

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 driver software relative to NI switch modules. For a more detailed explanation of NI-DAQ 7.x, refer to the *DAQ Quick Start Guide* available on the NI-DAQ 7.x Device Documentation CD.

For more information about a specific switch module, such as features and programming with NI-SWITCH, refer to the *NI Switches Help* at **Start»Programs»National Instruments»NI-SWITCH»Documentation**. Refer to the specifications document that ships with your device for detailed specifications.

Contents

Conventions	1
Safety and Compliance	2
Related Documentation	2
1. Verifying the System Requirements	3
2. Unpacking	4
3. Verifying the Kit Contents	5
4. Installing the Software	5
5. Installing the PXI Hardware	7
6. Installing the SCXI Hardware	9
Procedure 1: Installing the SCXI Switch in an Existing System	12
Procedure 2: Cable the Controller to the SCXI Switch	13
Procedure 3: Controller in the Rightmost PXI Slot	17
Procedure 4: Controller Not in Rightmost PXI Slot of PXI-1011 ...	18
7. Configuring the PXI Hardware in MAX	19
8. Configuring the SCXI Hardware in MAX	20
9. Connecting Signals	27
10. Programming the Switch Modules	29
Technical Support Resources	30

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 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.

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**.

- *NI xxx-xxxx Specifications* contains detailed specifications for your switch module.
- *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 available in printed form.
- *DAQ Quick Start Guide* contains additional information about NI-DAQ 7.x and the relationship between Traditional NI-DAQ and NI-DAQmx. Available on the NI-DAQ 7.x Device Documentation CD.
- *NI-DAQmx Help* contains information about programming your switch with the NI-DAQmx API.
- *VI, Function & How-To Help* contains information about the NI-DAQmx VIs available to program your switch module. This document is available at **Program Files»National Instruments»<LabVIEW x.x>**.

1. Verifying the System Requirements

This section specifies the minimum and recommended system requirements for your driver software and switch hardware.

Minimum System Components

The minimum system requirements include the following items:

- Pentium 200 MHz or equivalent processor
- 64 MB RAM
- A screen resolution of 800 × 600
- Windows 2000

- ◆ PXI switch modules require the following:
 - PXI chassis or PXI/SCXI combination chassis
 - 1/8 in. flathead screwdriver
- ◆ SCXI switch modules require the following:
 - Switch controller (NI 4021/4060/407x or E Series device)
 - Cable adapter (if cabling directly to a controller)
 - Cable (if cabling directly to a controller)
 - SCXI chassis or PXI/SCXI combination chassis

Recommended System Components

The recommended system requirements include the following items:

- Pentium III/Celeron 600 MHz or equivalent processor
- 256 MB RAM
- A screen resolution of 1024 × 768
- Windows 2000/XP or later
- The minimum PXI switch module requirements
- The minimum SCXI switch module requirements
- One of the following application development environments (ADEs):
 - LabVIEW 7.x or later
 - LabWindows™ /CVI™ 7.x or later
 - Microsoft Visual C++ (MSVC) 6.0 or later

2. Unpacking

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 touching 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.

3. Verifying the Kit Contents

Verify that the kit contains the following items:

- Switch module
- NI-DAQ 7 software driver folder and software
- Specifications document for your switch
- NI-SWITCH Instrument Driver Quick Reference Guide*
- Read Me First: Safety and Radio-Frequency Interference*

4. Installing the Software

National Instruments switch modules are packaged with NI-DAQ 7.x driver software which contains three drivers each with a corresponding API—NI-SWITCH, NI-DAQmx, and Traditional NI-DAQ. Each API has an extensive library of functions and VIs that you can call from your application software, such as LabVIEW or LabWindows/CVI, to program your NI switch module.

Confirm the Application Software Version

If you are using NI application software (LabVIEW, LabWindows/CVI, or Measurement Studio), the NI-DAQmx API requires versions 7.x or later. The NI-SWITCH API supports LabVIEW 6.1, LabVIEW 7.x, and LabWindows/CVI 6.0 and later. Install or upgrade your application software *before* installing the driver software.

Uninstall Earlier Versions of NI-DAQ

If you are upgrading to NI-DAQ 7.x from a previous version, uninstall the earlier version of NI-DAQ now. 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 devices no longer supported.



Caution 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.

Install the NI-DAQ 7.x Software



Caution Do not install NI-DAQ 7.x if your existing applications include unsupported devices. Refer to the *DAQ Quick Start Guide* for a list of unsupported devices.

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 instructions, refer to the Hardware Installation/Configuration Troubleshooter at ni.com/support/install.

Install your driver software *before* installing the switch module to ensure proper installation.

Select an API

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

- NI-SWITCH 2.x is an IVI-compliant instrument driver with 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 supports all NI switch modules.
- NI-DAQmx is the latest NI-DAQ driver with VIs, functions, and development tools for programming switch modules, E Series devices and SCXI modules. NI-DAQmx supports all NI switch modules.
- 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. Traditional NI-DAQ supports only the NI SCXI-1160/1161/1163R 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.



Note If you install NI-DAQ 7.x first, then later install your NI application software version 7.x, run the NI-DAQ 7.x installer again to install the correct application software support.

5. Installing the PXI Hardware

To install a PXI module, complete the following steps:



Caution Make sure the chassis is powered off. PXI modules are not hot-swappable. Adding or removing modules while the chassis is powered on can damage the chassis and modules.

1. Power off and unplug the PXI chassis before installing a PXI device. Follow proper ESD precautions to ensure you are grounded before installing the hardware.
2. If the PXI chassis has multiple fan speed settings, ensure that the fans are set to high.
3. Position the PXI chassis so that inlet and outlet vents are not obstructed. For more information, refer to the chassis documentation.
4. Ensure that the ejector handle is in the unlatched (downward) position.
5. Holding the device by the ejector handle, slide it into an empty slot, ensuring that the base card (the card on the left when looking at the front of the device) engages with the card guides in the chassis, as shown in Figure 1.
6. Slide the device completely into the chassis and latch by pulling up on the ejector handle.
7. Tighten the captive screws at the top and bottom of the device front panel. Performance may suffer if both screws are not tightened properly.
8. Verify that the PXI chassis fans are operable and free of dust and other contaminants restricting airflow.

9. Before operating the device, cover all empty PXI slots using blank PXI filler panels.
10. Plug in and power on the PXI chassis.

