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Find the *National Instruments PXIe-4113* at our website: *Click HERE*

GETTING STARTED GUIDE

# NI PXIe-4112/4113

## Dual-Output Programmable DC Power Supply

**Note** Before you begin, install and configure your chassis and controller.

This document explains how to install, configure, and test the NI PXIe-4112/4113 (NI 4112/4113). The NI 4112/4113 are single-quadrant, dual output, 60 W programmable DC power supplies.

To access NI 4112/4113 documentation, navigate to **Start»All Programs»National Instruments»NI-DCPower»Documentation**.

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## 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 are designed to 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

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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 National Instruments 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 connected to the Output port. Cable shields must be terminated to one of the ground pins of the Output port. Note that the cables connected to the Aux Power Input port may be unshielded.

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

# Verifying the System Requirements

To use the NI-DCPower instrument driver, your system must meet certain requirements.

For more information about minimum system requirements, recommended system, and supported application development environments (ADEs), refer to the product readme, which is available on the driver software media or online at *ni.com/updates*.

# Unpacking the Kit

**Caution** To prevent electrostatic discharge (ESD) from damaging the device, ground yourself using a grounding strap or by holding a grounded object, such as your computer chassis.

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

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

   Notify NI if the device appears damaged in any way. Do not install a damaged device.
3. Unpack any other items and documentation from the kit.

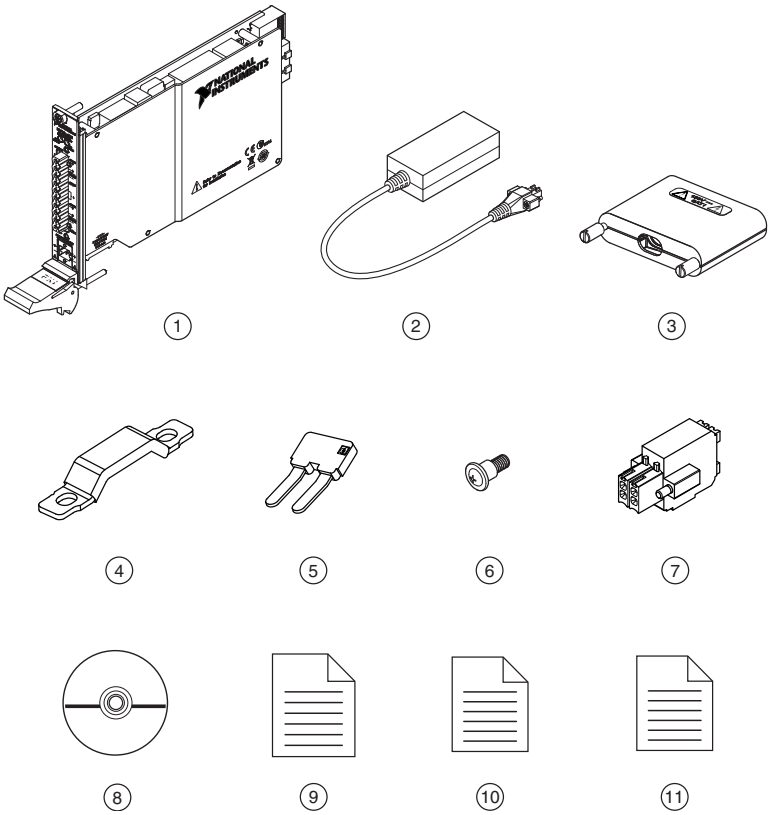
Store the device in the antistatic package when the device is not in use.



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# Kit Contents

**Figure 1.** NI 4112/4113 Kit Contents




1. NI PXIe-4112/4113 DC Power Supply Device
2. Auxiliary 48 V Power Source
3. Output Connector Assembly with Four Sense Jumpers Installed
4. Strain Relief
5. Two Extra Sense Jumpers
6. Extra Screws for the Output Connector Assembly
7. Additional Auxiliary Power Connector
8. Driver Software DVD
9. NI PXIe-4112/4113 Getting Started Guide (this document)
10. Maintain Forced-Air Cooling Note to Users
11. Read Me First: Safety and Electromagnetic Compatibility



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## Other Equipment

There are several required items not included in your device kit that you need to operate the NI 4112/4113. Your application may require additional items not included in your kit to install or operate your device.

