LX Wizard and LON Integration

Technical Bulletin

Johnson Controls

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Document Introduction

LX Wizards offer a user-friendly interface to program and configure the LX controllers. The wizards are the Facility Explorer versions of LNS® plug-ins found with an LNS based network management tool. The wizards group device configuration properties in an intuitive programming interface. This document does not include information on how to program and configure specific LX controllers.

Related Documentation

Table 1: Related Documentation

For Information On	See	LIT Number
Using Graphical Programming Interface (GPI) with LX Controllers	*LX Graphical Programming Interface Users Guide*	*LIT-12011489*

System Requirements

Table 2 describes the LX Wizards system requirements. You must install Facility Explorer software version 4.1 or later.

Table 2: LX Wizards System Requirements

Operating System	Minimum: Windows XP® or later Recommended: Windows® 7
Processor	Minimum: Intel® Pentium® 4 or higher (or AMD® equivalent) Recommended: Intel Core™ 2 Duo or higher (or AMD equivalent)
Memory	Minimum: 1 GB or as required by your chosen operating system Recommended: 2 GB or as required by your chosen operating system
Hard Disk	500 MB free disk space
Display	Minimum: 800 x 600 Recommended: 1024 x 768
Network Interface	An IP (Ethernet) network interface is required.
Service	Internet access is required for LX Smart Installer application download.

Detailed Procedures

Setting up a Station

This section details how to properly configure a Facility Explorer Supervisory station to support LX controllers on a LONWORKS® network.

Installing the LX Support Pack

The LX support pack contains software to install and configure the LX controllers.

To install the LX Support Pack:

1. Close all running programs on your computer. You must be logged in with Administrator rights.

2. Run the support pack executable file (.exe). The LX Wizard Support Pack Setup window appears (Figure 1).

   For Windows 7, right-click the support pack installation executable file and select Run As Administrator. For Windows XP, run the support pack installation executable file.

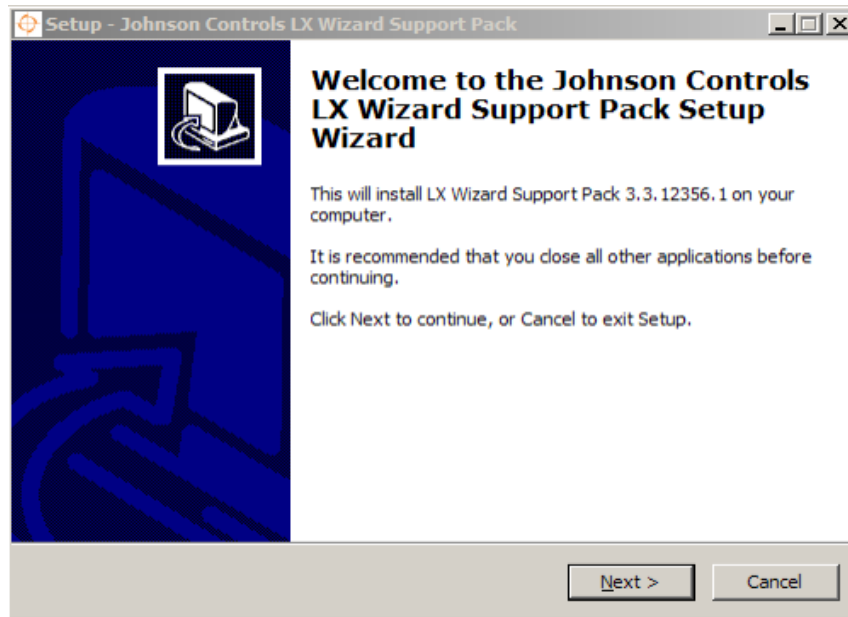3. Click **Next**. The Choose Destination Location window appears.

Figure 1: Starting the LX Controllers Support Pack Installation

Note: To install the preloaded applications, install and run the JCI-ABCS Smart Installer Client software. The Smart Installer is available on the FX Supervisory Software release DVD: LP-FXWB-COPY or via download on the Pro FX User Community.

4. After you select where to install the support pack file, click **Next**. The Niagara^{AX} Versions Selection window appears.
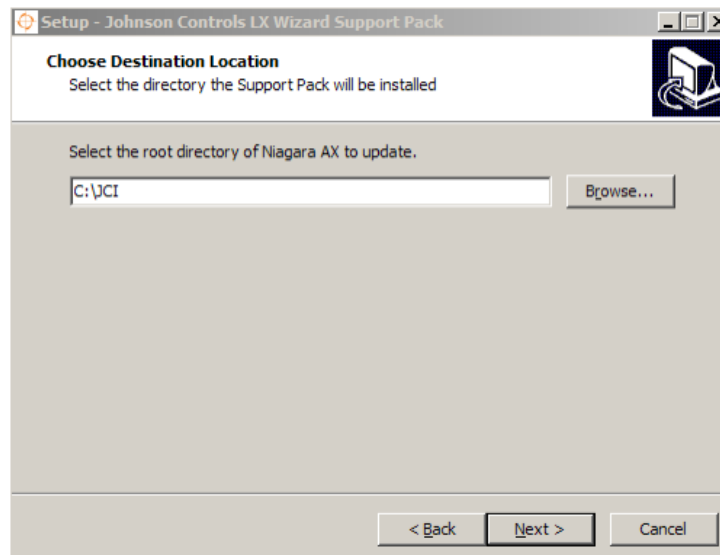

Figure 2: Selecting the Destination Location

5. Select the FX Workbench installations to use with the support pack. Click **Next**. The Ready to Install window appears.
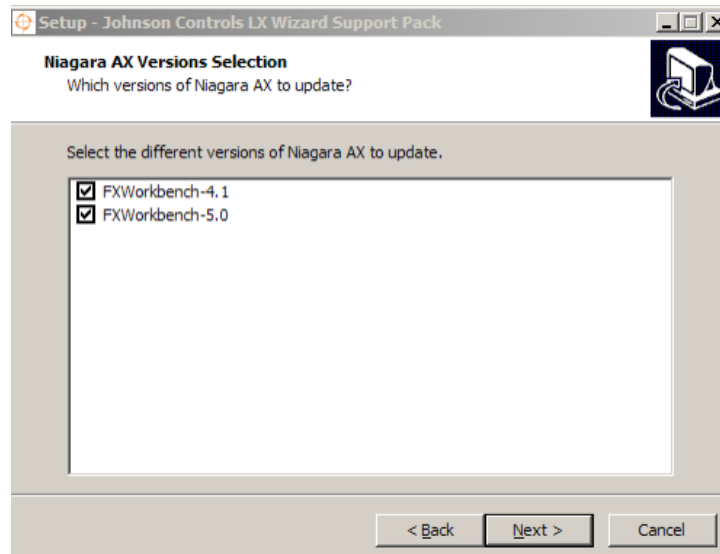
Figure 3: Selecting the Support Pack Versions

6. Click **Install** to begin the installation.
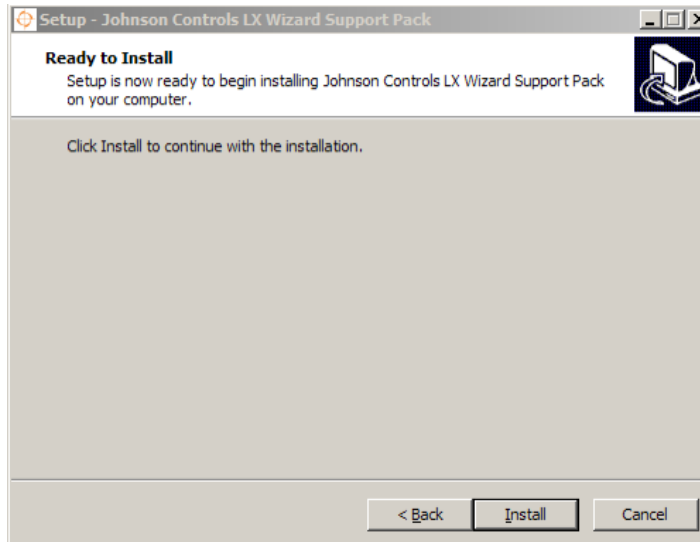
Figure 4: Ready to Install

7. Click **Finish** when the installation is complete.

Figure 5: Installation Complete Dialog Box

Installing the Preloaded Applications via JCI-ABCS Smart Installer

To install the preloaded applications, install and run the JCI-ABCS Smart Installer Client software. The Smart Installer is available on the FX Supervisory Software 5.0 DVD (LP-FXWB-COPY) or via download on the Pro FX User Community website.

This section does not cover installing the JCI-ABCS Smart Installer on your computer.

For the preloaded applications to properly function, ensure the PreloadedApps.dll file installs to the correct file folder location:

- The LX GPI Plug-in (Version 4.1.1) automatically installs the .dll file to the file location when you install the GPI Plug-in. The .dll file is then available via the code library in the plug-in.

- If installing the file manually, place the PreloadedApps.dll file in the following file folder locations:

  For Windows 7, place the file in Libraries > Documents > JCI > GPI > Toolboxes > RunTime. See Figure 6.
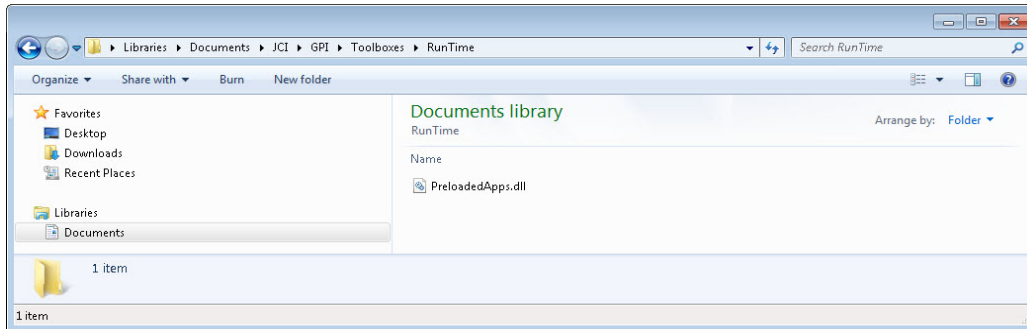

Figure 6: PreloadedApps.dll File Location in Windows 7

For Windows XP, place the PreloadedApps.dll file in My Documents > JCI> GPI > Toolboxes > RunTime. See Figure 7.
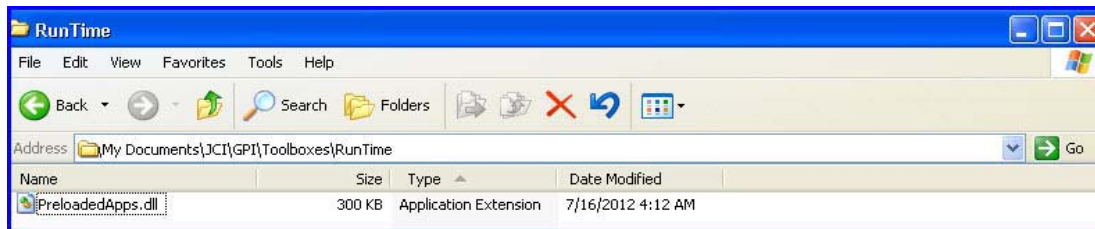
Figure 7: PreloadedApps.dll File Location in Window XP

Connecting to the Platform

After you install the LX support pack on your computer, you must connect to the FX Supervisor platform to configure it.

1. In the Nav side bar, right-click the necessary Facility Explorer platform and select **Open Platform** (Figure 8).
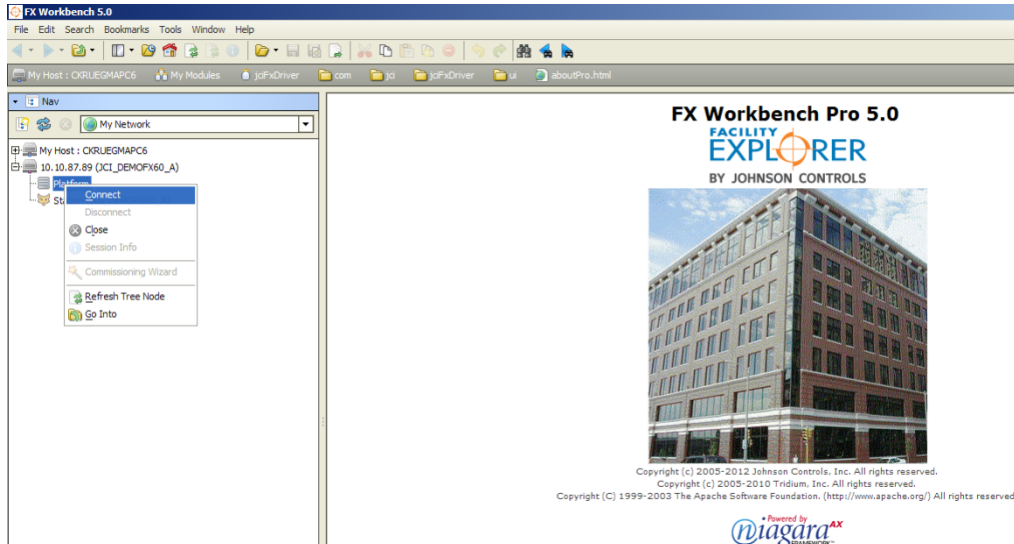
Figure 8: Opening the LX Platform

Note: The first time you access the platform, the Facility Explorer platforms on the network may not appear. Select File > Open > Open Platform to open the Open Platform window. Enter the IP address of the appropriate platform and proceed to Step 2.

2. Enter the Username and Password.
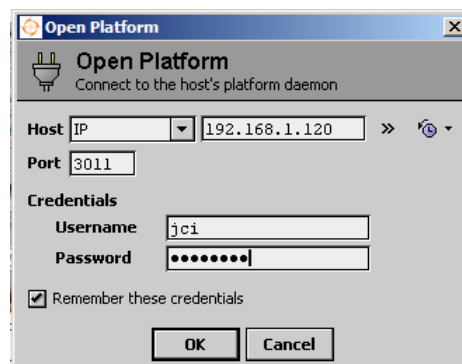
Figure 9: Open Platform Dialog Box

Note: The default platform username is **jci**, and the default password is **explorer**.

3. Click **OK**.

Installing the Distribution Files

The distribution file allows the Facility Explorer Supervisory Controller to use and configure the LX controllers through the LX Wizards.

To install the distribution file:

1. Expand the Platform tree in the Nav side bar and click **Distribution File Installer**. The Distribution File Installer opens in the view pane.
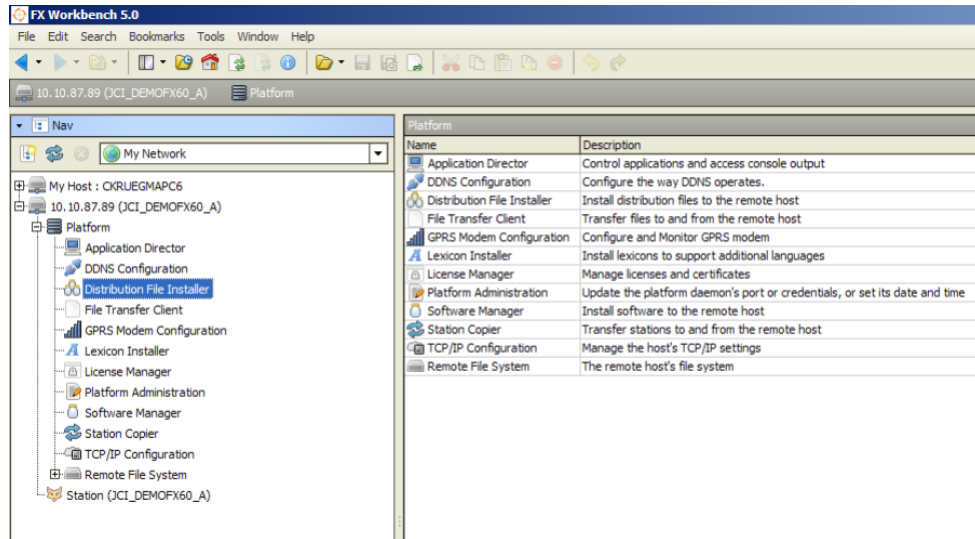
Figure 10: Distribution File Installer

By default, the distribution files are installed in the Johnson Controls Files folder under the FX Workbench installation on the computer. The distribution files are typically located in the following location: C:\JCI\FXWorkbench-[X.X]\Johnson Controls Files, where [X.X] is the FX Workbench version.

