

## Related Documentation

Most FieldPoint manuals also are available as PDFs. You must have Adobe Reader with Search and Accessibility 5.0.5 or later installed to view the PDFs. Refer to the [Adobe Systems Incorporated Web site](http://www.adobe.com) at www.adobe.com to download Adobe Reader. Refer to the [National Instruments Product Manuals Library](http://ni.com/manuals) at ni.com/manuals for updated documentation resources.

The following documents contain information that you may find helpful as you use this help file:

- *LabVIEW Help*, including *FieldPoint LabVIEW Interface Help*—Use this help file to learn more about developing and using VIs and projects.
- FieldPoint network module manuals installed at [FieldPoint folder]\documentation\Manuals\Network Modules\<
- FieldPoint I/O module operating instructions and other documents on the FieldPoint software CD in the \docs\ folder

## **Using Help**

[Conventions](#)



[Navigating Help](#)

[Searching Help](#)

[Printing Help File Topics](#)

## Conventions

This help file uses the following formatting and typographical conventions:

- < > Angle brackets that contain numbers separated by an ellipsis represent a range of values associated with a bit or signal name—for example, AO <0..3>.
- [ ] Square brackets enclose optional items—for example, [response].
- » The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.
-  This icon denotes a note, which alerts you to important information.
-  This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash.
- bold** Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names.
- dark red** Text in this color denotes a caution.
- green Underlined text in this color denotes a link to a help topic, help file, or Web address.
- italic* Italic text denotes variables, emphasis, cross references, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
- monospace Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.
- monospace bold** Bold text in this font denotes the messages and responses that the computer automatically prints to the screen. This font also emphasizes lines of code that are different from the other examples.
- monospace italic* Italic text in this font denotes text that is a placeholder for a word or value that you must supply.

## Navigating Help (Windows Only)

To navigate this help file, use the **Contents**, **Index**, and **Search** tabs to the left of this window or use the following toolbar buttons located above the tabs:

- **Hide**—Hides the navigation pane from view.
- **Locate**—Locates the currently displayed topic in the **Contents** tab, allowing you to view related topics.
- **Back**—Displays the previously viewed topic.
- **Forward**—Displays the topic you viewed before clicking the **Back** button.
- **Options**—Displays a list of commands and viewing options for the help file.

## **Searching Help (Windows Only)**

Use the **Search** tab to the left of this window to locate content in this help file. If you want to search for words in a certain order, such as "related documentation," add quotation marks around the search words as shown in the example.

Searching for terms on the **Search** tab allows you to quickly locate specific information and information in topics that are not included on the **Contents** tab.

## Wildcards

You also can search using asterisk (\*) or question mark (?) wildcards. Use the asterisk wildcard to return topics that contain a certain string. For example, a search for "prog\*" lists topics that contain the words "program," "programmatically," "progress," and so on.

Use the question mark wildcard as a substitute for a single character in a search term. For example, "?ext" lists topics that contain the words "next," "text," and so on.



**Note** Wildcard searching will not work on Simplified Chinese, Traditional Chinese, Japanese, and Korean systems.

## **Nested Expressions**

Use nested expressions to combine searches to further refine a search. You can use Boolean expressions and wildcards in a nested expression. For example, "example AND (program OR VI)" lists topics that contain "example program" or "example VI." You cannot nest expressions more than five levels.

## Boolean Expressions

Click the  button to add Boolean expressions to a search. The following Boolean operators are available:

- **AND** (default)—Returns topics that contain both search terms. You do not need to specify this operator unless you are using nested expressions.
- **OR**—Returns topics that contain either the first or second term.
- **NOT**—Returns topics that contain the first term without the second term.
- **NEAR**—Returns topics that contain both terms within eight words of each other.




# Search Options

Use the following checkboxes on the **Search** tab to customize a search:

- **Search previous results**—Narrows the results from a search that returned too many topics. You must remove the checkmark from this checkbox to search all topics.
- **Match similar words**—Broadens a search to return topics that contain words similar to the search terms. For example, a search for "program" lists topics that include the words "programs," "programming," and so on.
- **Search titles only**—Searches only in the titles of topics.

## Printing Help File Topics (Windows Only)

Complete the following steps to print an entire book from the **Contents** tab:

1. Right-click the book.
2. Select **Print** from the shortcut menu to display the **Print Topics** dialog box.
3. Select the **Print the selected heading and all subtopics** option.  
 **Note** Select **Print the selected topic** if you want to print the single topic you have selected in the **Contents** tab.
4. Click the **OK** button.

## **Printing PDF Documents**

This help file may contain links to PDF documents. To print PDF documents, click the print button located on the Adobe Acrobat Viewer toolbar.

## Configuring FieldPoint in MAX

With NI Measurement & Automation Explorer (MAX), you can configure a FieldPoint bank manually or let MAX create a configuration using the current device configuration of a FieldPoint system on your network. After you have configured the devices in your system, you can read, write, and test FieldPoint data [items](#) from MAX.

MAX makes it easy to ensure the integrity of your FieldPoint hardware configuration and test the I/O before using FieldPoint from other software such as [LabVIEW](#), Measurement Studio, [LabWindows/CVI](#), and [OPC](#).

1. Install the hardware as described in the network module user manual or quick start guide.
2. Launch MAX.
3. [Add a comm resource](#) for the new FieldPoint bank to your system.
4. Configure communication settings for the new [serial](#) or [Ethernet](#) comm resource.
5. Configure [access control](#) if the network module is an Ethernet module.
6. Configure the [I/O modules](#) and individual [channels](#) on the bank.
7. Configure the [bank](#) to respond in specific ways to system failures and other events.
8. [Test channels and data items](#) by reading and writing to them on the I/O Data tab in MAX.
9. Save the configuration. Select the **FieldPoint** category icon under **My System»Data Neighborhood**, then click the **Save** button on the toolbar.

Refer to the *Configuring FieldPoint in LabVIEW* topic of the *FieldPoint LabVIEW Interface Help* for information about configuring and using FieldPoint in LabVIEW projects and applications.

## The MAX Configuration Tree

The MAX configuration tree is the leftmost pane of the MAX window. The most important parts of the tree for FieldPoint are **My System»Data Neighborhood**, **My System»Devices and Interfaces**, and **Remote Systems**.

**My System»Data Neighborhood** shows everything you have configured for use on your system. This includes FieldPoint comm resources, devices, and data items.

**My System»Devices and Interfaces** shows installed and detected hardware connected directly to the host PC, such as a FieldPoint serial bank connected to a COM port.

**Remote Systems** shows NI hardware on your network. The FP-1601 and [c]FP-20xx FieldPoint network modules, for example, appear in **Remote Systems** when you connect them to your network.

## **Installing and Upgrading Software on FieldPoint Ethernet Controllers**

The version of the RT engine on a [c]FP-2xxx controller must match the version of the LabVIEW Real-Time Module installed on the host computer. You can use the LabVIEW Real-Time Install Software Wizard to check, install, upgrade, or downgrade software on a [c]FP-2xxx controller. For information about using the LabVIEW Real-Time Install Software Wizard, refer to the *Installing Software on a LabVIEW Real-Time Target* topic in the Remote Systems help (**Help»Help Topics»Remote Systems**). For information about compatibility between LabVIEW RT and FieldPoint software components on the host machine and on the FieldPoint RT controller, refer to NI Knowledge Base article 37F9DEXD.

To upgrade firmware on an FP-160x or cFP-180x, use the Firmware tab in MAX. Click **Browse**, then browse to the firmware image, select it, and click **Upload**.

## **Default Installation Directories**

The following tables list the default installation directories for components of FieldPoint. Items in brackets indicate the installation directory for that particular program. <Windows\System> represents your Windows system directory, typically WINDOWS\System or WINNT\System32.

## Firmware Images for FieldPoint Devices

<b>Component</b>	<b>Default Directory for Installation</b>
[c]FP-2xxx	Refer to LabVIEW Real-Time module documentation.
FP-1000	\Program Files\National Instruments\FieldPoint\Firmware\Serial
FP-1600	\Program Files\National Instruments\FieldPoint\Firmware\Ethernet\1600
FP-1601	\Program Files\National Instruments\FieldPoint\Firmware\Ethernet\1601
cFP-180x	\Program Files\National Instruments\FieldPoint\Firmware\Ethernet\cFP-180x



## LabVIEW Interface

Component	Default Directory for Installation
FieldPoint VIs	<LabVIEW>\vi.lib\FieldPoint
FPLVMgr.dll	<LabVIEW>\vi.lib\FieldPoint\SubVIs
Examples	<LabVIEW>\Examples\FieldPoint
fplv.chm	<LabVIEW>\help

## CVI Interface

Component	Default Directory for Installation
FieldPoint Instrument Driver	<CVI>\FieldPoint & <CVI>\Bin
Examples	<CVI>\samples\FieldPoint
fpcvi.chm	<CVI>\FieldPoint
FPCVIMgr.dll	<Windows\System>
FieldPoint.h	<CVI>\FieldPoint & <CVI>\include
FieldPoint.obj	<CVI>\FieldPoint & <CVI>\Bin & <CVI>\extlib

## OPC Source

Component	Default Directory for Installation
FieldPointOPC2.exe	Program Files\National Instruments\FieldPoint
opcconn_ps.dll	<Windows\System>
opcproxy.dll	<Windows\System>

## Ethernet Communication Protocol DLLs

Component	Default Directory for Installation
lkbrow.dll	<Windows\System>
lkodynam.dll	<Windows\System>
lkhist.dll	<Windows\System>
lkobenv.dll	<Windows\System>
lkproc.dll	<Windows\System>
lkreal.dll	<Windows\System>
lksec.dll	<Windows\System>
lksock.dll	<Windows\System>
lkstime.dll	<Windows\System>

## Ethernet Communication Protocol Services

Component	Default Directory for Installation
lkads.exe	<Windows\System>
lkcidl.exe	<Windows\System>
lktsrv.exe	<Windows\System>

## **Configuring Comm Resources**

A FieldPoint comm resource is a pathway through which MAX communicates with FieldPoint devices. A comm resource can be a serial port or an IP address.

