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USB-1357

INSTALLATION GUIDE

NI 1357/1358/1359

SCXI™ Controller/Adapter Kit

このドキュメントには、日本語ページも含まれています。

This document describes the components, installation, and configuration of the National Instruments SCXI-1357/1358/1359 and the NI USB-1357/1358/1359 controller/adapter kits. The SCXI kit connects a switch controller to an SCXI switch module; the USB kit connects a computer to an SCXI switch module. Both SCXI and USB kits create a high-voltage analog backplane and share high-voltage signals among switches.

Introduction



Note Both SCXI and USB kits connect to an SCXI switch with a 10-pin rear connector. Refer to the *NI Switches Getting Started Guide* to determine the switches and switch controllers that your kit supports.

The NI 1359 kit (2 slots) consists of the following components:

- NI USB-1359
(2-slot high-voltage analog bus (HVAB) backplane adapter with USB connector)
or
NI SCXI-1359
(2-slot HVAB backplane adapter with 9-pin DIN connector)
- SH9MD-9MD cable (SCXI kits) or USB cable (USB kits)

The NI 1358 kit (12 slots) consists of the following components:

- NI USB-1359 or NI SCXI-1359
- One 8-slot HVAB backplane adapter
- NI SCXI-1359

- Two 8-pin HVAB plugs
- SH9MD-9MD cable (SCXI kits) or USB cable (USB kits)

The NI 1357 kit (4 slots) consists of the following components:

- NI USB-1359 or NI SCXI-1359
- NI SCXI-1359
- One 8-pin HVAB plug
- SH9MD-9MD cable (SCXI kits) or USB cable (USB kits)

Figure 1 illustrates the components of the NI 1357/1358/1359 kit.

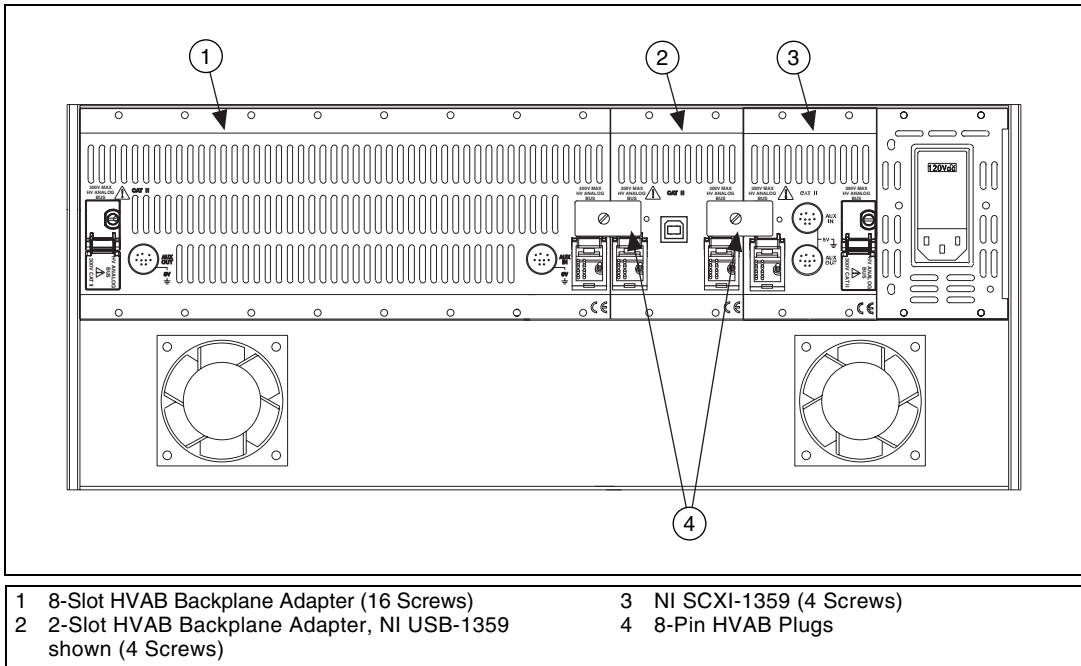


Figure 1. Components of the NI 1357/1358/1359 Controller/Adapter Kit

Installing the Kit



Note Install NI-DAQ 7.4 or later *before* you install the NI 1357/1358/1359 kit.

