



FactoryTalk Linux Gateway Getting Results Guide

Version 6.40.00



Important User Information

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

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

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.

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



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



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

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

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



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



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



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

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



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

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

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Preface

About this publication

The *Getting Results Guide* provides you with information on installing and using FactoryTalk® Linx Gateway.



Tip: The *Getting Results Guide* is included in a portable document format (PDF) on your FactoryTalk Linx Gateway software installation DVD. These files must be viewed using the Adobe® Acrobat® Reader software.

This section includes the following information:

- Intended audience
- Where to find additional information
- Legal notices

Intended audience

You should be familiar with:

- Microsoft® Windows® operating systems
- FactoryTalk Linx (previously called RSLinx Enterprise)
- Allen-Bradley® programmable logic controllers (PLCs) and programmable automation controllers (PACs)
- Rockwell Automation® control system development software

Find additional information

For additional information about FactoryTalk Linx Gateway, consult the following resources:

Help

The Help includes overview, procedural, screen, and reference information for the product. The Help contains these basic components:

- Overview topics
- Quick-start topics
- Step-by-step procedures
- Dialog box descriptions

To view the Help, click **Help** in the **FactoryTalk Linx Gateway Configuration Tool**.

Release Notes

The Release Notes provide information updates that are necessary to use FactoryTalk Linx Gateway effectively. The Release Notes contains the following components:

- System requirements
- System features
- Anomalies
- Functional changes
- Application notes

To view the FactoryTalk Linx Gateway Release Notes, download them from the [Product Compatibility and Download Center](#).

Knowledgebase

The Rockwell Automation Customer Support Center offers an extensive online database that includes frequently asked questions and the latest patches. The Knowledgebase webpage leads to a comprehensive, searchable database of support information for all Rockwell Automation products.

To access the Knowledgebase webpage, visit www.rockwellautomation.com/en-us/support, then select **Knowledgebase**.

Technical support

Questions concerning installation and use of FactoryTalk Linx Gateway software are handled by the Rockwell Automation Customer Support Center. The center is staffed Monday through Friday, except on U.S. holidays, from 8 a.m. to 5 p.m. Eastern time zone for calls originating within the U.S. and Canada.

To reach the Customer Support Center, call 440-646-3434 and follow the prompts. For calls originating outside the U.S. or Canada, locate the number in your country by visiting <https://rockwellautomation.custhelp.com/app/phone>.

When you call, you should be at your computer and be prepared to provide the following information:

- The product version number
- The type of hardware you are using
- The exact wording of any errors or messages that appeared on your screen
- A description of what happened and what you were doing when the problem occurred
- A description of how you tried to solve the problem

Training programs

Rockwell Automation offers a wide range of training programs, from regularly scheduled classes to custom-tailored classes conducted at your site.

If you need more information about these training programs, visit the Rockwell Automation site or contact the Rockwell Automation Training Coordinator. The website address and telephone numbers are available at the bottom of the back cover.

Consulting services

Rockwell Automation provides expert consulting and turnkey implementations for making optimal use of Rockwell Automation software products. Contact your local representative for more information.

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 in 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\ENU\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.

The following table lists the commercially licensed software components in FactoryTalk Linx Gateway.

Component	Copyright
Softing OPC UA C++ Server SDK for Windows version 6.20.1	Copyright Softing Industrial Automation GmbH 2009 - 2023

Welcome to FactoryTalk Linx Gateway

This chapter includes the following information:

- What is FactoryTalk Linx Gateway?
- Overview of basic concepts
- Quick start: Set up and use FactoryTalk Linx Gateway

What is FactoryTalk Linx Gateway?

FactoryTalk® Linx™ Gateway enables third-party software to access control system information using OPC Unified Architecture (UA), Classic Data Access (DA), Dynamic Data Exchange (DDE), Excel Real-time Data (RTD), and Application Programming Interface (API) interfaces. It allows clients to connect to and access tag data from FactoryTalk applications that contain FactoryTalk Linx, FactoryTalk View SE, FactoryTalk Linx OPC UA Connector, and OPC DA servers. FactoryTalk Linx Gateway also provides a Remote Proxy service to enable FactoryTalk Linx on other computers to share the FactoryTalk Linx service on the FactoryTalk Linx Gateway computer to interface with an automation network.

FactoryTalk Linx Gateway consists of:

- A service that provides tag data to up to 20 OPC DA clients and 200,000 tags.
- A service that provides tag data to up to 100 OPC UA clients, while the suggested connection quantity is 20 based on the previous testing.
- A configuration tool that configures the runtime operation of the service. The configuration tool enables the selection of the area or application, from which you want to access data (called the scope) as well as to start and stop the service.
- An interface that supports DDE with 20 clients and 4,000 tags at most.
- An interface that supports Excel RTD with 20 clients and 40,000 tags at most.
- A SDK Application Programming Interface (API) that enables client software from other sources to utilize FactoryTalk Linx as a service to communicate with Rockwell Automation and CIP-enabled equipment. The SDK interface supports 200 clients with 200 devices at most.
- A Remote Proxy Service that enables FactoryTalk Linx on other computers to share the FactoryTalk Linx service on the FactoryTalk Linx Gateway computer to interface with an automation network. A remote proxy server can connect 400 drivers with 400 devices at most. A client can connect 2,000 remote drivers with 2,000 remote devices at most.

Use FactoryTalk Linx Gateway if you need to:

- Use FactoryTalk Linx as a data server for OPC clients.
- Use FactoryTalk View SE as a data server for OPC clients to access HMI server tags (such as alarm, derived, and system tags) and direct references.

IMPORTANT:

- FactoryTalk Linx Gateway service starts and stops from the machine on which it is installed.
- FactoryTalk Linx Gateway supports OPC client notification under normal shutdown conditions. However, it is the OPC client's responsibility to provide a mechanism to detect when it is no longer connected to the server and flag data as bad quality.
- Your access to, and actions within, FactoryTalk Linx Gateway are controlled by FactoryTalk Security settings.

Only one FactoryTalk Linx Gateway is permitted to run on a given computer. The activation type determines feature support and the maximum capacity of unique tags that can be added to the FactoryTalk Linx Gateway server. The tag limit is for all unique tags, including active, inactive, and valid tags. However, the OPC DA service and UA service tag limits are separate; a 5,000 tag limit activation can simultaneously serve 5,000 tags to DA clients and 5,000 tags to UA clients. All FactoryTalk Linx Gateway activations support a capacity of up to 20 simultaneous OPC DA or OPC UA client connections.

FactoryTalk Diagnostics and FactoryTalk Diagnostics Counter Monitor provide alerts when FactoryTalk Linx Gateway has reached the maximum tag capacity. This capacity can be increased with additional activations. Refer to [About Activations on page 92](#) for more information about activations.

Before FactoryTalk Linx Gateway version 6.00.00, here are the available activations:

Activation Name	Activation	Tag Limit (UA)	FactoryTalk Directory	Distributed Network	Activates FactoryTalk Linx Data Bridge
FactoryTalk Gateway Distributed	RSOPCD.UNLTD	500,000*	Local or Network	Y	N
FactoryTalk Gateway Distributed 70K	RSOPCD.70000	70,000	Local or Network	Y	N
FactoryTalk Gateway Distributed 32000	RSOPCD.32000	32,000	Local or Network	Y	N
FactoryTalk Gateway Station 32000	RSOPCS.32000	32,000	Local	N	N
FactoryTalk Gateway Distributed 5000	RSOPCD.5000	5,000	Local or Network	Y	N
FactoryTalk Gateway Station 5000	RSOPCS.5000	5,000	Local	N	N

Activation Name	Activation	Tag Limit (UA)	FactoryTalk Directory	Distributed Network	Activates FactoryTalk Linx Data Bridge
FactoryTalk Gateway Distributed 1500	RSOPCD.1500	1,500	Local or Network	Y	N
FactoryTalk Gateway Station 1500	RSOPCS.1500	1,500	Local	N	N

From FactoryTalk Linx Gateway version 6.00.00, only the four activations below are available for new users. However, the other legacy activations used in previous versions of the product are still supported.

Activation Name	Activation	Tag Limit (UA)	FactoryTalk Directory	Distributed Network	Activates FactoryTalk Linx Data Bridge
FactoryTalk Linx Gateway Professional	LINXGW.PROFESSIONAL	500,000*	Local or Network	Y	Y
FactoryTalk Linx Gateway Distributed	LINXGW.DISTRIBUTED	32,000	Local or Network	Y	N
FactoryTalk Linx Gateway Standard	LINXGW.STANDARD	5,000	Local or Network	N	N
FactoryTalk Linx Gateway Basic	LINXGW.BASIC	1,000	Local or Network	N	N

NOTE: Starting from FactoryTalk Linx Gateway version 6.30.00, Professional activation tag limit is changed from unlimited to 500,000.

500,000*: Default tag limit. You can edit it in the FactoryTalk Administration Console (**System > Policies > FactoryTalk Linx Gateway > FactoryTalk Linx Gateway Policy > Tag count limitation for professional activation**).

From FactoryTalk Linx Gateway version 6.21.00, three activations are added for users.

Activation Name	Activation	Tag Limit (UA)	FactoryTalk Directory	Distributed Network	Activates FactoryTalk Linx Data Bridge
FactoryTalk Linx Gateway Extended	LINXGW.EXTENDED	15,000	Local or Network	N	N
FactoryTalk Linx Gateway Embedded	Verifies its operating on a CompactLogix 5480 windows core	500	Local or Network	N	N

FactoryTalk Linx Data Bridge Embedded	Verifies its operating on a CompactLogix 5480 windows core	500	Local or Network	N	Y
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For more information regarding OPC, refer to the OPC Foundation Web site: <https://opcfoundation.org>.

Overview of basic concepts

Because FactoryTalk Linx Gateway enables OPC clients to connect to FactoryTalk applications, it is important to understand some basic concepts about FactoryTalk. For more detailed information about FactoryTalk, refer to the FactoryTalk Services Platform Help.

FactoryTalk Services Platform

Formerly known as FactoryTalk Automation Platform, the FactoryTalk Services Platform is an underlying architecture and set of services that Rockwell Automation software products build upon.

The FactoryTalk Services Platform:

- Provides common services (such as diagnostic messages, health monitoring services, access to real-time data) and shares plant resources (such as tags and graphics) throughout an automation system.
- Allows defining plant-floor resources once, and then allows simultaneous access to those resources across product boundaries.
- Supports centralized security services.

The FactoryTalk Services Platform includes the following components:

- FactoryTalk Directory
- FactoryTalk Live Data
- FactoryTalk Diagnostics
- FactoryTalk Administration Console
- FactoryTalk Security
- FactoryTalk Activation Manager

FactoryTalk Directory

FactoryTalk Directory allows products to share a common address book, which finds and provides access to plant-floor resources, such as data tags and graphics.

The FactoryTalk Services Platform includes two separate directories: a Local Directory and a Network Directory. In a Local Directory, a Directory Server, all project information, and all participating software products are located on a single computer. Local applications cannot be shared across a network. A Network Directory organizes project information from multiple FactoryTalk products across multiple computers on a network.

FactoryTalk Live Data

FactoryTalk Live Data manages connections between FactoryTalk products and data servers. It reads values from and writes values to OPC Unified Architecture (UA), OPC Classic Data Access (DA), and Live Data servers on behalf of client software products, such as FactoryTalk View and FactoryTalk Transaction Manager.

FactoryTalk Diagnostics

FactoryTalk Diagnostics provides the ability to log errors, warnings, and other status messages generated throughout a FactoryTalk-enabled system to a central location called an event log. If you encounter a problem, you can review the events in the log that led up to the problem to assist in determining the cause. Or, you can monitor the log to identify potential problems and take corrective action before a problem occurs.

Note that FactoryTalk Diagnostics messages are displayed for the local workstation only.

Refer to the *FactoryTalk Services Platform Help* for more information about FactoryTalk Diagnostics and the event log. Refer to the *FactoryTalk Linx Gateway Help* for more information about diagnostic messages specific to FactoryTalk Linx Gateway.

FactoryTalk Administration Console

FactoryTalk Administration Console is an optional, stand-alone tool that enables you to configure and manage FactoryTalk-enabled applications.

FactoryTalk Security

FactoryTalk Security offers centralized security services that provides the ability to control access to your automation system. Your access to, and actions within, the FactoryTalk Linx Gateway tool are controlled by FactoryTalk Security settings.

If you are experiencing problems with FactoryTalk Security, refer to:

- [Secure FactoryTalk Linx Gateway using FactoryTalk Security on page 108](#)
- Troubleshooting topics in *FactoryTalk Services Platform Help*.

FactoryTalk Activation Manager

FactoryTalk Activation Manager provides a secure, software-based system for activating Rockwell Automation software products and managing software activation files.

Application types

An application organizes project information, including elements such as data servers, HMI servers, and alarm and event servers, and makes it available to FactoryTalk-enabled software products that support the same FactoryTalk Directory type.

- **Network applications** are held in a FactoryTalk Network Directory. Project information and participating software products can be located on multiple computers distributed across a network. All the computers participating in a particular Network application share a common Network Directory Server located on a network computer.
- **Local applications** are held in a FactoryTalk Local Directory. Project information is located on a stand-alone computer and is available only to software products installed on that same local computer. Local applications cannot be accessed remotely and cannot share project information with a Network application.

IMPORTANT:

- Ensure all components intended for use in the same FactoryTalk system support the same FactoryTalk Directory types.
- The installed FactoryTalk Linx Gateway activation may limit support for FactoryTalk Directory types. For details on which FactoryTalk Directory types are supported by a certain activation, see [Activation types on page 93](#).

Quick start: Set up and use FactoryTalk Linx Gateway

IMPORTANT: If there is a possibility that a client will attempt to access tags during setup, before continuing, shut down all OPC clients and inhibit FactoryTalk Linx Gateway services using **FactoryTalk Linx Gateway Configuration Tool > Server Configuration**. This prevents the services from automatically starting while making changes.

Use the following checklist to guide you through the process of setting up and using FactoryTalk Linx Gateway.

Step	Description	Refer to:
1.	Read and understand the FactoryTalk Linx Gateway <i>Getting Results Guide</i> .	
2.	Verify your personal computer meets the minimum hardware and software requirements.	System requirements on page 17
3.	Install FactoryTalk Linx Gateway.	Install FactoryTalk Linx Gateway on page 17
4.	Install a valid FactoryTalk Linx Gateway activation.	About Activations on page 92
5.	Configure FactoryTalk Security, if required.	FactoryTalk Services Platform Help
6.	Create a FactoryTalk application (or point to an existing application).	FactoryTalk Services Platform Help
7.	Add a FactoryTalk Linx data server or an HMI server.	FactoryTalk View Site Edition Help or FactoryTalk Services Platform Help.
8.	Create a shortcut between the FactoryTalk application and the server or controller.	FactoryTalk View Site Edition Help or FactoryTalk Services Platform Help.
9.	Start FactoryTalk Linx Gateway by clicking Start > Programs > Rockwell Software > FactoryTalk Linx Gateway > FactoryTalk Linx Gateway Configuration .	Start FactoryTalk Linx Gateway on page 36

Step	Description	Refer to:
10.	Select the scope using the FactoryTalk Linx Gateway Select FactoryTalk Directory dialog box.	About the FactoryTalk Linx Gateway Scope Selection dialog box on page 62
11.	Configure to make sure DA or UA Server in Server Configuration tab is running and not inhibited.	Server Configuration on page 40
12.	Configure OPC UA server endpoint in the UA Server Endpoints tab	FactoryTalk Linx Gateway Help
13.	(Optional) Enable and configure tag list and tag list access to decide if all data to be available or limit it to specific items or if an OPC UA client to be able to access structures and arrays. If disable all available tags from FactoryTalk data servers, the tag list will be available to all OPC Clients.	Tag List on page 45
14.	When the OPC client makes a connection with FactoryTalk Linx Gateway, enter FactoryTalk Linx Gateway as the server name to which you wish to connect. If the OPC client supports browsing, select FactoryTalk Linx Gateway from the list of available servers.	OPC client documentation
15.	If OPC UA endpoint security is enabled, trust incoming certificate from the UA client in the Certificate Management tab.	Certificate Management on page 66
16.	Run the OPC client and select the tags you want to access (up to, but not exceeding, the activation count).	OPC client documentation

FactoryTalk Linx Gateway installation method

The FactoryTalk Linx Gateway installation DVD provides wizards to guide you through the installation process.

FactoryTalk Linx Gateway supports two installation methods: Setup wizard installation and automated installation with command line syntax. This chapter uses the Setup wizard installation method to illustrate the steps. The automated installation with command line syntax reduces user interaction and provides command line parameters to install FactoryTalk Linx Gateway. See [Install FactoryTalk Linx Gateway with command line syntax on page 98](#).

This chapter contains the following information:

- System requirements
- Where to install FactoryTalk Linx Gateway
- Install FactoryTalk Linx Gateway for the first time
- Update an existing system
- Install Remote FactoryTalk Linx Gateway

System requirements

To use FactoryTalk Linx Gateway, your personal computer must meet the following minimum hardware and software requirements:

Hardware requirements

We recommend the following hardware for applications with typical data acquisition needs:

- Intel® Core™ i5 Standard Power processor
- Total processor cores are recommended to be no less than 4 for virtual machines
- 4 GB of memory

Lower level x86 based CPUs will also work in standalone configurations with reduced data acquisition needs.

For small applications, the following configuration was also evaluated:

- Intel® Atom™ CPU E3845 @ 1.91 GHz (4 CPUs)
- 4 GB of memory
- 1500 data points

We recommend that you run a performance validation test on the planned computer hardware to ensure that the desired capacity and performance can be achieved.



Tip: When FactoryTalk Linx Gateway is operating on Windows® 10 IOT Enterprise (for example, the Windows core of a CompactLogix™ 5480 controller), it is limited to a FactoryTalk Directory and FactoryTalk Linx data server running in the same environment (a remote directory and data server are not supported).

Tested FactoryTalk Linx Gateway update rates

Tested FactoryTalk Linx Gateway OPC DA service update rates configured using a FactoryTalk Application

CPU and memory requirements for the FactoryTalk Linx Gateway OPC DA server increase as tags are set to active (up to the activation tag capacity) or as more clients connect to the server (up to the 20 connected client capacity). Rockwell Automation tests with the following update rates for a number of active tags.

Processor	Number of tags	Scan rate of all tags	Total CPU utilization
Single	70,000	Controller data values changing at 250 msec	75%
Dual-core	70,000	Controller data values changing at 250 msec	50%
Dual-core	70,000	Controller data values changing at 1000 msec	20%

NOTE: Many of the FactoryTalk services use change of state processing. The high data value change rate used in this test was selected to place a high processing load on the system to evaluate the computer's CPU impact. Because each system has different operational requirements, testing should be performed to determine how a proposed system will operate.

These values are tested on a computer with a dual-core Intel® Core™ i3-2120 processor, 3.3 GHz, with 4G of RAM. The single core test is run using only one of the cores to provide a basis for comparison. FactoryTalk Linx Gateway and FactoryTalk Linx are installed and configured on the same computer in a FactoryTalk Application for the test.

The largest impact on CPU utilization is the rate that the data is changing even if the data server (in this case, FactoryTalk Linx) is local or remote to the FactoryTalk Linx Gateway.

The total amount of memory used for the runtime tests was approximately 700 MB. Additional memory would be used if browsing occurred.

Tested FactoryTalk Linx Gateway update rates for OPC UA service configured using a FactoryTalk Application

Rockwell Automation tests with the following update rates for a number of active tags. This data is captured in FactoryTalk Linx Gateway version 6.40.00 with security disabled.

CPU and memory requirements for the FactoryTalk Linx Gateway server increase as tags are set to active (up to the activation tag capacity) or as more clients connect to the server.

- Example test for OPC UA using folders with scalar data:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
50,000	0.5	0.5
100,000	0.5	1

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
150,000	0.5	1.8
200,000	0.5	2
250,000	0.5	2.5
300,000	0.5	3
350,000	0.5	3.5
400,000	0.5	4
450,000	0.5	4.5
500,000	0.5	5

NOTE: This data was based on tests with the Folder with scalar data enabled in the UA server. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has different operational requirements, testing should be performed to determine how a proposed system will operate.

- Example test for OPC UA using tag list:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
1,000	0.5	0.5
2,000	0.5	0.5
5,000	0.5	0.5
10,000	0.5	0.5
50,000	0.5	0.6
100,000	0.5	1
150,000	0.5	1.5
200,000	0.5	2
250,000	0.5	2.5
300,000	0.5	3
350,000	0.5	3.5
400,000	0.5	4.1
450,000	0.5	4.5
500,000	0.5	5.2

NOTE: This data was based on tests with the UA tag list enabled. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all

value changes that were delivered. Because each system has different operational requirements, testing should be performed to determine how a proposed system will operate.

- Example test for OPC UA using custom namespace:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
10,000	0.5	0.5
50,000	0.5	0.5
100,000	0.5	1
150,000	0.5	1.9
200,000	0.5	2
250,000	0.5	2
300,000	0.5	3
350,000	0.5	3
400,000	0.5	3
450,000	0.5	4
500,000	0.5	4

NOTE: This data was based on tests with the Custom namespace enabled. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has different operational requirements, testing should be performed to determine how a proposed system will operate.

Tested FactoryTalk Linx Gateway update rates for RTD service configured using a FactoryTalk Application

- Example test for RTD using folders with scalar data:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
5,000	0.5	1.9
10,000	0.5	1.9
15,000	0.5	1.9
20,000	0.5	1.9
25,000	0.5	2
30,000	0.5	2
35,000	0.5	2
40,000	0.5	2

NOTE: This data was based on tests with the Folder with scalar data enabled for the RTD. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has different

operational requirements, testing should be performed to determine how a proposed system will operate.

- Example test for RTD using custom namespace:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
5,000	0.5	1.9
10,000	0.5	1.9
15,000	0.5	1.9
20,000	0.5	2
20,000	0.5	2
30,000	0.5	2
35,000	0.5	2
40,000	0.5	2.1

NOTE: This data was based on tests with the Custom namespace enabled for the RTD. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has different operational requirements, testing should be performed to determine how a proposed system will operate.

Tested FactoryTalk Linx Gateway update rates for DDE service configured using a FactoryTalk Application

- Example test for DDE using folders with scalar data:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
500	0.5	0.8
1,000	0.5	0.8
1,500	0.5	0.8
2,000	0.5	0.9
2,500	0.5	1.0
3,000	0.5	1.2
3,500	0.5	1.4
4,000	0.5	1.8

NOTE: This data was based on tests with the Folder with scalar data enabled for the DDE. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has different

operational requirements, testing should be performed to determine how a proposed system will operate.

- Example test for DDE using custom namespace:

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
500	0.5	1.8
1,000	0.5	1.9
1,500	0.5	1.9
2,000	0.5	1.9
2,500	0.5	1.9
3,000	0.5	1.9
3,500	0.5	1.9
4,000	0.5	2.1

NOTE: This data was based on tests with the Custom namespace enabled for the DDE. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has different operational requirements, testing should be performed to determine how a proposed system will operate.

Tested FactoryTalk Linx Gateway update rates for OPC DA service configured using a standalone data source

- Example test for OPC DA service

Number of Active Tags	Requested Rate (s)	Achieved Update Rate (s)
1,000	1	1
3,000	1	1
5,000	1	1
10,000	1	1
20,000	1	1
50,000	1	1
100,000	1	1
120,000	1	1
150,000	1	1
200,000	1	2

NOTE: This data was based on tests with the OPC DA enabled for the standalone data source. This data is provided as an example to show how tag quantity will impact the speed that data can be delivered. The test did not verify all value changes that were delivered. Because each system has

different operational requirements, testing should be performed to determine how a proposed system will operate.

These values are tested on a computer with Win 10 enterprise 64 bit, 8G RAM, Intel® Xeon® CPU, E5-2699A v4 @ 2.40 GHz 2.39 GHz 4v CPU.

Software requirements

FactoryTalk Linx Gateway was tested on the following operating systems:

- Windows Server® 2022
- Windows Server 2019
- Windows Server 2016
- Windows 11 (v21H2 and v22H2)
If you use FactoryTalk Services Platform on Windows 11, you must update Windows 11 with patch KB5008215.
- Windows 10* (v21H2 and v22H2)
FactoryTalk Services Platform adopts .NET 4.8 which is only supported on Windows 10 v1803 and later.
- Windows 10 IoT Enterprise 2021 Long-Term Servicing Channel (LTSC)
- Windows 10 IoT Enterprise 2019 Long-Term Servicing Channel (LTSC)

*For additional information about Windows 10 Support for the FactoryTalk Suite of Rockwell Software® products, refer to Knowledgebase Document ID: [IN4493 - Windows 10 Support for the FactoryTalk Suite of Rockwell Software products](#).

Software compatibility

FactoryTalk Linx Gateway version 6.40.00 is compatible with these Rockwell Software products:

- FactoryTalk Activation Manager version 5.01.00
- FactoryTalk Services Platform version 6.40.00
- FactoryTalk View version 14.00.00
- FactoryTalk Linx version 6.40.00

Prerequisite software

FactoryTalk Linx Gateway Setup wizard supports to automatically install a series of Rockwell software and the necessary prerequisite software, including:

Rockwell Software

- FactoryTalk Services Platform version 6.40.00
- FactoryTalk Activation Manager version 5.01.00
- FactoryTalk Alarms and Events version 6.40.00
- FactoryTalk Linx version 6.40.00
- Rockwell Automation x64 Driver v2.03.11

Prerequisite software

- FactoryTalk Diagnostics version 6.40.00
- Microsoft .NET Framework 4.8
- Microsoft Visual C++ 2015-2022 Redistributable (x86) 14.36
- Microsoft Visual C++ 2015-2022 Redistributable (x64) 14.36
- Microsoft ODBC Driver 18.0 for SQL Server (x86) 18.2.2.1
- Microsoft ODBC Driver 13.1 for SQL Server (x64) 18.2.2.1
- OPC .NET API 2.01
- Windows Firewall Configuration Utility 1.00.17
- Wibu CodeMeter Runtime Kit v7.60
- Microsoft Edge WebView2 Runtime 102.0

System features

FactoryTalk Linx Gateway version 6.00.00:

- Adds OPC UA data access (non-secured endpoint).
- Provides read access to CIP Energy Object information.

FactoryTalk Linx Gateway version 6.10.00:

- Supports FactoryTalk Security to control configuration access/changes.
- Supports FactoryTalk Audit tracking for configuration changes.
- Supports OPC UA Secured endpoints with signing and encryption.

FactoryTalk Linx Gateway version 6.20.00:

- Adds the ability to read/write device data (e.g. PowerFlex Drive, E300 Motor Protector, etc.) using FactoryTalk Linx CIA Messaging. FactoryTalk Linx Gateway also provides the ability to control access to this option.
- Adds the ability to allow OPC UA clients accessing multiple values of an array tag in a single action by configuring the "Index Range" parameter. For example, add an item [shortcut]Tag with index range 1:3 returns the values of Tag[1], Tag[2], and Tag[3] together.
- Adds the ability to allow OPC UA clients to directly access the tag information without browsing the tag in a client application. This is achieved by accessing the tag by entering the object node ID.
- Supports customized outgoing certificate, import and the ability to create a certificate signing request for external Certificate Authority (CA) to sign.
- Adds the ability to allow users to choose the specific activation that will be requested on startup.

FactoryTalk Linx Gateway version 6.21.00:

- Adds the ability to support tag list to view and edit the tag group, add tags to tag group and set tag access rights. The tag list supports complex types using array and structures, including the ability to import and export the configuration and includes an option to manually refresh the namespace available to an OPC UA Client when changes are made to the tag list or in other parts of the system (for example, Logix on-line changes).
- Adds new activation type, which is FactoryTalk Linx Gateway Extended, with capacity of 15,000 tags.
- Supports CompactLogix5480 Windows Core embedded activation, with a capacity of 500 tags.
- Adds the ability to support configuration changes without requiring Admin rights.

- Adds the ability to change the Namespace Index that OPC UA clients will utilize when accessing the FactoryTalk Linx Gateway's data model when no tag groups or lists are configured. The user interface provides an option to select a Namespace Index of (2 or 3). Beginning with version 6.20.00, the namespace index presented to OPC UA clients defaults to 2. In previous versions, 3 was the default.
- Adds configuration checks and informs the user when required configuration settings are incorrect or missing. (for example, UA enabled but no endpoint is defined, tag list selected but no tags configured, a client certificate is received but no client certificates are trusted).
- Adds a button on the FactoryTalk Directory scope selection dialog to navigate to the FactoryTalk Administration console where FactoryTalk Linx and other OPC DA/UA data sources can be configured.

