

## DEVICE SPECIFICATIONS

# PXI-2584

### 300 V CAT II, 600 V CAT I Multiplexers

This document lists specifications for the PXI-2584 high-voltage multiplexer switch module. All specifications are subject to change without notice. Visit [ni.com/manuals](http://ni.com/manuals) for the most current specifications.

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## PXI-2584 Specifications

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*Specifications* characterize the warranted performance of the instrument under the stated operating conditions. Data in this document are *Specifications* unless otherwise noted.

*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<sub>pk</sub>, or a combination unless otherwise specified.



**Caution** The protection provided by the PXI-2584 can be impaired if it is used in a manner not described in this document.

# Topology

Refer to the *NI Switches Help* at [ni.com/manuals](http://ni.com/manuals) for detailed topology information.

Topologies	1-wire 12 × 1 multiplexer
	1-wire dual 6 × 1 multiplexers
	2-wire 6 × 1 multiplexer
	2-wire 11 × 1 interleaved multiplexer
	Independent

## Input Characteristics



**Caution** The PXI-2584 is not EMC protected and may generate emissions interference or disturbance. Relay contact actuation can cause unwanted emission disturbance in which case the installer or user will be required to take suppression measures such as, shielded cables, metal conduits, grounding, filtering, and protection techniques necessary to mitigate the source of interference or disturbance. The PXI-2584 is intended for use in industrial installations in which the user provides EMC controls.



**Caution** When hazardous voltages ( $>42.4$  Vpk/60 V DC) are present on any channel, safety low-voltage ( $\leq 42.4$  Vpk/60 V DC) cannot be connected to any other channel.



**Caution** This module is rated for 300 V Category II and 600 V Category I. This module can withstand up to 2,500 V impulse voltage. Do not use this module for connection to signals or for measurements within Categories III or IV. Do not connect this module to MAINS Category II circuits when operated above 300 V.

### Maximum switching voltage

Channel-to-ground	300 V, Measurement Category II 600 V DC, V ACpk, Measurement Category I <sup>1</sup>
Channel-to-channel	300 V



**Caution** The switching power is limited by the maximum switching current and the maximum voltage. Switching power must not exceed 10 W.

### Maximum switching power (per channel)

DC systems	10 W
Maximum current (switching or carry, per channel or common)	0.5 A

<sup>1</sup> Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.



**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](https://ni.com/info) and enter the Info Code `relayflyback`.

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#### DC path resistance (1-wire path)

Initial	$\leq 1.1 \Omega$
End-of-life	$> 2 \Omega$

DC path resistance typically remains low for the life of the relay. At the end of relay life, the path resistance rapidly rises above  $2 \Omega$ . Load ratings apply to relays used within the specification before the end of relay life.

Minimum switching capacity	0.5 V 1 mA
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Bandwidth (-3 dB, 50 $\Omega$ termination)	$\geq 900$ kHz, typical
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#### Isolation (50 $\Omega$ termination)

Open channel	
10 kHz	$> 86$ dB, typical
100 kHz	$> 76$ dB, typical
1 MHz	$> 58$ dB, typical

DC open channel isolation	$> 1.0 \times 10^{11} \Omega$ , typical
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Thermal EMF (1-wire path, channel-to-common)	$< 50 \mu\text{V}$ , typical
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## Dynamic Characteristics

Relay operate time	0.4 ms, typical 0.81 ms, maximum
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**Note** Certain applications may require additional time for proper settling. Refer to the *NI Switches Help* at [ni.com/manuals](https://ni.com/manuals) for more information about including additional settling time.

Maximum scan rate	600 channels/s
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#### Expected relay life

Mechanical	
1 V at 10 mA resistive	$3 \times 10^8$ cycles

## Electrical

600 V at 7 mA 90 pF capacitive	$1.8 \times 10^7$ cycles
600 V at 16.5 mA 90 pF capacitive	$7 \times 10^6$ cycles



**Note** Reed relays are highly susceptible to damage from in-rush currents. Switching capacitive loads without resistive or inductive protection can weld the relay contacts in less than  $5 \times 10^5$  cycles.



**Note** Relays are field replaceable. Refer to the *NI Switches Help* at [ni.com/manuals](https://ni.com/manuals) for more information about replacing a failed relay.

## Trigger Characteristics

### Input trigger

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



**Note** The PXI-2584 can recognize trigger pulse widths less than 150 ns if you disable digital filtering. Refer to the *NI Switches Help* at [ni.com/manuals](https://ni.com/manuals) for information about disabling digital filtering.

