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**SCB-100A**



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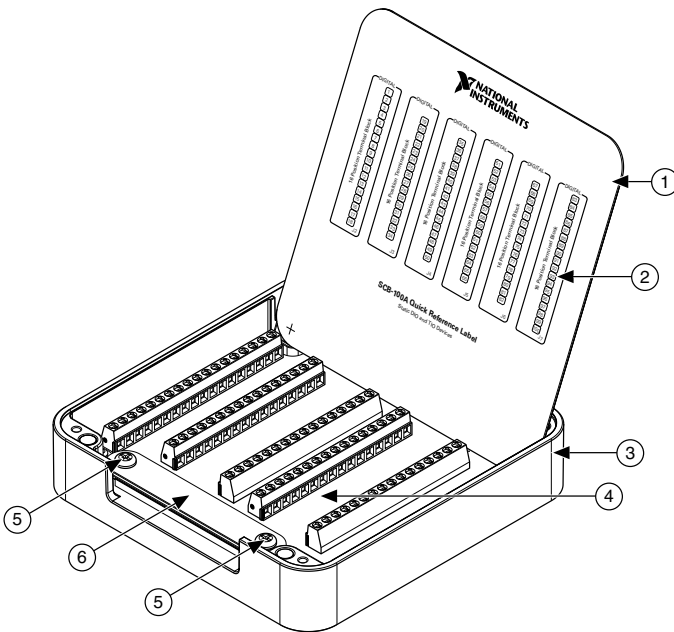
<https://www.apexwaves.com/modular-systems/national-instruments/accessories/SCB-100A>

# SCB-100A

## 100-Pin Shielded Screw Terminal DAQ Accessory

The NI SCB-100A is a shielded I/O connector block with 100 screw terminals for easy signal connection to National Instruments Digital I/O products (PCI-DIO-96, NI 6508, NI 6509, NI 6511, NI 6512, NI 6513, NI 6514, NI 6515, NI 6528, and NI 6529), Counter/Timer products (NI 6624), or other products with a 100-pin 0.050 series shielded D-type I/O connector. This document describes how to connect and use the SCB-100A with 100-pin data acquisition (DAQ) products, and lists specifications.

**Figure 1.** SCB-100A Parts Locator Diagram



- |                          |                            |
|--------------------------|----------------------------|
| 1. Top Cover (Required)  | 4. SCB-100A Board Assembly |
| 2. Quick Reference Label | 5. Strain-Relief Screw     |
| 3. Enclosure Base        | 6. Strain-Relief Bar       |



**Caution** This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on a product, refer to the [Safety Guidelines](#) section for information about precautions to take.

# Safety Guidelines

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The following cautions contain important safety information concerning hazardous voltages and connector blocks.



**Caution** Do not connect hazardous voltages (>30 V RMS/42 V peak/60 V DC). Refer to your product documentation for information about the electrical limits of your device or module.



**Caution** Install cover prior to use. To avoid electrical shock, do not remove SCB-100A covers unless you are qualified to do so. Before removing the cover, disconnect any live circuit from the connector block. Replace cover for use.



**Caution** The chassis ground lug on your SCB-100A is for grounding high-impedance sources, such as a floating source (1 mA maximum) and for terminating the shields of connected cables. Do not use the chassis ground lug as a safety earth ground.

# Electromagnetic Compatibility Guidelines

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This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference when the product is operated in its intended operational electromagnetic environment.

This product is intended for use in residential, commercial, and industrial locations. However, harmful interference may occur in some installations or when the product is connected to a peripheral device or a test object. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any changes or modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.



**Caution** To ensure the specified EMC performance, operate this product only with shielded cables and accessories.



**Caution** To ensure the specified EMC performance, signal wires routed outside of the enclosure must be contained within a shielded cable and connected to shielded accessories. Cable shields must be terminated to the chassis ground lug using as short a connection as is practical.

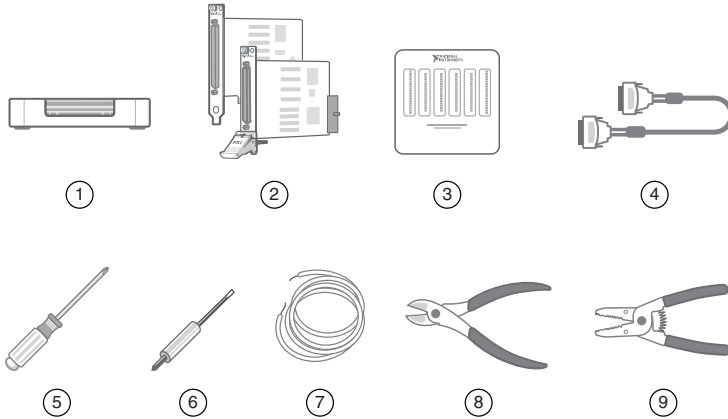
# What You Need to Get Started

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To set up and use your SCB-100A, you need the items shown in the following figure. You can find quick reference labels, which specify accessory pinout information for many compatible products, by going to [ni.com/info](http://ni.com/info) and entering the Info Code `scb100aLabels`.

