



FactoryTalk Batch Equipment Editor User Manual

Rockwell Automation Publication BATCH-UM004C-EN--D - November 2023
Supersedes Publication# BATCH-UM004B-EN-D - May 2022



Important User Information

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

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

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

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



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



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

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

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



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



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



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

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 Equipment Editor

This publication contains the following new or updated information. This list includes substantive updates only and is not intended to reflect all changes. The identified change will fall into one of these categories:

- New feature
- Enhanced feature
- Functional change
- Anomaly fix
- Usability improvement
- Clarification

Topic	Reason for change
Area models on page 23	Enhanced feature
Material capability removal on page 27	New feature
Create Phase Class dialog box - General tab on page 139	Enhanced feature
Edit Phase dialog box - General tab on page 163	Enhanced feature
Edit Operation Sequence dialog box - General tab on page 190	Enhanced feature

Summary of changes in Equipment Editor Preface	About the Equipment Editor manual 13
	Legal Notices 13
	Additional resources 14
	Chapter 1
FactoryTalk Batch Equipment Editor	FactoryTalk Batch Equipment Editor security 18
	Open FactoryTalk Batch Equipment Editor 18
	FactoryTalk Batch Equipment Editor interface 19
	Menu bar 20
	Toolbar 20
	Chapter 2
Area models	Create an area model 24
	Open an area model 25
	Area models migration 26
	Area models and FactoryTalk Batch Material Manager 26
	Material database changes 26
	Material database is unavailable 27
	Material capability removal 27
	Verify and deploy area model 28
	Chapter 3
Import and export area models	XML area models 31
	Import an XML area model 31
	Import enumerations 32
	Import system phase classes 33
	Export an area model to XML 34
	Convert XML to binary from command line 34
	Chapter 4
Enumerations overview	System enumeration sets 37
	Create enumeration sets 38
	Add enumeration members 39
	Edit enumerations and sets 40
	Delete enumerations and sets 40
	Chapter 5
Parameters and reports with FactoryTalk Batch	Parameters and reports in recipes 43
	Parameters example 43
	Parameters, reports, and phase tags 44
	Overview of tags for phases 44
	Phase tags 45
	Batch parameters and reports 46
	Phase class parameters 46
	Phase class reports 46
	Material parameters 47
	Types of containers 47

	Default material parameters	47
	Scale parameters	48
	Verification method for parameter deviations	49
	Control strategies overview	49
	Control strategies example	49
	Implement control strategies	50
	Parameter and report subsets	51
	Phase class with different subsets	51
	Download parameter requests	52
	Upload report requests.....	53
	Automatic Upload/Download	53
	Control strategy with parameter subset.....	54
	 Chapter 6	
Electronic signatures	Types of electronic signatures	57
	How electronic signatures work	57
	Signature template	61
	Edit signature templates dialog box	61
	Add a signature template	62
	Set signature template signoffs.....	63
	Set security permissions for a signoff	65
	Remove signoff permissions.....	67
	Delete a signature template	67
	Modify a signature template	68
	Command verification policies.....	69
	Add electronic signatures to commands	69
	Edit command verification policies.....	70
	Change a command verification policy.....	70
	Remove signature requirement commands	70
	 Chapter 7	
Recipe approval process overview	Recipe approval tasks.....	73
	Configure recipe approval steps	74
	Recipe Approvals Configuration settings	76
	Edit a recipe approval.....	77
	Disable recipe approval.....	77
	 Chapter 8	
Security authority overview	Security authority configuration.....	79
	Secure an area model.....	80
	 Chapter 9	
Data servers overview	Area model data servers	83
	Data Servers dialog box.....	84
	Edit a data server	84
	Delete a data server.....	85
	Assign data servers.....	86
	OPC data servers.....	86

	Add an OPC data server	87
	FactoryTalk Linx FactoryTalk Live Data server	88
	Add a data server	88
	FactoryTalk Linx server path	90
	Configure the FactoryTalk Linx server path	90
	Logix5000 CIP data server	91
	Add a Logix5000 CIP data server	91
	Edit a Logix5000 CIP data server	92
	Assign a Logix5000 CIP data server to a phase or sequence	93
	Chapter 10	
Resources overview	Manage Diagnostics page system elements	95
	Define shared resources	96
	Set general information for resources	96
	Configure arbitration information	97
	Set cross invocation information	98
	Configure hyperlink information	98
	Chapter 11	
Global binding requirements	Unit binding expression builder	99
	Expression operators	100
	Supported data types	101
	Operands	102
	Expression validation	102
	Create global binding requirements	102
	Edit binding requirements	103
	Delete binding requirements	104
	Chapter 12	
Process cell overview	Create a process cell class	105
	Edit a process cell class	105
	Create process cell instances	106
	Configure a process cell instance	106
	Set general data for a process cell	107
	General tab of Edit process cell	107
	Set arbitration data for process cell	107
	Arbitration tab of Edit Process Cell	108
	Set cross invocation data for process cell	108
	Cross Invocation tab properties	109
	Configure hyperlink data for a process cell	109
	Edit process cell dialog box - Hyperlink tab	110
	Remove a process cell instance	110
	Verify icon paths	111
	Unique icons	111
	Chapter 13	
Unit overview	Create a unit class	113

Edit a unit class	114
Create a unit instance	115
Unit instance configuration	115
Open the Edit Unit dialog box	115
Configure the general data for a unit.....	116
Edit Unit dialog box - General tab	116
Configure unit attribute tags data	117
Edit Unit dialog box - Attribute Tags tab	117
Configure arbitration data for a unit.....	118
Edit Unit dialog box - Arbitration tab	119
Configure cross invocation data for a unit.....	119
Edit Unit dialog box - Cross Invocation tab	120
Configure hyperlink data for a unit	120
Edit Unit dialog box - Hyperlink tab	121
Remove a unit instance	121
Link unit instances	121
Share units	122

Chapter 14

Tags overview

Unit attribute tags.....	125
Add a unit attribute	126
Edit a unit attribute	127
Delete a unit attribute	127
Create a unit attribute tag.....	127
Unit Attribute Tags dialog box.....	129
Phase tags	129
Edit tags from the menu	130
Default equipment names	131
Set all tag items to default name and access path	131
Global unit attribute	132
Create a global unit attribute	132
Edit a global unit attribute.....	134
Delete a global unit attribute	134
Remove a global unit attribute	135

Chapter 15

Phase class overview

Tags	137
Create and configure phase classes	138
Configure phase class general attributes	138
Create Phase Class dialog box - General tab	139
Configure phase class parameters	140
Create Phase Class dialog box - Parameters tab	142
Configure phase class reports	144
Create Phase Class dialog box - Reports tab	145
Select context IDs	147
Configure phase class messages	148
Create Phase Class dialog box - Messages tab	149
Configure phase class control strategies	149
Create Phase Class dialog box - Control Strategy tab... ..	150

Verification policies.....	151
How verification policies work	151
Configure parameters and reports verification policy	152
Verification Policies dialog box	154
How verification policies work with control strategies.....	156
How editing target parameters affects report verification policies	156
Material-enabled phase classes	157
Standard phase class with matching parameter and report names	157
Standard phase class with control strategies configured	158
Disable material on a material-enabled phase class	158
Duplicate a phase class	158
Copy a phase class.....	159
Cut and paste a phase class.....	159

Chapter 16

Configure phases

Create a phase	161
Configure the general data for a phase.....	162
Edit Phase dialog box - General tab	163
Configure the tag data for a phase.....	164
Edit Phase dialog box - Tag tab.....	165
Phase tag	165
Set tag items to the default addresses.....	168
Configure the arbitration data for a phase.....	169
Edit Phase dialog box - Arbitration tab.....	169
Configure cross invocation data for a phase	170
Edit Phase dialog box - Cross Invocation tab	170
Configure hyperlink data for a phase	171
Edit Phase dialog box - Hyperlink tab.....	171
Configure container data.....	171
Edit Phase dialog box - Containers tab.....	172
Parameter limit tags	173
Enable parameter limit tags	173
Edit Phase dialog box - Parameter Limit Tags tab.....	173
Map parameter tags to parameter limit tags.....	174
Report limit tags	175
Edit Phase dialog box - Report Limit Tags tab	175
Enable report limit tags	176
Map report tags to report limit tags	176
Configure parameter and report limit tags	177
Parameters, reports, and phase classes edits and limit tags	178
Sharing phases and operation sequences between units	178
Share a phase or operation sequence	179

Chapter 17

Operation sequence class configuration

Create an operation sequence class.....	181
Edit an operation sequence class	182

Edit Operation Sequence Class dialog box - General tab... 182
 Configure operation sequence class general attributes . 183
 Edit Operation Sequence Class dialog box - Parameters tab
 183
 Configure parameters for an operation sequence class 184
 Edit Operation Sequence Class dialog box - Reports tab ... 185
 Configure reports for an operation sequence class 186

Chapter 18

Operation sequence configuration

Create an operation sequence189
 Edit Operation Sequence dialog box - General tab190
 Configure the general data for an operation sequence...190
 Edit Operation Sequence dialog box - Arbitration tab 191
 Configure the arbitration data for an operation sequence
 191
 Edit Operation Sequence dialog box - Tags tab..... 192
 Configure parameters for an operation sequence class 192
 Configure reports for an operation sequence class 193
 Sharing phases and operation sequences between units 194
 Share a phase or operation sequence 195

Appendix A

Supported area model changes for Warm and Warm-All restart

Area model object warm restart support197
 Resource classes warm restart support.....197
 Resources warm restart support198
 Unit attributes warm restart support 198
 Unit attribute tags warm restart support 198
 Equipment phase tags warm restart support..... 199
 Enumeration sets warm restart support..... 199
 Data servers warm restart support 199
 Process cell classes warm restart support 200
 Process cells warm restart support 200
 Unit classes warm restart support 201
 Units warm restart support 201
 Parameters warm restart support 202
 Added parameters warm restart support..... 202
 Report warm restart support..... 202
 Added reports warm restart support..... 203
 Configured messages warm restart support..... 203
 Recipe phases warm restart support..... 203
 Equipment phases warm restart support..... 204

Appendix B

Troubleshoot issues

Unable to access instruction file.....207
 Illegal characters encountered in writing instruction file207
 Unable to access Material Server for material support 208
 COM-related exception errors 208
 XML parser error messages..... 209
 Material-specific errors..... 209

Invalid signoff 210
 Resolve invalid signoff for deleted group or user 211
 Resolve invalid signoff for omitted information 212
No Signature templates configured in Area Model 213
Area model secured to different network directory 213
Area model is secured to different network directory 214

Index

About the Equipment Editor manual

This manual provides usage instructions for the FactoryTalk Batch Equipment Editor. It 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 \(PCDC\)](#).

Legal Notices

Rockwell Automation publishes legal notices, such as privacy policies, license agreements, trademark disclosures, and other terms and conditions on the [Legal Notices](#) page of the Rockwell Automation website.

Software and Cloud Services Agreement

Review and accept the Rockwell Automation Software and Cloud Services Agreement [here](#).

Open Source Software Licenses

The software included in this product contains copyrighted software that is licensed under one or more open-source licenses.

You can view a full list of all open-source software used in this product and their corresponding licenses by opening the `oss_license.txt` file located your product's `OPENSOURCE` folder on your hard drive. This file is divided into these sections:

- **Components**
Includes the name of the open-source component, its version number, and the type of license.
- **Copyright Text**
Includes the name of the open-source component, its version number, and the copyright declaration.
- **Licenses**
Includes the name of the license, the list of open-source components citing the license, and the terms of the license.

The default location of this file is:

```
C:\Program Files (x86)\Common Files\Rockwell\Help\<product name>\Release Notes\OPENSOURCE\oss_licenses.txt
```

You may obtain Corresponding Source code for open-source packages included in this product from their respective project web site(s). 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

This table is a comprehensive documentation list 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.
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.

Resource	Description
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
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.
FactoryTalk Batch eProcedure Administrator Guide (BWEPRO-UM011)	Provides procedures specific to FactoryTalk Batch eProcedure, such as implementing security. 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 Reference Manual (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.

Resource	Description
FactoryTalk Batch eProcedure Instruction File Design Reference Manual (BWEPRO-RM001)	Provides information about building instruction files for manual phases in the equipment database 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.

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.

FactoryTalk Batch Equipment Editor

Use FactoryTalk Batch Equipment Editor to create and maintain an equipment database. The area model is 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. The area model is stored in a file with a **.cfg** file extension and is available to all other FactoryTalk Batch programs, including FactoryTalk Batch Recipe Editor, FactoryTalk Batch View, and Phase Simulator.

For example, during recipe configuration, the area model provides a list of available units and phases. Later during recipe verification, it verifies 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.

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

IMPORTANT Verify any recipes that run against a new or modified area model and restart the FactoryTalk Batch Server service.

As outlined in the ISA S88.01 Batch Control Standard, the facility area model organizes into model components:

- Process Cell
- Unit
- Phase
- Control Module

In addition to the creation of an area model, FactoryTalk Batch Equipment Editor:

- Defines signature templates for electronic signatures and recipe approval signoffs.
- Configures steps and approval signoffs for recipe approval.
- Enables recipe version control.
- Secures an area model using security authority.
- Specifies server communication functions.
- Specifies FactoryTalk Event Archiver filters and reporting options.

If using FactoryTalk Batch with FactoryTalk Batch Material Manager, set security for FactoryTalk Batch to access the material database.

See also

[FactoryTalk Batch Equipment Editor security](#) on [page 18](#)

FactoryTalk Batch Equipment Editor security

Security for FactoryTalk Batch Equipment Editor uses the FactoryTalk Security product policy settings defined in the FactoryTalk Directory. Only FactoryTalk Security users have access to FactoryTalk Batch Equipment Editor.

FactoryTalk Batch Equipment Editor **Single Sign-On** product policy setting created in the FactoryTalk Local Directory in conjunction with the FactoryTalk **Use single sign-on** system policy setting enables and disables the FactoryTalk single sign-on. Single sign-on allows users to log on just once, per directory, on a given computer. Once a user logs on to the FactoryTalk Directory, all participating FactoryTalk-enabled products that run in that directory, on that computer, automatically use the logged on user's security credentials.

When opening FactoryTalk Batch Equipment Editor, the user logged on to the FactoryTalk Directory automatically logs on to FactoryTalk Batch Equipment Editor or the **Log on to FactoryTalk** dialog box opens requiring a user name and password.

If enabled, the FactoryTalk **Use single sign-on** system policy setting and FactoryTalk Batch Equipment Editor **Single Sign-On** product policy setting is **True**, these scenarios are possible when opening FactoryTalk Batch Equipment Editor:

- If a FactoryTalk Security user with FactoryTalk Batch Equipment Editor permissions opens FactoryTalk Batch Equipment Editor while currently logged on to the FactoryTalk Directory, the security permissions are the same.
- If a Windows-linked user with FactoryTalk Batch Equipment Editor permissions opens FactoryTalk Batch Equipment Editor, the user logs on to the FactoryTalk Directory.
- If a user is not found, the **Log on to FactoryTalk** dialog box opens.



Tip: FactoryTalk Windows-linked user: A user account created in Windows and then added to the FactoryTalk Directory.

If disabled the FactoryTalk **Use single sign-on** system policy setting or FactoryTalk Batch Equipment Editor **Single Sign-On** product policy setting is **False**, then the **Log on to FactoryTalk** dialog box displays and a FactoryTalk Security user with permissions to open FactoryTalk Batch Equipment Editor must be entered.

See also

[Open FactoryTalk Batch Equipment Editor](#) on [page 18](#)

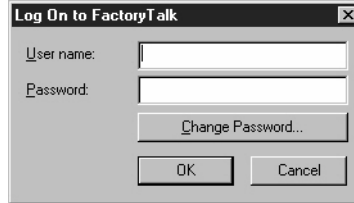
Use these instructions to open FactoryTalk Batch Equipment Editor.

To open FactoryTalk Batch Equipment Editor:

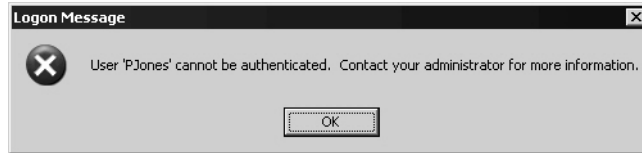
1. Select **Start > Rockwell Software > Equipment Editor**.

Open FactoryTalk Batch Equipment Editor

- (optional) If the **Log On to FactoryTalk** dialog box displays, type the user name and password and then select **OK**.



- (optional) If a FactoryTalk user name and password is not found in the FactoryTalk Directory or if the user is not configured to run FactoryTalk Batch Equipment Editor, the **Logon Message** dialog box opens.



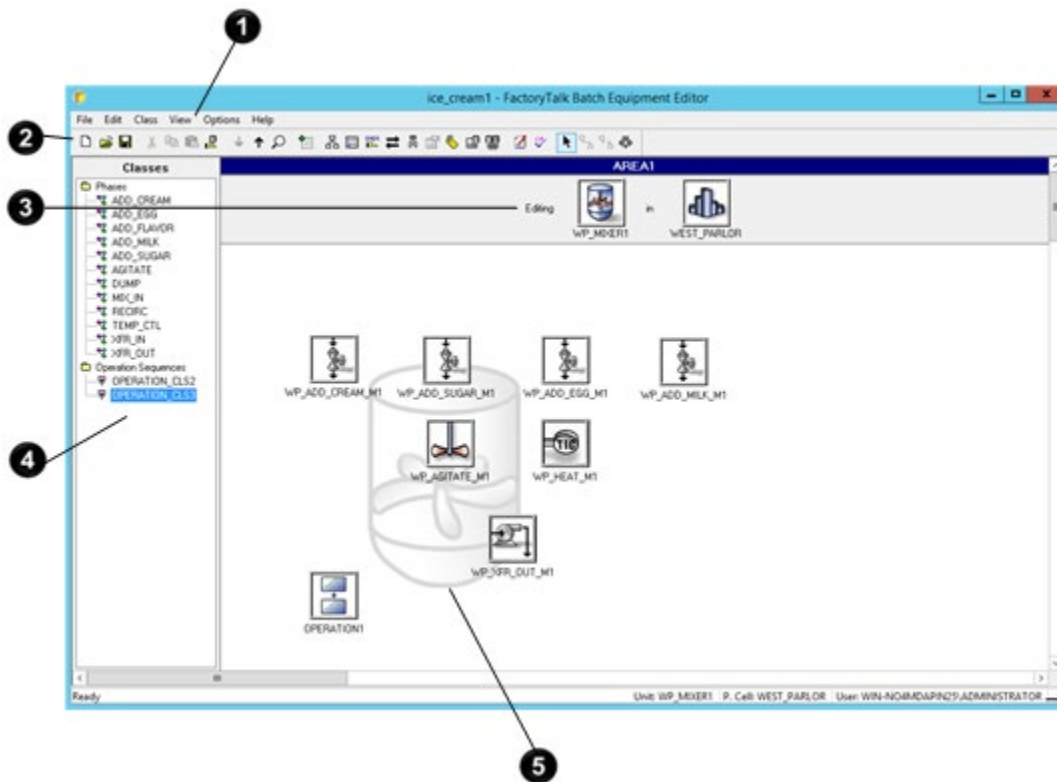
See also

[FactoryTalk Batch Equipment Editor security](#) on [page 18](#)

FactoryTalk Batch Equipment Editor interface

Use FactoryTalk Batch Equipment Editor to configure the facility area model. The components defined in the FactoryTalk Batch Equipment Editor interface with the facility process-connected devices.

The following illustration shows the FactoryTalk Batch Equipment Editor interface:



The sections of the FactoryTalk Batch Equipment Editor interface include:

Item	Name	Description
1	Menu bar	The menu bar shows the available menus.
2	Toolbar	The toolbar shows all the available operations.
3	Location bar	The location bar indicates the unit and process cell currently working. Select View > Location Bar to show and hide.
4	Class View area	Shows the existing cell classes, unit classes, or phases 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 that item.
5	Design View area	Use this area to construct the area model and display the layout of the active level. In 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.
6	Status bar	The right side of the status bar displays the selected unit, process cell, and current user name.

See also

[Menu bar](#) on [page 20](#)

[Toolbar](#) on [page 20](#)

[Area models](#) on [page 23](#)

Menu bar

The **Menu** bar commands include:



Name	Purpose
File	Lists options for opening, creating, saving, securing, importing, exporting, and verifying/deploying area models.
Edit	Edit the various area model components, perform a tag import, and configure signoffs for recipe approval.
Class	Create a new class of items for the current level.
View	Specify the FactoryTalk Batch Equipment Editor components to display, and indicate the zoom percentage.
Options	Specify directories for area model icons and configure the FactoryTalk Batch Server options. Server options include project settings (directories, recipe storage file type, recipe versioning enable and disable), archiver event filters, batch reporting, and other settings.
Help	Provides on-line help and information regarding the software and the system.


























See also

[FactoryTalk Batch Equipment Editor interface](#) on [page 19](#)

Toolbar

The FactoryTalk Batch Equipment Editor toolbar contains a group of buttons used to perform commands in FactoryTalk Batch Equipment Editor. The buttons, from left to right, are:

Graphic	Name	Description	Keyboard Shortcut
	New	Creates an area model.	Ctrl + N
	Open	Opens an existing area model.	Ctrl + O

Graphic	Name	Description	Keyboard Shortcut
	Save	Saves the active area model.	Ctrl + S
	Cut	Deletes the highlighted item and saves it to the clipboard.	Delete
	Copy	Copies the highlighted item and saves it to the clipboard.	Ctrl + C
	Paste	Pastes the cut or copied item from the clipboard.	Ctrl + V
	Share	Shares the selected unit or phase class.	Ctrl + H
	Go Down	Moves down through the levels and displays the next lower level.	None
	Go Up	Moves up through the levels and displays the next higher level.	None
	Zoom	Specifies the magnification of the current sequential function chart (SFC) display.	None
	Add New Object	Opens the appropriate Create dialog box for the active level.	None
	Edit Area	Edit the area information.	Ctrl + A
	Edit Enumerations	Opens the Create Enumeration Sets and Enumerations dialog box.	Ctrl + M
	Edit Servers	Opens the Create Servers dialog box.	Ctrl + D
	Synchronize	Synchronizes the equipment area model with the Logix Designer project file.	Ctrl + L
	Edit Shared Resources	Opens the Edit Resources dialog box.	Ctrl + R
	Edit Properties	Opens the appropriate Edit dialog box for the selected item.	Ctrl + E
	Edit Tags	Opens the Edit Tags dialog box.	Ctrl + T
	Edit Unit Attributes	Opens the Edit Unit Attributes dialog box.	Ctrl + U
	Edit Global Binding Requirements	Opens the Edit Global Unit Binding Requirements dialog box.	Ctrl + B
	Edit Signature Templates	Opens the Edit Signature Templates dialog box.	None
	Edit Command Verification Policies	Opens the Edit Command Verification Policies dialog box.	Ctrl + P
	Select Instance	Changes the cursor to the selection tool.	None
	Link Units	Changes the cursor to the linking tool. Links define the upstream and downstream relationships between units within a process cell. The FactoryTalk Batch Server uses the links to determine which units are available for selection when defining equipment requirements for procedures.	None
	Unlink Units	Changes the cursor to the unlinking tool, to unlink the units within a process cell.	None
	Invoke Recipe Editor	Opens FactoryTalk Batch Recipe Editor.	None
	Verify/Deploy Area Model	Opens the Verify/Deploy dialog box.	

See also

[FactoryTalk Batch Equipment Editor interface](#) on [page 19](#)

Area models

An area model is a definition of the manufacturing facilities capabilities with which the FactoryTalk Batch server interacts. The information for a facility is stored in a configuration file you build using the FactoryTalk Batch Equipment Editor and saved as a file with a `cfg` extension (such as, `SouthPlant.cfg`).

The area model contains information about the process equipment used to create batches. It includes all the equipment configured for one area of a specific physical plant. An area model corresponds to a single FactoryTalk Batch Server. The area model configuration file (`.cfg`) is used by FactoryTalk Batch Recipe Editor, FactoryTalk Batch Server, and Phase Simulator.

Create the area model in this order:

- Enumerations
- Data servers
- Resources
- Process cells
- Units
- Phase classes
- Phases

In some cases, you need to re-configure upper-level equipment after defining the lower-level equipment.

Runtime area models

Once the area model is configured it is ready to be brought online and used during runtime to produce batches. If changes to the area model are required while it is running you can modify the offline area model and then deploy it to the runtime area model to respond to the updated requirements.

Area model configurations are composed of a set of elements that define the functions of the area. A subset of these elements cannot be changed when the model is running. After modifying an area model you must verify it against the runtime area model to confirm that the elements modified are permitted to be updated. After the area model changes are verified they can be deployed to the runtime area model.

Licensing support

Making changes to an area model might change the number of unit licenses required for the FactoryTalk Batch software components.

Additional software licenses might need to be acquired or licenses currently allocated might be able to be released.

When changes to an area model are verified the number of required unit licenses are calculated. If more licenses are required, a request is made to the licenses server to grant the number of licenses required. If an error is encountered during the license check, the updates to the area model can not be deployed. Any licensing errors are recorded in the Compare/Update log

This table describes errors that can be encountered during the license check:

Error Message	Description
Unable to acquire all required licenses. %s. Area Model changes not permitted.	There are not enough licenses available to satisfy the license request. To resolve this issue, request additional licenses or release any licenses that are currently assigned to inactive units.
Timeout awaiting response for required licenses from license server:%s. Area Model changes not permitted.	Unable to acquire the licenses from the license server within the time limit defined on the Batch server. The default timeout value is 120 seconds. To resolve this issue, verify connectivity with the Batch server and the license server. If both servers are accessible, update the Batch server timeout value to provide additional time to receive the licenses.

** The placeholder %s represents the a description of the required licenses.*

The batch server will not attempt to acquire or release unit licenses when performing an area model update in the following conditions:

- When running in demo mode
- When licensed under a distributor license
- When running under a grace period activation

See also

[Enumerations overview](#) on [page 37](#)

[Data servers overview](#) on [page 83](#)

[Resources overview](#) on [page 95](#)

[Phase class overview](#) on [page 137](#)

[Create an area model](#) on [page 24](#)


Create an area model

Certain FactoryTalk Batch modules use the area model name to identify the FactoryTalk Batch system data to associate with the area model.

IMPORTANT The area name must be unique for each FactoryTalk Batch Server running on a network.

To create an area model:

1. Select **Start > Rockwell Software > Equipment Editor**.

2. Select **File > New**. A blank area model opens.
3. Select **Edit Area** (). The **Edit Area** dialog box opens.
4. In **Name**, type a unique name for the area.
5. In **Version**, type a version number.
6. Select **OK** to return to the **Design View** area. The area name displays in the title bar of the **Design View** area.
7. Select **File > Save**.
8. Type an appropriate file name, and then select **Save** to save the area model.

The area model saves to the configuration file and can open at any time for modification.

IMPORTANT Restart the FactoryTalk Batch Server to initiate the changes and re-verify any recipes that run against any modified area model.



Tip: If running FactoryTalk Batch Material Manager, and the FactoryTalk Batch Server loses communications with the Material Server while creating or editing the area model, some of the enumeration sets contain only the default values – NULL_MATERIAL, NULL_CLASS, and NULL_CONTAINER.

See also

[Open an area model](#) on [page 25](#)

Open an area model

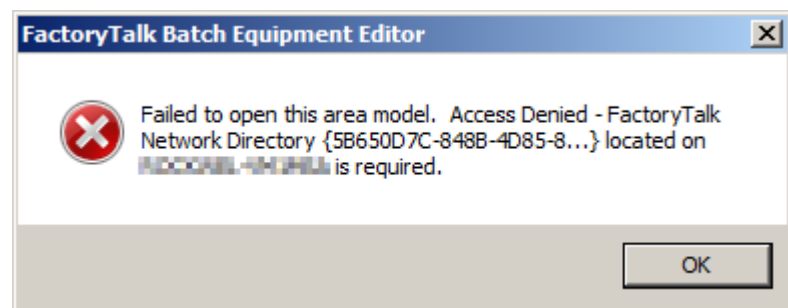
Use these instructions to open an area model.

To open an area model:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **File > Open**.
3. Locate and select the area model file (.cfg), and then select **Open**.

Possible error scenario

If security authority is applied to the area model, and there is a mismatch between the security authority identifier (SAI) in the area model and the SAI in the FactoryTalk Network Directory, an error message opens:



Before closing the error message take note of the FactoryTalk Network Directory and host computer information

To recover from this scenario you can either

- Restore the FactoryTalk Network Directory SAI to which the area model is secured. The name of the computer that hosts that SAI is provided in the dialog box. Use the FactoryTalk Administration Console to restore a saved backup of the SAI. Then use **File > Open** to open the secured area model.
- Open an unsecured copy of the area model. You must have saved a copy of the area model prior to securing it to have this recovery option available.

See also

[Area models migration](#) on [page 26](#)

[Area models and FactoryTalk Batch Material Manager](#) on [page 26](#)

Area models migration

When opening area models created using FactoryTalk Batch version 11.00 or later, the option to have the area model automatically migrated to the latest FactoryTalk Batch version is available. The existing data migrates to the new schema. If the area model is not migrated, the current FactoryTalk Batch Equipment Editor version is unable to open.



Tip: If upgrading from a FactoryTalk Batch version older than the previous major release (such as from version 10.xx or earlier to version 12.xx), contact the Rockwell Customer Support Representative to have the area model upgraded to the new equipment database schema.

See also

[Open an area model](#) on [page 25](#)

Area models and FactoryTalk Batch Material Manager

When opening area models containing enumeration sets of the same name as the system enumeration sets (YES_NO, and if FactoryTalk Batch Material Manager is supported, MATERIALS, MATERIAL_CLASSES, and CONTAINERS), rename these non-FactoryTalk Batch Material Manager enumeration sets. Renaming the enumeration sets updates all parameters, report parameters, and unit attribute tags to the renamed enumeration set and creates the new system enumeration set. If not renamed, the area model cannot open in the current FactoryTalk Batch Equipment Editor version.



Tip: When using FactoryTalk Batch Material Manager in conjunction with FactoryTalk Batch, there is a dependency between the area model and the material database. When an area model opens, the MATERIALS and CONTAINERS enumeration sets recreate, based on the materials and containers that exist in the material database. If the Material Server is unavailable, the enumeration sets contain only the default values – NULL_MATERIAL and NULL_CONTAINER.

See also

[Open an area model](#) on [page 25](#)

[Material database changes](#) on [page 26](#)

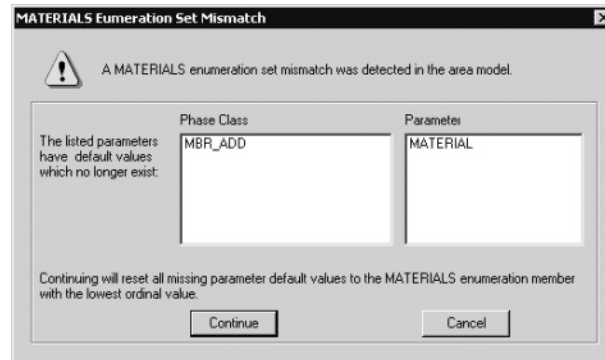
[Material database is unavailable](#) on [page 27](#)

Material database changes

FactoryTalk Batch Material Manager only.

If a member of the MATERIAL enumeration set previously assigned to a

phase class is no longer in the material database, a warning message displays an error.



- Select **Continue** to substitute the NULL_MATERIAL enumeration for the unsupported enumeration.
- Select **Cancel** to open the area model unchanged. When affected phase class's **Parameter** tab opens, the first enumeration in the alphabetically sorted list substitutes for the unsupported enumeration.

IMPORTANT The controller ID of a material and container is the ordinal value for the enumeration. If modified the item controller ID in the material database, the ordinal value of the associated enumeration changes. This change could affect the phase logic.

See also

[Material database is unavailable](#) on [page 27](#)

[Area models and FactoryTalk Batch Material Manager](#) on [page 26](#)

Material database is unavailable

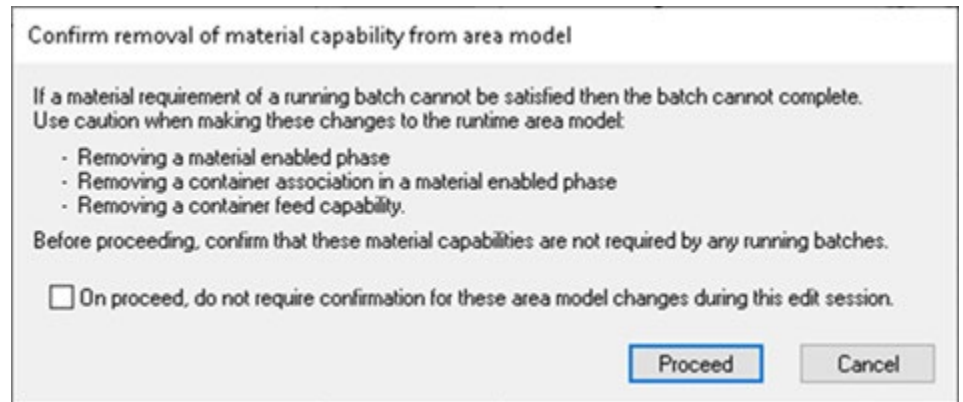
The MATERIALS and CONTAINERS enumeration sets recreate each time an area model creates, opens, or imports. If the Material Server is unavailable, the enumeration sets only contain the default values — NULL_MATERIAL and NULL_CONTAINER.

See also

[Area models and FactoryTalk Batch Material Manager](#) on [page 26](#)

Material capability removal

If a change to an area model removes a material capability that could result in batches that are unable to complete due to the inability to satisfy a material requirement, this confirmation message is displayed.



This confirmation will occur if any of these changes are made to the area model:

- Removal or unsharing of a material enabled phase
- Removal of a container association from a material-enabled phase
- Removal of the distribution capability of a container association
- Removal of the addition capability of a container association



Tip: If you are making several edits to the material capabilities of the area model, select the checkbox to not require confirmation of every subsequent edit.

Verify and deploy area model

To prepare an area model for deployment, an operator can verify that changes made to the area model are permitted.

Then, the operator can deploy changes to the runtime area model.



Tip: An area model can also be verified and deployed from the FactoryTalk Batch Service Manager. For more information about updating online area models, see the *FactoryTalk Batch Administrator Guide*.

To verify an area model using the FactoryTalk Batch Equipment Editor

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **File > Open**.
3. Locate and select the area model file (.cfg) to be verified, and then select **Open**.
4. Select **File > Verify/Deploy...**
5. In the **Verify/Deploy Area Model** dialog box, review the information and select **Verify Area Model** to compare the original area model with the changed area model.
6. If the verification is not successful, a message displays. Select **View Log** to view the reason for the differences that are not permitted.
7. Select **Close**.

To deploy an area model using the FactoryTalk Batch Equipment Editor

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **File > Open**.
3. Locate and select the area model file (.cfg) to be deployed, and then select **Open**.
4. Select **File > Verify/Deploy...**
5. In the **Verify/Deploy Area Model** dialog box, select **Deploy Area Model**.

The **Status** area displays whether or not the deployment is allowed. If it is not successful, a message displays. Select **View Log** to view the details.



Tip: If an operator attempting to deploy an area model does not have FactoryTalk permissions, the **Deploy Area Model** button is disabled.

6. Select **Close**.

IMPORTANT The FactoryTalk eProcedure Server does not automatically pick up the changes deployed to the area model. To update the eProcedure Server:

1. Open the **FactoryTalk Batch Service Manager**.
2. In **Service**, select **FactoryTalk eProcedure Server**.
3. In the **Server** area, clear the **Cold Boot** checkbox.
4. In **Service State**, click **Stop**, then click **Start/Continue**.

This performs a warm restart of the FactoryTalk eProcedure server that applies the changes in the area model to the currently running batches.

The warm restart of the eProcedure Server while there are active instructions will cause a phase communication error which may causes batches to be held.

See also

[Area models](#) on [page 23](#)

Import and export area models

FactoryTalk Batch gives the ability to import XML area models or export area models to XML format. XML provides a standard, non-proprietary format for distributing the area model configuration.

See also

[Import an XML area model](#) on [page 31](#)

[Export an area model to XML](#) on [page 34](#)

XML area models

XML schemas and XML instance documents have become the industry standard for providing implementation of neutral information. With FactoryTalk Batch, FactoryTalk Batch Equipment Editor can import and export an area model in XML format. This function allows for the exchange of the area model information with other companies in a standard, non-proprietary XML format. The area model information may be edited using text editors or XML editors.



Tip: When securing an area model to a Security Authority Identifier, the **Export** command disables, and the area model cannot export.

See also

[Import an XML area model](#) on [page 31](#)

[Export an area model to XML](#) on [page 34](#)

[Convert XML to binary from the command line overview](#) on [page 34](#)

Import an XML area model

When an XML area model imports, FactoryTalk Batch Equipment Editor constructs the area model in memory. Save the imported area model to the proprietary binary file or export it to another text file.

FactoryTalk Batch Equipment Editor validates the information provided by the XML file. Only well-formed, validated XML files import. The XML files must have the extension `.axml` to import. FactoryTalk Batch Equipment Editor attempts to read the files as XML files only if the files have the correct file extension.

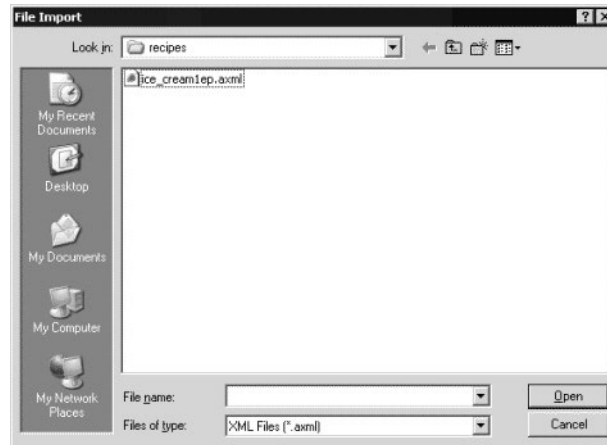
Files with extensions other than `.axml` read as tab-delimited files. Although the `.txt` file extension is expected for the tab-delimited text files, FactoryTalk Batch Equipment Editor attempts to read all files with extensions other than `.axml` as tab-delimited text files.



Tip: The YES_NO, MATERIALS, MATERIAL_CLASSES, and CONTAINERS enumeration sets recreate each time a new area model creates, opens, or imports. Existing values are not imported. If the Material Server is not available, the MATERIALS, MATERIAL_CLASSES, and CONTAINERS enumeration sets create with the NULL_MATERIAL, NULL_CLASS, and NULL_CONTAINER default values only. (See **Import enumerations** for more information.)

To import an XML area model:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **File > Import**.



3. From the **Files of type** list, select **XML Files (*.xml)**.
4. Locate and select the XML file to import.
5. Select **Open** to initiate the import process. A message box displays the name of each component imported and validated.
6. Select **OK** to complete the import process and return to FactoryTalk Batch Equipment Editor.
7. Select **File > Save As** to save the newly imported file.

The **Save As** dialog box opens with Untitled.cfg highlighted in the **File name** box.

8. In **File name**, type the new file name. Give the file the same name as the currently selected area model to overwrite the current file.
9. Select **Save**. The new area model saves and the file name displays on the FactoryTalk Batch Equipment Editor title bar.



Tip: If the file name is anything other than the area model currently selected in the **Server Options** dialog box, change the **Server Options** settings before the new area model is used.

See also

[Import enumerations](#) on [page 32](#)

[Import system phase classes](#) on [page 33](#)

Import enumerations

Create and maintain these system enumeration sets in FactoryTalk Batch Equipment Editor:

- PHASE_FAILURES
- YES_NO
- REPORTING_CONTEXTS
- MATERIALS (with an installed Material Server)
- MATERIAL_CLASSES (with an installed Material Server)

- CONTAINERS (with an installed Material Server)

With the exception of PHASE_FAILURES and REPORTING_CONTEXTS, the data type or the members of these system-maintained enumeration sets cannot change. The XML file must include these system enumeration sets for validation against the schema. These system enumeration sets cannot import.



Tip: The PHASE_FAILURES AND REPORTING_CONTEXTS system enumeration sets can import along with any user-defined enumerations in these enumeration sets.

See also

[Import an XML area model](#) on [page 31](#)

[Import system phase classes](#) on [page 33](#)

Import system phase classes

FactoryTalk Batch Equipment Editor creates and maintains these system phase class sets:

- \$NULL
- \$TIMER

On import of system phase classes, the entire phase class validates and only those that match completely import.



Tip: If any of the system phase classes (\$TIMER or \$NULL) contain errors, only the first error show.

\$NULL phase

The \$NULL phase class validates:

- The name of the phase class must be \$NULL.
- There must be no configured recipe or report parameters.
- There must be no configured messages.
- There must be no configured control strategies.
- There must be no configured request parameters.
- There must be no configured message partners.
- All other configurable values are not set.

\$TIMER phase

The \$TIMER phase class validates:

- The name of the phase class must be \$TIMER_**X** (where **X** is the type of Timer and the unit of measure; for example, \$TIMER_DN_SECOND or \$TIMER_UP_DAY).
- There must be no configured messages.
- There must be no configured control strategies.
- There must be no configured request parameters.
- There must be no configured message partners.

See also

[XML area models](#) on [page 31](#)

Export an area model to XML

FactoryTalk Batch allows export of an area model to a well-formed XML format. With the exception of PHASE_FAILURES and REPORTING_CONTEXTS, the data type or the members of the system-maintained enumeration sets cannot change. The XML file must include these system enumeration sets for validation against the schema. These system enumeration sets can export but cannot import.

All system phases (\$NULL or \$TIMER) export. All associated recipe and report parameters and associated data (for \$TIMER_X phases) are part of the export (for example, where X is the type of Timer and the unit of measure; \$TIMER_DN_SECOND or \$TIMER_UP_DAY).



Tips:

- The PHASE_FAILURES AND REPORTING_CONTEXTS system enumeration sets export along with any user-defined enumerations in these enumeration sets.
- When an area model secures to a FactoryTalk Network Directory Security Authority Identifier, the **Export** command is disabled.

To export an area model to XML:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **File > Open** to open the area model.
3. Select **File > Export**. The **File Export As** dialog box opens.
4. Locate and select the file to export the area model or, in **File name**, type a new file name.
5. In **Save as type**, select **XML Files (*.axml)**.
6. Select **Save** to initiate the export process. If the file already exists, confirm to replace the file.
7. Select **OK** to complete the export process and return to FactoryTalk Batch Equipment Editor.

See also

[Import and export area models overview](#) on [page 31](#)

Convert XML to binary from command line

Convert XML area models to the proprietary binary format from the command line using the supplied program **AreaModelConvert.exe**. Only well-formed, schema-conformed, and program-validated XML files convert.

When exporting from a command line, change to the directory containing **AreaModelConvert.exe** and the paths cannot contain any spaces. UNC names are also supported, as demonstrated in this syntax example:

The syntax for the command line is:

```
C:\AreaModelConvert.EXE InputFile OutputFile LogFile
```

Where:

- InputFile specifies the path for the input XML filename.
- OutputFile specifies the path for output binary filename.
- LogFile specifies the path for log file.

Example:

```
C:\AreaModelConvert.EXE
\\Batchctl\SampleDemo1\recipes\ice_cream1.xml
\\Batchctl\SampleDemo1\recipes\ice_cream1.cfg
\\Batchctl\SampleDemo1\logs\convert.log
```

The command line validates the information in the XML file and overwrites the existing file specified by **OutputFile**. Error messages append to the log file.

IMPORTANT The command line program will not validate material-specific information, which includes:

- Running status of the Material Server
 - Existence of the referenced materials
 - Existence of the referenced material classes
 - Existence of the referenced containers
-

If the command line arguments are valid, the program returns a **0** (zero), indicating a successful import. If the command line arguments are invalid, the command line program returns a **1** (one), indicating a failure. View the return code in the log file to check if the conversion succeeded or failed.



See also

[Export an area model to XML](#) on [page 34](#)

Enumerations overview

Enumerations are system objects that are defined as a variable data type consisting of a numeric value (called an ordinal value) and an associated text string. The process-connected device (PCD) and the FactoryTalk Batch Server communicate using the numeric ordinal value. The server then displays the ordinal value associated text string to the operator. Use enumerations to display meaningful text to an operator, instead of a number.

Enumeration sets contain groupings of related enumerations. The FactoryTalk Batch and the PCD create and maintain these default system enumeration sets:

- PHASE_FAILURES
- YES_NO
- MATERIALS (for Material Server-installed system)
- MATERIAL_CLASSES (for Material Server-installed system)
- CONTAINERS (for Material Server-installed system)
- REPORTING_CONTEXTS

The data type and the members of the YES_NO, MATERIALS, MATERIAL_CLASSES, or CONTAINERS system-maintained enumeration sets cannot change.

Create custom enumerations and enumeration sets within an area model.

Use negative ordinal as shown in this example.

