



SERVICES PLATFORM PROFILE

FactoryTalk® Alarms and Events

OVERVIEW

Maintaining a current, accurate alarm and event status in an architecture can be challenging. A traditional alarming system stores the status and state of an alarm in the human-machine interface (HMI), so keeping the view from operator to operator or database to database has always been difficult. Re-booting an alarm server might require manually rebuilding the state of the alarm, but you are left with the question of whether the alarm is acknowledged or suppressed?

FactoryTalk Alarms and Events rewrites this paradigm by moving all alarm configuration (including alarm messages) down to the controller where the alarm conditions are monitored. As part of the FactoryTalk Services Platform, FactoryTalk Alarms and Events provides components that allow FactoryTalk-enabled products to participate in a common, consistent view. It provides management of alarms and events throughout a FactoryTalk system.

FactoryTalk Alarms and Events helps eliminate the problems of traditional alarm and event systems such as required programming in both the controller and the HMI software; alarms being detected and processed twice; heavy polling between the HMI and controller tags resulting in heavy network overhead; and alarm time stamps being delayed because they are applied by the HMI after polling and processing. FactoryTalk Alarms and Events creates a consistent user interface for visualization and management across the entire control system and significantly reduces network traffic due to alarm reporting by exception.

FactoryTalk Alarms and Events can support information provided by two different types of alarm sources:

- **Device-based Alarms** — Pre-built alarm instructions that are programmed in a Logix5000 project and then downloaded into a Logix controller (Figure 2). The controller detects alarm conditions and publishes event information, which is routed through the system for display and logging.
- **Tag-based Alarms** — Software-based alarm servers monitor data tags for alarm conditions and publish event information for display and logging (Figure 3). Tag based alarm monitoring is supported by Logix controllers, PLC-5 controllers, SLC 500 controllers, or any third-party device through OPC Data Access (OPC-DA).

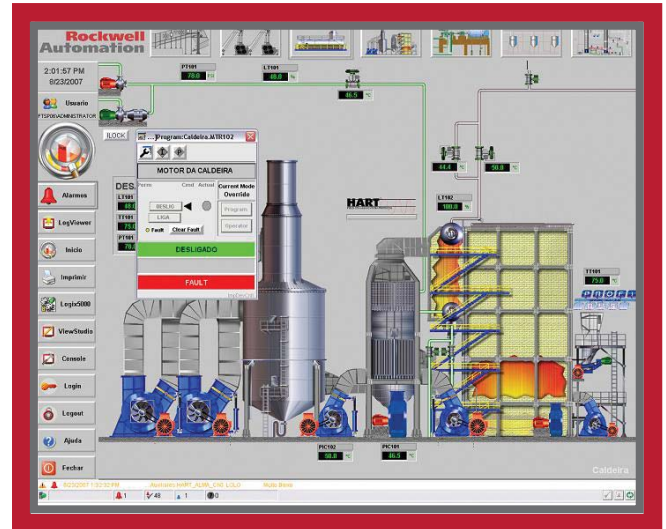


Figure 1. Docked alarm banner in FactoryTalk View SE

HIGHLIGHTS OF FACTORYTALK ALARMS AND EVENTS

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 Logix5000 controllers, you can use pre-built alarm instructions, available in RSLogix 5000 v. 16 or later, to simplify coding, and then download 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.
- Allows other controllers to participate in the integrated system with tag-based alarm monitoring. If your automation system includes other controllers, such as PLC-5s or SLC 500s, or if you prefer not to use the new alarm instructions with

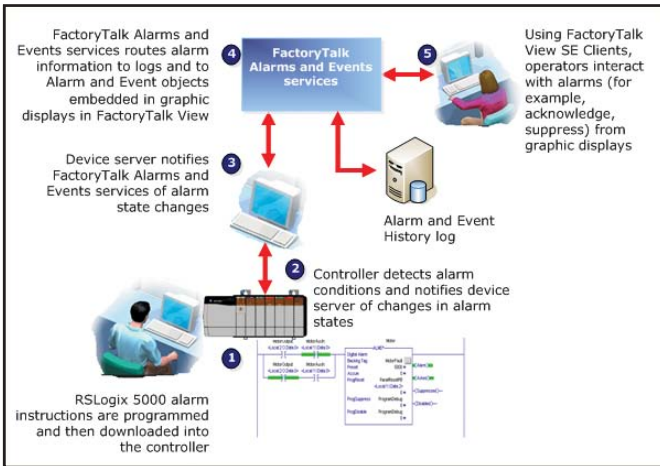


Figure 2. Device-based alarms

Logix5000 controllers, software-based alarm servers monitor controllers for alarm conditions and publish event information.