2. Select the necessary distribution file and click Install.
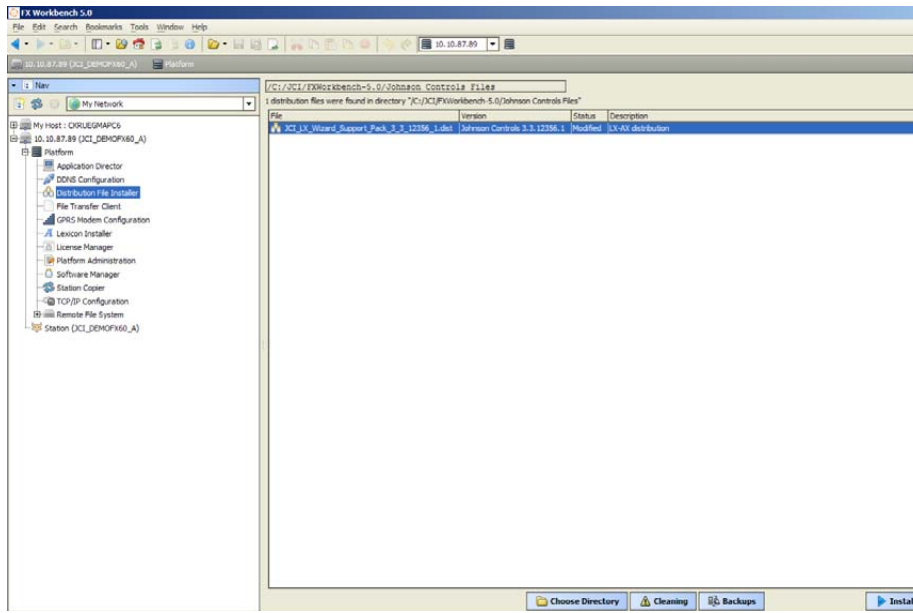
Figure 11: Installing the Distribution Files

Note: You are prompted to close running stations.

3. Click **Finish**. The Distribution File Progress window appears (Figure 12).
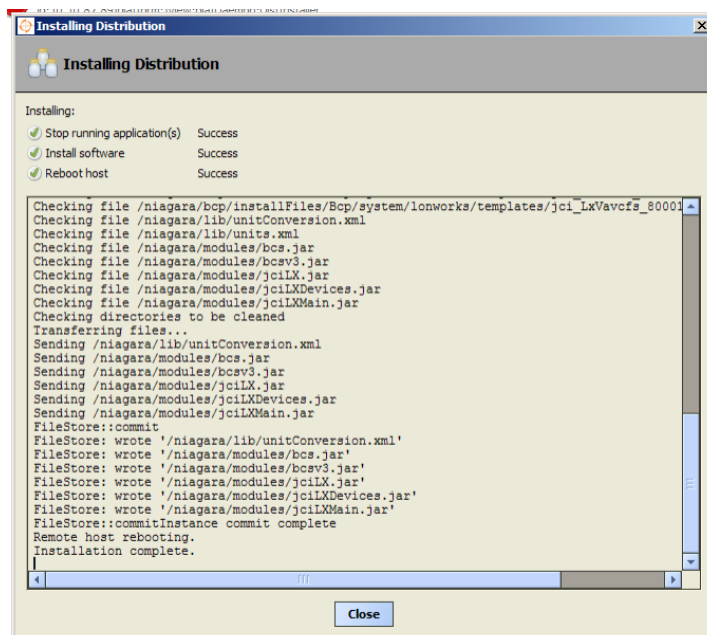
Figure 12: Progress Window

4. Connect to the desired station.

Installing the Wizard Service

The support pack includes the Wizard Service. The Wizard Service is required to add the LX controllers to a LONWORKS network in a Facility Explorer station and to configure the controllers using the LX Wizards.

Two installation methods are available:

- For new stations that do not have a LON network, see *Adding the Wizard from the jciLX palette*.

- For existing stations that require an upgrade from a previous version and have an existing LON network, see *Upgrading an Existing Station for the Wizard Service*.

Adding the Wizard from the jciLX palette

1. Right-click the desired station, and click **Connect** (Figure 13).
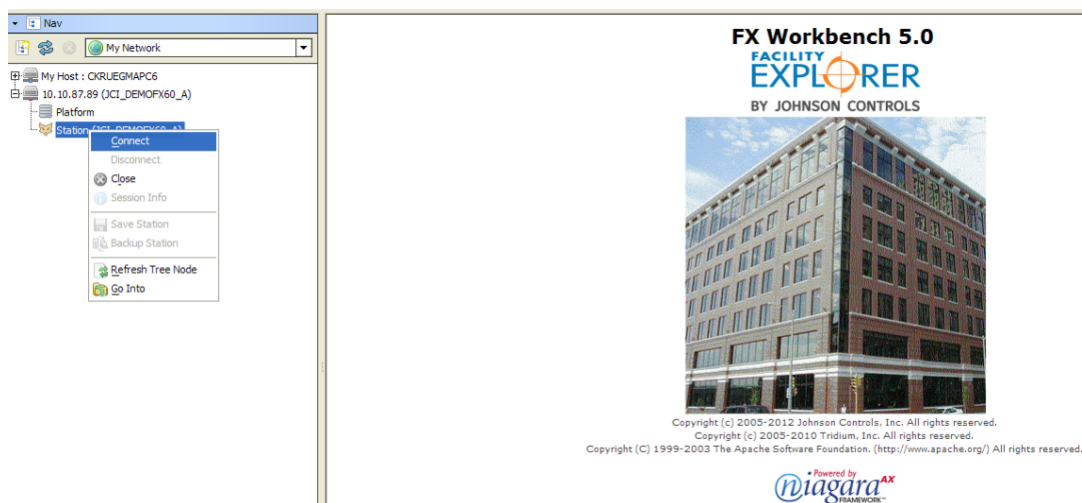
Figure 13: Connecting to a Station

2. Enter the Username and Password. Click **OK**.

Figure 14: Authentication Dialog Box

3. On the **Side Bars** menu, click **Palette** to open the Open Palette selection window.
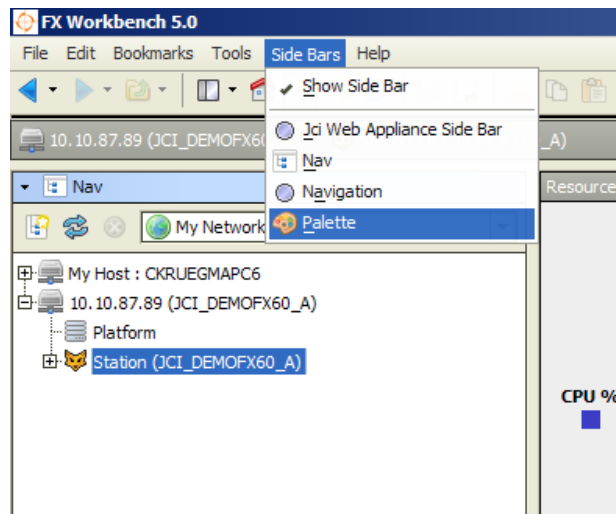
Figure 15: jciLX Palette Selection

4. In the Open Palette selection window, select **jciLX**.
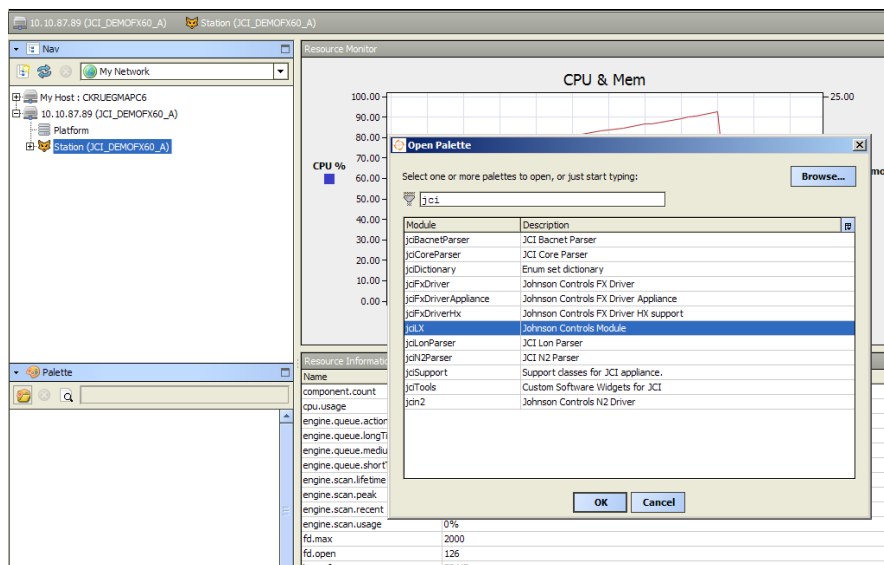
Figure 16: Palette Sidebar

5. Click **OK**. The jciLX palette is added to the Palette side bar.

6. From the jciLX palette, drag and drop WizardService into the Services tree of the station.

Note: Locate the Services tree within the Config tree of the station. The Wizard Service is now added to the Services folder of the tree of the station.
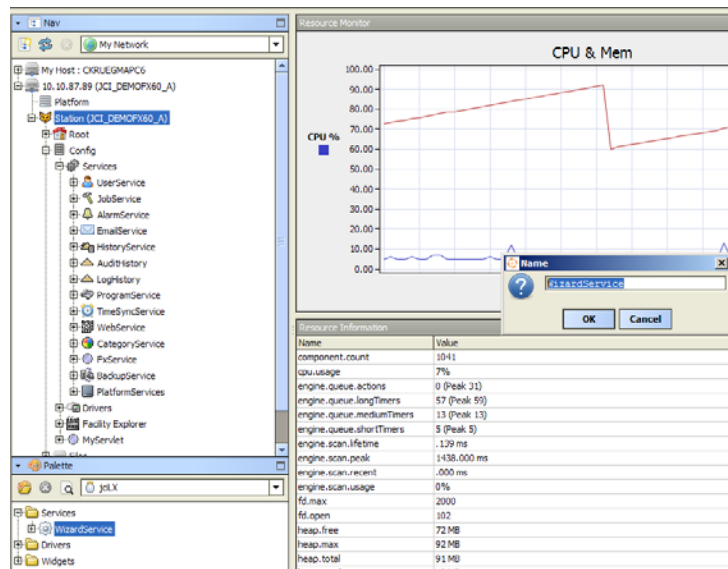
Figure 17: Adding the WizardService to Services Tree

Upgrading an Existing Station for the Wizard Service

To upgrade the Bcp Server Service to the Wizard Service, use this installation method.

You must have an existing station with a network of LONWORKS devices. Upgrade the Bcp Server Service to the Wizard Service to use the upgraded Wizards and new LX controllers. Before upgrading your station, verify you have the JCI LX Support Pack installed on your FX Workbench.

1. Connect to the Platform of the FX20/60/70 you intend to upgrade.

2. Run the Software Manager to verify that the JCI LX Support Pack is installed.

   To access the Software Manager, expand the Platform tree of the FX Supervisor. The results appear (Figure 18).

| File	Installed Version	Avail. Version	
bcs	BCS 2.7.6.2	BCS 2.7.9.19	Out of Date
jciLXDevices	Johnson Controls 2.7.6	Johnson Controls 3.3.12356.1	Out of Date
jciLXMain	Johnson Controls 2.7.6	Johnson Controls 3.3.12356.1	Out of Date
bcsv3	-	BCS 3.3.12356.1	Not Installed
jciLX	-	Johnson Controls 3.3.12356.1	Not Installed

Figure 18: Upgrade Results

3. Expand the Platform view and double-click the Distribution File Installer. If you installed the JCI LX Support Pack on your Workbench version, a .dist file is available. Select the .dist file. Click **Install**.

Note: The .dist file is available at: C:\JCI\FXWorkbench-4.1\Johnson Controls Files. The .dist file name is JCI_LX_Wizard_Support_Pack_3_3_xxxxxx_x.dist, where xxxxxx_x is replaced with version numbers.

Note: You must be at Niagara 3.6.47 or later to upgrade.
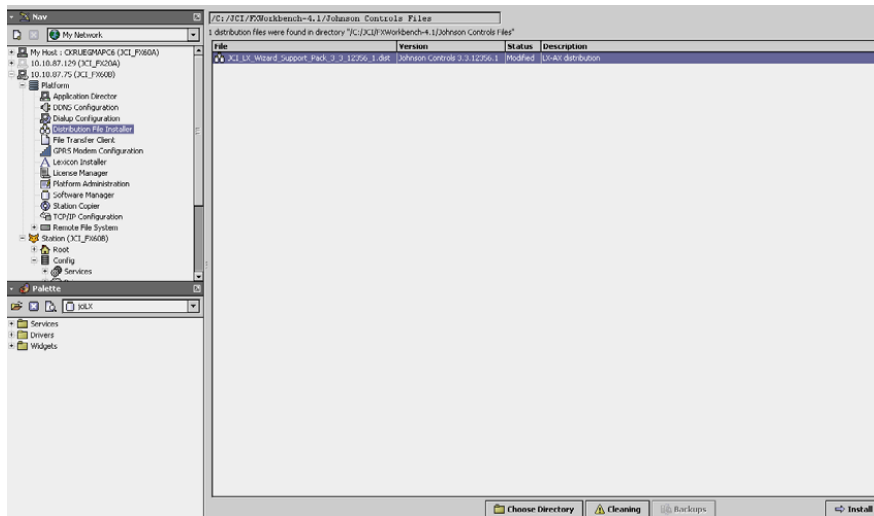
Figure 19: Installing the JCI LX Wizard Support Pack

4. If the Distribution File Installer prompts you to add bacnetws dependency, click **Next**.

5. Click **Finish**. The Distribution File Installer installs the software and reboots the FX Supervisor Station.
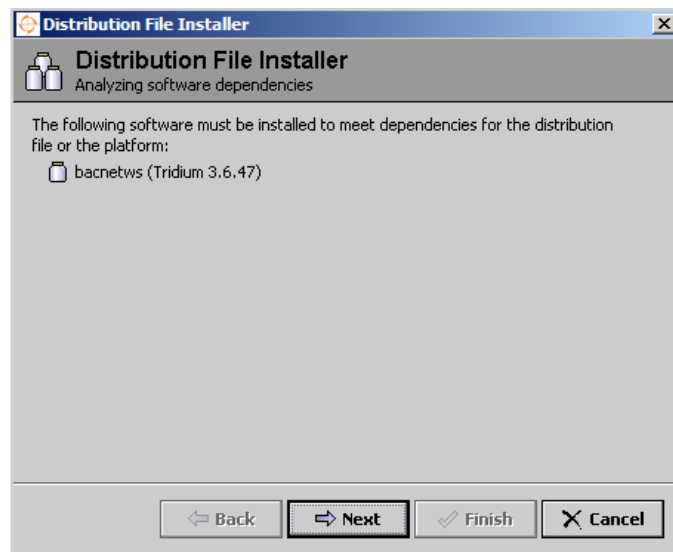
Figure 20: Add bacnetws Dependency

The Distribution File Installer installs the software and reboots the FX Supervisor Station.
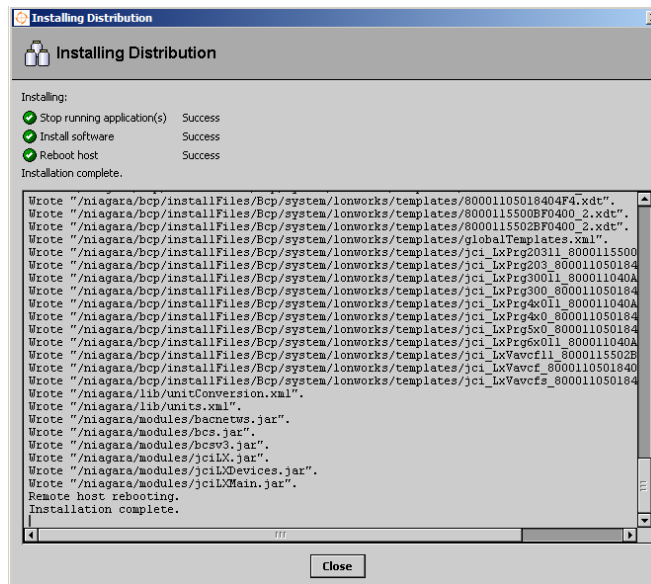
Figure 21: Installation Complete

6. Click **Close** when the installation finishes.

The FX Supervisory device reboots after the installation is complete. Once the FX Supervisory device reboots, reconnect the Platform and the Station. The Bcp Server Service is replaced by Wizard Service. Additionally, the jciLXMain Palette is replaced by the jciLX Palette.
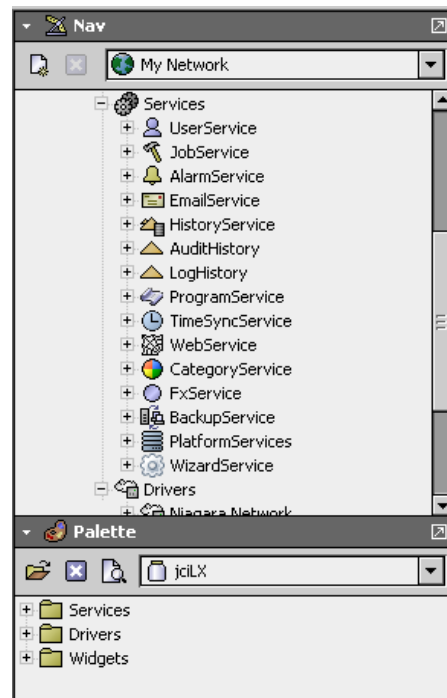
Figure 22: New Wizard Service and jciLX Palette

Configuring the Wizard Service

When configuring the Wizard Service, you can define properties such as the communication port and the maximum number of simultaneous connections.

