NI-9264 and sbRIO-9264 Specifications

2025-03-10

Contents

NI-9264 and sbRIO-9264 Specifications 3

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These specifications apply to the NI-9264 and sbRIO-9264.

Revision History

Version	Date changed	Description
378903B-01	February 2025	Updated accuracy table.
378903A-01	June 2023	Initial release.

Looking For Something Else?

For information not found in the specifications for your product, such as operating instructions, browse ***Related Information***.

Related information:

- NI-9264 Getting Started
- Software Support for CompactRIO, CompactDAQ, Single-Board RIO, R Series, and EtherCAT
- NI-9264 Calibration Procedure
- Calibration Services
- Software and Driver Downloads
- Dimensional Drawings
- Product Certifications
- Letter of Volatility
- Discussion Forums
- NI Learning Center

Connector Types

The NI-9264 has more than one connector type: NI-9264 with spring terminal and NI-9264 with DSUB. Unless the connector type is specified, NI-9264 refers to all

connector types.

The NI-9264 with spring terminal is available in two types: push-in spring terminal and spring terminal. The push-in type spring terminal connector is black and orange. The spring terminal connector is black. NI-9264 with spring terminal refers to both types unless the two types are specified. Differences between the two types of spring terminal connectors are noted by the connector color.

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. All voltages are relative to COM unless otherwise noted.

NI-9264 with Spring Terminal (Black Connector) Pinout

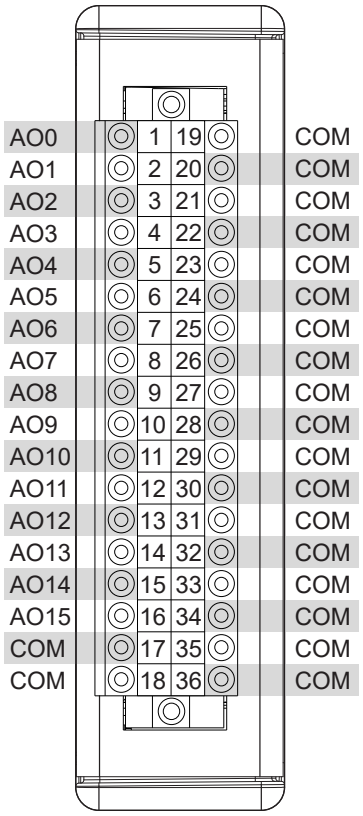

Table 1. Signal Descriptions

Signal	Description
AO	Analog output signal connection
COM	Common reference connection to isolated ground

NI-9264 with Push-in Style Spring Terminal (Black/Orange Connector) Pinout

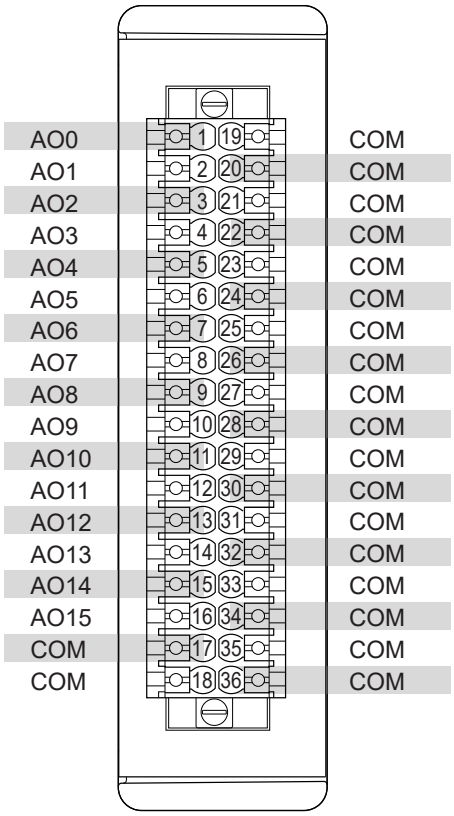

Table 2. Signal Descriptions

Signal	Description
AO	Analog output signal connection
COM	Common reference connection to isolated ground

NI-9264 with DSUB Pinout

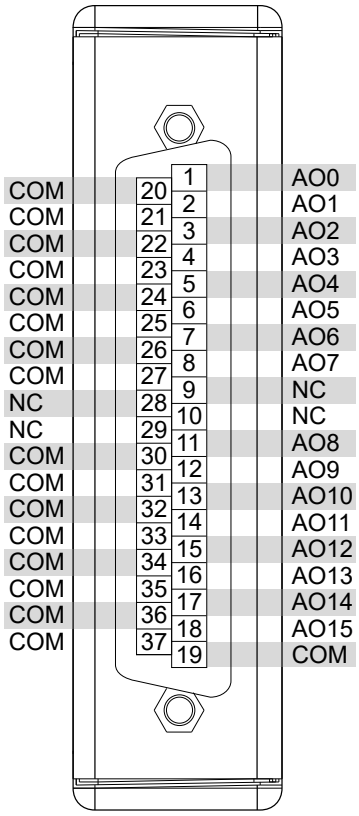

Table 3. Signal Descriptions

Signal	Description
AO	Analog output signal connection
COM	Common reference connection to isolated ground
NC	No connection

Output Characteristics

Number of channels	16 analog output channels
DAC resolution	16 bits
Type of DAC	String
Power-on output state	Channels off
Startup voltage[1]	0 V

1. When the module powers on, a glitch occurs for 20 µs peaking at 500 mV.

Power-down voltage[2]	0 V

Table 4. Output Range

Nominal	±10 V
Minimum	±10.35 V
Typical	±10.5 V
Maximum	±10.65 V

Current drive	±16 mA all channels maximum; ±4 mA per channel typical
Output impedance	2.0 Ω