The agitator in Premixer B (Unit #2) might use:

Enumeration Set Name		-->	MOTORS
Enumeration Name	Ordinal		String
Enumeration_1	0		OFF
Enumeration_2	1		FORWARD
Enumeration_3	-1*		REVERSE

See also

[System enumeration sets](#) on [page 37](#)

[Create enumeration sets](#) on [page 38](#)

System enumeration sets

There are five default system enumeration sets. The data type or the members of these system-maintained enumeration sets are not allowed to change, except for the Phase_Failures and Reporting_Contexts enumeration sets.

System Enumeration Set	Purpose
------------------------	---------

System Enumeration Set	Purpose
PHASE_FAILURES	By default, there are no members in this enumeration set. Add enumerations based on the particular implementation requirements.
IMPORTANT PHASE_FAILURES enumerations cannot have ordinal values greater than 32767 or less than 0 (zero).	
REPORTING_CONTEXTS	This enumeration set makes it possible to add reporting context strings to phase class parameters and reports. The events about the sets may be more easily queried and sorted. Add, remove, and edit enumeration set members to this enumeration set. The default enumeration is NULL, with an ordinal value of 0.
PHASE_FAILURES and REPORTING_CONTEXTS are the only system enumeration sets to which enumerations can be added. System enumeration sets display in bold text to differentiate them from custom enumeration sets.	
YES_NO	This is a simple enumeration set that contains two members: NO with an ordinal value of 0 and YES with an ordinal value of 1. This enumeration set cannot be modified.
MATERIALS (for Material Server-installed system)	Represents the set of materials configured in the FactoryTalk Batch Material Manager material database. The default enumeration is NULL_MATERIAL, with an ordinal value of 0. This value allows assignment of an enumeration to a parameter of type MATERIALS, which delays the actual material assignment until the recipe is built. All other enumeration set members are recreated each time an area model creates, opens, or imports, based on the material data in the material database. The controller ID range for Materials is from 1 through 999999999 .
CONTAINERS (for Material Server-installed system)	Represents the set of containers configured in the FactoryTalk Batch Material Manager material database. The default enumeration is NULL_CONTAINER, with an ordinal value of 0. All other enumeration set members are recreated each time an area model creates, opens, or imports, based on the container data in the material database. The controller ID range for Containers is from 1 through 999999999 .
<p>If the FactoryTalk Batch Material Manager material database is unavailable, the MATERIALS and CONTAINERS enumeration sets only contain the default enumerations.</p> <p>The controller ID of a material and container is the ordinal value for the enumeration. If modified the controller ID in the material database, the ordinal value of the associated enumeration changes, which could affect the phase logic.</p>	

See also

[Enumerations overview](#) on [page 37](#)

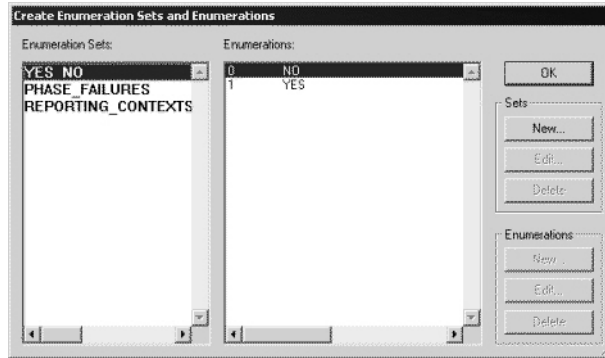
Create enumeration sets

Use these instructions to create enumeration sets.

To create enumeration sets:

1. Select **Start > Rockwell Software > Equipment Editor**.

2. Select **Edit > Enumeration Sets** to open the **Create Enumeration Sets and Enumerations** dialog box.



3. Under **Sets**, select **New**.
4. In the **Create Enumeration Set** dialog box, type the new enumeration set name. Select **OK** to return to the **Create Enumeration Sets and Enumerations** dialog box.

The new enumeration set name displays in the **Enumeration Sets** column.



Tip: If members are not added to a new enumeration set, the set will not display as an option in the Enum/E.U. list when updating phase class parameters and reports.

See also

[Add enumeration members](#) on [page 39](#)

Add enumeration members

Use these instructions to add enumeration members.

To add enumeration members:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Enumeration Sets** to open the **Create Enumeration Sets and Enumerations** dialog box.
3. Select the enumeration set.
4. Under **Enumerations**, select **New**.



Tip: Members to the system enumeration sets cannot be added: YES_NO, MATERIALS, MATERIAL_CLASSES, and CONTAINERS.

5. Type the enumeration name and the ordinal value, or accept the default ordinal value.

IMPORTANT PHASE_FAILURES enumerations only support positive ordinals from 0 through 32767.

6. Select **OK** to return to the **Create Enumeration Sets and Enumerations** dialog box. The new enumeration name displays under **Enumerations**.

See also

[Create enumeration sets](#) on [page 38](#)

[Edit enumerations and enumeration sets](#) on [page 40](#)

Edit enumerations and sets

Use these instructions to edit enumerations and enumeration sets.



Tip: The YES_NO, MATERIALS, MATERIAL_CLASSES, or CONTAINERS system enumeration sets cannot be renamed or edited. PHASE_FAILURES and REPORTING_CONTEXTS are the only system enumeration sets to which enumerations can be added. System enumeration sets display in **bold** text to differentiate them from custom enumeration sets.

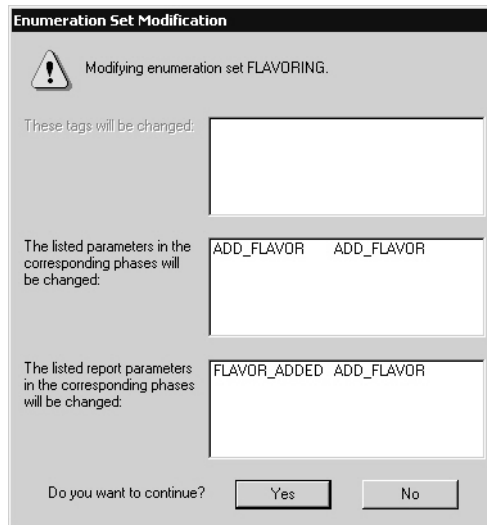
To edit enumerations and enumeration sets:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Enumeration Sets** to open the **Create Enumeration Sets and Enumerations** dialog box.
3. Select the enumeration set or enumeration to edit.
4. Select the corresponding **Edit** button (**Sets** or **Enumerations**).
5. If editing an enumeration, type the new enumeration name.

IMPORTANT PHASE_FAILURES enumerations support positive ordinals from 0 to 32767 only.

6. If an unassigned enumeration set is being edited, the **Edit Enumeration Set Name** dialog box displays. Type the new enumeration set name and select **OK** to return to the **Create Enumeration Sets and Enumerations** dialog box.

If editing an assigned enumeration set, a warning appears with a list of the items with the enumeration assigned.



7. Select **Yes** to edit the enumeration set name. The items listed in this dialog box modify to include the new enumeration set name. Or, select **No** to cancel the modification.
8. Select **OK** to return to the **Create Enumeration Sets and Enumerations** dialog box.

See also

[Delete enumerations and enumeration sets](#) on [page 40](#)


Delete enumerations and sets

Use these instructions to delete enumerations and enumeration sets.



Tip: The system enumeration sets or members (enumerations) of the system enumeration sets cannot be deleted: YES_NO, MATERIALS, MATERIAL_CLASSES, and CONTAINERS.

To delete enumerations and enumeration sets:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Enumeration Sets** to open the **Create Enumeration Sets and Enumerations** dialog box.
3. Select the enumeration set or enumeration to delete.
4. Select **Delete**.
 - If deleting an enumeration, continue to step 5.
 - If deleting an enumeration set, skip to step 6.
5. To delete an enumeration:
 - If the enumeration is not the default for a phase class parameter, a warning displays verifying deletion of the enumeration. Select **Yes** to delete the enumeration. Select **No** to cancel the deletion.
 - If the enumeration is the default for a phase class parameter and **Yes** is selected to delete the enumeration, a message displays stating that the enumeration cannot be deleted and gives the phase class parameter name with this enumeration as the default value. First, modify the phase class parameter to remove the enumeration as the default value. Select **OK** to close the warning dialog box and return to the **Create Enumeration Sets and Enumerations** dialog box.
6. To delete an enumeration set:
 -  Tip: Items that were using the deleted enumeration set are defaulted to **Type = Integer** and **Eng.Units = Eng.Units**.
 - A warning displays, verifying deletion of the enumeration set. Select **Yes** to delete the enumeration. Select **No** to cancel the deletion.
 - A warning displays with a list of assigned items.
 - a. Select **Yes** to delete the enumeration set. A message displays the number of tags, parameters, and reports that change from deletion. Select **OK** to close the message dialog box and return to the **Create Enumeration Sets and Enumerations** dialog box.
 - b. Select **No** to cancel the deletion.
 - c. Select **Close** to return to the **Design View** area.

See also

[Edit enumerations and enumeration sets](#) on [page 40](#)

Parameters and reports with FactoryTalk Batch

The FactoryTalk Batch Server uses parameters to send values to the process-connected device (PCD). Reports return values from the PCD to the FactoryTalk Batch Server. Use FactoryTalk Batch Equipment Editor to configure parameters and reports for the phase. The phase instance inherits the parameters and reports of the phase class from which it was created.

See also

[Parameters and reports in recipes](#) on [page 43](#)

[How parameters and reports work with phase tags](#) on [page 44](#)

[Batch parameters and reports](#) on [page 46](#)

[Material parameters](#) on [page 47](#)

[Scale parameters](#) on [page 48](#)

Parameters and reports in recipes

When adding a phase class to an operation-level recipe using FactoryTalk Batch Recipe Editor, the phase class parameters are formula values, and the phase class reports are report values. When defining the formula values, the recipe author has these options:

- Accept the default formula value (this is the corresponding phase class parameters default value).
- Assign a new value.
- Defer the formula value assignment to the operator or to a recipe formula parameter - a parameter associated solely with the recipe.

Using parameters can minimize the number of phase classes or recipes needed.

See also

[Parameters warm restart support](#) on [page 202](#)

[Parameters example](#) on [page 43](#)

Parameters example

If a plant has a unit that mixes several different products, define a phase class to indicate the agitator's speed in the mixer unit. Either define a different phase class for each of the required speeds, or define one phase class and configure a parameter for the agitator speed. When using the phase class in a recipe, assign a value immediately or later. By deferring the value assignment, one operation is created to use in multiple recipes.

Parameters, reports, and phase tags

See also

[Parameters and reports in recipes](#) on [page 43](#)

A phase, which is an instance of a phase class in an area model, uses tags to communicate with the engineered logic in the process-connected device (PCD). Each tag in the phase maps to a specific memory address or tag in the PCD where data associated with the phase is stored during the recipe's execution. The FactoryTalk Batch Server and the PCD use the tags to exchange information regarding the phase.



Tip: The configuration for FactoryTalk Linx FactoryTalk Live Data tags is identical to that of OPC tags

Every OPC phase has a minimum of ten standard tags. When configuring the phase class from which the OPC phase is created, define the number of tags required for parameter and report communications, as well as additional request tags.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, it is not necessary to define the number of parameter, report, and request tags. The correct number of tags automatically configure when the area model synchronizes with the Logix Designer project.

See also

[Additional request, parameter, and report tags for phases](#) on [page 44](#)

[Phase tags](#) on [page 45](#)

Overview of tags for phases

A Request tag is one of the ten standard tags associated with every OPC phase. The process-connected device (PCD) uses the Request tag to request service from the FactoryTalk Batch Server. Sometimes, the PCD needs to communicate more information to the FactoryTalk Batch Server than can be accommodated by the single standard Request tag. For this purpose, specify on the phase class, the number of additional request tags needed for an OPC phase.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, do not configure request tags. The tags automatically create for Logix5000 CIP phases when the area model synchronizes with the Logix Designer project.

It is possible to configure a different number of phase class parameters and reports than parameter and report tags for an OPC phase. Some OPC phase logic programs may not want the number of parameters to match the number of parameter tags, or the number of reports to match the number of report tags.

To have the number of parameters and reports on the phase class always equal the number of parameter tags and report tags on the associated phases, enable **Parameter/Tag Locking** on the phase class. If **Parameter/Tag Locking** is disabled, specify on the phase class the number of parameter and report tags that exist on the associated OPC phases. This number may be different from the number of defined phase class parameters and reports for OPC phases.



Tip: For Logix5000 CIP phases, **Parameter/Tag Locking** always enables, regardless of the setting selected. When the area model synchronizes with the Logix Designer project file, FactoryTalk Batch Equipment Editor creates the same number of parameter tags as parameters that exist on the phase class, and the same number of report tags as reports that exist on the phase class.

In summary, when creating the phase, specify the following:

- The number of parameters and reports associated with the phase class.
- The number of tags in the phase associated with those parameters, reports, and additional requests. Either enable **Parameter/Tag Locking**, or specify the actual number of tags.



Tip: The configuration for FactoryTalk Linx FactoryTalk Live Data tags is identical to OPC tags.

When creating the OPC phase instance (phase assigned an OPC data server), specify:

- The memory addresses or tags in the PCD associated with each of the ten standard tags.
- The memory addresses or tags in the PCD associated with any configured parameters, reports, and additional request tags.



Tip: If the number of phase tags does not equal the number of parameters for the specified phase class (the number of phase tags should be equal to the highest parameter ID number), the Upload/Download functionality does not operate correctly. Additionally, to correctly pass parameter values, the phase logic must use request data parameters for specifying how FactoryTalk Batch uploads the parameters.

See also

[Phase class overview](#) on [page 137](#)

[Phase tags](#) on [page 45](#)

Phase tags

Review the configuration of the process-connected device (PCD) to verify that the number of tags configured for the OPC phase corresponds to an equal number of tags in the PCD. The parameter and report data types defined in FactoryTalk Batch Equipment Editor must be compatible with the corresponding tag data types in the PCD.



Tip: The configuration for FactoryTalk Linx FactoryTalk Live Data tags is identical to that of OPC tags.

This table shows each parameter and report data type that can be defined in FactoryTalk Batch Equipment Editor and its corresponding data types that can be stored in PCD memory:

FactoryTalk Batch Equipment Editor Data Type	Compatible PCD Data Types
Real	Real
Integer	Real, Integer
Enumeration	Real, Integer
String	String

See also

[Additional request, parameter, and report tags for phases](#) on [page 44](#)

Batch parameters and reports

Parameters pass values from the FactoryTalk Batch Server to the process-connected device (PCD). The PCD uses reports for returning values to the server.

IMPORTANT Do not use these words or phrases as parameter names or report names:

- all
- length
- recipenpath
- outerhtml
- finalinstructions
- stepindex
- submitstring
- submit

Using these phrases as parameter or report names can cause errors during manual phase control.

See also

[Phase class parameters](#) on [page 46](#)

[Phase class reports](#) on [page 46](#)

Phase class parameters

Phase class parameters pass from the FactoryTalk Batch Server to the phase logic during the recipe phase's execution. Phase class parameters usually correspond to phase tags, which are addressed to actual, configured parameters in the process-connected device (PCD).

When configuring the phase class, define phase class parameters. When configuring the OPC phase, define the corresponding parameter tags, including the address or tag in the PCD to which it is addressed.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, the parameter tags automatically create when the area model synchronizes with the Logix Designer project. Parameter tags for Logix5000 CIP phases do not have to be defined.

See also

[Phase class reports](#) on [page 46](#)

Phase class reports

Phase class reports values pass from the process-connected device (PCD) to the FactoryTalk Batch Server. Report values contain data that indicates how the phase functioned. They are in the event journal file (.evt) for the running batch and can be in FactoryTalk Batch reports. Phase class reports usually correspond to phase tags addressed to configured parameters in the PCD.



Tip: The configuration for FactoryTalk Linx FactoryTalk Live Data report tags is identical to that of OPC tags.

When configuring the phase class, define phase class reports for the phase. When configuring the OPC phase, define the corresponding report tags, including the address or tag in the PCD to which it is addressed.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, the report tags automatically create when the area model synchronizes with the Logix Designer project. There is no need to define report tags for Logix5000 CIP phases.

See also

[Phase class parameters](#) on [page 46](#)

Material parameters

If using FactoryTalk Batch Material Manager with FactoryTalk Batch, create material-enabled phase classes. Material-enabled phase classes use system parameters that specify the material and amount of material to use within a recipe.

The default parameters associated with a material-enabled phase class are MATERIAL and AMOUNT. The default report parameters associated with each material-enabled phase class are ACTUAL_AMOUNT and FEED_COMPLETE. Each material-enabled phase class can be assigned optional material parameters: CONTAINER, LOT, LABEL, and MATERIAL_CLASS. The values of the MATERIAL, LOT, and LABEL parameters are combined to create the material specification.

The material specification determines the container from which a material is drawn or into which a material distributes when a batch runs. The material specification always contains a material name. The specification may include a lot name, a label, or both based on the container type.

See also

[Types of containers](#) on [page 47](#)

[Default material parameters](#) on [page 47](#)

Types of containers

FactoryTalk Batch Material Manager uses three types of containers: Composite, Plug-Flow and Pallet. All three containers require the material specification to contain at least a material name. Composite and plug-flow containers support a material specification that includes a lot name. Pallet containers support a material specification that includes a lot name, or a label, or both.

If a material specification is only a material name, then any three of the container types are valid. However, if a material specification includes a material name, lot, and label, then only the pallet container type is valid.

See also

[Default material parameters](#) on [page 47](#)

Default material parameters

Default material parameters:

Parameter	Purpose
MATERIAL	Generally configured with the default value of NULL_MATERIAL; the actual material is assigned in the recipe. Assign a material to the parameter, but then the phase class can only be used to feed that specific material. The combination of the MATERIAL parameter, the unit for the phase in which the phase class is running, and the high and low values for the AMOUNT parameter determines if the phase class is going to be an addition of material, distribution, or both.
FEED_COMPLETE	Reports that a material addition or distribution is complete. The ACTUAL_AMOUNT report parameter records the actual quantity of material produced or consumed.

Parameter	Purpose
MATERIAL	Generally configured with the default value of NULL_MATERIAL; the actual material is assigned in the recipe. Assign a material to the parameter, but then the phase class can only be used to feed that specific material. The combination of the MATERIAL parameter, the unit for the phase in which the phase class is running, and the high and low values for the AMOUNT parameter determines if the phase class is going to be an addition of material, distribution, or both.
CONTAINER	Used to hold the name of the container to which a step is bound when a batch runs. It is created with a default value of NULL_CONTAINER. The CONTAINER parameter cannot be assigned a value in the area model or in a recipe. Containers are considered to be equipment outside of the area model. Either the FactoryTalk Batch Server or the operator determines the appropriate container to which the step is bound. At that time, the value of the bound container name is assigned to the CONTAINER parameter. Other than the default value, the parameter only contains a value while the step is bound during run time.
MATERIAL_CLASS	Represents a set of material classes configured in the material database. It is created with a default value of NULL_CLASS. The only attributes of MATERIAL_CLASS that can be modified are Default and Download on Start, depending on whether or not control strategies are enabled.
LOT	Used to refine the list of materials to which a phase class can be bound. The lot specifies a discrete quantity of a given material. When this parameter is blank at run time, the FactoryTalk Batch Server binds to a container without regard to the lot.
LABEL	Represents a subplot of a material, which is a discrete quantity of a given material's lot distributed to a specific container. In material addition phase classes, the label is used to refine the material list to which a phase class can be bound. In material distribution phase classes, the label is applied to the subplot of material distributed into inventory.



Tip: The values of the optional material parameters (except for the MATERIAL_CLASS parameter) within FactoryTalk Batch Equipment Editor cannot be edited.

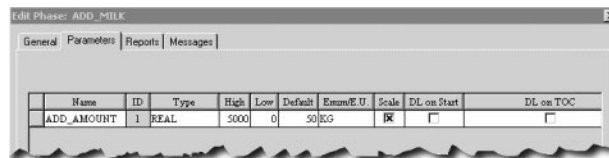
See also

[Types of containers](#) on [page 47](#)

Scale parameters

Select the **Scale** check box to set a parameter to automatically adjust proportionally when a batch containing a phase based on this phase class scaled at runtime.

For example, if a batch containing a phase based on this phase class runs at a scale of 200%, the ADD_AMOUNT value automatically increments by 200%. The ADD_AMOUNT adjusts to 100, since the default is 50. Likewise, if the batch runs at a scale of 50%, the ADD_AMOUNT adjusts to 25.



See also

[Parameters and reports with FactoryTalk Batch](#) on [page 43](#)

Verification method for parameter deviations

A parameter deviation occurs when the parameter or report value is outside the acceptable range defined by the designer of the area model. A verification policy defines the set of acceptable limits for each parameter and the corresponding action to take when the parameter or report value exceeds or falls short of the limits. The Verification Method is the policy portion that defines the set of acceptable limits for a parameter or report. When adding a parameter or report to a phase class, either accept the default Verification Method, which is No Limits, or select a different Verification Method.



Tip: To require electronic signatures as part of a Verification Policy, set up Signature Templates before configuring the Verification Policy.

See also

[Verification policies](#) on [page 151](#)

[Signature template](#) on [page 61](#)

Control strategies overview

Create parameters and reports applicable to a specific phase class in FactoryTalk Batch Equipment Editor. The parameters and reports are directly associated with the phase class. All the parameters and reports assume to be applicable to each recipe that includes the phase class. However, some phase classes may assume different roles within a single recipe or different roles across different recipes. In this situation, only a subset of the parameters and reports associated with the phase class may be required, resulting in unnecessary phase I/O when the recipe executes. This is where control strategies are helpful.

Control strategies are user-defined groupings of phase class parameters and reports that can be associated with a single phase class. Organizing parameters and reports into separate control strategies allows phase classes to assume multiple roles without generating unnecessary phase I/O.

Create multiple control strategies for a phase class, each with its own parameters and reports. Within a phase class associate parameters and reports with a single or multiple control strategies. If a parameter or report is associated with more than one control strategy, the value range, engineering units, and the engineering units of the report can be defined independently for each control strategy with which the parameter or report is associated.



Tip: In FactoryTalk Batch Recipe Editor, when viewing recipe phase class enabled control strategies, only the parameter values with specified control strategy display. Associating parameters with specific control strategies eliminates the need for the recipe author or operator to determine which phase class parameters, and report parameters are applicable when creating, viewing, and executing a specific recipe.

See also

[Control strategies example](#) on [page 49](#)

[Implement control strategies](#) on [page 50](#)

Control strategies example

This table represents the configured parameters, reports, and control strategies for a single phase class. The table illustrates the relationship

between parameters, reports, and control strategies. An **X** placed below a control strategy indicates that the parameter or report is associated with that control strategy.

Parameter Name	CONTROL_STRATEGY_1	CONTROL_STRATEGY_2	Strategy 1 Value	Strategy 2 Value
PARAMETER_A	X		150	
PARAMETER_B	X	X	200	275
PARAMETER_C		X		70
REPORT_A	X	X	125	125

For example, a phase class contains three phase class parameters, PARAMETER_A, PARAMETER_B, and PARAMETER_C, and a report parameter named REPORT_A. As indicated above, a parameter can associate with only one control strategy as is the case with PARAMETER_A and PARAMETER_C. Or, a parameter associate with more than one control strategy as is the case with PARAMETER_B and REPORT_A. Parameters associated with more than one control strategy can have separately defined values for each control strategy as indicated by PARAMETER_B.

See also

[Implement control strategies](#) on [page 50](#)

Implement control strategies

Configure the phase class in an area model to enable or disable the control strategy functionality. For phase classes that have the control strategy functionality enabled, configure one or more strategies for that phase class. Assign phase class parameters and reports to each control strategy, as well as configure their ranges, values, and engineering units.

When creating master recipes using FactoryTalk Batch Recipe Editor, specify which control strategy to use for each instance of the phase class within the recipe.

When the recipe executes, the phase class uses only the parameters associated with the control strategy specified during recipe creation.

Likewise, when the executed recipe is viewed in the FactoryTalk Batch View or other client program, a control strategy-enabled phase class only displays the specified control strategy and any parameters associated with that control strategy.

However, the default values of parameters associated with control strategies can be changed.

Additionally, if a phase class is executed using manual phase control, select which control strategy to use before running the phase class.



Tip: Configure the tags in the phase and the phase logic in the process-connected device(s)(PCD) to support control strategy use.

When a PCD requests to download phase class parameters or upload phase class reports, only the appropriate phase class parameters and reports are loaded, based on the control strategy.

Configure and map the phase class and report parameters to the tags in the PCD(s).

See also

[Configure phase class control strategies](#) on [page 149](#)

Parameter and report subsets

Use the download parameter subsets to define subsets of phase class parameters for **Download (DL) on Start** and **Download (DL) on Transfer of Control (TOC)**. These subsets provide for a more efficient batch execution. Also, the upload report subsets allows definition of a subset of the phase class reports for **Upload (UL) on Terminal State** or **Upload (UL) on Transfer of Control (TOC)**. These subsets provide for a more efficient process.



Tip: Transfer of control means that two instances of the same phase exist in a recipe and are separated by a recipe transition condition containing something other than <Phase Name>.State = Complete. In this case, the running logic does not terminate when the transition condition becomes true.

Assign parameters to none, one, or both of the upload/download sets. By assigning a parameter or report to a subset, that parameter or report, along with the other members of the subset, are downloaded (parameters) or uploaded (reports) when the appropriate phase logic request is issued.



Tip: The 145 (Request Failed) command value can be issued by the FactoryTalk Batch Server when processing a phase logic request experiences an error. This enhanced error handling phase logic protocol is supported by making a request where the value is 10,000 greater than the current standard requests.

For example, to upload a report parameter using the enhanced phase logic request, add 10,000 to the standard request code of 2200 to get the enhanced request code of 12200.

IMPORTANT When using Auto Upload with the FactoryTalk Batch Server configured for Warm or Warm All Restart, the Server may upload addition material information twice when a phase is transitioned to External during the upload. Check the journal file. If the upload has occurred twice, manually adjust the amount in the material database. The setpoint of the amount parameter is recalculated with each warm restart as well. This number may need to be manually updated.

See also

[Phase class with different subsets example](#) on [page 51](#)

[Download parameter requests](#) on [page 52](#)

[Upload report requests](#) on [page 53](#)

[Configure phase class parameters](#) on [page 140](#)

[Configure phase class reports](#) on [page 144](#)

Phase class with different subsets

This table is an example of a phase class and how its parameters and reports can be assigned to the different subsets:

AGITATE_1					
Parameters	DL on Start	DL on TOC	Reports	UL on Terminal State	UL on TOC
SPEED	X	X	AGITATE_TIME	X	X
TIME	X	X	AVG_TEMP	X	
LEVEL	X		AVG_SPEED	X	X

TEMP	X		AMT_DUMPED	X	
------	---	--	------------	---	--

See also

[Parameter and report subsets overview](#) on [page 51](#)

[Download parameter requests](#) on [page 52](#)

[Upload report requests](#) on [page 53](#)

Download parameter requests

Download parameter subsets allows definition of subsets of parameters downloaded to the process-connected device (PCD) when the appropriate phase logic requests are sent to the FactoryTalk Batch Server.

- If **DL on Start** is selected, the FactoryTalk Batch Server downloads these parameters to the PCD before the FactoryTalk Batch Server issues a START command to the phase. Once the download is verified, the FactoryTalk Batch Server starts the phase. The phase logic can explicitly request this or the phase can be configured for the FactoryTalk Batch Server to automatically download these parameters before it issues a START command.
- If **DL on TOC** is selected, the parameters may be downloaded to the PCD when a transfer of control situation occurs. Transfer of control means that two instances of the same phase exist in a recipe and are separated by a recipe transition condition that contains something other than <Phase Name>.State = Complete. In this case, the phase’s running logic does not terminate when the transition condition becomes true. When the transition condition becomes true, the phase logic must explicitly request the Server to download the transfer of control subset of parameters to the PCD.

To download only the parameters assigned to the **DL on Start** subset, use these download requests:

(OPC or FTD) phases	Logix5000 CIP phases
1501 or 11501 request	PXRQ instruction, External request: Download Input Parameters Subset DINT[0] - 1

To download only the parameters assigned to the **DL on TOC** subset, use these download requests:

(OPC or FTD) phases	Logix5000 CIP phases
1502 or 11502 request	PXRQ instruction, External request: Download Input Parameters Subset DINT[0] - 2

When one of these requests is issued, each parameter is downloaded to the memory address or tag in the PCD that corresponds to the parameter tag in the phase.

See also

[Parameter and report subsets overview](#) on [page 51](#)

[Upload report requests](#) on [page 53](#)

[Configure phase class parameters](#) on [page 140](#)

[Configure phase class reports](#) on [page 144](#)

Upload report requests

If **UL on Terminal State** is selected, the FactoryTalk Batch Server uploads this subset of reports from the process-connected device (PCD) after the phase logic transitions to a terminal state of COMPLETE, STOPPED, or ABORTED. The phase logic can explicitly request the server to upload these reports or the phase can be configured for the server to automatically upload these reports after the phase logic transitions to a terminal state.

If **UL on TOC** is selected, the reports are uploaded to the PCD when a transfer of control situation occurs. In this case, the phase logic must explicitly request the FactoryTalk Batch Server to upload the transfer of control report subset from the PCD.

To upload only the reports assigned to the **UL on Terminal State** subsets:

(OPC or FTD) phases	Logix5000 CIP phases
2501 or 12501 request	PXRQ instruction, External request: Upload Output Parameters Subset DINT[0] - 1

To upload only the reports assigned to the **UL on TOC** subset:

(OPC or FTD) phases	Logix5000 CIP phases
2501 or 12501 request	PXRQ instruction, External request: Upload Output Parameters Subset DINT[0] - 2

See also

[Parameter and report subsets overview](#) on [page 51](#)

Automatic Upload/Download

Automatic Upload/Download decreases batch duration time as well as the amount of phase logic programming required. **Automatic Upload/Download** works with **Download Parameter Subsets** and **Upload Report Subsets**. **Automatic Upload/Download** allows the FactoryTalk Batch Server to automatically download parameters grouped into the download on START subset or to upload reports grouped into the upload on terminal state subset. Phase logic can be developed to make these requests; however, it is not required.

Use **Automatic Upload/Download** to configure the FactoryTalk Batch Server to:

- Automatically download the parameters grouped into the download on start subset when all the conditions required to start the phase are true.
- Automatically upload the appropriate report values grouped into the upload on terminal state subset when the phase transitions to a terminal state of COMPLETE, STOPPED, or ABORTED.

Automatic Upload/Download eliminates the need to send the download on start or upload on Terminal State request from the phase logic to the FactoryTalk Batch Server.



Tip: Downloading parameters on Transfer of Control and uploading reports on transfer of control is not automatic and still requires a phase logic request.

The **Automatic Download Parameter Upon Start** and **UL On Terminal State** are configured for each individual phase (as long as the parameters and reports of the phase class from which the phase was created are grouped into the appropriate subsets). The **Automatic Download parameter Upon Start** and **UL on Terminal State** may also be configured independently of each other on a phase. For **UL on Terminal State**, specify any or all terminal states for which the automatic function is applicable: COMPLETE, STOPPED, or ABORTED.



Tip: The 145 (Request Failed) command value can be issued by the FactoryTalk Batch Server when processing a phase logic request experiences an error. This enhanced error handling phase logic protocol is supported by making a request where the value is 10,000 greater than the current standard requests.

For example, to upload a report parameter using the enhanced phase logic request, add 10,000 to the standard request code of 2200 to get the enhanced request code of 12200.

See also

[Parameter and report subsets overview](#) on [page 51](#)

[Control strategies with upload/download parameter subsets](#) on [page 54](#)

[Configure the general data for a phase](#) on [page 162](#)

Control strategy with parameter subset

If parameters or reports are assigned to Upload/Download Parameter Subsets, and Control Strategies are enabled, only those parameters common to all the involved subsets and selected Control Strategy are uploaded or downloaded.

In this example, the phase class has a number of reports and parameters. The control strategies are enabled and the CS1 control strategy is the default. When a phase logic request:

- Is issued for **Download on Start**, only the SPEED, TIME, LEVEL, and TEMP parameters are included.
- Is issued for **Download on TOC**, only the SPEED and TIME parameters are included.
- For **Upload on Terminal State** is issued, only the AVG_SPEED, AGITATE_TIME, AVG_TEMP, and AMT_DUMPED reports are included.
- For **Upload on TOC** is issued, only the AVG_SPEED and AGITATE_TIME reports are included.

AGITATE_1 (Control Strategies enabled; CS1 is the default control strategy)

Parameters	DL on Start	DL on TOC	CS1	Reports	UL on Terminal State	UL on TOC	CS1
SPEED	X	X	X	AVG_SPEED	X	X	X
TIME	X	X	X	AGITATE_TIME	X	X	X
LEVEL	X		X	AVG_TEMP	X		X
TEMP	X		X	AMT_DUMPED	X		X

See also

[Parameters and reports with FactoryTalk Batch](#) on [page 43](#)

Electronic signatures

An electronic signature is an electronic representation of a signature and its associated data, including:

- Signoff meanings (such as review, approval, responsibility, or authorship)
- Signer comments
- Signer security requirements
- Date and time of signature

An electronic signature in the FactoryTalk Batch system can consist of signoffs by one, two, or three FactoryTalk users or groups.

See also

[Types of electronic signatures](#) on [page 57](#)

[How electronic signatures work](#) on [page 57](#)

[Signature template](#) on [page 61](#)

Types of electronic signatures

Signatures can be configured for verification of these runtime FactoryTalk Batch events:

- Report parameters for automated and manual (eProcedure) phases.
- Changes to the recipe parameter values made by operators from the FactoryTalk Batch View or FactoryTalk Batch View HMI Controls.
- Completion of eProcedure steps.
- Batch or phase commands issued by operators from FactoryTalk Batch View or FactoryTalk Batch View HMI Controls.
- General usage that can be configured to display at any time when executing an automated or manual phase.

Electronic signatures are stored in the FactoryTalk Batch Event Journal with their corresponding electronic records. These electronic signatures include all the components necessary for compliance with 21 CFR Part 11.

See also

[Electronic signatures](#) on [page 57](#)

How electronic signatures work

The steps involved in configuring and executing electronic signatures span the FactoryTalk Batch product suite.

- The FactoryTalk Batch system administrator sets up electronic

signature and signoff security.

IMPORTANT Changing the FactoryTalk Directory Server after configuring electronic signatures using FactoryTalk Security is not supported. Doing so may cause Signature Signoffs to fail.

- In FactoryTalk Batch Equipment Editor, the FactoryTalk Event Archiver event filters for the signature events to capture for use in FactoryTalk Event Archiver with Reporting Services reports, or other reports.
- Create signature templates for the area model. To obtain electronic signatures for recipe parameters and report parameters of specific phase classes, configure the verification method and signature template to be used when the phase class is created or edited. To download all the limits information to the phase logic, map parameter tags and report tags to the appropriate limit tags on the phases. To require signature verification for the execution of specific commands, set up command verification policies in FactoryTalk Batch Equipment Editor using the signature templates that were created.

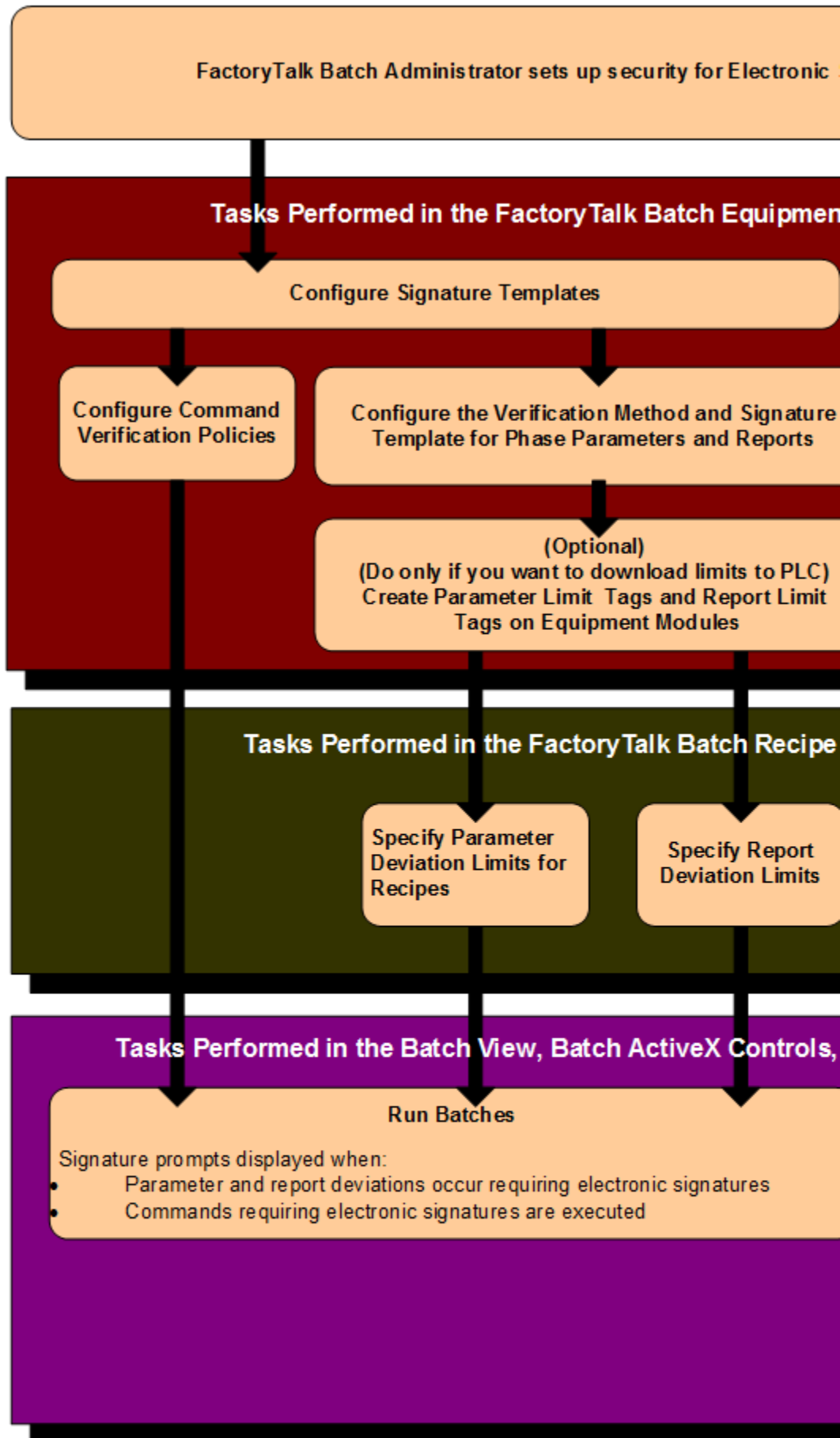
When the master recipe builds, the recipe parameter limits that trigger the verification policy default from the parameter limits specified on the equipment phase. Change these values at the recipe level in FactoryTalk Batch Recipe Editor. If configured a phase class to obtain a signature for deviation of report limits, specify those limits on the report for the phase class in FactoryTalk Batch Recipe Editor.

When a batch runs and parameter or report deviations occur requiring signature verification, or the operator issues commands requiring signature verification, a signature is added to the signature list in FactoryTalk Batch View, the Electronic Signature HMI Controls, or the eProcedure client, prompting the appropriate users to enter signatures.

All signatures record as Signature events in the FactoryTalk Batch Event Journal viewer in FactoryTalk Batch View.

Once signature event data generates, create FactoryTalk Event Archiver reports, or other reports that capture electronic signature data.

This flowchart shows the sequence of tasks in the setup and configuration, execution, viewing, and reporting of electronic signatures:



See also

[Electronic signatures](#) on [page 57](#)

[Signature template](#) on [page 61](#)

Signature template

Before setting up phase classes and recipes to require electronic signatures, 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 users or user groups have the required security permissions to complete the signoff. Create as many templates as needed to distinguish the different signature types the business processes requires.

The process of creating a signature template consists of three main procedures:

- Add a signature template
- Configure signature template signoffs
- Assign security permissions for a signoff

See also

[Edit signature templates dialog box](#) on [page 61](#)

[Add a signature template](#) on [page 62](#)

[Configure signature template signoffs](#) on [page 63](#)

[Delete a signature template](#) on [page 67](#)

[Modify a signature template](#) on [page 68](#)

Edit signature templates dialog box

The **Edit Signature Templates** dialog box contains:

Name	Purpose
General tab	
Template Name	Displays the name of the template selected in the Signature Templates list. If there are no templates in the template list, this is disabled. <ul style="list-style-type: none"> • Template names must be unique, and can range from 1 through 50 characters in length. • The name must begin with an alpha character (a-z or A-Z) and may be followed with any combination of alphanumeric characters or under score. • Template Name is not case sensitive. • Spaces are not valid.
Template Index	The unique identification number of the template selected in the Signature Templates list. This value must be a positive integer from 1 to 2,147,483,647.
Signoffs Required	The number of signatures required in the verification policy this template represents.
Last Signoff	A number indicating which signoff must be completed last, after other signatures have been entered. If None is selected, the signatures may be entered in any order.
New Template	Opens the Create Signature Template dialog box where new templates can be added to the Signature Templates list.
Delete Template	Removes the selected Signature Template form the list. If the selected template is used by the verification policy of any commands, phase class parameters, or reports, the template cannot be deleted.
Signoffs tab	

Name	Purpose
Template Name	Lists the templates that have been added on the General tab. Select the template to see its signoff information or to configure signoffs.
Signoff	Each number in the list represents a required signature for the selected template. These values are determined by the value selected in the General tab Signoffs Required box. Select the number of the Signoffs. Consider which value was selected in the General tab Last Signoff box.
Meaning	(optional) Type a short phrase describing the significance of the selected signoff. For example, Command Authorized by Signer, Done By Signer, or Checked by Signer. The Meaning displays as part of the signoff event recorded in the FactoryTalk Batch event journal. The Meaning box can range from 0 through 80 characters, and can contain any viewable and printable character. Special control or non-printable characters are not valid.
Comment	Select whether a comment is Optional , Required , or Not Allowed by the signer at the time the signoff is entered.
Security Permissions	Displays the users and groups of users that can complete the selected signoff. If this area is blank, no security permissions have been configured yet. Security Permissions must be configured for all signoffs before the Edit Signature Templates dialog box can be closed.
Add	Opens the Select User or Group dialog box. Select which users and groups have permission to complete the selected signoff.
Delete	Removes the selected user or group from the Security Permissions box, and removes the user or group permission to complete the selected signoff.

See also

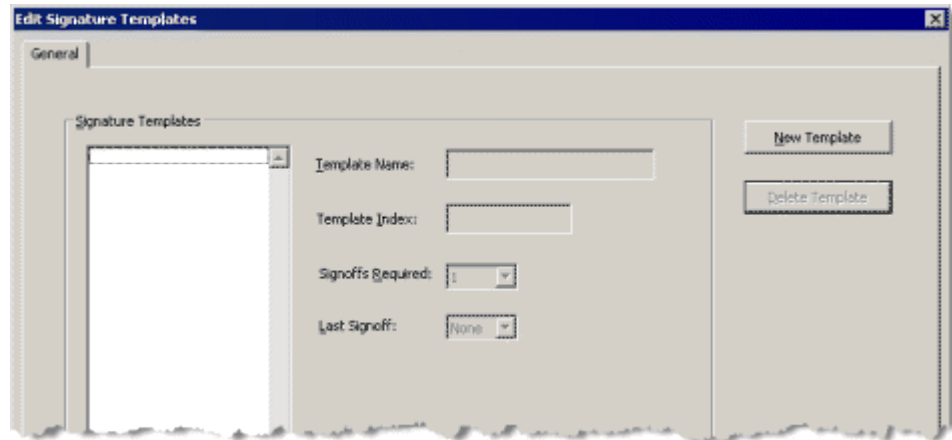
[Delete a signature template](#) on [page 67](#)

Add a signature template

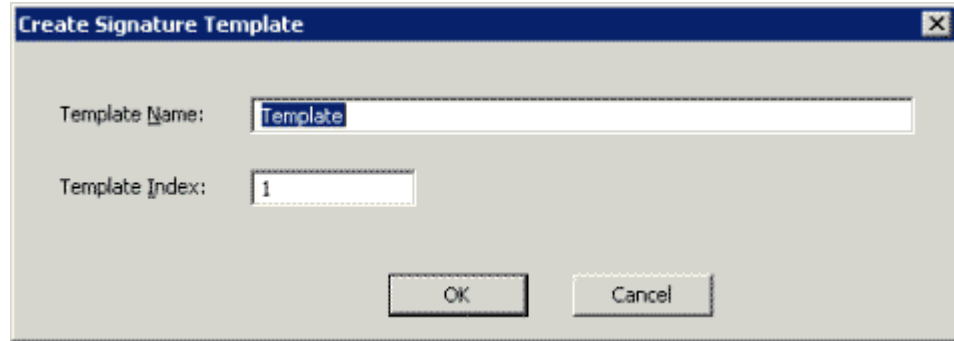
Use these instructions to add a signature template.

To add a signature template:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **File > Open**, and then select the area model file.
3. Select **Edit > Signature Templates** to open the **Edit Signature Templates** dialog box.



4. Select **New Template** to open the **Create Signature Template** dialog box.



5. In the **Template Name** box, enter a unique name to identify the template. The name must begin with an alpha character (a through z or A through Z) and may be followed with any combination of alphanumeric characters or underscores. This box is not case sensitive. Spaces are not accepted as valid input.

