



FactoryTalk Alarms and Events System Configuration Guide

Version 6.40.00



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

IMPORTANT: Identifies information that is critical for successful application and understanding of the product.

These labels may also be on or inside the equipment to provide specific precautions.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

The following icon may appear in the text of this document.



Tip: Identifies information that is useful and can help to make a process easier to do or easier to understand.

Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

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What you need to get started

The *FactoryTalk® System Configuration Guide* describes the tasks that are required to install, configure, and use FactoryTalk Alarms and Events services as part of a FactoryTalk-enabled automation system. This guide also includes references to additional documentation that provides more detail.

IMPORTANT: This guide describes how to set up a local station application. However, the procedure for setting up a network station application or network distributed application is similar. This guide provides information about the latter two applications where it is necessary. See the Help included with the individual software products used to configure and use Alarms and Events services.

Required software

The following software is required to configure and operate FactoryTalk Alarms and Events services:

Software	Version
FactoryTalk Services Platform	2.10 or later
FactoryTalk Alarms and Events	2.10 or later (included in FactoryTalk View SE and FactoryTalk Services)
FactoryTalk® Linx™	5.00 or later
RSLogix 5000®	16.05 or later (or the Studio 5000 Logix Designer® version 24.02 or later)
Studio 5000 Logix Designer	24.02 or later (or RSLogix 5000 version 16.05 or later)
RSLogix 500®	Version that supports FactoryTalk Services Platform version 2.10 or later
RSLogix™ 5	Version that supports FactoryTalk Services Platform version 2.10 or later
FactoryTalk View SE	5.00 or later
FactoryTalk View Studio	5.00 or later
RSLinx® Classic (used for Logix programming)	2.50.20 or later
ControlFLASH™	4.00.09 (used to download firmware)
ControlFLASH Plus®	1.00 or later (used to download firmware)
SoftLogix™	16.03 or later
Microsoft® SQL Server®	Version that supports FactoryTalk Alarms and Events historical logging. For more information, see Supported SQL Server databases on page 167 .

Recommended hardware and supported operating systems

The hardware and supported operating systems that are recommended to run FactoryTalk Alarms and Events are the same as those recommended to run FactoryTalk View Site Edition. For details, see the *FactoryTalk View Site*

Edition Installation Guide. To access the guide, on the FactoryTalk View Studio toolbar, click **Help > Online Books > Installation Guide.**

Studio 5000 controllers

The Studio 5000 controllers listed in the following table support FactoryTalk Alarms and Events services. When you use built-in alarm instructions in Studio 5000 controllers, these controllers require a firmware update to revision 16.20 or later (excluding 21 to 23). If you do not want to update the firmware in your controllers, use a Tag Alarm and Event Server for software-based alarms and events. See [Decide what type of alarm monitoring you need on page 26.](#)

Catalog number	Name
1756-L61	ControlLogix Processor
1756-L62	ControlLogix Processor
1756-L63	ControlLogix Processor
1756-L64	ControlLogix Processor
1756-5555	5555 ControlLogix Processor
1768-L43	CompactLogix L43 Controller
1769-L31	CompactLogix L31 Controller
1769-L32C	CompactLogix L32C Controller
1769-L32E	CompactLogix L32E Controller
1769-L35CR	CompactLogix L35CR Controller
1769-L35E	CompactLogix L35E Controller
1794-L34	FlexLogix L34 Controller
1756-L61S	ControlLogix Safety Processor
1756-L62S	ControlLogix Safety Processor
PowerFlex 700S 2	DriveLogix5370
1789-L60	SoftLogix5800
EMULATE	RSLogix Emulate 5000

The following controllers with firmware revision 24 and later support FactoryTalk Alarms and Events services:

Catalog number	Name
ControlLogix 1756-L71 Series B	ControlLogix Processor
ControlLogix 1756-L71S Series B	ControlLogix Safety Processor
ControlLogix 1756-L72 Series A	ControlLogix Processor
ControlLogix 1756-L72 Series B	ControlLogix Processor
GuardLogix 1756-L72S Series B	ControlLogix Safety Processor
ControlLogix 1756-L73 Series A	ControlLogix Processor
ControlLogix 1756-L73 Series B	ControlLogix Processor
ControlLogix 1756-L73XT Series B	ControlLogix Processor

Catalog number	Name
GuardLogix 1756-L73S Series B	ControlLogix Safety Processor
GuardLogix 1756-L73SXT Series B	ControlLogix Safety Processor
ControlLogix 1756-L74 Series A	ControlLogix Processor
ControlLogix 1756-L74 Series B	ControlLogix Processor
ControlLogix 1756-L75 Series A	ControlLogix Processor
ControlLogix 1756-L75 Series B	ControlLogix Processor
CompactLogix 1769-L16ER-BB1B	CompactLogix L16ER-BB1B Controller
CompactLogix 1769-L18ER-BB1B	CompactLogix L18ER-BB1B Controller
CompactLogix 1769-L18ERM-BB1B	CompactLogix L18ERM-BB1B Controller
CompactLogix 1769-L24ER-QB1B	CompactLogix L24ER-QB1B Controller
CompactLogix 1769-L24ER-QBFC1B	CompactLogix L24ER-QBFC1B Controller
CompactLogix 1769-L27ERM-QBFC1B	CompactLogix L27ERM-QBFC1B Controller
CompactLogix 1769-L30ER	CompactLogix L30ER Controller
CompactLogix 1769-L30ER-NSE	CompactLogix L30ER-NSE Controller
CompactLogix 1769-L30ERM	CompactLogix L30ERM Controller
CompactLogix 1769-L33ER	CompactLogix L33ER Controller
CompactLogix 1769-L33ERM	CompactLogix L33ERM Controller
CompactLogix 1769-L36ERM	CompactLogix L36ERM Controller
SoftLogix 1789-L60	SoftLogix5800



Tip: Firmware revisions 21 through 23 do not support the new alarms functionality.

The following controllers with firmware revision 29 introduce support for FactoryTalk Alarms and Events services:

Catalog number	Name
ControlLogix 1756-L81E	ControlLogix Processor
ControlLogix 1756-L82E	ControlLogix Processor
ControlLogix 1756-L83E	ControlLogix Processor
ControlLogix 1756-L84E	ControlLogix Processor
ControlLogix 1756-L85E	ControlLogix Processor
CompactLogix 5069-L306ER	CompactLogix L306ER Controller
CompactLogix 5069-L306ERM	CompactLogix L306ERM Controller
CompactLogix 5069-L310ER	CompactLogix L310ER Controller
CompactLogix 5069-L310ERM	CompactLogix L310ERM Controller
CompactLogix 5069-L310ER-NSE	CompactLogix L306ER-NSE Controller
CompactLogix 5069-L320ER	CompactLogix L320ER Controller
CompactLogix 5069-L320ERM	CompactLogix L320ERM Controller

Catalog number	Name
CompactLogix 5069-L330ER	CompactLogix L330ER Controller
CompactLogix 5069-L330ERM	CompactLogix L330ERM Controller
CompactLogix 5069-L340ER	CompactLogix L340ER Controller
CompactLogix 5069-L340ERM	CompactLogix L340ERM Controller

The following controllers with firmware revision 30 introduce support for FactoryTalk Alarms and Events services:

Catalog number	Name
CompactLogix 5069-L380ERM	CompactLogix L380ERM Controller
CompactLogix 5069-L3100ERM	CompactLogix L3100ERM Controller
CompactLogix 1769-L37ERMO	CompactLogix L37ERMO Controller
GuardLogix 1769-L37ERMOS	CompactLogix Safety Processor

The following controllers with firmware revision 32 introduce support for FactoryTalk Alarms and Events services:

Catalog number	Name
CompactLogix 5069-L46ERMW	CompactLogix 5480 Controller

The following controllers with firmware revision 33 introduce support for FactoryTalk Alarms and Events services:

Catalog number	Name
ControlLogix 1756-L81EP	ControlLogix Processor
ControlLogix 1756-L83EP	ControlLogix Processor
ControlLogix 1756-L85EP	ControlLogix Processor

Automatic Diagnostics is supported only on Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers, and the firmware revision must be 33 or later.

Compatible firmware

The controller firmware revisions listed in the following table are compatible with FactoryTalk Alarms and Events services:

Controller	Firmware revision
ControlLogix	16.20 or higher (excluding 21 to 23)
CompactLogix L3x and L4x	
DriveLogix	
ControlLogix Redundant Systems	16.60 or higher (excluding 21 to 23)
SoftLogix	16.03 or higher (excluding 21 to 23)

Other controllers

These controllers also support FactoryTalk Alarms and Events services:

- Studio 5000 controllers that communicate with FactoryTalk Linx, using Tag Alarm and Event Servers.
- PLC-5[®] and SLC[™] 500 controllers that communicate with FactoryTalk Linx (or RSLinx Classic to bridge from Ethernet to DH+[™] or DH-485 networks), using Tag Alarm and Event Servers.
- Third-party PLCs that communicate with OPC[®] data servers such as KEPWare using Tag Alarm and Event Servers.

How to get the information you need

For more information about the products and components discussed in this guide, the following manuals and Help files are available:

- *FactoryTalk Linx Help*
- *FactoryTalk Services Platform Help*
- *Studio 5000 Logix Designer Help* (for help with developing a controller project)
- Studio 5000 Logix Designer online books
- FactoryTalk View Site Edition Installation Guide (publication VIEWSE-IN003)
- FactoryTalk View Site Edition User Guide (publication VIEWSE-UM006)
- FactoryTalk Linx Getting Results Guide (publication LIXENT-GR001)

Overview of FactoryTalk Alarms and Events services

FactoryTalk Alarms and Events was introduced with FactoryTalk Services Platform 2.0 (CPR 9) and FactoryTalk View Site Edition 5.0 (CPR 9) to provide a common, consistent view of alarms and events throughout a FactoryTalk system.

Starting from FactoryTalk Alarms and Events 2.30 (CPR 9 SR 3), device-based and tag-based servers support redundant server configuration. Starting from FactoryTalk Alarms and Events 6.30 (CPR 9 SR 13), OPC UA alarm monitoring is supported.

IMPORTANT: FactoryTalk View version 10.00 is the last release to support the legacy HMI tag alarms. We highly recommend that you update your alarming strategy to use FactoryTalk Alarms and Events.

FactoryTalk Alarms and Events supports the following alarm monitoring:

- Device-based alarms, including:
 - Logix instruction-based alarms

Alarm instructions are programmed and then downloaded into Studio 5000 controllers. The controller detects alarm conditions and publishes the alarm information, which is routed to FactoryTalk Alarms and Events.
 - Logix tag-based alarms

Logix tag-based alarms associate alarm conditions with tags for Studio 5000 controllers. Logix tag-based alarms monitor tag values to determine the alarm condition, but they are not part of the logic program and do not increase the scan time for a project. Logix tag-based alarms are supported only on Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers.
- Server tag-based alarms

Alarm conditions are defined and managed with software that monitors programmable controllers through tags. Tag-based alarm monitoring is supported by Rockwell Automation controllers communicating through Rockwell Automation device servers (FactoryTalk Linx), third-party controllers communicating through OPC data servers, and HMI tags. Use server tag-based alarm monitoring if you do not want to use the pre-built instructions in Studio 5000 Logix Designer, or do not have Studio 5000 controllers.
- OPC UA alarms

Alarm conditions are provided by third-party OPC UA servers. The alarm data is then routed to FactoryTalk Alarms and Events through FactoryTalk Linx OPC UA Connector.

FactoryTalk Alarms and Events:

- Provides a single, integrated set of alarm information.

All participating FactoryTalk products work together to provide a consistent way to define, manage, log, and view alarm and event information across a FactoryTalk application.
- Streamlines alarm programming and eliminates polling with device-based alarm monitoring.

If your automation system includes Studio 5000 controllers, you can use pre-built alarms or alarm instructions, available in the Logix Designer application (RSLogix 5000 software version 16 or later), to simplify coding, and then download them to the controller. Device-based alarm monitoring eliminates the need for duplicating alarm tags in an HMI server and requires fewer controller communication resources by eliminating polling.
- Supports other controllers in the integrated system with server tag-based alarm monitoring.

If your automation system includes other Rockwell Automation controllers, such as PLC-5s or SLC 500s, or if you prefer not to use the alarms or alarm instructions with Studio 5000 controllers, software-based tag servers monitor controllers for alarm conditions and publish event information.

- Monitors alarms and events from third-party controllers.

Server tag-based alarm monitoring also makes it possible to monitor alarm conditions from third-party controllers, which communicate through OPC data servers.

- Provides accurate time stamps on alarm conditions that are generated from Studio 5000 controllers using device-based alarm monitoring.

When you use device-based alarm monitoring, timestamps are applied immediately in the controller and are not delayed until alarms reach an HMI server. To make sure that the timestamps on device-based alarms are accurate, synchronize the clocks of all controllers that produce alarms. The event time is propagated throughout the FactoryTalk Alarms and Events system, so inaccurate timestamps can affect where alarms are displayed in the Alarm and Event Summary or the Alarm and Event Banner as well as reports about the alarm and event history. For more information about synchronizing controller clocks, see [Time synchronization on page 175.](#))

- Subscribes to and displays diagnostic events enabled by the Automatic Diagnostics feature of Studio 5000 Logix Designer.

Automatic Diagnostics is supported only on Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers, and the firmware revision must be 33 or later.

- Sends process data with events and messages.

You can associate up to four tags with each alarm to include process data with event information and alarm messages.

- Secures access to alarm and event operations through integration with FactoryTalk Security.
- Generates messages for logging.

Log messages include audit messages that track operator actions, system-related diagnostic messages, and historical alarm and event messages.

- Shows alarm messages and status information at runtime, in FactoryTalk View graphic displays.

Migrating HMI tag alarms

FactoryTalk View version 10.00 is the last release to support the legacy HMI tag alarms. We highly recommend that you update your alarming strategy to use FactoryTalk Alarms and Events.

Use the FactoryTalk View Alarm Migration tool to migrate HMI tag alarms to FactoryTalk Alarms and Events.

Migrate to FactoryTalk Alarms and Events if you want to:

- Use device-based alarm monitoring. You can use a Studio 5000 controller not only to detect alarms, but also to monitor alarms. This keeps all alarm and event processing in the controller. To use device-based alarm monitoring, add the built-in alarm instructions, available in the Logix Designer application (or RSLogix 5000 software version 16 or later), to a logic project and then download the project to a Studio 5000 controller. The controller detects alarm conditions and publishes event information, which can be displayed and logged.
- Use language-switching with alarm messages. For Logix instruction-based and Logix tag-based alarms, you only need to translate once in Studio 5000 Logix Designer without having to translate within HMI servers.

- Take advantage of the richer feature set offered by FactoryTalk Alarms and Events, including:
 - Redundant software-based Tag Alarm and Event servers that monitor controllers for alarm conditions through data servers and publish event information that can be displayed and logged.
 - Configurable Alarm and Event Summary that includes the ability to suppress alarms directly from the summary, without the use of separate commands.
 - Alarm and Event Banner, Alarm and Event Log Viewer, Alarm Status Explorer, and Automatic Diagnostic Event Summary objects that are hosted on graphic displays. You can use the Alarm Status Explorer to enable or disable alarms, suppress or unsuppress alarms, shelve or unshelve alarms, and view operator comments.
 - System-wide views in the Alarm and Event Banner, rather than just the alarms in a single HMI server.

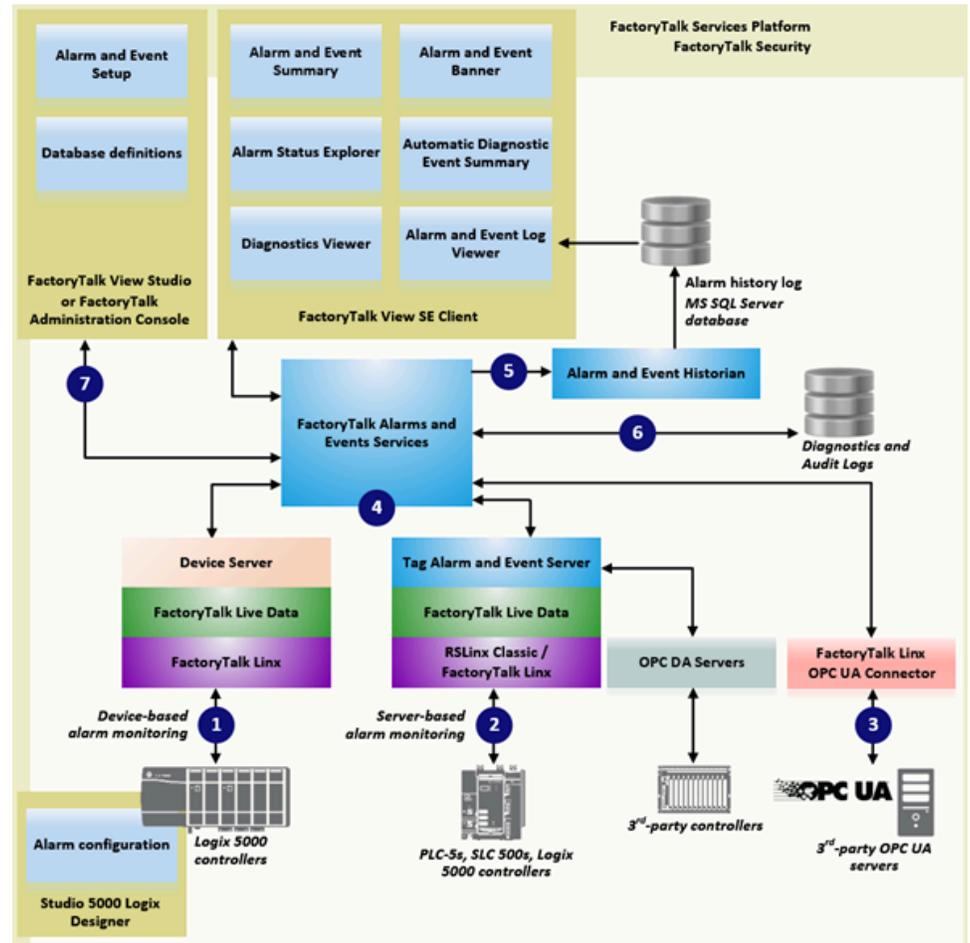
Where to start

Here is an overview of the sections covered in this guide:

1. [Overview of FactoryTalk Alarms and Events services on page 14](#)
2. [Plan your system on page 25](#)
 - Set up device-based alarm monitoring
 - a. [Define device-based alarms in Studio 5000 controllers on page 29](#)
 - b. [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#)
 - Set up tag-based alarm monitoring
 - a. [Add an OPC data server for third-party controllers on page 45](#)
 - b. [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#)
 - Set up OPC UA alarm monitoring
 - a. [Define and configure alarms in the third-party OPC UA server on page 55](#)
 - b. [Add FactoryTalk Linx OPC UA Connector and enable alarms on page 55](#)
3. [Set up graphic displays on page 58](#)
4. [Monitor and interact with alarms at runtime on page 82](#)
5. [Set up historical alarm and event logging on page 100](#)
6. [Configure redundancy for alarms and events on page 120](#)

FactoryTalk Alarms and Events components

The following diagram shows a high-level view of the components of the FactoryTalk Alarms and Events system. For more detailed information, see *FactoryTalk Alarms and Events Help*.



1 Device-based alarm monitoring

With device-based alarm monitoring that are available with the Studio 5000 Logix Designer application, pre-built alarms or alarm instructions are configured and then downloaded into a Studio 5000 controller. The controller detects alarm conditions and notifies alarms and events services of alarm states. Software components publish this information to a device server. From the device server, the information can be logged to a database and monitored from FactoryTalk View graphic displays.

Use device-based alarm monitoring with Studio 5000 controllers, programmed with the Logix Designer application, communicating through Rockwell Automation Device Servers (FactoryTalk Linx).

2 Server tag-based alarm monitoring

If you are not using Studio 5000 controllers, or if you do not want to use the pre-built alarming available with the Logix Designer application, use server tag-based alarm monitoring. The server tag-based Alarm and Event servers monitor controllers for alarm conditions through data servers and publish event information for display and logging. These data servers serve tags, or data items, contained in OPC DA (Data Access) servers. Clients that need access to data items, such as FactoryTalk View Studio and FactoryTalk Transaction Manager, use data server application

elements referenced from the FactoryTalk Directory to locate the computers that are hosting OPC DA 2.0 compliant data servers.

Use the server tag-based alarm monitoring for Studio 5000 controllers, PLC-5 devices, and SLC 500 devices communicating through Rockwell Automation Device Servers (FactoryTalk Linx), or for third-party controllers communicating through OPC DA data servers.

3 OPC UA alarm monitoring

OPC UA alarm monitoring captures alarm information originated from third-party OPC UA servers. FactoryTalk Linx OPC UA Connector routes the alarm information to FactoryTalk Alarms and Events for display and logging.

4 FactoryTalk Alarms and Events services

Device-based alarms, tag-based alarms and events, and OPC UA alarms are published to FactoryTalk Alarms and Events services, which then routes the information to FactoryTalk Alarms and Events objects hosted in FactoryTalk View, the alarm and event history log, and to diagnostic logs and audit logs.

5 Alarm and Event Historian

The Alarm and Event Historian is a logging component that installs silently as part of the FactoryTalk Alarms and Events software. It manages connections between alarm servers and databases and logs data from each alarm server to an alarm history database. An Alarm and Event Log Viewer allows viewing and printing data from alarm history databases. Third-party database tools can also retrieve, view, analyze, and print alarm history information.

To use alarm and event logging, install SQL Server separately, or use an existing SQL Server database. See the release notes for FactoryTalk Alarms and Events for the latest qualified versions of SQL Server.

6 Diagnostic and audit logs

FactoryTalk Diagnostics routes messages generated by FactoryTalk Alarms and Events to Local logs on the computers hosting FactoryTalk components, and optionally to a centralized database log. Audit messages are routed to the Local log as well and to the FactoryTalk Audit Log if FactoryTalk AssetCentre is installed.

7 Alarm and event setup and monitoring

These components define alarm conditions, set up alarm servers, view and interact with alarm conditions, and view and run reports on historical alarm information:

- Alarm and Event Banner
Use the Alarm and Event Banner object, embedded in a FactoryTalk View graphic display, to monitor and respond to the most serious alarms requiring immediate attention.
- Alarm and Event Log Viewer
Use the Alarm and Event Log Viewer object, embedded in a FactoryTalk View graphic display, to view, filter, and print historical alarm information stored in SQL Server databases.
- Alarm and Event Summary
Use the Alarm and Event Summary object, embedded in a FactoryTalk View graphic display, to acknowledge, disable, suppress, filter, and sort alarms during runtime.
- Alarm Status Explorer

Use the Alarm Status Explorer object, embedded in a FactoryTalk View graphic display, to enable or disable alarms, suppress or unsuppress alarms, shelve or unshelve alarms, and view operator comments.

- Automatic Diagnostic Event Summary

Use the Automatic Diagnostic Event Summary object, embedded in a FactoryTalk View graphic display, to suppress, unsuppress, filter, and sort diagnostic events during runtime.

- Alarm Server Setup

Use either FactoryTalk View Studio or FactoryTalk Administration Console to add Rockwell Automation Device Servers (as part of configuring FactoryTalk Linx data servers) and Tag Alarm and Event Servers to a FactoryTalk application.

- Database definitions

Use database definitions to define logging options from an alarm server to a SQL Server database.

- Diagnostics Viewer

Use the Diagnostics Viewer to view, filter, and export system-generated diagnostic messages. Run the Diagnostics Viewer from either FactoryTalk View Studio or FactoryTalk Administration Console.

- FactoryTalk Audit Log

Use the FactoryTalk Audit Log to view and manage audit messages routed by FactoryTalk Diagnostics. To access the Audit Log, use FactoryTalk AssetCentre software.

About monitoring for alarm conditions

You can monitor for alarm conditions using:

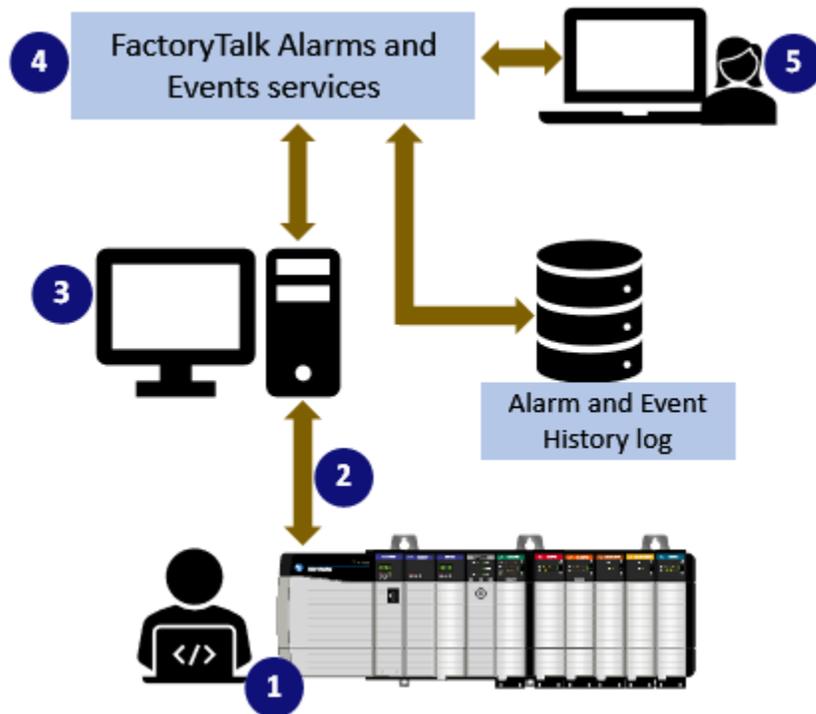
- Device-based alarm monitoring
- Server tag-based alarm monitoring
- OPC UA alarm monitoring

About device-based alarm monitoring

Built-in alarms or alarm instructions, that are available in the Logix Designer application (RSLogix 5000 software version 16 or later), are programmed in a logic project and then downloaded to a Studio 5000 controller. With device-based alarm monitoring, detection and monitoring for alarm conditions are both done in the controller. The controller detects alarm conditions and publishes event information, which can be displayed and logged.

This is in contrast to server tag-based alarm monitoring, where alarm detection occurs in the controller, but alarm monitoring is performed by software-based servers.

Device-based alarm monitoring workflow



- 1** Alarm instructions or alarms are programmed and then downloaded into a Studio 5000 controller.
- 2** The controller detects alarm conditions and notifies its device server, FactoryTalk Linx, of alarm states.
- 3** The device server extracts alarms and publishes the information to FactoryTalk Alarms and Events services.
- 4** FactoryTalk Alarms and Events services routes the alarm information to logs and to Alarm and Event objects embedded in graphic displays in FactoryTalk View.
- 5** Using FactoryTalk View SE Clients, operators interact with alarms through objects embedded in graphic displays, such as Alarm and Event Summary, Alarm and Event Banner, and Alarm Status Explorer.

This approach offers a number of benefits over generic methods of alarm detection:

- Alarm instructions are programmed only once, and then downloaded to the controller, reducing programming effort and errors.
- Alarm conditions are detected more quickly.
- Real-time alarming is performed in the controller.
- HMI tags or alarms in a Tag Alarm and Event Server are not required, reducing overhead and potential tag-mapping errors.
- Alarm states are managed, processed, and preserved by controllers, even if a server goes down.
- Data polling is eliminated; alarm status is communicated only when state changes, reducing network overhead and controller processing, and improving overall system performance.
- Time stamps on alarm conditions are more accurate, because they are applied in the controller, and not delayed until they reach the HMI software or Tag Alarm and Event Server. Because device-based alarms are stamped with the controller's time, all controllers producing alarms must have their clocks synchronized. The

event time is propagated throughout the FactoryTalk Alarms and Events system, so inaccurate time stamps can affect where alarms are displayed in the Alarm and Event Summary or the Alarm and Event Banner as well as reports based on the alarm and event history.

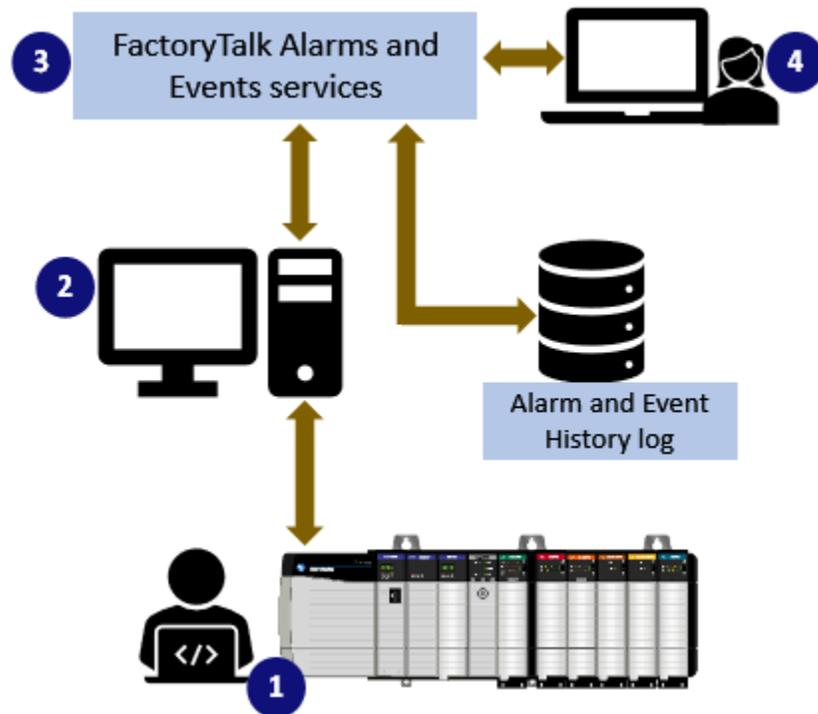
For more information about synchronizing controller clocks, see [Time synchronization on page 175](#).

About server tag-based alarm monitoring

Tag-based alarm monitoring offered by FactoryTalk Alarms and Events is an example of *software-based* alarm monitoring. With software-based alarm monitoring, alarm detection occurs in the controller, but alarm monitoring is performed by software-based servers.

Software-based alarm monitoring is a generic way of monitoring controllers for alarm conditions through data servers and publish event information, which can be displayed and logged. Tag-based alarm monitoring is supported for Studio 5000, PLC-5, and SLC 500 devices communicating through Rockwell Automation device servers (FactoryTalk Linx), or for third-party controllers that communicate through OPC data servers. Choose server tag-based alarm monitoring if you do not want to change the logic in your programmable controllers, or if you do not want to update the firmware in Studio 5000 controllers.

Server tag-based alarm monitoring workflow



- 1 Logic in a controller is programmed to detect problems and latch alarm conditions in tags.
- 2 A Tag Alarm and Event Server polls controller tags and notifies clients, including FactoryTalk Alarms and Events, of alarm conditions.
- 3 FactoryTalk Alarms and Events services routes the alarm information to logs and to Alarm and Event objects embedded in graphic displays in FactoryTalk View.
- 4 Using FactoryTalk View SE Clients, operators interact with alarms through objects embedded in graphic displays, such as Alarm and Event Summary, Alarm and Event Banner, and Alarm Status Explorer.

With the server tag-based monitoring:

- Programming is required in both the controller and in the HMI software or Tag Alarm and Event Server.
- Tags must be duplicated in the HMI server and mapped to the controller. For Tag Alarm and Event Servers, controller tags must be mapped to alarms—care must be exercised to avoid errors.
- Alarms are detected and processed twice, first in the controller logic and then again in the HMI software or Tag Alarm and Event Server.
- Polling between the HMI server or Tag Alarm and Event Server and controller tags results in increased network overhead.
- Alarm time stamps are delayed because they are applied by the HMI server or Tag Alarm and Event Server after polling and processing, rather than immediately when they occur. Time stamps are not synchronized among multiple alarm servers.
- Alarm acknowledge and enable states are held in the computer, and not in the controller. If redundant servers are not used, alarm state information can be lost.

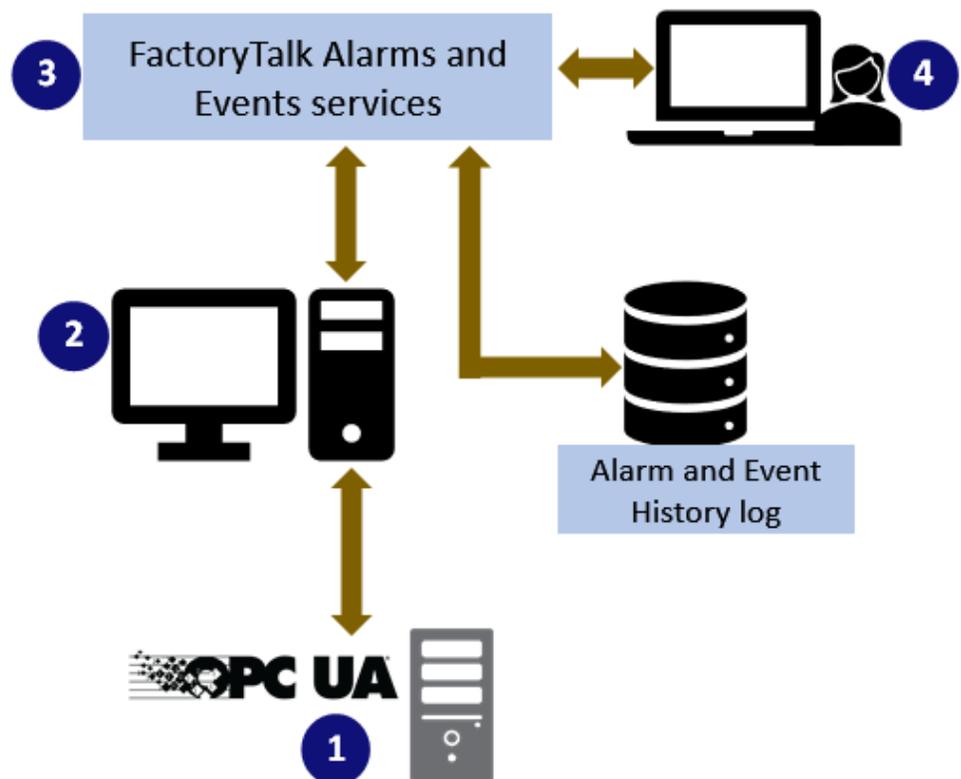
About OPC UA alarm monitoring

OPC UA alarm monitoring captures alarm information originated from third-party OPC UA servers. FactoryTalk Linx OPC UA Connector routes the alarm information to FactoryTalk Alarms and Events for display and logging.

Unlike server tag-based or device-based alarm monitoring, OPC UA alarm monitoring does not require a Tag Alarm and Event Server or FactoryTalk Linx.

FactoryTalk Linx OPC UA Connector is needed as a proxy between the OPC UA servers and a FactoryTalk application, and aggregates the alarm data and delivers the alarm information to FactoryTalk Alarms and Events.

OPC UA alarm monitoring workflow



- 1 Alarm instructions or alarms are routed from third-party devices via an OPC UA server.
- 2 FactoryTalk Linx OPC UA Connector communicates with the OPC UA server for the alarms and publishes the information to FactoryTalk Alarms and Events services.
- 3 FactoryTalk Alarms and Events services routes the alarm information to logs and to Alarm and Event objects embedded in graphic displays in FactoryTalk View.
- 4 Using FactoryTalk View SE Clients, operators interact with alarms through objects embedded in graphic displays, such as Alarm and Event Summary, Alarm and Event Banner, and Alarm Status Explorer.

With the OPC UA alarm monitoring:

- Alarm conditions are provided by third-party OPC UA servers.
- FactoryTalk Linx OPC UA Connector is required to route alarm data from the third-party OPC UA server.
- Alarm statuses are managed in third-party OPC UA servers. FactoryTalk Alarms and Events allows you to monitor the alarms once the alarm status changes.

Choose a suitable type of alarm monitoring

Use device-based alarm monitoring with:

- Studio 5000 controllers, using downloaded alarms or alarm instructions programmed with the Logix Designer application (or RSLogix 5000 software version 16 or later)

Use server tag-based alarm monitoring with:

- Studio 5000 controllers
- PLC-5, SLC 500 devices
- Third-party controllers that communicate through OPC data servers

Use OPC UA alarm monitoring with:

- Third-party OPC UA servers that communicate with third-party devices

Graphic objects in FactoryTalk Alarms and Events

FactoryTalk Alarms and Events graphic objects are on the **Objects** menu in the graphics editor in FactoryTalk View Site Edition.

To do this	With FactoryTalk Alarms and Events, you do it this way
Acknowledge, disable, suppress, shelve, unshelve, filter, and sort alarms during runtime	Alarm and Event Summary
Enable or disable alarms, suppress or unsuppress alarms, shelve or unshelve alarms, and view operator comments	Alarm and Event Summary (suppress only; to unsuppress alarms, use the Alarm Status Explorer) Alarm Status Explorer
Monitor and respond to the most serious alarms that require immediate attention	Alarm and Event Banner
View, filter, and print historical alarm information	Alarm and Event Log Viewer Historical alarm information is stored in Microsoft SQL Server databases.

Plan your system

Before you build and deploy FactoryTalk Alarms and Events as part of a local or network application, consider which computer hardware and operating systems you plan to use, and where to install the various hardware and software components. The information in this chapter offers some guidelines as you begin planning. See also [Required software on page 9](#) and [Recommended hardware and supported operating systems on page 9](#).

Decide what type of application you are building

You must decide whether you are building a local station application or network station application on a stand-alone computer, or a network distributed application distributed across multiple computers. This system configuration guide primarily discusses how to install, configure, and use software on a stand-alone system.

IMPORTANT: FactoryTalk Alarms and Events is not supported for use with FactoryTalk View Machine Edition.

- **Network distributed applications** are held in a FactoryTalk Network Directory. Participating software products can be located on multiple computers, distributed across a network. All of the computers participating in a particular network distributed application share a common Network Directory Server located on a network computer. See [Typical distributed system on a network on page 185](#) for a graphical overview.
The application you create in the Network Directory can be divided into any number of areas. Each area can contain one or more sub-areas and one or more data servers. Each area or sub-area can contain only one HMI server. A network distributed application supports FactoryTalk Alarms and Events redundancy.
- **Network station applications** are held in a FactoryTalk Network Directory. All participating software products (except for data servers) must be installed on the same computer. Network station applications can connect to data servers that are located on different machines. All of the computers participating in a particular network station application share a common Network Directory Server located on a network computer. See [Typical stand-alone system on page 27](#) for a graphical overview.
The application you create in the Network Directory can be divided into any number of areas. Each area can contain one or more sub-areas and one or more data servers. A network station application consists of only one HMI server. You can add the HMI server in the root area or within the areas you have created. A network station application supports FactoryTalk Alarms and Events redundancy.
- **Local station applications** are suitable for self-contained, stand-alone processes that do not interact with other processes or systems. Local station applications are held in a FactoryTalk Local Directory and are accessible only from the local computer where they reside. Even if the computer is connected to a network and even if a network application resides on the same computer, the applications you create in the FactoryTalk Local Directory remain self-contained and do not share data or project elements.
Local station applications do not support areas, and all application components and participating software products are located on a single computer. See [Typical stand-alone system on page 27](#) for a graphical overview.

IMPORTANT: To use FactoryTalk Alarms and Events with a local station application, install all software on the same computer.

FactoryTalk Alarms and Events redundancy is only supported in network station applications and network distributed applications.

Decide what type of alarm monitoring you need

FactoryTalk Alarms and Events supports the following alarm monitoring:

- [Device-based alarm monitoring on page 19](#)
- [Server tag-based alarm monitoring on page 21](#)
- [OPC UA alarm monitoring on page 23](#)

Follow these steps

Follow these steps to plan your system:

- Determine network configuration
- Install and activate FactoryTalk View software



Tip: FactoryTalk Services Platform, FactoryTalk Alarms and Events, FactoryTalk Linx, and FactoryTalk Linx OPC UA Connector are installed along with FactoryTalk View.

- Install RSLinx Classic software
- Install and activate RSLogix software
- Update Studio 5000 firmware to V16 or later (optional if using Tag Alarm and Event Servers)
- (optional) Install Microsoft SQL Server

What you need

- Decide what type of application you are building.
- Decide what type of alarm monitoring you need.
- Install and activate FactoryTalk software.
- Update Studio 5000 firmware to revision 16.20 or later (excluding 21 to 23), if you plan to use device-based alarm monitoring and alarm instructions that are built into Studio 5000 controllers. If you do not plan to use device-based alarm instructions, you can skip this step and use tag-based alarm monitoring with a Tag Alarm and Event Server instead.

Install and activate FactoryTalk software

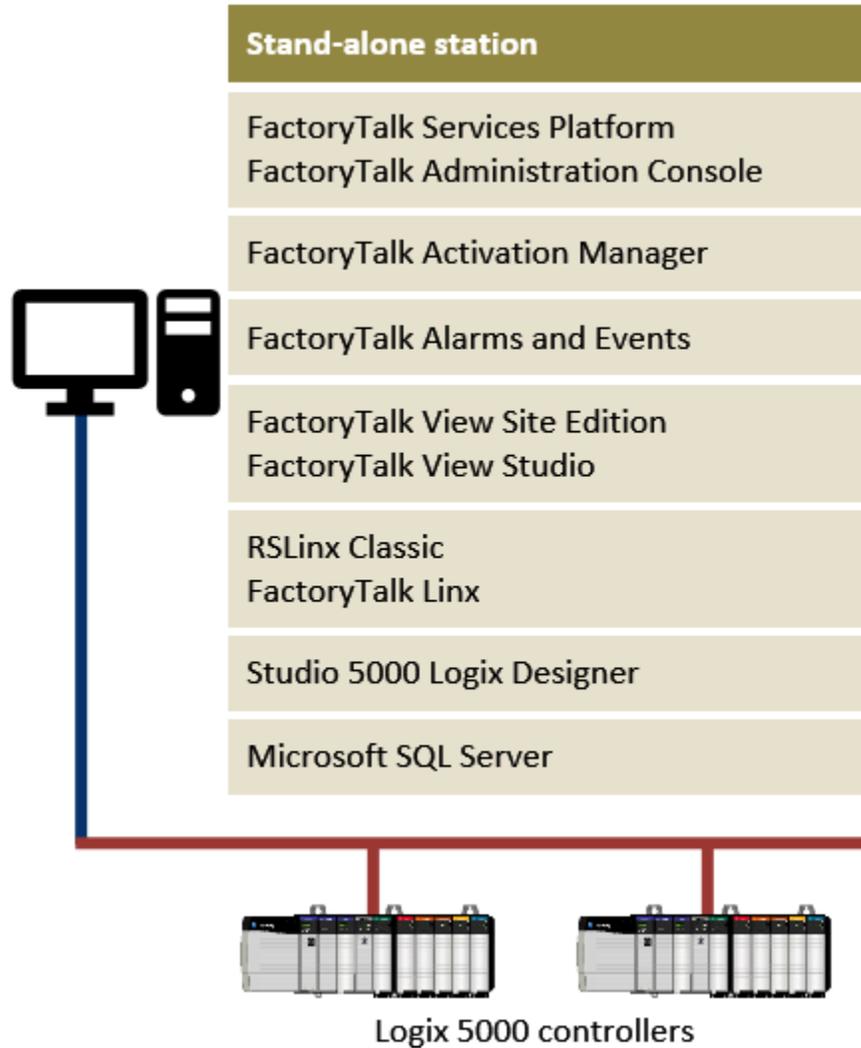
Follow these procedures to install and activate the software products required for FactoryTalk Alarms and Events.

IMPORTANT: This guide describes how to set up a local station application. The procedure to set up a network station application or network distributed application is similar. This guide provides additional information about the two applications where it is necessary. See also [Reference for building a distributed system on page 185](#).

For more information about each software product, see its respective product Help.

Typical stand-alone system

To use FactoryTalk Alarms and Events with a local station application or a network station application as part of a stand-alone FactoryTalk system, install all software on the same computer. Use this diagram only as a starting point—your own system will vary.



Install FactoryTalk software

For specific installation instructions, refer to the installation guide for each product.

- To develop or run local station applications, install all the necessary software components on one computer.
- To develop or run network station applications, install all the necessary software components (except for data servers) on one computer. Network station applications can connect to data servers that are located on different machines.

- To develop or run network distributed applications, install different combinations of software on each computer, depending on your needs. For more information, see *FactoryTalk Services Platform Help*. Click **Start > All Programs > Rockwell Software > FactoryTalk Help**.
-

IMPORTANT: This guide provides additional information about network distributed applications or network station applications where it is necessary.

To set up a FactoryTalk system, install the following software:

- FactoryTalk Services Platform
 - FactoryTalk Activation
 - FactoryTalk View Site Edition
 - FactoryTalk Linx
 - RSLinx Classic
 - The Studio 5000 Logix Designer application (known previously as RSLogix 5000 software)
 - Update Studio 5000 firmware to revision 16.20 or later (excluding 21 to 23).
-



Tip: To take advantage of the new alarms functionality in the v24 firmware, we recommend you install FactoryTalk Services Platform v2.71 or later and update your controller firmware to revision 24 or later.

Install SQL Server for logging

If you plan to log historical alarm and event messages to a database, you must install Microsoft SQL Server software on the computer you want to use for logging. If you do not have Microsoft SQL Server software installed, see [Install Microsoft SQL Server on page 164](#).



Tip: If you already have Microsoft SQL Server installed, you may need to change the configuration options to log alarm and event messages. For configuration instructions, see [Use an existing Microsoft SQL Server database on page 167](#).

Define device-based alarms in Studio 5000 controllers

To set up device-based alarm monitoring, you program alarms or alarm instructions that are available with the Logix Designer application (RSLogix 5000 software version 16 or later), and download them to a Studio 5000 controller. The controller detects alarm conditions and notifies alarms and events services of alarm states. Software components publish this information to a device server, where it can be logged to a database, and interacted from FactoryTalk View graphic displays.

FactoryTalk Alarms and Events can handle many different types of alarms. The controller limits the alarms to Logix tag-based alarms and instruction-based alarms. The instruction-based alarms include digital and analog alarms. An analog alarm instruction monitors two types of alarm conditions: Level and Rate of Change. A server tag-based alarm supports three alarm types: Digital, Level, and Deviation.

Logix tag-based alarms associate alarm conditions with tags for Studio 5000 controllers. Logix tag-based alarms monitor tag values to determine the alarm condition, but they are not part of the logic program and do not increase the scan time for a project.

**Tip:**

Logix tag-based alarms are supported only on Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers.

A digital alarm instruction is based on the input rung state (in ladder logic) or on the alarm input (for function block). The trigger condition compares the value of the tag to either zero or one.

An analog alarm defines a condition that evaluates a single analog tag against up to four limit values (high-high to low-low) and up to two rate of change limits (positive and negative).



Tip: If your FactoryTalk application does not include Studio 5000 controllers, or if your controllers are not programmed with the alarm instructions included in the Logix Designer application (RSLogix 5000 software version 16 or later), see [Add an OPC data server for third-party controllers on page 45](#) and [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).

Alarm buffering during loss of connection to the controller

To receive device-based alarms, the alarm server (FactoryTalk Linx) establishes a subscription to the alarms in the Logix controller. The controller maintains a connection to each subscriber and monitors the status of that connection.

As alarm state changes occur, the controller caches information such as timestamps, alarm state and associated tag values, and transmits the information to all of the subscribers.

If any subscriber fails to confirm the receipt of the alarm information, or if the connection to a subscriber is not good, the controller stores the undelivered alarm information in a 100 KB buffer. Each subscriber has its own buffer and communication problems with one subscriber do not interfere with alarm delivery to other subscribers. When the buffer is full, newer alarm information is discarded and a FactoryTalk Diagnostics message is logged. The buffer

is created when the subscriber establishes its initial connection, and is maintained for a length of time after a subscriber loses its connection. The length of time is specified in the Buffer Timeout setting on each FactoryTalk Linx device shortcut. See "Create a new shortcut to the controller" in [Add a device server on page 38](#).

IMPORTANT: Firmware revision 21 to revision 23 do not support the new alarms functionality. The buffer timeout setting is not available to controllers with firmware revision 24 or later. For controllers with version 20 or earlier, we recommend that you do not change the default buffering time unless instructed by Technical Support.

Before you begin

- Review [Plan your system on page 25](#).
 - Verify that you have installed and activated the software listed in the next section under [What you need on page 30](#).
 - Verify that the Studio 5000 firmware has been updated to revision 16 or later (excluding revisions 21 to 23).
-



Tip: To take advantage of the new alarms functionality in the revision 24 firmware, we recommend you install FactoryTalk Services Platform software version 2.71 or later, and update your controller firmware to revision 24 or later.

What you need

- Logix Designer application (RSLogix 5000 software)
- ControlFLASH
- RSLinx Classic

Follow these steps

Follow these steps to define a digital or analog alarm:

- Plan your system
- Run Studio 5000 Logix Designer software
- Create a project
- For a digital alarm, define a boolean tag or a rung state on which to alarm
For an analog alarm, define a analog tag on which to alarm
- Add a digital or analog alarm instruction
- Configure the digital or analog alarm properties
- Downland the project to the controller
- Test the alarm instruction
- Add a device server
- Add a data server

Define a Logix tag-based alarm

Use Logix tag-based alarms to send alerts about specific events or conditions. Logix tag-based alarms are similar to instruction-based alarms that are created using alarm instructions (ALMA and ALMD), but Logix tag-based alarms do not affect the scan time of the project.



Tip:

Logix tag-based alarms are supported only on Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers.

To define a Logix tag-based alarm:

1. On the **Controller Organizer**, expand the **Alarm Manager** folder, right-click **Alarms**, and select **New Alarm**. To create an alarm in **Tag Editor** or in the **Ladder**, **Sequential Function Chart**, **Function Block**, or **Structured Text** editors, right-click a tag and select **Add Alarm for [tag]**.
2. In the **Name** box, enter a name for the alarm.
3. In the **Input** box, add the input tag for the alarm. If you launch the **New Alarm** dialog box from a logic editor, the **Input** box is populated with the tag that you right-clicked.
4. To enable the alarm, select the **Use and evaluate alarm** check box. All new alarms are disabled by default.
5. Adjust other alarm settings as necessary.

Create an alarm definition

An alarm definition is associated with an Add-On Instruction (AOI) or a defined data type. When a tag is created using a data type or an AOI that has alarm definitions, alarms are created automatically based on the alarm definitions.

You can create an alarm definition for the following components:

- Any scalar tag or parameter of an AOI.
- Any scalar member of a user-defined data type (UDT).
- Any scalar member of a system-defined data type (SDT).
- Any scalar member of a module-defined data type (MOT).

When a tag uses a data type that has alarm definitions associated with it, alarm conditions are automatically added for the tag based on its alarm definitions.

When an AOI is based on an AOI definition, alarm conditions are automatically added for the AOI instance based on the alarm definitions associated with the AOI definition.

To create an alarm definition:

1. On the **Controller Organizer**, expand the **Alarm Manager** folder, right-click **Alarm Definitions**, and select **New Alarm Definition**. You can also right-click a scalar tag or parameter of an AOI or a scalar member of a data type and select **Add Alarm Definition**.
2. In the **Name** box, enter a name for the alarm definition.
3. When creating an alarm definition for a UDT or AOI, in the **Input** box, add an input tag. When creating an alarm definition for a data type, add a data type member in the **Input** box.

4. To enable all instances of the alarm, select the **Required to be used and evaluated for all alarm instances** check box. All new alarms definitions are disabled by default.
5. Adjust other settings as necessary.

Download the program to controller and test the alarm

You can download the program containing the Logix tag-based alarm to the controller and then use FactoryTalk View to test the alarm.

1. If it is not already running, start RSLinx Classic to establish communications between the controller and the Logix Designer application (RSLogix 5000 software version 16 or later).
2. On the Logix Designer application menu, click **Communications > Who Active**.
3. Select the controller to which you want to download the project.
4. Click **Download**. At the prompt, click **Download** again. The controller is placed in Program mode.
5. To switch the controller to run mode, click **Communications > Run Mode**.
6. To test the alarm, in FactoryTalk View Studio, create a FactoryTalk Alarms and Events graphic object (for example, Alarm and Event Summary) to read Logix tag-based alarms with the fully qualified name.

Define an instruction-based alarm: digital

Digital tags are either on or off. They have states instead of limits. The alarm trigger condition compares the value of the tag to the configured alarm state. An alarm can be triggered if the digital alarm is in one of these two states:

- The rung evaluation or input tag is equal to zero
- The rung evaluation or input tag is not equal to zero



Tip: If your FactoryTalk application does not include Studio 5000 controllers, or if your controllers are not programmed with the alarm instructions included in the Logix Designer application (RSLogix 5000 software version 16 or later), see [Add an OPC data server for third-party controllers on page 45](#) and [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).

Configure the digital alarm and download to the controller

This example uses the ladder logic editor that comes with the Logix Designer application (RSLogix 5000 software) to define a digital alarm. You can also configure digital alarms in function blocks or structured text.

Step 1. Create a rung of logic that will trigger the alarm

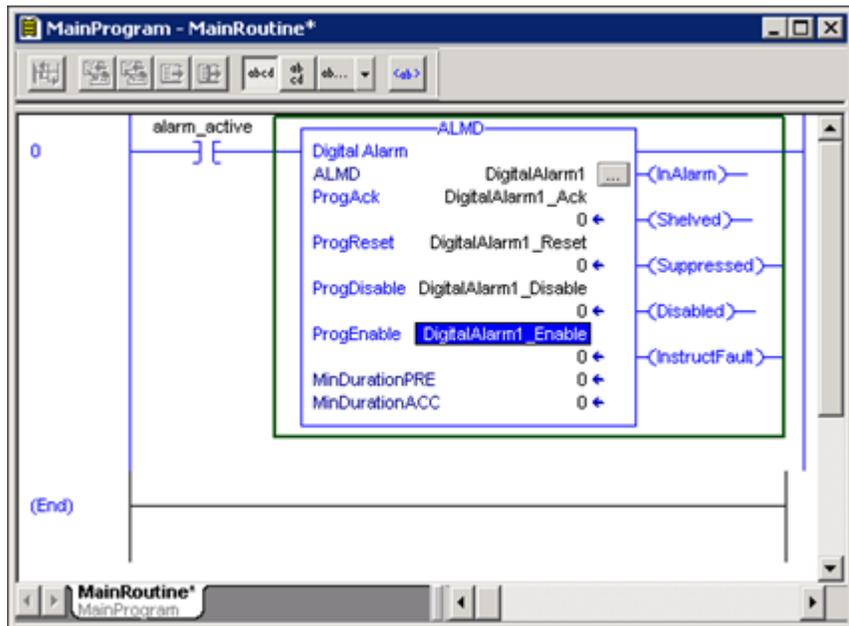
1. Create a new project with default settings. In this example, we use **West_Plant_Controller**.
2. In the left pane, expand the folders **Tasks > MainTask > MainProgram**, and then double-click **MainRoutine**.
3. On the **Language Element** toolbar, click the **Examine-on** instruction button  to add it to a rung on the ladder project.
4. At the top of the Examine-on instruction, click the question mark to select it. On the **File** menu, click **New Component**, and then click **Tag**.
5. In the **New Tag** dialog box, type a name for the tag, choose **BOOL** as the data type, and then click **Create**. In our example, we name the tag **alarm_active**.

Step 2. Add a digital alarm instruction to the rung

1. On the **Language Element** toolbar, click the **Alarms** tab, and then click the **ALMD** button . The instruction block is placed in the ladder logic.
2. Inside the alarm instruction, beside ALMD, select the question mark.
3. On the **File** menu, click **New Component**, and then click **Tag**.
4. In the dialog box that opens, type a name for the digital alarm tag, and then click **Create**. In our example, we named the tag **DigitalAlarm1**.

Step 3. Specify a tag for each of the digital alarm's operands, or just enter 0

1. Inside the alarm instruction, select the **ProgAck** operand.
2. On the **File** menu, click **New Component**, and then click **Tag**.
3. In the **New Tag** dialog box, type a name for the tag, select **BOOL** as the data type, and then click **Create**. In our example, we named the tag **DigitalAlarm1_Ack**. For details about using the **New Tag** dialog box, click **Help**.
4. Create tags for the ProgReset, ProgDisable, and ProgEnable operands. When you are finished, the alarm instruction should resemble the one shown here:



Step 4. Configure the properties of the new digital alarm tag

1. Inside the alarm instruction, click the **Browse** button (...).
2. In the **ALMD Properties** dialog box, specify configuration settings, and then click **OK**. For help with specifying configuration settings, click **Help**.



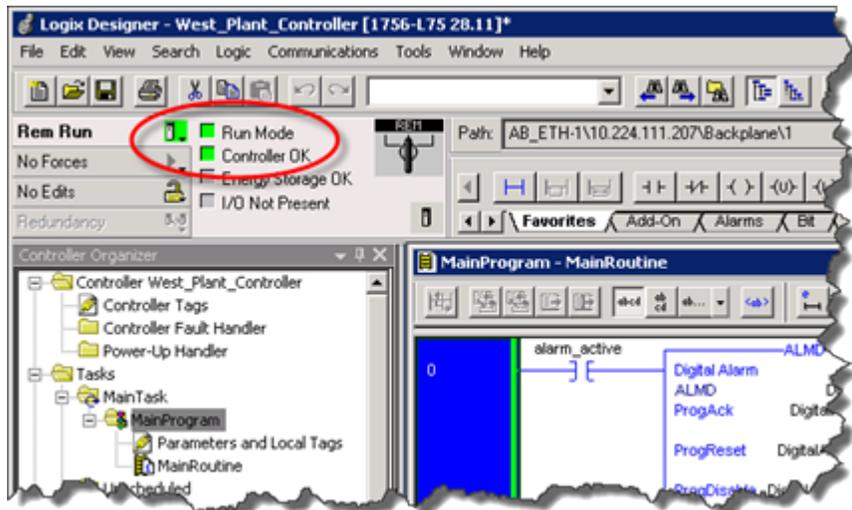
Tip: To create a text message with embedded variables for each alarm, click the **Message** box **Browse** button (...). At runtime, these messages appear in Alarm and Event graphic objects, such as the Alarm and Event Summary. The maximum length of an alarm message is 255 characters. When importing alarm messages, the Logix Designer application (or RSLogix 5000 software) will verify the message length and display a warning if the alarm message exceeds the character limit.

Step 5. Download the program containing the ladder logic to the controller

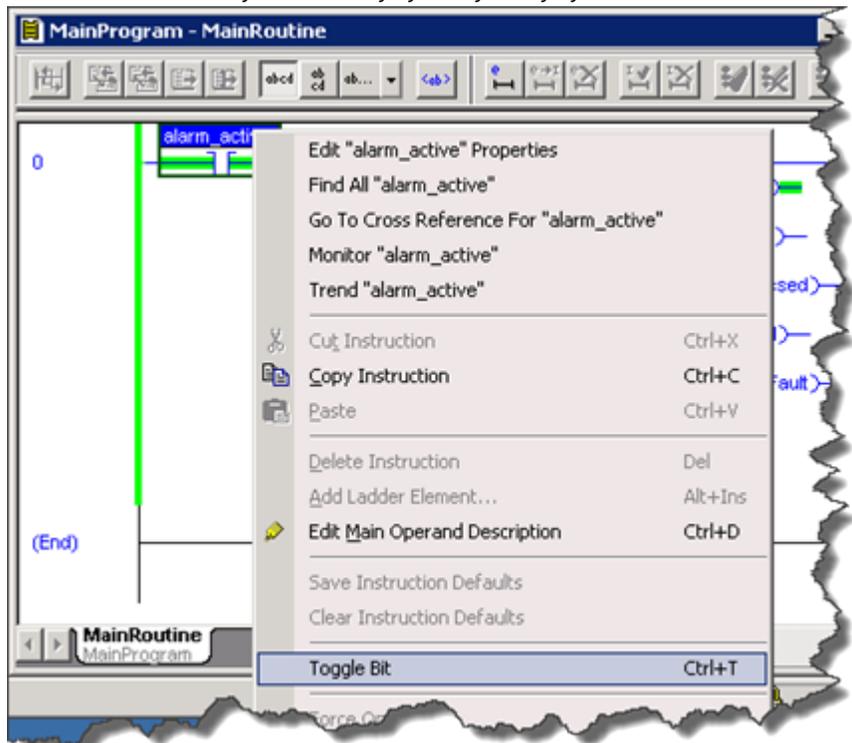
1. If it is not already running, start RSLinx Classic to establish communications between the controller and the Logix Designer application (RSLogix 5000 software version 16 or later).
2. On the Logix Designer application menu, click **Communications > Who Active**.
3. Select the controller to which you want to download the project.
4. Click **Download**. At the prompt, click **Download** again. The controller is placed in Program mode.

Step 6. Test the alarm instruction by switching to run mode and triggering the alarm

1. On the Logix Designer application menu, click **Communications > Run Mode**. Click **Yes** to switch the controller to run mode.



2. To trigger the alarm, right-click the contact on the rung (the one named alarm_active), and then click **Toggle Bit**. The contact should change from a blue highlight to a green highlight.



