

SPECIFICATIONS

PXIe-6509

96-channel, 5 V TTL/CMOS, 24 mA PXI Digital I/O Module

This document lists specifications for the PXIe-6509 96-channel, 5 V TTL/CMOS, 24 mA PXI Digital I/O Module.

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- *Typical* specifications describe the performance met by a majority of models.
- *Nominal* specifications describe an attribute that is based on design, conformance testing, or supplemental testing.

Specifications are *Typical* unless otherwise noted.

Conditions

Specifications are typical at 25 °C unless otherwise noted.

Digital I/O

Number of channels	96 input/output
Compatibility	TTL Schmitt Trigger/CMOS, single-ended GND reference
Power-on state	Input pulled up or down (software-selectable), output 1 or 0
Data transfers	Interrupts, programmed I/O
I/O connector	100-pin female 0.050 series SCSI

Pull resistor

Pull-up resistor	4.7 k Ω (typical)
Pull-down resistor	47 k Ω (typical)
Input voltage protection	± 20 V on up to two pins, maximum

Digital Logic Levels

Input Signals

Level	Minimum	Maximum
Input voltage (V_{in})	0 V	5 V
Positive-going threshold (V_{T+})	—	2.2 V
Negative-going threshold (V_{T-})	0.8 V	—
Delta VT hysteresis ($V_{T+} - V_{T-}$)	0.2 V	—
Input high current (I_{IH}) ($V_{in} = 5$ V, resistors set to pull-up)	—	260 μ A
Input high current (I_{IH}) ($V_{in} = 5$ V, resistors set to pull-down)	—	260 μ A
Input low current (I_{IL}) ($V_{in} = 0$ V, resistors set to pull-up)	—	-1250 μ A
Input low current (I_{IL}) ($V_{in} = 0$ V, resistors set to pull-down)	—	-20 μ A

Output Signals

Level	Minimum	Maximum
High-level output current (I_{OH})	—	-24 mA
Low-level output current (I_{OL})	—	24 mA
Output voltage (V_{out})	0 V	5.5 V
Output high voltage (V_{OH}), at -24 mA	3.4 V	—
Output low voltage (V_{OL}), at 24 mA	—	0.78 V

The total current sinking/sourcing from one port cannot exceed 100 mA.

Power Requirements

Current draw from bus during no-load condition

Typical	575 mA on +3.3 VDC; 20 mA on +12 VDC
Peak	700 mA on +3.3 VDC; 90 mA on +12 VDC
+5 V power available at I/O connector (pins 49 and 99)	+4.0 V to 5.25 V; 1A, maximum



Note The voltage at the I/O connector depends on the amount of current drawn from the PXIe-6509.

Physical Characteristics

Printed circuit board dimensions	Standard 3U PXI
Dimensions (without connectors)	14.2 cm × 10.4 cm (5.6 in. × 4.1 in.)
Weight	140 g (4.8 oz)
I/O Connector	100-pin SCSI

Environmental Guidelines



Notice This model is intended for use in indoor applications only.

Environmental Characteristics

Temperature and Humidity

Temperature	
Operating	0 °C to 55 °C
Storage	-40 °C to 71 °C
Humidity	
Operating	10% to 90%, noncondensing
Storage	5% to 95%, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m (at 25 °C ambient temperature)

Shock and Vibration

Random vibration

Operating	5 Hz to 500 Hz, 0.3 g RMS
Non-operating	5 Hz to 500 Hz, 2.4 g RMS
Operating shock	30 g, half-sine, 11 ms pulse

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 *Commitment to 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 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.)

Environmental Standards

This product meets the requirements of the following environmental standards for electrical equipment.

- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry heat
- IEC 60068-2-78 Damp heat (steady state)
- IEC 60068-2-64 Random operating vibration
- IEC 60068-2-27 Operating shock
- MIL-PRF-28800F
 - Low temperature limits for operation Class 3, for storage Class 3
 - High temperature limits for operation Class 2, for storage Class 3
 - Random vibration for non-operating Class 3
 - Shock for operating Class 2

Absolute Maximum Voltage Rating

Absolute maximum voltage rating refers to the peak voltage recommended during normal operation, including transient voltages. Refer to [Digital Logic Levels](#) on page 2 for the maximum voltage input and output.

Channel-to-earth

-0.5 V to 5.5 V, Measurement Category I



Caution Do not connect the PXIe-6509 to signals or use for measurements within Measurement Categories II, III, or IV.



Attention Ne connectez pas le PXIe-6509 à des signaux et ne l'utilisez pas pour effectuer des mesures dans les catégories de mesure II, III ou IV.

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as *MAINS* voltage. *MAINS* is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.



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

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 UL and other safety certifications, refer to the product label or the [Product Certifications and Declarations](#) section.

Electromagnetic Compatibility Standards

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



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 In Australia and New Zealand (per CISPR 11), Class A equipment is intended for use only in heavy-industrial locations.



Notice For EMC declarations and certifications, and additional information, refer to the [Product Certifications and Declarations](#) section.

CE Compliance

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

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.

Additional Resources

Visit [ni.com/manuals](#) for more information about your model, including specifications, pinouts, and instructions for connecting, installing, and configuring your system.

Worldwide Support and Services

The NI website is your complete resource for technical support. At [ni.com/support](#), you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

Visit [ni.com/services](#) for information about the services NI offers.

Visit [ni.com/register](#) to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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