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DEVICE SPECIFICATIONS

NI PXI/PXIe-2569

100-Channel SPST Relay Module

This document lists specifications for the NI PXI/PXIe-2569 (PXI/PXIe-2569) general-purpose relay module. All specifications are subject to change without notice. Visit *ni.com/manuals* for the most current specifications.

Contents

About These Specifications

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_{pk}, or a combination unless otherwise specified.

Topology	100-SPST (latching), 50-DPST

Refer to the *NI Switches Help* at *ni.com/manuals* for detailed topology information.

Caution The protection provided by the PXI/PXIe-2569 can be impaired if it is used in a manner not described in this document.

Input Characteristics

Maximum switching voltage	
Channel-to-channel	100 V
Channel-to-ground	100 V, CAT I

Caution This module is rated for Measurement Category I. It is intended to carry signal voltages no greater than 100 Vrms, 150 Vpk, or 150 VDC. 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 VAC or 230 VAC.[1]

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

Caution The switching power is limited by the maximum switching current and 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)	1 A
Simultaneous channels at maximum current (≤35 °C)	50

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`.

Module Load Derating at >35 °C

Load derating is dependent on the ambient temperature and the sum of the current squared of each channel simultaneously carrying a signal. The result must fall within the shaded region of the following figure. The following examples represent this calculation.

Example 1: Fifty channels carry 0.75 A while 10 channels carry 0.5 A.

$(50 \times 0.75^2) + (10 \times 0.5^2) = 30.6\ A^2 \times \text{channels}$

Example 1 can be used at ambient temperatures between 0 °C and 55 °C.

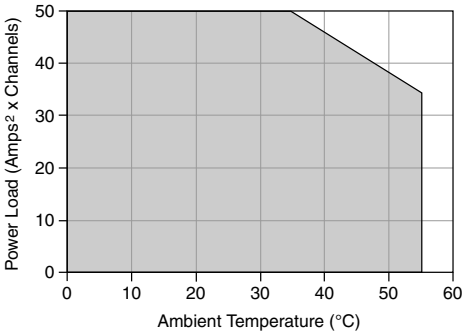
[1] Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Example 2: Sixty channels carry 0.75 A while 35 channels carry 0.5 A.

$(60 \times 0.75^2) + (35 \times 0.5^2) = 42.5\ A^2 \times$ channels

Example 2 can be used at ambient temperatures between 0 °C and 45 °C.

Figure 1. Module Load Derating



Minimum switch load	20 mV/10 mA
DC path resistance	
Initial	<0.55 Ω
End of life	≥1.0 Ω

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

Thermal EMF	<12 µV, typical
Bandwidth (-3 dB, 50 Ω termination)	≥20 MHz, typical
Crosstalk (50 Ω termination, channel-to-channel)	
10 kHz	≤-85 dB, typical
100 kHz	≤-65 dB, typical
1 MHz	≤-45 dB, typical
10 MHz	≤-25 dB, typical
Isolation (50 Ω termination, open channel)	
10 kHz	≥85 dB, typical
100 kHz	≥65 dB, typical
1 MHz	≥45 dB, typical
10 MHz	≥25 dB, typical

Dynamic Characteristics

Relay operate time	1 ms, typical 3.4 ms maximum

Note Certain applications may require additional time for proper settling. Refer to the *NI Switches Help* at *ni.com/manuals* for more information about including additional settling time.

Expected relay life	
Mechanical	1×10^8 cycles
Electrical	
10 VDC, 100 mADC resistive	2.5×10^6 cycles
10 VDC, 1 ADC resistive	1×10^6 cycles
30 VDC, 1 ADC resistive	5×10^5 cycles
60 VDC, 1 ADC resistive	1×10^5 cycles

Note Relays are field replaceable. Refer to the *NI Switches Help* at *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/PXIe-2569 can recognize trigger pulse widths less than 150 ns if you disable digital filtering. Refer to the *NI Switches Help* at *ni.com/manuals* for information about disabling digital filtering.

Output trigger	
Destinations	PXI trigger lines <0...7>
Pulse width	Programmable (1 µs to 62 µs)

Physical Characteristics

Relay type	Electromechanical, latching
Relay contact material	Palladium-ruthenium, gold covered
I/O connector	200 POS LFH Matrix 50, receptacle

Power requirement	
PXI	6 W at 5 V 2.5 W at 3.3 V
PXI Express	7.5 W at 12 V 2.5 W at 3.3 V
Dimensions (L × W × H)	3U, one slot, PXI/cPCI module, PXIe compatible, 21.6 cm × 2.0 cm × 13.0 cm (8.5 in. × 0.8 in. × 5.1 in.)
Weight	289 g (10.2 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.)
Relative humidity range	10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Storage Environment

Ambient temperature range	-20 °C to 70 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)
Relative humidity range	5% to 95%, noncondensing (Tested in accordance with IEC 60068-2-56.)

