GETTING STARTED GUIDE

NI PXIe-5622

16-bit 150 MS/s Digitizer

This document explains how to install, configure, and test the NI PXIe-5622 (NI 5622). The NI 5622 is a 150 MS/s digitizer with onboard signal processing (OSP). The NI-SCOPE instrument driver ships with the NI 5622 and programs the device.

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

To access NI 5622 documentation, navigate to **Start»All Programs»National Instruments» NI-SCOPE»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 provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

NATIONAL INSTRUMENTS

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 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** 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 30 m (100 ft).

Verifying the System Requirements

To use the NI 5622, your system must meet certain requirements. For more information about minimum system requirements, recommended system, and supported application development environments (ADEs), refer to the readme, which is available on the 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.

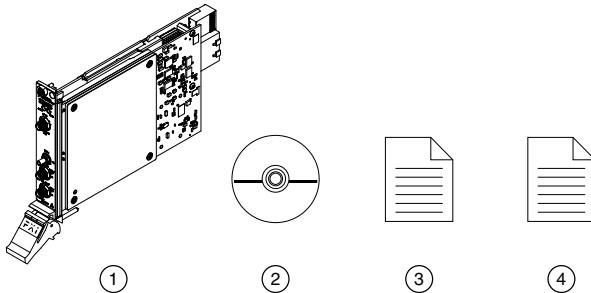⚠ **Caution** Never touch the exposed pins of connectors.

📝 **Note** Do not install a device if it appears damaged in any way.

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

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

Kit Contents

Figure 1. NI 5622 Kit Contents

1. NI PXIe-5622
2. Driver Software DVD
3. NI PXIe-5622 Getting Started Guide (this document)
4. Maintain Forced-Air Cooling Note to Users

Other Equipment

In addition to the items in your device kit, a PXI Express chassis with a controller and the chassis documentation are required for installation and operation of the NI 5622.

Preparing the Environment

Ensure that the environment in which you are using the NI 5622 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.)
Maximum 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 that the hardware is completely dry and free from contaminants before returning it to service.

For more information, refer to the specifications document for the device at *ni.com/manuals*.

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 5622

> ⚠ **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.

Figure 2. Chassis Compatibility Symbols
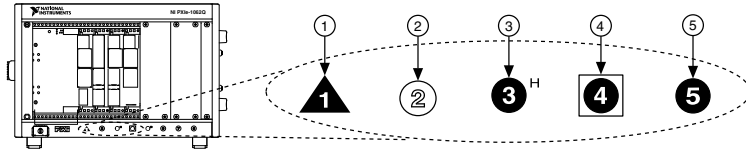
1. PXI Express System Controller Slot
2. PXI Peripheral Slot
3. PXI Express Hybrid Peripheral Slot
4. PXI Express System Timing Slot
5. PXI Express Peripheral Slot

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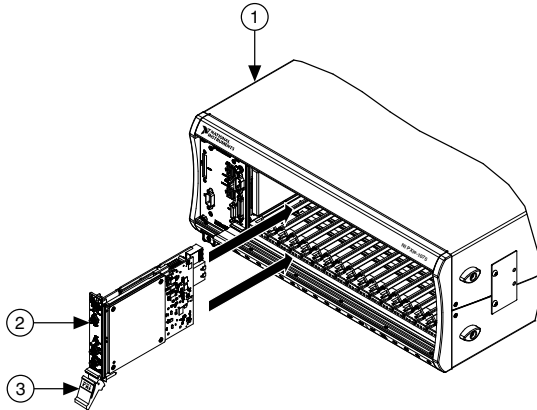
1. Chassis
2. Hardware Module
3. Ejector Handle in Down (Unlatched) Position

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. Power on the chassis.

