Honeywell

Experion PKS
IEC 61850 SCADA Configuration Guide

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EPDOC-X375-en-431A	431	0	February 2015

Disclaimer

Contents

1 About this guide

This document provides information about configuring and operating the IEC 61850 system interface software in Experion.

Revision history

Revision	Date	Description
A	February 2015	Initial release of the document.

Intended audience

This guide is intended for Project Engineers and Maintenance Engineers who are responsible for configuring IEC 61850 system interface software in Experion.

Prerequisite skills

- Familiar with working in a Microsoft Windows operating environment.
- Familiar with Experion system topology and using Experion applications.
- Familiar with using Configuration Studio.

Related documents

You may also refer to the following related Experion documents.

Document	Description
Communication networks and systems in substations - Part 1–10 Publication date: 2004-05	These documents describe the next generation communication systems, provide an overview of the IEC 61850 standards and how it meets these needs

2 Introduction

This section provides information about IEC 61850 SCADA configuration you must know before configuring it in an Experion network.

Related topics

“About IEC 61850” on page 8
“IEC 61850 system interface in Experion” on page 9
“Alternate supported topologies” on page 11
“IEC 61850 system configurator tool” on page 14
“Terms and definitions” on page 16

2.1 About IEC 61850

This section gives an overview about IEC 61850 and lists the available IEC 61850 standards.

About IEC 61850

IEC 61850 is a global standard for the design of electrical substation automation. IEC 61850 is a part of the International Electrotechnical Commission's (IEC) technical committee reference architecture for electric power systems. It enables the integration of protection, metering, monitoring and control functions with one common standard. It supports a comprehensive set of substation functions.

IEC 61850 runs over TCP/IP networks or substation LAN using high speed switched Ethernet to obtain the necessary response times for protective relaying.

The IEC 61850 standards specification document is available in the IEC website (http://www.iec.ch).

IEC 61850 features

Some of the features of IEC 61850 include.

- Enables use of multi-vendor electrical devices on a common bus network facilitating integration, device engineering and fast response.
- Ensures easy introduction of newer devices into the electrical network without the need for removing the older devices.
- Supports large number of diagnostic parameters.
- Reduces costs of installation, commissioning and maintenance.

2.2 IEC 61850 system interface in Experion

This section gives an overview of the integration of IEC 61850 system interface in Experion and how it is used in the Experion environment.

Experion supports an enhanced interface to the IEC 61850 networks configuration. The following features are now available.

- Bulk configuration using cloning option
- Offline configuration support using import/export feature
- Automated upgrade support
- Enhanced user experience for the following options
  - Multiple views for configuration
  - Alarm and SOE configuration for the same status point

With the enhanced IEC 61850 SCADA interface, you can mitigate the following risks and costs.

- Extra license needed for OPC Client Interface to configure alarm and SOE for different points.
- Manually replicate multiple copies of the same type of device.

Network topology

The following figure explains IEC 61850 system interface software in Experion.

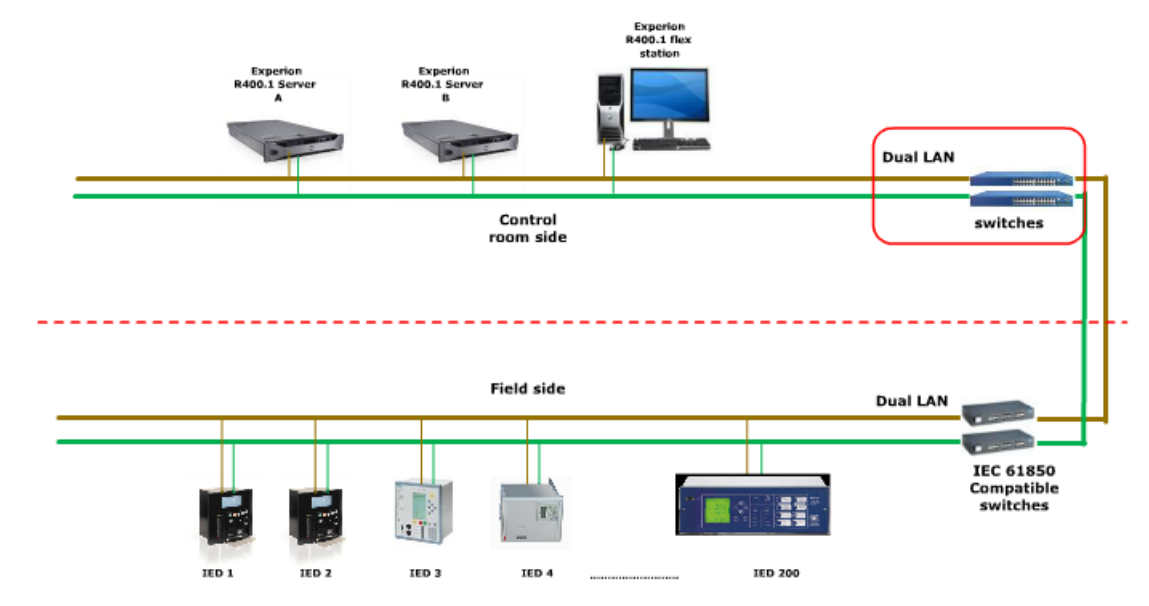


Figure 1: IEC 61850 system interface in Experion

Tip

Refer to section “Dual home configurations for SCADA server” on page 22 for dual home configurations on SCADA server.

Benefits of IEC 61850 SCADA interface integration in Experion

- Increased engineering efficiency.
- Automated upgrade support.
- Reduces number of OPC client interfaces and additional SCADA point license cost.

Bulk configuration using cloning option

Cloning creates multiple IEDs of same configuration. You can create multiple IEDs of the same model with same configuration and with minimal user interaction.

Offline configuration support using import/export feature

Using the import/export feature, you can import and export the configuration details of the configured IED. The configuration data is exported into Microsoft Excel spreadsheet.

The configuration information in the Microsoft Excel spreadsheet contains following information.

- Analog_Points
- Analog_Parameters
- Status_Points
- Status_Parameters
- Reports

Analog_Points and **Analog_Parameters** pages contain the information about analog points. **Status_Points** and **Status_Parameters** pages contain the information about status points. **Reports** page contains information about IEC 61850 report control blocks.

For details of parameters in the Microsoft Excel spreadsheet, see the “Offline configuration” on page 37

2.3 Alternate supported topologies

This section describes additional topologies supported by IEC 61850 system interface in Experion.