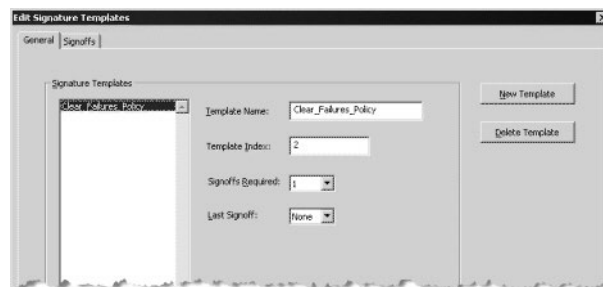


Tip: Choose a name that easily identifies the template properties or purpose. The template name is used to identify the signature template when the command verification policies, phase classes, and recipes are being configured.

6. (optional) A unique identification number is defaulted in the **Template Index** box. If needed, change this number (must be a positive integer).

IMPORTANT If a decimal is entered in the **Template Index** box, the value is automatically rounded up or down to the nearest integer. If the nearest integer is already assigned to another template, a duplicate index value error message is opened.

7. Select **OK**. The **Create Signature Template** dialog box closes and the new template is listed in the **Signature Templates** list in the **Edit Signature Templates** dialog box.
8. In the **Signoffs Required** list, select the number of signatures that must be obtained for this signature template.
9. In the **Last Signoff** list, select the number of the signoff that corresponds to the signature that must be completed last (that is, after other signatures have been entered). If the signatures do not have to be completed in any particular order, select **None**.



10. Configure the signoffs for the signature template.

See also

[Configure signature template signoffs](#) on [page 63](#)

Set signature template signoffs

Use these instructions to configure the signature template signoffs.

Prerequisite

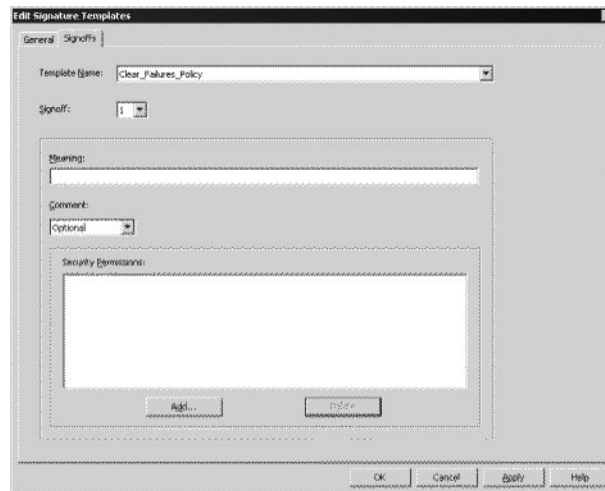
- Verify the signature template has been added.

To configure signature template signoffs:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. From the **Edit Signature Templates** dialog box, select the **Signoffs** tab.
3. From **Template Name**, select the template to configure signoff information.
4. From **Signoff**, select the number that represents the signoff to configure.



Tip: This **Signoff** list corresponds to the **Signoffs Required** list on the **General** tab. When completing these steps, keep in mind the number selected for **Last Signoff** on the **General** tab.



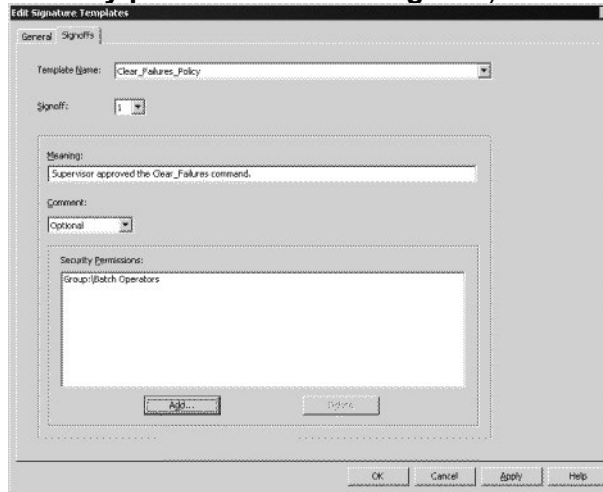
5. (optional) In **Meaning**, enter a short phrase that describes the significance of this signoff.



Tip: The **Meaning** displays as part of the signoff event recorded in the FactoryTalk Batch event journal.

6. From **Comment**, select whether signer comments are **Optional**, **Required**, or **Not Allowed**.
7. Under **Security Permissions**, assign privileges to the users and groups authorized to complete this signoff.

When finished assigning security permissions for the signoff, the User and Group names are displayed in the **Security Permissions** area. (For detailed instructions, see **Assign security permissions for a signoff.**)



8. Select **Apply**.
9. If creating a template that requires more than one signoff, repeat steps 3 through 7 until all the signoffs have been configured for the template.



Tip: When a signature requires multiple signoffs, each signoff must be made using a unique UserID and password.

10. When finished configuring all the signoffs for the template, either return to the **General** tab to add other signature templates, or select **OK** to close the dialog box.

See also

[Add a signature template](#) on [page 62](#)

[Assign security permissions for a signoff](#) on [page 65](#)

[Remove signoff permissions for a user or group](#) on [page 67](#)

Set security permissions for a signoff

When configuring signoffs for a signature template, specify which users or groups may complete each signoff.

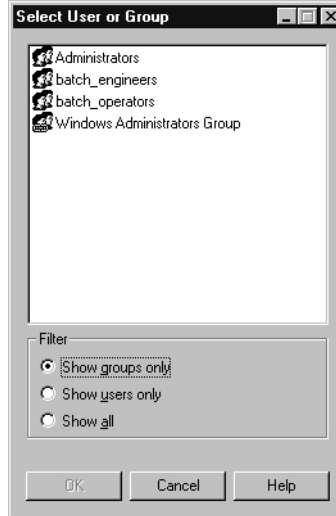
Prerequisite

- Add a signature template.
- On the **Signoffs** tab, enter a **Template Name**, select a **Signoff** number and **Comment** option, and enter a **Meaning**.

To assign security permissions for a signoff:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. From the **Edit Signature Templates** dialog box, select **Signoffs** tab.

- From the **Security Permissions** area, select **Add**. The **Select User or Group** dialog box opens.

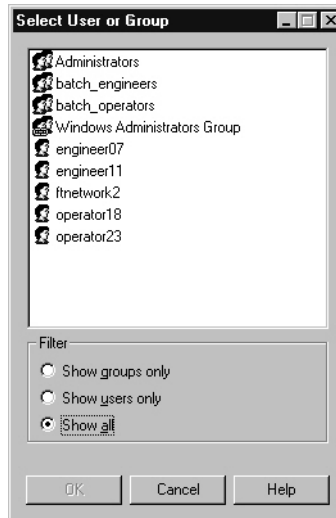


- In the **Select User or Group** dialog box, select **Show all** to view a list of all users and groups. The list displays all FactoryTalk Security users and groups and all Windows-linked users and groups defined in the FactoryTalk Directory Server.



Tip: Changing the FactoryTalk Directory Server after adding users and groups to a signature template is not supported and may cause signature signoffs to fail.

- Select the appropriate user or group.



- Select **OK**.

IMPORTANT Changing the FactoryTalk Directory Server after configuring electronic signatures using FactoryTalk Security is not supported and may cause signature signoffs to fail.

See also

[Add a signature template](#) on [page 62](#)

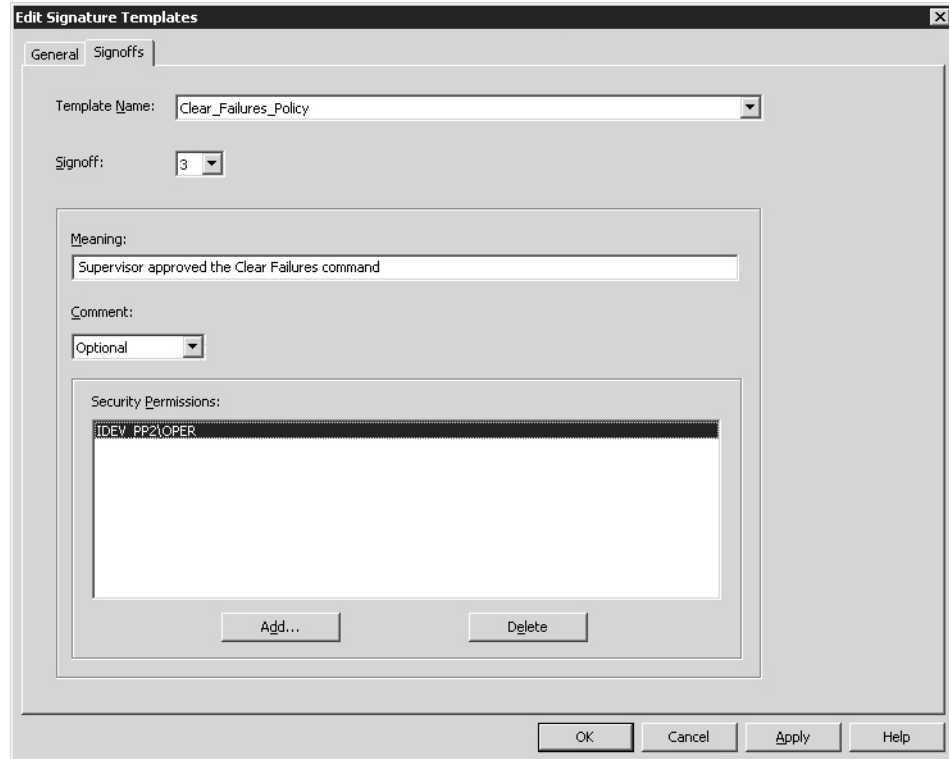
[Configure signature template signoffs](#) on [page 63](#)

Remove signoff permissions

Complete these steps to remove authority from an individual or group to complete a particular signoff.

To remove signoff permissions for a user or group:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Signature Templates**, select the template, and then select the **Signoffs** tab.
3. Under **Security Permissions**, select the individual or group.



4. Select **Delete**.
5. Select **OK**.

See also

[Add a signature template](#) on [page 62](#)

Delete a signature template

A signature template cannot be deleted if it is used in:

- The verification policy for any command.
- The verification policy for phase class parameters or reports.
- The approval process for a recipe.

Before you begin:

- Modify each command verification policy that uses the template to use a different signature template or to not require signature verification.
- Modify the verification policy for phase class parameters or reports to use a different signature template or no signature template, or

the parameter or report must be deleted before the template currently in use can be deleted.

- Modify recipe approval step to have a different signature template assigned to its signoff.

To delete a signature template:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the area model file.
3. Select **Edit > Signature Templates**.
4. On the **Edit Signature Templates** dialog box, from **Signature Templates**, select the template to delete.
5. Select **Delete Template**. The template name is removed from the **Signature Templates** list.
6. Select **OK**.

See also

[Command verification policies](#) on [page 69](#)

[Modify a signature template](#) on [page 68](#)

Modify a signature template

The Template Name or Template Index cannot be modified if the signature template is currently used in the verification policy of any command, phase class parameters, or reports, or if assigned to a recipe approval step.

Before you begin:

- Modify each command verification policy that uses the template to use a different signature template or to not require signature verification.
- Modify the verification policy for phase class parameters or reports to use a different signature template or no signature template, or the parameter or report must be deleted before the template currently in use can be deleted.
- Modify recipe approval step to have a different signature template assigned to its signoff.

IMPORTANT

If the number of Signoffs Required for a template is changed, the value of Last Signoff may also be affected. If the change results in the value of Last Signoff being greater than the value of Signoffs Required, the value of Last Signoff automatically changes to None. To enforce a different signature as the last signoff, select a different value in Last Signoff.

For example, the value of Signoffs Required is 3 and Last Signoff is 3. If Signoffs Required is changed to 2, the value of Last Signoff is automatically changed to None.

To modify a signature template:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the area model file.
3. Select **Edit > Signature Templates**.

4. On the **Edit Signature Templates** dialog box, in **Signature Templates**, select the template to modify.
5. On the **General** tab and modify boxes as needed.
6. Select **OK**.

See also

[Command verification policies](#) on [page 69](#)

Command verification policies

Set up command verification policies to obtain signatures for batch or phase commands issued by operators from FactoryTalk Batch View or HMI Controls.

Before configuring command verification policies, create signature templates that describe the signoff policies to use for the commands.

IMPORTANT If signature verification for the **Remove** command is enabled, all AUTOREMOVE executes sent to the FactoryTalk Batch Server fail and generate an error message. The AUTOREMOVE execute tells the server to automatically remove a batch when its state reaches COMPLETE.

See also

[Signature template](#) on [page 61](#)

[Add a signature requirement to commands](#) on [page 69](#)

[Change the verification policy for a command](#) on [page 70](#)

[Remove the signature requirement for a command](#) on [page 70](#)

Add electronic signatures to commands

Follow these instructions to add electronic signatures to commands.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Command Policies**.



Tip: The ability to secure FactoryTalk eProcedure instruction files does not currently exist in FactoryTalk Security, require an electronic signature on Parameter Change to prevent unauthorized users from executing instructions.

3. Select the checkbox next to the command that requires an electronic signature.
4. From **Select Template**, select the signature template that defines the signature policy to use for this command.
5. Select **OK**. The **Select Signature** dialog box closes, and the signature template displays in the **Signature Template** box next to the selected command.
6. Repeat these steps for each additional command that requires an electronic signature.
7. Select **OK**.

See also

[Edit command verification policies dialog box](#) on [page 70](#)

[Change the verification policy for a command](#) on [page 70](#)

[Remove the signature requirement for a command](#) on [page 70](#)

Edit command verification policies

The components in the **Edit Command Verification Policies** dialog box include:

Name	Purpose
Command	This column displays each command that can be configured to require an electronic signature (view only).
Requires Signature	Opens the Select Signature Template dialog box. Select the check box next to each command that should require an electronic signature when it is executed.
Signature Template	Displays the signature template that defines the verification policy for the command. If the command does not require a signature, this box is disabled. To change the Signature Template , select browse (...) and select a different template in the Select Signature Template dialog box.

See also

[Add a signature requirement to commands](#) on [page 69](#)

Change a command verification policy

If a command requires a signature and has a signature template specified, follow these instructions to change the verification policy for the command.

Prerequisite

- Verify a signature template already exists that describes the new signoff policies to use. If not, create one.

To change the verification policy for a command

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Command Policies**.
3. Select browse (...) next to the signature template to change.
4. On the **Select Signature Template** dialog box, from **Select Template**, select the signature template that defines the signature policy used for this command.
5. Select **OK**. The **Select Signature** dialog box closes. The signature template chosen displays in the **Signature Template** box next to the selected command.
6. Repeat these steps for each additional verification policy to change.
7. Select **OK**.

See also

[Signature template](#) on [page 61](#)

[Command verification policies](#) on [page 69](#)

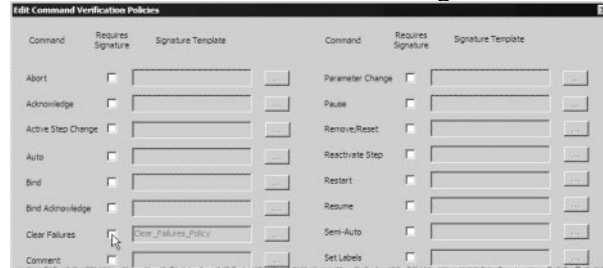
Remove signature requirement commands

To remove the verification policy and signature requirement for a command, complete these steps.

To remove the signature requirement for a command

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Command Policies**.
3. Clear the **Requires Signature** check box next to the appropriate command.

The **Signature Template** box is disabled and the template name appears shaded. This indicates that the signature template is not in use for this command and no signature verification is required.



Tip: To re-enable the signature requirement for a command, select the **Requires Signature** check box. The signature template previously used automatically activates.

4. Select **OK**.

See also

[Add a signature requirement to commands](#) on [page 69](#)

[Command verification policies](#) on [page 69](#)

Recipe approval process overview

The recipe approval process validates the development and maintenance of batch recipes. Using signature certification, the recipe approval process safeguards design workflow in a formalized manner. This ensures that each recipe is validated by authorized personnel before being released to production, or released as a component within a larger recipe.

The Recipe Approvals process is configured and enabled in the FactoryTalk Batch Equipment Editor, then executed in the FactoryTalk Batch Recipe Editor. When the approvals process is complete, the recipe is added to the **Recipe List** in FactoryTalk Batch View. At that point, production batches can be made from the recipe.

In addition to the primary approval process with up to six approval steps (three optional), a two-step expedited approval process is available. Both primary and expedited processes provide a revert option to allow forward and reverse progress through the recipe approval process.

See also

[Recipe approval tasks](#) on [page 73](#)

[Configure recipe approval steps](#) on [page 74](#)

[Edit a recipe approval](#) on [page 77](#)

[Disable recipe approval](#) on [page 77](#)

Recipe approval tasks

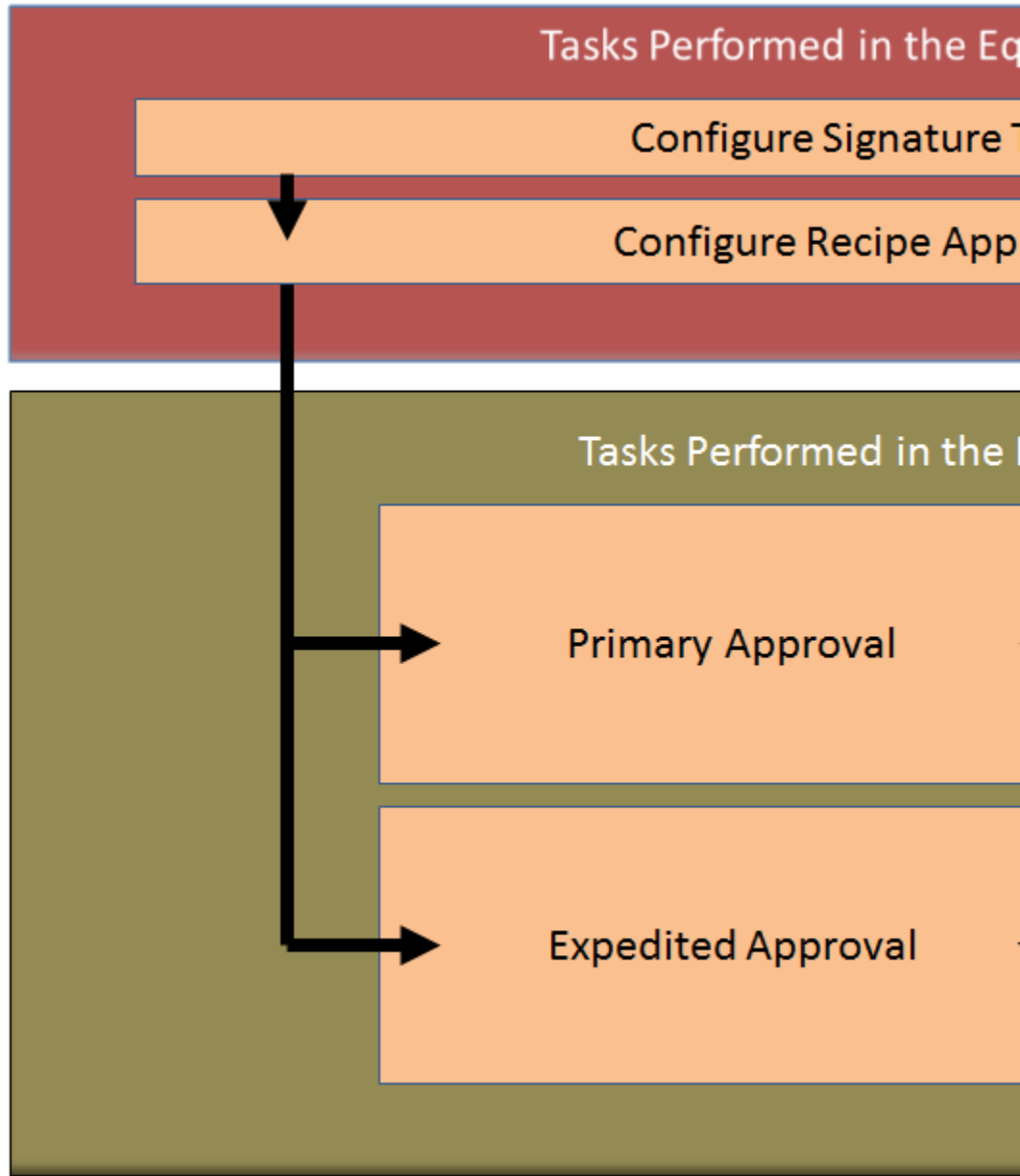
As a necessary first step, a FactoryTalk Batch system administrator sets up electronic signatures for signoff security.

Typically, an administrator, or a process engineer with full administrative rights, then defines signature templates in FactoryTalk Batch Equipment Editor. Signature templates define which users can sign off on recipe approval steps, either to approve or to revert the step.

Also in FactoryTalk Batch Equipment Editor, a process engineer configures recipe approval steps according to a defined approval process. The primary approval process comprises up to six steps (three optional). The expedited approval process involves just two approval steps.

Finally, the primary approval process (or expedited approval process) itself executes in FactoryTalk Batch Recipe Editor.

This flow chart shows this sequence of tasks in the setup, configuration, and execution of signatures for recipe approval.



See also

[Configure recipe approval steps](#) on [page 74](#)

[Edit a recipe approval](#) on [page 77](#)

Configure recipe approval steps

Use the **Recipe Approvals Configuration** dialog box to configure the steps used by the primary approval process and expedited approval process. This includes assigning step names, step order, step concurrency and signature templates to the selected approval steps. Upon saving the area model, FactoryTalk Batch Equipment Editor stores the current recipe approval process configuration.



Tip: The recipe approval process uses signoffs to progress through the primary approval process, the expedited approval process, or to revert back from a prior approval. Determine if existing signature templates are sufficient for the recipe approval process signoffs or if additional templates must be created.

To configure recipe approval steps:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Recipe Approvals Configuration**. The **Recipe Approvals Configuration** dialog box opens.




Tip: If configured with View Only access rights under FactoryTalk Policies, the **OK** button is disabled, and changes are not saved.

Step Order	Step Name	Approval	Revert
1	Begin Approvals	operator	administrator
2	Confirm Author		
3	Review Recipe		
4	Approve Recipe		
2	Release Recipe as Step	operator	operator
2	Release Recipe to Production	administrator	administrator

Refresh Order

Step Order	Step Name	Approval	Revert
2	Release Recipe as Step	operator	

3. Configure the steps for the approval process. Three steps are mandatory: the first listed step (default label: **Begin Approval**), **Release Recipe as Step**, and **Release Recipe to Production** must all have **Approval** and **Revert** signoffs configured before enabling recipe approval.
 - For each step, select a Signature Template to Approve. Select browse (...) and select a template from the list of templates on the **Select Signature Template** dialog box. Select **OK**.

- For each step, select a Signature Template to Revert. Select browse () and select a template from the list of templates in the **Select Signature Template** dialog box. Select **OK**.



Tip: Change the step order for the optional steps any time during or after configuration by selecting the desired number from the **Step Order** list and then selecting **Refresh Order**.

4. (optional) To enable one or more of the three optional steps in the primary approval process, select the check box next to the desired step. Once enabled, customize the name and description for these steps if desired. The optional steps can be named for any approval milestone the methodology requires.
5. When configured Approval and Revert signature templates for all enabled steps, select the **Enable Recipe Approvals** check box. The recipe approval process enables for all recipes in the current project.

IMPORTANT

Recipe formulations cannot be created, modified, or deleted from a recipe protected by Recipe Approval. Modifications include changing the formulation name, formulation description, or formulation parameter values. The formulation can be created, modified, or deleted by reverting an approved recipe. If the formulation in a recipe protected by Recipe Approval is invalid, the recipe cannot be signed until the issue is resolved.

6. Select **OK** to close the dialog box.



Tip: If configured to have **View Only** rights in FactoryTalk Batch Equipment Editor, the **OK** button is disabled.

7. Save the area model and exit FactoryTalk Batch Equipment Editor. Open and verify all recipes against the updated area model (in FactoryTalk Batch Recipe Editor), to activate the approval process.

The actual approval of recipe steps is done in FactoryTalk Batch Recipe Editor. Either the primary approval process or expedited approval process is available.

See also

[Recipe Approvals Configuration dialog box](#) on [page 76](#)

[Signature template](#) on [page 61](#)

Recipe Approvals Configuration settings

The **Recipe Approvals Configuration** dialog box contains:

Name	Purpose
Step Order	The order that steps are approved. There can be multiple steps with the same number. When that happens, all steps of that number must be approved before the recipe can continue to the next step.
Step Name	Name of each approval step. Default names are provided. If needed, edit the name for the first and optional steps. Names must be unique, and must begin with 0 through 9, or A through Z. Maximum number of characters allowed is 32.
Approval	Approval signoff template.
Revert	Revert signoff template.
Description	An editable description of each approval step. Maximum number of characters allowed is 128.

See also

[Configure recipe approval steps](#) on [page 74](#)

[Edit a recipe approval](#) on [page 77](#)


Edit a recipe approval

Use these instructions to edit a recipe approval.

To edit a recipe approval:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Recipe Approvals Configuration**. The **Recipe Approvals Configuration** dialog box opens.
3. Make the necessary modifications. In this example one of the optional approval steps is enabled, and approval and revert signoffs are assigned:

Step Order	Step Name	Approval	Revert
1	Begin Approvals	operator	administrator
<input checked="" type="checkbox"/> 2	Confirm Author	operator	operator
<input type="checkbox"/> 3	Review Recipe		

4. Select **OK**.
5. Save the area model and select **Invoke Recipe Editor** () to open FactoryTalk Batch Recipe Editor.



Tip: FactoryTalk Batch Recipe Editor must be restarted to see the updated area model and recipe approval changes made.

See also

[Disable recipe approval](#) on [page 77](#)

Disable recipe approval

Use these instructions to disable recipe approval.

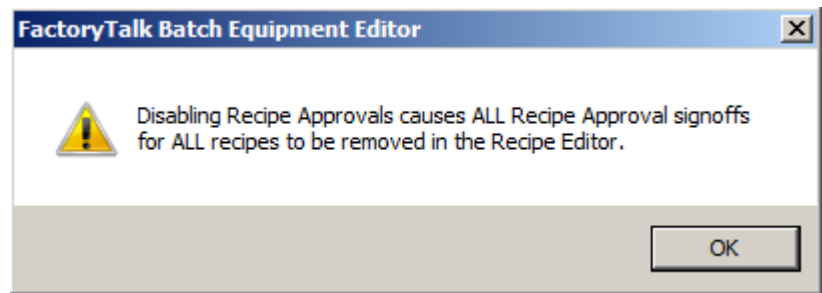
To disable recipe approval:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Recipe Approvals Configuration**. The **Recipe Approvals Configuration** dialog box opens.

3. Uncheck **Enable Recipe Approvals**.



4. Select **OK**. A dialog box displays a warning that existing approval signoffs are removed from all recipes in the current working set when FactoryTalk Batch Recipe Editor is next opened.



- 5. Select **OK**.
- 6. Save the area model.
- 7. (optional) Select **Invoke Recipe Editor** () to open FactoryTalk Batch Recipe Editor.



Tip: FactoryTalk Batch Recipe Editor must be restarted to see the updated area model and recipe approval changes made.

See also

[Edit a recipe approval](#) on [page 77](#)

Security authority overview

FactoryTalk Batch Security Authority, when enabled, helps protect intellectual property (as held in the area model) and secures it from unauthorized use.

FactoryTalk Batch Equipment Editor, when directed by an authenticated user to secure an area model, reads the FactoryTalk Network Directory Security Authority Identifier (SAI) and stores a copy of it in the area model.

Later, when FactoryTalk Batch Equipment Editor is directed to open and read a secured area model, the SAI of the area model is compared to the SAI of the current FactoryTalk Network Directory.

If they match, FactoryTalk Batch Equipment Editor loads the area model.

If they do not match, for example when running under another instance of FactoryTalk or if the SAI has been regenerated, the editing session does not have the authority to open the area model and stops the reading process.

IMPORTANT If the SAI in a FactoryTalk Network Directory is changed or lost, any area model that is bound to it can lose access.
Rockwell Automation recommends that, before securing an area model, back up the FactoryTalk Network Directory, and save an unsecured version of the area model in a secure location.

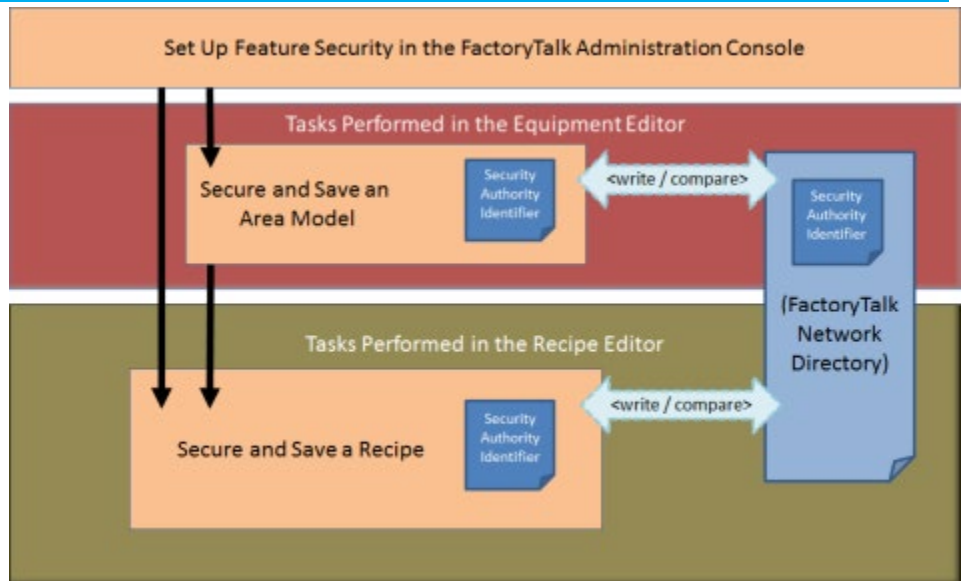
See also

[Security authority configuration](#) on [page 79](#)

[Secure an area model](#) on [page 80](#)

Security authority configuration

This flow chart shows the sequence of tasks in the configuration and use of security authority.



Authority to secure area models and recipes is assigned in the FactoryTalk Administration Console. Security Authority is disabled by default.

Area models are secured within FactoryTalk Batch Equipment Editor using the **Security Authority** command. The FactoryTalk Network Directory Security Authority Identifier (SAI) is written into the area model schema. To subsequently open and edit the area model, the SAI in the area model must match that of the current FactoryTalk Network Directory. No match prevents the opening and editing of an area model and its associated recipes in FactoryTalk Batch Recipe Editor.

Recipes are secured within FactoryTalk Batch Recipe Editor using the **Security Authority** command. The FactoryTalk Network Directory SAI is written into the recipe header data. To subsequently open and edit the recipe in FactoryTalk Batch Recipe Editor, the SAI in the recipe must match the one in the current FactoryTalk Network Directory.

Import and export operations with secured recipes are restricted.

See also

[Security authority overview](#) on [page 79](#)

[Secure an area model](#) on [page 80](#)

Secure an area model

Area models are secured using the Security Authority command.

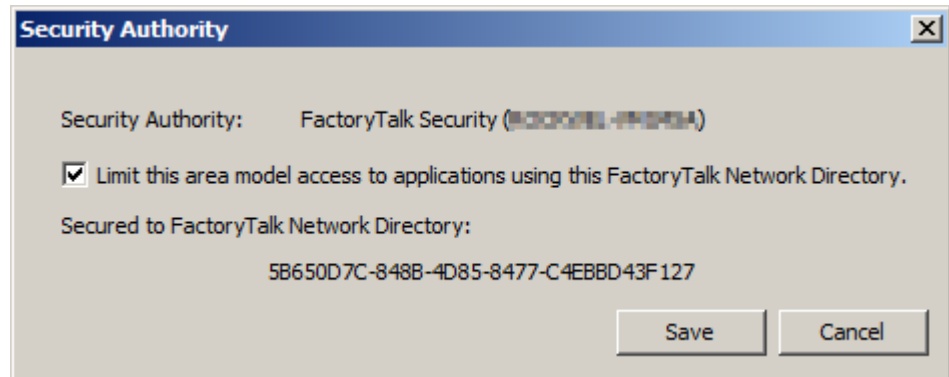
To secure an area model:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the area model to secure.

IMPORTANT Before securing an area model to a specific FactoryTalk Network Directory, Rockwell Automation recommends backing up the FactoryTalk Network Directory and storing unsecured versions of the area model file in configuration (.cfg), XML (.axml), or text (.txt) formats in a secure location. For backup details, see FactoryTalk Help: Select **Start > Rockwell Software > FactoryTalk Tools FactoryTalk Help**.

Once an area model is secured with a particular FactoryTalk Network Directory, the area model cannot be opened if the security authority identifier associated with that directory no longer exists.

3. Select **Edit > Security Authority**. The **Security Authority** dialog box opens.
4. Select the check box to secure the area model. If the check box is not enabled, the logged in user account is not authorized to use this feature.



5. Select **OK**.

See also

[Security authority overview](#) on [page 79](#)

Data servers overview

A FactoryTalk Batch data server is a system object that is a reference to an OPC, FactoryTalk Linx FactoryTalk Live Data, or Common Industrial Protocol (CIP) data server program and one of its associated data sources. These data server references provide run-time information from the process-connected device (PCD) to FactoryTalk Batch View or the HMI software. Data servers are used to pass data between the FactoryTalk Batch Server and the PCD. Configure a separate FactoryTalk Batch data server for each data source, and its associated data server program, that communicates with the FactoryTalk Batch Server.

In FactoryTalk Batch Equipment Editor, add a data server definition for each data server program (and its associated data source) that communicates with the FactoryTalk Batch Server. This allows FactoryTalk Batch to access current tag data within the PCD, which is necessary to successfully run recipes, arbitrate equipment, and control single phases or operation sequences.



Tip: The FactoryTalk Linx FactoryTalk Live Data protocol is based on the OPC Data Access protocol. The FactoryTalk Batch Simulator imitates the functionality of a data server and can communicate with the FactoryTalk Batch Server using OLE for Process Control (OPC) communications. Sample programs are included with the FactoryTalk Batch Phase Simulator and can be run to simulate batch processes without being connected to a PCD.

See also

[Area model data servers](#) on [page 83](#)

[OPC data servers](#) on [page 86](#)

Area model data servers

A minimum of one data server needs to be defined in the area model. Define a data server before adding phases or operation sequences to the area model.

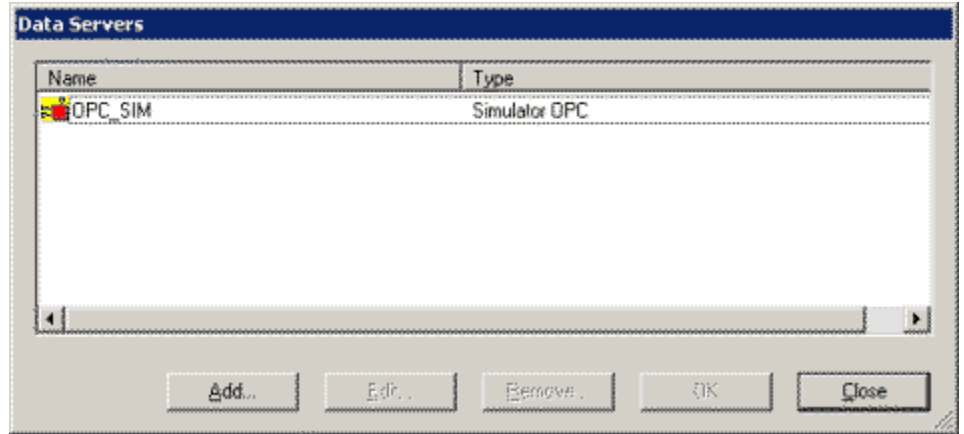
IMPORTANT The Instruction-Based Server is for use with FactoryTalk eProcedure only. The data server automatically creates when an area model opens. A new data server using the InstructionBasedServer data server type cannot be created. If this data server is deleted, any phases or operation sequences and associated tags are also deleted. The next time the area model opens, the data server automatically creates again.

FactoryTalk Batch supports these data server protocols:

- OPC Data Access protocol
- FactoryTalk Live Data protocol
- Common Industrial Protocol (CIP)

The **Data Servers** dialog box provides a list of data servers defined for the active area model. When you create a phase or operation and multiple Data Servers are listed, the first data server in this list is the

default. Select the **Name** header to sort the list in ascending or descending alphabetical order.



See also

[Data Servers dialog box](#) on [page 84](#)

Data Servers dialog box

The **Data Servers** dialog box contains:

Name	Purpose
Name	The user-defined name of the data server. Select the Name header to sort the data servers in ascending or descending alphabetical order.
Type	The type of data server, defined by a DSDf file. By selecting the Type header, the data server types can be sorted in ascending or descending alphabetical order.
Add	Opens the Add Data Server dialog box that is used to add new data servers to the area model.
Edit	Opens the Edit Data Server dialog box that is used to edit existing data servers.
Remove	Opens the Remove Data Server dialog box that is used to remove an existing data server. The dialog box displays a list of all associated phases or operation sequences, phase tags or operation sequence tags, and unit attribute tags that are removed.
Close	Closes the dialog box without applying a data server selection.

See also

[Area model data servers](#) on [page 83](#)

Edit a data server

When editing an OPC or FactoryTalk® Linx FactoryTalk Live Data server associated with a unit attribute tag, a phase or any tag within a phase, Logix5000 CIP does not display in the **Type** list. One OPC type can be changed to another or changed from an OPC type to a FactoryTalk Linx FactoryTalk Live Data type (for example, for a Simulator OPC data server, change **Type** to **Rockwell FactoryTalk Linx OPC**), but an OPC or FactoryTalk Linx FactoryTalk Live Data type server cannot be changed to a Logix5000 CIP type data server.

To change the **Type** to Logix5000 CIP, delete the data server, and add a new one.

IMPORTANT When using FactoryTalk Linx with a Live Data/OPC data server, the following entry must be added to the FTLX.dsdf in the \Batch\DataServers folder:
 ForceBoolTrueToOne=YES
 This is also required when updating from RSLinx Classic to FactoryTalk Linx.

To edit a data server:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Data Server** to open the **Data Servers** dialog box.
3. Select the data server definition edit, and then select **Edit**.

The **Edit Data Server** dialog box opens.

4. Make any required changes and select **OK** to return to the **Data Servers** dialog box.

All phase tags assigned to the modified data server definition are updated to reflect the changes.

5. Close the **Data Servers** dialog box.

See also

[OPC data servers](#) on [page 86](#)

[Delete a data server](#) on [page 85](#)

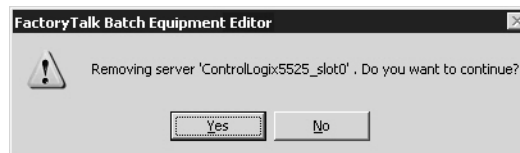
Delete a data server

Use these instructions to delete a data server.

To delete a data server:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the **Data Servers** dialog box.
3. Select the data server to delete, and then select **Remove**.

- If the data server is not assigned to any phases or operation sequences, this message displays:



- If the data server is assigned to any phases, operation sequences, or unit attribute tags, the **Remove Server** dialog box opens. All the phases, operation sequences, and unit attribute tags associated with the data server are listed.



Tip: The displayed phases or operation sequences and all of their tags, as well as the displayed unit attribute tags, are deleted when the data server is removed.

4. Perform one of the following steps:
 - To delete the data server and remove all associated phases or operation sequences and tags, select **Yes**.
 - To cancel the deletion and return to the **Data Servers** dialog box, select **No**.
5. Close the **Data Servers** dialog box.

See also

[Assign data servers](#) on [page 86](#)

Assign data servers

After a data server is added, assign it to either a phase, an operation sequence, or a unit.

Phase or operation sequence	Unit
Assign a data server to a phase or operation sequence to link the equipment piece to the specified controller.	Assign the same data server to all phases or operation sequences subsequently created in a unit. Select the data server in the Edit Unit dialog box.

See also

[Configure the general data for a process cell](#) on [page 107](#)

[Data servers overview](#) on [page 83](#)

OPC data servers

These items are displayed for OPC data servers.

When adding a data server to the area model, these items must be configured in the **Add Data Server** dialog box:

Name	Purpose
Name	The unique user-defined name for the data server definition.
Type	The various choices of data server types are defined within separate DSDF files.
Default Item Access Path	The OPC item access path that is the default for the tags on all subsequently created phases that this data server is assigned to. To reset the access path for all phase tags to this value, in the Edit Phase dialog box Tags tab, select Defaults . The tag item names are also reset to include the name of the phase.
Watchdog Item Access Path	The OPC watchdog item access path is for data servers that do not require separate read and write items. For data servers that require separate read and write items, this label changes to Watchdog Read Item Access Path and is used only for the read item access path. This is optional, depending on the data server.
Watchdog Item Name	The name of the OPC watchdog item for data servers that do not require separate read and write items. For data servers that require separate read and write items, this label changes to Watchdog Read Item Name and is used only for the read item name.
Location	Only used with OPC data servers. The location of the OPC data server. If the data server is located on the local computer, Local must be selected. If the data server is located on a remote network computer, Remote must be selected and the name of the computer where the data server is located must be provided. Enter the name of the remote computer using the naming scheme of the network transport. By default, Universal Naming Convention (UNC) names and Domain Names System (DNS) names are supported.
FactoryTalk Linx Server Path	Only used with FactoryTalk Linx FactoryTalk Live Data servers. A string that defines the path to a data server located in the FactoryTalk Directory. (See FactoryTalk Linx Live Data server for more information.)
Watchdog Protocol	The type of watchdog protocol to be used by the data server. This can be either the Standard or Enhanced protocol.
Watchdog Write Item Access Path	The OPC access path for the watchdog write item. If the data server does not require separate read and write items or does not require an access path, this is disabled.
Watchdog Write Item Name	The OPC item name for the watchdog write item. If the data server does not require separate read and write items, this is disabled.

Name	Purpose
Scan Rates	The default On Control and Off Control scan rates for the data server, in milliseconds. The valid range of the On Control scan rate is 250 through 30,000 milliseconds. The valid range of the Off Control scan rate is 250 through 60,000 milliseconds. The usage of these rates is determined by the type of data server selected. Typically, these values do not need to be modified.

See also

[FactoryTalk Linx FactoryTalk Live Data server](#) on [page 88](#)

Add an OPC data server

These instructions only apply to OPC data servers.



Tip: When using FactoryTalk Linx with a Live Data/OPC data server, the following entry must be added to the RSLinxEnterprise.dsdf in the \Batch\DataServers folder:

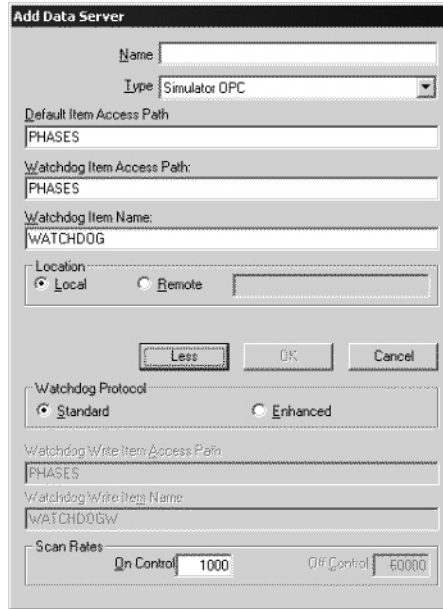
```
ForceBoolTrueToOne=YES
```

This is also required when updating from RSLinx Classic to FactoryTalk Linx.

To add an OPC data server:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Data Server**. The **Data Servers** dialog box opens.
3. Select **Add**.
4. In **Name**, type a name for the data server.
5. From **Type**, select the data server definition that corresponds to the physical OPC data server being defined.
6. If necessary, type the appropriate values for the **Default Item Access Path**, **Watchdog Item Access Path**, and **Watchdog Item Name**.
7. Under **Location**, select the appropriate option. If **Remote** is selected, type the remote data server name.
8. Select **More**. Additional options display.
9. Under **Watchdog Protocol**, select either the **Standard** or **Enhanced** protocol.
10. If necessary, type the appropriate values for the **Watchdog Write Item Access Path** and the **Watchdog Write Item Name**.

- Under **Scan Rates**, type the **On Control** and **Off Control** scan rates for the data server.



- Select **OK** to save the data server configuration and return to the **Data Servers** dialog box.

See also

[OPC data servers](#) on [page 86](#)

**FactoryTalk Linx
FactoryTalk Live Data
server**

The FactoryTalk Linx FactoryTalk Live Data protocol provides services that read and write real-time manufacturing data from OPC servers and controllers for all participating FactoryTalk-enabled products in the FactoryTalk Directory. FactoryTalk Live Data improves on OPC-Data Access (DA) by making communication with multiple servers easier.

To support FactoryTalk Batch as a FactoryTalk Live Data client, FactoryTalk Linx must be part of the FactoryTalk system. FactoryTalk Linx is a communication server that provides plant-floor device connectivity for Rockwell Automation applications and Logix processors.

