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LabVIEW™ Real-Time Module for Mac OS X User Manual Addendum

This addendum supplements the *LabVIEW Real-Time Module User Manual* with information specific to running the LabVIEW Real-Time Module under Mac OS X. The primary difference between Windows and Mac OS X versions of the Real-Time Module involves file path specifications and configuring RT targets and SCXI DAQ systems.

Contents

Installing the Software

Complete the following steps to install the LabVIEW Real-Time Module on the host computer.

✏️ **Note** You must log in as administrator or as a user with administrator privileges before attempting to install software.

1. Insert the LabVIEW Real-Time Module for Mac OS X CD into the CD-ROM drive.

2. Browse the CD and double-click the **Install LabVIEW Real-Time for Mac OS X** application.

3. Follow the instructions to complete the installation.

Refer to the *LabVIEW Real-Time Module User Manual* for information about programming deterministic applications.

NATIONAL INSTRUMENTS™

Specifying Mac OS X File Paths

When you create VIs with the Real-Time Module for Mac OS X, you must adhere to the Mac OS convention for file paths using the LabVIEW path type. LabVIEW formats the path using the standard syntax for the RT target before downloading the VI to the target.

The Mac OS delimiter for file paths is the colon. The following is an example of a Windows file path:

```
c:\National Instruments\LabVIEW
```

The same file path changes to the following under Mac OS X:

```
c:National Instruments:LabVIEW
```

Configuring RT Targets

The Real-Time Module for Mac OS X does not support RT Series plug-in data acquisition devices or RT Series FieldPoint devices as RT targets. This section contains general instructions for configuring RT Series PXI devices as remote RT targets. Refer to the specific RT Series PXI device documentation for information about installing the device.

Booting RT Targets into the Real-Time Operating System

You must boot RT Series PXI controllers into the Real-Time Operating System (RTOS) before you can configure the network settings for the controller. Some controllers do not have the RTOS pre-installed. However, you can use a floppy disk to boot into the RTOS on a PXI controller that does not have the RTOS installed.

The Real-Time Module for Mac OS X includes a disk labeled **PXI Boot Disk for LabVIEW Real-Time Module, ver 7.1**. Insert this boot disk into the floppy drive of an RT Series PXI controller. Power on or reset the PXI controller to boot into the RTOS.

Configuring Network Settings of RT Targets

The Remote System Explorer, shown in Figure 1, is the Mac OS X version of the NI Measurement & Automation Explorer used in Windows. The Remote System Explorer allows you to configure RT Series PXI controllers and to update software on the controllers. Double-click the

Remote System Explorer application located in the **Applications» National Instruments»Shared»Remote System Explorer** directory to launch the Remote System Explorer.
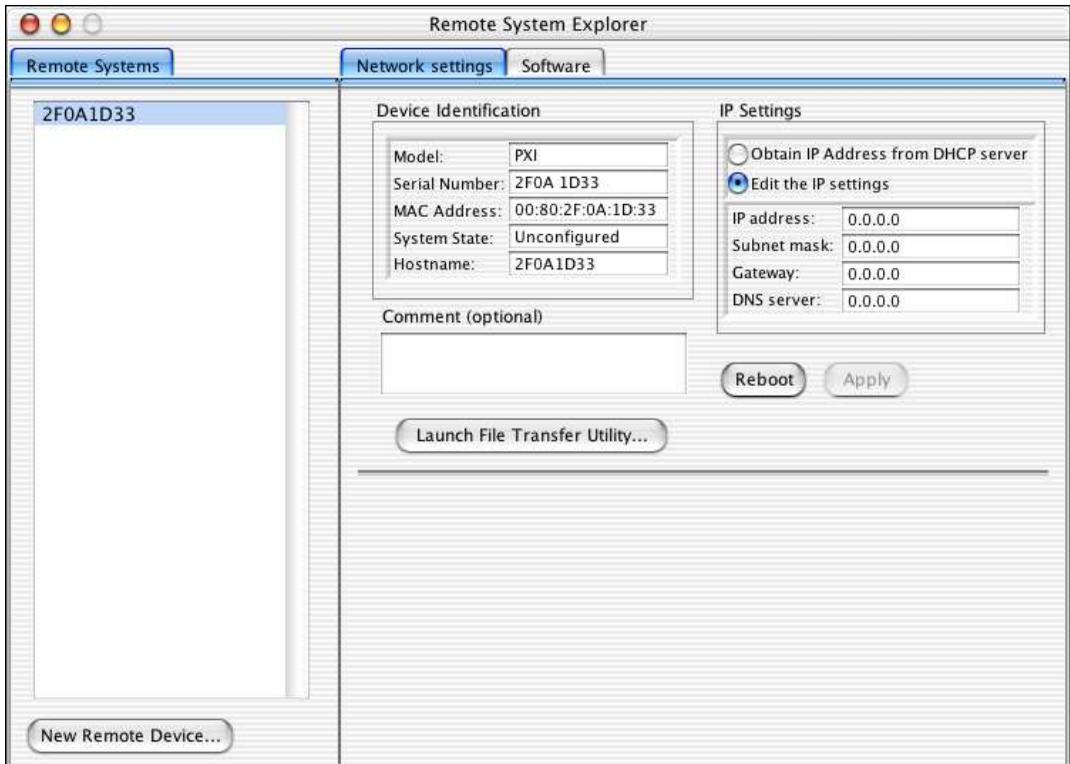

Figure 1. Remote System Explorer

The Remote System Explorer automatically searches the local subnet for available RT targets and displays them in the **Remote Systems** list. If the RT target you want to configure does not appear, select **View»Refresh** to refresh the **Remote Systems** list.

