SCXI™-1353 SHIELDED CABLE ASSEMBLY

This guide describes how to install the National Instruments SCXI-1353 shielded cable assembly between a 100-pin E Series data acquisition (DAQ) device and two SCXI modules. The SCXI-1353 consists of an SH1006868 cable, an SCXI-1349 shielded cable adapter, and an AI-48/DIO-24 adapter.

Introduction

The SCXI-1353 makes a low-noise, long-distance connection between a 100-pin E Series DAQ device and two SCXI modules. The SH1006868 cable is available in lengths of 1, 2, 5, and 10 m. The SH1006868 cable is Y-shaped, with a 100-pin male connector and two 68-pin female connectors. One branch of the cable is labeled *MIO-16*, and the other branch is labeled *EXTENDED I/O*.

The 100-pin connector of the cable attaches to a 100-pin E Series DAQ device. The 68-pin connector on the MIO-16 branch of the cable attaches to an SCXI-1349. The 68-pin connector on the EXTENDED I/O branch of the cable attaches to an AI-48/DIO-24. The SCXI-1349 and AI-48/DIO-24 can attach to a variety of SCXI modules. Both these adapters have breakout connectors that you can use to connect to other SCXI accessories, such as the SCXI-1180 and the SCXI-1351.

What You Need to Get Started

To install and use the SCXI-1353, you need the following items:

❑ SCXI-1353 shielded cable assembly (included in this kit)
  – SH1006868 cable
  – SCXI-1349 shielded cable adapter
  – AI-48/DIO-24 adapter

❑ SCXI chassis

❑ 100-pin E Series DAQ device

❑ Two SCXI modules

Note Refer to the *Connections and Pin Assignments* section for the SCXI modules that you can use with each 100-pin E Series DAQ device.

❑ Computer

❑ Four small screws (included in this kit)

❑ Two cable tie wraps

❑ *SCXI-1353 Shielded Cable Installation Guide*

❑ Small Phillips screwdriver

❑ Small flat-blade screwdriver

Conventions

The following conventions are used in this guide:

bold   Bold text denotes items that you must select or click on in the software, such as menu items and dialog box options. Bold text also denotes parameter names.

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 installation category for this device, installation category I, is for measurements performed on circuits not directly connected to MAINS[1].
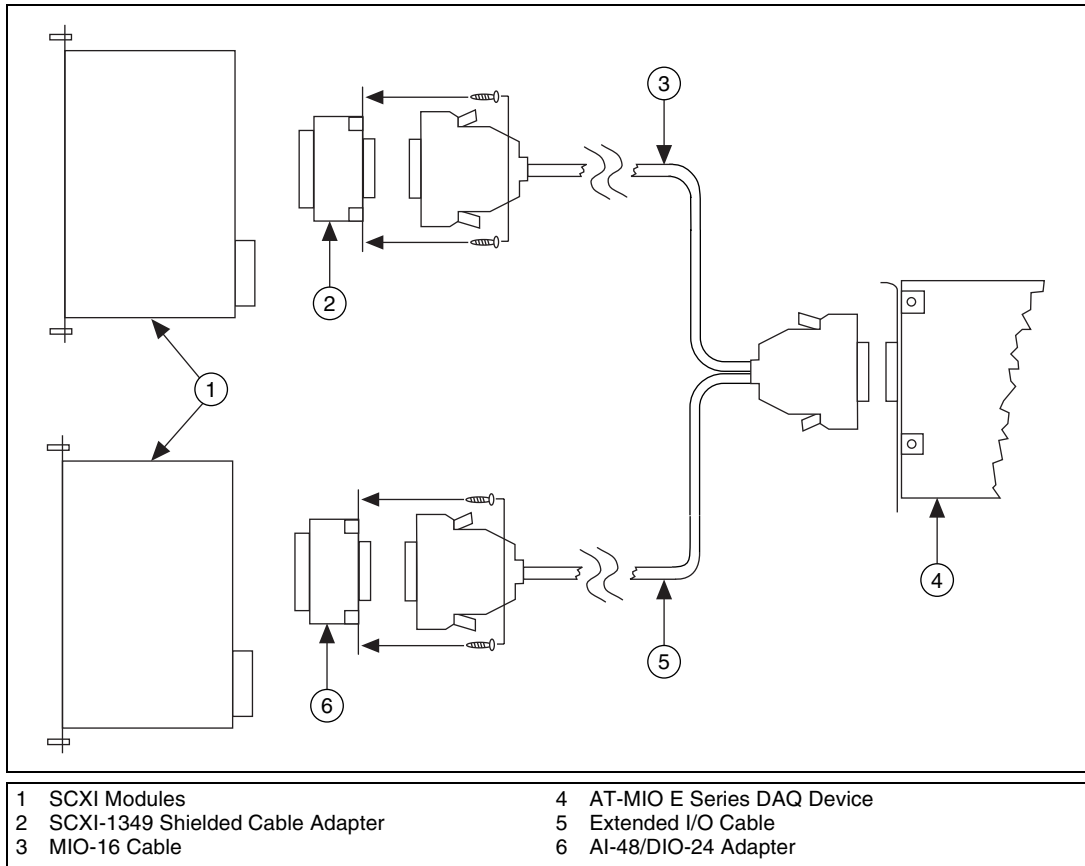
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[1] MAINS is defined as the electricity supply system to which the equipment concerned is designed to be connected either for powering the equipment or for measurement purposes.