### Required Items

- A PXI Express chassis and chassis documentation. For more information about compatible chassis options, refer to *ni.com*.
- A PXI Express embedded controller or MXI controller system that meets the system requirements specified in this guide and chassis documentation.

### Optional Items

- NI screwdriver (part number 781015-01).

# Preparing the Environment

Ensure that the environment you are using the NI 4112/4113 in meets the following specifications.

Operating Environment

Ambient temperature range.....0 °C to 55 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.)

Relative humidity range.....10% to 90%, noncondensing (Tested in accordance with IEC 60068-2-56.)

Storage ambient temperature range.....-40 °C to 70 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2.)

Maximum altitude.....2,000 m (800 mbar) (at 25 °C ambient temperature)

Pollution Degree.....2

Indoor use only.

**Note** Refer to the device specifications on *ni.com/manuals* for complete specifications.



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# Safety

**Caution** Always refer to the specifications document included with the NI 4112/4113 device before connecting signals. Failure to observe the specified maximum signal ratings can cause shock, a fire hazard, or damage to the devices connected to the NI 4112/4113. NI is not liable for any damage or injuries resulting from incorrect signal connections.

**Related Information**

*For information about connecting signals for specific devices, refer to the NI DC Power Supplies and SMUs Help.*

# Installing the Software

You must be an Administrator to install NI software on your computer.

1. Install an ADE, such as LabVIEW or LabWindows™/CVI™.
2. Insert the driver software media into your computer. The installer should open automatically.

   If the installation window does not appear, navigate to the drive, double-click it, and double-click `autorun.exe`.
3. 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.
4. When the installer completes, select **Restart** in the dialog box that prompts you to restart, shut down, or restart later.

# Installing the NI 4112/4113

**Caution** To prevent damage to the device caused by ESD or contamination, handle the device using the edges or the metal bracket.

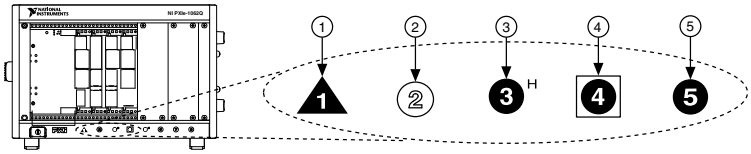
1. Ensure the AC power source is connected to the chassis before installing the modules.

   The AC power cord grounds the chassis and protects it from electrical damage while you install the modules.
2. Power off the chassis.
3. Inspect the slot pins on the chassis backplane for any bends or damage prior to installation. Do not install a module if the backplane is damaged.
4. Remove the black plastic connectors from all the captive screws on the module front panel.
5. Identify a supported slot in the chassis. The following figure shows the symbols that indicate the slot types.



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**Figure 2.** Chassis Compatibility Symbols

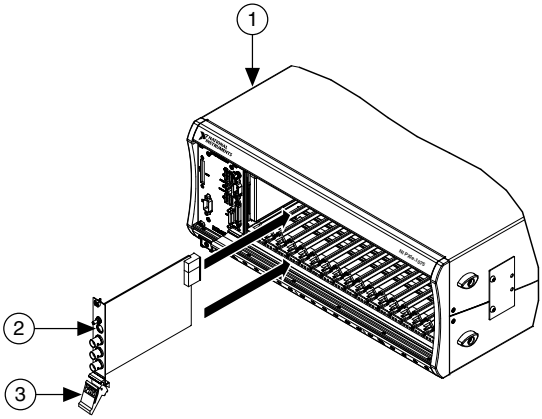



1. PXI Express System Controller Slot
2. PXI Peripheral Slot
3. PXI Express Hybrid Peripheral Slot
4. PXI Express System Timing Slot
5. PXI Express Peripheral Slot

NI 4112/4113 modules can be placed in PXI Express peripheral slots, PXI Express hybrid peripheral slots, or PXI Express system timing slots.

6. Touch any metal part of the chassis to discharge static electricity.
7. Ensure that the ejector handle is in the unlatched (downward) position.
8. Place the module edges into the module guides at the top and bottom of the chassis. Slide the device into the slot until it is fully inserted.

**Figure 3.** Module Installation




1. Chassis
2. Hardware Module
3. Ejector Handle in Down (Unlatched) Position

9. Latch the module in place by pulling up on the ejector handle.
10. Secure the device front panel to the chassis using the front-panel mounting screws.

