NI Switches Getting Started Guide

For PXI and SCXI™ Switch Modules

This document explains how to install, configure, and set up National Instruments PXI and SCXI switch modules. This document covers the NI-DAQ 7.*x* software relative to NI switch modules. For a more detailed explanation of NI-DAQ 7.*x*, refer to the *DAQ Quick Start Guide for NI-DAQ 7.x* available on the NI-DAQ 7.*x* Device Documentation CD.

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NATIONAL INSTRUMENTS™

Conventions

The following conventions are used in this manual:

»   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.

♦   The ♦ symbol indicates that the following text applies only to a specific product, a specific operating system, or a specific software version.

This icon denotes a tip, which alerts you to advisory information.

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 and information on hardware labels.

italic   Italic text denotes variables, emphasis, a cross reference, or an introduction to a key concept. This font 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, and code excerpts.

`monospace italic`   Italic text in this font denotes text that is a placeholder for a word or value that you must supply.

Safety and Compliance

Refer to the *Read Me First: Safety and Radio-Frequency Interference* document for important safety and compliance information.

Note Refer to the specifications document included with the switch module for additional safety information.

Related Documentation

The following documents contain additional information about your switch module and the APIs used to program them. The documents are available in electronic form at **Program Files»National Instruments» NI-SWITCH»Documentation** or **Program Files»National Instruments»NI-DAQ**.

- Specifications document for your switch

- *NI Switches Help* contains technical and programming support for your NI switch module and the NI-SWITCH 2.*x* API

- *NI-SWITCH Instrument Driver Quick Reference Guide* contains an API overview and function/VI overview

- *Read Me First: Safety and Radio-Frequency Interference* includes safety and compliance information

- *DAQ Quick Start Guide* contains additional information about NI-DAQ 7.*x*, the relationship between Traditional NI-DAQ and NI-DAQmx, and a complete list of supported modules. Available on the NI-DAQ 7.*x* Device Documentation CD.

- *NI-DAQmx Help* contains information about programming your switch with the NI-DAQmx API

- *NI-DAQmx - Data Acquisition VIs Help*

1. Unpack the Module and Accessories

The switch module is shipped in an antistatic package to prevent electrostatic damage (ESD) that can damage several components in the module.

⚠ **Caution** *Never* touch the exposed pins of connectors.

To avoid such damage when you handle the module, take the following precautions:

- Ground yourself using a grounding strap or by holding a grounded object.

- Touch the antistatic package to a metal part of the chassis before you remove the module from the package.

Remove the module from the package and inspect the module for loose components or any sign of damage. Notify NI if the module appears damaged in any way. Do *not* install a damaged module in the chassis.

Store the module in the antistatic package when the module is not in use.

2. Verify the Components

Make sure you have the following items:

❑ NI-DAQ 7.*x* software and documentation package

❑ The specifications document for your NI switch module

❑ 1/8 in. flathead screwdriver

❑ For development, at least one of the following software packages and documentation:

– LabVIEW

– LabWindows™/CVI™

– Microsoft Visual C++

– Microsoft Visual Basic

♦ PXI switch modules require the following:

❑ PXI switch module

❑ PXI chassis or PXI/SCXI combination chassis

♦ SCXI switch modules require the following:

❑ Switch Controller (NI 4021/4060/4070 or E Series device)

❑ Cable adapter

❑ Cable

❑ SCXI switch module

❑ SCXI chassis or PXI/SCXI combination chassis

3. Install the Software

National Instruments switch modules are packaged with NI-DAQ 7.*x*. This driver software package contains three drivers as well as an extensive library of functions and VIs you can call from your application software, such as LabVIEW or LabWindows/CVI, to program your NI switch module. The NI-DAQ 7.*x* driver software has an application programming interface (API), which is a library of functions, classes, VIs, attributes, and properties for creating applications for your device.

Confirm the Application Software Version

You must use NI application software (LabVIEW, LabWindows/CVI, or Measurement Studio) version 7.*x* or later with NI-DAQmx. The NI-SWITCH API supports LabVIEW 6.1, LabVIEW 7.*x*, and LabWindows/CVI 5.5 and later. Install or upgrade your application software *before* installing the driver software.

Uninstall NI-DAQ 6.9.3 or Earlier

If you are upgrading from NI-DAQ 6.9.3 or earlier, you *must* uninstall the software before installing NI-DAQ 7.*x*. Some NI-DAQ devices supported in 6.9.3 may no longer be supported. Before uninstalling NI-DAQ 6.9.3 or earlier, refer to the *DAQ Quick Start Guide*, available on the NI-DAQ 7.*x* Device Documentation CD, for details.

NI-DAQ 7.*x* cannot exist on the same system with earlier versions of NI-DAQ. When you install NI-DAQ 7.*x*, the latest version of Traditional NI-DAQ replaces earlier versions of NI-DAQ and any support files installed by the earlier version. Earlier versions of NI-DAQ are removed when you install NI-DAQmx.

Insert the NI-DAQ 7.*x* CD

⚠️ **Caution** Do not install NI-DAQ 7.*x* if your existing applications include unsupported devices. Refer to the *DAQ Quick Start Guide*, available on the NI-DAQ 7.*x* Device Documentation CD, for details.

Insert the NI-DAQ 7.*x* CD. The NI-DAQ 7.*x* installer should open automatically. If not, select **Start»Run**. Enter x:\setup.exe, where x is the letter of the CD drive. For troubleshooting and operating system-specific instructions, refer to the Hardware Installation Wizard at ni.com/support/install.

💡 **Tip** Install your driver software *before* installing the switch module to ensure proper installation and to avoid warnings about driver installation asking you to install the driver.

Select an API

NI-DAQ 7.*x* includes three drivers, each with its own API.

- Traditional NI-DAQ is an upgrade of the earlier version of NI-DAQ. Traditional NI-DAQ has the same VIs and functions and works the same way as NI-DAQ 6.9.3, except that you can use Traditional NI-DAQ and NI-DAQmx on the same computer.
- NI-DAQmx is the latest NI-DAQ driver with new VIs, functions, and development tools for programming switch modules as well as E Series and other SCXI modules.
- NI-SWITCH 2.*x* is the latest NI-SWITCH driver with new VIs, functions, and development tools for programming switch modules. NI-SWITCH is a driver layer on top of the NI-DAQmx and Traditional NI-DAQ drivers. NI-SWITCH is an IVI-compliant instrument driver that supports all NI switch modules.

Refer to Table 1 to determine which APIs work with your switch module.

Table 1. Switch Module API Support

Module	NI-DAQmx API	Traditional NI-DAQ API	NI-SWITCH 2.*x* API
NI SCXI-1160/1161/1163R	✓	✓	✓
All other SCXI switch modules	✓	—	✓
NI PXI-2501/2503/2565/2590/2591	—	—	✓
All other PXI switch modules	✓	—	✓

Install Support Files

The NI-DAQ 7.*x* installer detects the NI software installed on the system and automatically selects the latest versions of the driver, application software, and language support files from the CD.

Verify that the installer detected and selected the correct support files and the correct version number of the application software and/or language. You can select additional options to install the support files, examples, and documentation. Follow the software prompts.

✎ **Note** If you install NI-DAQ 7.*x* before installing your NI application software version 7.*x* or later, you must run the NI-DAQ 7.*x* installer again to install the correct application software support. Select **Start»Run**. Enter `x:\setup.exe`, where *x* is the letter of the CD drive.

4. Install the PXI Switch Modules

To install a PXI module, complete the following steps:

1. Power off and unplug the PXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Remove the filler panel of an unused PXI slot.

3. Touch any metal part of the chassis to discharge static electricity.

4. Insert the device into the PXI slot. Use the injector/ejector handle to fully insert the device.

5. Screw the device front panel to the chassis front panel mounting rail.

| 1 | PXI or PXI/SCXI Combination Chassis | 3 | Screws |
| 2 | PXI Switch Module | 4 | Injector/Ejector Handle |
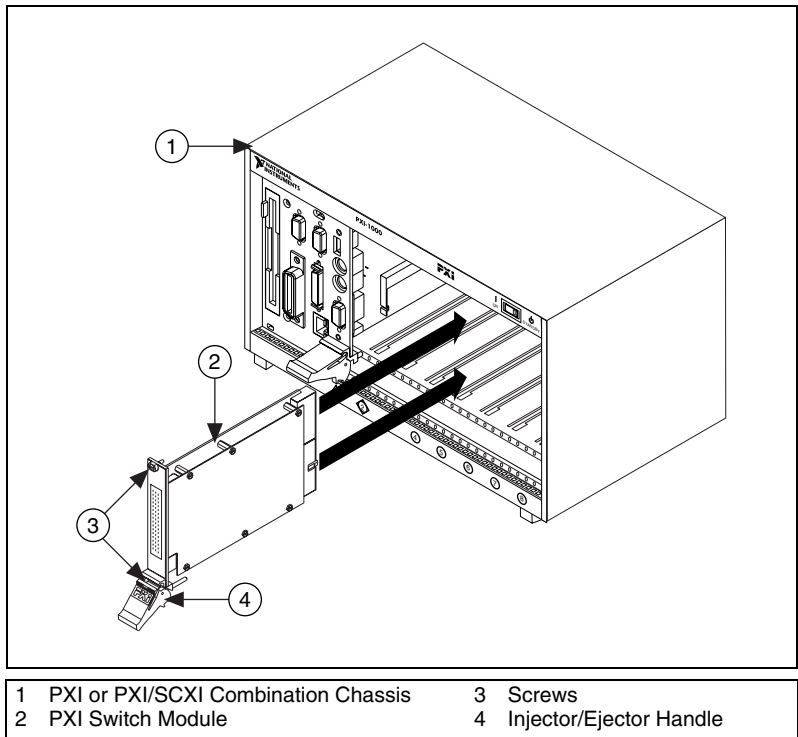
Figure 1. Installing a PXI Switch Module