To configure the Wizard Service:

1. In the Nav side bar, access the Wizard Service property sheet.

2. Right-click **WizardService** and select Views > Property Sheet. Table 3 defines the Wizard Service property sheet.
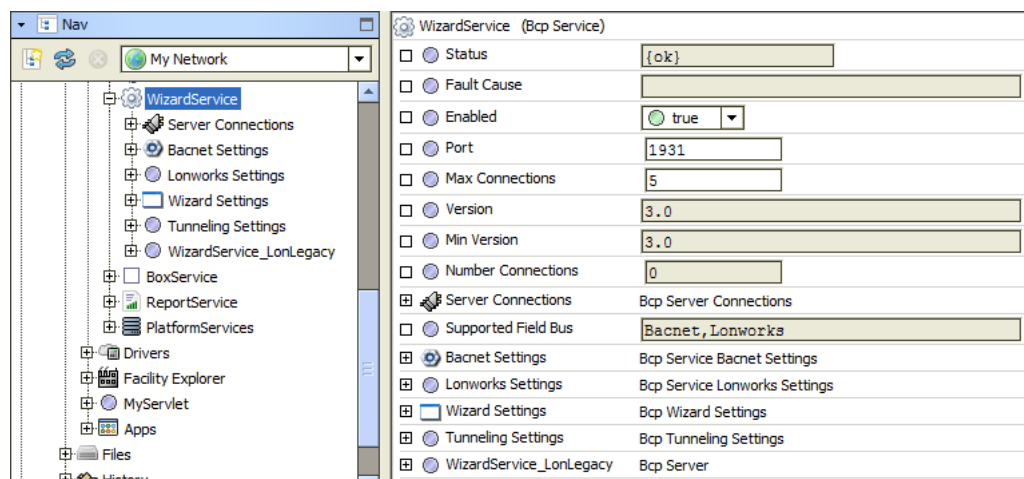
Figure 23: Wizard Service Property Sheet

Table 3: Wizard Service Property Sheet Parameters (Part 1 of 2)

| Field	Description
Status (Read-Only)	Displays the status of the Wizard Service. When the service is enabled, an OK status appears. When the service is not enabled, a disabled status appears.
Fault Cause (Read-Only)	Lists the fault causes.
Enabled	Enables or disables the Wizard Service. True enables the service and False disables the service.
Port	Displays the ports that the station is using to communicate with Niagara. The default port is 1931.
Max Connections	Displays the maximum number of connections (wizards) that are able to run simultaneously. The default is 5.
Version (Read-Only)	Displays the current version of the Wizard Service communication protocol.
Min Version (Read-Only)	Lists the minimum required version of the Wizard Service communication protocol that is required for this service to operate.
Number Connections (Read-Only)	Displays the number of clients (wizards) currently running and using the Wizard Service.
BACnet Settings	Not applicable
LONWORKS Settings	
TagUpdateLatency	Displays time during which the device message tags are buffered before the messages are sent to the GPI. The default settings is 500 milliseconds.

Table 3: Wizard Service Property Sheet Parameters (Part 2 of 2)

Field	Description
Comm Config	For our controllers, we strongly recommend using the following settings: • Repeat Timer set to Milli Sec96. • Transmit Timer set to Milli Sec512. • Retry Count set to 3. Sometimes, certain LONWORKS devices may process LONWORKS messages slower than normal, resulting in errors when you do commissioning or binding operations—where the commission or bind reports as failed. You can confirm such problems by using the Lon Utilities Manager and running a verify report. The verify report lists the inconsistencies between the bindings that Niagara's LON network management determines that they should have. Under these conditions, it may be necessary to raise the Temp Transmit Timer setting to Milli Sec1024.
Comm Config/Auto Update	If set to True, the Comm Config settings are pushed above the Lon Comm Config on all LONWORKS BcpLonNetworks. If set to False, the settings of the individual LONWORKS BcpLonNetworks are preserved.
Wizard Settings	
Create Proxy Point Description	Allows the GPI block property Description to be created as a description property under proxy points with the Create Points device action. This description can be used to provide information on a Px Page.
Default Numeric Point Precision	Numeric precision for floating point numbers displayed by proxy points created with the Create Points device action.
Tunneling Settings	When connected to an FX Supervisor whose IP address is not directly accessible from your computer, tunneling may be used as a connection method, when properly configured.
WizardService_LonLegacy	Wizard service extension to manage the application-specific and line-by-line programmable controllers.
Client Path	This is the client path where the application to launch the legacy wizards are found. We strongly recommend you do not change this field.
Server Connections	Sets the server connection parameters. The number of supported connection is set in *Max Connections*.
Si Save Data	If true, maintains compatibility for controllers operating with LNS versions less than or equal to 3.0. If false, nv change types are accelerated.
Supported Field Bus	Lists the network types supported by the Wizard Service.
Wire Sheet Layout Settings	Controls LONMARK® object layout on the property sheet for specific GPI device types.

The WizardService_LonLegacy parameter of the property sheets supports the use of the LX Configuration Wizards. Figure 24 displays the WizardService_LonLegacy parameter and associated settings in FX Workbench. Table 4 lists the settings of the parameter.

Figure 24: WizardService_LonLegacy

Table 4: WizardService_LonLegacy Parameter Settings (Part 1 of 2)

Field	Description
Status (Read-only)	Displays the status of the WizardService. If the server is enabled (Enabled field set to True), an {ok} status is displayed. If the server is disabled (Enabled field set to False), a {disabled} status is displayed.
Fault Cause (Read-only)	If there is a problem with the WizardService, this field lists the possible cause of the problem.
Enabled	Enables or Disables the WizardService_LonLegacy parameter. Enable the server by setting this field to True. Disable the server by setting this field to False.
Port	Displays the ports that the station is using to communicate with the legacy wizards. The default port is 1930.
Max Clients	Displays the maximum number of clients (wizards) that are able to run simultaneously. The default is 5.
Temp Transfer Timer	Some LONWORKS devices may process LONWORKS messages slower than typical processing time, which results in errors or failures during commissioning or binding operations. Using the Lon Utilities Manager (after receiving an error or failure message), run a verify report. The verify report lists any inconsistencies between actual bindings on the device and bindings that were attempted. Under these conditions, it may be necessary to raise the Temp Transfer Time to Milli Sec1024.

Table 4: WizardService_LonLegacy Parameter Settings (Part 2 of 2)

Field	Description
Client Path	Displays the client path (or location) of the application to launch the legacy wizards. We recommend not modifying this field.
Version (Read-only)	Displays the current version of the legacy Wizard Service communication protocol.
Number Connections (Read-only)	Lists the number of clients (wizards) currently running and using the WizardService.
Wizard Settings	Stubs container that allows reuse of the Niagara categories for managing access rights to applications.
Units	Determines the default unit of measurement when a wizard launches.

Server Connections Parameter Settings

Figure 25 displays the Server Connection parameter and associated settings in Workbench. The server connection parameter settings are listed in Table 5.
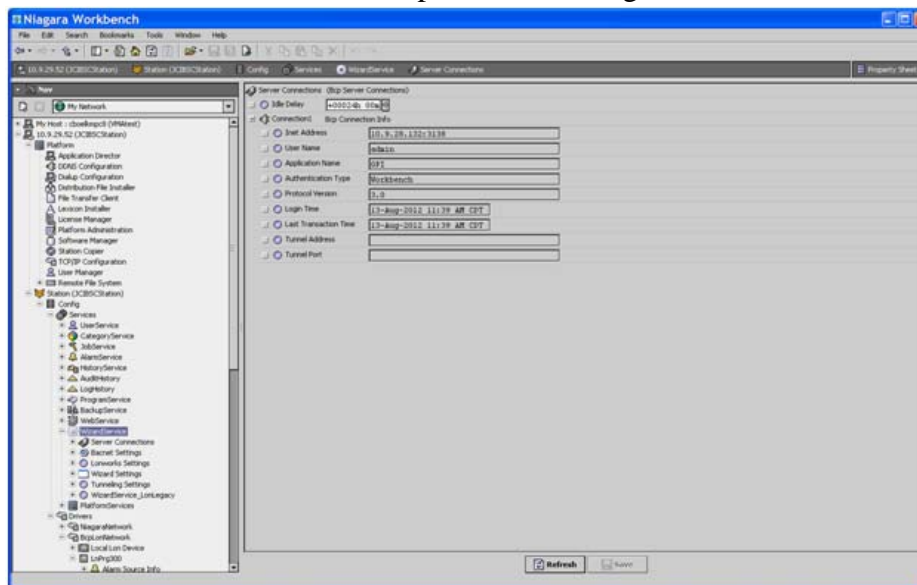
Figure 25: Server Connection Parameter

Table 5: Server Connection Parameter Settings

Field	Description
Idle Delay	Sets the delay after an idle connection is disconnected. This setting is calculated from the Last Transaction Time.
Server Connections (Connection 1)	**Inet Address:** Displays the IP Address of the computer used to make the connection
	User Name: Displays the user name from Workbench or GPI used to connect with the FX Supervisor
	Application Name: Displays the name of the connected application
	Authentication Type: Lists how the application connected (via Workbench or Digest from the Desktop).
	Protocol Version: Lists the bcp protocol version
	Login Time: Displays the time the connection is established
	Last Transaction Time: Displays the time of last transaction

Setting the WizardService Comm Config Properties

If Auto Update is set to True, the current Comm Config properties from the WizardService define the master LONWORKS network settings that overwrite the Lon Comm Config settings of all BcpLonNetwork property sheets when:

- the FX Supervisor reboots

- a wizard connection is made (see *Launching and Using an LX Wizard*)

- the settings on this page are saved

- right-clicking Comm Config and selecting Actions > Update Networks

For a LONWORKS network to best handle traffic while configuring and debugging LX Controllers, use the following settings:

1. Set the Receive Timer (drop-down menu) to Milli Sect384.

2. Set the Transmit Timer (drop-down menu) to Milli Sec512.

3. Set the Retry Count field to 3.

4. Apply the Comm Config settings to all BcpLonNetwork property sheets. You can apply the settings by right-clicking Comm Config and selecting Actions > Set to Default.

5. See Table 4 for settings related to *Temp Transfer Timer*.

If the FX Supervisor operates with LONWORKS networks that have other requirements for the Comm Config setting, set Auto Update to False. Setting Auto Update to False prevents the Lon Comm Config settings of the BcpLonNetwork property sheets from overwriting when the FX Supervisor reboots or when the GPI starts.

To set the appropriate values:

1. For a LONWORKS network that requires no other Comm Config settings, set Auto Update to True. For a LONWORKS network that has other requirements for the Comm Config settings, set Auto Update to False.

2. Click **Save**.

3. Right-click **Comm Config** and select Actions > Set to Default to set the values necessary to use the LX Controllers.

4. Click **Save**.

Resetting the Wizard Service

Upon Reset, the Wizard Service closes all connections between the Wizard Service and the connected wizards.

To reset the Wizard Server:

1. Expand the Services tree, and right-click **WizardService**.

2. Select Action > Reset Connections.
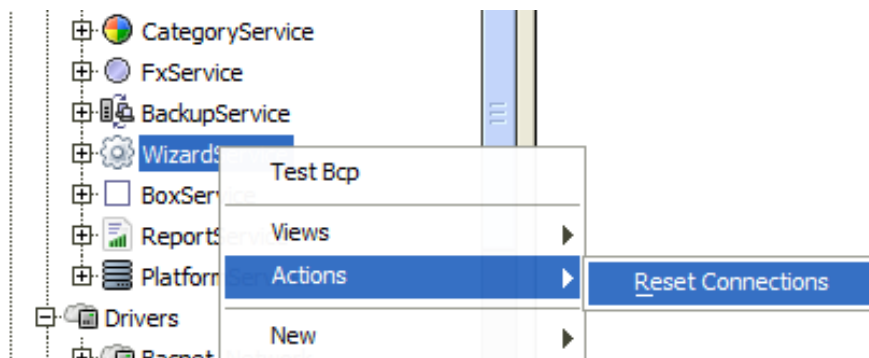
Figure 26: Resetting the Wizard Service

Installing and Using LX Wizards

After you install the support pack and distribution files and configure the Wizard Service, you are ready to install the wizards for the LX controllers.

Installing an LX Wizard

Use the configuration wizards to program and configure the devices you add to the LONWORKS network. You must install the applications and wizards prior to using the LX controllers. Each device type has one wizard.

To install an LX Wizard:

1. Close all running programs.

2. Right-click the device wizard .exe file. The installation welcome screen appears.
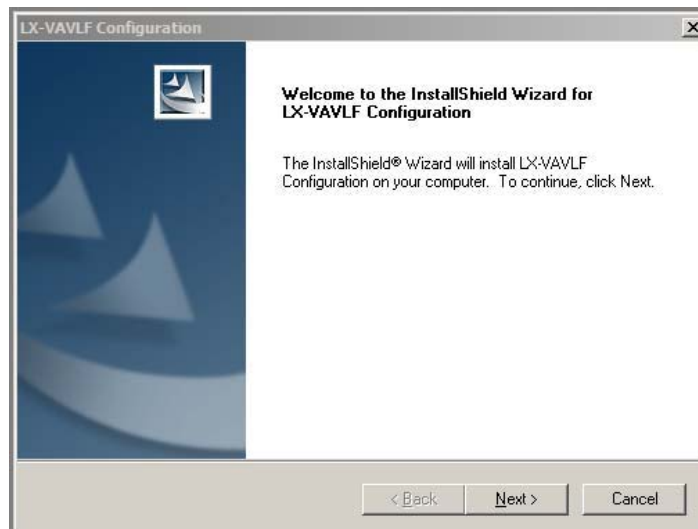
Figure 27: LX-VAVLF Configuration Welcome Screen

Note: Locate the install on the FX Supervisory Controller Family release installation DVD (LP-FXWB-COPY). You can also download the latest wizards from the Pro FX User Community.

3. Click **Next**.

4. Follow the instructions on the screen.

5. Click **Finish.**

Adding and Configuring a LONWORKS Network

An established LONWORKS network must be in place prior to adding, configuring, and monitoring LX controllers.

Adding a LONWorks Network to a Station

To add a LONWORKS network to a station:

1. In the Nav side bar, double-click **Drivers**. The Drivers Manager opens in the view pane.

Figure 28: Driver Manager Window

2. Click **New**.

3. Select **Bcp Lon Network** from the Type to Add drop-down list.
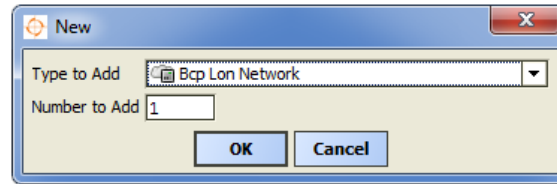
Figure 29: New Bcp LON Network

4. Click **OK**. The BcpLonNetwork driver screen appears.
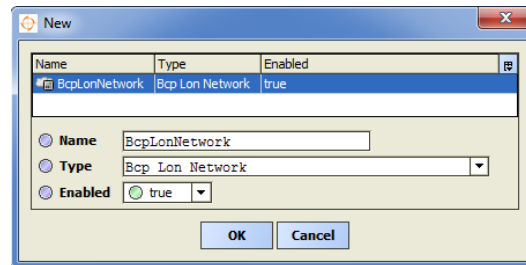
Figure 30: Bcp LON Network Driver Screen

5. Enter the name for the Bcp LONWORKS network.
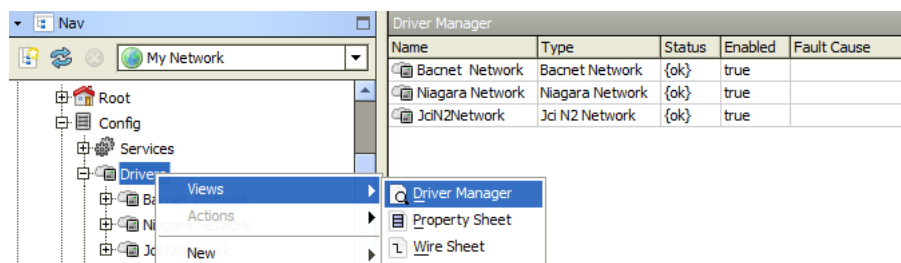
6. Verify the Enabled field is set to True.

7. Click **OK**.

8. Configure the Bcp LON Network.

Configuring the Bcp LON Network

To configure the Bcp LON network:

1. In the Nav side bar, right-click BcpLonNetwork > Views > Property sheet to ensure the Bcp LON network is configured correctly.

2. Verify the Enabled field is set to **True**.

3. Expand the Lon Comm Config field.

4. In the Device Name Field, confirm that the setting is LON1.

5. Ensure the Repeater Timer field is set to Milli Sec96, the Receive Timer filed is set to Milli Sec384, the Transmit Timer is set to Milli Sec512, and the Retry Count is set to 3.

