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Product Brochure

# PXI Switch Modules

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# PXI Matrix Switch Modules

[PXI-2529](#), [PXIe-2529](#), [PXIe-2531](#), [PXI-2532B](#), [PXIe-2532B](#), [PXI-2533](#), [PXI-2534](#), [PXI-2535](#), [PXI-2536](#), [PXIe-2737](#), [PXIe-2738](#), and [PXIe-2739](#)



FIGURE 1

PXIe-2737, PXIe-2529, PXIe-2532B

- **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.

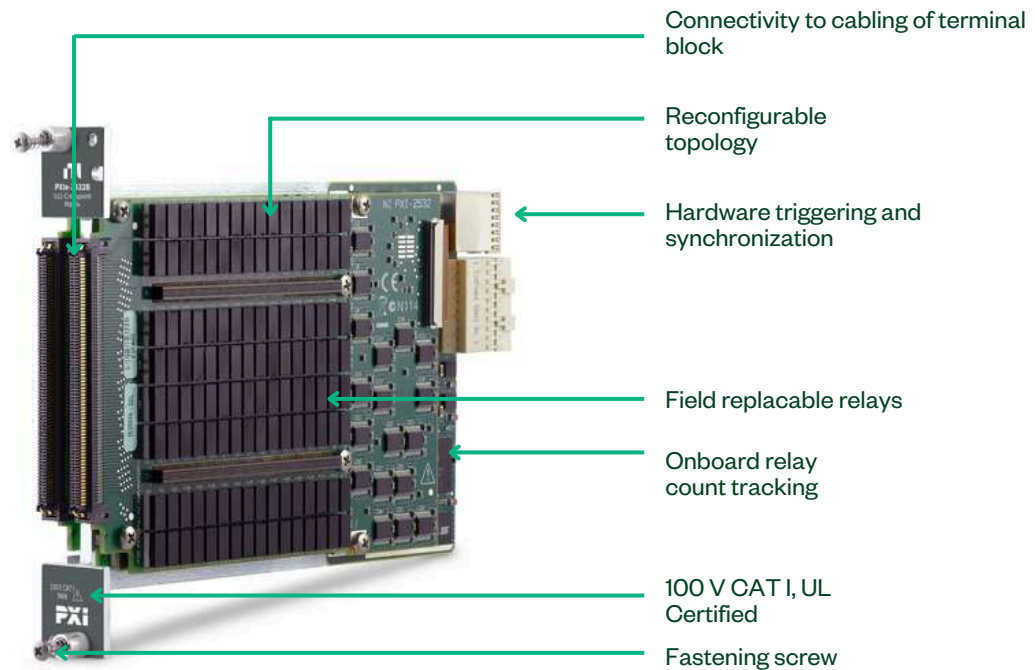
Additionally, NI switch modules offer advanced features, such as hardware triggering, relay health monitoring, onboard relay count tracking, and a wide variety of reconfigurable models, providing you the option to modify the topology of the switch based on your needs. These advanced features offer a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

## PXI Matrix Switch Modules

	Maximum Voltage	Maximum Current	Maximum Bandwidth	Relay Type	Configuration(s)
PXI-2529 and PXIe-2529	150 V	1 A	10 MHz	EMR	4x32, 2-wire matrix 8x16, 2-wire matrix Dual 4x16, 2-wire matrix
PXIe-2531	60 V DC	500 mA	10 MHz	Reed	4x128, 1-wire matrix 8x64, 1-wire matrix 2-bank, 4x64, 1-wire matrix 2-bank, 8x32, 1-wire matrix
PXI-2532B and PXIe-2532B	100 V DC	500 mA	30 MHz	Reed	4x128, 1-wire matrix 8x64, 1-wire matrix 16x32, 1-wire matrix 2-bank, 4x64, 1-wire matrix 2-bank, 8x32, 1-wire matrix 2-bank, 16x16, 1-wire matrix 4-bank, 4x32, 1-wire matrix 16-bank, 2x16, 1-wire matrix 4x64, 2-wire matrix 8x32, 2-wire matrix 16x16, 2-wire matrix 2-bank, 4x32, 2-wire matrix
PXI-2533	55 V DC 30 V AC	1 A	1.5 MHz	Solid-state	4x64, 1-wire matrix
PXI-2534	55 V DC 30 V AC	1 A	2 MHz	Solid-state	8x32, 1-wire matrix
PXI-2535	120 V DC 8 V AC	100 mA	1 MHz	FET	4x136, 1-wire matrix
PXI-2536	12 V DC 8 V AC	100 mA	1 MHz	FET	8x68, 1-wire matrix
PXIe-2737	100 V	2 A	10 MHz	EMR	4x64, 2-wire matrix
PXIe-2738	100 V	2 A	10 MHz	EMR	8x32, 2-wire matrix
PXIe-2739	100 V	2 A	10 MHz	EMR	16x16, 2-wire matrix

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

Figure 2. Detailed View of the 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 select the topology that best suits your application. For example, the [PXIe-2532B](#) can be reconfigured into various matrix topologies, ranging from a single 4x128, 1-wire matrix to a 16-bank 2x16, 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 chassis. Triggering 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.

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.

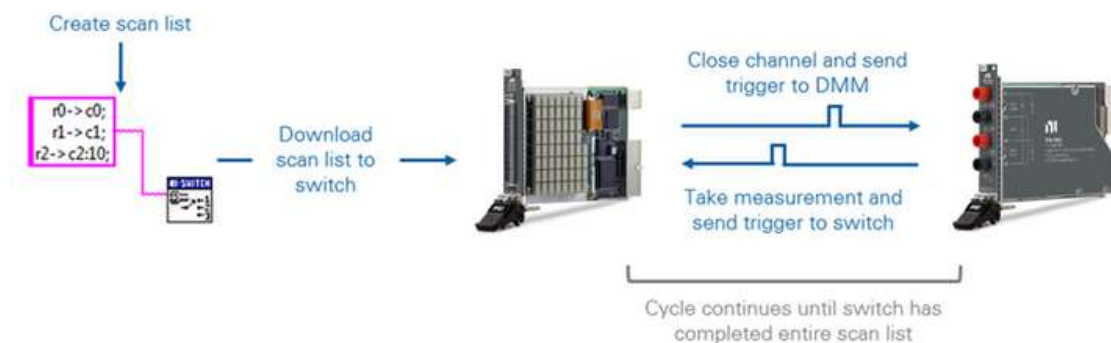


FIGURE 3

Depiction of the Scanning Process from the NI-SWITCH API to the DMM.

# 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 Center.

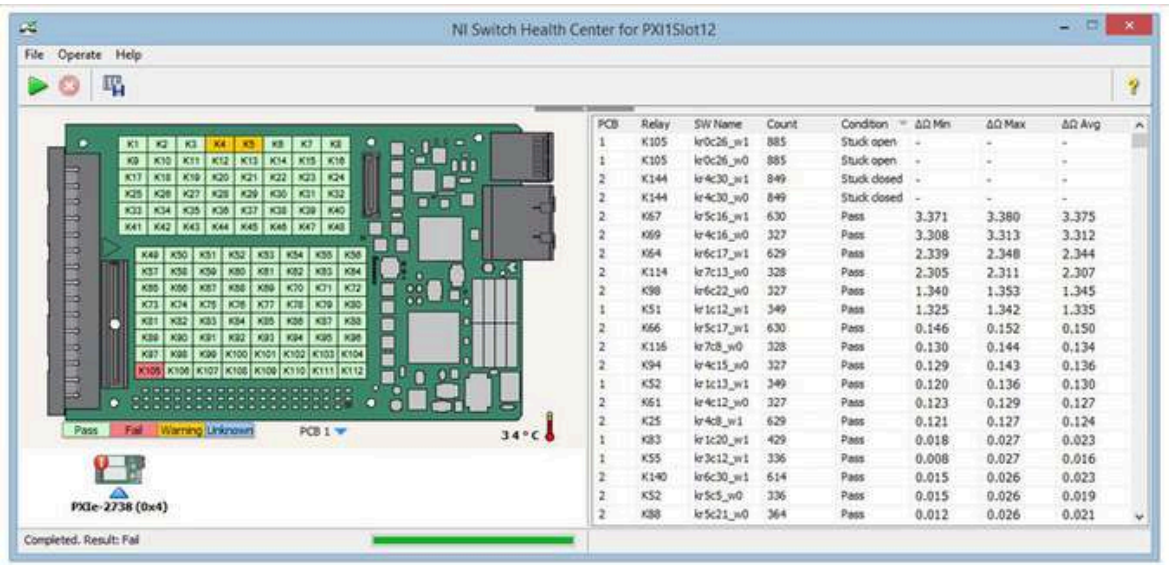


FIGURE 4

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

The NI Switch Health Center is available on some NI switches. To check if this feature is supported by a switch module, reference the following 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, the 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](#).



# PXI Multiplexer Switch Modules

[PXI-2503](#), [PXIe-2524](#), [PXIe-2525](#), [PXIe-2526](#), [PXI-2527](#), [PXIe-2527](#), [PXI-2530B](#), [PXI-2575](#), [PXIe-2575](#), [PXI-2576](#), [PXI-2584](#), and [PXI-2585](#)



FIGURE 5

PXIe-2527, PXIe-2575, PXI-2530B

- **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-, 2-, and 4-wire options
- Up to 196 channels
- Up to 600 V or 12 A

## Built for Automated Test and Measurement

PXI Multiplexer Switch Modules are ideal for high-channel-count applications that need to connect measurement or signal generation instruments to various test points on devices or units under test (DUTs or UUTs). PXI Multiplexer Switch Modules use a variety of relay types, including electromechanical armature relays (EMRs), reed relays, field-effect transistor (FET) relays, and solid-state relays, each with their own benefits, allowing you to choose a multiplexer that fits your requirements.

Additionally, NI switch modules offer advanced features, such as hardware triggering, 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.

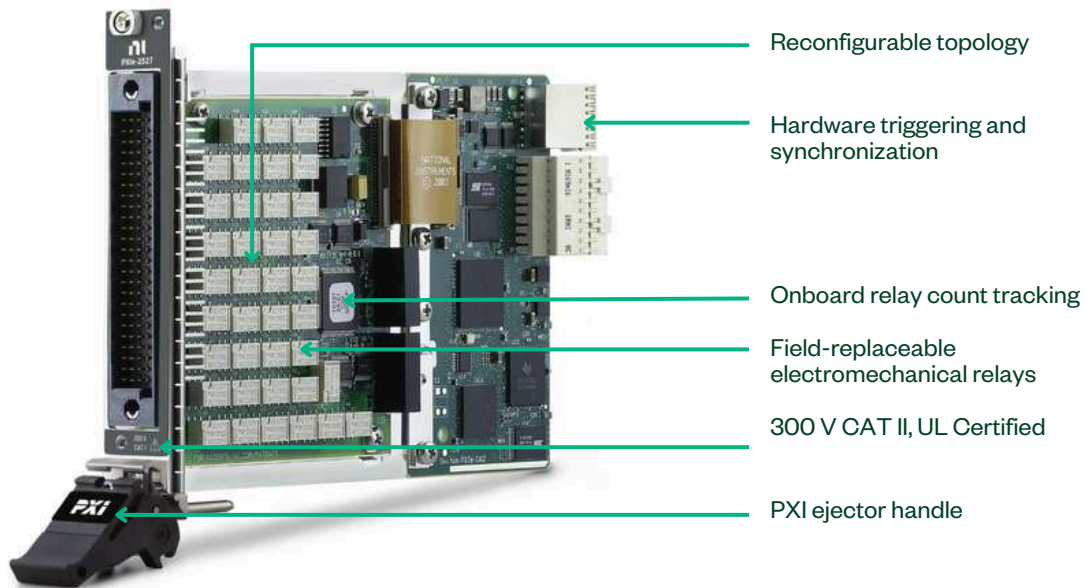
## PXI Multiplexer Switch Modules

	Maximum Voltage	Maximum Current	Maximum Bandwidth	Relay Type	Configuration(s)
PXI-2503	60 V DC 30 V AC	1 A	10 MHz	EMR	48-channel, 1-wire multiplexer 24-channel, 2-wire multiplexer 12-channel, 4-wire multiplexer
PXIe-2524	150 V	2 A	10 MHz	EMR	16-bank, 8-channel, 1-wire multiplexer 8-bank, 16-channel, 1-wire multiplexer 4-bank, 32-channel, 1-wire multiplexer 2-bank, 64-channel, 1-wire multiplexer 128-channel, 1-wire multiplexer
PXIe-2525	150 V	2 A	10 MHz	EMR	16-bank, 4-channel, 2-wire multiplexer 8-bank, 8-channel, 2-wire multiplexer 4-bank, 16-channel, 2-wire multiplexer 2-bank, 32-channel, 2-wire multiplexer 64-channel, 2-wire multiplexer
PXIe-2526	150 V	2A	10 MHz	EMR	158-channel, 1-wire multiplexer 79-channel, 2-wire multiplexer
PXI-2527 and PXIe-2527	300 V	2A	30 MHz	EMR	64-channel, 1-wire multiplexer 32-channel, 2-wire multiplexer 2-bank, 16-channel, 2-wire multiplexer 16-channel, 4-wire multiplexer
PXI-2530B	60 V DC 30 V AC	400 mA	19 MHz	Reed	128-channel, 1-wire multiplexer 2-bank, 64-channel, 1-wire multiplexer 4-bank, 32-channel, 1-wire multiplexer 8-bank, 16-channel, 1-wire multiplexer 64-channel, 2-wire multiplexer 2-bank, 32-channel, 2-wire multiplexer 4-bank, 16-channel, 2-wire multiplexer 32-channel, 4-wire multiplexer 2-bank, 16-channel, 4-wire multiplexer
PXI-2575 and PXIe-2575	100 V	1 A	20 MHz	EMR	196-channel, 1-wire multiplexer 98-channel, 2-wire multiplexer 95-channel, 2-wire multiplexer
PXI-2576	100 V	1A	30 MHz	EMR	64-channel, 1-wire multiplexer 2-bank, 32-channel, 2-wire multiplexer 4-bank, 16-channel, 2-wire multiplexer 8-bank, 8-channel, 2-wire multiplexer 16-bank, 4-channel, 2-wire multiplexer
PXI- 2584	600 V	500 mA	900 kHz	Reed	12-channel, 1-wire multiplexer 2-bank, 6-channel, 1-wire multiplexer 6-channel, 2-wire multiplexer
PXI-2585	300 V	12 A	10 MHz	EMR	10-channel, 1-wire multiplexer

Table 2: NI offers a variety of PXI Multiplexer Switch Modules, varying in topology, channel density, relay type, and voltage/current rating, allowing you to select the model that best fits your needs.