Table 5. Accuracy

	Range	Measurement Conditions	Within 1 Year of Calibration		Within 10 Years of Calibration	
			Percent of Reading (Gain Error)	Percent of Range (Offset Error)	Percent of Reading (Gain Error)	Percent of Range (Offset Error)
Calibrated	10.5 V	Maximum (-40 °C to 70 °C)	0.15%	0.15%	0.22%	0.30%
		Typical (25 °C)	0.05%	0.05%	0.09%	0.12%
Uncalibrated[3]	10.5 V	Maximum (-40 °C to 70 °C)	0.6%	1.0%	0.67%	1.15%
		Typical (25 °C)	0.2%	0.25%	0.24%	0.32%

Note NI recommends a calibration interval of 1 year and only provides

2. The power-down voltage peaks at 1.7 V, then exponentially discharges to 0 V in 200 ms. You can add a load to reduce peak voltage.
3. ***Uncalibrated accuracy*** refers to the accuracy achieved when acquiring data in raw or unscaled modes and in which calibration constants that are stored in the module are not applied to the data.

> calibration services referencing the 1-year specification limits. If you choose to calibrate less often, the 10-year column provides predicted performance over this extended interval. Choose an appropriate interval based on your application requirements. Longer calibration intervals are more likely to result in As-Found calibration failures when the device is sent back for calibration and compared against the 1-year specification limits.

Table 6. Stability

Gain drift	6 ppm/°C
Offset drift	80 µV/°C

Table 7. Protection

Overvoltage	±27 V at 25 °C
Short-circuit	Indefinitely

Table 8. Update Time

Number of Channels	Update Time for cRIO-9151 R Series Expansion Chassis	Update Time for All Other Chassis
1	3.7 µs minimum	3.1 µs minimum
2	6.6 µs minimum	5.3 µs minimum
3	9.4 µs minimum	7.5 µs minimum
16	47 µs minimum	37 µs minimum

Noise[4]	500 µV RMS
Slew rate	4 V/µs
Crosstalk at 1 kHz sine wave	85 dB

Table 9. Settling Time (100 pF Load, to 1 LSB)

20 V step	20 µs
1 V step	15 µs

4. The noise specification includes the glitch energy.

0.1 V step	13 µs

Capacity drive	1,500 pF maximum
Monotonicity	16 bits
DNL	±1 LSB maximum
INL (endpoint)	±12 LSBs maximum
MTBF	595,509 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

NI-9264 with Spring Terminal (Black Connector) Safety Voltages

Connect only voltages that are within the following limits.

Isolation	
Channel-to-channel	None
Channel-to-earth ground	
Continuous	250 V RMS, Measurement Category II
Withstand	2,300 V RMS, verified by a 5 s dielectric withstand test

NI-9264 with Push-In Spring Terminal (Black/Orange Connector) Safety Voltages

Connect only voltages that are within the following limits.

Channel-to-channel	None
Channel-to-earth ground	
Continuous	250 V RMS, Measurement Category II
Withstand up to 4,000 m	3,000 V RMS, verified by a 5 s dielectric withstand test

NI-9264 with DSUB Safety Voltages

Connect only voltages that are within the following limits.

Isolation	
Channel-to-channel	None
Channel-to-earth ground	
Continuous	60 V DC, Measurement Category I
Withstand up to 2,000 m	1,000 V RMS, verified by a 5 s dielectric withstand test

Measurement Category

Measurement Category I

Caution Do not connect the NI-9264 with DSUB to signals or use for measurements within Measurement Categories II, III, or IV.

Attention Ne pas connecter le NI-9264 with DSUB 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 NI-9264 with DSUB 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 NI-9264 with DSUB 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 NI-9264 with spring terminal to signals or use for measurements within Measurement Categories III or IV.

Attention Ne pas connecter le NI-9264 with spring terminal 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

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	
NI-9264 with spring terminal (black connector)	2,000 m
NI-9264 with spring terminal (push-in style, black/orange connector)	4,000 m
NI-9264 with DSUB	2,000 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

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

Physical Characteristics

Weight

NI-9264 with spring terminal (black connector)	156 g (5.5 oz)
NI-9264 with push-in spring terminal (black/orange connector)	161 g (5.7 oz)
NI-9264 with DSUB	146 g (5.2 oz)

NI-9264 with spring terminal (Black Connector) Wiring

Spring terminal wiring	
Gauge	0.08 mm^2 to 1.0 mm^2 (28 AWG to 18 AWG) copper conductor wire
Wire strip length	7 mm (0.28 in.) of insulation stripped from the end
Temperature rating	90 °C minimum
Wires per spring terminal	One wire per spring terminal
Connector securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.2 N · m (1.80 lb · in.)

NI-9264 with Push-In Spring Terminal (Black/Orange Connector)

Push-in spring terminal wiring	
Gauge	0.14 mm^2 to 1.5 mm^2 (26 AWG to 16 AWG) copper conductor wire
Wire strip length	10 mm (0.394 in.) of insulation stripped from the end
Temperature rating	90 °C minimum
Wires per spring terminal	One wire per spring terminal; two wires per spring terminal using a 2-wire ferrule
Connector securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.2 N · m (1.80 lb · in.)

Power Requirements

Power consumption from chassis	
Active mode	1 W maximum
Sleep mode	25 µW maximum
Thermal dissipation (at 70 °C)	
Active mode	1 W maximum

Sleep mode	25 µW maximum

Calibration

You can obtain the calibration certificate and information about calibration services for the NI-9264 at ni.com/calibration.

Recommended calibration interval	1 year