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, 0.31 g_{rms} (Tested in accordance with IEC 60068-2-64.)
Nonoperating	5 Hz to 500 Hz, 2.46 g_{rms} (Tested in accordance with IEC 60068-2-64. Test profile exceeds the requirements of MIL-PRF-28800F, Class 3.)

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 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*.

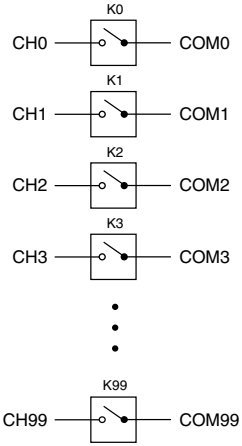
电子信息产品污染控制管理办法（中国 RoHS）

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`.)

Diagrams

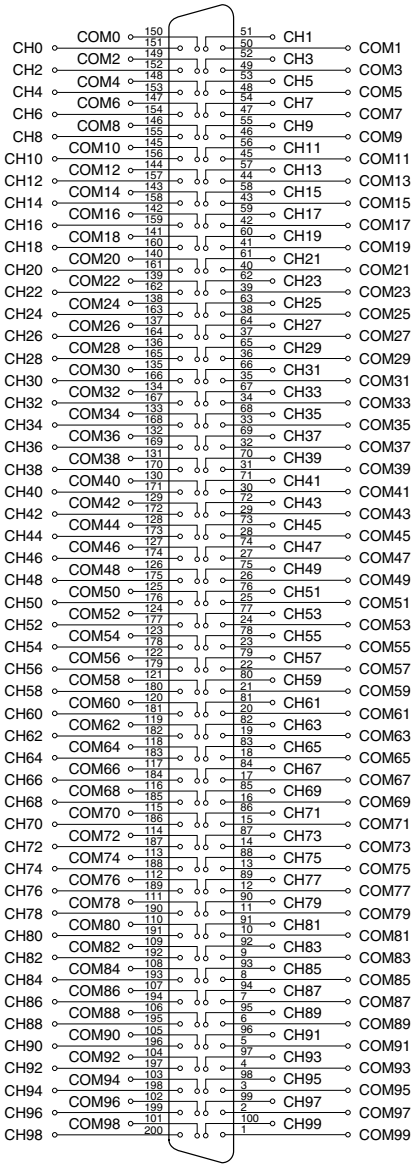
The following figure shows the PXI/PXIe-2569 power-on state diagram.

Figure 2. PXI/PXIe-2569 Power-on State



The following figure shows the PXI/PXIe-2569 connector pinout.

Figure 3. PXI/PXIe-2569 Connector Pinout



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

Accessories

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

Table 1. NI Accessories for the PXI/PXIe-2569

Accessory	Part Number
LFH200 to 50-pin DSUB switch cable (CH-Com twisted), 1 m	779038-02
LFH200 connector to bare-wire switch cable, 2 m	779038-01
NI TBX-50B, 50-pin DSUB screw terminal block	782866-01

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.

Table 2. Third-Party Accessories for the PXI/PXIe-2569

Accessory	Manufacturer	Part Number
Terminal sticks (four required per module)	Molex	71715-4002
Plug connector subassembly	Molex	71719-3000
Backshell only	Jevons	JDC200B-832
Mass interconnect cable assembly, 20 in.	Virginia Panel	540105010105
Mass interconnect cable assembly, 36 in.	Virginia Panel	540105010205
Mating ITA module[2] (one required per module)	Virginia Panel	510108131
Mating ITA PC[2] (198 required per module)	Virginia Panel	720101101
DAK assembly NI PCB, 200 Pin LFH, male	MAC Panel	561036

[2] PCB mount, additional cover, or enclosure required.

Table 3. Third-Party Accessories for the LFH200 to 50-pin D-SUB Switch Cable

Accessory	Manufacturer	Part Number
VARIOFACE module, with screw connection and 50 position D-SUB pin strip	Phoenix Contact	FLK-D50 SUB/S
VARIOFACE module, with screw connection and 50 position D-SUB pin strip	Phoenix Contact	FLKM-D50 SUB/S
VARIOFACE module, with screw connection and 50 position D-SUB pin strip	Phoenix Contact	FLKMS-D50 SUB/S
VARIOFACE module, with screw connection and 50 position D-SUB pin strip, with LED indicators	Phoenix Contact	FLKM-D50 SUB/S/LA

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