

# FactoryTalk Batch Getting Results Guide

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## 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.

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

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**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.



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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.

## Summary of changes in FactoryTalk Batch Getting Results Guide

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This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes.

Topic	Reason for change
<a href="#">FactoryTalk Batch</a> on <a href="#">page 15</a>	Functional change
<a href="#">FactoryTalk Batch View</a> on <a href="#">page 59</a>	Functional change
<a href="#">FactoryTalk Batch View HMI Controls</a> on <a href="#">page 113</a>	Functional change



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### About this manual

This information was developed to introduce you to the basics of automated batch manufacturing and the FactoryTalk® Batch product components. This manual is one of a set of related manuals that describe installing, programming, and operating the FactoryTalk® Batch system.

To review FactoryTalk Batch release notes and latest information regarding product compatibility refer to the [Product Compatibility and Download Center \(PCDC\)](#).

### Document organization

The information in this document is presented in an order that should minimize the effort required to obtain a basic overview of Batch.

The following subjects are presented in this document:

- FactoryTalk Batch Documentation
- Modular Batch Automation
- FactoryTalk Batch Components
- FactoryTalk Batch Server
- FactoryTalk Batch Equipment Editor
- FactoryTalk Batch Recipe Editor
- FactoryTalk Batch View
- FactoryTalk Event Archiver
- ActiveX Controls
- PC-Based Phases
- Glossary of Terms

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Alternatively, you may obtain complete Corresponding Source code by contacting Rockwell Automation via the **Contact** form on the Rockwell Automation website: <http://www.rockwellautomation.com/global/about-us/contact/contact.page>. Please include "Open Source" as part of the request text.

## Additional resources

Following is a comprehensive list of documentation for the FactoryTalk® Batch products from Rockwell Automation.

### Installation, Quick Start, and Getting Results Guides

Resource	Description
FactoryTalk Batch Components Installation and Upgrade Guide (BATCH-IN002)	Provides information and procedures for FactoryTalk Batch system installation. Includes information for FactoryTalk Batch Material Manager, FactoryTalk Event Archiver, and associated FactoryTalk Batch Client and Server components.
FactoryTalk Batch View Quick Start Guide (FTBVS-QS001)	Provides information about using FactoryTalk Batch View to create, view, and command control recipes, acknowledge prompts and signatures, view equipment phases and diagnostic information, and view profile information.

Resource	Description
FactoryTalk Batch View HMI Controls Quick Start Guide (BATCH-QS001D)	Provides a general overview of FactoryTalk Batch View HMI Controls.
FactoryTalk Batch eProcedure® Getting Results Guide (BWEPRO-GR011)	Explains the basics of FactoryTalk Batch eProcedure.
FactoryTalk Batch Getting Results Guide (BATCH-GR011)	Introduces the basics of automated batch manufacturing and the FactoryTalk Batch product components.
FactoryTalk Batch Material Manager Getting Results Guide (BWMTR-GR011)	Introduces the basics of FactoryTalk Batch Material Manager.

## User Guides

Resource	Description
FactoryTalk Batch Material Editor User Guide (BWMTR-UM001)	Provides access to information and procedural instructions required to configure materials and the containers to hold them. The material data is stored in the material database, which is used to create material-based recipes. This information is intended as a reference for formulators.
FactoryTalk Batch Equipment Editor User Guide (BATCH-UM004)	Provides information on creating and maintaining an equipment database (area model). The area model is available to all other FactoryTalk Batch programs, including the Recipe Editor, Batch View, and Phase Simulator.
FactoryTalk Batch PhaseManager™ User Guide (BATCHX-UM011)	Describes the integration of the FactoryTalk Batch software with the Studio 5000 Logix Designer® application and the Logix 5000™ family of controllers. The integration simplifies the configuration and maintenance of the FactoryTalk Batch automation system, provides better communication between the FactoryTalk Batch Server and the Logix 5000 controller, and significantly reduces the programming effort required to develop the phase logic code that resides in your Logix 5000 controller.
FactoryTalk Batch Recipe Editor User Guide (BATCH-UM006)	Provides instructions on using FactoryTalk Batch Recipe Editor to create and configure master recipes for use in batch automation. The interface is based on IEC 61131-3 sequential function charts to organize recipes graphically into procedures, unit procedures, operations, and phases. Build recipes using either the SFC format or a table-based format.
FactoryTalk Batch View HMI Controls User Manual (FTBVS-UM003)	Provides details about using FactoryTalk Batch View HMI Controls to monitor and interact with the production process within a FactoryTalk View SE Display Client.
FactoryTalk Batch View User Manual (FTBVS-UM002)	Provides information and procedural instructions for using FactoryTalk Batch View in a modern and intuitive portal into a comprehensive batching solution for effective operations, leveraging its own web server using HTML5 technology to provide connectivity into a FactoryTalk Batch Server.
FactoryTalk Event Archiver User Guide (BATCH-UM012)	Provides information and instructions specific to the FactoryTalk Event Archiver. Intended for use by system administrators and production supervisors.

## Administrator Guides

Resource	Description
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FactoryTalk Batch Administrator Guide (BATCH-UM003)	Provides instructions for configuring security and services, and implementation and use of components not typically accessed or used by batch operators, such as the FactoryTalk Batch Server.
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Resource	Description
FactoryTalk Batch eProcedure Administrator Guide (BWEPRO-UM011)	Provides procedures specific to FactoryTalk Batch eProcedure, such as implementing security and configuring the user-defined area Active Server Page. Included are instructions for tasks specific to FactoryTalk Batch, such as configuring security and services to support FactoryTalk Batch eProcedure. Provides instructions on the implementation and use of components not typically accessed or used by batch operators, such as the FactoryTalk Batch Server.
FactoryTalk Batch Material Manager Administrator Guide (BWEPRO-UM011)	Provides information and instructions specific to FactoryTalk Batch Material Manager. Intended for use by system administrators and database administrators.

## Reference Guides

Resource	Description
FactoryTalk Batch Material Server API Technical Reference (BWMTR-RM001)	Provides access to information regarding the interface between the FactoryTalk Batch Material Server and the FactoryTalk Batch Material Editor and FactoryTalk Batch. It is intended to be used as a reference information by custom interface developers.
FactoryTalk Batch PCD Programming Reference Manual (BATCH-RM004)	Provides information and instructions about the FactoryTalk Batch PCD interface design. It is intended to be used as a reference guide for PCD programmers.
FactoryTalk Batch Server API Reference Manual (BATCH-RM003)	Provides information regarding the interface between the FactoryTalk Batch Server and FactoryTalk Batch View – the Server Application Programming Interface (API). It is intended to be used as a reference guide by custom interface developers.
FactoryTalk Batch System Files Reference Manual (BATCH-RM005)	Provides the technical information for configuration and maintenance of a FactoryTalk Batch system. It can be used as a reference information for implementation engineers and system administrators.
FactoryTalk Batch eProcedure Instruction File Design Reference Manual (BWEPRO-RM001)	Includes information about the building of instruction files for use in equipment database creation and recipe development. This information is intended to be used as a reference by instruction file authors.

View or download publications at <http://www.rockwellautomation.com/literature>. To order paper copies of technical documentation, contact your local Allen-Bradley® distributor or sales representative.

## FactoryTalk Batch

As part of the FactoryTalk family, the FactoryTalk Batch components increase overall plant efficiency by delivering the visibility, control, and reporting you need to optimize manufacturing. With coordinated execution, you can reduce scrap and rework and improve product quality and consistency. Through real-time management of equipment utilization, you can maximize your return on assets. By implementing optimized recipes and procedures, you can increase your plant capacity. By using electronic, paperless operations, you can improve your productivity. You also reduce compliance costs by using electronic batch record implementation, paperless manufacturing, and quality sign-offs. By lifting the compliance burden from manufacturing, you reduce inventory levels and cycle times, which greatly improves customer service.

The FactoryTalk Batch components help you optimize plant floor operations, giving you quick return on your net assets. New product definitions are deployed quickly into manufacturing. Production order information is accurate. Business and plant-level control systems are tightly coordinated and multiple sites operate as a team. FactoryTalk Batch components are an open, configurable set of products that help you define, manage, monitor, and control manufacturing at local, remote, or contractor plants. You can deploy any of the FactoryTalk Batch components wherever you need them, one at a time or all at once, to improve productivity and plant control. The FactoryTalk Batch components include:

- FactoryTalk Batch Server
- FactoryTalk Batch Recipe Editor
- FactoryTalk Batch Equipment Editor
- FactoryTalk® Batch View
- FactoryTalk Batch View HMI Controls
- FactoryTalk Event Archiver
- FactoryTalk Batch Network Editor
- FactoryTalk Batch Enterprise Integration Server
- eProcedure® Server and Client components
- FactoryTalk Batch Material Manager

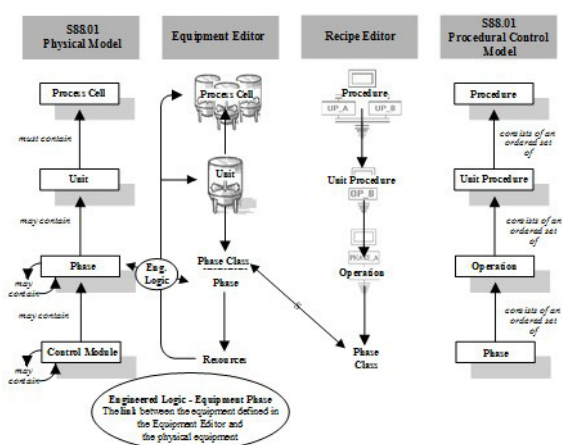
### What is FactoryTalk Batch?

To see the true value of a FactoryTalk Batch solution, become familiar with Modular Batch Automation and how it relates to the ISA S88.01 International Batch Control Standard. The next section is a brief overview of modular batch automation.

## Modular Batch Automation

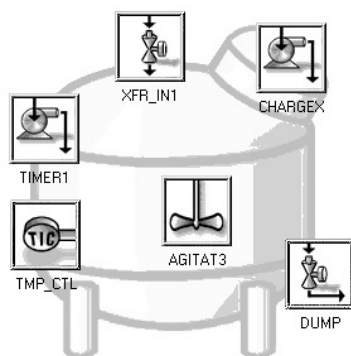
In the late 1980s, the Instrument Society of America (ISA) started the SP88 committee to establish a set of standards for batch control. One of the most important terms that has been associated with this standard is Modular Batch Automation (MBA). Using the modular approach, a batch process is defined by a sequence of small modules rather than by a large, cumbersome, monolithic program. The initial step in implementing MBA is to separate the batch process into two models: Equipment and Procedural. This separation provides for a more efficient means of developing and modifying an automated batch process. Modularizing your equipment and procedures allows you to create re-usable components.

This diagram shows the relationship between the S88.01 models and the FactoryTalk Batch Editors. The FactoryTalk Batch Equipment Editor and FactoryTalk Batch Recipe Editor are tied together at the Phase level.



## FactoryTalk Batch Equipment Editor example

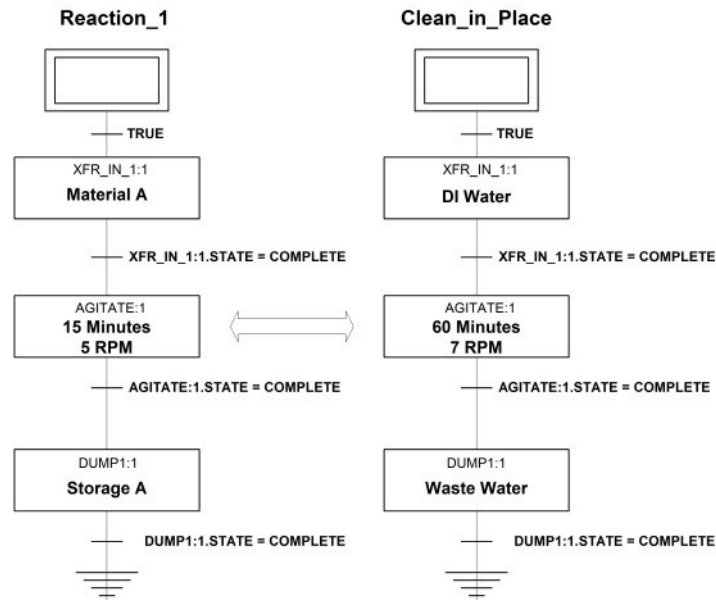
As an example, you create a reactor unit in the FactoryTalk Batch Equipment Editor. The reactor unit, which is displayed here, contains six phases that are used to perform individual actions (adding various ingredients, mixing-heating-transferring the contents of the reactor, etc.). Once the unit and its associated phases are defined in the FactoryTalk Batch Equipment Editor, you are ready to use the FactoryTalk Batch Recipe Editor to create operations for this reactor to execute.



## FactoryTalk Batch Recipe Editor example

To continue the example in the FactoryTalk Batch Recipe Editor, you create two operations, Reaction\_1 and Clean\_in\_Place, which are shown below. The Reaction\_1 operation transfers Material A into the reactor, agitates the contents for 15 minutes at 5 RPM, and then dumps the contents into Storage Unit A. The Clean\_in\_Place operation transfers water into the reactor, agitates the contents for 60 minutes at 7 RPM, and then dumps the contents as Waste Water.

Both operations use the same phases but in a different way. You control how the phase operates through the use of parameters, such as speed and time as shown in the AGITATE:1 phase.



For more information regarding how FactoryTalk Batch applies the ISA S88.01 concepts, contact your Rockwell Sales Representative. For a copy of the S88.01 document, write to: **ISA**, 67 Alexander Drive, P.O. Box 12277, Research Triangle Park, NC 27709

## Who uses FactoryTalk Batch?

FactoryTalk Batch organizes information for a number of different occupational roles:

- **Process Engineer:** Uses the FactoryTalk Batch Equipment Editor to create an area model that captures all capabilities of the specific plant.
- **Control Systems Engineer:** Understands the specific control system being used and links the control system with FactoryTalk Batch.
- **Formulator:** Uses the FactoryTalk Batch Recipe Editor to create master recipes that run against the area model of the plant.

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**IMPORTANT** Separation of the Equipment and Procedural models allows for greater protection of a company's intellectual property. When implementing a project with FactoryTalk Batch, engineers responsible for configuring the equipment in the plant don't need access to the recipes. They are only responsible for designing equipment-specific phases (optimizing the physical capabilities of the plant). The recipes remain in the hands of the formulators (usually company employees).

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- **Operator:** Uses the FactoryTalk Batch View and/or ActiveX controls to schedule, start, and stop batches. Also uses a third-party human machine interface (HMI) software package to view the physical plant (pumps, valves, etc.). Can also review past batches and make parameter adjustments online.
  - The facility operator is the user of the designated equipment.
  - The operator is the recipient of requests for parameter data deferred to the operator.
  - The operator is the default owner of a resource if the facility operator is manually arbitrating between resources.
- **MIS Administrator:** Interacts with the uploaded event journals to create batch reports and monitor material usage. The FactoryTalk Event Archiver can upload batch data to a Microsoft SQL database.

Make sure that all user accounts have been created and given the necessary permissions before attempting the procedures in this guide. For more information, see the *FactoryTalk Batch Components Installation and Upgrade Guide*.

## Reference guidelines and standards

The following is a list of reference documents that may be consulted for more complete information.

- **NAMUR Guidelines "Normen Arbeitsgemeinschaft für Mess- und Regeltechnik in der Chemischen Industrie"**  
Standard that defines the terminology used to describe modular batch automation's component parts.
- **IEC 61131-3 "Programmable Controllers, Programming Languages"**  
Standard that describes sequential function charts.
- **ISA's S88.01 "Batch Control, Models and Terminology"**  
Standard which describes the standard terminology used to describe modular batch automation's component parts.
- **ISA's ANSI/ISA-95.00.01-2000 "Enterprise-Control System Integration Part 1: Models and Terminology"**  
Standard that describes the relevant functions in the enterprise and the control domain and which objects are normally exchanged between these domains.
- **ISA's ANSI/ISA-95.00.02-2001 "Enterprise-Control System Integration Part 2: Object Model Attributes"**  
Standard that defines the details of the interface content between manufacturing control functions and other enterprise functions.

## **FactoryTalk Batch Components**

FactoryTalk Batch comes with several components that interact with each other to design, create, configure and run batch recipes.

### **FactoryTalk Batch Server**

The FactoryTalk Batch Server is the engine that runs FactoryTalk Batch. It is the component that controls system information, phases and recipes. The server allows integration with process-connected devices (PCDs) and third-party software packages. Prior to opening FactoryTalk Batch View, the FactoryTalk Batch Server must be running and remain active during all batch functions.

The FactoryTalk Batch Server operates as a Windows service, which means that the FactoryTalk Batch Server can be configured to start automatically and that control of the FactoryTalk Batch Server can be given to the Windows Service Manager. Because the FactoryTalk Batch Server runs as a service, it does not require an operator to log on to run. Therefore, logging on or off Windows during operation does not disrupt the performance of the FactoryTalk Batch Server.

### **FactoryTalk Batch Recipe Editor**

The FactoryTalk Batch Recipe Editor is used to graphically create and configure recipes.

- The interface is based on IEC 61131-3 sequential function charts (SFC) that graphically organizes recipes into procedures, unit procedures, operations and phases along with any applicable comments.
- In addition to the SFC view, the FactoryTalk Batch Recipe Editor offers a table view. Table-based recipes provide a mechanism for creating simple recipes that do not require a complex recipe structure or elaborate transition expressions. Additionally, you can view table-based recipes and edit all recipe parameters without having to navigate between steps.
- The FactoryTalk Batch Recipe Editor allows you to specify sequences of phases. The actual phase logic must be configured in the process-connected device (PCD) while the interface to the PCD must be configured in the FactoryTalk Batch Equipment Editor.
- Recipe reports can be generated in SFC and/or descriptive format.
- If Recipe Approvals are enabled in the underlying area model, approval signoffs are executed in the FactoryTalk Batch Recipe Editor.
- When Recipe Version Control is enabled, a version of a recipe (a read-only, numbered snapshot of a recipe) can be saved and protected from further editing. New work-in-progress (WIP) copies of a version allow the recipe author to continue to make changes and updates to a recipe. When a versioned recipe no longer matches the underlying area model, or references a deleted or non-existent sub-recipe, it is marked as obsolete.

## FactoryTalk Batch Equipment Editor

The FactoryTalk Batch Equipment Editor is a graphical interface through which a database of process equipment is defined and maintained (an area model).

- Components defined in the FactoryTalk Batch Equipment Editor are used to interface with process-connected devices (PCDs) in the facility. During recipe configuration, the area model provides a list of available units and phase classes.
- Configure phases and commands to trigger an electronic signature request when a report or recipe parameter is out of range (parameter deviation), or when specific commands are executed on a batch (such as Abort Batch or Active Step Change).
- During recipe verification, the area model confirms that the designated equipment is capable of executing the procedures.
- During recipe execution, resource arbitration functions use the area model to allocate equipment based on recipe and operator requests.
- The area model is available to all other FactoryTalk Batch applications.

In addition to the area model, the FactoryTalk Batch Equipment Editor allows configuration of the following:

- Communication functions
- Electronic signatures
- Enumeration sets
- Data servers
- Recipe approvals
- Recipe version control
- FactoryTalk Event Archiver functions

## FactoryTalk Batch View

Use FactoryTalk® Batch View to initiate and control the batch process. A batch is a running control recipe. The material produced by a single execution of a recipe is also considered a batch.

- Use **Batches** to create, view, and command a control recipe, observe the execution of a single recipe, and bind units for class-based recipes. Once a control recipe is created, it remains in the **Batches** list until it is removed or until the FactoryTalk Batch Server is restarted with a cold boot. A graphical representation of a running batch and its associated data is displayed.
- Use **Prompts** to alert operators to value requests for parameters, unit binding, material binding, and signatures or manual instructions. A control recipe cannot complete execution until the operator provides the requested information. In most cases, pending requests for information (value prompts, signatures, or manual instructions) are not acknowledged until a user either provides the information or stops or aborts the control recipe.



- Value prompts alert operators to requests for parameter values, unit binding, and material phase/container binding.
- Signatures are requests for signoffs that require user permissions and optional comments. When a signature is generated against a control recipe, acknowledge the signature by completing the associated signoffs. The requested user information in a signature is determined by the signature template defined in the area model.
- Instructions are individual steps of a manually executed phase. As a batch executes, the instruction for each active step appears. Instructions execute in the order specified within the master recipe.
- Use **Equipment** for an equipment-centric view of the defined area model. There are three levels of equipment: process cell, unit, and phase.
- Use **Diagnostics** to view server and service status, server performance, server statistics, arbitration, and journals.
- Use **Profile** to change the default language, view assigned groups, enable or disable the minimal view, and view authorization settings

For more information on using these features, see FactoryTalk Batch View Help.

## **FactoryTalk Event Archiver**

The FactoryTalk Event Archiver's purpose is to translate the FactoryTalk Batch tab-delimited ASCII electronic batch record files to a user-specified file type. These electronic batch record files are maintained separately for each batch created and viewed with a word processor or spreadsheet. Many plants have standardized on one of the many commercially available Relational Database Management System (RDBMS) software packages. We recommend using a high-performance database, such as SQL Server, due to their better robustness and performance. The Archiver collects data from each electronic batch record file and stores it in the specified RDBMS database format.

## **FactoryTalk Batch Network Editor**

The FactoryTalk Batch Network Editor is a utility that indicates where other FactoryTalk Batch and FactoryTalk Batch Material servers are located on the network. This network configuration allows for ease of integration with other FactoryTalk Batch components and simplifies the process of reconfiguring a multi-computer system. If FactoryTalk Batch Material Manager is also installed the FactoryTalk Batch Network Editor is also used to indicate the location of the material database.

## **FactoryTalk eProcedure Server**

The FactoryTalk eProcedure Server provides the services to the FactoryTalk Batch Server to enable the use of HTML instruction files. Prior to connecting a client to FactoryTalk eProcedure, FactoryTalk eProcedure Server must be running and remain active during all batch functions.

## FactoryTalk Batch Material Manager

FactoryTalk Batch Material Manager is used to track material consumption in batch recipes. It consists of two components: Material Server and Material Editor.

The Material Editor provides an interface to help you create the material database, which consists of material, lot, subplot, container, and storage location data. The Material Server provides the communication between the material database and the FactoryTalk Batch Server. During a batch run, information about available containers is presented to the operator for binding decisions. Binding is the process of mapping steps within a control recipe to actual equipment in a plant. After a batch is run, quantities consumed or distributed are updated in the material database for use in inventory tracking.

The Material Server consists of a group of components that work together to service various applications. The primary applications that the Material Server services are the Material Editor, FactoryTalk Batch Server, FactoryTalk Batch Recipe Editor, and FactoryTalk Batch Equipment Editor. Any third-party application can also use custom solutions based on the exposed Material Object Model (MOM).

## FactoryTalk Batch Material Editor

The Material Editor provides an interface to help you create the material database, which consists of material, lot, subplot, container, and storage location data. The Material Server provides the communication between the material database and the FactoryTalk Batch Server. During a batch run, information about available containers is presented to the operator for binding decisions. Binding is the process of mapping steps within a control recipe to actual equipment in a plant. After a batch is run, quantities consumed or distributed are updated in the material database for use in inventory tracking.

## FactoryTalk Batch Material Server

The Material Server consists of a group of components that work together to service various applications. The primary applications that the Material Server services are the Material Editor, FactoryTalk Batch Server, FactoryTalk Batch Recipe Editor, FactoryTalk Batch Equipment Editor, and the Storage Container ActiveX control. Any third-party application can also use custom solutions based on the exposed Material Object Model (MOM).

## FactoryTalk Batch Server

For ease of understanding, and for tutorial purposes, this guide refers to configuring and using the sample files that are installed with FactoryTalk Batch. The SampleDemo folders contain complete area models and recipes for a simulated plant. Before running the demonstrations, you must add a FactoryTalk Security user, configure the FactoryTalk Batch Server to recognize the required project directories, select the initialization path and file name, and then start the FactoryTalk Batch Server and the FactoryTalk Batch Phase Simulator.



Tip: This guide outlines the configuration and use of the SampleDemo1 demonstration files. Because these files are used as an example throughout the guide, it is recommended that you follow the directions for using this demonstration step by step.

### FactoryTalk Batch Server overview

The FactoryTalk Batch Server is the engine that runs FactoryTalk Batch. It is this component that allows integration with the process-connected devices (PCDs) and third-party software packages.

The FactoryTalk Batch Server operates as a Windows Service, which means you can configure the Server to start automatically and give control of the Server service to the Windows Service Manager. Because the FactoryTalk Batch Server runs as a service, logging on or off Windows during operation does not disrupt the operation of the Server.

Using the FactoryTalk Batch Service Manager, you can control the FactoryTalk Batch Server manually, select the boot method for the Server, and configure the Server to run in Demo mode. Use the FactoryTalk Batch Equipment Editor to configure the FactoryTalk Batch Server.

The FactoryTalk Batch Server coordinates the following functions:

- **Creating a Batch:** Transforms the configured recipe into an executable working recipe.
- **Executing a Recipe:** Communicates with the process-connected devices to execute phases.
- **Arbitrating Equipment:** Allocates resources based on recipe and operator requirements.
- **Collecting Data:** Gathers and stores production information for reporting and archiving.
- **Performing Client Communications:** Transfers data between the process-connected devices (PCDs), operator displays, Human Machine Interfaces (HMIs), databases, and various other software packages.

See the *FactoryTalk Batch Equipment Editor User Guide* and the *FactoryTalk Batch Administrator Guide* for more detailed information about the FactoryTalk Batch Server.

## Sample demonstration setup

The installation process placed the *SampleDemo1* and *SampleDemo2* folders in the **BATCHCTL** share on your hard drive. Within each of these *SampleDemo* folders are four subfolders that contain the files for the area model. To run the sample demonstrations, add a FactoryTalk Security user, configure the FactoryTalk Batch Server to locate the area model, and then verify the recipes in the area model.

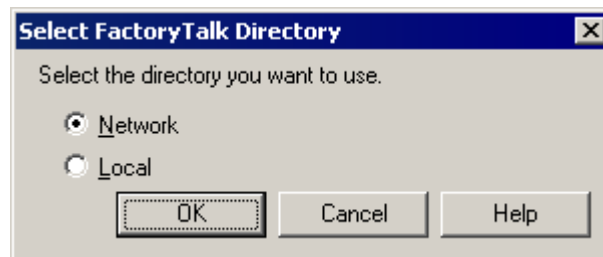
## Add sample FactoryTalk Security users

For the sample demonstrations file, create FactoryTalk user accounts for an operator and an engineer. Create these user accounts in the FactoryTalk Directory.

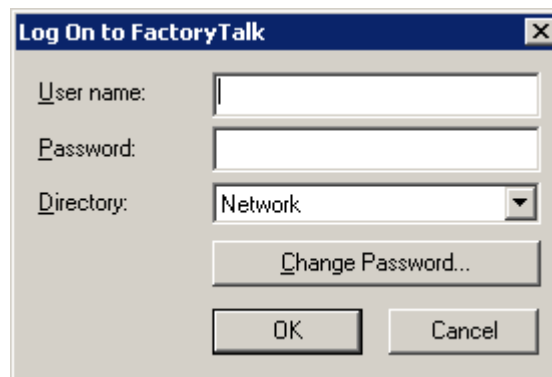
### To add sample FactoryTalk Security users:

1. Select **Start > Rockwell Software > FactoryTalk Administration Console**. The **Select FactoryTalk Directory** dialog box opens.

**IMPORTANT** Administrator privileges are required to perform this procedure.

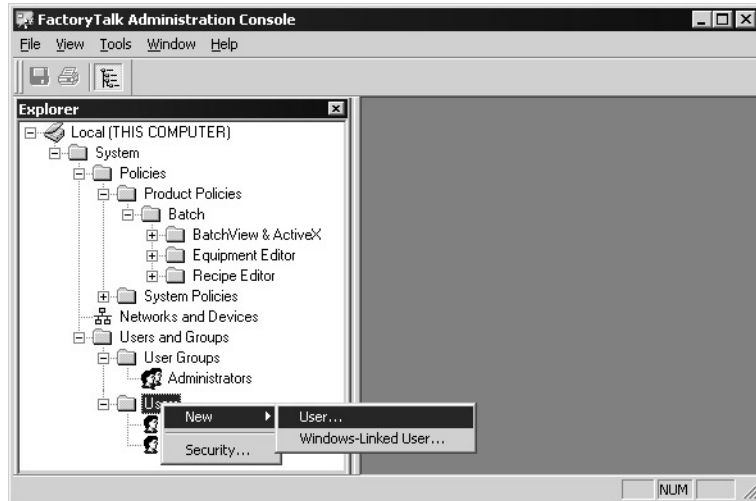


2. Select **Network** to add this user account to the FactoryTalk Network Directory, and select **OK**.
3. If not already logged on to the FactoryTalk Network Directory, the **Log On to FactoryTalk** dialog box opens. In **User name**, type the user name for the Administrator that was configured when the FactoryTalk Services Platform was installed.

