MAX Remote Systems Help

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This help file contains information about how to configure your remote systems or devices with Measurement & Automation Explorer (MAX).

Note Install the LabVIEW Real-Time Module and MAX on the host computer before you configure your remote system or device. Refer to Chapter 2, *Installation*, of the *LabVIEW Real-Time Module Release and Upgrade Notes* for more information about installing the LabVIEW Real-Time Module.

To comment on National Instruments documentation, refer to the National Instruments Web site.

Related Documentation

Most National Instruments manuals also are available as PDFs. You must have Adobe Acrobat Reader with Search and Accessibility 5.0.5 or later installed to view the PDFs. Refer to the Adobe Systems Incorporated Web site to download Adobe Reader. Refer to the National Instruments Product Manuals Library for updated documentation resources.

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

- *LabVIEW Help* (In LabVIEW, select **Help»Search the LabVIEW Help** to display the *LabVIEW Help*. On the Contents tab, navigate to the Real-Time Module book.)
- *LabVIEW Real-Time Module Release and Upgrade Notes*
- LabVIEW Real-Time Module documentation, tutorials, examples, and discussion forums are available on the internet at http://ni.com/support/labview/real-time.
- *NI-CAN User Manual*

Real-Time FAQs

You can find a LabVIEW Real-Time Module FAQ on the National Instruments Web site, ni.com.

Common Error Codes

You can find the most current information on an error code at http://ni.com/support by entering a search for the error code.

LabVIEW Real-Time Target Configuration

Complete the following steps to configure your remote system for use with the LabVIEW Real-Time Module. For a more complete explanation of these steps, refer to the [LabVIEW Real-Time Target Configuration Tutorial](#).

1. ## **Boot into LabVIEW Real-Time**
2. ## **Configure Network Settings**

3. ## **Install Software**
4. ## **Configure I/O**
5. ## **Configure System Settings**

When you complete these steps, your remote system is ready to target from LabVIEW Real-Time.

LabVIEW Real-Time Target Configuration Tutorial

Complete the following steps to configure your remote system for use with the LabVIEW Real-Time Module.

1. **Boot target into LabVIEW Real-Time** Before you begin configuration, make sure your RT series hardware is booted into LabVIEW Real-Time. If your RT target came with only LabVIEW Real-Time preinstalled on its hard drive, the system is already set up to boot into LabVIEW Real-Time. If your system does not have a floppy drive, it may have DIP switches or BIOS settings for booting into LabVIEW Real-Time. For more information, refer to Booting Into the LabVIEW Real-Time Module.

   If you have a system that has a floppy disk drive, you may need to create a boot disk to boot the system into LabVIEW Real-Time. For help creating a boot disk, refer to PXI Boot Disk or Desktop PC Boot Disk. In addition to the normal LabVIEW Real-Time boot procedure, there are some additional boot modes that you can use to troubleshoot or recover an RT target that is in a faulty state. Alternatively, you can permanently format the hard drive and configure it to boot directly into RT without a boot floppy by using the Desktop PC Utility USB Drive, a PXI Format Hard Drive Disk, or a Desktop PC Format Hard Drive Disk.

   📝 **Note** You must use Windows XP/2000 computers to create the disk utilities. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

2. **Configure Network Settings**
   Verify that your RT target is detected by expanding the **Remote Systems** tree (click the plus sign [+] beside **Remote Systems**). Your device may show up as 0.0.0.0 if you have not previously configured it with an IP address. If your device is not listed, refresh the list by pressing <F5>. Devices that have not been configured with an IP address must be on the same local subnet as the host in order to configure the IP address. If your device is already configured with an IP address but is not on the local subnet, add it to **Remote Systems** by right-clicking **Remote**

Systems and selecting **Create New**. Complete the wizard to add your system.

> **Note** Make sure that any network firewalls have been disabled. Even if exceptions have been set to allow communication, some firewalls continue to block IP addresses of 0.0.0.0 as long as they are enabled.

If your network uses DHCP, select the **Obtain an IP address automatically** radio button. Not all DHCP servers are implemented in the same manner. Therefore, some might not be compatible with the LabVIEW Real-Time Module. After you select **Obtain an IP address automatically** and restart the controller, LabVIEW Real-Time tries to obtain an IP address from the DHCP server. If this operation fails, LabVIEW Real-Time restarts the controller. If your target supports automatic IP assignment, it will attempt to obtain an automatic private IP address ($169.254.x.x$) and use it to boot up the rest of the system. After three failed attempts, LabVIEW Real-Time returns to the default configuration with IP address 0.0.0.0. You must then explicitly specify the network parameters.

If you need to specify an IP address manually, select the **Use the following IP address** radio button and click the **Suggest Values** button. This selection suggests settings based off of the network adapter in your computer. You are then prompted for an IP Address. Choose one that is not already in use on the network and click **OK**. If a Gateway and DNS are not available on the network, set these to the default value of 0.0.0.0.

You can enter a more descriptive name for the remote system as well as any comments you would like to include to describe the system and its components. When you are finished, click the **Apply** button at the top of the screen to save your changes. You are then informed that the system must be rebooted in order for the changes to take effect. You can reboot the system remotely.

For more information on network configuration, refer to [Configuring Network Settings](#).

3. **Install Software**
   You can install the LabVIEW Real-Time Module or other driver software on the remote target after you have assigned it an IP address.

   If your RT target has LabVIEW Real-Time preinstalled, you may still need to download additional driver software or update existing driver software.

   Complete the following steps to download software using the LabVIEW Real-Time Software Wizard:
   a. Expand **Remote Systems** in the configuration tree and then expand your RT target.
   b. Select **Software**. Click the **Add/Remove Software** icon on the toolbar to launch the LabVIEW Real-Time Software Wizard. If your target does not have a **Software** category, then it does not support the LabVIEW Real-Time software. Determine what you want to do. If your target uses recommended software sets, refer to Installing Recommended Software Sets. If your target uses a custom software selection, refer to Installing a Custom Software Selection.

      Note If a driver is installed on the host PC but is not displayed in the LabVIEW Real-Time Software Wizard, the Real-Time component of that driver may not be installed. This issue commonly occurs when drivers were installed prior to installing the LabVIEW Real-Time module. To resolve this issue, navigate to **Start»Control Panel»Add or Remove Programs** (in Windows Vista, navigate to **Start»Control Panel»Programs»Programs and Features**) and select **National Instruments Software** in **Currently installed programs**. Click **Change** to modify the driver installation to add the LabVIEW Real-Time components.

   c. **Configure System Settings**
      You can configure two system-level settings for your LabVIEW Real-Time target—time zone and locale.

Use the time zone setting to configure time zone and daylight saving settings for the location in which the target resides. You can use this setting in conjunction with LabVIEW time and date VIs to provide accurate time information, relative to the time zone setting.

Use the locale setting to change the locale of strings returned from the remote target. This setting is not supported by all software and is disabled if not supported by any software on your target.

