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Find the *National Instruments NI 8352* at our website: ***Click HERE***

# INSTALLATION GUIDE
# NI 8352/8353

This guide includes installation information for the NI 8352/8353. For more information about configuring, using, and maintaining the NI 8352/8353, refer to the *NI 8352/8353 User Manual*. You can download the user manual in PDF format at `ni.com/manuals`.

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# Related Documentation

The following documents contain information that you may find helpful as you read this manual:

- *CompactPCI Specification PICMG 2.0 R 3.0*
- *PXI Hardware Specification*, *Revision 2.1*
- *PXI Software Specification*, *Revision 2.1*
- ANSI/IEEE Standard 1014-1987, *IEEE Standard for a Versatile Backplane Bus: VMEbus*
- ANSI/VITA 1-1994, *VME64*
- *NI-VISA User Manual*
- *NI-VISA Programmer Reference Manual*
- *Read Me First: Safety and Radio-Frequency Interference*, National Instruments

# Unpacking

Carefully inspect the shipping container and the NI 8352/8353 for damage. Check for visible damage to the metal work. 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 reshipment.

# What You Need to Get Started

The NI 8352/8353 kit contains the following items:

- ❑ NI 8352/8353 rack mount controller
- ❑ *NI 8352/8353 User Manual*
- ❑ Windows recovery CD/DVD
- ❑ NI driver CD
- ❑ Rack mount kit
- ❑ AC power cable (refer to Table 1 for a list of AC power cables)

**Table 1.** AC Power Cables

| Power Cable | Reference Standards |
|---|---|
| Standard 120 V (USA) | ANSI C73.11/NEMA 5-15-P/IEC83 |
| Switzerland 220 V | SEV |
| Australia 240 V | AS C112 |
| Universal Euro 230 V | CEE (7), II, IV, VII IEC83 |
| North America 240 V | ANSI C73.20/NEMA 5-15-P/IEC83 |
| United Kingdom 230 V | BS 1363/IEC83 |
| Japan 100 V | ANSI C73.11/NEMA 5-15-P/IEC83 |

If you are missing any of the above items, or if you have the incorrect AC power cable, contact National Instruments.

# Key Features

The NI 8352/8353 combines the performance of a PC with a National Instruments remote controller for PXI in a rack-mountable compact 1U form factor.

## Mainboard Features

### CPU

- Intel Core2 Duo 2.4 GHz/Core2 Quad 2.4 GHz CPU with 800 MHz FSB and 4/8 MB L2 cache

### Chipset

- Intel 3000 chipset
- Intel ICH7R chipset
- Intel PXH-V

### Memory

- 1 GB memory standard (2 × 512 MB ECC (32 M × 64 bit), unbuffered, DDR-II)
- Maximum memory supported: 8 GB 533/667 DDR-II SDRAM in 4 DIMM sockets (240 pin)

### Slots

- PCI Express x8 slot
- PCI-X 64-bit 133 MHz

### Video

- ATI ES 1000 with 16 MB SDRAM

### HDD

- 2 × 250 GB (or greater) SATA hard drive RAID0
- 4 × 3.5 in. expansion bay SATA

### DVD-ROM

- Slim DVD-ROM drive

## Onboard LAN

- 2 × Intel 82573V/L Gigabit Ethernet controller

## Onboard I/O

- PS/2 keyboard port
- PS/2 mouse port
- Serial port
- VGA port
- Two USB 2.0 ports (rear)
- Two USB 2.0 ports (front)
- Two RJ-45 ports

## Power Management Features

- RTC alarm and wake up
- Wake up on LAN (WOL)
- Wake up on serial ring
- Wake up on keyboard/mouse from sleep (S1)
- Wake up on USB from sleep (S1)
- Wake up on PCI
- Supports ACPI S1/S4/S5 functions

