

# GETTING STARTED GUIDE

# NI PXIe-4610

Power Amplifier

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

This document explains how to install, configure, and set up the NI PXIe-4610 power amplifier. NI-DAQmx 9.8 has added support for the NI PXIe-4610 device. To download the NI-DAQmx driver, visit [ni.com/info](http://ni.com/info) and enter the Info Code `daqmx`.

## Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference when the product is operated in its intended operational electromagnetic environment.

This product is intended for use in industrial locations. There is no guarantee that harmful interference will not occur in a particular installation, when the product is connected to a test object, or if the product is used in residential areas. To minimize the potential for the product to cause interference to radio and television reception or to experience 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.



**Caution** This product may become more sensitive to electromagnetic disturbances in the operational environment when test leads are attached or when connected to a test object.



**Caution** To ensure the specified EMC performance, operate this product only with shielded cables and accessories.



**Caution** To ensure the specified EMC performance, the length of all I/O cables must be no longer than 3 m (10 ft).



**Caution** Using the NI PXIe-4610 in a manner not described in this document may impair the protection the NI PXIe-4610 provides.

# Unpacking

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The NI PXIe-4610 module ships in an antistatic package to prevent electrostatic discharge from damaging device components. To prevent such damage when handling the device, ground yourself using a grounding strap or by holding a grounded object and complete the following steps:

1. Touch the antistatic package to a metal part of the grounded object before removing the device from package.
2. Remove the device from the package and inspect the device for loose components or any other sign of damage.

Notify NI if the device appears damaged in any way. Do not install a damaged module into your system. Store the module in the antistatic package when not in use.

## Verify the Kit Contents

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The following items are necessary to set up and use the NI PXIe-4610:

- NI PXIe-4610 Power Amplifier Module
- Two 2-terminal detachable screw-terminal connectors
- *NI PXIe-4610 Getting Started Guide*

## Other Equipment

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The following additional items, not included in the device kit, are necessary to operate the NI PXIe-4610:

- NI-DAQmx
- PXI Express chassis with
  - controller, or
  - MXI-Express (card or built-in)
- Signal source to drive the input to the amplifier
- LabVIEW 2010 or later (optional)

# Install the Software

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Software support for the NI PXIe-4610 is provided by NI-DAQmx. The *DAQ Getting Started* guides, which you can download at [ni.com/manuals](http://ni.com/manuals), offer step-by-step NI-DAQmx instructions for installing software and hardware, configuring channels and tasks, and getting started developing an application. For detailed NI software version support, refer to the NI-DAQmx readme.

You must install the software before using the hardware.

1. Install the latest service packs for your operating system.
2. Install a compatible version of NI-DAQmx. To download the NI-DAQmx driver, visit [ni.com/info](http://ni.com/info) and enter the Info Code `daqmx`.
3. Follow the instructions in the installation prompts.



**Note** Windows 7/Vista users may see access and security messages during installation. Accept the prompts to complete the installation. For troubleshooting information, refer to the [Worldwide Support and Services](#) section.

4. When installation completes, select **Restart** in the dialog box that asks if you want to restart, shut down, or restart later.

# Install the Hardware

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You must install the software before using the hardware.

1. Plug in your chassis before installing the NI PXIe-4610. The power cord grounds the chassis and protects it from electrical damage while you install the module.
2. Make sure the chassis is powered off.



**Caution** To protect yourself, the chassis, and the NI PXIe-4610 from electrical hazards, leave the chassis powered off until you finish installing the NI PXIe-4610 module.

3. Touch a metal part on the chassis to discharge any accumulated static electricity.
4. Remove the protective plastic covers from the two front panel mounting screws on the module.
5. Make sure the NI PXIe-4610 injector/ejector handle is in its downward position as shown in Figure 1.
6. Remove the filler panels covering the selected slots.

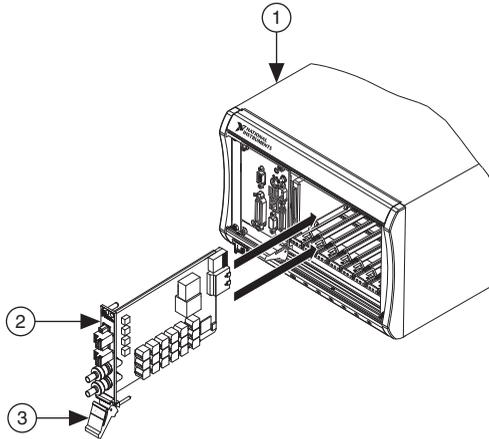


**Caution** When installing the module, make sure both edges are positioned inside the guides and that the module components do not come into contact with adjacent modules.