Hardware Front Panel Connectors

Figure 4. NI 5622 Front Panel

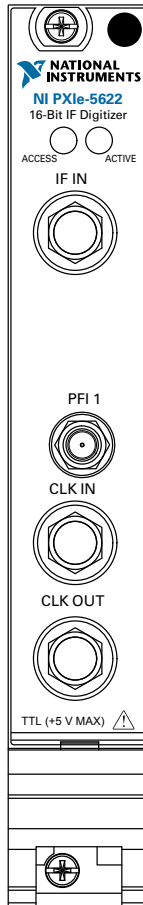**Table 1.** NI 5622 Front Panel Signal Connections

Connector	Description	Function
IF IN	SMA connector	Analog input connection; digitizes data and triggers acquisitions
PFI 1	SMB connector	Digital trigger connection

Table 1. NI 5622 Front Panel Signal Connections (Continued)

Connector	Description	Function
CLK IN	SMA connector	Imports an external reference or sample clock to the digitizer
CLK OUT	SMA connector	Exports the digitizer reference or sample clock

Configuring the Hardware 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-SCOPE .

1. Launch MAX.

2. In the configuration tree, double-click **Devices and Interfaces** to see the list of installed devices.

   Installed devices appear under the name of their associated chassis.

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 5622.

5. Self-test the device by selecting the device in the configuration tree and clicking **Self-Test** in the MAX toolbar.

   The MAX self-test performs a basic verification of hardware resources.

6. Run the test panels on the device to verify the signal.

   a) To access the test panels, right-click the device and select **Test Panels**. The NI-SCOPE Soft Front Panel (SFP) launches automatically.

   b) Complete one of the following steps to connect a signal to the device:

   - Connect an external signal and click **Auto** or select the appropriate device parameters for the signal.
   - Connect a cable from PFI 1 to an input channel and select **Utility**»**Probe Compensation** from the SFP menu.

   Note The NI 5622 has self-calibration capabilities, which you can access programmatically with NI-SCOPE and your ADE, or interactively with NI-SCOPE SFP or MAX.

Programming the NI 5622

You can acquire data interactively using the NI-SCOPE SFP, or you can use the NI-SCOPE instrument driver to program your device in the supported ADE of your choice.

Table 2. NI 5622 Programming Options

Application Programming Interface (API)	Location	Description
NI-SCOPE SFP	Available from the start menu at **Start»All Programs»National Instruments»NI-SCOPE»NI-SCOPE Soft Front Panel**.	The NI-SCOPE SFP acquires, controls, analyzes, and presents data, similar to stand-alone oscilloscopes. The NI-SCOPE SFP operates on the PC, so you can view and control waveforms directly from your computer. You can also run multiple sessions of the NI-SCOPE SFP simultaneously.
NI-SCOPE Instrument Driver	LabVIEW—Available on the LabVIEW Functions palette at **Measurement I/O»NI-SCOPE**.	The NI-SCOPE API configures and operates the device hardware and provides customizable acquisition, control, analysis, and measurement options using LabVIEW VIs or LabWindows/CVI functions.
	C or LabWindows/CVI—Available at **Program Files»IVI Foundation»IVI»Drivers»niScope**.	
	Microsoft Visual C/C++—Use examples located in the `<NIDocDir>\NI-SCOPE\examples` directory, where `<NIDocDir>` is one of the following directories: • Windows 8/7/Vista—`Users\Public\Documents\National Instruments` • Windows XP—`Documents and Settings\All Users\Shared Documents\National Instruments`	You can modify an NI-SCOPE C example to create an application with Microsoft Visual C/C++. Copy an NI-SCOPE example to copy required project settings for include paths and library files. Alternatively, refer to the *Creating an Application with Microsoft Visual C and C++* topic of the *NI High-Speed Digitizers Help* to manually add all required include and library files to your project.

Troubleshooting

Why Is the ACCESS LED Off When the Chassis is On?

The LEDs may not light until the device has been configured in MAX. Before proceeding, verify that the NI 5622 appears in MAX.

If the ACCESS LED fails to light after you power on the chassis, a problem may exist with the chassis power rails, a hardware module, or the LED.

⚠️ **Caution** Apply external signals only while the NI 5622 is powered on. Applying external signals while the device is powered off may cause damage.