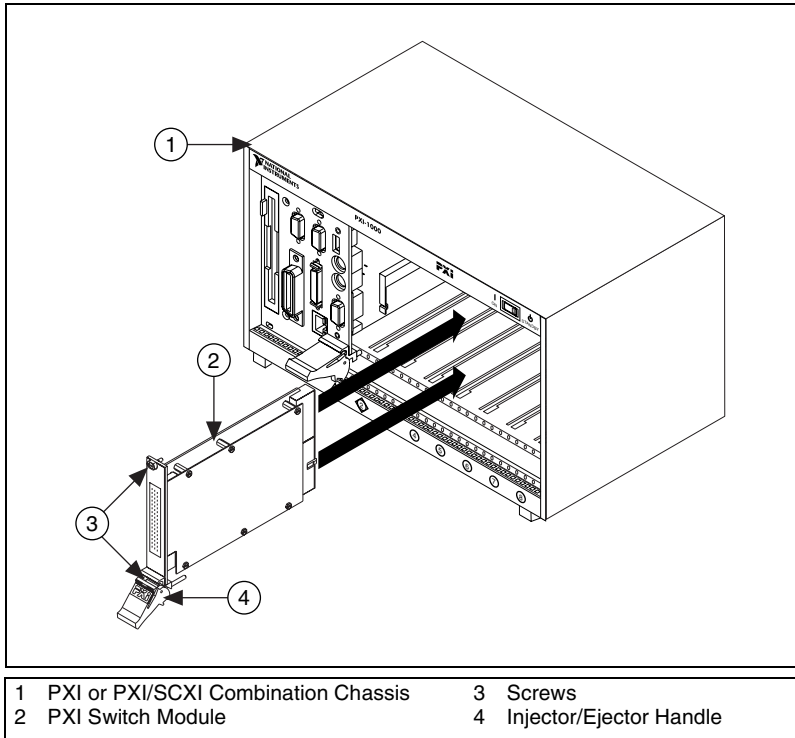


Figure 1. Installing a PXI Switch Module

6. Installing the SCXI Hardware

Rear Connectors

SCXI switches have two types of rear connectors that differentiate their cabling schemes: a 10-pin and a 50-pin connector. Refer to Table 1 and look at the back of the switch module to determine how many pins are on the rear connector.

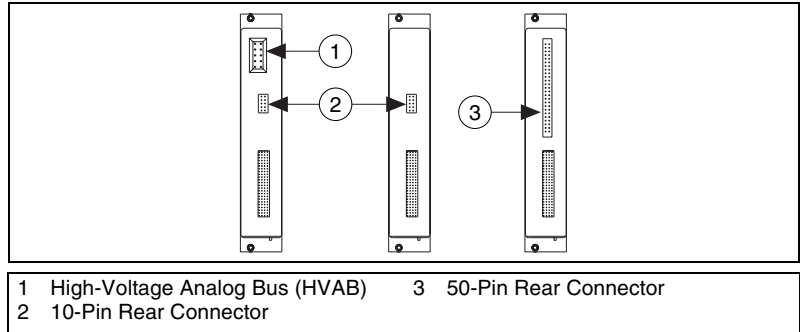


Figure 2. SCXI Switch Module Rear Connectors

SCXI Controllers

SCXI switch modules require a controller cabled to one of the SCXI modules in a system. Before installing an SCXI switch module, refer to Table 1 to ensure that your controller supports your switch and identify the cable adapter kit(s) needed for connecting the controller directly to the switch module.



Note If you are using a PXI-1010 or PXI-1011 chassis and install the switch controller in the rightmost PXI slot, no cables are required between the controller and SCXI switch.

Table 1. SCXI Controllers and Supported SCXI Switches

Rear Connector	Switch Module	SCXI Switch Controllers			
		NI 4021	NI 4060	NI 407x	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 directly cable to switch module ²
	SCXI-1128				
	SCXI-1129				
	SCXI-1130				
	SCXI-1166		Not supported ¹		
	SCXI-1167				
	SCXI-1169				
	SCXI-1193				
50-pin	SCXI-1160 ³	SCXI-1362 kit	SCXI-1362 kit	SCXI-1362 kit	SH6868-EP and SCXI-1349
	SCXI-1161 ³				
	SCXI-1163R				
	SCXI-1190				
	SCXI-1191				
	SCXI-1192				
<p>¹ The NI 4060 can control only the SCXI-1127/1128/1129/1160/1161/1163R/1190/1191/1192 switch modules configured under Traditional NI-DAQ Devices in MAX. For software support information, refer to Table 2.</p> <p>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 another SCXI switch module. Alternatively, you can install the E Series device in the rightmost PXI slot of a PXI-1010 or PXI-1011 chassis.</p> <p>³ To use this module with the listed controllers, set jumpers W2, W3, and W4 on the switch module to MIO. Refer to the <i>NI SCXI-1160/1161 Jumpers Note to Users</i> or the <i>NI Switches Help</i>.</p>					

Install and configure the controller as described in its documentation. Refer to the *DAQ Quick Start Guide* for information about installing an E Series or NI 4021 device and to the *NI Digital Multimeters Getting Started Guide* for information about installing the NI 4060/407x.

Installation

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



Caution Make sure the chassis is powered off. SCXI modules are not hot-swappable. Adding or removing modules while the chassis is powered on can result in blown chassis fuses or damage to the chassis and modules.

