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# NI-9476 and sbRIO-9476 Specifications

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# NI-9476 and sbRIO-9476 Specifications

## NI-9476 Nomenclature

In this article, the NI-9476 with spring terminal and NI-9476 with DSUB are referred to inclusively as the NI-9476. The information in this document applies to all versions of the NI-9476 unless otherwise specified.

## 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.

## Output Characteristics

Number of channels	32 digital output channels
Output type	Sourcing
Output Voltage	$V_{\text{sup}} - (I_0 * R_0)$
Power-on output state	Channels off
External power supply voltage range ( $V_{\text{sup-to-COM}}$ )	6 V DC to 36 V DC
<b>Continuous output current (<math>I_0</math>) per channel (DO-to-COM)</b>	
With 6 V DC to 30 V DC supply voltage	250 mA maximum
With 30 V DC to 36 V DC supply voltage	200 mA maximum
Output impedance ( $R_0$ )	0.3 $\Omega$ maximum
Continuous overvoltage protection ( $V_{\text{sup}}$ )	up to 40 V maximum
Reversed-voltage protection	None
Current limiting	None

Short-circuit protection	Indefinitely protected when a channel is shorted to COM or to a voltage up to $V_{sup}$
<b>Trip current for one channel</b>	
With all other channels at rated current	3 A typical
With all other channels off	5 A typical
$V_{sup}$ current consumption	28 mA maximum
Maximum update rate	40 $\mu$ s maximum
Propagation delay	500 $\mu$ s maximum
MTBF	1,091,425 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method


## NI-9476 with Spring Terminal Safety Voltages


Connect only voltages that are within the following limits.

$V_{sup}$ -to-COM	40 V DC maximum
DO	$V_{COM} \leq V_{DO} \leq V_{sup}$
<b>Isolation</b>	

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

## 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.

## NI-9476 with DSUB Safety Voltages

Connect only voltages that are within the following limits.

$V_{sup-to-COM}$	40 V DC maximum
DO	$V_{COM} \leq V_{DO} \leq V_{sup}$
<b>Isolation</b>	

Channel-to-channel	None
<b>Channel-to-earth ground</b>	
Continuous	60 V DC, Measurement Category 1
Withstand up to 2,000 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.

## 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
<b>Maximum altitude</b>	
NI-9476 with spring terminal	5,000 m
NI-9476 with DSUB	2,000 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	250 mW maximum
Sleep mode	25 $\mu$ W maximum
<b>Thermal dissipation (at 70 °C)</b>	
Active mode	1.5 W maximum

Sleep mode	30 mW maximum
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## Physical Characteristics

If you need to clean the module, wipe it with a dry towel.

Dimensions	Visit <a href="http://ni.com/dimensions">ni.com/dimensions</a> and search by module number.	
<b>Spring-terminal wiring</b>		
Gauge	0.14 mm <sup>2</sup> to 1.5 mm <sup>2</sup> (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 screw terminal	One wire per spring terminal; two wires per spring terminal using a 2-wire ferrule	
Ferrules	0.14 mm <sup>2</sup> to 1.5 mm <sup>2</sup>	
<b>Connector securement</b>		
Securement type	Screw flanges provided	
Torque for screw flanges	0.2 N · m (1.80 lb · in.)	
<b>Weight</b>		

NI-9476 with spring terminal	167 g (5.9 oz)
NI-9476 with spring terminal	147 g (5.2 oz)

**Related information:**

- [Dimensional Drawings](#)