

Getting Results with RSNNetWorx for ControlNet



Important user information

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

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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:

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Purpose of this document	This getting results guide provides you with information on how to install and navigate the RSNetWorx™ for ControlNet™ software. It explains how to effectively use the RSNetWorx for ControlNet software and how to access and navigate the online help.
Intended audience	We assume that you are familiar with: <ul style="list-style-type: none">• Microsoft® Windows® operating systems• RSLinx® Classic™ communications software
How does this guide fit in with other Rockwell Software product documentation?	<p>The <i>Getting Results with RSNetWorx for ControlNet</i> guide can be considered the entry point into Rockwell Software's documentation set for this product. Other components of the documentation set include online help, Online Books, and electronic release notes.</p> <p>The documentation set contains pertinent, easily accessible product information. This set ships with the software product, and is designed to free you from tedious paper shuffling and reduce information overload.</p>
Online help	The online help includes all overview, procedural, screen, and reference information for the product. The help contains these basic components: overview topics, quick start topics, step-by-step procedures, troubleshooting topics, and screen element descriptions (for example, text boxes, drop-down lists, and option buttons). All of the help is context-sensitive with the application and provides you with immediate access to application tasks and screen element descriptions. Refer to the "Finding the information you need" chapter in this guide for a more detailed description of the online help.
Product manuals	<p>Within RSNetWorx for ControlNet, we provide a Product Manuals feature that allows you to immediately access and search your product documentation from the Help menu. This feature includes the <i>Getting Results with RSNetWorx for ControlNet</i> guide, as well as several hardware product reference guides, in an electronic book format. As a part of the product installation, you have the option of installing these electronic books to your local hard drive during installation, or access them directly from the installation files.</p> <p>Tip: The product manuals included with RSNetWorx for ControlNet are in portable document format (PDF), and can be viewed using Adobe® Acrobat® Reader.</p>
Contact Rockwell Automation Technical Support	<p>If you cannot find the answer to your question in the documentation or on the Internet, contact Rockwell Automation Technical Support, using any of these methods:</p> <ul style="list-style-type: none">• Telephone: 1-440-646-3434

- Online:
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Support staff are available Monday to Friday from 8:00 a.m. to 5:00 p.m. local time (North America only), except on statutory holidays.

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Please include "Open Source" as part of the request text.

A full list of all open source software used in this product and their corresponding licenses can be found [in the OPENSOURCE folder](#) included with this product's Release Notes respectively. The default installed location of these licenses is:

- For RSNetWorx for ControlNet, C:\Program Files (x86)\Common Files\Rockwell\Help\RSNetWorx for ControlNet Release Notes\OPENSOURCE\index.htm.
- For RSNetWorx for DeviceNet, C:\Program Files (x86)\Common Files\Rockwell\Help\RSNetWorx for DeviceNet Release Notes\OPENSOURCE\index.htm.
- For RSNetWorx for EtherNet/IP, C:\Program Files (x86)\Common Files\Rockwell\Help\RSNetWorx for EtherNetIP Release Notes\OPENSOURCE\index.htm.

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Welcome to RSNetWorx for ControlNet

RSNetWorx for ControlNet is a 32-bit Windows application program that lets you configure ControlNet networks. Using either a graphical or a spreadsheet representation of your network, you can configure network-wide parameters and generate the network-wide schedule for all nodes with a ControlNet scanlist. Also bundled with RSNetWorx for ControlNet is the Scanlist Configuration Tool (SCT), which is the scanner-specific configuration tool. This program lets you define scanlist entries for certain scanners and map scanner memory onto the network and network data into the scanner memory from within RSNetWorx for ControlNet.

This chapter contains the following sections:

- Features and benefits
- Understanding ControlNet concepts
- Exploring RSNetWorx for ControlNet
- Quick Start steps

Features and benefits

RSNetWorx for ControlNet has the following features:

- Support for FactoryTalk® Activation. If you are a new user, you must activate your software using FactoryTalk Activation.
- Support for FactoryTalk Security. FactoryTalk Security is intended to improve the security of your automation system by limiting access to those with a legitimate need. FactoryTalk Security authenticates user identities and authorizes user requests to access a FactoryTalk-enabled system. These security services are fully integrated into the FactoryTalk Directory and are included as part of the FactoryTalk Services Platform that installs with many products.
- Device usages view displays usage percentages for factors such as minimum and maximum CPU, and connection usages (when your device's Electronic Data Sheet (EDS) file contains capacity information) or raw transmission data information (when your device's EDS file does not contain capacity information). When edits are enabled, you will get to see both current and pending device usage information.
- Embedded EDS is supported. With this functionality, you can now change the state of your device from unknown to known by uploading and registering its EDS, instead of obtaining the EDS file from an external website or a DVD.

- A Windows-based point and click interface that allows you to easily configure ControlNet networks.
- Use of RSLinx Classic communication services, which allows you to browse online through various networks, devices, bridges, etc., to choose the network you want to view or edit.
- The ability to optimize your network by configuring network parameters, such as network update time (NUT) and maximum scheduled or unscheduled addresses.
- The ability to edit configurations either online or offline.
- Simple and complete network upload/download. You can upload a configuration directly from the network or download a configuration to the online network. When you upload or download a configuration, both the ControlNet network configuration and the scanlist for the integrated scanners (PLC-5C processor, 1747 scanner) are transferred, as well as the network schedule for all scanners.
- The Scanner Configuration Tool configures both I/O and peer-to-peer data addresses. Supports target devices for Rockwell Automation and third-party devices via ControlNet International standard Electronic Data Sheet (EDS) files.
- Integration with RSLogix5 software (release 4.0 and higher), allowing you to configure, commission, and maintain a PLC-5C-based system on a ControlNet network.
- Reports generated in HTML format.
- Comprehensive context-sensitive online help, including additional information and troubleshooting hints on any message that appears in the Message View.
- Quickly detect and resolve conditions that arise when initially commissioning a system, minimizing initial start-up times and costs.
- Debug and correct network/device problems, thereby reducing network downtimes and related costs.
- Detect preventive maintenance needs within the devices on your network, thereby preventing system downtimes.

Understanding ControlNet concepts

You begin configuring your ControlNet network by determining how many devices will be connected to your network and the type of data the devices will be exchanging. ControlNet provides the capabilities to exchange data in both a scheduled and unscheduled fashion. (The details of the scheduling algorithms are presented in the ControlNet International specification.) Scheduled bandwidth is generally used for time critical, control process I/O data. Unscheduled data is generally used for less time critical I/O exchanges as well as configuration operations (for example, upload, download, or browse). RSNetWorx for ControlNet allows you to describe your scheduled traffic and execute the tasks necessary to distribute this schedule to the devices on your network, such as ControlLogix scanners, ControlNet PLC-5C processors, 1747 scanners, and other vendor's scanners that follow the ControlNet International specification. Each device on the ControlNet network must be assigned a unique address. For devices sending scheduled data, assign a node address between 1 and the maximum scheduled node address. For all other devices, assign a node address between the maximum scheduled node address + 1 and the maximum unscheduled node address (for further information about the maximum scheduled and unscheduled node address, see page 4). For example, if the maximum scheduled node address is 10 and the maximum unscheduled node address is 20, then the devices sending scheduled data would be given a node address between 1 and 10, and the devices sending unscheduled data would be given a node address between 11 and 20.

To schedule the ControlNet network, you must determine your data update requirements. Typically you will set your Network Update Time (NUT) to the fastest data exchange required. The NUT is the basic unit of scheduling on the ControlNet network. It defines a periodic network cycle. If a valid schedule was specified, each node whose address is between 1 and the maximum scheduled address will send its scheduled data (which is also scheduled for transmission) during the scheduled portion of the NUT. If an invalid schedule was specified (too much scheduled data to be transmitted within the NUT), RSNetWorx informs you and you must either reduce the amount of scheduled data and/or change the NUT. After all scheduled traffic is transmitted within a NUT, unscheduled data is transmitted in round-robin fashion until the NUT expires.

You may also define the maximum scheduled node address for your ControlNet network. This indicates the highest address that will be able to transmit in the scheduled (vs. unscheduled) portion of the NUT. As well as indicating the Maximum Scheduled Node Address, you may also configure the Maximum Unscheduled Node Address. This indicates the highest address that will be able to transmit any information on the ControlNet network. You enter these values into your configuration by utilizing the Network Parameters tab on the Network Property pages.

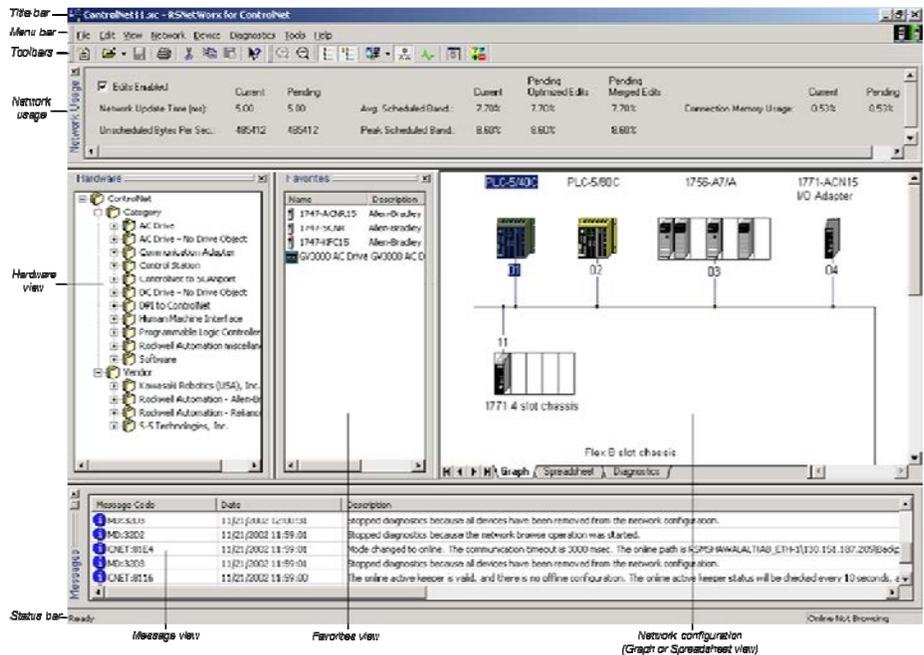
Tip: If the Maximum Unscheduled Node Address is set lower than the node address of the workstation that is communicating with the network, then the workstation won't be able to successfully communicate with the network. You continue configuring your network by determining the physical layout of the devices, i.e., the amount of coaxial cable (to the nearest 100 meters) and/or the amount of fiber optic cable (to the nearest 100 meters) needed. Also, you need to know how many and what type of repeaters will be needed. Determine the longest path (in terms of delay time). This is the worst-case data path through the network. After you have defined this worst-case path, you use the Media Configuration tab on the Network property pages of the RSNetWorx for ControlNet software to enter the parameters of that path into your configuration file.

Finally, you finish creating the configuration by defining connections between the nodes on the network. To do this, you determine which data is to be consumed by each scanner, and you determine where in each scanner's data table this data is placed. You may also choose to determine which scanner will maintain the configuration for each adapter device. After you have defined these parameters, you use the Scanlist Configuration Tool (with integrated scanners) or Studio 5000 Logix Designer (with non-integrated scanners) to enter them into your configuration for each of your ControlNet scanners.

For many devices, you can also use the Scanlist Configuration Tool to configure how outputs are set in the event of a fault, such as loss of communication to the controlling scanner. Depending on the information contained in a device's EDS file, you may be able to configure other device parameters. These parameters may be found on the connection's property page from the Configuration Settings tab and/or the Advanced Settings tab depending on the device or module for which you are setting the parameters. However, the PLC-5C processor requires the use of RSLogix 5 to set the Configuration Settings.

Exploring RSNetWorx for ControlNet

When you start RSNetWorx for ControlNet software, the RSNetWorx for ControlNet window appears. It shows the current network (ControlNet is the default network filename) in its view. The following illustration shows the RSNetWorx for ControlNet window and the design elements associated with it. (The Message view and Favorites view will not be automatically shown in the default view, but may be chosen by selecting **View > Messages > Show** or **View > Favorites**.) Each of the design elements are described in the sections following this illustration.

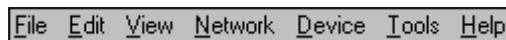


Title bar

The title bar shows the RSNetWorx icon, the name of the current RSNetWorx configuration, and the name of the software product.

Menu bar

The RSNetWorx for ControlNet menu bar contains the following menus:



Each menu contains options for performing the following tasks:

Menu	Description
File	New, print, open, and save a network configuration, generate reports, or exit RSNetWorx for ControlNet.
Edit	Invoke actions such as cut, copy, and paste on selected items in the network configuration.
View	Set and change RSNetWorx for ControlNet interface displays.
Network	Browse the network, toggle between online and offline mode, enable and cancel edits, and upload and download data to and from the network.
Device	Edit the properties of the selected device, chassis, or module.
Tools	Launch the EDS Wizard.

Menu	Description
Help	Access help options for RSNetWorx for ControlNet, ControlNet related hardware, and other Rockwell Software products and services.

Online icon

The online icon displays in the right side of the RSNetWorx for ControlNet window at the same level as the menu bar.

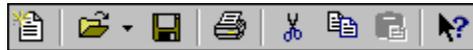


This icon indicates whether or not RSNetWorx for ControlNet is in the online mode. If you toggle the Online toolbar button to online, the Online icon becomes animated. If the icon is not animated, RSNetWorx for ControlNet is in offline mode. When online, RSNetWorx for ControlNet writes information to the devices and to the offline file when you save. When offline, RSNetWorx for ControlNet only updates the offline file when you save.

Toolbars

The toolbars contain shortcuts to several commonly used functions. Each toolbar button is a graphical representation of a command (except Symbol Legend) that is also available from the RSNetWorx for ControlNet menu bar. RSNetWorx for ControlNet contains the standard toolbar and the tools toolbar.

The following items appear on the RSNetWorx for ControlNet standard toolbar.



Icon	Menu Selection	Description
	File > New	Creates a new network configuration.
	File > Open	Opens an existing network configuration. The arrow to the right of the Open icon provides quick access to recently used files.
	File > Save	Saves the current network configuration.
	File > Print	Prints the current network configuration.
	Edit > Cut	Cuts the selected device from the network configuration and place it on the clipboard. If you cut a device, only the device, not its configuration, is retained.

Icon	Menu Selection	Description
	Edit > Copy	Copies the selected device to the clipboard. If you copy a device, only the device type, not its configuration, is retained.
	Edit > Paste	Pastes the device from the clipboard to the current network configuration.
	Help > What's This?	Places the cursor in What's This? help mode. Place the cursor on the control you want help with and right-click to see the context-sensitive help.

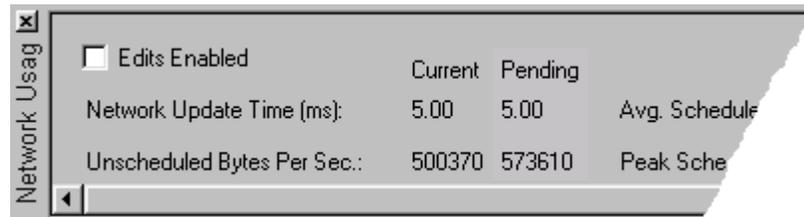
The following items appear on the RSNetWorx for ControlNet tools toolbar.



Icon	Menu Selection	Description
	View > Zoom-In	Increases the size of the images located in the current network configuration. The choices available are high, medium, and low. Zoom-In only applies to the graph view.
	View > Zoom-Out	Decreases the size of the images located in the current network configuration. The choices available are high, medium, and low. Zoom-Out only applies to the graph view.
	View > Hardware	Displays a list of all available hardware devices.
	View > Favorites	Displays a list of hardware devices that you have added to your favorites list.
	Network > Single Pass Browse or Network > Continuous Browse	Locates all currently available devices based on the drivers configured in RSLinx Classic. Allows you to browse once and stop (single pass) or browse continuously (continuous browse).
	Network > Online	Places RSNetWorx for ControlNet in online mode. To go offline, click the button or choose Network > Online again.
	View > Diagnostics	Displays the Diagnostic view, allowing you to view the diagnostic parameters for all of the devices on your network, and indicates the current diagnostic status of your network.
	View > Refresh	Refreshes the window. This will reorder the graphic display by device address.
	No menu selection	Displays the Symbol Legend, which contains descriptions of the device comparison states. The Symbol Legend can also be accessed from the online help system by selecting Help > Contents and selecting symbol legend from the index tab.

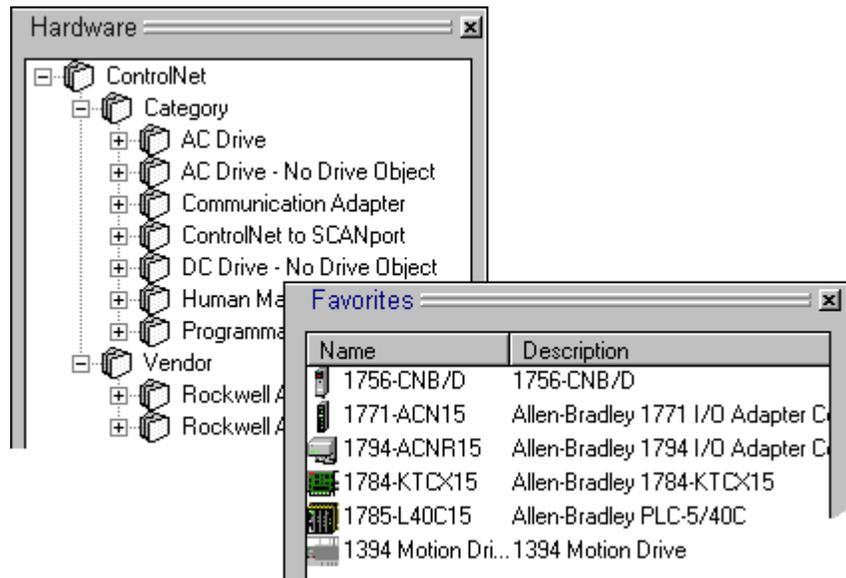
Network usage

The Network Usage area allows you to obtain the edit resource, enabling and disabling edits to the current ControlNet offline configuration file (*.xc) and online network, while also displaying statistics such as current and pending network update time and scheduled bandwidth.