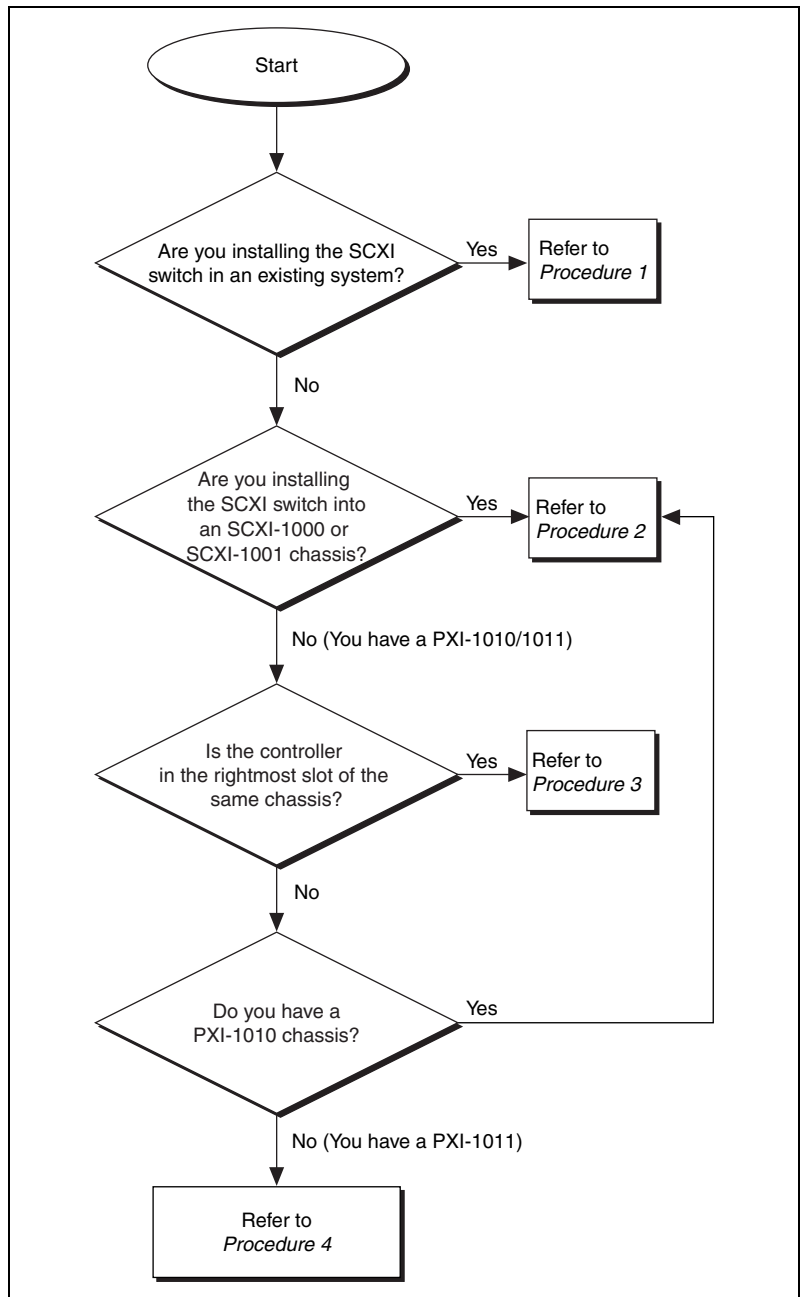


Figure 3. SCXI Switch Module Installation Flowchart

Procedure 1: Installing the SCXI Switch in an Existing System

If your SCXI system already has a controller installed, you can simply add additional SCXI switch modules in any available SCXI slots. Refer to Table 1 to determine if your controller supports your SCXI switch module. To install your SCXI switch, 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. 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 switch front panel to the chassis front panel mounting rail.

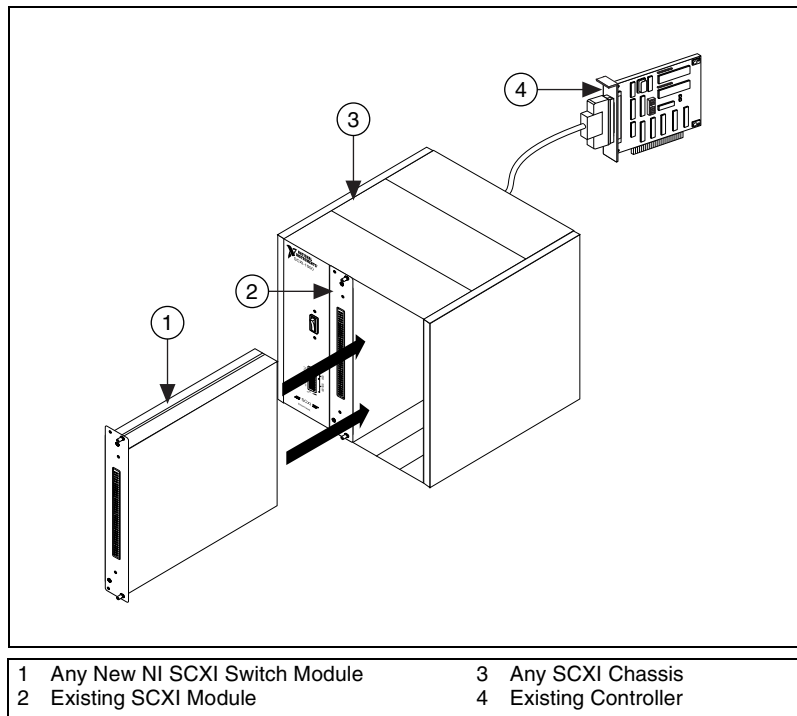


Figure 4. Installing an SCXI Switch Module in an Existing System

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.

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

3. Confirm the correct power settings of the chassis (100, 120, 220, or 240 VAC) shown in Figure 5.
4. Connect the chassis power cord.

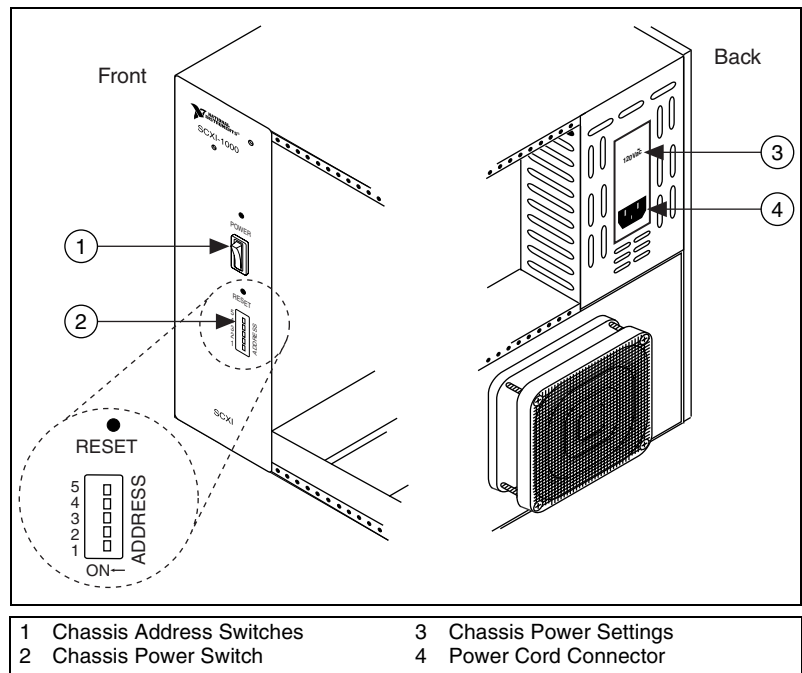


Figure 5. Chassis Preparation

After you have prepared your chassis, complete the appropriate instructions in this section for your controller. Refer to Table 1 to determine if your controller supports and connects to your SCXI switch module.