## Front Panel LEDs

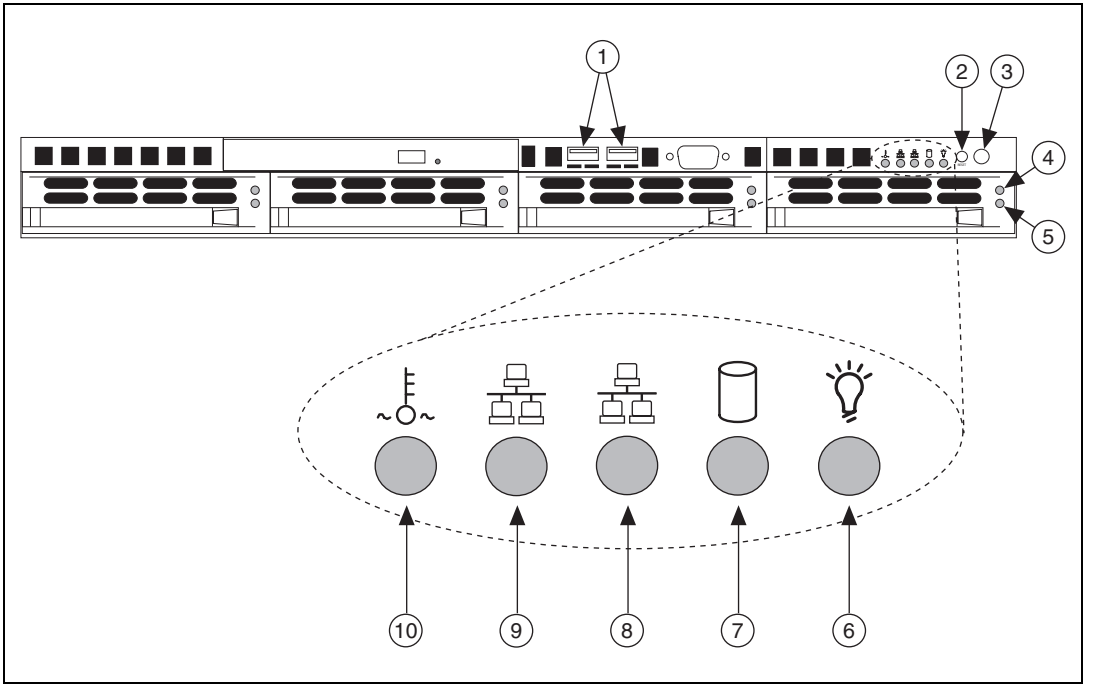
- Power
- LAN activity
- HDD activity
- Thermal trip LED

## System Management

- SMB ($I^2C$)
- Temperature, voltage, and fan monitors
- Chassis intrusion

# NI 8352/8353 Description

Figure 1 shows the key features of the NI 8352/8353 front panel. For detailed information about the NI 8352/8353 rear panel, refer to Chapter 3, *I/O Information*, in the *NI 8352/8353 User Manual*.



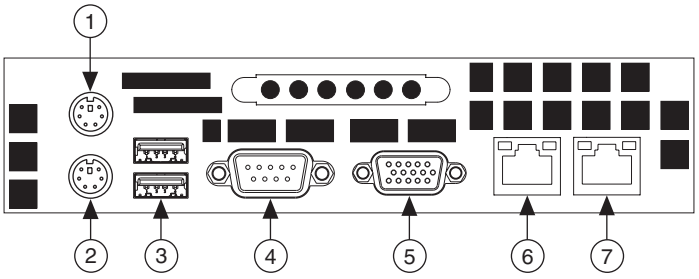

| | | | |
|---|---|---|---|
| 1 | USB Ports | 6 | Power Indicator |
| 2 | Reset Switch | 7 | HDD Indicator |
| 3 | Power Switch | 8 | LAN1 Status Indicator |
| 4 | Hard Drive Activity Indicator | 9 | LAN2 Status Indicator |
| 5 | Hard Drive Error Indicator | 10 | System Temp and Fan Warning Indicator |

**Figure 1.** Front View of the NI 8352/8353

The front panel includes the following LEDs:

- **Power indicator**—glows when the NI 8352/8353 is powered on.
- **LAN status indicators**—flash when there is activity on LAN1 or LAN2.
- **Overheat/FanFail LED**
  - Off—Normal
  - On—Overheat
  - Flashing—Fan

Figure 2 shows the rear panel layout of the NI 8352/8353.




| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | PS/2 Mouse Connector | 3 | USB Ports | 5 | VGA Port | 7 | LAN 2 |
| 2 | PS/2 Keyboard Connector | 4 | Serial Port | 6 | LAN 1 | | |

**Figure 2.** NI 8352/8353 Rear Panel Layout

# Optional Equipment

## Memory Upgrades

You can upgrade the NI 8352/8353 memory to a maximum of 8 GB.