## Figure 6. Detailed View of the PXIe-2527 Multiplexer Switch Module



## Key Features

### Reconfigurable Topologies

As referenced in Table 2, many PXI Multiplexer Switch Modules can be reconfigured to achieve multiple topologies within a single device, allowing you to select the topology that best suits your application. In some cases, such as the [PXIe-2524](#), this operation can be done in software, without any additional hardware, by using internal relays to reshape the topology. In other cases, such as the [PXI-2530B](#), it requires different terminal blocks, which connect various signal paths to reshape the topology.

# PXI Relay Modules

[PXI-2520](#), [PXI-2521](#), [PXI-2522](#), [PXI-2523](#), [PXI-2564](#), [PXI-2566](#), [PXI-2568](#), [PXI-2569](#), [PXIe-2569](#), [PXI-2571](#), and [PXI-2586](#)



FIGURE 7

PXIe-2568, PXI-2564, PXIe-2569

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- SPST, SPDT, DPST, and DPDT options
- Up to 100 relays
- Up to 300 V or 12 A

## Built for Automated Test and Measurement

PXI Relay Modules consist of multiple, independent, electromechanical armature relays and come in a variety of configurations, such as single-pole single-throw (SPST), single-pole double-throw (SPDT), and double-pole double-throw (DPDT) relays. PXI Relay Modules are ideal for high-channel-count applications that need to connect measurement or signal generation instruments to various test points on devices or units under test (DUTs or UUTs).

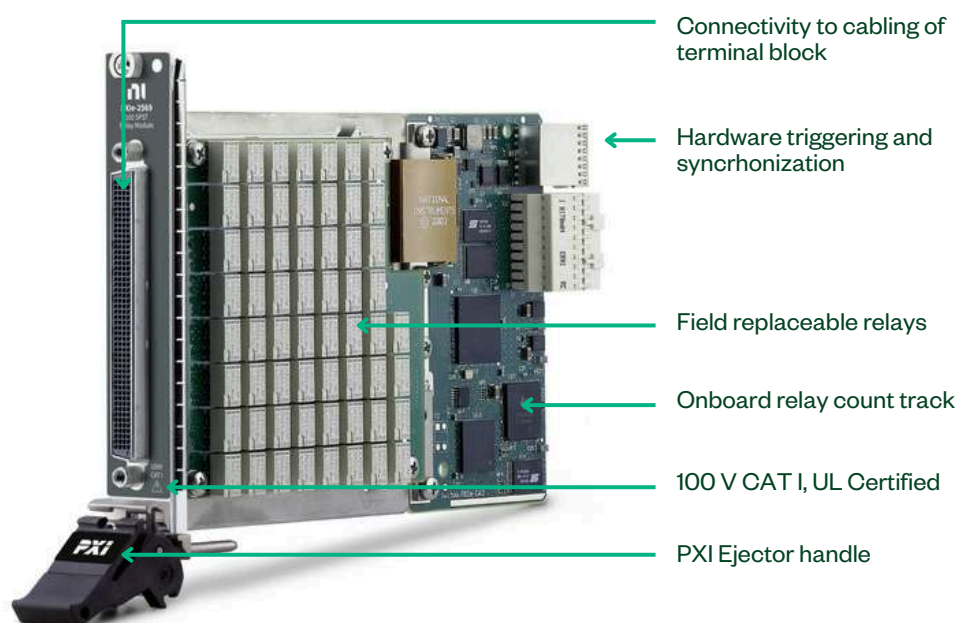
Additionally, NI switch modules offer advanced features, such as hardware triggering, onboard relay count tracking, and a wide variety of reconfigurable models, providing you the option to modify the topology of the switch based on your needs. These advanced features offer a smarter way to tackle difficult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

## PXI Relay Modules

	Number of Relays	Relay Configuration	Maximum Voltage	Maximum Current	Maximum Bandwidth	Relay Type
PXI-2520	80	SPST, non-latching	150 V	2 A	35 MHz	EMR
PXI-2521	40	DPST, non-latching	150 V	2 A	30 MHz	EMR
PXI-2522	53	SPDT, non-latching	100 V	2 A	51 MHz	EMR
PXI-2523	26	DPDT, non-latching	100 V	2 A	35 MHz	EMR
PXI-2564	16 8	SPST, non-latching DPST, non-latching	150 V	5 A	30 MHz	EMR
PXI-2566	16 8	SPDT, non-latching DPDT, non-latching	150 V DC 125 V AC	5 A	10 MHz	EMR
PXI-2568	31 15	SPST, latching (form A) DPST, latching (form A)	150 V	2 A	40 MHz	EMR
PXI-2569 and PXIe-2569	100 50	SPST, latching (form A) DPST, latching (form A)	100 V	1 A	20 MHz	EMR
PXI-2571	66	SPDT, latching (form C)	100 V	1 A	35 MHz	EMR
PXI-2586	10	SPST	300 V	12 A	20 MHz	EMR

Table 3: NI offers a variety of PXI Relay Modules, varying in relay configuration, channel density, relay type, and voltage/current rating, allowing you to select the model that best fits your needs.

## Figure 8. Detailed View of the PXIe-2569 Relay Module



# Key Features

## Reconfigurable Topologies

As referenced in Table 3, some PXI Relay Modules can be reconfigured to achieve multiple topologies within a single device, allowing you to select the topology that best suits your application. For example, the [PXIe-2569](#) can be reconfigured in software—without any additional hardware—allowing you to reshape the topology into either 100 SPST relays or 50 DPST relays.

## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

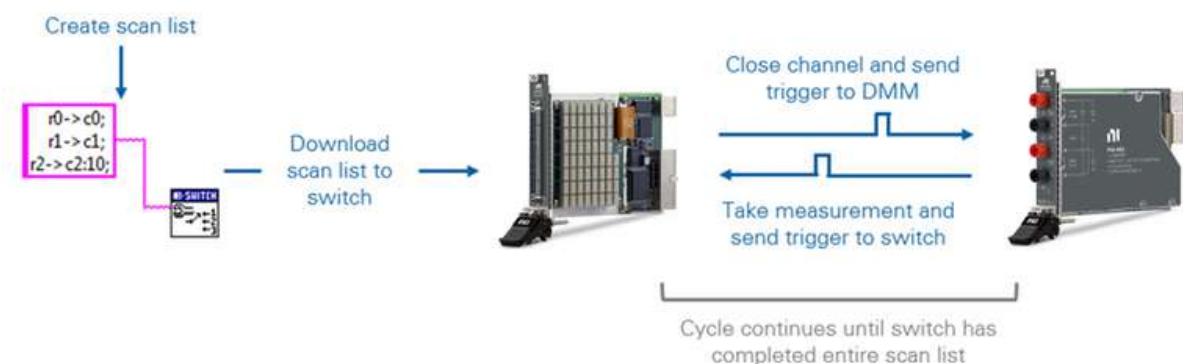


FIGURE 9

Depiction of the Scanning Process from the NI-SWITCH API to the DMM.

# PXI RF Matrix Switch Modules

## PXIe-2540 and PXIe-2541



FIGURE 10

PXIe-2540 and PXIe-2541

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Bandwidth up to 500 MHz
- Onboard relay count tracking
- Ability to store RF path calibration information in NI Switch Executive

## Built for Automated Test and Measurement

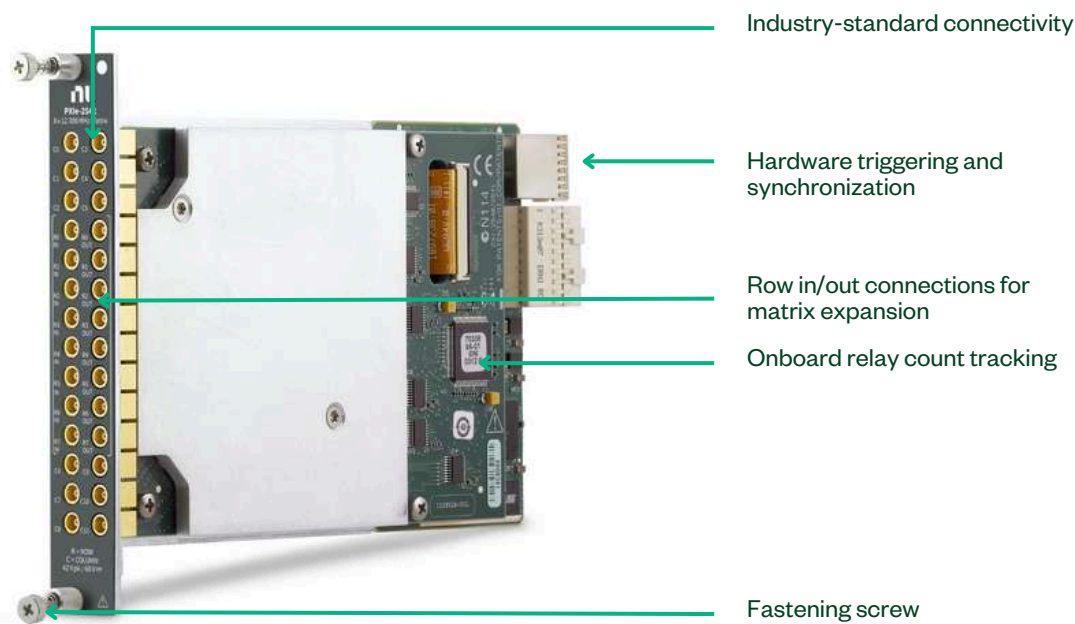
PXI RF Matrix Switch Modules are organized into rows and columns and provide maximum flexibility for switching systems by allowing you to connect any channel to any other channel. Additionally, NI switch modules offer advanced features, such as hardware triggering, onboard relay count tracking, and a 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.

PXI RF Matrix Switch Modules

	Configuration	Maximum Bandwidth	Characteristic Impedance	Termination	Relay Type
PXIe-2540	8x9 RF Matrix	350 MHz	50 Ω	No	Reed
PXIe-2541	8x12 RF Matrix	300 MHz	50 Ω	No	Reed

Table 4: NI offers a variety of PXI RF Matrix Switch Modules, varying in topology, density, relay type, and bandwidth, allowing you to select the model that best fits your needs.

Figure 11. Detailed View of the PXIe-2541 RF Matrix Switch Module





# Key Features

## Matrix Expansion

Matrix modules can also serve as building blocks for creating larger configurations that are well beyond the size of a single module. Column expansion is the process of connecting each row between two or more matrix modules, effectively doubling the number of columns within the expanded matrix. Some NI matrix modules offer cable or terminal block solutions for easy matrix expansion, such as the [PXIe-2541](#).

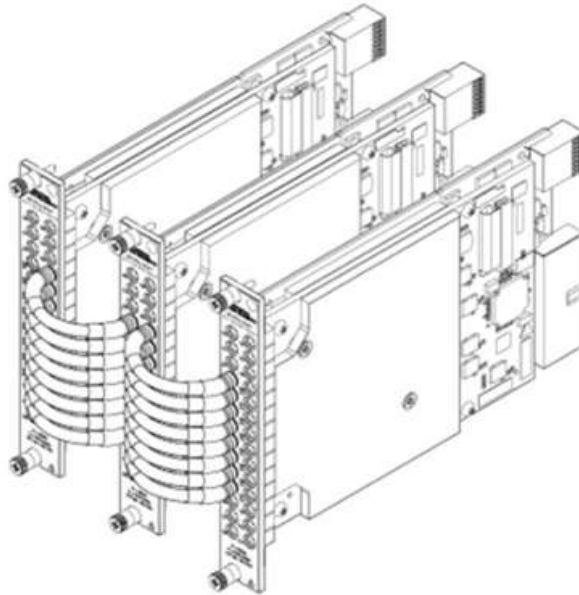


FIGURE 12

Column expansion is straightforward using purchasable accessories with the PXIe-2541.

## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

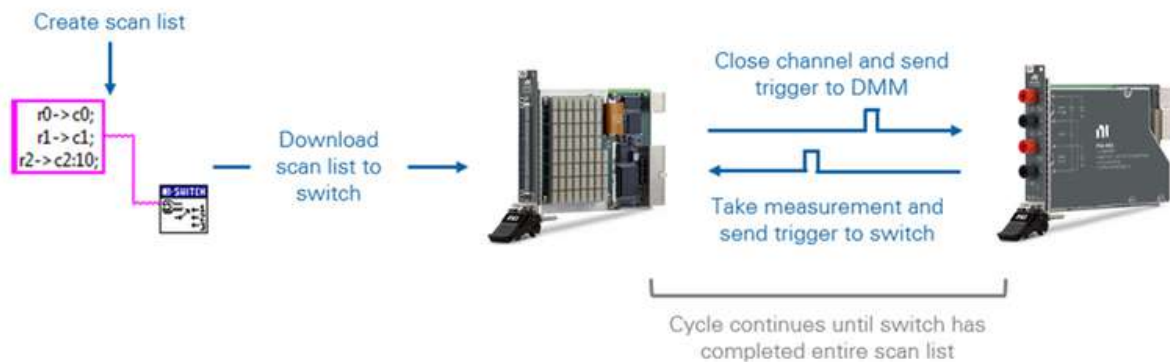


FIGURE 13

Depiction of the Scanning Process from the NI-SWITCH API to the DMM

# PXI RF Multiplexer Switch Modules

[PXIe-2543](#), [PXIe-2544](#), [PXI-2545](#), [PXI-2546](#), [PXI-2547](#), [PXIe-2593](#), [PXI-2594](#), [PXI-2596](#), [PXI-2597](#), [PXIe-2746](#), [PXIe-2747](#), [PXIe-2748](#), [PXI-2796](#), and [PXI-2797](#)



FIGURE 14

PXIe-2543, PXI-2545, PXI-2596, PXI-2796

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Electromechanical and FET relay options
- Bandwidth up to 40 GHz
- Unterminated and terminated options
- Onboard relay count tracking
- Ability to store RF path calibration information in NI Switch Executive

## Built for Automated Test and Measurement

PXI RF Multiplexer Switch Modules are ideal for high-channel-count applications that need to connect measurement or signal generation instruments to various test points on devices or units under test (DUTs or UUTs). PXI RF Multiplexer 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 multiplexer that fits your requirements.

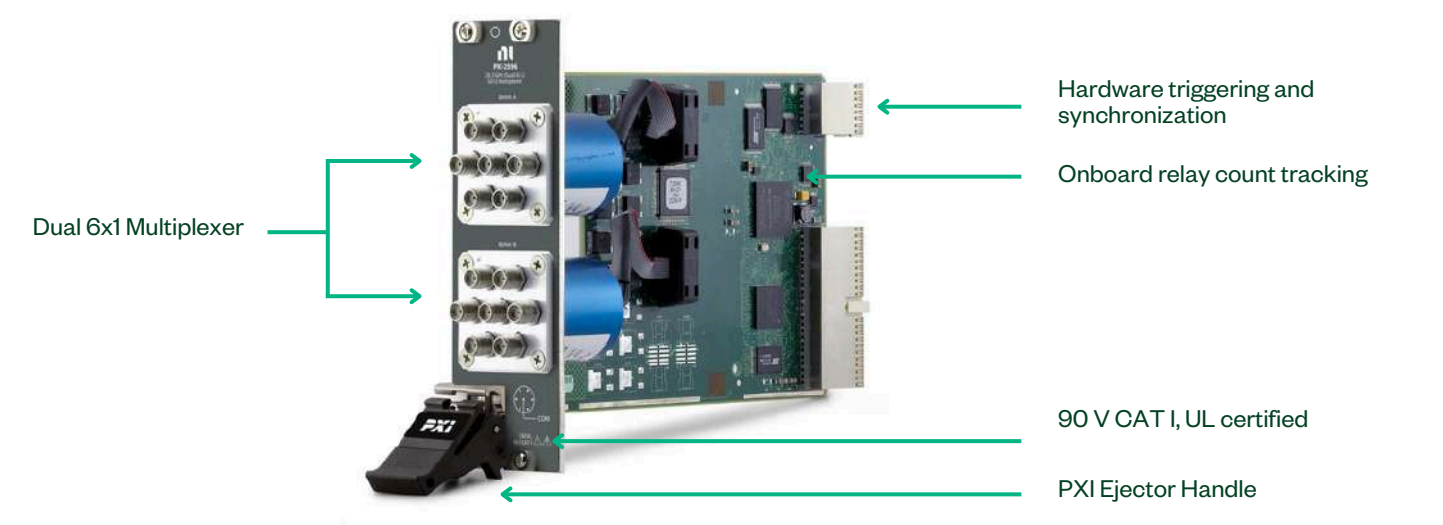
Additionally, NI switch modules offer advanced features, such as hardware triggering, onboard relay count tracking, and a wide variety of reconfigurable models, providing you the option to modify the topology of the switch based on your needs. These advanced features offer a smarter way to tackle difficult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

## PXI RF Multiplexer Switch Modules

	Configuration	Maximum Bandwidth	Characteristic Impedance	Termination	Relay Type
PXIe-2543	2-bank, 4-channel RF multiplexer	6.6 GHz	50 $\Omega$	Yes	FET
PXIe-2544	8-channel RF multiplexer	6.6 GHz	50 $\Omega$	Yes	FET
PXI-2545	4-channel RF multiplexer	2.7 GHz	50 $\Omega$	Yes	EMR
PXI-2546	2-bank, 4-channel RF multiplexer	2.7 GHz	50 $\Omega$	No	EMR
PXI-2547	8-channel RF multiplexer	2.7 GHz	50 $\Omega$	No	EMR
PXIe-2593	16-channel RF multiplexer 8-channel RF multiplexer 2-bank, 8-channel RF multiplexer 2-bank, 4-channel RF multiplexer	500 MHz	50 $\Omega$	No	EMR
PXI-2594	4-channel RF multiplexer	2.5 GHz	50 $\Omega$	No	EMR
PXI-2596	2-bank, 6-channel (SP6T) RF multiplexer	26.5 GHz	50 $\Omega$	No	EMR
PXI-2597	6-channel (SP6T) RF multiplexer	26.5 GHz	50 $\Omega$	Yes	EMR
PXIe-2746	4-bank, 4-channel RF multiplexer	2.7 GHz	50 $\Omega$	No	EMR
PXIe-2747	2-bank, 8-channel RF multiplexer	2.7 GHz	50 $\Omega$	No	EMR
PXIe-2748	16-channel RF multiplexer	3.0 GHz	50 $\Omega$	No	EMR
PXI-2796	2-bank, 6-channel (SP6T) RF multiplexer	40 GHz	50 $\Omega$	No	EMR
PXI-2797	6-channel (SP6T) RF multiplexer	40 GHz	50 $\Omega$	Yes	EMR

Table 5: NI offers a variety of PXI RF Multiplexer Switch Modules, varying in topology, channel density, relay type, and bandwidth, allowing you to select the model that best fits your needs.

Figure 15. Detailed View of the PXIe-2596 RF Multiplexer Module



Key Features

Reconfigurable Topologies

As referenced in Table 5, some PXI RF Multiplexer Switch Modules can be reconfigured to achieve multiple topologies within a single device, allowing you to select the topology that best suits your application. For example, the PXIe-2593 can be reconfigured in software, without any additional hardware, allowing you to reshape the topology into four different multiplexer configurations, with termination options.



FIGURE 16

The PXIe-2593 is one example of a PXI RF Multiplexer Switch Module that can be reconfigured into various multiplexer topologies, ranging from a 16-channel, unterminated RF multiplexer to a 2-bank, 4-channel, terminated RF multiplexer.

## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

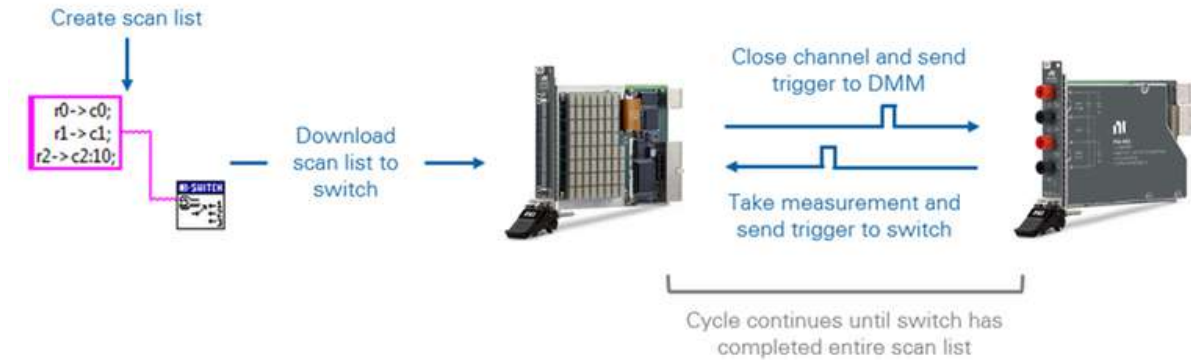


FIGURE 17

Depiction of the Scanning Process from the NI-SWITCH API to the DMM

# PXI RF Relay Modules

PXIe-2542, PXI-2548, PXI-2549, PXI-2599, and PXI-2799



FIGURE 18

PXI-2599, PXI-2548, PXI-2549

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Electromechanical and FET relay options
- Bandwidth up to 40 GHz
- Underterminated and terminated options
- Onboard relay count tracking
- Ability to store RF path calibration information in NI Switch Executive

## Built for Automated Test and Measurement

PXI RF Relay Modules offer single-pole double-throw (SPDT) and terminated switches. SPDT models include excellent insertion loss, voltage standing-wave ratio (VSWR), and isolation parameters to minimize signal degradation. You can use the onboard relay count tracking feature on these models to predict relay lifetime and reduce unexpected system downtime. SPDT models are also well suited for passing high-order harmonics from PXI RF Signal Upconverter Modules or routing multiple sources to PXI RF Signal Downconverter Modules. Terminated switch models feature front-mounted SMA connectors and high-performance solid-state relays for fast switching time and unlimited mechanical lifetime. These models also include termination on every COM line and channel, which helps minimize reflections of the RF signal and protect your instruments.

Additionally, NI switch modules offer advanced features, such as hardware triggering, 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.

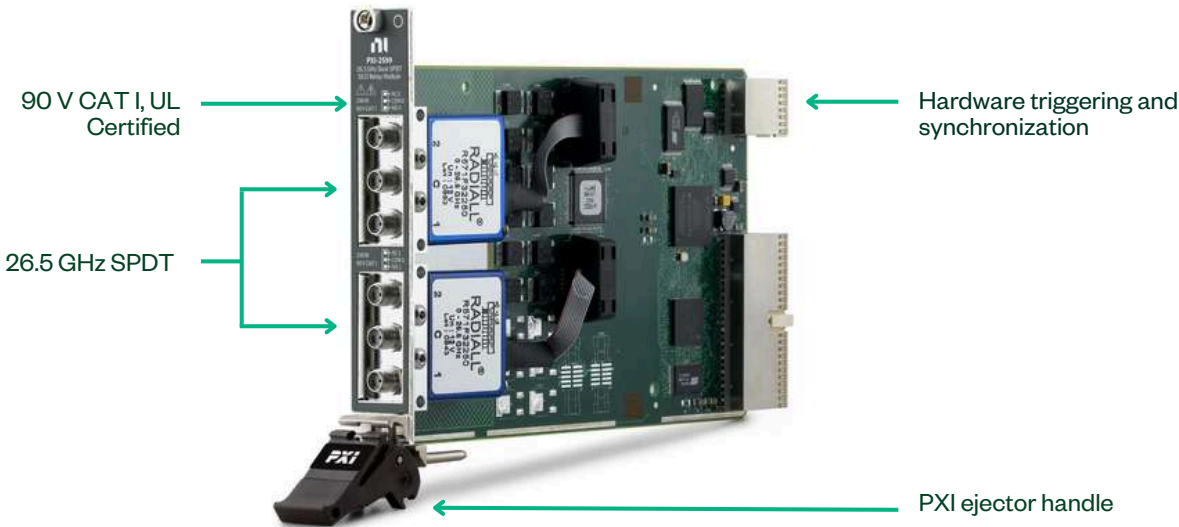


# PXI RF Relay Modules

	Number of Relays	Relay Configuration	Maximum Bandwidth	Characteristic Impedance	Termination	Relay Type
PXIe-2543	4	SPDT	6.6 GHz	50 Ω	Yes	FET
PXIe-2544	4	SPDT, latching	2.7 GHz	50 Ω	No	EMR
PXI-2545	2	SPDT, latching	2.7 GHz	50 Ω	Yes	EMR
PXI-2546	2	SPDT, latching	26.5 GHz	50 Ω	No	EMR
PXI-2547	2	SPDT, latching	40 GHz	50 Ω	No	EMR

Table 6: NI offers a variety of PXI RF Relay Modules, varying in relay configuration, channel density, relay type, and bandwidth, allowing you to select the model that best fits your needs.