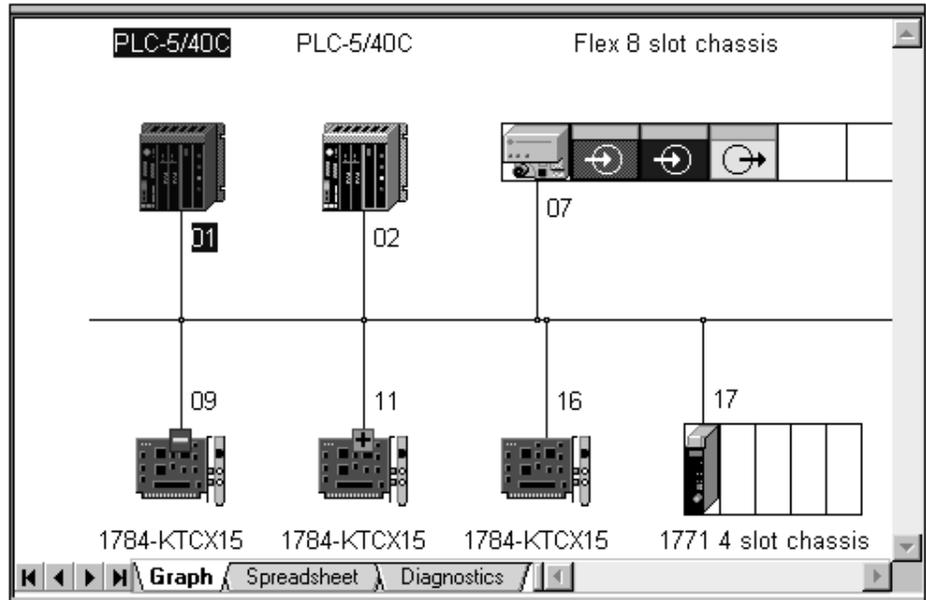
Hardware and Favorites views

A device can be added to the network configuration by selecting it from the Hardware view and dragging it to the configuration (graph or spreadsheet view). Once a device is added, it will display in the appropriate configuration. The Favorites view displays all hardware devices that you have defined as favorites by selection from the Hardware list. To add an item from the Hardware list to the Favorites list, select the item, right-click and choose Add to Favorites.



Graph or Spreadsheet view

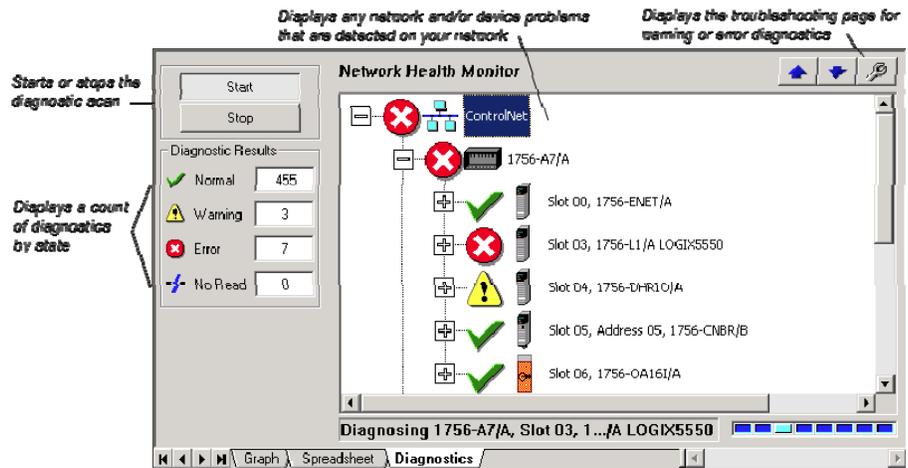
The application workspace displays network information in either a graphic or a spreadsheet view. Click on the appropriate tab in the network configuration to display the desired view.



Name	State	Address	Slot	Description
PLC-5/40C	Ok	01		
PLC-5/40C	Ok	02		
1794-ACNR15 FLEX I/O Contro...	Ok	07	n/a	
Flex 8 slot chassis	Ok			
1794-ACNR15 FLEX I/O...	Ok	07	n/a	
1794-IF4I/A	Ok		0	
1794-IB16/A	Ok		1	
1794-OF4I/A	Ok		2	
[Slot Empty]			3	
[Slot Empty]			4	
[Slot Empty]			5	
[Slot Empty]			6	
[Slot Empty]			7	
1784-KTCX15	Missing	09		
1784-KTCX15	Extra	11		
1784-KTCX15	Ok	16		
1771-ACNR15 I/O Adapter Red	Ok	17	n/a	

Diagnostics view

RSNetWorx Diagnostics provides a hierarchal view of the real-time status (or health) of a network. At a glance, you can quickly and easily determine the overall status of your network, or any device on your network, by viewing a single status indicator. Click the Diagnostics tab in the network configuration to display this view.



Message view

The message view, which appears in the bottom portion of the workspace, displays a log of messages. Each message consists of four parts:

- an icon that indicates error, warning, or information.
- an error code (including a distinguishing software component designator and a 16-bit numeric designator)
- a timestamp that displays the date and time the message is generated
- a description of the message

Tip: If View > Messages has not been previously selected, the Message View will automatically appear when a message is logged by RSNetWorx for ControlNet. If you want more information on any particular message, you can select the message and press the F1 key to access the online help. You can Show, Clear, Copy, or Clear and Hide messages by making the appropriate selection from the View > Messages command on the main menu, or by right-clicking and selecting the Message option while in the Message view.

Status bar

The status bar, which is located at the bottom of the RSNetWorx for ControlNet main window, provides information about the status of the software.

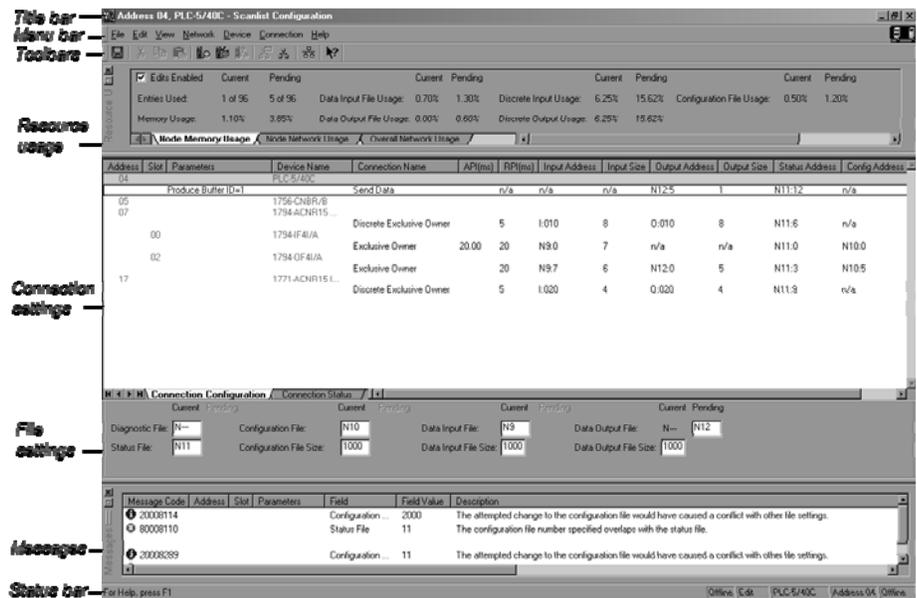
The left portion of the status bar displays informational messages about the operation of RSNetWorx for ControlNet software. For example, when you highlight a device in the application workspace, a brief description of that device appears on the status bar.

The right portion of the status bar displays the current state of the browsing operation.



Exploring the Scanlist Configuration Tool

The Scanlist Configuration Tool is an extension of the RSNetWorx software that allows you to create, modify, and delete connection entries within a scanlist (for example, a PLC-5 processor). Using the Scanlist Configuration Tool, you can establish connections among devices and their respective I/O components (identifying data types, sizes, and timing intervals) and then map that information to the data table. The following illustration shows the Scanlist Configuration Tool window and the design elements associated with it. (The Message view will not be automatically shown in the default view, but may be chosen by selecting **View > Messages > Show.**) Each of the design elements are described in the sections following this illustration.



Title bar

The title bar shows the Scanlist Configuration Tool icon, the name of the selected scanner, the name of the software product and so on.

Menu bar

The Scanlist Configuration Tool menu bar contains the following menus:



Each menu contains options for performing the following tasks:

Menu	Description
File	Save a configuration, generate a report for this scanner, or exit the Scanlist Configuration Tool.
Edit	Invoke actions such as cut, copy, and paste on selected items in the configuration.
View	Set and change the Scanlist Configuration Tool interface displays.

Menu	Description
Network	Toggle between online and offline mode, and enable or cancel edits.
Device	Change mode of the scanner from, for example, run to program mode or download to device.
Connection	Insert connections or change connection parameters.
Help	View help options for the Scanlist Configuration Tool and other Rockwell Software products and services.

Online icon

The online icon displays in the right side of the Scanlist Configuration Tool at the same level as the menu bar.



This icon indicates whether or not RSNetWorx for ControlNet is in the online mode. If you toggle the Online toolbar button to online, the Online icon becomes animated. If the icon is not animated, RSNetWorx for ControlNet is in offline mode. When online, RSNetWorx for ControlNet writes information to the devices and to the offline file when you save. When offline, RSNetWorx for ControlNet only updates the offline file when you save.

Toolbar

The toolbars contain shortcuts to several commonly used functions. Each button on the toolbars is a graphical representation of a command that is also available from the Scanlist Configuration Tool menu bar.

The following items appear on the Scanlist Configuration Tool toolbar.

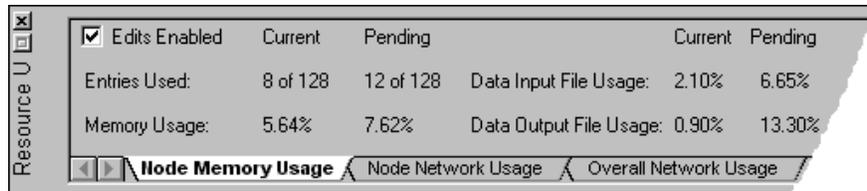


Icon	Menu Selection	Description
	File > Save	Saves the current network configuration.
	Edit > Cut	Cuts the selected field value and places it on the clipboard.
	Edit > Copy	Copies the selected field value to the clipboard.
	Edit > Paste	Pastes the field value from the clipboard to the current network configuration.
	Connection > Auto Insert > All Devices	Interrogates all devices that can have connections on the ControlNet configuration and adds connections to the scanlist.

Icon	Menu Selection	Description
	Connection > Auto Insert > Selected Devices	Interrogates selected devices that can have connections in the ControlNet configuration and adds connections to the scanlist.
	Connection > Auto Address > All Entries	Auto maps all unmapped addresses in all entries.
	View > Connection Configuration	Displays information respective to the selected connection.
	View > Connection Status	Switches the view to a display of the status of each connection.
	Network > Online	Places the Scanlist Configuration Tool in online mode. To go offline, click the button or choose Network > Online again. This button is unpressed when in online mode.
	Help > What's This?	Places the cursor in What's This? help mode. Place the cursor on the control you want help with and right-click to see the context-sensitive help.

Resource usage

Within the Scanlist Configuration Tool, you can also view all of the network aspects related to the selected node, including node memory usage, node network usage, and overall network usage. With this information, you can easily make changes to any scanlist and readily identify how your changes affect the ControlNet network.



Scanlist entries

The scanlist entries enable you to perform tasks such as defining the connection targets and inserting connections for the selected devices. You must be in edit mode to edit these entries.

Address	Slot	Parameters	Device Name	Connection Name	API(ms)	RPI(ms)
04			PLC-5/40C			
		Produce Buffer ID=1		Send Data	n/a	n/a
05			1756-CNBR/B			
07			1794-ACNR15 ...			
	00		1794-IF4I/A	Discrete Exclusive Owner	5.00	5
	01		1794-IE4XOE2/B	Exclusive Owner	20.00	20
	02		1794-OF4I/A			
	03		1794-OE4/B	Exclusive Owner	20.00	20
	04		1794-OV16/A			
17			1771-ACNR15 I...			
				Discrete Exclusive Owner	5.00	5

File settings

File settings are only available for the PLC-5C processor. The file settings enable you to define the files to be used by the scanlist entries for the selected device. You must be in edit mode to edit these files. If you choose the auto address command, the necessary files are selected for you; otherwise, you can specify your own files.

	Current	Pending		Current	Pending
Diagnostic File:	N9		Configuration File:	N11	N12
Status File:	N10	N11	Configuration File Size:	2000	

Status bar

The status bar, which is located at the bottom of the Scanlist Configuration Tool window, provides information about the status of the software and the scanner.

The left portion of the status bar displays informational messages about the operation of the configuration software. For example when you mouse over a toolbar icon, a brief description of that icon appears on the status bar.

The right portion of the status bar displays the following information:

- Online mode - Offline or Online
- Edit mode - Monitor or Edit
- Scanner type, series, and revision
- Address number
- Scanner mode - Remote Program, Program, Remote Run, or Run

For Help, press F1 Offline Monitor PLC-5/40C Address 04 Offline

Quick Start steps

The fastest way to configure your ControlNet network is to let the RSNetWorx for ControlNet software browse your online network for ControlNet devices and automatically add them into your configuration. Then, let the Scanlist Configuration Tool automatically configure connections to your target devices. You can follow this same procedure for configuring your network in the offline mode by manually dragging and dropping devices from your Hardware tab into your network configuration.

For some devices, you need additional RSLogix software to complete your network configuration. Refer to the following table:

If you have the following device in your network:	Use this software to complete your configuration:
PLC-5C processors	RSLogix 5
SLC scanners	RSLogix 500
ControlLogix processors	Studio 5000 Logix Designer

Important: There is no offline mode when working with ControlLogix processors. Also, for more information on using Studio 5000 Logix Designer and ControlLogix processors, refer to the online help for the Scanlist Configuration Tool.

This section walks you through the tasks you will need to perform to use RSNetWorx for ControlNet software in both the online and offline modes. To remain focused on the high-level nature of each task and on the flow of these tasks, the following steps do not include the step-by-step procedure for accomplishing each task. When you are ready to use RSNetWorx for ControlNet software, you should follow the detailed procedures found in the Quick Start, which is located in the RSNetWorx for ControlNet online help.

To access the software's quick start, select **Help > Quick Start** from the RSNetWorx for ControlNet window. To see information about any control on the RSNetWorx for ControlNet or Scanlist Configuration Tool windows, remember to use the What's This? help.

Online mode

Step 1 - Create a new configuration and browse for an online network

The first step in using RSNetWorx for ControlNet in the online mode is to create a new ControlNet configuration. Once you create the configuration, an empty network displays in the network configuration.

Next, go online and select a communication driver using the RSWho browse utility. A graphical representation of the selected network appears in the network configuration. If you would like to see a tabular view of the information instead of the graphical view, click the Spreadsheet tab.

Step 2 - Configure your ControlNet network and save your configuration

After creating your new configuration and going online, you must configure your ControlNet network by enabling edits to obtain the edit resource for the network. Once you obtain the edit resource for the network, no other

individual can simultaneously edit the online network or the associated .xc file. Enabling edits also obtains exclusive write access to the .xc file. Editing your network properties consists of tasks such as entering the media configuration information, and setting network parameters (for example, maximum scheduled node and maximum unscheduled node).

Tip: At various times, you may want to save the work you have completed on your network configuration. To save a configuration file (*.xc), click **File > Save**. If you save, keep in mind that you will lose the edit resource. To obtain the edit resource again, click the Edits Enabled checkbox.

Step 3 - Start the Scanlist Configuration Tool and insert a connection

The Scanlist Configuration Tool is a software tool used to create, modify, and delete scanlist entries in a scanner. This tool also allows you to define how particular devices communicate on the network. To configure devices that contain an internal scanlist (for example, a PLC-5 processor), use the Scanlist Configuration Tool. Once you open the Scanlist Configuration Tool, you can either insert connections to other devices on the network manually, or you can use the auto insert feature within the Scanlist Configuration Tool to automatically insert the scanlist entries.

Step 4 - Define a connection target and save your schedule

To provide data from the scanner to other devices on the network, you must define a connection target. You can define the connection target for the scanner nodes on your network manually. After defining your connection targets, the final step is to save your configuration schedule and exit the Scanlist Configuration Tool.

Step 5 - Diagnose and troubleshoot your online network

Once you save your configuration, you can diagnose the network and determine the status of all of the devices on that network. If any of the devices are exhibiting diagnostics problems, you can troubleshoot those devices and return your network to proper operating condition.

Step 6 - Schedule network diagnostics

After diagnosing and troubleshooting your online network, you can schedule diagnostics to occur for each network that has associated offline configuration file (*.xc) developed in RSNetWorx, allowing you to support an unattended, background mode of diagnostic operation. Further, via the RSNetWorx Diagnostics Service Monitor, you can start, stop, and establish the startup mode for each network diagnostic schedule that you have configured.

Offline mode

Step 1 - Create a new configuration and describe your network topology

The first step in using RSNetWorx for ControlNet in the offline mode is to create a new ControlNet configuration (**File > New**). Once you create the configuration, an empty network displays in the network configuration.

Next, Enable Edits to obtain exclusive write access to the offline configuration file (*.xc). After you obtain the edit resource, no other individual can simultaneously edit the offline configuration file. In the edit mode, you can describe your network topology by double-clicking on an available device or by dragging it from the Hardware tab and dropping it into the network configuration. When you are finished, a graphical representation of the selected network appears in the network configuration. If you would like to see a tabular view of the information instead of the graphical view, click the Spreadsheet tab.