See also

[Add a data server](#) on [page 88](#)

[FactoryTalk Linx server path](#) on [page 90](#)

[Configure the FactoryTalk Linx server path](#) on [page 90](#)

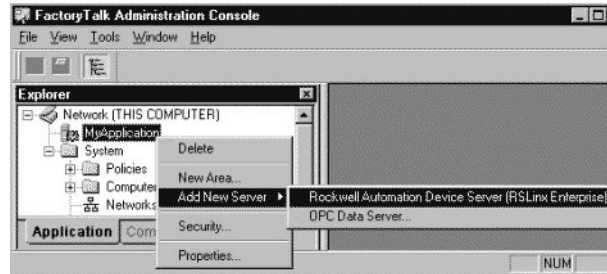
Add a data server

The items necessary to configure a FactoryTalk® Live Data data server in FactoryTalk Batch Equipment Editor are identical to OPC servers with the exception of the FactoryTalk Linx server path.

Before you begin:

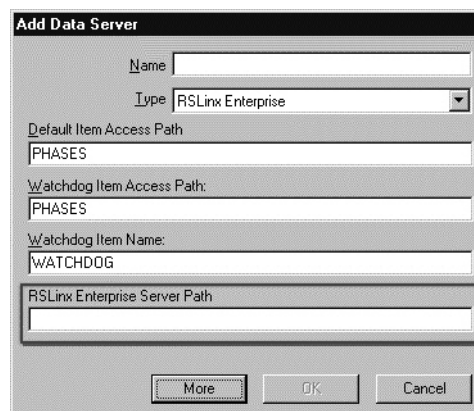
Complete these prerequisites:

- Install and configure FactoryTalk Linx. (For more information, refer to FactoryTalk Linx Help.)
- Create an Application in the FactoryTalk Directory. (For more information, refer to FactoryTalk Help located in the FactoryTalk Administration Console.)
- Add a FactoryTalk Linx data server to the FactoryTalk Application. Adding a data server to an application provides a link between a hardware device containing tags and the FactoryTalk Directory. (For more information, refer to FactoryTalk Help located in the FactoryTalk Administration Console.)



To add a data server:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Data Serve FactoryTalk Batch Suite > FactoryTalk Batch**, and then select **r** to open the **Data Servers** dialog box.
3. Select **Add** to open the **Add Data Server** dialog box.
4. In **Name**, type a name for the data server.
5. From **Type**, select **FactoryTalk Linx**. When the data server **Type** is **FactoryTalk Linx**, the **FactoryTalk Linx Server Path** text box replaces the **Location** text box in the **Add Data Server** dialog box.



6. If necessary, type the appropriate values for the **Default Item Access Path** and the **Watchdog Item Access Path**. (These are the device shortcut name(s) assigned in FactoryTalk Linx FactoryTalk Live Data.)
7. If necessary, type the appropriate values for the **Watchdog Item Name**.
8. Type the connection string for the **FactoryTalk Linx Server Path** found on the **FactoryTalk Administration Console** dialog box. Enter the path that is shown, but without the server name shown at

- the end of the path. (See **FactoryTalk Linx path** for more information.)
- 9. Select **More** to view the watchdog write item access path and name and the on and off control scan rates for the data server.
- 10. Select **OK** to save the data server configuration and return to the **Data Servers** dialog box.

See also

[FactoryTalk Linx server path](#) on [page 90](#)

FactoryTalk Linx server path

Once a FactoryTalk Linx data server is added to an Application in the FactoryTalk Directory, to view the FactoryTalk Linx Server Path connection string that is needed to configure the FactoryTalk Linx server type in FactoryTalk Batch Equipment Editor, see the **Communication Setup** title in the **Communication Setup** dialog box.

In this example, the FactoryTalk Linx Server Path connection string is:
RNA://\$Global/MyApplication/

(Note that the final name in the path (FactoryTalk Linx) does not show at the end as shown in the image.)



See also

[Configure the FactoryTalk Linx server path](#) on [page 90](#)

Configure the FactoryTalk Linx server path

Use these instructions to open the FactoryTalk **Communication Setup** dialog box.

To configure the FactoryTalk Linx server path:

1. Open the FactoryTalk Administration Console and log on to the appropriate FactoryTalk Directory.
2. Point to **MyApplication > FactoryTalk Linx > Communication Setup**.
3. Right-click **Communication Setup** and select **Open**.

The **Communication Setup** dialog box opens. The FactoryTalk Linx Server Path connection string displays as part of the title.

See also

[FactoryTalk Linx FactoryTalk Live Data server](#) on [page 88](#)

Logix5000 CIP data server

Configure the Logix5000 CIP data server in FactoryTalk Batch Equipment Editor to use PhaseManager features. To configure the FactoryTalk Batch system with PhaseManager, add a Logix5000 CIP data server and assign it to PhaseManager phases. After these configuration tasks are completed, automatically create the FactoryTalk Batch phases in the Logix Designer project file by synchronizing the area model with the project file.

See also

[Add a Logix5000 CIP data server](#) on [page 91](#)

[Assign a Logix5000 CIP data server to a phase or sequence](#) on [page 93](#)

Add a Logix5000 CIP data server

Add data servers either before creating the rest of the elements in the area model, or after defining the process cells, unit classes, phase classes, operation sequence classes, and resources in the area model. Define at least one data server before creating the specific phases from the phase classes or specific operation sequences from the operation sequence classes.

If possible, create the project file in Logix Designer before adding a Logix5000 CIP data server. Specify the project file when adding a Logix5000 CIP data server to detect errors more easily when designing the system.

Prerequisites

- Configure device shortcuts in the FactoryTalk Administration Console for all controllers that FactoryTalk Batch communicates with PhaseManager or SequenceManager objects.
- Install and configure FactoryTalk Linx. (For more information, refer to FactoryTalk Linx Help.)
- Create an Application in the FactoryTalk Directory. (For more information, refer to FactoryTalk Help in the FactoryTalk Administration Console.)
- Add a FactoryTalk Linx data server to the FactoryTalk Application. Adding a data server to an application provides a link between a hardware device containing tags and the FactoryTalk Directory. (For more information, refer to FactoryTalk Help in the FactoryTalk Administration Console.)

To add a Logix5000 CIP data server

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Data Server** to open the **Data Servers** dialog box.
3. Select **Add** to open the **Add Data Server** dialog box.
4. In the **Name** box, type a name for the data server.



Tip: The name should easily identify the Logix 5000 controller that this data server represents. Using the type of Logix 5000 controller and its location in the chassis as the name, or the unit that this controller connects to in the plant as the name, may help to easily identify the controller.

When synchronizing the area model with the Logix Designer project, this name displays in the **Synchronize Logix5000 Data Servers** dialog box. Choose which data server to synchronize by selecting the name.

5. Select **Logix5000 CIP** for the **Type**.
6. (optional) To create phases or operation sequences in the area model before completing the remaining information in this dialog box, select **OK** to close this dialog box. Finish adding information about the data server later.
7. To enable synchronization between the **.acd** file and the area model, select **Browse**, navigate to a project **.acd** file that contains the phase for the controller this data server represents. The file's revision and controller type display in the boxes.



Tip: The Logix Designer project file must be revision 16.0 or higher. To resolve any error messages that appear when selecting a project file, see **Select a project file - error messages**.

8. In the **FactoryTalk Linx Controller Shortcut** box, select **Browse** to locate the device shortcut for communicating with the specified controller.

Alternatively, type the path to the shortcut using this format:

```
RNA://Global/UsersApplicationName/FTLinxAreaName/FactoryTalkLinx/ShortcutName
```

9. (optional) Select **More** to display the **Timeout** and **Retries** boxes.
10. The default values are the recommended settings for these boxes. Adjust these values for the speed of the network.

Name	Value
Timeout	How often the FactoryTalk Batch Server attempts to contact the controller. The range of valid values is 500 milliseconds to 100000 milliseconds. The default is 8000 milliseconds.
Retries	The number of times the FactoryTalk Batch Server tries to contact the controller before dropping the connection. The valid values appear in the list. The default is 4.

Timeout * Retries = Length of time the FactoryTalk Batch Server attempts to contact the controller before losing the connection.

11. Select **OK** to close the **Add Data Server** dialog box.
12. Select **OK** to close the **Data Servers** dialog box.

See also

[Edit a Logix5000 CIP data server](#) on [page 92](#)

Edit a Logix5000 CIP data server

Use these instructions to edit a Logix5000 CIP data server.

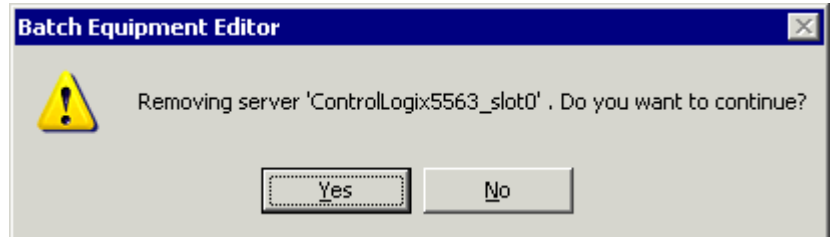
To edit a Logix5000 CIP data server:

1. Select **Edit > Data Server**. The **Data Servers** dialog box opens.
2. Select the data server definition to be edited, and select **Edit**. The **Edit Data Server** dialog box opens.
3. Make any required changes and select **OK** to return to the **Data Servers** dialog box.



Tip: After adding a data server as a Logix5000 CIP type data server, the type cannot change. No other data server types appear in the **Type** selection list when editing. To change the **Type**, delete the data server and add a new one.

4. (optional) To delete a data server, select the data server to delete and select **Remove**.
 - If the data server is not assigned to any phases, this message displays:



- If the data server is assigned to phases, the **Remove Server** dialog box opens, displaying these phases and unit tags associated with the data server.
The displayed unit tags and phases, as well as their parameter, report, and limit tags are deleted when the data server is removed.
- Select **Yes** to delete the data server and remove all associated phases and tags.

See also

[Assign a Logix5000 CIP data server to a phase or sequence](#) on page 93

Assign a Logix5000 CIP data server to a phase or sequence

After adding a Logix5000 CIP data server, assign it to each phase or sequence that represents a piece of equipment connected to the controller specified in the controller network path of the Logix5000 CIP data server.

To assign a Logix5000 CIP data server to a phase or sequence:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the phase or sequence icon in the **Design View** area and select **Edit > Properties**. The **Edit Phase** dialog box, **General** tab displays.
3. From the **Data Server** list, select the Logix5000 CIP data server that represents the controller connected to the piece of equipment defined by this phase or sequence.
4. Select **OK**.

See also

[Edit a Logix5000 CIP data server](#) on page 92

Resources overview

Resource is a general term for equipment including process cells, units, phases and shared control modules.

Define the resources in the area model before assigning them as shared equipment. Create resource classes (such as PUMPS) and resource instances (such as PMP102). After resource instances are defined in the area model, they can be assigned to process cells, units, phases, and other resources as necessary equipment that is allocated by the FactoryTalk Batch Server. To configure a resource instance, assign a name, equipment ID, the maximum number of owners, and any other equipment requirements for that resource. When the maximum number of owners are defined, the number of area model components that can simultaneously use the resource are also defined.

Resources can be simultaneously owned by one or more area model components, depending on the program. For example, if a pump is physically configured to charge an ingredient into three different vessels but it has the capacity to charge only two of the three vessels simultaneously, define the pump as a shared resource and specify the maximum number of owners as **2**.

See also

[View and manage system elements from the Diagnostics page](#) on [page 95](#)

Manage Diagnostics page system elements

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.

See also

Arbitration

View arbitration information from the Diagnostics page

Acquire a system element from the Diagnostics page

Release a system element from the Diagnostics page

Reorder the Needed By queue from the Diagnostics page

Define shared resources

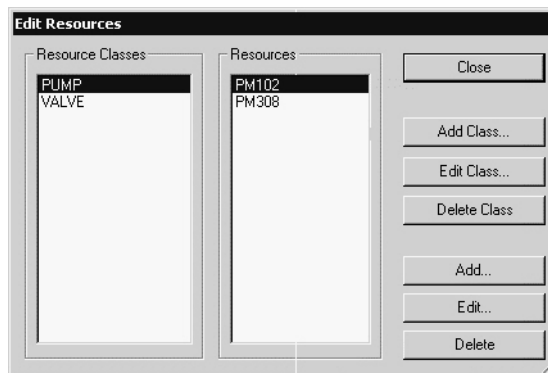
Use these instructions to define shared resources.

To define shared resources:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Resources**.
3. To create a new resource class, select **Add Class**. The **Edit Resource Class** dialog box displays.
 - d. In **Name**, type the new resource class name.
 - e. Select **OK** to return to the **Edit Resources** dialog box. The new resource class displays in the **Resource Classes** column.
4. To add a resource instance to a resource class, select the new resource class, and then select **Add**. The **Edit Resources: [Resource Name]** dialog box displays.

The **Edit Resources: [Resource Name]** dialog box contains four tabs:

- General
- Arbitration
- Cross Invocation
- Hyperlink (eProcedure only)



See also

[Configure general information for resources](#) on [page 96](#)

[Configure arbitration information for resources](#) on [page 97](#)

[Configure cross invocation information for resources](#) on [page 98](#)

[Configure hyperlink information for resources](#) on [page 98](#)

Set general information for resources

Use these instructions to configure general information.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Resources**.
3. Under **Resources**, select the resource and then select **Edit**.
4. In the **Edit Resources: [Resource Name]** dialog box, select the **General** tab.
5. In **Name**, type the resource name (for example, Pump101, PV203).

6. Type the appropriate Equipment ID, or accept the default ID.
7. Select **Apply** to save changes and continue, or select **OK** to return to the **Edit Resources** dialog box.

See also

[Define shared resources](#) on [page 96](#)

[Configure arbitration information for resources](#) on [page 97](#)

[Configure cross invocation information for resources](#) on [page 98](#)

[Configure hyperlink information for resources](#) on [page 98](#)

Configure arbitration information

In the **Edit Resources** dialog box **Arbitration** tab, the **Equipment Allocation by Resource** area contains a hierarchical view in the left pane that displays the current equipment configuration of the area model. The hierarchy has two roots: Process Cells and Resources. The right pane is the list of equipment on which this resource is dependent. Any equipment in the right pane must be acquired by the FactoryTalk Batch Server before any procedural element requiring this resource can begin execution.

Expand the **Process Cells** root to view all the process cells within the area model. From here, organization is hierarchical, so process cells contain units and units contain phases.

Expand the **Resources** root to view a list of all the configured resource instances within the area model.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Resources**.
3. Under **Resources**, select the resource and then select **Edit**.
4. In the **Edit Resources: [Resource Name]** dialog box, select the **Arbitration** tab.
5. In **Max Owners**, enter the number that represents how many process cells, units, phases, or other resources can maintain ownership of this resource at one time.
6. Under **Equipment Allocation by Resource**, browse the area model's equipment hierarchy to specify equipment this resource needed. A plus sign (+) to the left of the equipment type indicates equipment of that type has been defined.
 - To add equipment to the right pane, select the equipment needed by the resource in the left pane and select **Add**. The equipment this resource needs to acquire displays in the right pane.
 - To remove equipment, in the right pane, select the equipment to delete and select **Remove**. The selected equipment is removed from the list.
7. Select **Apply** to save changes and continue, or select **OK** to return to the **Edit Resources** dialog box.

See also

[Define shared resources](#) on [page 96](#)

[Configure general information for resources](#) on [page 96](#)

[Configure cross invocation information for resources](#) on [page 98](#)

[Configure hyperlink information for resources](#) on [page 98](#)

Set cross invocation information

Use the **Cross Invocation** tab to specify cross invocation labels for different resource types.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Resources**.
3. Under **Resources**, select the resource and then select **Edit**.
4. In the **Edit Resources: [Resource Name]** dialog box, select the **Cross Invocation** tab.
5. In **Cross Invocation Label #**, type the cross invocation string contents information.
6. Select **Apply** to save changes and continue, or select **OK** to save changes and return to the **Edit Resources: [Resource Name]** dialog box.

See also

[Configure hyperlink information for resources](#) on [page 98](#)

Configure hyperlink information

This feature, allows hyperlinks to be associated with any of the equipment resources, used in conjunction with eProcedure only.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Resources**.
3. Under **Resources**, select the resource and then select **Edit**.
4. If hyperlinks are being used, in the **Edit Resources: [Resource Name]** dialog box, select the **Hyperlink** tab.
5. In **Hyperlink Label # English**, type a valid URL string.
6. Select **Apply** to save changes and continue, or select **OK** to return to the **Edit Resources: [Resource Name]** dialog box.
7. When finished creating the shared resources, select **OK** to return to the **Design View** area.

See also

[Define shared resources](#) on [page 96](#)

[Configure general information for resources](#) on [page 96](#)

[Configure arbitration information for resources](#) on [page 97](#)

[Configure cross invocation information for resources](#) on [page 98](#)

Global binding requirements

Global unit binding requirements are sets of expressions that tell the FactoryTalk Batch Server what units are valid binding candidates for a recipe. A binding requirement 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 the FactoryTalk Batch Server attempts to bind a unit requirement during recipe execution, the entire set of binding requirements defined for the unit requirement is evaluated against each potential binding candidate. Units unable to meet every binding requirement defined for the unit requirement are eliminated as potential binding candidates.

A global binding requirement is automatically applied to every unit requirement within a recipe. Pre-configuring global binding requirements in an area model, and then loading that area model within FactoryTalk Batch Recipe Editor, eliminates having to manually add the binding requirement to every unit requirement in every recipe.

For example, a global binding requirement may be **Days_since_CleanInPlace < 3**. This binding requirement might be imposed by corporate quality standards. This means that no unit is considered acceptable for use unless it has been cleaned within the last three days. As a global unit requirement, this requirement is required to be applied against every unit requirement in the plant.

See also

[Unit binding expression builder](#) on [page 99](#)

[Create global binding requirements](#) on [page 102](#)

Unit binding expression builder

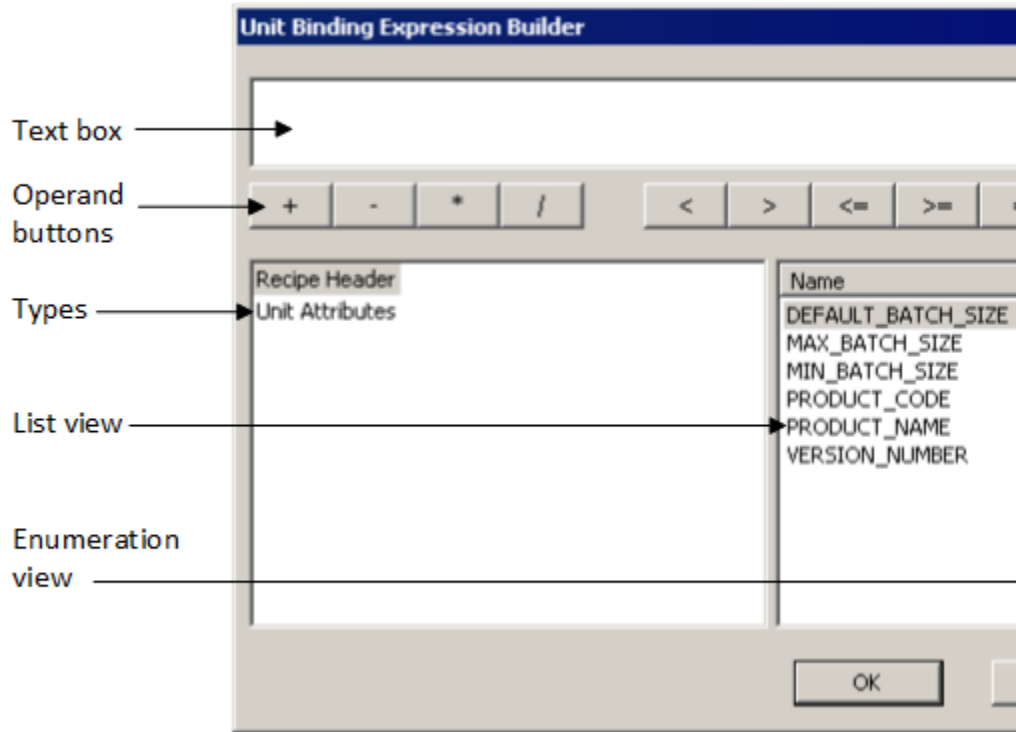
Create expressions in the **Unit Binding Expression Builder**. The **Unit Binding Expression Builder** contains a type list on the left pane, which displays Recipe Header and Unit Attribute data that can be used to build an expression.

When **Recipe Header** is selected, a list of recipe header parameters displays in the list view (in the middle). The **Recipe Header** box names map to the same boxes defined in FactoryTalk Batch Recipe Editor within a **Recipe Header**.

When the **Unit Attributes** is selected, an alphabetic list of all global unit attributes existing within the area model displays in the list view.

Create or edit an expression by typing directly in the **Expression Builder** text box, selecting items in the list view and enumerations view, selecting various operators, or selecting a combination of items and operators. The **Operator** buttons of the **Expression Builder** are always enabled. When an **Operator** button is selected, the corresponding operator is inserted

into the expression at the current cursor position and displays in the **Expression Builder** text box.



See also

- [Create a global unit attribute on page 132](#)
- [Expression operators on page 100](#)
- [Supported data types on page 101](#)
- [Operands on page 102](#)
- [Expression validation on page 102](#)

Expression operators

Binding expressions support operators. The precedence of the execution depicts from highest to lowest. An operator with a higher precedence executes before an operator of lower precedence.

Expression Operator	Purpose
()	Expressions within parentheses are evaluated before expressions outside of parentheses.
NOT, -	Logical NOT, subtraction.
*, /, AND	Multiplication, division, and logical AND.
+, -, OR	Addition, subtraction, and logical OR.
<, <=, >, >=	Less than, less than or equal to, greater than, and greater than or equal to.
=, <>	Equal to, and not equal to.

See also

- [Unit binding expression builder on page 99](#)
- [Supported data types on page 101](#)

[Operands](#) on [page 102](#)

[Expression validation](#) on [page 102](#)

Supported data types

The data types supported are integer, real, string, and enumeration.



Unsigned data types introduced in Logix5000 version 32.00 are not supported by FactoryTalk Batch. Configuring a FactoryTalk Batch tag to reference a controller tag of any unsigned data type (USINT, UINT, UDINT, ULINT) will result in bad communication. If you attempt to run batches referencing any tags that include one of these data types a communication failure occurs at the point when the tag is used.

Use FactoryTalk Batch **Tag Verify** to produce a report that identifies any issues with the tag(s).

Supported data type examples:

Integer: 423

Real: 423.123456789012

String: The string constant must be in quotes: "READY".

Enumeration: As a string, the enumeration constant must be in quotes: "BUTTER_PECAN". As an integer, the ordinal for the enumeration may be: 4.

See also

[Unit binding expression builder](#) on [page 99](#)

[Operands](#) on [page 102](#)

[Expression validation](#) on [page 102](#)

Operands

Operands used within a global unit binding expression can reference recipe header data, global unit attributes, and constants.

Examples of allowable expression entities and the required syntax:

Expression Entity	Expression Syntax	Example
Recipe header data	[Recipe header item]	[VERSION_NUMBER]
Global unit attribute	Unit attribute name	CAPACITY
Constant		100

See also

[Unit binding expression builder](#) on [page 99](#)

Expression validation

Although an invalid expression cannot be created, a previously valid expression may become invalid through subsequent changes elsewhere in the area model. When the **Edit Global Unit Binding Requirements** dialog box is invoked all binding expressions are re-validated. If any current expressions have become invalid due to subsequent changes, an error message opens and the dialog displays an asterisk beside each invalid expression.

The expression validates for consistency and syntactical correctness. If the defined expression validates successfully, the dialog box closes. If the expression is invalid, then the location of where the first error encountered highlights, a description of the error displays in a message box, and the dialog box does not close.

Validation rules:

- An expression must resolve to either TRUE or FALSE and meet the criteria:
 - An expression must contain at least one operator (+ (addition), - (subtraction), * (multiplication), / (division), = (equals), > (greater than), < (less than), <= (less than, or equal to), >= (greater than, or equal to), <> (not equal to), Not, And, and Or.

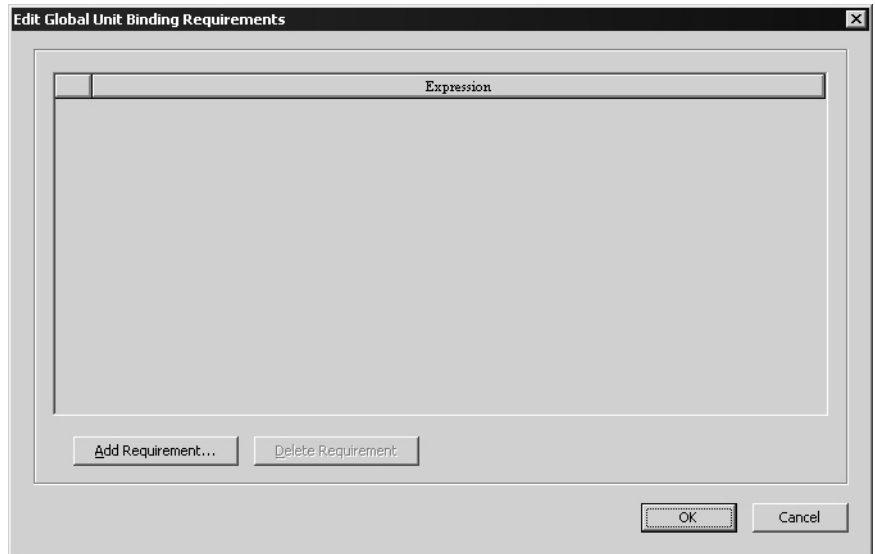
Tip: OR transitions fire if at least one side of the expression is TRUE.
 - Separate each entity (recipe header, global unit attribute, or constant) with an operator.
 - The operated entities must evaluate to acceptable data types (string with a string; integer with integer or real; real with integer or real).
 - Maximum expression length must not exceed 1023 characters.
 - Duplicate expressions are allowed.

Use these instructions to create global binding requirements.

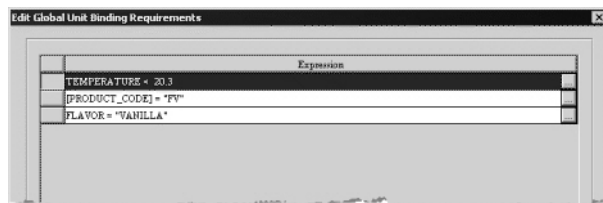
Create global binding requirements

To create global binding requirements:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Global Binding Requirements**.



3. Select **Add Requirement**.
4. In the **Unit Binding Expression Builder** dialog box, select options from the three different sections or type to build an expression.
 - Tip: A binding requirement expression evaluates to either a TRUE or FALSE value, TEMPERATURE < 20.3, for example.
5. Select **OK** to save the expression and return to the **Edit Global Unit Binding Requirements** dialog box.



6. Continue building more binding requirements, or select **OK** to exit the dialog box.

See also

[Unit binding expression builder](#) on [page 99](#)

[Expression validation](#) on [page 102](#)

[Edit binding requirements](#) on [page 103](#)

[Delete binding requirements](#) on [page 104](#)

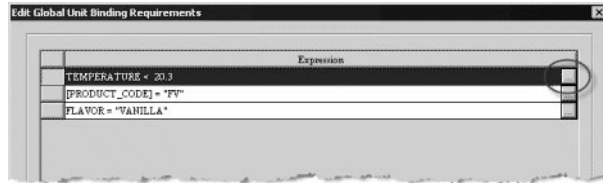
Edit binding requirements

Use these instructions to edit binding requirements:

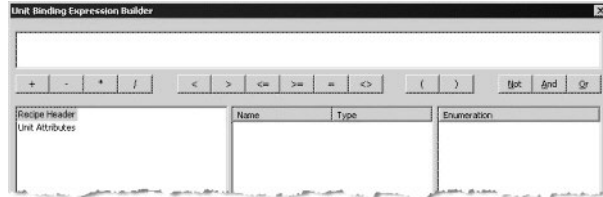
To edit binding requirements:

1. Select **Start > Rockwell Software > Equipment Editor**.

2. Select **Edit > Global Binding Requirements**.



3. Select browse () next to the requirement to edit.



4. Make the desired changes, and then select **OK**.
5. Select **OK** to close the **Edit Global Unit Binding Requirements** dialog box.

See also

[Create global binding requirements](#) on [page 102](#)

[Delete binding requirements](#) on [page 104](#)

Use these instructions to delete binding requirements.

To delete binding requirements:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Global Binding Requirements**.
3. Select **Delete Requirement**, and then select **OK** to confirm the deletion or **Cancel** to keep the requirement.
4. Select **OK** to close the **Edit Global Unit Binding Requirements** dialog box.

See also

[Create global binding requirements](#) on [page 102](#)

[Edit binding requirements](#) on [page 103](#)

Delete binding requirements

Process cell overview

A **process cell** is a logical grouping of equipment, including units, required for the production of one or more batches. It can contain more than one grouping of equipment if more than one grouping is needed to make a batch. Process cells are grouped into classes. For each type of process cell in a selected area, a process cell class must first be created. Once the process cell class has been created, an instance of that class can be created in the **Design View** area.

See also

[Create a process cell class](#) on [page 105](#)

[Edit a process cell class](#) on [page 105](#)

[Create and configure process cell instances](#) on [page 106](#)

[Configure hyperlink data for a process cell](#) on [page 109](#)


Create a process cell class

Use these instructions to create a process cell class.



Tip: If the icon column is empty, see [Verify icon paths](#).

To create a process cell class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Class View** area, verify that the column heading is **Cell Classes**. If not, select **Go Up** () until the top level of the area model is shown.
3. Select **Class > New Process Cell Class**.
4. In **Name**, enter a name for the process cell class.
5. Under **Icon**, select an icon.
6. Select **OK**.

See also

[Verify icon paths](#) on [page 111](#)

[Process cell overview](#) on [page 105](#)

Edit a process cell class

Use these instructions to edit a process cell class.

To edit a process cell class:

1. Select **Start > Rockwell Software > Equipment Editor**.

2. Select the process cell class to edit.
3. Select **Edit > Properties**. The **Edit Process Cell Class** dialog box opens.
4. Make the desired changes, and then select **OK** to return to the **Class View** area.

See also

[Create and configure process cell instances](#) on [page 106](#)

[Verify icon paths](#) on [page 111](#)

[Unique icons](#) on [page 111](#)

Create process cell instances

Use these instructions to create and configure process cell instances.

To create and configure process cell instances:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the desired process cell class.
The cursor changes to a **c**.
3. Place the cursor in the desired location in the **Design View** area and select.
The process cell icon displays in the **Design View** area with a default name of PROCESS_CELL# (where # is a sequentially assigned number starting with 1).

See also

[Configure a process cell instance](#) on [page 106](#)

Configure a process cell instance

Use these instructions to configure a process cell instance.

To configure a process cell instance:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a process cell icon in the **Design View** area.
3. Select **Edit > Properties**.

The **Edit Process Cell** dialog box displays with the assigned defaults. The **Edit Process Cell** dialog box contains four tabs:

- General
- Arbitration
- Cross Invocation
- Hyperlink (eProcedure only)

See also

[Configure the general data for a process cell](#) on [page 107](#)

Set general data for a process cell

Use these instructions to configure the general data.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a process cell icon in the **Design View** area.
3. Select **Edit > Properties**.
4. In the **Edit Process Cell** dialog box, select the **General** tab.
5. In **Name**, type a process cell name.
6. In **ERP Alias**, type the SAP R/3 process cell name.

The ERP alias is the process cell name in SAP. It maps the process cell from FactoryTalk Batch to SAP.

7. In **Equipment ID**, type the equipment ID, or accept the default value.
8. Select **Apply** to save changes.

See also

[Edit process cell dialog box - General tab](#) on [page 107](#)

General tab of Edit process cell

The **General** tab of the **Edit Process Cell** dialog box contains:

Name	Purpose
Name	The name of the process cell. (The default name is PROCESS_CELL#. The # is a consecutive number starting with 1 that is assigned to each process cell as it is added to an area.)
Icon	The icon selected for the process cell class (view-only).
Class	The name of the process cell class (view-only).
ERP Alias	The SAP name for the phase. The ERP alias maps the equipment module from FactoryTalk Batch to SAP.
Equipment ID	The equipment identification number identifies this process cell. (A default ID is automatically assigned to the process cell, based on the next available sequential number. The first item added to an area is assigned ID #1.) To request this process cell, the equipment ID must be the same as the equipment ID that is used by the phase logic.

See also

[Configure the general data for a process cell](#) on [page 107](#)

Set arbitration data for process cell

In the **Equipment Allocation by Resource** area, the left pane is a hierarchical display of the current equipment configuration of the area model. The hierarchy has two roots: Process Cells and Resources. The right pane is the list of equipment this process cell is dependent upon. Any equipment in this list must be acquired by the process cell before any procedural element linked to this process cell can begin execution.

Expand **Process Cells** to view all the process cells defined within the area model. From here, organization is hierarchical; process cells contain units and units contain phases.

Expand **Resources** to view a list of all the configured resources within the area model.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a process cell icon in the **Design View** area.
3. Select **Edit > Properties**.
4. In the **Edit Process Cell** dialog box, select the **Arbitration** tab.

5. In **Max Owners**, type the maximum number of owners.
6. Browse the area models equipment hierarchy to specify equipment the process cell must acquire. The lack of a plus or minus sign to the left of an equipment type indicates no equipment of that type has been defined, or the equipment type cannot be used as a needed equipment item at this level.
 - To add equipment, under the **Equipment Allocation by Resource** area, select the equipment needed by the process cell and select **Add**. The selected equipment displays in the right pane.
 - To remove equipment, in the right pane, select the equipment to delete and select **Remove**. The selected equipment is removed from the list.
7. Select **Apply** to save changes.

See also

[Edit Process Cell dialog box - Arbitration tab](#) on [page 108](#)

Arbitration tab of Edit Process Cell

The **Edit Process Cell** dialog box on the **Arbitration** tab contains:

Name	Purpose
Name	The name of the process cell (view-only). The default name is PROCESS_CELL# . The # is a consecutive number starting with 1 that is assigned to each process cell as it is added to an area.
Icon	The icon selected for the process cell class (view-only).
Class	The name of the process cell class (view-only).
Max Owners	The maximum number of owners (other process cells, units, phases, or other resources) that can simultaneously use this process cell. The default is 1.
Equipment Allocation by Resource	<p>A list of the equipment for which ownership is required by this process cell in order for any procedural element linked to the process cell to begin execution. The default is blank. In general, assign any required resources to the lowest possible level to allow for maximum efficiency when running multiple processes.</p> <p>The left pane is a hierarchical display showing the current equipment configuration of the area model. The hierarchy has two roots:</p> <ul style="list-style-type: none"> • Process Cells: Displays all the process cells within the area model. From here, organization is hierarchical: process cells contain units and units contain phases and operations sequences. • Resources: Displays a list of all the configured resources within the area model. <p>The right pane is the list of equipment this process cell is dependent upon. Any equipment in this list must be acquired by the process cell before the process cell itself can be acquired.</p>

See also

[Configure the arbitration data for a process cell](#) on [page 107](#)

Set cross invocation data for process cell

Use these instructions to configure cross invocation data.

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a process cell icon in the **Design View** area.
3. Select **Edit > Properties**.

4. In the **Edit Process Cell** dialog box, select the **Cross Invocation** tab.
5. Type the cross invocation string information in the **Cross Invocation Label** boxes.
6. Select **Apply** to save changes.

See also

[Edit process cell dialog box - Cross Invocation tab](#) on [page 109](#)

Cross Invocation tab properties

The **Edit Process Cell** dialog box on the **Cross Invocation** tab contains:

Name	Purpose
Name	The name of the process cell (view-only). The default name is PROCESS_CELL# , where # is a consecutive number starting with 1, assigned to each process cell as it is added to an area.
Class	The name of the process cell class (view-only).
Icon	The icon selected for the process cell class (view-only).
Cross Invocation Configuration	The cross invocation strings indicate the addition of an item to FactoryTalk Batch View and HMI control shortcut menus. This includes the caption for each menu item and the data to be passed to the specified automation server when the menu item is selected. The default labels associated with each of the five fields are Cross Invocation Label # (where # is 1 through 5). These labels can be modified in the Server Options dialog box, and are seen in the Edit Process Cell dialog box.

See also

[Configure cross invocation data for a process cell](#) on [page 108](#)

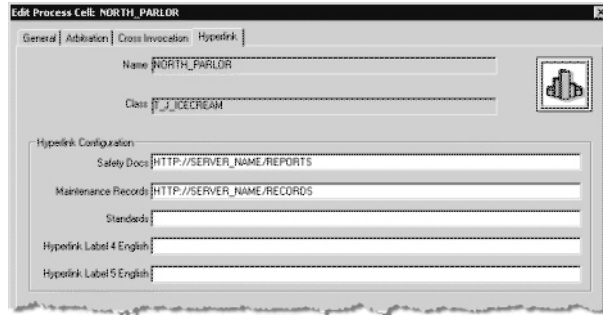
Configure hyperlink data for a process cell

This feature is used in conjunction with FactoryTalk eProcedure only. Use these instructions to configure hyperlink data.

To configure hyperlink data for a process cell:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a process cell icon in the **Design View** area.
3. Select **Edit > Properties**.
4. In the **Edit Process Cell** dialog box, if hyperlinks are being used, select the **Hyperlink** tab.

5. In the **Hyperlink Configuration** boxes, type a valid URL string.



- 6. Select **Apply** to save changes.
- 7. Select **OK** to return to the **Design View** area.

See also

[Edit process cell dialog box - Hyperlink tab](#) on [page 110](#)

Edit process cell dialog box - Hyperlink tab

The **Edit Process Cell** dialog box **Hyperlink** tab contains:

Name	Purpose
Name	The name of the process cell (view-only). The default name is PROCESS_CELL# . The # is a consecutive number starting with 1 that is assigned to each process cell as it is added to an area.
Icon	The icon selected for the process cell class (view-only).
Class	The name of the process cell class (view-only).
Hyperlink Configuration	The URL associated with each hyperlink label. The default labels associated with each of the five fields are Hyperlink Label # English (where # is 1 through 5). These labels can be modified in the Server Options dialog box. The labels are used in the eProcedure Client Equipment view.

See also

[Configure hyperlink data for a process cell](#) on [page 109](#)

Remove a process cell instance

Use these instructions to remove a process cell instance.

To remove a process cell instance:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a process cell icon in the **Design View** area.
3. Press **Delete**.

The **Remove Process Cell** warning displays that lists the associated units and phases that are removed when deleted the process cell.

4. Select **Yes** to delete the process cell, or select **No** to cancel the deletion and return to FactoryTalk Batch Equipment Editor.

See also

[Configure a process cell instance](#) on [page 106](#)

Verify icon paths

The directory paths for each type of icon are set by the installation procedure; modify them only if the bitmaps have been moved to another directory.

To verify icon paths:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Options > Directories**.
3. Verify the directory paths for each type of icon.
4. Select **OK** to return to the **Design View** area.

See also

[Create and configure process cell instances](#) on [page 106](#)

[Unique icons](#) on [page 111](#)

Unique icons

Create a graphical representation of a process cell class, unit class, unit class background, or phase class using a graphic paint program. Create icons specific to the facility or process. Use the following rules when designing unique icons:

- Icons must be stored in the appropriate directory as a **.bmp** file.
- The icon must be a square or rectangle, with a width made up of an even number of pixels. Icons with an odd numbered pixel width will not show.
- The file must not exceed 7K in size (116 x 116 pixels). Icons exceeding the size limit are displayed as a blank icon with a red question mark.
- Icons are stored in one of these directories:
 - **Process Cell Class**
C:\Program Files\Rockwell Software\Batch\BMP\PROCCEL
 - **Unit Class**
C:\Program Files\Rockwell Software\Batch\BMP\UNIT
 - **Unit Class Backgrounds**
C:\Program Files\Rockwell Software\Batch\BMP\UNIT\VESSELS
 - **Phase Class**
C:\Program Files\Rockwell Software\Batch\BMP\PHASE



Tip: New icons that meet these criteria display in the **Icon** column for process cell classes, unit classes, and phase classes.

See also

[Verify icon paths](#) on [page 111](#)

[Process cell overview](#) on [page 105](#)

Unit overview

A unit consists of phases, control modules, or both types of modules centered around a material-containing vessel that performs one or more major processing activities. The material contained in the central vessel is usually transformed either physically, chemically, or biologically. Units run one operation or unit procedure-level recipe at a time. Process & Instrumentation Diagrams (P&IDs) are a good source of information for determining unit boundaries.

Often process facilities contain multiple instances of similar equipment, such as unit vessels, that consist of the same or similar components and functionality. These groupings of similar equipment can be described as a unit class. In the area model database, create unit classes (such as MIXER_CLS) and one or many unit instances of a particular unit class (such as MIXER_A and MIXER_B).

Recipes can be configured to run within a specific unit instance or within a unit class. The action of specifying the particular unit in which a recipe runs is called unit binding. If a recipe is configured to run within a unit instance, the unit in which the recipe runs is specified at the time the recipe is created. If a recipe is configured to run within a unit class, the recipe can run in any unit instance of that unit class. The specific unit instance is determined:

- By the operator when the batch is created, prior to starting the batch.
- By the operator, after the batch is started, at the time a unit procedure level recipe is ready to run (the operator responds to a prompt).
- By the FactoryTalk Batch Server, after the batch is started, at the time a unit procedure level recipe is ready to run.

Class-based recipes:

- Minimize the number of recipes that need to be maintained.
- Allow the freedom to choose the most appropriate unit for binding the recipe at the time the batch is run.



Tip: To navigate to the unit level, double-click a **Process Cell** icon or select a **Process Cell** icon and select **Go Down** (↓).

See also

[Create a unit class](#) on [page 113](#)

[Edit a unit class](#) on [page 114](#)

Create a unit class

Use these instructions to create a unit class.

To create a unit class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Class View** area, verify that the column heading is **Unit Classes**.

The current unit classes for the selected process cell are displayed in the **Class View** area.

3. Select **Class > New Unit Class**. The **Create Unit Class** dialog box opens with the assigned defaults.
 - The **Unit Attributes** area lists non-global unit attributes.
 - The **Global Unit Attributes** area is view-only and lists unit attributes associated with every unit class in the area model.
4. In **Name**, type the unit class name.
5. Under **Icon**, select an icon.



Tip: If the icon column is empty, see [Verify icon paths](#).

6. If unit attributes have been defined and is used with this unit class, select the check box for the tag(s) to assign to the unit from the **Unit Attributes** list.



Tip: Global unit attributes are associated automatically with the unit class being created.

7. Select **OK**.

See also

[Verify icon paths](#) on [page 111](#)

[Add a unit attribute](#) on [page 126](#)

[Create a global unit attribute](#) on [page 132](#)

[Edit a unit class](#) on [page 114](#)

Edit a unit class

Use these instructions to edit a unit class.

To edit a unit class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Class View** area, verify that the column heading is **Unit Classes**.

The current unit classes for the selected process cell are displayed in the **Class View** area.

3. Select the unit class to edit and then select **Edit > Properties**.
4. In the **Edit Unit Class** dialog box, in **Name**, type a new unit class name.
5. From **Icon**, select a new unit class icon or modify the existing unit attribute tag selection. If any global unit attributes exist, they are listed in the **Global Unit Attributes** list (view-only).
6. Select **OK**.

See also

[Create a unit instance](#) on [page 115](#)

[Unit instance configuration](#) on [page 115](#)

[Remove a unit instance](#) on [page 121](#)

[Link unit instances](#) on [page 121](#)

[Share units](#) on [page 122](#)

Create a unit instance

Use these instructions to create a unit instance.

To create a unit instance:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the **Unit Class** to be placed in the **Design View** area.
3. Place the cursor in the **Design View** area where the unit is to be located and select.
4. Configure the unit instance.

See also

[Edit a unit class](#) on [page 114](#)

Unit instance configuration

Unit configuration includes:

- Specifying a name for the unit.
- Creating unit attribute tags
- Assigning a data server.
- Specifying any equipment resources required by the unit during operation.

See also

[Open the Edit Unit dialog box](#) on [page 115](#)

[Configure the general data for a unit](#) on [page 116](#)

[Configure unit attribute tags data](#) on [page 117](#)


[Configure arbitration data for a unit](#) on [page 118](#)

[Configure cross invocation data for a unit](#) on [page 119](#)

Open the Edit Unit dialog box

Unit configuration is performed using the **Edit Unit** dialog box.

To open the Edit Unit dialog box:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, select the unit icon and then select **Edit Properties** (). The **Edit Unit** dialog box displays with the unit defaults and these five tabs:
 - General

- Attribute Tags
- Arbitration
- Cross Invocation
- Hyperlink (eProcedure only)

See also

[Configure the general data for a unit](#) on [page 116](#)

[Configure unit attribute tags data](#) on [page 117](#)

[Configure arbitration data for a unit](#) on [page 118](#)

[Configure cross invocation data for a unit](#) on [page 119](#)

[Configure hyperlink data for a unit](#) on [page 120](#)

Configure the general data for a unit

Use these instructions to configure the general data for a unit.