Cable the E Series Device to the Switch

E Series devices can directly cable only to switches with 50-pin rear connectors. Refer to Table 1 to determine if your switch module has a 50-pin rear connector. To cable an E Series device to your SCXI switch, 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. 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 switch 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 and the other to the E Series device.

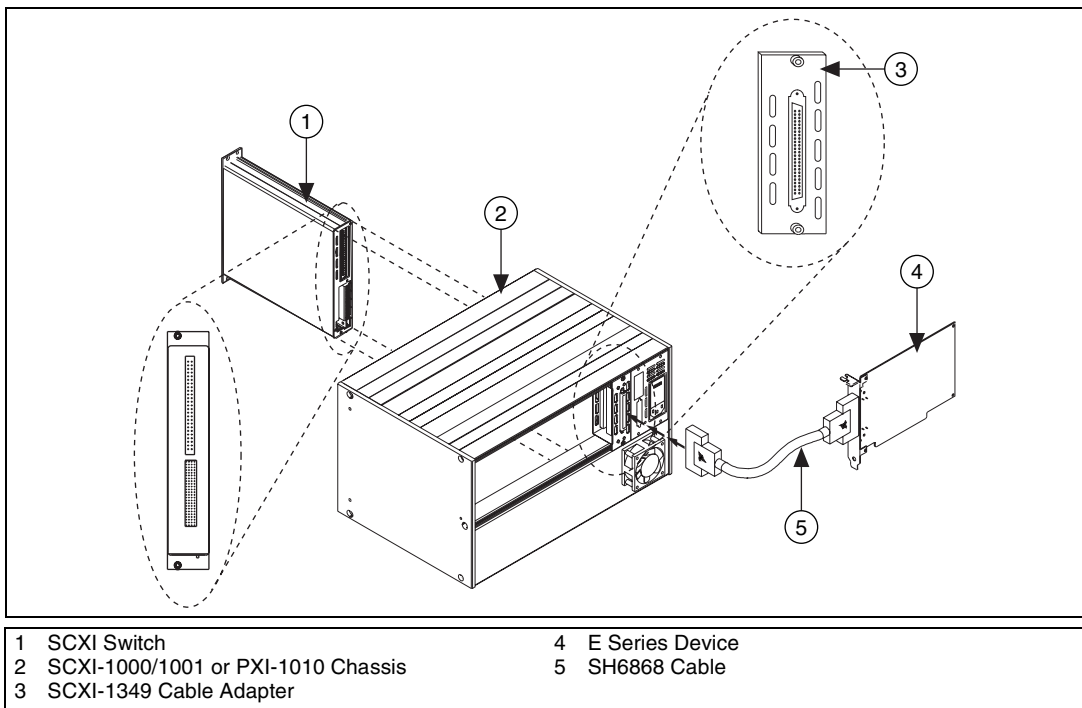


Figure 6. Cabling to an E Series Device

Cable the NI 4021/4060/407x to the Switch

To cable an NI 4021/4060/407x to your SCXI switch, complete the appropriate steps based on the switch module rear connector. Refer to Table 1 to determine the number of pins are on the rear connector.

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 switch module into the SCXI slot.
5. Screw the switch 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 4021/4060/407x.

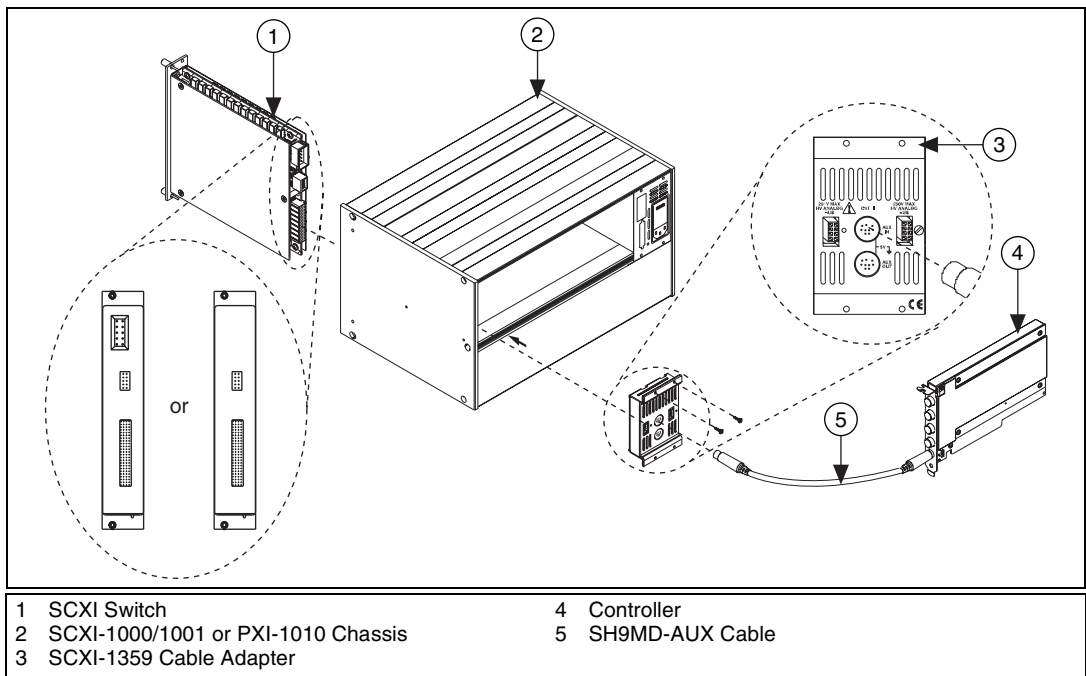


Figure 7. Cabling an NI 4021/4060/407x to a 10-Pin Rear Connector Switch Module

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 switch module into the SCXI slot.
5. Screw the switch 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 4021/4060/407x.