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.

Installing the SCXI-1353 Shielded Cable Assembly

Perform the following steps to install the SCXI-1353. Refer to Figure 1 for the installation procedure.

1	SCXI Modules	4	AT-MIO E Series DAQ Device
2	SCXI-1349 Shielded Cable Adapter	5	Extended I/O Cable
3	MIO-16 Cable	6	AI-48/DIO-24 Adapter

Figure 1. SCXI-1353 Installation

1. Turn off the computer and SCXI chassis.
2. Install the SCXI modules in the SCXI chassis following the instructions in the module user manual.

3. Insert the 50-pin female connector on the rear of the SCXI-1349 into the rear signal connector of the SCXI module that passes analog signals to the 100-pin E Series DAQ device.

4. Screw the rear panel of the SCXI-1349 to the threaded strips in the rear of the SCXI chassis to secure the adapter.

5. Connect the end of the cable labeled *MIO-16* to the 68-pin connector of the SCXI-1349.

6. Insert the 50-pin female connector on the rear of the AI-48/DIO-24 into the rear signal connector of the SCXI module or feedthrough panel that connects to pins 51–100 of the DAQ device.

7. Screw the rear panel of the AI-48/DIO-24 to the threaded strips in the rear of the SCXI chassis to secure the adapter.

8. Connect the end of the cable labeled *EXTENDED I/O* to the 68-pin connector of the AI-48/DIO-24.

9. Connect the 100-pin end of the cable to the I/O connector of the DAQ device.

10. Use the tie wraps to secure the cable to a fixed object to relieve the strain on the cable. Strain relief is necessary because the SCXI-1353 has a long, stiff backshell that can exert leverage on the DAQ device connector.

Connections and Pin Assignments

Table 1 lists the pin assignments for connections between the 100-pin E Series DAQ device and the MIO-16 cable. Table 2 lists the pin assignments for connections between the 100-pin E Series DAQ device and the EXTENDED I/O cable. The 100-pin E Series DAQ device you use determines which SCXI modules you can use with the SCXI-1353.

Table 1. MIO-16 Cable Connections

Signal Names	Connector Pin Numbers		
100-Pin E Series Device	**100-Pin**	**50-Pin**	**68-Pin**
AIGND	1, 2	1, 2	24, 27, 29, 32, 56, 59, 64, 67
ACH0	3	3	68
ACH8	4	4	34
ACH1	5	5	33
ACH9	6	6	66
ACH2	7	7	65

Table 1. MIO-16 Cable Connections (Continued)