5. Install the SCXI Switch Modules

Rear Connectors

SCXI switches have two types of rear connectors that differentiate their cabling schemes: a 10-pin and a 50-pin. Refer to Table 2 and look at the back of the switch module to determine how many pins are on the rear connector.

| 1 | High-Voltage Analog Bus (HVAB) | 3 | 50-pin Rear Connector |
| 2 | 10-pin Rear Connector | | |
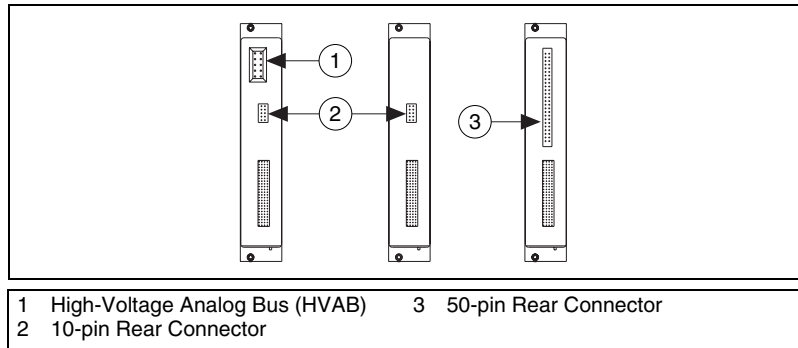
Figure 2. SCXI Switch Module Rear Connectors

SCXI Controllers

SCXI switch modules require a controller. Before installing an SCXI switch module, refer to Table 2 to ensure that your controller supports your switch. Table 2 also lists the cable adapter kit(s) necessary to cable the controller directly to the switch module.

Table 2. SCXI Controllers and Supported SCXI Switches

| Rear Connector | Switch Module | SCXI Switch Controllers | | | |
		NI 4021	NI 4060	NI 4070	E Series
10-pin	SCXI-1127	SCXI-1359 kit	SCXI-1357 kit or SCXI-1358 kit or SCXI-1359 kit	SCXI-1357 kit or SCXI-1358 kit or SCXI-1359 kit	Can control but not cable directly to switch module[2]
	SCXI-1128				
	SCXI-1129				
	SCXI-1130		Not supported[1]		
	SCXI-1166				
	SCXI-1167				
	SCXI-1193				

Table 2. SCXI Controllers and Supported SCXI Switches (Continued)

Rear Connector	Switch Module	SCXI Switch Controllers			
		NI 4021	**NI 4060**	**NI 4070**	**E Series**
50-pin	SCXI-1160	SCXI-1362 kit	SCXI-1362 kit	SCXI-1362 kit	SH6868-EP and SCXI-1349
	SCXI-1161				
	SCXI-1163R				
	SCXI-1190				
	SCXI-1191				
	SCXI-1192				

[1] The NI 4060 cannot control the SCXI-1130/1166/1167 or SCXI-1193 switch modules. For software support information, refer to Table 3.

[2] An E Series device can control these switches when cabled to another SCXI module in the same chassis. The cabled SCXI module can be an SCXI signal conditioning device or other SCXI switch module. Alternatively, you can install the E Series device in the rightmost PXI slot of a PXI-1010 or PXI-1011 chassis.

Install and configure the controller as described in its documentation. Refer to the *DAQ Quick Start Guide* for installing an E Series or NI 4021 device and the *NI Digital Multimeters Getting Started Guide* for installing the NI 4060/4070.

Installation

After you have installed and configured the controller, refer to the flowchart in Figure 3 for your next steps.
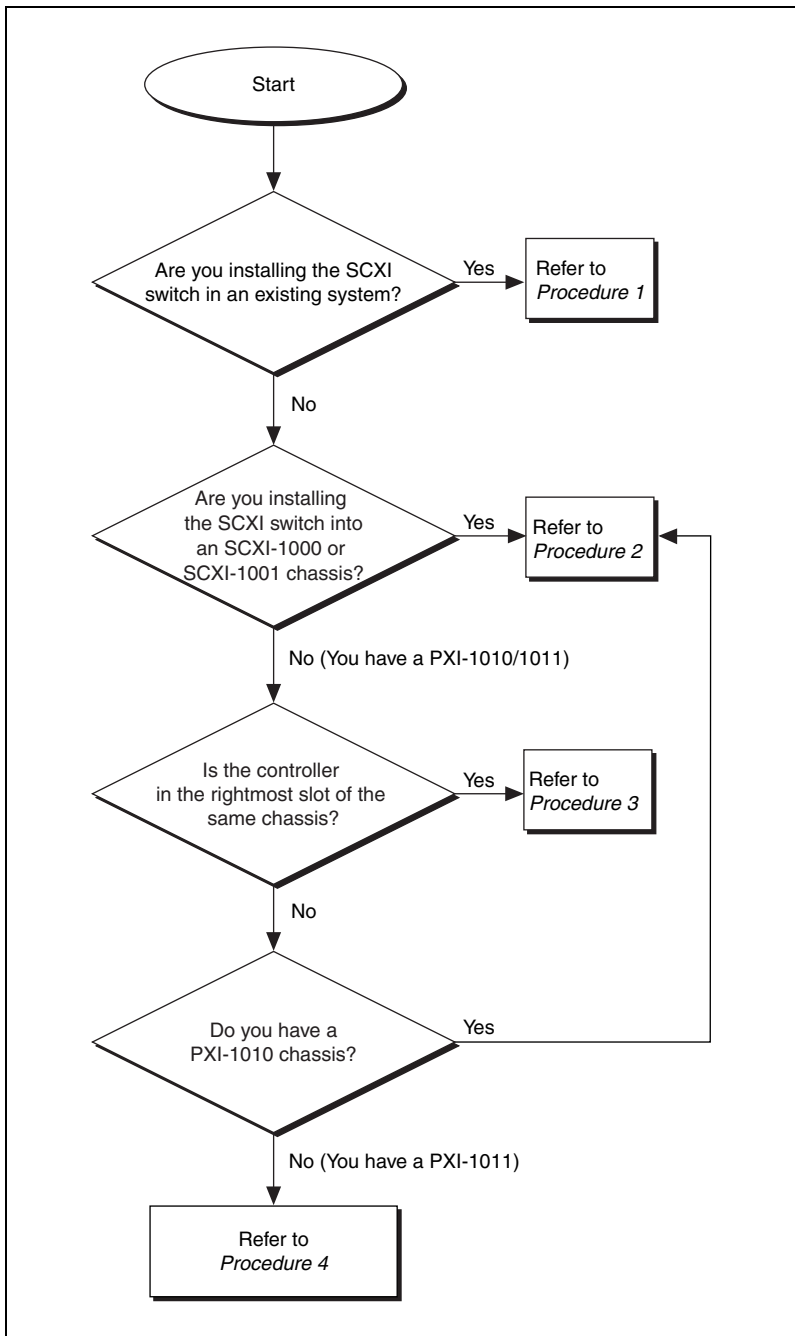
Figure 3. SCXI Switch Module Installation Flowchart

Procedure 1: Installing the SCXI Switch in an Existing System

If your SCXI system already has a controller established and the controller supports your switch, you can simply add additional SCXI switch modules in any available SCXI slots. Refer to Table 2 to determine if your controller supports your SCXI switch module.

1. Power off and unplug the SCXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Remove the filler panel in an unused SCXI slot.