Step 7. Finish creating alarms, and next steps

- Define additional digital alarms or analog alarms, using either ladder logic, function blocks, or structured text, and download the logic to the controller.
- When you finish defining alarms, create a device-based alarm server, and then configure it to subscribe to events detected by the Studio 5000 controller. See [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers for instructions. on page 38](#)

Define an instruction-based alarm: analog

An analog alarm defines a condition that evaluates a single analog tag against up to four limit values (high-high, hi, low, and low-low) and up to two rate of change limits (positive and negative).



Tip: If your FactoryTalk application does not include Studio 5000 controllers, or if your controllers are not programmed with the alarm instructions included in the Logix Designer application (RSLogix 5000 software version 16 or later), see [Add an OPC data server for third-party controllers on page 45](#) and [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).

Configure the analog alarm and download it to the controller

This example uses the Function Block editor that comes with the Logix Designer application (RSLogix 5000 software). You can also configure analog alarms in ladder logic or structured text.

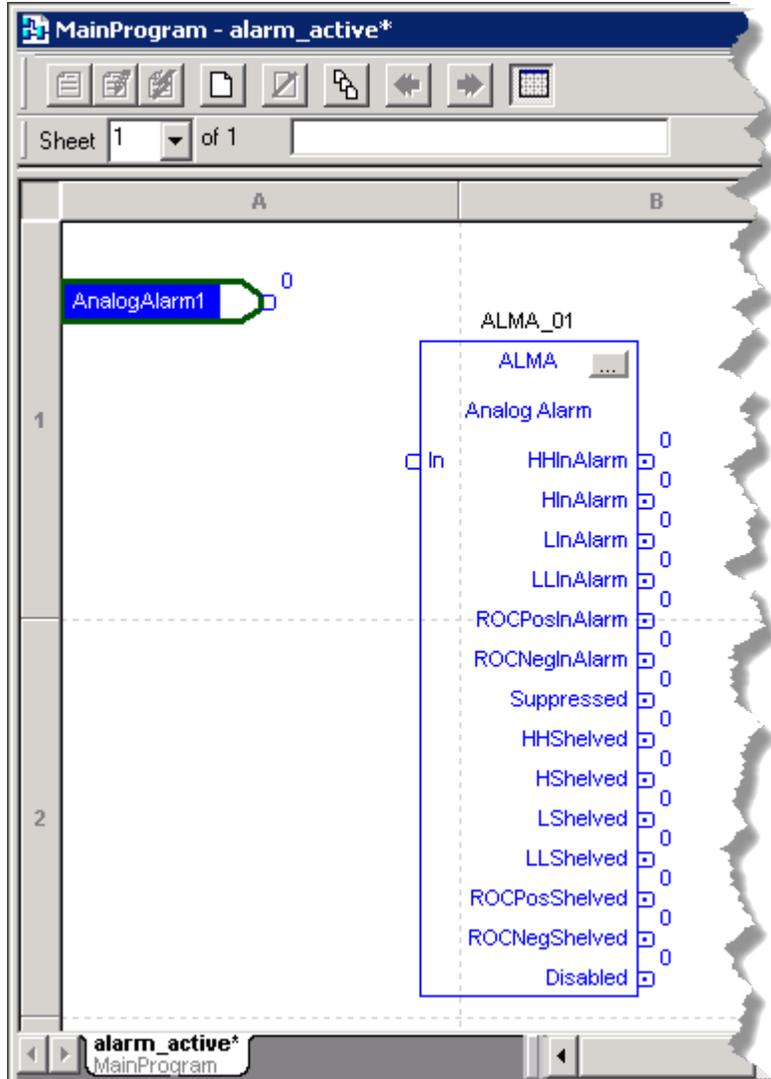
Step 1. Define a new routine

1. Create a new project with default settings. In this example, we use **East_Plant_Controller**.
2. Expand the **Tasks** folder in the left pane, right-click **MainProgram**, click **Add**, and then click **New Routine**.
3. In the **New Routine** dialog box, type a name for the routine. We use **alarm_active**.
4. In the **Type** list, click **Function Block Diagram**.
5. Select the **Open Routine** check box, and then click **OK**. The new routine appears in the Tasks folder under **MainRoutine** and the routine opens on the right side of the Logix Designer window.

Step 2. Build the function block logic

1. To add an alarm block, go to the tabs in the center right area (Favorites, Add-On, and so on) as shown in the following illustration. Scroll to the right, and then click the **Alarms** tab.
2. On the toolbar, click the **ALMA** button  to add an Analog Alarm block.
3. Using the same Alarm objects on the **Language Element** toolbar, click the **Input Reference** icon .
4. Right-click the single question mark inside the symbol and then click **New Tag**.
5. In the **New Tag** dialog box, type a name for the tag and then click **Create**.

In this example, we use **AnalogAlarm1**. The screen should resemble the one shown in the following illustration:



6. Connect the input reference block to the Input of the ALMA block by dragging the block's contact point to the contact point on the ALMA block.

Step 3. Configure the properties of the alarm block

1. Click the **Browse** button (...) on the alarm block.
2. In the **ALMA Properties** dialog box, set the **Input Levels** as shown in the following illustration and then click **OK**. To require that an operator acknowledge the alarm at runtime, make sure the **Acknowledgement Required** check box is selected.



Tip: To enter alarm messages and add variables for analog alarms, select the **Messages** tab. To create a text message with embedded variables, click the **Browse** button (...) beside the **Level** field, or beside the **Rate of Change** field. At runtime, alarm messages are displayed in Alarm and Event graphic objects such as the Alarm and Event Summary.

Step 4. Add a JSR instruction to the MainRoutine to run the function block

1. Double-click **MainRoutine** to open it.
2. Right-click the first rung and then click **Add Ladder Element**.
3. In the **Add Ladder Element** dialog box, scroll down to the **Program Control** folder and then double-click the folder to expand the list of controls.
4. Select **JSR** and then click **OK**.
5. In the JSR instruction, double-click **Routine Name** and then click **alarm_active**.
6. On the toolbar, click the **Save** button  to save the configuration.

Step 5. Download the program to the controller

1. If it is not already running, start RSLinx Classic to establish communications between the controller and the Logix Designer application (RSLogix 5000 software version 16 or later).
2. On the Logix Designer application menu, click **Communications > Who Active**.
3. Select the controller to which you want to download the project.
4. Click **Download**. At the prompt, click **Download** again. The controller is placed in Program mode.
5. To switch the controller to run mode, click **Communications > Run Mode**.

Step 6. Finish creating alarms, and next steps

- Define additional digital alarms or analog alarms using either ladder logic, function block, or structured text, and download the logic to the controller.
- When you finish defining alarms, create a device-based alarm server, and then configure it to subscribe to events detected by the Studio 5000 controller. See [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#).

Add a device server for Studio 5000, SLC 500, or PLC-5 controllers

Add a device server to your application to use:

- Device-based alarms in Studio 5000 controllers.
- Tag-based alarms in PLC-5, SLC 500, or Studio 5000 controllers.

Before you begin

- If you are using device-based alarms, define your alarms, as described in [Define device-based alarms in Studio 5000 controllers on page 29](#).
- If you are using tag-based alarms, you create a controller program to detect alarm conditions, and then associate those conditions with tags that are monitored by the FactoryTalk Tag Alarm and Event Server.

What you need

- FactoryTalk Linx
- FactoryTalk View Studio or FactoryTalk Administration Console



Tip: This guide uses FactoryTalk View Studio to define a device server. You can also use FactoryTalk Administration Console. For more information, in the FactoryTalk Administration Console menu bar, select **Help > Contents**.

Follow these steps

Follow these steps to add a device server:

- Define alarms
- Start FactoryTalk View Studio and open a Site Edition local application
- Add a new device server
- Configure the device server properties
- Open the Communication Setup editor
- Create a new shortcut to the Studio 5000 controller and configure settings
- Set up graphic displays
- Set up historical alarm and event logging

Add a device server

In this section, you will create a Rockwell Automation device server (FactoryTalk Linx) and then configure it to subscribe to alarms that will be detected by a Studio 5000 controller.

IMPORTANT: If you are using third-party controllers, you do not need a device-based alarm server. Instead, go to [Add an OPC data server for third-party controllers on page 45](#).

If you want to monitor OPC UA alarms, you need to add an OPC UA server. For details, go to [Add FactoryTalk Linx OPC UA Connector on page 55](#).

Step 1. Create an application in FactoryTalk View Studio

This example shows how to create a local station application.

1. To start FactoryTalk View Studio, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.

IMPORTANT: FactoryTalk Alarms and Events is not supported for use with FactoryTalk View Machine Edition.

3. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **New** tab.

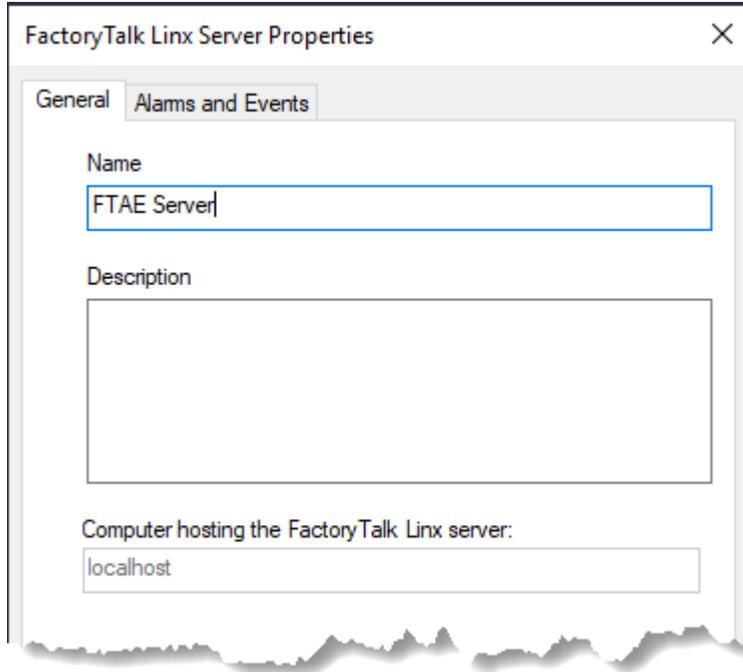
The screenshot shows a dialog box titled "New/Open Site Edition (Local Station) Application". It has two tabs: "New" (selected) and "Existing". The "New" tab contains the following fields and controls:

- Application name:** A text box containing "My Local Site".
- Description:** A large empty text area.
- Language:** A dropdown menu showing "English (United States), en-US".
- Buttons:** "Import...", "Create", and "Cancel".

4. In the **Application name** field, type a name for the new local station application. In this example, we name the application **My Local Site**.
5. Leave the **Description** field blank, or type a description for the application. For example, you can use this field to record revisions to the application, or contact information for technical support.
6. If it is not already selected, select the default language for the application. This is the language in which you are creating the application.
7. Click **Create**.

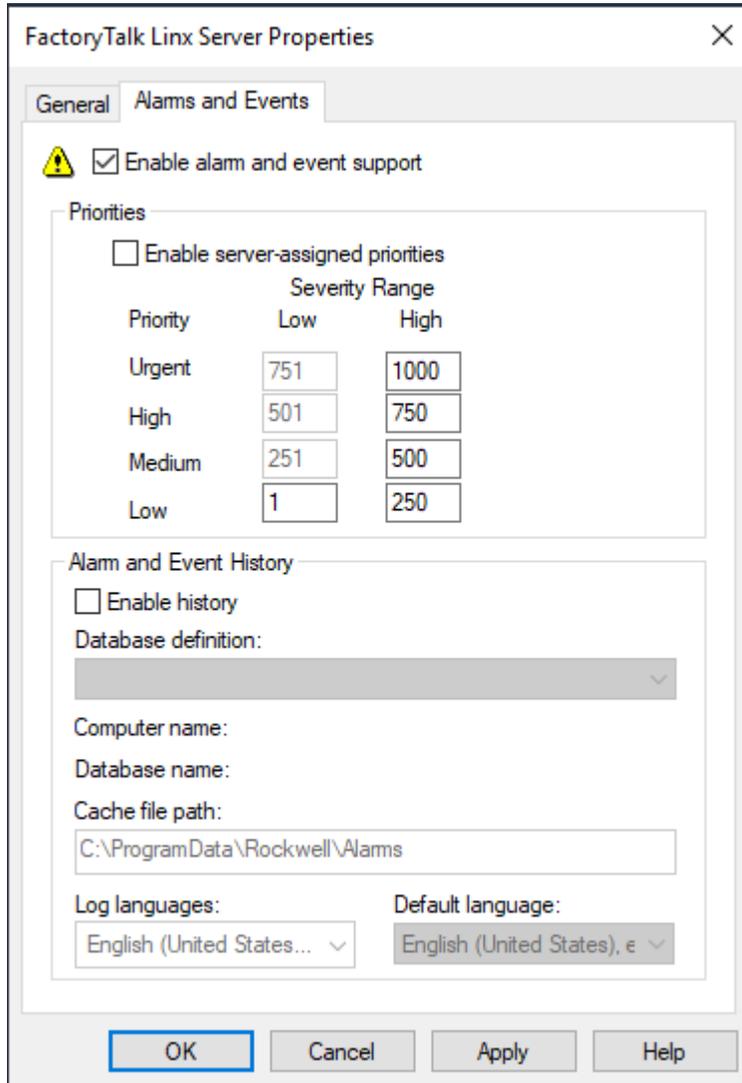
Step 2. Configure the device server

1. In the **Explorer** window, right-click the new application **My Local Site**, point to **Add New Server**, and then click **Rockwell Automation Device Server (FactoryTalk Linx)**.
2. In the **FactoryTalk Linx Server Properties** dialog box, click the **General** tab, type a name for the new server, and then click **Apply**. In this example, we name the server **FTAE Server**. Leave this dialog box open for the moment.



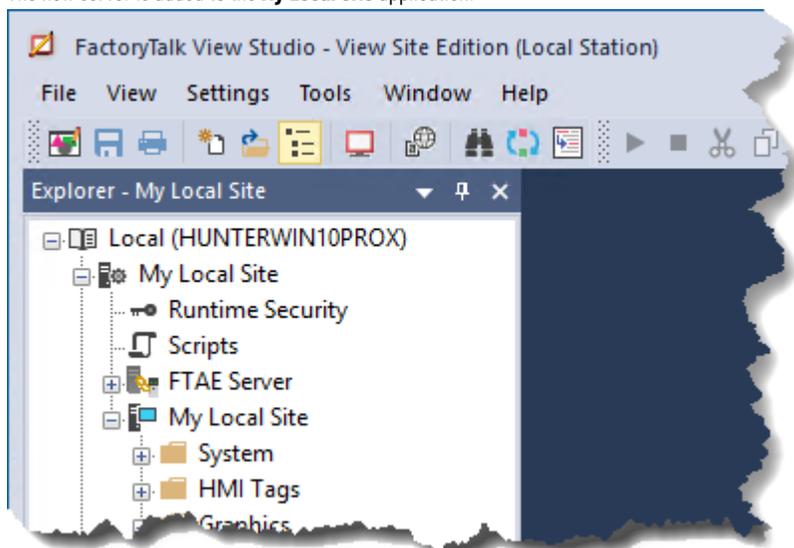
3. Do one of the following:
 - If you plan to use tag-based alarms, you can skip the rest of the steps in this section, and go on to the next major step: "Step 3. Create a new shortcut to the controller." Click **OK** to close the **FactoryTalk Linx Server Properties** dialog box.
 - If you are using built-in alarm instructions in Studio 5000 controllers, continue with the steps in this section.

4. On the **Alarms and Events** tab, select the **Enable alarm and event support** check box.



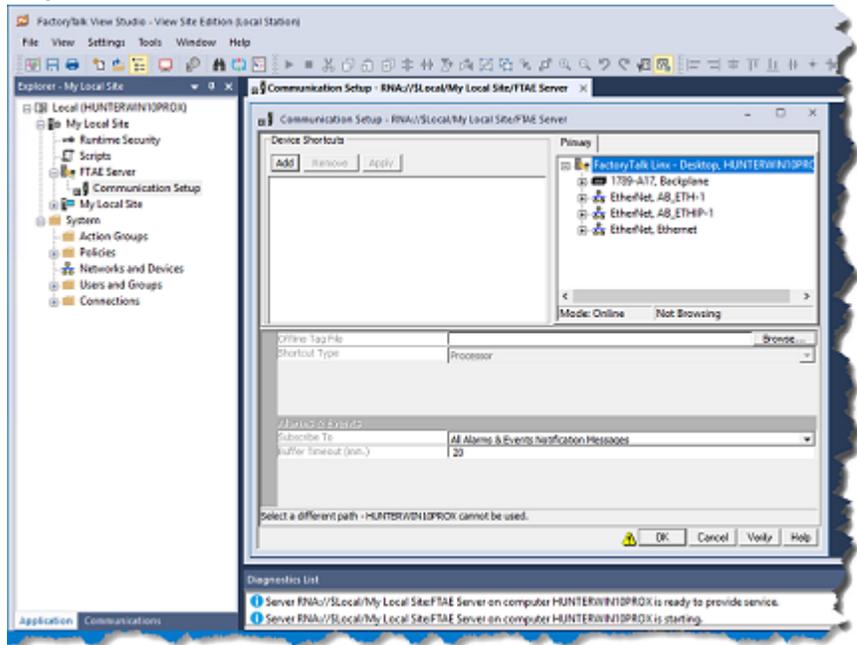
5. Clear the **Enable history** check box and then click **OK**. For information about historical logging, see [Set up historical alarm and event logging on page 100](#).

The new server is added to the **My Local Site** application:

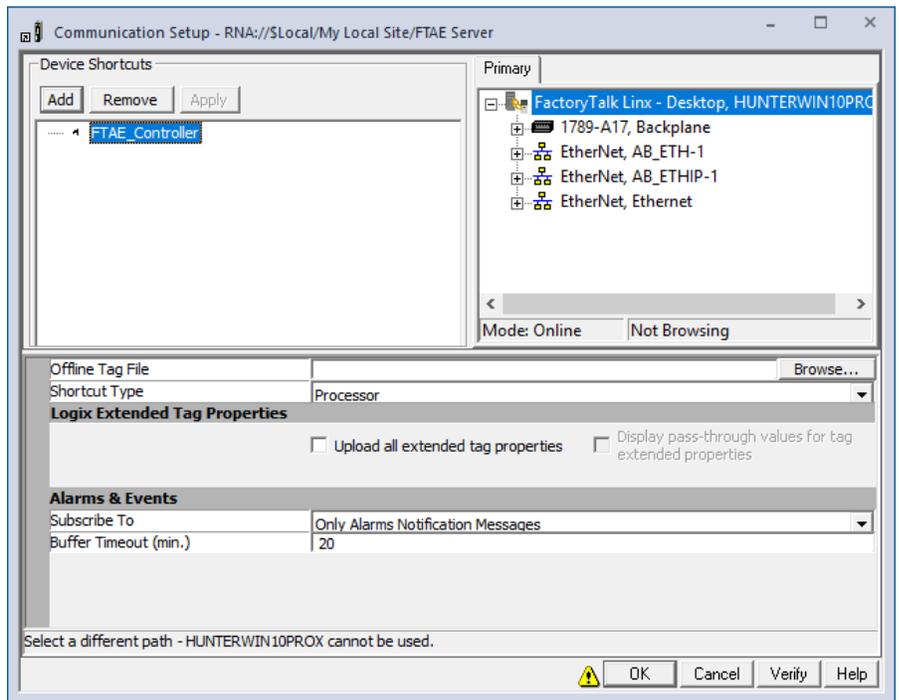


Step 3. Create a new shortcut to the controller

1. In the **Explorer** window, double-click the new FactoryTalk Linx server and then double-click **Communication Setup**.



2. In the **Communication Setup** dialog box, click the **Add** button, and then type a name for the new shortcut. We use **FTAE_Controller**.



Some options in this dialog box might be different if you are using PLC-5 or SLC 500 controllers.

The warning icon beside the **OK** button indicates that changing values in this dialog box at runtime can cause unexpected results. For details, click **Help**.

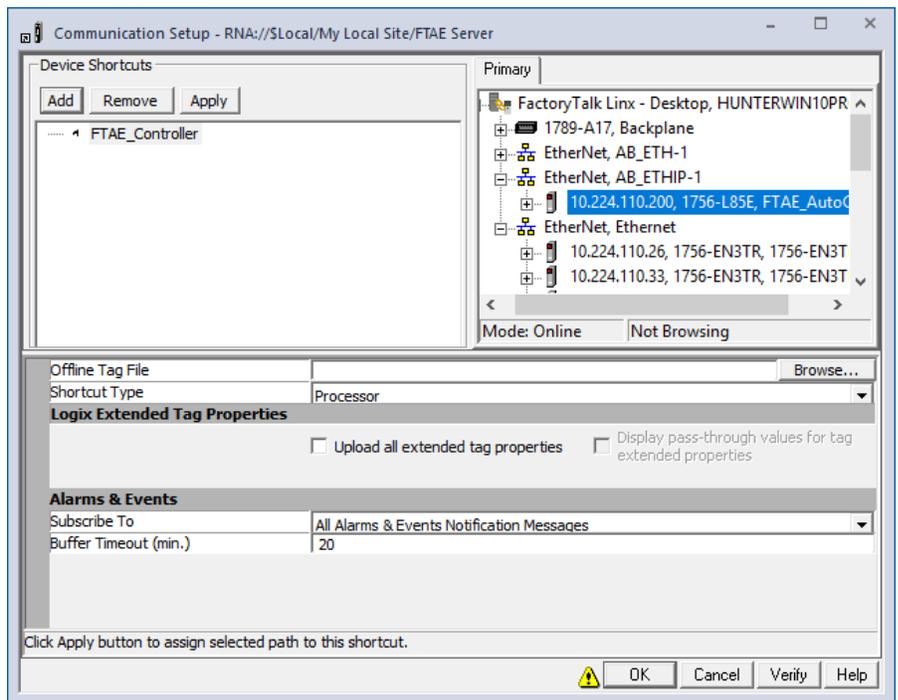
3. Skip this step if you do not plan to use Studio 5000 controllers with built-in alarm instructions. In the **Subscribe to** list, click **All Alarms & Events Notification Messages** or **Only Alarms Notification Messages** to enable Alarms and Events.

If you do not see the **Subscribe to** list, then **Enable alarm and event support** was not selected in the previous step 4.



Tip: Set **Buffer Timeout (min.)** for the length of time (zero to 120) you want to cache alarm information if the connection to the controller is lost. To disable alarm buffering, set the value to zero. See [Alarm Buffering during loss of connection on page 29](#).

4. On the **Primary** tab, expand the list of networks and devices until the controller you plan to use is visible, and then click the controller.



5. To set the path to the primary controller, click the **Apply** button.
6. To save the shortcut configuration and close the **Communication Setup** dialog box, click **OK**.

IMPORTANT: FactoryTalk Alarms and Events server redundancy is only supported in network station applications and network distributed applications.

Step 4. Finish creating data servers, and next steps

1. If your FactoryTalk application includes third-party OPC-DA controllers, add an OPC Data Server, create a tag-based alarm server, and then define alarms. See [Add an OPC data server for third-party controllers on page 45](#) and [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).
2. If your FactoryTalk application is communicating with PLC-5 or SLC 500 controllers, or Studio 5000 controllers that are not using built-in alarm instructions, you must add a device server (FactoryTalk Linx) to your application and then create a tag-based alarm server and define alarms. See [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).
3. If you want to monitor OPC UA alarms that originate from third-party OPC UA servers, you must add FactoryTalk Linx OPC UA Connector to enable the OPC UA alarm monitoring. OPC UA alarm monitoring does

not require a Tag Alarm and Event Server or FactoryTalk Linx. See [Add FactoryTalk Linx OPC UA Connector on page 55](#).

4. After you create data servers and alarms, add FactoryTalk Alarms and Events objects to graphic displays. See [Set up graphic displays on page 58](#).
5. If your FactoryTalk network distributed application or network station application plan calls for data redundancy, you will want to configure your device-based alarm server for redundancy. We recommend leaving this step until after the FactoryTalk application is fully configured and all HMI features have been tested using non-redundant servers. Adding data server redundancy does not affect the configuration of the graphic displays in the HMI application. See [Configure redundancy for alarms and events for more information. on page 120](#)

IMPORTANT: FactoryTalk data server redundancy is only supported in network station applications and network distributed applications.

Add an OPC data server for third-party controllers

To monitor alarms in a third-party controller, create a controller program to detect alarm conditions and communicate them through tags. Use an OPC Data Server (for example, KEPLWare server) to obtain tag values from the controller, and use a Tag Alarm and Event Server to monitor those tags for alarm conditions.

This chapter shows an example using RSLinx Classic as an OPC Data Server. In most situations FactoryTalk Linx is used to communicate with a PLC-5 or SLC 500 controller. However, at times RSLinx Classic is used to communicate with a controller that is bridged over Ethernet to a DH+ or DH-485 network.

Before you begin

- Review [Plan your system on page 25](#).
- Verify that you have installed and activated the software listed under [What you need on page 45](#).

What you need

- PLC-5, SLC 500 or third-party OPC-DA programmable controller
- RSLogix 5 or RSLogix 500 software
- RSLinx Classic software
- FactoryTalk Linx software
- FactoryTalk View Studio or FactoryTalk Administration Console

Follow these steps

Follow these steps to add a data server:

- Plan your system
- Run RSLinx Classic and configure a device driver
- Run RSLogix software and configure system
- Develop a ladder file and assign symbols to tags
- Create OPC topics
- Run FactoryTalk View Studio
- Add a link between controller tags and FactoryTalk Directory
- Add a tag-based alarm server for PLC, SLC, or third-party OPC-DA controllers and Studio 5000* controllers
* Studio 5000 controllers that have not been programmed with alarm instructions in RSLogix 5000 V16 or later

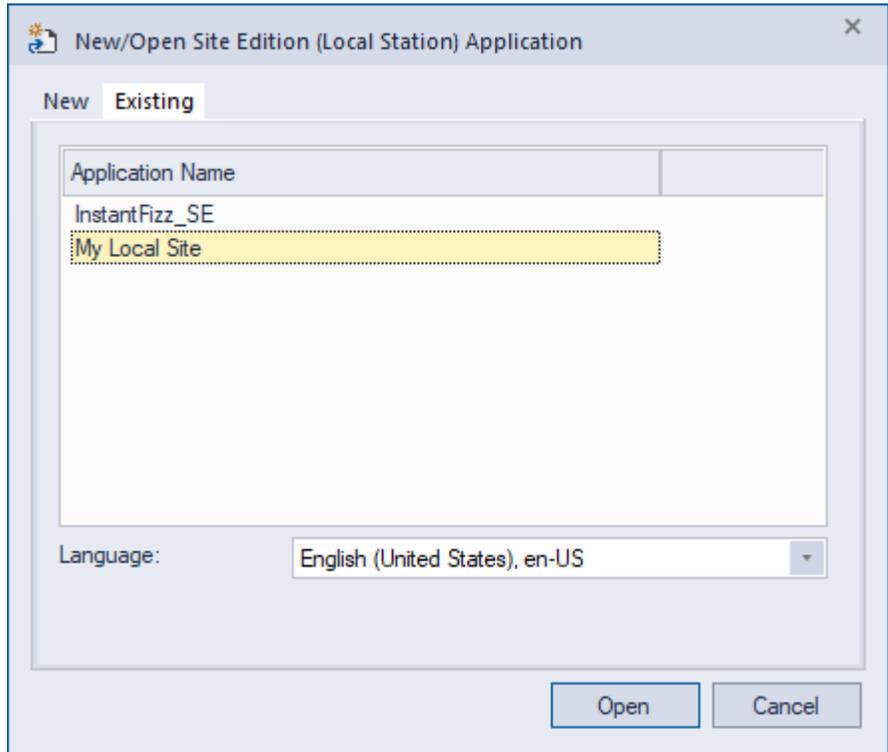
Add an OPC data server to an application

When you add a data server to an application or area, tags published by the data server can be accessed by any client—in this case, the Tag Alarm and Event Server.

IMPORTANT: This guide uses FactoryTalk View Studio to add a data server. You can also use FactoryTalk Administration Console. For more information, select **Help > Contents** from the FactoryTalk Administration Console window.

Step 1. Open an existing application in FactoryTalk View Studio

1. To run FactoryTalk View Studio, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.
3. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab and select the application you created in [Add a device server for Studio 5000, PLC on page 38](#) (we use -5, or SLC 500 controllers **My Local Site**).



Step 2. Add a data server

1. In the **Explorer** window, right-click the application, point to **Add New Server**, and then click **OPC DA Server**.
2. In the **OPC Data Server Properties** dialog box, type a name for the server. We use **My OPC Server**.
3. Beside the **OPC Server name (ProgID)** field, click the **Browse** button.
4. In the **Available OPC Data Servers** dialog box, select **RSLinx OPC Server**, and then click **OK**.



Tip: When creating a network station application or network distributed application, select **RSLinx Remote OPC Server**.

5. Click **OK** to close the **OPC Data Server Properties** dialog box.
6. Next, add a Tag Alarm and Event Server and define alarm conditions. See [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).
7. If your FactoryTalk network station application or network distributed application plan calls for data redundancy, you will want to configure your tag-based alarm server for redundancy. We recommend completing this step after the FactoryTalk application is fully configured and all HMI features have been

tested using non-redundant servers. Adding data server redundancy does not affect the configuration of the graphic displays in the HMI application.

IMPORTANT: FactoryTalk Alarms and Events server redundancy and data server redundancy are only supported in network station applications and network distributed applications.

Add a tag-based alarm server for Studio 5000, SLC 500, PLC-5, or third-party controllers

FactoryTalk Tag Alarm and Event Servers provide software-based alarms and events. Use tag alarm and event servers to monitor alarm conditions in Studio 5000 controllers, PLC-5, SLC 500, or third-party OPC-DA programmable controllers.



Tip: If your FactoryTalk system does not include PLC, SLC, or third-party controllers, you can skip this chapter.

A FactoryTalk Tag Alarm and Event Server provides a link between a hardware device that contains data and the FactoryTalk Directory. This includes third-party controllers. All that is required is a data server (such as KEPCore) to communicate with the controller.

FactoryTalk Tag Alarm and Event Servers can be used to provide an alternative to device-based alarms—alarms provided by devices such as Studio 5000 controllers or sensors using built-in alarm instructions.

Before you begin

- If you are using third-party controllers, you do not need a device-based alarm server. Instead, go to [Add an OPC data server for third-party controllers on page 45](#).

What you need

- Studio 5000 controllers, PLC-5, or SLC 500 devices communicating through Rockwell Automation device servers (FactoryTalk Linx)
- RSLogix 5 or RSLogix 500 software
- FactoryTalk Linx, RSLinx Classic (or RSLinx Classic for bridging from Ethernet to DH+ or DH-485 networks)
- FactoryTalk View Studio or FactoryTalk Administration Console

Follow these steps

Follow these steps to add a tag-based alarm server:

- Add a data server for PLC, SLC, third-party, or Studio 5000 controllers



Tip: To use tag-based alarms in PLC-5, SLC 500, or Studio 5000 controllers, you must add a device server (FactoryTalk Linx) to your application.

- Run FactoryTalk View Studio
- Add a new device server (FactoryTalk Linx)
- Add a new tag alarm and event server
- Configure the server properties
- Set up conditions for triggering alarms in your FactoryTalk system
- Add Alarm and Event objects to graphic displays
- Set up graphic displays

Create an application

In this section, you will create a Rockwell Automation device server (FactoryTalk Linx) and then configure it to subscribe to alarms that will be detected by a Studio 5000 controller. In this example, the Rockwell Automation device server (FactoryTalk Linx) is used as a data server for tag values, not as an alarm server.

Create an application in FactoryTalk View Studio



Tip: If you created a local station application previously, you can skip the steps in this section. Open the application you created and go on to the next section *Add a data server*.

This example shows how to create a local station application.

1. To start FactoryTalk View Studio, in Windows, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.

IMPORTANT: FactoryTalk Alarms and Events is not supported for use with FactoryTalk View Machine Edition.

3. In the **New/Open Site Edition (Local Station) Application** dialog box click the **New** tab.

The screenshot shows a dialog box titled "New/Open Site Edition (Local Station) Application". It has two tabs: "New" (selected) and "Existing". Under the "New" tab, there are three fields: "Application name:" with the text "My Local Site", "Description:" which is empty, and "Language:" with a dropdown menu showing "English (United States), en-US". At the bottom right of the dialog, there are three buttons: "Import...", "Create", and "Cancel".

4. In the **Application name** field, type a name for the new application. In this example, we name the application **My Local Site**.
5. Leave the **Description** field blank, or type a description for the application. For example, you can use this field to record revisions to the application, or contact information for technical support.

6. If it is not already selected, select the default language for the application. This is the language in which you are creating the application.
7. Click **Create**.

Add a data server

Step 1. Configure the device server (FactoryTalk Linx)

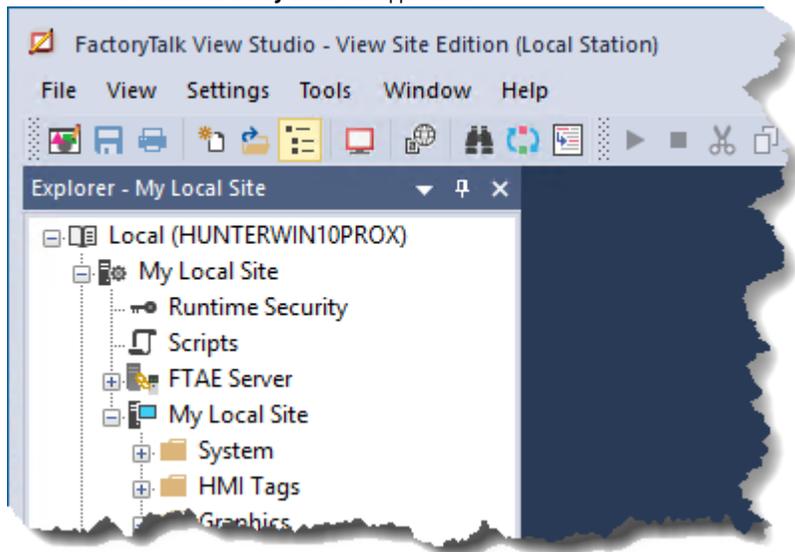
When you add a data server to an application or area, tags published by the data server can be accessed by any client—in this case, the Tag Alarm and Event Server.

IMPORTANT: This guide uses FactoryTalk View Studio to add a data server. You can also use FactoryTalk Administration Console. For more information, select **Help > Contents** from the FactoryTalk Administration Console window.

In this example a device server (FactoryTalk Linx) is added to the application to act as a data server.

1. In the **Explorer** window, right-click the application (**My Local Site**), point to **Add New Server**, and then click **Rockwell Automation Device Server (FactoryTalk Linx)**.
2. In the **FactoryTalk Linx Server Properties** dialog box, click the **General** tab, type a name for the server, and then click **Apply**. In this example, we name the server **FTAE Server**.

The new server is added to the **My Local Site** application:

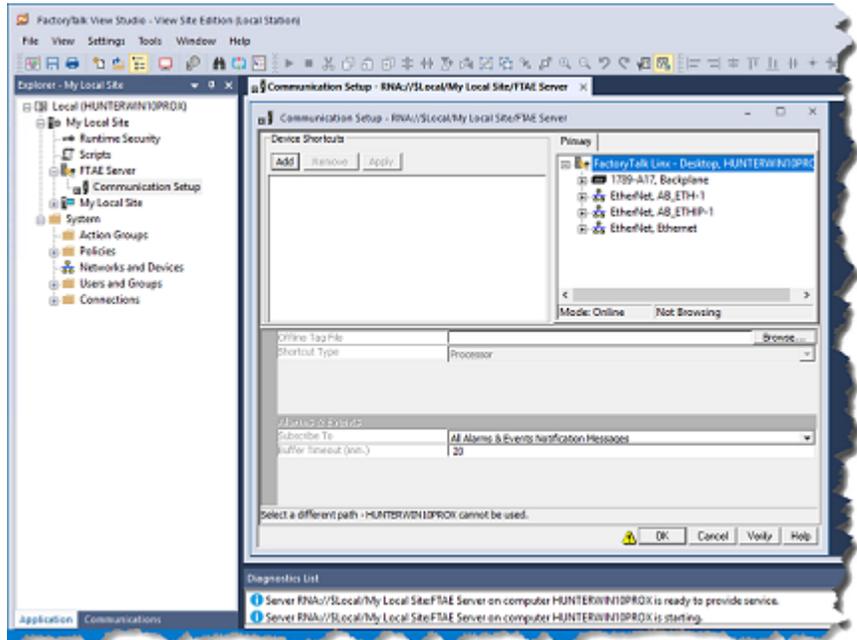


Step 2. Create a new shortcut to the controller

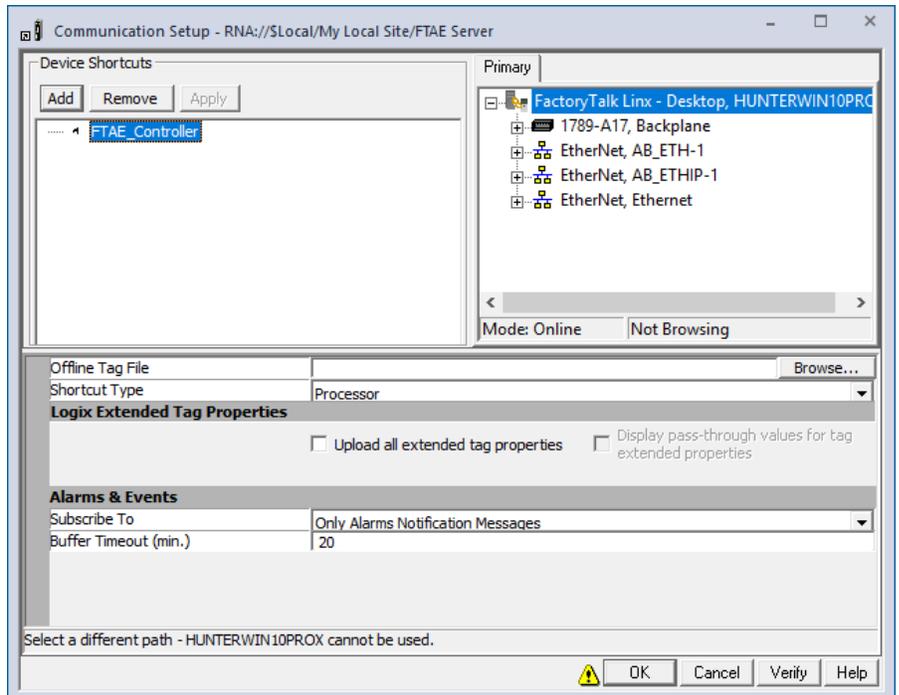


Tip: If you already created a shortcut to the controller in a previous chapter, you can skip this step.

1. In the **Explorer** window, double-click the new FactoryTalk Linx server and then double-click **Communication Setup**.



2. In the **Communication Setup** dialog box, click the **Add** button and then type a name for the new shortcut. We use **FTAE_Controller**.



Some options in this dialog box might be different if you are using PLC-5 or SLC 500 controllers.

The warning icon beside the **OK** button indicates that changing values in this dialog box at runtime can cause unexpected results. For details, click **Help**.

3. On the **Primary** tab, expand the list of networks and devices until the controller is visible, and then click the controller. To set the path to the primary controller, click the **Apply** button.
4. To save the shortcut configuration and close the **Communication Setup** dialog box, click **OK**.

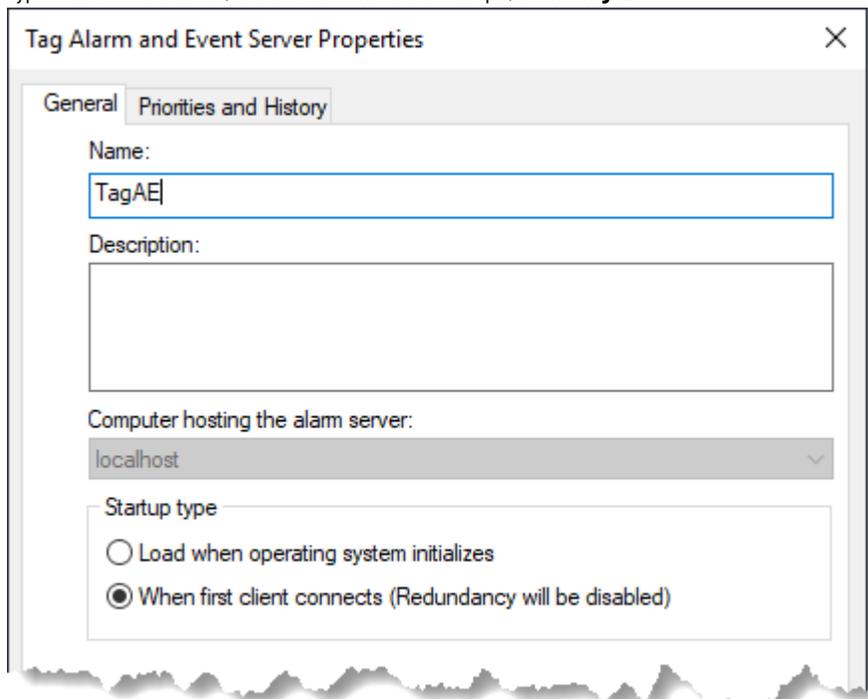
Add a Tag Alarm and Event Server

To create a server and define alarm conditions that monitor tags for PLC-5, SLC 500 controllers, or Studio 5000 controllers, complete the following steps.

These instructions apply to FactoryTalk View Studio. For help with FactoryTalk Administration Console, click **Start > All Programs > Rockwell Software > FactoryTalk Tools > FactoryTalk Help**.

Add a Tag Alarm and Event Server

1. In the **Explorer** window, right-click the application. Point to **Add New Server**, and then click **Tag Alarm and Event Server**.
2. In the **Tag Alarm and Event Server Properties** dialog box, click the **General** tab.
3. Type a name for the server, and then click **OK**. In this example, we use **TagAE**.



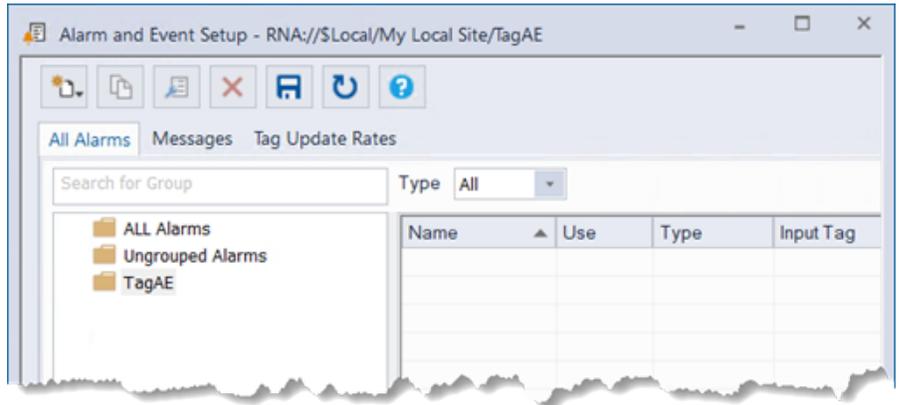
4. On the **Priorities and History** tab, clear the **Enable history** check box. The **Priorities and History** tab is used to configure alarm and event logging. [Set up historical alarm and event logging on page 100](#) describes how to set up alarm logging for a Tag Alarm and Event Server.
5. To create the Tag Alarm and Event Server and close the dialog box, click **OK**.

Define alarm conditions

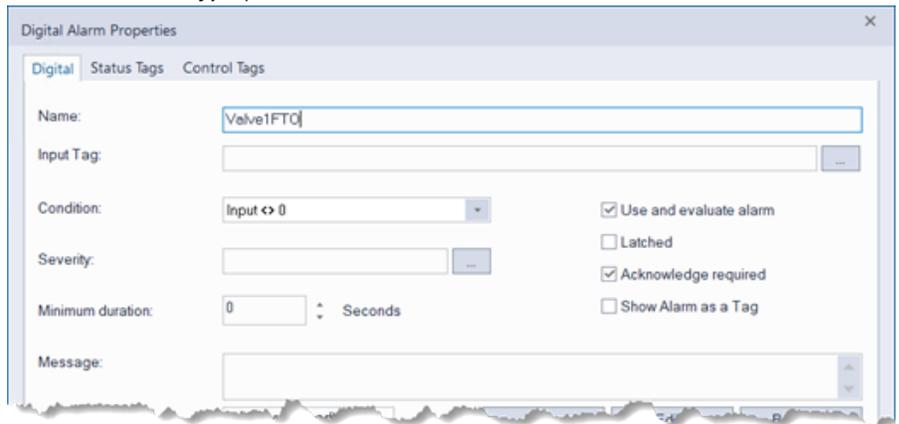
After creating a Tag Alarm and Event Server, define the conditions that will trigger alarms at runtime.

This example shows how to create a digital alarm in a Tag Alarm and Event Server.

1. In the **Explorer** window, expand the **TagAE** server, and then double-click **Alarm and Event Setup**.
2. In the **Alarm and Event Setup** dialog box, click the **New** button  on the toolbar, and then click **Digital**.

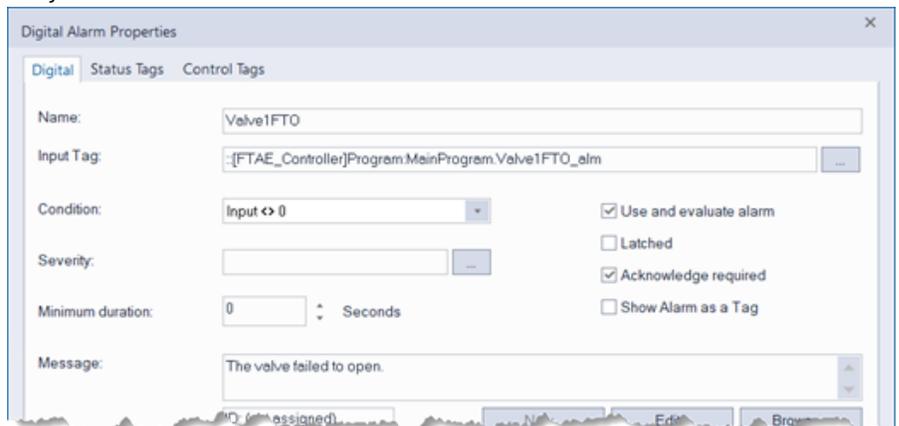


3. In the **Digital Alarm Properties** dialog box, type a name for the alarm. In this example we use **Valve1FTO**.
4. To select an **Input Tag** for the alarm, click the **Browse** button (...), and then expand the folder tree until you can select the online tag you plan to monitor.



5. Select the tag you plan to monitor and then click **OK**. In this example we used **Valve1FTO_alm**.
6. In the **Digital Alarm Properties** dialog box, type a message. In this example, in the **Message** field we type **The valve failed to open**.

You can also embed variables within the message. For details, click **Help** on any tab in the **Alarm Setup** dialog box.



7. To close the **Digital Alarm Properties** dialog box, click **OK**.
8. To save the alarm and start monitoring for the alarm condition, click **Save**.

Next steps

Do the following:

1. Define additional alarms and (optionally) define alarm groups.
2. After you define alarms and groups, you can add FactoryTalk Alarms and Events objects to graphic displays. See [Set up graphic displays on page 58](#).
3. If your FactoryTalk network station application or network distributed application plan calls for data redundancy, you will want to configure your tag-based alarm server and tag data servers for redundancy. We recommend completing this step after the FactoryTalk application is fully configured and all HMI features have been tested using non-redundant servers. Adding data and alarm server redundancy does not affect the configuration of the graphic displays in the HMI application. See [Configure redundancy for alarms and events on page 120](#) for more information.

IMPORTANT: FactoryTalk Alarms and Events redundancy and data server redundancy are only supported in network station applications and network distributed applications.

Add FactoryTalk Linx OPC UA Connector for third-party OPC UA servers

OPC UA alarm monitoring captures alarm information originated from third-party OPC UA servers. To monitor OPC UA alarms, define and configure alarms in the third-party OPC UA server. Use FactoryTalk Linx OPC UA Connector as the proxy to route the alarm information to FactoryTalk Alarms and Events for display and logging.

Unlike tag-based or device-based alarm monitoring, OPC UA alarm monitoring does not require a Tag Alarm and Event Server or FactoryTalk Linx.

This chapter shows an example in FactoryTalk View Studio, where you add and enable FactoryTalk Linx OPC UA Connector for alarm and event.

Before you begin

- Review [Plan your system on page 25](#).
- Verify that you have installed and activated the software listed under [What you need on page 45](#).

What you need

- Third-party OPC UA servers
- FactoryTalk Linx OPC UA Connector (installed as part of FactoryTalk Services Platform)
- FactoryTalk View Studio or FactoryTalk Administration Console

Follow these steps

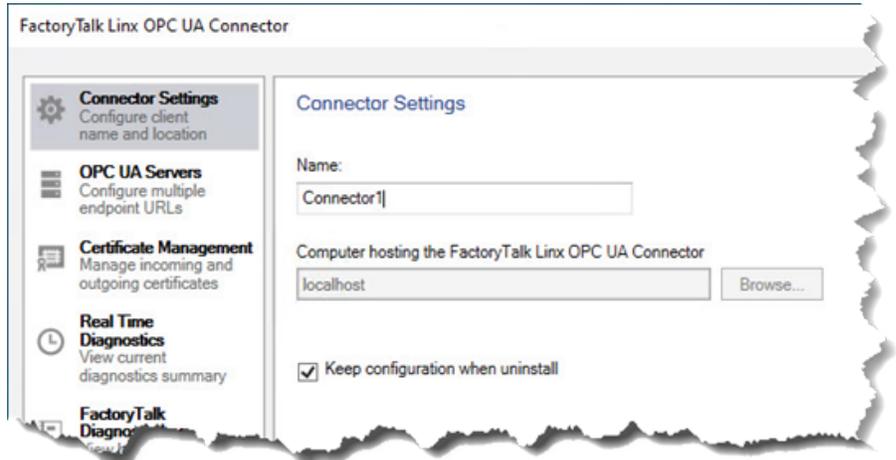
- Define and configure alarms in the third-party OPC UA server
For more information on how to define and configure alarms, see the user document of your OPC UA server.
- Run FactoryTalk View Studio
- Add FactoryTalk Linx OPC UA Connector and enable alarms
- Add Alarm and Event objects to graphic displays
- Set up graphic displays

Add FactoryTalk Linx OPC UA Connector

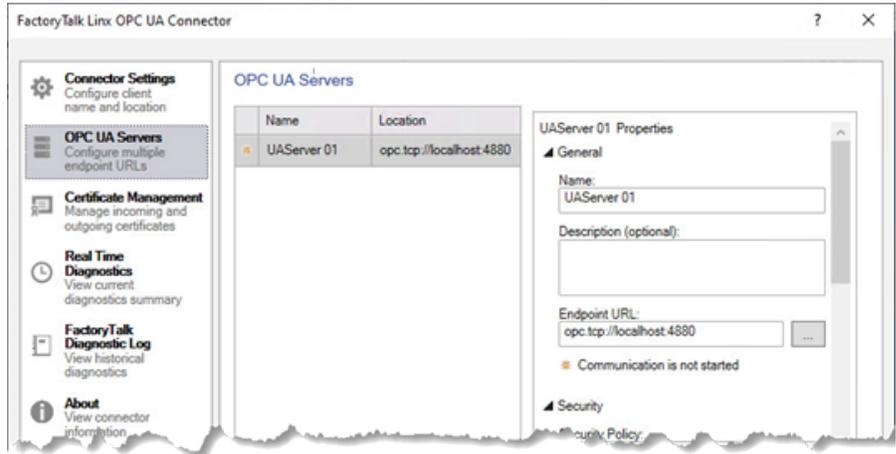
In this section, you will create FactoryTalk Linx OPC UA Connector in FactoryTalk View Studio, and then configure it to subscribe to alarms that originate from third-party OPC UA servers.

Step 1. Add FactoryTalk Linx OPC UA Connector

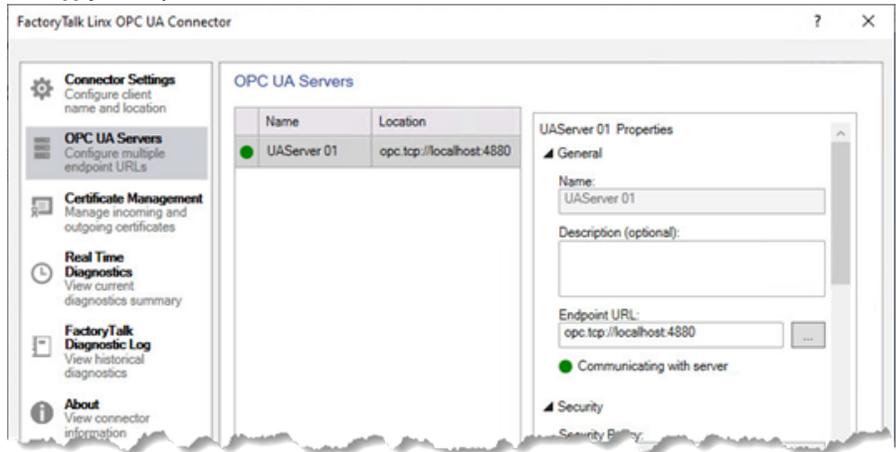
1. In the **Explorer** window, right-click the application (**My Local Site**), point to **Add New Server**, and then click **OPC UA Server**.
2. In **FactoryTalk Linx OPC UA Connector**, enter the connector name. This example uses the default name **Connector1**.



3. In the left pane, click **OPC UA Servers**.
4. Under **General**, enter the OPC UA server name. This example uses the default name **UAServer 01**.
5. Under **Endpoint URL**, enter the network path to the OPC UA server.



6. Click **Apply** to verify the connection to the OPC UA server.



Step 2. Enable alarm and event

1. Go to **Alarm Settings**, and then select **Enable alarm and event support**.

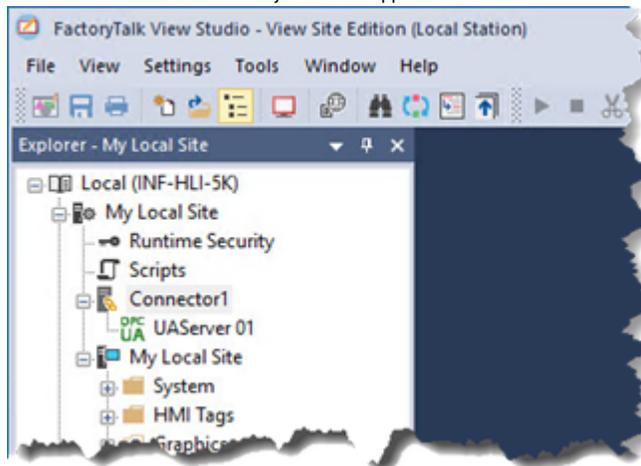


2. Click **Apply** to verify the connection to the OPC UA server.



3. Click **OK**.

The new server is added to the My Local Site application:



Set up graphic displays

Create graphic displays in FactoryTalk View Studio. These are containers for objects, such as the FactoryTalk Alarm and Event Summary object. Add FactoryTalk Alarms and Events objects to graphic displays so that an operator can monitor and interact with device-based, tag-based, OPC UA alarms, and diagnostic events at runtime.

Other graphic objects (for example, objects representing equipment) can be animated (for example, to change color) using FactoryTalk View Site Edition expression functions that monitor the state of alarms. See [Use color animation to indicate alarm state changes on page 73](#). Also see *FactoryTalk View Site Edition Help*.

This section describes how to create graphic displays, and then create and configure the FactoryTalk Alarms and Events graphic objects and macros that determine how the graphic displays open in the FactoryTalk View Site Edition Client. This section is one example of how you might create your graphic displays.

Before you begin

- Define the alarms you plan to use, as described in [Define device-based alarms in Studio 5000 controllers on page 29](#).
- Add the required server, as described in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#), [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#), [Add an OPC data server for third-party controllers on page 45](#), or [Add FactoryTalk Linx OPC UA Connector for third-party OPC UA servers on page 55](#).

What you need

- FactoryTalk Linx software
- FactoryTalk View Studio software

Follow these steps

Follow these steps to set up graphic displays:

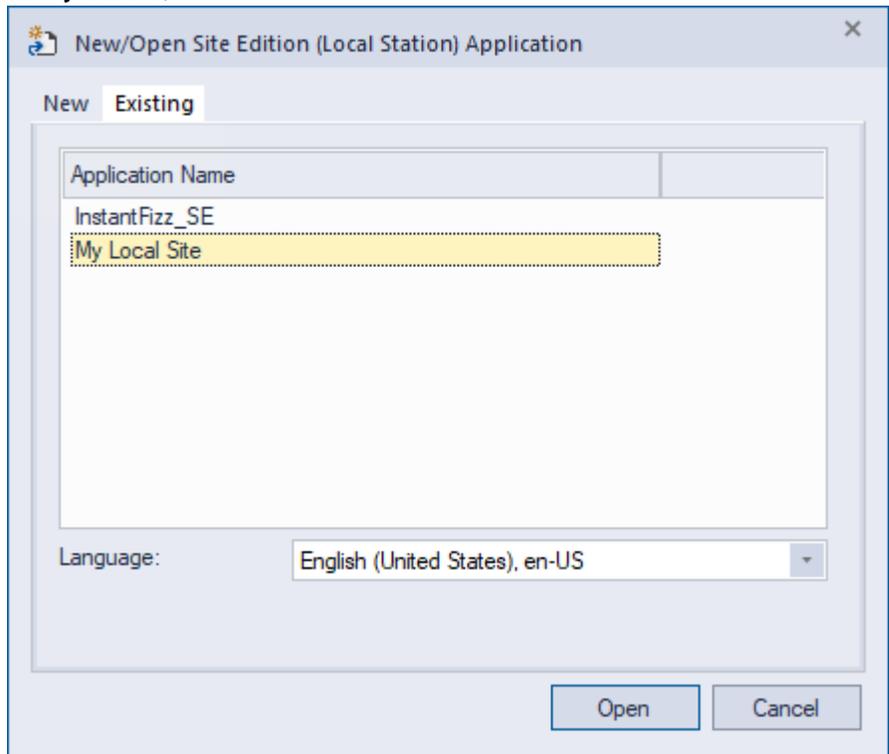
- Add a device server, a tag-based alarm server, an OPC data server, or FactoryTalk Linx OPC UA Connector
- Run FactoryTalk View Studio and open an application
- Create a graphic display
- Add an Alarm and Event Summary object
- Configure the object's properties
- Create a graphic display
- Add an Alarm and Event Banner object
- Configure the object's properties
- Create a startup macro
- Create a graphic display
- Add an Automatic Diagnostic Event Summary object
- Configure the object's properties
- Animate a display with expressions
- Monitor and interact with alarms during runtime
- Set up historical alarm and event logging

Create a graphic display

Create a graphic display to host FactoryTalk Alarms and Events objects, such as the Alarm and Event Summary.

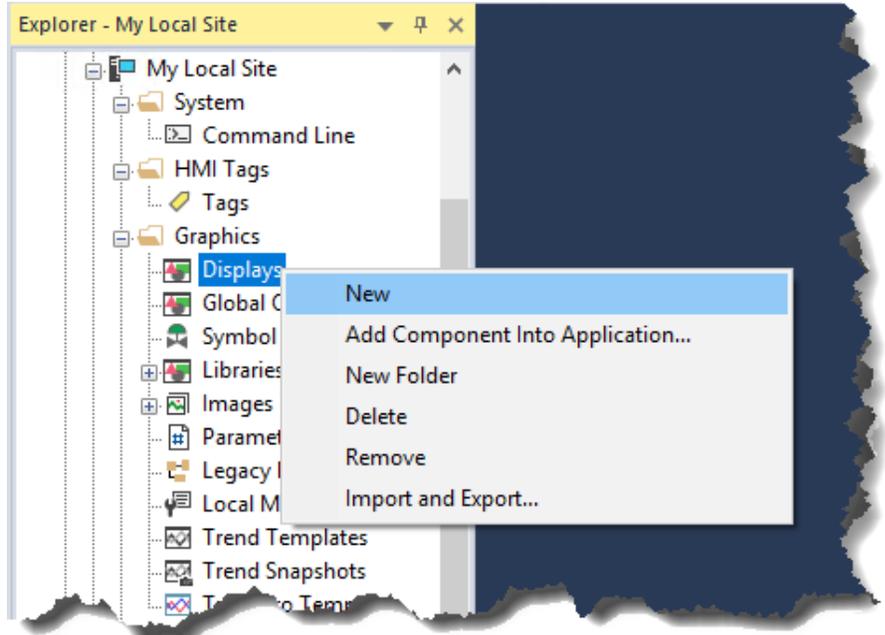
Step 1. Open an existing application in FactoryTalk View Studio

1. To run FactoryTalk View Studio, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.
3. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab, and select the application you created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#) (we used **My Local Site**).