Complete the following steps to install the NI 1357/1358/1359 kit:

1. Power off and unplug the SCXI chassis. Follow proper electrostatic discharge (ESD) precautions and ensure high voltage analog backplane is *not* connected before installing the hardware.

2. Remove the filler panel in an unused SCXI slot.
3. Touch any metal part of the 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 NI 1359, included with the kit, to the rear of the SCXI switch module. Ensure that the 10-pin rear connector of the switch module connects to the lower, right 10-pin rear connector of the NI 1359 cabled to the computer or the switch controller. Refer to Figures 2 and 3 to verify the connector positions on the NI 1359.

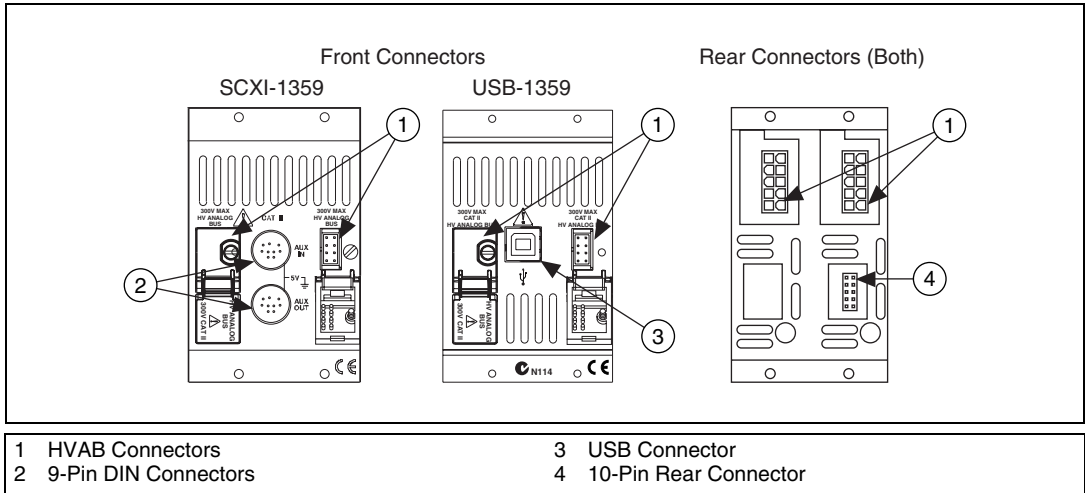


Figure 2. 2-Slot HVAB Backplane Adapter Connectors

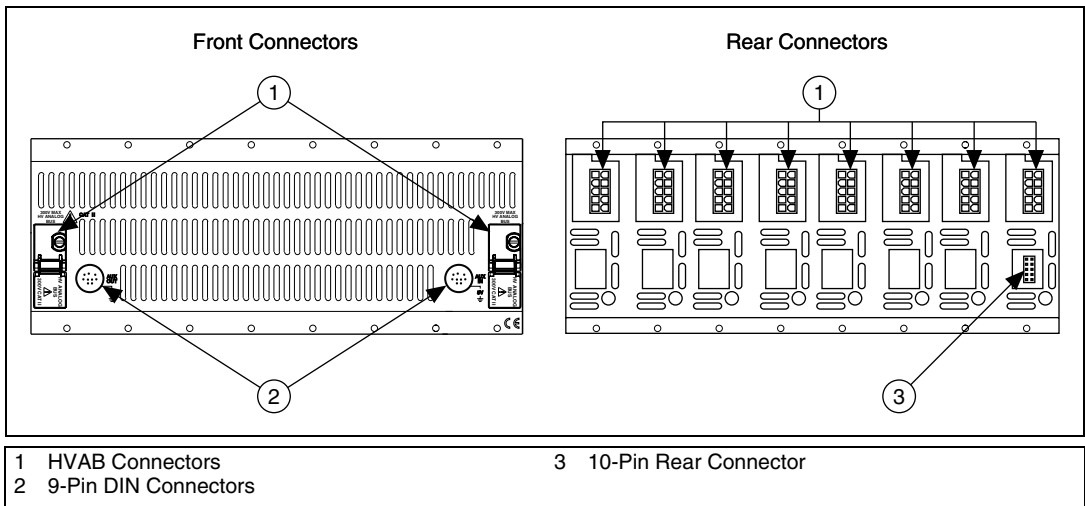


Figure 3. 8-Slot HVAB Backplane Adapter Connectors