FactoryTalk Linx Gateway version 6.30.00:

- Supports Chinese version.
- Adds an option to change the DA access setting on the **Server Configuration** tab after installation completes.
- Adds an option to include additional sub-element references (scalar, structure, or array) for all arrays in the namespace provided to OPC UA Clients.
- Adds the ability to include individual array sub-elements (scalar, structure, or array) in tag groups.
- Adds the ability to backup and restore configurations.
- Adds the ability to specify, refresh, import, or export OPC UA namespace index.
- Adds the ability to restart after the FactoryTalk Directory was restored.
- Updates installation option to diminish security risk by selecting **Gateway Server OPC DA and UA (only local DA clients)** or **Gateway Server OPC DA and UA (local or remote DA clients)** before installation.
- Adds the ability to limit access to security certificate management operations to administrators or individuals approved by an administrator to diminish security risk.
- Adds the ability to substantially improve or reduce the amount of time required to load tag information into the **Add Tag** dialog.
- Adds user interface warning when the configuration contains an invalid scope or a referenced workstation is renamed.
- Changes Professional activation tag limit from unlimited to 500,000.
- Encrypts the configuration files and does not support copying them to another computer. Instead, use the [Backup and Restore on page 80](#) function to reuse the configuration.
- Downgrades OPC UA service account to **Local Service**.
- Raises the default DCOM authentication level to Packet Integrity.

FactoryTalk Linx Gateway version 6.31.00:

- Adds a **Reversed Connection** option to enable a server to initiate the connection to an OPC UA client.
- Adds support for DDE and Excel RTD protocols.
- Adds Remote Proxy service that permits FactoryTalk Linx or RSLinx Classic on one computer to bridge through a central FactoryTalk Linx Gateway Professional workstation to communicate with automation system devices on a different network.
- Adds a Software Development Kit (SDK) that provides a collection of software development tools that permit custom-built software to communicate with automation equipment using an Application Program Interface (API) in FactoryTalk Linx.

- Adds support for a custom OPC UA namespace to create tag definitions for the OPC UA interfaces and bind or map them to system data points to provide consistent names for different components or to organize the data to comply with an industry standard.
- Adds support for a custom RTD/DDE namespace to create tag definitions for the DDE and Excel RTD interfaces and bind or map them to system data points to provide consistent names for different components or to limit the data an external DDE/RTD client can access.

FactoryTalk Linx Gateway version 6.40.00:

- Uses the Standalone OPC DA and DDE data Service to connect to the Logix series controller without requiring a FactoryTalk Application.
- Caches the UA server namespace for faster startup.
- Adds folders in the Custom UA namespace.
- Accesses bits within integers in UA tag list and custom namespace
- Allows the tag and data type to have the same name in the Custom UA Namespace.

Where to install FactoryTalk Linx Gateway

For FactoryTalk Local Directory applications and network station, you must install FactoryTalk Linx Gateway on the local computer.

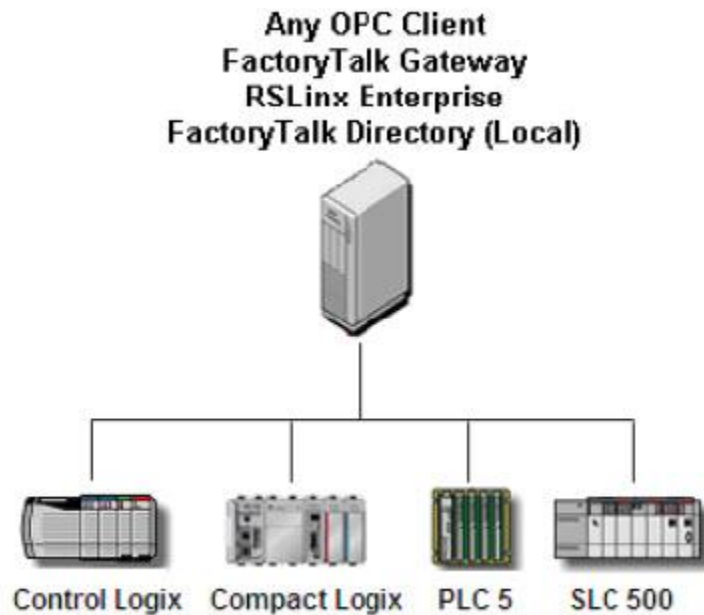
In a FactoryTalk Local Directory application and network station, all project information and security settings are located on a single computer, and the FactoryTalk-enabled system cannot be shared across a network. A FactoryTalk Linx Gateway Local Directory and network station, however, can support remote OPC clients. Products such as FactoryTalk View Site Edition (SE) Station and RSLogix use the Local Directory.

A FactoryTalk application directories can be configured as Local, Network Station, or Network Distributed. These options are determined by the capabilities defined by the license/activation that is being used.

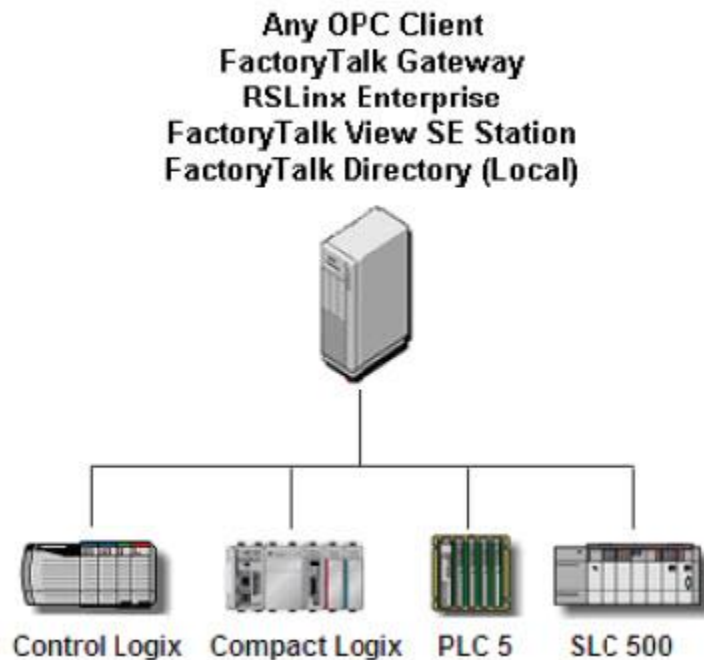
1. Local – Small application where the FactoryTalk Linx or FactoryTalk Linx OPC UA Connector communications service is operated on the same workstation with FactoryTalk Linx Gateway. A local application is configured with a single level where all communications services are defined at the same top level (no areas are supported).
2. Network Station – This configuration uses the Network directory, with all of the communications services defined on the same workstation with FactoryTalk Linx Gateway. A network station application permits areas to be created to improve the organization of the application (This type of configuration can be used with software like FactoryTalk View SE Station or FactoryTalk Historian which does not support Local directory).
3. Network Distributed – This type of directory permits communications services to be located on multiple / different workstations from FactoryTalk Linx Gateway. Up to ten (10) of each type of communications services (FactoryTalk Linx and FactoryTalk Linx OPC UA Connector) can be defined in a system. These communications services can be configured as redundant to support high availability configurations (This type of configuration can be used with software like FactoryTalk View SE Distributed).

Depending on your requirements, FactoryTalk Linx Gateway installation options for Local FactoryTalk Directory applications include the following:

To use FactoryTalk Linx as a data server to HMI and other third-party OPC clients, FactoryTalk Linx Gateway, FactoryTalk Linx, and FactoryTalk Directory are installed on the same machine as shown in the following diagram:



For FactoryTalk View Site Edition (SE) applications that need to serve OPC data, FactoryTalk View SE Station can also be installed on the same machine, as shown in the following diagram. This also provides the benefit of FactoryTalk View SE Station features, such as alarm and derived tags and direct references. Plus, either FactoryTalk Linx or FactoryTalk View SE Station can be used as a data server.



For FactoryTalk Network Directory applications, you can install FactoryTalk Linx Gateway on any computer.

A FactoryTalk Network Directory organizes project information and security settings from multiple FactoryTalk-enabled products across multiple computers on a network. When a Network Directory is configured on a computer,

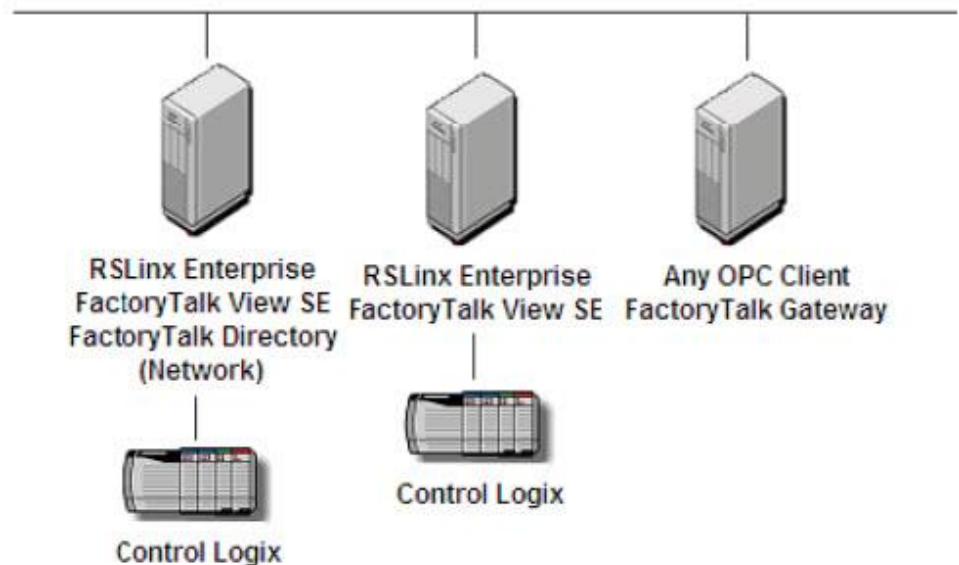
that computer can then be used as a Network Directory Server, or it can be made a client of a Network Directory Server configured on a different computer on the network. Products such as FactoryTalk View SE Distributed and FactoryTalk Transaction Manager use the Network Directory.



Tip: In FactoryTalk Network Directory applications, you can choose from multiple computers to install FactoryTalk Linx Gateway. It is recommended that you install FactoryTalk Linx Gateway and the client on the same computer, instead of using Remote OPC across the network. Because FactoryTalk Live Data is used as the network protocol in what is considered to be a more robust and secure fashion than Remote OPC.

Depending on your requirements, FactoryTalk Linx Gateway provides many installation options for FactoryTalk Network Directory applications.

To connect to multiple FactoryTalk Linx servers or multiple FactoryTalk View SE Distributed servers, FactoryTalk Linx Gateway, FactoryTalk Linx, and FactoryTalk Directory can be distributed over different machines, as shown in the following diagram:



In this example, one FactoryTalk Linx Gateway is serving all clients. If a system requires 32,000 or more tags, use a no fixed limit tag activation and refer to the **FactoryTalk Linx Gateway Release Notes > Application Notes** for tested hardware and update rates.

You can have multiple FactoryTalk Linx Gateway servers point to the same scope in the same FactoryTalk Directory to provide redundancy for each other. The client code controls the switching between the FactoryTalk Linx Gateway servers.

FactoryTalk Linx Gateway supports redundant FactoryTalk Linx data servers and HMI servers. Refer to the FactoryTalk Services Platform Help for more information.

About Remote FactoryTalk Linx Gateway

Remote FactoryTalk Linx Gateway enables an OPC DA client to access a remote OPC DA server like FactoryTalk Linx Gateway without installing Rockwell Automation software on the OPC DA client computer. It is intended for use with OPC DA clients that do not support server enumeration and cannot discover or identify remote OPC DA servers.

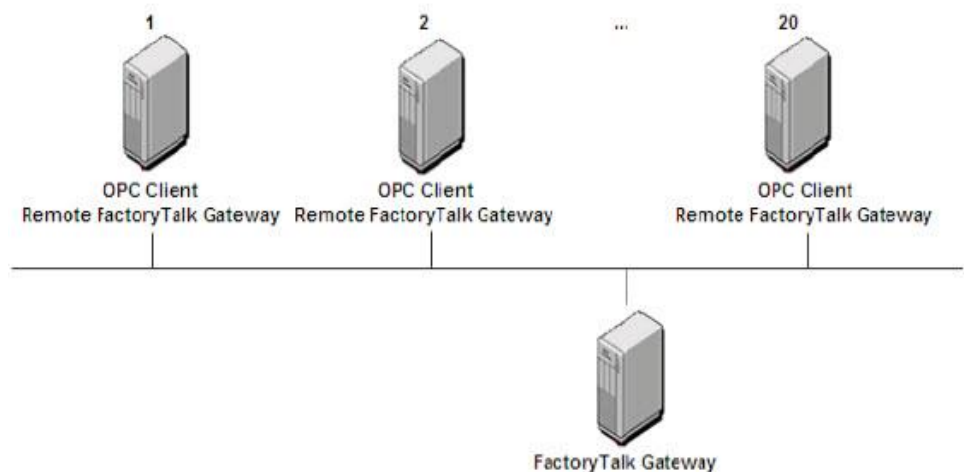
During the install, the Remote FactoryTalk Linx Gateway installer configures the Windows Firewall and security settings to allow DCOM communications between the OPC DA client and Remote FactoryTalk Linx Gateway.

Remote FactoryTalk Linx Gateway does not have a configuration interface. Remote FactoryTalk Linx Gateway does not support connections to OPC UA servers. A Remote FactoryTalk Linx Gateway installation is not required for an OPC UA client on one workstation to connect to the FactoryTalk Linx Gateway OPC UA service on another workstation.

Where to install Remote FactoryTalk Linx Gateway (OPC DA client computer configuration)

Install Remote Gateway (DA Client remote configuration) on page 28 on the same computer as an OPC DA client that does not support server enumeration.

Shown below are multiple OPC DA clients connecting to a single FactoryTalk Linx Gateway OPC DA server. Remote Gateway (DA Client remote configuration) is installed once per computer that hosts an OPC DA client.



Configure Windows firewall for Remote FactoryTalk Linx Gateway

If you install Remote FactoryTalk Linx Gateway on page 28 on a remote third party OPC client, you need to configure Windows firewall to allow connections with the FactoryTalk Linx Gateway server. This is automatically configured after installation of FactoryTalk Gateway version 3.90.00 and later. If you want to verify the setting or make changes, follow the steps below.



Tip: The following procedure applies Windows Server 2012.

To configure Windows firewall:

1. Select **Start > Control Panel > System and Security** (View by: Category).
2. In the **Windows Firewall** section, click **Allow a program through Windows Firewall**.

For Windows 10 or Windows Server 2016, Type **Allow an app through Windows Firewall** in the **Windows Search** field, and then press **Enter**.

3. In the **Allowed Programs and features** list, verify the program **OPCTest.exe** which FactoryTalk Linx Gateway provided, or your own application for remote connecting, is in the list. If you cannot find it in the list, you can click **Allow another program** to browse and add it to the allowed programs list.
4. Click **OK** to save the changes and close the dialog box.

Install FactoryTalk Linx Gateway

You can install one or more Rockwell Automation software products to a single personal computer.

IMPORTANT: The user installing or configuring FactoryTalk Linx Gateway must have administrative rights in Windows on the computers where the software is being installed or configured. The Windows domain Administrator account has these rights, for example.

To install FactoryTalk Linx Gateway software:

1. Start your Windows operating system.
2. Insert the FactoryTalk Linx Gateway DVD into the DVD-ROM drive.
3. (optional) If **FactoryTalk Linx Gateway Setup** does not appear, start the setup utility:
 - a. In Windows, select **Start > Run**.
 - b. In **Open**, type `x:\setup`, where x is the letter of the drive containing the FactoryTalk Linx Gateway DVD-ROM, and then click **OK**.
 - c. If Microsoft .NET Framework 4.0 or later is not installed on your computer, the **Microsoft .NET Framework Setup** dialog box shows. Click **Install**.
4. In **FactoryTalk Linx Gateway Setup**, select a product to install from the drop down list. The available products are:
 - **All Gateway services (OPC DA local and remote clients)**
Installs OPC DA, OPC UA, DDE, Excel RTD, and Remote Proxy Services. The OPC DA service logs on using the Local System account and adds **ANONYMOUS LOGON** and **Everyone** to the DCOM security configuration to enable the remote clients.
 - **All Gateway services (OPC DA local clients only)**
Installs OPC DA, OPC UA, DDE, Excel RTD, and Remote Proxy Services. DCOM remote access permissions are disabled.
Select **All Gateway services (OPC DA local and remote clients)** or **All Gateway services (OPC DA local clients only)** to install FactoryTalk Linx Gateway and all supporting FactoryTalk software on this computer. FactoryTalk Linx Gateway serves FactoryTalk application data from this computer to OPC DA and UA clients.
 - **Remote Gateway (DA Client remote configuration)**
Does not install services. Adjusts the computers' Windows Firewall settings for an OPC DA client to communicate to FactoryTalk Linx Gateway on a different computer.
Select **Remote Gateway (DA Client remote configuration)** to install Remote FactoryTalk Linx Gateway. No other FactoryTalk software is installed on this computer. Remote FactoryTalk Linx Gateway enables

an OPC DA client on this computer to access a remote OPC DA server. It is intended for use with OPC DA clients that do not support server enumeration and cannot discover or identify remote OPC DA servers. The OPC test client will be installed, and the installer will configure the Windows Firewall settings to allow the opctest.exe and TCP port 135 during installation.

5. Choose either:
 - **Install Now:** Install FactoryTalk Linx Gateway and prerequisite software to the default installation directory: **C:\Program Files (x86)\Rockwell Software**.
 - **Customize:** Specify which software should be installed and select a different installation directory, then click **Install**.
6. In **End-User License Agreements**, read the agreements, then select **Accept all** to continue the installation, or click **Decline** to return to the previous page.
7. (optional) If prompted to restart your computer during the installation, click **Restart now** to restart your computer and continue the installation, or **Restart later** to suspend and exit the installation.
8. If you are installing FactoryTalk Linx Gateway, **Almost there** appears. Select one of the following options, then click **Next**.
 - Select **Activate your software** to activate FactoryTalk Linx Gateway now.
 - Select **Skip activation** to activate FactoryTalk Linx Gateway later using FactoryTalk Activation Manager. For more information, refer to [About Activations on page 92](#).
If you are installing Remote Gateway, no activation is required.
9. In **That's it!**, click **Restart now** to restart your computer and continue the installation, or **Restart later** to exit the installation. You must restart your computer before using FactoryTalk Linx Gateway. Meanwhile, you can also:
 - Click **Installation Summary** to see the installation details.
 - Click **Register for updates** to learn how to receive email updates about product patches.
 - Click **Download it free** to install Adobe Acrobat Reader. Adobe Acrobat Reader is required to open the *FactoryTalk Linx Gateway Getting Results Guide* and other documents.
10. The FactoryTalk Linx Gateway installation is complete. When you finish installing the software, remove the FactoryTalk Linx Gateway DVD from the DVD-ROM drive, and store it in a safe place.

Change DA access

After installation completes, FactoryTalk Linx Gateway supports changing the DA access setting in the **Server Configuration** tab when the current FactoryTalk Linx Gateway Configuration is relaunched as administrator.

- Go to **Start> FactoryTalk Linx Gateway Configuration> Run as administrator**.



Tip: This configuration will not be backed up.

Uninstall FactoryTalk Linx Gateway

To uninstall FactoryTalk Linx Gateway software, do any of the following:

- Open **Programs and Features** in Windows **Control Panel**, right-click FactoryTalk Linx Gateway and then click **Uninstall**.
- Open Setup.exe, and then click **modify** or **uninstall**.
- Open the **Command Prompt** window and type a command with the following syntax:

```
Setup.exe [/Q | /QS] /Uninstall /Product="Gateway Server OPC UA and DA (local  
or remote DA clients)"
```

NOTE: Components, such as FactoryTalk Activation Manager, that are shared with other products will not be uninstalled.

For more information about command-line parameter, see [Parameters on page 98](#).

Update an existing installation

Before you begin to upgrade FactoryTalkLinx Gateway

Note the following before upgrading FactoryTalk Linx Gateway:

- The user installing or configuring FactoryTalk Linx Gateway must have administrative rights in Windows on the computers where the software is being installed or configured.
- If you upgrade from RSOPC Gateway 1.00 (CPR 7), do not use **Add/Remove Programs** from Windows **Control Panel** to uninstall RSOPC Gateway 1.00 (CPR 7). Using this method to remove RSOPC Gateway 1.00 (CPR 7) deletes RSOPC Gateway 1.00 (CPR 7) configuration files.
- If you upgrade from FactoryTalk Gateway v3.90 or earlier to FactoryTalk Linx Gateway v6.00 or later, uninstall FactoryTalk Gateway using **Add/Remove Programs** before installing FactoryTalk Linx Gateway.

Upgrade FactoryTalk Linx Gateway

Perform the following steps to upgrade to the latest version of FactoryTalk Linx Gateway:

1. Stop the FactoryTalk Linx Gateway services by selecting the **Inhibit** checkbox in **FactoryTalk Linx Gateway Configuration Tool > Server Configuration**.
2. If FactoryTalk Diagnostics Counter Monitor is running, exit the program.
3. Close the **FactoryTalk Linx Gateway Configuration Tool**.
4. Insert the FactoryTalk Linx Gateway product DVD. Perform the installation steps as presented on the screen.
5. Restart your computer.

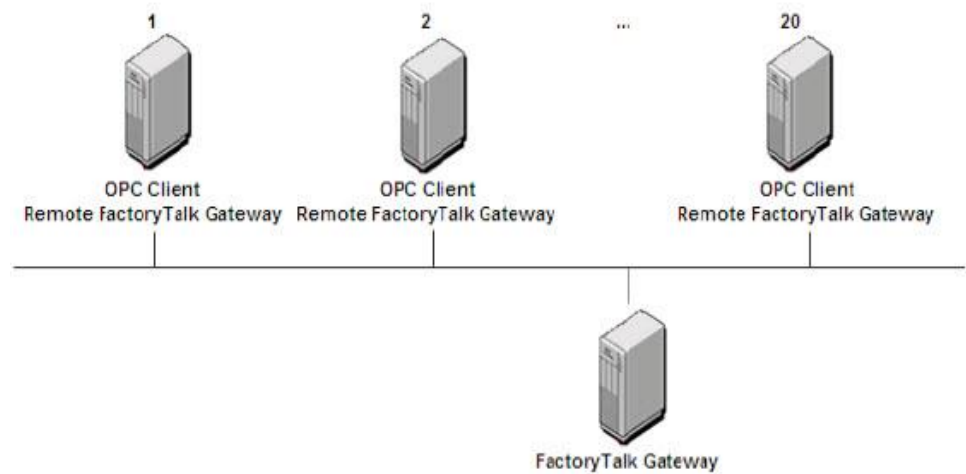
NOTE: You must restart your computer after installing Rockwell Automation software products. If you are installing multiple products, you must restart your computer after all of the products are installed.

Install Remote FactoryTalk Linx Gateway

Remote FactoryTalk Linx Gateway enables an OPC DA client to access a remote OPC DA server like FactoryTalk Linx Gateway without installing Rockwell Automation software on the OPC DA client computer. It is intended for use with OPC DA clients that do not support server enumeration and cannot discover or identify remote OPC DA servers.

Remote FactoryTalk Linx Gateway does not have a configuration interface. Remote FactoryTalk Linx Gateway does not support connections to OPC UA servers.

Shown below are multiple OPC DA clients connecting to a single FactoryTalk Linx Gateway OPC DA server. Remote FactoryTalk Linx Gateway is installed once per computer that hosts an OPC DA client.



To install Remote FactoryTalk Linx Gateway, select **Remote Gateway (DA Client remote configuration)** in **FactoryTalk Linx Gateway Setup**, then follow the installation instructions.

Start FactoryTalk Linx Gateway and explore the user interface

This chapter includes the following information:

- Application authentication level for DCOM security
- Starting FactoryTalk Linx Gateway
- About the FactoryTalk Linx Gateway Configuration dialog box

DCOM security

In response to Microsoft Distributed Component Object Model (DCOM) Hardening patch (MS KB5004442), the minimum DCOM authentication level used by Rockwell Automation products was raised to Packet Integrity.

IMPORTANT: Installing this product's latest version with earlier unpatched versions of other FactoryTalk products or products using Classic OPC DA connections may cause a loss of connectivity due to the difference in DCOM authentication level used. For additional information, see the Knowledgebase Document ID: [IN39461 - Microsoft DCOM Hardening Information TOC](#).

Microsoft releases the DCOM Hardening patch in response to CVE-2021-26414. This patch elevates the minimum DCOM authentication level that is required to establish a DCOM connection. DCOM is used by many Rockwell Automation products and may be affected by the change that is made by the Microsoft patch. For additional information about the affected Rockwell Automation products, see the Knowledgebase Document ID: [PN1581 - Product Notification 2022-01-001 - Rockwell Automation products unable to establish proper DCOM connection after installing Microsoft DCOM Hardening patch \(MS KB5004442\)](#).

Impact on Rockwell Automation software

If computers within your network have installed the Microsoft patch, the DCOM authentication level of the client or server applications on these computers is required to update to `RPC_C_AUTHN_LEVEL_PKT_INTEGRITY`, while the authentication level of applications on other computers are not. As a result, the communication across the two types of computers will fail.



Tip:

- The distributed third-party OPC DA server and client applications are also impacted.
- To ensure proper communication, the authentication level of both the server application and the client application should be at the same level.

Solutions

We recommend installing the latest version of Rockwell Automation software or installing the patch for the corresponding software version.

To avoid the compatibility issue, make sure all Rockwell Automation applications you use are updated.

If any computers within your network have not installed the Microsoft patch or some Rockwell Automation applications are not updated to the latest version, you can lower the DCOM application authentication level on all computers. To do so, do one of the following:

- Remove the Microsoft DCOM patch from all workstations in the system.
- Switch the DCOM authentication level on all workstations in the system using one of the following methods:
 - Use **Registry Editor**.
 - FactoryTalk software
 - Open **Registry Editor**, select **HKEY_LOCAL_MACHINE > SOFTWARE > WOW6432Node > Rockwell Software > FactoryTalk > Platform**, right-click **DCOMAuthLevel > Modify**, and then edit the **Value data** to 1. The default value after upgrading the Rockwell Automation application is 5 (RPC_C_AUTHN_LEVEL_PKT_INTEGRITY) and the former value is 1 (RPC_C_AUTHN_LEVEL_PKT_NONE).
 - RSLinx Classic software
 - Open **Registry Editor**, select **HKEY_LOCAL_MACHINE > SOFTWARE > WOW6432Node > Rockwell Software > RSLinx**, right-click **DCOMAuthLevel > Modify**, and then edit the **Value data** to 1. The default value after upgrading the Rockwell Automation application is 5 (RPC_C_AUTHN_LEVEL_PKT_INTEGRITY) and the former value is 1 (RPC_C_AUTHN_LEVEL_PKT_NONE).
 - Use the **DCOMAuthLevel** utility.
 - Open **DCOMAuthLevel**, select **None (for backward compatibility)**, and then click **OK**.



Tip:

- The authentication level lower than 5 will not be supported after installing the Microsoft patch.
- This utility will adjust the Authentication level for FactoryTalk Services Platform, FactoryTalk Live Data OPC DA client interface, FactoryTalk Linx Gateway OPC DA server interface, and RSLinx Classic's OPC DA server interface.
- The Windows Component Services DCOM configuration setting is not utilized or supported by FactoryTalk software or RSLinx Classic.

Workgroup and domain settings after the applications' authentication level is required to be updated


After the applications authentication level is adjusted to RPC_C_AUTHN_LEVEL_PKT_INTEGRITY, ensure all users in your network that contains Rockwell Automation software and third party OPC DA meet the requirement of DCOM for RPC_C_AUTHN_LEVEL_PKT_INTEGRITY:

- When working within a workgroup, each user needs to be created locally on each computer involved in the connection. Furthermore, each workstation in a workgroup must have the same user accounts, with the same user names and passwords on each machine for authentication to occur. A blank password is not valid in most cases. In some cases, even though the user account has administrative privileges, you might have the DCOM authentication problems, and we recommend that you use the Windows built-in administrator account to get it to work.
- When working within a domain, local users and groups are not required to be added to each computer. If working within a domain is preferred, a network administrator may have to implement changes.

For more information, see Microsoft documentation [How to Configure a Domain User or Group](#).

Open FactoryTalk Linx Gateway

Open FactoryTalk Linx Gateway by selecting **Start > Programs > Rockwell Software > FactoryTalk Linx Gateway**

Configuration. (Or click  on the FactoryTalk Administration Console menu bar.) The **FactoryTalk Linx Gateway Configuration** dialog box opens. The default setting exposes all projects in the directory under the Network node.



Tip: To start or stop the FactoryTalk Linx Gateway service, you must be a Windows Administrator or Power User of the computer.

