



ABB Technology Days Fall 2013

# Symphony Plus Evolution

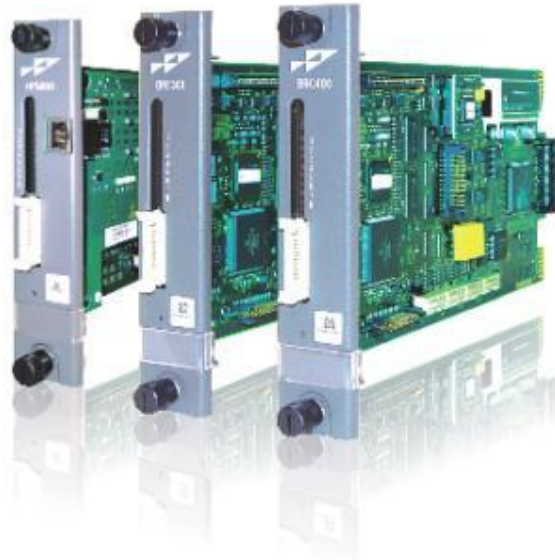
# S+ Control & I/O Update

## Presentation Outline

- ❑ Harmony Rack Update & Evolution
- ❑ SD Series Hardware
- ❑ IEB800 Infi-Net to Ethernet Bridge
- ❑ New Developments Coming Soon...
- ❑ S+ Engineering Update
- ❑ Latest Version of S+ Operations

# What has Changed?

## Life Cycle Commitment



- Previous Support commitment Increased from 2025 to **indefinitely**
- Active investment
- New features and functions at all levels of the system
- Introduction of **Symphony Plus** Product Name

# S+ Control & I/O Update

## Upgrading to Latest Rack Hardware



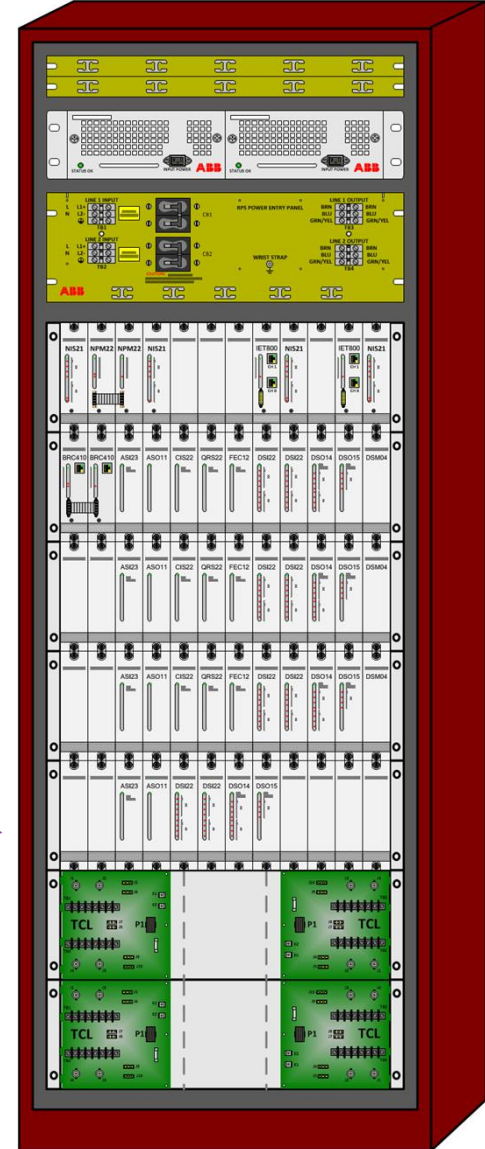
Upgrade Power System to MPS3

Upgrade PCU Communications modules to NIS21 / NPM22

Upgrade Serial or SCSI CIU's to ICI800 Ethernet CIU's

Merge & upgrade multiple MFP's into 1 (pair) of BRC410's

Replace outdated I/O Modules





# Power Supplies

## Harmony Power Supply - MPSIII

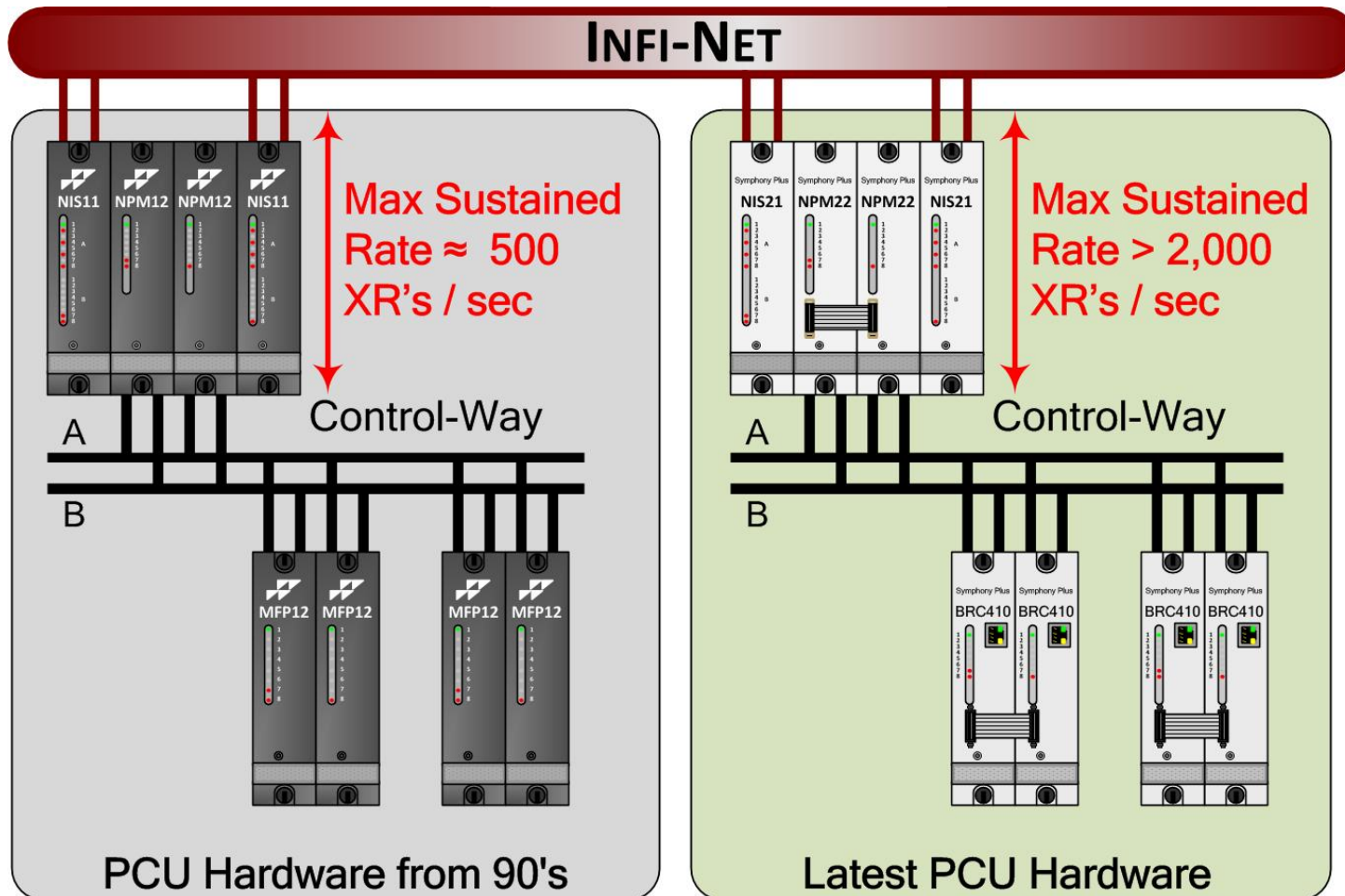


- Multi-Voltage DC Power System
  - System and Field Power
- 2N and N+1 Configuration
- System Monitoring
- “Slide-in” Design
- Evolution for Network 90, MPS I (PMU), and MPS II Supplies



# S+ Control & I/O Update

## Upgrading PCU Communications



- ❑ Replacement NIS01/11 & NPM02/12
- ❑ Form / Fit / Function replacement \*
- ❑ Increased Capacity (8x)
- ❑ Increased Performance (> 4x)

# Symphony Plus Communications

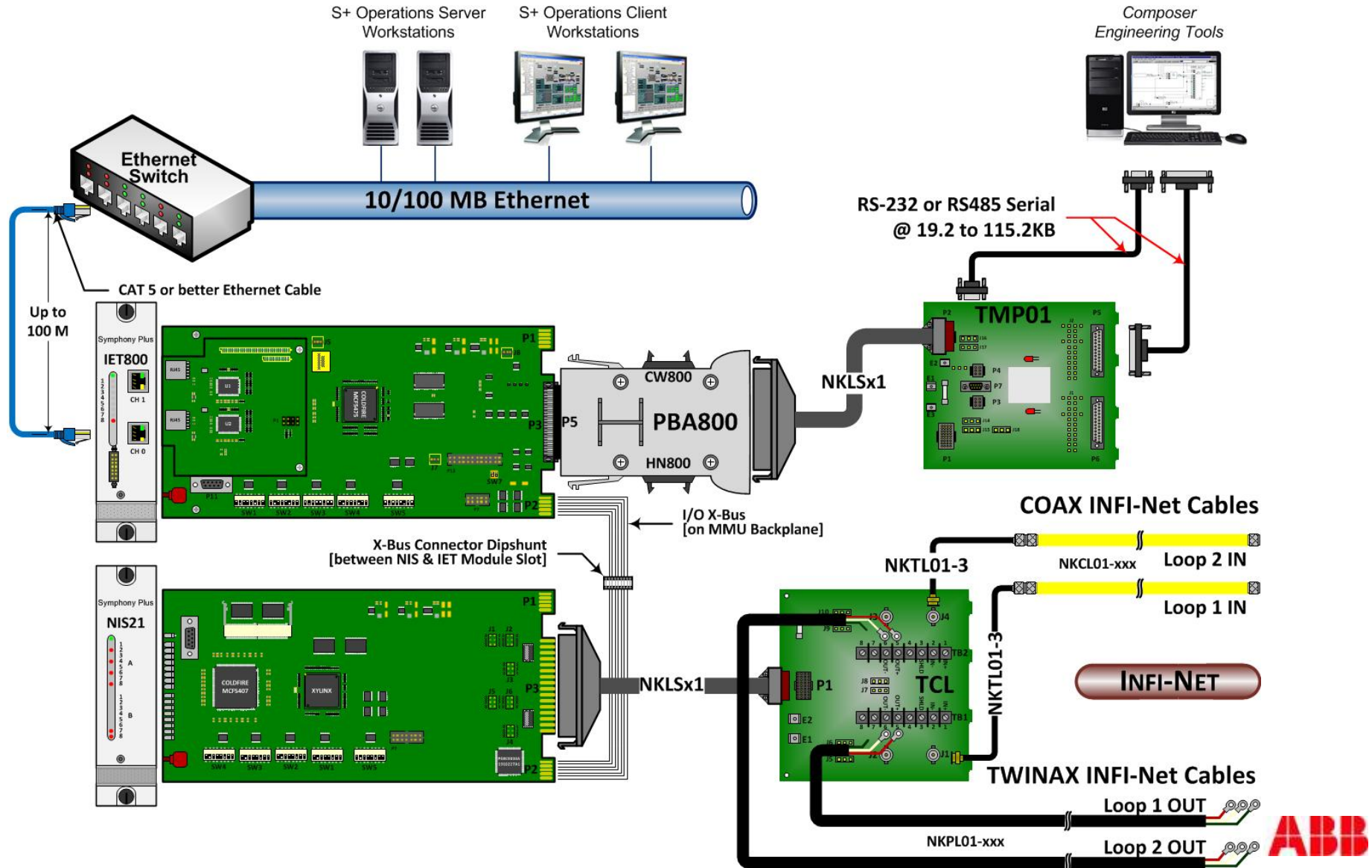
IET800:  
INFI-Net to  
Ethernet  
Transfer



- Ethernet interface to INFI-Net used by:
  - Composer 5.1 and Higher
  - Harmony OPC
  - Harmony Connect (800xA Process Portal v. 5.1A)
  - S+ Operations
  - PPB, Conductor NT\*
- Security Modes
  - **Basic** (Twofish) [Default]
    - 128 –bit block cipher
  - **Advanced** (TLS1/SSL3)
    - 256-bit encryption
- Supports up to 30,000 tags (Ethernet)

# S+ Control & I/O Update

## Upgrading to ICI800 Ethernet CIUs





# Symphony Plus Control & I/O

## BRC410



- Performance increase depends on specific function blocks used, but in general performance of latest module (BRC410) compared with older modules:
- ~ 10x vs. MFP01/02/11/12
- ~ 4x vs. BRC100/200
- Enhanced On-Line Configuration provided by BRC410
- BRC410 also provides ModBus TCP
- BRC410 support 30,000 block addresses
- Infi90 Modulebus support\*
- Downloadable firmware

# S+ Control & I/O Update

## Upgrading to S+ Rack Modules



### □ Harmony Rack Modules

- Grey Front Plates
- Module Nomenclatures: IMxxxx or INxxxx
- Build to Order, longer lead

### □ S+ Rack Modules

- White Front Plates
- Module Nomenclatures: SPxxxx
- Original Price of Grey Modules
- Std Factory Lead Time

# Symphony Harmony Comprehensive I/O system

Rack I/O



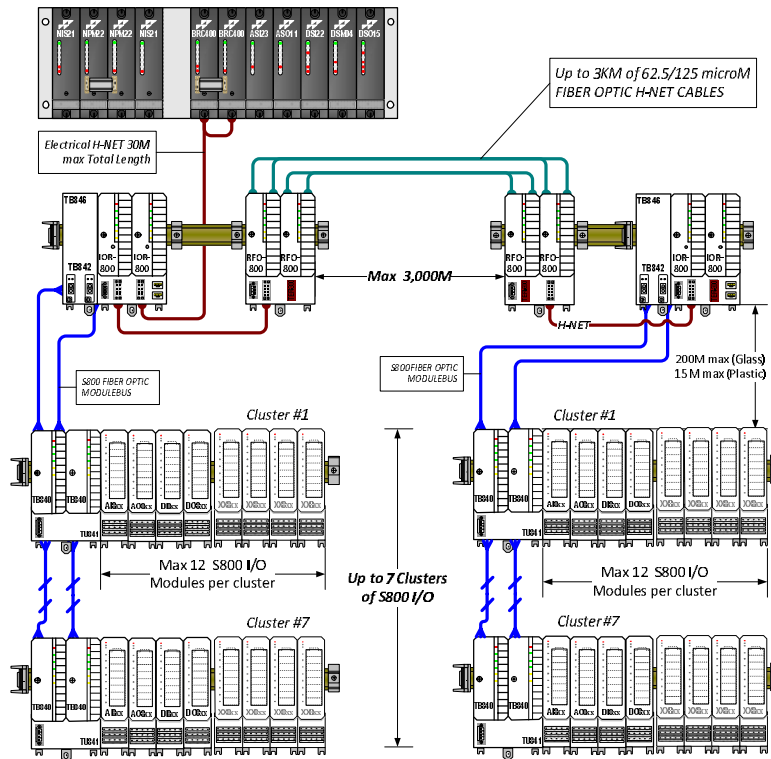
S800 I/O



- Modular to meet varying I/O requirements
  - Local and remote I/O options
  - Rack and DIN I/O options
- I/O Types
  - Analog Input
  - Analog Output
  - Pulse Input
  - Digital Input
  - Digital Output
  - Turbine Control
- SOE timestamp resolution of +/- 1 msec across the entire Harmony system

# Harmony I/O options

## Expanding with S800 I/O

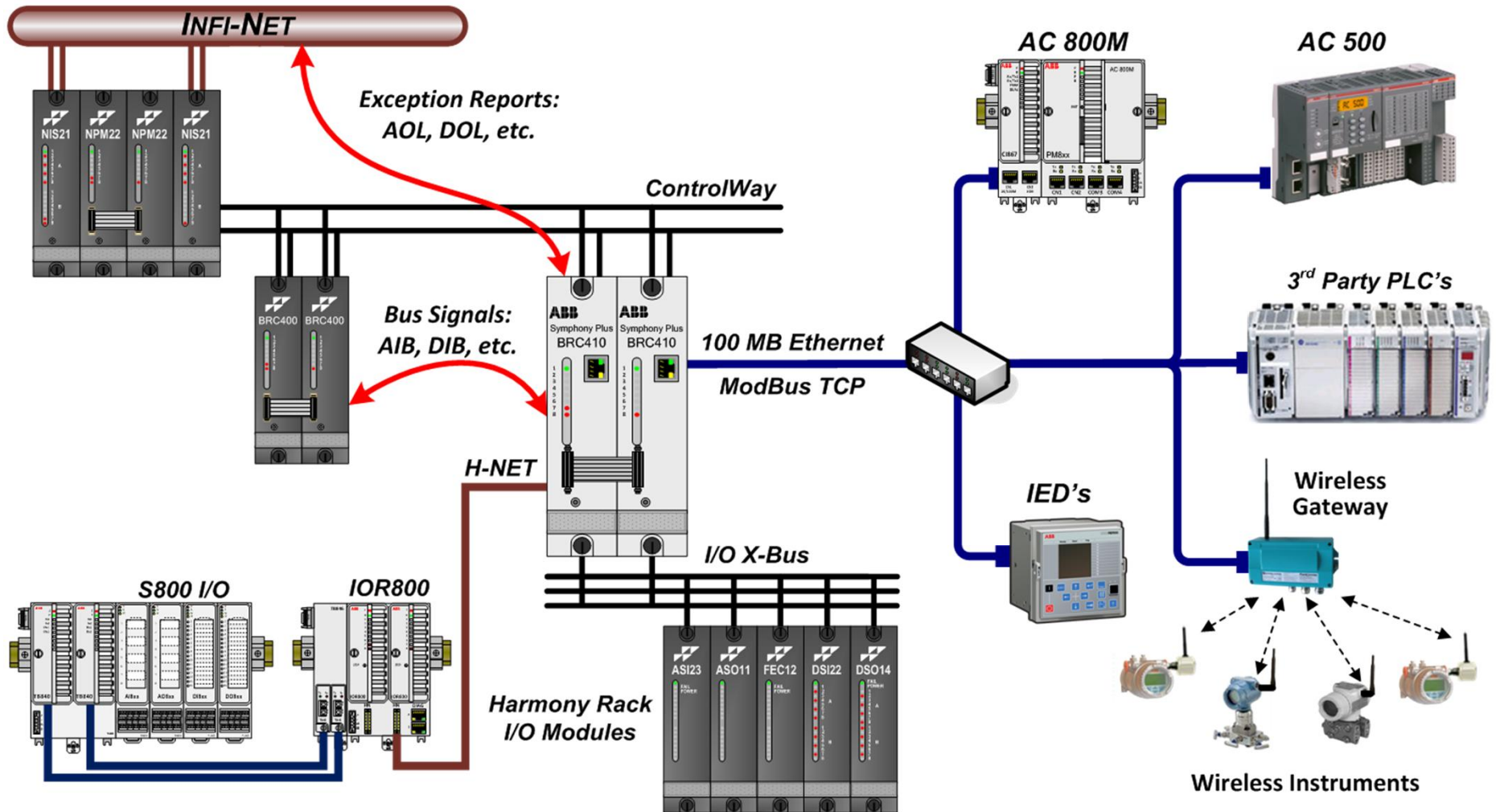


- S800 I/O is configured using Composer and standard function codes
- BRC simultaneously supports Harmony Rack & S800 I/O
- Each IOR-800 supports up to 7 clusters
- Each cluster modem supports up to 12 S800 I/O modules

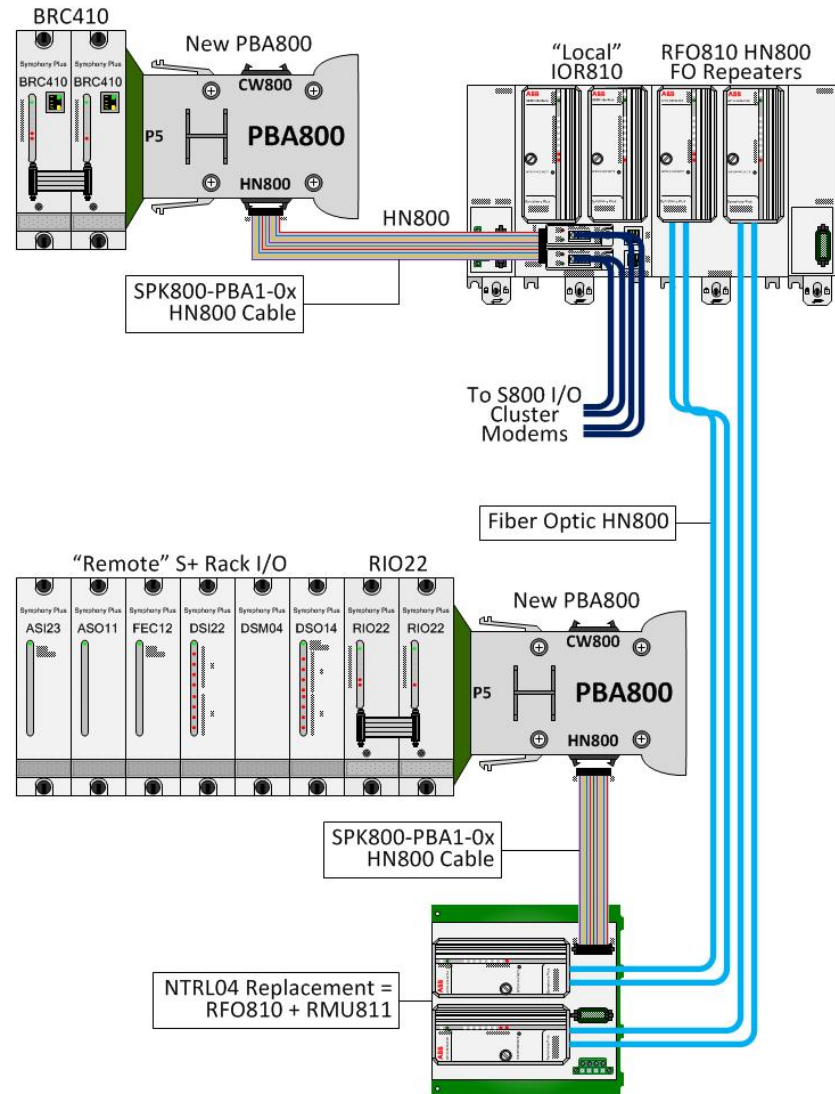
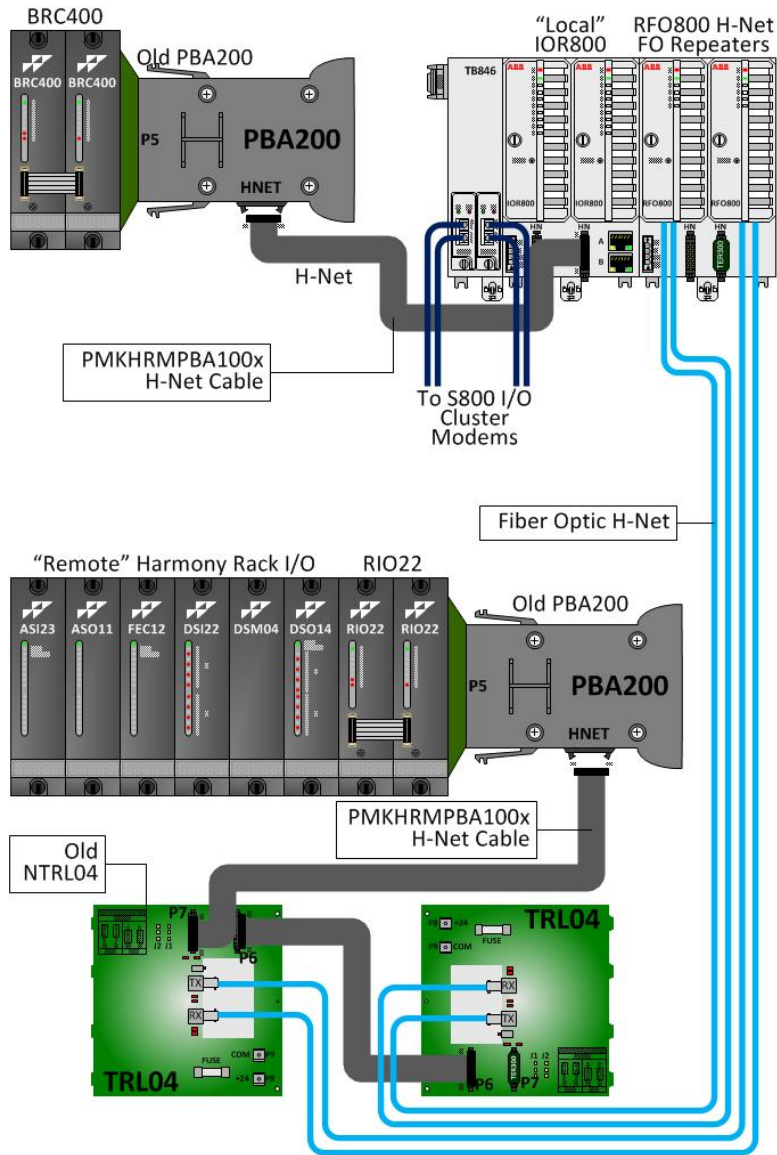