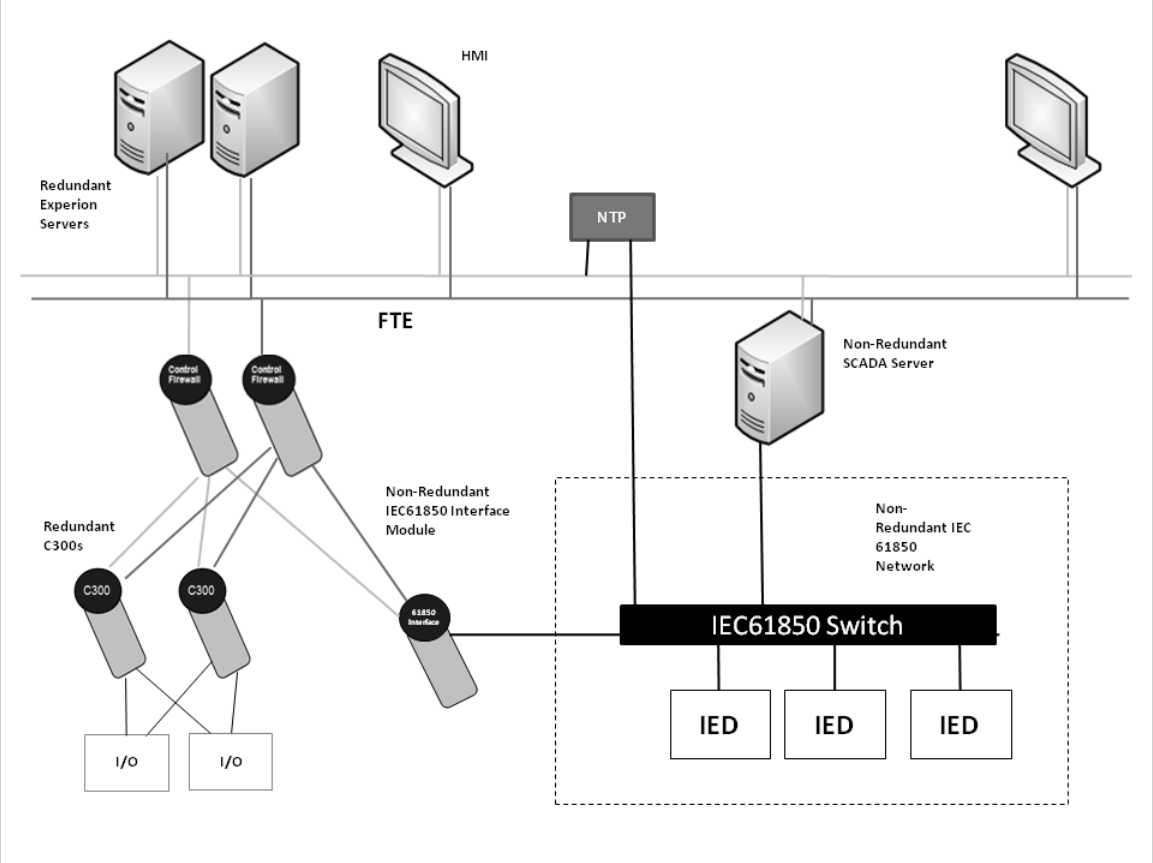


Figure 2: Non-redundant Ethernet ring topology model

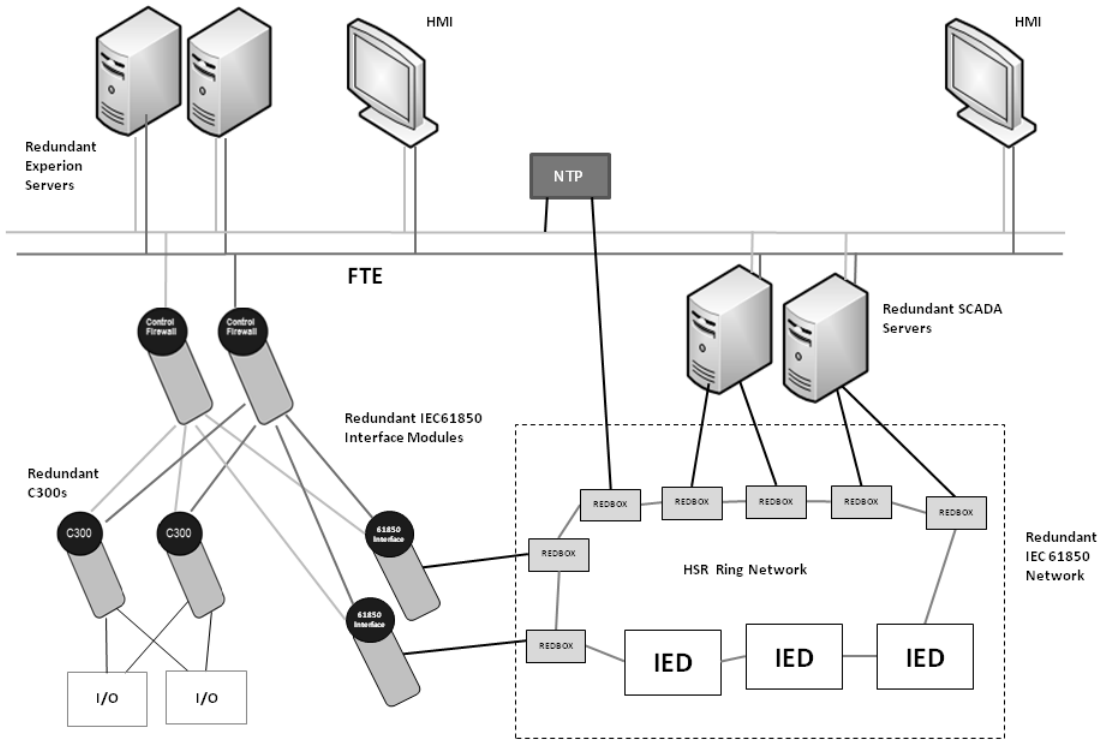


Figure 3: HSR topology model

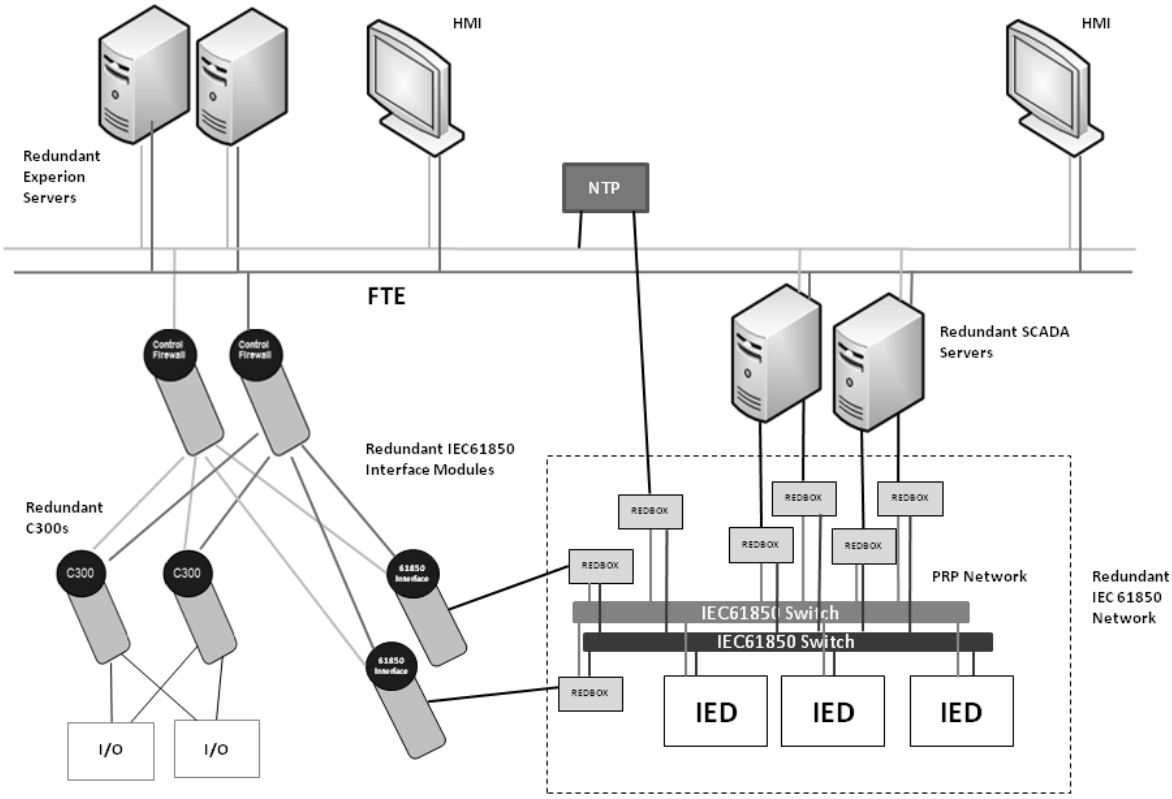
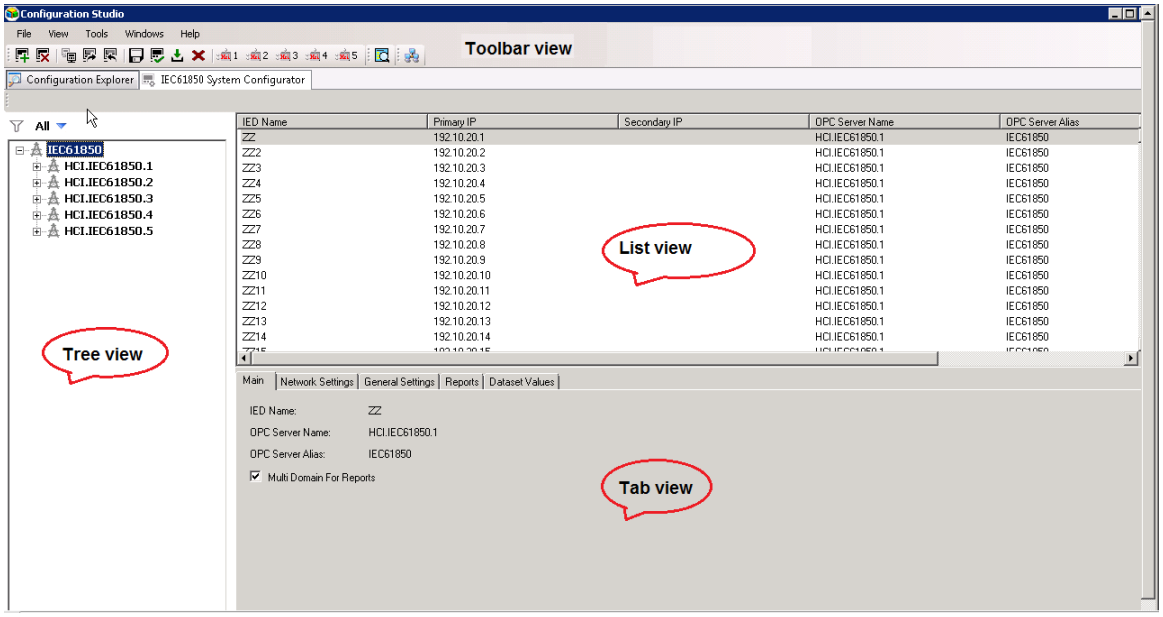


Figure 4: PRP topology model

2.4 IEC 61850 system configurator tool

The IEC 61850 system configurator tool is the interface used for configuring system interface components. The main page consists of four views.



The details of the views are as follows:

View	Description
Toolbar view	You can perform the following: • Save configuration • Add IED • Delete IED • Export IED • Import IED • Clone IED • Download points • Delete points • Auto enable reports • Synchronize servers
Tree view	You can perform the following: • Download points • Delete points • Delete IED • Auto enable reports • Export IED • Import IED • Clone IED
List view	You can view the following: • IEDs configured • Points configured under IED

View	Description
Tab view	You can view or modify the IED or Points parameter values.

2.5 Terms and definitions

This section provides information about the terms and definitions associated with IEC 61850 system interface in Experion used in the document.

Terminology	Description
Asset	Assets represents entities such as fixed plant equipment, materials, and buildings. The Asset Model provides a hierarchical structure that more closely resembles your organization. The points in your system belong to assets. For example, you might have an asset that represents a furnace in your plant. All the points associated with the physical furnace (analog points measuring the temperature, status points controlling valves or pumps associated with the furnace) might belong to the asset that represents the furnace. The part of the system for which you are responsible can be controlled by assigned assets to you or the Station you are using. In addition, where assets have been assigned to you, the tasks that you can perform can be restricted. For example, you may have View access to an asset in your system. In this case, you can only view items associated with the asset, you cannot make any changes, such as acknowledging alarms or changing a point parameter.
Channel	The communications port used by the server to connect to an IED.
DAI	Instantiated Data Attribute
Display	Station uses displays to present Experion information to operators in a manner that they can understand. The style and complexity of displays varies according to the type of information being presented. Displays are sometimes called *pages*, a term which is used for Web pages.
Dual home	Dual-home/ dual homing is a network topology where a network device is built with more than one network interface.
Faceplate	A specialized popup that shows a subset of the details shown on the matching point detail (or template) display. It typically shows the point's run-time values and control settings. A faceplate appears when an operator clicks an object that is linked to a point.
IEC	International Electrotechnical Commission.
IED	Intelligent Electronic Device An intelligent control and messaging device used for interfacing substation automation controllers and networks to target electrical equipment such as relays, circuit breakers, and so on.
IED technical name	The IED name configured by the vendor. It is also known as **IED network name**.
BR	Buffered Reports
RP	Unbuffered Reports
Parameter	Each item of information about a point is called a parameter. The main parameters store: • The current value or state of the point (sometimes referred to as Process Variable or PointValue/PointState). • The uncalibrated value of the point (sometimes referred to as output or OutputValue/ OutputState). • The control state of the point, that is, whether the point is being automatically controlled or manually controlled (sometimes referred to as Mode or ModeState).

Terminology	Description
Point	A point is a collection of information about a particular part of your system. For example, a point representing a motor would include: • A Point name, which uniquely identifies the motor. • A description. • A full item name. • The current state (off or on). The desired state. This is applicable if you are allowed to control the point. For example, if current state of the motor is "On" you can change the real state of the motor to "Off" using the display.
Point Parameter	A unit of information about a point. For example, an analog point includes parameters such as: process variable parameter (PointValue) and output parameter (OutputValue).
Point Server	A high-level interface that allows Experion to exchange data with another application or subsystem without the need for separately defining points in Experion. The database structure of a point on a point server (called a flexible point) is determined by the application/subsystem, rather than by Experion.
PointValue	The process variable parameter of a standard point.
SOE	Indicates the Sequence Of Events.

3 Installation and upgrades

Installation

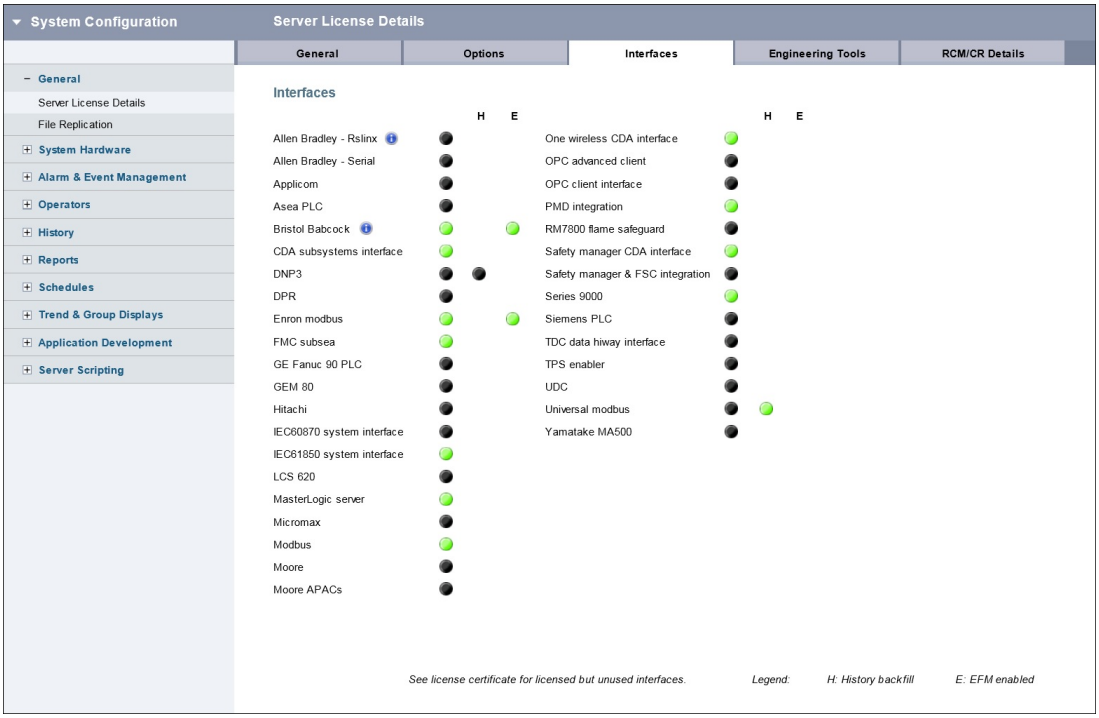
IEC 61850 system interface software components are installed while installing Experion. These components are installed on Experion nodes supporting IEC 61850 system interface software.

Before you begin installation, check for IEC 61850 system interface license by performing the following steps.

To check for IEC 61850 system interface license

1. Start **Station** and then click **Configure > Server License Details**.

   The **Server License Details** page appears.
2. Click the **Interfaces** tab.
3. Verify the status for the **IEC 61850 System Interface**.



- Green LED before the component indicates that you have the license option enabled.
- Black LED before the component indicates you do not have the license.

Upgrades

IEC 61850 system interface software upgrade is performed along with Experion server upgrade. For information about upgrade, refer to the *Experion Migration guides*.

4 Configuration

Related topics

4.1 Dual home configurations for SCADA server

- Ensure that the lower MAC address is selected for FTE network installation. As the Dell servers like Dell 320 have four built-in NIC interfaces, ensure to use the first two NICs for FTE connection and other two NICs for IEC 61850 network connections. If you have installed additional dual NICs on two NIC built-in type server, ensure that lower MAC address NIC is selected for FTE. With this setup, Experion installation automatically selects the lower MAC interfaces (first two interface of built-in NICs) for FTE and system management and also sets proper binding order that FTEMUX is on top .
- Disable the IP routing between the FTE interfaces and the IEC 61850 interfaces.
- Disable Microsoft Windows Client and File Sharing for the IEC 61850 ports on the SCADA server.
- Change the TCP/IPv4 interface metric on both the IEC 61850 interfaces to 5 and 10, and disable netBIOS on both IEC 61850 interfaces.
- Do not include a gateway address on either IEC 61850 interface with an assumption that gateway address is already defined on the FTEMUX.

To verify IP routing is disabled

1 Choose **Start > All Programs > Honeywell Experion PKS > Server > Diagnostic Tools > Experion Command Prompt**.
The **Experion Command Prompt** window appears.

