CompactLogix System

Allen-Bradley

Catalog Numbers 1769-L31, 1769-L32C, 1769-L32E, 1769-L35CR, 1769-L35E CompactLogix Controllers, POINT I/O Modules, PowerFlex 70 Drives, PowerFlex 40 Drives, PanelView Plus Terminals

Quick Start

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

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

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

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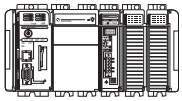
Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
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
SHOCK HAZARD 	Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
BURN HAZARD 	Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

Follow the path that matches your hardware and network configuration.

Required

Chapter 1
Prepare the CompactLogix Hardware



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Required

Chapter 2
Prepare the Computer

page 27

Optional
Depending on your system.

Chapter 3
Prepare the Distributed POINT I/O Hardware

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Chapter 4
Prepare the PowerFlex 70 Drive

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Chapter 5
Prepare the PowerFlex 40 Drive

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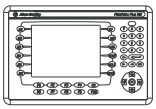
Chapter 6
Prepare the PanelView Plus Terminal



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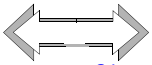
Optional
Depending on your networks.

Chapter 7
Configure the EtherNet/IP Network



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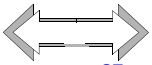
Chapter 8
Configure the ControlNet Driver



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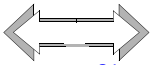
Chapter 9
Configure the DeviceNet Network



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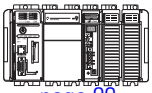
Required

Chapter 10
Create a Project Using RSLogix 5000 Programming Software



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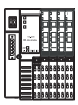
Optional
Depending on your system.

Chapter 11
Add Distributed I/O Modules to the Project



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Chapter 12
Create a PowerFlex 70 Application

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Chapter 13
Create a PowerFlex 40 Application

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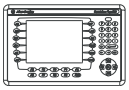
Chapter 14
Create a PanelView Plus Application



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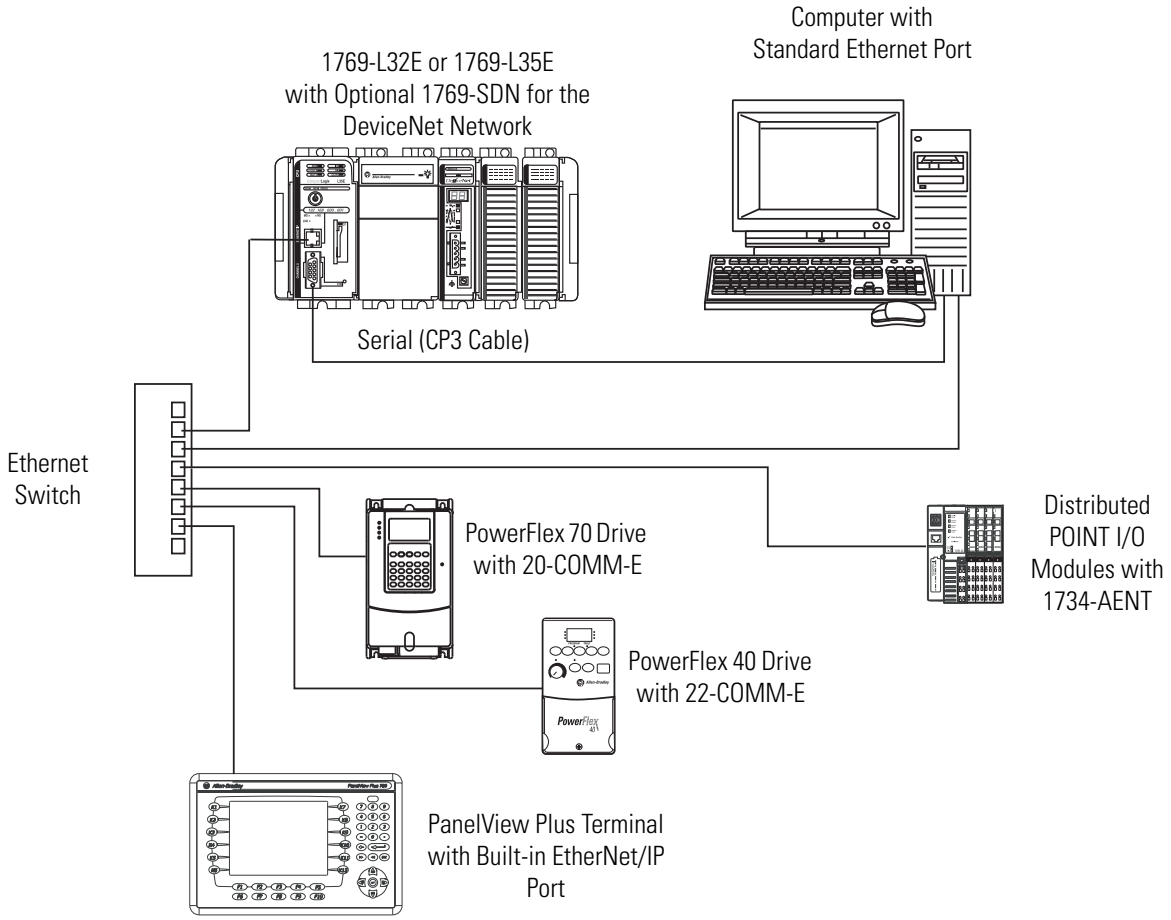
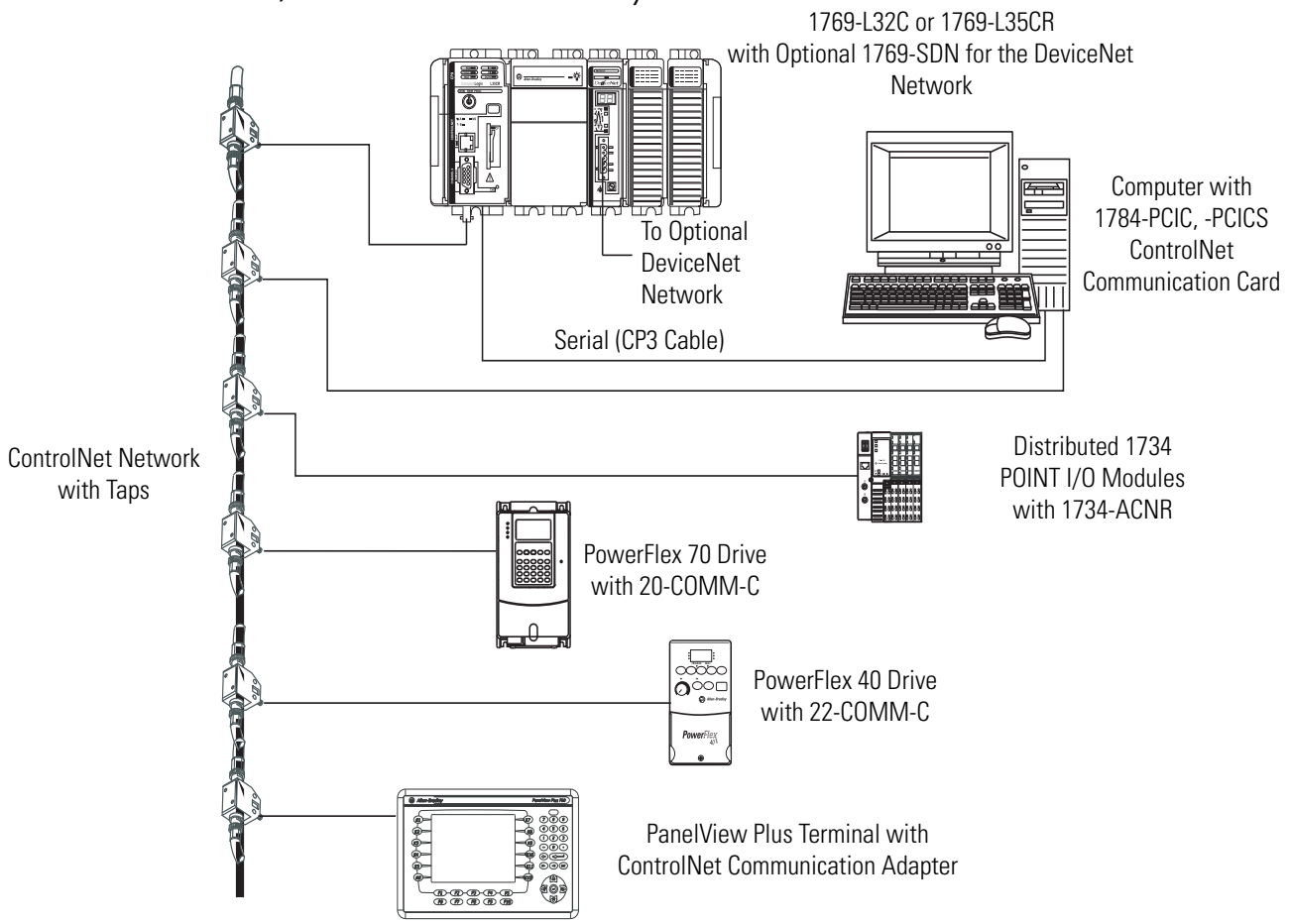
How Hardware is Connected

This quick start demonstrates the following possible control systems. Choose your hardware and networks, then follow the matching examples.

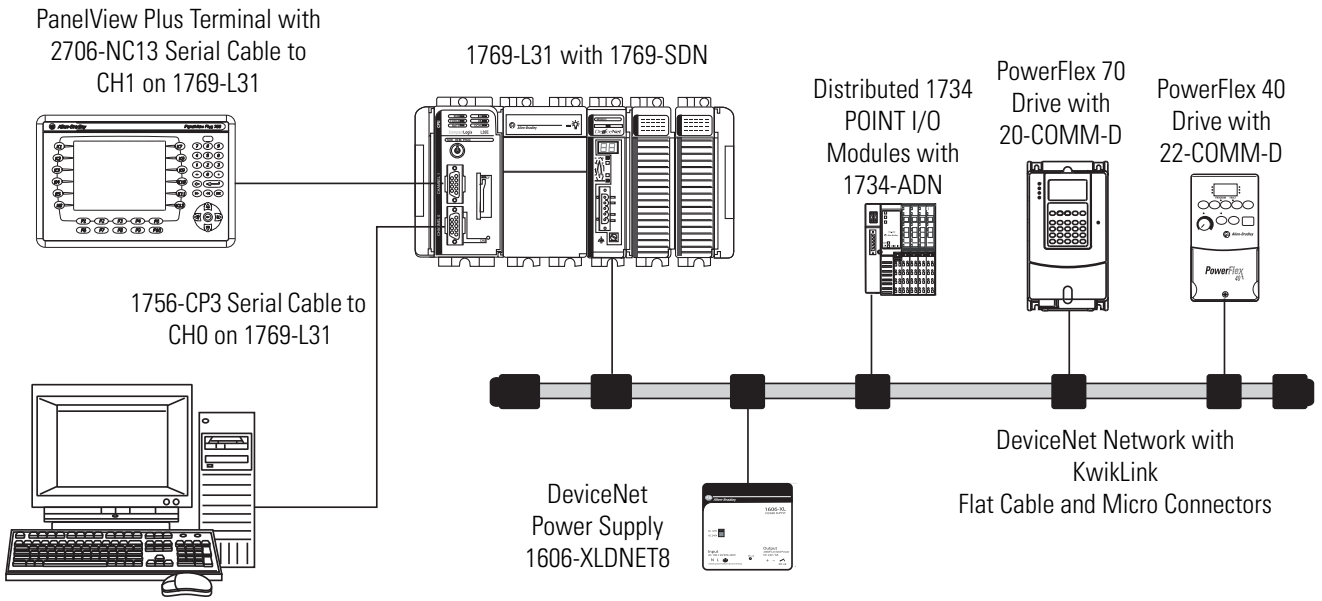
Option 1: 1769-L32E, 1769-L35E Control System



Option 2: 1769-L32C, 1769-L35CR Control System



Option 3: 1769-L31 Control System



Notes:

About This Publication

This quick start provides examples and procedures for the use of a CompactLogix system. This publication includes version 18 release updates for RSLogix 5000 programming software. The procedures cover many of the most common user tasks, such as:

- connecting the controller to multiple devices (local and distributed I/O, drives, and a PanelView Plus terminal).
- connecting and configuring networks (EtherNet/IP, ControlNet, DeviceNet, and serial) for use with CompactLogix systems.
- creating and monitoring controller programs.

The examples are designed to get devices installed and communicating with each other in the simplest way possible. The programming examples are not complex, and offer easy solutions to verify that devices are functioning and communicating properly.

The beginning of each chapter contains the following information. Read these sections carefully before beginning work in each chapter.

- **Before You Begin** - This section lists the steps that must be completed and decisions that must be made before starting the chapter. Because the chapters in this quick start do not have to be completed in the order in which they appear, this section defines the minimum amount of preparation required before completing the current chapter.
- **What You Need** - This section lists the tools that are required to complete the steps in the current chapter. This includes, but is not limited to, hardware and software.
- **Follow These Steps** - This illustrates the steps in the current chapter and identifies which steps are required to complete the examples by using specific networks.

The electronic version of this publication contains links to pages within the publication for easier navigation. Click on any chapter title, chapter number, topic title, or page number to follow a link to the item.

Additionally, resources available on the Web and listed in the Additional Resources tables function as hyperlinks within this electronic publication.

Required Software

To complete examples in this quick start, you need one of the following software packages.

If using network	Use RSLogix 5000 programming software edition
EtherNet/IP (Options 1, 2, and 3)	• Full • Standard • Professional
ControlNet (Option 2)	• Standard • Professional
DeviceNet (Option 3)	• Standard • Professional

If you do not use the RSLogix 5000 programming software packages recommended, you may need to purchase additional software to complete the examples in this quick start.

You will need to install the following software, included with the RSLogix 5000 programming software packages listed:

- BootP-DHCP server
- ControlFlash software
- DeviceNet Tag Generator
- RSLinx software, version 2.54 or later
- RSLogix 5000 programming software, version 17 or later
- RSNetWorx software (version specific to your network option)

If you plan to complete the PanelView Plus examples within this quick start, you will also need FactoryTalkView Machine Edition software.

Parts List

This table lists the hardware used in this quick start. The hardware you need depends on the options and examples you choose to complete. Specific hardware requirements are listed at the beginning of each chapter.

✓	Quantity	Catalog Number	Description
General Configuration			
	1	1769-IF4	Compact 4 Channel Analog Current/Voltage Input Module
	1	1769-IQ16	Compact 16 Point 24V DC Sinking/Sourcing Input Module
	1	1769-IF4XOF2	Compact 8 Bit Resolution, High Speed 4 In/2 Out Analog Combination Module
	1	1769-OF2	Compact 2 Channel Analog Current/Voltage Output Module
	1	1769-OB16(1)	Compact 16 Point 24V DC Sourcing Output Module
	1	1769-PA2	Compact Expansion Power Supply 120/240V AC Input 2 A @ 5V DC Output Module
	1	1769-ECR	Compact I/O Right End Cap/Terminator
	1	1734-IB4(2)	POINT I/O 4 Sink Input Module
	1	1734-OB4E(2)(3)	POINT I/O 4 Protected Output Module
	1	1734-OE2C(2)	POINT I/O 2 Current Output Analog Module
	3	1734-TB	Wiring Base w/ Removable IEC Screw Terminals
	1	1794-PS13	FLEX I/O 85 - 264V AC to 24V DC 1.3 A Power Supply
	1	22B-V2P3N104	PowerFlex 40 Drive
	1	22B-CCB	PowerFlex 40 Communication Adapter Cover
	1	20AB4P2A3AYNNNNN	PowerFlex 70 Drive
	1	2711P-K10C4D1	PanelView Plus 10 inch Color Keypad Terminal with EtherNet/IP and RS-232 networks
	1	1794-PS3 or 2711P-RSACDIN	FLEX I/O DC Power Supply or general use AC Power Supply
	2	1756-CP3	RS-232 Cable
	1	2706-NC13	PanelView Plus Serial Cable
	2...3	N/A	DIN Rail (steel not aluminum)
EtherNet/IP Configuration			
	1	1769-L32E	CompactLogix EtherNet/IP Controller
	1	1734-AENT	POINT I/O EtherNet/IP Adapter
	1	22-COMM-E	EtherNet/IP Adapter for Use With the PowerFlex 40
	1	20-COMM-E	EtherNet/IP Adapter for Use With the PowerFlex 70
	1	N/A	8-Port Ethernet Switch
	6	N/A	Ethernet Cables (straight through)

✓	Quantity	Catalog Number	Description
ControlNet Configuration			
	1	1769-L32CR	CompactLogix ControlNet Controller with Redundant Tap
	1	1784-PCIC or 1784-PCICS	ControlNet Communication Card for a Personal Computer
	1	1734-ACNR	POINT I/O ControlNet Adapter
	1	22-COMM-C	ControlNet Adapter for Use With the PowerFlex 40
	1	20-COMM-C	ControlNet Adapter for Use With the PowerFlex 70
	1	2711P-RN15S	PanelView Plus 1000 ControlNet Interface Module
	6	1786-TPR	ControlNet Tap
	2	1786-XT	ControlNet Terminating Resistor
	5	1786-BNCP	ControlNet BNC Coaxial Connector
Serial Configuration			
	1	1769-L31	1769-L31 CompactLogix Controller
	1	1756-CP3	RS-232 cable
	1	2706-NC13	Point-to-Point RS-232 Cable
DeviceNet Configuration			
	1	1769-SDN	Compact I/O DeviceNet Scanner
	1	1734-ADN	POINT I/O DeviceNet Adapter
	1	22-COMM-D	DeviceNet Adapter for use with the PowerFlex 40
	1	20-COMM-D	DeviceNet Adapter for use with the PowerFlex 70
	1	1606-XLDNET8	DeviceNet Power Supply
	N/A	1485C-P1E75	KwikLink Flat Cable
	2	1485A-T1E4	KwikLink Terminator/Resistor
	4	1485P-P1E4-R5	KwikLink Sealed Micro Connector
	4	1485K-P1F5-C	KwikLink Right-angle Male to Cable
	1	1485T-P1E4-B1	KwikLink Power Tap Module

(1) The 1769-OB16 module is the only Compact I/O module used in this quick start. The other modules are added as examples only and are not required.

(2) Use Point I/O modules at series C or later to complete examples in this quick start.

(3) The 1734-OB4E module is the only POINT I/O module used in this quick start. The other modules are added as examples only and are not required.

Conventions

This manual uses the following conventions.

Convention	Meaning	Example
bold	Bold text denotes menus, menu items, buttons or options.	Click **OK**.
Check/uncheck	Click to activate/deactivate a checkbox.	Check the **Do not show this dialog again** checkbox.
Click	Click left mouse button once. (Assumes cursor is positioned on object or selection.)	Click **Browse**.
`Courier font`	Type or enter text exactly as shown.	Type `cmd`.
Double-click	Click left mouse button twice in quick succession. (Assumes cursor is positioned on object or selection.)	Double-click the H1 icon.
Expand	Click the + to the left of a given item /folder to show its contents.	In the H1-1 window, expand the FFLD.
Right-click	Click right mouse button once. (Assumes cursor is positioned on object or selection.)	Right-click the Fieldbus Networks icon.
Select	Click to highlight a menu item or list choice.	Select **Properties** from the drop-down list.
>	Shows nested menu selections as menu name followed by menu selection.	Click **File** > **Page Setup** > **Options**.

Additional Resources

Resource	Description
1769 CompactLogix Controllers Selection Guide, publication 1769-SG001	Provides information and specifications for consideration when selecting CompactLogix controllers and software.
1769 Compact I/O Selection Guide, publication 1769-SG002	Provides information and specifications for consideration when selecting I/O modules for use with the CompactLogix system. Includes Compact I/O, POINT I/O, and FLEX I/O modules.
NetLinx Selection Guide, publication NETS-SG001	Provides information and specifications for consideration when selecting a network to use and which hardware and cables you need.

Notes:

Prepare the CompactLogix Hardware

In this chapter, you install your CompactLogix hardware, including the controller, power supply, any local 1769 Compact I/O modules, and an optional 1769-SDN module (used only if you have distributed I/O on the DeviceNet network).

Before You Begin

Determine which of these networks and appropriate hardware to use:

- For the EtherNet/IP network (option 1), use the 1769-L32E or 1769-L35E controller.
- For the ControlNet network (option 2), use the 1769-L32C or 1769-L35CR controller.
- For a serial connection (option 3), use the 1769-L31 controller.
- For the DeviceNet network (options 2 and 3), use the 1769-SDN module with the 1769-L31 controller.

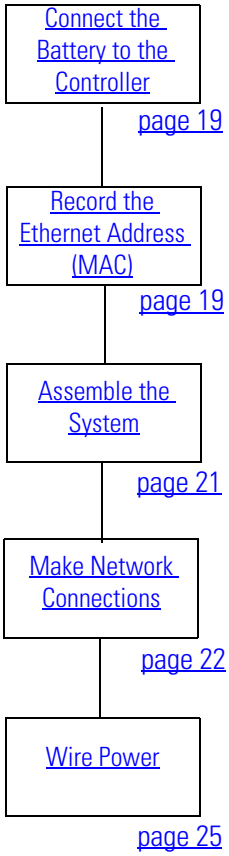
What You Need

- CompactLogix controller: 1769-L32E, 1769-L35E, 1769-L32C, 1769-L35CR, or 1769-L31
- CompactLogix controller battery: 1769-BA (included with your controller)
- Compact power supply: 1769-PA2
- Compact I/O end cap: 1769-ECR
- Compact I/O module: this example uses a 1769-OB16 module. Other Compact I/O modules can also be used, but are not required
- Compact I/O DeviceNet scanner module: 1769-SDN (only if you are using a DeviceNet network)
- Network cable: Ethernet (commercially available), ControlNet (1786-TPR), or serial (1756-CP3)

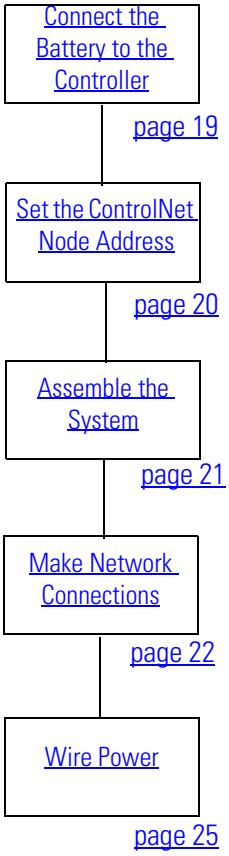
Follow These Steps

Complete the steps shown for your controller.

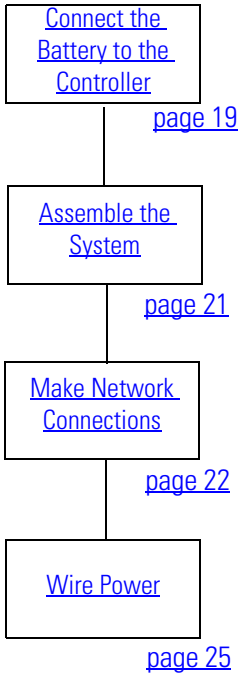
1769-L32E, 1769-L35E



1769-L32C, 1769-L35CR



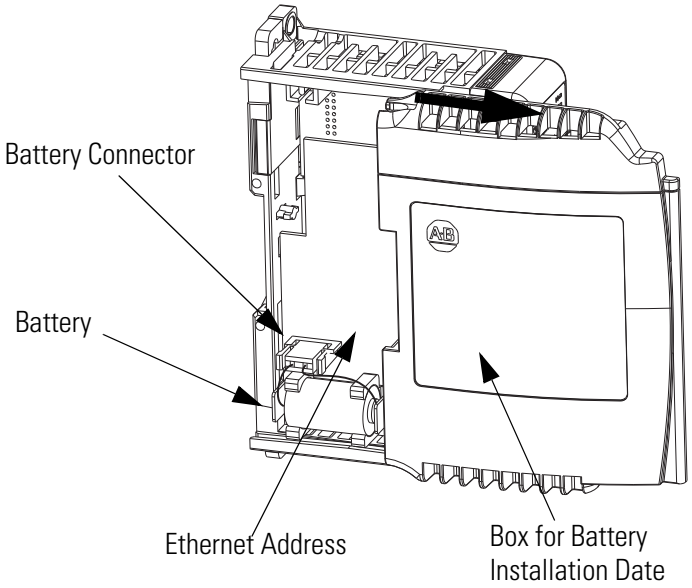
1769-L31



Connect the Battery to the Controller

1769-BA Battery

1. Insert the battery and battery connector.
2. Record the battery installation date in the box provided on the label.



Record the Ethernet Address (MAC)

1769-L32E or 1769-L35E controllers

The Ethernet address (MAC) is found on a label near the battery. This is an example address.

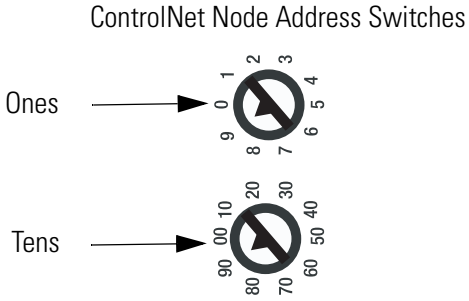
00:00:BC:21:D7:BE Ethernet Address

Record the Ethernet address (MAC) for the CompactLogix controller on the Network Worksheet at the back of this quick start. This address is used to set the IP address later.

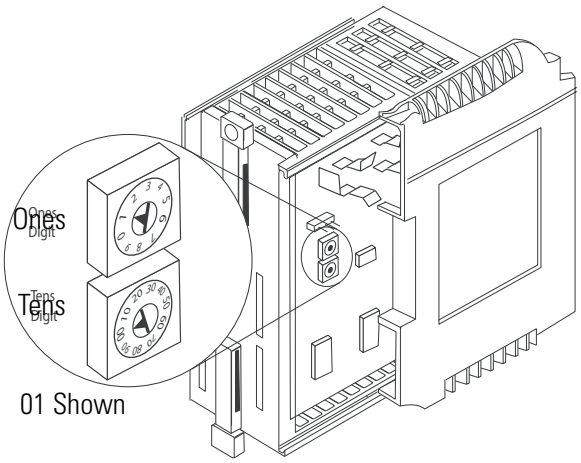
Set the ControlNet Node Address

1769-L32C or 1769-L35CR controllers

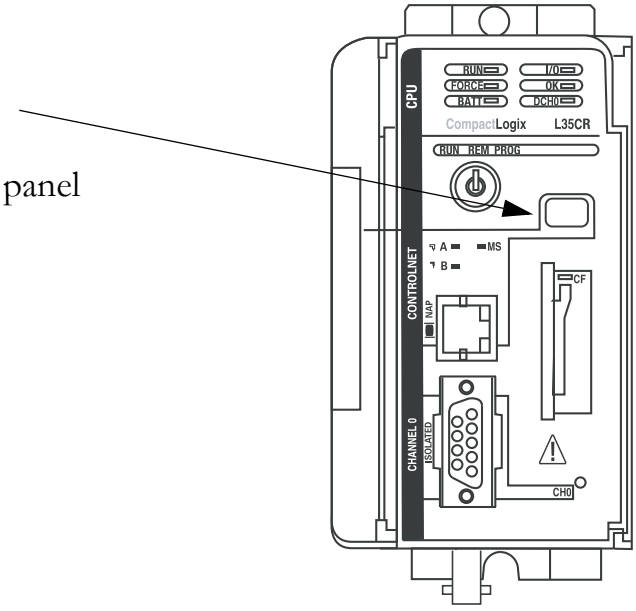
Controllers are shipped with the node address set at 99.



1. Use a small, flathead screwdriver to set the node address to node 01.



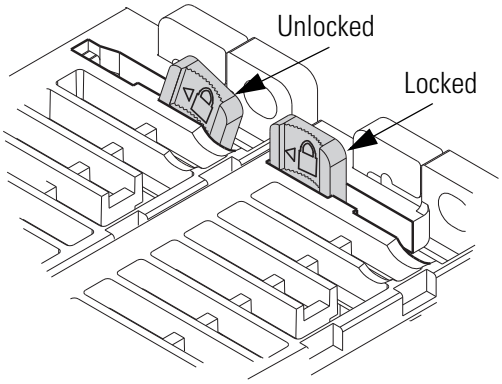
2. Record the node address on the front panel overlay.



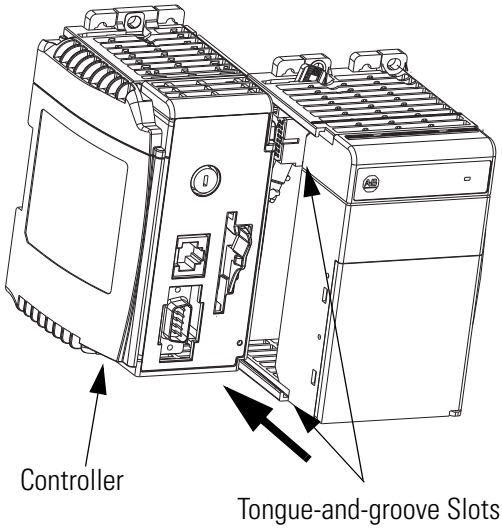
Assemble the System

Controller, power supply, local I/O modules, 1769-SDN module, end cap terminator

1. On the top of each module, verify that all of the locking tabs are unlocked.



2. Use the tongue-and-groove slots to slide the power supply, then the I/O modules onto the controller.



3. If you have an 1769-SDN module, record the series letter (see label on the side of the module) on the Network Worksheet inside the back cover of this quick start.

4. If you have an 1769-SDN module, slide it onto the other modules.

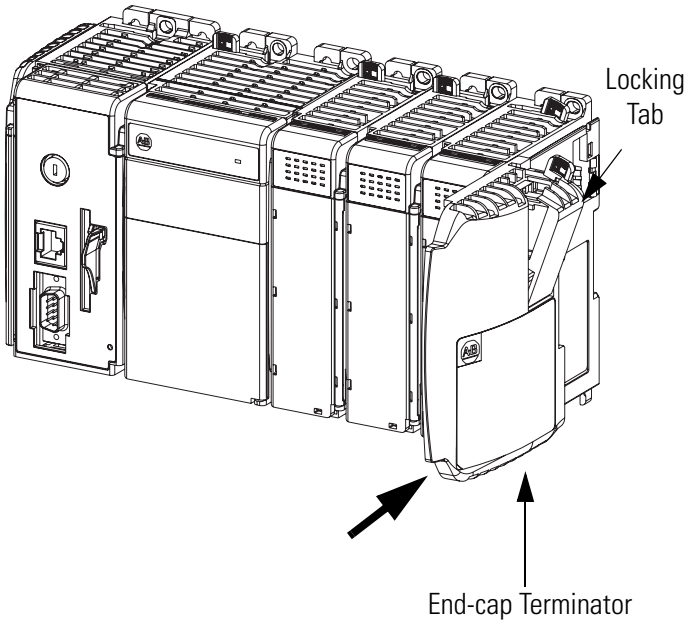
There can be a maximum of three modules between the 1769-SDN module and the power supply.

5. Lock all of the locking tabs on the top of the modules.

6. Verify that the tabs are all the way to the left.

7. Slide the end cap terminator on and lock the locking tab.

8. Press the assembled system onto a DIN rail.

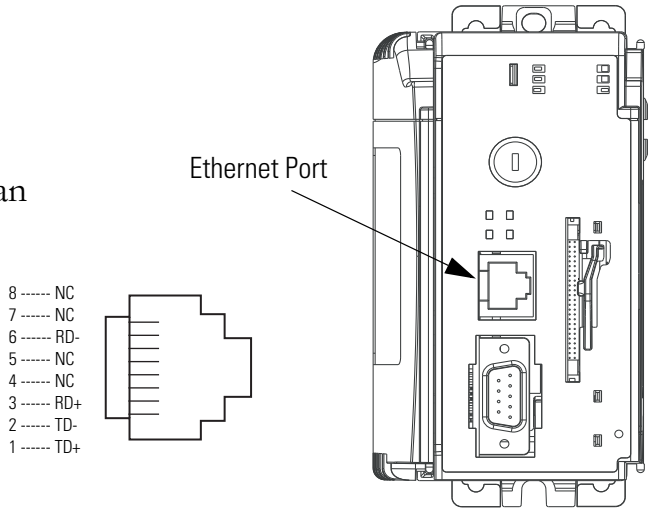


Make Network Connections

1769-L32E or 1769-L35E controllers

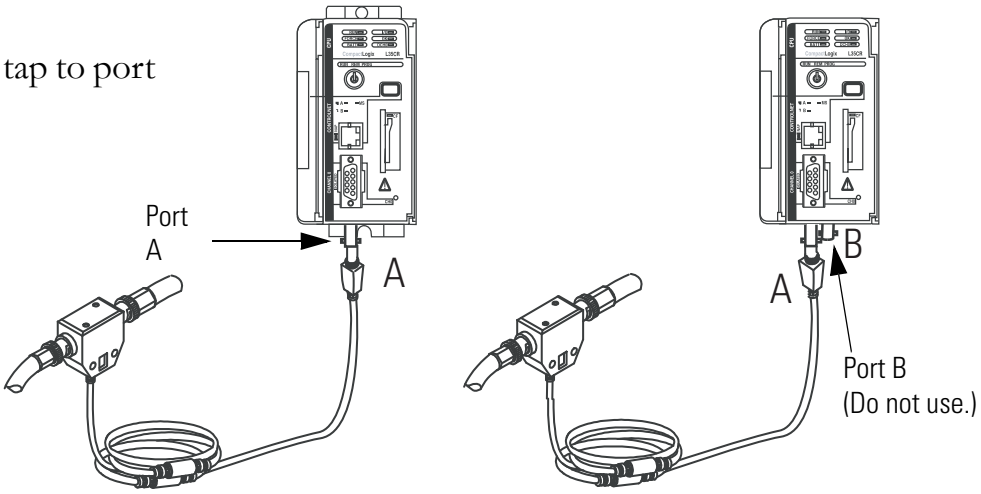
1. Insert an Ethernet cable with an RJ-45 connector.

2. Connect the other end of the cable to an Ethernet switch.



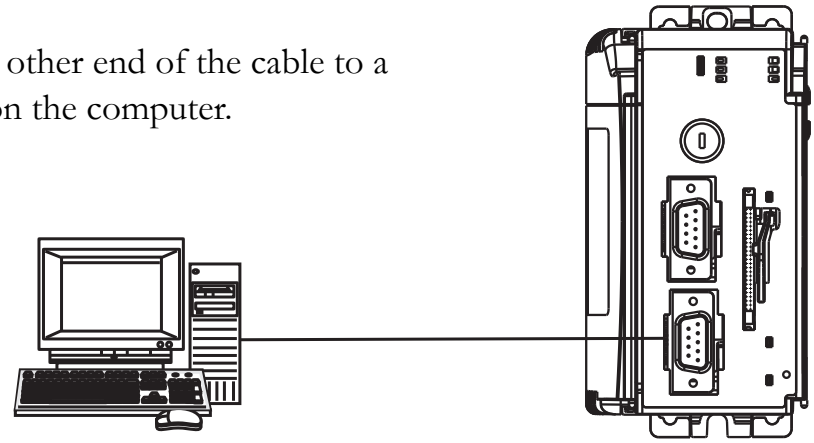
1769-L32C or 1769-L35CR controllers

Connect a ControlNet tap to port A of the controller.



Required for all CompactLogix controllers

1. Connect the 1756-CP3 cable to the channel 0 serial port on the controller.
2. Connect the other end of the cable to a COM port on the computer.

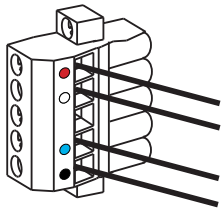


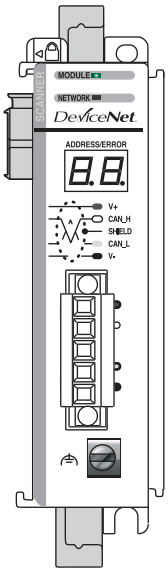
1769-SDN module

1. Connect a DeviceNet cable to the removable connector.

Connect	To
Red	V+
White	CAN High
Bare	Shield
Blue	CAN Low
Black	V-

2. Connect the removable connector to the module.





Wire Power

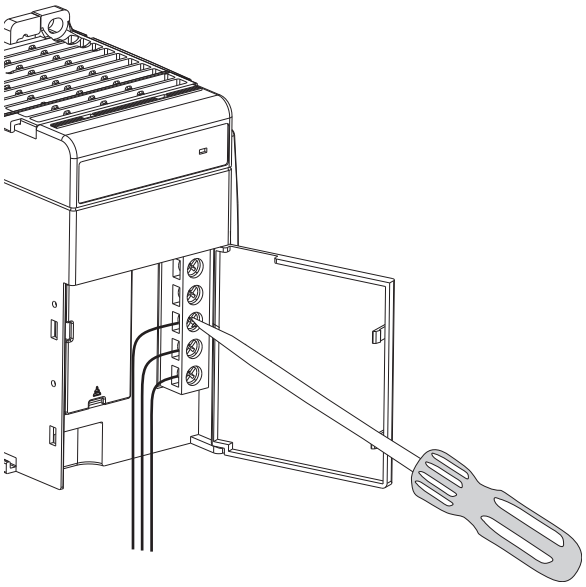
1769-PA2 power supply

WARNING

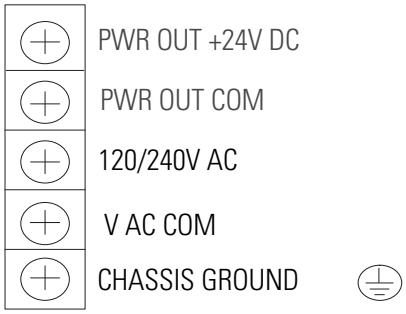
Verify that all incoming power is turned off before wiring power.

1. Insert the 120/240V AC, V AC COM, and Chassis Ground wires and tighten the terminal screws.

2. Turn on incoming power.



Terminal Wiring Diagram



Additional Resources

Resource	Description
1769-L32E and 1769-L35E CompactLogix Controller Installation Instructions, publication 1769-IN020	Provides details about assembling and mounting the controller and upgrading firmware as well as controller technical specifications.
1769-L32C and 1769-L35CR CompactLogix Controller Installation Instructions. publication 1769-IN070	Provides details about assembling and mounting the controller and upgrading firmware as well as controller technical specifications.
1769-L31 CompactLogix Controller Installation Instructions, publication 1769-IN069	Provides details about assembling and mounting the controller and upgrading firmware as well as controller technical specifications.
1769-SDN Compact I/O DeviceNet Scanner Module Installation Instructions, publication 1769-IN060	Provides information about installing the 1769-SDN module and technical specifications.
Compact 1769 Expansion I/O Power Supplies Installation Instructions, publication 1769-IN028	Provides details on power considerations, master control relay, safety circuits, grounding, power dissipation, input power requirements, and technical specifications.

Prepare the Computer

In this chapter, you configure network communication on your computer and install the necessary programming and configuration software.

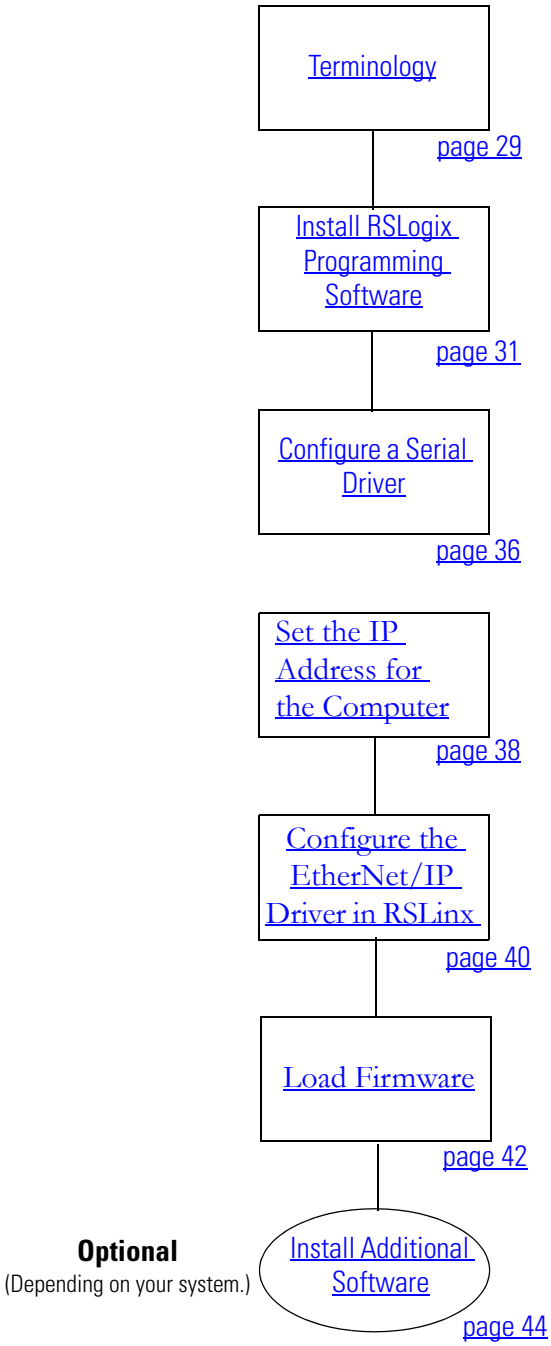
Before You Begin

- Verify that your computer meets the software's system requirements for your edition of RSLogix 5000 programming software.
- If using a ControlNet network (option 2), install a 1784-PCIC or 1784-PCICS ControlNet communication card on the computer.

What You Need

- RSLinx Classic software, version 2.54 or later (packaged with RSLogix 5000 programming software).
- RSLogix 5000 programming software (see the Preface for version and edition information)
- RSNetWorx for ControlNet software for the ControlNet network
- RSNetWorx for DeviceNet software for the DeviceNet network
- ControlFlash software (packaged with RSLogix5000 programming software)
- BOOTP/DHCP server utility (packaged with RSLogix 5000 programming software).
- A Network Interface Card (NIC) and its associated Windows driver installed (the NIC and driver are standard on most computers).
- An Ethernet Address (MAC) for each device. You recorded these addresses in the Network Worksheet on the back cover.
- A planned IP Address for each device. If you are using an isolated network, determine a numbering convention for your IP addresses. Record these addresses on the Network Worksheet inside the back cover.

Complete these steps.



Terminology

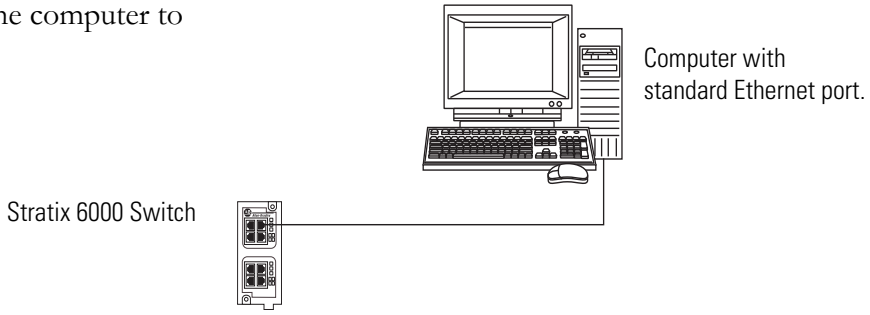
Ethernet networks use these types of addresses.

Term	Definition
Ethernet Address	Each Ethernet device has a unique Ethernet address (sometimes called a MAC address). The address appears as twelve digits separated by colons (for example, *xx:xx:xx:xx:xx:xx*). It is usually on a label on the device itself. Each digit is a number in hexadecimal (0 to 9 or A through F). No other device in the world will have the same address, and it can not be changed. You use the Ethernet address to identify a device so you can assign it an IP address.
IP Address	In addition to the Ethernet address, an IP address identifies a node on an Ethernet network. The IP address can be manually set. or you can use special software to automatically assign it. An IP Address consists of four decimal integers separated by periods (*xxx.xxx.xxx.xxx*). Each *xxx* is a decimal value from 0…255. For example, an IP Address could be 192.168.1.092 The selection of IP Addresses is beyond the scope of this quick start, so please contact your network administrator or use the ones provided in the examples. Once you set an IP address for a device, you generally reference the device by its IP address. The examples in this quick start use IP Addresses to define communication paths to the devices.

Make Network Connections

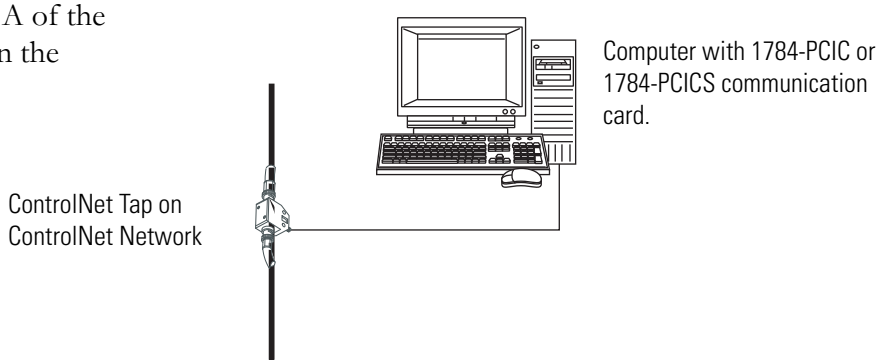
Ethernet connection - Required for all options

Connect the Ethernet port of the computer to the Ethernet switch.



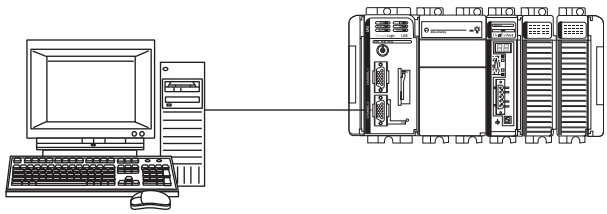
ControlNet connection - 1769-L32C and 1769-L35CR controllers only

Connect a ControlNet tap to port A of the ControlNet communication card in the computer.



Serial connection - Required for all controllers

You connected a 1756-CP3 cable to a COM port on the computer and to the CH0 port on the controller in Chapter 1.



1756-CP3 serial cable to CH0 on 1769-L31.

Install RSLogix Programming Software

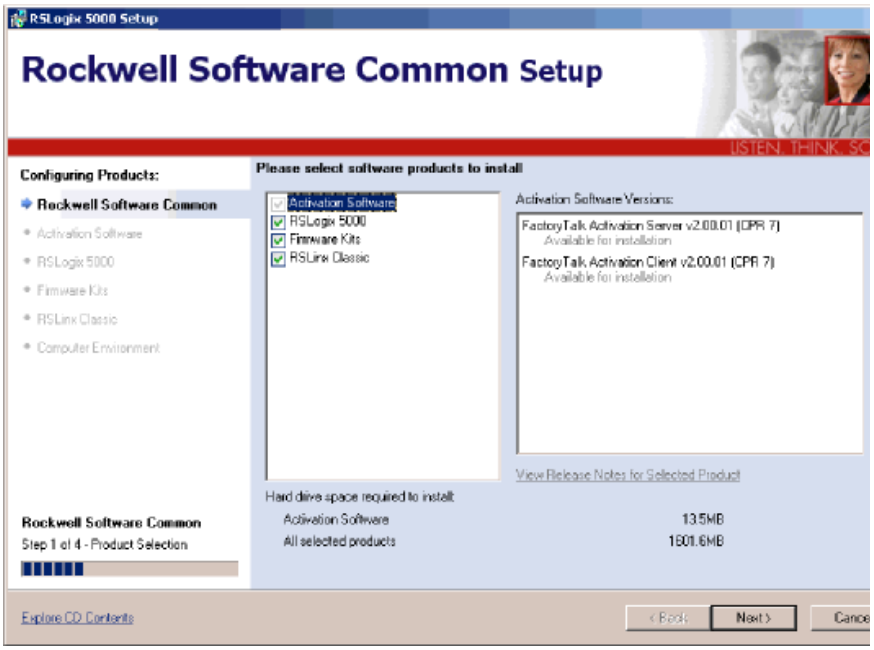
Required for all controllers

Throughout the installation, click **Next** to use default RSLogix 5000 installation settings except when indicated in the steps below.

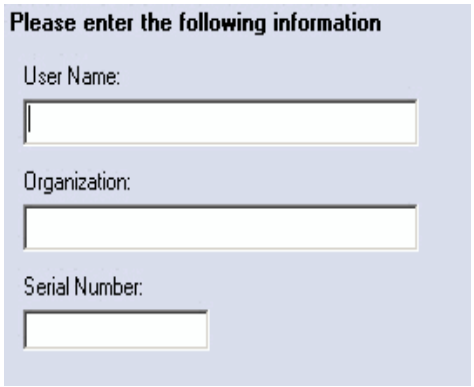
1. Begin the RSLogix 5000 software installation.

2. Choose your language and click **Continue**.

3. Accept the default software products for installation and click **Next**.

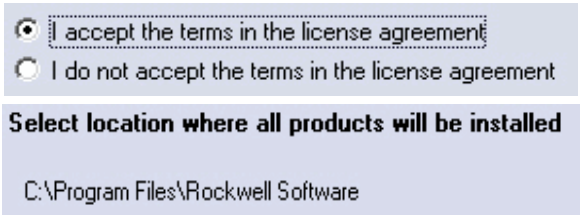


4. Enter your user name, organization, and software serial number, then click **Next**.



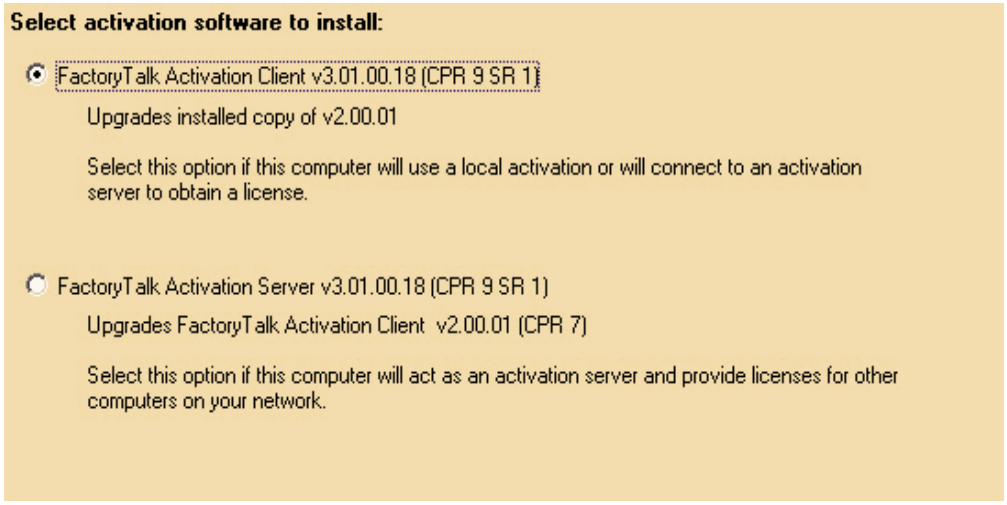
5. Accept the license agreement and click **Next**.

6. Click **Next** to install the program files to the default directory.



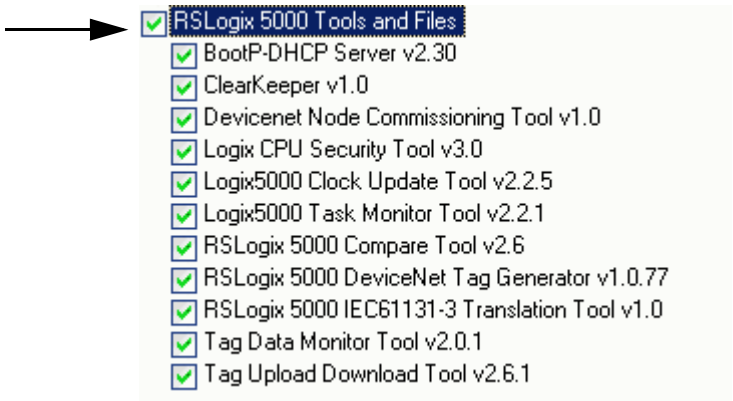
7. Select your activation type and click **Next**.

   This quick start uses FactoryTalk Activation software to activate RSLogix 5000 software. For more information, see the FactoryTalk Activation FAQ, publication Ftalk-FA017.

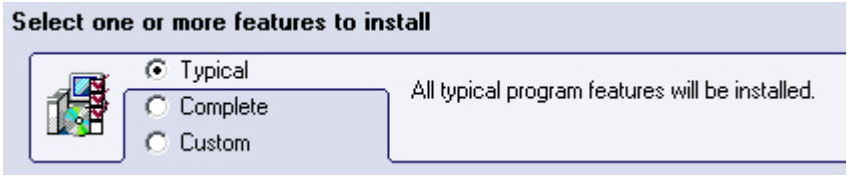


8. Click **Next** to install only the latest version of RSLogix 5000 software (version 18).

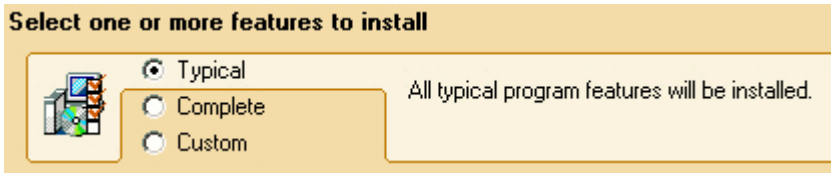
9. Verify that RSLogix 5000 Tools and Files is checked and click **Next**.



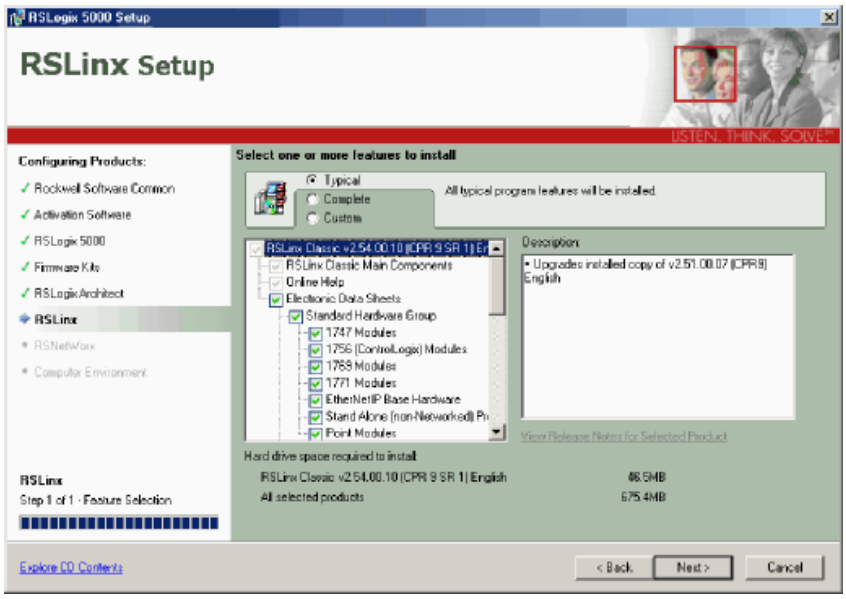
10. Click **Next** to install the typical firmware kits.



11. Click **Next** to install typical RSLogix Architect tools.

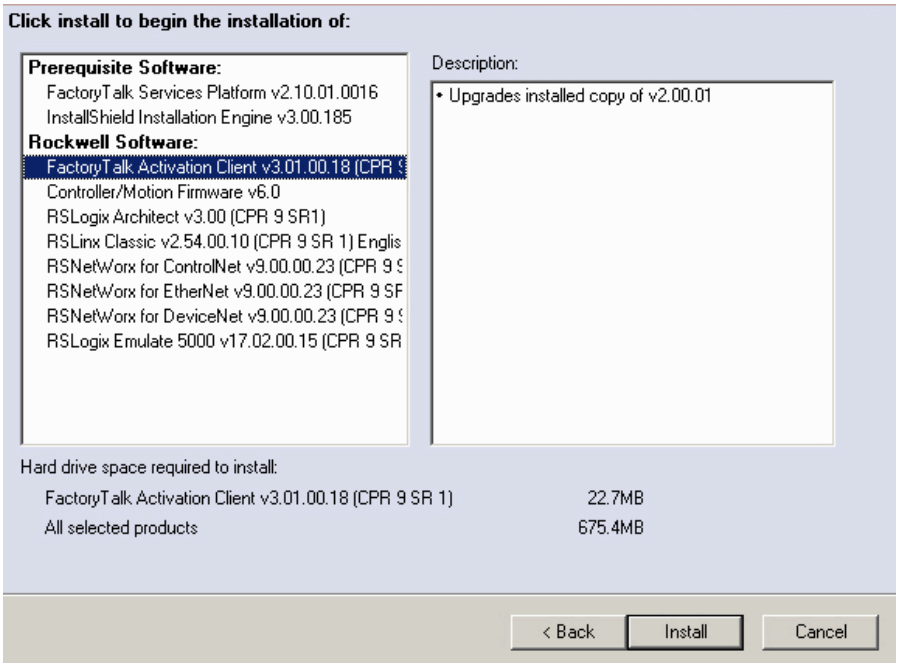


12. Click **Next** to install the typical set of EDS files and RSLinx software.



13. Click **Install** to complete the installation.

    The installation dialog box displays progress while the software installs.



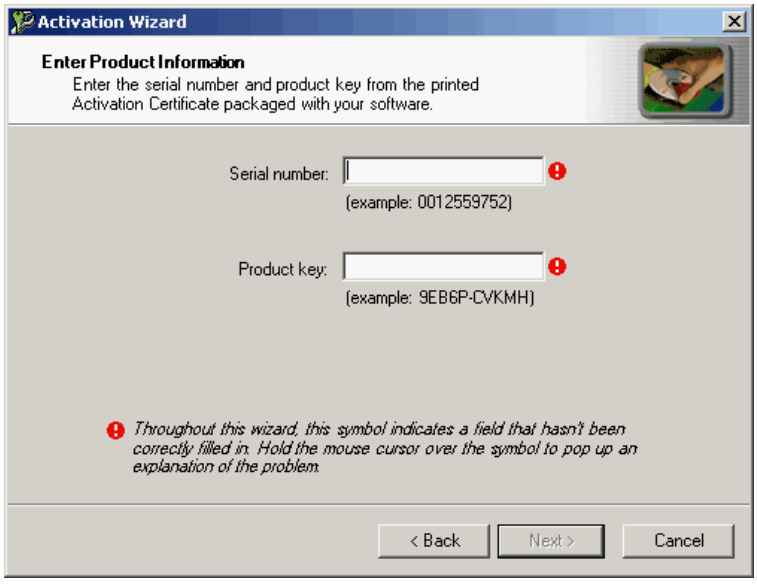
TIP As the installation progresses, you may be prompted to complete additional set-up tasks depending on your system configuration. Follow those prompts and enter information as indicated in the dialog boxes to complete your installation.