1. Disconnect any signals from the module front panels.
2. Power off the chassis.
3. Remove the module from the chassis and inspect it for damage. Do not reinstall a damaged device.
4. Reinstall the module in a different chassis slot.
5. Power on the chassis.
6. Verify that the device appears in MAX.
7. Reset the device in MAX and perform a self-test.

Related Information

Installing the NI 5622 on page 4

What Should I Do if the NI 5622 Doesn't Appear in MAX?

1. In the MAX configuration tree, expand **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**.

Operating System	Description
Windows XP	Select **Start»Control Panel»System»Hardware»Device Manager**.

5. If you are using a PXI or PXI Express controller, verify that a **National Instruments** entry appears in the system device list. Reinstall NI-SCOPE 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.

What Should I Do if the Module Fails the Self-Test?

1. Restart the system.
2. Launch MAX, and perform the self-test again.
3. Power off the chassis.
4. Reinstall the failed module in a different slot.
5. Power on the chassis.
6. Perform the self-test again.

Thermal Shutdown Error

If you receive an over-temperature or thermal shutdown error and your device shuts down, complete the following steps to re-enable your device:

1. Power off the computer or chassis that contains the device.
2. Reinstall the device and make any necessary adjustments to make sure that the device is effectively cooled.
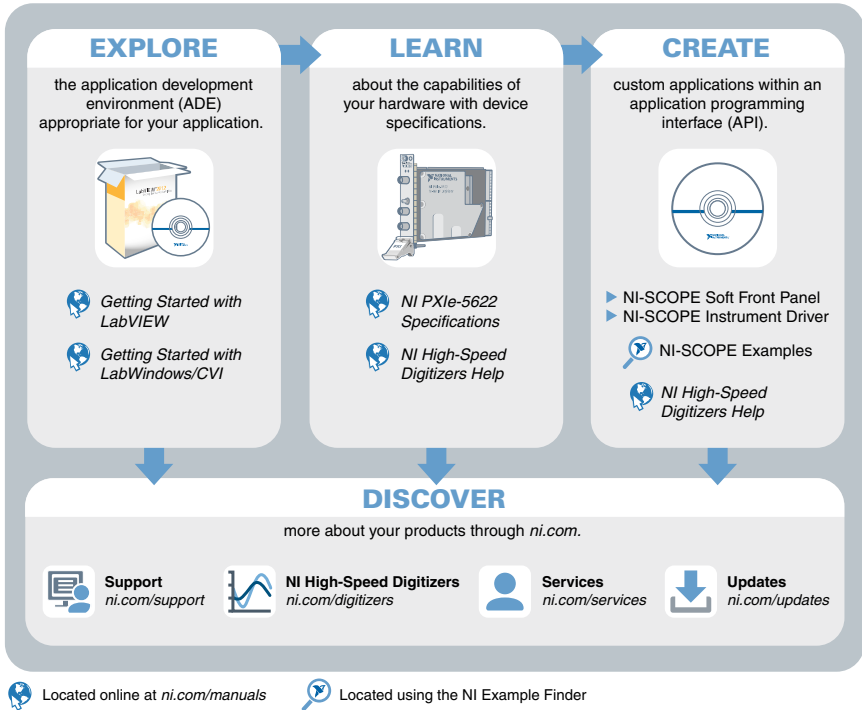3. Power on the computer or chassis.

> **Note** The thermal shutdown error is reported until the device has cooled to an acceptable operating temperature and has been successfully reset.

For more information about cooling the device, refer to the *Maintain Forced-Air Cooling Note to Users* included in your kit.

Related Information

Installing the NI 5622 on page 4

Where To Go Next

EXPLORE the application development environment (ADE) appropriate for your application.

- Getting Started with LabVIEW
- Getting Started with LabWindows/CVI

LEARN about the capabilities of your hardware with device specifications.

- NI PXIe-5622 Specifications
- NI High-Speed Digitizers Help

CREATE custom applications within an application programming interface (API).

- ▶ NI-SCOPE Soft Front Panel
- ▶ NI-SCOPE Instrument Driver
- NI-SCOPE Examples
- NI High-Speed Digitizers Help

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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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