
NI-9403 Getting Started

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Overview

This document explains how to connect to the NI-9403.



Note Before you begin, read the **NI-9403 Safety, Environmental, and Regulatory Information** document on ni.com/manuals and complete the software and hardware installation procedures in your chassis documentation.



Note The guidelines in this document are specific to the NI-9403. The other components in the system might not meet the same safety ratings. Refer to the documentation for each component in the system to determine the safety and EMC ratings for the entire system.

Safety Guidelines



Caution Observe all instructions and cautions in the user documentation. Using the product in a manner not specified can damage the product and compromise the built-in safety protection.



Attention Suivez toutes les instructions et respectez toutes les mises en garde de la documentation d'utilisation. L'utilisation du produit de toute autre façon que celle spécifiée risque de l'endommager et de compromettre la protection de sécurité intégrée.

Safety Voltages

Connect only voltages that are within the following limits:

| | |
|------------------|---|
| Channel-to-COM | ±30 V maximum on up to 8 channels at a time, Measurement Category I |
| Isolation | |

Channel-to-channel

None

Channel-to-earth ground

Continuous 60 V DC, Measurement Category I

Withstand

Up to 3,000 m altitude 1,000 V RMS, verified by a 5 s dielectric withstand test

Up to 5,000 m altitude 860 V RMS, verified by a 5 s dielectric withstand test

Safety Guidelines for Hazardous Locations

The NI-9403 is suitable for use in Class I, Division 2, Groups A, B, C, D, T4 hazardous locations; Class I, Zone 2, AEx nA IIC T4 Gc and Ex nA IIC T4 Gc hazardous locations; and nonhazardous locations only. Follow these guidelines if you are installing the NI-9403 in a potentially explosive environment. Not following these guidelines may result in serious injury or death.



Caution Do not disconnect I/O-side wires or connectors unless power has been switched off or the area is known to be nonhazardous.



Caution Do not remove modules unless power has been switched off or the area is known to be nonhazardous.



Caution Substitution of components may impair suitability for Class I, Division 2, or Zone 2.




Caution The system must be installed in an enclosure certified for the intended hazardous (classified) location, having a tool secured cover/door, where a minimum protection of at least IP54 is provided.



Caution For Division 2 and Zone 2 applications, connected signals must be within the following limits.

| | |
|-------------|---------------------|
| Capacitance | 0.2 μ F maximum |
|-------------|---------------------|

Special Conditions for Hazardous Locations Use in Europe and Internationally

The NI-9403 has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO 07ATEX 0626664X and is IECEx UL 14.0089X certified. Each NI-9403 is marked  II 3G and is suitable for use in Zone 2 hazardous locations, in ambient temperatures of $-40\text{ }^{\circ}\text{C} \leq T_a \leq 70\text{ }^{\circ}\text{C}$. If you are using the NI-9403 in Gas Group IIC hazardous locations, you must use the device in an NI chassis that has been evaluated as Ex nC IIC T4, Ex IIC T4, Ex nA IIC T4, or Ex nL IIC T4 equipment.



Caution Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage value of 85 V at the supply terminals to the equipment.



Caution The system shall only be used in an area of not more than Pollution Degree 2, as defined in IEC/EN 60664-1.



Caution The system shall be mounted in an ATEX/IECEx-certified enclosure with a minimum ingress protection rating of at least IP54 as defined in IEC/EN 60079-15.



Caution The enclosure must have a door or cover accessible only by the use of a tool.

Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any changes or modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

Special Conditions for Marine Applications

Some products are approved for marine (shipboard) applications. To verify marine approval certification for a product, visit ni.com/product-certifications, search by model number, and click the appropriate link.



Notice In order to meet the EMC requirements for marine applications, install the product in a shielded enclosure with shielded and/or filtered power and input/output ports. In addition, take precautions when designing, selecting, and installing measurement probes and cables to ensure that the desired EMC performance is attained.

Preparing the Environment

Ensure that the environment in which you are using the NI-9403 meets the following specifications.

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

Indoor use only.

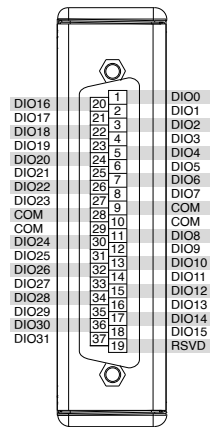


Note Refer to the **NI-9403 Specifications** on ni.com/manuals for complete specifications.

Connecting the NI 9403

The NI-9403 provides connections for 32 digital input/output channels.

Figure 1. NI 9403 Pinout



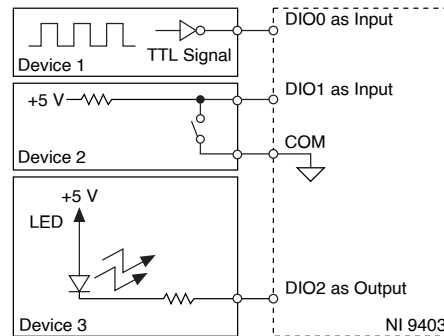
| Signal Name | Description |
|-------------|---|
| DIO | Each channel includes a DIO pin to which you can connect a digital input or output device. |
| COM | DIO channels are internally referenced to COM, so you can use any of the four COM lines as a reference for the external signal. |
| RSVD | This channel is reserved and is not a user-facing signal. |

Table 1. NI-9403 Signal Descriptions

Connecting Digital Devices to the NI-9403

You can connect digital devices to the NI-9403.

Figure 2. Connecting Digital Devices to the NI-9403



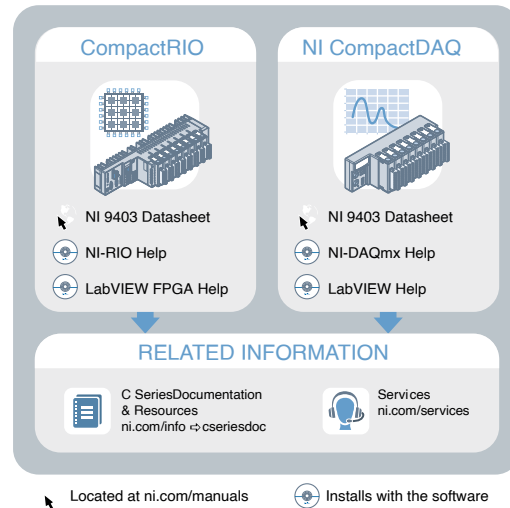
Overcurrent/Short-Circuit Protection

The overcurrent protection allows only a specified amount of current through the output channels to protect the NI-9403 from short circuits. If the NI-9403 goes into an overcurrent state, the module sets all the DIO channels to high impedance for approximately 280 ms.

When the channels are in an overcurrent state, the NI-9403 can accept new line direction configuration and output state data but cannot pass valid input data to the software.

After the overcurrent protection period, the NI-9403 automatically recovers to the latest direction configuration and output state. If the overcurrent condition still exists, the module again sets the channels to high impedance. This cycle continues until the overcurrent condition is removed.

Where to Go Next



NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

NI corporate headquarters is located at 11500 N Mopac Expwy, Austin, TX, 78759-3504, USA.