

# IMAQ™ SCB-68 CONNECTOR BLOCK AND IMAQ SH68-C68 CABLE

This guide describes how to connect and use the IMAQ SCB-68 68-pin shielded connector block with the IMAQ SH68-C68 cable and any National Instruments image acquisition (IMAQ) devices featuring a 68-pin VHDCI connector.



**Caution** Use the SH68-C68 cable with IMAQ devices only. Do *not* use data acquisition (DAQ) cables with IMAQ devices. Using the SH68-C68 cable with other devices or using DAQ cables with IMAQ devices may result in damages to your device or your computer. National Instruments is *not* liable for any damages or injuries resulting from improper use or connection.

## Introduction

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The IMAQ SCB-68 68-pin connector block is a shielded board with 68 screw terminals that connects to IMAQ devices featuring the 68-pin VHDCI connector.

The terminal block has 68 screw terminals for easy connection to signal wires. When you use the IMAQ SCB-68 shielded connector block with your IMAQ device, set the switches as shown in the *Switch Settings* section to obtain a generic 68-screw terminal connector block. The IMAQ SCB-68 also features a strain-relief bar for securing signal wires or cables.

The IMAQ SH68-C68 cable connects your IMAQ device to the IMAQ SCB-68 connector block.

# What You Need to Get Started

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To install and connect signals to the IMAQ SCB-68 connector block, you will need the following items:

- IMAQ SCB-68 68-pin shielded connector block
- IMAQ SH68-C68 cable
- IMAQ SCB-68 Connector Block and IMAQ SH68-C68 Cable Installation Guide*
- IMAQ SCB-68 quick reference label (included with your IMAQ SCB-68 kit)
- Your IMAQ device and documentation
- Your camera or other video sources
- Number 1 and 2 Phillips screwdrivers
- 0.125 in. flathead screwdriver
- Long-nose pliers
- Wire cutters
- Wire insulation strippers
- Soldering iron and solder
- Resistors and capacitors (specific to your application)

# Switch Settings

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You must change the IMAQ SCB-68 switch settings to the generic screw terminals switch configuration, as shown in Figure 1, before you connect your IMAQ SH68-C68 cable to the IMAQ SCB-68 connector block. This setting change disconnects the IMAQ SCB-68 temperature sensor and accessory grounds.

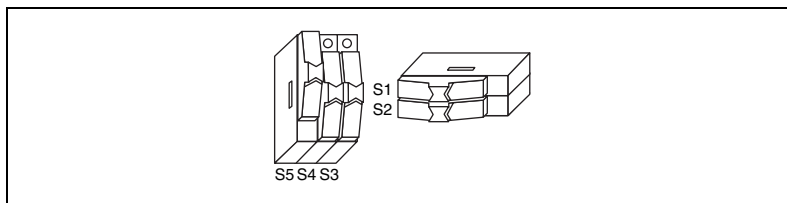


Figure 1. IMAQ SCB-68 Switch Settings

## IMAQ Quick Reference Label

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The quick reference label illustrates switch configuration and defines screw terminal pinouts for your IMAQ device. Attach the quick reference label to the inside cover of the connector block for quick reference.

## Safety Information

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**Caution** The following paragraphs contain important safety information you *must* follow when installing and operating the device.

Do *not* operate the device in a manner not specified in the documentation. Misuse of the device may result in a hazard and may compromise the safety protection built into the device. If the device is damaged, turn it off and do *not* use it until service-trained personnel can check its safety. If necessary, return the device to National Instruments for repair.

Keep away from live circuits. Do *not* remove equipment covers or shields unless you are trained to do so. If signal wires are connected to the device, hazardous voltages can exist even when the equipment is turned off. To avoid a shock hazard, do *not* perform procedures involving cover or shield removal unless you are qualified to do so. Disconnect all field power prior to removing covers or shields.

If the device is rated for use with hazardous voltages ( $>30 V_{\text{rms}}$ ,  $42.4 V_{\text{pk}}$ , or  $60 V_{\text{dc}}$ ), it may require a safety earth-ground connection wire. See the device specifications for maximum voltage ratings.

Because of the danger of introducing additional hazards, do *not* install unauthorized parts or modify the device. Use the device only with the chassis, modules, accessories, and cables specified in the installation instructions. All covers and filler panels *must* be installed while operating the device.

Do *not* operate the device in an explosive atmosphere or where flammable gases or fumes may be present. Operate the device only at or below the pollution degree stated in the specifications. Pollution consists of any foreign matter—solid, liquid, or gas—that may reduce dielectric strength or surface resistivity. Pollution degrees are listed below:

- Pollution Degree 1—No pollution or only dry, nonconductive pollution occurs. The pollution has no effect.
- Pollution Degree 2—Normally only nonconductive pollution occurs. Occasionally, nonconductive pollution becomes conductive because of condensation.
- Pollution Degree 3—Conductive pollution or dry, nonconductive pollution occurs. Nonconductive pollution becomes conductive because of condensation.

