



Studio 5000 Smart Object Configurator Quick Start Guide

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Important User Information

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

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

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



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



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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.



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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).

This manual includes new and updated information. Use these reference tables to locate changed information.

Global changes

None for this release.

New or enhanced features

This table contains a list of topics changed in this version, the reason for the change, and a link to the topic that contains the changed information.

Topic Name	Reason
Create a node on page 12	Added step 4.
Edit an AOI with existing FactoryTalk Smart Object instances on page 17	New topic.
Modify the OPC quality code of a FactoryTalk Smart Object on page 11	New topic.

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This manual shows how to use the Studio 5000 Smart Object Configurator to gather metrics on specific data and deliver it to higher-level systems for processing.

This manual is one of a set of related manuals that show common procedures for programming and operating Logix 5000 controllers.

For a complete list of common procedures manuals, refer to the [Logix 5000 Controllers Common Procedures Programming Manual](#), publication [1756-PM001](#).

The term Logix 5000 controller refers to any controller based on the Logix 5000 operating system.

Studio 5000 environment

The Studio 5000 Automation Engineering & Design Environment® combines engineering and design elements into a common environment. The first element is the Studio 5000 Logix Designer® application. The Logix Designer application is the rebranding of RSLogix 5000® software and will continue to be the product to program Logix 5000™ controllers for discrete, process, batch, motion, safety, and drive-based solutions.



The Studio 5000® environment is the foundation for the future of Rockwell Automation® engineering design tools and capabilities. The Studio 5000 environment is the one place for design engineers to develop all elements of their control system.

Additional resources

These documents contain additional information concerning related Rockwell Automation products.

Resource	Description
FactoryTalk Edge Gateway Quick Start Guide	Provides guidelines for using FactoryTalk Edge Gateway.
Logix 5000 Controllers I/O and Tag Data , publication 1756-PM004	This manual shows how to access I/O and tag data in Logix5000 controllers.

Resource	Description
Logix 5000 Controllers Tasks, Programs, and Routines , publication 1756-PM005	This manual details how to set up controllers tasks along with the programs and routines for the proper execution of these tasks.
Logix 5000 Controllers Ladder Diagram , publication 1756-PM008	This manual shows how to program Logix 5000 controllers with the relay ladder programming language.
Industrial Automation Wiring and Grounding Guidelines , publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications webpage, available at http://ab.rockwellautomation.com	Provides declarations of conformity, certificates, and other certification details.

View or download publications at <http://www.rockwellautomation.com/literature>. To order paper copies of technical documentation, contact the local Rockwell Automation distributor or sales representative.

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End User License Agreement (EULA)

You can view the Rockwell Automation End User License Agreement (EULA) by opening the license.rtf file located in your product's install folder on your hard drive.

The default location of this file is:

C:\Program Files (x86)\Common Files\Rockwell\license.rtf.

About Studio 5000 Smart Object Configurator

Studio 5000 Smart Object Configurator gathers metrics on specific data by bundling the data and delivering it to higher-level systems for processing.

Use Studio 5000 Smart Object Configurator to:

- Turn existing Logix tags into FactoryTalk Smart Object instances by extending existing base Logix tags with an additional set of user-defined configuration properties.
- Organize FactoryTalk Smart Object instances into information models and define synchronous data collection based on the model hierarchy.

FactoryTalk® Edge Gateway™ consumes both the FactoryTalk Smart Object information models and collected data and then delivers the contextualized synchronous data to applications.

Configuration performed in Studio 5000 Smart Object Configurator transfers to the controller and appears in parallel with the existing ladder logic.

Changes are not saved to the .acd file until the .acd file is saved in Logix 5000.



Tip: Use program-scoped tags to create FactoryTalk Smart Object instances in Studio 5000 Smart Object Configurator. Creating controller-scoped FactoryTalk Smart Object causes an error on the Studio 5000 Smart Object Configurator.

See also

[Install base code](#) on [page 10](#)

Install Smart Object Configurator

Use the Studio 5000 Smart Object Configurator common installer to install Studio 5000 Smart Object Configurator.