Signal Names	Connector Pin Numbers		
100-Pin E Series Device	100-Pin	50-Pin	68-Pin
ACH10	8	8	31
ACH3	9	9	30
ACH11	10	10	63
ACH4	11	11	28
ACH12	12	12	61
ACH5	13	13	60
ACH13	14	14	26
ACH6	15	15	25
ACH14	16	16	58
ACH7	17	17	57
ACH15	18	18	23
AISENSE	19	19	62
DAC0OUT	20	20	22
DAC1OUT	21	21	21
EXTREF	22	22	20
AOGND	23	23	54, 55
DGND	24, 33	24, 33	4, 7, 9, 12, 13, 15, 18, 35, 36, 39, 44, 50, 53
DIO0	25	25	52
DIO4	26	26	19
DIO1	27	27	17
DIO5	28	28	51
DIO2	29	29	49
DIO6	30	30	16
DIO3	31	31	47
DIO7	32	32	48
+5V	34, 35	34, 35	8, 14

Table 1. MIO-16 Cable Connections (Continued)

Signal Names	Connector Pin Numbers		
100-Pin E Series Device	**100-Pin**	**50-Pin**	**68-Pin**
SCANCLK	36	36	46
EXTSTROBE*	37	37	45
PFI0/TRIG1	38	38	11
PFI1/TRIG2	39	39	10
PFI2/CONVERT*	40	40	43
PFI3/GPCTR1_SOURCE	41	41	42
PFI4/GPCTR1_GATE	42	42	41
GPCTR1_OUT	43	43	40
PFI5/UPDATE*	44	44	6
PFI6/WFTRIG	45	45	5
PFI7/STARTSCAN	46	46	38
PFI8/GPCTR0_SOURCE	47	47	37
PFI9/GPCTR0_GATE	48	48	3
GPCTR0_OUT	49	49	2
FREQ_OUT	50	50	1
Pins 1 through 9 and pins 35 through 43 on the 68-pin connector are not connected.			

Table 2. Extended I/O Cable Connections

Signal Names		Connector Pin Numbers		
NI 6031E, NI 6033E, NI 6061E, NI 6071E	**NI 6021E, NI 6025E**	**100-Pin**	**50-Pin**	**68-Pin**
ACH16	PC7	51	1	68
ACH24	GND	52	2	34
ACH17	PC6	53	3	33
ACH25	GND	54	4	67
ACH18	PC5	55	5	32
ACH26	GND	56	6	66
ACH19	PC4	57	7	65

Table 2. Extended I/O Cable Connections (Continued)

Signal Names		Connector Pin Numbers		
NI 6031E, NI 6033E, NI 6061E, NI 6071E	NI 6021E, NI 6025E	100-Pin	50-Pin	68-Pin
ACH27	GND	58	8	31
ACH20	PC3	59	9	30
ACH28	GND	60	10	64
ACH21	PC2	61	11	29
ACH29	GND	62	12	63
ACH22	PC1	63	13	62
ACH30	GND	64	14	28
ACH23	PC0	65	15	27
ACH31	GND	66	16	61
ACH32	PB7	67	17	26
ACH40	GND	68	18	60
ACH33	PB6	69	19	59
ACH41	GND	70	20	25
ACH34	PB5	71	21	24
ACH42	GND	72	22	58
ACH35	PB4	73	23	23
ACH43	GND	74	24	57
AISENSE2	PB3	75	25	56
AIGND	GND	76	26	22
ACH36	PB2	77	27	55
ACH44	GND	78	28	21
ACH37	PB1	79	29	20
ACH45	GND	80	30	54
ACH38	PB0	81	31	19
ACH46	GND	82	32	53
ACH39	PA7	83	33	52

Table 2. Extended I/O Cable Connections (Continued)

Signal Names		Connector Pin Numbers		
NI 6031E, NI 6033E, NI 6061E, NI 6071E	NI 6021E, NI 6025E	100-Pin	50-Pin	68-Pin
ACH47	GND	84	34	18
ACH48	PA6	85	35	17
ACH56	GND	86	36	51
ACH49	PA5	87	37	16
ACH57	GND	88	38	50
ACH50	PA4	89	39	49
ACH58	GND	90	40	15
ACH51	PA3	91	41	14
ACH59	GND	92	42	48
ACH52	PA2	93	43	13
ACH60	GND	94	44	47
ACH53	PA1	95	45	46
ACH61	GND	96	46	12
ACH54	PA0	97	47	11
ACH62	GND	98	48	45
ACH55	+5V	99	49	10
ACH63	GND	100	50	44
Pins 1 through 9 and pins 35 through 43 on the 68-pin connector are not connected.				

