

GETTING STARTED GUIDE

HDD-8261

4-Drive, In-Chassis High-Speed Data Storage Module



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

This document explains how to install and configure the HDD-8261. For more information about configuring, using, and maintaining the HDD-8261, refer to ni.com.

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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.

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.

Unpacking



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. Carefully inspect the shipping container and the HDD-8261 for damage.
2. Check for visible damage to the metal work.



Caution Never touch the exposed pins of connectors.



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

3. Check to make sure all hardware and switches are undamaged.

If damage appears to have been caused during shipment, file a claim with the carrier. Retain the packing material for possible inspection and/or reshipping.

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

What You Need to Get Started

The HDD-8261 kit contains the following items:

- HDD-8261 module
- HDD-8261 documentation



Note The device kit does not include driver media. Go to ni.com/info and enter the Info Code `RAIDDrivers` for instructions on where to download the drivers for your device.

Key Features

The HDD-8261, using software RAID or JBOD mode, provides a compact storage solution in a 3U PXI Express platform.

Table 1. HDD-8261 Mainboard Features

SATA Chipset	<ul style="list-style-type: none"> • Marvel 88SE9485
HDD	<ul style="list-style-type: none"> • 4 × 1 TB (or greater) SATA (platter) hard drives, or • 6 × 400 GB (or greater) SATA solid state hard drives
Front Panel LEDs	<ul style="list-style-type: none"> • Power • Failure LED • HDD activity

HDD-8261 Overview

The HDD-8261 PXI Express/cPCI Express Storage Module supports a software-based striped/simple/spanned RAID array. The HDD-8261 is a three-slot wide hard drive storage device that holds up to four or six 2.5 in. solid-state or mechanical laptop hard drives. The module has a GEN2 x8 PXI Express high-bandwidth connector to the chassis backplane.



Note The only supported version of Microsoft Windows is Windows 7 (64-bit). Using the HDD-8261 in any other version of Windows results in reduced performance and is not recommended.

Optimizing Streaming Performance



Note For more information about optimizing streaming performance, visit ni.com/info and enter the info codes provided in the following table:

Description	Info Code
Optimizing Performance on the NI 8261	ex23vi
Optimizing Streaming Performance	exme7j
Understanding RAID	ex88ay

The HDD-8261 2U in-chassis storage module expands NI high-speed streaming solutions by offering high in-chassis data streaming rates and storage capacities, using software RAID combined with either HDDs for capacity or SSDs for bandwidth. For maximum streaming bandwidth, use the HDD-8261 in the PXIe-1085 chassis with the PXIe-8880 controller.

The HDD-8261 offers up to 2 GB/s read and write speed for the SSD drive option and up to 250 MB/s read and write speed for 80% of the striped array (RAID 0) capacity across all four drives in the HDD drive option.

SSD/HDD Performance

The system configuration used for this benchmarking included a PXIe-8880 embedded controller running Windows 7 64-bit OS, with 24 GB system RAM, in PXIe-1085 chassis. For best throughput, configure a striped volume across all the drives of the HDD-8261 using disk management.

