

PXI Matrix Switch Modules

PXI-2501, PXI-2503, PXI-2529, PXIe-2529, PXI-2530B, PXI-2531, PXIe-2531, PXI-2532B, PXIe-2532B, PXI-2533, PXI-2534, PXI-2535, PXI-2536, PXIe-2737, PXIe-2738, and PXIe-2739



- **Software:** Includes interactive soft front panel, API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Electromechanical, Reed, solid state, and FET relay options
- 1- and 2-wire options
- Up to 544 crosspoints in a single PXI slot
- Up to 150 V or 2 A
- Option for relay health monitoring through the NI Switch Health Center

Built for Automated Test and Measurement

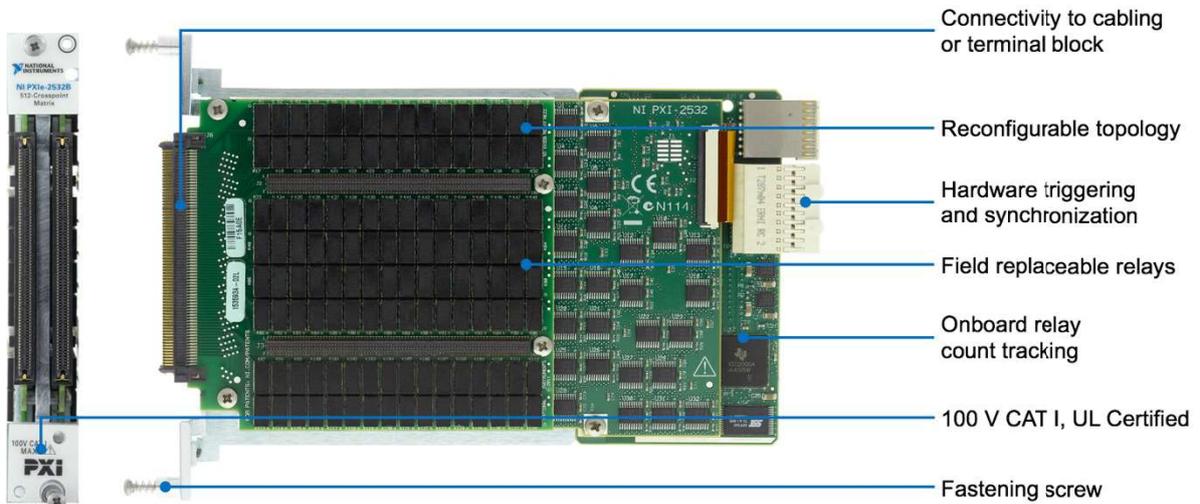
PXI Matrix Switch Modules are organized into rows and columns and provide maximum flexibility for switching systems by allowing you to connect any channel to any other channel. PXI Matrix Switch Modules use a variety of relay types, including electromechanical armature relays, reed relays, field-effect transistor (FET) relays, and solid-state relays, each with their own benefits, allowing you to choose a matrix that fits your requirements.

Additionally, NI switch modules offer advanced features, such as hardware triggering, relay health monitoring, onboard relay count tracking, and a wide variety of reconfigurable models, providing you the option to modify the topology of the switch based on your needs. These advanced features offer a smarter way to tackle difficult applications in industries ranging from consumer electronics to aerospace and defense.

Table 1. NI offers a variety of PXI Matrix Switch Modules, varying in topology, density, relay type, and voltage/current rating, allowing you to pick the model that best fits your needs.