6. Click **Save**.

7. Expand the Lon Netmgmt field.

8. Set the Domain Id to a length of 1 and the Id to 01.
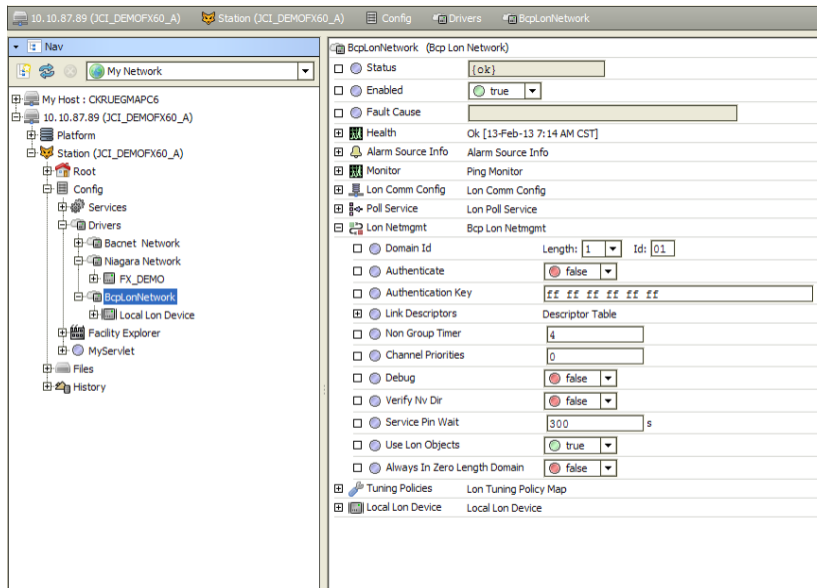
Figure 31: Device Name and Domain Id

9. Click **Save**.

Note: If the LONWORKS network is already configured, the Domain Id may be set
to a number other than 1. Verify the Domain Ids for the network and
controllers are identical.

Adding a Device to the LONWORKS Network

If you are adding a device to a LONWORKS network, follow the procedure in the *Adding Other Controllers to the LONWORKS Network* section.

If you are replacing an LX-PRGxxx-11 on a LONWORKS network, follow the procedure in the *Replacing an LX-PRG Controller on the Lonworks Network* section.

Adding Other Controllers to the LONWORKS Network

1. In the Palette side bar, select Open Palette. The Open Palette selection window appears.

2. In the Open Palette selection window, select jciLX.
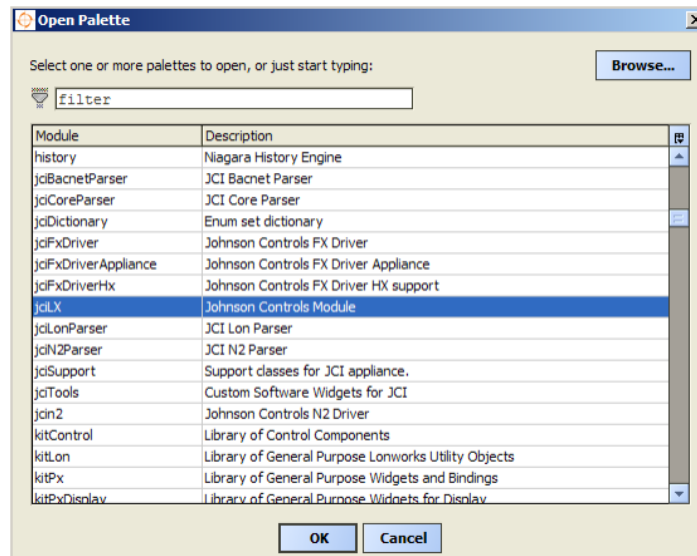
Figure 32: Open Palette Section Dialog Box

3. Click **OK**. The jciLX Palette appears in your Palette side bar.

4. Expand the Devices folder and drag the necessary controller from the jciLX palette into the LonNetwork tree.
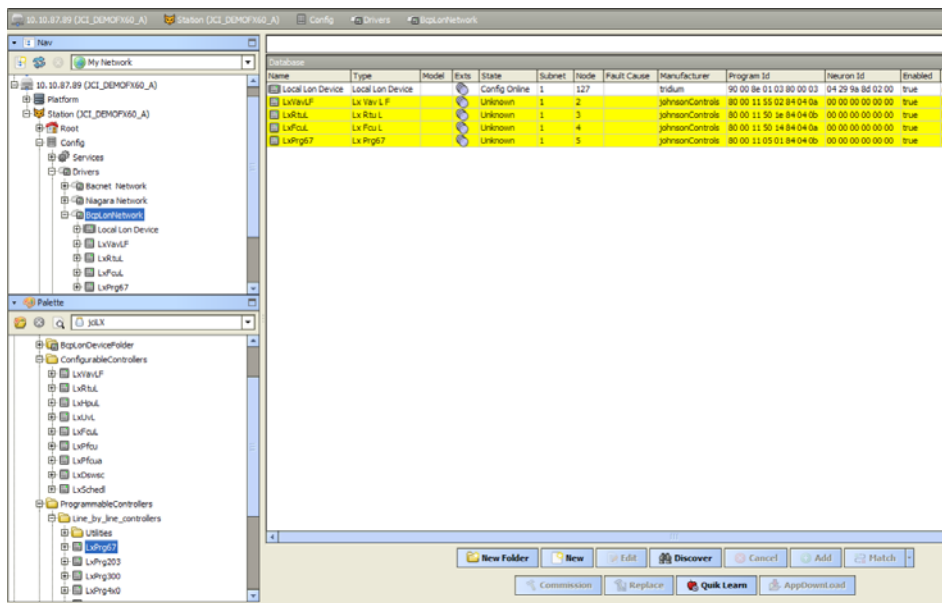
Figure 33: Added Controllers in the Nav Side Bar

5. The added controllers appear below Local Lon Device in both the Nav side bar and the view pane. Commission the device if it appears yellow in the View pane.

6. When you add a programmable controller (Bcp Lonworks device), you have to select a device model. Right-click the device after it is added (Figure 34).
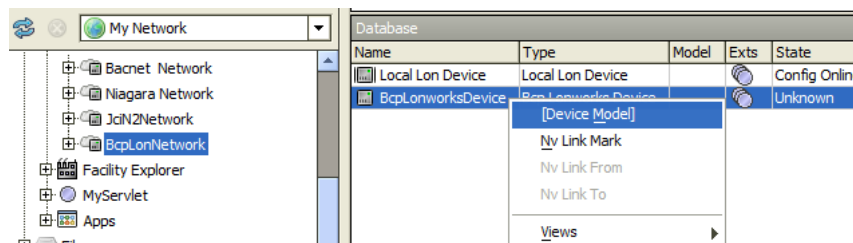
Figure 34: Select Device Model from Menu

The Model Selector dialog box appears.

7. Select the appropriate model from the list (Figure 35).
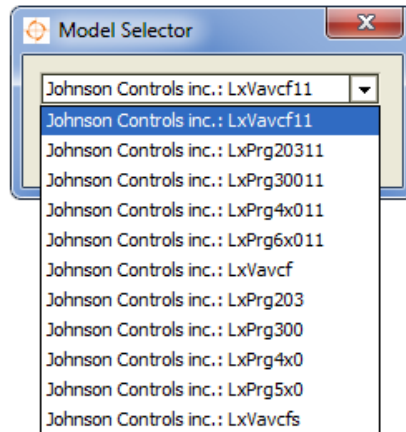
Figure 35: Example Model Selector Options

Replacing an LX-PRG Controller on the LONWORKS Network

Note: If you are replacing an existing LX-PRG controller on your FX Supervisor, you must first decommission the existing LX-PRG controller and remove it from the site entirely. When this is complete, you can add the new controller to the site using these steps.

1. Back up the existing station using the Station Copier.

2. Remove the existing LX-PRG controller.

3. Install the new LX-PRG controller.

4. Discover the new LX-PRG controller.

5. Match the new controller with the existing controller definition in the FX Supervisor database.

6. Launch the LX-GPI wizard.

7. Perform the Build and Send function to verify the code and send the code to the controller.

8. Perform a Synchronization.

9. Restart the FX-Supervisor.

10. Launch the LX-GPI wizard and confirm operation and live values.

Commissioning the Device

You can commission the device manually or with the service pin.

Manual Commissioning

To commission the device manually:

1. Select the device and click **Commission**. The Commission window appears (Figure 36).

2. Enter the device Neuron ID number in the field.

3. Click **Apply** (Figure 36).

4. The device is ready to configure. The device state changes from Unknown to Config Online.

Service Pin Commissioning

To commission the device with the service pin:

1. Select the device and click **Commission**. The Commission window appears (Figure 36).
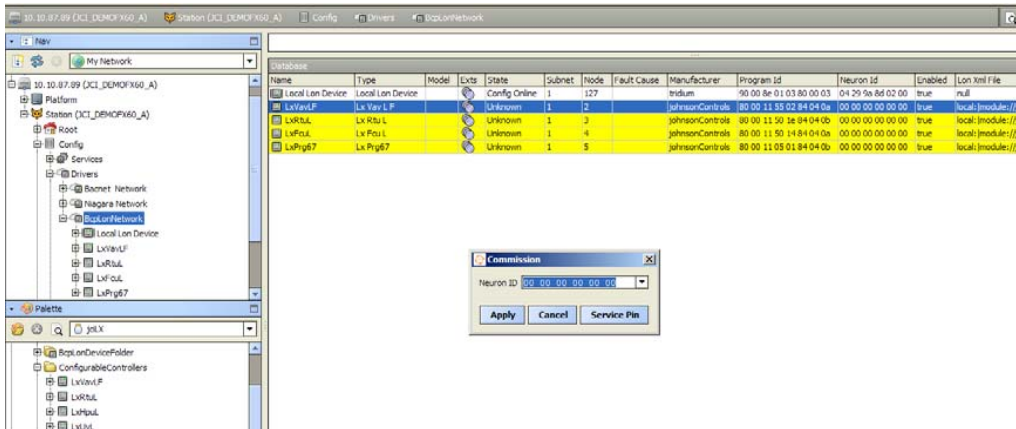
Figure 36: Commissioning

2. Click Service Pin and press the service pin on the device.

Figure 37: Device Service Pin

3. The device is ready to configure. The device state changes from Unknown to Config Online.

Device Upload

A device upload reads transient (nvs) and persistent (ncis and cps) data from the device and writes it to the station's database. Device upload is necessary when adding a new device to the FX Supervisor database.

To upload a new device:

1. Right-click the device and select Actions > Upload.
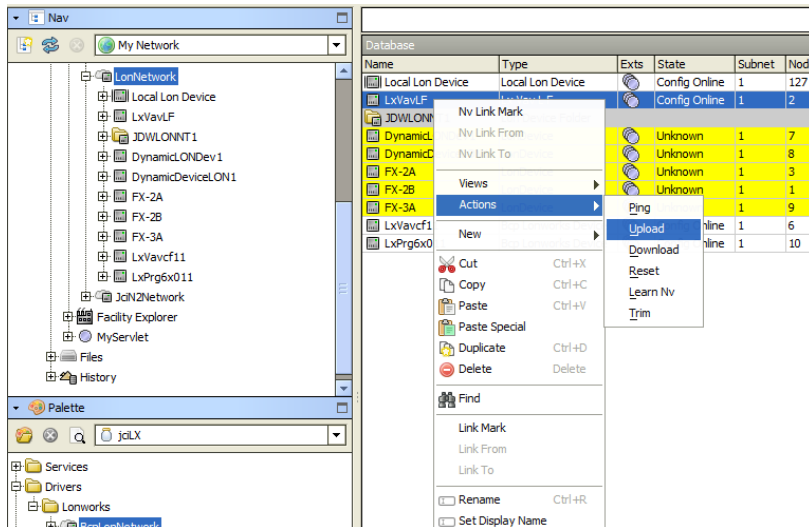
Figure 38: Device Upload

2. An Upload dialog box appears. The dialog box allows you to select the type of data. Typically, you leave the dialog parameters at their default settings – a recursive action is always recommended.
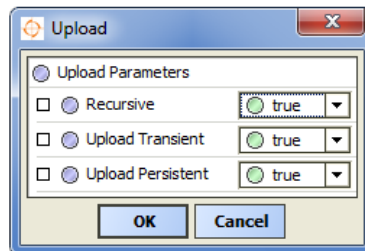
Figure 39: Upload Dialog Box

3. Click **OK.** An Upload action is also available at the BcpLonNetwork level with the same Upload dialog settings. This action provides a global upload from all LON devices.

Device Download

A device download writes persistent data (ncis and cps) to the device from values in the station's database. Device download is necessary when you add or modify blocks in your code that are available as network variables while the controller is offline.

To download a device:

1. Right-click the device and select Actions > Download.
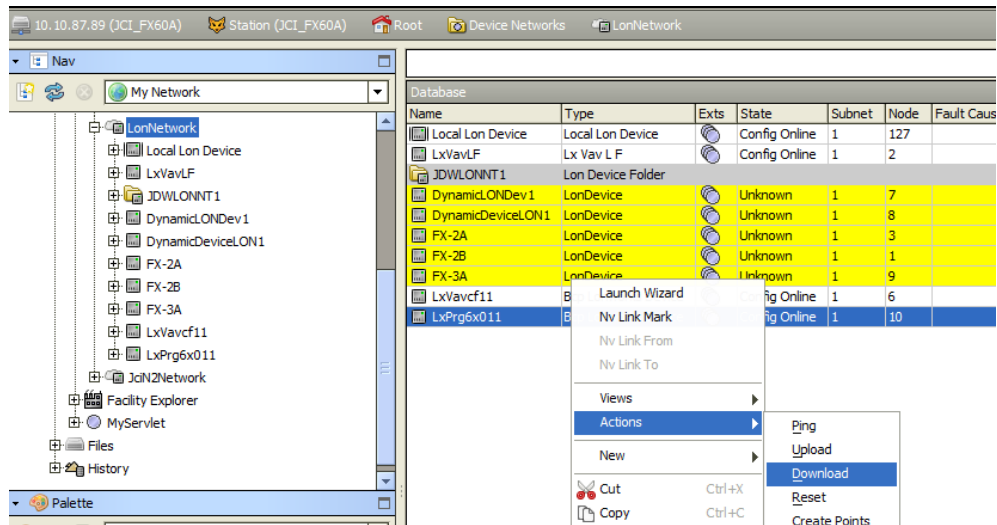
Figure 40: Device Download

2. A Download dialog box appears. The dialog box allows you to select recursive writers. Typically, you leave recursive at its default (true), to write all child data items. Use Downloads to restore nci and cpi values to known good values previously saved in the station. Click **OK**.
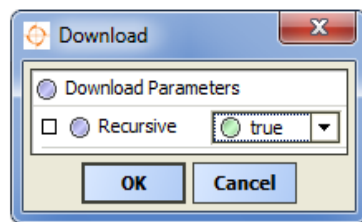
Figure 41: Download Dialog Box

The Download action is also available at the BcpLonNetwork level with the same Upload dialog selections. This action allows for a global upload from all LON devices.

Launching and Using an LX Wizard

An LX Wizard allows you to program and configure devices through the FX Supervisor.

Launching an LX Wizard

To launch an LX Wizard:

1. Right-click the device in the Nav side bar and select **Wizard Launch** from the menu. The Wizard Launch application appears in the View pane. Table 6 describes the fields.
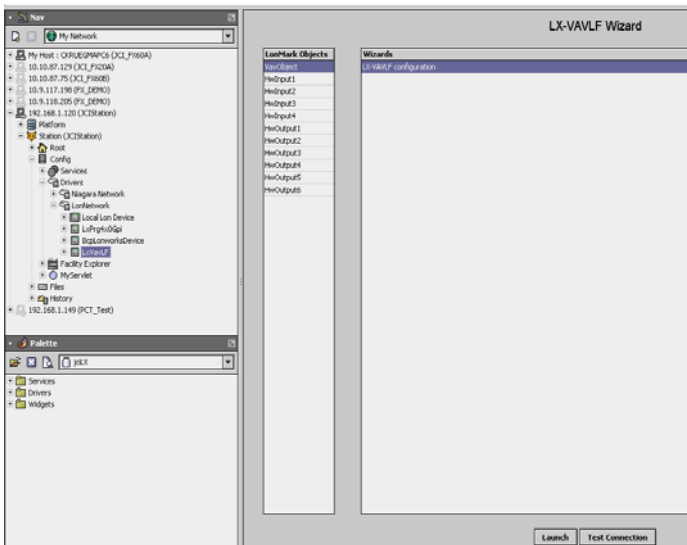
Figure 42: Example of LX Wizard View

2. Select the desired LONMARK object and wizard.

3. Click **Launch**. The device's wizard appears.

Table 6: Wizard Launch Fields

Field	Description
LONMARK Objects	The LONMARK objects in this device that can be configured using an LX Wizard.
Wizards	Displays the wizards you use to configure the selected object.
Launch	Starts the devices LX Wizard.
Test Connection	Starts a test for three required conditions for the wizard to start and function correctly. The test checks: if the BCP server client application is available on the station, if the user has been authenticated with the BCP server, and if the wizard is present on the client side.

Note: You can only use the device wizard from one location. Multiple users at multiple sites can not view the same device wizard at the same time.

Note: Launching the GPI Wizard is different from launching other wizards.