7. Align the NI PXIe-4610 with the card guides on the top and bottom of the selected slots.

8. Hold the injector/ejector handle down as you slowly slide the module into the chassis until the handle catches on the injector/ejector rail, as shown in Figure 1.

**Figure 1.** Sliding the NI PXIe-4610 into the Chassis



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1	PXI Express Chassis	2	NI PXIe-4610 Module	3	Injector/Ejector Handle in Down Position
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9. Raise the injector/ejector handle to latch the module into the chassis. The front panel of the NI PXIe-4610 should be even with the front panel of the chassis.
10. Tighten the two front panel mounting screws to 0.31 N · m (2.7 lb · in.) on the top and bottom of the module front panel to secure the NI PXIe-4610 to the chassis.
11. Power on the chassis.

## Configure the Hardware in MAX

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Use Measurement & Automation Explorer (MAX) to configure your National Instruments hardware. MAX informs other programs about which devices reside in the system and how they are configured. MAX is automatically installed with NI-DAQmx.

1. Launch MAX.
2. In the Configuration pane, expand **Devices and Interfaces** to see a the list of installed devices. Installed devices appear under the name of their associated chassis.
3. Expand your **Chassis** tree item.



**Note** MAX lists all devices installed in the chassis. Your default device names may vary.

4. Record the device identifier MAX assigns to the hardware. Use this identifier when programming the NI PXIe-4610.

# Enable the NI PXIe-4610 Outputs

The NI PXIe-4610 outputs are disabled by default. You must enable the outputs in MAX or programmatically. Complete the following steps to enable the outputs using MAX:

1. Launch MAX.
2. In the Configuration pane, expand **Devices and Interfaces** to see a list of installed devices. Select the NI PXIe-4610 device.
3. Click the **Power Amplifier Configuration** tab.
4. Select the **Amplified 10X** option button for each channel you want to enable.

## Connect a Signal Source to the NI PXIe-4610 Input

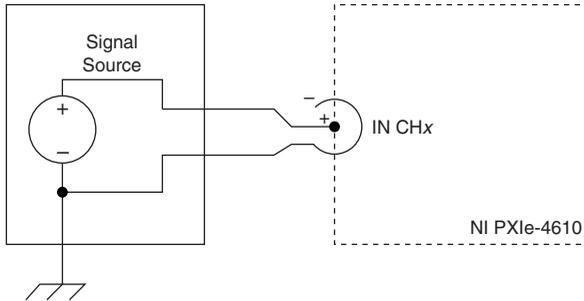
You can connect ground-referenced and floating signal sources to the NI PXIe-4610 inputs. Refer to Figure 8 for the NI PXIe-4610 front panel.



**Note** Refer to the *NI PXIe-4610 Specifications* for information about the operating input range and overvoltage protection.

Figures 2 and 3 show the connection of ground-referenced signal sources to an NI PXIe-4610 input.

**Figure 2.** Connection for Single-Ended Ground-Referenced Signal Source



**Figure 3.** Connection for Differential Ground-Referenced Signal Source

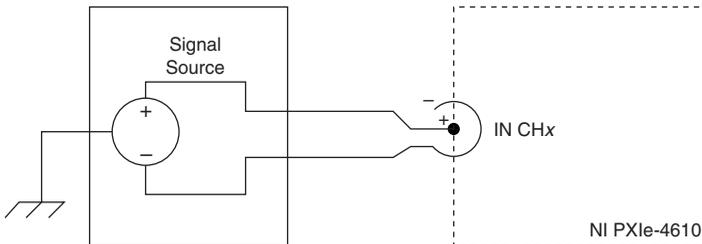
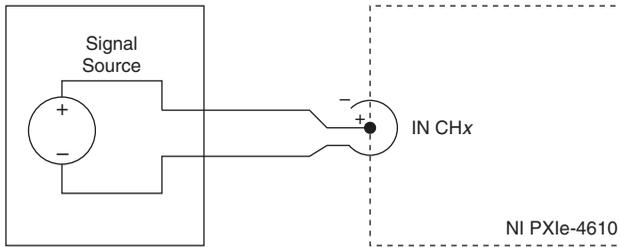


Figure 4 shows the connection of a floating signal source to an NI PXIe-4610 input.

