NI-9472 Specifications

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Contents

NI-9472 Specifications

Connector Types

The NI-9472 has more than one connector type: NI-9472 with screw terminal, NI-9472 with spring terminal, and NI-9472 with DSUB. Unless the connector type is specified, NI-9472 refers to all connector types.

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 voltages are relative to COM unless otherwise noted.

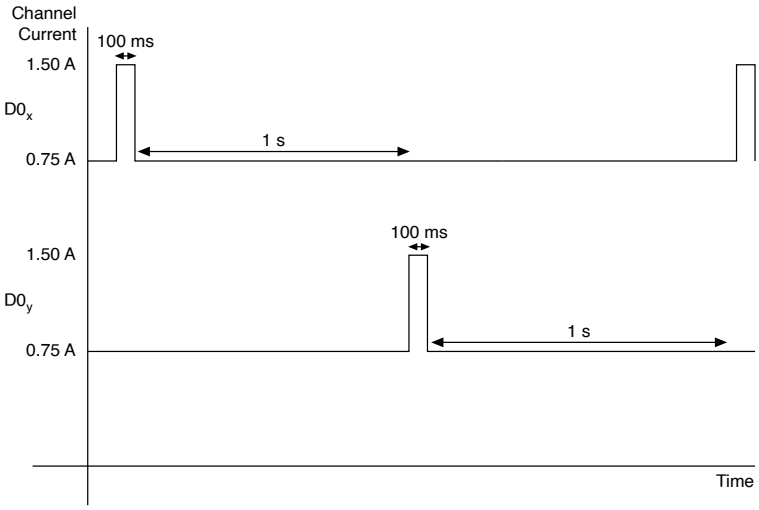
Output Characteristics

Number of channels	8 digital output channels
Output type	Sourcing
Power-on output state	Channels off
External power supply voltage range (Vsup)	6 VDC to 30 VDC
Output impedance (R_0)	
Typical	0.07 Ω
Maximum	0.13 Ω
Continuous output current (I_0), per channel	0.75 A maximum
Output voltage (V_0)	Vsup - ($I_0 \cdot R_0$)
I/O protection	
Voltage	30 VDC maximum
Reversed voltage	None
Short circuit trip time	10 µs at 14 A

Table 1. Short-circuit Behavior

Current	Channel Behavior	Module Protection
Less than .75 A	Channel does not trip	Module is not damaged
.75 A to 1.5 A for 100 ms maximum, repeatable after 1 s[1]	Channel does not trip	Module is not damaged
1.5 A to 4.4 A	Channel does not trip	Module may be damaged
4.4 A to 14 A	Channel may trip	Module may be damaged
Greater than 14 A	Channel trips	Module is not damaged

Figure 1. Short-circuit Behavior



Output delay time (full load)	100 µs maximum
MTBF	1,113,301 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

NI-9472 with Screw Terminal and Spring Terminal Safety Voltages

Connect only voltages that are within the following limits.

1. One channel at a time.

Channel-to-COM	30 VDC maximum
Isolation	
Channel-to-channel	None
Channel-to-earth ground	
Continuous	250 Vrms, Measurement Category II
Withstand	2,300 Vrms, verified by a 5 s dielectric withstand test

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.

NI-9472 with DSUB Safety Voltages

Connect only voltages that are within the following limits.

Channel-to-COM	30 VDC maximum
Isolation	

Channel-to-channel	None
Channel-to-earth ground	
Continuous	60 VDC, Measurement Category I
Withstand	1,000 Vrms, verified by a 5 s dielectric withstand test

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	
NI-9472 with screw terminal	2,000 m
NI-9472 with spring terminal	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.

Power Requirements

Power consumption from chassis	
Active mode	230 mW maximum

Sleep mode	0.4 mW maximum
Thermal dissipation (at 70 °C)	
Active mode	1.5 W maximum
Sleep mode	55 mW maximum

Physical Characteristics

Dimensions	Visit ni.com/dimensions and search by module number.
Weight	
NI-9472 with screw terminal	150 g (5.3 oz)
NI-9472 with spring terminal	139 g (4.9 oz)
NI-9472 with DSUB	145 g (5.1 oz)
Screw Terminal Wiring	
Gauge	0.2 mm^2 to 2.5 mm^2 (26 AWG to 14 AWG) copper conductor wire
Wire strip length	13 mm (0.51 in.) of insulation stripped from the end
Temperature rating	90 °C, minimum

Torque for screw terminals	0.5 N · m to 0.6 N · m (4.4 lb · in. to 5.3 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^2 to 2.5 mm^2
Spring Terminal Wiring	
Gauge	0.2 mm^2 to 2.5 mm^2 (30 AWG to 12 AWG) copper conductor wire
Wire strip length	10 mm (0.39 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
Ferrules	0.25 mm^2 to 2.5 mm^2
Connector Securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.2 N · m (1.80 lb · in.)