Step 2 - Configure your ControlNet network and devices

After creating your new configuration, you must configure your ControlNet network and devices. This consists of tasks such as entering the media configuration information, and setting network parameters (for example, maximum scheduled node and maximum unscheduled node).

Tip: At various times, you may want to save the work you have completed on your network configuration. To save a configuration file (*.xc), click **File > Save**. If you save, keep in mind that you will lose the edit resource. To obtain the edit resource again, click the Edits Enabled checkbox.

Step 3 - Start the Scanlist Configuration Tool and insert a connection

The Scanlist Configuration Tool is a software tool used to create, modify, and delete scanlist entries in a scanner. This tool also allows you to define how particular devices communicate on the network. To configure devices that contain an internal scanlist (for example, a PLC-5C processor), use the Scanlist Configuration Tool. Once you open the Scanlist Configuration Tool, you can either insert connections for the scanner nodes on your network manually, or you can use the auto insert feature within the Scanlist Configuration Tool to automatically insert the scanlist entries.

Step 4 - Define a connection target and save your schedule

To provide data from the scanner to other devices on the network, you must define a connection target. You can define the connection target for the scanner nodes on your network manually. After defining your connection targets, the final step is to save your configuration schedule and exit the Scanlist Configuration Tool.

Installing and starting RSNetWorx for ControlNet

This chapter explains how to install and start RSNetWorx for ControlNet software. This chapter includes information on the following:

- system requirements
- software compatibility
- installation methods
- installation procedure
- starting procedure
- troubleshooting

After installing the software, we recommend that you read the release notes located in the online help. The release notes may contain more up-to-date information than was available when this document was published. To view the release notes, start RSNetWorx for ControlNet, and then choose **Help > Release Notes** from the main menu.

System requirements

To run RSNetWorx for ControlNet, your system must meet the following hardware and software requirements:

Hardware requirements

To run RSNetWorx for ControlNet, your system must meet the following hardware requirements:

- An Intel® Core™ 2 Duo processor running at 2.8 GHz or faster or another processor with equivalent specifications
- 4 GB or more memory RAM
- At least 16GB of available hard drive space

Software requirements

To run RSNetWorx for ControlNet, you require one of the following operating systems:

- Windows 10 Enterprise v1803
- Windows 10 Professional v1803
- Windows 10 Enterprise v1709
- Windows 10 Professional v1709

- Windows 10 Enterprise v1703
- Windows 10 Professional v1703
- Windows 7 Ultimate with Service Pack 1
- Windows 7 Enterprise with Service Pack 1
- Windows 7 Professional with Service Pack 1
- Windows Server 2016 Standard
- Windows Server 2016 Datacenter
- Windows Server 2012 Standard
- Windows Server 2012 Datacenter
- Windows Server 2012 R2 Standard
- Windows Server 2012 R2 Datacenter
- Windows Server 2008 R2 Standard with Service Pack 1
- Windows Server 2008 R2 Enterprise with Service Pack 1

Software compatibility

RSNetWorx for ControlNet version 28.00 is a component aligned to Studio 5000 Logix Designer™ version 32.00. This version of RSNetWorx has been tested with, and is compatible with, the following products:

- FactoryTalk® Activation Manager version 4.03
- FactoryTalk® Services Platform version 6.10
- RSLinx® Classic version 4.10
- RSLogix™ 5 version 9.00
- RSLogix 500® version 12.00
- Studio 5000 Logix Designer® version 32.00

It is recommended that you use all products from the same CPR release.

Installing RSNetWorx for ControlNet software

RSNetWorx supports two installation methods: Setup wizard installation and unattended installation.

The unattended installation reduces user interaction and provides command line parameters to install RSNetWorx. For more information, see [Use unattended installation](#) on [page 81](#).

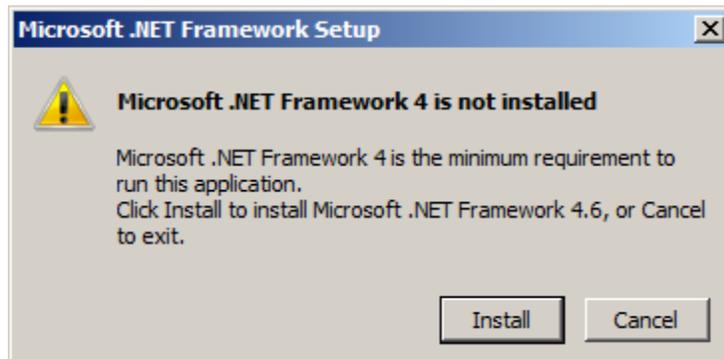
This chapter uses the Setup wizard installation method to illustrate the steps.

Tip: While installing RSNetWorx for ControlNet software, you will have the opportunity to specify a directory. The default directory is:
x:\Program Files\Rockwell Software\RSNetWorx
where *x* is the drive where the operating system is installed.
We recommend that you use the default directory whenever possible. This subdirectory contains all of the application files required to run the product.
In procedures that appear throughout this document, it is assumed that you used the default name. If you did not use the default name, substitute the actual name you specified for the default name shown.

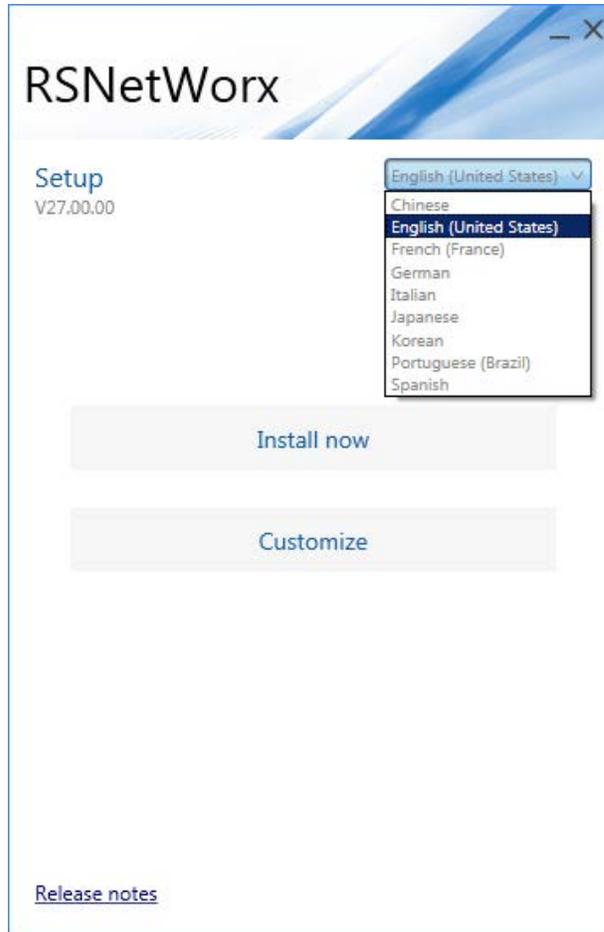
To install RSNetWorx for ControlNet software, perform the following steps:

1. Launch the installation wizard and select what to install.
2. Set up security in RSNetWorx.
3. Read and accept license agreements.
4. Start the installation.
5. Finish the installation.
 1. Close all open programs.
 2. In the RSNetWorx installation package, double-click **Setup.exe**.
 3. If Microsoft .NET Framework 4 is not installed on your computer, the **Microsoft .NET Framework Setup** dialog box shows. Click **Install**.

Step 1: Launch the installation wizard and select what to install

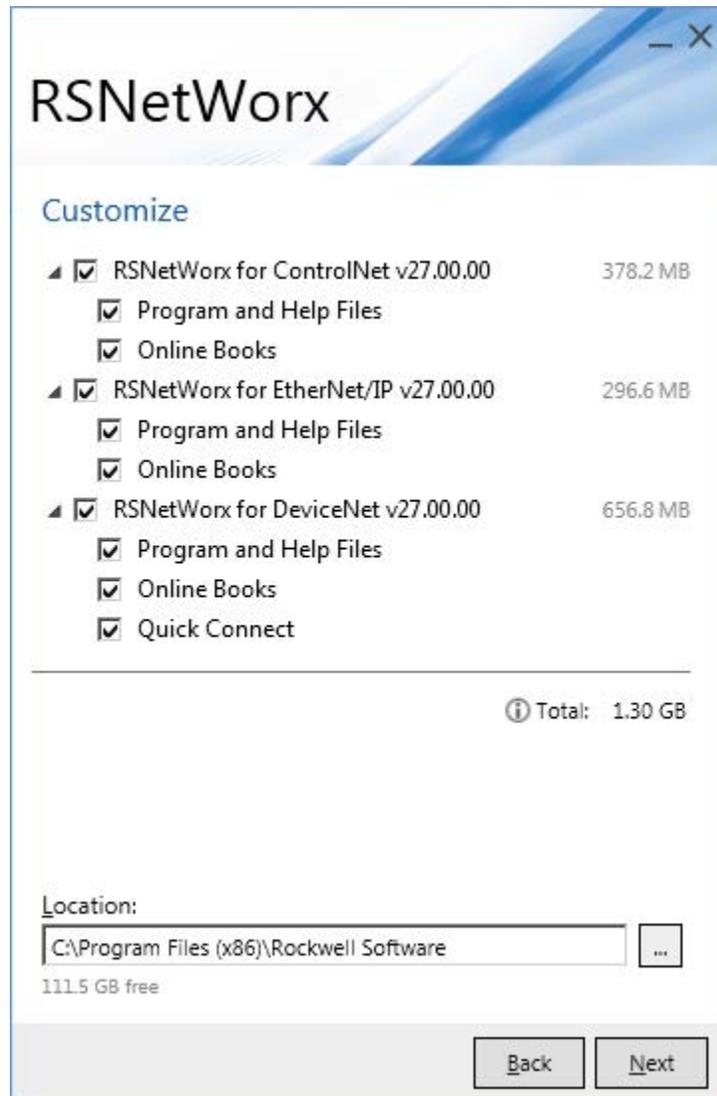


4. On the **RSNetWorx Setup** page, select a language to be shown during the installation process if needed. By default, your system language is selected.



5. To install RSNetWorx for ControlNet, RSNetWorx for EtherNet/IP, and RSNetWorx for DeviceNet, click **Install now** and skip to [Step 2: Read and accept license agreements](#) on [page 34](#).
6. To select a particular software product, click **Customize**.

7. On the **Customize** page, select **RSNetWorx for ControlNet v27.00.00** and its components.



8. Select the location for Rockwell Automation software. The default location is **C:\Program Files (x86)\Rockwell Software**.
9. Click **Next**.

Step 2: Set up security in RSNetWorx

On this page, you can set up FactoryTalk Security in RSNetWorx to improve the security of your automation system by limiting access to those with a legitimate need.

1. Select the **Enable FactoryTalk® Security** option. And then select the FactoryTalk directory (Network or Local) that will be used to authenticate and authorize user access.



2. Click **Install**.

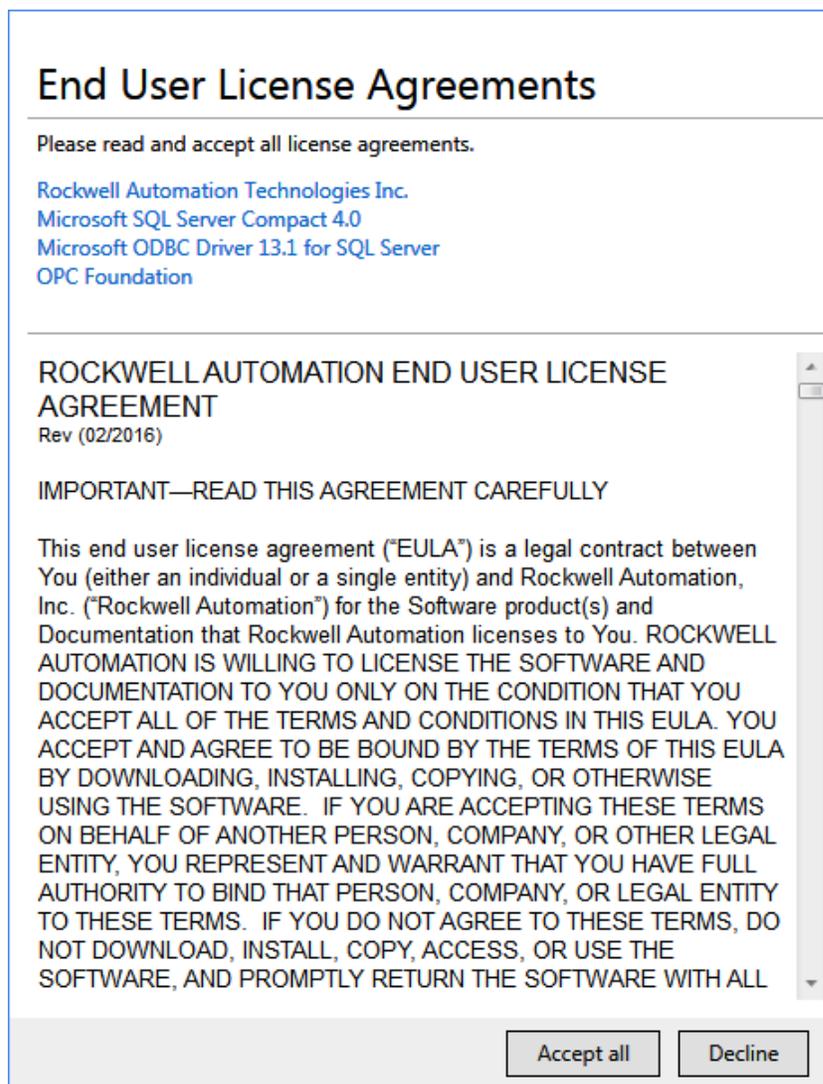
Step 3: Read and accept license agreements

End-user license agreements (EULA) spell out your rights and responsibilities. Depending on the components being installed, there may be more than one license agreement on this page. The individual license agreements are listed above the text box.

Tip: You can also view the license agreements from the **License** folder of RSNetWorx installation package.

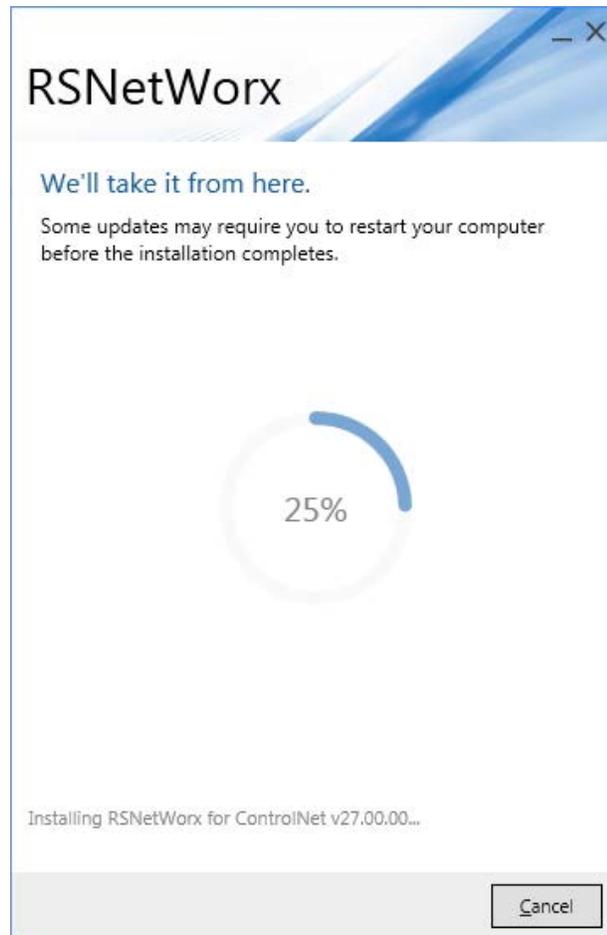
Some software products may be delivered or made available only after you agree to the terms and conditions of each of the license agreements.

1. On the **End User License Agreements** page, select each agreement and read the agreement carefully.
2. When all license agreements have been read, click **Accept All**.

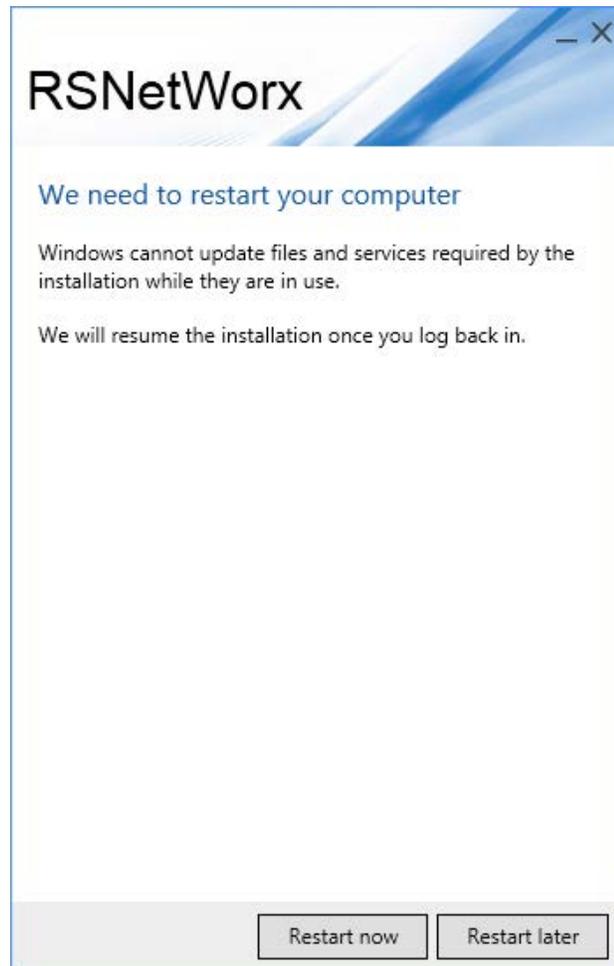


Step 4: Start the installation

After accepting the license agreements, the Setup Wizard automatically installs all the Rockwell Software applications selected previously.