### Output trigger

Destinations	PXI trigger lines <0...7>
Pulse width	Programmable (1 $\mu$ s to 62 $\mu$ s)

## Physical Characteristics

Relay type	Reed
Relay contact material	Rhodium
I/O connector	MINI-COMBICON, 3.81 mm (16 position)
PXI power requirement	1.6 W at 5 V 0.2 W at 3.3 V
Dimensions (L $\times$ W $\times$ H)	3U, one slot, PXI/cPCI module, 21.6 cm $\times$ 2.0 cm $\times$ 13.0 cm (8.5 in. $\times$ 0.8 in. $\times$ 5.1 in.)
Weight	212 g (7.5 oz)

## Environment

Maximum altitude	2,000 m (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

## Operating Environment

Ambient temperature range	0 °C to 55 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)
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Relative humidity range	10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)
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## Storage Environment

Ambient temperature range	-20 °C to 70 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)
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Relative humidity range	5% to 95%, noncondensing (Tested in accordance with IEC 60068-2-56.)
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## 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.)
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Random vibration	
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Operating	5 Hz to 500 Hz, 0.31 g <sub>rms</sub> (Tested in accordance with IEC 60068-2-64.)
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Nonoperating	5 Hz to 500 Hz, 2.46 g <sub>rms</sub> (Tested in accordance with IEC 60068-2-64. Test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)
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## 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 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, refer to the [Online Product Certification](#) section.

## CE Compliance

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](https://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](https://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](https://ni.com/environment/weee).

## 电子信息产品污染控制管理办法（中国 RoHS）



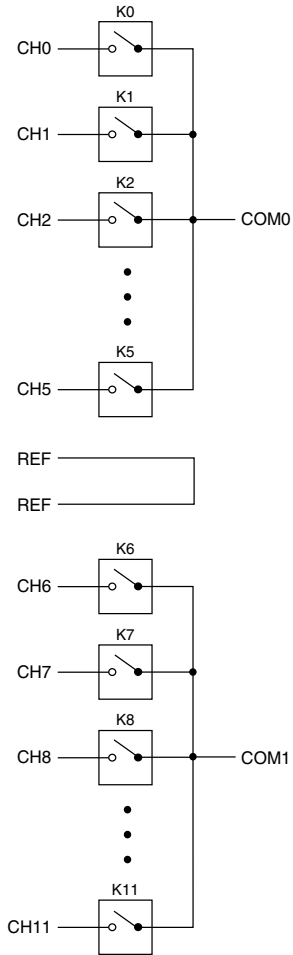
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## Diagrams

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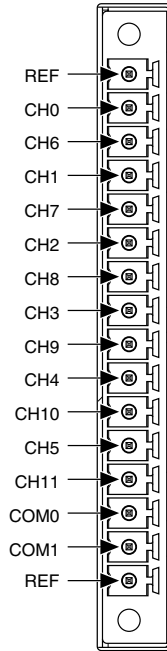
Refer to the following figure for the PXI-2584 power-on state:

**Figure 1. PXI-2584 Power-On State**



Refer to the following figure for the PXI-2584 front panel connector pinout:

**Figure 2.** PXI-2584 Connector Pinout



**Note** For topology-specific connection information, refer to your device in the *NI Switches Help* at [ni.com/manuals](http://ni.com/manuals) and associated cable or terminal block installation instructions.

## Accessories

Visit [ni.com](http://ni.com) for more information about the following accessories.



**Caution** You must ensure that devices and circuits connected to the PXI-2584 are properly insulated from human contact. Use the PXI-2584 BACKSHELL custom cable kit to ensure that the terminals are not accessible.

**Table 1.** NI Accessories for the PXI-2584

Accessory	Part Number
PXI-2584 BACKSHELL custom cable kit	779168-02

Use 28 AWG to 16 AWG signal wires with the appropriate voltage rating, safety certifications, and wiring methods for the applied load.



**Caution** You must install mating connectors according to local safety codes and standards and according to the specifications provided by the connector manufacturer. You are responsible for verifying safety compliance of third-party connectors and their usage according to the relevant standard(s), including UL and CSA in North America and IEC and VDE in Europe.

Plug screw terminal torque	Tighten the screws to 0.5 to 0.6 N · m (4.4 to 5.3 lb · in.) of torque.
Wire strip length	Strip 7 mm (0.25 in.) of insulation from the ends of the signal wires.

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