2 Type `ipconfig /all` and press ENTER.
The IP configuration details are listed.

3 In the **Windows IP Configuartion** section, ensure that the value of **IP Routing Enabled** is set as **No**.

To disable Microsoft Windows Client and File Sharing for the IEC 61850 ports on the SCADA server

1 Choose **Start > Control Panel**.
The **Control Panel** window is displayed.

2 Perform one of the following depending upon your operating system.

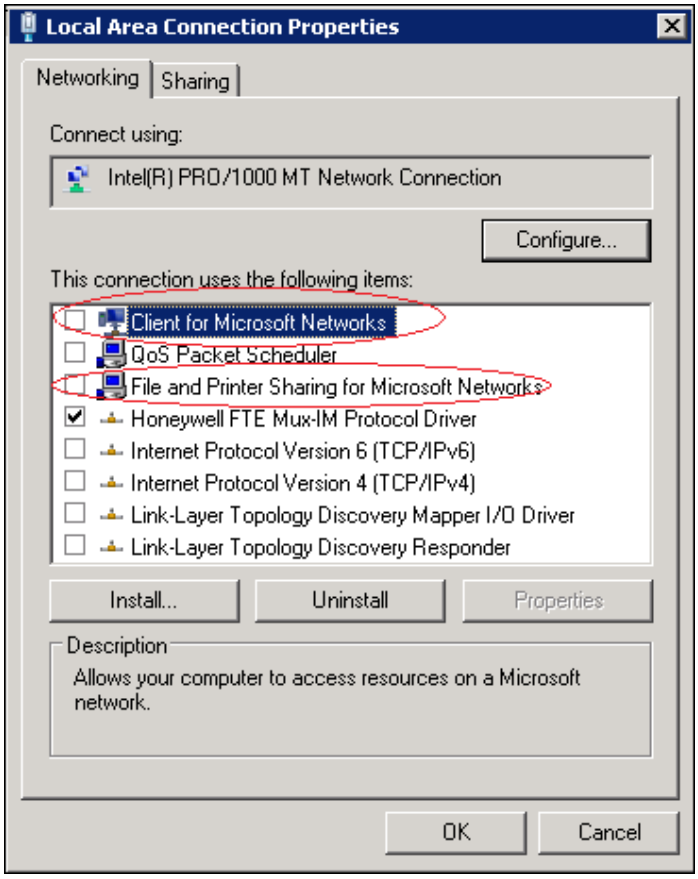
Option	Description
Windows 7	Click **Network and Internet > Network and sharing Center > Change Adapter Settings**.
Windows Server 2008	Click **Network and sharing Center > Manage Network Connections**.

The **Network Connections** window is displayed.

3 Right-click the network connections and choose **Properties**.
The **User Account Control** dialog box is displayed.

4 Click **Continue**.

5 In the **Networking** tab, disable the following options.
- Client for Microsoft Networks
- File and printer sharing for Microsoft Networks



6 Click **OK**.

To change the TCP/IPv4 interface metric and disable netBIOS

1 Choose **Start > Computer**.

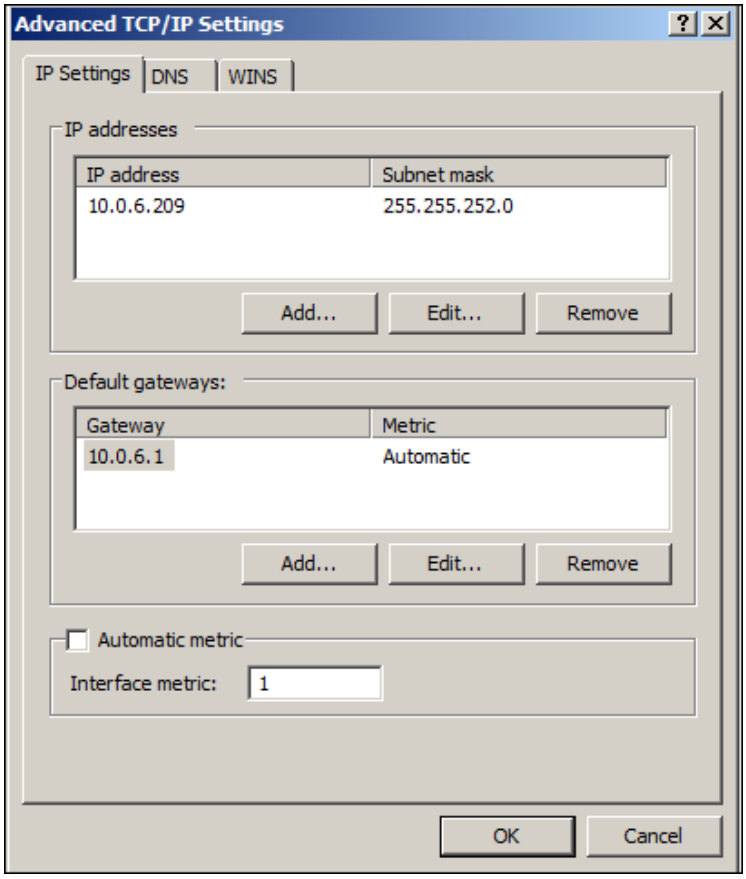
2 Right-click **Network** and choose **Properties**.

3 Right-click on the **DHEB Network connection** and choose **Properties**.

4 Select **Internet Protocol (TCP/IP)** and choose **Properties**.

5 Click the **Advanced** button on the **Internet Protocol (TCP/IP) Properties** window.

6 In the **Interface Metric** box, specify **5** for one IEC 61850 interface.



7 Click the **WINS** tab.

8 Click **Disable NetBIOS over TCP/IP** and then click **OK**.

9 Click **OK** on the **Internet Protocol (TCP/IP) Properties** dialog box.

10 Click **OK** on the **DHEB Network Properties** dialog box.

11 Repeat the above steps to change the **TCP/IPv4 interface metric** on the other IEC 61850 interface to **10**.

4.2 System configuration

This section includes tasks to configure the system for IEC 61850.

Related topics

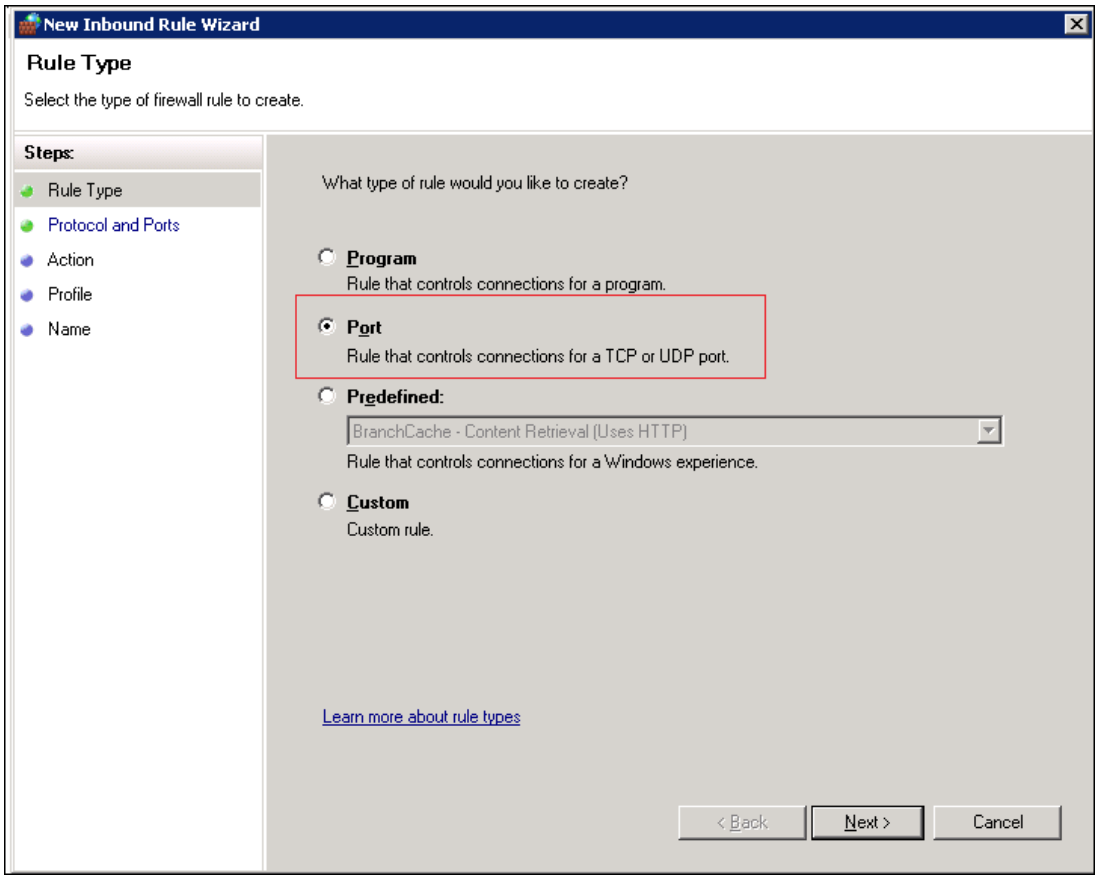
“Configuring the firewall settings” on page 25
“Configuring the IEC 61850 system interface” on page 29
“Configuring file replication” on page 31

4.2.1 Configuring the firewall settings

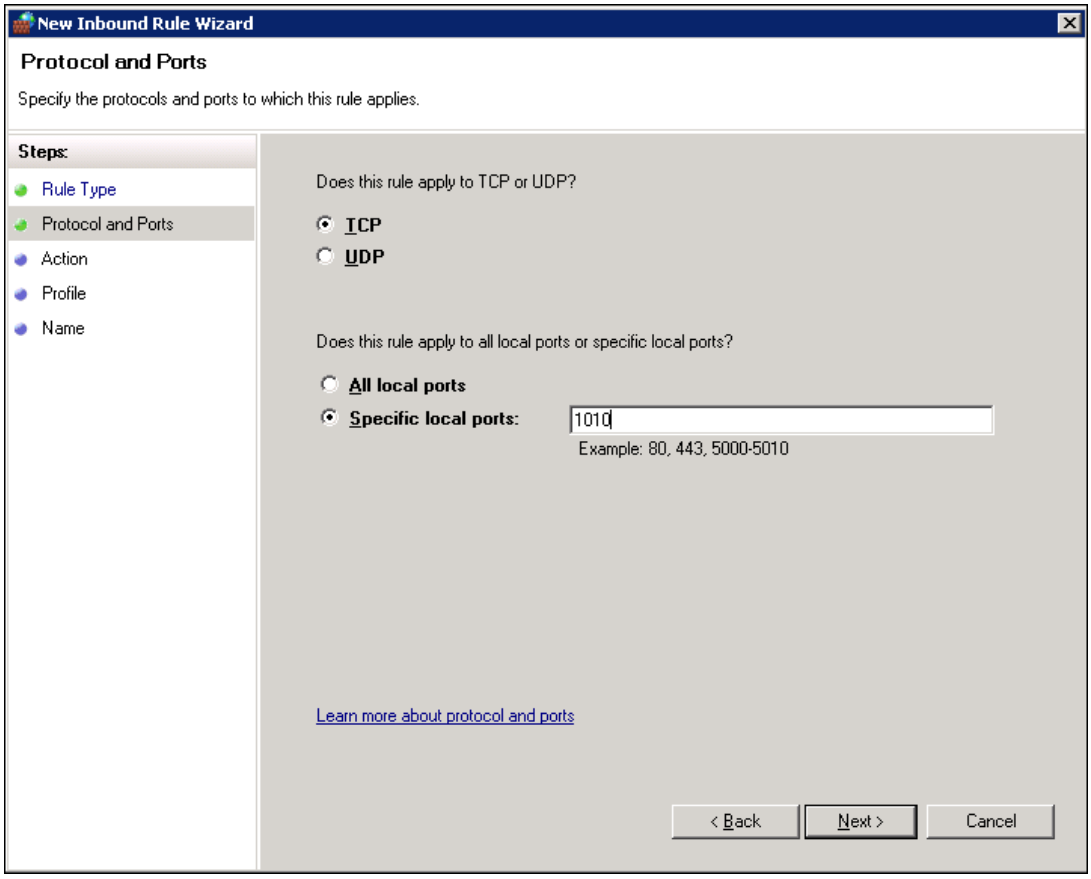
1 Click **Start > Control Panel > System and Security > Windows Firewall**, or **Start > Control Panel > Administrative Tools> Windows Firewall with Advanced Security**.
The **Windows Firewall with Advanced Security** page appears.

2 Click the **Inbound Rules** in the left pane and then click **New Rule** in the right pane to add the new rule.
The **New Inbound Rule Wizard**, with the **Rule Type** page appears.