**Note** A 32-bit operating system such as Windows XP Pro addresses a maximum of 4 GB.

The NI 8352/8353 supports dual-channel DDR-II SDRAM unbuffered memory in four 240-pin DIMM sockets. The NI 8352/8353 supports ECC memory.

**Note** National Instruments has tested and verified that the DDR-II DIMMs we sell work with the NI 8352/8353. We recommend you purchase your DDR-II DIMM modules from National Instruments. Other off-the-shelf DDR-II DIMM modules are not guaranteed to work properly.

## Rack Mount Kit

A rack mount kit is included for mounting the NI 8352/8353 chassis into a 19 in. instrument cabinet.

## USB Floppy Disk Drive

A USB floppy drive is available from National Instruments, part number 778492-02.

# NI 8352/8353 Overview

The NI-8352/8353 is a 1U PC-server-based controller for MXI-Express-based control of PXI chassis. The controller provides leading-edge processing power with Intel Pentium Core2 Duo and Core2 Quad processors, high disk bandwidth with hardware RAID support, high I/O bandwidth with a PCI Express x8 slot or an option for a PCI-X slot, and up to 8 GB of memory. The server fits in a 26 in. rack.

# Safety Information

**Caution** Before undertaking any troubleshooting, maintenance, or exploratory procedure, carefully read the following caution notices.

This equipment contains voltage hazardous to human life and safety, and can inflict personal injury.

- **Chassis Grounding**—The NI 8352/8353 requires a connection from the premise wire safety ground to the NI 8352/8353 chassis ground. The earth safety ground *must* be connected during use of this equipment to minimize shock hazards. Refer to the *Connecting Safety Ground* section for instructions on connecting safety ground.
- **Live Circuits**—Operating personnel and service personnel *must not* remove protective covers when operating or servicing the NI 8352/8353. Adjustments and service to internal components must be undertaken by qualified service technicians. During service of this product, the mains connector to the premise wiring must be disconnected. Dangerous voltages may be present under certain conditions; use extreme caution.
- **Explosive Atmosphere**—*Do not* operate the chassis in conditions where flammable gases are present. Under such conditions this equipment is unsafe and may ignite the gases or gas fumes.
- **Parts Replacement**—Only service this equipment with parts that are exact replacements, both electrically and mechanically. Contact National Instruments for replacement part information. Installation of parts with those that are not direct replacements may cause harm to personnel operating the chassis. Furthermore, damage or fire may occur if replacement parts are unsuitable.
- **Modification**—*Do not* modify any part of the NI 8352/8353 from its original condition. Unsuitable modifications may result in safety hazards.

# Chassis Cooling Considerations

The NI 8352/8353 is designed to operate on a bench or in an instrument rack. Determine how you want to use the NI 8352/8353 and follow the appropriate installation instructions.

## Providing Adequate Clearance

Apertures in the front, top, rear, and along both sides of the chassis facilitate power supply and motherboard cooling. Air enters through the front and top inlets of the chassis and exits through the fans on the rear of the chassis. Place the NI 8352/8353 on a bench top or in an instrument rack so that the fans (air outlets) and the air inlet apertures along the top and front of the chassis have adequate ventilation. Keep other equipment a minimum of 76.2 mm (3 in.) away from the air outlets on the rear of the chassis.

# Installation

Follow these steps to connect devices to the NI 8352/8353:

1. Connect a keyboard and mouse to the appropriate connectors on the NI 8352/8353 rear panel.
2. Connect the VGA monitor video cable to the VGA connector on the rear panel.
3. (Optional) To boot into LabVIEW RT, connect the network cable to LAN jack 1 on the rear panel. (Refer to Figure 2 for the location of LAN jack 1.)
4. Connect the USB, serial, and parallel devices as necessary to the NI 8352/8353 front and rear panel ports.