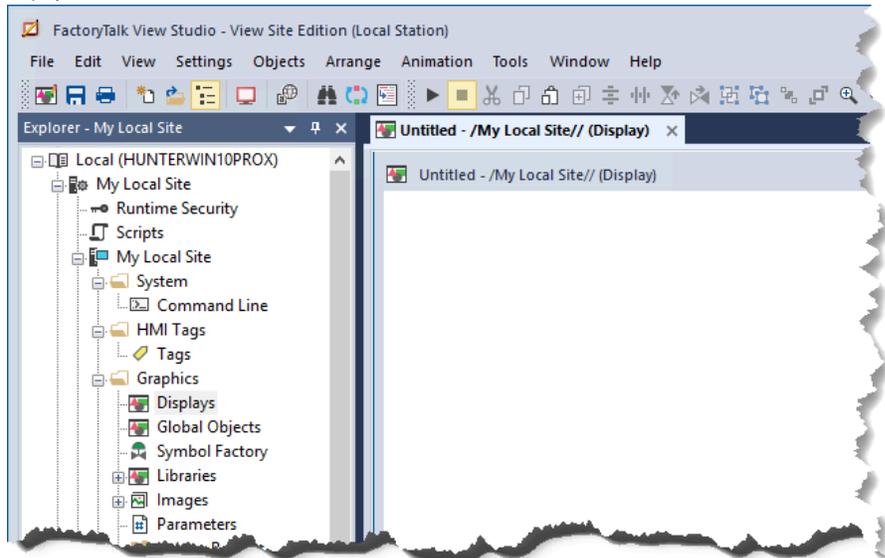


Step 2. Create a graphic display to host FactoryTalk Alarms and Events objects

1. In the **Explorer** window, expand the **Graphics** folder, right-click **Displays**, and then click **New**.



A blank display appears in the workspace. Next, add FactoryTalk Alarm and Event objects to the graphic display.



Create an Alarm and Event Summary

Use the Alarm and Event Summary object to view and interact with a summary of all the current alarms and events in an application. You can acknowledge, suppress, disable, shelve, or unshelve alarms.

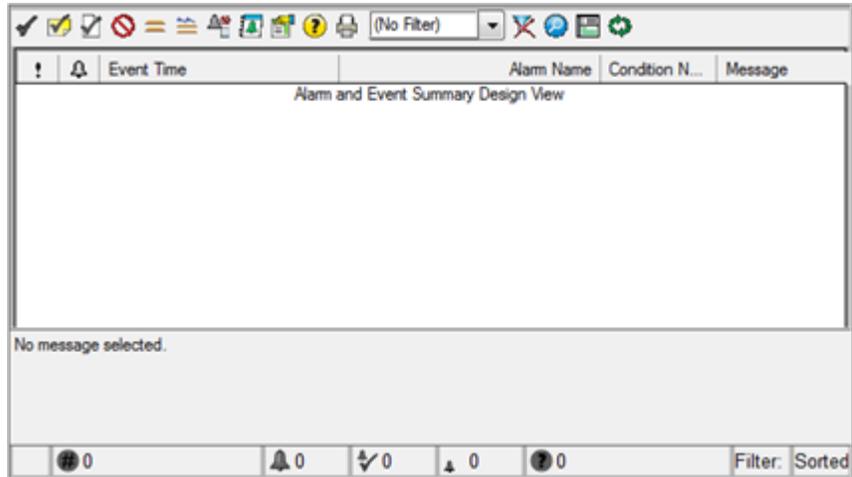


Tip: You cannot use the Alarm and Event Summary to enable or turn alarm suppression off. To enable or turn alarm suppression off, use the **Alarm Status Explorer**. See [Monitor alarms and events on page 86](#). To silence an alarm, use the Alarm and Event Banner.

You can use FactoryTalk Security to control which users can acknowledge, enable, disable, reset, suppress, shelve, or unshelve alarms at runtime in an application (or in an area). To do this, right-click the application (or area) and then click **Security**. For details, see the *FactoryTalk Security System Configuration Guide*.

Step 1. Add an Alarm Summary to a graphic display

1. On the **Objects** menu, point to **Alarm and Event**, click **Summary** (or in the toolbox, select **Alarm and Event Summary**), and then place the cursor approximately where the object is to be on the display.
2. Hold the left mouse button down and drag it to create a rectangle the size that the Alarm and Event Summary object should be.
3. When the object is the desired size, release the left mouse button. The Alarm and Event Summary object is drawn on the display.



Step 2. Change the settings of the Alarm and Event Summary display

1. On the menu bar, click **Edit > Display Settings**.

The screenshot shows the 'Display Settings' dialog box with the 'Properties' tab selected. Several options are highlighted with red boxes:

- Cache After Displaying:** 'Yes' is selected, and the 'Always Updating' checkbox is checked.
- Title Bar:** The checkbox is unchecked.
- Size to Main Window at Runtime:** The checkbox is checked.
- Resize:** 'Allow Display to be Resized' is checked, and 'Scale' is selected under 'When Resized'.

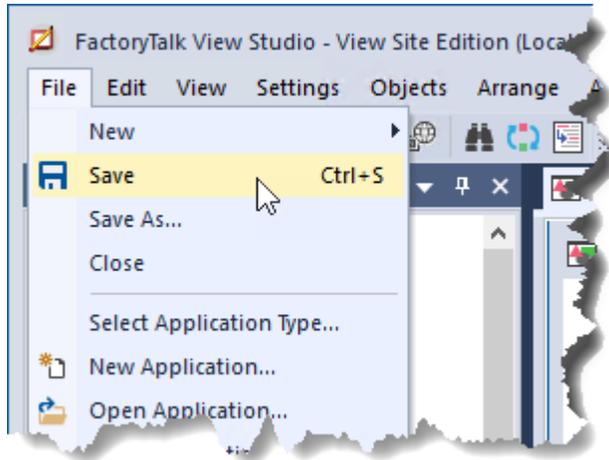


Tip: In any application, do not include more than two graphic displays that have **Cache After Displaying** and **Always Updating** set because these options can consume large numbers of processor cycles.

2. In the **Display Settings** dialog box, on the **Properties** tab, make the following changes and then click **OK**.
 - Under **Cache After Displaying**, click **Yes** and then select the **Always Updating** check box.
When you set **Cache After Displaying** to **Yes**, the display stays in memory cache when you close it. This shortens the time required to open the graphic display the next time.
When you select the **Always Updating** check box, the display continues to be updated with changes in alarm states when it is cached. This shortens the time necessary to update the Alarm and Event Summary with current alarms when you open it again.
If Cache After Displaying is set to **No**, and the **Always Updating** check box is cleared, every time you close the graphic display, all alarms are removed from the Alarm and Event Summary. When you re-open the graphic display, the Alarm and Event Summary is blank, and then begins to receive the most recent alarms when they occur.
 - Clear the **Title Bar** check box.
 - Select the **Size to Main Window at Runtime** check box.
 - Select the **Allow Display to be Resized** check box.
 - Under **When Resized**, select the **Scale** check box if it is not already selected.

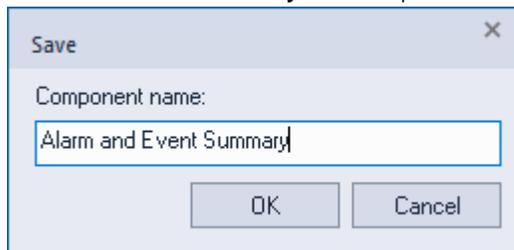
Step 3. Save the display

1. On the **File** menu, click **Save**.



2. In the **Save** dialog box, type a name for the new display and then click **OK**.

We use **Alarm and Event Summary** in this example.



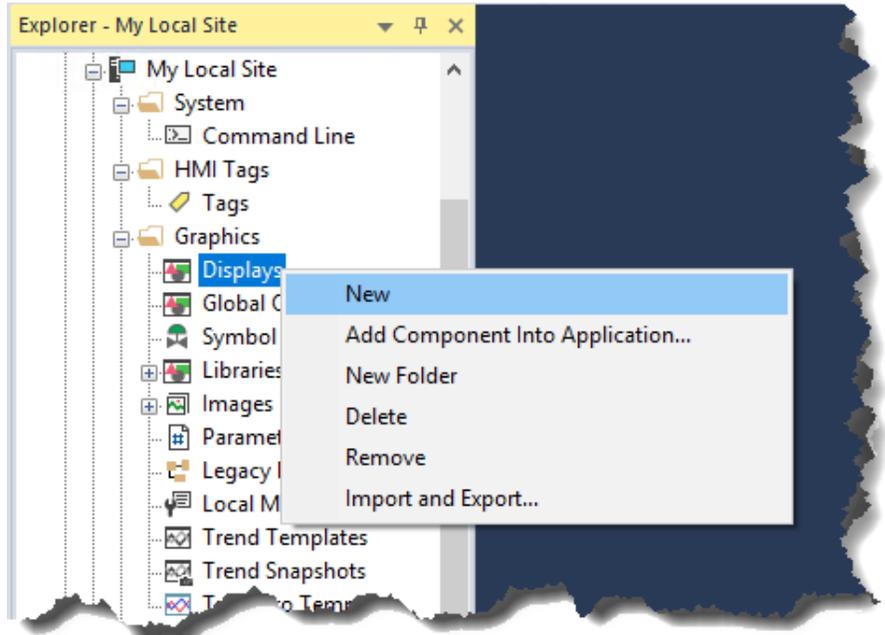
3. Close the graphic object.

Create an Alarm and Event Banner display

This section describes how to add an Alarm and Event Banner object to a graphic display, and then create a startup macro that docks the Banner to the bottom of the FactoryTalk View Site Edition Client window.

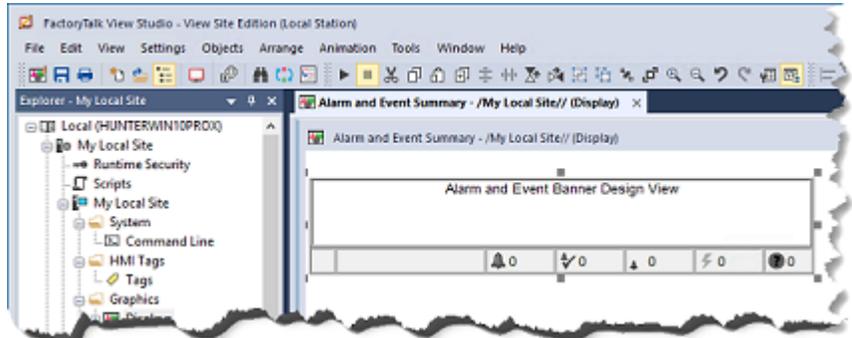
Step 1. Create a new graphic display

1. In the **Explorer** window, expand the **Graphics** folder.
2. Right-click **Displays**, and then click **New**.

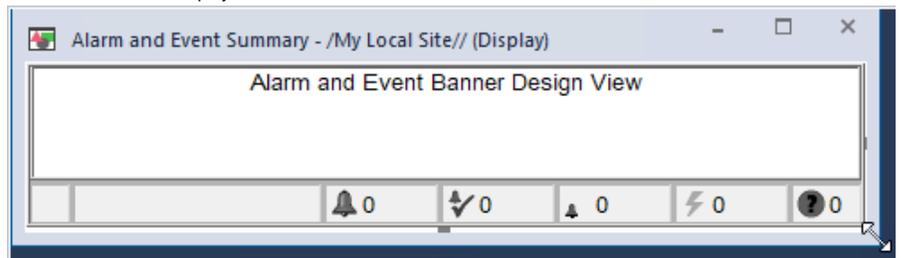


Step 2. Add an Alarm and Event Banner object to the display

1. On the **Objects** menu, point to **Alarm and Event**, click **Banner** (or, in the toolbox, select **Alarm and Event Banner**), and then place the cursor approximately where the object is to be on the display.
2. Hold the left mouse button down and drag it to create a rectangle the size that the Alarm and Event Banner should be.
3. When the object the desired size, release the left mouse button. The Alarm and Event Banner object is drawn on the display.

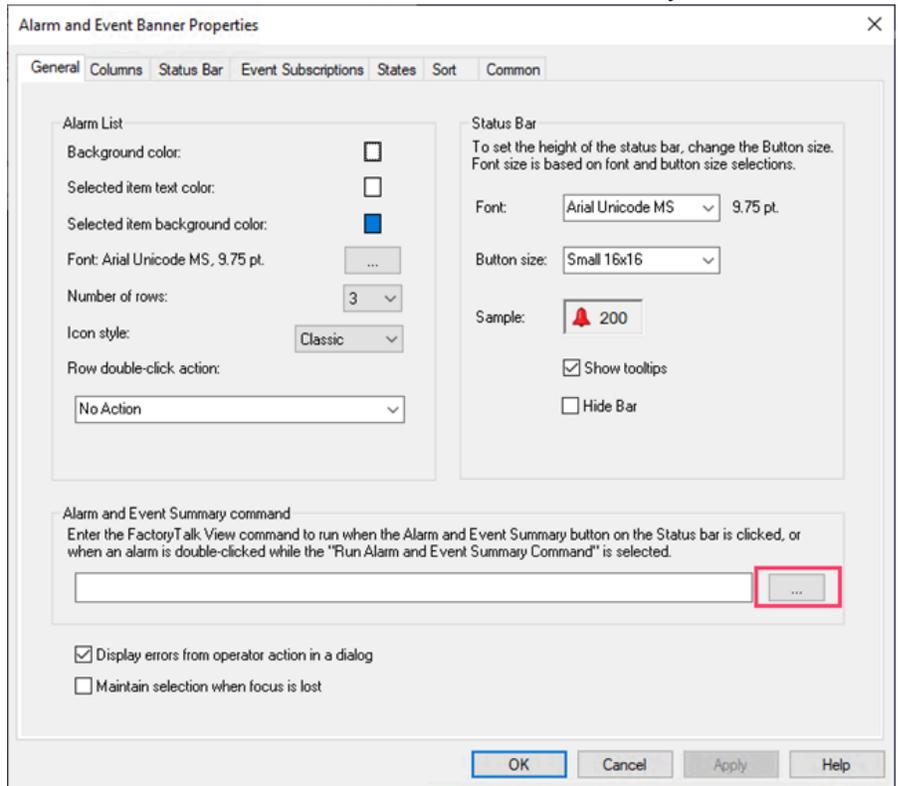


4. Resize the graphic display so that the Banner fills the graphic display (do not leave white space). Do so because the Banner displays no more than five alarms at a time.



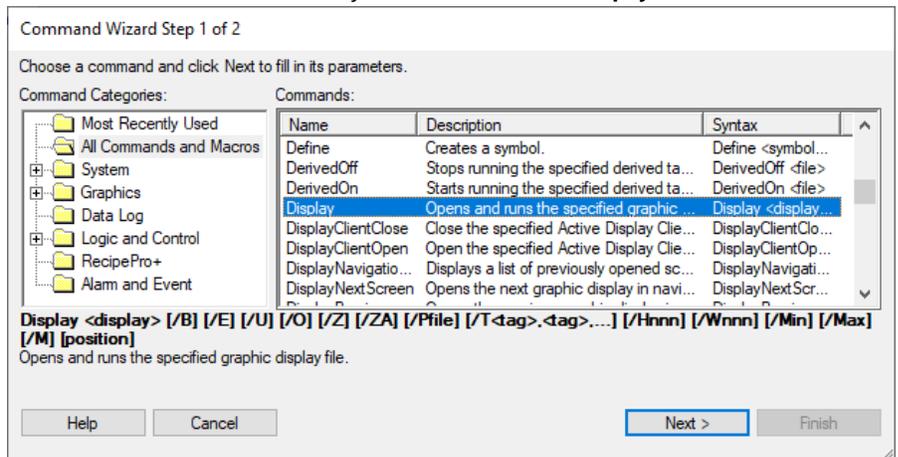
Step 3. Configure the properties of the Alarm and Event Banner

- To open the **Alarm and Event Banner Properties** dialog box, double-click the Alarm and Event Banner object. For details about all of the properties in the dialog box, click **Help**.
- On the **General** tab, click the **Browse** button (...) under **Alarm and Event Summary command**.

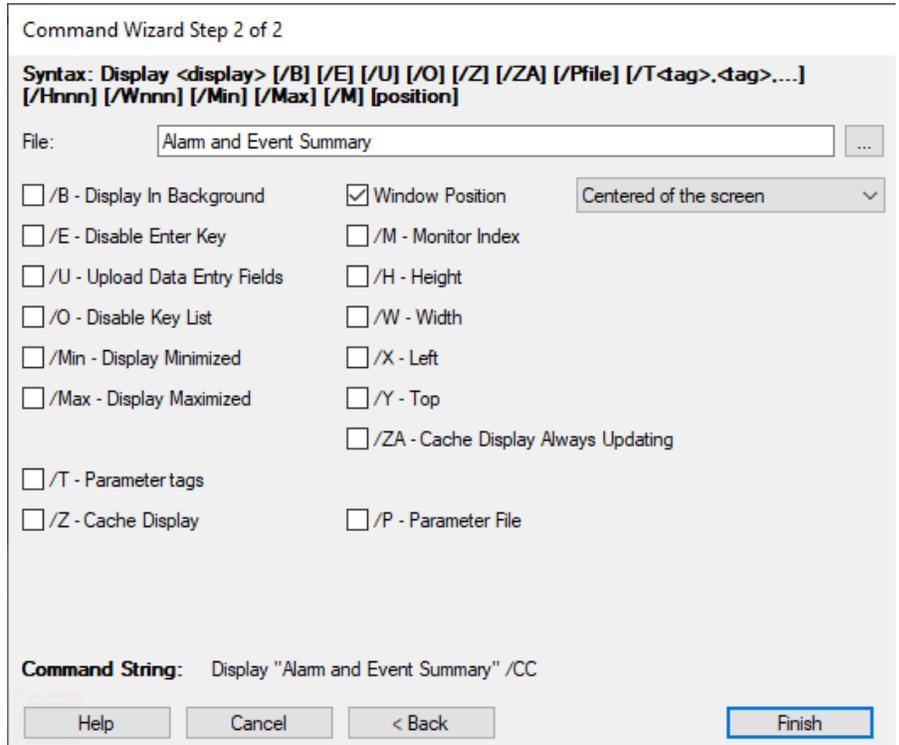


This opens the **Command Wizard** where you will create a command to start the Alarm and Event Summary graphic display from the Alarm and Event Banner.

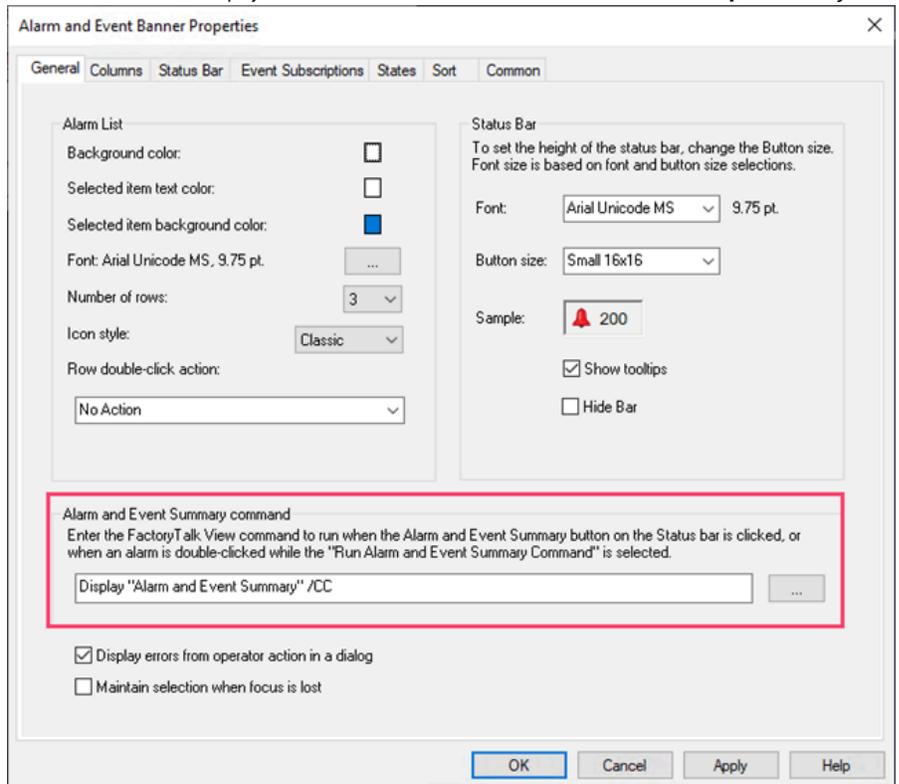
- Scroll down the list of commands on the right side of the wizard, select **Display**, and then click **Next**.



- In the **File** list, click **Alarm and Event Summary**.



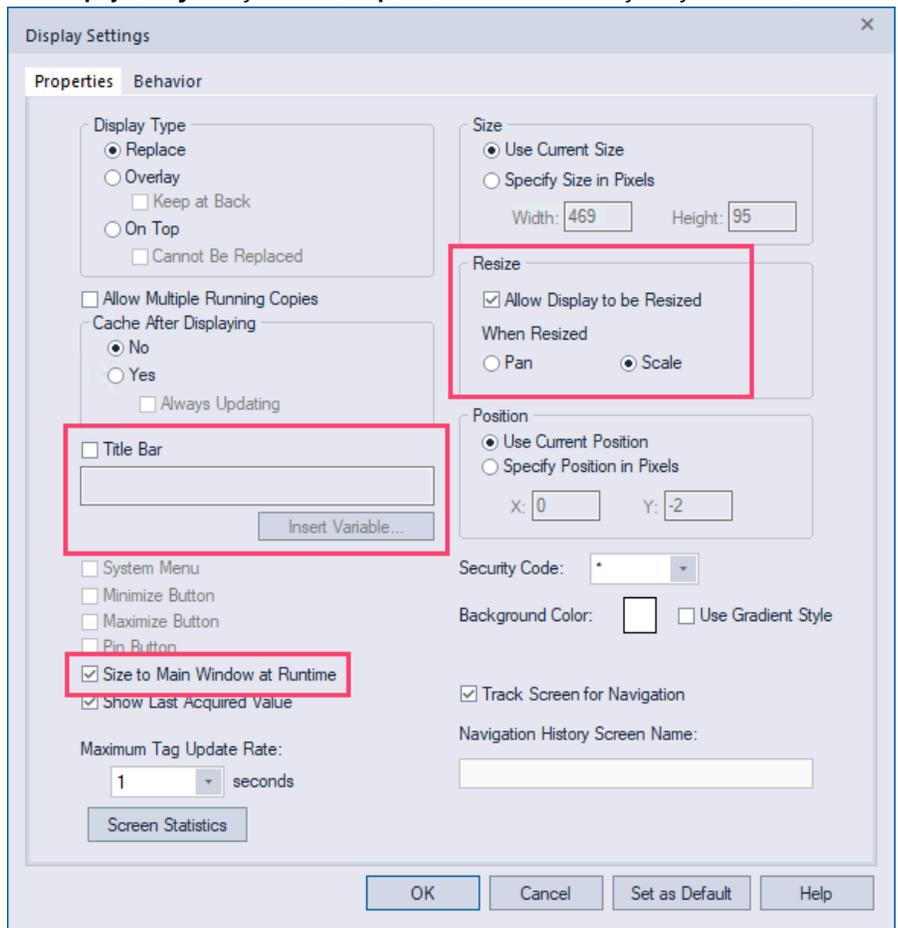
- Select the **Window Position** check box. Scroll down the list on the right and then click **Centered of the screen**.
- Click **Finish** to save the Display command and add it to the **Alarm and Event Banner Properties** dialog box.



- Click **OK** to close the dialog box.

Step 4. Change the display settings for the Alarm and Event Banner display

1. On the **Edit** menu, click **Display Settings**.
2. In the **Display Settings** dialog box, on the **Properties** tab, make the following changes, and then click **OK**:



- Clear the **Title Bar** check box.
 - Select **Size to Main Window at Runtime**.
 - Select **Allow Display to be Resized**.
 - Under **When Resized**, select **Scale** if it is not already selected.
3. The Alarm and Event Banner graphic display is always visible because it is docked. You do not need to turn on **Cache After Displaying**, as you did for the Alarm and Event Summary object. See step 2: "Change the settings of the Alarm and Event Summary display" in [Create an Alarm and Event Summary on page 60](#).

Step 5. Save the graphic display

1. On the **File** menu, click **Save**.
2. In the **Save** dialog box, type a name for the graphic display and then click **OK**.

In this example, we use **Alarm and Event Banner**.



3. Close the graphic display.

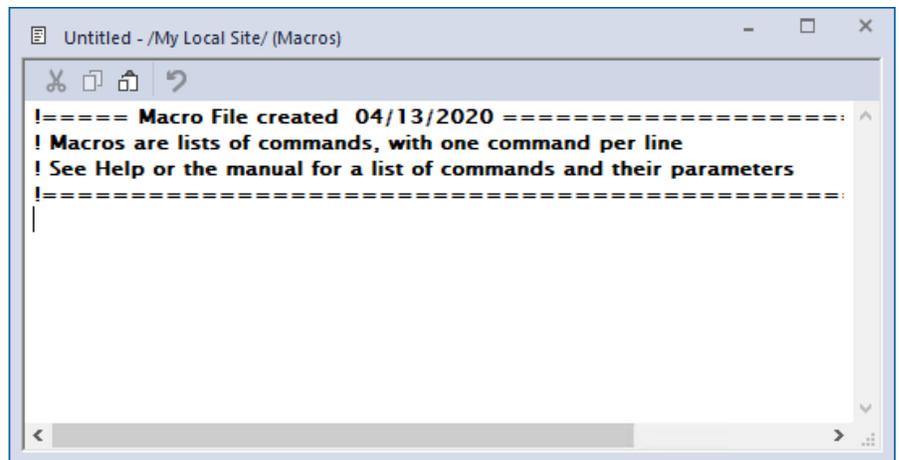
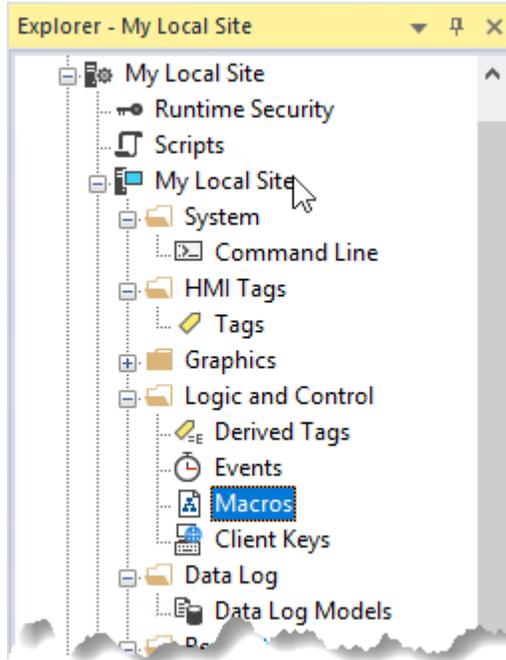
Create a startup macro for the Banner display

This section describes how to create a startup macro. You will use the macro when you configure the FactoryTalk View Site Edition Client. See [Monitor and interact with alarms at runtime on page 82](#).

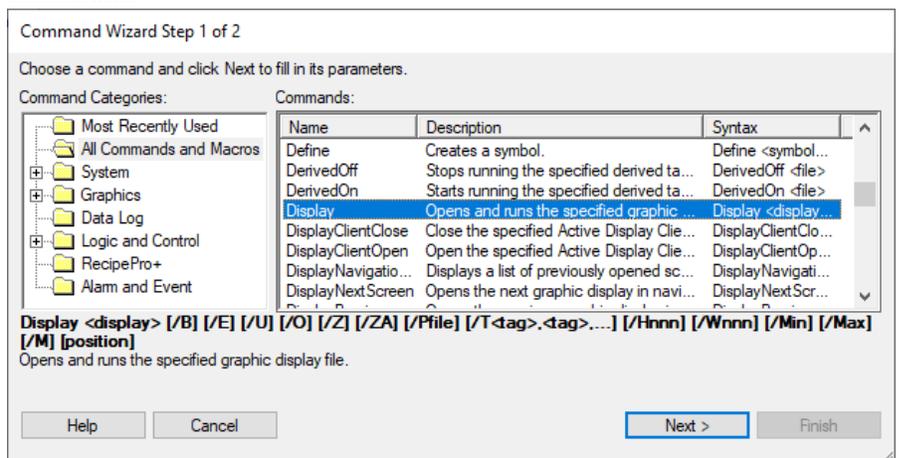
Step 1. Configure a startup macro

This startup macro docks the Banner display to the bottom of the FactoryTalk View SE Client window.

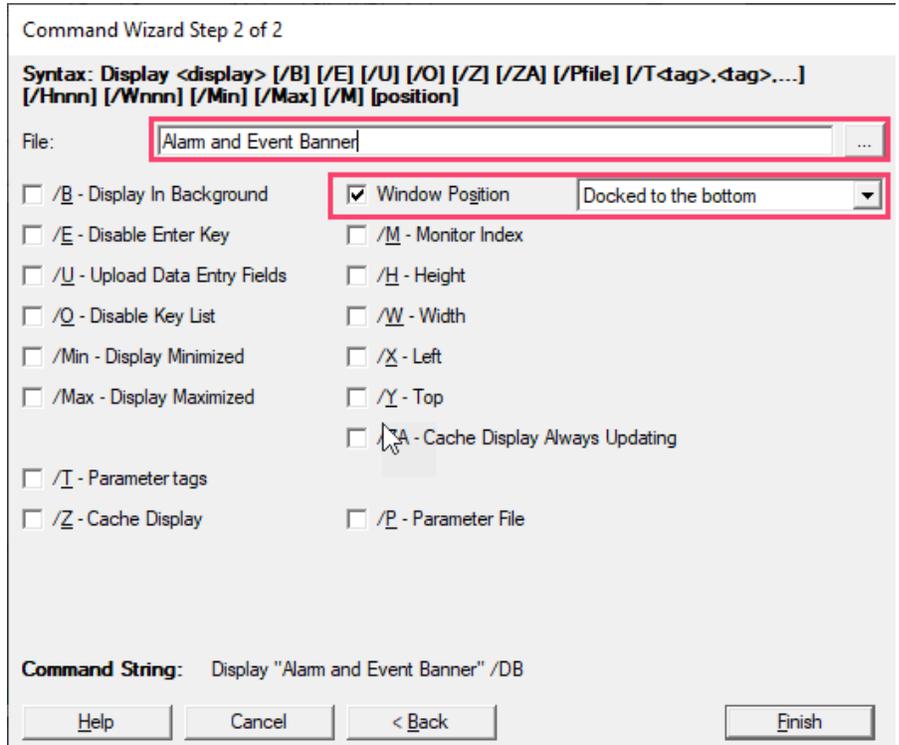
1. In FactoryTalk View Studio, in the **Explorer** window, right-click **Macros** and then click **New** to open the editor.



2. To open the **Command Wizard**, double-click anywhere in the body of the macro editor.
3. In the **Command Wizard**, scroll down the list of commands on the right side of the wizard, click **Display**, and then click **Next**.



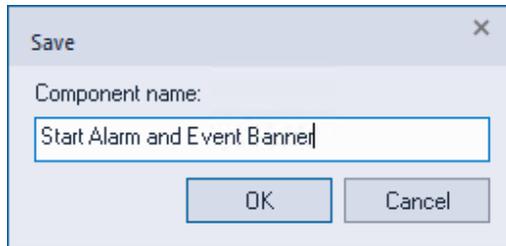
- In the **File** list, click **Alarm and Event Banner**.



- Select the **Window Position** check box. Scroll down the list on the right and then select **Docked to the bottom**.
- To save the Display command and add it to the macro, click **OK**.

Step 2. Save the macro

- On the **File** menu, click **Save**.
- In the **Save** dialog box, type a name for the new macro and then click **OK**. In this example, we use **Start Alarm and Event Banner**.



Create an Automatic Diagnostic Event Summary

Use the Automatic Diagnostic Event Summary object to subscribe to and show diagnostic events collected by Rockwell Automation controllers via Ethernet. It is enabled by the Automatic Diagnostics feature.

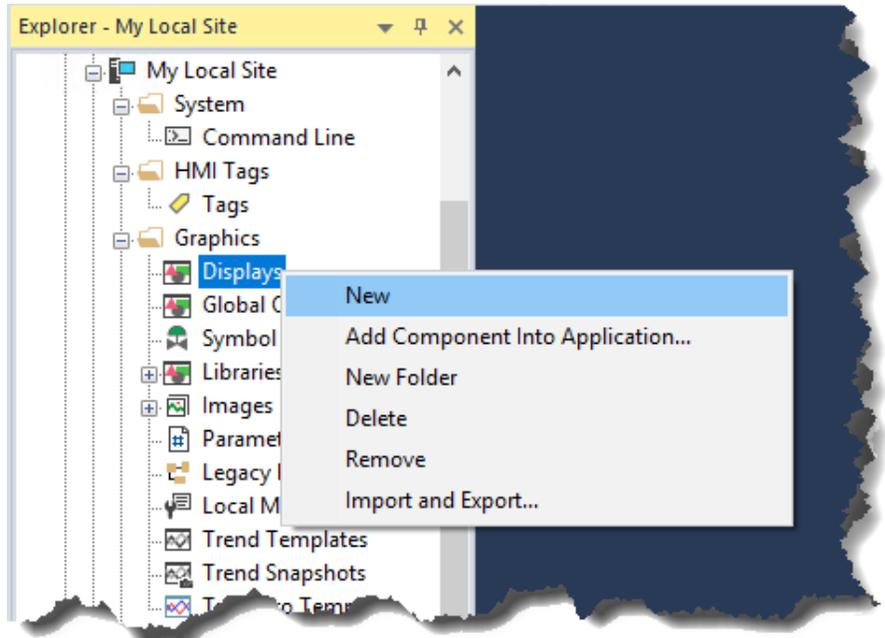
Automatic Diagnostics is supported only on Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers, and the firmware revision must be 33 or later.

With the Automatic Diagnostic Event Summary, you can suppress, unsuppress, filter, and sort diagnostic events at runtime.

You can use FactoryTalk Security to control which users can suppress or unsuppress events at runtime in an application (or in an area). To do this, right-click the application (or area) and then click **Security**. For details, see the *FactoryTalk Security System Configuration Guide*.

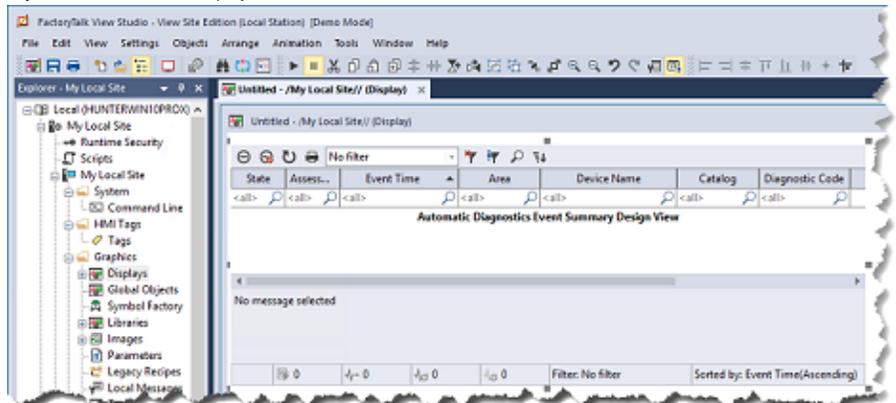
Step 1. Create a new graphic display

1. In the **Explorer** window, expand the **Graphics** folder.
2. Right-click **Displays**, and then click **New**.



Step 2. Add an Automatic Diagnostic Event Summary object to the display

1. On the **Objects** menu, point to **Alarm and Event**, click **Automatic Diagnostic Event Summary** (or, in the toolbox, select **Automatic Diagnostic Event Summary**), and then place the cursor approximately where the object is to be on the display.
2. Hold the left mouse button down and drag it to create a rectangle the size that the Automatic Diagnostic Event Summary should be.
3. When the object the desired size, release the left mouse button. The Automatic Diagnostic Event Summary object is drawn on the display.

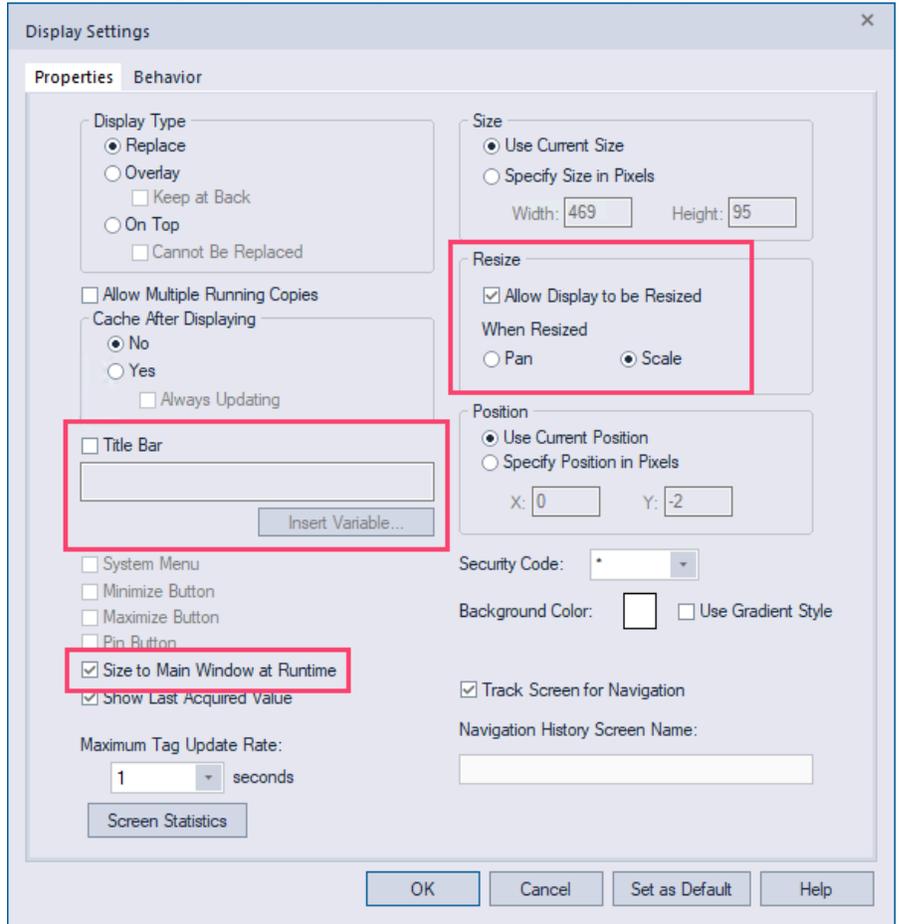


Step 3. Configure the properties of the Automatic Diagnostic Event Summary

- To open the **Automatic Diagnostic Event Summary Properties** dialog box, right-click the Automatic Diagnostic Event Summary object. For details about all of the properties in the dialog box, click **Help**.

Step 4. Change the display settings for the Automatic Diagnostic Event Summary display

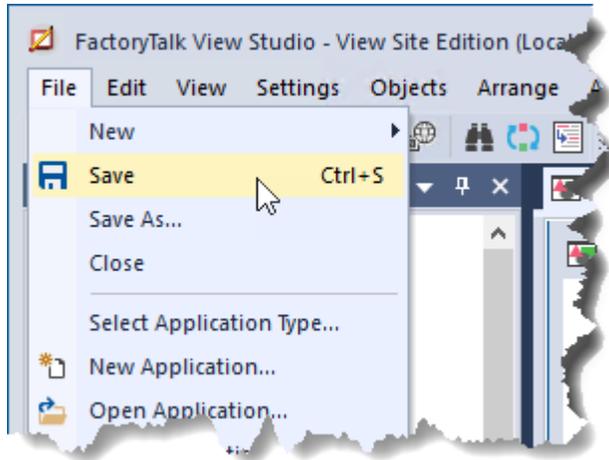
- On the **Edit** menu, click **Display Settings**.
- In the **Display Settings** dialog box, on the **Properties** tab, make the following changes, and then click **OK**:



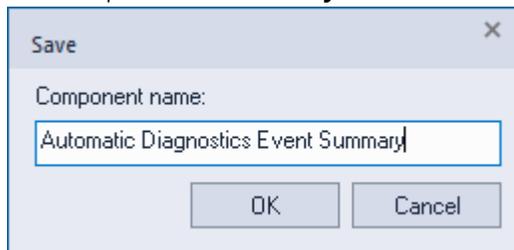
- Clear the **Title Bar** check box.
- Select **Size to Main Window at Runtime**.
- Select **Allow Display to be Resized**.
- Under **When Resized**, select **Scale** if it is not already selected.

Step 5. Save the graphic display

1. On the **File** menu, click **Save**.



2. In the **Save** dialog box, type a name for the graphic display and then click **OK**.
In this example, we use **Automatic Diagnostic Event Summary**.



3. Close the graphic display.

Use color animation to indicate alarm state changes

In this section, you use alarm expressions in FactoryTalk View to animate a rectangle on a graphic display so that it changes color when the alarm state changes at runtime:

- If there are active unacknowledged alarms, the rectangle flashes red.
- If all active alarms have been acknowledged, the rectangle is a steady red.
- If there are no active alarms but there are normal unacknowledged alarms, the rectangle is yellow.
- If there are no active or unacknowledged alarms, the rectangle is green.

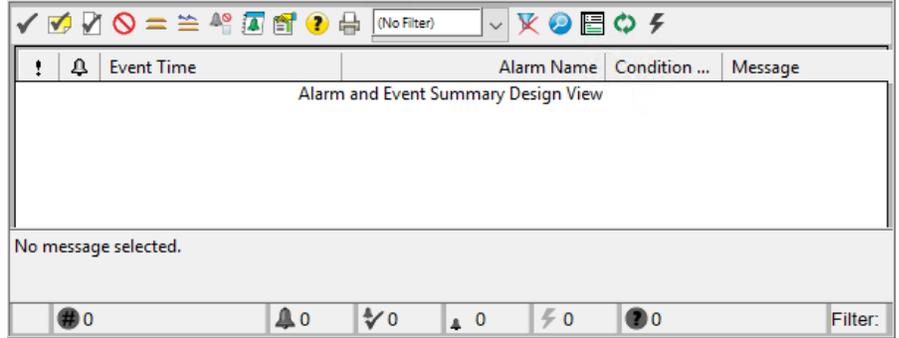
Step 1. Create a new graphic display

1. In the **Explorer** window, expand the **Graphics** folder.
2. Right-click **Displays**, and then click **New**.

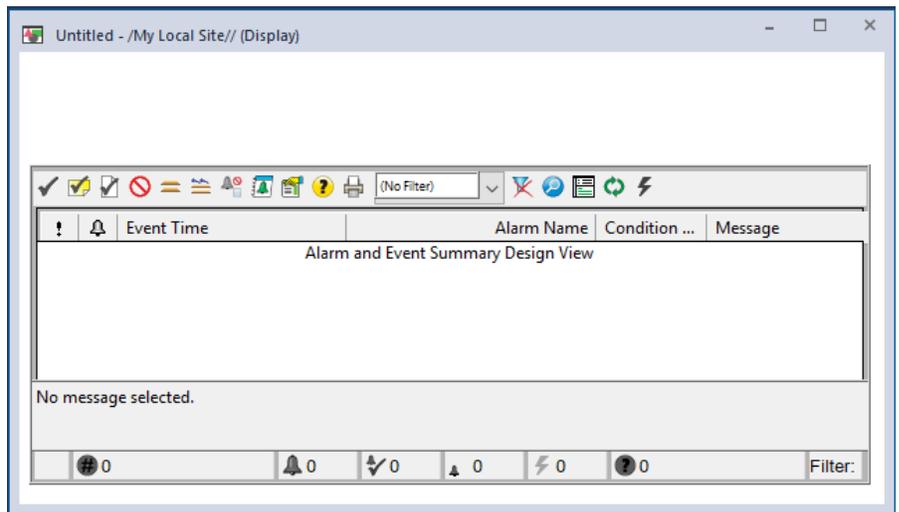
Step 2. Add an Alarm and Event Summary to the graphic display

1. On the **Objects** menu, point to **Alarm and Event**, and then click **Summary** (or in the toolbox, click **Alarm and Event Summary**).
2. Hold the left mouse button down and drag it to create a rectangle the size that the Alarm and Event Summary object should be.

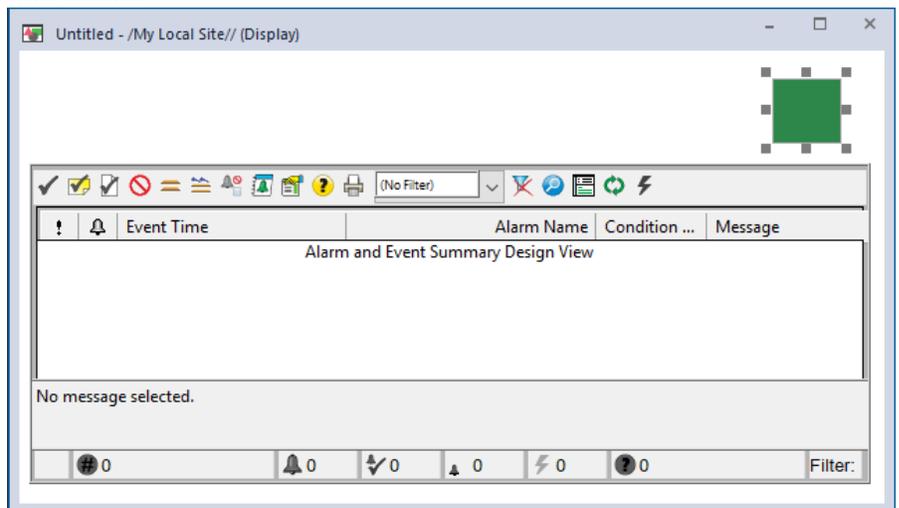
- When the object is the desired size, release the left mouse button. The Alarm and Event Summary object is drawn on the display.



- If necessary, resize either the Alarm and Event Summary object or the graphic display to expose enough white space at the top, bottom, or on one side to add a rectangle object that will be the alarm status indicator.



- On the **Objects** menu, point to **Drawing** and then click **Rectangle**.
- In the graphic display, hold down the left mouse button and then drag the mouse to draw a box for the alarm status indicator.



Step 3. Add an expression to animate the rectangle

1. Right-click the rectangle, point to **Animation** and then click **Color**.

To create an expression for the color animation, you can compose the expression step by step, as explained in the following steps, or you can type the following expression in the **Expression** box:

If AE_InAlmUnackedCount("*") > 0 Then 0 Else

If AE_InAlmAckedCount("*") > 0 Then 1 Else

If AE_NormalUnackedCount("*") > 0 Then 2 Else 3

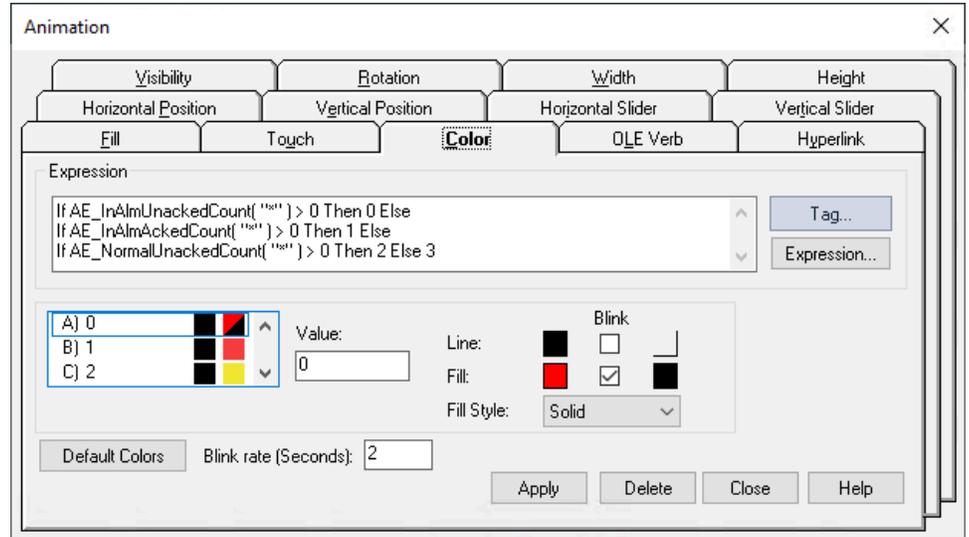


Tip:

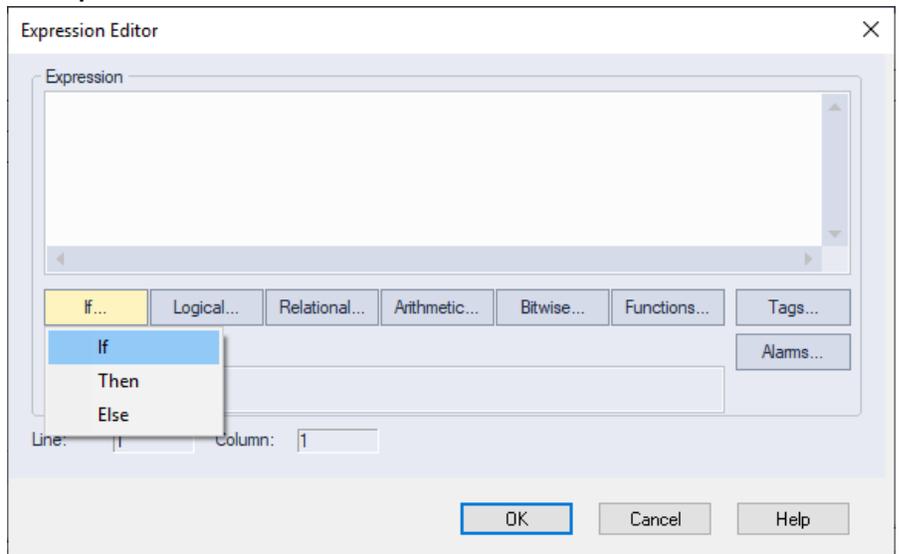
In the preceding expression, "*" means include all alarms that are in the same location (area) as the HMI server. If the preceding expression is used in a network station application or network distributed application with areas, the expression would include all alarms from the alarm servers that are located in the same area as the HMI server.

If you want to include alarms from other areas, use the absolute path syntax. For example, **("/AreaName::*")**.

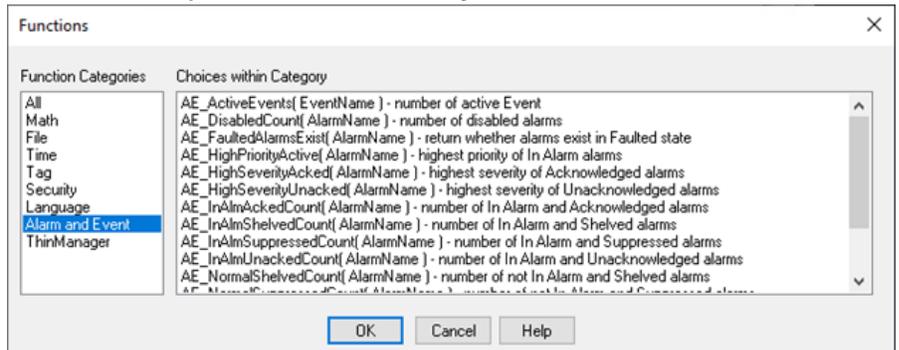
If you type the expression instead of composing it, skip to the next major step "Step 4. Set up colors for the alarm states" to apply colors to each state.



1. In the **Animation** dialog box, click **Expression**.
2. In the **Expression Editor**, click the **If** button and then click **If** to add the IF condition.



3. In the **Expression Editor**, click **Functions**.
4. In the **Functions** dialog box, in the list of **Function Categories**, click **Alarm and Event**.



5. In the list of functions on the right, click **AE_InAlmUnackedCount(AlarmName)**, and then click **OK**.

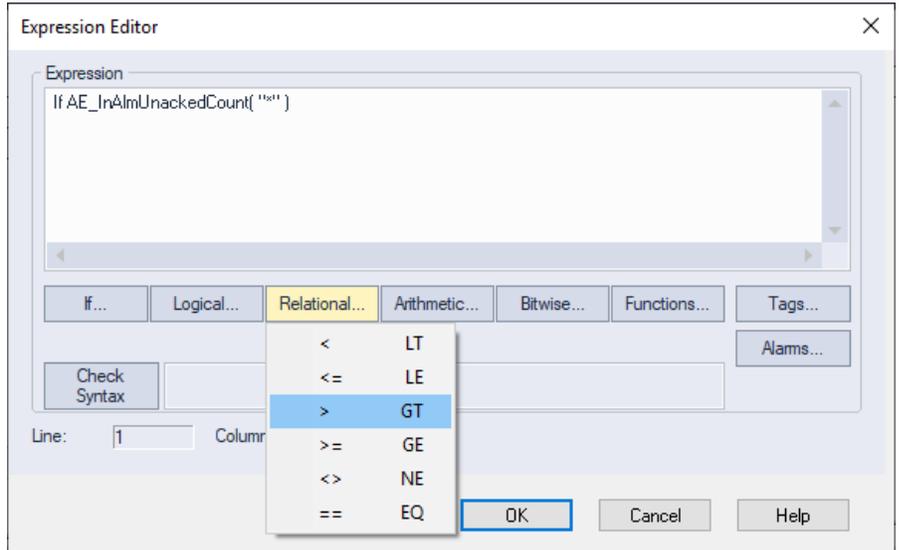
- In the **Expression Editor**, the **AE_InAlmUnackedCount()** function appears in the **Expression** box, with the cursor between the parentheses. Next, type "*" to return a count of all alarms that are in the same location (area) as the HMI server and are in the In Alarm and Unacknowledged state. Next, move the cursor to the right of the closing parenthesis.

To count the number of instances of a specific alarm, you can type a tag name instead of the asterisk.

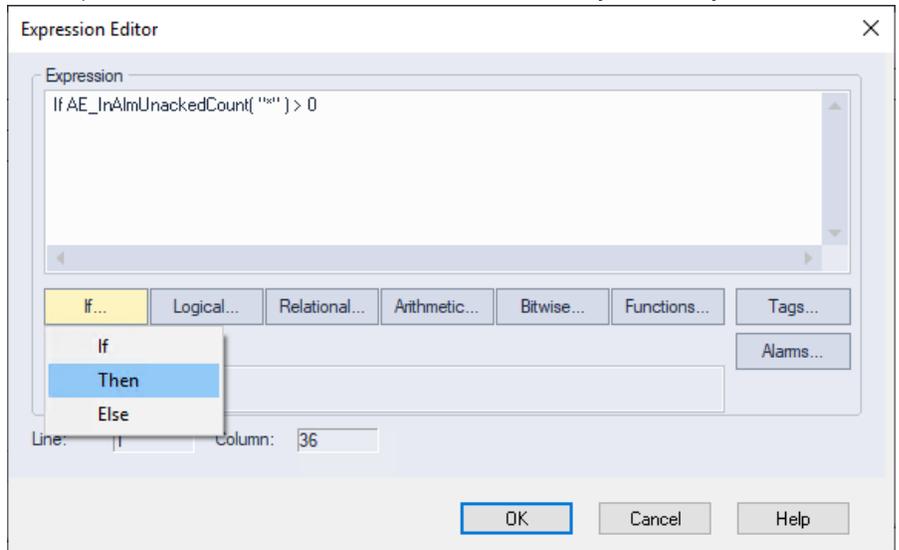
To include alarms from other areas, use the absolute path syntax. For example,

("/AreaName:*").

- Click **Relational** and then click **> GT** for *greater than*.

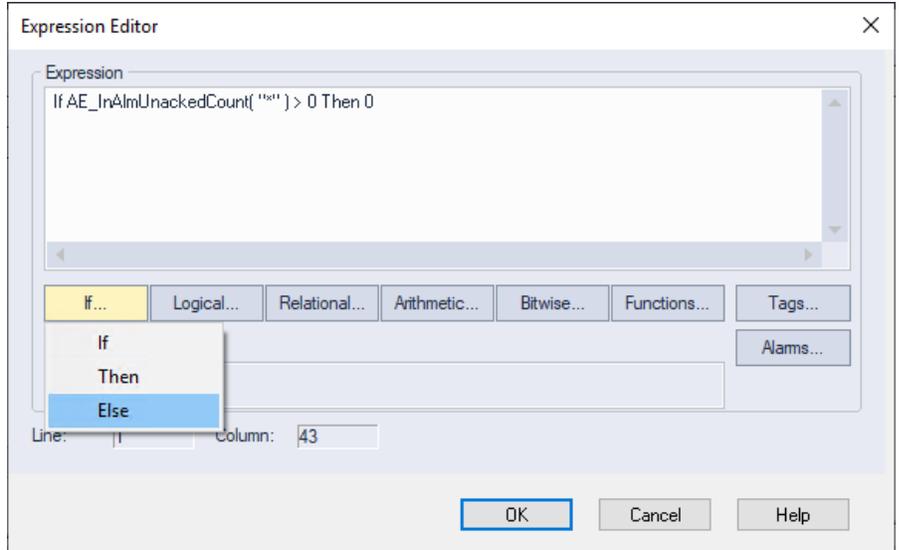


- In the **Expression** box, type **0**, click **If** and then click **Then** to add a THEN condition. This completes the IF condition: "If the number of In Alarm, Unacknowledged alarms is greater than 0..."



- In the **Expression** box, type **0**, click **If** and then click **Else** to add an ELSE condition.

This completes the THEN condition: "If the number of In Alarm, Unacknowledged alarms is greater than 0, then animate the rectangle to show the colors for state 0."



- Follow the same process, substituting the necessary selections to add the remaining two expressions, and then click **OK**.

If AE_InAlmAckedCount(\"\") > 0 Then 1 Else (animates the rectangle to show the colors for state 1)

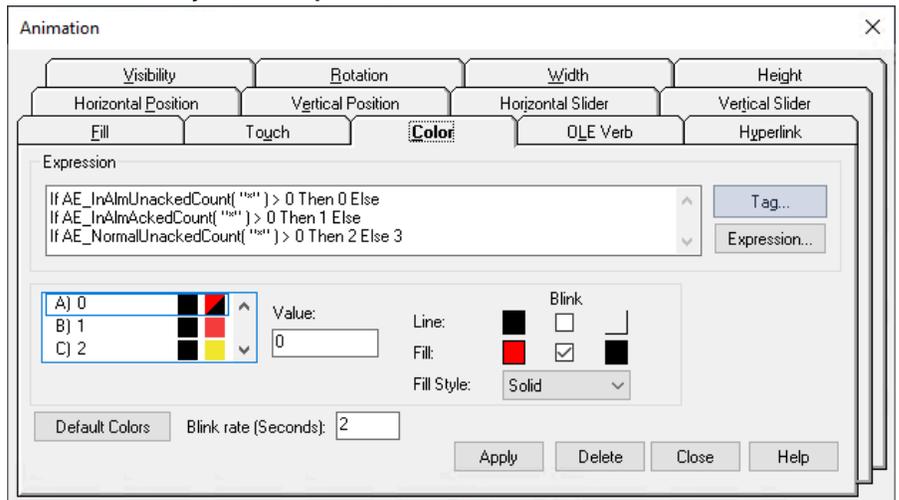
If AE_NormalUnackedCount(\"\") > 0 Then 2 Else 3 (animates the rectangle to show the colors for state 2.)

If none of the conditions are true, the expression animates the rectangle to show the colors for state 3.)

Step 4. Set up colors for the alarm states

This step describes how to set up colors for the rectangle for each solution to the expression.

- In the **Animation** dialog box, under **Expression**, click state **A**.



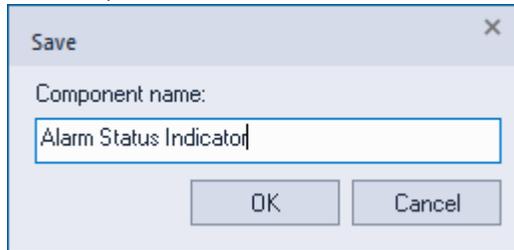
- In the Value box, type **0**.
- Beside **Fill**, select the **Blink** check box. A colored box is displayed so that you can specify an alternative color.
- Beside **Fill**, make sure the colored boxes are set to red (for the fill color) and black (for the blink/alternative color).

5. Set up the colors for the remaining states:
 - State **B**: Value = 1, Line = Black, Fill = Red
 - State **C**: Value = 2, Line = Black, Fill = Yellow
 - State **D**: Value = 3, Line = Black, Fill = Green
6. When you are finished setting up the colors, click **Apply** and then click **Close**.

Step 5. Save the graphic display

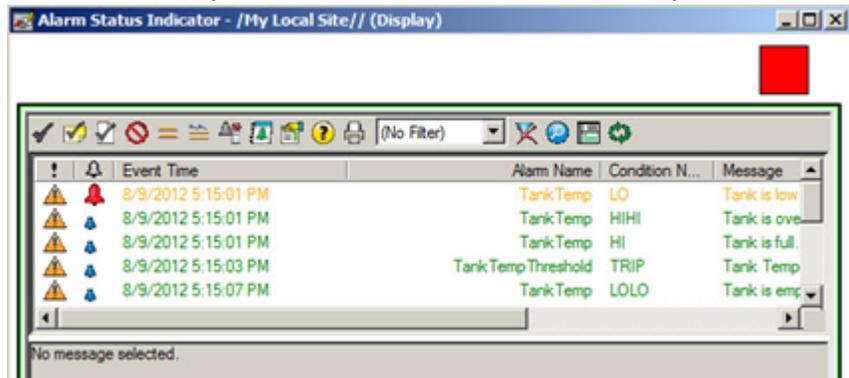
1. On the **File** menu, click **Save**.
2. In the **Save** dialog box, type a name for the graphic display and then click **OK**.

