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***NI-9208***

# GETTING STARTED GUIDE

## NI 9203

### 8-Channel, $\pm 20$ mA, 16-Bit Analog Input Module

Français

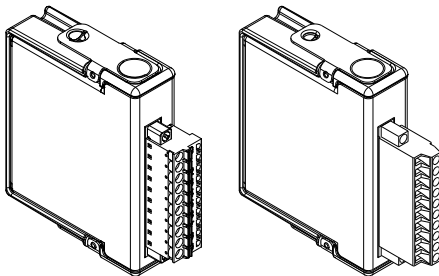
Deutsch

日本語

한국어

简体中文

[ni.com/manuals](http://ni.com/manuals)



This document explains how to connect to the NI 9203. In this document, the NI 9203 with screw-terminal and the NI 9203 with spring-terminal are referred to inclusively as the NI 9203.



**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 9203. 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 9203 only as described in this document.



**Caution** Do not operate the NI 9203 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.

Channel-to-COM..... $\pm 30$  VDC max

## Isolation Voltages

Channel-to-channel.....None

Channel-to-earth ground

Continuous

up to 2,000 m.....	250 Vrms, Measurement altitude Category II
up to 5,000 m.....	60 VDC, Measurement altitude Category I

Withstand

up to 2,000 m.....	2,300 Vrms, verified by a altitude 5 s withstand test
up to 5,000 m.....	1,000 Vrms, verified by a altitude 5 s withstand test

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 9203 to signals or use for measurements within Measurement Categories II, III, or IV.

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 9203 to signals or use for measurements within Measurement Categories III or IV.

## Safety Guidelines for Hazardous Locations

The NI 9203 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 9203 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.

## Special Conditions for Hazardous Locations Use in Europe and Internationally

The NI 9203 has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO Certificate No. 03 ATEX 0324020X and is IECEx 14.0089X certified. Each NI 9203 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 9203 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

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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](https://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 9203 meets the following specifications.

Operating temperature.....-40 °C to 70 °C  
(IEC 60068-2-1, IEC 60068-2-2)

Operating humidity.....10% RH to 90% RH,  
(IEC 60068-2-78) noncondensing

Pollution Degree.....2

Maximum altitude.....5,000 m

Indoor use only.



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

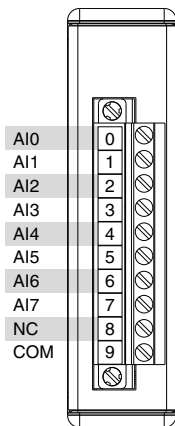
## Connecting the NI 9203

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The NI 9203 provides connections for 8 analog input channels.

**Figure 1. NI 9203 Pinout**

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Each channel has an AI terminal to which you can connect a current signal. The NI 9203 also has a common terminal, COM, that is internally connected to the isolated ground reference of the module.

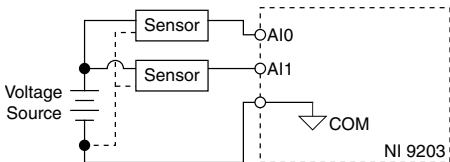
## Overvoltage Protection

The NI 9203 provides overvoltage protection for each channel. Only one channel can be in an overvoltage condition at a time. Refer to the device datasheet on [ni.com/manuals](http://ni.com/manuals) for complete specifications.

## Connecting Single-Ended Current Signals

You can connect single-ended current signals to the NI 9203.

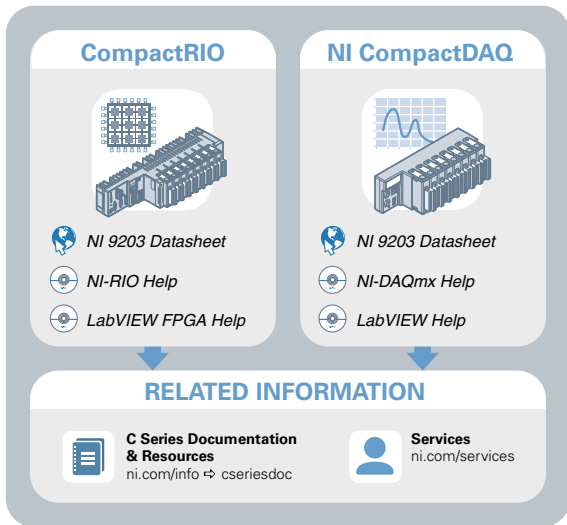
**Figure 2.** Connecting Single-Ended Current Signals to the NI 9203



**Note** You must use 2-wire ferrules to create a secure connection when connecting more than one wire to a single terminal on the NI 9203.

# Where to Go Next

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



Installs with the software

## Worldwide Support and Services

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Visit [ni.com/register](http://ni.com/register) to register your National Instruments 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 [ni.com/certification](http://ni.com/certification). If your product supports calibration, you can obtain the calibration certificate for your product at [ni.com/calibration](http://ni.com/calibration).

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