National Instruments™ SCB-68 Breakout Box

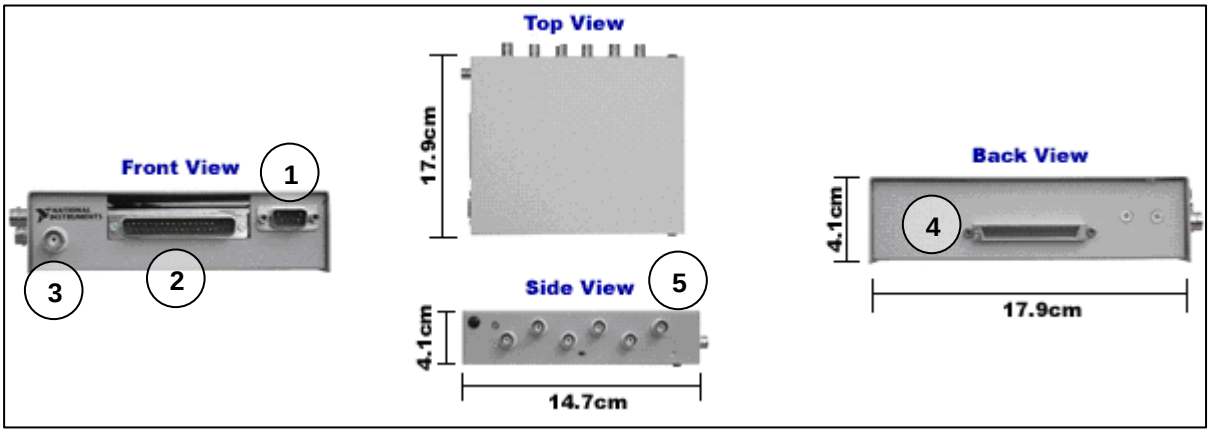
Description

The SCB-68 is a shielded I/O connector block that has been modified by Plexon to facilitate interfacing Plexon hardware with the National Instruments 16-channel A/D boards PCI-6040E, PCI-6052E, and PCI-6070E.

Plexon recommends that the A/D card be configured for Non-Referenced Singled Ended operation. In this mode, the output of each channel of the A/D card is the amplified difference between a channel input and a common reference input called AISENSE.

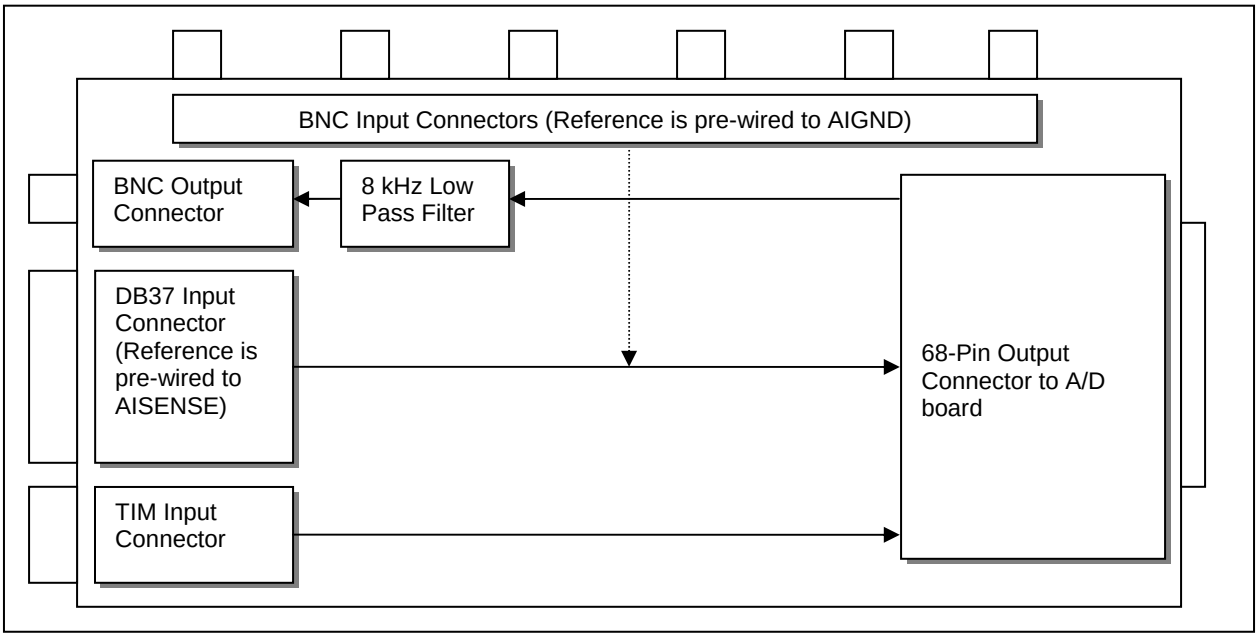
Figure 1 shows the pictorial and quick connection diagram and Figure 2 shows the functional diagram of the SCB-68.

