

# 256-Crosspoint SSR Matrix Modules

## NI PXI-2533, NI PXI-2534 **NEW!**

- PXI-2533: 4x64 (1-wire)
- PXI-2534: 8x32 (1-wire)
- Switch capacity
  - $\pm 55$  VDC/30 VAC
  - 1 A switching/carry
  - 55 W
- 400 crosspoints/s
- Unlimited mechanical lifetime
- Unlimited simultaneous crosspoint connections
- 32,000-step scan list for determining scanning
- Fully software programmable
- Onboard relay count tracking

### Operating Systems

- Windows Vista/XP/2000

### Recommended Software

- LabVIEW
- LabVIEW Real-Time
- LabWindows™/CVI
- Measurement Studio
- NI Switch Executive
- NI TestStand

### Other Compatible Software

- Microsoft Visual Basic
- C/C++

### Driver Software (included)

- NI-SWITCH



## Overview

The National Instruments PXI-2533 and PXI-2534 high-density solid-state relay (SSR) matrix modules feature 256 crosspoints in a compact, single-slot, 3U PXI form factor. The NI PXI-2533 is configured as a 4x64 one-wire matrix and the NI PXI-2534 is configured as an 8x32 one-wire matrix. Because the modules use SSR technology, they offer unique benefits such as unlimited mechanical lifetime and the ability to route 55 V at 1 A on all channels simultaneously (unlimited simultaneous crosspoint connections). These features make the PXI-2533 and PXI-2534 ideal for routing general-purpose signals in high-density matrix applications. Use these modules with the NI PXI-4110 programmable power supply and the NI PXI-4071 7½-digit FlexDMM to build high-density automated test systems up to  $\pm 55$  VDC/30 VAC and 1 A.

## Software

All PXI switch modules from NI are shipped with NI-SWITCH, an IVI-compliant driver offering complete functionality for all switch modules. When programming high-channel-count switch modules such as the PXI-2533 and PXI-2534, switch management software like NI Switch Executive can help simplify programming. With NI Switch Executive, you gain increased development productivity by interactively configuring and naming switch modules, external connections, and signal routes. You also increase test code reuse and system performance using switch programming with NI TestStand test management software, the NI LabVIEW and LabWindows/CVI development environments, and NI Measurement Studio for Microsoft Visual Basic 6.0.

## Automatic Scanning

The PXI-2533 and PXI-2534 maximize throughput in automated test applications through 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-2533 and PXI-2534 modules with an instrument, such as the PXI-4071 7½-digit FlexDMM, which issues a trigger after each measurement.

## Connectivity

The PXI-2533 and PXI-2534 modules use a single 68-pin SCSI connector. You can connect signals to these modules using the NI SH68-68-S cable and the NI TBX-68 external terminal block.

## Ordering Information

NI PXI-2533.....	778572-33
NI PXI-2534.....	778572-34
Includes NI-SWITCH and NI-DAQmx driver software.	

### Accessories

NI TBX-68 connector block.....	777141-01
NI SH68-68-S 68-pin shielded cable .....	185262-01
NI Switch Executive	
Development System .....	778546-01
Deployment Engine .....	778548-00

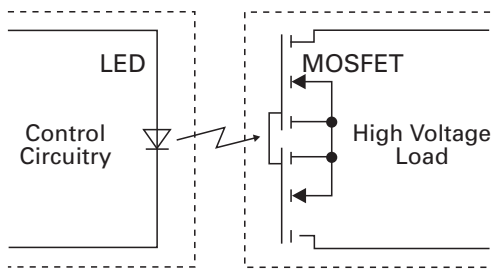
## BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to [ni.com/switches](http://ni.com/switches).

## 256-Crosspoint SSR Matrix Modules

### Solid-State Relays

A solid-state relay (SSR) is constructed using a photo-sensitive metal-oxide semiconductor field-effect transistor (MOSFET) that is controlled using a light emitting diode (LED). Light from the encapsulated LED actuates the photo-sensitive MOSFET and allows current to flow through it. LED actuation provides a galvanic isolation barrier (no charge can flow) between the control circuitry and the MOSFET. This is analogous to the isolation barrier formed between the magnetic coil and the mechanical armature in electromechanical relays.



Mixed Case Isolation Barrier

Figure 1. Solid-State Relay Construction

There are two main advantages to using SSR technology in PXI: extended lifetime and unlimited simultaneous crosspoint connections.

Because SSRs use solid-state devices (MOSFETS) to switch states instead of mechanical contacts, they have infinite mechanical lifetime. PXI switch modules that are based on SSR technology last longer and help reduce overhead in many applications by eliminating the need for frequent switching component replacement.

Compared to electromechanical relays, SSRs require very little power to transition between ON and OFF states. This feature is especially useful when building PXI switch systems. The PXI backplane supplies limited power to each slot in the chassis. Most high-density electromechanical relay-based matrix modules require more power than that available from the backplane to close all crosspoints simultaneously. SSR-based matrix modules are not limited in the same way due to the low power consumption of SSR technology.

The PXI-2533 and PXI-2534 256-crosspoint matrix modules are high-density switch products that incorporate SSR technology. Both modules offer unlimited mechanical lifetime and unlimited simultaneous crosspoint connections while providing the ability to switch up to 55 V at 1 A on all channels.

