batch System events, Batch Trend, Batch Variables, Batch Variables matched pair)

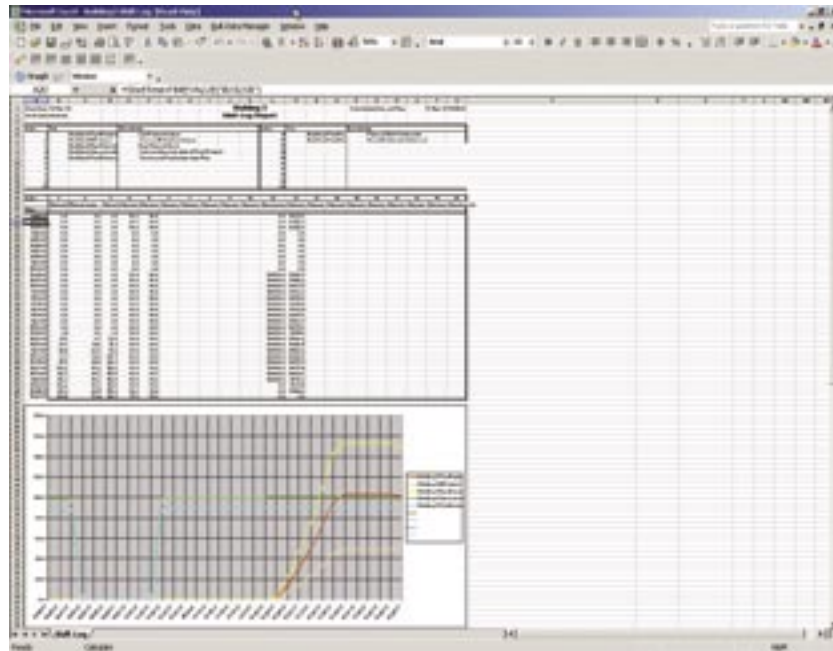


Figure 8. Production Shift Report

## Regulatory Agency Compliance Support

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ABB has a thorough understanding of the regulatory and environmental requirements for the chemical, utility and life sciences industries. The 800xA system was designed with those requirements in mind and provides built-in integrated data security options. Regulations require that electronic record keeping be reliable and secure. They also dictate how process information, alarms and events and reports must be maintained electronically. This is extremely important for industries where such information must be provided without fail.

Information Management functions in the 800xA system provide the following electronic data management features:

- Electronic signatures
- System-wide authority and access functions for change control
- Audit trail
- Versioning
- Archiving
- Easy to use standard reports

The system features and functions provided help manufacturers meet stringent regulatory requirements. The Food and Drug Administration (FDA), Good Automated Manufacturing Practices (GAMP), Environmental Protection Agency (EPA), worker safety and other local and national organizations set forth the requirements.

Standard reports that are easy to customize are provided to help users meet the regulated reporting requirements. These reports reduce engineering time and help provide the information needed to document the process and products manufactured.

For the batch industry, the Batch Management, Manufacturing Management, and Information Management functions of the 800xA system are tightly integrated.

