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SCXI-1169

NI SCXI™-1169 Specifications

100-Channel SPST Relay Module

このドキュメントには、日本語ページも含まれています。

This document lists specifications for the NI SCXI-1169 general-purpose relay module. All specifications are subject to change without notice. Visit ni.com/manuals for the most current specifications.

Topology 100-channel SPST,
latching

Refer to the *NI Switches Help* for detailed topology and pinout information.

Input Characteristics

All specifications at 23 °C unless otherwise noted.

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

Maximum switching voltage

Channel-to-channel 100 V
Channel-to-ground..... 100 V, CAT I



Caution This module is rated for Measurement Category I and is intended to carry signal voltages no greater than 100 V. This module can withstand up to 500 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 about measurement categories.



Caution When hazardous voltages (>42.4 V_{pk}/60 VDC) are present on any relay terminal, safety low-voltage (<42.4 V_{pk}/60 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)..... 1 A

Minimum switching conditions..... 20 mV/1 mA

Simultaneous channels
at maximum current (≤ 25 °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 *induct*.

Module Load Derating at >25 °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 Figure 1. The following examples represent this calculation.

Example 1

50 channels carry 0.75 A, while
10 channels carry 0.5 A

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

Example 2

60 channels carry 0.75 A, while
5 channels carry 0.5 A

$$(60 \times 0.75^2) + (5 \times 0.5^2) = 35 \text{ A}^2 \times \text{Channels}$$

The module in Example 1 can be used at ambient temperatures between 0 °C and 45 °C. The module in Example 2 can be used at ambient temperatures between 0 °C and 40 °C.

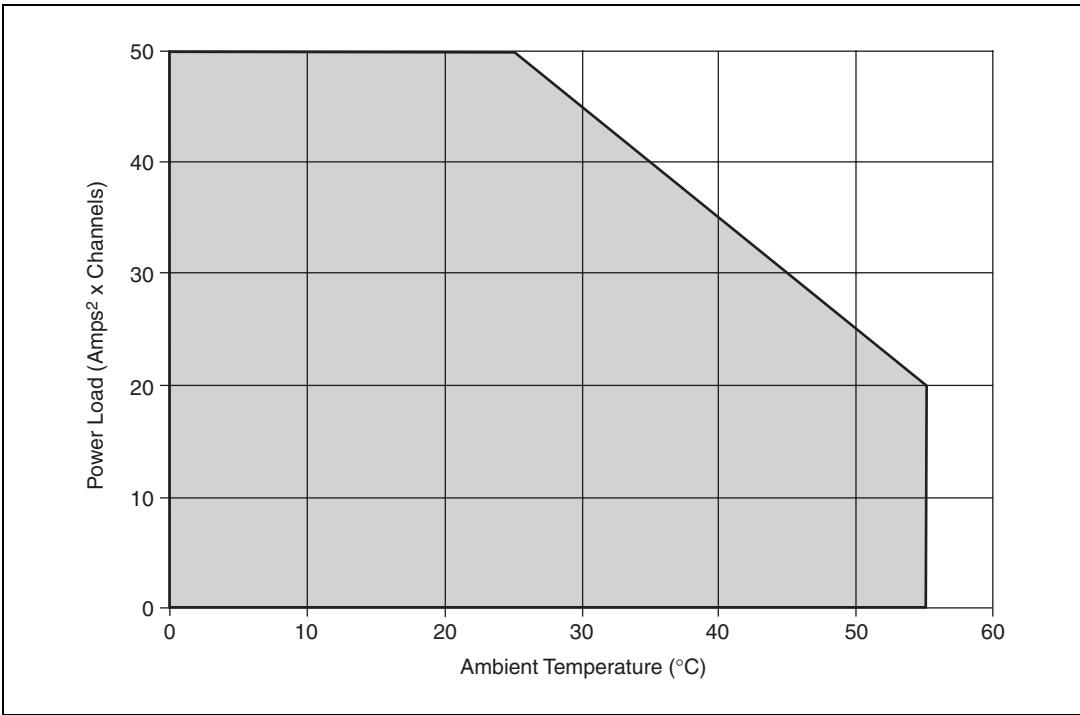


Figure 1. Module Load Derating

DC path resistance

- Initial <0.55 Ω
- End-of-life $\geq 1 \Omega$

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

Thermal EMF

(typical at 23 °C) $\leq 12 \mu V$

Bandwidth (-3 dB, typical at 23 °C)