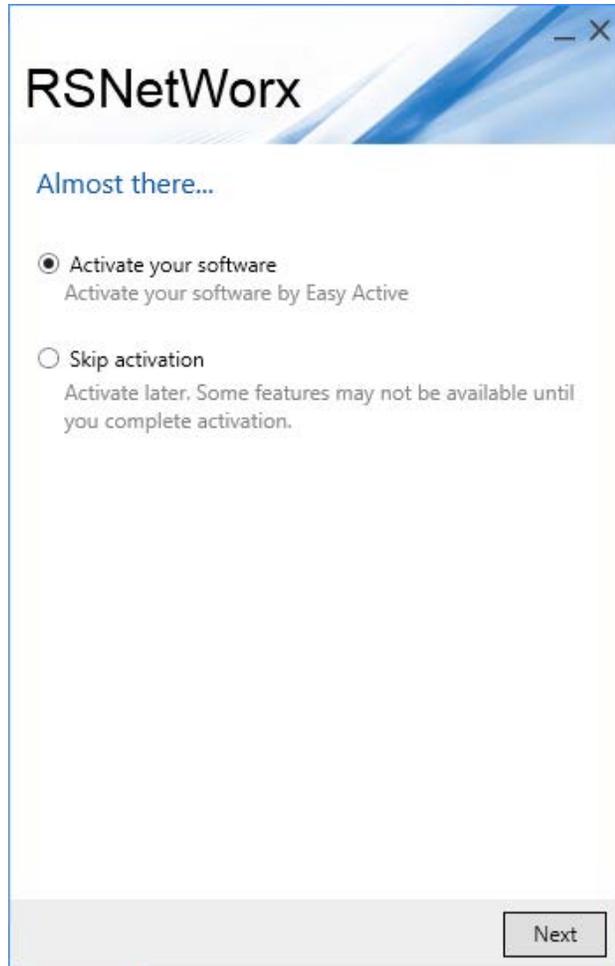


During the installation, if prompted to restart your computer, click **Restart now**.



Step 5: Finish the installation

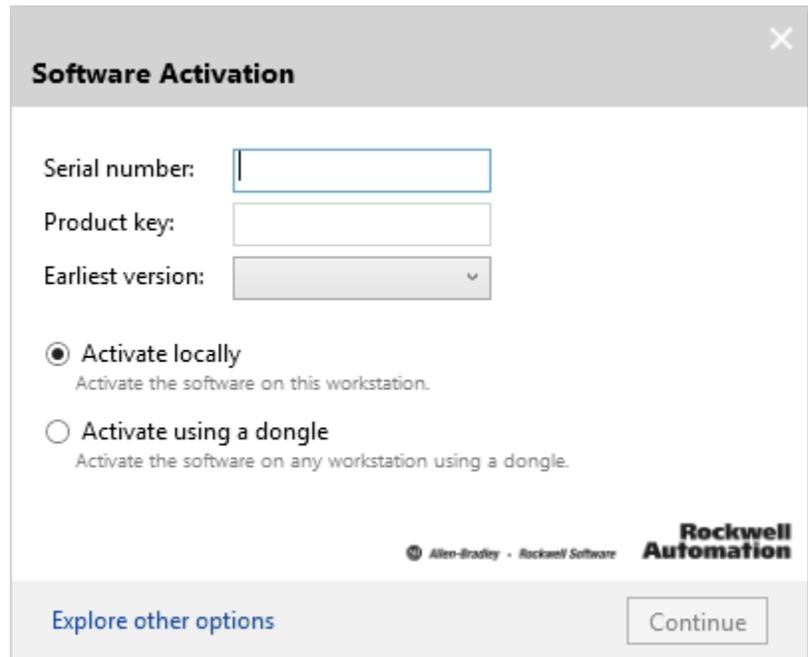
After the installation completes, you need to activate the software for its full feature capabilities. You can activate the software now or later. For more information about activation, see [Activation](#) on [page 73](#).



- To activate the software, select **Activate your software** and click **Next**. Make sure your computer is connected to the Internet.

In the **Software Activation** dialog box, enter the required information and click **Continue**.

You will be prompted to restart the computer after the activation.



The image shows a 'Software Activation' dialog box with a close button (X) in the top right corner. The dialog contains the following fields and options:

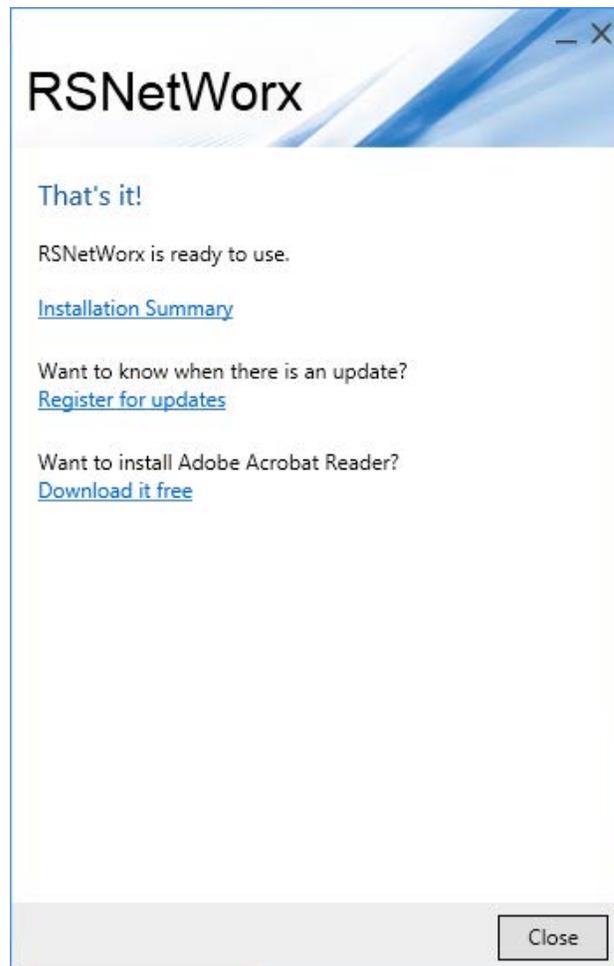
- Serial number: [Text input field]
- Product key: [Text input field]
- Earliest version: [Dropdown menu]
- Activate locally**
Activate the software on this workstation.
- Activate using a dongle**
Activate the software on any workstation using a dongle.

At the bottom right, there is the Allen-Bradley - Rockwell Software logo and the Rockwell Automation logo. At the bottom left, there is a link 'Explore other options' and a 'Continue' button.

- To finish the installation without activation, Select **Skip activation** and click **Next**.

- To view the installation details, click Installation Summary.
- To receive latest product updates and patch notification, click **Register for updates**.
- To install the latest version of Adobe Acrobat Reader, click **Download it free** and follow the on-screen instructions.

Restart the computer to complete the installation.



Installing a client copy from a dedicated server

As a client to a client-server installation, you can install one or more Rockwell Software products from the dedicated server location to an end-user destination. To install the RSNetWorx for ControlNet software from the server, perform the following steps:

1. Map a network drive to the dedicated server location provided by your system administrator. The system administrator must have copied the entire installation contents and provided only Read and Execute permissions of the files. Users installing the software cannot have write access to the files.
2. Double-click Setup.exe in the client installation directory.

Starting RSNetWorx for ControlNet Troubleshooting installation

3. See the [Installing RSNetWorx for ControlNet software](#) on [page 30](#) section in this chapter.

To start RSNetWorx for ControlNet software, click **Start > All Programs > Rockwell Software > RSNetWorx > RSNetWorx for ControlNet**.

If RSNetWorx for ControlNet does not start up or run properly, consider the following:

- Do you have the correct version of RSLinx Classic installed? RSNetWorx for ControlNet requires RSLinx Classic version 4.00.
- Does your computer have enough memory? RSNetWorx for ControlNet requires a minimum of 4GB of RAM.
- Have you reinstalled an earlier Service Pack, or removed a component, such as DCOM, that RSNetWorx for ControlNet requires?
- Have you checked the RSNetWorx support on the web for troubleshooting information? Go to <http://www.rockwellautomation.com/support/>, click Knowledgebase, and search for Tech Notes on RSNetWorx for ControlNet.
- Do you have the up-to-date compatibility information for the software? Go to Product Compatibility and Download Center at <https://compatibility.rockwellautomation.com/Pages/home.aspx>.

Advanced concepts

This chapter contains the following sections:

- EDS-based devices
- Class Instance Editor
- ControlNet versus Remote I/O and DH+ networks
- RSLogix 5 and RSNetWorx integration

EDS-based devices

RSNetworx for ControlNet relies on an electronic data sheet (EDS) for configuring devices. An electronic data sheet is an ASCII file that is created by the manufacturer and supplied with the device.

As long as the EDS file for the device you want to configure is registered with the RSNetWorx for ControlNet software, you can configure its target connection configuration (attributes) and how it will communicate with other devices on the ControlNet network. Although the procedure for configuring a device is basically the same for all devices, each device has a unique set of properties.

EDS library

The electronic data sheet (EDS) library is a collection of EDS files that have been registered with RSNetWorx for ControlNet. The EDS files, which are provided by the device manufacturers, contain configuration and identification information for the devices.

RSNetWorx for ControlNet software can access only those devices that have been registered. You must use the EDS Registry Wizard for registering EDS files for unknown devices, or if you have updated EDS files to install. To access the EDS Wizard, select **Tools > EDS Wizard**.

Although you get a large number of electronic data sheet (EDS) files with the RSNetWorx for ControlNet software, there may be a time when you need to acquire/create additional EDS files. The most common ways to get these files are to:

- obtain them on distribution media that accompany the devices.
- download them from ControlNet sites on the world wide web. You can either select the device in the network configuration, right-click the mouse and select Re-register Device, and click **Download EDS File** in the EDS Wizard or access one of the following world wide web sites from which EDS files are available:

- <http://www.odva.org> (ODVA organization website)
- <https://www.rockwellautomation.com/global/support/networks/eds.page?> (Allen-Bradley technical support site)
- download them from a different manufacturer's site.

Class Instance Editor

The Class Instance Editor is a tool that allows you to send data to, and read data from, a ControlNet device that is not otherwise configurable with RSNetWorx for ControlNet. Using the Class Instance Editor you can either enter raw data and download it to the device, or read the data from the device.

Important: We do not recommend configuring devices with the Class Instance Editor unless you are instructed to do so by technical support personnel for the hardware product.

To use the editor, you will need to know the service code, class, instance, and attribute by their appropriate hexadecimal codes within the device. This information may be on the printed data sheet accompanying the device.

Tip: For further information about configuring a device with the Class Instance Editor, contact the manufacturer of the device. For more information on how to enter data into the Class Instance Editor, contact Rockwell Automation technical support.

ControlNet versus Remote I/O and DH+ networks

Because ControlNet combines the functionality of an I/O network with that of an informational network, you can use it in place of using Remote I/O and DH+ or Remote I/O and Ethernet networks in combination. However, when you design your architecture, keep the following considerations in mind.

- The ControlNet network is designed optimally for predictable and repeatable delivery of scheduled data (much like the Remote I/O network). This design also provides for the delivery of unscheduled data, like the DH+ network, but makes it difficult to predict unscheduled data transfer performance.
- ControlNet and Ethernet are not equivalent networks and they are designed for different purposes. Used correctly, these networks are complementary but not competitive. Therefore, be aware that if you use ControlNet for applications with predominant or heavy unscheduled traffic, you may be misapplying the network.

Data delivery for traffic on an Ethernet network is designed for first-come, first-served delivery. Therefore, the delivery of a particular message on a lightly loaded Ethernet network could be faster than on ControlNet. Also, for comparison, one maximum-size Ethernet message (750 words) may be substituted with as many as seven ControlNet unscheduled messages.

As a rule, if you expect to use small, unscheduled packets with fewer than 100 words and do not expect heavy unscheduled network traffic,

you can use either ControlNet or Ethernet for unscheduled messaging with comparable performance. If you expect to use larger packets and heavy traffic, you should use the Ethernet network.

- The PLC-5/C15 processor implementation of ControlNet 1.5 unscheduled messaging simulates Programmable Controller Communication Command (PCCC) messaging and therefore, does not support more than 128 words in a single message packet (versus 255 words maximum allowable). As a result, PLC-5/C15 processors must work twice as hard to send/receive unscheduled messages on ControlNet.
- Buffer limitations are device-specific and can affect the total number of messages handled by that device, thereby affecting overall performance. The following table provides information about available product buffers for unscheduled connected and unconnected messaging.

Product	Connected	Unconnected
PLC-5/C processor	32	20
1784-KTc module	25	20
1756-CNB module	64*	20/5**

*This is not a fixed value; it is determined by the Network Update Time (NUT).

**The limit is five prior to firmware release A01.19 of the module and 20 with firmware release A01.19 and later.

By their nature, connected messages require the use of buffers for longer periods of time than do unconnected messages because the connection—and thus the buffer—remains in use until the connection is ended. By contrast, with unconnected messages, a connection, and its buffer, remains in use for only short periods of time.

RSLogix 5 and RSNetWorx integration

This section contains the following topics:

- Online without Allen-Bradley remote I/O (RIO) usage
- Offline without Allen-Bradley remote I/O (RIO) usage
- Offline with Allen-Bradley remote I/O (RIO) usage
- Online with Allen-Bradley remote I/O (RIO) usage

Online without Allen-Bradley remote I/O (RIO) usage

To quickly and effectively use RSNetWorx for ControlNet and RSLogix 5 in the online mode when Allen-Bradley remote I/O (RIO) is not a consideration, perform the following steps:

Tip: These steps assume that you have configured a communication driver with RSLinx Classic for communication to your ControlNet network.

- Define the network layout

- Insert connections
- Associate an RSLogix 5 project file (*.rsp) with each PLC-5C node in the ControlNet configuration file (*.xc) and specify module configuration information
- Integrate RSLogix 5 edits
- Synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

Define the network layout

1. In RSNetWorx for ControlNet, define the hardware layout of your ControlNet network. Complete the following:
 - a. Start RSNetWorx for ControlNet and select **Network > Online**.
 - b. On the Browse for Network dialog, select a communication path to your ControlNet network, and then click **OK**. Allow the entire browse operation to complete before proceeding to step c.
 - c. Click the Edits Enabled checkbox.

Tip: If the Online/Offline Mismatch dialog appears, choose the use offline data (download) option, and then click **OK**.

Insert connections

1. In RSNetWorx for ControlNet, define the connections needed by the PLC-5C for ControlNet communication. To define these connections, complete the following:
 - a. In the network configuration, click a PLC-5C processor and then select **Device > Scanlist Configuration**. RSNetWorx for ControlNet launches an instance of the Scanlist Configuration Tool and displays the scanlist for the selected PLC-5C processor.

The PLC-5C you are currently configuring is highlighted in green. In addition, the node address of the PLC-5C is also displayed in the title bar.

- b. Click the device that you want to insert a connection to, then select **Connection > Insert**. On the Connection Properties dialog, specify all of the ControlNet configuration properties associated with that connection. When complete, click **OK**.

Repeat for each device that you want to connect to on your ControlNet network.

Tip: You can insert default connections to all of the devices on the ControlNet network or a selected set of devices on the ControlNet network. Select **Connection > Auto Insert > All Devices** to search all of the devices in the configuration and insert a pending connection entry. Select **Connection > Auto Address > All Entries** to allow the software to select the next available, unconfigured address and define the ControlNet specific files (for example, status, configuration, data input, and data output) needed for each connection.

2. Repeat step 1 of this section for each PLC-5C on your ControlNet network.

Tip: Keep in mind that a separate instance of the Scanlist Configuration Tool will be launched for each PLC-5C that you are actively editing on your ControlNet network.

3. In RSNetWorx for ControlNet, select **File > Save** to save your work to the ControlNet configuration file (*.xc). You will associate individual RSLogix 5 project files (.rsp) to this file in the following sections.

When complete, minimize each instance of the Scanlist Configuration Tool. Then minimize RSNetWorx for ControlNet.

Associate an RSLogix 5 project file (*.rsp) with each PLC-5C node in the ControlNet configuration file (*.xc) and specify module configuration information

1. In RSLogix 5, create a new project for a PLC-5C processor and associate the project to the configuration file (*.xc) created in RSNetWorx for ControlNet. Complete the following:
 - a. Start RSLogix 5, and then select **Comms > Who ActiveGo Online**.
 - b. In the Communications dialog, select a PLC-5C processor node, and then click **OK**.
 - c. On the Default Program Rename dialog, enter a name for the selected PLC-5C processor, and then click **OK**. The processor image is uploaded to the RSLogix 5 project file (*.rsp)

Tip: If the PLC-5C already has a name, the Going to Online dialog is displayed. Click **Create New File**.

- d. In the Project tree control, select the Controller Properties icon. Click the right mouse button and select Open. On the Controller Properties dialog, browse your computer to find the ControlNet configuration file (*.xc) that you created in steps 1 and 2 of the [Insert connections](#) on [page 46](#) section. In addition, be sure to specify the node address where the selected PLC-5C resides on your ControlNet network, and then click **OK**.

Tip: It is not necessary to enter a value for the ControlNet Source Link ID field. For more information on the ControlNet Source Link ID field, see the RSLogix 5 online help.

2. Configure each module and store the configuration data in the processor's data table. To define these locations in RSLogix 5, complete the following:
 - a. In the Project tree control, select the I/O Configuration icon. Click the right mouse button and select Open. On the I/O Configuration - Chassis Table dialog, all of the devices that this processor communicates with and associated I/O mapping information are displayed.
 - b. Select the chassis that contains the module that you want to configure on the ControlNet network. Click the right mouse button and select Display Chassis. Each of the modules that this PLC-5C communicates with in that chassis are automatically added and displayed by RSNetWorx for ControlNet.
 - c. Select the module type in that chassis that you want to configure. Click the right mouse button and select Display Module. On the Module Configuration dialog for the selected module, configure the module for your application. When complete, click **Accept Edits**, and then click **Close**. Close all of the associated dialogs.

