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# NI-9149

# Specifications

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# NI-9149 Specifications

## 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 valid for the range -40 °C to 70 °C unless otherwise noted.

## Operating System



**Note** For minimum software support information, visit [ni.com/r/swsupport](http://ni.com/r/swsupport).

Supported operating system	NI Linux Real-Time (32-bit)
<b>Software requirements</b>	
Application software	LabVIEW 2014 SP1 or later LabVIEW FPGA Module 2014 SP1 or later <sup>1</sup>

Driver software	NI CompactRIO 14.5 or later
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## Memory

Nonvolatile memory <sup>2</sup>	512 MB
Volatile memory (DRAM)	256 MB

## Network

Network interface	10Base-T, 100Base-T, 1000Base-T Ethernet
Compatibility	IEEE 802.3
Communication rates	10 Mb/s, 100 Mb/s, 1,000 Mb/s auto-negotiated
Maximum cabling distance	100 m/segment

## Internal Real-Time Clock

Accuracy	5 ppm
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1. LabVIEW FPGA Module is not required when using Scan Interface mode. To program the user-accessible FPGA on the NI-9149, LabVIEW FPGA Module is required.
2. Formatted capacity of nonvolatile memory may be slightly less than this value.

## USB Port

USB device port	
Type	USB 2.0 Hi-Speed, with standard B connector
Maximum data rate	480 Mb/s

## Reconfigurable FPGA

Type	Xilinx Zynq-7000, XC7Z020 All Programmable SoC
Number of logic cells	85,000
Number of flip-flops	106,400
Number of 6-input LUTs	53,200
Number of DSP slices (18 × 25 multipliers)	220
Available block RAM	4480 kbits
Number of DMA channels	16
Number of logical interrupts	32

## Battery Life



**Note** The battery is not user-replaceable. Refer to the **NI-9149 Safety, Environmental, and Regulatory Information** document for information about replacing the battery.



**Note** Battery life may drop dramatically in extreme temperatures.

Typical battery life with power applied to power connector	10 years
Typical battery life in storage at 55 °C	5.7 years
Minimum battery life in storage at 85 °C	5.3 years

## Safety Voltages

Connect only voltages that are below these limits.

V terminal to C terminal	30 V maximum, Measurement Category I
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## Measurement Category



**Caution** Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV.



**Attention** Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour effectuer des mesures dans ces catégories.



**Warning** Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINS circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.



**Mise en garde** Ne pas connecter le produit à des signaux dans les catégories de mesure II, III ou IV et ne pas l'utiliser pour des mesures dans ces catégories, ou des mesures sur secteur ou sur des circuits dérivés de surtensions de catégorie II, III ou IV pouvant présenter des surtensions transitoires supérieures à ce que le produit peut supporter. Le produit ne doit pas être raccordé à des circuits ayant une tension maximale supérieure à la tension de fonctionnement continu, par rapport à la terre ou à d'autres voies, sous peine d'endommager et de compromettre l'isolation. Le produit peut tomber en panne et son isolation risque d'être endommagée si les tensions transitoires dépassent la surtension transitoire nominale. Une analyse des tensions de fonctionnement, des impédances de boucle, des surtensions temporaires et des surtensions transitoires dans le système doit être effectuée avant de procéder à des mesures.

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.

## Environmental Characteristics

Temperature	
Operating	-40 °C to 70 °C
Storage	-40 °C to 85 °C
Humidity	
Operating	10% RH to 90% RH, noncondensing
Storage	5% RH to 95% RH, noncondensing
Ingress protection	IP40
Pollution Degree	2
Maximum altitude	5,000 m
Shock and Vibration	
Operating vibration	
Random	5 g RMS, 10 Hz to 500 Hz
Sinusoidal	5 g, 10 Hz to 500 Hz



Operating shock	30 g, 11 ms half sine; 50 g, 3 ms half sine; 18 shocks at 6 orientations
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Indoor use only.<sup>3</sup>

## Power Requirements

Voltage input range	9 V DC to 30 V DC
Reverse-voltage protection	30 V DC maximum
Maximum power input, with four C Series modules	19 W
Maximum power input, without C Series modules	11 W

## Physical Characteristics



**Tip** For two-dimensional drawings and three-dimensional models of the NI-9149, visit [ni.com/dimensions](https://ni.com/dimensions) and search by module number.

Weight (unloaded)	1,048 g (36.97 oz)
Dimensions (unloaded)	272.8 mm × 88.1 mm × 62.3 mm (10.74 in. × 3.47 in. × 2.45 in.)
<b>Screw-terminal wiring</b>	

- Use NI-9917 and NI-9918 industrial enclosures to protect the device in harsh, dirty, or wet environments.

Gauge	0.2 mm <sup>2</sup> to 2.1 mm <sup>2</sup> (24 AWG to 14 AWG) copper conductor wire
Wire strip length	6 mm (0.24 in.) of insulation stripped from the end
Temperature rating	85 °C
Torque for screw terminals	0.20 N · m to 0.25 N · m (1.8 lb · in. to 2.2 lb · in.)
Wires per screw terminal	One wire per screw terminal
<b>Connector securement</b>	
Securement type	Screw flanges provided
Torque for screw flanges	0.3 N · m to 0.4 N · m (2.7 lb · in. to 3.5 lb · in.)