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SCXI™

SCXI Chassis User Manual

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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.
	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. When this icon is marked on the product, refer to the *Read Me First: Safety and Radio-Frequency Interference* document, shipped with the product, for precautions to take.
	When symbol is marked on a product it denotes a warning advising you to take precautions to avoid electrical shock.
	When symbol is marked on a product it denotes a component that may be hot. Touching this component may result in bodily injury.
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.
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.
SCXI chassis	Refers to the SCXI-1000, SCXI-1000DC, and SCXI-1001. When information pertains to only one chassis, that chassis is named explicitly; for example, the SCXI-1001 has 12 module slots.
SCXIbus	Refers to the backplane in the chassis. A signal on the backplane is referred to as the SCXIbus <signal name> line (or signal). The SCXIbus descriptor may be omitted when the meaning is clear.
Slot 0	Refers to the power supply and control circuitry in the SCXI chassis.

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1 Introduction

This manual describes the electrical and mechanical aspects of the SCXI-1000, SCXI-1000DC, and SCXI-1001 chassis and contains information concerning their operation. The SCXI chassis supply power to and contain control circuitry for the SCXI series of modules. The SCXI-1000 and SCXI-1000DC hold up to four modules. The SCXI-1001 holds up to 12 modules.

This chapter describes the SCXI chassis, lists what you need to get started, describes the optional software and optional equipment, and explains how to unpack the SCXI chassis kit.

About the SCXI Chassis

The SCXI-1000 and SCXI-1001 chassis are powered with standard AC power. The SCXI-1000DC is powered by any 9.5 to 16 VDC source such as the optional SCXI-1382 battery pack or the SCXI-1383 power supply.

Every SCXI chassis supplies a low-noise environment for signal conditioning, supplying power and control circuitry for the modules. It is a general-purpose chassis that you can use with current SCXI modules.

Refer to Appendix A, *Specifications*, for detailed SCXI-1000, SCXI-1000DC, and SCXI-1001 specifications.

What You Need to Get Started

To set up and use the SCXI chassis, you need the following items:

- ❑ One of the following SCXI chassis:
  - SCXI-1000
  - SCXI-1000DC
  - SCXI-1001
- ❑ *SCXI Chassis User Manual*

- ❑ *Read Me First: Safety and Radio-Frequency Interference*
- ❑ Power from one of the following:
  - Power cord (120, 220, or 240 VAC)
  - SCXI-1382
  - SCXI-1383 (VDC)
- ❑ One of the following software packages and documentation:
  - LabVIEW
  - LabWindows™/CVI™
  - Measurement Studio
  - NI-DAQ
- ❑ The computer

Unpacking

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

Electrostatic discharge can damage several components on the chassis. To avoid such damage in handling the chassis, *never* touch the exposed pins of connectors.

Software Programming Choices

There are several options to choose from when programming the NI plug-in DAQ and SCXI hardware. You can use LabVIEW, LabWindows/CVI, Measurement Studio, or NI-DAQ.

NI-DAQ

NI-DAQ has an extensive library of functions that you can call from the application development environment (ADE). These functions allow you to use all the features of NI measurement products.

NI-DAQ carries out many of the complex interactions, such as programming interrupts, between the computer and the DAQ hardware. NI-DAQ maintains a consistent software interface among its different versions so that you can change platforms with minimal modifications to

your code. Whether you are using LabVIEW, LabWindows/CVI, Measurement Studio, VI Logger, or other ADEs, your application uses NI-DAQ.

You can download a free copy of the most recent version of NI-DAQ from ni.com.

National Instruments ADE Software

LabVIEW features interactive graphics, a state-of-the-art interface, and a powerful graphical programming language. The LabVIEW Data Acquisition VI Library, a series of virtual instruments for using LabVIEW with National Instruments DAQ hardware, is included with LabVIEW.

LabWindows/CVI is a complete ANSI C ADE that features an interactive user interface, code generation tools, and the LabWindows/CVI Data Acquisition and Easy I/O libraries.

Measurement Studio, which includes tools for Visual C++ and tools for Visual Basic, is a development suite that allows you to design test and measurement applications. For Visual Basic developers, Measurement Studio features a set of ActiveX controls for using National Instruments DAQ hardware. These ActiveX controls provide a high-level programming interface for building virtual instruments (VIs). For Visual C++ developers, Measurement Studio offers a set of Visual C++ classes and tools to integrate those classes into Visual C++ applications. The ActiveX controls and classes are available with Measurement Studio and the NI-DAQ software.

VI Logger is an easy-to-use yet flexible tool specifically designed for data logging applications. Using dialog windows, you can configure data logging tasks to easily acquire, log, view, and share your data. VI Logger does not require any programming; it is a stand-alone, configuration-based software.

Using LabVIEW, LabWindows/CVI, Measurement Studio, or VI Logger greatly reduces the development time for your data acquisition and control application.

National Instruments Documentation

The *SCXI Chassis User Manual* is one piece of the documentation set for the data acquisition and SCXI system. You could have any of several types of documents, depending on the hardware and software in the system. Use the documents you have as follows:

- *Getting Started with SCXI*—Read this manual first. It gives an overview of the SCXI system and contains the most commonly needed information for the modules, chassis, and software.
- The SCXI hardware user manuals—Read these manuals next for detailed information about signal connections and module configuration. They also explain in greater detail how the module works and contain application hints.
- The DAQ hardware user manuals—These manuals have detailed information about the DAQ hardware that plugs into or is connected to the computer. Use these manuals for hardware installation and configuration instructions, specification information about the DAQ hardware, and application hints.
- Software documentation—Examples of software documentation you may have are the LabVIEW, Measurement Studio, and NI-DAQ documentation sets. After you set up the hardware system, use either the application software (LabVIEW or Measurement Studio) or the NI-DAQ documentation to help you write your application. If you have a large, complicated system, it is worthwhile to look through the software documentation before you configure the hardware.
- Accessory installation guides or manuals—If you are using accessory products, read the terminal block and cable assembly installation guides or accessory user manuals. They explain how to physically connect the relevant pieces of the system. Consult these guides when you are making the connections.
- If you are designing your own module, the *SCXIbus System Specification* is available from NI upon request. The specification describes the physical, electrical, and timing requirements for the SCXIbus.

Optional Equipment

NI provides a full line of modules that amplify, filter, isolate, and multiplex a wide variety of signal types, such as thermocouples, resistance temperature detectors (RTDs), strain gauges, high-voltage inputs, current inputs, analog outputs, and digital I/O signals. Cables and terminal blocks with screw terminals, BNC connectors, or thermocouple plugs are available to connect signals to the modules.