**Figure 2. SCB-100A Installation Supply List**

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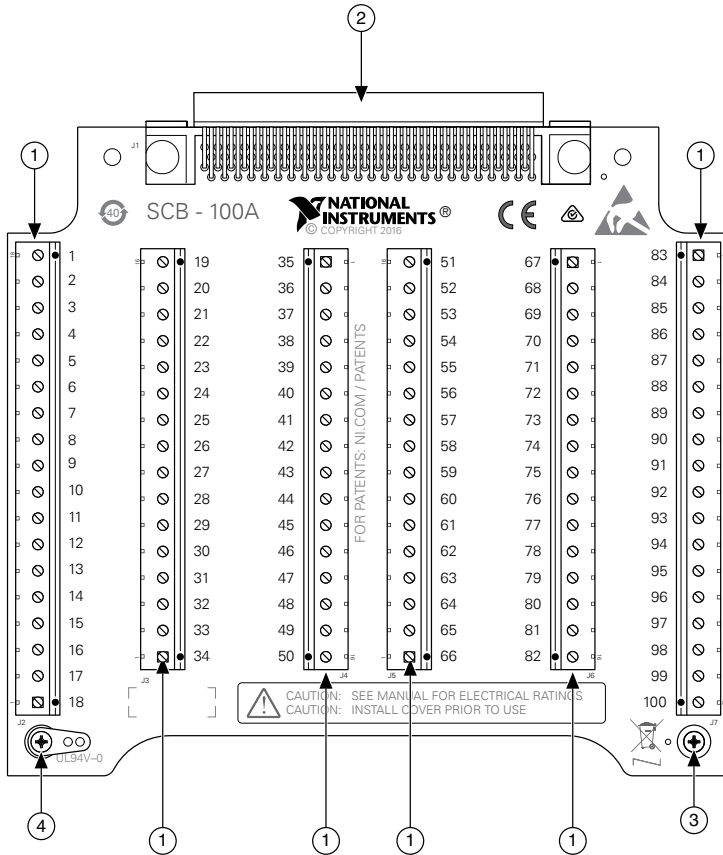
- 
- |  |                                   |
|--|-----------------------------------|
| 1. SCB-100A 100-pin Shielded Connector Block Kit | 6. 0.125 in. Flathead Screwdriver |
| 2. 100-pin DAQ Device/Module and Documentation   | 7. 16 AWG to 30 AWG Signal Wire   |
| 3. (Optional) Quick Reference Label PDF          | 8. Wire Cutters                   |
| 4. SH100-100-F Cable (Part Number 185095-0x)     | 9. Wire Insulation Stripper       |
| 5. #2 Phillips Screwdriver                       |                                   |
- 

## Getting Started with the SCB-100A

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The following figure shows the SCB-100A printed circuit board (PCB) parts locator diagram. If the kit is missing any of the components in the figure, contact NI.

**Figure 3. SCB-100A PCB Diagram**



- |                          |   |
|--------------------------|---|
| 1. Screw Terminals       | 3. PCB Mount Screw                        |
| 2. 100-Pin I/O Connector | 4. Chassis Ground Lug and PCB Mount Screw |



**Caution** The chassis ground lug on your SCB-100A is for grounding high-impedance sources, such as a floating source (1 mA maximum) and for terminating the shields of connected cables. Do not use the chassis ground lug as a safety earth ground.

To get started with the SCB-100A, complete the following steps while referring to the previous figures. If you have not already installed your DAQ device or module, refer to the

getting started guide that came with your product for instructions. Remove all cables from the SCB-100A before getting started.

1. (Optional) Mount the SCB-100A to a panel or DIN rail, as described in the [Mounting the SCB-100A](#) section.
2. Remove the cover.
3. Remove the film from both sides of the cover.
4. (Optional) Attach the quick reference label to the inside of the cover. For quick reference labels for most compatible products, go to [ni.com/info](http://ni.com/info) and enter the Info Code `scb100alabels`.



**Tip** You can stand the cover in the SCB-100A for easy reference.

5. Loosen the strain-relief bar by removing the strain-relief screws with a #2 Phillips screwdriver.
6. Connect the wires to the screw terminals by stripping off the wire insulation, inserting the wires into the screw terminals, and securely tightening the screws with the flathead screwdriver. Refer to the [Specifications](#) section for screw-terminal wiring gauge and torque information.



**Caution** To ensure the specified EMC performance, signal wires routed outside of the enclosure must be contained within a shielded cable and connected to shielded accessories. Cable shields must be terminated to the chassis ground lug using as short a connection as is practical.