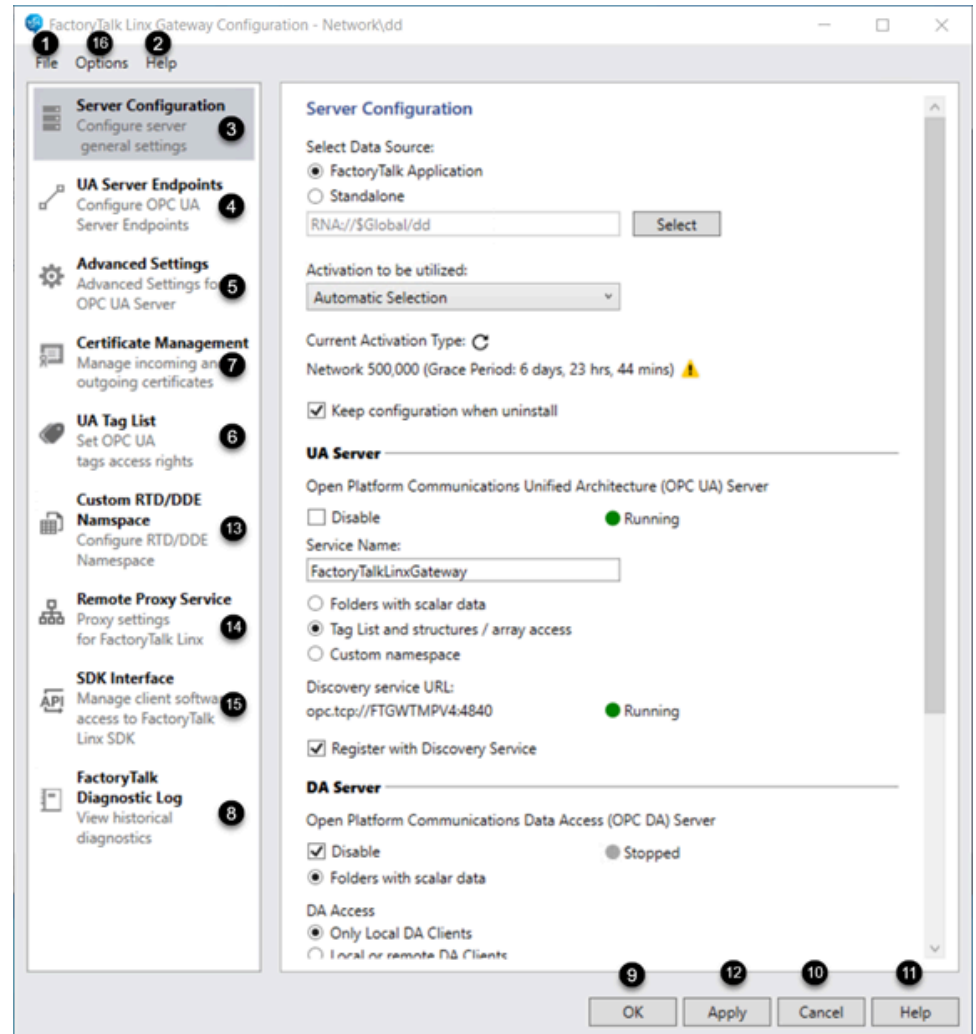
About the FactoryTalk Linx Gateway Configuration dialog box

The **FactoryTalk Linx Gateway Configuration** dialog box shows the Server Configuration, OPC UA Server Endpoints, software revision and activation information, and certificate and diagnostic information.

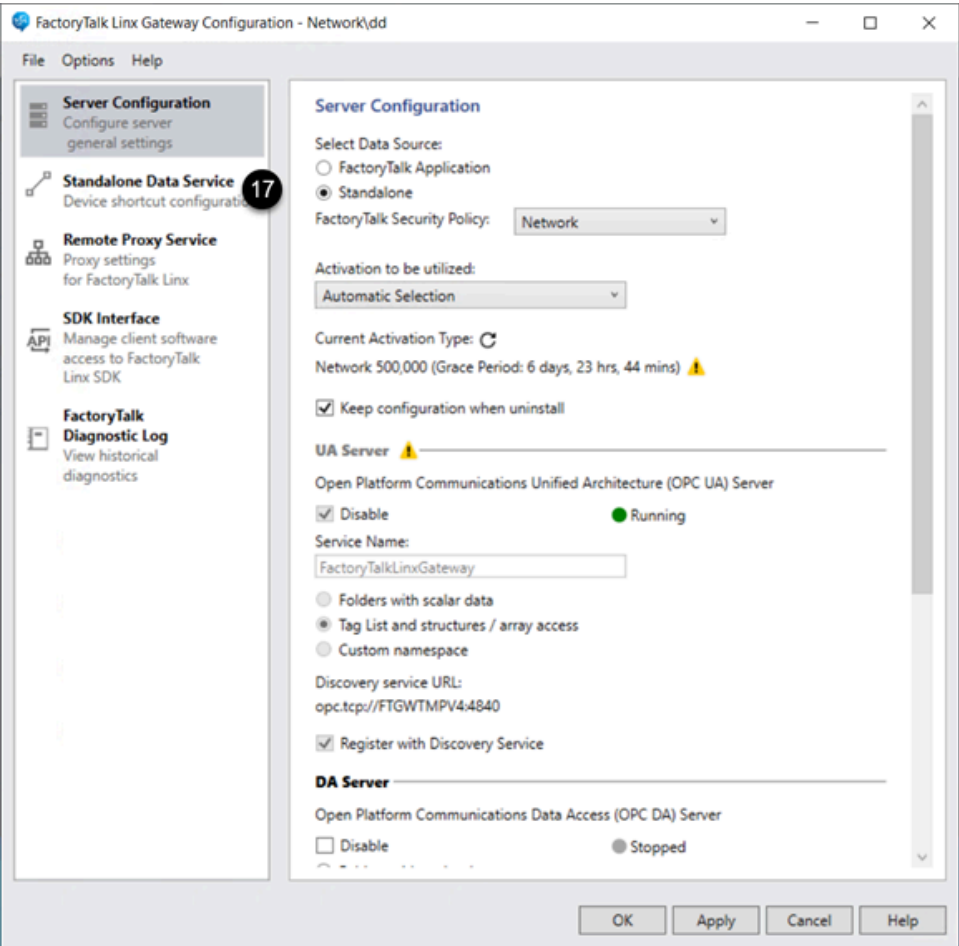
NOTE: If there is a possibility that a remote client can start the FactoryTalk Linx Gateway service, you must disable the FactoryTalk Linx Gateway service via the Windows Control Panel (or all of the OPC clients should be stopped or shut down) before you reconfigure the scope. This will prevent the service from automatically starting while you are making changes to the scope configuration. The default DCOM settings prohibit launching the FactoryTalk Linx Gateway remotely and is the recommended setup.

The **FactoryTalk Linx Gateway Configuration** supports using the FactoryTalk Application and Standalone to access data.

If you select **FactoryTalk Application**, it shows the following information:



If you select **Standalone**, it shows the following information:



Item	Description
1	The File button contains information about: <ul style="list-style-type: none">Log OnLog OffExit FactoryTalk Linx Gateway Configuration.
2	The Help button contains information about: <ul style="list-style-type: none">Release Notes.Help ContentSoftware version number.ActivationCopyrightContact information
3	The Server Configuration tab contains information about: <ul style="list-style-type: none">Data source selection.OPC UA server name, status, OPC discovery service URL, status, and service inhibit checkbox.OPC DA server status and service inhibit checkbox.

Item	Description
4	<p>The UA Server Endpoints tab contains information about:</p> <ul style="list-style-type: none"> • OPC UA server name, port, and URL. • Security mode and policy. • Authentication settings. • Diagnostic logging settings.
5	<p>The Advanced Settings tab contains information about:</p> <ul style="list-style-type: none"> • OPC UA namespace index configuration. • Create additional references for each array element in the OPC UA namespace.
6	<p>Depending on the UA Server namespace configuration, one of the following tabs will be available to modify the namespace.</p> <p>The UA Tag List tab contains information about:</p> <ul style="list-style-type: none"> • Set tag group, add tags to tag groups • Access of tags • Data type in UA Tag List and OPC UA/DA Client <p>The Custom UA Namespace tab contains information about:</p> <ul style="list-style-type: none"> • The Data Model pane • The Namespace pane • The Namespace Properties pane • The Tag Browser pane <p>Use the Custom UA Namespace editor to create tag definitions for the OPC UA interfaces and bind or map them to system data points to provide consistent names for different components or to organize the data to comply with an industry standard.</p>
7	<p>The Certificate Management tab contains information about:</p> <ul style="list-style-type: none"> • Incoming certificate import, reject, trust, and remove button. • Outgoing certificate regenerate button. • Certificate properties
8	<p>The FactoryTalk Diagnostic Log tab contains information about:</p> <ul style="list-style-type: none"> • FactoryTalk Diagnostics information.
9	Click OK to apply the changes and restart FactoryTalk Linx Gateway service.
10	Click Cancel to close the dialog box.
11	Click Help to access the FactoryTalk Linx Gateway Help.
12	Click Apply to save the server configuration.
13	<p>The Custom RTD/DDE Namespace tab contains information about:</p> <ul style="list-style-type: none"> • The Data Model pane • The Tags Properties pane • The Tag Browser pane

Item	Description
	Use the Custom RTD/DDE Namespace editor to create tag definitions for the Excel RTD and DDE interfaces and bind or map them to system data points to provide consistent names for different components or to provide a limited list of tags that can be accessed from an external DDE or Excel client.
14	<p>The Remote Proxy Service tab contains information about:</p> <ul style="list-style-type: none"> Activation status Enable access to the SDK Interface <p>Proxy service allows FactoryTalk Linx on one computer to bridge through a central FactoryTalk Linx Gateway Professional workstation on the network to communicate with automation system devices on a different network.</p>
15	<p>The SDK Interface tab contains information about:</p> <ul style="list-style-type: none"> Activation status Enable access to the SDK Interface <p>Starting from version 6.31, the FactoryTalk Linx Software Development Kit (SDK) provides a collection of software development tools that permit custom-built software to communicate with automation equipment using an Application Program Interface (API) in FactoryTalk Linx.</p>
16	<p>The Options button contains information about:</p> <ul style="list-style-type: none"> Language <p>Use this option to customize the software language.</p>
17	<p>The Standalone Data Service tab contains information about:</p> <ul style="list-style-type: none"> The Device shortcut configuration pane The Network Browser pane The Properties pane <p>Use the Standalone Data Service to access tags directly from Logix 5000 controllers without using without creating FactoryTalk applications and FactoryTalk Linx servers.</p>



Tip: The red boxes and text indicate the configuration is incomplete or invalid and requires changes to permit normal operation.

Server Configuration

Use **Server Configuration** to set FactoryTalk application scope and global server properties for the FactoryTalk Linx Gateway service.

Global Settings

Field	Description
Select Data Source	<p>Sets the data source.</p> <ul style="list-style-type: none"> FactoryTalk Application This option will utilize FactoryTalk Live Data to communicate to FactoryTalk Linx servers defined in a FactoryTalk Application. Choose this option to access tags via an existing FactoryTalk application which is created in FactoryTalk View Studio or FactoryTalk, and tags from that application are accessible to clients. You must configure the FactoryTalk Directory Scope to use the enabled UA, DA, DDE, or RTD Server. Processor, Redundant, Symbolic, EDS Parameter, and CIP Object shortcuts are supported. Standalone Choose this option to access tags directly from Logix 5000 controllers without using without creating FactoryTalk applications and FactoryTalk Linx servers. However, when Standalone is selected, a FactoryTalk Linx service is configured within FactoryTalk Linx Gateway on the same computer. The Standalone Data Service supports the OPC DA server and DDE server. You must select a FactoryTalk Security Policy: <ul style="list-style-type: none"> Network Local Only the Processor shortcut is supported, and it can only reference a Logix controller.
Activation to be utilized	Lists all the activation types. The default option is "Automatic Selection" which FactoryTalk Linx Gateway selects the activation that supports the most tags.
Current Activation Type	A status shows the activation utilized.
Keep configurations when uninstall	<p>Retains configuration when FactoryTalk Linx Gateway is un-installed.</p> <p>The files are saved in C:\ProgramData\Rockwell\FactoryTalk Linx Gateway</p>

UA Server Settings

Field	Description
Service Name	Sets the OPC UA service name visible to OPC UA clients.
Disable	<p>Disables or enables the OPC UA service.</p> <ul style="list-style-type: none"> Checked: Disables the OPC UA service from operating. Unchecked: Enables the OPC UA service. (default) <p>Tip: To restart the service, select the Disable check box, and then apply the change. Once the service is stopped, clear the</p>

Field	Description
	Disable checkbox, and then apply the change to restart the service.
Folders with scalar data	Allows OPC UA Clients to access all data as scalar from all FactoryTalk application sources.
Tag List and structure / array access	Controls which FactoryTalk Application data are accessible to specific OPC UA Clients and to access complex types using structures (Logix UDTs) and arrays. When enabled, OPC UA Clients will be limited to the items selected on the UA Tag List tab.
Custom namespace	Permits the creation of user defined structures and tags within FactoryTalk Linx Gateway and assigns these definitions to tag data from FactoryTalk application data sources. This allows you to reorganize or remap the underlying information to support a different naming convention often required to support OPC UA Companion data models.
Discovery service URL	Lists the URL at which the OPC UA service can be accessed. Tip: Copy the URL text into the OPC UA client that accesses information from the FactoryTalk Linx Gateway OPC UA service.
Register with Discovery Service	Sets whether the OPC UA service is listed as part of the local OPC UA discovery service.

DA Server Settings

Field	Description
Disable	<p>Disables or enables the OPC DA service.</p> <ul style="list-style-type: none"> Checked: Disables the OPC DA service from operating. Unchecked: Enables the OPC DA service. (default) <p>Tip: If the system only utilizes one of the OPC services, We recommends that you disable the other service to reduce the impact on the host computer and eliminate unwanted communications.</p> <p>To restart the service, select the Disable check box, and then apply the change. Once the service is stopped, clear the Disable checkbox, and then apply the change to restart the service.</p>

Field	Description
DA Access	<p>Changes the DA access after installation. This setting is only available when the current FactoryTalk Linx Gateway Configuration is relaunched as administrator.</p> <ul style="list-style-type: none"> Selects Only local DA clients to allow DA client and FactoryTalk Linx Gateway to operate on the same computer. Selects Local or remote DA clients to allow DA client to operate on the same or on a remote computer. If this is selected, security risk might occur with higher DCOM privilege. <p>Tip: This configuration will not be backed up.</p> <p>For more information about DCOM authorization level change, see Application authentication level for DCOM security on page 34.</p>

Excel RTD Interface Settings

Field	Description
Disable	<p>Disables or enables the Excel RTD interface.</p> <ul style="list-style-type: none"> Checked: Disables the Excel RTD interface from operating. (default) Unchecked: Enables the Excel RTD interface. <p>Tip: To restart the service, select the Disable check box, and then apply the change. Once the service is stopped, clear the Disable checkbox, and then apply the change to restart the service.</p>
Folders with scalar data	Allows Excel to access all data as scalar from all FactoryTalk application sources.
Custom namespace	Permits the creation of user defined structures and tags within FactoryTalk Linx Gateway and assigns these definitions to tag data from FactoryTalk application data sources. This allows you to reorganize or remap the underlying information to support a different naming convention often required to support OPC UA Companion data models.

DDE Interface Settings

Field	Description
Disable	<p>Disables or enables the DDE interface.</p> <ul style="list-style-type: none"> Checked: Disables the DDE interface from operating. (default) Unchecked: Enables the DDE interface. <p>Tip: To restart the service, select the Disable check box, and then apply the change. Once the service is stopped, clear the</p>

Field	Description
	Disable checkbox, and then apply the change to restart the service.
Folders with scalar data	Allows DDE clients to access all data as scalar from all FactoryTalk application sources.
Custom namespace	Permits the creation of user defined structures and tags within FactoryTalk Linx Gateway and assigns these definitions to tag data from FactoryTalk application data sources. This allows you to reorganize or remap the underlying information to support a different naming convention often required to support OPC UA Companion data models.

Data Model Options

Field	Description
Folders with scalar data	<ul style="list-style-type: none"> It is available for the OPC DA server, OPC UA server, Excel RTD Interface, and DDE Interface. All controller or system tags are accessible. The data type information is limited to the scalar items. Tag access control is limited by the controller only. Client can access bits from within an Integer tag,
Tag Lists	<ul style="list-style-type: none"> It is only available for the OPC UA server. It is limited to tags selected in the FactoryTalk Linx Gateway configuration. The scalar, structure, and array data type definition information is available to the OPC UA clients. Uses FactoryTalk Security Groups to authorize the individual OPC UA client access to groups. Tags excluded from the data model cannot be accessed through FactoryTalk Linx Gateway. Clients can only access bits from within an integer if the integer is included in a folder or structure.
Custom namespace	<ul style="list-style-type: none"> It is available for the OPC UA server, Excel RTD Interface, and DDE Interface. Using the FactoryTalk Linx Gateway configuration interface, customers can define a custom tag list and structures to map the underlying system data. This option provides the improved organization. Scalar, structure, and array type information is available to clients.

Field	Description
	<ul style="list-style-type: none"> All clients have the same access level. Tags excluded from the data model cannot be accessed through FactoryTalk Linx Gateway. Clients can only access bits from within an integer if bit is specifically added to the custom namespace.

UA Tag List

How do I open UA Tag List?

1. On the **Server Configuration** pane, select the **Tag List and structures / array access** checkbox under **UA Server**.
2. Click **UA Tag List** that shows on the left column.

The UA tag list configuration determines the data values that each OPC UA Client can access from FactoryTalk Linx Gateway. The UA tag list option provides both enhanced security and complex type information (for example, structures and arrays). When the UA tag list option is disabled, all tags that are available from data sources in a FactoryTalk Application (for example, controllers and hardware via FactoryTalk Live, OPC DA and OPC UA servers) are accessible as scalar values to OPC UA Clients. The UA tag list contains one or more tag groups that define access rights and includes complex type information enabling an OPC UA Client to utilize structures or User Defined Types (UDT) from Logix controllers.

Use **UA Tag List** to view and edit the tag group, add tags to the tag group and [set tag access rights on page 47](#).

FactoryTalk Linx Gateway provides the ability to create tag groups, which includes a subset of data tags in the FactoryTalk system and to add one tag to multiple tag groups. By configuring the tag group access rights with users, FactoryTalk Linx Gateway limits the OPC UA Client's access to this group of tags instead of exposing all the tags and manages accesses to different groups of clients. Users who are not given access to a tag group in FactoryTalk Security will have no access to the tags in the tag group.

UA Tag List is also required if the OPC UA Client needs to access structured type information.

Only the tags configured in the tag group can be added to namespace under the group folder.

FactoryTalk Linx Gateway adds the OPC UA namespace based on the groups configured in **UA Tag List**.

Use **UA Tag List** to add the following tags:

- Structure and array and its elements separately.

NOTE: If an element is added while the structure itself is not added, the structure will be added as a folder, and the rest elements under the structure will not be added automatically. If you add a structure or array in the **UA Tag List**, the exact structure or array will show in OPC UA Client.

- Scalar.

- Folder (for example, Shortcut to a Logix controller or program in a Logix controller and all its contents). OPC UA Client is able to find the tags under the folder in a real-time and dynamic way. When the tags in the **Tag Browsed** pane are changed, re-browse to find the updated tags.



Tip: You need to add all the items you want to access individually to the tag list.



Tip: The UA tag list does not support FactoryTalk Diagnostic Audit message.

Set up and use UA Tag List

Configure [UA Tag List on page 45](#) to add tags to groups, [set access right on page 47](#) and user group of tags, export and import tags, and enable client to monitor and edit tags.

Use the **Export** function to back up tags to a CSV file, which simplifies the operations of adding and editing multiple tags and tag groups.

Use the **Import** function to import tags and tag groups in bulk.

To add a tag group

1. Click + next to **Tag**



2. In the **Tag Group Setting** dialog box, define **Name**, **Description**, **Access Configuration**, and **Permission**.



Tip: For multiple tag groups, by clicking **Overview** under **Tag Groups**, FactoryTalk Linx Gateway supports batch editing of access rights and tag groups.

To add a tag to a tag group

1. Click **Add Tags**.
2. Expand the left pane's folder to locate a controller shortcut folder for data items within a controller navigate in into the shortcuts **Online** Folder and select the item(s) you want to add in the **Tag Browsed** pane.



Tip: You can select multiple items simultaneously in the **Tag Browsed** pane. Selecting a shortcut or Logix program, structure or array will result in all items associated within the selected item being included in the tag group.

3. In the **Tag Browsed** pane, click + to select the tag and click **Add**.



Tip: The number of total items of all tag groups should be no more than 300,000 or error message will appear and cannot apply the configuration. Recommend adding array, structure or folder to avoid the large number of items.

In the **Add Tag** window, the left side shows Folder and Structure. Array is listed in the right **Tag Browsed** pane.

The **Tag Browsed** pane only displays two access rights, ReadOnly and ReadWrite.



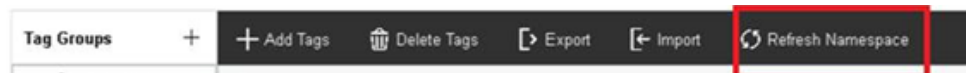
Tip:

- The access right column displays the level of access provided by the Logix controller associated with the shortcut in the configuration. Utilize Studio 5000 Logix Designer to modify the controller's tag settings.
- If the tags or folders added in the UA tag list are invalid, the user should delete them or they will be shown in the Client with bad quality.

Use **Refresh Namespace** to sync namespace if namespace or projects in controllers are edited or updated.

To refresh namespace

- Click **Refresh Namespace**.



Tip: When processing a namespace refresh operation, the UA tag list cannot be modified.

To stop a namespace Refresh operation

- At the bottom of the **FactoryTalk Linx Gateway Configuration** window, click **Stop refreshing**.

After the namespace refresh is stopped, the user can configure the UA tag lists and then restart refreshing.

When namespace refresh is finished, the UA tag list is refreshed and saved. Click **OK** or **Apply** to restart the service for the OPC UA Server to utilize the updated namespace.

Access configuration in UA Tag List

To improve security, set different accesses to each tag to different user groups.

Tags can be configured to be accessed by all users or a specific FactoryTalk Security group. If tags are assigned to a FactoryTalk Security group, when an OPC Client connects, its user ID and password are checked against FactoryTalk Security. If a valid user ID is provided, the security groups for the user are verified with the Security Groups associated with each tag group. If the user is in a security group authorized to access a tag group, the client is given access to the tags in the authorized tag groups.

To configure the tag group access

On the **Tag Group Setting** pane, under **Permission**,

- Select **All OPC UA client users can access**. All users can access this tag group.
Then under **Access Configuration**, select **Tags in group limited to read only** or **Tags in group support read/write**.
- Select **Limit to selected FactoryTalk User Groups**.

Only the users assigned to the certain user groups can access this tag group. The tag access rights of the users under the selected user group are defined in FactoryTalk Security.



Tip:

- At least one user group should be selected, otherwise all users will have access.
- If you configure user groups in FactoryTalk Administration Console while using **UA Tag List**, you need to restart FactoryTalk Linx Gateway Configuration to load the updated user groups.

Add Tag Group

Name

TagGroup01

Description

TagGroup01 description

Permission

☒ All OPC UA client users can access

☐ Limit to selected FactoryTalk User Groups

Access Configuration

☐ Tags in group limited to ready only

☒ Tags in group support read/write

Add

Cancel

Add Tag Group

Name

TagGroup01

Description

TagGroup01 description

Permission

☐ All OPC UA client users can access

☒ Limit to selected FactoryTalk User Groups

User Group	
Administrators	<input type="checkbox"/>
Authenticated Users	<input type="checkbox"/>
Engineers	<input checked="" type="checkbox"/>
Maintenance	<input checked="" type="checkbox"/>
Windows Administrators	<input type="checkbox"/>

Add

Cancel



Tip: Multiple OPC UA Clients can be configured in the same FT Security group. A FactoryTalk Linx Gateway tag group can be assigned to multiple FactoryTalk Security groups.

Multiple tags can be configured in a single FactoryTalk Linx Gateway tag group. The read/write access for tags is determined by the associated settings for the FactoryTalk Security group it is configured in.

The following table lists access configuration and results of tags when the UA tag list is enabled or disabled.

Desired access	Server Configuration OPC UA "Tag List and structures / array access" Setting	OPC UA Server Endpoint "Authentication" setting	Tag Group "Permission" setting
All tags from all data servers can be accessed by all clients	Disabled	Anonymous	N/A
All tags from all servers can be accessed by authenticated clients	Disabled	FactoryTalk Security	N/A
A limited set of tags can be accessed by all clients	Enabled	FactoryTalk Security	One or more tag groups with, "All OPC Client users can access" selected
Each client can access a different set of tags	Enabled	FactoryTalk Security	Multiple tag groups with "Limit to selected FactoryTalk User Groups" selected
Client can access bits from within an Integer tag	While not in the namespace, a client can append a period and a bit number the end of an integer tag's node ID.	Bits within integers are not in the namespace. For integers in a folder or a structure, a client can append a period and a bit number the end of an integer tag's node ID. Not supported for scalar items in the tag list.	User must manually create a custom namespace tag mapped to a bit in an integer by adding a period and bit number to the end of a mapped tag reference.

The following table describes how to configure the security options from the previous table.

Access configuration location and how to locate	Access configuration
Tag Group Setting page Click the UA Tag List on page 45 tab.	Select Read only or Read and Write under Access Configuration . Select a user group that is allowed to access the tags: <ul style="list-style-type: none"> All OPC UA client users can access Limit to selected FactoryTalk User Groups
Authentication Settings Click the UA Server Endpoints on page 63 tab and find in the Endpoints Properties pane.	Set access to users: <ul style="list-style-type: none"> Anonymous If the OPC UA endpoint is configured to accept Anonymous users and the tag group access is set as Limit to selected FactoryTalk User Groups on the Tag Group Setting pane, the

Access configuration location and how to locate	Access configuration
	Anonymous user should be added as a member of the selected FactoryTalk User Groups . Configure read and write access to CIA message in the UA Server Endpoints tab. <ul style="list-style-type: none">Authenticate with FactoryTalk Security
FactoryTalk Administration Console Open FactoryTalk Administration Console and expand System > Policies > Product Policies > FactoryTalk Linx Gateway . Double-click Feature Security .	Create a user in the desired FactoryTalk Security group for the OPC UA Client to use as its Login ID and Password. Set OPC UA Client Read and Write access to different user groups. See more in Authenticate an OPC UA client on page
Controller	The access set in the controller.

IMPORTANT: The final access right of a tag is determined by the intersection of all the access configuration results.

If a tag is set as Read Only in the controller and Read and Write in Tag Group, OPC UA Client will quote the access as Read and Write set in the Tag Group. However, the tag's actual access in OPC UA Client is Read Only, so it's unable to write.

NOTE: For Structure tag access right, if one element under the structure is set as Read Only, others are set as Read and Write, when clients try to write the structure, the element with the Read Only access fails to be written, while other elements are written successfully.

If an offline tag .ACD file contains tags with access right set to be None in the controller, when adding the .ACD file in OPC UA Servers and adding its tags to a tag group in **UA Tag List**, the offline tags' actual access is not able to be browsed in **Tag Browsed** pane.

Data type in UA Tag List and OPC UA/DA Client

The data type shown in the [UA Tag List on page 45](#) and **Tag Browsed** pane uses the type names utilized by Logix5000 which is somewhat different from the names defined by OPC UA and DA. To clarify the map of the data type shown in different applications, the following table lists the corresponding data type relationship.

UA Tag List	OPC DA	OPC UA
BOOL	VT_BOOL	Boolean
USINT	VT_UI1	Byte
SINT	VT_I1	SByte
INT	VT_I2	Int16
UINT	VT_UI2	UInt16
DINT	VT_I4	Int32
UDINT	VT_UI4	UInt32

LINT	VT_I8	Int64
ULINT	VT_UI8	UInt64
REAL	VT_R4	Float
LREAL	VT_R8	Double
STRING	VT_BSTR	String

Custom UA Namespace

How do I open Custom UA Namespace?

1. From the **Start** menu, select **Rockwell Software > FactoryTalk Linx Gateway Configuration**.
2. In the **Server Configuration** pane, under **UA Server**, select **Custom namespace**.

Use the **Custom UA Namespace** editor to create tag definitions for the OPC UA interfaces and bind or map them to system data points to provide consistent names for different components or to organize the data to comply with an industry standard.

If you do not use the **Tag Browser** to add or edit a tag in the **Custom UA Namespace** editor, you must ensure that the tag's data type is the same as the data source, such as the Logix controller, or OPC UA server connected via the FactoryTalk Linx OPC UA Connector.

If you change a tag's data type in a controller, you must ensure that the tag's data type in the **Custom UA Namespace** editor is the same as that in the controller. Otherwise, an error message "BadTypeMismatch" appears in the UA clients when a tag is requested, or a FactoryTalk Diagnostic message will be generated listing the type mismatch for a write operation.



Tip: Use **Ctrl**+rotate the mouse wheel to zoom in or zoom out the **Custom UA Namespace** tab.

Naming conventions in Custom UA Namespace

The following table shows the naming conventions in the **Custom UA Namespace**.