7. Screw the backplane adapter to the chassis mounting rail.
8. Power on the chassis.
9. Cable the kit:



Note To auto-detect the NI USB-1359 and auto-create the SCXI chassis in Measurement & Automation Explorer (MAX), power on the SCXI chassis *before* you cable the NI USB-1359 to the computer. If you are using an NI PXI-1010 chassis, MAX auto-detects this chassis as an NI SCXI-1000 chassis.

- SCXI kits—Connect one end of the SH9MD-AUX cable to the NI SCXI-1359 cable adapter and the other end to the NI 4021/4060/407x switch controller as shown in Figure 4.

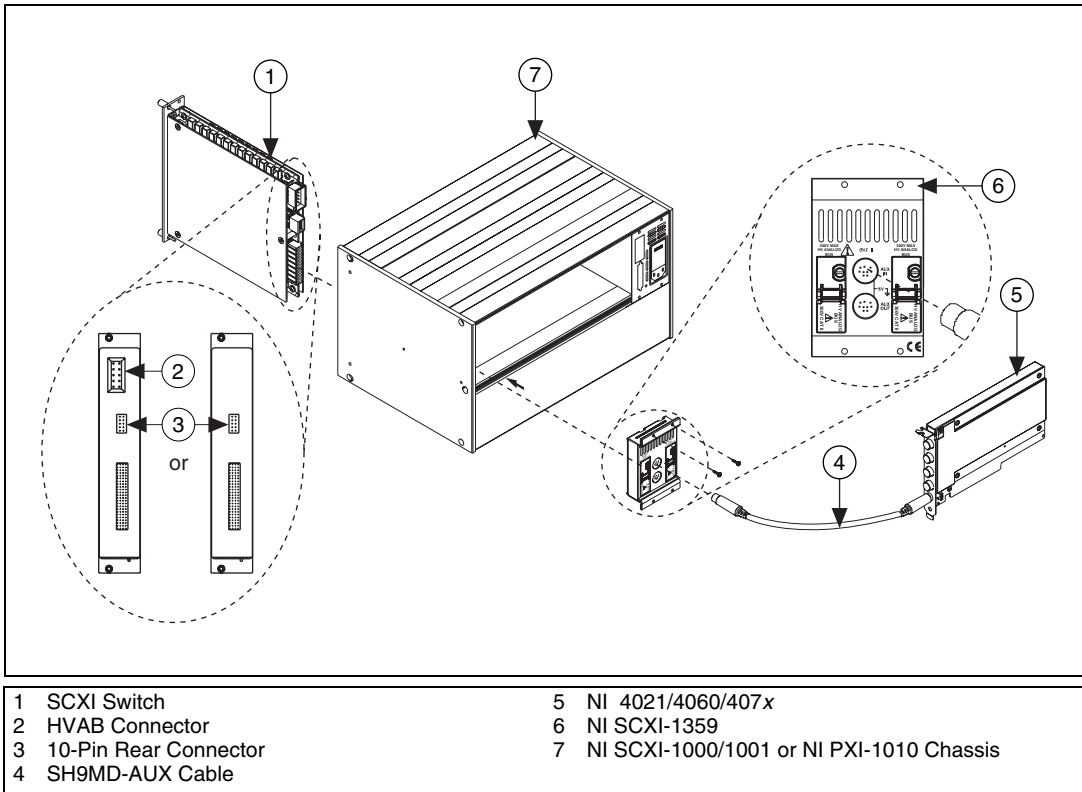


Figure 4. Cabling an NI 4021/4060/407x Switch Controller to a 10-Pin Rear Connector Switch Module

- USB kits—Connect one end of the USB cable to the NI USB-1359 switch controller and the other end to a USB hub or port on the computer as shown in Figure 5.

