ABB Ability™ Symphony® Plus SCADA
Executive Overview
Agenda

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Current challenges in SCADA Automation
ABB Ability™ Symphony® Plus SCADA
Current challenges in SCADA Automation

How can a SCADA system help me to...

- reduce time to action and operational errors?
- deploy effective monitoring of large geographically distributed systems?
- effectively deploy remote management solutions?
ABB Ability™ Symphony® Plus SCADA
Current challenges in SCADA Automation

How can a SCADA system help me to...

- ensure reliability and availability of the system?
- protect my system regarding physical security and cybersecurity?
- start small and grow efficiently with little engineering effort?
Current challenges in SCADA Automation

How can a SCADA system help me to...

- adopt new solutions and improve operational performance?
- manage an ageing workforce and attract a younger generations?
- consolidate data to a unified operations center?
ABB Ability™ Symphony Plus® SCADA
**Symphony Plus® SCADA**

Introduction

Symphony Plus SCADA is an open, flexible and scalable platform which serves as a reliable and secure platform for all SCADA applications.
BUILT ON ITS VALUE PILLARS OF:

- Openness, Flexibility and Scalability
- Visual Awareness
- Remote Operations
- Efficient Engineering
- Digital Innovation

Adapting easily to your growth delivering a unique maintenance and operation experience.
Symphony Plus® SCADA
Optimal orchestration for geographically distributed systems

Openness, flexibility and scalability

Visual Awareness  Remote Operations  Efficient Engineering  Digital Innovation
Openness, flexibility and scalability

Open communication

Connect your sources

Open architecture supporting complete and seamless integration of remote sites, PLC's, controllers, electrical systems, and intelligent devices

- Supporting many Connectivity's (protocols) to most PLC’s and Controllers available in the market
- Capability to integrate data from disparate facilities systems
- Open system supporting open standards and industrial protocols
- Store and forward – Store and forward at every level to avoid any data loss

<table>
<thead>
<tr>
<th>Third Party PLC/RTU Connects using standard interfaces</th>
<th>Telemetry Protocols</th>
<th>Electrical Integration</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>• OPC DA, AE, HDA</td>
<td>• IEC 60870-5-101</td>
<td>• IEC 61850</td>
<td>• Text Driver</td>
</tr>
<tr>
<td>• OPC UA Client</td>
<td>• IEC 60870-5-103</td>
<td>• IEC 61400-25 for Wind integration</td>
<td>• ComLi</td>
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<tr>
<td>• Modbus TCP</td>
<td>• IEC 60870-5-104,</td>
<td>• DNP 3.0</td>
<td>• IEC 60870-6 (ICCP) using TMW Gateway</td>
</tr>
<tr>
<td>• SNMP, SNMP Trap</td>
<td>• DNP 3.0</td>
<td></td>
<td>• Kepware using OPC</td>
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</table>
Openness, flexibility and scalability
System Architectures

Flexible and scalable design
Supports diverse set of SCADA applications with a simple and flexible system architecture

Deployments:
- Single node or stand-alone architecture
- Redundant architecture
- Segregated architecture
- Composite or Multi-Master architecture
- Hierarchical architecture
- Disaster Recovery architecture
- Cloud based architecture
- Multi-System architecture
Symphony Plus® SCADA
Optimal orchestration for geographically distributed systems

Openness, flexibility and scalability

Visual Awareness

Remote Operations

Efficient Engineering

Digital Innovation
**High Performance HMI**

Contextual Navigation allows an operator to easily navigate

- Icon Bar Navigation
- Display Select
- Alarm Group Graphic Bars
- Tab / Tile Windows
- Side Menu
- Flyout Navigation
- Tag Browser
- Fast Search
- Operator Notes
- Points Off Scan
- Limit Indicators
- Bar Graphs
- Operator Notes
- Alarm and Event List
- Operator Parameters
- Red Tag
- Greyscale
- Normal Operations

**Secure and Personalized workplaces**

Increases efficiency and reduces fatigue

- Reduces time to decision and maximizes uptime by providing tailored plant information for each user role
- Better situational awareness leads to faster recognition of abnormal situations and faster response
- Tailored workplace minimizes chances of costly errors

**Current challenges in SCADA Automation**

- Engineering
- Operations
- Manager
- Maintenance
Visual Awareness
Disparate data sources with same look and feel

Seamless data presentation from varied sources for one consistent and familiar operator environment regardless of underlying communication protocols.
Visual Awareness
Advanced Alarm Management

**Alarm presentation**
Embedded alarm management features remove unnecessary alarms to bring those alarms that need action to the forefront and define alarm relevancy to the operator, including:
- Alarm grouping
- Alarm filtering
- Alarm inhibiting
- Alarm shelving
- Alarm suppressing

**Alarm analysis tools**
Operations ISA 18.2 / EEMUA 191-compliant alarm analysis tools support the implementation and maintenance of effective alarm management strategies, including:
- Instantaneous reports
- Alarm / Event frequency
- Alarms over time
- Priority distribution
- Alarm duration
- Time to acknowledge
- Alarm performance
- Loops in manual
- Etc.
Embedded Historian