**Caution** To minimize shock hazard, make sure the electrical power outlet you use to power the NI 8352/8353 has an appropriate earth safety ground. Refer to the *Connecting Safety Ground* section for more information.

5. Connect the AC power cable to the AC inlet on the rear panel and to an AC power outlet. For more information, refer to *Connecting to Power Source* section.
6. Connect the MXI-Express port on the rear of the NI 8352/8353 to the PXI chassis and power on the chassis.
7. Power on the NI 8352/8353.
8. Verify that the NI 8352/8353 boots. If it does not boot, refer to the *What if the NI 8353/8353 does not boot?* section of Chapter 5, *Troubleshooting*, in the *NI 8352/8353 User Manual*.

# Connecting Safety Ground

The NI 8352/8353 is designed with a three-position NEMA 5-15 style plug for the U.S. that connects the ground line to the chassis ground. To minimize shock hazard, make sure the electrical power outlet you use to power the chassis has an appropriate earth safety ground.

# Connecting to Power Source

Attach input power through the rear AC inlet using the appropriate AC power cable supplied.

**Caution** To completely remove power, you *must* disconnect the AC power cable.

The power switch allows you to power on the chassis or place it in standby mode. Push the power switch to the On position (if not already on). Observe that all fans become operational and the power indicator is lit.

# Rack Mounting

**Note** To rack mount the NI 8352/8353, the chassis must be at least 26 in. deep.

The rack mounting hardware includes:

- One pair of inner slides to be installed on the chassis.
- One pair of outer slides to be installed in the rack.
- Two pairs of short brackets for the front of the outer slides.

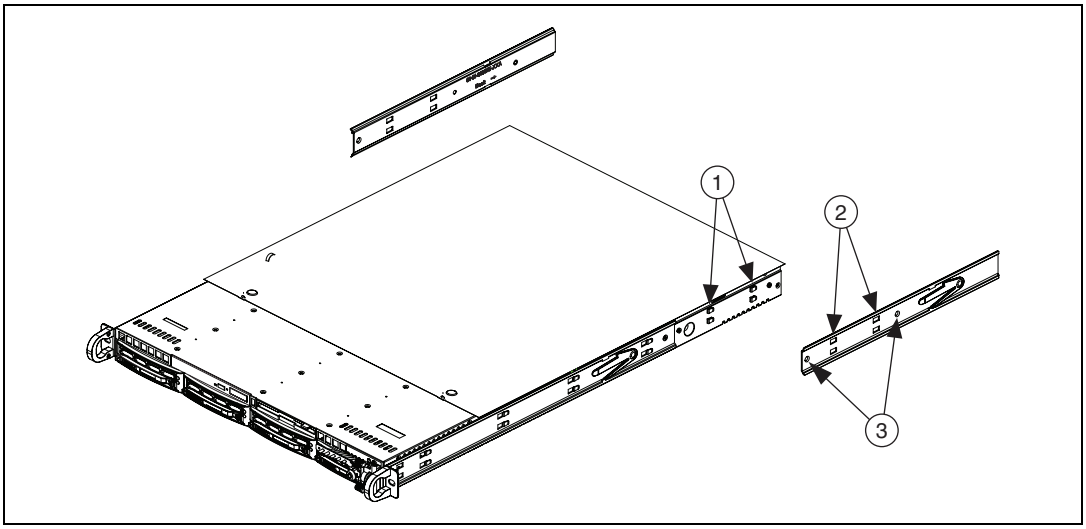
**Note** One pair of short brackets includes screw threads, and the other pair does not. Use the pair that fits into your rack.

- One pair of long brackets for the rear of the outer slides.

## Installing Inner Slides

Follow these steps to install the inner slides:

1. Locate the right inner slide (the slide used on the right side of the chassis when facing the chassis front panel).
2. Align the four square holes on the right inner slide against the hooks on the right side of the chassis, as shown in Figure 3.
3. Securely attach the slide to the chassis with two M4 flathead screws. Repeat steps 1–3 to install the left inner slide to the left side of the chassis.