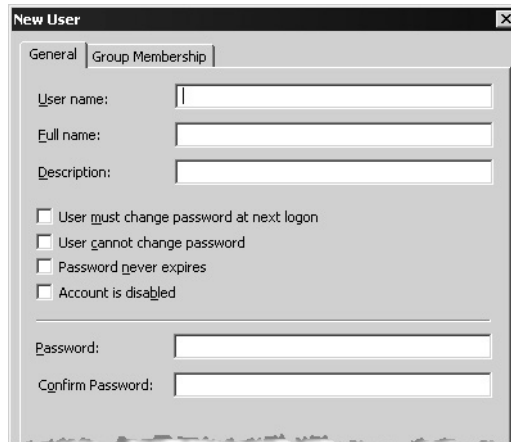


4. In **Password**, type the password for the Administrator.

5. Verify the **Directory** and select **OK**. The **FactoryTalk Administration Console** window opens and displays the specified FactoryTalk Directory.
6. Expand **Users and Groups**.
7. Right-click the **Users** folder, and select **New > User** to create a new FactoryTalk Security user account in FactoryTalk Directory.



8. The **New User** dialog box opens and displays the **General** tab. In the **User name** box, type **OPER**.



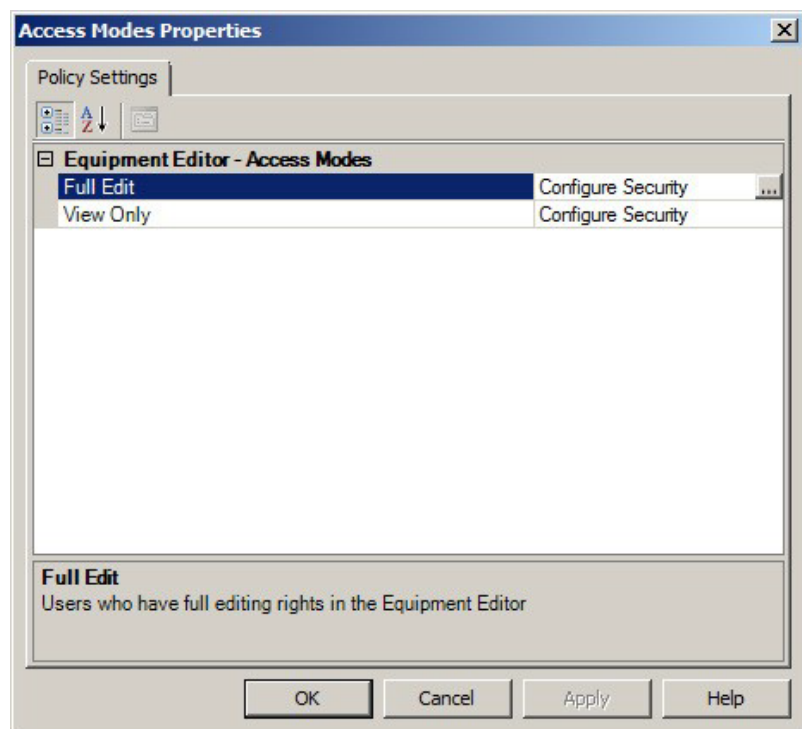
9. In **Full name**, type **Operator**.
10. In **Password**, type **password**, and confirm it by re-entering **password** in the **Confirm Password** box.
11. Select **Create**.
12. Repeat steps 7-11, but this time in the **User Name** field, enter **ENG** and in the **Full Name** field, enter **Engineer**.
13. Keep the FactoryTalk Administration Console open to configure permissions for these FactoryTalk Security users in the next exercise.

## Configure sample permissions for FactoryTalk Security users

After creating the FactoryTalk security users, set up access modes for each FactoryTalk Batch component to specify which users are permitted to view or perform actions. Configure security settings in the FactoryTalk Administration Console. To tighten security in the client, remove the **All Users** group from the **Full Edit** policy setting.

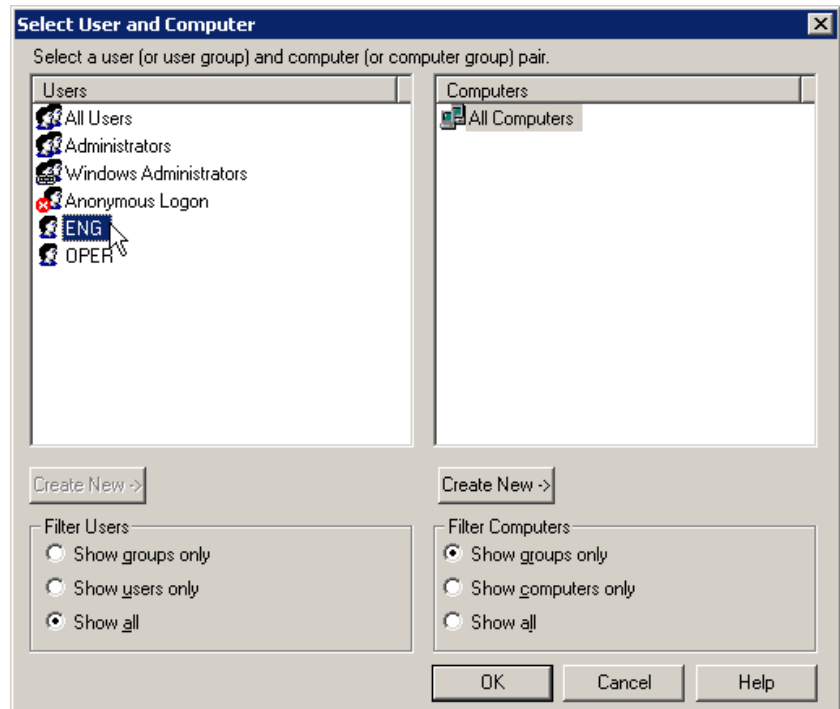
### To configure sample permissions for FactoryTalk Security users:

1. In the FactoryTalk Administration Console Explorer pane, navigate to **System > Policies > Product Policies > Batch > Equipment Editor > Access Modes**.
2. Right-click **Access Modes**, and then select **Properties**. The **Access Modes Properties** dialog box opens.

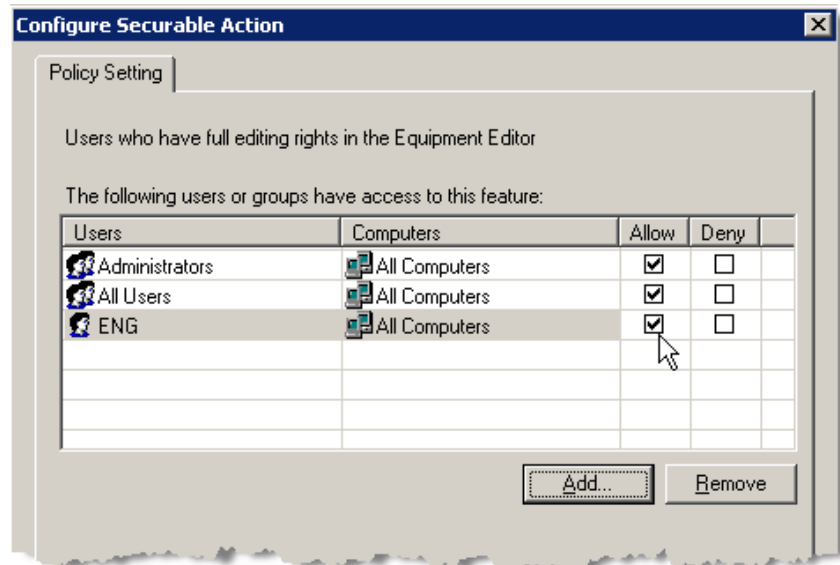


3. In the **Full Edit** row, select the **Configure Security** browse button. The **Configure Securable Action** dialog box opens.
4. Select **Add**. The **Select User and Computer** dialog box opens.
5. In the **Filter Users** box, select **Show All**.

6. In **Users**, select **ENG**.



7. Select **OK**. The **Configure Securable Action** dialog box is updated, showing **ENG** in the list of **Users** with the **Allow** checkbox selected.



8. Select **OK** to close the **Configure Securable Action** dialog box.
9. In the **Access Modes Properties** dialog box, select **View Only**.
10. In the **View Only** row, select the **Configure Security** browse button.  
The **Configure Securable Action** dialog box opens.
11. Select **Add**. The **Select User and Computer** dialog box opens.
12. In the **Filter Users** box, select **Show All**.
13. In **Users**, select **OPER**.
14. Select **OK**. The **Configure Securable Action** dialog box is updated, showing **OPER** in the list of **Users** with the **Allow** checkbox selected.
15. Select **OK** to close the **Configure Securable Action** dialog box.



16. Select **OK** to close the **Access Modes Properties** dialog box.

See the *FactoryTalk Batch Administrator Guide* for more information on security.

## Configure the sample FactoryTalk Batch Server

To set up the sample demonstrations, configure the FactoryTalk Batch Server to locate the folders that contain the demonstration files and to the **\Restart** and **bin** folders where the FactoryTalk Batch Server writes data upon system failure. Configure the FactoryTalk Batch Server in the FactoryTalk Batch Equipment Editor.

### To configure the sample FactoryTalk Batch Server:

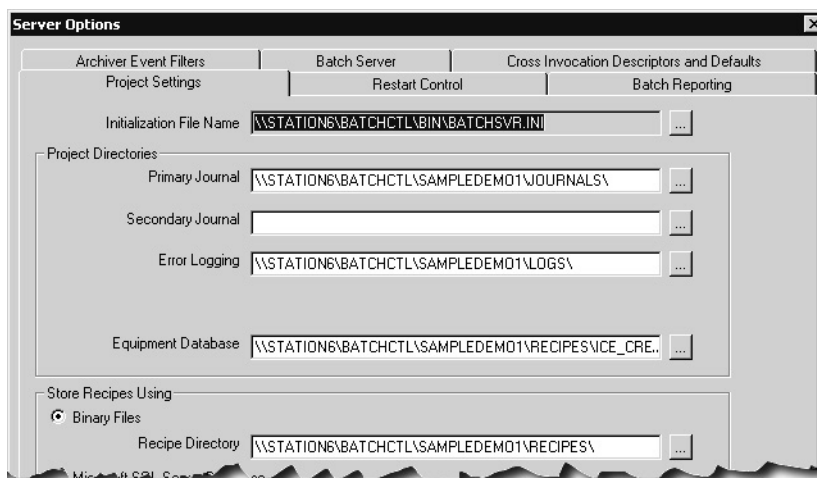
1. Select **Start > Rockwell Software > Equipment Editor**. The FactoryTalk Batch Equipment Editor opens (log on to FactoryTalk if prompted).

---

**IMPORTANT** Administrator privileges are required to perform this procedure.

---

2. Select **Options > Server Options**. The **Server Options** dialog box opens to the **Project Settings** tab.



3. In the **Project Directories** area, select the **Primary Journal** browse button. The **Select Directory** dialog box opens.
4. From the **Look in** list, select the **SampleDemo1\Journals** folder, and then select **Open**.
5. Select the **Error Logging** browse button. The **Select Directory** dialog box opens.
6. From the **Look in** list, select the **SampleDemo1\Logs** folder, and then select **Open**.
7. Click the **Instructions** browse button. The **Select Directory** dialog box opens.

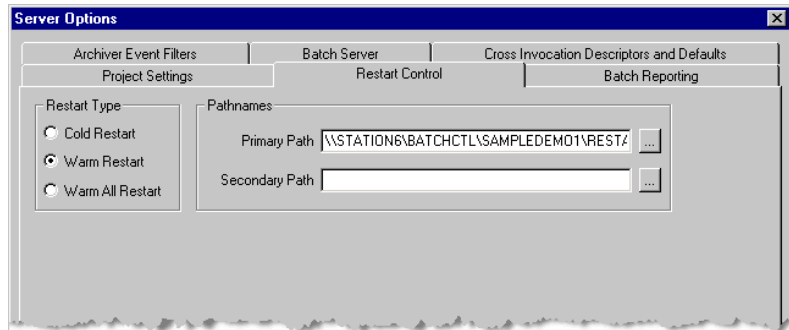
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**IMPORTANT** In order for the *e*Procedure Server to start, you must define the instruction path and an instruction file for each instruction-based phase in the area model. (See the *FactoryTalk Batch Equipment Editor User Guide* for instructions on defining instruction-based phases.)

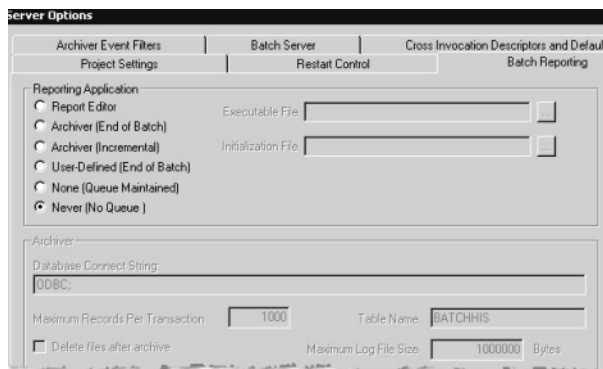
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8. Select the **Equipment Database** browse button. The **Select Equipment Database** dialog box opens.

9. From the **Look in** list, open the **SampleDemo1\Recipes** folder, select the **ice\_cream1.cfg** file, and then select **Open**.
10. In the **Store Recipes Using** area, select **Binary Files**, and then select the **Recipe Directory** browse button. The **Select Directory** dialog box opens.
11. From the **Look in** list, select the **SampleDemo1\Recipes** folder, and then select **Open**.
12. Select the **Restart Control** tab.



13. Select the **Primary Path** browse button. The **Select Directory** dialog box opens.
14. From the **Look in** list, select the **SampleDemo1\Restart** folder, and then select **Open**.
15. Select the **Secondary Path** browse button. The **Select Directory** dialog box opens.
16. From the **Look in** list, select the **Bin** folder.
17. Select the **Batch Reporting** tab. Leave **Never (No Queue)** as the default reporting application.



18. Select **OK** to close the **Server Options** dialog box.
19. Select **File > Exit** to exit the FactoryTalk Batch Equipment Editor.



Tip: These steps set up the FactoryTalk Batch Server to run the tutorial steps in this manual. There are many other settings to consider when setting up the FactoryTalk Batch system. (See the *FactoryTalk Batch Administrator Guide* for more information on the **Server Options** dialog box.)

## Rebuild the recipe directory


To run the demonstration recipes, you must rebuild the recipe directory and verify the recipes in the area model using the FactoryTalk Batch Recipe Editor.

---

**IMPORTANT** Administrator privileges are required to perform this procedure.

---

### To rebuild the recipe directory:

1. Select **Start > Rockwell Software > Recipe Editor**. The FactoryTalk Batch Recipe Editor reads the area model.  
 **Tip:** If you are logged in with an account that does not have administrator privileges, right-click **Recipe Editor** and select **More > Run as administrator** to run under elevated privileges.
2. If prompted, log on to FactoryTalk. If a message displays asking you to verify the recipes, select **Cancel**.
3. Select **File > Rebuild Recipe Directory**. When the rebuild is complete, select **OK**, and then select **Yes** to verify the recipes.
4. When the recipe verification is complete, select **Accept** to save the recipes, and then select **Close**.
5. Select **File > Exit** to exit the FactoryTalk Batch Recipe Editor.

## Start the FactoryTalk Batch Server service

The FactoryTalk Batch Service Manager communicates with the Windows Services of the selected computer to determine available services. There may be a noticeable delay as communications are established, marked by the cursor displayed as an hourglass. If the FactoryTalk Batch Service Manager cannot communicate with the selected computer's Windows Services, a message box is displayed stating that the FactoryTalk Batch Service Manager failed to connect to the specified computer.

The FactoryTalk Batch Phase Simulator must be running to test FactoryTalk Batch in a demo environment. For more information, see **The FactoryTalk Batch Phase Simulator** in the *FactoryTalk Batch Administrator Guide*.

---

**IMPORTANT** The FactoryTalk Batch Server cannot start if **Security Authority** is enabled and there is a mismatch between the Security Authority Identifiers (SAIs) in the area model and the FactoryTalk Network Directory. For information on your recovery options, see **Troubleshooting** in the *FactoryTalk Batch Equipment Editor User Guide*.

---

### To start the FactoryTalk Batch Server service:


1. Select **Start > Rockwell Software > Batch Service Manager**. The **Batch Service Manager** opens.
2. Select **Select Computer**. The **Select Computer** dialog box opens.

---


**IMPORTANT** Administrator privileges are required to perform this procedure.

---

3. In the **Enter the object name to select** area, enter the name of the computer where the FactoryTalk Batch Server is installed (or select the **Advanced** button to search for a computer).
4. Select **OK** to close the **Select Computer** dialog box.
5. From the **Service** list, select **FactoryTalk Batch Server**.
6. (optional) Select **Allow Demo Mode** if you want to run FactoryTalk Batch in demo mode. If you run FactoryTalk Batch in the demo mode, be aware that the Server stops after 2 hours of operation.
7. Select the method to use for restarting the server after a service halt.
  - **Cold Boot:** Restarts the server in a cold state. All journal data or recipe content is erased upon startup. If Security Authority is enabled, SAIs in a secured area model and any secured recipes must match the current Network FactoryTalk Directory SAI.
  - **Warm Boot:** Restarts the server, restoring the set of batches that were on the batch list when the server previously terminated. No validation for Security Authority is performed.
  - **Warm All Boot:** Restarts the server only if it is able to restore all of the batches to the batch list. No validation for Security Authority is performed.
8. Select the **Start/Continue** button to start the service. Wait for the status to change to RUNNING and the light is green.
9. Select the **Server Details** button. The **FactoryTalk Batch Server Details** dialog box opens.
10. Select the **PCD Communications** tab. The **Data Server Status** box displays the status of the conversation. Make sure that conversation is GOOD.
11. Select **Start**. The tag verification process begins. When tag verification is COMPLETED, select **OK**, or select **Stop** to end the verification process and then select **OK**.
 



Tip: If the number of COM servers exceeds the viewable area within the **Data Server Status** box, a scroll bar displays, enabling you to scroll through the list.
12. Select **Close**. The **Batch Service Manager** dialog box closes.
 



Tip: If software component conversation becomes *LOST* while running in Demo mode, make sure that the simulator is running and try starting the server(s) again.

## Batch Service Manager dialog box - Server options

The following methods are available for restarting the FactoryTalk Batch Server after a service halt:

<b>Cold Boot</b>	Restarts the FactoryTalk Batch Server in a cold state. All journal data or recipe content is erased upon startup. If Security Authority is enabled, SAIs in a secured area model and any secured recipes must match the current Network FactoryTalk Directory SAI.
<b>Warm Boot</b>	Restarts the FactoryTalk Batch Server, restoring the set of batches that were on the batch list when the FactoryTalk Batch Server previously terminated. No validation for Security Authority is performed.
<b>Warm All Boot</b>	Restarts the FactoryTalk Batch Server only if it is able to restore all of the batches to the batch list. No validation for Security Authority is performed.

## Start the sample FactoryTalk Batch Phase Simulator

FactoryTalk Batch comes with a phase logic simulation program, referred to as the FactoryTalk Batch Phase Simulator used to simulate the batch process without connecting to a PCD. The Phase Simulator imitates the functionality of a data server and can communicate with the FactoryTalk Batch Server using OPC communication protocol. The Phase Simulator is a powerful tool for testing, experimentation and demonstration purposes. In this guide, run the sample demonstration using the Phase Simulator.



Tip: If the Phase Simulator is required and OPC protocol is used for communications, the FactoryTalk Batch Server automatically starts the Phase Simulator. Check the Windows taskbar to see if the Phase Simulator is started.

To run the sample demonstration correctly, open the **ice\_cream1.sim** file in the Phase Simulator.

### To start the sample FactoryTalk Batch Phase Simulator:

1. If the Phase Simulator is already running, maximize it from the Windows taskbar. If the Phase Simulator is not running, select **Start > Rockwell Software > Simulator**. The FactoryTalk Batch Phase Simulator opens.

---

**IMPORTANT** Administrator privileges are required to perform this procedure.

---

2. Select **File > Open**. The **Open Simulator Configuration File** dialog box opens.
3. From the **Look in** list, open the **Program Files > Rockwell Software > Batch > SampleDemo1 > Recipes** folder. Select the **ice\_cream1.sim** file, and then select **Open**.
4. Minimize the **FactoryTalk Batch Phase Simulator** window.

## Verify PCD communications

Use the following instructions to verify PCD communications.

---

**IMPORTANT** Administrator privileges are required to perform this procedure.

---

### To verify PCD communications:

1. Select **Start > Rockwell Software > Batch Service Manager**. The **FactoryTalk Batch Service Manager** opens.
2. Make sure **FactoryTalk Batch Server** is selected in the **Service** box.
3. Select **Server Details**. The **FactoryTalk Batch Server Details** dialog box opens.
4. Select the **PCD Communications** tab. The Data Server Status area displays the status of the conversation with the OPC\_SIM data server (Phase Simulator), which should be PHASES GOOD.
5. In the **Tag Verify** area, select **Start** to begin the verify process. The tag verification process takes several minutes.
6. When the **Status** box shows COMPLETED, select **OK** to close the **FactoryTalk Batch Server Details** dialog box.

## Learn about FactoryTalk Batch

The rest of this document is designed to give you a tour through the FactoryTalk Batch components using the sample demo. Proceed through the next chapters to learn about:

- FactoryTalk Batch Equipment Editor
- FactoryTalk Batch Recipe Editor
- FactoryTalk Batch View
- FactoryTalk Event Archiver
- FactoryTalk Batch View HMI Controls
- PC-Based Phases





## FactoryTalk Batch Equipment Editor

The FactoryTalk Batch Equipment Editor is the component to configure the equipment and associated functions to produce your facility's area model. The components defined in the FactoryTalk Batch Equipment Editor interface with the process-connected devices (PCDs) in the facility.

As outlined in the ISA S88.01 Batch Control Standard, the area model of a plant is separated into the following physical components:

- Process Cell
- Unit
- Phase
- Control Module

To build the area model, configure each of these components. In addition to the area model, the FactoryTalk Batch Equipment Editor allows specification of communication functions, enumeration sets, data servers, FactoryTalk Event Archiver functions, and configuration of FactoryTalk Batch Server options.

In this section, open a sample file to examine a configured area model for an ice cream plant.

### Open the FactoryTalk Batch Equipment Editor with a sample user

Use the following instructions to open the FactoryTalk Batch Equipment Editor with the sample user, ENG.

#### To open the FactoryTalk Batch Equipment Editor with a sample user:

1. Select **Start > Rockwell Software > Equipment Editor**. A blank FactoryTalk Batch Equipment Editor window opens. The **Equipment Editor Login** dialog box also opens if FactoryTalk Security is configured.
2. In the **User Name** field, enter **ENG**. (This is the FactoryTalk Security user with Full Edit permissions you created in the **FactoryTalk Batch Server introduction** section.)
3. In the **Password** field, enter **password** and select **OK**. (This is the password you created for the ENG user in the **FactoryTalk Batch Server introduction** section.)

## Open a sample area model

The definition for an area model is contained in a configuration file (.cfg) that you build using the FactoryTalk Batch Equipment Editor. In this exercise, you will look at a configuration file, **ice\_cream.cfg**, which was installed with FactoryTalk Batch.

### To open a sample area model:

1. From the **File** menu, select **Open**, or select the **Open** toolbar button. The **Open** dialog box opens.
2. Select **ice\_cream.cfg**, and then select **Open** to open the file. The **Classes View** area displays the icon that represents the PARLOR process cell class, which is used to create the process cells shown in the **Design View** area. The WEST\_PARLOR process cell displays in the **Design View** area.

## The FactoryTalk Batch Equipment Editor window

The FactoryTalk Batch Equipment Editor window is divided into two main areas: **Classes View** and **Design View**.

- The **Classes View** displays the existing cell classes, unit classes, phase classes, or operation sequence classes in the active area model. The column heading reflects the active level. Double-click or right-click an icon to open the **Edit** dialog box for the item.
- The **Design View** is used to construct the area model and display the layout of the active level. In the select mode, double-click an item to display the layout of the next lower level. Right-click the item to open the **Edit** dialog box.

The FactoryTalk Batch Equipment Editor also has a menu bar and toolbar. Take a moment to examine the menus and the tooltips for each toolbar icon. (See the *FactoryTalk Batch Equipment Editor User Guide* for more information on the menus and toolbar icons.)

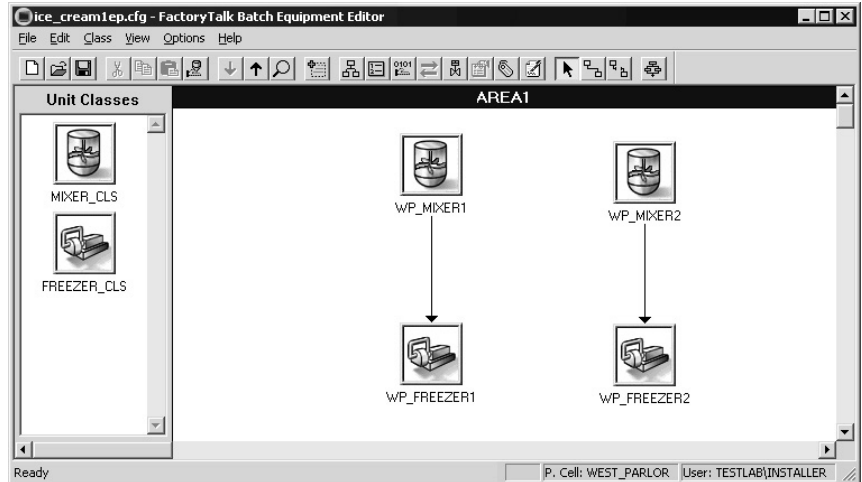
## Navigate within the area model

To navigate within the area model, use the **Go Down** and **Go Up** toolbar buttons. Double-clicking an icon in the **Design View** takes you down through the area model.

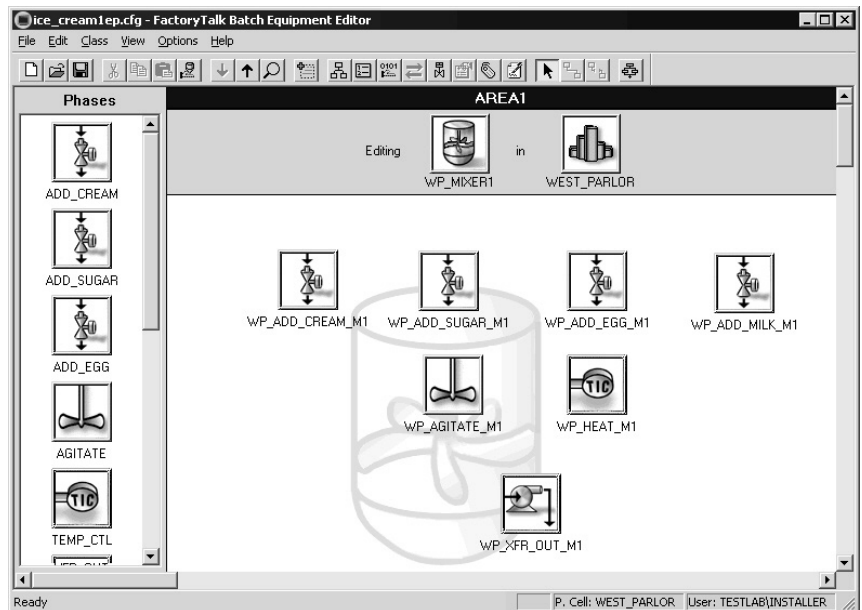
### To navigate within the area model:

1. Double-click the **WEST\_PARLOR** icon in the **Design View**. The **Design View** displays the units that make up the selected process cell. The

**Classes View** displays all the unit classes defined in the area model that you can add to the process cell structure.



2. Double-click the **WP\_MIXER1** unit icon in the **Design View**. The **Design View** displays the phases that make up the selected unit. The **Classes View** area displays all the phase classes defined in the area model that you can add to the unit structure.



The **Location Bar** displays the unit and process cell in which you are working, which currently is the WP\_MIXER1 unit within the WEST\_PARLOR process cell. If the **Location Bar** is not displayed in your window, select **Location Bar** from the **View** menu.

## Create and configure a phase class

A phase class is a reusable process-oriented function, such as Heat, Mix, or Add. A phase instance occurs when a phase class is added to the **Design View**.

A phase class describes what is to occur in the recipe, but not how to do it. When a phase class is added to the **Design View**, the resultant phase serves as a link to the engineered logic in the phase logic that contains the instructions for how to do it.



Tip: Control modules (the logic for pumps, valves, etc.) are configured in the process-connected device (PCD).

## View a sample phase class configuration

Use the following instructions to view the sample phase class configuration.

### To view a sample phase class configuration:

1. Right-click the **ADD\_SUGAR** phase class icon in the **Classes View**. The **Edit Phase Class** dialog box opens to the **General** tab.
2. Select each tab and examine the settings that were defined for the **ADD\_SUGAR** phase class.
  - The **General** tab configures the general attributes of the phase class, such as the phase class name, phase class type, the number of phase class message partners, and the number of tags associated with the phase class. Select an icon to graphically represent all phases based on the phase class throughout the area model. Additionally, enable or disable the use of control strategies and material-based recipes for the phase class.

Tip: The use of material-based recipes requires the installation of FactoryTalk Batch Material Manager.
  - The **Parameters** tab contains a list of parameters associated with the phase class. Create, edit and delete phase class parameters, as well as configure verification methods for parameter values. The parameters allow FactoryTalk Batch to send data to a PCD.
  - The **Reports** tab contains a list of report parameters associated with the phase class. Additionally, add new reports, edit, and delete reports from the list, as well as configure verification methods for report values. The report parameters allow the PCD to send data to FactoryTalk Batch.
  - The **Messages** tab contains a list of messages associated with the phase class. Phase class messages are typically used for journal entry purposes and for troubleshooting phase logic problems. In some instances, the message may be displayed to the operator. A phase class message has two pieces of data associated with it: name and message ID.
  - The **Control Strategies** tab, which is only available if **Control Strategies** is enabled on the **General** tab, is used to add, edit, or delete control strategies.
3. Select **Cancel** to close the dialog box.