	Maximum Voltage	Maximum Current	Maximum Bandwidth	Relay Type	Configuration(s)
PXI-2501	10 VDC 7 VAC	3 mA	400 kHz	FET	4 x 6, 2-wire matrix
PXI-2503	60 VDC 30 VAC	1 A	10 MHz	EMR	4 x 6, 2-wire matrix
PXI-2529 and PXIe-2529	150 V	2 A	10 MHz	EMR	4 x 32, 2-wire matrix 8 x 16, 2-wire matrix Dual 4 x 16, 2-wire matrix
PXI-2530B	60 VDC 30 VAC	400 mA	19 MHz	Reed	4 x 32, 1-wire matrix 8 x 16, 1-wire matrix 4 x 16, 2-wire matrix
PXI-2531 and PXIe-2531	60 VDC 30 VAC	500 mA	20 MHz	Reed	4 x 128, 1-wire matrix 8 x 64, 1-wire matrix 2-bank, 4 x 64, 1-wire matrix 2-bank, 8 x 32, 1-wire matrix
PXI-2532B and PXIe-2532B	60 VDC 30 VAC	500 mA	20 MHz	Reed	4 x 128, 1-wire matrix 8 x 64, 1-wire matrix 16 x 32, 1-wire matrix 2-bank, 4 x 64, 1-wire matrix 2-bank, 8 x 32, 1-wire matrix 2-bank, 16 x 16, 1-wire matrix 4-bank, 4 x 32, 1-wire matrix 16-bank, 2 x 16, 1-wire matrix 4 x 64, 2-wire matrix 8 x 32, 2-wire matrix 16 x 16, 2-wire matrix 2-bank, 4 x 32, 2-wire matrix
PXI-2533	55 VDC 30 VAC	1 A	1.5 MHz	Solid-State	4 x 64, 1-wire matrix
PXI-2534	55 VDC 30 VAC	1 A	2 MHz	Solid-State	8 x 32, 1-wire matrix
PXI-2535	12 VDC 8 VAC	100 mA	1 MHz	FET	4 x 136, 1-wire matrix
PXI-2536	12 VDC 8 VAC	100 mA	1 MHz	FET	8 x 68, 1-wire matrix
PXIe-2737	100 V	2 A	10 MHz	EMR	4 x 64, 2-wire matrix
PXIe-2738	100 V	2 A	10 MHz	EMR	8 x 32, 2-wire matrix
PXIe-2739	100 V	2 A	10 MHz	EMR	16 x 16, 2-wire matrix

Detailed View of PXIe-2532B Matrix Switch Module



Key Features

Reconfigurable Topologies

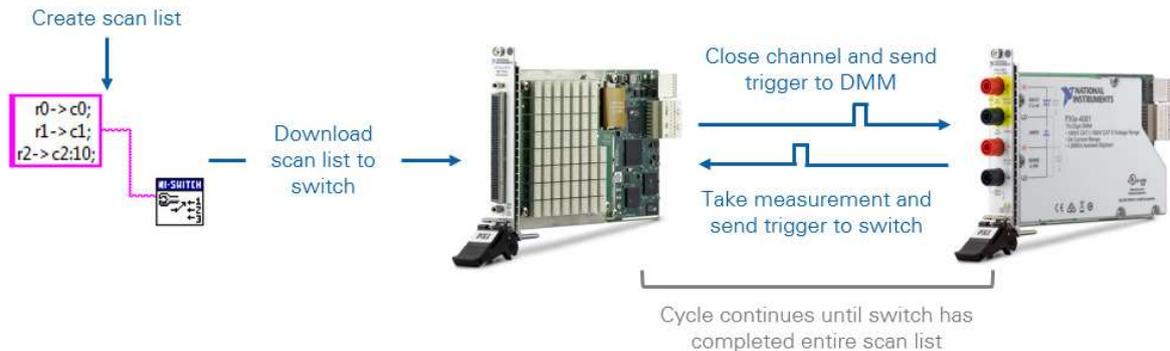
As referenced in Table 1, many PXI Matrix Switch Modules can be reconfigured to achieve multiple topologies within a single device, allowing you to pick the topology that best suits your application. For example, the [PXIe-2532B](#) can be reconfigured by using one of many different front-mounting terminal block, which connect various signal paths to reshape the topology.



Figure 1. The PXIe-2532B is one example of a PXI Matrix Switch Module that can be reconfigured into various matrix topologies, ranging from a single 4 x 128, 1-wire matrix to a 16-bank 2 x 16, 1-wire matrix.

Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis¹. You can store a list of switch connections in memory onboard the switch module and then use the integrated hardware scanning and triggering engine to advance the switch sequence and rapidly communicate with any PXI instrument that can send and receive digital triggers, such as DMM or oscilloscope. This advanced switching method removes the software overhead and reduces the bus latency associated with traditional software-controlled switching operations for faster test execution with more repeatable timing.



¹Triggering is available on most NI switches. To check if this feature is supported by a switch module, reference the “Trigger Characteristics” section of the product specification document.

Relay Health Monitoring

To simplify relay maintenance and increase reliability in high-channel-count systems, NI PXI Matrix Switch Modules offer advanced relay health monitoring features, such as onboard relay count tracking, which is available on all NI switch modules, and functional and resistive self-tests, available through the NI Switch Health Center².

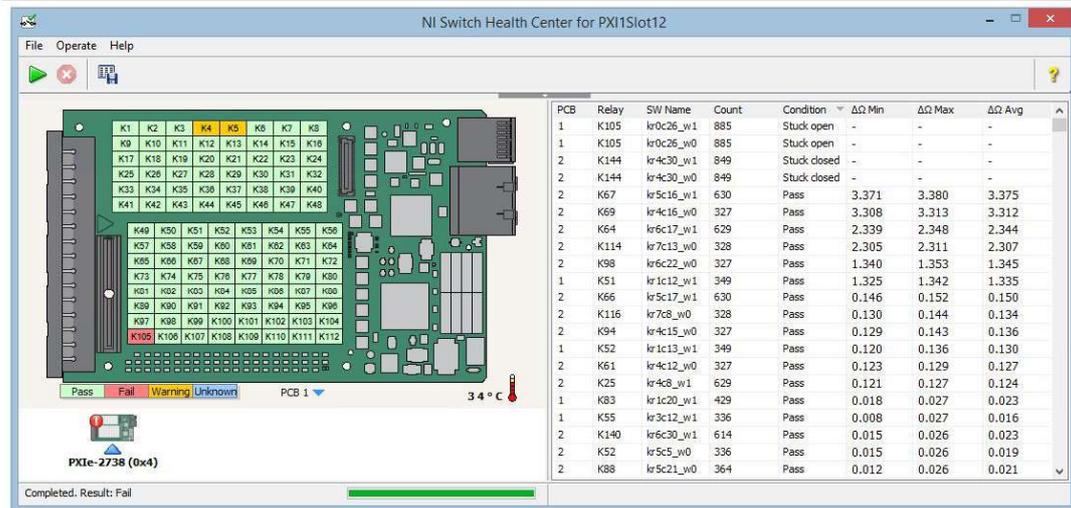


Figure 2. The NI Switch Health center provides advanced relay health monitoring options, including functional and resistive self-tests, onboard relay count tracking, and report generation.

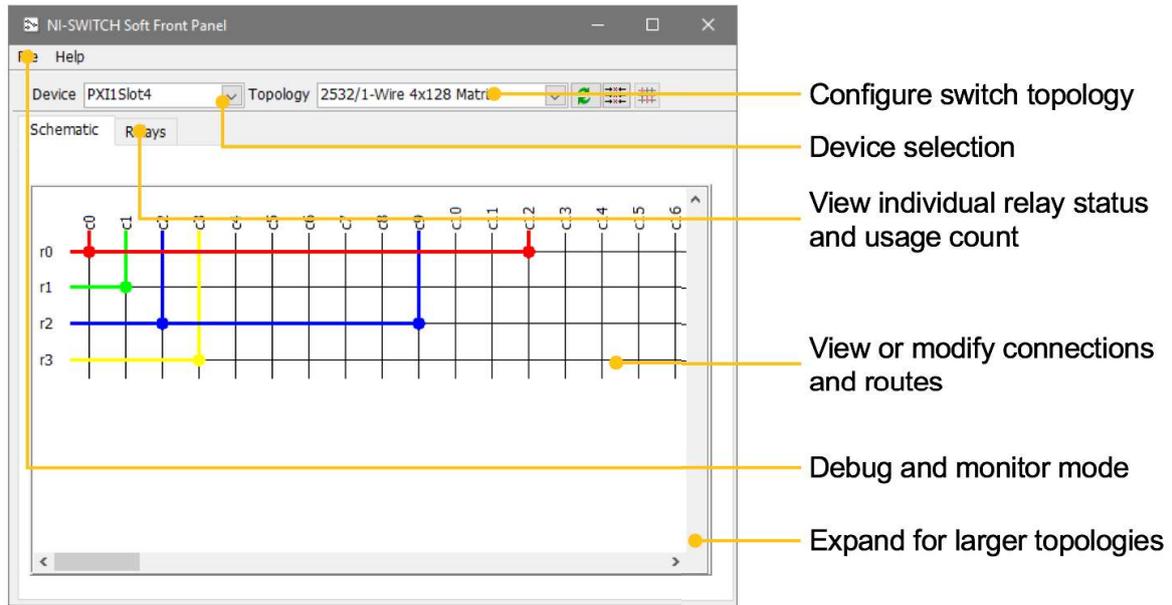
²The NI Switch Health Center is available on some NI switches. To check if this feature is supported by a switch module, reference KnowledgeBase article: [Which NI Switch Modules Support Resistive Self Test and Temperature Monitoring?](#)