Repeat for each module in that chassis (if applicable).
 - d. You are prompted to download the configuration to the module. Click **OK**.
3. Enter the appropriate ladder logic for the PLC-5C processor.
4. Save the RSLogix 5 project file (*.rsp) for this PLC-5C processor. You are prompted to upload current data table values; click **Yes**. At this point, the changes are committed to the specified RSLogix 5 project file and all pending edit information is included in the associated .xc file.

When complete, close the RSLogix 5 project file.

5. Repeat steps 1 through 4 of this section for each PLC-5C processor on your ControlNet network.

Tip: Be sure to specify a unique ControlNet node number for each PLC-5C processor on your ControlNet network.

When complete, minimize RSLogix 5.

Integrate RSLogix 5 edits

1. In RSNetWorx for ControlNet, integrate the changes made in RSLogix 5 for each PLC-5C on the network to the configuration file (*.xc) created in the [Define the network layout](#) on [page 46](#) and [Insert Connections](#) on [page 46](#) sections. Complete the following:
 - a. Maximize RSNetWorx for ControlNet and select the Edits Enabled checkbox. All changes made in RSLogix 5 are automatically included as pending edits.

Tip: In each instance of the Scanlist Configuration Tool, you can review the changes made to the modules in RSLogix 5. These changes appear in blue text (pending edits).
 - b. In RSNetWorx for ControlNet (or any instance of the Scanlist Configuration Tool), select **File > Save** to incorporate all of the pending RSLogix 5 changes into the associated *.xc file. On the Save configuration dialog, select the correct save option and click **OK**.
 - c. Minimize each instance of the Scanlist Configuration Tool.

Your system configuration is now complete.

Synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

1. In RSLogix 5, open each project file (*.rsp) that was created for each PLC-5C node on your network. Complete the following:
 - a. Open a RSLogix 5 project file (*.rsp).
 - b. Select **Comms > Upload** to save the network configuration in the ControlNet configuration file (*.xc). Your offline network should match your online network.
 - c. Select **Comms > Go Online**.

Tip: If you are prompted to save changes, click **Yes**.
 - d. Select **Remote Run** mode.
2. Repeat for each RSLogix 5 project file (*.rsp). When complete, RSLogix 5 and RSNetWorx for ControlNet are synchronized.

For more information about the integration of RSLogix 5 and RSNetWorx for ControlNet, contact Rockwell Software Technical Support.

Offline without Allen-Bradley remote I/O (RIO) usage

To quickly and effectively use RSNetWorx for ControlNet and RSLogix 5 in the offline mode when Allen-Bradley remote I/O (RIO) is not a consideration, and then download that information to your online network, perform the following steps:

Tip: These steps assume that you have configured a communication driver with RSLinx Classic for communication to your ControlNet network.

- Define the network layout
- Define the local rack information and insert connections
- Associate an RSLogix 5 project file (*.rsp) with each PLC-5C node in the ControlNet configuration file (*.xc) and specify module configuration information
- Integrate RSLogix 5 edits
- Download the ControlNet configuration file (*.xc) that contains the PLC-5C scanlist
- Download and synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

Define the network layout

1. In RSNetWorx for ControlNet, define the hardware layout of your ControlNet network. Complete the following:
 - a. Start RSNetWorx for ControlNet and click the Edits Enabled checkbox.
 - b. In the Hardware view, select one of the devices on your ControlNet network (for example, PLC-5C or adapter module) and drag it to the network configuration area (either the Graph or Spreadsheet view). RSNetWorx for ControlNet automatically assigns the next available node number to the device; if it is not acceptable for your application, change the node number accordingly.

Repeat for each device on your ControlNet network.
 - c. Click an adapter module in the network configuration and specify the contents of the chassis by selecting **Device > Define Chassis**. On the Define Chassis dialog box, add all of the appropriate modules to that chassis to match the actual hardware allocated on your network. When complete, click **OK**.

Repeat for each adapter module on your ControlNet network.

Define the local rack information and insert connections

1. In RSNetWorx for ControlNet, define the local rack information and insert the connections needed by the PLC-5C for ControlNet communication. Complete the following:
 - a. In the network configuration, click a PLC-5C processor and then select **Device > Scanlist Configuration**. RSNetWorx for ControlNet launches an instance of the Scanlist Configuration Tool and displays the scanlist for the selected PLC-5C processor.

The PLC-5C you are currently configuring is highlighted in green.

- b. Click **Device > I/O File Allocation**. Specify your local rack information, then click **OK**.
- c. Click the device that you want to insert a connection to, then select **Connection > Insert**. On the Connection Properties dialog, specify all of the ControlNet configuration properties associated with that connection. When complete, click **OK**.

Repeat for each device that you want to connect to on your ControlNet network.

Tip: You can insert default connections to all of the devices on the ControlNet network or a selected set of devices on the ControlNet network. Select **Connection > Auto Insert > All Devices** to search all of the devices in the configuration and insert a pending connection entry. Select **Connection > Auto Address > All Entries** to allow the software to select the next available, unconfigured address and define the ControlNet specific files (for example, status, configuration, data input, and data output) needed for each connection.

2. Repeat step 1 of this section for each PLC-5C on your ControlNet network.

Tip: Keep in mind that a separate instance of the Scanlist Configuration Tool will be launched for each PLC-5C that you are actively editing on your ControlNet network.

3. In RSNetWorx for ControlNet, select **File > Save** to save your work to the ControlNet configuration file (*.xc). You will associate individual RSLogix 5 project files (.rsp) to this file in the following sections.

When complete, minimize each instance of the Scanlist Configuration Tool. Then minimize RSNetWorx for ControlNet.

Associate an RSLogix 5 project file (*.rsp) with each PLC-5C node in the ControlNet configuration file (*.xc) and specify module configuration information

1. In RSLogix 5, create a new project for a PLC-5C processor and associate the project to the configuration file (*.xc) created in RSNetWorx for ControlNet. Complete the following:
 - a. Start RSLogix 5.
 - b. Open a new project file by selecting **File > New**. On the Select Processor Type dialog, specify the correct platform (ControlNet), PLC-5C processor (including series and revision), processor name, communication driver, and node number for a PLC-5C processor on your ControlNet network. Click **OK**.

Tip: To work with a ControlNet network, you must specify one of the PLC-5C processors that are followed by 1.5 suffix (for example, PLC-5/40C 1.5).

- c. On the Select ControlNet Project dialog, browse your computer to find the ControlNet configuration file (*.xc) that you created in steps 1 and 2 of the [Define the local rack information and insert connections](#) on [page 50](#) section. In addition, specify the node address where the specified PLC-5C processor resides on your ControlNet network, and then click **OK**.
2. Configure each module and store the configuration data in the processor's data table. To define these locations in RSLogix 5, complete the following:
 - a. In the Project tree control, select the I/O Configuration icon. Click the right mouse button and select Open. On the I/O Configuration - Chassis Table dialog, all of the devices that this processor communicates with and associated I/O mapping information are displayed.
 - b. Select the chassis that contains the module that you want to configure on the ControlNet network. Click the right mouse button and select Display Chassis. Each of the modules that this PLC-5C communicates with in that chassis are automatically added by RSNetWorx for ControlNet and displayed.
 - c. Select the module type in that chassis that you want to configure. Click the right mouse button and select Display Module. On the Module Configuration dialog for the selected module, configure the module for your application. When complete, click **Accept Edits**, and then click **Close**. Close all of the associated dialogs.

Repeat for each module in that chassis (if applicable).
 3. Enter the appropriate ladder logic for the PLC-5C processor.
 4. Save the RSLogix 5 project file (*.rsp) for this PLC-5C processor. At this point, the changes are committed to the specified RSLogix 5 project file and all pending edit information is included in the associated .xc file. Close the RSLogix 5 project file.
 5. Repeat steps 1 through 4 of this section for each PLC-5C processor on your ControlNet network.

Tip: Be sure to specify a unique ControlNet node number for each PLC-5C processor on your ControlNet network.

When complete, minimize RSLogix 5.

Integrate RSLogix 5 edits

1. In RSNetWorx for ControlNet, integrate the changes made in RSLogix 5 for each PLC-5C on the network to the configuration file (*.xc) created in the [Define the network layout](#) on [page 50](#) and [Define the local rack information and insert connections](#) on [page 50](#) sections.

Complete the following:

- a. Maximize RSNetWorx for ControlNet and select the Edits Enabled checkbox. All changes made in RSLogix 5 are automatically included as pending edits.

Tip: In each instance of the Scanlist Configuration Tool, you can review the changes made to the modules in RSLogix 5. These changes appear in blue text (pending edits).

- b. In RSNetWorx for ControlNet (or any instance of the Scanlist Configuration Tool), select **File > Save** to incorporate all of the pending RSLogix 5 changes into the associated .xc file. On the Save configuration dialog, select the correct save option and click **OK**.
- c. Minimize each instance of the Scanlist Configuration Tool.

Your system configuration is now complete.

Download the ControlNet configuration file (*.xc) that contains the PLC-5C scanlist

1. Attach to the online ControlNet network and download the integrated configuration file (*.xc). Complete the following:

- a. Select **Network > Online**. On the Network Browse dialog, select the ControlNet network to which you want to download the integrated configuration file (*.xc). Click **OK**.

Tip: If the Online/Offline Mismatch dialog appears, specify that you want to use the offline data and download it to the network. Click **OK**.

If the Online/Offline Mismatch dialog does not appear, select **Network > Download**.

- b. Close RSNetWorx for ControlNet. Each instance of the Scanlist Configuration Tool closes automatically.

Download and synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

1. In RSLogix 5, open each project file (*.rsp) that was created for each PLC-5C node on your network. Complete the following:
 - a. Select **Comms > System Comms**. On the Communications dialog, select the appropriate node, and then click **Download**. You are prompted to proceed with the download; click **Yes**.
 - b. You are prompted to keep the existing online configuration; click **Yes**. You are prompted to continue with the download; click **Yes**.

- c. On the Save Program As dialog, you are prompted to save the RSLogix 5 file; click **Save**. You are then prompted to go online; click **Yes**.
 - d. Select Remote Run mode.
2. Repeat for each RSLogix 5 project file (*.rsp). When complete, RSLogix 5 and RSNetWorx for ControlNet are synchronized.

For more information about the integration of RSLogix 5 and RSNetWorx for ControlNet, contact Rockwell Software Technical Support.

Offline with Allen-Bradley remote I/O (RIO) usage

To quickly and effectively use RSNetWorx for ControlNet and RSLogix 5 in the offline mode when Allen-Bradley remote I/O (RIO) is a consideration, and then download that information to your online network, perform the following steps:

Tip: These steps assume that you have configured a communication driver with RSLinx Classic for communication to your ControlNet network.

- Open the ControlNet configuration file (*.xc) and define the network layout
- Define the local rack information
- Associate each PLC-5C to the ControlNet configuration file (*.xc) and define the remote I/O
- Insert connections
- Specify module configuration information
- Integrate RSLogix 5 edits
- Download the ControlNet configuration file (*.xc) that contains the PLC-5C scanlist
- Download and synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

Open the ControlNet configuration file (*.xc) and define the network layout

1. In RSNetWorx for ControlNet, define the hardware layout of your ControlNet network. Complete the following:
 - a. Start RSNetWorx for ControlNet and click the Edits Enabled checkbox.

- b. In the Hardware view, select one of the devices on your ControlNet network (for example, PLC-5C or adapter module) and drag it to the network configuration area (either the Graph or Spreadsheet view). RSNetWorx for ControlNet automatically assigns the next available node number to the device; if it is not acceptable for your application, change the node number accordingly.

Repeat for each device on your ControlNet network.

- c. Click an adapter module in the network configuration and specify the contents of the chassis by selecting **Device > Define Chassis**. On the Define Chassis dialog box, add all of the appropriate modules to that chassis to match the actual hardware allocated on your network. When complete, click **OK**.

Repeat for each adapter module on your ControlNet network.

Define the local rack information

1. In RSNetWorx for ControlNet, define the local rack information needed by the PLC-5C for ControlNet communication. Complete the following:
 - a. In the network configuration, click a PLC-5C processor and then select **Device > Scanlist Configuration**. RSNetWorx for ControlNet launches an instance of the Scanlist Configuration Tool and displays the scanlist for the selected PLC-5C processor.

The PLC-5C you are currently configuring is highlighted in green. In addition, the name of the PLC-5C is also displayed in the title bar.
 - b. Click **Device > I/O File Allocation**. Specify your local rack information, then click **OK**.
 - c. Select **File > Save** to save your work to a ControlNet configuration file (*.xc). You will associate individual RSLogix 5 project files (*.rsp) to this file in the following sections.

When complete, close the Scanlist Configuration Tool.

2. Repeat step 1 of this section for each PLC-5C on your ControlNet network, saving your changes to the same ControlNet configuration file (*.xc) created in step 1c.

When complete, minimize RSNetWorx for ControlNet.

Associate each PLC-5C to the ControlNet configuration file (*.xc) and define the remote I/O

1. In RSLogix 5, create a new project for a PLC-5C processor and associate the project to the ControlNet configuration file (*.xc) generated in step 1 of the [Define the local rack information](#) on [page 55](#) section. Complete the following:
 - a. Start RSLogix 5.
 - b. Open a new project file by selecting **File > New**. On the Select Processor Type dialog, specify the correct platform (ControlNet), PLC-5C processor (including series and revision), processor name, communication driver, and node number for a PLC-5C processor on your ControlNet network. Click **OK**.

Tip: To work with a ControlNet network, you must specify one of the PLC-5C processors that are followed by 1.5 suffix (for example, PLC-5/40C 1.5).

- c. On the Select ControlNet Project dialog, click **Browse** to find the location where your ControlNet configuration files (*.xc) reside. On the Open dialog, find the appropriate directory location on your computer, and then select the name for the ControlNet configuration file created in step 1c of the [Define the local rack information](#) on [page 55](#) section. When complete, click **Open**.

When you return to the Select ControlNet Project dialog, specify the node address where the specified PLC-5C processor resides on your ControlNet network, and then click **OK**.

2. Configure the remote I/O data table settings for your ControlNet network. Complete the following:
 - a. In the Project tree control, select the Channel Configuration icon. Click the right mouse button and select **Open**.
 - b. Coordinate your remote I/O channel settings for your specific application. When complete, click **Apply**, and then close all associated dialogs.
 - c. When complete, close the Edit Channel Properties dialog.
3. Select **File > Save** to save your RSLogix 5 project file (*.rsp). Specify a name for your RSLogix 5 project file, and then click **Save**. All changes will also be associated to the ControlNet configuration file (*.xc) that you created in step 1 of this section.

When complete, close the RSLogix 5 project file.

4. Complete steps 1 through 3 of this section for each PLC-5C on your ControlNet network. Note that for each PLC-5C on your network, you will associate the same ControlNet configuration file (*.xc) specified in step 1c of the [Define the local rack information](#) on [page 55](#) section.

When complete, minimize RSLogix 5.

Insert connections

1. In RSNetWorx for ControlNet, define the data table input, output, and integer file locations needed by the PLC-5C for ControlNet communication. To define these locations, complete the following:
 - a. Maximize RSNetWorx for ControlNet and click the Edits Enabled checkbox. A separate instance of the Scanlist Configuration Tool will be launched for each PLC-5C that you are actively editing on your ControlNet network.

Tip: When working offline, the number of scanners (for example, PLC-5C processors) that can be scheduled on a ControlNet network are dependent upon the particular operating system and the amount of RAM installed on the computer. For more information, see the capacity document.
 - b. In the network configuration of RSNetWorx for ControlNet, click a PLC-5C processor and then select **Device > Scanlist Configuration**. RSNetWorx for ControlNet displays the instance of the Scanlist Configuration Tool that contains the scanlist for the selected PLC-5C processor. The PLC-5C you are currently configuring is highlighted in green. In addition, the PLC-5C is also displayed in the title bar.
 - c. Click the device that you want to insert a connection to, then select **Connection > Insert**. On the Connection Properties dialog, specify all of the ControlNet configuration properties associated with that connection. When complete, click **OK**.

Repeat for each device that you want to connect to on your ControlNet network.

Tip: You can insert default connections to all of the devices on the ControlNet network or a selected set of devices on the ControlNet network. Select **Connection > Auto Insert > All Devices** to search all of the devices in the configuration and insert a pending connection entry. Select **Connection > Auto Address > All Entries** to allow the software to select the next available, unconfigured address and define the ControlNet specific files (for example, status, configuration, data input, and data output) needed for each connection.

2. Repeat step 1 of this section for each PLC-5C on your ControlNet network.
3. In RSNetWorx for ControlNet, select **File > Save** to save your work to the ControlNet configuration file (*.xc).

When complete, minimize each instance of the Scanlist Configuration Tool. Then minimize RSNetWorx for ControlNet.

Specify module configuration information

1. In RSLogix 5, configure each module and store the configuration data in the processor's data table. To define these locations in RSLogix 5,

complete the following:

- a. Maximize RSLogix 5.
- b. Open the RSLogix 5 project file (*.rsp) for a PLC-5C processor.
- c. In the Project tree control, select the I/O Configuration icon. Click the right mouse button and select Open. On the I/O Configuration - Chassis Table dialog, all of the devices that this processor communicates with and associated I/O mapping information are displayed.
- d. Select the chassis that contains the module that you want to configure on the ControlNet network. Click the right mouse button and select Display Chassis. Each of the modules that this PLC-5C communicates with in that chassis are automatically added by RSNetWorx for ControlNet and displayed.

Select the module type in that chassis that you want to configure. Click the right mouse button and select Display Module. On the Module Configuration dialog for the selected module, configure the module for your application. When complete, click **Accept Edits**, and then click **Close**. Close all of the associated dialogs. Repeat for each module in that chassis (if applicable).

Tip: RSNetWorx for ControlNet will be displayed, signifying that changes have been made in RSLogix 5. Minimize RSNetWorx for ControlNet.