3. Touch any metal part of your chassis to discharge static electricity.

4. Insert the switch module into the SCXI slot.

5. Screw the device front panel to the chassis front panel mounting rail.

| 1 | Any New NI SCXI Switch Module | 3 | Any SCXI Chassis |
| 2 | Existing SCXI Module | 4 | Existing Controller |
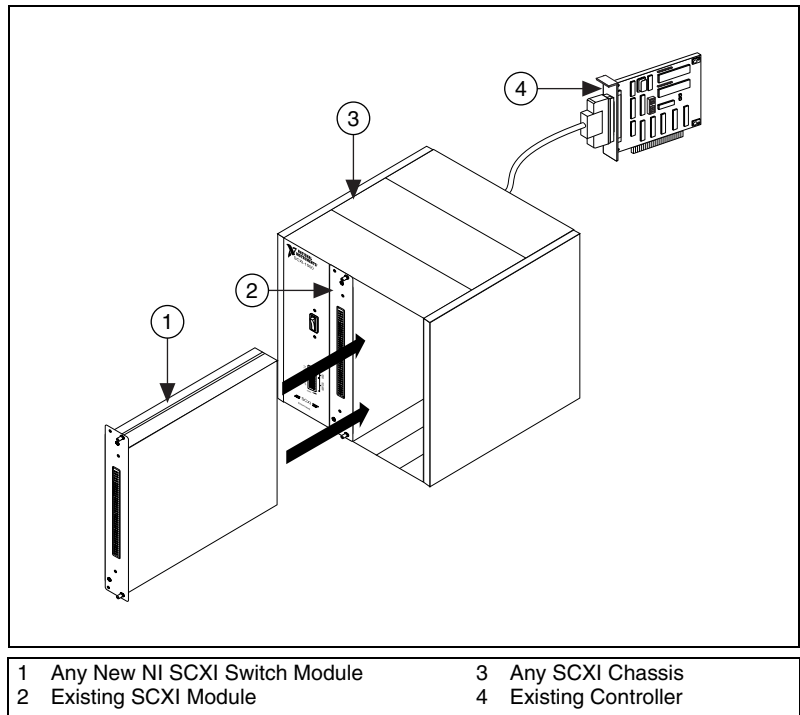
Figure 4. Installing an SCXI Switch Module in an Existing System

# Procedure 2: Cable the Controller to the SCXI Switch

If you are using an SCXI-1000/1001 or PXI-1010 chassis, complete the following steps:

1. Power off and unplug the SCXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Set the chassis address switches to OFF. In Figure 5, all switches are shown in the OFF position.

📝 **Note** Older chassis use jumpers inside the front panel, instead of chassis address switches. Older chassis also differ in fuses and AC power selection. Refer to the chassis documentation for more information.

3. Confirm the correct power settings (100, 120, 220, or 240 VAC).

4. Connect the power cord.

| 1	Chassis Address Switches	3	Power Settings
2	Chassis Power Switch	4	Power Cord Connector
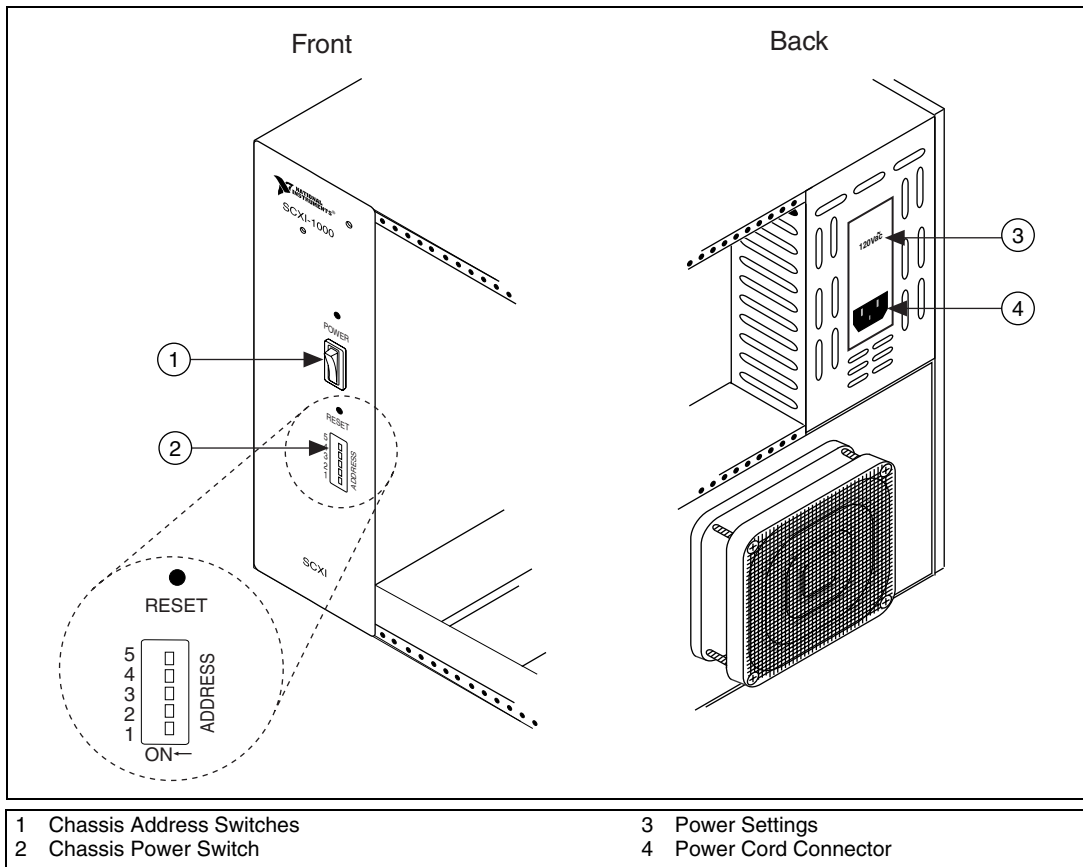
Figure 5. Chassis Preparation

After you have prepared your chassis, complete the instructions appropriate to your controller. Refer to Table 2 to determine if your controller supports and connects to your SCXI switch module.

E Series

E Series devices can directly cable only to switches with 50-pin rear connectors. Refer to Table 2 to determine if your switch module has a 50-pin rear connector.

1. Power off and unplug the SCXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Remove the filler panel in an unused SCXI slot.

3. Touch any metal part of your chassis to discharge static electricity.

4. Insert the device into the SCXI slot.

5. Screw the device front panel to the chassis front panel mounting rail.

6. Attach the SCXI-1349 cable adapter to the rear of the SCXI switch module.

7. Screw the cable adapter to the chassis cable adapter mounting rail.

8. Connect one end of the SH6868 cable to the SCXI-1349 cable adapter and the other to the E Series device.
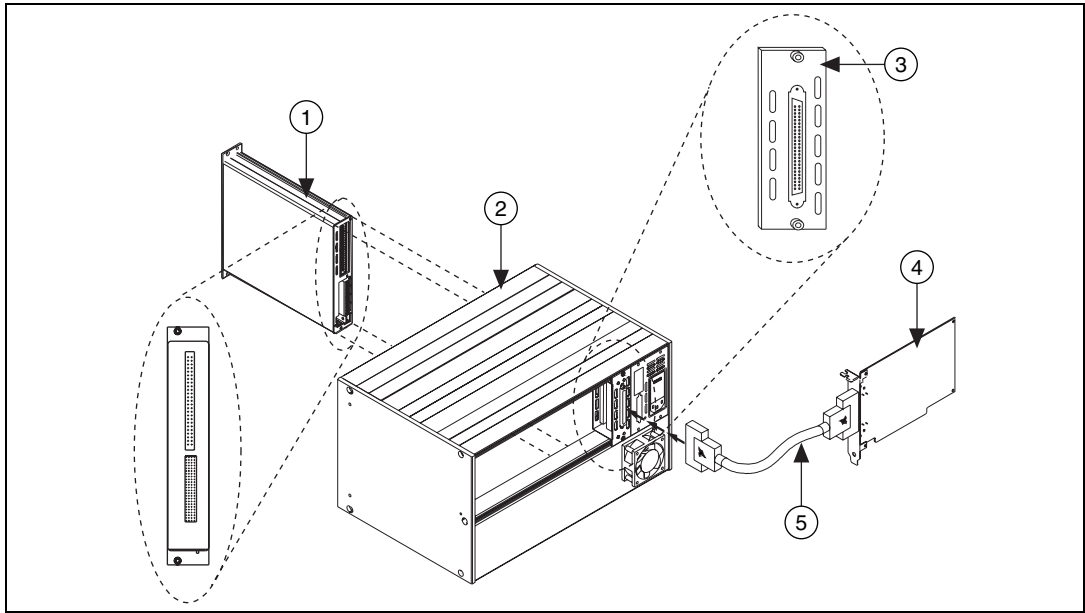
|			
1	SCXI Switch	4	E Series Device
2	SCXI-1000/1001 or PXI-1010 Chassis	5	SH6868 Cable
3	SCXI-1349 Cable Adapter		

Figure 6. Cabling to an E Series Device

NI 4021/4060/4070

Complete the following steps based on the rear connector of your switch module. Refer to Table 2 to determine how many pins are on the rear connector of the switch module.