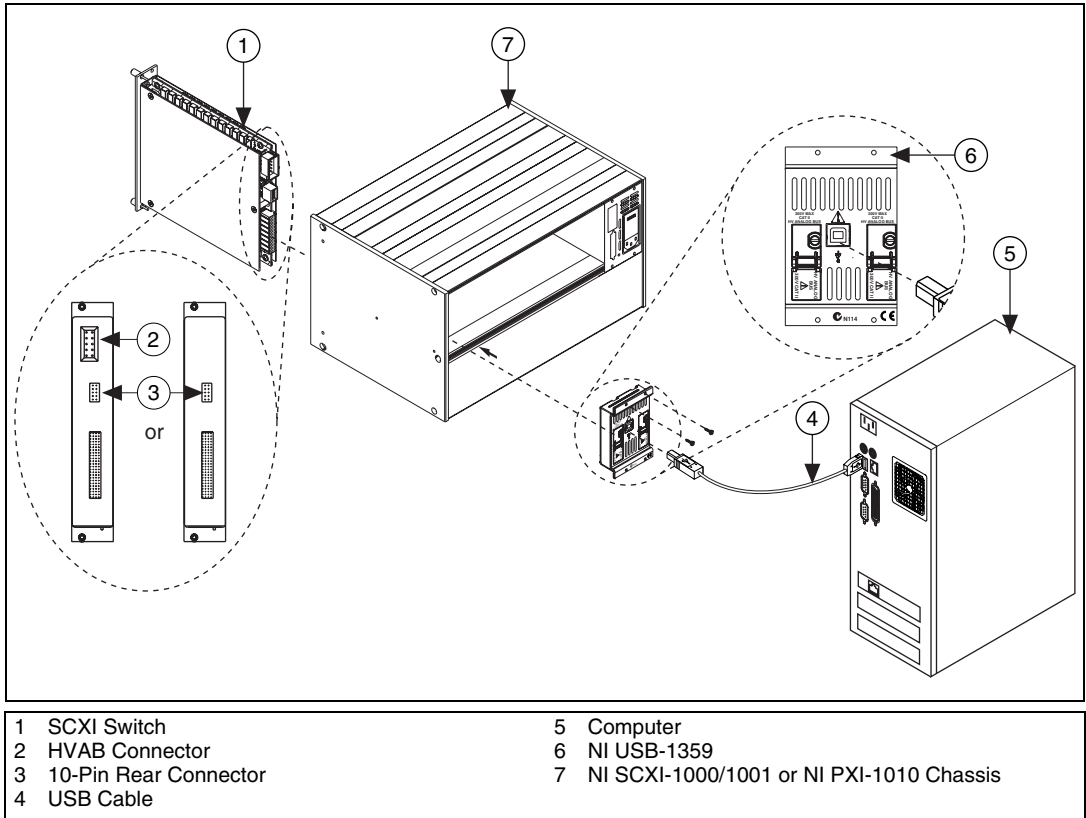


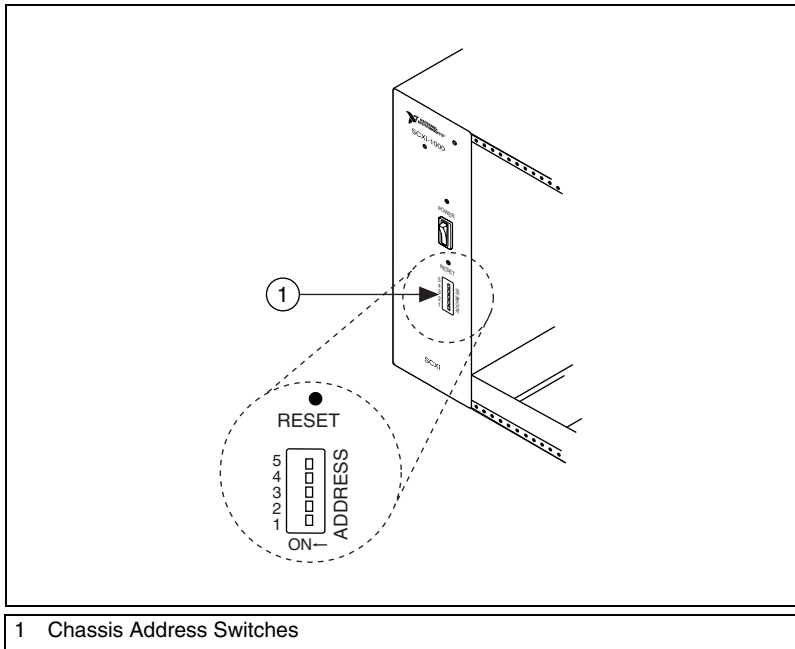
Figure 5. Cabling a USB Switch Controller to a 10-Pin Rear Connector Switch Module