For more information on configuring these settings, refer to Configuring System Settings.

d. **Configure I/O**
You must configure any National Instruments I/O devices before you can target them from a LabVIEW Real-Time application. For information on how to correctly configure I/O devices, refer to Device Configuration or the documentation for that hardware.

When you complete these steps, your remote system is ready to be targeted from the LabVIEW Real-Time module.

Connecting to LabVIEW Real-Time Targets

Complete the following steps to locate and connect to a LabVIEW Real-Time target.

1. **Connect to a Host Computer** Your target must be connected to the same subnet that contains the host computer you use to configure the remote system. For information about how to connect your target, refer to Making Network and Non-Network Connections.

2. **Detect the Remote System**
   In order to configure your target, you must detect it within MAX. For information about how to detect the remote system, refer to Using MAX to Detect Remote Systems.

Using the Network Settings panel, you can also enter a name or comments for your target.

System States

Connected systems can be in any one of number of states, as defined in the following table:

State	Description
Unconfigured	The IP address is set at 0.0.0.0. You need to obtain a valid IP address.
Disconnected	MAX cannot find the target on the network.
Disconnected - Rebooting	The target is rebooting.
Initializing	The target is currently starting up.
Inconsistent IP Settings	The target is connected but has an IP address that may not allow full configuration. You need to correct its IP settings.
Connected - Running	The target has booted and is functioning normally.
Connected - Install Mode	The target is connected in Install mode. Install mode means the target is in safe mode where you can change any software on the target using MAX.
Connected - Safe Mode (No Software Installed)	The target is connected in safe mode, but it has no software installed on it. You will see No software installed on the target's monitor if the system boots but cannot find the necessary LabVIEW Real-Time operating system files on the target.
Connected - Safe Mode (User Directed)	You will see Safe Mode (User Directed) when the target has been designated to enter safe mode by flipping a safe mode switch on a target, or if you boot into safe mode using a Safe Mode floppy disk or Safe Mode on the Desktop PC Utility USB Drive.
Connected - Safe Mode (Software Update Required)	The target does not support the version of software installed on the system. This

	mode requires that you install a newer version of LabVIEW Real-Time and/or components. The target's monitor will indicate the oldest compatible version of LabVIEW Real-Time supported by that hardware target.
Connected - Safe Mode (Software Error)	This mode occurs after the target's controller rebooted three times unexpectedly because of a crashing startup application or driver or some other problem that causes the target to have an unsafe reboot.
Connected - Safe Mode (Improper Installation)	This mode occurs after the target's controller attempted to boot and caused specific errors when attempting to load core operating system files. This mode is similar to No Software Installed, however the files are present and are causing fatal errors when attempted to load. This message can also be displayed if required tokens are not present in the ni-rt.ini file that refer to startup information and/or core operating system files.

Note Booting into safe mode bypasses the normal boot programs on the RT target. Safe mode boots only essential services required for updating the RT target's configuration and installing software. Safe mode is useful if the software on the RT target becomes corrupted, as it bypasses the corrupted software. You can then use MAX to reinstall the software. For more information on booting into safe mode, refer to Booting Into the LabVIEW Real-Time Module.

Booting Into the LabVIEW Real-Time Module

How to boot into LabVIEW Real-Time Module depends on the mode and the type of system you have.

Boot Modes

You can boot into LabVIEW Real-Time using the modes described in the following table.

Boot Mode	Description
Normal Boot Mode	Booting into this mode makes the RT target fully operational. This is the default boot mode.
IP Reset	Booting into this mode clears all the IP configuration information, as well as the system configuration password. You can use IP Reset to recover from misconfigured IP settings or a forgotten password.
Startup Application Disabled	Booting into this mode prevents a LabVIEW startup application from running on the RT target, even if one is present. You can use Startup Application Disabled mode to recover from a startup application which takes over the CPU and prevents connections to the target.
Safe Mode	Booting into this mode bypasses the normal boot programs on the RT target. Instead, it boots only essential services required for updating the RT target's configuration and installing software. Safe mode is useful if the software on the RT target becomes corrupted, as it bypasses the corrupted software. You can then use MAX to reinstall the software.
Uninstall Mode	Booting into this mode removes the LabVIEW Real-Time-related software from the RT target. You can use Uninstall Mode if the software on the RT target becomes corrupted, as this mode removes the corrupted software. You can use MAX to reinstall your software. This mode is valid only for RT targets with floppy drives.

Types of Systems

Booting the RT target into the LabVIEW Real-Time Module depends on the type of RT target you have.

Common ways to boot into LabVIEW Real-Time Module include using a floppy disk, a USB drive, DIP switches, and setting the Safe Mode boot option in the BIOS. Refer to your hardware documentation for more detailed information on how to boot your system into LabVIEW Real-Time Module. Refer to the RT Disk Utilities and Desktop PC Utility USB Drive topics for information on creating utility disks and USB drives, if appropriate for your system.

RT Disk Utilities

Notes

- If you use a remote system that does not have a floppy drive, refer to your hardware documentation for information about how to perform these tasks. You can format your hard drive by right-clicking the remote system in the configuration tree and selecting **Format Disk**, if your remote system supports this feature.
- You must use Windows XP/2000 computers to create the disk utilities. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Use the **Tools»RT Disk Utilities** menu in MAX to create floppy disks for your remote system. If you have multiple versions of these utilities, MAX prompts you to select the appropriate version. You can create the following disks:

[Desktop PC Utility USB Drive](#)

[PXI Format Hard Drive Disk](#)

[PXI Boot Disk](#)

[PXI Safe Mode Disk](#)

[Desktop PC Format Hard Drive Disk](#)

[Desktop PC Boot Disk](#)

[Desktop PC Safe Mode Disk](#)

[Launch Settings Reset Disk](#)

[IP Reset Disk](#)

[Uninstall Disk](#)

All disks except for the PXI Boot Disk and the Desktop PC Boot Disk are usually used for troubleshooting purposes. The boot disks are necessary to use the LabVIEW Real-Time Module with a Windows operating system.

You must define the boot sequence for your desktop PC or PXI controller in the BIOS settings to boot from a floppy disk. If this BIOS setting is set to boot from the hard drive before the floppy drive, the controller boots

into Windows. Refer to your hardware documentation for more information about BIOS settings.

In addition, you might need to change your BIOS settings if you are booting your remote system without a keyboard. Refer to your hardware documentation to determine whether your system supports this option. If you are using the RT Series PXI controller and it does not appear in MAX, try the following techniques:

- When configuring the RT Series PXI controller, ensure that the controller is located on the same subnet of your network as the host PC. If you are unsure of your network configuration, consult your network administrator for assistance.
- If you do not have a keyboard connected to the RT Series PXI controller, check the BIOS settings of the controller. The **Halt On** setting must be set to **All, But Keyboard** for the PXI controller to boot without a keyboard connected. You can find the **Halt On** setting in the **Standard CMOS Setup** options. Refer to the PXI controller documentation for information about BIOS settings.