Figure 1 - National Instruments SCB-68 Pictorial Diagram and Quick Connection Guide



1	**TIM Input Connector** Map System – connects to TIM board Recorder System - not used
2	**DB37 Input Connector** Connects to PBX output Reference pre-wired to AISENSE
3	**BNC Output Connector** MAP System – not used Recorder System – connects to oscilloscope
4	**68 Pin Output Connector** Connects to NIDAQ card in PC See PCI E Series User Manual (www.ni.com)
5	**BNC Input Connectors (Optional)** 6 BNC connectors Use of each is optional If used replace any or all of channels 11-16 on the DB37 connector – see text

Figure 2 - National Instruments SCB-68 Functional Diagram



TIM Input Connector

The TIM Input Connector is a male DB9 connector that can be used to bring external timing signals to the NIDAQ board. When used in conjunction with a MAP system, the TIM Input Connector receives a clock and a start signal from the MAP. These signals ensure that the continuous data acquired by the NIDAQ board is synchronized with the spike data recorded by the MAP box. The TIM Input Connector is not used with Recorder systems.

DB37 Input Connector

The DB37 Input Connector is the default analog signal input to the SCB-68. There are 16 analog inputs and one common reference input (AISENSE). The recorded signal for each channel is the amplified difference between the channel input and the common reference input.

Caution: The signal sources should be ground referenced, not “floating”. If you have a “floating” signal source such as a battery powered device please contact Plexon for assistance in connecting it to the SCB-68.

BNC Input Connectors

The BNC Input Connectors are not initially configured but may optionally be used to connect analog signals from a separate source than that used for the DB37 Input Connector. Each optional BNC input may be used instead of the corresponding input from the DB37 Input Connector (see page 4 for details on configuring a BNC input). The BNC inputs are intended for use with relatively large amplitude (> 1V) input signals and low levels of gain on the NIDAQ card.

Caution: The outer conductor of each BNC is connected to the ground of the NIDAQ card, “AIGND”. Note, however, that the recorded signal is still the difference between the input and the common reference input AISENSE from the DB37 Connector. Thus, you must have a signal source connected to the DB37 Input Connector before using the BNC inputs. If you would like to use one or more BNC connectors with no input connected to the DB37 input connector, please contact Plexon for assistance.

68 Pin Output Connector

The 68 Pin Output Connector connects to a NIDAQ board in a PC. For more information see the National Instruments PCI Series-E User Manual.

BNC Output Connector

The BNC Output Connector outputs the active channel when using Recorder software and is not used with a MAP system.