50 Ω termination ≥ 20 MHz

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

Channel-to-channel

- 10 kHz ≤ -85 dB
- 100 kHz ≤ -65 dB
- 1 MHz ≤ -45 dB
- 10 MHz ≤ -25 dB

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

Open channel

- 10 kHz ≥ 85 dB
- 100 kHz ≥ 65 dB
- 1 MHz ≥ 45 dB
- 10 MHz ≥ 25 dB

Dynamic Characteristics

Maximum cycle speed 145 cycles/s

Relay operate time

- Typical 1 ms
- Maximum 3.4 ms



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	
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 The relays used in the NI SCXI-1169 are field replaceable. Refer to the *NI Switches Help* for information about replacing a failed relay.

Trigger Characteristics

Input trigger

Sources	SCXI trigger lines 0–7, rear connector
Minimum pulse width	150 ns

Output trigger

Destinations	SCXI trigger lines 0–7, rear connector
Pulse width	Programmable (1 μ s to 62 μ s)

Physical Characteristics

Relay type	Electromechanical, latching
Relay contact material	Palladium-ruthenium, gold covered
I/O connector	200 POS LFH Matrix 50, receptacle
SCXI power requirement	
+5 VDC	50 mA
+18.5 VDC to +25 VDC	170 mA
–18.5 VDC to –25 VDC	170 mA
Dimensions (L \times H \times W)	19.8 cm \times 3 cm \times 17.3 cm (7.8 in. \times 1.2 in. \times 6.7 in.)
Weight.....	755 g (26.6 oz)

Environment

Operating temperature	0 °C to 50 °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.	

Accessories

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

Table 1. NI Accessories for the NI SCXI-1169

Accessory	Part Number
LFH200 to 50-pin D-SUB switch cable (CH-Com twisted), 1 m	779038-02
LFH200 connector to bare wire switch cable, 2 m	779038-01



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 NI SCXI-1169

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* (one required per module)	Virginia Panel	510108131
Mating ITA PC* (198 required per module)	Virginia Panel	720101101
DAK assembly NI PCB, 200 Pin LFH, male	MAC Panel	561036
* PCB mount, additional cover, or enclosure required. See previous safety caution.		

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

Figure 2 shows the NI SCXI-1169 power-on state.

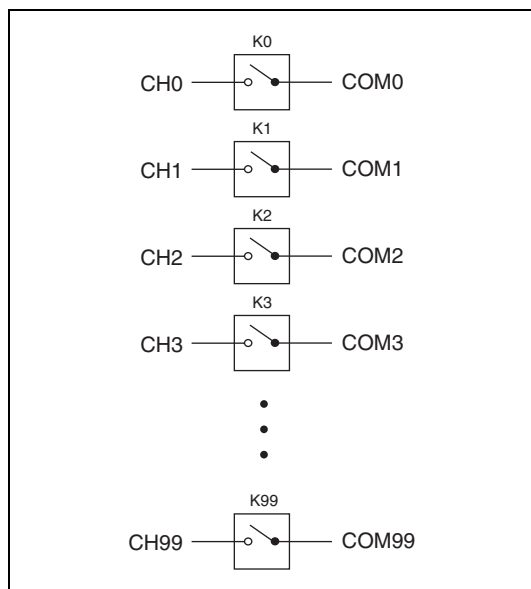


Figure 2. NI SCXI-1169 Power-On State

Compliance and Certifications

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 61010-1, CSA 61010-1



Note For UL and other safety certifications, refer to the product label or visit ni.com/certification, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A



Note For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

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



Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain 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

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* 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 their life cycle, all products *must* be sent to a WEEE recycling center.

For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit ni.com/environment/weee.htm.

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