Refer to the latest NI catalog and `ni.com/catalog` for a complete listing of sensors and I/O types supported in SCXI.

2

Configuring and Installing the SCXI Chassis

This chapter contains instructions for configuring and installing the SCXI chassis. It describes the following:

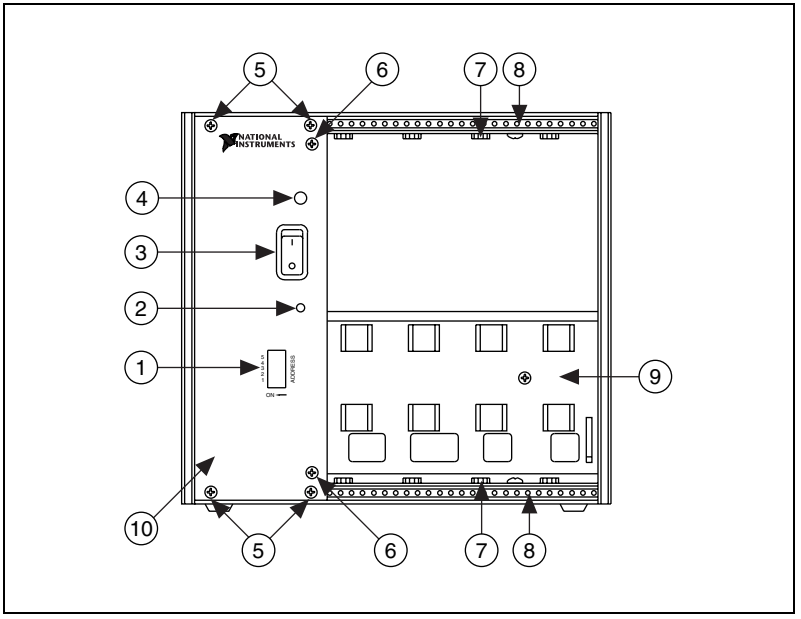
- chassis address selection
- voltage and fuse selection
- chassis, modules, and accessories installation
- fan filter maintenance

Chassis Description

Table 2-1 describes the front view items shown in Figures 2-1, 2-2, and 2-3.

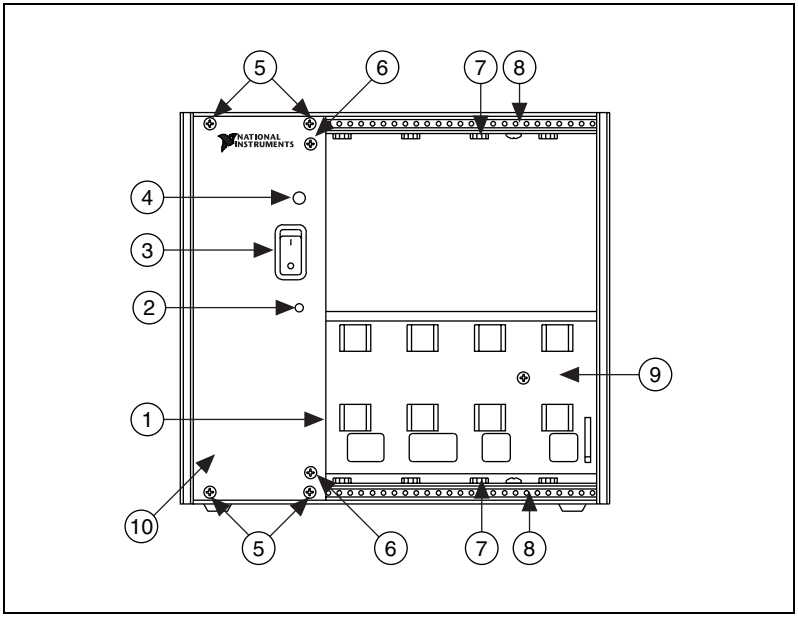
Table 2-1. SCXI Chassis Front View Items

Item	Definition
Power switch	Powers the chassis on and off
Indicator light	When lit, indicates that the chassis is powered on
Reset button	Reinitializes Slot 0 and all modules to their power-on state when pressed
Slot 0/power supply	Contains the power supply and control circuitry for the chassis
Address DIP switches	Determine the chassis address—SCXI-1000 and SCXI-1001
Address selection jumpers (located behind the front panel)	Determine the chassis address—SCXI-1000DC only
Module guides	Guide modules to connect with the SCXIbus connector
Backplane	Brings power, control lines, and analog bus connections to modules
Front threaded strips	Secure modules in the chassis and attach front panels



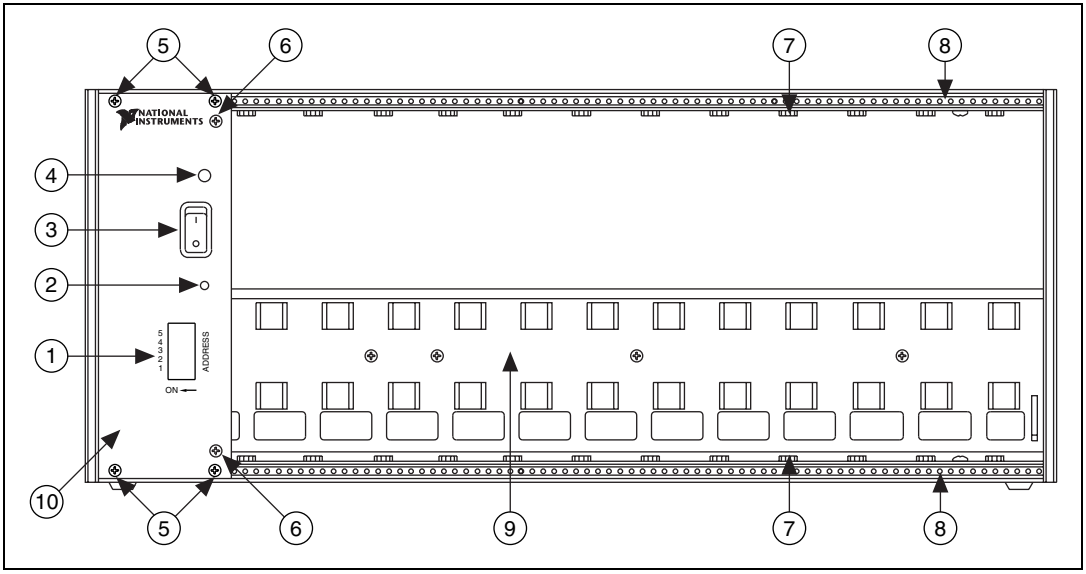
1	DIP Switches	6	Front Panel Screws (early revisions only)
2	Reset Button	7	Module Guides
3	Power Switch	8	Threaded Strips
4	Indicator Light	9	Backplane
5	Front Panel Screws (flathead on some revisions)	10	Slot 0/Power Supply