To configure the general data for a unit:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, select the unit icon and then select **Edit > Properties**.
3. In the **Edit Unit** dialog box, select **General** tab.
4. In **Name**, type the resource name.
5. In **Class**, type the class.
6. In **ERP Alias**, type the SAP R/3 unit name.
7. In **Equipment ID**, type or accept the default ID.
8. Select the **Data Server**.
9. Select **Apply** to save changes and continue, or select **OK** to return to the **Edit Unit** dialog box.

See also

[Open the Edit Unit dialog box](#) on [page 115](#)

[Edit Unit dialog box - General tab](#) on [page 116](#)

Edit Unit dialog box - General tab

The **Edit Unit** dialog box **General** tab contains:

Name	Purpose
Name	The name of the process cell. (The default name is PROCESS_CELL#. The # is a consecutive number starting with 1 that is assigned to each process cell as it is added to an area.)
Class	The name of the unit class.
ERP Alias	The SAP name for the phase. The ERP alias maps the equipment module from FactoryTalk Batch to SAP.
Equipment ID	The equipment identification number identifies this unit. (A default ID automatically assigns to the process cell, based on the next available sequential number. The first item added to an area is assigned ID #1.) To request this unit, the equipment ID must be the same as the equipment ID used by the phase logic.

See also

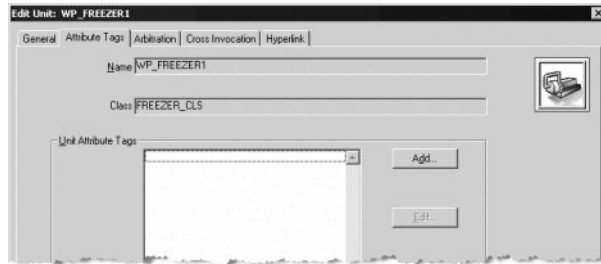
[Configure the general data for a unit](#) on [page 116](#)

Configure unit attribute tags data

Use these instructions to configure the unit attribute tag data.

To configure unit attribute tags data:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, select the unit icon and then select **Edit > Properties**.
3. In the **Edit Unit** dialog box, select the **Attribute Tags** tab.



4. Under **Unit Attribute Tags**, select **Add** and create the required unit attribute tags.



Tip: If any global unit attributes have been created for the area model, their associated tags are also listed.

5. To edit an existing tag, select the tag in the **Unit Attribute Tags** area and select **Edit**. The **Edit Unit Attribute Tag** dialog box opens.



Tip: Unit attribute tags can only be assigned to OPC or FactoryTalk Linx FactoryTalk Live Data servers. They cannot be assigned to Logix5000 CIP data servers.

6. To remove an existing tag, select the tag in the **Unit Attribute Tags** area and select **Remove**.



Tip: It is not an option to cancel the removal of the unit attribute tag. However, select **Cancel** and any changes made to the unit definition are undone.

7. Select **Apply** to save changes.

See also

[Edit Unit dialog box - Attribute Tags tab](#) on [page 117](#)

[Create a unit attribute tag](#) on [page 127](#)

Edit Unit dialog box - Attribute Tags tab

The **Edit Unit** dialog box **Attribute Tags** tab contains:

Name	Purpose
Name	The unique name assigned to this unit (view-only).
Class	The unit class name (view-only). The icon associated with the unit class displays next to Name and Class .
Unit Attribute Tags	Process-connected device data associated with the unit that is used with recipes. Unit attribute tags are organized by unit attributes. Unit attribute tag instances are created at the time the unit is configured.

Configure arbitration data for a unit

See also

[Configure unit attribute tags data](#) on [page 117](#)

In the **Equipment Allocation by Resource** area, the left pane is a hierarchical display of the current equipment configuration of the area model. The tree has two roots: Process Cells and Resources. The right pane is the list of equipment this unit is dependent on. Any equipment in this list must be acquired by the unit before any procedural element linked to this unit can begin execution.

Expand **Process Cells** to view all the process cells within the area model. From here, organization is hierarchical, so process cells contain units and units contain phases.

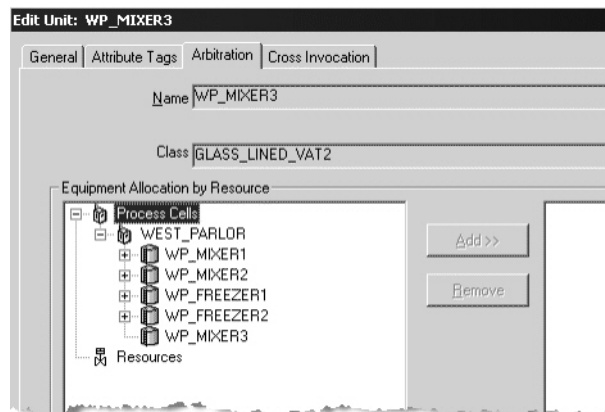
Expand **Resources** to view a list of all the configured resources within the area model.



Tip: Units do not have a **Max Owners** box to define because a unit can execute only one procedural element (operation or unit-procedure level recipe) at a time. Therefore, all units can have only one owner.

To configure arbitration data for a unit:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, select the unit icon and then select **Edit > Properties**.
3. In the **Edit Unit** dialog box, select the **Arbitration** tab.



4. Browse the area models equipment hierarchy to specify equipment the unit must acquire. The lack of a plus or minus sign to the left of an equipment type indicates that no equipment of that type has been defined, or that the equipment type cannot be used as a needed equipment item at this level.
 - To add equipment, under the **Equipment Allocation by Resource** area, select the equipment needed by the unit and select **Add**. The equipment selected displays in the right pane.
 - To remove equipment, in the right pane, select the equipment to delete and select **Remove**. The equipment selected is removed from the list.
5. Select **Apply** to save changes.

See also

[Edit Unit dialog box - Arbitration tab](#) on [page 119](#)

Edit Unit dialog box - Arbitration tab

The **Edit Unit** dialog box **Arbitration** tab contains:

Name	Purpose
Name	The unique name assigned to this unit (view-only).
Class	The name of the class of the unit (view-only).
Class Icon	The unit class icon (view-only).
Max Owners	An equipment list requiring ownership by this unit in order for any procedural element linked to the unit to begin execution.
Equipment Allocation by Resource	<p>A list of the equipment for which ownership is required by this unit to begin execution.</p> <p>The left pane is a hierarchical display showing the current equipment configuration of the area model. The hierarchy has two roots:</p> <ul style="list-style-type: none"> • Process Cells: Displays all the process cells within the area model. From here, organization is hierarchical: process cells contain units and units contain phases and operations sequences. • Resources: Displays a list of all the configured resources within the area model. <p>The right pane is the list of equipment this unit is dependent upon. Any equipment in this list must be acquired by the unit before the unit itself can be acquired.</p>

See also

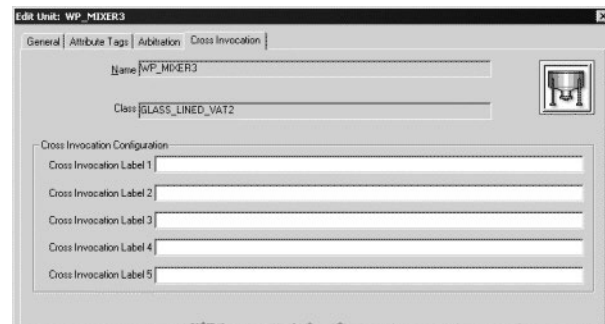
[Configure arbitration data for a unit](#) on [page 118](#)

Configure cross invocation data for a unit

Use these instructions to configure cross invocation data.

To configure cross invocation data for a unit:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, select the unit icon and then select **Edit > Properties**.
3. In the **Edit Unit** dialog box, select the **Cross Invocation** tab.



4. In the **Cross Invocation Label** boxes, type the cross invocation string information.
5. Select **Apply** to save changes.

See also

[Edit Unit dialog box - Cross Invocation tab](#) on [page 120](#)

Edit Unit dialog box - Cross Invocation tab

The **Edit Unit** dialog box **Cross Invocation** tab contains:

Name	Purpose
Name	The unique name assigned to this unit (view-only).
Class	The name of the class of the unit (view-only).
Class Icon	The unit class icon (view-only).
Cross Invocation Configuration	The cross invocation strings indicate the addition of an item to FactoryTalk Batch View and HMI control shortcut menus. This includes the caption for each menu item and the data to be passed to the specified automation server when the menu item is selected. The default labels associated with each of the five fields are Cross Invocation Label # (where # is 1 through 5). These labels can be modified in the Server Options dialog box, and are seen in the Edit Process Cell dialog box.

See also

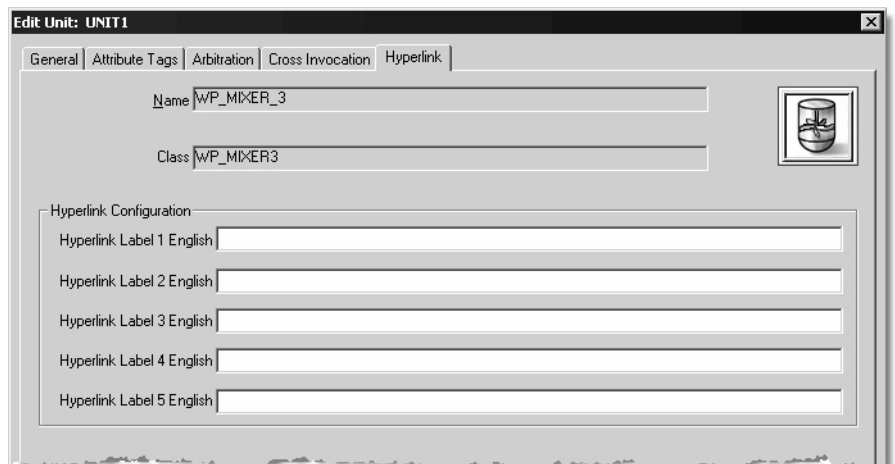
[Configure cross invocation data for a unit](#) on [page 119](#)

Configure hyperlink data for a unit

This feature is used in conjunction with FactoryTalk eProcedure only. Use these instructions to configure hyperlink data.

To configure hyperlink data for a unit:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, select the unit icon and then select **Edit > Properties**.
3. If hyperlinks are being used, in the **Edit Unit** dialog box, select the **Hyperlink** tab.



4. In the **Hyperlink Configuration** boxes, type a valid URL string.
5. Select **Apply** to save changes.
6. Select **OK** to return to the **Design View** area.

See also

[Edit Unit dialog box - Hyperlink tab](#) on [page 121](#)

Edit Unit dialog box - Hyperlink tab

The **Edit Unit** dialog box **Hyperlink** tab contains:

Name	Purpose
Name	The unique name assigned to this unit (view-only).
Class	The name of the unit class (view-only).
Class Icon	The unit class icon (view-only).
Hyperlink Configuration	The URL associated with each hyperlink label. The default labels associated with each of the five fields are Hyperlink Label # English (where # is 1 through 5). These labels can be modified in the Server Options dialog box. The labels are used in the eProcedure Client Equipment view.

See also

[Configure hyperlink data for a unit](#) on [page 120](#)

Remove a unit instance

Use these instructions to remove a unit instance.

To remove a unit instance:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the unit to be removed and press the **Delete** key.
A warning displays that when the unit is deleted, the phase instances it contains are deleted.
3. Select **Yes** to delete the unit, or select **No** to cancel the deletion and return to FactoryTalk Batch Equipment Editor.

See also


[Link unit instances](#) on [page 121](#)

[Share units](#) on [page 122](#)

Link unit instances

Links define the upstream and downstream relationships between units within a process cell. The FactoryTalk Batch Server uses the links to determine which units are available for selection when defining equipment requirements for procedures.

To link unit instances:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Link Units** (). The cursor changes to **+**.
3. Select and hold the mouse button on the source unit icon. Drag the cursor to the destination unit icon, and release the mouse button.
4. Repeat step 2 until all units link as needed.

See also

[Share units](#) on [page 122](#)

Share units

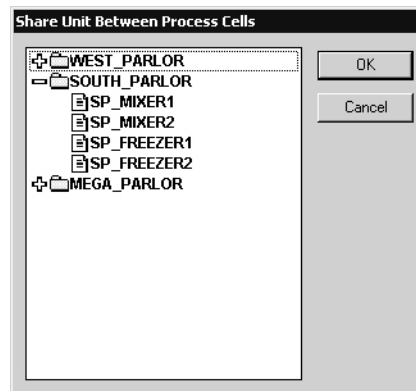
When more than one process cell requires a single unit instance, it must be shared by all process cells that require it. Create the unit instance in one process cell. This unit instance is shared by the other process cell(s). Do not create a new instance of the same unit in the other process cells. Before sharing a unit instance, verify that the unit can physically be shared.

A unit may have only one owner at a time. Sharing a single unit allows any of the shared process cells to gain ownership of it during batch execution. But the unit cannot be owned by more than one process cell at the same time.

When a unit instance is shared, any changes made to it are reflected in each process cell that contains the shared unit instance, including its physical placement in the **Design View** area. When deleted an instance of a shared unit from one process cell, the unit instance is removed from the selected process cell, but it is still present in any other process cells to which it belongs.

To share units:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Create the unit to share.
3. Move to the process cell that does not contain this unit.
4. Select **Share**. The **Share Unit Between Process Cells** dialog box displays with a list of existing process cells.



- A plus sign (+) to the left of the process cell indicates defined units within that process cell. The lack of a plus sign or minus sign to the left of a process cell indicates that no defined units are within that process cell.
 - Display the units in each process cell by selecting the plus sign (+) for the appropriate process cell folder.
5. Select the unit to share, and select **OK**.

The **Share Unit Between Process Cells** dialog box closes. The icon of the selected unit, with a small hand at the bottom left corner, displays in both process cells.



Tip: Deleting an instance of a shared unit only deletes the link to that unit. The unit is not deleted until the last instance of the unit is deleted.

See also

[Link unit instances](#) on [page 121](#)

Tags overview

FactoryTalk Batch uses tags to communicate with the process-connected device (PCD). For OPC and FactoryTalk® Linx FactoryTalk Live Data phases, define tags in the area model equipment database. Area model tags point to a specific memory address or tag in the PCD. The FactoryTalk Batch Server and the PCD exchange information and communicate through these tags.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, do not define tags. The tags create automatically when the area model synchronizes with the Logix Designer project.

The area model has two categories of tags:

- Tags associated with a unit
- Tags associated with a phase

Unit attribute tags are items in the area model database that represent a single piece of PCD information. Unit attribute tags link to a process tag such as a level, temperature, or flow process variable. Unit attribute tags allow actual process values in recipe transition conditions.

A phase uses phase tags to communicate with the engineered logic in the PCD. Every phase has a minimum of ten standard tags with which it is associated. When defining the phase class from which an OPC or FactoryTalk Linx FactoryTalk Live Data phase is created, indicate the number of tags required for parameter and report communications, as well as additional tags for requests from the PCD to the FactoryTalk Batch Server.

See also

[Unit attribute tags](#) on [page 125](#)

[Create a unit attribute tag](#) on [page 127](#)

[Phase tags](#) on [page 129](#)

[Global unit attribute](#) on [page 132](#)

Unit attribute tags

Unit attribute tag instances create at the time of unit instance configuration. Unit attributes (such as LEVEL_PV) organize Unit attribute tag instances (such as LI101_PV). Each unit attribute tag instance links to a specific tag in the process-connected device (PCD).

IMPORTANT Each unit can have only one unit attribute tag instance of each unit attribute.

A defined unit attribute tag instance is part of the area model database and can be used in recipe transition conditions for any recipe. In other words, the unit attribute tag instance can be used in a recipe that is bound

to any unit in the area model (not just the unit for which the unit attribute tag was defined).



Tip: Prior to creating the unit attribute tags, compile a list of data servers and tag addresses to which FactoryTalk Batch connects. Create unit attribute tags that have an OPC or FactoryTalk Linx FactoryTalk Live Data server as their data source. Create unit attribute tags that represent tag information from a Logix5000 CIP data server.

See also

[Add a unit attribute](#) on [page 126](#)

[Edit a unit attribute](#) on [page 127](#)

[Delete a unit attribute](#) on [page 127](#)

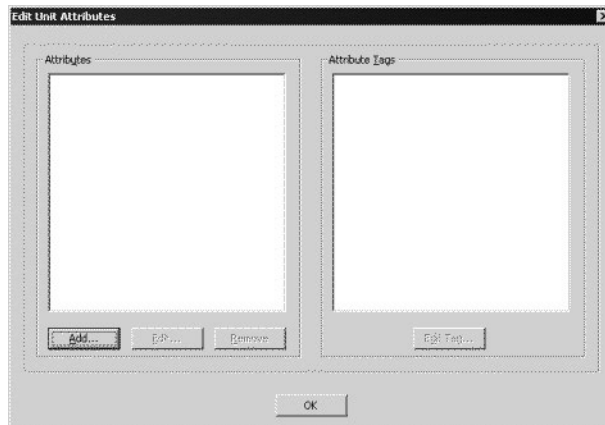
[Create a unit attribute tag](#) on [page 127](#)

Add a unit attribute

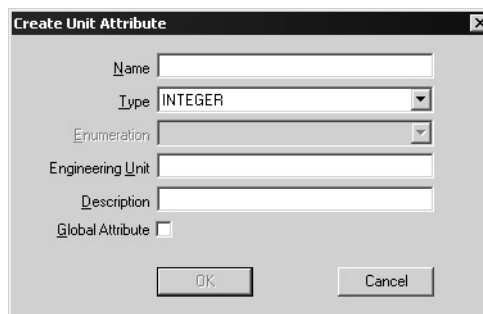
Use these instructions to add a unit attribute.

To add a unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Unit Attributes**.
3. Select **Add**.



4. In **Name**, type a name for the new attribute.
5. From the **Type** list, select the appropriate tag type.
6. If the tag type is Enumeration, select the appropriate enumeration name from the **Enumeration** list.
7. Type the **Engineering Units** used for the tag.
8. (optional) Type a **Description** of the attribute.
9. Select **OK** to return to the **Edit Unit Attributes** dialog box.



10. Continue adding unit attributes, or select **OK** to exit. All changes are saved.

See also

[Unit attribute tags](#) on [page 125](#)

[Edit a unit attribute](#) on [page 127](#)

[Delete a unit attribute](#) on [page 127](#)

[Create a unit attribute tag](#) on [page 127](#)

Edit a unit attribute

Use these instructions to edit a unit attribute.

IMPORTANT Deletion or modification of global unit attributes may invalidate existing global unit binding expressions. Therefore, all global unit binding expressions configured in the area model are revalidated when **OK** is selected. If any expression is found to be invalid, open the **Global Unit Binding Requirements** dialog box to correct them.

To edit a unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Unit Attributes**.
3. Under **Attributes**, select an attribute and select **Edit**.
4. On the **Edit Unit Attribute** dialog box, modify as needed and then select **OK** to return to the **Edit Unit Attributes** dialog box.

See also

[Delete a unit attribute](#) on [page 127](#)

[Create a unit attribute tag](#) on [page 127](#)

Delete a unit attribute

Use these instructions to delete a unit attribute.

To delete a unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Unit Attributes**.
3. Under **Attributes**, select an attribute and select **Remove**.
4. To delete all tags and the selected attribute, select **Yes**.
5. To cancel the removal, select **No**.

See also

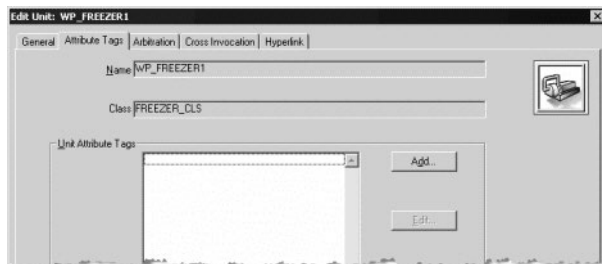
[Create a unit attribute tag](#) on [page 127](#)

Create a unit attribute tag

Use these instructions to create a unit attribute tag.

To create a unit attribute tag:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Design View** area, right-click the appropriate unit.
3. Select **Attribute Tags** tab.



4. Under **Unit Attribute Tags**, select **Add**.
 - If a unit attribute exists, the **Create Unit Attribute Tag** dialog box opens. Otherwise, a prompt to create a unit attribute displays. If so, select **Yes**, and follow instructions in **Add a unit attribute**.
5. In **Name**, type the unit attribute tag name.
6. From **Attribute**, select the appropriate unit attribute.
7. From **Type**, select the appropriate tag type.

If the tag type is **Enumeration**, from **Enumeration**, select the appropriate enumeration name.

8. In **Engineering Unit**, type the engineering units used for the tag.
9. If **Static** is selected, in **Value**, type the unit attribute tag value.



Tip: The value of a dynamic unit attribute tag is held in the PCD. The value of a static unit attribute tag is held in the FactoryTalk Batch Server.

10. If **Dynamic** is selected:
 - f. From **Data Server**, select the appropriate data server. The corresponding data server type automatically appears in **Server Type**.



Tip: Only OPC and FactoryTalk Linx FactoryTalk Live Data servers appear in the selection list. Logix5000 CIP data servers are not displayed.

- g. In **Access Path**, type the appropriate access path.
 - h. In **Item Name**, type the appropriate item name.
 - i. If the data server requires separate read and write items, in **Write Access Path**, type the write access path.
 - j. If the data server requires separate read and write items, in **Write Item Name**, type the write item name.
11. Select **OK** to return to the **Attribute Tags** tab.

See also

[Unit Attribute Tags dialog box](#) on [page 129](#)

[Add a unit attribute](#) on [page 126](#)

Unit Attribute Tags dialog box

A unit attribute tag represents the value of a unit attribute for a specific unit. In previous releases of FactoryTalk Batch, unit attribute tags were known as unit tags.

When creating a unit attribute tag, these items are configured in the **Create Unit Attribute Tags** dialog box.

Name	Purpose
Name	Tag name for the unit attribute. Follow the naming conventions.
Attribute	Lists the unit attribute name options for the unit attribute tag.
Type	Lists the data type selections for the unit attribute tag. Valid types include: <ul style="list-style-type: none"> • Real • Integer • String • Enumeration
Enumeration	Lists the appropriate enumeration selections. This list is only enabled if the tag type is Enumeration .
Engineering Unit	The engineering units associated with this tag.
Data Source	Defines the type of data source, Static or Dynamic . <ul style="list-style-type: none"> • If data source is Static, the data is a constant value. The value entered here depends on the engineering units assigned and associates with a particular unit. • If data source is Dynamic, the value comes from the PCD, and the data server information must be defined.
Data Server	Displays the data server from which the tag is acquiring data. This list includes all configured data servers for the active area. Only OPC and FactoryTalk Linx FactoryTalk Live Data servers display in the selection list. Logix5000 CIP data servers are not displayed.
Server Type	Displays the server type that corresponds with the selected data server as defined in the data server definition (DSDF) files (view-only).
Access Path	The access path used with the read item when attempting to subscribe to the tag value or when performing read operations. This box changes to Read Item Access Path when the associated data server requires separate read and write items. This is disabled if the data server does not require an access path.
Item Name	The name of the item used when subscribing to a tag value or when performing read operations. This box changes to Read Item Name when the associated data server requires separate read and write items.
Write Access Path	The OPC access path for the write item. This disables if the data server does not require separate read and write items.
Write Item Name	The item name in the write items process-connected device. This disables if the data server does not require separate read and write items or does not require an access path.

See also

[Create a unit attribute tag](#) on [page 127](#)

Phase tags

The number of tags associated with an OPC or FactoryTalk Linx FactoryTalk Live Data phase depends on the phase class configuration from which the phase is created. Every phase has a minimum of ten standard tags. When defining the phase class from which the OPC or FactoryTalk Linx FactoryTalk Live Data phase is created, define additional tags required for parameter and report communication as well as additional request tags for requests from the process-connected device (PCD) to the FactoryTalk Batch Server.

A Request tag is one of the ten standard tags associated with every phase and is used for the PCD to request service from the server. Occasionally, the PCD needs to communicate more information to the server than can be accommodated by the single standard Request tag. Specify, on the phase class, the number of additional request tags needed for the phase.

If configured the phase class to require any of these additional tags, create corresponding tags in the OPC or FactoryTalk Linx FactoryTalk Live Data phase.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, do not configure additional request tags. All required tags automatically create for Logix5000 CIP phases when the area model synchronizes with the Logix Designer project. FactoryTalk Batch Equipment Editor creates the same number of parameter tags as parameters that exist on the phase class, and the same number of report tags as reports that exist on the phase class.

See also

[Edit tags from the menu](#) on [page 130](#)

[Default equipment names](#) on [page 131](#)

Edit tags from the menu

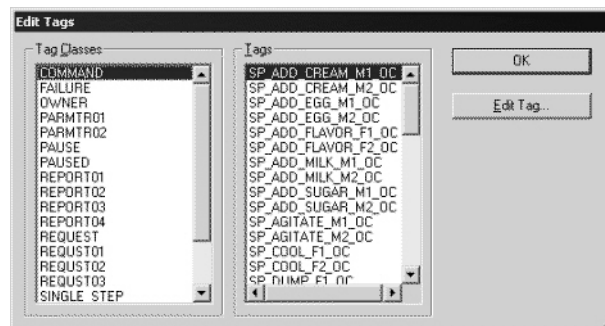
The **Edit Tags** dialog box lists all of the tag classes configured for the selected area model, along with the associated tags.

To edit tags from the menu:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Tags**.
3. Under **Tag Classes**, select the appropriate tag class.
4. Under **Tags**, select the tag to edit
5. Select **Edit Tag**. The **Edit [TagType] Tag** dialog box displays, where **[TagType]** represents the type of tag being edited (phase or unit).



Tip: Instruction-based tags are view-only.



6. Modify as needed and then select **OK**.

See also

[Phase tags](#) on [page 129](#)

Default equipment names

When creating a phase from a phase class in the area model, the default phase name is <phasename>1. For example, if the phase is AGITATE, the phase creates from this phase class with the default name of AGITATE1.

The phase's tag items the default name is: <Equipment Module Name><Tag Separator><Tag Extension>

For example, if the tag separator is a period (.), the Request tag (RQ) for phase AGITATE1 would be: **AGITATE1.RQ**

If the phase name changes, the tag item names do not automatically change to reflect the new phase name. For example, if the phase name changes from AGITATE1 to AGITATE_U2, the tag Names reflect the new name (AGITATE_U2), but the tag Item Names still reflect the original name of the phases (AGITATE1). The example request tag for the AGITATE_U2 phase would still be AGITATE1.RQ.

When a phase creates from a phase class in the area model, the tag access path is the **Default Item Access Path** specified for the assigned data server. Change the **Access Path** for an individual tag on the **Edit Phase Tag** dialog box.

See also

[Set all tag items to default name and access path](#) on [page 131](#)

[Edit tags from the menu](#) on [page 130](#)

Set all tag items to default name and access path

Use these instructions to globally change all the tag Item Names in the area model to reflect the names of their respective phases and reset the Access Path of each phase tag to the **Default Item Access Path** specified for its data server.



Tip: To change the tag names for only a single phase, change them on the **Tags** tab of the phase.

To set all tag items to default name and access path:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Set Default Tag Items**.

IMPORTANT This is an irreversible action! Once selected, all tag item names and access paths are automatically changed.

3. Select **OK** to continue.

A message displays indicating all tag items have been set to the tag name and access paths have been reset.

4. Select **OK** to return to the **Design View** area.



Tip: The default character (tag separator) that separates the phase tag item name from its extension may vary depending on the tag separator defined in the **batcheqp.ini** file. The available characters are the underscore (_), slash (/), or period (.). If changed, the default character is not overridden.

See also

[Set tag items to the default addresses](#) on [page 168](#)

[Configure phases](#) on [page 161](#)

Global unit attribute

FactoryTalk Batch associates units within unit classes that represent the common functionality of all the units in the class. This allows for the construction of class-based recipes, built against a unit class(es). This aggregation of common functionality allows for the authoring of recipes that can run against any instance of the unit class (with the exception of flowpath requirements and FactoryTalk Batch Material Manager functionality).

However, the set of functionality common across all instances of a unit class may be so small as to not allow for the creation of useful class-based recipe structures. There is likely to be significant commonality among some reactors that does NOT extend to the entire set. For example, some subset of reactors may contain agitators. Other subset of reactors may contain temperature sensors.

Also, there may be attributes of a unit, such as materials of construction, or temperature, that make it acceptable, unacceptable, desirable, or undesirable for use with certain recipes. The batch product has no mechanism for specification or enforcement of these requirements.

The ability to build class-based recipes that utilize subsets of commonality would be extremely useful in this case. Global unit attributes provides the ability to build class-based recipes that utilize subsets of commonality. A global unit attribute is a unit attribute 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 a custom unit attribute to every unit class.

See also

[Create a global unit attribute](#) on [page 132](#)

[Edit a global unit attribute](#) on [page 134](#)

[Delete a global unit attribute](#) on [page 134](#)

[Remove a global unit attribute](#) on [page 135](#)

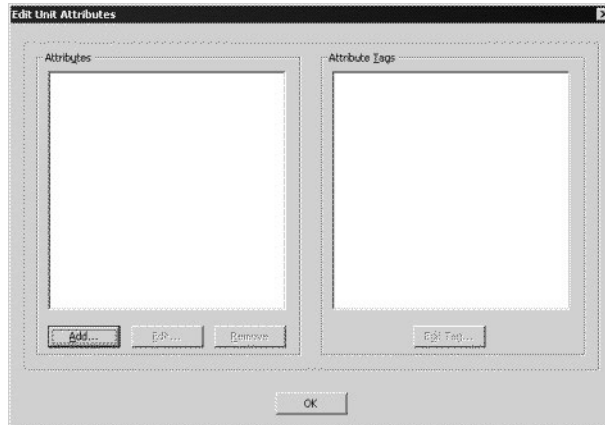
Create a global unit attribute

Use these instructions to create a global unit attribute.

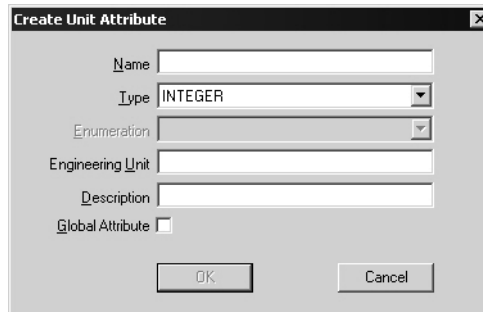
To create a global unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.

2. Select **Edit > Unit Attributes**. When an attribute is selected, it populates with the associated attribute tags. The first attribute tag is selected by default.



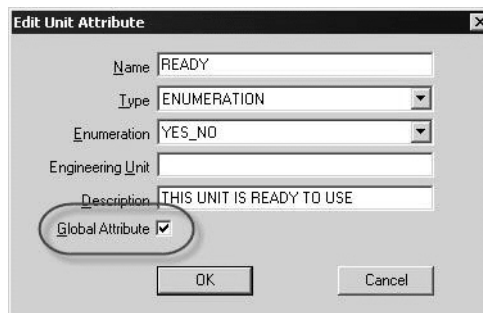
3. Under **Attributes**, select **Add** to open the **Create Unit Attribute** dialog box.



4. In **Name**, type a name for the new unit attribute.
5. From **Type**, select the appropriate tag type.
 - If the tag type is **Enumeration**, select the appropriate enumeration name from the **Enumeration** list.
6. In **Engineering Units**, type the engineering units used for the tag.
7. In **Description**, type a description of the tag class.
8. To be a global unit attribute that is applied to all new units, select **Global Attribute**.

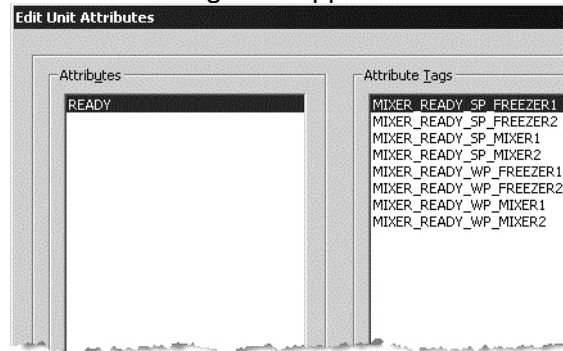


Tip: If **Global Attribute** is selected, all unit classes within the area model, both existing and newly created, are associated with that unit attribute. In addition, all unit instances within the area model, both existing and those subsequently created, contain a unit attribute tag instance.



9. Select **OK** to return to the **Edit Unit Attributes** dialog box.

The new attribute is listed under **Attributes**. If it is a global unit attribute, it is associated with all existing unit classes. Attributes and attribute tags are upper-case and in alphabetic order.



See also

[Edit a global unit attribute](#) on [page 134](#)

Edit a global unit attribute

Use these instructions to edit a unit attribute.

To edit a global unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Unit Attributes**.
3. Under **Attributes**, select an attribute and select **Edit**.
4. Make the required modifications, and select **OK** to return to the **Edit Unit Attributes** dialog box.

See also

[Delete a global unit attribute](#) on [page 134](#)

[Remove a global unit attribute](#) on [page 135](#)

Delete a global unit attribute

Use these instructions to delete a unit attribute.

To delete a global unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Unit Attributes**.
3. Under **Attributes**, select a unit attribute and select **Remove**.

A warning displays to verify the removal of all the unit attribute tags of the unit attribute.

4. To delete all attribute tags and the selected unit attribute, select **Yes**.
5. To cancel the removal, select **No**.

See also

[Remove a global unit attribute](#) on [page 135](#)

Remove a global unit attribute

Use these instructions to remove a global unit attribute.

To remove a global unit attribute:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select **Edit > Unit Attributes**.
3. Under **Attributes**, select the unit attribute that to edit and select **Edit**.
4. Clear the **Global Attribute** check box, and then select **OK**.
5. To remove the unit attribute, select **Yes**.
6. To cancel the removal, select **No**.

See also

[Delete a global unit attribute](#) on [page 134](#)

[Create a global unit attribute](#) on [page 132](#)

Phase class overview

A phase class is a reusable, process-oriented function. A phase class is usually a general representation of a group of equipment that performs a minor processing activity or a sub-function for a unit but does not describe the details of how that activity is accomplished. Examples of phase classes include Heat, Agitate, Add, and Transfer.

Phase classes may have associated parameters and reports. Each phase class contains attributes common to all phases of that specific phase class type. Phase classes are used to create recipes in FactoryTalk Batch Recipe Editor.

An instance of a phase class is a phase. Every phase inherits attributes of the phase class from which it is created. Phase classes and phases link the engineered logic in the process-connected device (PCD) to the recipe. A phase class describes the recipe phase, while the phase maps to the equipment operation or equipment phase in the engineered logic.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, do not define the number of parameter, report, and request tags. The required tags automatically configure when the area model synchronizes with the Logix Designer.

Every OPC or FactoryTalk Linx FactoryTalk Live Data phase automatically assigns ten standard tags to communicate with the engineered logic in the PCD. When defining the phase class from which an OPC or FactoryTalk Linx FactoryTalk Live Data phase is created, indicate the number of tags required for parameter and report communications, as well as additional tags for requests from the PCD to the FactoryTalk Batch Server.

See also

[Tags on page 137](#)

[Create and configure phase classes on page 138](#)

[Verification policies on page 151](#)

[Material-enabled phase classes on page 157](#)

[Disable material on a material-enabled phase class on page 158](#)

Tags

One of the ten standard tags associated with every OPC or FactoryTalk Linx FactoryTalk Live Data phase is a Request tag. The process-connected device (PCD) uses the Request tag to request service from the FactoryTalk Batch Server. Sometimes, for OPC and FactoryTalk Linx FactoryTalk Live Data phases, the PCD needs to communicate more information to the FactoryTalk Batch Server than can be accommodated by the single standard Request tag. For this purpose,

specify on the phase class, the number of additional request tags needed for the phase.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, do not configure request tags. The tags automatically create for Logix5000 CIP phases the area model synchronizes with the Logix Designer. FactoryTalk Batch Equipment Editor creates the same number of parameter tags as parameters that exist on the phase class, and the same number of report tags as reports that exist on the phase class.



See also

[Configure phase class general attributes](#) on [page 138](#)

Create and configure phase classes

Use the **Create Phase Class** dialog box to create and configure phase classes.

To create and configure phase classes:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. Select **Add New Object** () and then select **New Phase Class**.
4. In the **Create Phase Class** dialog box, use the tabs to configure the phase class:
 - **General**
 - **Parameters**
 - **Reports**
 - **Messages**
 - **Control Strategy** (this tab is only available if the **Control Strategy** box is enabled on the **General** tab)
5. Select **OK**. The new phase class displays in the phase class list.



Tip: To edit the phase class, right-click the phase class to open the **Edit Phase Class** dialog box.

See also

[Configure phase class general attributes](#) on [page 138](#)

[Configure phase class control strategies](#) on [page 149](#)

[Configure phase class messages](#) on [page 148](#)

[Configure phase class parameters](#) on [page 140](#)

[Configure phase class reports](#) on [page 144](#)

Configure phase class general attributes

Use the **Create Phase Class** dialog box **General** tab to configure the phase class general attributes.



Tip: Use names that can easily be understood. Names display to the operator during batch execution.

To configure phase class general attributes:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. With the **Create Phase Class** dialog box open, select the **General** tab.
3. Under **Icon**, select an appropriate icon. (If the icon area is empty, see [Verify icon paths](#) on [page 111](#).)
4. In **Name**, type an appropriate phase class name.
5. In **Type**, type a phase class type.
6. In **Default Controller Program Name**, type a name to represent the phase class in the controller.
7. Under **Additional Functionality**, do the following:
 - Select **Control Strategy** to indicate whether control strategies are used for the phase class.
 - (optional) If FactoryTalk Batch Material Manager is installed, select **Material Based Recipes** to indicate whether the phase class is material-enabled.
 - Under **Parameter/Tag Locking**, enable or disable locking for parameters and tags.
 - To edit the number of parameter and report tags associated with the phases created from this phase class, disable **Parameter/Tag Locking**. This option only applies to OPC and FactoryTalk Linx FactoryTalk Live Data phases created from this phase class. For Logix5000 CIP phases, **Parameter/Tag Locking** is always enabled, regardless of the setting selected.
 - If **Parameter/Tag Locking** is enabled, the **Parameter** and **Report** boxes are disabled and display the number currently enforced by **Parameter/Tag Locking**.
 - Under **Number of Tags**, edit the number of tags in **Parameter** and **Report** and enter the appropriate number of tags in **Request**.
 - Under **Message Partners**, in **Number**, type the appropriate number.
8. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.



Tip: If the phase class is in a phase link group for communication or synchronization purposes, first configure the correct number of message partners on the phase class in the area model.

The selected icon displays in the **Class View** area.


See also

[Create Phase Class dialog box - General tab](#) on [page 139](#)

Create Phase Class dialog box - General tab

The phase class general attributes include the phase class name, phase class type, the number of phase class message partners, and the number of tags associated with each phase. Select an icon to graphically represent all phases throughout the area model based on the phase class. Enable or disable the use of control strategies and material-based recipes for the phase class.

The **General** tab contains:

Name	Purpose
Icon area	Displays all of the icons available for selection. Scroll through the icons using the scroll bar or the up and down arrows in the vertical scroll bar.
Name	The name of the phase class.
Type	An optional box that can be used to categorize phase classes for reporting purposes.
Default Controller Program Name	The Controller Program Name that will be used when an instance of the class is created. If blank, the name of the phase class is used.
Control Strategy	Enables the use of separate control strategies for the phase class.
Material Based Recipes	(Used with FactoryTalk Batch Material Manager.) Enables the binding of material references to actual equipment. This makes the phase class a material-enabled phase class.
Parameter/Tag Locking	To have the number of parameters and reports on the phase class to always equal the number of parameter tags and report tags on the associated phase classes, enable Parameter/Tag Locking on the phase class. If Parameter/Tag Locking is disabled, specify on the phase class the number of tags for the parameters and reports that exist on the associated OPC or FactoryTalk Linx FactoryTalk Live Data phases. This number may be different from the number of defined phase class parameters and reports for OPC and FactoryTalk Linx FactoryTalk Live Data phases.
Number of Parameter Tags	The number of memory registers within the phase to which FactoryTalk Batch can write parameter information. Generally equivalent to the number of parameters defined for the phase class.
Number of Report Tags	The number of memory registers within the phase from which FactoryTalk Batch can read report tag information. Generally equivalent to the number of reports defined for the phase class.
Number of Request Tags	The number of memory registers within the phase to which the phase logic can write request information.
Number of Message Partners	Message partners are two or more phases that need to communicate with each other during the execution of their respective phase logic for synchronization and timing purposes. In FactoryTalk Batch Recipe Editor, message partners are organized into Link Groups that inform the FactoryTalk Batch Server which phases require messaging. If the phase is in a phase link group for communication or synchronization purposes, this is the number of additional phases with which the phase must be linked in order to operate properly.  Tip: Define the message partners in FactoryTalk Batch Equipment Editor before defining the corresponding phase link groups in FactoryTalk Batch Recipe Editor.

See also

[Configure phase class general attributes](#) on [page 138](#)

Configure phase class parameters

Use the **Create Phase Class** dialog box **Parameters** tab to configure phase class parameters.



Tip: Use the keyboard to move around in the grid. Pressing the **Tab** key moves focus to the grid. Pressing **Ctrl+Alt+Home** highlights the first editable cell in the grid.

To configure phase class parameters:

1. Select **Start > Rockwell Software > Equipment Editor**.

2. With the **Create Phase Class** dialog box open, select the **Parameters** tab. A list displays of parameters associated with the phase class.



Tip: If control strategies are enabled for the phase class, the **Control Strategy** list displays at the top of the **Parameters** tab. Only phase class parameters associated with the control strategy selected in the **Control Strategy** list are listed. If **<All>** is selected, then the **High**, **Low**, **Default**, or **Enum/E.U.** boxes are not editable for the phase class parameters. The material parameters, including the optional material parameters (if enabled), are added to each control strategy created. Edit the values for the **MATERIAL**, **MATERIAL_CLASS** and **AMOUNT** material parameters for each configured control strategy.

3. Select **Add Parameter** to add a new phase class parameter. A new parameter displays with default values.
4. Under **Name**, type a unique name for the parameter.
5. Under **Type**, select the appropriate parameter type.
 - If the **Type** is **Real** or **Integer**, add the **High** value, **Low** value, and **Default** value, then type the engineering units in the **Enum/E.U.** box.
 - If the **Type** is **Enumeration**, choose the appropriate enumeration set from the **Enum/E.U.** list and select the appropriate default enumeration from the **Default** list.
 - If the **Type** is **String**, type the engineering units in the **Enum/E.U.** box and the default string in the **Default** box.
6. If the parameter must scale within a recipe when a batch scales, select the **Scale** check box. (See **Scale parameters** for more information.)

Tip: The **DL on Start** and **DL on TOC** check boxes are unavailable if not enough parameter tags are specified in **Number of Parameter Tags** on the **General** tab. Specify as many parameter tags as actual parameters to have these check boxes available for each parameter.
7. To add the parameter to the download on start subset, select the **DL on Start** check box.
8. To add the parameter to the download on transfer of control subset, select the **DL on TOC** check box.

Tip: Material-enabled phase classes do not support transfer of control.
9. To assign a context or descriptor to the phase class parameter for the recipe, select one or more Context IDs from the **Reporting Contexts** column.
10. To require electronic signatures or generate deviation events in the FactoryTalk Batch event journal when deviations from the accepted range of parameter values occur, see **Configure the verification policy for parameters and reports** for instructions.
11. To delete a parameter, select the parameter row header and select **Delete Parameter**. Select **Yes** to confirm the deletion.
12. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.

See also

[Create Phase Class dialog box - Parameters tab](#) on [page 142](#)

[Scale parameters](#) on [page 48](#)

[Select context IDs](#) on [page 147](#)

[Configure the verification policy for parameters and reports on page 152](#)

Create Phase Class dialog box - Parameters tab

Phase class parameters values pass from the FactoryTalk Batch Server to the phase logic during the execution of a recipe phase. For PhaseManager phases, which use a Logix5000 CIP data server, the phase definition includes its parameters. For other data servers, a phase parameter is defined for the phase class, and a corresponding parameter tag and tag address is configured in the process-connected device.


The verification methods of parameter values can be configured for real or integer phase parameters. The verification methods define the policies for verifying up to three sets of high and low limits of the parameter. They also define the actions to be taken if the parameter value falls outside the configured limits.



If **Material Based Recipes** is enabled, two parameters, MATERIAL and AMOUNT, can be defined. Add these optional parameters for material-enabled phases: CONTAINER, LOT, LABEL, and MATERIAL_CLASS.



Tip: Context IDs are only assigned to recipe parameters and report parameters configured on a phase class. Thus, only phase class parameters may have Context IDs and they may not be changed within recipes.

