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# PXle-6509 Specifications

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# PXIe-6509 Specifications

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      |
| <b>Pull resistor</b>     |                                       |
| Pull-up resistor         | 4.7 k $\Omega$ (typical)              |
| Pull-down resistor       | 47 k $\Omega$ (typical)               |
| Input voltage protection | $\pm 20$ 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 $\mu$ A   |
| Input high current ( $I_{IH}$ ) ( $V_{in} = 5$ V, resistors set to pull-down) | —       | 260 $\mu$ A   |
| Input low current ( $I_{IL}$ ) ( $V_{in} = 0$ V, resistors set to pull-up)    | —       | -1250 $\mu$ A |
| Input low current ( $I_{IL}$ ) ( $V_{in} = 0$ V, resistors set to pull-down)  | —       | -20 $\mu$ 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;<br>20 mA on +12 VDC |
| Peak   | 700 mA on +3.3 VDC;<br>90 mA on +12 VDC |
| +5 V power available at I/O connector (pins 49 and 99) | +4.0 V to 5.25 V;<br>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

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


|                         |                              |
|-------------------------|------------------------------|
| Operating vibration     | 5 Hz to 500 Hz, 0.3 g RMS    |
| Non-operating vibration | 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 **Engineering a Healthy Planet** web page at [ni.com/environment](http://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](http://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](http://ni.com/environment/rohs_china)。(For information about China RoHS compliance, go to [ni.com/environment/rohs\\_china](http://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](#) 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 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](http://ni.com/product-certifications), search by model number, and click the appropriate link.

## Additional Resources

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

## NI Services

Visit [ni.com/support](https://ni.com/support) to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit [ni.com/services](https://ni.com/services) to learn about NI service offerings such as calibration options, repair, and replacement.

Visit [ni.com/register](https://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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