SPECIFICATIONS

NI PXI-2533

256-Crosspoint SSR Matrix

This document lists specifications for the NI PXI-2533 256-crosspoint, SSR matrix (NI 2533). All specifications are subject to change without notice. Visit *ni.com/manuals* for the most current specifications.

Topology	1-wire 4 × 64 matrix

Caution To ensure the specified EMC performance, operate this product only with shielded cables and accessories.

Caution Refer to the *Read Me First: Safety and Electromagnetic Compatibility* document for important safety and electromagnetic compatibility information. To obtain a copy of this document online, visit *ni.com/manuals* and search for the document title.

Related Information

Refer to the NI Switches Help for detailed topology information.

About These Specifications

Specifications characterize the warranted performance of the instrument under the stated operating conditions.

Typical Specifications are specifications met by the majority of the instrument under the stated operating conditions and are tested at 23 °C ambient temperature. Typical specifications are not warranted.

All voltages are specified in DC, AC_{pk}, or a combination unless otherwise specified.

Caution The protection provided by the NI 2533 can be impaired if it is used in a manner not described in this document.

Input Characteristics

Maximum switching voltage (channel-to-ground and channel-to-channel)	±55 VDC, 30 VAC_{rms}
Maximum switching power	55 W
Maximum switching current	1 A

Note Switching inductive loads (for example, motors and solenoids) can produce high voltage transients in excess of the module's rated voltage. Without additional protection, these transients can interfere with module operation and impact relay life. For more information about transient suppression, visit *ni.com/info* and enter the Info Code `induct`.

DC isolation resistance	>2 GΩ, typical
Offset voltage	2 µV, typical
Total path resistance, row-to-column	
Typical	1 Ω
Maximum	1.4 Ω

RF Performance Characteristics

Typical single crosspoint bandwidth (50 Ω system, one row to one column)	>1.5 MHz
Typical crosstalk (50 Ω system)	
10 kHz	<-40 dB
100 kHz	<-20 dB

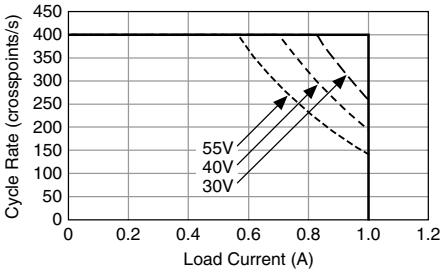
Dynamic Characteristics

SSR operate time[1]	
Typical	724 µs
Maximum	2.5 ms

Note Certain applications may require additional time for proper settling.

Maximum scan rate	400 crosspoints/s (when switching <20 V and 1 A, refer to the following figure for other voltages)
Simultaneous drive limit	256 relays
Expected relay life	Unlimited, when operated within specified limits

Figure 1. SSR Cycle Frequency Derating by Load Current and Load Voltage



Related Information

Refer to the NI Switches Help for information about including additional settling time.

[1] Operate time is the time from trigger received by hardware to switch output activation.

Trigger Characteristics

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

Physical Characteristics

Relay type	Solid-state relay (SSR)
I/O connector	68-pin male SCSI
Power requirement	1 W at 3.3 V, typical, 8 W at 5 V, typical (all crosspoints closed)
Dimensions (L × W × H)	3U, one slot, PXI/cPCI module, 21.6 × 2.0 × 13.0 cm (8.5 × 0.8 × 5.1 in.)
Weight	238 g (8.4 oz)

Environment

Operating temperature	0 °C to 55 °C
Storage temperature	-40 °C to 70 °C
Relative humidity	5% to 85%, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m

Indoor use only.

Shock and Vibration

Operational Shock	30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC 60068-2-27. Test profile developed in accordance with MIL-PRF-28800F.)

Random Vibration	
Operating	5 Hz to 500 Hz, 0.3 g_{rms}
Nonoperating	5 Hz to 500 Hz, 2.4 g_{rms} (Tested in accordance with IEC 60068-2-64. Nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

Diagrams

Figure 2. NI 2533 Hardware Diagram

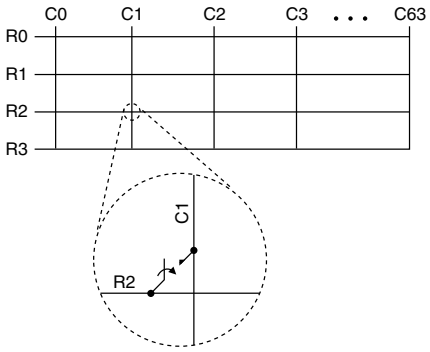
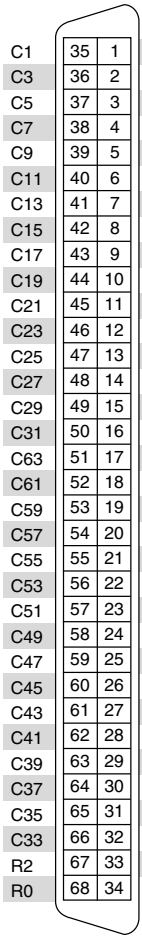


Figure 3. NI 2533 Connector Pinout



Related Information

For topology-specific connection information, refer to your device in the NI Switches Help.

Accessories

Visit *ni.com* for more information about the following accessories.

Caution NI products typically must be operated with shielded cables and accessories to ensure compliance with Electromagnetic Compatibility (EMC) requirements. To determine if shielded cables or accessories are required for this

product, refer to the EMC specifications in the *Electromagnetic Compatibility* section of this document. If shielded cables or accessories are required for EMC compliance, do not use unshielded cables or accessories unless they are installed in a shielded enclosure with properly designed and shielded input/output ports, and are connected to the NI product using a shielded cable. If unshielded cables or accessories are not properly installed and shielded, the EMC specifications for the product are no longer guaranteed.

Table 1. NI Accessories for the NI 2533

Accessory	Part Number
NI TB-2633 matrix terminal block	780270-01
NI TBX-68 unshielded, I/O connector block with DIN-rail mounting	777141-01
SH68-68S shielded cable, 1 m	185262-01
SH68-68S shielded cable, 2 m	185262-02
SH68-68S shielded cable, 5 m	185262-05

Compliance and Certifications

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards 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 the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for sensitive electrical equipment for measurement, control, and laboratory use:

- EN 61326-2-1 (IEC 61326-2-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe,

Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations and certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

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

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the *Minimize Our Environmental Impact* web page at *ni.com/environment*. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

电子信息产品污染控制管理办法（中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 National Instruments 中国 RoHS 合规性信息，请登录 `ni.com/environment/rohs_china`。(For information about China RoHS compliance, go to `ni.com/environment/rohs_china`.)

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