The **Parameters** tab contains:

Name	Purpose
Control Strategy	A list of configured control strategies used to filter the displayed parameters. Separate control strategies can be selected from the list or all control strategies can be viewed at the same time. This list is only visible if Control Strategy is enabled.
Add Optional Material Parameters	Enables the optional material-based recipe parameters (CONTAINER, MATERIAL_CLASS, LOT, and LABEL). This check box is only visible if Material Based Recipes is enabled. This check box only enables if <All> is selected in the Control Strategy list.
Name	The name of the phase class parameter. The name of the material parameters (MATERIAL, AMOUNT, CONTAINER, LOT, or LABEL) cannot be edited.
ID	The identification number of the phase class parameter. If Control Strategy is enabled after parameters have been defined, the IDs are increased by one, as the control strategy itself always has the parameter ID of 1. For material-enabled phases, parameter ID fills in the first available integer greater than zero. The MATERIAL parameter is the first of the Material Based Recipe parameters to be assigned an ID (view-only).
Type	The phase parameter data type: Real, Integer, String, and Enumeration. The data type for material-enabled phase parameters cannot be modified: <ul style="list-style-type: none"> • MATERIAL, MATERIAL_CLASS and CONTAINER = ENUM • AMOUNT = REAL • LOT and LABEL = STRING
Max	The maximum limit for the phase parameter. Defaults to 100.
Min	The minimum limit for the phase parameter. Defaults to zero (0). <ul style="list-style-type: none"> • Addition: Low = 0, High = positive number • Distribution: Low = negative number, High = 0 • Both: Low = negative number, High = positive number  <p>Tip: For the material-enabled phase parameter AMOUNT, the Min and Max values specify whether the phase is a material addition, distribution, or both.</p>

Name	Purpose
Default	<p>The default value for the phase parameter. Defaults to zero (0). The value must be set between the Min and Max values. If a Verification Method of High/Low, High-High/Low-Low, or High-High-High/Low-Low-Low is selected, the default value must be within the high and low values.</p> <p>For material-enabled phases, these are the defaults:</p> <ul style="list-style-type: none"> • MATERIAL defaults to NULL_MATERIAL • MATERIAL_CLASS defaults to NULL_CLASS • CONTAINER defaults to NULL_CONTAINER <p>The default value for the CONTAINER, LOT, or LABEL parameters cannot be modified.</p>
Enum/E.U.	<p>The engineering units for the phase parameter. If the parameter Type is Enumeration, the Enum/E.U. value is the name of the enumeration set.</p> <p> Tip: The Enum/E.U. for the MATERIAL, CONTAINER, LOT, LABEL, or MATERIAL_CLASS material-enabled phase parameters cannot be modified.</p>
Scale	<p>Indicates whether the phase parameter is scalable with a recipe at batch creation time.</p>
DL on Start	<p>If selected, the parameter can be downloaded by the FactoryTalk Batch Server in these situations:</p> <ul style="list-style-type: none"> • When the phase logic requests the download. • When the phase is configured to automatically download on the START command. See Phase overview for more information.)
DL on TOC	<p>If selected, the parameters are downloaded by the FactoryTalk Batch Server when a transfer of control takes place on the phase, when the phase logic requests the download.</p> <p>Material-enabled phase classes do not support transfer of control.</p>
Reporting Contexts	<p>Reporting contexts allows defining associations between a parameter and a set of context IDs. The defined context IDs are recorded by the FactoryTalk Batch Server in the Context ID box of the batch event journal records, whenever a parameter event logs. The default value for a new parameter is a null string. Select browse () to open the Reporting Contexts dialog box, to select one or more context strings to be used for the particular parameter. Context IDs are members of the REPORTING_CONTEXTS enumeration set.</p>
Verification Method	<p>The part of the verification policy that defines the set of acceptable limits for a parameter or report. The phase parameter type must be Real or Integer.</p> <p>No Limits: To configure a verification policy to enact when the parameter or report value is within the Minimum and Maximum limits. Also select this option to not use verification policies.</p> <p>High/Low: Allows configuration of up to two verification policies. In addition to the No Limits policy, specify a High and Low limit and a separate verification policy to use when the parameter or report value exceeds the High limit or falls short of the Low limit.</p> <p>High-High/Low-Low: Allows configuration of up to three verification policies. In addition to the No Limits policy and the High/Low policy, specify a second higher limit, a second lower limit, and a separate verification policy to use when the parameter or report value exceeds this second High limit or falls short of this second Low limit.</p> <p>High-High-High/Low-Low-Low: Allows configuration of up to four verification policies. In addition to the No Limits policy, the High/Low policy, and the High-High/Low-Low policy, specify a third higher limit, a third lower limit, and a separate verification policy to use when the parameter or report value exceeds this third High limit or falls short of this third Low limit.</p>
Add Parameter	<p>Adds a new parameter to the list.</p>
Delete Parameter	<p>Removes the selected parameter from the list.</p>

See also

[Configure phase class parameters](#) on [page 140](#)

[Area model data servers](#) on [page 83](#)

Configure phase class reports

Use the **Create Phase Class** dialog box **Reports** tab to configure phase class reports. A phase class report is defined for the phase class, while the corresponding report tag, including the address or tag in the process-connected device, is defined for the phase.

To configure phase class reports:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. With the **Create Phase Class** dialog box open, select the **Reports** tab. A list of phase class reports associated with the phase class is shown.



Tip: Use the keyboard to move around in the grid. Pressing the **Tab** key moves the focus in the grid. Pressing **Control+Alt+Home** highlights the first editable cell in the grid.

3. Select **Add Report** to add a new phase class report.

A new report displays with default values.

- Under **Name**, type a unique name for the report parameter.
- Under **Type**, select the appropriate parameter type.
 - If **Type** is REAL, STRING, or INTEGER, type the engineering units in **Enum/E.U.** If control strategies are enabled, edit the **Enum/E.U.** value for each configured control strategy.
 - If **Type** is ENUM, select the appropriate enumeration set in **Enum/E.U.**



Tip: If there are not enough report tags specified on the **General** tab in the **Number of Report Tags** box, the **UL on Terminal State** and **UL on TOC** check boxes are unavailable. Specify as many report tags as actual reports to have these check boxes enabled for each report.

- Under **Accumulate**, select how the FactoryTalk Batch Server handles uploaded report values. These are the valid values:
 - **None**
 - **Phase**
 - **Batch**
- To add the report to the upload on terminal state subset, select **UL on Terminal State**.
- To add the report to the upload on transfer of control subset, select **UL on TOC**.



Tip: Material-enabled phase classes do not support transfer of control.

- To assign a context or descriptor to the report parameter, from the **Reporting Contexts** column, select one or more Context IDs.
- To require electronic signatures or generate deviation events in the FactoryTalk Batch event journal when deviations from the accepted range of parameter values occur, see **Configure the verification policy for parameters and reports** for instructions.
- (optional) In **ERP Alias**, type the SAP R/3 report name.

4. To delete a report, select the report row header and select **Delete Report**. Select **Yes** to confirm the deletion.
5. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.

See also

[Configure the verification policy for parameters and reports](#) on [page 152](#)

[Create Phase Class dialog box - Reports tab](#) on [page 145](#)

[Select context IDs](#) on [page 147](#)

Create Phase Class dialog box - Reports tab

Phase class reports values pass from the process-connected device (PCD) to the FactoryTalk Batch Server. Report values contain data that indicates how the phase functioned. They are included in the event journal file (.**evt**) for the running batch and can be included in batch reports. For PhaseManager phases, which use a Logix5000 CIP data server, the phase definition includes its reports. For other data servers, a phase report is defined for the phase class, and a corresponding parameter tag and tag address is configured in the PCD.

The verification methods of report values can be configured for real or integer phase class reports. The verification methods define the policies for verifying up to three sets of high and low limits of the report. They also define the actions to take if the report value falls outside the configured limits.



If **Material Based Recipes** is enabled, two phase class reports (ACTUAL_AMOUNT and FEED_COMPLETE) are created automatically.





Tip: If control strategies are configured for the phase class, the **Control Strategy** list displays at the top of the **Reports** tab. Only reports associated with the control strategy selected from the **Control Strategy** list display. If <All> is selected and the **Type** is Real, String, or Integer, the **Enum/E.U.** box cannot be edited. This must be set for each control strategy.

The material-enabled phase reports are added to each control strategy created. Edit the **Enum/E.U.** value for each configured control strategy.

The Reports tab contains:

Name	Purpose
Control Strategy	A list of configured control strategies used to filter the displayed phase class reports. Select separate control strategies from the list or view all control strategies. This list is only available if Control Strategy has been enabled on the General tab.
Name	The name of the phase class reports.  Tip: The name of the material phase class reports ACTUAL_AMOUNT and FEED_COMPLETE cannot be edited.
ID	The identification number of the phase class reports. For material-enabled phase classes, parameter ID fills in the first available integer greater than zero. The ACTUAL_AMOUNT report is the first of the Material Based Recipe reports assigned an ID (view-only).
Type	The report data type: Real, Integer, String, and Enumeration.  Tip: The data type for material-enabled phase reports ACTUAL_AMOUNT = REAL and FEED_COMPLETE = ENUM cannot be modified.

Name	Purpose
Enum/E.U.	If Enumeration Type is selected, shows the name of the enumeration set. Otherwise, shows the engineering units for the report parameter.  Tip: The Enum/E.U. for the FEED_COMPLETE material-enabled phase class report cannot be modified.
Accumulate	Defines the phase class report parameter to add the value of uploaded values to its current value instead of just storing it. None: The report parameter acts as a normal output parameter on the phase. When the phase logic uploads a value to FactoryTalk Batch Server using either the automatic upload or by PXRQ / Request (2000 series), the value is stored in the report and logged in the event journal. If the phase logic uploads multiple times on a single run of the phase, each value is recorded in the event journal and the last uploaded value displays in the report parameter. PHASE: The report value accumulates the value in the report every time the phase logic uploads a value to the report for the entire phase execution. The event journal records each uploaded value as a report increment and records the totaled value for the report value. The type of upload does not matter. BATCH: The report value accumulates the value in the report every time the phase logic uploads a value to the report for the entire batch. The event journal records each uploaded value as a report increment and records the totaled value for the report value. If the phase step executes again in the same batch, as in a loop, the value continues to totalize. The type of upload does not matter. Changing the Accumulate setting also changes the UL on Terminal State setting: If the Accumulate value is set to None (Default), the UL on Terminal State value is on and enabled. If the Accumulate value is set to PHASE , the UL on Terminal State value is off and disabled. If the Accumulate value is set to BATCH , the UL on Terminal State value is off and disabled.
UL on Terminal State	If selected, the FactoryTalk Batch Server uploads the reports: <ul style="list-style-type: none"> • When the phase logic requests the upload. • When the phase is configured to automatically upload when the step changes to COMPLETE, STOPPED, or ABORTED. (See Create a phase for more information.)
UL on TOC	If selected, the report uploads when a transfer of control takes place on the phase, if the proper phase logic request is issued. Material-enabled phase classes do not support transfer of control.
Reporting Contexts	Defines associations between a phase report and a set of context IDs. The defined context IDs are recorded by the FactoryTalk Batch Server in the Context ID box of the batch event journal records, whenever a report event logs. Select  to open the Reporting Contexts dialog box, select one or more context strings to use for the report.
ERP Alias	The SAP name for the report. The ERP alias maps the report from FactoryTalk Batch Server to SAP.

Name	Purpose
Verification Method	<p>The part of the verification policy that defines the set of acceptable limits for a parameter or report. The phase class parameter or report type must be Real or Integer.</p> <p>No Limits: Configures a verification policy to enact when the parameter or report value is within the verification limits. Also select this option to not use verification policies.</p> <p>High/Low: Configures up to two verification policies. In addition to the No Limits policy, specify a High and Low limit and a separate verification policy to use when the parameter or report value exceeds the High limit or falls short of the Low limit.</p> <p>High-High/Low-Low: Configures up to three verification policies. In addition to the No Limits policy and the High/Low policy, specify a second higher limit, a second lower limit, and a separate verification policy to use when the parameter or report value exceeds this second High limit or falls short of this second Low limit.</p> <p>High-High-High/Low-Low-Low: Configures up to four verification policies. In addition to the No Limits policy, the High/Low policy, and the High-High/Low-Low policy, specify a third higher limit, a third lower limit, and a separate verification policy to use when the parameter or report value exceeds this third High limit or falls short of this third Low limit.</p>
Add Report	Adds a new report to the phase class.
Delete Report	Removes the selected report from the phase class.

See also

[Create and configure phase classes](#) on [page 138](#)

[Configure phase class reports](#) on [page 144](#)

Select context IDs

Context IDs, or descriptors, can be associated with each phase class report or parameter so that events recorded in the event journal may be more easily queried and sorted. This association makes report generation and analysis easier.

To assign a context ID to phase class parameters or reports, select one or more context IDs in the **Create Phase Class** dialog box.

IMPORTANT Context IDs are only assigned to recipe parameters and report parameters configured on a phase class. Thus, only phase class parameters may have Context IDs and they may not be changed within recipes.

To select context IDs:

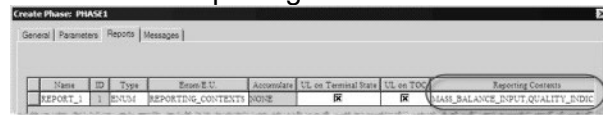
1. With the **Create Phase Class** dialog box open, select the **Parameters** or **Reports** tab. A list of phase class parameters or reports associated with the phase class is shown.

2. Under **Reporting Contexts**, select browse (...).



3. Select one or more context IDs by single-clicking on each, and then select **OK**.

The selected reporting contexts are added to the report.



See also

[Configure phase class parameters](#) on [page 140](#)

[Configure phase class reports](#) on [page 144](#)

[Phase class overview](#) on [page 137](#)

Configure phase class messages

Use these instructions to add new messages, edit existing messages, and delete phase class messages from the list in the **Create Phase Class** dialog box **Messages** tab.

To configure phase class messages:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. With the **Create Phase Class** dialog box open, select the **Messages** tab. A list of messages associated with the phase class is shown.
3. Select **Add Message** to add a new phase class message. A new default message is added.
4. In the **Name** box, type the appropriate message.
5. In the **ID** box, type a message ID.
6. To delete a message, select the message row header, and then select **Delete Message**. Select **Yes** to confirm the deletion.
7. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.

See also

[Create Phase Class dialog box - Messages tab](#) on [page 149](#)

Create Phase Class dialog box - Messages tab

Phase class messages are typically used for journal entry purposes and for troubleshooting phase logic problems. In some instances, the message displays to the operator. A phase class message has two pieces of data associated with it: the name and the message ID. Phase class message requests must be generated from within the phase logic (a 30NN or 130NN request) and a corresponding phase class message must be created in the area model for each phase class message request.

The **Messages** tab contains:

Name	Purpose
Name	The name of the message. This text also serves as the actual phase class message.
ID	The identification number of the report message.
Add Message	Adds a new phase class message to the phase class.
Delete Message	Removes the selected phase class message from the phase class.

See also

[Configure phase class messages](#) on [page 148](#)

Configure phase class control strategies

Use these instructions to edit the default control strategy, create new control strategies, and delete control strategies. To remove all of the control strategies, disable the **Control Strategy** option on the **Create Phase Class** dialog box **General** tab.



Tips:

- The **Control Strategy** tab is not visible unless the **Control Strategy** check box is selected in the **Create Phase Class** dialog box **General** tab.
- Disabling control strategies for a phase class results in a warning message indicating the parameter information that is lost if control strategies are disabled. Confirmation is required to complete the process.

To configure phase class control strategies:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. With the **Create Phase Class** dialog box open, select the **Control Strategy** tab. A list displays of control strategies associated with the phase class.
3. Select **Add Control Strategy** to add a new control strategy.
4. On the **Create Enumeration** dialog box, in the **Enumeration** box, type a name for the new control strategy.
5. In the **Ordinal** box, type the ordinal identification value for the control strategy, or accept the default value and select **OK**.

The new control strategy is added.

6. For each parameter in the **Parameters** table, select or clear the parameter's check box within the column for the new control strategy.

IMPORTANT If the target parameter is removed from the same control strategy as the report, the verification method for the report is automatically reset to **No Limits**.

7. For each report in the **Reports** table, select or clear the corresponding check box in the column for the new control strategy.

8. From the **Set Default Control Strategy** list, select the appropriate control strategy to configure that control strategy as the default for the phase class.
9. To edit or delete a control strategy, select the control strategy column, and then select **Edit Control Strategy** or **Delete Control Strategy**.
10. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.

See also

[Create Phase Class dialog box - Control Strategy tab](#) on [page 150](#)

Create Phase Class dialog box - Control Strategy tab

A control strategy identifies a subset of the phase class and report parameters configured on a phase class to be used at runtime. A control strategy value is assigned to the phase class and only the parameters and reports of that control strategy are available for use. A phase class can be configured to have one or more control strategies.

Individually configure each control strategy with a subset of the defined phase class parameters and reports. Define the value, range, and engineering unit for each parameter, and the engineering unit for each report independently for each control strategy. When creating master recipes using FactoryTalk Batch Recipe Editor, specify which control strategy to use for each instance of the phase class within the recipe.

If **Material Based Recipes** and **Add Optional Material Parameters** are enabled, the material parameters and reports for a material-enabled phase class are added to every control strategy created and cannot be deleted.

When the control strategy function is enabled, a default control strategy is created.

The **Control Strategy** tab contains:

Name	Purpose
Set Default Control Strategy	A list of configured control strategies for the phase class. The selected control strategy is the default control strategy for any recipes based on the phase class.
Parameters	A table used to assign parameters to control strategies. Each row of the table represents an associated parameter, and each column of the table represents a different control strategy, as identified by the column header. Parameters can be assigned or unassigned to a control strategy by selecting or clearing the check box for the parameter in the appropriate control strategy column. A single parameter can be assigned to multiple control strategies.
Reports	A table used to assign reports to control strategies. Each row of the table represents an associated report, and each column of the table represents a different control strategy, as identified by the column header. Reports can be assigned to or removed from a control strategy by selecting or clearing the check box for the report in the appropriate control strategy column. A single report may be assigned to multiple control strategies.
Add Control Strategy	Adds a new control strategy to the phase class.
Edit Control Strategy	Edits the selected control strategy. Select the column header to select a control strategy.
Delete Control Strategy	Removes the selected control strategy from the phase class.

See also

[Configure phase class control strategies](#) on [page 149](#)

Verification policies

Configure a separate verification policy for each parameter and report designated as a Real or Integer type.



Tip: A verification policy for String or Enumeration parameters or reports cannot be configured. The **Verification Policies** dialog box still displays for Strings and Enumerations, but all boxes are view-only.

The Verification Method consists of four verification levels:

- **No Limits:** The selected policy is enacted when the parameter or report value is within the deviation limits.
- **High/Low:** The options selected in this area describe the actions to be taken when the parameter or report value is outside the calculated high-low deviation limits.
- **High-High/Low-Low:** The options selected in this area describe the actions to be taken when the parameter or report value is outside the calculated high-high/low-low deviation limits.
- **High-High-High/Low-Low-Low:** The options selected in this area describe the actions to be taken when the parameter or report value is outside the defined high-high-high/low-low-low limits.

See also

[How verification policies work](#) on [page 151](#)

[Configure the verification policy for parameters and reports](#) on [page 152](#)

[How verification policies work with control strategies](#) on [page 156](#)

[How editing target parameters affects report verification policies](#) on [page 156](#)

How verification policies work

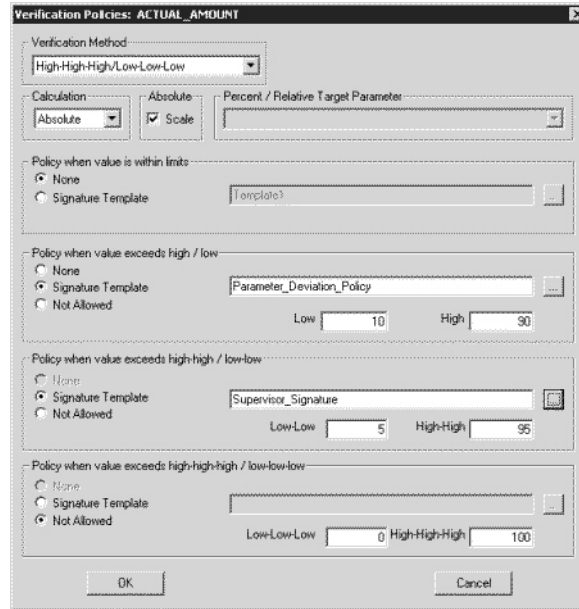
When choosing a verification method, specify a calculation method used in determining the deviation limits. For each verification level, select a verification policy option:



Tip: To use the signature template policy, first configure signature templates.

- **None:** A deviation event writes to the FactoryTalk Batch event journal when the parameter or report value is outside the calculated deviation limits, but no signature is required.
- **Signature Template:** Requires selection of a pre-configured signature template that describes the number of signoffs required and the user and groups permitted to enter an electronic signature.

- Not Allowed: If the parameter or report value is outside the calculated range, stops the batch from continuing its processing.



The verification method selected, along with the options selected within an area, affect the options available in the subsequently higher verification level areas. For example, the No Limits verification method is selected, any options for the High/Low, High-High/Low-Low or High-High-High/Low-Low-Low verification methods cannot be configured.

Verification options cannot be defined in a higher verification level less stringent than those defined in a lower verification level. For example, if the High-High/Low-Low verification method is selected, and the Signature Template option for the policy when the value is within limits is selected, the None option is disabled for the policy when the value exceeds the high/low level.



Tip: For recipe parameters, the highest and lowest limits must be within the minimum and maximum values specified for the parameter in the Edit Phase dialog box Parameters tab. This does not apply to reports.

The default parameter value specified on the Parameters tab must be within the range of the low and high limits.

The sets of high and low limits must conform to this relationship:

$$\text{Maximum} \geq \text{HHH} > \text{HH} > \text{H} = \text{Default} = \text{L} > \text{LL} > \text{LLL} \geq \text{Minimum}$$

See also

[Signature template](#) on [page 61](#)

[Configure the verification policy for parameters and reports](#) on [page 152](#)

Configure parameters and reports verification policy

Use the **Edit Phase Class** dialog box to configure the verification policies for parameters and reports.

Before you begin:

- Verify set up of the electronic signature templates.




Tip: The phase class parameter or report type must be Real or Integer. A Verification Method for String or Enumeration parameters or reports cannot be configured.

To configure the verification policy for parameters and reports

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase Class** dialog box, select the **Parameters or Reports** tab to configure a verification policy for either a parameter or report, respectively.
3. In the parameter or report row header, select the **Verification Method** browse to open the **Verification Policies** dialog box.
4. From the **Verification Method** list, select the verification method used for the parameter or report. The selected method determines which boxes in the dialog box become enabled.
 - If the **High/Low, High-High/Low-Low**, or the **High-High-High/Low-Low-Low** verification method is selected, specify a calculation method. From the **Calculation** list, select the calculation method that is used to determine the deviation limits. (**Absolute** is the only available selection for parameters. If selected the **No Limits** verification method, the **Calculation** list is disabled. Continue with Step 5.)
 - If the **Absolute** calculation method is selected, there is an option of selecting the **Scale** check box. The Scale option scales the absolute verification limits the same percentage as the **Batch Scale** value specified on the **Batch Creation** dialog box in the FactoryTalk Batch View.
 - If the **Percent** or **Relative** calculation method is selected, select a parameter from the **Percent/Relative Target Parameter** list. The parameter value selected is used in the percentage or relative calculation that determines the report verification limit. The list only displays real or integer recipe parameters assigned to the same control strategy as the report on the phase class being edited.

IMPORTANT Changes to the target parameter could automatically alter the verification policy of all referencing reports.

5. In the **Policy when value is within limits** area, select one of the policy options.
 - If **Signature Template** is selected, select browse () next to the **Signature Template**.
 - From the **Select Template** list, select the signature template that defines the signature policy to use for this parameter or report verification limit.
 - Select **OK**. The **Select Signature** dialog box closes, and the signature template chosen displays in the box next to the **Signature Template** option.
6. Repeat step 4 for each policy area enabled. In addition to these steps, for each enabled policy, enter values in each respective set of **Low** and **High** boxes that are used in calculating the verification limit.

IMPORTANT If a parameter or report type is changed from Real to Integer, and the calculation method for the verification policy is Absolute or Relative, the values in each set of Low and High limits are automatically rounded to the nearest integer.

7. Select **OK** to save changes and return to the **Edit Phase Class** dialog box.
8. To download the verification limits to the phase logic, enable or define a set of limit tags. After setting up verification policies, enable or define these limit tags when configuring each phase for automatic (non-instruction based) phase classes.

See also

[Signature template](#) on [page 61](#)

[How editing target parameters affects report verification policies](#) on [page 156](#)

[Verification Policies dialog box](#) on [page 154](#)


[Parameter limit tags](#) on [page 173](#)

[Report limit tags](#) on [page 175](#)

Verification Policies dialog box

The **Verification Policies** dialog box contains:

Name	Purpose
Verification Method	<p>A list that allows selection of Verification Methods:</p> <p>No Limits: Define the actions taken when the parameter or report value is within the verification limits. To not use verification policies, select this option.</p> <p>High/Low: Define two verification policies. Specify a High and Low limit and a separate verification policy to use when the parameter or report value exceeds the High limit or falls short of the Low limit.</p> <p>High-High/Low-Low: Configure up to three verification policies. Specify a second higher limit, a second lower limit, and a separate verification policy to use when the parameter or report value exceeds this second High limit or falls short of this second Low limit.</p> <p>High-High-High/Low-Low-Low: Configure up to four verification policies. Specify a third higher limit, a third lower limit, and a separate verification policy to use when the parameter or report value exceeds this third High limit or falls short of this third Low limit.</p>

Name	Purpose
Calculation	<p>Verification limit calculation. Only enabled for reports. Select the type of equation used to calculate the verification limit for reports. The FactoryTalk Batch Server calculates the limits when the batch is added to the batch list or when the target parameter changes.</p> <p>Example configuration settings: Target Parameter = 120 High Limit = 10 Low Limit = -10</p> <p>Absolute: The deviation limit is the specified value defined in the recipe. The absolute values entered in the three sets of Low and High boxes are displayed as the default values for the LLL, LL, L, H, HH, HHH boxes in the FactoryTalk Batch Recipe Editor Parameter Value Entry/Report Limit Entry dialog box. This is the default and only type of limit calculation for recipe parameters.</p> <p>At runtime, the Server calculates: High limit = 10 Low limit = -10</p> <p>Percentage: The Target Parameter value is multiplied by the percentage specified in the Low and High boxes. Only available for reports.</p> <p>For example: At runtime, the FactoryTalk Batch Server calculates: High Limit = $120 + (.10)(120) = 132$ Low Limit = $120 + (-.10)(120) = 108$</p> <p>Relative: The Target Parameter value plus the value specified in the Low and High boxes. Only available for reports. For example: At runtime, the Server calculates: High Limit = $120 + (10) = 130$ Low Limit = $120 + (-10) = 110$</p>
Scale	<p>Enabled only when the Calculation is Absolute. Indicates whether the absolute verification limits are scaled the same percentage as the Batch Scale value specified in the FactoryTalk Batch View Batch Creation dialog box.</p>
Percent/Relative Target Parameter	<p>Enabled when the calculation is Percentage and Relative of report limits. Select the parameter whose value is to be used in the percentage or relative calculation that determines the report verification limit.</p> <p>The list only displays real or integer recipe parameters assigned to the same control strategy as the report on the phase class being edited.</p>
None	<p>A deviation event is recorded in the FactoryTalk Batch event journal, but no other action occurs (default).</p>
Signature Template	<p>Indicates that a signature verification is required when parameter or report values fall outside of the specified range.</p> <p>If selecting this option, select browse () to open the Select Signature Template dialog box. Select the signature template that contains the Signoff groups who have the security privileges to enter signature verifications at this verification level.</p>
Not Allowed	<p>Indicates the recipe cannot proceed when the values for the parameter or report are outside the defined limits. No event is recorded in the event journal.</p>

Name	Purpose
Low/High Low-Low/High-High Low-Low-Low/ High-High-High	These boxes are used in calculating the default parameter deviation limits. These values can be changed in the recipe, but if no values are provided in the recipe parameters, the values entered here are used. The definition of this box differs depending on the Calculation method selected. <ul style="list-style-type: none"> • Absolute calculation: The actual values entered are the Low and High deviation limits. Deviation Limit = Absolute value. • Percent calculation: These values define the percentage of the Target Parameter used in calculating the Low and High deviation limits. These values are the Percentage in this equation: Deviation Limit = Target Parameter + (Target Parameter * Percentage). Enter positive and negative values. To define the Low limit as lower than the Target Parameter value, enter a negative value in the Low box. • Relative calculation: The actual value entered is added to the Target Parameter value to determine the deviation limit. These values are the Relative value in this equation: Deviation Limit = Target Parameter + (Target Parameter + Relative value). Enter positive and negative values. To define the Low limit as lower than the Target Parameter value, enter a negative value in the Low box. The selected policy is enacted when the parameter or report values are outside of the calculated deviation limits.

See also

[Configure the verification policy for parameters and reports on page 152](#)

How verification policies work with control strategies

If implementing control strategies, set up a different verification policy for each parameter and report in each control strategy.

If selected Percent or Relative as the calculation method for a report's verification policy, select a different target parameter for each control strategy. The target parameter must be assigned to the same control strategy as the report. When enabled control strategies, the target parameter list only displays integer and real parameters assigned to the same control strategy as the report.

IMPORTANT If a report's target parameters are removed from the same control strategy as the report, the verification method automatically resets to No Limits.

See also

[How editing target parameters affects report verification policies on page 156](#)

How editing target parameters affects report verification policies

If any of these changes are made to a parameter, the verification method automatically resets to No Limits for all reports that reference that parameter as the target parameter:

- Parameter name changes.
- Parameter type changes from Integer or Real to String or Enumeration.
- Removed Parameter from the same control strategy as a report.
- Deleted Parameter.

IMPORTANT If a report verification policy is set up with the Percent or Relative calculation method, changes to the target parameter could automatically alter the verification policy of the referencing report.

See also

[How verification policies work with control strategies](#) on [page 156](#)

Material-enabled phase classes

If using FactoryTalk Batch Material Manager in conjunction with FactoryTalk Batch, two parameters (MATERIAL and AMOUNT) and two reports (ACTUAL_AMOUNT and FEED_COMPLETE) are automatically added to each material-enabled phase class.

Add optional parameters for material-enabled phase classes:

- CONTAINER
- LOT
- MATERIAL_CLASS
- LABEL

These optional parameters make data available to the phase class and to the client programs as the batch runs.



Tip: The optional material parameter values within FactoryTalk Batch Equipment Editor cannot be edited.

Because material-enabled phase classes are different from standard phase classes, be aware of these issues when configuring a phase class to be material-enabled:

- What to do with existing parameters and report parameters.
- What to do about the number of tags configured on the phase class.

If a standard phase class does not have matching parameter and report names reserved for materials, making this phase class material-enabled is quite simple. Once the **Material Based Recipes** check box is enabled, the two reserved parameters and two reserved report parameters are added. The same applies to **Add Optional Material Parameters**.

If disabled **Parameter/Tag Locking**, add the appropriate number of tags.

See also

[Phase class overview](#) on [page 137](#)

[Verification policies](#) on [page 151](#)

[Disable material on a material-enabled phase class](#) on [page 158](#)

[Duplicate a phase class](#) on [page 158](#)

Standard phase class with matching parameter and report names

If a standard phase class uses any of the reserved material parameter or material report names, they must be of the correct data type for a material-enabled phase class. In addition, if the MATERIAL parameter exists, it must also have the correct enumeration set selected.



Tip: The exceptions to this are the optional Material Parameters. The four parameters, CONTAINER, LOT, MATERIAL_CLASS, and LABEL, cannot already exist as non-system parameters. If the system finds parameters matching the reserved names, delete or rename the parameters before enabling the **Add Optional Material Parameters**.

If the data types of the existing parameters are not exactly what the material-based recipes subsystem expects, enabling a phase class to support materials could result in issues. The system checks for correct data types and displays a message to correct those with an invalid data type.

The parameter and report IDs previously configured remain unchanged. The other material-based recipe parameters and reports that have not been configured are added and assigned IDs using the first-available integer greater than zero.

See also

[Standard phase class with control strategies configured](#) on [page 158](#)

Standard phase class with control strategies configured

If a standard phase class has control strategies configured and **Material Based Recipes** is enabled, the material parameters (including optional parameters, if enabled) and reports are added to every control strategy. If disabled **Parameter/Tag Locking**, add the appropriate number of tags.

See also

[Material-enabled phase classes](#) on [page 157](#)

Disable material on a material-enabled phase class

Disabling Material Based Recipes on a material-enabled phase class automatically deletes the two reserved parameters (and the optional parameters, if enabled) and the two reports. If **Parameter/Tag Locking** is enabled, remove the appropriate number of tags.

If multiple phases are created using the material-enabled phase classes, delete the extra phases in each unit. Then, disable the Material Based Recipes on the phase class.

See also

[Material-enabled phase classes](#) on [page 157](#)

Duplicate a phase class

Phase classes can be cut, copied, or pasted within the **Class View** area using the FactoryTalk Batch Equipment Editor toolbar. Duplicate phase classes within an area model, including all of the phase parameters, reports, and messages. Use this feature to cut or copy a phase class from one area model to another.

See also

[Copy a phase class](#) on [page 159](#)

[Cut and paste a phase class](#) on [page 159](#)

Copy a phase class

Use these instructions to copy a phase class.

To copy a phase class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. From the **Class View** area, select the phase class to be copied.
3. Select **Edit > Copy Phase Class**.
4. Select **Edit > Paste Phase Class**. A new phase class creates with the default name **PHASE CLASS NAME#**, where # is an integer (beginning with **1**) that increments each pasted phase class.

See also

[Cut and paste a phase class](#) on [page 159](#)

Cut and paste a phase class

Use these instructions to cut and paste a phase class.



Tip: To cut and paste between area models, open the first area model, cut or copy the appropriate phase class, and then open the second area model and paste the phase class into the **Class View** area.

To cut and paste a phase class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. From the **Class View** area, select the phase class to be cut.
3. From the **Edit > Cut Phase Class**. The phase class is removed from the **Class View** area and held in memory.
4. Select any phase class within the **Class View** area and, select **Edit > Paste Phase Class**.

See also

[Copy a phase class](#) on [page 159](#)

Configure phases

A phase is an instance of a specific phase class. Only one instance of a specific phase class can be added to each unit, unless the phase class is material-enabled. Once a phase class instance is added to a unit instance, the phase must be configured.

A phase maps to the phase class in the engineered logic via tag addresses. If a single instance of this phase class is required by multiple units, it may be shared between the units. At a minimum, each tag in OPC or FactoryTalk Linx FactoryTalk Live Data phases must be configured to indicate the tag's address location in the process-connected device.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, it is not necessary to configure tag data.

Phase tags represent data associated with a specific phase during the execution of a recipe. The number of tags associated with a phase depends on the phase class configuration. Each phase has a minimum of ten pre-defined tags with which it is associated. Additional tags may be configured. There are three types of additional tags:

- Parameter
- Report
- Request

If the phase class is configured to require any of these additional tags, a corresponding tag creates in the phase.

When using material-enabled phase classes, add multiple instances of the same phase class to a single unit instance. Even though these phases are created from the same phase class, they are distinguished from each other by the unique material containers with which they are associated. Phases mapping to the same phase class have independent resource IDs.



Tip: When a phase is selected in the **Design View**, the phase class on which it is based is highlighted. If the phase class on which they are based is modified, phases are automatically updated. Phases created prior to modifying the phase class are also updated.

When the same phase is required by multiple units, it can be shared between the units. However, a phase can only be owned by one unit at a time.


See also

[Create a phase](#) on [page 161](#)

Create a phase

Use these instructions to create a phase.

To create a phase

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Navigate to the phase class level of the area model (select **Go Down** () to the lowest level).
3. Select the desired phase class icon in the **Classes** tree.
4. Place the cursor in the **Design** View pane where the phase is to be located and click to open the **Create Phase** dialog box.

The **Create Phase** dialog box contains these tabs:

- General
 - Arbitration
 - Cross Invocation
 - Hyperlink (used with eProcedure)
 - Containers (used with Material Manager)
 - Tags
 - Parameter Limit Tags
 - Report Limit Tags
5. Complete the tabs as appropriate, then click OK.
 6. To add multiple instances of the same phase to the same unit instance, select again. Only material-enabled phase classes can be used for multiple phases.

See also

[Configure the general data for a phase](#) on [page 162](#)

Configure the general data for a phase

Use these instructions to configure the **Edit Phase** dialog box **General** tab.


To configure the general data for a phase:

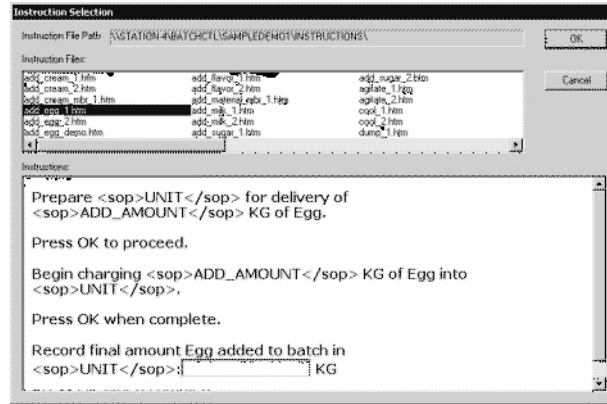
1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the **Edit Phase** dialog box, **General** tab.
3. In the **Name** box, type the phase name.
4. In **ERP Alias**, type the SAP R/3 phase name.
5. In **Equipment ID**, type the equipment ID, or accept the default value.
6. In **Data Server**, confirm that the correct data server that corresponds to the phase displays. If it does not, select the list to locate the appropriate server.



Tip: If the data server does not correspond to the phase, a message displays stating that continuing resets the assignment to <None>.



7. (For use with FactoryTalk eProcedure only)

- k. Select browse () next to the **Instruction File** box. The **Instruction Selection** dialog box opens.



- l. Select the instruction file that applies to the phase. The instructions display in the **Instructions** area.

IMPORTANT Define an instruction file for each instruction-based phase. If an instruction-based phase has no instruction file associated with its configuration, the eProcedure Server will not start.

- m. Select **OK** to return to the **Edit Phase** dialog box.
8. In **Controller Program Name**, enter the name of the phase in the controller program.
 -  Tip: If the **Controller Program Name** is not entered, you will be notified that the **Controller Program Name** is being set equal to the phase name.
 9. To automatically download the appropriate parameters on a **START** command, enable the **Automatically Download Parameters Upon START** check box.
 -  Tip: Automatic upload/download are configurable on a phase only when the associated phase class parameters and reports have at least one member of the upload/download parameter subsets. These features are disabled when an Instruction Based Server is selected.
 10. To automatically upload the appropriate report values when the batch transitions to a terminal state (**COMPLETE**, **STOPPED**, or **ABORTED**), enable all or individual **Automatically Upload Parameters Upon** check boxes.
 11. Select **Apply** to save changes.

See also

[Edit Phase dialog box - General tab](#) on [page 163](#)
[Automatic Upload/Download](#) on [page 53](#)

Edit Phase dialog box - General tab

The **Edit Phase** dialog box **General** tab contains:

Name	Purpose
Name	The name of the phase.
Phase Class	The name of the phase class from which this phase was created (view-only). The icon associated with the phase class is displayed next to the Name and Phase Class .
ERP Alias	The SAP name for the phase. The ERP alias maps the equipment module from FactoryTalk Batch to SAP.

Name	Purpose
Equipment ID	<p>A unique number identifies this phase. It must be the same ID used in the phase logic to request this phase.</p> <p>When Dynamic Unit Allocation is enabled and the First Available method is selected, the FactoryTalk Batch Server performs a final ascending sort on this box and chooses equipment with the smallest ID number that meets the required criteria.</p>
Data Server	<p>Displays the currently assigned server. When the list opens, configured servers display.</p>
Instruction File	<p>Use this feature in conjunction with eProcedure only. Disables if the data server is not an Instruction Based Server. This maps to the instruction file associated with the phase.</p>
Controller Program Name	<p>The name of the phase in the controller program.</p>
Automatically Download Parameters Upon START	<p>When a START command issues, the FactoryTalk Batch Server downloads the parameters configured with the Download on Start option on the phase. Enable this function by selecting the check box. If no parameters exist on the phase, this option is dimmed.</p> <ul style="list-style-type: none"> • If an OPC or FactoryTalk Linx FactoryTalk Live Data server is assigned to the phase, this option is enabled when the number of parameter tags on the phase class is equal or greater than the number of parameters. • If a Logix5000 CIP data server is assigned to the phase, this option enables when DL on Start is selected for at least one parameter on the phase class. • If the Instruction Based Server is assigned to the phase, this function disables.
Automatically Upload Parameters Upon COMPLETE STOPPED ABORTED	<p>When the batch transitions to a terminal state (COMPLETE, STOPPED, or ABORTED) the FactoryTalk Batch Server uploads the report values configured with the Upload on Terminal State option on the phase class. Enable this function so that it occurs for any or all of these terminal states by selecting the check box. If no reports exist on the phase class, these options are dimmed.</p> <ul style="list-style-type: none"> • If an OPC or FactoryTalk Linx FactoryTalk Live Data server is assigned to the phase, this option enables when the number of report tags on the phase class is equal or greater than the number of reports. • If a Logix5000 CIP data server is assigned to the phase, this option enables when UL on Terminal State is selected for at least one report on the phase class. • If the Instruction Based Server is assigned to the phase, this function disables.

See also

[Configure the general data for a phase](#) on [page 162](#)

Configure the tag data for a phase

Configure the tag data for the phase. These instructions only apply to phases assigned to an OPC or FactoryTalk Linx FactoryTalk Live Data server.



Tip: For PhaseManager phases assigned to a Logix5000 CIP data server, it is not necessary to configure tag data.

To configure the tag data for a phase:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box, select the **Tags** tab.
3. In the **On Control** and **Off Control** boxes, type the On Control and Off Control scan rates for the phase.

If the data server associated with the phase is an OPC or FactoryTalk Linx FactoryTalk Live Data server that allows for

configurable scan rates, the default scan rates for the phase can be modified. If the values cannot be modified, the boxes disable.

4. Select **Apply** to save changes.

See also

[Edit Phase dialog box - Tag tab](#) on [page 165](#)

Edit Phase dialog box - Tag tab

In the **Edit Phase** dialog box **Tags** tab, these boxes are available for phases assigned an OPC or FactoryTalk Linx FactoryTalk Live Data server:

Name	Purpose
Name	The name of the phase (view-only).
Phase Class	The name of the phase class from which this phase was created (view-only). The icon associated with the phase class is displayed next to the Name and Phase Class .
Phase Tags	A list of all tags that must be defined for the phase.
Defaults	Returns all tag items associated with this phase to their default item names and the default access path that is configured on the data server that is assigned to the phase. The default tag item names include the name of the phase. (See Set tag items to the default addresses for more information.)
Name	The name of the highlighted tag (view-only).
Type	The phase tag data type (view only). The box below the Type box displays comments associated with the default tags. There are no comments associated with the report, parameter, or additional request tags (view-only).
Class Description	Displays a description of the currently selected tag class.
On Control Scan Rate	Displays the on control scan rate for the OPC or FactoryTalk Linx FactoryTalk Live Data server associated with the phase (view-only). The scan rate can be modified only within specific data server definition (DSDF) files. Typically, these values do not need to be modified. The valid range of the on control scan rate is 250 to 30,000 milliseconds.
Off Control Scan Rate	Displays the off control scan rate for the OPC or FactoryTalk Linx FactoryTalk Live Data server associated with the phase (view-only). The scan rate can be modified only within specific data server definition (DSDF) files. Typically, these values do not need to be modified. The valid range of the off control scan rate is 250 to 60,000 milliseconds.

See also

[Set tag items to the default addresses](#) on [page 168](#)

Phase tag

Phase tags automatically name and cannot be directly modified. If the phase name changes, the tag name changes. There are ten default tags created for each OPC or FactoryTalk Linx FactoryTalk Live Data phase. Additional tags create based on the number of report, parameter, and request tags specified.

After the phase creates, all phase tags must be configured to include the correct tag item. An item references the address location in which the tag data is stored. The data type for the ten default tags is integer and cannot be modified.

The default data type for any additional tags that have been configured is real. Change the data types for parameter and report tags when they are defined for the phase class. Change the data types for the additional request tags when the phase is edited.



Tip: Unsigned data types are not supported.

When a phase is added to the area model, select the data server for assignment to each tag. Change the data server assigned to the tags when the phase is edited.



Tip: The data server for a limit tag must be the same as the data server for its associated parameter tag. If the data server for a parameter tag is changed, the data server for the associated limit tags is also automatically changed.

The data server for a limit tag cannot be changed. To change the data server for a limit tag, change the data server for its associated parameter tag.

See also

[Phase tag naming conventions on page 166](#)

[Configure a phase tag on page 167](#)

Phase tag naming conventions

These naming conventions used for phase tags are based on a phase called CHARGE1. The ## is a sequentially-assigned number for each user-defined parameter, report, and additional request tag, beginning with 01. This example has only a single parameter, report, and additional request configured on the phase class. Replace the ## with 01.