Full featured historian

- Supports aggregates like AVG, MIN, MAX to store the values
- Short Term logs (90 days only)
- Long Term logs (Unlimited storage)
- Redundant Historian (1oo2)
- Excel reports and scheduled reports
- Trend reports, Balance reports, Maintenance reports and more
- Calculation package
- Maintenance totalizers
- EEMUA 191 alarm management reports
Symphony Plus® SCADA
Optimal orchestration for geographically distributed systems

Openness, flexibility and scalability
Visual Awareness
Remote Operations
Efficient Engineering
Digital Innovation
Remote Operations
Remote management solutions for supervision and control

Native remote command and control management
The command gateway routes IEC 60870-5-104 (IEC 104) commands coming from a remote IEC 60870-5-104 master to different underlying Connectivity’s (i.e. OPC)
• Enables handling of remote-control stations from central command
• Useful for Hydro Projects located geographically
• Perfectly suitable if central control station has very low bandwidth communications to the remote sites

Remote notifications of system alarms
S+ SCADA provides **SMS and Email notification** triggered by an Alarm condition in the plant.
• It allows timely intervention by operator and supervisor for critical functions of the plant.
• Alarms can also be acknowledged directly with an automated call response.
Remote Operations
Monitor and supervise from any device at any time

Accessing data anytime form anywhere
Pocket portal allows to easily expand user operations directly from a smartphone, tablet or laptop

- Platform independent, HTML5 web-based application
- Provides access to real-time and historical data simultaneously in one display
  - Access to device status, process conditions, trends, alarms and events, performance dashboards, etc.
- Full touch-based design suited for mobile devices
- Runs within any browser without need for additional client software
- Secure using protocol encryption and user access control
Remote Operations
Intuitive GIS Navigation for more effective operations

Integrated Geographical Information System

Visualization of geographical information from GIS in the operational environment
- Cross navigation between GIS and SCADA process objects (tags, alarms, graphics etc.)
- Alarm Visualization and acknowledgement directly on the maps
- Combine temporal and spatial representation of data in GIS
- Independent of maps vendor – fully compatible with maps from vendors like ESRI ArcGIS, Google, Bing
- Ability to use own geo-database, GIS map-server and web-based GIS client visualization
- Enhanced security inside the control room – S+ Operations GIS allows full functionality without requiring internet connection
Remote Operations
User privileges elevation when required

Delegating privileges across units

Feature provides the possibility to distribute monitoring and control privileges in geographically distributed systems

- Users outside the jurisdiction area: have no access to the signals belonging to the jurisdiction area
- User not belonging to a specific jurisdiction area “A” can ask for the permission to temporary control (=execute commands) also signals belonging to area “A”
- Users belonging to area “A” with just “read-only” access can ask for the permission to temporary control (=execute commands) signals belonging to area “A”
Symphony Plus® SCADA
Optimal orchestration for geographically distributed systems

- Openness, flexibility and scalability
- Visual Awareness
- Remote Operations
- Efficient Engineering
- Digital Innovation
Efficient Engineering
Easily contextualize data into useful information
Efficient Engineering
Generating Cost Effective Solutions

Engineer projects in less time and more efficiently

- Tailored Solutions for a substantial reduction of engineering and configuration
  - Engineering Assistant tool for easily creation of tags and plc logic for the water industry

- Simple system engineering for efficient project deployment
  - Topology designer gives visual engineering experience
  - Bulk engineering support based on templates

- Made for Re-use:
  - Object oriented, reusable solutions
  - Remote operational graphics with no additional efforts (pocket portal support)
Symphony Plus® SCADA
Optimal orchestration for geographically distributed systems

- Openness, flexibility and scalability
- Visual Awareness
- Remote Operations
- Efficient Engineering
- Digital Innovation
Digital Innovation
Embrace Digitalization

- Monitoring and Optimization (M+O) applications can be managed and delivered through cloud.
- Own release cycle separate from Core SCADA system
Digital Innovation
Analyze and predict abnormal events

Analytics Engine

It’s a platform to create or run performance algorithms to analyze and predict plant maintenance issues. This platform provides following features:

- Calculation Runtime
- Online Display of Calculation Diagnostic
- Possibility to load External calculation DLLs from Script
- On the fly calculation updates
- Event Trigger Based Calculations
- Time Series Calculation Support
- Parallel and Stand-by redundancy support
- Parallel Calculation Execution
- Integrated Engineering Interface (module based and script based)
- Offline Testing and Validation of Scripts and Modules
- Scripting (Real Time) and Module based (Historian) Engineering together
Digital Innovation
Applications to support the remote operator