Figure 1. SDD Write Performance

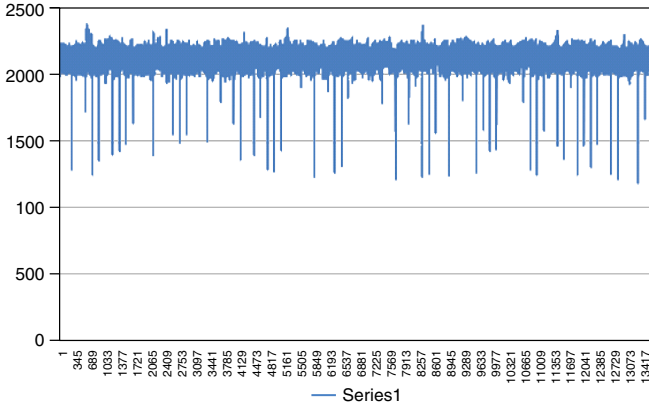


Figure 2. SSD Read Performance

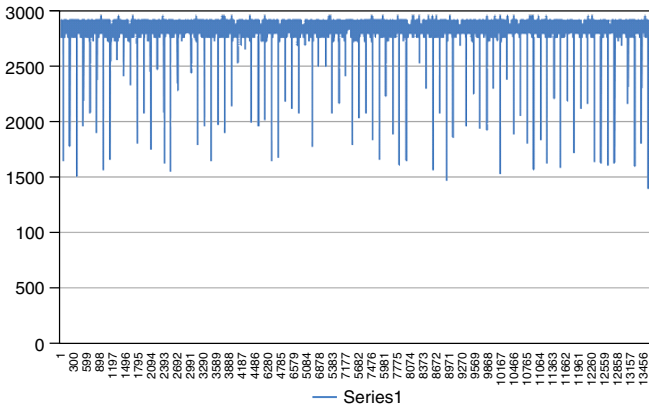


Figure 3. HDD Write Performance

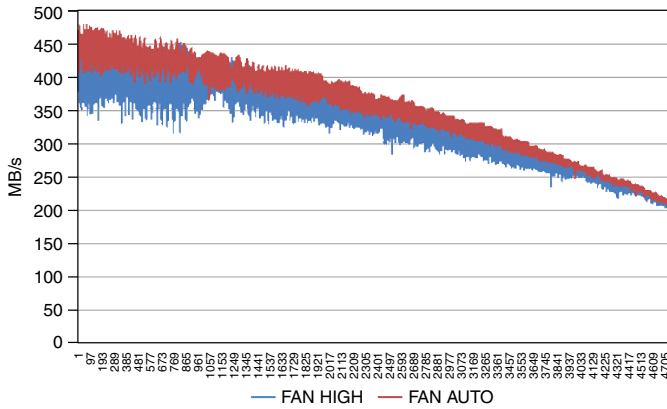
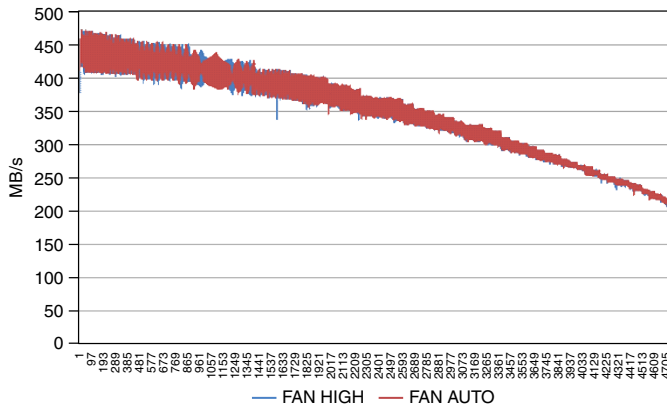


Figure 4. HDD Read Performance



Note The HDD-8261 HDD version performs best in a PXIe-1085 chassis with fans set to Auto. With fans operating on High, performance degrades due to increased vibrations.

Hardware Installation



Caution To protect both yourself and the chassis from electrical hazards, leave the chassis off until you finish installing the HDD-8261.



Note For important information about using the HDD-8261 with chassis fans on high, go to ni.com/info and enter Info Code `HDD8261Setup`.

1. Power off your PXI Express or CompactPCI Express chassis, but leave it plugged in while installing the HDD-8261. The power cord grounds the chassis and protects it from electrical damage while you install the module.
2. Locate an available PXI Express or CompactPCI Express slot in the chassis. Do not install the HDD-8261 in the controller slot (slot 1 in a PXI Express chassis).



Note The HDD-8261 requires three open slots.

3. Remove or open any doors or covers blocking access to the slot in which you intend to install the HDD-8261.
4. Touch the metal part of the case to discharge any static electricity that might be on your clothes or body.
5. Make sure the injector/ejector handle is in its downward position. Be sure to remove all connector packaging and protective caps from retaining screws on the module. Align the HDD-8261 with the card guides on the top and bottom of the selected slot.



Caution Do not raise the injector/ejector handle as you insert the HDD-8261. It will not insert properly unless the handle is in its downward position so that it does not interfere with the injector/ejector rail on the chassis.