# S+ Control & I/O Update

## BRC410 Bridge Controller and Gateway



# H-Net to Enhanced HN800



# Symphony Plus SD Controller

## Harmony Control & Communications on a DIN-Rail

### PN800: Plant Network

Redundant 100MB Ethernet TCP/IP

## Key Points.

## • Uses Composer / Function Blocks

• Talks to Rack I/O

• Talks to S800 I/O

• Talks to HART I/O

• Talks to Profibus

• Talks Modbus TCP

### ▪ PN800: S+ Plant Network

- Protocol = “*INFI-NET over Ethernet*”
- Connects consoles (S+ Operations) and tools (S+ Engineering) to HPC800 Harmony Controllers

### ▪ HPC800: Harmony Control Processor

- Executes INFI 90 Function Codes
- BRC / HPG Functionality

### ▪ CP800: Communications Processor

- Combination of NIS / NPM modules
- Control Network Interface

### ▪ CTB810/811: Comm. Term. Board

- **HN800** I/O interface for Rack I/O (via RIO22), S800 and new I/O
- **CW800** provides PTP communications between controllers

ModBus TCP

HN800

CW800

# HPC800 Harmony Process Controller

Primary

Back-up



Property	Characteristic / Value
Power Requirements	5W @ +24 VDC (per Processor Module)
PN800 Plant Network Communications	1,000 XR's per second (process value updates)
HN800 I/O Device Bus	4.0 Mbaud, up to 64 Devices (up to 6-pairs PDP800s)
CW800 Controller PTP Bus	4 Mbaud, up to 30 Controllers 30 m [Electrical], 3 km [Fiber Optic]
Programming Languages	Up to 30K INFI 90 Function Blocks Batch 90 / UDF & C programs
Closed Loop Control	5,000 I/O $\leq$ 250 msec
ModBus TCP Communications Interface	Up to 8 Servers & 128 Clients 500 to 10,000 Points
Ethernet Ports 100 MB	EN1 A – Time Sync EN1 B – ModBus TCP PN800 A – PN800 Plant Network PN800 B – PN800 Plant Network





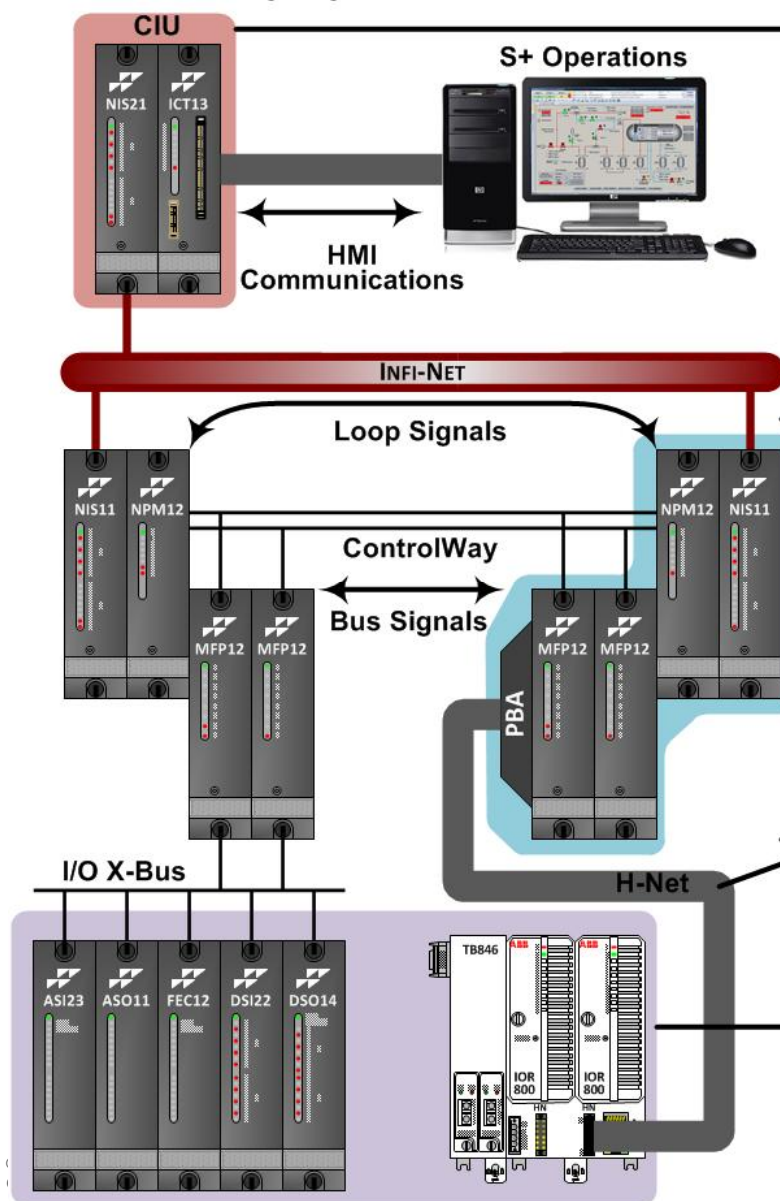
# PNI800 Plant Network Interface



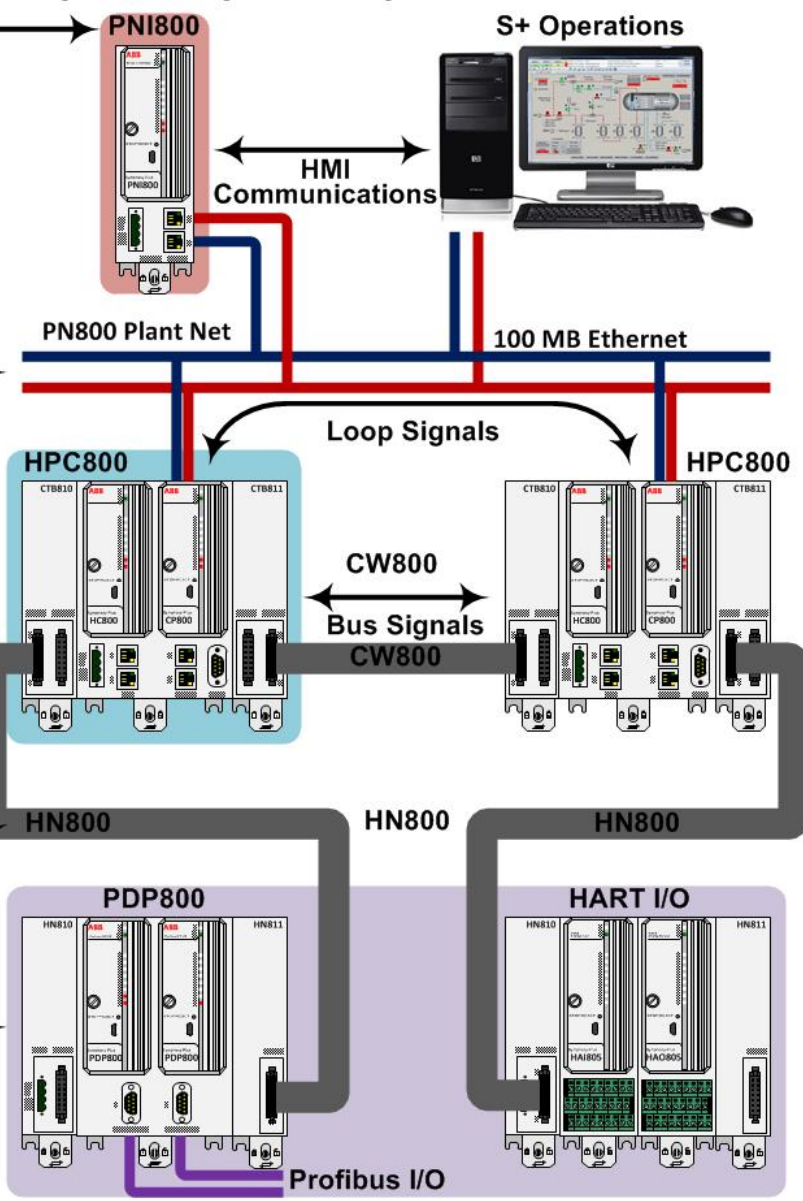
- DIN-Rail CIU for Symphony Plus
- 1-PNI800 required for each HMI Server:
  - S+ Operations Server
  - Harmony RTDS of 800xA PPA
- 1-PNI800 can be shared by up to 10 Composer Client Workstations
  - Composer Communications Server for PN800 Plant Network
- PNI800 supports PN800 line redundancy
  - Connects to both Ethernet lines

# SD Series Control & I/O Architectural Comparison

## Harmony System Architecture



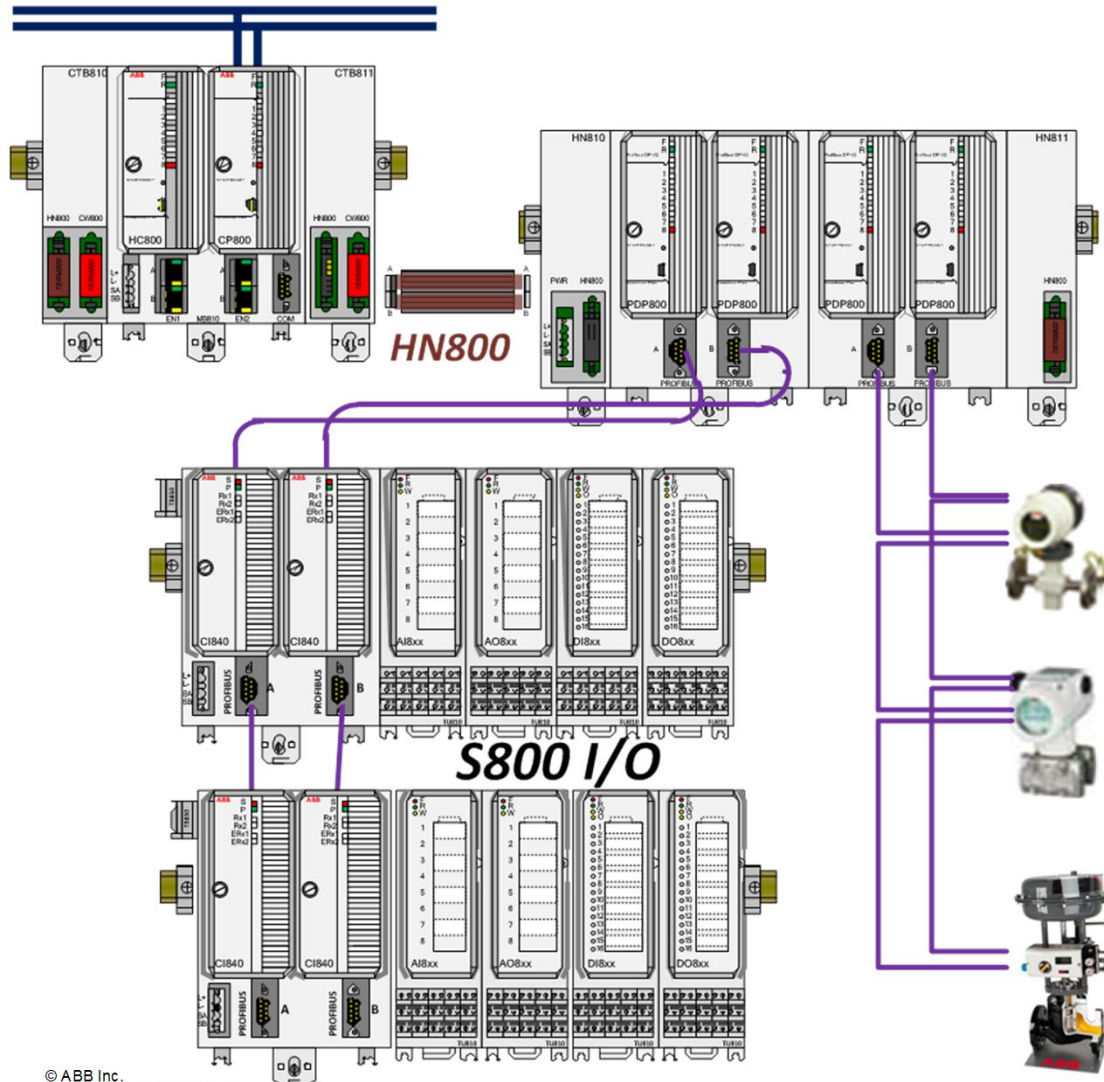
## Symphony Plus System Architecture



# Symphony Plus

## PDP800: Profibus DP Master for Harmony

### PN800: S+ Plant Network



- DIN-Rail mounted
- Profibus DP-V0, -V1 and -V2
- Transmission rates from 9.6 Kbps to 10 Mbps
- Std. Profibus Diagnostic functions
- SOE Time-Stamping with S800 I/O or other devices that support this feature
- Master & Line Redundancy
- Up to 64 Profibus Slaves per PDP800
- Communicates to Harmony Controller via HN800 [Redundant]

*Profibus Instruments*

# PDP800 Profibus Master Module



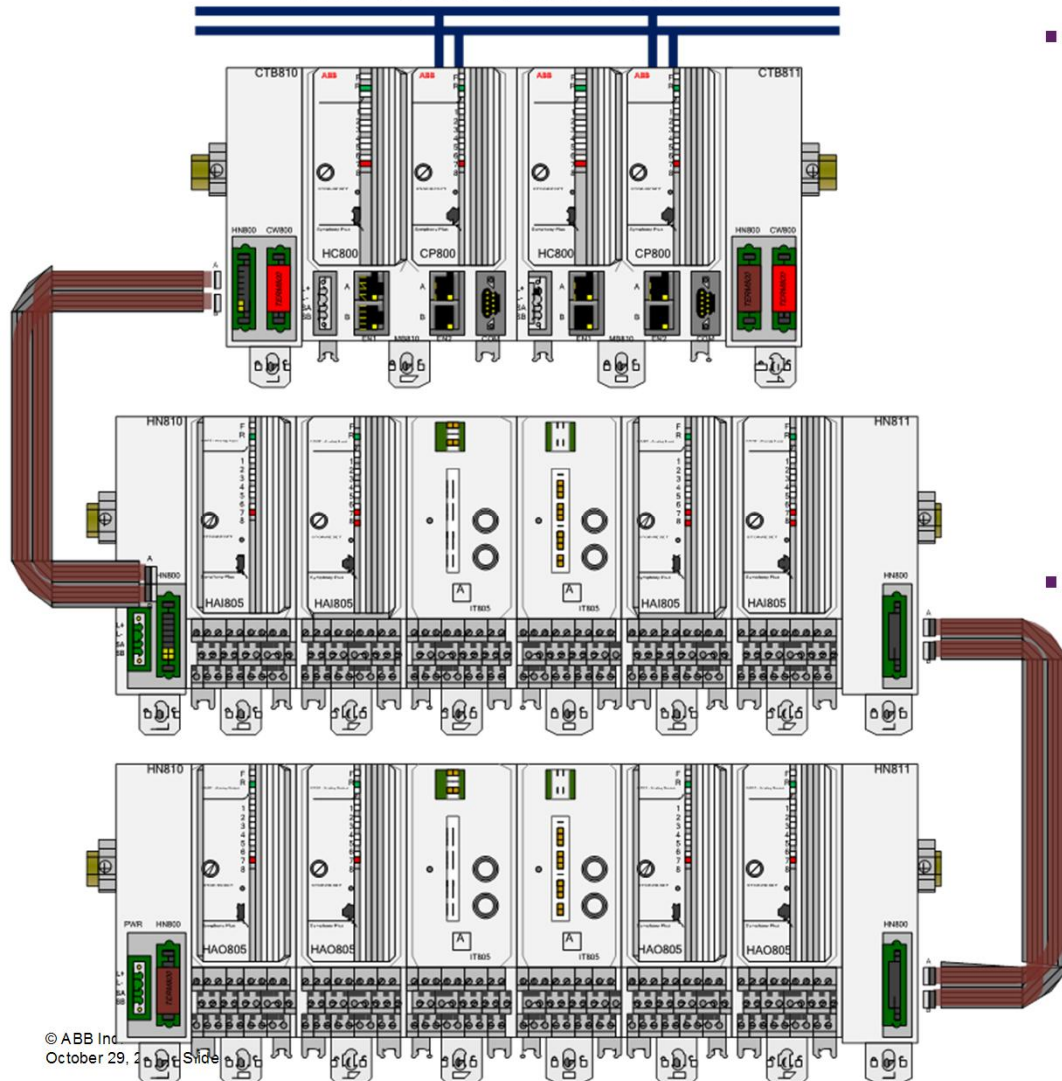
Property	Characteristic / Value	
Power Requirements	Approx. 3.5W @ +24 VDC (per Processor Module)	
HN800 Communication Bus	4.0 Mbps RS485 Max Length [Electrical] 50 M Max Length [Fiber Optic] 3.0 KM	
PROFIBUS Baud Rate & Max Bus Length  * using DP Cable type A	9.6kbaud 19.2kbaud 93.75kbaud 187.5kbaud 500.0kbaud 1.5Mbaud 3.0Mbaud 6.0Mbaud 12.0Mbaud	1200 M 1200 M 1200 M 1000 M 400 M 200 M 150 M 125 M 100 M
PROFIBUS Protocols	DP-V0 Basic DP-V1 Acyclic DP-V2 SoE Time Sync PA [via DP-PA segment coupler]	
Capacity	Up to 8 PDP800's can connect to HPC800 Each PDP800 supports up to 64 Slaves	



# Symphony Plus

## HAI805 & HAO805: HART AI & AO Modules

### PN800: S+ Plant Network



- HART I/O Modules
  - HAI805 – 8 Analog Inputs
  - HAO805 – 8 Analog Outputs
  - Dedicated HART modem for each I/O Channel
  - Communicate to Controller via [Redundant] HN800
- Secondary /Tertiary HART variables:
  - Variables available in Controller (can be used in control strategy)
  - Update rates: less than 1 sec
  - Up to 4 secondary/tertiary ... variables per channel or device

# HAI805 & HAO805 HART Analog I/O Modules

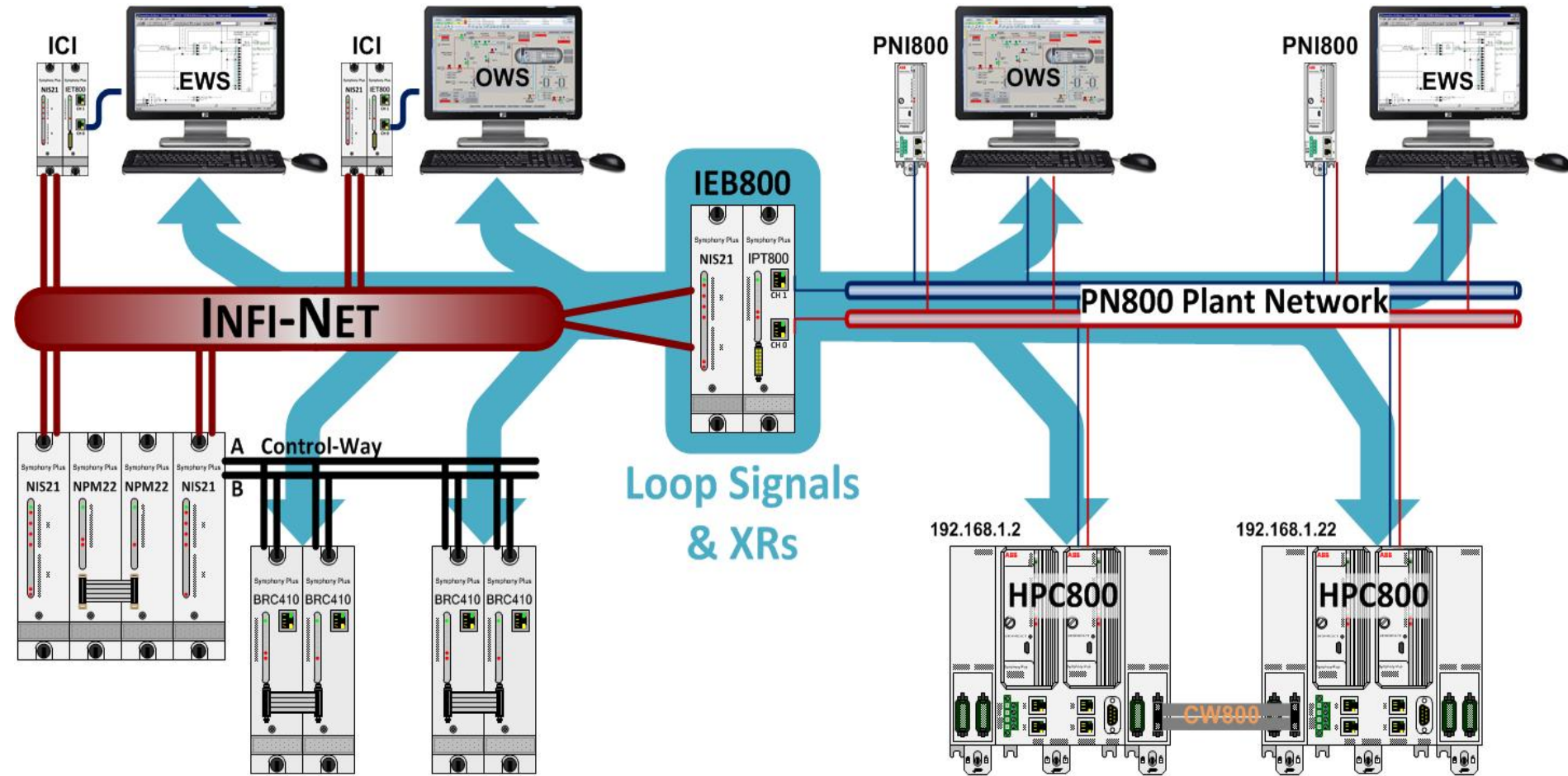


Property	Characteristic / Value
Power Requirements	Typical 4.8W @ +24 VDC +/- 10%
Analog Inputs	4 to 20 mA DC
Analog Outputs	4 to 20 mA DC
Accuracy (% full scale range @ 25 deg C) Temp effect on accuracy	0.10% +/- 0.003% / deg C maximum
A/D Resolution Analog Conversion	14 bits with polarity 200 msec
HART Secondary Variable update rate	1 times / sec [up to 32 secondary variables]
Rejection (50-60 Hz) Normal mode Common mode DC Common mode rejection	-70 dB minimum -90 dB minimum -35 dB minimum