## Create a sample phase class

Phase classes are created and configured using the **Create Phase Class** dialog box.

### To create a sample phase class:

1. From the **Class** menu, select **New Phase Class**. The **Create Phase Class** dialog box opens to the **General** tab.
2. In the **Name** box, type **ADD\_WATER**.
3. In the **Icon** list, select an icon to represent the **ADD\_WATER** phase class.
4. Select **Parameter/Tag Locking**, if necessary. Select **Apply**.
5. Select the **Parameters** tab, and then select the **Add Parameter** button. A new parameter is added to the list.
  - a. In the **Name** box, type **ADD\_AMOUNT**.
  - b. In the **Default** box, type **50**.
  - c. In the **Enum/E.U.** box, type **KG**.
  - d. Select **Apply**.
6. Select the **Reports** tab, and then select the **Add Report** button. A new report parameter is added to the list.
  - a. In the **Name** box, type **AMOUNT\_ADDED**.
  - b. In the **Enum/E.U.** box, type **KG**.
  - c. Select **Apply**.
7. Select **OK**. The new phase class displays in **Classes** at the bottom of the list.

## Create and configure phases

When a phase class is added to a unit it becomes a phase. Only one instance of a specific phase class to each unit, with the exception of material-enabled phase classes. When a phase is required in multiple units, share it between the units or add another instance of a phase class with a different name.

There are many options for configuring phases. As a minimum, modify each tag in the phase to indicate the tag's addressable location in the process-connected device (PCD).

When using material-enabled phase classes, you can have multiple phases based on the same phase class within a single unit. For each phase, define the material containers with which the phase is associated. Phases mapping to the same phase class have independent resource IDs.

## View a sample phase configuration

Use the following instructions to view a sample phase configuration.

### To view a sample phase configuration:

1. Right-click the **WP\_ADD\_CREAM\_M1** icon in the **Design View**. The **Edit Phase** dialog box opens to the **General** tab.

2. Select each tab and examine the settings defined for the WP\_ADDCREAM\_M1 phase.
  - The **General** tab allows you to configure general attributes of the phase, such as the name, equipment ID, and automatic upload/download.
  - The **Arbitration** tab displays a list of the equipment for which ownership is required by this phase in order to begin execution.
  - The **Cross Invocation** tab configures the cross invocation strings, which indicate the addition of an item to the FactoryTalk Batch View and ActiveX controls' shortcut menus, including the caption for each menu item and what data is passed to the specified automation server when the menu item is selected.
  - The **Tags** tab displays a list of all tags to define for the phase. You can set a server for each tag and the scan rate.
  - The **Parameter Limit Tags** tab is used to enable the FactoryTalk Batch Equipment Editor to determine and build the tags required to download the parameter limits and verification configuration details to the phase logic if **Parameter/Tag Locking** is enabled. Or, if **Parameter/Tag Locking** is disabled, you can select the appropriate set of parameter limit tags for each parameter.
  - The **Report Limit Tags** tab is used to enable the FactoryTalk Batch Equipment Editor to determine and build the tags required to download the report limits and verification configuration details to the phase logic, if **Parameter/Tag Locking** is enabled. Or, if **Parameter/Tag Locking** is disabled, you can select the appropriate set of report limit tags for each parameter.
  - The **Containers** tab is used to configure which containers the phase can select material from, and which containers it can distribute material into. The **Containers** tab is visible with material-enabled phases only, which requires the installation of FactoryTalk Batch Material Manager.
3. Select **Cancel** to close the dialog box.

## View a sample FactoryTalk Batch tags

FactoryTalk Batch uses phase tags to connect and talk to the phase logic in the PCD. Phase logic is code that issues real-time commands to actual devices in the plant. These tags also determine the size of the FactoryTalk Batch Server needed for a particular process.

### To view a sample FactoryTalk Batch tags:

1. Double-click the **WP\_AGITATE\_M1** icon. The **Edit Phase** dialog box opens.
2. Select the **Tags** tab. The **Phase Tags** list shows the various tags associated with the WP\_AGITATE\_M1 phase.

3. Double-click the **COMMAND** tag. The **Edit Phase Tag** dialog box opens. The **Item Name** box contains the tag address defined in the PCD. Notice that the **COMMAND** tag is associated with the Phase Simulator (OPC\_SIM).
4. Click **Cancel** twice to close the dialog boxes.

## Create a sample phase

To create a phase, place a phase class icon in the **Design View**, assign it to a data server, and then configure the phase.

### To create a sample phase:

1. Select the **ADD\_WATER** phase class icon in the **Classes View**, place the cursor in the **Design View** where you want to place the phase, and then left-click. The **Edit Phase** dialog box opens to the **General** tab.
2. From the **Data Server** list, select the **OPC\_SIM** data server and then select **Apply**.

The FactoryTalk Batch Equipment Editor assigns a name and an equipment ID to the phase. Since automatic upload and download is enabled in the phase class, automatic upload and download is also enabled in the phase, but you can selectively disable this feature.

3. In the **Name** box, type **WP\_ADD\_WATER\_M1** to match the other phase names in the unit.

In normal use, you would now configure tags for this phase, but since you are using the Phase Simulator for this example, it is not necessary.

4. Select **OK**. A default phase is created and it is assigned to the Phase Simulator (OPC\_SIM). While the icon is selected, drag it around the **Design View**.

## Create a sample signature template

Before you can set up your phases and recipes to require electronic signatures, you must establish a set of signature templates. Each signature template defines the number of signoffs required, the meaning of those signoffs, whether comments are included with the signoff, and which security permissions an operator must have to complete the signoff.



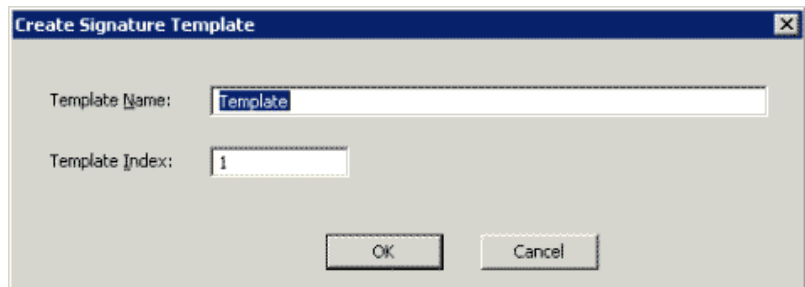
Tip: The following exercises require you to save the area model. If you want to preserve the original area model, exit the FactoryTalk Batch Equipment Editor without saving the changes, and **copy** the **SampleDemo1.cfg** file to a different location before proceeding with the following steps.

### To create a sample signature template:

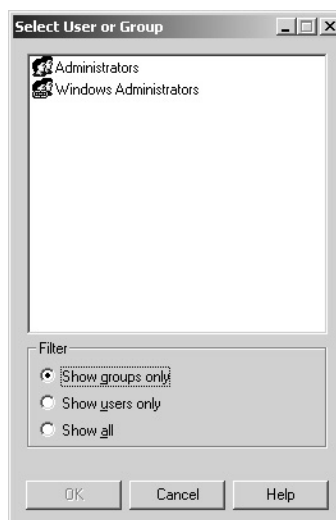
1. If you closed the FactoryTalk Batch Equipment Editor, open it and then open the **SampleDemo1.cfg** area model.



2. From the **Edit** menu, select **Signature Templates**. The **Edit Signature Templates** dialog box opens.
3. Select the **New Template** button. The **Create Signature Template** dialog box opens.



4. In the **Template Name** field, type **CommandsTemplate** and select **OK** (the Template Index is optional). The **Create Signature Template** dialog box closes and the new template is listed in the **Signature Templates** list on the **Edit Signature Templates** dialog box.
5. In the **Signoffs Required** drop-down, select **1** (this is the number of signatures that must be obtained for this signature template).
6. Select the **Signoffs** tab.
7. In the **Template Name** field, make sure **CommandsTemplate** is selected.
8. From the **Signoff** dropdown, select **1** (this represents the Signoff you are going to configure.)
9. In the **Meaning** field, type **Authorizes commands**.
10. From the **Comment** drop-down, select **Optional**.
11. In the **Security Permissions** area, select the **Add** button. The **Select User or Group** dialog box opens.



12. In the **Filter** box, select **Show all**.
13. Select **OPER** and select **OK**. (See the *FactoryTalk Batch Administrator Guide* for more information on security.)
14. Select **OK** to save the **Create Signature Template** dialog box. (See the *FactoryTalk Batch Equipment Editor User Guide* for more information on creating and configuring Signature Templates.)



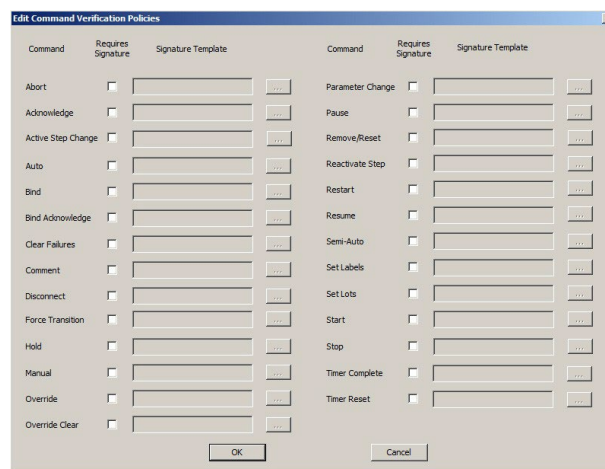
## Use signature templates

Signature templates can be used to request signoffs for reports and parameters, and can be configured to request a signoff when specified commands are generated from within the FactoryTalk Batch View.

The template you created in the previous section, **CommandsTemplate**, will be used to generate a signature request when the **START** command is issued from the FactoryTalk Batch View application. This requires that you enable **Command Verification Policies**.

### To use signature templates:

1. Select **Command Policies** from the **Edit** menu. The **Edit Command Verification Policies** dialog box opens.



2. Select the **Start** checkbox. The **Select Signature Template** dialog box opens.
3. Since **CommandsTemplate** is the only template currently defined, it is selected by default. Select **OK**. **CommandsTemplate** should display in the Signature Template box next to the Start command.
4. Select **OK** to close the dialog box.
5. Select **Save** from the **File** menu to save the area model. This is required because you will be using the Signature feature later in this guide.

## Use signature templates with recipe approvals

Signature templates are used to provide signoffs for the Recipe Approvals process. The Recipe Approvals process:

- Validates the development and maintenance of batch recipes.
- Safeguards design workflow in a formalized manner.
- Confirms each recipe is validated by authorized personnel before being released to production.

Additional signature templates may be required for the recipe approval process--configuration for these is the same as for other signature templates. Assigning signature templates to recipe approval steps is handled in the

FactoryTalk Batch Equipment Editor **Recipe Approvals Configuration** dialog box. Approval signoffs are executed in the FactoryTalk Batch Recipe Editor.

### To use signature templates with recipe approvals:

1. In the FactoryTalk Batch Equipment Editor, select **Recipe Approvals Configuration** from the **Edit** menu to open the **Recipe Approvals Configuration** dialog box.

Step Order	Step Name	Approval	Revert	Used
1	Begin Approvals	operator	administrator	<input checked="" type="checkbox"/>
<input type="checkbox"/> 2	Confirm Author			<input type="checkbox"/>
<input type="checkbox"/> 3	Review Recipe			<input type="checkbox"/>
<input type="checkbox"/> 4	Approve Recipe			<input type="checkbox"/>
2	Release Recipe as Step	operator	operator	<input type="checkbox"/>
2	Release Recipe to Production	administrator	administrator	<input type="checkbox"/>

Refresh Order

Expedited Approval

Step Order	Step Name	Approval	Revert	Used
	Release Recipe as Step	operator		<input type="checkbox"/>



Tip: If your account has been granted View Only access rights under FactoryTalk Policies, the dialog box opens but **OK** is disabled—any changes you make are not saved.

2. Select from available signature templates using the **Browse** button to the right of each **Approval** and **Revert** field for the step you want to configure. You may need to configure additional signature templates for the approval roles in your process.

Configure **Approval** and **Revert** signoffs for at least these three steps:

- The first listed step (labeled **Begin Approval** by default).
- **Release Recipe as Step** (for both the Approval Process and the Expedited Process steps).
- **Release Recipe to Production** (for both the Approval Process and the Expedited Process steps).

Once valid signoffs are configured for these steps, the **Enable Recipe Approvals** checkbox is no longer grayed out.

3. (optional) Check the box ☒ to the left of one or more of the three optional steps to enable and configure more approval steps if needed. These step labels are user-modifiable.
4. Check the **Enable Recipe Approvals** box. Once you have enabled recipe approvals, either the formal process of three to six steps, or the expedited approval process of two steps, is available for execution in the FactoryTalk Batch Recipe Editor. Either approval process must be completed for the recipe to be marked as **Release Recipe to Production**, at which point it is added the FactoryTalk Batch Server to the Batch List in FactoryTalk Batch View, ActiveX Controls, and/or eProcedure.

See **Configure recipe approval steps** in the *FactoryTalk Batch Equipment Editor User Guide* for more information on recipe approvals configuration.

See **Approve a recipe** in the *FactoryTalk Batch Recipe Editor User Guide* for more information on recipe approval.

## Enable recipe version control

A versioned recipe is a saved, read-only snapshot of the recipe taken at a particular point in time. Recipe version control is useful when you, or a team of authors, need to store and protect revisions of a recipe during its development.

Recipe version control is enabled in the **Options > Server Options** menu in the FactoryTalk Batch Equipment Editor. Enforcement of version naming is handled by the FactoryTalk Batch Recipe Editor. To enable versioning, follow the instructions given in **Enable recipe version control** in the *FactoryTalk Batch Administrator Guide*.

For information on using recipe versioning, see **Work with recipe versions** in the *FactoryTalk Batch Recipe Editor User Guide*.

## Enable recipe and area model security

A recipe or an area model can be secured to a Security Authority Identifier (SAI) in the FactoryTalk Network Directory. When secured, a recipe or an area model cannot be viewed, modified, or used under a different FactoryTalk security authority identifier.

Recipes are secured using the **Recipe > Security Authority** command in the FactoryTalk Batch Recipe Editor. For more information on using recipe security, see **Security authority overview** in the *FactoryTalk Batch Recipe Editor User Guide*.

Area models are secured to a SAI using the **Edit > Security Authority** command in the FactoryTalk Batch Equipment Editor. For more information on using area model security, see **Security authority overview** in the *FactoryTalk Batch Equipment Editor User Guide*.

## Share equipment

Both the WP\_MIXER1 and WP\_MIXER2 units require the ADD\_WATER phase. Rather than create two identical phases, you can share the phase between the units.

### To share equipment:

1. Select **Go Up** to return to the Unit level.
2. Double-click the **WP\_MIXER2** icon.
3. Select **Share Unit**. The **Share Phase Between Units** dialog box opens.
4. Expand **WP\_MIXER1**, and then select **WP\_ADD\_WATER\_M1**.
5. Select **OK**.

## Exit the FactoryTalk Batch Equipment Editor

Use the following instructions to exit the FactoryTalk Batch Equipment Editor.

### To exit the FactoryTalk Batch Equipment Editor:

1. From the **File** menu, select **Exit**.
2. Select **No** to discard any changes you made to the **.cfg** file. This does not discard any previously saved changes.

## FactoryTalk Batch Equipment Editor summary

In this section, you:

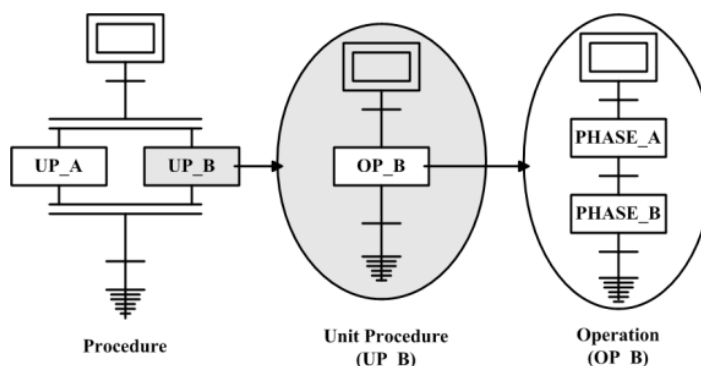
- Opened the FactoryTalk Batch Equipment Editor.
- Examined the **FactoryTalk Batch Equipment Editor** window.
- Opened an area model.
- Created a phase class.
- Created a signature template.
- Enabled a command verification policy.
- Examined phase tags.
- Created a phase.

(See the *FactoryTalk Batch Equipment Editor User Guide* for more information about the FactoryTalk Batch Equipment Editor.)

## FactoryTalk Batch Recipe Editor

The FactoryTalk Batch Recipe Editor is used to create and configure master recipes. The FactoryTalk Batch Recipe Editor lets you use tables, sequential function charts, or both, to graphically organize procedural information into unit procedures, operations, and phases. This FactoryTalk Batch component is used primarily by recipe formulators to create or edit recipes (sequences of steps) and formula values (parameters, set point values, etc.).

All recipes are configured and displayed using the ISA S88.01 Batch Control Standards, which define the Procedure, Unit Procedure, and Operation (Phase) layers for the procedural model.



In this section, you open a sample file to examine and edit a recipe for French Vanilla ice cream.



Tip: This chapter provides a brief glance at the recipe-building capabilities of the FactoryTalk Batch Recipe Editor. See the *FactoryTalk Batch Recipe Editor User Guide* for more information on completing, importing, approving, versioning, exporting, and maintaining recipes.

### Open the FactoryTalk Batch Recipe Editor

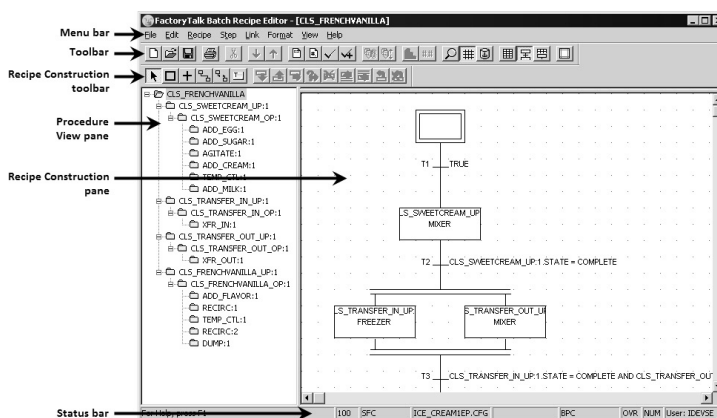
Use the following instructions to open the FactoryTalk Batch Recipe Editor.

#### To open the FactoryTalk Batch Recipe Editor:

1. Select **Start > Rockwell Software > Recipe Editor**. A blank FactoryTalk Batch Recipe Editor window displays. The **Recipe Editor Login** dialog box also opens if security is configured.
2. Enter a FactoryTalk Security user name and password and select **OK**. If a recipe verification box displays, select **Yes** to verify all the recipes in the Area Model's recipe directory.
3. When this is complete, select **Close**.

## FactoryTalk Batch Recipe Editor window

The FactoryTalk Batch Recipe Editor component allows you to construct recipes by sequencing phases graphically. The actual phase logic resides in the process control device and is configured separately using controller-specific programming software. The phases are configured in the FactoryTalk Batch Equipment Editor.



The FactoryTalk Batch Recipe Editor window consists of the following components:

- The **Procedure View** pane occupies the left side of the **FactoryTalk Batch Recipe Editor** window and contains a hierarchical list of the current recipe components. Selecting a component from the list displays the corresponding step(s) in the **Recipe Construction** pane.
- The **Recipe Construction** pane occupies the right side of the **FactoryTalk Batch Recipe Editor** window and is used to construct master recipes. The **Recipe Construction** pane allows you to construct and view recipe structures using a sequential function chart (SFC) or a table. Both the **SFC View** and the **Table View** can be displayed exclusively, or the **Recipe Construction** pane can be tiled to display both views at the same time. Selecting a component within either view will highlight the corresponding item in the **Procedure View** pane.

The FactoryTalk Batch Recipe Editor also has a menu bar, toolbar, and a Recipe Construction toolbox. Take a moment to examine the menus and the tooltips for each toolbar icon and toolbox tool. See the *FactoryTalk Batch Recipe Editor User Guide* for more information on the menus, toolbar icons, and toolbox tools.

## Open a recipe

In this section, you will edit an existing recipe. Step-by-step instructions for building a recipe are located in the *FactoryTalk Batch Recipe Editor User Guide*.

### To open a recipe:

1. From the **File** menu, select **Open Top Level**. The **Open [Type] Recipe** dialog box opens. In this case [Type] is **BINARY**. (Other recipe storage types are **XML** and **RDB**.)

2. From the **Select the recipe to open** list, select **CLS\_FRENCHVANILLA**. In the right column, notice the information about the recipe and the **Release Recipe as Step** and **Release Recipe To Production** checkboxes.
3. Select **Open**.



Tip: When Recipe Approvals are disabled, the **Release Recipe as Step** and **Release Recipe to Production** checkboxes display the state of these properties, but are inactive. These properties are set in the **Recipe > Header Data** dialog box.

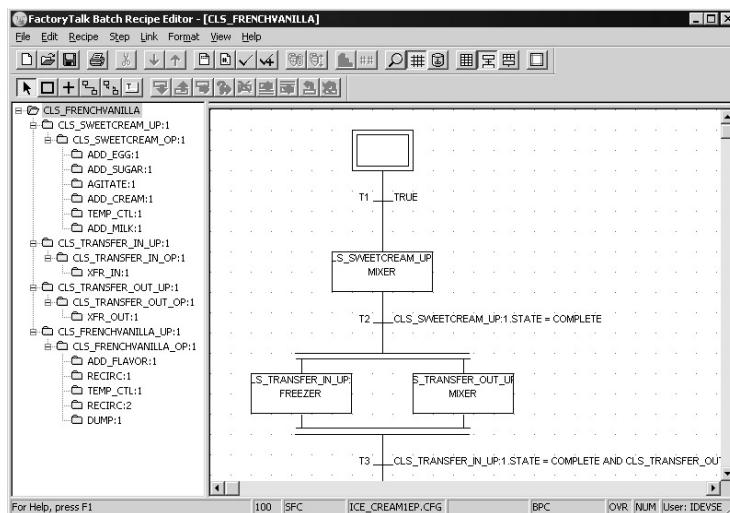
When Recipe Approvals are enabled, these properties are treated as two steps in the approval process, and are set as part of the approval signoff process.

When **Release Recipe as Step** is true (box is checked), the recipe can be used by other recipes. When **Release Recipe to Production** is true, the recipe is shown in the Recipe List in FactoryTalk Batch View, eProcedure, and ActiveX Controls. This allows batches to be created from the recipe.



## Review the recipe structure

The ISA S88.01 recipe structure of CLS\_FRENCHVANILLA is displayed on the left side in the **Procedure View** pane. The SFC version of the CLS\_FRENCHVANILLA recipe structure is displayed on the right side in the **Recipe Construction** pane.

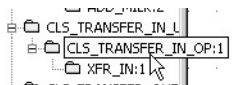


## View hidden information

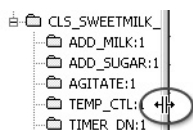
Some of the information displayed within the **Procedure View** pane is too large for the window, resulting in the information being hidden.

### There are two ways to view the hidden information:

- Hover over the item to view the entire name in a tooltip.



- Move the cursor over the split bar between the **Procedure View** pane and the **Recipe Construction** pane. When the pointer changes into a horizontal double-headed arrow, select and drag the split bar to the right or left.



## Change the recipe view

By default, the SFC version of the recipe structure displays in the **Recipe Construction** pane.

### To change the recipe view:

1. Select **Table** to view the table version of the recipe structure. Size the columns if necessary to view the contents.
2. Select **Tile** to view both the SFC and table views simultaneously.



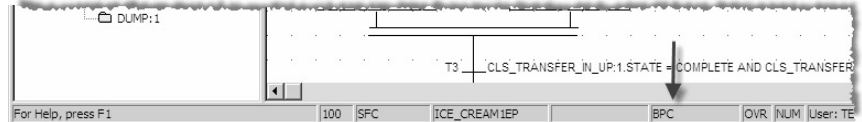
## Move down through SFC levels

Like the FactoryTalk Batch View, the FactoryTalk Batch Recipe Editor allows you to view all of the SFC levels by double-clicking the SFC step or selecting the step from the **Procedure View** area.

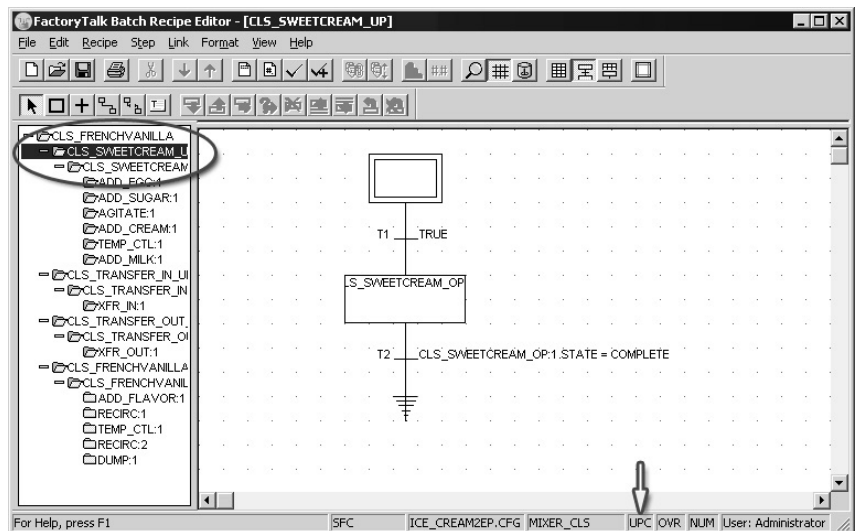
### To move down through SFC levels:

1. Select **SFC** to view the SFC.

Notice the letters **BPC** in the right corner of the status bar. These letters signify that you are currently viewing the Batch Procedure (BPC) level of the recipe.

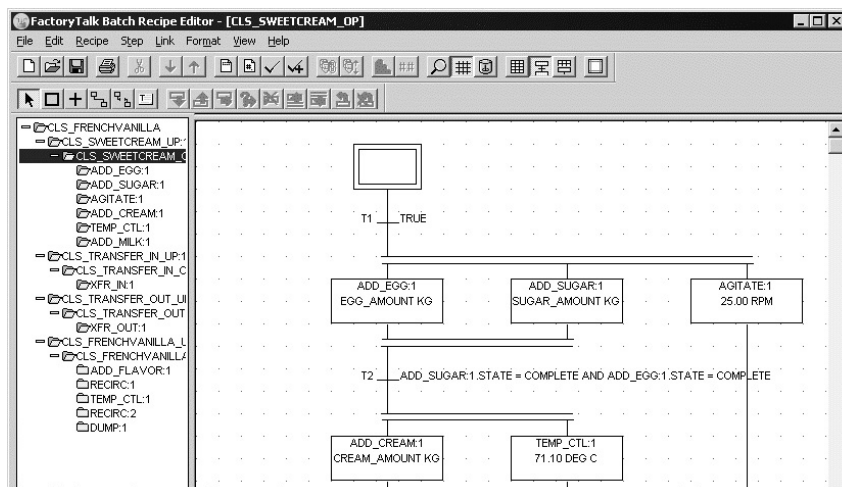


2. Double-click the **CLS\_SWEETCREAM\_UP:1** step in the SFC to move to the Unit Procedure (UPC) level.



Notice that the blue highlight in the **Procedure View** indicates the selected level and that the letters **UPC** display in the lower right corner of the window.

- Double-click the **CLS\_SWEETCREAM\_OP:1** step in the SFC to move to the Unit Operation (UOP) level. All of the phases within the CLS\_SWEETCREAM\_OP:1 unit operation display.



## Move up through SFC levels

Selecting the initial step sends you up through the SFC levels. You also can select a level in the **Procedure View** pane.

### To move up through SFC levels:

- Double-click the initial step of the **CLS\_SWEETCREAM\_OP:1** Operation at the top of the SFC to return to the Unit Procedure level.
- Double-click the initial step of the **CLS\_SWEETCREAM\_UP:1** Unit Procedure at the top of the SFC to return to the Batch Procedure level.

## Add steps

You build a recipe by adding steps. The FactoryTalk Batch Recipe Editor automatically adds and configures the transitions between the steps.

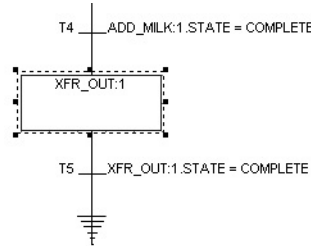
## Add a sequential step in the sample operation level

Use the following instructions to add a sequential step in the operation level.

### To add a sequential step in the sample operation level:

- With the **Selection Tool** selected, double-click the **CLS\_SWEETCREAM\_UP:1** unit procedure in the **Procedure View**. The CLS\_SWEETCREAM\_OP:1 operation displays.
- Double-click the **CLS\_SWEETCREAM\_OP:1** operation. The recipe steps within the operation display.
- Select the **ADD\_MILK:1 STATE = COMPLETE** transition at the bottom of the operation.

4. Select **Add Step** in the **Recipe Construction Toolbox**. A new step and transition are added below the selected transition and the **Select Phase** dialog box opens.
5. Select **XFR\_OUT**, and then select **OK**. The new step is defined as XFR\_OUT:1 and the transition below the step is defined as XFR\_OUT:1.STATE = COMPLETE.



