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SCXI™-1356 SHIELDED CABLE INSTALLATION GUIDE

This guide describes how to install the SCXI-1356 shielded cable between a 100-pin VXI-MIO Series module and two SCXI modules.

Introduction

With the SCXI-1356 shielded cable, you can make a low-noise, long-distance connection between a VXI-MIO Series module and two SCXI modules. The cable is available in 1, 2, 5, and 10 m lengths. The cable is Y-shaped, with a 100-pin male connector at one end and two 68-pin female connectors on the branched end. One 68-pin connector branch is labeled **MIO-16**, and the other is labeled **ACH16-ACH63**. Refer to Figure 1 for the parts locator diagram.

The 100-pin connector attaches to a VXI-MIO-64E-1 or VXI-MIO-64XE-10 module. The MIO-16 branch of the cable attaches to an SCXI-1349 adapter. The ACH16–ACH63 branch of the cable attaches to an AI-48/DIO-24 adapter.

The SCXI-1349 and AI-48/DIO-24 attach to a variety of SCXI modules. Both of these adapters have breakout connectors for connecting to other SCXI accessories, such as the SCXI-1180 and the SCXI-1351.

What You Need to Get Started

To install the SCXI-1356 shielded cable, you need the following items:

❑ SCXI-1356 shielded cable (type SH96-6868)

❑ *SCXI-1356 Shielded Cable Installation Guide*

❑ SCXI-1349 adapter—several surface-mount parts and the number 182677 are visible on the underside of the board (included in this kit)

❑ AI-48/DIO-24 adapter, labeled **AI-48/DIO-24** on the underside of the board (included in this kit)

NATIONAL INSTRUMENTS™

- ❑ Two SCXI modules

- ❑ SCXI chassis

- ❑ VXIbus chassis

- ❑ One of the following modules:
    - – VXI-MIO-64E-1
    - – VXI-MIO-64XE-10

- ❑ Four small screws (included in this kit)

- ❑ Lockwashers

- ❑ Jackscrews

- ❑ Small Phillips screwdriver

- ❑ Small flathead screwdriver

- ❑ 3/16 in. nutdriver

Conventions

The following conventions are used in this document:

bold   Bold text denotes parameter names and hardware labels.

This icon denotes a note, which alerts you to important information.

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.

Safety Information

The following section contains important safety information that you *must* follow when installing and using the product.

Do *not* operate the product in a manner not specified in this document. Misuse of the product can result in a hazard. You can compromise the

safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to National Instruments for repair.

Do *not* substitute parts or modify the product except as described in this document. Use the product only with the chassis, modules, accessories, and cables specified in the installation instructions. You *must* have all covers and filler panels installed during operation of the product.

Do *not* operate the product in an explosive atmosphere or where there may be flammable gases or fumes. Operate the product only at or below the pollution degree stated in the *Specifications* section. Pollution is foreign matter in a solid, liquid, or gaseous state that can reduce dielectric strength or surface resistivity. The following is a description of pollution degrees:

• Pollution degree 1 means no pollution or only dry, nonconductive pollution occurs. The pollution has no influence.

• Pollution degree 2 means that only nonconductive pollution occurs in most cases. Occasionally, however, a temporary conductivity caused by condensation must be expected.

• Pollution degree 3 means that conductive pollution occurs, or dry, nonconductive pollution occurs that becomes conductive due to condensation.

Clean the product with a soft nonmetallic brush. Make sure that the product is completely dry and free from contaminants before returning it to service.

You *must* insulate signal connections for the maximum voltage for which the product is rated. Do *not* exceed the maximum ratings for the product. Remove power from signal lines before connecting them to or disconnecting them from the product.

Operate this product only at or below the installation category stated in the *Specifications* section.

The following is a description of installation categories:

• Installation category I is for measurements performed on circuits not directly connected to MAINS[1]. This category is a signal level such as voltages on a printed wire board (PWB) on the secondary of an isolation transformer.

  Examples of installation category I are measurements on circuits not derived from MAINS and specially protected (internal) MAINS-derived circuits.

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[1] MAINS is defined as the electricity supply system to which the equipment concerned is designed to be connected either for powering the equipment or for measurement purposes.

- Installation category II is for measurements performed on circuits directly connected to the low-voltage installation. This category refers to local-level distribution such as that provided by a standard wall outlet.