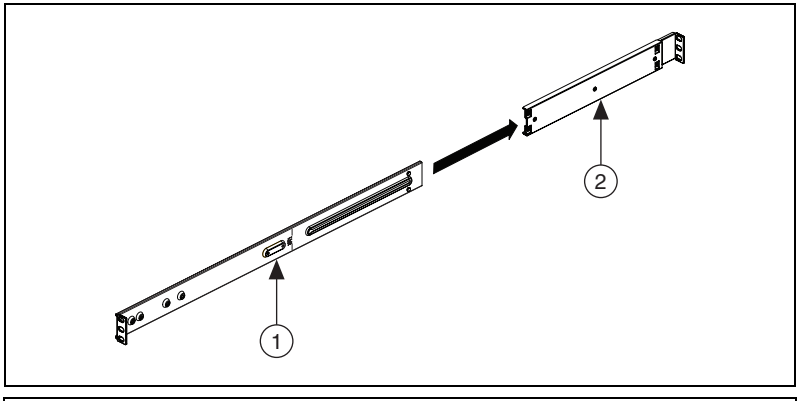

| | | |
|---|---|---|
| 1 Hooks on Chassis | 2 Square Holes on Right Inner Slide | 3 Holes for M4 Screws |

**Figure 3.** Installing Inner Slides

## Installing Outer Slides

Follow these steps to install the outer slides:

1. Measure the distance from the front rail of the rack to the rear rail of the rack.
2. Attach a short bracket to the rear of the right outer slide and a long bracket to the front of the right outer slide, as shown in Figure 4.
3. Adjust the short and long brackets to the proper distance so that the chassis fits snugly into the rack.
4. Repeat steps 1–3 for the left outer slide.

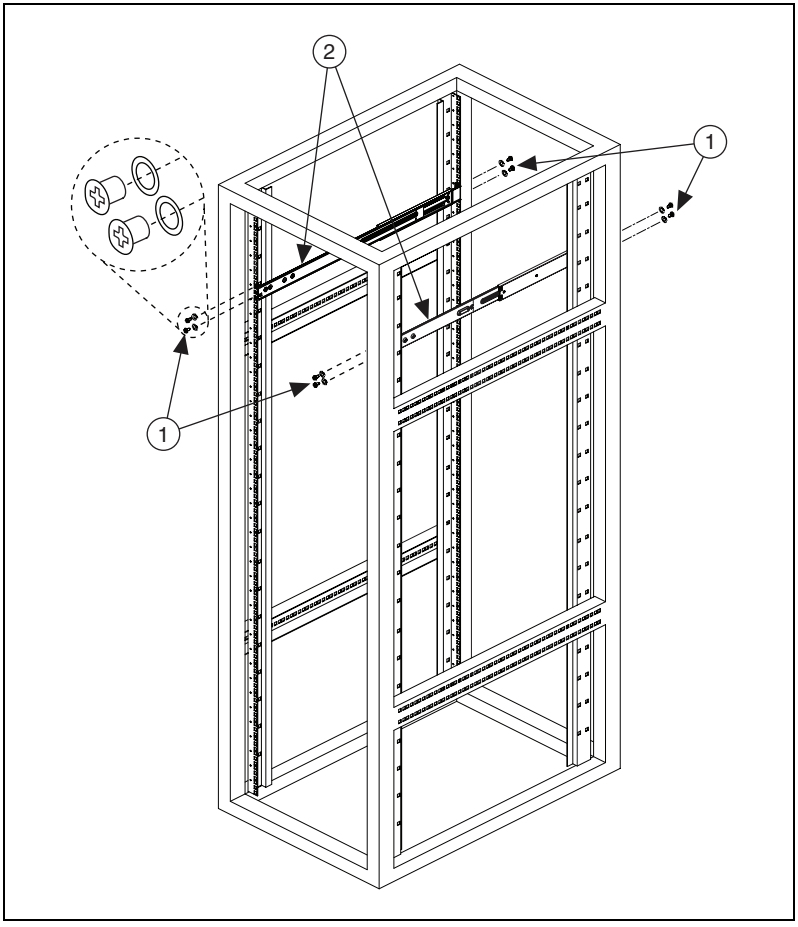



| | | | |
|---|---|---|---|
| 1 | Long Bracket | 2 | Short Bracket |

**Figure 4.** Installing Outer Slides

## Installing the Slide Assemblies in the Rack

Use the M5 screws and washers to secure the slide assemblies to the rack, as shown in Figure 5.