Insulate signal connections for the maximum voltage for which the device is rated. Do *not* exceed the maximum ratings for the device. Remove power from signal lines before connection to or disconnection from the device.

Operate this device only at or below the installation category stated in the specifications. Installation categories are listed below:

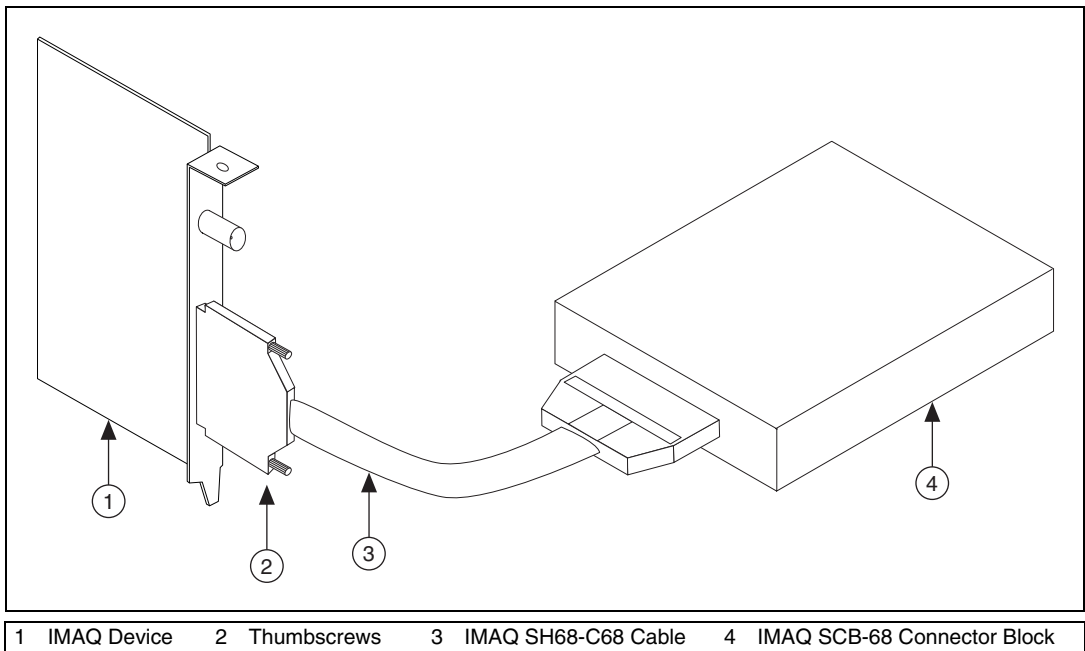
- Installation Category I—for measurements performed on circuits not directly connected to mains. Examples include measurements on circuits not derived from mains, and specially-protected (internal) mains-derived circuits.
- Installation Category II—for measurements performed on circuits directly connected to the low-voltage installation. Examples include measurements on household appliances, portable tools, and other similar equipment.
- Installation Category III—for measurements performed in the building installation. Examples include measurements on distribution boards, circuit-breakers, wiring (including cables), bus bars, junction boxes, switches, socket outlets in the fixed installation, equipment for industrial use, and some other types of equipment, such as stationary motors permanently connected to the fixed installation.

- Installation Category IV—for measurements performed at the source of the low-voltage installation. Examples include electricity meters, measurements on primary overcurrent protection devices, and ripple-control units.

Clean the device and accessories by brushing off light dust with a soft, nonmetallic brush. Remove other contaminants with a stiff, nonmetallic brush. The unit *must* be completely dry and free from contaminants before returning it to service.

## Installation

Attach one end of the SH68-C68 cable to your IMAQ device and attach the other end to the IMAQ SCB-68 connector block, as seen in Figure 2. Tighten the thumbscrews as necessary.



**Figure 2.** Connecting the SH68-C68 Cable to Your IMAQ Device and IMAQ SCB-68 Connector Block

# Signal Connections

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This section explains how to connect the signal to the IMAQ SCB-68. For more information on the parts mentioned in signal connection, refer to the parts locator diagram in Figure 3.

The following warnings contain important safety information concerning hazardous voltages and terminal blocks.



**Caution** Avoid live circuits. To avoid electrical shock, do *not* remove equipment covers or shields unless you are qualified to do so. If signal wires are connected to the IMAQ SCB-68, dangerous voltages may exist even when the equipment is turned off. Before removing the cover, disconnect the AC power or any live circuit from the terminal block.