In this example, we use **Alarm Status Indicator**.

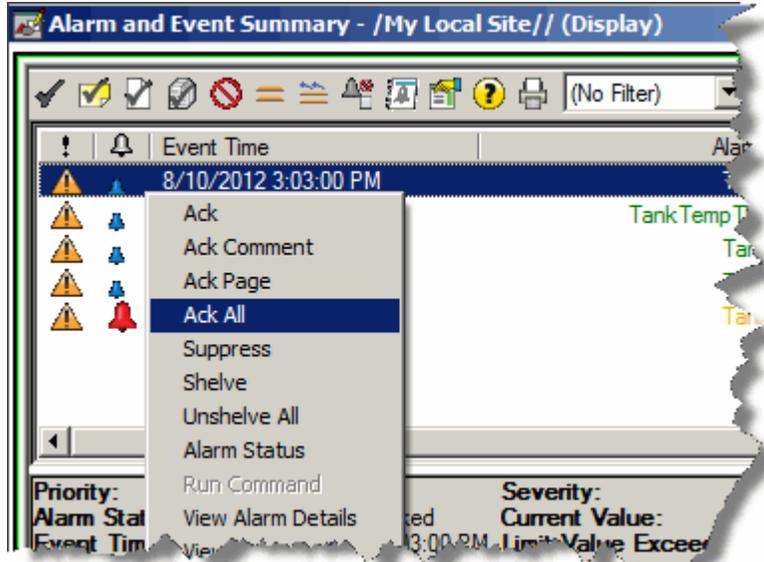


Step 6: Test run the display

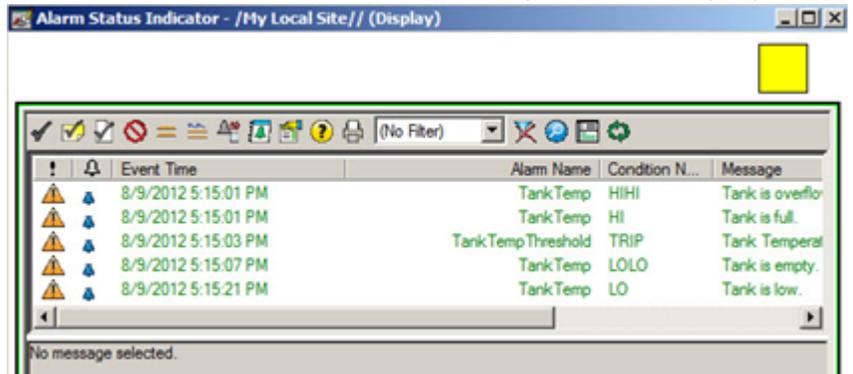
1. On the **View** menu, click **Test Display**, or click the **Test Display** button (shown at left) on the toolbar. If there are unacknowledged alarms whose alarm condition is In Alarm, the rectangle flashes red.



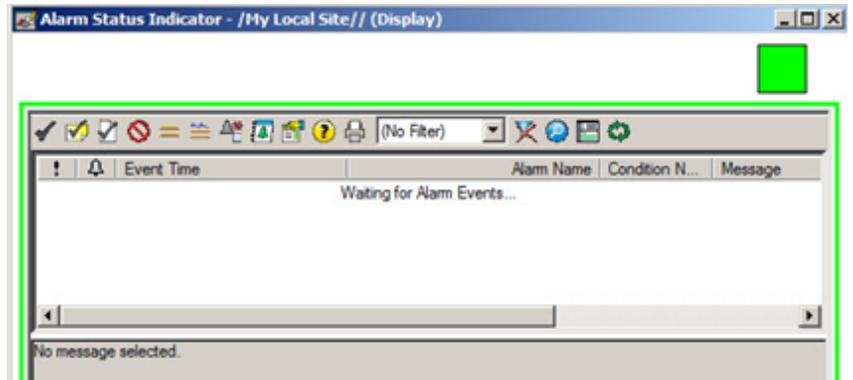
2. Right-click one of the alarms, and then click **Ack All**. Because all active alarms have been acknowledged, the rectangle changes to a steady red.



3. Continue experimenting to observe the effects of acknowledging alarms:
 - If there are no active alarms, but there are normal unacknowledged alarms, the rectangle is yellow.



- If there are no active or unacknowledged alarms, the rectangle is green.



4. When you are finished, on the **View** menu, click **Edit Display**, or click the **Edit Display** button  on the toolbar.

Next steps

Do one of the following:

- Use the graphic displays you just created to monitor and interact with alarms and events. See [Monitor and interact with alarms at runtime on page 82](#).
- Set up historical alarm and event logging. See [Set up historical alarm and event logging on page 100](#).

Monitor and interact with alarms at runtime

To interact with alarms and events at runtime, set up a FactoryTalk View Site Edition Client and configure one or more graphic displays that host Alarm and Event objects. Next, run the client and then monitor the alarms and events that are shown.

Before you begin

- Be sure you have defined alarms as described in [Define device-based alarms in Studio 5000 controllers on page 29](#).
- Add the required server, as described in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#), [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#), [Add an OPC data server for third-party controllers on page 45](#), or [Add FactoryTalk Linx OPC UA Connector for third-party OPC UA servers on page 55](#).
- Set up and configure any graphic display objects as described in [Set up graphic displays on page 58](#).

What you need

- FactoryTalk Linx software
- FactoryTalk View SE software
- FactoryTalk View SE Client software

Follow these steps

Follow these steps to monitor and interact with alarms during runtime:

- Set up graphic displays
- Run FactoryTalk View SE Client wizard and create a configuration file
- Run the FactoryTalk View SE Client
- Monitor graphic displays with Alarm and Event objects
- Acknowledge an alarm
- Disable and enable an alarm
- Suppress and unsuppress an alarm
- Set up historical alarm and event logging

Create and then run a FactoryTalk View Client configuration

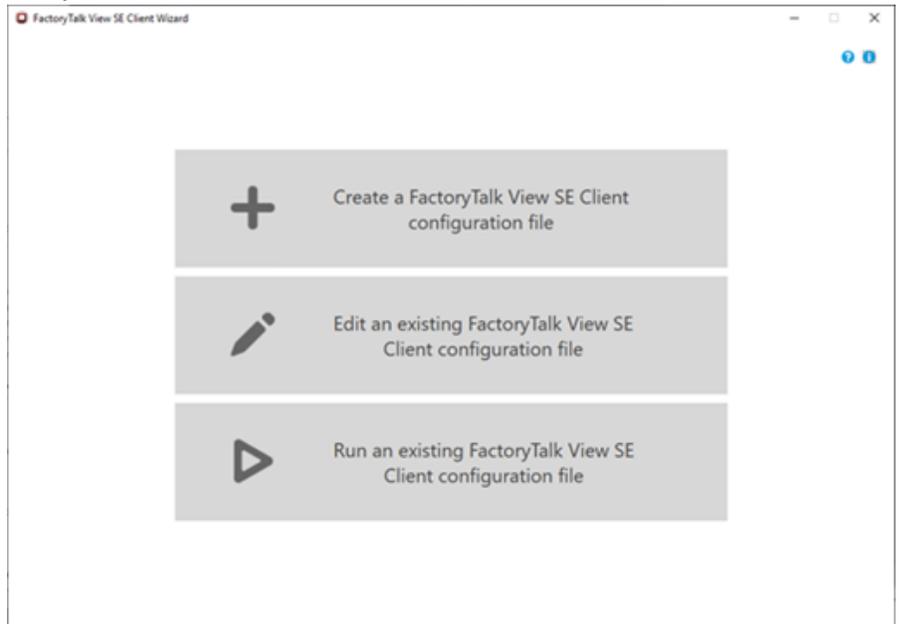
To run an application and monitor graphic displays for alarm messages, start the FactoryTalk View Site Edition Client.

IMPORTANT: For this example, be sure that the controller is running the West_Plant_Controller program that we created in Chapter 4, and that you have tripped the alarm (right-click the rung contact and then click **Toggle Bit**).

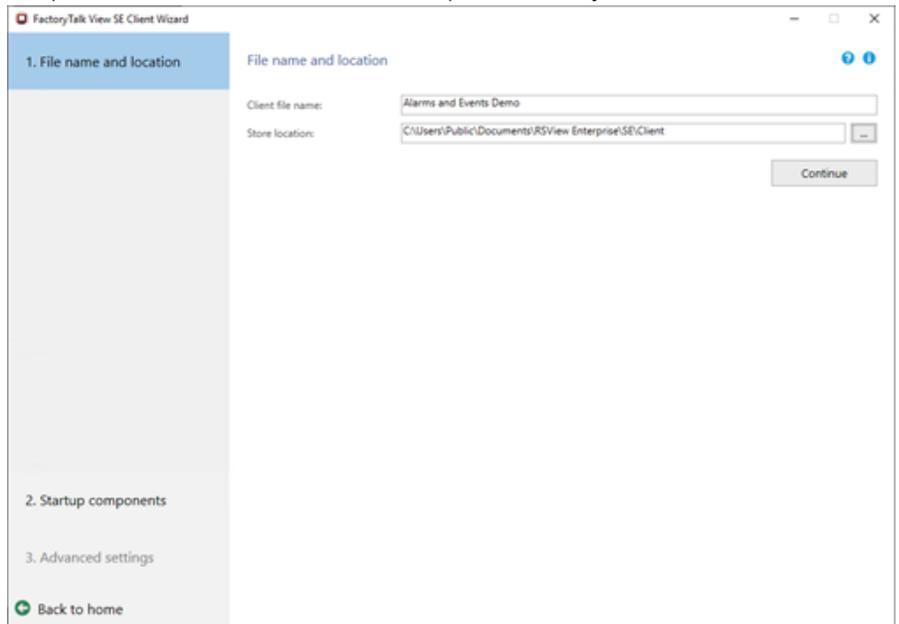
Step 1. Create a FactoryTalk View Site Edition Client configuration file

1. To open the **FactoryTalk View SE Client Wizard**, in Windows, click **Start > Rockwell Software >**

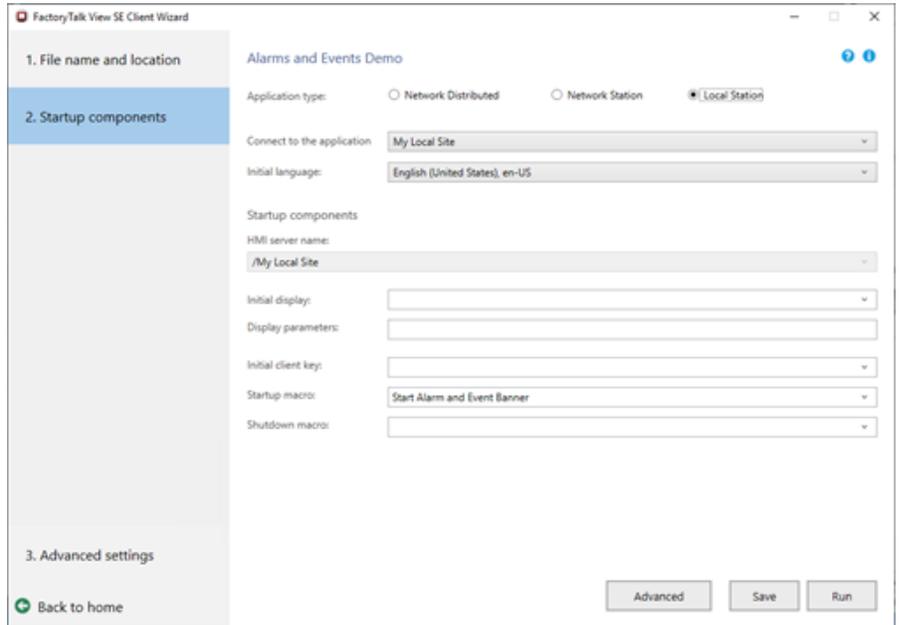
FactoryTalk View Site Edition Client.



2. In the **FactoryTalk View SE Client Wizard**, click **Create a FactoryTalk View SE Client configuration file**.
3. On the **File name and location** page, in **Client file name**, type a name for the configuration file. In this example, we used **Alarms and Events Demo**. Select a path for the configuration file and click **Continue**.



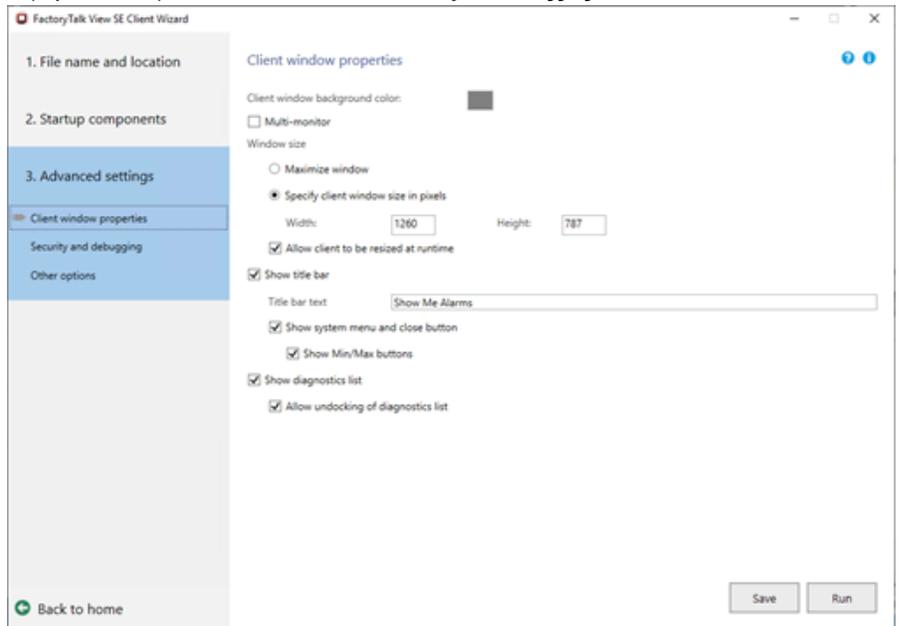
- On the **Startup components** page, select **Local Station**.



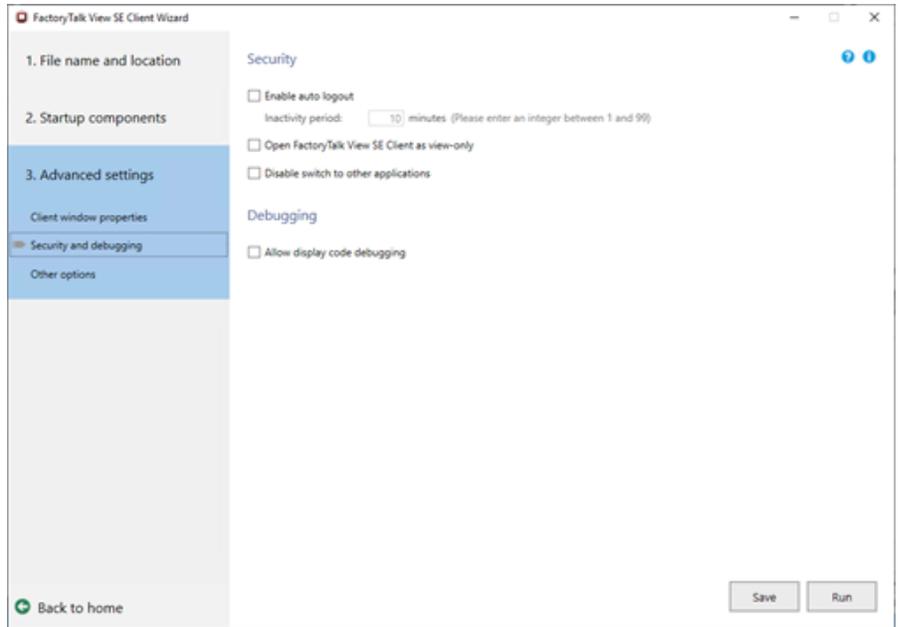
In the **Connect to the application** list, select the name of the application you plan to connect to. In this example, use the **My Local Site** application created in [Set up graphic displays on page 58](#).

In the **Startup macro** list, select **Start Alarm and Event Banner**, and then click **Advanced**.

- On the **Client window properties** page, configure how the FactoryTalk View SE Client window will look at runtime. In this example, we entered **Show Me Alarms** in the **Title bar text** box. At runtime, this text is displayed at the top of the Client window. Click **Security and debugging**.



6. On **Security and debugging** page, you can configure the Client to log out automatically after a period of inactivity.

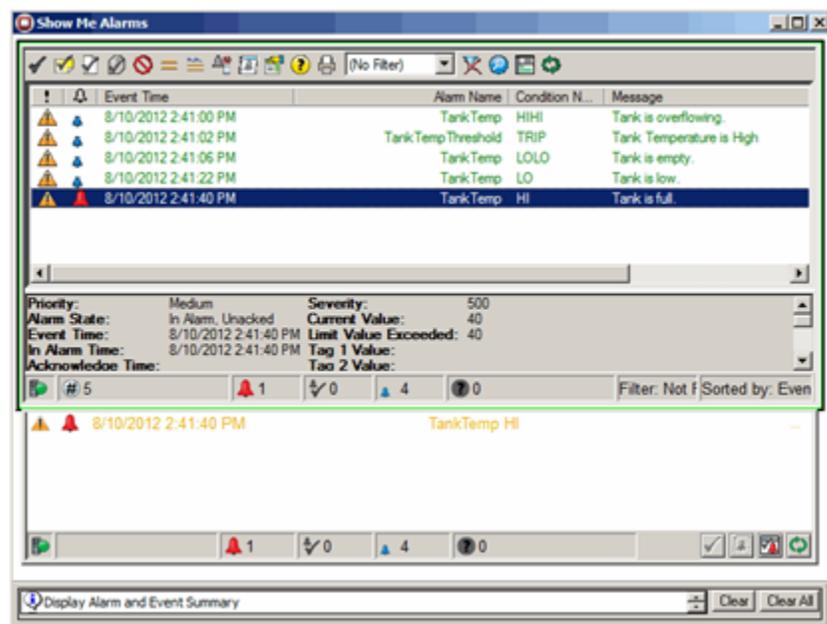


7. Click **Save**, and then **Run**.

The Client window opens with the Alarm and Event Banner docked at the bottom.

Step 2. Open the Alarm and Event Summary from the Alarm and Event Banner

In the Alarm and Event Banner, click the **Alarm and Event Summary** button (shown at left). The Alarm and Event Summary opens, and is similar to the following graphic display.



Step 3. Next steps

Do either of the following:

- Monitor and interact with alarms and events as shown in the next section.
- Set up historical logging for alarms and events using the graphic displays and startup macros created in this chapter and in [Set up graphic displays on page 58](#). See [Set up historical alarm and event logging on page 100](#).

Monitor alarms and events

The data fields in the Alarm and Event Banner window are organized in columns, and represent various alarm and event data. At runtime, only the columns that were configured at design time to be visible are displayed in the Alarm and Event Banner.



In this example, the alarm list shows these columns:

- Priority - Medium
- Alarm State - In Alarm and Unacknowledged
- Event time and date stamp
- Message

The status bar shows (from left to right):



The connection status of the Tag Alarm and Event Server – whether connected or disconnected from the Alarm and Event Banner. The green icon shows that the Tag Alarm and Event Server is connected. When disconnected, the icon flashes red.



The number of alarms that are In Alarm and Unacknowledged



The number of alarms that are In Alarm and Acknowledged



The number of alarms that are Normal and Unacknowledged



The number of alarm faults

For all of the possible priorities and alarms states that can be shown in the Alarm and Event objects, see *FactoryTalk Alarms and Events Help*.

Security for alarms and events

You can use FactoryTalk Security to control which users can acknowledge, enable, disable, reset, suppress, or shelve alarms at runtime in an application (or in an area).

To do this, in FactoryTalk View Studio or FactoryTalk Administration Console, right-click the application (or area) where the alarms are located and then click **Security**. For details, see the *FactoryTalk Security System Configuration Guide*. In Windows, click **Start > Rockwell Software > FactoryTalk Security System Configuration Guide**.

Acknowledge an alarm

When you acknowledge an alarm it does not correct the condition causing the alarm, but it indicates that an operator is aware of the alarm.



Tip: The **Digital Alarm Properties**, **Level Alarm Properties**, and **Deviation Alarm Properties** dialog boxes each contain a **Control Tags** tab that allows you to acknowledge alarms by using tags in the controller (remote acknowledgment).

- At runtime, the alarm state in graphic objects changes to Acknowledged when the remote acknowledge tag value is changed to positive.
- The alarm import and export functions support remote acknowledgment.

See *FactoryTalk Alarms and Events Help* for more information on using the **Control Tags** tab.

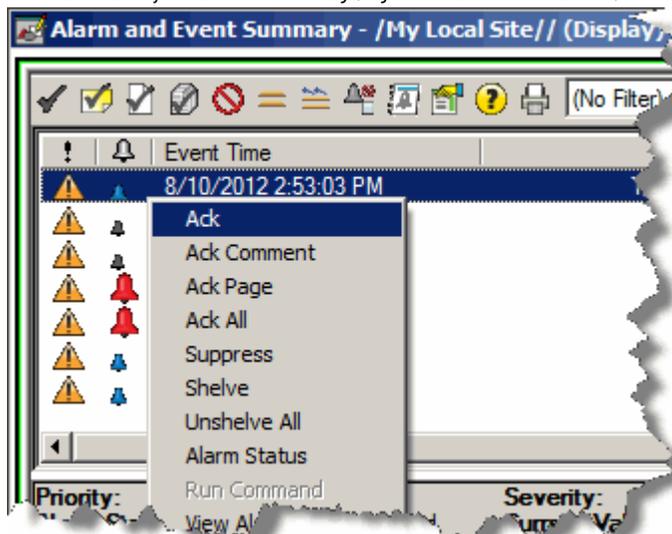
A single tag might have several alarm conditions In Alarm. Each alarm condition must be acknowledged separately. For example, a tag that monitors a temperature might trigger HI and HIIH alarm conditions by the time it is acknowledged. The alarm could also go In Alarm and Out of Alarm several times before it is acknowledged.

Previous occurrences of an alarm that have gone Out of Alarm and then back In Alarm cannot be acknowledged. These older occurrences are referred to as *out of scope* and are displayed in the alarm list with a different icon. When the most recent occurrence of an alarm is acknowledged, previous occurrences are removed from the alarm list.

Acknowledge the selected alarm

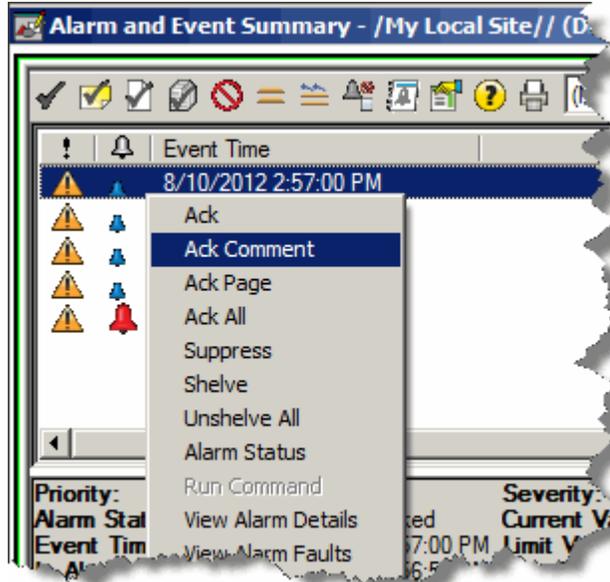
In the **Alarm and Event Summary** event list, do one of the following:

- Select the alarms you want to acknowledge, and then click the **Acknowledge selected alarm** button 
- Select the alarms you want to acknowledge, right-click the selected alarms, and then click **Ack**.

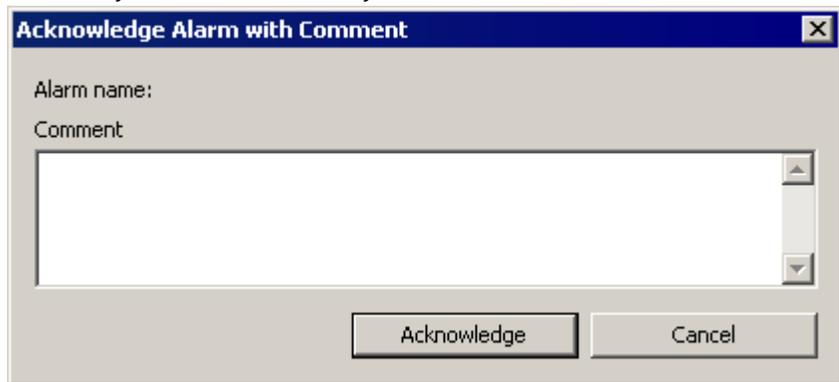


Acknowledge the selected alarm and enter a comment

1. In the **Alarm and Event Summary** event list, do one of the following:
 - Select the alarms you want to acknowledge, and then click **Acknowledge selected alarm with comment** 
 - Select the alarms you want to acknowledge, right-click the selected alarms, and then click **Ack Comment**.



2. In the **Acknowledge Alarm with Comment** dialog box, type a comment, and then click **Acknowledge**. If historical logging is set up, the comment is displayed in the Alarm and Event Log as part of the Tracking event that is generated from the Acknowledge command.

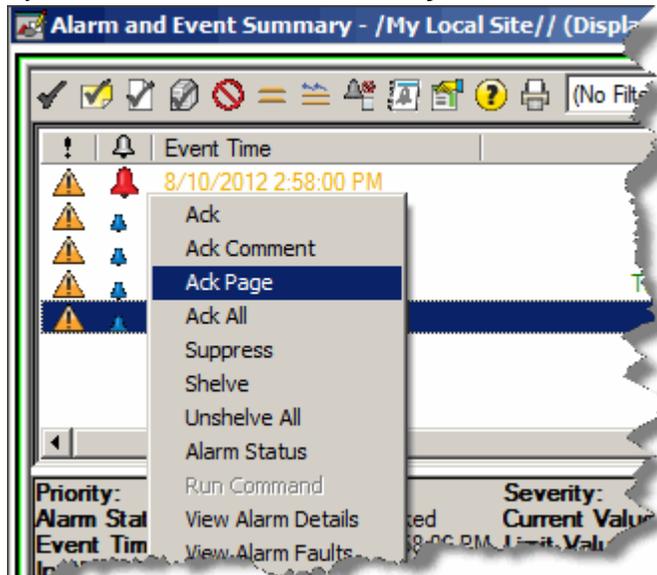


Tip: You can view the last comment that was entered for an operation (for example, ack, disable, suppress) in the **Alarm Details** dialog box. To view a comment associated with an alarm state, select an alarm and then click the **Show details for the selected alarm** button on the toolbar. In the **Alarm Details** dialog box, expand an alarm state (Disabled, Suppressed, Acknowledged, and so on) to view the comment associated with that state.

Acknowledge all of the alarms displayed on the page

In the **Alarm and Event Summary** toolbar, do one of the following:

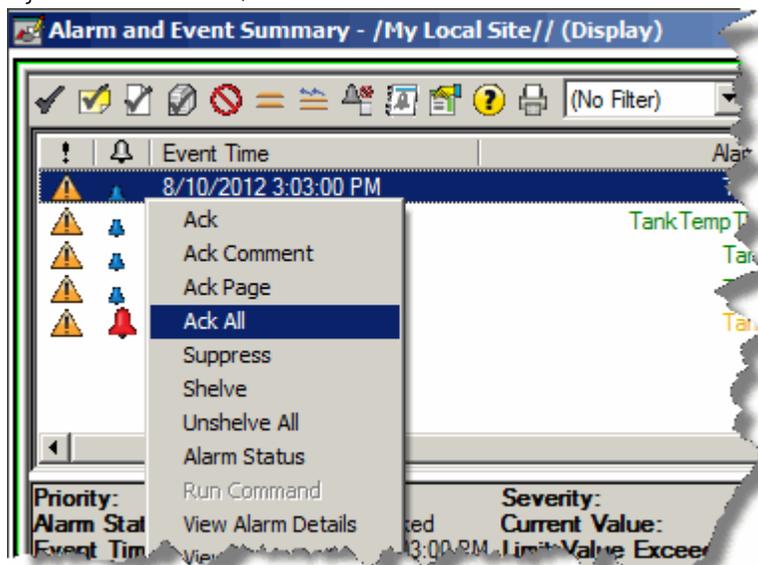
- Click **Ack page of alarms** . All alarms currently visible in the event list are acknowledged.
- Right-click one of the alarms and then click **Ack Page**.



Acknowledge all of the alarms in the event list

In the **Alarm and Event Summary** toolbar, do one of the following:

- Click **Acknowledge all alarms contained in list** . All alarms in the event list are acknowledged, even if they are not all visible. However, if the list is filtered, alarms that are filtered out are not acknowledged.
- Right-click one of the alarms, and then click **Ack All**.



Disable or enable an alarm

When an alarm is disabled the operator is not notified when the alarm condition occurs and the alarm is removed from the Alarm and Event Banner.

- An alarm that is disabled is effectively turned off in the controller.
- The alarm condition is no longer monitored and notifications are not generated by the controller.
- Disabled alarms do not sound the alarm bell in the Alarm and Event Banner.
- Unacknowledged disabled alarms are displayed in the Alarm and Event Summary.

Unlike a silenced alarm, a disabled alarm does not trigger the alarm bell in the Alarm and Event Banner if the alarm condition occurs again after the alarm was disabled.



Tip: Disable alarms that are related to equipment that is being shut down or serviced.

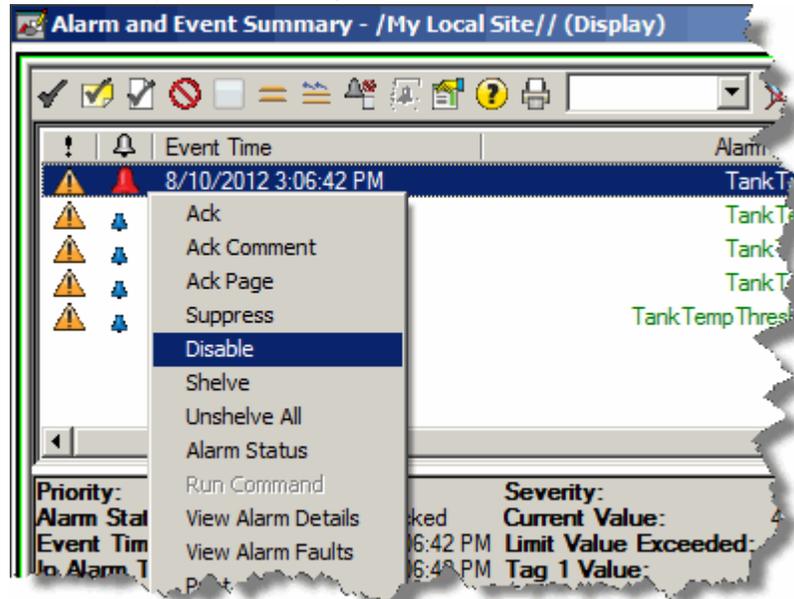
To enable alarms, use the **Alarm Status Explorer**. See [Enable selected alarms on page 92](#).

When an alarm is enabled, the operator is notified when the alarm condition occurs. Enabled alarms sound the alarm bell, and continue appearing as new events in the Alarm and Event Summary, unless they are suppressed.

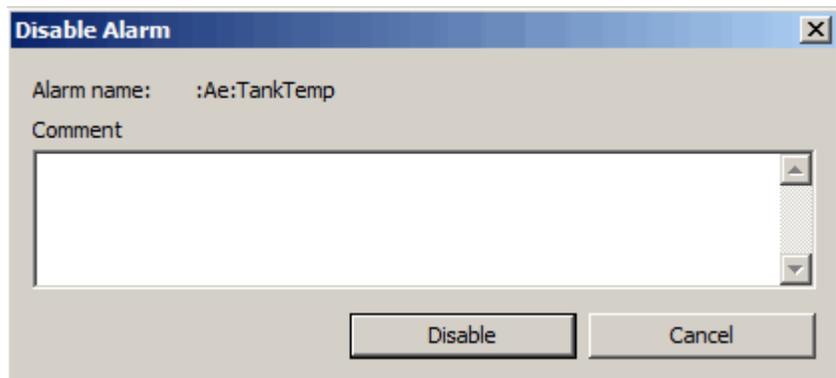
IMPORTANT: You can use FactoryTalk Security to control who can disable or suppress alarms. If a user attempts to perform an operation for which they do not have the required security rights, the operation will fail and a message will be displayed stating that the user has insufficient rights to perform the operation. To add another level of security, the Alarm and Event Summary can be configured not to show the toolbar buttons, which also hides those operations on the context (shortcut) menu.

Disable selected alarms

1. In the Alarm and Event Summary event list, do one of the following:
 - Select the alarms you want to disable, and then on the toolbar, click the **Disable selected alarm** button.
 - Select the alarms you want to disable, right-click the selected alarms, and then click **Disable**.



2. In the **Disable Alarm** dialog box, type a comment (for example, to explain why the alarm is disabled) and then click **Disable**.



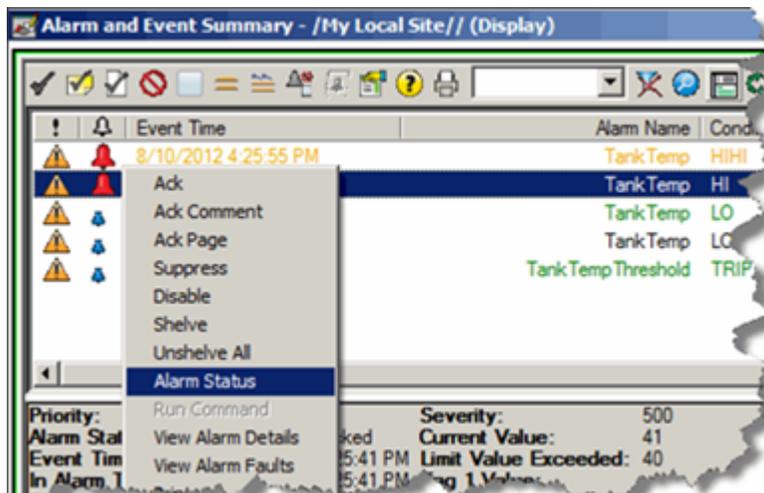
This comment is stored with the alarm and is logged to the Comment field in the Alarm and Event Log, which you can view using the Alarm and Event Log Viewer.



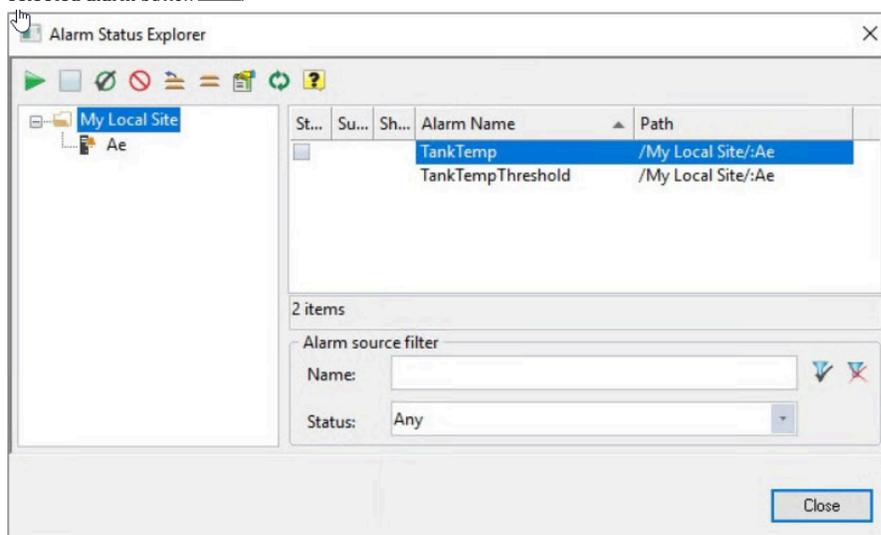
Tip: Any alarms you disable stay in that state until you enable them again. You must use the **Alarm Status Explorer** to enable alarms.

Enable selected alarms

- In the Alarm and Event Summary window, do one of the following:
 - If it is visible on the toolbar, click the **Display the Alarm Status Explorer** button 
 - If the toolbar button is not visible, right-click an alarm in the Alarm and Event Summary event list, and then click **Alarm Status**.



- In the **Alarm Status Explorer** window, select the alarms you want to enable and then click the **Enable selected alarm** button 



Any alarms you enable stay in that state until you disable them again.

For details about the other features of the **Alarm Status Explorer**, click **Help**  in the dialog box.

Suppress or unsuppress an alarm

You can suppress an alarm that is not needed temporarily, for example, suppress an alarm that is caused by another alarm that you are already addressing. You can suppress or unsuppress up to 2000 alarms at one time.

- A suppressed alarm is not displayed in the Alarm and Event Banner.
 - If an alarm is displayed in the Alarm and Event Banner and then suppressed, it is removed from the alarm list.
- An unacknowledged suppressed alarm is displayed in the Alarm and Event Summary.
 - If an alarm is displayed in the Alarm and Event Summary and then suppressed, it is *only* removed from the alarm list when it is acknowledged.

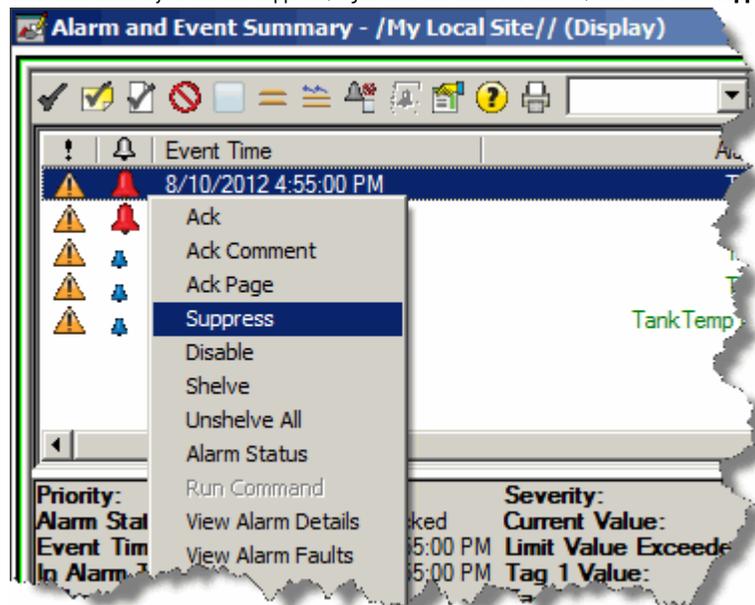
- A suppressed alarm continues to be logged in the alarm history log, which you can view using the Alarm and Event Log Viewer. See [Set up historical alarm and event logging on page 100](#) for more information.
- A suppressed alarm also continues to set the appropriate InAlarm parameters of an alarm instruction in the controller.

Disable an alarm instead of suppressing it if you want to completely turn off the alarm detection logic for the alarm source and prevent the alarm from being detected. See [Disable selected alarms on page 91](#).

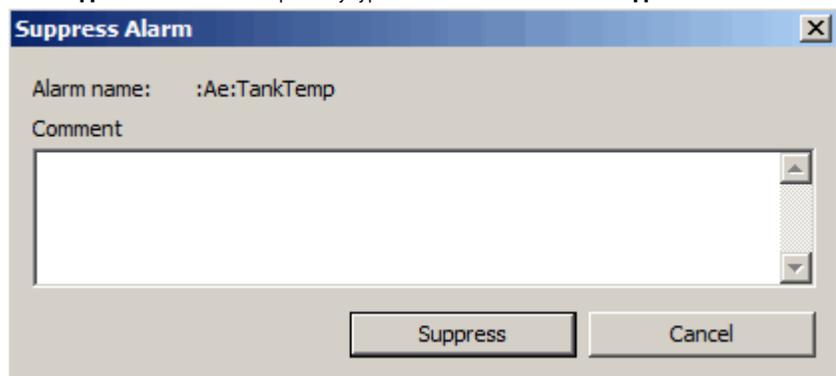
Suppress an alarm

1. In the **Alarm and Event Summary** event list, do one of the following:

- Select the alarms you want to suppress and then click the **Suppress selected alarm** button .
- Select the alarms you want to suppress, right-click the selected alarms, and then click **Suppress**.



2. In the **Suppress Alarm** window, optionally type a comment, and then click **Suppress**.



A comment is stored with the alarm and is logged to the **Comment** field in the Alarm and Event Log, which you can view using the Alarm and Event Log Viewer.

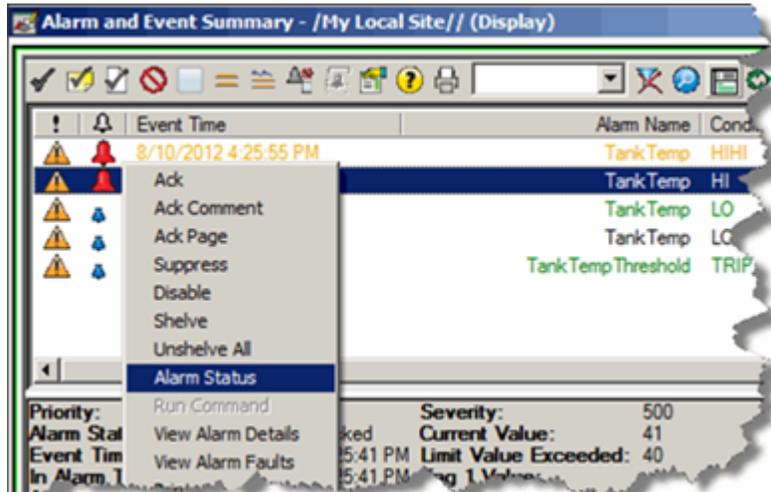
Unsuppress an alarm

Unsuppress an alarm that was previously suppressed if it now needs to be monitored again. For example, an operator might have suppressed an alarm because the alarm was caused by another alarm that an operator was already attending to.

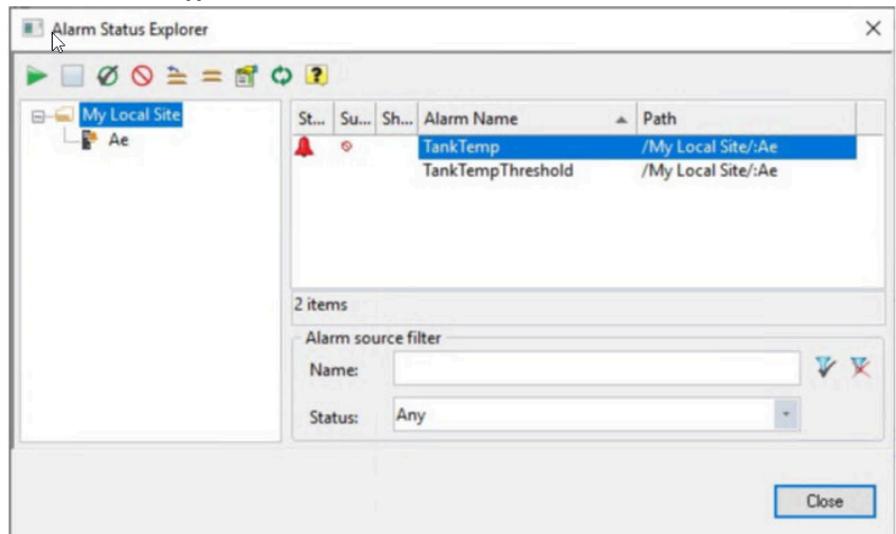
An unacknowledged suppressed alarm is displayed in the Alarm and Event Summary.

To unsuppress an alarm, follow these steps:

1. In the **Alarm and Event Summary**, right-click an alarm and then click **Alarm Status**.

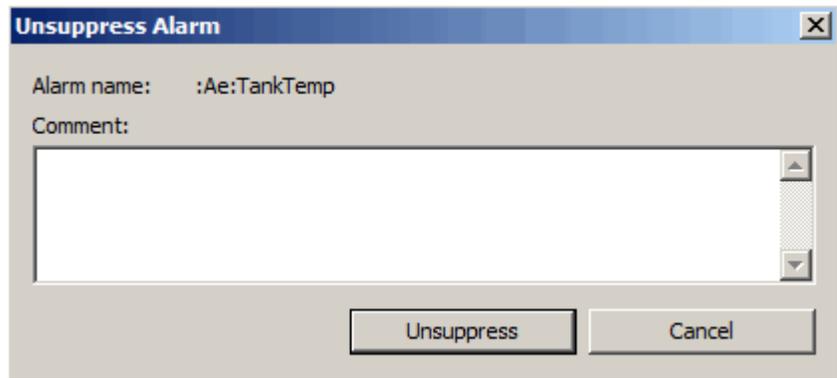


2. In the **Alarm Status Explorer** window, select the alarm or alarms you want to unsuppress, and then on the toolbar click the **Unsuppress selected alarm**  button.



Tip: You can filter alarm sources to make it easier to find the alarm you want. In the **Name** box, type all or part of an alarm name, or select an alarm status from the list. You can use the * and ? wildcard characters in the filter. For details about filtering alarm sources, see FactoryTalk Help. In Windows, click **Start > All Programs > Rockwell Software > FactoryTalk Help**.

- In the **Unsuppress Alarm** dialog box, optionally type a comment on why the alarm is unsuppressed, and then click **Unsuppress**.



This comment is stored with the alarm and is logged to the Comment field in the Alarm and Event Log, which you can view using the Alarm and Event Log Viewer if historical logging has been configured.

For details about the other features of the **Alarm Status Explorer**, click the **Help** button .

Shelve or unshelve an alarm

Shelving an alarm temporarily suppresses it. When shelving, the operator specifies a duration for the alarm to remain shelved. The alarm is automatically unshelved when the duration runs out.



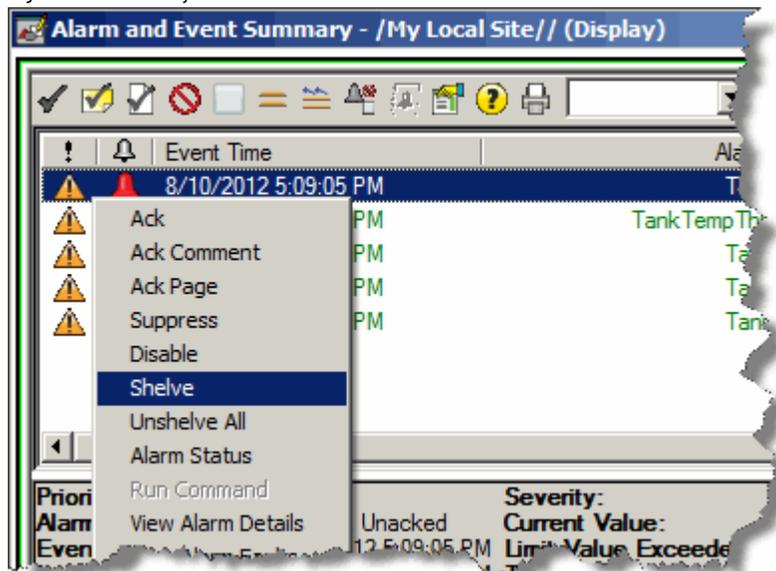
Tip: Shelving is supported in the Logix Designer application version 21 or later.

A shelved alarm is displayed in the Alarm and Event Summary or **Alarm Status Explorer**. However, a shelved alarm is not displayed in the Alarm and Event Banner.

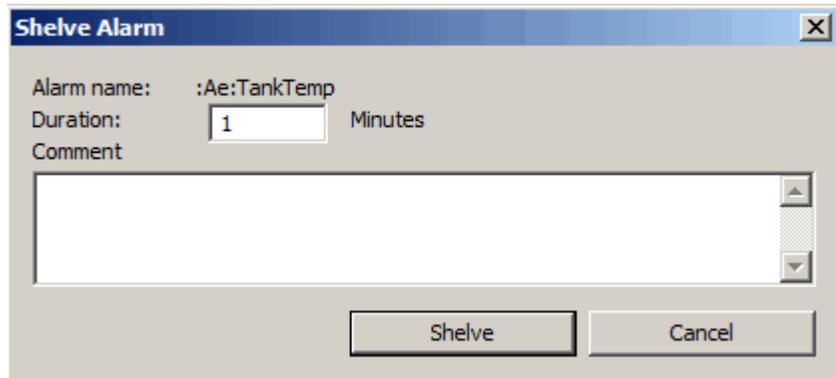
Disable an alarm, instead of shelving it, if you want to completely turn off the alarm detection logic for the alarm source, and prevent the alarm from being detected. See [Disable selected alarms on page 91](#) for more information.

Shelve an alarm

1. In the **Alarm and Event Summary** event list, do one of the following:
 - Select the alarm you want to shelve and click the **Shelve selected alarm** button  on the toolbar.
 - Right-click the alarm you want to shelve and select **Shelve**.



2. The **Shelve Alarm** dialog box appears.



In the dialog box, enter the following information if desired:

Field	Description
Alarm name	Shows the name of the selected alarm. If multiple alarms are selected, this shows as <i>Multiple (x alarms selected)</i> where x is the total count of selected alarms.
Shelve duration	Specifies the period of time the alarm should be shelved. Once the shelve duration expires, the alarm is unshelved. The value must be a whole number. <ul style="list-style-type: none"> ◦ Default: 1 ◦ Minimum: 1 ◦ Maximum: 2147483647
Comment	(optional) Specifies the reason for shelving the alarm.

Field	Description
	<p>The default value is empty. The maximum length is 512 characters.</p> <p>This comment is stored with the alarm and is logged to the UserComment field in the alarm database, which you can view using the Alarm and Event Log Viewer.</p>

- When complete, click **Shelve**.

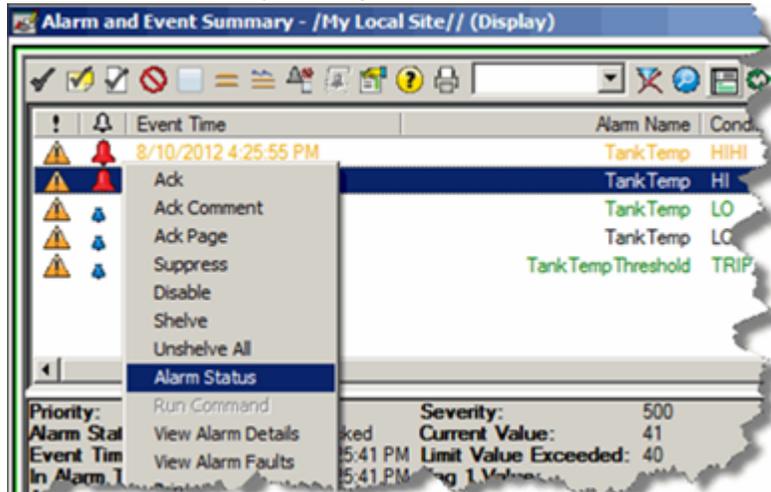
When you reshelve alarms, the conditions vary depending on the type of alarms:

Alarm type	Alarm condition
A digital alarm	The alarm is shelved with the new specified duration. The alarm unshelve time is also updated accordingly.
An analog alarm	<p>If one or more of the alarm conditions you reshelve were previously shelved, the alarm condition is shelved with the new specified duration and the alarm unshelve time is also updated accordingly.</p> <p>If none of the alarm conditions you reshelve were previously shelved, the alarm condition is shelved targeting to the old unshelve time.</p>

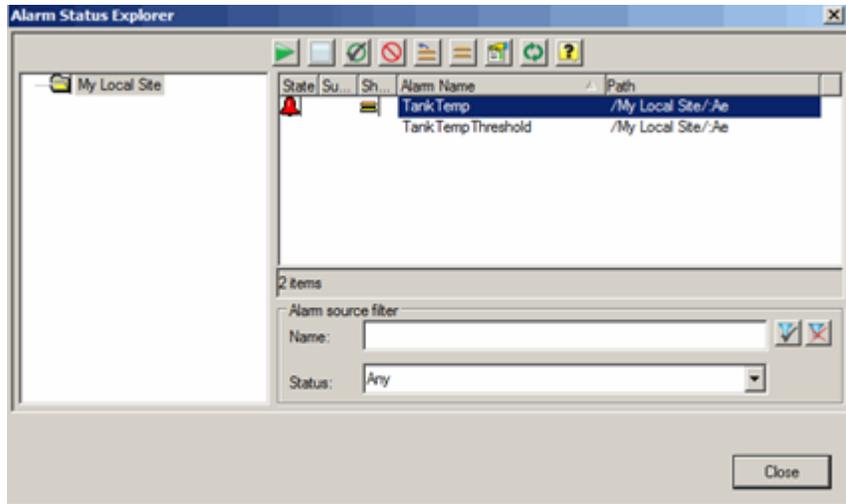
Unshelve an alarm

If alarms that were previously shelved need to be monitored again, you can unshelve the specified alarms in the **Alarm Status Explorer**.

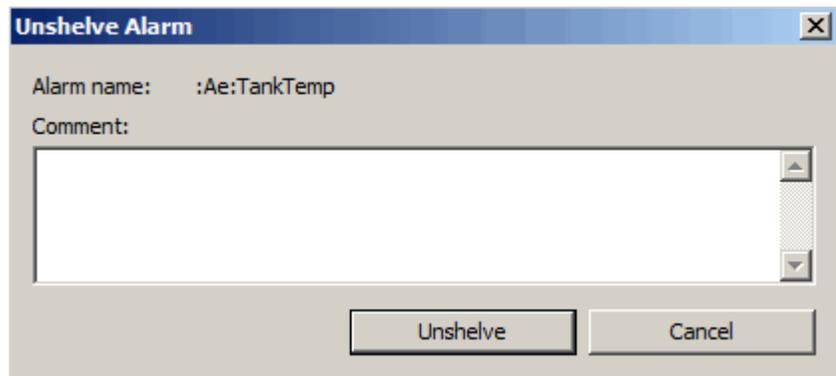
1. In the Alarm and Event Summary window, right-click an alarm and then click **Alarm Status**.



2. In the **Alarm Status Explorer**, select the alarm or alarms you want to unshelve, and then click the **Unshelve selected alarm** button  on the toolbar.



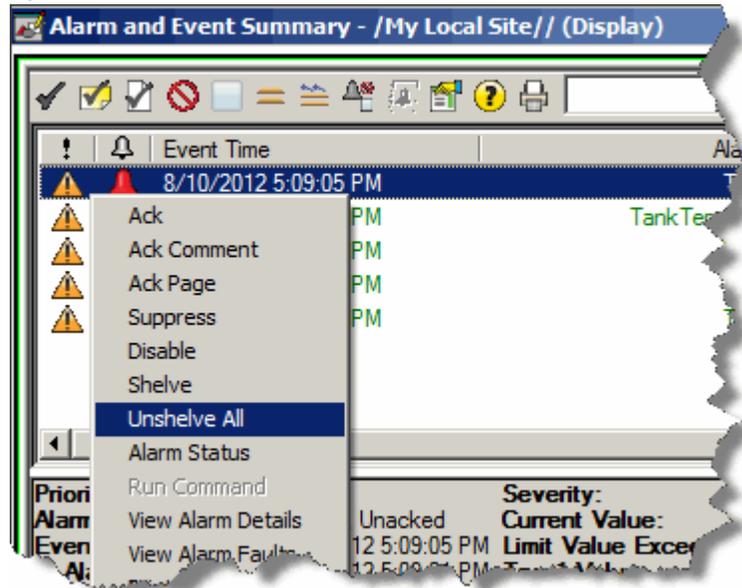
3. In the **Unshelve Alarm** dialog box, optionally enter a comment about why the alarm is unshelved, and then click **Unshelve**.



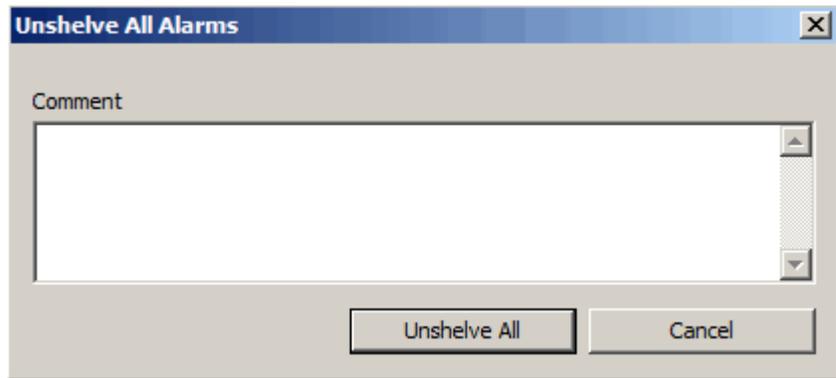
The comment is stored with the alarm and is logged to the **Comment** field in the Alarm and Event Log, which you can view using the Alarm and Event Log Viewer if historical logging has been configured.

You can also unshelve all shelved alarms in the Alarm and Event Summary:

1. In the Alarm and Event Summary event list, do one of the following:
2. On the toolbar, click the **Unshelve all alarms** button 
 - Right-click an alarm in the list, and then click **Unshelve All**.



3. The **Unshelve All Alarms** dialog box appears. Optionally enter a comment on why the alarms are unshelved and then click **Unshelve All**.



Set up historical alarm and event logging

Use the FactoryTalk Alarm and Event Log Viewer to view alarms and events that have been logged to a Microsoft SQL Server database that is configured to store historical alarm and event data.



Tip: If you do not have a Microsoft SQL Server database installed, we recommend that you install it using the batch file available in the FactoryTalk View installation package in the **Redist** folder. For installation instructions, see [Install Microsoft SQL Server on page 164](#).

If you already have Microsoft SQL Server installed, you may need to change the configuration options to log alarm and event messages. For configuration instructions, see [Use an existing Microsoft SQL Server database on page 167](#).

Use the Alarm and Event Log Viewer to display entries corresponding to all event types or to filter the events you want to view. Alarms and events generated during runtime can be logged to a Microsoft SQL Server database.

IMPORTANT: Simple Events are not currently supported. A simple event describes a simple occurrence in the system, such as failure to access a computer or device. Condition-related events—those that relate to changes in alarm state, and tracking-related events—those that monitor audited changes to the system, are supported.

To set up historical alarm and event logging, here is an overview of the steps to follow. Each step is explained in detail in this chapter.

- Confirm that the Microsoft SQL Server software is installed.
- Add a database definition to your FactoryTalk system.
- Associate a database definition with an alarm and event server.
- Add an Alarm and Event Log Viewer object to a graphic display.
- Run the FactoryTalk View Site Edition Client software and then monitor the graphic display.

Before you begin

- If you do not already have Microsoft SQL Server software installed, you can install it from the FTView\Redist folder in the FactoryTalk View installation package. For installation instructions, see [Install Microsoft SQL Server on page 164](#).
- Define alarms as described in [Define device-based alarms in Studio 5000 controllers on page 29](#).
- Add the required server, as described in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#), [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#), [Add an OPC data server for third-party controllers on page 45](#), or [Add FactoryTalk Linx OPC UA Connector for third-party OPC UA servers on page 55](#).
- Set up graphic display objects as described in [Set up graphic displays on page 58](#).

What you need

- FactoryTalk Linx software
- FactoryTalk View Studio software

- FactoryTalk View SE Client software
- Microsoft SQL Server software

Follow these steps

Follow these steps to set up historical logging:

- Plan your system
- Confirm that the Microsoft SQL Server software is installed



Tip: Microsoft SQL Server Express is available in the FactoryTalk View installation package in the **Redist** folder.

- Run FactoryTalk View Studio
- Add a database definition to your FactoryTalk system
- Associate the database definition with an alarm server
- Add an Alarm and Event Log Viewer object to a graphic display
- Run FactoryTalk View SE Client software and then monitor the graphic display
- Monitor and interact with alarms during runtime

Confirm that the SQL Server software is installed

To log historical alarms and events, you can either install Microsoft SQL Server or you can use an existing SQL Server database already installed on your network. If you are using an existing SQL Server database you need to set up your database for alarm and event logging.

FactoryTalk Alarms and Events can log historical data to any of the supported SQL Server databases. For more information, see [Supported SQL Server databases on page 167](#).



Tip: Microsoft SQL Server Express is available in the FactoryTalk View installation package in the **Redist** folder.

To install SQL Server, see [Install Microsoft SQL Server on page 164](#).