### Topology Diagrams

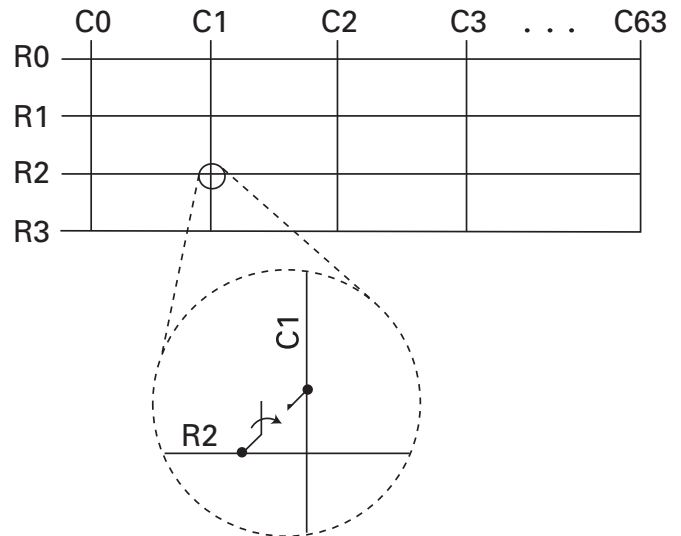


Diagram 1. PXI-2533 4x64 1-Wire

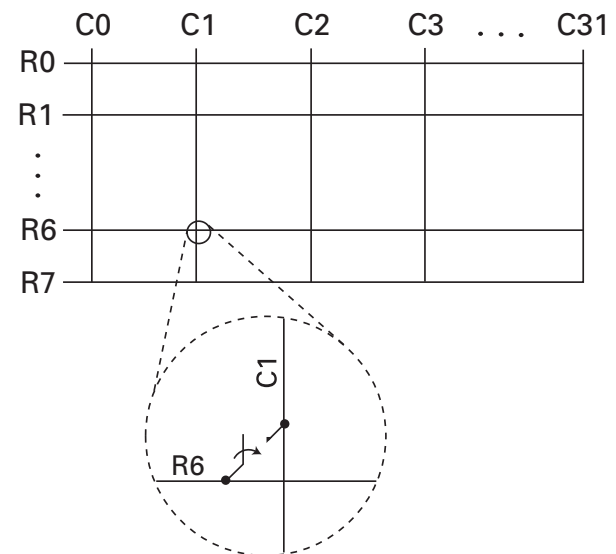


Diagram 2. PXI-2534 8x32 1-Wire

## 256-Crosspoint SSR Matrix Modules

### Specifications

All specifications are subject to change without notice.  
Visit [ni.com/manuals](http://ni.com/manuals) for the most current specifications.

#### Topologies

PXI-2533 .....	4x64 (1-wire) matrix
PXI-2534 .....	8x32 (1-wire) matrix

#### Input Characteristics

All input characteristics are DC, AC<sub>rms</sub>, or a combination unless otherwise specified. Typical values are representative of an average unit operating at room temperature (25 ± 3 °C) unless otherwise specified.

Maximum switching voltage .....	±55 VDC, 30 VAC <sub>rms</sub> (channel-to-ground and channel-to-channel)
Maximum switching current.....	1 A
Maximum switching power .....	55 W
DC isolation resistance.....	>2 GΩ, typical
Offset voltage .....	2 μV, typical
Total path resistance row-to-column Typical .....	1 Ω
Maximum.....	1.4 Ω

#### Dynamic Characteristics

FET operate time	
Typical .....	724 μs
Maximum.....	2.5 ms
Maximum scan rate .....	400 crosspoints/s
Simultaneous drive limit.....	256 relays
Expected relay life .....	Unlimited, when operated within specified limits

#### Trigger Characteristics

Input trigger	
Sources .....	PXI trigger lines 0-7
Minimum pulse width.....	70 ns
Output trigger	
Destinations.....	PXI trigger lines 0-7
Pulse width .....	Programmable (1 to 62 μs)

#### Physical Characteristics

Relay type .....	Solid-state relay (SSR)
I/O connectors.....	68-pin male SCSI
Power requirement .....	1 W at 3.3 V, typical 8 W at 5 V, typical (all crosspoints closed)
Dimensions.....	3U, single-slot PXI
Weight.....	300 g (12 oz)

#### Environment

Operating temperature .....	0 to 55 °C
Storage temperature.....	-20 to 70 °C
Relative humidity .....	5 to 85%, noncondensing
Pollution degree.....	2

Approved at altitudes up to 2,000 m.

### Safety and Compliance

#### 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 61010-1, CSA 61010-1

**Note:** For UL and other safety certifications, refer to the product label or visit [ni.com/certification](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

#### Electromagnetic Compatibility

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

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

**Note:** For EMC compliance, operate this device according to product documentation.

#### CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

**Note:** Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit [ni.com/certification](http://ni.com/certification), search by model number or product line, and click the appropriate link in the Certification column.

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NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit [ni.com/training](http://ni.com/training).

## Professional Services

Our NI Professional Services team is composed of NI applications and systems engineers and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and

integrators. Services range from start-up assistance to turnkey system integration. Visit [ni.com/alliance](http://ni.com/alliance).



## OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit [ni.com/oem](http://ni.com/oem).

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We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit [ni.com/ssp](http://ni.com/ssp).

## Hardware Services

### NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with [ni.com/pxiadvisor](http://ni.com/pxiadvisor).

### Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit [ni.com/calibration](http://ni.com/calibration).

### Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit [ni.com/services](http://ni.com/services).



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