USER GUIDE
Digital Flying Lead Cable
Accessory for Single-Ended NI Digital Waveform Generator/Analyzers

The NI SHC68-H1X38 cable is a single-ended cable that breaks out each NI digital waveform generator/analyzer signal into two 0.1 inch header receptacles, one receptacle each for the signal and ground. The NI SHC68-H1X38 cable provides an easy way to connect NI single-ended high-speed digital waveform generator/analyzer devices to various types of devices and circuits for interfacing, testing, or analysis.

This cable offers connectivity similar to that found on a typical logic analyzer, so you can use it in logic analyzer-type applications. Unlike a typical logic analyzer, however, this cable also allows for simultaneous pattern generation and acquisition so that it can be used in stimulus/response applications as well.

This guide explains how to set up and use the NI SHC68-H1X38 cable with single-ended NI digital waveform generator/analyzer modules.

Contents

NATIONAL INSTRUMENTS

What You Need to Get Started

To set up and use the NI SHC68-H1X38 cable, you need the following items:

❏ Compatible NI digital waveform generator/analyzer, installed in a PXI chassis, compactPCI chassis, or PCI slot

❏ The documentation included with the digital waveform generator/analyzer and driver software

Related Documentation

The NI digital waveform generator/analyzer ships with several documents designed to familiarize you with different aspects of the module. The documentation set includes the following pieces:

• *NI Digital Waveform Generator/Analyzer Getting Started Guide*—Read this printed document to set up the digital waveform generator/analyzer and configure it to complete your first acquisition or generation.

• *NI Digital Waveform Generator/Analyzer Help*—This online document provides more in-depth information about the hardware capabilities of the module, theory of operation, programming flow, and software reference.

• NI digital waveform generator/analyzer specifications—These printed documents provide specifications for your device.

Parts Locator

Refer to Figure 1 to locate connectors and components on the
NI SHC68-H1X38 cable. The lead pairs are shown in more detail in
Figure 2.

1 Lead Pairs	2 Removable Sleeving	3 68-Pin VHDCI Connector
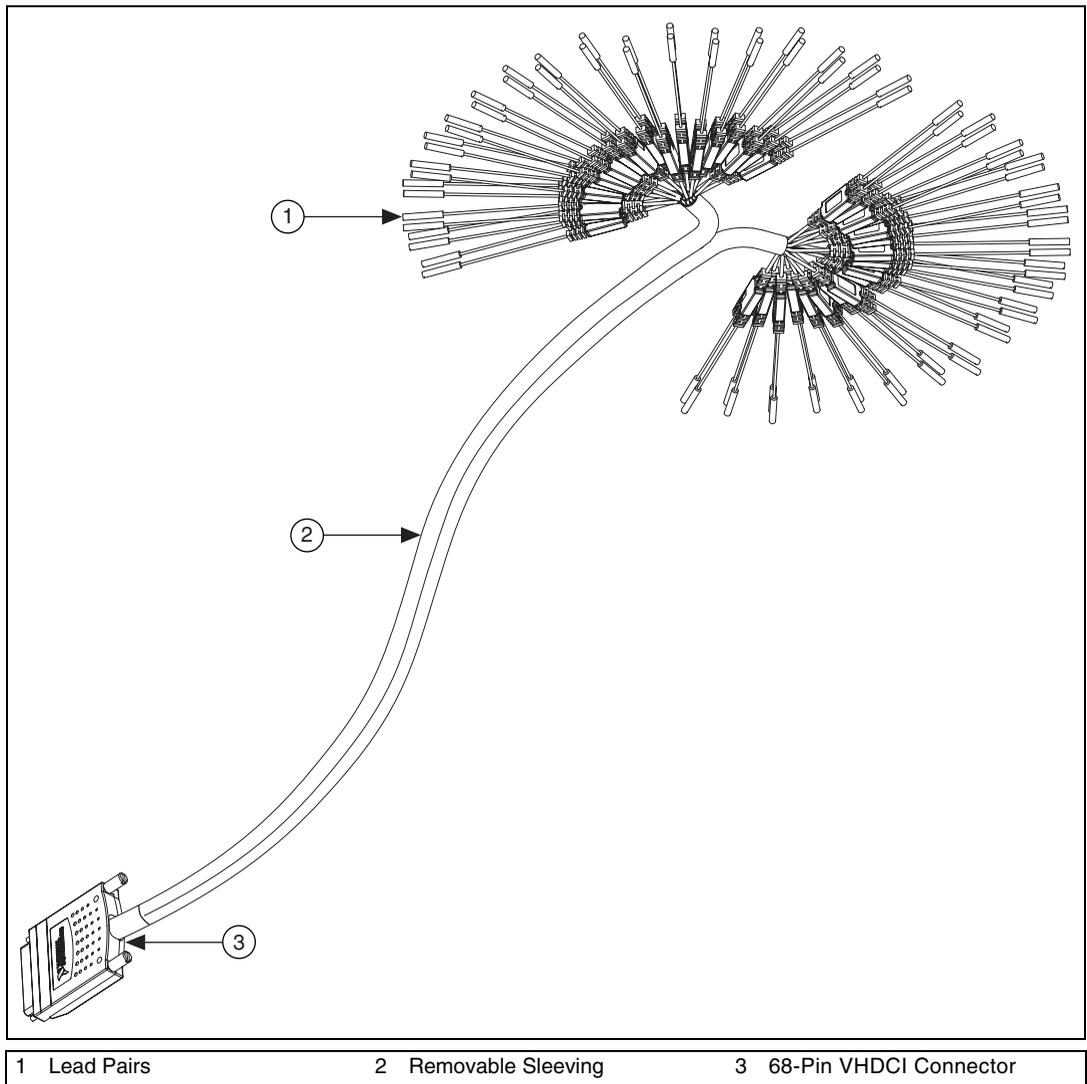
Figure 1. NI SHC68-H1X38 Cable Parts Locator Diagram

