NI-9381 Getting Started

2025-03-21

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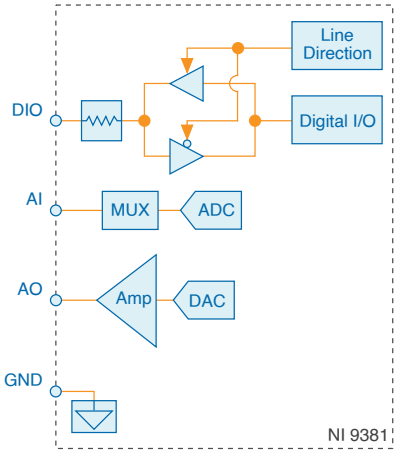
NI-9381 Block Diagram



- The module provides an analog-to-digital converter (ADC), eight digital-to-analog converters (DAC), and four digital lines.
- Line direction logic enables/disables the line input and output transceiver.

NI-9381 Pinout

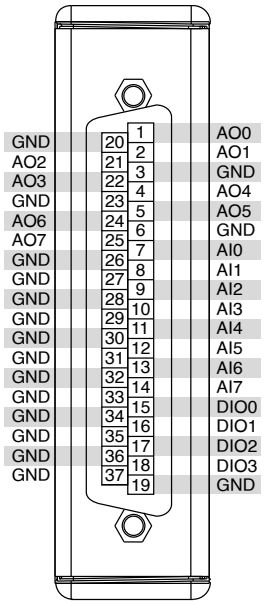
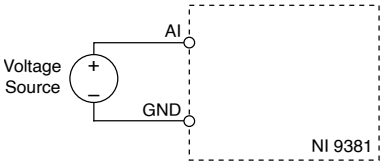


Table 1. Signal Descriptions

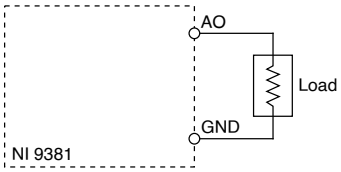
Signal	Description
AI	Analog input signal connection
AO	Analog output signal connection
DIO	Digital input/output signal connection
GND	Ground connection

Single-Ended Connections

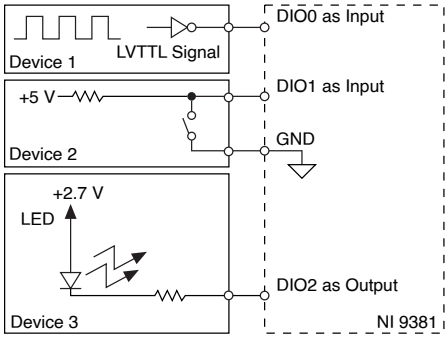


To ensure fast settling times, connect signal sources that have an impedance smaller than 1 kΩ. Large source impedances increase the settling time of the ADC, which decreases the accuracy at fast scanning rates.

Analog Output Connections



Digital Input/Output Connections



DIO channel direction is software selectable. Changing the direction on any channel does not affect the direction on the other channels.

Timing Guidelines

When using the AI, AO, and DIO channels on the NI-9381 concurrently, follow these guidelines to ensure high accuracy.

- Use a single I/O Node to access AI and AO operations to ensure proper sequencing.
- Configure the line direction of the DIO channels before performing operations on other channels or stop all operations to change the line direction of a DIO channel.

Tip Refer to the ***NI CompactRIO Device Drivers Help*** on ni.com/manuals for more information about NI-9381 timing.

Conformal Coating

The NI-9381 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-9381 Safety, Environmental, and Regulatory Information***, the NI-9381 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