
PXle-2515

Specifications

2025-07-22



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This document lists specifications for the PXIe-2515 high-speed digital signal insertion switch. The PXIe-2515 is intended for use with compatible single-ended NI high-speed DIO devices. Refer to the [NI Switches Help](#) for a list of supported NI high-speed DIO devices. These specifications are valid within the operating temperature range. All specifications are subject to change without notice. Visit ni.com/manuals for the most current specifications.

The minimum software requirements are:

- NI-SWITCH 4.0
- NI-DAQmx 9.0

Topology	Independent
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Refer to the [NI Switches Help](#) for detailed topology information.



Caution The protection provided by the PXIe-2515 can be impaired if it is used in a manner not described in this document.

About These Specifications

Maximum and **minimum** specifications are warranted not to exceed these values within certain operating conditions and include the effects of temperature and uncertainty unless otherwise noted.

Typical specifications are unwarranted values that are representative of a majority (90%) of units within certain operating conditions and include the effects of temperature and uncertainty unless otherwise noted.

Characteristic specifications are unwarranted values that are representative of an average unit operating at room temperature.

All specifications are **characteristic** unless otherwise specified.

Nominal specifications are unwarranted values that are relevant to the use of the product and convey the expected performance of the product.

PXIe-2515 Pinout

Front Panel

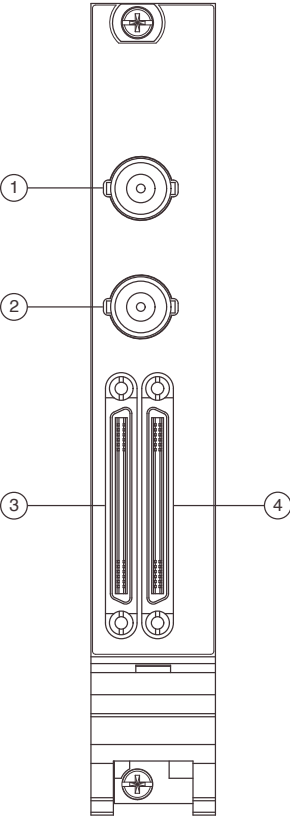


Table 2. Front Panel

Callout	Description
1	Bus A connector
2	Bus B connector
3	HSDIO connector
4	DUT connector

HSDIO (Left) Connector

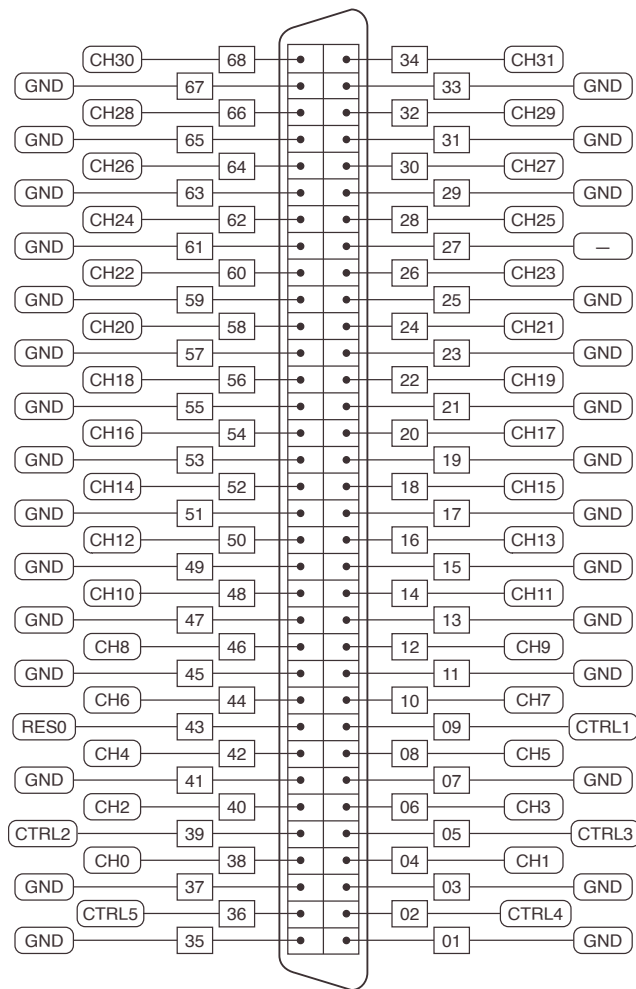


Table 3. Signal Descriptions

Signal	Description
CHx	Signal connection
CTRLx	Control connection
GND	Ground connection
RES0	Reserved, do not connect
—	No connection



Notice Do not connect to Res0. Res0 is reserved for future use.