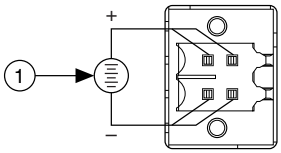
**Note** Tightening the top and bottom mounting screws increases mechanical stability and also electrically connects the front panel to the chassis, which can improve the signal quality and electromagnetic performance.

11. Cover all empty slots using filler panels or slot blockers to maximize cooling air flow.
12. Connect the required auxiliary 48 V power source to the auxiliary power input connector of the device. Tighten the screws to hold the auxiliary 48 V power source in place.



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**Figure 4.** Connecting the Required 48 V Power Source




1. Required Auxiliary Power Source

**Note** An auxiliary 48 V power source is required to operate the NI 4112/4113. The auxiliary power source provided by NI uses sufficient wire gauge to maintain voltage requirements for the device. If you use a third-party auxiliary power source, you must use the appropriate wire gauge to ensure that it can provide the required device current without dropping below the minimum voltage at the auxiliary power input connector.

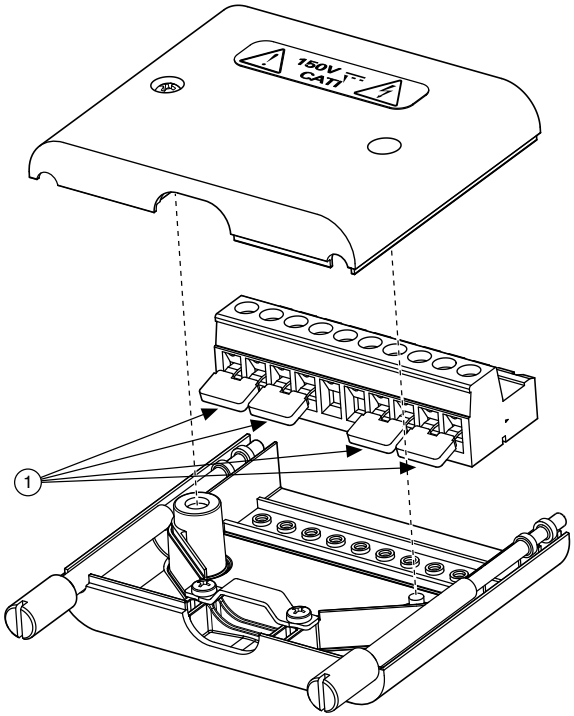
13. Connect the output connector assembly to the device. Tighten the thumbscrews on the output connector assembly to hold it in place.

**Note** The NI 4112/4113 ships with four sense jumpers installed inside the output connector assembly, as shown in the figure below. For local sense configuration, keep the sense jumpers installed within the output connector assembly. For remote sense configuration, remove the sense jumpers and connect the sense pins to the remote sense wires of the load.



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**Figure 5.** Sense Jumpers




1. Sense Jumpers Installed on the Output Connector Plug

14. Power on the chassis.

### Related Information

*For information about local and remote sense configuration for specific devices, refer to the NI DC Power Supplies and SMUs Help.*

*For information about wire gauge, refer to the NI DC Power Supplies and SMUs Help.*

# Configuring the NI 4112/4113 in MAX

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-DCPower.

1. Launch MAX by navigating to **Start»All Programs»National Instruments»NI MAX** or by clicking the NI MAX desktop icon.
2. In the Configuration pane, double-click **Devices and Interfaces** to see the list of installed devices. Installed devices appear under the name of their associated chassis.



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3. Expand your **Chassis** tree item. MAX lists all devices installed in the chassis. Your default device names may vary.

   **Note** If you do not see your device listed, press <F5> to refresh the list of installed devices. If the device is still not listed, power off the system, ensure the device is correctly installed, and restart.

4. Record the device identifier MAX assigns to the hardware. Use this identifier when programming the NI 4112/4113.
5. The MAX self-test performs a basic verification of hardware resources. To self-test a module in MAX, right click the module and select **Self-Test**.

   If any module fails the self-test, refer to the *Troubleshooting* section of this document.

# Programming the NI 4112/4113

You can generate signals interactively using the NI-DCPower Soft Front Panel (SFP) or you can use the NI-DCPower instrument driver to program your device in the supported ADE of your choice.