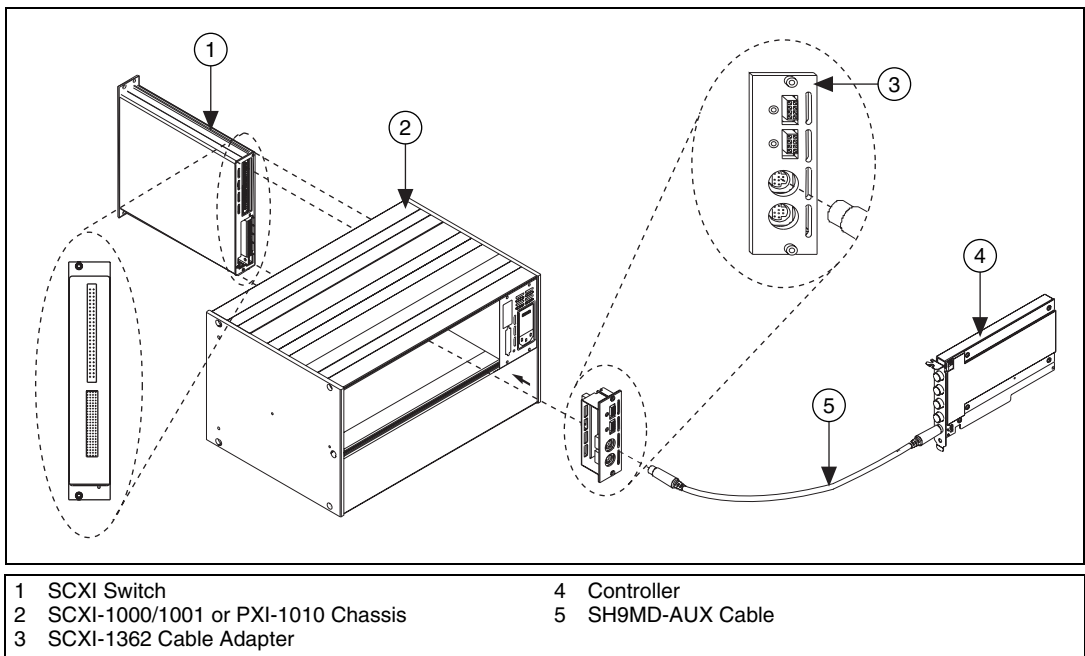## SCXI Switch with 10-Pin Rear Connector

1. Power off and unplug the SCXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Remove the filler panel in an unused SCXI slot.

3. Touch any metal part of your chassis to discharge static electricity.

4. Insert the device into the SCXI slot.

5. Screw the device front panel to the chassis front panel mounting rail.

6. Attach the SCXI-1359 cable adapter, included with SCXI-1357/1358 and SCXI-1359 kits, to the rear of the SCXI switch module. Ensure that the 10-pin connector of the switch module, shown in Figure 2, connects to the lower right 10-pin connector of the SCXI-1359 (facing the back).

7. Screw the cable adapter to the chassis cable adapter mounting rail.

8. Connect one end of the SH9MD-AUX cable to the SCXI-1359 cable adapter and the other to the NI 4021/4060/4070.
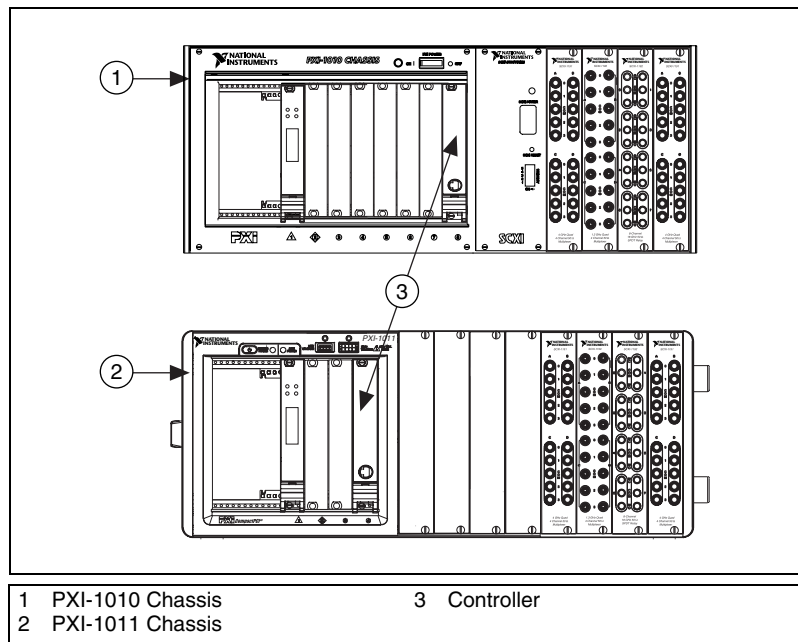

1	SCXI Switch	4	Controller
2	SCXI-1000/1001 or PXI-1010 Chassis	5	SH9MD-AUX Cable
3	SCXI-1359 Cable Adapter		
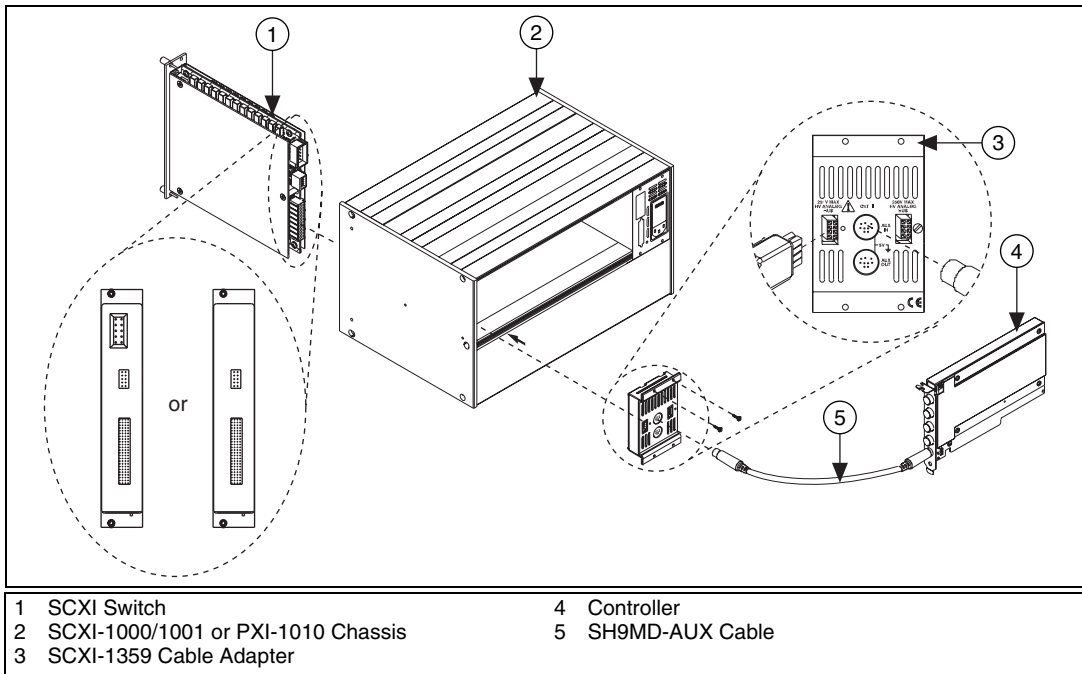
Figure 7. Cabling an NI 4021/4060/4070 to a 10-Pin Rear Connector Switch Module

SCXI Switch with 50-Pin Rear Connector

1. Power off and unplug the SCXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Remove the filler panel in an unused SCXI slot.

3. Touch any metal part of your chassis to discharge static electricity.

4. Insert the device into the SCXI slot.

5. Screw the device front panel to the chassis front panel mounting rail.

6. Attach the SCXI-1362 cable adapter to the rear of the SCXI switch module.

7. Screw the cable adapter to the chassis cable adapter mounting rail.

8. Connect one end of the SH9MD-AUX cable to the SCXI-1362 cable adapter and the other to the NI 4021/4060/4070.

1	SCXI Switch	4	Controller
2	SCXI-1000/1001 or PXI-1010 Chassis	5	SH9MD-AUX Cable
3	SCXI-1362 Cable Adapter		

Figure 8. Cabling an NI 4021/4060/4070 to a 50-Pin Rear Connector Switch Module

Procedure 3: Controller in the Rightmost PXI Slot

You can control your SCXI switches without additional cabling by installing your controller in the rightmost PXI slot of a PXI-1010 or PXI-1011 chassis. Refer to Table 2 to determine if your controller supports your SCXI switch module. Complete the following steps:

1. Power off and unplug the PXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. (PXI-1010 only) Set the chassis address switches to OFF. All switches in the OFF position are shown in Figure 5.

