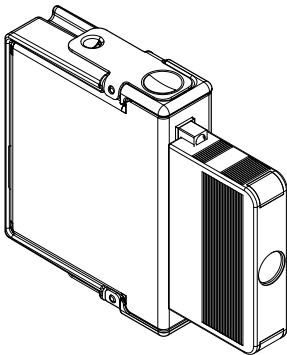


## GETTING STARTED GUIDE

# NI 9436

8 DI,  $\pm 100$  VDC to  $\pm 250$  VDC/100 VAC to  
250 VAC, Sinking/Sourcing, 20 ms



This document explains how to connect to the NI 9436.



**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 9436. 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

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Operate the NI 9436 only as described in this document.



**Caution** Do not operate the NI 9436 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:

DIa-to-DIb	250 Vrms maximum, Measurement Category II
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### Isolation

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#### Channel-to-channel

Continuous	250 Vrms, Measurement Category II
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Withstand	1,500 Vrms, verified by a 5 s dielectric withstand test
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#### Channel-to-earth ground

Continuous	250 Vrms, Measurement Category II
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Withstand	3,000 Vrms, verified by a 5 s dielectric withstand test
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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.



**Caution** Do not connect the NI 9436 to signals or use for measurements within Measurement Categories III or 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.



**Hazardous Voltage** This icon denotes a warning advising you to take precautions to avoid electrical shock.



**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.

# Electromagnetic Compatibility Guidelines

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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

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Ensure that the environment in which you are using the NI 9436 meets the following specifications.

Operating temperature (IEC 60068-2-1, IEC 60068-2-2)	-40 °C to 70 °C
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Operating humidity (IEC 60068-2-78)	10% RH to 90% RH, noncondensing
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Pollution Degree	2
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Maximum altitude	5,000 m
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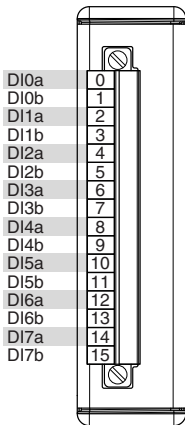
Indoor use only.



**Note** Refer to the device datasheet on [ni.com/manuals](https://ni.com/manuals) for complete specifications.

# NI 9436 Pinout

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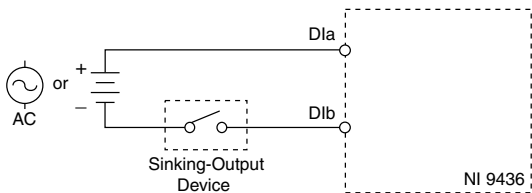


**Table 1.** Signal Descriptions

Signal	Description
DIa and DIb	Digital input signal connections

## Sinking-Output Connections

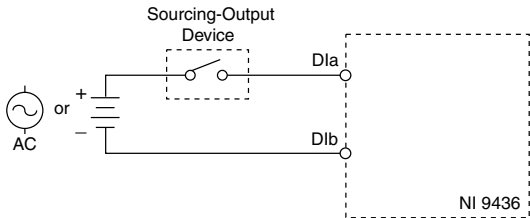
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The NI 9436 channel registers as ON when the sinking-output device drives the input within the input ON range. If no device is connected to DI, the channel registers as OFF.

## Sourcing-Output Connections

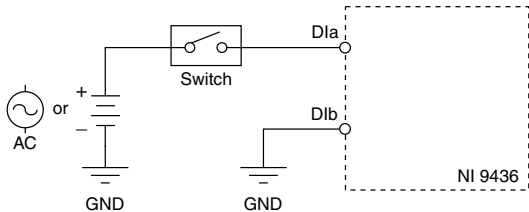
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The NI 9436 channel registers as ON when the sourcing-output device drives enough current or applies enough voltage to DI. If no device is connected to DI, the channel registers as OFF.

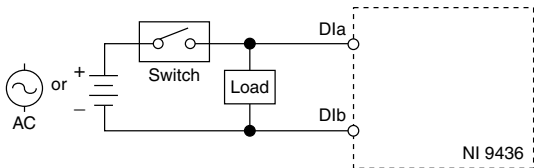
## Switch Connections

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## Load Connections

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## NI 9436 Connection Guidelines

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Make sure that devices you connect to the NI 9436 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 9436.

### Wiring the NI 9436



**Caution** For safe operation with hazardous voltages, you must use the NI 9939 Connector Backshell with the 16-position screw terminal connector on the NI 9436.

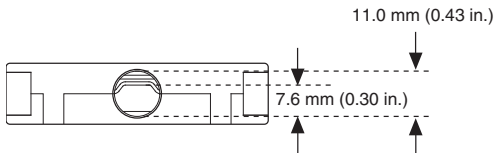
When connecting all 16 terminals, the total maximum wire diameter including insulation must not exceed 2.3 mm (0.09 in.) per wire in order to fit through the 11.0 mm (0.43 in.) opening on the NI 9939.