Type	Limitation	Maximum length	Case-sensitive (Yes or No)
Namespace name	The name must consist of any character from the following: <ul style="list-style-type: none"> • 0 - 9 • a - z • A - Z • - 	256	Yes
Tag name	The name must consist of any character from the following: <ul style="list-style-type: none"> • 0 - 9 • a - z • A - Z 	256	No

Type	Limitation	Maximum length	Case-sensitive (Yes or No)
	<ul style="list-style-type: none"> • - • @ 		
Tag descriptions	The descriptions cannot contain quotation marks.	256	N/A
Folder name	The name must consist of any character from the following: <ul style="list-style-type: none"> • 0 - 9 • a - z • A - Z • - 	256	No
Mapping ID	The following metadata are supported: <ul style="list-style-type: none"> • .@timestamp • .@quality • .@TIMESTAMP • .@QUALITY • .@TIMEstamp • .@ua_ • .@UA_ Other metadata with ".@" are not supported. Quotation marks are not supported. The space is supported.	260	N/A
Type name	The name must consist of any character from the following: <ul style="list-style-type: none"> • 0 - 9 • a - z • A - Z • - 	256	Yes
Type descriptions	The descriptions cannot contain quotation marks.	256	N/A
Type member name	The name must consist of any character from the following: <ul style="list-style-type: none"> • 0 - 9 • a - z • A - Z • - 	256	Yes
Type members description	The descriptions cannot contain quotation marks.	256	N/A

Add a namespace

A namespace is initially created by default. You can add a namespace as needed.

You can back up or restore the namespace when you click the namespace node.

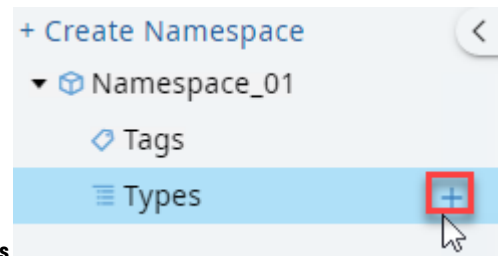
To add a namespace

1. Click **+ Create Namespace**.
2. In the **Namespace Properties** pane, configure **Name** and **Index** for the namespace.
The valid range of **Index** is from 10 through 9,999.
The namespace name is case-sensitive.

Configure the data types of a namespace

You can configure the data types as needed before mapping tags.

To configure the data types of a namespace



1. Click the plus sign next to **Types**.
2. Select the ways to add data types.
 - Select **Add New** to add a data type.
 - a. In the **UDT Properties** pane, configure **Name** and **Description** for the data types.
 - b. Add the data type:
 - Click **Insert** to insert a data type member at any location.
 - Enter the data type name in the **Click here to Add** box to add a data type member at the bottom.
 - Select **Add from Logix Controller** to add the existing data type in the controller.
 - Browse and select the tag with the data type.
3. (optional) You can rename the data type and configure its description in the **UDT Properties** pane.



Tip:

- The data type name and its element name are case-sensitive.
- When you click the **Types** node, you can see all the data types and their reference relationships. Data types that are referenced by other tags or data types are not editable.

Delete the data type element

Custom UA Namespace supports deleting a data type element.



Tip: You cannot delete a data type element if it is referenced by tags.


To delete a data type element

1. Select one or multiple data type elements that you want to delete.
2. Click **Delete**.

Order the data type element

You can change the order of the data type element.

To change the order of the data type element

1. Click **Order**.
2. Hover over  and drag the element to the desired location.
3. Click **Apply New Order**.

Configure tags' properties for the UA namespace

Follow these steps to configure the tags' properties.


To configure tags' properties

1. Select **Tags**.
2. In the **Tags Properties** pane, configure the permissions to tags.

Add a folder to the UA namespace

Create folders in the UA namespace to manage tags. A folder can contain subfolders and tags at the same time.


To add a folder

1. Expand a namespace.
2. Select the **Tags** node or any folder node, and then select .
3. Specify the folder name, and then select **OK**.

Change folder names in the UA namespace

Change folder names for your convenience to manage tags.


To change a folder name

1. In the namespace pane, select  beside the folder.
2. Specify the folder name, and then select **OK**.

Delete a folder in the UA namespace

Delete a folder in the namespace as needed.

To delete a folder

- Hover over the folder node you want to delete, and then select .

Add a tag for the UA namespace

Follow these steps to add a tag for the UA namespace.

To add a tag

1. Select the **Tags** node.
2. Add a tag:
 - Click **Insert** to insert a tag at any location.
 - Enter the tag name in the **Click here to Add** box to add a tag at the bottom.



NOTE: If you want to set the selected data type as an array, you can configure the array dimensions in the **Select Data Type** dialog box.

- Add multiple tags, such as scalar, array, or structure tags, from the **Tag Browser** by selecting **Click here to Add**.
3. (optional) Browse and select the tag's data type. If you don't add data types, the data types will be added automatically when you map tags from **Tag Browser**.

Add an existing tag from a data source

Follow these steps to add an existing tag from a data source like a controller.

To add an existing tag from a data source



1. Expand a namespace, and then select **Tags**.
2. In the **Namespace_Tags** pane, select **Click here to Add**.
3. In the upper-right corner, select  to open **Tag Browser**.
4. Select one or multiple tags, and then select .

NOTE: The scalar, array, or structure tags are supported.

Map a tag for the UA namespace

You need to map tags from a controller or an OPC data source to a tag or element of a tag in a custom UA namespace to choose the data to be delivered to an external OPC UA client.

To map a tag

1. In the **Mapping** column, select the tag and browse to open the **Tag Browser**, or click  in the upper-right corner to open the **Tag Browser**.
2. Click  to add the tag that needs to be mapped.

You can select multiple tags at once to map. The number of tags selected should be equal to the number of tags selected in the **Tag Browser**.

**Tip:**

- The tag name is not case-sensitive.
- If the custom namespace tag has a datatype assigned, the mapped tag's type must be defined with the same type.
- If the custom namespace tag's type is not previously assigned, the type from the mapped tag will be used.
- When there are multiple custom namespace items mapped that attempt to write to the same system tag, the tag's value will be updated multiple times making it difficult to determine the resulting value. It is recommended to only map a tag to a single item in the custom namespace.

Delete a tag

Custom UA Namespace supports deleting a tag.


To delete a tag

1. Select one or multiple tags that you want to delete.
2. Click **Delete**.

Order the tag

You can change the order of the tag.


To change the order of the tag

1. Click **Order**.
2. Hover over  and toggle the tag to the desired location.
3. Click **Apply New Order**.

Delete the data type and namespace

Custom UA Namespace supports deleting a data type and namespace.

To delete a data type

- Select the data type node, and then next to the data type, click .

To delete a namespace

- Select the namespace node, and then next to the namespace, click .

Custom RTD/DDE Namespace

How do I open Custom RTD/DDE Namespace?

1. From the **Start** menu, select **Rockwell Software > FactoryTalk Linx Gateway Configuration**.
2. In the **Server Configuration** pane, under **Excel RTD Interface** or **DDE Interface**, select **Custom namespace**.

Use the **Custom RTD/DDE Namespace** editor to create tag definitions for the Excel RTD and DDE interfaces and bind or map them to system data points to provide consistent names for different components or to provide a limited list of tags that can be accessed from an external DDE or Excel client.

If you do not use the **Tag Browser** to add or edit a tag in the **Custom RTD/DDE Namespace** editor, you must ensure that the tag's data type is the same as the data source, such as the Logix controller, or OPC UA server connected via the FactoryTalk Linx OPC UA Connector.

If you change a tag's data type in a controller, you must ensure that the tag's data type is consistent in the **Custom RTD/DDE Namespace** editor is the same as that in the controller. Otherwise, an error message "BadTypeMismatch" appears in the UA clients.

You can back up or restore the namespace when you click the namespace node.



Tip: Use **Ctrl**+rotate the mouse wheel to zoom in or zoom out the **Custom RTD/DDE Namespace** tab.

Naming conventions in Custom RTD/DDE Namespace

The following table shows the naming conventions in **Custom RTD/DDE Namespace**.

Type	Limitation	Maximum length	Case-sensitive (Yes or No)
Tag name	<p>The name must consist of any character from the following:</p> <ul style="list-style-type: none"> 0 - 9 a - z A - Z - 	256	No
Tag descriptions	The descriptions cannot contain quotation marks.	256	N/A
Mapping ID	<p>The following metadata are supported:</p> <ul style="list-style-type: none"> .@timestamp .@quality .@TIMESTAMP .@QUALITY .@TIMEstamp .@ua_ .@UA_ <p>Other metadata with ".@" are not supported.</p> <p>Quotation marks are not supported.</p> <p>The space is supported.</p>	260	N/A

Configure tags' properties for the RTD/DDE namespace

Follow these steps to configure tags' properties.

To configure tags' properties

- In the **Tags Properties** pane, configure the namespace name, tag refresh rate, and permissions to tags.

Items in the Tags Properties pane


The following table shows the items in the **Tags Properties** pane.


Items	Descriptions
Name	Specifies the namespace's name.
Refresh Rate	<p>Specifies the refresh rate of FactoryTalk Live Data.</p> <p>The default setting is 2 seconds.</p> <p>Tip: The default refresh rate of Excel is 2 seconds. You can modify this rate in excel if VBA is being used to access the interface.</p> <p>You can use the following sample code from a Visual Basic application to change the refresh rate of Excel.</p> <pre>Sub ChangeRtdRefreshRate() Application.RTD.ThrottleInterval = 1000 End Sub</pre> <p>"1000" means 1000 milliseconds. You can change it as needed.</p> <p>For more information, refer to RTD.ThrottleInterval property (Excel).</p>
Tag Access	<p>Specifies the RTD and DDE client's access to the tags, including:</p> <ul style="list-style-type: none">• Read Write• Read Only

Map a tag for the RTD/DDE namespace

You need to map tags to use the custom RTD/DDE namespace.

To map a tag

1. Select the **Tags** node.
2. Add a tag:
 - Click **Insert** to insert a tag at any location.
 - Enter the tag name in the **Click here to Add** box to add a tag at the bottom.
3. (optional) Browse and select the data type of the tag. If you don't add data types, the data types will be added automatically when you map tags from the **Tag Browser**.
4. In the **Mapping** column, select the tag and browse to open the **Tag Browser** or click  in the upper-right corner to open the **Tag Browser**.

5. Click  to add the tag that needs to be mapped.
 - You can select multiple tags at once to map. The number of tags selected should be equal to the number of tags selected in the **Tag Browser**.
 - You can add multiple scalar tags from the **Tag Browser** by selecting the last row **Click here to Add**.



Tip: The tag name is case-insensitive.

Delete a tag for the RTD/DDE namespace

Custom RTD/DDE Namespace supports deleting a tag.


To delete a tag

1. Select one or multiple tags that you want to delete.
2. Click **Delete**.

Order the tag

You can change the order of the tag.

To change the order of the tag

1. Click **Order**.
2. Hover over  and toggle the tag to the desired location.
3. Click **Apply New Order**.


Copy the tag ID


You can copy the RTD and DDE tag ID directly from the namespace into the windows clipboard. The clipboard contents can then be pasted into an Excel worksheet. This provides properly formatted references to access the data using either DDE or a function RTD.

Prerequisites

- Enable **Excel RTD Interface** or **DDE Interface** in the **Server Configuration** pane.

To copy the tag ID

- Select the tag and then click one of the following:
 - 

It is used to copy the RTD tag.
 - 

It is used to copy the DDE tag.



Tip:

- When using the Custom Namespace, an option is provided in the namespace editor to copy the reference for a tag in a format that can be pasted directly into Excel to access the data
- You can copy the tag ID to Excel to read the tag values. You must apply changes before copying tags.
- You can select multiple tags to copy the tag ID.

Remote Proxy Service

How do I open Remote Proxy Service?

1. From the **Start** menu, select **Rockwell Software > FactoryTalk Linx Gateway Configuration**.
2. Select **Remote Proxy Service**.

Proxy service allows FactoryTalk Linx on one computer to bridge through a central FactoryTalk Linx Gateway Professional workstation on the network to communicate with automation system devices on a different network. FactoryTalk Linx Gateway Professional must be installed, enabled with a Professional activation, and configured to enable the Remote Proxy Service. Additionally, the FactoryTalk Linx Network Browser running on the central gateway workstation must have drivers configured to locate the desired automation devices, either on the same network or a sperate network. The FactoryTalk Linx Network Browser on each remote engineering or maintenance workstation can then configure a driver using the "remote Devices via Proxy Service" selection and bind it to a driver on the central gateway. Each driver can view, browse, and navigate the network topology from the gateway and go online with the device using the gateway as a bridge. This proxy service eliminates the need to configure similar drivers on multiple computers and makes the gateway driver configuration changes immediately visible to all remote computers.

Remote Proxy service supports 400 drivers with 400 devices at most (A client can connect 2,000 remote drivers from different servers at most).

Remote Proxy service supports Ethernet and Backplane drivers.

Remote Proxy service supports:

- FactoryTalk Linx. You need to add a **Remote Devices via Proxy Service** driver.
- RSLinx Classic. You need to add a **Remote Devices via Linx Gateway** driver.






Tip:

- Before using **Remote Proxy Service**, you must install FactoryTalk Linx version 6.31.00 or later.
- Use **Ctrl**+rotate the mouse wheel to zoom in or zoom out the **Remote Proxy Service** tab.

Remote Proxy




Field	Description
Activation Status	Shows the status of the FactoryTalk Linx Gateway activations. Tip: The FactoryTalk Linx Gateway Professional activation is required to utilize the Remote Proxy Service.

Field	Description
Enable remote proxy service	Selects to enable the Remote Proxy Service and use this workstation as the centralized server.
Refresh	Selects to refresh the status of the server IP addresses.
Server IP Address	Shows the IP addresses on this workstation.
Description	Shows the Network Interface Card (NIC) name of the IP addresses.
Enable	<p>Selects to enable the IP address for remote proxy.</p> <ul style="list-style-type: none"> • On: Enables the connection between the server IP address and the client IP address. • Off: Disables the connection between the server IP address and the client IP address.
Status	<p>Shows the connection status of the corresponding IP address, including:</p> <ul style="list-style-type: none"> •  This IP address is enabled and valid to be connected. •  This IP address is disabled to be connected. •  This IP address is enabled to be connected but is not valid. See Information for the detailed reason.
Information	Provides an description for connection issues for the corresponding IP address.
Restrict Access	<p>Specifies the IP addresses for remote workstations that will be permitted to access the Remote Proxy service on this workstation.</p> <ul style="list-style-type: none"> • All Any remote workstation can access the remote proxy servers. • Listed IP Address Lists the IP addresses that can access the Remote Proxy service. • Defined by CIP Security All connections between the server IP address and the client IP address must be configured by CIP Security using FactoryTalk Policy Manager. Selecting this option also provides communications integrity and confidentiality. This option may prevent RSLinx Classic on remote workstations from accessing the Remote Proxy service.
Add	Selects to add an IP address.
Delete	Selects to delete the selected IP addresses.

Field	Description
Copy	Selects to copy the selected IP addresses.
Paste	Selects to paste the copied single or multiple IP addresses to this list.
IP Address or hostname	Shows the IP addresses that can access the Remote Proxy service.



Tip: The Client list supports:

- Sorting the item ascending or descending in each column.
In the column, select  to sort the table's contents in ascending order based on column's items. Select  to sort the table's contents in descending order based on the column's items.
- Filtering the items in each column.
Select  and enter the word you want to filter.

Enable remote proxy service

Prerequisites

- Install FactoryTalk Linx and FactoryTalk Linx Gateway version 6.31.00 or later.
- Get an available activation on page .

To enable remote proxy service

1. On the **Remote Proxy Service** tab, select **Enable remote proxy service**.
2. In the **Server IP Address** list, set the **Enable** status to **On** to enable the IP address for remote proxy.
3. In **Restrict Access**, set the client access. For more information, see [Remote Proxy Service on page 60](#).

Select FactoryTalk Directory

Use **Select FactoryTalk Directory** to select an application, area, or sub-area (also known as the *scope*) from the FactoryTalk Directory. Tags from the scope are presented to OPC UA and DA clients as node IDs for subscription. The top-level or root location in the FactoryTalk Directory tree is not a valid selection.



Tip:

- If the server scope is changed up or down a level in the FactoryTalk Directory tree, OPC clients may not be able to access tags from the original configuration. This is because the OPC browse interface provides node ID paths that are relative to the configured scope. After changing the scope, check all relative paths in client applications to determine if their values need to be updated.
- You must inhibit the FactoryTalk Linx Gateway services before you can configure the scope. Note that if you do not have read permission, an error message opens when you configure scope. Refer to [Secure FactoryTalk Linx Gateway using FactoryTalk Security on page 108](#). You must be logged into FactoryTalk to be able to configure the scope. If you have not already done so, you will be prompted to log in when you click **Select**.

UA Server Endpoints

How do I open UA Server Endpoints?

1. From the **Start** menu, select **Rockwell Software > FactoryTalk Linx Gateway Configuration**.
2. Select **UA Server Endpoints**.

Use **UA Server Endpoints** to add, remove, and configure OPC UA server endpoint URLs and properties.

UA Server Endpoints

Field	Description
UA Server Endpoints	A list of all configured OPC UA server endpoint URLs, their security modes, and security policies.
Add	Adds a new OPC UA server endpoint to the list. on page
Remove	Removes the highlighted OPC UA server endpoint from the list. on page

Field	Description
Name	Sets the name for the OPC UA server endpoint. The name must be unique. The server name displays in the OPC UA namespace and is included in the full tag path for all nodes provided by the server.
Port	Sets the port number for the OPC UA server endpoint. The port must be unique. The default port is 4990 and increments by 1 for each additional endpoint.
Address	Selects the hostname or IP address of the computer.
URL	Sets the network path to the OPC UA Server. This URL must be provided to OPC UA client applications in order to connect to the FactoryTalk Linx Gateway UA service. The firewall on the FactoryTalk Linx Gateway OPC UA server must allow incoming connections to the selected port for the connection to succeed.
Copy	Copies the URL into the windows clipboard, so it can be pasted into the OPC UA Client.
Disable	Turns off the endpoints.
Enable reverse connect	Enables a server to initiate the connection to an OPC UA client.
Client URL	Sets the URL to identify the OPC UA client the server will communicate with using the reverse connect. The URL must be in the format <code>opc.tcp://hostname_or_ip:port/Endpoint</code> where <code>hostname_or_ip</code> and <code>port</code> are replaced with the hostname or IP address and port number of the OPC UA client. <code>Endpoint</code>

Field	Description
	<p>is optional. Do not use the port that is already occupied by other clients.</p> <p>The maximum number of Client URLs supported is 20 for each endpoint.</p>
Max Connection	<p>Sets the maximum number of clients connected to the current UA server endpoint. These clients should be on the same computer with the same client URL.</p> <p>The valid range of Max Connection is 1-20.</p>
Security Mode	<p>Displays the security method required for connections between OPC UA clients and the FactoryTalk Linx Gateway OPC UA server.</p> <ul style="list-style-type: none"> • Sign: Use signature to secure the connection. • Sign & Encrypt: Use signature and encryption to secure the connection. • Sign + Sign & Encrypt: Use either signature or signature and encryption to secure the connection.
Security Policy	<p>Displays whether security is required or optional for connections between OPC UA clients and the FactoryTalk Linx Gateway OPC UA server.</p> <p>There are four security algorithm suites:</p> <ul style="list-style-type: none"> • None • Basic128Rsa15 • Basic256 • Basic256Sha256
Anonymous	Sets Anonymous account with access to FactoryTalk Linx Gateway.
Limit to read-only access	Sets Anonymous account with only read access.
Enable read access to CIA message	Permits an OPC UA client connected to FactoryTalk Linx Gateway with Anonymous login and read access permissions to retrieve information from a device using a FactoryTalk Linx shortcut configured with: CIP Object - Class/Instance/Attribute Message
Enable write access to CIA message	Permits an OPC UA client connected to FactoryTalk Linx Gateway with Anonymous login and write access permissions to send information to a device using a FactoryTalk Linx shortcut configured with: CIP Object - Class/Instance/Attribute Message
FactoryTalk Security User	Sets FactoryTalk Security user with read and write access. The user is created in FactoryTalk Administration Console > System > Users and Groups. Username and password are needed.
Log diagnostic message on tag write	When enabled, FactoryTalk Linx Gateway will create a diagnostic or audit message every time a tag is written by an external OPC UA client. The default setting is disabled.

Field	Description
Log as audit message	When enabled, FactoryTalk Linx Gateway will create an audit message in the FactoryTalk Audit log with time-and date-stamped information to track changes that occurred during the operation of the system.
Log as diagnostic message	When enabled, FactoryTalk Linx Gateway will create a diagnostic message in the FactoryTalk Diagnostics log with time-and date-stamped information to help diagnose anomalies.

Approaches for OPC UA clients to connect to FactoryTalk Linx Gateway

There are two approaches for OPC UA clients to connect to FactoryTalk Linx Gateway:

- The OPC UA client connects to the OPC UA server directly on page 64.
- Use the Reverse Connect option to enable a server to initiate the connection to an OPC UA client. For more details, see [Configure Reverse Connect on page 65](#).

Configure Reverse Connect

Usually, a connection is opened by the client before starting the UA-specific handshake. However, this will fail when servers are behind firewalls with no open ports to connect to. In the reverse connectivity scenario, the server opens the connection and starts with a ReverseHello message requesting that the client establish a secure channel using this connection.

To use **Reverse Connect**, you should configure the connection in both FactoryTalk Linx Gateway and the OPC UA client.



IMPORTANT: Changing the Max Connection to 1 may prevent client communication because some OPC UA clients require 2 connections to operate normally.

To configure Reverse Connect in FactoryTalk Linx Gateway

1. On the **UA Server Endpoints** pane, select **Enable reverse connect**.
2. Click **Add** and enter the client URL.
The URL must be in the format `opc.tcp://hostname_or_ip:port/Endpoint` where `hostname_or_ip` and `port` are replaced with the hostname or IP address and port number of the OPC UA client. `Endpoint` is optional. Do not use the port that is already occupied by other clients.
Example: client IP=192.168.1.1, port number=4001, Client URL= `opc.tcp://192.168.1.1:4001`
3. Click **Apply**.

For more details about Reverse Connect, see [UA Server Endpoints on page 63](#).

To configure Reverse Connect in UA Client (taking UaExpert as an example)

- 
1. In the **Unified Automation UaExpert** dialog box, click  to add a server.
 2. In the **Add Server** dialog box, under **Reverse Discovery**, enter the URL which is the same URL entered in the **Client URL** box in FactoryTalk Linx Gateway.
 3. Click **OK**.

About

How do I open About?

1. From the **Start** menu, select **Rockwell Software > FactoryTalk Linx Gateway Configuration**.
2. Select **Help > About**.

Use **About** to identify the version of the FactoryTalk Linx Gateway user interface, OPC UA and DA servers, OPC Foundation Discovery Service, Excel RTD Interface, DDE Interface, SDK Interface, and Remote Proxy Service and to view the copyright and contact information of FactoryTalk Linx Gateway.

Revision

Field	Description
FactoryTalk Linx Gateway User Interface Revision	Lists the version number of the FactoryTalk Linx Gateway user interface on the local machine.
FactoryTalk Linx Gateway OPC UA Server Revision	Lists the version number of the FactoryTalk Linx Gateway OPC UA service on the local machine.
FactoryTalk Linx Gateway OPC DA Server Revision	Lists the version number of the FactoryTalk Linx Gateway OPC DA service on the local machine.
OPC Foundation Discovery Service Revision	Lists the version number of the OPC Foundation Discovery Service on the local machine.
Excel RTD Interface Revision	Lists the version number of the Excel RTD interface on the local machine.
DDE Interface Revision	Lists the version number of the DDE interface on the local machine.
FactoryTalk Linx SDK Revision	Lists the version number of the FactoryTalk Linx SDK interface on the local machine.
FactoryTalk Linx Remote Proxy Service Revision	Lists the version number of the FactoryTalk Linx Remote Proxy service on the local machine.

Certificate Management

Use **Certificate Management** to view FactoryTalk Linx Gateway OPC UA server certificate information.

FactoryTalk Linx Gateway creates a default, self-signed security certificate during installation. The security certificate is stored at `C:\ProgramData\Rockwell\FTLinxGateway\PKI\own\cert_ftgw_opcua_server.der` on the host computer for the FactoryTalk Linx Gateway server. A custom security certificate can be created by generating a certificate signing request in FactoryTalk Linx Gateway and

signed by an external trusted security authority and then imported to FactoryTalk Linx Gateway to replace the default certificate.

Certificate properties

Field	Description
Name	Displays the name of the security certificate.
Status	Displays the certificate status, either Trusted or Rejected .
Location	Displays the path to the security certificate on the FactoryTalk Linx Gateway computer.
Application Name	Displays the application from where the certificate is presented.
Organization	Displays the organization name that submitted to CA when requesting the certificate.
Application URI	Displays the FactoryTalk Linx Gateway application URI associated with the security certificate.
Domain	Displays the workstation name.
Subject Name	Displays the subject properties on the certificate. For example, Common Name (CN).
Valid From	The date and time when the security certificate is valid.
Expiration Time	The date and time when the security certificate expires.
Thumbprint	A short sequence of bytes created by applying the cryptographic hash function to identify a certificate.

Certificate actions

Button	Description
Import	Specifies and import the certificate to be used as incoming certificate or outgoing certificate.
Reject	Moves the specific certificate(s) from Trusted Certificates list to Rejected Certificates list. The client(s) cannot communicate with FactoryTalk Linx Gateway.
Remove	Removes the specific certificate(s) from Trusted Certificates list or Rejected Certificates list. The client(s) cannot communicate with FactoryTalk Linx Gateway.
Trust	The specific certificate is added to Trusted Certificates list and the client can communicate with FactoryTalk Linx Gateway.
Create CSR	Creates a Certificate Signing Request (CSR) and save the request as a CSR file.
Regenerate	Creates another certificate to renew the valid period.
Refresh	Refreshes to display the latest certificates.

Button	Description
Manage Access	<p>Limits access to security certificate management operations to administrators or individuals approved by an administrator. This function is only available to Administrator.</p> <p>To add user or group:</p> <ol style="list-style-type: none"> On Certificate Management tab, click Manage Access. In Manage Access dialog, click Add. In Select User or Group dialog, click Advanced > Find Now. In Search results, select the name of the user or group you want to add. Click OK. <p>Tip: If you are Administrator and in the Administrator group but this option is still not available, do the following:</p> <ol style="list-style-type: none"> Launch Run. Enter gpedit.msc and click OK. In Local Group Policy Editor dialog, select Computer Configuration > Windows Settings > Security Settings > Local Policies > Security Options. Double-click User Account Control: Run all administrators in Admin Approval Mode. Select Disabled.

Advanced Settings

How do I open Advanced Settings?

- From the **Start** menu, select **Rockwell Software > FactoryTalk Linx Gateway Configuration**.
- Select **Advanced Settings**.

Use **Advanced Settings** to configure advanced performance. The following settings are not available if you select **Custom namespace** on the **Server Configuration** tab.

Field	Description
Enable configuration of OPC UA namespace index	<p>Selects this checkbox to specify, refresh, delete, import or export OPC UA namespace index when tag list is turned on. For more details, see Enable configuration of OPC UA namespace index.</p>
Namespace index presented to OPC UA clients	<p>Sets user option to select FactoryTalk Linx Gateway OPC UA service namespace index value. An OPC UA Client will see (2 or 3). Default is 2.</p> <ul style="list-style-type: none"> When tag list is enabled, the UA client browsed the tag as namespace index = 2 or 3, with scalar/array/structure. When tag list is disabled, the UA client browsed the tag as namespace index = 2 or 3.

Create additional references for each array element in the OPC UA namespace	When selected, FactoryTalk Linx Gateway will support OPC UA Clients to browse sub-elements under array. Tip: This option is only available when Tag List and structure/array access on the Server Configuration on page tab is selected.
Cache UA Server namespace	Select this checkbox to create a cache for UA Tag List and Custom UA Namespace. The cache will be created when you apply all changes and restart the server. The Cache UA Server namespace checkbox is cleared by default. Changing the UA Tag List and Custom UA Namespace configuration will recreate a cache.
Refresh	It is available when the Cache UA Server namespace checkbox is selected. Select this button to clear the cache and then restart the UA service. Refreshing the cache will cause all OPC UA clients to be disconnected while the namespace is regenerated. Note: Based on the number of tags defined in the namespace, this could take an extended period of time to complete.

Enable configuration of OPC UA namespace index

A "namespace index" is a number a client can utilize to identify the data to be accessed from an OPC UA server. Changes to the configuration may cause the namespace index values to also be modified, causing difficulty for some OPC UA clients. FactoryTalk Linx Gateway provides the ability to override the default namespace index numbers and assign numbers to help OPC UA clients connect to the service.

With the **Enable configuration of OPC UA namespace index** option turned off:

- A single namespace index is used for data from FactoryTalk Directory. FactoryTalk Linx Gateway pulls data from multiple tags and structures which can exist in multiple controllers that use the same datatype name with the prefix [Shortcut name] but defined by a different layout.

With the **Enable configuration of OPC UA namespace index** option turned on:

- The namespace index can represent each data source of FactoryTalk Linx shortcuts or UA Connector endpoints to avoid a collision where two sources have different types with identical type and tag names. The common index is 10 for other types of data servers.