800xA Demo				
Batch Manager Events				
Batch ID: A800-03				12/18/03 6:28 PM
Let To: Lortix	Location: A800-03	Operator: jposervice	Batch Start: 2003/11/18 20:55:54	
Sign ID: Complic	Location: A800-03	Operator: jposervice	Batch End: 2003/11/18 20:18:00	
Name: BrewKettle	Location: A800-03	Operator: jposervice		
Version: 3.1	Location: A800-03	Operator: jposervice		
Time	Procedure	Procedure Path	Category	Message
20:55:54	Complic	BrewKettle.Start	Batch Back Status	Procedure 'BrewKettle' started at 20:55:54.518
20:56:00	A800-03	BrewKettle.35	Batch Back Status	Message start at 12:56:00.634 11/18/2003
20:56:00	A800-03	BrewKettle.35	Batch Back Status	Message reply received True
20:56:00	A800-03	BrewKettle.31	Batch Back Status	Reserve equipment started at 19:55:16.797
20:56:00	A800-03	BrewKettle.31	Batch Back Status	Reserve equipment ended at 20:07:36.516
20:56:00	A800-03	BrewKettle.32	Batch Back Status	Flow 'GrossWater' (A8L_TankChange) started at 20:07:36.516
20:56:00	A800-03	BrewKettle.32	Batch Back Status	Flow 'GrossWater' (A8L_TankChange) ended at 20:08:03.532
20:56:00	A800-03	BrewKettle.32	Batch Back Status	Procedure block 'Cook' started at 20:08:03.532
20:56:00	A800-03	BrewKettle.42.Short	Batch Back Status	Procedure 'A8L_KettleBrew' started at 20:08:03.532
20:56:00	A800-03	BrewKettle.42.4	Batch Back Status	Resorted Compets block at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.42.1	Batch Back Status	Tube collection finished at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.42.3	Batch Back Status	Flow 'Heart On/Off' (A8L_Tank Temp) started at 20:08:03.532
20:56:00	A800-03	BrewKettle.19	Batch Back Status	Reserve equipment started at 20:08:03.532
20:56:00	A800-03	BrewKettle.19	Batch Back Status	Reserve equipment ended at 20:08:03.532
20:56:00	A800-03	BrewKettle.17	Batch Back Status	Procedure block 'Socche Change'
20:56:00	A800-03	BrewKettle.17.Short	Batch Back Status	Procedure 'A8L_SoccheBrew' started at 20:08:03.532
20:56:00	A800-03	BrewKettle.12.2	Batch Back Status	Resorted Compets block at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.13.1	Batch Back Status	Flow 'Change' (A8L_TankChange) started at 20:08:03.532
20:56:00	A800-03	BrewKettle.13.1	Batch Back Status	Flow 'Change' (A8L_TankChange) ended at 20:08:03.532
20:56:00	A800-03	BrewKettle.44.Short.1	Batch Back Status	Procedure 'A8L_RecycleBrew' started at 20:08:03.532
20:56:00	A800-03	BrewKettle.44.3	Batch Back Status	Transition started at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.13.2	Batch Back Status	Flow 'Change' ended at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.13.2	Batch Back Status	Resorted Compets block at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.12.Short	Batch Back Status	Procedure 'A8L_SoccheBrew' ended at 20:08:03.532
20:56:00	A800-03	BrewKettle.17	Batch Back Status	Procedure block 'Socche Change'
20:56:00	A800-03	BrewKettle.44.3	Batch Back Status	Transition ended at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.44	Batch Back Status	Procedure block '4076 2777000000' ended at 20:08:03.532
20:56:00	A800-03	BrewKettle.26	Batch Back Status	Reserve equipment started at 20:08:03.532 11/18/2003
20:56:00	A800-03	BrewKettle.47.3	Batch Back Status	Flow 'Heart On/Off' ended at 20:11:55.326
20:56:00	A800-03	BrewKettle.42.4	Batch Back Status	Flow 'Heart On/Off' (A8L_Tank Temp) started at 20:11:55.326
20:56:00	A800-03	BrewKettle.42.4	Batch Back Status	Flow 'Heart On/Off' ended at 20:14:20.429
20:56:00	A800-03	BrewKettle.42.5	Batch Back Status	Flow 'Heart On/Off' (A8L_Tank Temp) started at 20:14:20.429
20:56:00	A800-03	BrewKettle.42.5	Batch Back Status	Flow 'Heart On/Off' ended at 20:16:05.007
20:56:00	A800-03	BrewKettle.42.6	Batch Back Status	Batch start at 20:16:44.427 11/18/2003

Figure 9. Batch Manager Events Report

## Comprehensive Production Records

In System 800xA, production records containing all manufacturing execution information are stored in Production Data Logs (PDLs). Standard tools and data views via standard open interfaces provide access to production data from Batch and Manufacturing Management applications. For batch processes, all information is structured according to the batch procedure and associated with the Batch ID. Batch information includes data from control recipe execution, operator actions and comments, process alarms/events from equipment acquired by batch, and of course any runtime changes. This makes it very easy to display and/or report any information from a specific batch, or from an entire campaign.

PDL stores the complete production record. Inventory transactions (e.g. Requisition, Consume, Move, Create, etc.), quality management actions (e.g. Sampling, Quality Checks, etc.), and manual operations (e.g. Weigh & Dispense) executed as part of the overall manufacturing strategy are all recorded in PDL. When Batch and Manufacturing Management are interfaced to an Enterprise Resource Planning system, business information (e.g. purchase orders, supplier information, etc.) can also be stored in PDL.

Standard reports that are easy to customize are provided to help users meet the regulated reporting requirements. These reports reduce engineering time and help provide the information needed to document the process and products manufactured.