Figure 2-1. SCXI-1000 Front View Diagram



1	Jumpers (behind front panel)	6	Front Panel Screws (early revisions only)
2	Reset Button	7	Module Guides
3	Power Switch	8	Threaded Strip
4	Indicator Light	9	Backplane
5	Front Panel Screws (flathead on some revisions)	10	Slot 0/Power Supply

Figure 2-2. SCXI-1000DC Front View Diagram



1	DIP Switches	6	Front Panel Screws (early revisions only)
2	Reset Button	7	Module Guides
3	Power Switch	8	Threaded Strips
4	Indicator Light	9	Backplane
5	Front Panel Screws (flathead on some revisions)	10	Slot 0/Power Supply

Figure 2-3. SCXI-1001 Front View Diagram

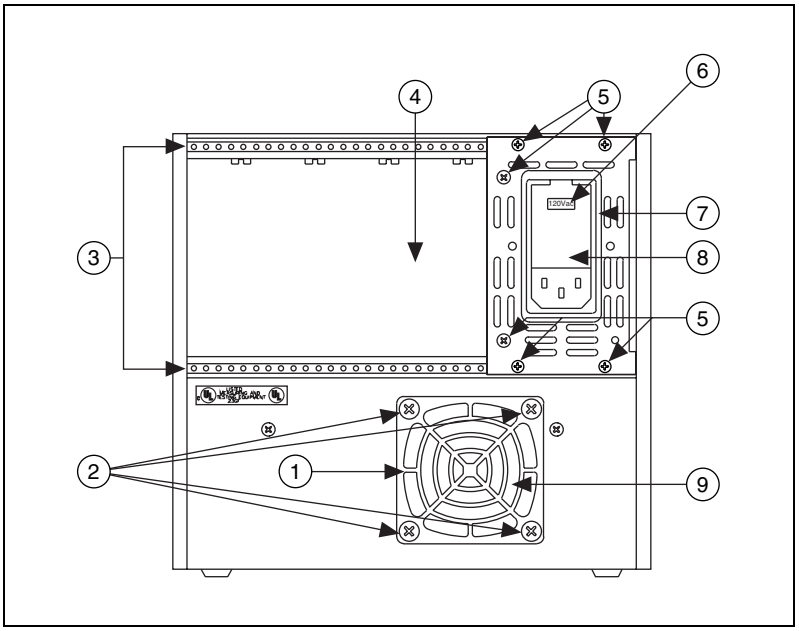
Tables 2-2 and 2-3 describe the rear view items shown in Figures 2-4, 2-5, and 2-6.

Table 2-2. SCXI-1000/1001 Chassis Rear View Items

Item	Description
Power entry module	IEC receptacle for power input, voltage selection board, and fuse
Fuse	Protects both you and the SCXI chassis in case of a fault in the chassis
Voltage selection wheel	Configures the chassis for the AC line voltage
Fan(s)	Cools the chassis
Filter(s)	Prevents dirt from contaminating the circuitry in the chassis
Fan screws	Secure the fan(s) to the chassis

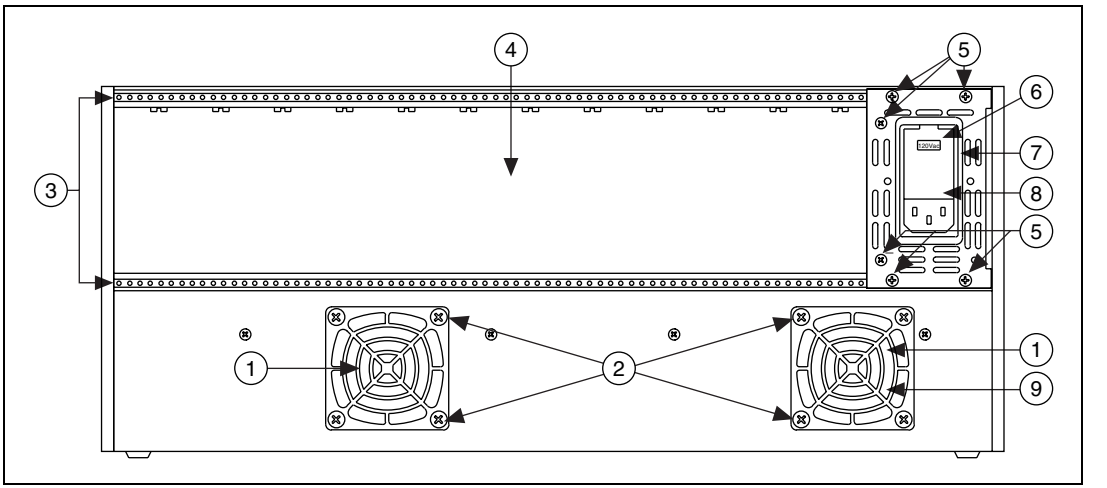
Table 2-2. SCXI-1000/1001 Chassis Rear View Items (Continued)

Item	Description
Backplane fuses	Protect the power supply from shorts on modules
Rear connector space	For module space, connector mounting brackets, or adapters
Rear threaded strips	Secure cable connections, mounting brackets, or filler panels to the chassis



1 Fan and Filter
2 Fan Screws
3 Rear Threaded Strips
4 Rear Connector Space
5 Rear Panel Screws (flathead on some revisions)
6 Voltage Selection Wheel
7 Power Entry Module
8 Fuse (concealed)
9 Backplane Fuses (behind fan)