Desktop PC Utility USB Drive

The Desktop PC Utility USB Drive lets you perform maintenance operations on a USB-capable desktop PC with LabVIEW Real-Time installed on its hard drive.

Notes
- You must use a bootable USB device.
- You must have Administrator privileges on the host computer in order to create this utility.

Complete the following steps to create the Desktop PC Utility USB Drive from your host PC or PXI system:

1. Launch MAX by selecting **Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
2. Plug a USB drive into a USB port.

   Note Close all applications and windows that access the USB drive you want to use as the Desktop PC Utility USB Drive. The USB drive must not be in use by any other processes.

3. Select **Tools»RT Disk Utilities»Create Desktop PC Utility USB Drive**.
4. Click **Yes** to confirm that you want to create the Desktop PC Utility USB Drive.
5. Select the version of the utility you want to use and click **OK**.
6. Select the USB drive you want to format as a Desktop PC Utility USB Drive. Click **OK**.

   Caution Any data on the USB drive will be overwritten.

7. If necessary, confirm that you are aware that this operation destroys all data on the selected USB drive.

To use the Desktop PC Utility USB drive, plug it into an empty USB port on the desktop PC you use as the remote system. Power on or reset the remote desktop PC.

Note You must set the BIOS of the computer on which you want to use the USB device to allow booting from a USB drive. Set the

boot sequence to search for boot files on the USB drive first.

The Desktop PC Utility USB Drive presents six menu selections:

1. **Boot using software installed on the hard-disk.** Boots the system using NI Real-Time software installed on the hard drive. If there is no NI Real-Time software installed on the hard drive, the utility boots the system into safe mode to allow software to be installed.
2. **Boot into safe mode.**
   Boots the system into safe mode. This selection brings up the minimal set of services necessary to configure the system's network settings and to install software to the system. This mode does not utilize any installed software on the hard drive, so it is useful as a recovery mode if you are having difficulty booting the software from the hard drive.
3. **Reset network configuration.**
   Clears the system's IP address, subnet mask, gateway, and DNS address. When the target is rebooted, it will automatically acquire an IP address if your target supports automatic IP assignment. If your target has an IP address of 0.0.0.0, you must reconfigure its network settings.
4. **Clear password.**
   Clears the system's password, if one has been set.
5. **Disable LabVIEW Real-Time start-up application.**
   If there is a LabVIEW Real-Time start-up application present, this selection prevents it from running when the system starts up. Once the application has been disabled, you must use the LabVIEW Real-Time development environment to reenable it.
6. **Format hard disk.**
   Reformats the system's hard drive to allow you to boot NI Real-Time software directly from the hard drive. This operation will destroy all data currently on the hard drive. Targets that support automatic IP address assignment will be assigned an IP address. For targets that do not support automatic IP address assignment, the first time the system boots from the hard drive after it has been formatted, it will boot into safe mode with an IP address of 0.0.0.0. You can then configure the system's network settings and install software to the hard drive.

PXI Format Hard Drive Disk

The PXI Format Hard Drive Disk reformats the C: drive of the remote system, deleting all data on that system. It then configures the hard disk to boot directly into the real-time operating system, which allows you to boot into the LabVIEW Real-Time Module if LabVIEW Real-Time was not preinstalled. All other operating systems and data are deleted.

To boot your PXI system into either Windows or LabVIEW Real-Time, use a PXI Boot Disk when you want to boot into LabVIEW Real-Time. If you prefer to use your PXI system only for real-time LabVIEW Real-Time applications, use the PXI Format Hard Drive disk once to enable the system to boot into LabVIEW Real-Time without a boot floppy.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the PXI Format Hard Drive Disk

Complete the following steps to create a PXI Format Hard Drive Disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create PXI Format Hard Drive Disk**.
4. The **PXI Format Hard Drive Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT PXI Format Hard Drive Disk*.

Using the PXI Format Hard Drive Disk

Insert the boot disk into the floppy drive of the PXI controller you use as the remote system. Power on or reset the controller to format the hard drive.

Note The hard drive must be formatted FAT32 in order to use the PXI Format Hard Drive Disk.

PXI Boot Disk

The PXI Boot Disk boots a PXI controller into the LabVIEW Real-Time Module. You must have this disk in the PXI controller floppy drive to boot into LabVIEW Real-Time if your PXI system has a Windows operating system installed.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the PXI Boot Disk

Complete the following steps to create a boot disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create PXI Boot Disk**.
4. The **PXI Boot Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT PXI Boot Disk*.

Using the PXI Boot Disk

Use this boot disk each time you boot your PXI system into LabVIEW Real-Time. Insert the boot disk into the floppy drive of the system you will use as the remote system. Power on or reset the system to boot into LabVIEW Real-Time. When the PXI system is booted into LabVIEW Real-Time, you can configure the remote system. Refer to your PXI documentation for more information about configuring your desktop PC.

PXI Safe Mode Disk

The PXI Safe Mode Disk bypasses the normal boot programs on the controller. Instead, it uses programs on the floppy disk to boot only essential services required for updating the controller's configuration and installing software. Safe Mode is useful if the software on the controller becomes corrupted, as it bypasses the corrupted software. You can then use MAX to reinstall the software.

> **Note** You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the PXI Safe Mode Disk

Complete the following steps to create a safe mode boot disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create PXI Safe Mode Disk**.
4. The **PXI Safe Mode Disk** dialog box appears. Click **Yes** to make the disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT PXI Safe Mode Disk*.

Using the PXI Safe Mode Disk

Complete the following steps to boot into this mode if your system has a floppy drive:

1. Place disk into the PXI system's floppy disk drive.
2. Restart the system.
3. Remove the disk from the RT target and reboot as normal.

You can now use MAX to reconfigure the RT target and reinstall software. Refer to your PXI documentation for more information about configuring your PXI controller.

Desktop PC Format Hard Drive Disk

The Desktop PC Format Hard Drive Disk reformats the C: drive of the remote system, deleting all data on that system. It then configures the hard disk to boot directly into the real-time operating system, which allows you to boot into the LabVIEW Real-Time Module if LabVIEW Real-Time was not preinstalled. All other operating systems and data are deleted.

To boot your desktop PC system into either Windows or LabVIEW Real-Time, use a Desktop PC Boot Disk when you want to boot into LabVIEW Real-Time. If you prefer to use your desktop PC system only for real-time LabVIEW Real-Time applications, use the Desktop PC Format Hard Drive disk once to enable the system to boot into LabVIEW Real-Time without a boot floppy.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the Desktop PC Format Hard Drive Disk

Complete the following steps to create a Desktop PC Format Hard Drive Disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create Desktop PC Format Hard Drive Disk**.
4. The **Desktop PC Format Hard Drive Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT Desktop PC Format Hard Drive Disk*.