After a few moments, the FactoryTalk Installation Wizard starts.

14. Click **Next**.

15. Enter the **Serial number** and **Product key** from the certification letter packaged with your software.

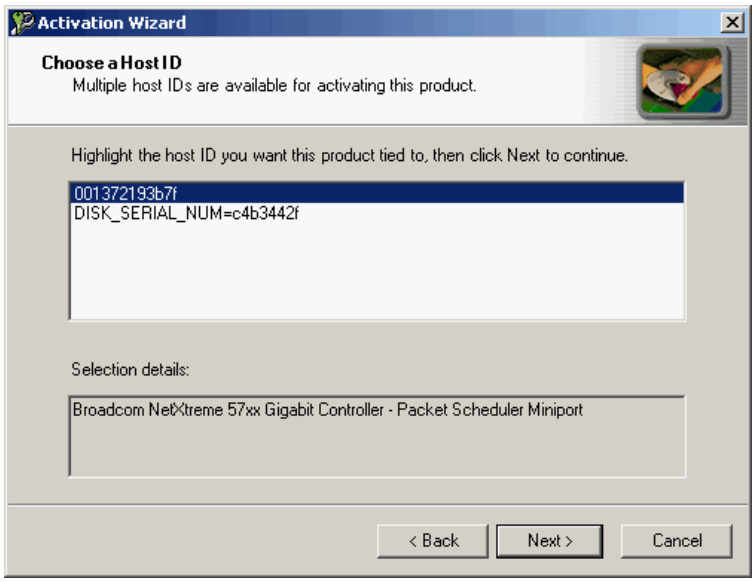
16. Click **Next**.



17. Select your host ID and click **Next**.

    The activation completes if the computer is connected to the Internet.

    If Internet access is not available, call Rockwell Automation Technical Support to complete your activation.

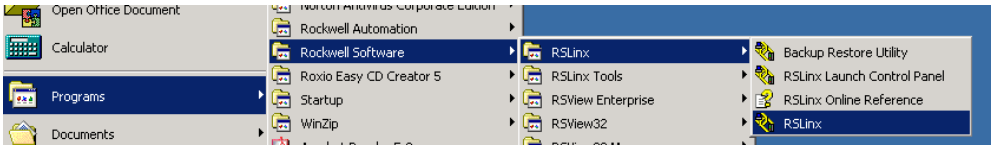


18. Click **Finish** to close the Activation Wizard.

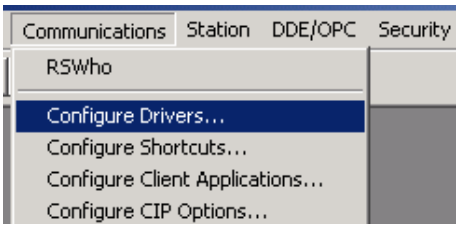
Configure a Serial Driver

Required for all controllers

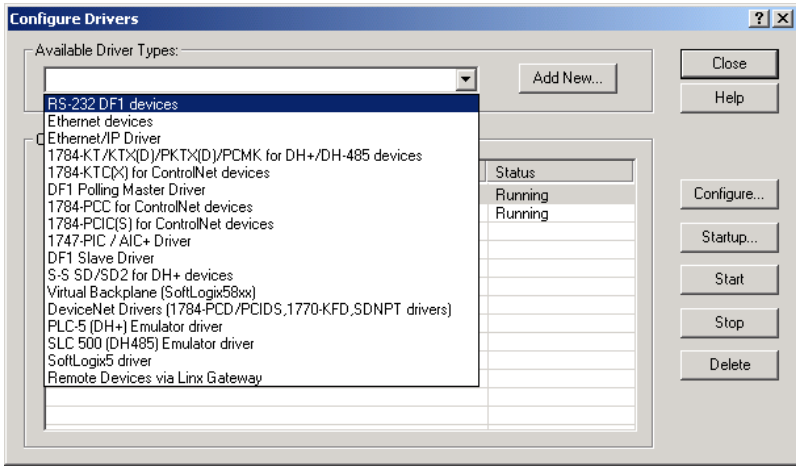
1. Launch RSLinx software.



2. Under Communications, select **Configure Drivers**.



3. Select **RS-232 DF1 devices**.



4. Click **Add New**.

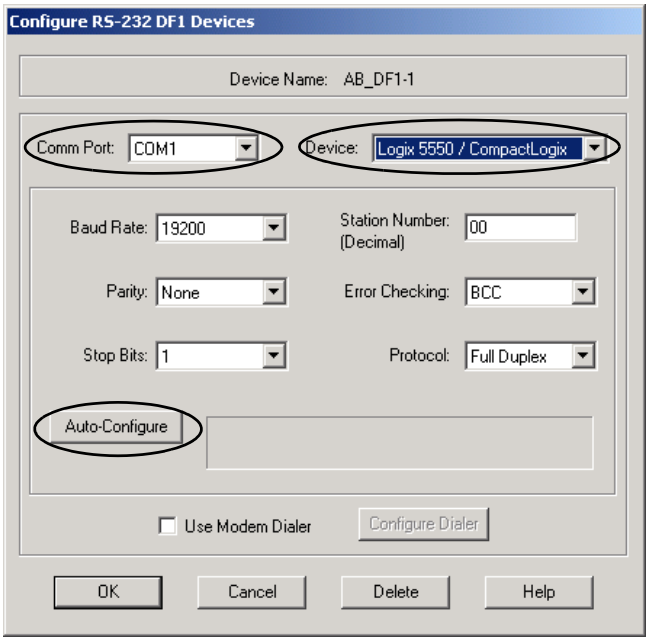
5. Click **OK** to keep the default name.

6. Select the Comm Port to which you connected the 1756-CP3 cable.

7. For Device, select **Logix5550/CompactLogix**.

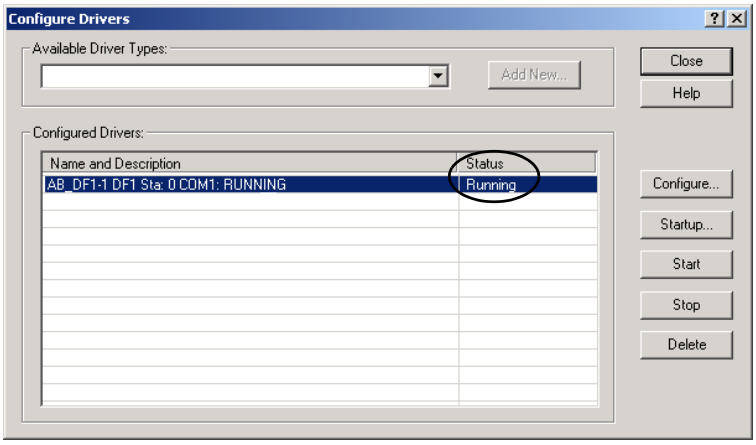
8. Click **Auto Configure**.

9. Click **OK**.

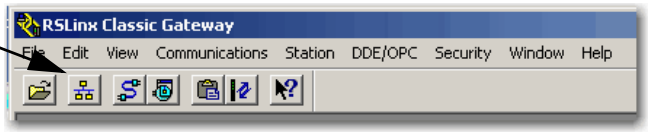


The Serial driver is added to the Configured Drivers list.

10. Verify that the Status of the driver is Running, and click **Close**.

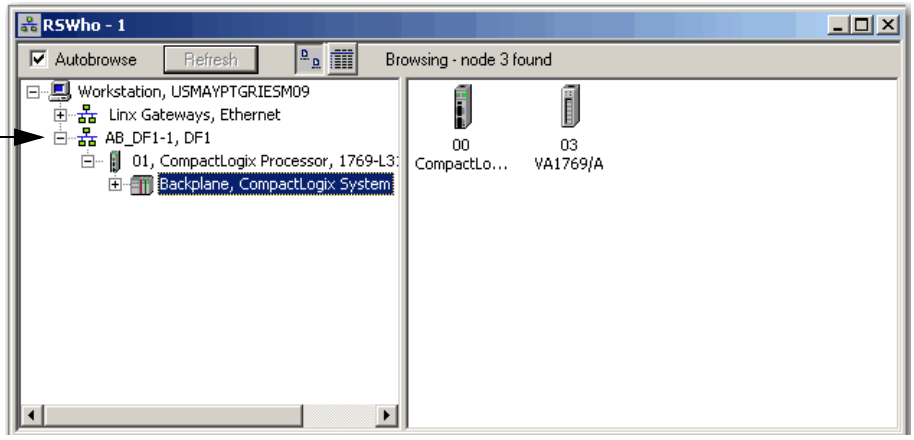


11. Click the **RSWho** icon to view the driver.



All of the configured, active drivers display.

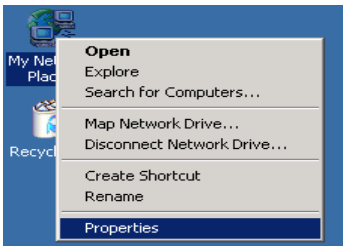
Expand the serial driver to see connected devices.



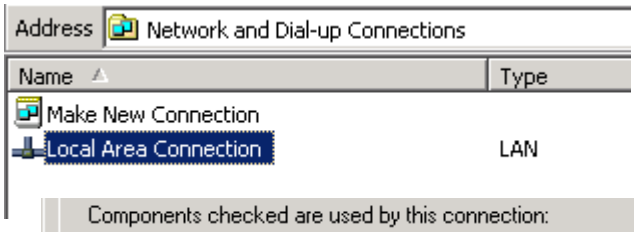
Set the IP Address for the Computer

Required for all controllers, regardless of network choice

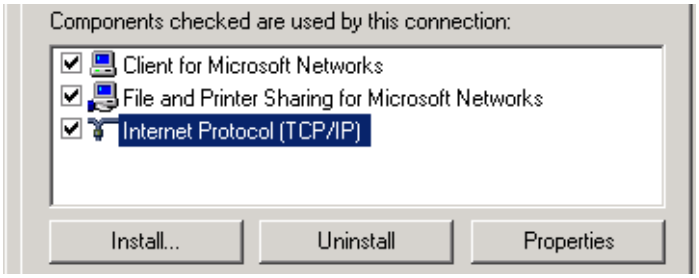
1. On your desktop, right-click **My Network Places** and select **Properties**.



2. Double-click the Local Area Connection.

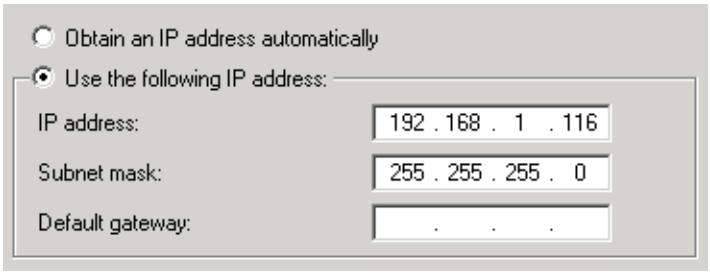


3. Click **Properties**.



4. On the General tab, select **Internet Protocol (TCP/IP)** and click **Properties**.

5. Select **Use the following IP address** and enter an IP address and Subnet mask for your computer using the example shown or enter your own address.



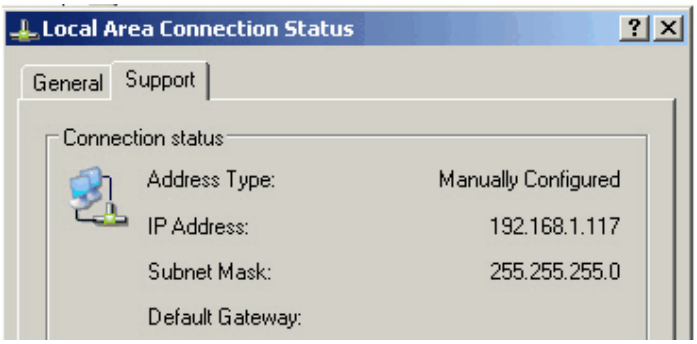
   For more information about selecting an IP Address, see page 81.

6. Click **OK**.
7. Record the IP address and subnet mask in the Network Worksheet on the back cover.
8. Click **OK**.

9. Click the **Support** tab.

10. Verify that the IP Address and Subnet Mask match what you entered on the Network Worksheet.

    If these numbers do not match what you entered, contact your network administrator to verify that your IP address is correct.



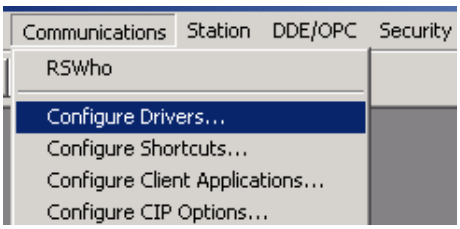
11. Close the Local Area Connection Status dialog box.

Configure the EtherNet/IP Driver in RSLinx Software

Required for 1769-L32E,1767-L35E, and PanelView Plus

1. If RSLinx software is not open, launch RSLinx software.

2. From the **Communications** menu, choose **Configure Drivers**.

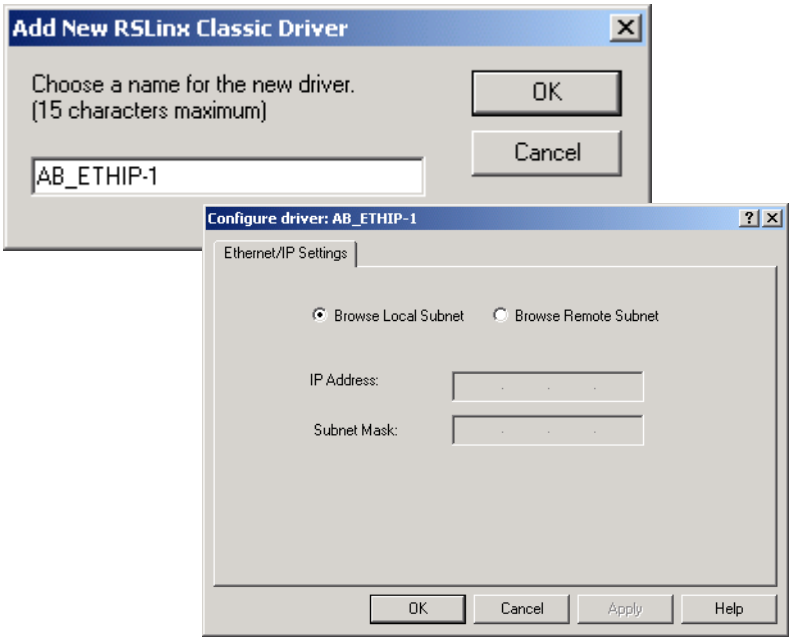


3. From the Available Driver Types, select **Ethernet/IP Driver**.

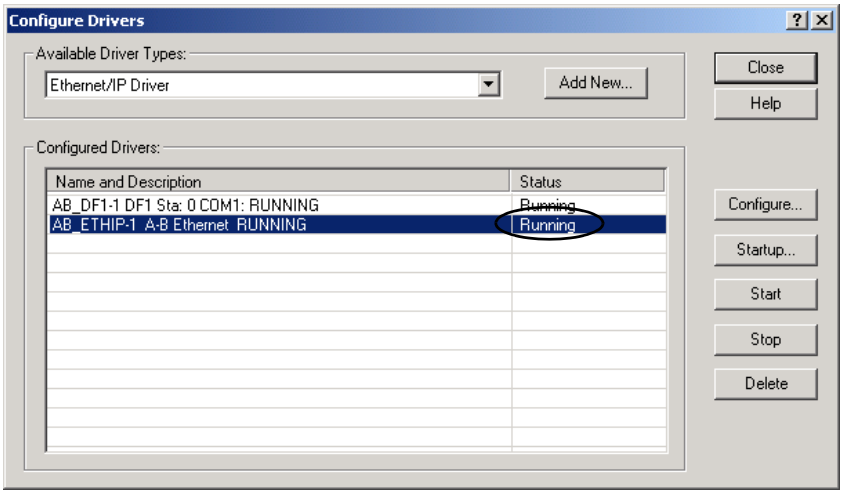
4. Click **Add New**.

5. Click **OK** to keep the default name.

6. Click **OK** to Browse Local Subnet.



The EtherNet/IP driver is added to the Configured Drivers list.



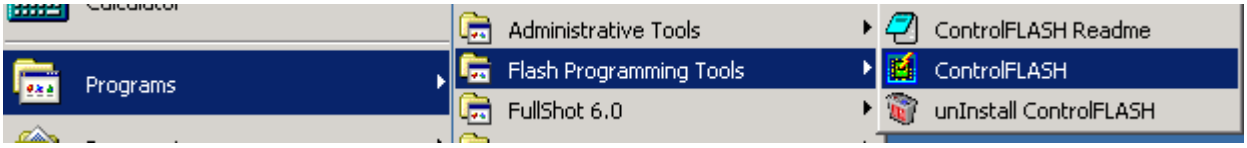
7. Verify that the driver's Status is Running, and click **Close**.

Load Firmware

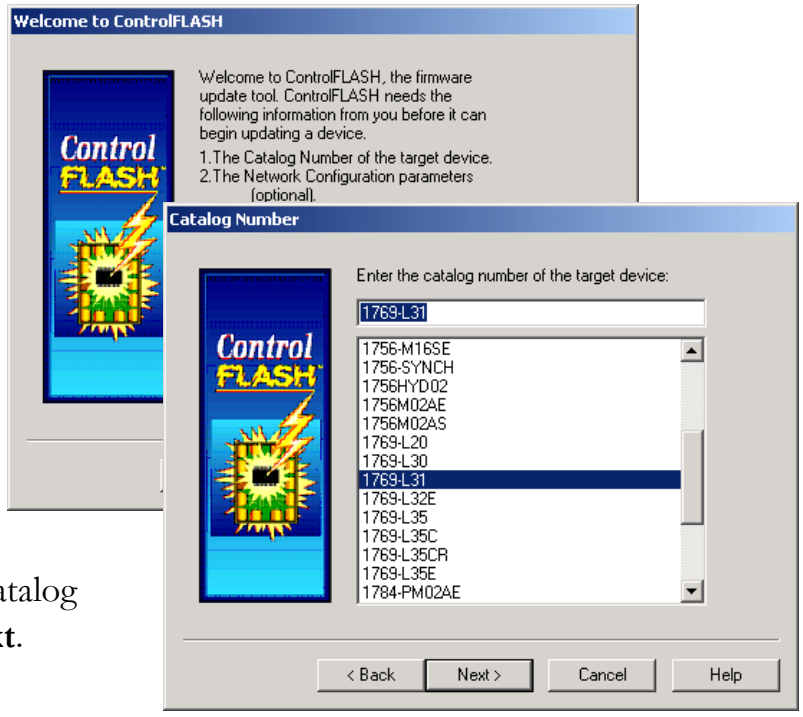
Required for all packaged controllers

TIP This example shows how to load firmware using a serial connection. It is faster to load firmware via an EtherNet/IP or ControlNet connection. For more information, see the installation instructions for the controller as listed at the end of the chapter.

1. Launch ControlFlash software.



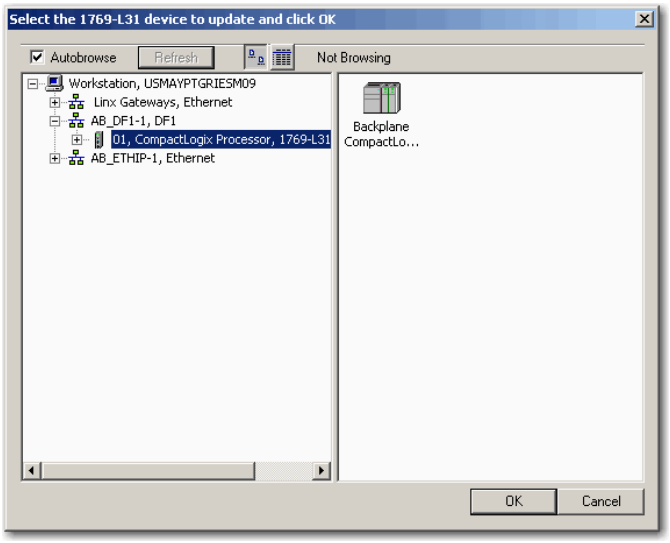
2. Click **Next**.



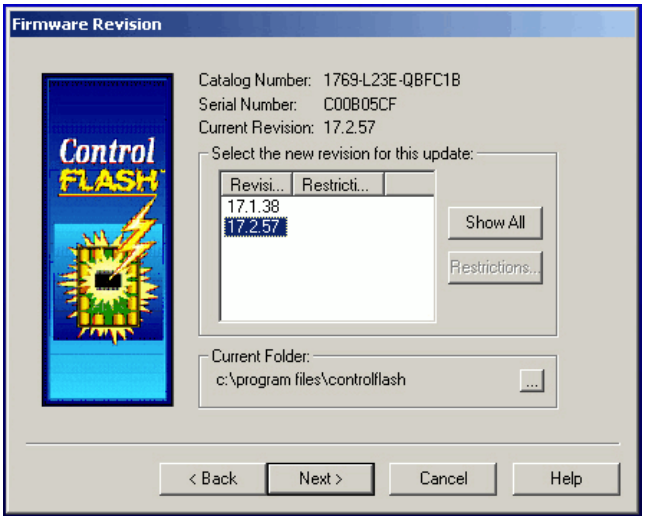
3. Select the controller catalog number and click **Next**.

4. Expand the AB_DF1-DFI driver, and select your controller.

5. Click **OK**.



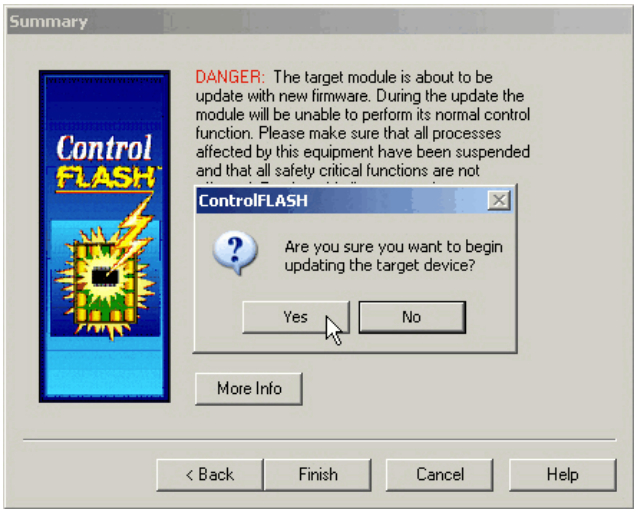
6. Move the keyswitch on the controller to PROG.



7. If the Current Revision matches the revision of firmware you want, click Cancel and skip to Chapter 3.

   Otherwise, select the desired firmware revision and click **Next**.

8. Click **Finish** to start the firmware update.



Install Additional Software

- If you are completing the PanelView Plus chapters in this quick start, install FactoryTalkView Machine Edition software and RSLinx Enterprise software from the FactoryTalkView Machine Edition package. This software must be installed before you install any additional software.
- If you are using a ControlNet network, install RSNetWorx for ControlNet software.
- If you are using a DeviceNet network, install RSNetWorx for DeviceNet software.

Additional Resources

Resource	Description
1769-L32E and 1769-L35E CompactLogix Controller Installation Instructions, publication 1769-IN020	Provides details about assembling and mounting the controller and upgrading firmware as well as controller technical specifications.
1769-L32C and 1769-L35CR CompactLogix Controller Installation Instructions. publication 1769-IN070	Provides details about how to assemble and mount the controller, how to upgrade firmware, and controller technical specifications.
1769-L31 CompactLogix Controller Installation Instructions, publication 1769-IN069	Provides details about assembling and mounting the controller and upgrading firmware as well as controller technical specifications.
FactoryTalk Activation FAQ, publication FTalk-FA017	Provides answers to FactoryTalk Activation questions, including how the FactoryTalk Activation differs from master disk activation.
ControlFlash Firmware Upgrade Kit, publication 1756-QS105	Provides details regarding the installation of ControlFlash software and execution of firmware upgrades.

Notes:

Prepare the Distributed POINT I/O Hardware

In this chapter, you install the 1734 POINT I/O network adapter and the 1734 POINT I/O modules.

Before You Begin

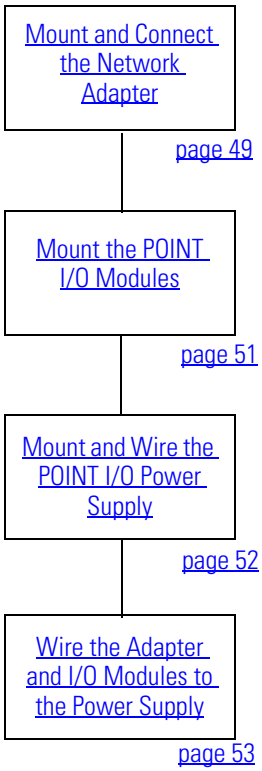
- Determine which of these network adapters to use:
  - for an EtherNet/IP network (option 1), use the 1734-AENT adapter.
  - for a ControlNet network (option 2), use the 1734-ACNR adapter.
  - for a DeviceNet network (option 3), use the 1734-ADN adapter.
- Select the appropriate mounting base for I/O modules:
  - if you use a 1734-IT2I module, then use the 1734-TBCJC.
  - for all other I/O modules use the 1734-TB or 1734-TBS.

What You Need

- POINT I/O adapter: 1734-AENT, 1734-ACNR, and/or 1734-ADN
- POINT I/O mounting bases: 1734-TB or 1734-TBS, and 1734-TBCJC
- A digital-output POINT I/O module: The examples use a 1734-OB4E, however, other POINT I/O modules can also be used, but are not required
- Power supply: 1794-PS3 or 1794-PS13

Follow These Steps

If you have a POINT I/O system, complete these steps.



Mount and Connect the Network Adapter

EtherNet/IP 1734-AENT adapter

1. Locate the Ethernet address (MAC), found next to the label. Record the Ethernet address (MAC) for the POINT I/O adapter on the Network Worksheet.

   This address is used to set the IP address later in the quick start.

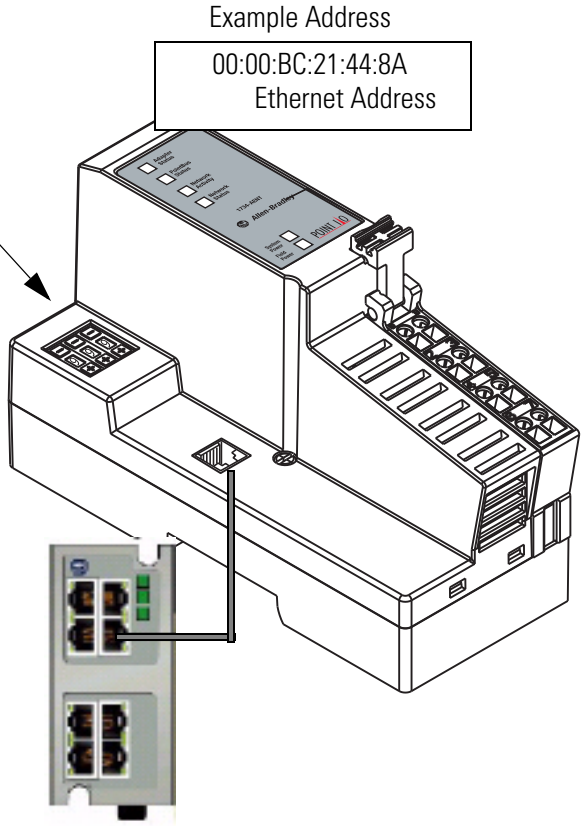
2. Set the address to a value greater than or equal to 256.

   This example uses 999.

3. Remove the safety end cap.

4. Press the adapter onto the DIN rail.

5. Insert an Ethernet cable.



Go to Mount the POINT I/O Modules.

ControlNet 1734-ACNR adapter

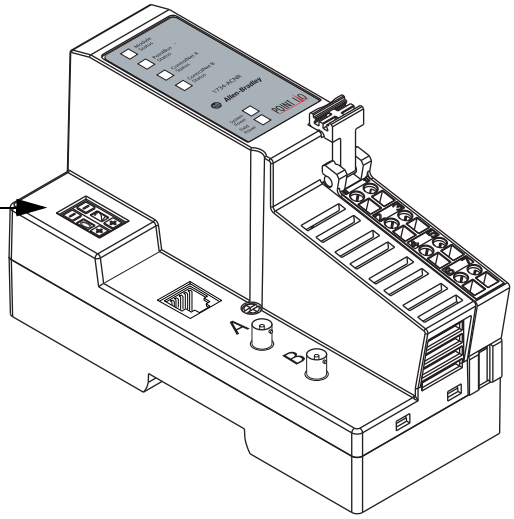
1. Remove the safety end cap.

2. Press the adapter onto the DIN rail.

3. Set the node address.

   This example uses node 02.

4. Connect a ControlNet tap to the A port.

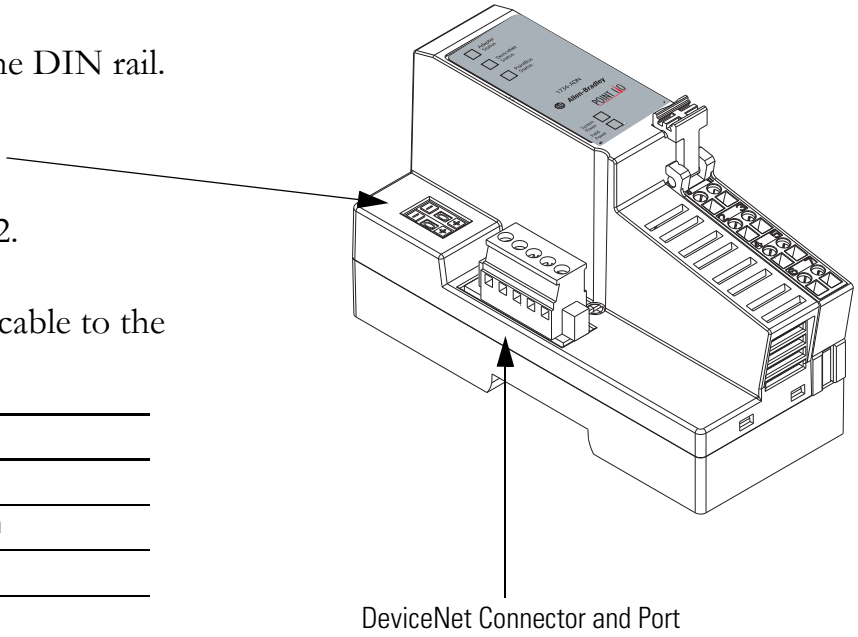


Go to Mount the POINT I/O Modules.

DeviceNet 1734-ADN adapter

1. Remove the safety end cap.
2. Press the adapter onto the DIN rail.
3. Set the node address.

   This example uses node 02.



4. Connect the DeviceNet cable to the removable connector.

Connect	To
Red	V+
White	CAN High
Bare	Shield
Blue	CAN Low
Black	V-

5. Connect the removable connector to the adapter.

Go to Mount the POINT I/O Modules.

Mount the POINT I/O Modules

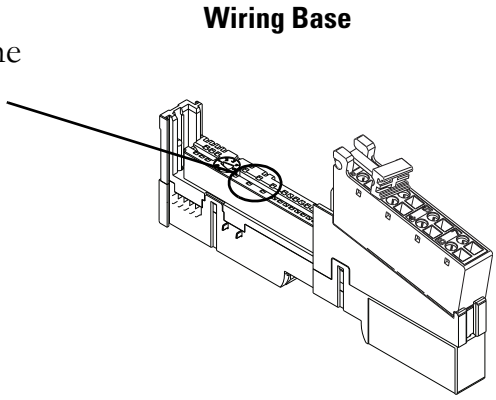
All controllers, POINT I/O modules, and wiring bases

ATTENTION

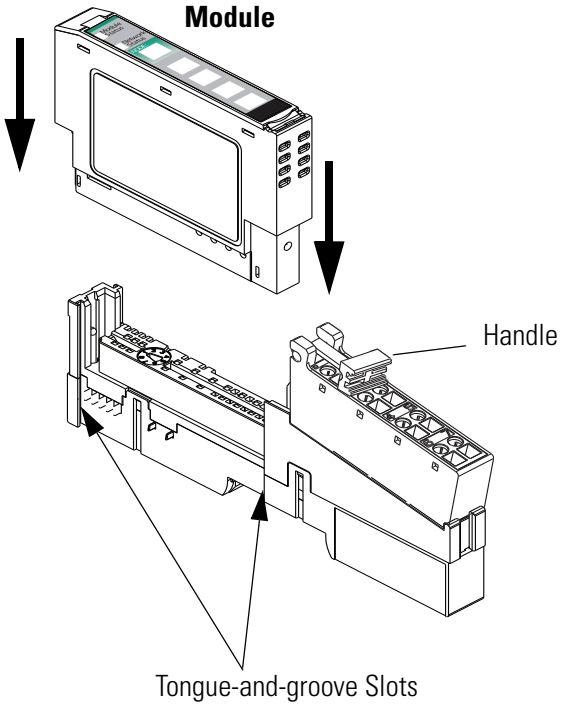
The 1734-IT2I module must be mounted in the 1734-TBCJC wiring base. All other modules can be mounted in either of the 1734-TB or 1734-TBS wiring bases.

1. Using a small, flathead screwdriver, rotate the keyswitch to match the figure on the I/O module.

Figure on Module



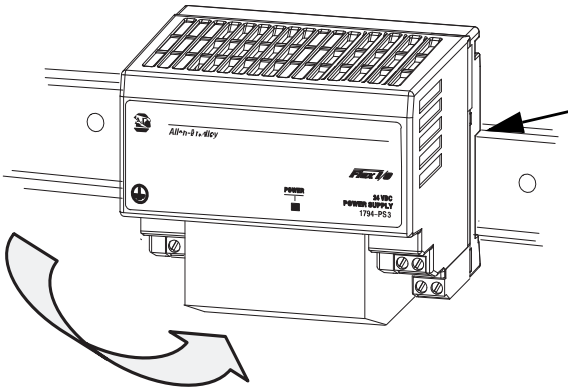
2. Press the module into the wiring base.
3. Snap the handle up.
4. Complete steps 1–3 with all POINT I/O modules.
5. Slide the first module and wiring base assembly along the adapter and press it onto the DIN rail.
6. Repeat with all of the I/O assemblies.



Mount and Wire the POINT I/O Power Supply

1794-PS3 or 1794-PS13 power supplies

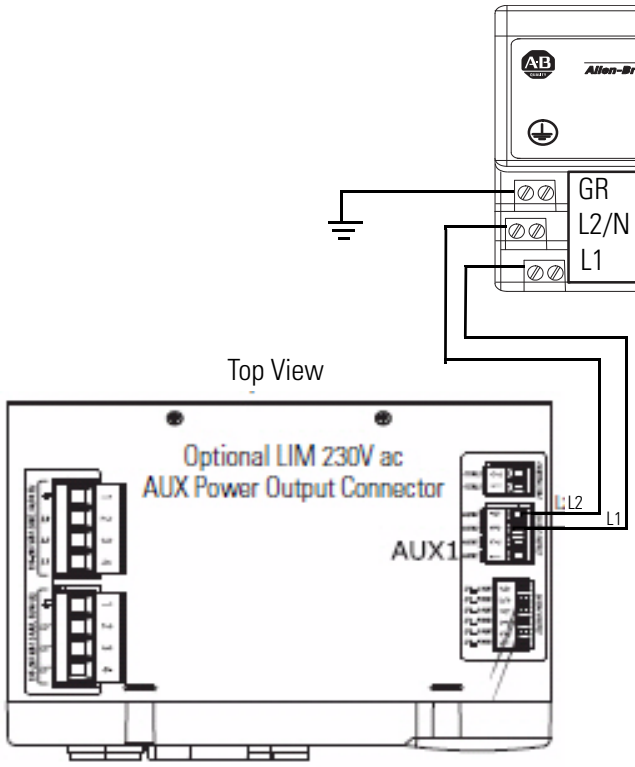
1. Hook the upper-lip of the DIN rail latch onto the DIN rail.



2. Press the module onto the DIN rail.

WARNING

Verify that all incoming power is turned off before wiring power.

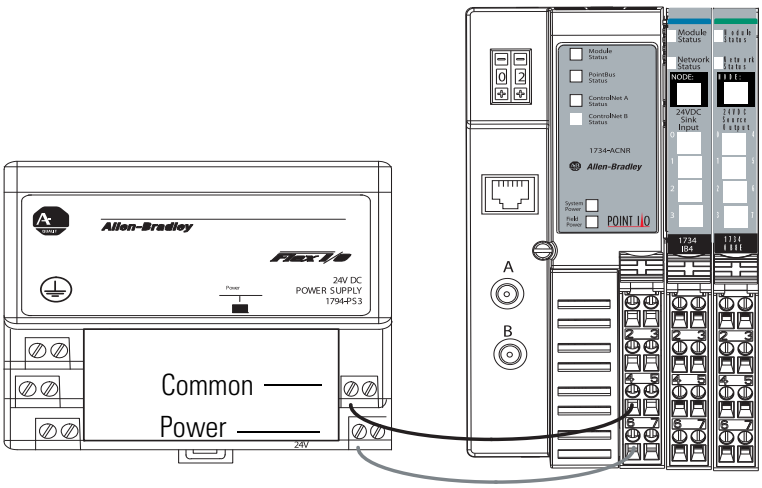


3. Connect the 120/230V AC power, 120/230V AC common and AC Ground wires.

Wire the Adapter and I/O Modules to the Power Supply

POINT I/O adapter, I/O modules, and power supply

1. Connect the 12/24V DC common and 12/24V DC power wires from the power supply to the adapter.
2. Refer to the individual POINT I/O installation instructions for wiring the I/O modules.
3. Turn on incoming power.



Additional Resources

Resource	Description
Point I/O Ethernet Adapter Installation Instructions, publication 1734-IN590	Provides details regarding installation of the adapter and technical specifications.
1734 Point I/O ControlNet Adapter Installation Instructions, publication 1734-IN582	Provides details regarding installation of the adapter and technical specifications.
Point I/O DeviceNet Adapter Installation Instructions, publication 1734-IN026	Provides details regarding installation of the adapter and technical specifications.
POINT I/O Wiring Base Assembly Installation Instructions, publication 1734-IN511	Provides details regarding installation of the POINT I/O wiring base.
Cold Junction Compensated Terminal Block Installation Instructions, publication 1734-IN583	Provides details regarding installation of the Cold Junction Compensated Terminal Block wiring base.
Point I/O Protected Output Module Installation Instructions, publication 1734-IN056	Provides details about the installation and wiring of POINT I/O Protected Output Modules.
FLEX I/O DC Power Supply Modules Installation Instructions, publication 1794-IN069	Provides details about the installation and wiring of FLEX I/O power supplies.

Notes:

Prepare the PowerFlex 70 Drive

In this chapter, you mount and wire power to a PowerFlex 70 drive. You also configure your communication adapter and make network connections.

Before You Begin

Determine which network and appropriate adapter to use on the PowerFlex 70 drive:

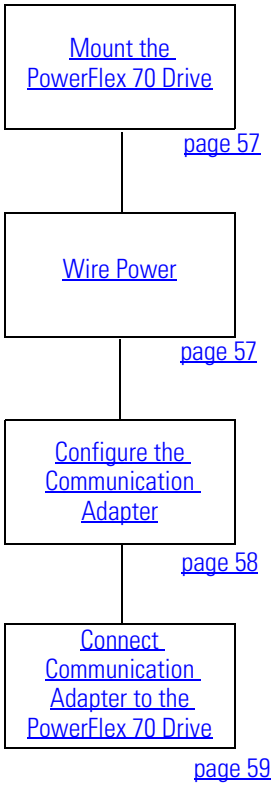
- For an EtherNet/IP network (option 1), use the 20-COMM-E module.
- For a ControlNet network (option 2), use the 20-COMM-C module.
- For a DeviceNet network (option 3), use the 20-COMM-D module.

What You Need

- PowerFlex 70 drive
- Communication adapter for use with the PowerFlex 70 drive: 20-COMM-E (EtherNet/IP adapter), 20-COMM-C (ControlNet adapter), or 20-COMM-D (DeviceNet adapter)

Follow These Steps

If you have a PowerFlex 70 drive, complete these steps.

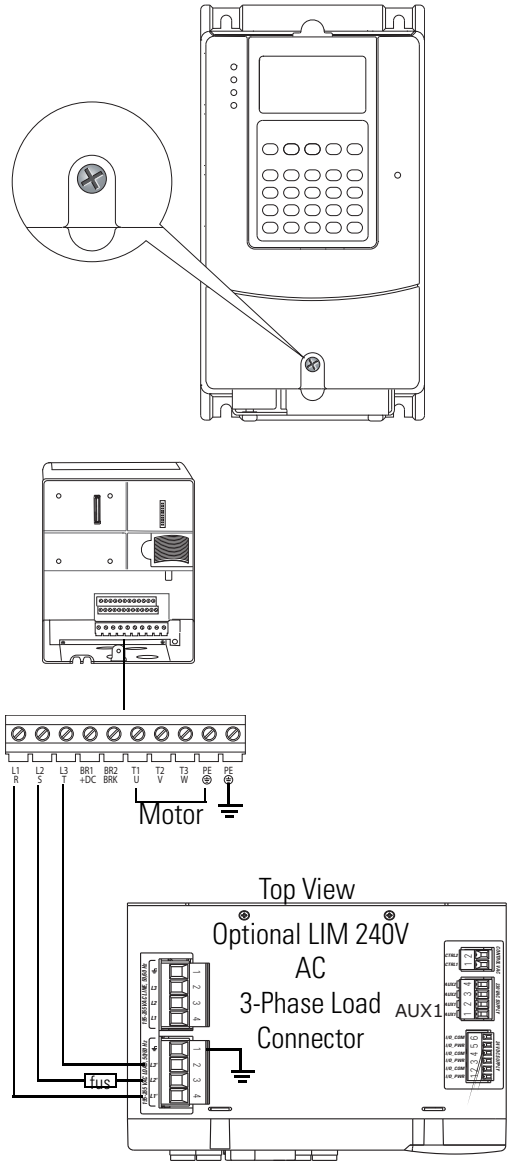


Mount the PowerFlex 70 Drive

For the purpose of this quick start, the PowerFlex 70 drive can be propped in a safe and convenient location.

For mounting instructions, see the PowerFlex 70 Drive User Manual, publication 20A-UM001.

Wire Power



WARNING

Verify that all incoming power is turned off before wiring power.

1. Loosen the screw and remove the cover.

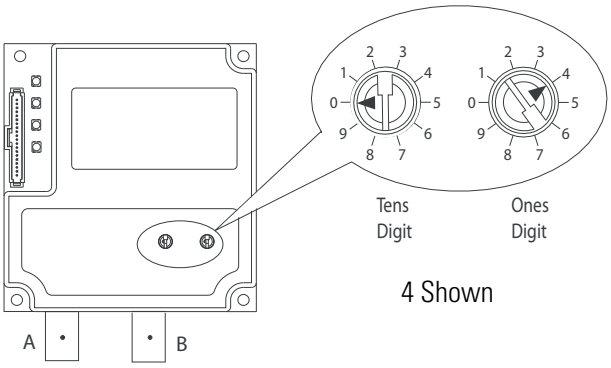
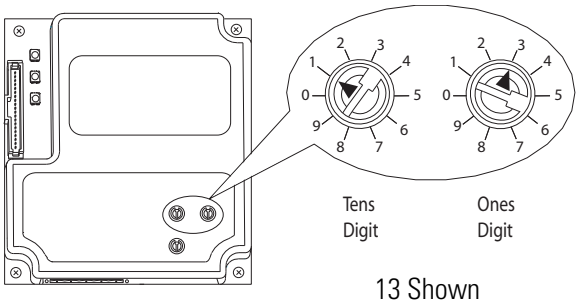
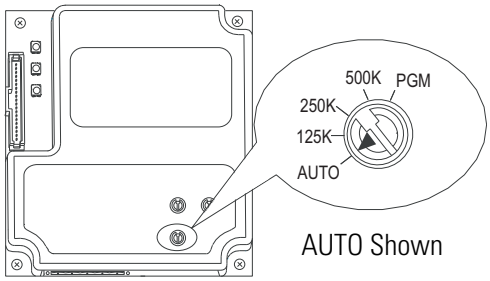
2. Loosen the screws and slide the metal plate out of the drive.

3. Connect the 120/240V AC, V AC COM and chassis ground wires to the terminal block.

Connect	To
120/240V AC	L1 R
V AC COM	L2 S
Chassis ground	PE ⏚

4. Replace the metal plate and tighten the screws.

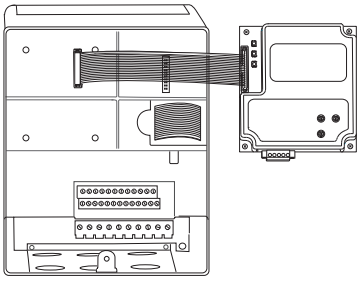
Configure the Communication Adapter

Adapter	Action	Figure
EtherNet/IP 20-COMM-E	The Ethernet address (MAC) is found on the adapter's label. Record the Ethernet address (MAC) on the Network Worksheet. This address is used to set the IP address later in the quick start.	For example: HW Address 00:00:BC:21:D7:BE
ControlNet 20-COMM-C	Set the adapter's node address. The quick start examples use node number 4.	 4 Shown
DeviceNet 20-COMM-D	1. Set the adapter's node address. The quick start examples use node number 13.	 13 Shown
	2. Set the adapter for autobaud.	 AUTO Shown

Connect Communication Adapter to the PowerFlex 70 Drive

20-COMM-D DeviceNet Adapter for DeviceNet System

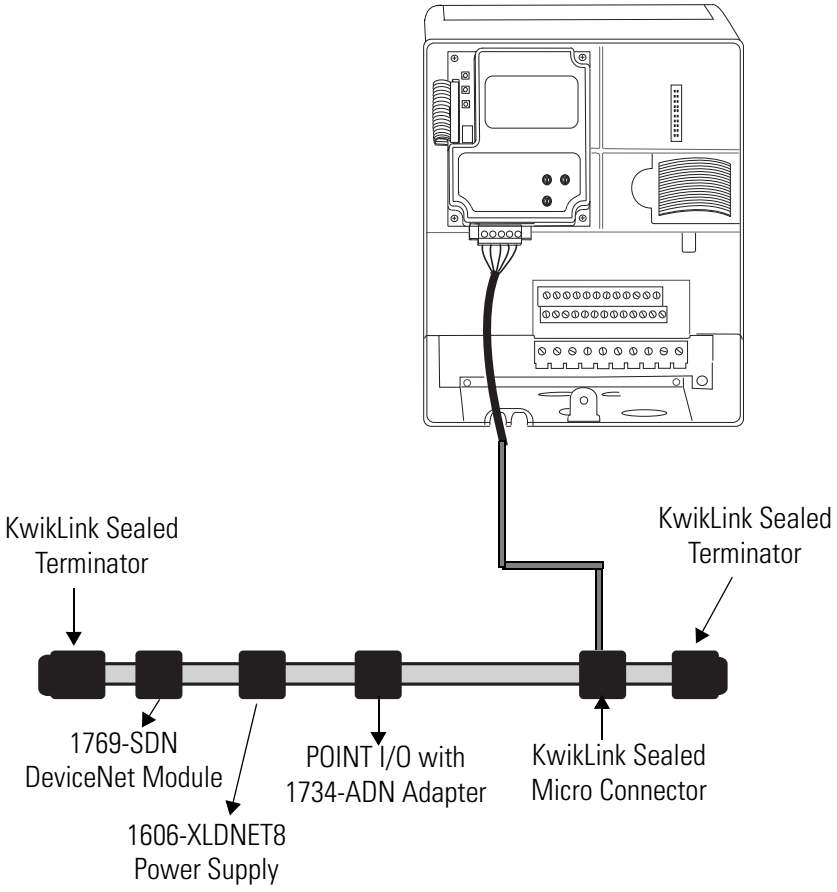
1. Connect the flat-ribbon cable between the adapter and the PowerFlex 70 drive.



2. Fold the cable under adapter without creasing and secure adapter on drive using the captive screws.
3. Remove a knockout from the bottom plate on the drive and route the DeviceNet network cable through the hole.
4. Wire the KwikLink QD Micro Cordset to the 20-COMM-D connector.

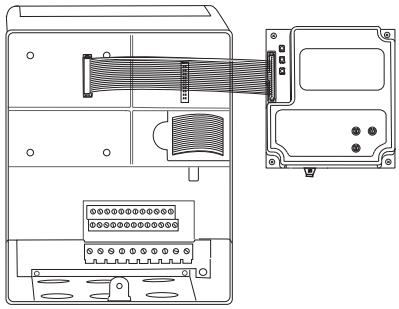
Connect	To
Red	V+
White	CAN High
Bare	Shield
Blue	CAN Low
Black	V-

5. Connect the QD Micro Cordset to a KwikLink sealed micro connector on the DeviceNet network.
6. Replace drive cover.



20-COMM-E EtherNet/IP Adapter for EtherNet/IP System

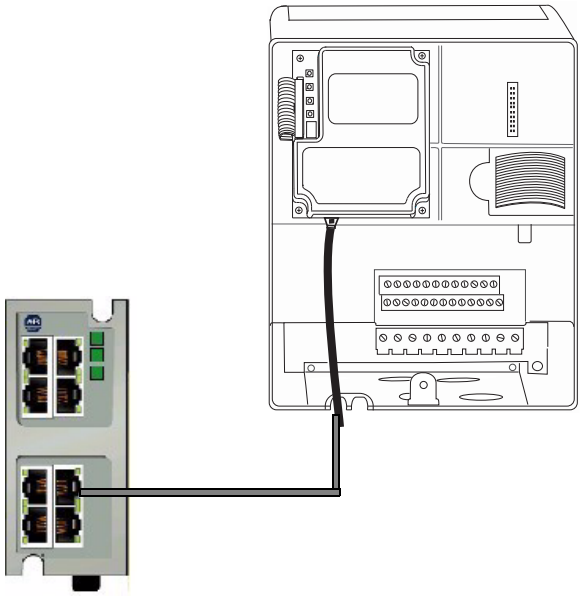
1. Connect the flat-ribbon cable between the adapter and the PowerFlex 70 drive.



2. Fold the cable under the adapter without creasing and secure the adapter on the drive using the captive screws.

3. Remove a knockout from the bottom plate on the drive route the Ethernet cable through the hole.

4. Connect a CAT5 Ethernet cable between the Ethernet adapter and the Ethernet switch.



5. Replace drive cover.

Additional Resources

Resource	Description
PowerFlex 70 User Manual, publication 20A-UM001	Provides details on how to install, program, and edit parameters for the PowerFlex 70 drive.
PowerFlex 70 EtherNet/IP Adapter User Manual, publication 20COMM-UM010	Provides details on how to install, configure, and use the adapter.
PowerFlex 70 ControlNet Adapter User Manual, publication 20COMM-UM003	Provides details on how to install, configure, and use the adapter.
PowerFlex 70 DeviceNet Adapter User Manual, publication 20COMM-UM002	Provides details on how to install, configure, and use the adapter.

Notes:

Prepare the PowerFlex 40 Drive

In this chapter, you mount and wire power to a PowerFlex 40 drive. You also configure your communication adapter and make network connections.

Before You Begin

Determine which of these networks and appropriate adapter to use:

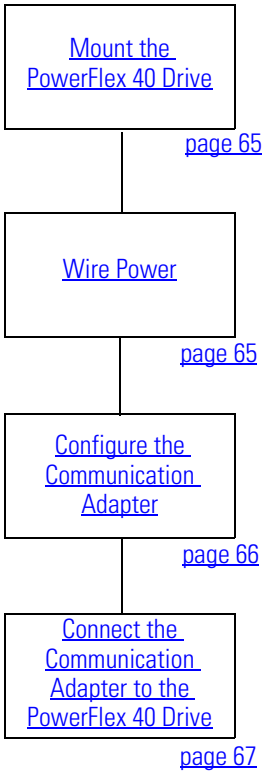
- For an EtherNet/IP network (option 1), use the 22-COMM-E.
- For a ControlNet network (option 2), use the 22-COMM-C.
- For a DeviceNet network (option 3), use the 22-COMM-D.

What You Need

- PowerFlex 40 drive
- Communication adapter for use with the PowerFlex 40 drive: 22-COMM-E (EtherNet/IP adapter), 22-COMM-C (ControlNet adapter) or 22-COMM-D (DeviceNet adapter)
- Communication adapter cover for use with the PowerFlex 40

Follow These Steps

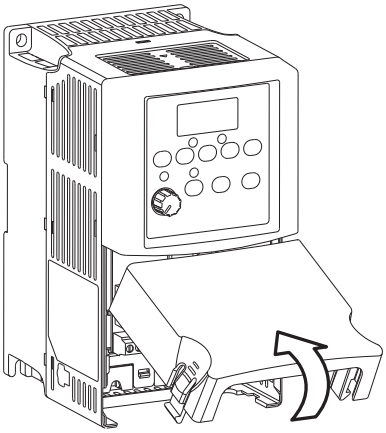
If you have a PowerFlex 40 drive, complete these steps.



Mount the PowerFlex 40 Drive

For mounting instructions, see the PowerFlex 40 Drive User Manual, publication 22B-UM001.

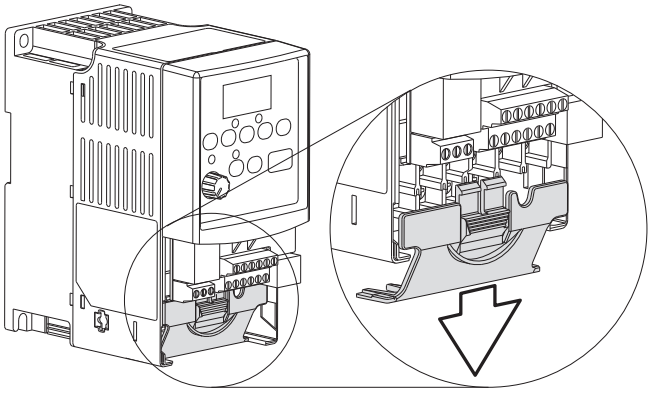
Wire Power



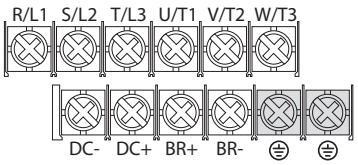
WARNING

Verify that all incoming power is turned off before wiring power.

1. Remove the cover.



2. Remove the terminal block cover to access the power connections.



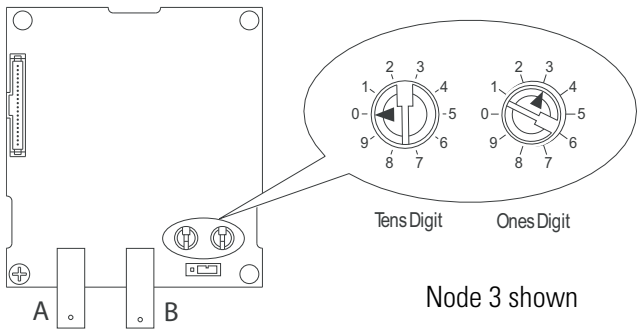
3. Insert the 120/240V AC, V AC COM and chassis ground wires and tighten the terminal screws.

Connect	To
120/240V AC	R/L1
V AC COM	S/L2
Chassis ground	⏚

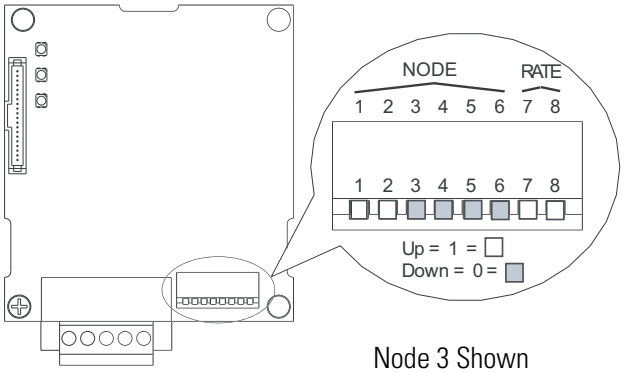
Configure the Communication Adapter

<table>
<tr><th>Adapter</th><th>Action</th><th>Figure</th></tr>
<tr><td>EtherNet/IP
22-COMM-E</td><td>The Ethernet address (MAC) is found on the adapter's label. Record the Ethernet address (MAC) on the Network Worksheet. This address is used to set the IP address.</td><td>For example:
HW Address 00:00:BC:21:D7:BE</td></tr>
<tr><td>ControlNet
22-COMM-C</td><td>Set the adapter's node address.

This example uses node number 3.

Important: The front side of the adapter (shown here) faces down when it is installed in the drive. So, in the installed position, port A is to the right of port B.</td><td> 

Node 3 shown</td></tr>
<tr><td>DeviceNet
22-COMM-D</td><td>1. Set the adapter's node address.
<table>
<tr><th rowspan="2">Node</th><th colspan="6">Switch</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr>
<tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>3</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>4</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>5</td><td>1</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>6</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr>
</table>
This example uses node number 3.

