

NI PXI-2521 Specifications

40-Channel DPST Relay Module

This document lists specifications for the NI PXI-2521 general-purpose relay module. All specifications are subject to change without notice. Visit ni.com/manuals for the most current specifications.



Caution The protection provided by the NI PXI-2521 can be impaired if it is used in a manner not described in this document.

Topology 40-channel DPST, non-latching

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 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.



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

Input Characteristics

Maximum switching voltage

Channel-to-channel 150 V

Channel-to-ground 150 V, CAT I



Caution This module is rated for Measurement Category I and intended to carry signal voltages no greater than 150 V. This module can withstand up to 800 V impulse voltage. Do *not* use this module for connection to signals or for measurements within

Categories II, III, or IV. Do not connect to MAINS supply circuits (for example, wall outlets) of 115 or 230 VAC. Refer to the *Read Me First: Safety and Electromagnetic Compatibility* document for more information on measurement categories.



Caution When hazardous voltages ($>42.4 \text{ V}_{\text{pk}}/60 \text{ VDC}$) are present on any relay terminal, safety low-voltage ($\leq 42.4 \text{ V}_{\text{pk}}/60 \text{ VDC}$) cannot be connected to any other relay terminal.



Caution The switching power is limited by the maximum switching current, the maximum voltage, and must not exceed 60 W, 62.5 VA.

Maximum switching power (per channel) 60 W, 62.5 VA (DC to 60 Hz)

Maximum current
(switching or carry, per channel) 2 A

Simultaneous channels at maximum
current ($\leq 55^\circ\text{C}$) 40

Minimum switching conditions 20 mV/1 mA



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 `relayflyback`.

DC path resistance

Initial $<0.5 \Omega$

End-of-life $\geq 1.0 \Omega$

DC path resistance typically remains low for the life of the relay. At the end of relay life, the path resistance rises rapidly above 1Ω . Load ratings apply to relays used within the specification before the end of relay life.

Thermal EMF (typical at 23°C) $12 \mu\text{V}$

Bandwidth (-3 dB , 50Ω termination, typical at 23°C)

1-wire $\leq 30 \text{ MHz}$

2-wire $\leq 25 \text{ MHz}$

Crosstalk (typical at 23°C , 50Ω termination)

Channel-to-channel

10 kHz $\leq -75 \text{ dB}$

100 kHz $\leq -50 \text{ dB}$

Isolation (typical at 23°C , 50Ω termination)

Open channel

10 kHz $\geq 75 \text{ dB}$

100 kHz $\geq 55 \text{ dB}$

Dynamic Characteristics

Relay operate time

Typical	1 ms
Maximum.....	3.4 ms

Simultaneous drive limit..... 40 relays



Note Certain applications may require additional time for proper settling. For information about including additional settling time, refer to the *NI Switches Help*.

Expected relay life

Mechanical.....	1×10^8 cycles
Electrical (resistive)	
30 V, 1 A.....	5×10^5 cycles
30 V, 2 A.....	1×10^5 cycles



Note The relays used in the NI PXI-2521 are field replaceable. Refer to the *NI Switches Help* for information about replacing a failed relay.

Trigger Characteristics

Input trigger

Sources.....	PXI trigger lines 0-7
Minimum pulse width.....	150 ns



Note The NI PXI-2521 can recognize trigger pulse widths less than 150 ns if you disable digital filtering. For information about disabling digital filtering, refer to the *NI Switches Help*.

Output trigger

Destinations	PXI trigger lines 0-7
Pulse width	Programmable (1 μ s to 62 μ s)

Physical Characteristics

Relay type	Electromechanical, non-latching
Relay contact material	Palladium-ruthenium, gold covered
I/O connector	160 DIN 41612, 160 positions, male
PXI power requirement	7 W at 5 V, 2.5 W at 3.3 V

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	182 g (6.4 oz)

Environment

Operating temperature	0 °C to 55 °C
Storage temperature	-20 °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 to 500 Hz, 0.3 g _{rms}
Nonoperating	5 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 1 shows the NI PXI-2521 hardware diagram.