Figure 19. Detailed View of the PXI-2599 RF Relay Module



## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

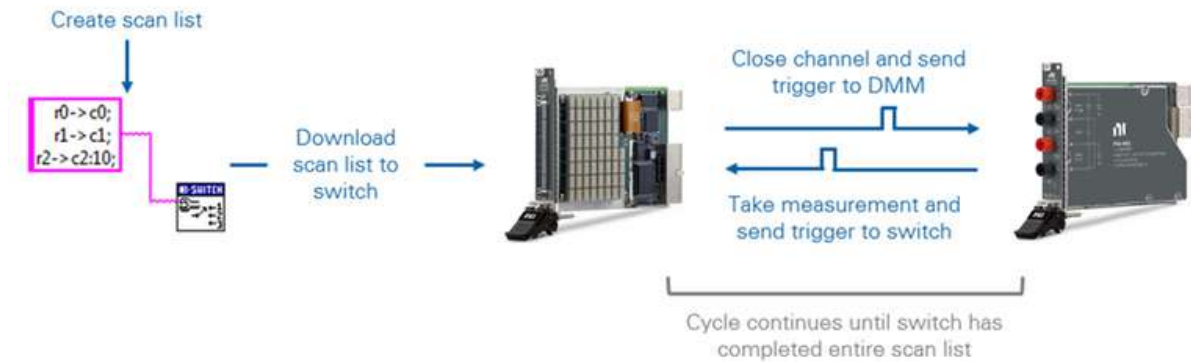


FIGURE 20

Depiction of the Scanning Process from the NI-SWITCH API to the DMM

# SwitchBlock

PXI Carrier Module for SwitchBlock and Matrix Modules for SwitchBlock  
PXI-2800, SWB-2810, SWB-2815, SWB-2816, SWB-2833, and SWB-2834

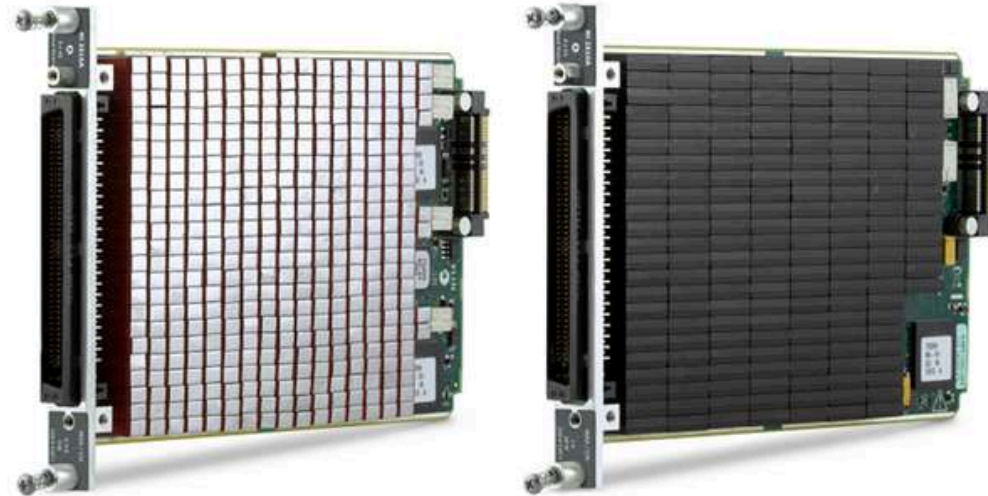


FIGURE 21  
NI-2816A, NI-2810A

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Electromechanical and FET relay options
- Relay health monitoring through the NI Switch Health Center
- Up to 2,000 crosspoints in a single carrier
- Up to 8,000 crosspoints in a single 18-slot PXI chassis
- 1- and 2-wire options
- Up to 150 V or 2 A

## Built for Automated Test and Measurement

NI SwitchBlock is a flexible and intelligent solution for creating large matrix switches that minimizes wiring and simplifies connectivity. The PXI Carrier Module for SwitchBlock occupies four PXI slots, holds up to six Matrix Modules for SwitchBlock, and includes an integrated analog bus for combining individual matrices into a single, large matrix. By connecting multiple SwitchBlock relay cards through the carrier's integrated analog bus, you can easily create large matrices with more than 2,000 crosspoints in four PXI slots and more than 8,000 crosspoints in a single PXI chassis.

Additionally, SwitchBlock systems offer advanced features, such as relay health monitoring and onboard relay count tracking, providing you with an intelligent way to monitor the health of your switching system. These advanced features offer a smarter way to tackle difficult applications in industries ranging from consumer electronics to aerospace and defense.

PXI Matrix Modules for SwitchBlock

	Maximum Voltage	Maximum Current	Maximum Bandwidth	Relay Type	Number of Slots (within a SwitchBlock Carrier Module)	Configuration(s)
SWB-2810	150 V	1 A	10 MHz	Reed	1	4x43, 1-wire matrix
SWB-2815	100 V	300 mA	6 MHz	Reed	1	4x86, 1-wire matrix
SWB-2816	100 V	300 mA	8 MHz	Reed	1	8x46, 1-wire matrix
SWB-2833	100 V	2 A	10 MHz	EMR	2	4x71, 2-wire matrix
SWB-2834	100 V	2 A	10 MHz	EMR	2	8x34, 2-wire matrix

Table 7: NI offers a variety of Matrix Modules for SwitchBlock, varying in topology, density, relay type, and voltage/current rating, allowing you to select the model that best fits your needs. Each PXI Carrier Module for SwitchBlock can hold up to six Matrix Modules for SwitchBlock.

Matrix Modules for SwitchBlock cannot be used in a PXI chassis without a PXI Carrier Module for SwitchBlock, shown in Figure 22, which serves as a sub-chassis within a PXI system. Each PXI Carrier Module for SwitchBlock can hold up to six Matrix Modules for SwitchBlock.

Figure 22. Detailed View of the PXI-2800 Carrier Module for SwitchBlock

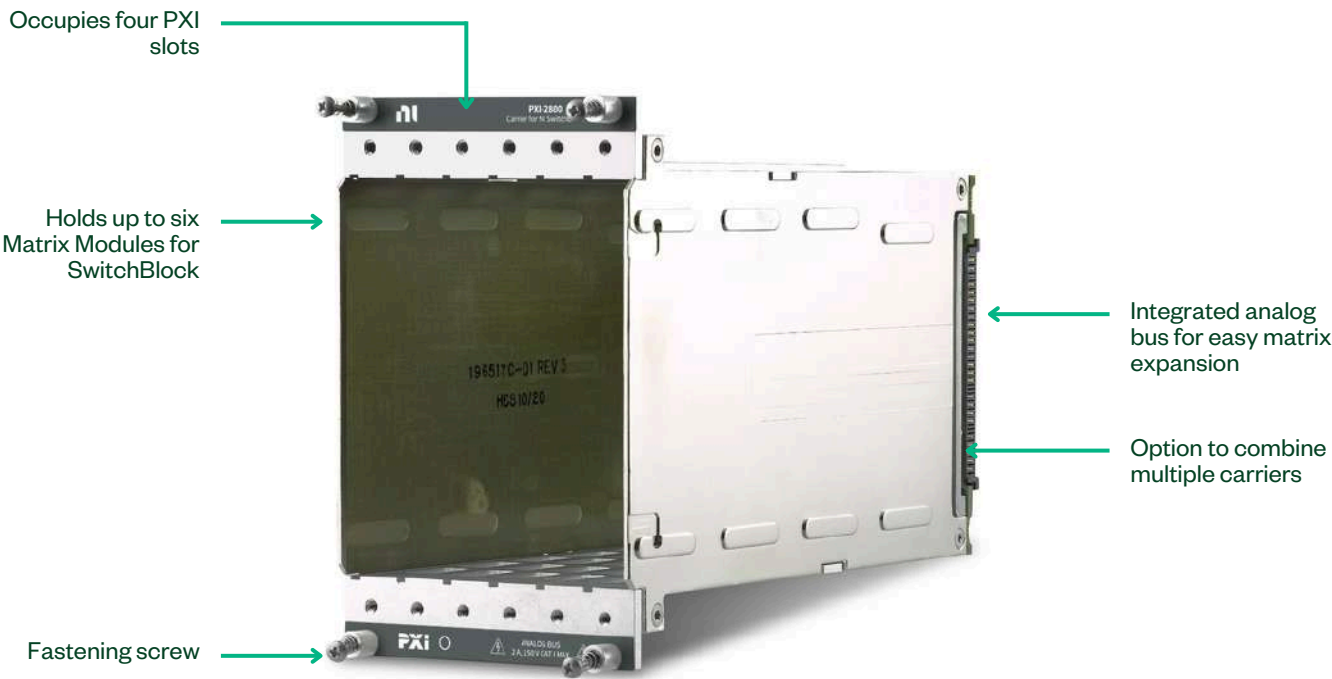
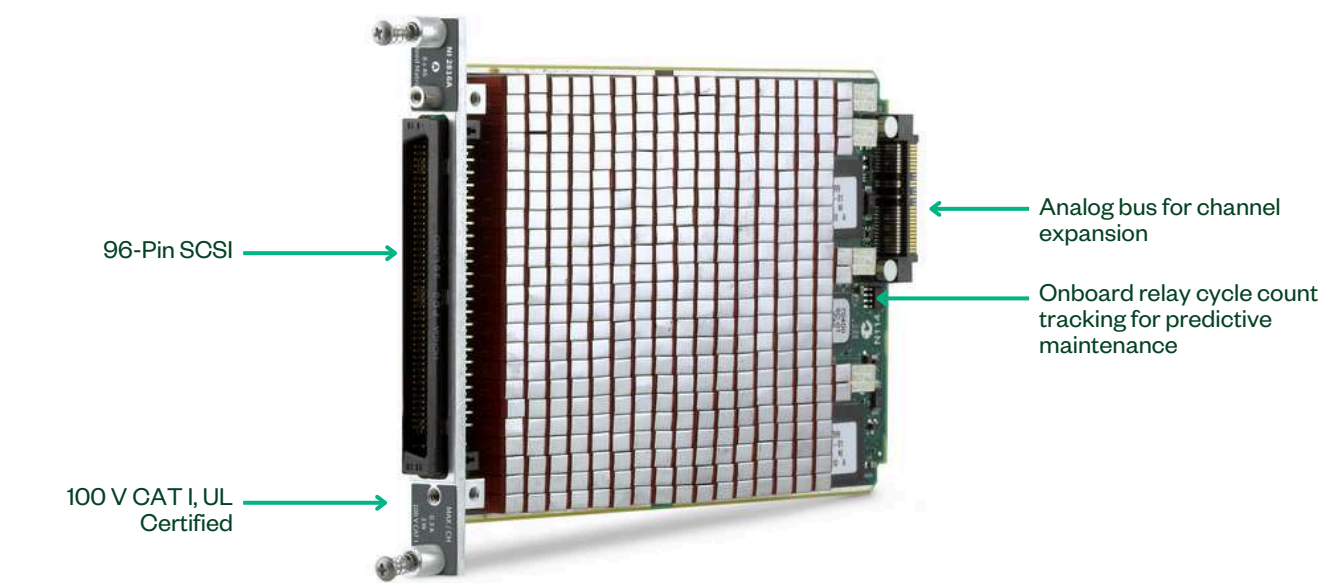


Figure 23. Detailed View of the NI-2816A Matrix Module for SwitchBlock



## Key Features

### Relay Health Monitoring

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

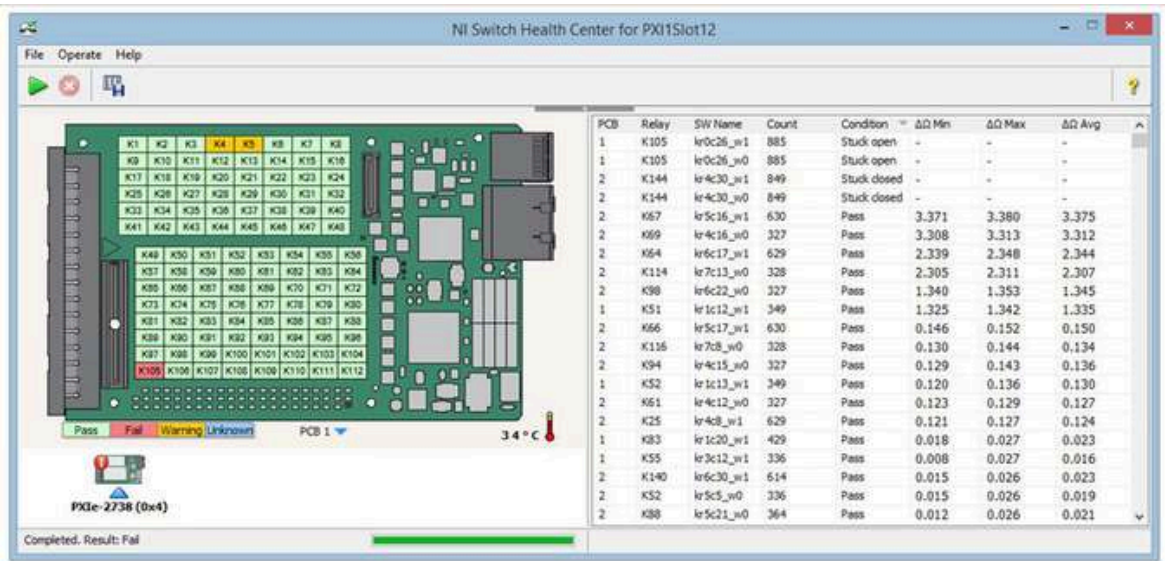


FIGURE 24 The NI Switch Health Center provides advanced relay health monitoring options, including functional and resistive self-tests, onboard relay count tracking, and report generation.

The NI Switch Health Center is available for all Matrix Modules for SwitchBlock, but the resistive relay self-test feature is only available on some PXI Matrix Switch Modules. To find out which devices support the resistive relay self-test feature, reference the 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.

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

## Designed for Matrix Expansion

The customizable hardware design of the NI SwitchBlock makes it easy to create large switch matrices in PXI while minimizing wiring, simplifying connectivity, and providing a high degree of flexibility for your switching needs. A SwitchBlock system comprises a PXI Carrier Module for SwitchBlock (PXI-2800) that occupies four PXI slots and can hold up to six 1-slot or three 2-slot Matrix Modules for SwitchBlock. The PXI Carrier Module for SwitchBlock features a hybrid-compatible connector on the back of the second PXI slot which allows you to place it in a PXI chassis or in a hybrid-compatible slot of a PXI Express chassis.