Launching the GPI Wizard

To launch the GPI Wizard:

1. Right-click the device and select Launch Wizard. The GPI Wizard appears.
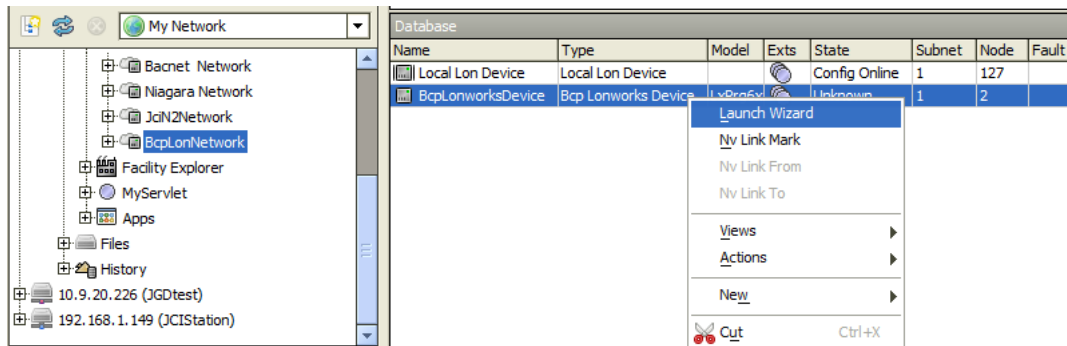
Figure 43: GPI Device Launch Screen
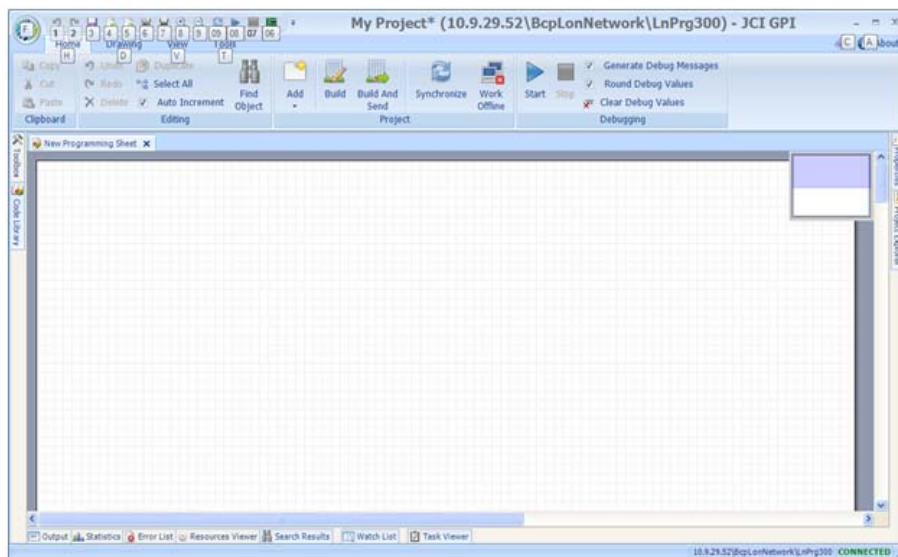
Figure 44: GPI Wizard Screen

Launching the GPI Wizard from a Px Page Using a LaunchButton Widget

By adding a LaunchButton widget to a Px Page, a user can launch any action found by right-clicking the device and selecting Wizards. This includes launching the GPI wizard.

To add a LaunchButton to a Px Page:

1. Expand Widgets folder and drag and drop the LaunchButton widget from the jciLX palette onto the Px Page.
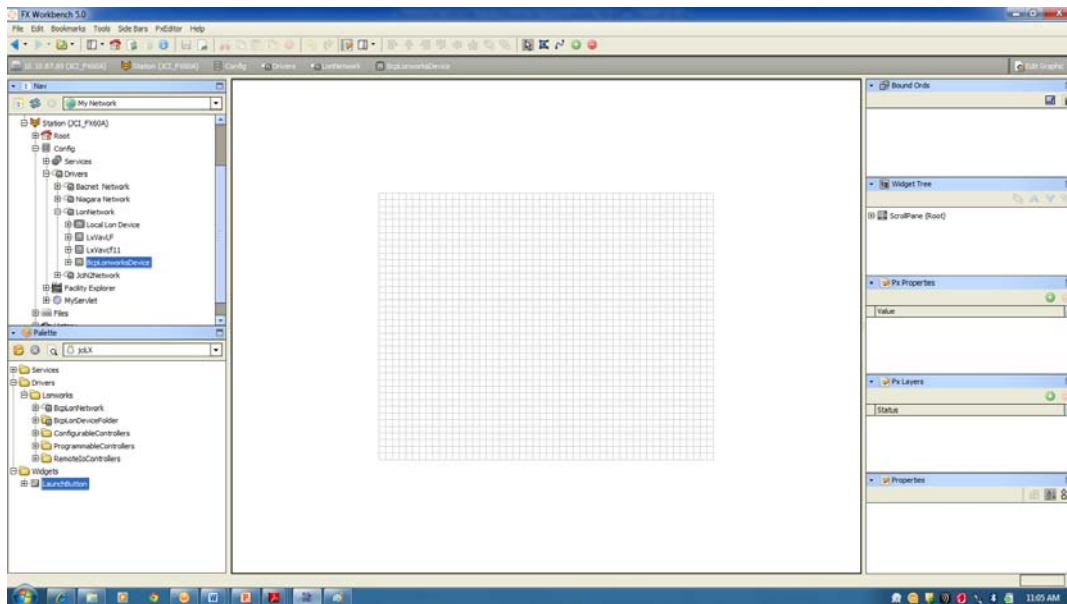
Figure 45: Adding LaunchButton to the Px Page

2. Right-click the **Launch** button on the Px Page to open the Properties window. Configure the button's look and behavior in the Image Button section.

3. Select the device for the LaunchButton wizard action.

    a. Expand Binding. Select Component Chooser from the Ord list.
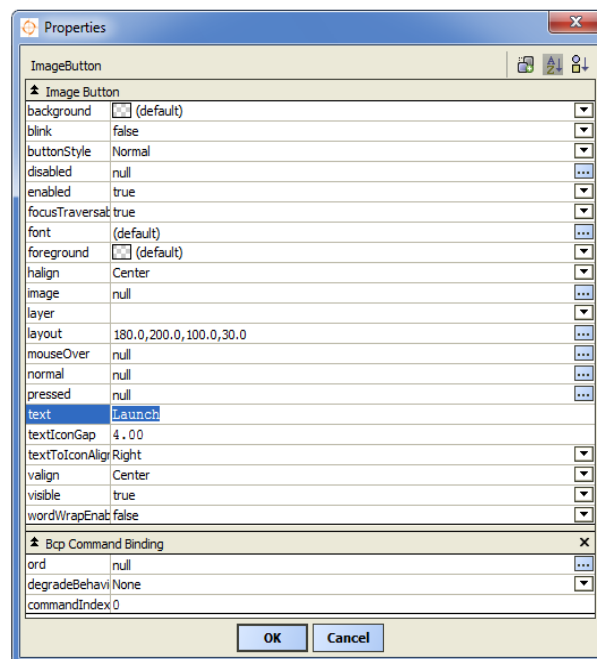
Figure 46: Opening LaunchButton Properties

b. In the Select Ord window, select the device for the LaunchButton wizard action under Drivers, BcpLonNetwork. Set the type to Slot and click **OK**.
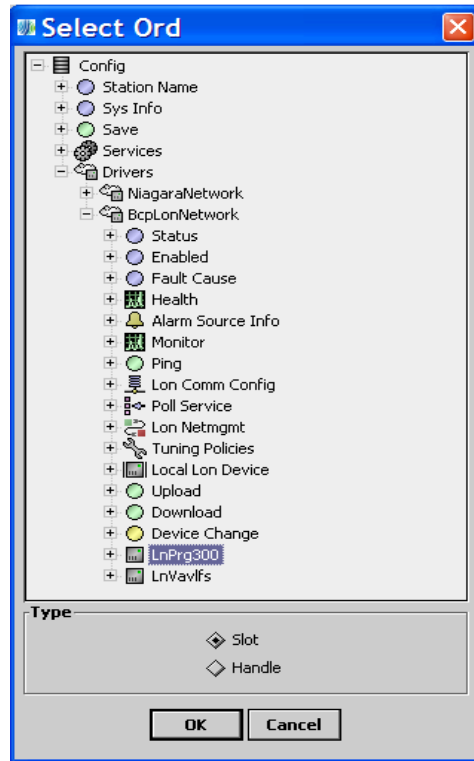
Figure 47: Selecting the Device

4. Set the button behavior when the service is unavailable in degradeBehavior.

5. Set the Wizard to launch in the commandIndex. This number corresponds to the list of wizards shown when you right-click the device selected in Figure 47 for the LaunchButton wizard action and select **Wizards**.

After right-clicking the device and selecting Wizards, the following example options are displayed:

- **Gpi** - Set commandIndex to 0.

- **Rtc** - Set the commandIndex to 1.

- **Scheduler 1** - Set the commandIndex to 2.

- **Scheduler 2** - Set the commandIndex to 3.

.
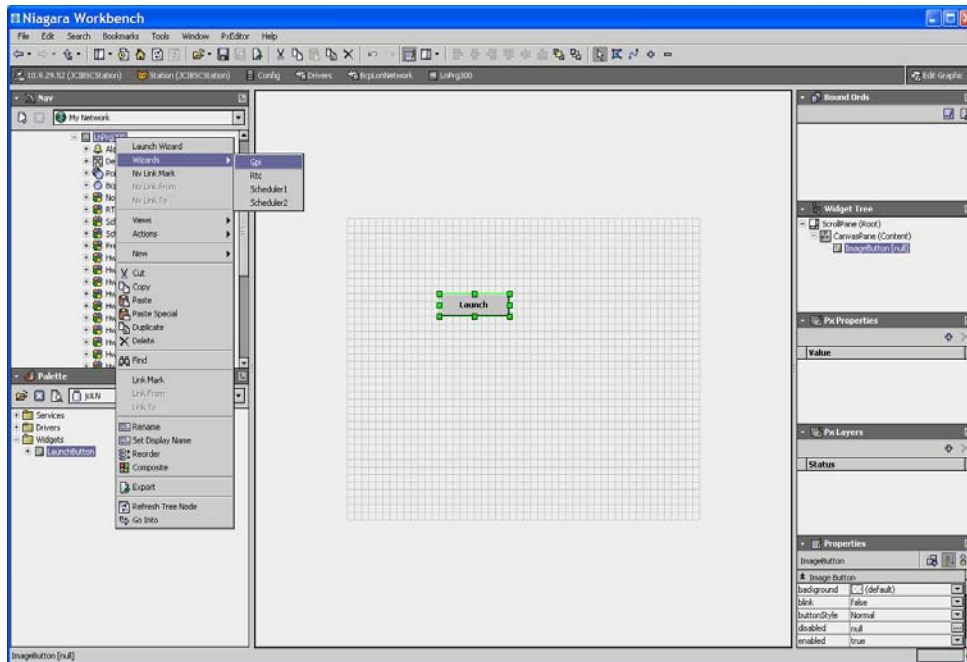
Figure 48: Wizards Available for Device

Note: If Launch Wizard appears in the right-click menu instead of Wizards, only one wizard is available for the device. Set the commandIndex to 0 to launch the wizard.

Discovering an Existing Network

You may have to discover an existing network to add a device to a specific LON network within your system.

To discover an existing network:

1. Double-click the bcpLonNetwork driver in the Nav side bar. The LON Network database appears in the view pane.

2. Click **Discover**. The View pane divides into two sections. The lower section lists the LON Network database, and the upper section lists all the discovered devices.

3. Select the Discovered devices and click **Add**. The Add window appears.

Note: To add multiple controllers, hold the CTRL key and select all the controllers you wish to add.

4. Click **OK**. The discovered devices are added to the LON network database. You may need to configure or commission some of the added devices. See the *Launching and Using an LX Wizard* or *Commissioning the Device* section for more information.

Device Discover Issues

If the controllers are not discovered, the controllers may have been previously commissioned with another Domain Id. Change the Domain Id of the BcpLonNetwork to the controller, and add the controller to the database. If necessary, change the Domain Id of the BcpLonNetwork back to the original number. The FX Supervisor updates the Domain Id of all devices in the database.

To commission the device to update the Domain Id of all devices in the database:

1. Press the Service Pin on the device. The device appears in the Discovered device list.

2. Right-click the **BcpLonNetwork** in the Nav side bar, and select Views > Lon Utilities Manager**.**
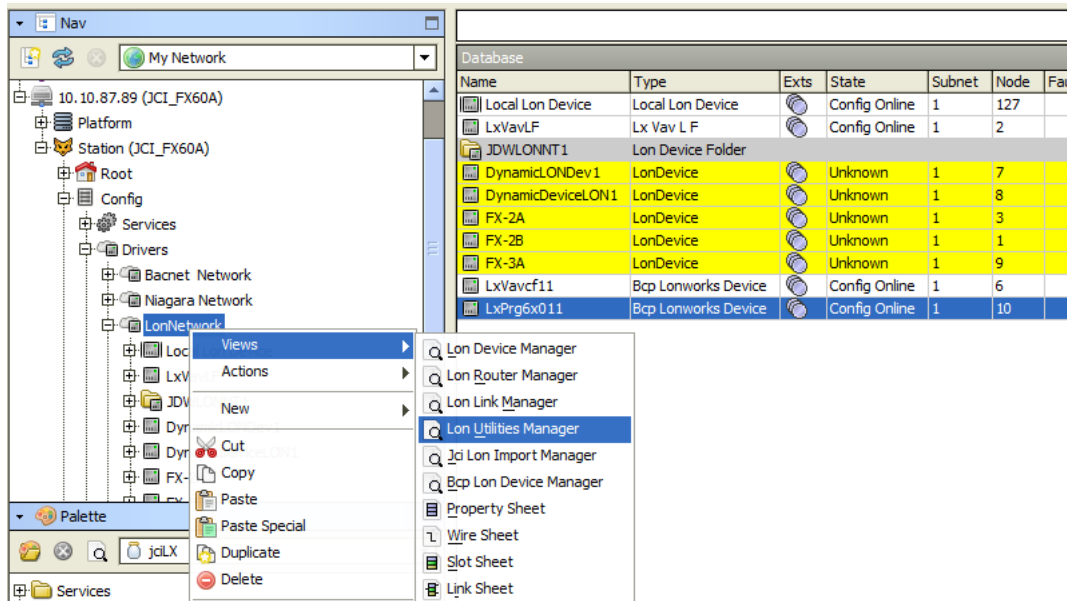
Figure 49: Selecting the Lon Utilities Manager

3. In the Device drop-down list, select the device that was found with the Service Pin. Set Command to Data Structs and set SubCommand to Domain Table. Click **Execute**.
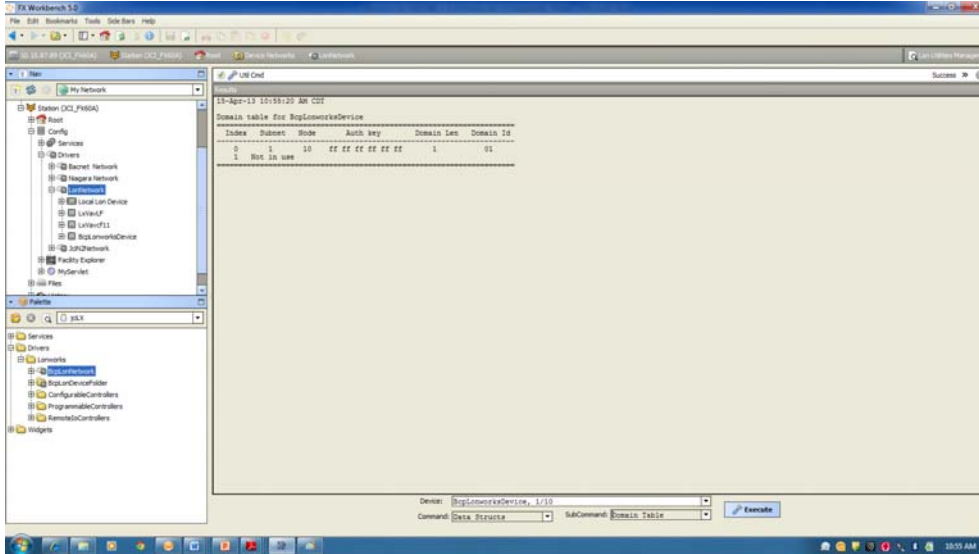
Figure 50: Executing the Device

Note: If the Domain Length and Domain Id are the same as the BcpLonNetwork properties, skip forward to Step 7.

4. Right-click the **BcpLonNetwork** in the Nav side bar, and select Views > Property Sheet.

5. Set the Domain Length and Domain Id to that of the device, and click **Save**.

6. Right-click the **BcpLonNetwork** driver in the Nav side bar. The LONWORKS Network Database appears in the view pane.

7. Click **Discover** and add the discovered devices.

Matching Devices

A site may have an existing LON Network and an established LON database. When this occurs, you have to match the devices from the site to the devices in the LON network database.

To match devices:

1. Double-click the bcpLonNetwork driver in the Nav side bar. The LON Network database appears in the view pane.

2. Click **Discover**. The View pane divides into two sections-one listing the LON Network database and the other listing all the discovered devices.

3. Select the device from the Discovered section to match with the device from the Database section.

4. Click **Match**. The match window appears.

5. Click **OK**. The devices are matched. You may need to configure or commission some of the matched devices. See the *Commissioning the Device* section for more information.

Managing LONWORKS Programmable Controller Internal Points in the FX Supervisor

A GPI controller can be programmed using its programming tool on an FX Supervisor just like any other device. However, if the FX Supervisor is to manage the programmable controller directly, it needs to connect to the device's internal points in a certain way. By using special control points that can be linked to the internal points of the programmable controller, the controller's internal points can be used in graphics (Px) pages, logs, or alarms, or use LONWORKS component objects to link one controller to another controller.