6. Hold the handle as you slowly slide the module into the chassis until the handle catches on the injector/ejector rail.
7. Raise the injector/ejector handle until the module firmly seats into the backplane receptacle connectors. The front panel of the HDD-8261 should be even with the front panel of the chassis.
8. Tighten the bracket-retaining screws on the top and bottom of the front panel to secure the HDD-8261 to the chassis.
9. Replace or close any doors or covers to the chassis.

Software/Driver Installation

The HDD-8261 does not include interface software to control the module. After you install the drivers, you must use the Disk Management Utility in Windows to manage the software RAID.

1. Download the driver from ni.com/download/ni-8261-1.0/5756/en/ and unzip it.
2. Open Windows Device Manager (**Start**»**Control Panel**»**Device Manager**).
3. Right-click **RAID Controller** under **Other devices** in the hardware list.
4. Select **Update Driver Software**.
5. Select **Browse my computer for driver software** and choose the **NI8261_x64_driver** folder unzipped in step 1.
6. Leave **Include Subfolders** checked and click **Next**.
7. Complete the automatic installation. When the installation is complete, refer to the following section to set up the RAID array.

RAID Creation

To configure the software RAID on the HDD-8261, complete the following steps. The module uses the Marvell SATA controller, which does not have a built-in hardware RAID. Instead, you must build the RAID volume using the OS software.

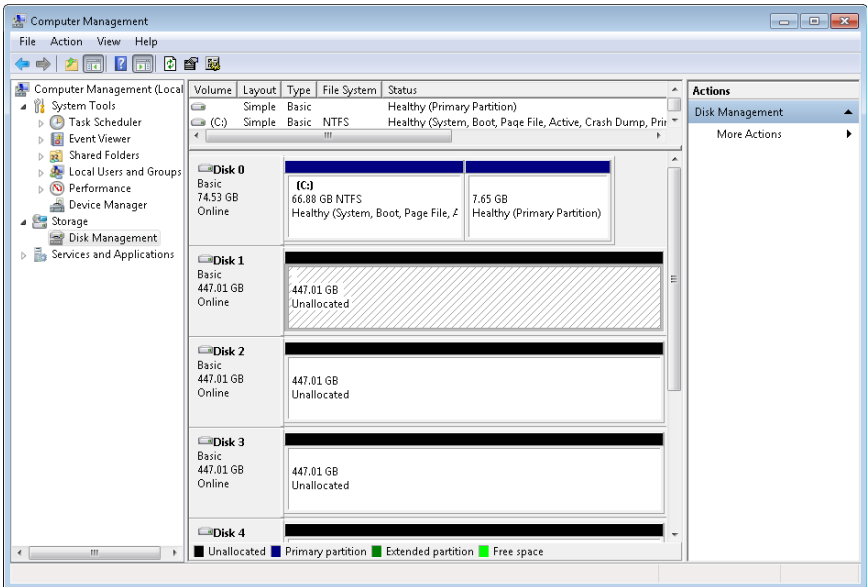


Note The HDD-8261 drivers must be installed for Windows to see the drives.

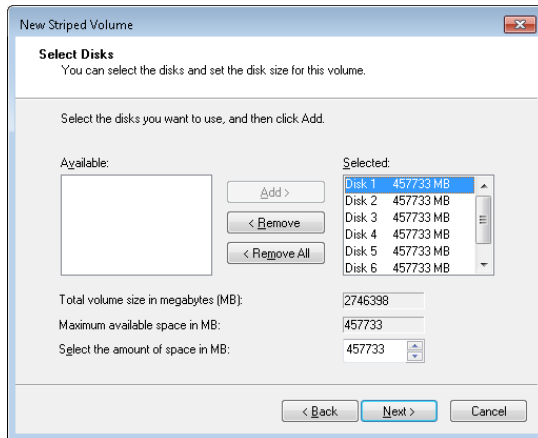


Note Back up your data before you configure the software RAID.