2. Set the rate to Autobaud.
<table>
<tr><th rowspan="2">Rate</th><th colspan="2">Switch</th></tr>
<tr><th>7</th><th>8</th></tr>
<tr><td>125 Kbps</td><td>0</td><td>0</td></tr>
<tr><td>250 Kbps</td><td>1</td><td>0</td></tr>
<tr><td>500 Kbps</td><td>0</td><td>1</td></tr>
<tr><td>Autobaud</td><td>1</td><td>1</td></tr>
</table></td><td> 

Node 3 Shown
Autobaud Shown</td></tr>
</table>

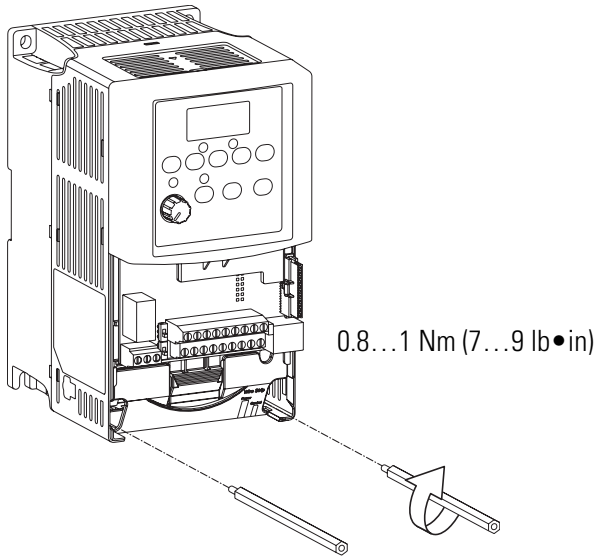
Connect the Communication Adapter to the PowerFlex 40 Drive

22-COMM-E, 22-COMM-C, 22-COMM-D adapter

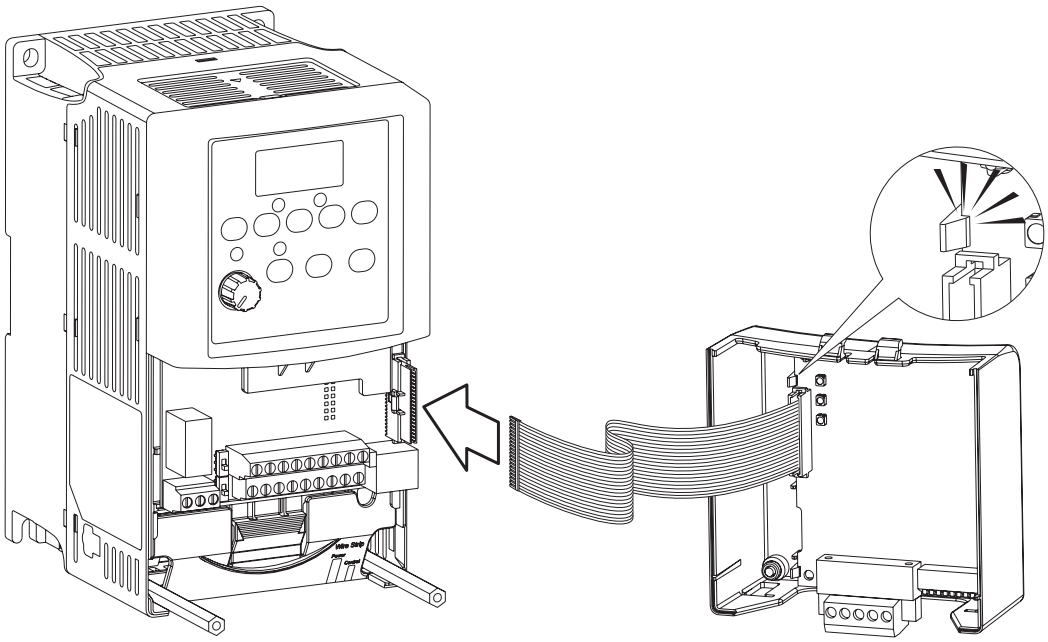
1. If you are using a DeviceNet network, remove the terminal block connector from the 22-COMM-D adapter and connect the DeviceNet cable to the terminal block.

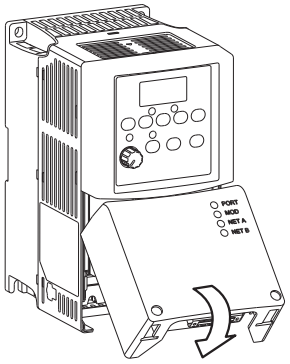
Connect	To
Red	V+
White	CAN High
Bare	Shield
Blue	CAN Low
Black	V-

2. For all adapters, attach the extending screws.



3. Snap the adapter into the cover and connect the cable from the adapter to the PowerFlex 40 drive.



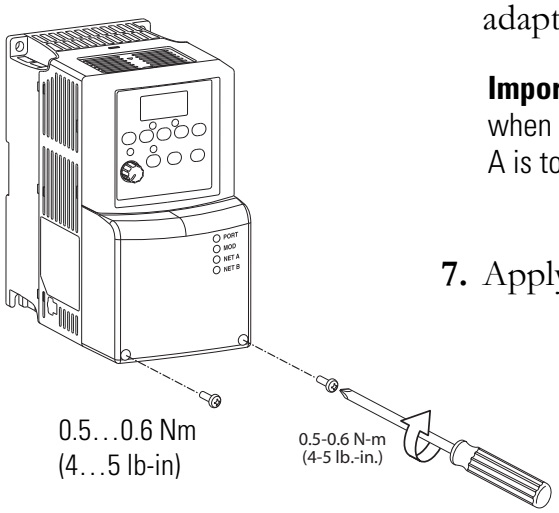


4. Place the adapter cover on the PowerFlex.

5. Tighten the screws.

6. For all networks, connect the network cable to the adapter.

Important: The front side of the ControlNet adapter faces down when it is installed in the drive. So, in the installed position, port A is to the right of port B.



7. Apply power to the PowerFlex 40 drive.

Additional Resources

Resource	Description
PowerFlex 40 Adjustable Frequency AC Drive User Manual, publication 22B-UM001	Provides details on how to install, program, and edit parameters for the PowerFlex 40 drive.
PowerFlex 40 EtherNet/IP Adapter User Manual, publication 22COMM-UM004	Provides details on how to install, configure, and use the adapter.
PowerFlex 40 ControlNet Adapter User Manual, publication 22COMM-UM006	Provides details on how to install, configure, and use the adapter.
PowerFlex 40 DeviceNet Adapter User Manual, publication 22COMM-UM003	Provides details on how to install, configure, and use the adapter.

Notes:

Prepare the PanelView Plus Terminal

In this chapter, you mount and wire power to a PanelView Plus terminal. You also configure network communication and make network connections.

Before You Begin

Determine which network connection to use: EtherNet/IP, ControlNet, or serial.

Regardless of which CompactLogix controller you use, you need to connect to the PanelView Plus terminal via an EtherNet/IP network for initial configuration, via a cross-over cable or an Ethernet switch.

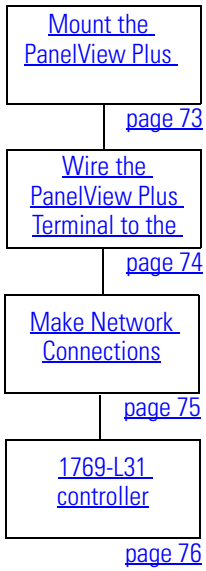
What You Need

- PanelView Plus terminal
- For a ControlNet network (option 2), use a PanelView Plus ControlNet interface module
- One power supply, either a 1794-PS3 or a 2711P-RSACDIN
- Ethernet cable and switch or Ethernet cross-over cable
- For a serial connection (option 3), 2706-NC13 cable

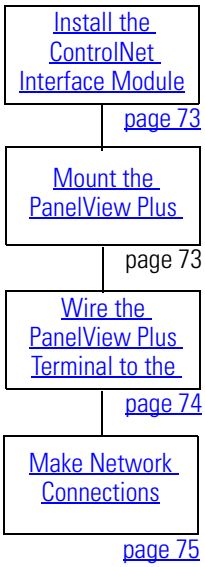
Follow These Steps

If you have a PanelView Plus terminal, complete these steps for your network.

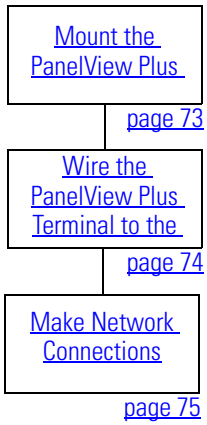
EtherNet/IP



ControlNet



Serial



Install the ControlNet Interface Module

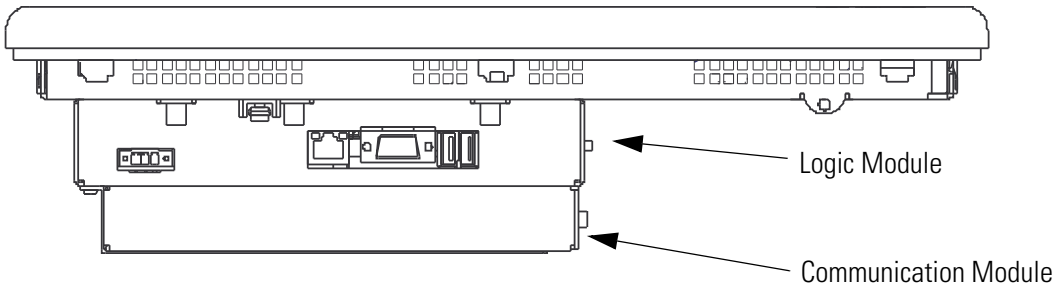
ControlNet only

1. Remove the label covering the communication module connector on the logic module.

2. Position the communication module over the logic module so the connectors align.

3. Push down on the communication module until connectors are firmly seated.

4. Tighten the 4 screws that secure the communication module to the logic module.



Mount the PanelView Plus Terminal

2711P-K10C4D1 terminal and all controllers

For the purpose of this quick start, the PanelView Plus can be propped on a desktop.

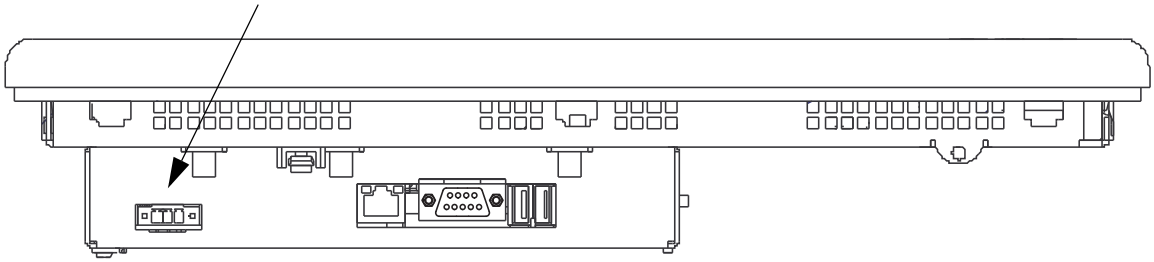
For mounting instructions, see the PanelView Plus Terminals User Manual, publication 2711P-UM001.

Wire the PanelView Plus Terminal to the Power Supply

WARNING

Verify that all incoming power is turned off before wiring power.

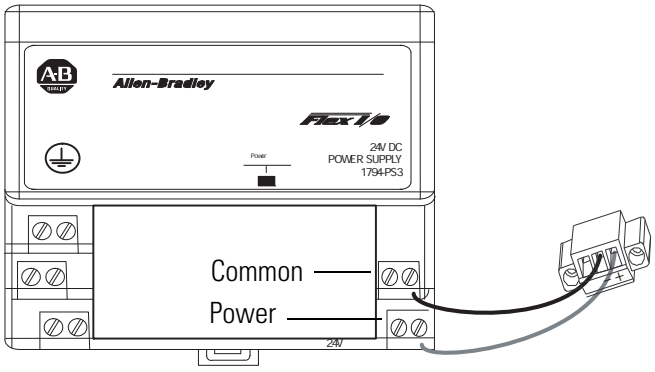
1. Remove the terminal block from the PanelView Plus terminal.



2. Connect the 12/24V DC common and 12/24V DC power wires from the power supply to the terminal block, - (common) and + (power).

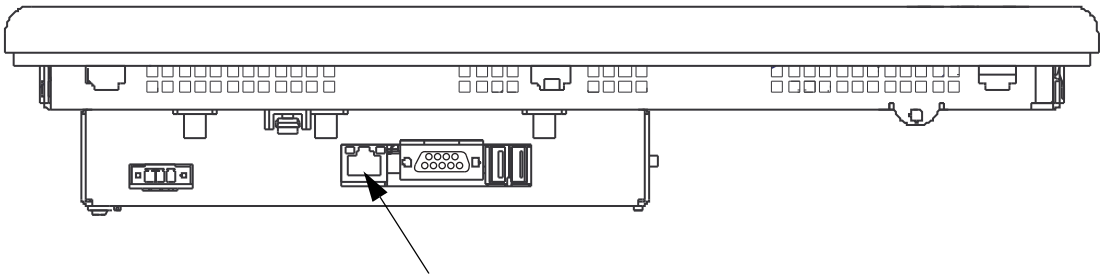
3. Connect the terminal block to the PanelView Plus.

4. Turn on incoming power.



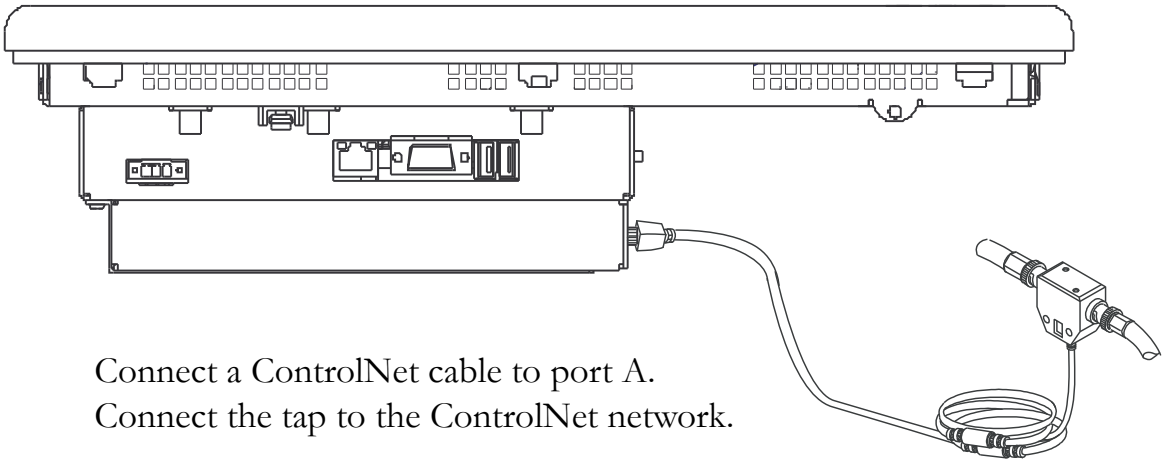
Make Network Connections

Required for all controllers



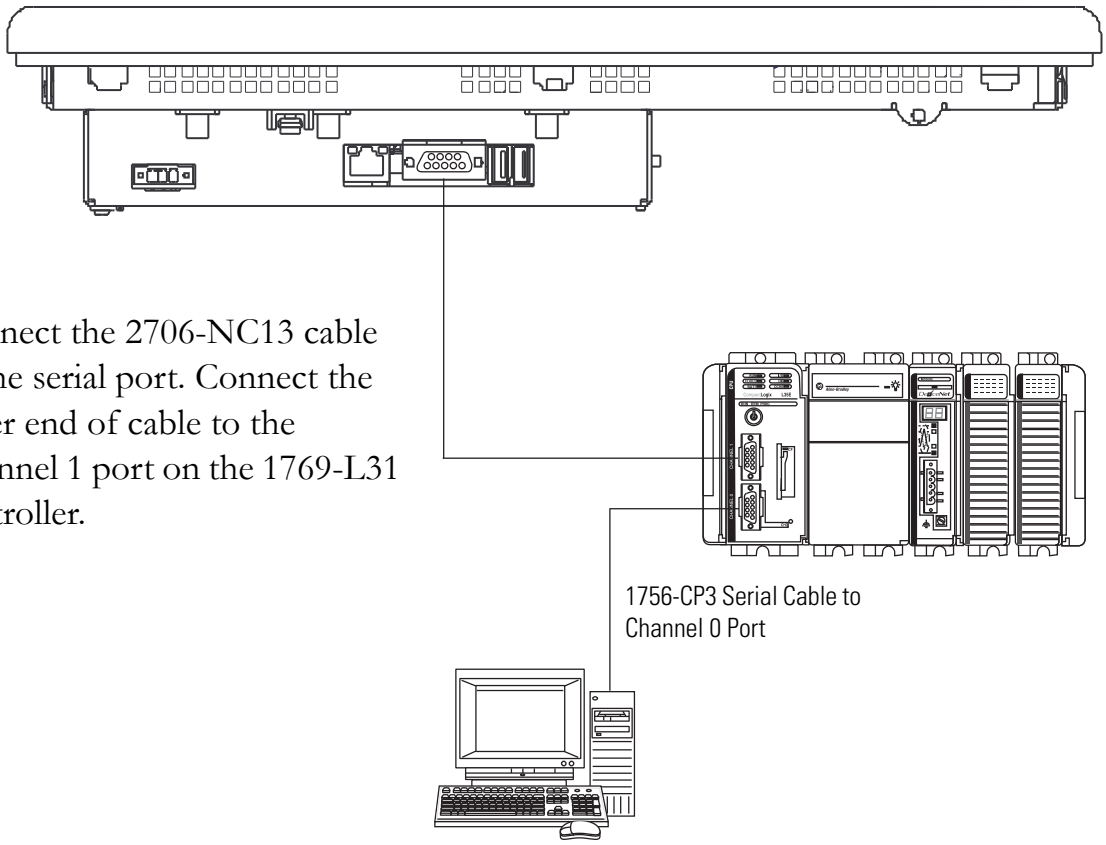
Connect an Ethernet cable.
Connect the other end of the cable to an Ethernet switch.

1769-L32C or 1769-L35CR controllers



Connect a ControlNet cable to port A.
Connect the tap to the ControlNet network.

1769-L31 controller



Connect the 2706-NC13 cable to the serial port. Connect the other end of cable to the Channel 1 port on the 1769-L31 controller.

Assign an IP Address

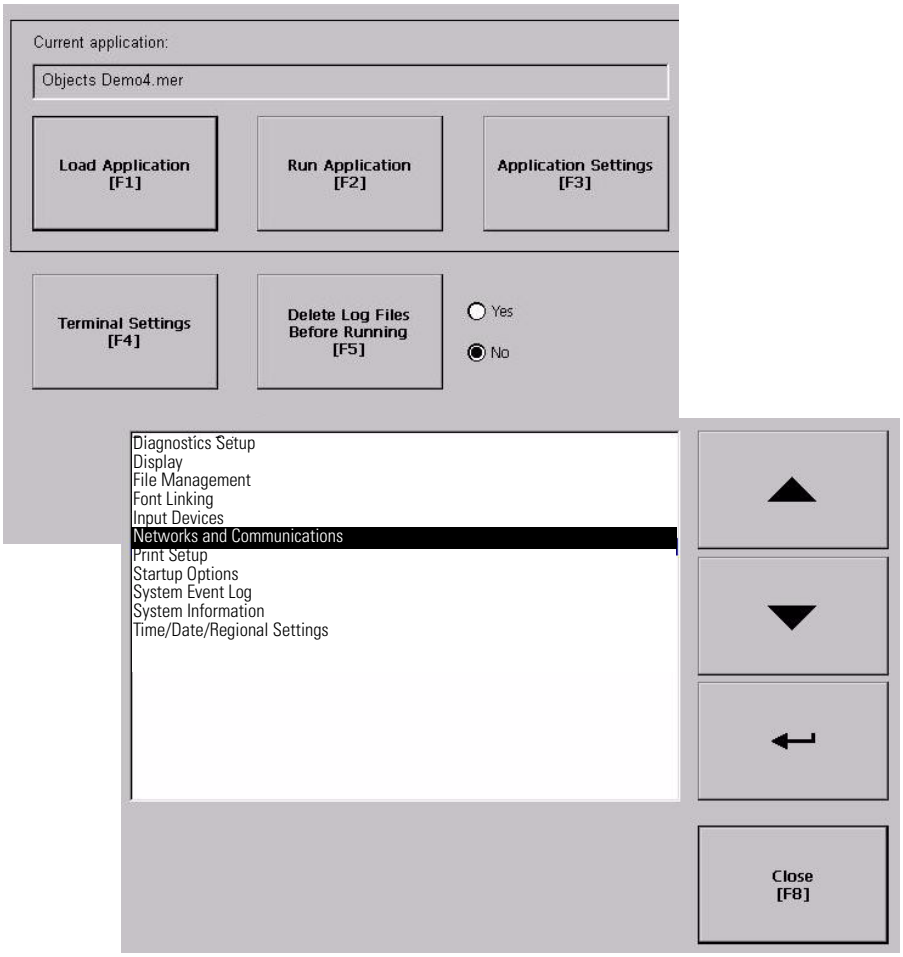
Required for all Ethernet/IP System

1. Apply power to the PanelView terminal.

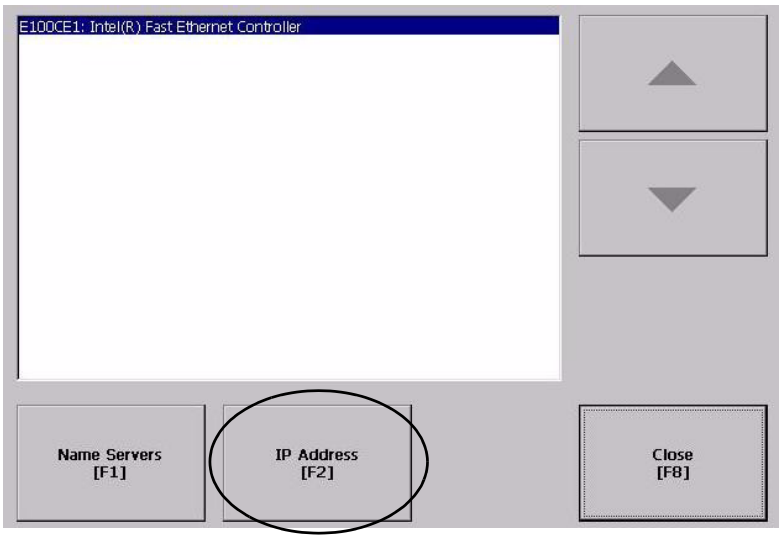
2. On the initial PanelView configuration screen, select Terminal Settings [F4].

3. Navigate to Built-in Ethernet Controller by selecting the path shown.

   Networks and Communications
   ↓
   Network Connections
   ↓
   Network Adapters
   ↓
   Built-in Ethernet Controller



4. Select IP Address [F2].



5. Select IP Address [F1].

a. Enter an IP address in the input panel.

b. Press Enter.

c. Record IP address in Appendix A.

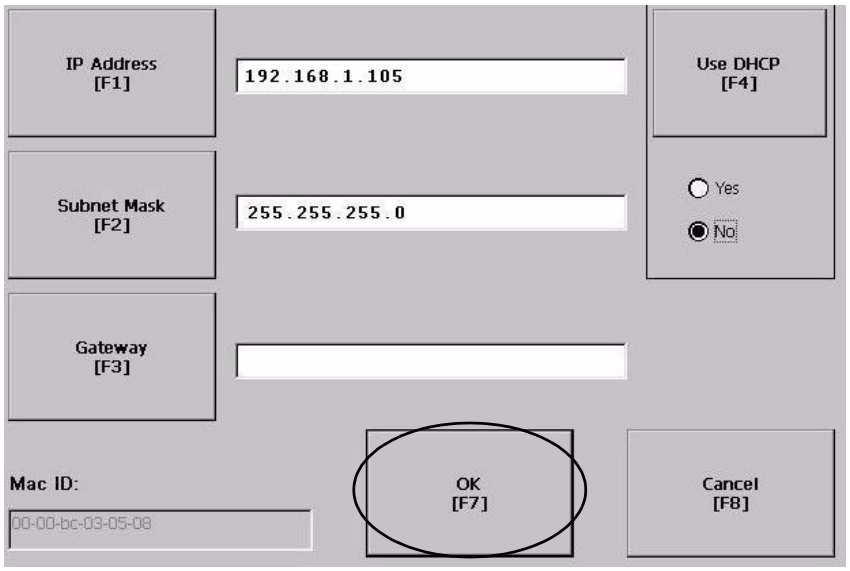
For information on IP addresses, see Chapter 7.

6. Select Subnet Mask [F2].

a. Enter the subnet mask you wrote on the Network Worksheet.

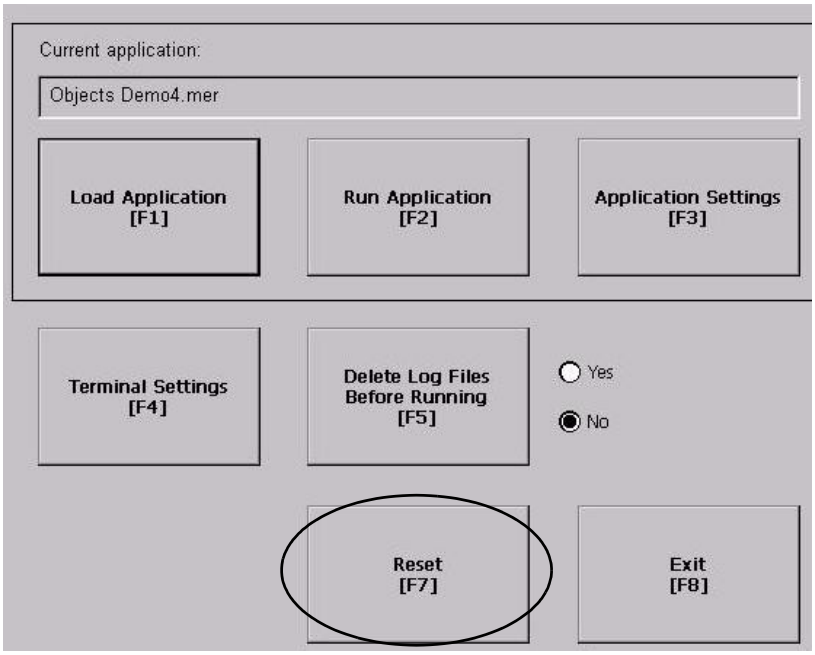
b. Press Enter.

7. Select OK [F7] to save settings, then OK [F7] again to acknowledge reset message.



8. Select Close [F8] until you return to the initial configuration screen.

9. Select Reset [F8] to reset the terminal, then Yes [F7] to confirm.



Additional Resources

Resource	Description
PanelView Plus Terminals User Manual, publication 2711P-UM001	Provides details on how to install, program, and edit parameters for the PowerFlex 70 drive.

Configure the EtherNet/IP Network

In this chapter, you assign IP addresses to devices on an EtherNet/IP network.

Before You Begin

- Prepare the computer, see Chapter 2
- Install all hardware, see Chapters 1–6

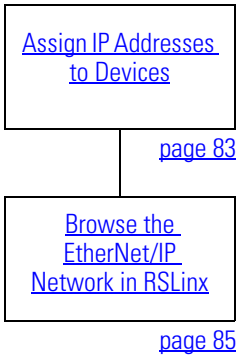
  If you connect all of the devices, including the computer, through an Ethernet switch, you can create an isolated network. This chapter assumes you are using an isolated network. If you are not, contact your network administrator to obtain IP addresses.
- Verify that power is applied to all devices.

What You Need

- The computer needs a Network Interface Card (NIC) and its associated Windows driver installed (the NIC and driver are standard on most computers).
- BOOTP/DHCP utility, such as the one that ships on the RSLogix 5000 programming software CD.
- An Ethernet Address (MAC) for each device. You recorded these addresses in the Network Worksheeton the back cover.
- An IP Address for each device. If you are on an non-isolated network, obtain these addressed from your network administrator. If you are on an isolated network, determine a numbering convention for your IP addresses. Record these addresses in the Network Worksheet on the backcover.
- You do not need to assign an IP address to the PanelView Plus terminal, it was already assigned in Chapter 6.

Follow These Steps

If you have an EtherNet/IP network, complete these steps.



Terminology

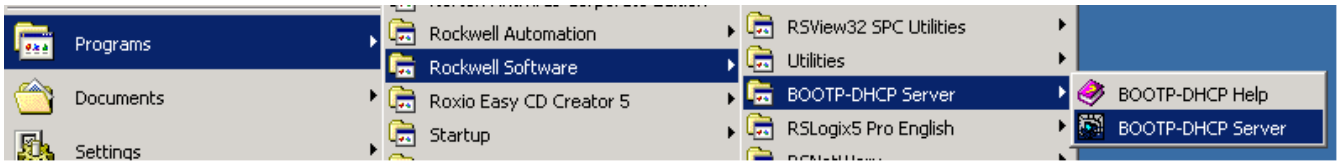
Ethernet networks use these types of addresses:

Term	Definition
Ethernet Address	Each Ethernet device has a unique Ethernet address (sometimes called a MAC address). The address appears as twelve digits separated by colons (for example, xx:xx:xx:xx:xx:xx). It is usually on a label on the device itself. Each digit is a number in hexadecimal (0 to 9 or A to F). No other device in the world will have the same address, and it can not be changed. You use the Ethernet address to identify a device so you can assign it an IP address.
IP Address	In addition to the Ethernet address, an IP address identifies a node on an Ethernet network. The IP address can be manually set. or you can use special software to automatically assign it. An IP Address consists of four decimal integers separated by periods (xxx.xxx.xxx.xxx). Each xxx is a decimal value from 0 to 255. For example, an IP Address could be 192.168.0.1. The selection of IP Addresses is beyond the scope of this quick start, so please contact your network administrator or use the ones provided in the examples. Once you set an IP address for a device, you generally reference the device by its IP address. The examples in this quick start use IP Addresses to define communication paths to the devices.

Assign IP Addresses to Devices

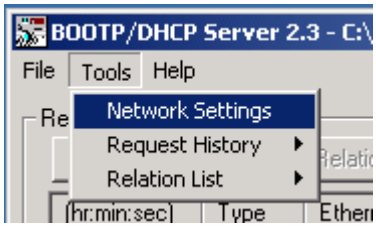
This step assigns IP addresses to all of the devices in your system, except for the PanelView Plus terminal. The IP address for the PanelView Plus terminal was assigned during installation (see Chapter 6).

1. Launch the BOOTP/DHCP Server utility.



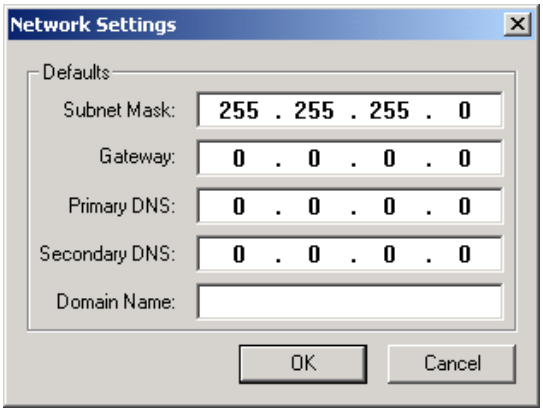
The BOOTP/DHCP Server utility is used to assign IP addresses to most of the devices in this quick start.

2. From the Tools menu, choose **Network Settings**.



3. Enter the Subnet Mask from the Network Worksheet.

4. Click **OK**.



TIP

Devices on the EtherNet/IP network broadcast requests for IP addresses until the IP addresses have been assigned.

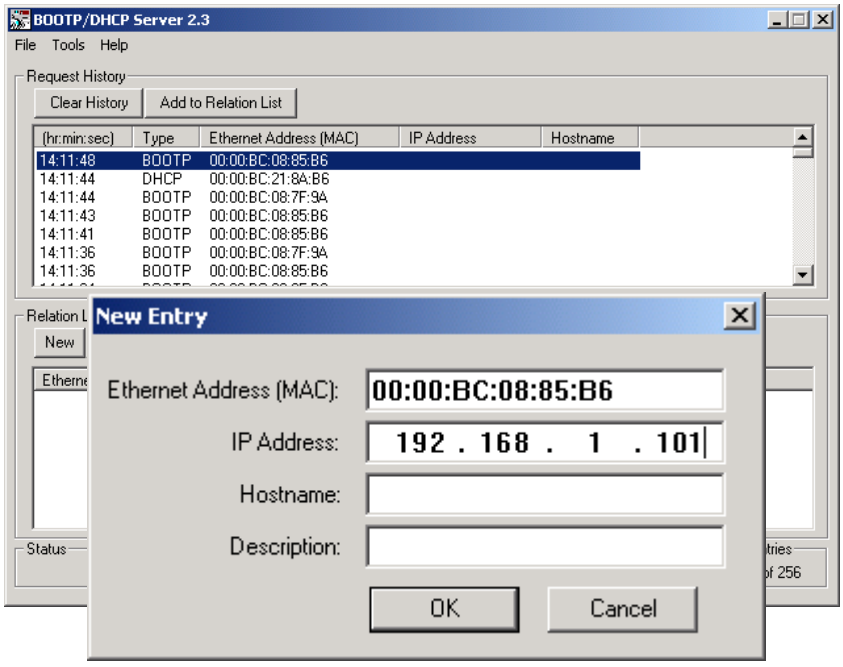
The procedure in this chapter uses the BOOTP Server packaged with RSLogix 5000 programming software to assign IP addresses, however, any industry-standard BootP server will work.

The Request History displays all the devices on your network that need IP addresses. The Ethernet address (MAC) corresponds with the addresses recorded on Network Worksheet.

5. Double-click a request from one of the devices.

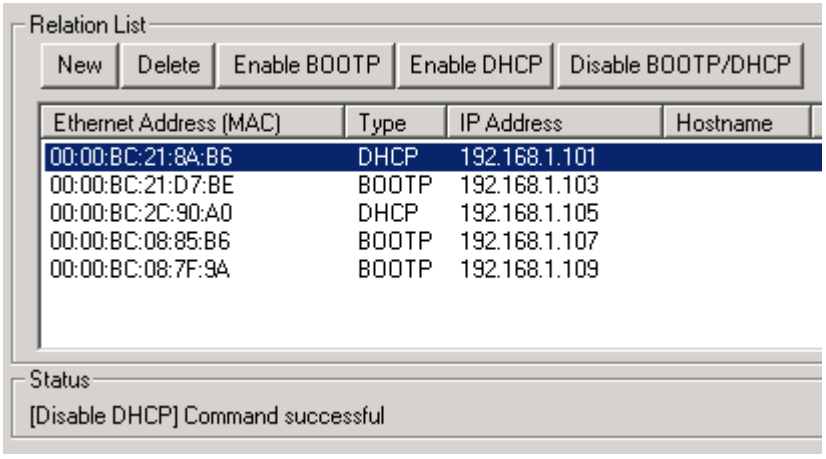
6. Enter the corresponding IP address that you selected from the Network Worksheet.

   If you are not using an isolated network, obtain these numbers from your network administrator.



7. Repeat steps 5 and 6 for all devices, except the PanelView Plus terminal (the IP address for the PanelView Plus terminal was set in Chapter 6).

   If a device is power cycled, it will not retain its IP address unless you disable BOOTP/DHCP.



8. Select the first device in the Relation List and click **Disable BOOTP/DHCP**.

   [Disable BOOTP/DHCP] Command successful appears in the Status bar.

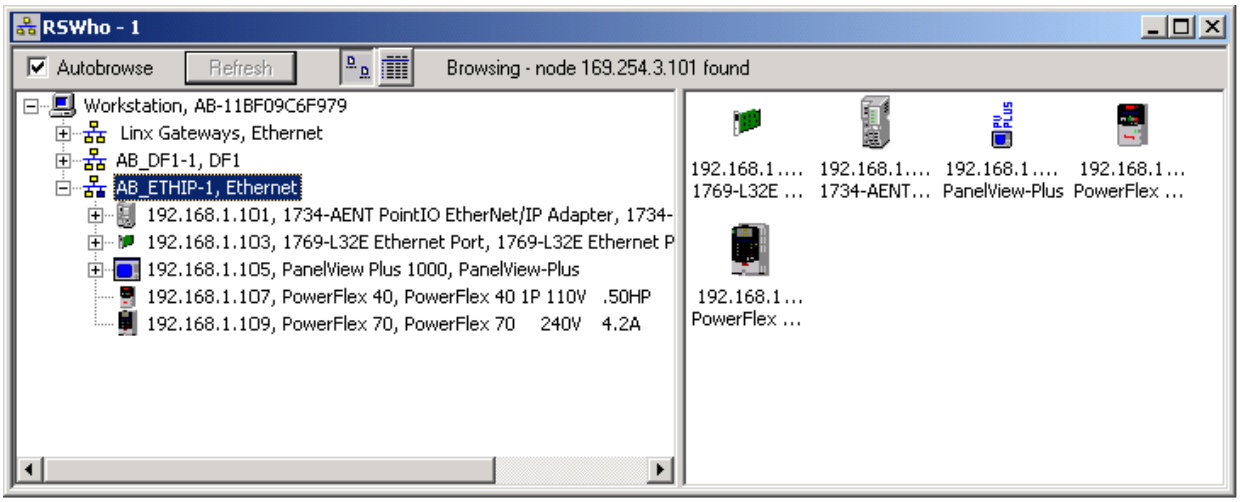
9. Repeat step 8 for all devices, except the PanelView Plus.

10. Close the BOOTP/DHCP Server utility.

    If you are prompted to save changes, click **No**.

Browse the EtherNet/IP Network in RSLinx

Click the RSWho button to view the EtherNet/IP driver and devices.



Additional Resources

Resource	Description
EtherNet/IP Modules in Logix5000 Control Systems, publication ENET-UM001	Provides details regarding the installation, configuration, and operation of EtherNet/IP modules.
Tech Note # E47839422 available at: http://www.rockwellautomation.com/knowledgebase/	Provides a description of a common Comms error dialog and its solution.

Notes:

Configure the ControlNet Driver

In this chapter, you configure the ControlNet driver for your computer so you can program over a ControlNet network.

Before You Begin

- Prepare the computer, see Chapter 2.
- Install all hardware, see Chapters 1-6.
- Connect the computer, controller and all other ControlNet devices to a ControlNet network. This example uses BNC coaxial connectors to connect the taps and a terminating resistor at each end.
- Verify that power is applied to all devices.

What You Need

- RSNetWorx for ControlNet
- A 1784-PCIC or 1784-PCICS card and associated driver installed on your computer

Follow These Steps

If you have a ControlNet network, complete this step.

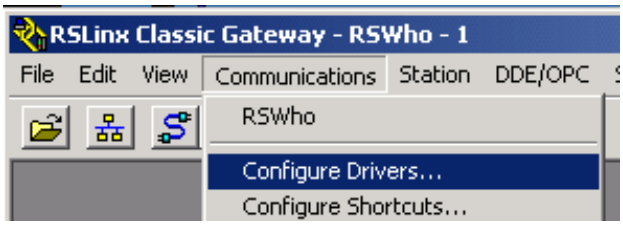
Configure the ControlNet Driver in RSLinx
page 88

Configure the ControlNet Driver in RSLinx

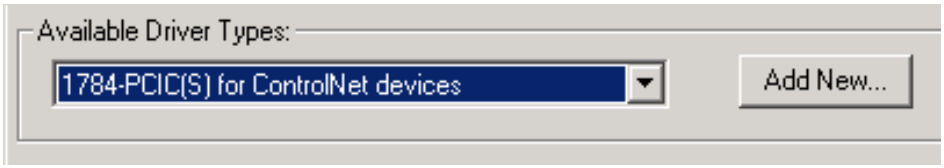
RSLinx software

1. Launch RSLinx software.

2. From the **Communications** menu, choose **Configure Drivers**.

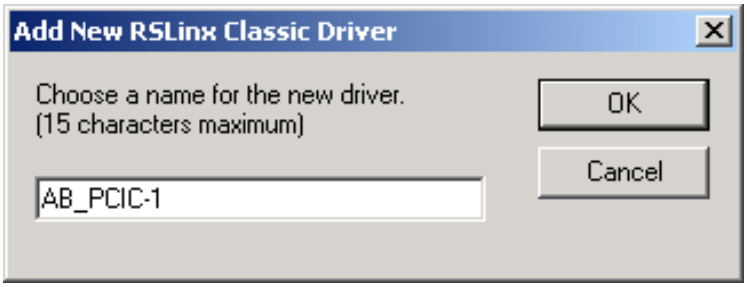


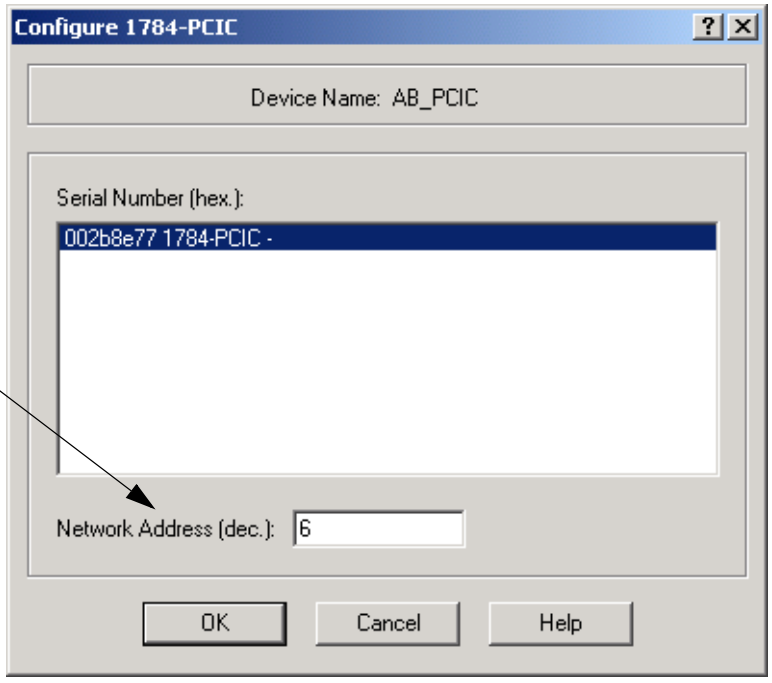
3. From the Available Driver Types pull-down menu, choose **1784-PCIC(S) for ControlNet devices**.



4. Click **Add New**.

5. Click **OK** to keep the default name.





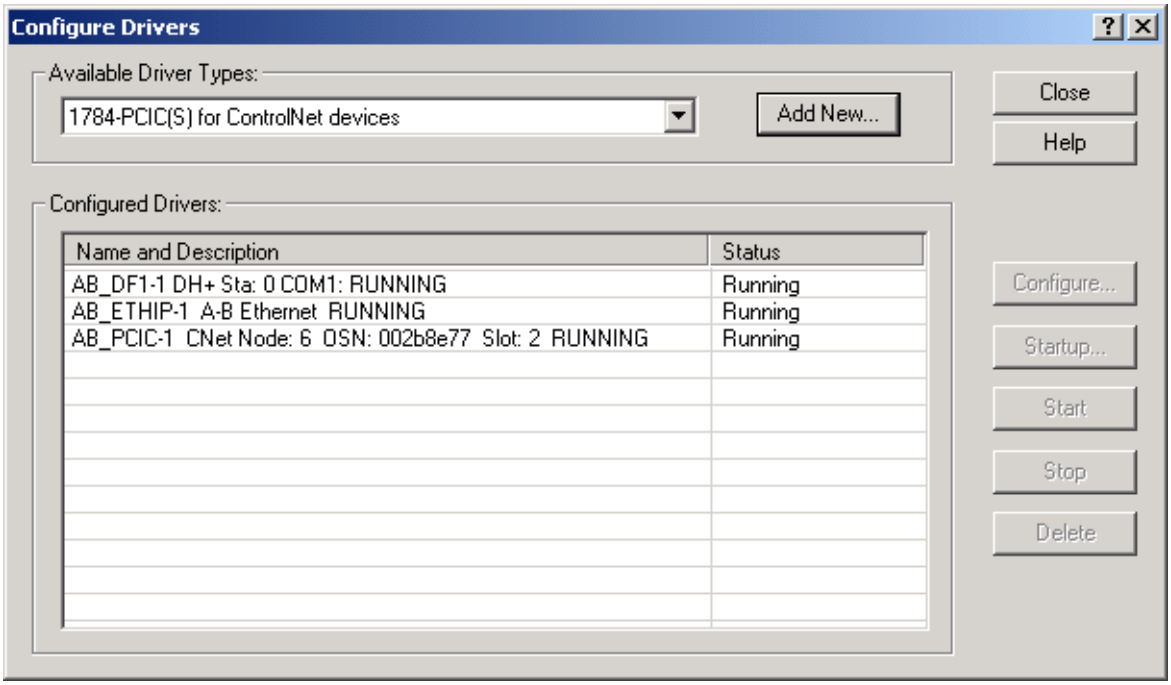
6. Enter an available ControlNet node address for the PCIC card.

   This example uses node addresses between 1 and 10 because it is a small ControlNet Network.

7. Click **OK**.

   The ControlNet driver is added to the Configured Drivers list.

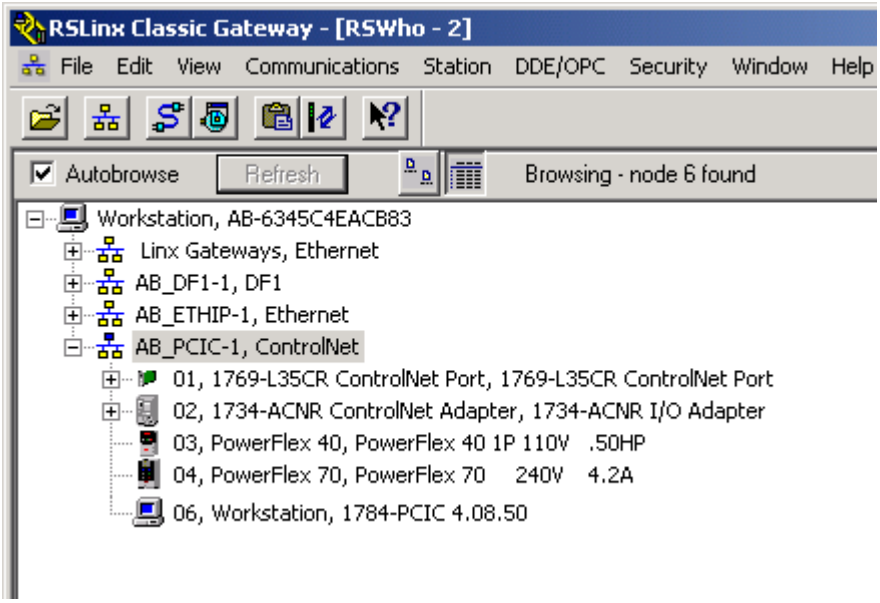
8. Verify that the driver's Status is Running, and click **Close**.



9. Click RSWho to view the driver.

10. Expand the driver to view the devices on your ControlNet network.

    The PanelView Plus terminal does not appear because you have not set the node address yet. The node address is set in Chapter 14.



Additional Resources

Resource	Description
ControlNet Modules in Logix5000 Control Systems, publication CNET-UM001	Provides details regarding the installation, configuration, and operation of ControlNet modules.

Configure the DeviceNet Network

In this chapter, you configure the DeviceNet node address for the 1769-SDN module. You also create the RSNetWorx for DeviceNet file that stores network configuration.

Before You Begin

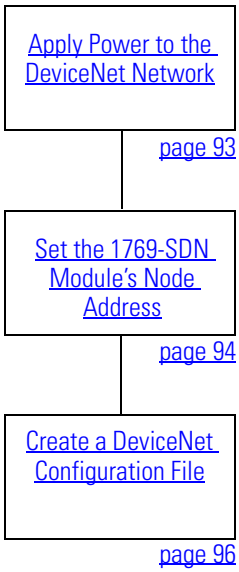
- Prepare the computer, see Chapter 2.
- Install all hardware, see Chapters 1–6.
- Connect the 1769-SDN module, the 1734-ADN adapter and the PowerFlex drives to a DeviceNet network.
  This example uses KwikLink right-angle male cables with sealed micro connectors connected to flat cable with terminator/resistors on each end.
- Verify that power is applied to all devices.

What You Need

- Power supply and tap for the DeviceNet network.
  This example uses the 1606-XLDNET8 and a KwikLink power tap module.
- RSNetWorx for DeviceNet software.

Follow These Steps

If you have a DeviceNet network, complete these steps.



Apply Power to the DeviceNet Network

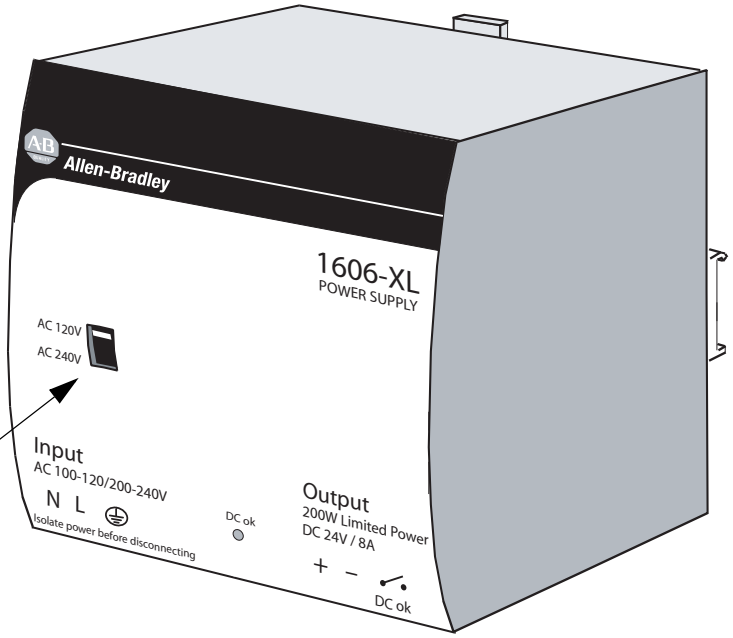
1606-XLDNET8 power supply

WARNING

Verify that all incoming power is turned off before wiring power.

1. Connect incoming power to the power supply.

Connect	To
V AC COM	N (neutral)
120/240V AC	L (line)
Ground	⏚



2. Place the switch in the position that matches your supply voltage.

3. Connect the DeviceNet power tap to the power supply.

Connect	To
Red	+
White	N/A
Shield	N/A
Blue	N/A
Black	–

For this example, there is no need to connect the DC ok relay on the power supply to anything.

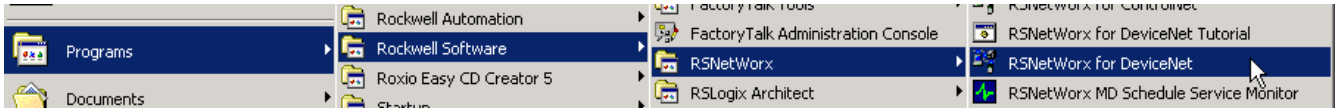
4. If you have unused DeviceNet wires, make sure they do not come into contact with the other wires.

5. Connect the DeviceNet power tap to the DeviceNet network.

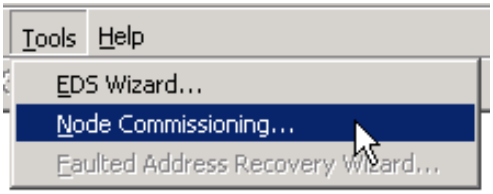
6. Turn on incoming power.

Set the 1769-SDN Module's Node Address

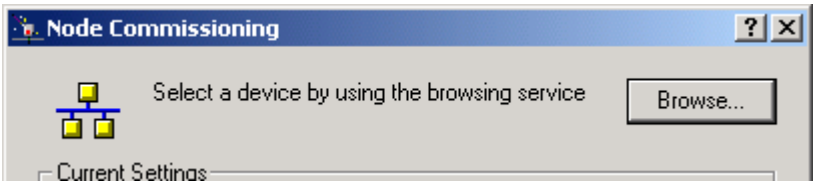
1. Launch RSNetWorx for DeviceNet software.



2. From the **Tools** menu, choose **Node Commissioning**.



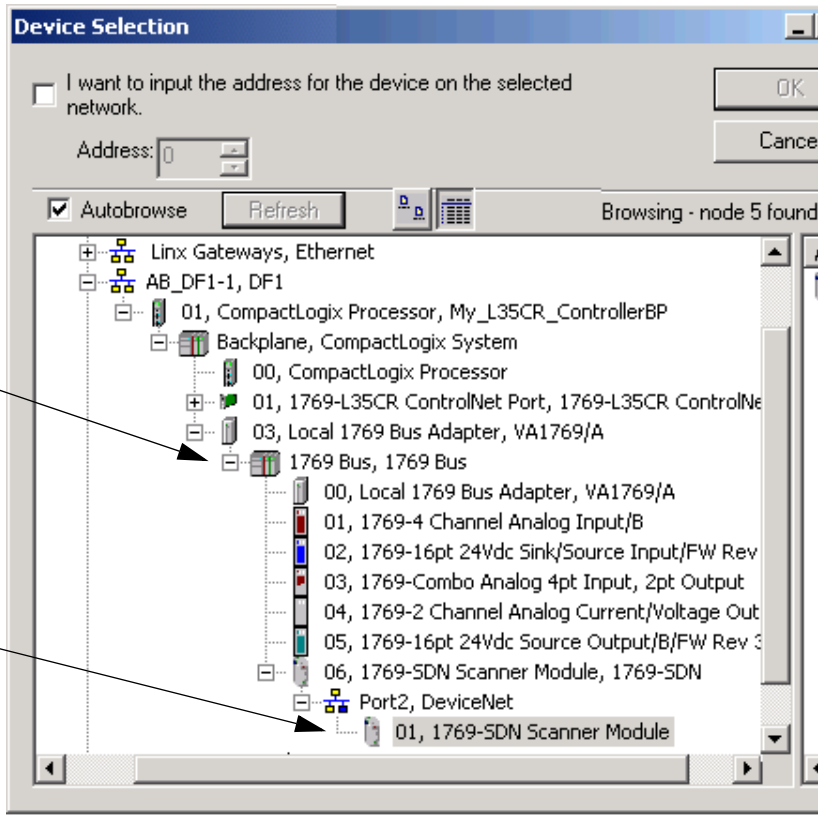
3. Click **Browse**.



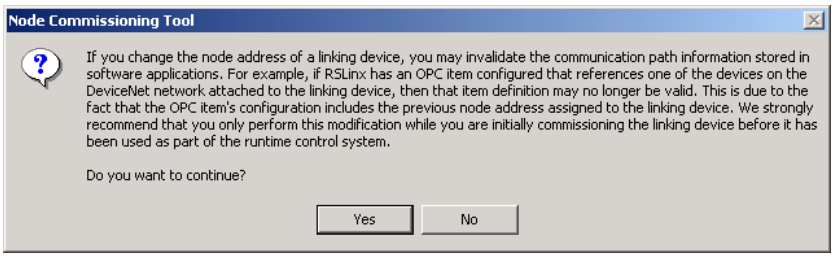
4. Under AB_DF1-1, expand the CompactLogix Backplane and the 1769 Bus.

5. Expand the 1769-SDN and the DeviceNet Port, and select the **1769-SDN**.

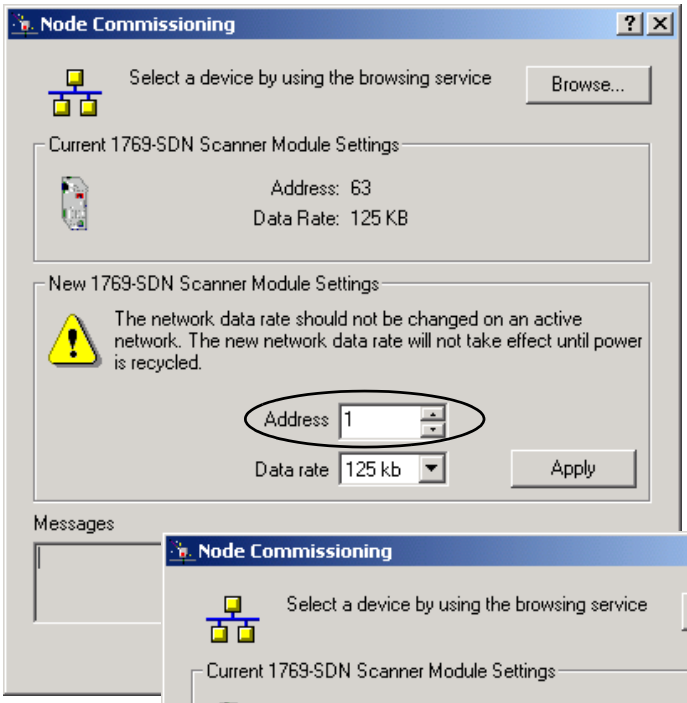
6. Click **OK**.



7. If you receive a linking device warning, click **Yes**.

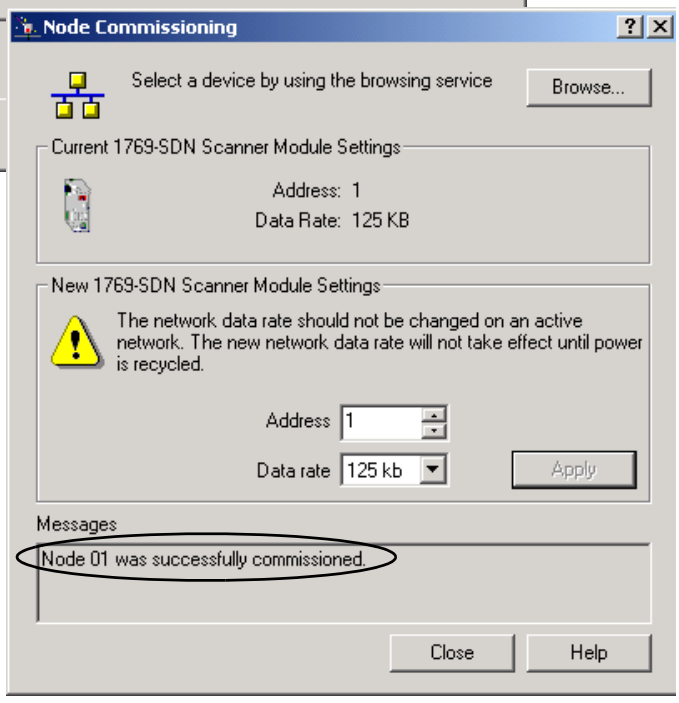


The Node Commissioning dialog is populated with the 1769-SDN module's current settings.



8. Select 1 for the node Address of the 1769-SDN and click Apply.

The Address is applied and is confirmed in the Messages box.

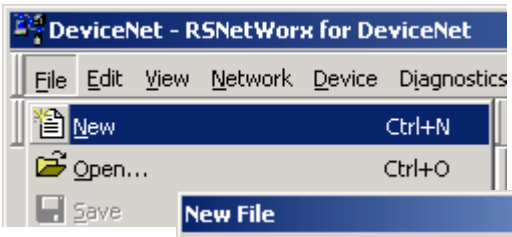


9. Record the node address on the Network Worksheet.

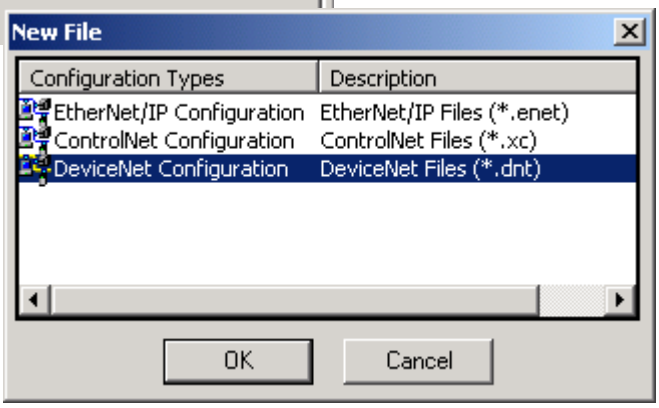
10. Click **Close**.