2. Enter the appropriate ladder logic for the PLC-5C processor.
3. Select **File > Save** to save the RSLogix 5 project file (*.rsp) for this PLC-5C processor. At this point, the changes are committed to the specified RSLogix 5 project file and all pending edit information is included in the associated .xc file. Close the RSLogix 5 project file.
4. Repeat steps 1 through 3 of this section for each PLC-5C processor on your ControlNet network.

When complete, minimize RSLogix 5.

Integrate RSLogix 5 edits

1. In RSNetWorx for ControlNet, integrate the changes made in RSLogix 5 for each PLC-5C on the network to the ControlNet configuration file (*.xc) created in step 1c of the [Define the local rack information](#) on [page 55](#) section. Complete the following:
 - a. Maximize RSNetWorx for ControlNet and select the Edits Enabled checkbox. All changes made in RSLogix 5 are automatically included as pending edits.

Tip: In each instance of the Scanlist Configuration Tool, you can review the changes made to the modules in RSLogix 5. These changes appear in blue text (pending edits).

- b. In RSNetWorx for ControlNet (or any instance of the Scanlist Configuration Tool), select **File > Save** to incorporate all of the pending RSLogix 5 changes into the associated ControlNet configuration file (*.xc). On the Save configuration dialog, select the correct save option and click **OK**.
- c. Minimize each instance of the Scanlist Configuration Tool.

Your system configuration is now complete.

Download the ControlNet configuration file (*.xc) that contains the PLC-5C scanlist

1. In RSNetWorx for ControlNet, attach to the online ControlNet network and download the integrated ControlNet configuration file (*.xc). Complete the following:
 - a. Select **Network > Online**. On the Network Browse dialog, select the ControlNet network to which you want to download the integrated configuration file (*.xc). Click **OK**.

Tip: If the Online/Offline Mismatch dialog appears, specify that you want to use the offline data and download it to the network. Click **OK**.

If the Online/Offline Mismatch dialog does not appear, select **Network > Download**.

- b. Close RSNetWorx for ControlNet. Each instance of the Scanlist Configuration Tool closes automatically.

Download and synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

1. In RSLogix 5, open each project file (*.rsp) that was created for each PLC-5C node on your network. Complete the following:
 - a. Select **Comms > System Comms**. On the Communications dialog, select the appropriate node, and then click **Download**. You are prompted to proceed with the download; click **Yes**.
 - b. You are prompted to keep the existing online configuration; click **Yes**. You are prompted to continue with the download; click **Yes**.
 - c. On the Save Program As dialog, you are prompted to save the RSLogix 5 file; click **Save**. You are then prompted to go online; click **Yes**.
 - d. Select Remote Run mode.
2. Repeat for each RSLogix 5 project file (*.rsp). When complete, RSLogix 5 and RSNetWorx for ControlNet are synchronized.

For more information about the integration of RSLogix 5 and RSNetWorx for ControlNet, contact Rockwell Software Technical Support.

Online with Allen-Bradley remote I/O (RIO) usage

To quickly and effectively use RSNetWorx for ControlNet and RSLogix 5 in the online mode when Allen-Bradley remote I/O (RIO) is a consideration, perform the following steps:

Tip: These steps assume that you have configured a communication driver with RSLinx Classic for communication to your ControlNet network.

- Open the ControlNet configuration file (*.xc) and define the network layout
- Define the local rack information
- Associate each PLC-5C to the ControlNet configuration file (*.xc) and define the remote I/O
- Insert connections
- Specify module configuration information
- Integrate RSLogix 5 edits
- Synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

Open the ControlNet configuration file (*.xc) and define the network layout

1. In RSNetWorx for ControlNet, define the hardware layout of your ControlNet network. Complete the following:
 - a. Start RSNetWorx for ControlNet and select **Network > Online**.
 - b. On the Browse for Network dialog, select a communication path to your ControlNet network, and then click **OK**. Allow the entire browse operation to complete before proceeding. The entire network configuration is displayed.

Tip: If the Online/Offline Mismatch dialog appears, choose the use the offline data (download) option, and then click **OK**.
 - c. Click the Edits Enabled checkbox.

Define the local rack information

1. In RSNetWorx for ControlNet, define the local rack information needed by the PLC-5C for ControlNet communication. Complete the following:
 - a. In the network configuration, click a PLC-5C processor and then select **Device > Scanlist Configuration**. RSNetWorx for ControlNet launches an instance of the Scanlist Configuration Tool and displays the scanlist for the selected PLC-5C processor. The local rack information is automatically obtained for the selected PLC-5C processor.

The PLC-5C you are currently configuring is highlighted in green. In addition, the name of the PLC-5C is also displayed in the title bar.

- b. Select **File > Save** to save your work to a ControlNet configuration file (*.xc). You will associate individual RSLogix 5 project files (*.rsp) to this file in the following sections.

When complete, close the Scanlist Configuration Tool.

2. Repeat step 1 of this section for each PLC-5C on your ControlNet network, saving your changes to the same ControlNet configuration file (*.xc) created in step 1b.

When complete, minimize RSNetWorx for ControlNet.

Associate each PLC-5C to the ControlNet configuration file (*.xc) and define the remote I/O

1. In RSLogix 5, create a new project for a PLC-5C processor and associate the project to the ControlNet configuration file (*.xc) generated in step 1 of the [Define the local rack information](#) on [page 60](#) section. Complete the following:

- a. Start RSLogix 5, and then select **Comms > Who ActiveGo Online**.
- b. In the Communications dialog, select a PLC-5C processor node, and then click **OK**.
- c. On the Default Program Rename dialog, enter a name for the selected PLC-5C processor, and then click **OK**. The processor image is uploaded to the RSLogix 5 project file (*.rsp).

Tip: If the PLC-5C already has a name, the Going to Online dialog is displayed. Click **Create New File**.

- d. In the Project tree control, select the Controller Properties icon. Click the right mouse button and select **Open**. On the Controller Properties dialog, click **Browse** to find the directory location where your ControlNet configuration files (*.xc) reside. On the Open dialog, find the appropriate directory location on your computer, and then select the name for the ControlNet configuration file created in step 1.

When complete, click **Open**.

When you return to the ControlNet Properties dialog, specify the node address where the specified PLC-5C processor resides on your ControlNet network, and then click **OK**.

Tip: It is not necessary to enter a value for the ControlNet Source Link ID field. For more information on the ControlNet Source Link ID field, see the RSLogix 5 online help.

2. Configure the remote I/O data table settings for your ControlNet network. Complete the following:
 - a. In the Project tree control, select the Channel Configuration icon. Click the right mouse button and select Open.
 - b. Coordinate your remote I/O channel settings for your specific application. When complete, click **Apply**, and then close all associated dialogs.
 - c. When complete, close the Edit Channel Properties dialog.
 - d. Select **File > Save** to save your RSLogix 5 project file (*.rsp). Specify a name for your RSLogix 5 project file, and then click **Save**. You are prompted to upload your changes; click **Yes**. At this point, the changes are committed to the specified RSLogix 5 project file. In addition, all changes will also be associated to the ControlNet configuration file (*.xc) that you created in step 1.
 - e. When complete, close the RSLogix 5 project file.
3. Complete steps 1 through 3 for each PLC-5C on your ControlNet network. Note that for each PLC-5C on your network, you will associate the same ControlNet configuration file (*.xc) specified in step 1b of the [Define the local rack information](#) on [page 60](#) section. When complete, minimize RSLogix 5.

Insert connections

1. In RSNetWorx for ControlNet, define the connections needed by the PLC-5C for ControlNet communication. To define these connections, complete the following:
 - a. Maximize RSNetWorx for ControlNet and click the Edits Enabled checkbox. A separate instance of the Scanlist Configuration Tool will be launched for each PLC-5C that you are actively editing on your ControlNet network.

Tip: When working online, the number of scanners (for example, PLC-5C processors) that can be scheduled on a ControlNet network are dependent upon the particular communications device and operating system. For more information, see the capacity document.

- b. In the network configuration, click a PLC-5C processor and then select **Device > Scanlist Configuration**. RSNetWorx for ControlNet launches an instance of the Scanlist Configuration Tool and displays the scanlist for the selected PLC-5C processor.

The PLC-5C you are currently configuring is highlighted in green. In addition, the name of the PLC-5C is also displayed in the title bar.

2. Click the device that you want to insert a connection to, then select **Connection > Insert**. On the Connection Properties dialog, specify all of the ControlNet configuration properties associated with that connection.

When complete, click **OK**.

Repeat for each device that you want to connect to on your ControlNet network.

Tip: You can insert default connections to all of the devices on the ControlNet network or a selected set of devices on the ControlNet network. Select **Connection > Auto Insert > All Devices** to search all of the devices in the configuration and insert a pending connection entry. Select **Connection > Auto Address > All Entries** to allow the software to select the next available, unconfigured address and define the ControlNet specific files (for example, status, configuration, data input, and data output) needed for each connection.

3. Repeat step 2 of this section for each PLC-5C on your ControlNet network.

Tip: Keep in mind that a separate instance of the Scanlist Configuration Tool will be launched for each PLC-5C that you are actively editing on your ControlNet network.

4. In RSNetWorx for ControlNet, select **File > Save** to save your work to the ControlNet configuration file (*.xc).

When complete, minimize each instance of the Scanlist Configuration Tool. Then minimize RSNetWorx for ControlNet.

Specify module configuration information

1. Configure each module and store the configuration data in the processor's data table. To define these locations in RSLogix 5, complete the following:
 - a. In RSLogix 5, open a RSLogix 5 project file (*.rsp) for a PLC-5C and select **Comms > Go Online**.
 - b. On the Going to Online Programming State dialog, click **Upload Logic, Merge with Existing Files Comments/Symbols Database**. The processor image is uploaded to the RSLogix 5 project file (*.rsp).
 - c. In the Project tree control, select the I/O Configuration icon. Click the right mouse button and select **Open**. On the I/O Configuration - Chassis Table dialog, all of the devices that this processor communicates with and associated I/O mapping information are displayed.

- d. Select the chassis that contains the module that you want to configure on the ControlNet network. Click the right mouse button and select Display Chassis. Each of the modules that this PLC-5C communicates with in that chassis are automatically added by RSNetWorx for ControlNet and displayed.
- e. Select the module type in that chassis that you want to configure. Click the right mouse button and select **Display Module**. On the Module Configuration dialog for the selected module, configure the module for your application. When complete, click **Accept Edits**, and then click **Close**. Close all of the associated dialogs.

Repeat for each module in that chassis (if applicable).

Tip: RSNetWorx for ControlNet will be displayed, signifying that changes have been made in RSLogix 5. Minimize RSNetWorx for ControlNet.

2. Enter the appropriate ladder logic for the PLC-5C processor.
3. Select **File > Save** to save the RSLogix 5 project file (*.rsp) for this PLC-5C processor.
4. Select **Comms > Download**. You are prompted to keep existing changes; click **Yes**. At this point, the changes are committed to the specified RSLogix 5 project file and all pending edit information is included in the associated .xc file. Close the RSLogix 5 project file.
5. Repeat steps 1 through 4 of this section for each PLC-5C processor on your ControlNet network.

Tip: Be sure to specify a unique ControlNet node number for each PLC-5C processor on your ControlNet network.

When complete, minimize RSLogix 5.

Integrate RSLogix 5 edits

1. In RSNetWorx for ControlNet, integrate the changes made in RSLogix 5 to the ControlNet configuration file (*.xc) created in step 1 of the [Define the local rack information](#) on [page 60](#) section for each PLC-5C on the network. Complete the following:
 - a. Maximize RSNetWorx for ControlNet and select the Edits Enabled checkbox. All changes made in RSLogix 5 are automatically included as pending edits.

Tip: In each instance of the Scanlist Configuration Tool, you can review the changes made to the modules in RSLogix 5. These changes appear in blue text (pending edits).

- b. In RSNetWorx for ControlNet (or any instance of the Scanlist Configuration Tool), select **File > Save** to incorporate all of the pending RSLogix 5 changes into the associated ControlNet configuration file (*.xc). On the Save configuration dialog, select the correct save option and click **OK**.
- c. Close RSNetWorx for ControlNet. Notice that each instance of the Scanlist Configuration Tool closes automatically.

Your system configuration is now complete.

Synchronize the RSLogix 5 project file (*.rsp) with the online PLC-5C

1. In RSLogix 5, open each project file (*.rsp) that was created for each PLC-5C node on your network. Complete the following:
 - a. Open a RSLogix 5 project file (*.rsp).
 - b. Select **Comms > Upload** to save the network configuration in the ControlNet configuration file (*.xc). Your offline network should match your online network.
 - c. Select **Comms > Go Online**.
 - d. Select Remote Run mode.
2. Repeat for each RSLogix 5 project file (*.rsp). When complete, RSLogix 5 and RSNetWorx for ControlNet are synchronized.

For more information about the integration of RSLogix 5 and RSNetWorx for ControlNet, contact Rockwell Software Technical Support.

Finding the information you need

This chapter describes how to:

- Use the online help
- Access product manuals
- Participate in Rockwell Automation training courses
- Contact technical support

Using the online help

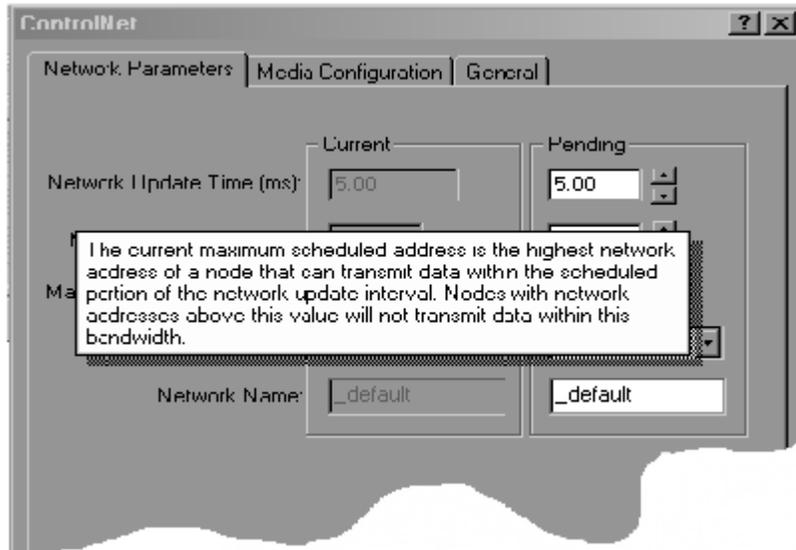
RSNetWorx for ControlNet online help provides general overview information, comprehensive step-by-step procedures, and context-sensitive, dialog box control definitions for working with all of the features in the software. To view online help while running RSNetWorx for ControlNet:

- choose **Contents** from the Help menu on the RSNetWorx for ControlNet main window
- click **Help** on any RSNetWorx for ControlNet dialog box or property page
- position the cursor over a control with which you want help and right-click
- press **F1**
- click the **What's This?** icon located in the toolbar or in the upper right corner of dialog boxes, then click any control

Accessing help for a control or field



To display a definition for a control or a field, click the What's This? icon in the upper right corner of the dialog box, drag the cursor to the selected area, and then click to display the definition. You can also right-click on a control to display the definition. In this example, the Current Maximum Scheduled Address was selected.



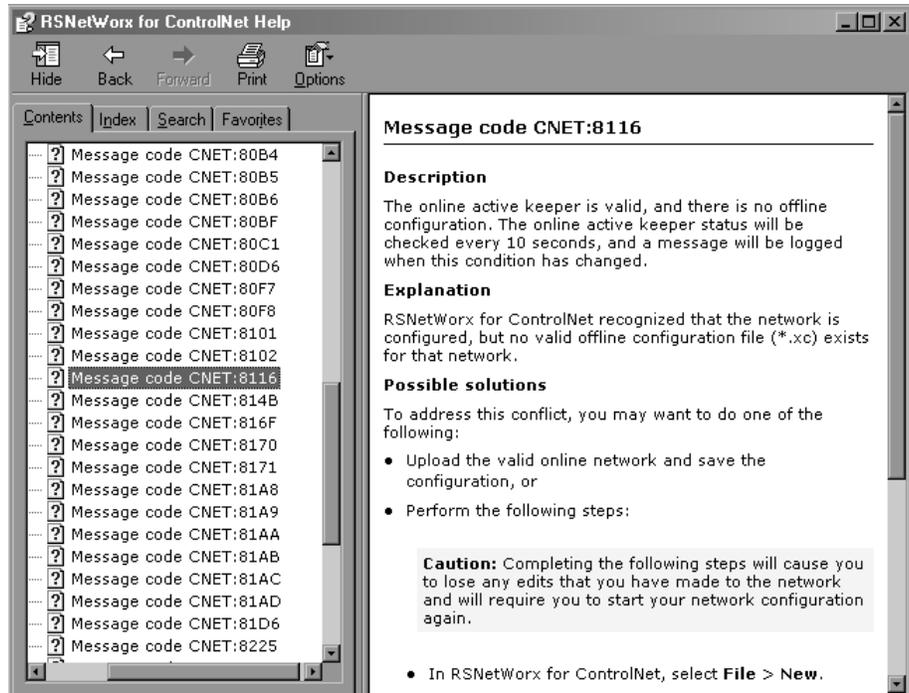
Accessing help for messages

The Message view, which appears in the bottom portion of the workspace, displays a log of messages. This view may contain informational, warning, and/or error messages.

Message Code	Date	Description
CNET:81E6	1/16/2003 14:50:34	Save completed.
CNET:8013	1/16/2003 14:50:34	No user action needed. The maximum scheduled address
CNET:81E7	1/16/2003 14:50:02	Edits enabled.
CNET:805B	1/16/2003 14:50:02	Connections found in address 04 have been added to the
CNET:81E4	1/16/2003 14:49:12	Mode changed to online. The online path is RSM SHA

To troubleshoot a particular message, you can select the message and press the F1 key or right-click on the message and select **Troubleshoot** to access the online help.

For example, if you select the CNET:8116 message code shown here and press F1, the "This network is configured and there is no offline configuration" troubleshooting help topic displays.

