High-Density Multiconfiguration Matrix

NI PXI-2532

- 512-crosspoint matrix in a single 3U PXI slot
- 4x128 (1-wire), 8x64 (1-wire), 4x64 (2-wire), and 8x32 (2-wire) matrix configurations
- Switch capacity
  - Up to 100 VDC/100 VAC
  - Up to 0.5 A switching/carry
- 2,000 cycles/s
- 32,000-step scan list for deterministic scanning
- Fully software programmable
- Onboard relay count tracking
- Multiple-module synchronization with hardware triggers
- Sixteen 2x16 matrix banks for custom matrix configurations

Operating Systems
- Windows 2000/NT/XP

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

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

Driver Software (included)
- NI-SWITCH
- NI-DAQmx

Compliance
- UL
- CE

Overview

The National Instruments PXI-2532 is a 512-crosspoint, high-speed matrix switch module. With the largest matrix size available in a 3U PXI slot, the NI PXI-2532 offers ultrahigh-density switch configurations in PXI. With the ability to create up to a 4x2176 or 8x1088 1-wire matrix in a single PXI chassis and even larger configurations with multichassis solutions, the PXI-2532 is ideal for high-channel-count automated test configurations. Featuring compact reed relays with switching speeds up to 2000 cycles/s and the ability to synchronize with instruments, the PXI-2532 provides maximum throughput in a test system for signals up to 100 VDC/100 VAC or 0.5 A.

Matrix Operation

The PXI-2532 is a general-purpose matrix used to route referenced or differential signals. Through software, you can control the matrix to connect any row to any column. One of the key advantages of this module is its adaptability to your switching needs. You can configure the PXI-2532 in four different matrix configurations by using the NI terminal blocks. For example, you can create a 4x128, 1-wire matrix by using the TB-2640 terminal block with a PXI-2532 module. You can easily transform the same PXI-2532 module into an 8x64, 1-wire matrix by simply replacing the TB-2640 with a TB-2641 terminal block.

Because the PXI-2532 is built with sixteen 2x16 matrices, you can also create matrix sizes outside of the TB-264x configurations. Other 1-wire configurations could include a 16x32 matrix or four independent 4x32 matrices. In a 2-wire configuration, you could build a dual 4x32 or 16x16 matrix. In its design, the PXI-2532 provides the granularity needed to scale to many different configurations, so it can be reused in application after application. Contact NI for more information on creating custom configurations.

Relay Count Tracking

The PXI-2532 counts relay closures on each of its 512 relays. Relay counts are incremented each time a relay is actuated. The counts, stored onboard the module, are retrievable programmatically and can be used for predictive maintenance to reduce unexpected system downtime.

Automatic Scanning

The PXI-2532 maximizes 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-2532 with an instrument, such as the NI PXI-4070 6½-digit FlexDMM, which issues a trigger after each measurement.

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High-Density Multiconfiguration Matrix

Signal Connections

Several solutions are available for your signal connections. Terminal blocks provide connectivity to strain-relieved 0.050 in. pitch headers ideal for ribbon cable. Mass interconnect solutions are also available from industry leaders such as Virginia Panel and MAC Panel. Contact NI for information on these products or for information on creating your own custom connectivity solutions.

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, consider using NI Switch Executive.

NI Switch Executive Software

NI Switch Executive is an intelligent switch management and routing application. 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 with switch programming in conjunction with National Instruments TestStand test management software, LabVIEW and LabWindows/CVI development environments, and Measurement Studio for Microsoft Visual Basic 6.0. Ultimately, NI Switch Executive simplifies switch system configuration and increases test performance, thus lowering your cost of test.

Ordering Information

NI PXI-2532 778572-32
Includes switch module and NI-SWITCH driver software

Accessories

NI TB-2640 4x128 Terminal Block 779056-01
NI TB-2641 8x64 Terminal Block 779056-03
NI TB-2643 4x64 Terminal Block 779056-07
NI TB-2644 8x32 Terminal Block 779056-09
NI Switch Executive
Development System 778546-01
Deployment Engine 778548-00

Specifications

Input Characteristics

All input characteristics are DC, AC_{pk}, or a combination unless otherwise specified.

Maximum switching voltage	
channel-to-ground	100 V
channel-to-channel	100 V, CAT I
Maximum switching current	0.5 A (per channel)
Maximum carry current	0.5 A (per channel)
Maximum switching power	10 W (per channel)
DC path resistance	
Initial	<1 Ω
End of life	≥2 Ω
Open channel	>1 GΩ

Transfer Characteristics

Thermal emf	
1-wire	<50 µV
2-wire	<20 µV
Bandwidth (-3 dB)	
1-wire row/column	>30 MHz
2-wire row/column	>25 MHz
Crosstalk (typical) – channel to channel, 50 Ω system	
10 kHz	<-89 dB
100 kHz	<-73 dB
1 MHz	<-54 dB
10 MHz	<-36 dB
Isolation (typical) – open channel	
10 kHz	>91 dB
100 kHz	>71 dB
1 MHz	>51 dB
10 MHz	>32 dB

Dynamic Characteristics

Maximum cycle speed	2000 cycles/s
Relay operate time	0.25 ms
Release time	0.25 ms
Simultaneous drive limit	40 relays
Expected relay life	
Mechanical	10^9 cycles
Electrical (resistive)	
10 V, 100 mA	10^8 cycles
25 V, 400 mA	$5x10^6$ cycles
60 V, 160 mA	10^6 cycles

Physical

Relay type	reed
Relay contact material	rhodium
I/O connectors (2)	160 pos, Samtec BTE-EM
Terminal block connector	Standard 0.050 in. pitch headers
Dimensions	10 by 16 cm (3.9 by 6.3 in.) single slot, 3U

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	2000 m, maximum

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

Electromagnetic Compatibility

CE, C-Tick, and FCC Part 15 (Class A) Compliant

Emissions	EN 55011 Class A at 10 m FCC Part 15A above 1 GHz
Immunity	EN 61326:1997 +A2:2001, Table 1

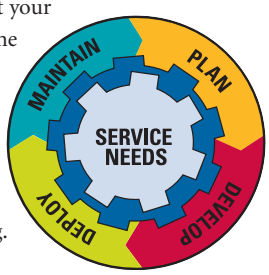
CE Compliance CE

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

NI Services and Support

NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit ni.com/services.



Training and Certification

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.

Professional Services

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide NI 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.

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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.

Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at ni.com/support.

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit 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.

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.

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.

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