**Figure 4.** Connection for Floating Signal Source



## Connect a Load to the NI PXIe-4610 Output

The NI PXIe-4610 outputs are differential and ground-referenced.

You can connect floating loads and balanced, ground-referenced loads to the NI PXIe-4610 outputs. Refer to Figure 8 for the NI PXIe-4610 front panel.



**Note** Refer to the *NI PXIe-4610 Specifications* for information about the operating output range, short-circuit, and overvoltage protection.

Figure 5 shows the connection of a floating load to an NI PXIe-4610 output.

**Figure 5.** Connection for Floating Load

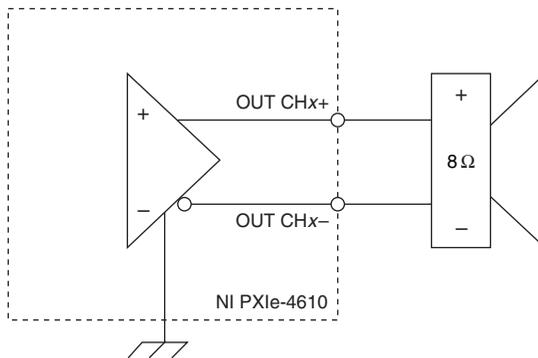
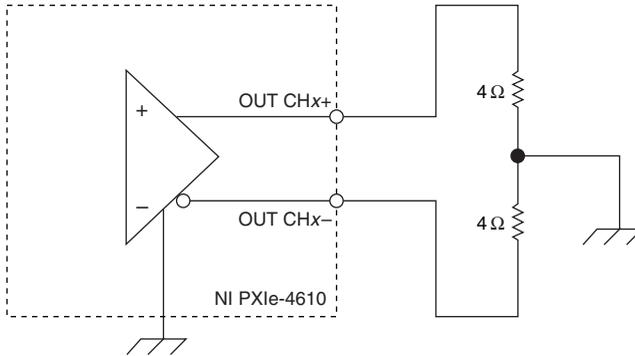


Figure 6 shows the connection of a balanced, ground-referenced load to an NI PXIe-4610 output.

**Figure 6.** Connection for Balanced Ground-Referenced Load



You can connect an unbalanced, ground-referenced load, provided the impedance to ground can be driven by the NI PXIe-4610 outputs.

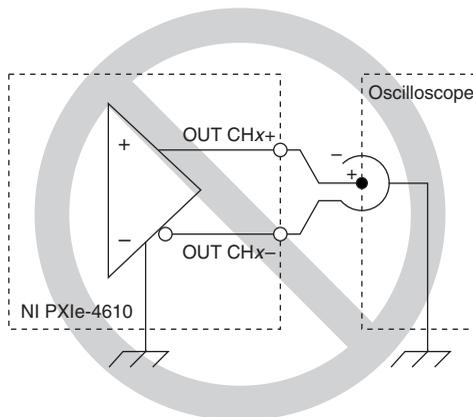


**Note** Connecting an unbalanced, ground-referenced load to an NI PXIe-4610 output introduces an unbalanced ground loop that may degrade the dynamic performance of the amplifier.

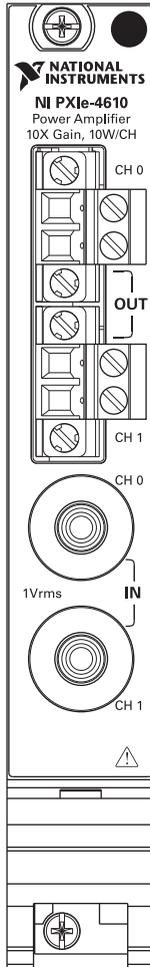


**Caution** Connecting a ground-referenced load or instrument to an NI PXIe-4610 output, as shown in Figure 7, effectively short-circuits one output terminal to ground, which activates the short-circuit protection.

**Figure 7.** Ground-Referenced Instrument Short Circuit



**Figure 8.** NI PXIe-4610 Front Panel



# Worldwide Support and Services

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The National Instruments website is your complete resource for technical support. At [ni.com/support](https://ni.com/support) you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

Visit [ni.com/services](https://ni.com/services) for NI Factory Installation Services, repairs, extended warranty, and other services.

Visit [ni.com/register](https://ni.com/register) to register your National Instruments product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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