3. Confirm the correct power settings of the chassis (100, 120, 220, or 240 VAC).

4. Connect the chassis power cord.

5. Remove the filler panel in an unused SCXI slot.

6. Touch any metal part of your chassis to discharge static electricity.

7. Insert the device into the SCXI slot.

8. Screw the device front panel to the chassis front panel mounting rail.

| 1 | PXI-1010 Chassis | 3 | Controller |
| 2 | PXI-1011 Chassis | | |

Figure 9. Controller in Rightmost PXI Slot

Procedure 4: Controller Not in Rightmost PXI Slot of PXI-1011

If you do not install the SCXI controller in the rightmost PXI slot of the PXI-1011 chassis, you can control the SCXI switches using the SH9MD-AUX cable. Refer to Table 2 to determine if your controller supports and connects to your SCXI switch module.

1. Power off and unplug the PXI chassis. Follow proper ESD precautions to ensure you are grounded before installing the hardware.

2. Confirm the correct power settings of the chassis (100, 120, 220, or 240 VAC).

3. Connect the chassis power cord.

4. Remove the filler panel in an unused SCXI slot.

5. Touch any metal part of your chassis to discharge static electricity.

6. Insert the device into the SCXI slot.

7. Screw the device front panel to the chassis front panel mounting rail.

8. Connect the SH9MD-AUX cable to the rear of the PXI-1011 chassis.

1 PXI-1011 Chassis	2 SH9MD-AUX Cable
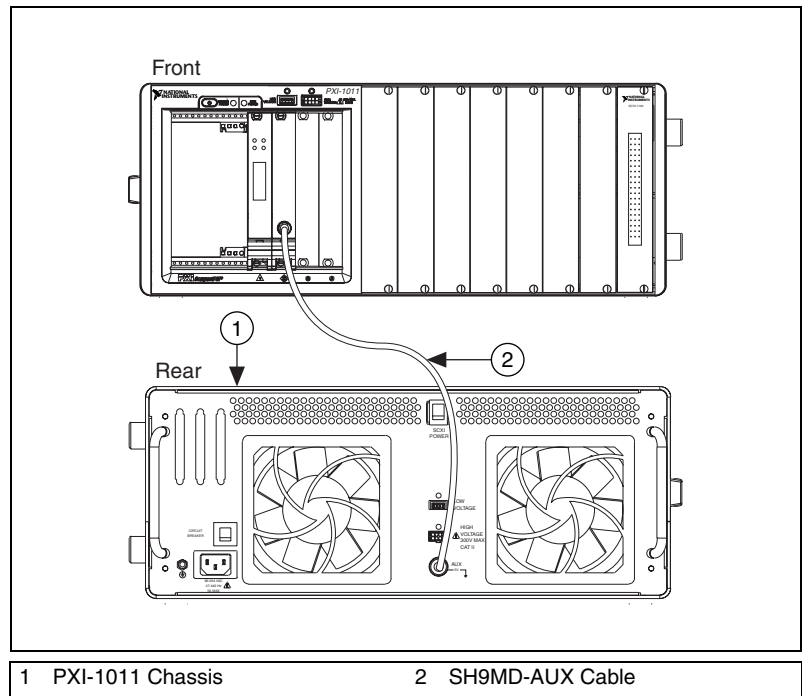
Figure 10. Cabling the Controller to the Back of a PXI-1011 Chassis

6. Configure the PXI Switch Modules

In Measurement & Automation Explorer (MAX), configure each PXI switch module you installed. Configuring the switch modules in MAX establishes the default settings for the switch module. The PXI-2501/2503/2565/2590 and PXI-2591 must be configured under PXI System while all other PXI switches are configured under NI-DAQmx Devices.

1. Power on the chassis.

2. Double-click the **Measurement & Automation** icon on the desktop to open MAX.

3. Expand **Devices and Interfaces**.

4. Check that your PXI switch module appears under Devices and Interfaces.

   If your device does not automatically appear, press <F5> to refresh the view in MAX. If the device is still not recognized, refer to `ni.com/support/install` for troubleshooting information.

NI-DAQmx

1. Right-click the switch name and select **Properties**. Be sure to click the device name under NI-DAQmx Devices.
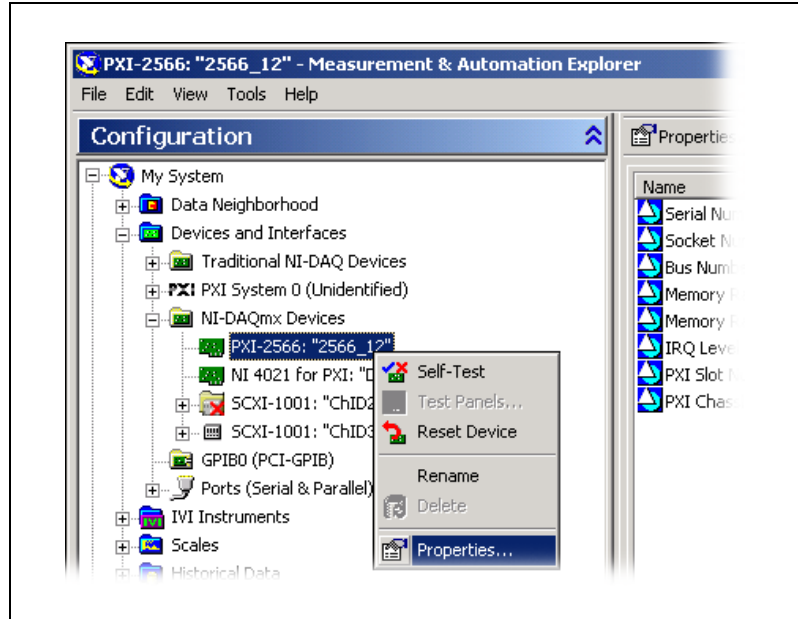
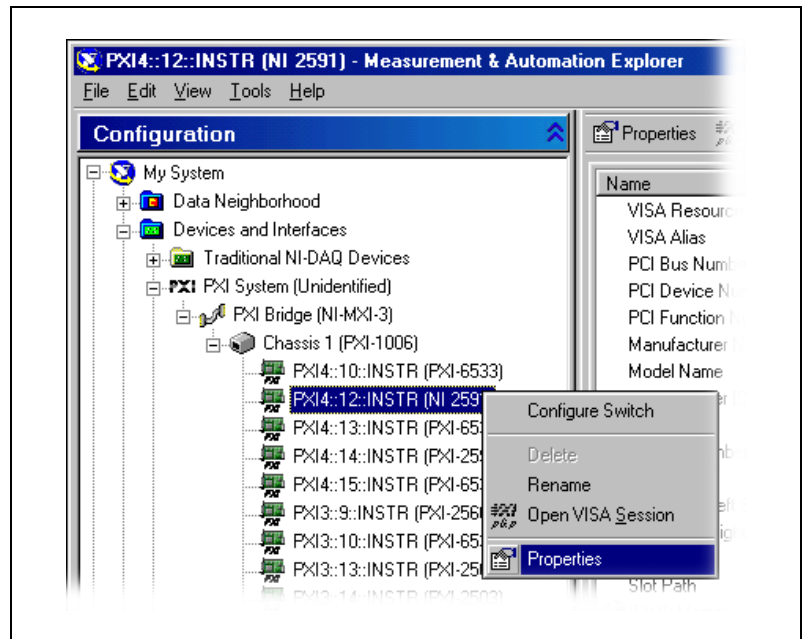**Figure 11.** Configuring Switch Modules Under NI-DAQmx Devices in MAX

2. Configure the module properties.

- (Optional) Select the terminal block/accessory from the **Terminal Block/Accessory** list box.

- Set the default topology of the switch module by selecting a topology from the **Topology** list box.

3. Click **OK** to accept the changes.

4. You can perform a self-test on switches listed under NI-DAQmx Devices. Right-click the switch you want to test.

5. Select **Self-Test** to test the selected device.

6. When the self-test finishes, a message indicates if an error occurred. If an error occurs, refer to `ni.com/support/install` for troubleshooting information.

PXI System

1. Right-click the switch name and select **Properties**. Be sure to click the device name under PXI System.

✎ **Note** Only the PXI-2501/2503/2565/2590 and PXI-2591 can be configured under PXI System.

Figure 12. Configuring Switch Modules Under PXI System in MAX

2. Configure the module properties.

    •   (Optional) Select the terminal block/accessory from the
        Terminal Block/Accessory list box.

    •   Set the default topology of the switch module by selecting a
        topology from the **Topology** list box.

3. Click **OK** to accept the changes.

7. Configure the SCXI Switch Modules

In MAX, configure each SCXI switch module you installed. SCXI switches
can be configured under NI-DAQmx Devices and/or Traditional NI-DAQ
Devices. Configuring the switch modules in MAX establishes the default
settings for the switch module.

Refer to Table 3 to determine your MAX configuration options according
to your controller. For example, the NI 4021 can control a switch module
configured under NI-DAQmx Devices or Traditional NI-DAQ Devices.
The NI 4060 can only control SCXI switch modules configured under
Traditional NI-DAQ Devices.