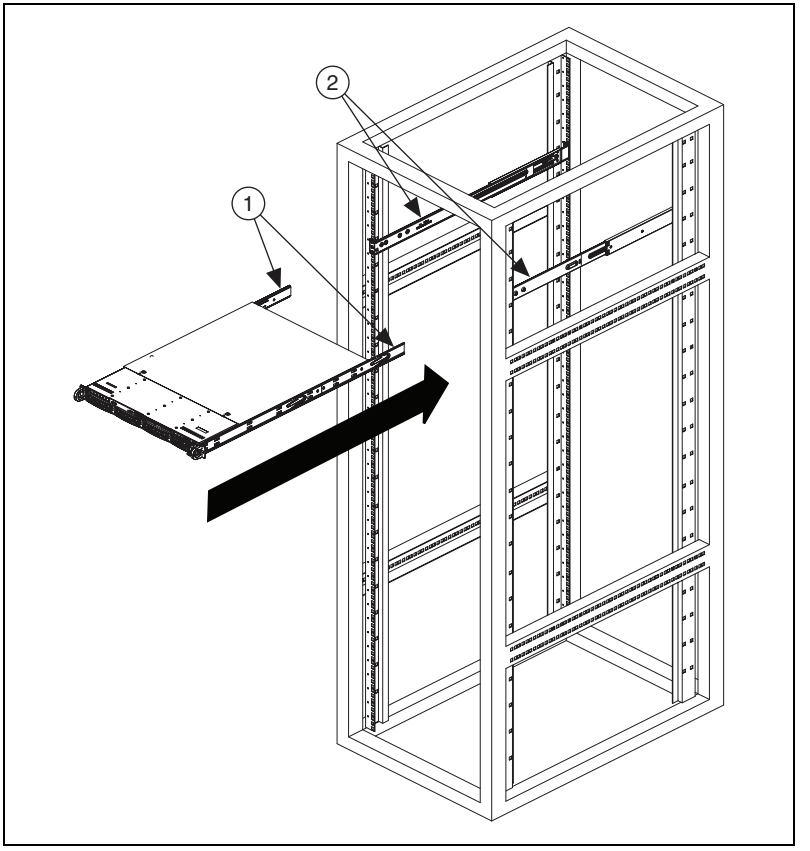

| | | | |
|---|---|---|---|
| 1 | M5 Screws and Washers | 2 | Slide Assemblies |

**Figure 5.** Installing Slide Assemblies into Rack

## Installing the Chassis into the Rack

Follow these steps to install the chassis in the rack:

1. Push the inner slides, attached to the chassis, into the grooves of the outer slide assemblies installed in the rack, as shown in Figure 6.




| | | | |
|---|---|---|---|
| 1 | Inner Slides | 2 | Grooves of Outer Slide Assemblies |

**Figure 6.** Installing Inner Slides into Outer Slides

2. Push the chassis all the way to the back of the outer slide assemblies, as shown in Figure 7. (The plastic bezel is not included in the kit.)