Figure 2-4. SCXI-1000 Rear View Diagram

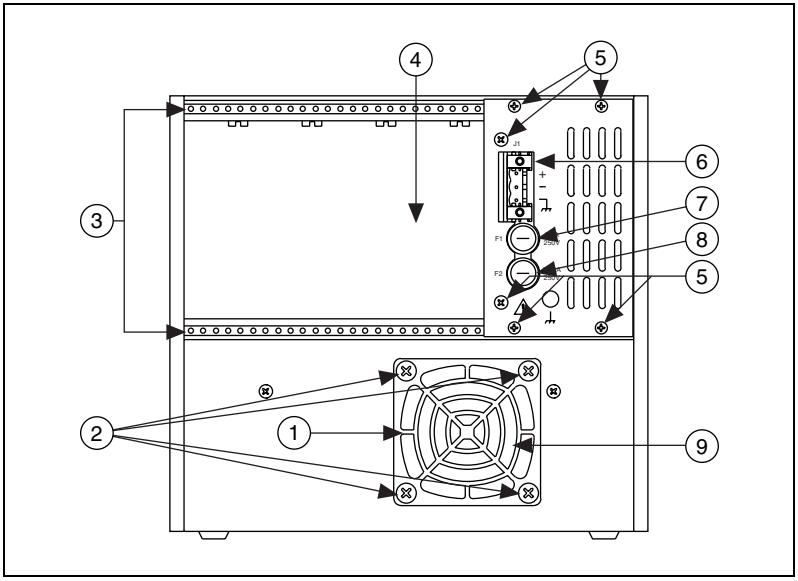


1 Fans and Filters
2 Fan Screws (each fan)
3 Rear Threaded Strips
4 Rear Connector Space
5 Rear Panel Screws (flathead on some revisions)
6 Voltage Selection Wheel
7 Power Entry Module
8 Fuse (concealed)
9 Backplane Fuses (behind fan)

Figure 2-5. SCXI-1001 Rear View Diagram

Table 2-3. SCXI-1000DC Chassis Rear View Items

Item	Description
Power entry connector J1	Receptacle for power input; uses a 9.5 to 16 VDC power source
Fuse F1	Power input fuse (6.3 A), protects both you and the SCXI chassis in case of a fault in the chassis
Fuse F2	+5 VDC internal power supply fuse (3.15 A), protects the power supply from shorts on modules
Fan(s)	Cools the chassis
Fan screws	Secure the fan(s) to the chassis
Backplane fuses	Protect the power supply from shorts on modules
Rear connector space	For module space, connector mounting brackets, or adapter boards
Rear threaded strips	Secure cable connections, mounting brackets, or filler panels to the chassis



1	Fan and Filter	6	Power Entry Connector
2	Fan Screws	7	Power Input Fuse
3	Rear Threaded Strips	8	+5 VDC Internal Power Supply Fuse
4	Rear Connector Space	9	Backplane Fuses (behind fan)
5	Rear Panel Screws (flathead on some revisions)		

Figure 2-6. SCXI-1000DC Rear View Diagram

Chassis Uses

Before you configure the chassis, decide whether you are going to use it in multiplexed mode or parallel mode.

In multiplexed mode, analog input (AI) channels are multiplexed into one module output so that the cabled E Series DAQ device has access to the multiplexed output of the module and the outputs of all other multiplexed modules in the chassis.

In parallel mode, you need a separate E Series DAQ device for each module to send each of its output channels directly to a separate AI channel of the E Series DAQ device connected to the module.

Configuring the SCXI Chassis

Configuring the chassis involves selecting a chassis or high-level data link control (HDLC) address, line voltage, and fuse value on any chassis.

Note Refer to the *Read Me First: Safety and Radio-Frequency Interference* document before removing equipment covers or connecting or disconnecting any signal wires.

Selecting Chassis Addresses

These sections provide information regarding how to select addresses for the SCXI chassis.

SCXI-1000/1001

Unless you are using multiple chassis and need to configure one or more SCXI chassis for a different address, you can skip this section, and the SCXI chassis retains factory-default address of 0.

You can configure the SCXI chassis for one of 32 different addresses so that you can connect multiple SCXI chassis to the same control source. The five switches on the front panel of Slot 0 determine the chassis address.

Switches one through five represent the values 1, 2, 4, 8, and 16, when set to the ON position. When set to the OFF position, their value is zero. The chassis address is the sum of the switch values. Figure 2-7 shows examples of both the factory-default setting of the chassis address 0 and the switch setting for chassis address 19.

Note SCXI-1000 chassis through revision D do not have address jumpers or switches and respond to any address, but you cannot use them in multichassis systems. Revision E chassis use jumpers for chassis addressing. Revision F and later chassis use a DIP switch for chassis addressing.

SCXI-1001 chassis through revision D use jumpers for chassis addressing. Revision E and later chassis use a DIP switch for chassis addressing.

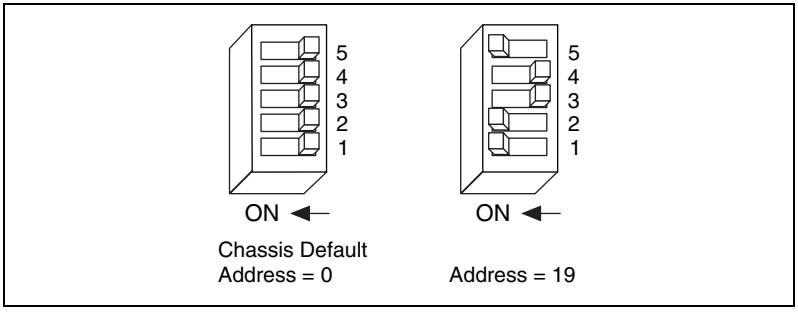


Figure 2-7. Address Setting Examples

SCXI-1000DC

Unless you are using multiple chassis and need to configure one or more SCXI chassis for a different address, you can skip this section, and the SCXI chassis retains the factory-default address of 0.

You can configure the SCXI chassis for one of 32 different addresses so that you can connect multiple SCXI chassis to the same control source. Three jumpers that determine the chassis address are located behind the front panel of Slot 0 just below the Reset button. The chassis address is the sum of the values of all the jumpers. Figure 2-8 shows examples of both the factory-default setting of address 0 and the jumper settings for address 19.

Note SCXI-1000DC chassis through revision C do not have address jumpers or switches and respond to any address, but you cannot use them in multichassis systems. Revision D and later chassis use jumpers for chassis addressing.

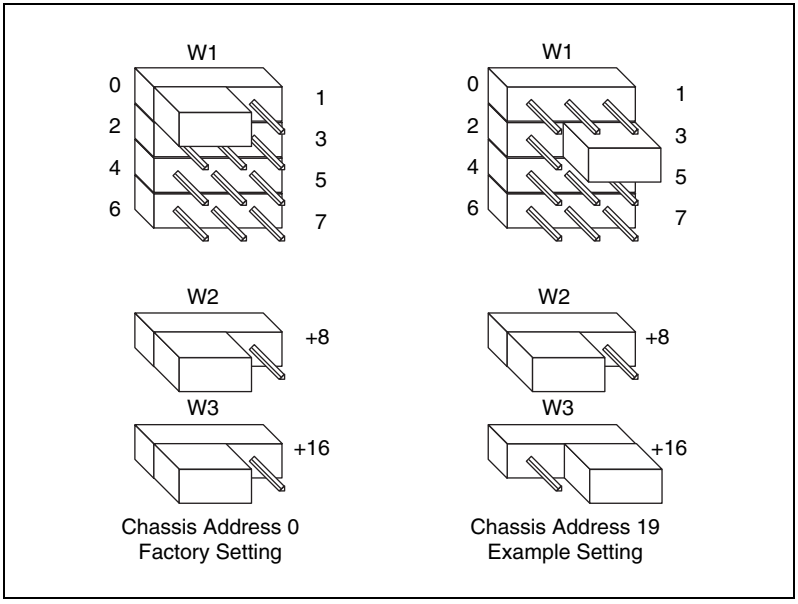


Figure 2-8. SCXI-1000DC Chassis Address Jumper Settings

Changing the Chassis Address

While referring to Figures 2-2 and 2-6, complete the following steps to change the chassis address of the SCXI-1000DC:

Caution To prevent shock hazard, make sure that the chassis is powered off and the power cord is removed from the power entry module.