  Examples of installation category II are measurements on household appliances, portable tools, and similar equipment.
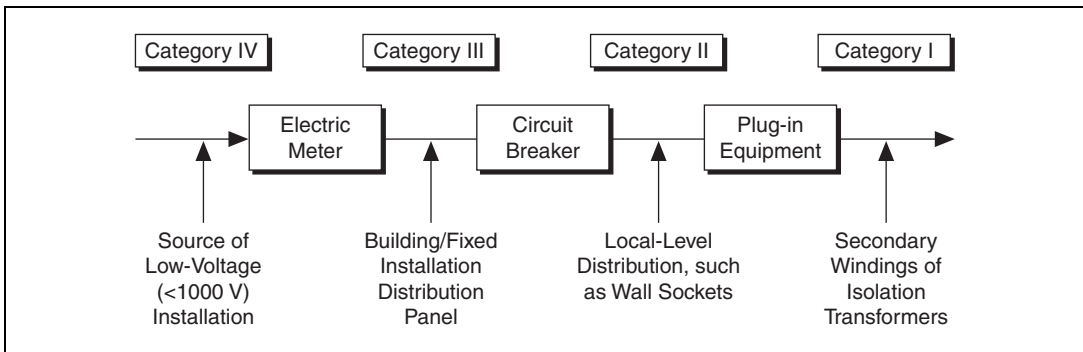
- Installation category III is for measurements performed in the building installation. This category is a distribution level referring to hardwired equipment that does not rely on standard building insulation.

  Examples of installation category III include measurements on distribution circuits and circuit breakers. Other examples of installation category III are wiring including cables, bus-bars, junction boxes, switches, socket outlets in the building/fixed installation, and equipment for industrial use, such as stationary motors with a permanent connection to the building/fixed installation.

- Installation category IV is for measurements performed at the source of the low-voltage (<1,000 V) installation.

  Examples of category IV are electric meters, and measurements on primary overcurrent protection devices and ripple-control units.

Below is a diagram of a sample installation.

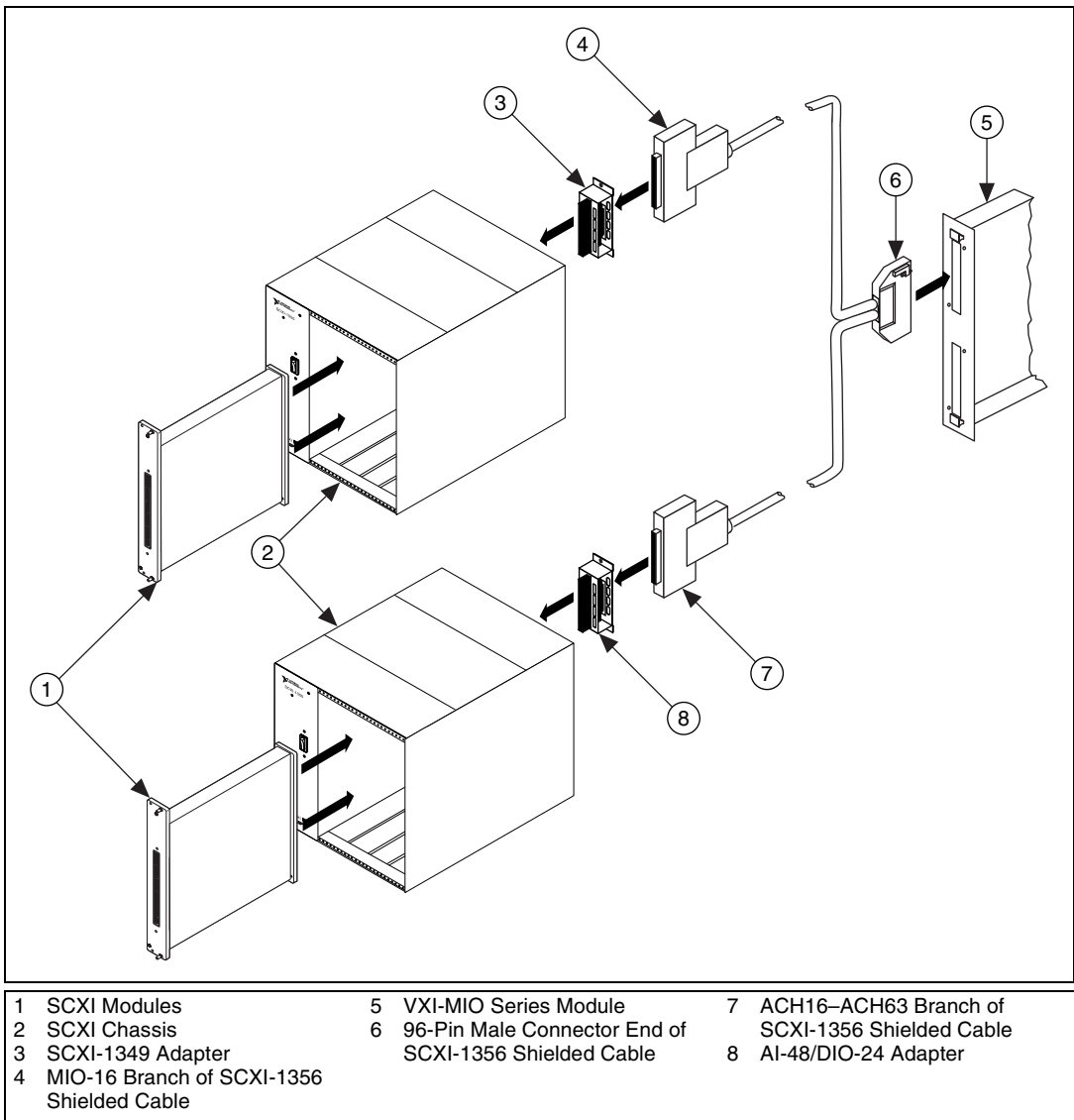| Category IV	Category III	Category II	Category I
Electric Meter	Circuit Breaker	Plug-in Equipment	
Source of Low-Voltage (<1000 V) Installation	Building/Fixed Installation Distribution Panel	Local-Level Distribution, such as Wall Sockets	Secondary Windings of Isolation Transformers