Using the Desktop PC Format Hard Drive Disk

Insert the boot disk into the floppy drive of the remote desktop PC you use as the remote system. Power on or reset the remote desktop PC to format the hard drive.

> **Note** The hard drive must be formatted FAT32 in order to use the Desktop PC Format Hard Drive Disk.

Desktop PC Boot Disk

The Desktop PC Boot Disk boots a desktop PC into the LabVIEW Real-Time Module. You must have this disk in the desktop PC floppy drive to boot into LabVIEW Real-Time if your system has a Windows operating system installed.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the Desktop PC Boot Disk

Complete the following steps to create a boot disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create Desktop PC Boot Disk**.
4. The **Desktop PC Boot Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT Desktop PC Boot Disk*.

Using the Desktop PC Boot Disk

Use this boot disk each time you boot your Windows desktop PC into LabVIEW Real-Time. Insert the boot disk into the floppy drive of the desktop PC you will use as the remote system. Power on or reset the PC to boot into LabVIEW Real-Time. When the remote desktop PC is booted into LabVIEW Real-Time, you can configure the remote system. Refer to your PC documentation for more information about configuring your desktop PC.

Desktop PC Safe Mode Disk

The Desktop PC Safe Mode Disk bypasses the normal boot programs on the remote desktop PC. Instead, it uses programs on the floppy disk to boot only essential services required for updating the remote desktop PC's configuration and installing software. Safe Mode is useful if the software on the remote desktop PC becomes corrupted, as it bypasses the corrupted software. You can then use MAX to reinstall the software.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the Desktop PC Safe Mode Disk

Complete the following steps to create a safe mode boot disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create Desktop PC Safe Mode Disk**.
4. The **Desktop PC Safe Mode Disk** dialog box appears. Click **Yes** to make the disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT Desktop PC Safe Mode Disk*.

Insert the boot disk into the floppy drive of the desktop PC you use as the remote system. Power on or reset the remote desktop PC to boot the system into safe mode.

Using the Desktop PC Safe Mode Disk

Complete the following steps to boot into this mode if your system has a floppy drive:

1. Place disk in the system's floppy disk drive.
2. Restart the system.
3. Remove the disk from the RT target and reboot as normal.

You can now use MAX to reconfigure the RT target and reinstall software. Refer to your remote desktop PC documentation for more information about configuring a remote desktop PC.

Launch Settings Reset Disk

The Launch Settings Reset Disk resets the system so that the LabVIEW Real-Time Module does not start any user applications on startup. No other settings are affected. Use this disk if a runaway user application has caused the system to become unresponsive upon startup.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the Launch Settings Reset Disk

Complete the following steps to create a Launch Settings Reset Disk from your host PC or PXI system:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create Launch Settings Reset Disk**.
4. The **Launch Settings Reset Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT Launch Settings Reset Disk*.

Using the Launch Settings Reset Disk

Complete the following steps to boot into Launch Settings Reset mode using an RT target with a floppy drive:

1. Place the disk in the RT target's floppy drive.
2. Power on or reset the remote system to reset the launch settings.
3. Remove the disk from the RT target and boot as normal.

IP Reset Disk

The IP Reset Disk resets the IP network settings of the PXI controller or remote desktop PC to the factory defaults, 0.0.0.0. You also can use this disk to clear the password and unlock the remote system if the system is locked with a password.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Complete the following steps to create an IP Reset Disk from your host PC or PXI system:

Creating the IP Reset Disk

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host PC.
3. Select **Tools»RT Disk Utilities»Create IP Reset Disk**.
4. The **IP Reset Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT IP Reset Disk*.

Using the IP Reset Disk

Complete the following steps to boot into IP Reset mode using an RT target with a floppy drive:

1. Place the IP Reset Disk in the RT target's floppy drive.
2. Power on or reset the controller to reset the IP settings and password.
3. Remove the disk from the RT target and boot as normal.

You must use MAX to reconfigure the IP address before you can connect to the RT target using LabVIEW.

Uninstall Disk

The Uninstall Disk removes an installation of the LabVIEW Real-Time Module, along with all configuration information, such as IP address. Use the uninstall disk if the remote system becomes unresponsive and prevents you from installing software remotely.

Note You must use Windows XP/2000 computers to create this disk utility. If your system uses Windows Vista, you must create a Desktop PC Utility USB Drive instead.

Creating the Uninstall Disk

Complete the following steps to create an uninstall disk from your host computer:

1. Place a floppy disk in the drive of the host PC. Any data on the floppy disk will be overwritten.
2. Launch MAX by selecting **All Programs»National Instruments»Measurement & Automation Explorer** from the Windows **Start** menu on the host computer.
3. Select **Tools»RT Disk Utilities»Create Uninstall Disk**.
4. The **Uninstall Disk** dialog box appears. Click **Yes** to make the boot disk. Follow the instructions that appear on your screen.
5. Select the version of the disk utilities you want to use.
6. After the system finishes creating the boot disk, remove the floppy disk and label it *LabVIEW RT Uninstall Disk*.

Using the Uninstall Disk

Complete the following steps to boot into this mode:

1. Place the disk in the RT target's floppy drive.
2. Reboot the RT target.
3. Remove the disk from the RT target and replace it with a boot disk.
4. Reboot the RT target again.

You must now use MAX to reconfigure the RT target and reinstall software.

Making Network and Non-Network Connections

The host computer communicates with the remote system over a standard Ethernet connection. If the host computer is already configured on a network, you must configure your remote system on the same network. If neither machine is connected to a network, you must connect the two machines directly using a CAT-5 crossover cable or hub. You can use the direct connection to configure the remote system from the host computer system.

Note If your target does not support automatic IP address assignment and you want to make a direct connection using a CAT-5 crossover cable, you must first disable DHCP on your host computer. Complete the following steps to disable DHCP:

1. From the Windows Start menu, select the following, depending on your computer's operating system:
    *   **Control Panel»Network and Internet»Network and Sharing Center»Manage network connections** if you are using Windows Vista
    *   **Control Panel»Network Connections** if you are using Windows XP
    *   **Settings»Control Panel»Network and Dial-up Connections** if you are using Windows 2000
2. Right-click the network connection you want to configure, and then select **Properties**.
3. On the **General** tab, click **Internet Protocol (TCP/IP)**, and then select **Properties**. In Windows Vista, select **Internet Protocol Version 4 (TCP/IPv4)**.
4. Click **Use the following IP address**. Enter an IP address for your host computer.

For targets that do not automatically acquire their IP addresses from DHCP, both the host computer and the remote system must reside on the same subnet in order for you to configure the remote system with MAX.

You can develop and run LabVIEW Real-Time Module applications when the remote system is on a different subnet than that of the host computer. To run LabVIEW Real-Time applications on a remote system that resides on a different subnet, assign a static IP address to the controller that

corresponds to the subnet where the remote system is located. Refer to [Assigning an IP Address](#) for more information about IP addresses.