1. Using a screwdriver, remove the four (six on some revisions) panhead screws from the front panel of Slot 0.
2. Remove the six screws from the rear panel.
3. Remove the controller from Slot 0.
4. Set all three jumpers for the chassis address you want.
5. Replace the controller in Slot 0.
6. Replace the four (six on some revisions) screws. Do *not* overtighten.
7. Replace the six screws in the rear panel. Do *not* overtighten.

Selecting Voltage and Replacing the Fuse for the SCXI-1000 and SCXI-1001

If you ordered the chassis with the appropriate part number (the -0*x* extension of the kit part number corresponds to your geographical region), the voltage selection wheel and fuse are correct for operation in your geographical region. Check the voltage on the voltage selection wheel to ensure that you have the correct voltage selection wheel setting and fuse.

The SCXI chassis can operate with line voltages of 100, 120, 220, and 240 VAC. The voltage selection wheel in the power entry module determines the voltage for which the chassis is configured. You can identify the operating voltage by looking at the number on the power entry module when the door that covers the selection wheel is closed. The fuse is 5×20 mm, which has a current rating relative to the operating voltage. Table 2-4 shows the proper voltage selections and fuse ratings for different regions.



Caution For continued protection, replace fuses only with fuses of the same type and rating.

Table 2-4. SCXI-1000/1001 Voltage Selection and Fuse Ratings by Region

SCXI Chassis Type	Region/ Voltage	Main Power Fuse Quantity	Main Power Fuse Type	Backplane Fuse Quantity	Backplane Fuse Type
SCXI-1000	100 V Japan	1	3/4 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI
	120 V	1	1/2 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI
	220 V Swiss	1	1/4 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI
	240 V Australia	1	1/4 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI
	240 V Europe	1	1/4 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI
	240 V North American	1	1/4 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI
	240 V U.K.	1	1/4 A 250 V 5 mm × 20 mm SLO-BLO	2	1.5 A 125 V LittleFuse R251 01.5 TI

Table 2-4. SCXI-1000/1001 Voltage Selection and Fuse Ratings by Region (Continued)

SCXI Chassis Type	Region/ Voltage	Main Power Fuse Quantity	Main Power Fuse Type	Backplane Fuse Quantity	Backplane Fuse Type
SCXI-1001	100 V Japan	1	2.0 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI
	120 V	1	2.0 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI
	220 V Swiss	1	1.6 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI
	240 V Australia	1	1.6 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI
	240 V Europe	1	1.6 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI
	240 V North American	1	1.6 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI
	240 V U.K.	1	1.6 A 250 5 mm × 20 mm SLO-BLO	2	4 A 125 V LittleFuse R251 01.5 TI

Selecting the Voltage

Complete the following steps to select a voltage:

1. Power off the chassis.
2. Remove the power cord from the power entry module.
3. Using a flathead screwdriver, pry the door to the selection wheel open from the top.
4. Remove the selection wheel.
5. Rotate the wheel for the appropriate voltage and reinsert it into the power entry module.
6. Close the door.
7. Check that the voltage showing on the selection wheel is correct.
8. Reinsert the power cord.

Replacing the Power Entry Module Fuse

Caution Disconnect all power before removing the cover.

Complete the following steps to replace the power entry module fuse:

1. Power off the chassis.
2. Remove the power cord from the power entry module.
3. Using a flathead screwdriver, pry the door to the selection wheel open from the top.
4. Pull out the fuse drawer.
5. Remove the fuse.
6. Install the new fuse in the drawer.
7. Reinsert the fuse drawer in the right-hand slot with the arrow pointing to the right.
8. Close the door.
9. Reinsert the power cord.

Replacing and Checking Backplane Fuses on the SCXI-1000 and SCXI-1001

In addition to the power entry module fuse, the analog supply lines on the backplane are fused at 1.5 A on the SCXI-1000 chassis and at 4 A on the SCXI-1001 chassis.

If you are making your own modules, fuse the module at 250 mA to avoid blowing the backplane fuses. Fusing the module also better protects the module because a failure can result in a large amount of current drawn, but not enough current drawn to blow the backplane fuses.

On the SCXI-1000, the backplane fuses are located behind the fan. On the SCXI-1001, the backplane fuses are located behind the right-hand fan, near the power entry module, as viewed from the rear of the chassis.

Complete the following steps to check or replace fuses:

1. Remove the appropriate fan and filter from the rear of the chassis by following the instructions in the *Maintaining the Fan Filter* section. Make sure to switch the power off and remove the power cord.

2. The fuse marked with a copper + on the backplane is for the positive analog supply, and the fuse marked with a copper – is for the negative analog supply. To check whether a fuse is blown, connect an ohmmeter across the leads. If the reading is not approximately 0 Ω, replace the fuse.
3. Using a pair of needle-nose pliers, carefully extract the fuse.
4. Take a new fuse and bend its leads so the component is 12.7 mm (0.5 in.) long, the dimension between the fuse sockets, and clip the leads to a length of 6.4 mm (0.25 in.).
5. Using the needle-nose pliers, insert the fuse into the socket holes.
6. Repeat, if necessary, for the other fuse.
7. Check the fan filter and, if it is dirty, clean it as described in the *Maintaining the Fan Filter* section.
8. Reinstall the fan and filter.

Replacing the Fuses on the SCXI-1000DC

There are two fuses located on the rear panel of the SCXI-1000DC. The input power fuse (F1) is a 6.3 A, 5 × 20 mm time-lag fuse. The internal +5 VDC supply is fused by a 3.15 A, 5 × 20 mm time-lag fuse (F2).

Replacing the Power Entry Fuse and +5 VDC Fuse

Caution For continued protection against fire, replace fuses only with fuses of the same type and rating.