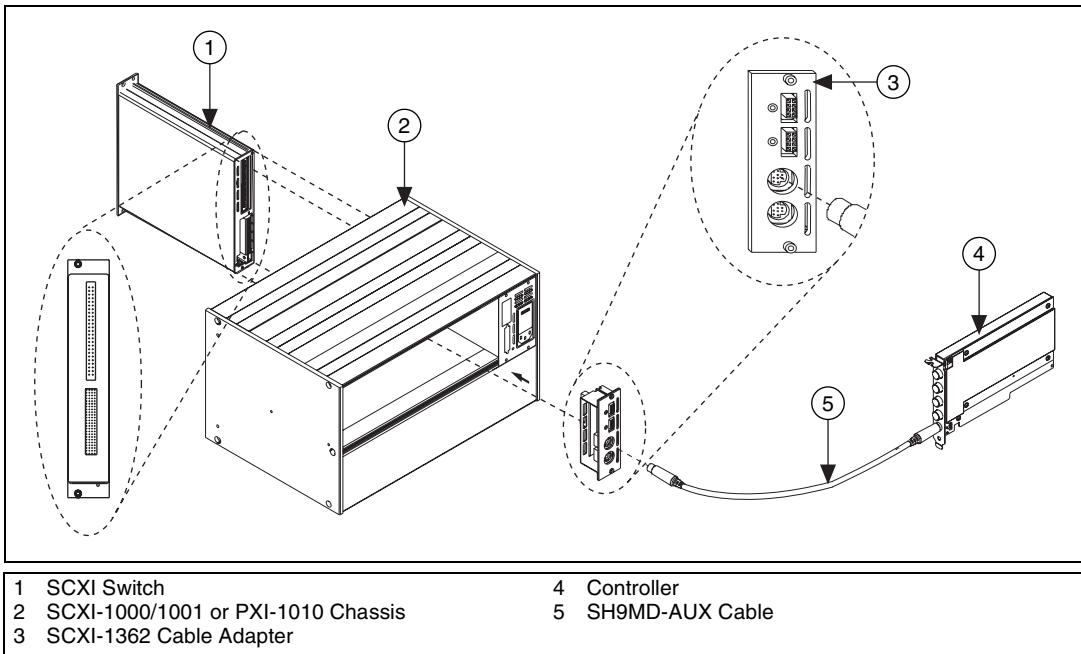


Figure 8. Cabling an NI 4021/4060/407x to a 50-Pin Rear Connector Switch Module

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 1 to determine if your controller supports your SCXI switch module. To install your switch module with the controller in the rightmost PXI slot, 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 address switches shown in Figure 5 are in the OFF position.
3. Confirm the correct power settings of the chassis (100, 120, 220, or 240 VAC) shown in Figure 5.
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 switch module into the SCXI slot.
7. Screw the switch front panel to the chassis front panel mounting rail.
8. Connect the chassis power cord.

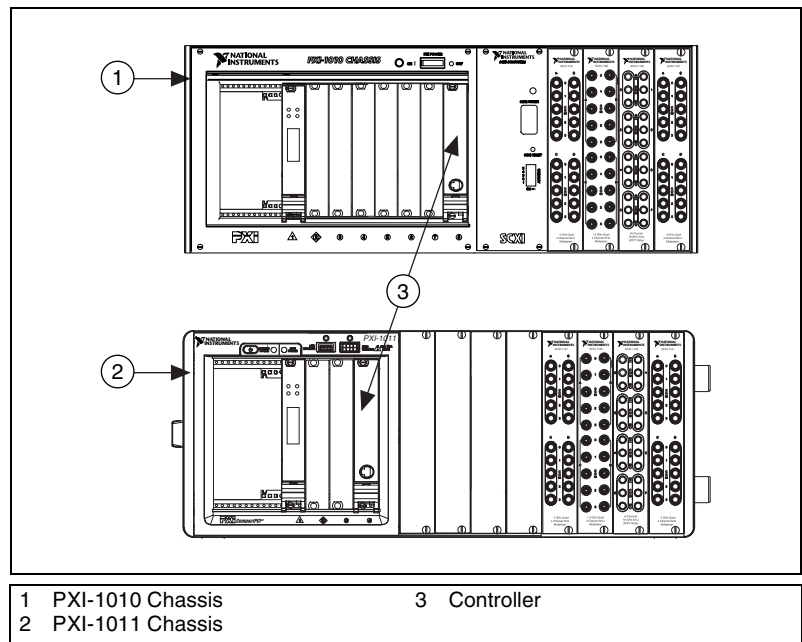


Figure 9. Controller in Rightmost PXI Slot

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 1 to determine if your controller supports and connects to your SCXI switch module. To install your switch module when the controller is not in the rightmost PXI slot of a PXI-1011 chassis, 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. Confirm the correct power settings of the chassis (100, 120, 220, or 240 VAC) shown in Figure 5.
3. Remove the filler panel in an unused SCXI slot.
4. Touch any metal part of your chassis to discharge static electricity.
5. Insert the switch module into the SCXI slot.
6. Screw the device front panel to the chassis front panel mounting rail.
7. Connect the SH9MD-AUX cable to the rear of the PXI-1011 chassis.
8. Connect the chassis power cord.

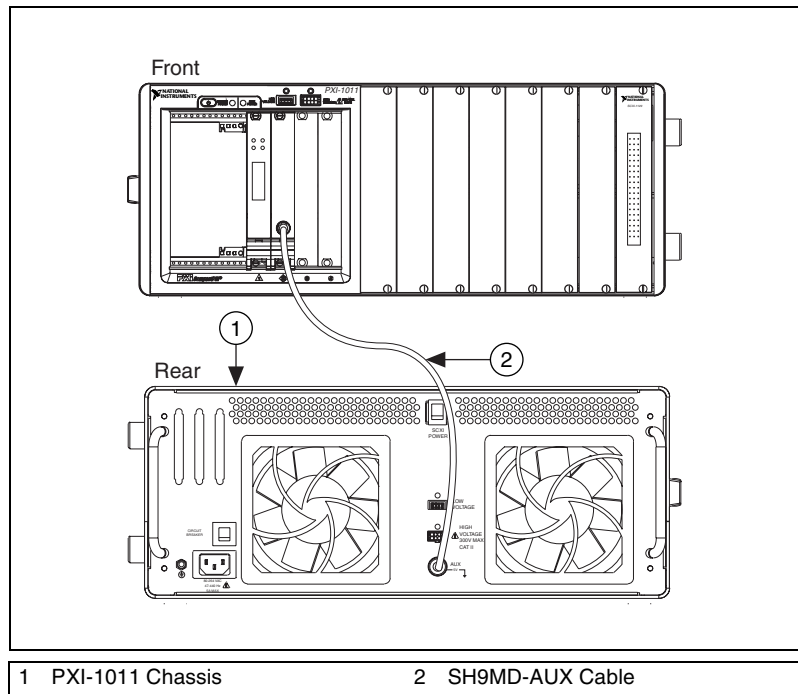


Figure 10. Cabling the Controller to the Back of a PXI-1011 Chassis

7. Configuring the PXI Hardware in MAX

In Measurement & Automation Explorer (MAX), configure each PXI switch module you installed. Configuring the switch modules in MAX establishes the settings for the switch module. All PXI switches can be 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**. If you are using a remote system running LabVIEW Real-Time, expand **Remote Systems**, find and expand your target, and then 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.