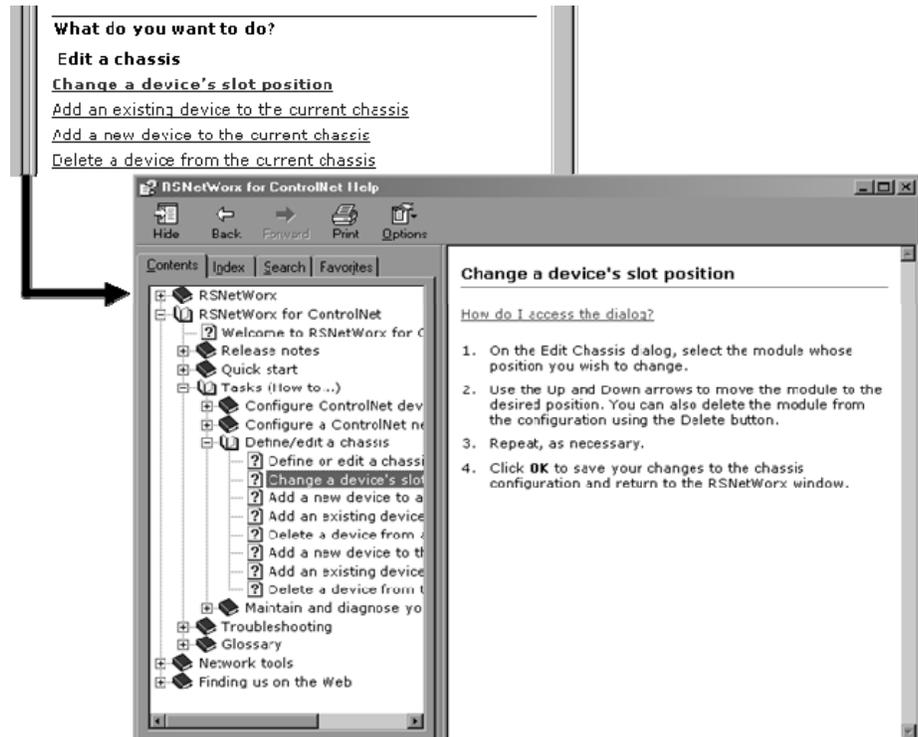


From the message view, you can also select a message and choose **View > Messages > Troubleshoot** to display online help for the message. You can also show, clear, and/or clear and hide messages by making the appropriate selection from the **View > Messages** command on the main menu. The copy menu item copies the selected message to the Windows clipboard so it can be pasted into other applications (for example, an e-mail message).

Finding step-by-step procedures

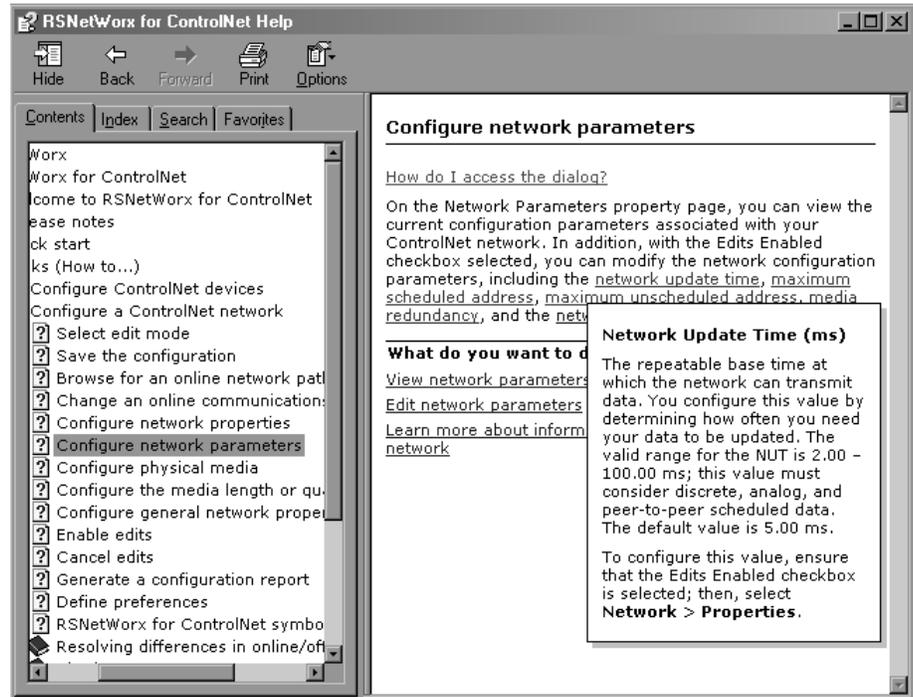
To view a list of tasks related to the task-based topic, move to the What do you want to do? section at the bottom of the help window and select one of the listed tasks. The contents pane of the help window is updated, displaying a step by step procedure for completing the selected task.

For example, from the Define or edit a chassis help topic, if you select Change a device's slot position under the What do you want to do? section, the help topic that describes how to change a device's slot position replaces the original help topic. Also, in the Change a device's slot position help topic, How do I access the dialog? is a drop down navigational tip.



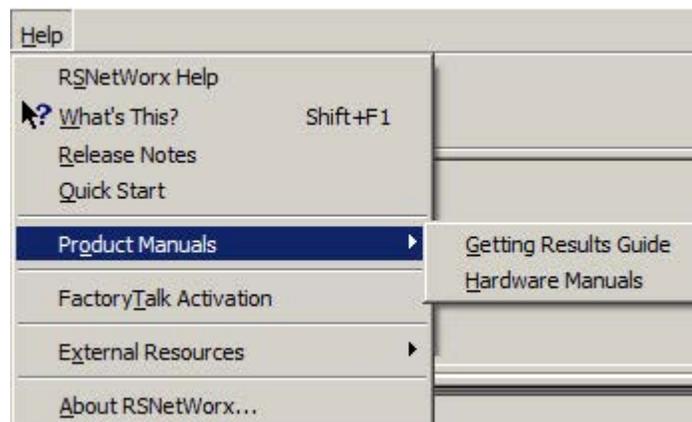
Finding definitions

Within the RSNetWorx for ControlNet help, blue highlighted text with an underline indicates a pop-up definition or a link to a related topic. For example, in the Configure network parameters help topic, network update time, maximum scheduled address, maximum unscheduled address, media redundancy, and network name are pop-up definitions.



Accessing the Product Manuals

You can gain immediate access to product documentation through the product manuals feature in RSNetWorx for DeviceNet. Product manuals include this Getting Results Guide, as well as many reference guides, in an electronic book format. Select **Help > Product Manuals** to access this documentation.



Training

One of the best ways to increase your proficiency at using Rockwell Software products is to attend a Rockwell Automation training program. Our training programs can help you master the basics and show you how to unleash the full potential of our software.

We offer a wide range of training programs, from regularly scheduled classes conducted at Rockwell Software facilities, to custom-tailored classes conducted at your enterprise. The size of each class is kept small intentionally to maximize student engagement.

If you would like more information about our training programs, visit the Rockwell Software website or contact the Rockwell Automation Training Coordinator. Our website address and telephone numbers appear on the inside front cover of this document.

Tip: For more information on Rockwell Automation training, go to the Training Services website:
<http://www.rockwellautomation.com/global/products/training/overview.page?>

Technical support

If you cannot find answers to your questions in the *Getting Results with RSNetWorx for ControlNet* guide, the online help, or the Online Books documentation, you can call Rockwell Software Technical Support at the numbers listed on the inside front cover of this guide. You can also access the Rockwell Software Online Support Library and receive information about Autofax Product Information System from the website listed on the inside front cover of this guide.

When you call

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

- product serial number and product version number
- The product serial numbers and version number can be found in the software by selecting **Help > About RSNetWorx**
- hardware you are using
- operating system plus service packs, and version of Internet Explorer (if any) installed
- exact wording of any errors or messages that appeared on your screen
- description of what happened and what you were doing when the problem occurred
- description of how you attempted to solve the problem

Tip: For more information on Rockwell Software training, go to the Training Services website:
<http://www.rockwellautomation.com/global/products/training/overview.page?>

Activation

RSNetWorx for ControlNet only supports FactoryTalk activation. If you are a new user, you will need to activate your software using FactoryTalk Activation.

Activate RSNetWorx with FactoryTalk Activation

RSNetWorx for ControlNet supports the following types of activation:

Node-locked activation

This type of activation can be either locked to a particular piece of hardware, such as an EtherNet card or a hard disk of a stand-alone computer, or to a hardware dongle. Depending upon the kind of device (stand-alone computer or hardware dongle) you want to activate, you can purchase either

- Local "node-locked" activation: This kind of activation activates software only on a single computer. If the activation file is copied to another computer, the software will not run on that other computer, or
- Mobile "node-locked" activation: This kind of activation is locked to hardware dongle. A dongle is a security or copy protection device that must be connected to the computer while the program runs. The activation files can be copied to multiple computers, but the software activates only on the computer where the dongle is connected.

Concurrent activation

This type of activation allows multiple computers across a network to use Rockwell Software products at the same time. There are two kinds of concurrent activations:

- Floating activations: activations that "float" from an activation server to any computer that needs them.
- Borrowed activations: activations that are retrieved from a server for a specific period of time before expiring and returning automatically to the pool of available activations on the server.

For more information about FactoryTalk Activation, refer to the FactoryTalk Activation Manager help.

How to activate RSNetWorx

You can activate your copy of RSNetWorx on the **Software Activation** dialog box towards the end of installation. If you skipped the activation during installation, activate RSNetWorx using the FactoryTalk Activation Manager installed during the installation process.

Finding more information about FactoryTalk Activation

For help with FactoryTalk Activation at any point, you can click:

- the Help button in FactoryTalk Activation Manager
- the Help link on the Rockwell Software Activation website: <https://activate.rockwellautomation.com/>
- View How to Activate Rockwell Software Products on the Required Steps of the Install program

If you cannot connect to the Internet, call Technical Support for help creating an activation file from an e-mail or a fax.

Phone: 440-646-3434 in North America. Outside of North America, call your local support organization.

Grace period

In RSNetWorx for ControlNet v9.00.00 (CPR 9 Service Release 1) and later, the software supports a seven day activation grace period when a valid activation is not found. During grace period:

- If RSNetWorx is started and an activation key is not present, the software shall enter grace period and run with full functionality.
- Once RSNetWorx has entered grace period, the software shall check for an activation key every four hours. If the activation is not found, a message will be generated to FactoryTalk Diagnostics.
- RSNetWorx can be started an unlimited number of times while in grace period and be able to run with full functionality. If the grace period ends and a valid activation has not been found, RSNetWorx shall run in Demo mode.
- While RSNetWorx is running, the software cannot change modes. RSNetWorx can only change to Demo mode when the software is restarted and/or grace period has already expired.

Tip: If RSNetWorx is unable to successfully obtain valid activations (for example, a network failure occurs), the software will attempt run in grace period for up to seven days.

Protecting your activation files

To avoid damaging your activation files, do not perform the following operations with activation files on the hard drive.

- Restore from backup
- Upgrade the operating system
- Compress or uncompress the hard drive

Defragmentation utilities will not harm activation files.

Some common questions

Following are some common problems that people encounter with activation

and their solutions.

**My activation files were damaged.
What should I do?**

If you have lost the activation because the activation file is damaged, you need to reset activation. Follow the Reset Codes instructions on the Rockwell Software Technical Support web page, or call the technical support telephone number. The web page and telephone number are both listed on the inside front cover of this guide.

**I accidentally deleted the software
directory on my hard drive. Do I need
to call Rockwell Software for
replacement activation files?**

No. Deleting the program files does not delete your activation. The activation files are not stored in the program directory; they are located in the root directory. Your activation files will not be lost unless you format the hard drive, tamper with hidden files in the root directory, or perform certain other hard drive operations (refer to the "Protecting your activation files" section in this chapter for more information).

To get the software running again, simply reinstall the software, but do not move the activation when given the opportunity.

Security

FactoryTalk Security™ is intended to improve the security of your automation system by limiting access to those with a legitimate need. FactoryTalk Security authenticates user identities and authorizes user requests to access a FactoryTalk-enabled system. These security services are fully integrated into the FactoryTalk Directory and are included as part of the FactoryTalk Services Platform that installs with many products.

For more information on how to use security services, refer to FactoryTalk Security's Online help.

How do I set up security in RSNetWorx?

RSNetWorx supports FactoryTalk Security. FactoryTalk Security is intended to improve 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-enabled system against a set of defined user accounts and access privileges held in the FactoryTalk Directory. For more information on FactoryTalk Security, refer to the "About FactoryTalk Security" topic in RSNetWorx for ControlNet Online Help.

Follow the steps below to set up security in RSNetWorx:

1. During RSNetWorx's installation, you will see the **RSNetworx Security Configuration Selection** page. On this page, select the **Enable FactoryTalk® Security** option. And then select the FactoryTalk Directory (Network or Local) that will be used to authenticate and authorize user access.



2. Click **Install** to continue the RSNetWorx installation.
3. Follow the screen instructions to complete the installation.

What can I secure in RSNetWorx?

RSNetWorx implements FactoryTalk Security through three securable actions: Access, Modify, and Go Online. These securable actions let you restrict user access to actions, such as opening a project file, creating a new project file, making changes to a project file, uploading or downloading to a device, browsing to a device from the network, viewing the properties of a device, etc., in RSNetWorx.

Securable action	Description
Access	The Access securable action allows you to perform actions such as opening an offline project file for viewing, viewing the properties of a device, etc.
Modify	The Modify securable action allows you to perform actions such as creating a project file, making changes to a project file, saving any pending edits, etc.
To modify a project file, you need both Access (to open the file) and Modify (to make changes) securable actions.	
Go Online	The Go Online securable action allows you to download information saved in a project file or upload information into a project file, as well as browse to a device on the network.
<ul style="list-style-type: none"> To download information saved in an existing project file, you need Access (to open the file), Go Online (to go online to prepare to download), and Modify (to download) securable actions. To upload information into an existing project file, you need Access (to open the file), Go Online (to go online to prepare to upload), and Modify (to upload) securable actions. To upload information into a new project file, you need Go Online (to go online to upload) securable action. 	

To allow or deny user access to one or more of the above securable actions, you will need to:

1. Start FactoryTalk Administration Console from **Start > Programs > Rockwell Software > FactoryTalk Administration Console**. You will see the Log On to FactoryTalk screen, as shown below.



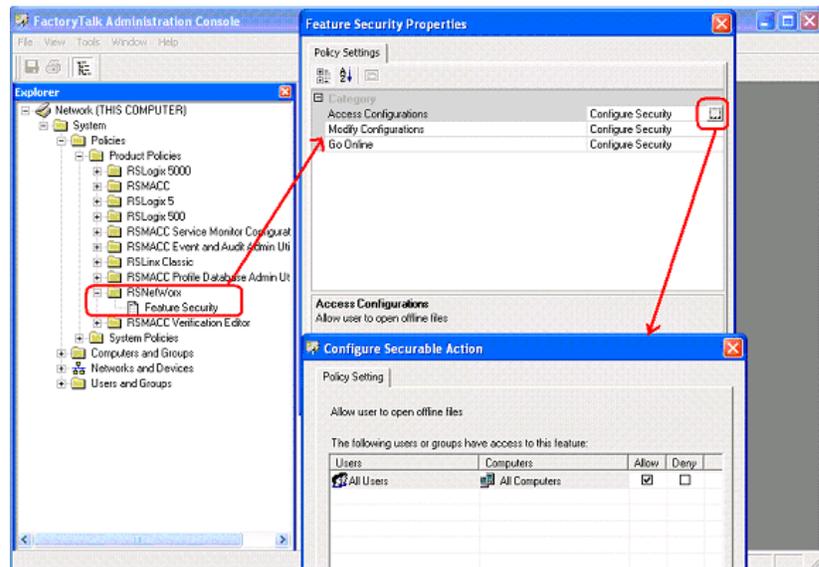
2. Enter your username and password, and select the directory you want to log on to. (The username and password were set when you set up an account during FactoryTalk Directory configuration.)

Tips for choosing a directory:

- Click **Network** to access Network (also called Distributed) applications on the Network Directory Server.
- Click **Local** to access Local (also called Stand-alone) applications on the Local Directory. Local applications are always located on

your local computer. You cannot access local applications remotely.

- If you cannot log on to a particular directory on your computer, it may be because it has not yet been configured. For more information, refer to the Right FactoryTalk Directory is not configured on this computer topic in FactoryTalk help. You can launch FactoryTalk Help from FactoryTalk Administration Console.
3. In FactoryTalk Administration Console, click on the **RSNetWorx** folder (located under **System > Policies > Product Policies**), to expand it. You will see the Feature Security file.
 4. Double-click the Feature Security file to launch the Feature Security Properties dialog box.



5. In the Feature Security Properties dialog box, click the securable action you want to grant the user access to.
6. In the Configure Secureable Action dialog box, from the list of users, select the user you want to grant access to, and click **Add**.

Tip: For more information on FactoryTalk and FactoryTalk Security, refer to RSNetWorx for ControlNet Online Help.

Use unattended installation

The unattended installation is an automated installation method that you can use to install RSNetWorx. 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 RSNetWorx 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.

For detailed description about each parameter, see [Parameters](#) on [page 82](#). You can also type **Setup /?** in the **Command Prompt** window, and press **Enter** to view the help information of all parameters and examples.

To install RSNetWorx 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.
3. In the **Command Prompt** window, navigate to *D:*, where *D:* is the drive containing the RSNetWorx 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 unattended installation requires the administrator permission.

4. Type a command line with the following syntax:

```
Setup {/Q | /QS}
/IAcceptAllLicenseTerms
[/AutoRestart]
[/SetupLanguage=language]
[/ProductLanguage=product_language]
[/InstallLocation=location]
[/SerialNumber=serial_number]
[/ProductKey=product_key]
[/Version=product_version]
```

Perform unattended installation

5. Press **Enter**. The installation process starts with the parameters you specified.

Parameters

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

If your installation package is Personalized Edition, the following parameters will be ignored during installation:

- /SerialNumber
- /ProductKey

/Q

Required if **/QS** or **/Record** is not specified.