- Allows monitoring alarms and events from third-party controllers. Tag-based alarm monitoring also makes it possible to monitor alarm conditions from third-party controllers, which communicate through OPC-DA servers.
- Provides accurate time stamps on alarm conditions that are generated from Logix5000 controllers using device-based alarm monitoring. With device-based alarm monitoring, time stamps are applied immediately in the controller and are not delayed until alarms reach an HMI server.
- 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.
- Common Open Microsoft SQL database for alarm history storage. Use the FactoryTalk Alarm and Event Log Viewer, create your own SQL queries or use third-party tools to interrogate the standard SQL database.

Visualization of alarms is accomplished in FactoryTalk View SE using four new graphic objects that can be placed in your graphic displays. Each graphic object has its own customization options to make it fit your user requirements.

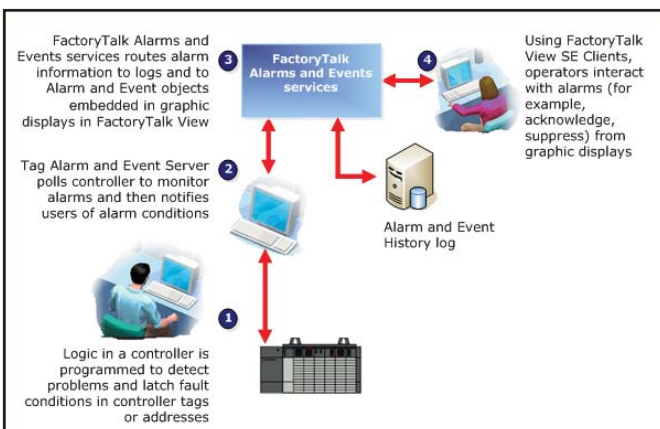


Figure 3. Tag-based alarms

- **Alarm and Event Banner:** Displays up to five of the most recent, active alarms with the highest priority. The Alarm and Event Banner is a graphic object that can be added to a graphic display. The graphic display can then be docked at the bottom of the operator's screen. Once docked, the alarm and event banner display reserves its space in the FactoryTalk View SE Client window. From the Alarm and Event Banner an operator can execute specific commands linked to the alarm, act on the alarm (for example, suppress or acknowledge the alarm), or open a graphic display containing the Alarm and Event Summary.
- **Alarm and Event Summary:** This object displays up to 2000 of the most recent alarms. It shows details about the selected alarm, its source, and other configurable items. From the Alarm and Event Summary the operator can execute specific commands linked to the alarm and act on the alarm (for example, suppress or acknowledge the alarm). The Alarm and Event Summary also contains a full suite of filter and sorting options to allow the operator to see exactly what is important.
- **Alarm and Event Log Viewer:** This object is used to view the history of alarms and events that have been logged to a database. The Alarm and Event Log Viewer object also has a full suite of filter and sorting options to allow the operator to view data from the historical SQL database. From this screen, an operator can easily reconstruct the sequence of events occurring in time that lead to a process failure.
- **Alarm Status Explorer:** This object is a graphic object users can add to graphic displays. The graphic display then can show the status of all alarms in the FactoryTalk system and allows an operator to suppress, unsuppress, disable and enable alarms. From this graphic display an operator can quickly identify what alarms are currently suppressed or disabled.

This alarm monitoring system provides many benefits over traditional alarming systems including:

- Alarm instructions are programmed only once and then downloaded to the controller, reducing programming effort and errors. And full programmatic access is available from the control system to change alarm state. For example, during a machine switchover, alarms from a removed tool can be suppressed or disabled from the control program.
- Alarm conditions are detected more quickly and alarm status is maintained. And since the controller is the device that creates and maintains the alarm state, replacing a server or re-booting an HMI means nothing to the actual state of the alarm. It's stored in the controller and reported to the HMI when it again becomes available.
- Real-time alarming is performed in the controller. Alarm state is managed, processed, and preserved by controllers, even if a computer goes down.
- HMI tags are not required, reducing overhead and potential tag mapping errors. The HMI only requires a simple subscription to the controller and definition of how the alarms should be viewed and logged.

- Data polling is eliminated; alarm status is communicated only when state changes, reducing network overhead, controller processing, and improving overall system performance.
- Time stamps on alarm conditions are accurate, because they are applied in the controller, and not delayed until they reach the HMI software. Now resolution to first-in conditions on alarms triggered a few milliseconds apart can be achieved easily.