When connecting all 16 terminals using the cable retainer, the total maximum wire diameter including insulation must not

exceed 1.6 mm (0.06 in.) per wire in order to fit under the 7.6 mm (0.30 in.) clearance of the NI 9939 cable retainer.

**Figure 1.** NI 9939 Wire Clearance Dimensions

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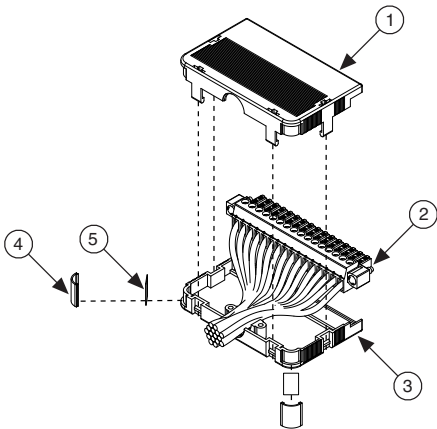
Complete the appropriate procedure based on the total maximum wire diameter used.

## Installing the NI 9939

### What to Use

- NI 9939 kit
- $0.05 \text{ mm}^2$  to  $1.5 \text{ mm}^2$  (30 AWG to 14 AWG) wire with 6 mm (0.24 in.) of the insulation stripped
- Slotted screwdriver

## What to Do



1. Insert the stripped end of the wire fully into the appropriate terminal on the 16-Position Screw Terminal Connector (2) and tighten the screw. Make sure no exposed wire extends past the screw terminal.

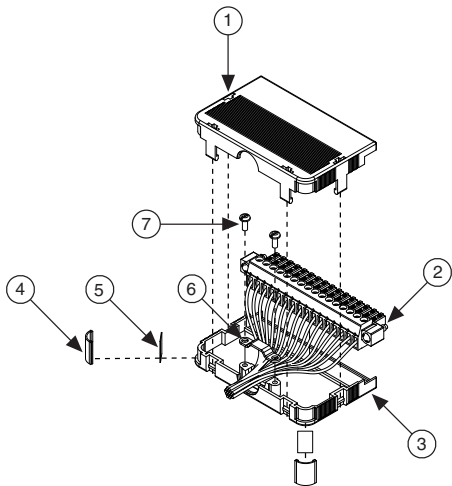
2. Route the wire through the NI 9939 opening and remove slack from the wiring.
3. Install the Backshell Top Enclosure (1) to the Backshell Bottom Enclosure (3).
4. Place the Label (5) in the Label Carrier (4) and attach onto the backshell.

## Installing the NI 9939 Using the Cable Retainer

### What to Use

- NI 9939 kit
- 0.05 mm<sup>2</sup> to 1.5 mm<sup>2</sup> (30 AWG to 14 AWG) wire with 6 mm (0.24 in.) of the insulation stripped
- Slotted screwdriver

## What to Do



1. Insert the stripped end of the wire fully into the appropriate terminal on the 16-Position Screw Terminal Connector (2)



and tighten the screw. Make sure no exposed wire extends past the screw terminal.

2. Route the wire through the NI 9939 opening, remove slack from the wiring, and secure wires using the Cable Retainer (6) and tighten the Screws (7).
3. Install the Backshell Top Enclosure (1) to the Backshell Bottom Enclosure (3).
4. Place the Label (5) in the Label Carrier (4) and attach onto the backshell.

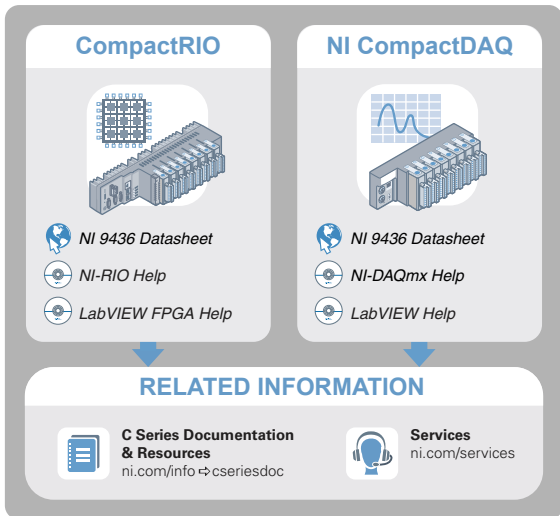
## High-Vibration Application Connections


If your application is subject to high vibration, NI recommends that you follow these guidelines to protect connections to the NI 9436:

- Use ferrules to terminate wires to the detachable connector.
- Use the NI 9939 backshell kit.

# Where to Go Next

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 Located at [ni.com/manuals](https://ni.com/manuals)

 Installs with the software

## Worldwide Support and Services

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The NI website is your complete resource for technical support. At [ni.com/support](https://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 [ni.com/services](https://ni.com/services) for NI Factory Installation Services, repairs, extended warranty, and other services.

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

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