Symphony Plus Control and I/O

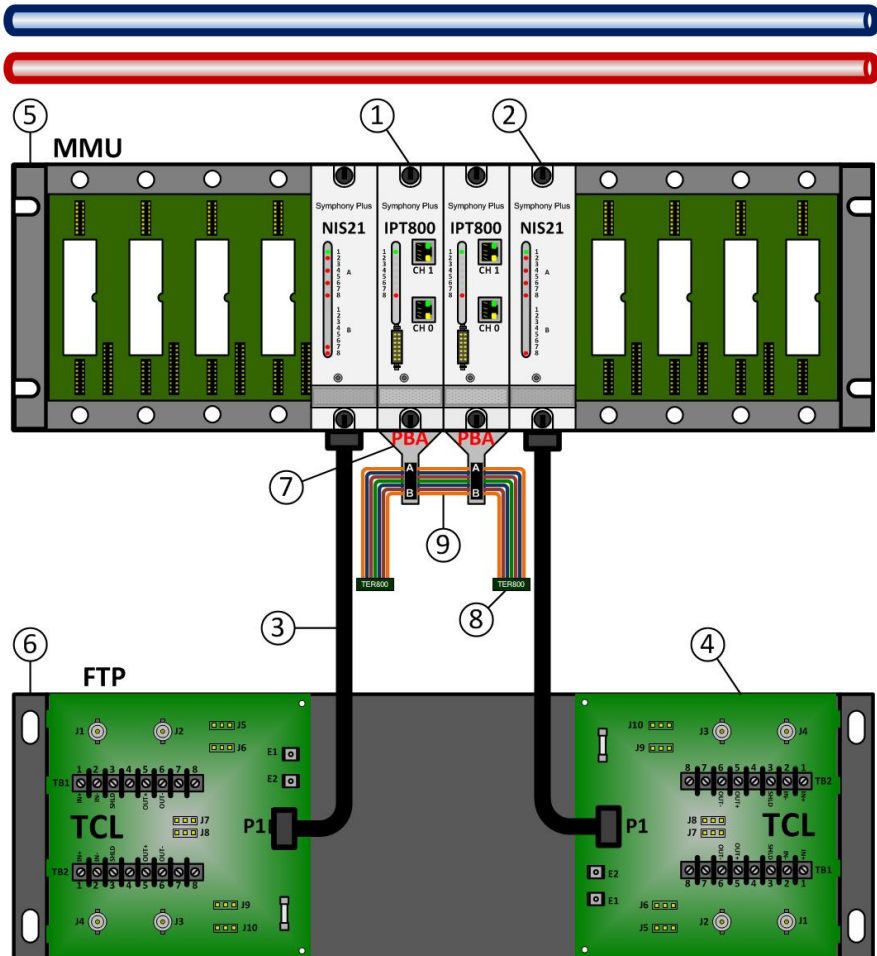
# IEB800 INFI-NET TO ETHERNET BRIDGE

# IEB800 Infi-Net to Ethernet Bridge



# IEB800K02 INFI-Net to Ethernet Bridge [Redundant]

## PN800 Plant-Net

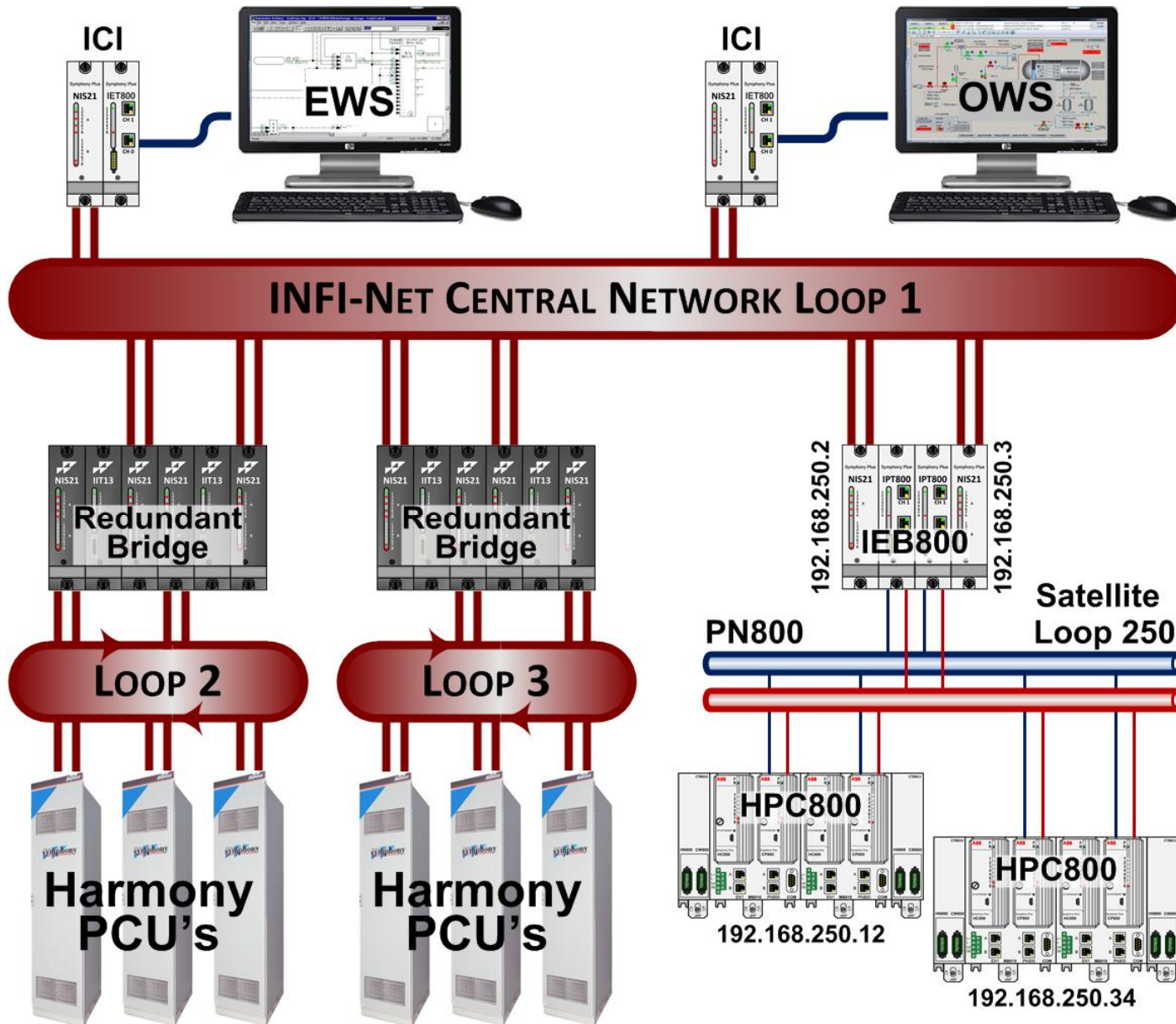


## INFI-NET

#	Qty	Part No.	Description
1	2	SPIPT800	INFI-Net to Plant Network Transfer Module
2	2	SPNIS21	Network Interface Module
3	2	NKLS01-10	Communications Module Cable
4	2	NTCL01	Communications TU
5	1	IEMMU21	Module Mounting Unit
6	1	NFTP01	Field Termination Panel
7	2	PBA800	Process Bus Adaptor 800
8	2	TER800	HN800/CW800 Bus Terminator
9	1	SPK800-RCL1	Redundancy Cable



# IEB800 Adding a PN800 as a Satellite Loop



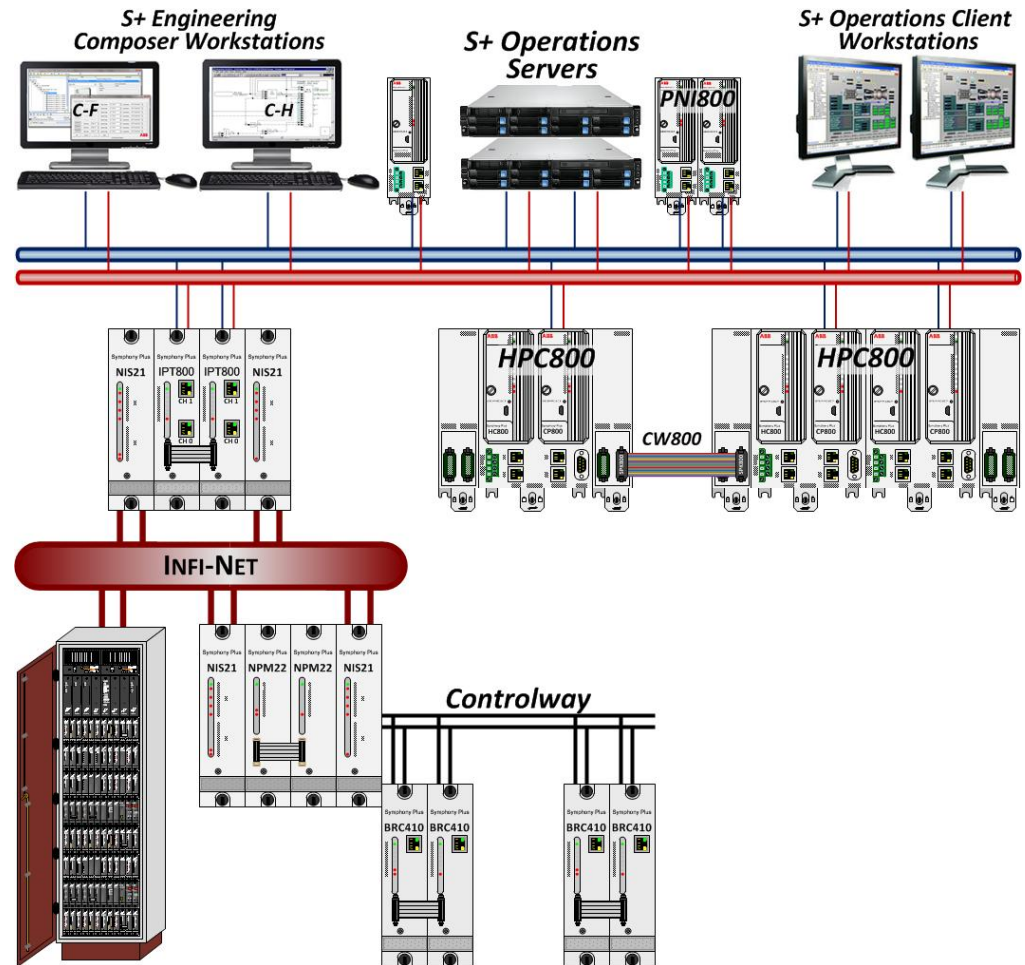
Symphony Plus Engineering

# COMPOSER UPDATE

# S+ Engineering Composer Harmony

## Most Recent Product Releases

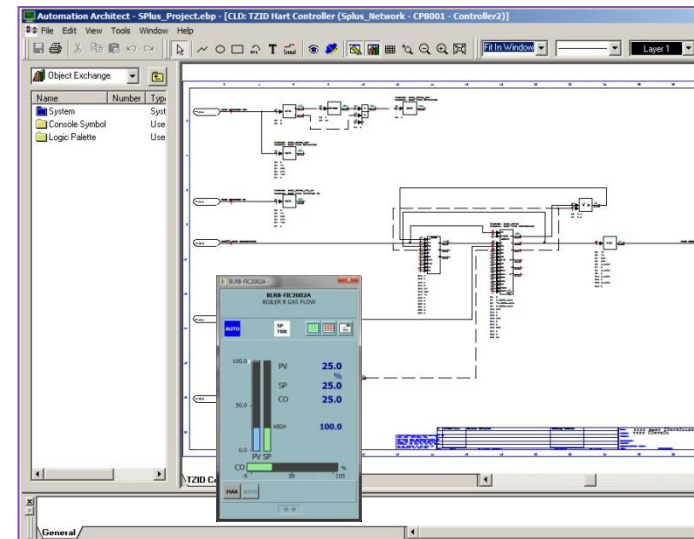
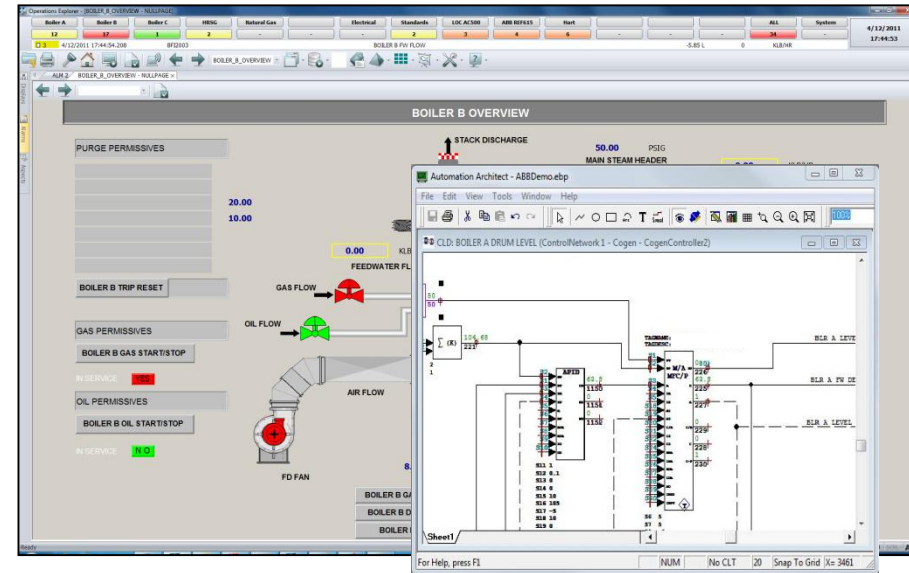
- ❑ V 6.0, SP1 December, 2012
  - ❑ Improved Fieldbus config workflow
- ❑ V 6.1, August 2013
  - ❑ Automatic export of Harmony tag list to S+ Operations
  - ❑ Support for import and export hardware structure
  - ❑ Improved Profi-Bus workflow
  - ❑ Support for new I/O



# S+ Engineering Composer

## View Control Logic / view Faceplate

- ❑ Right click navigation
  - ❑ Graphic to Composer logic
  - ❑ Alarm to Composer logic
- ❑ View logic
- ❑ Monitor status in real time
- ❑ Navigate within Composer
- ❑ Right click navigation
  - ❑ Exception Report block to faceplate
- ❑ Supports engineering maintenance / tuning
- ❑ Automatically configured within system



# S+ Engineering Composer

## Configuring PROFIBUS DP Field Devices

### □ PROFIBUS DP Example

#### □ AI820 Analog Input module

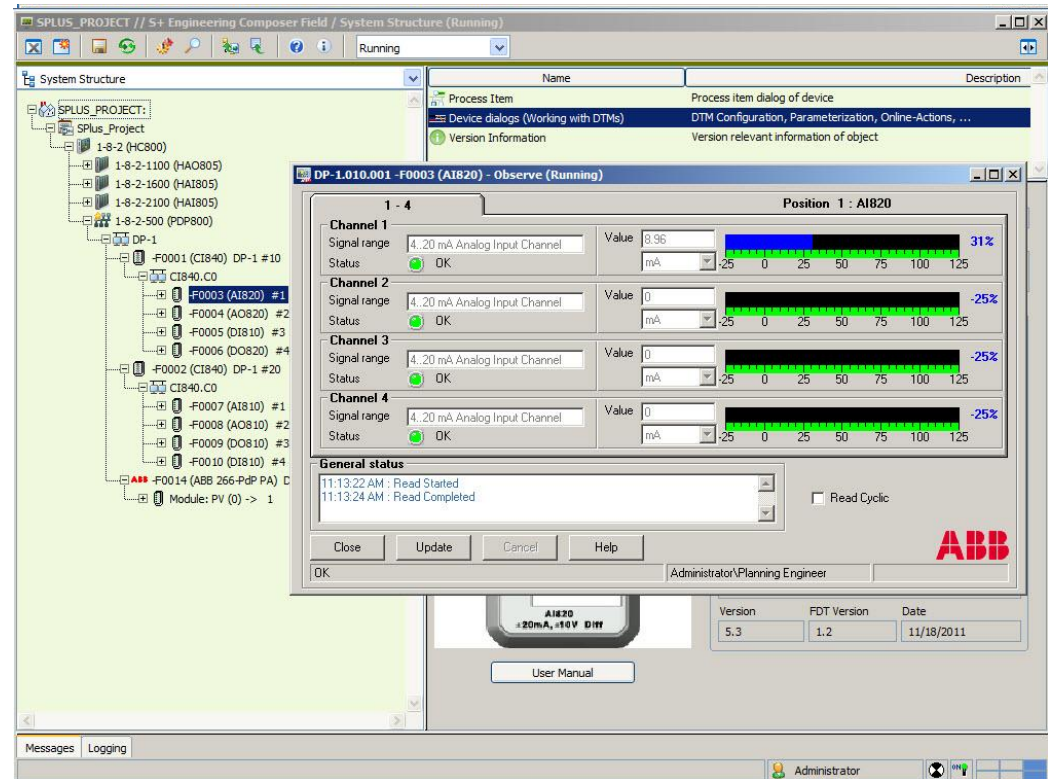
### □ PROFIBUS DTM functions

#### □ Configure

#### □ Calibrate

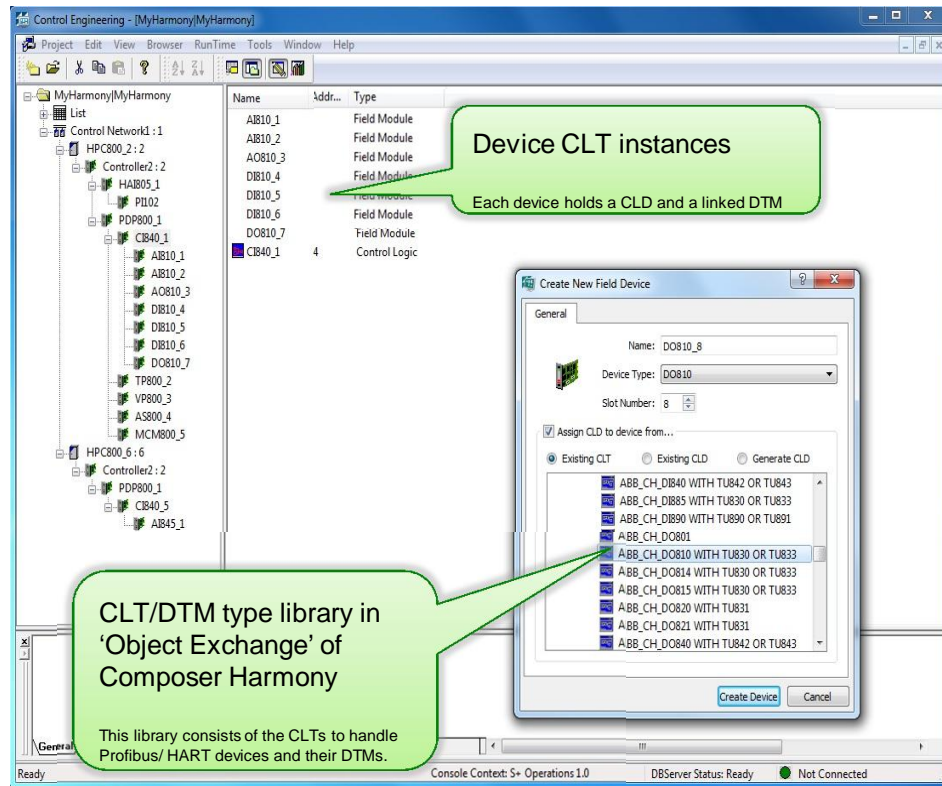
#### □ Observe

#### □ Trouble-shoot





# S+ Engineering Composer Harmony Streamlined Fieldbus Engineering Workflow



- ❑ Build complete HW structure in CH
- ❑ Call-up DTM directly from CH
- ❑ Simple instantiation of CLD/DTM library objects

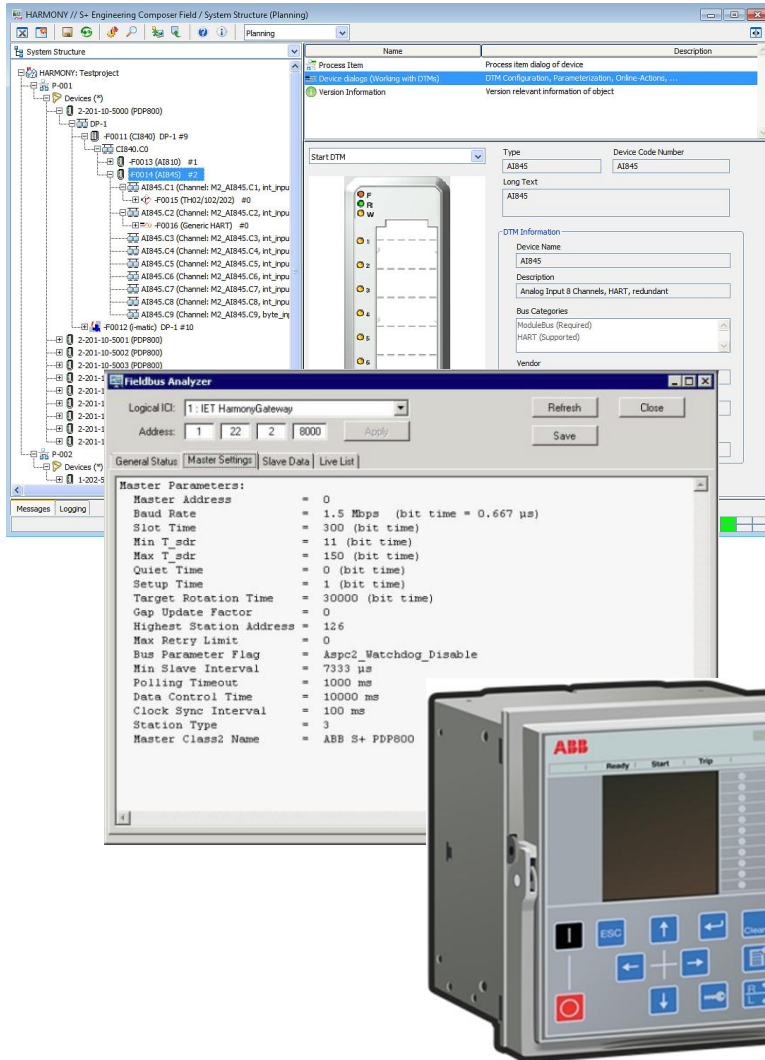
- ❑ Remove block number requirement when adding fieldbus masters
- ❑ Use CLTs for devices - New folders in Exchange to hold templates slaves and I/O modules
- ❑ Ability to add fieldbus slaves and I/O modules to CH tree.