**Table 3.** Switch Module Configuration in MAX by Controller

Controller	SCXI-1130/1166/1167/1193 Can Be Configured Under	All Other SCXI Switch Modules Can Be Configured Under
NI 4021	NI-DAQmx Devices	NI-DAQmx Devices/ Traditional DAQ Devices
NI 4060	—	Traditional DAQ Devices
NI 4070	NI-DAQmx Devices	Traditional DAQ Devices
E Series	NI-DAQmx Devices	NI-DAQmx Devices/ Traditional DAQ Devices

NI-DAQmx

If you are using NI-DAQmx, complete the following steps, as shown in the
figures, to configure the SCXI chassis and switch module.

1. Right-click **NI-DAQmx Devices** in the configuration tree and select
    Create New NI-DAQmx Device.

2. Select **NI-DAQmx SCXI Chassis** and choose the chassis.

3. Select the controller cabled to the communicating SCXI module from
    Chassis Communicator. If MAX detects only one DAQ device, the
    device is chosen by default, and this option is disabled.

4. Select the module slot connected to the chassis communicator from **Communicating SCXI Module Slot**.

5. Enter the chassis address setting in **Chassis Address**. Make sure the setting matches the address setting on the SCXI chassis.

6. Select whether or not to auto-detect SCXI modules. If you do not auto-detect modules, MAX disables the Communicating SCXI Module Slot.

7. Click **Save**.
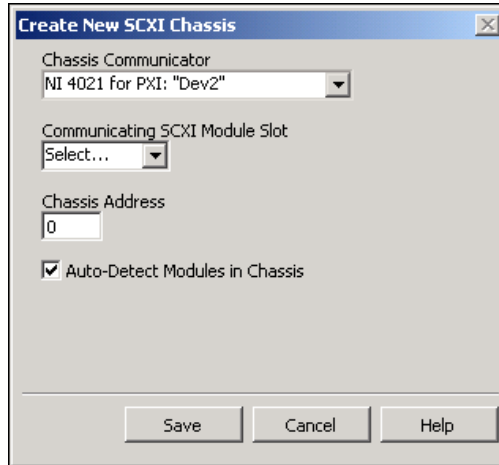
Figure 13. Configuring SCXI Switch Modules Under NI-DAQmx Devices

8. The SCXI Chassis Configuration window opens. The **Modules** tab is selected by default. If you did not auto-detect modules, select an SCXI module from the **Modules** list box. Be sure to locate the module in the correct slot.
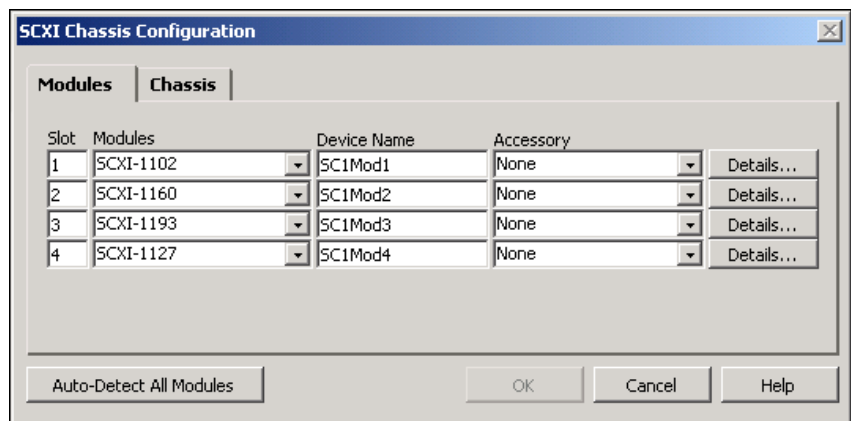
Figure 14. Configuring SCXI Switch Modules Under NI-DAQmx Devices

9. MAX provides a default name for the Device Name field. To change the name, click in the field and enter a unique alphanumeric ID for the SCXI module.

✎ **Note** The text in the Device Name column is the name you reference in the NI-DAQmx API and is the **resource name** for the NI-SWITCH API.

10. If you are using a connected accessory, such as a terminal block, select it from **Accessory**.

11. Click **Details** to configure the switch module options.

12. The switch module configuration window opens. The **Terminal Block/Accessory** tab is selected by default. Select the terminal block connected to the switch module from the **Terminal Block/Accessory** list box.

13. Set a default topology from the **Topology** list box.

✎ **Note** The SCXI-1127/1128 can connect to the high-voltage analog bus (HVAB) during scanning. You can configure the switch to automatically connect to the HVAB during scanning by selecting an optional checkbox (not shown) on the previous window.
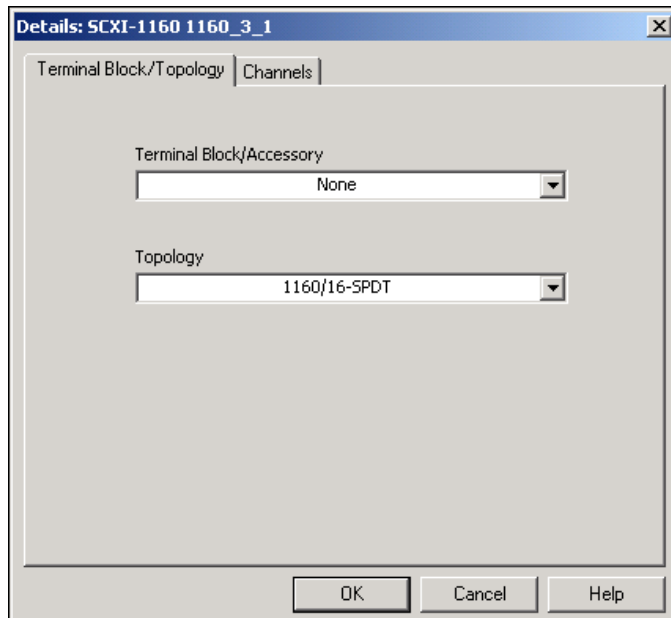
Figure 15. Configuring SCXI Switch Modules Under NI-DAQmx Devices

14. Click the **Channels** tab.

15. Designate source channels for the topology selected in the **Terminal Block/Topology** tab. You can set different source channels for each topology.

16. Designate reserved for routing channels. You can reserve different channels for routing in each topology.

17. Click **OK**.

18. Repeat steps 11 through 17 to configure additional SCXI switch modules.

19. If you need to change any chassis settings, click the **Chassis** tab.

20. Click **OK** to accept and save the settings for this chassis.

Note   You cannot save the chassis configuration until you finish entering module information. A message at the top of the SCXI Chassis Configuration window alerts you of the status of the configuration. You cannot save if an error appears in the message box. If a warning appears in the message box, you can save the configuration.

21. Right-click the chassis name in the NI-DAQ API you want to test under Devices and Interfaces.

22. Select **Test**. If the test fails, a message explains the failure.

Traditional NI-DAQ

If you are using Traditional NI-DAQ, complete the following steps, as shown in the figures, to configure the SCXI chassis and switch module.
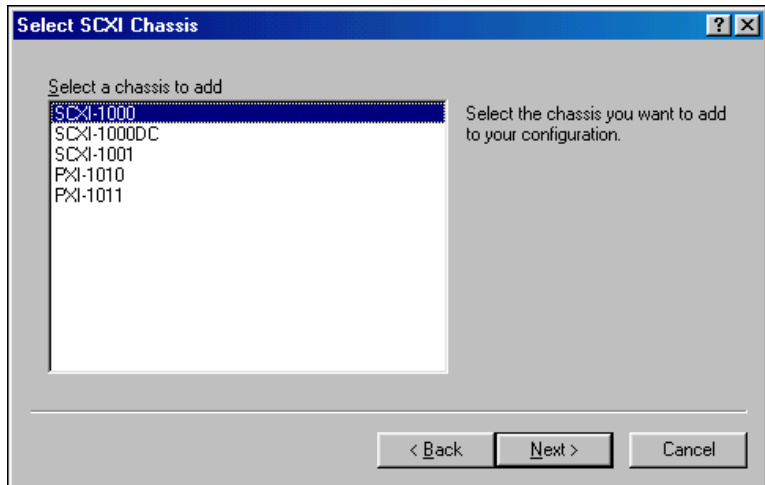
1. Right-click **Traditional NI-DAQ Devices** in the configuration tree and select **Add SCXI Chassis**.