| 1 | 0.25 in. diameter 0.1 in. pitch compatible receptacles | 3 | Microcoaxial wire |
| 2 | Strain-relief and label | 4 | Ground |
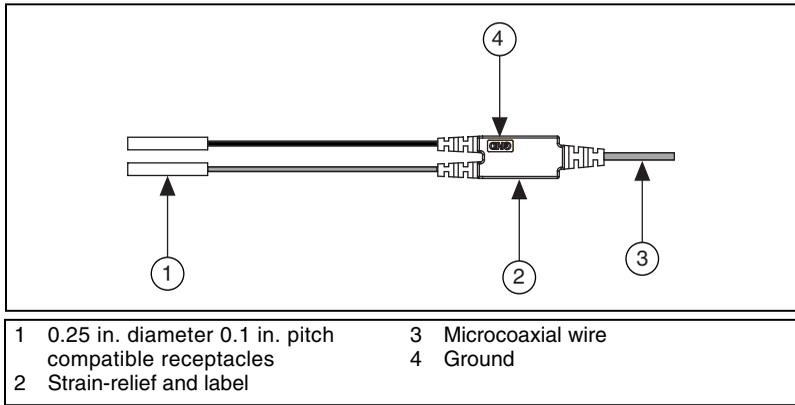
Figure 2. Detailed Parts Locator Diagram for the Lead Pairs

Connecting Signals

Each DIO, PFI, and clock channel of the NI digital waveform generator/analyzer connects to a corresponding pair of leads on the NI SHC68-H1X38 cable.

The NI SHC68-H1X38 cable is separated into two bundles of 19 channels, and each channel is split into a pair of leads for connecting the signal and its associated ground. Table 1 describes the channels and shows how they are grouped by bundle.

Table 1. NI Digital Waveform Generator/Analyzer Signal Descriptions

Channel	Signal Description	Bundle
DIO <0..31>	Bidirectional digital data channels 0 through 31. Refer to the documentation for your NI digital waveform generator/analyzer for information about the number of available DIO channels on your device. DIO <20..31> may not apply to your device.	DIO<0..15>: Bundle A DIO<16..31>: Bundle B
STROBE / PFI 5	For devices that have a STROBE channel, this signal is the external Sample clock source for dynamic acquisition. Otherwise, this is programmable functional interface (PFI) 5.	Bundle A

Table 1. NI Digital Waveform Generator/Analyzer Signal Descriptions (Continued)

Channel	Signal Description	Bundle
CLKOUT / PFI 4	For devices that have a DDC CLK OUT channel, this signal is the exported sample clock signal. Otherwise, this is PFI 4.	Bundle A
PFI <1..3>	Programmable functional interface PFI <1..3>.	PFI 1: Bundle A PFI <2..3>: Bundle B
Reserved / PFI 0	For devices that have PFI 0 on a front-panel SMB connector, this channel is reserved and should not be used. Otherwise, this channel serves as PFI 0	Bundle B
GND	Each channel is split into a pair of leads. The lead attached with the black wire is the GND signal, which serves as the ground reference for that particular channel.	N/A

Using Your Accessory

The NI SCH68-H1X38 cable breaks out every signal through a 50 Ω characteristic impedance microcoaxial cable, which is then split into the two leads with receptacles. This cable was designed for both acquisition and generation operations with your single-ended NI digital waveform generator/analyzer. Refer to the Termination sections in the *NI Digital Waveform Generator/Analyzer Help* to learn how to correctly terminate your signals to achieve optimal signal quality.