5. Under **NI-DAQmx Devices**, right-click the switch name and select **Properties**.

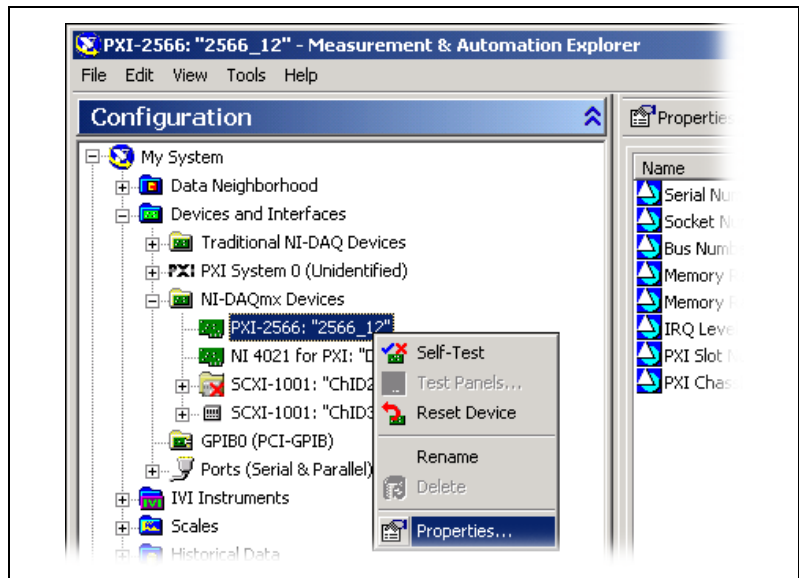


Figure 11. Configuring Switch Modules Under NI-DAQmx Devices in MAX

6. The **Terminal Block/Topology** tab is selected by default. Select the terminal block connected to the switch module from the **Terminal Block/Topology** list box.

7. Set a default topology from the **Topology** list box.
8. Click the **Channels** tab.
9. Designate source channels for the topology selected in the **Terminal Block/Topology** tab. You can set different source channels for each topology.
10. Designate reserved channels for routing. You can reserve different channels for routing in each topology.
11. Click **OK** to accept the changes.



Note General-purpose switch modules with 32 or fewer channels have a digital test panel. To access the digital test panel, right-click the switch name and select **Test Panels**.

12. To perform a self-test on the switch listed under **NI-DAQmx Devices** or **Remote Systems»Devices and Interfaces»NI-DAQmx Devices**, right-click the switch you want to test and select **Self-Test**.

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



Note If you have a PXI-2501/2503/2565/2590 or PXI-2591, you can use the legacy PXI configuration under **PXI System**.

1. Right-click the switch name under **PXI System** and select **Properties**.
2. The **Terminal Block/Topology** tab is selected by default. Select the terminal block connected to the switch module from the **Terminal Block/Topology** list box.
3. Set a default topology from the **Topology** list box.
4. Click **OK** to accept the changes.

8. Configuring the SCXI Hardware in MAX

In MAX, configure each SCXI switch module you installed. You can configure SCXI switches 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 2 to determine your MAX configuration options. For example, the NI 4021 can control a switch module configured under **NI-DAQmx Devices** or **Traditional NI-DAQ Devices**. The NI 4060 can control only SCXI switch modules configured under **Traditional NI-DAQ Devices**.

Table 2. Switch Module Configuration in MAX by Controller

Controller	SCXI-1127/1128/1129/1160/1161/1163R/1190/1191/1192 MAX Configuration Category	All Other SCXI Switch Modules MAX Configuration Category
NI 4021 NI 407x E Series	NI-DAQmx Devices/ Traditional DAQ Devices	NI-DAQmx Devices
NI 4060	Traditional DAQ Devices	—

NI-DAQmx Devices

If you are using NI-DAQmx, complete the following steps, as shown in Figures 12 through 14, 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**. If you are using a remote system running LabVIEW Real-Time, browse for your module under **Remote Systems»Devices and Interfaces»NI-DAQmx Devices**.
2. Select **NI-DAQmx SCXI Chassis** and choose the chassis. The Create New SCXI Chassis window opens.

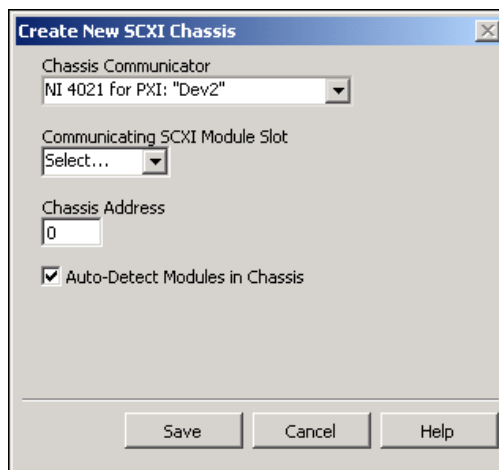


Figure 12. Configuring SCXI Switch Modules under NI-DAQmx Devices

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 shown in Figure 5.
6. Select whether or not to auto-detect the installed SCXI modules. If you do not auto-detect modules, MAX disables the Communicating SCXI Module Slot.
7. Click **Save**.
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.

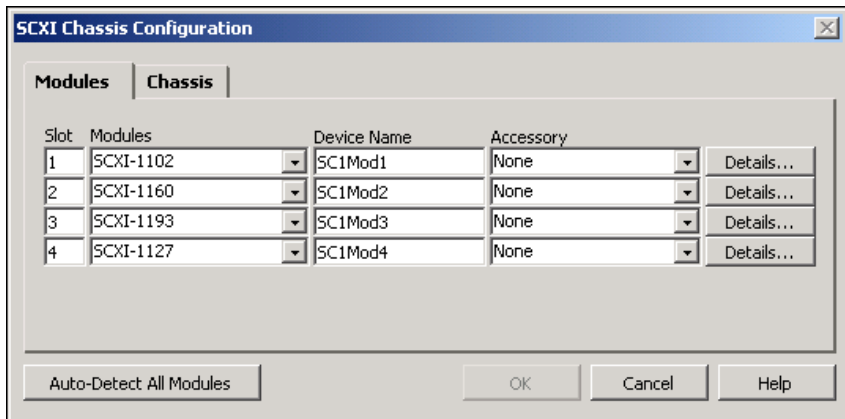


Figure 13. Configuring SCXI Switch Modules under NI-DAQmx Devices

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 string you use for the **resource name** in the NI-SWITCH API and **switch device** in the NI-DAQmx API.