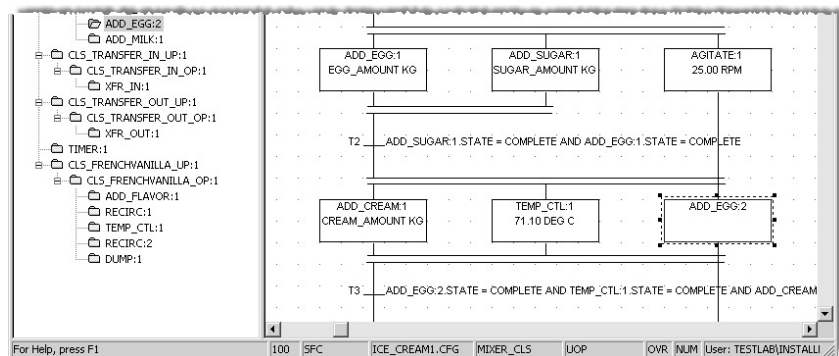
The recipe elements in CLS\_SWEETCREAM\_OP:1 automatically rearrange to make room for the new step and transition. This auto-arrange functionality of the FactoryTalk Batch Recipe Editor greatly simplifies both the recipe creation and modification processes and also increases the overall readability of the recipe.

## Add a parallel step in the sample operation level

Use the following instructions to add a parallel step in the operation level.

### To add a parallel step in the sample operation level:

1. While still in the CLS\_SWEETCREAM\_OP:1 operation, select the **TEMP\_CTL:1** step.
2. Select **Add Parallel**. A new step is added in parallel to the selected step and the **Select Phase** dialog box opens.
3. Select **ADD\_EGG**, and then select **OK**. The new step is now defined as ADD\_EGG:2 and the transition below the step is automatically re-defined as ADD\_EGG:2.STATE = COMPLETE AND TEMP\_CTL:1.STATE = COMPLETE AND ADD\_CREAM:1.STATE = COMPLETE to reflect the new parallel structure.

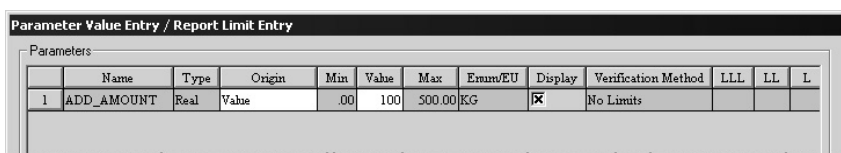


## Assign step formula values to the sample operation level

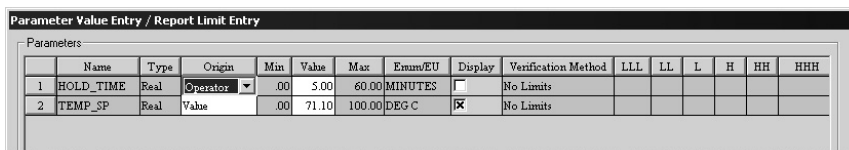
Once a step is added to an operation, you can assign formula values, which involves specifying the values and selecting the parameter to display for the selected step.

### To assign step formula values to the sample operation level:

1. While still in the CLS\_SWEETCREAM\_OP:1 operation, select the **ADD\_EGG:2** step.
2. Select **Value Entry**. The **Parameter Value Entry/Report Limit Entry** dialog box opens listing the parameters associated with the step. The only parameter is ADD\_AMOUNT.
3. Type **100** in the **Value** box, and then select **Display** so the value displays on the SFC.



4. Select **OK** to return to the FactoryTalk Batch Recipe Editor window.  
Next, you decide to change the parameter for TEMP\_CTL:1 so that the operator can enter the amount when the batch is run.
5. Select the **TEMP\_CTL:1** step, and then select **Value Entry**. The **Parameter Value Entry/Report Limits Entry** dialog box opens listing the parameters associated with the step. There are two parameters: HOLD\_TIME and TEMP\_SP. You want the operator to decide how long to hold the mixture.
6. From the **Origin** list for the HOLD\_TIME parameter, select **Operator** to indicate that the operator enters the amount when the recipe is run.



7. Select **OK** to return to the FactoryTalk Batch Recipe Editor window.

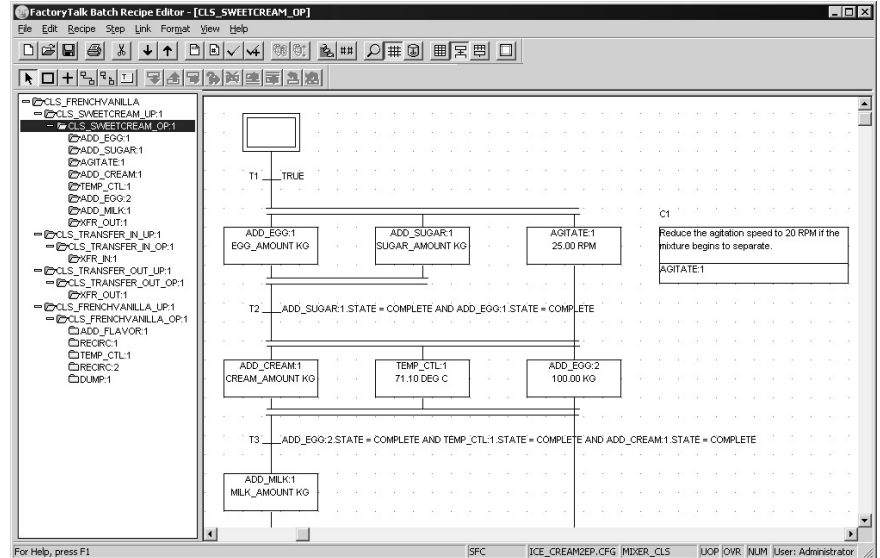
## Add recipe comments to the sample operation

Recipe commenting provides you with a tool to create and edit comments for viewing at design and run time. With this feature, important information can be inserted into the recipe and associated with a step, transition, or entire recipe.

### To add recipe comments to the sample operation:

1. While still in the CLS\_SWEETCREAM\_OP:1 operation, select **Text Box Tool**. The cursor changes to a text tool.

2. Move the cursor to the right of the AGITATE:1 step and select. A text box labeled C1 is placed in the SFC.
3. Select **Link**, and move the cursor (now a +) back to the C1 text box.
4. Select anywhere in the box, hold the mouse button, and drag the cursor to the AGITATE:1 step. AGITATE:1 now appears in the bottom half of the text box indicating the C1 text box is associated with the AGITATE:1 step.
5. Choose the **Selection Tool** and double-click inside the text box. Type **Reduce the agitation speed to 20 RPM if the mixture begins to separate.**



6. Select outside the text box when the comment is complete.

## Remove steps

When you remove a step from the recipe, the FactoryTalk Batch Recipe Editor will reconfigure the links and transitions accordingly. However, sometimes the links and transitions are complex and you may have to redo the links and reconfigure the transitions manually.

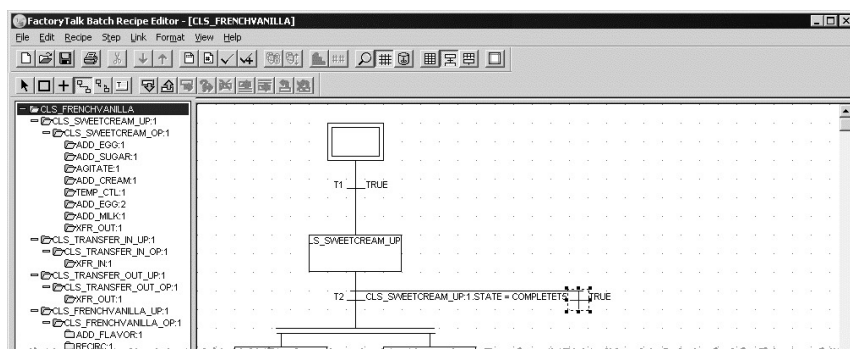
## Add a continuous loop to the sample unit procedure

FactoryTalk Batch is capable of performing looping at all levels of the procedural model. Not only is this a powerful recipe management tool, it is a simple task to complete.

### To add a continuous loop to the sample unit procedure:

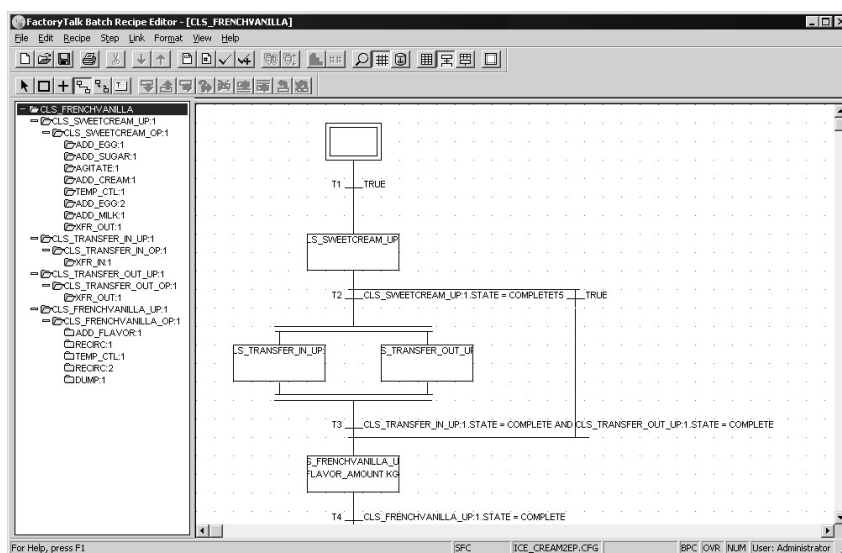
1. Select **Go Up** on the toolbar twice to move to the CLS\_SWEETCREAM\_UP:1 unit procedure.
2. Select **Transition Tool**. Place the pointer to the right of the existing transition labeled CLS\_SWEETCREAM\_UP:1.STATE = COMPLETE, and then select to add an undefined transition.
3. Select the **Link Tool** button.

4. Select and drag the pointer from the step labeled CLS\_SWEETCREAM\_UP:1 to the new TRUE transition. Release the mouse button to add the link.



**IMPORTANT** All loops and transitions must branch to the right side of the sequential function chart as shown.

5. Select and drag the pointer from the TRUE transition to the last step of the unit procedure (CLS\_FRENCHVANILLA\_UP:1). This completes the loop structure.



6. Select the Selection Tool button, and then double-click the new TRUE transition.
7. Select the Common Expressions folder.
8. Double-click Step.State = Complete.
9. In the upper part of the dialog box, highlight = (equal sign) in the expression, and then select the GREATER THAN OR LESS THAN button.

The transition should now read CLS\_SWEETCREAM\_UP:1.STATE <> COMPLETE. This transition makes sure that the CLS\_SWEETCREAM\_UP:1 operation will continue to run until it reaches a COMPLETE state.

10. Select OK.

## Verify the recipe

After a recipe is created or edited, it needs to be verified to make sure it was configured properly and that it will run against a particular set of equipment (the area model).

### To verify the recipe:

1. Select the **Verify** button. The **Verification Process Results** dialog box opens. The result should be: **CLS\_FRENCHVANILLA >> Verification of recipes has completed.**
2. Select **Close**.

## Remove a sequential step from the sample operation

Use the following instructions to remove a sequential step.

### To remove a sequential step from the sample operation:

1. While still in the CLS\_SWEETCREAM\_OP:1 operation, select the **XFR\_OUT:1** step.
2. Select the **Remove Step** button. The XFR\_OUT:1 step is removed, including its links and the following transition. The SFC automatically rearranges to adjust for the removed step.

## Remove a parallel step from the sample operation

Use the following to remove a parallel step from the sample operation.

### To remove a parallel step from the sample operation:

1. While still in the CLS\_SWEETCREAM\_OP:1 operation, select the **ADD\_EGG:2** parallel step.
2. Select the **Remove Step** tool. The ADD\_EGG:2 parallel step is removed, including its links, and the following transition is re-configured. The SFC automatically rearranges to adjust for the removed step.



Tip: Because transitions that follow parallel structures can be complex, the transition may not reconfigure automatically. If the transition following the removed parallel step requires reconfiguration, you must configure the transition manually.

## FactoryTalk Batch Recipe Editor summary

In this section, you:

- Opened the FactoryTalk Batch Recipe Editor.
- Examined the **FactoryTalk Batch Recipe Editor** window.
- Opened a recipe.
- Resized the **Procedure View** pane.
- Navigated through the SFC and Procedure View hierarchy.
- Added a sequential step to a recipe.
- Added a parallel step to a recipe.
- Assigned formula values.
- Added a comment.
- Removed steps.
- Built step transitions.
- Added a continuous loop.
- Verified the recipe.
- Exited the FactoryTalk Batch Recipe Editor.

This chapter provided a brief overview of the capabilities of the FactoryTalk Batch Recipe Editor module. (See the *FactoryTalk Batch Recipe Editor User Guide* for more information on the FactoryTalk Batch Recipe Editor.)

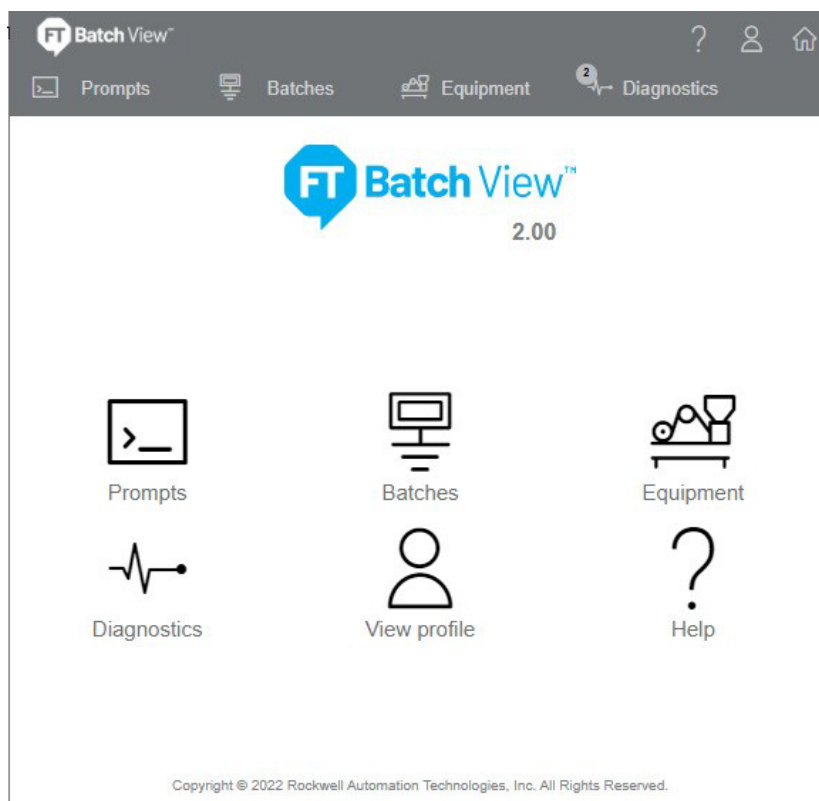


## FactoryTalk Batch View

This section describes how to use FactoryTalk Batch View.

FactoryTalk Batch View is used to initiate and control the batch process and to view running batches. It has a graphical user interface with easy to use windows and buttons and, like most of the FactoryTalk Batch components, is based primarily on input from ISA's S88.01 Batch Control Standard.

This chapter takes you through the FactoryTalk Batch View initial connection and using the FactoryTalk Batch View interface.



### Set up a remote FactoryTalk Batch View client

Following are instructions on how to set up a remote FactoryTalk Batch View client.

#### To set up a remote FactoryTalk Batch View client

1. On the remote client, open a browser.
2. Enter the URL for the FactoryTalk Batch View Server.



Tip: The URL must be in the form of `https://[node].[port].com`. For example: `https://MyBatchViewServer.MyDomain.com`

- [node]: The computer on which the FactoryTalk Batch Server and FactoryTalk Batch View Server are installed. The node value is either the IP address or the fully qualified node name.
- [port]: The default port number is 443. If the FactoryTalk Batch View Service is installed on a different port, launch the client on the FactoryTalk Batch View Server machine to identify the port number in the URL. The port number is not shown in the URL if the default port number (443) is in use.

For example:

- `https://192.168.0.10` (IP address and the default port of 443)
  - `https://192.168.0.10:4431` (IP address and a port number other than the default port of 443)
  - `https://Win2019DC-ABC.domain1234.com` (a fully qualified machine name and default port number)
3. On the FactoryTalk Batch View login page, enter your user name and password, and then select Log On.

## HTTPS certificates

The FactoryTalk Batch View application uses a self-signed certificate created during the product installation on the server. Modern web browsers are designed to warn users when encountering self-signed certificates because they are not signed by a certificate authority (CA). Self-signed certificates do provide for secure, encrypted data transmission, but are not signed by a CA.

When using FactoryTalk Batch View for the first time in a browser, accept a self-signed certificate for a given session, or configure the browser to always trust the certificate.

## Single session self-signed certificates

When using FactoryTalk Batch View for the first time in a browser, accept a self-signed certificate for a given session.

### Google Chrome

1. In the address bar, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Select **Advanced**.
3. Select **Proceed**.

### Microsoft Edge

1. In the address bar, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Select **Advanced**.
3. Select **Continue**.

## Apple Safari

1. In the address bar, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Select **Continue**.

## Mozilla Firefox

1. In the address bar, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Select **Advanced**.
3. Select **Add Exception**.
4. Select **Confirm the Exception**.

## Trusting self-signed certificates

You can configure your browser to trust the FactoryTalk Batch View self-signed certificate so that you are not prompted to accept the certificate the next time you use the browser with FactoryTalk Batch View.



Tip: Instructions may vary slightly based on browser updates.

## Google Chrome

This procedure applies to Google Chrome version 56.

1. In Google Chrome, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Open **Developer tools** by selecting *Ctrl + Shift + I*.
3. Select the **Security** tab.
4. Select **View Certificate**.
5. In the **Certificate** dialog box, select the **Details** tab, and select **Copy to File** to start the **Certificate Export Wizard**.
  - a. In the **Certificate Export Wizard**, select **Next**.
  - b. Select **DER encoded binary X.509 (.CER)**, and select **Next**.
  - c. Browse to the location where you want to export the file, and enter a file name. Select **Save**, and then select **Next**.
  - d. Select **Finish**.
  - e. In the **Certificate Export Wizard** message, select **OK**.
  - f. In the **Certificate** dialog box, select **OK**.
6. In the Chrome browser, open **Settings**, and select **Privacy and security**.
7. Select **Security**.
8. Scroll down the page and select **Manage certificates**.

9. In the **Certificates** dialog box, select the **Trusted Root Certification Authorities** tab, and then select **Import**.
10. In the **Certificate Import Wizard**, follow these steps:
  - a. Select **Next**.
  - b. Select **Browse** and select the certificate file you saved, and then select **Open**.
  - c. Select **Next**.
  - d. Select **Place all certificates in the following store** and verify that the **Certificate store** shows Trusted Root Certification Authorities.
  - e. Select **Next**, and then select **Finish**.
  - f. Select **OK**, and then select **Close**.
11. Restart the Chrome browser.

## Microsoft Edge

1. In Microsoft Edge, enter the URL generated during installation of the FactoryTalk Batch View server.
2. Open **Developer tools** by selecting *Ctrl + Shift + I*.
3. Select the **Security** tab.
4. Select **View Certificate**.
5. In the **Certificate** dialog box, select the **Details** tab, and select **Copy to File** to start the **Certificate Export Wizard**.
  - a. In the **Certificate Export Wizard**, select **Next**.
  - b. Select **DER encoded binary X.509 (.CER)** and select **Next**.
  - c. Browse to the location where you want to export the file, and enter a file name. Select **Save**, and then select **Next**.
  - d. Select **Finish**.
  - e. In the **Certificate Export Wizard** message, select **OK**.
  - f. If the **Security Warning** dialog box is displayed, select **Yes** to install the certificate.
  - g. In the **Certificates** dialog box, select **OK**.
6. In the Microsoft Edge browser, open **Settings**, and select **Privacy and services**.
7. Under **Privacy**, select **Manage certificates**.
8. In the **Certificates** dialog box, select the **Trusted Root Certification Authorities** tab, and then select **Import**.
9. In the **Certificate Import Wizard**, follow these steps:
  - a. Select **Next**.

- b. Select **Browse** and select the certificate file you saved, and then select **Open**.
- c. Select **Next**.
- d. Select **Place all certificates in the following store** and verify that the **Certificate store** shows Trusted Root Certification Authorities.
- e. Select **Next**, and then select **Finish**.
- f. If the **Security Warning** dialog box is displayed, select **Yes** to install the certificate.
- g. In the **Certificates** dialog box, select **Close**.

### Apple Safari

1. In the address bar, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Select **Show Certificate**.
3. Select **Always trust <URL> when connecting to <URL>**.
4. Select **Continue**.

### Mozilla Firefox

1. In the address bar, go to the URL generated during installation of the FactoryTalk Batch View server.
2. Select **Advanced**.
3. Select **Add Exception**.
4. Select **Permanently store this exception**, then select **Confirm the Exception**.

## Prompts

Use **Prompts** to alert operators to value requests for parameters, unit binding, material binding, and signatures or manual instructions. A control recipe cannot complete execution until the operator provides the requested information. In most cases, pending requests for information (value prompts, signatures, or manual instructions) are not acknowledged until a user either provides the information or stops or aborts the control recipe.


- Value prompts alert operators to requests for parameter values, unit binding, and material phase/container binding.
- Signatures are requests for signoffs that require user permissions and optional comments. When a signature is generated against a control recipe, acknowledge the signature by completing the associated signoffs. The requested user information in a signature is determined by the signature template defined in the area model.

- Instructions are individual steps of a manually executed phase. As a batch executes, the instruction for each active step appears. Instructions execute in the order specified within the master recipe.

## Acknowledge a prompt

Prompts alert operators when requests for parameter values are issued. Acknowledge prompt(s) to complete control recipe execution.

### To acknowledge a prompt

1. Select **Prompts**.
2. Select the prompt to acknowledge.
3. Enter the value and select **Acknowledge** .
4. If the prompt has associated signature(s), sign off on the prompt to complete the acknowledgment.

## Instructions

Instructions represent the individual steps of a phase that the user can take action to answer. Instructions include:

- Processing instructions
- Recipe parameter values and entry of values
- Valid HTML components
- Run-time data
- Batch ID, recipe, and phase originating the instruction

Instructions are identified by type to show the status. Present instructions appear enabled, while Past and Future instructions appear disabled.

## Execute an instruction

Instructions execute as part of an active recipe step. They represent the individual steps of a phase. As a batch executes, the current manual instruction for each active step displays. Instructions execute in the order specified within the master recipe.

If you have more than one active recipe step, instructions are displayed for all active recipe steps.

### To locate and execute the instruction

1. Select **Prompts**.
2. (optional) Use the **Filter** bar to filter and display only the instructions to execute.
3. Locate and select the instruction to execute.
4. Follow the directions provided in the instruction.

## Sign an instruction

Use these steps to sign an instruction.

### To sign an instruction

1. Select **Prompts**.
2. Select the instruction.
3. Select the signature request.
4. Enter a valid user ID and password for each required signoff.
5. If required, enter a comment.
6. Select **Sign**. The signature appears after the instruction.

## Cancel an instruction signature request

Use the following instructions to sign a instruction to cancel a signature request.

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**IMPORTANT** Canceling a signature request undoes the request for the signature and the action that generated the signature.

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### To cancel a signature request

1. Select **Prompts**.
2. Select the instruction.
3. Select the signature request.
4. Select **Cancel**.
5. Select **Yes** to cancel the signature request.

## Reactivate an instruction

Reactivate past instructions in a phase that is currently RUNNING that does not have pending, reactivated steps. Reactivate one instruction at a time. If the **Reactivate** command was configured with a signature template in FactoryTalk Batch Equipment Editor, the signature request displays in the instruction being reactivated.

### Prerequisites

- If **Past** instructions do not appear in the **Prompts** list, select the box to the right of the **Filter** bar, and clear **Hide Past**.
- Ensure property security privileges for the step to reactivate.

### To reactivate an instruction

1. Select a valid past instruction, and then select **Reactivate**.
2. Change any incorrect values.
3. If a signature request displays, enter the required User ID and password, and a comment, if required, and then select **Sign**.

4. Select **OK**.

## Signatures

Signatures are used to secure control over runtime FactoryTalk Batch processes by configuring signature requirements. These signature events are then recorded in an electronic batch record, which includes the name of the signer, the date and time the signature was executed, and the meaning associated with the signature.

The types of signatures may include report parameter verification for automated and manual phases, recipe parameter change verification, eProcedure step verification, batch and phase command verification, and a general usage signature that will allow a phase to request a signature whenever needed.



FactoryTalk Batch Equipment Editor is used to configure signature templates that consist of signoffs, meanings, security permissions, and comment requirements. Once configured, signature templates can be associated with command verification policies to control specific batch processes.

For more information, see **Signature template** in the *FactoryTalk Batch Equipment Editor User Guide*.

## Acknowledge a signature

When a control recipe requires a signature for a batch action, acknowledge the signature by completing the signoffs.

### To acknowledge a signature

1. Select **Prompts**.
2. Select the signature request.  
 Tip: If there are multiple signoffs, select the appropriate signoff.
3. Enter the user name and password for each signoff.
4. (optional) Enter comments.  
 Tip: If the signature template in the area model requires comments, this step is required.
5. Select **Sign**.

## Cancel a signature request

Cancel a signature to not sign off on a control recipe. The requested batch action does not complete. Signatures are cancelled both manually and by the FactoryTalk Batch Server.



Tip: Canceling a signature request applies to all batch commands and actions except for a control recipe ABORT command, because that command completes before the signature is signed.



## To cancel a signature request

1. Select **Prompts**.
2. Select the signature request.
3. Select **Cancel**.
4. Select **Yes**.


## Batches

Use **Batches** to create, view, and command a control recipe, observe the execution of a single recipe, and bind units for class-based recipes. Once a control recipe is created, it remains in the **Batches** list until it is removed or until the FactoryTalk Batch Server is restarted with a cold boot. A graphical representation of a running batch and its associated data is displayed.

## Create a control recipe


Use **Batches** to add a control recipe from a master recipe. The **Batches** list displays control recipes that are ready to run, are running, or are complete.

### To create a control recipe

1. Select **Batches**.
2. Select **Add** .
3. Select a master recipe.
4. (optional) If the recipe contains a material class-based phase, select the material you want to use in this particular batch, and then select Next.
5. Enter a unique batch ID.



Tip: The **Batch ID** box accepts non-unique IDs. When duplicate batch IDs are used, it is difficult to associate prompts with the correct batch when viewed in Prompts.

6. (optional) Perform any of the following:
  - To run a batch at a percentage other than 100%, in the **Batch Scale** box, enter the percentage.
  - To change the description of the batch, in the **Description** box, enter a new description.
  - Select the equipment for the control recipe in the **Unit Bindings** area.
  - To assign or change a formula value, enter new values in **Formula Values**.
7. Select OK  to add the control recipe to the **Batches** list.

## Command a batch

Commands perform actions on a batch. These commands are supported:

- Abort
- Start
- Stop
- Remove

- Restart
- Hold
- Resume

Issue control recipe commands from the **Batches** list, the **Detail** section, or the **Summary** section. Enabled command buttons appear for commands that are valid for the current conditions of a batch. The command buttons in the **Detail** and **Summary** sections affect the selected step in O-AUTO mode.

If a command policy is configured in the FactoryTalk Batch Equipment Editor, the FactoryTalk Batch Server does not execute the command until the signature is complete. The **Abort** command executes immediately, before signatures complete.

### To command a batch

1. Select **Batches**.
2. (optional) To view the control recipe details before performing a command, select a batch.
3. Select the command to execute.



Tip: While commanding a batch, prompts requiring action may appear in the Prompts area. Respond to the prompts to continue processing the batch.

## Clear failure messages

Failure messages appear when a command is not run successfully on a batch or due to phase failures, unexpected execution conditions, or communication problems. To run the batch again, clear the failure messages first.

### To clear failure messages

- Select **Clear Failures** in the **Batches** list, the **Detail** section, or the **Summary** section.

## Change the active step

Use **Batches > Detail** to change an active step. The active step is the step currently in progress in the batch. Changing the active step is permitted only when the recipe level that contains the active step is in manual mode.

### To change the active step

1. Select **Batches**.
2. Select a batch.
3. In the **Batch Detail** display, select the recipe level that contains the active step, and then select Manual.



Tip: If Manual is not visible, verify that the user profile has permission for manual recipe control.

4. Select **Change Active Step**.



Tip: Steps in the HELD state cannot be deactivated as the active step.

5. To deactivate a step, select the step. The step appears in the **Steps to deactivate** list.



Tip: Steps to be deactivated should be in one of the Terminal states such as STOPPED, ABORTED, COMPLETED, etc.

6. To activate a step, select a step. The step appears in the Steps to activate list.



Tip: Only steps in the IDLE state can be selected to be made active.

7. Select **Execute**.
8. To change the active step, select **Yes**.

## Monitor a batch

You can monitor the execution status of a control recipe using either a Sequential Function Chart (**Detail** section) or table format (**Summary** section). Command buttons are enabled based on the current condition of the batch.



Tip: The **Detail** section sometimes displays recipe comments. Recipe comments contain read-only notes, instructions, or information added in the Recipe Editor. Recipe comments include:

- **Comment Name.** The name generated by the Recipe Editor in the form *C#*, where the number is incremented so that each comment has a unique name within the scope of the recipe.
- **Comment.** The comment text.
- **Association** (optional). The name of a step or transition the comment is associated with.