For optimal signal quality, connect both the signal and ground receptacles and twist the pair of leads together as shown in the following figure.
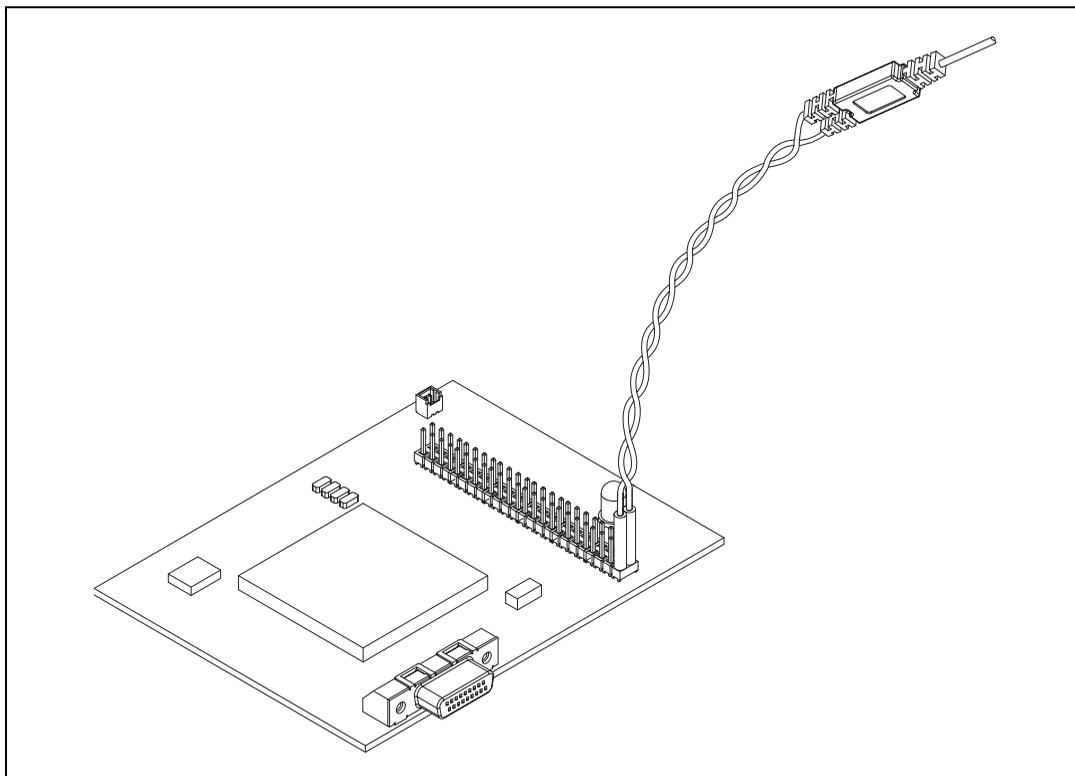
Figure 3. Using the NI SCH68-H1X38 Cable for Interface

The receptacles on the SHC68-H1X38 easily attach to standard 0.1 inch pitch, 0.025 inch diameter header pins. The shipping kit for this cable also contains ten 4×2 header-to-receptacle strips for one-time arrangement of the flying leads. These strips are useful when you must disconnect and reconnect the cable to rows of 0.1 inch test pins on a circuit board, for example. You can easily find other adapters that provide male header pins on one side and an array of connectors on the other side.

Specifications

Digital I/O

DIO Channels.. 32, single-ended

Control I/O Channels .... 6, single-ended

Typical Propagation delay .... 13.5 ns

Typical channel-to-channel skew........... ±250 ps

Typical characteristic impedance........... 50 Ω

Typical Input capacitance .... 150 pF

Physical

Length .... 1.5 m

I/O Connectors .... One 68-pin DDC Connector
38 header-receptacle pairs
(signal and ground)