Symphony Plus Control and I/O

**ENHANCEMENTS COMING  
SOON ...**

# S+ Engineering Composer Harmony 6.x

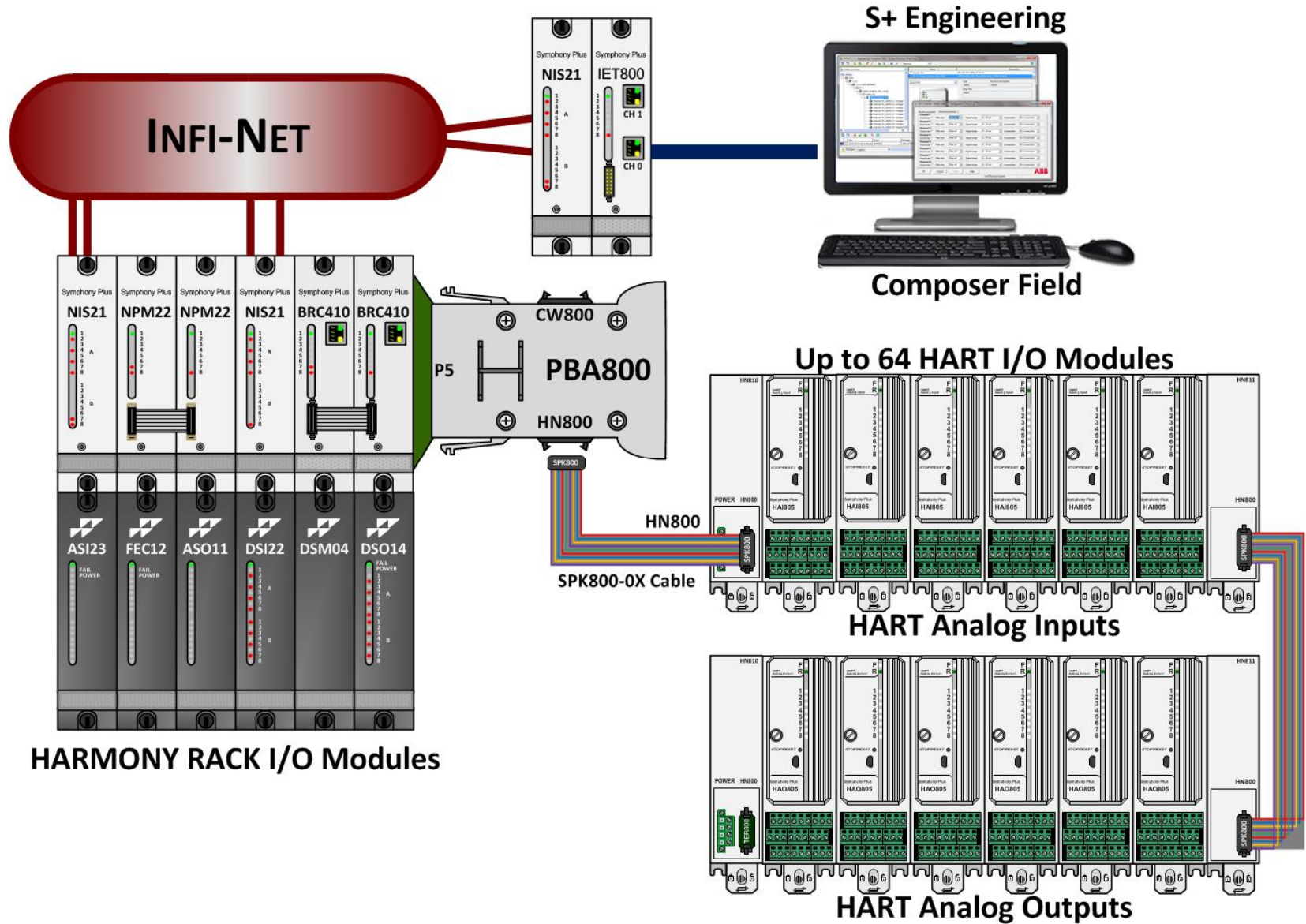
## Upcoming Releases in 2013



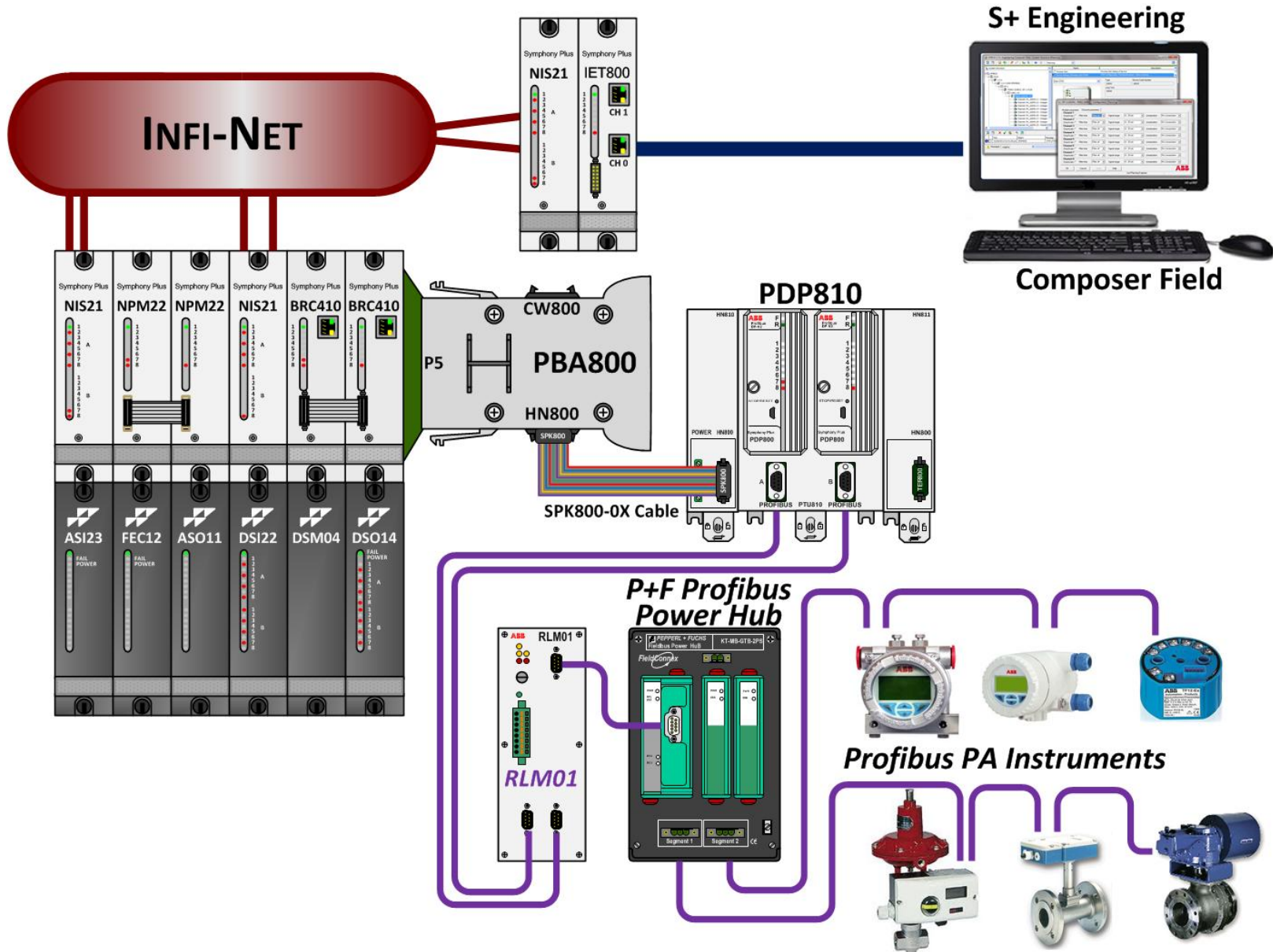
- ❑ V 6.2 DEC 2013 [**Target**]
- ❑ New CI850 Communications I/F
  - ❑ IEC-61850 GOOSE
- ❑ “Virtual PNI Interface”
- ❑ Add HART & Profibus support to BRC300/400/410 Controllers!



# S+ Control & I/O Adding HART I/O to Rack



# S+ Control & I/O Adding Profibus to Rack





Symphony Plus HMI

# **SYMPHONY PLUS OPERATIONS 2.0**

# S+ Operations overview

## Table of contents

- Introduction
- Architecture
- Operation features
- Integrated information management
- Reliable operations
- Lifecycle management
- Summary

# S+ Operations

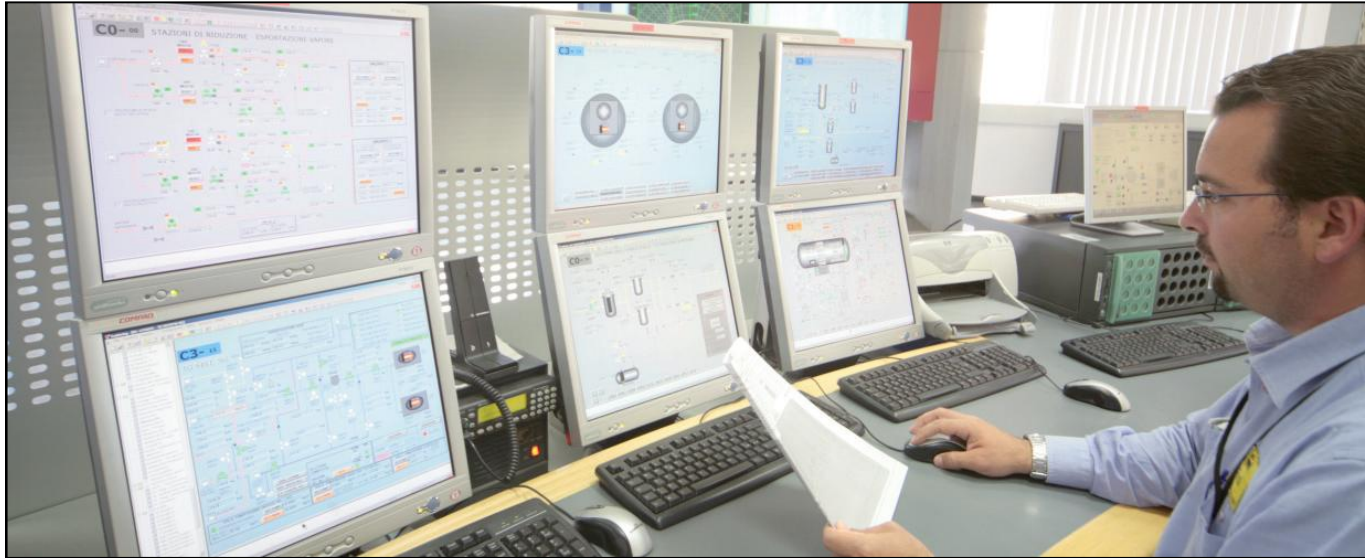
## Primary objectives for development



- Simple to use
- Scalable
- Secure
- Based on proven technology
  - S+ Ops is next revision to PGP
  - Power Generation Portal (PGP): +2300 systems worldwide
  - S+ Ops integrates Power Gen Information Manager (PGIM)

# S+ Operations features

## Life cycle management and investment protection



S+ Operations protects investments in traditional Harmony or INFI 90 HMIs by retaining existing operator graphic displays and tag databases

- Support for SODG based graphics (MCS, OIS, PCV & CVMS)
- Support for SLGMS based graphics (CNT & PPB)
- Upgrades performed on-line and in parallel operation with existing HMI
- Automation Sentinel provides incremental and cost-effective path to the latest S+ Operations software and keeps HMI software up-to-date

# S+ Operations overview

## Table of contents

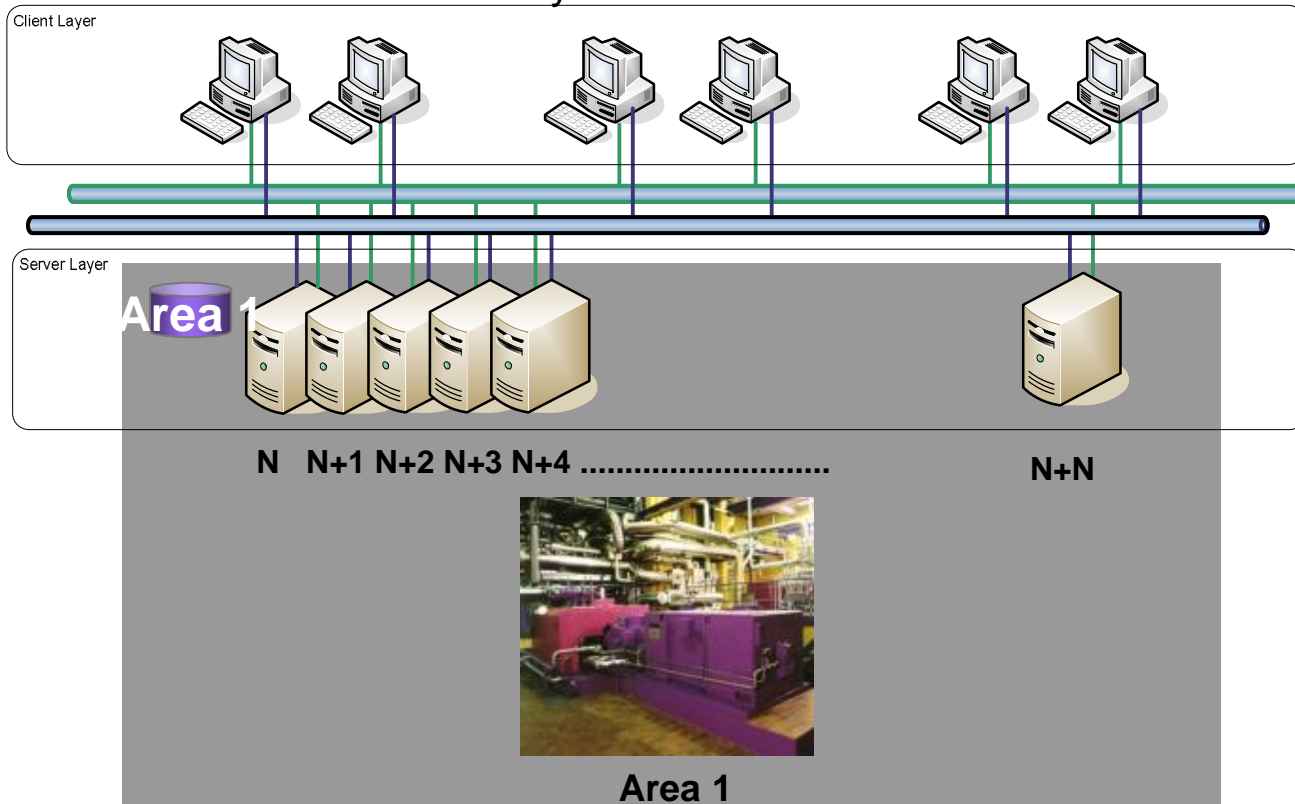
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# S+ Operations

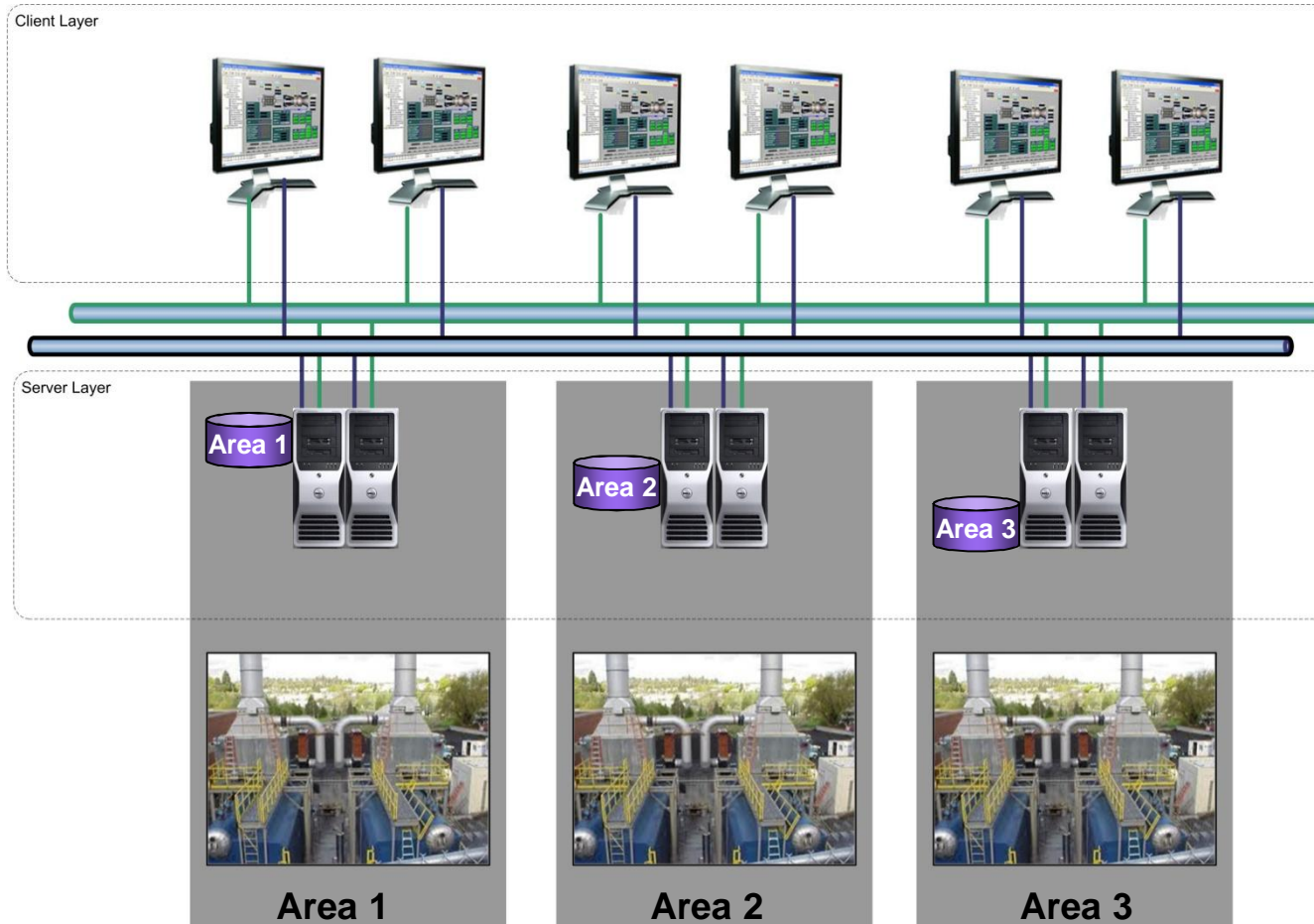
## Fault tolerant N+N server capability

- Supports multiple servers with parallel data streams
- Provides N+N server redundancy
- Clients can connect to any server



# S+ Operations architecture

## Scalable: segregated architecture



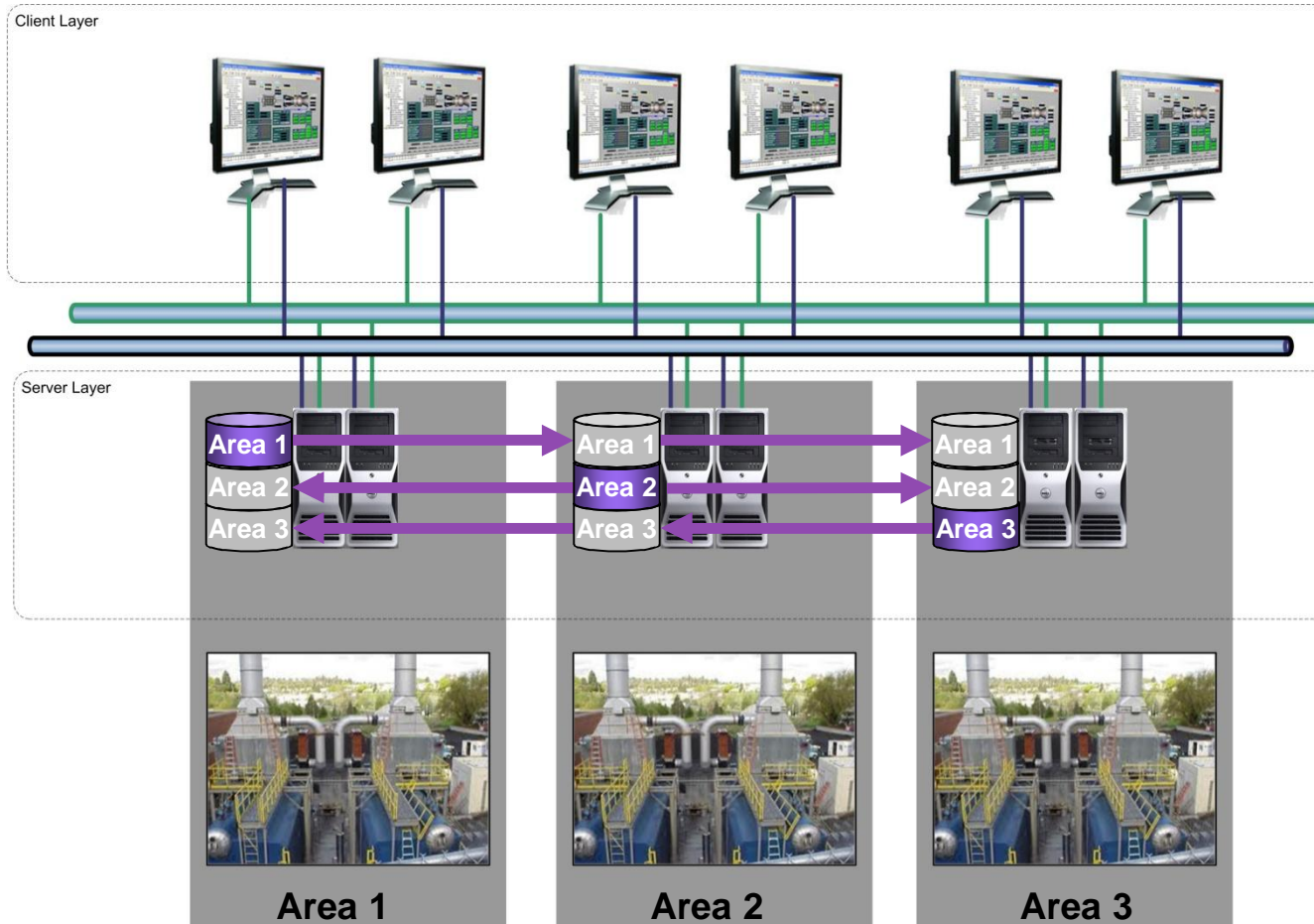
Solutions when independent servers are required for plant areas (e.g. separate groups)