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

11. Click **Details** to configure the switch module options. The switch module configuration window opens.

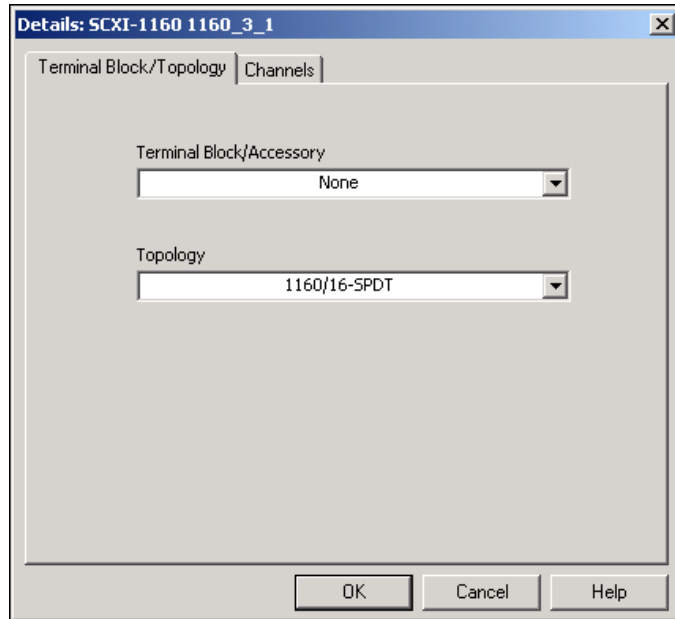


Figure 14. Configuring SCXI Switch Modules under NI-DAQmx Devices

12. The **Terminal Block/Topology** tab is selected by default. Select the terminal block connected to the switch module from the **Terminal Block/Topology** 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) in Figure 14.

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 channels for routing. You can reserve different channels for routing in each topology.
17. Click **OK** to accept the changes.



Note General-purpose switch modules with 32 or fewer channels have a digital test panel. To access the digital test panel, right-click the switch name and select **Test Panels**.

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 configuration status. 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 of the switch module you want to test under **Devices and Interfaces**.
22. Select **Test**. If the test fails, a message explains the failure.

Traditional NI-DAQ Devices

If you are using Traditional NI-DAQ, complete the following steps, as shown in Figures 15 through 19, to configure the SCXI chassis and switch module.

1. Right-click **Traditional NI-DAQ Devices** in the configuration tree and select **Add SCXI Chassis**. The Add SCXI Device window opens.
2. Select **SCXI Chassis** and click **Next**. The Select SCXI Chassis window opens.
3. Select the type of chassis to add and click **Next**. A chassis configuration window opens.
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 Figure 5 for help locating the chassis address switches and click **Next**. The SCXI Auto-Detect window opens.
6. Select whether or not to auto-detect the SCXI modules and click **Next**. The Select SCXI Communication Path window opens.

7. Select the controller that acts as the communication path between the chassis and the computer and click **Next**. The SCXI Auto-Detection Results window opens.

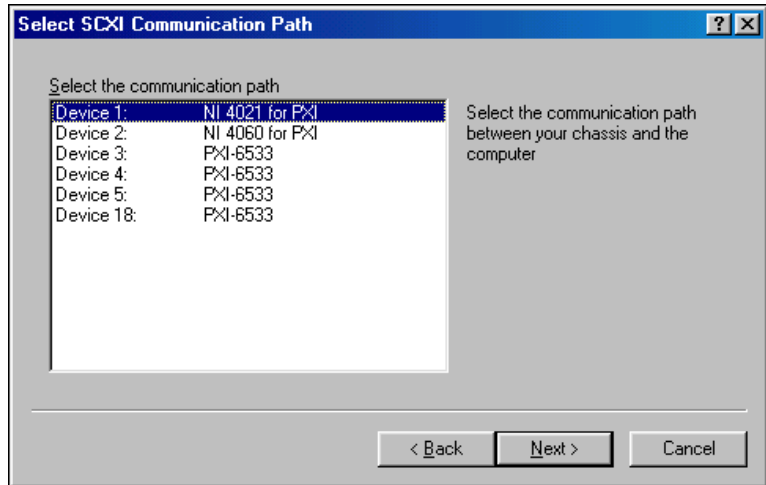


Figure 15. Select the Controller

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

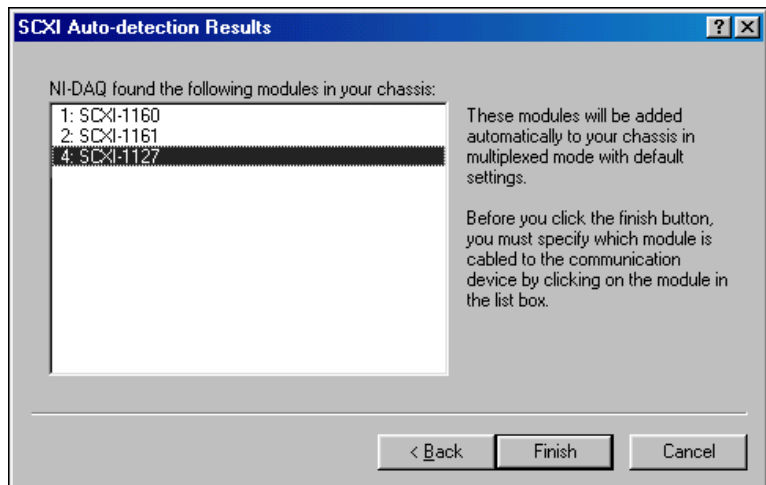


Figure 16. Select the Cabled Switch Module

9. Select the chassis from **Devices and Interfaces»Traditional NI-DAQ Devices**.
10. Right-click a module slot and select **Properties**.