Note You must set **Subnet Mask** to 255.255.255.0 in the network options of the host computer to display RT targets in the **Remote Systems** list. Open the **System Preferences** dialog box and then double-click **Network** to access the network options.

You can manually add RT targets located on other subnets to the **Remote Systems** list by clicking the **New Remote Device** button located below the **Remote Systems** list and entering the appropriate device host name or IP address. The RT target then appears in the **Remote Systems** list.

You can configure network settings for RT targets when the device appears in the **Remote Systems** list. Complete the following steps to configure the network settings for an RT Series PXI controller.

1. Select the RT target from the **Remote Systems** list.

2. Enter a device name in the **Hostname** text box located in the **Device Identification** section. The default device name is the serial number of the RT Series hardware.

3. Enter the network parameters you want to assign to the device. You can either choose to assign a static IP address or have the system retrieve an IP address automatically from a DHCP server.

   A DHCP server allocates an IP address to the PXI device at startup. Select **Obtain IP Address from DHCP server** in the **IP Settings** section of the **Network settings** tab to obtain an execution target IP address automatically from the DHCP server. Use DHCP if a static IP address is not available. Consult with the network administrator for more information about using DHCP.

   Use a static IP address if the remote RT target will use the same IP after a reboot. Using a static IP address ensures the proper behavior of applications that communicate with RT targets using a specific IP address. Select **Edit the IP settings** in the **IP Settings** section of the **Network settings** tab and specify the following network parameters:

   - **IP address**—The unique, computer-readable address of a networked device. Each IP address contains a set of four numbers in the range from 0 through 255. Each number is separated by a period. For example, 130.164.44.143.

   - **Subnet mask**—A network code that helps a network device determine whether other devices are on the same network.

   - **Gateway**—The IP address of the gateway server. The gateway server functions as a connection between two separate networks.

   - **DNS server**—The IP address of a Domain Name Server (DNS) that stores host names and translates them into IP addresses.

   You must provide a value for the **IP address** and **Subnet mask** parameters. If the network of the remote RT target does not have a gateway or DNS server, set **IP address** and **Subnet mask** to the default setting of 0.0.0.0.

4. Click the **Apply** button.

5. Click the **Reboot** button to reboot the remote system and apply the changes.

Installing Software on the RT Target

Complete the following steps in the Remote System Explorer to install or upgrade the software on an RT target.

1. Click the **Software** tab to display the software settings. The **Software** tab displays the software currently installed on the RT target.

2. Select the software to install from the host computer to the RT target from the **Features** list or select **Select all for install** from the **Autoselect** pull-down menu to install all available software on the target.

3. Click the **Next** button and review the selections. Click the **Next** button to install the selections.

The Remote System Explorer installs the software to the RT target and then reboots the target.

Configuring a DAQ System

The Real-Time Module for Mac OS X provides the Config SCXI VIs located in the `vi.lib:DAQ:scxi daq config.llb` to configure signal conditioning DAQ accessories or an SCXI chassis, modules, and accessories in a DAQ system. With the Config SCXI VIs, you can programmatically configure the components of a DAQ system.

Use the Config SCXI VIs to programmatically configure SCXI DAQ system components or signal conditioning DAQ accessories in a DAQ system from within a LabVIEW application that runs on the RT target. Complete the following steps to programmatically configure SCXI DAQ system components or signal conditioning DAQ accessories.

1. Use the Reset SCXI Configuration VI to reset the SCXI configuration stored on the RT target, including all SCXI chassis, SCXI module, and DAQ accessory configurations.

Note If you connected a signal conditioning DAQ accessory, such as the SC-2345, directly to a DAQ device, you need to call only the Create DAQ Accessory VI and the Set SC2345 Configuration VI to create the configuration file.

2. Use the Create SCXI Chassis VI to create a new configuration file for the SCXI chassis.

3. Use the Create SCXI Module VI to add an SCXI module to the configuration and define the connections to DAQ devices in the system.

4. Depending on the specific module, you might need to configure specific module settings. Use the following VIs to configure specific module settings:

   - Set 1520 Module Settings VI
   - Set 153x Module Settings VI
   - Set 1540 Module Settings VI
   - Set 1126 Module Settings VI
   - Set SCXI Module Wire Sensor Mode VI

5. If necessary, use the Set SCXI Module Gain VI to set the gain for a specific SCXI channel.

6. Use the SCXI Module Filter VI to set the filter settings for a specific SCXI channel.

7. Use the Create SCXI Accessory VI to add an SCXI accessory to the configuration.

8. If the accessory supports accessory gain settings, use the Set SCXI Accessory Gain VI to set the gain of an accessory channel.