Figure 1. NI PXI-2521 Power-On State

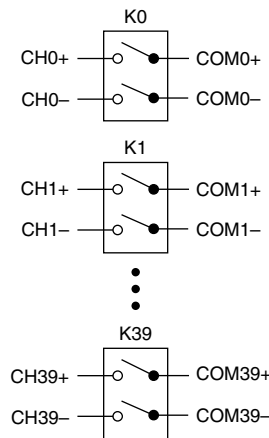
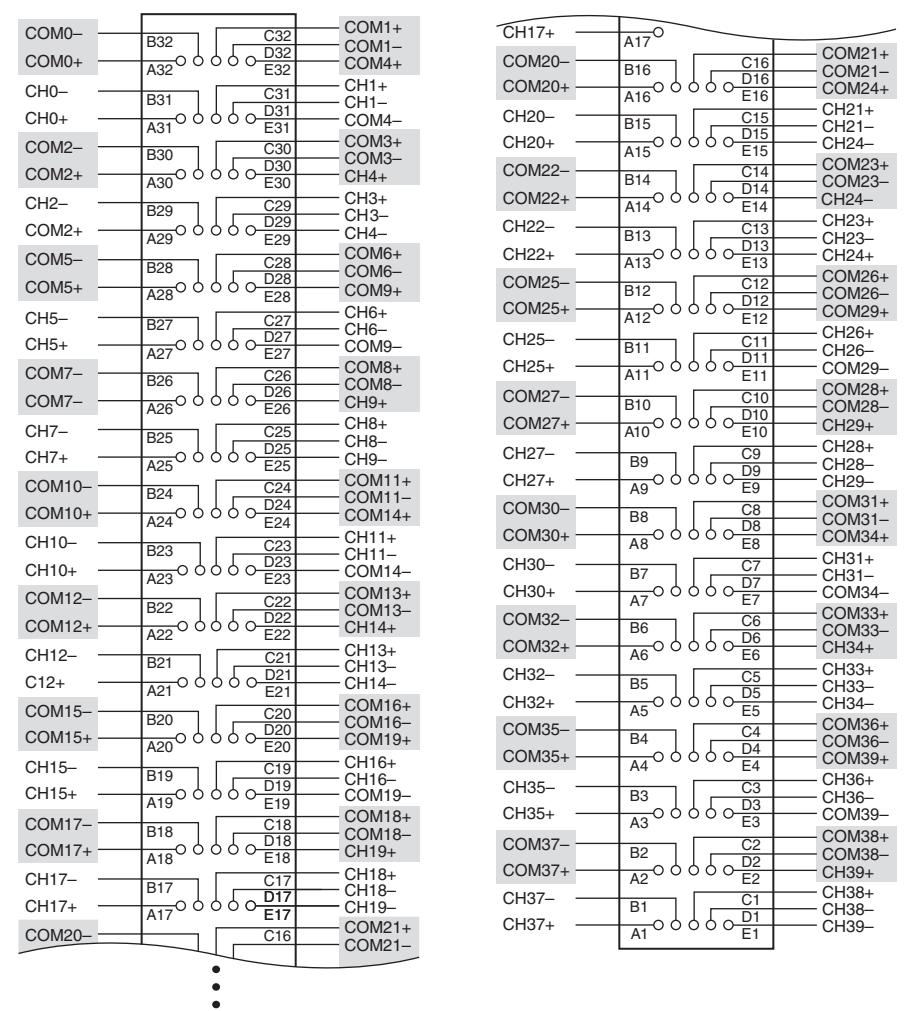


Figure 2 shows the NI PXI-2521 connector pinout.

Figure 2. NI PXI-2521 Connector Pinout



Accessories

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

Table 1. NI Accessories for the NI PXI-2521

Accessory	Part Number
DIN160 to 50 Pin DSUB switch cable, 1 m	782417-03
DIN160 to DIN160 switch cable, 1 m	782417-02
DIN160 to bare wire switch cable, 1 m	782417-01
Relay replacement kit	782461-10

Compliance and Certifications

Safety

This product meets 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 the [Online Product Certification](#) section.

Electromagnetic Compatibility

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

- EN 61326-1 (IEC 61326-1): 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

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

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

Online Product Certification

To obtain product certifications and the Declaration of Conformity (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 products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国 RoHS）



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