## **Adding a FieldPoint Comm Resource to Your System**

### **Adding a FieldPoint Serial Comm Resource**

To add a FieldPoint serial comm resource to your system, complete the following steps:

1. Install the serial network module and connect it to the host PC according to the documentation shipped with the module.
2. Right-click **My System»Devices and Interfaces** in the MAX configuration tree and select **Create New**.
3. In the Create New dialog box that appears, select **FieldPoint»FieldPoint Serial**, then click **Next**.
4. Configure [serial communication settings](#) for the network module. When you click **Finish**, MAX creates a serial comm resource under **My System»Devices and Interfaces** named FP @ COMx, and a folder for the new serial comm resource under **My System»Data Neighborhood**. If you have the **Automatically find devices** checkbox selected, MAX finds all devices connected to the serial network module and creates default items for them under the new serial comm resource.

## Adding a New FieldPoint Ethernet Comm Resource

To add a new FieldPoint Ethernet comm resource to your system, complete the following steps:

1. Install the Ethernet network module and connect it to the network according to the documentation shipped with the module.
2. Expand **Remote Systems** in the MAX configuration tree.
3. Click IP address 0.0.0.0, then click the [Network Settings](#) tab at the bottom of the pane on the right. If there is more than one 0.0.0.0, find the one with the serial number of the network module you installed.
4. Enter the [network settings](#) and click **Apply**. Let MAX reboot the network module to apply the new settings.
5. Click **Find Devices**. MAX finds all devices connected to the remote system and adds default items for them in My System»Data Neighborhood.



## **Adding a FieldPoint Comm Resource that Is Already on the Network**

To add a FieldPoint comm resource to your system when the comm resource is already on the network, complete the following steps:

1. Expand **Remote Systems** in the MAX configuration tree.
2. Right-click the IP address of the remote system you want to add as a comm resource and select **Find Devices**. MAX finds all devices connected to the remote system and adds default items for them in **My System»Data Neighborhood**.

## Configuring Ethernet Communication Settings

If you are using a [c]FP-20xx with the LabVIEW RT module version 7.0 or later, a cFP-21xx, or a cFP-180x, *and* your network has a DHCP server, you can select [Obtain IP address from DHCP server](#) and avoid having to configure IP settings for the controller. You cannot configure the [c]FP-20xx for DHCP while it is in safe mode if the safe mode version is 10.4 or earlier.

If you are using an FP-160x, or your network does not have a DHCP server, or you want to assign a static IP address to the FieldPoint controller, complete the following steps:

1. On the **Network Settings** tab, enter a name, IP address, subnet mask, gateway, and DNS server address for the Ethernet network module. Click **Suggest Values** or ask your network administrator if you are unsure of any of these values.
2. Click **Apply**.

Enter an IP address for [Time Server](#) under **Additional Configuration**.

To assign an IP address to one system when the IP is currently assigned to another system, complete the following steps:

1. Delete the system that currently has the IP address from Remote Systems.
2. Right-click the new system under Remote Systems and select **Change IP (Offline)**.
3. Enter the IP address in the dialog box that appears, then click **OK**.



**Note** If the comm resource for the system under Data Neighborhood has a default name based on the old IP address, you can change the name to avoid confusion. However, you do not need to change the name.

For more information about Ethernet communication settings, refer to the Remote Systems help (**Help»Help Topics»Remote Systems**).

## Using DHCP

DHCP makes it easy to configure and test the FieldPoint system in different applications. Static IP assignment requires more user involvement in initial configuration but is more reliable.

If a FieldPoint network module is configured to use DHCP and cannot connect to the DHCP server on startup, the network module pauses for up to a few minutes while it tries to connect to the DHCP server. If the FieldPoint system can become disconnected from the network, assign a static IP address to the network module.

Depending on whether **Halt if TCP/IP Fails** is checked, expect the following behavior from LabVIEW RT 7.0 or later and a LabVIEW RT controller on DHCP failure or on any other TCP/IP failure:

**Halt if TCP/IP Fails** is checked: If TCP/IP fails for any reason on system startup, LabVIEW RT restarts the controller and attempts to connect again. After three failed attempts, LabVIEW RT resets the controller to IP address 0.0.0.0.

**Halt if TCP/IP Fails** is unchecked: LabVIEW RT starts and runs applications on the controller at system startup, even if TCP/IP fails. When the connection becomes available, you must manually restart the controller in order to connect it to the network.

Depending on whether **Halt if TCP/IP Fails** is checked, expect the following behavior from a cFP-180x on DHCP failure or on any other TCP/IP failure:

**Halt if TCP/IP Fails** is checked: If TCP/IP fails for any reason on system startup, the network module restarts and attempts to connect again. After three failed attempts, the network module resets its IP address to 0.0.0.0 and boots into safe mode.

**Halt if TCP/IP Fails** is unchecked: The network module starts the OptoMUX server on the RS-232 port even if TCP/IP fails. When the connection becomes available, you must manually restart the controller in order to connect it to the Ethernet network.

## **Configuring Serial Communication Settings**

1. Select the COM port that the serial network module is connected to.
2. Specify the baud rate to match the setting on the network module.
3. Specify the timeout.
4. Click **Finish** or **Apply**.

If the Automatically find devices box is checked when you click **Apply**, MAX queries the comm resource for all devices connected to it and creates default items for them in **My System»Data Neighborhood**.

## Configuring Access Control for FieldPoint Ethernet Network Modules

You can limit host access to a FieldPoint Ethernet network module by setting access permissions for different host machines. The default setting gives all host machines Read/Write access. To change the network security settings, complete the following steps:

1. Select the comm resource under Remote Systems and click the **FieldPoint Access Control** tab. If the host machine does not have access to the network module, the Access List is grayed out.
2. Make additions or changes as follows:
  - To add a host machine to the list, enter its IP address in the **IP Pattern** edit box, select the desired access type (Read/Write, Read Only, or Deny Access) from the **Access Type** list, then click the **Add** button. You can use the \* wildcard when specifying the IP address. For example, to give Read/Write access to all hosts, enter \* in the **IP Pattern** edit box, or to Deny Access to all machines on the 111.222.333 subnet, enter 111.222.333.\* in the **IP Pattern** box.
  - To remove a host machine from the list, either click the entry or type the entry in the **IP Pattern** box, then click the **Remove** button or press the <Delete> key.
  - If you have an IP access list saved in a file or you want the security settings to match the settings of another network module, check the **Import** box, then click **Browse** and select the source. The settings read from the source are shown in the Access List, and you can modify them if you need to.



**Note** If the Access List is not empty, any IP address that does not have a matching entry is denied access to the network module.

- To change the order of the entries in the list, select an entry and click the up arrow or down arrow button that is located next to the Access List. A new entry is always added to the end of the list. You can have multiple matching entries for a given IP address. In that case, the first entry that matches the IP address is used, starting from the bottom of the list.
- To save the Access List to a file to be used for other network modules,

click the **Save** checkbox and enter a file name.



**Note** For performance reasons, place frequently matched entries toward the bottom of the Access List.

3. When you are satisfied with the changes, click **Apply**. A dialog box prompts you for the password. Enter the password if one has been set for the network module, then click **OK** to apply the changes to the network module.


## **Configuring a FieldPoint Bank**

On the Bank Configuration tab, you can configure [watchdog settings](#) for the bank, configure offline devices, reset the bank, take a [snapshot](#) of the current bank configuration, and restore the bank to factory default settings.

## Configuring the Network Watchdog

The network watchdog enables you to guard your system against failures in the network connection, cables, or host computer. If the network watchdog is enabled and the network module loses communication with all hosts or clients over the network, the network module sets output channels to predefined watchdog values.

By default, the network watchdog for a FieldPoint bank is disabled on power-up. To enable the network watchdog for a FieldPoint bank, complete the following steps:

1. Select the bank under Devices and Interfaces or Remote Systems.
2. In the Watchdog Configuration area of the Bank Configuration tab, select **Enable**.
3. Enter a timeout value for the watchdog. The timeout is the period of lost communication with hosts or clients over the network before the watchdog settings take effect. The maximum value is 65536 ms.  
 **Note** Make sure the **factory configuration** box is unchecked before you click **Apply**.
4. Click **Apply**.
5. Click **Save**.

The network watchdog is now enabled for this FieldPoint bank. If you want individual output channels to revert to predefined output values in case of communication failure, you also must complete the following steps:

1. Under Devices and Interfaces or Remote Systems, select the device that contains the output channels you want the watchdog to affect.
2. Click the **Device Configuration** tab.
3. In the Watchdog Configuration area, select **Enable**.
4. Click **Apply**.
5. Click the **Channel Configuration** tab.
6. Select the output channel you want the watchdog to affect.
7. Enter a **Watchdog Value** and click **Enable**.
8. Repeat steps 6 and 7 for each channel you want the watchdog to affect.
9. Click **Apply**.

**Caution** The network watchdog is not compatible with embedded applications on a LabVIEW RT





controller such as the [c]FP-2xxx. National Instruments recommends that you use the hardware watchdog functionality available in LabVIEW RT. Refer to the user manual for the controller for more information about the hardware watchdog.

## Copying a Configuration to One or More FieldPoint Banks

You can use the Copy Bank Wizard to copy the configuration on an existing FieldPoint bank to one or more other FieldPoint banks, reproducing all custom data items, ranges, startup states, and other settings that you have configured for the I/O modules on the bank. The Copy Bank Wizard copies some network module configuration but does not copy data items on the network module.

The Copy Bank Wizard creates comm resources in the .iak file for the copied banks. In addition to modifying the .iak file, the Copy Bank Wizard can apply the copied configuration to one or more of the target banks if the banks are online.

Complete the following steps to copy the configuration of a FieldPoint bank to one or more other FieldPoint banks.

1. From My System»Data Neighborhood, right-click the comm resource for the bank you want to copy and select **Go to Comm Resource Configuration**. From Devices and Interfaces or Remote Systems, select the comm resource for the bank you want to copy.
2. Click the + sign beside the comm resource so that the bank icon appears.
3. Right-click the bank icon and select **Copy Bank**.
4. Enter the number of banks to which you want to copy the configuration, then click **Next**.
5. Enter the properties for the first system in the dialog box that appears. If the bank is offline or if for any other reason you want to store the configuration to apply to the bank later, uncheck **Apply copied configuration to hardware**.
6. Click **Next** to move on to the next bank.
7. When you have finished setting the properties for all the banks, click **Finish**.