7. Reinstall the strain-relief (if removed) and tighten the strain-relief screws. If the shielded cable is too large to route through the strain-relief hardware, either use multiple, smaller-diameter cables or remove the top strain-relief bar and add insulation or padding if necessary to constrain the cable.
8. Replace the cover.



**Caution** You must install cover prior to use.



**Caution** Do not connect input voltages  $>30$  V RMS/42 V peak/60 V DC to the SCB-100A. Input voltages  $>30$  V RMS/42 V peak/60 V DC can damage the SCB-100A, all devices or modules connected to it, and the host computer.

9. Connect the SCB-100A to the DAQ device or module using the SH100-100-F cable. Refer to the [Specifications](#) section for information about the SCB-100A I/O connector.



**Note** To ensure the specified EMC performance, operate this product only with shielded cables.

10. Launch Measurement & Automation Explorer (MAX). In the left panel, expand **Devices and Interfaces** to confirm that your DAQ device or module is recognized, and then configure your device settings.

11. (Optional) Configure the DAQ device or module connected to the SCB-100A by completing the following steps.
  - a. In MAX, right-click your DAQ device or module and select **Configure**.
  - b. Configure the device or module properties and click **OK**.
12. Test specific device functionality. Run a Test Panel in MAX by right-clicking your DAQ device or module and selecting **Test Panels**. Click **Start** to test the device or module functions.



**Note** When you have finished using the SCB-100A, power off any external signals connected to the SCB-100A before you power off your computer.

## Mounting the SCB-100A

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You can use the SCB-100A on a desktop, or mount it to a panel or a standard DIN rail. For two-dimensional drawings and three-dimensional models of the SCB-100A, visit [ni.com/dimensions](https://ni.com/dimensions) and search by product name.

### Panel Mounting

Three keyholes are located on the back of the SCB-100A for mounting it to a panel or wall. To mount the SCB-100A to a board or panel, complete the following steps.

1. Download and print the panel mounting template PDF by going to [ni.com/info](https://ni.com/info) and entering the Info Code `scb100amounting`.
2. Using the template, mark the three points on the panel. Verify that the narrow ends of the panel mounting screw keyholes are pointing up.
3. Screw #6-32 panhead machine screws or M3 panhead machine screws into the points marked on the panel, leaving room to easily remove the SCB-100A from the panel. Installed screw height for both screw types (from the wall to the top of the screw) is 5 mm (0.2 in.).

### DIN Rail Mounting

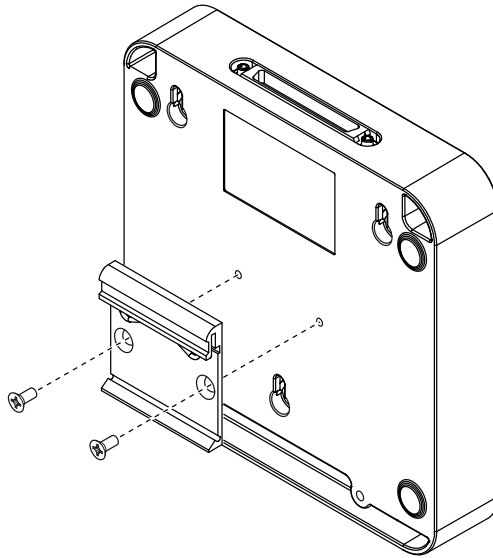
The NI 9913 DIN rail mounting kit (part number 781740-01) contains one clip for mounting the SCB-100A on a standard 35 mm DIN rail. Fasten the DIN rail clip to the accessory using two FLH #6-32 x 5/16" screws (included in the kit) with a #2 Phillips screwdriver, as shown in the following figure.



**Note** The threaded holes on the SCB-100A for DIN rail mounting should not be used more than five times. Unscrewing and reinstalling the DIN rail clip will produce a compromised connection between the DIN rail clip and accessory.

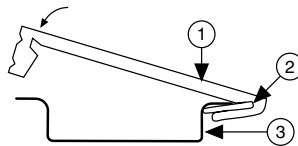


**Figure 4. SCB-100A DIN Rail Clip Installation**



Clip the chassis onto the DIN rail with the larger lip of the DIN rail clip positioned up, as shown in the following figure.

**Figure 5. DIN Rail Clip Parts Locator Diagram**



1. DIN Rail Clip
2. DIN Rail Spring
3. DIN Rail

## Securing the Cover on the SCB-100A

In most cases, attaching the cover with the integrated magnets is sufficient. To permanently secure the cover to the SCB-100A base, you will need two M3 × 6 (#4-40 × 5/16") thread-forming Phillips panhead screws, such as Taptite® Trilobular® screws. You can purchase Taptite screws from many vendors.

Complete the following steps.

