
NI-9411

Specifications

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Contents

NI-9411..... 3

NI-9411 Specifications

The following specifications are typical for the range -40 °C to 70 °C unless otherwise noted. All voltages are relative to COM unless otherwise noted.



Caution Do not operate the NI-9411 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.



Caution Le NI-9411 ne doit en aucun cas être utilisé d'une autre façon que celle spécifiée dans ce document. Une mauvaise utilisation du produit peut s'avérer dangereuse. Si le produit est endommagé de quelque manière que ce soit, la sécurité intégrée dans le produit risque d'en être compromise. Si le produit est endommagé, le renvoyer à NI pour réparation.

Input Characteristics

Number of channels	6 digital input channels
Input type	Differential or single-ended
Digital logic levels	
Differential (DIa and DIb)	
Input high range	300 mV to 24 V
Input low range	-300 mV to -24 V
Common-mode voltage	-7 V to 12 V
Single-ended	

Input high range	2 V to 24 V
Input low range	0 V to 0.8 V
Input current	
At 5 V	±1 mA per channel
At 24 V	±4 mA per channel
Input impedance	8.4 kΩ
I/O protection	
Input voltage (channel-to-COM)	30 V maximum
Input current	±4 mA, internally limited
Input delay time	500 ns maximum
MTBF	800,319 hours at 25 °C; Bellcore Issue 2, Method 1, Case 3, Limited Part Stress Method

Power Requirements

Power consumption from chassis	
Active mode	340 mW maximum
Sleep mode	1.1 mW maximum
Thermal dissipation (at 70 °C)	
Active mode	1.4 W maximum
Sleep mode	1.1 W maximum

External Power Supply

Input voltage range (V_{sup})	5 V DC to 30 V DC maximum
5 V regulated output	
Voltage tolerance	5 V \pm 3%, $V_{sup} \geq 6$ V
Current	200 mA
Short-circuit protection	400 mA



Notice The NI-9411 does not provide overvoltage protection for the external power supply.

Physical Characteristics

Screw-terminal wiring

Gauge	0.05 mm ² to 1.5 mm ² (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 ² to 1.5 mm ²
Ferrules	0.25 mm ² to 1.5 mm ²
Weight	136 g (4.8 oz)
Connector securement	
Securement type	Screw flanges provided
Torque for screw flanges	0.2 N · m (1.80 lb · in.)

Safety Voltages

Connect only voltages that are within the following limits.

Channel-to-COM or Vsup-to-COM	30 V maximum, Measurement Category I
Isolation	
Channel-to-channel	None
Channel-to-earth ground	
Continuous	30 V RMS, 42.4 Vpk, 60 V DC
Withstand	400 V RMS, verified by a 5 s dielectric withstand test

Hazardous Locations

U.S. (UL)	Class I, Division 2, Groups A, B, C, D, T4; Class I, Zone 2, AEx nA IIC T4 Gc
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Canada (C-UL)	Class I, Division 2, Groups A, B, C, D, T4; Ex nA IIC T4 Gc
Europe (ATEX) and International (IECEX)	Ex nA IIC T4 Gc DEMKO 03 ATEX 0324020X IECEX UL 14.0089X

Safety Compliance and Hazardous Locations Standards

This product is designed to meet the requirements of the following electrical equipment safety standards for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA C22.2 No. 61010-1
- EN 60079-0, EN 60079-7
- IEC 60079-0, IEC 60079-7
- UL 60079-0, UL 60079-7
- CSA C22.2 No. 60079-0, CSA C22.2 No. 60079-7



Note For safety certifications, refer to the product label or the [Product Certifications and Declarations](#) section.

Electromagnetic Compatibility

- EN 61326 (IEC 61326): Class A emissions; Industrial immunity



Note For EMC compliance, operate this device with shielded cables.

CE Compliance

- 2014/34/EU; Potentially Explosive Atmospheres (ATEX)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit ni.com/product-certifications, search by model number, and click the appropriate link.

Shock and Vibration

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

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

Environmental

Refer to the manual for the chassis you are using for more information about meeting these specifications.

Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 70 °C
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Storage temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 85 °C
Ingress protection	IP40
Operating humidity (IEC 60068-2-30)	10% RH to 90% RH, noncondensing
Storage humidity (IEC 60068-2-30)	5% RH to 95% RH, noncondensing
Pollution Degree	2
Maximum altitude	2,000 m

Indoor use only.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the **Engineering a Healthy Planet** web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

EU and UK Customers

- **Waste Electrical and Electronic Equipment (WEEE)**—At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

电子信息产品污染控制管理办法（中国 RoHS）

-  中国 RoHS— NI 符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于 NI 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)