Each server only acquires and maintains data from the related plant area

Clients are logically connected to one server, but graphical pages can include tags from other servers

# S+ Operations architecture

## Scalable: composite architecture



Solutions when servers are required to maintain a complete database

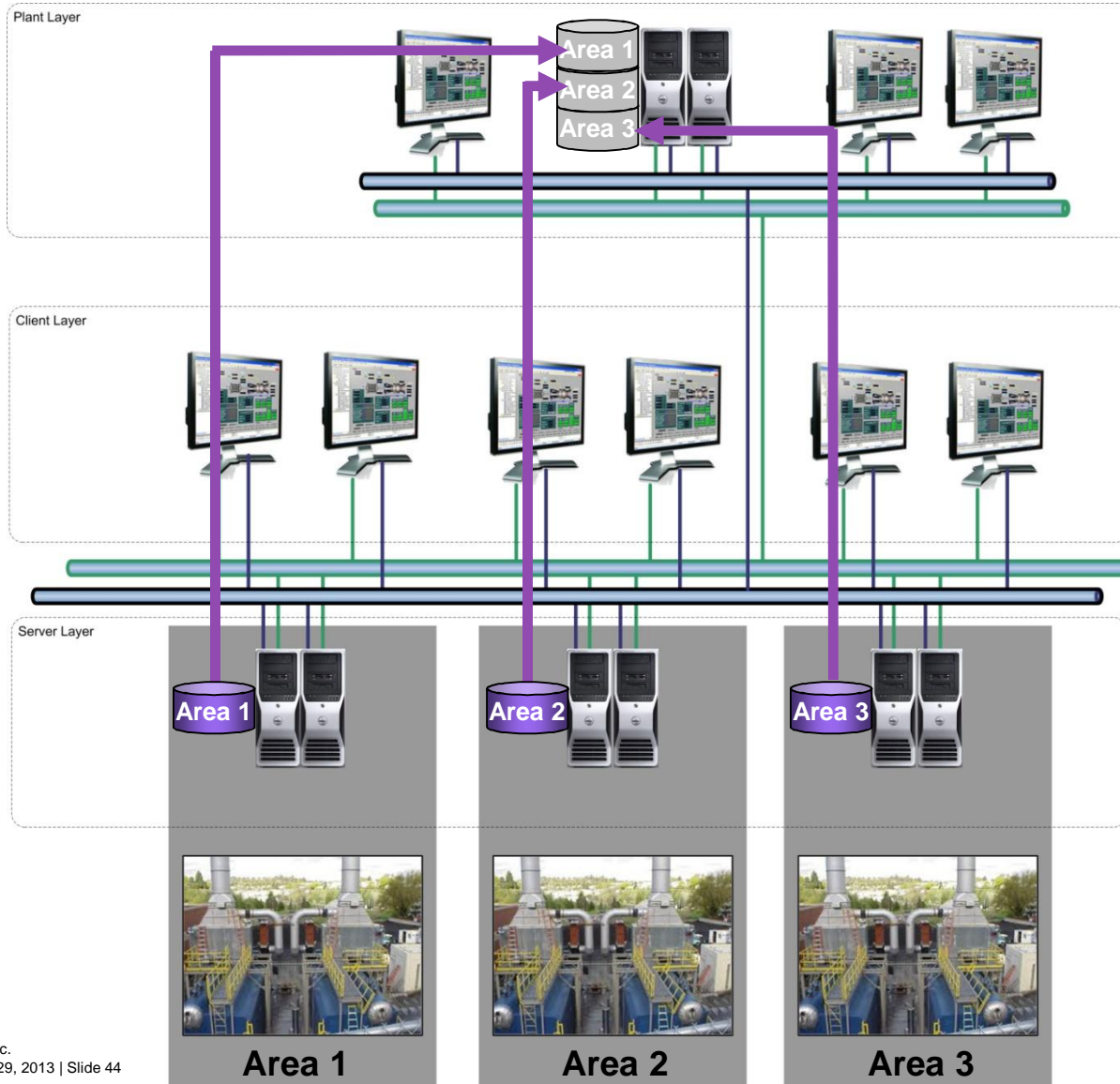
Each server acquires data from the related plant area through the connected controllers

Tags from other plant areas are acquired through the network

Clients are logically connected to one server, and from that server they can see tags for all plant areas

# S+ Operations architecture

## Scalable: multi-system architecture



Solutions when areas need dedicated servers and/or workstations and central control room with access to whole plant

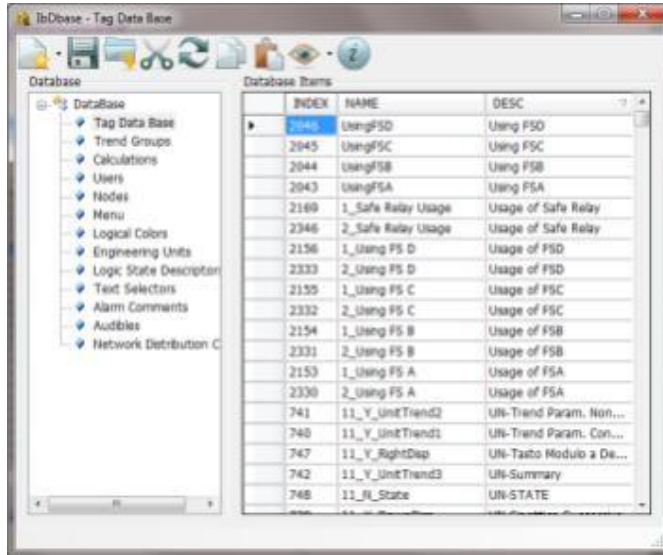
Each area server acquires data from related plant area through connected controllers.

Central plant server acquires tags from area servers through InterServer protocol

Area clients logically connected to corresponding area server  
Plant clients are logically connected to the plant server with access to tags from entire plant

# S+ Operations

## Tag data base

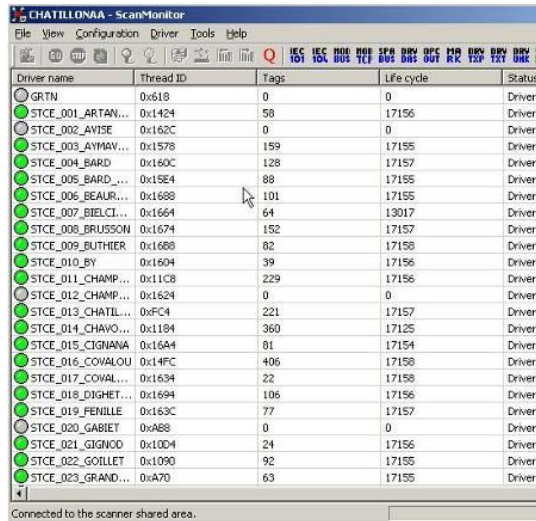
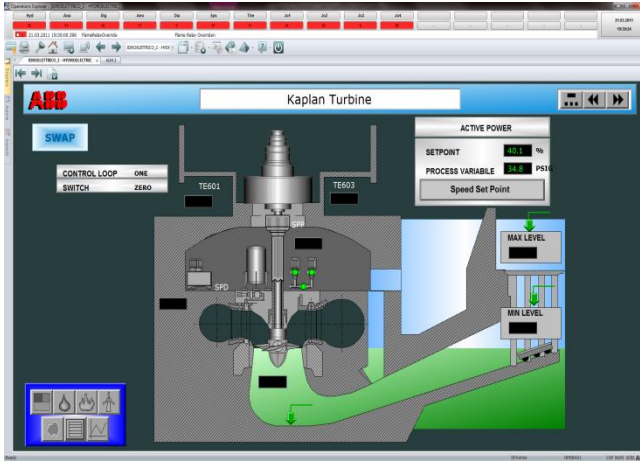


- Supports large systems
  - Up to 512,000 tags per server
  - 30,000 Harmony Tags
  - 256,000 non-boolean
- Direct Harmony tag export Composer to S+ Operations







# S+ Operations

## I/O scanners



- Plug-in drivers

- Harmony/INFI (serial/SCSI/ethernet CIU)
- Freelance 800F
- 800xA AC800M
- AC870P
-  AC500
- Procontrol P13
-  Procontrol P14
- OPC DA, AE, HDA
- Modbus, Modbus TCP
- IEC 870-5-101/103/104
- DNP 3.0
-  Universal Connect
- Siemens Teleperm (XU)
- General Electric GSM (Mark V/VI) (GE Standard Messages, GSM)
-  Contronic E
- SPABUS
- Text

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# S+ Operations features

## High performance operations workplace

Icon Bar  
Navigation

Tab / Tile Windows

Display Select

Tag Browser  
Fast Search  
Operator Notes  
Points off scan

Alarm Group /  
Graphic Bars

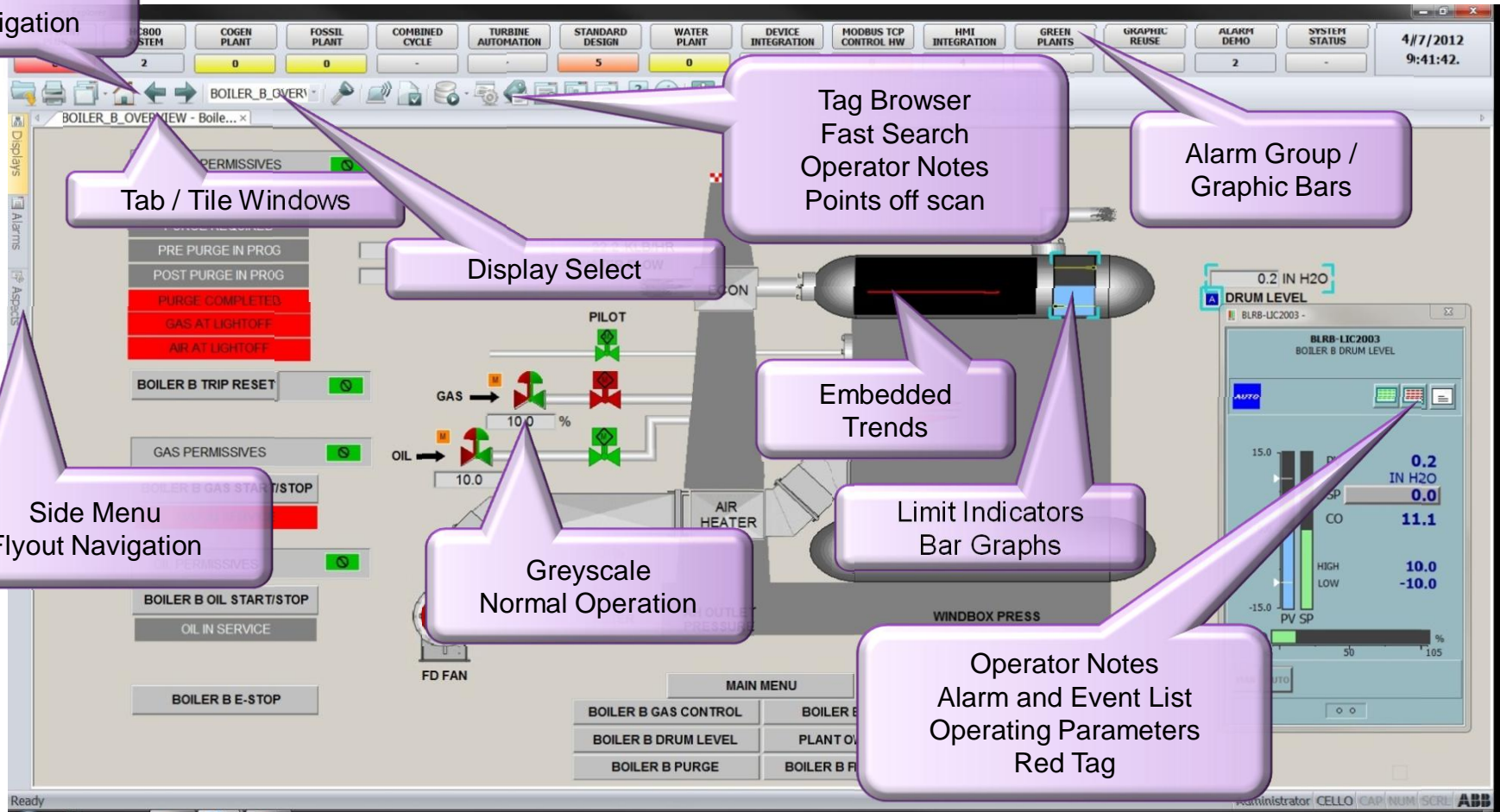
Side Menu  
Flyout Navigation

Greyscale  
Normal Operation

Embedded  
Trends

Limit Indicators  
Bar Graphs

Operator Notes  
Alarm and Event List  
Operating Parameters  
Red Tag

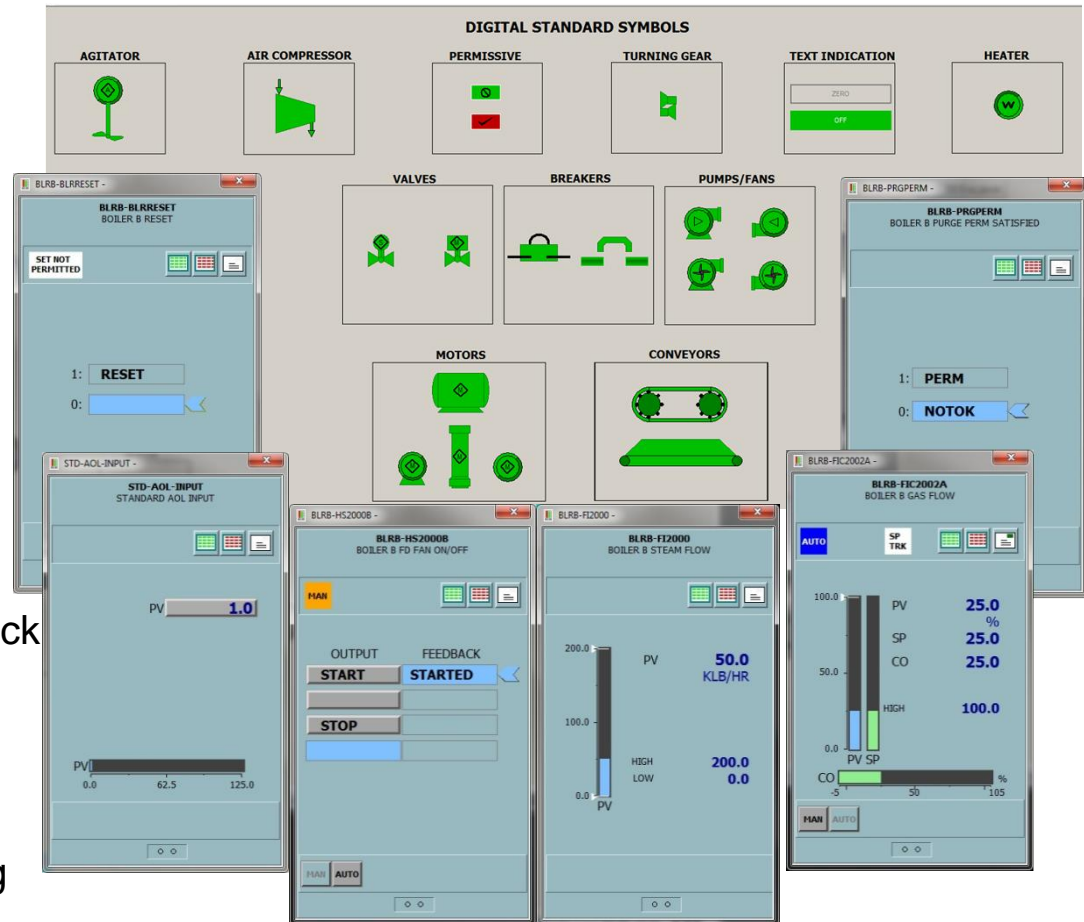


# S+ Operation features

## Control faceplates and symbols (Harmony)

### Standard Symbol Library

- Drive Symbols
- Face Plates
- DCS: Digital Control Stations
- DD: Device Driver
- MSDD: Multi-state Device Driver
- PV: Analog Control Station
- DI: Digital Input
- RCM: Remote Control Memory
- RMCB: Remote Motor Control Block
- RMSC: Remote Manual Set Constant
- TEXTSTR: Text Selector
- DAANG: Data Acquisition - Analog

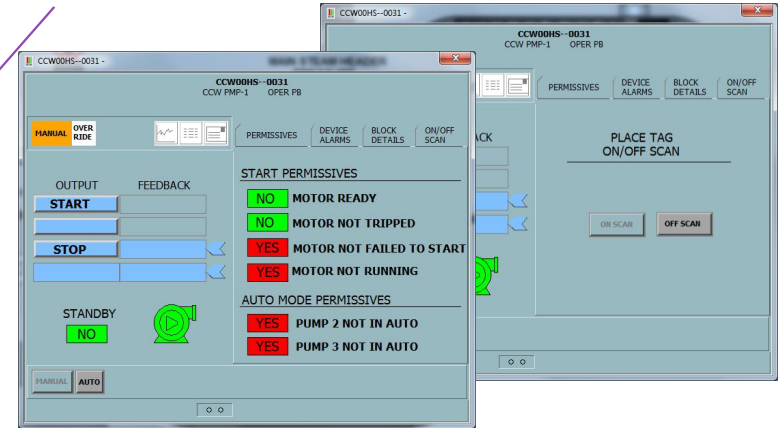


New in S+ Operations 1.1

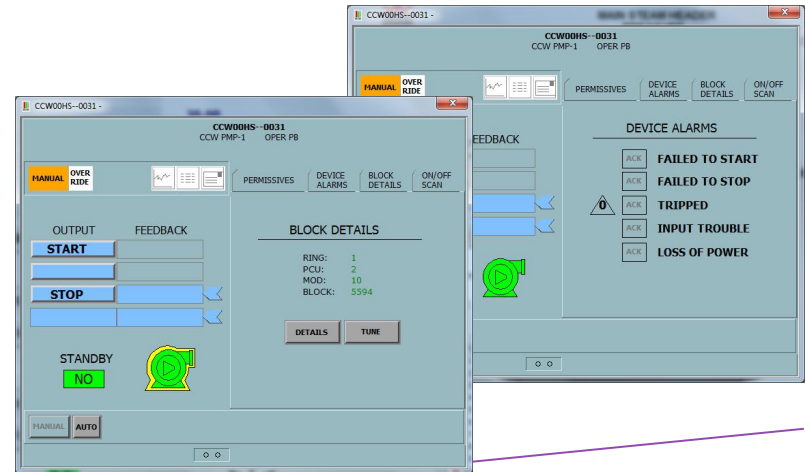
# S+ Operations

## Supports extended control faceplates

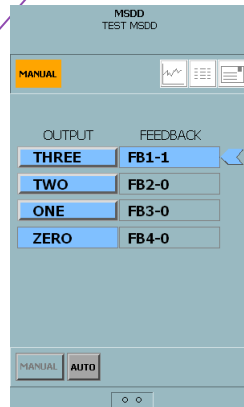
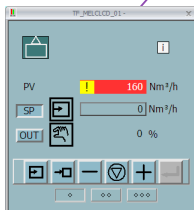
Extended faceplate  
tabbed menus with  
additional analysis  
information



Standard faceplate  
with additional  
information



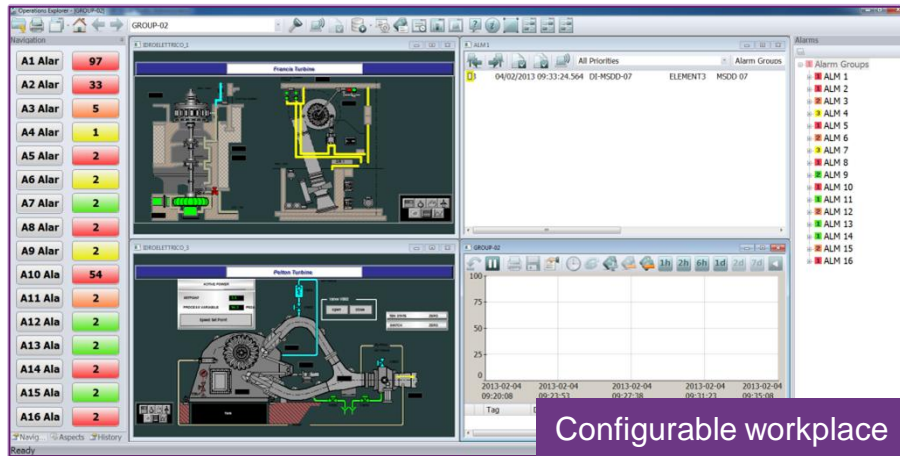
Basic faceplates  
with operations  
functions





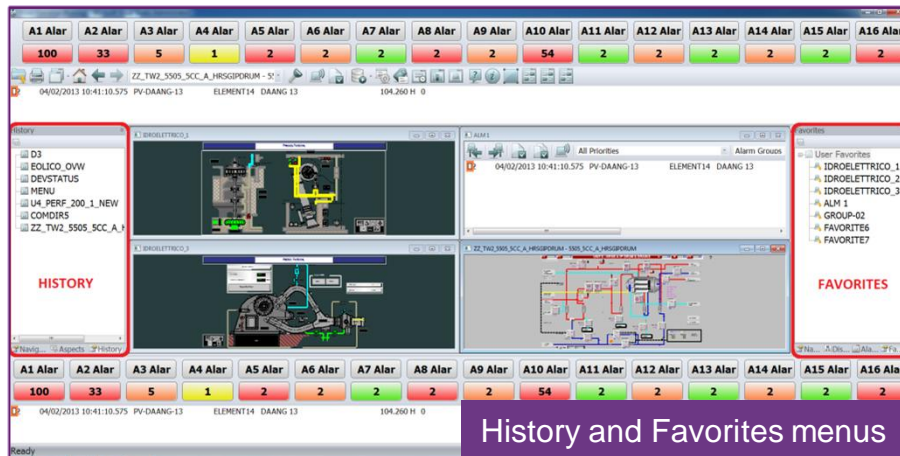
# S+ Operations features

## High performance operations workplace: customized



Configurable workplace

- Free workplaces definition for each user, multi screen supported
- Alarms bars at the top, bottom, left or right
- Fly-Outs for aspects, alarms, displays, history, favorites and navigation
- Definition of up to 4 default displays for each workplace