3 On the **Rule Type** page, select the **Port** option.



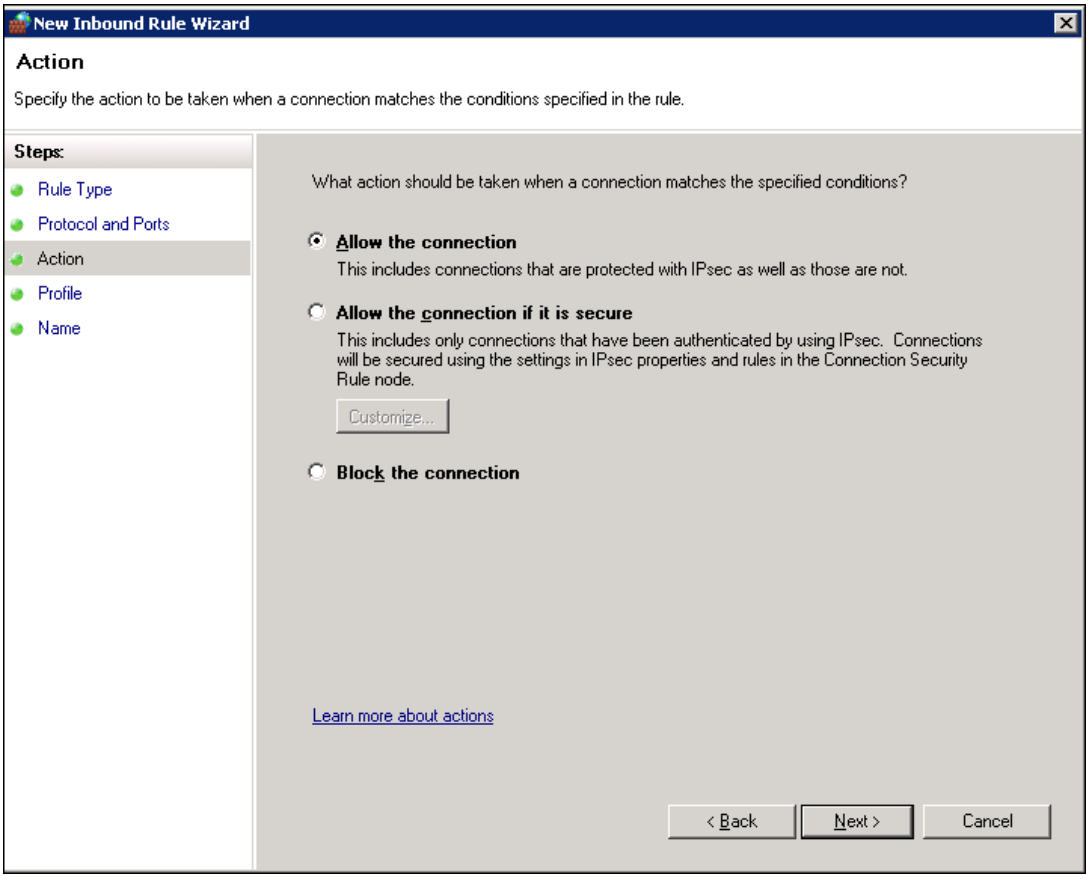
4 Click **Next**.
The **Protocols and Ports** page appears.



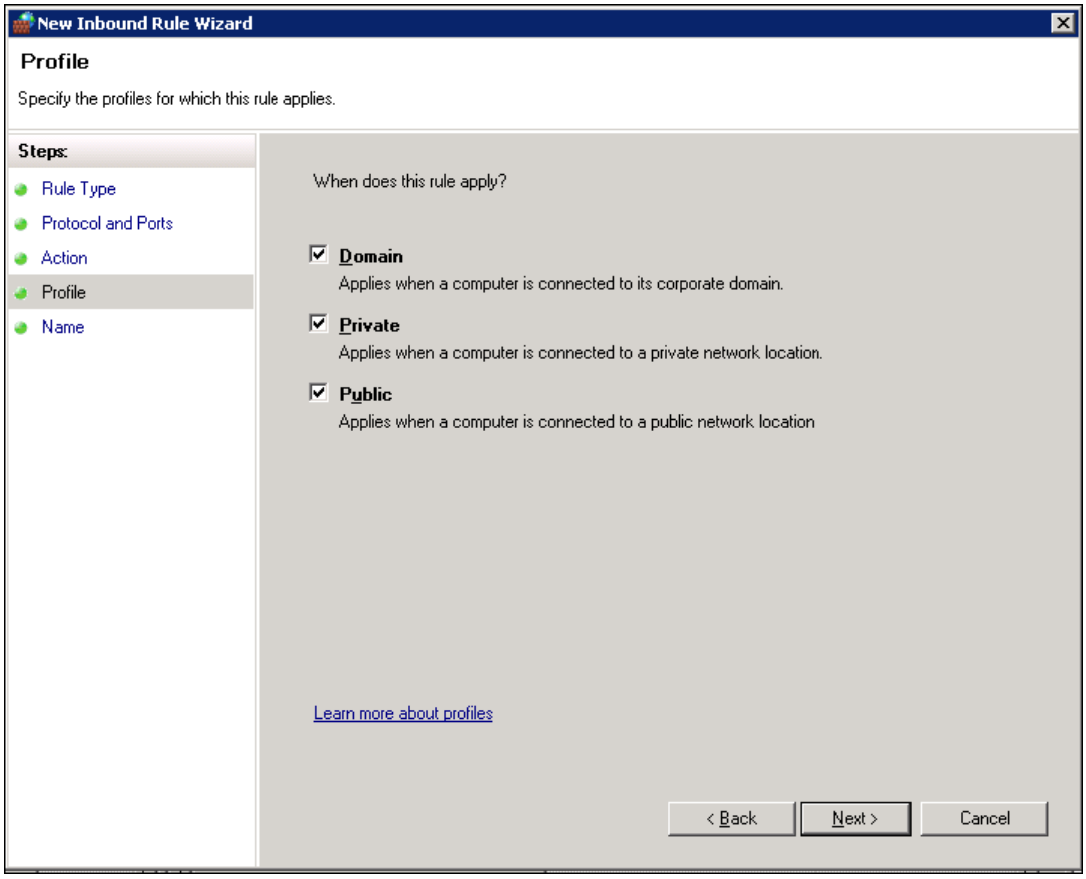
Perform the following:

- Select the **TCP** option button.
- Select the **Specific local ports** option button.
- Type **1010.**

5 Click **Next.**
The **Action** page appears.



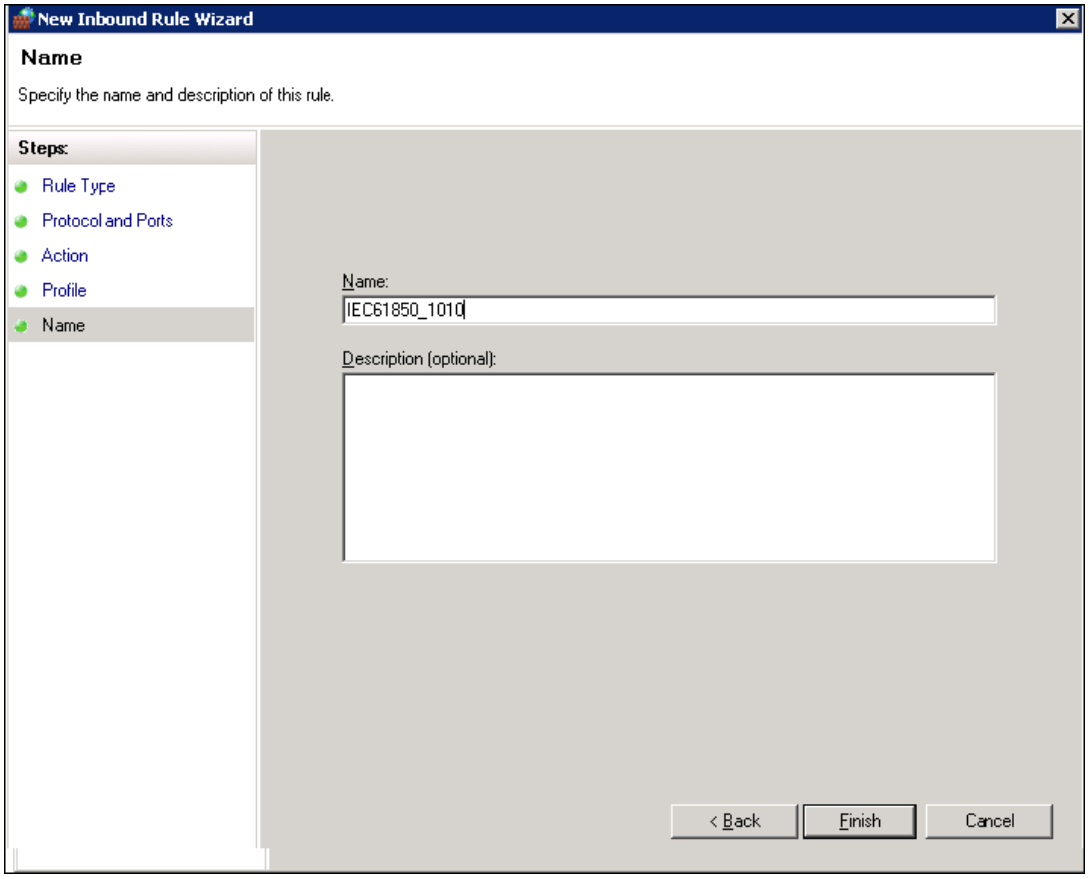
6 On the **Action** page, select the **Allow the connection** option and then click **Next.**
The **Profile** page appears.



7 On the **Profile** page, select the following check boxes.
- Domain
- Private
- Public

8 Click **Next.**
The **Name** page appears.

9 Enter the name of the wizard and Click **Finish** to close the **New Inbound Rule Wizard** for TCP port 1010.



10 Repeat the same procedure to add the following to ensure communication through Windows firewall.
- Inbound Rule of TCP port 1011
- Outbound Rule of TCP port 1010
- Outbound Rule of TCP port 1011

4.2.2 Configuring the IEC 61850 system interface

Prerequisites

You must have **mngr** access level to configure the system interface.

To configure the IEC 61850 system interface

1 Start the **Station.**

2 Click **Configure>System Hardware>System Interfaces**.
The **Configuration Summary** page appears.

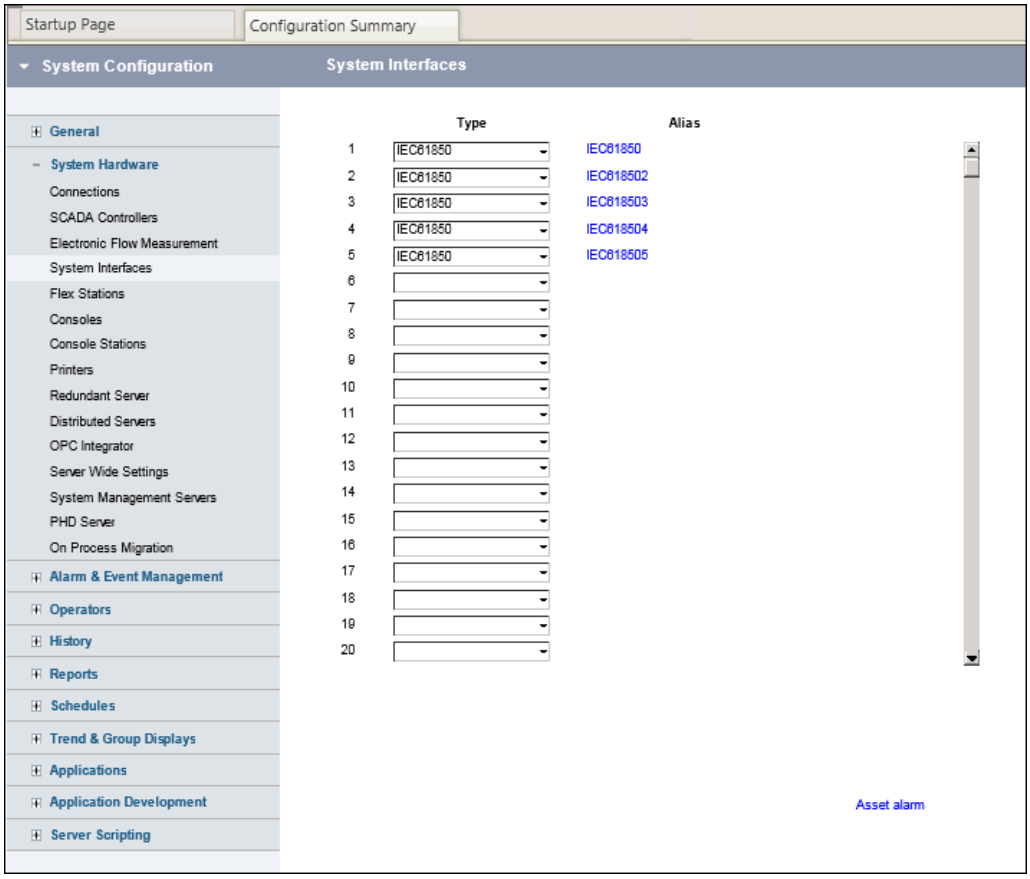


Figure 5: Configuration Summary page

3 From the **Type** drop-down list, select .

4 In the **Alias** column, click **IEC 61850.**
The **OPC Server Configuration** page appears.

5 Select the **Status** tab, and click the **Enabled** check box, to enable **Notifications.**

Attention
Notifications connection status LED appears Green only after at least one IED is configured. Refer to the section “Removing IED” on page 35.