Using MAX to Detect Remote Systems

Expand **Remote Systems** in the Measurement & Automation (MAX) configuration tree. Previously detected remote systems appear immediately beneath Remote Systems in the configuration tree. MAX continues to search for newly attached remote systems on the local subnet. Detected systems will be added to the list after a short delay. All detected systems appear beneath **Remote Systems** in the configuration tree. MAX searches for new remote systems every time you launch MAX and expand **Remote Systems**. You can also detect newly connected remote systems by selecting **View»Refresh (F5)** to scan for local and remote devices.

Note The IP address of your remote system appears as the default remote system name in the configuration tree. If more than one system appears in **Remote Systems**, select the IP address of the system you want to configure. Use the **Network Settings** tab of the configuration view to assign a host name, if available, to your remote system. MAX then uses the name to identify the device in the configuration tree. (This host name is not necessarily a DNS host name. For more information about host names, refer to Configuring Network Settings.) The system state may be **Unconfigured** if your target does not support automatic IP assignment and if you have not set the IP address for the target.

For more information about setting an IP address, refer to IP Settings Information.

Configuring Network Settings

Complete the following steps to configure the network settings of your networked RT Series devices:

1. From MAX, expand **Remote Systems** in the configuration tree and select your remote system.
2. Select the **Network Settings** tab. If this is the first time that you have started the controller, the setting could show either a network address, an automatic private IP address (169.254.*x.x*), or 0.0.0.0, depending on how your target acquires network addresses.
3. Enter a host name in the **Name** text box. Choose a name that makes your system easy to identify.

   Note Your system may already have a named assigned to it. You can keep this name or enter another name.

   Note You can assign a remote system either a static IP address or automatically. If you use a static IP address, then you cannot use the host name from another computer to contact the remote system. The host name is just a label in this case.

   If you configure your system to automatically acquire an IP address, the system requests an IP address from the DHCP server when the system starts up. When it assigns the IP address, the DHCP server can also assign a host name based on a requested host name from your system. If everything is configured correctly, then the DHCP server adds that host name to the DNS tables, and you can now contact this host with its host name using DNS. Because this host name request is part of the DHCP protocol, it only works with DHCP.

   Although the DHCP specification allows for a remote system to request a host name from the server, it does not require that the DHCP server grant this request. The DHCP server can:

- Grant the request.
- Ignore the request entirely.
- Alter the host name, such as turning a requested host name of myhost into myhost_dynip123.

The DHCP server has no feedback mechanism. The only way to find out the assigned host name is to do a reverse DNS lookup on the IP address of the system. (From a command prompt, type nslookup *<ip address>*.)

Note DHCP for FieldPoint requires LabVIEW Real-Time 7.0 or later. DNS name assignment for FieldPoint requires LabVIEW Real-Time 7.1 or later.

4. On the **Network Settings** tab, enter the Ethernet parameters you want to assign to the remote system.

   You can either assign a static IP address or have the system retrieve an IP address automatically. For more information, refer to IP Configuration. For more information on setting static IP addresses, refer to Specifying a Static IP Address. For more information on obtaining an IP address automatically, refer to Assigning an IP Address.

   IP Address and **Subnet Mask** are required parameters. Set **Gateway** and **DNS Server** to the default configuration, 0.0.0.0, if your network does not have a gateway or DNS server.

5. If you are running a PXI system and if you do not have a static IP address, select **Obtain an IP address automatically** in the IP Settings section of the Network Settings tab to obtain an IP address automatically. If you configured your device to use a static IP address, skip this step.

6. Click **Apply** in the Network Settings tab.

7. Click **Yes** when prompted to restart the remote system.

8. Configure locking and TCP/IP halt, if desired.

IP Configuration

Assigning an IP Address

You can connect to your remote system either by connecting it and your host computer to a local area network or by connecting it directly to your host computer using a CAT-5 crossover cable. Either way, your remote system must have an IP address assigned to it. You can either attempt to obtain an IP address automatically or manually specify one.

Some targets, such as all FieldPoint FP-160x RT targets, require that you specify a static IP address, as they do not support automatic IP address assignment. You may also need to specify an IP address if your remote system is not connected to a network and you want to make a direct connection. Refer to Specifying a Static IP Address for help specifying an IP address.

If your remote system is on a network that has a DHCP server, you may be able to automatically obtain an IP address from the DHCP server. A DHCP server allocates an IP address to your target each time the target is started. You do not need to specify other information such as **Subnet Mask** if you select the **Obtain an IP address automatically** option. If you do not know whether your network has a DHCP server, check with your network administrator for assistance. To automatically obtain an IP address, select **Obtain an IP address automatically**, then click **Apply**. You must restart the remote system for any changes to take effect.

Not all DHCP servers are implemented in the same manner. Therefore, some might not be compatible with the LabVIEW Real-Time Module. After you select **Obtain an IP address automatically** and restart the RT target, LabVIEW Real-Time tries to obtain an IP address from the DHCP server. If this operation fails, LabVIEW Real-Time automatically restarts the RT target and attempts to assign an automatic private IP address ($169.254.x.x$), if your target supports this feature. Automatic private IP addresses are network addresses intended for use in a local network only. After three failed attempts, LabVIEW Real-Time returns to the default configuration with IP address 0.0.0.0. In this case, you need to explicitly specify the network parameters.

In addition, when you use a DHCP server, the server allocates an IP address to the remote system each time you boot the target. The new IP address might be different than the address previously assigned. If you use the DHCP server to assign an IP address to your target, you need to

check the IP address using MAX each time you target LabVIEW Real-Time to the target. To avoid needing to check the IP address each time, specify a static IP address for the target instead of using a DHCP server.

Specifying a Static IP Address

If you choose to specify an IP address, select **Use the following IP address** from the Network Settings tab, fill in the network parameters described below with correct values for your network, then click **Apply**. You must restart the remote system for any changes to take effect.

- **IP Address**—The unique address of a device on your network. Each IP address is a set of four one- to three-digit numbers. Each number is in the range from 0 through 255 and is separated by a period. This format is called dotted decimal notation. The IP address 224.102.13.24 is an example of dotted decimal notation.
- **Subnet Mask**—A code that helps the network device determine whether another device is on the same network or a different network. 255.255.255.0 is the most common subnet mask.
- **Gateway**—The IP address of a device that acts as a gateway server, which is a connection between two networks.
- **DNS Address**—The IP address of a network device that stores DNS host names and translates them into IP addresses.

Consult with your network administrator before specifying these parameters. If you do not have a network administrator or you are the network administrator, refer to IP Settings Information for more help. If you are uncertain about what to set, click **Suggest Values** to have MAX attempt to detect the appropriate settings. Click **Refresh** to revert your changes.