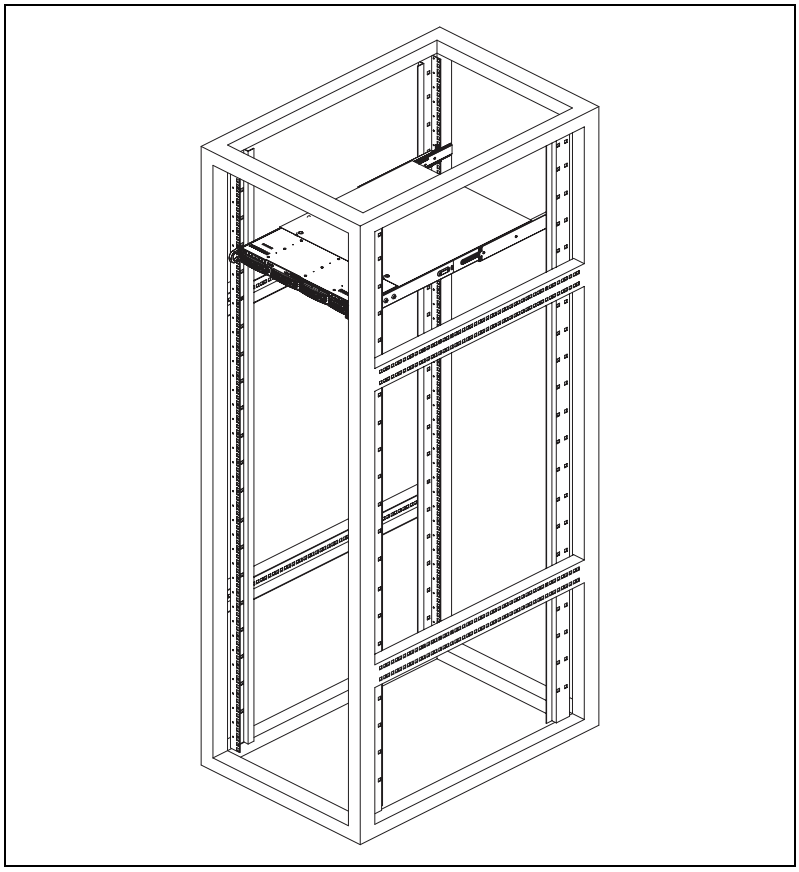


**Figure 7.** Installing Chassis Into Rack

# Hard Drive Recovery

The NI 8352/8353 includes two methods of restoring the original factory condition of your hard drive. Hard drive-based recovery stores a factory backup on a separate part of your hard drive, allowing you to restore your controller without additional media. The NI 8352/8353 also ships with an OS Recovery CD that allows you to reinstall your operating system onto your hard drive via an external CD-ROM. For more information about these tools, refer to KnowledgeBase 2ZKC02OK at `ni.com/support`.

**Note** Recovering the OS erases the contents of your hard disk. Back up any files you want to keep.

# Cleaning

**Caution** *Always* disconnect the AC power cable before cleaning or servicing the chassis.

## Exterior Cleaning

**Cautions** Avoid getting moisture inside the chassis during exterior cleaning, especially through the top vents.

Do *not* wash the front- or rear-panel connectors or switches. Cover these components while cleaning the chassis.

Do *not* use harsh chemical cleaning agents; they may damage the chassis. Avoid chemicals that contain benzene, toluene, xylene, acetone, or similar solvents.

Clean the exterior surfaces of the chassis with a dry lint-free cloth or a soft-bristle brush. Do *not* use abrasive compounds on any part of the chassis.

# Specifications

This section lists the NI 8352/8353 electrical, mechanical, and environmental specifications.

## Electrical

### AC Input

Input voltage range .....100–240 VAC

Operating voltage range[1] .....90–264 VAC

Input frequency.....50/60 Hz

Operating frequency range[1] .....47–63 Hz

Input current rating .....5 A max

Power disconnect.....The AC power cable provides main power disconnect. Depressing the front panel power switch enables or inhibits the internal power supply.

[1] Operating range is guaranteed by design.

## Mainboard

| | |
|---|---|
| Socket | LGA 775 |
| Chipset | Intel 3000 chipset, supports 533/800/1066 MHz FSB, 8 GB dual-channel DDR-II memory |
| Memory Slots | Four 240-pin DIMM slots, two per channel |
| PCI/PCI Express | One PCI Express x8 slot or one PCI 32-bit slot (both risers included) |
| SATA | Four SATA ports compliant with the Serial-ATA 2.0 specification. Maximum data rate of 300 MB/s |
| IDE | One primary IDE connector and one CompactFlash card IDE connector. (If the CompactFlash card connector is populated, the primary connector is available for one device only; otherwise, the primary connector can connect multiple devices.) |
| USB ports | Four USB 2.0 ports |
| Keyboard | PS/2 keyboard port |
| Mouse | PS/2 mouse port |
| Video | VGA port, onboard ATI ES 1000 with 16 MB SDRAM |
| Serial | One RS-232 serial port |
| LAN | Two RJ45 LAN jacks |
| Onboard LAN controller | Intel 82573V/L Gigabit Ethernet controller |