10. To add a chassis to the configuration, refer to the *Multichassis Configuration* section. If you are *not* creating a multichassis configuration, refer to the [Configuring the SCXI Switch Module in MAX](#) section to configure the switch module.

Multichassis Configuration

Complete the following steps to create a multichassis switch configuration:

1. Complete the [Installing the Kit](#) section, steps 1 through 7, for each chassis you want to add to the configuration.
2. Set a distinct address for each chassis. Figure 6 illustrates the address switches located on the front of the chassis.



1 Chassis Address Switches

Figure 6. Chassis Address Switches

3. Refer to the [Configuring the SCXI Switch Module in MAX](#) section to configure the switch modules.
4. Cable the chassis:
 - SCXI kits—Complete the following steps to cable the chassis:
 - a. Designate one chassis to be the first chassis. On the first chassis, connect one end of an SH9MD-AUX cable to the AUX IN of the HVAB backplane adapter and the other end to the NI 4021/4060/407.x switch controller.
 - b. Using another SH9MD-AUX cable, connect the AUX OUT of the HVAB backplane adapter on the first chassis to the AUX IN of the HVAB backplane adapter on the next chassis.
 - c. Repeat step b until the HVAB backplane adapters on each chassis are connected.
 - USB kits—For every NI USB-1359 in the configuration, connect one end of a USB cable to the NI USB-1359 and the other end to a USB hub or port on the computer.

Routing to the High-Voltage Backplane



Caution National Instruments installs safety covers on the HVAB connectors of the NI 1357/1358/1359 kit. To use the HVAB connectors on the NI 1357/1358/1359 kit, unscrew and flip back the covers. Always screw in the safety covers when the HVAB connectors are *not* in use.

If you are using the NI SCXI-1127/1128/1129/1175, you can use the NI 1357/1358/1359 kit to create a high-voltage analog backplane. High-voltage backplanes share high-voltage signals among SCXI switches. Unlike digital signals from the SH9MD-AUX cable that are routed to only one switch, high-voltage signals are shared among *all* SCXI switches that are connected to the backplane.

Configuring the SCXI Switch Module in MAX

Complete the following steps to configure the SCXI switch module:



Notes If you are using NI-DAQmx to configure SCXI switch modules cabled to an NI SCXI-1357/1358/1359 kit, proceed directly to step 4 to create a new SCXI chassis.

If you are using NI-DAQmx to configure SCXI switch modules cabled to an NI USB-1357/1358/1359 kit and the NI USB-1359 is auto-detected and the chassis is auto-created in MAX, expand the **NI-DAQmx Devices** tab, right-click the chassis, and choose **Properties**. The SCXI Chassis Configuration dialog box opens. The **Modules** tab is selected by default. Proceed directly to step 5b to configure the switch module.

If you are using NI-DAQmx to configure an SCXI switch module cabled to an NI USB-1357/1358/1359 kit and the kit was cabled before the chassis was powered on, the chassis is *not* auto-detected and does *not* appear in MAX. Complete *all* of the following steps to create your switch module and the chassis, and, subsequently, configure the switch module.

1. Power on the chassis.
2. Right-click **NI-DAQmx Devices** in the configuration tree, and select **Create New NI-DAQmx Device**. If you are using a remote RT target, browse for your switch module under **Remote Systems»Devices and Interfaces»NI-DAQmx Devices**.