### To monitor a batch

1. Select **Batches**.
2. Select a batch.
3. To watch the batch, execute in a:
  - Sequential Function Chart (SFC) format and view steps and transitions, select **Detail**.
  - Table format, select **Summary**.
4. (optional) To see the batch description or equipment information, select **General**.

## Override a parameter expression value

When there is an issue with the evaluation of a parameter expression, the operator can override the expression by assigning a new value and can clear the override value.

### IMPORTANT

It is strongly recommended that this command be used in conjunction with a command signature or FactoryTalk Security to require authorization before an expression value can be overridden. See the *FactoryTalk Batch Administrator Guide* for information on configuring FactoryTalk Security on Batch View commands, or the *FactoryTalk Batch Equipment Editor User Guide* for information on configuring Electronic Signature Templates and Command Policies.

## Force a transition to fire

The **Force Transition** command immediately fires an active transition. For example, if a transition expression references the report parameter and the value is preventing the transition from firing, use the **Force Transition** option to force the transition to fire.

### To force a transition to fire

1. Select **Batches**.
2. Select the running batch.
3. In the **Batch Detail** display, select the active or armed transition.
 

Tip: The **Force Transition** command is:

  - Available at the procedure, unit procedure, and operation levels.
  - Not available in Manual mode or when Force Transition is in a HELD state.
4. Select **Force Transition**.
5. (optional) If forcing the transition requires a signature, complete the confirmation or electronic signature.

## Valid states and modes

The following states and modes are valid for a step. Valid states for a step include:

- READY
- IDLE
- RUNNING
- RESTARTING
- HOLDING
- HELD
- STOPPING
- STOPPED
- ABORTING
- ABORTED
- COMPLETE
- DOWNLOADING
- UPLOADING

Step and transition states are color coded:

Batch State	Color
READY	Gray
IDLE	Gray
RESTARTING	Green
HOLDING	Yellow
STOPPING	Blue
ABORTING	Magenta
COMPLETE	Gray
RUNNING	Green
STARTING	Green
HELD	Dark Yellow

Batch State	Color
STOPPED	Dark Blue
ABORTED	Dark Magenta
DOWNLOADING	Green
UPLOADING	Green

Each valid step can be in one of four modes:

- **O\_AUTO (Operator Auto):** The batch sequences normally. Commands are sent to a recipe level in the O\_AUTO mode. O\_AUTO is a valid mode for all recipe levels. A recipe step in O\_AUTO mode can be commanded by an operator.
- **P\_AUTO (Procedure Auto):** The batch sequences normally. Commands cannot be sent to a recipe level in the P\_AUTO mode. P\_AUTO is a valid mode for all recipe levels. A recipe step in P\_AUTO mode is commanded by the higher-level procedure it belongs to.
- **S\_AUTO (Semi Auto):** The batch sequences normally, but pauses at a True transition and waits for the RESUME command. The RESUME command is issued to a recipe level that is in the S\_AUTO mode. S\_AUTO is a valid mode for all recipe levels.
- **MANUAL:** The batch sequencing is stopped. Commands are sent to lower recipe level steps. The change active step command is only valid on a recipe level that is in manual mode. MANUAL is not a valid mode for the phase level.

## Place a batch in auto mode

A batch that is in semi-auto or manual mode must be placed in auto mode to resume normal execution.

### To place a batch in auto mode

1. Select **Batches**.
2. Select a batch. The batch opens to the **Detail** section.
3. Select **Summary** or **Detail**, and then select the item to place in auto mode.
4. Select **Auto**. The mode changes to Auto.



Tip: To place the entire batch in auto mode, select the highest recipe level such as the operation, unit procedure, or procedure and place it in auto mode.



Tip: Depending on the situation, the batch may resume normal execution. Or, in the case of Failures/Warm all server restarts, the procedure changes to Manual mode. In these cases, after switching to Auto, a restart may be required or failures (if they exist) must be cleared before restarting.

## Place a batch in semi-auto mode

Place a batch in semi-auto mode to control the execution of steps in a specific recipe level. Place a batch level in semi-auto mode when the batch is in manual or auto mode. When a batch is placed in semi-auto mode, all higher level steps are placed in manual mode, and all lower level steps are placed in auto mode.

## To place a batch in semi-auto mode

1. Select **Batches**.
2. Select a batch. The batch opens to the **Detail** section.
3. Select **Summary** or **Detail**.
4. Select the batch level to place in semi-auto mode.
5. Select **Semi-auto**.
6. To continue execution, select the step to resume and select **Resume**. The step transitions to the *RUNNING* state.
7. Select **Resume** for each subordinate step.
8. Place the batch in auto mode to continue normal execution or perform semi-auto processing at another batch level.

## Place a batch in manual mode

Use manual mode to stop automatic sequencing of a batch. A batch in manual mode allows any lower-level active steps to complete without automatically transitioning to the next step.

For example, to determine which step to execute through changing an active step, place a batch in manual mode. Two things happen when placing a batch level in manual mode:

- Any higher-level recipes that contain the batch level you put into manual mode, also go into manual mode.
- Any lower-level steps contained by the batch level in manual mode go into O-AUTO mode.

## To place a batch in manual mode

1. Select **Batches**.
2. Select a batch. The batch opens to the **Detail** section.
3. Select **Summary** or **Detail**.
4. Select the batch level containing the steps to be manually commanded.
5. Select **Manual**. The active step completes, but the transition does not fire, even if its expression evaluates to True. The step transitions to the *COMPLETE* state.
6. To resume execution, place the batch in auto mode.

## View sequential function charts of the current batch

**Batches > Detail** displays the sequential function charts (SFCs) view of the selected batch.

When no steps or transitions are selected, view the recipe and report parameters of the batch level on the **Params** and **Reports** tabs. Select a step to view that step's recipe and report parameters.

## To view sequential function charts of a batch

1. View the recipe and report parameters by selecting a step or selecting a breadcrumb in the banner above the SFC chart. Navigate to different levels of the batch by selecting the down arrow on the associated step.



Tip: The displayed SFC chart is resizable.

2. View the transition details by selecting the transition expression. For an active or armed transition, the current and expected values are displayed separately in the **Detail** section.



Tip: The values update dynamically as long as the transition expression is selected.

## View and manage system elements from the Batch Detail

You can view, acquire, release, and reorder system elements from **Batch Detail > Arbitration**.


If a batch is attempting to acquire a system element that is already owned, the execution status of the transition is set to **Acquiring**.

When a system element is released, it is acquired by the next system element in the queue, in the order shown in the **Needed By** list.

## View arbitration information from the Batch Detail

To navigate to details of a system element, select a batch and use **Batch Detail > Arbitration**.

## To view arbitration information from the Batch Detail

1. Select **Batches**.
2. Select the batch that contains the system element to be viewed.
3. In the **Batch Detail** display, select the **Arbitration** tab.
4. In the **Owns**, **Owned By**, **Needs**, or **Needed By** lists, select the  menu, and select **View <system element>**.

## Acquire a system element from the Batch Detail

A system element is acquired either when it is not owned or the number of current owners is fewer than the defined maximum number of owners. Only the current owner can release a system element.




Tips:

- Only authorized users (acting as the operator) can acquire a system element, as configured in FactoryTalk Batch Security settings.
- A request to acquire an owned system element is queued. When the system element is released, the next system element in the queue acquires that system element automatically.

## To acquire a system element from the Batch Detail

1. Select **Batches**.

2. Select that batch that has the system element to be acquired.
3. In the **Batch Detail** display, select the **Arbitration** tab.
4. In the **Owns** area, select the  menu next to the system element to acquire, and select **Acquire**.
5. In the **Authorize** message, select **Yes**.

If the system element is available, the current operator gains ownership of it. If the system element is not available, the current operator is added to the **Needed By** list at the end of the system element queue.


## Release a system element from the Batch Detail

Release a system element after previously acquiring it to make it available to other processes.



Tip: Only authorized users (acting as the operator) can release a system element, as configured in FactoryTalk Batch Security settings.

### To release a system element from the Batch Detail

1. Select **Batches**.
2. Select the batch that has the system element to be released.
3. In the **Batch Detail** display, select the **Arbitration** tab.
4. In the **Owns** area, select the  menu next to the system element, and select **Release**.
5. In the **Authorize** message, select **Yes**.

## Reorder the Needed By queue from the Batch Detail

To change the priority order for a system element waiting to acquire another system element, use **Arbitration > Needed By**.

For example, Batch 1, Batch 2, and Batch 3 all request to acquire Unit 1, in that order. Batch 1 acquires Unit 1, Batch 2 is the first in the **Needed By** queue, and Batch 3 is last. A process change requires that Batch 3 needs to run before Batch 2. Reorder the Unit 1 **Needed By** queue so Batch 3 is next in the queue.

### To reorder the Needed By queue from the Batch Detail

1. Select **Batches**.
2. Select the batch that has the system element whose queue needs to be reordered.
3. In the **Batch Detail** display, select the **Arbitration** tab.
4. Select the system element.
5. In the **Needed By** section, select the system element to be reordered.
6. Select the Up or Down arrow.



## Equipment

Use **Equipment** for an equipment-centric view of the defined area model. The FactoryTalk Batch Equipment Editor defines the equipment that appears.

There are three levels in **Equipment** displayed: process cell, unit, and phase or operation sequence. Each level includes run-time data and other information for each resource. From the phase level, you can view phase-specific information and run phases or operation sequences manually, independent of recipes.

In **Equipment**, view the area model hierarchy using different views:

- **List view** (default): Each item lists different values depending on the window size: either mobile or desktop size. More fields are available in desktop size.
- **Diagram view**: Process cells, units, and phases or operation sequences appear as graphical elements in the area model.
  - Zoom in, zoom out, and zoom to fit buttons on the top left of the diagram view.
  - The top right of the diagram view describes which equipment level is being viewed: process cells, units, or phases/operation sequences.
- **Phase Summary view**: View all phases or operation sequences for all units in all process cells at once in a list type view.

## View process cells, units, and phases or operation sequences in list view or diagram view

There are several ways to view **Equipment** process cells, units, and phases or operation sequences.

### To view process cells, units, and phases or operation sequences

1. Select **Equipment**.
2. To the right of the **Filter** box, select a display type:
  - Select **List** to view the **Equipment** levels as a list of items.
  - Select **Diagram** to view the **Equipment** levels as graphical elements in the area model.
  - Select **Phase Summary** to view all phases or operation sequences at once in a list-type view.

## Process cell

The **Process Cell** area includes each process cell in the selected area. The process cells are visible in two views: List view (default) and Diagram view.



Tips:


- At the **Process Cell** level, the state counts indicate the number of active and inactive units in that process cell.
  - A unit is considered active if it contains one or more phases or operation sequences in the Running, Held, Stopped, or Aborted states.
  - A unit is considered inactive if all of its phases or operation sequences are in the Idle or Complete states.
- The batch count increments only if a phase or operation sequence is executing as a step in a batch on the **Batches** list.
- The Batch count number in **Equipment** may differ from the number in the **Batches** list because:
  - **Equipment** displays the actual bound equipment in the count number.
  - The **Batches** list number indicates the equipment requirement but not the bound equipment.
  - **For example:** If two running batches on the **Batches** list require the same phase, only one batch at a time can be bound to the phase. In **Equipment**, for the unit or process cell, the Batches count (in the List view) or the Active Batches count (in the Diagram view) displays a value of 1, even though there are two batches on the **Batches** list.

## List view

- Process cell name.
- Unit state count:
  - Active (Running, Held, Stopped, or Aborted) count.
  - Inactive (Idle or Complete) count.
- Phase failure count, if phase failures exist.
- Prompts count, if prompts exist.



Tip: The Prompts count includes unacknowledged prompts, signatures, and instructions.

- Batches count.
- Batch ID and batch state.
- Process cell menu (appears after selecting the  menu):
  - **Navigate Down:** Navigates to the **Units** level.
  - **Phases With Failures:** Navigates to **Phase Summary** view and displays only phases belonging to the associated process cell that has failures.
  - **Phases With Prompts:** Navigates to **Phase Summary** view and displays only phases or operation sequences belonging to the associated process cell that has prompts.
  - **Display Batches:** If the process cell has associated batches, navigates to the **Batches** list and displays only batches associated with the process cell.
  - **Display Prompts:** If the process cell has associated prompts, navigates to **Prompts** and displays only prompts associated with the process cell.

## Diagram view

- Process cell name.
- Unit state count:

- Active (Running, Held, Stopped, or Aborted) count.
- Inactive (Idle or Complete) count.
- Phase failure count, if phase failures exist.
- Prompts count, if prompts exist for the phases associated with the selected process cell. Selecting the Prompts count opens the **Prompts** page, which displays the prompts associated with that process cell.
- Active batches count. Selecting the Active batches link opens the **Batches** list and displays only the batches associated with the process cell.
- Hyperlinks, if configured, display near the process cell name. Selecting a hyperlink opens a new window.

## Unit

The **Unit** area includes each unit in the selected **Process Cell**. The units are visible in two views: List view (default) and Diagram view.



Tips:


- At the **Unit** level, the state count indicates the number of active and inactive phases or operation sequences in that unit. The state is a rollup value that reflects the least to most critical phase state in the unit, in this order: Running, Held, Stopped, Aborted.
  - A phase or operation sequence is considered active if it is in the Running, Held, Stopped, or Aborted states.
  - A phase or operation sequence is considered inactive if it is in the Idle or Complete state.
- The active batch count increments only if a phase or operation sequence is executing as a step in a batch on the **Batches** list.
- The Batch count number in **Equipment** may differ from the number in the **Batches** list because:
  - **Equipment** displays the actual bound equipment in the count number.
  - The **Batches** list number indicates the equipment requirement but not the bound equipment.
  - **For example:** If two running batches on the **Batches** list require the same phase, only one batch at a time can be bound to the phase. In **Equipment**, for the unit or process cell, the Batches count (in the List view) or the Active Batches count (in the Diagram view) displays a value of 1, even though there are two batches on the **Batches** list.

## List view

- Unit name and state.
- Phase state count:
  - Active (Running, Held, Stopped, or Aborted) count.
  - Inactive (Idle or Complete) count.
- Phase failure count, if phase failures exist.
- Prompts count, if prompts exist for the phases associated with the selected unit.



Tip: The Prompts count includes unacknowledged prompts, signatures, and instructions.

- Active batches count.
- Batch ID and batch state.
- Unit menu (appears after selecting the  menu):
  - **Navigate Down:** Navigates to the **Phases** level.
  - **Navigate Up:** Navigates to the **Process Cell** level.

- **Phases With Failures:** Navigates to **Phase Summary** view and displays only phases belonging to the associated unit that has failures.
- **Phases With Prompts:** Navigates to **Phase Summary** view and displays only phases or operation sequence belonging to the associated unit that has prompts.
- **Display Batches:** If the unit has associated batches, navigates to the **Batches** list and displays only batches associated with the unit.
- **Display Prompts:** If the unit has associated prompts, navigates to **Prompts** and displays only prompts associated with the unit.

## Diagram view

- Unit name and state.
- Phase state count:
  - Active (Running, Held, Stopped, or Aborted) count.
  - Inactive (Idle or Complete) count.
- Phase failure count, if phase failures exist.
- Prompts count, if prompts exist for phases associated with the selected unit. Selecting the Prompts count opens the **Prompts** page and displays only prompts associated with that unit.
- Active batches count. Selecting the Active batches link opens the **Batches** list and displays only the batches associated with that unit.
- Flow path between units
- Hyperlinks, if configured, display near the unit name. Selecting a hyperlink opens a new window.

## Phase

The **Phase** area includes each phase contained in a **Unit**. View phases as a list or diagram. The phases are visible in two views: List view (default) and Diagram view.


### List view

- Phase or operation sequence name.
- Phase or operation sequence state.
- Phase or operation sequence sub state name (Pausing and Paused).
- Owner.
- Step index only displays if the phase is not idle.
- Mode only displays if the phase or operation sequence is acquired.
- Phase failure count, if phase failures exist, selecting the phase displays the failure message near the phase name.
- Prompts count, if prompts exist for the selected phase or operation sequence. Selecting a phase or operation sequence opens a command menu to the left of the phase list, which includes a **Prompts** link.

Selecting the Prompts link opens the **Prompts** page, which displays the prompts associated with that phase



Tip: The Prompts count includes unacknowledged prompts, signatures, and instructions.

- Batch ID and batch state. Selecting the Batch ID link navigates to **Batches > Detail** for a regular batch or to **Batches > Summary** for a batch associated with Manual Phase Control or Manual Operation Sequence Control.
- Phase menu (appears after selecting the  menu):
  - **Navigate Up:** Navigates to the **Units** level.
  - **Display Batches:** Navigates to **Batches > Detail** for a regular batch or to **Batches > Summary** for a batch associated with Manual Phase Control or Manual Operation Sequence Control.
  - **Display Prompts:** Navigates to **Prompts** and displays only prompts associated with the phase or operation sequence.

## Diagram view

- Phase or operation sequence name.
- Phase or operation sequence state count.
- ActiveStep index displays only if phase or operation sequence is not IDLE.
- Mode only displays if the phase or operation sequence is acquired.
- Phase errors, if they exist, display failure text in a popup window if the **Failure** icon is selected.
- Prompts count, if prompts exist for the selected phase. Selecting the Prompts count opens the **Prompts** page, which displays the prompts associated with that phase



Tip: The Prompts count includes unacknowledged prompts, signatures, and instructions.

- Batch ID and batch state if a batch is assigned to a phase or operation sequence. Selecting the Batch ID navigates to **Batches > Detail** for a regular batch or to **Batches > Summary** for a batch associated with Manual Phase Control or Manual Operation Sequence Control.
- Hyperlinks, if configured, display near the phase name. Selecting a hyperlink opens a new window.



## Manual phase control

Use **Equipment** to view phase-specific information and command phases manually, independent of recipes. This forces the phase logic to execute. A phase can only be acquired when it is not currently owned. A phase must be acquired to use manual phase control. Manual phase control is useful for testing a recipe before releasing it to production.

## Manually command a phase



Manually controlling a phase creates a default batch ID. This ID is based on the control recipe that currently owns the unit. If no control recipe exists, the batch ID is the default BATCH\_ID.

### To command a phase using manual phase control

1. Select **Equipment**.
2. Navigate to **Phases** and select the phase to control.
3. Select **Acquire** .
4. Select **Start** .
5. If prompted, confirm the command.
6. Click **Yes** to start the phase.
7. Enter a unique batch ID when prompted and select **OK**. The phase displays the current step index, the active state, the owner, and the mode. The phase transitions to the RUNNING state and then to the COMPLETED state after all steps execute.
8. If prompts display for the phase:
  - a. Select **Prompts**.
  - b. In **Prompts**, select the prompt and enter the appropriate value.
  - c. Select **Acknowledge**.



Tip: If prompts are present, a **x Prompts** link displays in the left sidebar navigation. Selecting the **Prompts** link goes to the **Prompts** list, displaying only the prompts for that phase.

9. When the phase completes, select **Reset**  to reset the phase.
10. Select **Release**  to release the selected phase.


## Manually command a material-based phase



Command a material-based phase using manual phase control in **Equipment**.









**WARNING:** If communication with the Material Server fails while in Equipment, and the material policy option is configured for Switch to Manual, all containers associated with the phase display. The list is not filtered by the selected material. Use extreme caution when operating without the Material Server. Failure to select the correct container or phase pair could result in a hazardous situation, depending on the material.

### To command a material-based phase using manual control

1. Select **Equipment**.
2. Select the material-enabled phase to acquire and select **Acquire** .
3. If prompted, confirm the command.
 




 Tip: The manual phase control session requests ownership of the phase (and OPERATOR will appear in the phase's Needed By list). The phase must be released by the control recipe, and then the operator acquires the phase.
4. Select **Start** .
5. If prompted, confirm the command.

6. If the phase is configured as both a material distribution and addition, from the **Feed Type** list, select the type for the phase.  
 Tip: If the phase is not configured as both a material distribution and addition, the configured **Feed Type** for the material phase cannot change.
7. Select a material to use from the **Material** list, and select **Continue**.
8. Enter a unique batch ID.
9. (optional) If a phase has a control strategy, select the strategy from the **Control Strategy** box.
10. Select a container, and select **OK**. The batch state displays **DOWNLOADING**.  
 Tip: If the phase has automatic uploads and downloads, **Prompts** shows the prompt(s) to acknowledge.
11. If prompts generate for the phase, select **Prompts**.  
 Tip: If prompts are present, an **x Prompts** link displays in the left sidebar navigation. Selecting the **Prompts** link goes to the **Prompts** list, displaying only the prompts for that phase.
12. In **Prompts**, select the prompt, enter the appropriate value, and select **Acknowledge** .
13. Once the phase completes, select the phase, and then select **Reset** .
14. With the phase still selected, select **Release** .

## Manually command a phase with control strategies

Command a phase with control strategies using manual phase control in **Equipment**. A control strategy identifies a subset of the phase class reports and parameters configured on a phase class to use at run-time.

### To command a phase with control strategies using manual control

1. Select **Equipment**.
2. Navigate to **Phases** and select the desired phase.
3. Select **Acquire** .
4. If prompted, confirm the command.  
 Tip: The manual phase control session requests ownership of the phase (and OPERATOR will appear in the phase's Needed By list). The phase must be released by the control recipe, and then the operator acquires the phase.
5. Select **Start** .
6. If prompted, confirm the command.
7. Enter a unique batch ID when prompted.
8. Select the strategy from the **Control Strategy** box, then select **OK**.  
**IMPORTANT** If **Automatically Download Parameters Upon Start** is selected when control strategies are configured for the phase instance in FactoryTalk Batch Equipment Editor, the FactoryTalk Batch Server downloads these parameters before the FactoryTalk Batch Server issues a START command to the phase. After verifying the download, the FactoryTalk Batch Server starts the phase. The batch state displays **DOWNLOADING** until the parameters are downloaded and acknowledged in **Prompts**.




9. If prompts generate for the phase, select **Prompts**.



Tip: If prompts are present, a **x Prompts** link displays in the left sidebar navigation.

**Prompts** link  
goes to the  
**Prompts** list,  
displaying only  
the prompts for  
that phase.







10. In **Prompts**, select the prompt, enter the appropriate value, and select **Acknowledge** .
11. Once the phase completes, select the phase, and then select **Reset** .
12. With the phase still selected, select **Release** .

## Manually command a phase in semi-auto mode





Manually step through a phase using the SEMI-AUTO mode. The phase logic must set the Paused bit where appropriate. These programmed break points determine where the phase pauses while in semi-auto processing.

### To manually command a phase in semi-auto mode

1. Select **Equipment**.
2. Navigate to **Phases** and select the phase.
3. Select **Acquire** .
4. Select **Start** .
5. If prompted, confirm the command.
6. Click **Yes** to start the phase.
7. Enter a unique batch ID when prompted and select **OK**. The phase displays the current step index, the active state, the owner, and the mode. The phase transitions to the RUNNING state and then to the COMPLETED state after all steps execute.
8. Select **Semi-Auto**  to initiate phase processing.
9. If prompts generate for the phase:
  - a. Select **Prompts**.
  - b. In **Prompts**, select the prompt and enter the value.
  - c. Select **Acknowledge** .



Tip: If prompts are present, a **x Prompts** link displays in the left sidebar navigation. Selecting the **Prompts** link goes to the **Prompts** list, displaying only the prompts for that phase.

10. Select **Resume**  to restart phase execution.
11. Select **Auto**  to return the phase to the AUTO mode.
12. Once the phase completes, select **Reset**  to reset the phase.
13. Select **Release**  to release the selected phase.

## Hyperlinks

**Equipment** includes up to five hyperlinks for each process cell, unit, and phase displayed. In the diagram view, view the hyperlinks near the equipment icon.

Using the Equipment View Hyperlink feature with FactoryTalk Batch View requires changing the location of the files to link to the appropriate FactoryTalk Batch View directory.



Tip: The hyperlink descriptors and defaults are defined in the FactoryTalk Batch Equipment Editor. For more information, see the *FactoryTalk Batch Equipment Editor User Guide*.

## To create a hyperlink folder in the FactoryTalk Batch View directory

1. In File Explorer, navigate to the FactoryTalk Batch View web root directory. If FactoryTalk Batch View is installed in the default location, this is: `C:\Program Files (x86)\Rockwell Software\Batch View Server\Bin\wwwroot`
2. Create a new folder and enter a name for the folder, such as *Project\_Files*.
3. Place the files to be linked in this folder.
4. In FactoryTalk Batch Equipment Editor, ensure that the path configured for the hyperlink matches the directory path set in step 2 (such as `/Project_Files/<file name>`).
5. Repeat steps 2-4 if using more than one folder for hyperlink files, such as **Images** or **Video**.

## View results of an area model update

When an online area model is updated on the FactoryTalk Batch Server, FactoryTalk Batch View displays the changes and alerts the operator to the update.

- During the online area model update, the FactoryTalk Batch View Server drops all but the essential connection to the FactoryTalk Batch Server. The operator cannot interact with the system and may see a **Server Communication Error: Online Area Update** message.
- After the online area model update is complete, an **Information** message alerts the operator that the online area model was updated.

When communication between the FactoryTalk Batch Server and FactoryTalk Batch View is lost and then restored, work in FactoryTalk Batch View is largely uninterrupted.

However, in these circumstances, the operator is navigated to the top level location in the user interface:

Before the update, if an operator is viewing the:	After the update, the operator will be viewing the:
• <b>Batch Detail</b> display	• <b>Batches</b> list
• <b>Prompts/Acknowledge Signature Signoff</b> page	• <b>Prompts</b> list
• <b>Manual Instructions</b> page	• <b>Prompts</b> list
• <b>Diagnostics</b> tab with <b>Server</b> , <b>Statistics</b> , <b>Journals</b> , or <b>Arbitration</b> selected	• <b>Diagnostics</b> tab with <b>Status</b> selected
• <b>Process Cell</b> , <b>Unit</b> , or <b>Phase/Operation Sequence</b> detail levels in the <b>Equipment</b> view	• Top <b>Area</b> level
• <b>Help</b> for a specific topic	• Top level <b>Help</b> page

## Diagnostics

Use **Diagnostics** to view server and service status, server performance, server statistics, batch event journals, and arbitration information.

- **Status** - view version and connection information for the FactoryTalk Batch View, FactoryTalk Batch Server, FactoryTalk Services, eProcedure Server, and FactoryTalk Activation. Displays the status of configured data servers and services.
- **Server** - view server performance, hardware, and software information.
- **Statistics** - view information on connections, equipment model file name and save time, and perform tag verification.
- **Journals** - view a list of all available event journals.
- **Arbitration** - view, acquire, release, and reorder system elements.

## View server information

View the server performance, hardware, and software for the FactoryTalk Batch Server to troubleshoot server issues.

### To view the server information

1. Select **Diagnostics**.
2. Select **Server**.
3. View the appropriate server information.
  - **Uptime**: View the uptime for the operating system, FactoryTalk Batch Server, and the FactoryTalk Batch View Service.
  - **Memory**: View the total amount of memory used, the amount of free memory available, and the amount of memory being used by the FactoryTalk Batch View Service.
  - **Disk**: View the total amount of disk space and the amount of free disk space available.

## View the status of servers and services

The **Status** tab displays status and version information for services used by the application and the status for each data server used by the Batch Server.

### To view the status of servers and services

1. Select **Diagnostics**.
2. Select **Status**.
3. View the appropriate server or service.
  - **Services**: View the status of the FactoryTalk Batch View Service, the FactoryTalk Batch Server, eProcedure Server, FactoryTalk Services, and FactoryTalk Activation.
  - **Data Servers**: View the status of the configured data servers, and the status of the Material Server.



Tips: The status of each service and data server is indicated by the color:

- **Green:** Communication is good.
- **Yellow:** Communication is suspect.
- **Orange:** Communication is bad.
- **Red:** Communication is lost.

## View statistics

The **Statistics** tab displays the following information:

- **Connection(s):** Monitors the number of Component Object Model (COM) and OLE for Process Control (OPC) conversations taking place between the FactoryTalk Batch Server and client software, such as the FactoryTalk Batch View service, FactoryTalk Batch View, and HMI Controls.
- **Equipment Model:** Displays the file name and the last saved time.
- **Tag Verification:** Reads the current value of tags defined in the area mode and displays the number of verified tags, bad tags, and unverified tags.

## View connections

The **Connections** area monitors the number of Component Object Model (COM) and OLE for Process Control (OPC) conversations taking place between the FactoryTalk Batch Server and client software, such as the FactoryTalk Batch View service, FactoryTalk Batch View, and HMI Controls. Viewing the connections is helpful troubleshooting connection issues with the FactoryTalk Batch Server

### To view the connections

1. Select **Diagnostics**.
2. Select **Statistics**.
3. View the item count, OPC connections, and COM connections in the **Connections** area.

## View equipment model information

View the filename and timestamp of the equipment model in use.

### To view the equipment model information

1. Select **Diagnostics**.
2. Select **Statistics**.
3. View the equipment model information:
  - **File:** File name of the equipment model.
  - **Last Save Time:** Last time the equipment model was saved.

## Verify tags

Tag verification displays the number of verified tags, bad tags, and unverified tags. During tag verification, the count of tags verified, bad, and unverified displays. When tag verification completes, the count of verified and bad tags displays.

### To verify tags

1. Select **Diagnostics**.
2. Select **Statistics**.
3. Select **Start**.



Tip: To abort tag verification, select **Abort** instead of **Start**.