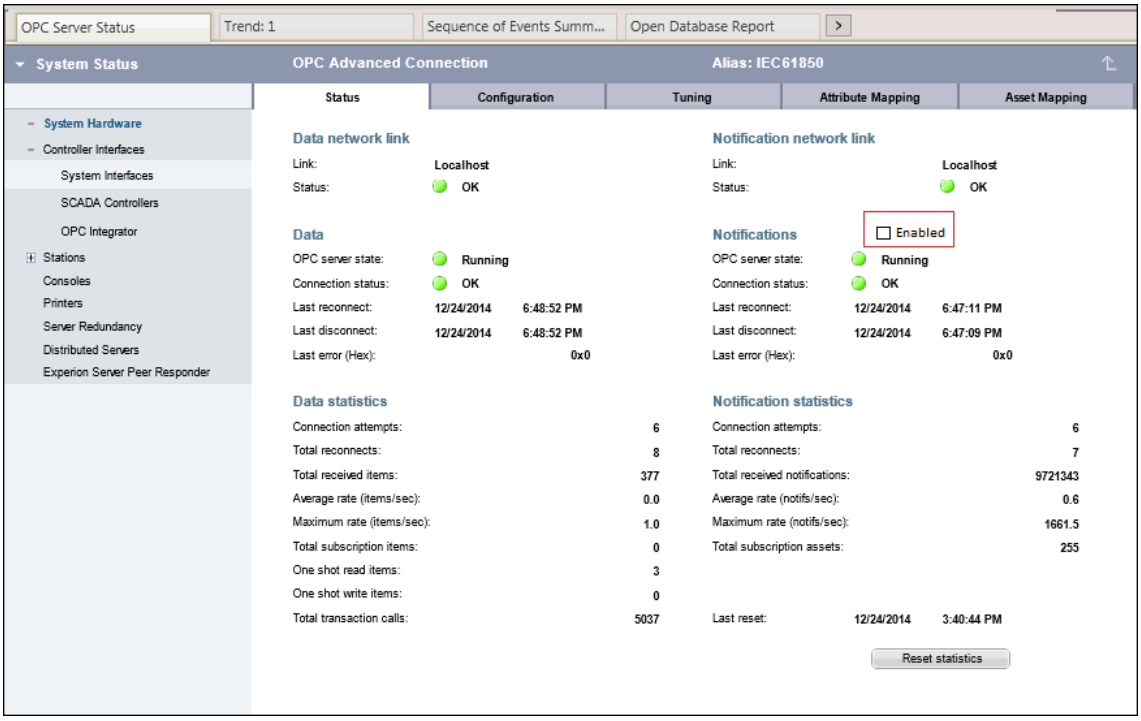


Figure 6: Enabling notifications for IEC 61850 system interface

6 Repeat the steps for the remaining four interfaces.

4.2.3 Configuring file replication

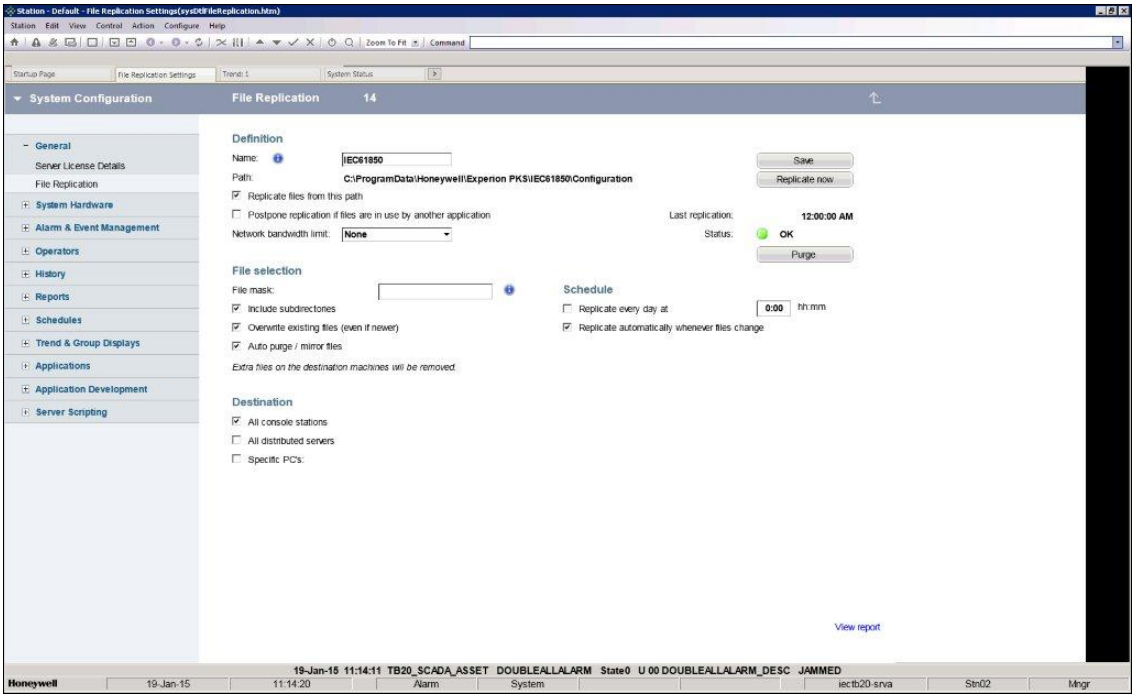
> **Attention**
> This section is required only for the redundant Experion server.

To configure file replication

1 Start **Station.**

2 Click **Configure>File Replication**.
The **File Replication Summary** page is displayed.

3 Click an unconfigured slot and then configure the file replication for IEC 61850, as displayed in the following figure.


Station - Default - File Replication Settings(sysDtlFileReplication.htm)
Station Edit View Control Action Configure Help
Command
Startup Page
File Replication Settings
Trend: 1
System Status
System Configuration
File Replication 14
General
Server License Details
File Replication
System Hardware
Alarm & Event Management
Operators
History
Reports
Schedules
Trend & Group Displays
Applications
Application Development
Server Scripting
Definition
Name: IEC61850
Path: C:\ProgramData\Honeywell\Experion PKS\IEC61850\Configuration
Replicate files from this path
Postpone replication if files are in use by another application
Network bandwidth limit: None
Save
Replicate now
Last replication: 12:00:00 AM
Status: OK
Purge
File selection
File mask:
Include subdirectories
Overwrite existing files (even if newer)
Auto purge / mirror files
Extra files on the destination machines will be removed.
Schedule
Replicate every day at 0:00 hh:mm
Replicate automatically whenever files change
Destination
All console stations
All distributed servers
Specific PC's:
View report
19-Jan-15 11:14:11 TB20_SCADA_ASSET DOUBLEALLALARM State0 U 00 DOUBLEALLALARM_DESC JAMMED
Honeywell
19-Jan-15
11:14:20
Alarm
System
iectb20-srva
Stn02
Mngr

4.3 IED Configuration

This section includes tasks to configure the IED and points belonging to the IED.

Related topics

“Starting the IEC 61850 system configurator” on page 33
“Adding IED” on page 34
“Removing IED” on page 35
“Cloning IED” on page 35
“Exporting IED” on page 36
“Importing IED” on page 39

4.3.1 Starting the IEC 61850 system configurator

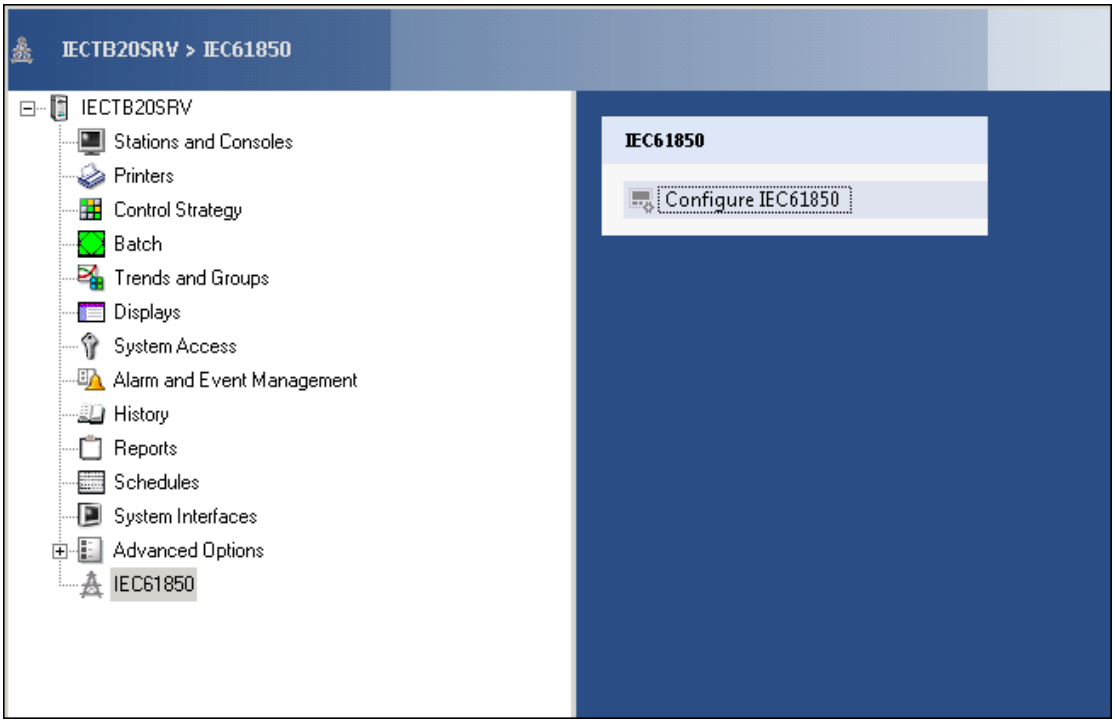
Using the Configuration Studio, you can configure IEC 61850 system interface in Experion. The Experion system and Experion nodes connected to the system and server are listed when the Configuration Studio is launched.

Prerequisites

To log on, you must be a member of the Administrator group.

To start the IEC 61850 system configurator

1 Log on to the Experion server.
2 Choose **Start > All Programs > Honeywell Experion PKS > Configuration Studio**.
3 Right-click **Configuration Studio** and then click **Run as administrator.**
The **Connect** dialog box appears.
4 In the list of systems and servers, click the system or specific server that you want to connect to and click **Connect**.
The **Login to Server** dialog box appears.
5 Log on to Configuration Studio with the required privileges.
6 On the Configuration Studio, click the **IEC 61850** icon in the left pane.
IEC 61850 appears in the right pane.



7 Click **Configure IEC 61850.**
The **IEC 61850 System Configurator** tab appears next to the **Configuration Explorer** tab.

4.3.2 Adding IED

Considerations

- Ensure that the combination of IED + IED network name + logical device name + domain status name does not exceeds 40 characters. If this name exceeds 40 characters, the IED is not added into Experion.
- The **Multi Domain for Reports** option must be selected if the IED has more than one logical device associated with it.

To add IED

1 Select one of the following options to begin adding the IED.

View	Procedure
Toolbar view	Click the icon.
Tree view	Right-click the required IEC 61850 server and then choose **Add IED**

The **Add IED** dialog box appears.

2 Select one of the following options to configure the IED.

Option	Procedure
To configure the IED using ICD/CID file	1. Select the **ICD File** option and then click **Browse.** 2. Click to browse for the applicable ICD/CID file, and navigate to the location of the required file and then click **Open.** 3. Select the file and click **OK.** The IED properties page appears.
To configure the IED directly from the device	1. Select the **From Device** option and then click **OK.** The **IED properties** page is displayed

3 Specify the following details for the IED.

- **IED Name**. If you are configuring the IED through the ICD/CID file, the name is populated automatically. Specify the IED name or accept the default value.
- **OPC Server**. The **Server Alias** field is populated automatically when the server name is selected.
- Select **IED Redundant** if you have a redundant IED, and enter the following details.
  - **IP address**: enter the IP address of the redundant IED
  - **AP Title**
  - **AE Qualifier**
  - **Presentation Selector**
  - **Selection Selector**
  - **Transport Selector**

> **Attention**
> The parameters, **AP Title**, **AE Qualifier**, **Presentation Selector**, **Selection Selector** and **Transport Selector**, must match the IED configuration.

4 Click **OK**.
A progress bar appears, displaying the progress of import.
After the IED is imported successfully, it appears in the IED *Tree* view.

4.3.3 Removing IED

This sections describes tasks to remove IEDs.

To remove IED

1 Select one of the following options to begin removing the IED.

View	Procedure
Toolbar view	Click the icon.
Tree view	Right-click **IEC 61850 server** and then choose **Delete IED.**

A warning message is displayed, asking for confirmation to delete the IED.

2 Click **OK** to delete the IED.
A progress bar appears, displaying the progress of deletion.
After the IED is deleted successfully, the *Tree* view in the left pane no longer displays the IED.

4.3.4 Cloning IED

Considerations

- You can clone a maximum of 50 IEDs at a time.
- Ensure to have a list of IED network names before you begin cloning.
  You cannot clone redundant IEDs using a non-redundant IED.

To clone IED

1 Navigate with one of the following views to begin cloning.

View	Procedure
Toolbar view	Click the icon.
Tree view	Right-click **IEC 61850 server**, and then choose **Clone IED.**

The **Clone IED** dialog box appears.