3. Select **NI-DAQmx SCXI Chassis**, and choose the chassis. The Create New SCXI Chassis dialog box opens as shown in Figure 7.

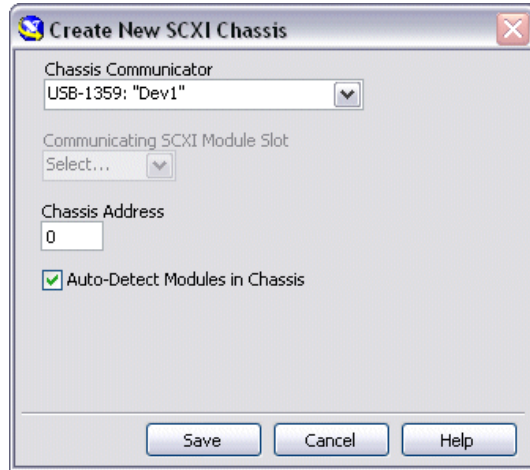


Figure 7. Configuring the Create New SCXI Dialog Box

4. Create a new SCXI chassis:



Note If you are using an NI PXI-1010 chassis and the switch controller is *not* in the rightmost PXI slot, create the chassis as an NI SCXI-1000 in MAX.

- a. Select the switch controller (NI USB-1359 or NI 4021/4060/407x) cabled to the communicating SCXI switch module from the **Chassis Communicator** listbox. If MAX detects only one communicating device, this device is selected as the chassis communicator by default and the listbox is dimmed.
- b. SCXI kits only—Select the module slot connected to the chassis communicator from the **Communicating SCXI Module Slot** listbox.
- c. Enter the chassis address setting in the **Chassis Address** field. Ensure that the setting you enter matches the address setting on the SCXI chassis as shown in Figure 6.
- d. Enable the auto-detect option to auto-detect installed SCXI switch modules. If you do not auto-detect switch modules, MAX disables the Communicating SCXI Module Slot listbox.
- e. Click **Save**.

After creating a new chassis, the SCXI Chassis Configuration dialog box opens as shown in Figure 8. The **Modules** tab is selected by default.

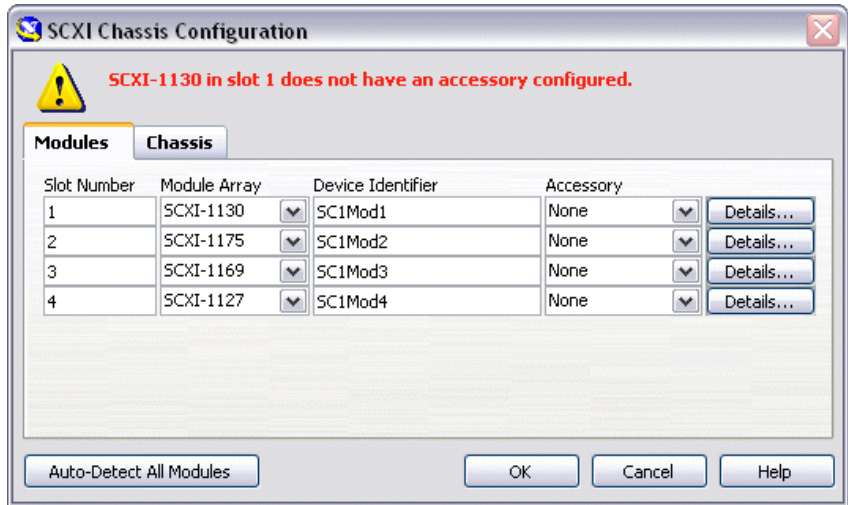


Figure 8. Configuring the SCXI Chassis Configuration Dialog Box

5. Configure the SCXI switch module:
 - a. If you did not enable auto-detection of the switch module in step 4d, select an SCXI switch module from the **Module Array** listbox. Assign the switch module the slot number that matches the physical slot location of the switch module in the chassis.
 - b. MAX assigns a default name to the SCXI switch module in the Device Identifier textbox. The **Device Identifier** is the **resource name** string in NI-SWITCH and the **switch device** string in NI-DAQmx. To edit the default name, click the **Device Identifier** textbox and enter a unique alphanumeric ID for the switch module.
 - c. If you are using a connected accessory, such as a terminal block, select it from the **Accessory** listbox.
6. Click **Details** to configure the switch module options. The Details dialog box for the switch module configuration dialog box opens. The **Terminal Block/Topology** tab is selected by default.
7. Configure the Details dialog box for an SCXI switch module:



Note During scanning, the NI SCXI-1127/1128 can connect to the HVAB. To configure the switch module to automatically connect to the HVAB during scanning, enable the optional checkbox in the Details dialog box.