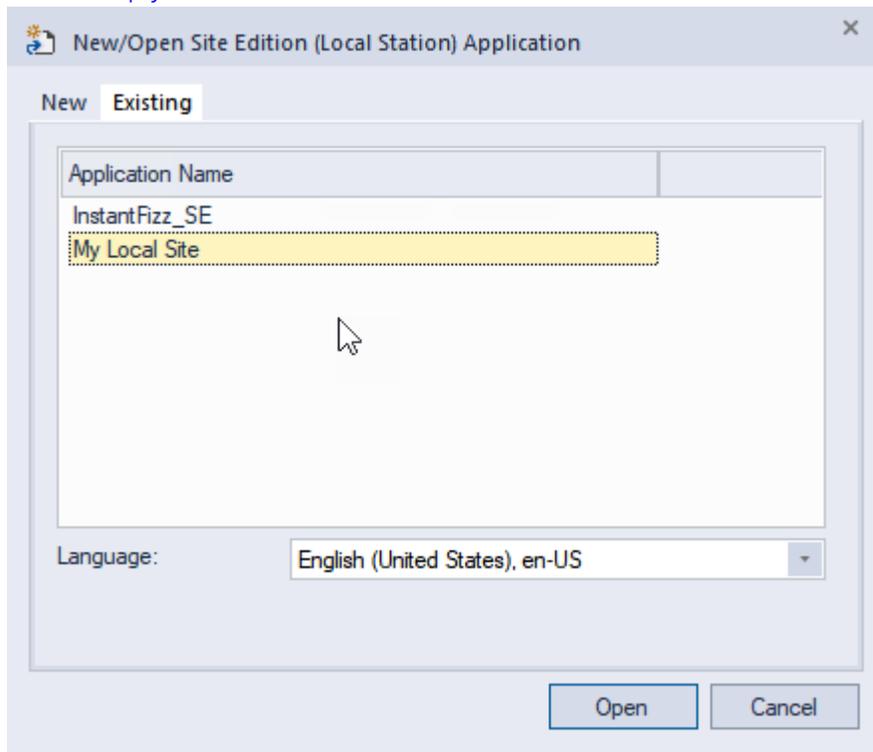
If you are using an existing SQL Server database, see [Use an existing SQL Server database on page 167](#).

Add a database definition to your FactoryTalk system

Create a database definition that specifies the connection information for the database and creates the required database objects.

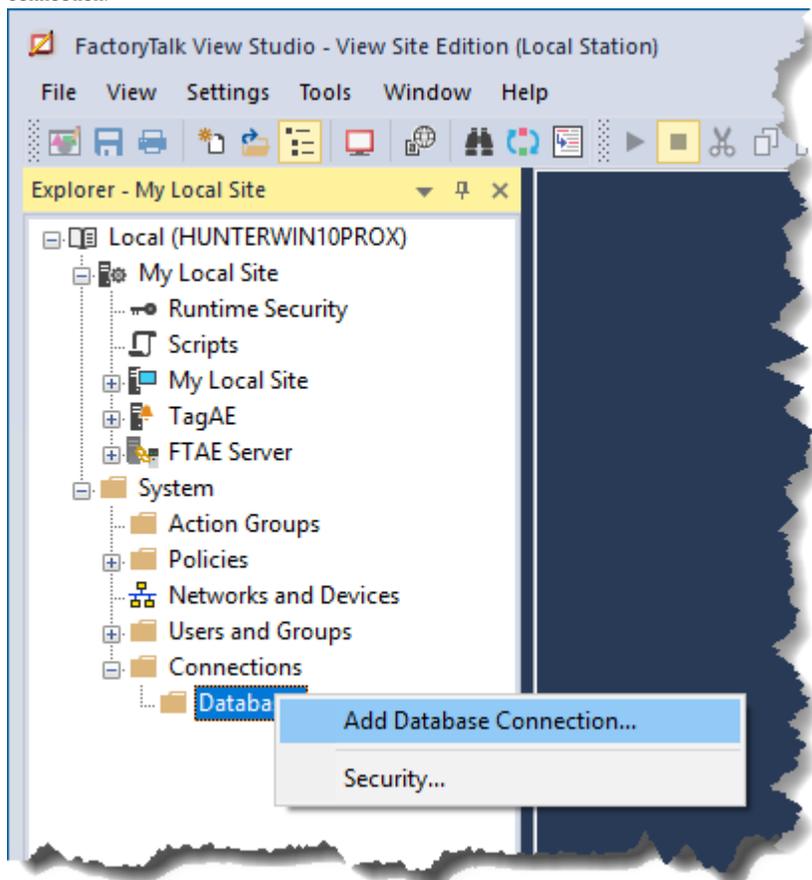
Step 1. Open an existing application in FactoryTalk View Studio

1. Open FactoryTalk View Studio.
2. In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.
3. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab, and then select the **My Local Site** application that you created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers. on page 38](#)



Step 2. Create a new database connection

1. In the **Explorer** window, expand the folders **System > Connections** and then right-click the **Databases** folder. Click **Add Database Connection**.



2. In the **Database Connection Properties** dialog box, configure properties for the new database definition. Select **FactoryTalk Alarms & Events History Database** in the **Database type** list. In this example, we used **FTAE_History** for the definition name and database name. The authentication includes Windows authentication and SQL Server authentication. We used SQL Server authentication with **FTAE_Historian** as the database user name, and **password** as the password.

(optional) You can also force encryption of the connection to SQL Server and validate the certificate on the SQL Server computer for certificate handshake. For more information, click **Help**.

The screenshot shows the 'Database Connection Properties' dialog box. It has three tabs: 'Database Connection', 'Alarms Size Management', and 'Alarms Advanced settings'. The 'Database Connection' tab is selected. The dialog contains the following fields and options:

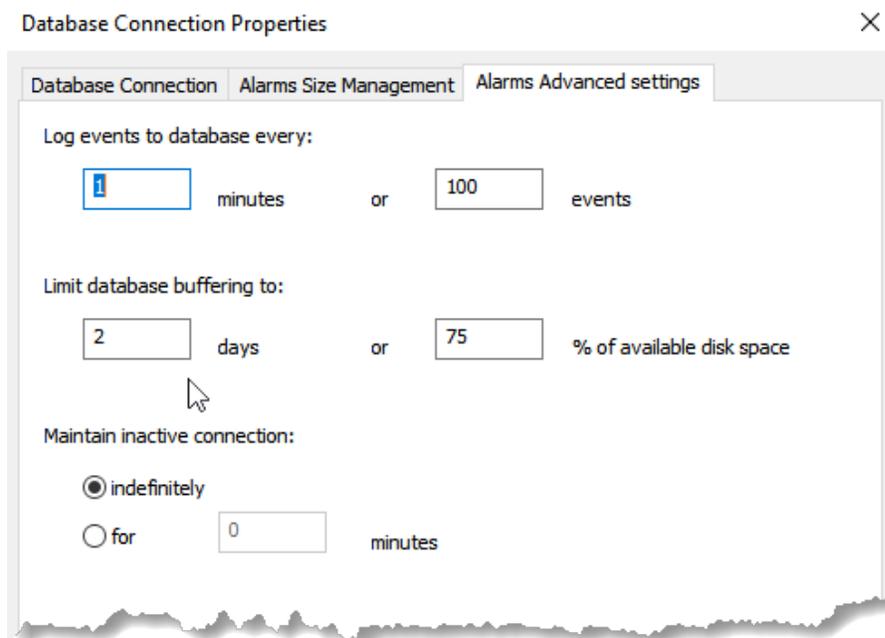
- Database type:** A dropdown menu set to 'FactoryTalk Alarm & Events History Database' with a 'Show Usage...' button to its right.
- Definition name:** A text box containing 'FTAE_History'.
- Server name\instance:** A text box containing 'AVCNDAEVIEWT' with a help icon (?) and an ellipsis button (...).
- Log in to SQL Server:** A section containing:
 - Authentication:** A dropdown menu set to 'SQL Server Authentication'.
 - User name:** A text box containing 'FTAE_Historian'.
 - Password:** A text box with masked characters (dots).
 - Encrypt connection
 - Trust server certificate
- Database name:** A text box containing 'FTAE_History' with an ellipsis button (...).

At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.



Tip: To improve efficiency when writing to the database, information is sent to a cache file located on the computer hosting the alarm server before writing to the database.

- Click the **Alarms Advanced settings** tab. The system will attempt to create the database, the user account, and the tables that are necessary to store the alarm and event information. If the database or user does not already exist in SQL Server, you are prompted to create them. Click **Yes**.



- Configure the settings for the Alarm and Event History Database.
- If the connection to the database is lost, alarm and event information will continue to be cached to files. After the connection is restored, the cached information will be sent to the database.
To limit how much information is cached, reduce the amount of days or % of available disk space for database buffering. When the limit is reached, the oldest information is overwritten.
- When you finish, click **OK**. If you are prompted to create the database, click **Yes**. The database definition is added to the **Databases** folder and is ready for use.

Associate a database definition with an alarm server

To set up a FactoryTalk Linx device server (device-based server), a FactoryTalk Tag Alarm and Event Server (tag-based server), or FactoryTalk Linx OPC UA Connector for third-party OPC UA servers to log historical alarm and event data to a database, you must associate a database definition with the alarm server.

If no alarm history database is associated with an alarm server, the alarm server does not log any historical data. You can associate different alarm servers with different alarm history databases, or you can have all alarm servers log their data to the same database.

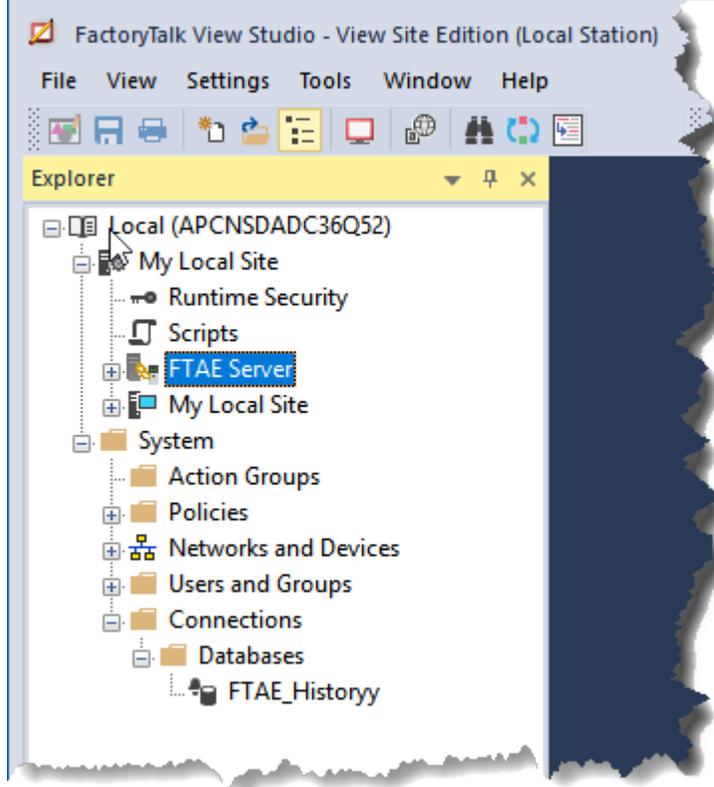
The example shows you how to configure a FactoryTalk Linx device server for alarm logging.

Step 1. Open an existing application in FactoryTalk View Studio

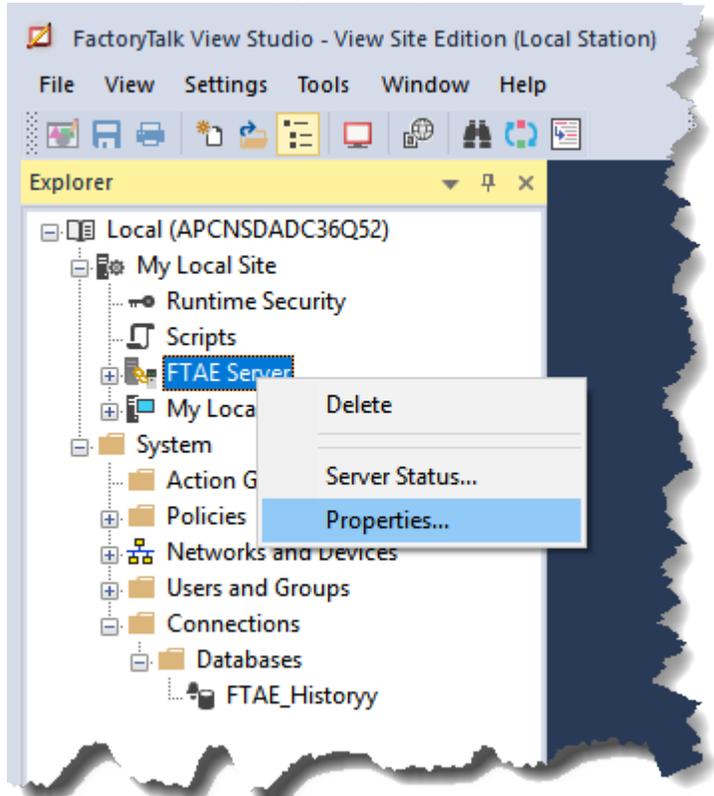
- Open FactoryTalk View Studio.
- In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.
- In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab, and then select the **My Local Site** application that you created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers. on page 38](#)

Step 2. Configure the alarm server

1. In the **Explorer** window, expand the application tree until each alarm server is visible.



2. Right-click the alarm server named **FTAE Server** that you created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers on page 38](#). Click **Properties**.



3. For a FactoryTalk Linx Device Server, do the following and then click **OK**:

The screenshot shows the 'FactoryTalk Linx Server Properties' dialog box with the 'Alarms and Events' tab selected. The 'Enable alarm and event support' checkbox is checked. Under 'Priorities', 'Enable server-assigned priorities' is checked, and a table defines severity ranges. Under 'Alarm and Event History', 'Enable history' is checked, and 'FTAE_History' is selected in the database definition dropdown. The cache file path is 'C:\ProgramData\Rockwell\Alarms' and the log language is 'English (United States), en-US'.

Priority	Severity Range	
	Low	High
Urgent	751	1000
High	501	750
Medium	251	500
Low	1	250

- In the **FactoryTalk Linx Server Properties** dialog box, click the **Alarms and Events** tab.
- Under **Alarm and Event History**, select the **Enable history** check box.
- In the **Database definition** list, select a definition (for this example, we use **FTAE_History**).

4. For a Tag Alarm and Event Server, do the following and then click **OK**:

The screenshot shows the 'Tag Alarm and Event Server Properties' dialog box with the 'Priorities and History' tab selected. The 'Priorities' section has the 'Enable server-assigned priorities' checkbox checked. Below it is a table for severity ranges:

Priority	Severity Range	
	Low	High
Urgent	751	1000
High	501	750
Medium	251	500
Low	1	250

The 'Alarm and Event History' section has the 'Enable history' checkbox checked. The 'Database definition' dropdown is set to 'FTAE_History'. The 'Computer name' is 'HUNTERWIN10PROX', the 'Database name' is 'FTAE_History', and the 'Cache file path' is 'C:\ProgramData\Rockwell\Alarms'. The 'Log languages' dropdown is set to 'English (United States), en-US'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

- In the **FTAE Server Properties** dialog box, click the **Priorities and History** tab.
- Under **Alarm and Event History**, select the **Enable history** check box.
- In the **Database Definition** list, select a definition. In this example, we use **FTAE_History**.

Create an Alarm and Event Log Viewer display

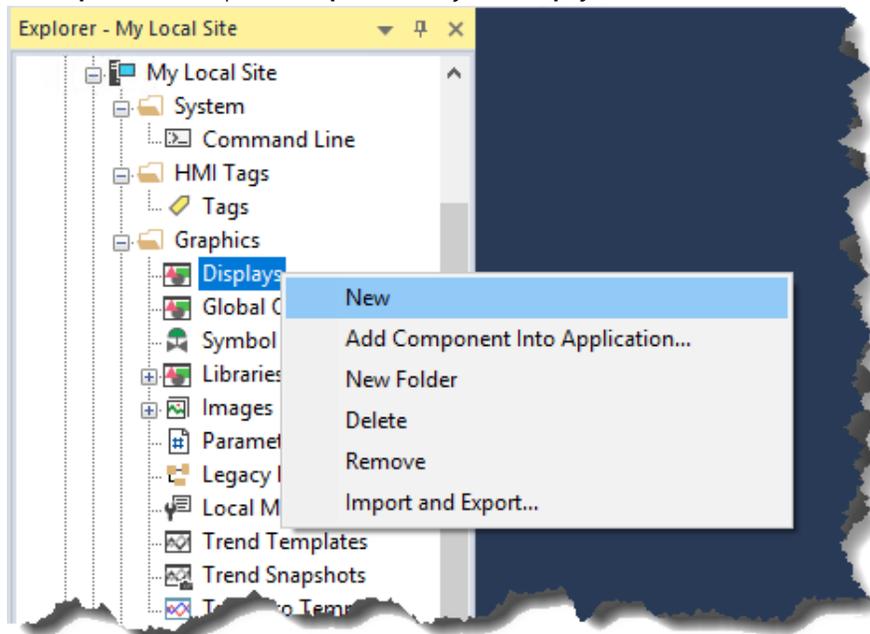
Use the Alarm and Event Log Viewer to view alarm and event information previously logged in a Microsoft SQL database configured to store historical data.

Step 1. Open an existing application in FactoryTalk View Studio

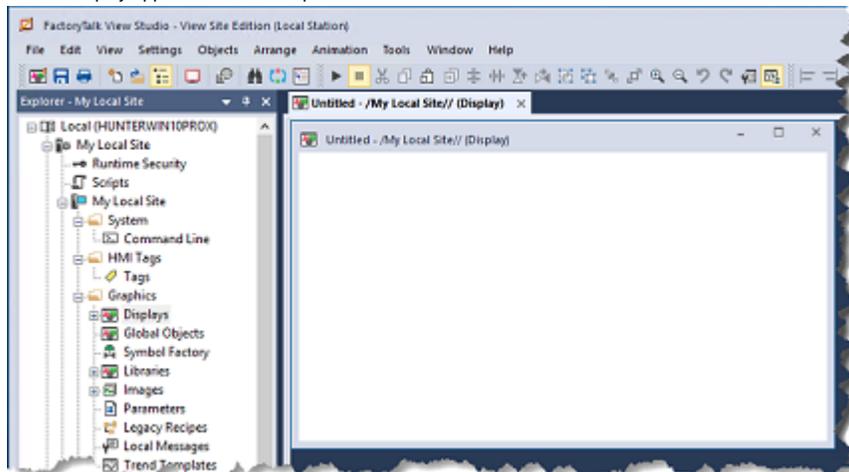
1. Open FactoryTalk View Studio.
2. In the **Application Type Selection** window, select **View Site Edition (Local Station)** and then click **Continue**.
3. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab, and select the **My Local Site** application that you created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers. on page 38](#)

Step 2. Create a new graphic display

1. In the **Explorer** window, expand the **Graphics** folder, right-click **Displays**, and then click **New**.



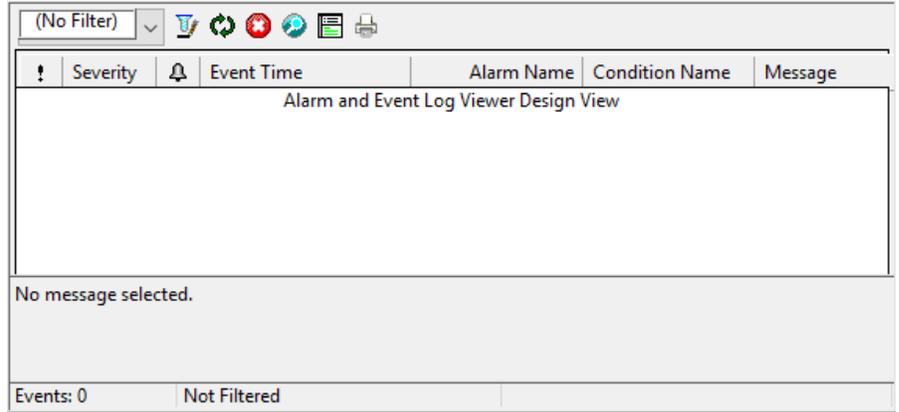
A blank display appears in the workspace.



2. If necessary, resize the graphic display to about the same size as the one you created for the Alarm and Event Summary.

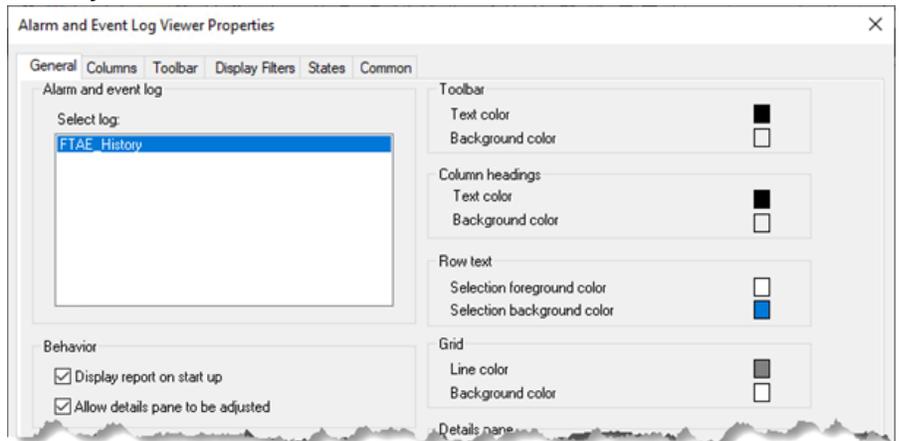
Step 3. Add an Alarm and Event Log Viewer object to the display

1. On the **Objects** menu, point to **Alarm and Event** and then click **Log Viewer** (or select **Alarm and Event Log Viewer** in toolbox).
2. Hold the left mouse button down and drag the mouse to create a rectangle that is the size required for the Alarm and Event Log Viewer object.
3. When the object is the correct size, release the left mouse button. The Alarm and Event Log Viewer object is drawn on the graphic display.



Step 4. Configure the properties of the Alarm and Event Log Viewer

1. To open the **Alarm and Event Log Viewer Properties** dialog box, double-click the **Alarm and Event Log Viewer** object.



2. On the **General** tab, select the alarm log whose entries you want to view. In the previous example, we selected **FTAE_History**. This is the SQL database we created in [Associate a database definition with an alarm server on page 105](#).
3. Click the **Columns** tab, and then clear the **Area** check box.
4. On the other tabs, set properties to customize the Log Viewer display, as desired. For details, click **Help**.
5. When you are finished, click **OK** to close the dialog box.

Step 5. Save the graphic display

1. On the **File** menu, click **Save**.
2. In the **Save** dialog box, type a name for the new display and then click **OK**.

In this example, we use **Alarm and Event Log Viewer** for the name of the graphic display.



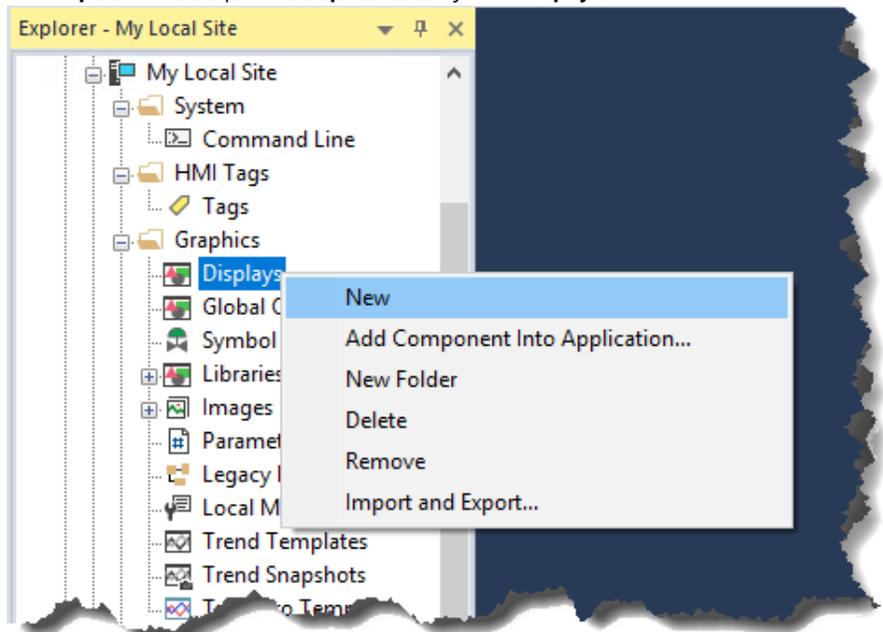
3. Close the graphic display.

Create a button to open the Alarm and Event Log Viewer display

In this section, we add a button to open the Alarm and Event Log Viewer display in the same FactoryTalk View Client window as the Alarm and Event Banner display.

Step 1. Create a new graphic display

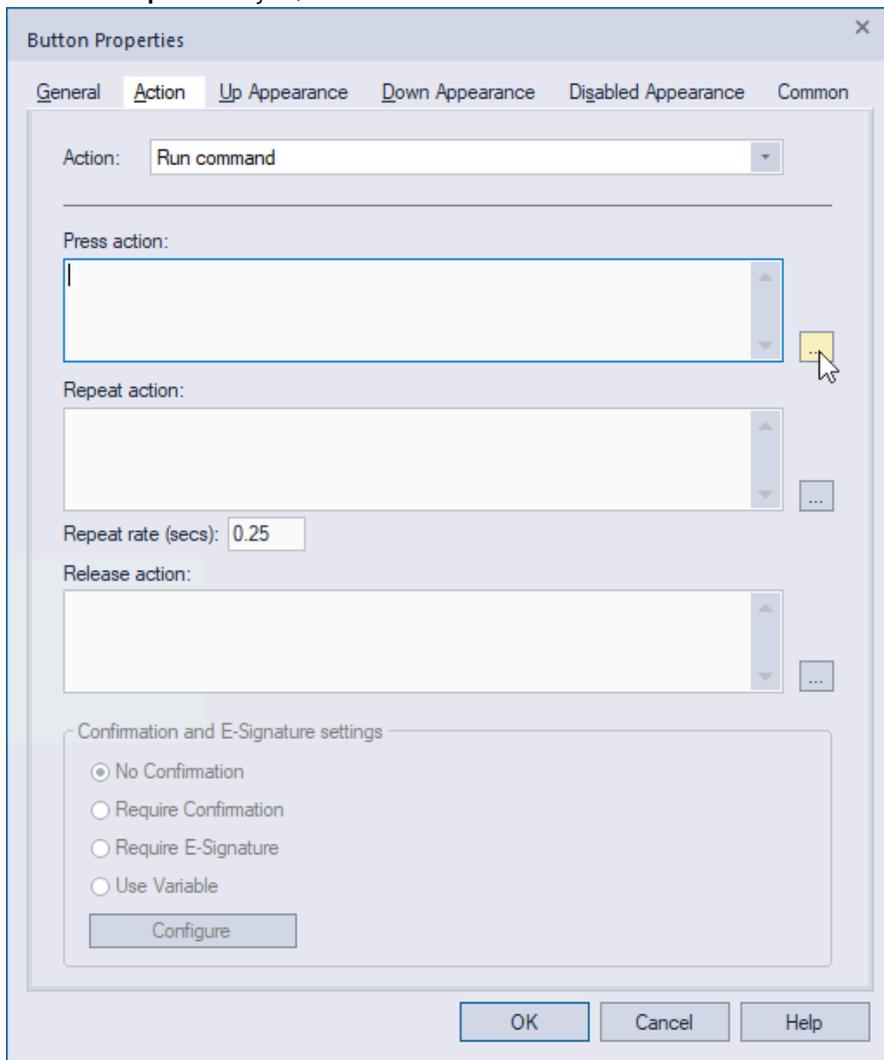
1. In the **Explorer** window, expand the **Graphics** folder, right-click **Displays**, and then click **New**.



2. If necessary, resize the graphic display to about the same size as the one you created for the Alarm and Event Summary.

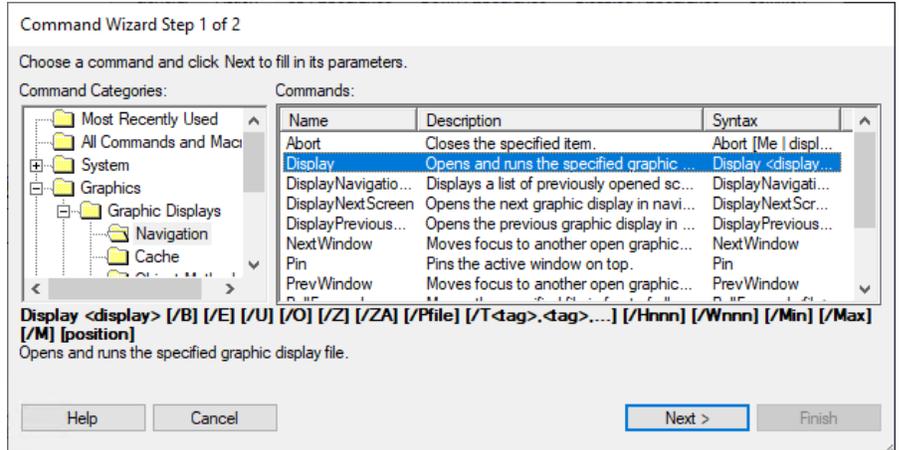
Step 2. Add a button to the graphic display

1. On the **Objects** menu, point to **Push Button**, and then click **Button** (or select **Button** in the toolbox).
2. Hold the left mouse button down and drag the mouse to create a rectangle the correct size for the button and then release the mouse button.
3. In the **Button Properties** dialog box, click the **Action** tab.



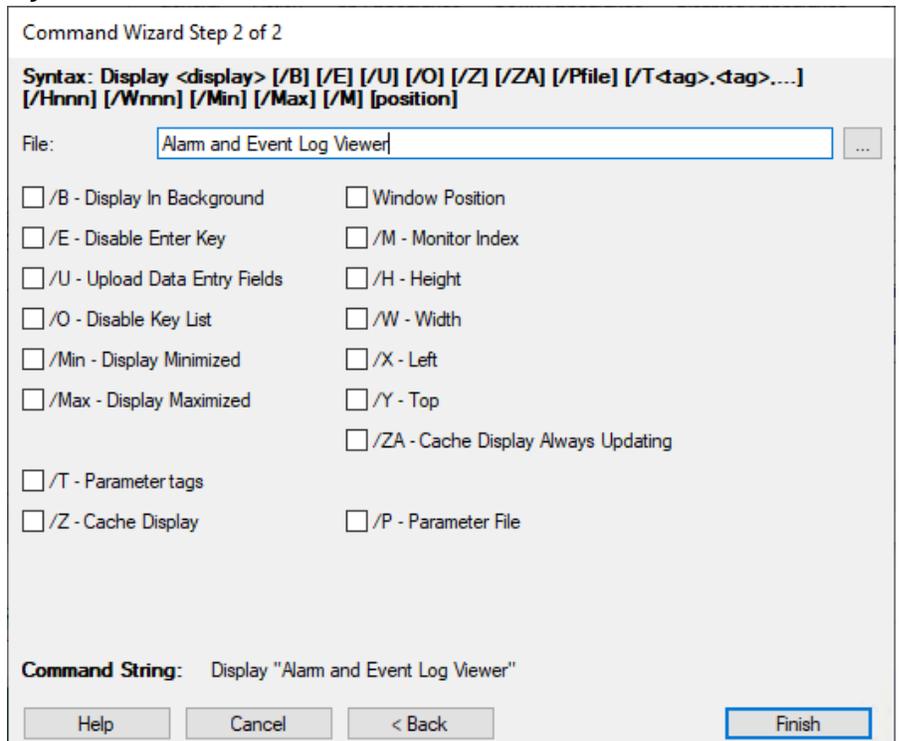
Step 3. Configure the button commands

1. Click the **Browse** button (...) to the right of the **Press action** field to open the **Command Wizard**.

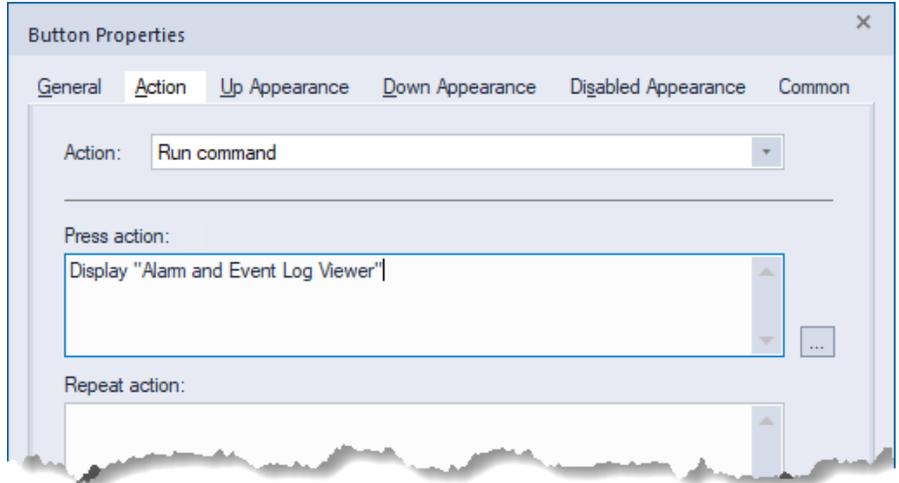


2. In the **Command Categories** pane on the left, expand **Graphics > Graphic Displays > Navigation**.
3. In the list of commands on the right, click **Display**, and then click **Next**.
4. In the **File** box, click the browse button to select the name of the graphic display that is to open when the button is clicked.

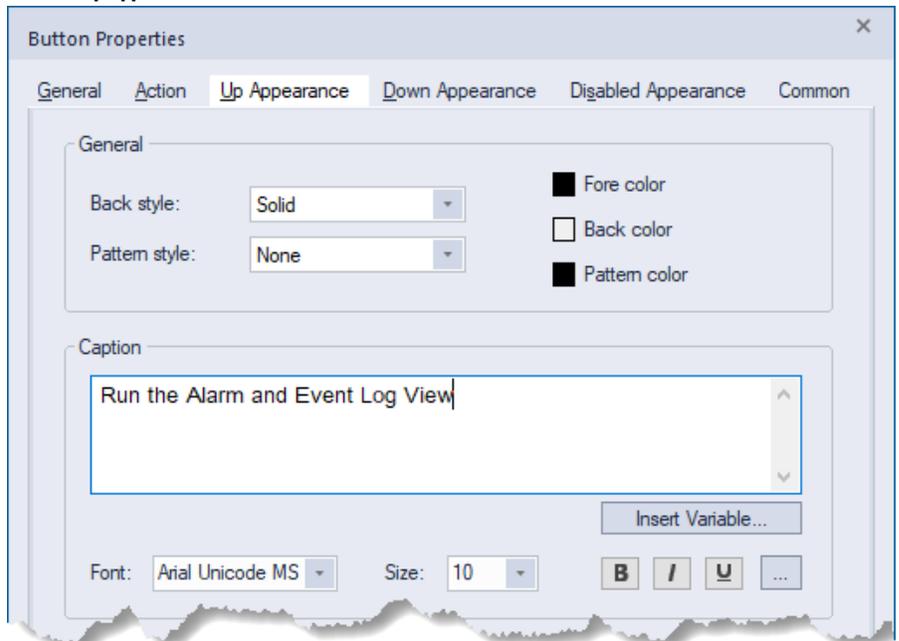
In this example, we want the button to start the Alarm and Event Log Viewer, so we select **Alarm and Event Log Viewer**.



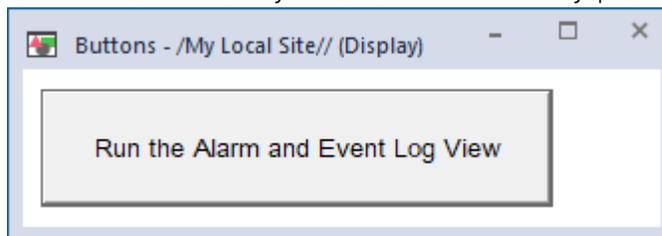
- To close the **Command Wizard**, click **Finish**. In the **Button Properties** dialog box, the command **Display "Alarm and Event Viewer"** appears in the **Press action** box.



- Click the **Up Appearance** tab.

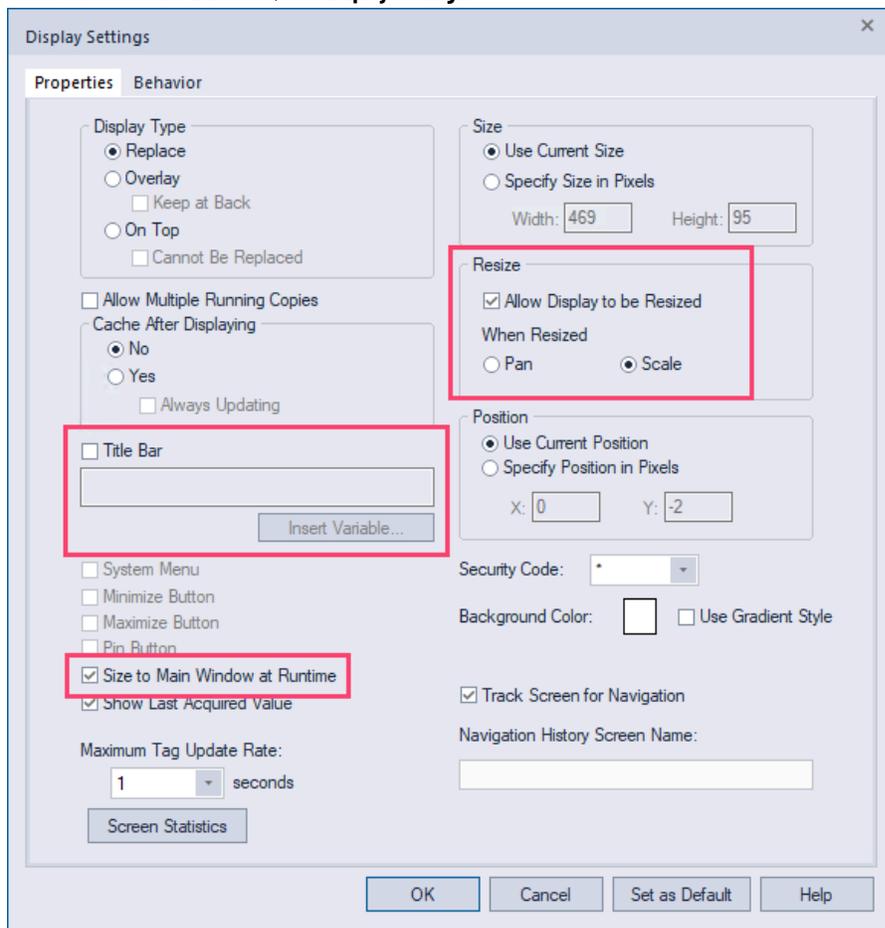


- In the **Caption** box, type **Run the Alarm and Event Log Viewer**. Press the **Enter** key after the word **Alarm** so that the text wraps to the next line. This is the text that will appear on the button.
- Click **OK** to save the button configuration. The button is drawn on the graphic display.



Step 4. Configure the properties of the graphic display

1. On the main menu bar **Edit** menu, click **Display Settings**.



2. In the **Display Settings** dialog box, make the following changes on the **Properties** tab:
 - Clear the **Title Bar** check box.
 - Select the **Size to Main Window at Runtime** check box.
 - Select the **Allow Display to be Resized** check box.
 - Under **When Resized**, select **Scale** option if it is not already selected.
 Click **OK** when finished.

Step 5. Save the graphic display

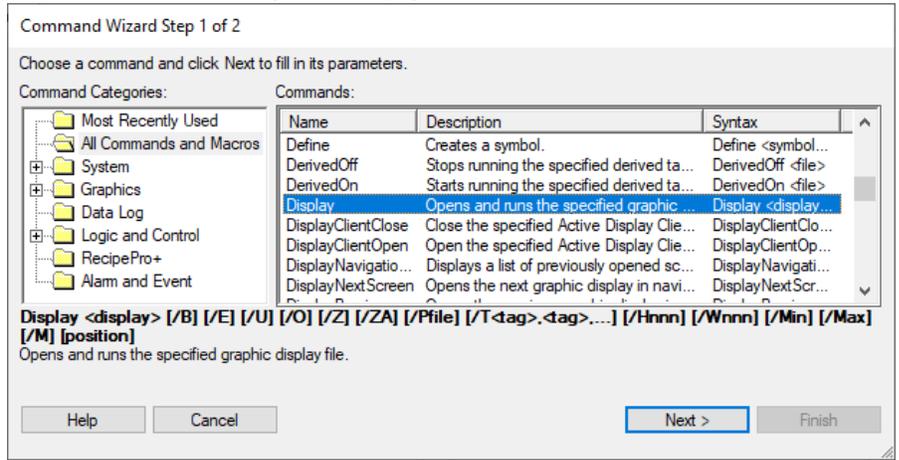
1. On the **File** menu, click **Save**.
2. In the **Save** dialog box, type a name for the new graphic display, and then click **OK**.
In this example, we use **Menu Bar** for the name of the graphic display.

Create a startup macro for the Menu Bar display

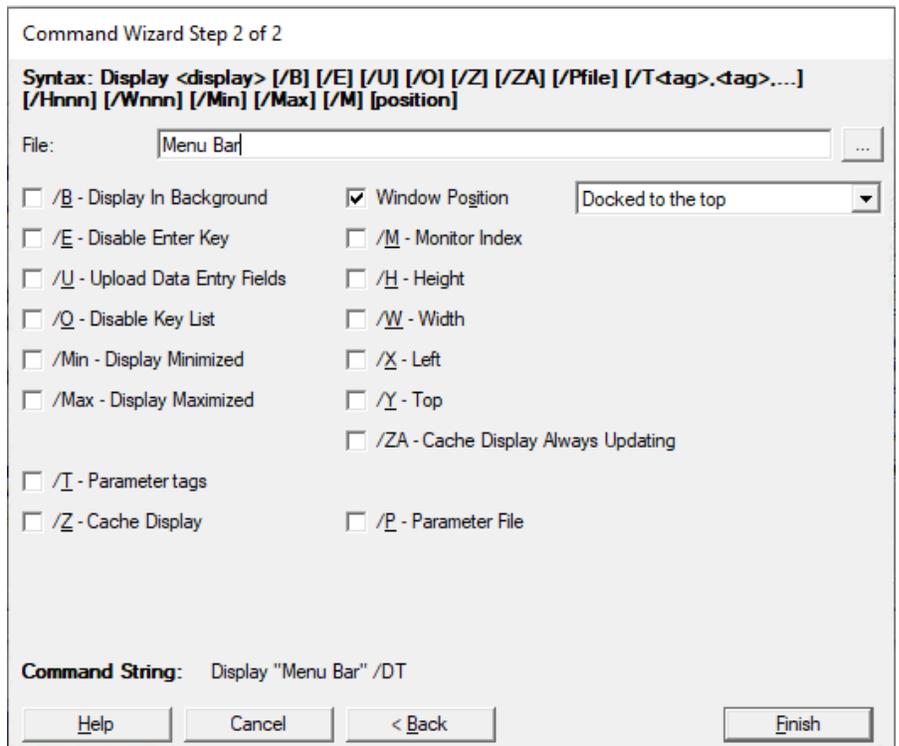
This section shows you how to modify the startup macro you created in [Set up graphic displays on page 58](#). This example also shows you how to add commands to the startup macro that will open the button display you just created and dock it to the top of the client window.

Step 1. Edit the startup macro

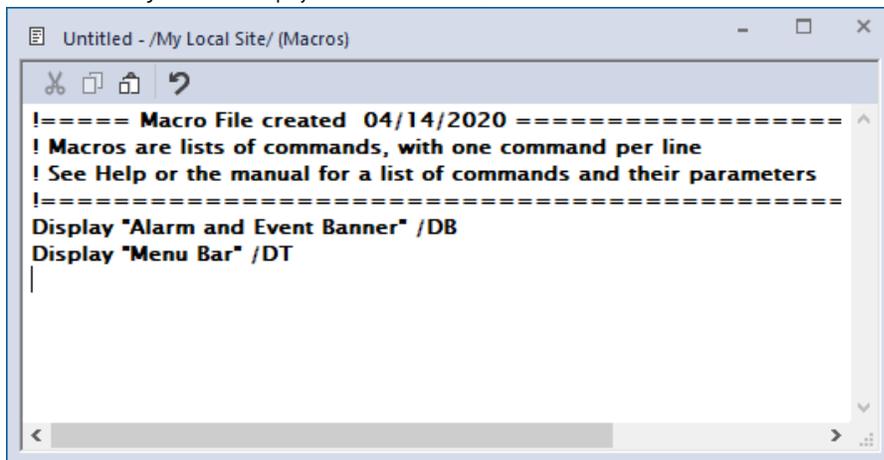
1. In FactoryTalk View Studio, in the **Explorer** window, double-click the **Start Alarm and Event Banner** macro. The macro editor opens, showing the Banner display command **Display "Alarm and Event Banner" /DB**.
2. To open the **Command Wizard**, double-click anywhere in the body of the macro editor.
3. In the list of commands on the right, select **Display** and then click **Next**.



4. In the **File** list, click **Menu Bar**.



5. Select the **Window Position** check box. In the list of window positions, click **Docked to the Top**.
6. To save the configuration and display it in the macro editor, click **Finish**.



Step 2. Save the startup macro in the application

1. On the **File** menu, click **Save**.
2. Close the macro editor.

View historical alarm data in a FactoryTalk View SE Client

Use the Alarm and Event Log Viewer—embedded in a FactoryTalk View graphic display—to view, sort, filter, and export historical alarm information stored in Alarm and Event Logs.

With the Alarm and Event Log Viewer, you can:

- Display alarm and event information that has been logged by the FactoryTalk Alarm and Event Historian.
- Define filters to determine which logged alarms and events will be displayed.
- Sort the alarms and events that will be displayed.

Run the application

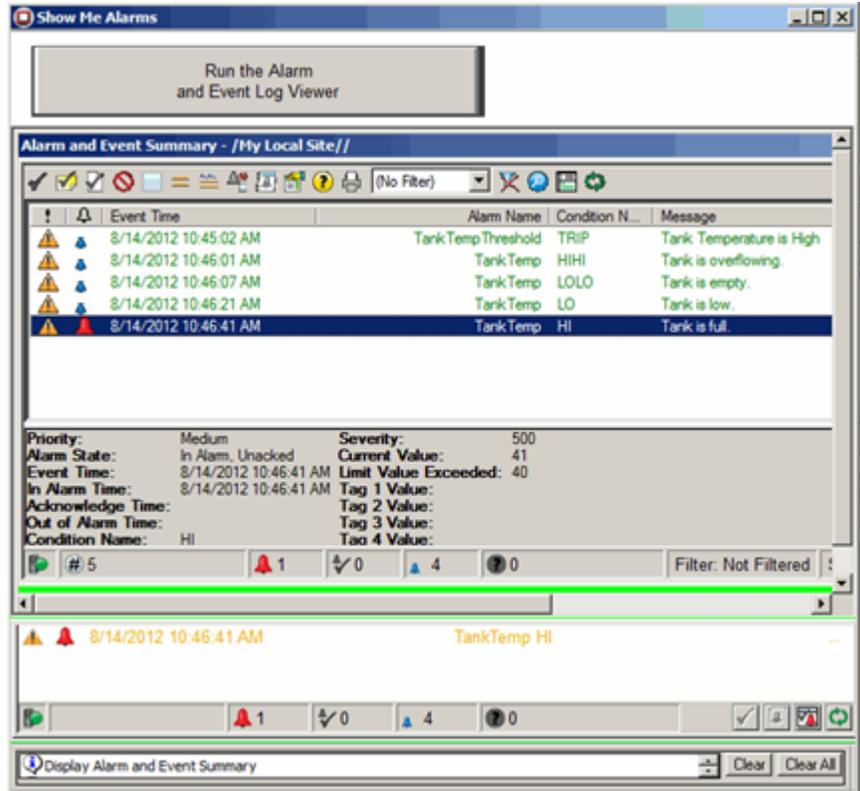
You can open the FactoryTalk View Site Edition Client in these ways:

- From the Windows **Start** menu. See [Monitor and interact with alarms at runtime on page 82](#).
- From within FactoryTalk View Studio, which is covered in this section.
- By double-clicking a FactoryTalk View SE Client configuration file (*.cli).

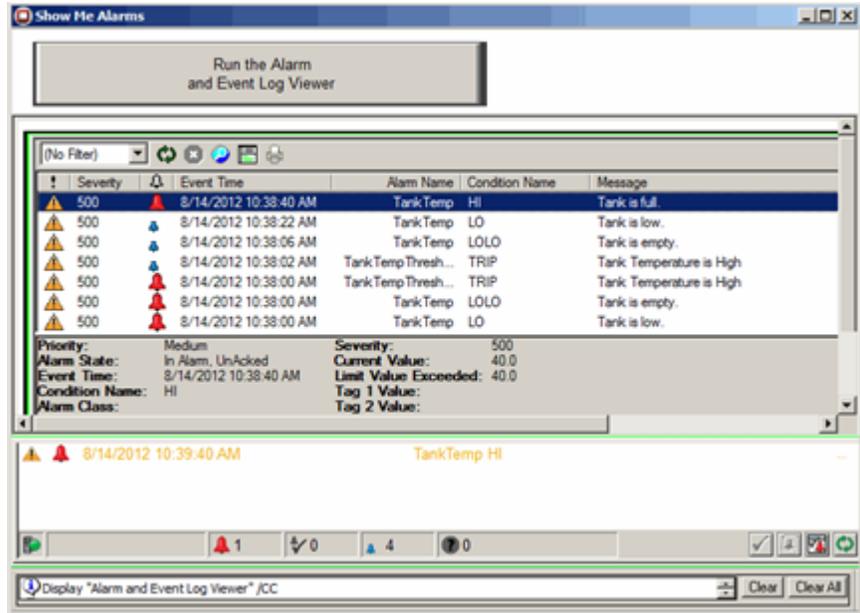
Start the FactoryTalk View SE Client from within FactoryTalk View Studio

1. If FactoryTalk View Studio is not still open, click **Start > Rockwell Software > FactoryTalk View Site Edition Client**.
2. In the **FactoryTalk View SE Client Wizard**, select **Run an existing FactoryTalk View SE Client configuration file**, and then select **Alarms and Events Demo.cli**. Click **OK**.

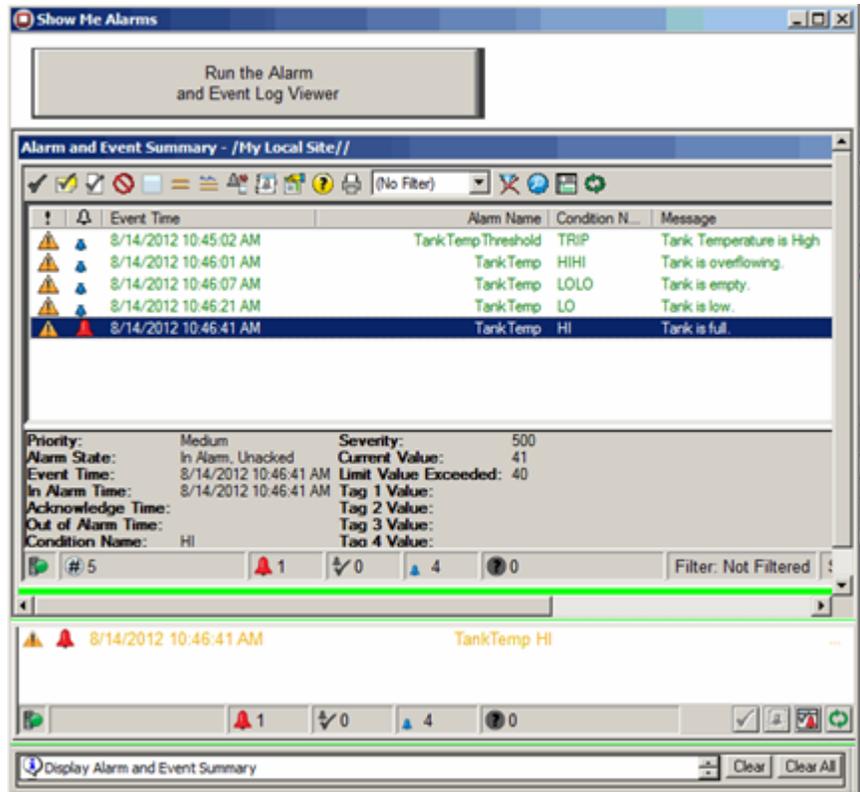
The FactoryTalk View SE Client opens after a few moments. The button appears at the top of the window and the Alarm and Event Banner appears at the bottom.



- Click the **Run Alarm and Event Log Viewer** button to make the Log Viewer appear in the middle of the client window:



- Click the **Run Alarm and Event Summary** button on the Banner display at the bottom of the window. The Summary display replaces the Log Viewer.



For details about enabling, disabling, suppressing, unsuppressing, shelving, unshelving, and acknowledging alarms, see [Monitor and interact with alarms at runtime on page 82](#).

Configure redundancy for alarms and events

This chapter describes how to configure FactoryTalk Alarms and Events device-based and tag-based alarm server redundancy.

Server redundancy is typically used to maximize system availability in case of:

- Computer hardware failure.
- Software failure on one server computer.
- Power failure on one server computer.

Redundancy requirements are unique to each application. The ideal redundant solution involves having at least two instances of everything—hardware, software, and networks. In practice, this is seldom necessary. Redundant FactoryTalk server components duplicate server information on a secondary computer that is used if a primary server computer fails.

FactoryTalk server redundancy

FactoryTalk server redundancy can be configured for:

- FactoryTalk Alarms and Events servers
- Data servers (FactoryTalk Linx or OPC data server)
- FactoryTalk Site Edition HMI servers

IMPORTANT: FactoryTalk Alarms and Events server redundancy and data server redundancy are only supported in network station applications and network distributed applications. FactoryTalk HMI server redundancy is only supported in network distributed applications.

For more information on planning and implementing a FactoryTalk distributed network application, see [Reference for building a distributed system on page 185](#).

Develop and test your application without redundancy

It is good practice when developing a FactoryTalk Alarms and Events application to develop and test with all alarm servers configured without redundancy. This approach effectively reduces the size and complexity of the application during the development and test phases.

Adding alarm server redundancy at the end of development to a properly planned network station application or network distributed application will not require any changes in graphic displays that are already developed and working properly.

Existing alarm servers and tag data servers can be configured to support redundancy if the distributed system supporting your FactoryTalk application has been adequately planned and prepared beforehand.

Before you begin

To implement redundant servers, the procedure depends on whether you are using a device-based alarm server or a tag-based alarm server.

- Plan and implement your FactoryTalk distributed system, taking into consideration which components require redundancy, the network layout of the components in the system, the CPU processing load that is expected for each component, and the software required to be installed on each component.
- Configure alarm servers and tag data servers as required. Initially, configure these servers without redundancy. Verify that all of the configured tags and alarms are working properly.
- Be sure all graphic displays are working properly on the FactoryTalk application with alarm servers configured without redundancy.
- For each redundant alarm server, determine if it will use *favor primary* or *favor current* switchover behavior.

Favor current. When a redundant switchover occurs, the secondary server remains active in the application even after the primary server is recovered and available once again. This is the default behavior, set in the **Server Properties** dialog box **Redundancy** tab under **Switchover options** by selecting **Continue using the secondary server even when the primary server becomes available again**. When it is selected you can perform manual switchovers from primary to secondary and back again. This can be useful for testing redundant applications. You can change this selection at any time.

Favor primary. After a redundant switchover has occurred, and the primary server is recovered and available again, control passes back to the primary server. This is set in the **Server Properties** dialog box **Redundancy** tab under **Switchover options** by selecting **Switch over to primary server when it becomes available again**.

You can change the redundant server configuration from favor current to favor primary any time that both servers are running and connected to the network station application or network distributed application.

What you need

If you are using device-based alarm servers:

- FactoryTalk Linx and FactoryTalk Alarms and Events installed and running on the primary server computer, configured and working as a non-redundant component.
- FactoryTalk Linx and FactoryTalk Alarms and Events installed and running on the secondary server computer.
- FactoryTalk View Studio or FactoryTalk Administration Console running on a development station or other component connected in the FactoryTalk application.

If you are using server tag-based alarm servers:

- FactoryTalk Linx or OPC Data Server installed, configured, and running on a separate component configured in the FactoryTalk application, or configured for redundancy and running on the primary and secondary server computers as a redundant pair.
- FactoryTalk Alarms and Events installed and running on the primary server computer, configured and working as a non-redundant component.
- FactoryTalk Alarms and Events installed and running on the secondary server computer.
- FactoryTalk View Studio or FactoryTalk Administration Console running on a development station or other component configured in the FactoryTalk application.

Follow these steps

Follow these steps for device-based alarm servers:

- Add a device-based alarm server
- Start FactoryTalk View Studio and open the Site Edition network application
- Select the device alarm server
- Configure the server properties
- Open the Communication Setup editor
- Configure the secondary path to the Studio 5000 controller
- Check the server status

Follow these steps for tag-based alarm servers:

- Add a tag-based alarm server
- Start FactoryTalk View Studio and open the Site Edition network application
- Select the tag alarm server
- Configure the tag alarm server properties
- Check the server status

Upgrade an existing device-based alarm server

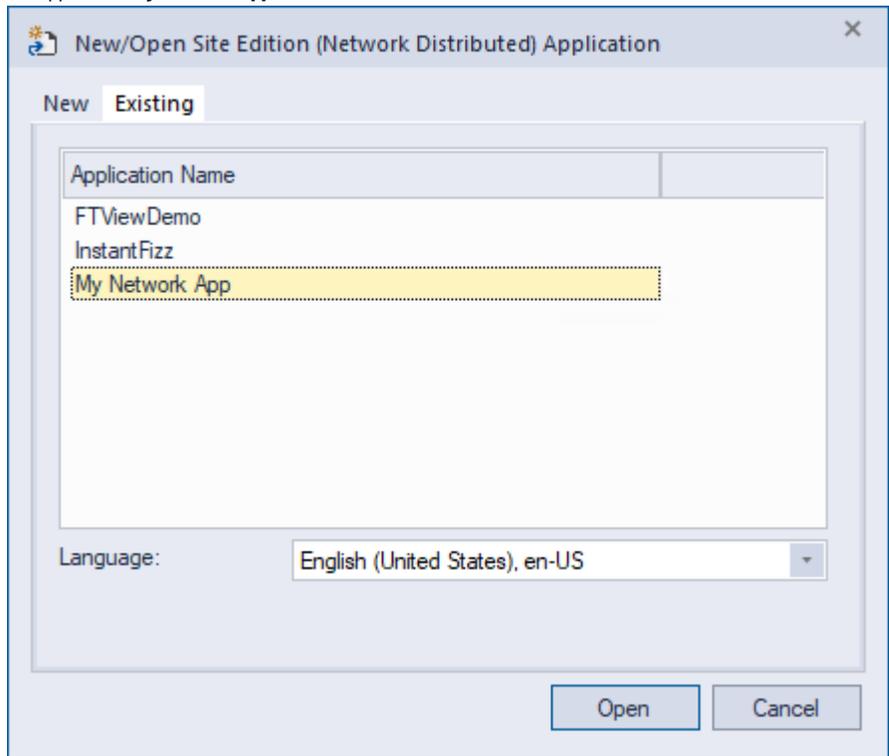
In this section, you will upgrade a configured Rockwell Automation device-based alarm server (FactoryTalk Linx) to support redundancy using a secondary computer already configured in the FactoryTalk network distributed application.

Step 1. Open the application in FactoryTalk View Studio

This example shows how to open an existing network distributed application in FactoryTalk View Studio.

1. To run FactoryTalk View Studio, in Windows, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection** window, select **View Site Edition (Network Distributed)** and then click **Continue**.

- In the **New/Open Site Edition (Network Distributed) Application** dialog box with the **Existing** tab selected, under the heading **Application Name**, select the name of the existing application. In this example, we name the application **My Network App**.



- Click **Open**.

Step 2. Select the device alarm server

In the **Explorer** window, open the application **My Network App** and find the device alarm server **FTAE Server**.

Step 3. Configure the alarm server properties

- In the **Explorer** window, right-click the alarm server **FTAE Server** and then select **Properties**.
- In the **FactoryTalk Linx Server Properties** dialog box, click the **Redundancy** tab. Select the **Provide redundancy using a secondary server** check box.
- In the **Redundancy** tab, click **Browse**.



Tip: If your distributed network application has been planned and implemented beforehand as recommended, then the secondary server computer name will be listed in the **Select Computer** dialog box.

- Select the name of the secondary server computer in the **Select Computer** dialog box and then click **OK**.
- In the **Redundancy** tab, the switchover option **Continue using the secondary server even when the primary server becomes available again** is selected by default. This allows you to use manual switchover to test the redundant pair. You can change the selection when testing is complete. If you select **Switch over to primary server when it becomes available again** manual switchover is not available.

Step 4. Open the Communication Setup editor

1. In the **Explorer** window, click the FactoryTalk Linx server **FTAE Server**, and then double-click **Communication Setup**.
2. Before the **Communication Setup** dialog box appears, a FactoryTalk Linx information dialog box appears. To save the changes, click **OK**.



Tip: The secondary controller is normally the same device as the primary controller but a different path may be used on the **Primary** tab. For instance, the secondary path may pass through an alternate bridge device in order to provide redundancy at the communications level.

3. To set the path to the secondary controller, click the **Apply** button.
4. To save the shortcut configuration and close the **Communication Setup** dialog box, click **OK**.

Upgrade an existing tag-based alarm server

In this section, you will upgrade a configured Rockwell Automation tag-based alarm server to support redundancy using a secondary computer configured in the FactoryTalk network distributed application.

Step 1. Open the application in FactoryTalk View Studio

This example shows how to open an existing network distributed application in FactoryTalk View Studio.