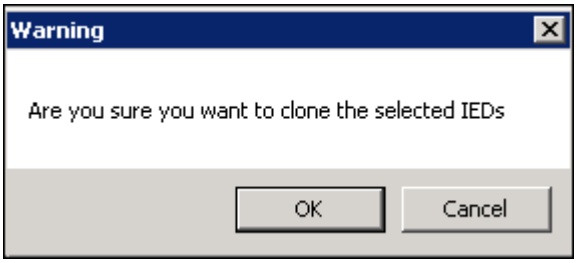
2 In the **IED network name** section, clear the **IED name is same as IED network name** check box if IED name and IED network name are different for the IED which you are cloning.

3 In the **Cloning options** section, enter the following details.

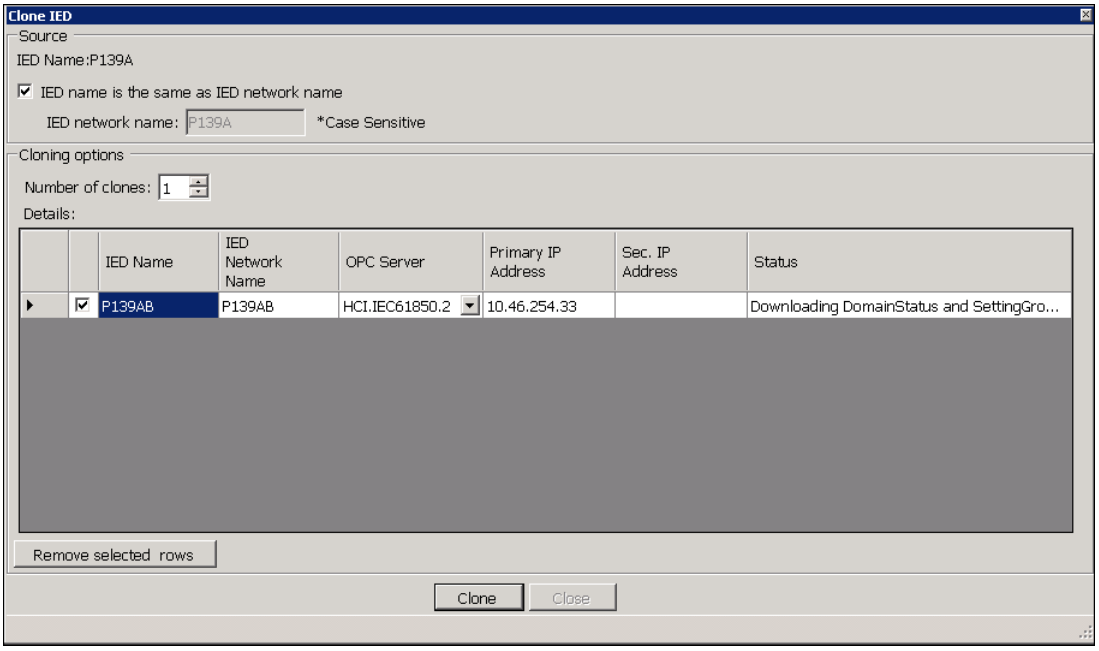
- Number of IEDs to be cloned in the **Number of clones** drop down box.
- IED name
- IED network name
- OPC server
- IP address

Attention
Ensure that you specify the IED name and OPC server before you begin cloning IEDs.

4 Click **Clone.**
A Warning message is displayed asking for confirmation to clone.



5 Click **OK.**
Cloning begins. The status of the clone is displayed in the **Status** column.



6 Repeat the previous steps to clone other IEDs. Click **Close** to exit.
The IEDs are displayed in the *Tree* view in the left pane, under their respective servers.

4.3.5 Exporting IED

This section describes tasks to export IED configuration details into Microsoft Excel spreadsheet.

To export IED

1 Select one of the following options to begin exporting the IED.

View	Procedure
Toolbar view	Click the  icon.
Tree view	Right-click **IEC 61850 server** and then choose **Export.**

The **Export/Import IED configuration** dialog box appears.

2 Click **Browse** to navigate to the path where the IED details must be exported.
The **Export file name** dialog box appears.

3 In the **File name** field, enter the name of the Microsoft Excel spreadsheet, and click **Open.**
The path and the name of the Microsoft Excel spreadsheet appears in the **Export/Import IED configuration** dialog box.

4 Click **OK**.
Exporting of IED begins. A message is displayed after the IEDs are successfully exported.

5 Click **OK.**
The IEC 61850 system interface configuration details are exported into a Microsoft Excel spreadsheet.

4.3.5.1 Offline configuration

The details of parameters in the Microsoft Excel spreadsheet are listed as follows:

Page	Non-editable fields	Editable fields
Analog_Points	• IEDName • LogicalDevice • LogicalNode • PointID • PointName • Description	• Asset • AssociatedDisplay • DetailDisplay • GroupFaceplateTemplateDisplay • ScanningEnabled
Analog_Parameters	• Parent Item Name • LogicalDevice • LogicalNode • ParameterName • ExperionMappingParameter • FunctionalConstraint • PointID	• AlarmType0 • AlarmPriority0 • AlarmLimit0 • AlarmType1 • AlarmPriority1 • AlarmLimit1 • AlarmType2 • AlarmPriority2 • AlarmLimit2 • AlarmType3 • AlarmPriority3 • AlarmLimit3 • AlarmDisable • RangeLow • RangeHigh • Deadband

Page	Non-editable fields	Editable fields
Status_Points	• IEDName • LogicalDevice • LogicalNode • PointID	• PointName • Description • Asset • AssociatedDisplay • DetailDisplay • GroupFaceplateTemplateDisplay
Status_Parameters	• Parent Item Name • LogicalDevice • LogicalNode • ParameterName • ExperionMappingParameter • FunctionalConstraint	• AlarmEnableState0 • AlarmDescriptorState0 • AlarmPriority0 • AlarmEnableState1 • AlarmDescriptorState1 • AlarmPriority1 • AlarmEnableState2 • AlarmDescriptorState2 • AlarmPriority2 • AlarmEnableState3 • AlarmDescriptorState3 • AlarmPriority3 • AlarmDisable • EnableSOE
Reports	• Dataset • ReportID • Domain	• SelectReport • IntergrityPeriod • SequenceNo • ReportTimeStamp • ReasonForInclusion • DataSetOption • DataReference • BufferOverflow • EntryID • ConfigurationRevision • Segementation • DataChange • QualityChange • DataUpdate • Intergrity • GI

Guidelines for modifying IED values in the Microsoft Excel spreadsheet

- You can modify only existing IEDs.
- You cannot add a new IED (new row).
- Ensure that you do not copy paste content in the editable fields in the Microsoft Excel spreadsheet. Validations are not performed on copy-pasted content.
- Ensure that you do not change the non-editable fields. Though Microsoft Excel spreadsheet allows you to make changes, these changes are not imported.
- You can modify the name of the Microsoft Excel spreadsheet.
- Ensure that the entries in the **DetailDisplay** and **GroupFaceplateTemplateDisplay** end with *.htm/.html*.

4.3.6 Importing IED

This section describes tasks to import IED configuration details from a Microsoft Excel spreadsheet.

To import IED

1 Select one of the following options to begin importing the IED.

View	Procedure
Toolbar view	Click the icon.
Tree view	Right-click **IEC 61850 server** and then choose **Import.**

The **Export/Import IED configuration** dialog box appears.

2 Click **Browse** to navigate to the path where the IED details are located.
The **Import file name** dialog box appears.

3 Select the Microsoft Excel spreadsheet, and click **Open.**
The path and the name of the Microsoft Excel spreadsheet appears in the **Export/Import IED configuration** dialog box.

4 Click **OK.**
Importing of IEDs begins. A message is displayed after the IEDs are successfully imported.

5 Click **OK.**
The IEC 61850 system interface configuration details are imported into a Microsoft Excel spreadsheet and displayed in the *Tree* view in the left pane, under their respective servers.

4.4 IEC 61850 points configuration

This section provides the information on the steps to configure the analog and digital points.

Configuring IEC 61850 points consists of the following steps:

- Configuring Alarms and SOE
- Downloading points
- Deleting points

Related topics

“Configuring alarms and SOE” on page 40
“Downloading points” on page 40
“Deleting points” on page 42

4.4.1 Configuring alarms and SOE

This section describes the steps to configure alarms and SOE for the IEDs.

To configure alarms and SOE

1 Expand the IED in the *Tree* view, and then browse until the required point.

2 In the *Tab* view, configure the following parameters.

Tab	Configuration
Main tab	• Description • Asset • Associated Display • Point Detail display • Group Faceplate Template Display
Alarm History & Trend tab	• Select the parameter for which you want to configure the alarms. • Specify the **parameter descriptor**, **state description** and **severity**. • Configure the history and trend numbers in the *History Options*, *Group and Trend Options* sections. • In the *Alarm Options* section, select **Field Timestamp** check box if you require field timestamp for alarms. **Attention** • The parameters **Group Number**, **Position in group** in the *Group and Trend options* section are configured for a point and not for a parameter. • Alarms are disabled by default. Clear **Disable alarms** check box to enable alarms.

4.4.2 Downloading points

Considerations

Point names exceeding 40 characters are not downloaded into Experion. (The RP and BR point names may exceed 40 characters). You must modify the point name to have characters less than 40.

To download points using the *List* view

1 In the *List* view, select the points you want to download. To select multiple points, hold the SHIFT key and then select the points.

2 Right-click the selected points and choose **Download**.
The downloading of points begins. The downloaded points appears dimmed, as shown in the figure.

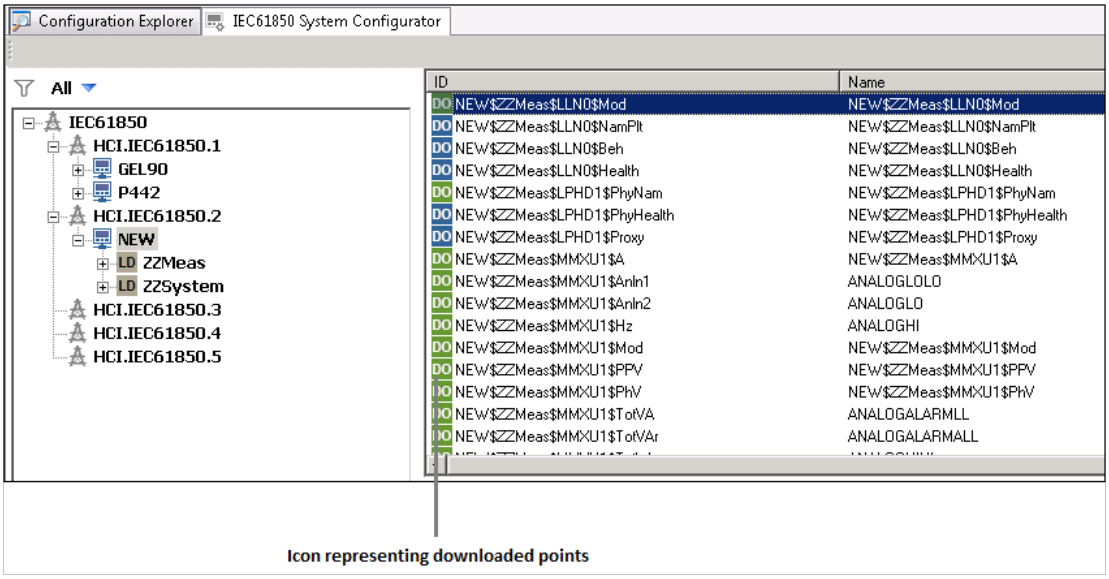
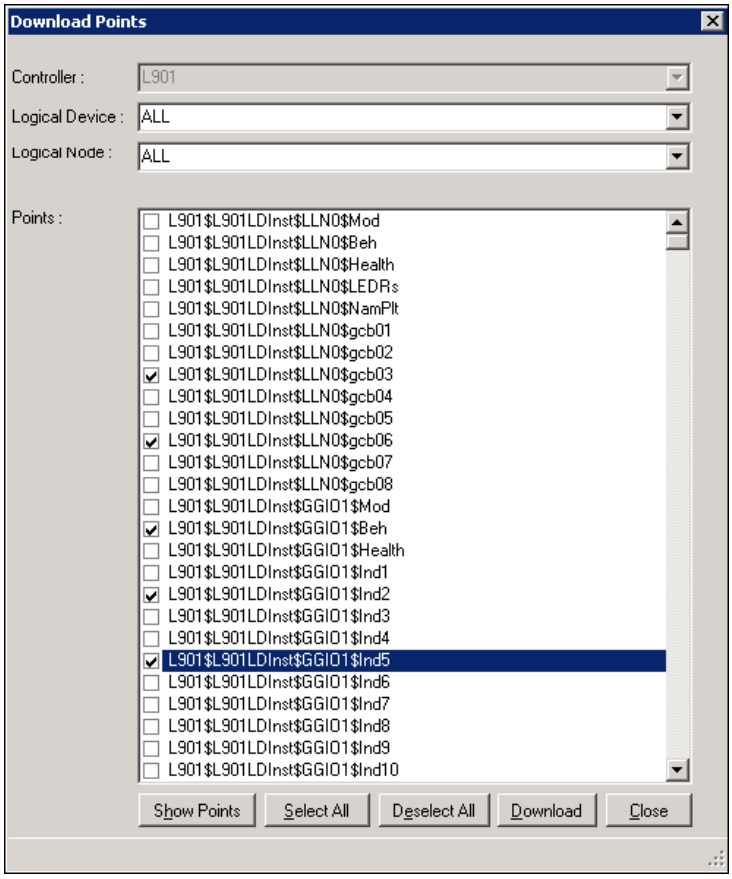