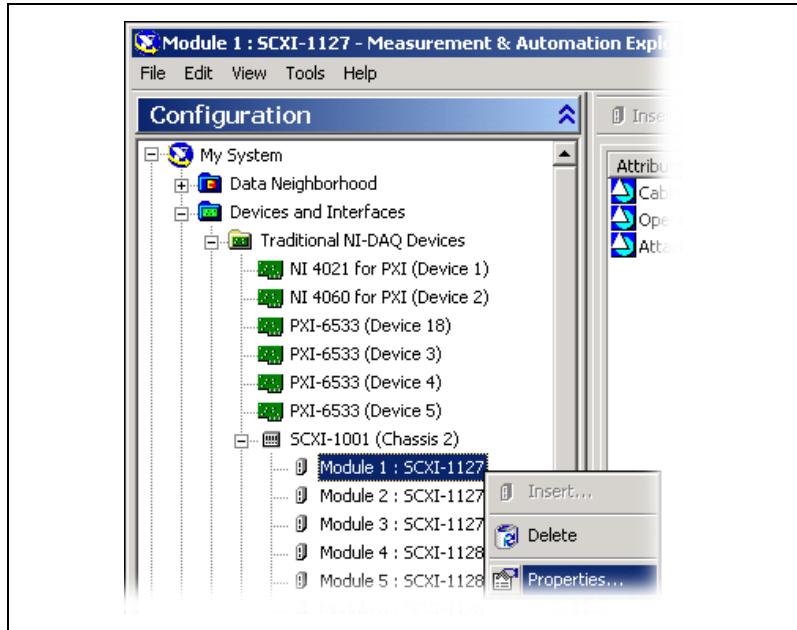


Figure 17. Configuring Switch Modules under Traditional NI-DAQ Devices in MAX

11. The **General** tab is selected by default. Choose the controller connected to the module from the **Connected to** listbox. Select the checkbox if the DAQ device controls the chassis.

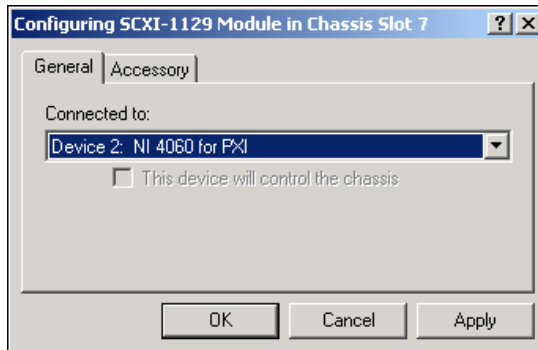


Figure 18. Configuring Switch Modules under Traditional NI-DAQ Devices in MAX

- Click the **Accessory** tab (if available). Select the terminal block connected to the switch module from the **Accessory** list box.

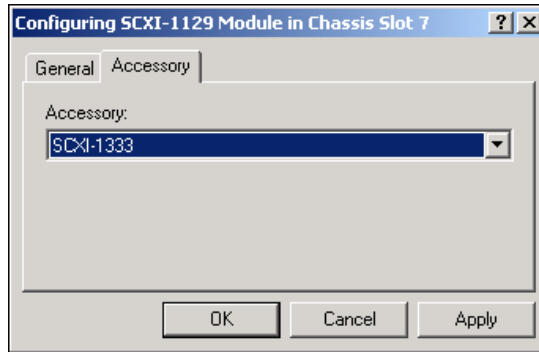


Figure 19. Configuring Switch Modules under Traditional NI-DAQ Devices in MAX

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

9. Connecting Signals

Complete the following steps to connect signals to the switch module:

- 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*.



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 signals are not connected to the backplane. Refer to the [Derating Modules That Share the HVAB](#) section for more information.

- Connect the module front connector to its mating connector on the terminal block.
- Tighten the top and bottom thumbscrews on the back of the terminal block rear panel to hold it securely in place.

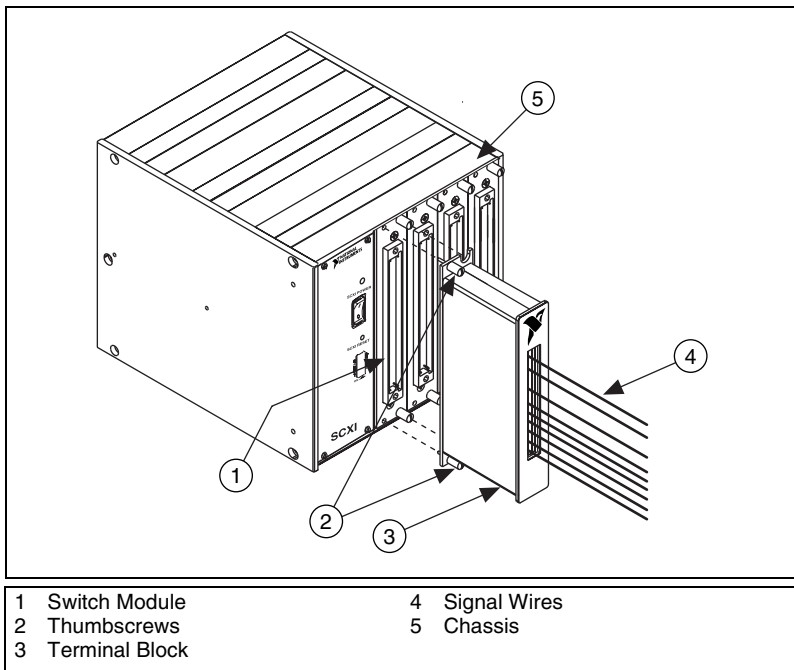


Figure 20. Installing a Terminal Block

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).

10. Programming 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. The NI-SWITCH SFP supports all NI switch modules.

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. The NI-SWITCH API supports all NI switch modules.

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.x, 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 switch modules with the NI-DAQmx API. NI-DAQmx is particularly useful for multimodule scanning operations. The NI-DAQmx API supports all NI switch modules.

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 corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504.

National Instruments also 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 (Ottawa) 613 233 5949,
Canada (Québec) 450 510 3055, Canada (Toronto) 905 785 0085,
Canada (Vancouver) 514 685 7530, China 86 21 6555 7838,
Czech Republic 420 224 235 774, Denmark 45 45 76 26 00,
Finland 385 0 9 725 725 11, France 33 0 1 48 14 24 24,
Germany 49 0 89 741 31 30, 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 22 3390150, 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

CVI™, IVI™, LabVIEW™, Measurement Studio™, National Instruments™, NI™, ni.com™, NI-DAQ™, and SCXI™ are trademarks of National Instruments Corporation. Product and company names mentioned herein are trademarks or trade names of their respective companies. For patents covering National Instruments products, refer to the appropriate location: **Help»Patents** in your software, the `patents.txt` file on your CD, or `ni.com/patents`.

© 2003–2004 National Instruments Corp. All rights reserved.



323131C-01

Mar04