NI-9205 Getting Started

2025-03-13

Contents

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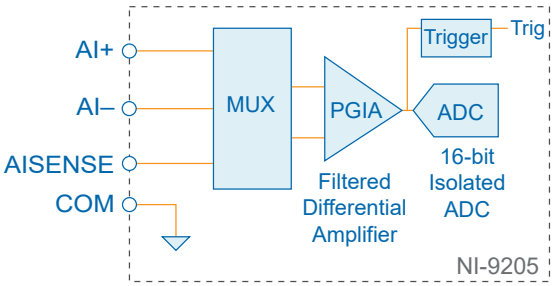
Connector Types

The NI-9205 has more than one connector type: NI-9205 with spring terminal and NI-9205 with DSUB. Unless the connector type is specified, NI-9205 refers to all connector types.

The NI-9205 with spring terminal is available in two types: push-in spring terminal and spring terminal. The push-in type spring terminal connector is black and orange. The spring terminal connector is black. NI-9205 with spring terminal refers to both types unless the two types are specified. Differences between the two types of spring terminal connectors are noted by the connector color.

NI-9205 Block Diagram

The NI-9205 channels share a common ground (COM) that is isolated from other modules in the system. All channels share a programmable gain instrumentation amplifier and are multiplexed to an ADC. Each channel also has ±30 V overvoltage protection.



NI-9205 with Spring Terminal (Black Connector) Pinout

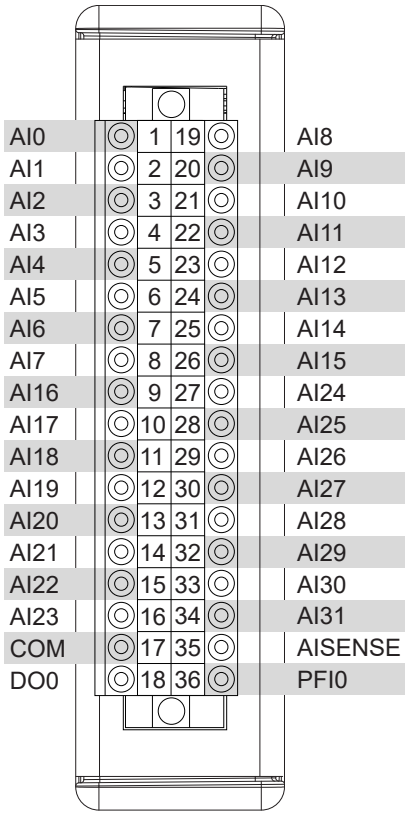


Table 3. Signal Descriptions

Signal	Description
AI	Analog input signal connection
AISENSE	Reference connection for NRSE measurements
COM	Common reference connection to isolated ground
DO	Digital output signal connection
PFI	Programmable function interface, digital input signal connection

NI-9205 with Push-in Style Spring Terminal (Black/Orange Connector) Pinout

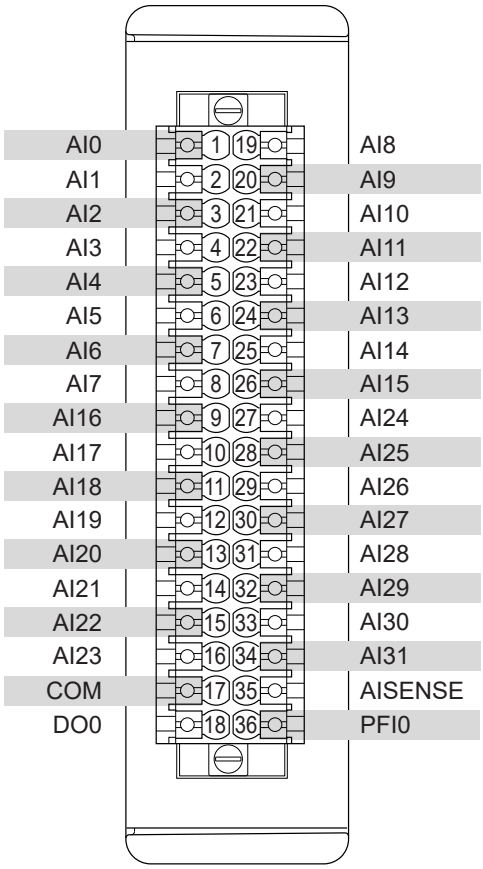


Table 3. Signal Descriptions

Signal	Description
AI	Analog input signal connection
AISENSE	Reference connection for NRSE measurements
COM	Common reference connection to isolated ground
DO	Digital output signal connection
PFI	Programmable function interface, digital input signal connection