Class Name	Tag Name	Example
Parameter Tags		
PARMTR##	[Phase_Name]P##	CHARGE1P01
Parameter Limit Tags		
PARMTR##M	[Phase_Name]P##M	CHARGE1P01M
PARMTR##L	[Phase_Name]P##L	CHARGE1P01L
PARMTR##H	[Phase_Name]P##H	CHARGE1P01H
PARMTR##LL	[Phase_Name]P##LL	CHARGE1P01LL
PARMTR##HH	[Phase_Name]P##HH	CHARGE1P01HH
PARMTR##LLL	[Phase_Name]P##LLL	CHARGE1P01LLL
PARMTR##HHH	[Phase_Name]P##HHH	CHARGE1P01HHH
Report Tags		
REPORT##	[Phase_Name]R##	CHARGE1R01
Report Limit Tags		
REPORT##M	[Phase_Name]R##M	CHARGE1R01M
REPORT##L	[Phase_Name]R##L	CHARGE1R01L
REPORT##H	[Phase_Name]R##H	CHARGE1R01H
REPORT##LL	[Phase_Name]R##LL	CHARGE1R01LL
REPORT##HH	[Phase_Name]R##HH	CHARGE1R01HH
REPORT##LLL	[Phase_Name]R##LLL	CHARGE1R01LLL
REPORT##HHH	[Phase_Name]R##HHH	CHARGE1R01HHH
Request Tags		
REQUEST##	[Phase_Name]Q##	CHARGE1Q01
Default Tags		
COMMAND	[Phase_Name].OC	CHARGE1.OC

Class Name	Tag Name	Example
FAILURE	[Phase_Name]_F	CHARGE1_F
OWNER	[Phase_Name]_W	CHARGE1_W
PAUSE	[Phase_Name]_P	CHARGE1_P
PAUSED	[Phase_Name]_PD	CHARGE1_PD
REQUEST	[Phase_Name]_RQ	CHARGE1_RQ
SINGLE_STEP	[Phase_Name]_SS	CHARGE1_SS
STATUS	[Phase_Name]_ST	CHARGE1_ST
STEP_INDEX	[Phase_Name]_SI	CHARGE1_SI
UNIT	[Phase_Name]_UN	CHARGE1_UN

See also

[Phase tag](#) on [page 165](#)

Configure a phase tag

Use these instructions to configure a phase tag.

To configure a phase tag:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. From the **Edit Tags** dialog box, double-click the desired phase tag in the **Tags** list box.

The **Edit Phase Tag** dialog box opens.

3. Select an appropriate data type from the **Type** list. OPC or FactoryTalk Linx FactoryTalk Live Data servers do not accept **Enumeration** data types. Use **Integer** instead. If the phase class has enabled **Parameter/Tag Locking**, the type cannot be modified.



Tip: Unassigned data types are not supported.

4. In **Access Path**, type the appropriate access path.
5. In **Item Name**, type the appropriate item name.
6. If the data server requires separate read and write items, type the write access path in the **Write Access Path** box.
7. If the data server requires separate read and write items, type the write item name in the **Write Item Name** box.
8. From the **Data Server** list, if the default is not correct, select the appropriate data server.
9. Select **OK** to return to the **Edit Tags** dialog box.
10. Select **OK** to close the **Edit Tags** dialog box.

See also

[Edit Phase Tag dialog box](#) on [page 167](#)

Edit Phase Tag dialog box

Phase tags are configured using the **Edit Phase Tag** dialog box, which contains:

Name	Purpose
Name	The automatically assigned name of the phase tag (view-only).
Tag Class	The phase tag class (view only).

Name	Purpose
Type	The phase tag data type. Parameters and reports defined as enumerations default to Integer as the tag type. Type should never be set to Enumeration because an OPC or FactoryTalk Linx FactoryTalk Live Data server does not recognize this tag type. Parameters and reports defined as enumerations should use Integer as the tag type. If the phase Parameter/Tag Locking is enabled (selected), the Type cannot be modified.
Enumeration	This should not be used. OPC or FactoryTalk Linx FactoryTalk Live Data servers do not recognize enumeration tag types. Parameters and reports defined as enumerations must use Integer as the tag type. If the phase Parameter/Tag Locking is enabled (checked), the Enumeration cannot be modified.
Access Path	The OPC access path used with the read item when the data server attempts to subscribe to the tag's value, or when performing read operations. This box changes to Read Item Access Path when the associated OPC data server requires separate read and write items.
Item Name	The name of the item used when subscribing to the value of the tag or when performing read operations. This box changes to Read Item Name when the associated OPC data server requires separate read and write items.
Write Access Path	The OPC access path for the write item. This disables if the data server does not require separate read and write items.
Write Item Name	The OPC item name for the write item. This disables if the data server does not require separate read and write items or does not require an access path.
Data Server	The user-defined data server name used by the phase tag. (This box disables for request, control, and limit tags.)
Type	The data server as defined in the DSDF file (view-only).

See also

[Configure a phase tag on page 167](#)

Set tag items to the default addresses

When creating a phase from a phase class in the area model, the default phase name is <phasename>1. For example, if the phase is AGITATE, the phase creates from this phase class with the default name of AGITATE1.

The phase's tag items the default name is: <Equipment Module Name>< Tag Separator><Tag Extension>

For example, if the tag separator is a period (.), the Request tag (RQ) for phase AGITATE1 would be: **AGITATE1.RQ**

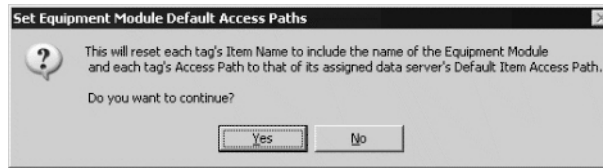
If the phase name changes, the tag item names do not automatically change to reflect the new phase name. For example, if the phase name changes from AGITATE1 to AGITATE_U2, the tag Names reflect the new name (AGITATE_U2), but the tag Item Names still reflect the original name of the phases (AGITATE1). The example request tag for the AGITATE_U2 phase would still be AGITATE1.RQ.

Re-establish the default address information for a phase by using the **Defaults** button. The **Item**, **Read Access Path**, **Read Item Name**, **Write Item Path**, and **Write Item Name** are returned to the appropriate default values specified for the data server assigned to the phase. The phase tag names are changed to reflect the current name of the phase.

IMPORTANT This is an irreversible action! Once **Defaults** is selected, all tag item names and access paths are automatically changed. (See **Set all tag items to default name and access path** for more information.)

To set tag to the default address:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box **Tags** tab, select **Defaults**.



3. Select **Yes** to set the defaults and return to the **Edit Phase** dialog box.

See also

[Set all tag items to default name and access path](#) on [page 131](#)

Configure the arbitration data for a phase

Use these instructions to configure the arbitration data.

To configure the arbitration data for a phase:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the **Edit Phase** dialog box **Arbitration** tab.
3. Browse the area models equipment hierarchy to specify the equipment acquired by the equipment phase. The lack of a plus or minus sign to the left of an equipment type indicates no defined equipment. It can also indicate that the equipment type cannot be used as a needed equipment item at this level.
 - To add equipment, under the **Equipment Allocation by Resource** area, select the equipment needed by the phase and select **Add**. The selected equipment displays in the right pane.
 - To remove equipment, in the right pane, select the equipment to delete and select **Remove**. The selected equipment is removed from the list.
4. Select **Apply** to save changes.



Tip: Phases do not have a **Max Owners** box to define because a phase can only execute one recipe phase class at a time. For that reason, all phases can have only one owner.

See also

[Edit Phase dialog box - Arbitration tab](#) on [page 169](#)

Edit Phase dialog box - Arbitration tab

The **Edit Phase** dialog box on the **Arbitration** tab contains:

Name	Purpose
Name	The name of the phase (view-only). The icon associated with the phase class displays next to the Name and Phase Class .
Phase Class	The name of the phase class from which this phase was created (view-only).

Equipment Allocation by Resource	<p>A list of the equipment for which ownership is required by this phase in order for any procedural element linked to the phase to begin execution.</p> <p>The left pane is a hierarchical display showing the current equipment configuration of the area model. The hierarchy has two roots:</p> <ul style="list-style-type: none"> • Process Cells: Displays all the process cells within the area model. From here, organization is hierarchical: process cells contain units and units contain phases and operations sequences. • Resources: Displays a list of all the configured resources within the area model. <p>The right pane is the list of equipment this phase is dependent upon. Any equipment in this list must be acquired by the phase before the phase can begin execution.</p>
Add	Add the selected equipment requirement to the Equipment Needed list.
Remove	Remove the selected equipment requirement from the Equipment Needed list.

See also

[Configure the arbitration data for a phase](#) on [page 169](#)

Configure cross invocation data for a phase

Use these instructions to configure cross invocation data.



Tip: Cross invocation is not supported in FactoryTalk eProcedure.

To configure cross invocation data for a phase:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the **Edit Phase** dialog box **Cross Invocation** tab.
3. In **Cross Invocation Configuration**, type the cross invocation string information.
4. Select **Apply** to save changes.

See also

[Edit Phase dialog box - Cross Invocation tab](#) on [page 170](#)

Edit Phase dialog box - Cross Invocation tab

The **Edit Phase** dialog box **Cross Invocation** tab contains:

Name	Purpose
Name	The name of the phase (view-only).
Phase Class	The name of the phase class from which this phase was created (view-only). The icon associated with the phase class is displayed next to the Name and Phase Class .
Cross Invocation Configuration	<p>The cross invocation strings indicate the addition of an item to FactoryTalk Batch View and HMI control shortcut menus. This includes the caption for each menu item and the data to be passed to the specified automation server when the menu item is selected.</p> <p>The default labels associated with each of the five fields are Cross Invocation Label # (where # is 1 through 5). These labels can be modified in the Server Options dialog box, and are seen in the Edit Process Cell dialog box.</p>

See also

[Configure cross invocation data for a phase](#) on [page 170](#)

Configure hyperlink data for a phase

This feature is used in conjunction with eProcedure only. Use these instructions to configure hyperlink data.

To configure hyperlink data for a phase:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box, select the **Hyperlink** tab.
3. In the **Hyperlink Configuration** boxes, type a valid URL string.
4. Select **Apply** to save changes.

See also

[Edit Phase dialog box - Hyperlink tab](#) on [page 171](#)

Edit Phase dialog box - Hyperlink tab

This feature is used in conjunction with eProcedure only.

The **Edit Phase** dialog box on the **Hyperlink** tab contains:

Name	Purpose
Name	The name of the phase (view-only).
Phase Class	The name of the phase class from which this phase was created (view-only). The icon associated with the phase class is displayed next to the Name and Phase Class .
Hyperlink Configuration	The URL associated with each hyperlink label. The default labels associated with each of the five fields are Hyperlink Label # English (where # is 1 through 5). These labels can be modified in the Server Options dialog box. The labels are used in the eProcedure Client Equipment view.

See also

[Configure hyperlink data for a phase](#) on [page 171](#)

Configure container data

The **Containers** tab is visible with material-enabled phase classes only.

Configure the set of containers from which this phase can select material, or into which it can distribute material, or both.



Tip: If the Material Server is unavailable, the **Container and Storage Location Associations** area contains an error message stating the container data is unavailable. The **CONTAINER** column is unavailable but contains the associations previously configured.

To configure container data:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select the **Edit Phase** dialog box **Containers** tab.
3. Browse the container and storage location trees to specify associations with the phase. The lack of a plus or minus sign to the left of **Containers** or **Storage Locations** indicates no containers

or storage locations have been defined. Define these in the Material Editor.

Select the container or storage location needed by the phase under the **Container and Storage Location Associations** area and select **Add**. The item selected displays in the right pane under the **Container/Storage Location** column. Adding a container that already exists in the **Container/Storage Location** column is not allowed.

To remove a container or storage location, in the right pane, select the item to delete and select **Remove**. The selected item is removed from the list.

4. Select the appropriate check box to indicate if the container is a source of material (material is drawn from this container), a material destination (material enters this container), or both.



Tip: At least one check box, addition, or distribution, must be selected for the configuration to be accepted, and it must agree with the container behavior. The **High** and **Low** values configured in the phase class parameters specify the container behavior, whether the phase class is a material addition, distribution, or both.

Addition - Low = 0, High = positive number

Distribution - Low = negative number, High = 0

Both - Low = negative number, High = positive number

5. Select **Apply** to save changes.
6. Select **OK** to close the **Edit Phase** dialog box.

See also

[Edit Phase dialog box - Containers tab](#) on [page 172](#)

Edit Phase dialog box - Containers tab

The **Edit Phase** dialog box **Containers** tab contains:

Name	Purpose
Name	The name of the phase (view-only).
Phase Class	The phase class name from which this phase was created (view-only). The icon associated with the phase class displays next to the Name and Phase Class .
Container and Storage Location Associations	<p>A list of containers and storage locations to which this phase connects. The two columns in the right pane indicate whether the container is a source or a destination for material. Icons are used to represent a material source (container with a plus sign), and a material destination (container with a minus sign).</p> <p>The left pane is a hierarchical display of the set of containers and storage locations currently configured in the material database. The hierarchy has two roots:</p> <ul style="list-style-type: none"> • Containers: Displays all the containers within the material database not associated with a storage location. Containers within storage locations are not displayed because the phase makes an association only with independent containers or storage locations, never with containers within storage locations. • Storage Locations: Displays a list of all the storage locations configured within the Material Editor.
Add	Add a selected container or storage location to the Container/Storage Location column.
Remove	Remove the selected container or storage location from the Container/Storage Location column.

See also

[Configure container data](#) on [page 171](#)

Parameter limit tags

If enabled, **Parameter/Tag Locking** enables FactoryTalk Batch Equipment Editor to determine and build the tags required for downloading all the parameter limits and verification configuration details to the phase logic. If **Parameter/Tag Locking** is disabled, have all the limits information downloaded to the parameters chosen by selecting the appropriate set of parameter limit tags for those parameters. The **Parameter Limit Tags** tab is not displayed for instruction-based phases.

See also

[Enable parameter limit tags](#) on [page 173](#)

[Edit Phase dialog box - Parameter Limit Tags tab](#) on [page 173](#)

[Map parameter tags to parameter limit tags](#) on [page 174](#)

Enable parameter limit tags

Use the **Edit Phase** dialog box **Parameter Limit Tags** tab to enable parameter limit tags. The **Parameter/Tag Locking** option must be enabled in the **Edit Phase** dialog box **General** tab.

When parameter limit tags are enabled, the required verification limit tags for the parameters that have signature verification policies defined are created.

To enable parameter limit tags:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box, select the **Parameter Limit Tags** tab.
3. Select the **Enable Limit Tags** check box.

The limit tags required for all parameters with signature verification policies in this phase are automatically created and displayed in the **Limit Tags** area.

4. Select **OK** to close the **Edit Phase** dialog box or **Apply** to keep the dialog box open.

See also

[Edit Phase dialog box - Parameter Limit Tags tab](#) on [page 173](#)

Edit Phase dialog box - Parameter Limit Tags tab

Automatically create and maintain the necessary phase parameter tags for the parameters defined in the phase class.

If the **Parameter/Tag Locking** option is enabled on the phase class from which the phase was created, the system automatically creates the required verification limit tags for the parameters that have signature verification policies defined.

The **Parameter Limit Tags** tab contains:

Name	Purpose
------	---------

Name	Purpose
Name	Name of the phase.
Phase Class	Name of the phase class from which the phase was created.
Enable Limit Tags	Creates the necessary parameter limit tags for the verification policies configured on the phase class. This option is only available if the Parameter/Tag Locking option was selected in the Edit Phase Class dialog box General tab. If the Parameter/Tag Locking option was not selected, define the limit tag sets and map the parameter tags to the limit tags.
These areas are enabled only if Parameter/Tag Locking is disabled.	
Parameter Tag to Limit Tag Mapping area	
Parameter Tag	Displays the tag name for the user-defined parameter that was created in the phase class (view only). (See Phase tags for information on phase tag naming conventions.)
Type	Displays the data type for the parameter (view only).
Limit Tag Set	Creates the necessary set of verification limit tags for the parameter. Select the same verification method that is configured in the Edit Phase Class dialog box Parameters tab.
Limit Tags area	
Limit Tags scroll box	Lists the set of phase tag classes created for the selected Limit Tag Set .
Name	Displays the phase tag defined for the selected tag class (view only).
Type	Displays the phase tag data type. The area below the Type box describes the phase tag (view only).

See also

[Enable parameter limit tags](#) on [page 173](#)

Map parameter tags to parameter limit tags

Use the **Edit Phase** dialog box **Parameter Limit Tags** tab to map parameter tags to parameter limit tags, if **Parameter/Tag Locking** is not enabled on the phase class and parameter tags are created manually. These instructions only apply to OPC or FactoryTalk Linx FactoryTalk Live Data phases.

If the **Parameter/Tag Locking** option is disabled on the phase class, manually select the appropriate limit tag set for each parameter tag.

To map parameter tags to parameter limit tags:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box, select the **Parameter Limit Tags** tab.
3. Place the cursor in the **Limit Tag Set** box that is in the same row as the parameter to map.



Tip: Remember to update the **Number of Tags** boxes in the **Edit Phase Class** dialog box **General** tab before mapping parameter tags to limit tags. Even if parameters are added to the phase class and verification methods are configured for them, parameter tags do not display in the **Parameter Tag to Limit Tag Mapping** area if the number of tags entered on the phase class is too low.

4. From the **Limit Tag Set** list, select the option that matches the verification method defined for the parameter on the phase class.



Tip: If the phase class on which the phase is based uses control strategies, select the verification method of the control strategy that has the largest number of limits. For example, if a phase class has two control strategies, and Strategy 1 has a verification method of H/L, and Strategy 2 has a verification method of HHH/LLL, choose the HHH/LLL limit tag set.

All limit tags required for the selected **Limit Tag Set** are created and displayed in the **Limit Tags** area.

5. Repeat steps 2 and 3 for each parameter that has a verification policy with parameter verification limits specified.
6. Select **OK** to close the **Edit Phase** dialog box or **Apply** to keep the dialog box open.

See also

[Parameter limit tags](#) on [page 173](#)

[Edit Phase dialog box - Parameter Limit Tags tab](#) on [page 173](#)

Report limit tags

If **Parameter/Tag Locking** is enabled, it allows FactoryTalk Batch Equipment Editor to determine and build the tags required for downloading the report limits and verification configuration details to the phase logic. If **Parameter/Tag Locking** is disabled, have all the limits information downloaded to the reports chosen by selecting the appropriate set of report limit tags for those parameters. The **Report Limit Tags** tab is not displayed for instruction-based phases.

See also

[Edit Phase dialog box - Report Limit Tags tab](#) on [page 175](#)

Edit Phase dialog box - Report Limit Tags tab

When the **Enable Limit Tags** check box is enabled, the necessary phase parameter and report tags are created and maintained for the parameters and reports defined in the phase.

The **Report Limit Tags** tab contains:

Name	Purpose
Name	Name of the phase.
Phase Class	Name of the phase class from which the phase was created.
Enable Limit Tags	Creates the necessary parameter limit tags for the verification policies configured on the phase class. This option is only available if the Parameter/Tag Locking option was selected in the Edit Phase Class dialog box General tab. If the Parameter/Tag Locking option was not selected, define the limit tag sets and map the parameter tags to the limit tags.
These areas are enabled only if Parameter/Tag Locking is disabled.	
Report Tag to Limit Tag Mapping area	
Report Tag	Displays the tag name for the user-defined report that was created in the phase class (view only). (See Configure a phase tag for information on phase tag naming conventions.)
Type	Displays the report data type (view only).
Limit Tag Set	Creates the necessary set of verification limit tags for the report. Select the same verification method configured in the Edit Phase Class dialog box Reports tab.
Limit Tags area	

Limit Tags scroll box	Lists the set of phase tag classes created for the selected Limit Tag Set .
Name	Displays the phase tag defined for the selected tag class (view only).
Type	Displays the phase tag data type. The area below the Type box describes the phase tag (view only).

See also

[Report limit tags](#) on [page 175](#)

[Configure a phase tag](#) on [page 167](#)

Enable report limit tags

Use the **Edit Phase** dialog box **Report Limit Tags** tab to enable limit tags. The **Parameter/Tag Locking** option must be enabled on the **Edit Phase** dialog box **General** tab to enable limit tags.

When the **Enable Limit Tags** check box is enabled, the necessary phase parameter and report tags are created and maintained for the parameters and reports defined in the phase.

To enable report limit tags:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box, select the **Report Limit Tags** tab.
3. Select the **Enable Limit Tags** check box.

The limit tags required for all reports with signature verification policies in this phase are automatically created and displayed in the **Limit Tags** area.

4. Select **OK** to close the **Edit Phase** dialog box or **Apply** to keep the dialog box open.

See also

[Map report tags to report limit tags](#) on [page 176](#)

[Edit Phase dialog box - Report Limit Tags tab](#) on [page 175](#)

Map report tags to report limit tags

If **Parameter/Tag Locking** is disabled and parameter tags are created manually, follow this procedure to create parameter limit tags. These instructions only apply to OPC or FactoryTalk Linx FactoryTalk Live Data phases.

If **Parameter/Tag Locking** is disabled, manually select the appropriate **Limit Tag Set** for each **Report** tag.

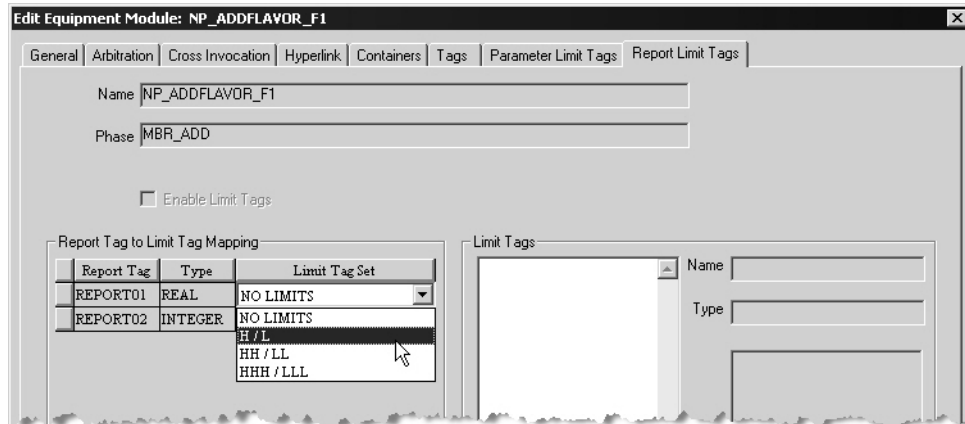
To map report tags to report limit tags:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. In the **Edit Phase** dialog box, select **Report Limit Tags** tab.
3. Place the cursor in the **Limit Tag Set** box that is in the same row as the parameter that to map.



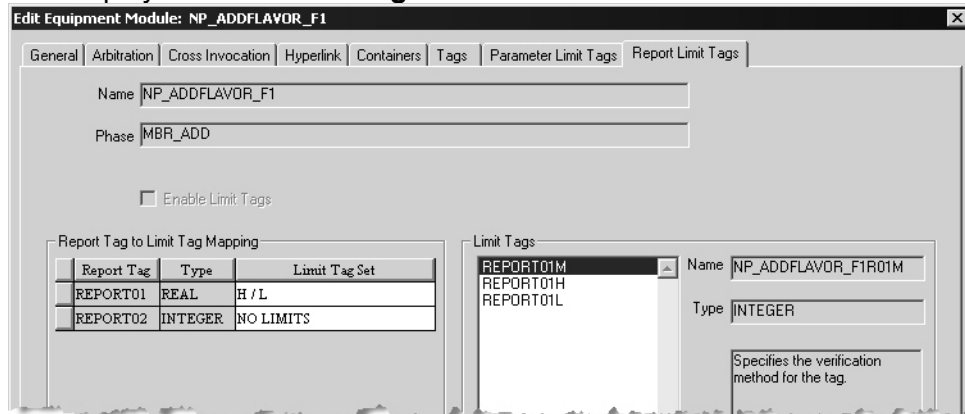
Tip: Remember to update the **Number of Tags** boxes in the **Edit Phase** dialog box **General** tab before mapping report tags to limit tags. Even if reports to the phase and configured verification methods for them are added, report tags do not display in the **Report Tag to Limit Tag mapping** area if the number of tags entered on the phase is too low.

- From the **Limit Tag Set** list, select the option that matches the verification method defined for the report on the phase class.



Tip: If the phase class on which the phase is based uses control strategies, select the verification method of the control strategy that has the largest number of limits. For example, if a phase class has two control strategies, and Strategy 1 has a verification method of H/L, and Strategy 2 has a verification method of HHH/LLL, choose the HHH/LLL limit tag set.

All limit tags required for the selected **Limit Tag Set** are created and displayed in the **Limit Tags** area.



- Select **OK** to close the **Edit Phase** dialog box or **Apply** to keep the dialog box open.

See also

[Enable report limit tags](#) on [page 176](#)

Configure parameter and report limit tags

After enabling or mapping the parameter and report limit tags, configure the Access Path and Item Name for each limit tag. These are configured in the same **Edit Phase Tag** dialog box where other phase tags are configured.



Tip: The data server cannot be changed for limit tags. The data server for a limit tag must be the same as the data server for the parameter or mapped report tag. When changing the data server for a parameter or report, the data server for its corresponding limit tags automatically changes to match.

Parameters, reports, and phase classes edits and limit tags

See also

[Phase tags](#) on [page 129](#)

After limit tags are enabled or mapped, if the verification method of the parameter or report changed, the limit tags are automatically adjusted to match the new verification method. New tags are automatically created or deleted. There is no need to alter the number of limit tags that exist.

IMPORTANT After limit tags are enabled or mapped, if the data server changed for the phase to the instruction server, all limit tags are automatically deleted. Limit tags are not needed for instruction-based phases.

If the **Parameter/Tag Locking** option is enabled:

- When the phase class contains control strategies, the number of limit tags for the parameter is the largest limit set for any of the control strategies to which the parameter is assigned. When a control strategy is deleted, the system automatically recalculates the limit tag set required for each parameter and adjusts the number of limit tags accordingly. If the control strategy that defined the largest set of limits for the parameter is deleted, the number of limit tags are automatically decreased.
- If **Parameter/Tag Locking** was enabled when limit tags were created for the phase, and then **Parameter/Tag Locking** is disabled, the existing tags are preserved and not modified.
- If a parameter or report is deleted, the corresponding set of limit tags are automatically deleted. The parameter tag to limit tag set is maintained for the other remaining parameters or reports, and the item names assigned to each tag remain the same.

IMPORTANT If **Parameter/Tag Locking** is not enabled and a parameter or report is deleted from the phase class and the number of tags in the **Edit Phase** dialog box **General** tab is decreased, re-map the remaining parameter tags to limit tag sets. The parameter tag names and limit tag associations are shifted; they are not maintained.

See also

[Configure parameter and report limit tags](#) on [page 177](#)

Sharing phases and operation sequences between units

When a single phase or operation sequence is required by more than one unit, it must be shared by all units that require it. Do not create a new instance of the same phase or operation sequence in the other unit(s). Prior to sharing a phase or operation sequence, verify the phase or operation sequence is physically able to be shared.



Tip: Phases cannot be shared between batch servers.

A phase or operation sequence may have only one owner at a time. Sharing a single phase or operation sequence allows any shared unit to gain ownership of it during batch execution. A phase or operation sequence cannot be owned by more than one unit at the same time.

When a phase or operation sequence is shared, any changes made to it are reflected in each unit that contains the shared phase or operation sequence, including its physical placement in the **Design View** area. When an instance of a shared phase or operation sequence is deleted

from one unit, the phase or operation sequence is removed from the selected unit but it is still present in any other units to which it belongs.

See also

[Share a phase or operation sequence](#) on [page 179](#)

Share a phase or operation sequence

Use these instructions to share a phase or operation sequence.

To share a phase or operation sequence:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the area model.
3. Navigate to the phase or operation sequence level of the unit in the area model that does not contain the phase or operation sequence to be shared.
4. Select **Share**.

The **Share Phases and Operation Sequences Between Units** dialog box displays. Navigate to the phases and operation sequences by selecting the plus (+) sign next to the unit names.

5. Select the phase or operation sequence to share with the current unit, then select **OK**.

The icon of the selected phase or operation sequence displays in the **Design View** area. A small hand is at the bottom left corner, in both the active unit and the unit in which the phase or operation sequence was originally defined.

See also

[Overview of sharing phases and operation sequences between units](#) on [page 178](#)

Operation sequence class configuration

Within the area model, an operation sequence class is a definition from which instances of that sequence program are added to a unit.

When configuring an operation sequence class, you specify the name and a type description of the operation sequence class. You can also configure parameters and reports for an operation sequence class.

See also

[Create an operation sequence class](#) on [page 181](#)

[Edit an operation sequence class](#) on [page 182](#)

[Edit Operation Sequence Class dialog box - General tab](#) on [page 182](#)



[Edit Operation Sequence Class dialog box - Parameters tab](#) on [page 183](#)

[Edit Operation Sequence Class dialog box - Reports tab](#) on [page 185](#)

Create an operation sequence class

Use these instructions to create an operation sequence class.

To create an operation sequence class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. Select **Add New Object** () and then select **New Operation Sequence Class**.
4. In the **Create Operation Sequence Class** dialog box, use the tabs to create the operation sequence class:
 - **General**
 - **Parameters**
 - **Reports**
5. Select **OK**.

See also


[Operation sequence class configuration](#) on [page 181](#)

[Edit an operation sequence class](#) on [page 182](#)

Edit an operation sequence class

Editing an operation sequence class updates all instances of that class, in all units containing that class. Use these instructions to edit operation sequence classes.

To edit an operation sequence class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. In the **Class View** area, right-click the operation sequence to open the **Edit Operation Sequence Class** dialog box.
4. In the **Edit Operation Sequence Class** dialog box, use the tabs to create the operation sequence class:
 - **General**
 - **Parameters**
 - **Reports**
5. Select **OK**.

See also

[Operation sequence class configuration](#) on [page 181](#)

[Create an operation sequence class](#) on [page 181](#)

[Configure general attributes for an operation sequence class](#) on [page 183](#)

[Configure parameters for an operation sequence class](#) on [page 184](#)

[Configure reports for an operation sequence class](#) on [page 186](#)

Edit Operation Sequence Class dialog box - General tab

The **Edit Operation Sequence Class** dialog box - **General** tab configures the name and type for an operation sequence class.

The **General** tab contains:

Name	Purpose
Name	The name of the operation sequence class.
Icon	Displays all of the icons available for selection to represent the operation sequence class. Scroll through the icons using the scroll bar or the up and down arrows in the vertical scroll bar.
Type	The type of operation sequence.
Default Controller Program Name	The name of the operation sequence in the controller program that will be used when an instance of the class is created. If blank, the name of the operation sequence class is used.
Parameter/Tag Locking	The number of parameters and reports on the operation sequence class are always equal to the number of parameter tags and report tags on the associated operation classes. This setting cannot be disabled for an operation sequence.
Number of Parameter tags	The number of memory registers within the operation sequence to which FactoryTalk Batch can write parameter information. Generally equivalent to the number of parameters defined for the operation sequence class.

Number of Report tags	The number of memory registers within the operation sequence from which FactoryTalk Batch can read report tag information. Generally equivalent to the number of reports defined for the operation sequence class.
-----------------------	--

See also


[Configure general attributes for an operation sequence class](#) on [page 183](#)


[Operation sequence class configuration](#) on [page 181](#)

Configure operation sequence class general attributes

Use the **Edit Operation Sequence Class** dialog box **General** tab to configure the operation sequence class general attributes.

To configure general attributes for an operation sequence class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. In the **Class View** area, right-click the operation sequence to open the **Edit Operation Sequence Class** dialog box. Select the **General** tab.
4. Type an appropriate operation sequence class name, operation sequence class type, and default controller program name.



 Tip: Use names that are easy to understand. Names display to the operator during batch execution.
5. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.

The selected icon displays in the **Class View** area.

See also


[Operation sequence class configuration](#) on [page 181](#)

[Edit Operation Sequence Class dialog box - General tab](#) on [page 182](#)

Edit Operation Sequence Class dialog box - Parameters tab

00The **Edit Operation Sequence Class** dialog box - **Parameters** tab configures parameters for operation sequence classes.

The **Parameters** tab contains:

Name	Purpose
Name	A unique name for the operation sequence class parameter.  Tip: The parameter name must match the name of the sequencing input parameter belonging to the equipment sequence in the controller.
ID	A unique identifier that is assigned when a parameter is created.
Type	A list of parameter types, including: <ul style="list-style-type: none"> • Real • Integer • String • Enumeration

Max	The maximum value for an Integer or Real parameter.
Min	The minimum value for an Integer or Real parameter.
Default	Add a default value. <ul style="list-style-type: none"> For an Integer or Real parameter, the default is a number between the Max and Min values. For an Enum, the default can be selected from values previously set up in the Recipe Editor.
Enum/E.U.	Holds the enumeration set name if the type is enumeration or the engineering units if any other type.
Scale	For Real and Integer values, select whether or not Scaling is applied.
Reporting Contexts	A list of report types. The default is Null.

See also

[Configure parameters for an operation sequence class](#) on [page 184](#)

[Operation sequence class configuration](#) on [page 181](#)


Configure parameters for an operation sequence class

Use the **Create Operation Sequence Class** dialog box **Parameters** tab to configure operation sequence class parameters.



Tip: Use the keyboard to move around in the grid. Press the **Tab** key to move focus to the grid. Press **Ctrl+Alt+Home** to highlight the first editable cell in the grid.

To configure parameters for an operation sequence class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. In the **Class View** area, right-click the operation sequence to open the **Edit Operation Sequence Class** dialog box.
4. Select the **Parameters** tab. A list of parameters associated with the operation sequence class displays.
5. Select **Add Parameter** to add a new operation sequence class parameter. A new parameter displays with default values.
6. In **Name**, type a unique name for the operation sequence class parameter.

IMPORTANT The parameter name must match the name of the sequencing input parameter belonging to the equipment sequence in the controller.

7. From the **Type** list, select the appropriate parameter type. The parameter type is equivalent to the sequencing input parameter type belonging to the equipment sequence in the controller. See **Create Operation Sequence Class dialog box - Parameters tab** for sequencing input parameter type information.
 - If the **Type** is **Real** or **Integer**, add the **Max** value, **Min** value, and **Default** value, and then optionally type the engineering units in the **Enum/E.U.** box.
 - If the **Type** is **Enumeration**, choose the appropriate enumeration set from the **Enum/E.U.** list and select the appropriate default enumeration from the **Default** list.

- If the **Type** is **String**, type the engineering units in the **Enum/E.U.** box and the default string in the **Default** box.
8. If the parameter must scale within a recipe when a batch scales, select the **Scale** check box. (See **Scale parameters** for more information.)
 9. To assign a context or descriptor to the recipe operation sequence class parameter, select one or more **Context IDs** from the **Reporting Contexts** column.
 10. To delete a parameter, do the following:
 - Select the parameter row header, then select **Delete Parameter**.
 - Select **Yes** to confirm the deletion.
 11. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.
The selected icon displays in the **Class View** area.

See also


[Operation sequence class configuration](#) on [page 181](#)

[Edit Operation Sequence Class dialog box - Parameters tab](#) on [page 183](#)

Edit Operation Sequence Class dialog box - Reports tab

The **Edit Operation Sequence Class** dialog box - **Reports** tab configures reports for operation sequence classes.

The **Reports** tab contains:

Name	Purpose
Name	A unique name for the operation sequence class parameter.  Tip: The parameter name must match the name of the sequencing output parameter belonging to the operation sequence class report parameter in the controller.
ID	A unique identifier that is assigned when a parameter is created.
Type	A list of parameter types, including: <ul style="list-style-type: none"> • Real • Integer • String • Enumeration
Enum/E.U.	The engineering units.
Reporting Contexts	A list of report types. The default is Null.

See also


[Configure reports for an operation sequence class](#) on [page 186](#)

[Operation sequence class configuration](#) on [page 181](#)

Configure reports for an operation sequence class

Use the **Create Operation Sequence Class** dialog box **Reports** tab to configure operation sequence class reports. An operation sequence class report is defined for the operation sequence class, while the corresponding report tag is automatically built for the operation sequence instance.

To configure operation sequence class reports:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. In the **Class View** area, right-click the operation sequence to open the **Edit Operation Sequence Class** dialog box.
4. Select the **Reports** tab. A list of operation sequence reports associated with the operation sequence displays.



Tip: Use the keyboard to move around in the grid. Press the **Tab** key to move the focus in the grid. Press **Control+Alt+Home** to highlight the first editable cell in the grid.

5. Select **Add Report** to add a new operation sequence report.

A new report displays with default values.

- In **Name**, type a unique name for the report parameter.

IMPORTANT The report name must match the name of the sequencing output parameters belonging to the equipment sequence in the controller.

- From the **Type** list, select the appropriate parameter type. The report type is equivalent to the sequencing output parameter type belonging to the equipment sequence in the controller. See **Create Operation Sequence Class dialog box - Reports tab** for sequencing output parameter type information.
 - If **Type** is REAL, STRING, or INTEGER, type the engineering units in the **Enum/E.U.** box.
 - If **Type** is ENUM, select the appropriate enumeration set from the **Enum/E.U.** box.
 - To assign a context or descriptor to the report parameter, from the **Reporting Contexts** column, select one or more **Context IDs**.
6. To delete a report, do the following:
 - Select the report row header, and then select **Delete Report**.
 - Select **Yes** to confirm the deletion.
 7. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.

The selected icon displays in the **Class View** area.

See also

[Operation sequence class configuration](#) on [page 181](#)

[Edit Operation Sequence Class dialog box - Reports tab](#) on [page 185](#)

Operation sequence configuration

An operation sequence is an instance of a specific operation sequence class. Only one instance of a specific operation sequence can be added to each unit. Once an operation sequence instance is added to a unit instance, the operation sequence must be configured.



Tip: It is not necessary to configure tag data, as SequenceManager Equipment Operation Sequences are assigned to a Logix5000 CIP data server.

When an operation sequence is selected in the **Design View**, the operation sequence class on which it is based is highlighted. If the operation sequence class on which operation sequences are based is modified, the operation sequences are automatically updated. Operation sequences created prior to modifying the operation sequence class are also updated.

See also


[Configure the general data for an operation sequence](#) on [page 190](#)

[Configure the arbitration data for an operation sequence](#) on [page 191](#)

Create an operation sequence

Use these instructions to create an operation sequence.

To create an operation sequence:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the area model.
3. Navigate to the operation sequence level of the area model (select **Go Down** () to the lowest level).
4. In the **Classes** area, select the operation sequence and place it in the **Design View** area where you want the instance to reside.
5. Use the **Edit Operation Sequence** dialog box to view and configure the properties in the **General**, **Arbitration**, and **Tags** tabs.



Tip: To allow FactoryTalk Batch to write to the sequence tag, in Studio 5000 Logix Designer, select the **Use current value of tag** radio button.

See also

[Configure the general data for an operation sequence](#) on [page 190](#)

[Configure the arbitration data for an operation sequence](#) on [page 191](#)

Edit Operation Sequence dialog box - General tab

The operation sequence general attributes include the operation sequence class name, equipment ID, and the current assigned data server.

The **Edit Operation Sequence** dialog box **General** tab contains:

Name	Purpose
Name	The name of the operation sequence.
Operation Class	The name of the operation sequence class from which this operation sequence was created (view-only).
Equipment ID	A unique number, greater than zero, that identifies this operation sequence. It must be the same equipment ID used in the phase logic to request this operation sequence.
Data Server	Displays the currently assigned server. When the list opens, configured servers are shown.
Controller Program Name	The name of the operation sequence in the controller program.
Automatically Download Parameters on Start	When a START command issues, the FactoryTalk Batch Server downloads the parameters configured with the Download on Start option on the operation sequence. If no parameters exist on the operation sequence, this option is dimmed.
Automatically Upload Reports on Stop Abort, and Complete	When the batch transitions to a terminal state (COMPLETE, STOPPED, or ABORTED) the FactoryTalk Batch Server uploads the report values configured with the Upload on Terminal State option on the operation sequence. If no reports exist on the operation sequence, this option is dimmed.

See also

[Configure the general data for an operation sequence](#) on [page 190](#)

Configure the general data for an operation sequence

Use these instructions to configure general data for an operation sequence, using the **Edit Operation Sequence** dialog box **General** tab.

To configure the general data for an operation sequence:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. With the **Edit Operation Sequence** dialog box open, select the **General** tab.
3. In **Name**, type the operation sequence name.
4. In **Equipment ID**, enter the equipment ID, or accept the default value.
5. In **Data Server**, confirm that the correct data server is shown. If it does not, select the list to locate the appropriate server.
6. In **Controller Program Name**, type the controller program name.
7. Select **Apply** to save changes, or select **OK** to save changes and return to the Equipment Editor.

See also

[Edit Operation Sequence dialog box - General tab](#) on [page 190](#)

Edit Operation Sequence dialog box - Arbitration tab

The **Edit Operation Sequence** dialog box **Arbitration** tab configures resources the operation sequence instance must acquire to be run.

The **Arbitration** tab contains:

Name	Purpose
Name	The name of the operation sequence (view-only).
Operation Class	The name of the operation sequence class from which this operation sequence was created (view-only).
Equipment Allocation by Resource	<p>A list of the equipment for which ownership is required by this operation sequence in order for any procedural element linked to the operation sequence to begin execution.</p> <p>The left pane is a hierarchical display showing the current equipment configuration of the area model. The hierarchy has two roots:</p> <ul style="list-style-type: none"> • Process Cells: Displays all the process cells within the area model. From here, organization is hierarchical: process cells contain units and units contain phases and operations sequences. • Resources: Displays a list of all the configured resources within the area model. <p>The right pane is the list of equipment this operation sequence is dependent upon. Any equipment in this list must be acquired by the operation sequence before the operation sequence can begin execution.</p>
Add	Add the selected equipment requirement.
Remove	Remove the selected equipment requirement.

See also

[Configure the arbitration data for an operation sequence](#) on [page 191](#)

Configure the arbitration data for an operation sequence

Use the **Edit Operation Sequence** dialog box **Arbitration** tab to configure arbitration data for an operation sequence.

To configure the arbitration data for an operation sequence:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. With the **Edit Operation Sequence** dialog box open, select the **Arbitration** tab.
3. Browse the area model's equipment hierarchy to specify the equipment acquired by the operation sequence. The equipment hierarchy can be navigated by opening equipment to view the contained resources.
 - To add equipment, under the **Equipment Allocation by Resource** area, select the equipment needed by the operation sequence and select **Add**. The selected equipment displays in the right pane.
 - To remove equipment, in the right pane, select the equipment to delete and select **Remove**. The selected equipment is removed from the list.
4. Select **Apply** to save changes.


Edit Operation Sequence dialog box - Tags tab

See also

[Edit Operation Sequence dialog box - Arbitration tab](#) on [page 191](#)

The **Edit Operation Sequence** dialog box **Tags** tab displays the configuration of CIP communication data for the operation sequence.

The **Tags** tab contains:

Name	Purpose
Name	The name of the operation sequence (view-only).
Operation Class	The name of the operation sequence class from which this operation sequence was created (view-only).
Operation sequence tags	A list of all the tags that are defined for the operation sequence (view-only). The tags shown are configured in the Operation Sequence Class dialog box in the Reports tab and Parameters tab.
Name	The name of the highlighted tag (view-only).
Usage	The type of parameter (view-only), either Input or Output .
Type	The operation sequence tag data type (view only).  Tip: Parameters and reports that use the ENUM type are shown as the INTEGER type for the Logix5000 controller.

See also

[Configure reports for an operation sequence class](#) on [page 186](#)

[Configure parameters for an operation sequence class](#) on [page 184](#)


Configure parameters for an operation sequence class

Use the **Create Operation Sequence Class** dialog box **Parameters** tab to configure operation sequence class parameters.



Tip: Use the keyboard to move around in the grid. Press the **Tab** key to move focus to the grid. Press **Ctrl+Alt+Home** to highlight the first editable cell in the grid.

To configure parameters for an operation sequence class:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. In the **Class View** area, right-click the operation sequence to open the **Edit Operation Sequence Class** dialog box.
4. Select the **Parameters** tab. A list of parameters associated with the operation sequence class displays.
5. Select **Add Parameter** to add a new operation sequence class parameter. A new parameter displays with default values.
6. In **Name**, type a unique name for the operation sequence class parameter.

IMPORTANT The parameter name must match the name of the sequencing input parameter belonging to the equipment sequence in the controller.

7. From the **Type** list, select the appropriate parameter type. The parameter type is equivalent to the sequencing input parameter type belonging to the equipment sequence in the controller. See

Create Operation Sequence Class dialog box - Parameters tab for sequencing input parameter type information.

- If the **Type** is **Real** or **Integer**, add the **Max** value, **Min** value, and **Default** value, and then optionally type the engineering units in the **Enum/E.U.** box.
 - If the **Type** is **Enumeration**, choose the appropriate enumeration set from the **Enum/E.U.** list and select the appropriate default enumeration from the **Default** list.
 - If the **Type** is **String**, type the engineering units in the **Enum/E.U.** box and the default string in the **Default** box.
8. If the parameter must scale within a recipe when a batch scales, select the **Scale** check box. (See **Scale parameters** for more information.)
 9. To assign a context or descriptor to the recipe operation sequence class parameter, select one or more **Context IDs** from the **Reporting Contexts** column.
 10. To delete a parameter, do the following:
 - Select the parameter row header, then select **Delete Parameter**.
 - Select **Yes** to confirm the deletion.
 11. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.
The selected icon displays in the **Class View** area.