IP Settings Information

If you are assembling your own Ethernet network, you can choose an IP address. The subnet mask determines the format of the IP address. Use the same subnet mask as the host computer when you configure your remote system. For example, if your subnet mask is 255.255.255.0, the first three numbers in every IP address on the network must be the same. If your subnet mask is 255.255.0.0, only the first two numbers in the IP addresses on the network must match.

For either subnet mask, you can use numbers between 1 and 254 for the last number of the IP address. (Do not use numbers 0 and 255; they are reserved.) You can use numbers between 0 and 255 for the third number of the IP address, but this number must be the same as other devices on your network if your subnet mask is 255.255.255.0.

If you are setting up your own network and do not have a gateway or DNS server, set these values to the default configuration, 0.0.0.0.

To find out the network settings for your host computer, run ipconfig.

To run ipconfig, open a command prompt window, type ipconfig at the prompt, and press **<Enter>**. If you need more information, run ipconfig with the /all option by typing ipconfig /all to see all the settings for the computer. Make sure you use the settings for the correct Ethernet adapter to configure your remote system.

Halting the System if TCP/IP Fails

Use the **Halt system if TCP/IP fails** checkbox to determine how the LabVIEW Real-Time Module and the controller behave when there is a TCP/IP failure while the controller is booting.

If the checkbox is not checked, LabVIEW Real-Time starts and runs start-up applications you created, even if it cannot automatically obtain an IP address, or if TCP/IP fails for any other reasons when you start the system. When the connection becomes available, you must manually restart the controller in order to connect it to the network.

If TCP/IP fails and the checkbox is checked, LabVIEW Real-Time attempts to obtain an automatic IP address using DHCP. If the attempt to obtain an IP address fails, LabVIEW Real-Time attempts to obtain an automatic private IP address (169.254.x.x), if your target supports this feature. If the attempt to obtain a private IP address also fails or is not supported, LabVIEW Real-Time will reboot the target to try again. After three failed attempts, LabVIEW Real-Time resets the controller to IP address 0.0.0.0.

Note DHCP failure is considered a TCP/IP failure.

Advanced Ethernet Settings

Use the Advanced Ethernet Settings dialog box to configure advanced Ethernet settings for an RT target. Click **Advanced Ethernet Settings** on the Network Settings tab to access these settings.

Note Use caution when attempting to change the Ethernet settings of an RT target. Changing the Ethernet settings of an RT target can affect the network performance of the target.

This dialog box includes the following components:

- **Ethernet Devices (by MAC Address)**—Lists by media access control (MAC) address all the Ethernet devices detected in the system. The first device in the list is the default device.
- **Make Primary**—Makes the selected device the primary device. The previous primary device is disabled. You can re-enable the previously primary device unless it is the default device. The button is disabled if the selected device is already the primary device.
- **Mode**—If the selected device is the primary network device, **Mode** is **TCP/IP Network**. The primary device can only be used for TCP/IP (DHCP or Static) or be disabled. For devices other than the primary device or the default device, **Mode** specifies how the device is used. The menu is disabled if the selected device is the primary or default device. You can reserve other network devices for application-specific purposes by selecting other modes, including Time-Triggered and EtherCAT, if supported. When you reserve a device, you set that device aside for an application that takes control of it at a later time. It is not configured or initialized at boot time like devices set for TCP/IP.
- **IP Address**—For devices other than the primary device or the default device, specifies the IP address for that device. The fields are disabled if the selected device is the primary device or the default device or if the **Mode** of the device is not **TCP/IP Network**. If the selected device is the primary device, the IP address is the primary IP address of the target as specified on the main Network Settings tab.
- **Subnet Mask**—For devices other than the primary device or the default device, specifies the subnet mask for that device. The fields are disabled if the selected device is the primary device or the

default device or if the **Mode** of the device is not **TCP/IP Network**. If the selected device is the primary device, the subnet mask is the primary subnet mask of the target as specified on the main Network Settings tab.

- **Preferred Media Mode**—For devices whose **Mode** is set to **TCP/IP Network** (including the primary device), selects the mode the device uses to communicate on the wire. The menu is displayed only if the device's **Mode** is **TCP/IP Network** and shows only those options the device supports.

    Note The remote target does not have to honor this setting. The actual mode used by the remote target may differ.

    You can set the following speed/duplex items:

    10 Sets the connection speed of the Ethernet hardware to 10 Mbps.

    100 Sets the connection speed of the Ethernet hardware to 100 Mbps.

    Gigabit Sets the connection speed of the Ethernet hardware to 1,000 Mbps, or 1 gigabit per second (Gbps)

    Half The RT target allows one-way communication through the Ethernet connection. The RT target can send data or receive data, but not simultaneously.

    Full The RT target allows two-way communication through the Ethernet connection. The RT target can send and receive data simultaneously.

    Note Setting the duplex of RT targets from full to half can increase network performance for some targets.

- **Packet Detection**—For devices whose mode is set to TCP/IP Network (including the primary device), selects the method the device uses to detect incoming packets. For targets that support the Advanced Ethernet DDP command, only the actual capabilities of the driver are enabled. For targets that do not support the Advanced Ethernet DDP command, both items are enabled regardless of the actual capabilities of the driver. The menu is disabled if the device's mode is not **TCP/IP Network**.

You can set the following mode settings for an RT target:

Interrupt The operating system of the RT target waits for an interrupt that signals the arrival of new data through the Ethernet connection. The operating system then retrieves the new data.

Polling he operating system of the RT target periodically checks for the arrival of new data through the Ethernet connection. If new data is available, the operating system retrieves the new data. You must set the polling interval if you select the polling mode.

- **Polling Interval**—For devices that are set to use polling for packet detection, specifies how often the driver should check for new packets. Permissible values range from 1 to 10000 ms. The field is disabled if the device is not set to use polling for packet detection.

- **Maximum Number of Sockets**—Specifies the maximum number of sockets that can be open simultaneously on the target. Some sockets are required for services such as the DDP server, the FTP server, and LabVIEW itself, so the number specified here is not the same as the number of network connections the user can make to the system. Permissible values range from 20 to 65534 sockets.

- **IP Fragment Hold Time**—Specifies how many seconds IP fragments are held waiting for the remaining fragments to be received to complete the packet. Permissible values range from 2 to 255 seconds.

Change IP (Offline)

Use **Change IP (Offline)** to change the IP address of your remote system after it obtained an IP address different from its current IP address.

MAX automatically detects an IP address change for targets on the local subnet. If the IP address of a target on a remote subnet changes, you can use this setting to make MAX aware of the change.

To access this setting, expand **Remote Systems** in the MAX configuration tree. Right-click your system and select **Change IP (Offline)**.

Configuring System Settings

You can set two system-level settings for your LabVIEW Real-Time target—time zone and locale.

Use the **Time zone** setting to configure the time zone in which the target resides. You can use this setting with LabVIEW time and date VIs to provide accurate time information, relative to the time zone setting. Check the daylight saving time checkbox to automatically adjust the target's clock for daylight saving time changes, if this feature is supported by the target.