**Caution** The chassis ground terminals on your IMAQ SCB-68 are for grounding high-impedance sources such as a floating source (1 mA maximum). Do *not* use these terminals as safety earth grounds.

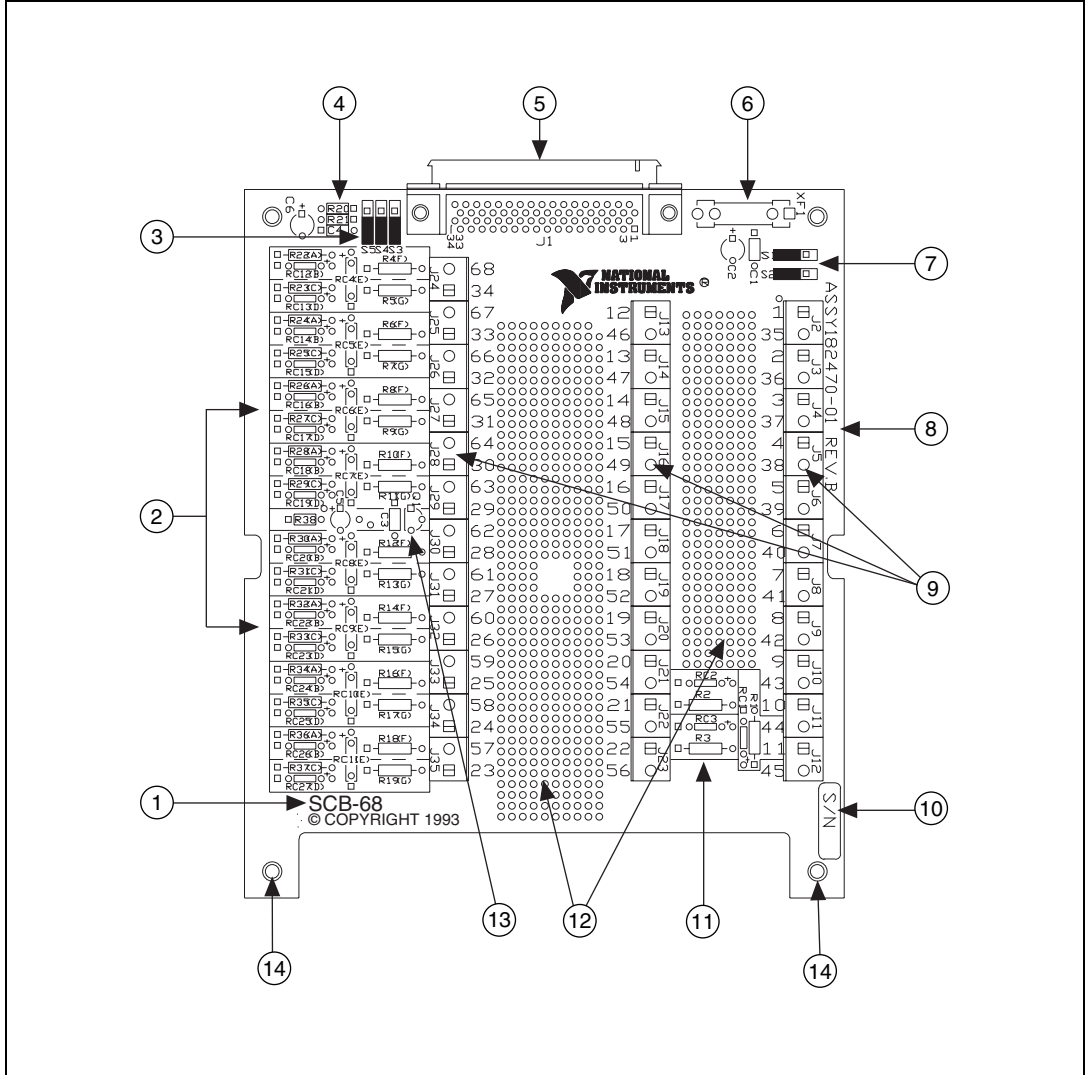


**Caution** Do *not* connect high voltages ( $\geq 42 V_{\text{rms}}$ ). National Instruments is *not* liable for any damages or injuries resulting from improper use or connection.

To connect the signal to the IMAQ SCB-68, perform the following steps:

1. If connected, disconnect the 68-pin cable from the IMAQ SCB-68.
2. Remove the screws on either side of the top cover with a Number 1 Phillips screwdriver and open the top cover.
3. Configure the switches, as explained in the [Switch Settings](#) section in this guide.
4. Adjust the strain-relief hardware.
  - a. Loosen the strain-relief screws with a Number 2 Phillips screwdriver and slide the signal wires through the front panel strain-relief opening.
  - b. Remove the top strain-relief bar if you are connecting multiple signals.
5. Add insulation or padding if necessary.
6. Connect the wires to the screw terminals.
  - a. Strip 1/4 in. of the insulation.
  - b. Insert the wires into the green terminals.
  - c. Tighten the screws.
7. Reinstall strain-relief (if removed) and tighten the strain-relief screws.
8. Close the top cover.

