High-Density Multiconfiguration Matrix

NI PXI-2529, NI SCXI™-1129

- 8 matrix configurations
- Switch capacity
  - 150 VDC, 150 V_{rms} CAT I
  - 1 A switching/2 A carry
- 32,000-step scan list for deterministic scanning
- Fully software programmable
- Effortless matrix expansion
- Multiple-module synchronization with hardware triggers
- Electromechanical relays

NI PXI-2529
- 128 crosspoint matrix
- 4x32 and 8x16 2-wire matrix configurations

NI SCXI-1129
- 256 crosspoint matrix
- Six 2-wire matrix configurations

Operating Systems
- Windows 2000/NT/XP

Recommended Software
- LabVIEW™
- LabWindows™/CVI™
- Measurement Studio
- NI Switch Executive

Other Compatible Software
- Visual Basic
- C/C++

Driver Software (included)
- NI-SWITCH

Overview

The National Instruments PXI-2529 and SCXI-1129 are high-density matrix relay modules built for applications with high channel counts. The modules are 2-wire matrices, configurable with front mounting terminal blocks to achieve many different matrix configurations. Table 1 provides a complete list of possible configurations. Expanding the matrix channel count is as easy as adding additional modules. With the NI SCXI-1129, analog signals can be passed between two or more switch modules via high-voltage backplane (HVAB), matrix expansion cables, or matrix expansion plugs. Using these connections, you can instantly expand your matrix without external wiring. The NI PXI-2529 and SCXI-1129 are designed to work well with both low and high-voltage levels. They use relays with low thermal offset to ensure accurate low-voltage measurements. These relays can switch up to 150 V_{rms} or 150 VDC.

	Terminal Block	Configuration (Row x Column)	Column Expansion Via Row Connection	Row Expansion Via Column Connection
NI SCXI-1129	SCXI-1333	Quad 4x16	External wires	With matrix expansion plug Examples: quad 8x16, quad 16x16, etc.
	SCXI-1334	4x64	With HVAB or matrix expansion cable Examples: 4x128, 4x256, etc.	With matrix expansion plug Examples: 8x64, 16x64, 32x64. etc.
	SCXI-1335	8x32	With matrix expansion cable (2 cables required). Examples: 8x64, 8x128, etc.	With matrix expansion plug Examples: 16x32, 32x32. etc.
	SCXI-1336	16x16	External wires	With matrix expansion plug Examples: 32x16, 64x16. etc.
	SCXI-1337	Dual 8x16	External wires	External wires
	SCXI-1339	Dual 4x32	External wires	External wires
NI PXI-2529	TB-2634	4x32	External wires	External wires
	TB-2635	8x16	External wires	External wires

Table 1. PXI-2529 and SCXI-1129 Configuration and Matrix Expansion

Matrix Operation

The PXI-2529 and SCXI-1129 are general purpose, 2-wire matrices used to route differential signals. Through software, you can control the matrices to connect any row to any column. One of the key advantages of these modules is their adaptability to your switching needs. You can configure the SCXI-1129 in six different matrix configurations and the PXI-2529 in two configurations by simply changing the terminal block. For example, you can create an 8x32, 2-wire matrix by using the SCXI-1335 terminal block with an SCXI-1129 module. You can easily transform the same SCXI-1129 module into a 16x16, 2-wire matrix by simply replacing the SCXI-1335 with an SCXI-1336 terminal block.

The PXI-2529 and SCXI-1129 use latching relays in the matrices to ensure that the state of each matrix remains unchanged in the event of accidental power loss. This feature prevents instruments and UUTs from switching during potentially damaging conditions. All relays open when power returns.

Automatic Scanning

The PXI-2529 and SCXI-1129 are able to maximize throughput in automated test applications by the use of scanning. Scanning improves throughput by downloading a list of up to 32,000 connections to the switch and cycling through the list using an event (trigger) without any interruption from the host processor. Scanning is most efficiently accomplished by mating the PXI-2529 or SCXI-1129 with an instrument, such as the NI PXI-4070 6½-digit FlexDMM, which issues a trigger after each measurement.

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Safety Disconnect

The SCXI-1129 incorporates a safety interlock that disconnects the SCXI high-voltage analog bus from the matrix if the front terminal block is removed. This arrangement prevents potentially hazardous voltages from appearing on exposed front panel connector pins.

Expansion with the SCXI-1129

Matrix modules can serve as building blocks for creating configurations well beyond the size of a single module. Connecting the rows of two modules doubles the column count. Likewise, connecting the columns of two modules doubles the row count. For example, you can expand a 4x64 matrix, made up of one SCXI-1129 module and one SCXI-1334 terminal block, to a 4x128, 4x192, 4x256, and so forth, by connecting the columns of multiple SCXI-1129 modules via the terminal block.