## Tips for Copying to Ethernet Banks

- If the bank has an IP address and is connected to the network, you can select the IP address from the **Use Existing Bank Address** drop-down control. The Copy Bank Wizard populates the Network Module Type and IP Address / Host Name controls.
- Alternatively, you can enter the host name in the **IP Address / Host Name** control. Type the host name as it appears under Remote Systems, and use the Network Module Type drop-down control to select the correct type.
- If the IP Address / Host Name matches that of a comm resource in the .iak file, the Copy Bank Wizard uses that name for the comm resource of the target bank. Otherwise, if you do not enter a name for the comm resource, the Copy Bank Wizard uses the default naming convention for the target bank.

## **Tips for Copying to Serial Banks**

- If the COM port matches that of a comm resource in the .iak file, the Copy Bank Wizard uses that name for the comm resource of the target bank. Otherwise, if you do not enter a name for the comm resource, the Copy Bank Wizard uses the default naming convention for the target bank.
- Refer to the *FP-1000/1001 User Manual* or the *FP-1000/1001 Quick Start Guide* for information about determining the address of a serial network module.

## **Network Module Configuration**

- If the network modules on the configured bank and on the target bank are of the same type, the Copy Bank Wizard copies all of the network module settings to the target bank. If the network modules are of different types, the Wizard copies only compatible settings. The Wizard does not copy data items from one network module to another regardless of type. Check the network module configurations on copied banks to make sure that the settings are correct.

## Using the Snapshot Feature

The **Snapshot** feature provides you with a single-step method for saving all of the current settings (ranges, attributes and current output data values) as the [power-up state](#) for the bank.



**Caution** Using the Snapshot feature overwrites any power-up values you have specified for individual channels using the [configurable power-up method](#).



**Caution** Make sure the **factory configuration** checkbox is unchecked when you are using the Snapshot feature.

To use the Snapshot feature, follow these steps:

1. Bring all channels to the desired power-up settings, including ranges, attributes, and output values. Using the Snapshot saves the current network watchdog data values. It does not save any other [network watchdog settings](#).
2. Select the bank in the Configuration tree.
3. Click the **Snapshot** button. Click **Yes** and **Apply** to approve the change.
4. Select **Tools»FieldPoint»Save** or click the **Save** button.

You may want to change the stored Snapshot information later. To make incremental changes to the Snapshot information, use the [configurable power-up method](#).

## **Configuring Devices**

On the Device Configuration tab, you can see and change the type, address, and retry count of a FieldPoint I/O module, and you can enable or disable watchdog settings. To see and change settings for individual channels, select the [Channel Configuration](#) tab.

## Adding a Device

Complete the following steps to add a device to a [previously created comm resource](#).

1. Right-click the bank and select **Create New Device**.
2. Select the Device Type you want to configure.
3. Enter the correct address of the device in the FieldPoint bank. (The default address may not be the correct address.)
4. If the device is a serial network module, make sure the Address DIP settings in the **Device Configuration** dialog box match those on the network module.
5. Set any watchdog timeout and power-up configurations.
6. Click **OK**.



## **Deleting a Device**

To delete a FieldPoint device, right-click the device in the configuration tree and select **Delete**.

Deleting the device removes all item configuration for the device in Data Neighborhood and all hardware configuration for the device in Devices and Interfaces or Remote Systems.

## Replacing a Network Module with a Network Module of a Different Type

To replace a network module on a FieldPoint bank and keep the same configuration for all of the I/O modules on the bank, complete the following steps:

1. Turn off the power to the bank and disconnect the power supply from the network module.
2. Remove the network module from the bank.
3. Install the new network module as described in the quick start guide shipped with the module.
4. Connect the power supply to the new network module as described in the quick start guide.
5. Connect the new network module to the computer or the network.
6. Power up the network module.
7. Find the comm resource for the configured bank under My System»Devices and Interfaces, right-click it, and select **Go to Comm Resource Configuration**.
8. Click the + sign beside the comm resource so that the bank icon appears, right-click the bank icon, and select **Copy Bank**.
9. Click **Next**.
10. Select the comm resource type for the new network module. Select **Ethernet** for an Ethernet network module or **RS232/485** for a serial network module.

## **Configuring I/O Modules**

To configure an I/O module, select the module under Devices and Interfaces or Remote Systems. A window appears with the following tabs:

[Device Configuration](#)

[Channel Configuration](#)

## Configuring Channels

On the Channel Configuration tab, you can configure ranges, [watchdog values](#), [power-up settings](#), [deadband](#), attributes, and commands for each channel of a FieldPoint module.

## Deadbanding for Ethernet Modules

Ethernet network modules with appropriate firmware (minimum revision 0300 for an FP-1600, any revision for a [c]FP-2xxx, cFP-180x, or FP-1601) can apply deadbands to the analog and count input channels of connected I/O modules.

The deadband is a filter that enables you to specify the percentage change required in order for a signal to be transmitted to any clients. For example, consider an analog input channel with a range of 0-10 V and a 1% deadband. This channel transmits new values back to clients only when the voltage has changed more than 0.1 V. Signal changes less than 0.1 V are ignored, allowing you to filter out noise and reduce the use of network bandwidth.

Follow these steps to configure a deadband:

1. Select the I/O module under Devices and Interfaces or Remote Systems.
2. Click the **Channel Configuration** tab.
3. Select an analog or count input channel.
4. Under Data Configuration, enter a value for Percent Deadband.
5. Click **Apply**.

## Configuring Power-Up States

Unless you configure FieldPoint modules to save their states, a power cycle or a reset to the bank will cause output channels to return to their factory default output states. To avoid this problem, you can configure a preferred power-up state for your hardware.

To configure a power-up state for your hardware, you can use the [Snapshot feature](#) or the [configurable power-up](#) method. With the Snapshot feature, you bring the hardware into the desired state and take a "snapshot" of that state. The configurable power-up method is not as fast as the Snapshot method, but it allows you to specify power-up values without having to bring the hardware into the desired state.

## Using the Configurable Power-Up Settings Method

When you want to [configure a power-up state](#) for your hardware, you can use the [Snapshot feature](#) or the configurable power-up method. To use the configurable power-up method, follow these steps:

1. Select the module under Devices and Interfaces or Remote Systems and click the **Channel Configuration** tab.
2. Fill in power-up output values for the channels you want to configure.
3. Click **Apply**.

When you click **Apply**, the attributes, ranges, deadband, and network watchdog values are sent to the devices to be used as the current settings and power-up settings. Power-up attributes and ranges are always the same as the current attributes and ranges. The power-up output values are sent to the device to be used whenever a reset or power cycle occurs.

4. Select the bank for the device.



**Note** Make sure the **factory configuration** box is unchecked before you click **Apply**.

5. On the Bank Configuration tab, click **Apply**.
6. Click **Save**.

## Configuring Items

An item represents one or more physical channels on a FieldPoint device.



**Note** If a FieldPoint item represents more than one analog or count channel, you can read from and write to only the first channel of the item from MAX.



## Adding an Item

1. Right-click a device under Data Neighborhood and select **Create New Item**.
2. If you are using a LabVIEW RT controller such as the [c]FP-2xxx, select [I/O Item](#) or [LabVIEW Item](#).

## **Deleting an Item**

Right-click an item under Data Neighborhood and select **Delete**.

## Duplicating an Item

1. Right-click an item under Data Neighborhood and select **Duplicate**.
2. Specify the number of duplicate items to create.
3. Click OK.

## **Editing an Item**

1. Select an item under Data Neighborhood and click the **Item Configuration** tab.
2. Enter the parameters in the dialog box that appears.
3. Click **Apply**.

## **Item Configuration Tab**

On the Item Configuration tab, you can rename an item, select the [advise rate](#) and type, and select channels to include.

## **Creating a New I/O Item**

To create a new FieldPoint item using one or more channels, right-click a device under **My System»Data Neighborhood** and select **Create New Item...** In the Create New I/O Item dialog box that appears, you can rename the new item, select the advise rate and type, and select channels to include.

## **Testing FieldPoint Items**

Use the I/O Data tab to read from and write to FieldPoint data items in MAX.

## Reading Items

1. Select the device containing the item(s) in **My System»Data Neighborhood**.
2. Click the **I/O Data** tab.
3. To read all items on the device, click **Start**. To read one or more items, select the items, then click **Start**.



## Writing to Items

1. Select the device containing the item(s) in **My System»Data Neighborhood**.
2. Click the **I/O Data** tab.
3. Select the item, then click **Write**.
4. Enter a value to write to the item.
5. Click **Write**.

## **Changing the Screen Update Rate**

By default, MAX updates the list view once every 250 milliseconds (ms). You can change the MAX screen update rate from the I/O Data tab by selecting **Tools»FieldPoint»I/O Data»Set Screen Update Rate**, and entering a new rate. Use a faster screen update rate if you are reading FieldPoint items that change at rates faster than once every 250 ms.

## Using FieldPoint I/O from LabVIEW

Complete the following steps to use FieldPoint I/O from within LabVIEW.

1. Configure and test your FieldPoint system in MAX.
2. Go to **Tools»FieldPoint»Save** to save the .iak configuration file.
3. Exit MAX.
4. Launch LabVIEW.
5. Use the FieldPoint I/O control and FieldPoint VIs to construct your LabVIEW FieldPoint application.

The LabVIEW FieldPoint VIs access FieldPoint data items through their items, device, and communication resource names. Refer to the *FieldPoint LabVIEW Interface Help* and the LabVIEW FieldPoint example VIs for more information about using FieldPoint I/O from LabVIEW.

## Using FieldPoint I/O from LabWindows/CVI

Complete the following steps to use FieldPoint I/O from LabWindows/CVI.

1. Configure and test the FieldPoint system in MAX.
2. Go to **Tools»FieldPoint»Save** to save the .iak configuration file.
3. Exit MAX.
4. Launch LabWindows/CVI.
5. Use the CVI-FieldPoint function panels to construct your LabWindows/CVI FieldPoint application.