History and Favorites menus

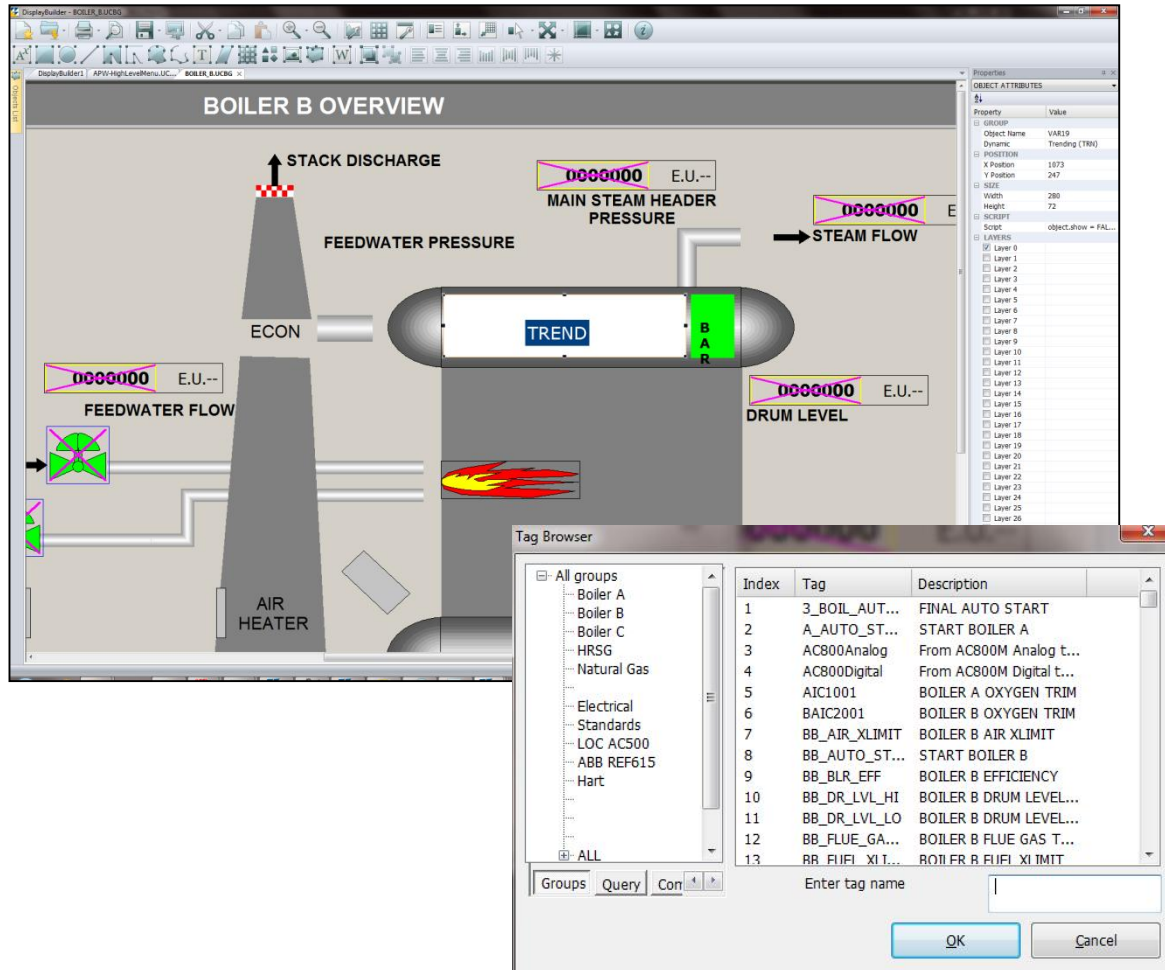
- “History” menu contains the list of recently-opened displays.
- “Favorites” menu contains a list of favorite displays defined for a single workplace.
- All menus are configurable per user



New in S+ Operations 2.0

# S+ Operations

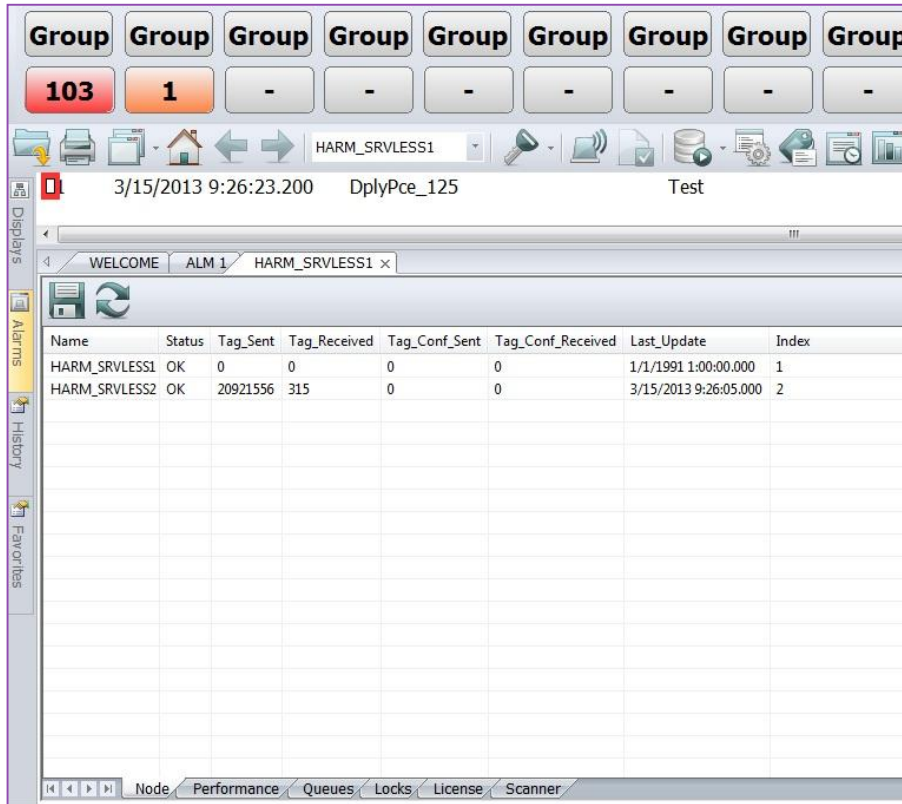
## High performance graphic editor



- Build Hi-Performance HMI
- Grayscale Graphics
- State of the art display builder
  - Toolbars
  - Tag Browser
  - Templates
  - Symbol Libraries
  - ActiveX
  - Pictures (GIF and JPEG)
  - Drag and Drop support
  - Support link of object classes with instances

# S+ Operations features

## Common System Diagnosis



Diagnostic viewer in Power Explorer

Nodes

Connectivity (Scanner-Harmony)

Queues

Locks

License

Example configuration to be delivered

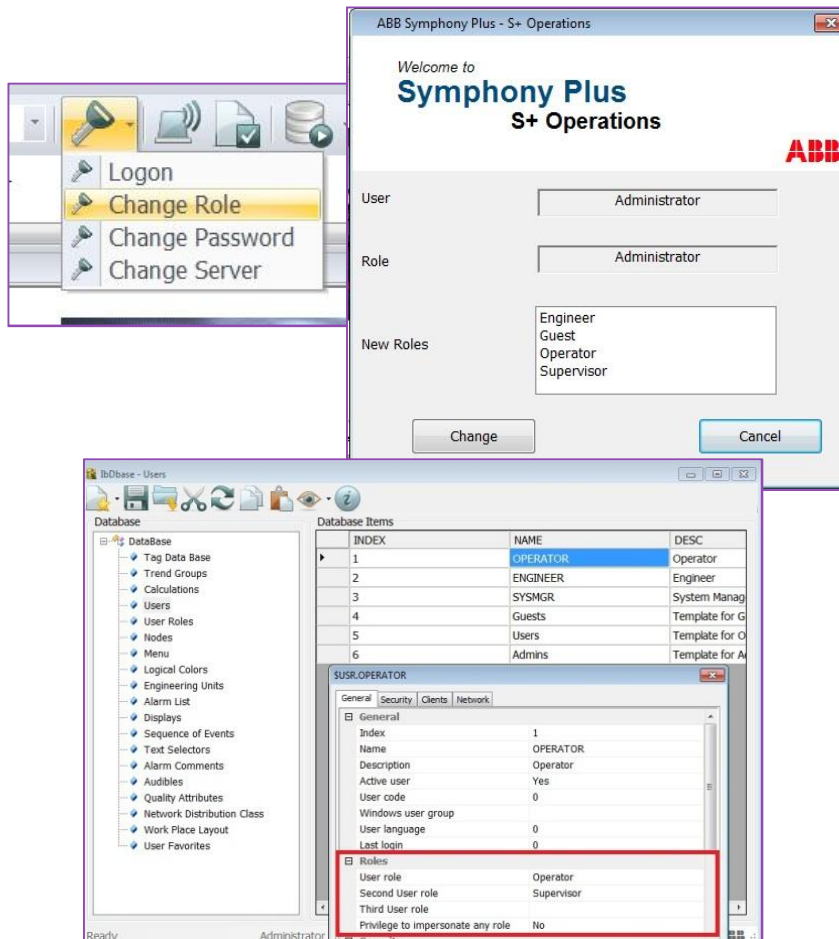
Diagnostic viewer as external component



New in S+ Operations 2.0

# S+ Operations features

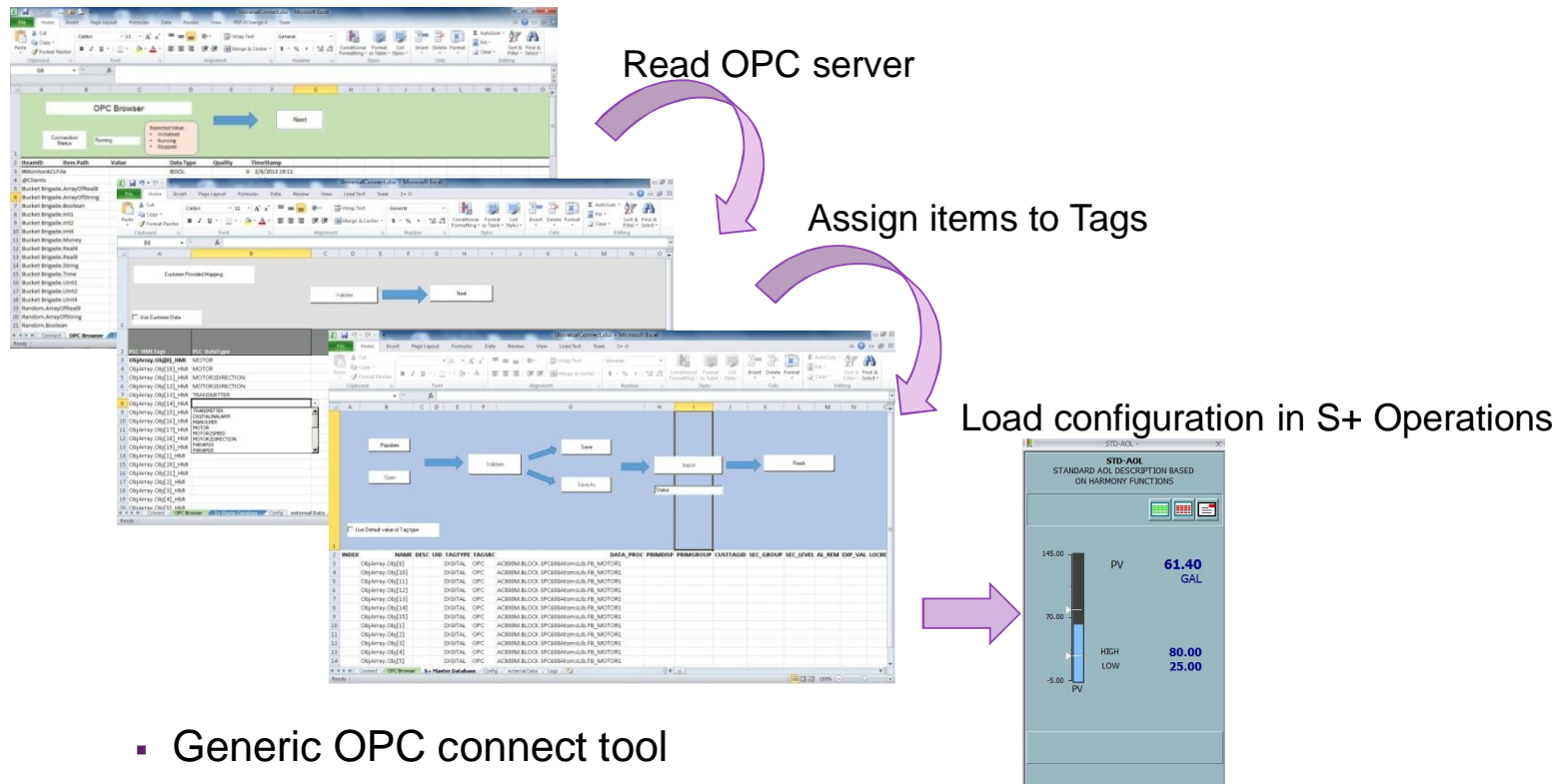
## User Management



Each user can have different roles, and roles are chosen at runtime

# S+ Operations features

## Universal Connect: a generic OPC connect tool



- Generic OPC connect tool
  - Configuration tool for universal OPC connections
  - Easy configuration of OPC items to S+ Operations tags
  - Basic set of faceplate and symbols



New in S+ Operations 2.0



# S+ Operations features

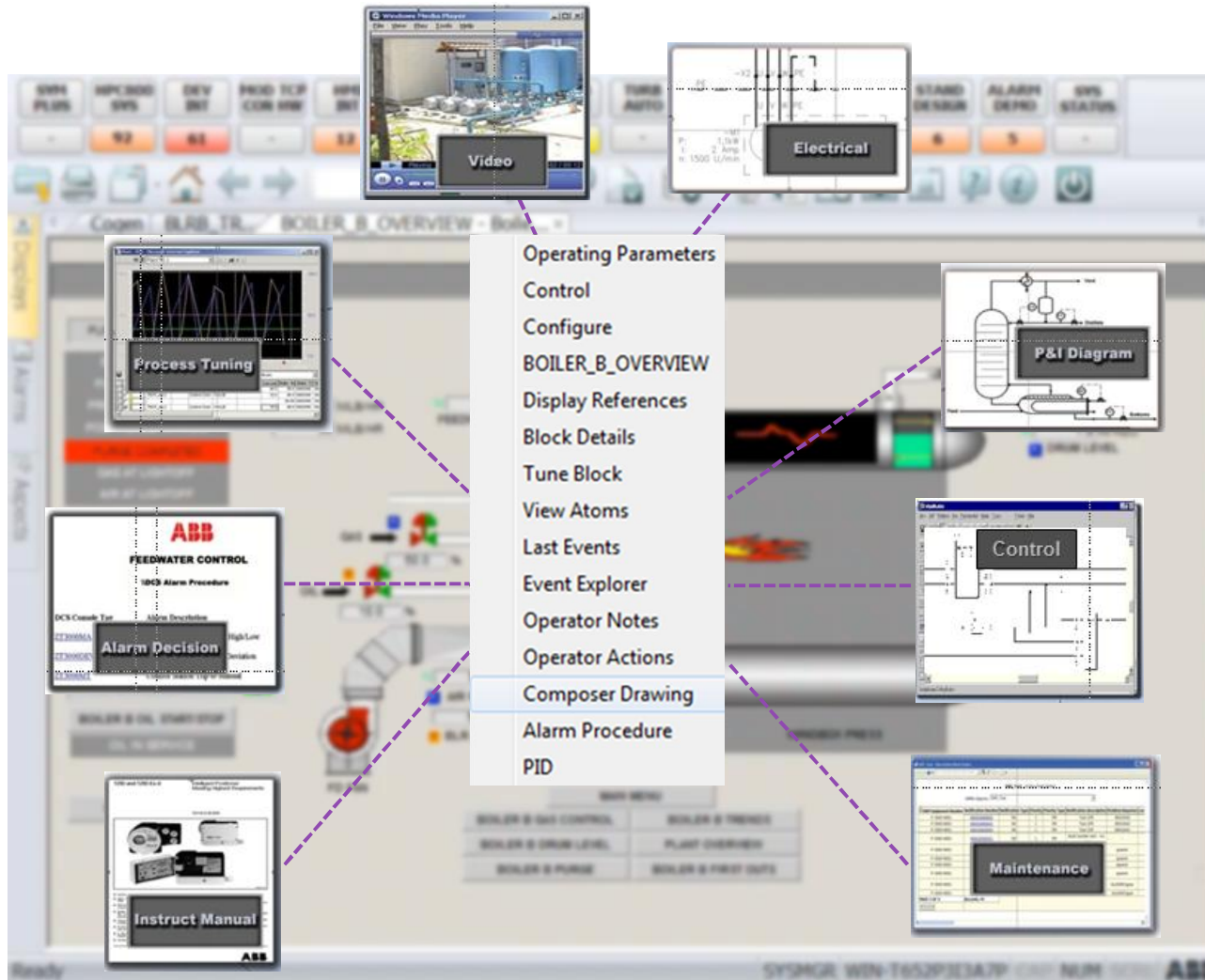
## Data publishing: open interfaces



- OPC Server and Client
  - DA, AE, HDA
- ODBC
  - Support mirroring
- HTTP
  - Integrated Web Server for pure thin client technology
- API
  - For application development
  - Available for Visual Studio

# S+ Operations features

## High performance aspect links

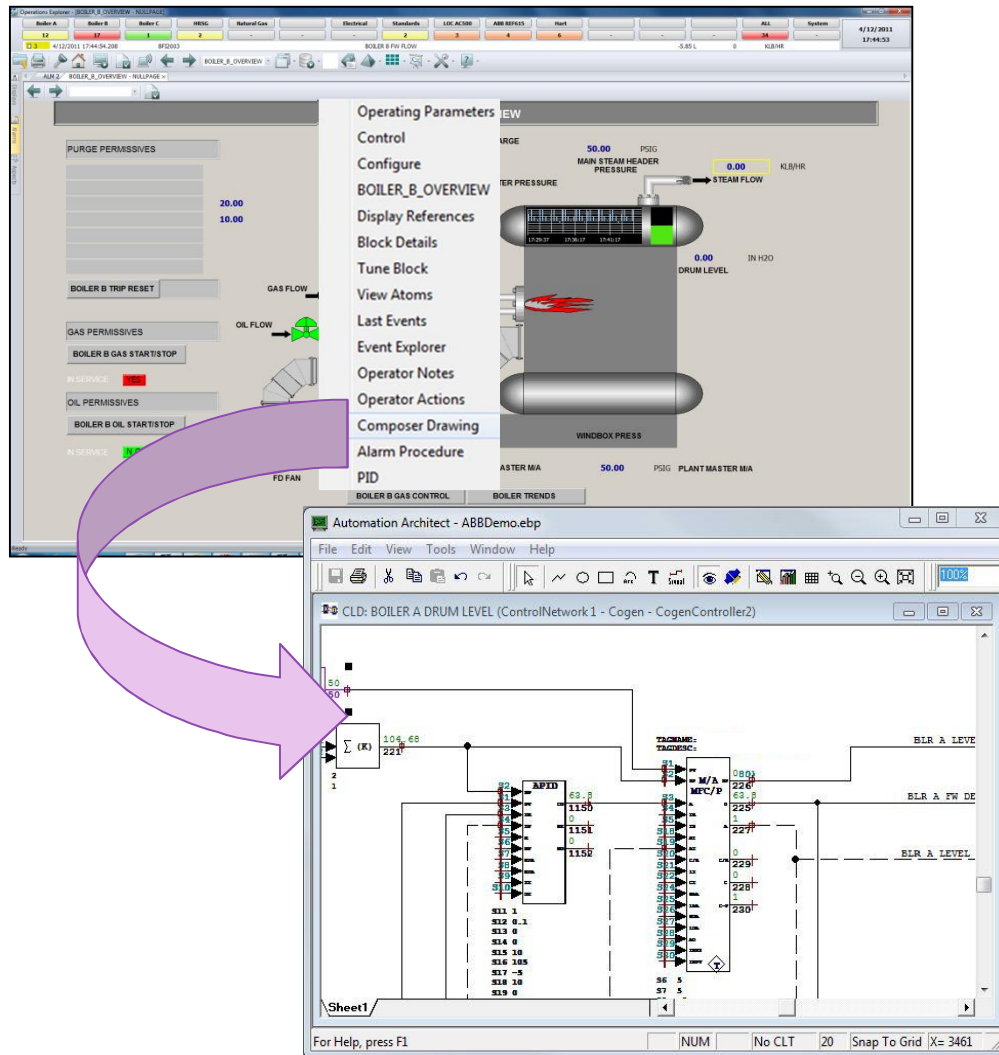


### Aspect links (right click)

- Quick navigation to graphics & trends
- Custom links per tag
- Link to documents or launch applications:
  - Instruction manuals
  - Maintenance packages
  - Standard operating procedures
  - Web pages
  - Plant P&ID's
  - Operator notes
  - Control logic