- a. Select the terminal block connected to the switch module from the **Terminal Block/Topology** listbox.
- b. Set a default topology from the **Topology** listbox.

- c. Select the **Channels** tab.
 - d. Designate source channels for the topology selected in the **Terminal Block/Topology** tab. Notice that you can set different source channels for each topology.
 - e. Designate reserved channels for routing. Notice that you can reserve different channels for routing in each topology.
 - f. Click **OK** to accept the changes.
8. To configure additional SCXI switch modules, repeat steps 6 and 7.
 9. If necessary, select the **Chassis** tab to modify chassis settings.
 10. Click **OK** to accept and save the settings for the chassis.



Note You cannot save the chassis configuration until after you enter the switch module information. A message at the top of the SCXI Chassis Configuration dialog box displays the configuration status. If a warning appears in the message box, you can save the configuration. If an error appears in the message box, you cannot save the configuration.

11. To test the configuration, right-click the chassis name listed under **Devices and Interfaces**, and select **Test**.

After the test, a message indicates successful verification of the configuration or if an error occurred. If an error occurs, refer to ni.com/support/install for troubleshooting information.

Specifications

Maximum Voltage

Terminal to earth300 V_{rms} or VDC

Terminal to terminal300 V_{rms} or VDC

Maximum Current

Maximum current (per channel)2 ADC, 2 AAC

Bus Interface

USB specificationUSB 2.0 full-speed

USB bus speed12 Mb/s

USB Power Requirements

5 VDC25 mA typical, 100 mA max

Derating Modules that Share the HVAB



Caution 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.

The following examples demonstrate how to derate switch modules:

Example 1

NI SCXI-1000 chassis
NI SCXI-1359 2-slot backplane adapter behind Slots 3 and 4
NI SCXI-1127 (300 V, CAT II) in Slot 4
NI SCXI-1129 (150 V, CAT I) in Slot 3

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

Example 2

NI SCXI-1000 chassis
NI SCXI-1359 2-slot backplane adapter behind Slots 3 and 4
NI SCXI-1127 (300 V, CAT II) in Slot 4
NI SCXI-1129 (150 V, CAT I) in Slot 2

The NI SCXI-1127 does not share the HVAB with the NI SCXI-1129. Therefore, the NI SCXI-1127 can operate at the full rating (300 V, CAT II).

Example 3

NI SCXI-1000 chassis
NI SCXI-1359 2-slot backplane adapter behind Slots 3 and 4
NI SCXI-1127 (300 V, CAT II) in Slot 4
NI SCXI-1190 (30 V, CAT I) in Slot 3

The NI SCXI-1190 does not have a HVAB connector. Therefore, the NI SCXI-1127 can operate at the full rating (300 V, CAT II).

Environment

The NI 1357/1358/1359 kit is intended for indoor use only.

Operating temperature..... 0 °C to 50 °C

Storage temperature –20 °C to 70 °C

Relative humidity 10% to 90%, noncondensing

Measurement Category II

Maximum altitude.....2,000 m

Pollution Degree2

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1
- CAN/CSA-C22.2 No. 61010-1



Note For UL and other safety certifications, refer to the product label or visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

EmissionsEN 55011 Class A at 10 m
FCC Part 15A above 1 GHz

ImmunityEN 61326:1997 + A2:2001,
Table 1

CE, C-Tick, and FCC Part 15 (Class A) Compliant



Note For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

Low-Voltage Directive (safety).....73/23/EEC

Electromagnetic Compatibility
Directive (EMC)89/336/EEC



Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

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