Create a DeviceNet Configuration File

1. From the File menu, select **New**.



2. Select **DeviceNet Configuration** and click **OK**.



3. Click Who Active to go online.

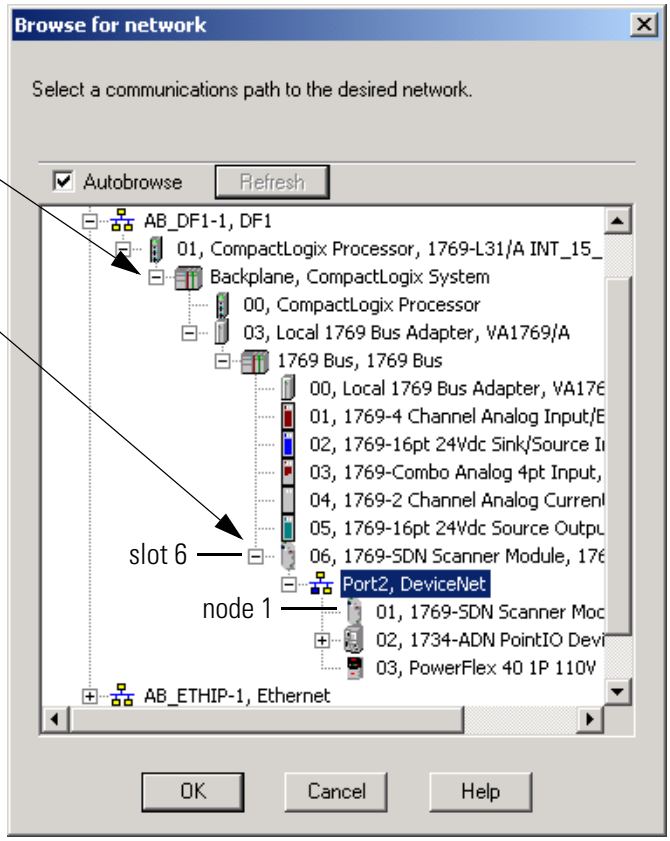
4. Under AB_DF1-1, expand the CompactLogix Backplane and the 1769 Bus.

5. Expand the 1769-SDN and the DeviceNet Port.

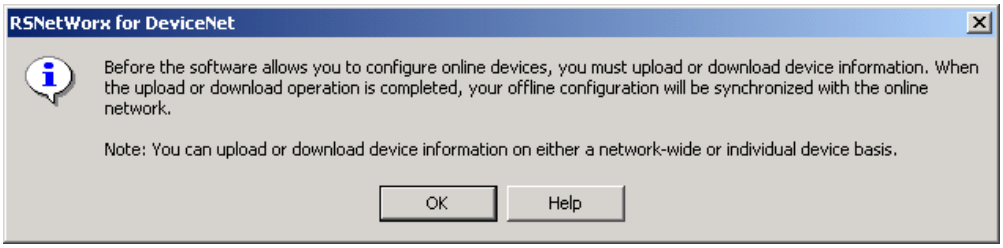
6. Record the 1769-SDN module's slot number on the Network Worksheet.

   In this example, the 1769-SDN module is in slot 6 of the 1769 Bus and is in node 1 on the DeviceNet network.

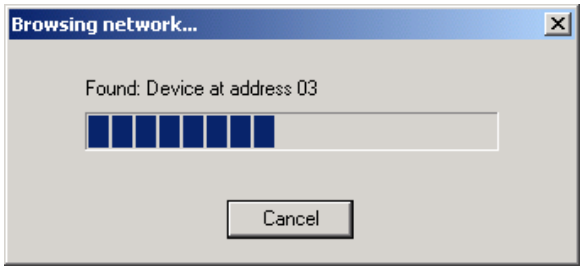
7. Select Port2, DeviceNet and click **OK**.



8. Click **OK**.



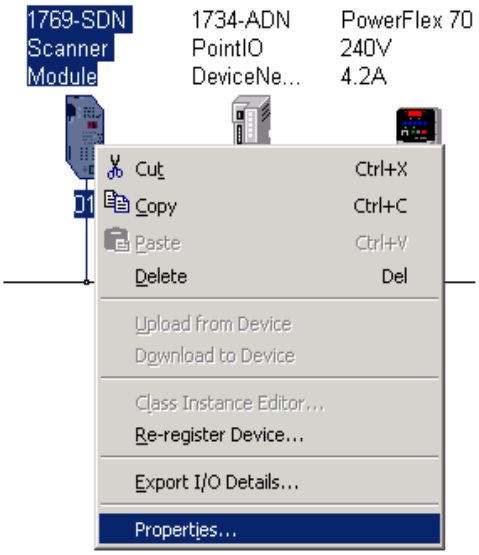
RSNetWorx software begins browsing the network.



TIP Once all of the devices on your DeviceNet network appear, you can click Cancel.

If your PowerFlex drive does not display, see Uploading an EDS File From a Drive, Knowledgebase ID 20539.

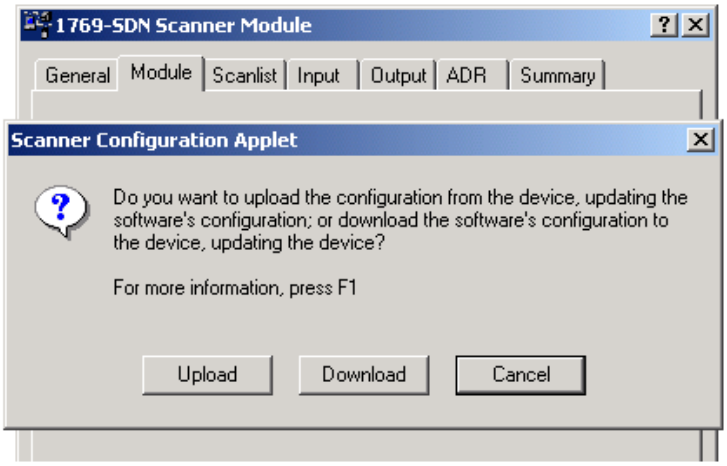
9. Right-click the 1769-SDN module and choose **Properties**.



10. Click the **Module** tab.

11. Click **Download**.

This clears all configuration from the 1769-SDN module, synching the software with the device.



12. From the **Platform** pull-down menu, select CompactLogix.

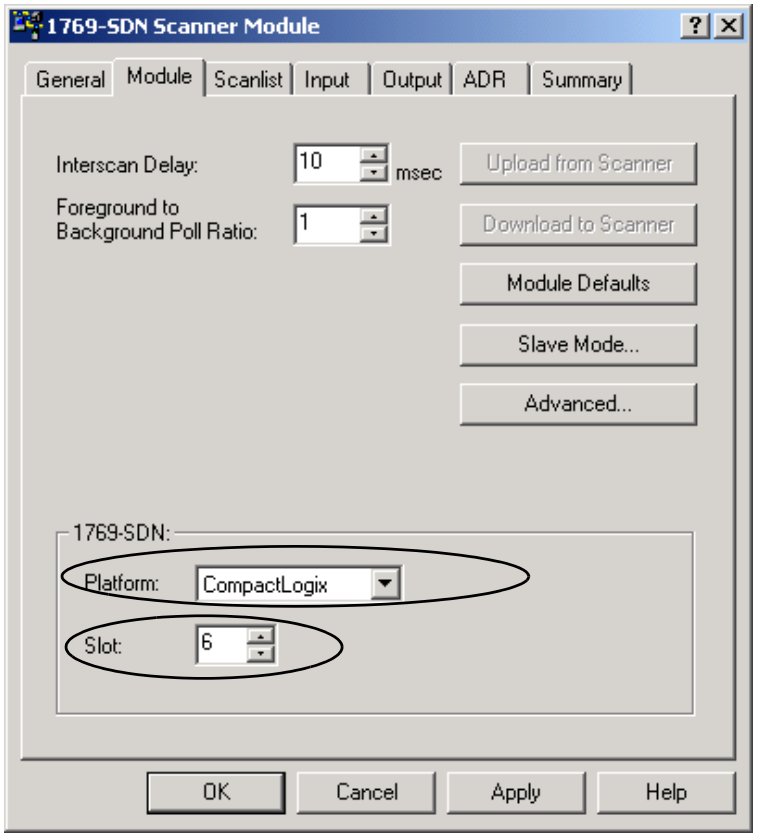
13. Enter the slot number of the 1769-SDN you recorded on the Network Worksheet.

14. Click **OK**.

15. **Save** the file and record the file name and path on the Network Worksheet.

    This quick start uses the example file name MainDNet.dnt.

16. Close RSNetWorx for DeviceNet software.



Additional Resources

Resource	Description
DeviceNet Modules in Logix5000 Control Systems, publication DNET-UM004	Provides details regarding the installation, configuration, and operation of DeviceNet modules.
Uploading an EDS File From a Drive, Knowledgebase ID 20539, http://www.rockwellautomation.com/knowledgebase/	Provides an explanation about uploading EDS files from drives.

Create a Project Using RSLogix 5000 Programming Software

In this chapter you create a project in RSLogix 5000 programming software. In the project you use ladder logic to create a push button that controls a light on a digital output module. This project is used in subsequent chapters to test communication with other devices.

Before You Begin

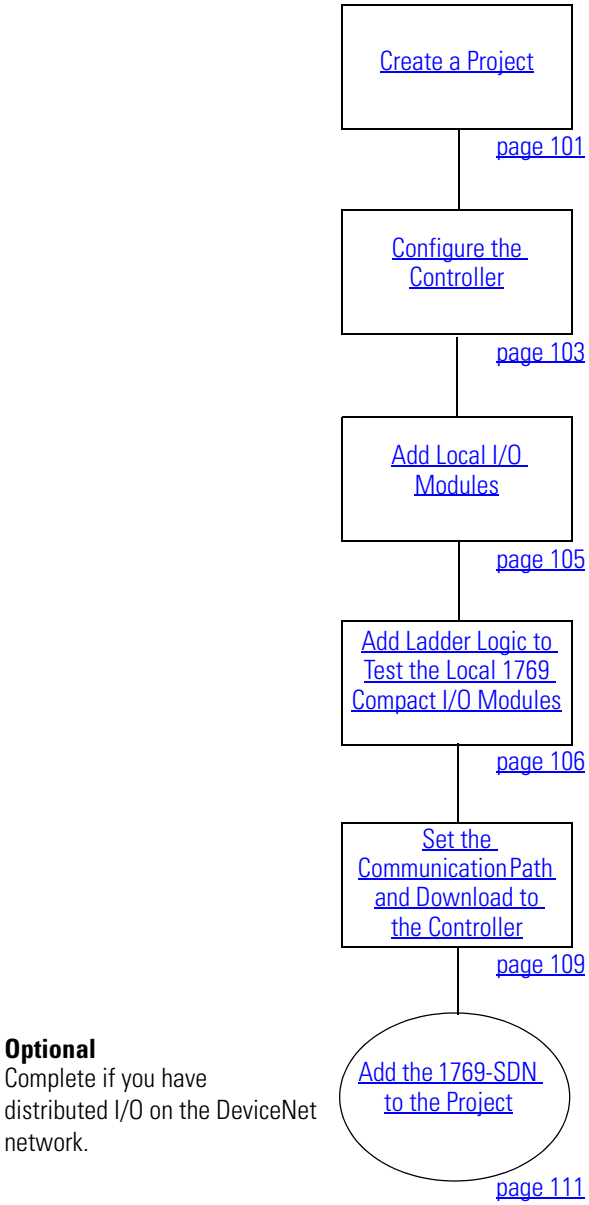
- Configure your network:
  - for an EtherNet/IP network, see Chapter 7
  - for a ControlNet network, see Chapter 8
  - for a DeviceNet network, see Chapter 9

What You Need

- A CompactLogix I/O module with digital outputs, this example uses a 1769-OB16.
- This example includes the following modules as well, but they are not required: 1769-IF4, 1769-IQ16, 1769-IF4XOF2, 1769-OF2.

Follow These Steps

Complete these steps.

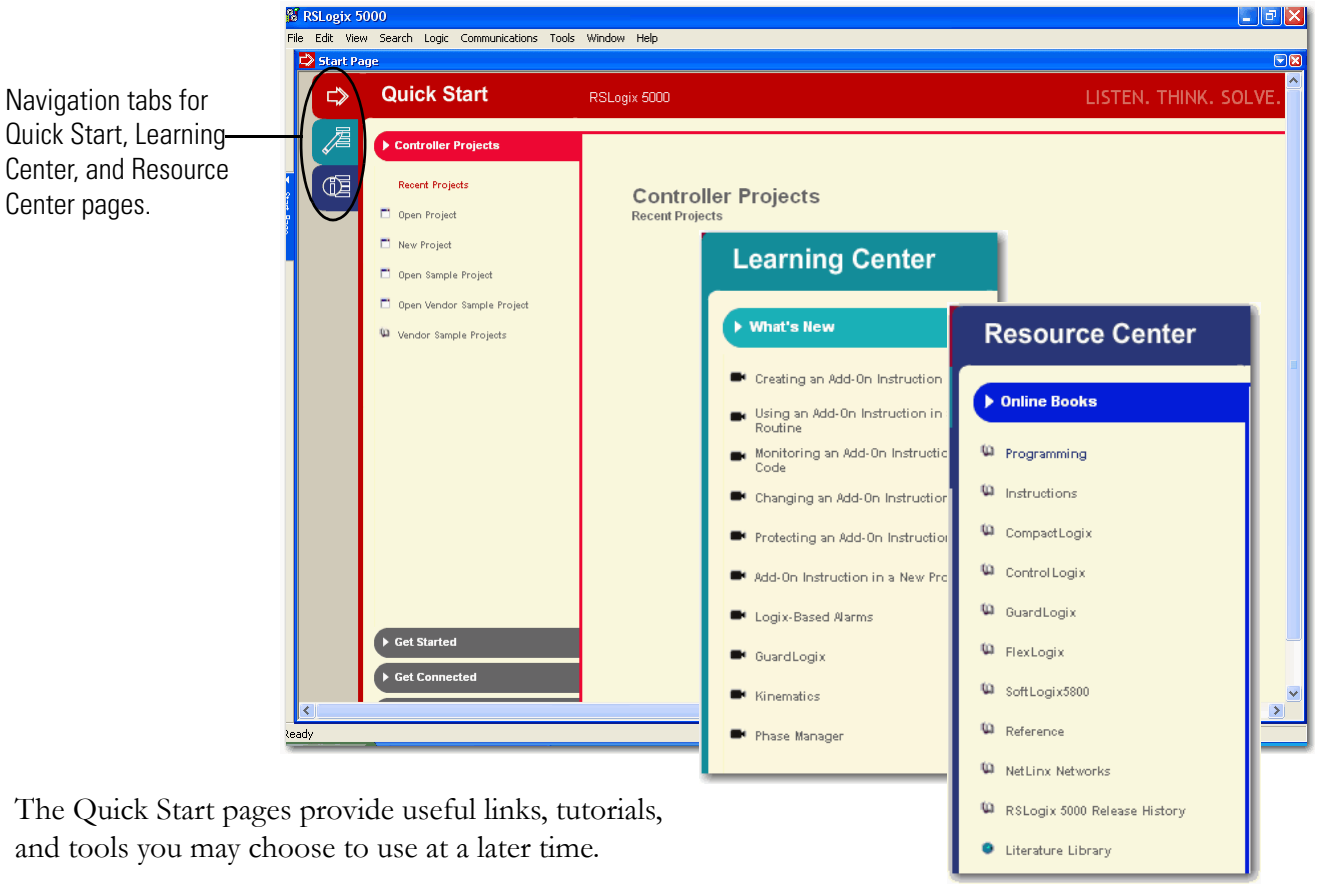


Create a Project

All controllers

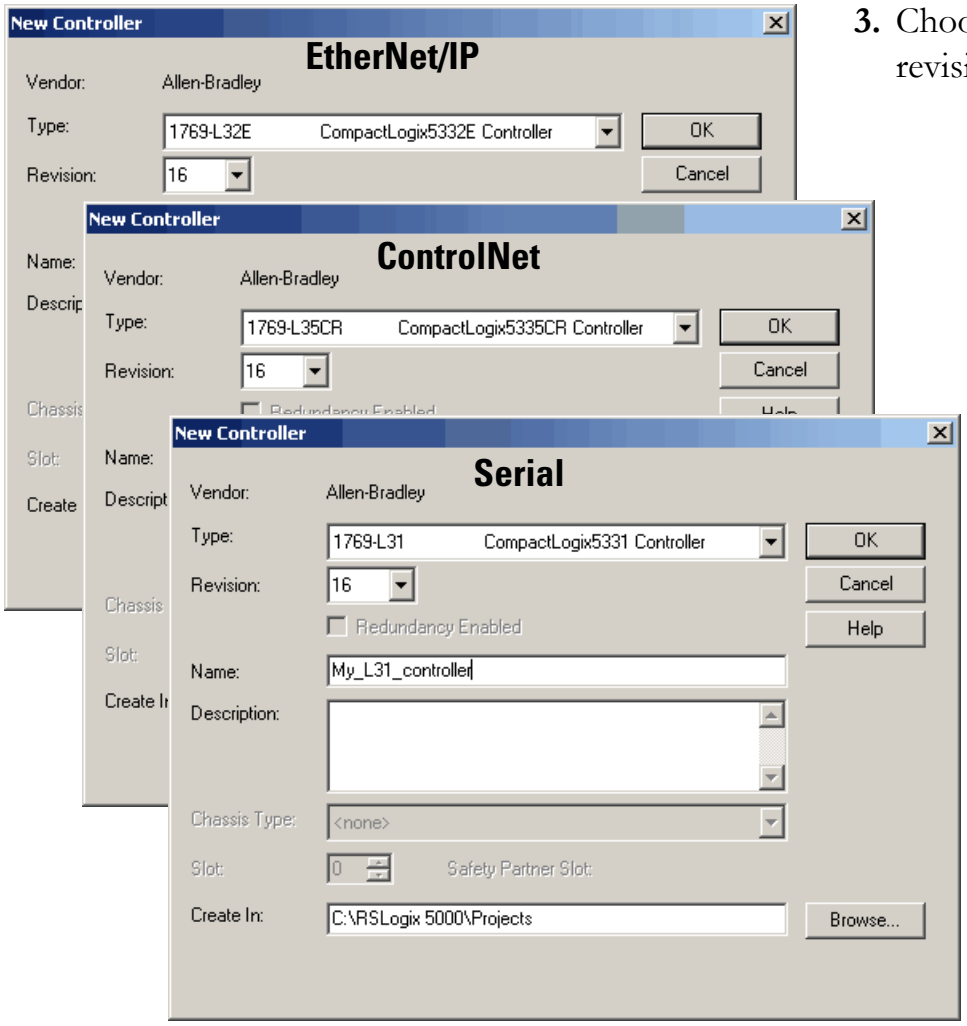
1. Double-click the RSLogix 5000 programming software icon to launch the software.

The Quick Start window displays in the RSLogix workspace.



The Quick Start pages provide useful links, tutorials, and tools you may choose to use at a later time.

2. Click New Project.



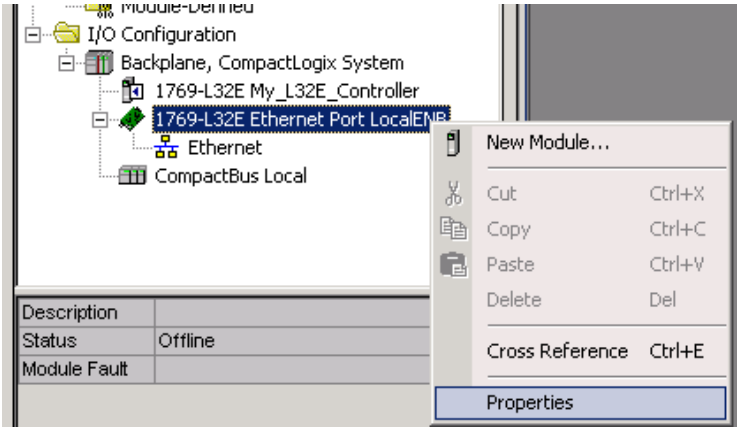
3. Choose your controller and revision number.

4. Enter a unique controller name.

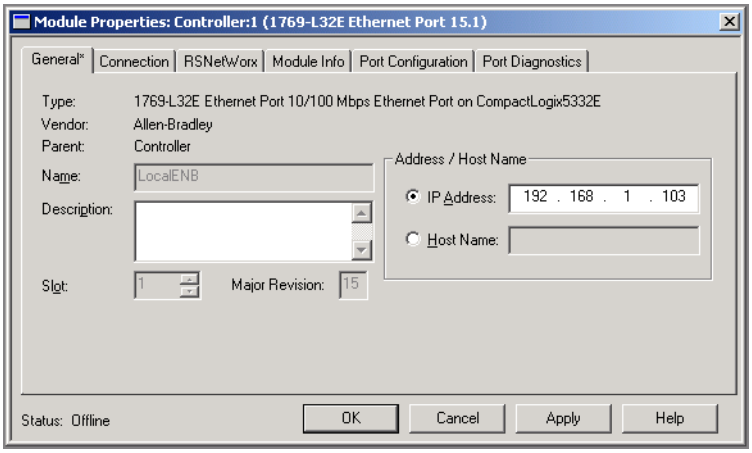
5. Click **OK**.

Configure the Controller

1769-L32E or 1769-L35E controllers

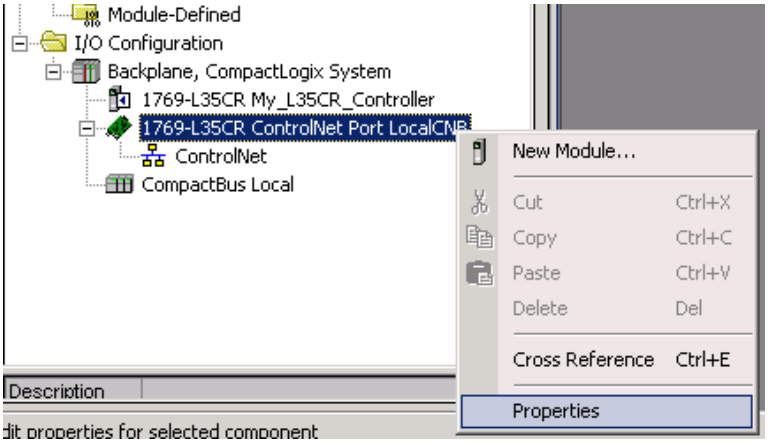


1. Expand the I/O Configuration tree.
2. Right-click the Ethernet Port and select **Properties**.

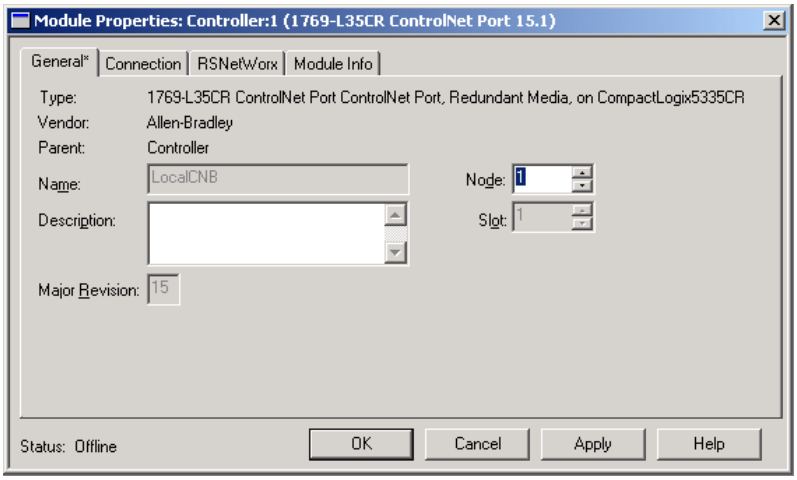


3. Enter the controller's IP address (recorded on the Network Worksheet) and click **OK**.

1769-L32C or 1769-L35CR controllers



1. Expand the I/O Configuration tree.
2. Right-click the ControlNet Port and select **Properties**.



3. In the Node box, enter the controller's node address and click **OK**.

1769-L31 controller

No further configuration is needed as the default properties are sufficient for the examples in this quick start.

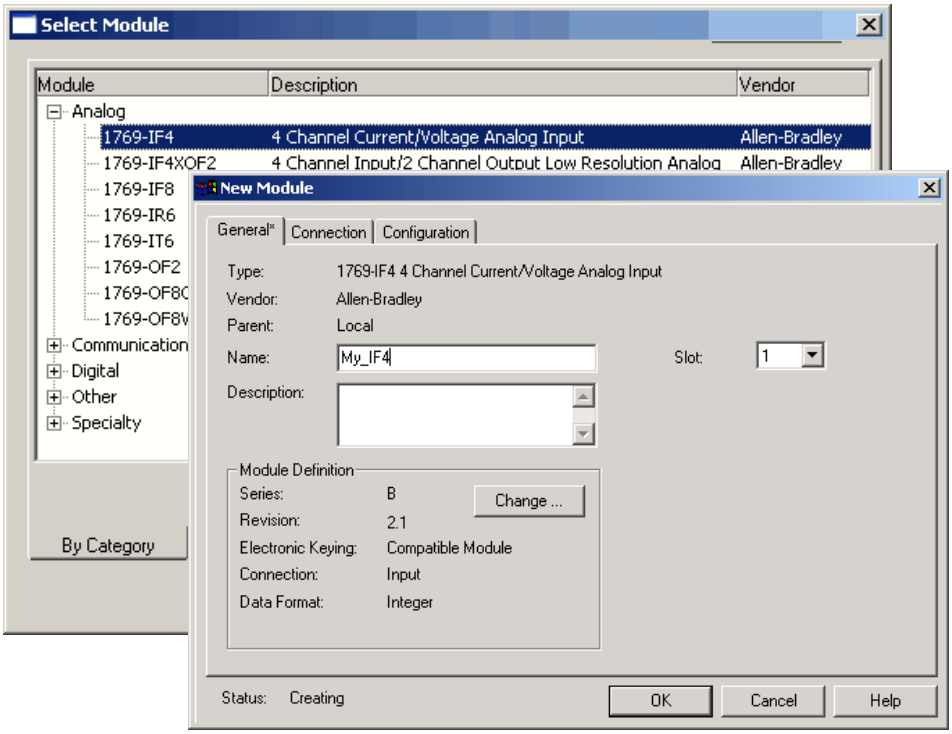
Add Local I/O Modules

All controllers

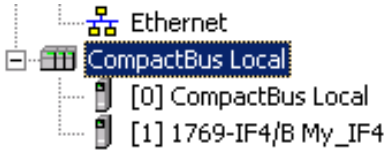
1. Right-click **CompactBus Local** and select **New Module**.

2. Select the leftmost I/O module in the 1769 CompactLogix chassis and assign a slot number, then click **OK**.

3. In the Name box, type a name and click **OK**.

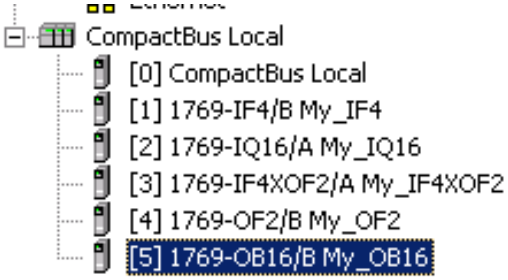


The module is added to the I/O Configuration.



4. Repeat steps 1–3 until all of your local I/O modules are added in order from left to right.

   Do not add the 1769-SDN module. It is added on page 111.

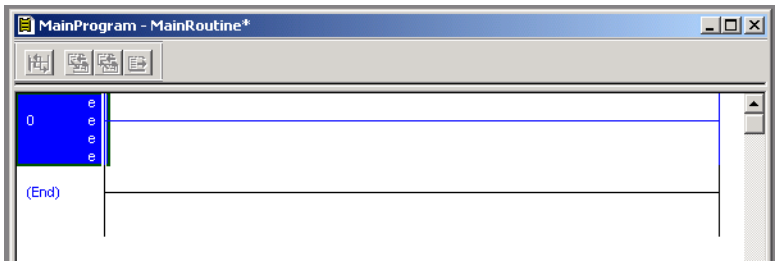


Add Ladder Logic to Test the Local 1769 Compact I/O Modules

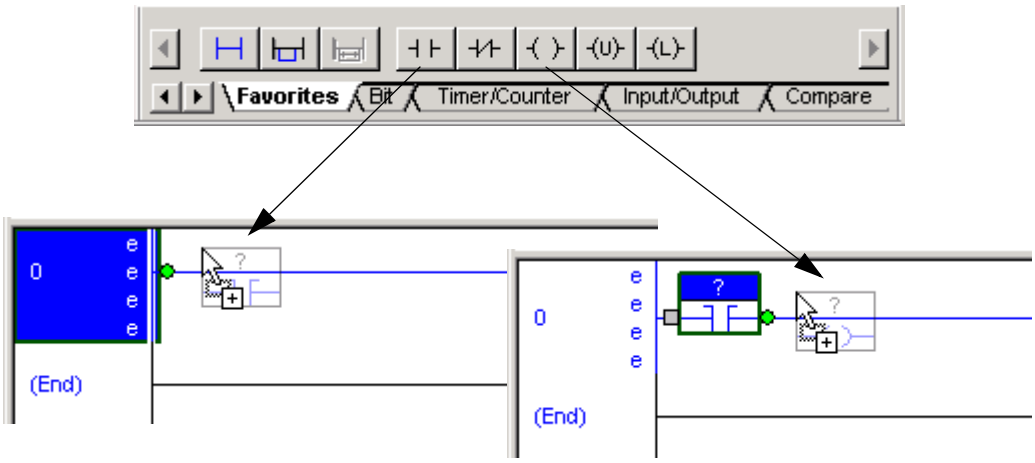
All controllers

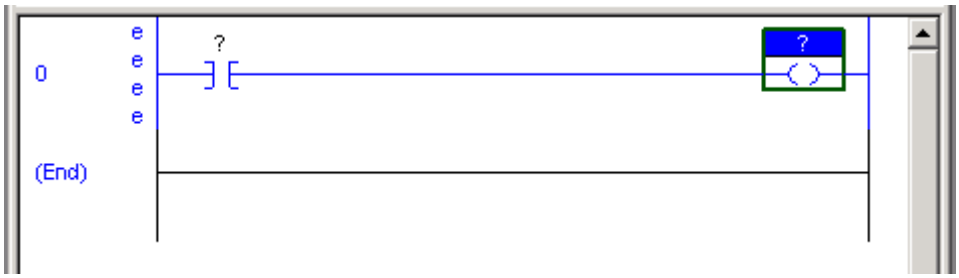
1. Expand the **Tasks** folders and double-click **MainRoutine**.

A blank MainRoutine opens.



2. From the Element Toolbar, drag and drop an **Examine On** and an **Output Energize** element onto the rung.

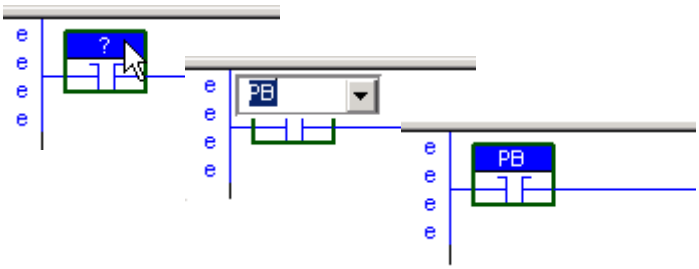




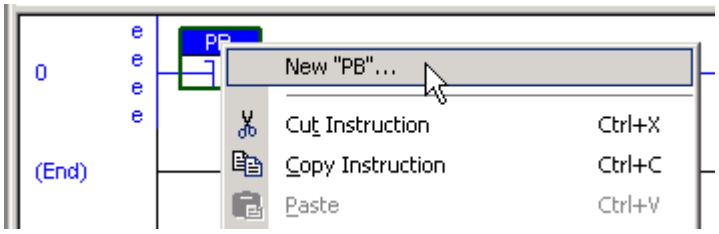
3. Double-click the **?** in the Examine On.

4. Type `PB` (for push button).

5. Press Enter.

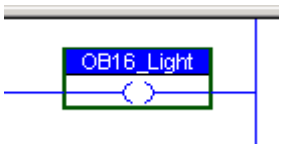


6. Right-click PB and select **New 'PB'**.



7. Click **OK** to keep the defaults.

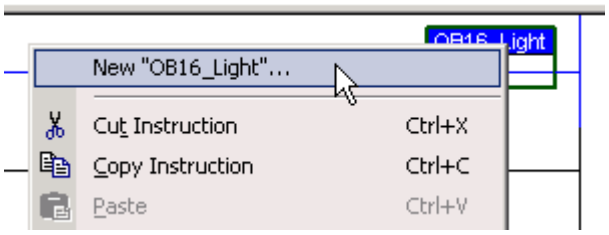
8. Name the Output Energize ***xxxx*_Light** (where *xxxx* is the suffix of the catalog number of the 1769 Compact I/O digital output module).



Important: Do not use spaces in the tag name. Use underscores (_) instead.

9. Right-click the *xxxx*_Light tag name and select **New '*xxxx*_Light'**.

*xxxx*_Light is an alias tag for the I/O point tag name. This lets you assign a simple name to a physical I/O point address.

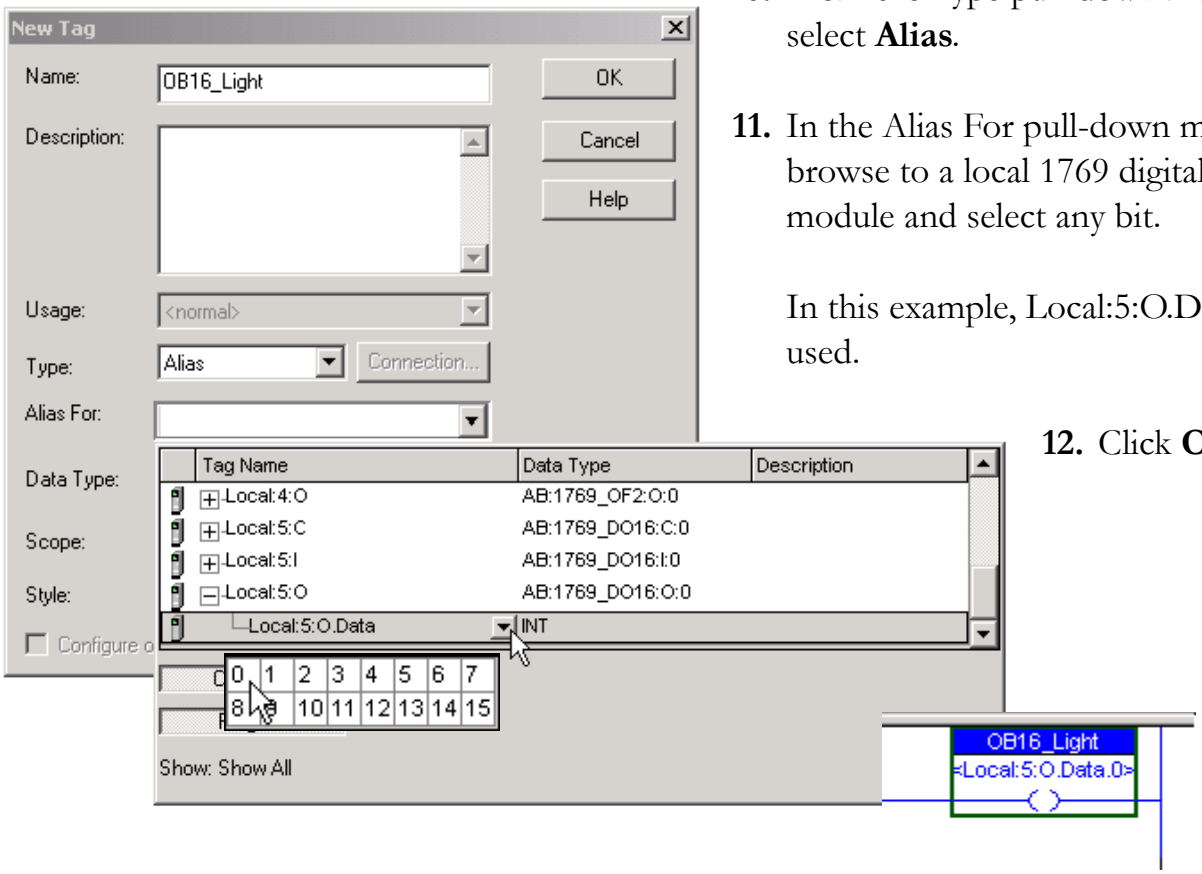


10. From the Type pull-down menu, select **Alias**.

11. In the Alias For pull-down menu, browse to a local 1769 digital output module and select any bit.

In this example, Local:5:O.Data.0 is used.

12. Click **OK**.



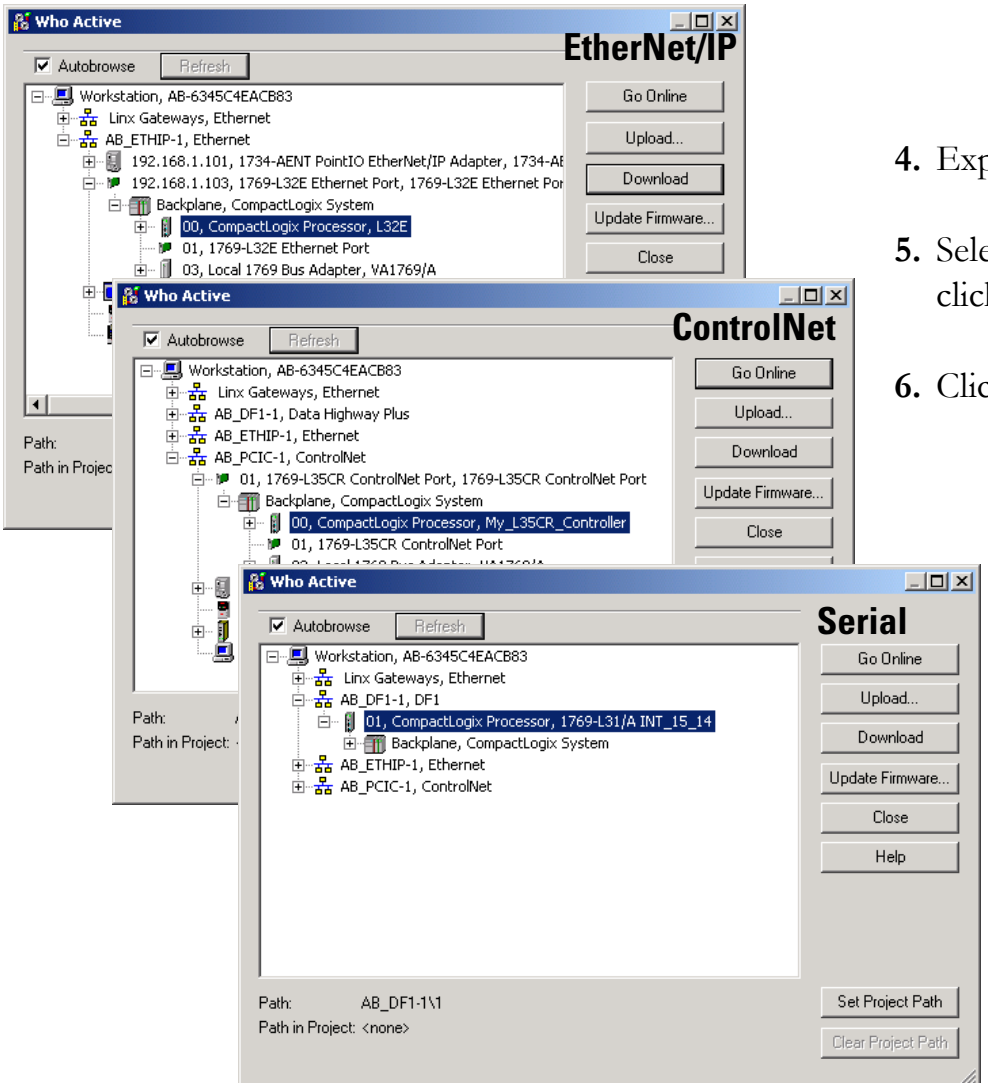
Set the Communication Path and Download to the Controller

All controllers

1. Save your changes.

2. Move the keyswitch on your controller to Program.

3. Click Who Active.

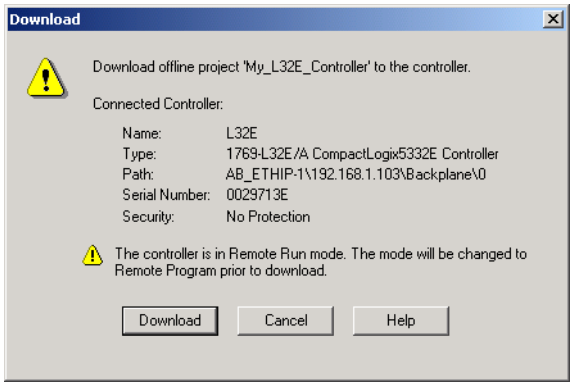


4. Expand the network tree.

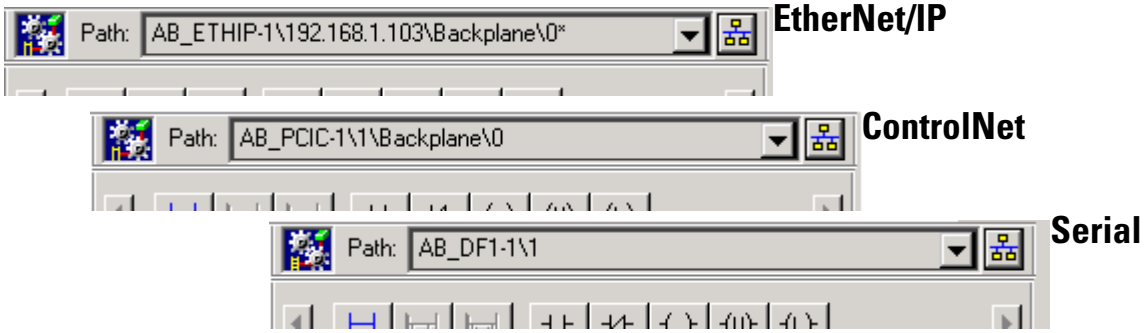
5. Select your controller and click **Set Project Path**.

6. Click **Download**.

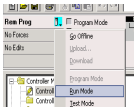
7. Click **Download**.



The project Path updates.

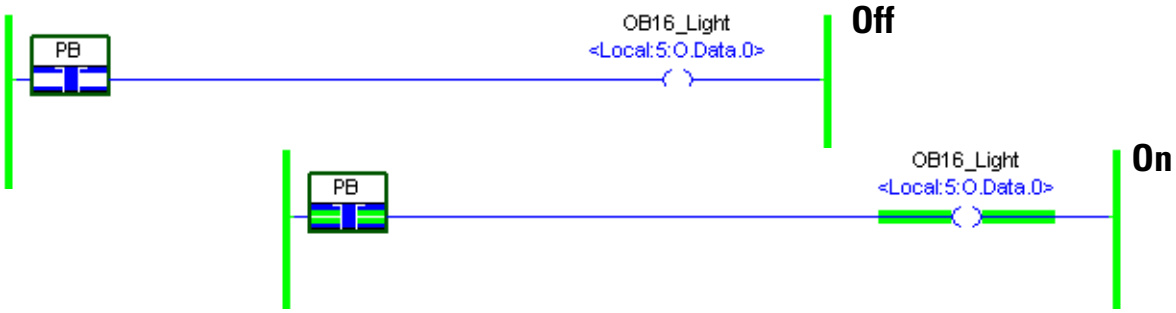


8. Move the keyswitch on your controller to Run.



9. Select the PB Examine On instruction and press Ctrl+T.

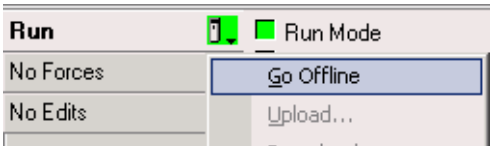
This toggles the state from 0 to 1 (off to on).



10. Verify that the LED indicator on the digital output module turns on.

11. Press Ctrl+T to toggle the state back to 0 (off).

12. Go Offline.



Add the 1769-SDN to the Project

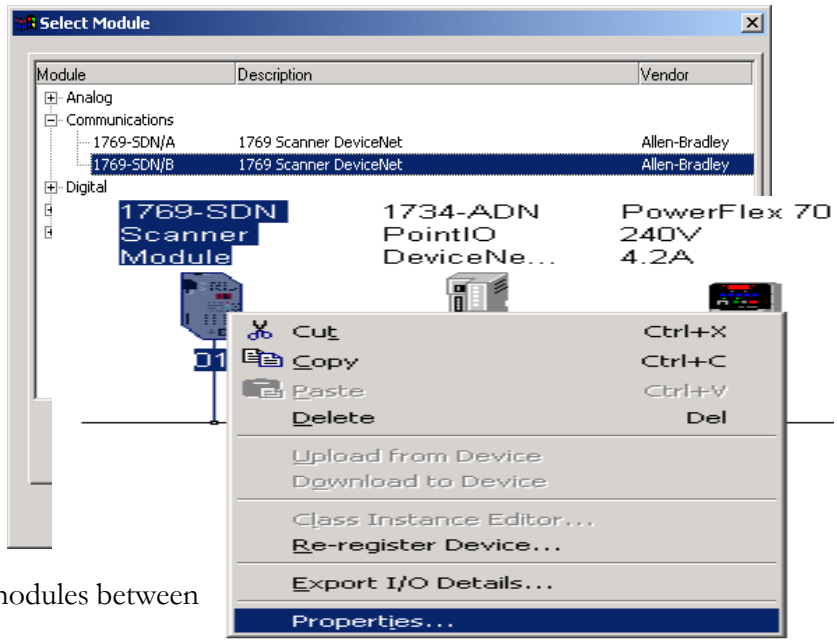
DeviceNet only

1. Right-click **CompactBus Local** and select **New Module**.

2. Under **Communications**, select 1769-SDN with the series letter recorded on the Network Worksheet and click **OK**.

3. In the Name field, type a name for your SDN module.

4. In the Slot field, enter the **Slot** number.



There can be a maximum of three modules between the 1769-SDN
module and the power supply.

5. In the Input Size and Output Size fields, enter values to accommodate the input and output sizes of the modules in your system.

   This example uses 20.

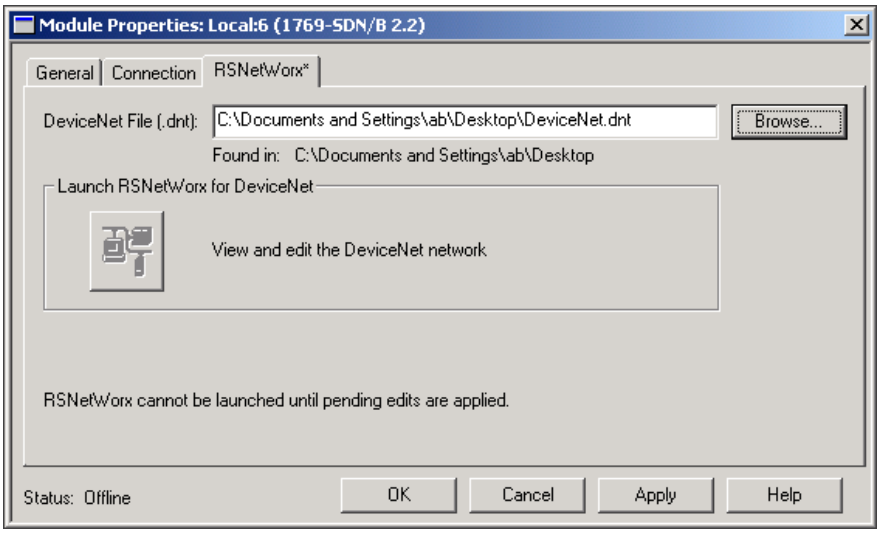
   For more information about determining input and output sizes, see the DeviceNet Modules in Logix5000 Control Systems User Manual, publication DNET-UM004.

6. From the Electronic Keying pull-down, choose **Disable Keying**.

7. Check the **Open Module Properties** check box and click **OK**.

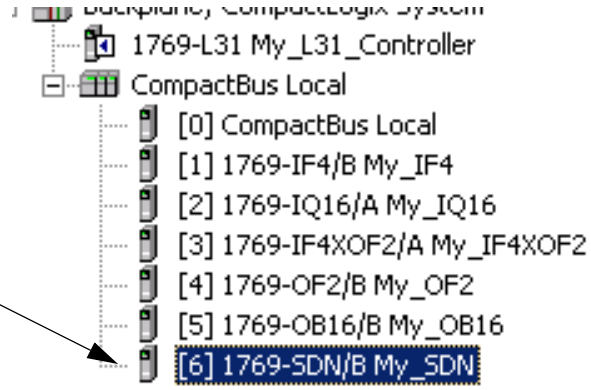
8. On the RSNetWorx tab, click **Browse** to find the configuration (.dnt) file recorded on the Network Worksheet.

   Use the configuration file name you saved on page 98. This quick start uses MainDNet.dnt.



9. Click **OK**.

   The module is added to the I/O Configuration.



Additional Resources

Resource	Description
Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001	Provides details about creating and editing a program, communicating with modules, and configuring modules.
DeviceNet Modules in Logix5000 Control Systems, publication DNET-UM004	Provides details regarding the installation, configuration, and operation of DeviceNet modules.

Add Distributed I/O Modules to the Project

In this chapter, you add distributed POINT I/O modules to your project using RSLogix 5000 programming software. You also add ladder logic and download the project to the controller so you can test communication with an I/O module. This project builds upon the program created in Chapter 10.

Before You Begin

- Prepare the POINT I/O hardware, see Chapter 3
- Create a project in RSLogix 5000 programming software, see Chapter 10

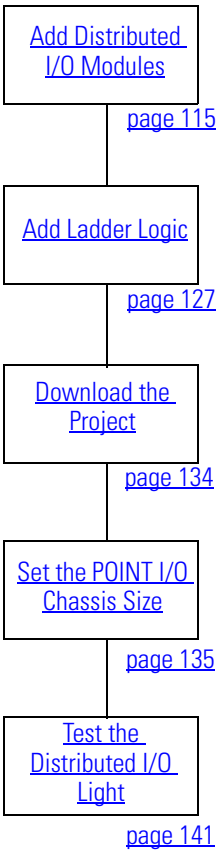
What You Need

- A POINT I/O module with digital outputs, this example uses a 1734-OB4E
- This example includes the following modules as well, but they are not required: 1734-IB4, 1734-OE2C
- For an EtherNet/IP network, no additional software is required
- For a ControlNet network, RSNetWorx for ControlNet software
- For a DeviceNet network, RSNetWorx for DeviceNet software

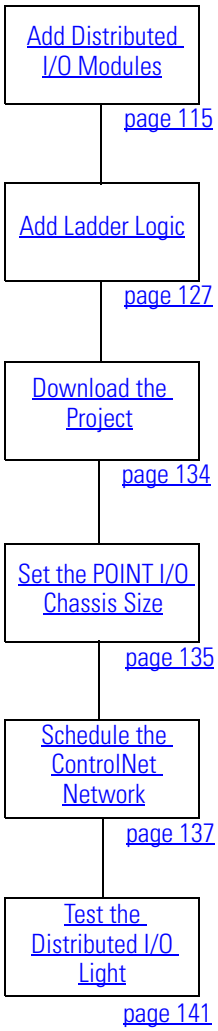
Follow These Steps

If you have distributed POINT I/O modules, complete these steps for your network.

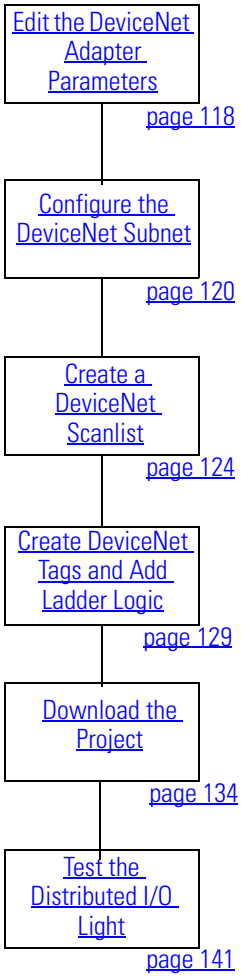
EtherNet/IP



ControlNet

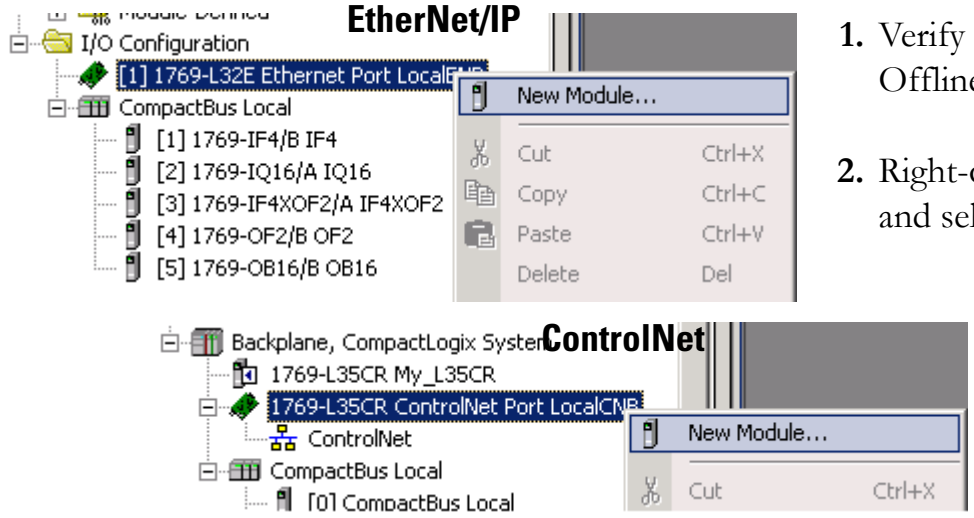


DeviceNet



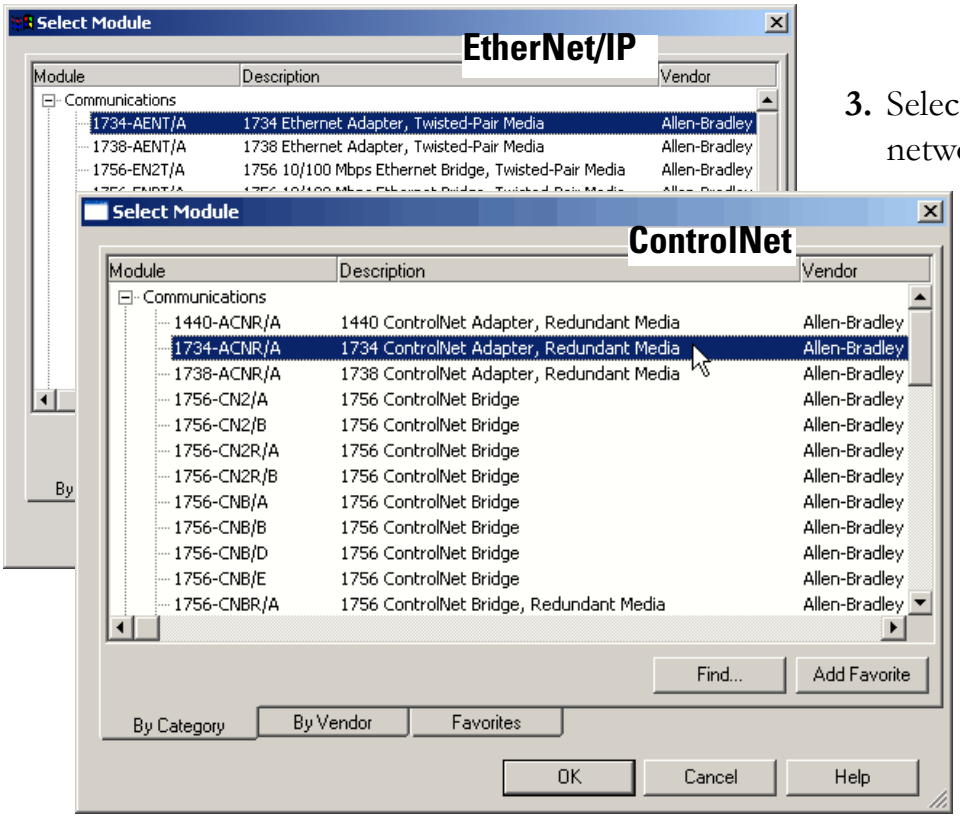
Add Distributed I/O Modules

EtherNet/IP and ControlNet only
(for DeviceNet, skip to page 120)



1. Verify that your project is Offline.

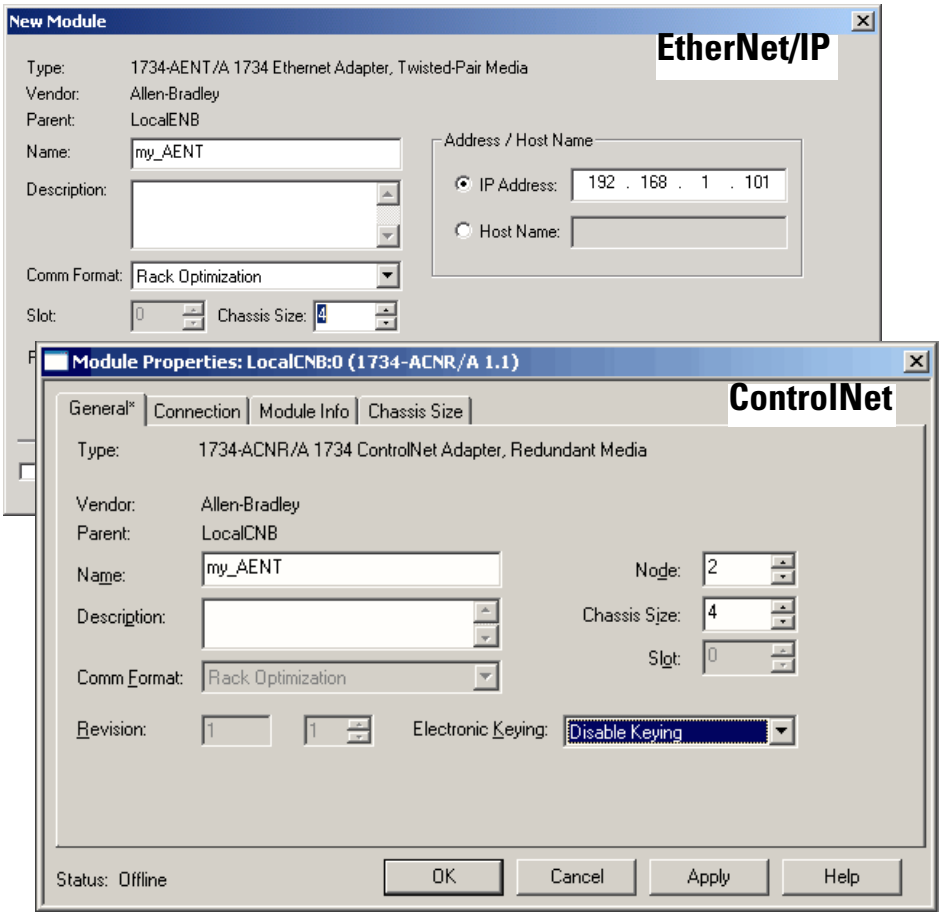
2. Right-click the network port and select **New Module**.