Using the SCXI-1353 with an NI 6031E, NI 6033E, NI 6061E, or NI 6071E

The MIO-16 cable connects the MIO-16 portion of the AT-MIO-64E-3 pinout to the SCXI-1349. The EXTENDED I/O cable connects the remainder of the AT-MIO-64E-3 pinout to the AI-48/DIO-24.

You can connect the MIO-16 cable, using the SCXI-1349, to the following SCXI modules: SCXI-1100, SCXI-1120, SCXI-1121, SCXI-1122, SCXI-1124, SCXI-1140, SCXI-1141, SCXI-1160, SCXI-1161, SCXI-1162, SCXI-1162HV, SCXI-1163, SCXI-1163R, SCXI-1180, or SCXI-1181.

You can connect the EXTENDED I/O cable, using the AI-48/DIO-24, to the SCXI-1180 feedthrough panel or SCXI-1181 module.

Using the SCXI-1353 with an NI 6021E or NI 6025E

The MIO-16 cable connects the MIO-16 portion of the AT-MIO-16DE-10 pinout to the SCXI-1349. The EXTENDED I/O cable connects the remainder of the AT-MIO-16DE-10 pinout to the AI-48/DIO-24.

You can connect the MIO-16 cable, using the SCXI-1349, to the following SCXI modules: SCXI-1100, SCXI-1120, SCXI-1121, SCXI-1122, SCXI-1124, SCXI-1140, SCXI-1141, SCXI-1160, SCXI-1161, SCXI-1162, SCXI-1162HV, SCXI-1163, SCXI-1163R, SCXI-1180, or SCXI-1181.

You can connect the EXTENDED I/O cable, using the AI-48/DIO-24, to the following SCXI modules: SCXI-1162, SCXI-1162HV, SCXI-1163, SCXI-1163R, SCXI-1180 feedthrough panel, or SCXI-1181.

Note If the module that you are using is not listed here, please refer to the NI Web site at ni.com/support for technical support.

Specifications

Maximum Working Voltage

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

Channel-to-earth ....±15 V, installation category I

Channel-to-channel.................................±15 V, installation category I

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-1353 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`.

Worldwide Support

NI has offices located around the world to help address your support needs. You can access our branch office Web sites from the Worldwide Offices section of `ni.com`. Branch office Web sites provide up-to-date contact information, support phone numbers, e-mail addresses, and current events.

If you have searched the technical support resources on our Web site and still cannot find the answers you need, contact your local office or NI corporate. For telephone support in the United States, dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

Australia 03 9879 5166, Austria 0662 45 79 90 0, Belgium 02 757 00 20, Brazil 011 3262 3599, Canada (Calgary) 403 274 9391, Canada (Montreal) 514 288 5722, Canada (Ottawa) 613 233 5949, Canada (Québec) 514 694 8521, Canada (Toronto) 905 785 0085, China (Shanghai) 021 6555 7838, China (ShenZhen) 0755 3904939, Czech Republic 02 2423 5774, Denmark 45 76 26 00, Finland 09 725 725 11, France 01 48 14 24 24, Germany 089 741 31 30, Greece 30 1 42 96 427, Hong Kong 2645 3186, India 91 80 535 5406, Israel 03 6393737, Italy 02 413091, Japan 03 5472 2970, Korea 02 3451 3400, Malaysia 603 9596711, Mexico 001 800 010 0793, Netherlands 0348 433466, New Zealand 09 914 0488, Norway 32 27 73 00, Poland 0 22 3390 150, Portugal 351 210 311 210, Russia 095 238 7139, Singapore 2265886, Slovenia 386 3 425 4200,

South Africa 11 805 8197, Spain 91 640 0085, Sweden 08 587 895 00,
Switzerland 056 200 51 51, Taiwan 02 2528 7227,
United Kingdom 01635 523545