GPI controllers have eight or more types of internal points that are stored in Network Constant Inputs (NCIs), Network Variable Inputs (NVIs), or Network Variable Outputs (NVOs). GPI controllers may have the following NCIs, NVIs, and NVOs. See the controller's functional profile in its datasheet for the specific details of the supported NCIs, NVIs, and NVOs.

Table 7: Typical Controller Internal Points (Part 1 of 2)

Internal Points	32-Bit Controllers	8-Bit Controllers
Constant Bool	nciCb01_248	--
Constant Enum	nciCe01_31, nciCe32_62	nciCe1_31
Constant Numeric	nciCn01_07, nciCn08_14, nciCn15_21, nciCn22_28, nciCn29_35, nciCn36_42, nciCn43_49, nciCn50_56	nciCn1_7, nciCn8_14, nciCn15_21, nciCn22_28, nciCn29_35
Variable Enum	nvoVe1_27, nvoVe28_54	nvoVe1_27
Variable Numeric	nvoVn1_7, nvoVn8_14, nvoVn15_21, nvoVn22_28, nvoVn29_35, nvoVn36_42, nvoVn43_49, nvoVn50_56	nvoVn1_7,nvoVn8_14,nvoVn15_21,nvoVn22_28, nvoVn29_35
Hardware Input (changeable type)	• Controller NVO name = nvoHwInput_#, nvoHwIn01_07, nvoHwIn08_14, nvoHwIn15_16. • I/O Module 1 NVO name = nvoHwInputX1_#, nvoHwInX1_01_07, and nvoHwInX1_08_12 – when equipped • I/O Module 2 NVO name = nvoHwInputX2_#, nvoHwInX2_01_07, and nvoHwInX2_08_12 – when equipped # = input number	nvoHwI# # = input number

Table 7: Typical Controller Internal Points (Part 2 of 2)

Internal Points	32-Bit Controllers	8-Bit Controllers
Hardware Output (changeable type)	• Controller NVI name = nviHwOutput_# • I/O Module 1 NVI name = nviHwOutputX1_# – when equipped • I/O Module 2 NVI name = nviHwOutputX2_# – when equipped • Controller NVO name = nvoHwOutput_# and nvoHwOut01_12 • I/O Module 1 NVO name = nvoHwOutputX1_# and nvoHwOutX1_01_12 – when equipped • I/O Module 2 NVO name = nvoHwOutputX2_# and nvoHwOutX2_01_12 – when equipped # = output number	nvoHwO# # = output number
Smart Sensor Input	--	Smart Sensor Input (nvoSmI1_5) or for devices that have 16 inputs, the Smart Sensor Input NVO also contains the NVOs for the last two Hardware Inputs of the controller, so the NVO appears as nvoHwI1516_SmI15 instead of nvoSmI1_5
Wireless Input	nvoWrIn1_14, nvoWrIn15_28	nvoWrI1_14
Wireless Output	nvoWrOut1_14, nvoWrOut15_28	--
ComSensor	nvoComSensr01_04, nvoComSensr05_08, nvoComSensr09_12	--
Optional Network Variables Input (changeable type)	nviFP_# # = 1 to 35	--
Optional Network Variables Output (changeable type)	nvoFP_# # = 1 to 35	--

The FX Supervisor can be used to manage these internal points for several purposes, including reading and writing to them in a graphics (Px) page, logging them, or linking them to alarms. However, to enable the FX Supervisor to be able to manage the internal points, they first must be added to the station. See *Automatic Generation of Control Points* and *Manual Creation of Internal Control Points*.

Internal control points provide an interface between the FX Supervisor and the internal points of a controller. Through this interface, the FX Supervisor can have proper control over the internal points to be able to read their modes and values, set their values, and override their modes. The three types of internal control points are InternalPointNumeric, InternalPointEnum, and InternalPointBoolean (see *Automatic Generation of Control Points*).

After an internal control point from the FX Supervisor is linked to an internal point from the controller, it needs to be updated with the values and modes from the internal point. The only way to update an internal control point is through binding.

Binding

Binding is a process of one-way or two-way communication (depending on the type) between a sender and receiver to send an updated value or mode. The internal point initiates the communication by sending an updated current value or mode to the control point. For NVOs, this method can be used for medium- to large-scale networks since, generally, updates are sent only when the value or mode of the internal point changes in accordance to the MaxSendTime and MinSendTime values defined in the controller.

NCIs cannot be bound. When an NCI is polled, the internal control point sends out only one request for an update when it becomes subscribed. This control point can either be initiated directly by the user or, if the NCI is in a graphics (Px) page, it is initiated when the page is first opened. An NCI is generally used as part of a graphics (Px) page where one value or mode update is sufficient and not when it is part of a control logic sequence, alarm sequence, or being logged where regular automatic updates are often required.

The Service/Link Types are Standard, Reliable, Critical, and Authenticated. You can select Link Types under the Proxy Ext parameter of each of the respective NVOs that are linked (see *Proxy Ext*). If you would like to select many NVO Service Types at the same time, use the Lon Link Manager. Right-click **BcpLonNetwork** in the Nav tree to access the Lon Link Manager.
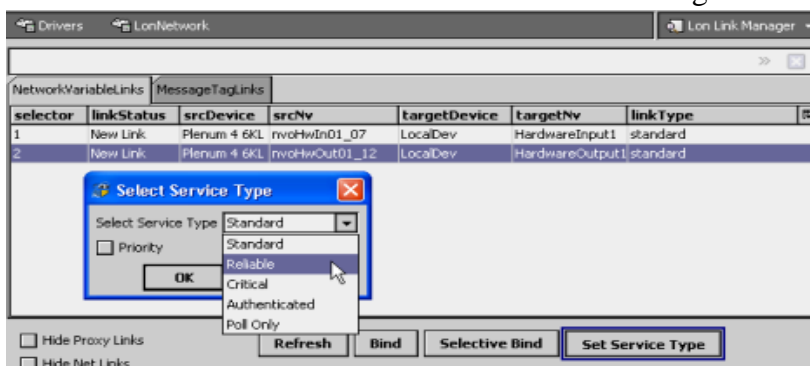

Figure 51: Selecting a Service Type

Table 8: Binding Values

Type	Description
Standard	Is the least reliable, yet often most widely used (also known as unacknowledged). This is the default service type for a Niagara binding. With this service, the message is sent one time and no response is expected. This service is typically used when the highest level of network performance is needed, network bandwidth is limited, and the application is not sensitive to the loss of messages.
Reliable	Is recommended for messaging that has been classified as important—if there is a specific need to know that a status has changed (also known as unacknowledged/repeated). Reliable messaging sends a message three times. The srcDevice sends each message three times, and if the targetDevice receives the message, it simply throws subsequent messages away.
Critical	Means that the targetDevice must acknowledge the fact that it received a message (also known as acknowledged). The srcDevice continues to send the message until the targetDevice acknowledges receipt of that message. You are limited to the number of bindings that can be defined as critical, because it taxes the system, and often causes communications issues (by loading down the network with message verification traffic).
Authenticated	Is a security service reserved for secure messaging. When using authentication, the srcDevice must identify itself to the targetDevice, and vice versa. This service is rarely used, and only in instances where messaging must be secure.

If you set Priority in combination with any of the message service types, upon a bind, the Priority flag is set in the network variable's Nv Config Data.

Be sure to change the default *MaxSendTime* and *MinSendTime* of programmable controllers in medium- to large- scale networks. For example, change the values to **MaxSendTime** = 300 seconds and **MinSendTime** = 15 seconds.

Once the links have been created, remove any unnecessary control points to reduce the amount of memory resources needed by using the Trim feature. See *Trimming LONWORKS Component Objects in the FX Supervisor*.

Automatic Generation of Control Points

A controller function automatically creates Niagara^{AX} control points from any block that has a LONWORKS Network tab in its Advanced Configuration and for any of the following GPI code objects:

- Network Variable Input
- Network Variable Output
- Hardware Input
- Hardware Output
- Constant Enum
- Constant Numeric
- Constant Boolean
- Variable Enum
- Variable Numeric
- Smart Sensor Outputs
- Wireless Inputs
- Wireless Outputs
- Flow Sensor
- Damper Control
- ComSensor

Control points are automatically linked to the internal points of a controller so that the internal points can be properly controlled by the FX Supervisor.

Automatically Creating FX Supervisor Control Points

The following procedure creates the control points on the FX Supervisor Station from blocks in the GPI code. If you update your code and want to see the change reflected on the Station, use the option Update Points (see *Updating a Control Point in the FX Supervisor*). Add control points that are associated with a device's internal control points as follows:

1. Right-click the device and select Actions > Create Points.
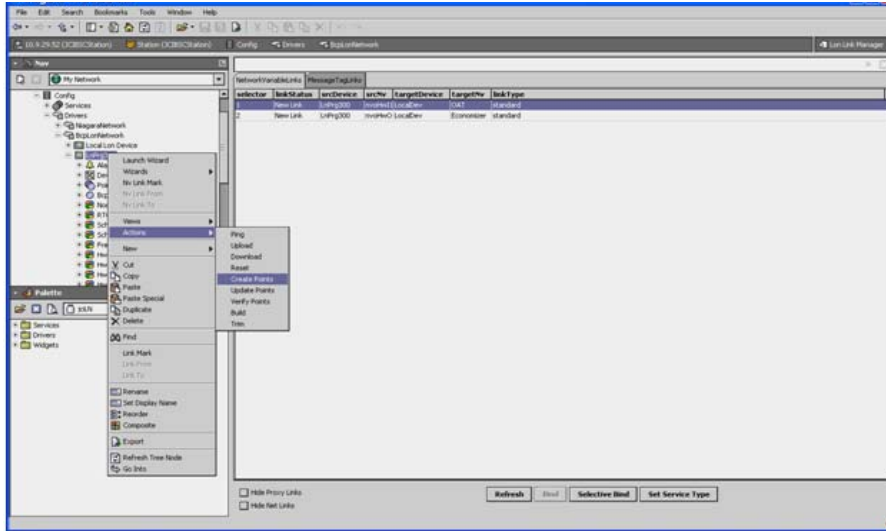
Figure 52: Create Control Points

2. A Create Points pop-up window asks if you want to use a temporary folder. Select TRUE to put the control points into a subfolder (you then choose the ones you need to use by moving them as necessary in the Points folder to then later delete the temporary folder to remove remaining unused ones). Select false to put all control points directly in the Points folder of the device – this is not recommended as this can create a large volume of network traffic that can impair normal operation.

Figure 53: Create Points Parameter Window

Pre-existing internal control points are not overwritten when creating control points with the same name using the above procedure. Control points are found under their corresponding network variable.

Figure 54: Points Created

3. Delete any unused internal control points that were created to reduce the amount of memory resources needed.

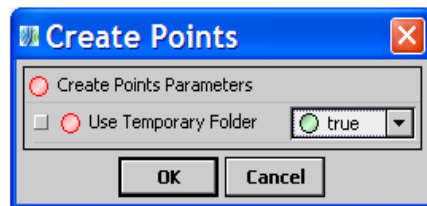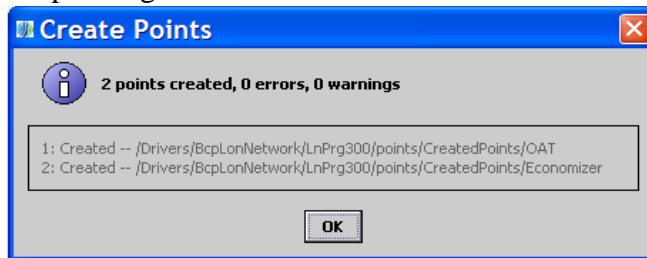When the default value is set for the control point in the GPI, the same default value is automatically set in the FX Supervisor for the control point.

Updating a Control Point in the FX Supervisor

If a control point has been automatically created in the FX Supervisor from a GPI project, and then you make a change of a block in GPI (for example, name, format type, unit, Boolean value, or text), the control point in the FX Supervisor is not automatically updated. First, update the control point in the FX Supervisor by right-clicking the device and selecting Actions > Update Points. Note that this does not update points located in the temporary CreatedPoints folder.

If the control point does not update, delete the control points and repeat the create control points procedure.

Converting GPI Formats to FX Supervisor Control Points

The Name, Type (Bool, Enum, or Numeric) and Units / Enumeration you configure for a LONWORKS network variable in GPI are reused to create the FX Supervisor control point. For example, in GPI, if you create a Numeric input that reads the Outdoor Air Temperature, the name of the block is OAT with the LONMARK Format set to Fahrenheit. The same name, type, and unit is reproduced in the FX Supervisor.

If no format is set for a block's output port, the control point is numeric without a facet applied.

Boolean

Output ports that are configured as Boolean format in GPI are automatically created as Boolean control points with the corresponding name and facets in the FX Supervisor.

Enumeration

Output ports that are configured as enumeration format in GPI are automatically created as enumeration control points with the corresponding name and facets in the FX Supervisor for the following objects:

- Hardware Output
- Constant Enum
- Variable Enum
- SmartSensor Outputs
- Wireless Inputs

For all other objects, they are automatically created as numeric control points. Enumeration value ranges do not exist in the FX Supervisor; therefore, any enumeration value range created in GPI is not created in the FX Supervisor.

Numeric Value + Text

Output ports that are configured as Numeric Value + Text format in GPI are automatically created as numeric control points with the corresponding name and without any facet.

LONMARK Enumeration

Output ports that are configured as LONMARK Enumeration format in GPI are automatically created as enumeration control points with the corresponding name and facets in the FX Supervisor for the following objects:

- Hardware Output
- Constant Enum
- Variable Enum
- SmartSensor Outputs
- Wireless Inputs

For all other objects, they are automatically created as numeric control points.

LONMARK Format

Output ports that are configured as LONMARK format in GPI are automatically created as numeric control points.

For LONWORKS 32-bit controllers only: GPI blocks that use a LONMARK format from any installed manufacturer's DRF are automatically converted into control points with the corresponding name and facets in Niagara^{AX}.

For LONWORKS 8-bit controllers only: Only GPI blocks that use a LONMARK format listed in Table 9 are automatically converted into control points with the corresponding name and facets in Niagara^{AX}. For formats not listed in the following table, you must set the facet manually in the FX Supervisor (see *Configuring Internal Control Points*).

Table 9: Supported LONMARK Formats

SNVT_abs_humid	SNVT_length_micr	SNVT_temp#US_diff
SNVT_amp	SNVT_length_mil	SNVT_temp_diff_p
SNVT_amp_c	SNVT_lev_cont	SNVT_temp_p#US_diff
SNVT_amp_mil	SNVT_lev_percent	SNVT_temp_p
SNVT_angle	SNVT_lux	SNVT_temp_ror
SNVT_angle_deg	SNVT_mass	SNVT_time_hour
SNVT_angle_vel	SNVT_mass_kilo	SNVT_time_min
SNVT_area	SNVT_mass_mega	SNVT_time_sec
SNVT_btu_kilo	SNVT_mass_mil	SNVT_turbidity
SNVT_btu_mega	SNVT_ph	SNVT_vol
SNVT_density	SNVT_power	SNVT_vol#US_gal
SNVT_elec_kwh	SNVT_power_kilo	SNVT_vol_kilo
SNVT_elec_whr	SNVT_ppm	SNVT_vol_kilo#US_gal
SNVT_enthalpy	SNVT_press	SNVT_vol_mil
SNVT_flow	SNVT_press#US_psi	SNVT_volt
SNVT_flow#US_liq	SNVT_press_p	SNVT_volt_ac
SNVT_flow_mil	SNVT_press_p#US_psi	SNVT volt_dbmv
SNVT_flow_p	SNVT_res	SNVT_volt_kilo
SNVT_freq_hz	SVNT_res_kilo	SNVT_volt_mil
SNVT_freq_kilohz	SNVT_rpm	UNVT_flow#SI_m3h
SNVT_freq_milhz	SNVT_sound_db	UNVT_press_p#US_milli
SNVT_grammage	SNVT_speed	
SNVT_length	SNVT_speed_mil	
SNVT_length_kilo	SNVT_temp	

Manual Creation of Internal Control Points

Internal control points are linked to the internal points of a controller so that the internal points can be properly controlled by the FX Supervisor.

The internal control points include:

- BcpNumericWritable
- BcpEnumWritable
- BcpBooleanWritable

Any type of internal control point can be linked to any type of internal point in the controller (with the exception that BcpEnumWritable cannot be linked to Constant Numeric, Variable Numeric, and Hardware Input); but generally, BcpNumericWritable internal control points are linked to internal points with numeric values, and BcpEnumWritable internal control points are linked to internal points with enumerated values.

It is easier to use the Automatic Generation of Control Points feature to automatically create the Internal control points into a temporary folder. Simply move the needed points from the temporary folder into the points folder and then delete the temporary folder.

Linking an Internal Point to an Internal Point of a GPI Controller

In order to link an Internal control point to an internal point of a controller:

1. Open the jciLX palette, and then expand the Drivers, LONWORKS, ProgrammableControllers, GPI controllers, and Utilities folders to locate the Bcp control points.