Complete the following steps to replace the rear panel fuses:

1. Power off the chassis.
2. Remove the power cord from power entry connector J1.
3. Turn the fuse holder counter-clockwise with a screwdriver and pull out the fuse holder to expose the fuse in the housing.
4. Remove the fuse.
5. Install the new fuse.
6. Push the fuse holder back into the housing and screw it clockwise until it is tight.
7. Reinsert the power cord.

Replacing and Checking Backplane Fuses

In addition to the power entry and the +5 V supply fuses, the analog supply lines on the backplane are fused at 1.5 A on the SCXI-1000DC chassis.

If you design a special/prototype module, use the SCXI-1181 module and fuse the module at 250 mA to avoid blowing the analog backplane and +5 V supply fuses. Fusing the module better protects the module because a failure can result in a large amount of current drawn, but not enough to blow the backplane and +5 V fuses.

On the SCXI-1000DC, the backplane fuses are located behind the fan. Complete the following steps to check or replace fuses:

1. Remove the appropriate fan and filter from the rear of the chassis by following the instructions in the *Maintaining the Fan Filter* section. Be sure to switch the power off and remove the power cord.
2. The fuse marked with a copper + on the backplane is for the positive analog supply, and the fuse marked with a copper – is for the negative analog supply. To check whether a fuse is blown, connect an ohmmeter across the leads. If the reading is not approximately 0 Ω, replace the fuse.
3. Using a pair of needle-nose pliers, carefully extract the fuse.
4. Take a new fuse and bend its leads so the component is 12.7 mm (0.5 in.) long, the dimension between the fuse sockets, and clip the leads to a length of 6.4 mm (0.25 in.).
5. Using the needle-nose pliers, insert the fuse into the socket holes.
6. Repeat, if necessary, for the other fuse.
7. Check the fan filter and, if it is dirty, clean it as described in the *Maintaining the Fan Filter* section.
8. Reinstall the fan and filter.

Installing the SCXI Chassis

These sections provide information on installing the SCXI chassis.

Installing the SCXI-1000 and SCXI-1001 Chassis

Complete the following steps to install the SCXI-1000 and SCXI-1001 chassis:

1. If necessary, change the chassis address of the box by following the instructions in the *Selecting Chassis Addresses* section. Unless you are using multiple chassis, skip this step and leave the address at its factory-default setting of 0.
2. Place the SCXI chassis on a sturdy, level surface. Leave at least 10 cm (4 in.) of space behind the chassis for adequate air circulation.
3. Power off the chassis.
4. Make sure the voltage selection wheel in the power entry module is set for the line voltage of the outlet. Refer to the *Selecting the Voltage* section if necessary.
5. Insert the female end of the power cord into the power entry module.
6. Insert the male end of the power cord into the wall outlet.
7. Install the modules into the chassis.
8. Install the necessary cabling for the modules. Consult the SCXI module user manual for cabling installation instructions.
9. Install any front and rear filler panels.
10. Power on the chassis.
11. Power on the computer connected to the modules.
12. Refer to the *SCXI Quick Start Guide* to complete the SCXI system installation.

Installing the SCXI-1000DC Chassis

Complete the following steps to install the SCXI-1000DC chassis:

1. If necessary, change the chassis address by following the instructions in the *Selecting Chassis Addresses* section. Unless you are using multiple chassis, skip this step and leave the address at its factory-default setting of 0.
2. Place the SCXI chassis on a sturdy, level surface. Leave at least 10 cm (4 in.) of space behind the chassis for adequate air circulation.
3. Place the chassis power switch in the off position.

4. Make sure the voltage of the power source is between 9.5 and 16 VDC.
5. Insert the power plug into the header J1.

Caution Revision A SCXI-1000DC chassis have screw terminals on the rear panel to connect the power source. Wire the power source to these screw terminals. Observe the correct polarity, as connecting the power source with the wrong polarity can cause permanent damage to the chassis. NI is *not* liable for any damage or injuries resulting from improper power connections.

6. Install the modules into the chassis.
7. Install the necessary cabling for the modules. Consult the SCXI module user manual for cabling installation instructions.
8. Install any needed front and rear filler panels.
9. Power on the chassis.
10. Power on the computer connected to the modules.
11. Refer to the *SCXI Quick Start Guide* to complete the SCXI system installation.

Installing Filler Panels

The front and rear filler panel accessories protect the inside of the chassis and the installed modules by preventing unwanted material from entering the chassis and damaging modules, or forming conductive paths that can degrade performance. Install all modules first, then start installing filler panels from the edge of a front panel.

Installing Front Filler Panels

Complete the following steps to install front filler panels:

1. Place the panel with the captive screws to the right of the chassis front. Line up the screws with the threaded strip holes.
2. Using a flathead screwdriver, screw the captive screws into the threaded strip holes.

Installing Rear Panels

Complete the following steps to install rear panels:

1. Place the panel at the rear of the chassis between the two threaded strips. Align the panel so that the serial number faces into the chassis and the screw holes are on the right.
2. Using a flathead screwdriver, screw the two screws through the rear panel into the threaded strip holes.

Maintaining the Fan Filter

The brushless fan(s) on the rear of the SCXI chassis cool the chassis and modules. To keep the fan effective, the fan filter(s) must be clean. Dust and dirt accumulation reduces airflow, making the inside of the chassis hotter, shortening the life of the chassis and modules. Complete the following steps to clean the fan filter(s):

1. Power off the chassis.
2. Remove the power cord from the power entry module.
3. Place the chassis face down on a flat surface so that the fan is on top. If the chassis is so heavily cabled that you cannot easily place it in this position, leave the chassis as it is, but be careful to support the fan during removal and reinstallation to avoid breaking the fan wires.
4. Remove the fan filter. Remove the four screws that secure the fan and filter to the rear of the chassis. When removing the last screw, be careful to hold the fan to avoid breaking the fan wires.
5. Clean the fan filter by moving the filter around under a gentle stream of cold tap water until all the dust is removed. Dry the filter.
6. Replace the fan filter by aligning the fan and filter with the fan holes, making sure that the label side of the fan is face down. Reinstall the four screws and make sure the assembly is secure.

A

Specifications

This appendix lists the specifications of the SCXI chassis. These are typical at 25 °C unless otherwise stated.