Connector Pin-outs

Figure 3 – DB37 Input Connector Pin-out

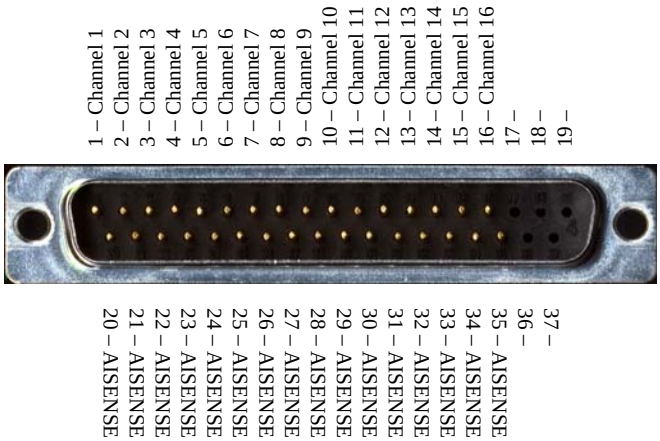
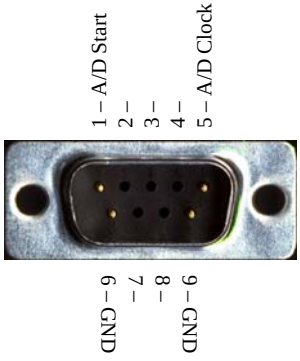
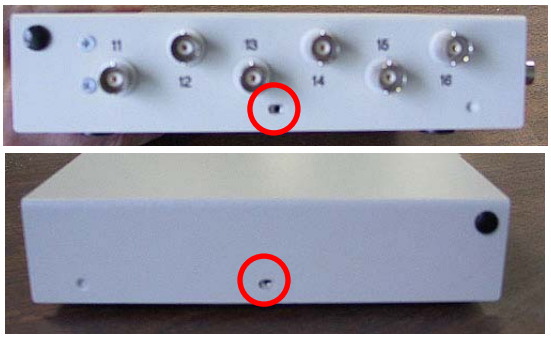
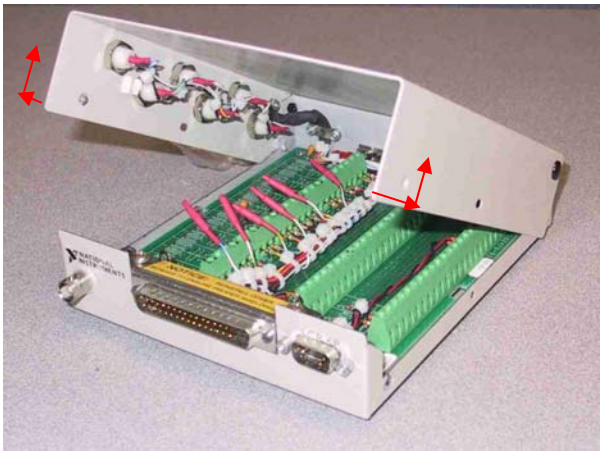


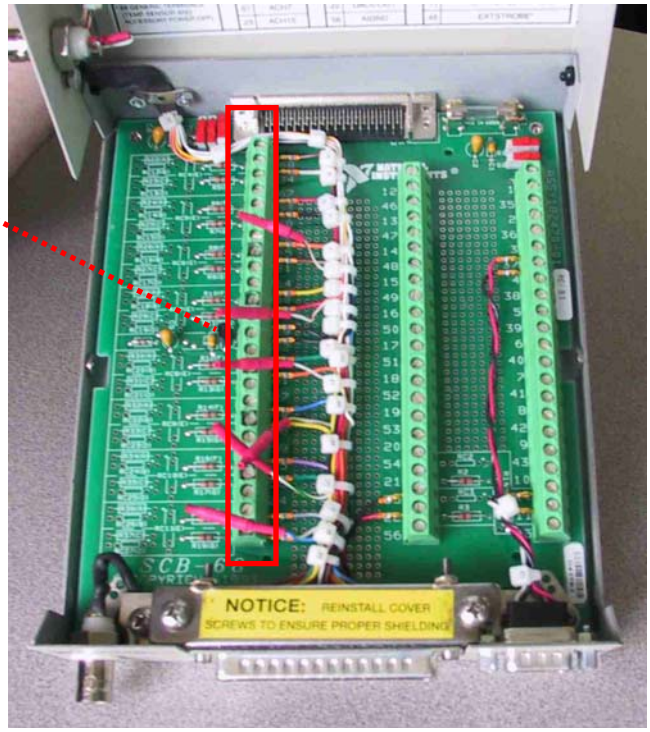
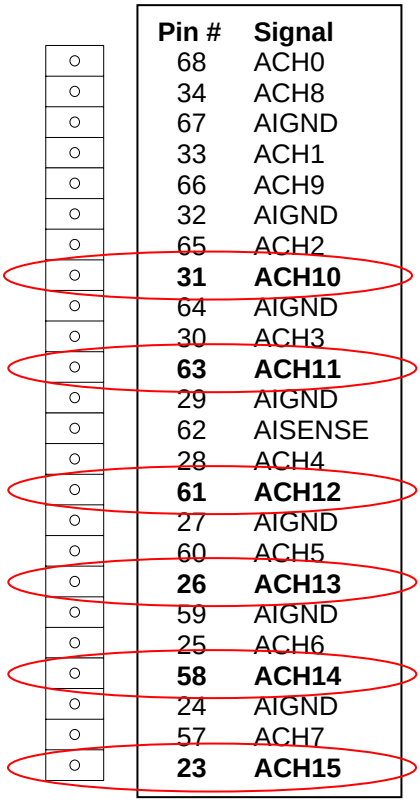
Figure 4 – TIM Input Connector Pin-out