**Table 1.** NI 4112/4113 Programming Options

| Application Programming Interface (API) | Location | Description |
|---|---|---|
| NI-DCPower SFP | Available from the start menu at **Start»All Programs»National Instruments»NI-DCPower»NI-DCPower Soft Front Panel**. | The NI-DCPower SFP acquires, controls, and presents data. The NI-DCPower SFP operates on the PC, to provide additional display capabilities. |
| NI-DCPower Instrument Driver | LabVIEW—Available on the LabVIEW Functions palette at **Measurement I/O»NI-DCPower**. | NI-DCPower configures and operates the device hardware and performs basic acquisition and measurement options using LabVIEW VIs or LabWindows/CVI functions. |
| | C or LabWindows/CVI—Available at **Program Files»IVI Foundation»IVI»Drivers»NI-DCPower**. | |
| | Microsoft Visual C/C++—NI-DCPower does not ship with installed C/C++ examples. | Refer to the *Creating an Application with Microsoft Visual C and C++* topic of the *NI DC Power Supplies and SMUs Help* to manually add all required include and library files to your project. |



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# Troubleshooting

If an issue persists after you complete a troubleshooting procedure, contact NI technical support or visit *ni.com/support*.

## What Should I Do if the NI 4112/4113 Doesn't Appear in MAX?

1. In the MAX configuration tree, click **Devices and Interfaces**.
2. Expand the **Chassis** tree to see the list of installed devices, and press <F5> to refresh the list.
3. If the module is still not listed, power off the system, ensure that all hardware is correctly installed, and restart the system.
4. Navigate to the Device Manager.

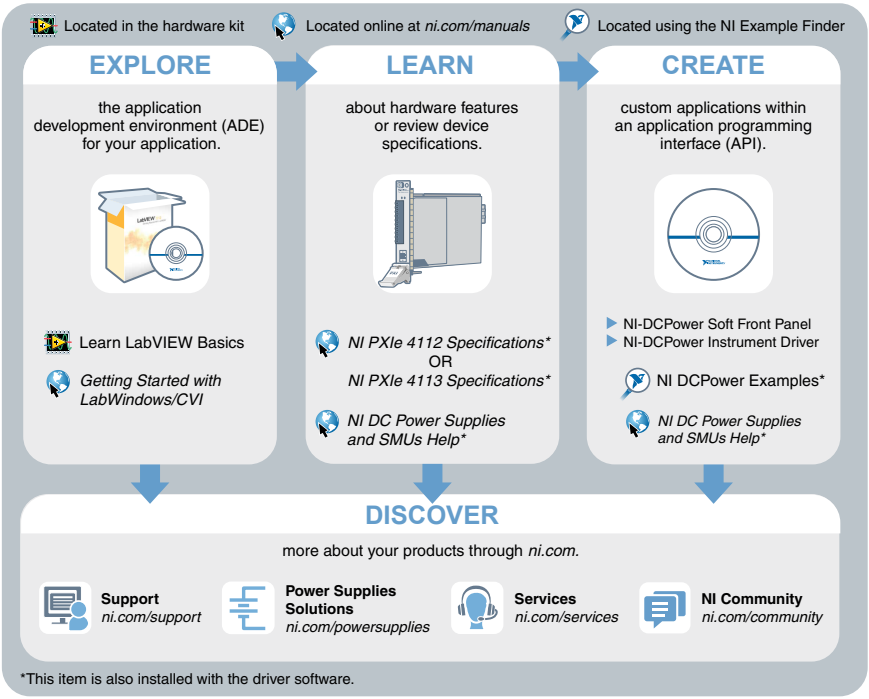
| Operating System | Description |
|---|---|
| **Windows 8** | Right-click the Start screen, and select **All apps»Control Panel» Hardware and Sound»Device Manager**. |
| **Windows 7** | Select **Start»Control Panel»Device Manager**. |
| **Windows Vista** | Select **Start»Control Panel»System and Maintenance»Device Manager**. |
| **Windows XP** | Select **Start»Control Panel»System»Hardware»Device Manager**. |

5. If you are using a PXI controller, verify that a **National Instruments** entry appears in the system device list. Reinstall NI-DCPower and the device if error conditions appear in the list. If you are using an MXI controller, right-click **PCI-to-PCI Bridge**, and select **Properties** from the shortcut menu to verify that the bridge is enabled.



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# Where To Go Next




# Worldwide Support and Services

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can obtain the DoC for your product by visiting *ni.com/certification*. If your product supports calibration, you can obtain the calibration certificate for your product at *ni.com/calibration*.

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