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General-Purpose Relays

NI SCXI-1161

- 8 independent SPDT electromechanical relays
- Nonlatching relays
- Switching capacity
 - 8 A at 125 V_{rms}
 - 6 A at 250 V_{rms}
 - 5 A at 30 VDC
- 3 operations/s
- Fully software programmable

NI SCXI-1160

- 16 independent SPDT electromechanical relays
- Latching relays
- Switching capacity
 - 2 A at 250 V_{rms}
 - 2 A at 30 VDC
- 50 operations/s
- Fully software programmable

Operating Systems

- Windows 2000/NT/XP

Recommended Software

- LabVIEW
- LabVIEW Real-Time Module
- LabWindows/CVI
- Measurement Studio
- NI Switch Executive

Other Compatible Software

- Visual Basic
- C/C++

Driver Software (included)

- NI-SWITCH

Certifications

- UL



Overview

The National Instruments SCXI-1160 and SCXI-1161 are general-purpose relay switching modules. The SCXI-1160 has 16 independent SPDT (Form C) latching relays with very low on-resistance and low thermal offset. With power capabilities of up to 2 A at 250 V_{rms} or 30 VDC, these relays are suitable for switching, routing, and controlling medium-level signals. The SCXI-1161 has eight independent SPDT nonlatching relays. Because the SCXI-1161 relays can switch up to 8 A at 125 V_{rms}, 6 A at 250 V_{rms}, or 5 A at 30 VDC, they are suitable for higher power applications. Each channel on both modules has a normally closed (NC), normally open (NO), and common (COM) terminal. You can use two or more SCXI-1160s and SCXI-1161s in one or more chassis to switch and control thousands of signals.

Extended Features and Specifications

National Instruments switch modules are built with a number of core features that are covered in detail in the Switch Overview section.

For additional information about the SCXI-1160 and SCXI-1161, including software, certifications and compliance, relay control, etc., please see page 20. For detailed specifications, please see page 506.

Ordering Information

NI SCXI-1160	776572-60
NI SCXI-1161	776572-61

Includes switch module and NI-SWITCH driver software.

Accessories

SCXI-1324 terminal block	777687-24
PXI-4021 switch controller	778278-01
PCI-4021 switch controller	778277-01

For information on extended warranty and value added services, see page 20.

See page 499 for accessory and cable options.

BUY ONLINE!

Visit ni.com/products and enter *scxi1160* and/or *scxi1161*.

Switch Specifications

Specifications (continued)

Physical

Dimensions 17.2 by 20.3 by 3.0 cm (6.8 by 8.0 by 1.2 in.)

Environment

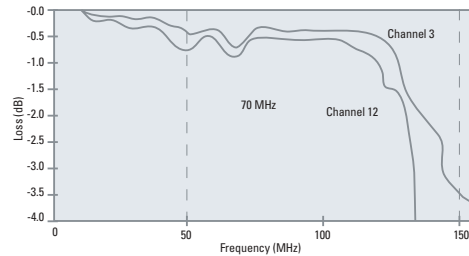
Operating temperature 0 to 50 °C
 Storage temperature -20 to 70 °C
 Relative humidity 5 to 90% noncondensing

¹Transfer rate depends largely on the computer and software. These tests were made using an AT-MIO-16E-2 installed in a 450 MHz Pentium III computer running LabVIEW and Windows NT.

PXI-2566, SCXI-1166

Input Characteristics

Maximum switching voltage
 Channel-to-channel 150 VDC, 125 VAC, CAT I
 Channel-to-ground 150 VDC, 125 VAC, CAT I
 Simultaneous channels at maximum switching current (≤ 25 °C)
 PXI-2566 16
 SCXI-1166 32
 Maximum carry current 5 ADC, 5 AAC (per channel)
 Simultaneous channels at maximum carry current (≤ 25 °C)
 PXI-2566 9
 SCXI-1166 8
 Maximum switching power 60 W, 62.5 VA (DC to 60 Hz) (per channel)
 DC path resistance
 Initial <1.0 Ω
 End of life $\geq 1.0 \Omega$
 Thermal EMF <9 μ V (typical at 23 °C)
 Minimum switching capacity 10 μ A at 10 mVDC
 Bandwidth (-3 dB) ≥ 70 MHz



Crosstalk (Typical at 23 °C)

Channel-to-channel
 10 kHz ≤ -75 dB
 100 kHz ≤ -65 dB
 1 MHz ≤ -45 dB
 10 MHz ≤ -25 dB

Isolation (Typical at 23 °C)

Open channel
 100 kHz ≥ 65 dB
 1 MHz ≥ 45 dB
 10 MHz ≥ 25 dB

Dynamic Characteristics

Maximum speed 115 operations/s
 Relay operate time
 Typical 2 ms
 Maximum 4.4 ms
 Expected relay life
 Mechanical 10^9 operations
 Electrical
 30 VDC, 1 A resistive 5×10^5 operations
 30 VDC, 2 A resistive 10^5 operations
 125 VAC, 0.2 A resistive 3×10^5 operations
 125 VAC, 0.5 A resistive 10^5 operations

Physical Characteristics

Relay type Electromechanical, nonlatching
 Relay contact material Gold clad silver alloy
 I/O connectors Two 62-pin D-Sub
 Dimensions
 PXI-2566 10 by 16 cm (3.9 by 6.3 in.)
 SCXI-1166 3.0 by 17.3 by 19.6 cm (1.2 by 6.7 by 7.6 in.)