In addition:

- **Historical Logging:** Reconstruct a sequence of events and actions easily using the FactoryTalk Alarms and Events history. FactoryTalk Alarms and Events logs all alarm actions and status to a Microsoft SQL Server database. Select your own existing MS SQL Server database for storage, or use the MS SQL Server Express database that comes with FactoryTalk View and RSLinx Enterprise. The contents of the database can be displayed, sorted, and filtered using the Alarm and Event Log Viewer.
- **Broadcast by Exception:** Improve system efficiency by reducing network usage and freeing controller resources. Device-based alarms use a new broadcast method for communications. When an alarm occurs, the controller broadcasts that alarm to all alarm subscribers. This broadcast-by-exception technique eliminates the constant polling traditional alarm systems required, freeing network bandwidth, as well as the controller resources servicing those requests.
- **Controller-based Time Stamp:** When operators need to build a historical reference of events that led up to a failure, the time associated with each event should be as precise as possible. Traditional alarm monitoring relied on the HMI system to time-stamp events. Polling cycles inherent in HMI-based alarm monitoring introduced latency as well as sequencing errors in the time stamps. With device-based alarms, time stamps are captured at the controller when the actual event occurs. Accuracy of the time stamps is now a function of the controllers' code scan.
- **Alarm Buffering:** Minimize the risk of losing alarm transitions in the event of a server crash with alarm buffering. In the event that the computer hosting an RSLinx Enterprise alarm server crashes or is restarted, rather than discard alarms that occur while the system is recovering, the controller buffers alarm

transitions. When the RSLinx Enterprise alarm server comes back online and reconnects, the controllers push the buffered alarm information up to the HMI, including the timestamps for when the event occurred. Additionally, alarm buffering is available between the alarm server and your Microsoft SQL alarm history database. In the event that the computer hosting the database is not currently connected or is rebooting, the alarm server will buffer any information on the local drive that needs to be logged in the database and will pass that information to the database when it reconnects.

THE EXPANDED INTEGRATED ARCHITECTURE

The FactoryTalk Services Platform delivers value through reuse and sharing of common service features (or services) across a range of software applications. This enables superior interoperability and commonality between applications and results in reduced engineering, operations and training costs while extending the life of existing investments. Products that are built on the FactoryTalk Services Platform are better integrated, easier to configure, have an identical look and feel, and are easier to maintain than products that do not share common features.

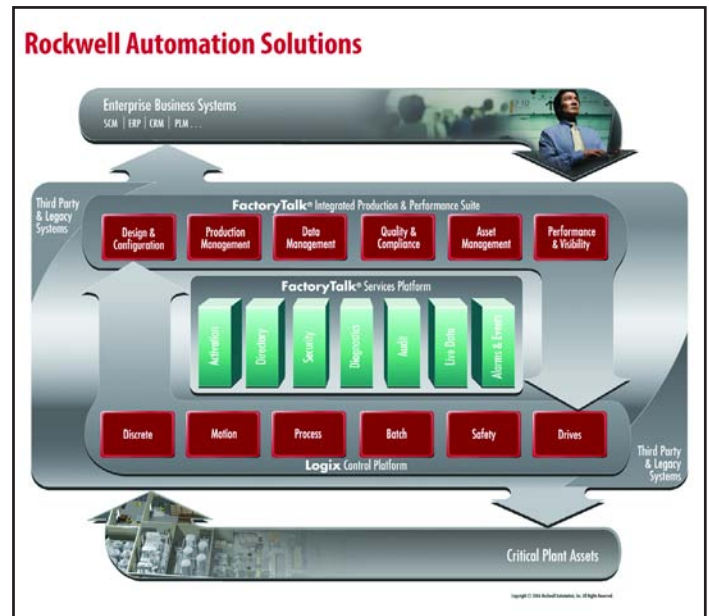


Figure 4. Rockwell Automation Integrated Architecture

	FactoryTalk AssetCentre	
	FactoryTalk Batch	
	FactoryTalk Gateway	
	FactoryTalk Historian SE	
	FactoryTalk Historian Classic	
	FactoryTalk Metrics	
	FactoryTalk Metrics LE	
	FactoryTalkPortal	
	FactoryTalkScheduler	
	FactoryTalk ProductionCentre	
	FactoryTalk View ME	
	FactoryTalk View SE	✓
	FactoryTalk Transaction Manager	
	RSLogix 5	
	RSLogix 500	
	RSLogix 5000	✓
	RSLinx Classic	
	RSNetWorx	
	RSView32	
Alarms & Events		

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