Notice Use only the NI SHC68-C68-D5 cable to connect the supported NI high-speed DIO device to the module. The cable translates the pinout of the supported NI high-speed DIO device to the HSDIO connector on the module so that the pinout of the DUT connector on the module matches that of the supported NI high-speed DIO device.



Note ctrl0, ctrl2, and ctrl3 do not route through relays, but rather pass through from the left connector to the right connector. These channels cannot be connected to the analog bus channels, busa and busb.

DUT (Right) Connector

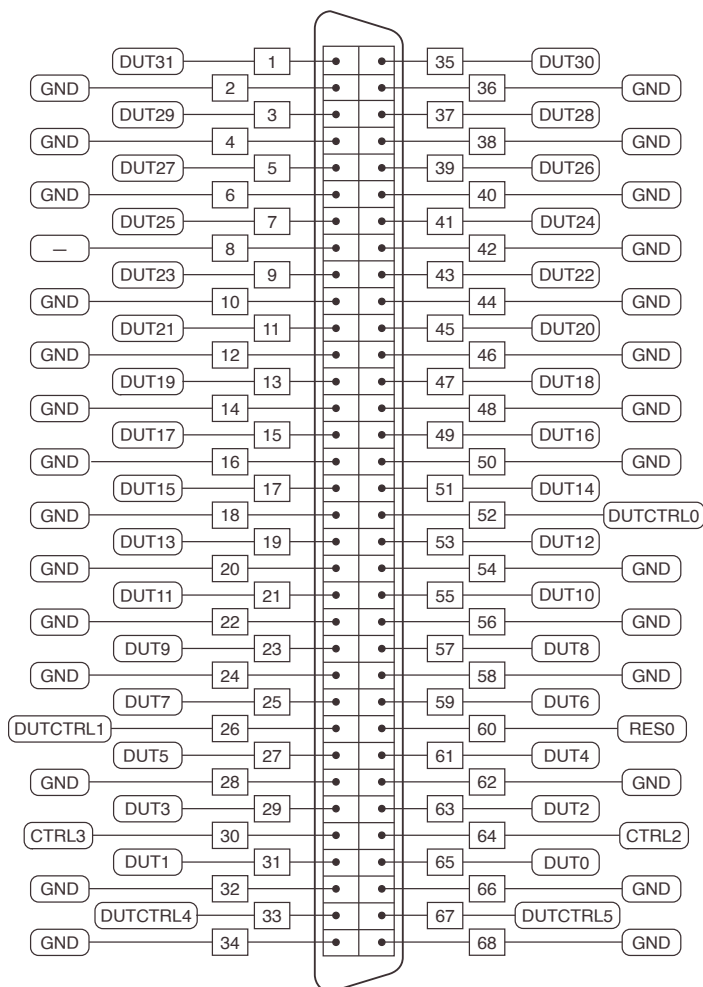


Table 4. Signal Descriptions

Signal	Description
CTRL x	Control connection
DUT x	DUT connection
DUTCTRL x	DUT control connection
GND	Ground connection
RES0	Reserved, do not connect
—	No connection

Related information:

- [PXIe-2515 Hardware Diagram](#)
- [NI Switches Cable and Accessory Compatibility](#)
- [PXIe-2515 Pin Associations](#)

Input Characteristics

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

Maximum switching voltage	
Channel-to-ground	30 V, CAT I ¹



Caution When hazardous voltages ($>42.4 \text{ V}_{pk}/60 \text{ VDC}$) are present on any relay terminal, safety low-voltage ($<42.4 \text{ V}_{pk}/60 \text{ VDC}$) 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 3 W.

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.

Maximum switching power (per channel)		3 W
Maximum switching current		0.25 A
Maximum carry current		0.3 A
Typical skew		
Channel-to-channel	<130 ps (across all data channels)	
Channel-to-control	<290 ps (across all data and control channels)	
Maximum DC path resistance (at 25 °C)		
Initial (CH x - DUT x)		<2 Ω
End-of-life (CH x - DUT x)		≥3 Ω
Initial (Analog bus)		<5 Ω
End-of-life (Analog bus)		≥6 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 the end of life value. Load ratings apply to relays used within the specification before the end of relay life.

