NI-9474 Getting Started

2025-03-22

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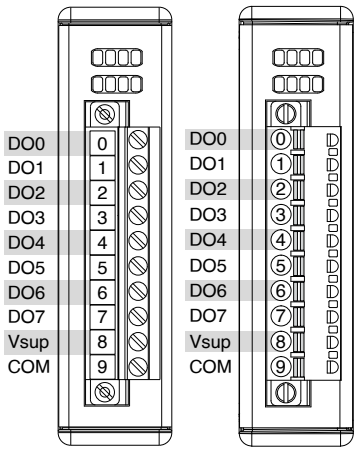
NI-9474 Nomenclature

In this article, the NI-9474 with screw terminal and NI-9474 with spring terminal are referred to inclusively as the NI-9474. The information in this document applies to all versions of the NI-9474 unless otherwise specified.

NI-9474 Pinout



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-9474 with screw terminal or NI-9474 with spring terminal.

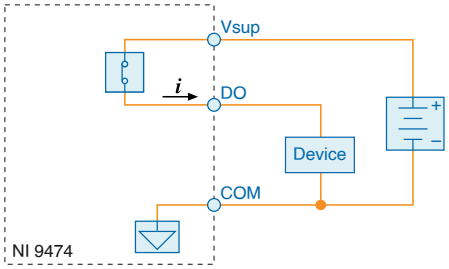
Table 1. NI-9474 Signal Descriptions

Signal	Description
COM	Common reference connection to isolated ground
DO	Digital output signal connection
V_{sup}	Voltage supply connection

Table 2. LED Indicators

LED Pattern	Indication
Solid	The channel has been programmed to be in the ON state.
Off	The channel has been programmed to be in the OFF state.

NI-9474 Block Diagram



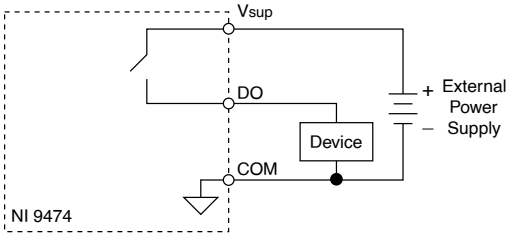
- The DO channels are internally referenced to COM.
- The NI-9474 has sourcing outputs. Sourcing outputs drive current from Vsup to DO when the channel is on.

Tip For more information about sourcing outputs, visit ni.com/info and enter the Info Code `sinksource`.

Connecting Digital Devices

You can connect a variety of industrial devices, such as solenoids, motors, actuators, relays, and lamps to the NI-9474. You must connect an external power supply to the NI-9474. The power supply provides the current for the output channels.

Figure 1. Connecting an Industrial Device to the NI-9474



Caution Do not install or remove C Series modules from your system if any external power supplies connected to the V_{sup} and COM pins are powered on.

Attention Ne pas installer ou retirer les modules de la Série C de votre système si une alimentation externe connectée aux broches V_{sup} et COM est sous tension.

Ensure that the devices you connect to the NI-9474 are compatible with the output specifications of the NI-9474. Refer to the module specifications at ni.com/docs for output specifications.

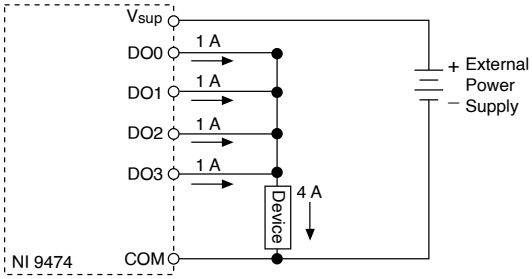
Note When the industrial device is off, DO is not connected to COM. For large source impedances, you must use a pull-down resistor between DO and COM. Go to ni.com/r/cseriesdopulsegen for more information.

Increasing Current Drive

Each channel of the NI-9474 has a continuous output current of 1.0 A. If you want to increase the output current to a device, you can connect any number of channels together in parallel.

For example, if you want to drive 4 A of current, connect DO0 through DO3 in parallel, as shown in the following figure. You must turn all parallel channels on and off simultaneously so that the current on any single channel cannot exceed the 1.0 A rating.

Figure 2. Increasing the Current to a Device Connected to the NI-9474



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-9474:

- Use ferrules to terminate wires to the detachable connector.
- Use the NI-9927 backshell kit with the NI-9474 with screw terminal or the NI-9981 backshell kit with the NI-9474 with spring terminal.

I/O Protection

The NI-9474 provides short-circuit protection.

Each channel has circuitry that protects it from current surges resulting from short circuits over 14 A.

Note Refer to the module specifications at ni.com/docs for maximum continous output current, short-circuit behavior, and short-circuit trip time specifications and information about conditions that may damage the module.

Note Refer to the IEC 61131-2 standard for more information about short-circuit-proof devices.

Note Because the NI-9474 includes internal flyback diodes, you do not need to add external diodes when connecting to switching devices that store energy.

Power Supplies and Overcurrent Conditions

If a short circuit occurs, the current through DO can exceed the current rating for the power supply and the maximum continuous output current for the NI-9474.

If the power supply you are using with the NI-9474 cannot supply more than 14 A, the module may be damaged if a short circuit condition occurs.

Detecting an Overcurrent Condition

If a device connected to the module is not working while the channel is on, the module channel may be in an overcurrent state. Neither the software nor the module LEDs indicate if an overcurrent condition occurs. A channel LED may be on even if the channel is off because of an overcurrent condition.

To determine if the channel is in an overcurrent state, measure the voltage between DO and Vsup. If the voltage is equal to the voltage of the external power supply connected to the module, the channel is in an overcurrent state.

Resetting Channels after an Overcurrent Condition

After you have determined and fixed the cause of an overcurrent condition, reset the channel by turning it off.

Alternatively, you can disconnect the external power supply from the chassis. However, doing so disconnects power from all the module channels.

Normal operation can resume after you correct the overcurrent condition and reset the channel.