Installing the SCXI-1356 Shielded Cable

Perform the following steps to install the SCXI-1356. Refer to Figure 1 and Figure 2 as you complete the installation.

1. Power off the VXIbus chassis and the SCXI chassis.

2. Install the SCXI modules in the SCXI chassis, following the instructions in the module user manuals.

3. Plug the socket connector of the SCXI-1349 into the rear signal connector of the SCXI module that will pass analog signals to the VXI-MIO Series module.

4. Secure the SCXI-1349 to the SCXI chassis by threading two of the screws through the rear panel of the SCXI-1349 and into the threaded strips in the rear of the SCXI chassis.

5. Connect the MIO-16 branch of the cable to the 68-pin connector of the SCXI-1349.

6. Plug the socket connector of the AI-48/DIO-24 into the rear signal connector of the SCXI module or the feedthrough panel to which you plan to connect the ACH16–ACH63 signals of the VXI-MIO Series module.

7. Secure the adapter by threading the other two screws through the rear panel of the AI-48/DIO-24 and into the threaded strips in the rear of the SCXI chassis.

8. Connect the ACH16–ACH63 branch of the cable to the 68-pin connector of the AI-48/DIO-24.

9. Install the jackscrews and lockwashers as shown in Figure 2.

10. Verify that the two backshell mounting ears are positioned as shown in Figure 2. If they are not, remove the mounting ears and install them in the correct position.

11. Connect the backshell assembly to the VXI module front connector and secure the backshell by tightening both M2.5 mounting screws.

1	SCXI Modules	5	VXI-MIO Series Module	7	ACH16–ACH63 Branch of
2	SCXI Chassis	6	96-Pin Male Connector End of		SCXI-1356 Shielded Cable
3	SCXI-1349 Adapter		SCXI-1356 Shielded Cable	8	AI-48/DIO-24 Adapter
4	MIO-16 Branch of SCXI-1356				
	Shielded Cable				

Figure 1. SCXI-1356 Installation Procedure

Figure 2 shows a closer view of the ACH16–ACH63 branch of the cable connecting to the VXI-MIO module.