Install Studio 5000 Smart Object Configurator on the same operating systems that Studio 5000 Logix Designer® supports.



Tip: Studio 5000 Smart Object Configurator does not support Windows® 7.

Install Studio 5000 Smart Object Configurator alongside Studio 5000 Logix Designer versions 28.00 to 33.00.

See also

[Install base code](#) on [page 10](#)

Install base code

Open the desired Logix application in Studio 5000 Logix Designer and then launch Studio 5000 Smart Object Configurator.

Connect to a Studio 5000 Logix Designer .acd project file to run Studio 5000 Smart Object Configurator. To create a FactoryTalk Smart Object, the .acd project file requires FactoryTalk Smart Object base code: program, routine, and rung.

If FactoryTalk Smart Object base code is not in the project, install the FactoryTalk Smart Object base code.

To install base code

1. Double-click an .acd project file.
2. In Studio 5000 Logix Designer, select **Tools > Studio 5000 Smart Object Configurator**.

If the project includes FactoryTalk Smart Object base code, Studio 5000 Smart Object Configurator launches with the FactoryTalk Smart Object information model.

3. If FactoryTalk Smart Object base code is not in the project, install the FactoryTalk Smart Object base code.
 - a. In **Insert base components** select a program. The program can be in the fastest executing task within the project.
 - b. Select a routine. The routine must be ladder logic.
 - c. Select a rung number.
4. Select **Add**.

Code is injected into the controller. The **Assets** tab in the **Controller Organizer** updates. A FactoryTalk Smart Object timer appears in the ladder logic according to the location set for the FactoryTalk Smart Object base code. A first element called **Information model** appears in Studio 5000 Smart Object Configurator.

See also

[Create a model](#) on [page 12](#)

Rules for names and backing tags

These rules apply to names and backing tags:

Name

- Names must be unique for each node that is located under the same parent level.
- Names are mandatory.
- Names are case insensitive.
- Names are limited to 40 Unicode characters and can be alphanumeric; special characters are not supported.
- Spaces are supported, but not at the beginning or end of names.
- Names accept underscores.

Backing tag

- Backing tags follow the Studio 5000 Logix Designer naming rules.
- Backing tags are limited to 40 alphanumeric characters (ASCII); special characters are not permitted.
- Backing tags cannot start with a number.
- Backing tags accept one underscore. Multiple underscores in a row are not permitted. An underscore at the end is not permitted.

See also

[Create a model](#) on [page 12](#)

[Create a node](#) on [page 12](#)

[Add a DINT data type to an information model](#) on [page 14](#)

Modify the OPC code quality value

A FactoryTalk Smart Object transmits quality code values to FactoryTalk Edge Gateway based on OPC quality. By default, the OPC quality code value in a Studio 5000 Smart Object Configurator is 192.

Create logic in the Logix 5000 application to change the [OPC quality values](#) that FactoryTalk Smart Object instances transmit to FactoryTalk Edge Gateway.

To modify the OPC quality code value of a FactoryTalk Smart Object

1. In the Logix 5000 application, create logic as needed.

2. Move the new OPC value to the backing tag of the FactoryTalk Smart Object (Smart Object.Inp_Quality).

Create a model

Create as many models as required for your FactoryTalk Smart Object information model.

To create a model

1. Right-click **Information models** and then select **Model**.
2. In **Model**, set these basic properties:
 - **Name:** Name of the model. See [Rules for names and backing tags](#).
 - **Backing tag:** Name of the backing tag in the controller. A backing tag is created in the Studio 5000 Logix Designer project that contains the configuration information for the FactoryTalk Smart Object.
 - **Program:** Controller program where the model resides.
 - **Routine:** Controller routine where the model resides. The routine is ladder logic.
 - **Rung:** Location to add a rung in the routine where the FactoryTalk Smart Object appears.
 - **End of routine:** Location at the end of the routine where the FactoryTalk Smart Object appears.

The code appears in Studio 5000 Logix Designer.