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

/QS

Required if **/Q** or **/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. Specified 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=setup_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 it is omitted or if the specified language is not available, the default language is the user or system user interface language.

/Record

Optional. Records the installation options chosen to a recoding file.

/Playback

Optional. Plays back a recording file to specify the installation options.

/ProductLanguage=product_language

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

If it is omitted or if the specified language is not available, the default language is the same as **SetupLanguage**.

/InstallLocation=location

Optional. Specifies the installation location.

If omitted, the default location is "C:\Program Files (x86)\Rockwell Software" (64-bit) or "C:\Program Files\Rockwell Software" (32-bit).

/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 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
```

means:

- The installation uses the default settings during the installation process.

Example 2:

```
Setup.exe /QS /IAcceptAllLicenseTerms /AutoRestart  
/SetupLanguage=CHS /SerialNumber=0123456789  
/ProductKey=ABCDE-FGHIJ /Version=27.00.00
```

means:

- During the installation, the displayed language is Chinese.
- The setup will get activation keys for RSNetWorx version 27.00.00 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.

Active keeper — The active keeper is the node responsible for sending a periodic keeper broadcast on a ControlNet network and responding to requests for scanner signatures from any other nodes with scheduled connections on that network. The periodic keeper broadcast sent by the active keeper is a transparent scheduled message containing information about:

- which keeper should be active
- the overall network signature
- any pending network change operations and network management resources

All networks must have an active keeper to change the ControlNet network or start scheduled connections. After joining the network, any new node with scheduled connections will communicate with the active keeper to verify scanner signatures for the ControlNet configuration. If the scanner signatures are compatible, the node can join the network and scheduled connections begin.

If more than one keeper capable node exists on the network, only one of those nodes can be the active keeper. For more information, see single keeper and multi-keeper.

Activation file — A hidden, read-only, system file that "activates" a Rockwell Software product. The software will run only if your system can find the correct activation file.

Activation key — Activation files contain a database of activation keys. Each key is particular to a certain product and must be accessible on a local or remote drive for that product to run.

Actual packet interval — The actual packet interval (API) value is based on the NUI, and is always less than or equal to the RPI. The API value is the largest binary multiple (1, 2, 4, 8, 16, 32, 64, or 128) of the NUT, whose value is less than or equal to the RPI.

Average scheduled bandwidth — Displays the percentage of average scheduled bandwidth, determined by averaging the percent of the NUT used for scheduled communication over (128) network update intervals for the configuration.

Configuration file — The configuration file is a user-specified integer data-table file, or group of contiguous integer data-table files, that are limited only by available memory. This file stores configuration information for each of the connection entries that allow it, including all analog entries. If you specify a configuration file for a connection entry, the contents of the data

table address is sent to the device each time a connection is established. The configuration file is only applicable to the PLC-5C processor.

Tip: You can specify and/or change a configuration file in the File Settings view available in the Scanlist Configuration Tool.

Connection — An open, logically binding communication path between two devices on a ControlNet network. Connections can be either point to point or multicast connection.

Connection ID — An identifier assigned to a particular connection between producers and consumers that specifies select application information.

Connection type — The connection type indicates the data ownership of a node. It defines the rule for how the connection entry controls outputs to the rack, module, or device. The following are standard connection types:

- **Exclusive Owner** - specifies an independent connection where a single device controls the output states in the target device. If you have an existing Exclusive Owner connection to a target device, you cannot specify another Exclusive Owner or Redundant connection to that same target device.

Tip: For 1771 module connections, an Exclusive Owner rack connection must exist prior to this connection succeeding. Also, only a PLC-5C processor with an Exclusive Owner connection to the adapter can have Exclusive Owner module connections.

- **Input Only** - specifies an independent connection where a device receives inputs from the target device and sends configuration data to the network. An Input Only connection does not send outputs; it only receives inputs. You can specify multiple Input Only connections to the target device from different originators.
- **Listen Only** - specifies a dependent connection where a device receives inputs from the target device, but does not send configuration data with the network. A Listen Only connection only functions properly when another non-Listen Only connection exists to the same target device. A Listen Only connection does not send outputs; it only receives inputs. You can specify multiple Listen Only connections to the target device from different originators.

Tip: All Listen Only connections will be terminated when all non-Listen Only connections are terminated.

- **Redundant** - specifies an independent connection where both a primary and secondary device share control of outputs and send configuration data to the network. If you have an existing Redundant connection to a target device, you can specify another Redundant connection to that same target device, but cannot specify an Exclusive Owner connection.

Tip: This connection type is used with a ControlNet PLC-5 Hot Backup system.

Consumer — A node that receives data from a producer on a ControlNet link.

ControlNet network — An industrial automation network sponsored by ControlNet International.

Data input file (DIF) —

PLC-5C processor

The data input file is a user-specified integer data-table file or group of contiguous integer data-table files (up to four). PLC-5C processors use this file to share non-discrete input data and scheduled peer-to-peer input data over the ControlNet network. The maximum number of words that can exist in the data input file is processor dependent.

Processor	Word maximum	Files
5/20C	2000	2
5/40C	3000	3
5/60C, 5/80C	4000	4

For example, if you specify a Data Input File of N34 and a Data Input File Size of 4000 words, RSNetWorx for ControlNet will automatically create integer files N34, N35, N36, and N37, all 1000 words long.

1747 Scanner

The M1 file is a module input file for the 1747 SCNR. M1 files are most appropriately used for non-critical I/O data transfers. There is no image for these files in the processor memory.

You can access ControlNet data located in M1 files using the COP(copy) instruction in your ladder program. The maximum data length you can transfer with the COP instruction is 128 words. The following explains the addressing format of M1 files:

Mf:e.s

M=module

f=file type (1)

e=slot (1-30)

s=word (3 to max. supplied by module)

The maximum number of words that can be supplied by the 1747-SCNR is 255.

Data output file (DOF) —

PLC-5C processor

The data output file is a user-specified integer data-table file. PLC-5C processors use this file to share non-discrete output data and scheduled peer-to-peer output data over the ControlNet network. The maximum number of words that can exist in the data output file is processor dependent.

Processor	Word maximum	Files
5/20C	2000	2
5/40C	3000	3
5/60C, 5/80C	4000	4

For example, if you specify a Data Output File of N30 and a Data Input File Size of 4000 words, RSNetWorx for ControlNet will automatically create integer files N30, N31, N32, and N33, all 1000 words long.

1747 Scanner

The M0 file is a module output file for the 1747 SCNR. M0 files are most appropriately used for non-critical I/O data transfers. There is no image for these files in the processor memory.

During the processor scan, M0 data can be changed by the processor according to ladder diagram instructions addressing the M0 files. You can access ControlNet data located in M0 files using the COP(copy) instruction in your ladder program. The maximum data length you can transfer with the COP instruction is 128 words. The following explains the addressing format of M0 files:

Mf:e.s

M=module

f=file type (0)

e=slot (1-30)

s=word (3 to max. supplied by module)

The maximum number of words that can be supplied by the 1747-SCNR is 255.

Discrete input (output) data — The data coming from a rack (chassis) connection. Typically, it is an array of bits, each one representing a discrete (single) field wiring point.

Diagnostic file — The diagnostic file is a user-specified integer data-table file starting at word zero. This file stores the PLC-5C processor diagnostic counters for the ControlNet channel.

If you are using this PLC-5C processor:	The diagnostic file can be:
Series F, Revision A or later	63 words
Series E, Revision D or later	63 words
Series D, Revision E or later	63 words
Series C, Revision N or later	63 words
Series E, Revision C or earlier	40 words
Series D, Revision D or earlier	40 words
Series C, Revision M or earlier	40 words

Tip: Use of this file is optional. Defining it results in additional traffic on the ControlNet network. Refer to the ControlNet PLC-5 Programmable Controllers User Manual, Phase 1.5 (publication number 1785-6.5.22) for specification information.

You can specify and/or change a diagnostic file in the File Settings view available in the Scanlist Configuration Tool.

FactoryTalk is a manufacturing information platform that integrates plant-wide control systems and connects the enterprise with the production facility.

The FactoryTalk Automation Platform:

- provides common services (such as diagnostic messages and access to real-time data) and shares plant resources (such as tags and graphic displays) throughout a production facility
- allows defining plant-floor resources once, and then allows simultaneous access to those resources across product boundaries
- supports centralized security services

FactoryTalk Administration Console — Part of the FactoryTalk Automation Platform, FactoryTalk Administration Console is an optional, stand-alone tool that allows you to:

- Create and configure application, area, and data server elements in the FactoryTalk Directory.
- Back up and restore an entire directory or an individual application.
- Set up redundancy for OPC data servers.
- Configure client computers to recognize the location of a FactoryTalk Directory Server computer.
- Configure options for routing and logging diagnostic messages.
- View system-wide diagnostic messages.
- Configure system-wide policy settings.

- Secure your FactoryTalk-enabled system with FactoryTalk Security™ services.

Run FactoryTalk Administration Console from the Windows Start menu:
Start > Programs > Rockwell Software > FactoryTalk Administration Console.

FactoryTalk Directory — FactoryTalk Directory provides a central lookup service for software products participating in a FactoryTalk-enabled automation system.

The FactoryTalk Automation Platform includes two separate directories: a Local Directory and a Network Directory. Either directory, or both directories, can be configured on the same computer. Project information, including security settings, cannot be shared between a Local Directory and Network Directory, even if both directories are configured on the same computer. Create and configure application, area, and data server elements in the FactoryTalk Directory.

- **Local Directory** — all project information and participating software products are located on a single computer, and the FactoryTalk-enabled system cannot be shared across a network or accessed remotely.
- **Network Directory** — organizes project information from multiple software products across multiple computers on a network.

Some FactoryTalk-enabled products require a Network directory, others require only a Local directory, and some require that both directories be configured.

Keeper — Device responsible for distributing link configuration data to all nodes on the network.

Invalid keeper — An invalid keeper is any keeper capable device that has joined an existing network but does not share the network signature with the current active keeper. An invalid keeper will automatically assume the role of the active keeper if there are no other valid keepers on the network.

Keeper signature — Indicates a unique, hexadecimal value that is stored by each keeper-capable device to uniquely identify a specific network configuration. During initial start-up, the keeper capable device determines if:

- another keeper-capable device had previously configured the network.
- its internal signature matches the network signature.

If the signatures match, the keeper-capable device joins the network as the valid keeper. If the signatures do not match, the keeper joins the network as an invalid keeper.

Macrocycle — A macrocycle is equal to 128 NUIs (Network Update Intervals). A macrocycle is the maximum period before scheduled traffic repeats.

Maintenance message — Allows the node with the lowest address to transmit information to keep the remaining nodes synchronized. This time is automatically subtracted from the network update time (NUT).

Maximum scheduled node — This is the node with the highest network address that can use scheduled time on a ControlNet link.

Maximum unscheduled node — This is the node with the highest network address that can use unscheduled time on a ControlNet link.

Tip: Nodes set at addresses higher than the maximum unscheduled node do not communicate on the network; for example, they will not display in RSLinx Classic.

Multicast connection — A connection made from one node to many nodes. Multi-cast connections allow multiple consumer nodes the ability to receive data from a single producer node.

Multi-Keeper device — A keeper device that supports multi-keeper network capabilities.

Multi-keeper network — Specifies that more than one keeper-capable device on the network can store the ControlNet network parameters and the ControlNet schedule for all scheduled connections on the network. The connections may or may not involve the keeper-capable device itself.

In a multi-keeper network, at least one valid multi-keeper device must be present on the network for any new scheduled connections to be established.

Tip: In a multi-keeper network, it is not required for the device at node 1 to be a valid keeper; RSNetWorx for ControlNet can be used as long as one multi-keeper device is present on the network. By default, the keeper-capable device at the lowest node number will be the only active keeper.

Node — A node is a ControlNet address. When a device is added to the network, it is assigned a node address from 1 to 99.

Network update interval — The network update interval (NUI) is one interval on the network equal to one NUT. Within each NUI, scheduled data, unscheduled data, and network maintenance information is transmitted.

Network update time — The network update time (NUT) is the repeatable base time at which the network can transmit data. This is user-configurable (in the range of 2 -100 milliseconds); the default value is 5 milliseconds.

Each NUT is divided into three major components: scheduled messages, unscheduled messages, and maintenance messages. For more information on the components of the NUT, see information exchange on a ControlNet network within the online help.

Peak scheduled bandwidth — Displays the percentage of peak scheduled bandwidth determined over the maximum, or worst case, network update interval in the configuration.

Point-to-point connection — A connection made between two nodes only.

Process control sample complete (PCSC) — Using a few status bits, PCSC notifies the PLC-5C processor user when a specific piece of new scheduled data arrives.

Producer — A node that is responsible for transmitting data on a ControlNet link.

Redundancy — Can be used to indicate both of the following:

- an independent connection type where both a primary and secondary device share control of outputs and send configuration data to the network. If you have an existing Redundant connection to a target device, you can specify another Redundant connection to that same target device, but cannot specify an Exclusive Owner connection. This connection type is used with a ControlNet PLC-5 Hot Backup system.
- a dual-cable system setting that allows you to receive the optimum signal over a ControlNet network. In a redundant media system, one cable system uses Channel A and one cable system uses Channel B.

Requested packet interval — The requested packet interval (RPI) value is determined by how often you want a particular piece of I/O or scheduled peer-to-peer data to be transmitted within the scheduled bandwidth of the NUI.

Scanlist Configuration Tool (SCT) — A program that maps processor memory onto the network and network data into processor memory. SCTs are scanner-specific; therefore, a unique SCT is required for each type of scanner.

Scanner — A ControlNet device that is a connection originator.

Scanner class device — A device that initiates connections and contains a scanlist. Refer to the RSNetWorx for ControlNet online tutorial for more information.

Scanner signature — Indicates a hexadecimal value, unique to the scanner, that is assigned to scanner devices that originate scheduled connections; a copy of the scanner signature is held by the active keeper. This value is stored in the scanner and in the offline configuration, and is used to determine if the offline and online configurations are synchronized. When a scanner device with scheduled connections joins the network for the first time, it requests its scanner signature from the active keeper. If the scanner signature matches the scanner signature obtained from the active keeper, then that device is allowed to open its scheduled connections. If the scanner

signature does not match, then the device is not allowed to open its scheduled connections.

Scheduled bandwidth — The amount of scheduled (i.e., time-critical) data, including I/O data and peer-to-peer interlocking data, that can be transmitted within the network update interval (NUI). The percent of scheduled bandwidth usage varies depending on the network configuration.

Tip: It is possible for the amount of scheduled data you wish to transmit to exceed the scheduled bandwidth. In other words, the speed at which you are able to transmit data is somewhat determined by the limitations of your particular system. You should keep this in mind when setting up your network. A good guideline to follow when determining your network update time (NUT) is .5 ms per rack.

Scheduled message — The network allows every scheduled node (on a rotating basis, in sequential order) a guaranteed opportunity to transmit information.

Information that is time-critical is sent during the scheduled message component of the network update interval (NUI).

Single-keeper device — Specifies that the keeper-capable device at node 1 must store the ControlNet network parameters and the ControlNet schedule for all scheduled connections on the network. The connections may or may not involve the keeper-capable device itself.

In a single keeper network, a valid single keeper device must be present at node 1 for any scheduled connection to be opened. After a scheduled connection is established, the network will continue to function even if the single keeper device at node 1 is removed from the network.

Tip: In a single keeper network, the device at node 1 must be present and a valid keeper to use RSNetWorx for ControlNet.

Slot time — The time to wait for a skipped network address or missing node from the network. This value is based on the physical attributes of the network, such as cable length and number of repeaters.

Status file —

PLC-5C processors

The status file is a user-specified integer data-table file starting at word zero. This file stores status information for each individual connection entry in the map table. The length of this file will vary depending on the number of connection entries; three words are allocated for each connection entry.

1747 Scanner

The status file is a module input file for the 1747 SCNR. Status files are most appropriately used for non-critical I/O data transfers. There is no image for these files in the processor memory.

You can access ControlNet data located in status files using the COP(copy) instruction in your ladder program. The maximum data length you can transfer with the COP instruction is 128 words. The following explains the addressing format of Status files:

Mf:e.s/b

M=module

f=file type (1)

e=slot (1-30)

s=word (600 to max. supplied by module)

b=bit (0-14, even #s only)

The maximum number of words that can be supplied by the 1747-SCNR is 607.

Unscheduled bandwidth — The amount of unscheduled (i.e., non-critical-time) data, including all programming and operator interface data, that can be transmitted within the network update interval (NUI).

Unscheduled message — The network allows all nodes (on a rotating basis, in sequential order) to transmit information. This rotation repeats until the time allotted for this component is complete.

The amount of time allocated for the unscheduled component is determined by the information load of the scheduled component. At least one node will have the opportunity to transmit unscheduled messages every interval.

Information that can be delivered with minimal time constraints is sent during this component of the network update interval (NUI).

Valid keeper — A valid keeper is any keeper capable device that has joined an existing network and shares the network signature with the current active keeper that established the network. If there is no active keeper when a valid keeper capable device joins the network, then its network signature must match the network signature that any other device obtained when it joined the network. A valid keeper will automatically assume the role of active keeper if the current active keeper were to fail.

When a network consists of valid keepers or both valid and invalid keepers, the valid keeper located at the lowest node number on the network becomes the active keeper. If there are no valid keepers on the network, a keeper-capable device acts as a faulted keeper until a valid keeper becomes part of the network.

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Rockwell Automation support

Rockwell Automation provides technical information on the web to assist you in using its products. At <http://www.rockwellautomation.com/support> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <https://rockwellautomation.custhelp.com> for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://www.rockwellautomation.com/services/online-phone>.

Installation assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator available at http://www.rockwellautomation.com/locations , or contact your local Rockwell Automation representative.

New product satisfaction return

Rockwell Automation tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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