The NI Switch Health Center is a free application that installs with the NI-SWITCH driver that can be used to monitor individual relay health, guide relay replacement, and generate user reports. The NI Switch Health Center verifies the condition of each relay by sending a signal through a combination of routes and alerting users if a relay has failed stuck open or closed. Additionally, large changes in contact resistance over time can indicate that a relay is approaching, or has reached, end of life. The NI Switch Health Center tests for changes in resistance using the integrated relay resistance test, allowing you to view the resistance change across individual relays and determine whether a relay is nearing the end of its usable life. A large change in resistance from the baseline indicates that you will soon need to replace the relay.

For more information on the Switch Health Center, relays, or switch topologies, see the [NI Switch Health Center white paper](#).

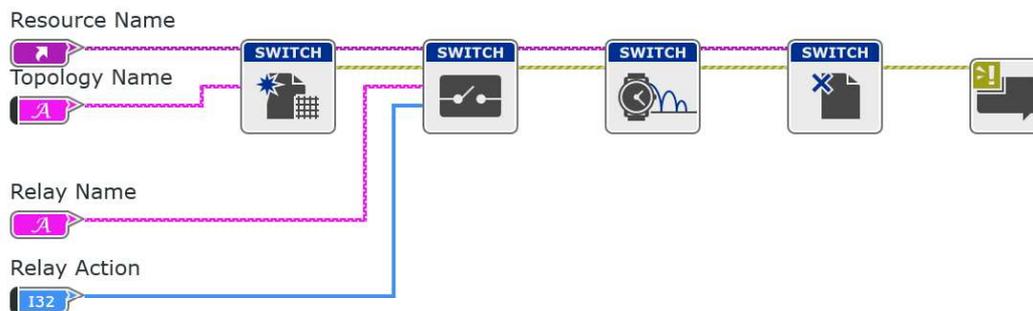
NI-SWITCH Soft Front Panel

The NI-SWITCH driver software includes an interactive soft front panel for full out-of-the-box functionality. This interactive soft front panel allows you to configure the switch topology and change switch connections with a simple click. In addition, you can use the **Debug Driver Session** mode to monitor and debug the switch during automated measurement. For example, you can monitor which signal paths are active, which individual relays are open/closed, and how many times each relay has been used.