2. Select **SCXI Chassis**. Click **Next**.
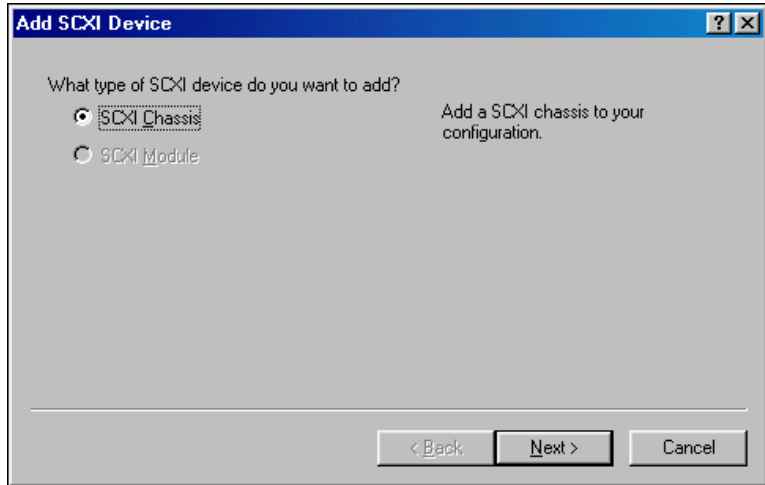
Figure 16. Adding an SCXI Chassis in MAX

3. Select the type of chassis. Click **Next**.

Figure 17. Selecting a Chassis Type in MAX

4. Select an ID for the SCXI chassis. The ID can be any integer between 1 and 3,200. Use this ID to identify the chassis in your application.
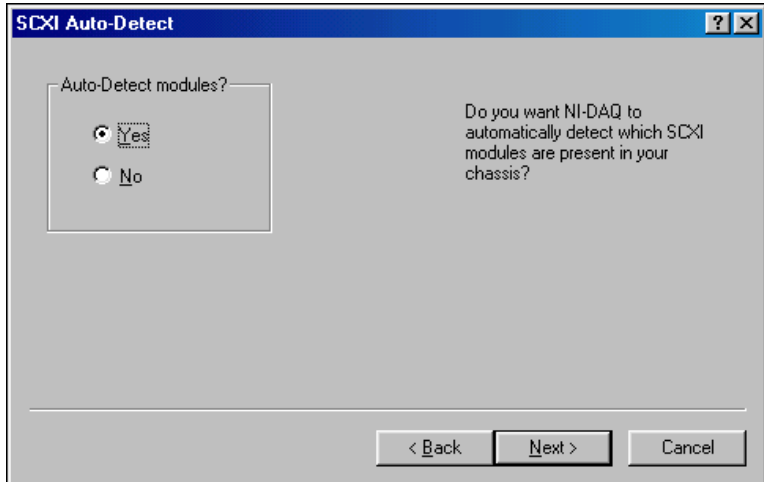
5. Enter the chassis address setting. Make sure the setting matches the chassis address setting on the SCXI chassis. Refer to the *Procedure 2* section for help locating the chassis address switches. Click **Next**.
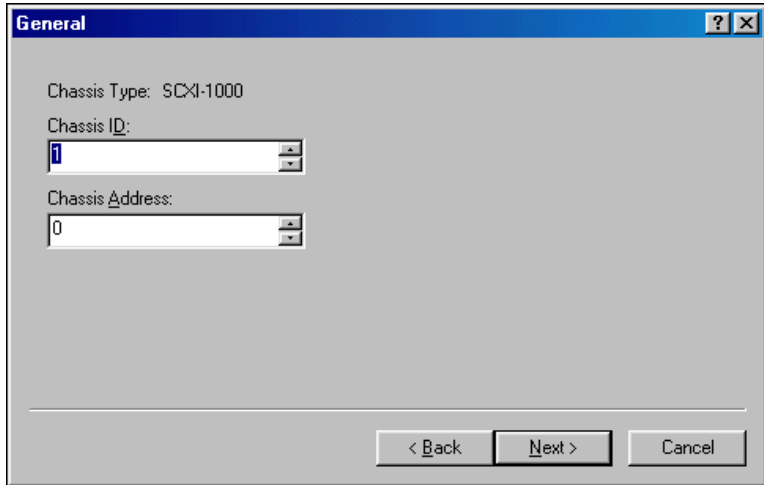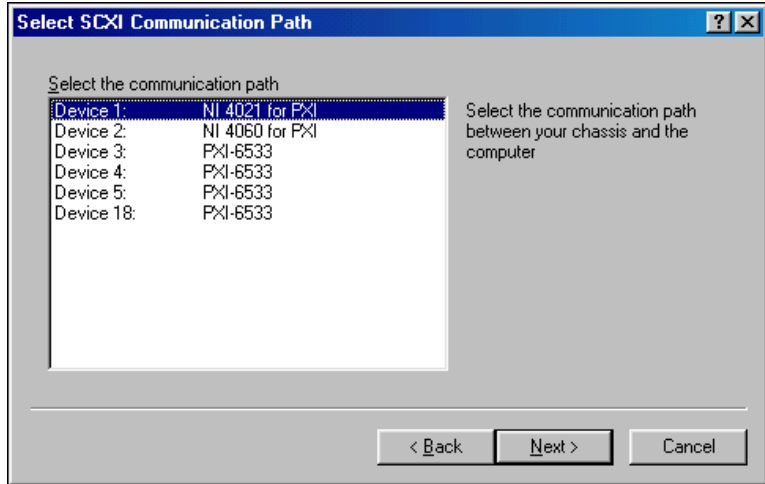

Figure 18. Configuring the Chassis ID and Address in MAX

6. Select whether or not to auto-detect SCXI modules. Click **Next**.
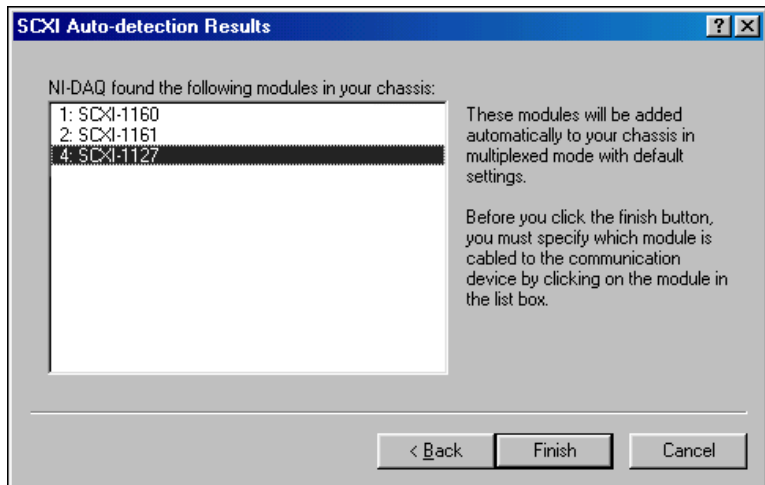

Figure 19. Auto-Detecting Modules

7. Select the controller which acts as the communication path between the chassis and the computer. Click **Next**.
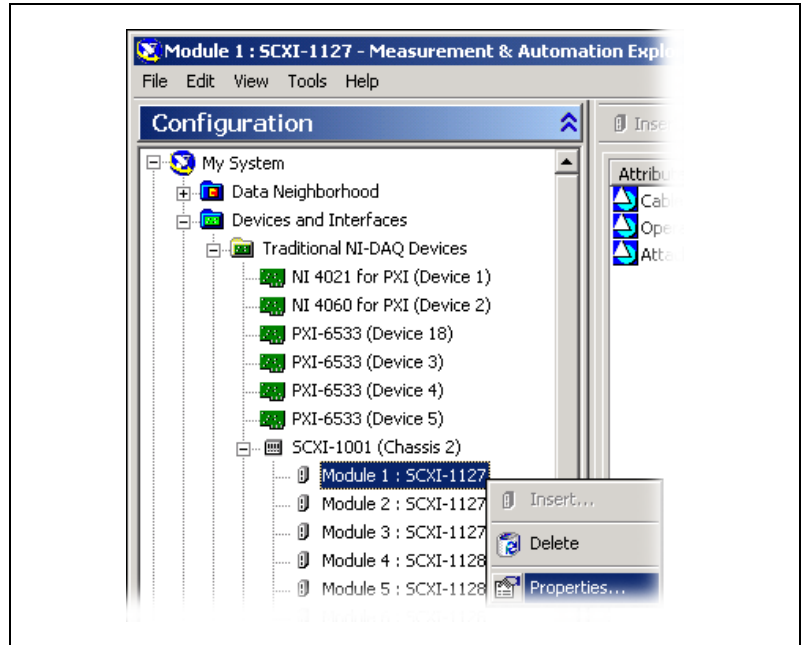

Figure 20. Select the Controller

8. Select the switch module that is cabled to the communication device. If the chassis has only one module, NI-DAQ selects the module by default.