1. To start FactoryTalk View Studio, in Windows, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection** window, select **View Site Edition (Network Distributed)** and then click **Continue**.
3. In the **New/Open Site Edition (Network Distributed) Application** dialog box with the **Existing** tab selected, under the heading **Application Name**, select the name of the existing application. In this example, we name the application **My Network App**.
4. Click **Open**.

Step 2. Select the tag alarm server

In the **Explorer** window, open the application **My Network App** and find the tag-based alarm server, for example, **TagAE**.

Step 3. Configure the alarm server properties

1. In the **Explorer** window, right-click the alarm server **TagAE** and then select **Properties**.
2. In the **Tag Alarm and Event Server Properties** dialog box, click the **General** tab. Select the **Load when operating system initializes** startup type option.

IMPORTANT: The configuration options on the **Redundancy** tab will be disabled if the **Load when operation system initialized** option is not selected on the **General** tab. This is because redundant servers need to be running and available in order to exchange redundant information in preparation for an unexpected switchover, even when the HMI application is not actually running.

3. In the **Tag Alarm and Event Server Properties** dialog box, click the **Redundancy** tab.
4. Select the **Provide redundancy using a secondary server** check box.
5. Select the secondary server computer from the computer list and then click **OK**.



Tip: If your distributed network application has been planned and implemented beforehand as recommended, then the secondary server computer name will be listed in the **Select Computer** dialog box.

6. In the **Tag Alarm and Event Server Properties** dialog box, the switchover option **Continue using the secondary server even when the primary server becomes available again** is selected by default. This allows you to use manual switchover to test the redundant pair. You can change the selection when testing is complete. If you select **Switch over to primary server when it becomes available again** manual switchover is not available.

Check the status of an alarm server

Follow this example anytime you change the configuration properties and settings of an alarm server.

After changing the alarm server configuration you need to reboot the server computer. For a network distributed application or network station application, the recommended start up sequence is:

1. FactoryTalk Directory server
2. Primary server computers
3. Secondary server computers
4. Operator workstations

This example demonstrates how to check the status of a redundant alarm server in FactoryTalk View Studio using the device alarm server **FTAE Server** created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers. on page 38](#)

Step 1. Open the application in FactoryTalk View Studio

1. To start FactoryTalk View Studio, in Windows, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the Application Type Selection window, select **View Site Edition (Network Distributed)**, and then click **Continue**.
3. In the **New/Open Site Edition (Network Distributed) Application** dialog box, on the **Existing** tab, select the name of the existing application. In this example, we named the application **My Network App**.
4. Click **Open**.

Step 2. Select the device alarm server

In the **Explorer** window, open the application **My Network App** and find the device alarm server, for example, **FTAE Server**.

Step 3. Check server status

1. In the **Explorer** window, right-click the alarm server **FTAE Server**, and then click **Server Status**.



Tip: To test your redundant server configuration, trigger a manual switchover by clicking the **Switchover** button. The **Switchover** button is enabled if the server is configured for redundancy, the **Switchover options** selection is **Continue using the secondary server, even when the primary becomes available again** (default), and both the primary and secondary servers are currently available.

2. To close the **Server Status** dialog box without making any changes, click **Cancel**.

Get started with language switching

You can use language switching to display text strings that you define when you create an application, in up to 40 different languages. At runtime, a FactoryTalk View SE Client can switch between any of the languages the application supports. In a network distributed application or network station application, multiple clients can run in different languages at the same time.

For more information on supported languages, see [Language identifiers for language switching on page 186](#). For additional information about configuring language switching configuration in FactoryTalk View Studio, see "Setting up Language Switching" in the FactoryTalk View Studio Site Edition Help.

IMPORTANT: Time and date formats do not switch. Alarm and Event objects in FactoryTalk View always display the date and time format of the operating system. The rest of a FactoryTalk View application shows the format for the language FactoryTalk View is displaying.

Dialog boxes that are part of the graphical user interface of FactoryTalk Alarms and Events but not user configurable—for example, the **Acknowledge with Comment** dialog box—do not switch languages. They are displayed in the language of the operating system.

Historical alarm and event messages do not switch languages. They are displayed in the language in which they were logged.

Before you begin

To implement language switching, the procedure depends on whether you are using device-based alarm monitoring or tag-based alarm monitoring. If you are not sure what type of alarm monitoring to use, see [Plan your system on page 25](#).

If you are using device-based alarm monitoring

- Review [Define device-based alarms in Studio 5000 controllers on page 29](#).
- Verify that you have installed and activated the software listed in [What you need on page 30](#).
- Verify that the Studio 5000 firmware has been updated to revision 16 or later (excluding 21 to 23).

If you are using tag-based alarm monitoring

- Review [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).
- If your alarms and events system uses a data server, review [Add an OPC data server for third-party controllers on page 45](#).

What you need

If you are using device-based alarms

- The Logix Designer application (or RSLogix 5000 software version 16 or later)
- ControlFLASH
- RSLinx Classic
- FactoryTalk Linx

- FactoryTalk View Studio
- FactoryTalk View SE Client

If you are using tag-based alarms

- PLC-5, SLC 500, third-party, or Studio 5000 controllers that have not been programmed with alarm instructions included in the Logix Designer application (or RSLogix 5000 software version 16 or later)
- RSLogix 5 or RSLogix 500 software
- FactoryTalk Linx, RSLinx Classic (for bridging from Ethernet to DH+ or DH-485 networks), or a third-party OPC Data Server (for example, KEPWare server) for communicating with third-party controllers
- FactoryTalk View Studio or FactoryTalk Administration Console
- Microsoft Excel® (for editing exported alarm messages in multiple languages)

Follow these steps

Follow these steps to get started with language switching:

- Add a device server or add a tag-based alarm server
- Create device-based or tag-based alarm messages
- Add buttons to a graphic display to switch languages
- Add languages to the application
- Edit alarm messages in alternate languages
- Create a display client configuration file
- Test alarm messages at runtime

Create device-based alarm messages

To create device-based alarm messages in multiple languages you can use the import and export features in the Logix Designer application (or RSLogix 5000 software). At runtime, alarm messages located in Studio 5000 controllers can be displayed in the language of the FactoryTalk View application in which they are displayed.

When FactoryTalk Linx connects to the controller, all alarm messages and their languages are uploaded from the controller. When a FactoryTalk View SE Client runs, the FactoryTalk Alarms and Events objects (Alarm and Event Summary, for example) connect to the FactoryTalk Alarms and Events system and request alarm messages in the current language. When you switch languages on the client computer, the alarm monitoring system and all of the client screens switch to the appropriate language on that specific client.

IMPORTANT: Historical alarm messages are logged in the language currently associated with the Alarm and Event Log. The Alarm and Event Log displays messages in the language in which they were logged. For example, a message logged in English will be displayed in English, even if the language is switched to Italian.

Translate alarm messages using import and export

A system may have thousands of alarm messages that need to be translated. To simplify this process, you can export alarm messages to a file, add translated messages in multiple languages to the file, and then import the file back into your project. Any of the languages you translate the strings into must be supported by FactoryTalk View.

You can enter text strings in multiple languages in two ways.

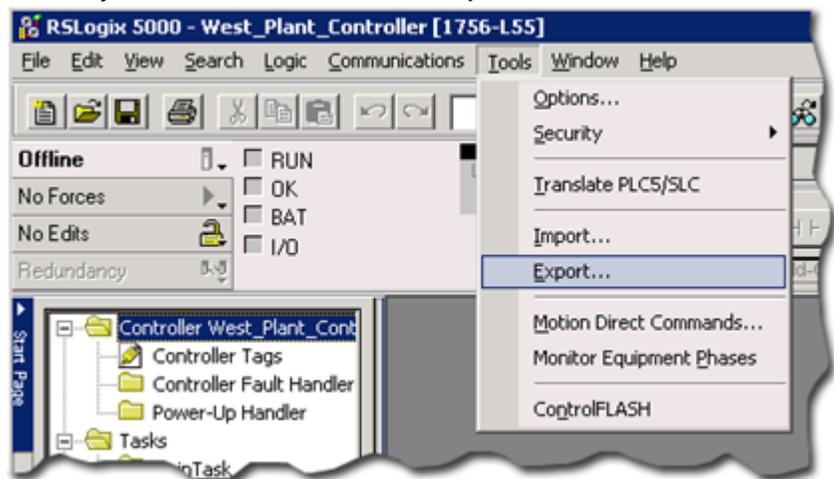
1. In RSLogix 5000 software version 16 or earlier, create alarm messages in one language, and use the RSLogix 5000 Export tool to export the project's tags, logic comments, descriptions and alarm messages from RSLogix 5000 to a comma-separated value (*.csv) file or a text (*.txt) file. The text strings can be translated into other languages and added to the file. Then use the RSLogix 5000 Import tool to import the strings back into the project.
2. In RSLogix 5000 software version 17 or later, you select a language for the project, and then in the **Project Documentation Language Configuration** dialog box you export a localization file that contains documentation from the project. The documentation included in the text (*.txt) file includes user-defined logic comments, component names, and alarm messages. The text strings can be translated into other languages and added to the file. Use the **Project Documentation Language Configuration** dialog box to import strings back into the project. See [Translating alarm messages using RSLogix 5000 version 17 or later on page 131](#).

Translate alarm messages in RSLogix 5000 version 16 or earlier

To translate alarm messages using RSLogix 5000 software version 16 or earlier, complete the following steps. To translate alarm messages in RSLogix 5000 software version 17 or later, using the project documentation language feature, see [Translating alarm messages using RSLogix 5000 version 17 or later on page 131](#).

Step 1. Export alarm messages from RSLogix 5000

1. Start RSLogix 5000 (version 16 or earlier) and open the West_Plant_Controller project you created in [Define device-based alarms in Studio 5000 controllers on page 29](#). If you have not yet created the project, do so before continuing.
2. In the RSLogix 5000 window, on the **Tools** menu, click **Export**.



3. In the **Export** dialog box, click **Export**.
If your RSLogix 5000 project includes a large number of programs, and you want to translate alarm messages from only one of them, you can make selections in the **Export** dialog box to limit the data that is exported. For details, click **Help**.



Tip: When translating to or from Unicode character sets (for example, Asian languages), you must export and then import the RSLogix 5000 tag database as a .txt file. The .csv format does not support Unicode character sets. This limitation does not apply to Tag Alarm and Event Servers.

Step 2. Translate the exported alarm messages

1. In Windows Explorer, locate the file you exported and then double-click it to open it in Notepad. You can also edit the file using Microsoft Excel.

```

File Edit Format View Help
remark,"CSV-Import-Export"
remark,"Date = Tue Mar 13 14:36:38 2007"
remark,"Version = RSLogix 5000 v16.00"
remark,"Owner = RSI"
remark,"Company = RSI"
0.3
TYPE,SCOPE,NAME,DESCRIPTION,DATATYPE,SPECIFIER,ATTRIBUTES
TAG,MainProgram,alarm_active,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Ack,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Disable,"", "DINT", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Enable,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Reset,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm,"", "ALARM_DIGITAL", "", "(Severity := 500, MinDurationPRE
ALMSG:en-us,MainProgram,DigitalAlarm,Tank Temperature is High,,AM"

```

The last line of text in the file is the alarm definition. The first element from the left is the instruction type (**ALMSG:**) and the language string for the alarm message (**en-us** for English in the United States).

The alarm message text appears as the fourth element from the left (**Tank Temperature is High**).

2. Copy the ALMSG line and paste it at the end of the file.
3. Change **en-us** to **it-it** (for Italian in Italy), and then change the alarm message text to read **La temperatura del serbatoio e alta**.
4. Paste another copy of the ALMSG line at the end of the file.
5. Change **en-us** to **de-de** (for German in Germany), and change the alarm message text to read **Hohe Tanktemperatur!**.

```

File Edit Format View Help
remark,"Date = Tue Mar 13 14:36:38 2007"
remark,"Version = RSLogix 5000 v16.00"
remark,"Owner = RSI"
remark,"Company = RSI"
0.3
TYPE,SCOPE,NAME,DESCRIPTION,DATATYPE,SPECIFIER,ATTRIBUTES
TAG,MainProgram,alarm_active,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Ack,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Disable,"", "DINT", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Enable,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm_Reset,"", "BOOL", "", "(RADIX := Decimal)"
TAG,MainProgram,DigitalAlarm,"", "ALARM_DIGITAL", "", "(Severity := 500, MinDurationPRE
ALMSG:en-us,MainProgram,DigitalAlarm,Tank Temperature is High,,AM"
ALMSG:it-it,MainProgram,DigitalAlarm,La temperatura del serbatoio e alta,,AM"
ALMSG:de-de,MainProgram,DigitalAlarm,Hohe Tanktemperatur!,,AM"

```

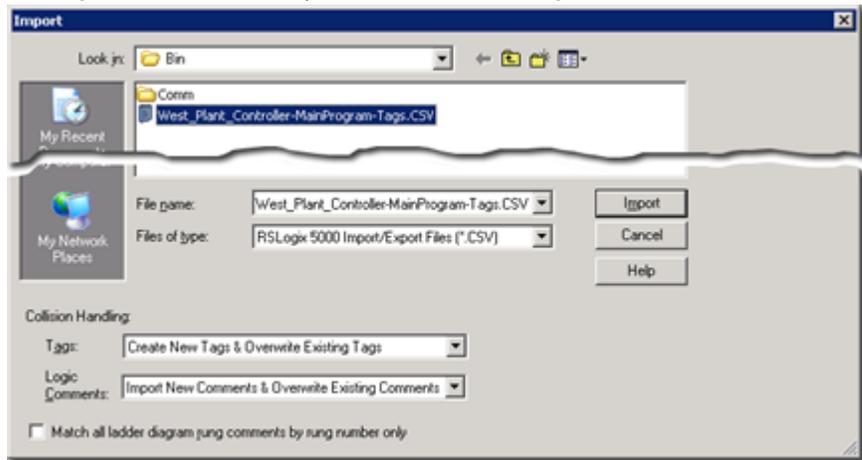
6. On the **File** menu, click **Save**.



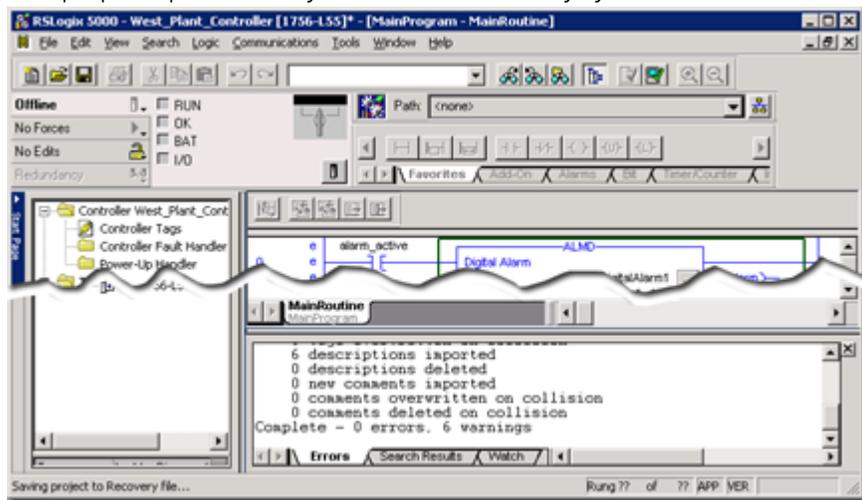
Tip: When you import alarm messages, the system verifies the message length and displays a warning if the alarm message exceeds the character limit.

Step 3. Import the translated alarm messages

1. In the RSLogix 5000 software, on the **Tools** menu, click **Import**.
2. In the **Import** window, select the file you modified and then click **Import**.



The import process produces warnings because it overwrites existing tags.



Step 4. Download the project to the controller

To update the controller with additional alarm messages in the new languages, download the project to the controller.

Next, either continue setting up tag-based alarm messages, or set up a graphic display for language switching. See [Add buttons to a graphic display to switch languages at on page 138](#).

Translate alarm messages using RSLogix 5000 version 17 or later

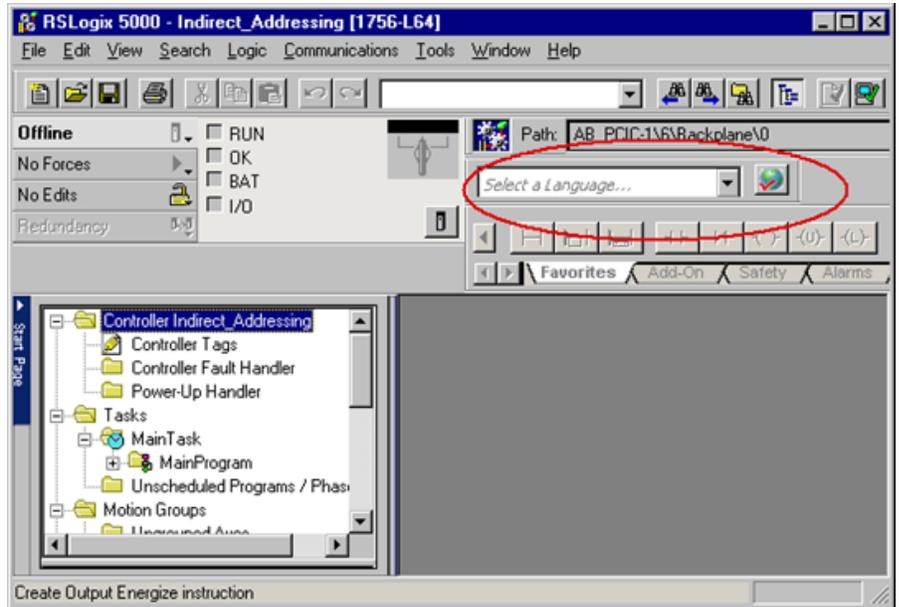
The steps in this procedure apply to RSLogix 5000 software version 17 and later, and the Studio 5000 Logix Designer application version 21 and later, both referred to in this procedure as *the application*.

To translate alarm strings use the project documentation import and export feature. Only the information that is necessary for localization is included in the exported file.

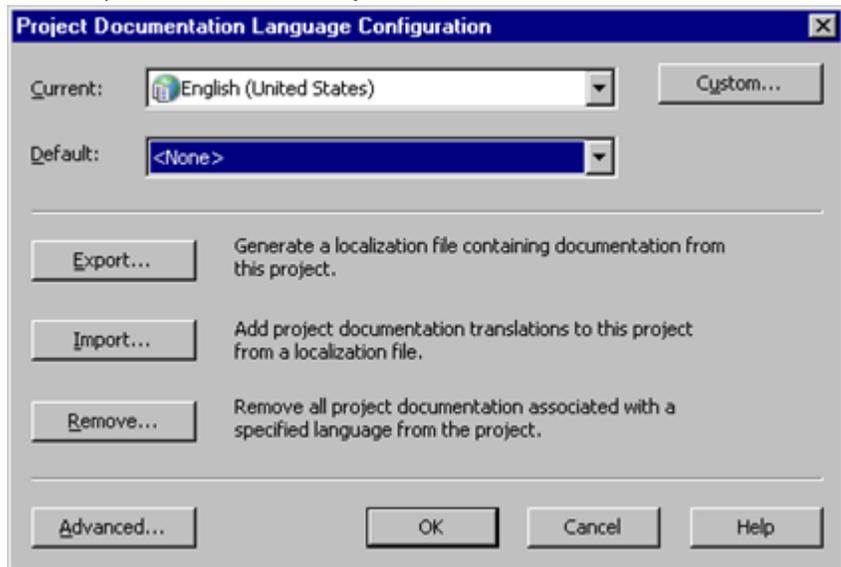
Step 1. Export alarm messages

1. Run the application and open the West_Plant_Controller project you created in [Define device-based alarms in Studio 5000> controllers on page 29](#). If you have not created the project, do so before continuing.
2. To open the **Project Documentation Language** dialog box, click the **Documentation Language**

Configuration icon  or click **Documentation Languages** on the Tools menu.



3. To associate the existing product documentation with a language, select a language from the **Select a language** list or click **Custom** and then add a custom language. For example, select **English (United States)** from the list and then click **OK**.
4. After you select a language for the project, the **Project Documentation Language Configuration** dialog box opens. If the dialog box does not open after a short time, click **Documentation Languages** on the **Tools** menu. To export a localization file, click **Export**.

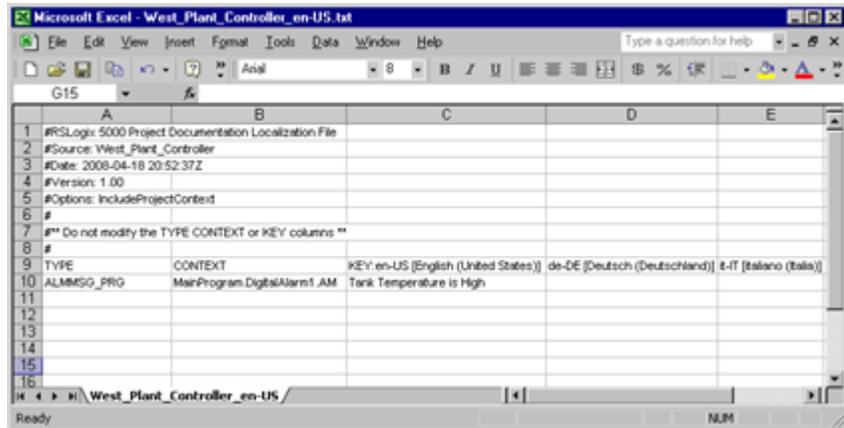


5. In the **Export Project Documentation** dialog box, select the languages to include in the localization file and then click **Next**. For example, select German (Germany) and Italian (Italy) if the project documentation will be translated into German and Italian.
6. To add the configuration information to the localization file, click **Next**.

7. Specify the name and location of the exported localization file and then click **Export**.
8. Click **OK**.

Step 2. Translate the exported alarm messages

1. In Windows Explorer, locate the file you exported. Right-click the file, point to **Open With** and then click **Microsoft Excel**.



The first column contains the instruction type **ALMMMSG**. Column **C** is labeled **KEY:en-US [English (United States)]** and the alarm message is displayed in English.

Column **D** is labeled **de-DE [Deutsch (Deutschland)]**, and Column **E** is labeled **it-IT [italiano (Italia)]**. These are the languages you selected for the export.

2. Type **Hohe Tanktemperatur!** in column **D** in the same row that shows **Tank Temperature is High**.
3. Type **La temperatura del serbatoio e alta** in column **E** in the same row that shows **Tank Temperature is High**.
4. On the **File** menu, click **Save**.

Step 3. Import the translated alarm messages

1. In the application, on the **Tools** menu, click **Documentation Languages**.
2. In the **Project Documentation Language Configuration** dialog box, click **Import**.
3. In the **Select File** dialog box, select the file you modified and then click **Import**.
4. Verify the languages you want to import in the **Import Project Documentation** dialog box, and then click **Import**.
5. Click **OK**.



Tip: When you import alarm messages, the application verifies the message length and displays a warning if the alarm message exceeds the 255 character limit.

Step 4. Download the project to the controller

To update the controller with additional alarm messages in the new languages, download the project to the controller.

Next, either continue with setting up tag-based alarm messages, or set up a graphic display for language switching.

See [Add buttons to a graphic display to switch languages at on page 138](#). runtime

Create tag-based alarm messages

The alarm messages in a tag-based alarm server also support language switching. As with device-based alarms, in FactoryTalk View you can also enter text strings in multiple languages in two ways:

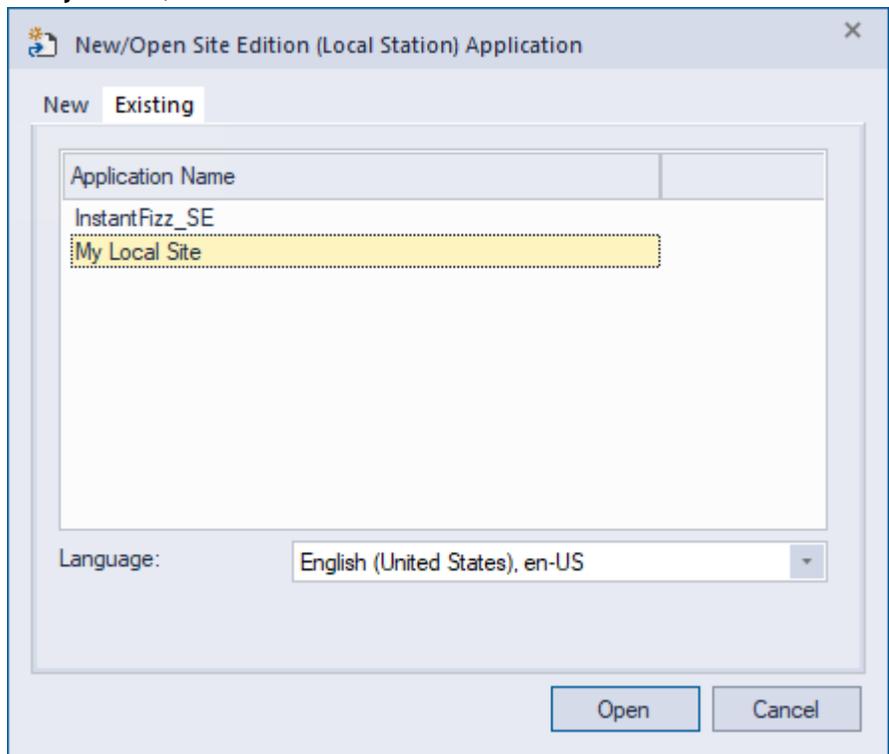
1. The messages in the **Alarm and Event Setup** editor are saved in the language you select when opening an application in FactoryTalk View.
2. After creating alarm messages in one language, you can export them from FactoryTalk View to a Microsoft Excel (*.xls) or XML file (*.xml), add translated versions of the strings to the exported file, and then import them into FactoryTalk View again.

The maximum length for alarm messages is 255 characters. When you import alarm messages, anything over 255 characters is truncated.

Enter text strings in FactoryTalk View Studio

Step 1. In FactoryTalk View Studio, choose a language in which to open an application

1. To start FactoryTalk View Studio, in Windows click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Studio**.
2. In the **Application Type Selection window**, select **View Site Edition (Local Station)** and then click **Continue**.
3. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab, select the application you created in [Add a device server for Studio 5000, PLC-5, or SLC 500 controllers](#) on page 38 (we used **My Local Site**).

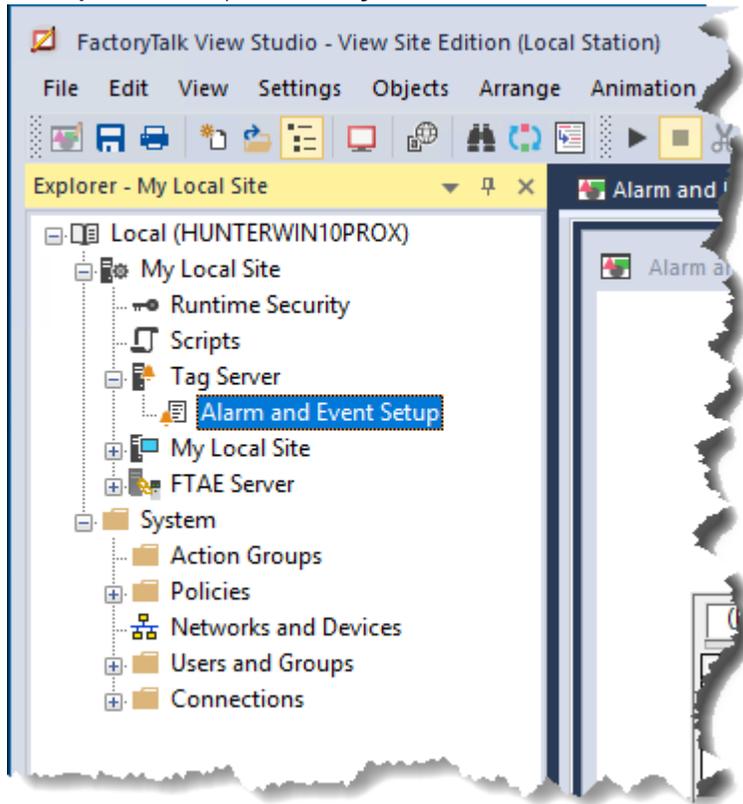


4. In the **Language** list, select the language in which you are creating your application (in this example, **English (United States), en-US**), and then click **Open**.

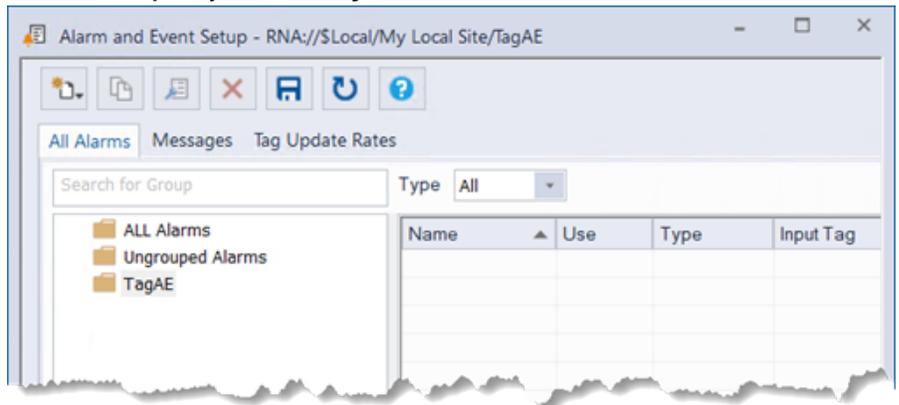
Step 2. Create a digital alarm

This section uses the FactoryTalk Tag Alarm and Event Server you created in [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#). If you have not yet created the server, do so before continuing.

1. In the **Explorer** window, expand the new **Tag Server**, and then double-click **Alarm and Event Setup**.

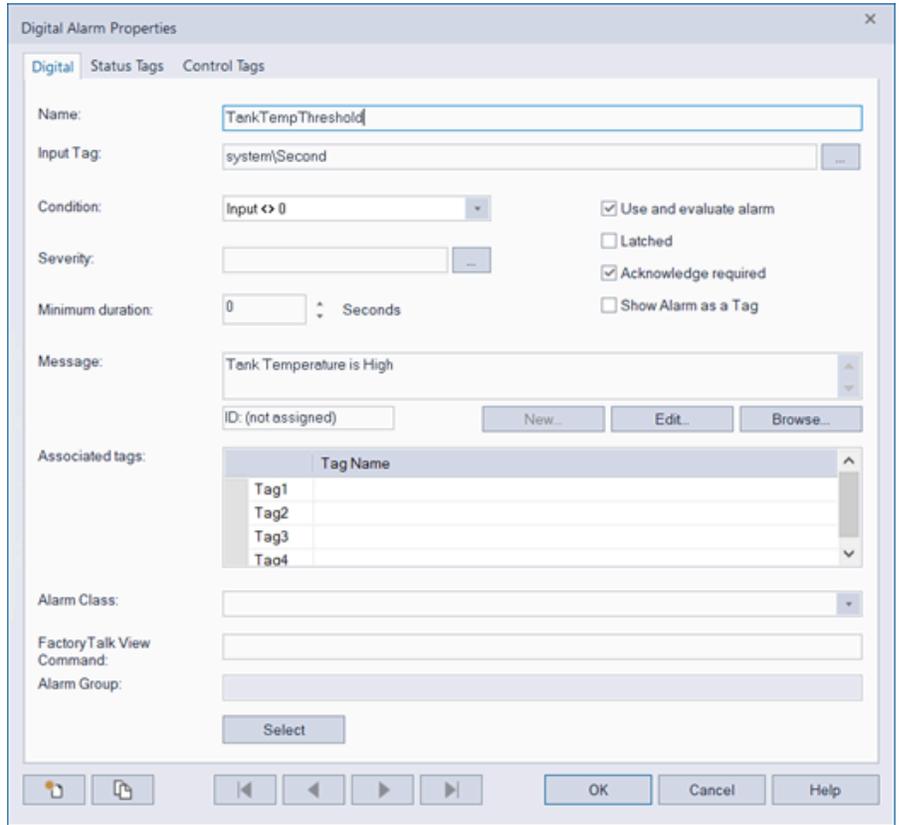


In the **Alarm Setup** dialog box, click the **Digital** tab.

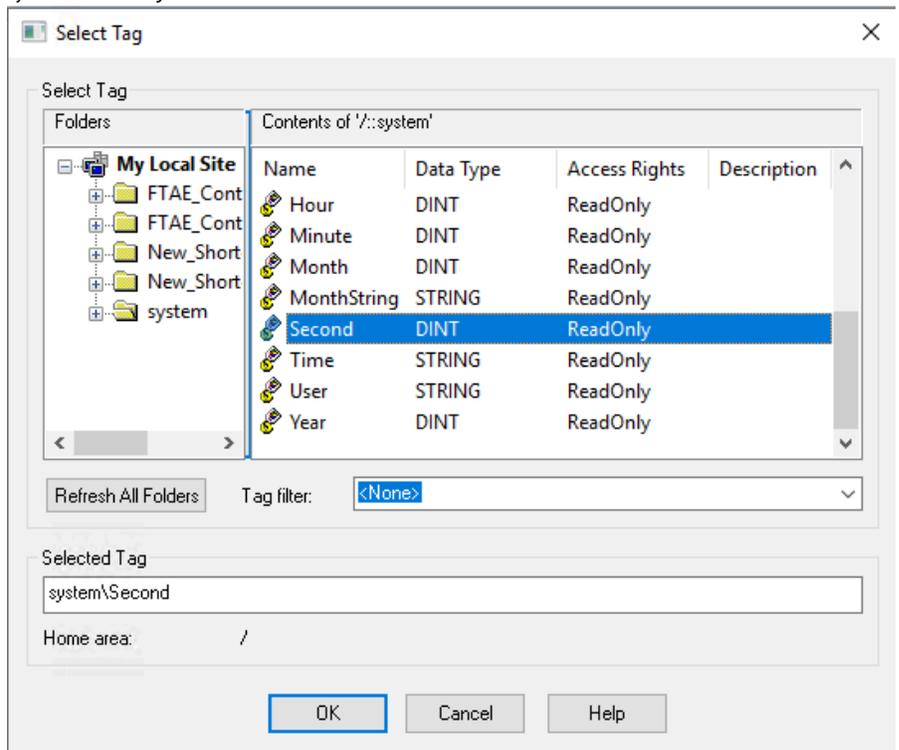


2. On the toolbar, click the **New** button .

- In the **Digital Alarm Properties** dialog box, in the **Name** box, type **TankTempThreshold**.

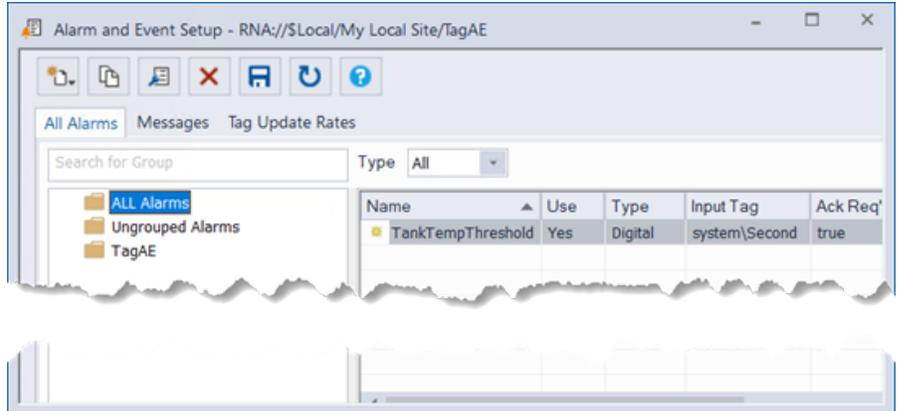


- In the **Input Tag** field, type **system\Second**. This tag uses the second count from the computer's internal clock to trigger the alarm. You can also click the **Browse** button (...) beside the **Input Tag** field to select the **system\Second** tag and then click **OK**.



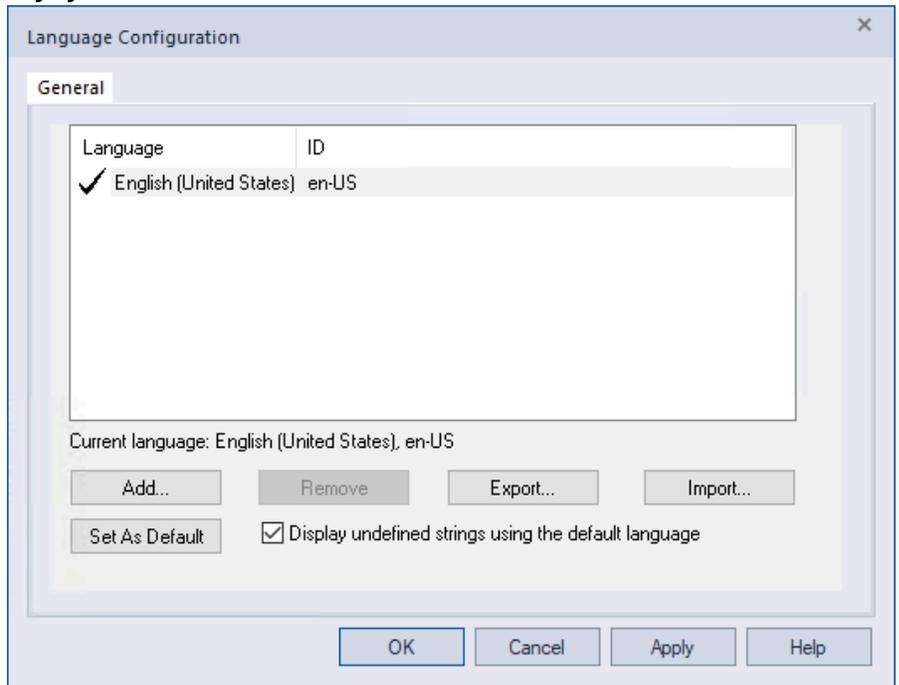
- In the **Digital Alarm Properties** dialog box, in the **Condition** list, select **Input**. This triggers the alarm every time the value of the **system\Second** tag is 0, which happens every minute. = 0

6. In the **Message** field, type **Tank Temperature is High**, and then click **OK**.
7. Close the **Alarm and Event Setup** editor and save your changes.



Add languages to the application

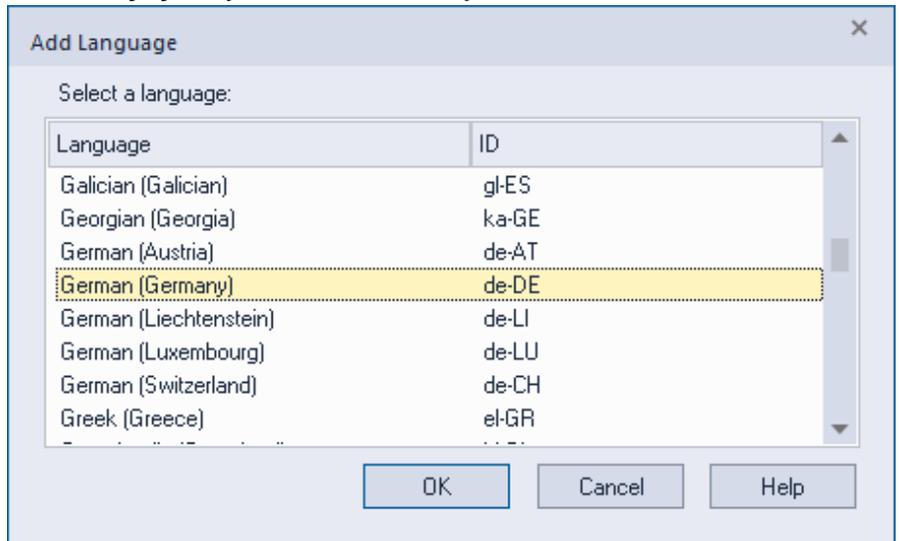
1. In FactoryTalk View Studio, on the **Tools** menu, click **Languages**.
2. In the **Language Configuration** dialog box, select the **Display undefined strings using the default language** check box, and then click **Add**.



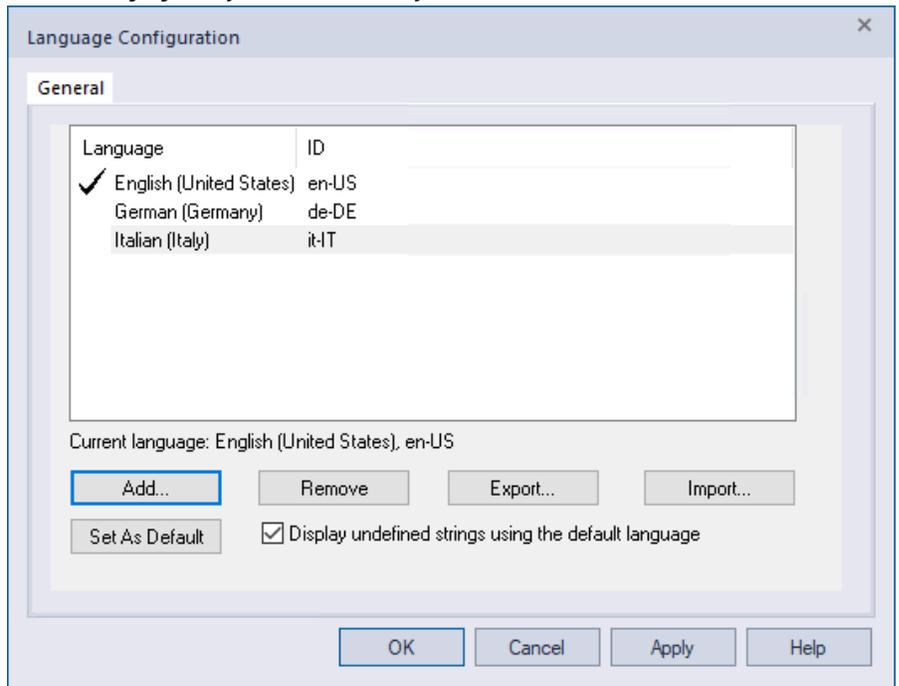
When the **Display undefined strings using the default language** check box is selected, any strings that are not defined in the current language are displayed in the default language at runtime.

When this check box is not selected, any strings that are not defined in the current language are displayed as question marks (???) at runtime.

- In the **Add Language** dialog box, click **German (Germany)** and then click **OK**.



- In the **Language Configuration** dialog box, click **Add** to add the next language.
- In the **Add Language** dialog box, click **Italian (Italy)** and then click **OK**.



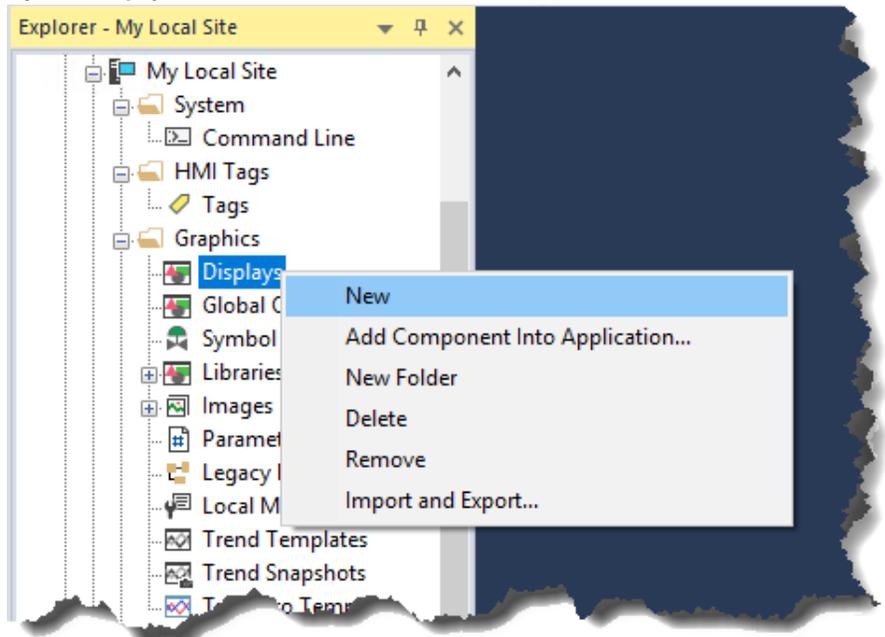
- In the **Language Configuration** dialog box, click **OK**.

Add buttons to a graphic display to switch languages at runtime

In this section, we add a button to a graphic display which can be used to switch among available languages at runtime.

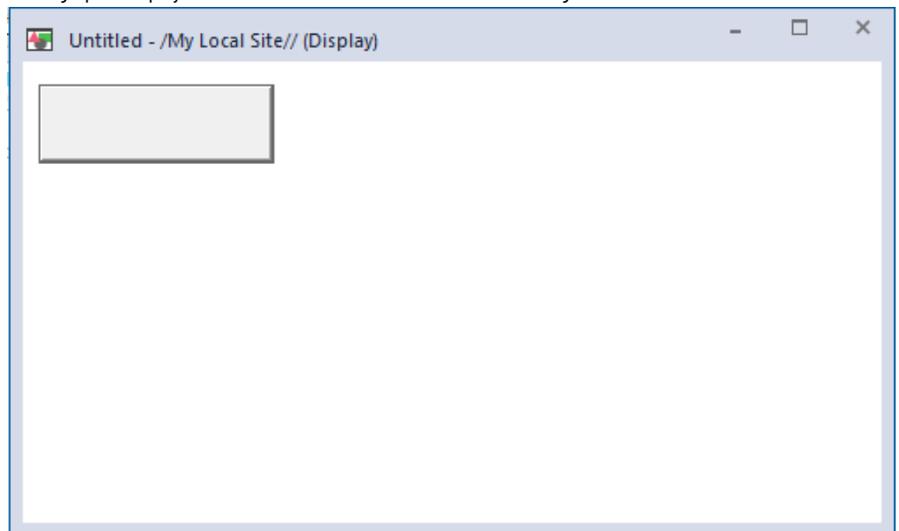
Step 1. Create a new graphic display

1. In FactoryTalk View Studio, in the **Explorer** window, expand the **Graphics** folder.
2. Right-click **Displays**, and then click **New**.



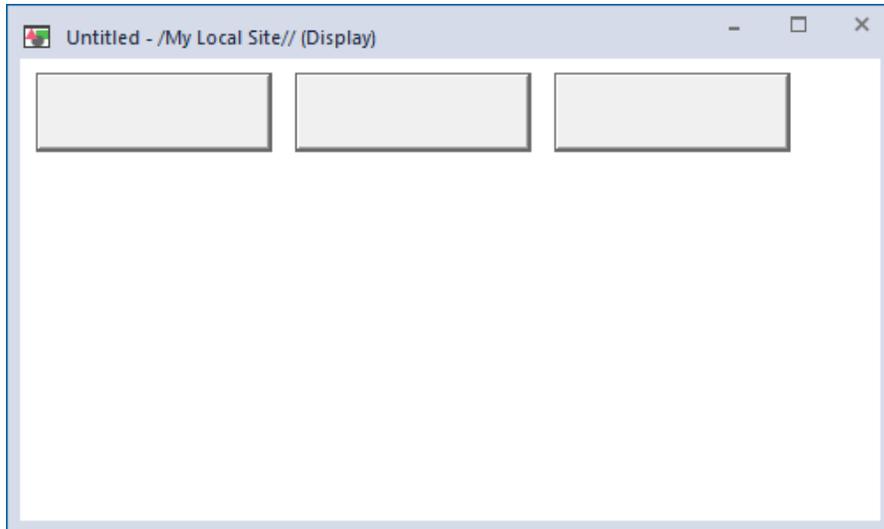
Step 2. Add buttons to the graphic display

1. On the **Objects** menu, select **Push Button > Button**.
2. In the graphic display, hold down the left mouse button and then drag the mouse to draw a box for the button.



3. On the **Edit** menu, click **Copy**.
4. On the keyboard, press **Ctrl-V** twice, to paste two more copies of the button in the graphic display.
5. Drag the copies of the button apart on the display.
6. On the keyboard, press **Ctrl-A** to select all of the buttons.

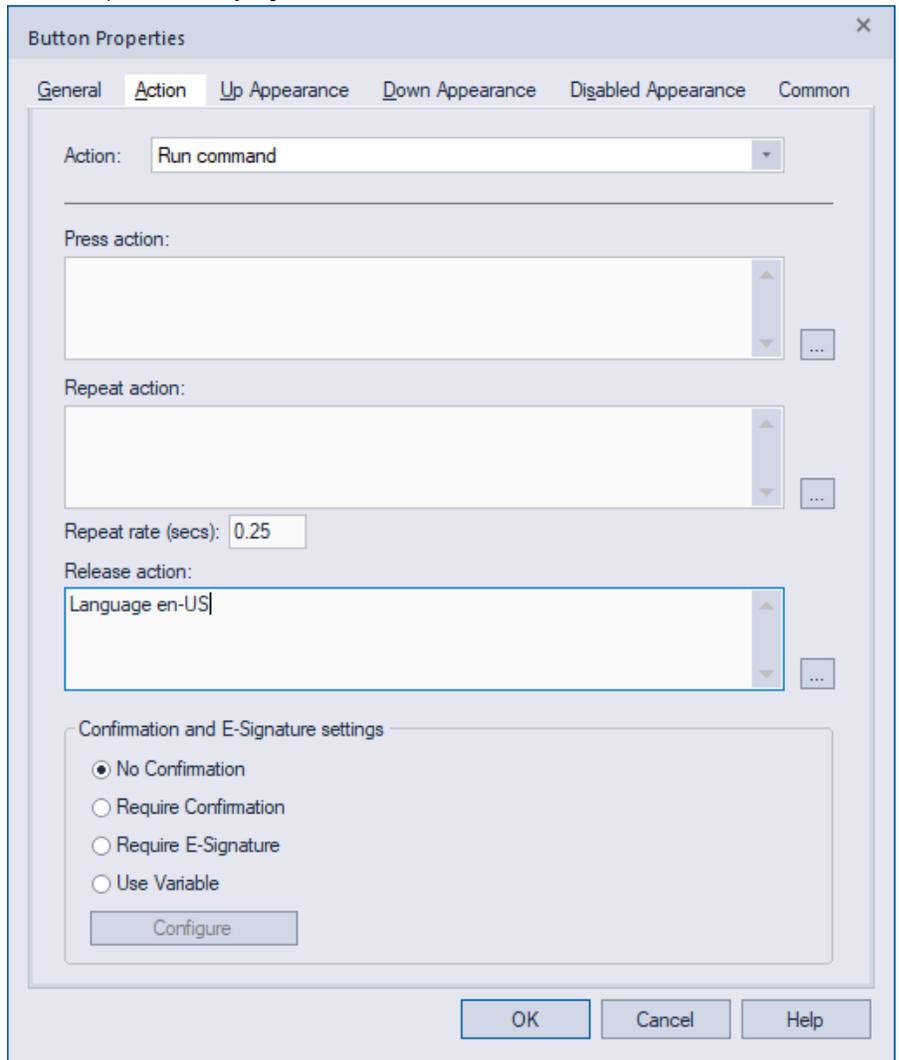
7. On the **Arrange** menu, click **Align Top** to align the tops of the buttons.
8. On the **Arrange** menu, click **Space Horizontal** to space the buttons equally apart.



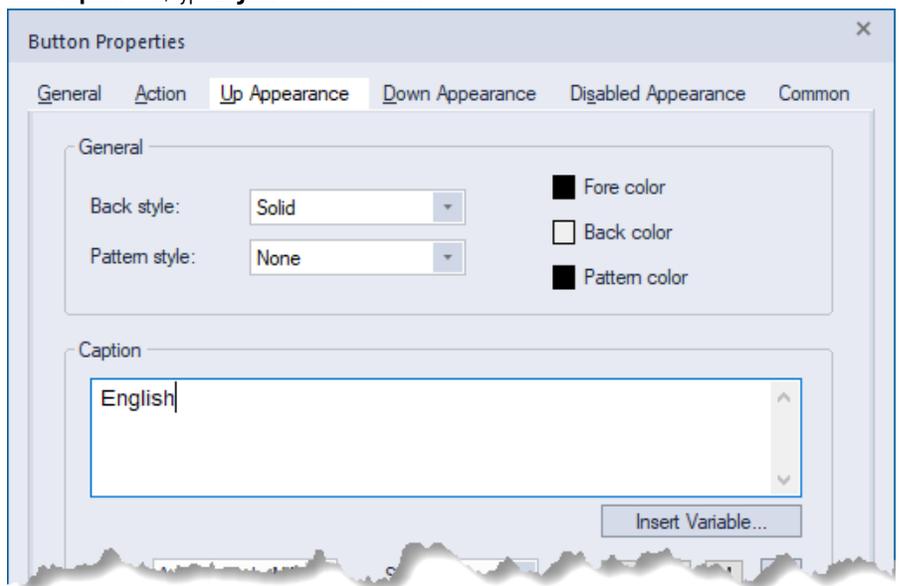
Step 3. Add captions to the buttons

1. Double-click the first button to edit it.
2. In the **Button Properties** dialog box, click the **Action** tab.
3. Click the **Browse** button  to the right of the **Release action** field. The **Command Wizard** opens.
4. In the **Command Categories** pane on the left, expand **All Commands and Macros**.
5. In the list of commands on the right, click **Language**, and then click **Next**.
6. In the **Language ID** list, select the name of the language and then click **Finish**.

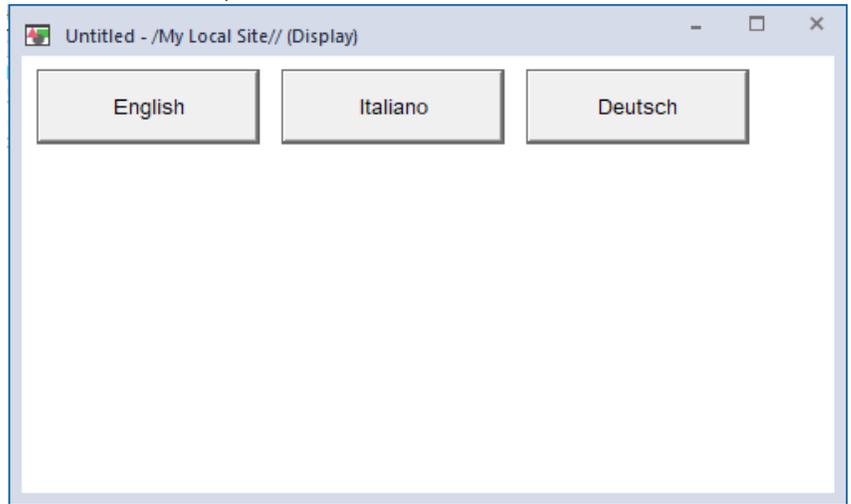
In this example, we are using **English (United States), en-US**.



7. In the **Button Properties** dialog box, click the **Up Appearance** tab.
8. In the **Caption** field, type **English** and then click **OK**.

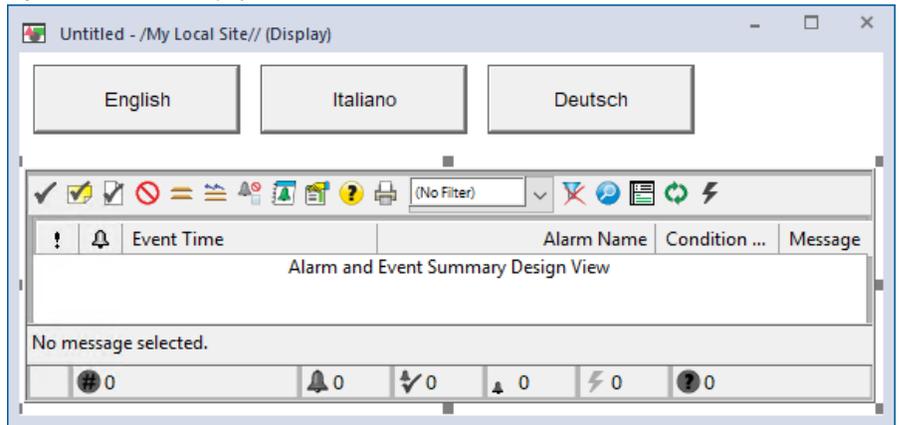


9. Repeat the steps above to add captions to the other two buttons:
 - For the second button, the press action is **Language it-IT** (Italian for Italy).
 - For the second button, the caption is **Italiano**.
 - For the third button, the press action is **Language de-DE** (German for Germany).
 - For the third button, the caption is **Deutsch**.



Step 4. Add an Alarm and Event Summary to the graphic display

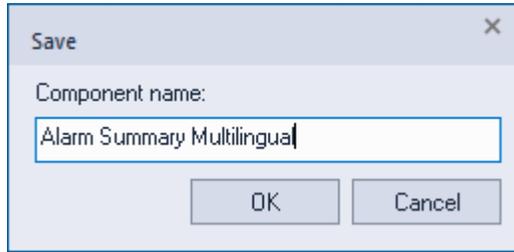
1. On the **Objects** menu, point to **Alarm and Event**, and then click **Summary** (or in the toolbox, click **Alarm and Event Summary**).
2. In the graphic display, hold the left mouse button down and drag the mouse to create a box for the Alarm and Event Summary object.
3. When you have the object the required size, release the left mouse button. The Alarm and Event Summary object is drawn on the display.



Step 5. Save and then close the graphic display

1. On the **File** menu, click **Save**.
2. In the **Save** dialog box, type a name for the graphic display and then click **OK**.

In this example, we used **Alarm Summary Multilingual**.



3. On the **File** menu, click **Close** to close the graphic display.

Enter alarm messages in other languages

In this section, we edit our application twice. The first time, we open the application in Italian, and enter the Italian alarm message in the **Alarm Properties** dialog box.

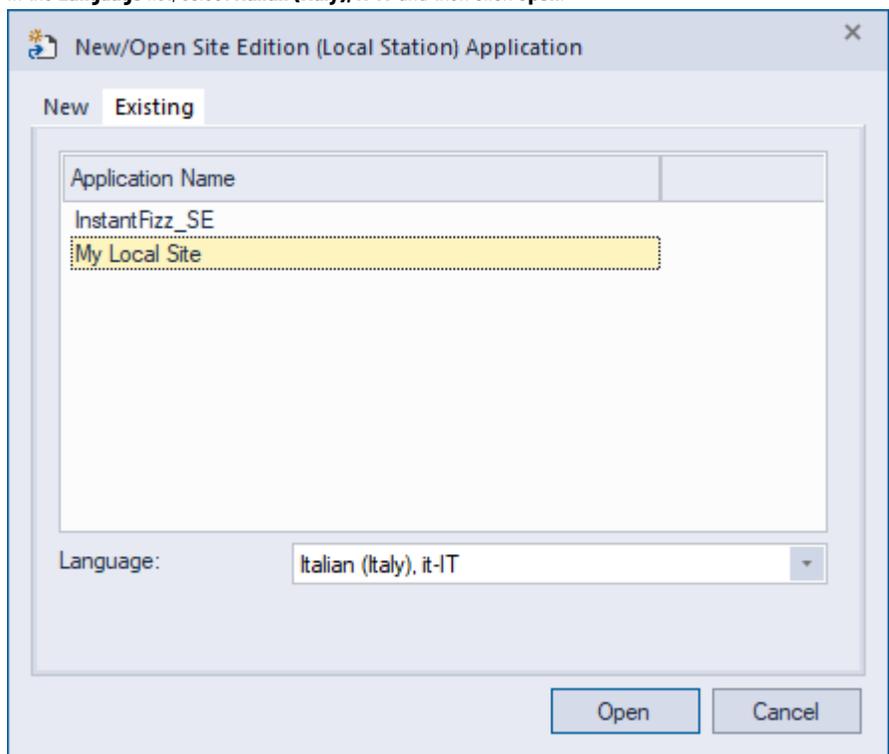
Next, we export the alarms and events to an Excel spreadsheet, enter the German alarm message in Excel, and then import the alarm messages again into our application.

When you enter alarm messages in multiple languages in Excel, you can add the text strings for all languages to one Excel file, and then import the translated text for all languages into the application in one operation.

When you import alarm messages, the maximum length that is allowed is 255 characters. Alarm messages longer than 255 characters are truncated.