## CPU

CPU .....Intel Core2 Duo/Core 2 Quad

Clock speed.....2.40 GHz

Front side bus speed .....1066 MHz

L2 cache.....4/8 MB

Package .....LGA 775

## Hard Disk Drive

Capacity .....250 GB in one, two, or four-drive configurations for maximum capacity of 1 TB

Interface .....Serial-ATA

## Memory

Standard memory.....2 × 512 MB (32 M × 64 bit), DDR-II SDRAM, ECC 667 MHz, unbuffered, 240-pin DIMMs

2 GB memory upgrade .....Standard memory plus 2 × 1 GB (128 M × 64 bit), DDR-II SDRAM, ECC 533 MHz, unbuffered, 240-pin DIMMs

4 GB memory upgrade .....4 × 1 GB (128 M × 64 bit), DDR-II SDRAM, ECC 667 MHz, unbuffered, 240-pin DIMMs,

## Mechanical

Overall dimensions (standard chassis)

- Height .....43 mm (1.70 in.)
- Width .....437 mm (17.2 in.)
- Depth .....503 mm (19.8 in.)

Weight .....8.6 kg (19.0 lbs)

## Environmental

Operating temperature for NI 8352..... 5 to 40 °C

Operating temperature for NI 8353..... 5 to 35 °C

Storage temperature ..... –10 to 60 °C

Relative humidity

Operating ..... 10 to 90% noncondensing

Nonoperational (storage) ..... 5 to 95% nonconducting

Operating location..... Indoor use

Altitude..... 2,000 m

Installation Category ..... II

Pollution Degree ..... 2

## Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 60950-1, EN-60950-1
- UL 60950-1, CSA 60950-1

**Note** For UL, Demko, and other safety certifications, refer to the product label or visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

## Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 55024, CISPR 24 EMC requirements
- EN 55022, CISPR 22 Emissions; Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

**Note** For EMC compliance, operate this device with shielded cabling.

## CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

**Note** Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain 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

National Instruments is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at `ni.com/environment`. This page contains the environmental regulations and directives with which NI complies, as well as any other environmental information not included in this document.

### Waste Electrical and Electronic Equipment (WEEE)

**EU Customers** At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit `ni.com/environment/weee.htm`.

### 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`.)

# Where to Go for Support

The National Instruments Web site 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.

National Instruments corporate headquarters is located at 11500 North Mopac Expressway, Austin, Texas, 78759-3504. National Instruments also has offices located around the world to help address your support needs. For telephone support in the United States, create your service request at `ni.com/support` and follow the calling instructions or dial 512 795 8248. For telephone support outside the United States, contact your local branch office:

Australia 1800 300 800, Austria 43 662 457990-0,
Belgium 32 (0) 2 757 0020, Brazil 55 11 3262 3599,
Canada 800 433 3488, China 86 21 5050 9800,
Czech Republic 420 224 235 774, Denmark 45 45 76 26 00,
Finland 358 (0) 9 725 72511, France 01 57 66 24 24,
Germany 49 89 7413130, India 91 80 41190000, Israel 972 3 6393737,
Italy 39 02 413091, Japan 81 3 5472 2970, Korea 82 02 3451 3400,
Lebanon 961 (0) 1 33 28 28, Malaysia 1800 887710,
Mexico 01 800 010 0793, Netherlands 31 (0) 348 433 466,
New Zealand 0800 553 322, Norway 47 (0) 66 90 76 60,
Poland 48 22 3390150, Portugal 351 210 311 210, Russia 7 495 783 6851,
Singapore 1800 226 5886, Slovenia 386 3 425 42 00,
South Africa 27 0 11 805 8197, Spain 34 91 640 0085,
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