Characteristic analog bus offset voltage	<50 μ V
Characteristic analog bus leakage current	<2 nA
Characteristic analog bus bandwidth (3 dB, 50 Ω termination)	50 MHz
Characteristic crosstalk (50 Ω termination)<600 MHz	<-10 dB
Characteristic open channel isolation (50 Ω termination)<600 MHz	>20 dB

Dynamic Characteristics

Maximum simultaneous drive limit for PXI/PXI Express	48 relays
Nominal relay operate time	0.25 ms
Nominal release time	0.05 ms
Nominal expected relay life, electrical (resistive)	
1 V, 10 mA	1×10^9 cycles
5 V, 10 mA	1×10^8 cycles

Trigger Characteristics

Input trigger	
Sources	PXI trigger lines <0...7>
Minimum pulse width ²	150 ns
Output trigger	
Destinations	PXI trigger lines <0...7>
Default pulse width	2 μ s, typical

Physical Characteristics

Relay type	Reed
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Note NI advises against installing reed relay modules directly adjacent to an embedded controller with a magnetic hard drive because of the sensitivity of reed relays and the possibility of interference from magnetic hard drives.

Relay contact material	Rhodium
I/O connectors	2 BNC female and 2 VHDCI female
Characteristic power requirement	

2. The PXIe-2515 recognizes trigger pulse widths less than 150 ns if digital filtering is disabled. Refer to the **NI Switches Help** for information about disabling digital filtering.

PXI	
5 V	9.1 W
3.3 V	0.45 W
PXI Express	
12 V	8.4 W
3.3 V	0.8 W



Note The maximum power requirements depend on how many relays are closed at the same time.

Dimensions (L × W × H)	3U, one slot, PXI/cPCI module, PXI Express compatible 21.6 cm × 2.0 cm × 13.0 cm (8.5 in. × 0.8 in. × 5.1 in.)
Weight	248 g (8.7 oz)

Estimating Reed Relay Life

Complete the following steps to estimate relay lifetimes using the nomograph:

1. Determine the peak voltage experienced across the relay while switching and mark this value on the **Volts** line.
2. Determine the sum of the DUT, cable, and instrumentation capacitances and mark this value on the **Load Capacitance** line.
3. Draw a straight line between both values.

The intersection points of this line and the **No Protection** and **50 Ω Protection**

axes are the corresponding estimated relay lifetimes in cycles.

Estimating Reed Relay Life Example

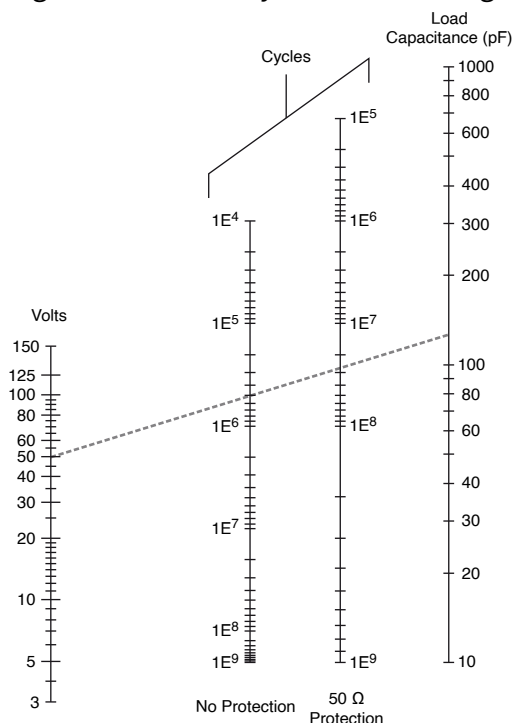
The reed relay module is connected to a DMM through 1 meter of cable. The DMM and cable capacitances are 100 pF and 30 pF respectively. The maximum voltage switched across the relay is 50 V. Determine the estimated number of relay cycles with and without protection resistance.

Solution

The total load capacitance is the sum of the cable and DMM capacitance, which is 130 pF. Draw a line between the 50 V point on the **Volts** axis and 130 pF on the **Load Capacitance** axis.

The line drawn intersects the **Cycles** axes at approximately 500,000 on the **No Protection** axis and about 25,000,000 on the **50 Ω Protection** axis, as shown in the following figure. This series resistance should be placed as close as possible to the relay for maximum effect.

Figure 3. Reed Relay Lifetime Nomograph



Environment

Table 5. 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

Table 6. 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, 0.3 g _{rms}
Random vibration, nonoperating	5 Hz 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.)

Compliance and Certifications

Safety Compliance Standards

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 C22.2 No. 61010-1



Note For safety certifications, refer to the product label or the [Product](#)

[Certifications and Declarations](#) 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
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: 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 ***Product Certifications and Declarations***.

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)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

- 2014/53/EU; Radio Equipment Directive (RED)
- 2014/34/EU; Potentially Explosive Atmospheres (ATEX)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

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 ***Engineering a Healthy Planet*** 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.

EU and UK Customers

-  **Waste Electrical and Electronic Equipment (WEEE)**—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RoHS**—NI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NI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.)