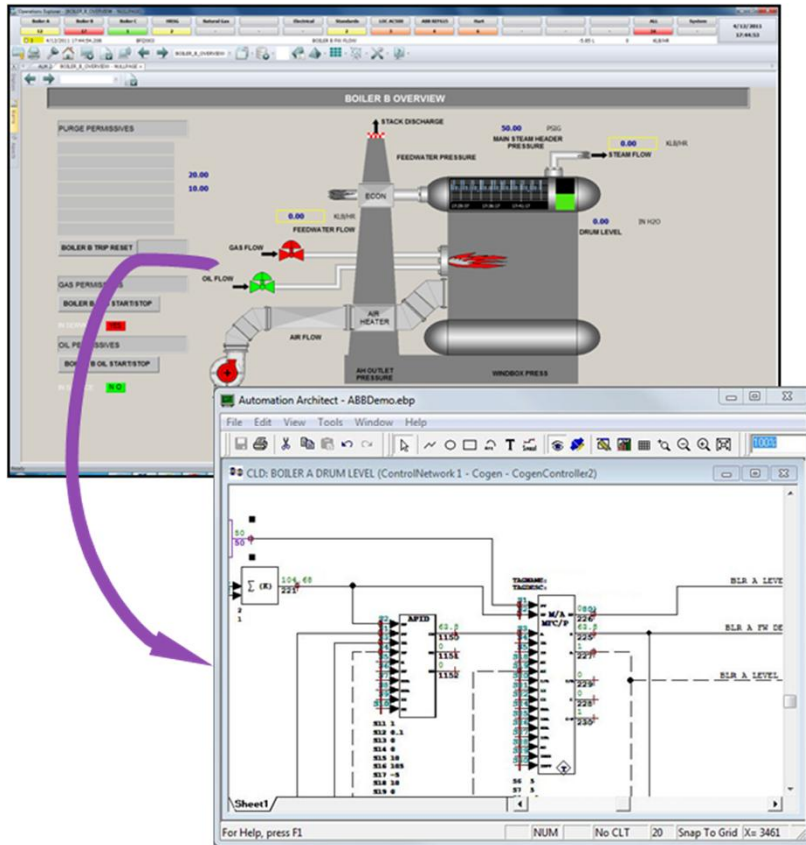
# S+ Operations features

## Aspect link: view Composer logic (view and monitor)

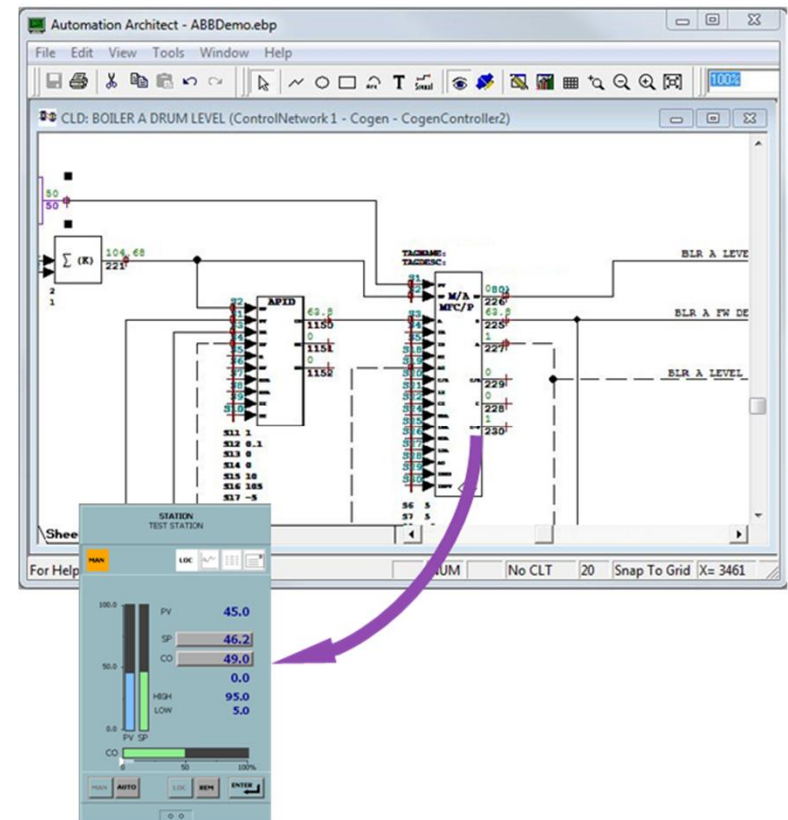


- Right-click navigation
  - Graphic to Composer logic
  - Alarm to Composer logic
- View logic
- Monitor status in real time
- Navigate within Composer

# Symphony Plus – Control and I/O Composer 6.0 Integration with S+ Operations



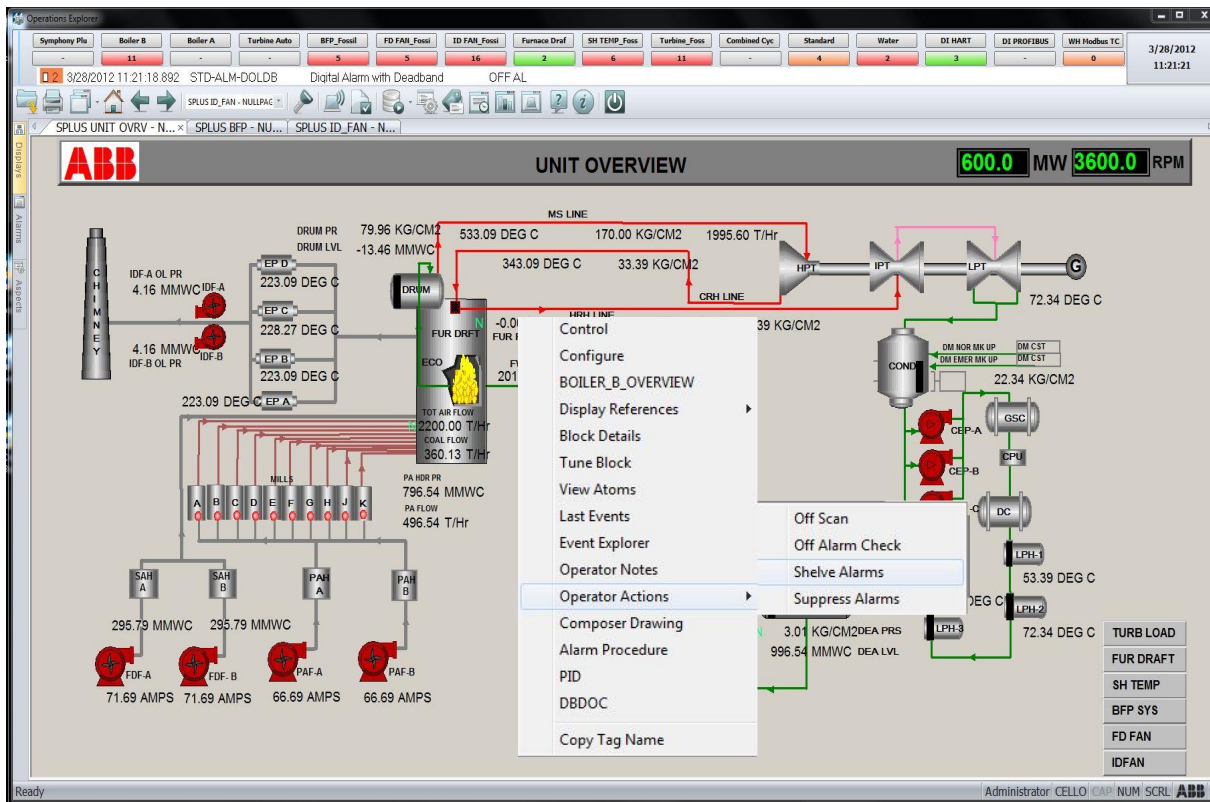
Call-up Composer View and  
Monitor from S+ Operator display



Call-up S+ Operator faceplate from  
Composer's Automation Architect

# S+ Operations features

## Aspect link: alarm shelving and suppression



- Alarm shelving and suppression
- Aspect link available from graphic or alarm window
- Provides temporary shelf state for alarms on per tag basis
- Supports EEMUA 191 and ISA SP 18.2 standards



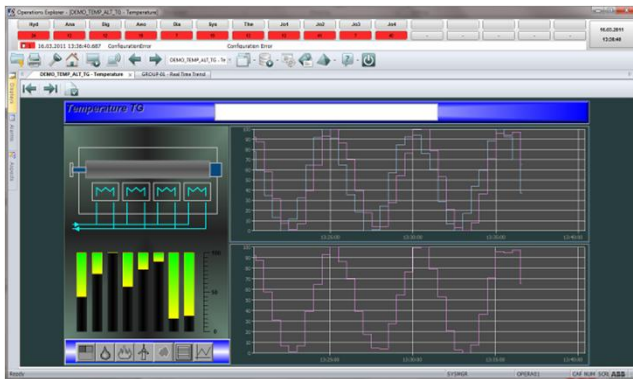
New in S+ Operations 1.1



# S+ Operations Alarm and trending

Seq	Date / Time	Item	Signal	Description	Value	U	M	Res
1	4/20/2011 17:23:40	BOILER A	BOILER A COMMON SAFETY TRIP	TRIP				
2	4/20/2011 17:23:40	BOILER A	BOILER A #1 LOW LIMIT	LO				
3	4/20/2011 17:23:40	BOILER A	BOILER A #1 LOW LIMIT FOR	LO				
4	4/20/2011 17:23:40	BOILER A	BOILER A #1 FAN OFF - FD	OFF				
5	4/20/2011 17:23:40	BOILER A	BOILER A TRIP	TRIP				
6	4/20/2011 17:23:40	BOILER A	BOILER A CLEANING VALVE PB	CLOS				
7	4/20/2011 15:57:40	BOILER A	BOILER A #1 FLOW	Good 0% status				
8	4/20/2011 15:57:40	BOILER A	BOILER A DRUM LEVEL	Good 0% status				
9	4/20/2011 15:57:40	BOILER A	BOILER A OVERHEAT TRIP	Good 0% status				
10	4/20/2011 15:57:40	BOILER A	BOILER A AIR FLOW	Good 0% status				
11	4/20/2011 15:57:40	BOILER A	BOILER A FANSE FAN/SD	Good 0% status				
12	4/20/2011 15:57:40	BOILER A	BOILER A GUN CLEANING TIME	Good 0% status				
13	4/20/2011 15:57:40	BOILER A	BOILER A GUN SHOOTER IN SERVICE	Good 0% status				
14	4/20/2011 15:57:40	BOILER A	BOILER A PILOT IN SERVICE	Good 0% status				
15	4/20/2011 15:57:40	BOILER A	BOILER A RESET READY	Good 0% status				
16	4/20/2011 15:57:40	BOILER A	BOILER A OPERATOR E-STOP	Good 0% status				
17	4/20/2011 15:57:40	BOILER A	BOILER A STEAM PRESS HI-HI	Good 0% status				
18	4/20/2011 15:57:40	BOILER A	BOILER A GIL CV LIGHTOFF FLT	Good 0% status				
19	4/20/2011 15:57:40	BOILER A	BOILER A GIL CV LIGHTOFF FAULT	Good 0% status				
20	4/20/2011 15:57:40	BOILER A	BOILER A STEAM FLOW	Good 0% status				
21	4/20/2011 15:57:40	BOILER A	BOILER A DRUM LEVEL LOW	Good 0% status				
22	4/20/2011 15:57:40	BOILER A	BOILER A DRUM LEVEL HIGH	Good 0% status				
23	4/20/2011 15:57:40	BOILER A	BOILER A AIR KILNET	Good 0% status				
24	4/20/2011 15:57:40	BOILER A	BOILER A RECTIFIER STOP PB	Good 0% status				
25	4/20/2011 15:57:40	BOILER A	BOILER A FAN ON/OFF	Good 0% status				
26	4/20/2011 15:57:40	BOILER A	BOILER A LOW AIR WATER/PO	Good 0% status				
27	4/20/2011 15:57:40	BOILER A	BOILER A POWER LOSS/PO	Good 0% status				
28	4/20/2011 15:57:40	BOILER A	BOILER A AIRFLOW AT LIGHTOFF	Good 0% status				
29	4/20/2011 15:57:40	BOILER A	BOILER A GIL CV AT LO	Good 0% status				
30	4/20/2011 15:57:40	BOILER A	BOILER A GIL CV AT HI	Good 0% status				
31	4/20/2011 15:57:40	BOILER A	BOILER A AIRFLOW AT FANSE	Good 0% status				
32	4/20/2011 15:57:40	BOILER A	BOILER A DRUM LEVEL NOT LOW	Good 0% status				
33	4/20/2011 15:57:40	BOILER A	BOILER A FAN/FLAME NOT LOW	Good 0% status				
34	4/20/2011 15:57:40	BOILER A	BOILER A FAN/FLAME ON	Good 0% status				
35	4/20/2011 15:57:40	BOILER A	BOILER A PILOT FAN/FLAME ON	Good 0% status				
36	4/20/2011 15:57:40	BOILER A	BOILER A GIL SLOW CLOSED	Good 0% status				
37	4/20/2011 15:57:40	BOILER A	BOILER A CLEANING VALV CLOSED	Good 0% status				
38	4/20/2011 15:57:40	BOILER A	BOILER A GIL FLOW	Good 0% status				
39	4/20/2011 15:57:40	BOILER A	BOILER A INACTOR	Good 0% status				
40	4/20/2011 15:57:40	BOILER A	BOILER A GIL FLOW	Good 0% status				
41	4/20/2011 15:57:40	BOILER A	BOILER A FUSE GAS TEMPERATURE	Good 0% status				
42	4/20/2011 15:57:40	BOILER A	BOILER A EFFICIENCY	Good 0% status				
43	4/20/2011 15:57:40	BOILER A	BOILER A MEDIUM LOAD	Good 0% status				
44	4/20/2011 15:57:40	BOILER A	BOILER A MEDIUM LOAD	Good 0% status				

- Alarming
  - 32 alarm priorities
  - 1024 alarm groups
  - Alarm filtering
  - Primary display from alarm list



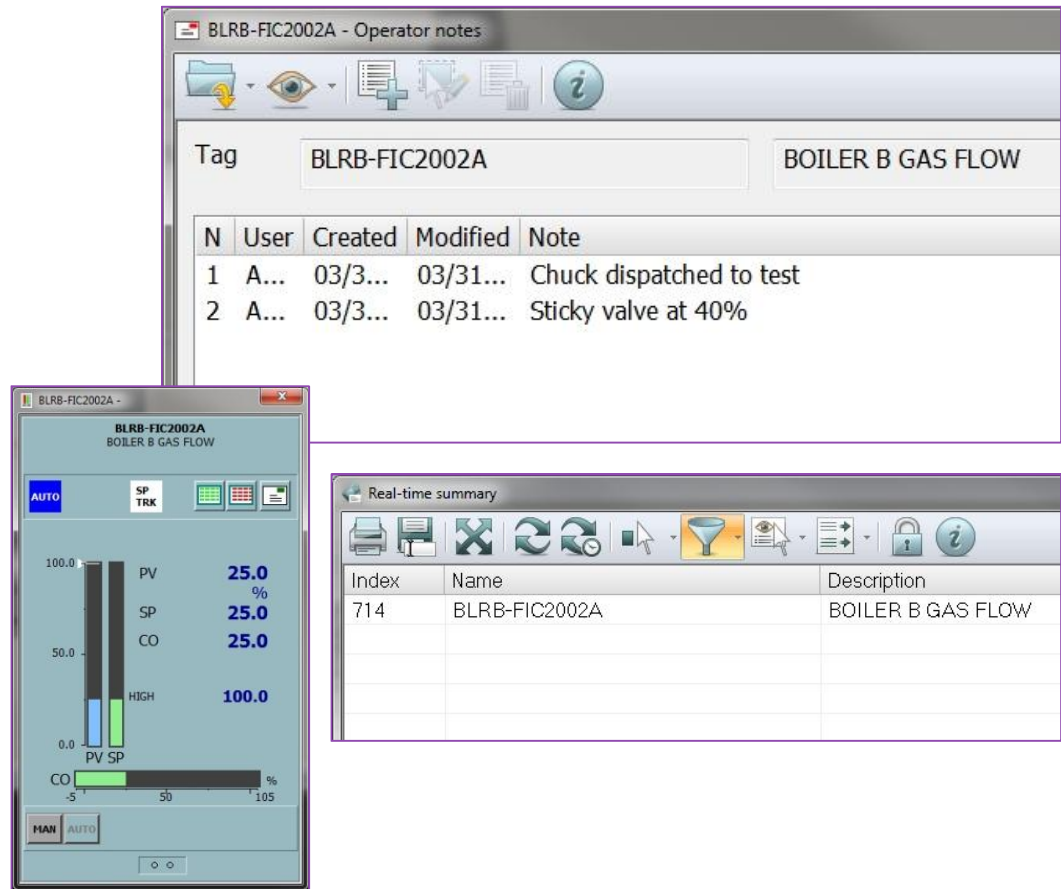
The alarm list window shows a table of alarms. A context menu is open for alarm 'ALM 13'. The menu options are:

- Tag25
- Operating Parameters
- Acknowledge
- Configure
- Last Events
- Event Explorer
- Operator Notes
- Operator Actions
  - Off Scan
  - Off Alarm Check
  - Shelve Alarms
  - Suppress Alarms
- Copy Tag Name

# S+ Operations features

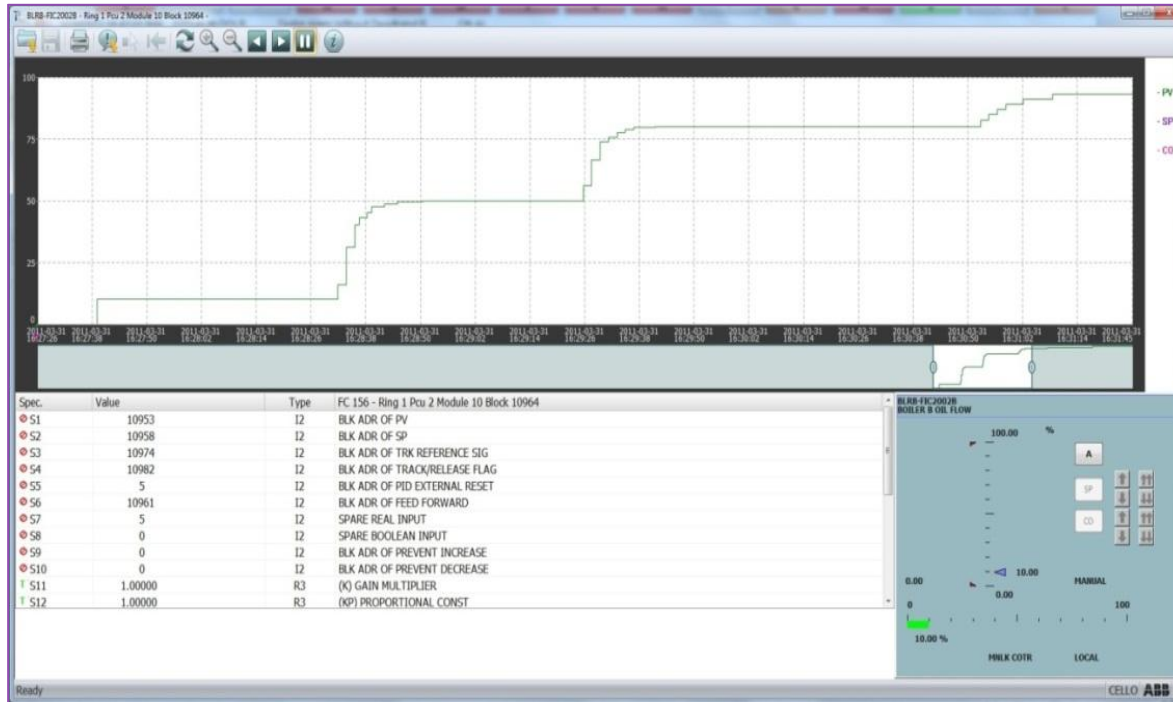
## Aspect link: operator note

- Operator notepad for sharing important information
- Right- click navigation from graphic object, faceplate, alarm summary
- Report includes all tags with notes



# S+ Operations features

Aspect link: block details and tuning window (Harmony)



- Right-click navigation
  - Graphic object to tuning window
- Block details / tune
- Trend window
- Faceplate

# S+ Operations

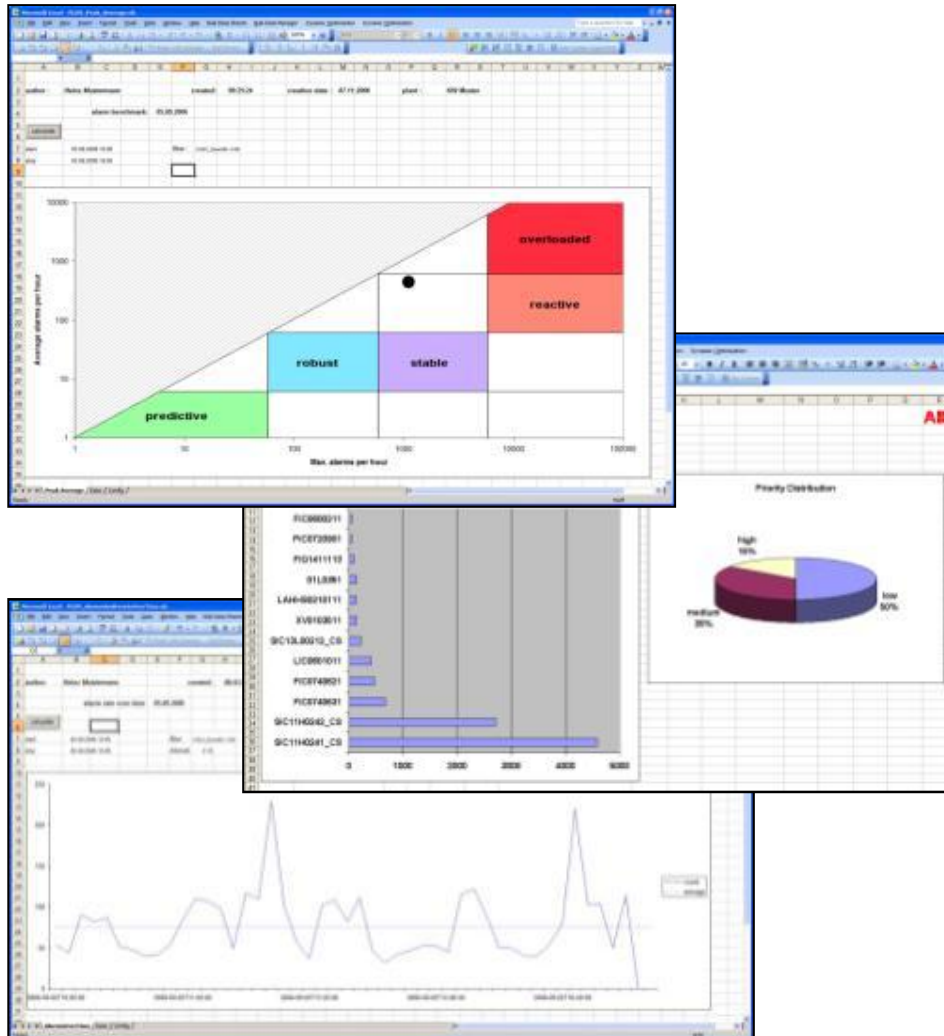
## Integrated alarm analysis tools

**Supports EEMUA 191 Standard**

### Report types

At the moment the following report types are available:

- 1) Alarm and/or Event frequency
- 2) Alarms and Events over time
- 3) Priority Distribution
- 4) Alarm Duration
- 5) Time to Acknowledge
- 6) Alarm performance levels
- 7) Control loops in hand mode
- 8) Operator actions
- 9) Intervals exceeding threshold
- 10) Distribution in plant areas
- 11) Standing alarms
- 12) CoOPccurences
- 13) Distribution
- 14) Detailed event sequence