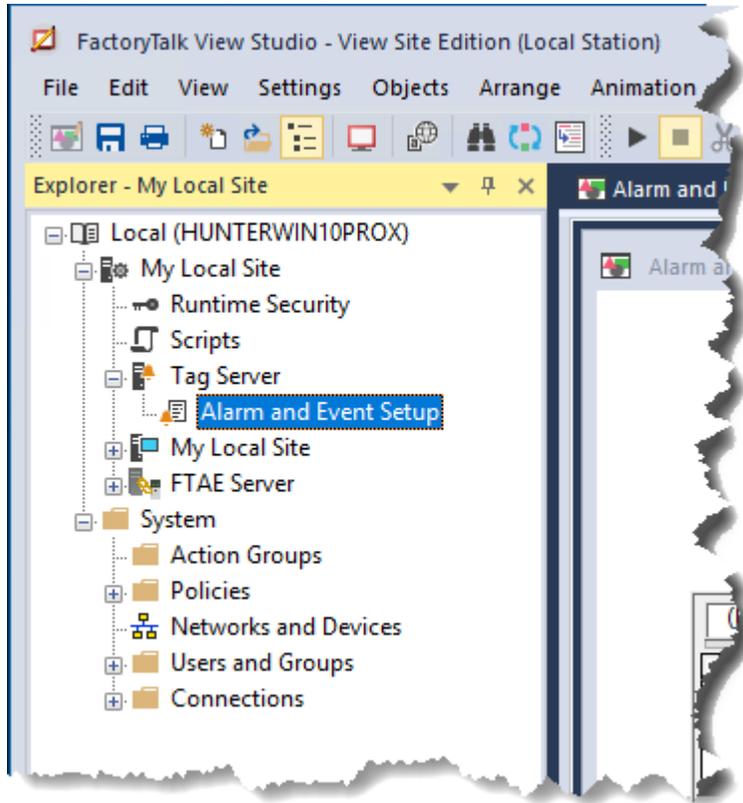
Step 1. Open the application in a new language

1. On the **File** menu, click **Close Application**.
2. In the **New/Open Site Edition (Local Station) Application** dialog box, click the **Existing** tab.
3. In the list of applications, click the name of your application (in this example, **My Local Site**).
4. In the **Language** list, select **Italian (Italy), it-IT** and then click **Open**.

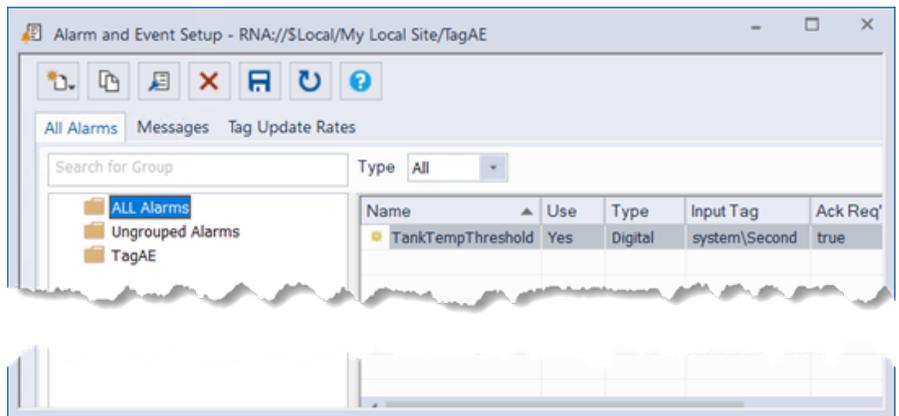


Step 2. Enter the alarm message for the digital alarm

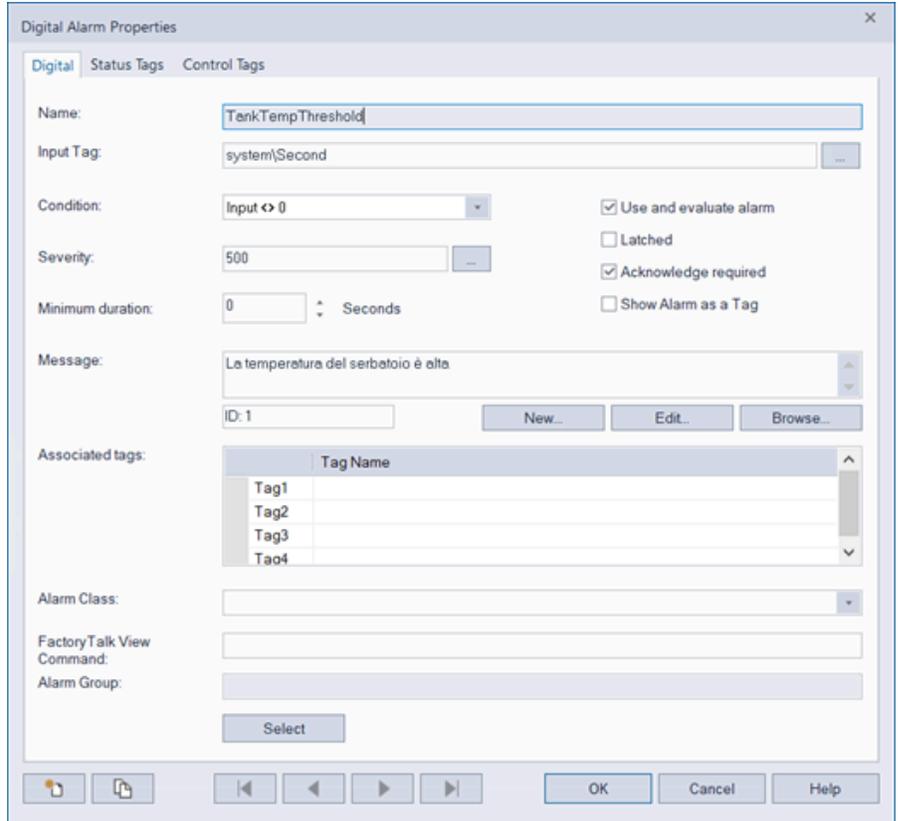
1. In the **Explorer** window, expand the **Tag Server**, and then double-click **Alarm and Event Setup**.



2. In the **Alarm and Event Setup** editor, click the **Digital** tab and then double-click the **TankTempThreshold** alarm to edit it.

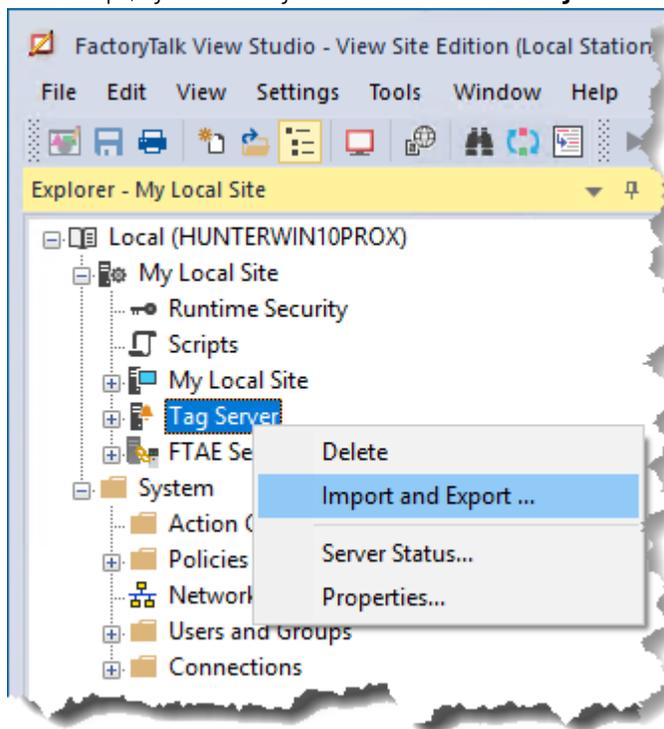


- In the **Digital Alarm Properties** dialog box, in the **Message** field, type **La temperatura del serbatoio e alta** and then click **OK**.

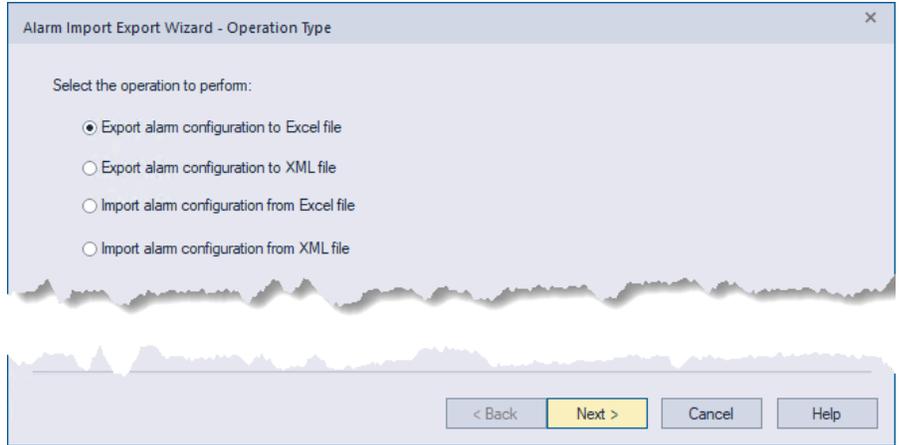


Step 3. Export alarm messages to an Excel spreadsheet

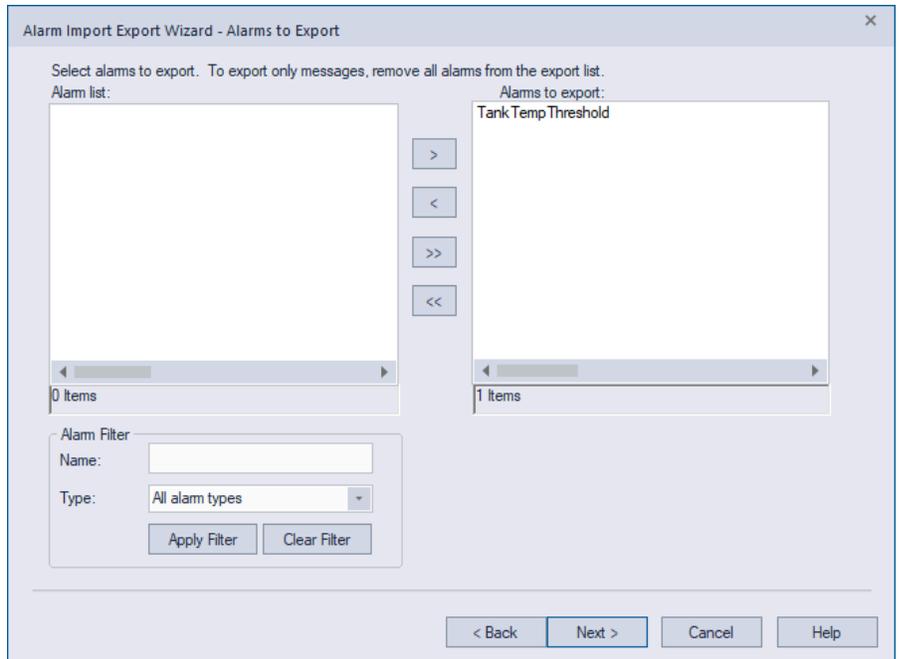
- Right-click the Tag Alarm and Event Server where the alarms are defined, and then click **Import and Export**. In this example, right-click the Tag Alarm and Event Server called **Tag Server**.



2. In the **Alarm Import Export Wizard - Operation Type** window, leave **Export alarm configuration to Excel file** selected and then click **Next**.

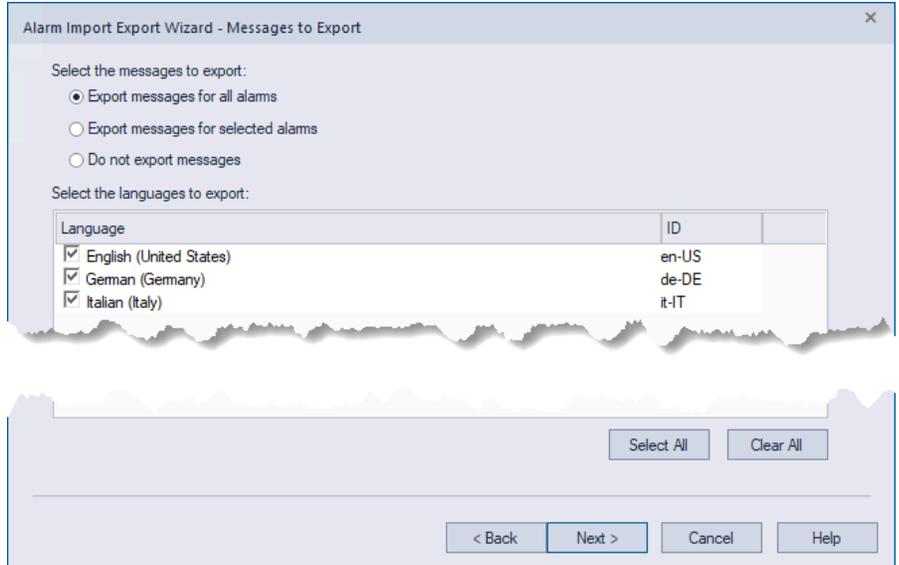


3. In the **Alarms to Export** window, leave the **TankTempThreshold** alarm in the list of alarms to export and then click **Next**.



If you have many alarms and you want to export only some of them, you can filter the list of alarms to find the ones you want, and then you can include only those alarms you need in the exported file. For details, click **Help**.

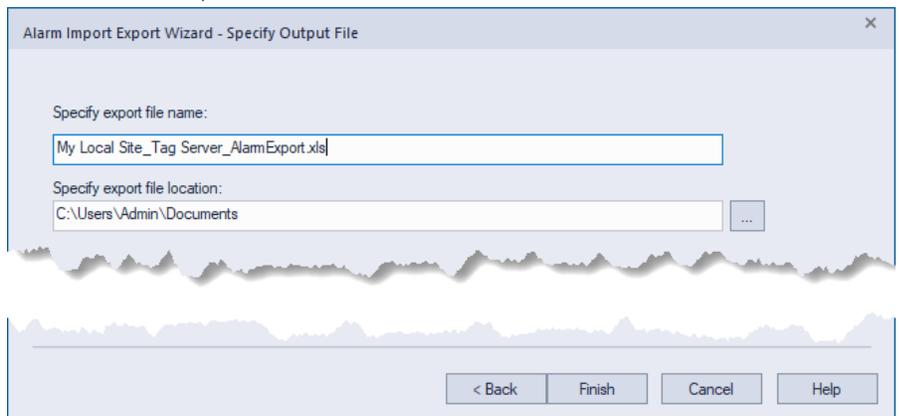
4. In the **Messages to Export** window, leave **Export messages for all alarms** selected, leave all of the languages selected, and then click **Next**.



In this window you can choose whether to export all alarm messages, the messages for only the alarms you selected in the previous step, or no alarm messages, which then exports only the alarm data. If you are exporting alarm messages, you can also select which languages you want to export.

5. In the **Specify Output File** window, leave the file name as it is. You can specify a location where you want the file to be save or use the default location that is displayed, and then click **Finish**.

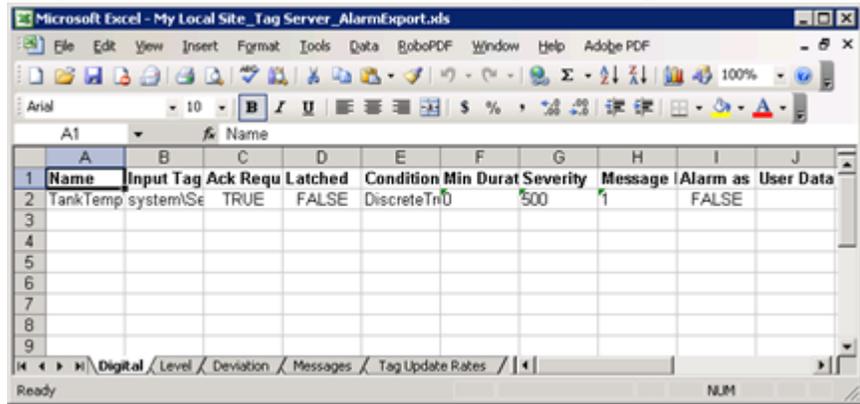
To browse for a location, click the **Browse** button .



6. After the export is complete, click **OK**.

Step 4. Enter alarm messages in Excel

1. Locate the exported alarm file and then double-click it to open it in Microsoft Excel. The default location is in your **My Documents** folder. In this example, the file is called **My Local Site_Tag Server_AlarmExport.xls**.



Each alarm is located in a new row in the spreadsheet. The column names correspond to the settings for each alarm. At the bottom of the Excel window there are tabs that organize the alarms by type (Digital, Level, Deviation).

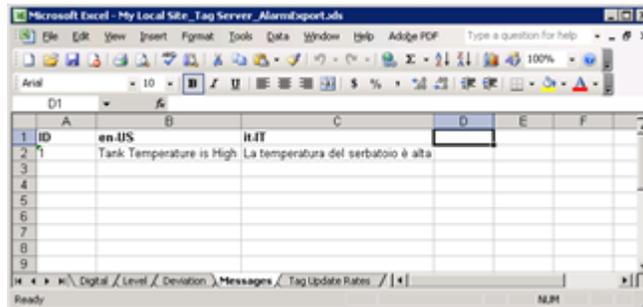
Two additional tabs contain the alarm messages and the tag update rates. These items are located on their own tabs because they can apply to multiple alarms.

For example, if you had 50 alarms, you could use the same alarm message for 10 of them, but have different messages for the rest. Instead of editing the same alarm message 10 times, you only need to edit it once.

Each alarm message has its own numeric identifier (in the Message column located in column H in our example), which links a message to each alarm (level alarms can have a different message for each level).

The maximum length for an alarm message is 255 characters. Messages that are longer than 255 characters are truncated when they are imported.

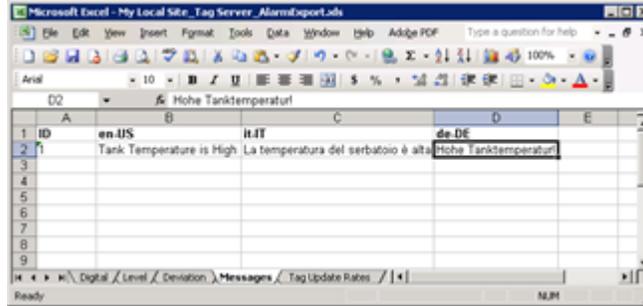
2. At the bottom of the Excel window, click the **Messages** tab.



3. To add a new language for messages, add a new column and then type the associated *language identifier* as the column heading. For example, click cell **D1** and then type **de-DE**. This is the language identifier for German.

For example, the column heading, **en-US** is the language identifier for English (United States). For more information, see [Language identifiers for language switching on page 186](#).

- To add messages, type the new message in a row under the column specified for that language. For example, click cell **D2** and then type **Hohe Tanktemperatur!**

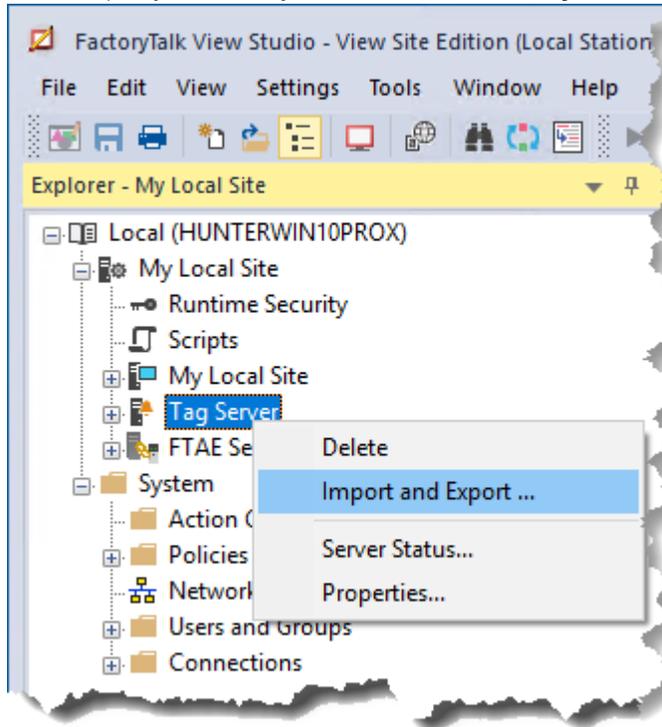


- At the bottom of the Excel window, click the **Tag Update Rates** tab. The columns are labeled with the update rates. For example cell **A-1**, is labeled **0.10** and cell **E-1** is labeled **2 Seconds**.
- To update an input tag every 2 seconds, enter the name of the input tag in the column labeled **2 Seconds**.
- To save your changes, on the **File** menu, click **Save**.
- Close Microsoft Excel.

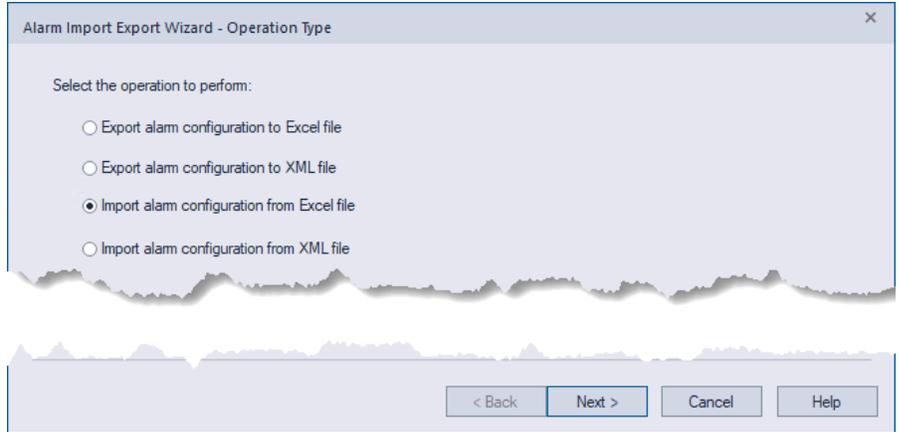
Step 5. Import the alarm messages

- In FactoryTalk View Studio, right-click the Tag Alarm and Event Server where the alarms are defined, and then click **Import and Export**.

In this example, right-click the Tag Alarm and Event Server called **Tag Server**.

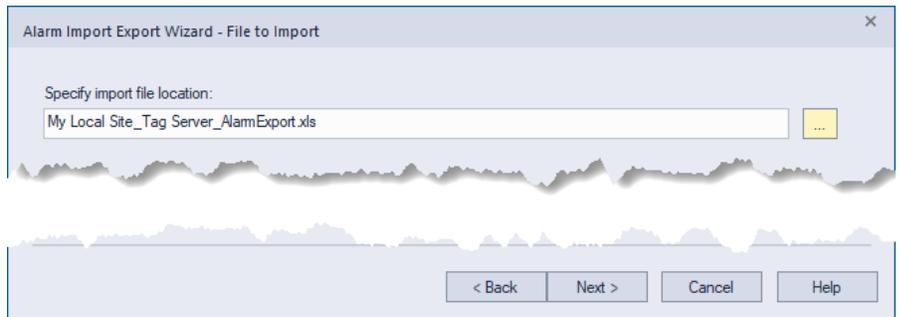


- In the **Alarm Import Export Wizard**, in the **Operation Type** window, select **Import alarm configuration from Excel file** and then click **Next**.

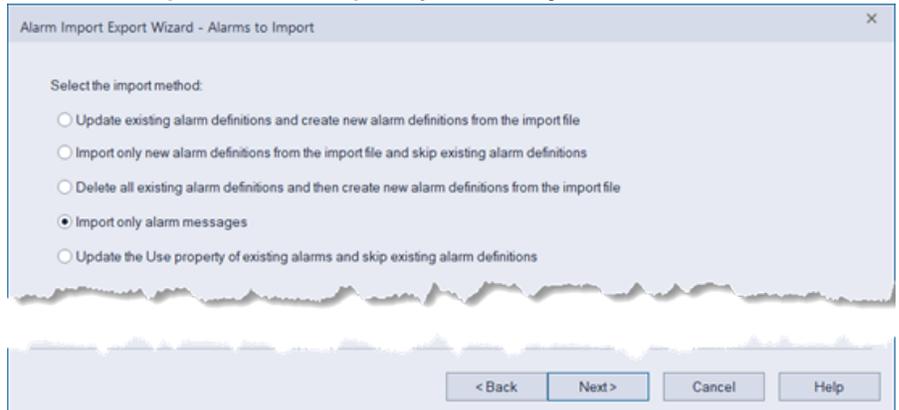


- In the **File to Import** window, select the Excel spreadsheet to which you added the German alarm message and then click **Next**.

To browse for the file, click the **Browse** button

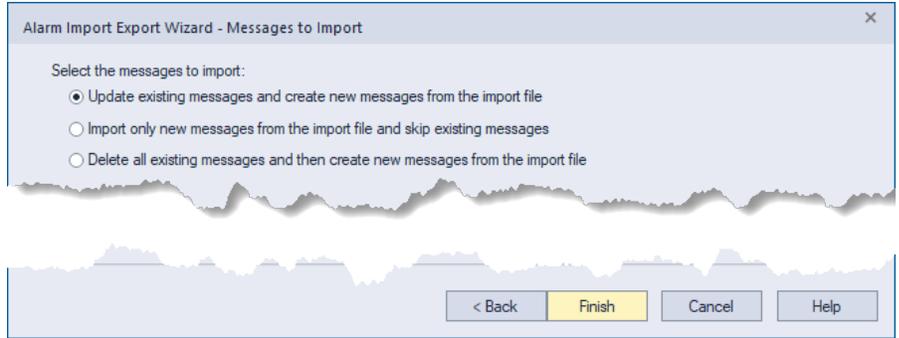


- In the **Alarms to Import** window, select **Import only alarm messages**, and then click **Next**.



In this window you can choose to overwrite any existing alarms, add only the new alarms—leaving all existing alarms unchanged, or delete all existing alarms and then import only those that are in the import file.

- In the **Messages to Import** window, select **Update existing messages and create new messages from the import file**, and then click **Finish**.



Do not select either of the other two options in this window. In our Excel spreadsheet, we added a language to an existing alarm message; we did not create a new alarm message. If you do not choose to update existing messages, the translated text will not appear in your alarm messages.

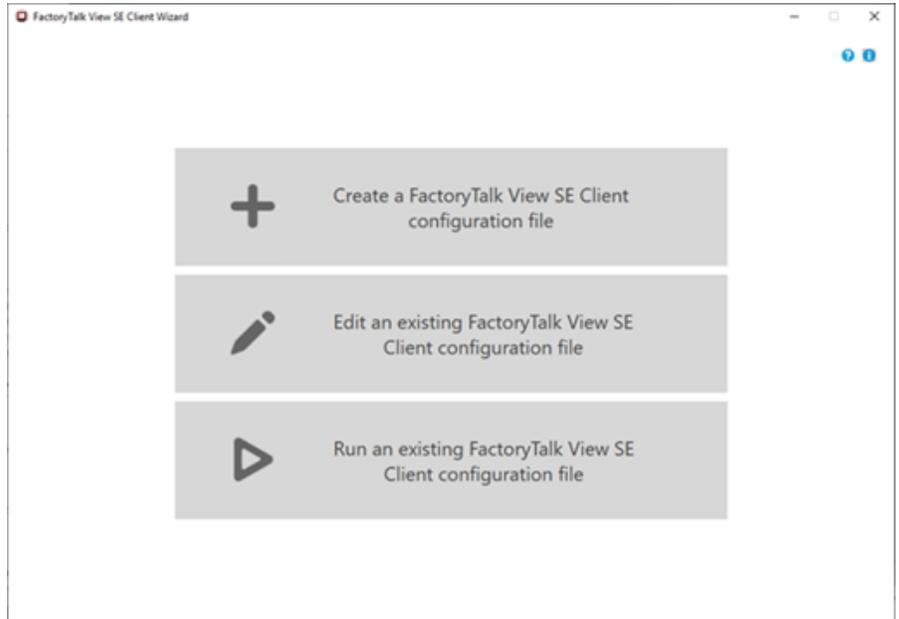
- After the import is complete, click **OK**.

Create a Display Client configuration file to test alarm messages

Because the Language command is ignored when you test run an application, you need to run the application from the FactoryTalk View Site Edition Client.

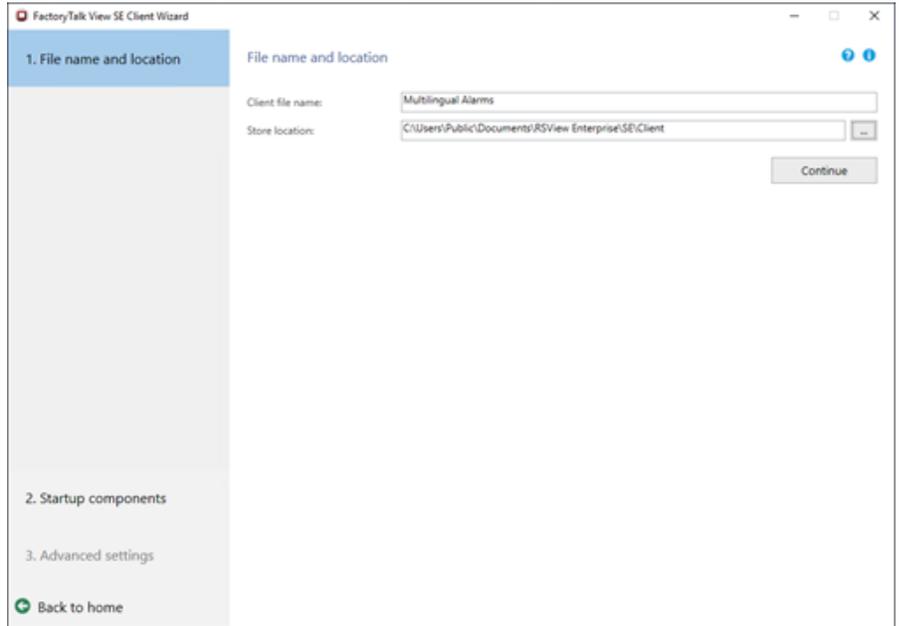
Step 1. Run FactoryTalk View Site Edition Client

- In Windows, click **Start > All Programs > Rockwell Software > FactoryTalk View > FactoryTalk View Site Edition Client**. The **FactoryTalk View SE Client Wizard** opens.

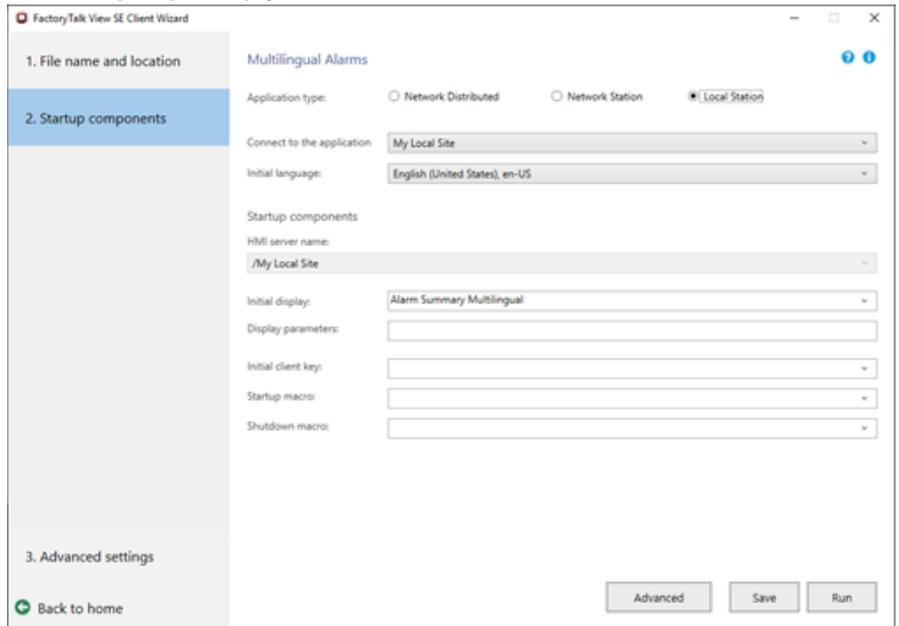


Step 2. Create a FactoryTalk View Site Edition Client configuration file

1. In the FactoryTalk View Client Wizard, click **Create a FactoryTalk View SE Client configuration file**.
2. On the **File name and location** page, in **Client file name**, type a name for the configuration file. In this example, we used **Multilingual Alarms**. Select a path for the configuration file and click **Continue**.

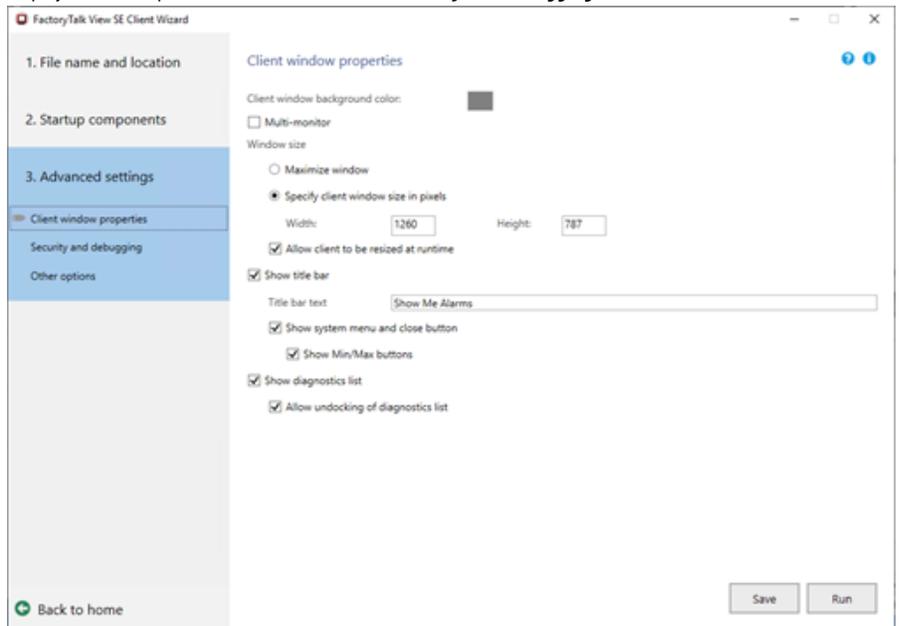


3. On the **Startup components** page, click **Local Station**.

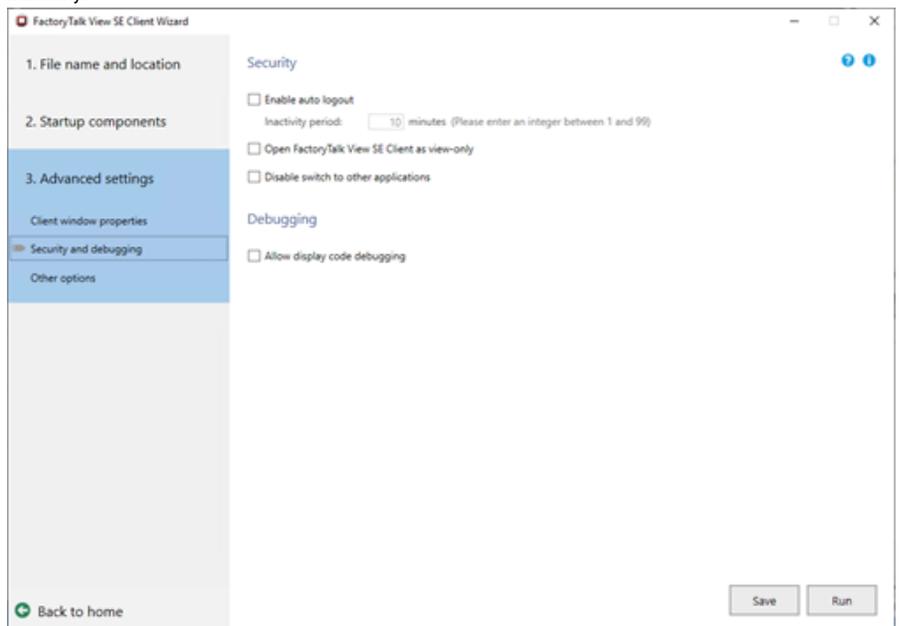


In the **Connect to the application** list, select the name of the application you want to connect to. In this example, we used the **My Local Site** application that we created in [Set up graphic displays on page 58](#). In the **Initial display** list, click **Alarm Summary Multilingual**, and then click **Advanced**.

- On the **Client window properties** page, configure how the FactoryTalk View SE Client window will look at runtime. In this example, we entered **Show Me Alarms** in the **Title bar text** box. At runtime, this text is displayed at the top of the Client window. Click **Security and debugging**.



- On **Security and debugging** page, you can configure the Client to log out automatically after a period of inactivity.



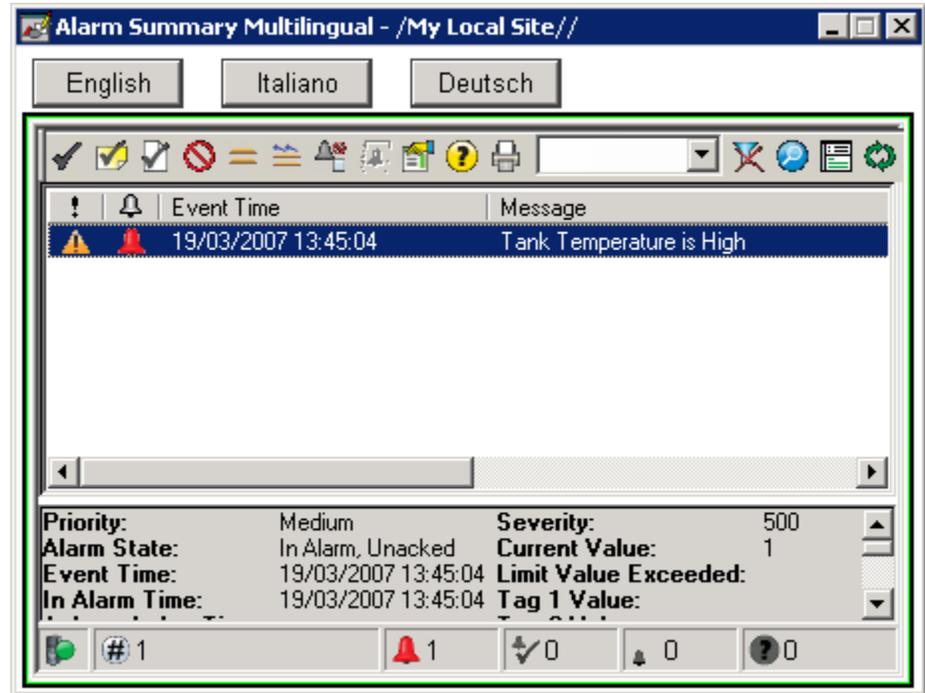
- Click **Save**, and then **Run**.

Test alarm messages at runtime

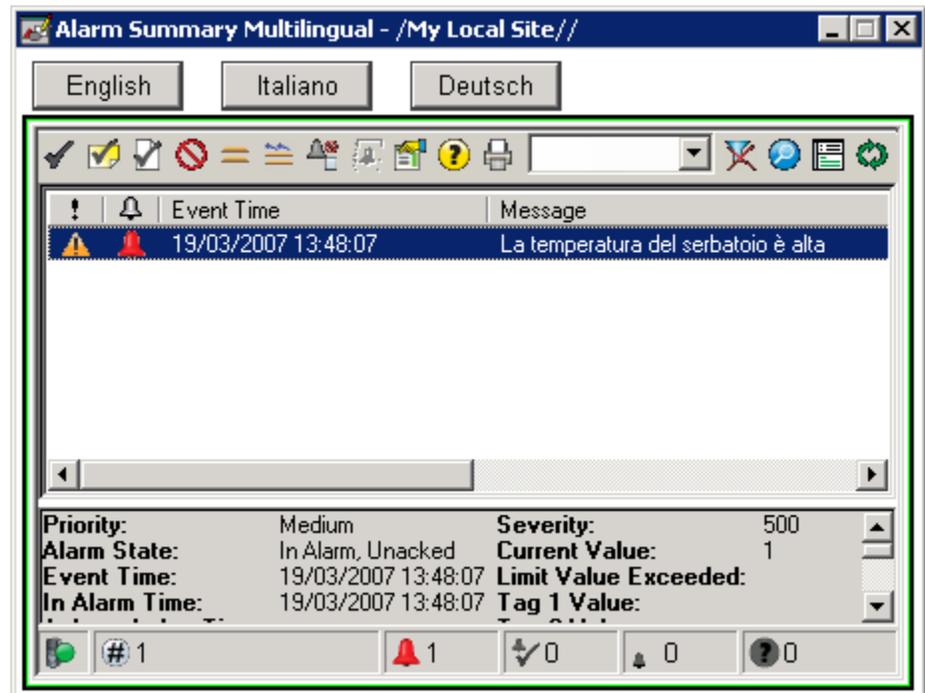
For details about triggering an alarm in the Logix Designer application (or RSLogix 5000 software), see step 6: "Test the alarm instruction by switching to run mode and triggering the alarm" in [Configure the alarm and download to the controller on page 32](#).

In a Tag Alarm and Event Server, the TankTempThreshold alarm we created triggers automatically once every minute.

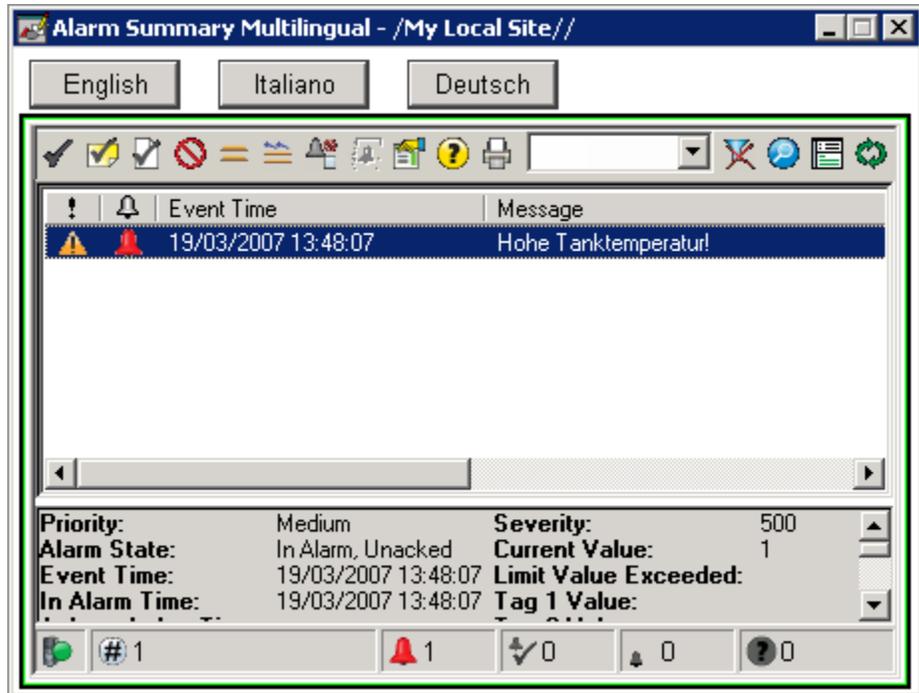
When an alarm conditions occurs, the alarm appears in the Alarm and Event Summary in the default runtime language (in this case, English for the United States).



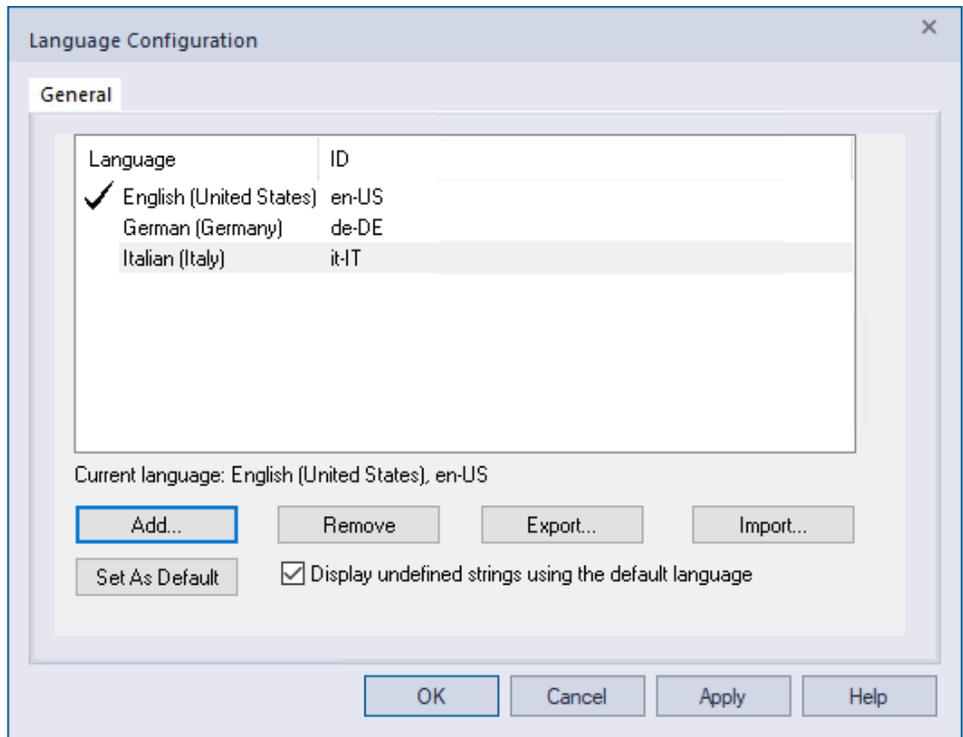
When you click the **Italiano** button, the alarm message appears in Italian. Notice that the other parts of the Alarm and Event Summary (for example, the **Details** pane) currently appear in the language version of the FactoryTalk View software you have installed on your computer. However, you can make these items switch languages by editing the properties of the Alarm and Event Summary to modify the column heading text. You can also export the graphic display's language strings in FactoryTalk View, and then translate them before importing them again.



The behavior of the display is the same when you click the **Deutsch** button to display the alarm message in German.



The labels on the buttons do not change when switching languages. This is the expected behavior because there are no translated strings for the buttons, and the **Display undefined strings using the default language** check box is selected. If you do not select this check box, undefined strings are displayed as question marks (?) at runtime.



Summary and tips for setting up language switching

To set up language switching for an application:

1. Develop the application in a base language.
2. Export the application's user-defined text strings.

When translating to or from Unicode character sets (for example, Asian languages), you must export and then import the Logix Designer tag database as a .txt file. The .csv format does not support Unicode character sets. This limitation does not apply to FactoryTalk Tag Alarm and Event Servers.

3. Translate the strings. You can use Notepad or Microsoft Excel. Excel is useful for large numbers of strings.
4. Import the translated strings back into the application.



Tip: For more detailed information about setting up language switching, see the FactoryTalk View Site Edition Help in FactoryTalk View Studio. Also see the *FactoryTalk View User's Guide* in FactoryTalk View—click **Help > Online Books**.

Text that supports language switching

In general, the user-defined strings that support language switching are those that an operator sees in an application at runtime. Specifically, these are:

- Text you specify for graphic objects and global objects including captions, tool tip text, time and date embedded variables, and numeric embedded variables.
- Graphic and global object display titles specified in the **Display Settings** dialog box.
- Text objects created in graphic displays and global object displays.

Text that does not support language switching

Text that does not support language switching:

- Text that is part of the language version of the FactoryTalk View Studio Site Edition or Client software, such as information from system tags, which is displayed in the same language as the operating system. These are translated when FactoryTalk View is localized.
- Text that can be displayed at runtime but is used to operate the application, such as the names of graphic displays, and command strings.
- Tag descriptions and string constants in expressions.
- Text in the title bar of a FactoryTalk View Site Edition Client window, which is part of the setup of the client, not part of the application.

Alarm and Event Summary and Alarm and Event Banner

If the Alarm and Event Summary or the Alarm and Event Banner is notified of a language switch, the contents are reloaded in the new language.

Any Alarm Fault List messages that you created in Logix Designer (in the **Alarm Properties** dialog box) do not currently switch languages.

You can use the **Alarm and Event Banner Properties** dialog box to configure tooltips and panel captions in multiple languages. Define strings in one language at a time. FactoryTalk View controls which language is displayed. You cannot switch the text labels for the alarm states and priorities.



Tip: When configuring language switching for the Alarm and Event Banner, see the FactoryTalk View Site Edition Help in FactoryTalk View Studio.

Alarm and Event Log Viewer

You can use the Alarm and Event Log Viewer to configure column headings, button captions, and button tooltips in multiple languages. Define strings in one language at a time. FactoryTalk View controls which language is displayed.

When the Alarm and Event Log Viewer is notified of a language switch, the contents of the viewer, which consists of report data, are not translated. This data continues to be displayed in the language that was used when the alarm or event was logged.

If text for a language is not available, the text for the default language is used.



Tip: When configuring language switching for the Alarm and Event Log Viewer, see the FactoryTalk View Site Edition Help in FactoryTalk View Studio.

System performance and limits

FactoryTalk Alarms and Events has been tested to conform to the following performance limits.



Tip: All testing was performed with the recommended hardware. For details, see the *FactoryTalk View Site Edition Installation Guide*.

Controller specifications

The specifications vary depending on the controller firmware revisions.

Controllers with revision 31 and later

Starting from revision 31, Logix tag-based alarms (configured alarms) are supported.

Specification	Value
Number of subscribers (FactoryTalk Linx servers) per L7x controller	3
Number of subscribers (FactoryTalk Linx servers) per L8z controller	6
Active alarm state transitions every 5 minutes per L7x or L8z controller	3,000
Maximum number of instruction alarms per L7x or L8z controller	3,000
Configured alarms only	
Maximum number of configured alarms only per L8z controller	10,000
Maximum number of "used" configured alarms per L8z controller	7,500
Configured alarms with instruction based alarms	
Maximum of configured alarms with instruction based alarms per L8z controller	10,000
Maximum number of "used" alarms per L8z controller	7,500
Maximum number of instruction based alarms within "used" alarms per L8z controller	3,000
Approximate controller memory used for each instruction based alarm	Digital 1 KB Analog 2.5 KB Using associated tags, string tags consume 750-1600 bytes per string tag depending on the alarm type.
Supported languages for alarm messages	All languages supported by FactoryTalk View.

Execution times for alarms

Rung State	Execution times	
	ALMD instruction	ALMA instruction
False with no alarm state change	7 μ s	5 μ s
False with alarm state change	16 μ s	5 μ s
True with no alarm state change	7 μ s	15 μ s
True with alarm state change	16 μ s	25 μ s

Controllers with revision 24 and later

The following table lists information for controllers with revision 24 and later.

Specification	Value
Number of subscribers (FactoryTalk Linx servers) per L7x controller	3
Number of subscribers (FactoryTalk Linx servers) per L8z controller	6
Active alarm state transitions every 5 minutes per L7x or L8z controller	3,000
Maximum number of instruction alarms per L7x or L8z controller	3,000
Approximate controller memory used for each instruction based alarm	Digital 1 KB Analog 2.5 KB Using associated tags, string tags consume 750-1,600 bytes per string tag depending on the alarm type.
Supported languages for alarm messages	All languages supported by FactoryTalk View.

Execution times for alarms

Rung State	Execution times	
	ALMD instruction	ALMA instruction
False with no alarm state change	7 μ s	5 μ s
False with alarm state change	16 μ s	5 μ s
True with no alarm state change	7 μ s	15 μ s
True with alarm state change	16 μ s	25 μ s

Controllers with revision 20 or earlier

The following table lists information for controllers with revision 20 or earlier.

Specification	Value
Number of subscribers (FactoryTalk Linx servers) per controller	3
Controller memory used for buffering by each subscriber (FactoryTalk Linx)	100KB

Specification	Value
Typical number of alarm state transitions per subscriber	1,000
Recommended maximum number of alarms per controller	2,000
Approximate controller memory used for each instruction based alarm	Digital 1 KB Analog 2.2 KB Using associated tags, string tags consume 750-1,600 bytes per string tag depending on the alarm type.
Supported languages for alarm messages	All languages supported by FactoryTalk View.

Execution times for alarms

Rung State	Execution times	
	ALMD instruction	ALMA instruction
False with no alarm state change	8 µs	17 µs
False with alarm state change	35 µs	17 µs
True with no alarm state change	8 µs	65 µs
True with alarm state change	35 µs	126 µs

Scan times increase during a scan when many alarms change state at the same time. An alarm state change is any event that changes the condition of the alarm. Minimize the potential for large alarm bursts by creating dependencies on related alarms. Large alarm bursts can have a significant impact on application code scan time.



Tip: Firmware revisions 21 to 23 do not support the new alarms functionality.

System sizing recommendations

When you design and set up a FactoryTalk system, we recommend using the following guidelines. If you find that your system needs to expand beyond these guidelines, contact your Rockwell Automation sales or distributor representative to discuss your application design.

Component	Recommended guidelines
FactoryTalk Alarms and Events	
FactoryTalk Alarms and Events servers per FactoryTalk Directory	10 non-redundant servers or 10 redundant server pairs ¹
FactoryTalk tag-based alarms per server	20,000 ²
Logix device-based alarms per server	10,000 ³
Total alarms per FactoryTalk Directory	100,000 ⁴
FactoryTalk Linx	
FactoryTalk Linx data servers per FactoryTalk Directory	10 non-redundant servers or 10 redundant server pairs ¹
Total device tags per FactoryTalk Directory	1,000,000 ⁵
Tags per FactoryTalk Linx data server	100,000 ⁵
FactoryTalk View SE	

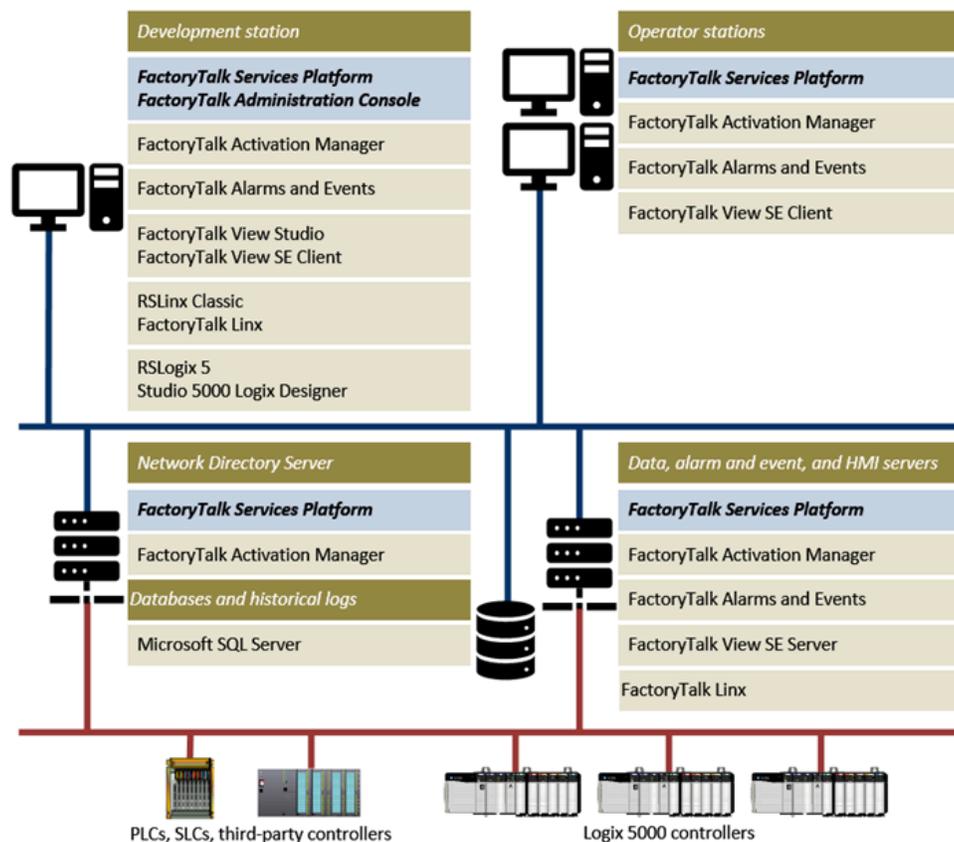
Component	Recommended guidelines
HMI servers per FactoryTalk Directory	10 non-redundant servers or 10 redundant server pairs ¹
HMI tags per HMI server	40,000 ⁶
Total data logged tags per HMI server (1 second scan rate)	5,000
FactoryTalk View SE client sessions simultaneously connected to the application	120 ⁵
FactoryTalk ViewPoint SE servers per application	4
FactoryTalk ViewPoint SE concurrent clients per ViewPoint server	50

1. Because multiple applications can run simultaneously within the same FactoryTalk Directory, the recommended number refers to the sum of servers across applications in one FactoryTalk Directory.
2. The number of alarm backing tags influences the maximum number of available alarms because they increase the resource requirements of the alarm server. When using backing tags for status and control, a good rule of thumb is to multiply the total number of backing tags by the total number of alarms, and ensure the result is less than 20,000. PlantPAx[®] users should refer to the PlantPAx Reference Manual [PROCES-RM001](#) for alarm server sizing guidance for a PlantPAx application.
3. This number is the sum of both instruction alarms and Logix tag-based alarms across all the controller shortcuts in each FactoryTalk Linx server.
4. The total number of alarms per FactoryTalk Directory includes all FactoryTalk Alarms and Events tag-based and device-based alarms in the directory.
5. Refer to Knowledgebase Document ID: [IN7377 - Amounts of device tags that may have in FactoryTalk View SE application](#) for detailed information to determine system scalability for the total device tags per FactoryTalk Directory.
6. The maximum number of HMI tags that can be created on a single HMI server is 175,000. Extensive use of HMI tags has a significant performance impact on an HMI server, so Rockwell Automation recommends minimizing their use, and instead using direct-reference tags as much as possible.

Install FactoryTalk Alarms and Events manually

FactoryTalk Alarms and Events software is installed when you install FactoryTalk View Site Edition and FactoryTalk Services software. If FactoryTalk Services Platform already exists on a computer where FactoryTalk Alarms and Events is not installed, you need to install it manually.

The following illustration shows a sample FactoryTalk system with FactoryTalk Alarms and Events installed on various computers.



Summary of steps (manual installation)

Step 1. Confirm that FactoryTalk Services Platform is installed on the computer where you are going to install FactoryTalk Alarms and Events.

Step 2. Install FactoryTalk Alarms and Events.

Confirm that FactoryTalk Services Platform is installed

FactoryTalk Services Platform must be installed before installing FactoryTalk Alarms and Events.

To check if you have FactoryTalk Services Platform:

1. On the **Start** menu, click **Control Panel** and then click **Programs and Features**.
2. In the list, look for FactoryTalk Services Platform 2.10 (CPR 9) or later. If it is not in the list, install it. For instructions, see either the *FactoryTalk View Site Edition Installation Guide* or the FactoryTalk Linx installation instructions.

Install FactoryTalk Alarms and Events

Log in as a user with administrative rights before you begin the installation. As part of the installation process, FactoryTalk Alarms and Events creates program folders and modifies registry entries. To make these modifications, the user that is currently logged in must have administrative rights on the computer on which FactoryTalk Alarms and Events is installed.

1. Close any open programs.
2. At the root of the FactoryTalk View SE, FactoryTalk Services, or FactoryTalk Linx installation package, under the **Common** folder, open the <version>-FTAE folder, and then double-click **FTAE.msi**.
3. Follow the on-screen instructions.

Install Microsoft SQL Server

FactoryTalk Alarms and Events uses Microsoft SQL Server as the database engine for logging alarm and event information. You can connect to an existing SQL Server database. You can also install SQL Server Express, which is included in the **Redist** folder in the FactoryTalk View installation package.

If you do not have an existing SQL Server database, or do not plan to use it, follow the instructions outlined in this chapter to make sure that SQL Server is installed with the correct features enabled. See [Summary of Steps on page 164](#) for details.

You can install the database on the same computer used to host other FactoryTalk servers, or on a separate computer. Depending on the size of your system, you might choose to use a separate computer as a dedicated logging computer to balance processing power.

For more information on using an existing SQL Server database, see [Use an existing SQL Server database on page 167](#).

Summary of steps (new SQL Server)

The following is a summary of the steps required to install SQL Server Express. Each step is described in more detail on the following pages.

Step 1. In the FactoryTalk View installation package, open the **Redist** folder, which contains the software for SQL Server Express.

Step 2. Install the .NET Framework. The SQL Server Express installation fails without this component.

Step 3. Run the **SQL Server Install** batch file to install and configure SQL Server Express.

Step 4. Configure the Windows firewall if you want to allow for remote connections.

Step 1. Open the Redist folder

The **Redist** folder is located in the FactoryTalk View installation package and contains the following folders:

Folder	Description
DotNETFX_4.8	Installation for Microsoft .NET Framework version 4.8. You might already have the .NET Framework software on your computer, but verify the correct version is installed or the SQL Server install fails. Note: This software component is a prerequisite that must be installed before you install SQL Server 2022 Express. If the installation program identifies other missing components, download them from the Microsoft website.
SQLServerEXPR_2022	Installation for SQL Server 2022 Express.

Step 2. Install the .NET Framework

The Microsoft .NET Framework version 4.8 is a prerequisite for SQL Server 2022 Express. Microsoft .NET Framework version 4.8 is installed automatically by the FactoryTalk View installation. You need to manually install it if it is not installed.



Tip: If you have .NET Framework 1.2 or any version before 2.0.50727, you must uninstall it (versions 1.0 and 1.1 do not have to be uninstalled) before installing the correct version.

To manually install the .NET Framework version 4.8

1. In the FactoryTalk View installation package, open the **Redist\DotNETFX_4.8** folder, and then double-click **ndp48-x86-x64-allos-enu.exe**.
2. Follow the on-screen instructions.

Step 3. Run the SQL Server install batch file (not the .exe)

The batch file installs SQL Server 2022 Express on your computer with the correct settings for logging alarms and events. The batch file configures the following settings for SQL Server:

- Allow remote connections to the database using the TCP/IP protocol.
- Enable SQL Server Browser.

To install SQL Server 2022 Express

1. Close any open programs.
2. In the FactoryTalk View installation package, open the **Redist\SQLServerEXPR_2022** folder, and then double-click **SQL Server Install.bat**.
3. Follow the on-screen instructions.