3. Select the 1734 POINT I/O network adapter and click **OK**.

For an EtherNet/IP network, select a 1734-AENT adapter.

For a ControlNet network, select a 1734-ACNR adapter.



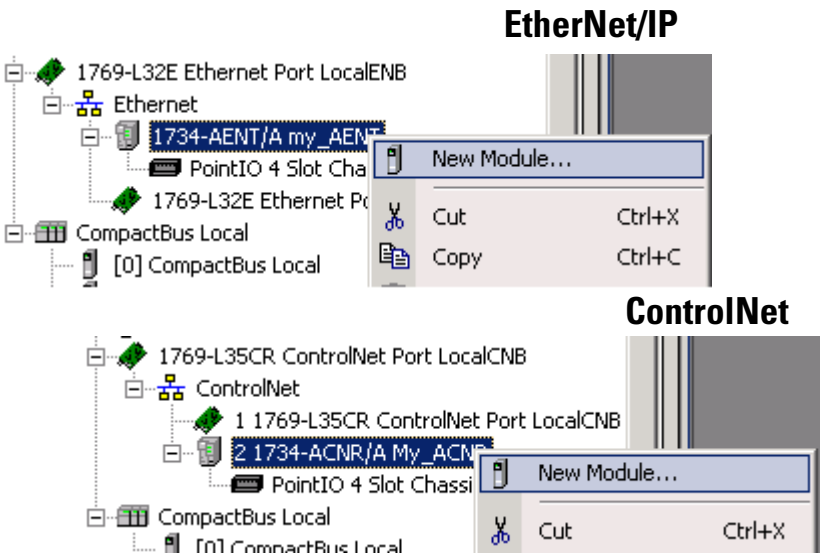
4. Type a **name** for the adapter.

5. For an EtherNet/IP network, type the **IP address**.

   For a ControlNet network, enter the adapter's **node number.**

   Use the Network Worksheet located inside the back cover as a reference.

6. Select the **Chassis Size** (exact number of POINT I/O modules + 1 for the adapter).



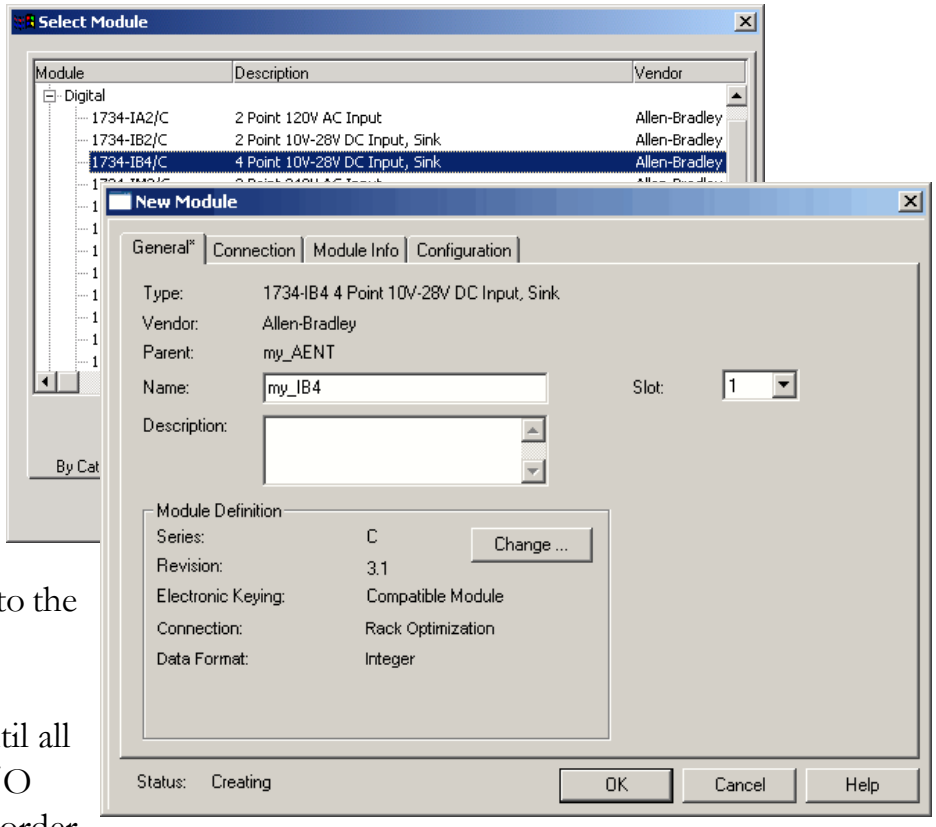
7. Choose **Disable Keying**.

8. Uncheck the **Open Module Properties** checkbox and click **OK**.

   The adapter is added to the I/O configuration.

9. Right-click the 1734 POINT network adapter module and select **New Module**.

10. Select the left-most POINT I/O module in your chassis and click **OK**.

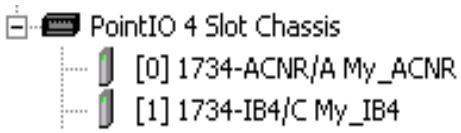


11. Enter a name.

12. Click **OK**.

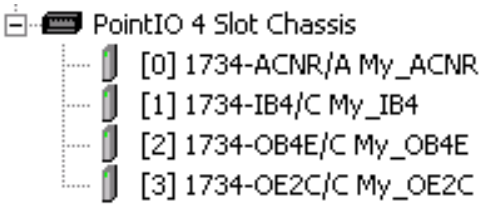
The module is added to the I/O Configuration.

13. Repeat steps 9–12 until all of your distributed I/O modules are added in order from left to right.



ControlNet Shown

14. Record the adapter name and digital output module slot number on page 128.



If you have added more than one digital output module, select the one you want to test in this project and record the name and slot number on page 128.

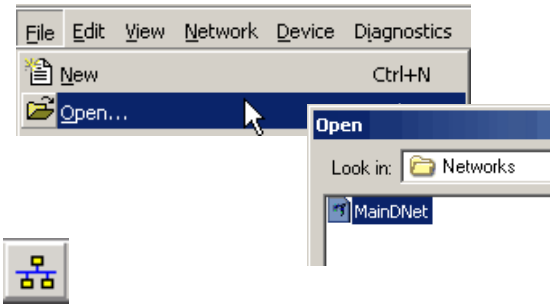
Go to Add Ladder Logic on page 127.

Edit the DeviceNet Adapter Parameters

DeviceNet only

1. Launch RSNetWorx for DeviceNet.

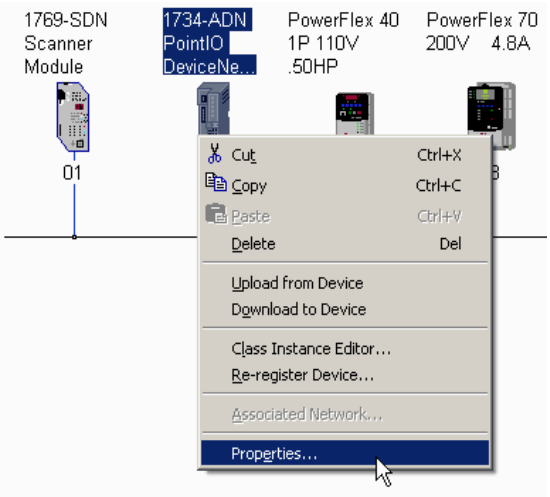
2. Open the main DeviceNet configuration file you saved and recorded on the Network Worksheet.



3. Click **Who Active** to go online.

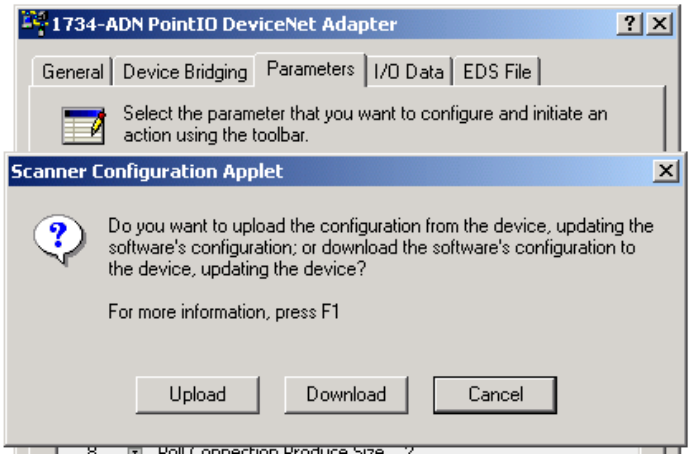
4. If prompted, click **OK**.

5. Right-click the adapter and select **Properties**.



6. Select the **Parameters** tab.

7. Click **Upload**.



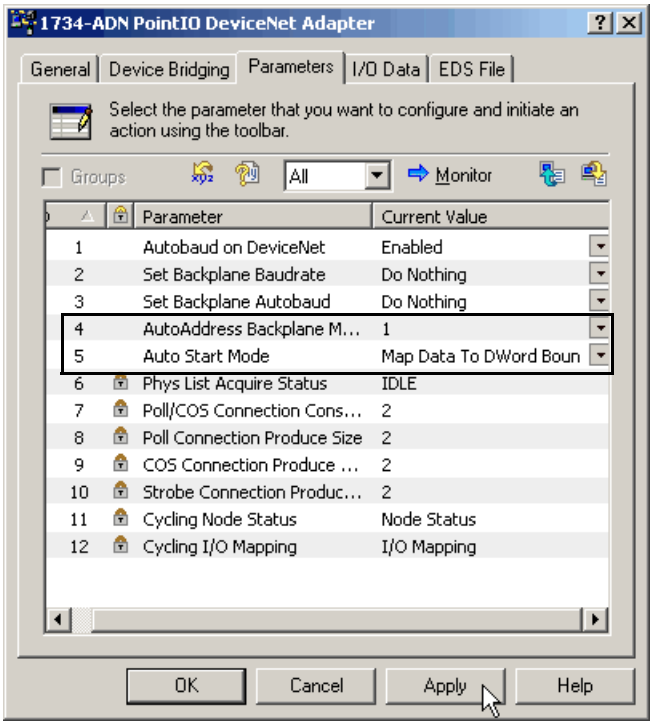
8. Set the AutoAddress Backplane parameter to **1**.

9. Set the Auto Start Mode parameter to **Map Data to DWord Boundaries**.

10. Click **Apply**, then click**Yes**.

11. Click **OK**.

12. Click **Save**. 

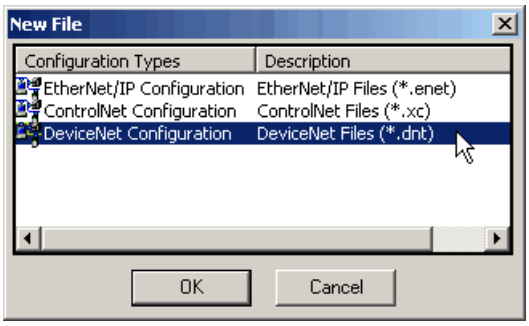


Configure the DeviceNet Subnet

DeviceNet only

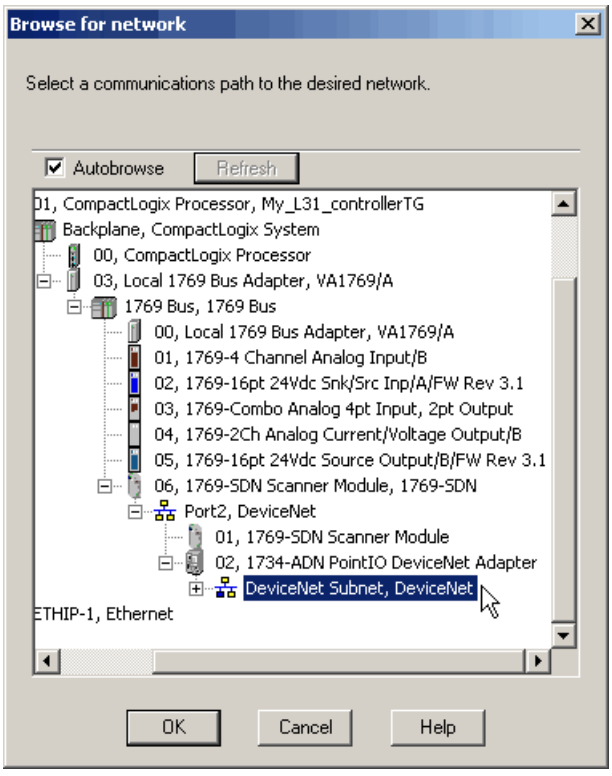
1. In RSNetWorx for DeviceNet, from the **File** menu, select **New**.

2. Select the **DeviceNet Configuration** file type.
3. Click **OK**.



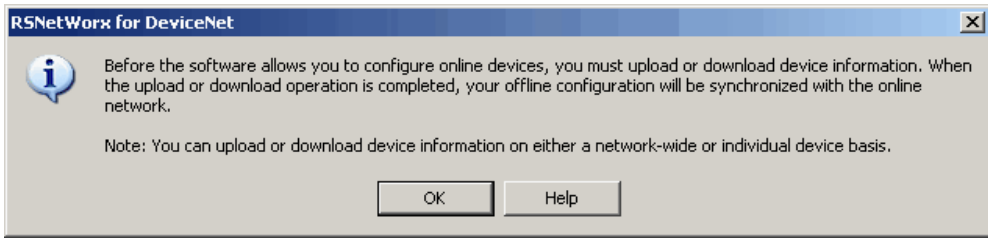
4. Click **Who Active** to go online.

5. Expand the AB_DF1-1, DF1 network and select the **DeviceNet Subnet, DeviceNet** network.
6. Click **OK**.

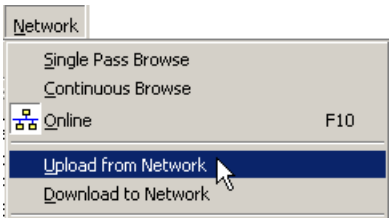


7. Click **OK**.

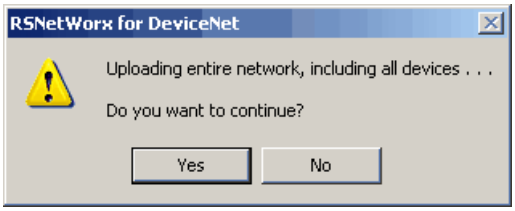
   The modules on the subnet display.



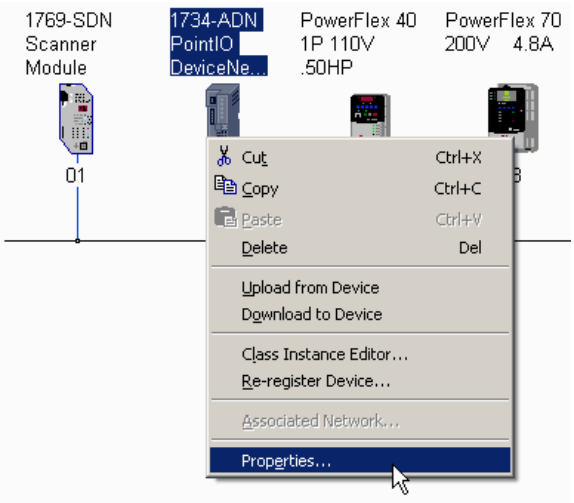
8. From the **Network** menu, choose **Upload from Network**.



9. Click **Yes**.

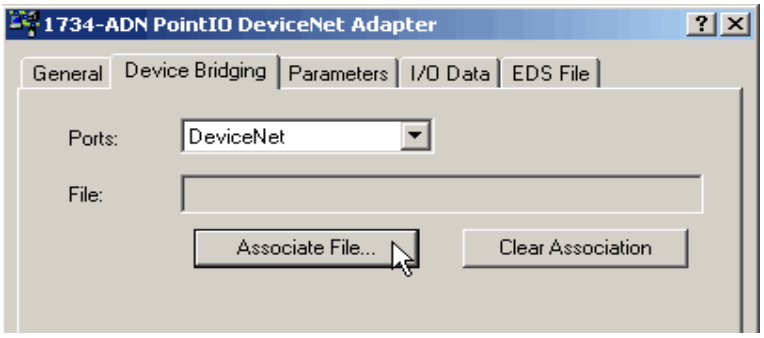


10. Right-click the scanner and select **Properties**.



11. Click the **Device Bridging** tab.

12. Click **Associate File**.



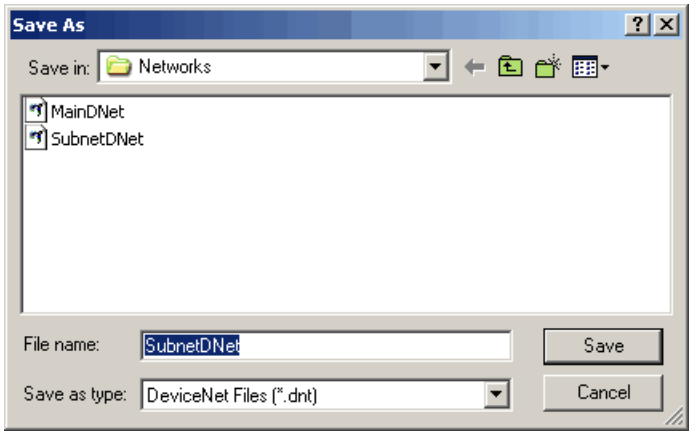
13. Select the main DeviceNet configuration file you recorded on the Network Worksheet.

14. Click **Open**.

15. Click **OK**.

16. **Save** the DeviceNet subnet configuration file.

Name the file so it can be easily identified as the subnet. This quick start uses the name SubnetDNet.dnt.

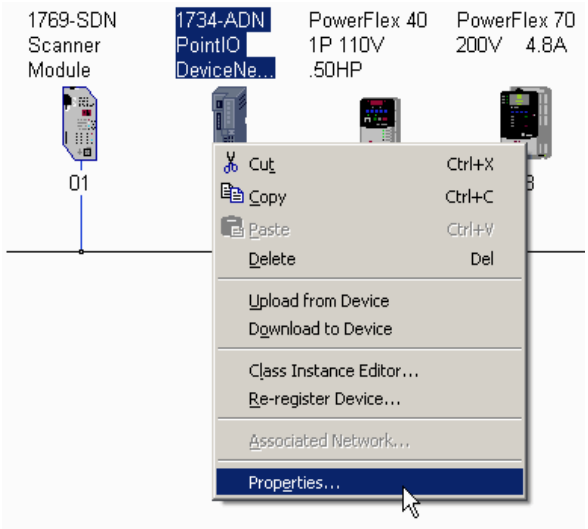


17. Record the file name on the Network Worksheet located inside the back cover of this quick start.

18. In RSNetWorx software, from the **File** menu, choose **Open**.

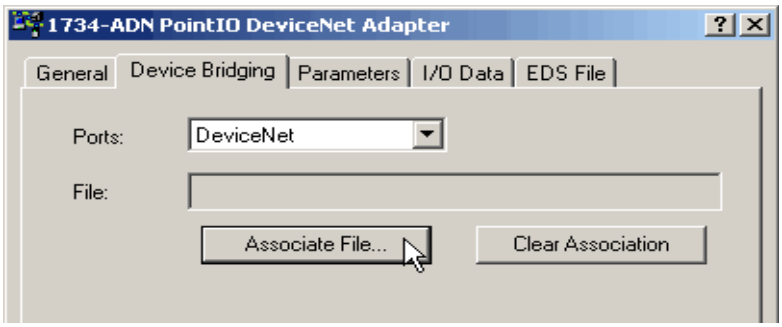
19. Select your main DeviceNet file and click **Open**.

20. Right-click the POINT I/O adapter and select **Properties**.



21. Click the **Device Bridging** tab.

22. Click **Associate File**.



23. Select the subnet configuration file you recorded on the Network Worksheet and click **Open**.

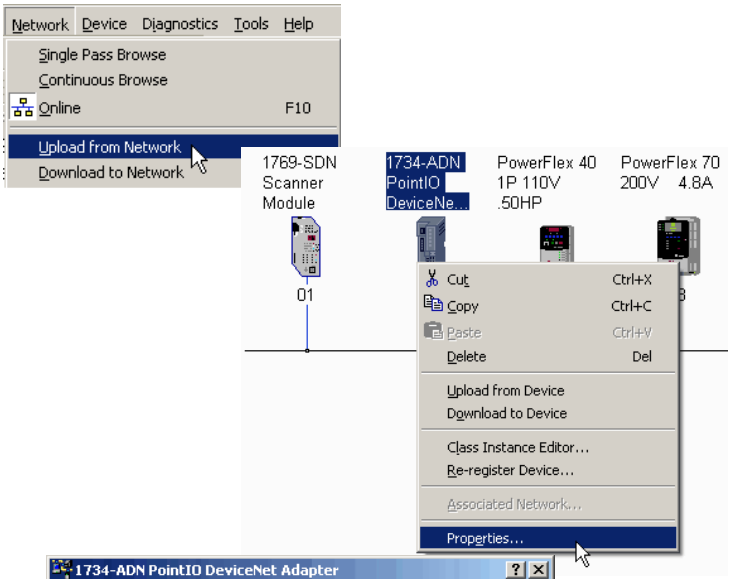
24. Click **OK**.

25. **Save** your main DeviceNet configuration file.

Create a DeviceNet Scanlist

Go Online. *DeviceNet only*
(for EtherNet/IP and ControlNet, skip to page 127)

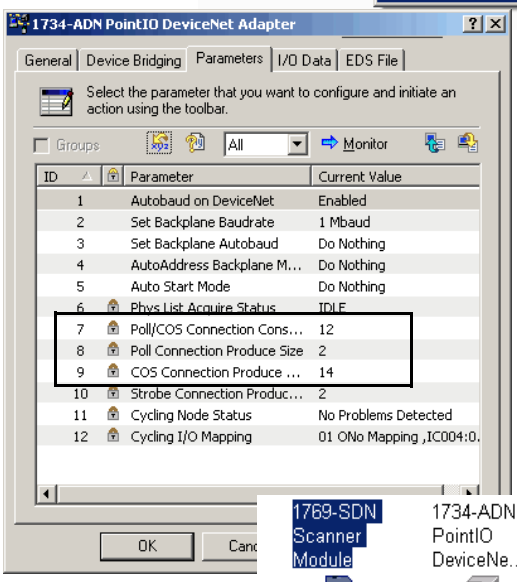
1. Select **Network > Upload from Network**.



2. Click **Yes.**

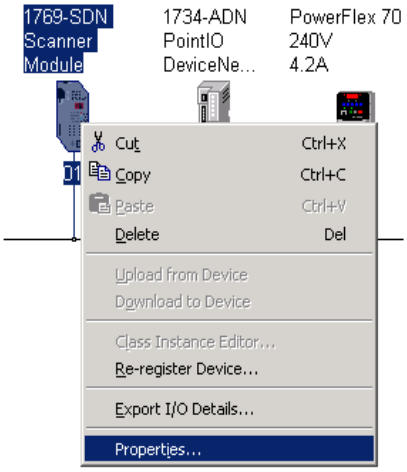
3. Right-click the 1734-ADN adapter and select **Properties**.

4. Click the **Parameters** tab and write down the parameters shown.



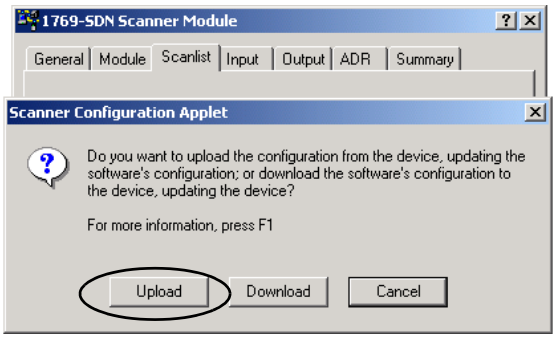
5. Click **OK**.

6. Right-click the 1769-SDN module and select **Properties**.

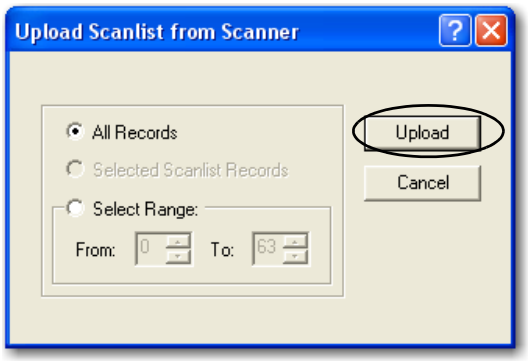


7. Click the **Scanlist** tab.
8. Click **Upload**.

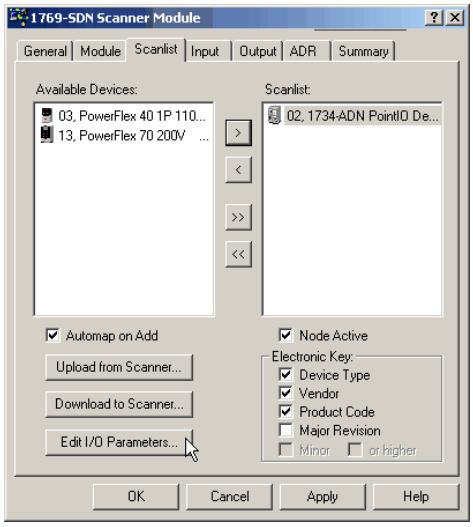
   The configuration is uploaded from the device.



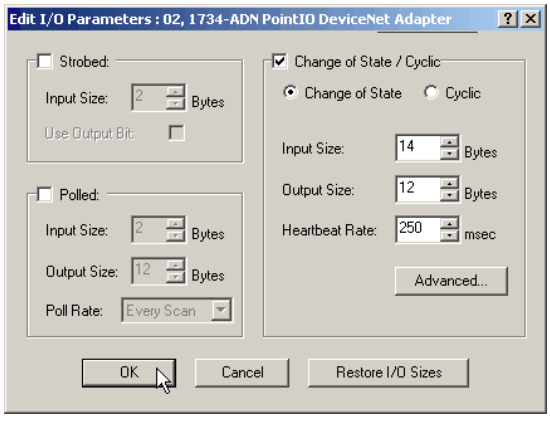
9. Click the All Records radio button.
10. Click **Upload.**



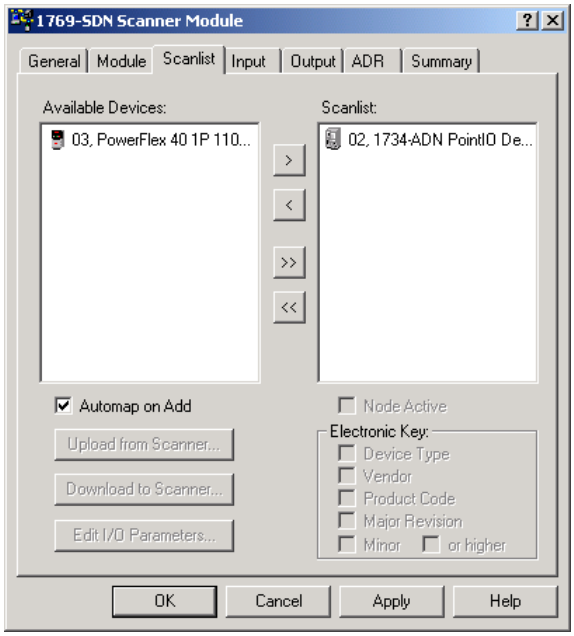
11. Select the 1734-ADN adapter and move it to the Scanlist.
12. Click **Edit I/O Parameters**.



13. Verify that the I/O parameters match step 4; if not, update them.
14. Click **OK**.

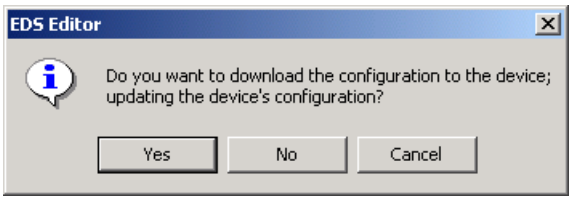


15. Verify that **Automap on Add** is checked and click **Apply**.



16. Click **Yes**.

    Click **OK**.



17. **Save** the configuration file. 

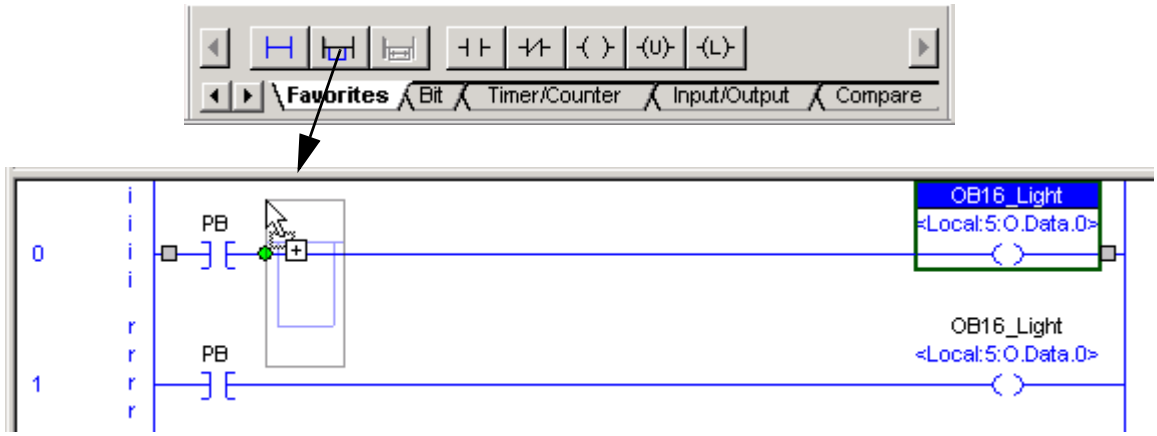
    You will use this file to Create DeviceNet Tags and Add Ladder Logic later in this chapter.

18. **Close** RSNetworx for DeviceNet software.

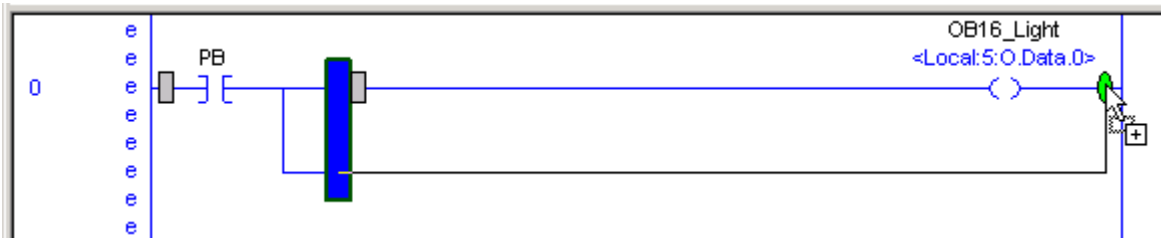
Add Ladder Logic

EtherNet/IP and ControlNet only
(for a DeviceNet, go to page 129)

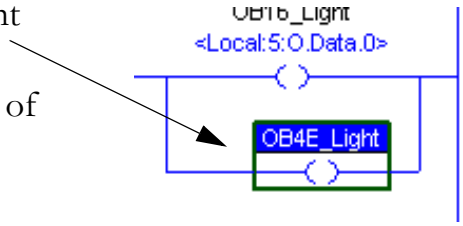
1. In RSLogix 5000 programming software, drag and drop a Branch onto the rung.



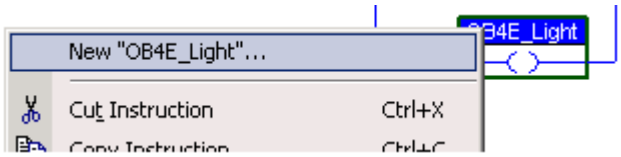
2. Expand the branch to the right side of the *xxxx*_Light.



3. Drag and drop another Output Energize element onto the Branch and name it `xxxx_Light` (where *xxxx* is the suffix of the catalog number of the digital 1734 POINT output module).

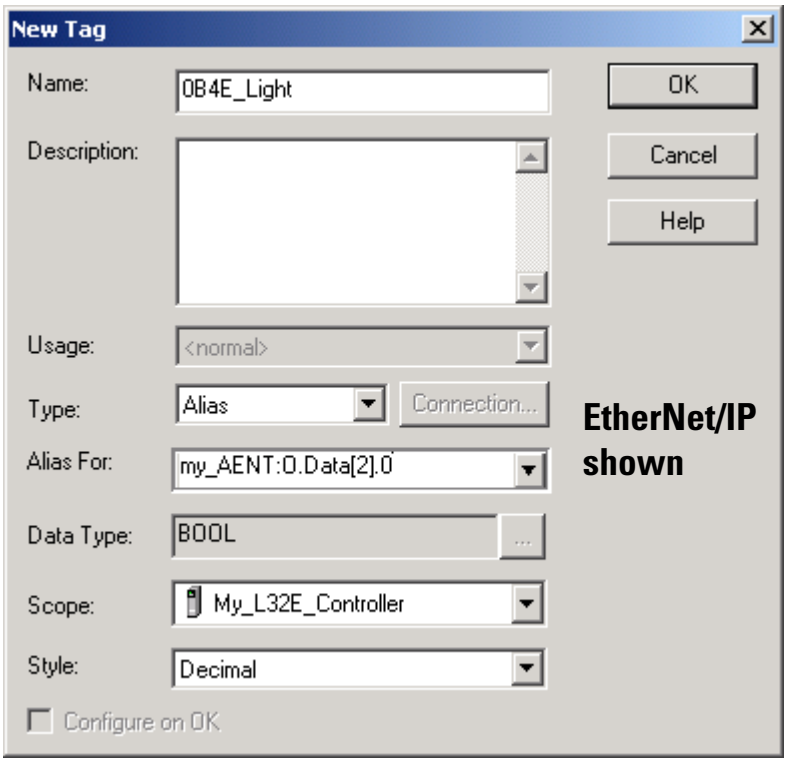


4. Right-click the Light and select **New '*xxxx*_Light'**.



5. From the Type pull-down, choose **Alias**.

6. From the **Alias For** pull-down menu, browse to find the addresses recorded below.

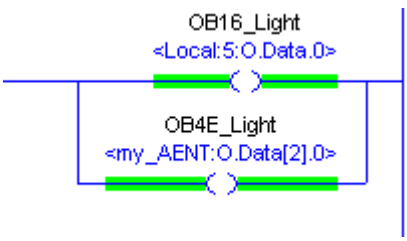


EtherNet/IP shown

For	Select This Address	Example	From
EtherNet/IP	_____:O.Data[____].____ adapter name / output module slot # / any bit	my_AENT:O.Data[2].0	Step 14 on page 117
ControlNet	_____:O.Data[____].____ adapter name / output module slot # / any bit	My_ACNR:O.Data[2].0	Step 14 on page 117

7. Click **OK**.

Go to page 134 to Download the Project.

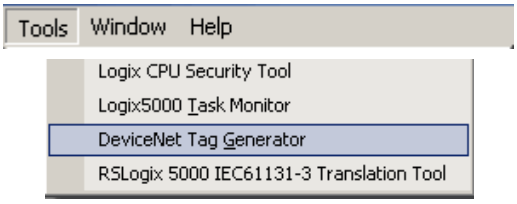


Create DeviceNet Tags and Add Ladder Logic

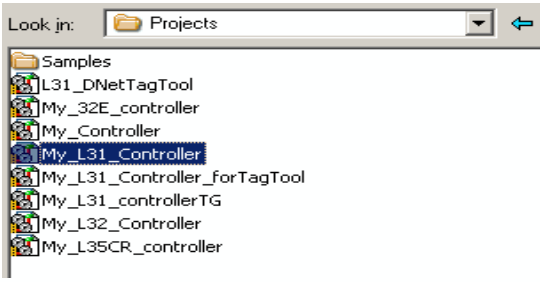
DeviceNet network only

IMPORTANT Before running the DeviceNet Tag Generator, verify that RSNetWorx for DeviceNet software is closed.

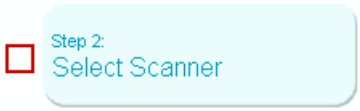
1. In RSLogix 5000 programming software, from the Tools menu, choose **DeviceNet Tag Generator**.



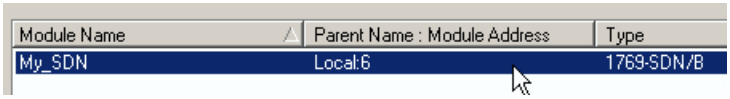
2. Select your RSLogix 5000 project.



3. Click **Select Scanner**.



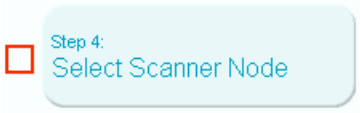
4. Select the 1769-SDN scanner that scans the network where the drive is located.



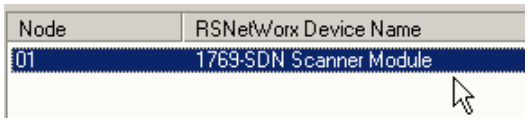
5. Click **Select RSNetWorx Project**.

6. Select main DeviceNet configuration file recorded on the Network Worksheet.

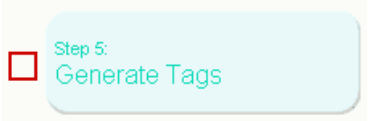
7. Click **Select Scanner Node**.



8. Select the node of the 1769-SDN scanner as recorded on the Network Worksheet.

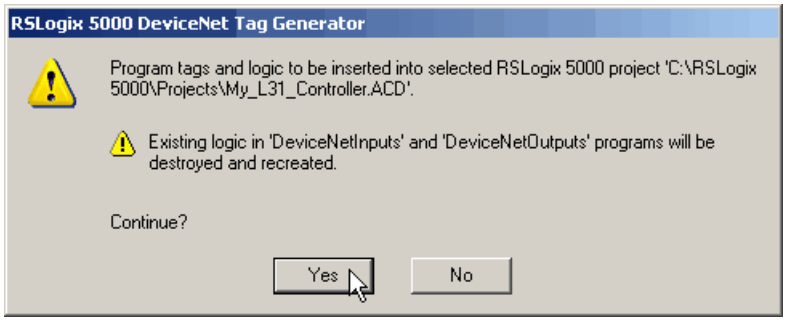


9. Click **Generate Tags**.

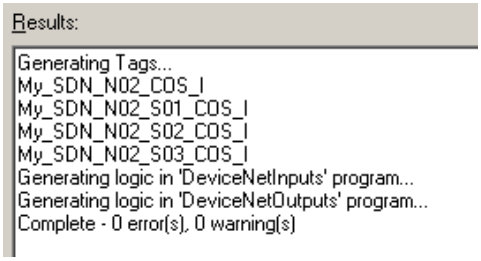


10. Click **Generate Tags**.

11. Click **Yes**.



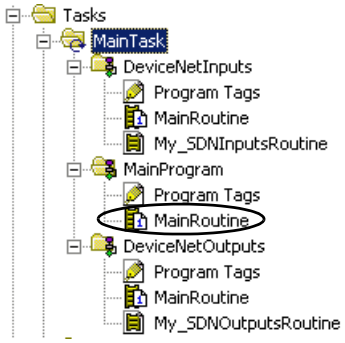
When tag generation is complete, the text log displays.



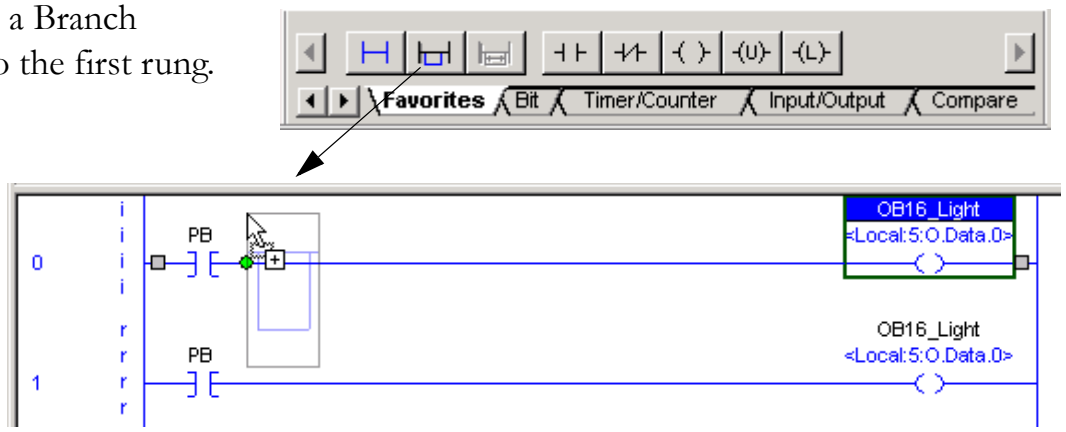
12. **Close** the DeviceNet Tag Generator.

Note that new programs and tags have been added to the controller organizer. These tasks were created by the Tag Generator.

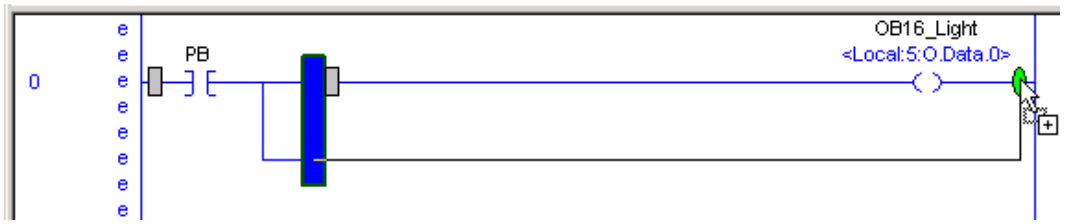
13. In the controller organizer, select **MainProgram > MainRoutine**.



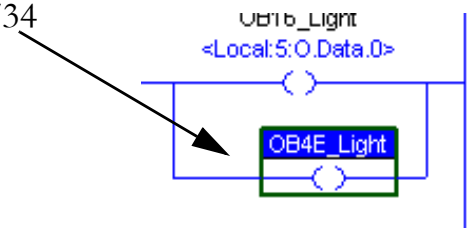
14. Drag and drop a Branch instruction into the first rung.



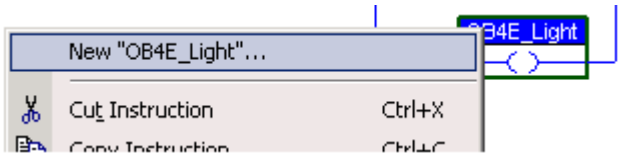
15. Expand tthe Branch to the right side of the *xxxx*_Light.



16. Drag and drop another Output Energize element onto the Branch and name it `xxxx_Light` (where *xxxx* is the suffix of the catalog number of the digital 1734 POINT output module).



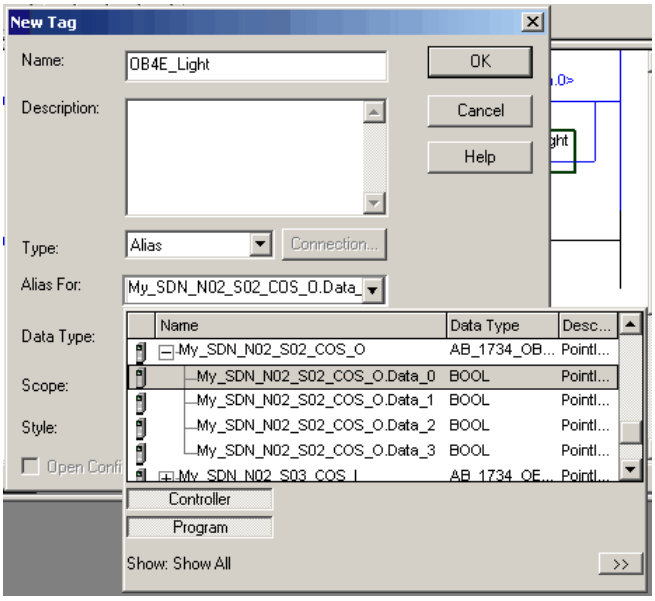
17. Right-click the Light and select **New '*xxxx*_Light'**.



18. From the Type pull-down menu, choose **Alias**.

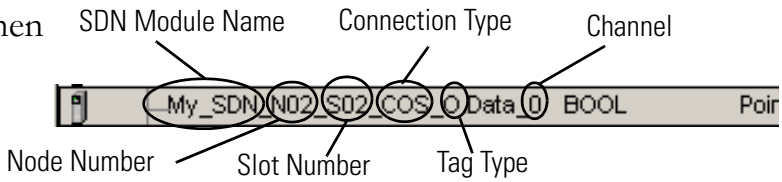
19. From the **Alias For** pull-down menu, browse to find SDN output data tags.

20. **Select** the output data tag that corresponds to the LED indicator you want to turn on.

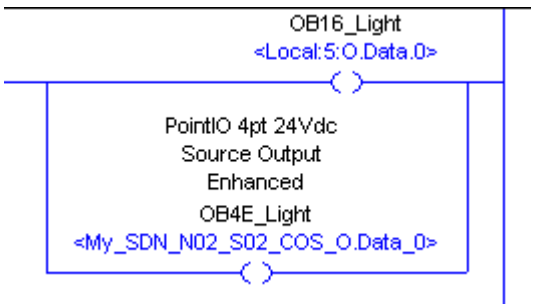


Use this diagram as a reference when selecting your output tag.

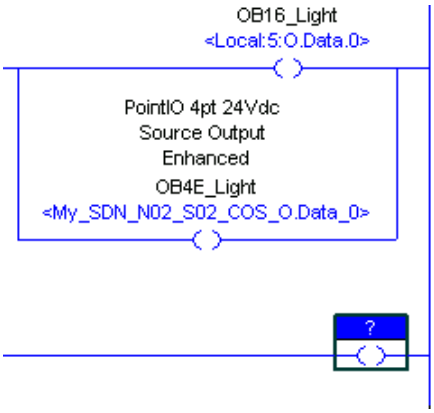
For example, selecting the tag that ends with O.Data.0 will turn on light 0 of the output module.



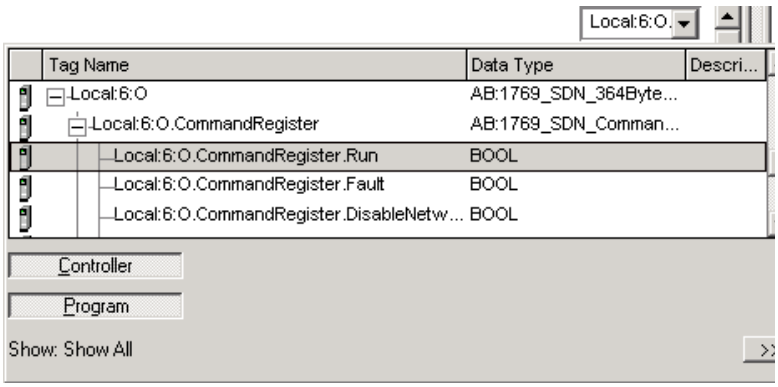
21. Click **OK**.



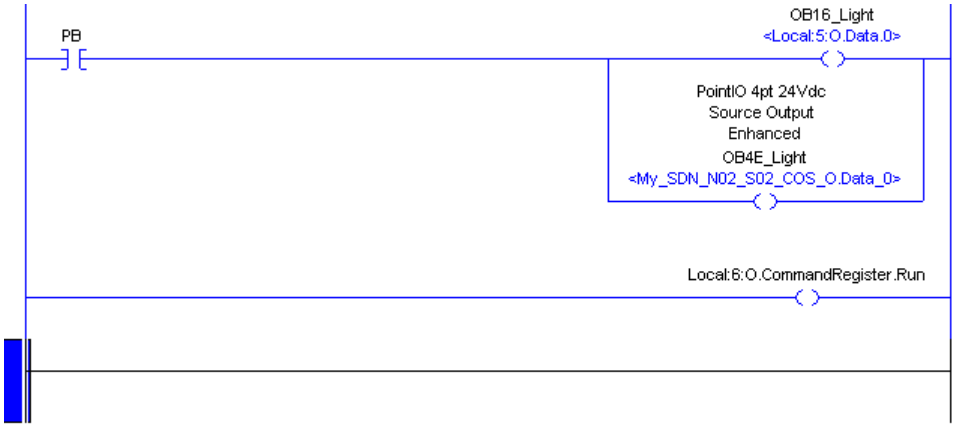
22. Add another Rung with an Output Energize element.



23. Double-click the **?** and select the tag Local:*X*:O.CommandRegister.Run where *X* is the slot of the 1769-SDN module (recorded on the Network Worksheet).



Programming this bit changes the 1769-SDN module from IDLE mode to Run mode.

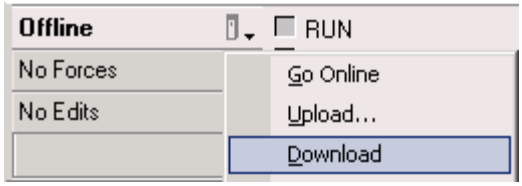


Download the Project

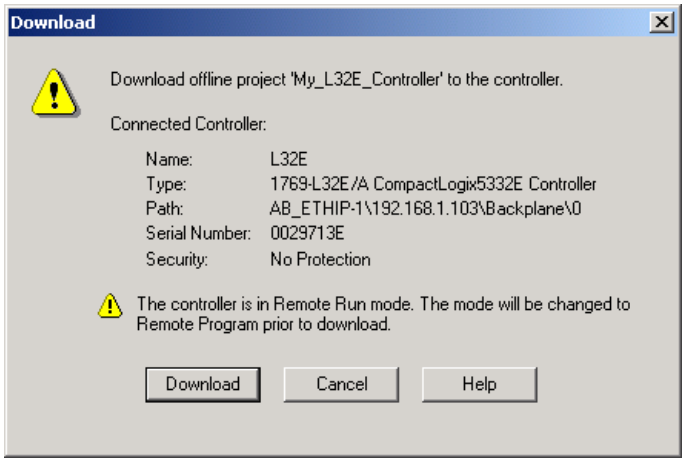
EtherNet/IP, ControlNet, and DeviceNet

1. Save your changes.

2. Move the keyswitch on your controller to Program.



3. Click the Controller Status icon and select **Download**.



4. Click **Download**.

   If you have no loads wired to your distributed output modules, the red status LEDs indicators may start blinking.

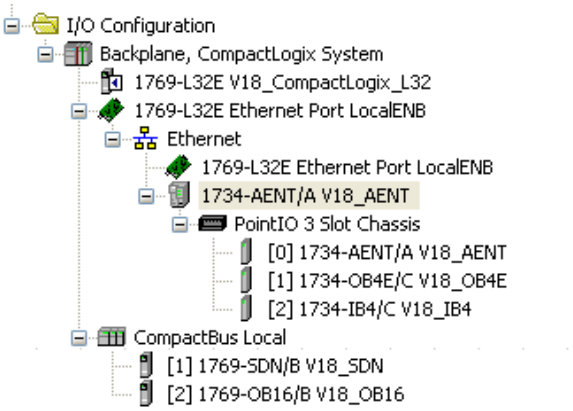
If you are using ControlNet or EtherNet networks, after you download to the controller, the 1734 modules show faults. Continue with Set the POINT I/O Chassis Size on page 135.

If you are using DeviceNet, skip to Test the Distributed I/O Light on page 141.

Set the POINT I/O Chassis Size

ControlNet and EtherNet
(DeviceNet networks, skip to page 141)

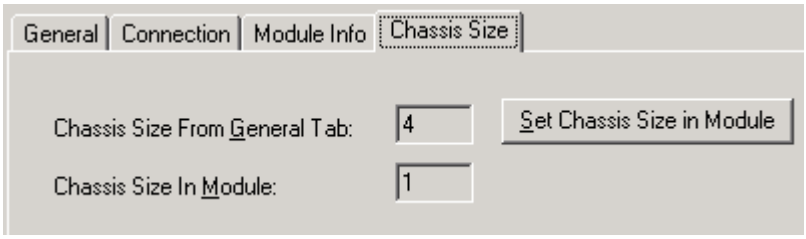
1. Right-click the 1734-ACNR/AENT and select **Properties**.



2. Click the **Chassis Size** tab.

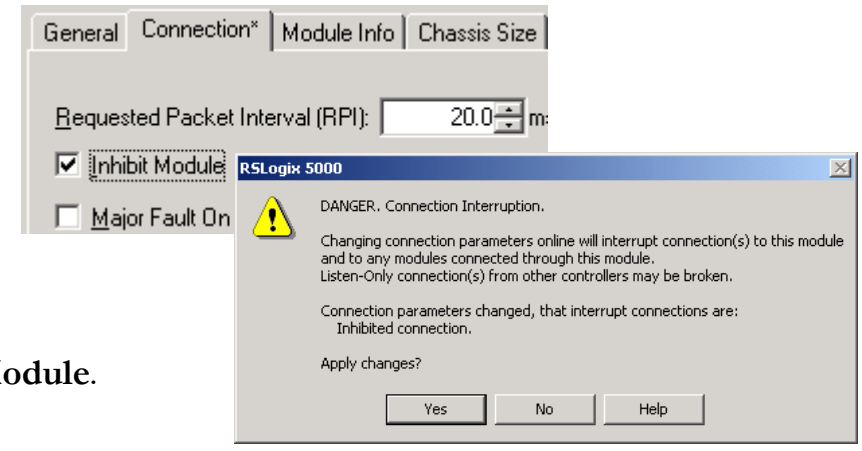
   If the chassis sizes match, skip to step 1 on page 137.

   If the numbers **do not** match, take the following action.



3. On the Connection tab, check the **Inhibit Module** checkbox and click **Apply**.

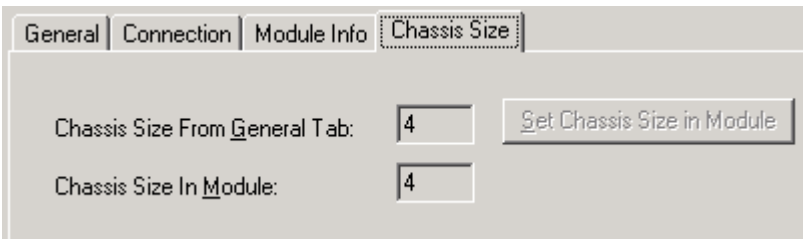
4. Click **Yes**.



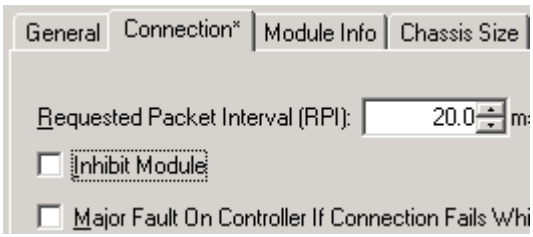
5. On the Chassis size tab, click **Set Chassis Size in Module**.

6. Click **OK** at the warning.

   The Module chassis size updates.

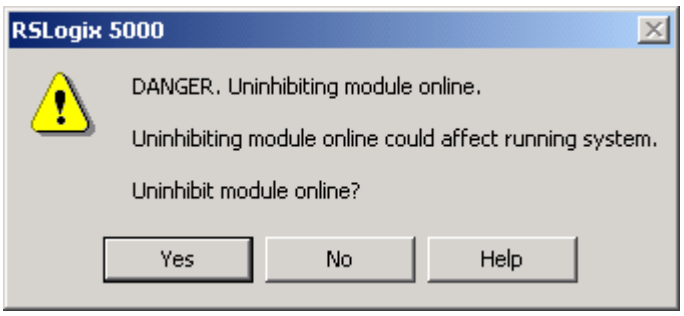


7. On the Connection Tab, uncheck the **Inhibit Module** checkbox and click **OK**.



8. Click **Yes**.

   You have set the POINT I/O chassis size.



9. Click **Save**.

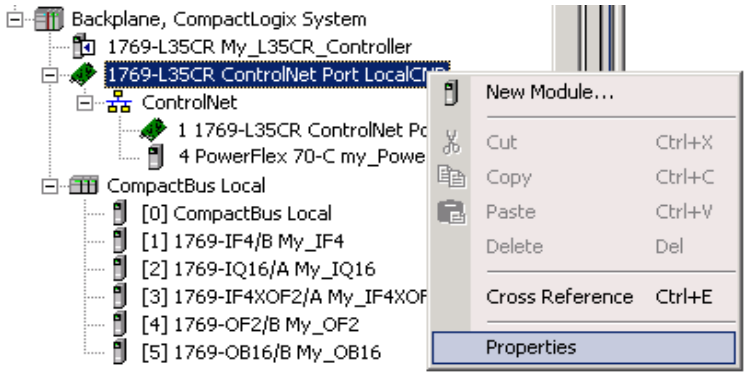
For ControlNet, go to Schedule the ControlNet Network on page 137.

For EtherNet, skip to Test the Distributed I/O Light on page 141.

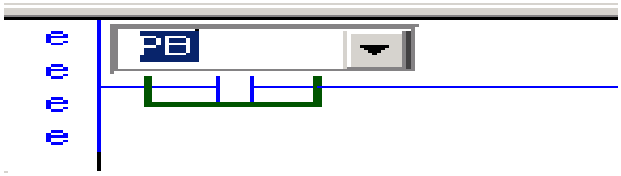
Schedule the ControlNet Network

ControlNet only
(For EtherNet or DeviceNet, skip to page 141.)