9. Reinsert the screws on the sides of the top cover to ensure proper shielding.
10. Using the SH68-C68 cable, connect the terminal block to the 68-pin connector on your IMAQ device.



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| <ol style="list-style-type: none"> <li>1 Product Name</li> <li>2 Pads for Analog Input Conditioning</li> <li>3 Switches S3, S4, and S5</li> <li>4 R20 (see fuse and power)</li> <li>5 68-Pin I/O Connector</li> <li>6 Fuse (0.8 A)</li> <li>7 Switches S1 and S2</li> </ol> | <ol style="list-style-type: none"> <li>8 Assembly Number and Revision Letter</li> <li>9 Screw Terminals</li> <li>10 Serial Number</li> <li>11 RC Filters and Attenuators for DAC0, DAC1, and Ext. Trig.</li> <li>12 Breadboard Area</li> <li>13 Cold-Junction Compensation Temperature Sensor (not used)</li> <li>14 Board Mount Screws</li> </ol> |
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**Figure 3.** IMAQ SCB-68 Terminal Block Parts Locator Diagram

# Removing the Board

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You can remove the board from its housing in order to solder components into place. To remove the board, perform the following steps:

1. If connected, disconnect the 68-pin cable from the IMAQ SCB-68.
2. Remove the screws on both sides of the top cover using a Number 1 Phillips screwdriver.
3. Open the top cover.
4. Loosen the strain-relief screws with a Number 2 Phillips screwdriver.
5. Remove the signal wires from the screw terminals.
6. Remove the board mount screws and 68-pin connector screws.
7. Remove the jack sockets using a 3/16 hex wrench.
8. Tilt the board up and pull it out of the housing.

# Adding Components to the IMAQ SCB-68 Printed Circuit Board

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Some applications may require you to make modifications to the printed circuit board, usually in the form of adding components or cutting jumpers. Follow these guidelines when modifying your IMAQ SCB-68 printed circuit board:

- Use a low-wattage soldering iron (20 to 30 W) when soldering to the board.
- Use vacuum-type tools to desolder on the IMAQ SCB-68. Use caution when desoldering to avoid damaging component pads.
- Use only rosin-core, electronic-grade solder. Acid-core solder can damage the printed circuit board and components.

To make signal modifications more efficient, jumper traces are located next to each analog screw terminal. You can cut these jumper traces with a razor blade or any instrument designed for precise cutting. Cutting the jumper traces will disconnect the signal from the screw terminal. See Figure 3 for more detail.



# Specifications

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This section lists the IMAQ SCB-68 specifications. These ratings are typical at 25 °C unless otherwise stated.

## General

Number of screw terminals ..... 68

## Maximum Working Voltage

Channel to earth ..... 5 V, Installation Category I  
(signal voltage plus  
common-mode voltage)

Channel to channel..... 5 V, Installation Category I  
(signal voltage plus  
common-mode voltage)

## Physical

Box dimensions (including feet)..... 19.6 by 15.2 by 4.6 cm  
(7.7 by 6.0 by 1.8 in.)

I/O connectors ..... One 68-pin male 0.050 series  
shielded D type connector

## Environmental

Operating temperature..... 0 to 55 °C

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

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

Maximum altitude ..... 2000 meters

Pollution degree ..... 2

Usage..... Indoor use only

# Electromagnetic Compatibility

EMC/EMI .....	CE, C-Tick, and FCC Part 15 (Class A) Compliant
Electrical emissions .....	EN 55011 Class A at 10 meters FCC Part 15A above 1 GHz
Electrical immunity .....	Evaluated to EN 61326:1997/ A1:1998, Table 1



**Note** For full EMC compliance, you *must* operate this device with shielded cabling. In addition, all covers and filler panels *must* be installed. See the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, click Declaration of Conformity at [ni.com/hardref.nsf/](http://ni.com/hardref.nsf/). This Web site lists the DoCs by product family. Select the appropriate product family, followed by your product, and a link to the DoC (in Adobe Acrobat format) appears. Click the Acrobat icon to download or read the DoC.

## Safety

These devices meet the requirements of the following standards for safety for electrical equipment for measurement, control, and laboratory use:

EN 61010-1:1993/A2:1995, IEC 61010-1:1990/A2:1995  
UL 3101-1:1993, UL 3111-1:1994, UL 3121:1998  
CAN/CSA C22.2 no. 1010.1:1992/A2:1997