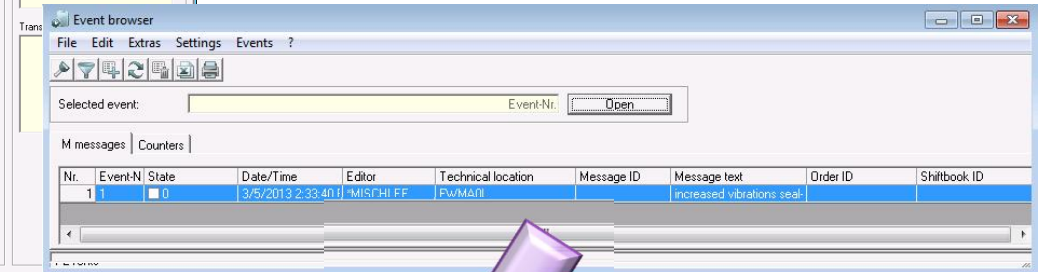
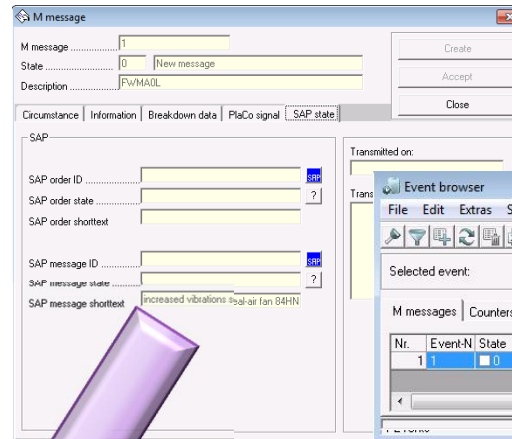


# S+ Operations features

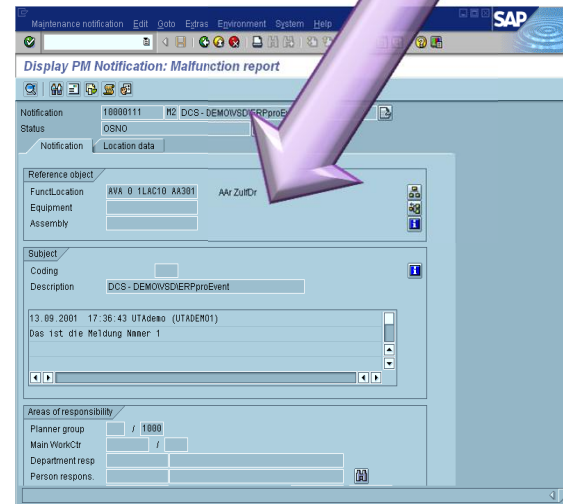
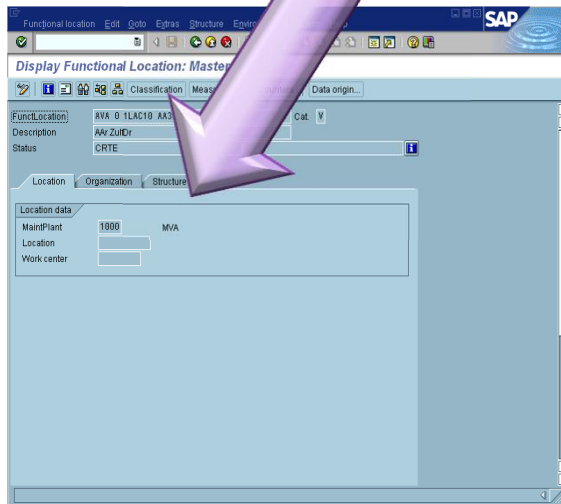
## Aspect link: SAP PM CMMS integration

S+ Operations' integration with SAP PM maintenance management systems (CMMS) allows for easy communication with and navigation to asset-specific maintenance activities.

- Direct links to SAP from S+ Operations
- Submittal of malfunction report
- View open maintenance requests



Nr.	Event-Nr.	State	Date/Time	Editor	Technical location	Message ID	Message text	Order ID	Shiftbook ID
1	1	0	3/5/2013 2:33:40	MISTHI FF	FW/MAL		Increased vibrations seal-		





# S+ Operations features

## Aspect link: Shiftbook and electronic shift log



Shiftbook and electronic shift log are alternatives to “paper” shift logs. Together with SAP PM CMMS integration, these features reduce the plant’s maintenance costs by streamlining operation and maintenance work processes.

Shift changes are automatically or manually noted in the operator shift log

The screenshot displays the PGM Shiftbook application. The main window shows a table of shift entries with columns for Id, State, Time Stamp, Priority, Brief Description, Damage class, Classification, Classification2, Last Editor, Last Changed, and Shift Id. The table contains five entries, with the first entry selected. A callout box points to the 'Brief Description' column, stating: 'Shift changes are automatically or manually noted in the operator shift log'. Below the main table, there is a section for 'Shift ending open work actions' with a 'ToDo list' and a 'Reset' button. To the right, a 'ShiftBook entry' dialog box is open, showing a detailed view of the selected entry. It includes fields for 'Classification' (Disturbance) and 'Classification2' (Power), a 'Brief Description' field with the text 'Increased vibrations seal-air fan 84-HNY41AN001', and a 'Comments' field with the text 'vibration measurement at motor seal-air fan 84-HNY41AN001: increased vibration value levels => please control screws and structural strenght'. A callout box points to the 'Comments' field, stating: 'Automatically create a malfunction report from within the shiftbook'.

Id	State	Time Stamp	Priority	Brief Description	Damage class	Classification	Classification2	Last Editor	Last Changed	Shift Id
1	<input checked="" type="checkbox"/>	12/18/2012 2:19:07 PM		Automatic Entry - Shift has been				S1	12/18/2012 2:19:07 PM	1
2	<input checked="" type="checkbox"/>	12/18/2012 2:19:35 PM		The first entry		Disturbance	Gazol	MUSTERMANN	2/6/2013 11:52:50 AM	1
3	<input checked="" type="checkbox"/>	1/30/2013 2:01:01 PM		Automatic entry - Shift change				S2	1/30/2013 2:01:01 PM	2
4	<input checked="" type="checkbox"/>	1/30/2013 3:40:16 PM		Automatic entry - Shift change				S1	1/30/2013 3:40:16 PM	3
5	<input type="checkbox"/>	1/31/2013 11:09:16 AM	2	The second entry	Ölverlust	Disturbance	Power	MUSTERMANN	3/5/2013 2:09:56 PM	3

Shift ending open work actions are passed to the next shift via the ToDo list (covers all shifts)

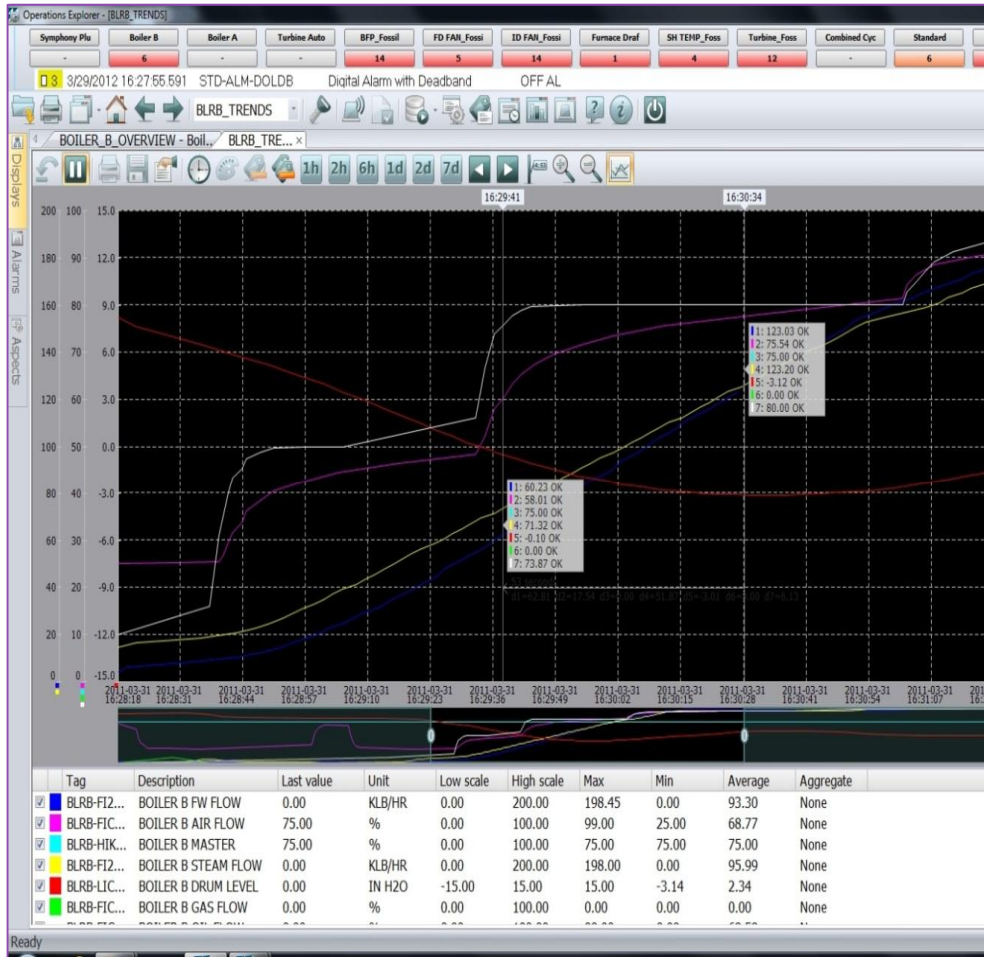
Automatically create a malfunction report from within the shiftbook



New in S+ Operations 2.0

# S+ Operations features

## Aspect link: high performance trend window



### NEW Enhanced operator trend feature

- Icon selection bar
- Mouse selectable traces
- Mini preview trend
- Drag focus window
- Drag and drop PV's
- Export functions
- Ruler views (Scooter)
- User configurable
- No trace limitation
- Operator trend integrated with history



New in S+ Operations 1.1

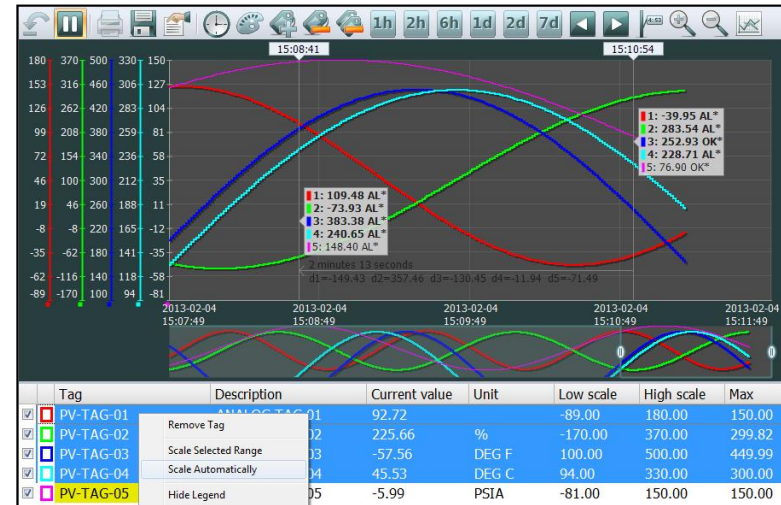
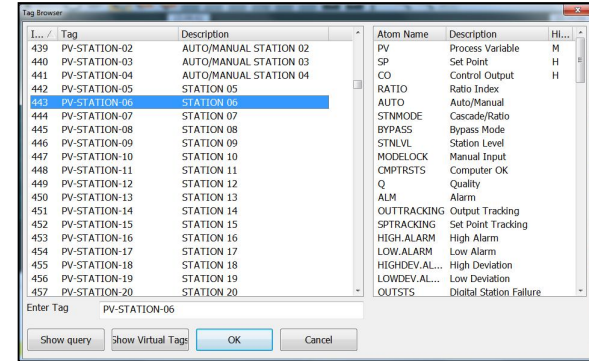
# S+ Operations features

## Trend improvements



### New in S+ Operations 2.0

- Embedded trends support transparent mode
- Support of new trend in ThinWebClient graphics
- Warning when tag is not configured in historian (or is misconfigured)
- Add tag or atom from tag browser dialog
- Show state in y-axis for digital tags
- Show legend in mimic graphic by default
- Add setting to control legend's default height
- Highlight selected tag in scooter's value box
- "Unselect all" context menu
- Multi-selection in legend
- Show current value in pause mode
- "Add Tag" button
- "Scale All Tags" context menu



New in S+ Operations 2.0

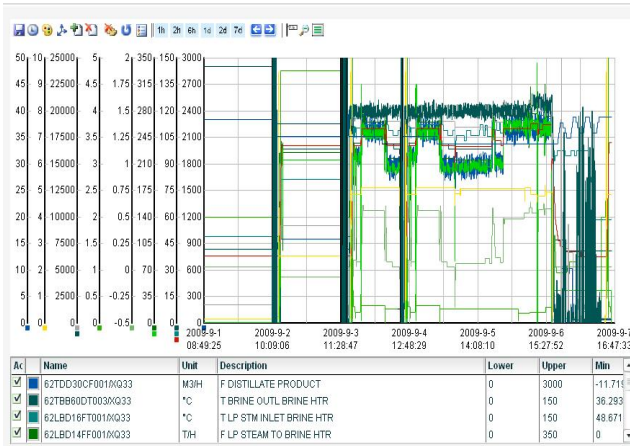


# S+ Operations overview

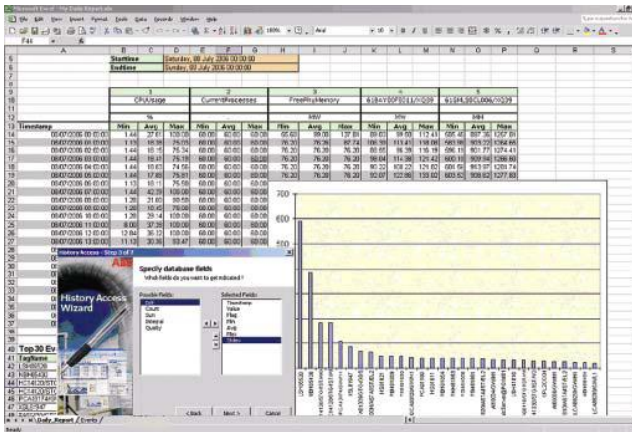
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- Reliable operations
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- Summary

## Information Management: integrated historian



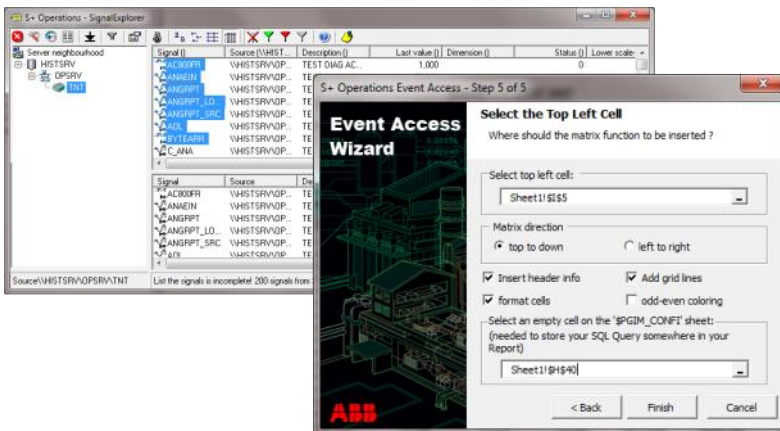
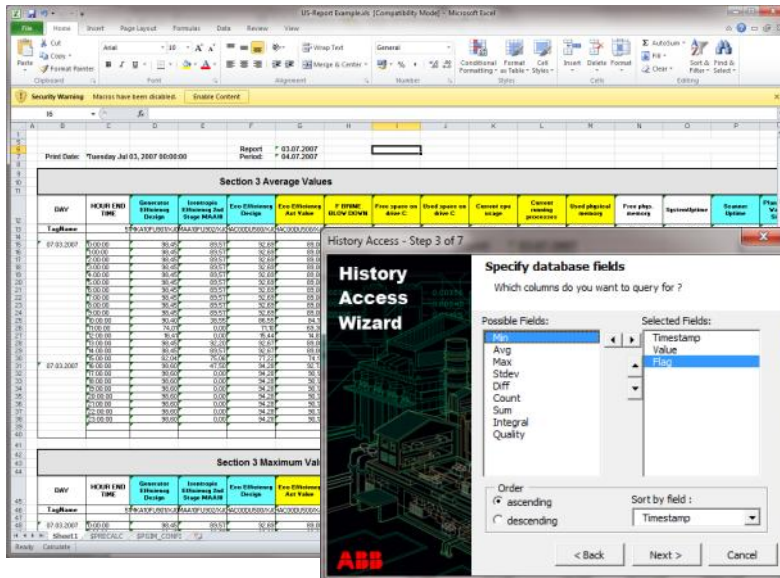
- Full featured historian integrated within S+ Operations
- Excel reporting and scheduled reports
- Calculation package / maintenance totalizers



- EEMUA 191 alarm management
- ISA 18-2 alarm management
- Supports thin client



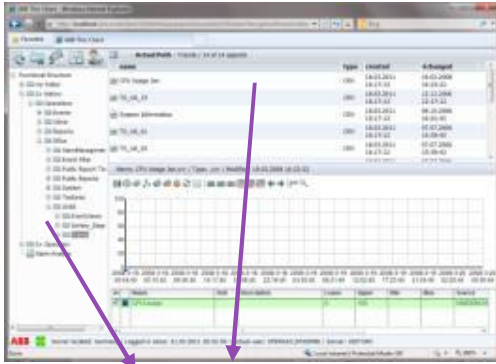
# S+ Operations: integrated information management Logs / reports (Excel integration)



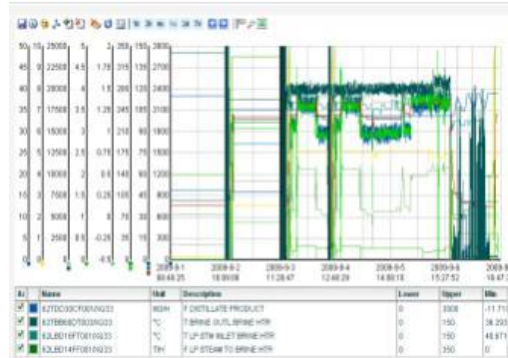
- Balance reports
  - Typical values for operation tracking
    - Average values
    - Max/in values
    - Totals
- Trend reports
  - Presentation of process behavior with configurable:
    - Time intervals
    - Time range
- Maintenance reports
  - Informs the maintenance staff about:
    - Actual operating hours
    - Actual switching cycles
    - Identification of components to be maintained

# S+ Operations

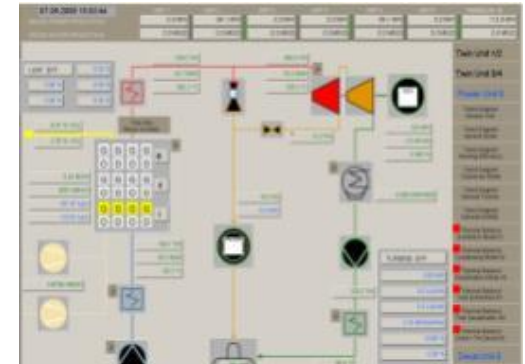
## S+ ThinClient: available views



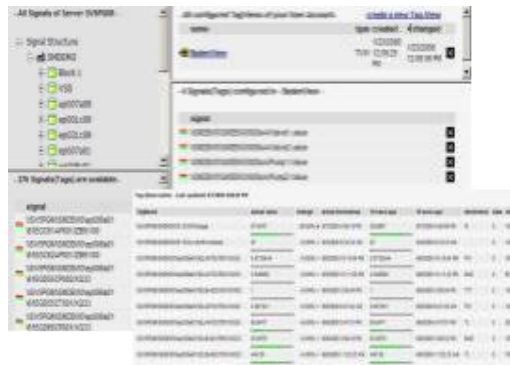
Intuitive navigation structure



Multi-line trend displays



View dynamic process graphics



Private user folders / signal explorer

Variable	Unit	Value	Unit
6770303000000000	°C	150	°C
6770303000000000	°C	150	°C
6770303000000000	°C	150	°C
6770303000000000	°C	150	°C

User reports / scheduled reports

Alarm	Status	Description
6770303000000000	Active	Temperature too high
6770303000000000	Active	Pressure too low
6770303000000000	Active	Flow rate too high
6770303000000000	Active	Level too high

Filtered alarm and event List

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# S+ Operations: reliable operations

## Focus on cyber security



### Malicious virus shuts down US power plant January 17 2013 by The Wall Street Journal

**A computer virus attacked a turbine control system at a US power company** when a technician unknowingly inserted an infected USB computer drive into the network, **keeping a plant off line for three weeks**, according to a report posted on a US government website. The Department of Homeland Security report did not identify the plant but said criminal software, which is used to conduct financial crimes such as identity theft, was behind the incident.

It was introduced by an employee of a third-party contractor that does business with the utility, according to the agency. DHS reported the incident, which occurred in October, along with a second involving a more sophisticated virus, on its website as cyber experts gather at a high-profile security conference in Miami known as S4 to review emerging threats against power plants, water utilities and other parts of the critical

## You probably have heard about issues like this...

that malicious targeted or unintentional random infection can occur," he said.

It said ICS-CERT responded to 198 cyber incidents reported by energy companies, public water districts and other infrastructure facilities in the fiscal year ending September 30, 2012. Attacks against the energy sector represented 41 per cent of the total number of incidents in the US in fiscal 2012. According to the report, ICS-CERT helped 23 oil and natural gas sector organisations after they were hit by a targeted spear-phishing campaign - when emails with malicious content are specifically targeted at their employees. The water sector had the second highest number of incidents, representing 15 per cent.

# S+ Operations: reliable operations

## Reliable system environment with built-in security

Ensure plant integrity and confidentiality with inherent system security



- Built in cyber security for software, systems and devices
  - User Authentication
  - Role Based Access Control
  - Event Logging / Audit Trails
  - Backup / Restore
  - Hardened Hosts
  - Host Firewall Configuration
  - Antivirus
  - Network Zones
  - Security Patch Validation
- Active participation on major security standards committees including: FERC, NERC, ISA, IEC and ISO



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# S+ Operations overview

## Summary: driving effective operations

Drive effective operations with complete plant information

- Greater awareness
- Faster response
- Better decisions

Benefits	Features
<b>Designed for high performance</b>	Ergonomic operator workplace
<b>Integrated operations</b>	Integrates all plant devices and systems
<b>Life cycle management</b>	Seamless evolution from earlier console platforms
<b>Information management</b>	Advanced historian
<b>Alarm management</b>	Support for EEMUA 191
<b>Secure operations</b>	Support for NERC CIP compliance manager
<b>Process optimization</b>	Plant performance monitoring tools
<b>Flexible, scalable, fault tolerant design</b>	Unique fault tolerant architecture adapts to any application or system size

# S+ Operations: driving effective operations



*All information, in one place, presented for swift and prompt action. It's time to sit down and take total control.*

Power and productivity  
for a better world™