ABB 800xA Batch Management - Demo Production Report						
Summary Overview						
BATCH ID:	800A0120	PRODUCTION:	EM_REACTION	REACTOR:	Advanced Operator	
SUP ID:	1200000000	VERSION:	0.0	START TIME:	2003/08/20 15:37:18	
CAMPAIGN ID:	800A012000	QUANTITY:	0.000	ACTUAL:	0.000	2003/08/20 15:34:00
PROD. NAME:	ALCOOL	TARGET:	1.000	ACTUAL:	1.000	
PRODUCT NAME:	Steel ALCOOL	CONC. (g/L):	0.0	0.20	0.0000	
BILL of MATERIALS						
	SAMPLE	ACTUAL	ENG. UNITS	MATERIAL SUP ID	POTENCY (%)	EXPIRATION DATE
Raw Material A	400.0	400.0	Liters	A-80-000000-4	0.0	0.0
Raw Material B	400.0	400.0	Liters	A-80-000000-4	0.0	0.0
Water	400.0	400.0	Liters	0.0	0.0	0.0
Dev Agent	0.0	0.0	kg	A-80-000000-4	0.0	20-01-01
BILL of EQUIPMENT						
	UNIT	START	END	DURATION (minutes)		
Max Process Unit	REACTOR	001	2003/08/20 15:42:00	2003/08/20 15:04:00	00:38	
Feed Tank	RAW MATERIAL A	FT1	2003/08/20 15:04:00	2003/08/20 15:04:00	00:00	
	RAW MATERIAL B	FT2	2003/08/20 15:04:00	2003/08/20 15:04:00	00:00	
EXCEPTIONS						
	USER	REASON	COMMENT	MESSAGE		
Process Change	Advanced Operator	Recipe Change	High Reactor, 400L	Batch Process is in state: Unfinished. Action required.		
Equipment Failure	Advanced Operator	Feed Tank	Feed Tank is empty.	Batch Process is in state: Unfinished. Action required.		
Doing Deviation	Advanced Operator	Water	Water is not added to the batch.	Batch Process is in state: Unfinished. Action required.		

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## Scheduling

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Versatile scheduling with System 800xA makes it possible to automate not only repetitive jobs, but also to initiate reactions to exceptional circumstances without the need of manual intervention.

A variety of scheduling techniques are provided:

- Event-driven
- Cyclic
- Time-based
- On-demand

The Scheduler lets the user schedule and run a variety of tasks including:

- **Data Collection:** Data collection can be triggered by system events. Event-driven collection activates the log term history logs to collect data for the time period specified by the trend buffers before and after the triggered events.
- **Calculations:** The Scheduler also provides a full range of scheduling options for calculations, which can be used to automate key actions. Such reusable application specific functions, can be used to improve both productivity and quality.
- **Reports:** The Scheduler supports scheduling of reports built with compatible applications such as Crystal Reports and Microsoft Excel. A typical example would be time based or cyclic scheduling of shift and production reports.
- **Archiving:** Archiving can be automated by use of the scheduler to secure data without manual intervention.
- **Message Log and PDL Consolidation:** Message logs and Production Data Logs on one or more history servers can be consolidated on one central server. This is done by creating a consolidation job, which is scheduled to run on the target history consolidation server.
- **System Back-up:** To adequately secure the system, the system back-up function can be scheduled to run at designated times.

## Security

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Data security is more than just a regulated industry issue. Good data security means that all users can be confident that their decisions are based on completely reliable information.

The dual and consolidated data configurations, along with off-line storage provided by 800xA Information Management, contribute to dependable data availability (see Data Storage section). Data backfill is accomplished throughout the system architecture, which supports redundant communications and buffering. This provides inherent fault resiliency.

It is also important to protect data from malicious or accidental modification. To this end the 800xA system provides user access restrictions to the control system, operating system, database and ABB applications. This is a multilevel user access model, integrated with Windows domain security, which provides access control based on user name.

For further information, please refer to the Operations Overview.

By using remote desktop views it is possible to provide information for non-operations personnel while protecting the control system against unauthorized actions.

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## Data Transformation

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Softpoint and Calculation functions within System 800xA add value to data by transforming it into actionable information. This enables timely decision-making for improved productivity.

Softpoint functions facilitate the integration of user-configured data points that do not exist as physical process signals. Calculation functions support definition of a calculation script with user-definable inputs and outputs. These inputs and outputs can come directly from process or Softpoint values. Combined, these features provide powerful reusable algorithms. They are also used as mechanisms for integrating external application data into the system.

### Softpoints

Softpoints are user-defined data points that do not directly connect to physical I/O. Softpoints include various data types such as Boolean, integer, single and double precision, floating point and string.

Softpoint data is fully integrated and treated in the same manner as any other value in the system. Engineering unit definitions, descriptor text, and alarm limits are part of softpoint configuration. Softpoint alarms are fully integrated with system wide alarms and events. Softpoints are accessible everywhere in the system including displays, historical recording and reports. Desktop Trends and Excel Data Access can read from and write to Softpoints.

Softpoints are tightly integrated with Calculations and can be used to provide industry application specific data. They can also be used as an easy mechanism for simple integration with external systems.

### Calculations

With Calculations, a calculation script is created with user-defined inputs and outputs.

Inputs can be any aspect object property (i.e. mode, measured value, etc.) of an actual process tag or a Softpoint, and outputs can be any updateable point in the system.

Calculations can be triggered by input changes, scheduled to execute cyclically or scheduled at a given date and time. Data quality information is maintained within all calculations. Therefore, if the input to a calculation has bad data quality, the resulting calculation will be marked as bad quality.

Some typical uses for Softpoint and Calculation functions include:

- Calculations required for regulatory reporting
- Preventative maintenance monitoring
- Model predictive control
- Process analysis
- Integration of external data into the system

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