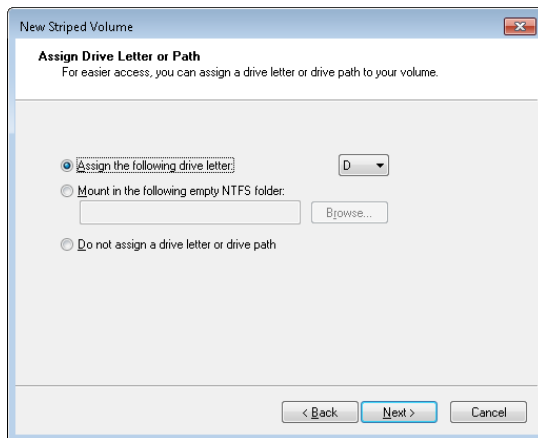
1. Right-click **My Computer** and click **Manage**.
2. Click **Disk Management** in the left window. You should see four/six disk drives of the same size in basic mode. If the disks do not have a status of **Unallocated**, right-click any disk and select **Delete Partition**.
3. Right-click any disk and select **New Striped Volume**, then click **Next**.



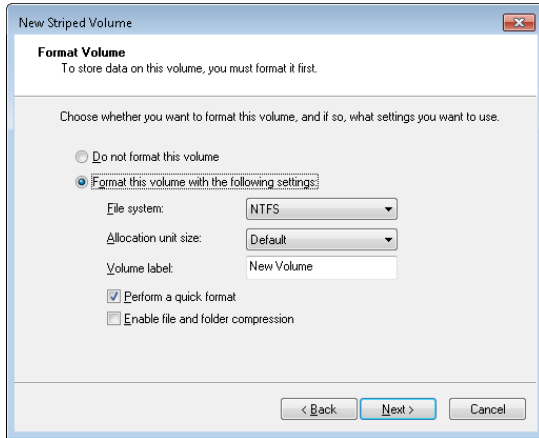
4. Click **Add** until all available disks are moved to the **Selected** window and click **Next**.



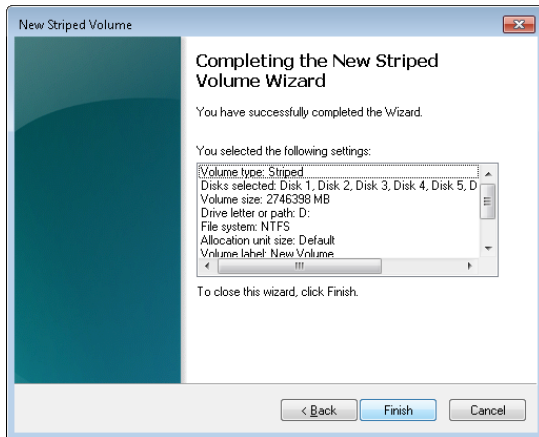
5. Assign a drive letter and click **Next**.



6. Configure the **Format Volume** page as shown in the following figure and click **Next**.



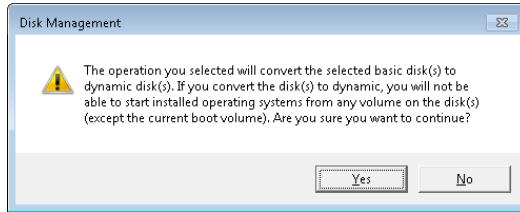
7. Click **Finish** to close the New Striped Volume Wizard.



8. If the disks were configured in basic mode, click **Yes** in the Disk Management dialog box to convert them to dynamic mode.



Note You must convert all disks that you want to include in the RAID array to dynamic mode.



Moving the HDD-8261 to a Different System

Complete the following steps to move your HDD-8261 to a different system or chassis with a different controller.