See also

[Create a node](#) on [page 12](#)

Create a node

Use nodes to organize FactoryTalk Smart Object instances and to define how FactoryTalk Smart Object instances are collected. A node does not sample a specific tag's value but instead defines the data collection mechanism for its children. A node exists only as a folder in a hierarchy to provide structure for the information model.

To create a node, set the node properties and then set the data collections parameters. Node properties are saved in the .acd project file and define basic information regarding the node.


Data collection parameters define how data is collected for FactoryTalk Smart Object instances that are under a node that collects data based on the Parent parameter. When data collection definition includes the Parent parameter,

data collected for a hierarchy based on this setting collects in the same controller scan and has synchronized time stamps.

Data collection in Studio 5000 Smart Object Configurator is hierarchical and by default data collection is based on the top level in the model. Break and re-establish the link between each node and its parent by using the Parent parameter in the data collection configuration.

To create a node

1. Perform one of these actions:
 - To add the first node, right-click **Information models** and then select **Node**.
 - To add a node under another node, right-click a node and then select **Node**.
2. In **Node**, set these basic properties:
 - **Name:** Name of the node displayed in the information model. See [Rules for names and backing tags](#).
 - **Backing tag:** Name of the backing tag created in the controller. A backing tag is created in the Studio 5000 Logix Designer project that contains the configuration information for the FactoryTalk Smart Object.
 - **Program:** Controller program where the node resides.
 - **Routine:** Controller routine where the node resides.
 - **Rung:** Location to add a rung in the routine where the FactoryTalk Smart Object appears.
 - **End of routine:** Location at the end of the routine where the FactoryTalk Smart Object appears.
3. Set these data collection parameters:
 - **Triggers:** When this check box is clear, and **Programmatic trigger** is also clear, data collection for this node does not occur.



Tip: The first node requires Triggers or Periodic data collection parameters because it does not have a parent.

It is possible to have multiple triggers active at once. Possible trigger combinations are: Parent and Programmatic trigger or Periodic and Programmatic.

 - **Parent:** When the parent is triggered, the FactoryTalk Smart Object is also triggered.
 - **Periodic:** Interval seconds at which point data is sampled in the source tag.
 - **Programmatic trigger:** Ladder logic that triggers the condition for collection.
4. (Optional) Select **ThingWorx**, and then type the name of the template to use for this node when mapping this model to a ThingWorx instance.



Tip: The ThingWorx template:

- Cannot exceed 256 characters.
 - Cannot contain three colons in a row (:::) or an ellipsis (...).
 - Cannot begin or end with a period (.) or a colon (:).
1. Select **Add**. The node appears in the FactoryTalk Smart Object information model.

See also

[Create a model](#) on [page 12](#)

[Add a DINT data type to an information model](#) on [page 14](#)

Add a DINT data type to an information model

Add a DINT data type to a FactoryTalk Smart Object information model. Set the basic collection properties to describe how the DINT FactoryTalk Smart Object collects data.

To add a DINT data type to an information model

1. Right-click a node and then select **DINT**.
A **DINT** tab appears.
2. Set these basic properties:
 - **Name:** Name of the data displayed in the information model. See [Rules for names and backing tags](#).
 - **Backing tag:** Name of the backing tag in the controller. A backing tag is created in the Studio 5000 Logix Designer project that contains the configuration information for the FactoryTalk Smart Object.
 - **Source value tag (optional):** Location where the data gathers.
 - **Program:** Controller program where the node resides.
 - **Routine:** Controller routine where the node resides.
 - **Rung:** Location to add a rung in the routine where the FactoryTalk Smart Object appears.
 - **End of routine:** Location at the end of a routine where the FactoryTalk Smart Object appears.
3. Set these data collection parameters:
 - **Triggers:** When this check box is clear, and **Programmatic trigger** is also clear, data collection for this data value does not occur.



Tip: It is possible to have multiple triggers active at once.

- **Parent:** When Parent is triggered, the FactoryTalk Smart Object is also triggered.
 - **Periodic:** Interval in seconds when data is sampled in the source tag.
 - **Programmatic trigger:** Ladder logic that triggers the condition for collection.
 - **On change:** Data is sampled each time that it changes based on the value in engineering units (positive number).
4. Select **Add**.