Use the **Locale** setting to change the locale of strings returned from the remote target. Not all software supports this setting, which is disabled if not supported by any software on your target.

You can view, but not change, four system-level items in the **System Monitor** section:

- **Total Disk Space** displays the total amount of disk space on the primary drive, for example C:, on this target.
- **Free Disk Space** displays the amount of free disk space on the primary drive, for example C:, on this target.
- **Total RAM** displays the total amount of memory on this target.
- **Free RAM** displays the amount of free memory on this target.

Adding or Removing Software

You can install the LabVIEW Real-Time Module or other driver software on the remote target after you have assigned it an IP address.

If your RT target has LabVIEW Real-Time preinstalled, you may still need to download additional driver software. In this case, the state of your RT target should be **Connected-Running** on the Network Settings tab.

If your RT target has a Windows operating system installed, you must install LabVIEW Real-Time. You can install or upgrade LabVIEW Real-Time or other driver software using the LabVIEW Real-Time Software Wizard.

Complete the following steps to launch the LabVIEW Real-Time Software Wizard:

1. Expand Remote Systems in the configuration tree and then expand your RT target.
2. Select the Software category. Click the **Add/Remove Software** icon on the toolbar to launch the LabVIEW Real-Time Software Wizard. If your RT target does not have a Software category, it does not support the LabVIEW Real-Time software.
3. Use the LabVIEW Real-Time Software Wizard to add, remove, or update the software on your remote target.

Using the LabVIEW Real-Time Software Wizard

Complete the following steps to download software using the LabVIEW Real-Time Software Wizard:

1. If you have not already launched the LabVIEW Real-Time Software Wizard, complete the following directions to do so:

   a. Expand Remote Systems in the configuration tree and then expand your RT target.

   b. Select **Software**. Click the **Add/Remove Software** icon on the toolbar to launch the LabVIEW Real-Time Software Wizard. If your target does not have a **Software** category, then it does not support the LabVIEW Real-Time software.

2. Determine what you want to do. If your RT target uses recommended software sets, refer to Installing Recommended Software Sets. If your RT target uses a custom software selection, refer to Installing a Custom Software Selection.

Installing a Recommended Software Set

Complete the following steps to download a recommended software set using the LabVIEW Real-Time Software Wizard:

1. Determine what you want to do, as follows:
    - Select the software you want to install. When you select an item, the right side presents a list of the software included in the software set predefined and recommended by National Instruments.

      If the recommended software set is grayed out, the software set cannot be installed for one of the following reasons:
        – Software versions required by the recommended software set are not present on the host computer. You can select **Custom software installation** to install other versions of the software.
        – Software is missing from the host computer. You can select **Custom software installation** to install other software or exit MAX and reinstall your driver software.
    - Select **Custom software installation** to manually select the features you want to install on your target.

      Note If you select **Custom software installation** and click **Next**, the **Features** page appears. If you select to install components from this page, your remote target will no longer have the recommended software set installed. For more information, refer to Installing a Custom Software Selection.
    - Select **Uninstall all software** to remove all software from your remote target.
2. Click **Next** to move to the confirmation page after you make the appropriate selections. This page lists all the changes that are to be made to the remote target.
3. Click **Next** to continue, if you are satisfied with these changes. The target first boots into install mode, if necessary, and then begins installation. During the installation, a progress bar tracks

the removal of old files and then the installation of new files, with the current file listed above the progress bar. When installation completes, the wizard reboots your remote target.

4. Click **Finish** to close the wizard.

The installed software should now be running on the remote target.

Updating the BIOS Firmware

Click **Update BIOS** to update the real-time BIOS firmware on your remote target if there is a newer version available. Updating the real-time BIOS firmware removes all existing installed software.

Installing a Custom Software Selection

Complete the following steps to download custom software features using the LabVIEW Real-Time Software Wizard:

1. Determine what you want to do, as follows:

    - View software already installed to your target.

        Note Software installed by MAX 3.0.*x* or earlier will not appear but will continue to work. You must reinstall your software in order for it to appear in this view.

    - View software available to install to your target.
    - Click **Update BIOS** to update the real-time BIOS firmware on your target if there is a newer version available. Updating the real-time BIOS firmware removes all existing installed software.
    - Change the software on your remote target. Click its icon and select the appropriate option. The icon changes and becomes more descriptive when the software in the list is selected. You can select from the following options:

        Install—Selected software will be installed to your target.

        Leave installed—Selected software will remain installed on your target.

        Newer available—Selected software will remain installed on your target, but a newer version is available for installation.

        Reinstall—Selected software will be reinstalled to your target. Choose this option also if you want to change the installed version.

        Uninstall—Selected software will be uninstalled from your target.

        Leave uninstalled—Selected software will remain uninstalled on your target.

Autoselect—Selects all software for install or uninstall.

When you select an item, the right side presents a more detailed view of that particular component, including:

- A description.
- Version installed on the remote target.
- Versions available on the local host. By default the latest version is selected for install. If you change the version in the drop-down list, you can install or reinstall an older version of the software. If the software is a child component, then you might not see a version in the tree or a version drop-down.
- An icon describing the state of the selected item and a message below the icon describing that state, including installed, not installed, selected for (re)install, selected for uninstall, or installed but a newer version exists on host.

Notes

- If the action you selected cannot be performed because of dependencies, a **Show Dependent Features** window appears to explain the dependencies and provide options for resolving the conflict.
- On some targets, such as the PXI-814*X* Series Controller, the LabVIEW Real-Time component must be installed to the target by itself prior to installing other driver software.

2. Click **Next** to move to the confirmation page after you make the appropriate selections. This page lists all the changes that are to be made to the remote target.

3. Click **Next** to continue, if you are satisfied with these changes. The target first boots into install mode, if necessary, and then begins installation. During the installation, a progress bar tracks the removal of old files and then the installation of new files, with the current file listed above the progress bar. When installation completes, the wizard reboots your remote target.

4. Click **Finish** to close the wizard.

The installed software should now be running on the remote target.

Locking System Configuration

After you configure the remote system, you can lock the system configuration with a password to prevent others on your network from changing the configuration, if your device supports locking.

Note Only **Network Settings**, **System Settings**, the LabVIEW Real-Time Software Wizard, and some VISA/PXI settings are protected with the **Lock** setting.

In addition, a host computer on the network cannot target the LabVIEW Real-Time Module to the remote system without a password unless the host is in the **RT Target: Access** list in LabVIEW. To access this list from within LabVIEW 8.0 or later, right-click a project window and select Properties. In LabVIEW 7.*x* or earlier, select the **Tools»RT Target Options** menu item.

If you check **Password-protect Resets** in MAX and click **Apply** before you lock your remote system, your users will be prompted for a password when trying to reboot the remote system from the network.