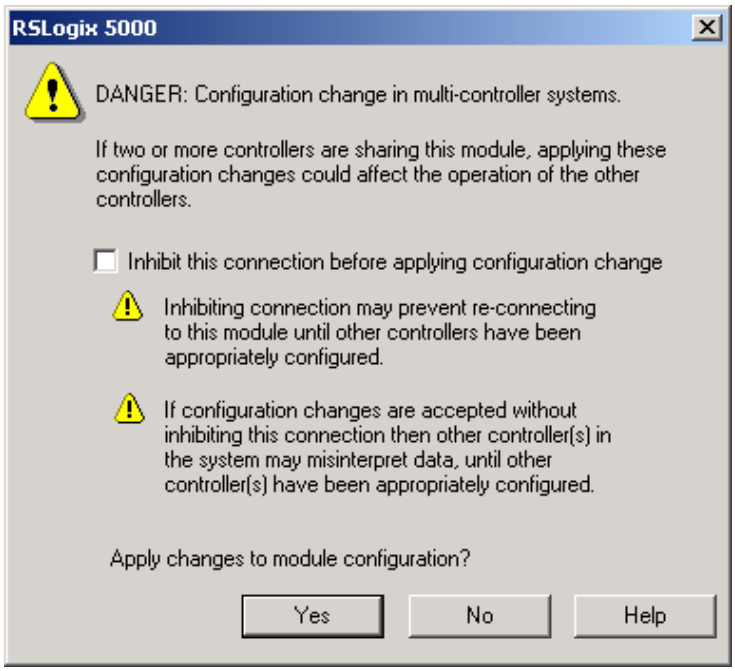
1. Right-click the ControlNet Port and select **Properties**.



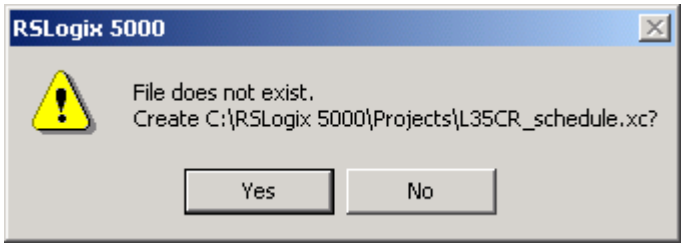
2. On the RSNetWorx tab, enter a new **ControlNet file** name and click **Apply.**



3. Click **Yes**.



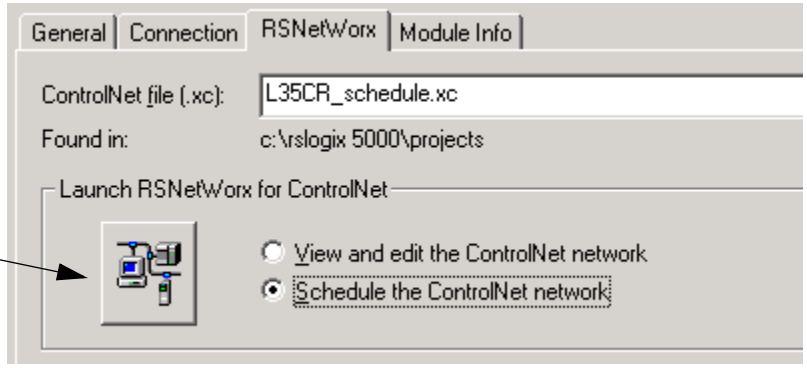
4. Click **Yes**.



5. Select **Schedule the ControlNet network**.

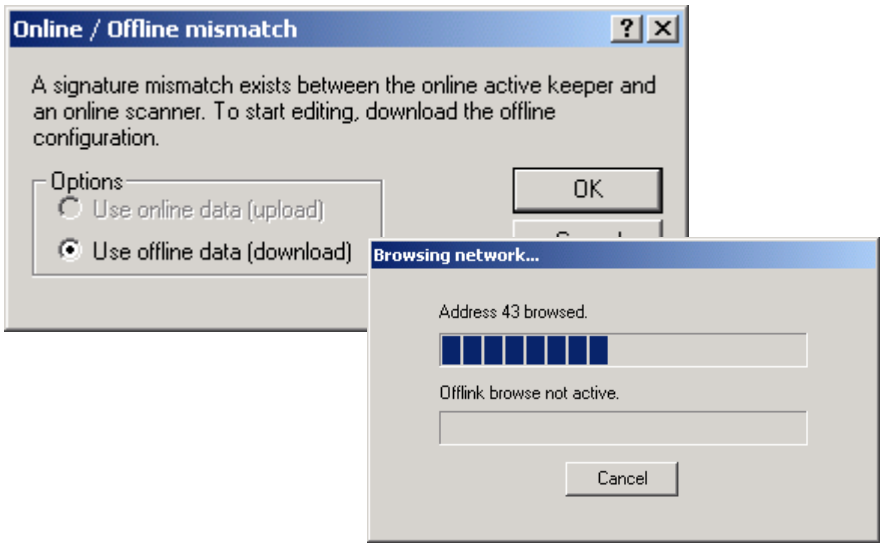
6. Click the RSNetWorx icon.

   RSNetWorx for ControlNet launches.



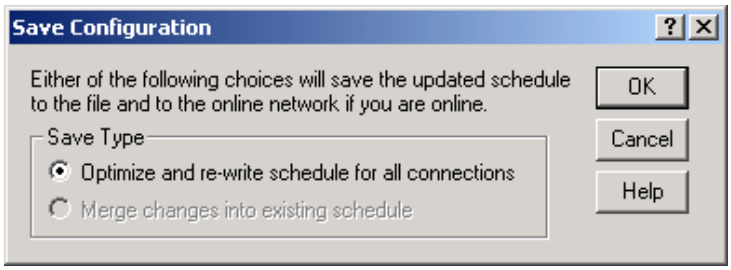
7. Verify that **Use offline data (download)** is selected and click **OK**.

   RSNetWorx browses the network.

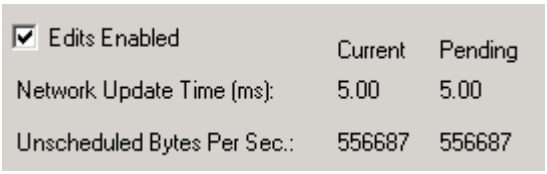


8. If prompted, select **Optimize** and click **OK**.

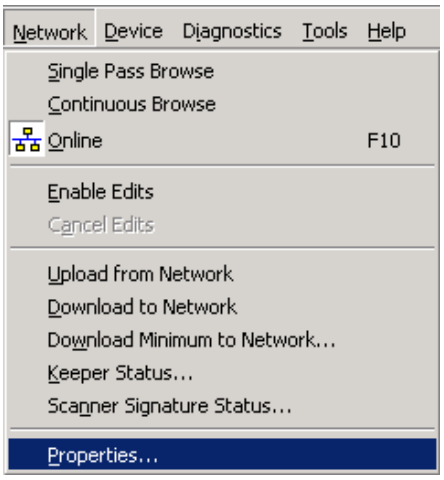
   RSNetWorx for ControlNet software browses the network again.



9. Check the **Edits Enabled** checkbox.



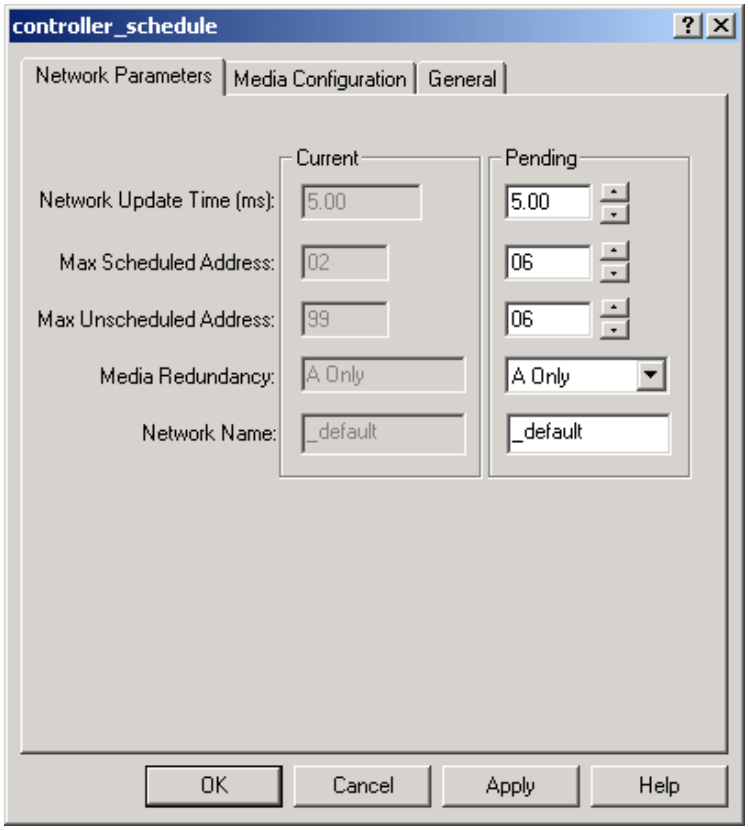
10. From the Network menu, choose **Properties**.



11. In the **Pending** column, select a **Max Scheduled Address** and **Max Unscheduled Address** that are equal to the largest node addresses in your system.

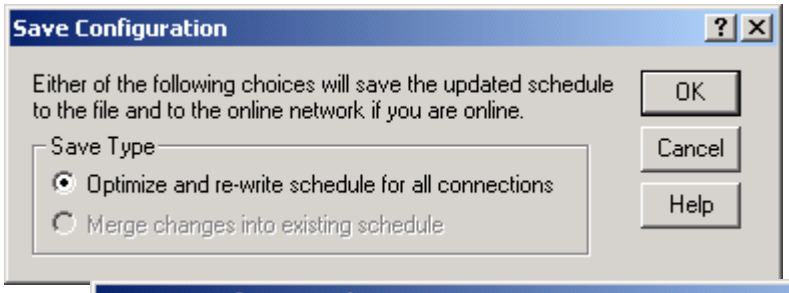
    This example uses 6.

12. Click **OK**.

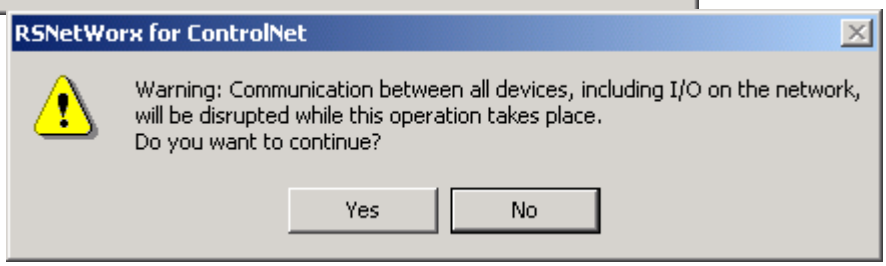


13. Save your changes.

14. Click **OK**.



15. Click **Yes**.

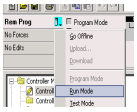


RSNetWorx for ControlNet software browses the network again. This time fewer node addresses are browsed because of the smaller Max Unscheduled Address.

Test the Distributed I/O Light

EtherNet/IP, ControlNet, and DeviceNet

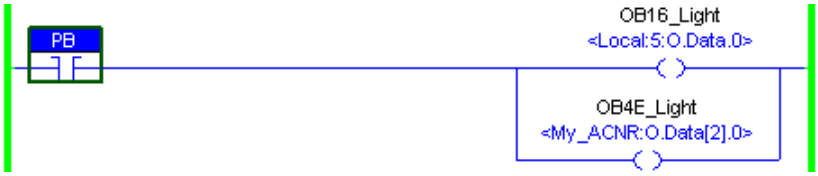
1. Move the keyswitch on your controller to RUN.



2. Select the PB and press Ctrl+T.

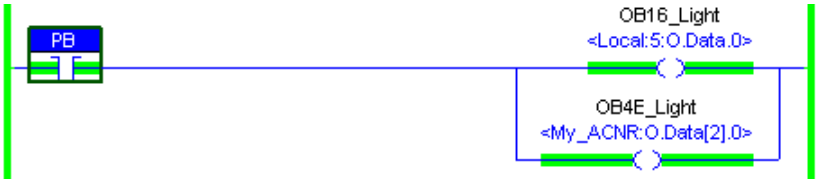
   This toggles the state from 0 to 1 (off to on).

Off



ControlNet Shown

On



3. Verify that the light on both the local and distributed digital output modules turn on.

4. Press **Ctrl+T** to toggle the state back to 0 (off).

5. Select **Go Offline**.

Additional Resources

Resource	Description
ControlLogix Controllers Common Procedures Programming Manual, publication 1756-PM001	Provides details about adding and configuring modules, establishing communication, and writing ladder logic.
DeviceNet Modules in Logix5000 Control Systems, publication DNET-UM004	Provides details about creating scanlists as well as other DeviceNet-specific application information.
ControlNet Modules in Logix5000 Control Systems, publication CNET-UM001	Provides details about configuring and scheduling the ControlNet modules.

Create a PowerFlex 70 Application

In this chapter, you configure a PowerFlex 70 drive and add the drive to the RSLogix 5000 project created in Chapter 10. You also download the project to the controller so you can test communication with the drive.

Before You Begin

- Prepare the PowerFlex 70 drive and network adapter, see Chapter 4
- Create a project using RSLogix 5000 programming software, see Chapter 10

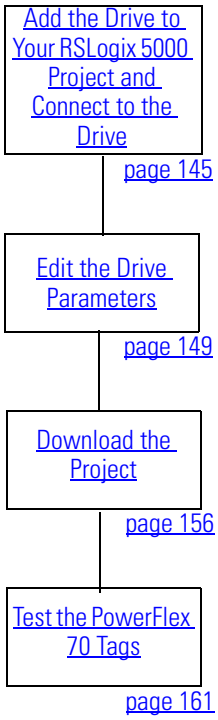
What You Need

- For an EtherNet/IP network, no additional software is needed
- For a ControlNet network, RSNetWorx for ControlNet software
- For a DeviceNet network, RSNetWorx for DeviceNet software

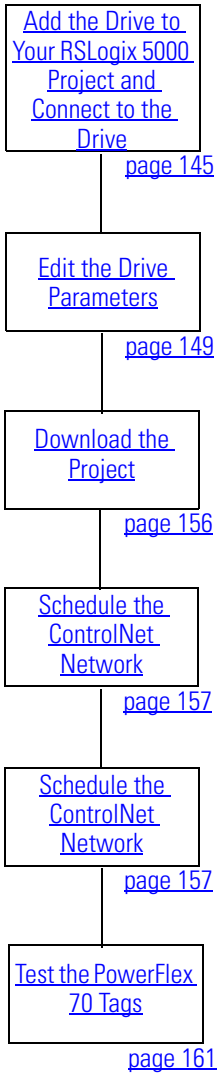
Follow These Steps

If you have a PowerFlex 70 drive, complete these steps for your network:

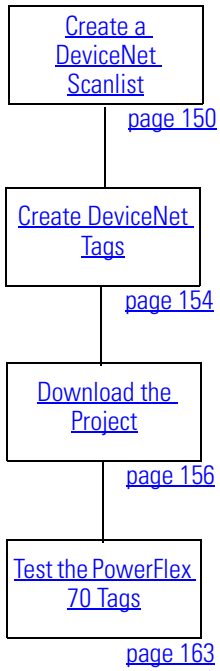
EtherNet/IP



ControlNet



DeviceNet



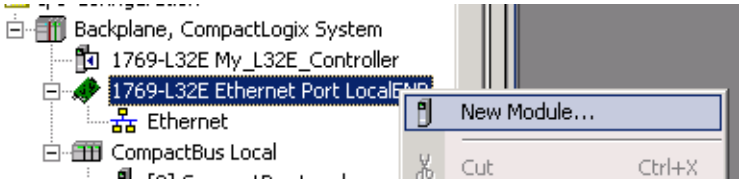
Add the Drive to Your RSLogix 5000 Project and Connect to the Drive

Ethernet/IP and ControlNet only
(for a DeviceNet, skip to page 150)

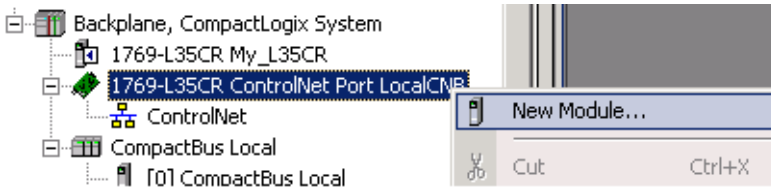
1. Move the controller keyswitch to PROG and go offline.

2. In the RSLogix 5000 programming software, right-click the controller network port and select **New Module**.

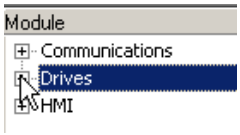
EtherNet/IP



ControlNet

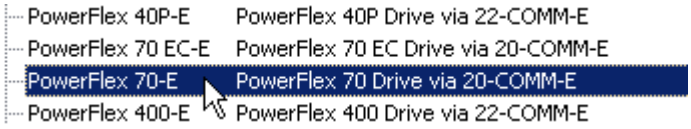


3. Expand **Drives**.

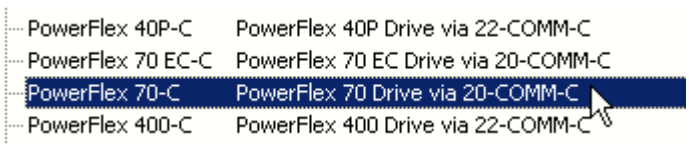


4. Select the **PowerFlex 70-*x*** and click **OK**.

EtherNet/IP

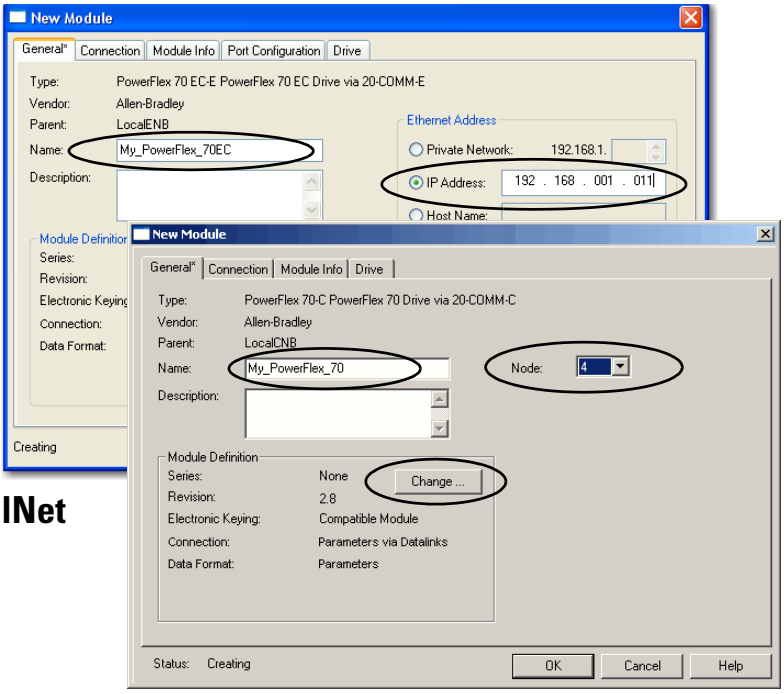


ControlNet



EtherNet/IP

5. Enter a **Name** and **IP Address** (EtherNet/IP) or **Node** number (ControlNet).



ControlNet

6. Click **Change...**

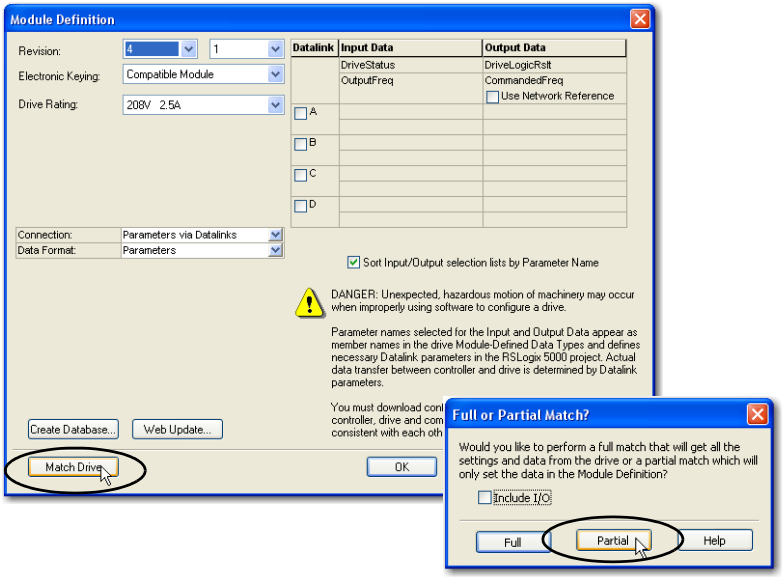
7. On the Module Definition dialog box, click **Match Drive**.

8. On the Full or Partial Match dialog box, make sure the **Include I/O** box is unchecked and click **Partial**.

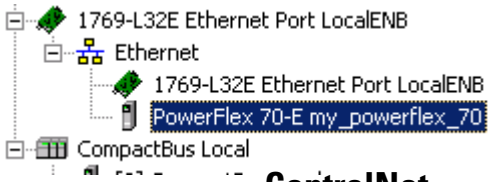
9. Click **OK**.

   The PowerFlex 70 is added to the controller organizer under the network port.

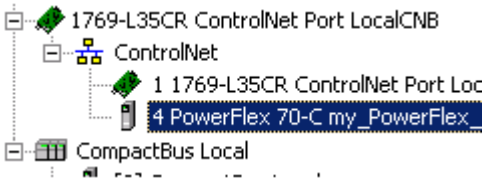
10. Click **Save**.



EtherNet/IP

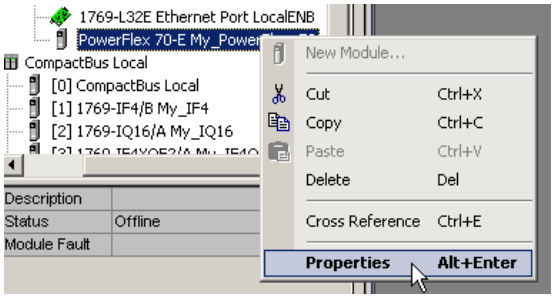


ControlNet



11. **Download** and put the controller in Remote Run mode.

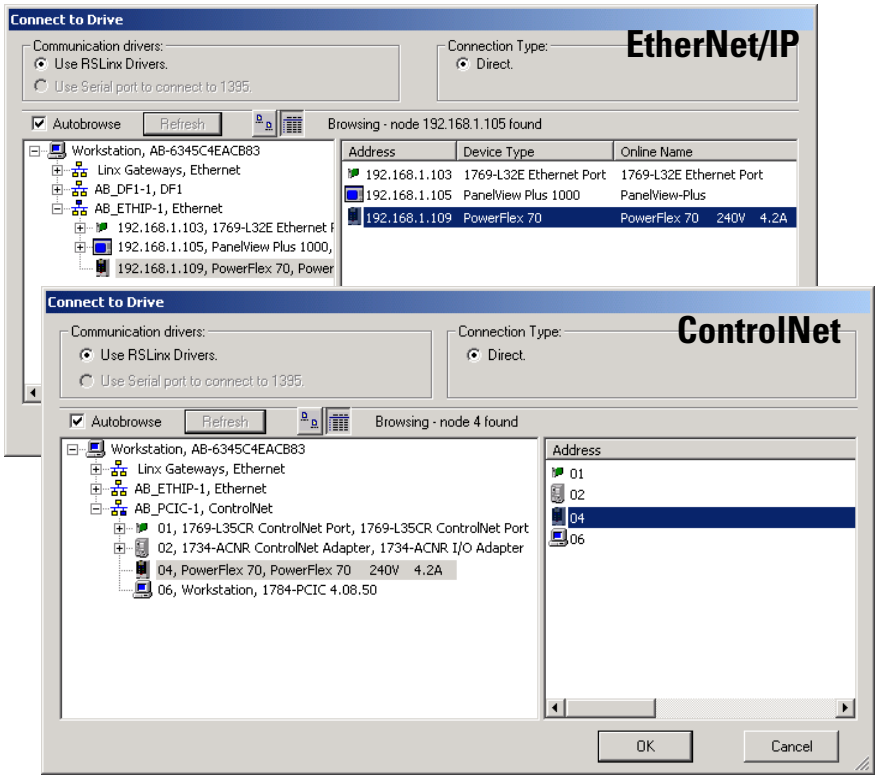
12. Right-click the PowerFlex 70 drive and select **Properties**.



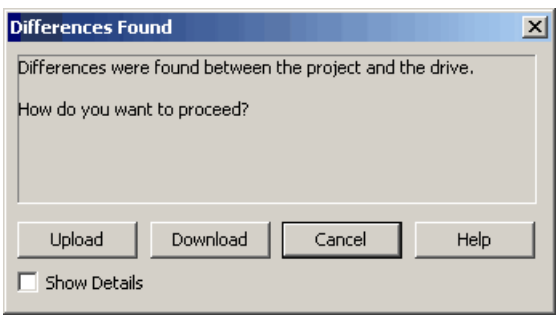
13. Click the **Drive** tab.

14. Click **Connect to Drive**.

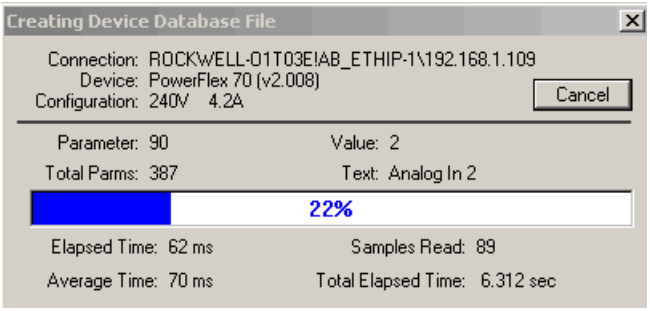
15. Select the **PowerFlex 70 drive** and click **OK**.



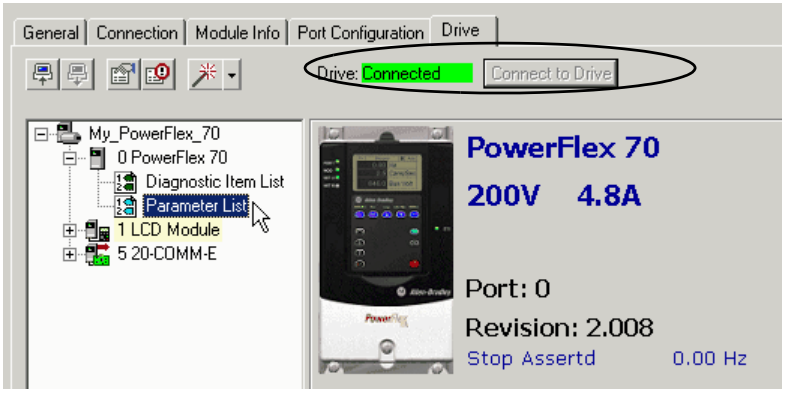
16. Click **Download**.



A drive database is created.



After the download and drive database creation is complete, the drive status will change to connected.

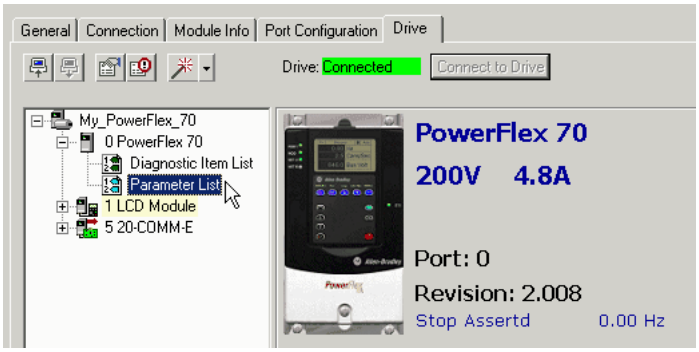


Once the drive is connected, go to Edit the Drive Parameters on page 149.

Edit the Drive Parameters

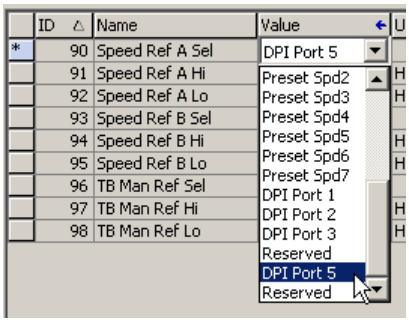
EtherNet/IP and ControlNet only
(for a DeviceNet, skip to page 150)

1. In the drive organizer, double-click **Parameter List.**



2. Enter the following parameters:

Parameter	Name	Value
Parameter 61	Autotune	Ready
Parameter 90	**Speed Ref A Sel**	**DPI Port 5**
Parameter 361	Digital In1 Sel	Not Used
Parameter 362	Digital In2 Sel	Not Used
Parameter 363	Digital In3 Sel	Not Used
Parameter 364	Digital In4 Sel	Not Used
Parameter 365	Digital In5 Sel	Not Used
Parameter 366	Digital In6 Sel	Not Used



3. Click **OK.**
   The parameters are loaded to the drive.

4. **Close** the PowerFlex 70 Properties dialog.

If you are using a EtherNet network, go to Test the PowerFlex 70 Tags on page 161.

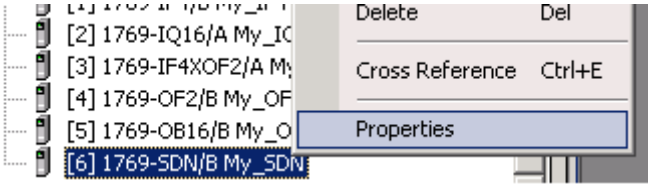
If you are using ControlNet, go to Schedule the ControlNet Network on page 157.

Create a DeviceNet Scanlist

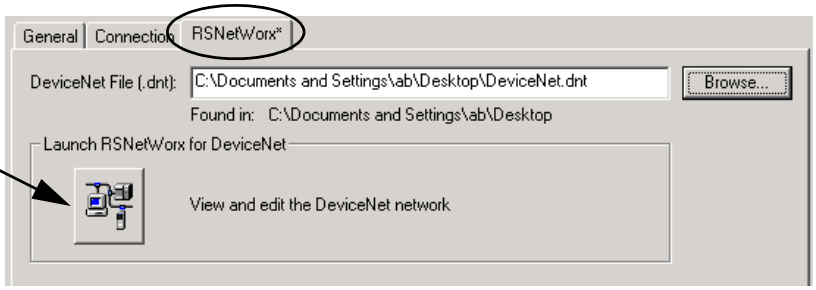
DeviceNet only

1. Move the controller keyswitch to PROG and go offline.

2. In RSLogix controller organizer, right-click the 1769-SDN and select **Properties**.



3. On the RSNetWorx tab, click the RSNetWorx icon.

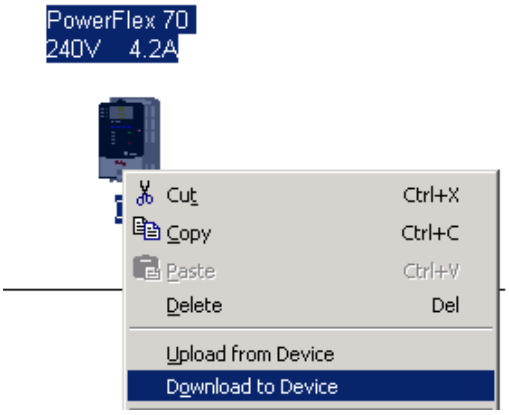


4. In RSNetWorx for DeviceNet, click **Who Active** to go online.

5. Click **OK**.

   If the drive does not display or displays with an error regarding the EDS file, see Knowledgebase article 20539.

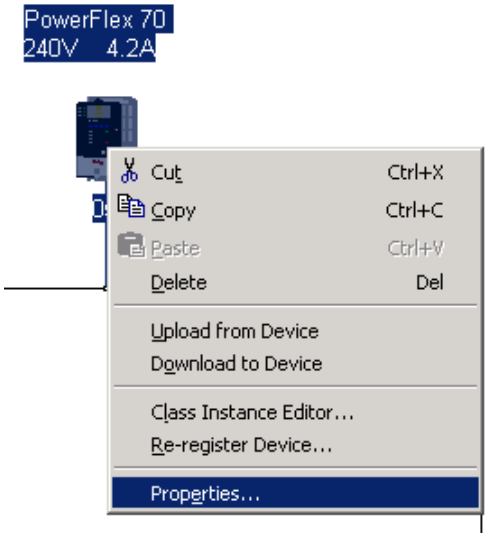
6. Right-click the PowerFlex 70 drive and select **Download to Device**.



7. Click **Yes**.

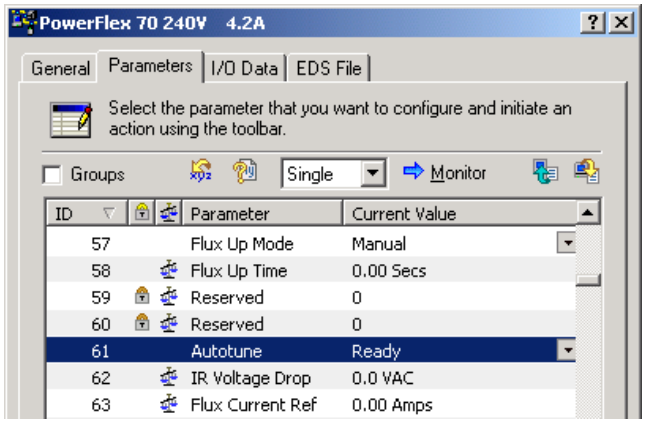
   The configuration is downloaded to the PowerFlex 70 drive.

8. Right-click the PowerFlex 70 drive and select **Properties**.



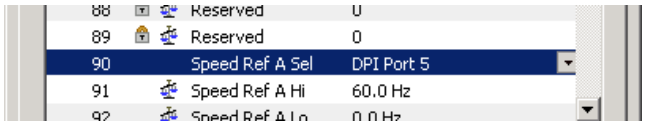
9. Select the **Parameters** tab.

10. Change 61, Autotune, to **Ready**.



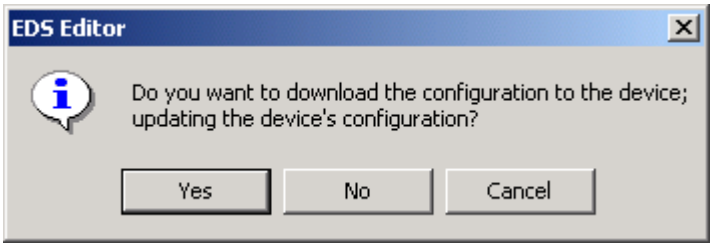
11. Change 90, Speed Ref A Sel, to **DPI Port 5**.

    Setting this parameter configures drive to use the speed reference from the network.



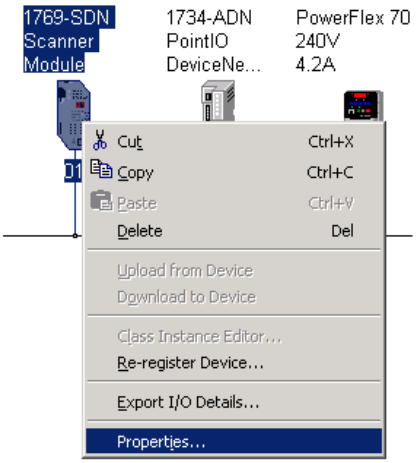
12. Click **OK**.

13. Click **Yes**.



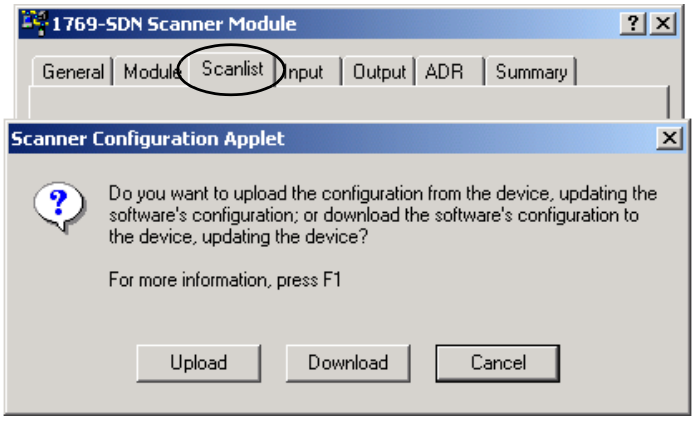
The configuration is downloaded to the PowerFlex 70 drive.

14. Right-click the 1769-SDN scanner and select **Properties**.



15. Select the **Scanlist** tab.

16. Click **Upload**.

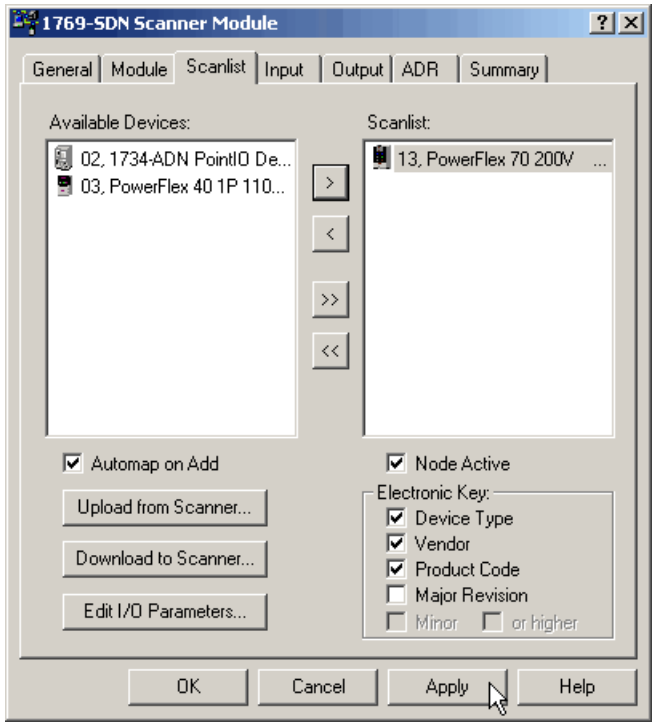


The configuration is uploaded from the 1769-SDN scanner.

17. Select the PowerFlex 70 drive and move it to the Scanlist.

18. Verify that **Automap on Add** is checked and click **Apply**.

19. Click **Yes** to download.



20. **Save** your file.

21. **Close** RSNetWorx for DeviceNet.

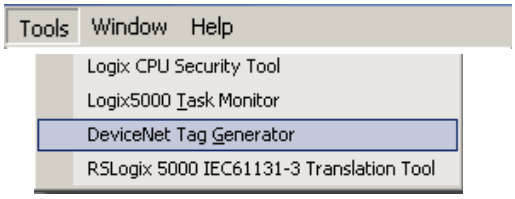
Create DeviceNet Tags

DeviceNet only

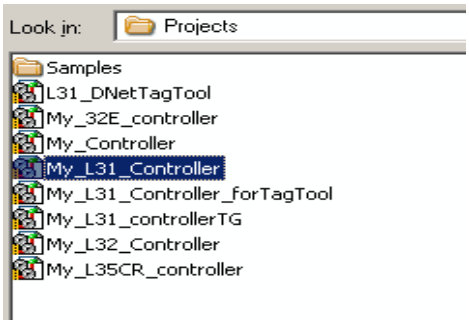
1. Switch the controller to Program Mode.

IMPORTANT Before running the DeviceNet Tag Generator, verify that RSNetWorx for DeviceNet software is closed.

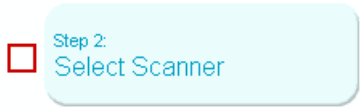
2. In RSLogix 5000 programming software, from the Tools menu, choose **DeviceNet Tag Generator**.



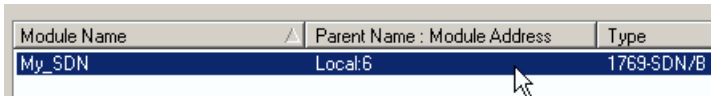
3. **Select** the RSLogix 5000 project you are creating tags for.



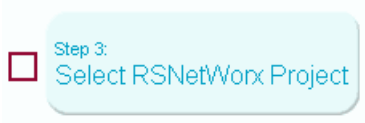
4. Click **Select Scanner**.



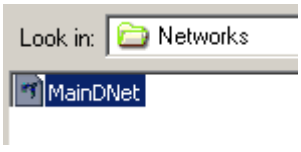
5. Select the 1769-SDN scanner that scans the network where the drive is located.



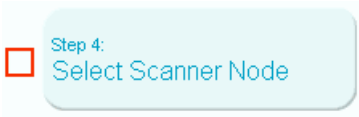
6. Click **Select RSNetWorx Project**.



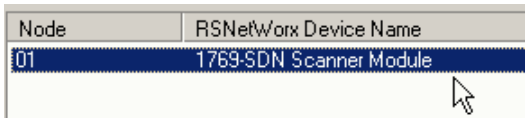
7. Select DeviceNet configuration file recorded on the Network Worksheet.



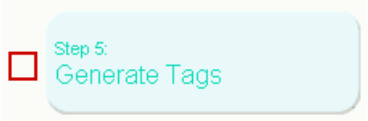
8. Click **Select Scanner Node**.



9. Select the node of the 1769-SDN scanner as recorded on the Network Worksheet.

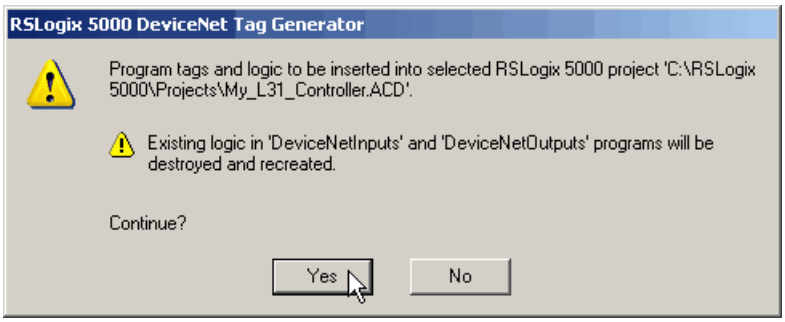


10. Click **Generate Tags**.

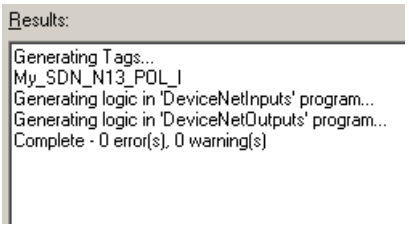


11. Click **Generate Tags**.

12. Click **Yes**.



When tag generation is complete, the text log displays.



13. **Close** the DeviceNet Tag Generator.

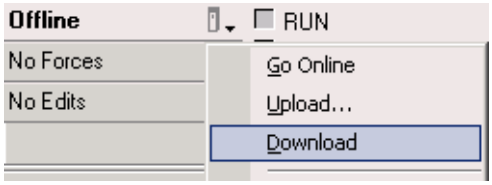
Download the Project

DeviceNet only

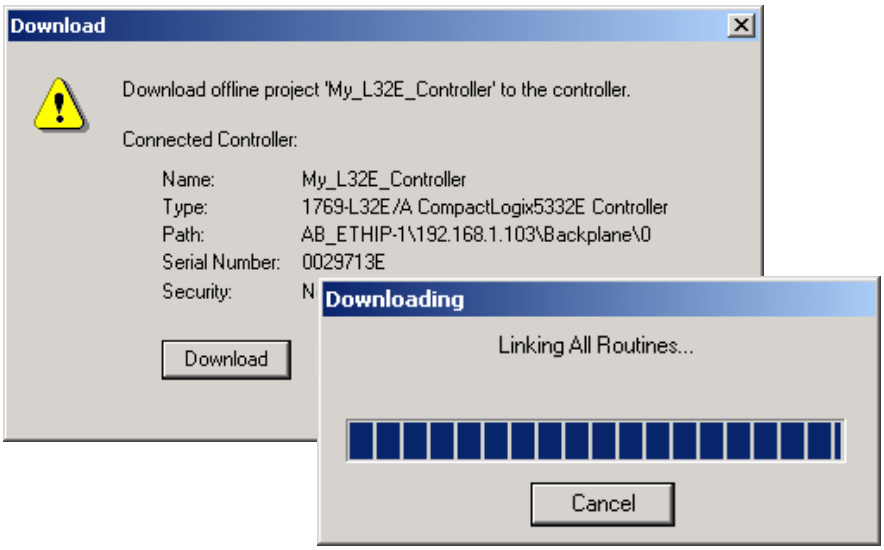
TIP If you receive a fault message on your PowerFlex 70 drive display, press  on the keypad to clear the fault.

1. If you have not already done so, move the keyswitch on your controller to PROG.

2. Click the Controller Status icon and select **Download**.



3. Click **Download**.



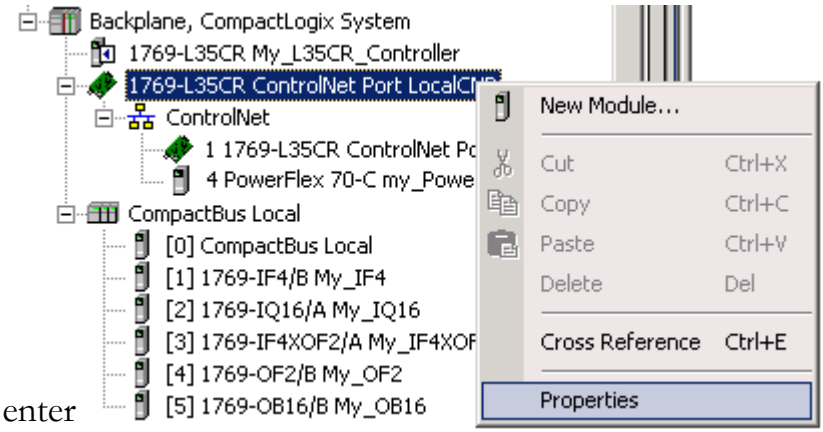
The project downloads to the controller.

If you are using a DeviceNet network, go to Test the PowerFlex 70 Tags on *page 163*.

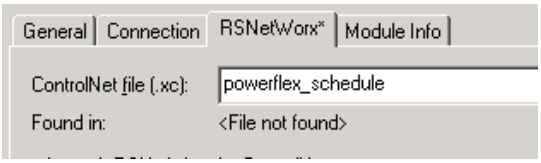
Schedule the ControlNet Network

ControlNet only
(for Ethernet/IP, skip to page 161; for DeviceNet, skip to page 163)

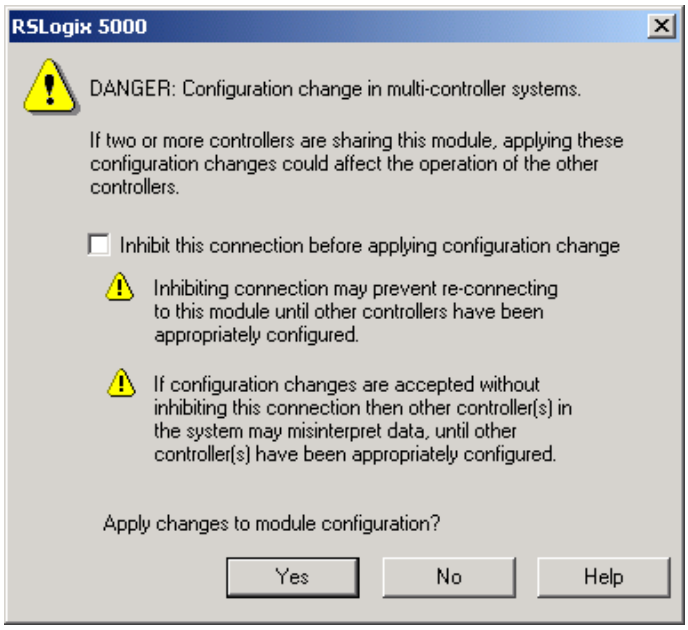
1. Right-click the ControlNet Port and select **Properties**.



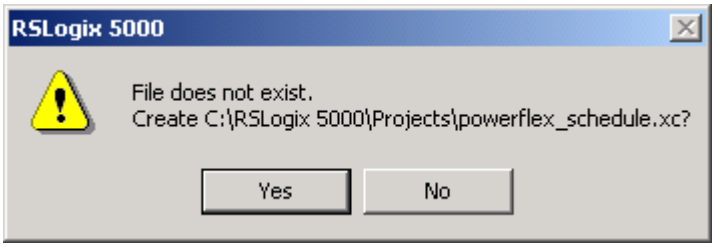
2. On the RSNetWorx tab, enter a new **ControlNet file** name and click **Apply**.



3. Click **Yes**.



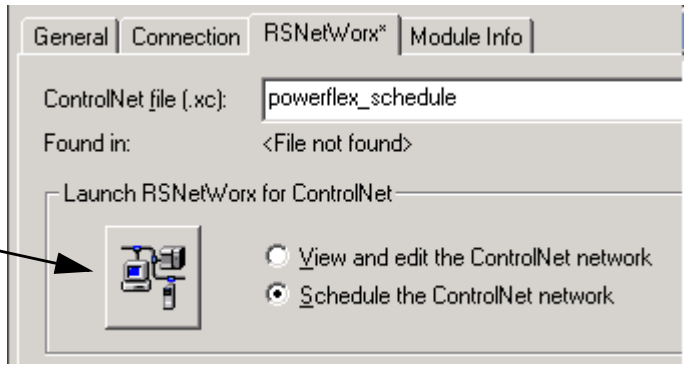
4. Click **Yes**.



5. Select **Schedule the ControlNet network**.

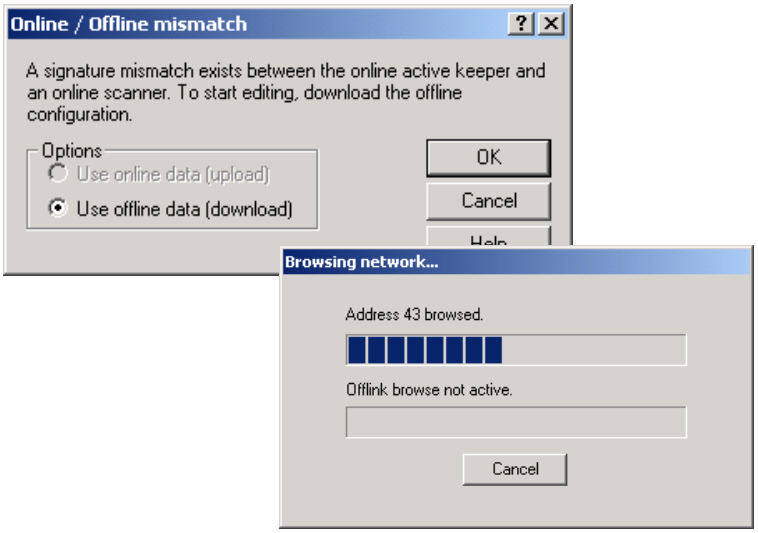
6. Click the RSNetWorx icon.

   RSNetWorx for ControlNet software launches.



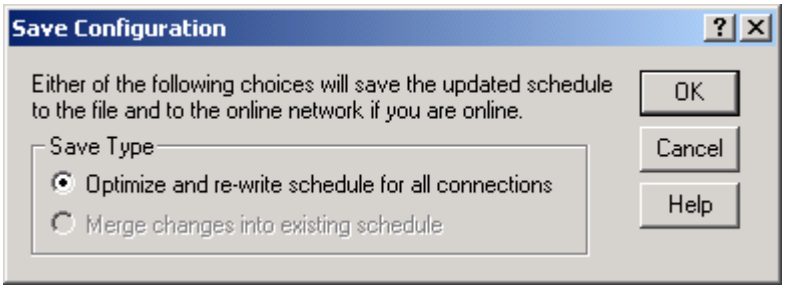
7. Verify that **Use offline data (download)** is selected and click **OK**.

   RSNetWorx browses the network.

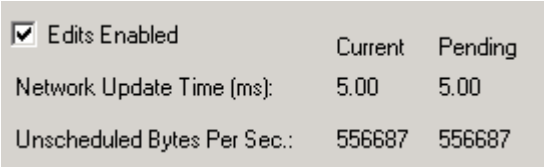


8. If prompted, select **Optimize** and click **OK**.

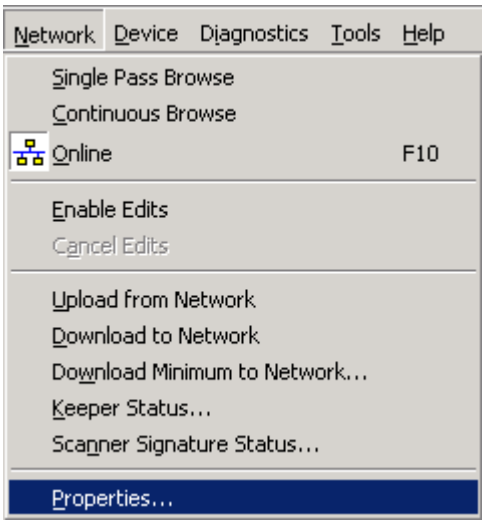
   RSNetWorx browses the network again.



9. Check the **Enable Edits** checkbox.

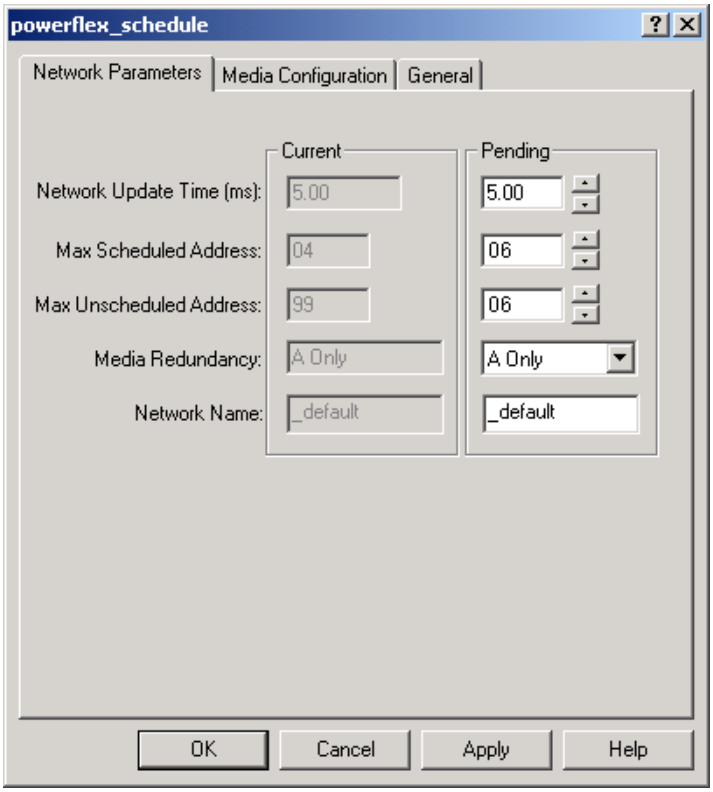


10. From the Network menu, choose **Properties**.



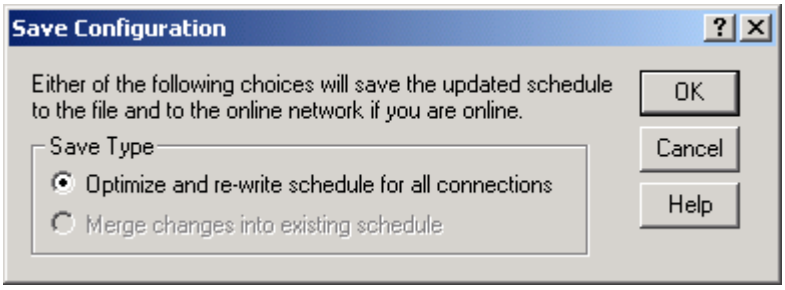
11. In the **Pending** column, select a **Max Scheduled Address** and **Max Unscheduled Address** that are equal to the largest node addresses in your system.

12. Click **OK**.



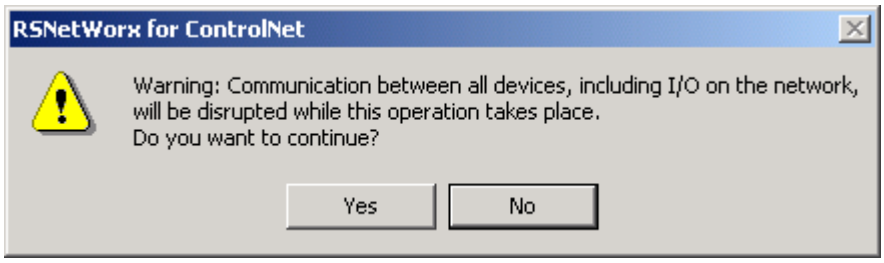
13. Save your changes.

14. Click **OK**.



15. Click **Yes**.

RSNetWorx browses the network again. This time fewer node addresses are browsed because of the smaller Max Unscheduled Address.



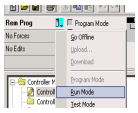
Test the PowerFlex 70 Tags

Ethernet/IP and ControlNet only (for DeviceNet, skip to page 163)

TIP To change a tag in RSLogix:

1. Select the tag value.
2. Enter or select the desired value.
3. Press Enter.

1. Move the controller keyswitch to RUN.



2. Double-click **Controller Tags**.

3. Locate and expand the PowerFlex 70 output tag.

My_PowerFlex_70:O	{...}	{...}		AB:PowerFlex70_...
My_PowerFlex_70:O.DriveLogicRslt	2#0000_000...		Binary	INT
My_PowerFlex_70:O.DriveLogicRslt_Stop	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Start	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Jog	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_ClearFault	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Forward	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Reverse	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_LocalContrl	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_MOPInc	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Accel1	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Accel2	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Decel1	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_Decel2	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_SpdRefID0	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_SpdRefID1	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_SpdRefID2	0		Decimal	BOOL
My_PowerFlex_70:O.DriveLogicRslt_MOPDec	0		Decimal	BOOL

4. Change the ClearFault tag to **1** to clear any initial faults.

5. Change the ClearFault tag back to **0**.

6. Verify that the I.Ready tag value is **1**.

   This tag indicates that the drive is ready to start.

7. Change the O.CommandedFreq tag to **15000** engineering units (this is approximately 59.5 Hz).

$$\frac{EU}{Hz} = \frac{32767}{130}$$

WARNING

If there is a motor attached to your drive, completing the next step will cause it to turn.

8. Change the Start tag to **1**.

   The display on the drive registers the speed increase in Hz until the value entered at the reference tag is reached.

9. Change the Start tag back to **0**.

10. Change the Stop tag to **1**.

    The display on the drive will show a speed decrease until the drive reaches 0.00 Hz.

11. Change the Stop tag from 1 to **0**.

12. **Go Offline**.

By starting and stopping the drive, you verified that:

- the controller is correctly communicating with the drive.
- the drive can receive simple commands.