Step 4. Configure the Windows firewall

If you want to allow remote connections to the SQL Server database, the database engine service and the SQL Server browser service must be added as exceptions in Windows firewall. Perform these steps if you:

- Have remote clients (for example, a log viewer) that needs access to the database.
- Want to configure the database remotely.

To configure the Windows firewall

1. Click **Start > Control Panel > Windows Firewall**.
2. Click **Allow an app or feature through Windows Defender Firewall**.
3. Click **Allow another app**.
4. To add the database engine service:
 - a. In the **Add an app** dialog box, click **Browse**, and then go to C:\Program Files\Microsoft SQL Server\<Your SQL Server Instance Name>\MSSQL\Binn\sqlservr.exe.
 - b. Click **Open**.
 - c. Click **Add**.

5. To add the browser service:
 - a. In the **Add an app** dialog box, click **Browse**, and then go to C:\Program Files (x86)\Microsoft SQL Server\90\Shared\sqlbrowser.exe.
 - b. Click **Open**.
 - c. Click **Add**.
6. Click **OK**.

Use an existing SQL Server database

FactoryTalk Alarms and Events can use an existing Microsoft SQL Server as the database engine for logging alarm and event information.

You must set up the correct settings for logging alarm and event data if you are using an existing SQL Server database. For more information on the settings, see [Summary of steps on page 167](#).

Supported SQL Server databases

FactoryTalk Alarms and Events can use the following Microsoft SQL Server database:

- SQL Server 2022 Express (64-bit)
- SQL Server 2022 Standard (64-bit)
- SQL Server 2019 Standard (64-bit)
- SQL Server 2017 Standard (64-bit)
- SQL Server 2016 Standard SP2 (64-bit)
- SQL Server 2014 Standard SP3 (64-bit)

Remote connections to the SQL Server database

To allow remote connections to the database you must configure the TCP/IP protocol, the SQL Server Browser, and the Windows Firewall. Perform these steps if you:

- Have remote clients (for example, a log viewer) that needs access to the database.
- Want to configure the database remotely.

Summary of steps (existing SQL server)

Step 1. [Install SQL Server Management Studio on page 167](#)

Step 2. [Specify Mixed Mode authentication for the SQL Server database on page 168](#)

Step 3. [Configure TCP/IP protocol for the database on page 168](#)

Step 4. [Enable the SQL Server Browser service on page 168](#)

Step 5. [Configure the Windows Firewall on page 168](#)

Step 1. Install SQL Server Management Studio

Prior to SQL Server 2016, management tools are included in a SQL Server installation. Starting from SQL Server 2016, you need to download and install management tools, such as SQL Server Management Studio separately.

To install SQL Server Management Studio, complete these steps:

1. Go to the Microsoft [Download SQL Server Management Studio \(SSMS\) webpage](#) and download the installation package.
2. Double-click the EXE file and follow the on-screen instructions.
3. After completing the installation, restart your computer.

Step 2. Specify Mixed Mode authentication for the SQL Server database

To change the authentication mode and configure the **sa** login, complete these steps:

1. Open **SQL Server Management Studio**.
2. In Object Explorer, right-click the server node, and then click **Properties**.
3. On the Security page, under Server authentication, select **SQL Server and Windows Authentication mode**, and then click **OK**.
4. In Object Explorer, expand **Security**, expand **Logins**, right-click **sa**, and then click **Properties**.
5. On the General page, you may have to create and confirm a password for the **sa** login.
6. On the Status page, under **Login**, click **Enabled**, and then click **OK**.
7. If you changed the authentication mode, restart the server. In Object Explorer, right-click the server node, and then click **Restart**.

Step 3. Configure TCP/IP protocol for the database

To configure TCP/IP protocol for the database, complete these steps:

1. Open **SQL Server Configuration Manager**.
2. In Object Explorer, expand **SQL Server Network Configuration**, and then click **Protocols for MSSQLSERVER**.
3. In the details pane, right-click **TCP/IP**, and then click **Enabled**.
4. Set all other protocols listed in the details pane to **Disabled**.
5. To finish, restart the SQL Server. In the Object Explorer of SQL Server Management Studio, right-click the SQL Server instance, and then click **Restart**.

Step 4. Enable the SQL Server Browser service

To enable the SQL Server Browser service, complete these steps:

1. Open **SQL Server Configuration Manager**.
2. Click **SQL Server Services**.
3. In the details pane, right-click **SQL Server Browser**. Click **Properties**.
4. In the **Properties** dialog box, on the **Service** tab, set **Start Mode** to **Automatic**, and then click **OK**.
5. On the **SQL Server Configuration Manager** main page, right-click **SQL Server Browser** again, and then choose **Start**.

Step 5. Configure the Windows Firewall

To configure the Windows Firewall, perform the following steps:

1. Click **Start > Control Panel > Windows Firewall**.
2. Click **Allow an app or feature through Windows Defender Firewall**.
3. Click **Allow another app**.
4. To add the database engine service:
 - a. In the **Add an app** dialog box, click **Browse**, and then go to C:\Program Files\Microsoft SQL Server\<Your SQL Server Instance Name>\MSSQL\Binn\sqlservr.exe.
 - b. Click **Open**.
 - c. Click **Add**.

5. To add the browser service:
 - a. In the **Add an app** dialog box, click **Browse**, and then go to C:\Program Files (x86)\Microsoft SQL Server\90\Shared\sqlbrowser.exe.
 - b. Click **Open**.
 - c. Click **Add**.
6. Click **OK**.

Alarm time stamping

FactoryTalk Alarms and Events provides excellent time-stamp accuracy compared with traditional alarm monitoring systems, and you can obtain better time-stamp resolution in some cases by using time stamps directly retrieved from peripheral devices such as I/O cards or other time-stamping hardware.

When an analog (ALMA) or digital (ALMD) alarm instruction executes as an alarm event occurs, the current Universal Coordinated Time (UTC) value of the controller's wall clock is captured and delivered to the FactoryTalk Alarms and Events system with the alarm.

This appendix shows how to replace the controller's wall clock time in an alarm event with a time stamp from an external source.

You can take events from an I/O card such as a 1756-IB16ISOE and use the 50-microsecond accuracy from the card's time stamp when delivering an alarm to the rest of the alarm monitoring system.

Resolve these points when you replace the normal time stamp provided with the alarm instructions:

- Alarm time stamps must be in UTC with no time zone or daylight savings time offset included (these offsets are automatically added to the time stamp when it is displayed).
- The alarm time stamp is usually represented as a long integer (LINT) data type, occupying one 64-bit word. Most I/O cards stamp time using two double integers (DINT), occupying two 32-bit words.

Overview of time keeping

In the Studio 5000 Logix Designer environment, time is represented in three different ways: Local Time, Coordinated System Time, and Universal Coordinated Time.

Coordinated System Time (CST)

Coordinated System Time is provided by a free-running backplane clock that starts counting the first time the system is powered up. CST is used for time stamping, event tracking between processors and I/O cards, as well as for motion planning among multiple motion modules. CST has no relevance to real-world time, but can be converted to Coordinated Universal Time (UTC) using an offset. CST time stamps must be converted to UTC before passing them to the alarm monitoring system.

Coordinated Universal Time (UTC)

Coordinated Universal Time is a real-world time relative to a time constant, but with no time zone information and no daylight savings time offsets. It is the raw value used to represent time and also the value required for time stamps in the FactoryTalk Alarms and Events system. UTC is equivalent to Greenwich Mean Time, with no daylight savings time offsets.

Advantage of using UTC for time stamps is that distributed events can be compared, regardless of their geographical location or where they are, relative to Daylight Savings Time (DST). The software reading the time stamp can then convert UTC time stamps to local time. Studio 5000 and FactoryTalk Alarms and Events graphic objects convert UTC time stamps to the local time of the workstation running the software application.

Time stamps from different sources may or may not be returned in UTC format, depending on the device generating the time stamp and how it is configured. For example, a 1756-IB16ISOE module can return time in UTC if configured to do so.

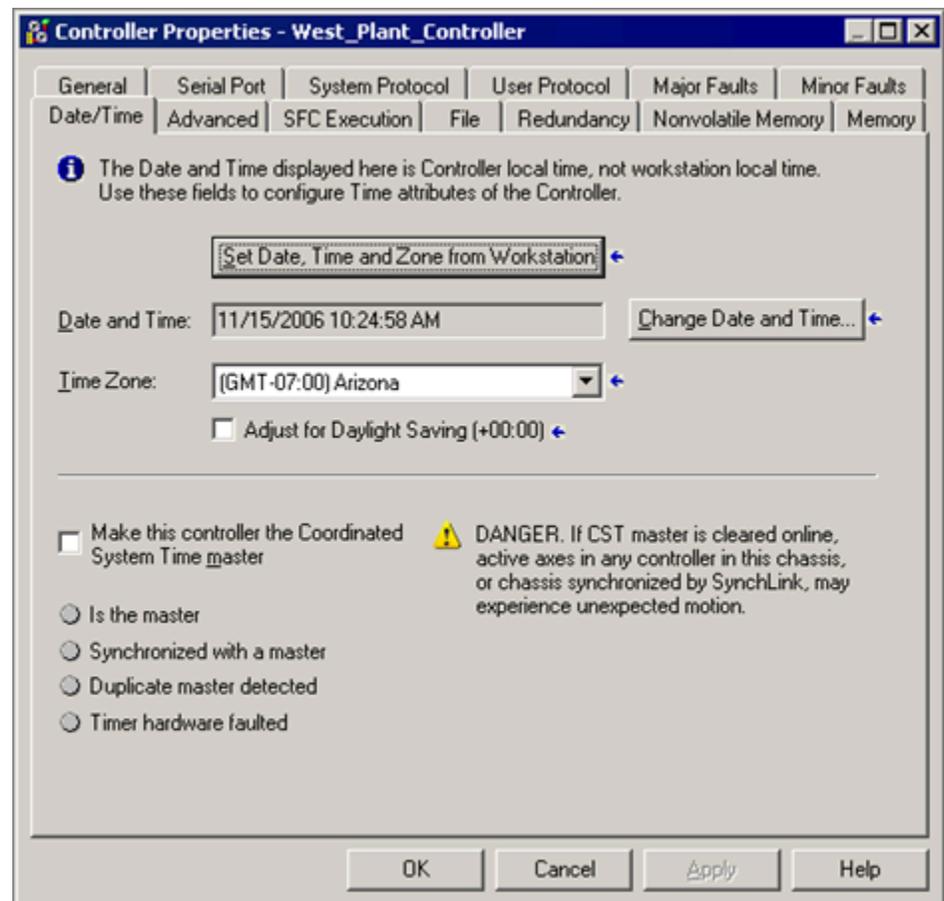
In the Studio 5000 Logix Designer software, time is often returned as two 32-bit DINT data types instead of one 64-bit LINT data type. The FactoryTalk Alarms and Events system requires the time stamps to use the LINT data type. If a module (for example, the 1756-IB16ISOE module) returns the time stamp in two DINTs instead of a LINT, you will have to convert the time format into a LINT. To perform this conversion, an Add-On Instruction is available for download from the Studio 5000 Logix Designer sample code website in the [Rockwell Automation Sample Code Library](#). You can locate this code by performing a search for **LINT** on the search page.

Local Time (Wall Clock Time)

Local time (often referred to as Wall Clock Time) is the time in the real world where the controller is located. This means that Wall Clock time is UTC, but with time zone and Daylight Savings Time (DST) offsets added.

Local Time is typically used to trigger local events (like turning on a pump at 1:00AM during shift change). Local time values must be converted to UTC before passing them to an alarm monitoring system.

You can see the calculated result in Studio 5000 Logix Designer, in the **Controller Properties** dialog box, on the **Date/Time** tab, as shown in the following illustration.

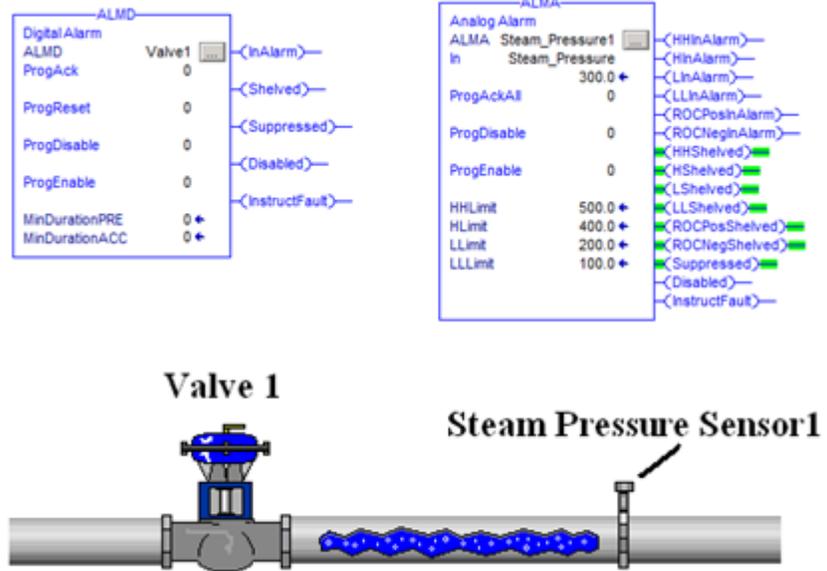


We recommend using local time only to drive events from the controller, and not to time-stamp alarms.

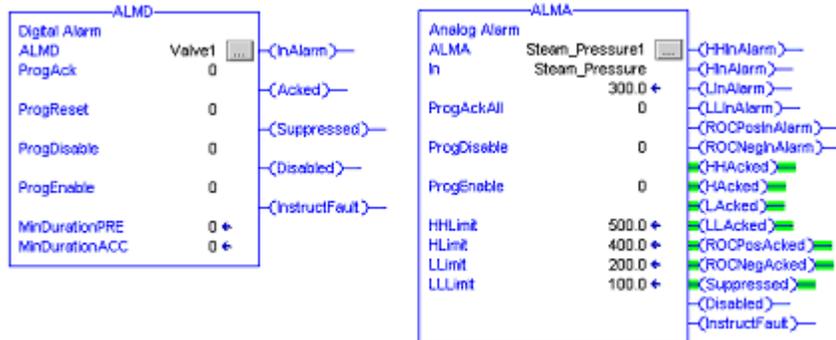
ALMD and ALMA alarm blocks

When the controller detects a condition that causes an In Alarm event, the controller stores the current UTC value in the backing tag for the alarm.

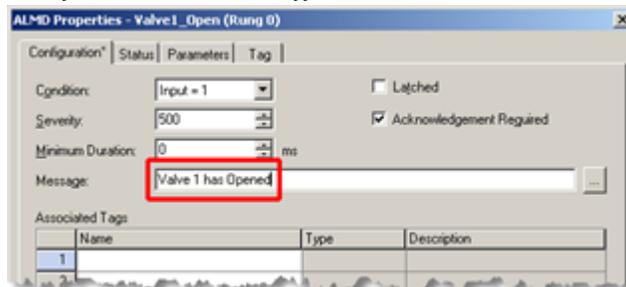
- The alarm is provided by ladder logic that includes the ALMD or ALMA instructions:



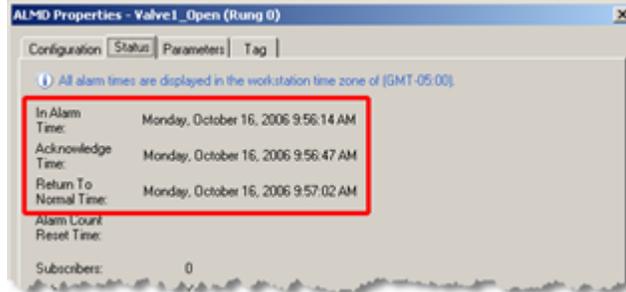
If you are using RSLogix 5000 version 20 or earlier, the instruction block is like this:



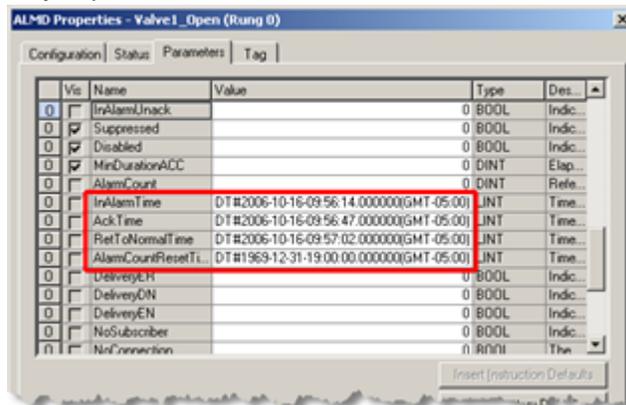
- In the **ALMD Properties** dialog box, in the **Configuration** tab, click the **Browse** button (...) to edit the alarm message sent when the alarm is triggered.



- On the **Status** tab, time stamps appear when the alarm is triggered, acknowledged, returns to normal, or when the alarm count is reset.



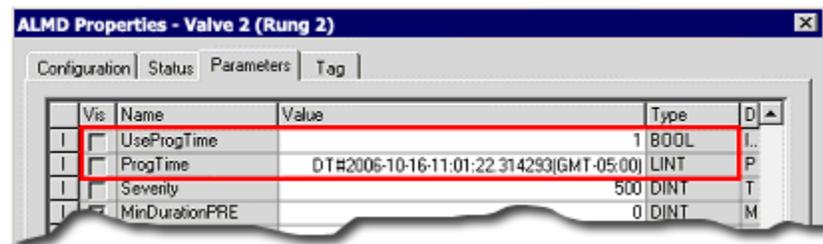
- On the **Parameters** tab, these UTC time stamps are automatically transferred to tags that you can then use in logic of your own.



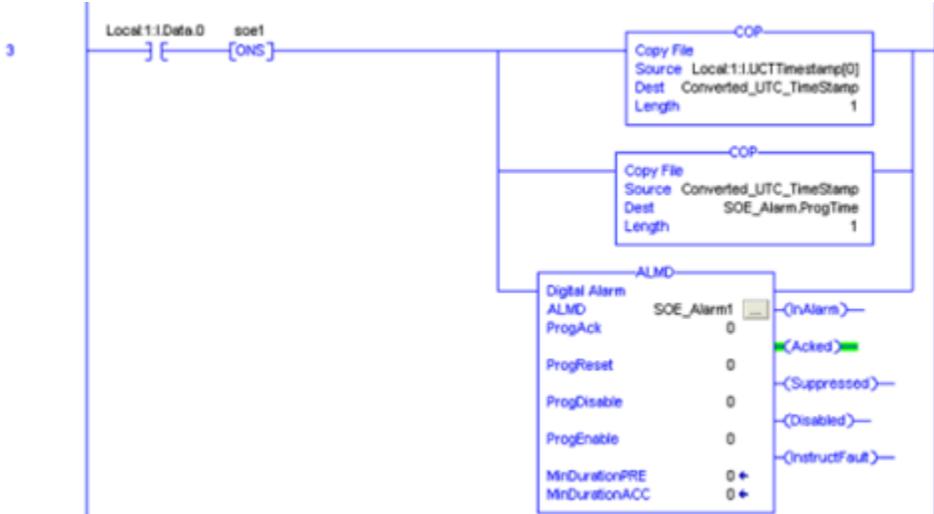
For details about adding an Alarm and Event Summary object to a graphic display in FactoryTalk View, see [Set up graphic displays on page 58](#).

Insert time stamps manually

To insert a time stamp manually, in the **ALMD Properties** dialog box, on the **Tag** tab, enter the new time under the **.ProgTime** element. Set the boolean **.UseProgTime** in the backing tag for the alarm *before* the actual alarm instruction is triggered.



Example



Time synchronization

FactoryTalk Alarms and Events provides excellent resolution and accuracy for alarms and events time stamps. You can build a very accurate time sequence for events that led to a failure, or simply to diagnose the exact order of their occurrence. Because the alarms are generated by the controller, the time-stamp accuracy is a function of the rate of the controller's ability to scan the alarm instruction, plus the accuracy of the controller's wall clock.

When an alarm instruction is evaluated in code and an alarm transition event occurs (goes into alarm, or is acknowledged, suppressed, and so on), the instruction immediately records the current value of the controller's wall clock. This 64-bit, microsecond-resolution number reflects the time of the event relative to the controller's wall clock in UTC time (no time zone or daylight savings information is included). When you view this time stamp, either in Studio 5000 Logix Designer or in FactoryTalk View Site Edition, the time zone of the computer running the software is used to visualize the time value. You can use a distributed system that covers multiple time zones to display a valid sequence of events at an operator or maintenance station independently of the time zone the time stamps are captured in.

Coordinate multiple controller wall clocks

Because alarm events can originate in multiple controllers distributed over an enterprise, it is important to provide a common time reference to set these clocks. A controller with a wall clock that is out of synchronization with the rest of the enterprise can potentially log events out of the time sequence in which they actually occurred, relative to the other controllers.

Setting the controllers' wall clocks individually by hand is inefficient. Additionally, clock drift naturally causes these clocks to record time further and further apart from each other. There are several automated methods to manage the wall clocks on multiple controllers. One of the methods is using the Logix5000 Clock Update Tool. For other methods to set clocks in a ControlLogix system, see Knowledgebase Document ID: [QA8202 - Controller Clock setting and Time synchronization between racks, ControlLogix \(various methods\)](#).

The Logix5000 Clock Update Tool lets you view and synchronize the system time of the controllers and devices on a network, using any computer running Microsoft Windows and RSLinx Classic. You can also schedule automatic synchronization of all devices. See [Create a synchronization schedule on page 177](#).

The accuracy of time synchronization varies based on many factors, including the network path and what the controller is doing when the time synchronization takes place. Typical systems using the Logix5000 Clock Update Tool coordinate clocks to approximately 300ms. If you need greater accuracy for clock synchronization than the Logix5000 Clock Update Tool can provide, there are several other hardware-based options to improve the accuracy of time stamps in the control system. These include IRIGB, NTP, GPS, and IEEE 1588 Ethernet.

Install the Logix5000 Clock Update Tool

Using RSLinx to browse to multiple controllers, this stand-alone tool synchronizes multiple wall clocks at a user-defined rate in a variety of controllers, including PLC-5, SLC 500s, MicroLogix, and all Studio 5000 controllers (except the SoftLogix controller which typically obtains the time from the clock in the computer where the controller is installed).

1. Go to [Product Compatibility and Downloads Center \(PCDC\)](#).
2. Go to **Downloads by Product**.

3. In the search bar type **Studio 5000** and click **Studio 5000 Tools**.
The tools will appear on the right hand menu.
4. Click the **DOWNLOADS** button on the right upper corner.
5. Follow the instructions on the screen.

For more information, see Knowledgebase Document ID: [IN6753 - Download Studio 5000 Tools](#).

Start Clock Update Tool

- Click **Start > All Programs > Rockwell Software > RSLogix 5000 Tools > Logix5000 Clock Update Tool > Logix5000 Clock Update Tool**.

Start the Update Tool automatically

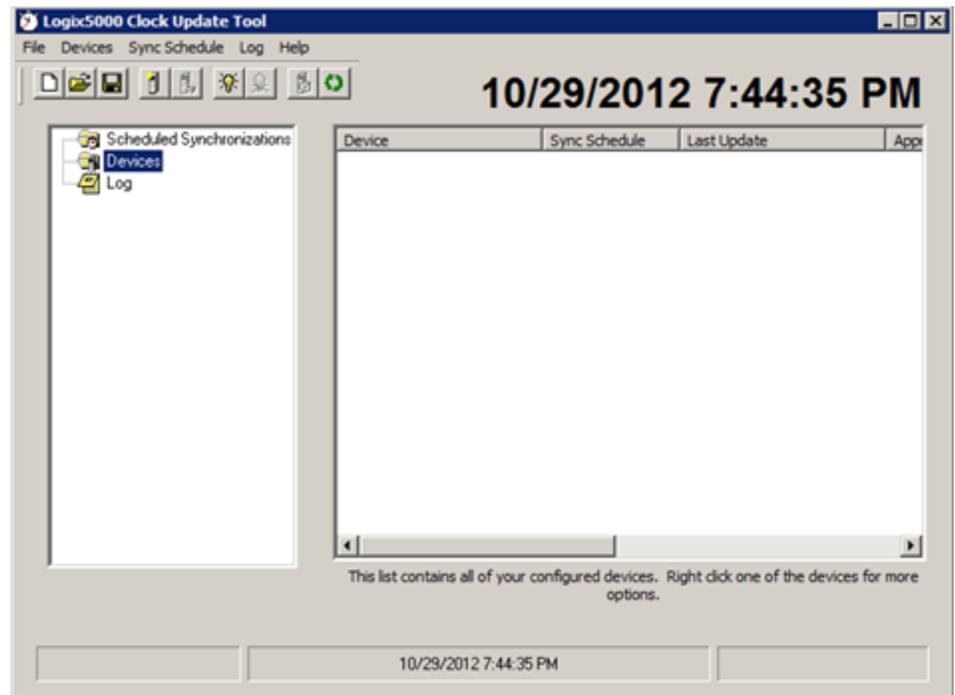
You can start the Logix5000 Clock Update Tool automatically when you start Windows.

- In the Logix5000 Clock Update Tool, on the **File** menu, click **Start the application when Windows starts**.

The next time you start Windows, the Clock Update Tool opens automatically.

Use the Logix5000 Clock Update Tool

The Logix5000 Clock Update Tool lets you view and synchronize the system time of the controllers and devices on a network, using any computer running Microsoft Windows and RSLinx Classic. You can also schedule automatic synchronization of all devices.



The left pane of the **Clock Update Tool** window contains a tree view, with these items:

- **Scheduled Synchronizations** lists synchronization schedules that have been configured. Right-click an individual schedule for more options.
- **Devices** lists devices that have been configured. Right-click an individual device for more options.
- **Log** contains a log of the most recent events. The path indicated under the list of events contains the location of the complete log file for the day.

Synchronize devices on a schedule

To synchronize devices on a schedule, complete these steps:

1. Create a synchronization schedule. This schedule determines when synchronization takes place.
2. Create a list of devices you want to synchronize and then add them to synchronization schedules. Devices that are not included in this list are not synchronized.
3. Optionally, match existing devices with existing synchronization schedules. Skip this step if you specified a synchronization schedule when you added the device. Devices that are not matched to any synchronization schedule are not synchronized.

This section includes information about each of these steps.

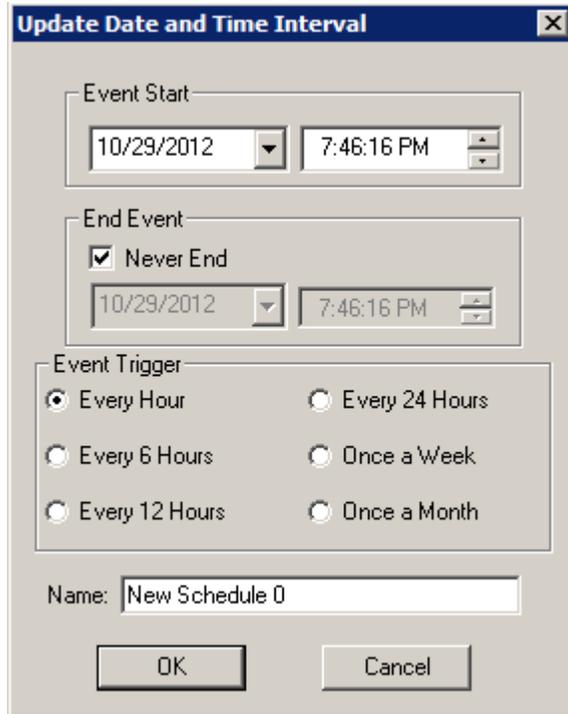
Synchronization schedule

A synchronization schedule determines when devices are synchronized. For example, you can schedule devices to be synchronized on a fixed time interval. You can also configure a synchronization schedule to expire on a particular date.

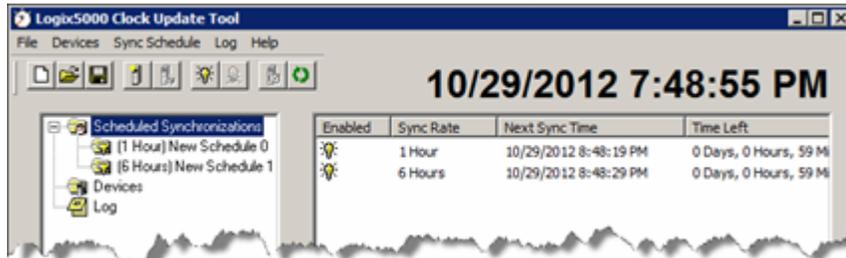
Create a synchronization schedule

1. In the **Logix5000 Clock Update Tool** window, in the left pane, click **Scheduled Synchronizations**.
2. Right-click the right pane and then click **Add Event**.

3. In the **Update Date and Time Interval** dialog box, set up a schedule for synchronizing the date and time, and then click **OK**.



The new schedule information appears, as shown in the following example:



Remove a synchronization schedule

To remove a synchronization schedule from the list:

1. Right-click the synchronization schedule you want to remove and then click **Remove Event**.
2. Any devices that were associated with this synchronization schedule are no longer associated with a schedule.

Modify a synchronization schedule

1. To modify an existing synchronization schedule, right-click the synchronization schedule and then click **Modify Event**.
2. In the **Update Date and Time Interval** dialog box, modify the schedule information, and then click **OK**.

Enable or disable a synchronization schedule

Occasionally, you might want to temporarily disable a synchronization schedule, rather than permanently delete it.

- To disable a synchronization schedule, right-click the synchronization schedule you want to disable and then click **Disable Event**.
- To enable a synchronization schedule, right-click the disabled synchronization schedule you want to enable, and then click **Enable Event**.

Add devices

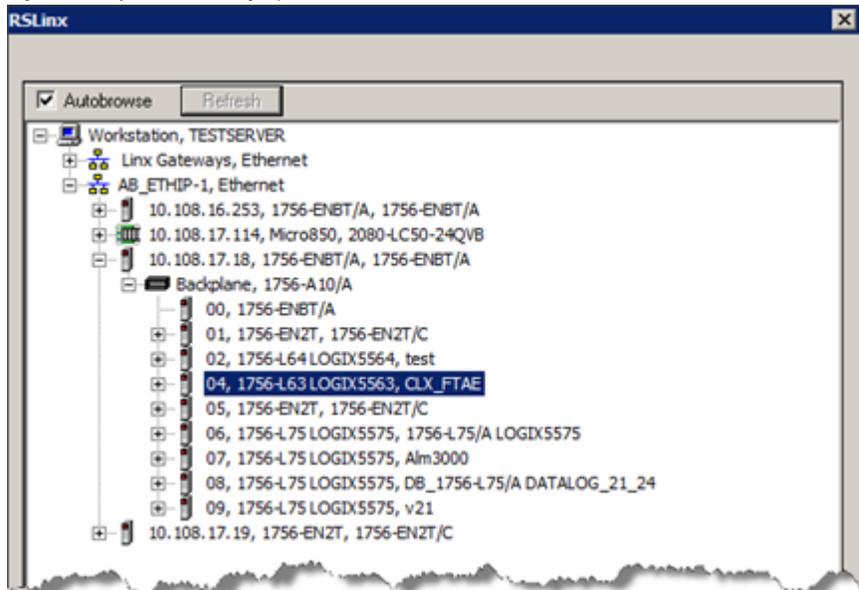
After creating one or more synchronization schedules, add the devices you want to include in the schedules.

When you add a device, you can also match it to a synchronization schedule, or you can add all of the devices first and then match them to synchronization schedules later. If you add the devices later, you can add all of the devices to a single synchronization schedule in one step.

You can add a device to only one synchronization schedule.

Add a device

1. In the Logix5000 Clock Update Tool, in the left pane, click **Devices**.
2. Right-click anywhere in the right pane and then click **Add New Device** or click the **Add Device** button 



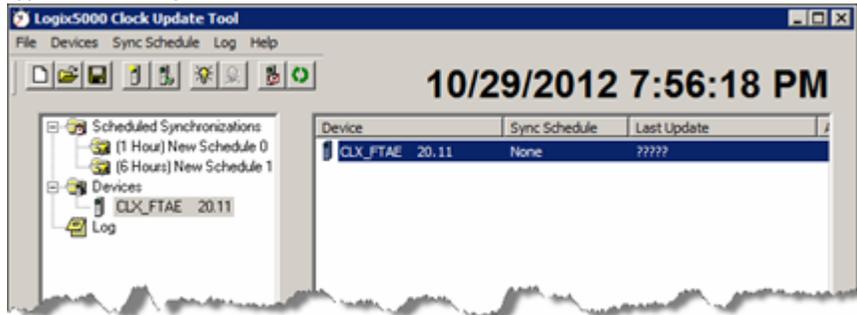
3. In the **RSLinx** dialog box, browse to the device you want to add, select it, and then click **OK**.



Tip: You cannot click **OK** unless you have selected a device that is capable of being synchronized and has not already been configured.

- In the **Add Device to Schedule** list, select the synchronization schedule to which you want to add the device, and then click **OK**.

The device is added to the list. Because this device has not yet been synchronized, question marks (?????) appear in the **Last Update** column.

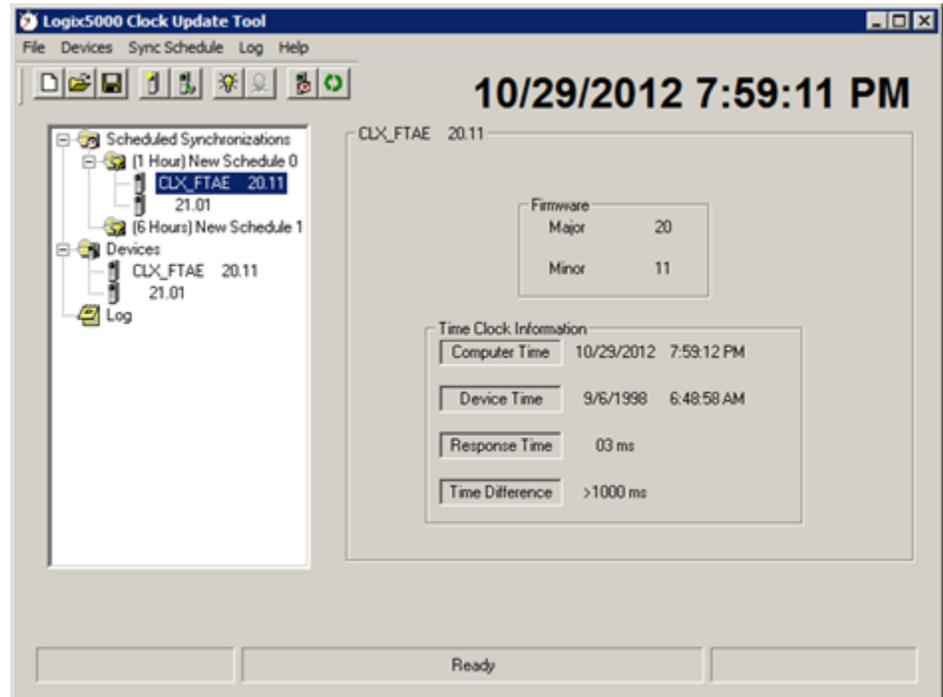


Remove a device

- To remove a device from the list, right-click the device you want to remove, and then click **Remove Device**. You can also select the device you want to remove, and then click the **Remove Device** button . If the device is associated with a particular synchronization schedule, it is removed from that schedule.
- If you want to remove all devices from the list, right-click in the **Device** pane and then click **Remove All Devices**. All devices are removed from the list, as well as from their respective synchronization schedules.

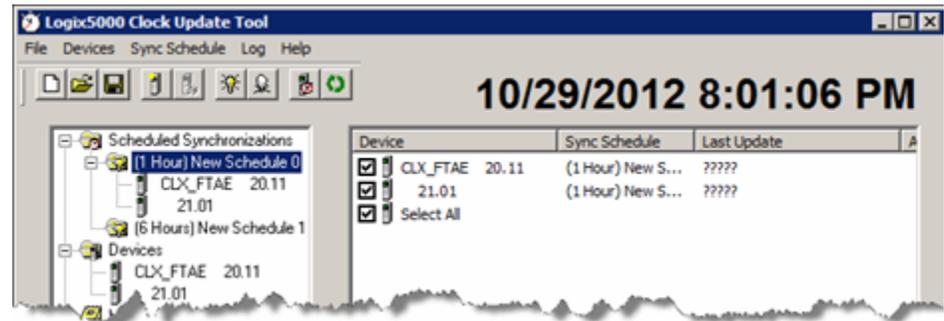
View details about a device

To view the details of a particular device, right-click the device and then click **Device Properties**. This shows major and minor firmware revision information, Computer Time, Device Time, Response Time, and the Time Difference between the computer and the device.



Assign devices to synchronization schedules

When a synchronization schedule is selected in the left pane, the Device pane lists all of the devices that are configured.



Tip: When you add a new device, you can assign it to a specific schedule at that time. See [Add devices on page 179](#).

- To add a device to the selected synchronization schedule, select the check box to the left of the device. To remove the device from the synchronization schedule, clear the check box.
- To add all devices to the specified schedule, select the **Select All** check box at the bottom of the list.

Synchronize devices manually

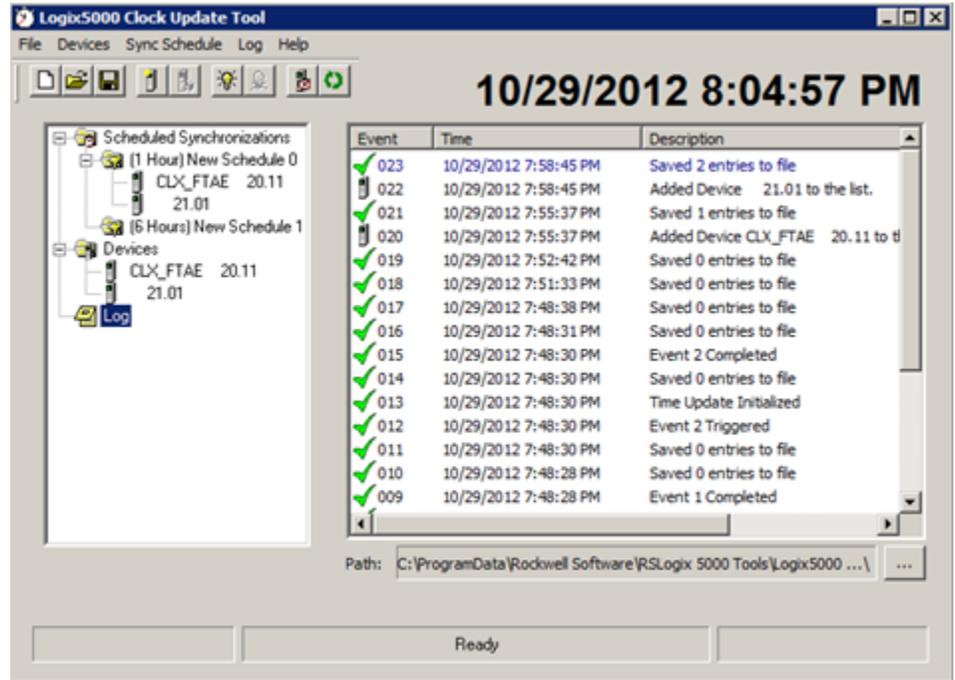
In addition to scheduling automatic synchronization, you can synchronize devices manually. Either:

- Click the **Synchronize All Devices** button  on the toolbar.
- Right-click a device and then click **Synchronize Device** or right-click anywhere in the **Device** pane and then click **Synchronize All Devices**.

Any errors in synchronization are saved to the log file. In addition, an icon appears in the device list and in the main tree view to indicate the error. The log file indicates a specific cause for the error, where one is known.

View the log file

To view a log of the most recent events, in the left pane click **Log**. The path shown under the list of events contains the location of the complete log file for the day. The log file is saved in **.txt** and **.xml** format.



Change the location of the log file

The default location for the synchronization log file is **C:\Program Files\Rockwell Software\RSLogix 5000 Tools\Logix5000 Clock Update Tool**.

To change the location of the log file:

1. On the **Log** menu, click **Change Log File Location** (or to the right of the **Path** box at the bottom of the **Update Tool** window, click the **Browse** button ).
2. In the **Browse for Folder** dialog box, select the new folder for the log files, and then click **OK**. To create a new folder for the log file, click **Make New Folder**.



Time stamps with tag-based alarms

If your FactoryTalk Alarms and Events system includes tag-based alarm servers, the time stamps for those alarms come from the computer that hosts the server that provides tags to the alarm server (for example, FactoryTalk Linx or a third-party Data Server). To ensure that alarms are ordered properly by time, you must synchronize the computer's clock with the controllers' clocks.

The simplest way to solve this synchronization problem is to run the Logix5000 Clock Update Tool on the same computer as the FactoryTalk Linx alarm server. This ensures that the controller clocks all synchronize with the computer's tag-based alarm server. Typical systems using this method commonly achieve 300ms synchronization.

If it is not possible to install the Logix5000 Clock Update Tool on the same computer that hosts the data server that provides tags for the tag-based alarm server, try to synchronize the computer's clock with the same NTP server that is used to synchronize the control network, with similar network latencies.

For details about tag-based alarms, see [Add a tag-based alarm server for Studio 5000, PLC-5, SLC 500, or third-party controllers on page 48](#).

Supported devices

The Logix5000 Clock Update Tool supports the following controller families:

- ControlLogix
- CompactLogix
 - All CompactLogix processors can be used with ENI. CompactLogix L32E and CompactLogix L35E can be directly connected via Ethernet or with ENI.
 - Make sure that the CompactLogix port is set up for DF1 full-duplex.
 - Make sure routing is enabled on NET-ENI. Net-ENI works with Ethernet devices drivers and not with EtherNet/IP drivers.
- DriveLogix
- FlexLogix
- PLC-5
- SLC
- MicroLogix
- PowerMonitor

Reference for building a distributed system

This system configuration guide primarily focuses on building an alarms and events system on a single computer.

When building a distributed system on multiple computers on the network, keep the following guidelines in mind.

When installing FactoryTalk Alarms & Events

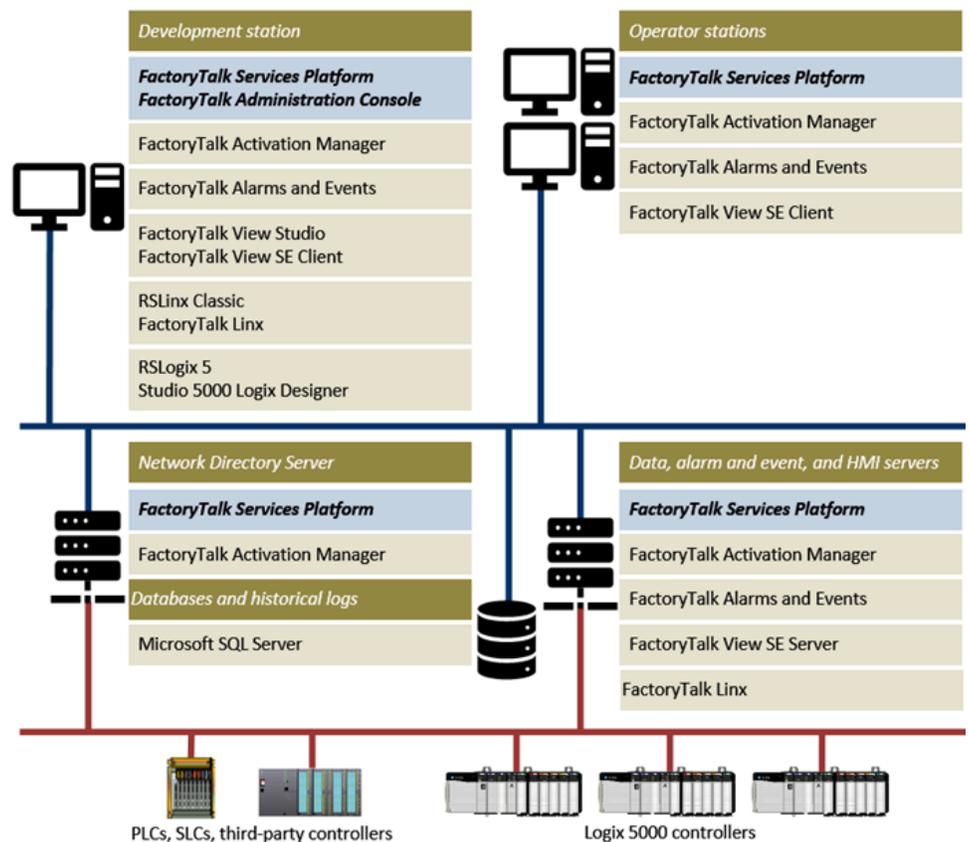
FactoryTalk Alarms and Events is installed with FactoryTalk View and FactoryTalk Services.

For details, see [Install FactoryTalk Alarms and Events manually on page 162](#).

Typical distributed system on a network

In the sample distributed automation system shown next, FactoryTalk Services Platform is installed on every computer in the network.

The diagram shows just one example of a possible network layout for a group of computers and software products participating in a FactoryTalk Alarms and Events system using a FactoryTalk Network Directory. Use this diagram only as a starting point—your own distributed system will vary.



Language identifiers

With the FactoryTalk View language switching feature, runtime operators can view the text strings defined in an application in up to 40 different languages. FactoryTalk View SE Clients can run in any of the languages an application supports. In a network distributed application or network station application, multiple clients can run in different languages at the same time.

The languages in the following table are supported for language switching by the application at runtime. Be sure that these languages are installed on the development and client computers before trying to switch languages.

To find out which languages are installed on a computer, open **Control Panel**. Click **Region and Language**.

Installed languages are listed in the dialog box. The language that has a check mark beside it is the default language.

For more information on adding alarm messages in multiple languages to a FactoryTalk Tag Alarm and Event Server, see [Enter alarm messages in other languages on page 143](#).

Language identifier list

The following table lists the language identifiers:

Language	ID
Afrikaans (South Africa)	af-ZA
Albanian (Albania)	sq-AL
Arabic (Algeria)	ar-DZ
Arabic (Bahrain)	ar-BH
Arabic (Egypt)	ar-EG
Arabic (Iraq)	ar-IQ
Arabic (Jordan)	ar-JO
Arabic (Kuwait)	ar-KW
Arabic (Lebanon)	ar-LB
Arabic (Libya)	ar-LY
Arabic (Morocco)	ar-MA
Arabic (Oman)	ar-OM
Arabic (Qatar)	ar-QA
Arabic (Saudi Arabia)	ar-SA
Arabic (Syria)	ar-SY
Arabic (Tunisia)	ar-TN
Arabic (U.A.E.)	ar-AE
Arabic (Yemen)	ar-YE
Armenian (Armenia)	hy-AM
Azeri (Cyrillic)	az-Cyrl-AZ
Azeri (Latin)	az-Latn-AZ

Language	ID
Basque	eu-ES
Belarusian	be-BY
Bosnian (Cyrillic, Bosnia and Herzegovina)	bs-Cyrl-BA
Bosnian (Latin, Bosnia and Herzegovina)	bs-Latn-BA
Bulgarian	bg-BG
Catalan	ca-ES
Chinese (Hong Kong S.A.R.)	zh-HK
Chinese (Macau S.A.R.)	zh-MO
Chinese (PRC)	zh-CN
Chinese (Singapore)	zh-SG
Chinese (Taiwan)	zh-TW
Croatian (Croatia)	hr-HR
Czech (Czech Republic)	cs-CZ
Danish (Denmark)	da-DK
Divehi (Maldives)	dv-MV
Dutch (Belgium)	nl-BE
Dutch (Netherlands)	nl-NL
English (Australia)	en-AU
English (Belize)	en-BZ
English (Canada)	en-CA
English (Caribbean)	en-029
English (Ireland)	en-IE
English (Jamaica)	en-JM
English (New Zealand)	en-NZ
English (Philippines)	en-PH
English (South Africa)	en-ZA
English (Trinidad)	en-TT
English (United Kingdom)	en-GB
English (United States)	en-US
English (Zimbabwe)	en-ZW
Estonian (Estonia)	et-EE
Faroese (Faroe Islands)	fo-FO
Farsi	fa-IR
Filipino(Philippines)	fil-PH
Finnish (Finland)	fi-FI
French (Belgium)	fr-BE
French (Canada)	fr-CA

Language	ID
French (France)	fr-FR
French (Luxembourg)	fr-LU
French (Monaco)	fr-MC
French (Switzerland)	fr-CH
Frisian (Netherlands)	fy-NL
FRY0 (Macedonian)	mk-MK
Galician	gl-ES
Georgian	ka-GE
German (Austria)	de-AT
German (Germany)	de-DE
German (Liechtenstein)	de-LI
German (Luxembourg)	de-LU
German (Switzerland)	de-CH
Greek (Greece)	el-GR
Gujarati (India)	gu-IN
Hebrew (Israel)	he-IL
Hindi (India)	hi-IN
Hungarian (Hungary)	hu-HU
Icelandic (Iceland)	is-IS
Indonesian (Indonesia)	id-ID
Inuktitut (Latin, Canada)	iu-Latn-CA
Irish (Ireland)	ga-IE
Italian (Italy)	it-IT
Italian (Switzerland)	it-CH
Japanese (Japan)	ja-JP
Kannada (India)	kn-IN
Kazakh (Kazakhstan)	kk-KZ
Konkani (India)	kok-IN
Korean (Korea)	ko-KR
Kyrgyz (Cyrillic)	ky-KG
Latvian (Latvia)	lv-LV
Lithuanian (Lithuania)	lt-LT
Luxembourgish (Luxembourg)	lb-LU
Malay (Brunei Darussalam)	ms-BN
Malay (Malaysia)	ms-MY
Maktese	mt-MT
Maori	mi-NZ

Language	ID
Mapudungun (Chile)	arn-CL
Marathi (India)	mr-IN
Mohawk (Mohawk)	moh-CA
Mongolian (Cyrillic)	mn-MN
Norwegian (Bokmal)	nb-NO
Norwegian (Nynorsk)	nn-NO
Polish (Poland)	pl-PL
Portuguese (Brazil)	pt-BR
Portuguese (Portugal)	pt-PT
Punjabi	pa-IN
Quechua (Bolivia)	quz-BO
Quechua (Equador)	quz-EC
Quechua (Peru)	quz-PE
Romanian (Romania)	ro-RO
Romansh (Switzerland)	rm-CH
Russian (Russia)	ru-RU
Sami, Inari (Finland)	smn-FI
Sami, Lule (Norway)	smj-NO
Sami, Lule (Sweden)	smj-SE
Sami, Northern (Finland)	se-FI
Sami, Northern (Norway)	se-NO
Sami, Northern (Sweden)	se-SE
Sami, Skolt (Finland)	sms-FI
Sami, Southern (Norway)	sma-NO
Sami, Southern (Sweden)	sma-SE
Sanskrit - India	sa-IN
Serbian (Cyrillic)	sr-Cyrl-CS
Serbian (Cyrillic, Bosnia and Herzegovina)	sr-Cyrl-BA
Serbian (Latin)	sr-Latn-CS
Serbian (Latin, Bosnia and Herzegovina)	sr-Latn-BA
Sesotho sa Leboa (South Africa)	ns-ZA
Sesswana (South Africa)	tn-ZA
Slovak	sk-SK
Slovenian (Slovenia)	sl-SI
Spanish (Argentina)	es-AR
Spanish (Bolivia)	es-BO
Spanish (Chile)	es-CL

Language	ID
Spanish (Colombia)	es-CO
Spanish (Costa Rica)	es-CR
Spanish (Dominican Republic)	es-DO
Spanish (Ecuador)	es-EC
Spanish (El Salvador)	es-SV
Spanish (Guatemala)	es-GT
Spanish (Honduras)	es-HN
Spanish (International Sort)	es-ES
Spanish (Mexico)	es-MX
Spanish (Nicaragua)	es-NI
Spanish (Panama)	es-PA
Spanish (Paraguay)	es-PY
Spanish (Peru)	es-PE
Spanish (Puerto Rico)	es-PR
Spanish (Traditional Sort)	es-ES_tradnl
Spanish (Uruguay)	es-UY
Spanish (Venezuela)	es-VE
Swahili (Kenya)	sw-KE
Swedish (Finland)	sv-FI
Swedish	sv-SE
Syriac (Syria)	syr-SY
Tamil (India)	ta-IN
Tatar (Russia)	tt-RU
Telugu (India)	te-IN
Thai (Thailand)	th-TH
Turkish (Turkey)	tr-TR
Ukrainian (Ukraine)	uk-UA
Urdu (Pakistan)	ur-PK
Uzbek (Cyrillic)	uz-Cyrl-UZ
Uzbek (Latin)	uz-Latn-UZ
Vietnamese (Vietnam)	vi-VN
Welsh	cy-GB
Xhosa	xh-ZA
Zulu	zu-ZA

For more information, see [Enter alarm messages in other languages on page 143](#).

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- **Components**
Includes the name of the open source component, its version number, and the type of license.
- **Copyright Text**
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C:\Program Files (x86)\Common Files\Rockwell\Help\FactoryTalk Services Platform\Release Notes\OPENSOURCE
 \<product name>_oss_licenses.txt

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Commercial Software Licenses

The following table lists the commercially licensed software components in FactoryTalk Services Platform, FactoryTalk Alarms and Events, FactoryTalk Linx OPC UA Connector, and FactoryTalk Linx.

Product	Component	Copyright
FactoryTalk Services Platform	Stingray 2022.1	Copyright 2022, Rogue Wave Software, Inc.
	BCGControlBar Pro for MFC 33.2	Copyright 1998 - 2021 BCGSoft CO Ltd.
FactoryTalk Alarms and Events	Stingray 2022.1	Copyright 2022, Rogue Wave Software, Inc.
	BCGControlBar Pro for MFC 33.2	Copyright 1998 - 2021 BCGSoft CO Ltd.

Legal Notices

Product	Component	Copyright
FactoryTalk Linx OPC UA Connector	Softing OPC UA C++ Client SDK for Windows V6.20.1	Copyright 2011-2023 Softing Industrial Automation BmbH
	highcharts 10.3.3	Copyright (c) 2009-2013 Torstein Hønsi
FactoryTalk Linx	There are no commercially licensed software components in FactoryTalk Linx.	

Glossary

In this section:

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[D on page 194](#)

[E - P on page 194](#)

[R - T on page 195](#)

A - C

- A -

Alarm history log

A Microsoft SQL Server database that is configured to accept alarm and event data from the FactoryTalk Alarms and Events system.

Analog alarm

An analog alarm defines a condition that evaluates a single analog tag. The trigger condition compares the value of the tag against a defined static value using an operator: equal to, not equal to, greater than or equal to, less than or equal to, greater than, or less than.

Application

An application organizes project information, including elements such as data servers, HMI servers, and alarm and event servers, and makes the information available to all software products and computers participating in a FactoryTalk system.

- **Network distributed applications** are held in a FactoryTalk Network Directory. Project information and participating software products can be located on multiple computers distributed across a network. All of the computers participating in a particular network distributed application share a common Network Directory Server located on a network computer.
- **Network station applications** are held in a FactoryTalk Network Directory. All participating software products (except for data servers) must be installed on the same computer. Network station applications can connect to data servers that are located on different machines. All of the computers participating in a particular network station application share a common Network Directory Server located on a network computer.
- **Local station applications** are held in a FactoryTalk Local Directory. Project information is located on a stand-alone computer and is available only to software products installed on that same local computer. Local station applications cannot be accessed remotely and cannot share project information with a network distributed application or network station application.

Area

Areas subdivide and organize a distributed network application into logical or physical divisions. For example, separate areas might correspond with separate manufacturing lines in a facility, separate plants in different geographical locations, or different manufacturing processes.

Areas are not available with local station applications.

- C -

Condition-related event

An event associated with a change in the state of an alarm. For example, a condition-related event is triggered when an alarm condition changes to In Alarm, Acknowledged, Return to Normal, or Disabled.

D

- D -

Data server

Data servers serve tags, or data items, contained in OPC-DA (Data Access) servers. Clients that need access to data items, such as FactoryTalk View Studio and FactoryTalk Transaction Manager, use data server application elements referenced from the FactoryTalk Directory to locate the computers that are hosting OPC-DA 2.0 compliant data servers.

Deviation alarm

A deviation alarm defines a condition that evaluates a single analog tag. A trigger condition compares the value of a tag against a deviation from a target value.

Device server

A server process that connects to devices (controllers) and subscribes to alarm, status, and diagnostic information. A device server processes this data and publishes it to client processes for graphic display and logging. FactoryTalk Linx is one common example of a device server.

Device-based alarm monitoring

With device-based alarm monitoring, pre-built alarm instructions, available in RSLogix 5000 v. 16 or later, are programmed in a logic project and then downloaded into a Studio 5000 controller. The controller detects alarm conditions and publishes event information, which is routed through the system for display and logging.

Digital alarm

A digital alarm defines a condition that evaluates a single digital tag. The trigger condition compares the value of the tag to either zero or one.

Docked

A graphic display that is fixed to the top, bottom, left or right side of a FactoryTalk View SE client window.

Dongle

A dongle is a security or copy protection device for commercial computer programs. When required by a program, a dongle must be connected to an input/output port, such as USB or parallel port of the computer, to allow the program to run. Programs that use a dongle query the port at start-up and at programmed intervals thereafter, and close if the dongle does not respond with the expected validation code.

E - P

- E -

Enabled

When an alarm is enabled, it is running its condition detection logic. Enabled alarms cannot be edited or deleted.

- H -

HMI server

HMI servers, also called FactoryTalk View SE Servers, store and serve HMI projects, which contain displays, alarms, tags and other services, to HMI clients such as FactoryTalk View Studio and FactoryTalk View SE Clients. HMI clients use FactoryTalk Directory to locate the computers that are hosting HMI servers.

- L -

Level alarm

A level alarm defines multiple conditions that evaluate a single level tag (sometimes called an analog tag). Each level can uniquely identify an alarm threshold, a severity, and an alarm message.

- O -

Offline data item

In RSLinx Classic, offline data points are read directly from a processor's project file defined in the RSLinx Classic DDE/OPC Topic Configuration (Use Symbols option).

In FactoryTalk Linx, offline data points are read directly from a processor's project file defined in the device shortcut. For ControlLogix, offline tag browsing requires firmware version 10 or higher.

Online data item

Online data items are read directly from a processor, exactly as they are defined in that processor.

Using a Studio 5000 controller you can create tags right in the controller and use RSLinx Classic or FactoryTalk Linx to access those tags directly. As a result, you can work with symbol names in a Studio 5000 processor both online and offline.

In a traditional PLC-5 or SLC 500 processor, tags are not created in the controller—instead symbol and tag names are associated with predefined PLC addresses. These associations are held in the logic program and are referenced by RSLinx Classic or FactoryTalk Linx. When reading data points online, only the PLC addresses exist inside the controller. You must work with RSLinx Classic offline data items to use ladder logic symbol names with these types of controllers.

OPC

OPC (OLE (Object Linking and Embedding) for Process Control) is a non-proprietary technical specification that defines a set of standard interfaces based on Microsoft's OLE/COM (Component Object Model) technology. Applying OPC standards makes interoperability possible among automation and control applications, field systems and devices, and business and office applications.

The FactoryTalk Services Platform supports and extends the OPC 2.0 specification, which includes the ability to browse data items.

- P -

Policy

A set of system-wide rules governing how security is implemented, such as rules related to password length and complexity.

R - T

- R -

RSLinx

RSLinx Classic and FactoryTalk Linx are families of software products that link networks and devices to products such as the FactoryTalk View family of HMI software and the RSLogix family of device-programming software.

Two versions of RSLinx are commonly used in FactoryTalk systems:

- **RSLinx Classic:** an OPC-DA 2.0 data server.
- **FactoryTalk Linx:** a FactoryTalk Live Data server and Alarms and Events server.

RSLogix

The RSLogix family of software products provides programming software for control devices, including the Studio 5000 series, PLC-5, and SLC 500. Use either of these two control programming tools to set up device-based alarm monitoring in FactoryTalk Alarms and Events:

- Studio 5000 Logix Designer application, version 21.00.00 and later.
- RSLogix 5000 software, version 16.00.00 and later.

- S -

Simple event

Any event describing a simple occurrence in the system. Example: failure to access a computer or device.

- T -

Tag update rate

The rate at which a tag is scanned for changes to its value. To reduce the quantity of network traffic, set the tag update rate to be as long as possible. For example, because an operator cannot respond to tag values that change faster than once every second, it is seldom necessary to set a tag update rate faster than once every few seconds. Set a faster tag update rate only if the system is programmed to respond automatically to tag values that change so quickly, bearing in mind the load this places on the network.

Tag-based alarm monitoring

Software-based Tag Alarm and Event Servers monitor controller tags for alarm conditions through data servers and publish event information for display and logging. Tag-based alarm monitoring is used for Studio 5000 controllers, PLC-5, and SLC 500 devices communicating through Rockwell Automation Device Servers (FactoryTalk Linx), or for third-party controllers communicating through OPC data servers.

Tracking-related event

An event that tracks changes made to the system over time. Examples: an event describing the acknowledgment of an alarm by an operator, or the modification of a tag value by an operator.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

Documentation feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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