Environment

Operating temperature 0 to 50 °C
 Storage temperature -20 to 70 °C
 Relative humidity 5 to 85% noncondensing
 Pollution degree 2
 Approved at altitudes up to 2,000 m

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 3111-1, UL 61010B-1
 CAN/CSA C22.2 No. 1010.1

CE Compliance

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

Low-Voltage Directive (safety) 73/23/EEC
 Electromagnetic Compatibility
 Directive (EMC) 89/336/EEC

SCXI-1160, SCXI-1161

Input Characteristics

Number of relays
 SCXI-1160 16
 SCXI-1161 8
 Relay type
 SCXI-1160 SPDT (Form C), latching
 SCXI-1161 SPDT (Form C), nonlatching
 Maximum input voltage
 Channel-to-channel 250 VDC, 250 V_{rms}
 Channel-to-ground 250 VDC, 250 V_{rms}
 Maximum switching voltage
 SCXI-1160 250 VDC, 250 V_{rms}
 SCXI-1161 250 VDC, 250 V_{rms}
 Maximum switching capacity
 SCXI-1160 2 A at 250 V_{rms} , 0.6 A at 48 VDC, 2 A at 30 VDC
 SCXI-1161 8 A at 125 V_{rms} , 6 A at 250 V_{rms} , 5 A at 30 VDC
 Minimum current load
 SCXI-1160 100 μ A
 SCXI-1161 100 mA
 Channel on resistance
 SCXI-1160 (includes terminal block) 75 m Ω (initially)
 SCXI-1161 175 m Ω (initially)
 Contact material
 SCXI-1160 Gold-clad silver alloy
 SCXI-1161 Silver alloy
 Thermal offset
 SCXI-1160 3 μ V

Dynamic Characteristics

Relay operate time
 SCXI-1160 10 ms
 SCXI-1161 15 ms
 Relay release time
 SCXI-1160 10 ms
 SCXI-1161 15 ms
 Maximum switching rate
 SCXI-1160 50 operations/s
 SCXI-1161 3 operations/s

Switch Specifications

Specifications (continued)

Expected life for SCXI-1160/1161	
Mechanical	10 ⁸ operations at 2 A, 30 VDC
Electrical	10 ⁹ operations at 2 A, 250 V _{rms}

Physical

Dimensions	3.0 by 17.2 by 20.3 cm (1.2 by 6.8 by 8.0 in.)
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Environment

Operating temperature	0 to 50 °C
Operating temperature	-20 to 70 °C
Relative humidity	5 to 90% noncondensing

PXI-2565

Input Characteristics

Number of relays	16 SPST
Common-mode voltage	
Channel-to-channel	250 V _{rms} , 250 VDC
Channel-to-ground	250 V _{rms} , 250 VDC
Maximum switching voltage	
AC	250 V _{rms}
DC	125 VDC
Maximum switching capacity per channel	
30 VDC (resistive load)	5 A
250 VAC (resistive load)	7 A
Maximum switching power per channel	1750 VA, 150 W
Maximum combined channel current	80 A
Channel on resistance	30 mΩ
Contact material	Gold-flash over silver alloy

Dynamic Characteristics

Relay operate time (20 °C)	5 ms typical, 10 ms maximum
Relay release time (20 °C)	4 ms typical, 10 ms maximum
Maximum switching rate	5 operations/s per channel

Expected life	
Mechanical (3 operations/s)	5x10 ⁷ operations
Electrical at maximum	10 ⁸ operations (exceeding maximum switching capacity decreases electrical life)
switching capacity	10 ⁸ operations (exceeding maximum switching capacity decreases electrical life)
PXI bus interface	Slave

PXI Trigger Bus

Trigger lines	8
Star trigger	1

Power Requirement

+5 VDC	350 mA (all relays open) 1.4 A (all relays closed)
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Physical

Dimensions	10x16 cm (3.9 x 6.3 in.) 2 slots wide
I/O connector	16x2 minicombin header
I/O mating connector	Two 16x1 minicombin connectors

Environment

Operating temperature	0 to 50 °C
Storage temperature	-20 to 70 °C
Relative humidity	5 to 85% noncondensing

Shock and Vibration

Functional shock	MIL-T-28800E Class3 (30 g half-sine shock pulse) also meets IEC 60068-2-27
Random vibration	MIL-T-28800E, MIL-STD-810E Category 1
Operational	5 to 500 Hz, 0.3 g _{rms}
Nonoperational	5 to 500 Hz, 2.4 g _{rms}



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