The LabWindows/CVI FieldPoint functions access the FieldPoint data items through their item, device, and communication resource names as configured in your .iak configuration file. Refer to the LabWindows/CVI FieldPoint instrument driver help, the *FieldPoint LabWindows/CVI Interface Help*, and CVI FieldPoint examples for more information on FieldPoint I/O from LabWindows/CVI.

## FieldPoint Error and Warning Codes

The following table lists error and warning codes that FieldPoint can return from procedure calls. Error codes have a negative value and warning codes have a positive value. Errors and warnings between 33486 and 33792 (absolute value) are specific to the FieldPoint module type. Refer to the [FieldPoint I/O Module Quick Reference](#) for descriptions of module-specific error codes if they are not listed in this help file.

To convert from FieldPoint server error code to FieldPoint module error code, use the following formulas:

If the FieldPoint server error code is between 33486 and 33586, inclusive:

$$\text{Module Error Code} = \text{FieldPoint Error Code} - 33486$$

If the FieldPoint server error code is greater than 33586, the return code indicates that some, but not all, of the channels associated with a FieldPoint item have a module error code:

$$\text{Module Error Code} = \text{FieldPoint Error Code} - 33586$$

<b>Error or Warning Code</b>	<b>Meaning of Error or Warning</b>
-34244	Unable to delete a nonexistent or empty object.
-34238	Incomplete object state. Some of the information in a configuration file is not in the proper format. The necessary data to create a comm resource, device, or item either was not present or could not be interpreted. The configuration file may be corrupt.
-34220	The current configuration file is read-only. You can view and use the file but cannot save any changes to it.
-34219	Failed to open/read the configuration file. Verify that the specified path name is correct and that you have access privileges to the file.
-34218	Error closing a file. Possible cause: The file was not opened successfully or it has already been closed.
-34217	Error creating the configuration file. Possible cause: Another file with the same name already exists or the system is out of disk space or you do not have privileges to create a file.
-34216	Error opening a configuration file. Possible cause: The file does not exist or you do not have access to it.
-34215	The internal state of the object is invalid. The object is either not properly initialized or has been corrupted.
-34214	Failed to create module information file for an FP-TB-10 module. The required dual-channel module information is either nonexistent or corrupt.
-34211	Error creating Windows registry key. Possible cause: The key already exists or the user does not have access to modify the registry.
-34210	Error opening Windows registry. Possible cause: The key does not exist or the user does not have access to the registry with the ACCESS parameters specified by the open call.

- 34209 Could not write to Windows registry key. Possible cause: The key is opened in read-only mode or the user does not have access to modify the registry.
- 34208 Failed to read Windows registry. Possible causes: The required key does not exist or the user does not have read access to the registry.
- 34201 Memory allocation has failed. Possible cause: The system is out of memory. Close some other applications to free memory.
- 34117 Attempt to publish data of incorrect type for specified item. The value wired into the input value terminal of the FP Publish Data VI does not match the data type of the existing item.
- 34116 Desired value is outside the configured range for some channels.
- 34115 The tag handle passed to a FieldPoint VI is invalid or unknown.
- 34114 Invalid IO Control string. The string value of the FieldPoint IO Control Node could not be parsed into constituent configuration file path name, comm resource, device, and item.
- 34112 The specified .iak file path is not valid for the configuration alias provided. The server name must match the alias assigned to the provided configuration file path.
- 34110 The requested new configuration file short name is already associated with a different configuration path.
- 34109 The database that associates short names with configuration paths is unavailable. Most likely the file could not be opened. Make sure you have read privileges for the directory where FieldPoint is installed.
- 34108 The specified name is not associated with a configuration file path. The requested action cannot be taken using the name provided.
- 34107 Unable to load the FieldPoint server .dll. Possible cause: The .dll does not support the required interface.
- 34106 The registered path for the FieldPoint server is invalid. Make sure the FieldPoint software is properly installed and registered.
- 34104 A required .dll failed to load properly. The .dll path may be invalid or the dll may not exist on this machine.
- 34103 Invalid parameter. At least one of the parameters passed to this function/VI has an invalid or unsupported value.
- 34102 Invalid Custom Create Tag VI. Custom Create Tag VIs must be in the vi.lib\FieldPoint\Custom Create Tag directory.
- 34101 Desired value is outside the configured range.
- 33818 The desired IP address is already in use by a different FieldPoint network module.
- 33817 Unable to use the COM port. Another comm resource in this configuration is already using this COM port.
- 33816 Unexpected character received from Optomux response.
- 33812 Unable to use the COM port. The COM port is already in use by a different FieldPoint communication resource with different baud rate settings.
- 33811 Unable to bind to the COM port. Another application is already using the COM port.
- 33810 The message from the serial port has a checksum different from the one calculated by the host application.
- 33809 The specified COM port does not exist on your machine. Check your system devices to make sure your COM port(s) is present and has required system resources

- 33808 The desired baudrate is not supported by the underlying network bus.
- 33807 The IP address is invalid. The given IP address does not follow the IP address syntax required by the Ethernet protocol.
- 33806 The required network connection was not found. Possible cause: A network resource specified in a Create Tag call was not available when the tag was created.
- 33805 The server received an invalid termination character from Serial communication.
- 33804 Ethernet communication has failed. Possible cause: missing or disconnected network card or network card drivers.
- 33803 The channel has not yet been subscribed to.
- 33802 The host has read-only access to this device.
- 33801 The host does not have access to this device.
- 33192 Deadbanding is not supported for the selected channel. Deadbanding is supported only for analog input and count input channels on FieldPoint Ethernet banks. Older versions of the FP-1600 firmware (older than 3.0) also do not support deadbanding.
- 33191 The desired range is not supported by this I/O module. Refer to the I/O module documentation for a list of supported ranges and corresponding range IDs.
- 33190 The IP pattern used to configure FieldPoint Access Control is not valid. Valid combinations are: \*, [num].\*, [num].[num].\*, [num].[num].[num].\* (where [num] can be any integer from 0-255).
- 33189 A module of different type already exists at the specified address in the currently loaded configuration.
- 33186 Invalid attribute value. The specified attribute(s) does not support the desired attribute setting. Check the operating instructions to make sure this setting is valid for the I/O module you are using.
- 33185 Invalid channel attribute. The specified attribute is not supported by the addressed channel(s).
- 33184 Invalid deadband value.
- 33183 Unable to create an I/O item for this device. The device does not support I/O items..
- 33181 Invalid password. The password provided to change network security settings is invalid or incorrect.
- 33180 The amount of data provided does not match the number of data items required or the number of channels to be addressed.
- 33165 The item addressed does not exist. Possible cause: The device is not connected or the item address is invalid.
- 33160 The requested feature is not supported by this type of network or I/O module.
- 33159 The firmware on the network module does not support the requested feature. Upgrade the firmware to the latest released version (download from [ni.com/support/fieldpoint](http://ni.com/support/fieldpoint)) and try again.
- 33157 The I/O module at this address has been hotswapped by a module of an incompatible type. Replace with a module of the original type for proper operation.
- 33156 The device is offline. Make sure the device is connected and its power is on.
- 33155 Module information not available for any FieldPoint module. You may have accidentally deleted the module information files or corrupted your registry. Rerun the FieldPoint installer to repair your FieldPoint installation.
- 33154 The module addressed is not of the selected type.
- 33153 Error identifying module. Possible causes: (1) The module information is not available on your system, or (2) the module is returning an invalid module ID. For (1), the module may be newly released and it must be online for the software to configure it the first time, OR you may have accidentally deleted the module information file(s) and/or corrupted your registry. Rerun the FieldPoint installer to repair your

- FieldPoint installation. For (2), module may not be correctly plugged in or the EEPROM on the module may be corrupted.
- 33036 Unknown error. An unidentifiable error condition has occurred.
  - 33035 Hardware error on instrument. An irrecoverable fault has occurred.
  - 33034 The response to the last command is unavailable.
  - 33033 The module addressed by the "Resend Last Response" is not the same module that was addressed by the previous command.
  - 33032 The module has been hotswapped since it was last sent a command. This response is sent only if the network module is enabled to report hotswaps, and if the hotswap occurred after hotswap reporting mode was enabled. The command was ignored. This error number can be sent in response to a standard command if you have enabled hotswap reporting for the bank.
  - 33030 One or more attributes specified either do not exist or do not support the setting specified. The command was ignored.
  - 33029 One or more ranges specified in the command either do not exist or do not support the setting specified. The command was ignored.
  - 33028 One or more channels specified in the command either do not exist or do not support the operation specified. The command was ignored.
  - 33027 The module addressed does not exist.
  - 33026 The FieldPoint network module detected a serial framing error in the command. The command was ignored.
  - 33025 The command is valid but is not supported by the addressed module.
  - 33024 One or more characters sent in the command could not be correctly converted to a digit (hex or decimal).
  - 32903 The specified limits are invalid for the command. This includes notification that an invalid digit (hex or decimal) was received.
  - 32902 Communications link network watchdog timed out. The command was ignored.
  - 32901 Not enough characters received. The module received an insufficient or incorrect number of characters for the specified command.
  - 32900 An unprintable ASCII character was received by the module. Only characters from ASCII value 33 to 127 are permitted within commands. The command was ignored.
  - 32899 Input buffer overrun. The received command was too long. The command was ignored.
  - 32898 The checksum does not match the sum of command characters. The checksum in the command does not match the calculated checksum of the characters in the command. The command was ignored.
  - 32897 Undefined or invalid command. The command character was not a legal command character, or the addressed module does not support this command. The command was ignored.
  - 32896 Power-up clear expected. The FieldPoint bank has power cycled since the last communication was sent. The command was ignored.
  - 32834 An advise operation on the selected item has already been started. You must stop the current operation before starting a new one.
  - 32831 The selected comm resource has no network or I/O modules associated with it. Make sure the FieldPoint bank is online and you have access to the network module. An empty Ethernet comm resource, if saved, can create an invalid .iak file.
  - 32824 The specified item name is already defined.
  - 32823 The specified device name is already defined.