Electrical Characteristics

Supplies	SCXI-1000/ 1000DC	SCXI-1101
V+		
Tolerance limits include peaks	+18.5 to +25 V	+18.5 to +25 V
Ripple (peak-to-peak)	1.5 V	1.5 V
Max load	680 mA	2.04 A
V–		
Tolerance limits include peaks	–18.5 to –25 V	–18.5 to –25 V
Ripple (peak-to-peak)	1.5 V	1.5 V
Max load	680 mA	2.04 A
+5 V		
Tolerance limits include peaks	+4.75 to +5.25 V	+4.75 to +5.25 V
Ripple (peak-to-peak)	50 mV	50 mV
Max load	250 mA	600 mA

Power dissipation ..... 7 W per slot

Maximum loads are the supply current for the entire chassis. Scaling the maximum power gives the allotted current per slot, as follows.

Supplies	SCXI-1000/1000DC	SCXI-1001
V+	170 mA	170 mA
V–	170 mA	170 mA
+5 V	50 mA	50 mA

Source Power Requirements

Line Voltage, 47–63 Hz	Max AC Current	
	SCXI-1000	SCXI-1001
120 VAC, ±10%	0.6 A	1.25 A
100 VAC, ±10%	0.5 A	1.25 A
240 VAC, ±10%	0.25 A	0.75 A
220 VAC, ±10%	0.25 A	0.75 A

SCXI-1000DC

Input voltage.....12 VDC nominal
(9.5 to 16.0 VDC)

Max DC operating current
at 9.5 VDC.....5.5 A

Physical

Weight

SCXI-1000.....3.9 kg (8 lb 10 oz)

SCXI-1000DC.....3.3 kg (7 lb 5 oz)

SCXI-1001.....6.8 kg (14 lb 14 oz)

Refer to Figures A-1 and A-2 for the physical dimensions of the four-slot chassis (SCXI-1000 and SCXI-1000DC) and the 12-slot chassis (SCXI-1001).