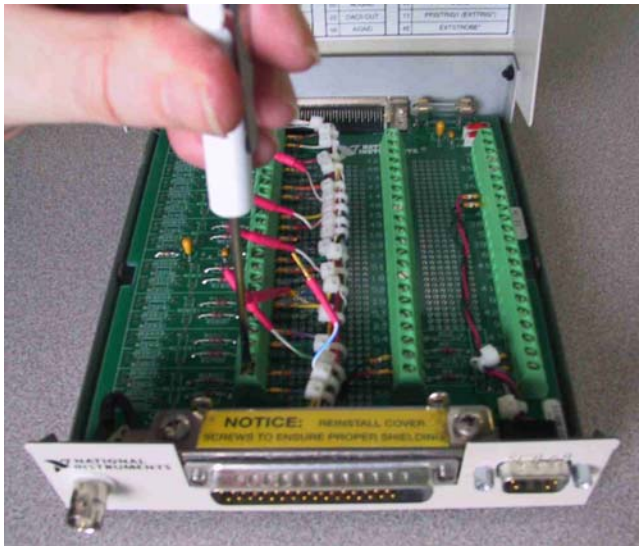
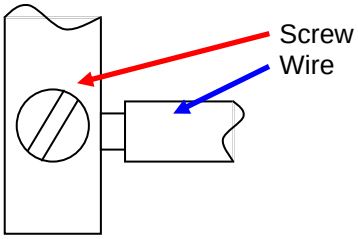
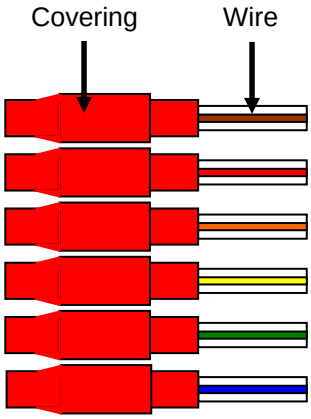


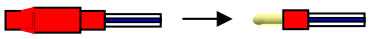
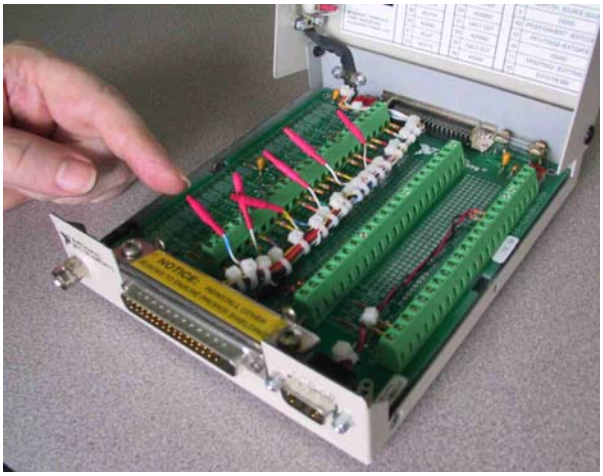
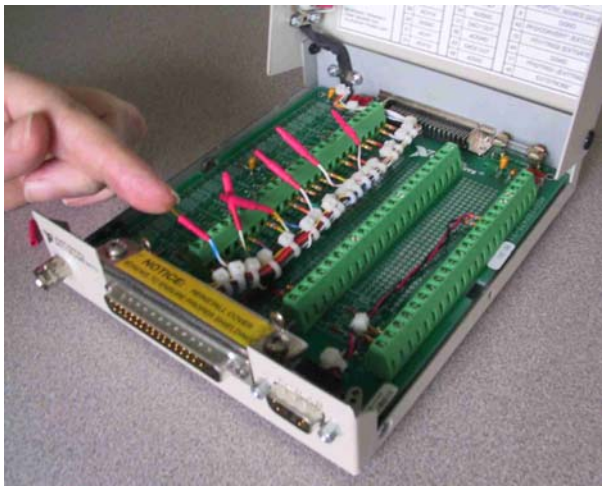
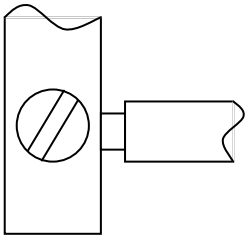
Procedure for Connecting BNC Inputs