- 32822 The specified comm resource name is already defined.
- 32819 The specified item is not present in the currently loaded configuration file.
- 32817 The specified device is not present in the currently loaded configuration file.
- 32816 The specified comm resource is not present in the currently loaded configuration file.
- 32811 The FieldPoint server failed either to destroy some of its active objects or to terminate some service(s).
- 32810 The FieldPoint server initialization failed. Possible causes: 1. Missing or corrupt configuration file; 2. Failed to create callbacks.
- 32809 The FieldPoint server has already been initialized.
- 32808 The FieldPoint server has not been initialized.
- 32806 Tag name too long. Possible cause: Tag name exceeds the character limit (31 characters) set by the configuration file.
- 32805 The tag name contains illegal characters. Possible cause: The name of a channel, block, device, or comm resource includes a line feed or a carriage return.
- 32802 An invalid completion was specified.
- 0 Success
- 32768 The task is terminated. Most likely the FP Close was called before this task was finished.
- 32769 The task is pending.
- 32803 An invalid task ID was specified. The task ID used when calling FP\_ReadCache or FP\_Stop is invalid. Verify that the task ID used matches the task ID returned by FP\_Advise.
- 32804 An invalid IAHandle was specified. Verify that the configuration file is valid and the IAHandle used matches the IAHandle returned by FP\_Open.
- 32812 The specified tag name was not found.
- 32816 The specified comm resource is not present in the currently loaded configuration file.
- 32817 The specified device is not present in the currently loaded configuration file.
- 32819 The specified item is not present in the currently loaded configuration file.
- 32820 The item is read only.
- 32821 The item is write only.
- 32822 The specified comm resource name is already defined.
- 32823 The specified device name is already defined.
- 32824 The specified item name is already defined.
- 32826 Failed to create or initialize at least one of the objects in the configuration file. Your next save will save only the objects that were successfully created.
- 32828 The connection to a remote device timed out.
- 32832 Initialization of default channel name database failed. Any new item created by "Find Devices" will be named "Channel." Make sure your FieldPoint software is installed and registered properly.
- 32896 Power-up clear expected. The FieldPoint bank has power cycled since the last communication was sent. The command was ignored.
- 32897 Undefined or invalid command. The command character was not a legal command character, or the addressed module does not support this command. The command was ignored.
- 32898 The checksum does not match the sum of command characters. The checksum in the command does

- not match the calculated checksum of the characters in the command. The command was ignored.
- 32899 Input buffer overrun. The received command was too long. The command was ignored.
- 32900 An unprintable ASCII character was received by the module. Only characters from ASCII value 33 to 127 are permitted within commands. The command was ignored.
- 32901 Not enough characters received. The module received an insufficient or incorrect number of characters for the specified command.
- 32902 Communications link network watchdog timed out. The command was ignored.
- 32903 The specified limits are invalid for the command. This includes notification that an invalid digit (hex or decimal) was received.
- 33024 One or more characters sent in the command could not be correctly converted to a digit (hex or decimal).
- 33025 The command is valid but is not supported by the addressed module.
- 33026 The FieldPoint network module detected a serial framing error in the command. The command was ignored.
- 33027 The module addressed does not exist.
- 33028 One or more channels specified in the command either do not exist or do not support the operation specified. The command was ignored.
- 33029 One or more ranges specified in the command either do not exist or do not support the setting specified. The command was ignored.
- 33030 One or more attributes specified either do not exist or do not support the setting specified. The command was ignored.
- 33032 The module has been hotswapped since it was last sent a command. This response is sent only if the network module is enabled to report hotswaps, and if the hotswap occurred after hotswap reporting mode was enabled. The command was ignored. This error number can be sent in response to a standard command if you have enabled hotswap reporting for the bank.
- 33033 The module addressed by the "Resend Last Response" is not the same module that was addressed by the previous command.
- 33034 The response to the last command is unavailable.
- 33035 Hardware error on instrument. An irrecoverable fault has occurred.
- 33036 Unknown error. An unidentifiable error condition has occurred.
- 33153 Error identifying module. Possible causes: (1) The module information is not available on your system, or (2) the module is returning an invalid module ID. For (1), the module may be newly released and it must be online for the software to configure it the first time, OR you may have accidentally deleted the module information file(s) and/or corrupted your registry. Rerun the FieldPoint installer to repair your FieldPoint installation. For (2), module may not be correctly plugged in or the EEPROM on the module may be corrupted.
- 33154 The module addressed is not of the selected type.
- 33156 The device is offline. Make sure the device is connected and its power is on.
- 33157 The I/O module at this address has been hotswapped by a module of an incompatible type. Replace with a module of the original type for proper operation.
- 33158 The I/O module at this address has been hotswapped by a different module of compatible type. No action necessary.
- 33161 The write operation failed to change the value on the FieldPoint bank. The connection may be broken.
- 33162 Unable to connect to the data item on the module. Possible causes: (1) A connection is broken, or (2)

- the network module is not powered on.
- 33163 The connection to the module has been broken. Check cabling, power, etc.
  - 33183 The desired configuration value was out of range. It has been coerced to the nearest valid number.
  - 33185 Invalid channel attribute. The specified attribute is not supported by the addressed channel(s).
  - 33186 Invalid attribute value. The specified attribute(s) does not support the desired attribute setting. Check the operating instructions to make sure this setting is valid for the I/O module you are using.
  - 33191 The desired range is not supported by this I/O module. Refer to the I/O module documentation for a list of supported ranges and corresponding range IDs.
  - 33436 Bad channel status reported by module. The module is in one of the following states: Unconfigured, Bad Status "A", Bad Status "B".
  - 33437 The specified serial network module was sent a Power-Up Clear command.
  - 33438 Bad channel status "A" reported for all contained channels. A channel-specific error has occurred. Check module documentation for more details.
  - 33439 Bad channel status "B" reported for all contained channels. A channel-specific error has occurred. Check module documentation for more details.
  - 33440 Bad channel status "Unconfigured" reported for all contained channels. All channels are in the "unconfigured" state. This error can occur if the network module is unable to configure the module because of a hardware failure.
  - 33441 None of the contained channels exists.
  - 33442 An unknown warning was returned by the optomux-based serial hardware. Possible cause: recoverable fault.
  - 33443 Bad channel status reported by several channels. At least one channel is in one of the following states: Unconfigured, Bad Status "A", Bad Status "B"
  - 33445 Bad channel status "B" reported for several contained channels. A channel-specific error has occurred. Check module documentation for more details.
  - 33446 Bad channel status "Unconfigured" reported for several contained channels. Some channels are in "unconfigured" state. This error can occur if the network module is unable to configure a module because of a hardware failure.
  - 33447 Several contained channels do not exist.
  - 33448 Bad channel status reported for all contained channels. All channels are in one of the following states: Unconfigured, Bad Status "A", Bad Status "B".
  - 33487 Out of range. The input signal you are measuring has gone out of the specified measurement range. Check the signal and, if necessary, change the range the channel is using.
  - 33488 Open current loop. Check wire connections for possible breakage or disconnection.
  - 33489 Open thermocouple. The thermocouple module did not detect a thermocouple connection on the channel. Check connections for possible breakage or disconnection.
  - 33490 Open RTD detected. The RTD module did not detect an RTD on the channel. Check connections for possible breakage or disconnection.
  - 33491 Count overflowed since last read. The counter module has reached its maximum count value. No action required.
  - 33492 The channel is sourcing the maximum current allowed. The device attached to the channel is drawing the maximum current from the channel. Check for possible shorts or external device failure.
  - 33493 The channel is in overcurrent protection mode. The device attached to the channel is passing more current than is allowed through the channel. Check for possible shorts or external device failure.

- 33494 Empty base or slot. The specified module cannot be detected by the network module or the FP-TB-10 base. Make sure the module is firmly fitted into the base and that the POWER and READY LEDs are lit.
- 33495 Bad data from channel. The data is corrupted and cannot be displayed correctly.
- 33496 The channel exceeded the specified terminal count.
- 33587 Some channels out of range. More than one of the input signals that you are measuring has gone out of the specified measurement range. Check the signals and, if necessary, change the range the module is using.
- 33588 Open current loop on some channels. One or more channels of the module has detected an open current loop. Check wire connections for possible breakage or disconnection.
- 33589 Open thermocouple on some channels. More than one channel on the thermocouple module has failed to detect a thermocouple connection. Check connections for possible breakage or disconnection.
- 33590 Open RTD on some channels. More than one channel on the RTD module has failed to detect an RTD. Check connections for possible breakage or disconnection.
- 33591 Count overflowed since last read for some channels. Some channels on the counter module have reached their maximum count value. No action required.
- 33592 More than one channel is sourcing the maximum current allowed. The device attached to the channel is drawing the maximum current from the channel. Check for possible shorts or external device failure.
- 33593 Some channels are in overcurrent protection mode. The device attached to the channel is passing more current than is allowed through the channel. Check for possible shorts or external device failure.
- 33594 Empty base or slot. The specified module cannot be detected by the network module or the FP-TB-10 base. Make sure the module is firmly fitted into the base and that the POWER and READY LEDs are lit.
- 33595 Bad data from channel(s). The data is corrupted and cannot be displayed correctly.
- 33818 The desired IP address is already in use by a different FieldPoint comm resource.
- 34206 An invalid status code was specified. The status code received does not match the predefined list of error codes returned by the FieldPoint software.
- 34208 Failed to read Windows registry. Possible causes: The required key does not exist or the user does not have read access to the registry.
- 34212 Error closing Windows registry. Possible cause: The key does not exist or has not been opened.
- 34213 Error accessing module information. The corresponding file either cannot be found or cannot be opened.
- 34218 Error closing a file. Possible cause: The file was not opened successfully or it has already been closed.
- 34220 The current configuration file is read-only. You can view and use the file but cannot save any changes to it.
- 34238 Incomplete object state. Some of the information in a configuration file is not in the proper format. The necessary data to create a comm resource, device, or item either was not present or could not be interpreted. The file configuration may be corrupt.

## Using FieldPoint I/O from an OPC Client

Complete the following steps to use FieldPoint I/O from an OPC client.