OPC UA namespace index value

The valid range of namespace index is from 0 through 9999.

By default, a new index is assigned for a new added FactoryTalk Linx shortcut or a new added UA Connector endpoint.

To edit the index

- Select the tag row and then click



Tip:

- If a tag ID starts with "[xxx]" from OPC DA Data Server (for example, tags that originate from RSLinx Classic), it will have an individual OPC UA namespace index not the common index as 10.
- We don't recommend an index sequence with large gaps.

Custom Namespace

How do I open Custom Namespace?

1. On the **Server Configuration** pane, select **Custom namespace** under **UA Server**, **DA Server**, **Excel RTD Interface**, or **DDE Interface**.
2. Click **Custom Namespace** that shows on the left column.

Use **Custom Namespace** to:

- Improve the organization of the automation system data. For example, to change the layout of structures coming from programmable controllers.
- Organize scalar data into structures.
- Combine data from multiple sources or programmable controllers into a structure.
- Apply a different naming convention for the automation system data. For example, to meet an industry specific standard without having to redefine and program the programmable controllers.
- Limit or secure the automation system data that is available to clients.

FactoryTalk Diagnostic Log

Use **FactoryTalk Diagnostic Log** to view historical error, warning, and information level diagnostic messages about the FactoryTalk Linx Gateway services on the current computer.

FactoryTalk Diagnostic Log

Button	Description
Refresh	Clears the FactoryTalk Diagnostic Log and refresh diagnostic messages from the FactoryTalk Diagnostics server on the local computer.
Launch FactoryTalk Diagnostic Viewer	Starts the FactoryTalk Diagnostic Viewer to view diagnostic messages for all FactoryTalk devices and services, or to view diagnostic messages for a remote computer.

Use FactoryTalk Linx Gateway to Access Data

This chapter includes the following information:

- Before you begin
- Starting FactoryTalk Linx Gateway
- Selecting the scope
- Accessing data

Before you begin

Before you can access data via FactoryTalk Linx Gateway, you must:


1. Install and activate FactoryTalk Linx Gateway.
For the detailed steps, refer to [Install FactoryTalk Linx Gateway on page 17](#).

NOTE: If you will use the standalone data source, steps 2-4 are not required.

2. Create a FactoryTalk application, or point to an existing application, in FactoryTalk Administration Console.
For the detailed steps, refer to FactoryTalk Services Platform Help.
3. Add a data server, for example, a FactoryTalk Linx data server.
For the detailed steps, refer to FactoryTalk Services Platform Help.
4. Add shortcuts to target controllers in FactoryTalk Linx.
For the detailed steps, refer to FactoryTalk Linx Online Help.

Open FactoryTalk Linx Gateway

Open FactoryTalk Linx Gateway by selecting **Start > Programs > Rockwell Software > FactoryTalk Linx Gateway**

Configuration. (Or click  on the FactoryTalk Administration Console menu bar.) The **FactoryTalk Linx Gateway Configuration** dialog box opens. The default setting exposes all projects in the directory under the Network node.



Tip: To start or stop the FactoryTalk Linx Gateway service, you must be a Windows Administrator or Power User of the computer.

Select a data source

Select a data source for data acquisition.

To select a data source

1. In **Server Configuration**, select a data source:
 - **FactoryTalk Application**
 - a. Click **Select**.
 - b. In **Select FactoryTalk Directory**, select the Network or Local FactoryTalk Directory.
 - c. From the FactoryTalk Directory tree, select an application or area.

- d. Select **OK**.

NOTE: When choosing this option to access data, you must go to FactoryTalk Administration Console to configure data sources and shortcuts.

- **Standalone**

- a. In the **Standalone Data Service** dialog, enable the OPC DA server and DDE server, and then select **OK**.
- b. Select the Network or Local FactoryTalk Directory for security policy.

NOTE: When choosing this option to access data, you must go to the **Standalone Data Service** tab to configure shortcuts.

2. Select **Apply**.
3. In **FactoryTalk Linx Gateway Configuration**, click **Yes** to restart the FactoryTalk Linx Gateway services and apply the scope change.

Scope for FactoryTalk Application

The scope is the area or application from which you want to access data. The main **FactoryTalk Linx Gateway Configuration** dialog box shows the current scope. The supported scope will depend on the FactoryTalk Linx Gateway activation purchased. For more information on supported scopes and activation, see [Activation types on page 93](#).

A local scope means that only one instance of a FactoryTalk Linx data server can be configured and resides on the local host computer. A network scope means that multiple FactoryTalk Linx data servers can be configured and may be distributed across the network. If the FactoryTalk Linx Gateway is providing data to a FactoryTalk View SE application, activations that support the local or network application must be installed for FactoryTalk Linx Gateway and FactoryTalk View SE.



Tip:

- If there is a possibility of a remote or local client requesting tag data from FactoryTalk Linx Gateway, you must disable the FactoryTalk Linx Gateway service via the Windows **Control Panel**, or stop or shut down all of the OPC clients before you reconfigure the scope. This will prevent the service from automatically starting while you are configuring the scope. The default DCOM settings prohibit launching the FactoryTalk Linx Gateway OPC <DA> service remotely and is the recommended setup.
 - You must stop the service before you can configure the scope. Note that if you do not have read permission, an error message opens when you configure scope. Refer to the FactoryTalk Linx Gateway Help. You must be logged into FactoryTalk to be able to configure the scope. If you have not already done so, you will be prompted to log in when you click **Select**.
 - When using a new system, or if you need to change the scope, use the FactoryTalk Administration Console.
-

Access the data

Your access to, and actions within, the FactoryTalk Linx Gateway tool are controlled by FactoryTalk Security settings. Refer to [Secure FactoryTalk Linx Gateway using FactoryTalk Security on page 108](#) before attempting to configure FactoryTalk Linx Gateway.

Once a FactoryTalk Directory data source is selected and the FactoryTalk Linx Gateway service is running, OPC UA and DA clients can read and write the data provided from the FactoryTalk Linx Gateway services. Refer to your OPC client documentation for more information.

Prerequisites:

NOTE: These prerequisites are required when you select **FactoryTalk Application** as the data source. Using **Standalone** as the data source allows to access data without creating FactoryTalk applications and FactoryTalk Linx servers. The standalone data source supports the OPC DA server and DDE server.

1. In the scoped FactoryTalk application, add a FactoryTalk Linx data server.
2. In the scoped FactoryTalk application, create a shortcut from the application to the server hosting the tag data.
 - a. In FactoryTalk View Studio or FactoryTalk Administration Console, open **Communication Setup**.
 - b. In **Device Shortcuts**, click **Add**.
 - c. (optional) Type a unique name for the shortcut.
 - d. In the communications hierarchy tree in the right-hand pane, click the device that contains the tag data, then click **Apply**.
 - e. Click **Yes** to apply changes.
 - f. In **Shortcut Type**, select a type of shortcut. The default value is Processor.
 - g. Click **OK** to close **Communication Setup**.

For more information about shortcuts, see *FactoryTalk Linx Help*.
3. (optional) On the FactoryTalk Linx Gateway host PC, use Server Configuration on page 108 to verify the FactoryTalk Linx Gateway OPC UA, OPC DA service, DDE interface, or Excel RTD interface is running.

To access data via FactoryTalk Linx Gateway by an OPC DA client:

1. Start an OPC DA client.
2. Configure the OPC UA or DA client to connect to the FactoryTalk Linx Gateway service by entering or browsing to the hostname or IP address of the FactoryTalk Linx Gateway server.
3. In the OPC DA client, add a data group.
4. In the OPC DA client, add one or more data items to the data group.



Tip: OPC DA clients can read and write all tags.

To access data via FactoryTalk Linx Gateway by an OPC UA client:

1. Start an OPC UA client.
2. Configure the OPC UA client to connect to the FactoryTalk Linx Gateway service by entering or browsing to an OPC UA Endpoint URL. If security is required, the client may need to accept the FactoryTalk Linx Gateway security certificate on page .
3. In the OPC UA client, add data items.



Tip: The reference used to access tags is configured differently depending on the OPC UA Service configuration setting:

- If you select **Folders with scalar data**, refer to Feature Security Properties on page .
- If you select **Tag List and structures / array access**, refer to [Access configuration in UA Tag List on page 47](#).
- If you select **Custom namespace**, refer to Custom UA Namespace.

To access data via FactoryTalk Linx Gateway by Excel RTD:

1. Enable the FactoryTalk Linx Gateway Excel RTD service
2. Choose and/or configure a data form option
 - Folders with scalars
 - Custom namespace
3. Start Excel.
4. Configure the Excel to connect to the FactoryTalk Linx Gateway service by entering RTD formulas. For RTD formula samples, refer to [Excel RTD formula sample on page 115](#).



Tip: The reference used to access tags is configured differently depending on the Excel RTD interface configuration setting:

- If you select **Folders with scalar data**, Excel can read and write all tags.
- If you select **Custom namespace**, see Custom RTD/DDE Namespace.

To access data via FactoryTalk Linx Gateway by an DDE client:

1. Enable the FactoryTalk Linx Gateway DDE service
2. Choose and/or configure a data form option
 - Folders with scalars
 - Custom namespace
3. Start an DDE client.
4. If the client is Excel, configure Excel to connect to the FactoryTalk Linx Gateway service by entering DDE formats to read tags or running VBA to read and write tags. For samples, see [DDE format sample on page 118](#) or [Visual Basic for Applications on page 119](#).
If other clients, access data by following the DDE standard.



Tip: The reference used to access tags is configured differently depending on the DDE interface configuration setting:

- If you select **Folders with scalar data**, DDE clients can read and write all tags.
- If you select **Custom namespace**, refer to Custom RTD/DDE Namespace.

For more information on FactoryTalk Linx Gateway activations, see [Activation types on page 93](#).

Use FactoryTalk Diagnostics Counter Monitor with FactoryTalk Linx Gateway

This chapter includes the following information:

- About FactoryTalk Diagnostics Counter Monitor
- Run FactoryTalk Diagnostics Counter Monitor
- Create a snapshot file
- Use FactoryTalk Diagnostics Counter Monitor to troubleshoot FactoryTalk Linx Gateway

About FactoryTalk Diagnostics Counter Monitor

FactoryTalk Diagnostics Counter Monitor is installed with FactoryTalk Services Platform. This stand-alone tool shows diagnostic counter information as well as OPC clients, groups, and corresponding items.

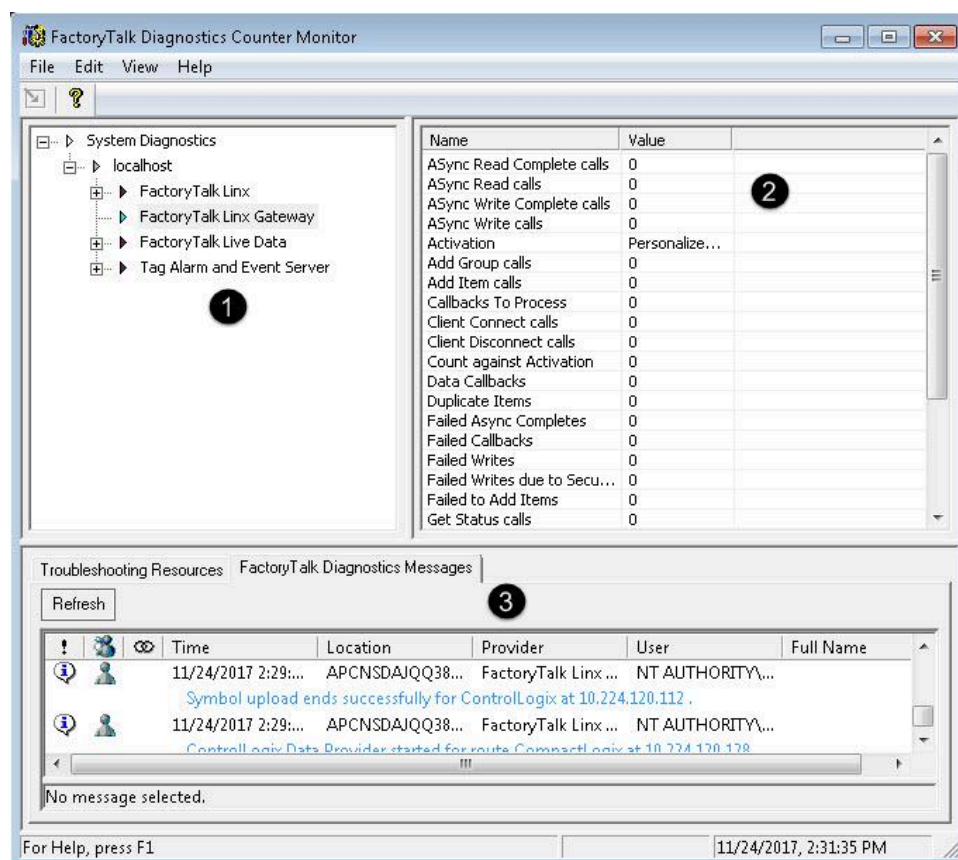
FactoryTalk Diagnostics Counter Monitor shows diagnostic information about the FactoryTalk Linx Gateway runtime operation:

- Diagnostic counters are displayed as properties at the FactoryTalk Linx Gateway, client, and group levels.
- Individual diagnostic items are displayed as children of their corresponding group connection.



Tip: FactoryTalk Diagnostics Counter Monitor shows diagnostics for FactoryTalk Linx Gateway, FactoryTalk Live Data, and FactoryTalk Linx (if installed).

The FactoryTalk Diagnostics Counter Monitor main window contains three areas:



Item	Description
1	<p>Navigator</p> <p>Workstations are manually added to or removed from a tree in the Navigator area. If FactoryTalk Linx or FactoryTalk Linx Gateway is installed on a workstation, FactoryTalk Diagnostics Counter Monitor automatically detects and shows them on the tree under the associated workstation.</p>
2	<p>Data</p> <p>The values of the selected diagnostic items are displayed in the Data area.</p> <p>The Data area contains the following columns:</p> <ul style="list-style-type: none"> • Name: At the root, provider, and client levels, this is the name of the diagnostic counter. At the group level, this is the tag name. • Value: At the root and provider levels, this is the returned data value of the diagnostic counter. At the group level, this indicates the status of the tag: Active or Inactive. <p>Note that neither the list of names nor their values can be modified.</p> <p>For a description of each counter, refer to the FactoryTalk Diagnostics Counter Monitor Help.</p>
3	<p>Viewer, which contains two tabs:</p> <ul style="list-style-type: none"> • Troubleshooting Resources <p>The Help is integrated into FactoryTalk Diagnostics Counter Monitor using this viewer.</p> <ul style="list-style-type: none"> • FactoryTalk Diagnostics Messages <p>Error messages associated with FactoryTalk Diagnostics Counter Monitor are logged to FactoryTalk Diagnostics. These messages are also displayed on the FactoryTalk Diagnostics Messages viewer. This enables you to see if there is any correlation between the logged messages and the values of the diagnostic items displayed in the Data area. Note that FactoryTalk Diagnostics messages are displayed for the local workstation only.</p>

To further aid in diagnosing problems, an **integrated snapshot feature** captures diagnostic values into an .xml file. This enables you to send this information to Rockwell Automation Technical Support if you need troubleshooting assistance. Refer to [Create a snapshot file on page 79](#).



Tip: FactoryTalk Diagnostics Counter Monitor is currently supported for desktop servers only. Windows CE is not supported in this release.

Keep the following in mind while using FactoryTalk Diagnostics Counter Monitor:

- Inactive tags are displayed with a value of Inactive.
- If a group's state is inactive, then the items within that group are inactive, regardless of what appears on the screen. However, if a group's state is active, it does not affect the state of any items within that group; that is, items within that group may be active or inactive.
- If client and group names are supplied by the client, then those names will be shown in the FactoryTalk Diagnostics Counter Monitor Navigator area.
- Duplicate items are given a numerical suffix (that is, itemname (#)) to distinguish them and are treated as unique tags. Duplicate items are numbered sequentially as they are added, regardless of the Group to which they are added. For more information, refer to FactoryTalk Diagnostics Counter Monitor Help.

Run FactoryTalk Diagnostics Counter Monitor

Note the following before you begin using FactoryTalk Diagnostics Counter Monitor:

- FactoryTalk Linux Gateway must be installed and running on one or more host computers on the network.
- The diagnostics client must have access to a workstation that has an application with diagnostic items associated with it. A client must be accessing those diagnostic items in order for them to be shown on FactoryTalk Diagnostics Counter Monitor.
- To prevent FactoryTalk Linux Gateway performance degradation, run only one instance of FactoryTalk Diagnostics Counter Monitor at a time, and close the tool when you have finished troubleshooting.

To run FactoryTalk Diagnostics Counter Monitor:

1. Start FactoryTalk Diagnostics Counter Monitor.


Click **Start > Programs > Rockwell Software > FactoryTalk Tools > FactoryTalk Diagnostics Counter Monitor**.

The FactoryTalk Diagnostics Counter Monitor main window opens. By default, the Navigator area shows a single root item called System Diagnostics.

2. Add a workstation to the **Navigator** area.

Right-click on the root in the **Navigator** area, and select **Add Workstation**. The **Enter Workstation IP Address/Hostname** dialog box opens.



Tip: Alternately, you can add a workstation by clicking the root in the **Navigator** area and clicking .

Enter the hostname or the device name of the workstation that contains the diagnostics you want to view, and click **OK**. For more information about the **Enter Workstation IP Address/Hostname** dialog box, refer to FactoryTalk Diagnostics Counter Monitor Help.

Note that the default workstation is localhost.

3. Expand the workstation to expose the installed data provider(s).
4. Click on any diagnostic item in the tree. The diagnostic counters associated with the selected item are shown in the **Data** area of the FactoryTalk Diagnostics Counter Monitor main window. While the item is selected, the counter values are updated automatically as new values are received.

Create a snapshot file


Snapshot files aid in troubleshooting by capturing all diagnostic values in an .xml file, which can then be sent to Rockwell Automation Technical Support. The .xml file contains the values of all of the diagnostic counters, whether expanded and displayed or not. Refer to the FactoryTalk Diagnostics Counter Monitor Help for more information.

To create a snapshot file:

1. Click **File > Save Snapshot**.
2. Select the location to which you want to save the snapshot file. The default location is the C: drive.
3. Enter a filename, or use the default filename, *FTDiagData.xml*.
4. Click **Save**.

Use FactoryTalk Diagnostics Counter Monitor to troubleshoot FactoryTalk Linx Gateway

To use FactoryTalk Diagnostics Counter Monitor to troubleshoot FactoryTalk Linx Gateway:

1. Start FactoryTalk Linx Gateway. (**Start > Programs > Rockwell Software > FactoryTalk Linx Gateway > FactoryTalk Linx Gateway Configuration** or click  on the FactoryTalk Administration Console menu bar.)
2. Start FactoryTalk Diagnostics Counter Monitor. (**Start > Programs > Rockwell Software > FactoryTalk Tools > FactoryTalk Diagnostics Counter Monitor**.)
3. Click **FactoryTalk Linx Gateway OPC UA Server** or **FactoryTalk Linx Gateway OPC UA Server** in the FactoryTalk Diagnostics Counter Monitor **Navigator** area.
4. Use the counters displayed in the Counter area to see the high-level status of the FactoryTalk Linx Gateway interactions with the clients:
 - **Activation:** Verify the value indicates the correct activation.
 - **Count against Activation:** Verify there are tags present (value > 0).
 - **Service Status:** Verify the service is Running.
 - **Selected Scope:** Verify the scope is correct for your application.
 - **Data Callbacks:** Verify that tags are updating (values increase). If tags are not updating, there are a number of possible reasons:
 - The data values are static.
 - The controller is in PROGRAM mode.
 - Groups or items at the client level are inactive.
5. Click the **FactoryTalk Diagnostics Messages** tab in the **Viewer** area. For more information about using this resource, refer to the FactoryTalk Diagnostics Counter Monitor Help.

Back up and restore FactoryTalk Linx Gateway configuration

Starting with version 6.30.00, the FactoryTalk Linx Gateway configurations can be backed up and restored in FactoryTalk Administration Console or by commands. It is important to create a backup of the system configuration after any significant changes are made, to help recover system operation if a computer hardware or operating system failure occur.

The FactoryTalk Linx Gateway configuration is contained in Server configuration, UA Server Endpoint settings, Advanced Settings, UA Tag List, SDK Interface, and Remote Proxy Service that must all be retained if you plan to restore the system later.

- [Back up FactoryTalk Linx Gateway configuration on page 80](#)
- [Restore FactoryTalk Linx Gateway configuration on page 81](#)

Back up FactoryTalk Linx Gateway configuration

FactoryTalk Services Platform provides an option to back up FactoryTalk Linx Gateway configuration configured on the same computer. You can back up the current settings and restore them later to control the settings, especially when the application or scope (Local or Network) of FactoryTalk Linx is changed.

IMPORTANT: During a backup operation, some FactoryTalk services will be temporarily locked, preventing new requests from being processed. This situation will result in new tag read or write operations from being performed and prevent some user interface operations. Once the backup is completed, new requests will operate normally. To minimize the potential impact on the automation system, the backup operation should be performed when the system is in an idle state.

The backup operation cannot include:

- Incoming and outgoing certificates of FactoryTalk Linx Gateway
- Trusted and rejected lists
- DA Access option
- The list of approved users that can manage certificates

Refer to [Restore FactoryTalk Linx Gateway configuration on page 81](#) to find steps to restore FactoryTalk Linx Gateway configuration on the local computer and distributed data servers.

Prerequisites

- Identify the security permissions needed to perform the backup operation. Backup is only available when you have the access in FactoryTalk Security (**System > Policies > System Policies > User Rights Assignment > Backup and Restore**).

To back up FactoryTalk Linx Gateway configuration

1. In FactoryTalk Administration Console **Explorer**, right-click the **Network** or **Local**, then select **Backup**.
2. In **Specify archive name**, use the default name or a customized name for the backup file.



Tip: We don't recommend changing the default archive name. The default name contains the leading digits of the security authority identifier which allows you to easily identify the archive file associated with a specific directory.

3. In **Specify archive location**, use the default archive path or customize the path as needed.

4. In **Backup Contents**:

- Select **FactoryTalk Linx Gateway configuration**.



Tip: This option is not available if the FactoryTalk Linx Gateway is not installed or the installed FactoryTalk Linx Gateway version is earlier than 6.30.00.

- (optional) Select **FactoryTalk Directory configuration** to back up the entire FactoryTalk Directory.
- (optional) Select **FactoryTalk Linx configuration** to back up the FactoryTalk Linx shortcut and driver configurations.

5. To encrypt your archive file, select the **Encrypt file contents** checkbox, and then enter the same passphrase in the **Passphrase** and **Confirm passphrase** boxes. If you clear this check box, your backup archive file will not be encrypted or protected.

Encrypt file contents is not available if your operating system does not support the proper level of encryption.

6. Select **OK**.

Restore FactoryTalk Linx Gateway configuration

The FactoryTalk Linx Gateway configuration can be restored when the configuration is backed up. This is helpful when a computer needs to be replaced or refreshed resulting from a significant hardware or operating system failure.

Prerequisites

- Identify the security permissions needed to perform the restore operation. Restore is only available when you have the access in FactoryTalk Security (**System > Policies > System Policies > User Rights Assignment > Backup and Restore**).

To restore FactoryTalk Linx Gateway configuration

1. In FactoryTalk Administration Console **Explorer**, right-click **Network** or **Local**, and select **Restore**.
2. In **Restore**, select **Browse**, select the BAK file to restore, and select **Open**.
3. Select **Next**.
4. If the backup file is encrypted, **Restore Backup File** opens. Enter the passphrase used during the backup operation.
5. In **Restore Contents**, select **FactoryTalk Linx Gateway configuration** to restore configurations.



Tip: This option is not available if the FactoryTalk Linx Gateway is not installed or the installed FactoryTalk Linx Gateway version is earlier than 6.30.00.

6. Select **Finish**.

After restoring is completed, you should:

1. Restart the computer.
2. Confirm that the FactoryTalk Directory scope is existing.
3. On the **UA Server Endpoints** tab, select the correct hostname or IP address if the hostname or IP address of the computer is changed.
4. Re-trust or re-reject the incoming certificates.
5. Regenerate or re-import the outgoing certificate.
6. (optional) Add users that can manage certificates.

Use commands to back up and restore

FactoryTalk Linx Gateway supports backup and restore by commands.

Parameter	Required/Optional	Description
-s	Required	Specifies the FactoryTalk Directory scope. Only "Global" and "Local" scopes are supported.
-sso	Required	Uses single sign-on for authentication.
-b	Required	Command for backup, which is conflict with the -r command.
-r	Required	Command for restore, which is conflict with the -b command.
-bak	Required	Specifies the location to save the backup file or the location where restore file can be found. (For example: -bak c:\aa.bak) <ul style="list-style-type: none"> For backup operation, the existing files will be replaced while creating new files. For restore operation, make sure the file already exists in the system.
-ftd	Optional	The whole FactoryTalk directory. The -sys and -app commands will be ignored if the -ftd is used.
-sys	Optional	The FactoryTalk System directory.
-app	Optional	Specifies the FactoryTalk application. Specific application names are needed when using this parameter.
-ido	Optional	Used to restore the FactoryTalk Directory identifier. It's only valid with command -r.
-prod	Optional	Specifies the product names. (For example: -prod "FactoryTalk Linx Gateway")
-e	Optional	Used to encrypt the backup file.

Parameter	Required/Optional	Description
-pp	Optional	<p>The plain passphrase is used to encrypt or decrypt the backup file. The command will be ignored when "-ep" command is used or the "-e" command is not used.</p> <p>Note: If the passphrase contains a " ", it should be type as " " in command line. For example, if the passphrase is</p> <pre>~!@#\$\$%^&*()_+={ } [] \ : " ; ' < > , . ? / ,</pre> <p>when you use the passphrase to encrypt or decrypt the backup file in commands, you should type the passphrase as</p> <pre>"~!@#\$\$%^&*()_+={ } [] \ : " ; ' < > , . ? / ,"</pre>
-f	Optional	Used to force replace the opened applications if needed.
-ow	Optional	Used to overwrite the existing applications.

Examples of using the command line:

- Back up the FactoryTalk Linx Gateway

```
"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -b -s Global -sso
-bak C:\backup\FTLGW_File.bak -prod "FactoryTalk Linx Gateway"
```

- Back up the the FactoryTalk Directory and FactoryTalk Linx

```
"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -b -s Global -sso
-bak C:\Users\Administrator\Desktop\identifier.bak -ido

"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -b -s Global -sso
-bak c:\backup\FTLGW_File.bak -prod "FactoryTalk Linx"
```

- Restore the FactoryTalk Linx Gateway

```
"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -r -s Global -sso
-bak C:\backup\FTLGW_File.bak -prod "FactoryTalk Linx Gateway"
```

- Restore the FactoryTalk Directory and FactoryTalk Linx

```
"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -r -s Global -sso
-bak C:\Users\Administrator\Desktop\identifier.bak -ido

"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -r -s Global -sso
-bak c:\backup\FTLGW_File.bak -prod "FactoryTalk Linx"
```

NOTE: For an encrypted bak file created in FactoryTalk Services Platform version 3.00 and before, if no passphrase was entered, the restore commands should be like:

```
"C:\Program Files (x86)\Common Files\Rockwell\FTSysBackupRestoreTool.exe" -r -s Global  
-sso -bak C:\Users\Administrator\Desktop\Network.bak -ftd -e
```

Troubleshoot FactoryTalk Linx Gateway

This chapter includes the following information:

- What to check first if you're having problems
- Troubleshooting tools for FactoryTalk Linx Gateway
- Troubleshooting topics
- How to contact technical support

What to check first if difficulties are experienced

Does your FactoryTalk Linx Gateway meet the minimum hardware and software requirements? Refer to [Install FactoryTalk Linx Gateway on page 17](#) for these requirements.

Is the software installed correctly? Refer to [Install FactoryTalk Linx Gateway on page 17](#) for installation instructions. Restart your computer after installing the software before you begin using FactoryTalk Linx Gateway.

Do you have a valid activation file? Check the FactoryTalk Diagnostics log. An information message is logged if the activation file is not detected by the system when you launch FactoryTalk Linx Gateway. Refer to the FactoryTalk Services Platform Help for information about FactoryTalk Diagnostics messages. Refer to [About Activations on page 92](#) for information about activations.

Is the OPC UA client successfully connected to the FactoryTalk Linx Gateway server? Check if the OPC UA client use the same security mode and policy with FactoryTalk Linx Gateway. For example, **Sign & Encrypt** and **Basic256Sha256**. Make sure the OPC UA client trust the FactoryTalk Linx Gateway certificate: `cert_ftgw_opcua_server.der`. Refer FactoryTalk Linx Gateway Online Help for information about secure OPC UA client and certificate validation. Also confirm both the OPC Client and the FactoryTalk Linx Gateway have trusted each other's security certificates. There could be a case where the two connect properly but no data is available. This can happen if the user chooses tag list but does not configure any tags. Another case could occur when the client successfully connects and is able to browse tags but is not able to read or write. This could be because the security is not configured or the client is not using the correct ID/Password credentials.