## View and manage system elements from the Diagnostics page

When you need to have an overall view or to manage system elements for an area, use **Diagnostics > Arbitration**.

**Diagnostics > Arbitration** provides a method for displaying arbitration information from different perspectives. System elements have a limited number of owners based on their definition in the area model. System elements are acquired when they are not currently owned, or the number of current owners is fewer than the defined maximum number of owners. Only the current owner can release a system element.

## View arbitration information from the Diagnostics page

To navigate to details of a system element, use **Diagnostics > Arbitration**.

### To view arbitration information from the Diagnostics page

1. Select **Diagnostics**.
2. Select **Arbitration**.
3. In **Choose a System Element**, select a type to filter the available options.
4. In the **System Element** list, select the system element to be viewed.

## Acquire a system element from the Diagnostics page


A system element can be acquired when it is not currently owned, or when the number of current owners is fewer than the defined maximum number of owners.



Tips:

- Only authorized users (acting as the operator) can acquire a system element, as configured in FactoryTalk Batch Security settings.
- A request to acquire an owned system element is queued. When the system element is released, the next system element in the queue acquires that system element automatically.

## To acquire resources as an operator

1. Select **Diagnostics**.
2. Select **Arbitration**.
3. In **Choose a System Element**, select a type to filter the available options.
4. In the **System Element** list, select the system element to be acquired.
5. In the  menu, select **Acquire**.

If the system element is available, the current operator gains ownership of the system element. Otherwise, the current operator is added to the **Needed By** list at the end of the system element queue, and the system element is added to the operator's **Needs** list.


## Release a system element from the Diagnostics page

Only the current owner of a system element can release it. When finished commanding a system element, release it to make it available for other processes.



Tip: Only authorized users (acting as the operator) can release a system element, as configured in FactoryTalk Batch Security settings.

## To release a system element from the Diagnostics page

1. Select **Diagnostics**.
2. Select **Arbitration**.
3. In **Choose a System Element**, select a type to filter the available options.
4. In the **System Element** list, select the system element to be released.
5. In the  menu, select **Release**.

## Reorder the Needed By queue from the Diagnostics page

To change the priority order for a system element waiting to acquire another system element, use **Arbitration > Needed By**.

For example, Batch 1, Batch 2, and Batch 3 all request to acquire Unit 1, in that order. Batch 1 acquires Unit 1, Batch 2 is the first in the **Needed By** queue, and Batch 3 is last. A process change requires that Batch 3 needs to run before Batch 2. Reorder the Unit 1 **Needed By** queue so Batch 3 is next in the queue.

## To reorder the Needed By queue from the Diagnostics page

1. Select **Diagnostics**.
2. Select **Arbitration**.
3. In **Choose a System Element**, select a system element type to filter the available options.
4. In the **System Element** list, select the system element whose queue needs to be reordered.

5. In the **Needed By** section, select the system element.
6. Select the Up or Down arrow.

## Material Server communications

The **Material Server Not in Use** warning displays when commanding a material-enabled phase when communication with the Material Server has been lost. Reestablish communication with the Material Server, depending upon the FactoryTalk Batch Server configuration for material policies when communication with the Material Server is lost:

- If the Material Policy on loss of communication is configured to **Failure and Hold** in the FactoryTalk Batch Server options, the FactoryTalk Batch Server automatically resumes communication with the Material Server when available. The Material Server status indicator changes to **Good** or green in **Diagnostics > Status**. Batches that were HELD continue to run.
- If the Material Policy on loss of communication is configured to **Switch to Manual** in the FactoryTalk Batch Server options, reestablish communication with the Material Server when it becomes available again. When the Material Status indicator changes to **Suspect** or yellow, attempt reconnection to the Material Server.



Tip: The status of each service and data server is indicated by the color:

- Green: Communication is good.
- Yellow: Communication is suspect.
- Orange: Communication is bad.
- Red: Communication is lost.

All material-based decisions or selections made by the operator without communications with the Material Server are reported in **Diagnostics > Journals** as Loss of Material Server and Loss of Material Tracking events. When the material database becomes available, manually reconcile the event journal with the material journal and update the material database with the **Amount**, **Lot**, and **Label** information for material inventory. See the *FactoryTalk Batch Material Editor User Guide* for more information.

After restoring communication with the Material Server, any material-based steps in a HELD state must finish executing to the COMPLETE state before further processing occurs.

## Reestablish communication with the Material Server on manual batches

When the Material Status indicator changes to Suspect, attempt reconnection to the Material Server.

---

**IMPORTANT** After restoring communication with the Material Server, manually reconcile the batch event journal with the material database. All Loss of Material Tracking and Loss of Material Server events indicate material steps that took place without Material Server communication. Use this information to manually update the **Amount**, **Lot**, and **Label** information for the material inventory in the material database. See the *FactoryTalk Batch Material Editor User Guide* for more information.

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Tip: The status of each service and data server is indicated by the color:

- **Green:** Communication is good.
- **Yellow:** Communication is suspect.
- **Orange:** Communication is bad.
- **Red:** Communication is lost.

## To reestablish communication with the Material Server on manual batches

1. Select **Diagnostics**, then **Status**.
2. In the **Data Servers** area, select **Reconnect**.



Tip: **Reconnect** displays next to the Material Server status when the status changes to **Suspect**.

## Journals

**Journals** displays the electronic batch record for a specific batch. The electronic batch record contains information about the events that occur during batch execution or phase execution. FactoryTalk Batch automatically creates the electronic batch record.

View the electronic batch record while the batch or phase is running or after processing is complete. To specify the event types included in the electronic batch record, use the FactoryTalk Batch Equipment Editor **Server Options** dialog box. See the *FactoryTalk Batch Equipment Editor User Guide* for more information.

## View the journal

View information about the events for batch or phase execution in the electronic batch record.

### To view the journal

1. Select **Diagnostics**.
2. Select **Journals**.
3. Select the appropriate batch. The event journal for the batch appears.



Tip: The journal is also available by selecting **Batches > General** and selecting the **<batch create id>.evt** file.

## Sort and filter journal columns

Filter a journal to limit the data returned. Journal columns sort the data in ascending or descending order, with the highest order given to numbers and special characters, followed by alphabetical order. The default journal column is **Time**. A batch may run on three different units. By filtering on a specific unit, only data for the requested unit appears.

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**IMPORTANT** If FactoryTalk Batch Material Manager and FactoryTalk Batch Procedure are not installed, the associated journal columns do not display.

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## To sort and filter journal columns

1. Select **Diagnostic > Journals** and select a journal.
2. To sort, select a column and then the column arrows.
3. To filter, enter a parameter in a selected column.

**Tip:** If a column does not appear, verify that the column is configured to display.

## Arbitration

When the FactoryTalk Batch Server uses system elements to execute recipes, it is called Arbitration. In FactoryTalk Batch View, the Arbitration view allows a user to interact with the arbitration process. An operator can see the status of system elements and can acquire, release, and reorder requests to acquire those system elements. System elements include process cells, units, phases, operation sequences, resources, batches, and the operator.

When a system element receives a request to be acquired, the FactoryTalk Batch Server, on behalf of that system element, issues a request to acquire its own dependent system element or elements. Once the requested system element acquires its own dependent system elements, it can then be acquired by the operator or batch resource user.



**Tip:** Only authorized users (acting as the operator) can acquire and release a system element, as configured in FactoryTalk Batch Security settings.

Batches can request ownership of any system element that can be acquired, including process cells, units, phases, operation sequences, and resources. Batches cannot request ownership of another batch or the operator.

The operator can request ownership of process cells, units, phases, operation sequences, and resources. The operator cannot request ownership of a batch.

In FactoryTalk Batch View, the Arbitration view is available in these scenarios:

- To provide an overall view and manage resources for an area, use **Diagnostics > Arbitration**.
- To observe the execution of a single control recipe, use **Batches > Batch Detail > Arbitration**.

## System elements in Arbitration

System elements that can be arbitrated include:

- **Process cell.** A logical grouping of equipment required for the production of one or more batches.
- **Unit.** Consists of a collection of associated equipment and phases that can carry out one or more major processing activities. The operator can view equipment that a unit acquires, needs, or owns.
- **Phase.** Represents a process action implemented as logic coordinating the use of equipment resources. Typically, phases are implemented as Equipment Phase Programs using the Phase Manager capability in Logix Designer and execute in a ControlLogix controller.

- **Operation sequence.** Coordinates the execution of phases. It is analogous to an operation recipe, except that the operation sequence executes in the ControlLogix controller, while an operation recipe executes in the FactoryTalk Batch Server.
- **Resource.** Can be configured to have a dependency on another piece of equipment or another system element.
- **Batch.** A process that leads to the production of finite quantities of material by subjecting quantities of input materials to a defined order of discontinuous processing actions that use one or more pieces of equipment. Requests ownership of units, operation sequences, phases, and resources.
- **Operator.** Makes informed decisions about the use of equipment and control recipes for an area of the plant to keep the production process operating smoothly. It can request ownership of process cells, units, phases, operation sequences, and resources.

## How Arbitration works

To own a system element, an operator or batch acquires it. When a phase or operation sequence system element is acquired, it can be commanded to change state. Sometimes, making a system element unavailable to the rest of the batch system is sufficient when managing simultaneously running batches. When use of a system element is complete, that system element is released.

System elements are configured to have a maximum number of users. Acquiring a system element may make it unavailable to the rest of the FactoryTalk Batch system.

For example, a storage tank can fill two units at a time via a piping manifold. The piping manifold between the tank and units is configured as an equipment resource, having a maximum of two owners. If three units need to draw material from the tank, the first two units that request to acquire the piping manifold are granted ownership. The third unit's request to acquire the piping manifold is denied and is queued. After one of the owning units releases ownership of the piping manifold, the third unit gains ownership.

When a system element requests ownership of another system element that is already at maximum ownership, the requesting system element is added to the **Needed By** list. When a system element is released by a prior owner, the next system element in the **Needed By** list automatically becomes its owner. If the **Needed By** list is empty, the system element is available to the next request to acquire it.



### Tips:

- If a system element is already owned, attempting to acquire a system element increments the number of its requesters.
- Units, phases, and operation sequences can have only one owner.
- An operator can reorder the list of system elements in the **Needed By** list of a system element.

To view and manage system elements, use these **Arbitration** options:

- **Owns.** A list of system elements that have been requested and are now owned.
- **Owned By.** A list of system elements that own another system element. Units, phases, and operation sequences can be owned by only one system element at a time. Process cells and resources have configured maximum number of owners.
- **Needs.** A list of requested system elements waiting to be acquired. The system element has an arbitration dependency on another system element.
- **Needed By.** A list of system elements that have requested to acquire another system element and are waiting to do so.

## Use filters to search

Filter to display prompts, signatures, control recipes, and equipment that meets the filter criteria.

A filter expression can contain more than one AND or OR, and any combination of AND and OR operators.

To narrow a search, use operators. To create a flexible and powerful filter, combine operators into expressions. Logical operators in expressions are applied in this order:

1. ( )
2. AND
3. OR

When multiple operators of the same precedence are used, they are applied from left to right. For example, `b:A OR b:B AND b:C OR b:D` evaluates in this order:

- `b:B AND b:C` (AND takes precedence over OR) = Result 1
- `b:A OR Result 1` (first OR encountered from left to right) = Result 2
- `Result 2 OR b:D` (the next OR encountered from left to right) = final result



### Tips:

- A space between filters is an implicit AND. For example, `someString someString2` is the same as `someString AND someString2`.
- A search on `someString` includes all search fields. For example, a `someString search` would also contain results for `recipe:someString`, whereas a `recipe:somestring` search would limit `someString` results to the `recipe` field only.
- A search can contain parentheses (and) to change the order of operation.
- Do not use parentheses within an exact-match search string. For example: `recipe:"some(st) ring"`

## To use filters to search

1. In the **Filter** box, enter keywords and operators.

The **Filter** box changes to orange, filter text displays to the right of the filter, and the number of filtered items out of total number of items. For example, 2/4 displays in parentheses beside the **Clear Filter** icon.

To filter on:	Use this operator:	Example:
Two or more keywords	AND (all capital letters)	vanilla AND speed returns a list of items that include the strings vanilla and speed.
One of several keywords	OR (all capital letters)	vanilla OR speed returns a list of items that include the strings vanilla or speed.
Exact keywords	" " (quotation marks)	"high limit" returns a list of items that include the string high limit. Quotation marks indicate the beginning and end of an exact phrase. The search returns matches only when a phrase is identical to the phrase within the quotation marks.

2. Use shortcuts to help filter the list:

- [Filter shortcuts for prompts and signatures](#) on [page 93](#)
- [Filter shortcuts for control recipes](#) on [page 94](#)
- [Filter shortcuts for monitoring a batch](#) on [page 94](#)
- [Filter shortcuts for master recipes](#) on [page 95](#)
- [Filter shortcuts for equipment](#) on [page 95](#)
- [Filter shortcuts for journals](#) on [page 96](#)

3. (optional) To clear the filter and show all entries, select **Clear Filter**.

## Filter shortcuts for prompts and signatures

Use the following shortcuts to help filter the list of prompts, signatures, and instructions.

The **Filter** box filters the list of prompts, signatures, and instructions using text containing alphanumeric characters, full words, fragments of a word, or a single letter or number. Use operators and filters for precise filtering. For example: `description:premium AND recipe:vanilla`.

- To filter the displayed items by using the description, use `description:descriptiontext, desc:descriptiontext, or d:descriptiontext`.
- To filter the displayed items by using the recipe name, use `recipe:recipeName or r:recipeName`.
- To filter the displayed items by using the equipment units, use `units:unitName or u:unitName`.
- To filter the displayed items by using the phase name, use `phases:phaseName or p:phaseName`.
- To filter the displayed items by using the process cell, use `processcells:processCellName or pc:processCellName`.
- To filter the displayed items for all signatures, use `type:e` or `t:e`. To filter the displayed items for all prompts, excluding signatures, use `type:o` or `t:o`. To filter the displayed items for all instruction

prompts, use `type:m` or `t:m`. To filter the displayed items for the instruction prompt state, select the box to the right of the **Filter** bar and select the state.

- To filter the displayed items by using the batch ID, use `batchid:batchname` or `b:batchname`.
- To filter the displayed items by using the create ID, use `createid:createid` or `c:createid`.

## Filter shortcuts for control recipes

Use the following shortcuts to help filter the list of control recipes.

The **Filter** box filters the list of control recipes using alphanumeric characters, full words, fragments of a word, or a single letter or number. Use operators and filters for precise filtering. For example: `description:premium` AND `recipe:vanilla`.

- To filter the displayed items by using the description, use `description:descriptiontext`, `desc:descriptiontext`, or `d:descriptiontext`.
- To filter the displayed items by using the recipe name, use `recipe:recipeName` or `r:recipeName`.
- To filter the displayed items by using the batch ID, use `batchid:batchname` or `b:batchname`.
- To filter the displayed items by using the equipment units, use `units:unitname` or `u:unitname`.
- To filter the displayed items by using the state of the batch, use `state:statename` or `s:statename`.
- To filter the displayed items by showing batches with failures or showing batches without failures, use `failure:yes` or `f:yes` to show batches with failures and `failure:no` or `f:no` to show batches without failures.
- To filter the displayed items by using the phase name, use `phases:phasename` or `p:phasename`.
- To filter the displayed items by using the process cells, use `processcells:processcellname` or `pc:processcellname`.
- To filter the displayed items by using the create ID, use `createid:createid` or `c:createid`.
- To filter the displayed items by using the mode, use `m:mode` or `mode:O_auto`.

## Filter shortcuts for monitoring a batch

In the **Batch Detail** display, use the following shortcuts to help filter in the **Params**, **Reports**, and **Binding** tabs.

The **Filter** box filters the list of parameters, reports, and binding using text containing alphanumeric characters, full words, fragments of a word, or a single letter or number. Use operators and filters for precise filtering. For example: `name:parametername` or `n:parametername`.

- To filter parameters by using the name, use `name:parametername` or `n:parametername`
- To filter parameters by using the value, use `value:parametervalue` or `v:parametervalue`
- To filter parameters by using the engineering unit, use `EngUnit:parametereu`, `e:parametereu`, or `eu:parametereu`
- To filter reports by using the name, use `name:reportname` or `n:reportname`
- To filter reports by using the value, use `value:reportvalue` or `v:reportvalue`
- To filter reports by using the engineering unit, use `EngUnit:reporteu`, `eu:reporteu`, or `eu:reporteu`
- To filter binding by using the name, use `name:bindingname` or `n:bindingname`
- To filter binding by using the type, use `type:bindingtype` or `t:bindingtype`
- To filter binding by using the class or instance, use `ClassOrInst:bindingClassOrInst` or `ci:bindingclassorinst`

## Filter shortcuts for master recipes

The **Filter** box filters the list of master recipes using text containing alphanumeric characters, full words, fragments of a word, or a single letter or number. Use operators and filters for precise filtering. For example:  
`description:premium AND recipe:vanilla.`

To filter the displayed items:

- Using the description, use `description:descriptiontext`, `desc:descriptiontext`, or `d:descriptiontext`.
- Using the recipe name, use `recipe:recipename` or `r:recipename`.
- Using the procedure abstract, use `abstract:abstractword` or `a:abstractword`.
- Using the equipment type, use `equipment:equipmenttype` or `e:equipmenttype`. Equipment types are: class, instance, and class/instance.
- Using the recipe type, use `recipetype:recipetypename` or `rt:recipetypename`. Recipe types are procedure, unit procedure, and operation.
- Using the product code, use `productcode:productcode` or `pc:productcode`.

## Filter shortcuts for equipment

Use shortcuts to filter the list of equipment phases.

The **Filter** box filters the list of equipment using text containing alphanumeric characters, full words, fragments of a word, or a single letter or number. Use operators and filters for precise filtering. For example:  
`name:phasename AND failure:no.`

The equipment data is hierarchical. Filtering is applied at all levels (process cells, units, phases) regardless of the level viewed. For example, entering the filter text `phases:wp_heat_m2` in the **Filter** box at the process level only displays process cells that contain phases with the name `wp_heat_m2`.

- To filter the displayed items by using the name, use `name:name` or `n:name`.
- To filter the displayed items by using the equipment units, use `units:unitname` or `u:unitname`.
- To filter the displayed items by using the batch ID, use `batchid:batchname` or `b:batchname`.
- To filter the displayed items by using the state of the batch, use `state:statename` or `s:statename`.
- To filter the displayed items by showing phases with failures or showing phases without failures, use `failure:yes` or `f:yes` to show phases with failures and `failure:no` or `f:no` to show phases without failures.
- To filter the displayed items by using the mode, use `mode:modename` or `m:modename`.
- To filter the displayed items by using the owner, use `owner:ownername` or `o:ownername`.
- To filter the displayed items by using the process cells, use `processcells:processcellname` or `pc:processcellname`.
- To filter the displayed items by using the phase name, use `phases:phasename` or `p:phasename`.
- To filter the displayed items by showing phases with prompts or phases without prompts, use `prompts:yes` or `pr:yes` to show phases with prompts and `prompts:no` or `pr:no` to show phases without prompts.

## Filter shortcuts for journals

Use the following shortcuts to filter the list of journals in **Diagnostics > Journals**.

The **Filter** box filters the list of journals using text containing alphanumeric characters, full words, fragments of a word, or a single letter or number. Use operators and filters for precise filtering. For example:

`description:premium AND recipe:vanilla.`

- To filter the search by description, use `description:descriptiontext, desc: descriptiontext, or d:descriptiontext.`
- To filter the search by recipe name, use `recipe:recipename` or `r:recipename.`
- To filter the search by batch ID, use `batchid:batchname` or `b:batchname.`
- To filter the search by time, use `time:timestamp` or `t:timestamp.`



## Binding

Binding is the process of mapping steps within a control recipe to actual equipment in a plant. Binding occurs as follows:

- **Unit binding** is the process of selecting a unit that meets the criteria of a recipe's unit requirement. The binding process allows the step and data references to be mapped to tags and phase programs at runtime. Unit binding is available for class-based recipes only.
- **Material phase binding** is the process of either binding unbound material-enabled phase steps to a material phase and associated container or rebinding a previously bound material-enabled phase step within a control recipe.

## Unit binding

Unit binding is the process of selecting a unit that meets the criteria of a recipe's unit requirement. The binding process allows the step and data references to be mapped to tags and phase programs at runtime. Unit binding is available for class-based recipes only.



Tip: Because \$Null and \$Timer are system procedures that are run by the FactoryTalk Batch Server at any level of a recipe, they do not require or display binding data.

Unit binding can occur at each of these levels:

- **Operation recipe.** Coordinates the execution of phases. An operation recipe is constrained to run in one unit and has one unit requirement. Each step of an operation recipe is mapped to a phase that performs the configured action. At runtime, when the operation batch is bound to a unit, its steps can be mapped to phase programs.
  - When an operation is a top-level procedure, the unit binding is either instance-based (defined to run in a specific unit) or class-based (uses the batch creation binding method to select a unit).
  - When an operation recipe is within a unit procedure, it is assigned the bound unit of the unit procedure. For example, if a unit procedure runs three operation recipes in series, each operation recipe must run in the same unit as the unit procedure. When the unit procedure is bound, all operations that run within it are also bound.
- **Unit procedure recipe.** Coordinates the execution of operations. A unit procedure recipe is constrained to run in one unit and has one unit requirement. Steps referencing operation recipes use the bound unit to map steps to phases.
  - When a unit procedure is a top-level procedure, the unit binding is either instance-based (defined to run in a specific unit) or class-based (uses the batch creation binding method to select a unit).
  - When a unit procedure recipe is within a batch procedure, it is assigned the bound unit of the batch procedure step.
- **Batch procedure recipe.** Coordinates the execution of unit procedures. A batch procedure recipe can span many units. Each unit procedure



step references a unit requirement. Before the step can run, its unit requirement must be bound to a unit. When a step is bound, the step's unit procedure, the operation recipes referenced by the unit procedure, and all the phases the operation recipes reference are also bound. All the phases and operation sequences within the batch procedure's step are mapped to the phases and operation sequences that can perform the configured actions.

The four methods for binding units in a batch procedure recipe are:

- **First Available.** The FactoryTalk Batch Server attempts to acquire all legal binding candidates. The first available candidate is bound. The remaining requests are canceled. If there are no unit binding candidates, the batch is held with a failure.



Tip: In the case of a failure, the operator must clear the failure, resolve the binding candidate issue, and restart the batch.

- **Prompt.** When a unit procedure is ready to run, the FactoryTalk Batch Server generates a prompt. An operator must respond to the prompt and assign the unit for binding. The unit instance selected by the operator is acquired and bound to the unit requirement.



Tip: The order of binding candidates in a prompt reflects the application of binding preferences, if they are configured.

- **Batch Creation.** When a batch is being created and added to the **Batches** list, the operator is prompted to select a unit from a list of unit candidates. If there are no binding candidates, an error message is displayed, indicating that no units met the recipe's unit requirement. The batch is not created, and the batch is not added to the **Batches** list.



Tip: When binding expressions are used with creation binding, the expressions are evaluated when the batch is created. In this scenario, the value of the expression can change after the binding occurs. To avoid this situation, use the **Prompt** or **First Available** options.

- **Operator Choice.** When the batch is created, the operator chooses a unit or can select **First Available** or **Prompt** binding.

## Understand unit requirements

Unit requirements are configured in the FactoryTalk Batch Recipe Editor. Unit requirements contain binding requirements and binding preferences.



Tips:

- Unit procedure recipes and operation level recipes run in one unit and have one unit requirement. A batch procedure recipe can have multiple unit requirements.
- In a batch procedure recipe, the unit requirement name can be edited. In unit procedure recipes and operation recipes, the unit requirement is named after the Alias\_<class name> unit class and cannot be edited.
- A unit requirement name is displayed on a step in the **Batch Detail** display when a batch procedure step is not bound. If the step is bound, the bound unit name is displayed.
- If the unit requirement is instance-based, it is by definition bound, and the bound unit name is displayed.

## Understand creation unit binding and unit binding errors

Creation binding is a method that binds a unit to a unit requirement when a batch is being created from a recipe. Each unit requirement whose binding method is configured to be **Creation** binding prompts the operator to select a unit for binding before the batch is put on the **Batches** list. Only unit class members that pass all configured binding requirements are binding candidates. In addition:

- The initial binding candidate list includes all unit instances.
- The list is trimmed by the binding requirements.
- The list is trimmed by evaluating flow paths.
- The list is sorted based on binding preferences.

Binding preferences provide the means to sort the candidate list to display the most preferred binding candidates at the top and the least preferred at the bottom. In addition:

- If a unit does not meet a binding preference, it can still be selected.
- Unmet binding preferences do not exclude units, while unmet binding requirements do exclude units.

A creation binding error occurs when the FactoryTalk Batch Server cannot find units that meet a recipe's unit requirement. The list of binding candidates is empty. The FactoryTalk Batch Server returns four kinds of data about a creation binding error:

- **Error message.** *No legal bind targets found for unit requirement: <unit requirement name>.*
- **Why a unit instance has been rejected.** For each unit instance of the unit class referenced by the unbound unit requirement, the error message displays the unit name and the reason it is not a legal binding candidate.
- **Identification of binding requirements applied.** For each binding requirement of a unit requirement, the configuration of the binding rule is displayed.
- **Identification of binding requirements that are expressions.** For each binding rule that is an expression, the expression and its terms are displayed as applied to each unit instance, as well as the expression's Boolean evaluation value.

## View unit requirements

Unit requirements are configured in the FactoryTalk Batch Recipe Editor. Unit requirements contain binding requirements and binding preferences. View unit requirements during batch execution.

### To view unit requirements

1. Select **Batches**.
2. Select the batch that has the unit requirements you want to view.

3. In the **Batch Detail** display, select a top-level recipe or procedure or a unit procedure step.
4. Select the **Binding** tab. Unit requirements summary information is displayed.



Tip: To find a unit requirement in a list, select the **Filter** field and enter information about the unit. You can filter unit requirements by name, type, and class/instance.

## View unit binding requirements

A binding requirement is an optional part of a unit requirement that specifies a logical expression (evaluating true or false) or a directive (including or excluding units based on configuration). A unit requirement can have any number of binding requirements.

When attempting to bind a unit requirement during recipe execution, the entire set of binding requirements defined on the unit requirement is evaluated against each potential binding candidate.

Units that are unable to meet every binding requirement defined on the unit requirement are eliminated as binding candidates for the unit requirement. A binding requirement expression, as defined within the FactoryTalk Batch Recipe Editor, evaluates either a True or False value (for example, "TEMPERATURE < 20.3").

View unit binding requirements during batch execution.

### To view unit binding requirements

1. Select **Batches**.
2. Select the batch that has the unit requirements you want to view.
3. In the **Batch Detail** display, do either of the following:
  - For a unit procedure or an operation batch, select the background.
  - For a batch procedure, select a step to see that step's unit requirement, or select the procedure to see all unit requirements associated with the batch procedure.

4. Select the **Binding** tab. Summary information for the unit requirements is displayed.



Tip: To find a unit requirement in a list, select the **Filter** field and enter information about the unit. You can filter unit requirements by name, type, and class/instance.

5. Select the unit requirement.
6. In the **Unit Requirement** details, view the binding requirements information, including type and description.



Tip: If a binding requirement type is an expression, select the requirement to display the real-time dynamic values.

7. When finished, select **Close**.

## View unit binding preferences

A binding preference is an optional part of a unit requirement that specifies an arithmetic expression (evaluating to a number), a minimized or maximized parameter or attribute, or a directive (to prefer or avoid units based on configuration). A unit requirement can have any number of binding preferences. A binding preference can specify a preferred or avoided phase, an operation sequence, a unit attribute, an expression, or a minimized or maximized expression.

View unit binding preferences during batch execution.

### To view unit binding preferences

1. Select **Batches**.
2. Select the batch that has the binding preferences you want to view.
3. In the **Batch Detail** display, do either of the following:
  - For a unit procedure or an operation batch, select the procedure.
  - For a batch procedure, select a step to see that step's unit requirement, or select the procedure to see all unit requirements associated with the batch procedure.
4. Select the **Binding** tab. Summary information for the unit requirements is displayed.



Tip: To find a unit requirement in a list, select the **Filter** field and enter information about the unit. You can filter unit requirements by name, type, and class/instance.

5. Select the unit requirement.
6. In the **Unit Requirement** details, view binding preferences information, including type and description.
7. When finished, select **Close**.

## View expression values for unit binding requirements and preferences

In the **Binding Requirement Expression Values** dialog box, a list of units is displayed that shows the potential legal binding candidates for a unit requirement. Each unit requirement displays:

- The unit name
- The current value (**True** or **False**), which shows whether unit binding candidates meet the selected binding requirement
- The order of the units, based on the evaluation of the binding preference expressions



Tip: If all preferences evaluate equally, the unit list is displayed with the lowest to highest equipment IDs, which are defined in the Area Model.

- The current value, which dynamically updates as the inputs to the expression change, and which may reorder the units when the dialog box is closed and reopened
- An expression value indicating whether the binding candidates meet the selected binding requirement




Tip: If { ??? } is displayed in the dialog box, an expression cannot be evaluated by the FactoryTalk Batch Server.


View expression values for unit binding requirements and preferences during batch execution.

## To view expression values for unit binding requirements and preferences

1. Select **Batches**.
2. Select the batch that has the unit requirement expression data you want to view.
3. In the **Batch Detail** display, do either of the following:
  - For a unit procedure or an operation batch, select the procedure.
  - For a batch procedure, select a step to see that step's unit requirement, or select the procedure to see all unit requirements associated with the batch procedure.
4. Select the **Binding** tab. Summary information for the unit requirements is displayed.
 