A new rung appears in the ladder logic. The DINT FactoryTalk Smart Object appears in the FactoryTalk Smart Object tree. Initials representing the trigger types, for example, P +T+CH, appear next to the model name.

See also

[Create a model](#) on [page 12](#)

[Create a node](#) on [page 12](#)

Export FactoryTalk Smart Object configuration values

Export FactoryTalk Smart Object configuration values to a CSV file to quickly update values. Use the CSV file to filter, and modify FactoryTalk Smart Object configuration values.

After modifying the FactoryTalk Smart Object configuration values in the CSV file, import the FactoryTalk Smart Object configuration values to Studio 5000 Smart Object Configurator.

To export FactoryTalk Smart Object configuration values

1. Go to **Functions > Modify Existing > Export**.
2. Select a location and type a file name.
A CSV file is created.
3. Select **Save**.
4. Modify the spreadsheet. Columns that are read-only contain (r) in the column header.

See also

[Import FactoryTalk Smart Object configuration values](#) on [page 16](#)

Import FactoryTalk Smart Object configuration values

After exporting and then updating FactoryTalk Smart Object configuration values in a CSV file, import the new FactoryTalk Smart Object configuration values to Studio 5000 Smart Object Configurator.



Tip: If an import error occurs, FactoryTalk Smart Object creates a log file in the Windows Documents folder. Consult the log file for a list of rows that contain errors.

To import FactoryTalk Smart Object configuration values

1. Go to **Functions > Modify existing > Import**.
2. Select a file.
3. Select **Open**.

The changes to the configuration values appear in the information model.

See also

[Export FactoryTalk Smart Object configuration values](#) on [page 15](#)

Download a CSV template to create new FactoryTalk Smart Object instances

Download a CSV template that contains the columns required for creating FactoryTalk Smart Object instances.

After using the CSV template to quickly create new FactoryTalk Smart Object instances, import the new FactoryTalk Smart Object instances into Studio 5000 Smart Object Configurator.

To download a CSV template to create new FactoryTalk Smart Object instances

1. Select **Functions > Create new > Download Template**.
2. Select a folder and then type a name for the file.
3. Select **Save**.

An empty template appears in your folder.

Edit an Add-On Instruction

Use Studio 5000 Smart Object Configurator to edit Add-On Instructions (AOIs).

To edit an Add-On Instruction

1. Select **Functions > Edit AOI**.
2. Select an AOI.
The AOI appears in a separate tab.
3. Add an information model to the AOI.

See also

[Create a model](#) on [page 12](#)

[Create a node](#) on [page 12](#)

Edit an Add-On Instruction with existing FactoryTalk Smart Object instances

Upon creation, an Add-On Instruction (AOI) inherits values from the definition. After AOI creation, manually push new AOI definition changes to the instances.

To edit an Add-On Instruction with existing FactoryTalk Smart Object instances

1. Select **Functions > Edit AOI**.
2. Select an AOI.
The AOI appears in a separate tab.
3. Perform one of these actions:
 - Add a data type or node, and then select **Done**.
 - Change the name and then select **Update**.
4. Verify that the AOI model is correct.
5. In Studio 5000 Logix Designer, go to the logic of the AOI and then monitor a tag.
6. In **Copy default values to tags of type**, select **Copy Specified Values**.
7. Select the local tag for the modified FactoryTalk Smart Object and then select **OK**.
8. Download the Studio 5000 Logix Designer project to a controller or emulator.
9. Put the controller in Run mode for at least 5 seconds. Save and then upload the values.
10. In Studio 5000 Smart Object Configurator, select **Reconnect**.
The information models reflect the changes.



Tip: To delete a FactoryTalk Smart Object inside an AOI, in Studio 5000 Logix Designer delete the code and backing tag. Reconnect Studio 5000 Smart Object Configurator. There is no need to download the project.

See also

[Edit an Add-On Instruction](#) on [page 16](#)

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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

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Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at rok.auto/docfeedback.

Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.





Rockwell Automation maintains current product environmental information on its website at rok.auto/pec.

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