See also


[Operation sequence class configuration](#) on [page 181](#)

[Edit Operation Sequence Class dialog box - Parameters tab](#) on [page 183](#)

Configure reports for an operation sequence class

Use the **Create Operation Sequence Class** dialog box **Reports** tab to configure operation sequence class reports. An operation sequence class report is defined for the operation sequence class, while the corresponding report tag is automatically built for the operation sequence instance.

To configure operation sequence class reports:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Select a unit icon and then select **Go Down** (). The **Design View** area may display the **Unit** icon, and **Classes** displays as the column header in the **Class View** area.
3. In the **Class View** area, right-click the operation sequence to open the **Edit Operation Sequence Class** dialog box.
4. Select the **Reports** tab. A list of operation sequence reports associated with the operation sequence displays.



Tip: Use the keyboard to move around in the grid. Press the **Tab** key to move the focus in the grid. Press **Control+Alt+Home** to highlight the first editable cell in the grid.

5. Select **Add Report** to add a new operation sequence report.
A new report displays with default values.

- In **Name**, type a unique name for the report parameter.

IMPORTANT The report name must match the name of the sequencing output parameters belonging to the equipment sequence in the controller.

 - From the **Type** list, select the appropriate parameter type. The report type is equivalent to the sequencing output parameter type belonging to the equipment sequence in the controller. See **Create Operation Sequence Class dialog box - Reports tab** for sequencing output parameter type information.
 - If **Type** is REAL, STRING, or INTEGER, type the engineering units in the **Enum/E.U.** box.
 - If **Type** is ENUM, select the appropriate enumeration set from the **Enum/E.U.** box.
 - To assign a context or descriptor to the report parameter, from the **Reporting Contexts** column, select one or more **Context IDs**.
6. To delete a report, do the following:
- Select the report row header, and then select **Delete Report**.
 - Select **Yes** to confirm the deletion.
7. Select **Apply** to save changes, or select **OK** to save changes and return to the **Class View** area.
- The selected icon displays in the **Class View** area.

See also

[Operation sequence class configuration](#) on [page 181](#)

[Edit Operation Sequence Class dialog box - Reports tab](#) on [page 185](#)

Sharing phases and operation sequences between units

When a single phase or operation sequence is required by more than one unit, it must be shared by all units that require it. Do not create a new instance of the same phase or operation sequence in the other unit(s). Prior to sharing a phase or operation sequence, verify the phase or operation sequence is physically able to be shared.



Tip: Phases cannot be shared between batch servers.

A phase or operation sequence may have only one owner at a time. Sharing a single phase or operation sequence allows any shared unit to gain ownership of it during batch execution. A phase or operation sequence cannot be owned by more than one unit at the same time.

When a phase or operation sequence is shared, any changes made to it are reflected in each unit that contains the shared phase or operation sequence, including its physical placement in the **Design View** area. When an instance of a shared phase or operation sequence is deleted from one unit, the phase or operation sequence is removed from the selected unit but it is still present in any other units to which it belongs.

See also

[Share a phase or operation sequence](#) on [page 179](#)

Share a phase or operation sequence

Use these instructions to share a phase or operation sequence.

To share a phase or operation sequence:

1. Select **Start > Rockwell Software > Equipment Editor**.
2. Open the area model.
3. Navigate to the phase or operation sequence level of the unit in the area model that does not contain the phase or operation sequence to be shared.
4. Select **Share**.

The **Share Phases and Operation Sequences Between Units** dialog box displays. Navigate to the phases and operation sequences by selecting the plus (+) sign next to the unit names.

5. Select the phase or operation sequence to share with the current unit, then select **OK**.

The icon of the selected phase or operation sequence displays in the **Design View** area. A small hand is at the bottom left corner, in both the active unit and the unit in which the phase or operation sequence was originally defined.

See also

[Overview of sharing phases and operation sequences between units](#) on [page 178](#)

Supported area model changes for Warm and Warm-All restart

This section lists properties of an area model that can be edited without affecting a Warm or Warm-All restart of the FactoryTalk Batch Server.

IMPORTANT If an option or parameter is not listed in this section, it is not considered safe to modify (create, edit, or delete) that object in order to ensure a successful Warm or Warm-All restart of the FactoryTalk Batch Server.

See also

[Area model object warm restart support](#) on [page 197](#)

[Resource classes warm restart support](#) on [page 197](#)

[Resources warm restart support](#) on [page 198](#)

[Unit attributes warm restart support](#) on [page 198](#)

[Unit attribute tags warm restart support](#) on [page 198](#)

Area model object warm restart support

A FactoryTalk Batch area model configuration file (.CFG file) always contains a single area object by definition.

To edit, select **Edit > Area**.

Area Model Object	Warm Restart Supported
Version	Yes

See also

[Supported area model changes for Warm and Warm-All restart](#) on [page 197](#)

Resource classes warm restart support

Select **Edit > Resources** to created or edited resource classes.

Warm restart support for adding resource classes within an area model setting:

Resource Class Action	Warm Restart Support
Create new resource class	Yes

Warm restart support for modifying resource class properties setting:

Resource Class Property	Warm Restart Support
Resource class name	Yes

See also

[Supported area model changes for Warm and Warm-All restart](#) on page 197

Resources warm restart support

Select **Edit > Resources** to create and edit resources.

Warm restart support for adding resources defined within an area model:

Resource Action	Warm Restart Support
Creation	Yes

Warm restart support for modifying resource properties:

Resource Property	Warm Restart Support
Name	Yes
Max Owners	The value of this property can be increased without affecting warm restart functionality.
Dependent Resources	Resources can be removed from a resource's list of dependent resources without affecting warm restart functionality.
Cross Invocation Labels	Yes
Hyperlink Labels	Yes

See also

[Supported area model changes for Warm and Warm-All restart](#) on page 197

Unit attributes warm restart support

Select **Edit > Tags** to create and edit unit attributes.

Warm restart support for adding unit attributes defined within an area model:

Unit Attribute Action	Warm Restart Support
Create tag classes	Yes

Existing warm restart support for modifying unit attribute properties:

Unit Attribute Property	Warm Restart Support
Engineering Unit	Yes
Description	Yes

See also

[Supported area model changes for Warm and Warm-All restart](#) on page 197

Unit attribute tags warm restart support

Create, delete, and edit unit attribute tags using the properties dialog of a unit object.

Warm restart support for editing unit attribute tags within an area model:

Unit Attribute Tag Action	Warm Restart Support
Creation	Yes

Warm restart support for modifying the properties of a unit attribute tag:

Unit Attribute Tag Property	Warm Restart Support
-----------------------------	----------------------

Engineering Unit	Yes
Data Source	Yes
Access Path	Yes
Item Name	Yes
Write Access Path	Yes
Write Item Name	Yes
Server	Yes

See also

[Units warm restart support](#) on [page 201](#)

[Unit overview](#) on [page 113](#)

Equipment phase tags warm restart support

Equipment phase tags for phases associated with OPC or FactoryTalk LiveData protocol data servers are automatically created by FactoryTalk Batch Recipe Editor when equipment phases are created.

Warm restart support for modifying the properties of an equipment phase tag:

Unit Attribute Tag Property	Warm Restart Support
Access Path	Yes
Item Name	Yes
Write Access Path	Yes
Write Item Name	Yes

See also

[Supported area model changes for Warm and Warm-All restart](#) on [page 197](#)

Enumeration sets warm restart support

Select **Edit > Enumeration Sets** to create and edit enumeration sets.

Warm restart support for adding enumeration sets defined within an area model.

- **Enumeration Set Action:** Creation
- **Warm Restart Support:** Yes

See also

[Supported area model changes for Warm and Warm-All restart](#) on [page 197](#)

Data servers warm restart support

Select **Edit > Server** to create and edit data servers.

Warm restart functionality for adding data servers to an area model:

Server Action	Warm Restart Support
Creation	Yes

Warm restart support for modifying data server properties:

Server Property	Warm Restart Support
-----------------	----------------------

Server Property	Warm Restart Support
Data Server Type	Yes
Watchdog Protocol	Yes
Watchdog Item Access Path	Yes
Watchdog Item Name	Yes
Watchdog Write Item Access Path	Yes
Watchdog Write Item Name	Yes
Server Location	Yes
On Control Scan Rate	Yes
Off Control Scan Rate	Yes

See also

[Supported area model changes for Warm and Warm-All restart on page 197](#)

Process cell classes warm restart support

Process cell classes are created within the main window of FactoryTalk Batch Equipment Editor. Properties of a process cell class can be edited by right-clicking on the icon that represents a process cell class.

Warm restart support for adding process cell classes.

Process Cell Class Action	Warm Restart Support
Creation	Yes

Warm restart support for modifying the properties of a process cell class:

Process Cell Class Property	Warm Restart Support
Name	Yes
Icon	Yes

See also

[Supported area model changes for Warm and Warm-All restart on page 197](#)

Process cells warm restart support

Process cells are created and deleted using the main window of FactoryTalk Batch Equipment Editor. Properties of a process cell can be edited by right-clicking on the icon that represents a process cell.

Warm restart support for adding process cells:

Process Cell Action	Warm Restart Support
Creation	Process cells can be added to an area model.

This table describes warm restart support for modifying the properties of a process cell:

Process Cell Property	Warm Restart Support
ERP Alias	Yes
Max Owners	The value of this property can be increased without affecting warm restart functionality.
Dependent Resources	Resources can be removed from a process cell's list of dependent resources without affecting warm restart functionality.
Cross Invocation Labels	Yes

Hyperlink Labels	Yes
------------------	-----

See also

[Area models](#) on [page 23](#)

[Process cell overview](#) on [page 105](#)

Unit classes warm restart support

Unit classes are created within the main window of FactoryTalk Batch Equipment Editor. Properties of a unit class can be edited by right-clicking on the icon that represents a unit class.

Warm restart support for adding unit classes:

Unit Class Action	Warm Restart Support
Creation	Unit classes can be added to an area model.

This table describes warm restart support for modifying the properties of a unit class:

Unit Class Property	Warm Restart Support
Icon	Yes
Assigned Unit Attributes	Unit attributes can be added to the assigned set of the unit class.

See also

[Supported area model changes for Warm and Warm-All restart](#) on [page 197](#)

Units warm restart support

Create units within the main window of FactoryTalk Batch Equipment Editor. Right-click the icon representing a unit to edit the unit properties.

Warm restart support for adding units:

Unit Action	Warm Restart Support
Creation	Yes

This table describes warm restart support for modifying unit properties:

Unit Property	Warm Restart Support
ERP Alias	Yes
Unit Attribute Tags	(See Unit attribute tags for information on which properties can be modified.)
Dependent Resources	Removing resources from the units list of dependent resources can be done without affecting warm restart functionality.
Cross Invocation Labels	Yes
Hyperlink Labels	Yes

See also

[Unit attribute tags warm restart support](#) on [page 198](#)

[Unit overview](#) on [page 113](#)

Parameters warm restart support

Right-click on a Phase icon to create Parameters for a phase in the **Edit Phase** dialog box **Parameters** tab.

Warm restart support for adding parameters to a phase setting:

Parameter Action	Warm Restart Support
Creation	Parameters can be added to a recipe phase without affecting warm restart functionality, with the exception of material parameters.

IMPORTANT If the **Edit Phase** dialog box **General** tab **Material Based Recipes** option is selected, the optional material parameters, MATERIAL and AMOUNT, are added to the **Parameters** tab. The warm restart functionality does NOT support adding these material parameters. Adding these material parameters and then performing a warm restart causes running batches to be removed from the Batch List.

Warm restart support for modifying the properties of a parameter associated with a phase settings:

Parameter Property	Warm Restart Support
High	Raise the value of this property.
Low	Lower the value of this property without affecting warm restart functionality.
Default	Yes
Engineering Units	Yes

See also

[Added parameters warm restart support](#) on [page 202](#)

Added parameters warm restart support

Phase steps configured inside of a Unit Operation recipe hold configured values for each parameter in the phase class associated with the phase step. The values of these parameters can be:

- Actual value
- Operator Prompt
- Deferral to a higher level parameter

If the FactoryTalk Batch Server detects that a new parameter has been added to the recipe phase (during the restoration of batches to the batch list during a warm restart), then there is no value for the parameter that can be found in the loaded recipe structure.

When no value is found, the server sets the value on the parameter for the step to Operator Prompt.

See also

[Supported area model changes for Warm and Warm-All restart](#) on [page 197](#)

Report warm restart support

Right-click on a phase class icon to create phase reports in the **Edit Phase Class** dialog box **Reports** tab.

Warm restart support for adding reports to a phase class setting:

Report Action	Warm Restart Support
---------------	----------------------

Creation	Reports can be added to a phase class without affecting warm restart functionality, with the exception of material reports.
----------	---

IMPORTANT When the **Material Based Recipes** option is selected in the **Edit Phase** dialog box **General** tab, the optional material reports ACTUAL_AMOUNT and FEED_COMPLETE are added to the **Reports** tab. The warm restart functionality does **not** support adding these material reports. Adding these material reports and then performing a warm restart causes running batches to be removed from the batch list.

Warm restart support for modifying report properties associated with phase class settings:

Report Property	Warm Restart Support
Engineering Units	Yes
Verification Method	Yes
ERP Alias	Yes

See also

[Added reports warm restart support on page 203](#)

Added reports warm restart support

When a unit operation level recipe is loaded into the FactoryTalk Batch Server, the value of each report for each recipe phase step is set to **Bad Value** with the exception of Accumulator type reports which are set to a value of zero. As the phase logic uploads report values, the value is updated based on the actual value reported by the phase logic.

If the FactoryTalk Batch Server detects that a new report has been added to the recipe phase (while restoring batches to the batch list during a warm restart), then the report is treated as if it was never uploaded and assigned a current value of either **Bad Value** or zero.

See also

[Report warm restart support on page 202](#)

Configured messages warm restart support

Right-click on a recipe phase class icon to create phase class messages in the **Edit Phase Class** dialog box, **Messages** tab.

Existing warm restart support for adding configured messages to a phase class settings:

- **Message Action:** Creation
- **Warm Restart Support:** Messages can be added to a phase class without affecting warm restart functionality.

See also

[Supported area model changes for Warm and Warm-All restart on page 197](#)

Recipe phases warm restart support

Right-click on a Recipe Phase icon to create and delete Recipe phases. Warm restart support for the adding of recipe phases setting:

Recipe Phase Action	Warm Restart Support
Creation	Recipe Phases can be added to an area model without affecting warm restart functionality.

Warm restart support for modifying the properties of a recipe phase settings:

Recipe Phase Property	Warm Restart Support
Number of Parameter Tags	An increase in this value is safe for warm restart functionality.
Number of Report Tags	An increase in this value is safe for warm restart functionality.
Parameters	(See Parameters for information on which properties can be modified.)
Reports	(See Reports for information on which properties can be modified.)
Messages	(See Configured messages for information on which properties can be modified.)

See also

[Parameters warm restart support](#) on [page 202](#)

[Report warm restart support](#) on [page 202](#)

[Configured messages warm restart support](#) on [page 203](#)

Equipment phases warm restart support

From the main window in FactoryTalk Batch Equipment Editor, right-click on an equipment phase icon to create equipment phases.

Warm restart support for adding equipment phases setting:

Equipment Phase Action	Warm Restart Support
Creation	Equipment phases can be added to an area model without affecting warm restart functionality.

Warm restart support for modifying properties of an equipment phase settings:

Equipment Phase Property	Warm Restart Support
ERP Alias	This property can be changed without affecting warm restart functionality.
Automatic Download on Start	Yes
Automatic Upload on Complete	Yes
Automatic Upload on Stopped	Yes
Automatic Upload on Aborted	Yes
Server	Yes
Tags	(See Equipment phase tags for information on which properties can be modified.)
Dependent Resources	Removing resources from a list of dependent resources can be done without affecting warm restart functionality.
Cross Invocation Labels	Yes
Hyperlink Labels	Yes

See also

[Equipment phase tags warm restart support](#) on [page 199](#)

Troubleshoot issues

Issues that may occur include:

- Import/export area model errors
- COM-related exception errors
- Signature template errors

See also

[Unable to access instruction file](#) on [page 207](#)

[Illegal characters encountered in writing instruction file](#) on [page 207](#)

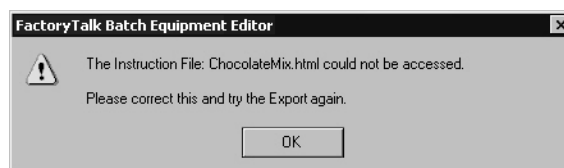
[Unable to access Material Server for material support per container](#) on [page 208](#)

[COM-related exception errors](#) on [page 208](#)

[Invalid signoff](#) on [page 210](#)

Unable to access instruction file

The XML schema requires that the contents of any instruction files must be included in the XML file. FactoryTalk Batch Equipment Editor must access the instruction file at the time of the export. If the instruction files cannot be accessed, this error message displays and the export does not occur.



See also

[Troubleshoot issues](#) on [page 207](#)

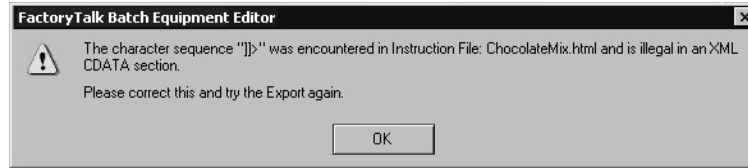
[Illegal characters encountered in writing instruction file](#) on [page 207](#)

[Unable to access Material Server for material support per container](#) on [page 208](#)

Illegal characters encountered in writing instruction file

Because the contents of instruction files are included (that is, putting them into a CDATA section), it is possible that the particular character sequence]]>, which is illegal in CDATA sections, might be encountered.

If this character sequence is encountered, this error message displays and the export does not occur.



See also

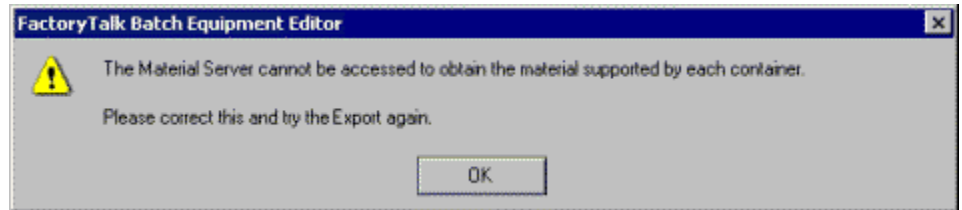
[Troubleshoot issues](#) on [page 207](#)

[Unable to access Material Server for material support per container](#) on [page 208](#)

Unable to access Material Server for material support

There is a requirement that material support per container must be included in the XML file. FactoryTalk Batch Equipment Editor must make a call to the Material Server at the time of the export. It is possible that the Material Server cannot be accessed at that time.

If the Material Server cannot be accessed, this error message displays and the export does not occur.



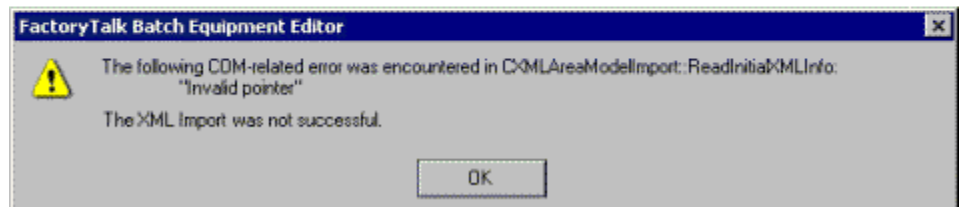
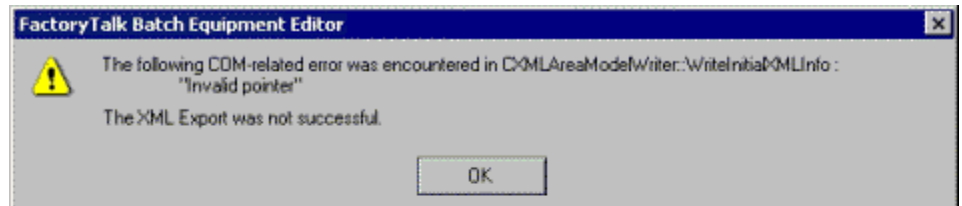
See also

[Troubleshoot issues](#) on [page 207](#)

COM-related exception errors

General COM-related system or program errors can occur for any number of reasons in processing the import or export request. A generic error handling displays the routine that encountered the error and the reason for the error as supplied by the originator (function) of the error.

If this occurs, an error message displays and the import or export does not occur. Examples include:



See also

[XML parser error messages](#) on [page 209](#)

[Material-specific errors](#) on [page 209](#)

XML parser error messages

The Microsoft XML parser returns different error messages for different error conditions. Examples of error conditions and error messages:

Error Condition	Error Message
Invalid Data	The element: <Element Name> has an invalid value according to its data type.
Invalid Element Content	The element content is invalid according to its Schema. Expecting: <Element Name>.
Undefined Key Reference	Undefined values for KeyRef identity constraint: <Reference Constraint Name>.
Uniqueness Violation	Duplicated values for unique/key identity constraint: <Uniqueness Constraint Name>.

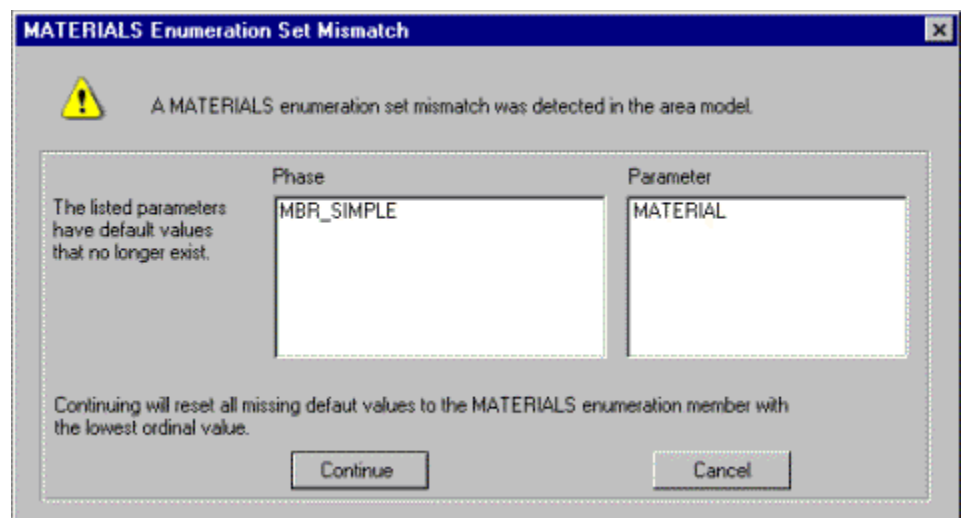
See also

[Troubleshoot issues](#) on [page 207](#)

[COM-related exception errors](#) on [page 208](#)

Material-specific errors

When the referenced material, material class, or container does not exist in the material database, a dialog box similar to the one shown here opens with a list of the missing phase class parameter values:



Select:

- **Continue:** Change the missing material, material class, or container with NULL_MATERIAL, NULL_CLASS, or NULL_CONTAINER, respectively, and continue the process.
- **Ignore:** Continue the process without any changes. A prompt displays to fix the problem.
- **Cancel:** Quit the process.

If the Material Server is installed, but not accessible, or if the material system enumeration sets (MATERIALS, MATERIAL_CLASSES, and CONTAINERS) are included in a material-enabled recipe phase class

and are not configured as NULL, the import occurs without generating an error message.

A material-enabled recipe phase class must contain:

- \$MATERIAL
- \$AMOUNT

A material-enabled recipe phase class must contain:

- \$ACTUAL_AMOUNT
- \$FEED_COMPLETE

A material-enabled recipe phase class may, as an option, contains four recipe parameters. They must be included together or not at all:

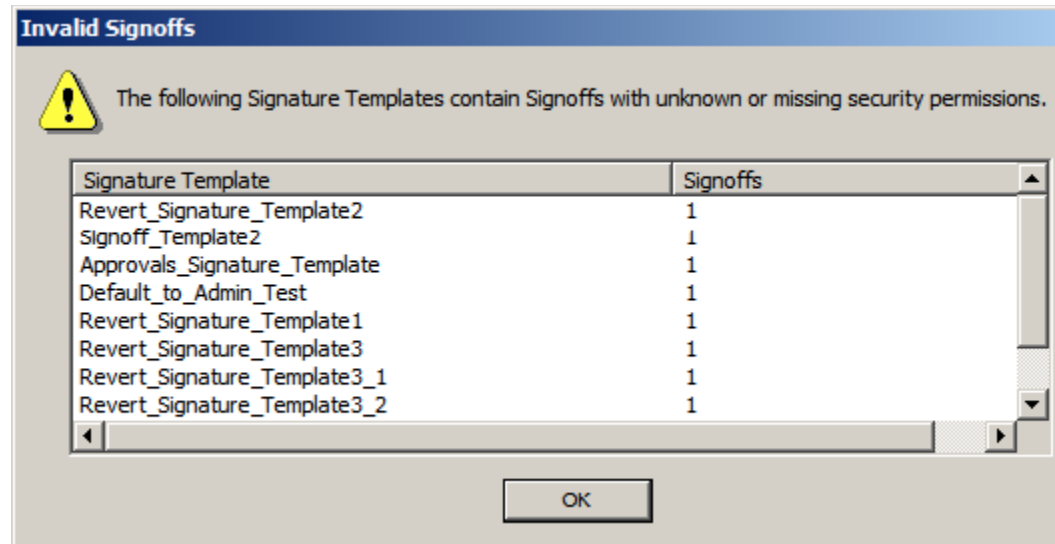
- \$CONTAINER
- \$LOT
- \$LABEL
- \$MATERIAL_CLASS

See also

[COM-related exception errors](#) on [page 208](#)

Invalid signoff

If required signoff information for a signature template is unknown or missing, the **Invalid Signoffs** dialog box opens when starting or using FactoryTalk Batch Equipment Editor:



This error notification can occur:

- When FactoryTalk Batch Equipment Editor starts after a group or user account used in signature template(s) is deleted.
- In FactoryTalk Batch Equipment Editor, **Edit Signature Templates** dialog box was exited without configuring all required signature information.

See also

[Resolve invalid signoff caused by deleted group or user](#) on [page 211](#)

[Resolve invalid signoff when required information is omitted](#) on [page 212](#)

Resolve invalid signoff for deleted group or user

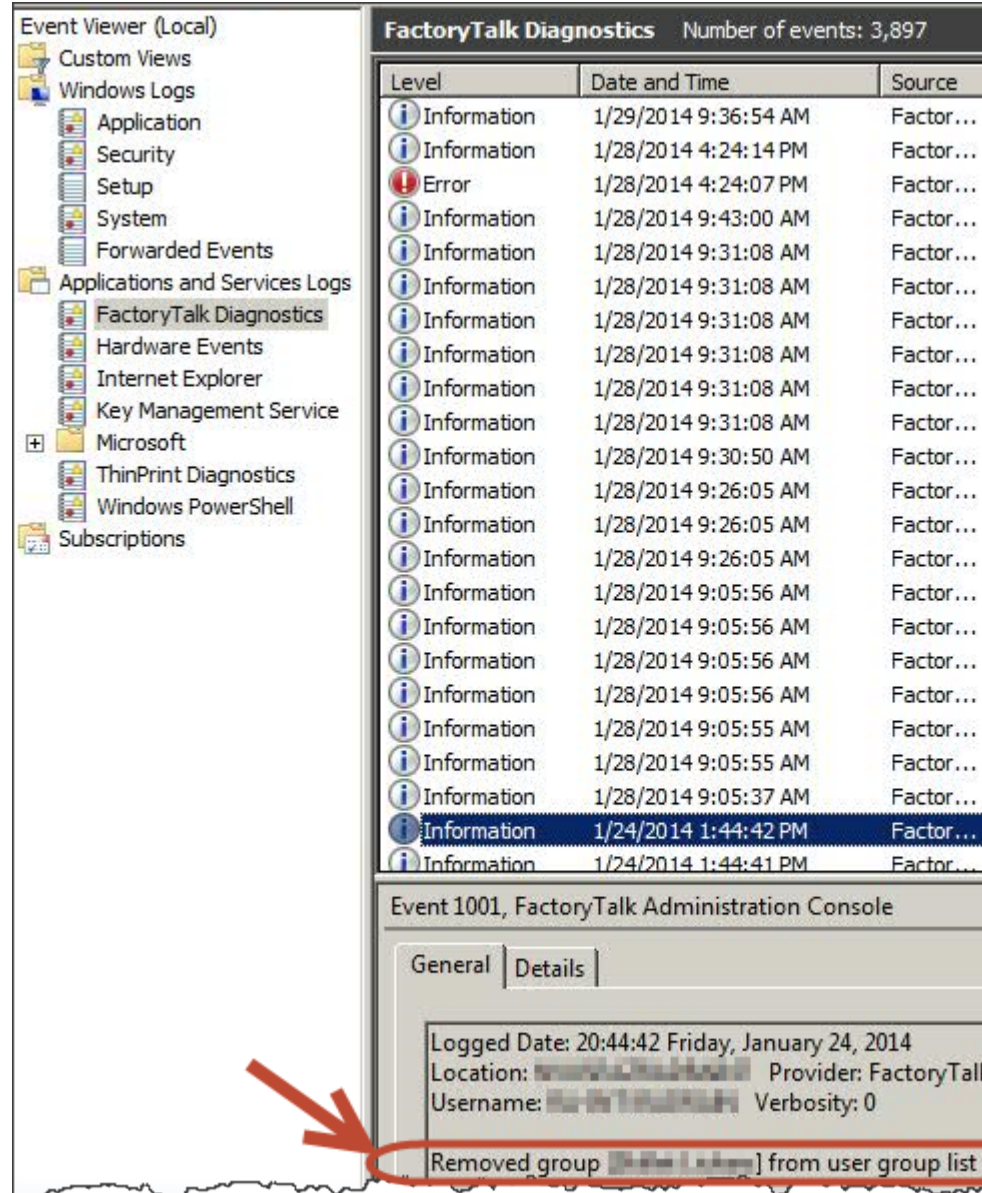
Use these instructions to troubleshoot the **Invalid Signoff** dialog box triggered by:

- Signature templates are created in FactoryTalk Batch Equipment Editor and then saved to the area model.
- FactoryTalk Batch Equipment Editor is closed.
- A group or user account used in one or more signature templates is deleted in the FactoryTalk Administration Console.
- FactoryTalk Batch Equipment Editor is re-started.
- The **Invalid Signoff** dialog box opens.

To resolve invalid signoff caused by deleted group or user:

- To delete the account from the signature template(s), select **OK**, save the area model and restart FactoryTalk Batch Equipment Editor. The error message no longer opens.

- To not delete the account from the signature template(s), select **OK**, and exit FactoryTalk Batch Equipment Editor without saving the area model. Determine the deleted group or user account in the Event Viewer (**Start > Windows Administrative Tools > Event Viewer > Applications and Services Logs > FactoryTalk Diagnostics**). Then re-add the account using the FactoryTalk Administration Console.



See also

[Invalid signoff](#) on [page 210](#)

Resolve invalid signoff for omitted information

Use this information to troubleshoot the Invalid Signoff dialog box triggered by these sequence of events:

- Signature templates are created in the **Edit Signature Templates** dialog box in FactoryTalk Batch Equipment Editor.

2. Required information for a valid signoff is omitted or forgotten (for example, multiple signoffs are configured but security permissions are not specified for all signoffs).
3. Selected **OK** or **Apply**.
4. The **Invalid Signoffs** dialog box opens.

To resolve invalid signoff:

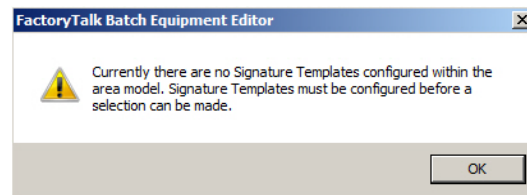
1. Examine the information presented in the **Invalid Signoffs** dialog box. Listed beneath the **Signature Template** column is the name of the template or templates not fully configured.
2. Select **OK** and then make the necessary change(s) in the **Edit Signature Templates** dialog box. For example, configure security permissions for all signoffs, select **OK** to save the signature template configuration, then use the **File > Save** command to save the signature templates in the area model.

See also

[Invalid signoff](#) on [page 210](#)

No Signature templates configured in Area Model

If no signature templates have been configured in the area model, attempted use of **Signature Template Selection Browse** produces this error message:



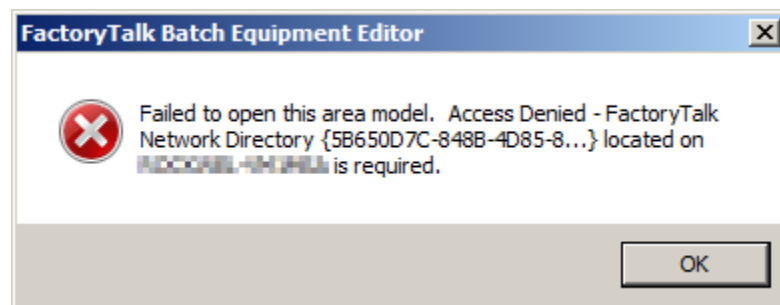
Define templates in **Edit > Signature Templates** and retry the operation.

See also

[Troubleshoot issues](#) on [page 207](#)

Area model secured to different network directory

If applied security authority to the area model, and there is a security mismatch between the security authority identifier (SAI) in the area model and the FactoryTalk Network Directory SAI, this error message opens in FactoryTalk Batch Equipment Editor:



Make note of the FactoryTalk Network Directory and host computer information, then select **OK** to close the error message.

If there is a backup of the FactoryTalk Network Directory SAI, or of the area model in an unsecured form, these options are available:

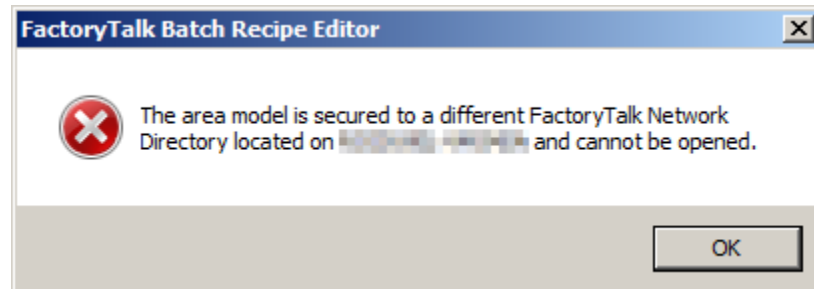
- Restore the FactoryTalk Network Directory SAI to which the area model is secured. The name of the computer that hosts that SAI is provided in the dialog box. Use the FactoryTalk Administration Console to restore a saved backup of the SAI. The **Restore** command is available by right-clicking on the top node in the Explorer pane. When the SAI restores, use **File > Open** in FactoryTalk Batch Equipment Editor to open the secured area model.
- Open an unsecured copy of the area model.

See also

[Troubleshoot issues](#) on [page 207](#)

Area model is secured to different network directory

When attempting to open FactoryTalk Batch Recipe Editor, and an SAI mismatch exists between the area model and the FactoryTalk Network Directory, this error message opens:



Make note of the FactoryTalk Network Directory and host computer information, then select **OK** to close the error message and FactoryTalk Batch Recipe Editor.

To recover, backup of the FactoryTalk Network Directory SAI, or of the area model in unsecured form.

- Restore the FactoryTalk Network Directory SAI to which secures the area model. The name of the computer that hosts that SAI is provided in the dialog box. Use the FactoryTalk Administration Console to restore a saved backup of the SAI. The **Restore** command is available by right-clicking on the top node in the Explorer pane. When the SAI with which the area model is associated is restored, open FactoryTalk Batch Recipe Editor.
- Open an unsecured copy of the area model in FactoryTalk Batch Equipment Editor, then select **File > Save**. Then, open FactoryTalk Batch Recipe Editor.

See also

[Troubleshoot issues](#) on [page 207](#)

Index

A

add

- data servers 199
- enumeration sets 199
- OPC data server 87
- process cell classes 200
- process cells 200
- resource classes 197
- resources 198
- unit attribute tags 198
- unit attributes 198
- unit classes 201
- units 201

arbitration information

- process cell 107
- shared resources 97
- unit 118

area model

- create 24
- edit 197
- import XML file 32, 33
- migration 26
- name 24
- open 25
- secure 80

automatic upload/download 53

B

batch commands, configure verification policies 69

binding expressions

- data types 101
- operators 100

binding requirements 99

- example 99

C

calculation method 151

command verification policies dialog box, field descriptions 70

command verification policy

- change 70
- configure 69
- remove 70

configure 99

- unit attribute tag information 117

configure a recipe approval 74

container information

- equipment module 171

control strategies

- and verification policies 156
- example 49
- implement 50
- overview 49
- with upload/download parameter subsets 54

copy a phase 159

create

- global unit attribute 132

create area model 24

create phase classes 138

create process cell class 105

cross invocation

- definition of 119

cross invocation strings

- equipment modules 170
- process cells 119
- shared resources 98
- unit 119

cut and paste a phase 159

D

data server

- add 83, 199
- default item access path 86
- delete 85
- edit 84
- FactoryTalk Linx Live 88
- location 86
- name 86
- OPC 86
- scan rates 86
- types 86
- watchdog item access path 86
- watchdog item name 86
- watchdog protocol 86
- watchdog write item access path 86
- watchdog write item name 86

data server properties

- modify 199

data server protocols

- CIP 83
- FTD 83
- OPC 83

data servers

- assign 86

data types

- binding expressions 101
- enumeration 101
- examples 101
- integer 101

- real 101
- string 101
- default tags**
 - naming conventions 165
- delete**
 - unit instance 121
- deviation limits 151**
- duplicate a phase 158**

E

- edit command verification policies dialog box, field descriptions 70**
- edit signature templates dialog box, field descriptions 61**
- electronic signature template 61**
 - add 62
 - configure signoffs 63
 - delete 67
 - modify 68
- electronic signatures**
 - how they work 57
 - sequence of tasks 57
 - types 57
 - use 57
- enable**
 - parameter limit tags 173
 - report limit tags 176
- enhanced phase logic request 51, 53**
- enumeration sets 37**
 - add 199
 - delete 40
 - description 37
 - example 37
 - negative ordinal values 37
 - work with 38
- enumerations**
 - material database unavailable 37
- equipment dependencies**
 - process cells 107
 - unit 118
- Equipment Editor**
 - interface 19
 - open 18
 - security 18
- equipment module**
 - container information 171
 - cross invocation strings 170
 - hyperlink strings 171
 - OPC tags 165
 - tag naming conventions 166
 - tags 129, 165
- equipment phase tag properties**
 - modify 199
- equipment phases**
 - modify 204

- example**
 - unit attribute binding 99
- expression builder**
 - unit binding 99
 - validation-Recipe Editor 102
- expressions**
 - operands-Equipment Editor 102
 - operators-Equipment Editor 100
 - validation-Equipment Editor 102

F

- FactoryTalk Linx 88**
- FactoryTalk Linx Live Data server 88**
- FactoryTalk Linx Live Data tags 44**
- FactoryTalk Linx Server Path 86, 90**
- FactoryTalk Live Data 88**

G

- general information**
 - process cells 163
 - shared resources 96
- global binding requirements 99**
- global unit attribute**
 - create 132
- groups, configure for electronic signatures 63**

H

- High/Low 151**
- High-High/Low-Low 151**
- High-High-High/Low-Low-Low 151**
- hyperlink strings**
 - equipment module 171
 - shared resources 98
 - unit 120

I

- icons**
 - create 111
 - path verification 111
- import**
 - enumerations (XML) 32
 - system phases (XML) 33
 - XML area model 32, 33
- import errors**
 - material-specific 209
 - XML parser 209

L

- limit tags**
 - map to parameter tags 174
 - map to report tags 176
 - name conventions 165

tag locking disabled 174, 176
tag locking enabled 173, 176

link

units 121

M**material database**

area model 27
enumerations 37

material-enabled phases

configure 157
disable 158

material-specific errors 209**menu bar 20****message partners 139****messages**

modify 203

modify

area object 197
data server properties 199
equipment phase tag properties 199
equipment phases 204
messages 203
process cell class 200
process cell properties 200
recipe parameter properties 202
recipe phases 203
report parameter properties 202
resource class properties 197
resource properties 198
unit attribute properties 198
unit attribute tag properties 198
unit attribute tags 198
unit class properties 201
unit properties 201

N**No Limits 151****none, verification policy 151****not allowed 151****O****operands**

binding expression-Equipment Editor
102

**operators, expressions-Equipment Editor
100****P****parameter deviations, select verification
method 49****parameter limits 49****parameter tags**

map to limit tags 174

naming conventions 165

parameters

overview 43
phase 46
report 46
scale 48
target 156

**permissions, configure for electronic
signatures 63****phase**

configuring to material-enabled 157
copy 159
cut 159
disable material-enabled 158
parameters
definition 46, 202
paste 159

**phase commands, configure verification
policies 69****phase link group 139****phase logic**

enhanced request 51, 53

phase parameters

definition 202

policy

change for a command 70
remove for a command 70
verification 69

process cell

add 200
arbitration information 107
class
create 105
edit 105
create 106
cross invocation strings 119
definition 200
general information 163

process cell classes

add 200
modify 200

process cell properties

modify 200

R**recipe approval 74****recipe parameter properties**

modify 202

recipe parameters

warm restart 202

recipe phases

modify 203

report parameter properties

modify 202

report parameters

- warm restart 203
 - report tags**
 - map to limit tags 176
 - name conventions 165
 - reports**
 - phase 46
 - request tags, name conventions 165**
 - resource class properties**
 - modify 197
 - resource classes**
 - add 197
 - resource properties**
 - modify 198
 - resources**
 - add 198
 - re-verify recipes 24**
- ## S
- save area model 24**
 - scale parameters 48**
 - scan rates**
 - data server 86
 - security permissions, configure for electronic signatures 63**
 - server options 20**
 - share**
 - units 122
 - shared resources**
 - define 96
 - description 95
 - signature requirement, remove for a command 70**
 - signature template**
 - add 62
 - configure signoffs 63
 - create 61
 - delete 67
 - modify 68
 - verification policy 151
 - signature templates dialog box, field descriptions 61**
 - signatures**
 - electronic 57
 - how they work 57
 - sequence of tasks 57
 - types 57
 - signoff policies, configure for commands 69**
 - signoffs, configure 63**
 - Single Sign-On Equipment Editor 18**
- ## T
- tags**
 - delete tag class 134
 - description 125
 - edit 130
 - edit from menu 130
 - edit tag class 134
 - equipment module information 164
 - equipment module tags
 - create 129
 - FactoryTalk Linx Live Data 44
 - map to limit tags 174, 176
 - naming conventions 165
 - set to default addresses 168
 - set to default names 131
 - unit attribute 127
 - unit attribute tags 125
 - information 117
 - work with 125
 - target parameters, and report verification policies 156**
 - template**
 - add 62
 - configure signoffs 63
 - delete 67
 - modify 68
 - signature 61
 - toolbar-Equipment Editor 20**
 - transitions**
 - data types-Equipment Editor 101
- ## U
- unique icons 111**
 - unit**
 - arbitration information 118
 - configure arbitration 118
 - configure cross invocation 119
 - configure hyperlinks 120
 - configure tag information 117
 - create a unit class 113
 - create a unit instance 115
 - create tags 127
 - cross invocation strings 119
 - definition 201
 - delete 121
 - edit a unit class 114
 - equipment dependencies 118
 - hyperlink strings 120
 - link 121
 - remove a unit instance 121
 - share 122
 - tags information 117
 - work with 113
 - unit attribute binding**
 - example 99
 - unit attribute properties**
 - modify 198
 - unit attribute tag properties**
 - modify 198
 - unit attribute tags 117**

- add 198
- create 127
- modify 198
- unit attributes**
 - add 198
- unit binding expression builder-Equipment Editor 99**
- unit class properties**
 - modify 201
- unit classes**
 - add 201
- unit instance**
 - create 115
 - remove 121
- unit properties**
 - modify 201
- unit tag class**
 - See 126
- units**
 - add 201
- upload/download parameter subsets 51**
 - use with control strategies 54
- user groups, configure for electronic signatures 63**

V

- validation**
 - binding expressions-Equipment Editor 102
- verification method, select 49**
- verification policies 151**
 - and control strategies 156
 - change for a command 70
 - configure 151
 - configure for commands 69
 - configure for parameters and reports 152
 - dialog box fields 154
 - remove for a command 70

W

- watchdog**
 - item access path 86
 - item name 86
 - protocol 86
- Windows-linked user 18**

X

- XML**
 - import enumerations 32, 33
- XML parser errors 209**

Rockwell Automation support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

Documentation feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.





Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

Allen-Bradley, expanding human possibility, Logix, Rockwell Automation, and Rockwell Software are trademarks of Rockwell Automation, Inc.

EtherNet/IP is a trademark of ODVA, Inc.

Trademarks not belonging to Rockwell Automation are property of their respective companies.

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752, İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

Connect with us.    

rockwellautomation.com — expanding human possibility™

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

ASIA PACIFIC: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846