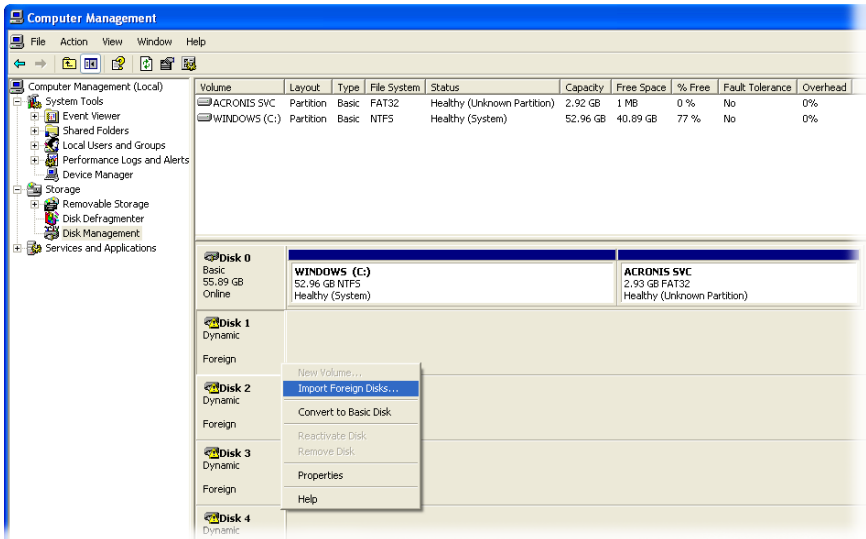


Note The following steps apply only if the HDD-8261 you are moving to a different system is in software RAID mode.

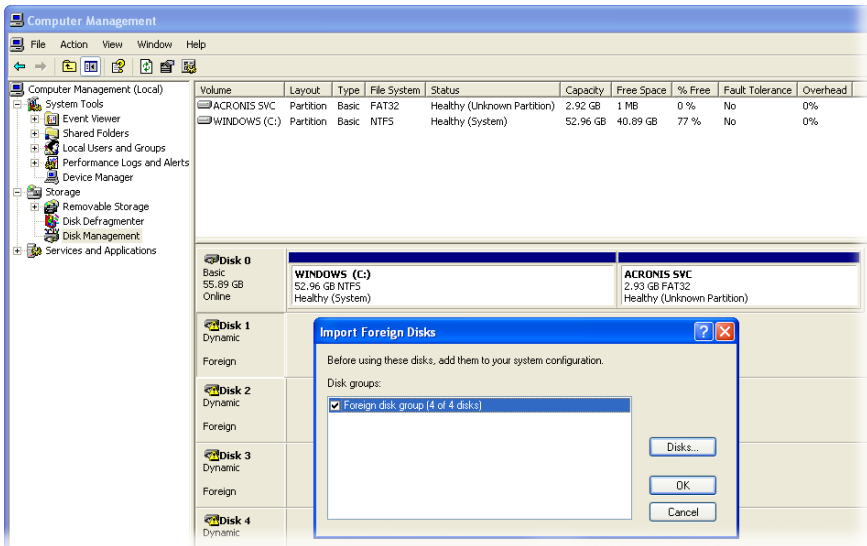


Caution To avoid data loss, do not move, swap, or replace the hard drives.

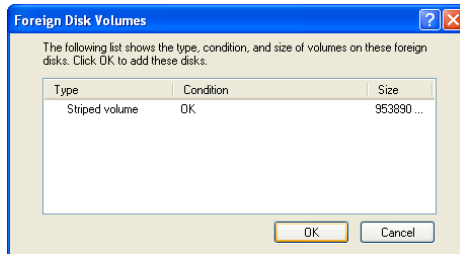
1. When the system boots, go into **Disk Management**. You will see four to six dynamic disks with yellow caution icons. Right-click any disk with a caution icon and select **Import Foreign Disks**.



2. Be sure the **Foreign disk group (4 of 4 disks)** or **Foreign disk group (6 of 6 disks)** checkbox is enabled and click **OK**.



- You may see the following dialog box if a RAID volume was present on the HDD-8261 before you moved it to the new system. Click **OK** to allow the new system to reinitialize the RAID volume.



- Your RAID drive is now ready for use on the new system.