Troubleshooting Tools

To help you isolate, diagnose, and correct any problems you may experience using FactoryTalk Linx Gateway, use the following troubleshooting tools:

FactoryTalk Linx Gateway Configuration Tool

Use the **FactoryTalk Linx Gateway Configuration Tool** to view status and diagnostic information. **Server Configuration** displays the server status. **About > FactoryTalk Historical Diagnostics** displays FactoryTalk Diagnostics messages scoped to the FactoryTalk Linx Gateway service.

FactoryTalk Diagnostics

FactoryTalk Diagnostics provides the ability to log errors, warnings, and other status messages generated throughout a FactoryTalk-enabled system to a central location called an event log. If you encounter a problem, you can review the events in the log that led up to the problem to assist in determining the cause. Or, you can monitor the log to identify potential problems and take corrective action before a problem occurs.

Note that FactoryTalk Diagnostics messages are displayed for the local workstation only.

Refer to the *FactoryTalk Services Platform Help* for more information about FactoryTalk Diagnostics and the event log.

Refer to the *FactoryTalk Linx Gateway Help* for more information about diagnostic messages specific to FactoryTalk Linx Gateway.

FactoryTalk Diagnostics Counter Monitor

FactoryTalk Diagnostics Counter Monitor aids in troubleshooting OPC connections from third-party products. It shows diagnostic information about the FactoryTalk Linx Gateway runtime operation. The FactoryTalk Diagnostics event log and Help are integrated into this tool. Refer to [Use FactoryTalk Diagnostics Counter Monitor with FactoryTalk Linx Gateway on page 76](#) for more information. Refer to the FactoryTalk Diagnostics Counter Monitor Help for individual counter descriptions.

FactoryTalk Live Data Test Client

FactoryTalk Live Data Test Client is a utility to test your OPC DA connection after you have configured the FactoryTalk Linx Gateway. This utility is installed automatically with FactoryTalk Services Platform. This utility can only test connections to the FactoryTalk Linx Gateway OPC DA service. While this test client is not able to interface with the FactoryTalk Linx Gateway OPC interface, it can be used to verify if FactoryTalk Linx is able to access the desired data.

OPC Test Client

OPC Test Client is a utility that enables you to test your data connections if you are using remote OPC Client functionality. This utility is installed automatically as part of Remote FactoryTalk Linx Gateway on the FactoryTalk Linx Gateway product DVD.

The OPC Foundation provides an OPC UA sample client, available for download at <https://opcfoundation.org/developer-tools/samples-and-tools-unified-architecture/net-stack-and-sample-applications/>.

Troubleshooting topics

The topics below provide information to help you troubleshoot FactoryTalk Linx Gateway.

FactoryTalk Linx Gateway's OPC UA service does not appear in the OPC Local Discovery Service (LDS)

Possible causes and solutions

- FactoryTalk Linx Gateway is not configured
 1. No scope
To solve this issue, configure the related scope based on the activation type and apply the system configuration.
 2. OPC UA is disabled
To solve this issue, enable the OPC UA server in the **Server Configuration** tab.
 3. No endpoint configured
To solve this issue, configure the endpoint URL in the **UA Server Endpoints** tab and apply the system configurations.
 4. An endpoint is disabled
To solve this issue, enable the endpoint.

- FactoryTalk Linx Gateway OPC UA service is not started
To solve this issue, start the OPC UA service from **Control Panel>System and Security>Administrative Tools>Services> FactoryTalk Linx Gateway OPC UA Server**.
- FactoryTalk Linx Gateway OPC UA service is disabled
To solve this issue, enable the OPC UA server in the **Server Configuration** tab.
- FactoryTalk Linx Gateway is not activated correctly or activation is expired
To solve this issue, get a new key from Rockwell Automation.
- The option to register with the LDS is disabled
To solve this issue, select **Register with Discovery Service** in the **Server Configuration** tab.
- FactoryTalk Linx Gateway has not trusted the OPC LDS certificate
To solve this issue, click **Trust** in the **Certificate Management** tab to add the LDS certificate into the trust list.
- The OPC LDS certificate has expired
To solve this issue, stop the service and delete its certificate from the hard drive. Once the service starts it will automatically regenerate the certificate.
- OPC Local Discovery Service (LDS) service is not started
To solve this issue, start the LDS service from **Control Panel>System and Security>Administrative Tools>Services>OPC UA Local Discovery Server**

Troubleshoot Excel RTD

The Excel RTD interface is not working. Use these steps to troubleshoot.

- Verify if **Excel RTD Interface** is enabled in FactoryTalk Linx Gateway.
- Verify if the FactoryTalk Linx Gateway RTD add-in is not added in Excel. Do the following:
 1. Open **Excel**.
 2. Select **File > Options > Add-Ins**.
 3. Next to **Manage**, select **Disabled Items > Go**.
 4. In the **Disabled Items** dialog box, select **FTLinxGatewayRTD > Enable > Close**.
- Verify if there is an available activation used in FactoryTalk Linx Gateway.
- Verify the tag names used to reference data in Excel use the correct format defined in FactoryTalk Linx Gateway.
- Disable **Excel RTD Interface**, click **Apply**, then enable **Excel RTD Interface**, and click **Apply**.
- Restart Excel.
- Restart the computer.

If users copy the formula to Excel with the double quotation marks containing incorrect formats, the tag values shown may be abnormal. Remove the copied double quotation marks and enter them using the keyboard.

If you switch Windows users when you are using RTD, RTD may not work as intended. Sign out users and then sign in.

Troubleshoot DDE

The DDE interface is not working. Use these steps to troubleshoot.

- Verify if **DDE Interface** is enabled in FactoryTalk Linx Gateway.
- Verify if DDE is turned on in clients. Take Excel (Microsoft 365) as an example.
 1. Open **Excel**.
 2. Select **File > Options > Trust Center > Trust Center Settings > External Content**.
 3. Select **Enable Dynamic Data Exchange Server Lookup** and **Enable Dynamic Data Exchange Server Launch**.
- Verify if an available activation is used in FactoryTalk Linx Gateway.
- Disable **DDE Interface**, click **Apply**, then enable **DDE Interface**, and click **Apply**.
- Restart DDE clients.
- Restart the computer.
- Verify if there are any tag names using a format that matches an Excel cell reference. The tag name should not be the same as the Excel cell reference, for example, A1 or tag1. Otherwise, DDE will not work when reopening Excel.
- Verify the tag names used to reference data in Excel use the correct format defined in FactoryTalk Linx Gateway.

If you switch Windows users when you are using DDE, DDE may not work as intended. Sign out users and then sign in.

FactoryTalk Linx Gateway activations

If you are experiencing activation problems, refer to:

- [About Activations on page 92](#)
- FactoryTalk Linx Gateway troubleshooting topics in *FactoryTalk Linx Gateway Help*.
- FactoryTalk Activation Manager troubleshooting topics in *FactoryTalk Activation Manager Help*.

FactoryTalk Security

FactoryTalk Security offers centralized security services that provides the ability to control access to your automation system. Your access to, and actions within, the FactoryTalk Linx Gateway tool are controlled by FactoryTalk Security settings.

If you are experiencing problems with FactoryTalk Security, refer to:

- [Secure FactoryTalk Linx Gateway using FactoryTalk Security on page 108](#)
- Troubleshooting topics in *FactoryTalk Services Platform Help*.

FactoryTalk Linx Gateway service (starting and stopping)

If you are experiencing problems starting or stopping the FactoryTalk Linx Gateway service, verify your Windows user account privileges. You must have administrative rights to start and stop the service.

Data quality

If you are experiencing problems with bad quality data, no data being returned, data is stale or frozen, or tags do not appear during an OPC client tag browse operation, use the following steps to isolate and correct the problem:

1. If testing an OPC DA connection, verify that the FactoryTalk connection is working.
 - a. If testing an OPC DA connection, use the FactoryTalk Live Data Test Client to connect directly to FactoryTalk (not FactoryTalk Linx Gateway). Then, verify that you can browse and add an item. If there are no problems, then the issue is with FactoryTalk Linx Gateway, not FactoryTalk.
2. Test the connection.
 - a. If testing an OPC DA connection, run OPC Test Client or FactoryTalk Live Data Test Client. Note that you may need to change the DCOM settings if you use OPC Test Client.
 - i. Navigate to the application containing the data server that you are trying to use.
 - ii. Browse, and put some tags on scan. If you cannot browse for tags, then the data server is not configured correctly or the devices that the data server is pointing to are not configured or connected.
 - b. If testing an OPC UA connection, use the OPC Foundation UA Sample Client to connect to FactoryTalk Linx Gateway. If the sample client connects, the issue is not with FactoryTalk Linx Gateway but with the OPC UA client.
3. Verify that the tags are not hidden by the External Access attribute (set in Logix Designer, starting with version 18 for controllers that support External Access). For more information on the External Access attribute, refer to the documentation for version 18 (CPR 9 SR 2) or later of the application. Note that if the External Access attribute for a tag in a controller is changed from None to Read or Read/Write, you may need to restart the data client to see the tag. If the External Access attribute for a tag in a controller is changed from Read or Read/Write to None, the Quality changes to Out of Service for that tag.
4. Check the FactoryTalk Linx Gateway configuration.
 - a. Open FactoryTalk Linx Gateway.
 - b. Verify that the server is running. If you are experiencing stale or frozen data, it is possible that the client was not notified that FactoryTalk Linx Gateway service had stopped.
 - c. Verify that the proper application, including scope (network or local), is selected.
 - d. Verify that you have the correct activation for the application you are trying to run.
5. Check the FactoryTalk Diagnostics log. Some events to check for:
 - a. A controller is in the process of downloading a new program. The FactoryTalk Diagnostics log will indicate if a new program has been downloaded and specify the path.
 - b. The activation is incorrect for the application or you have exceeded the activation capacity.
 - c. The tag does not exist. Any currently non-existing tags should be logged as not existing in the controller.
6. Check the FactoryTalk Linx configuration.
 - a. Open FactoryTalk Administration Console or FactoryTalk View Studio.
 - b. Right-click the FactoryTalk Linx server and select **Properties**. Verify the correct computer hosting FactoryTalk Linx is shown.
 - c. Double-click **Communication Setup**.
 - d. Verify that there is a shortcut configured and that it has the correct name.
 - e. Click the shortcut and verify that it is pointing to the expected device within the communication tree.
 - f. SS6. Right-click the network you are using and select **Start Browsing**. If the device disappears from the Communication tree, then FactoryTalk Linx is no longer finding the device. Verify that the device is online.

7. If testing an OPC DA quality issue, verify that DCOM access settings are configured correctly.
8. Verify any firewall software is configured to allow access to FactoryTalk Linx Gateway OPC DA and UA service ports.
9. Verify that the scope and FactoryTalk Linx shortcuts are correctly configured. Refer to [Access the data on page 73](#).

If the above steps do not resolve your problem, please contact Rockwell Automation Technical Support.

Communication slow or unreliable

There are many factors to consider when diagnosing communication problems:

- **Computer effect on communication**
 - Memory, disk space, and anti-virus scans can affect computer performance. Refer to [System requirements on page 17](#).
 - Firewalls and switches can completely or partially block communication.
 - The typical timing factor for communication updates is the CPU load. Rockwell Automation recommends a 40% maximum steady state CPU loading. This balances utilization of the hardware and gives enough bandwidth for peak loading.
- **Multiple clients effect on communication**
 - The packaging of data to OPC standards takes computer CPU power to achieve, and this can be significant depending on the data loading.
 - The number of clients requesting data from a single OPC data server can also significantly impact computer CPU loading, particularly if they are not requesting the same items (tags).
 - Clients creating and destroying groups can significantly impact CPU usage.
- **Network effect on communication**
 - An incorrect network configuration can reduce communication effectiveness. Verify your network configuration as well as your installation. Refer to [Install FactoryTalk Linx Gateway on page 17](#).
- **Controller effect on communication**
 - For ControlLogix controllers, data requests are handled by a CPU separate from the control program CPU. (FlexLogix controllers have one CPU to handle all tasks.) However, eventually these data requests are handled by the controller program. This affects communication efficiency since the controller is performing higher priority tasks and handles communication when CPU time is available. You can monitor task utilization using Logix 5000 Task Monitor on the Logix Designer utilities DVD.
 - Data requests are sent to controllers via a network port (for example, Ethernet, ControlNet, DeviceNet). For ControlLogix Ethernet communication, the ENET, ENBT, EN2T, or EWEB module is required. These modules could be a bottleneck to communication depending on the number of data requests and the number of requesting clients.
 - Tag structure in a controller program can also have a significant impact on communication efficiency. Refer to your Logix Designer documentation.
 - The communication time slice setting within the controller (set using Logix Designer application) will affect communication. You may need to increase the setting value.
 - The way OPC clients request data can either help or hinder the ControlLogix Optimized Packets process. Refer to your ControlLogix controller documentation.
 - Offline or disconnected controllers will cause additional retries and diagnostics to be logged. Disable a controller using FactoryTalk Linx if it will not be present in the system for an extended period of time.
- **DCOM effect on communication**

OPC DA is based on DCOM, therefore:

- Changing DCOM security settings may stop the OPC DA service from working.
- Changing DCOM security settings may prevent a client from browsing tags through the OPC UA service.
- If the server and client become disconnected (either via a physical network disconnect or a software disconnect), there is a hard-coded 6-minute time-out notification.
- If the server and client are reconnected, the OPC connection is not automatically reconnected to the original objects. Therefore, servers and clients may require restarting.
- In response to Microsoft Distributed Component Object Model (DCOM) Hardening patch (MS KB5004442), the minimum DCOM authentication level used has been raised to Packet Integrity.
- Both OPC DA clients and servers must have the same DCOM authentication level.

Contact Rockwell Automation Technical Support

If you are experiencing a problem with, or have a question about FactoryTalk Linx Gateway, please consult the Help and Release Notes. If you cannot find the answer, contact Rockwell Automation Technical Support.

Phone

440-646-3434

Worldwide web

<http://www.rockwellsoftware.com>

<http://support.rockwellautomation.com>

Hours of operation

Support staff are available 8 a.m. to 5 p.m. EST, Monday through Friday, except holidays.

Before you call

Before you call, you should be at your computer and be prepared to give the following information:

- The product serial number and version number. These can be found by clicking **Start > Settings > Control Panel > Add/Remove Programs** and clicking **FactoryTalk Linx Gateway**.
- The type of hardware you are using.
- The version of Windows operating system you are using.
- The exact wording of any messages that appeared on your screen.
- What happened and what you were doing when the problem occurred.
- How you tried to solve the problem.

About Activations

Rockwell Automation Windows-based software products are copy protected and require an activation key, located in an activation file, to run the software.

When you launch FactoryTalk Linx Gateway, the software checks for the activation file. If a valid activation cannot be found, an error is logged to FactoryTalk Diagnostics and FactoryTalk Linx Gateway operates under a grace period. Refer to FactoryTalk Services Platform Help for more information about grace periods.

This appendix includes the following information:

- Activate FactoryTalk Linx Gateway
- Activation types

Activate FactoryTalk Linx Gateway

FactoryTalk Linx Gateway supports activating software during the software installation. The new Installation Setup Wizard contains an **Software Activation** check box. This no longer requires you to open FactoryTalk Activation Manager to activate the software.

To activate your copy of FactoryTalk Linx Gateway in the **FactoryTalk Linx Gateway Installation Setup Wizard**, perform the following steps:

1. Perform the steps in [Install FactoryTalk Linx Gateway on page 17](#) to install FactoryTalk Linx Gateway software.
2. On the **Rockwell Software Setup** dialog box in the Installation Setup Wizard, select the **Activate your software** check box and click **Finish**.
3. On the **Software Activation** dialog box, enter the product key from your Activation Certificate. The serial number should have been automatically added. If the serial number is not automatically added, enter the serial number.
4. Select **Activate locally** to activate FactoryTalk Linx Gateway on a single computer, or select **Activate using a dongle** to activate FactoryTalk Linx Gateway on any computer by using a dongle.



Tip: The Activate using a dongle option requires that you have a dongle to lock the activation.

5. Click **Continue**.

You can still activate FactoryTalk Linx Gateway via FactoryTalk Activation Manager by clicking the **Explore other options** link in the **Software Activation** dialog box. The link provides direct access to the FactoryTalk Activation Manager software. To activate your copy of FactoryTalk Linx Gateway in the FactoryTalk Activation Manager, click **Get New Activations** and follow the instructions in the FactoryTalk Activation Manager.

For more information on using the FactoryTalk Activation Manager, click **More** or **Help** in the FactoryTalk Activation Manager.

EvRSI activation is replaced by FactoryTalk Activation Manager. If you are using EvRSI activation, please contact your local Rockwell Automation Sales office or Technical Support for information on migrating your activations to FactoryTalk Activation Manager.

For Rockwell Automation Technical Support in the U.S., call (440) 646-3434.

Outside the U.S., visit <http://www.rockwellautomation.com/locations>.

Activation types

The activation type determines feature support and the maximum capacity of unique tags that can be added to the FactoryTalk Linx Gateway server. The tag limit is for all unique tags, including active, inactive, and valid tags. However, the OPC DA service, UA service, DDE interface, and Excel RTD interface tag limits are separate. For example, a 1,000 tag limit activation can simultaneously serve 1,000 tags to DA clients, 1,000 tags to UA clients, 1,000 DDE tags, and 1,000 Excel RTD tags. For detailed information, refer to the following table.

If a valid activation cannot be found, FactoryTalk Linx Gateway operates under a grace period. The grace period activates FactoryTalk Linx Gateway at the professional level for 7 days.

NOTE: When the activation has changed, you need to restart services or interfaces to detect a new activation.

Beginning with version 6.20, the FactoryTalk Linx Gateway Basic and Standard activations can operate with a FactoryTalk View SE station or distributed application using a network directory when there is a single FactoryTalk Linx data server operating on the same workstation FactoryTalk Linx Gateway is installed on. Version 6.21 added the Extended activation with the same local and network/station capability. A patch is also available to support a similar operation and Extended activation for FactoryTalk Linx Gateway version 6.00 to version 6.20 and for FactoryTalk Gateway version 3.74 to version 3.90. Standard activation supports the FactoryTalk Linx Gateway SDK is limited to installation, setup configuration, and some assistance understanding error conditions. Extended activation supports writing or diagnosing application code utilizing the SDK/API can be acquired with a fee-based support agreement.

A FactoryTalk application can be configured using a Local or Network directory. These options are determined by the capabilities defined by the license/activation that is being used.

1. Local - Small application where the FactoryTalk Linx or FactoryTalk Linx OPC UA Connector communications service is operated on the same workstation as FactoryTalk Linx Gateway. A local application is configured with a single level where all communications services are defined at the same top level (no areas are supported).

NOTE: Grace period is a seven-day free trial of FactoryTalk Linx Gateway during which, a user has the tag subscription capability equals to the "Professional" activation. When the grace period is over, the OPC UA/DA clients cannot connect to the FactoryTalk Linx Gateway.

2. Network - This configuration uses the Network directory. A network station application permits areas to be created to improve the organization of the application (This type of configuration can be used with software like FactoryTalk View SE Station or FactoryTalk Historian which does not support Local directory). There are two categories designed for Network directory.
 - Station - Data servers (FactoryTalk Linx and FactoryTalk Linx UA Connector) must be on the same workstation as FactoryTalk Linx Gateway. When operating on a compute module, the data servers must be in the same module and cannot be remote.
 - Distributed - This type of directory permits communications services to be located on multiple/ different workstations from FactoryTalk Linx Gateway. Up to ten (10) of each type of communications

services (FactoryTalk Linx and FactoryTalk Linx OPC UA Connector) can be defined in a system. These communications services can be configured as redundant to support high availability configurations (This type of configuration can be used with software like FactoryTalk View SE Distributed).

If you select **Automatic Selection** on the **Server Configuration** page, FactoryTalk Linx Gateway finds and uses the activation with the highest feature support.

From FactoryTalk Linx Gateway version 6.00.00, four activations (FactoryTalk Linx Gateway Professional, FactoryTalk Linx Gateway Distributed, FactoryTalk Linx Gateway Standard, and FactoryTalk Linx Gateway Basic) are available for new users. From FactoryTalk Linx Gateway version 6.21.00, added three new activations (FactoryTalk Linx Gateway Extended, FactoryTalk Linx Gateway Embedded, and FactoryTalk Linx Data Bridge Embedded) are available for new users. However, the other legacy activations used in previous versions of the product (for example, FactoryTalk Gateway) are still supported. All the activations are shown in the table below from top to bottom as highest to lowest priority.

Activation Name	Activation	OPC UA tag limit	OPC DA tag limit	RTD tag limit	DDE tag limit	FactoryTalk Directory	Distributed Network	SDK device communications	Remote Proxy Services	Activates FactoryTalk Linx Data Bridge
FactoryTalk Linx Gateway Professional	LINXGW.PROFESSIONAL	500,000	200,000	40,000	4,000	Local or Network	Y	Multiple	Y	Y 200,000 Tag pairs
FactoryTalk Linx Gateway Distributed	LINXGW.DISTRIBUTED	32,000	32,000	32,000	4,000	Local or Network	Y	Multiple	N	N
FactoryTalk Linx Gateway Extended	LINXGW.EXTENDED	15,000	15,000	15,000	4,000	Local or Network	N	Multiple	N	N
FactoryTalk Linx Gateway Standard	LINXGW.STANDARD	5,000	5,000	5,000	4,000	Local or Network	N	One	N	N
FactoryTalk Linx Gateway Basic	LINXGW.BASIC	1,000	1,000	1,000	1,000	Local or Network	N	None	N	N
FactoryTalk Linx Gateway Legacy	Verifies its	500	500	N	N	Local or Network	N	N	N	N

Activation Name	Activation	OPC UA tag limit	OPC DA tag limit	RTD tag limit	DDE tag limit	FactoryTalk Directory	Distributed Network	SDK device communications	Remote Proxy Services	Activates FactoryTalk Linx Data Bridge
Gateway Embedded	operating on a Compact Logix 5480 windows core									
FactoryTalk Linx Data Bridge Embedded	Verifies its operating on a Compact Logix 5480 windows core	N	N	N	N	Local or Network	N	None	N	Y 500 Tag pairs
FactoryTalk Linx Data Bridge Standard	LINXDB.STANDARD	N	N	N	N	Local or Network	N	None	N	Y 2,000 Tag pairs
Gold Master	GOLDMASTER	500,000	200,000	40,000	4,000	Local or Network	Y	Multiple	Y	Y 200,000 Tag pairs
FactoryTalk Gateway Distributed	RSOPCD.U NLTD	500,000	200,000	N	N	Local or Network	Y	None	N	N
FactoryTalk Gateway Distributed 70K	RSOPCD.70000	70,000	70,000	N	N	Local or Network	Y	None	N	N
FactoryTalk Gateway	RSOPCD.32000	32,000	32,000	N	N	Local or Network	Y	None	N	N

Activation Name	Activation	OPC UA tag limit	OPC DA tag limit	RTD tag limit	DDE tag limit	FactoryTalk Directory	Distributed Network	SDK device communications	Remote Proxy Services	Activates FactoryTalk Linx Data Bridge
Distributed 32000										
FactoryTalk Gateway Station 32000	RSOPCS.32000	32,000	32,000	N	N	Local	N	None	N	N
FactoryTalk Gateway Distributed 5000	RSOPCD.5000	5,000	5,000	N	N	Local or Network	Y	None	N	N
FactoryTalk Gateway Station 5000	RSOPCS.5000	5,000	5,000	N	N	Local	N	None	N	N
FactoryTalk Gateway Distributed 1500	RSOPCD.1500	1,500	1,500	N	N	Local or Network	Y	None	N	N
FactoryTalk Gateway Station 1500	RSOPCS.1500	1,500	1,500	N	N	Local	N	None	N	N

If a system requires 32,000 or more tags, use the Professional activation and refer to the **FactoryTalk Linx Gateway Release Notes > Application Notes** for tested hardware and update rates.

*

500,000 : You can edit it in the FactoryTalk Administration Console (**System > Policies > FactoryTalk Linx Gateway > FactoryTalk Linx Gateway Policy > Tag count limitation for professional activation**). The default/tested value is 500,000. For personalized standard activation, the tag limitation is 5,000.



Tip: To check the number of tags added to FactoryTalk Linx Gateway, use FactoryTalk Diagnostics Counter Monitor.

- For OPC DA service tags, view the **Count against Activation** counter.
- For OPC UA service tags, view the **Total Items in Subscription** counter.



If you have multiple clients subscribing the same tags, the tags being used against the activation limit should be counted separately. For example, there are five clients subscribing to 1000 tags, then the total activation limit used is 5000 tags.

As a best practice, Rockwell Automation recommends using a shared concurrent activation, which is locked to a networked activation server computer but shared by client computers on the network. Refer to *FactoryTalk Services Platform Help* for more information.

Note that if you have multiple FactoryTalk Linx Gateway instances using different tag counts, each FactoryTalk Linx Gateway instance must be activated using its own specific activation file to ensure that each FactoryTalk Linx Gateway instance receives the correct tag count activation.



Tip: FactoryTalk Batch v9.00.00 (CPR 9) and later supports direct communication between FactoryTalk Live Data and plant-floor controllers and devices, removing the need for FactoryTalk Linx Gateway.

Install FactoryTalk Linx Gateway with command line syntax

Besides the Setup Wizard installation, FactoryTalk Linx Gateway also supports automated installation using command line syntaxes: unattended installation. You can typically use the unattended installation during large-scale rollouts when it might be too slow and costly to have administrators or technicians interactively install the FactoryTalk Linx Gateway software on individual computers.

In the unattended installation, you enter a specified command line with multiple parameters. During the installation process, instead of prompting you for installation and configuration information interactively, the process follows the parameters you specified in the command lines.

Perform unattended installation

To install FactoryTalk Linx Gateway in the unattended mode, follow the steps below. The steps may vary slightly. Follow the on-screen instructions that apply to your operating system.

1. Close all open Windows programs.
2. Open the **Command Prompt** window as administrator.
3. In the **Command Prompt** window, navigate to *D:*, where *D:* is the drive containing the FactoryTalk Linx Gateway installation DVD or installation package, and press **Enter**.



Tip: The **User Account Control** dialog box may show after you press **Enter**, click **Yes** to continue. The silent installation requires the Windows Administrator privilege.

4. Type a command line with the following syntax:

```
Setup.exe {/Q | /QS}
/IAcceptAllLicenseTerms
[/AutoRestart]
[/SetupLanguage=language]
/Product=product_name
[/InstallDrive=drive]
[/SerialNumber=serial_number]
[/ProductKey=product_key]
[/Version=product_version]
```

5. Press **Enter**. The installation process starts with the parameters you specified.
6. For detailed description about each parameter, see [Parameters on page 98](#). You can also type **Setup /?** in the **Command Prompt** window, and press **Enter** to view the help information of all parameters and examples.

Parameters

The parameters and values are not case sensitive. If the value includes spaces, you need to enclose it in quotation marks (" ").

/Q

One of **/Q** and **/QS** is required if **/Record** is not specified.

Installs the product in the silent mode without any user interface.

/QS

One of /Q and /QS is required if /Record is not specified.

Installs the product in the unattended mode without user interaction during installation, and shows the progress, errors, or complete messages on the user interface.

/IAcceptAllLicenseTerms

Required for /Q or /QS.

Specifies that you read and acknowledge all license agreements, and agree to continue the installation.

/AutoRestart

Optional. If specified, the computer will be restarted automatically after the installation, if a restart is required to complete the installation.

The parameter is ignored if a restart is not required.

/SetupLanguage= *language*

Optional. Specifies which language will be displayed during the installation process. The value must be the one of **ENU, CHS, DEU, ESP, FRA, ITA, JPN, KOR, or PTB**.

If omitted, the default language is the user or system user interface language.

/Record

Optional. Records your inputs to a recording file.

/Playback

Optional. Plays back a recording file.

/IgnoreWarning

Optional. If specified, the setup will ignore and continue.

/Product= *product name*

Required. Specifies which product will be installed. The product name must be one of the following:

- Gateway Server OPC UA and DA (local or remote DA clients)
- Gateway Server OPC UA and DA (only local DA clients)
- Remote Gateway (DA Client remote configuration)

For more details, please refer to the following list

- Setup.exe /Product="Gateway"
Equal to Setup.exe /Product="Gateway Server OPC UA and DA (local or remote DA clients)". Both will install "Gateway Server OPC UA and DA (local or remote DA clients)".
- Setup.exe /Product="Gateway-L"

Equal to Setup.exe /Product="Gateway Server OPC UA and DA (only local DA clients)". Both will install "Gateway Server OPC UA and DA (only local DA clients)".

- Setup.exe /Product="Remote Gateway"

Equal to Setup.exe /Product="Remote Gateway (DA Client remote configuration)". Both will install "Remote Gateway (DA Client remote configuration)".

/Uninstall=*Product name*

Optional. Uninstall the product.

/InstallDrive= *drive*

Optional. Specifies the installation drive.

