# PXIe-4463 User Manual

2025-07-23

# Contents

# Welcome to the PXIe-4463 User Manual

The PXIe-4463 User Manual provides detailed descriptions of product functionality and step-by-step processes for use.

## Looking for something else?

For information not found in the User Manual for your product, like specifications or API reference, browse Related Information.

**Related information:**

- PXIe-4463 Specifications
- PXIe-4463 Calibration Procedure
- PXIe-4463 Supported Properties
- PXIe-4463 Dimensional Drawings

# PXIe-4463 User Manual

This document explains how to install, configure, and set up the PXIe-4463 Dynamic Signal Acquisition (DSA) analog output module. Driver support for the PXIe-4463 was first available in NI-DAQmx 14.5. For the list of devices supported by a specific release, refer to the NI-DAQmx Readme, available on the version-specific download page or installation media. To download the latest version of NI-DAQmx, visit ni.com/info and enter the Info Code daqmx. The PXIe-4463 is available with BNC connectors or Mini-XLR connectors.

# Electromagnetic Compatibility Guidelines

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

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any modifications to the product not expressly approved by NI could void your authority to operate it under your local regulatory rules.

**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.).

# Unpacking the Kit

The PXIe-4463 module ships in an antistatic package to prevent electrostatic discharge from damaging module components. To prevent such damage when handling the module, 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 module from the package.
2. Remove the module from the package and inspect the module for loose components or any other sign of damage.

   **Caution** Never touch the exposed pins of connectors.

3. Unpack any other items and documentation from the kit.

Notify NI if the module 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.

# Preparing the Environment

Ensure that the environment in which you are using the PXIe-4463 meets the following specifications.

| | |
|---|---|
| Operating ambient temperature | 0 °C to 55 °C (IEC 60068-2-1, IEC 60068-2-2) |
| Operating relative humidity | 10% to 90%, noncondensing (IEC 60068-2-56) |
| Altitude | 2,000 m (800 mbar) (at 25 °C ambient temperature) |
| Pollution Degree | 2 |

Indoor use only.

**Caution** Clean the hardware with a soft, nonmetallic brush. Make sure the hardware is completely dry and free from contaminants before returning it to service.

**Note** Refer to the ***PXIe-4463 Specifications*** at `ni.com/docs` for complete specifications.

# Verifying the Kit Contents

The following items are necessary to set up and use the PXIe-4463:

- PXIe-4463 analog output module
- NI-DAQmx installation media
- ***PXIe-4463 User Manual***

**Note** You can download any needed documents from ni.com/docs.

# Other Equipment

The following additional items, not included in the module kit, are necessary to operate the PXIe-4463:

- PXI Express chassis with
  - Controller, or
  - MXI-Express (card or built-in)
- (Optional) LabVIEW

**Note** For a list of LabVIEW versions supported by a specific version of NI-DAQmx, refer to the NI-DAQmx Readme, available on the version-specific download page at ni.com/downloads or on the installation media.

# Installing the Software

Software support for the PXIe-4463 is provided by NI-DAQmx. The ***DAQ Getting Started Guide***, which you can download at ni.com/docs, describes how to install NI-DAQmx software, how to install and configure your NI-DAQmx supported hardware, and how to confirm that your device is operating properly. For detailed NI software version support, refer to the NI-DAQmx Readme.

You must install the software before using the hardware.

1. Optional: If you are developing an NI-DAQmx application, install an ADE, such as LabVIEW or LabWindows™/CVI™.
2. Install the latest service packs for your operating system.
3. Install a compatible version of NI-DAQmx. To download the NI-DAQmx driver, visit ni.com/info and enter the Info Code daqmx.
4. Follow the instructions in the installation prompts.

> **Note** Windows users may see access and security messages during installation. Accept the prompts to complete the installation. For troubleshooting information, refer to the ***NI Services*** section.

5. When installation completes, select **Restart** in the dialog box that asks if you want to restart, shut down, or restart later.
6. Optional: Download the NI Dynamic Signal Analyzer (DSA) and NI Dynamic Signal Generator (DSG) soft front panels (SFP) to aid with signal generation and spectral measurements. For more information about the SFPs, visit ni.com/info and enter the Info Code exqpwb.

# Installing the Hardware

**Note** To maintain forced air cooling in the PXI Express system, refer to the ***Maintain Forced-Air Cooling*** document.