NI-9205 with DSUB Pinout

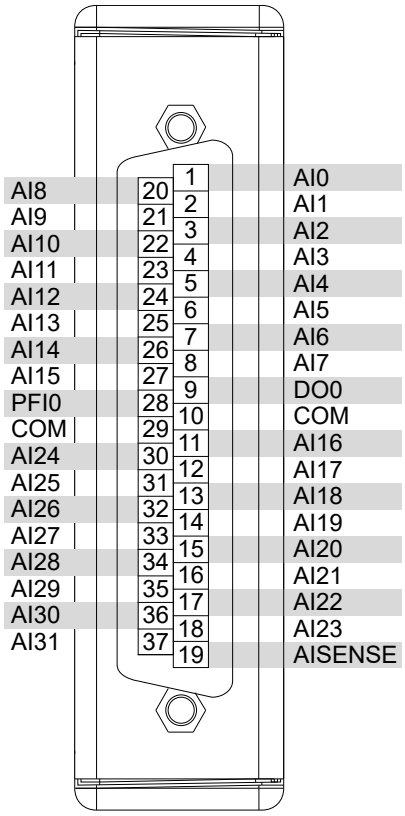


Table 3. Signal Descriptions

Signal	Description
AI	Analog input signal connection
AISENSE	Reference connection for NRSE measurements
COM	Common reference connection to isolated ground
DO	Digital output signal connection
PFI	Programmable function interface, digital input signal connection

NI-9205 Signals

You can connect single-ended or differential signals to the NI-9205; use a differential measurement configuration to attain more accurate measurements and less noise. Specific signal pairs are valid for differential connections.

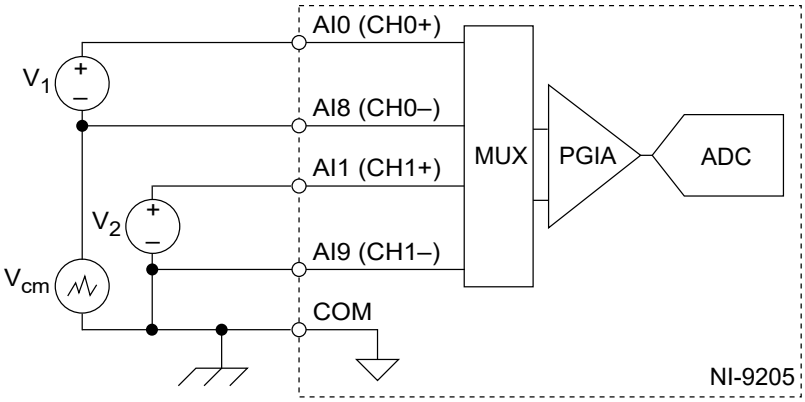
The following table shows the signal pairs that are valid for differential connection configurations with the NI-9205.

Table 4. NI-9205 Differential Pairs

Channel	AI+	AI-
0	AI0	AI8
1	AI1	AI9
2	AI2	AI10
3	AI3	AI11
4	AI4	AI12
5	AI5	AI13
6	AI6	AI14
7	AI7	AI15
16	AI16	AI24
17	AI17	AI25
18	AI18	AI26
19	AI19	AI27
20	AI20	AI28
21	AI21	AI29
22	AI22	AI30
23	AI23	AI31

Connecting Grounded Differential Signals

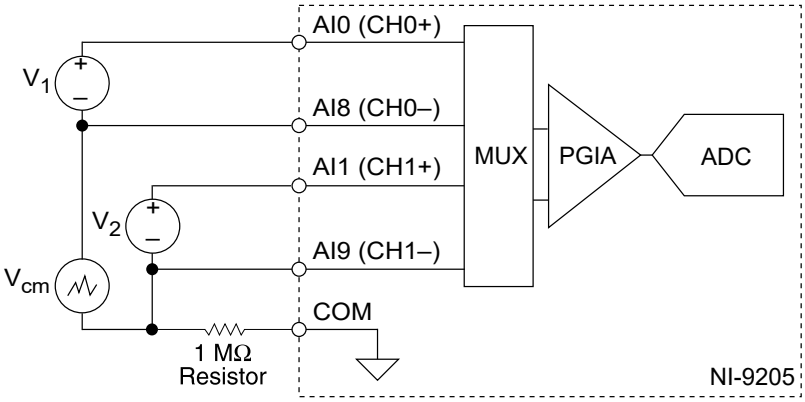
You can connect grounded differential signals to the NI-9205.



In a differential configuration, the NI-9205 rejects the common-mode noise voltage during the measurement of V_1. To connect grounded differential signals to the NI-9205, you must also connect the signal reference to COM.

Connecting Floating Differential Signals

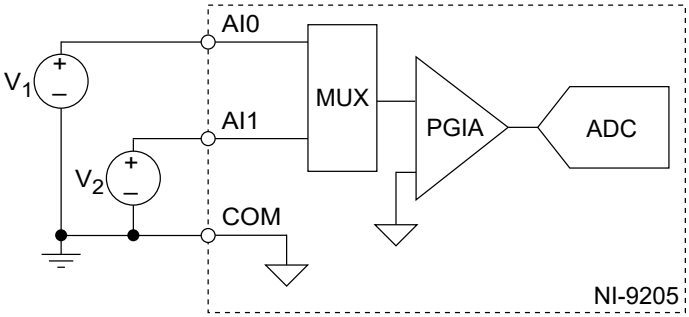
You can connect floating differential signals to the NI-9205.