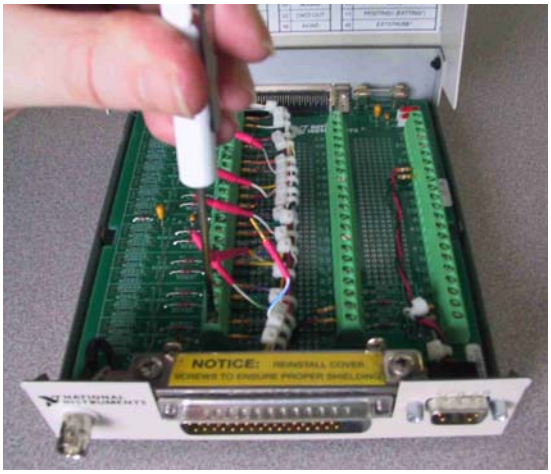
The optional BNC inputs for channels 11-16 may be used instead of the corresponding inputs from the DB37 input connector. Use the procedure in the table below to connect an optional BNC input.

Step	Action	Diagram
1	**Remove Panel Screws** Remove the screw from the bottom center of the Analog Input panel. Also, remove the screw from the panel on the opposite side.	
2	**Open the Lid** Open the SCB-68 with the National Instruments logo nearest you. You will need to use horizontal pressure on the bottom corners of the lid and force the lid upward as shown by the arrows on the diagram.	

Step	Action	Diagram
3	**Identify Long Terminal Strip** Locate the terminal strips on the inside of the bottom case of the SCB-68. Find the longest terminal strip.	
4	**Identify DB37 Signal Lines** On the long terminal strip locate the terminal that corresponds to an analog channel you wish to use. Channel 11 = Pin 31 (ACH10) Channel 12 = Pin 63 (ACH11) Channel 13 = Pin 61 (ACH12) Channel 14 = Pin 26 (ACH13) Channel 15 = Pin 58 (ACH14) Channel 16 = Pin 23 (ACH15) In the diagram, the corresponding pins are identified by **bold** font and enclosed by red ellipses. Suppose you wish to use Channel 16, then terminal 23 at the bottom of the strip would be the correct selection (colored blue).	

Step	Action	Diagram
5	**Disconnect DB37 Signal Line(s)** Loosen the screw of the appropriate terminal and remove the wire connected to it. Note the color of the wire: Channel 11 = brown Channel 12 = red Channel 13 = orange Channel 14 = yellow Channel 15 = green Channel 16 = blue	 
6	**Identify BNC Signal Line(s)** There are several loose white wires with color stripes that have red protective coverings attached. Find the wire whose stripe matches the color of the wire removed from the terminal strip. Channel 11 = brown stripe Channel 12 = red stripe Channel 13 = orange stripe Channel 14 = yellow stripe Channel 15 = green stripe Channel 16 = blue stripe	

Step	Action	Diagram
7	**Transfer Protective Covering** Remove the protective covering of the selected BNC wire.  Transfer the protective covering to the solid colored wire removed from the terminal strip in Step 5. 	
		
8	**Insert BNC Signal Line(s)** Insert the selected BNC wire into the terminal strip.	

Step	Action	Diagram
9	**Tighten the Screw** Tighten the screw of the selected terminal.	
10	Repeat Steps 3-9 for each channel chosen	