9. Use the Save SCXI Configuration VI to save the configuration to a file on the media storage device of the RT target.

Figure 2 illustrates how to use the Config SCXI VIs to programmatically configure the components of a DAQ system.
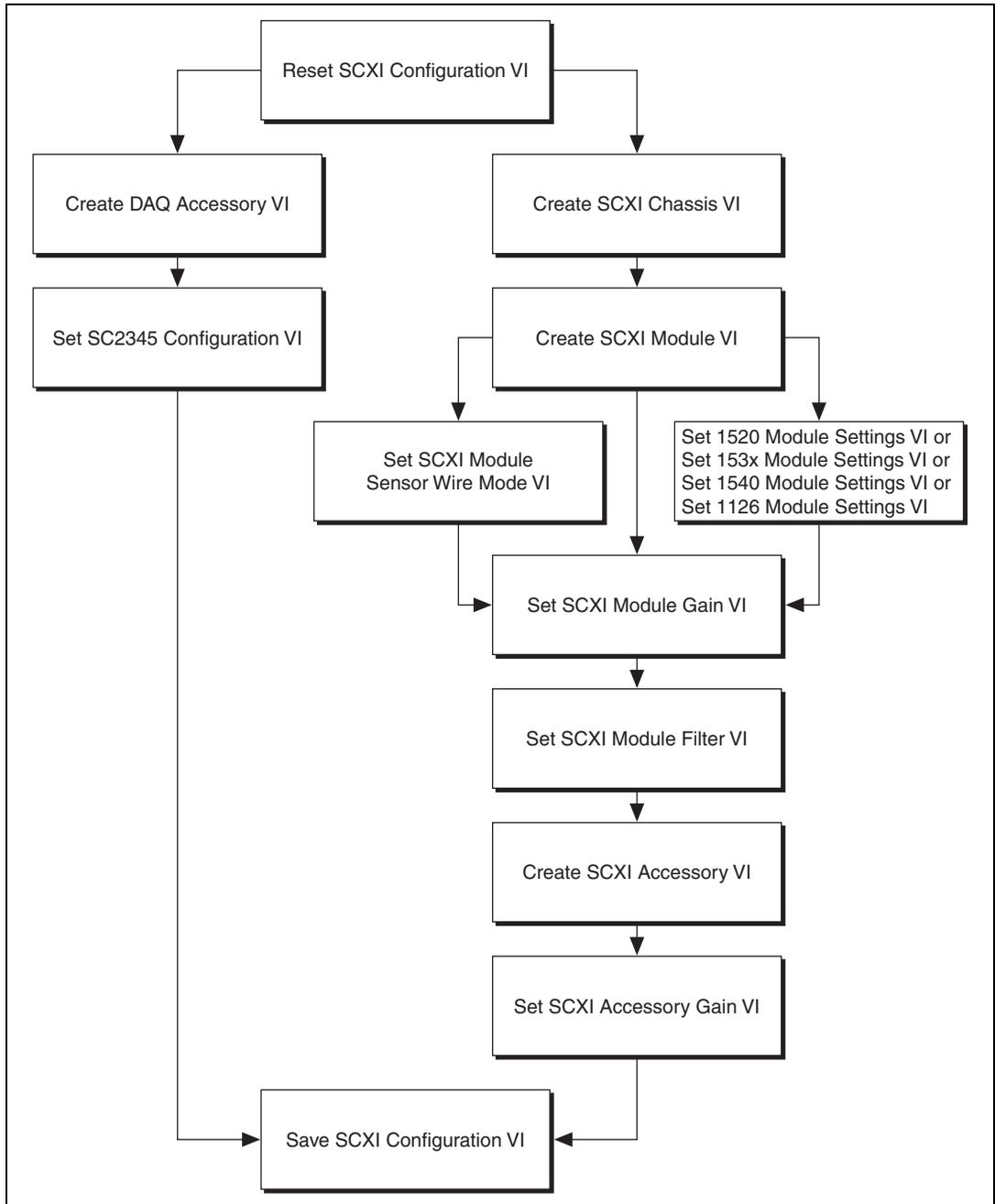

Figure 2. Programmatic Execution Flow of Config SCXI VIs

The example in Figure 3 creates a configuration file for a DAQ system with an SCXI chassis, module, and accessory. The VI saves the configuration file to the media storage device on the RT target.
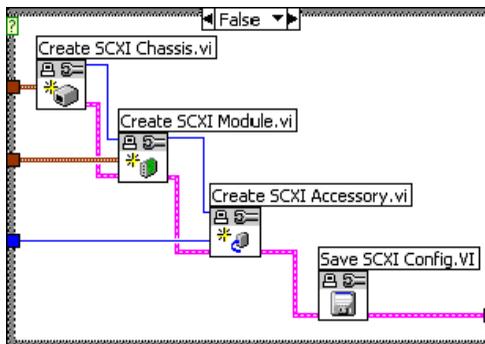

Figure 3. Programmatically Configuring Components of a DAQ System