1. Configure and test your FieldPoint system in MAX.
2. Go to **Tools»FieldPoint»Save** to save the .iak configuration file.
3. Exit MAX.
4. Launch the OPC client.
5. Select NationalInstruments.OPCFieldPoint.
6. Follow the instructions given by the OPC client to monitor FieldPoint I/O

The FieldPoint OPC Server imports the information from the last saved .iak file in order to access FieldPoint data items.



**Note** You can use any OPC client, including the OPC client shipped with National Instruments LabVIEW, LabVIEW DSC, and Lookout software.

## **[c]FP-AI-100**

All ID values are hexadecimal.

**Module ID**

010A

## Channel Status

Message	ID
Out of range	01



## Ranges

Name	ID
024 mA	00
3.524 mA	01
±24 mA	02
±6 V	05
06 V	06
±1.2 V	07
01.2 V	08
018 V	0E
±36 V	0F
036 V	11
±18 V	12

**No Attributes**

**No Commands**

## **[c]FP-AI-102**

All ID values are hexadecimal.

**Module ID**

0115

## Channel Status

Message	ID
Out of range	01

## Ranges

Name	ID
020 V	13
$\pm 20$ V	14
060 V	15
$\pm 60$ V	16
0120 V	17
$\pm 120$ V	18

**No Attributes**

**No Commands**

## **[c]FP-AI-110**

All ID values are hexadecimal.



**Module ID**

0101

## Channel Status

Message	ID
Out of range	01

## Ranges

Name	ID
021 mA	00
3.521 mA	01
$\pm 21$ mA	02
$\pm 10.4$ V	03
010.4 V	04
$\pm 5.2$ V	05
05.2 V	06
$\pm 1.04$ V	07
01.04 V	08
$\pm 325$ mV	09
$\pm 65$ mV	0A

## Attributes

Name	ID	Value	ID
Noise Rejection	01	60 Hz	00
		50 Hz	01
		500 Hz	02

**No Commands**

## **[c]FP-AI-111**

All ID values are hexadecimal.

**Module ID**

010C

## Channel Status

Message	ID
Out of range	01



## Ranges

Name	ID
021 mA	00
3.521 mA	01
$\pm 21$ mA	02

## Attributes

Name	ID	Value	ID
Noise Rejection	01	60 Hz	00
		50 Hz	01
		500 Hz	02

**No Commands**

## **cFP-AI-118**

All ID values are hexadecimal.

**Module ID**

0127

## Channel Status

Message	ID
Out of range	01

## Ranges

Name	ID
$\pm 10.4$ V	03
010.4 V	04
$\pm 5.2$ V	05
05.2 V	06
$\pm 1.04$ V	07
01.04 V	08
018 V	0E
$\pm 18$ V	12

## Attributes

Name	ID	Value	ID
Noise Rejection	01	10 Hz	0B
		None	FE



**No Commands**

## **FP-AI-C020**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
020 mA	00

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		100 Hz	06

**No Commands**

## **FP-AI-C420**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02



## Ranges

Name	ID
420 mA	01

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		100 Hz	06

**No Commands**

## **[c]FP-AIO-600**

All ID values are hexadecimal.

**Module ID**

0123

## Channel Status

Message	ID
Overcurrent protection (inputs)	01
Open current loop (outputs)	02

## Ranges

Type	Name	ID
Input	024 mA	00
	3.524 mA	01
	±24 mA	02
	±12 V	03
	012 V	04
	±6 V	05
	06 V	06
	018 V	0E
	±36 V	0F
	036 V	11
	±18 V	12
	Output	021 mA
3.521 mA		01

**No Attributes**

**No Commands**



## **[c]FP-AIO-610**

All ID values are hexadecimal.

**Module ID**

011B

## Channel Status

Message	ID
Overcurrent protection (inputs)	01
Overcurrent protection (outputs)	07

## Ranges

Type	Name	ID
Input	024 mA	00
	3.524 mA	01
	±24 mA	02
	±12 V	03
	012 V	04
	±6 V	05
	06 V	06
	018 V	0E
	±36 V	0F
	036 V	11
	±18 V	12
	Output	±12 V
012 V		04

**No Attributes**

**No Commands**

## **FP-AI-V1**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
01 V	08



## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		2 kHz	05

**No Commands**

## **FP-AI-V5**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
05 V	06

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		2 kHz	05

**No Commands**

## **FP-AI-V5B**

All ID values are hexadecimal.



## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
$\pm 5$ V	05

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		2 kHz	05

**No Commands**

## **FP-AI-V10**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
010 V	04

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		2 kHz	05



**No Commands**

## **FP-AI-V10B**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
$\pm 10$ V	03

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		2 kHz	05

**No Commands**

## **FP-AI-V50m**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02



## Ranges

Name	ID
050 mV	19

## Attributes

Name	ID	Value	ID
Input Filter 01		20 Hz	07
		500 Hz	02

**No Commands**

## **FP-AI-V100m**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Out of range	02

## Ranges

Name	ID
0100 mV	1A

## Attributes

Name	ID	Value	ID
Input Filter 01		1 kHz	08
		20 Hz	07

**No Commands**



## **[c]FP-AO-200**

All ID values are hexadecimal.

**Module ID**

0102

## Channel Status

Message	ID
Open current loop	01

## Ranges

Name	ID
021 mA	00
3.521 mA	01

**No Attributes**

**No Commands**

## **[c]FP-AO-210**

All ID values are hexadecimal.

**Module ID**

010F

## Channel Status

Message	ID
Overcurrent protection	01



## Ranges

Name	ID
010.2 V	04

**No Attributes**

**No Commands**

## **FP-AO-C020**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
020 mA	00

**No Attributes**

**No Commands**

## **FP-AO-C024**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01



## Ranges

Name	ID
0-24 mA	00

**No Attributes**

**No Commands**

## **FP-AO-C420**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
420 mA	01

**No Attributes**

**No Commands**

## **FP-AO-V5**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01



## Ranges

Name	ID
05 V	06

**No Attributes**

**No Commands**

## **FP-AO-V5B**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
$\pm 5$ V	05

**No Attributes**

**No Commands**

## **FP-AO-V10**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01



## Ranges

Name	ID
010 V	04

**No Attributes**

**No Commands**

## **FP-AO-V10B**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
$\pm 10$ V	03

**No Attributes**

**No Commands**

## **[c]FP-CTR-500**

All ID values are hexadecimal.

**Module ID**

010D



## Channel Status

Message	ID
Overflow since last read	01

## Ranges

Name	ID
Boolean	10
065535 Counts	40

## Attributes

Name	ID	Value	ID
Terminal Count	05	065535	
Terminal Count MSB [Most Significant Byte]	06		
Count Source	07	External Count Input	00
		Previous Channel	01
		1 kHz Reference	02
		32 kHz Reference	03
Gate Source	08	Gate Input 0	00
		Gate Input 1	01
		Gate Input 2	02
		Gate Input 3	03
		Always Disabled	04
		Always Enabled	05
Read Reset Mode	09	Dont Reset On Read	00
		Reset On Read	01
Noise Rejection	01	200 Hz	03
		50 kHz	04
Output Source	0A	Counter Channel 0	00
		Counter Channel 1	01
		Counter Channel 2	02
		Counter Channel 3	03
		Counter Channel 4	04
		Counter Channel 5	05
		Counter Channel 6	06
		Counter Channel 7	07
		Discrete Data	08
Output Mode	0B	Toggle, Reset Off	00
		Toggle, Reset On	01
		On Pulse	02
		Off Pulse	03

## Commands

Name	ID	Action	ID
Control 01		Increment	02
		Reset	01

## **[c]FP-CTR-502**

All ID values are hexadecimal.

**Module ID**

0114

## Channel Status

Message	ID
Overflow since last read	01

## Ranges

Name	ID
Boolean	10
065535 Counts	40



## Attributes

Name	ID	Value	ID
Terminal Count	05	065535	
Terminal Count MSB [Most Significant Byte]	06		
Count Source	07	External Count Input	00
		Previous Channel	01
		1 kHz Reference	02
		32 kHz Reference	03
Gate Source	08	Gate Input 0	00
		Gate Input 1	01
		Gate Input 2	02
		Gate Input 3	03
		Always Disabled	04
		Always Enabled	05
Read Reset Mode	09	Dont Reset On Read	00
		Reset On Read	01
Noise Rejection	01	200 Hz	03
		50 kHz	04
Output Source	0A	Counter Channel 0	00
		Counter Channel 1	01
		Counter Channel 2	02
		Counter Channel 3	03
		Counter Channel 4	04
		Counter Channel 5	05
		Counter Channel 6	06
		Counter Channel 7	07
		Discrete Data	08
Output Mode	0B	Toggle, Reset Off	00
		Toggle, Reset On	01
		On Pulse	02
		Off Pulse	03

## Commands

Name	ID	Action	ID
Control 01		Increment	02
		Reset	01

## **[c]FP-DI-300**

All ID values are hexadecimal.

**Module ID**

0109

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DI-301**

All ID values are hexadecimal.

**Module ID**

0105



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **cFP-DI-304**

All ID values are hexadecimal.

**Module ID**

0129

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DI-330**

All ID values are hexadecimal.

**Module ID**

0103



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DI-AC120**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DI-AC240**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DI-DC**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DIO-550**

All ID values are hexadecimal.

**Module ID**

0126



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DO-400**

All ID values are hexadecimal.

**Module ID**

0104

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DO-401**

All ID values are hexadecimal.

**Module ID**

0106



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DO-403**

All ID values are hexadecimal.

**Module ID**

0111

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-DO-410**

All ID values are hexadecimal.

**Module ID**

0110



## Channel Status

Message	ID
Current limited	07

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DO-AC120**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DO-AC240**

All ID values are hexadecimal.



## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DO-DC60**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-DO-DC200**

All ID values are hexadecimal.



## Channel Status

Message	ID
Empty	01

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-PG-522**

All ID values are hexadecimal.

