GETTING STARTED GUIDE

NI 9426

32 DI, 30 V, Sourcing, 7 μs
This document explains how to connect to the NI 9426.

**Note** Before you begin, complete the software and hardware installation procedures in your chassis documentation.

**Note** The guidelines in this document are specific to the NI 9426. 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

Operate the NI 9426 only as described in this document.

**Caution** Do not operate the NI 9426 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.
## Safety Voltages

Connect only voltages that are within the following limits:

<table>
<thead>
<tr>
<th>Voltage Type</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vsup-to-channel</td>
<td>30 VDC maximum</td>
</tr>
<tr>
<td>Isolation</td>
<td></td>
</tr>
<tr>
<td>Channel-to-channel</td>
<td>None</td>
</tr>
<tr>
<td>Channel-to-earth ground</td>
<td></td>
</tr>
<tr>
<td>Continuous</td>
<td>60 VDC, Measurement Category I</td>
</tr>
<tr>
<td>Withstand</td>
<td>1,000 Vrms, verified by a 5 s dielectric withstand test</td>
</tr>
</tbody>
</table>

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.
Caution  Do not connect the NI 9426 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 not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Safety Guidelines for Hazardous Voltages

If hazardous voltages are connected to the device, take the following precautions. A hazardous voltage is a voltage greater than 42.4 Vpk voltage or 60 VDC to earth ground.

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 Vpk/60 VDC), you must ensure that devices and circuits connected to the module are properly insulated from human contact.

Safety Guidelines for Hazardous Locations
The NI 9426 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 and Ex nA IIC T4 hazardous locations; and nonhazardous locations only. Follow these guidelines if you are installing the NI 9426 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.
Caution  For Division 2 and Zone 2 applications, install the system in an enclosure rated to at least IP54 as defined by IEC/EN 60079-15.

Caution  For Division 2 and Zone 2 applications, install a protection device that prevents the Vsup voltage from exceeding 42 V if there is a transient overvoltage condition.

Special Conditions for Hazardous Locations Use in Europe and Internationally

The NI 9426 has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO Certificate No. 07 ATEX 0626664X and is IECEx UL 14.0089X certified. Each NI 9426 is marked II 3G and is suitable for use in Zone 2 hazardous locations, in ambient temperatures of \(-40 \, ^\circ\text{C} \leq T_a \leq 70 \, ^\circ\text{C}\). If you are using the NI 9426 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  You must make sure that transient disturbances do not exceed 140% of the rated voltage.
Caution  The system shall only be used in an area of not more than Pollution Degree 2, as defined in IEC 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 Lloyd’s Register (LR) Type Approved for marine (shipboard) applications. To verify Lloyd’s Register certification for a product, visit [ni.com/certification](http://ni.com/certification) and search for the LR certificate, or look for the Lloyd’s Register mark on the product.

**Caution**  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 9426 meets the following specifications.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-40 °C to 70 °C (IEC 60068-2-1, IEC 60068-2-2)</td>
</tr>
<tr>
<td>Operating humidity</td>
<td>10% RH to 90% RH, noncondensing (IEC 60068-2-78)</td>
</tr>
<tr>
<td>Pollution Degree</td>
<td>2</td>
</tr>
<tr>
<td>Maximum altitude</td>
<td>2,000 m</td>
</tr>
</tbody>
</table>

Indoor use only.

**Note** Refer to the device datasheet on [ni.com/manuals](ni.com/manuals) for complete specifications.
<table>
<thead>
<tr>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DI</td>
<td>Digital input signal connection</td>
</tr>
<tr>
<td>NC</td>
<td>No connection</td>
</tr>
<tr>
<td>Vsup</td>
<td>Voltage supply connection</td>
</tr>
</tbody>
</table>
Connecting a Sinking-Output Device

You can connect 2- and 3-wire sinking-output devices to the NI 9426.

**Figure 1. Connecting a Sinking-Output Device to the NI 9426**

The NI 9426 channel registers as ON when the sinking-output device drives the input below Vsup and meets the input ON range. If no device is connected to DI, the channel registers as OFF.
Where to Go Next

**CompactRIO**
- NI 9426 Datasheet
- NI-RIO Help
- LabVIEW FPGA Help

**NI CompactDAQ**
- NI 9426 Datasheet
- NI-DAQmx Help
- LabVIEW Help

**RELATED INFORMATION**
- C Series Documentation & Resources
  - ni.com/info → cseriesdoc
- Services
  - ni.com/services

Located at ni.com/manuals
Installs with the software

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Worldwide Support and Services

The NI website is your complete resource for technical support. At \textit{ni.com/support}, you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

Visit \textit{ni.com/services} for NI Factory Installation Services, repairs, extended warranty, and other services.

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

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer’s declaration of conformity. This system affords the user protection for electromagnetic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting \textit{ni.com/certification}. If your product supports calibration, you can obtain the calibration certificate for your product at \textit{ni.com/calibration}. 
NI corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. NI also has offices located around the world. For telephone support in the United States, create your service request at ni.com/support or dial 1 866 ASK MYNI (275 6964). For telephone support outside the United States, visit the Worldwide Offices section of ni.com/niglobal to access the branch office websites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.