Complete the following steps to lock the system configuration:

1. Select your remote system in the configuration tree and click **Lock** in the toolbar. The **Locking System Configuration** dialog box appears.
2. Enter and confirm a password.
3. Click **OK** to lock the system configuration. Your system is locked if the **Lock** button appears pressed.

You must click **Lock** in MAX and enter the correct password to unlock the system configuration.

Viewing Error Logs

Use the **View Error Log** selection to view remote system error logs. To access the log from within MAX, right-click your remote system and select **View Error Log**.

Transferring User Files

Complete the following steps to transfer files to or from your remote system.

1. In Remote Systems, right-click your target.
2. Select **File Transfer** to launch the File Transfer Utility.
3. Enter your **Username** and **Password**, or check **Anonymous Login** if your system is not password-protected, and click **OK**.

Note This feature may not be available on some targets.

Windows Firewall

If you are using the Windows Firewall, you may notice the following behaviors in MAX:

- **Microsoft Windows XP with Service Pack 1 (SP1) installed** If the Microsoft Windows XP Internet Connection Firewall (ICF) is enabled, you cannot discover or install software to LabVIEW Real-Time targets unless you disable the ICF before browsing to these devices. Perform the following steps to disable the Internet Connection Firewall:
  1. From your desktop, open Network Connections by selecting **Start»Control Panel»Network Connections**.
  2. Double-click the connection you want to modify.
  3. Click **Properties**.
  4. On the Advanced tab, clear the **Protect my computer and network by limiting or preventing access to this computer from the Internet** checkbox.
- **Microsoft Windows XP with Service Pack 2 (SP2) or later installed**, or
  Microsoft Windows Vista
  When you update software on a LabVIEW Real-Time target while the Windows Firewall is enabled, a dialog box may prompt you to allow MAX to receive information over the network. Select **Unblock this program** so that MAX can communicate with your LabVIEW Real-Time target.

For more information on MAX and the ICF in Windows XP SP1, refer to the NI KnowledgeBase document 2WTAMTPK. For more information on Microsoft Windows XP SP2 and NI products, go to ni.com/info and enter winxpsp2. For more information on Microsoft Windows Vista and NI products, refer to ni.com/vista.

Note You must be logged in with Administrator privileges to enable or disable the ICF or Windows Firewall.

Device Configuration

You must configure any National Instruments Real-Time-compatible device before you can access it from a LabVIEW Real-Time Module application targeted to the remote system.

For more information about using your NI products in MAX, refer to your product-specific help, located on the **Help»Help Topics** menu item. You can also access NI product help from within MAX help, which you can launch from the **Help** menu or by pressing <F1>. For additional information, refer to the documentation you received with your device.

Note For help configuring Traditional NI-DAQ (Legacy) modules, refer to Traditional NI-DAQ (Legacy) Module Configuration.

Traditional NI-DAQ (Legacy) Module Configuration

You must configure any National Instruments PXI Traditional NI-DAQ (Legacy) devices before you can access them from a LabVIEW Real-Time Module application targeted to the remote system. Complete the following steps to configure your data acquisition modules:

1. Configure your RT series PXI controller. Refer to [Configuring Network Settings](#) for more information.
2. Delete the C:\ni-rt\system\niconfig.daq file on the target. This file contains all the Traditional NI-DAQ (Legacy) configuration information. The system rebuilds it when you restart the controller. For information on accessing files on target machines, refer to [Transferring User Files](#).
3. Restart the controller.
4. Test the DAQ module. If you are using SCXI, you must place this DAQ module in the last slot of the PXI chassis (slot 8 for the PXI-1010, slot 4 for the PXI-1011). To test the device, you must know the device number:
   a. In MAX, select **Tools»Traditional NI-DAQ (Legacy) Configuration»Remote DAQ Configuration**. Enter the IP address for your remote system and click **OK**.
   b. In the Remote DAQ Configuration Window, expand the list of Traditional NI-DAQ (Legacy) devices in your chassis. The DAQ modules and their device numbers appear.
   c. To test the DAQ module, refer to [Using RDA to test Your DAQ Module](#). You can also download and run a VI from LabVIEW Real-Time that uses the device. For E Series DAQ devices, you can download and run a [self-diagnostic VI](#).
5. To configure Traditional NI-DAQ (Legacy) and SCXI, you need to use **Remote DAQ Configuration**. In MAX, select **Tools»Traditional NI DAQ (Legacy) Configuration»Remote DAQ Configuration**. Enter the IP address for your remote system and click **OK**.
   a. In the **Remote DAQ Configuration** window, select **SCXI Chassis** and click **Add**.

b. Select **SCXI Chassis** and click **Next**.

c. Select your chassis and click **Next**.

d. Enter your **Chassis ID** and **Chassis Address**. Make sure that the chassis ID and address match the DIP switch settings on the PXI-1010 chassis. The PXI-1011 chassis has no dip switches.

e. Check the **Control SCXI with Internal Bus** box. If this entry is grayed out, make sure you have the proper pxisys.ini file on the RT Engine in C:\ni-rt\system and that you have restarted the controller after replacing it. Also make sure there is a DAQ Module in the last slot of the chassis and that the SCXI section of the chassis is powered on. Click **Finish**.

f. Restart the controller to ensure that the new niconfig.daq file is loaded.

   If you are using SCXI, refer to <u>Configuring SCXI on RT Systems</u> on ni.com/support for more information on configuring your system. Also refer to the <u>SCXI Troubleshooting Resource</u> on ni.com/support for rules on configuring SCXI systems.

6. To test your SCXI RT system:

a. Follow step 4 to connect your controlling DAQ devices through RDA and create virtual channels for your SCXI modules.

b. Right-click a virtual channel in **Data Neighborhood** and select **Test**.

Using RDA to Test Your Traditional NI-DAQ (Legacy) Module

Perform the following instructions to add a remote device and test your Traditional NI-DAQ (Legacy) Module using RDA:

1. Right-click **Devices and Interfaces»Traditional NI-DAQ (Legacy) Devices**, and select **Add Device**.
2. In the Add Device window, select the **Remote Device** option, and click **Next**.
3. In the Select Remote Computer window, enter the remote computer name or IP address in the Remote Computer Name/IP Address edit box. Or, click **Browse** to browse the network for the computer name. Click **Next**.

   Note Your computer may not recognize a remote computer name starting with numbers or using apostrophes.

4. Select the device you want to use from the Remote Configuration device list. Click **Next**.
5. Select the local device number you want to use.
6. Click **Finish**.

   Note RT Series plug-in devices currently do not support NI-DAQ Remote Device Access.

7. Your device should now appear under Devices and Interfaces. Right-click and select **Properties** to test resources or run test panels on the device.
8. Create virtual channels for your RT devices in the same manner you would for local devices. For more information on creating virtual channels, refer to *Creating Virtual Channels* in the Measurement & Automation Explorer Help for Traditional NI-DAQ. You can find the help file in the MAX help menu, **Help»Help Topics»Traditional NI-DAQ.**