**Module ID**

0113

## Ranges

Name	ID
Boolean	10
065535 Counts	40

## Attributes

Name	ID	Value	ID
Pulse Mode	0E	Finite	00
		Continuous	01
On Time	0F	165535	
On Time MSB [Most Significant Byte]	10		
Off Time	11	065535	
Off Time MSB	12		
Resolution	13	100 $\mu$ s	00
		10 ms	01
		1 s	02

## Commands

Name	ID	Action	ID
Control	01	Stop After Current Pulse	04
		Stop Immediately	03
Generate Pulses	02	165535	
Generate Pulses MSB	03		



## **[c]FP-PWM-520**

All ID values are hexadecimal.

**Module ID**

010E

## Ranges

Name	ID
0100%	38

## Attributes

Name	ID	Value	ID
Period (ms)	0C	165535	
Period (ms) MSB [Most Significant Byte]	0D		

**No Commands**

## **[c]FP-QUAD-510**

All ID values are hexadecimal.

**Module ID**

0116

## Ranges

Name	ID
Boolean	10
065535	40
$\pm 160$ count/ $\mu$ s	50
$\pm 80$ count/ $\mu$ s	51
$\pm 40$ count/ $\mu$ s	52
$\pm 20$ count/ $\mu$ s	53
$\pm 10$ count/ $\mu$ s	54
$\pm 5$ count/ $\mu$ s	55
$\pm 2.5$ count/ $\mu$ s	56
$\pm 1.25$ count/ $\mu$ s	57



## Attributes

Name	ID	Value	ID
Reset Mode	14	Dont Reset on Index	00
		Reset on Index	01

## Commands

Name	ID	Action	ID
Control	01	Reset	01

## **FP-RLY-420**

All ID values are hexadecimal.

**Module ID**

0108

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **cFP-RLY-421**

All ID values are hexadecimal.

**Module ID**

0121



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **FP-RLY-422**

All ID values are hexadecimal.

**Module ID**

0112

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **cFP-RLY-423**

All ID values are hexadecimal.

**Module ID**

0122



## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **cFP-RLY-425**

All ID values are hexadecimal.

**Module ID**

0125

## Ranges

Name	ID
Boolean	10

**No Attributes**

**No Commands**

## **[c]FP-RTD-122**

All ID values are hexadecimal.

**Module ID**

010B



## Channel Status

Message	ID
Out of range	01
Open RTD	02

## Ranges

Name	ID
731123 K	26
200 to 850 °C	27
328 to 1562 °F	28
0400 Ω	30
04000 Ω	31

## Attributes

Name	ID	Value	ID
RTD Type (R0 and TCR) 04		Pt100, TCR=0.00375	00
		Pt100, TCR=0.00385	01
		Pt100, TCR=0.003911	02
		Pt100, TCR=0.003916	03
		Pt100, TCR=0.003920	04
		Pt100, TCR=0.003928	05
		Pt1000, TCR=0.00375	06
		Pt1000, TCR=0.00385	07
		Pt1000, TCR=0.003911	08
		Pt1000, TCR=0.003916	09
		Pt1000, TCR=0.003920	0A
		Pt1000, TCR=0.003928	0B

**No Commands**

## **[c]FP-RTD-124**

All ID values are hexadecimal.

**Module ID**

0118

## Channel Status

Message	ID
Out of range	01
Open RTD	02

## Ranges

Name	ID
731123 K	26
200 to 850 °C	27
328 to 1562 °F	28
0400 Ω	30



## Attributes

Name	ID	Value	ID
RTD Type (R0 and TCR) 04		Pt100, TCR=0.00375	00
		Pt100, TCR=0.00385	01
		Pt100, TCR=0.003911	02
		Pt100, TCR=0.003916	03
		Pt100, TCR=0.003920	04
		Pt100, TCR=0.003928	05

**No Commands**

## **FP-RTD-PT100-3**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Open RTD	02

## Ranges

Name	ID
50 to 350 °C	2F
58 to 622 °F	32

**No Attributes**

**No Commands**

## **FP-RTD-PT100-4**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Open RTD	02



## Ranges

Name	ID
50 to 350 °C	2F
58 to 622 °F	32

**No Attributes**

**No Commands**

## **FP-RTD-PT100**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Open RTD	02

## Ranges

Name	ID
50 to 350 °C	2F
58 to 622 °F	32

**No Attributes**

**No Commands**

## **[c]FP-SG-140**

All ID values are hexadecimal.

**Module ID**

0119



## Channel Status

Message	ID
Out of range	01
Overcurrent protection	02

## Ranges

Name	ID
$\pm 3.90625$ mV/V	64
$\pm 7.8125$ mV/V	65
$\pm 31.25$ mV/V	66
$\pm 62.5$ mV/V	67

## Attributes

Name	ID	Value	ID
Noise Rejection	01	15 Hz	09
		60 Hz	00
		240 Hz	0A
Excitation Voltage	15	10 V	00
		5 V	01
		2.5 V	02
Half-Bridge Completion	16	Half-Bridge Completion OFF	00
		Half-Bridge Completion ON	01

**No Commands**

## **FP-TB-10**

All ID values are hexadecimal.

**Module ID**

0217

## **Ranges, Attributes, and Commands**

Refer to the module reference pages for the dual-channel modules you are using.

## **[c]FP-TC-120**

All ID values are hexadecimal.



**Module ID**

0107

## Channel Status

Message	ID
Out of range	01
Open thermocouple	02

## Ranges

Name	ID
$\pm 50$ mV	0A
$\pm 25$ mV	0B
20 to 80 mV	0C
$\pm 100$ mV	0D
02048 K	20
270 to 1770 °C	21
454 to 3218 °F	22

## Attributes

Attribute Name	Attribute ID	Attribute Value	Attribute ID
Thermocouple Type	02	J	00
		K	01
		T	02
		E	03
		R	04
		S	05
		N	06
		B	07
CJC Source	03	Internal	00
		0 °C	01
		25 °C	02

**No Commands**

## **FP-TC-J**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Open thermocouple	02

## Ranges

Name	ID
210 to 1200 °C	29
346 to 2191 °F	2A



**No Attributes**

**No Commands**

## **FP-TC-K**

All ID values are hexadecimal.

## Channel Status

Message	ID
Empty	01
Open thermocouple	02

## Ranges

Name	ID
100 to 1372 °C	2B
148 to 2501 °F	2C

**No Attributes**

**No Commands**

# Glossary

Prefixes A B C D H I L N O P R S V

Symbol	Prefix	Value
m	milli	$10^{-3}$
k	kilo	$10^3$
M	mega	$10^6$

## A

**advise rate** The rate at which advise operations are performed on a FieldPoint item. If the advise rate of the item is different from the screen update rate of the window where you are monitoring the item, you may not see the advises as they occur. Adjust either the advise rate of the item or the screen update rate of the window.

**analog channel** A channel on a FieldPoint module that accesses data represented as continuously variable quantities. For example, an analog channel could monitor a temperature sensor.

**API** Application programming interface.

## B

**B** Bytes.

**bank** A FieldPoint network module and all the FieldPoint modules connected to it.

## C

**comm resource** Communication resource. A pathway through which MAX communicates with FieldPoint devices. A comm resource can be a serial port or an IP address.

**controller** A FieldPoint network module that can run embedded LabVIEW applications.

## D

default items	Items that MAX creates automatically in My System»Data Neighborhood when it finds a specific type of device. For example, if MAX detects an FP-AO-200 module, it creates one item for each output channel and one item representing all eight output channels.
device	A FieldPoint module.
discrete channel	A channel that can have one of two values: On or Off. For example, a switch is a discrete channel.
.dll	Dynamic link library. An executable that can be loaded at runtime.
duplicate count	The number of duplicate elements to add to the current .iak configuration file.

## H

hotswap	To add or remove an I/O module from a FieldPoint bank while the power is on and the bank is functioning.
---------	--

## I

I/O module	A FieldPoint module with channels for input and/or output.
I/O point	A site for input and/or output of data. Also called a channel or item.
.iak	File extension for a FieldPoint configuration file.
item	One or more channels or variables in a FieldPoint bank that can be monitored or controlled by MAX. In MAX, items are normally I/O points. A blue icon indicates that the item is being monitored. A gray icon indicates that the item is not being monitored.

## L

LabVIEW item	When a Publish Data vi runs on a [c]FP-2xxx controller, it creates a LabVIEW data item in the Data Neighborhood of the controller.
--------------	--

## N

The network module sends and receives commands and data between

network module the computer and the I/O modules in a FieldPoint bank. Ethernet network modules include RT controllers such as the [c]FP-2xxx and non-RT network modules such as the FP-1601 and cFP-180x.

## O

OPC OLE for Process Control. An I/O specification. Refer to the OPC Foundation Web site, [www.opcfoundation.org](http://www.opcfoundation.org), for more information.

## P

password To set a password for a FieldPoint Ethernet controller, click the **Lock** button on the Network Settings tab and enter the password when prompted.

## R

remote I/O Using a FieldPoint RT controller to access I/O modules connected to other network modules. Refer to the *Remote I/O* topic of the *FieldPoint LabVIEW Interface Help* for more information about remote I/O.

## S

s Seconds.

screen update rate The rate at which the value column of the I/O Data tab updates. If the advise rate of the item is different from the screen update rate, you may not see the advises as they occur. Adjust either the advise rate of the item or the [screen update rate](#) of the I/O Data tab.

status The status of the last read or write operation to the selected FieldPoint item.

## V

value The numeric value to write to the selected FieldPoint item.



## **Important Information**

[Warranty](#)

[Copyright](#)

[Trademarks](#)

[Patents](#)

[Warning Regarding Use of NI Products](#)

## **Warranty**

The media on which you receive National Instruments software are warranted not to fail to execute programming instructions, due to defects in materials and workmanship, for a period of 90 days from date of shipment, as evidenced by receipts or other documentation. National Instruments will, at its option, repair or replace software media that do not execute programming instructions if National Instruments receives notice of such defects during the warranty period. National Instruments does not warrant that the operation of the software shall be uninterrupted or error free.

A Return Material Authorization (RMA) number must be obtained from the factory and clearly marked on the outside of the package before any equipment will be accepted for warranty work. National Instruments will pay the shipping costs of returning to the owner parts which are covered by warranty.