To expand the columns of the SCXI-1129, you can use expansion cables. Expansion cables connect four differential signals. Hence, you must use two matrix expansion cables for each expansion with the SCXI-1335 because it has eight rows. You can expand the row count of the SCXI-1129 with expansion plugs, which connect the columns of two adjacent switch modules as shown in Figure 1. With the expansion plugs, you can create the 128x16 matrix in less than five minutes. For further information on matrix expansion, please refer to NI Application Note 174, *National Instruments Guide to Matrix Expansion*.

SCXI Relay Control

Every SCXI switch system requires an external switch controller. The switch controller uses the digital communications bus on the SCXI chassis to control the switch circuitry. An NI 4021 Switch Controller, available for both PCI and PXI, is the recommended SCXI switch controller.

Figure 1. The matrix expansion plug simplifies expansion.

SCXI Analog Routing

You can increase the flexibility of your switch system with the addition of the high-voltage analog bus (HVAB). Using the HVAB, you can easily route high-voltage or low-voltage analog signals between multiple switch modules or instruments without the need for external wiring (assuming it is safe to do so). For example, you can use the HVAB to effortlessly create a 4x256 matrix out of four SCXI-1129 modules in the 4x64 matrix configuration (SCXI-1334 terminal block). Without the HVAB, the 4x256 matrix would require external wiring or cables. The HVAB works with the SCXI-1127, SCXI-1128, and SCXI-1129 modules.

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Signal Connections

Several solutions are available for your signal connections:

- Terminal blocks provide screw terminals, solder cups, or headers for easy connections.
- A shielded backshell features a 180-pin connector housing to accommodate custom cables on the SCXI-1129.
- Mass interconnect solutions from industry leaders.

Contact your local National Instruments office for information on these products.

Software

All National Instruments PXI and SCXI switch modules are shipped with NI-SWITCH, an IVI-compliant driver offering complete functionality for all switch modules. For additional assistance in configuring, programming, and managing higher-channel-count switching systems, NI Switch Executive software offers an easy-to-use, intelligent switch management and visual routing environment.

Ordering Information

NI PXI-2529 778739-01
NI SCXI-1129 776572-29
Includes NI-SWITCH driver software.

Accessories

NI TB-2634 (4x32).....778840-01
NI TB-2635 (8x16).....778839-01
NI SCXI-1333 (quad 4x16) 777687-33
NI SCXI-1334 (4x64).....777687-34
NI SCXI-1335 (8x32).....777687-35
NI SCXI-1336 (16x16).....777687-36
NI SCXI-1337 (dual 8x16).....777687-37
NI SCXI-1339 (dual 4x32).....777687-39
NI matrix expansion plugs 778364-01
NI matrix expansion cables
40 cm 185440-0R4
75 cm 185440-0R75

BUY ONLINE!

*Visit **ni.com/info** and enter pxi2529 and/or scxi1129.*

Specifications

Input Characteristics

Maximum switching voltage..... 150 V_{rms} or 150 VDC (channel-to-channel and channel-to-ground)
Maximum switching current..... 1 A (per channel)
Maximum carry current..... 2 A (per channel)
Maximum module current
PXI-2529..... 8 A
SCXI-1129..... 5 A
Maximum switching power..... 37.5 VA, 30 W (per channel)
Path resistance..... <1 Ω

Transfer Characteristics

Thermal EMF..... <9 µV

Typical Single Crosspoint Bandwidth

1 row – 1 column..... >10 MHz

Typical Crosstalk

50 Ω system
10 kHz..... ≤80 dB
100 kHz..... ≤65 dB
1 MHz..... ≤50 dB

Dynamic Characteristics

Maximum operating speed..... 110 crosspoints/s (PXI-2529)
125 crosspoints/s (SCXI-1129)
Relay operate time (at 20 °C)..... 4 ms max
Expected relay life
Mechanical..... 50,000,000 operations
Electrical
30 VDC, 1 A..... 100,000 operations
30 VDC, 100 mA..... 500,000 operations
150 V_{rms}, 0.25 A..... 100,000 operations

Physical

PXI-2529
Dimensions..... 2 x 10 x 16 cm (.8 x 3.9 x 6.4 in.)
I/O connector..... 100-pin HDI
SCXI-1129
Dimensions..... 3.0 by 17.2 by 20.3 cm (1.18 by 6.9 by 8.0 in.)
I/O connector..... 180-pin HDI

Environment

Operating temperature
PXI-2529..... 0 to 55 °C
SCXI-1129..... 0 to 50 °C
Storage temperature..... -20 to 70 °C
Relative humidity..... 5 to 85% noncondensing
Pollution degree..... 2
Approved at altitudes up to 2000 m
Indoor use only

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 3111-1, UL 61010B-1
- CAN/CSA C22.2 No. 1010.1

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:
Low-Voltage Directive (safety)..... 73/23/EEC
Electromagnetic Compatibility
Directive (EMC)..... 89/336/EEC

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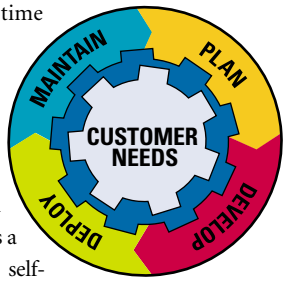

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