To connect floating differential signals to the NI-9205, you must connect the negative signal to COM through a 1 MΩ resistor to keep the voltage within the maximum working voltage. If the voltage source is outside the maximum working voltage, the NI-9205 does not read data accurately.

Connecting RSE Voltage Signals

You can connect referenced single-ended (RSE) signals to the NI-9205.

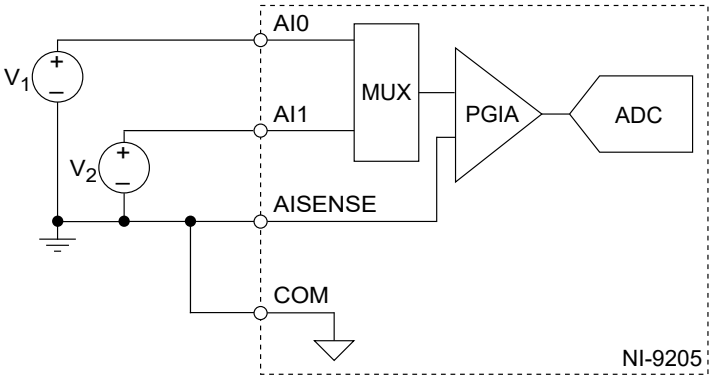


In an RSE configuration, the NI-9205 measures each channel with respect to COM. To connect RSE signals to the NI-9205, you must connect the voltage ground signal to COM to keep the maximum working voltage in the specified range.

Note If you leave COM unconnected, the signals float outside the working input range of the NI-9205. This may result in unreliable measurements because there is no way to ensure that the input signal is within 10 V of COM.

Connecting NRSE Voltage Signals

You can connect non-referenced single-ended (NRSE) signals to the NI-9205.



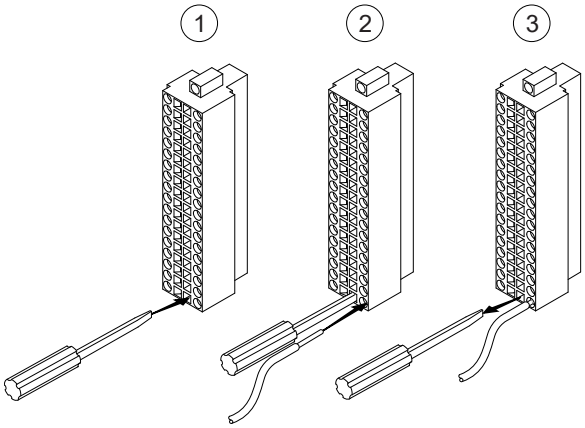
In an NRSE configuration, the NI-9205 measures each channel with respect to AISENSE. An NRSE configuration provides remote sense for the negative input of the PGIA that is shared by all channels and also provides improved noise rejection compared to an RSE connection.

Connecting to Wires to the NI-9205 with Spring Terminal (Black Connector)

What to Use

- NI-9205 with spring terminal (black connector)
- 0.08 mm^2 to 1.0 mm^2 (28 AWG to 18 AWG) copper conductor wire with 7 mm (0.28 in.) of insulation stripped from the end
- Flathead screwdriver with a 2.3 mm x 1.0 mm (0.09 in. x 0.04 in.) blade, included with the NI-9205

What to Do



1. Insert the screwdriver into a spring clamp activation slot to open the corresponding connector terminal.
2. Press a wire into the open connector terminal.
3. Remove the screwdriver from the activation slot to clamp the wire into place.

Connecting Wires to the NI-9205 with Push-in Style Spring Terminal (Black/Orange Connector)

What to Use

- NI-9205 with spring terminal (black/orange connector)
- 0.13 mm^2 to 1.5 mm^2 (26 AWG to 16 AWG) copper conductor wire with 10 mm (0.394 in.) of insulation stripped from the end
- Ferules (optional)

What to Do

Refer to the following table for how to insert a wire into a terminal depending on what type of wire you are using or if you are using a ferrule.

Option	Description
When using a solid wire or stranded wire with a ferrule	Push the wire into the terminal when using a solid wire or stranded wire with a ferrule
When using a stranded wire without a ferrule	Press the push button and then push the wire into the terminal

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

High-Vibration Application Connections

If your application is subject to high vibration, NI recommends that you use the NI-9940 backshell kit to protect connections to the NI-9205 with spring terminal.

Conformal Coating

The NI-9205 is available with conformal coating for additional protection in corrosive and condensing environments, including environments with molds and dust.

In addition to the environmental specifications listed in the ***NI-9205 Safety,***

Environmental, and Regulatory Information, the NI-9205 with conformal coating meets the following specification for the device temperature range. To meet this specification, you must follow the appropriate setup requirements for condensing environments. Refer to ***Conformal Coating and NI RIO Products*** for more information about conformal coating and the setup requirements for condensing environments.

Operating humidity (IEC 60068-2-30 Test Db)	80 to 100% RH, condensing

Related information:

- Conformal Coating and NI RIO Products

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