Test the PowerFlex 70 Tags

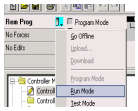
TIP

To change a tag in RSLogix:

1. Select the tag value.
2. Enter or select the desired value.
3. Press Enter.

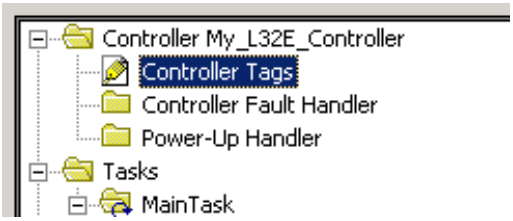
DeviceNet only

1. Move the controller keyswitch to RUN.



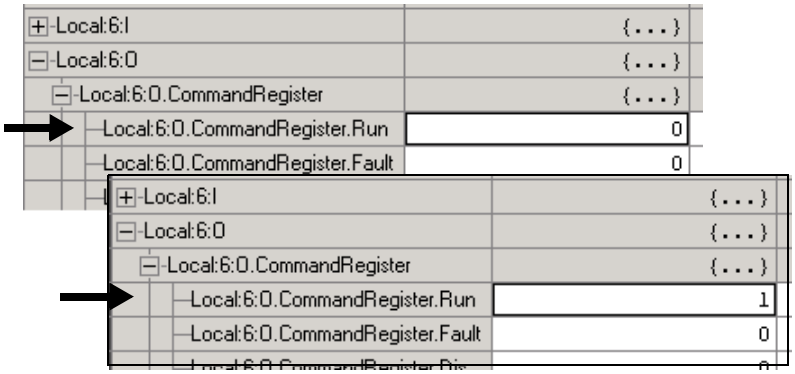
2. In the controller organizer, double-click **Controller Tags**.

   If you have added distributed I/O to your project in Chapter 11, skip to step 4.



3. Change the tag **O.CommandRegister.Run** tag to **1**.

   This changes the 1769-SDN scanner to Run mode.

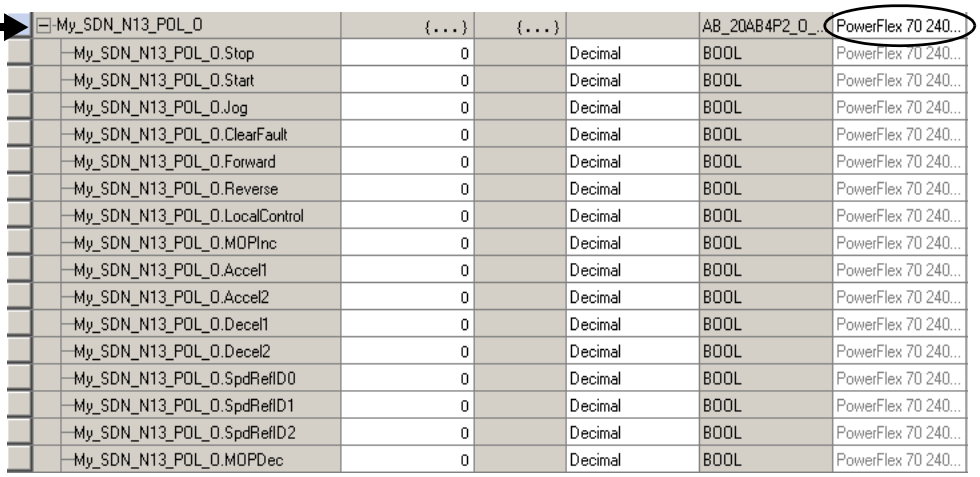


4. At the tag **O.Reference**, change the value to **15000** engineering units (this is approximately 59.5 Hz).

This is the speed your drive will accelerate to and is determined using the equation shown.

$$\frac{EU}{Hz} = \frac{32767}{130}$$

5. Expand the output tags for the PowerFlex 70.



My_SDN_N13_POL_0	{...}	{...}		AB_20AB4P2_0_...	PowerFlex 70 240...
My_SDN_N13_POL_0.Stop	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Start	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Jog	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.ClearFault	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Forward	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Reverse	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.LocalControl	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.MOPInc	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Accel1	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Accel2	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Decel1	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.Decel2	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.SpdRefID0	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.SpdRefID1	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.SpdRefID2	0		Decimal	BOOL	PowerFlex 70 240...
My_SDN_N13_POL_0.MOPDec	0		Decimal	BOOL	PowerFlex 70 240...

WARNING

If there is a motor attached to your drive, completing the next step will make it turn.

6. At the **O.Start** tag, enter **1**.

The display on the drive registers the speed increase in Hz until the value entered at the reference tag is reached.

7. Change the Start tag back to **0**.

8. Change the Stop tag to **1**.

The display on the drive will show a speed decrease until the drive reaches 0.00 Hz.

9. Change the Stop tag back to **0**.

10. Select **Go Offline**.

By starting and stopping the drive, you verified that:

- The controller is correctly communicating with the drive.
- The drive can receive simple commands.

Additional Resources

Resource	Topic
DeviceNet Modules in Logix5000 Control Systems, publication DNET-UM004	Describes common procedures and troubleshooting tasks related to DeviceNet networks.
Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001	Provides details about adding and configuring modules, establishing communication, and writing ladder logic.
PowerFlex 70 Adjustable Frequency AC Drive User Manual, publication 20A-UM001	Provides information about installing, programming, editing parameters, and troubleshooting the PowerFlex 70 drive.
PowerFlex 70 EtherNet/IP Adapter User Manual, publication 20COMM-UM010	Provides process for installing, configuring, and troubleshooting the adapter.
PowerFlex 70 ControlNet Adapter User Manual, publication 20COMM-UM003	Provides process for installing, configuring, and troubleshooting the adapter.
PowerFlex 70 DeviceNet Adapter User Manual, publication 20COMM-UM002	Provides process for installing, configuring, and troubleshooting the adapter.
Knowledgebase article ID 20539 at http://support.rockwellautomation.com/	Provides details about uploading EDS files from the drive.

Notes:

Create a PowerFlex 40 Application

In this chapter, you configure a PowerFlex 40 drive using with the drive keypad and add the drive to your project using RSLogix 5000 programming software. You also download the project to the controller so you can test communication with the drive. This project builds upon the project created in Chapter 10.

Before You Begin

- Prepare the PowerFlex 40 drive and network adapter, see Chapter 5
- Create a project using RSLogix 5000 programming software, see Chapter 10

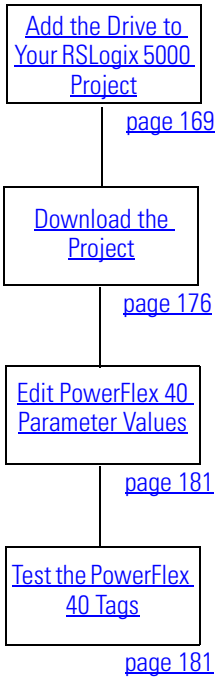
What You Need

- For an EtherNet/IP network, no additional software is needed
- For ControlNet, RSNetWorx for ControlNet software
- For DeviceNet, RSNetWorx for DeviceNet software

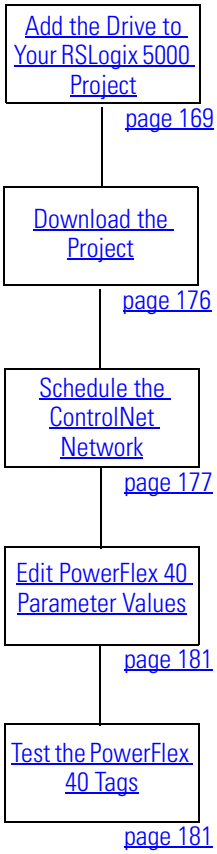
Follow These Steps

If you have a PowerFlex 40 drive, complete these steps for your network.

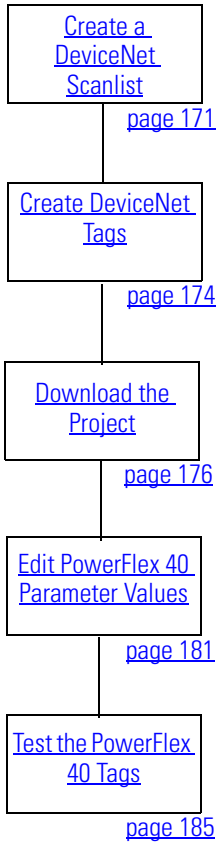
EtherNet/IP



ControlNet



DeviceNet

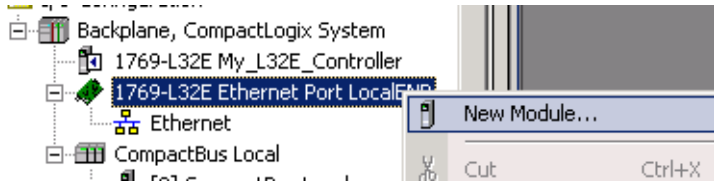


Add the Drive to Your RSLogix 5000 Project

EtherNet/IP and ControlNet networks only
(for a DeviceNet network, skip to page 171)

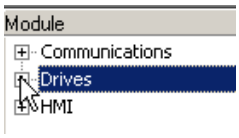
1. Right-click your network port and select **New Module**.

EtherNet/IP



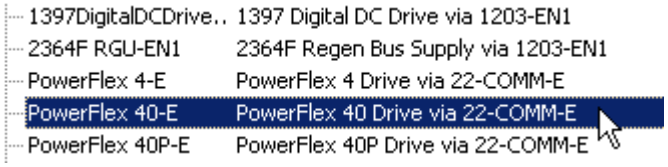
ControlNet

2. Expand **Drives**.

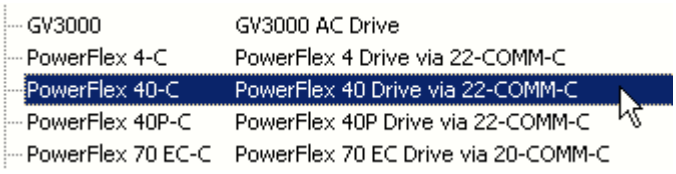


3. Select the **PowerFlex 40-*x***.

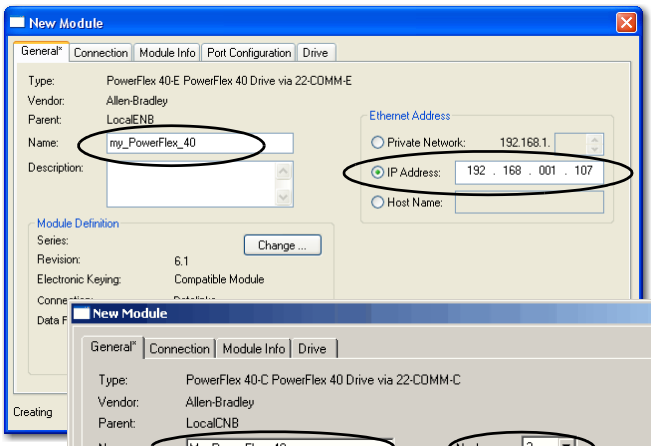
EtherNet/IP



ControlNet



EtherNet/IP

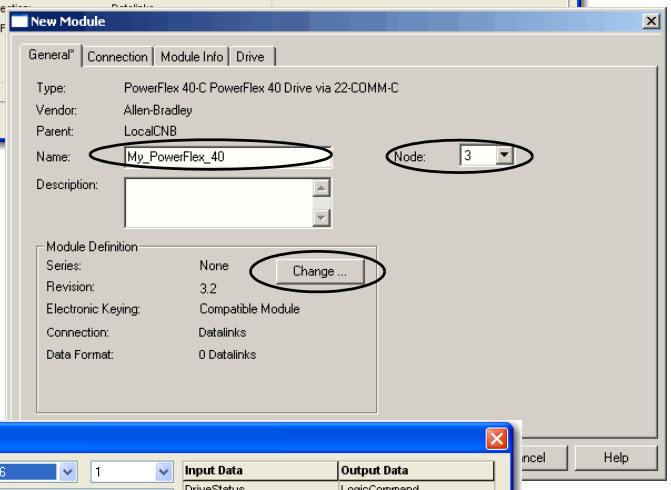


4. In the Name field, type a name for the drive.

5. Enter an **IP Address** (Ethernet network) or **Node** number (ControlNet network) for the PowerFlex 40 drive.

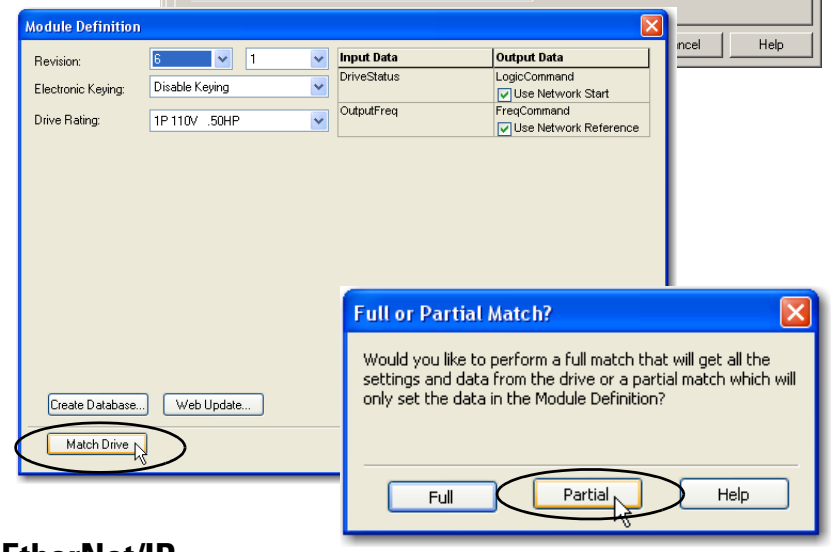
6. Click **Change**.

ControlNet



7. On the Module Definition dialog box, click **Match Drive**.

8. On the Full or Partial Match dialog box, click **Partial**.

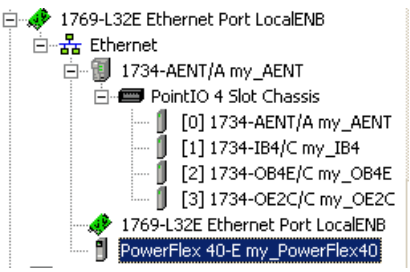


9. Click **OK**.

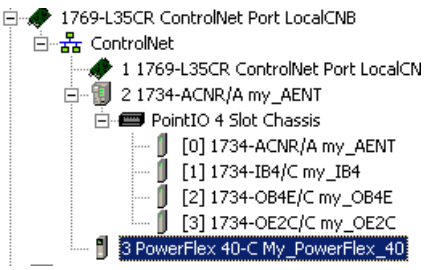
10. Click **OK** again.

The PowerFlex 40 is added to the controller organizer.

EtherNet/IP



ControlNet



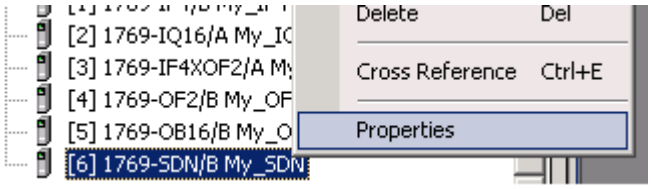
For EtherNet/IP and ControlNet, skip to Download the Project on page 176.

Create a DeviceNet Scanlist

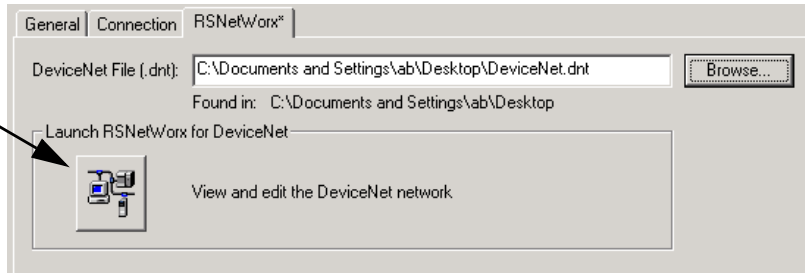
DeviceNet only

1. Move the controller keyswitch to PROG.

2. In the RSLogix 5000 programming software, right-click the 1769-SDN and select **Properties**.



3. If RSNetWorx for DeviceNet is open, skip to step 4.
   If RSNetWorx for DeviceNet is not open:
   a. In RSLogix 5000 programming, right-click the 1769-SDN and select **Properties**.

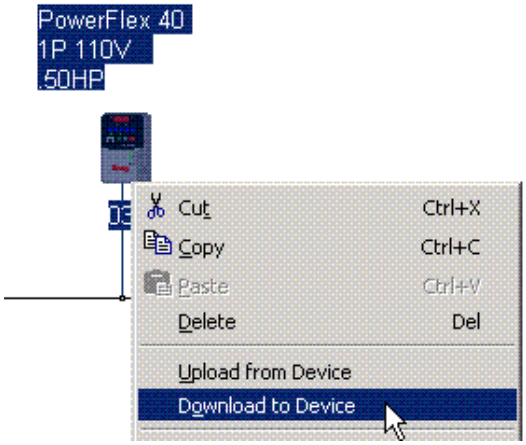


   b. On the RSNetWorx tab, click the RSNetWorx button.

4. Click Who Active to go online.

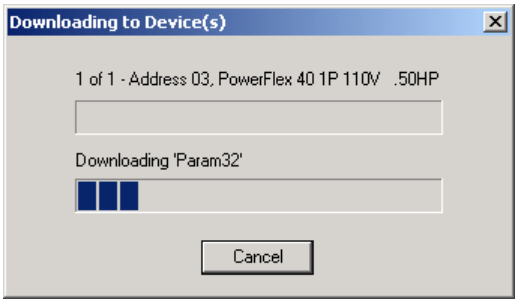
5. Click **OK**.

6. Right-click the PowerFlex 40 and select **Download to Device**.

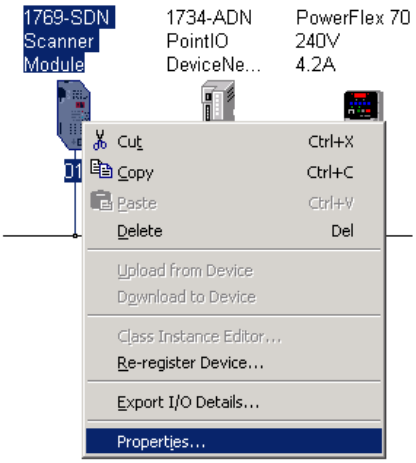


7. Click **Yes**.

   The configuration downloads to the PowerFlex 40.

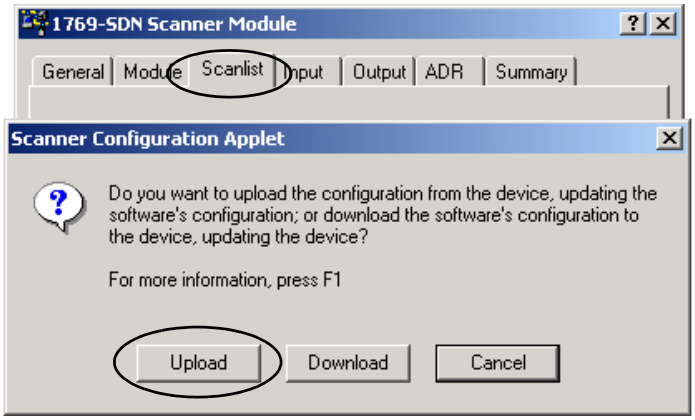


8. Right-click the 1769-SDN and select **Properties**.



9. Click the **Scanlist** tab.

10. Click **Upload**.



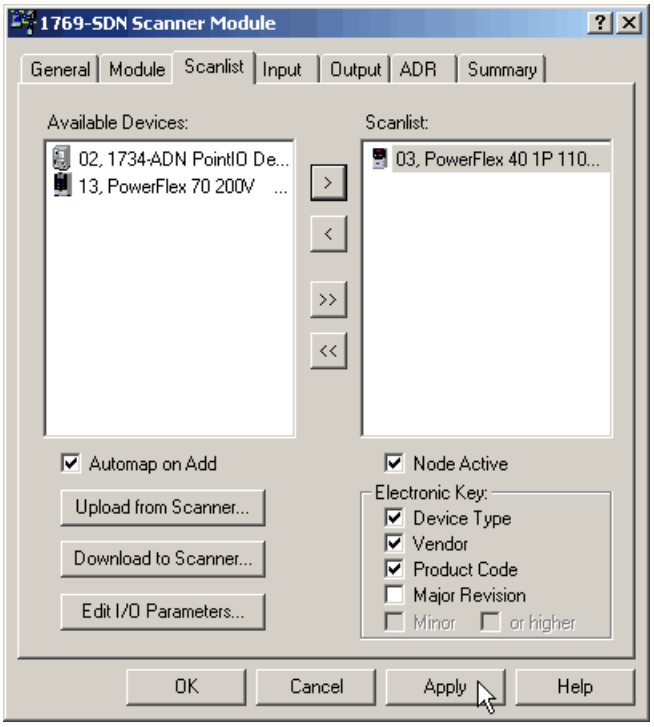
11. Select the PowerFlex 40 drive and move it to the Scanlist.

12. Verify that **Automap on Add** is checked and click **Apply**.

13. Click **Yes**.

14. Click **OK**.

15. **Save** your file.



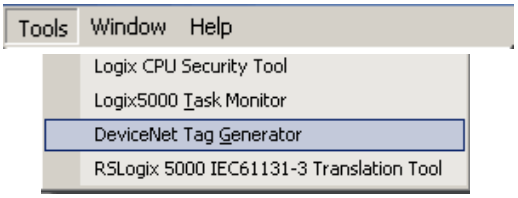
16. **Close** RSNetWorx for DeviceNet software.

Create DeviceNet Tags

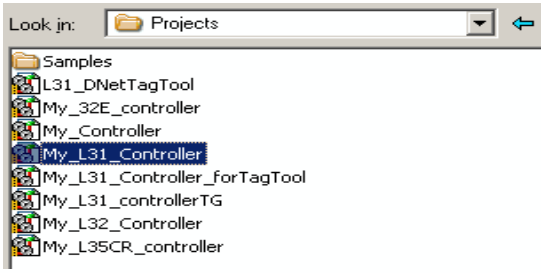
DeviceNet only
(to complete this step for EtherNet/IP or ControlNet, see page 169)

IMPORTANT Before running the DeviceNet Tag Generator, verify that RSNetWorx for DeviceNet software is closed.

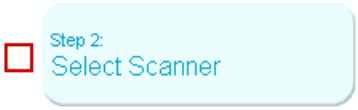
1. In RSLogix 5000 programming software, from the Tools menu, choose **DeviceNet Tag Generator**.



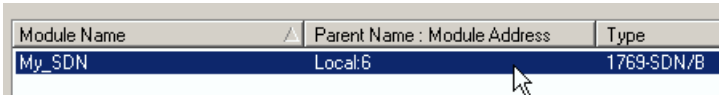
2. Select the RSLogix 5000 project.



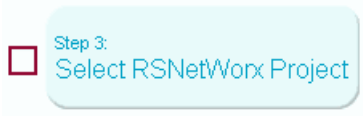
3. Click **Select Scanner**.



4. Select the 1769-SDN scanner that scans the network where the drive is located.

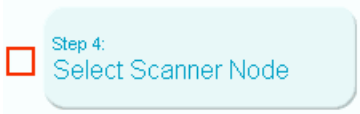


5. Click **Select RSNetWorx Project**.

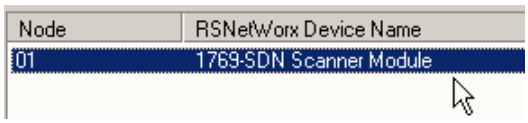


6. Select DeviceNet configuration file recorded on the Network Worksheet.

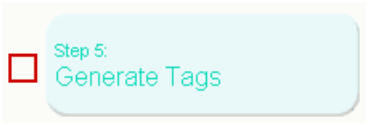
7. Click **Select Scanner Node**.



8. Select the node of the 1769-SDN module as recorded on the Network Worksheet.

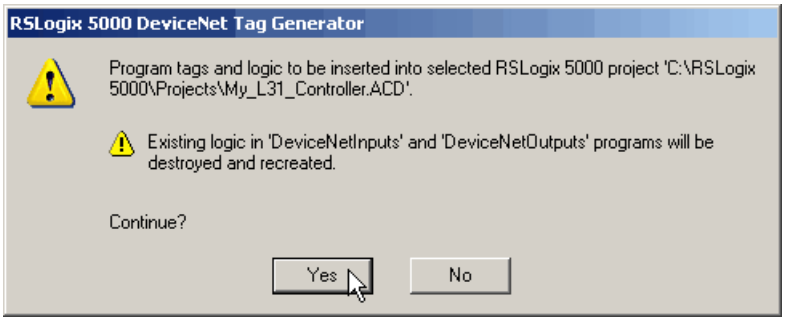


9. Click **Generate Tags**.

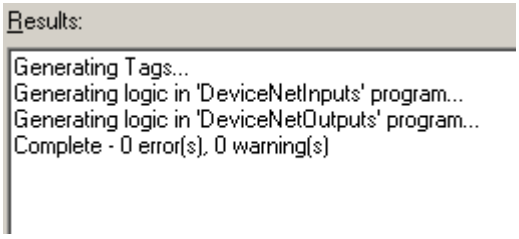


10. Click **Generate Tags**.

11. Click **Yes**.



When tag generation is complete, the text log displays.



12. **Close** the DeviceNet Tag Generator.

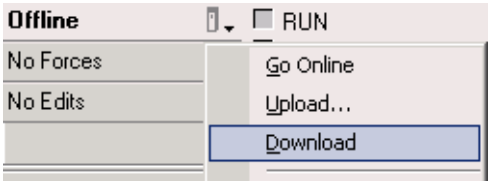
Download the Project

EtherNet/IP, ControlNet, and DeviceNet

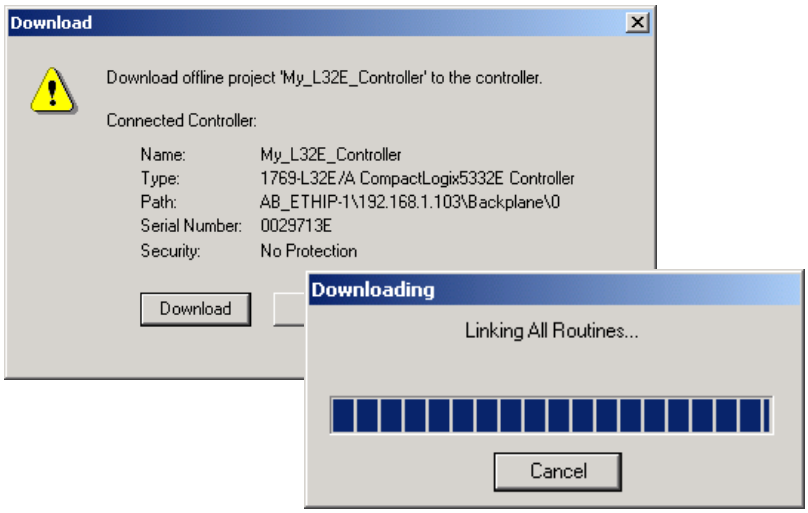
TIP If you receive a fault message on your PowerFlex 40, press  on the keypad to clear the fault.

1. If you have not already done so, move the keyswitch on your controller to PROG.

2. Click the Controller Status icon and select **Download**.



3. Click **Download**.



The project downloads to the controller.

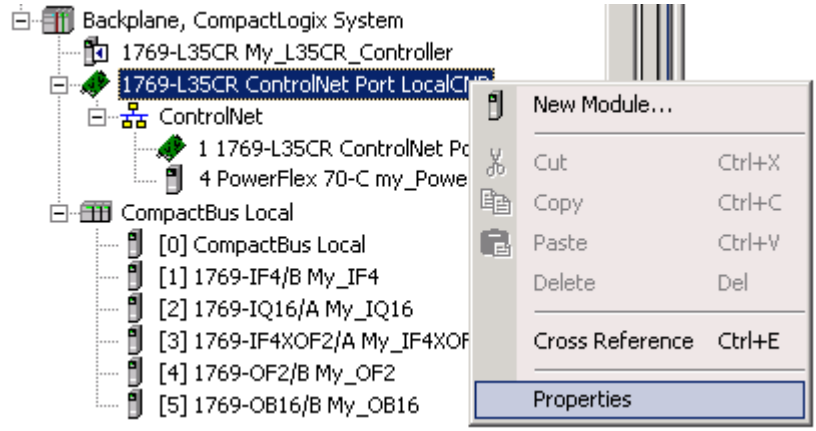
If you are using EtherNet/IP or DeviceNet networks, skip to Edit PowerFlex 40 Parameter Values on page 181.

If you are using ControlNet continue with Schedule the ControlNet Network on page 177.

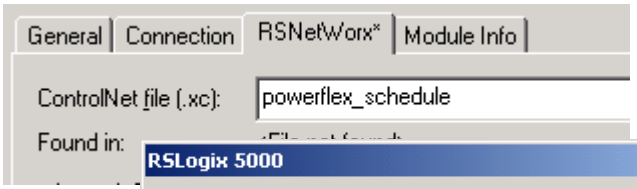
Schedule the ControlNet Network

ControlNet only
(for EtherNet/IP and DeviceNet, skip to page 181)

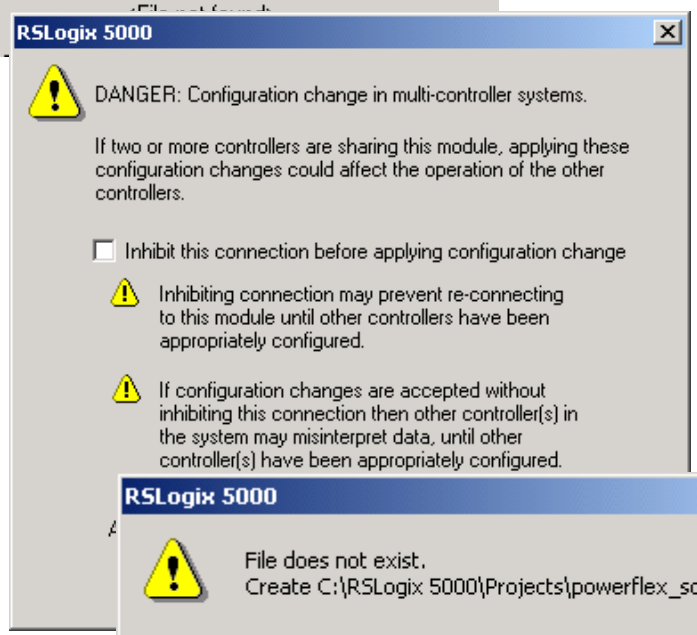
1. Right-click the ControlNet Port and select **Properties**.



2. On the RSNetWorx tab, enter a new **ControlNet file** name and click **Apply**.



3. Click **Yes**.

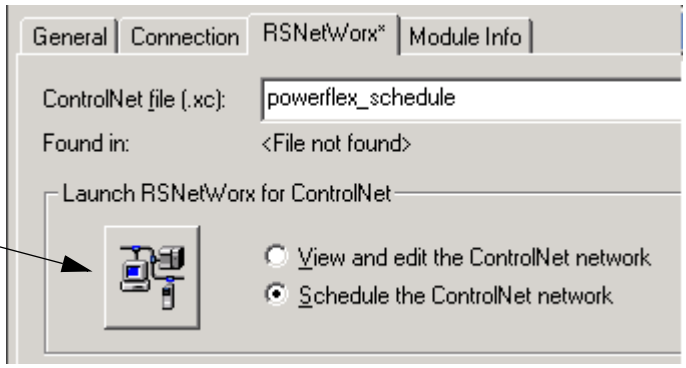


4. Click **Yes**.

5. Select **Schedule the ControlNet network**.

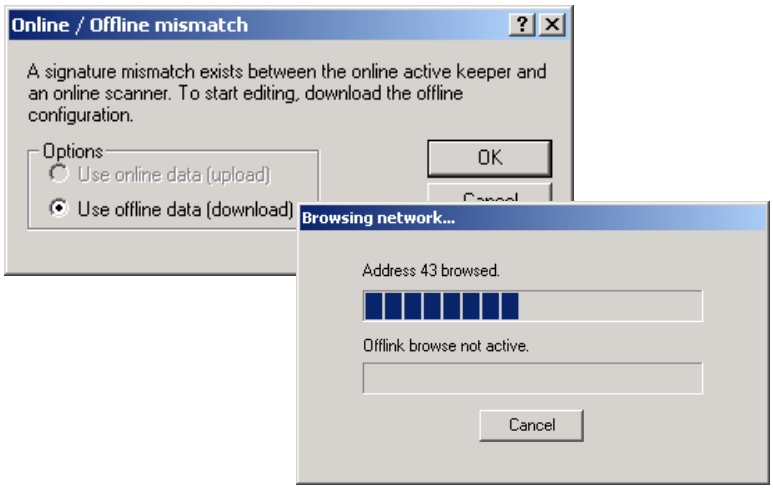
6. Click the RSNetWorx icon.

   RSNetWorx for ControlNet launches.



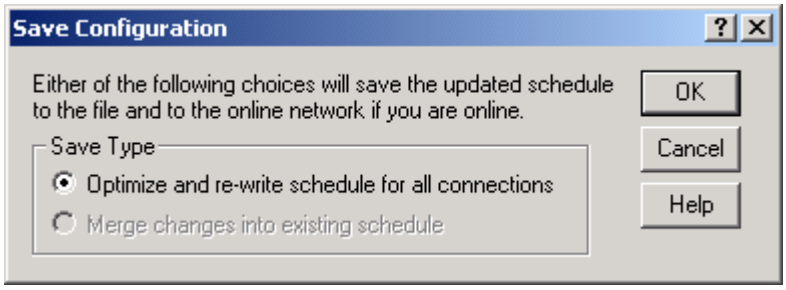
7. Verify that **Use offline data (download)** is selected and click **OK**.

   RSNetWorx browses the network.

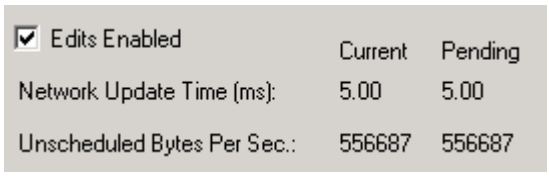


8. If prompted, select **Optimize** and click **OK**.

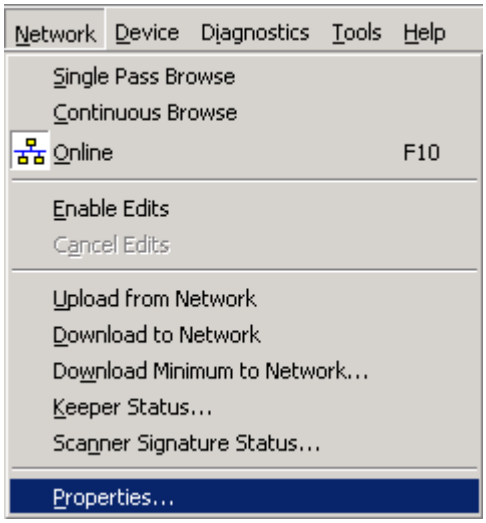
   RSNetWorx browses the network again.



9. Check the **Edits Enabled** checkbox.

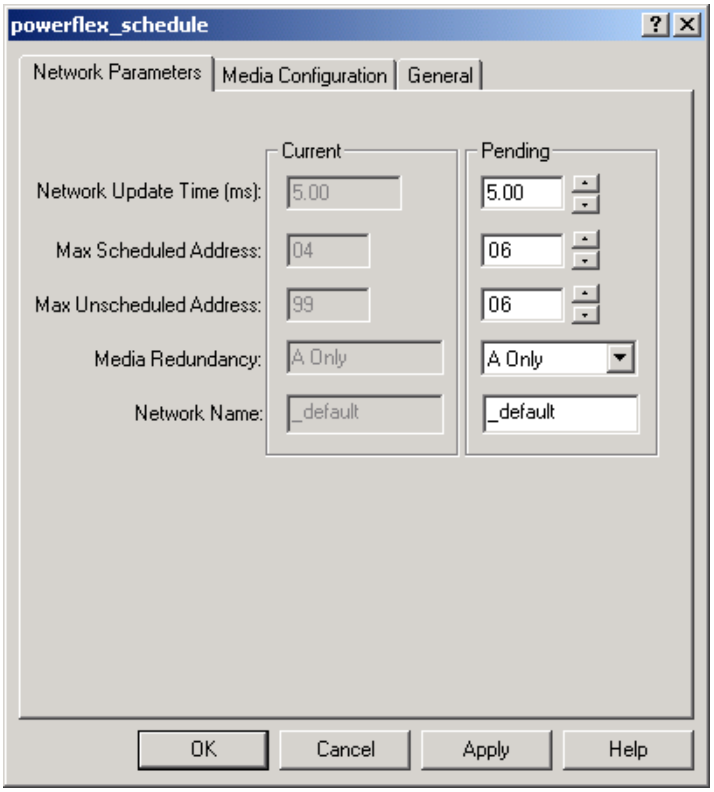


10. Select **Network > Properties**.



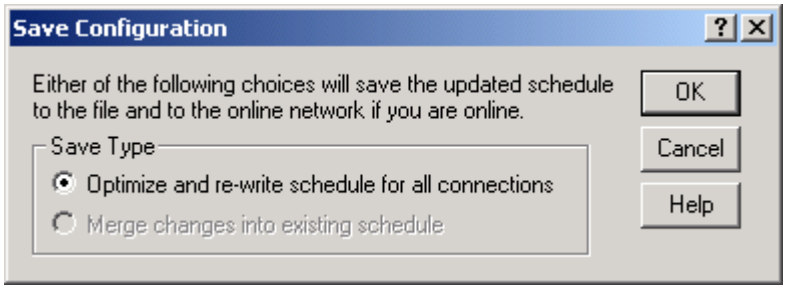
11. In the **Pending** column, select a **Max Scheduled Address** and **Max Unscheduled Address** that are equal to the largest node addresses in your system.

12. Click **OK**.



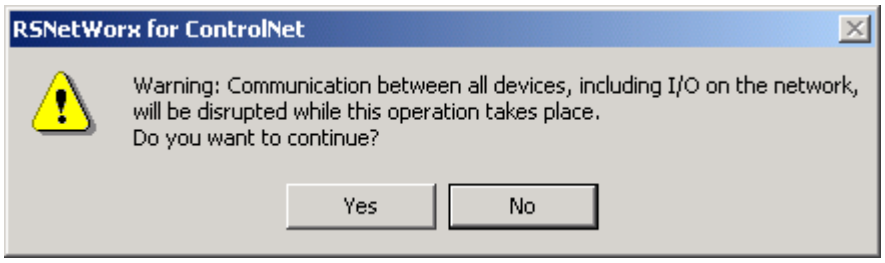
13. Save your changes.

14. Click **OK**.



15. Click **Yes**.

RSNetWorx software browses the network again. This time fewer node addresses are browsed because of the smaller Max Unscheduled Address.

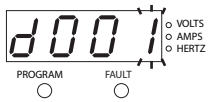


Edit PowerFlex 40 Parameter Values

TIP Use the table below as a reference when editing parameter values as instructed on page 182.

When power is first applied to the PowerFlex 40 drive, the display defaults to the current value.

Reference for Editing Parameters

Step	Displayed
1. Press Esc. The parameter number is displayed and blinks.	
2. Press Esc to select the group letter. The group letter blinks.	
3. Press ▲ or ▼ to scroll through the group letters.	
4. Press Enter to select the desired group letter. The parameter number blinks.	
5. Press ▲ or ▼ to scroll through the parameter numbers.	
6. Press Enter to select the desired parameter number. The parameter value is displayed.	
7. Press ▲ or ▼ to scroll through the parameter values. The values blink as you scroll through them.	
8. Press Enter to select the desired parameter value. The parameter stops blinking.	
9. Press Esc to return to the parameter number.	
10. Follow this procedure to change other parameter values, or press Esc repeatedly to return to the value display.	

EtherNet/IP, ControlNet, and DeviceNet

Use the reference on page 181 to make the following parameter value edits on your PowerFlex 40.

1. If your PowerFlex 40 has been previously used, reset it to factory defaults.

   a. Change the value of parameter P041 from 0 to 1.

      The drive is reset and fault F048 is displayed and blinks.

   b. Press  to clear the fault.

   c. Press  to return to editing parameters.

2. Change the value of parameters P036 and P038 from 0 to 5.

   Changing these parameters switch control the Start Source and the Speed Reference from the keypad to the communication port, giving you the ability to control these functions from the RSLogix 5000 tags.

3. Press  to accept parameter edits.

For EtherNet and ControlNet networks, go to Test the PowerFlex 40 Tags on page 183.

For a DeviceNet network, go to Test the PowerFlex 40 Tags on page 185.

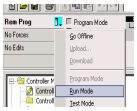
Test the PowerFlex 40 Tags

EtherNet/IP and ControlNet only
(for a DeviceNet network, skip to page 185)

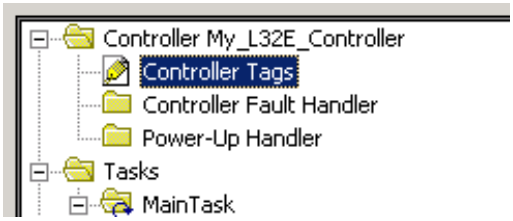
TIP To change a tag in RSLogix:

1. Select the tag value.
2. Enter or select the desired value.
3. Press <Enter>.

1. Move the controller keyswitch to **RUN**.



2. Double-click **Controller Tags**.



3. **Expand** the PowerFlex 40 output tag.

my_PowerFlex40:O	{...}	{...}		AB:PowerFlex40_...
my_PowerFlex40:O.LogicCommand	2#0000_000...		Binary	INT
my_PowerFlex40:O.Stop	0		Decimal	BOOL
my_PowerFlex40:O.Start	0		Decimal	BOOL
my_PowerFlex40:O.Jog	0		Decimal	BOOL
my_PowerFlex40:O.ClearFaults	0		Decimal	BOOL
my_PowerFlex40:O.Forward	0		Decimal	BOOL
my_PowerFlex40:O.Reverse	0		Decimal	BOOL
my_PowerFlex40:O.LocalControl	0		Decimal	BOOL
my_PowerFlex40:O.MOPIncrement	0		Decimal	BOOL
my_PowerFlex40:O.AccelRate1	0		Decimal	BOOL
my_PowerFlex40:O.AccelRate2	0		Decimal	BOOL
my_PowerFlex40:O.DecelRate1	0		Decimal	BOOL
my_PowerFlex40:O.DecelRate2	0		Decimal	BOOL
my_PowerFlex40:O.FreqSel01	0		Decimal	BOOL
my_PowerFlex40:O.FreqSel02	0		Decimal	BOOL
my_PowerFlex40:O.FreqSel03	0		Decimal	BOOL
my_PowerFlex40:O.MOPDecrement	0		Decimal	BOOL

4. At the O.FreqCommand Tag, enter **555.**

The value 555 equals 55.5 Hz.

WARNING

If there is a motor attached to your drive, completing the next step will cause it to turn.

5. At the O.Start tag, enter **1**.

The drive begins to run and the display will register the drive's speed until it reaches 55.5 Hz.

6. After the drive has reached 55.5 Hz, enter **0** at the O.Start tag.

7. At the O.Stop tag, enter **1**.

The drive begins to slow until reaching 0.0 Hz.

8. When the drive reaches 0.0 Hz, enter **0** at the O.Stop tag.

9. Select **Go Offline**.

By starting and stopping the drive, you verified that:

- the controller is correctly communicating with the drive.
- the drive can receive simple commands.

If you are using EtherNet/IP or ControlNet, you are done configuring the PowerFlex 40 drive and you can continue with the next chapter; or see page 187 for more information.

Test the PowerFlex 40 Tags

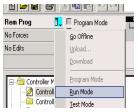
TIP

To change a tag in RSLogix:

1. Select the tag value.
2. Enter or select the desired value.
3. Press <Enter>.

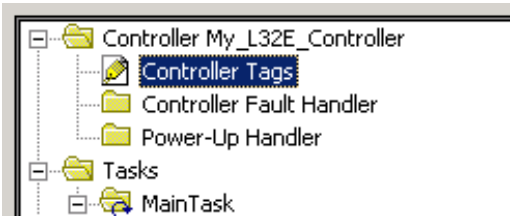
DeviceNet network only
(to complete this step on EtherNet/IP or ControlNet networks, see page 183)

1. Move the controller keyswitch to **RUN**.



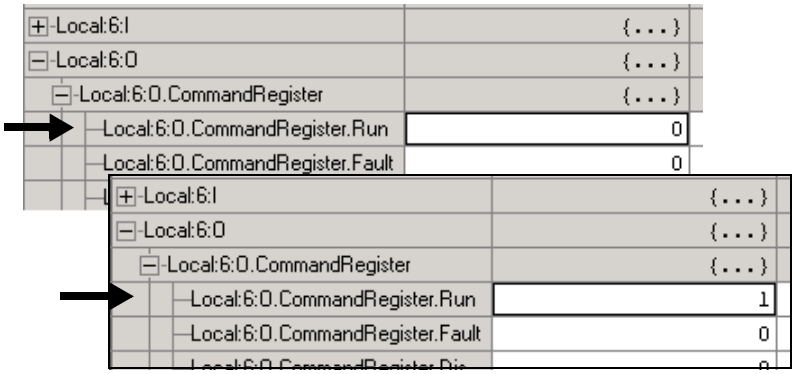
2. In the configuration tree, double-click **Controller Tags**.

   If you have added distributed I/O to your project in Chapter 11, skip to step 4.



3. Change the tag **O.CommandRegister.Run** tag to **1**.

   This changes the 1769-SDN to Run mode.

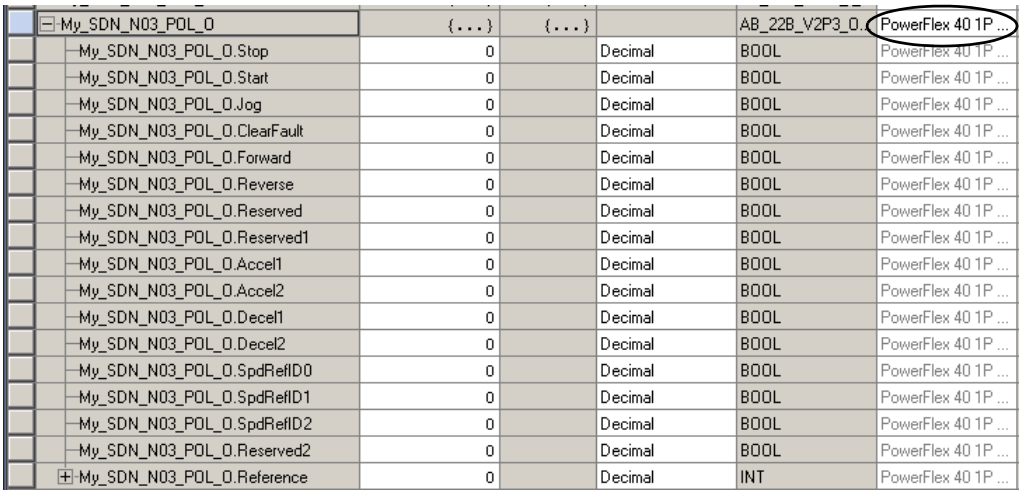


4. At the tag O.Reference, enter the value **555.**

   The value 555 equals 55.5 Hz. This is the speed to which your drive will accelerate.

PowerFlex 40 tags are identified in the description column.

5. **Expand** the PowerFlex 40 output tag.



My_SDN_N03_POL_O	{...}	{...}		AB_22B_V2P3_O...	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Stop	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Start	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Jog	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.ClearFault	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Forward	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Reverse	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Reserved	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Reserved1	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Accel1	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Accel2	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Decel1	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Decel2	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.SpdRefID0	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.SpdRefID1	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.SpdRefID2	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Reserved2	0		Decimal	BOOL	PowerFlex 40 1P ...
My_SDN_N03_POL_O.Reference	0		Decimal	INT	PowerFlex 40 1P ...

WARNING

If there is a motor attached to your drive, completing the next step will make it turn.

6. At the **O.Start** tag, enter **1**.

The display on the drive registers the speed increase in Hz until the value entered at the reference tag is reached.

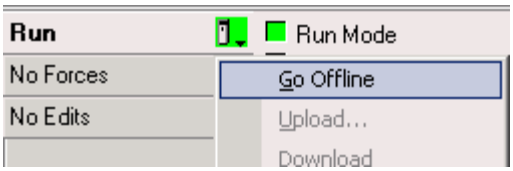
7. Change the O.Start tag back to **0**.

8. Change the O.Stop tag to **1**.

The display on the drive will show a speed decrease until the drive reaches 0.00 Hz.

9. Change the Stop tag back to **0**.

10. Select **Go Offline**.



By starting and stopping the drive, you verified:

- the controller is correctly communicating with the drive.
- the drive can receive simple commands.

Additional Resources

Resource	Topic
DeviceNet Modules in Logix5000 Control Systems, publication DNET-UM004	Describes common procedures and troubleshooting tasks related to DeviceNet networks.
Logix5000 Controllers Common Procedures Programming Manual, publication 1756-PM001	Provides details about adding and configuring modules, establishing communication, and writing ladder logic.
PowerFlex 40 Adjustable Frequency AC Drive User Manual, publication 22B-UM001	Provides information about installing, programming, editing parameters, and troubleshooting the PowerFlex 70 drive.
PowerFlex 70 EtherNet/IP Adapter User Manual, publication 22COMM-UM004	Provides process for installing, configuring, and troubleshooting the adapter.
PowerFlex 70 ControlNet Adapter User Manual, publication 22COMM-UM006	Provides process for installing, configuring, and troubleshooting the adapter.
PowerFlex 70 DeviceNet Adapter User Manual, publication 20COMM-UM003	Provides process for installing, configuring, and troubleshooting the adapter.

Notes:

Create a PanelView Plus Application

In Chapter 10, you used ladder logic in the RSLogix 5000 programming software to create a push button that controlled an LED indicator on a digital output module. In this chapter you create a push button and a multi-state indicator in FactoryTalkView software that use that ladder logic. You also transfer the application to the PanelView Plus so you can test communication with the controller.

Before You Begin

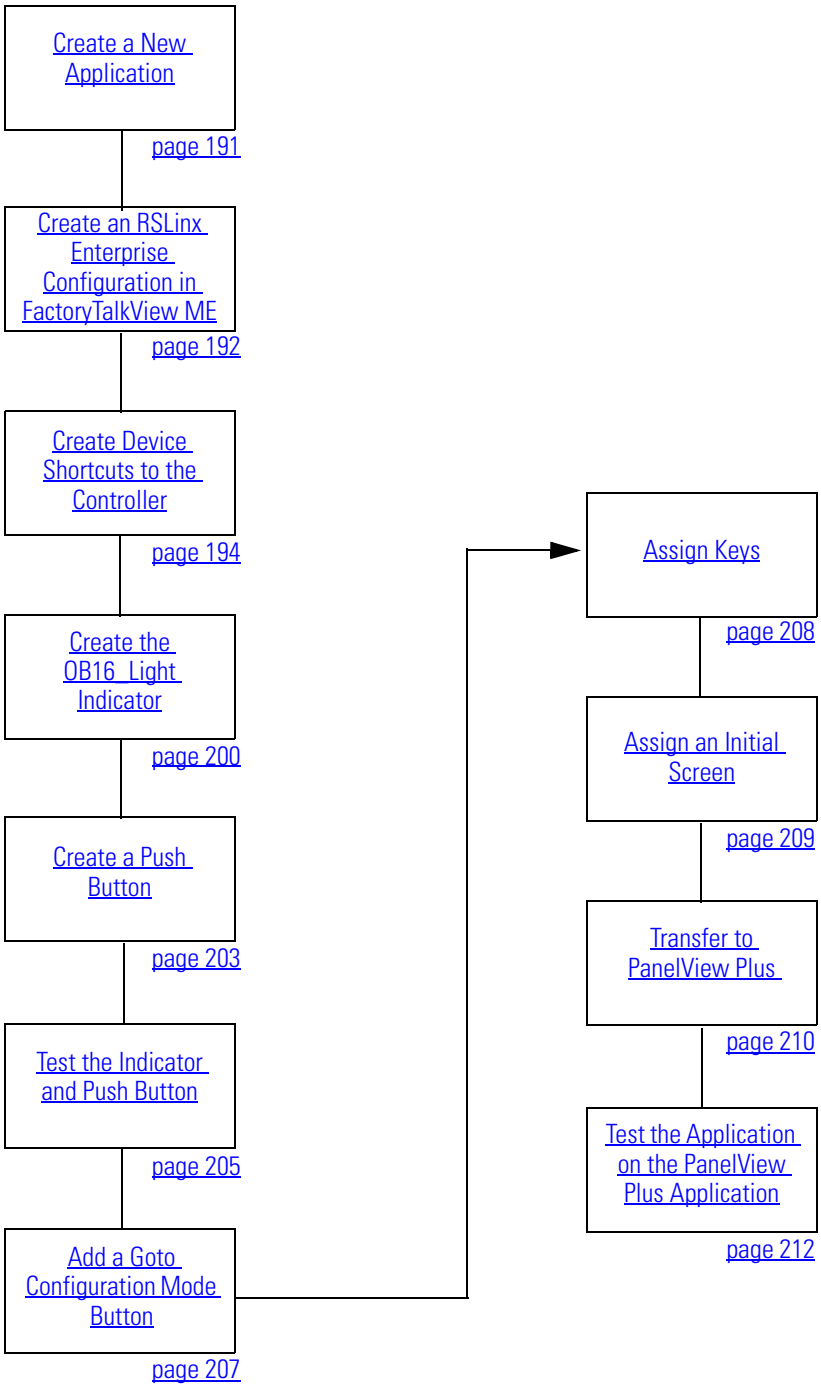
- Prepare the PanelView Plus, see Chapter 6
- Create a project in RSLogix 5000 programming software, see Chapter 10

What You Need

- FactoryTalkView Machine Edition software

Follow These Steps

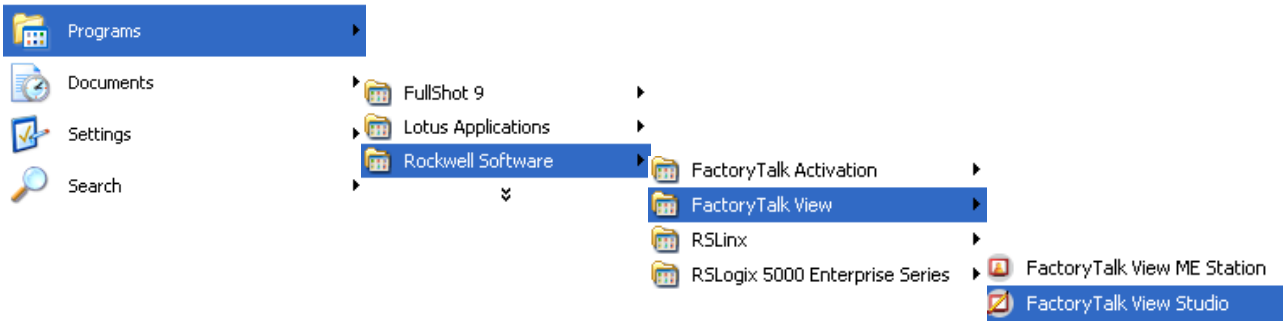
If you have a PanelView Plus terminal, complete these steps.



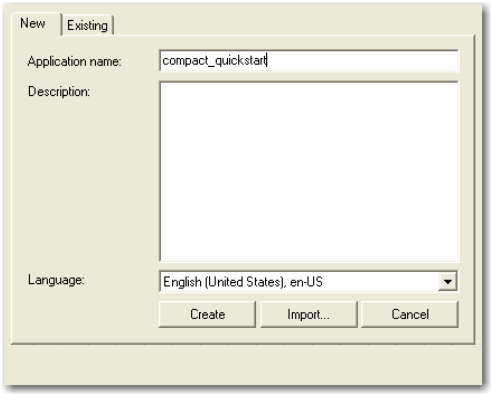
Create a New Application

All controllers

1. Launch FactoryTalkView Studio software.



2. Select the **New** tab.



3. In the Application Name field, type a name (do not use spaces) and click **Create**.

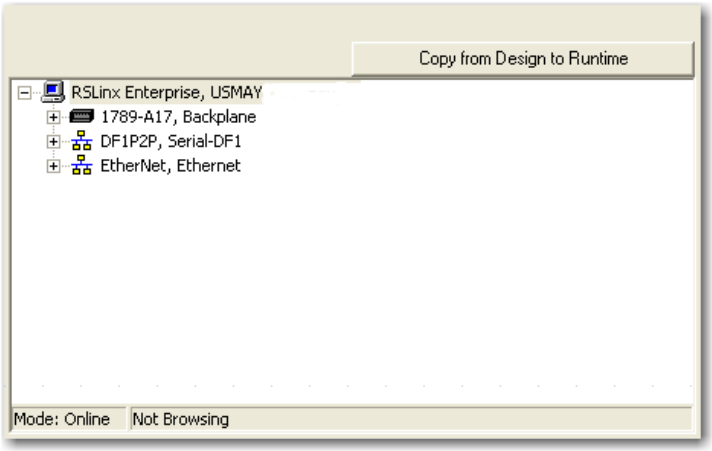
Create an RSLinx Enterprise Configuration in FactoryTalkView ME

All controllers

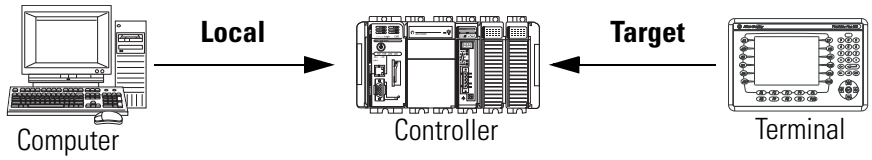
1. In the FactoryTalkView organizer, expand **RSLinx Enterprise** and double-click **Communication Setup**.

2. Click **Finish**.

RSLinx Enterprise opens.



The **Local** tab defines the path from the computer to the controller.
The **Target** tab defines the path from the PanelView Plus terminal to the controller.