1	Mounting Ear	3	Jackscrews	5	VXI Module
2	Front Connector	4	Lockwashers	6	M2.5 Mounting Screw
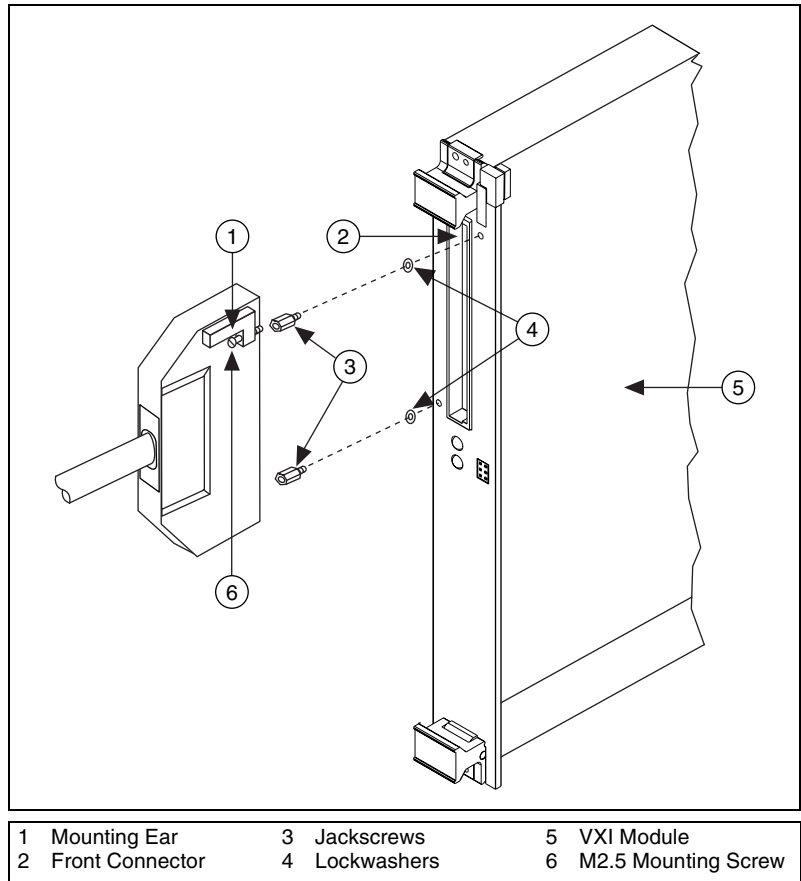
Figure 2. VXI Module Connection

Connections and Pin Assignments

Which VXI-MIO Series module you use determines which SCXI modules you can use with the SCXI-1356.

Connecting the SCXI-1356 to a VXI-MIO Series Module

The MIO-16 branch of the cable brings the MIO-16 portion of the VXI-MIO Series pinout to the SCXI-1349. The ACH16-ACH63 branch of the cable brings the remainder of the VXI-MIO Series pinout to the AI-48/DIO-24.

MIO-16 Branch Connections

You can connect the MIO-16 branch of the cable, using the SCXI-1349, to the following SCXI modules:

• SCXI-1100

• SCXI-1102

• SCXI-1120 or SCXI-1121 or SCXI-1122

• SCXI-1124

• SCXI-1140 or SCXI-1141

• SCXI-1160 or SCXI-1161 or SCXI-1162 or SCXI-1162R or SCXI-1163 or SCXI-1163HV

• SCXI-1180 or SCXI-1181

Table 1 lists the pin assignments for connections between the VXI-MIO Series module and the MIO-16 branch of the cable.

Table 1. Cable Connections for the MIO-16 Branch

Signal Names	Connector Pin Numbers		
	96-Pin	**68-Pin**	**50-Pin**
AIGND	B17	24, 27, 29, 32, 56, 59, 64, 67	1, 2
ACH0	A23	68	3
ACH8	C22	34	4
ACH1	B22	33	5
ACH9	A22	66	6
ACH2	C21	65	7
ACH10	B21	31	8
ACH3	A21	30	9
ACH11	C20	63	10
ACH4	A20	28	11
ACH12	C19	61	12
ACH5	B19	60	13
ACH13	A19	26	14
ACH6	C18	25	15
ACH14	B18	58	16
ACH7	A18	57	17

Table 1. Cable Connections for the MIO-16 Branch (Continued)

Signal Names	Connector Pin Numbers		
	96-Pin	68-Pin	50-Pin
ACH15	C17	23	18
AISENSE[1]	B20	62	19
DAC0OUT	A24	22	20
DAC1OUT	C23	21	21
EXTREF[2]	B23	20	22
AOGND	B24	54, 55	23
DGND	B27	4, 7, 9, 12, 13, 15, 18, 35, 36, 39, 44, 50, 53	24, 33
DIO0	C24		25
DIO4	A25	19	26
DIO1	B25	17	27
DIO5	C25	51	28
DIO2	A26	49	29
DIO6	B26	16	30
DIO3	C26	47	31
DIO7	A27	48	32
+5V	A28	8, 14	34, 35
SCANCLK	C27	46	36
DIO4	A25	19	26
DIO1	B25	17	27
DIO5	C25	51	28
DIO2	A26	49	29
DIO6	B26	16	30
DIO3	C26	47	31
EXTSTROBE*	B28	45	37
PFI0/TRIG1	C28	11	38
PFI1/TRIG2	A29	10	39
PFI2/CONVERT*	B29	43	40
PFI3/GPCTR1_SOURCE	C29	42	41
PFI4/GPCTR1_GATE	A30	41	42