1. Plug in your chassis before installing the PXIe-4463 module. 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.

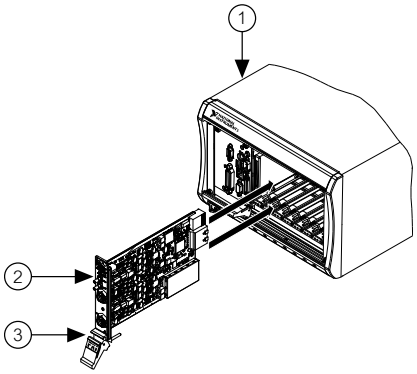
   **Caution** To protect yourself, the chassis, and the module from electrical hazards, leave the chassis powered off until you finish installing the module.

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. Remove the filler panels covering the selected slots.
6. Make sure the PXIe-4463 injector/ejector handle is in its downward position as shown in Figure 1.

   **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 PXIe-4463 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 PXIe-4463 into the Chassis




1. Chassis
2. Hardware Module (Mini-XLR model shown)
3. Injector/Ejector Handle in Down (Unlatched) Position

9. Raise the injector/ejector handle to latch the module into the chassis. The PXIe-4463 front panel should be even with the chassis front panel.
10. Tighten the top and bottom module mounting screws, shown in Figure 2 in Connect the PXIe-4463 Output, to 0.31 N · m (2.7 lb · in.) on the top and bottom of the module front panel to secure the PXIe-4463 to the chassis.

> **Note** Tightening the top and bottom mounting screws increases mechanical stability and also serves to electrically connect the front panel to the chassis, which can improve the signal quality and electromagnetic performance.

11. Power on the chassis.

# Configuring the PXIe-4463 in MAX

Use Measurement & Automation Explorer (MAX) to configure your NI 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 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.

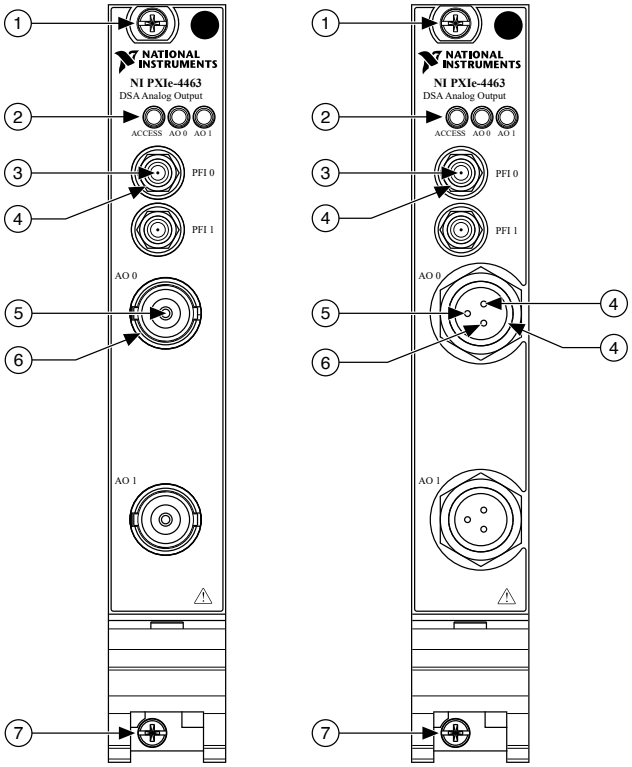
4. Record the device identifier MAX uses to identify the hardware. Use this identifier when programming the PXIe-4463.

# Connecting the PXIe-4463 Output

Figure 2 shows the front panel connections of the PXIe-4463 with BNC connectors and with Mini-XLR connectors.

**Note** Refer to the ***PXIe-4463 Specifications*** for information about the operating output range and overvoltage protection.

Figure 2. PXIe-4463 BNC and Mini-XLR Connector Front Panel

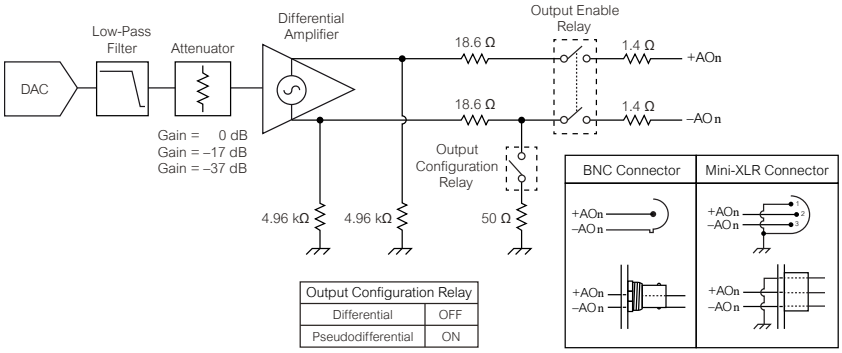



1. Top Module Mounting Screw
2. LEDs
3. PFI
4. Chassis Ground
5. AO+
6. AO-
7. Bottom Module Mounting Screw

# PXIe-4463 Output Connections

Figure 3 shows the PXIe-4463 analog output block diagram. Depending on the connector type, connect the signals as shown on the inset.