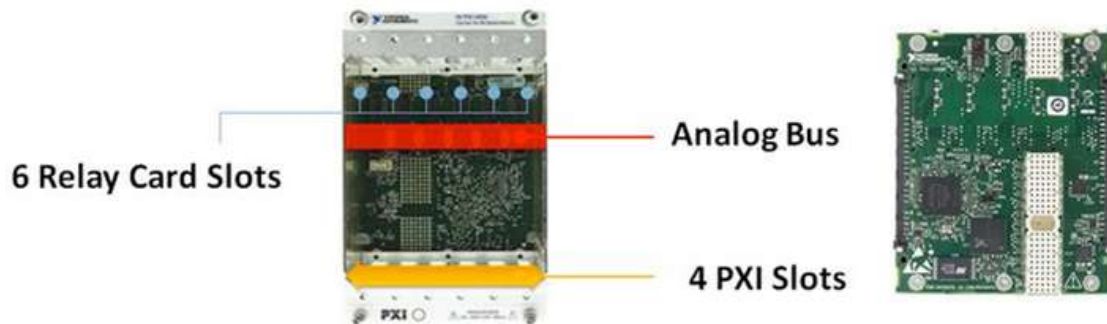


FIGURE 25

The PXI Carrier Module for SwitchBlock (PXI-2800) occupies four PXI slots, can hold up to six 1-slot Matrix Modules for SwitchBlock, and has an integrated analog bus designed to combine those matrix modules into a single large matrix, without additional external wiring.

The PXI Carrier Module for SwitchBlock (PXI-2800) has an integrated analog bus, allowing for easy matrix expansion without the need for additional external cabling. Each Matrix Module for SwitchBlock has analog bus relays that connect its rows to the analog bus of the carrier, effectively combining any matrices that are connected to the analog bus.

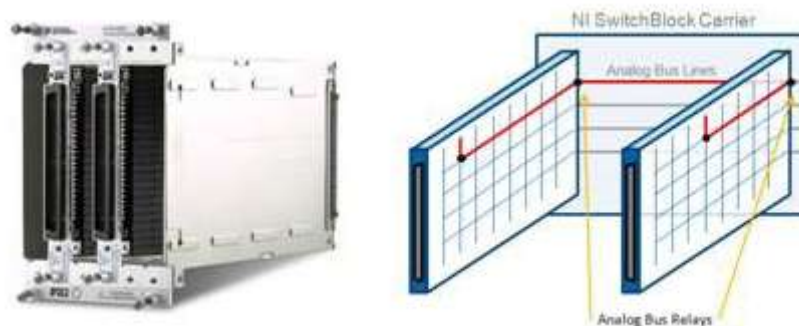


FIGURE 26

SwitchBlock is designed for easy matrix expansion, allowing up to 2,000 crosspoints in a single PXI Carrier Module for SwitchBlock (PXI-2800). Simply close the analog bus relays to connect that Matrix Module for SwitchBlock with any other devices connected to the analog bus.



Each Matrix Module for SwitchBlock is available in Type A and Type B configurations. The connector on the Type A card provides user access to the columns of the relay card as well as indirect row access, through the analog bus of the carrier. To preserve system bandwidth, Type B cards do not connect the analog bus to the front connector and only provide access to the columns through the front connector. Type A cards allow access to the rows of the matrix indirectly through the analog bus, via the analog bus connector pins. To optimize bandwidth, only one Type A card can connect to the analog bus at a single time, so most large SwitchBlock matrix systems have a single Type A card, and the rest are Type B cards of the same model number.

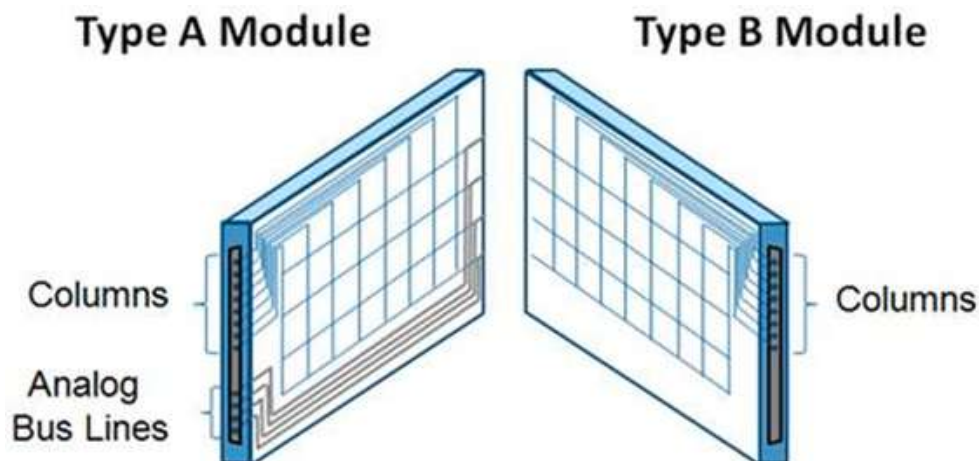


FIGURE 27

Type A modules provide column access and row access through the front connector, allowing for row-to-column connections and column-to-column connections. Conversely, Type B modules only provide column access and are restricted to column-to-column signal routes, unless joined to a Type A card through the analog bus.

A single PXI Carrier Module for SwitchBlock can create a 2,000-crosspoint matrix in four PXI slots. For larger matrices up to 8,000 crosspoints in an 18-slot PXI chassis, you can combine multiple PXI Carrier Modules for SwitchBlock by inserting a SwitchBlock Expansion Bridge (NI-2806) between two or more PXI Carrier Modules for SwitchBlock.

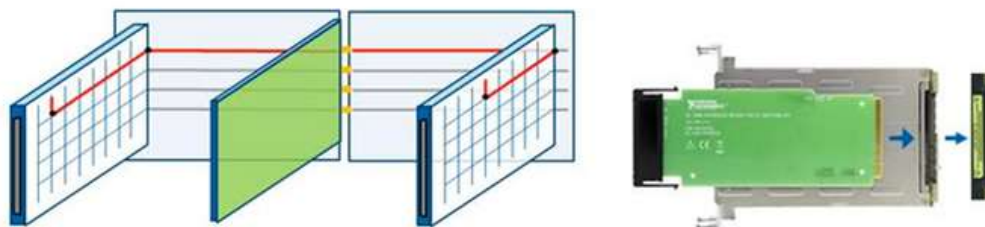


FIGURE 28

To create larger matrices, you can connect the analog buses of multiple PXI Carrier Modules for SwitchBlock by inserting a SwitchBlock Expansion Bridge (NI-2806) between the two or more PXI Carrier Modules for SwitchBlock. However, you must remove the analog bus cover before inserting the SwitchBlock Expansion Bridge.

For more information on SwitchBlock, see the [NI SwitchBlock Hardware Architecture white paper](#).

# PXI Relay Driver Module

## PXI-2567



FIGURE 29

PXI-2567

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Control up to 64 external relays
- Source up to 50 V or 600 mA per channel
- Source up to 25 A per module

## Built for Automated Test and Measurement

The PXI Relay Driver Module controls up to 64 external relays with up to 50 VDC or 600 mA per channel drive capacity when using an external power supply. This device can drive small DC motors or other inductive relay coils, and they include overcurrent, overvoltage, and flyback protection to ensure long operation. The PXI Relay Driver Module provides a commercial-off-the-shelf (COTS) option for controlling individual relays, regardless of relay types or configuration, while using the standard IVI-compliant NI-SWITCH driver software. This device is ideal for applications that need custom switching topologies, certain relay types, or switching as close to the device under test (DUT) as possible, while still utilizing COTS components and standard driver software.

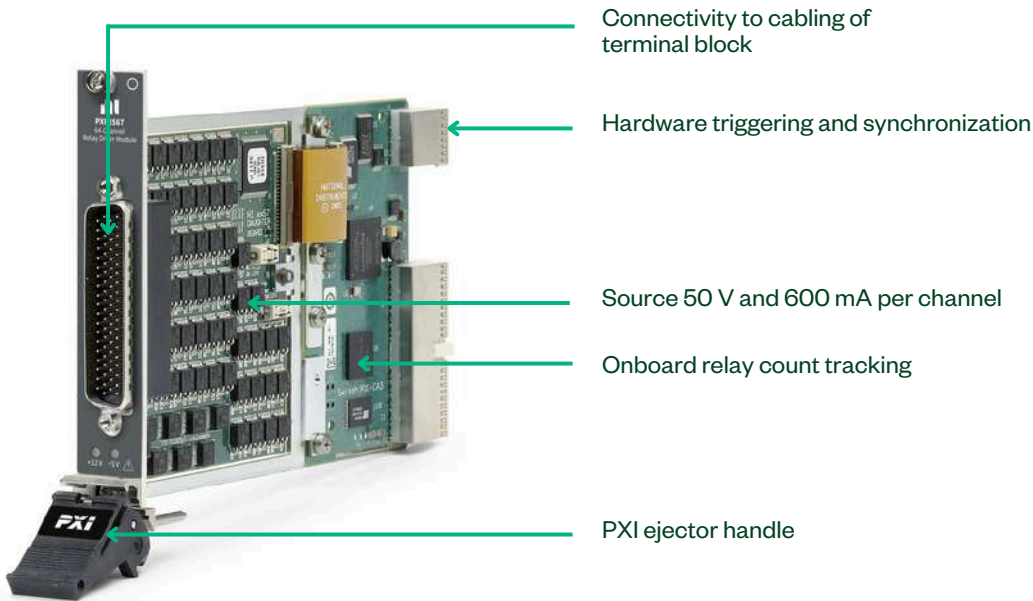
Additionally, the PXI Relay Driver Module offers advanced features, such as hardware triggering and scanning to improve throughput, offering a smarter way to tackle difficult applications in industries ranging from consumer electronics to aerospace and defense.

PXI Relay Driver Module

	Number of Channels	Maximum Drive Voltage with External Power	Maximum Drive Current
PXI-2567	64	50 V	25 A (per module) 600 mA (per channel)

Table 8: NI PXI Relay Driver Modules provide a commercial-off-the-shelf (COTS) solution for controlling individual relays, allowing you to select various relay types and design custom switch topologies, regardless of relay location.

Figure 30. Detailed View of the PXI-2567 Relay Driver module



# Key Features

## Drive External Relays

The PXI Relay Driver Module is capable of driving 64 external relays, including high-current, high-voltage, multipole, RF relays, and more. You can use the external relays independently as individual relays or combine them in a unique way to create a custom topology, such as a multiplexer or fault insertion unit (FIU).

The [PXI-2567](#) can provide up to 50 V and 600 mA of drive capacity per channel when connected to an external power supply. Without an external power supply, it can source up to 1.25 A from the 5 V pin or 500 mA from the 12 V pin provided by the PXI backplane. For added protection, the eight banks of eight relay drivers are protected against overvoltage and overcurrent conditions. When the condition clears, the channel is automatically reset so no disassembly of the module is required. Additionally, a Zener diode is included to protect against damage from inductive loads.

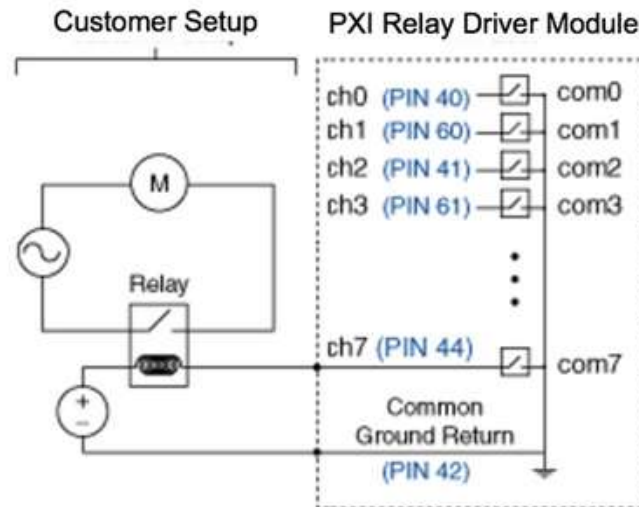


FIGURE 31

Example configuration for connecting a single-coil, non-latching relay using one channel of the PXI Relay Driver Module and an external power supply.

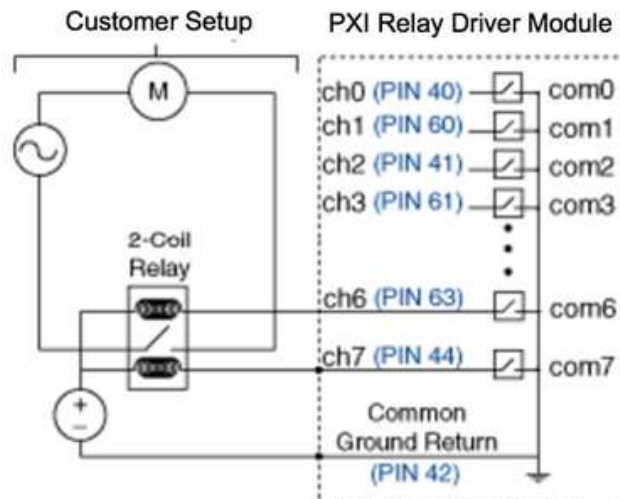


FIGURE 32

Example configuration for connecting a two-coil, latching relay using two channels of the PXI Relay Driver Module and an external power supply.

## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

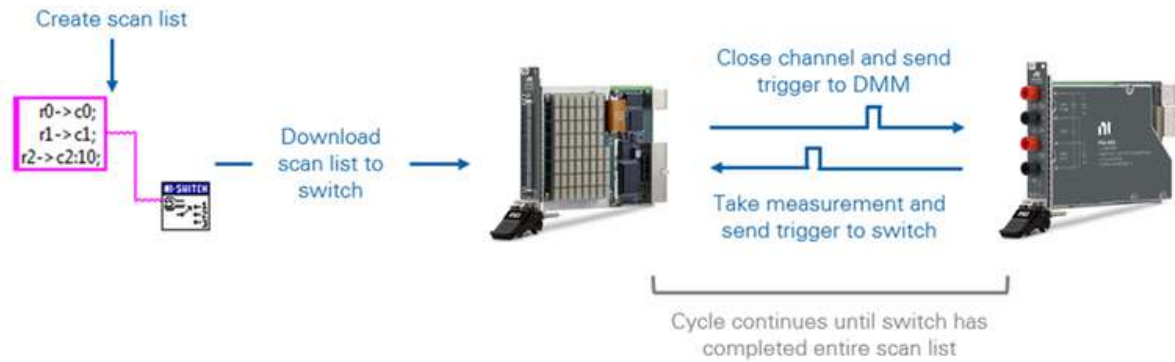


FIGURE 33

Depiction of the Scanning Process from the NI-SWITCH API to the DMM

# PXI Signal Insertion Switch Modules

PXI-2510, PXIe-2512, PXIe-2514, and PXIe-2515



FIGURE 34

PXIe-2512, PXIe-2514, PXI-2510

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Electromechanical, reed, and FET relay options
- Two analog buses for fault and signal insertion
- Up to 68 channels
- Up to 150 V or 40 A
- Onboard relay count tracking

## Built for Automated Test and Measurement

PXI Signal Insertion Switch Modules, also known as fault insertion units (FIUs), provide a set of feedthrough channels which make the switch transparent to the system when closed. You can open or short these channels to two fault buses, allowing you to simulate open or interrupted connections as well as shorts between pins, shorts to battery voltages, and shorts to ground on a per-channel basis. When controlled with the NI LabVIEW Real-Time Module, the PXI Signal Insertion Switch Module can validate the integrity of control systems including engine control units (ECUs) and full authority digital engine controls (FADECs). You can also use the FIU models for hardware-in-the-loop (HIL) applications and electronic reliability tests.

Additionally, NI switch modules offer advanced features, such as hardware triggering and onboard relay count tracking, providing a smarter way to tackle difficult applications in industries ranging from consumer electronics to aerospace and defense.

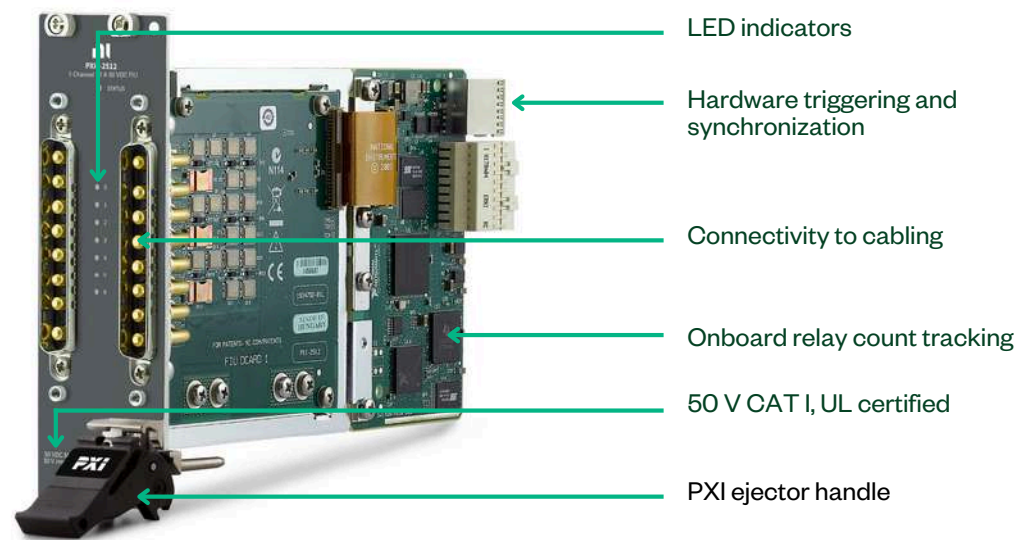


Table Title

	Number of Channels	Maximum Voltage	Maximum Current	Maximum Bandwidth	Relay Type
PXI-2510	68	150 V	2 A	6.5 MHz	EMR
PXIe-2512	7	50 V DC 30 V AC	10 A	800 kHz	FET
PXIe-2514	7	28 V DC 19.8 V AC	40 A	800 kHz	FET
PXIe-2515	32	150 V	2 A	50 MHz	EMR

Table 9: NI offers a variety of PXI Signal Insertion Switch Modules, varying in channel density, relay type, and voltage/current rating, allowing you to select the model that best fits your needs.

Figure 35. Detailed View of the PXIe-2512 Signal Insertion Module



# Key Features

## Hardware Fault Insertion

In many hardware-in-the-loop (HIL) test systems, hardware fault insertion or signal insertion is used to create signal faults between the electronic control unit (ECU) and the rest of the system to test, characterize, or validate ECU behavior under specific failure conditions. Fault insertion is most commonly used when it is imperative for a specific ECU to have both a known and an acceptable response to fault conditions—examples include ECUs for vehicles, aircraft, spacecraft, and machinery. To accomplish this, fault insertion units (FIUs) are inserted between the I/O interfaces of a test system and the ECU so the test system can switch between normal operation and fault conditions such as a short to battery, short to ground, or open circuit.

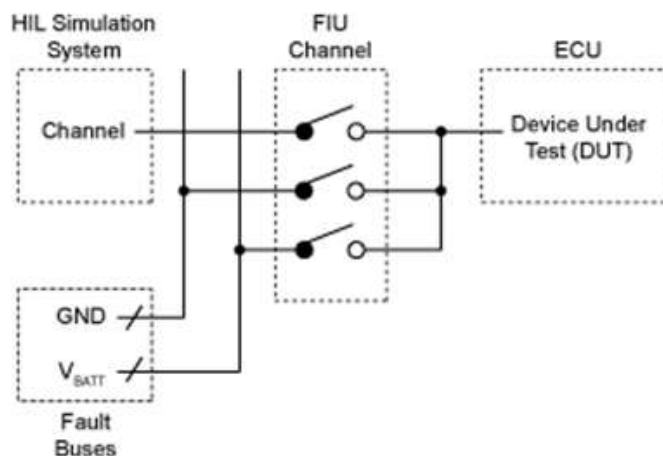


FIGURE 36

An FIU can insert fault conditions between automated test equipment, such as hardware-in-the-loop simulation systems and devices under test. This FIU schematic is capable of numerous example faults, including open circuit fault, short to ground, short to power, and pin-to-pin short.

## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

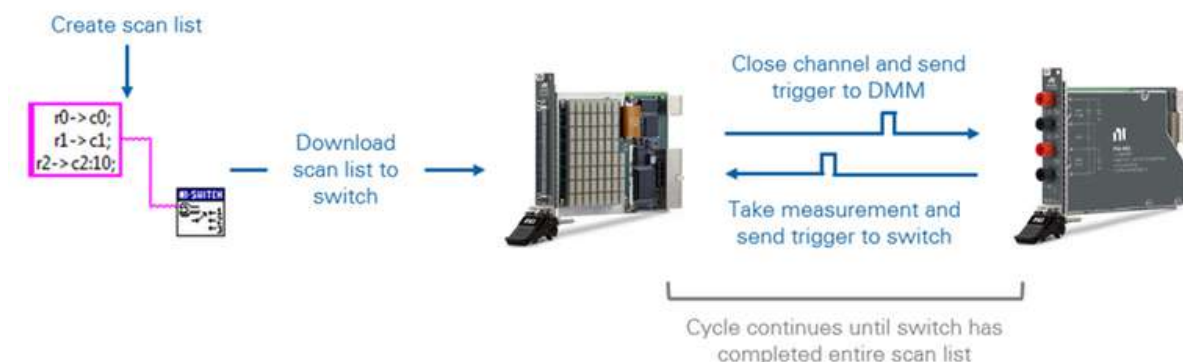


FIGURE 37

Depiction of the Scanning Process from the NI-SWITCH API to the DMM

# PXI Transfer Switch Modules

## PXI-2598 and PXI-2798



FIGURE 38

PXI-2598, PXI-2798

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Bandwidth up to 40 GHz
- Onboard relay count tracking
- Ability to store RF path calibration information in NI Switch Executive

## Built for Automated Test and Measurement

PXI Transfer Switch Modules have four connections and two possible switch positions, allowing you to perform basic signal routing or insert and remove components in a high-frequency signal path. These models boast excellent insertion loss, voltage standing-wave ratio (VSWR), and isolation parameters to minimize signal degradation, and have 50  $\Omega$  impedance that helps minimize reflections of the RF signal and protect your instruments.

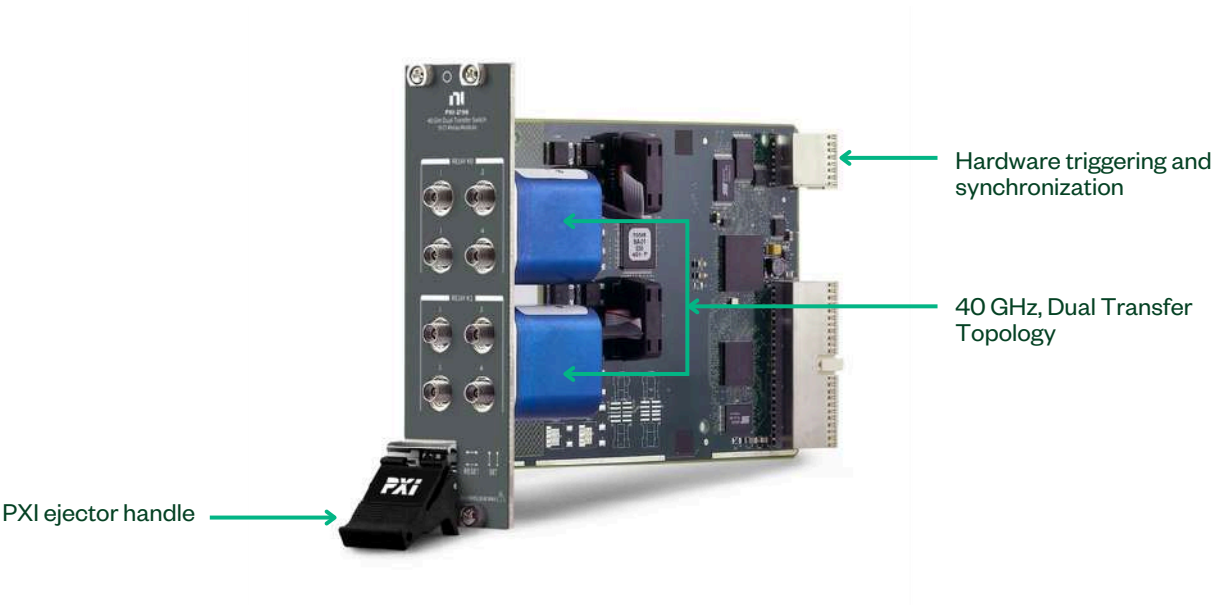
Additionally, NI switch modules offer advanced features, such as hardware triggering, onboard relay count tracking, and a wide variety of reconfigurable models, providing you the option to modify the topology of the switch based on your needs. These advanced features offer a smarter way to tackle difficult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

PXI Transfer Switch Modules

	Number of Relays	Relay Configuration	Maxum Bandwidth	Characteristic Impedance	Relay Type
PXI-2598	2	RF Transfer Switch	26.5 GHz	50 Ω	EMR
PXI-2798	2	RF Transfer Switch	40 GHz	50 Ω	EMR

Table 10: NI offers a variety of PXI Transfer Switch Modules with varying bandwidth, allowing you to select the model that best fits your needs.

Figure 39. Detailed View of the PXI-2798 Transfer Switch Module



# Key Features

## Synchronization and Integration

NI switches use the inherent timing and synchronization capabilities of the PXI platform to communicate with other instruments within the PXI chassis. Triggering 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.

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.

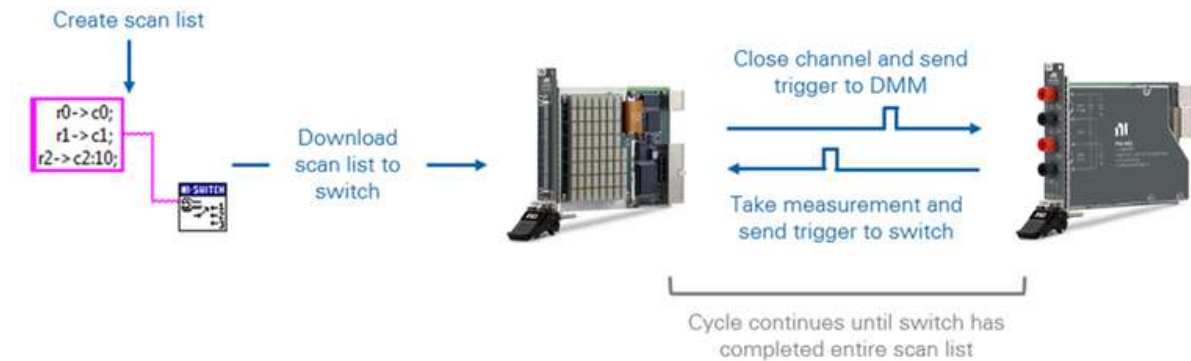


FIGURE 40

Depiction of the Scanning Process from the NI-SWITCH API to the DMM

# PXI Programmable Resistor Modules

## PXIe-2725 and PXIe-2727



FIGURE 41

PXIe-2727, PXIe-2725

- **Software:** Includes interactive Soft Front Panel API support for LabVIEW and text-based languages, shipping examples, and detailed help files
- Software configurable as an RTD simulator, potentiometer, or low-power resistive load
- Built-in DMM port for easy connectivity and path verification
- Up to 16 k $\Omega$  range
- Resolution options of 0.25  $\Omega$  and 1  $\Omega$
- Rated for 60 V or 300 mA

## Built for Automated Test and Measurement

PXI Programmable Resistor Modules replicate the behavior of resistance-based devices by controlling a series of relays that varies resistance across each channel. The ability to quickly and accurately vary resistance, with resolution down to 0.25  $\Omega$ , makes these devices well suited for simulating environmental conditions in hardware-in-the-loop (HIL) validation. Each PXI Programmable Resistor Module uses a 37-pin D-SUB connector on the front panel to provide access to all channels, as well as a 2x2 Micro-Fit connector for easy connection to a PXI Digital Multimeter (DMM). The driver software provides a simple user interface that accepts inputs in units of temperature or resistance, and configures the resistance across each channel, without needing to directly control individual relays.

