
NI-9425 Getting Started

2022-07-06



Contents

Overview.....	3
Safety Guidelines.....	3
Safety Guidelines for Hazardous Voltages.....	3
NI-9425 with Spring Terminal Safety Voltages.....	4
NI-9425 with DSUB Safety Voltages.....	5
Safety Guidelines for Hazardous Locations.....	5
Electromagnetic Compatibility Guidelines.....	7
Special Conditions for Marine Applications.....	7
Preparing the Environment.....	8
NI 9425 Pinout.....	8
Connecting a Sourcing-Output Device.....	9
NI-9425 Connection Guidelines.....	9
High-Vibration Application Connections.....	10
Where to Go Next.....	10
NI Services.....	10

Overview

This document explains how to connect to the NI-9425. In this document, the NI-9425 with spring terminal and the NI-9425 with DSUB are referred to inclusively as the NI-9425.



Note Before you begin, read the **NI-9425 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-9425. 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 Guidelines for Hazardous Voltages

- 

Caution Ensure that hazardous voltage wiring is performed only by qualified personnel adhering to local electrical standards.
- 

Caution Do not mix hazardous voltage circuits and human-accessible circuits on the same module.
- 

Caution Ensure that devices and circuits connected to the module are properly insulated from human contact.
- 

Caution When module terminals are hazardous voltage LIVE ($>42.4\text{ V}_{pk}/60\text{ V DC}$), you must ensure that devices and circuits connected to the module are properly insulated from human contact.

NI-9425 with Spring Terminal Safety Voltages

Connect only voltages that are within the following limits.

Channel-to-channel	
Up to 8 channels simultaneously	$\pm 60\text{ V}$ maximum
All channels simultaneously	$\pm 30\text{ V}$ maximum
Isolation	
Channel-to-channel	None
Channel-to-earth ground	
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



Caution Do not connect the NI 9425 with spring terminal to signals or use for measurements within Measurement Categories III or IV.

NI-9425 with DSUB Safety Voltages

Connect only voltages that are within the following limits.

Channel-to-channel

Up to 8 channels simultaneously	±60 V maximum
All channels simultaneously	±30 V maximum

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
Withstand up to 5,000 m	500 V RMS, verified by a 5 s dielectric withstand test



Caution Do not connect the NI 9425 with DSUB to signals or use for measurements within Measurement Categories II, III, or IV.



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.

Safety Guidelines for Hazardous Locations

The NI-9425 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-9425 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.

Special Conditions for Hazardous Locations Use in Europe and Internationally

The NI 9425 with spring terminal has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO 12 ATEX 1202658X and is IECEx UL 14.0089X certified. The NI 9425 with DSUB has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO 03 ATEX 0324020X and is IECEx UL 14.0089X certified. Each NI 9425 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 9425 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 9425 meets the following specifications.

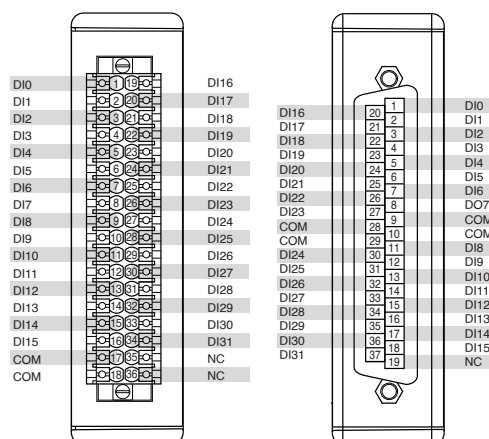
Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 70 °C
Operating humidity (IEC 60068-2-30)	10% RH to 90% RH, noncondensing
Pollution Degree	2
Maximum altitude	5,000 m

Indoor use only.



Note Refer to the **NI-9425 Specifications** on ni.com/manuals for complete specifications.

NI 9425 Pinout

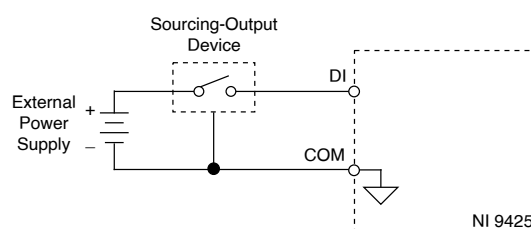


Signal	Description
COM	Common reference connection to isolated ground
DI	Digital input signal connection
NC	No connection

Table 1. Signal Descriptions

Connecting a Sourcing-Output Device

You can connect 2-, 3-, and 4-wire sourcing-output devices to the NI-9425.



The NI-9425 channel registers as ON when the sourcing-output device applies a voltage or drives a current that is in the input ON range to DI. The channel registers as OFF when the device applies a voltage or drives a current that is in the input OFF range to DI. If no device is connected to DI, the channel registers as OFF.

NI-9425 Connection Guidelines

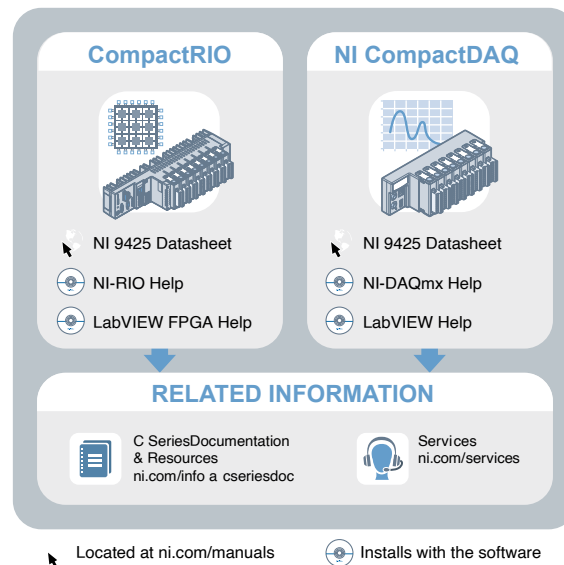
- Make sure that devices you connect to the NI-9425 are compatible with the module specifications.
- You must use 2-wire ferrules to create a secure connection when connecting more than one wire to a single terminal on the NI-9425 with spring terminal.
- For the NI-9425 with spring terminal, push the wire into the terminal when using a solid wire or a stranded wire with a ferrule.
- For the NI-9425 with spring terminal, open the terminal by pressing the push button when using stranded wire without a ferrule.

- For CAT II measurements, you must use a power supply with isolated DC outputs if you are using an external power supply.

High-Vibration Application Connections

If your application is subject to high vibration, NI recommends that you use the cRIO-9940 backshell kit to protect connections to the NI-9425 with spring terminal.

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.