Figure 3. PXIe-4463 Analog Output Block Diagram




The PXIe-4463 output stage is a differential amplifier. The output stage can be configured to pseudodifferential mode in software, where the -AOn terminal is internally connected to chassis ground through a 50 Ω resistor. This connection introduces a gain difference in the output stage of -31.8 mdB, for which the software corrects automatically. Refer to the ***NI-DAQmx Help*** for more information about terminal configuration.

The PXIe-4463 output stage can also be configured to pseudodifferential mode by making an external connection between +AOn or -AOn to chassis ground. This connection introduces a gain change in the output stage of -34.8 mdB, for which the software does not correct.

For most applications, configuring the PXIe-4463 output stage in differential mode will yield the best performance. For improved common-mode noise rejection, it is highly recommended to make a connection between the chassis ground of the PXIe-4463 and the input device ground. This connection is critical when the input device is isolated; if this connection is not available, it may be better to configure the PXIe-4463 output stage in pseudodifferential mode.

Figures 4 and 5 show the recommended output connections for both connector types.

Figure 4. PXIe-4463 Mini-XLR Recommended Output Connection

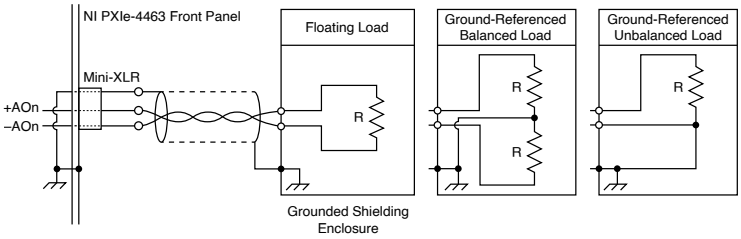
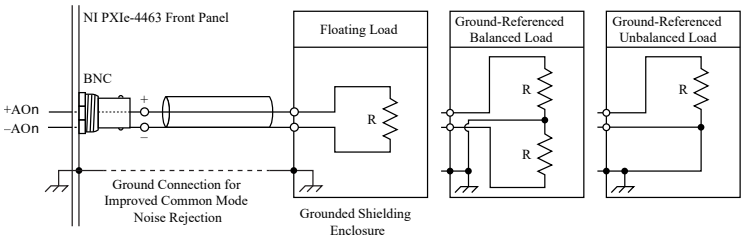



Figure 5. PXIe-4463 BNC Recommended Output Connection



# PXIe-4463 Front Panel LEDs

LEDs on the PXIe-4463 front panel provide information about basic hardware status and the analog output channels' statuses. Table 1 describes the front panel LEDs' functions.

Table 1. PXIe-4463 Front Panel LED Indicators

| LED | Indications |
|---|---|
| ACCESS | Indicates the analog output module's basic hardware status.<br><br>OFF—The module is not yet functional or has detected a problem with a PXI power rail.<br><br>AMBER—The module is being accessed.<br><br>GREEN—The module is ready to be programmed. |
| AO0, AO1 | Indicates the AO0 or AO1 analog output channel's status.<br><br>AMBER/GREEN (alternating)—The reference clock source is changing to onboard or PXIeClk100.<br><br>AMBER (solid)—The channel is waiting for a trigger to start generating.<br><br>GREEN (solid)—The channel is actively generating a signal.<br><br>RED (solid)—An error has been detected on the channel or board. Possible errors include the following:<br><br>• The board is overheated.<br>• The power supply is not at the proper |

| LED | Indications |
| --- | --- |
| | voltage.<br>• A clocking error occurred (PLL fell out of lock or PXIeClk100 was not present when using the external timebase).<br>• An external overvoltage or overcurrent was detected*.<br>• An overload was detected*.<br>• A streaming underflow was detected on the channel.<br>• Internal hardware failed (due to either software or hardware failure). |
| *You can read an external overvoltage, overcurrent, or overload error through DAQmx property nodes. | |

# Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and to NI customers.

For additional environmental information, refer to the ***Engineering a Healthy Planet*** web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

# EU and UK Customers

- **Waste Electrical and Electronic Equipment (WEEE)**—At the end of the product life cycle, all NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit ni.com/environment/weee.

# 电子信息产品污染控制管理办法（中国RoHS）

- **中国RoHS**— NI符合中国电子信息产品中限制使用某些有害物质指令(RoHS)。关于NI中国RoHS合规性信息，请登录 ni.com/environment/rohs_china。(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

# NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

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