If omitted, the default drive and location is:

- **C:\Program Files (x86)\Rockwell Software**

/SerialNumber= *serial_number*

Optional. Specifies the serial number that is required if you want to get activation keys during installation.

/ProductKey= *product_key*

Optional. Specifies the product key that is required if you want to get activation keys during installation.

/Version= *product_version*

Optional. Specifies the version corresponding to the product version that the **SerialNumber** and **ProductKey** are able to activate if you want to get activation keys during the installation.

If the version information is omitted, the installer uses a default version which is the most recent product version available when retrieving the activation.

Examples

The following examples show how to use the commands during the unattended installation.

Example 1

```
Setup.exe /Q /IAcceptAllLicenseTerms /Product="Gateway Server OPC UA and DA (local or remote DA clients)"
```

means:

The FactoryTalk Linx Gateway unattended installation uses the default settings during the installation process, with no user interface.

Example 2

```
Setup.exe /QS /IAcceptAllLicenseTerms /AutoRestart /SetupLanguage=CHS /  
Product="Gateway Server OPC UA and DA (local or remote DA clients)" /  
InstallDrive=D: /SerialNumber=0123456789 /ProductKey=ABCDE-FGHIJ /Version=6.30.00
```

means:

- During the installation, the progress, error, or complete messages show on user interfaces. The displayed language is Chinese.
- FactoryTalk Linx Gateway will be installed to **D:\Program Files (x86)\Rockwell Software**
- The setup will get activation keys during installation if the serial number *0123456789* and product key *ABCDE-FGHIJ* are valid.
- After the installation, if a restart is required, the computer will be restarted automatically.

Example 3

```
Setup.exe /Q /Uninstall /Product="Gateway Server OPC UA and DA (local or remote DA  
clients)"
```

means:

- The software is uninstalled silently with no user interface.

About FactoryTalk Linx

This appendix includes an overview of FactoryTalk Linx.

Overview of FactoryTalk Linx

FactoryTalk® Linx is a FactoryTalk® Live Data server and communications service designed to deliver control system information from Allen-Bradley® control products to the Rockwell Automation FactoryTalk® software portfolio and Studio5000® design software. While FactoryTalk Linx can communicate with most Allen-Bradley Programmable Logic Controllers (PLC®) and many other control products, it is optimized to work with Logix 5000™ Programmable Automation Controllers (PAC) and the PlantPax process controller using EtherNet/IP. It gives the fastest data rates and capacity possible while minimizing the impact on automation networks and control system operation. Use FactoryTalk Linx to:

- Browse devices in the network - The network browser provides the ability to discover devices in an automation system, permit the user to navigate the topology, perform device commissioning, access device properties, and diagnostic statistics.
- Acquire data - FactoryTalk Linx provides a scalable solution that can support small applications running on a single computer with a single controller, to large distributed and even redundant data server configurations communicating with many controllers.
- Use the FactoryTalk Linx Gateway Remote Proxy Server - Remote Devices via Proxy Service allows FactoryTalk Linx on one computer to bridge through a central FactoryTalk Linx Gateway Professional workstation on the network to communicate with automation system devices on a different network.

FactoryTalk Linx:

FactoryTalk Linx version 5.90.00 and earlier:

- Is delivered and installed with the FactoryTalk Services Platform which is included with most Rockwell Automation software products. FactoryTalk Linx is also delivered within the PanelView Plus Electronic Operator Interface (EOI) terminal's firmware.



Tip: The FactoryTalk Services Platform Installation includes several useful tools. Use FactoryTalk Live Data Test Client to interface with FactoryTalk Linx to read and write data directly to controllers. For more information about FactoryTalk Live Data Test Client, see FactoryTalk Services Platform Online Help.

- Is accessed as an embedded component within each software package that utilizes its services. Configure FactoryTalk Linx using the **Communication Setup** editor launched from a FactoryTalk application design environment (for example, FactoryTalk View Studio) or from the FactoryTalk Administration Console.
- Provides access to controller and device data from any FactoryTalk application using FactoryTalk Live Data.
- Is highly optimized for Logix 5000 communications.
- Starting with version 5.30.00, supports FactoryTalk Alarms and Events. For more information about FactoryTalk Alarms and Events, See *FactoryTalk Alarms and Events Online Help*.
- Starting with version 5.30.00, network applications provide the option of specifying a secondary, or redundant, server to take over when the primary server fails.

- Starting with version 5.60.00, reads data directly from devices using parameters specified in the device's Electronic Data Sheet (EDS) file.
- Starting with version 5.70.00, receives data from Logix 5000 controllers directly via unsolicited message.
- Starting with version 5.70.00, is able to communicate with Micro800 controllers.
- Starting with version 5.80.00, reads energy usage information from devices that support the ODVA CIP Energy object.
- Starting with version 5.90.00, reads Logix 5000 tag extended properties (for example, **@Min**, **@Max**, **@Description**) and delivers them to FactoryTalk View applications. With FactoryTalk Linx version 6.10.00, this capability is enhanced to improve read performance and adds the ability to provide a description using information indirectly associated with a tag. This enables a FactoryTalk View SE client to obtain descriptions for tag elements that do not directly have a description assigned. This is similar to the description pass-through capability of Studio 5000 Logix Designer.
- Starting with version 5.90.00, removes Logix 5000 tag requests when their external access is switched to *no access* in Logix Designer, and the tags can be removed from the controller while it is operating.
- Starting with version 5.90.00, permits communications to specific Logix 5000 shortcuts to be inhibited to reduce the impact of Logix 5000 controllers that are disabled or off-line.

FactoryTalk Linx version 6.00.00:

- Starting with version 6.00.00, EtherNet/IP network drivers can be configured directly from the FactoryTalk Linx Network Browser control embedded within Studio 5000 and other Rockwell Automation design software.
- Starting with version 6.00.00, provides access to Logix 5000 tag based alarm attributes (for example, **@Alarm...**).
- Offers a variety of communication drivers and routing options.
- Supports Local applications (also called stand-alone applications) for smaller systems, and Network applications (also called distributed applications) for larger systems.
- Starting with version 6.00.00, enables the configuration of two redundant shortcut paths to a single Logix 5000 controller to support high availability systems that desire to retain communications when a path through a network becomes disabled.
- Starting with version 6.00.00, permits the configuration of two shortcut paths to the primary and secondary Logix 5000 controllers in a redundant ControlLogix revision 31.5x system to retain communications when a redundancy switchover occurs.
- FactoryTalk Linx 6.00.00 added the ability to provide communications and browsing services for Studio 5000 and ControlFLASH. FactoryTalk Linx version 6.10.00 extends this functionality to support the Connected Components Workbench (CCW) version 12.00.00 and FactoryTalk AssetCentre version 9.00.00.
- FactoryTalk Linx version 6.00.00 updated both the Virtual Backplane and USB drivers and had them signed by Microsoft to permit them to operate on a workstation with Windows 10 Secure boot enabled. FactoryTalk Linx version 6.10.00 extends this functionality to include the drivers associated with the 1784-PCICS and 1784-PCKTS cards. In FactoryTalk Linx version 6.20.00, 1784-PKTX driver signed by Microsoft to support Windows 10 secure boot.

FactoryTalk Linx version 6.10.00:

- FactoryTalk Linx version 6.10.00 added a new standalone version of FactoryTalk Linx Network Browser that can be launched from the Windows Start Menu. Previously this component was only available from within other Rockwell Automation software (for example, ControlFLASH and Studio 5000 Logix Designer). The Network Browser can be used to visualize the network to determine which devices are active in the system.

- FactoryTalk Linx version 6.10.00 added FactoryTalk Security Product Policy to provide more control over the configuration for authorized users.
- FactoryTalk Linx version 6.10.00 added logging of FactoryTalk Audit messages to track configuration changes of FactoryTalk Linx.
- FactoryTalk Linx version 6.10.00 supports a new capability in Logix5000 V32 controllers to change the names of tags and structure members on a running controller. When FactoryTalk Linx detects the rename operation, it will immediately stop requesting the old names and provide an appropriate error status back to the FactoryTalk software that requested the data, making it easier to locate other software that is impacted by the rename operation.
- FactoryTalk Linx version 6.10.00 added the ability to receive unsolicited messages using PLC-2 Unprotected Writes. This enables Logix5000 or legacy controllers to send information to a FactoryTalk software package using FactoryTalk Linx.
- FactoryTalk Linx version 6.10.00 changes the default setting for the “listen on EtherNet/IP Encapsulation port” (port 44818) for its Ethernet driver so that FactoryTalk Linx will respond to network browse requests and receive unsolicited messages from Logix5000 controllers. RSLinx Classic version 4.00.01 or earlier allocated this port by default but was updated with version 4.10.00 to not allocate the port to reduce the likelihood of a conflict between these two software packages.
- FactoryTalk Linx version 6.10.00 added the ability to configure two independent instances of the data service on a single Windows operation system. It allows applications to have more tags, data clients (for example, HMI clients), and/or controllers without affecting the other FactoryTalk Linx data server.

FactoryTalk Linx version 6.11.00:

- FactoryTalk Linx version 6.11.00 added the ability to establish secure encrypted communications with FactoryTalk Policy Manager using CIP security. See *FactoryTalk Policy Manager Online Help* for more information about CIP security.

FactoryTalk Linx version 6.20.00:

- FactoryTalk Linx version 6.20.00 added the ability to access information inside of devices that support the Open Device Vendors Association (ODVA) Common Industrial Protocol (CIP), using the Class, Instance and Attribute (CIA) messaging with the **CIP Object - Class/Instance/Attribute Message** shortcut type.
- The FactoryTalk Security Policy for FactoryTalk Linx was enhanced to control the user's capabilities from the FactoryTalk Linx Network Browser and to control access to CIA Messaging.
- In conjunction with FactoryTalk Linx Gateway, provides standard OPC connectivity into the FactoryTalk system for third-party products. For more information about FactoryTalk Linx Gateway, refer to the FactoryTalk Linx Gateway Help. FactoryTalk Linx version 6.20.00 adds the ability to access information inside of devices that support the Open Device Vendors Association (ODVA) Common Industrial Protocol (CIP), using the Class, Instance and Attribute (CIA) messaging with the **CIP Object - Class/Instance/Attribute Message** shortcut type.
- Starting with version 6.20.00, FactoryTalk Linx supports tag communication with data types as LINT, ULINT, LREAL, USINT, UINT, and UDINT.
- Starting with version 6.20.00, FactoryTalk Linx instance02 supports Logix-based Alarms and Events.
- Starting with version 6.20.00, FactoryTalk Linx provides the ability to communicate using solicited messaging with Allen-Bradley controllers using PLC-5 or SLC-5 messaging over the DH+ network without having a 1784-PKTX card installed on the computer. This is achieved by using the 1756 EtherNet module bridging across a ControlLogix chassis to a DH+ network connected to a 1756-DHRIO module.

- FactoryTalk Linx version 6.20.00 adds the ability to configure existing drivers in FactoryTalk Linx Browser > **Configure Drivers** dialog box.
- FactoryTalk Linx version 6.20.00 adds the ability to view new CIP Identity Object Manufacturer information, which includes **Catalog Number**, **Manufacture Date**, **Hardware Revision**, **Warranty**, and **Series**.
- FactoryTalk Linx version 6.20.00 adds FactoryTalk Audit information to diagnose configuration changes made from the FactoryTalk Linx Network Browser.
- FactoryTalk Linx version 6.20.00 adds the ability for FactoryTalk Linx Network Browser to browse through the 5094 IO HART modules and display HART connected devices in the topology.
- FactoryTalk Linx version 6.20.00 adds the ability for the FactoryTalk Linx Network Browser to access Device Statistics to help diagnose devices.
- FactoryTalk Linx version 6.20.00 adds the ability for the FactoryTalk Linx Network Browser to access Device Configuration to help configure the port and network configuration of a device.
- FactoryTalk Linx version 6.20.00 adds the ability for the FactoryTalk Linx Network Browser to launch an Internet browser to open the device embedded web page.
- FactoryTalk Linx version 6.20.00 provides the ability for FactoryTalk and PanelView Plus V12 terminals to access four attributes @Name, @Quality, @Timestamp, and @Scope.
- FactoryTalk Linx version 6.20.00 adds the ability for FactoryTalk and PanelView Plus V12 terminals to access PlantPAX Controller extended tag properties: @Library, @Instruction, @Label, @Area, @URL, and @Navigation.
- Starting from version 6.20.00, FactoryTalk Linx changed to utilize a device's **Network Path** to store the location of the device in a system, which enables the user to configure and store the shortcut path using the device's IP address and slot number in a chassis.
- FactoryTalk Linx version 6.20.00 provides Chinese, German, French, and Japanese localized user interface (the localized FactoryTalk Linx can only be installed when installing the same localized version of FactoryTalk View SE).
- FactoryTalk Linx version 6.20.00 adds the ability to close unused connections after a specified time.
- FactoryTalk Linx version 6.20.00 adds the ability to specify the max number of connections for a **Processor** shortcut connecting to PLC/SLC controllers using the DHRIO module.

FactoryTalk Linx version 6.21.00:

- FactoryTalk Linx version 6.21.00 adds an **About** dialog box in FactoryTalk Linx Network Browser to show the version of the installed FactoryTalk Linx Network Browser and FactoryTalk Linx, or to view the copyright and contact information.
- FactoryTalk Linx version 6.21.00 adds the ability to detect devices that support a user initiating LED blink operation and presents an option on the device property dialog to locate where a device is physically installed by flashing a device's LEDs.
- FactoryTalk Linx version 6.21.00 adds an option to set the **Terminal file transfer communication package size**. Users can choose either 2000 bytes or 1400 bytes for the terminal communication package size (Default 2000). The smaller packet size improves the transfer time when FactoryTalk View Studio ME is operating within a virtual machine.
- FactoryTalk Linx version 6.21.00 adds two predefined tags (@NamespaceTimestamp, @NamespaceTimestampOPC) to show a timestamp for the last Logix controller namespace change.
- FactoryTalk Linx version 6.21.00 included a new tool named **FactoryTalk Linx Configuration Import Export Tool**, which enables the FactoryTalk Linx driver and shortcut configuration to be extracted, modified, and replaced, providing an alternative to manually creating or editing the driver and shortcuts configuration from the FactoryTalk Administration Console user interface.

- FactoryTalk Linx version 6.21 supports to backup and restore shortcut and driver configurations in FactoryTalk Administration Console.
- FactoryTalk Linx version 6.21 adds the ability to generate SysLog for select events including CIP Security configuration changes, network configuration changes, and FactoryTalk Linx service restart.
- FactoryTalk Linx version 6.21.00 improved performance for design software that utilizes FactoryTalk Linx for communications direct to devices (for example, Studio 5000 Logix Designer and ControlFLASH Plus).
- In FactoryTalk Linx version 6.21.00, the FactoryTalk Linx Redundancy Module Configuration Tool can be launched from the FactoryTalk Linx Network browser.

FactoryTalk Linx version 6.30.00:

- FactoryTalk Linx version 6.30.00 adds an option to enable or disable CIP Security (Port 2221) for the server workstation or a device via the **Network Browser**.
- FactoryTalk Linx version 6.30.00 supports browsing 5015 adapters and optimizes the user interface of 5015 adapters with their I/O modules.
- FactoryTalk Linx **Network Browser** version 6.30.00 supports indicating the offline status of devices.
- FactoryTalk Linx version 6.30.00 adds one predefined tag (**@TrackedStateValue**) to show the tracked state change detection value from a Logix L7 series controller.
- FactoryTalk Linx version 6.30.00 adds an **LLDP** tab in the **Network Browser** to view and edit the Link Layer Discovery Protocol (LLDP) detection status of a device.
- FactoryTalk Linx version 6.30.00 adds **@RedundancyEnabled** and **@RedundancyState** predefined tags associated with a processor shortcut, to indicate if the associated controller is operating in a ControlLogix Redundancy configuration and its current operational state. These tags are helpful for Human Machine Interface (HMI) displays that monitor the operation of a redundant ControlLogix controller's operation.
- FactoryTalk Linx **Network Browser** version 6.30.00 supports browsing of GuardLink connected devices.
- FactoryTalk Linx version 6.30.00 removes the "IO Linx" communications driver.
- FactoryTalk Linx version 6.30.00 enhances the configuration of port 44818 that keeps the same configuration status in both FactoryTalk Linx and FactoryTalk Administration Console.
- FactoryTalk Live Data version 6.30.00 extends the supported subscription rates to include 600, 700, 800, and 900 ms.
- FactoryTalk Live Data version 6.30.00 adds leading zeros for array indexes so that FactoryTalk Live Data Tag browser sorts array elements in the proper numerical order.
- FactoryTalk Linx version 6.30.00 raises the minimum DCOM authentication level to Packet Integrity. For additional information about the affected Rockwell Automation products, see the Knowledgebase Document ID: [PN1581 - Product Notification 2022-01-001 - Rockwell Automation products unable to establish proper DCOM connection after installing Microsoft DCOM Hardening patch \(MS KB5004442\)](#).

FactoryTalk Linx version 6.31.00:

- FactoryTalk Linx version 6.31.00 supports adding and configuring unsolicited message shortcuts for PLC5 and SLC500 controllers.
- FactoryTalk Linx **Network Browser** version 6.31.00 supports adding and configuring remote proxy drivers.
- FactoryTalk Linx **Network Browser** version 6.31.00 enhances the configurations on the **LLDP** tab. The neighbor information also shows on the **Port Configuration** tab.
- FactoryTalk Linx **Network Browser** version 6.31.00 adds audit messages for device configuration. When configuring device properties, audit messages are logged in FactoryTalk Diagnostics Viewer.
- FactoryTalk Live Data common tag browser user interface included with FactoryTalk Services Platform version 6.21.00 now uses data type names that match the types presented in Studio 5000 Logix designer.

FactoryTalk Linx version 6.40.00:

- FactoryTalk Linx version 6.40.00 supports shortcut connections through a FactoryTalk Linx Gateway remote proxy server.
- FactoryTalk Linx version 6.40.00 provides a 64bit communications service for FactoryTalk Policy Manager.
- FactoryTalk Linx version 6.40.00 updates the USB kernel drivers to permit Windows Core Isolation Device Security.
- FactoryTalk Linx version 6.40.00 removes 1784-PCICS card's kernel driver.
- FactoryTalk Linx version 6.40.00 supports FactoryTalk View ME Studio MER project file transfer to a VersaView6300 computer running FactoryTalk View ME.
- FactoryTalk Linx version 6.40.00 supports switching the local language from a setting in the FactoryTalk Administration Console.
- FactoryTalk Linx version 6.40.00 includes a new FactoryTalk Live Data Tag Browser that includes the ability browse Logix Extended Tag properties and bits embedded within integer tags.
- FactoryTalk Linx version 6.40.00 supports REAL array and LREAL array data types for the CIA message.
- FactoryTalk Linx version 6.40.00 supports Symbolic shortcut access to bits within Micro800 numeric tags.
- FactoryTalk Linx Network Browser version 6.40.00 supports the Explicit Protected Mode function.
- FactoryTalk Linx Network Browser version 6.40.00 supports customizing IP subnet with rotary switches on the controllers.
- FactoryTalk Linx Network Browser version 6.40.00 adds a new driver to communicate through a FactoryTalk Linx Gateway Remote Proxy service.
- FactoryTalk Linx Network Browser version 6.40.00 adds an auto-start and minimize to system tray option.
- FactoryTalk Linx Network Browser version 6.40.00 supports uploading IODD device description files from an IO-Link device and registering them with the Device Description (formerly EDS) Subsystem.
- FactoryTalk Linx version 6.40.00 increases the size of supported tag references received from FactoryTalk software from 260 characters to 1024 characters.
- FactoryTalk Linx Network Browser version 6.40.00 increases the number of items that can be added to the Ethernet driver list from 64 to 255.
- FactoryTalk Linx Network Browser version 6.40.00 now displays device's DNS host name in the topology tree along with its resulting IP address.
- FactoryTalk Linx Configuration Import Export Tool version 6.40.00 supports importing and exporting drivers without specifying a target server.

For more information, refer to *FactoryTalk Linx Help*.

Secure FactoryTalk Linx Gateway using FactoryTalk Security

This appendix includes the following information:

- About FactoryTalk Security
- Using FactoryTalk Security with FactoryTalk Linx Gateway
- Securing tag write access for FactoryTalk Linx Gateway

About FactoryTalk Security

FactoryTalk Security improves the security of your automation system by limiting access to those with a legitimate need. FactoryTalk Security authenticates the identities of users and authorizes user requests to access a FactoryTalk system against a set of defined user accounts and access permissions held in the FactoryTalk network directory or FactoryTalk local directory.

For help with configuring security services, refer to *FactoryTalk Services Platform Help*.

If you prefer not to use security services, you can grant all users full access to your automation system. For help overriding security services, refer to *FactoryTalk Services Platform Help*.

Secure the FactoryTalk Linx Gateway Configuration tool

The FactoryTalk Linx Gateway Configuration tool enables you to start or stop the FactoryTalk Linx Gateway service and configure the scope. To configure security for the tool, in the FactoryTalk Administration Console, right-click the network (the highest level of the tree), and select **Security** from the menu.

The following example shows the steps to restrict a user from changing the scope:

Before you begin:

- Log in as Windows Administrator or Power User of the computer.
- Obtain Read/Write/List Children permissions within the Common section of Security.
- Log in to FactoryTalk.

To restrict a user from changing the scope:

1. In the FactoryTalk Administration Console Explorer, right-click **Network > Security**. The **Security Settings for Network** dialog box opens.
For local scope, right-click **Local (THIS COMPUTER) > Security**. The **Security Settings for Local** dialog box opens.
2. On the **Permissions** tab, select **View permissions by User** and you can see all the user groups (Administrators, All Users, Anonymous Logon), highlight the user you want to restrict.
3. From the **Permissions for *** from All Computers list**, click **Common > Write**, and select the **Deny** check box.
4. Click **OK**.

Secure runtime actions

Runtime actions are browsing, reading, or writing to tags. You configure security governing these actions using the Anonymous Logon user account at either the application level or area level.

To browse the directory and read the data, the Anonymous Logon user must have List Children and Read permissions within the Common section of Security.

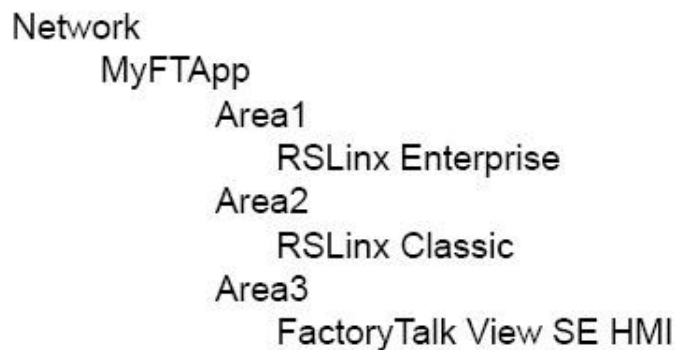
To write to tags, the Anonymous Logon user must have Write Value permissions within the Tag section of Security.

Keep the following in mind when securing runtime actions:

- Security for the FactoryTalk Linx Gateway is set at the FactoryTalk Linx Gateway level using the Anonymous Logon user account. Therefore, all clients that access that specific FactoryTalk Linx Gateway will have the same privileges. If different clients need different privileges, then a second FactoryTalk Linx Gateway will need to be configured on another computer.
- Security is area-based. It is a best practice to have only one data server per area. This allows you to place different permissions on each area (data server).
- When configuring the scope for the FactoryTalk Linx Gateway, you should select the FactoryTalk Application, not an area. Selecting the scope at the application level enables you to add areas to that application without having to change the scope. Changing a scope affects all the existing tag references that have been previously configured in the clients.
- You can deny both Read and Write access to areas. This is shown in the following example.

Example

Assume a Network-scoped distributed system. This system has a FactoryTalk Application called MyFTApp that contains three areas and three data servers.



Assume the requirements for the OPC clients are:

- Full access (Reads/Writes) allowed through FactoryTalk Linx.
- No Reads allowed from the OPC client through RSLinx Classic.
- No Writes allowed from the OPC client into the FactoryTalk View SE HMI (Reads are allowed).

To meet these requirements:

1. The selected scope (using the **FactoryTalk Linx Gateway Configuration** screen) should be Network/MyFTApp. (**Selected Scope** field shows Network/MyFTApp.)
2. Security for Area1 (using the FactoryTalk Administration Console) should be configured as follows:
 - a. Under Application **MyFTApp**, right-click **Area1 > Security** to open **Security Settings for Area1** dialog box, and then select **Anonymous Logon** user group.
 - b. From **Permissions for Anonymous Logon from All Computers** list, select **Common > Read > Allow**.
 - c. From **Permissions for Anonymous Logon from All Computers** list, select **Common > List Children > Allow**.
 - d. From **Permissions for Anonymous Logon from All Computers** list, select **Tag > Write Value > Allow**.

3. Security for Area2 (using the FactoryTalk Administration Console) should be configured as follows:
 - a. Under Application **MyFTApp**, right-click **Area2 > Security** to open **Security Settings for Area2** dialog box, and then select **Anonymous Logon** user group.
 - b. From **Permissions for Anonymous Logon from All Computers** list, select **Common > Read > Deny**.
4. Security for Area3 (using the FactoryTalk Administration Console) should be configured as follows:
 - a. Under Application **MyFTApp**, right-click **Area3 > Security** to open **Security Settings for Area3** dialog box, and then select **Anonymous Logon** user group.
 - b. From **Permissions for Anonymous Logon from All Computers** list, select **Tag > Write Value > Deny**.

If a write action is attempted into Area3, the following error is logged in FactoryTalk Diagnostics:

"FactoryTalk Linx Gateway write failed due to denied access for client 'Client' group 'Group1 (Active, 250ms)' item 'Area3::my_int'. Verify you have the correct security authorization to perform the write operation."

If you attempt to browse the FactoryTalk application, Area2 will not show since Read permissions have been denied. If your display has a tag previously referenced from Area2, its value will show as (Empty Data) with a Quality of Invalid Quality. The following errors are logged in FactoryTalk Diagnostics:

"Cannot interpret area RNA://\$Global/MyFTApp/Area2 (result=80042062)

Failed to add item '[FTL_Advanced]my_tag' to server RNA://\$Global/MyFTApp/Area2:RSLC' because of insufficient access rights."



Tip: Access to resources (such as applications, areas, or servers) and the ability to perform tasks (such as read or write) are governed by the permissions set in FactoryTalk Security. As a result, if you do not have the appropriate permission, some components on a dialog box may be unavailable, or entire dialog boxes or context menu selections described in the Help may be inaccessible. Refer to the FactoryTalk Services Platform Help for more information.

Secure tag write access for an application or area

When using the **Anonymous Logon**, the system administrator can manage tag write access in an application, area, or sub-area for FactoryTalk Linx Gateway servers. Tag write access is enabled (Write Tag permission is set to **Allow**) by default.

Before you begin:

- Find the Anonymous Logon in Users and Group > Users.
- Do not delete or change password.
- Check Effective permissions to verify Rights for the Anonymous Logon user.

To disable write access for an application, area, or sub-area:

1. On the **FactoryTalk Administration Console application** tab, click the application, area, or sub-area.
2. Right-click and select **Security**. The **Security Settings** dialog box opens.
3. Select **Anonymous Logon** from the list of users.
4. Click and expand **Tag** in the list of permissions to expose the **Write Value** permission.
5. Select the **Deny** check box.
6. Click **OK**.

Secure tag write access for a computer

When using the **Anonymous Logon**, the system administrator can manage tag write access for a specific computer. Use the system administrator to specify permissions for each FactoryTalk Linx Gateway.

Before you begin:

- Find the Anonymous Logon in Users and Group > Users.
- Do not delete or change password.
- Check Effective permissions to verify Rights for the Anonymous Logon user.

To disable tag write access for a computer:

1. On the application window, select the application, area, or sub-area.
2. Right-click and select **Security**. The **Security Settings** dialog box opens.
3. Click **Add**. The **Select User and Computer** dialog box opens.
4. Select **Anonymous Logon** from the list of users. If **Anonymous Logon** is not listed, select **Show users only**.
5. Select the appropriate computer from the list. If computers are not listed, select **Show computers only**, and then click **OK**.
6. Click and expand **Tag** in the list of permissions to expose the **Write Value** permission.
7. Select the **Deny** check box.
8. Click **OK**.

Feature Security Properties

Use the **Policy Settings** tab in **Feature Security Properties** dialog box to secure features of a single FactoryTalk product. By setting permissions to a single feature, you can limit a user or a group of users to perform securable actions.

The logon scope is determined by the user's activation type. If a user has a local license, he can only log on to local scope. If the user has a network license, he can logon to both network and local scope.

To log on FactoryTalk Linx Gateway server, do one of the followings

- Click **File > Log On**.
- Click **Select** next to **FactoryTalk Diagnostics Scope** on **Server Configuration** tab.

NOTE:

- If you have enabled single sign-on function in FactoryTalk Services Platform > **Explorer > System Policies > Security Policy**, there is no need to manually log on to FactoryTalk Linx Gateway server.
 - Log off and log on back for the feature security settings to take effect.
-

As the product policy is configured upon the logon scope, make sure the FactoryTalk Linx Gateway server logon scope is the same with FactoryTalk Diagnostics scope.