2. Drag and drop an Internal control point from the palette onto the Points folder of the GPI controller in the station. The internal control point is in fault until it is linked to an internal point.
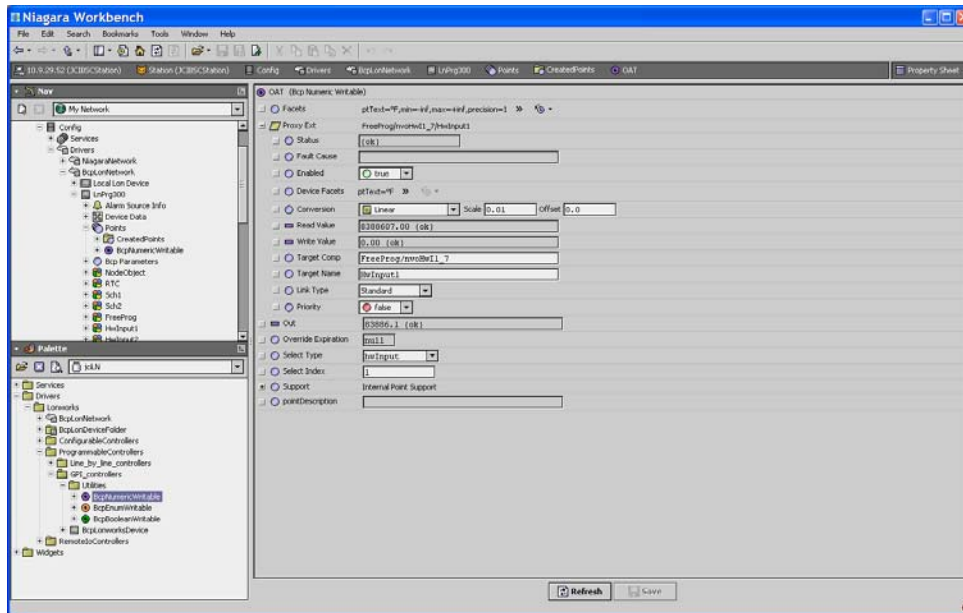

Figure 55: Link to an Internal Point

3. Configure the internal control point through its property sheet (see *Configuring Internal Control Points*). Access the property sheet by:

   • Right-clicking the point extension. The property sheet appears in the view pane.

- Right-clicking the point extension, and selecting Views > Property Sheet.

Figure 56: Point Extension Property Sheet

If the Points folder is expanded in the Nav side bar, the newly added internal control point appears underneath. The internal control point also appears in the controller's property sheet under the Points parameter.

The previous instructions explained a basic setup in order to set read/write access to an internal point. More internal control points can be added to represent other internal points from the GPI controller by repeating Steps 2 and 3. Once you are done adding internal control points, you can create a graphics (Px) page and drag and drop the points onto it.

After configuring the internal control points, you can copy and paste them into other GPI controllers if the same setup is desired using the following procedure:

1. Right-click the internal control point and select Copy.

2. Expand the desired GPI controller, right-click the Points folder, and select Paste.

Configuring Internal Control Points

Each internal control point has certain parameters that need to be configured in order to properly interface with the internal points of the controller.
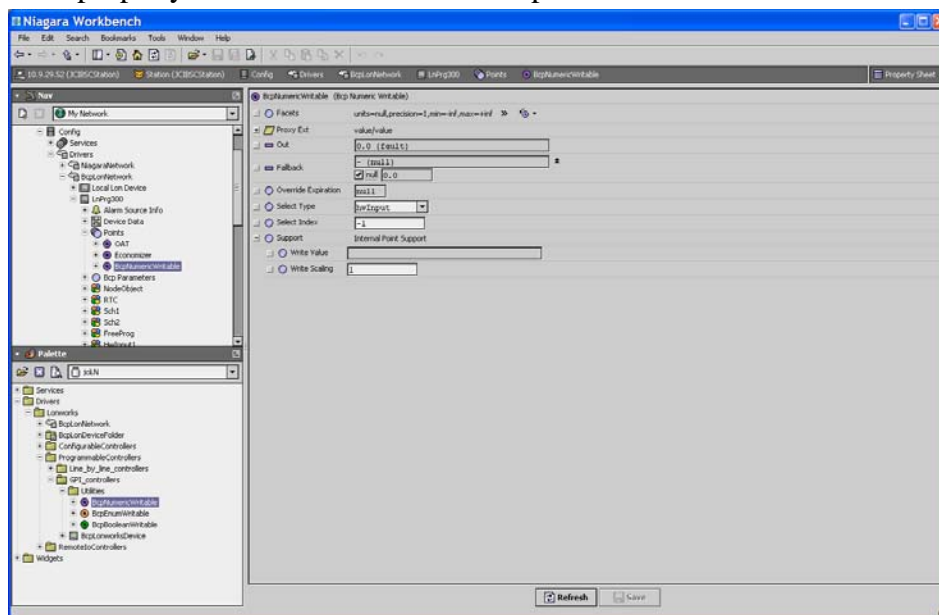

Figure 57: Configuring Internal Control Points

Table 10: Internal Control Point Parameters (Part 1 of 2)

Type	Description
Facets	Affects how the value of the linked internal point of the controller is displayed, such as decimal places, engineering units and enumerations. Click the button to open the Config Facets window and define how the data is displayed. Click the button to select from the most recently used facets. The range facet must be defined by the user for an InternalPointEnum internal control point.
Proxy Ext	Defines the link between the internal control point and the internal point of the controller. See *Proxy Ext* for more information on the Proxy Ext parameters.
Out	Displays the current value, status, and priority level of the linked internal point. This field is read-only.
def	Shows the default value when an internal control point is in Fault. Click the button to expand the view and to set the default value. To set a non-null value, deselect **null** and then set a value in the field to the right.

Table 10: Internal Control Point Parameters (Part 2 of 2)

Type	Description
Override Expiration	Displays the date and time that the override mode expires when the linked internal point is put into override mode. Null is displayed if the linked internal point is put into permanent override mode or if it is in automatic mode. This field is read-only.
Select Type	Select the type of internal point to which the internal control point is to be linked. The drop-down list includes the eight following internal point types: hwInput, wrInput, smInput, hwOutput, numVariable, enumVariable, numConstant, and enumConstant. hwInput, numVariable, and numConstant are not available in an InternalPointEnum internal control point.
Select Index	Select the index of the specific internal point to which the internal control point is to be linked. The range varies depending on the type of internal point selected and the type of controller. For example, if a controller has 10 hardware inputs and the internal control point is to be linked to hardware input 2, you select hwInput from the Select Type field and then enter 2 in the Select Index field.
Support Write Value	The last value written to the linked internal point. This field is read-only.
Support Write Scaling	This is an internal variable that should not be changed.

Proxy Ext

Proxy Ext parameters are used to further define the link between the internal control point and the internal point of the controller. These parameters are set with default values and usually do not require any user configuration.
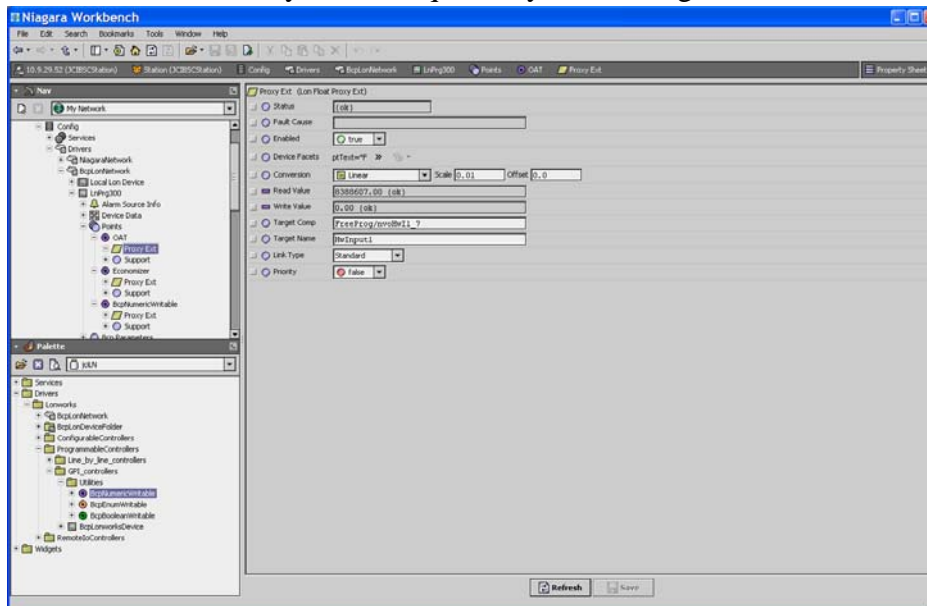

Figure 58: Proxy Ext Parameters

Table 11: Proxy Ext Parameters Default Values (Part 1 of 2)

Value	Description
Status	Status of the proxy extension, which in turn determines the status of the linked internal point. These status flags are set and cleared resulting from polled values or status updates received through the BcpLonNetwork. The following nine status flags are set automatically and are read-only: • {ok} – The link between the internal control point and internal point is functioning properly. • {alarm} – The linked internal point currently has a value in an alarm range as defined by its alarm extension. • {fault} – This indicates an FX Supervisor configuration error or license error. If a fault occurs following normal {ok} status, it could be a native fault condition detected within the controller or perhaps some other fault criteria was met. • {overridden} – The linked internal point is currently in override. • {disabled} – The internal control point has manually been disabled by setting the Enabled field to false. • {down} – The internal control point is unable to receive a response from the linked internal point. When one internal control point is in {down} status, all the other internal control points linked to the same controller are also in {down} status. • {stale} – Since the last poll update, the point's value has not been updated within the time specified in the Stale Time of the LONWORKS network's Tuning Policy. The {stale} status clears upon the next received poll value. • {null} – The linked internal point does not have a specific value. • {unackedAlarm} – Occurs after an alarm, if the point is back to normal, but the alarm event is still not acknowledged in the Alarm Console.
Fault Cause	If the internal control point is in {fault} status, this field displays a brief description as to the reason for the fault. This field is read-only.
Enabled	This field determines whether the Proxy Ext and in turn the internal control point is enabled or disabled. Set the Enabled field to TRUE to enable the control point. Set the Enabled field to false to disable the control point.
Device Facets	Native facets used in proxy read and write. Set the internal control points facets under its Facets field.
Conversion	Specifies the conversion used between the Device Facets of the Proxy Ext and the Facets of the internal control point. The five conversion types include: • Default – Conversion between units within the same category (for example, temperature, weight, or length) is automatically performed within the proxy point. For example, if the Device Facets of the Proxy Ext is set to °C and the Facets of the internal control point is set to °F, the output value is automatically converted. However, if the Facets of the internal control point is set to dissimilar units (for example, in this case to kilograms), a {fault} status occurs. • Linear – Conversion within the same unit linearly by specifying the Scale (which determines linear response slope) and Offset (offset used in output calculation). • Reverse Polarity – Useful for InternalPointBoolean to reverse the logic. Be careful in the use of the reverse polarity conversion, as it may lead to later confusion when troubleshooting logic or communications problems. • Thermistor Type 3 – Applies to an internal control point linked to an internal point that is using a type III thermistor (for example, Hardware Input for temperature sensing). This selection provides a built-in input resistance-to-temperature value response curve for Type 3 Thermistor temperature sensors. • Tabular Thermistor – Applies to an internal control point linked to an internal point that is using a thermistor (for example, Hardware Input for temperature sensing). This selection provides a control for a pop-up dialog for a custom resistance-to-temperature value response curve, including ability to import and export response curves. We strongly recommend that you do not edit this field. Use the Default conversion.
Read Value	Last value read from the device, expressed in device facets. This field is read-only.

Table 11: Proxy Ext Parameters Default Values (Part 2 of 2)

Value	Description
Write Value	Last value written, using device facets. This field is read-only.
Target Comp	The NVO linked to the internal control point. This is determined by the Select Type and Select Index fields. We strongly recommend that you do not edit this field. Use the Select Type and Select Index fields instead.
Target Name	The name of the specific object in the NVO linked to the internal control point. This is determined by the Select Type and Select Index fields. We strongly recommend that you do not edit this field. Use the Select Type and Select Index fields instead.
Link Type	Determines the service type of the internal control point. There are five available service types: • Standard – (unacknowledged) is the least reliable, yet often most widely used. This is the default service type for a Niagara binding. With this service, the message is sent one time and no response is expected. This service is typically used when the highest level of network performance is needed, network bandwidth is limited, and the application is not sensitive to the loss of messages. • Reliable – (unacknowledged/repeated) is recommended for messaging that has been classified as important--if there is a specific need to know that a status has changed. Reliable messaging sends a message three times. The controller sends each message three times, and if the FX Supervisor receives the message, it simply throws subsequent messages away. • Critical – (acknowledged) means that the FX Supervisor must acknowledge the fact that it received a message. The controller continues to send the message until the FX Supervisor acknowledges receipt of that message. You are limited to the number of bindings that can be defined as critical, because it often causes communication issues by loading down the network with message verification traffic. • Authenticated – a security service reserved for secure messaging. When using authentication, the controller must identify itself to the FX Supervisor , and vice versa. This service is rarely used, and only in instances where messaging must be secure. • Poll Only – This only polls the internal point.
Priority	Enable or disable the priority.

Internal Control Point Actions

After linking an internal control point to an internal point, the control point can be used to manually set or control the internal point.
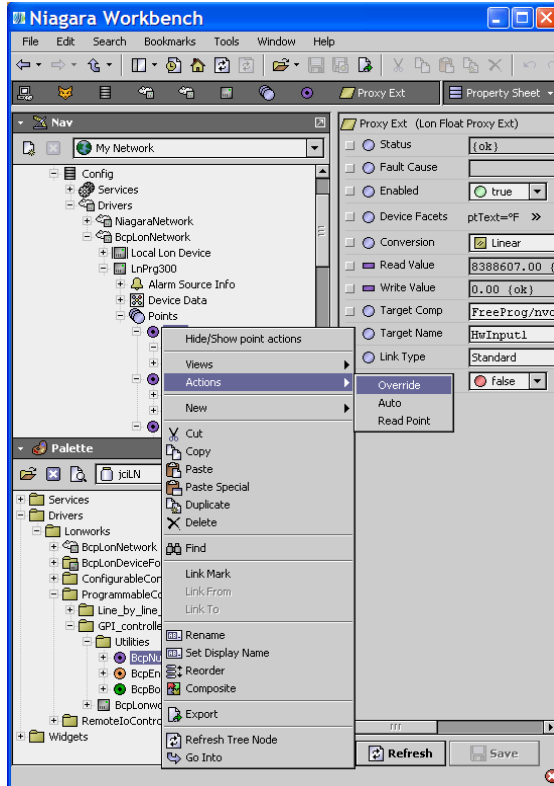

Figure 59: Linking an Internal Control Point

By right-clicking the internal control point and selecting Actions, a set of commands become available to the user to manually affect the internal point. The actions that are displayed depend on the internal control point being used, as well as the type of internal point.

InternalPointNumeric and InternalPointEnum Actions

If the internal control point is linked to an NVO internal:

- **Override** - Use this action to put the internal point into override mode. The override mode can be set in the Override window.

- **Auto** - Use this action to put the internal point into Automatic mode.

- **ReadPoint** - Use this action to read the current actual value of the internal point.

If the internal control point is linked to an NCI internal point:

- **Set -** Use this action to manually set the value of an internal point.

- **ReadPoint -** Use this action to read the current actual value of the internal point.

Note: An internal control point does not read an override that is activated directly in the programming tool of a programmable controller.

InternalPoint Boolean Actions

- **TRUE (Active)** - Use this action to put the internal point into override TRUE (Active) mode. How long the internal point remains TRUE is determined by the Min Active Time set in the InternalPointBoolean property sheet. The override duration can be set in the Override window.

- **FALSE (Inactive**) - Use this action to put the internal point into override FALSE (Inactive) mode. How long the internal point remains FALSE is determined by the Min Inactive Time set in the InternalPointBoolean property sheet. The override duration can be set in the Override window.

- **Auto** - Use this action to put the internal point into Automatic mode.

- **ReadPoint** - Use this action to read the current actual value of the internal point.

 If the internal control point is linked to an NCI internal point:

- **Set -** Use this action to manually set the value of an internal point.

- **ReadPoint -** Use this action to read the current actual value of the internal point.

Hide/Show Control Points

When control points are used on a Px graphics page, you do not always want an operator to be able to override the control point. This feature allows you to control what actions can be done to a control point on a Px graphics page. By selecting one or more control points, you can control any one of the actions that are available for the selected control points. This procedure presumes that the control points have already been created on the station for the controller – see *Automatic Generation of Control Points*. Proceed as follows.