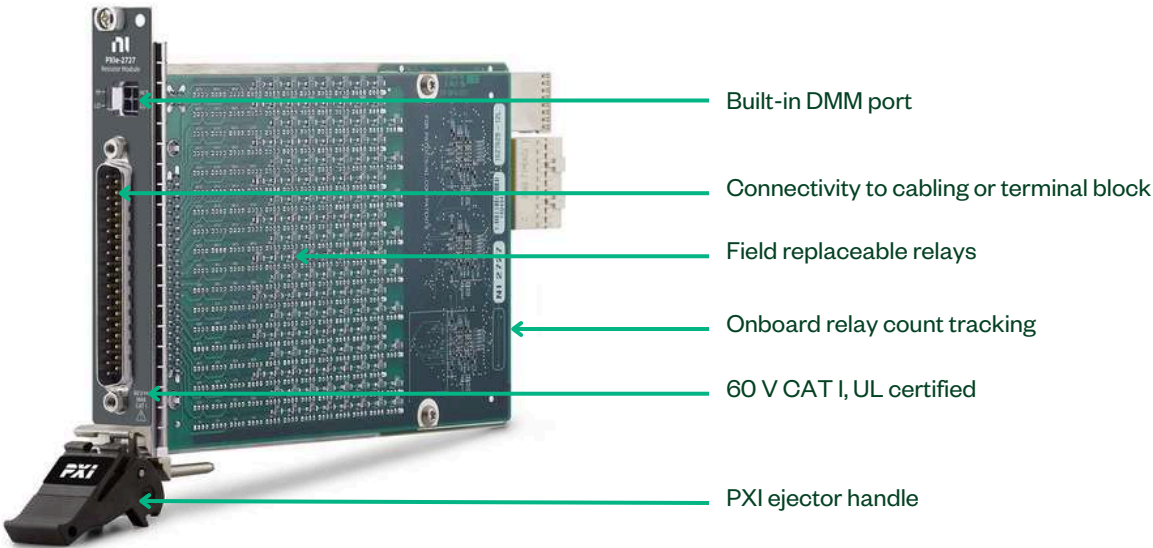


PXI Programmable Resistor Modules

	Number of Channels	Maximum Resistance	Resolution	Maximum Voltage	Maximum Current
PXIe-2725	18	255 Ω	1 Ω	60 V	300 mA
PXIe-2727	9	16 kΩ	0.25 Ω	60 V	300 mA

Table 11: NI offers a variety of PXI Programmable Resistor Modules, varying in resistance range, resolution, and density, allowing you to select the model that best fits your needs.

Figure 42. Detailed View of the PXIe-2727 Programmable Resistor Module



# Key Features

## Fully Programmable Resistance

Programmable resistors are test modules that replicate the behavior of resistance-based inputs and outputs such as potentiometers, RTDs, voltage dividers, and bridge elements. The total resistance across each channel, measured across the front connector terminals, is controlled by manipulating the circuit path resistance using relays to selectively route through discrete resistors. PXI Programmable Resistor Modules programmatically control the values of resistance appearing through an I/O connector, enabling usage in hardware-in-the-loop (HIL) validation, which performs rapid system tests during a variety of simulated system conditions.

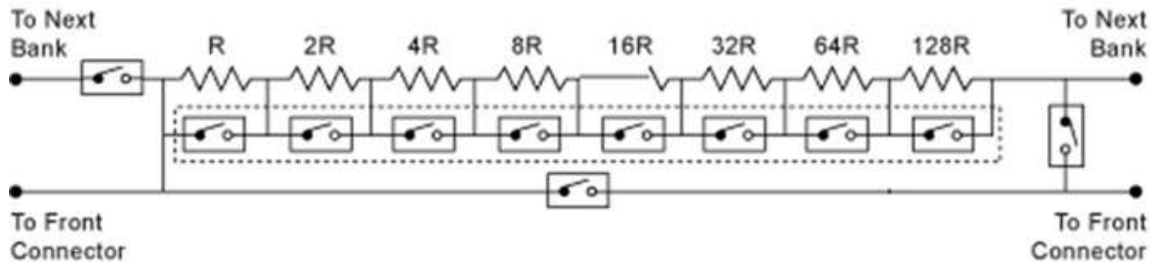


FIGURE 43

PXI Programmable Resistor Modules use banks of series resistors with optional, low-resistance parallel paths, enabled or disabled through relay actuation.

## NI-272x Reference VIs

Low-level control of individual relays is available through NI-SWITCH driver, which supports LabVIEW, C, C#, and others. However, this will require manual calculations, control of individual relays, and low-level programming, which is not ideal for quick resistance or temperature changes. For a higher-level starting point, use the [NI-272x driver](#), which is available for LabVIEW and includes reference VIs and example programs for using a PXI Programmable Resistor Module as an RTD simulator, programmable potentiometer, or low-power resistive load.

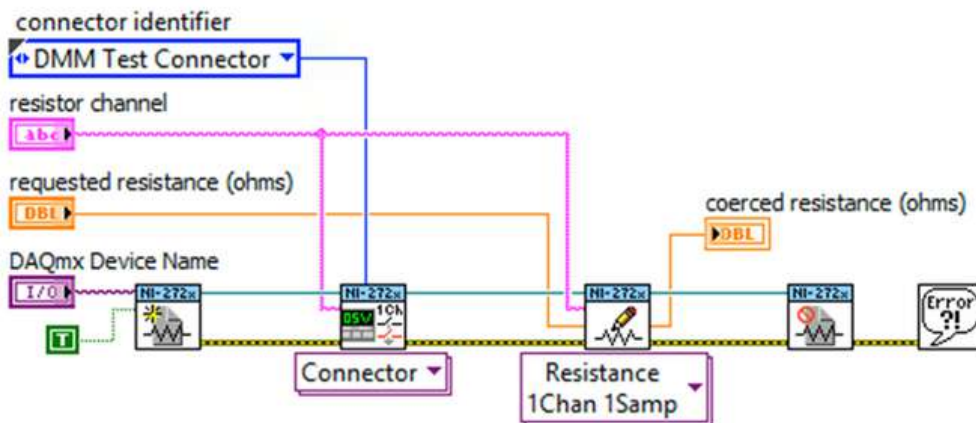


FIGURE 44

The NI-272x Reference VIs use a simple user interface that accepts inputs in units of temperature or resistance and configures the resistance across each channel.

# Software

## 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 select the device and open or close individual relays with a simple click. In addition, you can use the Debug Driver Session mode to monitor and debug the device during automated measurement. For example, you can monitor which individual relays are open/closed and how many times each relay has been used, while a LabVIEW application uses the same device in an automated application.

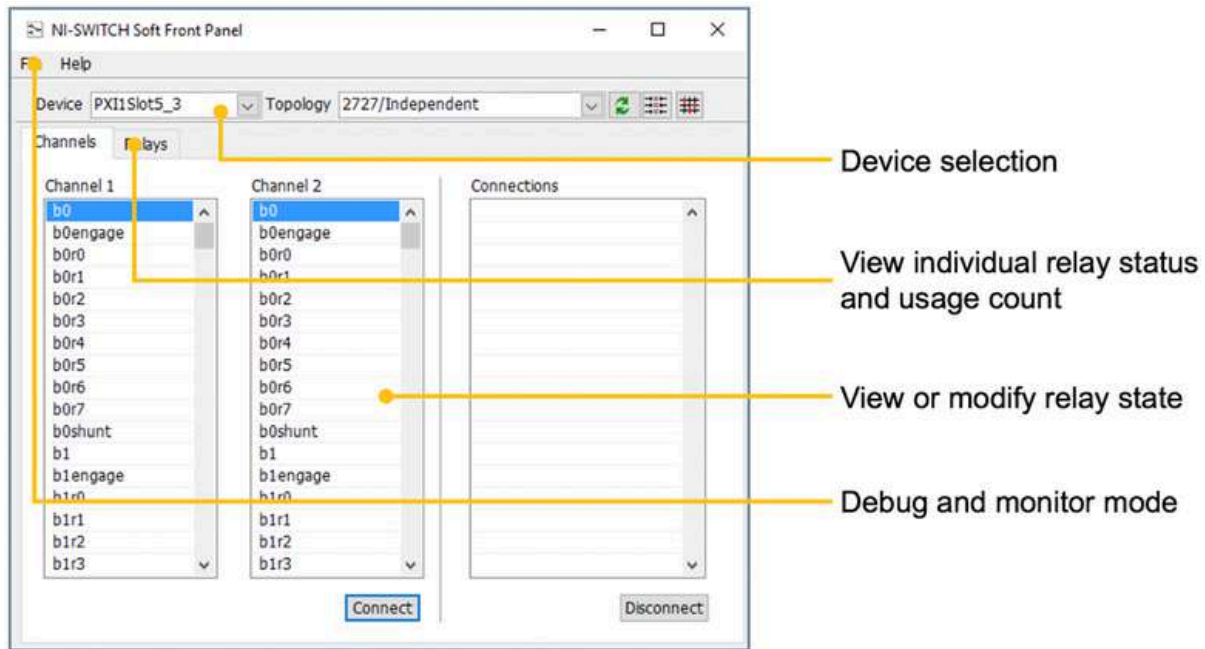


FIGURE 45 Use the NI-SWITCH Soft Front Panel for interactive control of your switches.

## NI-SWITCH 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, allowing you to control individual relays within the PXI Programmable Resistor Module. 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.

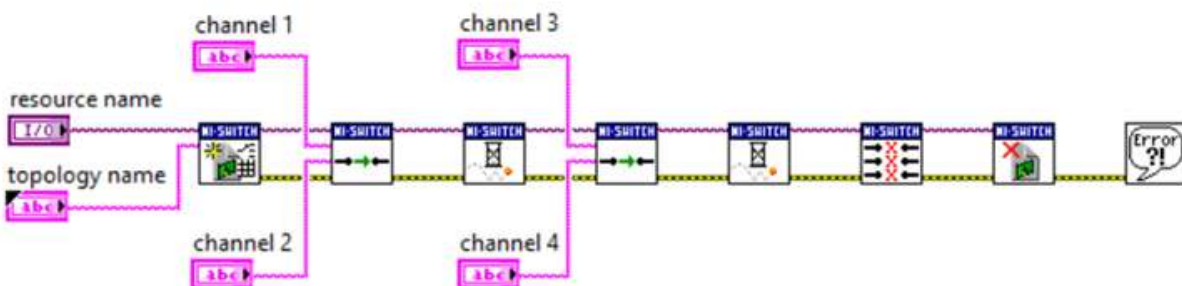


FIGURE 46 LabVIEW VI Using the NI-SWITCH API for Making Connections on a Switch.

## Switch Executive

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 NI TestStand, LabVIEW, LabWindows™ /CVI, and NI Measurement Studio™ software.

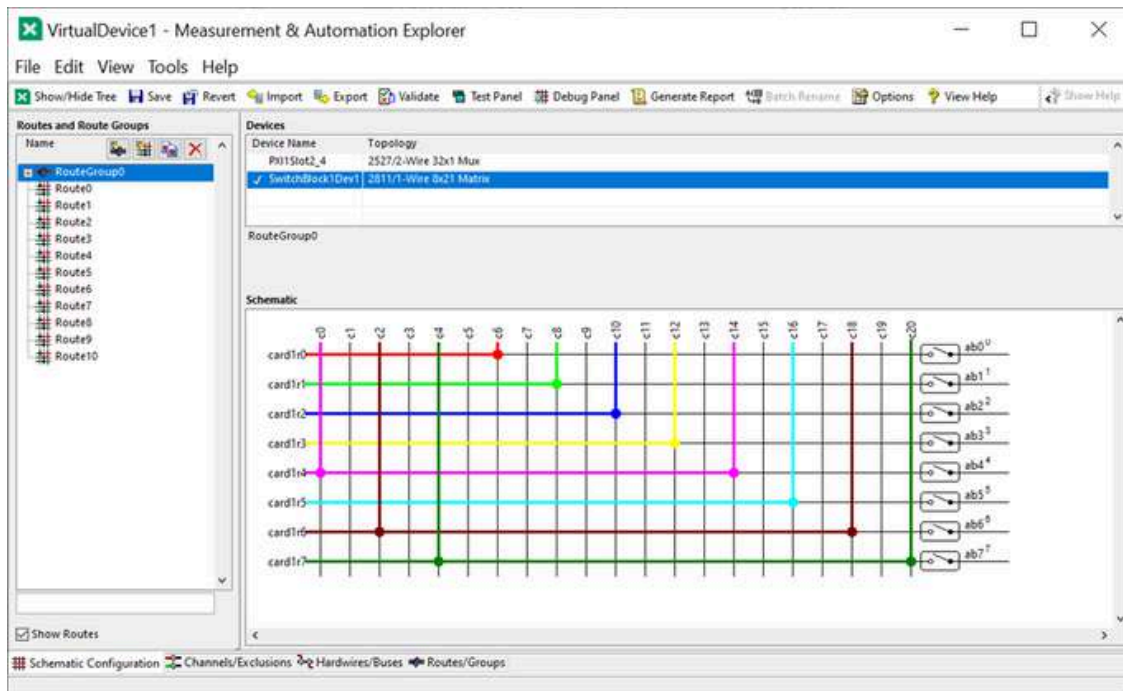


FIGURE 47  
Switch Executive Graphical Interface for Routing Connections.