Figure 7: Successfully downloaded points that appear dimmed

To download points using the *Tree* view

1 Right-click IED in the left pane and then choose **Download Points.**
The **Download Points** dialog box appears.



2 Perform the following:

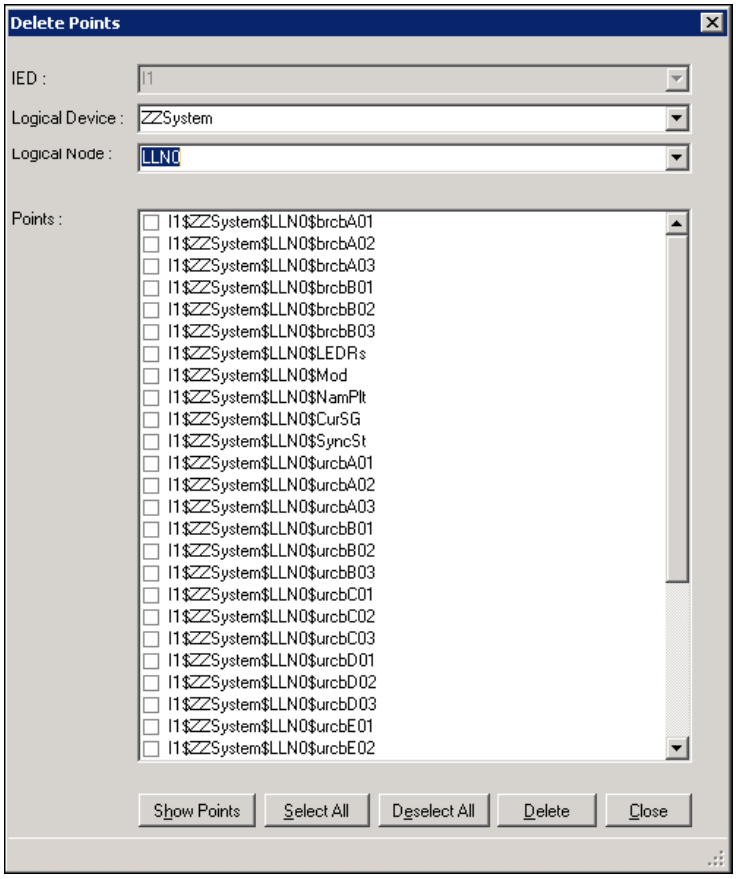
a Select the **Logical Device** and **Logical Node** from the respective drop-down lists.

b Select the required points and then click **Download**.

The downloading of points begins. The downloaded points appears dimmed, as shown in the figure above.

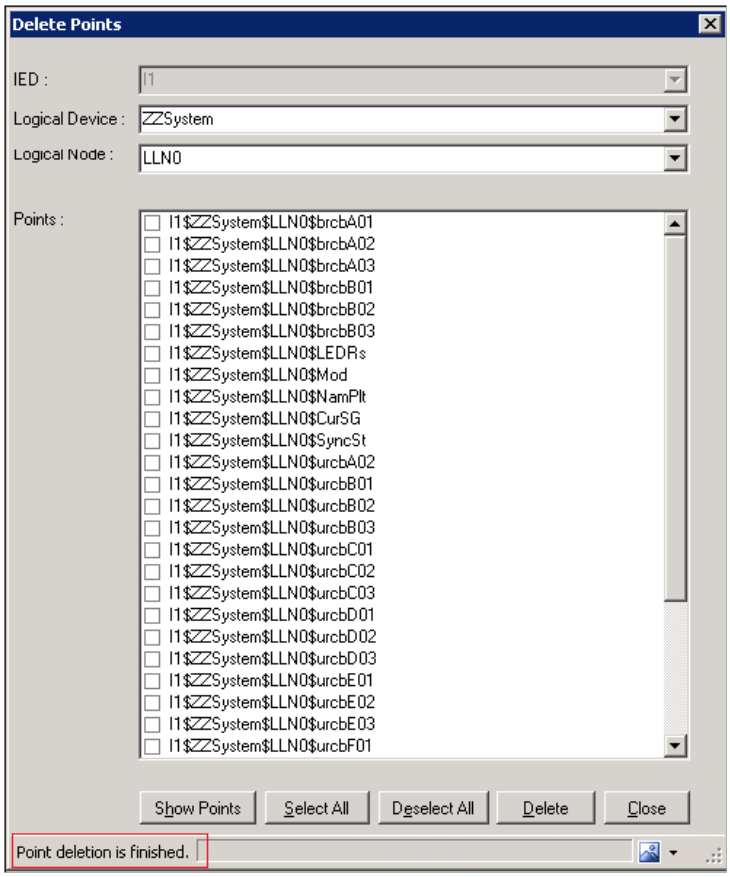
4.4.3 Deleting points

1 Right-click IED in the left pane and then choose **Delete Points**.
The **Delete Points** dialog box appears.



2 Select the Logical Device and Logical Node from the respective drop-down lists.

3 Select the required points and then click **Delete**.
The selected points are deleted, and a success message appears at the bottom of **Delete Points** dialog box.


Delete Points
IED :
I1
Logical Device :
ZZSystem
Logical Node :
LLN0
Points :
I1$ZZSystem$LLN0$brcbA01
I1$ZZSystem$LLN0$brcbA02
I1$ZZSystem$LLN0$brcbA03
I1$ZZSystem$LLN0$brcbB01
I1$ZZSystem$LLN0$brcbB02
I1$ZZSystem$LLN0$brcbB03
I1$ZZSystem$LLN0$LEDRs
I1$ZZSystem$LLN0$Mod
I1$ZZSystem$LLN0$NamPlt
I1$ZZSystem$LLN0$CurSG
I1$ZZSystem$LLN0$SyncSt
I1$ZZSystem$LLN0$urcbA02
I1$ZZSystem$LLN0$urcbB01
I1$ZZSystem$LLN0$urcbB02
I1$ZZSystem$LLN0$urcbB03
I1$ZZSystem$LLN0$urcbC01
I1$ZZSystem$LLN0$urcbC02
I1$ZZSystem$LLN0$urcbC03
I1$ZZSystem$LLN0$urcbD01
I1$ZZSystem$LLN0$urcbD02
I1$ZZSystem$LLN0$urcbD03
I1$ZZSystem$LLN0$urcbE01
I1$ZZSystem$LLN0$urcbE02
I1$ZZSystem$LLN0$urcbE03
I1$ZZSystem$LLN0$urcbF01
Show Points
Select All
Deselect All
Delete
Close
Point deletion is finished.

4.5 Enabling reports

This section includes tasks to enable reports for selected downloaded points.

Considerations

You should enable reports for data set that contain the downloaded points. You can also refer *Dataset Values* tab for information about the downloaded point.

Recommended settings for reports

Dataset type	Report control block type	Trigger options	Optional fields	Integrity period
Analog	Buffered	Periodic, GI & no data change	• Sequence number • Report Time Stamp • Dataset • Buffer overflow (for buffered reports only) • EntryID (for buffered reports only) • Configuration revision	1000
	Unbuffered	Periodic, GI & no data change		1000
Digital	Buffered	Data Change & GI and no periodic		0
	Unbuffered	Data Change & GI and no periodic		0

Prerequisites

Ensure that the point is downloaded before you enable reports.

To enable reports

1 Select the IED from the list view.

2 In the *Reports* tab, select the required reports that should be enabled. You can change the value if the following fields, if required.

- Optional fields
- Trigger options
- Integrity period

3 Right click on IED and perform auto enabled reports.

4.6 Configuring control parameters

Experion supports the following IEC 61850 control.

- direct execute
- select before operate
- direct execute with enhanced security
- select before operate with enhanced security

To exceute direct execute/direct execute with enhanced security control

1. Use **Operate** service to execute the command by writing Oper with high value along with the other parameters of Oper service with the required values according to the table below.
2. Use **Cancel** service to cancel the command by writing Cancel with high value along with the other parameters of cancel service with the required values according to the table below.

To execute select before operate control

1. Use **Select** service to select the desired control operation by writing SBO with high value along with the other parameters of SBO service with the required values according to the table below.
2. Use **Operate** service to execute the command by writing Oper with high value along with the other parameters of Oper service with the required values according to the table below.
3. Use **Cancel** service to cancel the command by writing Cancel with high value along with the other parameters of cancel service with the required values according to the table below.

To execute select before operate with enhanced security control

1. Use **Select** service to select the desired control operation by writing SBOw with high value along with the other parameters of SBOW service with the required values according to the table below.
2. Use **Operate** service to execute the command by writing Oper with high value along with the other parameters of Oper service with the required values according to the table below.
3. Use **Cancel** service to cancel the command by writing Cancel with high value along with the other parameters of cancel service with the required values according to the table below.

Recommended settings for control parameters

Experion parameters	IEC 61850 service	Recommended value
OperCheck	Operate	• 01: check interlock • 10: check synchrocheck • 11: check both • 00: nocheck
OperT		can be blank
OperTest		• 0: no test • 1: perform control in Test Mode
OperctlNum		can be blank
OperctlVal		• 0: open • 1: close
Oper		1: execute **Oper** command
OperoriginorCat		2
OperoriginorIdent		can be blank

Experion parameters	IEC 61850 service	Recommended value
CancelT	Cancel	can be blank
CancelTest		• 0: no test • 1: perform control in Test Mode
CancelctlNum		can be blank
CancelctlVal		• 0: open • 1: close
Cancel		1: execute **`Cancel`** command
CanceloriginorCat		2
CanceloriginorIdent		can be blank
SBO	Select	1: execute **`Select`** command
SBOCtrl		• 0: open • 1: close
SBOwCheck	SelectwithValue	• 01: check interlock • 10: check synchrocheck • 11: check both • 00: nocheck
SBOwT		can be blank
SBOwTest		0- No test, 1- Perform control in Test Mode
SBOwctlNum		can be blank
SBOwctlVal		0-Open, 1 -Close
SBOw		Write 1 to Exceute Select with value command
SBOworiginorCat		2
SBOworiginorIdent		can be blank

Attention

If Select, Cancel, Operate or Select with value operations fail, the value of SBO,Oper,cancel,SBOW contains value **-1**.

Tip

- Use **Operate** and **Cancel** services for **direct control** / **direct control with enhanced security** control.
- Use **Select**, **Operate** and **Cancel** services for **select before operate** control.
- Use **SelectwithValue**, **Operate** and **Cancel** services for **select before operate with enhanced security** control.

4.7 Synchronizing servers

This section includes tasks to synchronize servers for IEDs from the IEC 61850 configuration. Servers must be synchronized when configuration changes should be reflected in the Experion system.

Prerequisites

To synchronize servers, you must be a member of the *Administrator* group.

To synchronize servers

1 In the *Toolbar* view, click on the server icon which must be synchronized.
The **Synchronize** dialog box appears.

2 The **Synchronize** dialog box asks for a confirmation to synchronize. Click **Yes**.
The selected server is restarted.

4.8 Embedding a point in custom display

This section includes tasks to embed an analog point in a custom display.

1 Open the **HMIWeb Display Builder**.

2 **Click Start > All Programs > Honeywell Experion PKS > Server > HMIWeb Display Builder**.

> **Tip**
> The IED and points must be downloaded.

3 Open a new display.

4 Drag a text box on the display and then drag the alphanumeric object on the display.

5 Double-click the object and then click the **Data** tab.

6 Click the **Browse** button corresponding to the **Point** drop-down list.

7 In **Point Browser**, double-click the required point to be displayed in the **Point** text box.

> **Attention**
> Only the downloaded points are listed in the Point Browser.

8 Select the required parameter from the **Parameter** drop-down list.
The following figure displays an example of a display.

9 Save the display with a name in the abstract folder.

> **Tip**
> The abstract folder is located at:
> C:\ProgramData\Honeywell\ ExperionPKS\Client.