Table 1. Cable Connections for the MIO-16 Branch (Continued)

Signal Names	Connector Pin Numbers		
	96-Pin	68-Pin	50-Pin
GPCTR1_OUT	B30	40	43
PFI5/UPDATE*	C30	6	44
PFI6/WFTRIG	A31	5	45
PFI7/STARTSCAN	B31	38	46
PFI8/GPCTR0_SOURCE	C31	37	47
PF19/GPCTR0_GATE	A32	3	48
GPCTR0_OUT	B32	2	49
FREQ_OUT	C32	1	50
[1] SENSE for ACH0–ACH15			
[2] This pin is not connected on the VXI-MIO-64XE-10			

Note Avoid using the MIO-16 Branch digital lines by themselves when using the SCXI-1356.

You can access the PFI lines on the MIO-16 Branch of the cable for triggering through the SCXI-1349 side connector using the SCXI-1180 Feedthrough Panel. For more information on the SCXI-1180, refer to the *SCXI-1180/1181 User Manual.*

ACH16-ACH63 Branch Connections

You can connect the ACH16–ACH63 branch of the cable, using the AI-48/DIO-24, to the SCXI-1180 feedthrough panel or the SCXI-1181 breadboard module. Table 2 lists the pin designations for connections between the VXI-MIO Series module and the ACH16–ACH63 cable.

Table 2. Cable Connections for the ACH16–ACH63 Branch

Signal Names	Connector Pin Numbers		
	96-Pin	68-Pin	50-Pin
ACH16	A17	68	1
ACH24	C16	34	2
ACH17	B16	33	3
ACH25	A16	67	4
ACH18	C15	32	5

Table 2. Cable Connections for the ACH16–ACH63 Branch (Continued)

Signal Names	Connector Pin Numbers		
	96-Pin	**68-Pin**	**50-Pin**
ACH26	B15	66	6
ACH19	A15	65	7
ACH27	C14	31	8
ACH20	B14	30	9
ACH28	A14	64	10
ACH21	C13	29	11
ACH29	B13	63	12
ACH22	A13	62	13
ACH30	C12	28	14
ACH23	B12	27	15
ACH31	A12	61	16
ACH32	C11	26	17
ACH40	B11	60	18
ACH33	A11	59	19
ACH41	C10	25	20
ACH34	B10	24	21
ACH42	A10	58	22
ACH35	C9	23	23
ACH43	B9	57	24
AISENSE2*	A9	56	25
AIGND	B17	22	26
ACH36	C8	55	27
ACH44	B8	21	28
ACH37	A8	20	29
ACH45	C7	54	30
ACH38	B7	19	31
ACH46	A7	53	32
ACH39	C6	52	33
ACH47	B6	18	34

Table 2. Cable Connections for the ACH16–ACH63 Branch (Continued)

Signal Names	Connector Pin Numbers		
	96-Pin	**68-Pin**	**50-Pin**
ACH48	A6	17	35
ACH56	C5	51	36
ACH49	B5	16	37
ACH57	A5	50	38
ACH50	C4	49	39
ACH58	B4	15	40
ACH51	A4	14	41
ACH59	C3	48	42
ACH52	B3	13	43
ACH60	A3	47	44
ACH53	C2	46	45
ACH61	B2	12	46
ACH54	A2	11	47
ACH62	C1	45	48
ACH55	B1	10	49
ACH63	A1	44	50
* SENSE for ACH16–ACH63			

Note Pins 1 through 9 and pins 35 through 43 on the 68-pin connector of the ACH16–ACH68 branch of the SCXI-1356 are not connected.

Specifications

Maximum Working Voltage

Maximum working voltage refers to the signal voltage plus the common-mode voltage.

Channel-to-earth ....250 V, installation category II

Channel-to-channel.................................250 V, installation category II

Environmental

Operating temperature............................ 0 to 50 °C

Storage temperature .... −20 to 70 °C

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

Maximum altitude .... 2000 meters

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

Safety

The SCXI-1356 meets the requirements of the following standards for safety and electrical equipment for measurement, control, and laboratory use:

• EN 61010-1:1993/A2:1995, IEC 61010-1:1990/A2:1995

• UL 3111-1:1994

• CAN/CSA c22.2 no. 1010.1:1992/A2:1997

Technical Support Resources

National Instruments Web Support

NI Web support is your first stop for help in solving installation, configuration, and application problems and questions. Online problem-solving and diagnostic resources include frequently asked questions, knowledge bases, product-specific troubleshooting wizards, manuals, drivers, software updates, and more. Web support is available through the Technical Support section of ni.com.

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