Where to Go Next

The following documents contain information that you may find helpful as you use the HDD-8261:

- CompactPCI Specification PICMG 2.0 R 3.0*, available at www.picmg.org
- PXI Hardware Specification, Revision 2.1*, available at www.pxisa.org
- PXI Software Specification, Revision 2.1*, available at www.pxisa.org
- ANSI/IEEE Standard 1014-1987, *IEEE Standard for a Versatile Backplane Bus: VMEbus*, available at standards.ieee.org

- ANSI/VITA 1-1994, *VME64*, available at www.vita.com/specifications
- *Read Me First: Safety and Electromagnetic Compatibility*, available at ni.com/manuals

Specifications

This section lists the HDD-8261 electrical, mechanical, and environmental specifications.

Mainboard

SATA chipset	Marvel 88SE9485
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Hard Disk Drive

Total storage capacity	
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Rotating media (4 × HDD)	4 TB (or greater)
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Solid state media (6 × SSD)	2.8 TB (or greater)
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Interface	Serial-ATA 3.0
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Physical

Board dimensions	Three-slot 3U PXI Express module, 6 × 13 × 21.6 cm (2.4 × 5.1 × 8.5 in.)
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Slot requirements	One PXI Express module slot plus two module expansion slots
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Compatibility	CompactPCI Express spec component
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Weight	
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1 TB × 4 HDDs	750 g
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400 GB × 6 SSDs	740 g
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Environmental

Maximum altitude	2,000 m (800 mbar)
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Pollution degree	2
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Indoor use only.

Operating Environment

Ambient temperature range¹

Rotating media (HDD)	5 to 50 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2; meets MIL-PRF-28800F Class 3 high-temperature limit)
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Solid state media (SSD)	0 to 50 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2; meets MIL-PRF-28800F Class 3 limits)
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Relative humidity range	10 to 90% noncondensing (tested in accordance with IEC-60068-2-56)
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Storage Environment

Ambient temperature range

Rotating media (HDD)	-40 to 65 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2; meets MIL-PRF-28800F Class 3 low-temperature limit)
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Solid state media (SSD)	-40 to 71 °C (tested in accordance with IEC-60068-2-1 and IEC-60068-2-2; meets MIL-PRF-28800F Class 3 limits)
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Relative humidity range	5 to 95% noncondensing (tested in accordance with IEC-60068-2-56)
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Shock and Vibration (SSD Only)

Operational shock	30 g peak, half-sine, 11 ms pulse (tested in accordance with IEC-60068-2-27; test profile developed in accordance with MIL-PRF-28800F)
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¹ For chassis that are not available in the online catalog at ni.com, contact National Instruments for supported operating temperatures.

Random Vibration

Operating	5 to 500 Hz, 0.3 g _{rms} (with solid state hard drive)
Nonoperating	5 to 500 Hz, 2.4 g _{rms} (tested in accordance with IEC-60068-2-64; nonoperating test profile exceeds the requirements of MIL-PRF-28800F, Class 3)



Note Specifications are subject to change without notice.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.



Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.



Note For EMC declarations and certifications, and additional information, refer to the [Online Product Certification](#) section.

CE Compliance

This product meets the essential requirements of applicable European Directives as follows:

- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for this product, visit ni.com/

[certification](#), search by model number or product line, and click the appropriate link in the Certification column.

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 *Minimize Our Environmental Impact* 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.

Waste Electrical and Electronic Equipment (WEEE)



EU Customers This symbol indicates that waste products should be disposed of separately from municipal household waste according to WEEE Directive 2002/96/EC of the European Parliament and the Council on waste electrical and electronic equipment (WEEE). All products at the end of their life cycle must be sent to a WEEE collection and recycling center. Proper WEEE disposal reduces environmental impact and the risk to human health due to potentially hazardous substances used in such equipment. Your cooperation in proper WEEE disposal will contribute to the effective usage of natural resources. For information about the available collection and recycling scheme in a particular country, go to ni.com/environment/weee.

电子信息产品污染控制管理办法（中国 RoHS）



中国客户 National Instruments 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 National Instruments 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.)

Worldwide Support and Services

The NI website is your complete resource for technical support. At 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 for NI Factory Installation Services, repairs, extended warranty, and other services.

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

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electromagnetic compatibility (EMC) and product safety. You 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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