10 Open **Station.**

11 Change the security level to **Mngr.**

12 Type the display name in the command line and then press **ENTER.**

13 The display appears. The following figure displays an example of analog point.

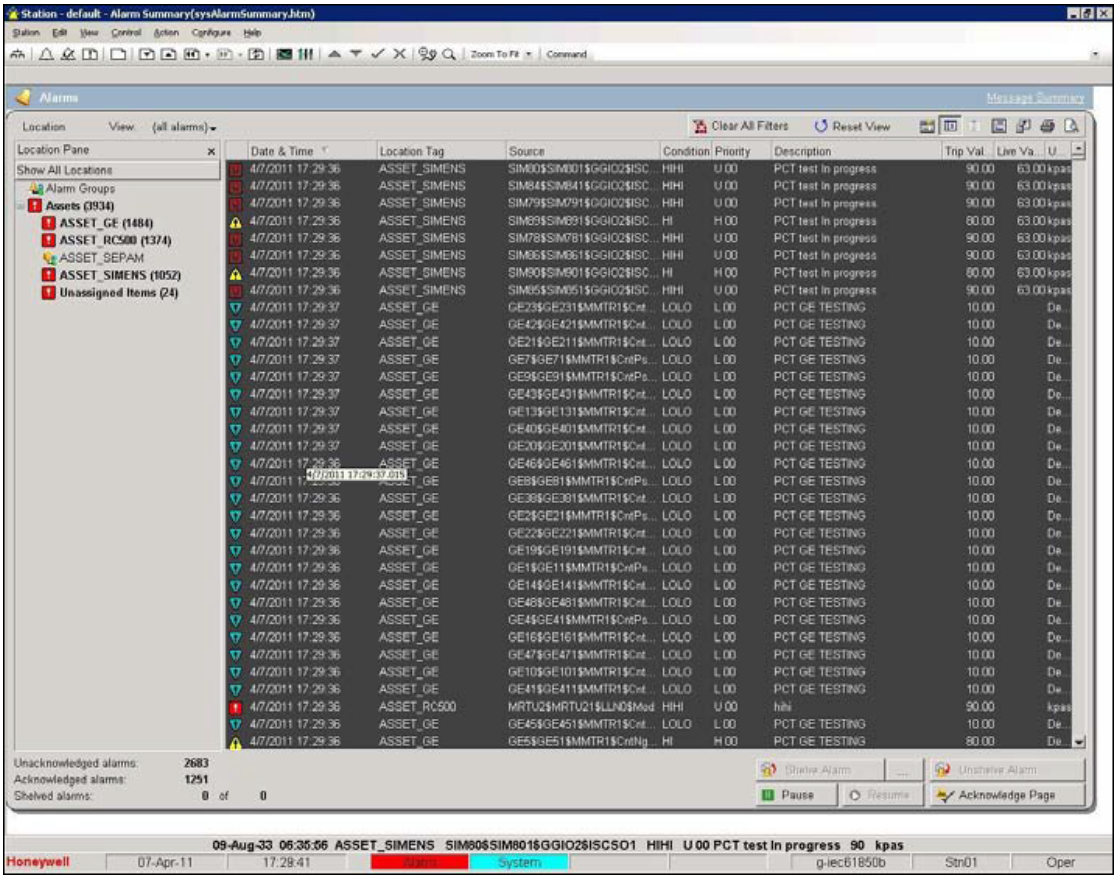
5 Operations

Related topics

“Alarms” on page 52
“Trend group” on page 53
“System status display” on page 54

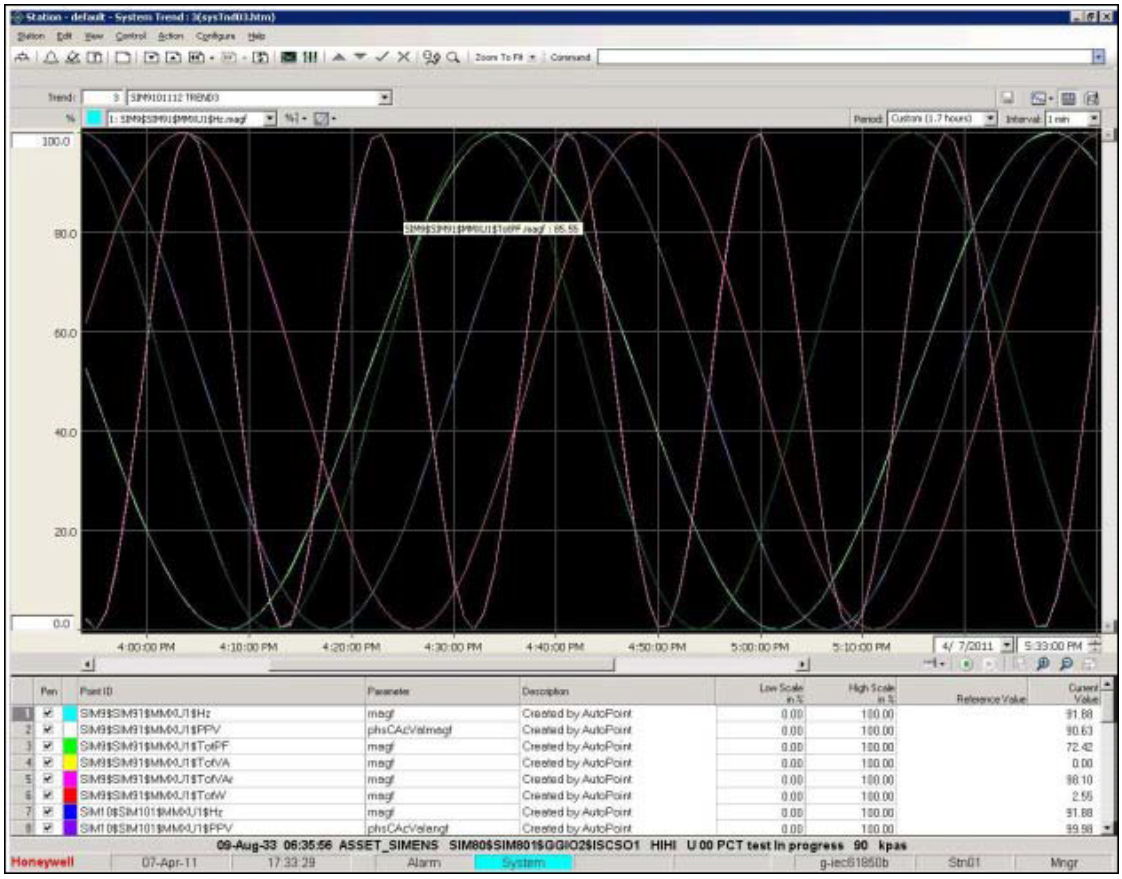
5.1 Alarms

Alarm can be viewed on the Experion station. You can process the alarms (acknowledge, shelve, and so on) like a normal CDA or a SCADA point alarm.



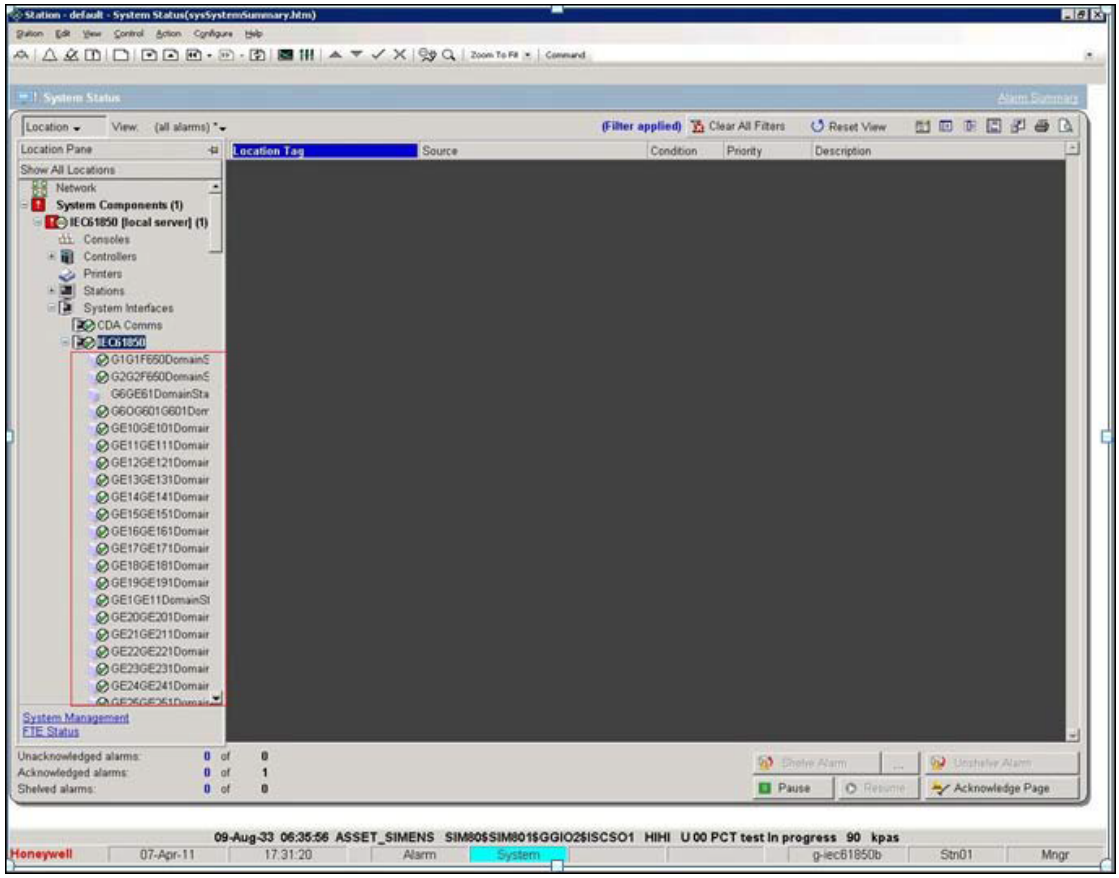
5.2 Trend group

In the Experion station, you can create and operate a trend group like any normal operation.



5.3 System status display

The System Status display page displays the domain status of the IEC 61850 device.



6 Troubleshooting and maintenance

This section provides general information on troubleshooting the typical problems faced while using the IEC 61850 interface.

Related topics

“OPC Data Connection status is 'Not connected'” on page 56
“OPC Notification status is ‘Connecting’” on page 57
“Data update failure” on page 58
“ICD import failure for IEDs” on page 59
“IEC 61850 server runs in secondary Experion server” on page 60

6.1 OPC Data Connection status is 'Not connected'

Problem	The OPC data connection display status appears as ‘Not connected’, on the Status tab. Also, the connection status does not appear in Green.
Cause	NA
Resolution	To view the status as Connected on the Status tab perform the following: • Click the **Configuration** tab or the **Tuning** tab and then click the **Status** tab again.

6.2 OPC Notification status is ‘Connecting’

Problem	The OPC data connection display status appears as ‘Connecting’, on the Status tab. Also, the connection status does not appear in Green.
Cause	No IEDs are configured.
Resolution	To view the status as Connected on the Status tab, perform the following: • Ensure that at least one IED is configured.

6.3 Data update failure

Problem	Data update fails when IED is configured using the ICD file.
Cause	The Data Object name (doName) may contain '.' instead of '$'. For example: <FCDA ldInst="Measurements" prefix="MmuPri" lnClass="MMXU" lnInst="1" doName=**"A.phsA"** fc="MX" />
Resolution	Perform the following: • Delete the current IED. • Modify the ICD file by replacing '.' with '$' in the Data Object name (doName). For example: <FCDA ldInst="Measurements" prefix="MmuPri" lnClass="MMXU" lnInst="1" doName=**"A$phsA"** fc="MX" />

Problem	Data update fails.
Cause	Reports are not enabled.
Resolution	Perform the following: • Enable the reports for the IED from the Configuration Studio.

Problem	Data update fails when IED is configured using ICD file.
Cause	Optflds (Optional Fields) attributes and Trgops (Trigger Options) attributes for the reports are not configured properly.
Resolution	Perform the following: • Ensure that all the Optflds (Optional Fields) attributes for the reports are set to "TRUE" (excluding "bufOvfl" and "segmentation" attribute if available). • Ensure that all Trgops (Trigger Options) attributes for the reports are set to "TRUE" (excluding "dupd"). **Attention** While enabling the Trgops (Trigger Options) attributes, do not enable the options that are not supported by IED. For example, for GE F35, "qchg" and "dupd" are not supported you must make 'FALSE'.

6.4 ICD import failure for IEDs

Problem	IED configuration using ICD file fails, especially for Alstom IEDs.
Cause	Presence of the special characters (‘) and/or (&) in the Instantiated Data Attribute (DAI) description fields.
Resolution	• Open the ICD file using Notepad. • CTRL+H and replace the special characters with empty string.

6.5 IEC 61850 server runs in secondary Experion server

Problem	IEC 61850 server (HCI.I61850.x, where ‘x’ = 1 to 5) is running in secondary Experion server.
Cause	No IEDs are configured under IEC61850 server (HCI.I61850.x, where ‘x’ = 1 to 5).
Resolution	Close IEC 61850 server (HCI.I61850.x, where ‘x’ = 1 to 5) using Task Manager.

7 Performance parameters and limitations

Server performance

Performance	Capacity
Number of IEDs	200
Number of IEDs per IEC 61850 server	40
Points per client	20000
Attributes per IED	1000
Number of Active Alarms from IEDs	4000
Number of Events (burst condition)	1000
History Sizing (Fast\ Standard\ Extended)	1000/ 2000/ 5000
SOE	9999
Time to upload the ICD/ CID file	5 minutes*
Database download	<= 5 minutes

Attention

* IED read may vary from 02 minutes to 20 minutes, depending on the IED type and the manufacturer IED settings.

Limitations

- The maximum number of points that can be downloaded by right-clicking is 64.
- The **ConfigUI.log*** files from *C:\ProgramData\Honeywell\Experion PKS\IEC 61850\Log* must be deleted or a backup must be taken at some other location.