DEVICE SPECIFICATIONS

NI PXI-2510

2 A Fault Insertion Unit

This document lists specifications for the NI PXI-2510 (NI 2510) matrix relay card. All specifications are subject to change without notice. Visit *ni.com/manuals* for the most current specifications.

Topology.....Independent

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

Caution The protection provided by the NI 2510 can be impaired if it is used in a manner not described in this document.

Contents

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.

Input Characteristics

Maximum switching voltage

Channel-to-channel.....150 V

Channel-to-ground.....150 V, CAT I[1]

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 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.

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

Maximum switching power.....60 W
(per channel)

Note This module and cable accessory can operate at various ambient temperatures and currents as shown in the following table.

[1] Measurement Categories CAT I and CAT O (Other) 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.

Table 1. NI PXI-2510 Operating Currents

Current	Module Alone	Module with Cable	
Operating temperature range	0 to 55 °C	0 to 55 °C	0 to 40 °C
Maximum total module current	64 A	32 A	48 A
Maximum current per channel	2 A	1 A	1.5 A[2]

Minimum switch load.....1 mA

Maximum DC path resistance (channel-to-DUT)

Initial.....150 mΩ, typical

End-of-life.....>1 Ω

Note 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.

Bandwidth, typical (50 Ω system).....>6.5 MHz[3]

Dynamic Characteristics

Relay Operate Time[4]

Typical.....1 ms

Maximum.....3 ms

Expected mechanical relay life.....1×10^8 cycles

Expected electrical relay life

30 V, 1 A.....5×10^5 cycles

30 V, 2 A.....1×10^5 cycles

Simultaneous drive limit.....38 relays

Note Relays are field replaceable. Refer to the *NI Switches Help* for more information about replacing a failed relay.

[2] Maximum 2 A per channel may be achieved with cable assembly with extra precaution on signal routing. See the *DIN160 Cable Installation Instructions* for more information.

[3] The module is designed to carry communication signals such as CAN signals up to 1 Mbps and FlexRay signals up to 20 Mbps (10 Mbps per channel path).

[4] Operate time is the time from the trigger received by hardware to relay output activation.

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

Note Opening a CHn to DUTn path counts toward the simultaneous drive limit.

Trigger Characteristics

Input trigger

Sources.....PXI trigger lines <0..7>

Minimum pulse width.....150 ns

Note The NI 2510 can recognize trigger pulse widths less than 150 ns if you disable digital filtering. Refer to the *NI Switches Help* 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, non-latching

Relay contact material.....Palladium-ruthenium, gold covered

Front panel connector.....160 DIN 41612, 160 positions, male

Power requirement

PXI

5 V, typical.....6.6 W

3.3 V, typical.....0.48 W

Dimensions (L × W × H).....3U, one slot, PXI/cPCI module, 18.8 cm × 2.0 cm × 13.0 cm (7.4 in. × 0.8 in. × 5.1 in.)

Weight.....358 g (12.6 oz)

Environment

Operating temperature.....0 °C to 55 °C

Storage temperature.....-40 °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.)

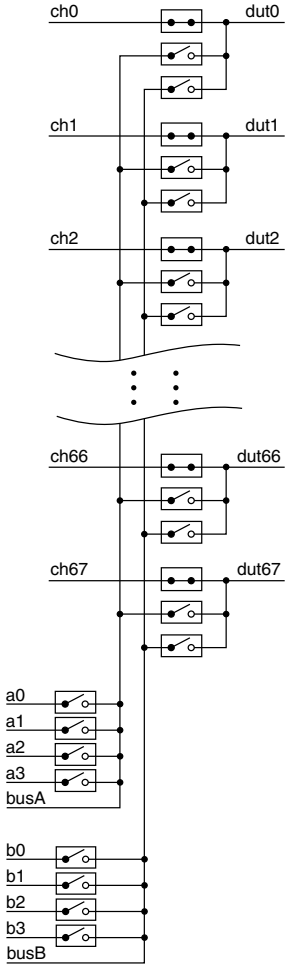
Random Vibration

- 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

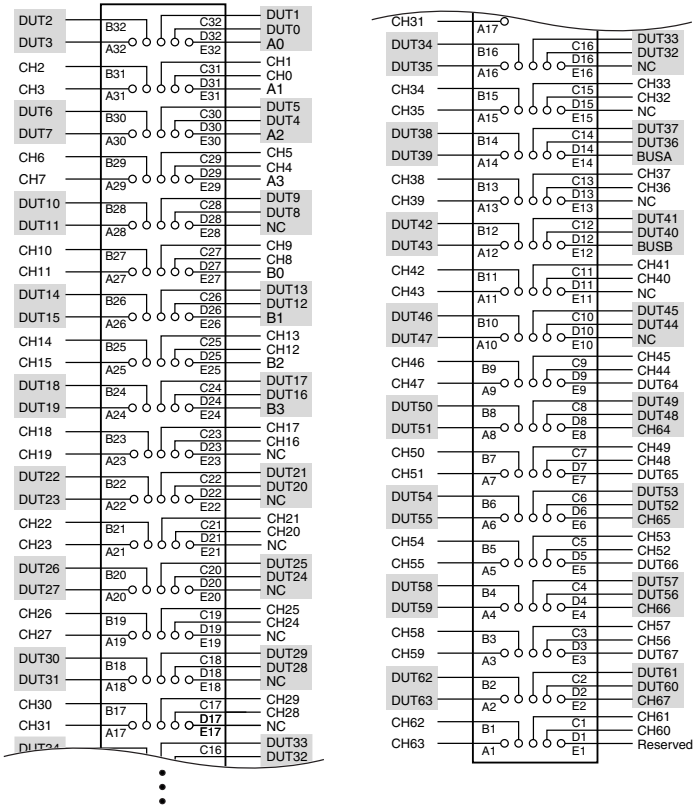
The following figure shows the NI 2510 power-on state.

Figure 1. NI 2510 Power-On State



The following figure shows the NI 2510 connector pinout.

Figure 2. NI 2510 Connector Pinout



Accessories

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

Table 2. NI Accessories for the NI 2510

Accessory	Part number
Cable for NI PXI-2510 (To 3, 50-pin D-SUB)	781090-01
Cable for NI PXI-2510 (To 160-pin DIN)	781090-02
Cable for NI PXI-2510 (To Bare Wire)	781090-03

Table 2. NI Accessories for the NI 2510 (Continued)

Accessory	Part number
NI TBX-50, 50-pin Dsub Screw Terminal Block	779305-01
IM02PNS Replacement Relays	781089-10

You must install mating connectors according to local safety codes and standards and according to the specifications provided by the manufacturer. You are responsible for verifying the 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.

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, certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance CE

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

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）

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