National Instruments believes that the information in this document is accurate. The document has been carefully reviewed for technical accuracy. In the event that technical or typographical errors exist, National Instruments reserves the right to make changes to subsequent editions of this document without prior notice to holders of this edition. The reader should consult National Instruments if errors are suspected. In no event shall National Instruments be liable for any damages arising out of or related to this document or the information contained in it.

EXCEPT AS SPECIFIED HEREIN, NATIONAL INSTRUMENTS MAKES NO WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CUSTOMER'S RIGHT TO RECOVER DAMAGES CAUSED BY FAULT OR NEGLIGENCE ON THE PART OF NATIONAL INSTRUMENTS SHALL BE LIMITED TO THE AMOUNT THEREFORE PAID BY THE CUSTOMER. NATIONAL INSTRUMENTS WILL NOT BE LIABLE FOR DAMAGES RESULTING FROM LOSS OF DATA, PROFITS, USE OF PRODUCTS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY THEREOF. This limitation of the liability of National Instruments will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against National Instruments must be brought within one year after the cause of action accrues. National Instruments shall not be liable for

any delay in performance due to causes beyond its reasonable control. The warranty provided herein does not cover damages, defects, malfunctions, or service failures caused by owner's failure to follow the National Instruments installation, operation, or maintenance instructions; owner's modification of the product; owner's abuse, misuse, or negligent acts; and power failure or surges, fire, flood, accident, actions of third parties, or other events outside reasonable control.

## **Copyright**

Under the copyright laws, this publication may not be reproduced or transmitted in any form, electronic or mechanical, including photocopying, recording, storing in an information retrieval system, or translating, in whole or in part, without the prior written consent of National Instruments Corporation.

## Patents

For patents covering National Instruments products, refer to the appropriate location: **Help»Patents** in your software, the patents.txt file on your CD, or [ni.com/patents](http://ni.com/patents).

## Trademarks

National Instruments, NI, ni.com, and LabVIEW are trademarks of National Instruments Corporation. Refer to the *Terms of Use* section on ni.com/legal for more information about [National Instruments trademarks](#).

FireWire® is the registered trademark of Apple Computer, Inc.

Handle Graphics®, MATLAB®, Real-Time Workshop®, Simulink®, and Stateflow® are registered trademarks, and TargetBox<sup>2</sup>™, xPC TargetBox<sup>2</sup>™, and Target Language Compiler™ are trademarks of The MathWorks, Inc.

Tektronix® and Tek are registered trademarks of Tektronix, Inc.

Other product and company names mentioned herein are trademarks or trade names of their respective companies.

Members of the National Instruments Alliance Partner Program are business entities independent from National Instruments and have no agency, partnership, or joint-venture relationship with National Instruments.

## **WARNING REGARDING USE OF NATIONAL INSTRUMENTS PRODUCTS**

(1) NATIONAL INSTRUMENTS PRODUCTS ARE NOT DESIGNED WITH COMPONENTS AND TESTING FOR A LEVEL OF RELIABILITY SUITABLE FOR USE IN OR IN CONNECTION WITH SURGICAL IMPLANTS OR AS CRITICAL COMPONENTS IN ANY LIFE SUPPORT SYSTEMS WHOSE FAILURE TO PERFORM CAN REASONABLY BE EXPECTED TO CAUSE SIGNIFICANT INJURY TO A HUMAN.

(2) IN ANY APPLICATION, INCLUDING THE ABOVE, RELIABILITY OF OPERATION OF THE SOFTWARE PRODUCTS CAN BE IMPAIRED BY ADVERSE FACTORS, INCLUDING BUT NOT LIMITED TO FLUCTUATIONS IN ELECTRICAL POWER SUPPLY, COMPUTER HARDWARE MALFUNCTIONS, COMPUTER OPERATING SYSTEM SOFTWARE FITNESS, FITNESS OF COMPILERS AND DEVELOPMENT SOFTWARE USED TO DEVELOP AN APPLICATION, INSTALLATION ERRORS, SOFTWARE AND HARDWARE COMPATIBILITY PROBLEMS, MALFUNCTIONS OR FAILURES OF ELECTRONIC MONITORING OR CONTROL DEVICES, TRANSIENT FAILURES OF ELECTRONIC SYSTEMS (HARDWARE AND/OR SOFTWARE), UNANTICIPATED USES OR MISUSES, OR ERRORS ON THE PART OF THE USER OR APPLICATIONS DESIGNER (ADVERSE FACTORS SUCH AS THESE ARE HEREAFTER COLLECTIVELY TERMED "SYSTEM FAILURES"). ANY APPLICATION WHERE A SYSTEM FAILURE WOULD CREATE A RISK OF HARM TO PROPERTY OR PERSONS (INCLUDING THE RISK OF BODILY INJURY AND DEATH) SHOULD NOT BE RELIANT SOLELY UPON ONE FORM OF ELECTRONIC SYSTEM DUE TO THE RISK OF SYSTEM FAILURE. TO AVOID DAMAGE, INJURY, OR DEATH, THE USER OR APPLICATION DESIGNER MUST TAKE REASONABLY PRUDENT STEPS TO PROTECT AGAINST SYSTEM FAILURES, INCLUDING BUT NOT LIMITED TO BACK-UP OR SHUT DOWN MECHANISMS. BECAUSE EACH END-USER SYSTEM IS CUSTOMIZED AND DIFFERS FROM NATIONAL INSTRUMENTS' TESTING PLATFORMS AND BECAUSE A USER OR APPLICATION DESIGNER MAY USE NATIONAL INSTRUMENTS PRODUCTS IN COMBINATION WITH OTHER PRODUCTS IN A MANNER NOT EVALUATED OR CONTEMPLATED BY NATIONAL INSTRUMENTS, THE USER OR

APPLICATION DESIGNER IS ULTIMATELY RESPONSIBLE FOR VERIFYING AND VALIDATING THE SUITABILITY OF NATIONAL INSTRUMENTS PRODUCTS WHENEVER NATIONAL INSTRUMENTS PRODUCTS ARE INCORPORATED IN A SYSTEM OR APPLICATION, INCLUDING, WITHOUT LIMITATION, THE APPROPRIATE DESIGN, PROCESS AND SAFETY LEVEL OF SUCH SYSTEM OR APPLICATION.



## Technical Support and Professional Services

Visit the following sections of the National Instruments Web site at ni.com for technical support and professional services:

- [Support](#)—Online technical support resources at ni.com/support include the following:
  - **Self-Help Resources**—For answers and solutions, visit the award-winning National Instruments Web site for software drivers and updates, a searchable [KnowledgeBase](#), [product manuals](#), step-by-step troubleshooting wizards, thousands of example programs, tutorials, application notes, instrument drivers, and so on.
  - **Free Technical Support**—All registered users receive free Basic Service, which includes access to hundreds of Applications Engineers worldwide in the [NI Developer Exchange](#) at ni.com/exchange. National Instruments Applications Engineers make sure every question receives an answer.  
  
For information about other [technical support options](#) in your area, visit ni.com/services or [contact](#) your local office at ni.com/contact.
- [Training and Certification](#)—Visit ni.com/training for self-paced training, eLearning virtual classrooms, interactive CDs, and Certification program information. You also can register for instructor-led, hands-on courses at locations around the world.
- [System Integration](#)—If you have time constraints, limited in-house technical resources, or other project challenges, National Instruments Alliance Partner members can help. To learn more, call your local NI office or visit ni.com/alliance.

If you searched ni.com and could not find the answers you need, contact your [local office](#) or NI corporate headquarters. You also can visit the [Worldwide Offices](#) section of ni.com/niglobal to access the branch office Web sites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

## Time Server

A **time server** ensures that all FieldPoint banks on the network are synchronized. Any computer running FieldPoint software and connected to the network can be a time server. A time client synchronizes with a time server periodically. Any FieldPoint Ethernet network module can be a time client. A [c]FP-2xxx running LabVIEW RT 7.1 or later can be a time client, a time server, or both.

To configure a FieldPoint Ethernet network module as a time client, go to the **Network Settings** tab and enter the IP address of the time server in the **Time Server** box, then click **Apply**.

To configure a [c]FP-2xxx as a time server, go to the **Bank Configuration** tab and check the **Enable as Time Server** box, then click **Apply**. If you do not want the [c]FP-2xxx to synchronize with an external time server, go to the **Network Settings** tab and enter 0.0.0.0 in the **Time Server** field, then click **Apply**.

To configure a [c]FP-2xxx as both a time server and a time client, go to the **Bank Configuration** tab and check the **Enable as Time Server** box, then click **Apply**. Go to the **Network Settings** tab and enter the IP address of the time server in the **Time Server** field, then click **Apply**.

The [c]FP-2xxx has an internal clock that provides consistent timestamps in the absence of a time server. You can set the date and time on the [c]FP-2xxx using the RT Set Date and Time VI. For information about using this VI, refer to the *LabVIEW Help*.

Back to [Configuring an Ethernet Network Module](#)

## Branch Offices

Office	Telephone Number
Australia	1800 300 800
Austria	43 0 662 45 79 90 0
Belgium	32 0 2 757 00 20
Brazil	55 11 3262 3599
Canada	800 433 3488
China	86 21 6555 7838
Czech Republic	420 224 235 774
Denmark	45 45 76 26 00
Finland	385 0 9 725 725 11
France	33 0 1 48 14 24 24
Germany	49 0 89 741 31 30
India	91 80 51190000
Israel	972 0 3 6393737
Italy	39 02 413091
Japan	81 3 5472 2970
Korea	82 02 3451 3400
Lebanon	961 0 1 33 28 28
Malaysia	1800 887710
Mexico	01 800 010 0793
Netherlands	31 0 348 433 466
New Zealand	0800 553 322
Norway	47 0 66 90 76 60
Poland	48 22 3390150
Portugal	351 210 311 210
Russia	7 095 783 68 51
Singapore	1800 226 5886
Slovenia	386 3 425 4200
South Africa	27 0 11 805 8197
Spain	34 91 640 0085
Sweden	46 0 8 587 895 00
Switzerland	41 56 200 51 51
Taiwan	886 02 2377 2222
Thailand	662 278 6777
United Kingdom	44 0 1635 523545
United States (Corporate)	512 683 0100