The following table shows the relationship between FactoryTalk Linx Gateway feature security policies and securable actions that the user can perform:

Feature security policy	Allow	Deny
View Gateway Server Properties	<p>Allow users to view information in Server Configuration tab including:</p> <ul style="list-style-type: none"> FactoryTalk Diagnostics Scope UA Server Service Name UA Server status Local Discovery Service URL and status. DA Server status 	<p>Hide UA Server and DA Server information.</p> <p>Users can only select scope in Server Configuration tab.</p>
Modify Gateway Server Properties	<p>Allow users to edit in Server Configuration tab:</p> <ul style="list-style-type: none"> Change UA Server Service Name. Inhibit UA Server communication. Select if register with LDS. Inhibit DA Server communication. 	<p>Set Service Name area, UA Server Inhibit checkbox, Register with Discovery Service checkbox, and DA Server Inhibit checkbox unavailable.</p>
View UA Server Endpoint Properties	<p>Allow users to view UA server configuration information and security settings in UA Server Endpoints tab including the endpoints':</p> <ul style="list-style-type: none"> Name Port URL Security Policy Security Mode Authentication Settings Dagnostic Logging 	<p>Hide the Endpoint Properties area.</p>
Remove UA Server Endpoint	<p>Allow users to remove the selected endpoint in UA Server Endpoints tab.</p>	<p>Set the Remove button unavailable.</p>
Add/Configure UA Server Endpoint Properties	<p>Allow users to add a new endpoint and edit existing endpoints' configuration information and security settings in UA Server Endpoints tab including:</p> <ul style="list-style-type: none"> Name Port URL Security Policy Security Mode Authentication Settings Dagnostic Logging 	<p>Set the Endpoint Properties area and the Add button unavailable.</p>
View Tag List Configuration	<p>Allow user to view tag list configuration in the UA Tag List tab</p>	<p>User cannot configure tag list in the UA Tag List tab</p>
Modify Tag List Configuration	<p>Allow user to modify tag list configuration in the UA Tag List tab</p>	<p>User cannot modify tag list in the UA Tag List tab</p>

Feature security policy	Allow	Deny
Manage Incoming Certificate	Allow users to view and import, reject, trust and remove certificates in Certificate Management tab.	Set the Import, Reject, Trust, and Remove button as unavailable.
View Outgoing Certificate Properties	Allow users to view the outgoing certificates information in Certificate Management > Outgoing Certificate tab.	Set the outgoing certificate properties unavailable. When switching to Outgoing Certificate tab, the Certificate Properties area still shows the Incoming Certificate properties.
Modify Outgoing UA Certificate Properties	Allow users to regenerate an outgoing certificate when the old one is expired or there is a need to do so.	Set the Regenerate button as unavailable.
OPC UA Client Read Access	Allow OPC UA clients to read data values through FactoryTalk Linx Gateway server.	OPC UA clients cannot read data values through FactoryTalk Linx Gateway server. An access denied error occurs during communication.
OPC UA Client Write Access	Allow OPC UA clients to read and write data values through FactoryTalk Linx Gateway server.	OPC UA clients cannot write data values through FactoryTalk Linx Gateway server. An access denied error occurs when editing tag values.

Use Excel RTD

Microsoft Excel provides a worksheet function, Real-time Data (RTD), that allows you to call a Component Object Model (COM) Automation server for the purpose of retrieving data in real-time. RTD components are introduced so that real-time data can stream into a Microsoft Excel spreadsheet. The RTD server communicates with Excel in a hybrid push-pull mechanism, greatly increasing the efficiency of the update. FactoryTalk Linx Gateway supports 20 Excel client connections.

To use Excel RTD

FactoryTalk Linx Gateway supports using Excel RTD in both 32-bit and 64-bit editions of Excel.

- In Excel, enter the RTD formula in the cell.

The Excel RTD function uses the following formula.

`=RTD("FTLinxGatewayRTD", "localhost", "Tag ID", "Refresh Rate", "History Index", "Write Value")`

- `FTLinxGatewayRTD`: RTD interface name. Do not change this parameter.
- `localhost`: "localhost" or empty. Only local communication is supported.
- `Tag ID`: refer to [Excel RTD formula sample on page 115](#).
- `Refresh Rate (ms)`: optional, the refresh rate of how often the monitor clock is triggered to refresh value from Live Data. It can be a UINT number, a string, or empty (empty=1000 ms).



Tip: To get the history data, make sure that the current data with the same TagID and refresh rate is in Excel. For example, to get

```
RTD("FTLinxGatewayRTD", "Localhost", "TagID", 1000, 2),
RTD("FTLinxGatewayRTD", "Localhost", "TagID", 1000, 0) must be in Excel.
```

- `History Index`: (optional) the index in the history queue to get history data. It can be a number or string from 0 through 1000 or empty (empty=0=the latest data). For example, when refresh rate=3000 ms and index=4, it will return the data value which is that of $3s \times 4 = 12s$ ago. This is helpful when using data in a trend chart.
- `Write value`: optional, you can write the tag value in Excel.

The action to write values is only triggered when this parameter changes after Excel opens.

To write a value, configure the access for the tag.

For format examples, see Excel RTD formula sample.



Tip:

- To locate the FactoryTalk Linx RTD interface in Windows **Task Manager**, perform one of these actions:
 - In **Task Manager**, select **Details** > **FTLinxGatewayRTD.exe**.
 - In **Task Manager**, select **Processes** > **FactoryTalk Linx RTD Server (32 bit)**.
- Excel RTD interface does not support L modifier.



- If the RTD interface fails to get data, it will return the following errors to Excel:
 - #REF: The tag does not exist.
 - #NA: The RTD interface is unable to read the tag due to errors, such as the tag's data type mismatch between the custom namespace and the data source.
 - #Value: There are communication errors.

To troubleshoot Excel RTD, see [Troubleshoot Excel RTD on page 87](#).

Excel RTD formula sample

Use these formulas to read tag values under different options.

On the **Server Configuration** tab, under **Excel RTD Interface**,

- If you select **Folders with scalar data**, the RTD formula could be:

```
=RTD("FTLinxGatewayRTD", "", "[ShortcutName]TagName", 1000, 0, "")
```

Example:

```
=RTD("FTLinxGatewayRTD", "", "[ShortcutName]Tag1", 1000, 0, "")
```

```
=RTD("FTLinxGatewayRTD", "", "[ShortcutName]Program:MainProgram.1_BoolArray1[006]", 1000, 0, "")
```

```
=RTD("FTLinxGatewayRTD", "", "area::
```

```
[ShortcutName]Program:MainProgram.1_BoolArray1[006]", 1000, 0, "")
```

```
=RTD("FTLinxGatewayRTD", "", "area:FactoryTalk Linx2:
```

```
[ShortcutName]Program:MainProgram.1_BoolArray1[006]", 1000, 0, "")
```

```
=RTD("FTLinxGatewayRTD", "", " :FactoryTalk Linx2:
```

```
[ShortcutName]Program:MainProgram.1_BoolArray1[006]", 1000, 0, "")
```

```
=RTD("FTLinxGatewayRTD", "", "[ShortcutName]StructTag.Element", 1000, 0, "")
```

```
=RTD("FTLinxGatewayRTD", "", "[ShortcutName]Program:MainProgram.StructTag.Element", 1000, 0, "")
```

- If you select **Custom namespace**, the RTD formula could be:

```
=RTD("FTLinxGatewayRTD", "", "[NamespaceName]TagName", 1000, 0, "")
```

Example:

```
=RTD("FTLinxGatewayRTD", "", "[Namespace_01]Tag1", 1000, 0, "")
```

RTD advantages over DDE

RTD offers these distinct advantages over software using a DDE connection:

- RTD communicates with the Excel spreadsheet using a push-pull mechanism. Therefore, it is extremely fast and efficient when handling updates to data in real-time.
- The push-pull architecture allows for seamless updates, even when modal dialog boxes are open or when multiple simultaneous commands are given.
- RTD uses Excel function-like syntax. The real-time data is placed directly in a cell and includes cell references that can be used in formulas, calculations and charts.
- RTD keeps track of the state and location of real-time data formulas so that the server doesn't have to.
- RTD can write the tag value without using VBA.
- RTD can customize the refresh rate by tag in the Excel formula.
- RTD supports history data, useful for trend charting.

DDE has some well-known issues including:

- DDE is inclined to stop responding altogether when asked to handle multiple commands simultaneously.
- DDE is unable to use cell references in a function; everything must be hard coded.
- DDE has the difficulty when asked to recalculate or chart new real-time data as it is streamed into the spreadsheet.
- DDE is inclined to have performance issues including dropped updates, inefficient response time, and unreliable performance.

Use DDE

Dynamic Data Exchange (DDE) is a standard inter-application communication protocol built into Microsoft Windows operating systems and supported by many applications that run under Windows. DDE takes data from one application and gives it to another application. It allows Windows programs that support DDE to exchange data between themselves. FactoryTalk Linx Gateway supports 20 DDE client connections.

FactoryTalk Linx Gateway only supports CF_TEXT and XLTABLE format. FastDDE and AdvanceDDE are not supported.

To use DDE in Excel

FactoryTalk Linx Gateway supports using DDE in both 32-bit and 64-bit editions of Excel.

- In Excel, enter the DDE format in the cell or use VBA to read the tag value.
For DDE format samples, see [DDE format sample on page 118](#). For VBA samples, see [Visual Basic for Applications \(VBA\) code sample on page 119](#).

IMPORTANT: DDE does not support wide characters, for example, 16-bit Unicode. Excel cannot show a tag value containing wide characters correctly.

Use L modifier in DDE

L modifier indicates the length (block size) or number of items to be read.

Use L modifier in a client application to read the data block (for example, array tag) in a single action.

The maximum numbers of this modifier for different data types are:

- BOOL: 3808
- INT/UINT: 238
- DINT/UDINT: 119
- SINT/USINT: 476
- REAL: 119

L modifier is only available when you select **Folders with scalar data**.

Excel (Microsoft 365) supports using L modifier to read array values in the spreadsheet by adding the L modifier at the end of the formula.

For example:

```
=FTLinxGatewayDDE| New_Shortcut01! 'Program:MainProgram.Values00[1],L10'
```

You can use the L modifier by VBA. All versions of Excel support to use L modifier by VBA. For VBA samples, see Visual Basic for Applications (VBA) code sample.

For more information on the L modifier, see *FactoryTalk Linx Help > Configure for local stand-alone applications > Modifiers in FactoryTalk Linx*.

Convert Excel to migrate the DDE interface from RSLinx Classic to FactoryTalk Linx Gateway

Take the **Folders with scalar data** option as an example.

In Excel spreadsheet

1. Replace the server name `RSLink` with `FTLinkGatewayDDE` in the formula.
2. Replace the RSLink Classic topic name with the FactoryTalk Linx shortcut name.

In VBA

1. Replace the server name `RSLink` with `FTLinkGatewayDDE` and replace the RSLink Classic topic name with the FactoryTalk Linx shortcut name in the code when initiating DDE.
2. Delete `,C1` from the code.

For example,

RSLink Classic:

```
DDEServer = DDEInitiate("RSLink", "TopicName")
tagValue = DDERequest(DDEServer, "tagName,L1,C1")
```

FactoryTalk Linx Gateway:

```
DDEServer = DDEInitiate("FTLinkGatewayDDE", "ShortcutName")
tagValue = DDERequest(DDEServer, "tagName,L1")
```

NOTE: To locate the FactoryTalk Linx DDE interface in Windows **Task Manager**, perform one of these actions:

- In **Task Manager**, select **Details** > **FTLinkGatewayDDE.exe**.
 - In **Task Manager**, select **Processes** > **FactoryTalk Linx DDE Server (32 bit)**.
-



Tip: If the DDE interface fails to get data, it will return the following errors to Excel:

- **#REF:** The tag does not exist.
 - **#NA:** The DDE interface is unable to read the tag due to errors, such as the tag's data type mismatch between the custom namespace and the data source.
 - **#Value:** There are communication errors.
-

To troubleshoot DDE, see [Troubleshoot DDE on page 88](#).

DDE format sample

Use these formats to read tag values under different options. Any sections in the DDE format with square bracket must be surrounded by single quotation marks.

On the **Server Configuration** tab, under **DDE Interface**,

- If you select **Folders with scalar data**, the DDE format could be:

```
=FTLinkGatewayDDE|ShortcutName!'TagName'
```

or

```
=FTLinkGatewayDDE|'[ShortcutName]!'!TagName'
```

Example:

```
=FTLinkGatewayDDE|ShortcutName!'Tag_1'
```

```
=FTLinkGatewayDDE|'[ShortcutName]!'!Tag_1'
```

```
=FTLinkGatewayDDE|ShortcutName!'Program:MainProgram.1_BoolArray1[006]'
```

```
=FTLinxGatewayDDE|[ShortcutName]!'Program:MainProgram.1_BoolArray1[006]'
=FTLinxGatewayDDE|Area::ShortcutName!'Program:MainProgram.1_BoolArray1[006]'
=FTLinxGatewayDDE|
Area::'[ShortcutName]!'Program:MainProgram.1_BoolArray1[006]'
=FTLinxGatewayDDE|:FactoryTalk
Linx:ShortcutName!'Program:MainProgram.1_BoolArray1[006]'
=FTLinxGatewayDDE|:FactoryTalk
Linx2:'[ShortcutName]!'Program:MainProgram.1_BoolArray1[006]'
=FTLinxGatewayDDE|ShortcutName!'StructTag.Element'
=FTLinxGatewayDDE|ShortcutName!'Program:MainProgram.StructTag.Element'
```

NOTE: If there is no area, the DDE format could be:

```
=FTLinxGatewayDDE|'!'TagName'
```

Example:

```
=FTLinxGatewayDDE|'::!'Tag_1'
```

```
=FTLinxGatewayDDE|'!'Tag_1'
```

There is a space in the quotation marks.

- If you select **Custom namespace**, the DDE format could be:

```
=FTLinxGatewayDDE|NamespaceName!'TagName'
```

or

```
=FTLinxGatewayDDE|'[NamespaceName]!'TagName'
```

Example:

```
=FTLinxGatewayDDE| Namespace_01!'Tag_1'
```



Tip: The tag name should not be the same as the Excel range name, for example, A1 or tag1. Otherwise, DDE will not work when reopening Excel.

Visual Basic for Applications (VBA) code sample

You can also perform a DDE read and write from a Visual Basic application to FactoryTalk Linx Gateway.

The following sample code reads the tag value.

```
Sub prRead()
    'Initiate DDE
    FTLGW_DDE = DDEInitiate("FTLinxGatewayDDE", "ShortcutNameOrNsName")
    'read tag value
    tagValue = DDERequest(FTLGW_DDE, "TagName")
    'Terminate DDE
    DDETerminate FTLGW_DDE
End Sub
```

The following sample code reads the array value.

```
Sub prReadArray()  
  
    'Initiate DDE  
  
    FTLGW_DDE = DDEInitiate("FTLinxGatewayDDE", "ShortcutName")  
  
    'read array tag value (start with element 2, length = 10) - for folder with scalar data  
    tagValues = DDERequest(FTLGW_DDE, "ArrayName[2],L10")  
  
    'Terminate DDE  
  
    DDETerminate FTLGW_DDE  
  
End Sub
```

The following sample code writes the tag value.

```
Sub prWrite()  
  
    'Initiate DDE  
  
    FTLGW_DDE = DDEInitiate("FTLinxGatewayDDE", "ShortcutNameOrNsName")  
  
    'write tag value from Range "A1" to Tag  
    DDEPoke FTLGW_DDE, "TagName", Range("A1")  
  
    'Terminate DDE  
  
    DDETerminate FTLGW_DDE  
  
End Sub
```


Glossary

[A-F on page 121](#)

[H-U on page 124](#)

A-F

- A -

access path

An access path defines the computer, driver, networks, and communication devices used to communicate with a destination device or processor in Object Linking and Embedding for Process Control (OPC) conversations.

acknowledgment (ACK)

An ASCII control character is used to acknowledge the reception and acceptance of a transmission block.

activate

To make a Rockwell Software product active so that it can run without the limitations imposed by demonstration mode. Without activation, some Rockwell Software products will not run, some will run with diminished functionality, and others will run for a limited period of time and then shut down with or without warning.

activation file

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

activation host

The device associated with an activation by a unique ID.

activation server

An activation server is any computer that hosts concurrent activations. The activation server manages the activations and shares them with other configured computers on the network.

alias

A logical name for a variable in a device or memory. Similar to a tag.

application

A machine or process monitored and controlled by a controller or the use of computer-based or controller-based routines for specific purposes.

API

API stands for Application Programming Interface. APIs are mechanisms that enable two software components to communicate with each other using a set of definitions and protocols.

area

An area organizes and subdivides a distributed Network application into logical or physical divisions.

- B -

baud

A unit of signaling speed equal to the number of discrete conditions or signal events per second. Where one bit is encoded on each signaling event, the number of baud is the same as the number of bits per second.

Block Check Character (BCC)

An error checking method developed to improve error detection in data communications. The BCC is added to the end of each block of data before the block is transmitted.

- C -

Certificate

A digital certificate is an electronic representation of an identity. A certificate binds the identities public key to its identifiable information, such as name, organization, email, username, and/or a device serial number. A certificate is used to authenticate the connection to other devices. Selected by default when CIP security is enabled.

CIA Messaging

To access information inside of devices that support the Open Device Vendors Association (ODVA) Common Industrial Protocol (CIP), using the Class, Instance, and Attribute (CIA) messaging with the CIP Object - Class/Instance/Attribute Message shortcut type.

client

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

Common Industrial Protocol (CIP)

The Common Industrial Protocol (CIP) is an industrial protocol for industrial automation applications supported by ODVA. Previously known as Control and Information Protocol, CIP defines messages and services for the collection of manufacturing automation applications – control, safety, synchronization, motion, configuration, and information. It is used in EtherNet/IP, DeviceNet, CompoNet, and ControlNet. Extensions to CIP are CIP Safety, CIP Motion, CIP Security, and CIP Sync.

CIP security

CIP security has multiple layers of security that enables a CIP-connected device to protect itself from malicious CIP communications. Then the device can reject data that has been altered, reject messages sent by untrusted people or untrusted devices, and reject messages that request actions that are not allowed. CIP security defines the notion of a security profile, which is a set of well-defined capabilities to facilitate device interoperability and end-user selection of devices with the appropriate security capability.

concurrent activation

A type of activation that allows multiple computers across a network to use Rockwell Software products at the same time. Concurrent activations include floating activations and borrowed activations.

configuration

A file that contains information about the physical structure you defined for your system. This file includes all network paths, defined drivers and devices, Data Providers, and object protocols.

connected messaging

A connected message opens a persisted link from the computer to a target device. This form of communications allocates resources in every device in the route to ensure responses and subsequent exchanges of information are able to pass more efficiently.

custom namespace

Custom namespace permits the customers to define the structure definitions and tags that will be exposed to an external client and then map these definitions to underlying system data. This can improve the organization of the automation system data, organize scalar data into structures, combine data from multiple sources or programmable controllers into a structure, apply a different naming convention for the automation system data, and limit or secure the automation system data that is available to clients.

cyclic redundancy check (CRC)

A Cyclic Redundancy Check (CRC) is an error checking technique used by computers.

- D -

DA

See **OPC DA**.

data element

An individually addressable item of data. For example, an OPC tag, an HMI tag, a graphic display, an event file, a node, and a channel.

data provider

One of the building blocks of FactoryTalk Linx, a data provider acts as a multiplexer for multiple clients and optimizes what data can be read together for more efficient handling.

data server

Data servers serve tags, or data items, contained in OPC-DA (Data Access) servers. Clients that need access to data items use data server application elements to locate the computers that are hosting OPC-DA 2.0 compliant data servers.

DCOM

Distributed Component Object Model (DCOM) is a proprietary Microsoft technology for communication between software components on connected computers. It allows a computer to run programs over the network on a different computer as if the program was running locally.

DDE

Dynamic Data Exchange (DDE) is a standard inter-application communication protocol built into Microsoft Windows operating systems and supported by many applications that run under Windows. DDE takes data from one application and gives it to another application. It allows Windows programs that support DDE to exchange data between themselves.

Data transmission library

Data transmission library (DTL) is an application programming interface (API) definition that provides communication between a computer and an automation device using the CIP or PCCC protocols.

dongle

A dongle is a security or copy-protection device for commercial computer programs. When required by a program, a dongle must be connected to an input/output port, such as a USB or parallel port of the computer, to allow the program to run. Programs that use a dongle query the port at startup and programmed intervals thereafter, and close if the dongle does not respond with the expected validation code.

Device Transport System Access

The Device Transport System Access (DTSA) is a cache utilized by the DTL interface to hold route information and state information to communicate with a device.

- E -

Endpoint

An endpoint represents the set of configuration settings on an OPC UA Server that determine how OPC UA clients will interface with the server. This includes a Universal Resource Locator (URL) string, Transport Control Protocol (TCP) port, security and data access settings.

Encryption

In cryptography, encryption is the process of encoding information. This process converts the original representation of the information, known as plaintext, into an alternative form known as ciphertext. Ideally, only authorized parties can decipher a ciphertext back to plaintext and access the original information. Encryption does not itself prevent interference but denies the intelligible content to a would-be interceptor.

Excel RTD

Microsoft Excel provides a worksheet function, Real-time Data (RTD), that allows you to call a Component Object Model (COM) Automation server for the purpose of retrieving data in real-time. RTD components are introduced so that real-time data can stream into a Microsoft Excel spreadsheet. The RTD server communicates with Excel in a hybrid push-pull mechanism, greatly increasing the efficiency of the update.

External Access

A property that allows you to specify the level of access (Read-Only, Read/Write, or None) external applications and devices have to tags.

- F -

floating activation

A type of concurrent activation that requires a continuous network connection and allows multiple computers to use Rockwell Software products concurrently. An activation server manages a predetermined number of activations in a pool and makes these activations available to any configured computer on the network.

When a computer connects to the network and runs a Rockwell Software product, it automatically "checks out" an activation from the pool of available concurrent activations. When the product shuts down, the activation is automatically freed and returns to the activation server's available pool. Checking out activations from the pool and returning them to the server happens automatically, without any user intervention.

H-U

- H -

HMI server

The software module that is responsible for performing core run-time operations such as data collection, alarm detection, historical data logging and retrieval, and for providing FactoryTalk View SE Clients with graphic displays, runtime data, and events.

- I -

Incoming Certificate

Certificate provided by an OPC UA client to FactoryTalk Linx Gateway when the client initiates a communications request. Note that incoming certificates are not trusted until a user accepts or trusts them through the FactoryTalk Linx Gateway's user interface.

Internal Object Identifier

Internal Object Identifier (IOI) identifies the CIP object with which the connection is to be established within the CIP device specified by the target.

IP Address

Each server or client on a TCP/IP internet is identified by a numeric IP (Internet Protocol) address. The two types of IP addresses are the IPv4 (IP version 4) address and the IPv6 (IP version 6) address.

IP addresses are managed and allocated to users by the Internet Assigned Numbers Authority (IANA) and its delegates. The internet address specifies both the network and the individual host. This specification varies with the size of the network. An IP address identifies a machine in an IP network and is used to determine the destination of a data packet. Port numbers identify a particular application or service on a system.

- L -

Localized

Software Localization is the process of adapting or translating software to a specific locale's language, culture, and legal requirements. Localization will require modifications to the user-visible components of software such as the user interface, images, and documentation.

L modifier

L modifier indicates the length (block size), or the number of items to be read. Use the L modifier in a client application to read the data block (for example, array tag) in a single action.

- N -

Namespace

A collection of information that a Server makes visible to its Clients.

Namespace index

The numeric values used to identify OPC UA namespaces correspond to the index in the NamespaceArray.

NodeID

A numeric or text value that uniquely identifies a data value in an OPC UA Server. An OPC UA client will receive NodeIDs from an OPC UA server while browsing its namespace and will make read, write, and subscription requests for data by delivering the NodeID back to the OPC UA server.

Network Interface Controller

A network interface controller (NIC) is a computer hardware component that connects a computer to a computer network, typically a circuit board or chip.

- O -

OPC DA

OPC (Open Platform Communications) Data Access (DA) is a non-proprietary technical specification that defines a set of standard interfaces based on Microsoft's OLE/COM (Component Object Model) technology. Applying OPC DA standards makes interoperability possible among automation and control applications, field systems and devices, and business and office applications.

The FactoryTalk Services Platform supports and extends the OPC DA 3.0 specification, which includes the ability to browse data items.

For more information on OPC DA, see <https://opcfoundation.org>.

OPC Test Client

A data connections test utility that shows whether you are using Remote OPC Client functionality.

OPC UA

OPC (Open Platform Communications) Unified Architecture (UA) is a platform-independent service-oriented architecture that integrates the individual OPC Classic specifications into one extensible framework. Applying OPC UA standards makes interoperability possible among automation and control applications, field systems and devices, and business and office applications.

For more information on OPC UA, see <https://opcfoundation.org>.

Outgoing Certificate

Certificate generated by FactoryTalk Linx Gateway and delivered to OPC UA clients when they initiate a communications request. Note that many OPC UA clients require manual approval when they receive a certificate to enable communications with an OPC UA server.

- P -

poll

Systematically request data from a device.

poll rate

Often how data is requested from a device. Poll rates are typically specified in milliseconds. (A poll rate of 1000 ms results in data being requested every second).

port number

A port number is a way to identify a specific process to which an internet or other network message is to be forwarded when it arrives at a server. All network-connected devices come equipped with standardized ports that have an assigned number. These numbers are reserved for certain protocols and their associated function.

proxy

Proxy is a function that acts as an intermediary between a client requesting a resource.

- R -

rehost (an activation)

Rehosting an activation provides a way of moving an activation file from one computer or device to another. Rehosting an activation file deactivates the file on the computer that is hosting it and then creates a rehost code that Rockwell Technical Support staff can use to generate a new activation file for use on another computer.

Remote Proxy service

Remote Proxy service enables FactoryTalk Linx on other computers to share the FactoryTalk Linx service on the FactoryTalk Linx Gateway computer to interface with an automation network.

RTD

Refer to Excel RTD.

- S -

signing

Cryptographic digital signatures use public key algorithms to provide data integrity. When you sign data with a digital signature, someone else can verify the signature, and can prove that the data originated from you and was not altered after you signed it.

Scalar tag

Defines a reference so a single memory variable represented using an elemental type, for example, BOOL, BYTE, SINT, INT, UINT, DINT, UDINT, LINT, ULINT, REAL.

scope

The level at which tags and routines may be created. They can be created at the controller level (accessible to all routines), or the program level (accessible to only the routines within a single program).

SDK

A software development kit (SDK) is a collection of software development tools in one installable package. They facilitate the creation of applications by having a compiler, debugger, and sometimes a software framework. They are normally specific to a hardware platform and operating system combination.

shortcut

A symbolic reference to a physical device that you want to connect to on the network, and the data that device contains. The communication path associated with the shortcut tells the application where to find that data.

Structure

A data structure is a compound data record that can contain multiple data elements each defined as a scalar, array or nested structures.

- T -

TCP

TCP (Transmission Control Protocol) is a standard that defines how to establish and maintain a network conversation through which application programs can exchange data. TCP works with the Internet Protocol (IP), which defines how computers send packets of data to each other.

tag

A named area of the process-connected device or controller's memory where data is stored. It is the basic mechanism for allocating memory, referencing data from logic, and monitoring data.

tag group

A set of data items defined in the FactoryTalk Linx Gateway's UA Tag List interface that share a set of security settings enabling authorized OPC UA clients to access the data.

topology

The way a network is physically structured. This includes all networks, nodes, devices, Data Providers, drivers/channels, and object protocols. In FactoryTalk Linx, this is presented in tree form (the communications tree).

- U -

UA

See **OPC UA**.

UA tag list

The UA tag list configuration determines the data values that each OPC UA Client can access from FactoryTalk Linx Gateway. The UA tag list option provides both enhanced security and complex type information (for example, structures and arrays). When the UA tag list option is disabled, all tags that are available from data sources in a FactoryTalk Application (for example, controllers and hardware via FactoryTalk Live, OPC DA, and OPC UA servers) are accessible as scalar values to OPC UA Clients. The UA tag list contains one or more tag groups that define access rights and includes complex type information enabling an OPC UA Client to use structures or User Defined Types (UDT) from Logix controllers.

Unconnected messaging

An unconnected message permits the computer to perform a single interaction with a device. While an unconnected message can be simpler to initiate, the entire route must be included in every request. Processing of the unconnected message request and response are lower priority than other forms of communications making this a less efficient form of communications.

URL

A Uniform Resource Locator (URL) is a reference to an OPC UA Server that specifies its location on a computer network and the TCP port used to interface with it.

- V -

VBA

VBA stands for Visual Basic for Applications. Excel VBA is Microsoft's programming language for Excel. For more information, refer to [Getting started with VBA in Office](#).

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

Documentation feedback

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

Waste Electrical and Electronic Equipment (WEEE)



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

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

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