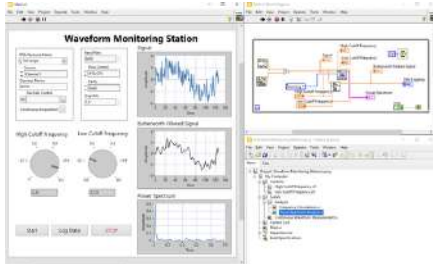
With Switch Executive you can:

- 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

# NI Software-The Right Tool for the Job

NI has a variety of software for engineers working on research, validation, and production test applications. Learn about our software that helps engineers perform quick ad-hoc tests, build an automated test system, automate data analysis and reporting, develop test sequences, and more.

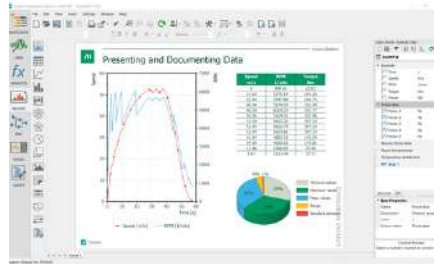
## LabVIEW



Graphical programming environment that engineers use to develop automated research, validation, and production test systems.

- Acquire data from NI and third-party hardware and communicate using industry protocols
- Use configurable, interactive display elements
- Take advantage of available analysis functions

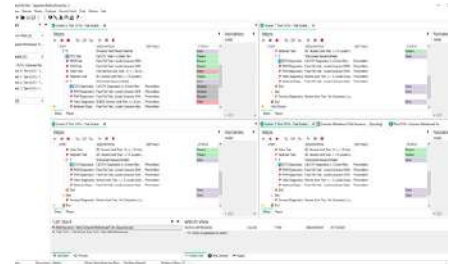
## DIAdem



Data analytics software for measurement data search, inspection, analysis, and automated reporting.

- Display data in multiple 2D-axis systems
- Perform calculations with a simple point-and-click interface
- Automate your measurement data analysis workflow, from import to analysis

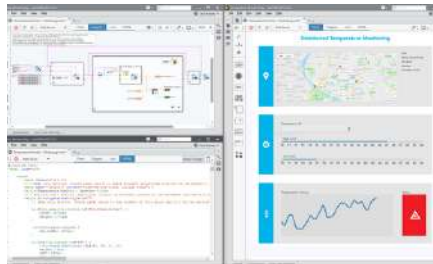
## TestStand



Test executive software that accelerates system development for engineers in validation and production.

- Call and execute tests in LabVIEW, Python, C/C++, or .NET
- Conduct complex tasks, such as parallel testing
- Create customer operator interfaces and robust tools for deployment and debugging

## G Web



Development software that helps engineers create web-based user interfaces without the need for traditional web development skills.

- Data transfer APIs for connecting to systems written in LabVIEW, Python, or C#
- Pre-built objects for data display and user input
- Included hosting on SystemLink™ Cloud

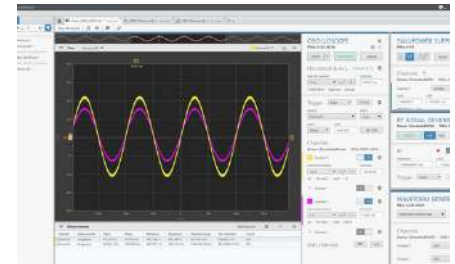
## FlexLogger™



No-code data acquisition software engineers use to build validation and verification test applications.

- Interactive visualization tools for monitoring tests with drag-and-drop charts, graphs, and controls
- Ability to set alarms that monitor single channels or groups for unexpected behavior

## InstrumentStudio™



Application software that simplifies setup and configuration of NI PXI hardware

- Customizable layouts for monitoring multiple instruments at once
- Interactively debug in tandem with code
- TDMS file export containing instrument settings, measurements, and raw data



# What Is PXI?

## A Platform Approach to Test and Measurement

Powered by software, PXI is a rugged PC-based platform for measurement and automation systems. PXI combines PCI electrical-bus features with the modular, Eurocard packaging of CompactPCI and then adds specialized synchronization buses and key software features. PXI is both a high-performance and low-cost deployment platform for applications such as manufacturing test, military and aerospace, machine monitoring, automotive, and industrial test. Developed in 1997 and launched in 1998, PXI is an open industry standard governed by the PXI Systems Alliance (PXISA), a group of more than 70 companies chartered to promote the PXI standard, ensure interoperability, and maintain the PXI specification.

### Software

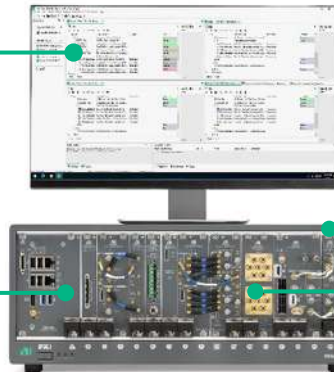
#### Test Management and Code Development

Code sequencing, database reporting, user management, operator interface, parallel execution, signal processing. LabVIEW, C/C++, .NET, Python

### Computer

#### PXI Embedded Controller

Windows and Real-Time OS options, Intel Xeon processing, peripheral ports, display output, integrated hard drive



### Timing and Synchronization

#### PXI Chassis

PCI Express Gen 3 throughput up to 24 GB/s sub-nanosecond latency, P2P streaming, integrated triggering

### Instrumentation

#### PXI Modules

DC to mmWave, oscilloscope, programmable power supply, switch/MUX, DMM, VSA, VSG, VST, AWG, SMU, DAQ

## Integrated with the Latest Commercial Technology

By leveraging the latest commercial technology for our products, we can continually deliver high performance and high-quality products to our users at a competitive price. The latest PCI Express Gen 3 switches deliver higher data throughput, the latest Intel multicore processors facilitate faster and more efficient parallel (multisite) testing, the latest FPGAs from Xilinx help to push signal processing algorithms to the edge to accelerate measurements, and the latest data converters from TI and ADI continually increase the measurement range and performance of our instrumentation.

### HIGHER DATA THROUGHPUT



PCI Express Gen 3

### PARALLEL TEST EXECUTION



Multicore Processors

### MEASUREMENT ACCELERATION



FPGAs

### INCREASED MEASUREMENT RANGE



Data Converters



# PXI Instrumentation

NI offers more than 600 different PXI modules ranging from DC to mmWave. Because PXI is an open industry standard, nearly 1,500 products are available from more than 70 different instrument vendors. With standard processing and control functions designated to a controller, PXI instruments need to contain only the actual instrumentation circuitry, which provides effective performance in a small footprint. Combined with a chassis and controller, PXI systems feature high-throughput data movement using PCI Express bus interfaces and sub-nanosecond synchronization with integrated timing and triggering.



## Oscilloscopes

Sample at speeds up to 12.5 GS/s with 5 GHz of analog bandwidth, featuring numerous triggering modes and deep onboard memory



## Digital Multimeters

Perform voltage (up to 1000 V), current (up to 3A), resistance, inductance, capacitance, and frequency/period measurements, as well as diode tests



## Digital Instruments

Perform characterization and production test of semiconductor devices with timing sets and per channel pin parametric measurement unit (PPMU)



## Waveform Generators

Generate standard functions including sine, square, triangle, and ramp as well as user-defined, arbitrary waveforms



## Frequency Counters

Perform counter timer tasks such as event counting and encoder position, period, pulse, and frequency measurements



## Source Measure Units

Combine high-precision source and measure capability with high channel density, deterministic hardware sequencing, and SourceAdapt transient optimization



## Power Supplies & Loads

Supply programmable DC power, with some modules including isolated channels, output disconnect functionality, and remote sense



## FlexRIO Custom Instruments & Processing

Provide high-performance I/O and powerful FPGAs for applications that require more than standard instruments can offer



## Switches (Matrix & MUX)

Feature a variety of relay types and row/column configurations to simplify wiring in automated test systems



## Vector Signal Transceivers

Combine a vector signal generator and vector signal analyzer with FPGA-based, real-time signal processing and control



## GPIB, Serial, & Ethernet

Integrate non-PXI instruments into a PXI system through various instrument control interfaces



## Data Acquisition Modules

Provide a mix of analog I/O, digital I/O, counter/timer, and trigger functionality for measuring electrical or physical phenomena

# Supporting Documentation

Table 12. PXI Switches Documentation

Document Type	Model
Getting Started Guide	<a href="#">PXI/PXIe Switches</a>
Specifications	<a href="#">PXI-2529</a> , <a href="#">PXIe-2529</a> , <a href="#">PXIe-2531</a> , <a href="#">PXI-2532B</a> , <a href="#">PXIe-2532B</a> , <a href="#">PXI-2533</a> , <a href="#">PXI-2534</a> , <a href="#">PXI-2535</a> , <a href="#">PXI-2536</a> , <a href="#">PXIe-2737</a> , <a href="#">PXIe-2738</a> , <a href="#">PXIe-2739</a> , <a href="#">PXI-2503</a> , <a href="#">PXIe-2524</a> , <a href="#">PXIe-2525</a> , <a href="#">PXIe-2526</a> , <a href="#">PXI-2527</a> , <a href="#">PXIe-2527</a> , <a href="#">PXI-2530B</a> , <a href="#">PXI-2575</a> , <a href="#">PXIe-2575</a> , <a href="#">PXI-2576</a> , <a href="#">PXI-2584</a> , <a href="#">PXI-2585</a> , <a href="#">PXI-2520</a> , <a href="#">PXI-2521</a> , <a href="#">PXI-2522</a> , <a href="#">PXI-2523</a> , <a href="#">PXI-2564</a> , <a href="#">PXI-2566</a> , <a href="#">PXI-2568</a> , <a href="#">PXI-2569</a> , <a href="#">PXIe-2569</a> , <a href="#">PXI-2571</a> , <a href="#">PXI-2586</a> , <a href="#">PXIe-2540</a> , <a href="#">PXIe-2541</a> , <a href="#">PXIe-2543</a> , <a href="#">PXIe-2544</a> , <a href="#">PXI-2545</a> , <a href="#">PXI-2546</a> , <a href="#">PXI-2547</a> , <a href="#">PXIe-2593</a> , <a href="#">PXI-2594</a> , <a href="#">PXI-2596</a> , <a href="#">PXI-2597</a> , <a href="#">PXIe-2746</a> , <a href="#">PXIe-2747</a> , <a href="#">PXIe-2748</a> , <a href="#">PXI-2796</a> , <a href="#">PXI-2797</a> , <a href="#">PXIe-2542</a> , <a href="#">PXI-2548</a> , <a href="#">PXI-2549</a> , <a href="#">PXI-2599</a> , <a href="#">PXI-2799</a> , <a href="#">SWB-2810</a> , <a href="#">SWB-2815</a> , <a href="#">SWB-2816</a> , <a href="#">SWB-2833</a> , <a href="#">SWB-2834</a> , <a href="#">PXI-2800</a> , <a href="#">PXI-2567</a> , <a href="#">PXI-2510</a> , <a href="#">PXIe-2512</a> , <a href="#">PXIe-2514</a> , <a href="#">PXIe-2515</a> , <a href="#">PXI-2598</a> , <a href="#">PXI-2798</a> , <a href="#">PXIe-2725</a> , <a href="#">PXIe-2727</a>

## Configure a Custom NI System

NI's online system advisors help you create a custom system based on your specific requirements. Use the advisor to choose compatible hardware, software, accessories, and services and then save your selections as configurations for easy quoting and purchasing later. Visit [ni.com/advisor](http://ni.com/advisor) to learn more.

# NI Hardware Services

All NI hardware includes a one-year warranty for basic repair coverage and calibration in adherence to NI specifications prior to shipment. PXI systems also include basic assembly and a functional test. NI offers additional entitlements to improve uptime and lower maintenance costs with service programs for hardware. Learn more at [ni.com/services/hardware](https://ni.com/services/hardware).

	Hardware	Standard	Premium	Description
Duration at Point of Sale	1 year; included	3 years; optional	3 years; optional	NI enhances warranty coverage with additional service benefits provided with a hardware service program.
Maximum Duration with Renewal	≤3 years with service program	≤3 years	≤3 years	NI maintains the high performance and availability of your hardware for up to three years with a hardware service program.
Extended Repair Coverage	•	•	•	NI restores your device's functionality and includes firmware updates and factory calibration; < 10 working days <sup>4</sup> + standard shipping.
System Configuration, Assembly, and Test <sup>1</sup>		•	•	NI technicians assemble, install software in, and test your system per your custom configuration prior to shipment.
Advanced Replacement <sup>2</sup>			•	NI stocks replacement hardware that can be shipped immediately if a repair is needed.
System Return Material Authorization (RMA) <sup>1</sup>			•	NI accepts the delivery of fully assembled systems when performing repair services.
Technical Support	•	•	•	NI provides access to support resources for your hardware.
Calibration Plan (Optional)		Standard	Expedited <sup>3</sup>	NI performs the requested level of calibration at the specified calibration interval for the duration of the service program.

<sup>1</sup> This option is only available for PXI, CompactRIO, and CompactDAQ systems.  
<sup>2</sup> This option is not available for all products in all countries. Contact your local NI sales engineer to confirm availability.  
<sup>3</sup> Expedited calibration is only available for the Traceable calibration level.  
<sup>4</sup> This applies to non-RF products only. Standard extended repair coverage for RF products is <15 working days + standard shipping.

## PremiumPlus Service Program

NI can customize the offerings listed above or offer additional entitlements such as on-site calibration, custom sparing, and lifecycle services through a [PremiumPlus Service Program](#). Contact your NI sales representative to learn more.

## Technical Support

NI hardware service programs and warranty include access to technical support provided by NI support agents during local business hours. Service requests can be managed online. Additionally, take advantage of NI's award-winning [online resources](#) and [communities](#).

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