1. Expand the Points folder tree under the device to show the control points.

2. Select the control points that you want to disable actions from being done to them from a Px graphics page. To select more than one control point, first click a control point, then hold down the CTRL or Shift key, and click again to select a control point individually or a range of control points.
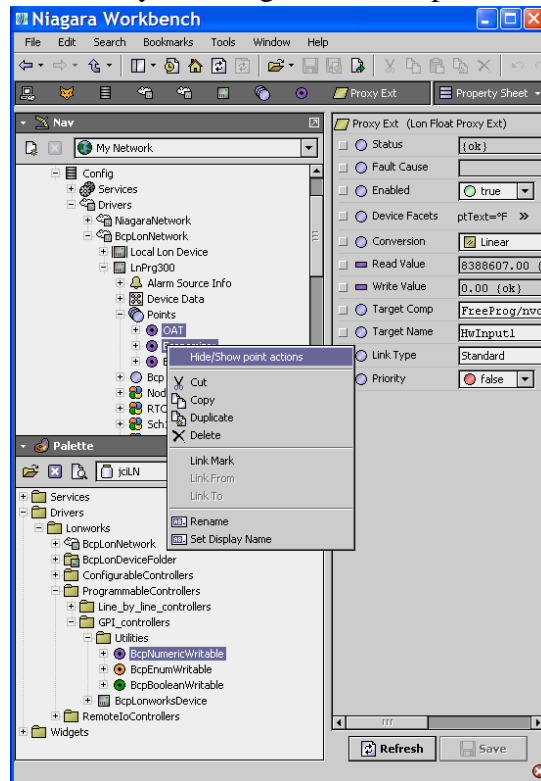

Figure 60: Disabling Control Points

3. When you right-click, the Hide/Show Points Actions pop-up window appears. The action's options shown change according to the actions available to each control point that has been selected. Selecting or deselecting an action applies to all selected control points, as applicable to the individual control point. Deselect the control point actions that you do not want an operator to be able to override on a Px graphics page. Click **OK**.
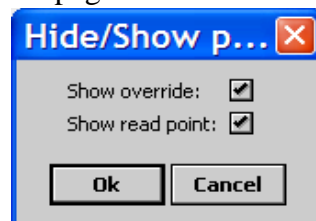
Figure 61: Hide/Show Points Actions

Linking, Building, and Trimming LONWORKS Component Objects in the FX Supervisor

The FX Supervisor is used to create and manage LONMARK component network bindings to link one controller to another controller thereby forming a direct network connection between the two controllers.

This is opposed to a proxy binding (through the creation of control points), which requires the FX Supervisor to be present on the network. Unlike proxy binding, no control points are created in the FX Supervisor, and therefore the data cannot be directly used in graphics (Px) pages, histories, or alarms.

When you add a device, the network bindings are automatically created. Be sure to set the same SNVT type for both matching variables on each controller.

- This procedure applies only to controllers that use the BcpLonworksDevice device type.

- When you are finished creating network bindings, use the Trim function to remove unused objects to reduce the amount of memory resources needed. Should you need to then create more network bindings, you can create them by using the Build function to create the underlying NV components.

Linking the LONWORKS Component Objects

Once the LONWORKS component objects are used in a project's code, they can be bound to other LONWORKS Component Objects that are used in the project's code of another LONWORKS controller.

If you need to create a control point in the FX Supervisor for a network variable that is going to be bound to another controller, it is best to create it only on the controller with the network variable output (as opposed to the controller with the network variable input). See also *Automatic Generation of Control Points*.

In the FX Supervisor, Bcp devices have the following two incompatible methods to link network variables between controllers. When using one Link Mark method in the menu, you cannot use the other method to complete the Link From or Link To in the menu.
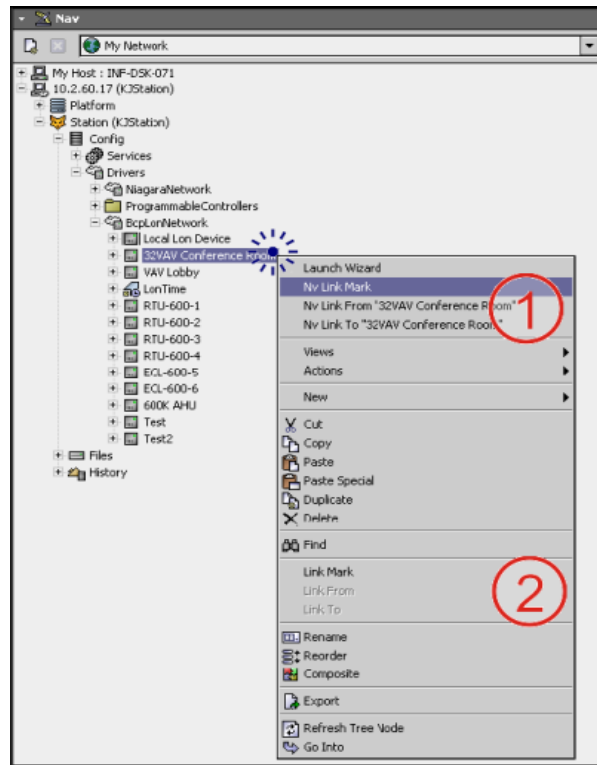

Figure 62: The Two Incompatible Link Methods

- The Bcp Nv Link Mark actions that are used according to the following procedure (Area 1 in Figure 62).

- The standard Niagara^{AX} Link Mark actions that are described in Niagara^{AX}'s documentation (Area 2 in Figure 62).

The following procedure shows how to link a network variable value from the first controller to make it available on the second controller.

1. In the GPI for both controllers, add a component object to the Programming Sheet and connect it to the appropriate code.

2. In the GPI for both controllers, be sure to set the same SNVT type for both matching variables on each controller.

3. In the GPI for both controllers, synchronize the project with their respective controller.

4. In the FX Supervisor, on Controller A, right-click the controller in the Nav tree and select Nv Link Mark.
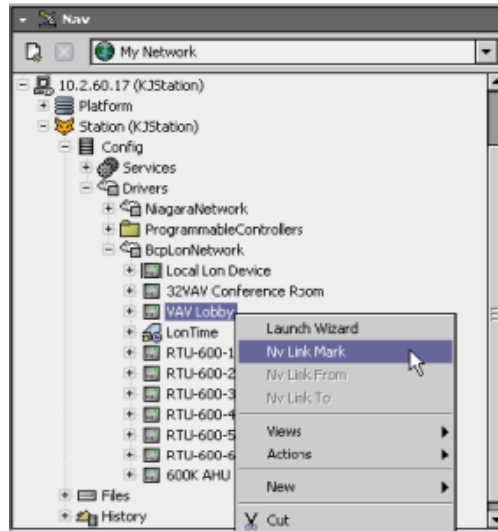
Figure 63: Nv Link Mark

5. In the FX Supervisor, on Controller B, right-click the controller in the Nav tree and select Nv Link From Controller A. The Link window opens.
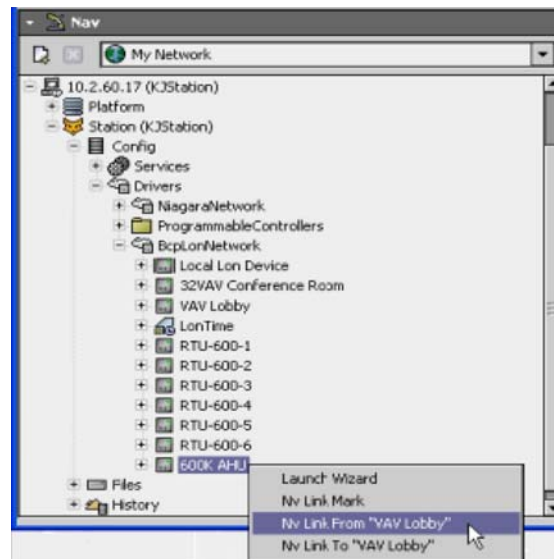

Figure 64: Selecting Link Window

6. In the Link window, select the Source object in the left pane (NVOs) and then the Target object in the right pane (NVIs). Only objects that have the same SNVT type can be linked. Click **OK**.
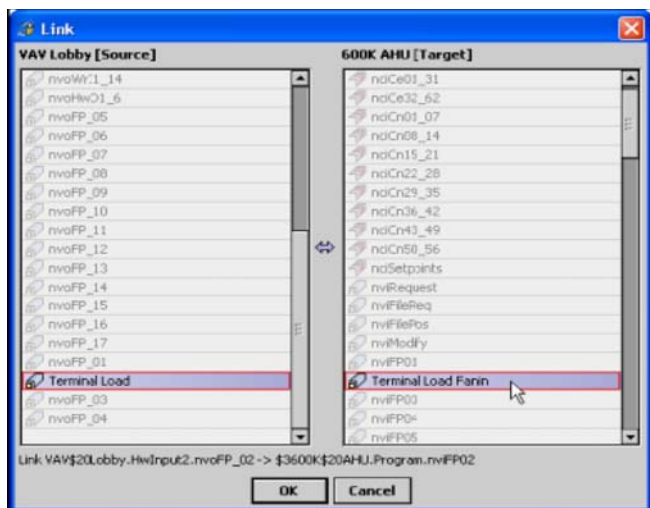
Figure 65: Source and Target Object Window

7. Links have to be bound through the Lon Link Manager view of a BcpLonNetwork. Right-click BcpLonNetwork in the Nav tree and select Views > Lon Link Manager**.**
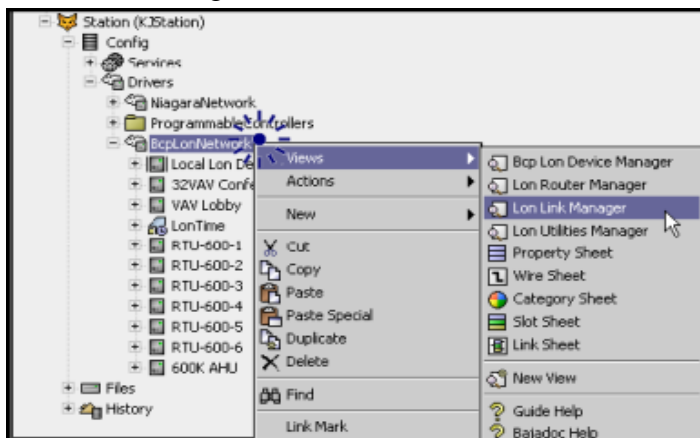
Figure 66: Setting the Lon Link Manager View

8. Select the New Link binding in the list and click Selective Bind.
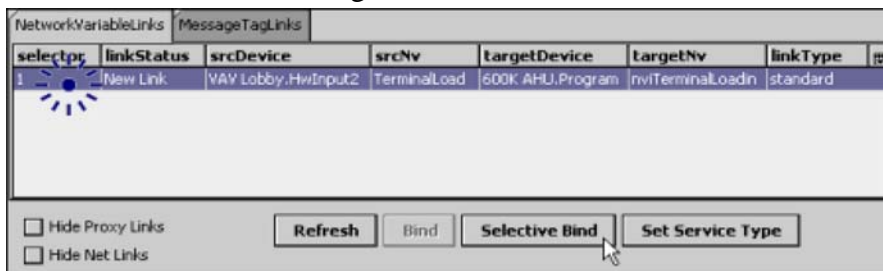
Figure 67: New Link Binding

9. Wait for the Lon Bind to complete and for the LinkStatus to become Bound**.**
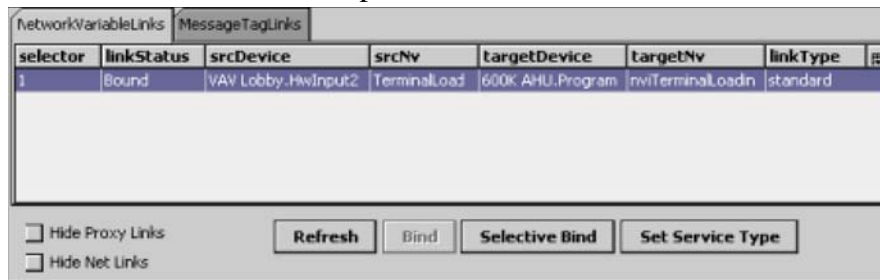
Figure 68: Bound LinkStatus

Removing the Binding Between Two Controllers

A binding between two controllers is managed by the FX Supervisor; however, the binding is made in the controllers themselves.

If you need to remove a binding that has control points that have been created in the FX Supervisor in either controller, we recommend you delete these control points on either controller before carrying out this procedure. Once this procedure is complete, recreate the control points in the FX Supervisor if necessary. See also *Automatic Generation of Control Points*.

To remove a binding:

1. Open the Lon Link Manager view of a BcpLonNetwork. Right-click **BcpLonNetwork** in the Nav tree and select Views > Lon Link Manager.

2. Find the srcDevice node for the link. In the Nav tree, right-click the corresponding node and select Views > Link Sheet.
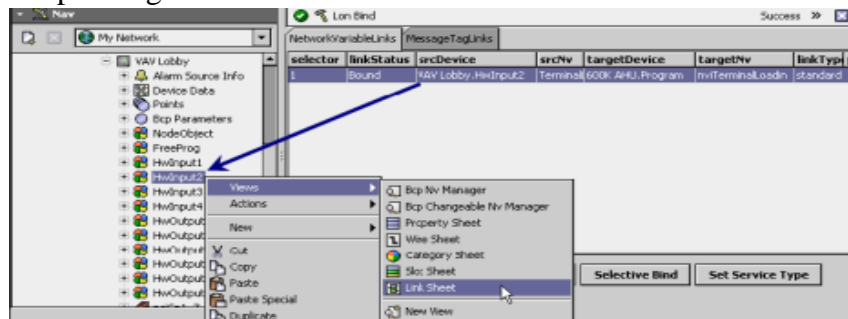

Figure 69: Viewing Link Sheet

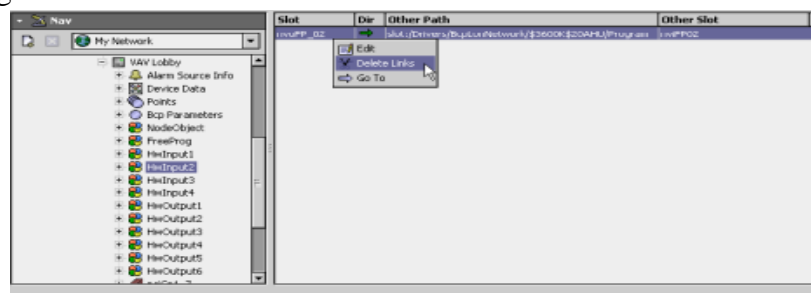3. Right-click the link and select **Delete Links**.

Figure 70: Deleting Links

4. Open the Lon Link Manager view of a BcpLonNetwork: Right-click **BcpLonNetwork** in the Nav tree and select Views > Lon Link Manager.

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5. Select the binding. Its linkStatus should be Obsolete. Click **Selective Bind**.
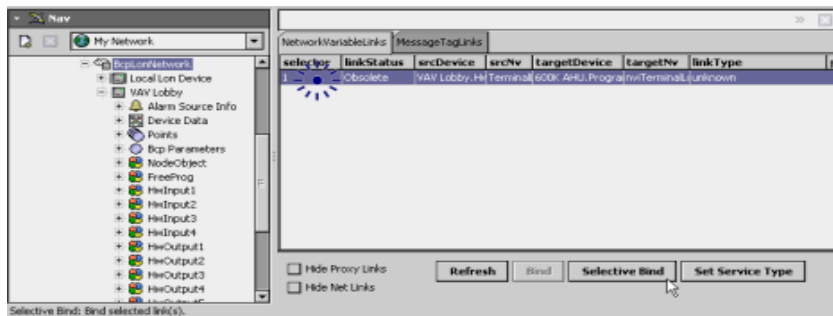

Figure 71: Obsolete LinkStatus

6. The binding's linkStatus should be Unbound. Click **Refresh** to remove the binding from the Lon Link Manager's list.

Figure 72: Unbound LinkStatus

Trimming LONWORKS Component Objects in the FX Supervisor

This procedure applies only to controllers that use the BcpLonworksDevice device type.

Unused proxy LONWORKS component objects should be removed to reduce the amount of memory resources needed. To remove these objects, right-click the device and select Actions > Trim.

Building LONWORKS Component Objects in the FX Supervisor

This procedure applies only to controllers that use the BcpLonworksDevice device type. Build LONWORKS component objects (network variables and LONMARK objects) when necessary as follows.
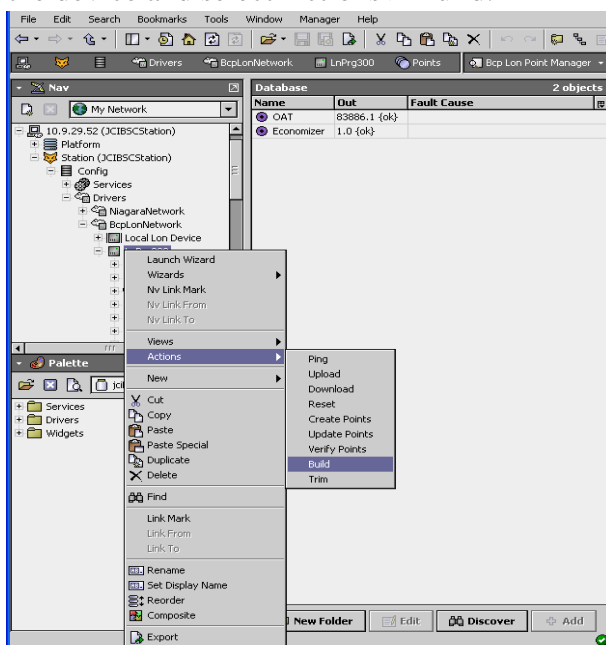
1. Right-click the device and select Actions > Build.

Figure 73: Building LONWORKS Component Objects
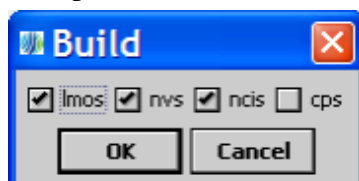
2. Select the desired Build option.

Figure 74: Build Options

Table 12: Build Options

Setting	Description
Imos	LONMARK object components
Nvs	Network variables components
Ncis	Network configurable input components
cps	Configuration properties components