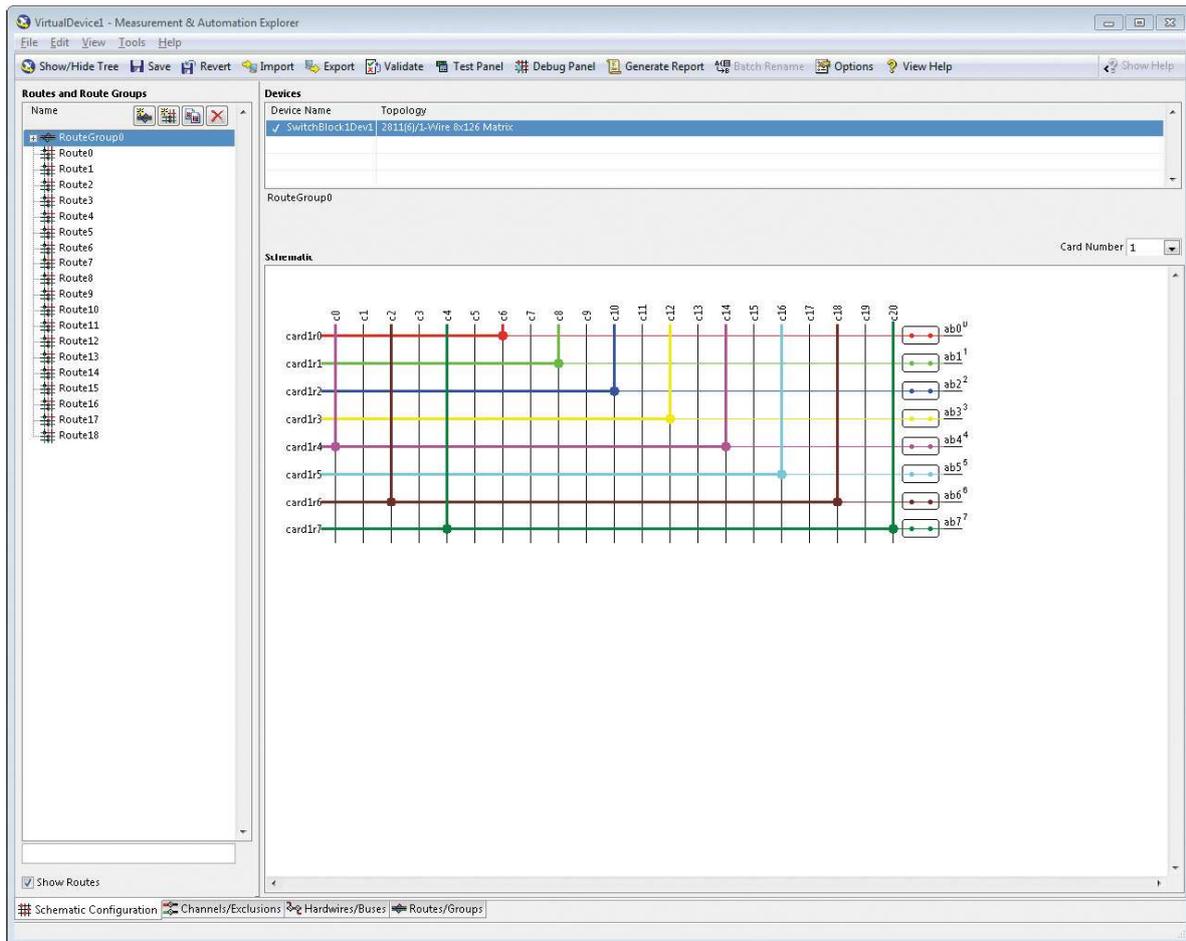
NI-SWITCH Application Programming Interface (API)

In addition to the soft front panel, the NI-SWITCH driver includes a best-in-class API that works with a variety of development options such as LabVIEW, C, C#, and others. The driver also provides access to help files, documentation, and dozens of ready-to-run shipping examples you can use as a starting point for your application.



Switch Executive Application Software

While the NI-SWITCH driver provides all the low-level functionality required to program switch actions, [Switch Executive](#) is application software for intelligent switch management and routing that accelerates development and simplifies maintenance of complex switch systems. The point-and-click graphical configuration and automatic routing capabilities make it easy to design your switch system. Using intuitive channel aliases and route names keeps your system documented for future modifications. Save time and increase test code reuse by integrating your system with TestStand, LabVIEW, LabWindows™ /CVI, and Measurement Studio.



- Graphically configure routes and route groups
- Develop reusable switching code and integrate it into NI TestStand or NI LabVIEW
- Automatically route signals between switch endpoints
- Scale switch configuration using Microsoft Excel
- Maintain switch configuration using route validation, reporting and debugging features