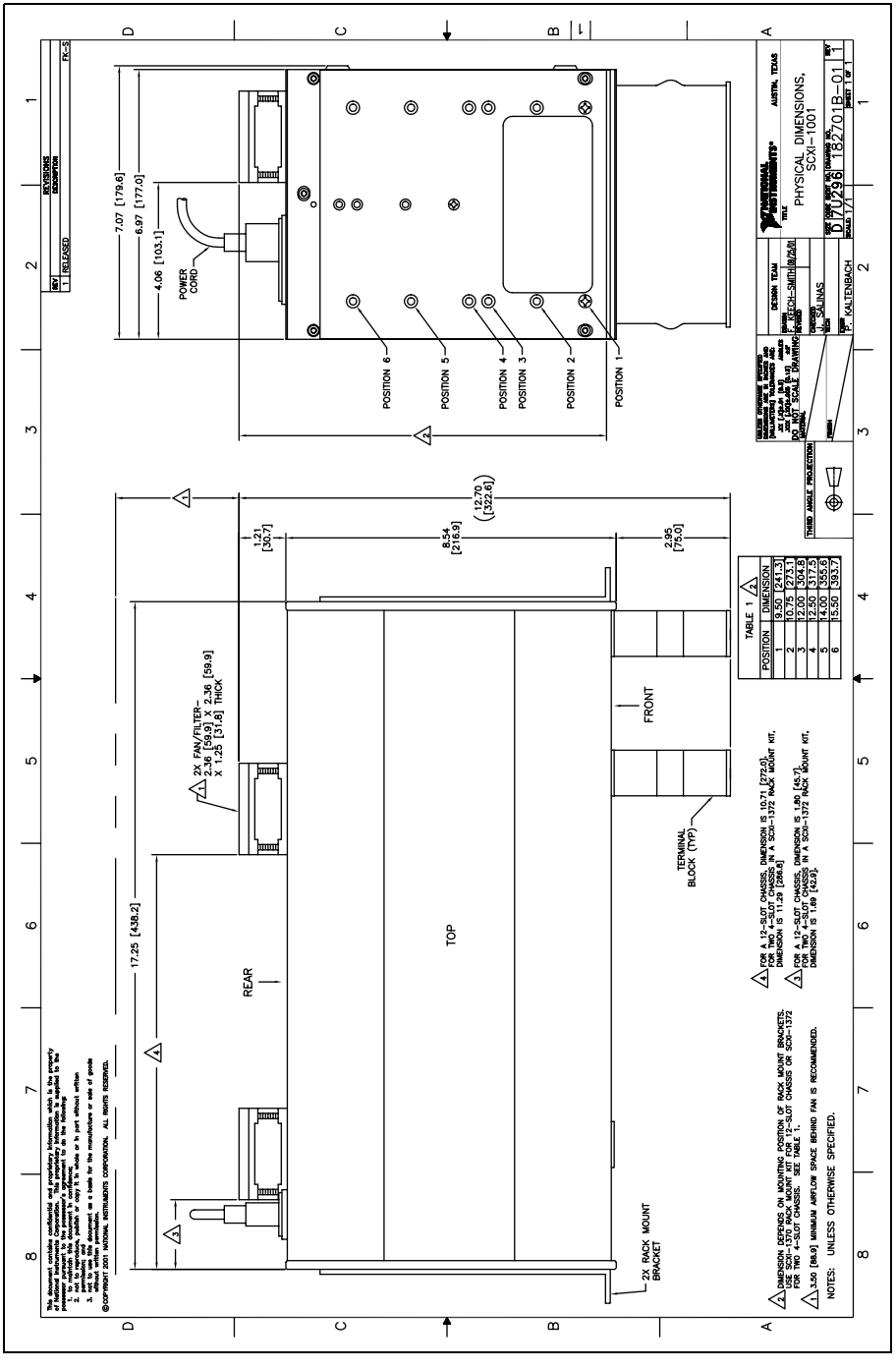


Figure A-1. Physical Dimensions of the SCXI-1001

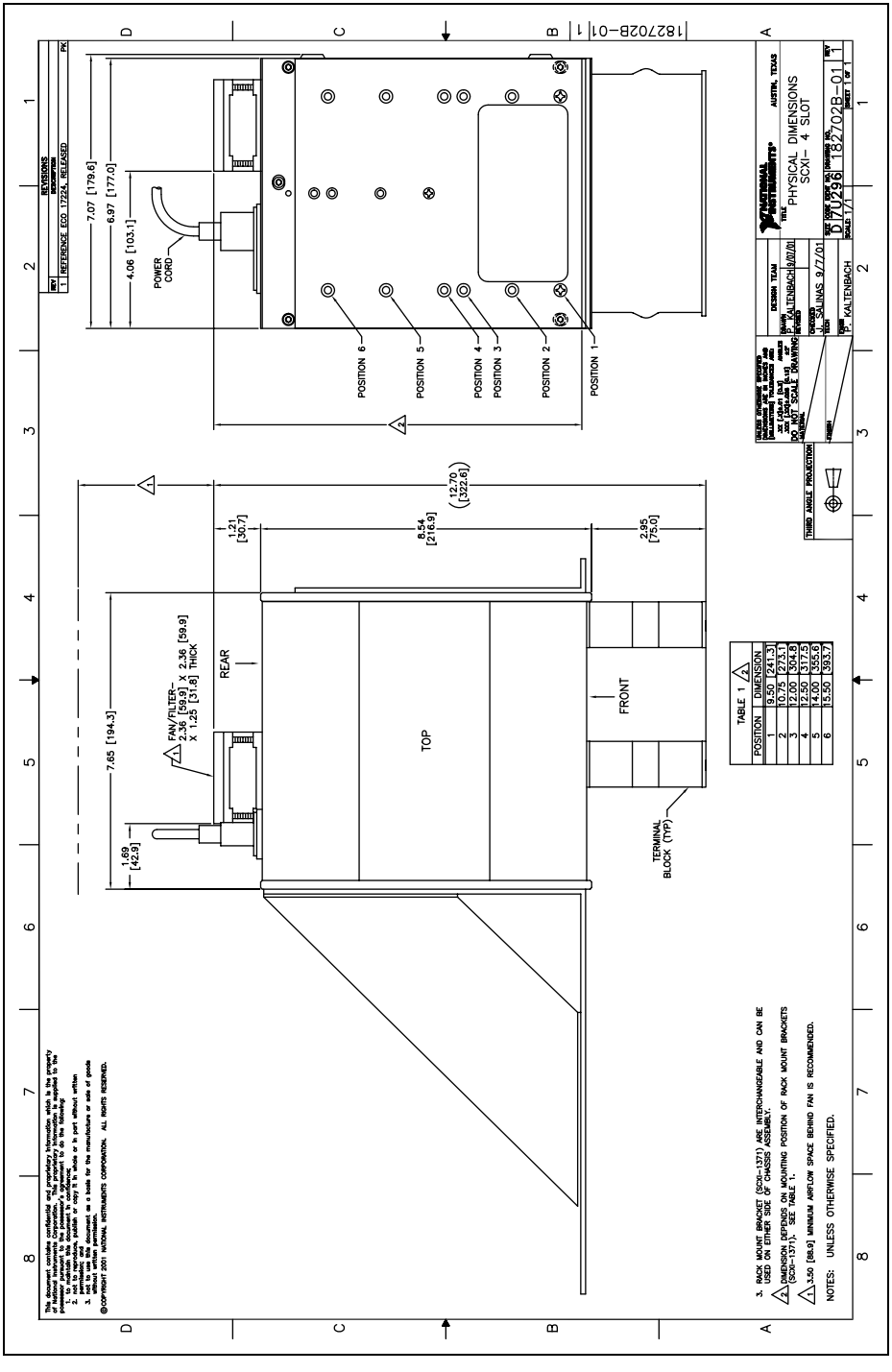


Figure A-2. Physical Dimensions of the SCXI-1000 and SCXI-1000DC

Environmental

Operating temperature..... 0 to 50 °C

Storage temperature ..... –20 to 70 °C

Humidity ..... 10 to 90% RH, noncondensing

Maximum altitude ..... 2,000 meters

Pollution Degree (indoor use only)..... 2

Safety

The chassis are 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 3111-1, UL 61010B-1
- CAN/CSA C22.2 No. 1010.1

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

Electromagnetic Compatibility

Emissions ..... EN 55011 Class A at 10 m.
FCC Part 15A above 1 GHz

Immunity ..... EN 61326-1:1997 + A2:2001, Table 1

EMC/EMI..... CE, C-Tick, and FCC Part 15 (Class A) Compliant

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

CE Compliance

The chassis meet 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/hardref.nsf`, search by model number or product line, and click the appropriate link in the Certification column.

B

Common Questions

My chassis worked fine until I inadvertently removed and reinserted a module while the chassis was on. Now my chassis does not power on. What can I do?

SCXI modules are not hot swapable, so you may have blown a fuse. Refer to Chapter 2, *Configuring and Installing the SCXI Chassis*, for information on fuse replacement. If replacing the fuse does not correct the problem, you may have damaged the digital bus circuitry or the SCXI module. Please contact NI Technical Support at `ni.com/support` for assistance.

My chassis power is on, my modules are configured for multiplexed mode, and I am not getting good data. All the channels read the same voltage even though I know I am putting different voltages into each channel. What is causing this problem?

The SCXI chassis has backplane fuses. One or both of these fuses could be blown. Refer to the *Replacing and Checking Backplane Fuses on the SCXI-1000 and SCXI-1001* section of Chapter 2, *Configuring and Installing the SCXI Chassis*, for fuse replacement information.

Can I programmatically detect whether or not my chassis is powered on?

Not exactly. You can determine whether or not you can communicate with configured modules through `SCXI_ModuleID_Read` in NI-DAQ or using a LabVIEW VI that you can obtain from `ni.com/express` by entering the info code `rdtscp`.

Glossary

Symbol	Prefix	Value
p	pico	10^{-12}
m	milli	10^{-3}
k	kilo	10^{3}

Numbers/Symbols

°	degrees
–	negative of, or minus
Ω	ohms
±	plus or minus
+	positive of, or plus
%	percent
+5 V (signal)	+5 VDC source signal

A

A	amperes
A/D	analog-to-digital
AC	alternating current

C

C	Celsius

D

D/A	digital-to-analog
DAQ	data acquisition—(1) collecting and measuring electrical signals from sensors, transducers, and test probes or fixtures and processing the measurement data using a computer; (2) collecting and measuring the same kinds of electrical signals with A/D and/or DIO boards plugged into a computer, and possibly generating control signals with D/A and/or DIO boards in the same computer

F

F	(1) Fahrenheit—a temperature measurement scale; (2) farad—a measurement unit of capacitance
FIFO	first-in first-out memory buffer
ft	feet
fuse	a protective device that breaks a circuit when a current exceeds a rated value

G

g	grams
GND	ground

H

HDLC	high-level data-link control
Hz	hertz—cycles per second of a periodic signal

I

I/O	input/output—the transfer of data to/from a computer system involving communications channels, operator interface devices, and/or data acquisition and control interfaces
IEC	International Electrotechnical Commission
in.	inch or inches

M

m	meters

O

oz	ounces

S

s	seconds
SCXI	Signal Conditioning eXtensions for Instrumentation

V

V	volts
VAC	volts, alternating current
VDC	volts, direct current

W

W	watts

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