9. Click **Finish** to accept the settings.

Figure 21. Select the Cabled Switch Module

10. Select the chassis from **Devices and Interfaces»Traditional NI-DAQ Devices**.

11. Right-click a module slot and select **Properties**.

Figure 22. Configuring Switch Modules Under Traditional NI-DAQ Devices in MAX

12. The **General** tab is selected by default. Choose which controller connects to the module from the **Connected to** list box. Select the check box if the DAQ device controls the chassis.
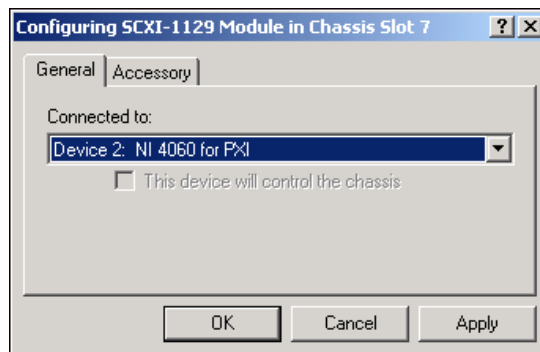
Figure 23. Configuring Switch Modules Under Traditional NI-DAQ Devices in MAX

13. Click the **Accessory** tab (if available). Select the terminal block connected to the switch module from the **Accessory** list box.
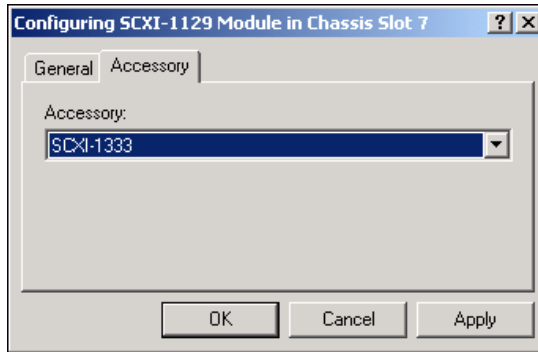
Figure 24. Configuring Switch Modules Under Traditional NI-DAQ Devices in MAX

14. Click **OK** to accept the settings.

8. Install the Terminal Blocks and Connect Signals

If your module uses a terminal block, complete the following steps:

1. Wire sensors to your switch module or the terminal block. For signal connection information, refer to the terminal block installation guide or the *NI Switches Help* for more information.

⚠️ **Caution** Always refer to the specifications document included with your switch *before* connecting signals. Exceeding specified switch signal ratings can create a shock or fire hazard and damage any or all of the devices connected to the switch.

⚠️ **Caution** Modules that share a common HVAB derate to their lowest common voltage rating, even if they do not connect signals to the backplane. Refer to the *Derating Modules That Share the HVAB* section for more information.

2. Connect the module front connector to its mating connector on the terminal block.

3. Tighten the top and bottom thumbscrews on the back of the terminal block rear panel to hold it securely in place.

1	Switch Module	4	Signal Wires
2	Thumbscrews	5	Chassis
3	Terminal Block		
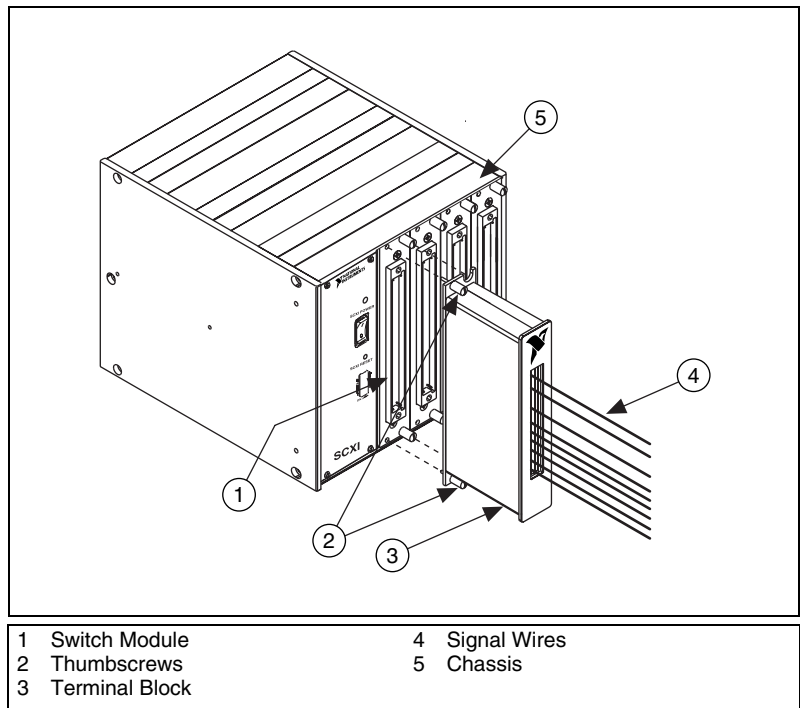
Figure 25. Installing a Terminal Block

Derating Modules That Share the HVAB

As a safety precaution, modules that share a common HVAB must be derated to their lowest common voltage rating, even if they do not connect signals to the backplane. Refer to Figure 2 to determine if your switch has an HVAB connector. The following examples demonstrate how to derate your modules.

Example 1

SCXI-1000 chassis
SCXI-1359 2-slot backplane adapter behind slots 3 and 4
SCXI-1127 (250 V, CAT II) in slot 4
SCXI-1129 (150 V, CAT I) in slot 3

Both modules share the HVAB and the SCXI-1127 must not exceed the rating of the SCXI-1129 (150 V, CAT I).

Example 2

SCXI-1000 chassis
SCXI-1359 2-slot backplane adapter behind slots 3 and 4
SCXI-1127 (250 V, CAT II) in slot 4
SCXI-1129 (150 V, CAT I) in slot 2

The SCXI-1127 does not share the HVAB with the SCXI-1129. Therefore, the SCXI-1127 can operate at the full rating (250 V, CAT II).

Example 3

SCXI-1000 chassis
SCXI-1359 2-slot backplane adapter behind slots 3 and 4
SCXI-1127 (250 V, CAT II) in slot 4
SCXI-1190 (30 V, CAT I) in slot 3

The SCXI-1190 does not have a HVAB connector. Therefore, the SCXI-1127 can operate at the full rating (250 V, CAT II).

9. Program the Switch Modules

You can operate the switch module in one of the following three ways.

- Interactively using the NI-SWITCH Soft Front Panel

- Programming using the NI-SWITCH API

- Programming using the NI-DAQmx API

NI-SWITCH Soft Front Panel (SFP)

The NI-SWITCH SFP is an interactive tool you use to test the basic functionality of the switch, become familiar with its operation, and troubleshoot your applications. All NI switches can be operated with the NI-SWITCH SFP.

You can launch the NI-SWITCH SFP from **Program Files»National Instruments»NI-SWITCH»NI-SWITCH Soft Front Panel**.

NI-SWITCH API

The NI-SWITCH API includes a set of operations and attributes that use all the functionality of the switch, including configuration, control, and other module-specific functions. All NI switches can be programmed with NI-SWITCH.

Information about programming with NI-SWITCH is available in the *NI Switches Help*. This help file contains measurement tasks, concepts, a detailed function/VI reference for NI-SWITCH 2.0, and information specific to your switch module.

For example locations, refer to **Programming»Getting Started with NI-SWITCH** in the *NI Switches Help* at **Program Files»National Instruments»Documentation»NI Switches Help**.

NI-DAQmx API

You can operate some switch modules with the NI-DAQmx API. NI-DAQmx is particularly useful for multimodule scanning operations. Refer to Table 1 to determine if you can program your switch with the NI-DAQmx API.

Information about programming with the NI-DAQmx API is available in the *NI-DAQmx Help*. Information specific to your switch module is available in the *NI Switches Help*.

For example locations, refer to the *DAQ Quick Start Guide*.

Technical Support Resources

NI Web Support

National Instruments Web support is your first stop for help in solving installation, configuration, and application problems and questions. Online problem-solving and diagnostic resources include frequently asked questions, knowledge bases, product-specific troubleshooting wizards, manuals, drivers, software updates, and more. Web support is available through the Technical Support section of ni.com.

A DoC is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electronic compatibility (EMC) and product safety. You can obtain the DoC for your product at ni.com/hardref.nsf. If your product supports calibration, you can obtain the calibration certificate at ni.com/calibration.

Worldwide Support

National Instruments has offices located around the world to help address your support needs. You can access our branch office Web sites from the Worldwide Offices section of `ni.com`. Branch office Web sites provide up-to-date contact information, support phone numbers, email addresses, and current events.

If you have searched the technical support resources on our Web site and still cannot find the answers you need, contact your local office or National Instruments corporate. For telephone support in the United States, dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

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 (Calgary) 403 274 9391, Canada (Montreal) 514 288 5722,
Canada (Ottawa) 613 233 5949, Canada (Québec) 514 694 8521,
Canada (Toronto) 905 785 0085, Canada (Vancouver) 514 685 7530,
China 86 21 6555 7838, Czech Republic 420 2 2423 5774,
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,
Greece 30 2 10 42 96 427, India 91 80 51190000,
Israel 972 0 3 6393737, Italy 39 02 413091, Japan 81 3 5472 2970,
Korea 82 02 3451 3400, Malaysia 603 9131 0918,
Mexico 001 800 010 0793, Netherlands 31 0 348 433 466,
New Zealand 0800 553 322, Norway 47 0 66 90 76 60,
Poland 48 0 22 3390 150, Portugal 351 210 311 210,
Russia 7 095 783 68 51, Singapore 65 6226 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 2 2528 7227,
Thailand 662 992 7519, United Kingdom 44 0 1635 523545

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