**Mobile App’s features**

- Support for iOS and Android Operating systems
- Easy and Intuitive navigation UX
- Alarm notifications
- Visualization of binary and analog values
- Quality indication and connection error handling
- Alarm limit visualization
- Trend curve with quality indication
- Object search with autocomplete
- Search history
- Objects can be added to Favorites / Custom list
- Full Alarm list overview
- Easy Sharing using Android services
3 Global References
Symphony Plus® SCADA
Global references
Summary
Symphony Plus® SCADA

Summary

Openness, flexibility and scalability
For reliable, secure systems which help to reduce the total cost of ownership by cost-effective deployment

Visual Awareness
To minimize unscheduled shutdowns and meet health, safety and environmental requirements with our HMI

Remote Operations
To reduce operational expenditures with remote management solutions

Efficient Engineering
To engineer and commission projects in less time and more efficiently

Digital Innovation
To protect your investment with ABB as a supplier and improve operational performance through innovation
**Symphony Plus® SCADA**

Summary (1/3)

Built on field proven features and functions

Symphony Plus SCADA includes:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>rich HMI, advanced alarm capabilities, consistent and consolidated view</td>
</tr>
<tr>
<td>Flexibility and Scalability</td>
<td>flexible and highly Scalable, adapts easily to the growing needs</td>
</tr>
<tr>
<td>Openness</td>
<td>open system built within native open standard communication protocols</td>
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</tbody>
</table>
## Symphony Plus® SCADA
### Summary (2/3)

Built on field proven features and functions

Symphony Plus SCADA includes:

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<tr>
<td>Digital Innovation</td>
<td>fast adoptable innovative solutions through Edge and Cloud technologies</td>
</tr>
<tr>
<td>Object oriented</td>
<td>contextualized data for easy navigation and faster response</td>
</tr>
<tr>
<td>engineering</td>
<td></td>
</tr>
<tr>
<td>Remote Operations</td>
<td>available from any device at any time</td>
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Symphony Plus® SCADA
Summary (3/3)

Built on field proven features and functions
Symphony Plus SCADA includes:

<table>
<thead>
<tr>
<th>Remote Operations</th>
<th>all required remote management capabilities</th>
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<tbody>
<tr>
<td>Security and reliability</td>
<td>high system availability for more uptime improving process reliability</td>
</tr>
<tr>
<td>Lifecycle support</td>
<td>established SCADA system in the market supplied by a market leader in automation</td>
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Symphony Plus® SCADA

Optimal orchestration for geographically distributed systems
Symphony Plus® SCADA System Architectures

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- Cloud based architecture
- Multi-System architecture
**Symphony Plus® SCADA**

**System Architectures**

**Single node / Server less**

- Symphony Plus SCADA can be deployed on a Single Node with all its features and functions including engineering capability
- Perfect fit for small size applications or for applications with no strong requirements for availability
- Single node optimizes cost for HW and SW
- Supports multiple remote clients (desktop or web based)
Symphony Plus® SCADA
System Architectures

Redundant or Multi-Redundant

Redundant architecture options include:
- 1ooN redundancy for Servers
- Master/Standby or Parallel Redundancy at communications layer
- 1oo2 Redundancy for Historian Servers
- Client redundancy

Suitable for high availability requirements of small to large size SCADA applications

Supports Client-Server architecture
Symphony Plus® SCADA System Architectures

**Segregated Architecture**

- Every plant area can have its own SCADA server in one system
- SCADA databases remain separate for each plant area
- Any SCADA client can connect to any Area server to see the data and control that area
**Symphony Plus® SCADA System Architectures**

**Composite or Multi-Master Architecture**

- Every plant area can have its own SCADA server in one System
- All areas share same SCADA database but separate communications to the field
- Any SCADA client can see data of any area and control that area without switching Servers
- Data is always propagated to all servers and commands can be propagated from one server to another server and eventually to the connected field devices
Symphony Plus® SCADA System Architectures

Hierarchical architecture

- Symphony Plus SCADA adapts quickly to growing size of applications both horizontally or vertically
- It allows you to build a hierarchy of servers from lower level to higher level
  - It collects data from lower server to higher server and provides control from higher each server to lower server and eventually to the field
- Perfectly fits the needs of highly distributed SCADA applications
Disaster Recovery Architecture

- Used for long distance transmission where one Control Center acts as a back-up control room in case the primary control room goes down or becomes inaccessible.

- Both Control centers can acquire data in parallel but only Primary control center executes commands.

- Can also be achieved using 1ooN redundancy configuration & Server to Server data replication.
Cloud Based Architecture

- S+ SCADA runs on cloud and uses IaaS subscription model
- Communications to field devices happens over internet using ethernet based protocols like IEC-104 or Modbus TCP
- Engineering can be done using RDP connection to Cloud Server
- Operators can access their workstations from anywhere in the world using RDP protocol and operate the plant
- Plant data can be visualized from anywhere through web browser using HTTPS protocol
Multi-System Architecture

- Symphony Plus SCADA can work with multiple systems using OPC or IEC-104. These systems can also be from a third-party vendor.

- Also, within Major versions of Symphony Plus SCADA it is possible to collect data and propagate commands across multiple systems.
Break
15 mins
Q&A