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# NI-9401

# Getting Started

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2023-08-02

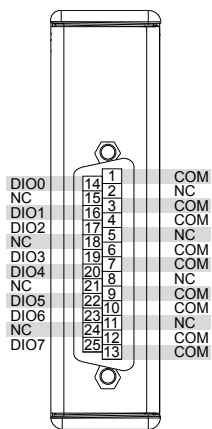


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## NI-9401 Pinout



**Table 1.** Signal Descriptions

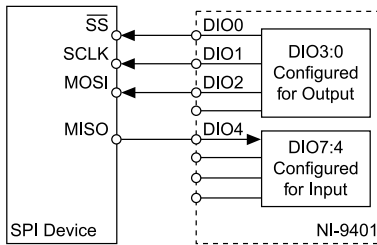
Signal	Description
COM	Common reference connection to isolated ground
DIO	Digital input/output signal connection
NC	No connection

## Ports

The DIO channels are grouped in two ports, one containing channels 0, 1, 2, and 3, and one containing channels 4, 5, 6, and 7. You can independently configure each digital port in software for input or output. Note that all four channels in the port must share the same line direction.

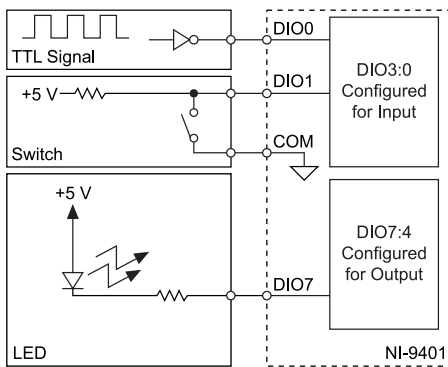
## Connecting a Serial Peripheral Interface Device

You can connect a Serial Peripheral Interface (SPI) device to the NI-9401.

**Figure 1.** Connecting an SPI Device to the NI-9401

## Connecting Digital Devices

You can connect several types of digital devices to the NI-9401.

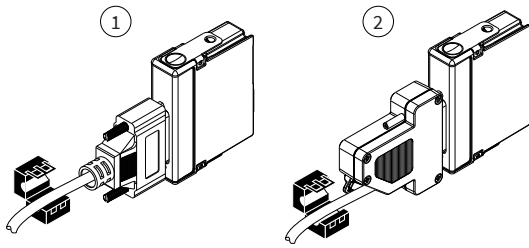
**Figure 2.** Connecting Digital Devices to the NI-9401

## Cable Requirements for EMC Compliance

Select and install cables for the NI-9401 in accordance with the following requirements:

- Install a clamp-on ferrite bead (782803-01) on the cable that you are connecting to NI-9401.
- The clamp-on ferrite bead must be connected to the cable as close to the module as possible. Placing the ferrite elsewhere on the cable noticeably impairs its effectiveness.

Figure 3. Installing a Ferrite Bead



1. Installing a ferrite bead on a 25-pin DSUB cable.
2. Installing a ferrite bead on the cable of the terminal block.

## Overcurrent/Short-Circuit Protection

The overcurrent protection allows only a specified amount of current through the output channels to protect the NI-9401 from short circuits. If the NI-9401 goes into an overcurrent state, the module sets all the DIO channels to high impedance for approximately 280 ms.

When the channels are in an overcurrent state, the NI-9401 can accept new line direction configuration and output state data but cannot pass valid input data to the software.

## NI-9401 Block Diagram

The eight DIO channels are internally referenced to COM, so you can use any of the nine COM lines as a reference for the external signal.

Figure 4. NI-9401 Circuitry

