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# NI-9217

# Specifications

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Ihr NI-Partner:



**AMC – Analytik & Messtechnik GmbH Chemnitz**

Heinrich-Lorenz-Str. 55      Tel.: +49/371/38388-0  
09120 Chemnitz              Fax: +49/371/38388-99  
E-Mail: [info@amc-systeme.de](mailto:info@amc-systeme.de)      Web: [www.amc-systeme.de](http://www.amc-systeme.de)



Integration  
Partner

SYSTEM INTEGRATOR

2023-06-28



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# NI-9217 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.

### Related information:

- [Software Support for CompactRIO, CompactDAQ, Single-Board RIO, R Series, and EtherCAT](#)

## Conditions

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

All specifications given in °C are specific to 100  $\Omega$  platinum RTDs.

## Input Characteristics

Number of channels	4 analog input channels
ADC resolution	24 bits

Type of ADC	Delta-sigma
Sampling mode	Scanned
<b>Measurement range</b>	
Temperature	-200 °C to 850 °C
Resistance	0 $\Omega$ to 400 $\Omega$
<b>Common-mode range</b>	
COM-to-earth ground	$\pm 250$ Vrms
Channel-to-COM	50 mV
<b>Conversion time</b>	
High-resolution mode	200 ms per channel, 800 ms total for all channels
High-speed mode	2.5 ms per channel, 10 ms total for all channels

Temperature accuracy (including noise), 4-wire mode

Measured Value	Typical (25 °C)	Maximum (-40 to 70 °C)
-200 °C to 150 °C	0.15 °C	0.35 °C
150 °C to 850 °C	0.20 °C	1.0 °C

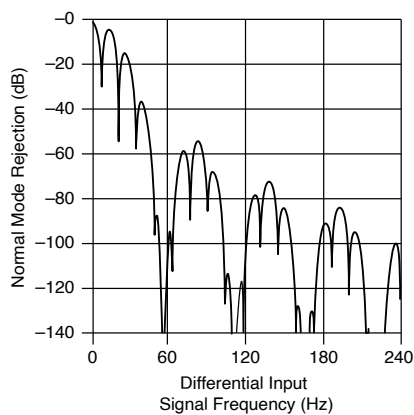
Temperature accuracy (including noise), 3-wire mode

Measured Value	Typical (25 °C)	Maximum (-40 to 70 °C)
-200 °C to 150 °C	0.20 °C	0.50 °C
150 °C to 850 °C	0.30 °C	1.0 °C

#### Noise

High-resolution mode	0.003 °C
High-speed mode	0.02 °C
Excitation current	1 mA per channel
<b>Noise rejection</b>	
<b>Normal mode (50/60 Hz)</b>	
High-resolution mode	85 dB minimum
High-speed mode	None
<b>Common-mode rejection, channel to earth ground (50/60 Hz)</b>	
High-resolution mode	170 dB minimum
High-speed mode	155 dB
Input bandwidth (high-resolution mode)	3.3 Hz

**Figure 1.** High-Resolution Filter Response



**Note** This image is provided courtesy of Linear Technology Corp. High-speed filter response has the same characteristics as the high-resolution filter response except that the first notch is at 14 kHz.

<b>Overvoltage protection</b>	
EX+ to COM	-20 V to 30 V
COM to COM	None
Any other pin-to-pin	±30 V
MTBF	891,597 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

## Safety Voltages

Connect only voltages that are within the following limits.

## Isolation Voltages

Channel-to-channel	None
<b>Channel-to-earth ground</b>	
<b>Continuous</b>	
up to 2,000 m	250 V RMS, Measurement Category II
up to 5,000 m	60 V DC, Measurement Category I
<b>Withstand</b>	
up to 2,000 m	2,300 V RMS, verified by a 5 s dielectric withstand test
up to 5,000 m	1,000 V RMS, verified by a 5 s dielectric withstand test

## Measurement Category I

**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.

## Measurement Category II



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



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

Measurement Category II is for measurements performed on circuits directly connected to the electrical distribution system. This category refers to local-level electrical distribution, such as that provided by a standard wall outlet, for example, 115 V for U.S. or 230 V for Europe.

## Environmental Characteristics

<b>Temperature</b>	
Operating	-40 °C to 70 °C
Storage	-40 °C to 85 °C
<b>Humidity</b>	



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
<b>Shock and Vibration</b>	
<b>Operating vibration</b>	
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

To meet these shock and vibration specifications, you must panel mount the system.

## Power Requirements

<b>Power consumption from chassis</b>	
Active mode	350 mW maximum
Sleep mode	1 mW maximum
<b>Thermal dissipation (at 70 °C)</b>	
Active mode	350 mW maximum

Sleep mode	1 mW maximum
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## Physical Characteristics

Weight	142 g (5.0 oz)
Dimensions	Visit <a href="https://ni.com/dimensions">ni.com/dimensions</a> and search by module number.
<b>Screw-terminal wiring</b>	
Gauge	0.05 mm to 1.5 mm (30 AWG to 14 AWG) copper conductor wire
Wire strip length	6 mm (0.24 in.) of insulation stripped from the end
Temperature rating	90 °C minimum
Torque for screw terminals	0.22 N · m to 0.25 N · m (1.95 lb · in. to 2.21 lb · in.)
Wires per screw terminal	One wire per screw terminal; two wires per screw terminal using a 2-wire ferrule
Ferrules	0.25 mm to 1.5 mm
<b>Connector securement</b>	
Securement type	Screw flanges provided
Torque for screw flanges	0.2 N · m (1.80 lb · in.)

## Calibration

You can obtain the calibration certificate and information about calibration services for the NI-9217 at [ni.com/calibration](https://ni.com/calibration).

Calibration interval	1 year
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