Tip: To find a unit requirement in a list, select the **Filter** field and enter information about the unit. You can filter unit requirements by name, type, and class/instance.
5. Select the unit requirement.
6. In the **Unit Requirement** details, under **Binding Requirements**, select either a binding requirement or a binding preference to display the real-time values of the expressions.
  - For binding requirements, the **Binding Requirement Expression Values** dialog box is displayed.
  - For binding preferences, the **Binding Preference Expression Values** dialog box is displayed.
7. View the expression data.
 



Tip: The current value updates in real-time.
8. When finished, select **Close**.
9. In the **Unit Requirements** dialog box, select **Close**.

## Manually bind a unit

In a batch procedure control recipe, an operator can manually bind a unit to a unit requirement that is referenced by a unit procedure step. A previously bound unit requirement can also be manually unbound and rebound to a different unit. You can also reassign a unit procedure step for either **Prompt** binding or **First Available** binding.

A unit requirement previously assigned to a unit can be manually reassigned to a different unit, as long as the unit procedure step is not active.

## Prerequisites

To perform manual binding to a unit procedure step in a batch procedure control recipe, make sure these conditions are met:

- The unit requirement of the selected step is class-based.
- The step is inactive or has a binding status of **BINDING** on the transition prior to the step.



Tips:

- When the binding workflow is initiated, the binding candidate list contains zero or more unit binding candidates and has **First Available** and **Prompt** binding options.
- All steps within the batch procedure recipe that are associated with the same unit requirement are bound to the same unit.

## To manually bind a unit

1. Select **Batches**.
2. Select the procedure-level control recipe that has the unit procedure step to be bound.
3. In the **Batch Detail** display, select the unit procedure step.
4. Select **Bind**
5. In the **Select Unit to Bind Unit Requirement** list, select the appropriate binding option and select **OK**.



Tip: The candidate list reflects the configuration of the unit requirement including the unit class, flow paths with upstream and downstream dependencies, and binding requirements. The list can be sorted by binding preferences.

## Set up prompted unit binding

Prompted binding is the process of binding a unit to a unit procedure step after a prompt is generated. Only those unit requirements defined with the **Prompt** binding method generate a prompt.

When prompted binding is configured, the execution of the batch pauses when the transition above the unbound step becomes true.


## To set up prompted unit binding

1. Select **Batches**.
2. Select a batch.
3. In the **Batch Detail** display, select a unit procedure step.
4. Select **Bind**
5. In **Select Unit to Bind Unit Step**, select **Prompt**.
6. Select **OK**.

## Respond to a unit binding prompt

Unit binding prompts are displayed when the operator has set up prompted binding for unit procedure steps. Respond to the unit binding prompts to select a unit to bind to a unit procedure step when the recipe is running.

## To respond to a unit binding prompt

1. Select **Batches**.
2. Select a batch.
3. In the **Batch Detail** display, select **Start**  to execute the recipe.  
The recipe is running, and a prompt alert is displayed.
4. Select **Prompts** and select the unit binding prompt for the recipe that is running.
5. Select a unit from the list.
6. Select **Acknowledge**.

## Material Phase Binding

Material phase binding is the process of either:

- Binding unbound material-enabled phase steps to a material phase and associated container
- Rebinding a previously bound material-enabled phase step within a control recipe

When configuring an operation recipe's step that references a material phase class, the operator can select one of the three types of binding:

- **A specific material phase and container.** The operator chooses a specific phase and container pair from the list.
- **Automatic:** The FactoryTalk Batch Server selects the equipment phase associated to the highest-priority container.
- **Prompt.** The operator must select a phase/container while the recipe is running.

To perform material binding, these criteria must be true:

- The step is associated with a material-enabled phase class in the recipe.
- The step is inactive or has a status of BINDING.

## Manually bind a material phase instance and associated container to a material phase step

A configured material requirement of the operation recipe's step gives the FactoryTalk Batch Server and Material Server enough information to select and bind a phase instance and its associated material containers to a batch. As a result, the correct phase that has access to the ingredient required is selected and run.

Manually binding a material-enabled phase step requires the operator to select not just a phase, but the container the phase is associated with, and depending on the material container type, the exact subplot (a specific measured amount of an ingredient) to be used.

In an operation control recipe, an operator can manually bind a phase instance and associated container to a material phase that is referenced by an operation step. A previously bound material phase step can also be manually

unbound and rebound to a different phase/container. You can also reassign a material phase step for either **Prompt** binding or **Automatic** binding.


A material phase step previously assigned to a phase/container can be reassigned manually to a different phase/container, as long as the material phase step has not already executed.

## Prerequisites

To perform manual binding to a material phase step in a batch procedure control recipe, make sure these conditions are met:

- The selected phase step is material-enabled.
- If the step is set to **Prompt** binding and the FactoryTalk Batch Server has issued the operator bind prompt, the step is inactive or has a binding status of BINDING on the transition prior to the step.

## To manually bind a phase instance and associated container to a material phase step


1. Select **Batches**.
2. Select a batch that has the step that requires binding.
3. In an operation's **Batch Detail** display, select the material phase step.
4. Select **Bind** .
5. In **Binding a Material Phase Step**, select a phase/container pair to bind to the material phase step.
6. Select **OK**.

## Manually assign prompted material phase binding to a material phase step

Prompted material phase binding is the process of binding a material phase after a prompt is generated. Only those requirements defined with the **Prompted Binding** method generate a prompt.

When prompted material phase binding is set up, the execution of the batch pauses when the transition above the unbound step becomes true.

## Manually assign prompted material phase binding to a material phase step


1. Select **Batches**.
2. Select a batch.
3. In the **Batch Detail** display, select a material step.
4. Select **Bind** .
5. In **Binding a Material Phase Step**, select **Prompt**.
6. Select **OK**.



## Respond to a material phase binding prompt

Material phase binding prompts are displayed when the operator has set up prompted binding for material phase/container pairs. Respond to the binding prompts to select a material phase/container pair when the recipe is running.

### To respond to a material phase binding prompt

1. Select **Batches**.
2. Select a batch.
3. In the **Batch Detail** display, select **Start** to execute the recipe.  
The recipe is running, and a prompt alert is displayed.
4. Navigate to the **Prompts** list and select the material phase binding prompt for the recipe that is running.
5. Select a material phase/container pair from the list.
6. Select **Acknowledge** .

## **FactoryTalk Batch View summary**

In this section, you:

- Setup the connection to the FactoryTalk Batch View client.
- Reviewed the use of prompts.
- Created a control recipe.
- Commanded a batch.
- Monitored a batch.
- Reviewed the equipment resources.
- View diagnostic information.
- Used filters to search for different items.
- Reviewed the types of binding.





## FactoryTalk Event Archiver

FactoryTalk Event Archiver collects data from the batch record files (.evt files) generated by the FactoryTalk Batch Server, and stores the data in a SQL Server database.

### Features and capabilities

The FactoryTalk Batch Server creates an electronic batch record for every batch on the **Batch List**. View this batch record file with a text processor or spreadsheet application. FactoryTalk Event Archiver collects data from each electronic batch record file and writes it to the database. Each electronic batch record file contains individual lines, each representing an event that occurred in a batch. FactoryTalk Event Archiver inserts a unique identifier with date and time to each event into the database.

FactoryTalk Event Archiver writes data to the **BatchHis** SQL table in the **BatchHistory** database. FactoryTalk Event Archiver with Reporting Services writes data to the **BHBatchHis** SQL table in the **BatchHistoryEx** database.

Configure FactoryTalk Event Archiver to archive data to the database in either of two ways:

- End-of-Batch
- Incremental

With End-of-Batch archiving, FactoryTalk Event Archiver inserts records into the database after a batch is removed from the batch list. The FactoryTalk Batch Server initiates FactoryTalk Event Archiver when a batch is removed from the batch list to archive the removed batch.

With Incremental archiving, FactoryTalk Event Archiver inserts records into the database on a pre-defined schedule. Configure this archiving time interval in FactoryTalk Batch Equipment Editor.

When a control recipe on the FactoryTalk Batch Server executes, the server adds the name of the batch record file to the FactoryTalk Event Archiver work queue file (**Archque.txt**). After FactoryTalk Event Archiver inserts all of the electronic batch records into the database, and the file is marked for removal from the batch list, FactoryTalk Event Archiver removes the name of the batch record file from the work queue file. FactoryTalk Event Archiver does not delete the batch record file unless it is specifically configured.

If FactoryTalk Event Archiver cannot successfully insert each item from the batch record file, it does not remove the name from the FactoryTalk Event Archiver work queue file. Each time FactoryTalk Event Archiver runs, it attempts to insert the records from each file listed in the queue into the database. In the event of a failure, FactoryTalk Event Archiver attempts to store the data later. This helps make sure that failures do not result in a loss of archived data.

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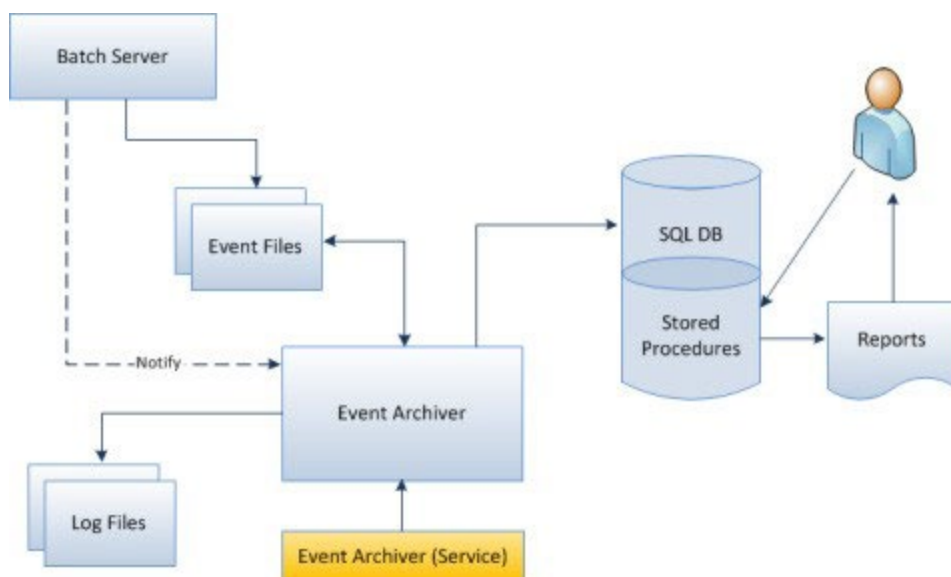
**IMPORTANT** When FactoryTalk Event Archiver runs at the end of a batch, the FactoryTalk Batch Server runs FactoryTalk Event Archiver as a Windows IDLE\_PRIORITY process. If the system is busy, higher-priority functions supersede FactoryTalk Event Archiver slowing the archiving process.

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## System architecture

FactoryTalk Event Archiver is a Windows service that archives events from the FactoryTalk Batch Server. Events are written to SQL database tables. View the events stored in the database as HTML reports with the Reporting Services.

### FactoryTalk Event Archiver with Reporting Services system architecture



FactoryTalk Event Archiver can run incrementally while a batch is running, or after a batch completes. FactoryTalk Event Archiver executes in a continuous loop using these basic steps:

1. The FactoryTalk Batch Server creates an event file.
2. FactoryTalk Event Archiver reads event records from the event file and translates them into SQL statements.
3. FactoryTalk Event Archiver writes the data to the SQL database.
4. FactoryTalk Event Archiver logs all archiving activities to a log file.
5. When Reporting Services is installed, reports can be generated from event data stored in the database.

## Run the FactoryTalk Event Archiver to insert batch record data

Use the following instructions to run the FactoryTalk Event Archiver to insert batch record data.

### To run the FactoryTalk Event Archiver to insert batch record data:

1. The operator or Manufacturing Execution System (MES) starts a batch. If it is to run in the incremental mode, the FactoryTalk Event Archiver must be enabled as a Windows service.
2. An electronic batch record file (.evt) is created.
3. The electronic batch record file's name is added to the electronic batch record directory file, **EventDir.txt**.
4. The FactoryTalk Batch Server incrementally writes to the work queue file in FactoryTalk Event Archiver, **ArchQue.txt**. The data in this file consists of the path to the electronic batch record file and, if the batch has been removed from the batch list, a tab and the word *REMOVED* follows the file name.
  - **End-of-Batch Archiving:** When a batch is removed from the batch list, the FactoryTalk Batch Server sends a message to the FactoryTalk Event Archiver to start running. The FactoryTalk Event Archiver must be enabled.
  - **Incremental Archiving:** The FactoryTalk Event Archiver runs on a pre-defined schedule. The FactoryTalk Event Archiver must be active at all times during batch processing.
5. The FactoryTalk Event Archiver reads the **ArchQue.txt** file for the name of the electronic batch record file and the status of the batch.
6. The FactoryTalk Event Archiver reads the electronic batch record file.
7. The FactoryTalk Event Archiver inserts records into the database.
8. If electronic batch record data is successfully inserted into the database, the file's name is removed from the **ArchQue.txt** file.

Steps 4 through 7 are repeated until the FactoryTalk Event Archiver has attempted to insert each electronic batch record file listed in the **ArchQue.txt** file into the database.

## FactoryTalk Event Archiver summary

In this section you:

- Learned about the system architecture of the FactoryTalk Event Archiver.

This chapter provided a brief overview of the capabilities of the FactoryTalk Event Archiver. (See the *FactoryTalk Event Archiver User Guide* for more information.)





## FactoryTalk Batch View HMI Controls

The FactoryTalk® Batch View HMI controls provide an interface that allows users to monitor and interact with the production process within a FactoryTalk View SE Display Client. The FactoryTalk Batch View HMI controls consist of:

- **BatchesList** control: Creates control recipes, displays current control recipes, and commands a control recipe. Shown as **BatchViewHMI.BatchesList** in the **Insert HMI Controls** dialog box and the **Property Panel**.
- **PromptsList** control: Displays a list of prompts that are waiting to be acknowledged, a list of electronic signatures associated with a batch that are waiting for signoff, and instructions waiting to be acknowledged. Shown as **BatchViewHMI.PromptsList** in the **Insert HMI Controls** dialog box and the **Property Panel**.
- **SFC** control: Enables the ability to command batches during FactoryTalk View SE runtime on the Details and Summary pages of the SFC. Shown as **BatchViewHMI.SFC** in the **Insert HMI Controls** dialog box and the **Property Panel**.
- **Full** control: Accesses the entire FactoryTalk Batch View site. In FactoryTalk View SE, shown as **BatchViewHMI.FullView** in the **Insert HMI Controls** dialog box and the **Property Panel**.

### BatchesList control

Use the **BatchesList** control to create, view, and command control recipes. Access the **BatchesList** control by placing it in a FactoryTalk View SE display. Control recipes are displayed on the Batches list until they are removed by the operator or when the FactoryTalk Batch Server is restarted with a cold boot.

Refer to the *FactoryTalk Batch View HMI Controls User Manual* to learn more about:

- BatchesList control methods
- BatchesList control properties
- BatchesList control events
- BatchesList control scripting support
- Base filter shortcuts for the BatchesList control

### PromptsList control

The **PromptsList** control displays a list of prompts and instructions waiting to be acknowledged and a list of electronic signatures associated with a batch that are waiting for signoff.

Prompts alert operators to requests for information. A control recipe cannot complete execution until the operator provides the requested information. A pending request for information remains unacknowledged until a user provides the information, stops, or aborts the control recipe. Requests for information include prompts, manual instructions, and signatures.

- Prompts alert operators to requests for parameter values, unit binding, and material binding.
- Instructions are individual steps of a manual instruction phase. As a batch executes, the instruction or set of instructions for each active step appears. Instructions execute in the order specified within the master recipe.
- Signatures are requests for signoffs that require user permissions and optional comments. When a signature is generated against a control recipe, acknowledge the signature by completing the associated signoffs. The requested user information in a signature is determined by the signature template.

Refer to the *FactoryTalk Batch View HMI Controls User Manual* to learn more about:

- PromptsList control methods
- PromptsList control properties
- PromptsList control events
- PromptsList control scripting support
- Base filter shortcuts for the PromptsList control

## SFC control

The **SFC** control displays the SFC batch structure, which is the same as the FactoryTalk Batch View **Batch Details** display page. The **SFC** control supports the set of commands an operator can perform on a selected batch or step. The **SFC** control generates events when an operator interacts with the running batch. Some property data of the **SFC** control is maintained for scripting.

Refer to the *FactoryTalk Batch View HMI Controls User Manual* to learn more about:

- SFC control methods
- SFC control properties
- SFC control events
- SFC control scripting support

## Full control

The **Full** control displays the entire FactoryTalk Batch View site, so that an operator can interact with the site using a single HMI control in a FactoryTalk View SE Display Client.

Use the **Full** control to create, view, and command control recipes, acknowledge prompts and signatures, view equipment phases and diagnostic information, and view profile information. The **Full** control has some

differences from viewing the **BatchesList** control or **PromptsList** control individually. In the Full control:

- The FactoryTalk Batch View navigation bar is shown instead of the **Diagnostic** bar.
- There is no **BaseFilter** property.

Refer to the *FactoryTalk Batch View HMI Controls User Manual* to learn more about:

- Full control methods
- Full control properties

## Diagnostic bar overview

The diagnostic bar provides status information when viewing the **BatchesList** control, **PromptsList** control, and **SFC** control in a FactoryTalk View SE Display Client.



Item	Description
1	Return to the <b>Home</b> page to view the list of items.
2	View the item count notification for the control type in the display window. If a base filter has been applied, the item count is the number of items after the filter was applied. If there is a syntax error in the base filter, the item count remains unchanged from the unfiltered list.
3	View the configured base filter value. The base filter icon only displays if a base filter is in use.
4	The name of the control type in the display window.
5	The domain and account name information for the logged in user.
6	The status of the FactoryTalk Batch Server's associated data servers and the FactoryTalk Batch Material server.
7	Provides access to the online help.

## Properties, methods, and events

Properties, methods, and events allow you to customize objects created by the FactoryTalk Batch View HMI controls. An object is a combination of code that can be treated as a unit, such as a control, form, or application. Each object is defined by a class. There are four object classes provided in the FactoryTalk Batch View HMI controls: **BatchesList**, **PromptsList**, **SFC**, and **Full**. Each of these objects has associated properties, methods, and events.

- **Property:** A named attribute of a control, form, application, or other object. Properties define object characteristics such as size, color, and screen location, or the state (for example, enabled, disabled) of an object.
- **Method:** A procedure that acts on an object.

- **Event:** An action (such as clicking the mouse or pressing a key) recognized by an object for which you can write code to respond. Events can occur as a result of a user action or program code or can be triggered by the control.

## Configure the control property settings

In FactoryTalk View SE, configure the control properties using the **Property Page** or the **Property Panel** and then configure the control to use Visual Basic®.



Tip: Behavior of the control properties differs depending on whether display caching is used.

**If caching is not used:**

Switching screen/display: If the user changed the design time value at runtime, returns to the design time value.

**If caching is used:**

Switching screen/display: If the design time value was changed at runtime, the screen is not reloaded so it never returns to the design time value.

To enable caching:

1. In FactoryTalk View SE, open **Display Settings**.
2. In **Cache After Displaying**, select **Yes**.
3. Select **OK**.

## Configure the control properties using the Property Page

To configure the **BatchesList** control, the **PromptsList** control, the **SFC** control, and the **Full** control to communicate with FactoryTalk Batch View, customize the settings in the **Property page** for the control.

### Prerequisites

- Open FactoryTalk View Studio.
- Open a display that contains a **FactoryTalk Batch View HMI** Control.

### To configure the control properties using the Property page

1. In the display window, right-click a **FactoryTalk Batch View HMI** control and select **Properties**.
2. In **Node**, enter the computer where the FactoryTalk Batch server and the FactoryTalk Batch View server is installed.



Tip: The computer can be the machine name, machine IP address, or *localhost*.

3. In **Port**, enter the port where the FactoryTalk Batch View server is configured to receive communication.



Tip: The default port number is 443. If the FactoryTalk Batch View Service is installed on a different port, launch the client on the FactoryTalk Batch View Server machine to identify the port number.

4. (optional) Perform any of these steps:
  - Select the **Enable Commanding** option.
  - In the **BatchesList** control, enables the ability to create and command batches during FactoryTalk View SE run-time.

- In the **PromptsList** control, enables the ability to respond to prompts, such as to enter parameter values and to acknowledge prompts, enables the ability to sign-off on electronic signatures, and enables the ability to respond to instructions.
  - In the **SFC** control, enables the ability to command batches during FactoryTalk View SE run-time on the **Details** and **Summary** pages of the SFC.
  - In the **Full** control, enables these abilities for batches and prompts. This property also enables the ability to perform Manual Phase Control in the **Equipment** page.
5. (optional) These are available in **BatchesList** and **PromptsList** controls only:
    - To display the filter bar during FactoryTalk View SE run-time, select the **Show Filter Bar** option.
    - To display the batches or prompts in a minimized format, select the **Minimal View** option.
    - To limit the items shown during FactoryTalk View SE run-time, enter an expression in **Base Filter**.
  6. Select **Apply**, and then select **OK**.
  7. In the FactoryTalk View SE toolbar, select **Save**.

## Configure the control properties using the Property Panel

To configure the **BatchesList** control, the **PromptsList** control, the **SFC** control, and the **Full** control to communicate with FactoryTalk Batch View, customize the settings in the **Property Panel** for each control.

### Prerequisites:

- Open FactoryTalk View Studio.
- Open a display that contains a **FactoryTalk Batch View HMI** control.

### To configure the control properties using the Property Panel

1. In the display window, right-click a **FactoryTalk Batch View HMI** control and if it is not already displayed, select **Property Panel**.
2. In **Node**, enter the computer where the FactoryTalk Batch server and the FactoryTalk Batch View server are installed.



Tip: The computer can be the machine name, machine IP address, or *localhost*.

3. In **Port**, enter the port where the FactoryTalk Batch View server is configured to receive communication.



Tips:

- The default port number is 443. If the FactoryTalk Batch View Service is installed on a different port, launch the client on the FactoryTalk Batch View Server machine to identify the port number in the URL.
- The port number is not shown in the URL if the default port number (443) is in use.

4. (optional) Perform any of these actions.
  - (If available) To display the filter bar during FactoryTalk View SE runtime, select **True** for the **ShowFilterBar** option.
  - To enable specific behavior for controls, select **True** for the **EnableCommand** property option.
    - In the **BatchesList** control, enables the ability to create and command batches during FactoryTalk View SE runtime.
    - In the **PromptsList** control, enables the ability to respond to prompts, such as to enter parameter values and to acknowledge prompts, enables the ability to sign-off on electronic signatures, and enables the ability to respond to instructions.
    - In the **SFC** control, enables the ability to command batches during FactoryTalk View SE runtime on the **Batch Details** display and the **Summary** page of the SFC.
    - In the **Full** control, enables these abilities for batches and prompts. This property also enables the ability to perform Manual Phase Control in the **Equipment** page.
5. (optional) These are available in **BatchesList** and **PromptsList** controls only:
  - To display the batches or prompts in a minimized format, select the **Minimal View** option.
  - To limit the items shown during FactoryTalk View SE runtime, enter an expression in **Base Filter**.
6. Close the **Property Panel**.
7. Select **Save**.

## Configure the control to use VBA

To configure the **BatchesList** control, the **PromptsList** control, **SFC** control, and the **Full** control to use Visual Basic, customize the **ExposeToVBA** setting in the **Property Panel**.

### Prerequisites:

- Open FactoryTalk View Studio.
- Open a display that contains the **FactoryTalk Batch View HMI** control.

### To configure the control to use VBA

1. In the display window, right-click the control.
2. Select **Property Panel**.
3. In **ExposeToVBA**, select **VBA Control** to use VBA for scripting.
4. Close the **Property Panel** window.

5. Select **Save**. The control properties, methods, and events are now exposed to VBA, where you can modify and manipulate the control using VBA code.

## Languages

The HMI User Controls inherits the language configured within FactoryTalk View SE.



Tip: For more information on FactoryTalk View SE language settings, see *Set up languages for an application (General tab)* in FactoryTalk View SE help.

The language configured in FactoryTalk View SE requires corresponding files configured in FactoryTalk Batch View Server to support the full implementation of language-switching. If a FactoryTalk View SE language is not supported on the FactoryTalk Batch View Server, the language defaults to English (EN).

The user control language can be changed at runtime using the FactoryTalk View SE language-switching mechanism.

With HMI Controls, you can:

- **Generate language locales on the FactoryTalk Batch View Server:** Add a language locale using a program that requires a .csv input file containing the string translations. FactoryTalk Batch View uses the language definition file selected in the Language list.
- **Run the localize tool via command prompt:** The localize tool validates the .csv file that contains the languages FactoryTalk Batch View uses. The localize tool generates a language definition file for each locale definition. The language definition files allow FactoryTalk Batch View to select different languages in the **Profile** area.
- **Run the localize tool with a GUI:** The localize tool validates the .csv file, and generates a language definition file for each locale definition. The language definition files allow FactoryTalk Batch View to select different languages in the **Profile** area.
- **View supported languages:** Supported languages are defined in and can be viewed from FactoryTalk View SE.

## Generate language locales on the FactoryTalk Batch View Server

You can add a language locale by using an application that can read a .csv input file containing the string translations. FactoryTalk Batch View uses the language definition file selected in the Language list.

### To generate a language locale

1. Navigate to the FactoryTalk Batch View install location on the computer.



Tip: The default FactoryTalk Batch View install location is **Program Files (x86) > Rockwell Software > Batch View Server > tools**.



2. Use Microsoft Excel or another spreadsheet program to open the file: **localized\_strings.xlsm**.
3. In Row 1, add the new language name code to the next available column. For example, for Spanish, use es in FactoryTalk Batch View and use es-ES for HMI User Control integration with FactoryTalk View SE.
4. Replace the English user interface term with the specific language translation for the user interface term in the row. Repeat until all terms have translations.
5. Save the **localized\_strings.xlsm** file.
6. Export to .csv and save the file as **localizedstrings.csv**.
7. Run the localize tool.

## Run the localize tool with command-line options

The localize tool validates the .csv file that contains the languages FactoryTalk Batch View uses. The localize tool generates a language definition file for each locale definition. The language definition files allow FactoryTalk Batch View to select different languages in the **Profile** area. Use command-line options to generate the language definition file as part of the install command.

### Prerequisites

- If the **locales** folder does not exist, create it in the install directory. The default install location is **Program Files (x86) > Rockwell Software > Batch View Server**.

### To run the localize tool

1. Open a command prompt.
2. Set the command prompt path to the **tools** directory in the install directory. For example, C:/Program Files (x86)/Rockwell Software/Batch View Server/tools.
3. Enter `localize-tool.exe install -c ./localizedstrings.csv -i ..\locales`.  
The tool runs and generates a language definition file.

## Run the localize tool with a GUI

The localize tool validates the .csv file and generates a language definition file for each locale definition. The language definition files allow FactoryTalk Batch View to select different languages in the **Profile** area. A graphical user interface (GUI) steps you through selecting the localized strings files and the directory in which to install the languages.



## Prerequisites

- If the **locales** folder does not exist, create it in the install directory. The default install location is **Program Files (x86) > Rockwell Software > Batch View Server**.

## To run the localize tool with a GUI

1. Open a command prompt.
2. Set the command prompt path to the **tools** directory in the install directory. For example, `C:/Program Files (x86)/Rockwell Software/Batch View Server/tools`.
3. Enter `localize-tool.exe install`.
4. In the dialog box, select the **localizedstrings.csv** file.
5. In the dialog box, select the folder where the language definition will be saved, by default the install directory, `C:/Program Files (x86)/Rockwell Software/Batch View Server/locales`.  
The tool runs and generates a language definition file.



## PC-based phases introduction

The PC-Based Phase option is an ActiveX control that allows you to design phases for use in FactoryTalk Batch recipes. These phases can be used for a variety of tasks, such as operator prompts, timers and calculations. A PC-based phase communicates with the FactoryTalk Batch Server and does not require a process-connected device. It can be used in place of phase logic, allowing you to decrease the amount of memory required within your process-connected device.

PC-based phases use the **Batch Phase Execution** control, which encapsulates the FactoryTalk Batch phase logic interface and the OPC interface. The **Batch Phase Execution** control functions as a data server for PC-based phases and supports the full functionality of a FactoryTalk Batch phase. It is an SP-88-aware component and is used to provide Level 2 control of the FactoryTalk Batch Control system. The **Batch Phase Execution** control is a persistent component that supports automatic checkpointing. It can be accessed directly from within Visual Basic, Access, or any other Microsoft-compatible control container.

(See the *FactoryTalk Batch PC-Based Phase Programmer's Technical Reference* for more information.)

## PC-based phases

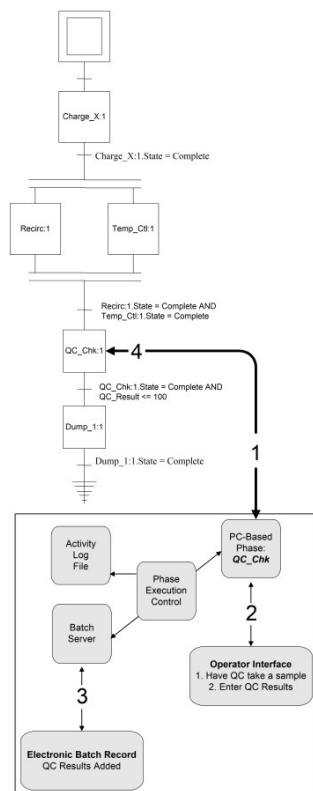
A PC-based phase allows you to program a phase outside a process-connected device (PCD). You can program the phase to meet your own unique requirements from within your Microsoft-compatible control container. The PC-based phase works the same as any phase defined in a PCD, communicating with the FactoryTalk Batch Server through the **Batch Phase Execution** control. This allows you to save your system's valuable memory for processes that require interaction with hardware.