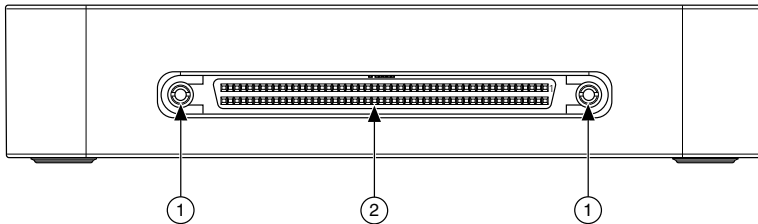
1. Using a 3.5 mm (9/64 in.) diameter drill bit, drill two holes through the silkscreened crosshairs on the label side of the cover. When drilling, place the cover on a flat surface, such as a drill press, and drill slowly to minimize burrs.
2. Replace the cover on the base, lining up the drill holes with the holes in the enclosure.
3. Screw the M3 × 6 (#4-40 × 5/16") screws in with a torque of 0.90 N · M to 1.13 N · M (8 in. · lb to 10 in. · lb). Screwing within the recommended torque range avoids stripping the threads of the enclosure holes.

## Removing the SCB-100A PCB from the Base

Complete the following steps to remove the SCB-100A from the base.

1. Disconnect the cable from the SCB-100A, if connected, and remove the top cover.
2. Loosen the strain-relief screws, shown in Figure 1, with a #2 Phillips screwdriver.
3. Remove any signal wires from screw terminals with a flathead screwdriver.
4. Remove the printed circuit board mount screws and chassis ground lug, shown in Figure 2, with a #1 Phillips screwdriver.
5. Remove the connector screws, shown in the following figure, with a flathead screwdriver.
6. Tilt the PCB up and pull it out of the enclosure base.

**Figure 6. SCB-100A Back View**



1. Connector Screws
2. 100-Pin I/O Connector



**Note** The threaded holes on the SCB-100A for the PCB mounting should not be used more than five times. Unscrewing and reinstalling the PCB will produce a compromised connection.

## Specifications

The following specifications are typical at 25 °C, unless otherwise noted.



**Caution** Do not connect hazardous voltages (>30 V RMS/42 V peak/60 V DC) to the SCB-100A.

# Power Requirements

## Maximum current at screw terminals

Terminals 1-48, 51-98	0.5 A
Terminals 49-50, 99-100	1 A



**Caution** Maximum current allowed at screw terminals may be less than specified depending on the DAQ device or module connected to the SCB-100A. Refer to the device specifications for maximum ratings of your device or module.

# Physical Characteristics

Dimensions (including feet)	14.7 cm × 14.7 cm × 3.0 cm (5.8 in. × 5.8 in. × 1.2 in.)
Weight	670 g (1 lb 7.6 oz)
I/O connector	One 100-pin male 0.050 series shielded D-type connector
Number of screw terminals	100, all I/O signals are available at screw terminals
Screw-terminal wiring	
Gauge	0.25 mm <sup>2</sup> to 1.29 mm <sup>2</sup> (30 AWG to 16 AWG) solid or stranded wire
Wire strip length	6 mm (0.24 in.)
Temperature rating	90 °C minimum
Torque	0.5 N · m to 0.6 N · m (4.4 in. · lb to 5.3 in. · lb)
Wires per screw terminal	One wire per screw terminal



**Note** It may not be possible to connect wires to all screw terminals through the opening of the enclosure when using wire larger than 1.02 mm<sup>2</sup> (18 AWG).

# Safety Voltages

Maximum voltage	30 V RMS, 42 V peak, 60 V DC
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**Caution** Not for use for measurements of MAINS circuits or Measurement Categories II, III, or IV.

# Environmental

Operating temperature	0 °C to 70 °C
Storage temperature	-18 °C to 82 °C

Operating humidity	5% to 90% RH, noncondensing
Storage humidity	5% to 90% RH, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m

Indoor use only.

## 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](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

## Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



**Note** In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.



**Note** Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.



**Note** For EMC declarations and certifications, and additional information, refer to the [Online Product Certification](#) section.

# CE Compliance

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

## Online Product Certification

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

## Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at [ni.com/environment](https://ni.com/environment). This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

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## Where to Go Next

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The following documents contain information that you may find helpful as you use this document:

- Documentation for your DAQ product at [ni.com/manuals](https://ni.com/manuals)
- LabVIEW, LabWindows™/CVI™, Measurement Studio, Visual Basic, and ANSI C examples at [ni.com/info](https://ni.com/info) (enter the Info Code `daqmxexp`)
- *Measurement & Automation Explorer Help*
- *NI-DAQmx Help*
- NI KnowledgeBase at [ni.com/kb](https://ni.com/kb)

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Visit [ni.com/services](http://ni.com/services) for NI Factory Installation Services, repairs, extended warranty, and other services.

Visit [ni.com/register](http://ni.com/register) to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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