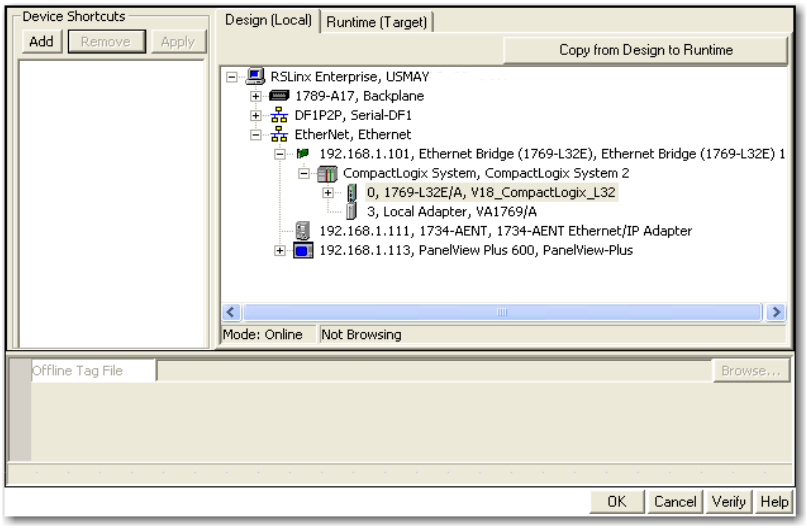
The computer needs to communicate with the controller when you are in Test Run mode. This path is defined on the **Local** tab.

The PanelView Plus terminal also needs to communicate with the controller, but that is sometimes a different path. This path is defined on the **Target** tab.

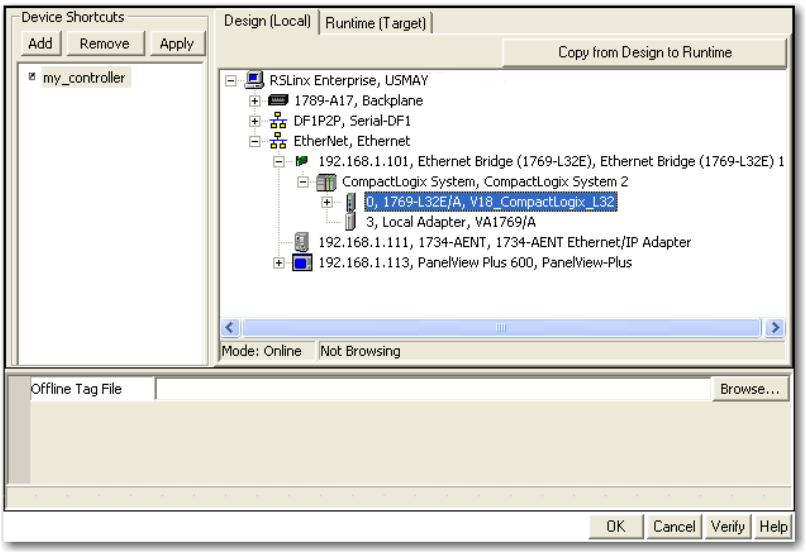
Create Device Shortcuts to the Controller

1769-L32E or 1769-L35E controllers
(for a 1769-L32C or 1769-L35CR controllers, skip to page 196;
for a 1769-L31 controller, skip to page 198)

1. Expand the EtherNet/IP tree, select your controller and click **Add**.



2. Type a shortcut name (do not use spaces) and click **Apply.**

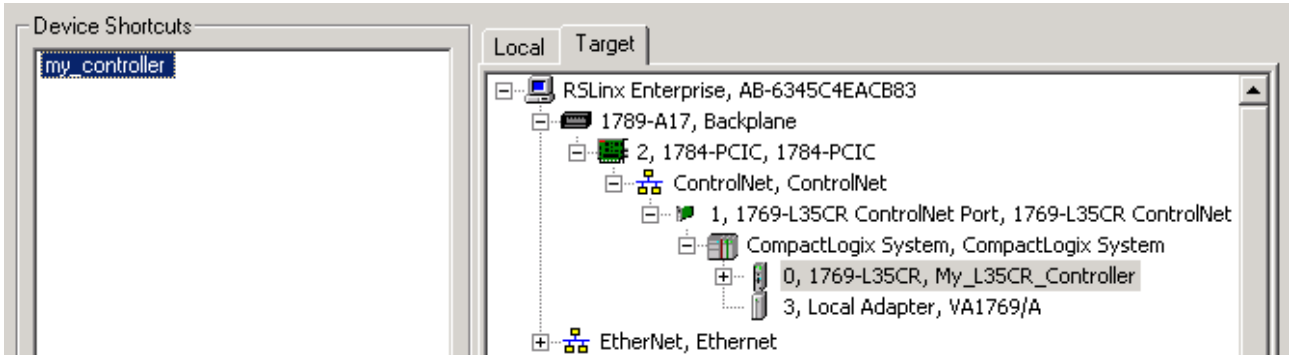


3. Click Copy from Design to Runtime button.

4. Click **Yes**.

5. Select the **Target** tab to view the path from the PanelView Plus terminal to the controller.

6. Click the shortcut to verify that your controller is highlighted.

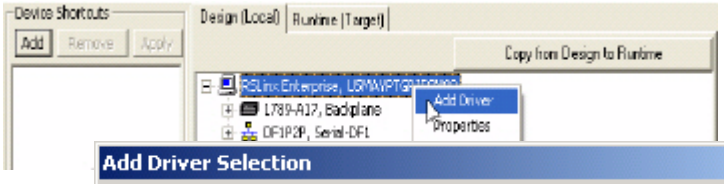


7. Click **OK**.

8. Skip to page 200.

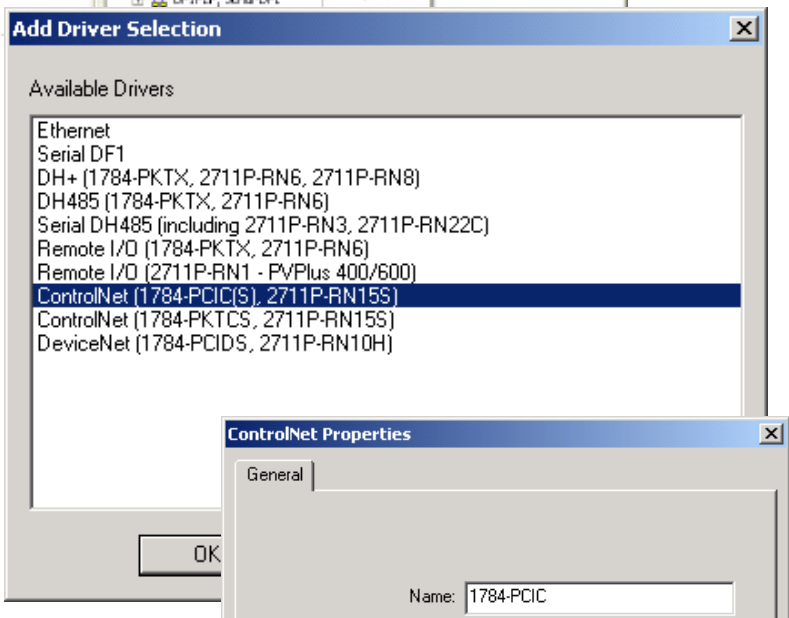
1769-L32C or 1769-L35CR controllers
(to complete this step on the 1769-L32E or 1769-L35E controllers, see page 194; for a 1769-L31 controller, skip to page 198)

1. Right-click RSLinx Enterprise and select **Add Driver**.

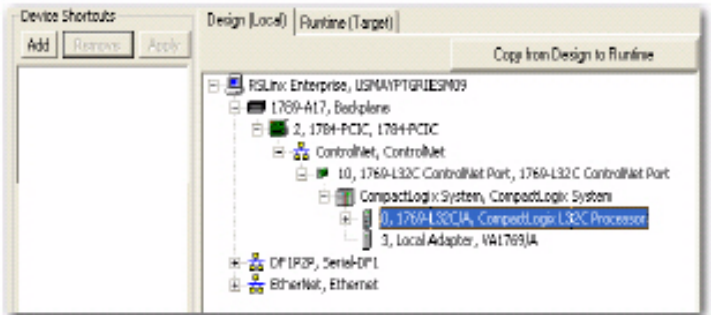


2. Select the **1784-PCIC(S)** driver and click **OK**.

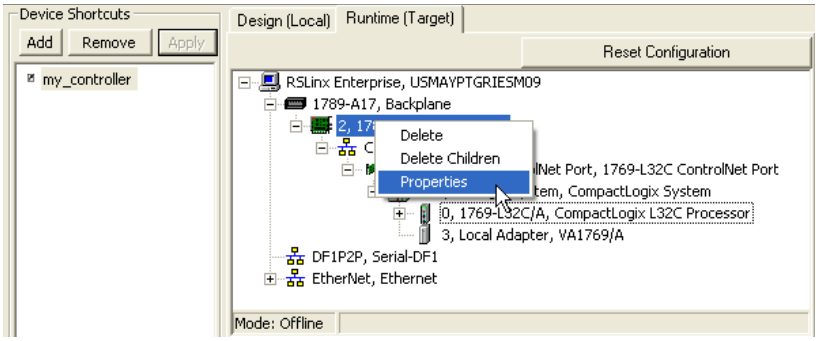
3. Define the properties for the ControlNet card.
   a. Keep the default **Name** to represent the card in the computer.
   b. Select an available ControlNet node **Address** for the card in the computer.
   c. Select any **Slot** number other than 0 (which is reserved). The slot number does not matter, so any number other than 0 works.
   d. Click **OK**.



5. Expand the Backplane tree, select your controller and click **Add**.



6. Right-click the 1784-PCIC(S) driver and select **Properties**.

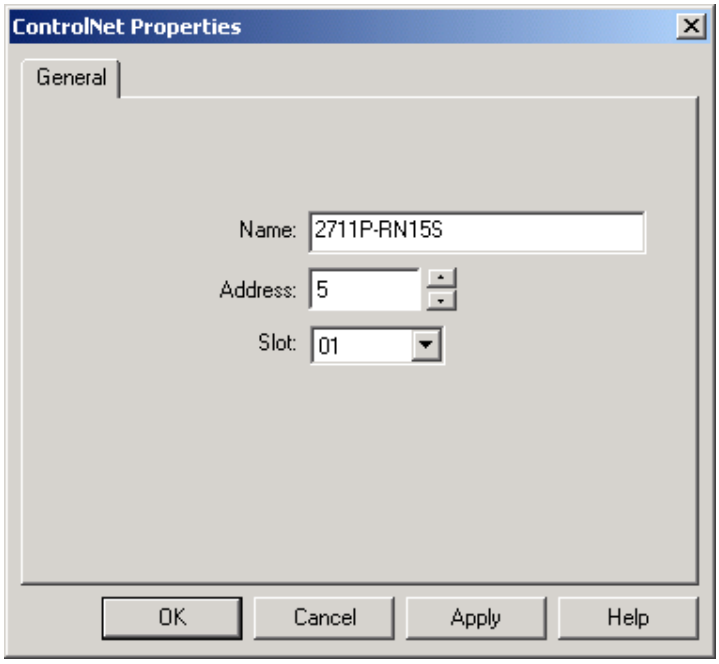


7. Change the **Name** to represent the ControlNet adapter on your PanelView Plus.

8. Assign an unused ControlNet node **Address**. to the ControlNet communication module on the PanelView Plus.

9. Change the **Slot** to **01**.

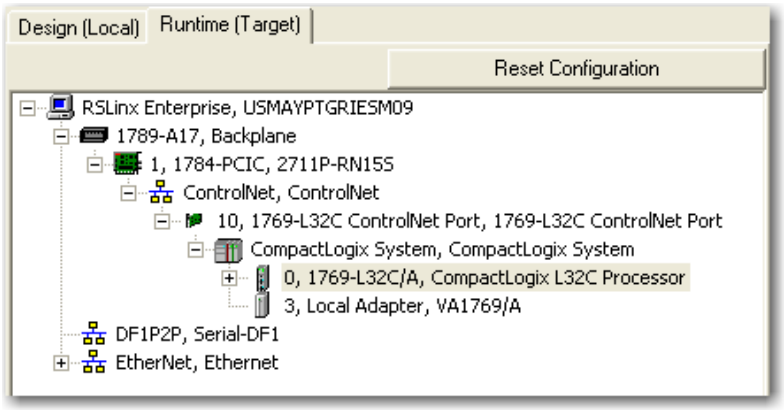
10. Click **OK**.



The name of the ControlNet adapter updates.

11. Click **OK**.

12. Skip to Create the OB16_Light Indicator on page 200.

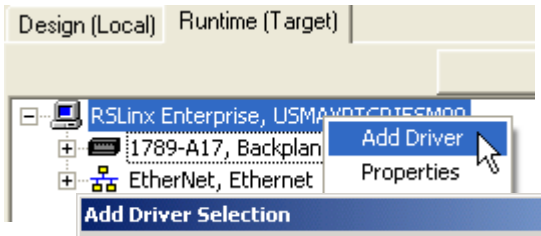


1769-L31 controller
(to complete this step on the 1769-L32E or 1769-L35E controllers, see page 194; to complete this step on the 1769-L32C or 1769-L35CR controllers, see page 196)

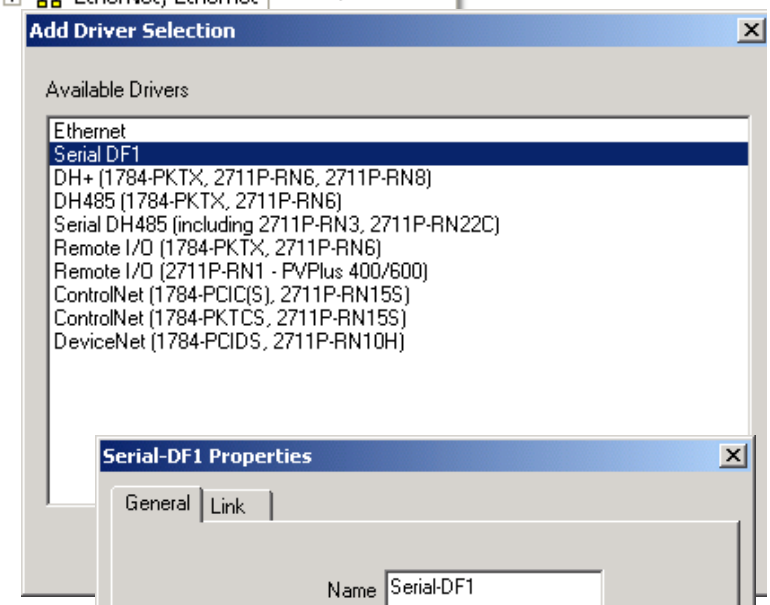
IMPORTANT Before you add the Serial driver in the following steps, you must stop and delete the Serial driver in RSLinx Classic.

Depending on the messages that display, you might have to take all programming and configuration software offline by selecting **File > Exit and Shutdown** in RSLinx Classic.

1. Right-click RSLinx Enterprise and select **Add Driver**.



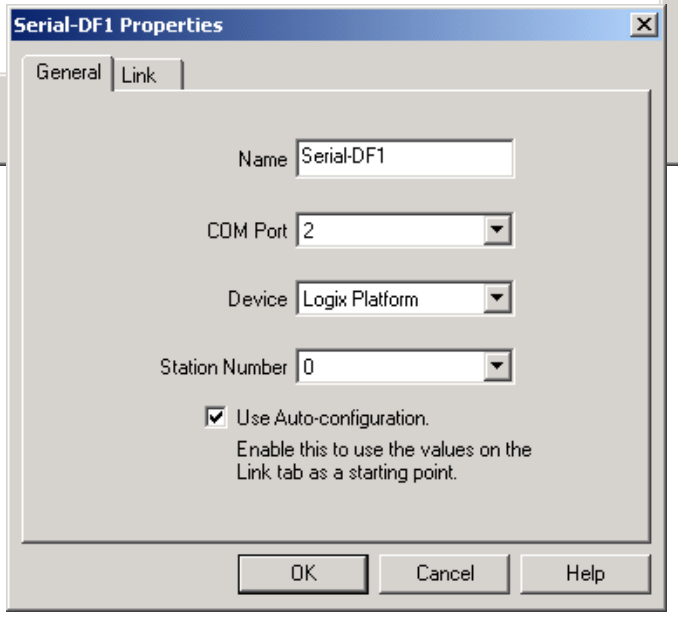
2. Select the **Serial DF1** driver and click **OK**.



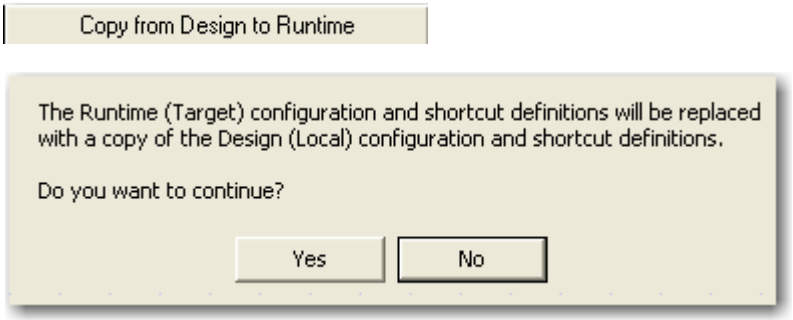
3. Select the Comm Port on your computer to which you connected the 1756-CP3 cable.

4. In the **Devices** field, select **Logix Platform**.

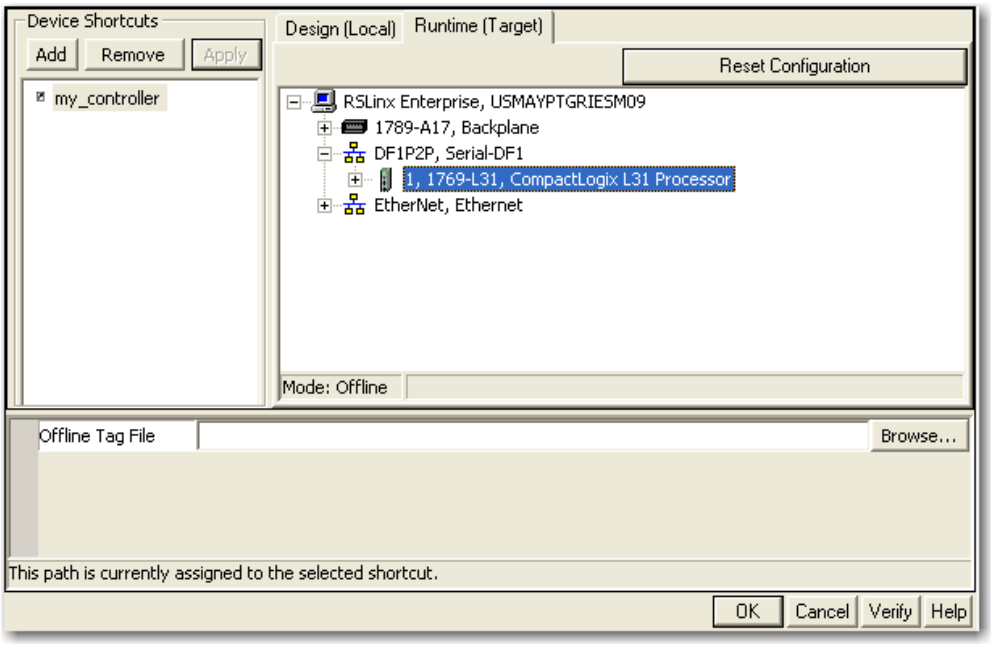
5. Check the **Use Auto-configuration** checkbox and click **OK**.



6. Click **Copy from Design to Runtime**.
7. Click **Yes**.



8. Select the **Runtime (Target)** tab to view the path from the PanelView Plus terminal to the controller.
9. Click the shortcut and verify that your controller is highlighted.



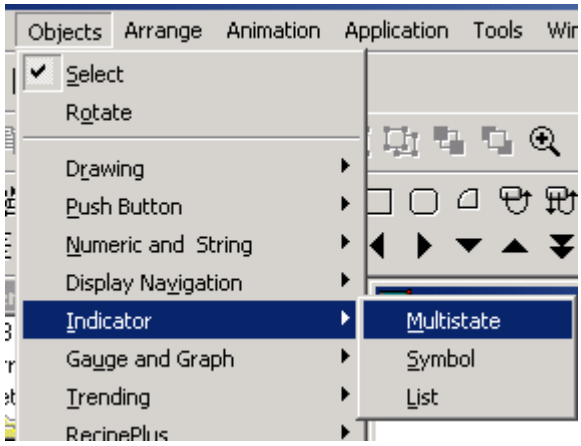
10. Click **OK**.

Create the OB16_Light Indicator

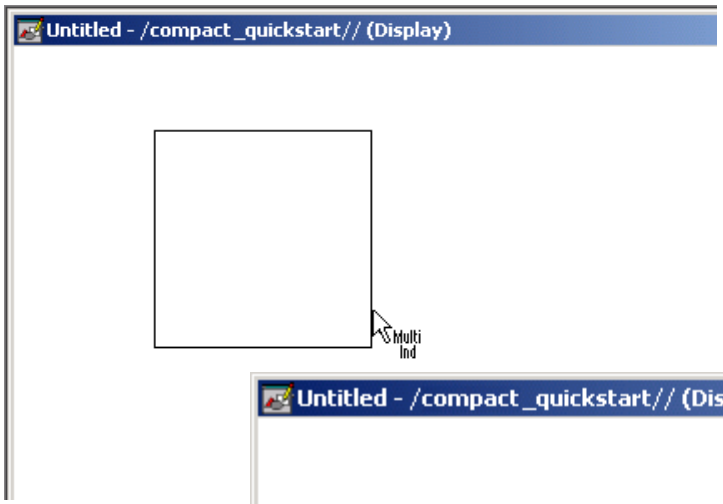
All controllers

1. In FactoryTalkView ME, under **Graphics**, right-click **Displays** and select **New**.

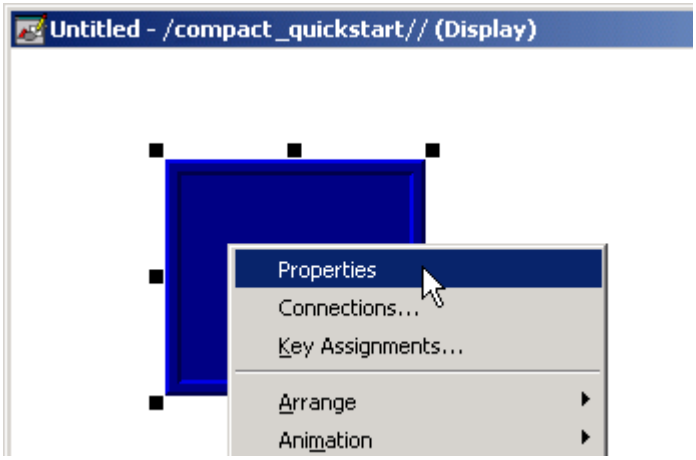
2. Under Objects on the main menu, select **Indicator > Multistate**.



3. Click and drag to create the indicator.



4. Right-click and select **Properties**.



5. On the General tab, select **2** for the Number of states.

6. On the States tab, verify that **State0** is selected.

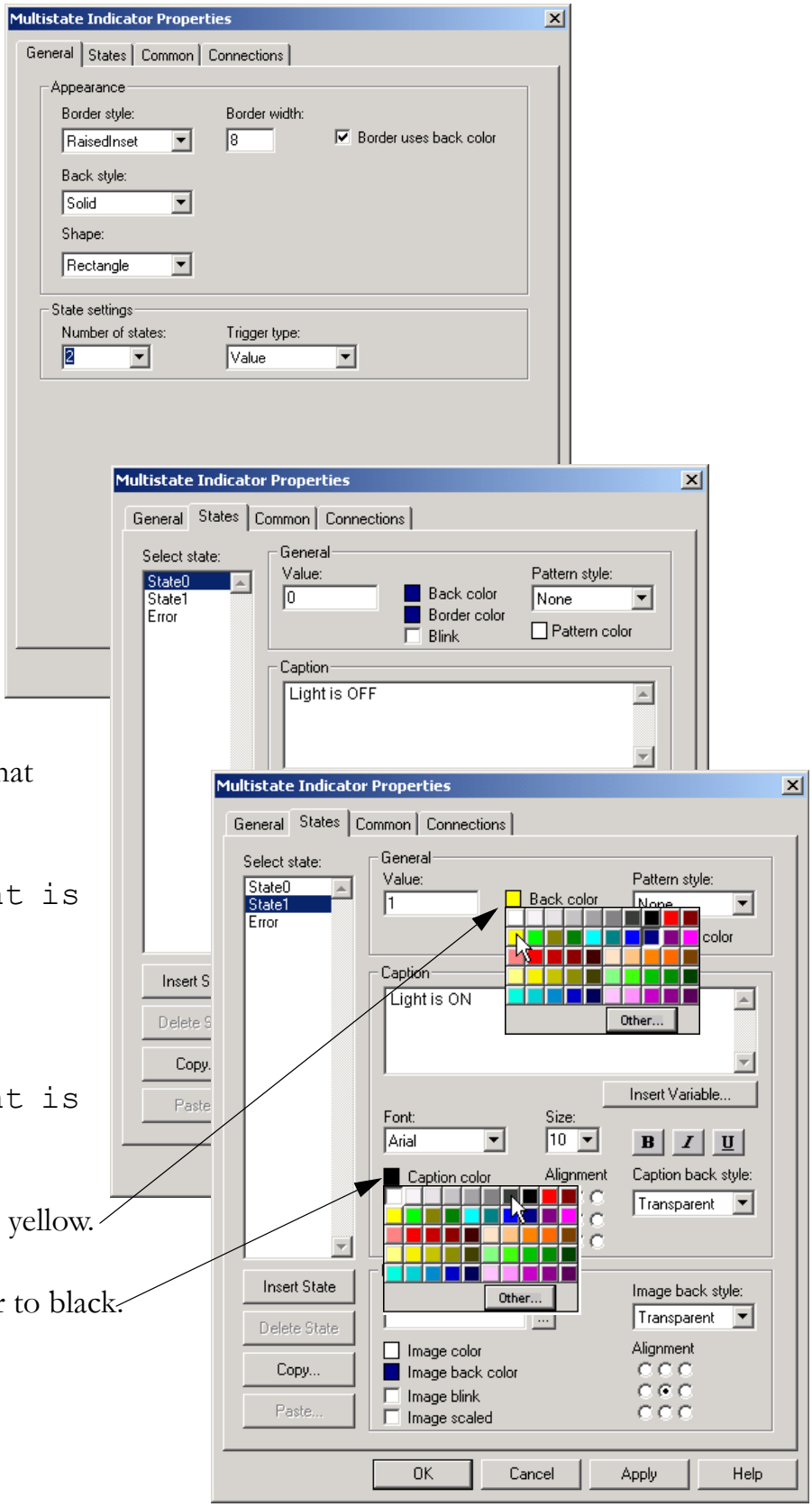
7. In the Caption, type `Light is OFF`.

8. Select **State1**.

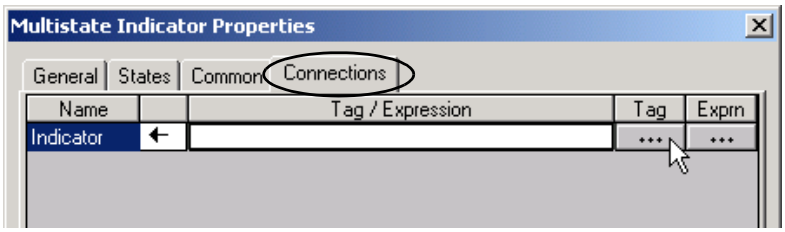
9. In the Caption, type `Light is ON`.

10. Change the Back Color to yellow.

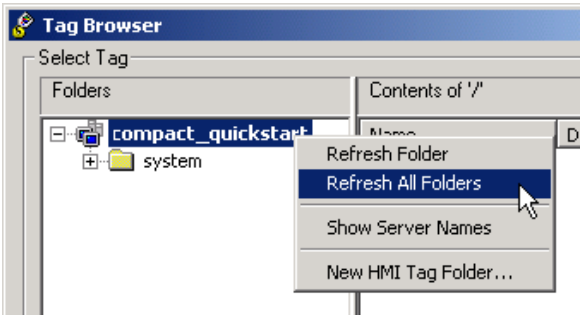
11. Change the Caption Color to black.



12. On the Connections tab, click **...** under Tag.

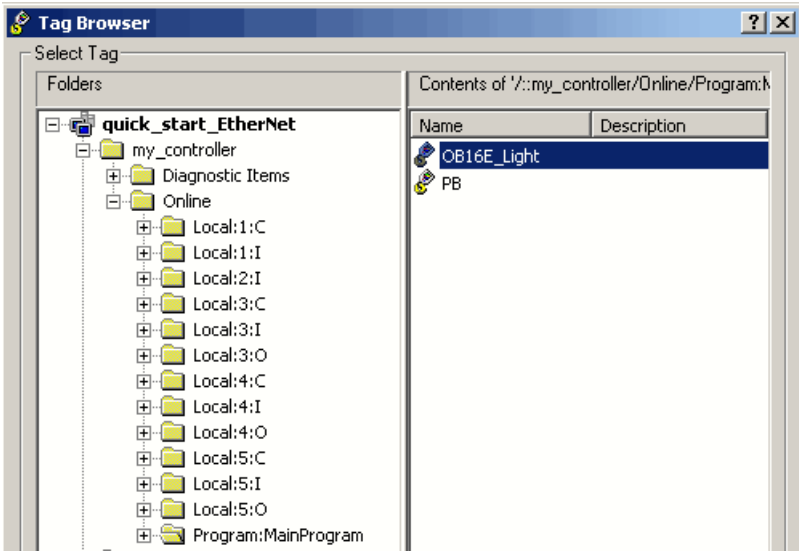


13. Right click your project and select **Refresh All Folders**.



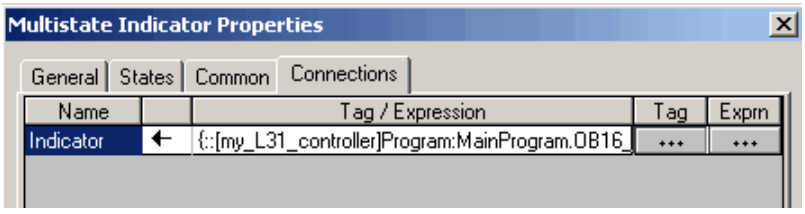
14. Expand the controller shortcut and select **Online > Program: Main Program**.

15. Select **'*xxxx*_Light'** (the name of your light in ladder logic) and click **OK**.



The Indicator tag is populated.

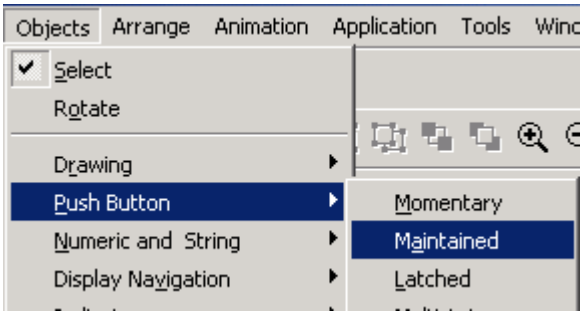
16. Click **OK**.



Create a Push Button

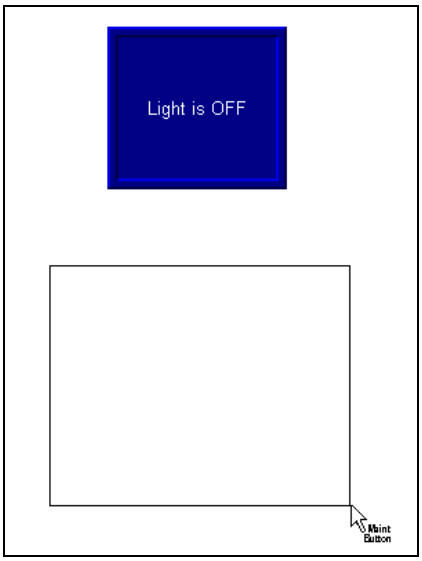
All controllers

1. From the Objects menu, select **Push Button > Maintained**.



2. Click and drag to create the push button beneath the indicator.

3. Right-click the push button you just created and select **Properties**.

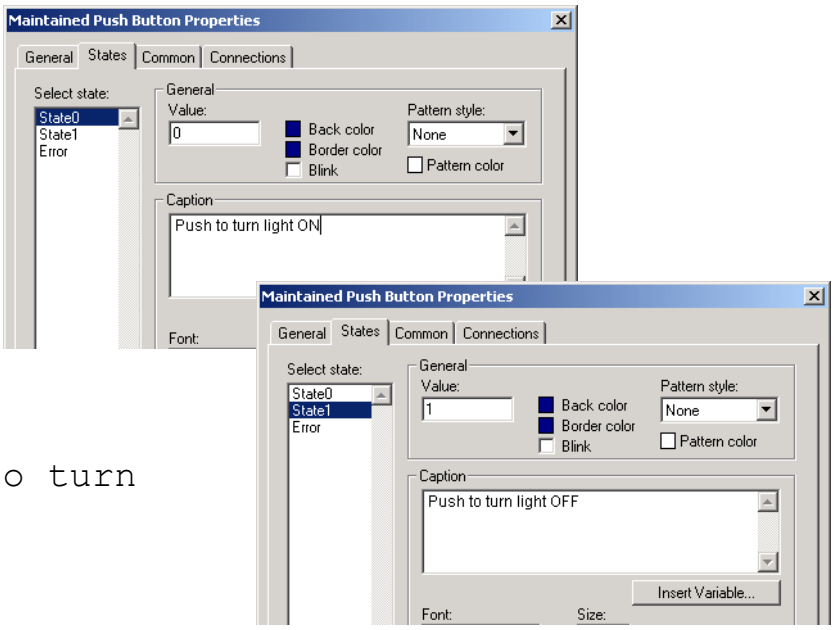


4. On the States tab, verify that **State0** is selected.

5. In the Caption, type `Push to turn light ON`.

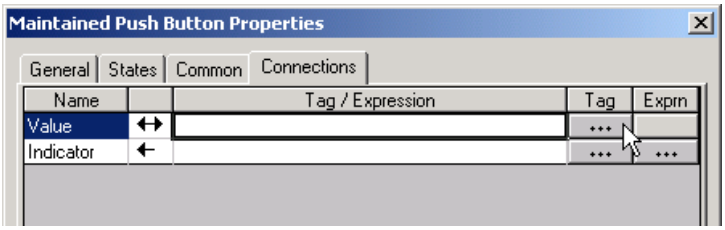
6. Select **State1**.

7. In the Caption, type `Push to turn light OFF`.



8. Select the **Connections** tab.

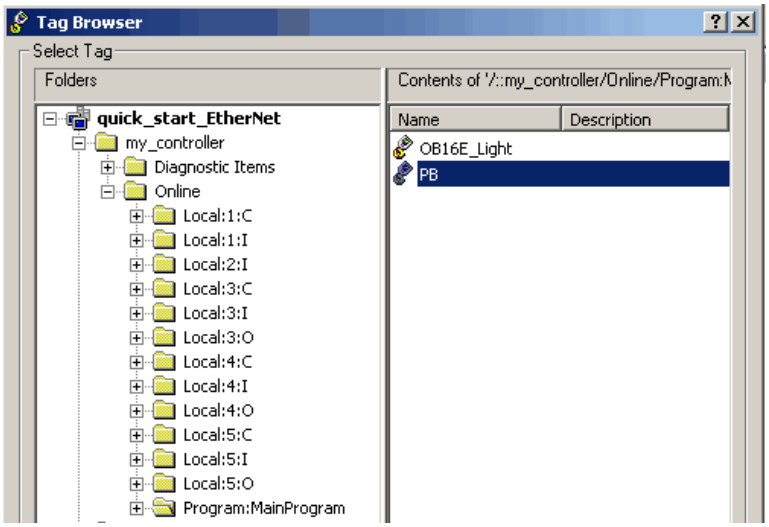
9. In the Value row, click **...** under Tag.



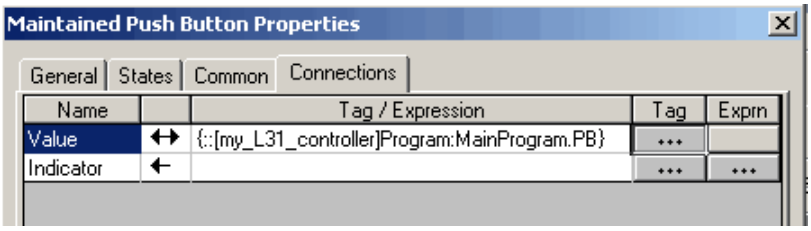
10. Expand your controller shortcut and select **Online > Program: MainProgram**.

11. Select **PB** and click **OK**.

    The Value tag is populated.



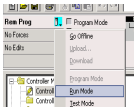
12. Click **OK**.



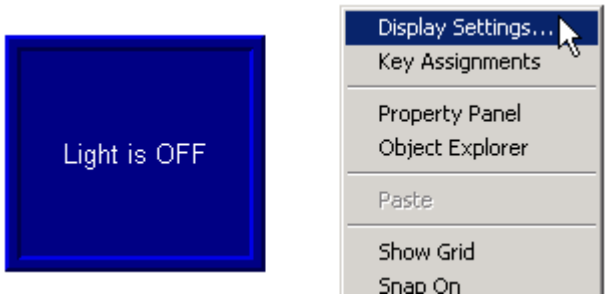
Test the Indicator and Push Button

All controllers

1. Verify that the keyswitch on your controller is moved to Run.

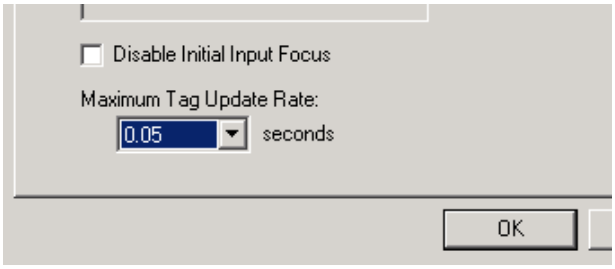


2. Right-click an unused area of the display and select **Display Settings**.



3. Change the Maximum Tag Update Rate to **0.05**.

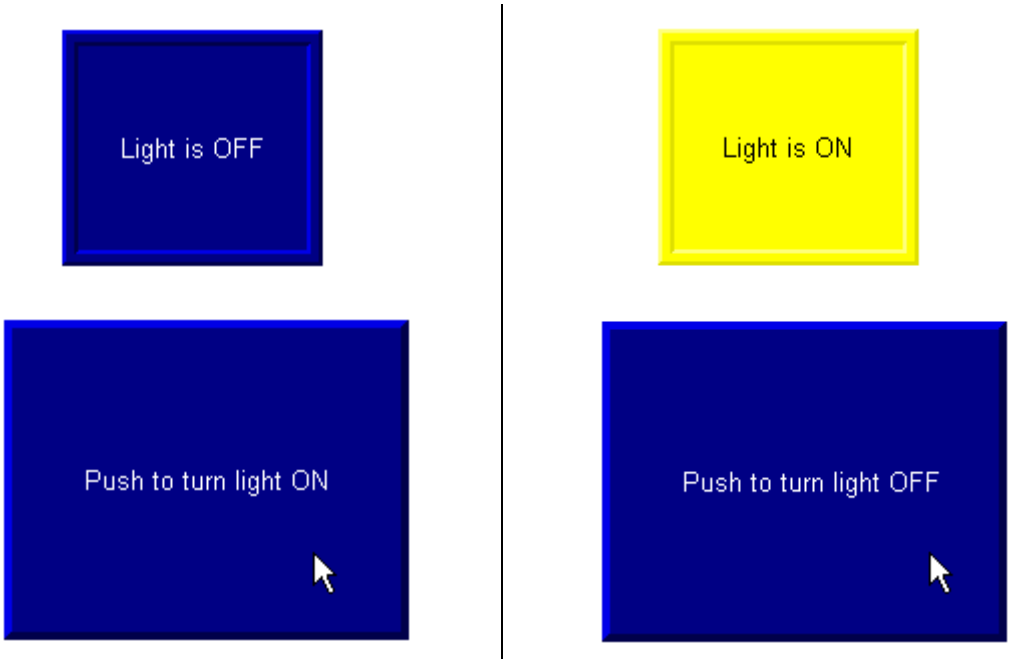
4. Click **OK** and then click **OK** again.



5. Click the Play button.

6. Click the Push Button to toggle the state and turn the light on and off.

   You could view the connected logic in the Main Program of the project you created in Chapter 10.



7. Click the Stop button.

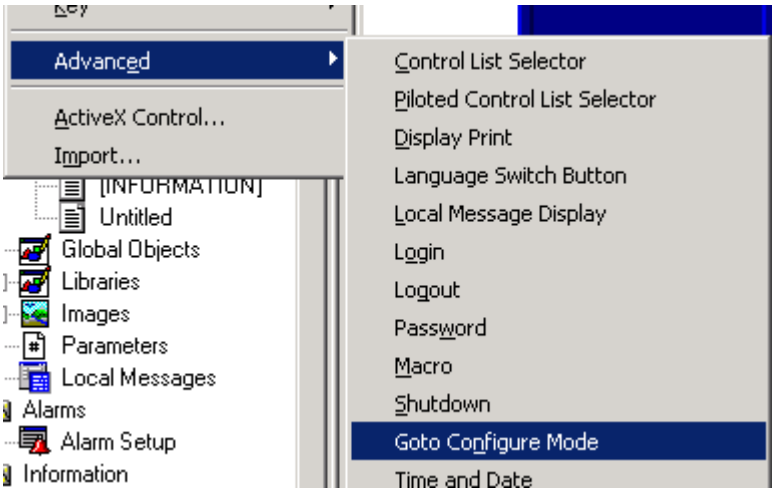
8. Save your changes.

   When prompted for a title for the display, type `test_logic`.

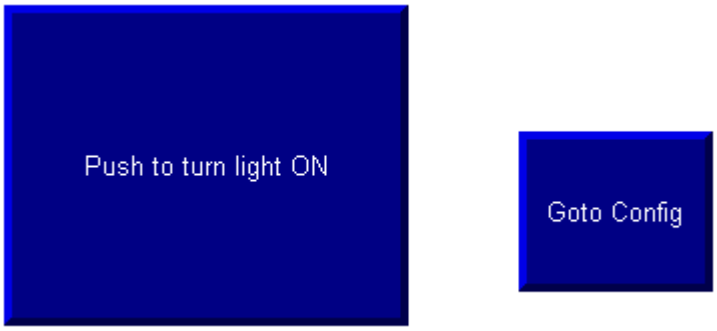
Add a Goto Configuration Mode Button

All controllers

1. From the Objects menu, choose **Advanced > Goto Configure Mode**.



2. Click and drag to create the Goto button next to the push button.
3. Right-click the pushbutton and select **Properties**.
4. On the Label tab, enter **Goto Config** for the caption.
5. Click **OK**.

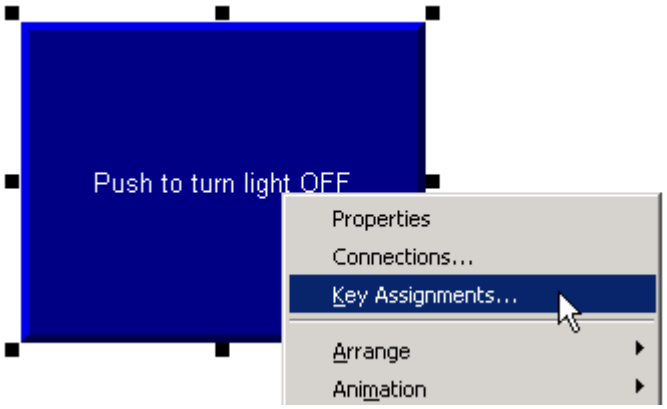


Assign Keys

All controllers with PanelView Plus terminals without a touchscreen

If your PanelView Plus **does not** have a touch screen, you must assign functions keys to the display buttons.

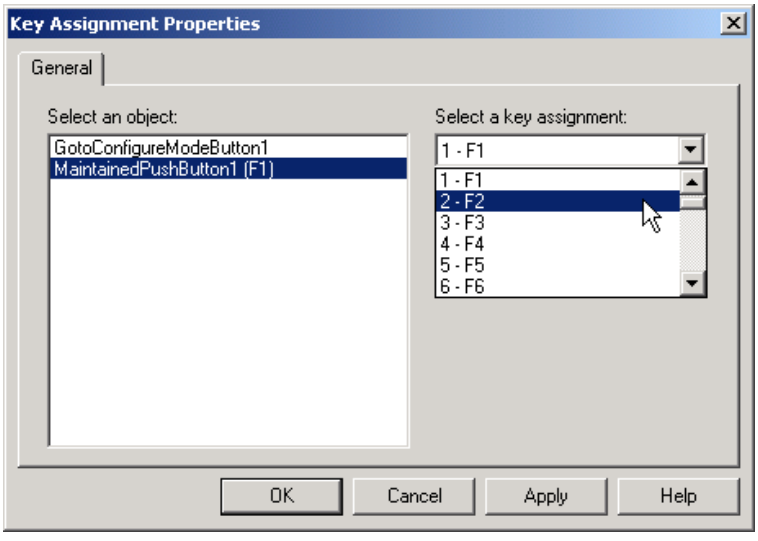
If your PanelView Plus has a touchscreen, skip to page 209.



1. Right-click the Push Button and select **Key Assignments**.

2. Under Select an object, verify that MaintainedPushButton is selected.

3. Select a function key and click **Apply**.
   This example uses F2.



4. Under Select an object, select GotoConfigureMode.

5. Select a different function key and click **Apply**.
   This example uses F8.

6. Click **OK**.

7. Add the function key names to the button captions (including both states of the indicator).

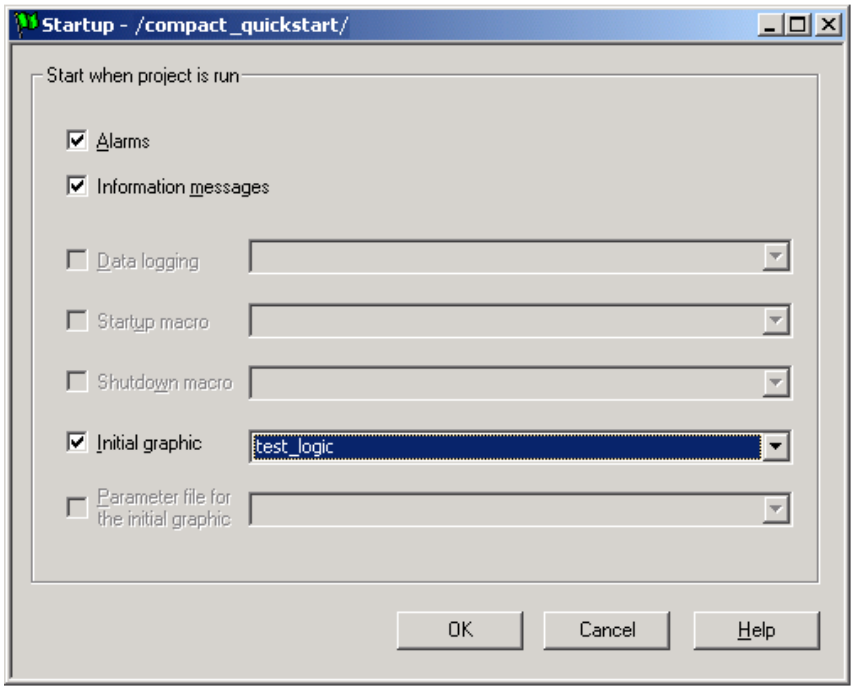
8. Save your changes.

Assign an Initial Screen

All controllers

1. Under System, double-click **Startup**.

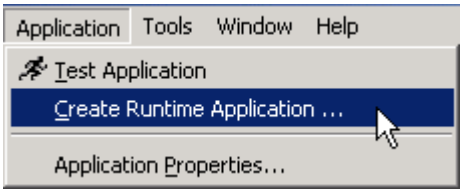
2. Check the **Initial graphic** checkbox and select **test_logic**.
3. Click **OK**.
4. Save your changes.



Transfer to PanelView Plus Firmware

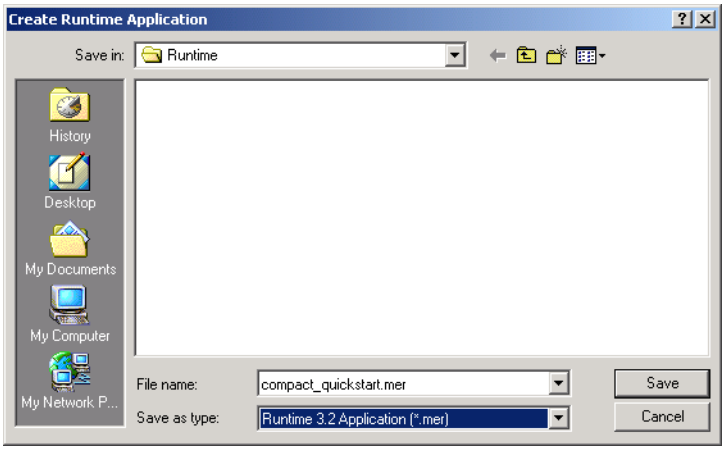
All controllers

1. Under Application, select **Create Runtime Application**.



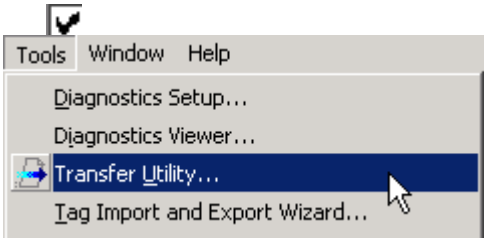
2. In Save as type, select the Runtime version that matches your PanelView Plus firmware.

   To check the PanelView Plus firmware revision, on the terminal select **Terminal Setting [F4] > System Information > About FactoryTalkView ME Station**

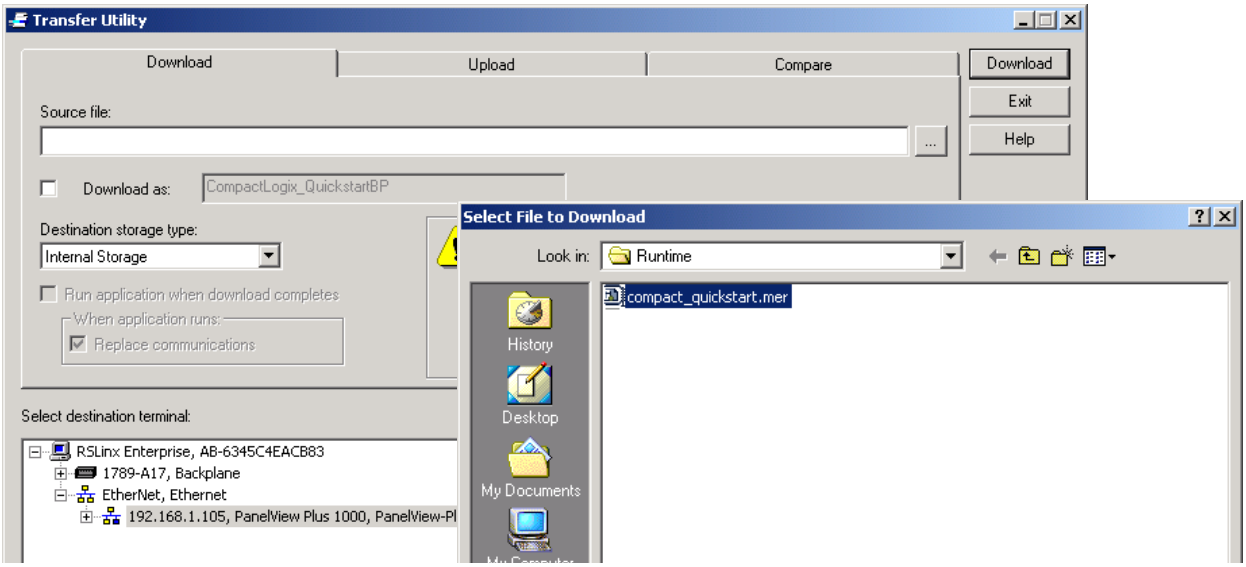


3. Click **Save** to accept the default file name.

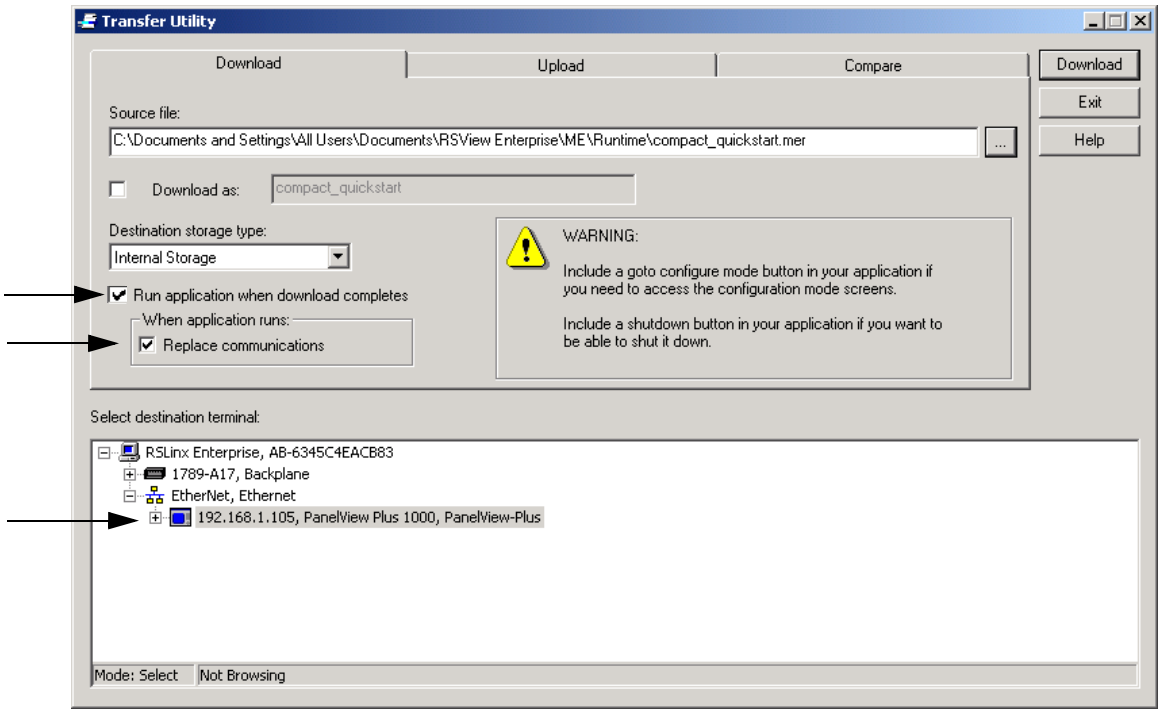
4. From the Tools menu, choose **Transfer Utility**.



5. Click the**...** button, select the .mer file you just created and click **Open**.

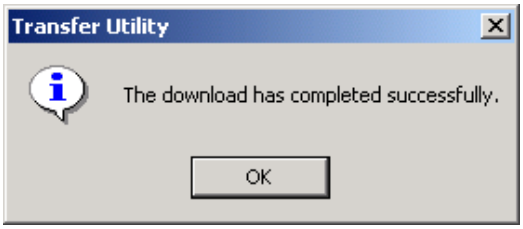


6. Verify that the **Run application** and **Replace communications** checkboxes are checked and verify that your PanelView Plus is selected for the destination terminal.



7. Click **Download**.

8. Click **OK**.

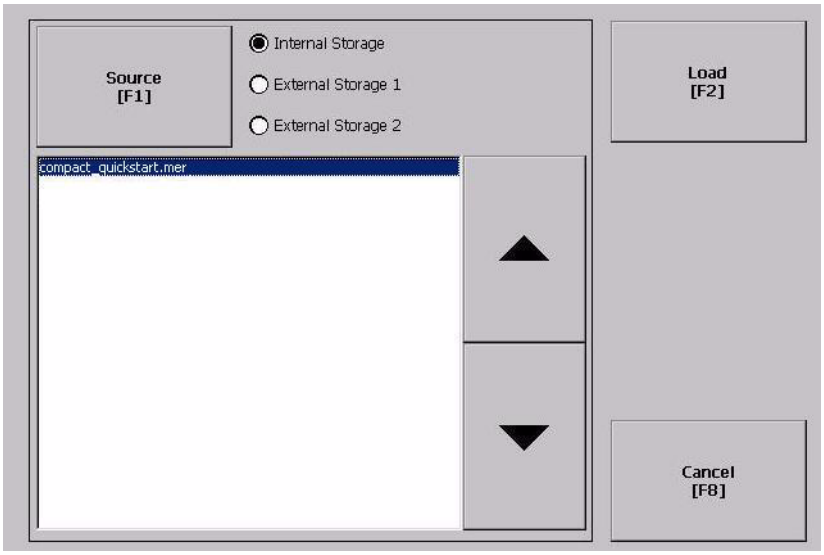


Test the Application on the PanelView Plus Application

All controllers

1. On the PanelView Plus application, press **Load Application [F1]**.

2. Select your .mer file and press **Load [F2]**.



3. Press **Yes [F7]**.

4. After the application loads, press **Run Application [F2]**.

5. Press the Push Button. Verify that the indicator turns on and that the light on the Compact digital output module turns on.

6. Press the Push Button again and verify that the indicator and light turn off.

Additional Resources

Resource	Description
FactoryTalkView online help	Contains procedures and information for all FactoryTalkView-specific topics.
PanelView Plus Terminal User Manual, publication 2711p-UM001	Provides descriptions and procedures for the use of the PanelView Plus terminal.

Notes:

Network Worksheet

EtherNet/IP

Enter EtherNet/IP data in the following table. Ethernet addresses (MAC) should be entered by using digits 1...9 and letters A...F. An example Ethernet address (MAC) is 00:00:BC:21:D7:BE.

Data For	Ethernet Address (MAC)	Assigned IP Address	Example Assigned IP Address
Controller			192.168.1.103
Computer	Not needed.		192.168.1.116
POINT I/O adapter			192.168.1.101
PowerFlex40 drive			192.168.1.107
PowerFlex70 drive			192.168.1.109
PanelView Plus terminal	Not needed.		192.168.1.105

For all EtherNet/IP addresses, the subnet mask is (from page 38): _____._____._____._____

This quick start uses the example EtherNet/IP subnet mask: _____.225.255.255

DeviceNet Network

1769-SDN Module Information

Series No. (from page 17)	**Node No.** (from page 96)	**Slot No.** (from page 96)

RSNetWorx DeviceNet Configuration File Information

Main configuration file name (from page 98): _____.dnt

Subnet configuration file name and path (from page 122): _____.dnt

ControlNet Network

ControlNet Node Numbers

Device	Controller	Computer	1734-ACNR adapter	PowerFlex 70 drive	PowerFlex 40 drive
Node No.					

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 manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience an anomoly 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 at http://www.rockwellautomation.com/support/americas/phone_en.html, 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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Publication IASIMP-QS001C-EN-P - October 2009
Supersedes Publication IASIMP-QS001B-EN-P - June 2007

Allen-Bradley

CompactLogix System

Quick Start