After a PC-based phase is created, the FactoryTalk Batch area model must be updated to include the new phase and the appropriate phase(s). Because the **Batch Phase Execution** control behaves as a data server, a new data server definition must be created. The data server definition is created using the FactoryTalk Batch Equipment Editor and defined using the **Batch Phase Execution** control's communication parameters. The FactoryTalk Batch phase can then be added to your recipes. The PC-based phase must remain active during recipe execution, allowing the phase to communicate with the FactoryTalk Batch Server through the **Batch Phase Execution** control.

## Execution of a PC-based phase example

An example of a PC-based phase executing within a recipe is shown. The PC-based phase is created to prompt the operator to take a sample to **Quality** control (QC) and then enter the results. The phase communicates with the FactoryTalk Batch Server by way of the **Batch Phase Execution** control. The phase can direct the server to prompt the operator, wait for results and have the FactoryTalk Batch Server store the result in the electronic batch record. The recipe will only proceed if the result is within the appropriate range.

In **Step 1**, as the batch is processed, the **QC\_Chk** phase is executed. In **Step 2**, the **QC\_Chk** phase displays a screen to the operator, requesting that the operator have QC take an in-process sample. The **QC\_Chk** phase will not continue processing until the operator enters the QC result. In Step 3, When the operator enters the result, the **QC\_Chk** phase sends the report value to the FactoryTalk Batch Server, using the **Batch Phase Execution** control, which stores the value in the electronic batch record. While the phase is executing, an activity log file is updated with process events. In **Step 4**, control is returned to the recipe, and it continues processing the balance of the transitions and steps.



## PC-based phases summary

In this section you:

- Learned about the execution of PC-based phases.

This chapter provided a brief overview of the capabilities of PC-based phases. (See the *FactoryTalk Batch PC-Based Phase Programmer Technical Reference Guide* for more information.)



## Glossary

### **acquire**

To gain ownership of a resource. Resources can be acquired automatically when a batch runs. Resources can also be acquired manually in the Arbitration and Phase Control processes.

### **acquiring**

Acquiring is a possible state of the **Firing attribute** of a transition. When the transition is in the Acquiring state, it has made non-binding related arbitration requests for resources needed by one or more steps following the transition.

### **action**

An Action is a queued Execute command to the FactoryTalk Batch Server that is pending one or more Signature completions prior to being performed.

### **action ID**

A 32-bit unsigned integer that uniquely identifies an action.

### **activation file**

A text file that contains all of the activation information that is required to license a software product and allow it to properly function. While the file is simply plain text, the contents of the file are protected by a signature.

### **ActiveX controls library**

The ActiveX Controls Library is a set of ActiveX Custom Controls that allows you to create and control batches without using the FactoryTalk Batch View, and also provides the ActiveX tools needed to create a custom user interface.

**allocation**

A form of coordination control that assigns a resource. An allocation can be for the entire resource or for portions of a resource.

**AND (Divergence)**

A structure in the sequential function chart (SFC) that indicates steps are activated concurrently.

**approval process (for a recipe)**

An umbrella term for the Primary approval and Expedited approval processes that are used to validate the development and maintenance of batch recipes. (Only one process can be used at a time.) Using signature certification, the approvals process for a recipe safeguards design workflow in a formalized manner. This ensures each recipe is validated by authorized personnel before being released to production.

**arbitration**

A form of coordination control that determines how a resource should be allocated when there are more requests for the resource than can be accommodated at one time.

**area**

A component of a batch manufacturing site that is identified by physical, geographical or logical segmentation within the site.

**area model**

The physical component of a batch facility. A database that consists of all equipment in the facility and all of the tasks that it is capable of performing.

**assigning**

The act of issuing a value to a parameter.



**automation server**

A software application that contains objects that can be used easily by other applications through the encapsulation and reuse of code.

**batch**

An entity that represents the production at any point in the process. A batch is a running control recipe. The material that is being produced or that has been produced by a single execution of a recipe is also considered a batch.

**batch control**

Consists of a sequence of one or more steps (phases) that must be performed in a defined order for a finite period of time to process finite quantities of input material to produce finished product.

**batch process**

A process that leads to the production of finite quantities of material by subjecting quantities of input materials to a defined order of discontinuous processing actions using one or more pieces of equipment.

**binding**

Binding is the process of mapping steps within a control recipe to actual equipment in a plant.

**binding (in transitions)**

Binding is a possible state of the **Firing attribute** of a transition. When the transition is in the Binding state, it is in the process of attempting to bind one or more of the steps following the transition. The binding process may involve the generation of binding prompts and/or the generation of arbitration requests.

**binding preference**

A Binding Preference is an object that can be evaluated against instance of a unit class in order to sort the legal bind targets for a unit requirement into a **most preferred** order.

## binding requirement

A Binding Requirement is an object that can be evaluated against instances of a unit class to determine which instances of the class are legal bind candidates for a unit requirement. When attempting to bind a unit requirement during recipe execution, the entire set of binding requirements defined on the unit requirement is evaluated against each potential binding candidate. Units that are unable to meet every binding requirement defined on the unit requirement are eliminated as potential binding candidates for the unit requirement.

## binding requirement expression

A Binding Requirement Expression, as defined within the Equipment Editor, evaluates to either a TRUE or FALSE value. An example would be "TEMPERATURE < 20.3".

## check in

Check in creates a new version of a recipe, which is read-only and designated with a ~Vn suffix (where n is the version number).

Example: Checking in *Make\_sauce* results in the creation of the *Make\_sauce~V1* version.

## check out

Check out creates an editable WIP (work-in-progress) recipe, designated with a ~Vn\_WIP suffix (where n is incremented by one).

Example: Checking out *Make\_sauce~V1* results in the creation of *Make\_sauce~V2\_WIP*. Subsequently, when *Make\_sauce~V2\_WIP* is checked in, it will result in the read-only *Make\_sauce~V2* version.

## class-based recipe

A recipe that specifies one or more unit classes for equipment requirements. The operator will then be required to specify a particular unit at the time the batch is created.

## client

A component or subsystem that uses data or functionality provided by some other component or subsystem (the server). The term can also refer to the computer that executes this software, connecting to a server computer across a communication network.

**command buttons**

The buttons used to initiate functions.

**comm err**

Comm Err is a possible state of the **Firing attribute** of a transition. When the transition is in the Comm Err state, a communications error with phase logic has been detected while the transition was in the Stopping/Resetting/Pending states of the firing process. The transition has rolled back to the beginning of the Stopping/Resetting/Pending process and is awaiting good communications and a RESTART command before re-initiating the firing process.

**committed**

Committed is a possible state of the **Firing attribute** of a transition. When the transition is in the Committed state, it has committed to the firing process, but is not in the process of firing because either the transition is in the HELD state or the parent procedure is in MANUAL mode.

**common resource**

A service that is provided to more than one requester. Common resources are identified as either exclusive-use resources or shared-use resources.

**control module**

A regulating device, a state-oriented device, or a combination of regulating and state-oriented devices that are controlled as a single device. This term applies to both physical equipment and the equipment entity.

**control recipe**

A type of recipe, which through its execution, defines the manufacture of a single batch of a specific product.

**control strategy**

A user-defined grouping of phase and report parameters associated with a single phase. Organizing parameters into separate control strategies allows phases to assume multiple roles without generating unnecessary phase I/O.

**container recipe**

A recipe that contains one or more steps assigned to a specified operation-level recipe or unit procedure-level recipe retrieved when using the Find Recipe References option.

**coordination control**

A type of control that directs, initiates, or modifies the execution of the procedural control and the utilization of equipment entities.

**data server**

A data server provides runtime information to the FactoryTalk Batch Client or the HMI software. This information comes from the PLC or PCD.

**DCS (Distributed Control System)**

A Distributed Control System (DCS) is a control device. Logic (programs) contained in the DCS read or write to the inputs or outputs of the field devices. A DCS is sometimes referred to as the process-connected device (PCD).

**dedicated resource**

A resource used by only one step at a time inside a recipe structure.

**deferred parameter**

Step formula value that is put off and takes on the value of another parameter at a higher level within the recipe. This function has the effect of passing Recipe formula parameter data from one level of a recipe down to another.

**display parameter**

The step formula value specified as being the one to be displayed as part of the SFC in the Procedure as SFC View window.

**download**

A request from a phase to the FactoryTalk Batch Server to send it data.

**downstream unit requirements**

If dynamic unit allocation is enabled, downstream unit requirements may be defined for class-based and instance-based unit procedures. Downstream unit requirements are used to control batch flow and to make sure that the appropriate unit is selected during unit-binding.

**dynamic unit allocation**

The process of binding a specific unit to a class-based unit procedure or operation. Dynamic unit allocation can be defined only at the procedural level.

**electronic signature**

An electronic representation of a signature, including all associated data. Can consist of one or two signoffs. Associated data includes meanings for the signoffs, comments, security requirements, and timestamps.

**enterprise**

An organization that coordinates the operation of one or more sites.

**end of batch archiving**

The FactoryTalk Batch Server automatically runs the Archiver when a batch is removed from the Batch list.

**equipment editor**

The equipment configuration module of the FactoryTalk Batch components. The FactoryTalk Batch Equipment Configure resources, phases, units, and communications data.

**equipment phase**

An equipment phase is the S88 terminology for the equipment phase and equipment phase interface. In FactoryTalk Batch, equipment phases are configured in the FactoryTalk Batch Equipment Editor as instances of the recipe phases. Equipment phases are bound to the recipe at runtime.

**exception handling**

Those functions that deal with facility or process contingencies and other exception conditions.

**exclusive-use resource**

A common resource that can only be used by one user at any given time.

**execution token**

A "marker" indicating a currently active step of an SFC. By definition, an SFC begins execution with a single Execution Token present in its Initial Step. When SFC execution reaches an "AND Divergence", a single Execution Token is split into two or more tokens, and when SFC execution passes through an "AND Convergence", two or more Execution Tokens are combined into a single token.

**expedited approval process**

An Expedited Approval Process can be used when you do not want to perform the Primary Approval Process, for example in the early stages of recipe design. A recipe can go through initial review using the expedited process. After the recipe is deemed ready, the approval process can be reverted to its starting point, and then the primary approval process is used to validate it for release to production.

**FactoryTalk Asset Centre**

Formerly RSMACC (Rockwell Software Maintenance Automation Control Center).

## final (terminal) step

The logical end of a sequential function chart (SFC).

## firing attribute

The Firing Attribute (formerly the Acquiring attribute) has nine legal states, defined as follows:

**"0": Not Firing** - The transition is not in the firing process.

**"1": Acquiring** - The transition is in the process of acquiring resources for the following steps.

**"2": Binding** - The transition is in the process of binding one or more of the following steps.

**"3": Committed** - The transition is committed to the firing process, but is not proceeding due to either a HELD state, or the parent procedure being in MANUAL mode.

**"4": Stopping** - The transition is waiting for one or more prior steps to achieve a terminal state after having been issued STOP commands.

**"5": Resetting** - The transition is waiting for one or more prior steps to transition to IDLE after having been issued RESET commands.

**"6": Pending** - The transition is waiting for one or more prior steps to transition into a legal state for a Transfer of Control operation.

**"7": Paused** - The transition is waiting for a RESUME command or a return of the parent procedure to AUTO mode.

## first available binding

- This is one of the ways that units are selected for binding. This is called late unit binding or dynamic unit allocation. When automatically selecting a unit for binding, the FactoryTalk Batch Server tries to use the unit that the recipe can acquire first. The acquired unit must belong to the unit class of the unit procedure step. Recipes can configure upstream and/or downstream dependencies defining a series of unit classes that a recipe requires as a recipe executes. The acquired unit supports the flow path to other units.

## formula

A category of recipe information that includes process inputs, process parameters and process outputs.

**formula value**

A value that is assigned to a parameter defined for a specific step of a phase, operation or unit procedure. A formula value may have a literal value assigned to it or it may receive a value from the next higher recipe level when the batch is run.

**global binding requirement**

A Global Binding Requirement is defined within the Equipment Editor for an area model, and is automatically applied to every unit requirement within a recipe. This saves the effort of having to manually add the binding requirement to every unit requirement in every recipe.

**global unit attribute**

A Global Unit Attribute is a unit attribute that has been configured to be automatically applied to all unit classes defined within the area model. This saves the area model author the effort of having to manually assign the unit attribute to every unit class.

**header**

General information about the recipe that includes the procedure identifier, version number, version date and the author.

**Human-Machine Interface (HMI)**

An application used in conjunction with the FactoryTalk Batch View to control the manufacturing equipment within a plant. The HMI software allows the operator to view actual process values and equipment states, such as Valve 101 = Open or TempCtrl 202 = 90° F.

**incremental archiving**

The Archiver, running as a Windows service, inserts records from the electronic batch record file into the specified database at a pre-defined interval. The Archiver is controlled from the FactoryTalk Batch Service Manager dialog box or the Windows Control Panel Services window.



**initial step**

The logical start of a sequential function chart (SFC).

**input parameter**

A parameter holding a value designed to specify how a sequence or procedure is to execute.

**instance-based recipe**

Recipe that uses unit instances for the equipment requirements.

**key parameter**

The step parameter specified as being the one to display as part of the SFC in the FactoryTalk Batch Recipe Editor SFC view window.

**late binding**

This is a binding method where a step is bound to equipment just before it is used. For unit procedure steps, this is also called dynamic unit allocation.

**linear segment**

The collective set of steps and transitions bounded by a Divergence and a Convergence.

**manual mode**

The mode of a control recipe when the procedure does not sequence automatically. Transitions are not checked, therefore the step performs its assigned functions and no further action is taken without operator intervention.

**master recipe**

A type of recipe that accounts for equipment capabilities and may include process cell-specific information.

**mode**

The manner in which the transition of sequential functions are carried out within a procedural element and the accessibility for manipulating the states (manually or by other control functions) of equipment.

**not firing**

Not Firing is a possible state of the **Firing attribute** of a transition. When the transition is in the Not Firing state, it is not in the process of firing and not committed to the firing process.

**null procedure**

A non-expandable procedure that does not refer to any logical definition in the area model nor any lower level recipe procedure. A null procedure executes automatically and plays a role in material loops where it is used for rebinding purposes.

**O-Auto mode**

The mode of a control recipe when the operator initiates all commands and functions.

**obsolete recipe**

An Obsolete recipe is a versioned recipe that has failed verification due to a change in the recipe's underlying area model. A versioned recipe is a read-only snapshot of a recipe that uses strict, system-enforced naming conventions.

**ODBC (Open Database Connectivity)**

A database connectivity standard written by Microsoft.

**OLE (Object Linking & Embedding)**

Method used to allow two different applications to share live information, which makes HMI connectivity much more robust.

**OPC (Open Platform Communications)**

A communications protocol that provides a defined set of COM interfaces that in turn provide data access functions. OPC can be used by the FactoryTalk Batch Server as a more flexible and powerful alternative to the Dynamic Data Exchange (DDE) communications protocol when communicating with process-connected devices (PCDs).

**operation/operation level**

The operation segment of a recipe. A procedural element defining an independent processing activity consisting of the algorithm necessary for the initiation, organization and control of phases.

**OR (Divergence)**

A structure within an SFC that represents a decision where recipe control is passed to only one of the subsequent steps.

**owned list**

When the perspective in the Arbitration Focus window is designated owner, the owned list consists of all running recipes, resources and operators that are displayed in the Owned By portion of the Arbitration window.

**owner list**

List of all running recipes, resources and operators that displays in the Arbitration Focus window when the perspective is owner.

**owner's perspective**

Function of the arbitration focus in which a resource or running recipe owns, or is requesting to own, other resources.

**owner's list**

When the perspective is resource, the owner's list is the roster of owners for all running recipes, resources and operators.

**P-Auto mode**

The mode of a control recipe when the procedure is sequencing automatically.

**PCD (Process-connected Device)**

Hardware that allows the FactoryTalk Batch Server to communicate with the equipment in a facility.

**PLC (Programmable Logic Controller)**

A control device. Logic (programs) contained in the PLC read or write to the inputs or outputs of the field devices. Referred to as the process-connected device in FactoryTalk Batch documentation.

**parameter**

Used to allow for flexibility in the recipe creation process. Parameter values are used in transition conditions or for substitution of phase parameters. A parameter is created for these recipe levels: operation, unit procedure or procedure. Values are assigned when a unit procedure or operation step is added to a recipe.

**parameter deviation**

A parameter deviation exists when a parameter value is not within the limits defined in the recipe.

**parameter expression**

An arithmetic expression that may be assigned to an input parameter or output parameter of a phase, operation, or unit procedure step that can reference other parameters and recipe header data within a recipe. The expression is evaluated and the result stored as the value of the parameter.

**path (stream)**

The order of equipment within a process cell that is used, or is expected to be used, in the production of a specific batch.

**paused**

Paused is a possible state of the **Firing attribute** of a transition. When the transition is in the Paused state, its expression has evaluated to TRUE and it is ready to fire. It is suspended the firing process due to the parent procedure being in SEMI-AUTO mode. It is awaiting either a RESUME command or a transition of the parent procedure to AUTO mode before continuing with the firing process.

**pending**

Pending is a possible state of the **Firing attribute** of a transition. When the transition is in the Pending state, it is waiting for one or more prior steps to transition into a legal state for a Transfer of Control operation.

**phase**

The lowest level procedural element in the procedural control model. The phase provides an interface to basic control.

**phase link group**

Group that identifies phases that may communicate and work together.

**phase state**

Term that appears inside the State Frame declaring the phase's current condition: IDLE, READY, RUNNING, ARMING, ARMED, FIRING, CONNECTING, DOWNLOADING, UPLOADING, UPLOADHELD, STARTING, COMPLETE, HOLDING, HELD, RESTARTING, STOPPING, STOPPED, ABORTING, ABORTED or UNKNOWN.

**primary approval process**

A full and formal approval process to validate the development and maintenance of batch recipes. In addition to the Primary Approval process with up to six approval steps (three optional), a two-step Expedited Approval process is available.

### **procedure/procedure level**

The procedure segment of a recipe, such as the strategy for accomplishing a process. Procedure level is a general term for the three segments of a recipe: operation, unit procedure, and procedure.

### **procedural control**

Control that directs equipment-oriented actions to take place in an ordered sequence to carry out a process-oriented task.

### **procedure file**

The saved file of a completed recipe.

### **procedural element**

A building block for procedural control that is defined by the procedure model.

### **process**

A sequence of chemical, physical or biological activities for the conversion, transport or storage of material or energy.

### **process cell**

A logical grouping of equipment, which includes the equipment required for the production of one or more batches. The process cell defines the span of logical control of one set of process equipment within an area.

### **process control**

The regulation or manipulation of variables (output) influencing the conduct of a process (or part of a process) in such a way as to obtain a product of desired quality and quantity (set point) in an efficient manner.

### **process management**

The activities necessary to manage batch production within a process cell.

**process operation**

A major processing activity that usually results in a chemical or physical change in the material being processed and that is defined without consideration of the actual target equipment configuration.

**providers**

System components that provide diagnostic information to the FactoryTalk Diagnostics system. Providers can be FactoryTalk system elements or applications such as the FactoryTalk Batch Equipment Editor and FactoryTalk Batch Recipe Editor.

**recipe approvals process**

An umbrella term for the Primary approval and Expedited approval processes that are used to validate the development and maintenance of batch recipes. (Only one process can be used at a time.) Using signature certification, the recipe approvals process safeguards design workflow in a formalized manner. This ensures each recipe is validated by authorized personnel before being released to production.

**recipe directory**

Directory of saved recipes.

**Recipe Editor**

The master recipe building application of the FactoryTalk Batch system. The FactoryTalk Batch Recipe allows the user to perform recipe management.

**recipe formula parameter**

A parameter specific to a recipe. A parameter can be used to pass values from one level of a recipe to the next lower level. A recipe formula parameter is configured in the FactoryTalk Batch Recipe Editor on a procedure or operation step. Recipe parameters can be deferred to recipe formula parameters.

## recipe management

The control activity that includes creating, editing, storing and retrieving general, site and master recipes.

## recipe parameter

A parameter specific to a recipe. A parameter can be used to pass values from one level of a recipe to the next lower level. A recipe parameter is configured on the recipe phase and downloaded to the equipment phase at runtime.

## recipe phase

A Recipe Phase is the S88 terminology for the lowest level of procedural element in the procedural control model, which is in a master or control recipe. In FactoryTalk Batch, recipe phases are configured in the FactoryTalk Batch Equipment Editor and used to build recipes in the FactoryTalk Batch Recipe Editor.

## recipe verification

A function of the FactoryTalk Batch Recipe Editor, recipe verification performs a set of error checks on a recipe.

## recipe version control

When Recipe Version Control is enabled in an area model, a versioned recipe is created with the **File > Check in** command in the FactoryTalk Batch Recipe Editor. A versioned recipe is a read-only snapshot of a recipe that uses strict, system-enforced naming conventions. Editable copies of versioned recipes are created using the **File > Check out** command in the FactoryTalk Batch Recipe Editor--these are called WIP (work-in-progress) recipes. If the area model that underlies a versioned recipe changes, the recipe becomes an Obsolete recipe.

## reference list

The list of all container recipes with steps that reference a specified recipe retrieved when using the Find Recipe References option.



## reference recipe

The operation or unit procedure referenced in container recipes searched when using the Find Recipe References option.

## release

Function in the arbitration process that allows the operator to release a resource that is currently owned by the operator.

## release recipe as step

A property of a recipe that signifies it is approved for release as a step, procedure, or operation to be used in a larger, more complex recipe. A recipe can only be added to the Batch list if all its children recipes have their **Release Recipe as Step** properties checked (set to true).

## release recipe to production

A property of a recipe that signifies it is approved for release to production. When this property is true, the recipe is shown on the Recipe List in FactoryTalk Batch View, eProcedure, or ActiveX controls. When all aspects of the recipe are verified and all steps are marked as **Release Recipe as Step**, batches can be created against the recipe.

## report aggregation - batch

In the Recipe Editor, a report parameter (output) that is defined to add each uploaded value to the report to its current value and store that value for the duration of the batch.

## report aggregation - none

In the Recipe Editor, a report parameter (output) that is defined to store an uploaded value, overwriting any value previously there. This is the behavior of report parameters in versions before FactoryTalk Batch 11.0 and is still the default behavior.

## report aggregation - phase

In the Recipe Editor, a report parameter (output) that is defined to add each uploaded value to the report to its current value and store that value until the phase is reset.

**report parameter**

A value specific to a phase. It is a value that is passed from the process-connected device (PCD) to the FactoryTalk Batch Server where it can be used in reports. Typically, the report parameter is a process value.

**requested list**

When the arbitration focus is in the owner perspective, this list displays the roster of resources requested by the resource or recipe that is identified in the **Name** box.

**resetting**

Resetting is a possible state of the Firing attribute of a transition. When the transition is in the Resetting state, it has issued RESET commands to the preceding steps and is waiting for them to transition to IDLE states in response to the command.

**resource**

A general term for equipment including process cells, units, phases, and shared control modules.

**resource's perspective**

Function in the Arbitration Focus window that allows the viewing, acquiring or releasing of resources or running recipes that currently own or are requesting to own a selected resource.

**resource list**

When the perspective is resource in the **Arbitration Focus** window, the roster of resources is the resource list.

**resource user**

An object that either owns or is requesting to own a resource. Can be the operator, a running recipe or another resource.

**resource**

A general term for equipment including process cells, units, phases, and shared control modules.

**scalable**

Located in the **Recipe formula parameter** list, this field indicates if the parameter is scalable with the scale of the recipe.

**semi-Auto mode**

The mode of a recipe level or phase that allows the operator to manually step through the recipe level or each line of the phase's program. This mode requires that the transitions be programmed to check the phase's paused bit. Each time the **Resume** button is pressed, the paused bit is reset.

**sequential function chart**

Sequential Function Chart is a graphical programming language that defines the logical flow of the recipe's procedure.

**sequential function chart step**

The structure in the SFC that references a subordinate phase or procedure.

**server**

A software application that communicates with another software application (the client). The server normally supplies data or functions to the client. The FactoryTalk Batch Server is both a client and a server. When communicating with the FactoryTalk Batch View component, the FactoryTalk Batch Server acts as the server; when communicating with a data server, it acts as the client.

**service**

A process that performs a specific system function, but that does not include a graphic user interface. Services often include an application programming interface that can be called by other processes and remotely from other computer nodes.

**service manager**

A software application that allows a user to remotely monitor and/or control Windows services. The FactoryTalk Batch Service Manager allows an operator to control all batch-related services, as well as access the **Server Statistics** dialog box.

**SFC**

Sequential Function Chart.

**SFC validation**

A function of the FactoryTalk Batch Recipe Editor, this error check looks for "logic" errors in the SFC structure defined within a recipe.

**shared resource**

A resource used in parallel by an unlimited number of steps at a time inside a recipe structure.

**shared-use resource**

A common resource that can be used by more than one user at a time.

**simulator**

The FactoryTalk Batch phase logic simulation program allows you to run the FactoryTalk Batch components and simulate your batch process without being connected to a PCD. The simulator can be used for testing, experimentation and demonstration purposes.

**site**

A component of a batch manufacturing enterprise that is identified by physical, geographical or logical segmentation within the enterprise.

**state**

The condition of equipment or a procedural element at a given time.

**static binding**

A binding method where a step or set of steps is bound to equipment when the recipe is built in the FactoryTalk Batch Recipe Editor (equipment bindings are specified in the master recipe). Material phase steps are never statically bound.

**step reference**

A step within a container recipe that is configured to reference an operation or unit procedure specified when using the Find Recipe References option.

**stopping**

Stopping is a possible state of the **Firing attribute** of a transition. When the transition is in the Stopping state, it has issued STOP commands to one or more of the preceding steps and is waiting for them to transition to terminal states.

**subarbitration**

The process of arbitrating the use of a dedicated resource required by phases operating in parallel within a control recipe.

**tag**

A named area of the process-connected device or controller's memory where data is stored. It is the basic mechanism for allocating memory, referencing data from logic, and monitoring data.

**terminal (final) step**

The logical end of an SFC.

**transition**

Defines how recipe control moves from step to step. When a step is complete, the transition designates the criteria that must be met before the recipe continues to its next logical step.

**unacknowledged prompt parameter**

A step parameter directed to prompt the operator for data when a phase requests a download.

**unit**

A collection of associated control modules and/or equipment modules that can carry out one or more major processing activities such as react, crystallize, make a solution, etc.

**unit-based recipe**

A recipe that specifies a specific unit for equipment requirements.

**unit class**

A means of categorizing units into groups of similar or identical sets of equipment. Recipes can be written specifying a unit class (class-based), or a specific unit (unit-based).

**unit procedure/unit procedure level**

A production sequence (consisting of contiguous operations and algorithms necessary for the initiation, organization, and control of those operations) executed within a unit. The unit procedure level is a general term for the level that contains unit procedures in a recipe.

**upload**

A request from a phase to send data to a batch server.

**verification limits**

Verification limits are the values against which a recipe parameter or report value are checked. Three types have been identified: Absolute, Percentage, and Value.

**verification method**

An algorithm specified in the equipment editor associated with each parameter or report parameter. The algorithm specifies what set of

limits are used for each parameter. For example: High-High-High/Low-Low-Low, High-High / Low-Low, High / Low or None.

### **verification policies**

The verification policies specify the actions that are taken if an entered parameter or report parameter is outside the specified verification limits. The current options are: none, require confirm, single signature, dual signature and not allowed.

### **verification signature**

A new type of prompt that is used to display the deviation information and request the confirmation or signatures required according to the configured verification policies.

### **verify recipe**

Process in which a recipe is checked for completion and accuracy.

### **versioned recipe**

A read-only snapshot of a recipe that uses strict, system-enforced naming conventions. When Recipe Version Control is enabled in an area model, a versioned recipe is created with the **File>Check in** command in the FactoryTalk Batch Recipe Editor. See also **WIP (work-in-progress) recipe** and **Obsolete recipe**.

### **view**

The recipe execution application of the FactoryTalk Batch components. The FactoryTalk Batch View allows the operator to create and run a batch, control phases, arbitrate resources, and view event data.

### **WIP (work-in-progress) recipe**

An editable copy of a versioned recipe. When Recipe Version Control is enabled, a WIP copy is created.





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## Rockwell Automation support

Use these resources to access support information.

<b>Technical Support Center</b>	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	<a href="http://rok.auto/support">rok.auto/support</a>
<b>Knowledgebase</b>	Access Knowledgebase articles.	<a href="http://rok.auto/knowledgebase">rok.auto/knowledgebase</a>
<b>Local Technical Support Phone Numbers</b>	Locate the telephone number for your country.	<a href="http://rok.auto/phonesupport">rok.auto/phonesupport</a>
<b>Literature Library</b>	Find installation instructions, manuals, brochures, and technical data publications.	<a href="http://rok.auto/literature">rok.auto/literature</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Get help determining how products interact, check features and capabilities, and find associated firmware.	<a href="http://rok.auto/pcdc">rok.auto/pcdc</a>

## 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](http://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](http://rok.auto/pec).

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